Appendix C: Geotechnical Investigation

GEOTECHNICAL INVESTIGATION
FIRE STATION #25 AND
PARK IMPROVEMENTS
SAN MATEO, CALIFORNIA

for

City of San Mateo
Department of Public Works
Attn: Gogo Heinrich, Project Manager
1949 Pacific Boulevard
San Mateo, CA 94403-1430

by

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March 2017

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March 21, 2017
Project No. 1295.5
Ser. 5428

City of San Mateo
Department of Public Works
Attn: Gogo Heinrich, Project Manager
1949 Pacific Boulevard
San Mateo, CA 94403-1430

RE: GEOTECHNICAL INVESTIGATION
FIRE STATION #25 AND PARK IMPROVEMENTS
BOREL PARK PROPERTY
SAN MATEO, CALIFORNIA

Dear Ms. Heinrich:

As requested, we have performed a geotechnical and geologic hazards investigation for the planned Fire Station #25 and park improvements project to be located on the Borel Park property fronting the northeast side of Shafter Street between Barneson and Borel Avenues in San Mateo, California. The accompanying report presents the results of our field investigation, laboratory testing and engineering analyses. The site and subsurface conditions are discussed and recommendations for the soil and foundation engineering aspects of the project design are presented. The recommendations presented in this report are contingent upon our review of the grading and foundation plans for the proposed new construction and observation/testing of the earthwork and foundation installation phases of the project.

We refer you to the text of the report for detailed recommendations. If you have any questions concerning our findings, please call.

Very truly yours,
CLEARY CONSULTANTS, INC.

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INTRODUCTION

This report presents the results of our geotechnical investigation for the planned new Fire Station #25 and park improvements project on the Borel Park property fronting the northeast side of Shafter Street between Barneson and Borel Avenues in San Mateo, California (see Drawing 1, Site Vicinity Map for location). The purpose of this investigation was to explore the soil and foundation conditions in the general location of the planned new fire station and associated improvements, and to develop recommendations for the geotechnical engineering aspects of the project design. We have also performed a geologic and seismic hazards assessment for the project as part of the geotechnical investigation.

As shown on the site topographic survey prepared by CSG Consultants, dated October 10, 2016, and undated preliminary drawings provided by WLC Architects, received February 3, 2017, the Fire Station #25 project will include the construction of a new two-story fire station building at the southeastern corner of the property. We understand that the new building, which will have a first floor elevation of 68.0 feet, will require cuts of up to approximately twelve feet with the western portion of the building constructed as a partial basement. Additionally, we understand that new asphalt-paved driveways and parking stalls, exterior site retaining walls of up to seven feet in height, concrete vehicular and pedestrian pavements, bioswales and new underground utilities will also be installed as part of this project.

We understand that the park improvements project is in the pre-design phase of construction, and would consist of re-development of Borel Park. As such, any specific details of the park improvements project are currently unknown, and portions of this report pertaining to that project are for to be considered for construction feasibility purposes only.

SCOPE

As outlined in our proposal agreement dated July 8, 2016, the scope of our services for this investigation has included:

A. Geotechnical Investigation

1. Several site reconnaissances by our staff and review of relevant published and unpublished geologic literature and maps.

2. A field subsurface investigation consisting of six (6) exploratory borings drilled in the vicinity of the planned fire station building and for the park improvements feasibility study.

3. Laboratory testing of the soil samples obtained from the borings.

4. Engineering analysis of the field and laboratory data.

5. Preparation of this geotechnical investigation and geologic and seismic hazards assessment report for use in the project design and construction. The report includes our findings and recommendations for the following:

    a. Geologic and seismic setting of the site and surrounding area, including research and review of available geologic/seismic reports and maps.

    b. 2016 CBC seismic design criteria.

    c. Site preparation and grading.

d. Fire station building and site retaining wall foundation type(s) and applicable soil and foundation engineering design criteria.

e. Estimated foundation settlements.

f. Lateral earth pressures for fire station basement and site retaining walls.

g. Support of interior and exterior concrete slabs-on-grade.

h. Asphaltic concrete and aggregate baserock sections for new pedestrian and vehicular pavements.

i. Treatment of expansive soils, as required.

j. Backfilling and compaction of utility trenches.

k. Surface and subsurface drainage.

l. Percolation testing results.

m. Any other unusual design or construction conditions encountered in the investigation.

B. Geologic and Seismic Hazards Assessment

1. Discussion of geologic and seismic conditions and data on the nature of the site and potential earthquake damage including:

a. Regional geology and seismic conditions and historical information on the local and regional seismicity.

b. Location of known active and potentially active faults in the vicinity of the site, as well as nearby inactive faults.

2. Earthquake ground motion acceleration design parameters and geologic site classification in accordance with the 2016 California Building Code study requirements.

3. Potential site impacts related to faulting, liquefaction, lateral spreading, seismic settlement and differential compaction, landsliding, flooding and dam failure inundation with recommended mitigation measures, where appropriate.

This report has been prepared for the specific use of the City of San Mateo and its consultants in accordance with generally accepted geotechnical engineering principles and practices. No other warranty, either expressed or implied, is made. In the event that any substantial changes in the design or nature of the project are planned, the conclusions and recommendations of this report shall not be considered valid unless such changes are reviewed and the conclusions of this report modified or verified in writing. Any use or reliance of this report or the information herein by a third party shall be at such party's sole risk.

It should also be recognized that changes in the site conditions may occur with the passage of time due to environmental processes and/or acts of man, and that changes in building codes, the state of the practice or new information may require modifications in the recommendations presented herein. Accordingly, neither the client, nor any other party should rely on the information or conclusions contained in this report after three years from its date of issuance without the express written consent of Cleary Consultants, Inc.

METHOD OF INVESTIGATION

Several site reconnaissances were performed during the period from September 16, 2016 to March 9, 2017. A total of six exploratory borings were drilled using truck-mounted, hollow-stem auger drilling equipment under the guidance of our staff engineering geologist, Mr. Chris McMahon, on September 20 and 21, 2016 to a maximum depth of 40.0 feet (practical drilling refusal) at the locations shown on Drawing 4. A key describing the soil classification system and soil consistency terms used in this report is presented on Drawing 6 and the soil sampling procedures are described in Drawing 7. Logs of the borings are presented on Drawings 9 through 19.

The borings were located in the field by surveyor's wheel measurements and interpolation of the features shown on the site plan provided us. These locations should be considered accurate only to the degree implied by the method used.

Samples of the soil materials from the borings were returned to our laboratory for classification and testing. The results of moisture content, dry density, percent finer than No. 200 sieve, plasticity index and free swell testing are shown on the boring logs. The laboratory testing procedures followed during this investigation are summarized on Drawing 8. Drawings 20 and 21, Plasticity Charts, presents additional data on the plasticity index testing. Drawing 24 presents the results of R-Value testing on representative untreated bulk samples collected from the upper three feet of the borings. The results of soil corrosivity testing performed on a composite sample of the surficial soils collected from the borings are presented on Drawing 25.

A list of references consulted during the investigation is included at the end of the text.

SITE CONDITIONS

A. Surface

The subject property is bordered by Borel Middle School to the northeast, Barneson Avenue to the northwest, Shafter Street to the southwest and Borel Avenue to the southeast. The proposed Fire Station #25 site is situated in the southeast portion of the subject property on a generally southeasterly-facing hillside sloping downward at approximately eight percent towards Borel Avenue.

The subject property is currently occupied by shrubs and medium-to-large-sized trees, with a public garden situated in the northwest corner of the property. The slopes throughout the site showed no signs of instability.

No evidence of surface moisture was observed during our subsurface investigation during September 2016. On March 9, 2017, standing water was observed in a rutted area in the west end of the fire station site and seepage onto the sidewalk was observed along the base of the slope above Borel Avenue. The seepage and standing water appears to be perched on the near-surface sandy clay soils following an extensive period of heavy rainfall over the preceding two months.

The elevation of the fire station site ranges from approximately 68 to 80 feet above sea level; the remainder of the Borel Park property varies in elevation from approximately 57 to 83 feet above sea level.

B. Subsurface

Borings EB-1, EB-2 and EB-3 were located in the vicinity of the planned Fire Station #25 site, and EB-4, EB-5 and EB-6 were located to the northwest and spread throughout the remainder of property.

The borings generally encountered very stiff to hard sandy clay and dense to very dense clayey sand slope wash (Qsr) material from just below the ground surface to depths of 21.5 to 26.5 feet, underlain by sandstone and shale bedrock of the Franciscan Assemblage (fs) to the maximum depth explored of 40 feet (practical drilling refusal).

On the planned Fire Station #25 site, very stiff sandy clay was encountered overlying the slope was in the upper 4.25 feet of EB-1 and upper two feet of EB-2.

Elsewhere on the site, slope wash was encountered in EB-4 from the ground surface to the maximum depth explored of 20 feet. In EB-5, slope wash was encountered from the ground surface to a depth of 11.5 feet, underlain by very dense sand to the maximum depth explored of 23.75 feet (practical drilling refusal); this very dense sand is most likely fractured Franciscan Assemblage sandstone (fs).

Hard drilling conditions were encountered with standard penetration blow counts of 50 or more per six inches of penetration in both the slope wash material and Franciscan Assemblage bedrock, resulting in practical drilling refusal at depths shallower than the anticipated maximum depth of 50 feet.

The upper sandy clay and clayey sand soils are considered to have a moderate to high expansion potential based on their plasticity characteristics (Plasticity Indices = 11 to 30 percent) and the free swell test data (Free Swells of 40 to 70 percent).

The attached boring logs and related information depict subsurface conditions only at the specific locations shown on Drawing 4 and on the particular dates designated on the logs. Soil conditions at other locations may differ from conditions occurring at these boring locations. Also, the passage of time may result in a change of soil conditions at these boring locations due to environmental changes.

C. Groundwater

Groundwater was not encountered in the exploratory borings during drilling. It should be noted that the borings were only open for a period of a few hours and this may not have been sufficiently long to establish the stabilized water table conditions. It should also be noted that fluctuations of localized perched groundwater and the regional groundwater level can occur due to such factors as variations in rainfall, temperature, runoff, irrigation, and other factors not evident at the time our measurements were made and reported herein.

A State of California Seismic Hazard Zone Report for the San Mateo Quadrangle is not currently available, and information on historically high ground water levels typically provided in this type of report is therefore not available. Additionally, the State Water Resources Control Board GeoTracker website does not have data available for the site vicinity.

GEOLOGY AND SEISMICITY

The Fire Station #25 project site is located within the lowermost easterly foothills of the northwest-trending Santa Cruz Mountain Range. Published geologic mapping by Pampeyan (1994) indicates that the foothills are comprised largely of Jurassic-to-Cretaceous age Franciscan Assemblage (fs, fsr) rocks primarily consisting of both intact and sheared sandstone with interbedded siltstone, shale and occasionally coal, and at lower elevations by slope wash, ravine

fill and colluvial deposits (Qsr) and Older Alluvium (Qoa), consisting of unconsolidated to moderately consolidated gravel, sand, silt and clay. The project site is shown to be predominantly underlain by slope wash deposits (Qsr), with Older Alluvium (Qoa) mapped in the southeasternmost corner of the site, as shown on Drawing 2, Geologic Map.

The San Francisco Bay Area is recognized by geologists and seismologists as one of the most active seismic regions in the United States. The three major fault zones which pass through the Bay Area in a northwest direction have produced approximately a dozen earthquakes per century strong enough to cause structural damage. The faults causing these earthquakes are part of the San Andreas fault system, a major rift in the earth's crust that extends for at least 450 miles along the California Coast and includes the San Andreas, San Gregorio, Hayward and Calaveras faults. The site is located approximately 2.5 miles northeast of the San Andreas fault, 9.9 miles northeast of the San Gregorio fault, 15.8 miles southwest of the Hayward fault, and 23.5 miles southwest of the Calaveras fault, respectively. In addition, the site is located about 8.6 miles northwest of the potentially active Monta Vista-Shannon fault.

Since the early 1800's, major earthquakes have been recorded along the San Andreas, Hayward and Calaveras fault zones (Toppozoda et al, 2000). In 1861, an earthquake having a Richter magnitude of approximately 6.5 was reported on the Calaveras fault. The presumed epicenter of this earthquake was located approximately 25 miles northeast of the site. In 1984, an earthquake having a Richter magnitude of approximately 6.1 was reported on the Calaveras fault near Mt. Hamilton. The epicenter of this earthquake was located approximately 39 miles southeast of the site.

In 1868, an earthquake having a Richter magnitude of approximately 7.0 was recorded along the Hayward fault. This earthquake opened fissures at random locations along the fault, from San Pablo to Mission San Jose. The presumed epicenter of the 1868 earthquake is located approximately 16 miles northeast of the site. The San Francisco Earthquake of 1906 had a Richter magnitude of approximately 8.3 and the epicenter of this earthquake (Toppozoda et al,

2000) was located approximately 14 miles northwest of the site; the San Andreas fault also produced earthquakes having approximate magnitudes of 7.4 and 6.6 in 1838 and 1865, the presumed epicenters of which are located about 20 miles southeast and 33 miles southeast of the site, respectively.

An earthquake with Richter magnitude 5.4 experienced on the Concord fault in 1955 had its epicenter approximately 33 miles northeast of the site. Another damaging earthquake with Richter magnitude 5.3 occurred in 1957 on the San Andreas fault in Daly City, causing approximately one million dollars in damage. The epicenter of this earthquake was about 14 miles northwest of the site. Two earthquakes in 1980, along traces of the Greenville fault, had their epicenters approximately 36 miles northeast of the site. These 1980 earthquakes had Richter magnitudes of 5.5 and 5.8. In addition, numerous earthquakes of magnitudes 4.0 or greater have been recorded throughout the Bay Area along the San Andreas, Hayward and Calaveras faults. On October 17, 1989, the Loma Prieta earthquake, which had its epicenter 43 miles southeast of the school site and a Moment magnitude of 6.9, produced damage at widespread locations throughout the Bay Area.

On August 24, 2014, a Magnitude 6.0 earthquake occurred in the vicinity of the West Napa fault near American Canyon in Napa County; this earthquake, which had its epicenter approximately 46 miles north of the site, caused extensive damage in south Napa County.

The distances between the site and the capable segments of the above faults, as well as other significant faults within a radius of 60 miles from the site, was determined using the USGS Earthquake Hazards Program 2008 USGS National Seismic Hazard Maps – Fault Parameters, as presented below in Table 1:

TABLE 1 - Summary of Significant Earthquake Faults Capable of Generating Strong Ground Shaking at the Fire Station #25 Site in San Mateo, California[1], [2]

Earthquake Generating Fault	Approximate Distance and Direction to Generating Fault (Miles)	Maximum Earthquake (Moment Magnitude)
N. San Andreas SAO+SAN+SAP+SAS	2.5 SW	8.1
Monta Vista - Shannon	8.6 SW	6.5
San Gregorio Connected	9.9 SW	7.5
Hayward – Rodgers Creek RC+HN+HS	15.8 NE	7.3
Calaveras CN+CC+CS	23.5 NE	7.0
Mount Diablo Thrust	27.3 NE	6.7
Green Valley Connected	30.3 NE	6.8
Greenville Connected	34.9 NE	7.0
Zayante-Vergeles	37.1 SW	7.0
Point Reyes	39.1 NW	6.9
Great Valley 5	41.4 NE	6.7
West Napa	42.6 NE	6.7
Monterey Bay-Tularcitos	44.7 SW	7.3

[1] USGS Earthquake Hazards Program 2008 USGS National Seismic Hazard Maps – Fault Parameters, ran September 29, 2016

[2] Site Latitude: 37.5491°N; Site Longitude: 122.3223°W

The historical seismicity of the greater San Francisco Bay Area and surrounding region is presented on Drawing 3, Regional Earthquake Epicenter Map.

Modeling of earthquake occurrence probabilities over the 30-year period of 2014 to 2043 on both a statewide and regional basis was performed by the 2014 Working Group on California Earthquake Probabilities. The results of the study are presented in the Long-Term Time-Dependent Probabilities for the Third Uniform California Earthquake Forecast (Field, E.H., et al, 2015). The report indicates a 72 percent probability that one or more earthquake of magnitude 6.7 or greater will occur in the San Francisco Bay region between 2014 and 2043. Additionally, the probability of one or more regional earthquake of magnitude 6.0 or greater over the same time period is indicated to be 98 percent. Likewise, the occurrence of at least one regional earthquake of magnitude 5.0 or greater over this time period is evaluated as being a near certainty.

Therefore, similar to most of the San Francisco Bay Area, it is reasonable to assume that the new fire station building and associated improvements will be subjected to a moderate to severe earthquake from one of the above-mentioned faults during their lifetime. During such an earthquake, strong ground shaking is likely to occur at the site.

GEOLOGIC AND SEISMIC HAZARDS EVALUATION

A. Fault Offset Hazard

Based on the findings of this investigation, we conclude that there are no known active or potentially active faults crossing the project site. The site is also not within an Earthquake Fault Zone of the State of California Alquist-Priolo Earthquake Fault Zoning Act. Therefore, the hazard resulting from surface fault rupture at the site is considered low.

B. Ground Shaking Hazards

1. Strong Ground Shaking

Strong ground shaking is likely to occur during the lifetime of the planned fire station as a result of movement along one or more of the regional active faults discussed above. The new fire station building and associated improvements will need to be designed and constructed in accordance with current standards of earthquake-resistant construction.

2. Soil Liquefaction

Liquefaction is a phenomenon in which saturated, essentially cohesionless soils lose strength during strong seismic shaking and may experience horizontal and vertical movements. Soils that are generally most susceptible to liquefaction are clean, loose, saturated, uniformly graded, fine-grained sands that lie within roughly 50 feet of the ground surface.

The soils encountered in the exploratory borings predominantly consisted of non-saturated dense to very dense clayey sand underlain by sandstone/shale bedrock to the maximum depth explored of 40.0 feet. Very stiff to hard sandy clay was encountered in the upper 4.25 feet of EB-1 and a layer of very stiff sandy silt was encountered at a depth of 12 to 17 feet in EB-6. Free groundwater was not encountered in the borings and historic groundwater data for the site vicinity was unavailable. For the purpose of performing our analysis using LiquefyPro, the depth to the bottom of the boring was input as the depth to groundwater.

LiquefyPro evaluates liquefaction potential and calculates the settlement of saturated and unsaturated deposits due to seismic loads using SPT blowcount, total unit weight, fines content, peak horizontal acceleration and earthquake moment magnitude data. The program is based on the most recent publications of the NCEER Workshop and SP117A Implementation.

Based on the results of our analysis using the Liquefy Pro computer program, the theoretical liquefaction-induced settlement is nil at the site, using the calculated peak ground acceleration ($PGA_M = 0.806$) for the site as specified in Item 20 of CGS Note 48 (2013), and the Tokimatsu and Seed calculation method with magnitude scaling correction.

Based on the above information, we conclude that the likelihood that the new fire station and associated improvements will be damaged by earthquake-induced soil liquefaction is remote.

The results and supporting data for the liquefaction and dry settlement analysis are attached to this report in Appendix A.

3. Soil Densification

The recognized procedures for evaluation of seismically-induced settlement in dry sandy soils (Tokimatsu and Seed, 1987; Pradel, 1998) are considered most applicable to non-cohesive loose clean sands with less than 5 percent fines (Day, 2002). The clayey sand soils encountered in EB-1, EB-3 and EB-6 were conservatively analyzed for seismically-induced settlement using the LiquefyPro computer program (Version 5.0) and a factor of safety (FOS) of 1.3 per CGS Special Publication 117A.

LiquefyPro evaluates liquefaction potential and calculates the settlement of saturated and unsaturated deposits due to seismic loads using SPT blowcount, total unit weight, fines content, peak horizontal acceleration and earthquake moment magnitude data. The program is based on the most recent publications of the NCEER Workshop and SP117 Implementation.

The analysis indicates a theoretical seismically induced dry soil settlement of up to one and one-half inches could occur with up to approximately three-quarters of an inch of differential settlement predicted over a distance of 50 feet.

Based on the above information, we conclude that the likelihood that the new fire station and associated improvements will be damaged by earthquake-induced soil densification is low.

4. Other Seismic Hazards

We have also considered the possibility of other seismically induced hazards at the site. Due to the very low potential for liquefaction associated with the subsurface soils, soil lurching and lateral spreading are considered unlikely.

Ground cracking may be caused by any of the phenomena discussed above. Since there is a very low potential for liquefaction-induced settlement, soil densification or lateral spreading of the soils underlying the site, it is also considered unlikely that significant ground cracking will occur at the site. Landsliding is also very unlikely to occur at the site based on the relatively dense soil conditions encountered in the borings.

C. Flooding

Federal Emergency Management Agency Flood Insurance Rate Mapping (FIRM), dated July 16, 2015, indicates that the site is within an area "being protected from the 1-percent annual chance or greater flood hazard by a levee system."

The site is outside of the runup zone resulting from a seismically-generated tsunami as mapped by the State of California (2009). The site is also not located within the inundation zone of any lakes or reservoirs as mapped by San Mateo County (2005), therefore there is not a hazard at the site from inundation resulting from dam failure or a seiche.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of our investigation, we judge that there are no geologic hazards or constraints which would preclude the construction of the proposed Fire Station #25 project. Our analysis indicates that the potential total seismically-induced dry soil settlement at the site is on the order of one and one-half inch maximum with three-quarters of an inch of differential settlement at over a distance of 50 feet; and the likelihood for liquefaction-induced settlement is remote due to the relatively dense soil/bedrock conditions and absence of a static groundwater table at the site. From a soil and foundation engineering standpoint, we also conclude that the improvements can be constructed as planned provided the recommendations of this report are incorporated into the design and construction of the project.

The new Fire Station #25 building and associated retaining walls can be supported on conventional spread footing foundations bearing in the native stiff to hard sandy clay and dense to very dense clayey sand soils encountered at the site. Loose fill, if encountered at bearing grade, should be removed and replaced (as required, after cuts are made) as properly engineered fill. The new building and exterior slabs-on-grade should be supported on a nominal cushion of imported fill (aggregate base material).

The recommendations presented in the remainder of this report are contingent on our review of the earthwork and foundation plans for the project and our observation of the grading and foundation installation phases of the construction.

Additional investigation may be required for park improvements; however, future improvements to the property for use as a park should be considered feasible from a geological and geotechnical design standpoint.

A. Earthwork

1. Stripping and Site Preparation

Existing pavements, surface vegetation, underground utilities, trees and tree roots/stumps designated to be removed, old foundations, underground obstructions, tree roots and other site improvements not designated to remain should be removed to their full depth and extent and hauled from the site.

Holes resulting from the removal of underground obstructions (such as old concrete footings, abandoned utilities or tree root bulbs) that extend below the planned finished grade should be cleared of loose soil and debris, and backfilled with suitable material compacted to the requirements discussed below for engineered fill (see Section 4, Fill Placement and Compaction).

2. Moisture Conditioning and Recompaction of Surface Soils

After the new construction areas have been properly prepared and required excavations have been made, the surface soils in improvement areas, including any areas to be filled, should be properly moisture conditioned and recompacted. This work should consist of ripping the upper 12 inches, thoroughly moisture conditioning the soils to at least two percent above optimum moisture content, and compacting them to at least 90 percent relative compaction as determined by ASTM Test Designation D1557. Compaction should be performed using appropriately sized compaction equipment such as a self-propelled sheepsfoot compactor. Any required additional fill then can be placed after the surface soils have been scarified, moisture conditioned, and recompacted. The moisture conditioned soils should not be allowed to dry out prior to placing new fill.

Any unstable or pumping subgrade areas should be subexcavated, plugged with baserock and overlain with a stabilizing fabric such as Mirafi 600X. Fabric installation should be performed in accordance with the manufacturer's recommendations. The method and extent of any required stabilization work should be evaluated by our representative.

3. Slope Gradients and Fill Placement Over Existing Slopes

New permanent cut slopes, and any fill slopes, should be no steeper than 2:1 (horizontal to vertical). Fill placed on slopes steeper than 6:1 (horizontal to vertical) should be benched a minimum of two feet horizontally for every two vertical feet of new fill. Any loose old fill material encountered in new slope construction should be removed and replaced as properly engineered fill. Cut and fill slopes should be planted to minimize erosion and surface runoff should be diverted away from the top of slopes and carried to a suitable drainage collection system.

4. Fill Placement and Compaction

Existing soils having an organic content of less than three percent by volume, and which are free of construction debris, can be used as engineered fill. Fill material should not, however, contain rocks or lumps greater than six inches in greatest dimension with not more than 15 percent larger than 2.5 inches. Any imported fill to be used to raise grades in building and pavement areas should be predominantly granular with a maximum plasticity index of twelve. Imported fill to be placed within building pad areas should not contain ground-up asphalt.

Engineered fill should be compacted to at least 90 percent relative compaction, as determined by ASTM Test Designation D1557. Fill material should be spread and compacted in lifts not exceeding eight inches in uncompacted thickness. In order to

achieve satisfactory compaction in the subgrade and fill soils, it may be necessary to adjust the soil moisture content at the time of soil compaction. This may require that water be added and thoroughly mixed into any soils which are too dry or that scarification and aeration be performed in any soils which are too wet.

5. Temporary Cutslopes and Shoring

New site retaining walls are expected to be up to 15 feet high. Temporary slope excavations for the walls in the sandy to silty clay and clayey sand soils encountered during the site investigation are anticipated to be reasonably stable at an inclination of 1.5:1 (horizontal to vertical).

There are a number of factors which can influence the stability of temporary excavations, some of which the contractor can control. The contractor, therefore, should be solely responsible for designing and constructing stable temporary excavations and should shore, slope or bench the excavations as required to maintain their stability and comply with all applicable safety standards, including CAL-OSHA requirements. The temporary shoring system design and performance should be the responsibility of the contractor.

6. Utility Trenches

The presently available subsurface information indicates that the required utility trenches can be excavated with conventional backhoe equipment. Trenches deeper than five feet should be properly braced or sloped in accordance with the current requirements of CAL-OSHA or the local governmental agency, whichever is more stringent.

Utility trenches should be backfilled with engineered fill placed in lifts not exceeding eight inches in uncompacted thickness, except thicker lifts can be used with the approval of our representative provided satisfactory compaction is achieved. If on-site soil is used,

the material should be compacted to at least 85 percent relative compaction by mechanical means only. Imported sand also can be used for backfilling trenches provided it is compacted to at least 90 percent relative compaction. In building, slab, and pavement areas, the upper three feet of trench backfill should be compacted to at least 90 percent relative compaction for on-site soils, and 95 percent where imported clean sand backfill is used.

Water jetting to achieve the required level of backfill compaction should not be permitted.

7. Surface Drainage

Positive surface gradients of at least two percent on porous surfaces and one percent on paved surfaces should be maintained adjacent to the building so that water does not collect in the vicinity of the foundations. Water from roof downspouts should be collected into closed pipes which carry the runoff away from the building and discharged into approved drainage facilities, or discharged onto hardscape surfaces which drain toward collection basins or surface collectors.

8. Construction Observation

Grading and earthwork operations should be observed and tested by our representative for conformance with the project plans/specifications and our recommendations. This work includes site preparation, selection of satisfactory fill materials, and placement and compaction of the subgrades and fills. Sufficient notification prior to commencement of earthwork is essential to make certain that the work will be properly observed.

B. Fire Station Building Foundations

The new fire station and associated retaining walls can be supported on conventional continuous and isolated spread footings bearing in the native very stiff to hard sandy clay and dense to very dense clayey sand soils encountered at the site starting near the ground surface and at the anticipated cut depths. Spread footings should be founded a minimum of 24 inches below lowest adjacent finished grade, or be embedded at least 18 inches into undisturbed soil (whichever is greater). Continuous footings should have a minimum width of 24 inches and isolated footing should be at least 36 inches square. Footings located adjacent to utility trenches should have their bearing surfaces below and imaginary 1.5:1 (horizontal to vertical) plane projected upward from the bottom edge of the trench.

At the above depths, footings can be designed for an allowable bearing pressure of 3000 psf due to dead loads with a one-third increase for dead plus live loads (4000 psf) and a 50 percent increase for total design loads, including wind and seismic (4500 psf). All continuous footings should be provided with adequate top and bottom reinforcement (as specified by the structural engineer) to provide structural continuity and to permit spanning of local irregularities. A subgrade modulus of 150 pci can be used in the design of any required structural slabs or footing elements.

Lateral loads may be resisted by friction between the footing bottoms and the supporting subgrade. A friction coefficient of 0.30 is considered applicable. As an alternative, a passive resistance equal to an equivalent fluid weighing 300 pounds per cubic foot may be used for footings poured neat.

The excavation of footing trenches so that the trenches are left open for the minimum practical length of time prior to the placement of concrete. Footing trenches should be kept moist so that

any drying-shrinkage cracks are closed prior to placement of concrete. Moisture should be added in a light mist spray.

Settlements under the anticipated loads are expected to be within tolerable limits for the proposed construction.

C. Seismic Design Parameters

Seismic design values for the project were determined using the USGS Seismic Design Maps Web Tool Application with the 2008 USGS Hazard Data and the 2010 ASCE 7 (with July 2013 errata), and the subsurface information obtained from the exploratory borings which was used for determining the site classification. A site-specific seismic hazard analysis is also required (per CBC 2016 Section 1616A.1.3) for the project site location, as the site is assigned to Seismic Design Category E (per CBC 2016 Section 1613A.3.5). The site specific design parameters should be used for structural design.

The site-specific seismic hazard analysis was performed in accordance with Chapter 11 and Chapter 21, ASCE 7-10, the 2016 California Building Code and USGS 2008 California seismic source maps.

Seismic design values for the project were determined using the code guidelines, the most recent version of the USGS Web Tool, the EZ-FRISK application (Version 7.65.004), and subsurface information obtained from the exploratory borings which was used for determining the site classification. Using the site Latitude (37.5491°N) and Longitude (122.3223°W), the site classification, and the attenuation curves of Boore-Atkinson (2008) NGA USGS 2008 MRC, Campbell-Bozorgnia (2008) NGA USGS 2008 MRC and Chiou-Youngs (2007) NGA USGS 2008 MRC as input, the computer application provides probabilistic and deterministic spectral ground motion information including the 84th percentile and maximum rotated component at five percent damping. Risk Coefficients (C_R) for each period were calculated using Method 1 as

presented in Section 21.2.1.1 of the 2010 ASCE 7, and then applied to the probabilistic MCE to obtain the probabilistic MCE_R ground motion.

Based on the subsurface information (and standard penetration blow counts) obtained from the exploratory borings which extended to depths of up to 40 feet, and the shear strength values from laboratory testing of the soil samples, it is our opinion that the site should be categorized as Site Class C with an average shear wave velocity (Vs30) of 1850 ft/s (584 m/s).

The data obtained from our analysis based on ASCE 7-10 guidelines is shown in table form on the attached Drawing 22, Site Specific Ground Motion Spectra, and is shown in graphical form on Drawing 23.

The modal magnitude and distance to the California Gridded fault source are 7.00 (Mw) and 5.00 kilometers, respectively. Based on information provided in Appendix O of the USGS Open File Report 2013-1165, CGS Special Report 228, and Southern California Earthquake Center Publication 1792, the California Gridded seismicity sources are points or planer fault sources at the centers of evenly spaced grid cells in polygon-shaped areas that make up the UCERF3 forecast region. The polygons "express future distributed earthquake occurrences and account for the fact that many large earthquakes do not occur on known, mapped faults."

The modal magnitude and distance to the San Andreas Fault (Northern) are 8.05 (Mw) and 3.92 km, respectively.

These seismic sources generated the highest spectral acceleration values for all faults located within 100 km of the site.

Based on the findings of our investigation and the site-specific seismic hazard analysis, the following seismic design parameters can be used in lateral force analyses at this site:

Site Class C – Very Dense Soil and Soft Rock with Standard Penetration Test Values of greater than 50 blows/foot

USGS Code Based Web Tool Values:

Site Coefficient Fa = 1.0
Site Coefficient Fv = 1.3
Mapped Spectral Acceleration Values; $S_S = 2.064$, $S_1 = 0.976$
Spectral Response Accelerations; $SM_S = 2.064$, $SM_1 = 1.268$
Design Spectral Response Accelerations; $SD_S = 1.376$, $SD_1 = 0.846$

Site-specific Ground Motion Analysis Values (ASCE 7-10 Chapter 11, 21 and 2013 CBC):

Maximum Considered EQ Spectral Response (0.2 Second Period); $SM_S = 2.46$
Maximum Considered EQ Spectral Response (1-Second Period); $SM_1 = 1.39$
Design Spectral Response Acceleration (0.2 Second Period); $SD_S = 1.64$
Design Spectral Response Acceleration (1-Second Period); $SD_1 = 0.92$
Seismic Design Category E (S1 > 0.75)

D. Retaining Walls

Permanent retaining walls required for the project must be designed to resist lateral earth pressures and any additional lateral loads caused by surcharge loading. Retaining walls integral with the new building can be supported on the spread footing foundations designed in accordance with our previous recommendations.

We recommend that unrestrained walls with level or gently sloping backfill conditions be designed to resist an equivalent fluid pressure of 45 pcf and that restrained walls be designed to resist an equivalent fluid pressure of 45 pcf plus an additional uniform lateral pressure of ten H psf where H = height of backfill above wall foundation in feet. Wherever walls will be subjected to surcharge loads, they should be designed for an additional lateral pressure equal to one-third or

one-half the anticipated surcharge load depending on whether the wall is unrestrained or restrained, respectively. A seismic component of lateral earth pressure of 10 H^2 pounds per lineal foot of wall acting 0.6 H up from the bottom of the wall can be used for retaining wall design.

Detached landscape walls can be supported on spread footings bearing in stiff/medium dense native soil or properly engineered fill and can be designed for an allowable bearing pressure of 1500 psf due to dead loads and a 50 percent increase for total design loads (2250 psf) including wind and seismic. Footings should be embedded at least 18 inches and have a minimum width of 18 inches.

The preceding pressures assume that sufficient drainage is provided behind the retaining walls to prevent the build-up of hydrostatic pressures from surface or subsurface water infiltration. Adequate drainage may be provided by means of clean, 3/4 inch drain rock material enclosed in a filter fabric, such as Mirafi 140, and a four-inch diameter perforated pipe (Schedule 40 or stronger) placed at the base of the wall. The perforated pipe should be tied into a closed pipe and carried to a suitable drainage system.

Backfill material placed behind retaining walls should be non-expansive and compacted to at least 90 percent relative compaction using lightweight compaction equipment. If heavy compaction equipment is used, the walls should be appropriately braced during the backfilling. An 18-inch cap of impervious native clay soil should be placed over the top of the retaining wall backfill to minimize surface water infiltration.

If old fill is encountered in the retaining wall footing excavations, these materials should be removed and replaced with properly engineered non-expansive fill. The actual required extent of overexcavation and replacement of unsuitable fill materials in new retaining wall footing areas should be determined in the field by our representative.

E. Slabs-on-Grade

Slab-on-grade construction can be used for new building slabs and exterior flatwork. Just prior to final slab preparation, the subgrade should be checked to determine that the upper 12 inches of native soils are at approximately optimum moisture content and proof-rolled to provide firm, uniform support.

Interior building slabs should be underlain by a minimum 15 mil vapor retarder of permeance less than or equal to 0.01 perms (as tested by ASTM E1249) placed over six inches of 3/4-inch clean, free draining crushed rock. Care should be taken to prevent wear, punctures and/or tearing of the membrane during the construction phase (such as could result from the placement of rebar) subsequent to its installation; any tears or punctures should be tightly sealed. The drain rock layer should be underlain by an additional six inches (minimum) of virgin Class 2 aggregate baserock placed on the prepared subgrade soil and compacted to at least 90 percent relative compaction.

The exterior concrete flatwork areas should be underlain by six inches (minimum) of Class 2 aggregate baserock placed on the prepared subgrade soil.

Reinforcement of slabs should be provided in accordance with their anticipated use and loading, but as a minimum, slabs should be reinforced with No. 3 bars at 18 inches on center, both ways, or No. 4 bars at 24 inches on center, both ways. Concrete slabs should be articulated with a maximum joint spacing of ten feet in both directions.

Drainrock, baserock and/or import material placed beneath interior slabs or within the building pads should be virgin "non-recycled" material.

F. Flexible Pavements

The results of laboratory R-Value testing performed on a representative bulk sample of the near surface soils indicate these materials have an R-Value of six. Utilizing the estimated Traffic Indices presented below, and design procedure 301-F of the California Department of Transportation, we have prepared the following minimum flexible pavement sections:

Table 2 - Recommended Flexible Pavement Sections

Traffic Condition	Asphaltic Concrete (inches)	Class 2 Aggregate Base (inches)	Total Thickness (inches)
Auto Parking (T.I. = 4.5)	**3.0**	**8.0**	**11.0**
Fire Lane, Driveways (T.I. = 6.0)	**4.0**	**12.0**	**16.0**

The upper six inches of subgrade and the Class 2 aggregate baserock section should be compacted to at least 95 percent relative compaction. Any fill required below the upper six inches of subgrade should be compacted to at least 90 percent.

The subgrade should be statically rolled with a heavy, smooth drum roller to provide a smooth firm surface.

AC hardscape pavements should consist of at least two inches of asphaltic concrete over a minimum of six inches of compacted Class 2 aggregate baserock.

Class 2 aggregate base should have an R-Value of at least 78 and conform to the requirements of Section 26, State of California "CALTRANS" Standard Specifications, latest edition. The aggregate base material should be placed in thin lifts in a manner to prevent segregation, and should be uniformly moisture conditioned and compacted to at least 95 percent relative compaction to provide a smooth, unyielding surface.

The asphaltic concrete should conform to and be placed in accordance with the requirements of Section 39 in the State of California CALTRANS Standard Specifications, latest edition.

G. Percolation Testing Results

Two percolation tests, PERC-1 and PERC-2, were performed in the vicinity of EB-2 and EB-6, respectively; PERC-1 is located in the vicinity of the planned Fire Station #25 site, whereas PERC-2 is located in the northwestern portion of the existing park. The approximately eight-inch diameter percolation test holes were drilled to a depth of approximately three and one-half feet below the adjacent subgrade. The sides and bottoms of the holes were scraped and cleared of loose soil. The bottoms of the holes were then filled with pea-gravel to a depth of two inches, a four-inch diameter perforated pipe was placed in each hole, and the annular space around the pipe was backfilled with additional pea-gravel. The holes were then "pre-soaked" by filling with water and left over-night. Water level percolation rates in the wells were subsequently measured the next day to establish the field percolation rate. The results of our analysis of the data from the field indicate corrected percolation rates[(1)] as follows:

PERC-1 = 0.41 in/hr
PERC-2 = 0.27 in/hr

[(1)]Results corrected for pipe thickness, pipe diameter, hole diameter and pea-gravel void ratio.

H. Soil Corrosivity

Laboratory resistivity, pH, chloride and sulfate testing was performed on a composite soil sample of the upper soils obtained from EB-1 through EB-6 during our geotechnical investigation for this project. The testing was performed by Cooper Testing Laboratory for the purpose of evaluating the soils' corrosion potential for use in the design of underground utilities and embedded concrete on this project.

In summary, the test results indicated a minimum resistivity of 2,415 Ohm-Cm, a pH of 7.0, a chloride content of eight ppm, and water soluble sulfate content of 32 ppm. Soils with chloride contents of less than 500 ppm and sulfate contents of less than 1500 ppm are considered to be of "low" corrosivity. However, based on the resistivity testing, the soils are considered "mildly corrosive."

Table 3 below shows the general correlation between resistivity and corrosion potential.

Table 3 - Correlation Between Resistivity and Corrosion Potential (c)

Soil Resistivity (ohm-cm)	Soil Classification
Below 500	Very Corrosive
500 to 1,000	Corrosive
1,000 to 2,000	Moderately Corrosive
2,000 to 10,000	Mildly Corrosive
Above 10,000	Progressively Less Corrosive

(c) National Association of Corrosion Engineers.

This condition could result in reduced life span of buried steel piping and culverts for this project. Thicker gauge pipelines would have greater life spans. For example, the life spans for 18, 16 and 14 gauge steel culverts with a soil resistivity of 2,415 ohm-cm and a pH of 7.0 are estimated to be roughly 23, 29 and 36 years, respectively (California Division of Highways, 1993).

For the purposes of design of concrete in contact with the soil, there are no restrictions on types of cementitious materials to be used based on the resistivity testing and sulfate testing.

PLAN REVIEW AND CONSTRUCTION OBSERVATION

We should be provided the opportunity to review the foundation and grading plans and the specifications for the project when they are available. We should also be retained to provide soil engineering observation and testing services during the grading and foundation installation phases of the project. This will provide the opportunity for correlation of the soil conditions found in our investigation with those actually encountered in the field, and thus permit any necessary modifications in our recommendations resulting from changes in anticipated conditions.

****

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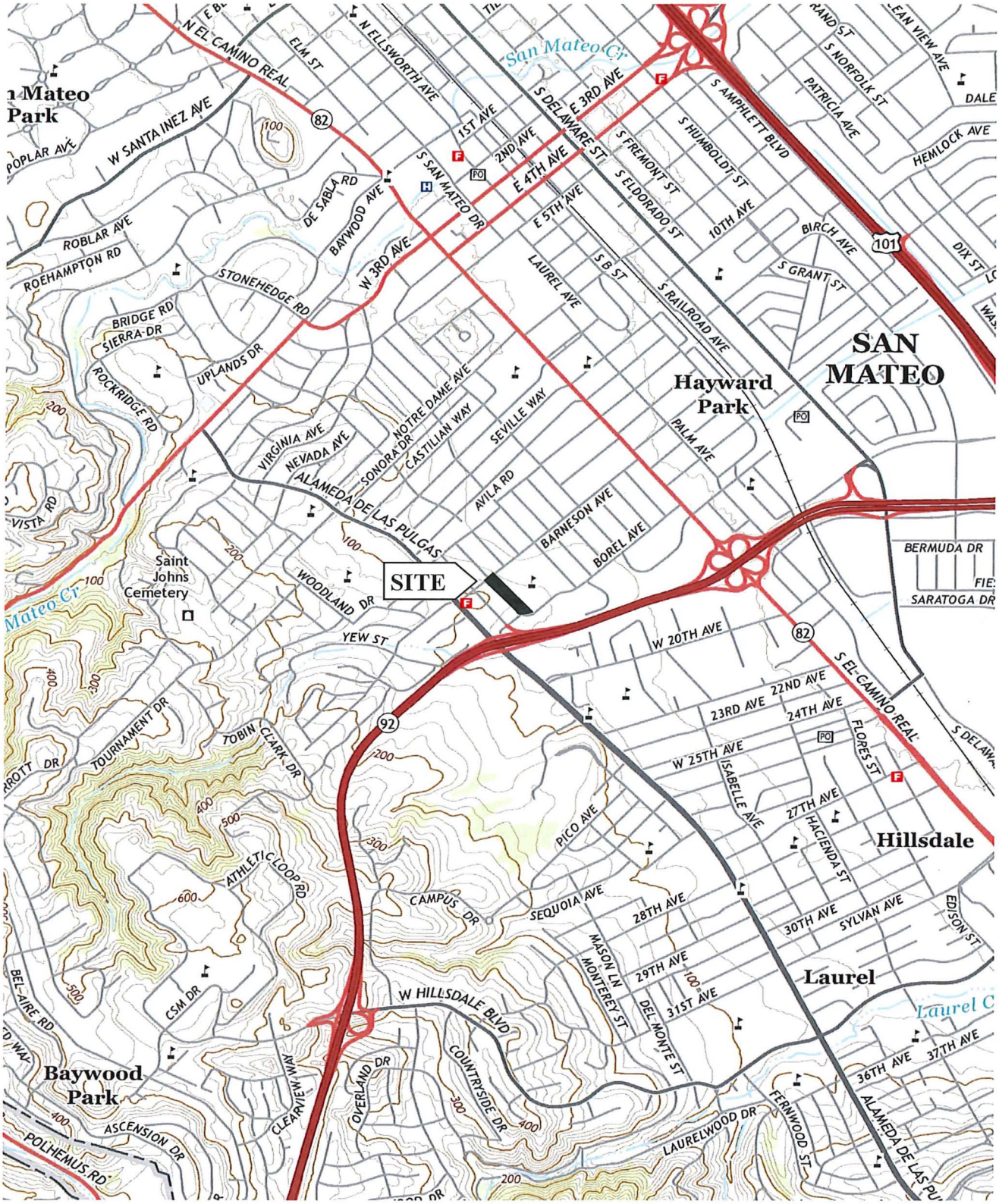
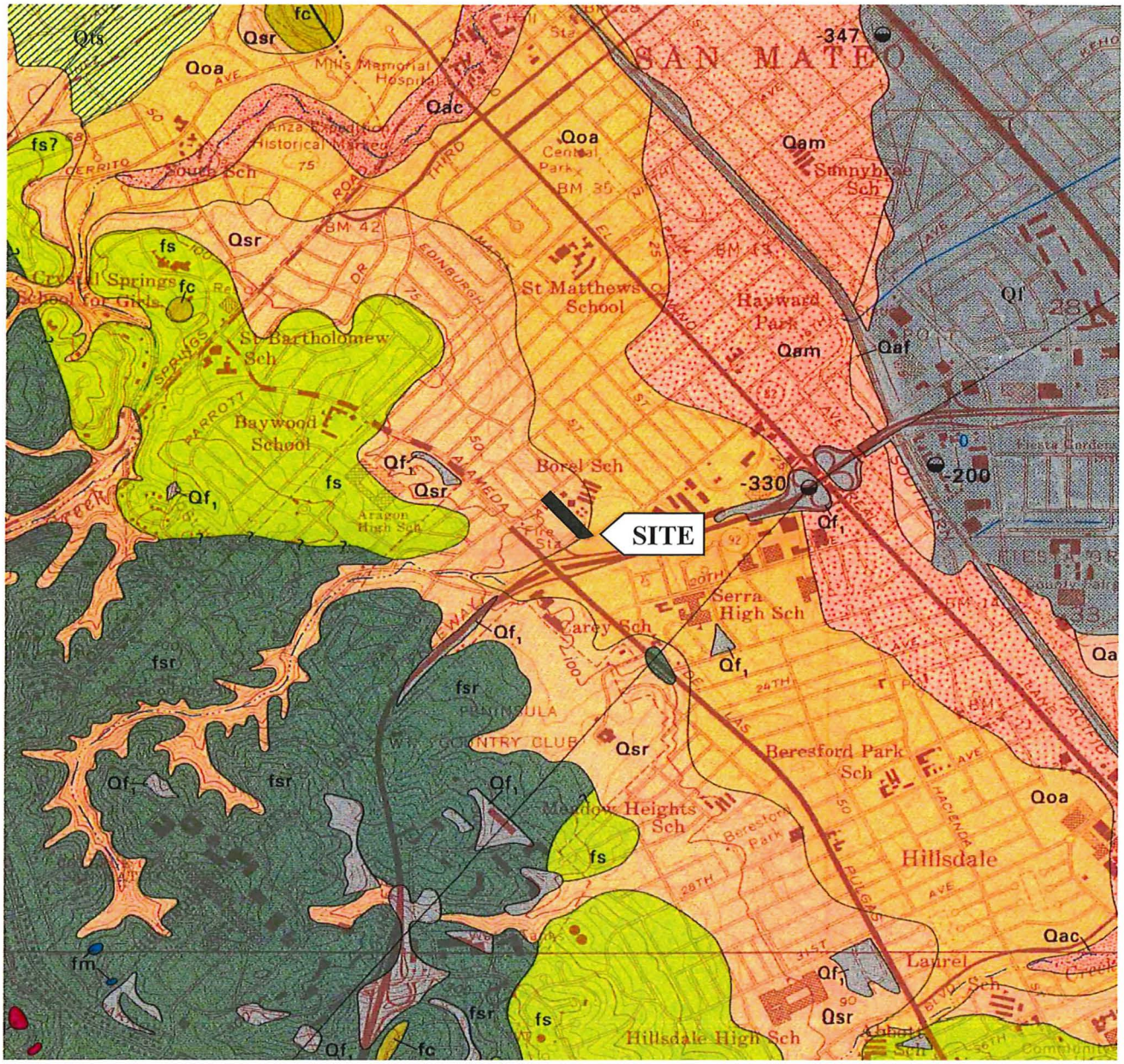


BASE: U.S. Geological Survey, 2015, San Mateo 7-1/2' Quadrangle, San Mateo County, California

SITE VICINITY MAP

CLEARY CONSULTANTS, INC. *Geotechnical Engineers and Geologists*	FIRE STATION #25 AND PARK IMPROVEMENTS City of San Mateo San Mateo, California			
APPROVED BY	**SCALE**	**PROJECT NO.**	**DATE**	**DRAWING NO.**
GF	1" = 2000'	1295.5	March 2017	1



EXPLANATION

Qf	Artificial Fill (Historic)
Qaf, Qam, Qac	Alluvium (Holocene)
Qsr	Slope Wash, Ravine Fill and Colluvium (Holocene)
Qoa	Older Alluvium (Pleistocene)
Qts	Undifferentiated Sedimentary Deposits (Quaternary)
fc, fm, fs, fsr	Franciscan Assemblage (Jurassic to Cretaceous)
	Fault (dashed where inferred, dotted where concealed)

N

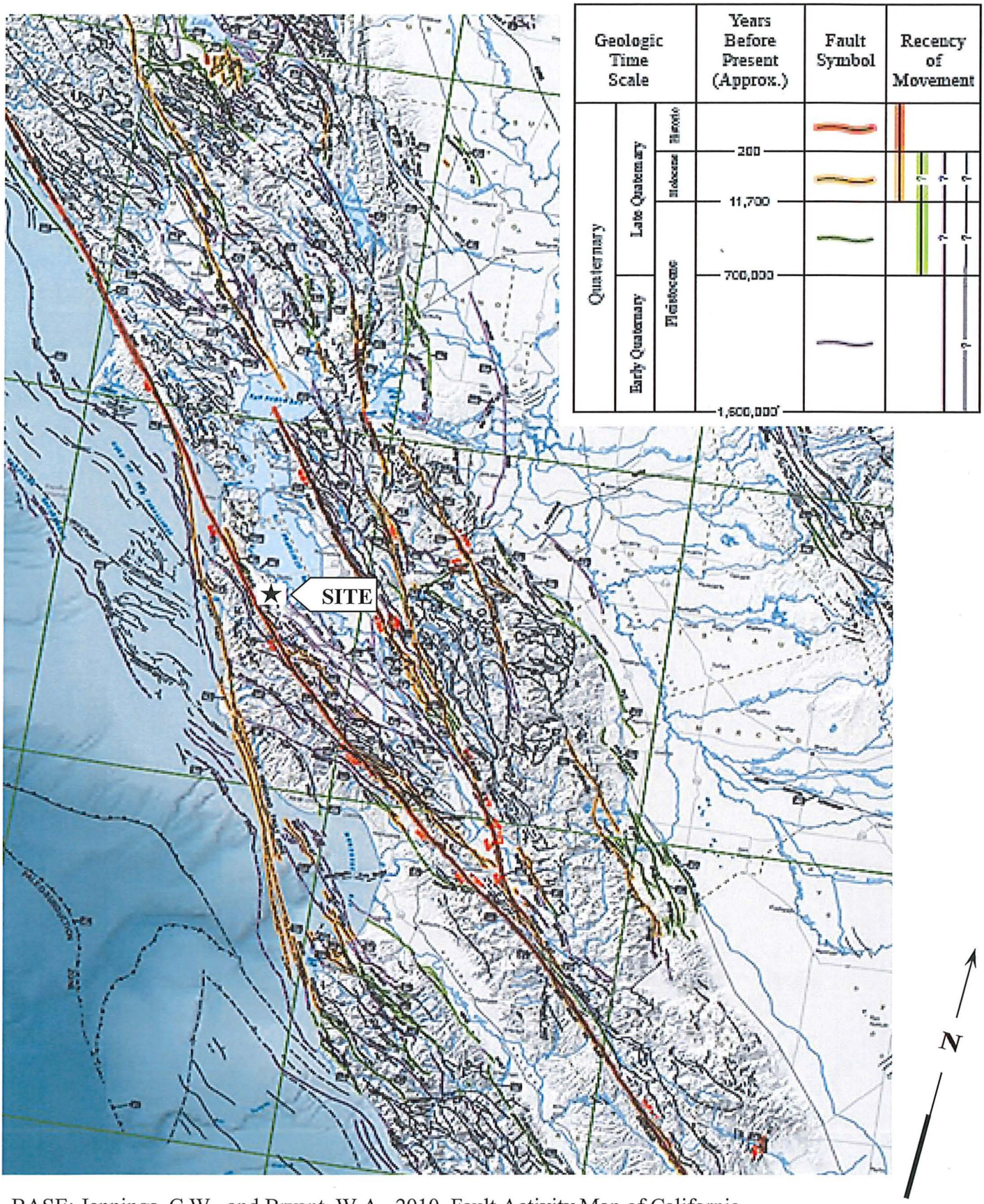
BASE: Pampeyan, E.H., 1994, Geologic Map of the Montara Mountain and San Mateo 7-1/2' Quadrangles, San Mateo County, California, U.S. Geological Survey Map, I-2390.

LOCAL GEOLOGIC MAP

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
GF	1" = 2000'	1295.5	March 2017	2



BASE: Jennings, C.W., and Bryant, W.A., 2010, Fault Activity Map of California

REGIONAL FAULT MAP

CLEARY CONSULTANTS, INC.
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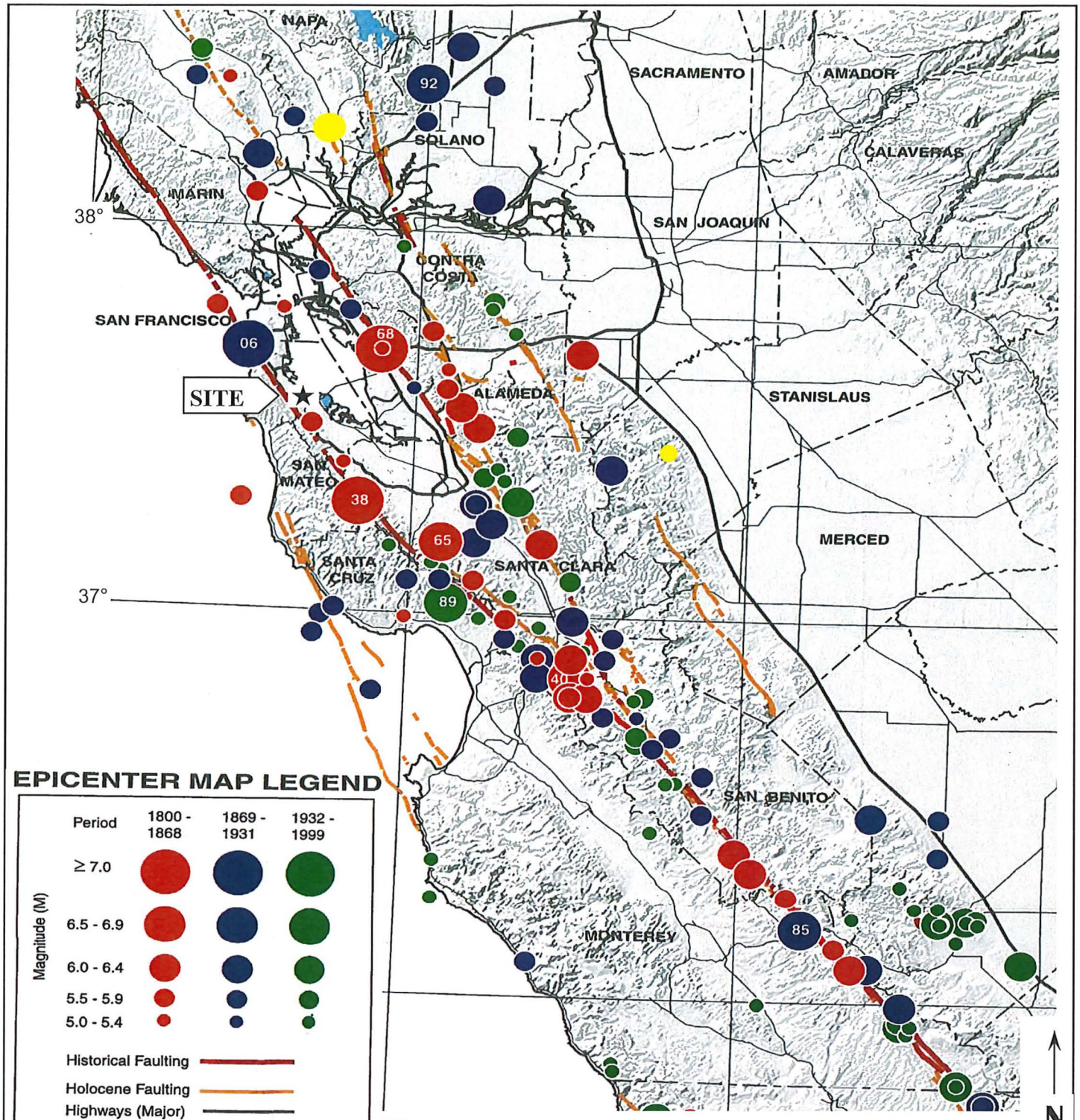
FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
GF	1" = 24 miles ±	1295.5	March 2017	3



BASE: CDMG Map Sheet 49; Toppozada et al, 2000. Magnitude 5.0 and Greater Earthquakes Plotted Through 1999; Subsequent Earthquakes through August 2014 plotted in yellow.

REGIONAL EARTHQUAKE EPICENTER MAP

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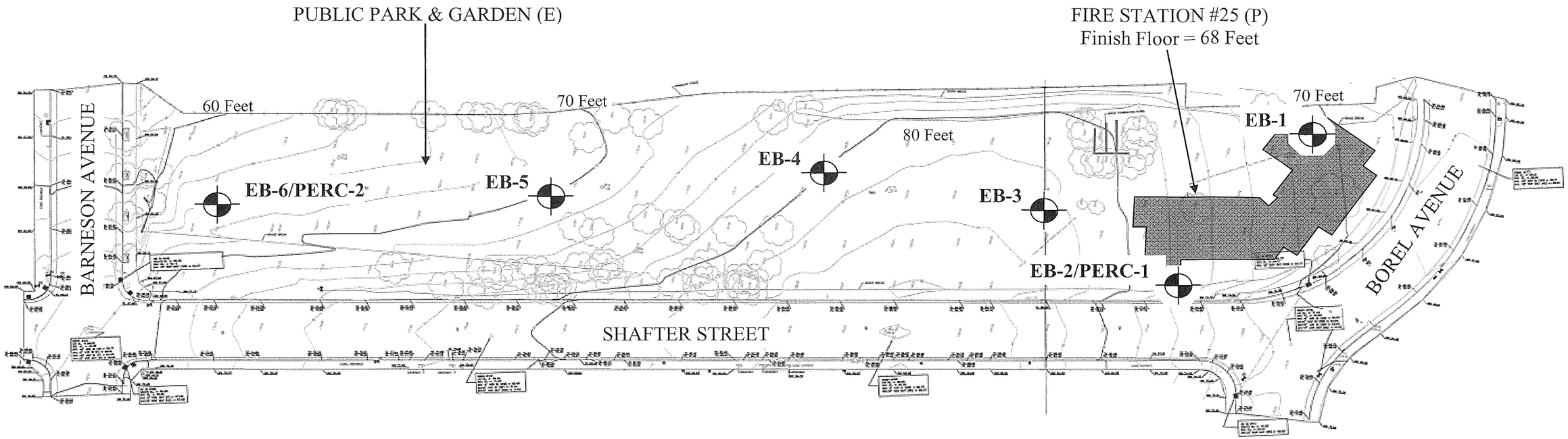
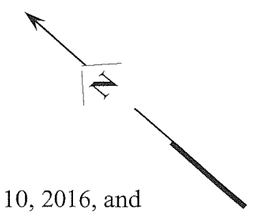
FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
GF	1" = 25 miles ±	1295.5	February 2017	4





EXPLANATION

EB-1/PERC-1 Approximate Location of Exploratory Boring/Percolation Test

BASE: Site Topographic Survey prepared by CSG Consultants, Inc., dated October 10, 2016, and Preliminary Building Footprint prepared by WLC Architects, Inc., received February 3, 2017.

SITE PLAN

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
GF	1" = 60' ±	1295.5	March 2017	5

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISION
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% 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	SM	Silty sands, sand-silt mixtures, non-plastic fines
			SC	Clayey sands, sand-clay mixtures, plastic fines
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS 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 IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous 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

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

U.S. STANDARD SERIES SIEVE — CLEAR SQUARE SIEVE OPENINGS

200	40	10	4	3/4"	3"	12"

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

GRAIN SIZES

SANDS AND GRAVELS	BLOWS/FOOT ✧
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

RELATIVE DENSITY

SILTS AND CLAYS	STRENGTH ☆	BLOWS/FOOT ✧
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

CONSISTENCY

✧ Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split barrel (ASTM D-1586).

☆ Unconfined compressive strength in tons/sq.ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

KEY TO EXPLORATORY BORING LOGS

FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

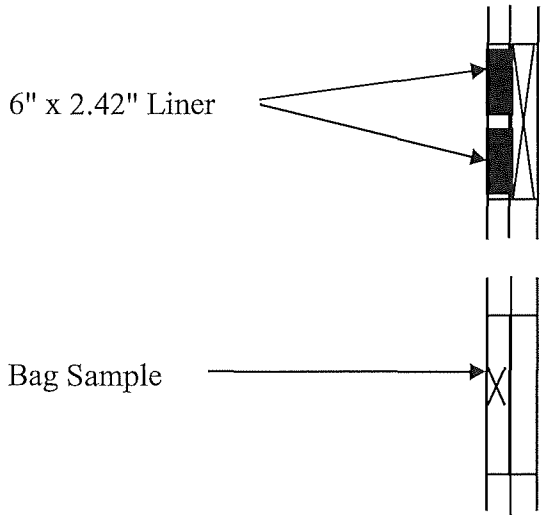
PROJECT NO.	DATE	DRAWING NO.
1295.5	March 2017	6

FIELD SAMPLING PROCEDURES

The soils encountered in the borings were continuously logged in the field by our representative and described in accordance with the Unified Soil Classification System (ASTM D-2487).

Representative soil samples were obtained from the borings at selected depths appropriate to the soil investigation. All samples were returned to our laboratory for classification and testing.

In accordance with the ASTM D1586 procedure, the standard penetration resistance was obtained by dropping a 140 pound hammer through a 30-inch free fall. The 2-inch O.D. Standard split barrel sampler was driven 18 inches or to practical refusal and the number of blows were recorded for each 6-inch penetration interval. The blows per foot recorded on the boring logs represent the accumulated number of blows, or N-value, required to drive the penetration sampler the final 12 inches. In addition, 3.0 inch O.D. x 2.42 inch I.D. drive samples were obtained using a Modified California Sampler and 140 pound hammer. Blow counts for the Modified California Sampler were converted to standard penetration resistance by multiplying by 0.6. The sample type is shown on the boring logs in accordance with the designation below.



Where obtained, the shear strength of the soil samples using either Torvane (TV) or Pocket Penetrometer (PP) devices is shown on the boring logs in the far right hand column.

CLEARY CONSULTANTS, INC. *Geotechnical Engineers and Geologists*	SUMMARY OF FIELD SAMPLING PROCEDURES FIRE STATION #25 AND PARK IMPROVEMENTS City of San Mateo San Mateo, California		
	PROJECT NO.	DATE	DRAWING NO.
	1295.5	March 2017	7

LABORATORY TESTING PROCEDURES

The laboratory testing program was directed toward a quantitative and qualitative evaluation of the physical and mechanical properties of the soils underlying the site.

The natural water content was determined on 76 samples of the materials recovered from the borings in accordance with the ASTM D2216 Test Procedure. These water contents are recorded on the boring logs at the appropriate sample depths.

Dry density determinations were performed on 54 samples to measure the unit weight of the subsurface soils in accordance with the ASTM D2937 Test Procedure. The results of these tests are shown on the boring logs at the appropriate sample depths.

Atterberg Limit determinations were performed on 13 samples of the subsurface soils in accordance with the ASTM D4318 Test Procedure to determine the range of water contents over which the materials exhibited plasticity. The Atterberg Limits are used to classify the soils in accordance with the Unified Soil Classification System and to evaluate the soil's expansion potential. The results of these tests are presented on Drawing 20 and 21 and on the boring logs at the appropriate sample depths.

The percent soil fraction passing the No. 4 and No. 200 sieves was determined on 13 and 19 samples of the subsurface soils, respectively, in accordance with the ASTM D1140 Test Procedure to aid in the classification of the soils. The results of these tests are shown on the boring logs at the appropriate sample depths.

Free swell tests were performed on 18 samples of the soil materials to evaluate the swelling potential of the soil. The free swell tests were performed by slowly pouring 10 ml of air dried soil passing the No. 40 sieve into a 100 ml graduated cylinder filled with approximately 90 ml of distilled water. The suspension was stirred repeatedly to ensure thorough wetting of the soil specimen. The graduated cylinder was then filled with distilled water to the 100 ml mark and allowed to settle until equilibrium was reached (approximately 24 hours). The free swell volume of the soil was then noted. The percent free swell was calculated by subtracting the initial soil volume from the free swell volume, dividing the difference by the initial volume, and multiplying the result by 100 percent. The results of these tests are presented on the boring logs.

R-Value testing was performed by Cooper Testing Laboratory on a representative mixture of untreated samples of the subgrade soils to provide data for the pavement design. The tests were performed in accordance with California Test Method 301-F and indicated an R-Value of six at an exudation pressure of 20 pounds per square inch. The results of the test are presented on Drawing 24.

Corrosion testing was performed on a composite sample of the surficial soil materials from EB-1 through EB-6 at a depth of 0.5 to 1.5 feet. Testing included resistivity, pH, chloride and sulfate testing performed in accordance with ASTM G57, ASTM G51, Caltrans 422(modified) and Caltrans 417(modified), respectively. The results of these tests are presented on Drawing 25 and are discussed in Section H. Soil Corrosivity.

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	70' ±	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	21.5' ±	DATE DRILLED	9/20/2016

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (feet)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
Dry Grass Landscape	Grayish Brown	Very Stiff	CL	0					
SANDY CLAY, moist, fine grained sand				1					
(Qsr - Slope Wash)						23	7	103	PP>4.5
@1.5': Liquid Limit = 27% Plasticity Index = 13% Finer than #4 = 98% Finer than #200 = 61% Free Swell = 40%				2					
				3		32	13		
				4			12	115	
CLAYEY SAND, moist, fine to medium grained sand	Yellowish Brown	Dense	SC-CL	5		43	11	110	PP>4.5
(Qsr - Slope Wash)		Very Dense							
@4.5': Liquid Limit = 32% Plasticity Index = 20% Finer than #4 = 100% Finer than #200 = 49% Free Swell = 60%				6		55	10		
				7					
			SC	8					
@9.0': fine subangular to subrounded gravel				9		64/9"	12	112	PP>4.5
				10			10	124	
				11					
				12					
				13					
				14		60			
		Dense		15					
@16.0': Finer than #4 = 71% Finer than #200 = 28% Free Swell = 30%				16		47	9	107	PP>4.5
				17			9	111	
	Grayish Brown	Very Dense		18					
				19		45/5"	9		
				20					

* Drilled with a CME-75 Truck Mounted Rig
PP = Pocket Penetrometer

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

LOG OF EXPLORATORY BORING NO. 1
FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
GF	---	1295.5	March 2017	9

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	70' ±	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	21.5' ±	DATE DRILLED	9/20/2016

DESCRIPTION AND CLASSIFICATION				DEPTH (feet)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
CLAYEY SAND, moist, continued... (Qsr - Slope Wash)	Grayish Brown	Very Dense	SC	21					
SANDSTONE, slightly moist, fine to medium grained sand, some clay (fs - Franciscan Assemblage) @23.5': Liquid Limit = 24% Plasticity Index = 10% Finer than #200 = 21% Free Swell = 40%	Dark Yellowish Brown	(Very Dense)	(SC)	22 23 24	⊠	30/3"	5		
				25 26 27	⊠	50/2"	5		
Bottom of Boring = 27.0' (Practical Drilling Refusal)				28 29 30 31 32 33 34 35 36 37 38 39 40					

* Drilled with a CME-75 Truck Mounted Rig

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

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LOG OF EXPLORATORY BORING NO. 1
FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
GF	---	1295.5	March 2017	10

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	77' ±	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	22.0' ±	DATE DRILLED	9/21/2016

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (feet)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
Dry Grass Landscape	Yellowish Brown	Very Stiff	CL	0					
SANDY CLAY, moist, fine to medium grained sand, fine rootlets				1			6	100	PP>4.5
@1.5': Liquid Limit = 35% Plasticity Index = 19% Finer than #4 = 100% Finer than #200 = 64% Free Swell = 50%				2		19	14	99	
		Hard	CL-SC	3		34	13		
SANDY CLAY, moist, fine to medium grained sand (Qsr - Slope Wash)	Yellowish Brown			4			11	117	PP>4.5
@4.5': Liquid Limit = 36% Plasticity Index = 17% Finer than #4 = 99% Finer than #200 = 51% Free Swell = 60%				5		53/11"	13	112	
				6		52	10		
				7					
CLAYEY SAND, moist, fine to coarse grained sand, occasional fine subrounded gravel (Qsr - Slope Wash)	Yellowish Brown	Medium Dense	SC	8					
				9			13	117	PP>4.5
				10		29	14	116	
				11					
		Dense		12					
				13					
@14.5': Finer than #4 = 71% Finer than #200 = 17% Free Swell = 30%				14			9	116	PP>4.5
				15		50	10	125	
				16					
		Very Dense		17					
				18					
				19			14	121	
				20		51/11"	12	125	

* Drilled with a CME-75 Truck Mounted Rig
PP = Pocket Penetrometer

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

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LOG OF EXPLORATORY BORING NO. 2
FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
GF	---	1295.5	March 2017	11

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	77' ±	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	22.0' ±	DATE DRILLED	9/21/2016

DESCRIPTION AND CLASSIFICATION				DEPTH (feet)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
CLAYEY SAND, moist, continued... (Qsr - Slope Wash)	Yellowish Brown	Very Dense	SC	21					
SHALE, slightly moist, fine grained sand (fs - Franciscan Assemblage) @23.5': Liquid Limit = 24% Plasticity Index = 10% Finer than #200 = 30%** Free Swell = 30%	Dark Gray	(Hard)	(CL)	22 23 24		30/6"	4	132	PP > 4.5
Bottom of Boring = 24.0'				25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40					

* Drilled with a CME-75 Truck Mounted Rig
** Value greater than 50% with additional processing (Shale)

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

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LOG OF EXPLORATORY BORING NO. 2
FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
GF	---	1295.5	March 2017	12

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	82' ±	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	26.5' ±	DATE DRILLED	9/20/2016

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (feet)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
Dry Grass Landscape	Yellowish Brown	Dense	SC-CL	0					
CLAYEY SAND, moist, fine to occasionally coarse grained sand, occasional fine subangular to subrounded gravel				1			10	108	PP > 4.5
						39	13	109	
(Qsr - Slope Wash)				2					
@1.5': Finer than #4 = 98% Finer than #200 = 50% Free Swell = 45%			SC	3	X	48	14		
		Very Dense		4			14	111	
@4.5': Liquid Limit = 50% Plasticity Index = 30% Finer than #4 = 93% Finer than #200 = 37% Free Sell = 70%						51	11	120	PP > 4.5
		Dense		5					
				6	X	47	14		
				7					
		Very Dense		8					
				9			11	118	
@9.5': occasional coarse subangular to subrounded gravel						53	11	122	
				10					
				11					
		Dense		12					
				13					
				14			17	110	
						42	12	124	
				15					
				16					
	Dark Yellowish Brown	Very Dense	SC-SP	17					
				18					
				19	X	49/6"	6	105	
				20					

* Drilled with a CME-75 Truck Mounted Rig
PP = Pocket Penetrometer

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

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LOG OF EXPLORATORY BORING NO. 3
FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
GF	---	1295.5	March 2017	13

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	82' ±	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	26.5' ±	DATE DRILLED	9/20/2016

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (feet)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
CLAYEY SAND, moist, continued... (Qsr - Slope Wash)	Dark Yellowish Brown	Very Dense	SC-SP	21					
				22					
				23					
				24		30/3"	10		
				25					
				26					
SHALE, slightly moist, fine to medium grained sand (fs - Franciscan Assemblage)	Dark Gray	(Hard)	(CL)	27					
				28					
@28.5': Liquid Limit = 21% Plasticity Index = 8% Finer than #200 = 31%** Free Swell = 30%				29		30/4"	5	120	
				30					
				31					
			(ML)	32					
				33					
@34.0': decreased clay content				34		45	10	129	
				35			10	129	
				36					
	Greenish Gray			37					
				38					
@39.0': serpentinized				39		52	12	126	
* Drilled with a CME-75 Truck Mounted Rig ** Value greater than 50% with additional processing (Shale) Bottom of Boring = 40.0' (Practical Drilling Refusal)				40			7	138	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

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LOG OF EXPLORATORY BORING NO. 3
FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
GF	---	1295.5	March 2017	14

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	80' ±	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	Not Enc.	DATE DRILLED	9/20/2016

DESCRIPTION AND CLASSIFICATION				DEPTH (feet)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
Soil Pathway	Yellowish Brown	Very Stiff	CL	1					
SANDY CLAY, moist, fine to medium grained sand									
(Qsr - Slope Wash)						23	7	102	PP > 4.5
@1.5': Liquid Limit = 49% Plasticity Index = 28% Finer than #4 = 100% Finer than #200 = 57% Free Swell = 70%		Hard		2			15	107	
				3		46	11		
CLAYEY SAND, moist, fine to coarse grained sand, fine subangular to subrounded gravel		Dense	SC	4			14	117	
(Qsr - Slope Wash)						47	15	116	
@4.5': Finer than #4 = 92% Finer than #200 = 31% Free Swell = 20%		Very Dense		5					
				6		51	15		
				7					
		Dense		8					
				9			12	120	
						44	15	124	
				10					
				11					
		Very Dense		12					
				13					
				14		30/6"			
				15		56			
				16					
		Dense		17					
				18					
				19			14	114	
				20		42	16	126	

* Drilled with a CME-75 Truck Mounted Rig
PP = Pocket Penetrometer
Bottom of Boring = 20.0'

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

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LOG OF EXPLORATORY BORING NO. 4
FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
GF	---	1295.5	March 2017	15

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	71' ±	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	Not Enc.	DATE DRILLED	9/21/2016

DESCRIPTION AND CLASSIFICATION				DEPTH (feet)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
Dry Grass Landscape	Yellowish Brown	Very Stiff	CL						
SANDY CLAY, moist, fine to occasionally coarse grained sand				1					
(Qsr - Slope Wash)				2		20	9	89	PP=1.25
@3.0': Liquid Limit = 35% Plasticity Index = 19% Finer than #4 = 99% Finer than #200 = 59% Free Swell = 70%				3		30	10		
				4					
				5		18	19	105	PP>4.5
		Hard		6		71/9"	10		
				7					
				8					
				9		30/2"	14		
				10					
				11					
SAND, slightly moist, fine to coarse grained sand	Brown	Very Dense	SP	12					
(fs? - probable fractured Franciscan Assemblage SANDSTONE)				13					
@13.5': Liquid Limit = Non-Plastic Plasticity Index = Non-Plastic Finer than #200 = 6% Free Swell = 10%				14		30/2"	3		
				15					
				16					
				17					
				18					
				19		30/3"	3		
				20					

* Drilled with a CME-75 Truck Mounted Rig
PP = Pocket Penetrometer

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

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Geotechnical Engineers and Geologists

LOG OF EXPLORATORY BORING NO. 5
FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
GF	---	1295.5	March 2017	16

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	71' ±	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	Not Enc.	DATE DRILLED	9/21/2016

DESCRIPTION AND CLASSIFICATION				DEPTH (feet)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
SAND, slightly moist, continued...	Brown	Very Dense	SP	21					
(fs? - probable fractured Franciscan Assemblage SANDSTONE)				22					
				23					
					■X	30/3"	3		
Bottom of Boring = 23.75'				24					
				25					
				26					
				27					
				28					
				29					
				30					
				31					
				32					
				33					
				34					
				35					
				36					
				37					
				38					
				39					
				40					

* Drilled with a CME-75 Truck Mounted Rig

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

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LOG OF EXPLORATORY BORING NO. 5
FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
GF	---	1295.5	March 2017	17

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	66' ±	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	22.0' ±	DATE DRILLED	9/21/2016

DESCRIPTION AND CLASSIFICATION				DEPTH (feet)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
Irrigated Garden	Yellowish Brown	Medium Dense	SC-CL	1			7	73	
CLAYEY SAND, moist, fine to coarse grained sand, fine subangular to subrounded gravel						24			PP > 4.5
(Qsr - Slope Wash)				2			10	104	
@1.5': Liquid Limit = 35% Plasticity Index = 17% Finer than #4 = 80% Finer than #200 = 49% Free Swell = 60%		Dense		3	X	43	14		
			SC	4			11	108	
@4.5': Liquid Limit = 30% Plasticity Index = 11% Finer than #4 = 66% Finer than #200 = 29% Free Swell = 50%				5		42	10	118	PP > 4.5
				6	X	46	15		
				7					
				8					
				9			14	114	
				10		32	15	114	PP > 4.5
				11					
				12					
SANDY SILT, moist, fine to medium grained sand	Yellowish Brown	Very Stiff	ML	13					
(Qsr - Slope Wash)				14			25	98	
@14.5': Finer than #200 = 74% Free Swell = 0%				15		20	25	100	PP=4.5
				16					
				17					
CLAYEY SAND, moist, fine to coarse grained sand	Yellowish Brown	Dense	SC	18					
(Qsr - Slope Wash)				19			14	115	
* Drilled with a CME-75 Truck Mounted Rig PP = Pocket Penetrometer				20		40	7	122	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

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LOG OF EXPLORATORY BORING NO. 6

FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
GF	---	1295.5	March 2017	18

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	66' ±	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	22.0' ±	DATE DRILLED	9/21/2016

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (feet)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
CLAYEY SAND, moist, continued... (Qsr - Slope Wash)	Yellowish Brown	Dense	SC	21					
				22					
SHALE, slightly moist, fine grained sand (fs - Franciscan Assemblage)	Dark Gray	(Hard)	(CL)	23					
				24			7	133	
@24.0': Liquid Limit = 30% Plasticity Index = 14% Finer than #200 = 74% Free Swell = 50%				25		37	10	129	
				26					
	(Greenish Gray)			27					
				28					
				29		58			
				30	X	92/8"	4		
				31					
				32					
				33					
					X	30/3"	6		
Bottom of Boring = 33.75' (Practical Drilling Refusal)				34					
				35					
				36					
				37					
				38					
				39					
				40					

* Drilled with a CME-75 Truck Mounted Rig
PP = Pocket Penetrometer

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

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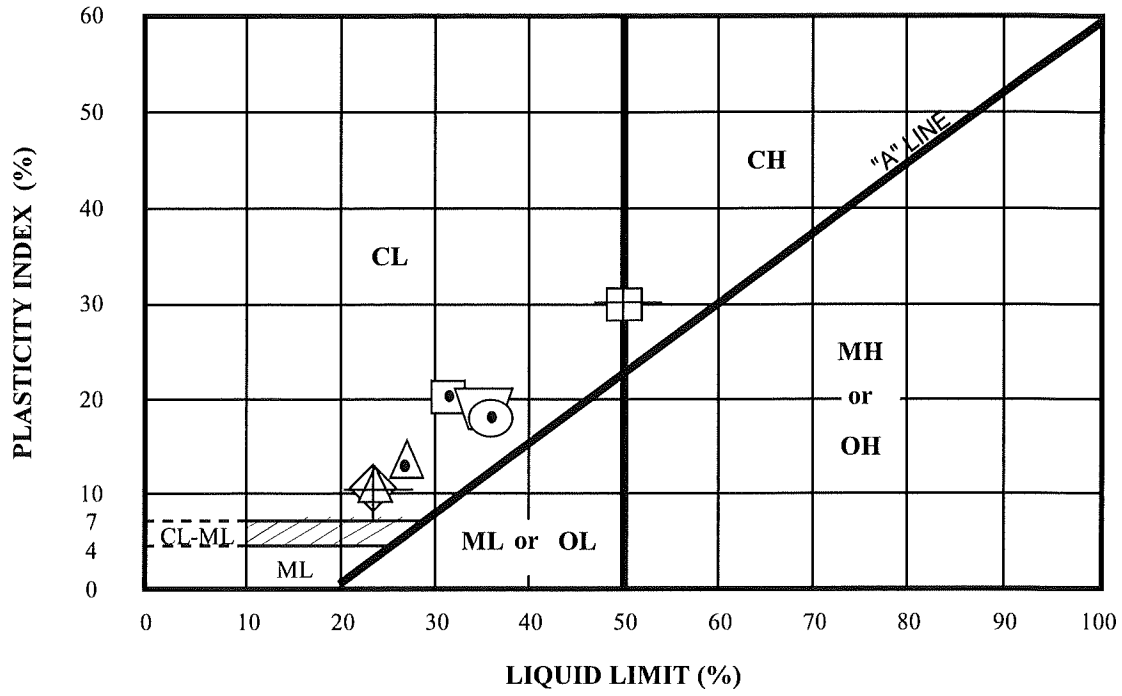
LOG OF EXPLORATORY BORING NO. 6
FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

APPROVED BY	SCALE	PROJECT NO.	DATE	DRAWING NO.
GF	---	1295.5	March 2017	19



KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
△	1	1.5	7	27	13	61	-0.5	CL
□	1	4.5	11	32	20	49	-0.1	SC* - CL
◇	1	23.5	5	24	10	21	-0.9	(SC)*
▽	2	1.5	14	35	19	64	-0.1	CL
○	2	4.5	13	36	17	51	-0.4	CL - SC*
⋀	2	23.5	4	24	10	30**	-1.0	(CL)
⊞	3	4.5	11	50	30	37	-0.3	SC*

*Classified as coarse-grained soil since less than 50% passes #200 sieve

**Value greater than 50% with additional processing (Shale)

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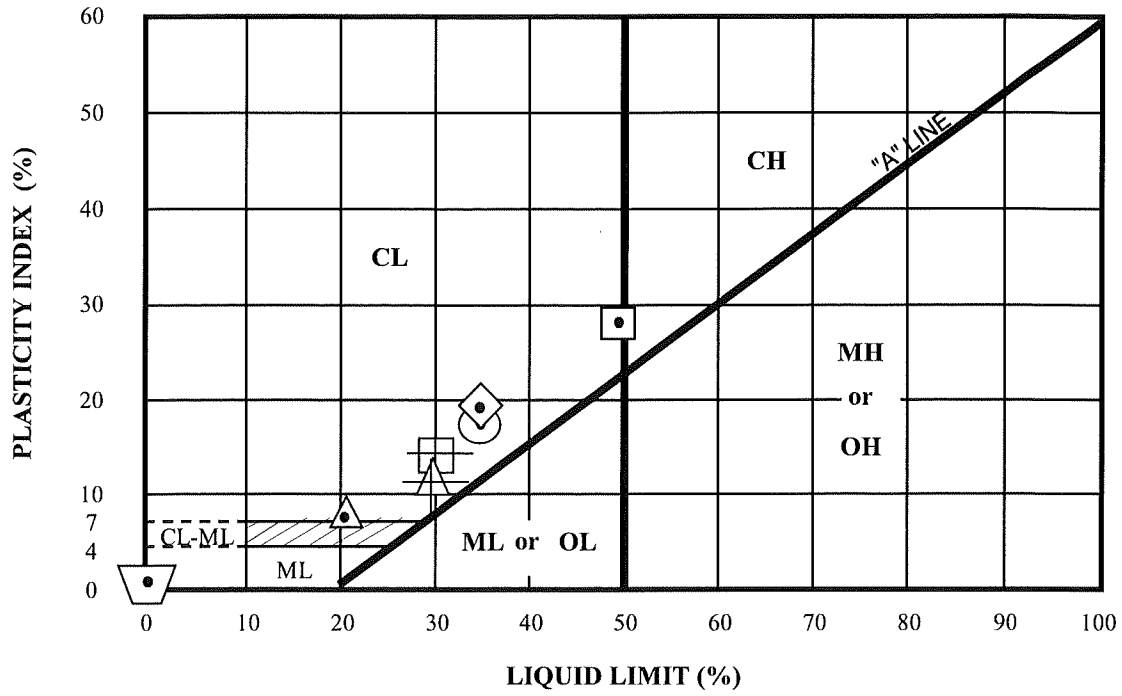
PLASTICITY CHART

FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

PROJECT NO.	DATE	DRAWING NO.
1295.5	March 2017	20



KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
△	3	28.5	5	21	8	31**	-1.0	(CL)
□	4	1.5	15	49	28	57	-0.2	CL
◇	5	3.0	10	35	19	59	-0.3	CL
▽	5	13.5	3	Non-Plastic	Non-Plastic	6	---	SP*
○	6	1.5	10	35	17	49	-0.5	SC* - CL
⋀	6	4.5	10	30	11	29	-0.8	SC*
⊞	6	24.0	10	30	14	74	-0.4	(CL)

*Classified as coarse-grained soil since less than 50% passes #200 sieve

**Value greater than 50% with additional processing (Shale)

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

PLASTICITY CHART

FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

PROJECT NO.	DATE	DRAWING NO.
1295.5	March 2017	21

Period (T) (Seconds)	Probabilistic (MCE_R) Analysis (Cr x 2% in 50yr-max rotated component 5% damping) (g)	Deterministic (MCE) Analysis-maximum rotated component (g)	Deterministic Analysis (Lower Limit)* (g)	Selected MCE_R Site-Specific Spectral Response (g)	Site-Specific Design Spectral Response (2/3) (g)	Code Based Design (g)	Code Based Design (@80%) (g)	Procedural Design Values (g)
0.0500	1.3536	1.3980	1.0325	1.3536	0.9029	0.8860	0.7088	0.9029
0.1000	2.0248	2.0020	1.4650	2.0020	1.3353	1.2216	0.9773	1.3353
0.2000	2.4581	2.5010	1.5000	2.4581	1.6396	1.3760	1.1008	1.6396
0.3000	2.2799	2.3320	1.5000	2.2799	1.5207	1.3760	1.1008	1.5207
0.4000	2.0906	2.1460	1.5000	2.0906	1.3944	1.3760	1.1008	1.3944
0.5000	1.9210	1.9270	1.5000	1.9210	1.2813	1.3760	1.1008	1.2813
0.7500	1.4924	1.4690	1.0400	1.4690	0.9798	1.1280	0.9024	0.9798
1.0000	1.2177	1.2400	0.7800	1.2177	0.8122	0.8460	0.6768	0.8122
2.0000	0.6928	0.7226	0.3900	0.6928	0.4621	0.4230	0.3384	0.4621
3.0000	0.4892	0.5326	0.2600	0.4892	0.3263	0.2820	0.2256	0.3263
4.0000	0.3742	0.4080	0.1950	0.3742	0.2496	0.2115	0.1692	0.2496

Site Latitude: 37.5491N

Site Longitude: 122.3223W

Site Classification: C

* Values calculated using ASCE 7-10; Figure 21.2-1 with Fa = 1.0 and Fv = 1.3

Procedure

1) Use greater of Deterministic (MCE_R) Analysis and Lower Limit.

2) Use lesser of #1 and Probabilistic Analysis.

3) Multiply #2 by 2/3 to get Design Response Spectra.

Check:

4) Design Spectra can't be less than 80% of Code Based Design.

5) $SD_{S\ (0.2\ sec)\ must\ be\ at\ least}$ 90% peak spectral acceleration at period larger than 0.2 sec.

6) SD_1: 2x Sa at 2.0 sec > Sa at 1.0 sec

7) Verify SM_S and SM_1 not less than 80% of Code Based SM_S and SM_1. **OK**

DESIGN VALUES
SM_S= 2.46
SM_1= 1.39
SD_S= 1.64
SD_1= 0.92

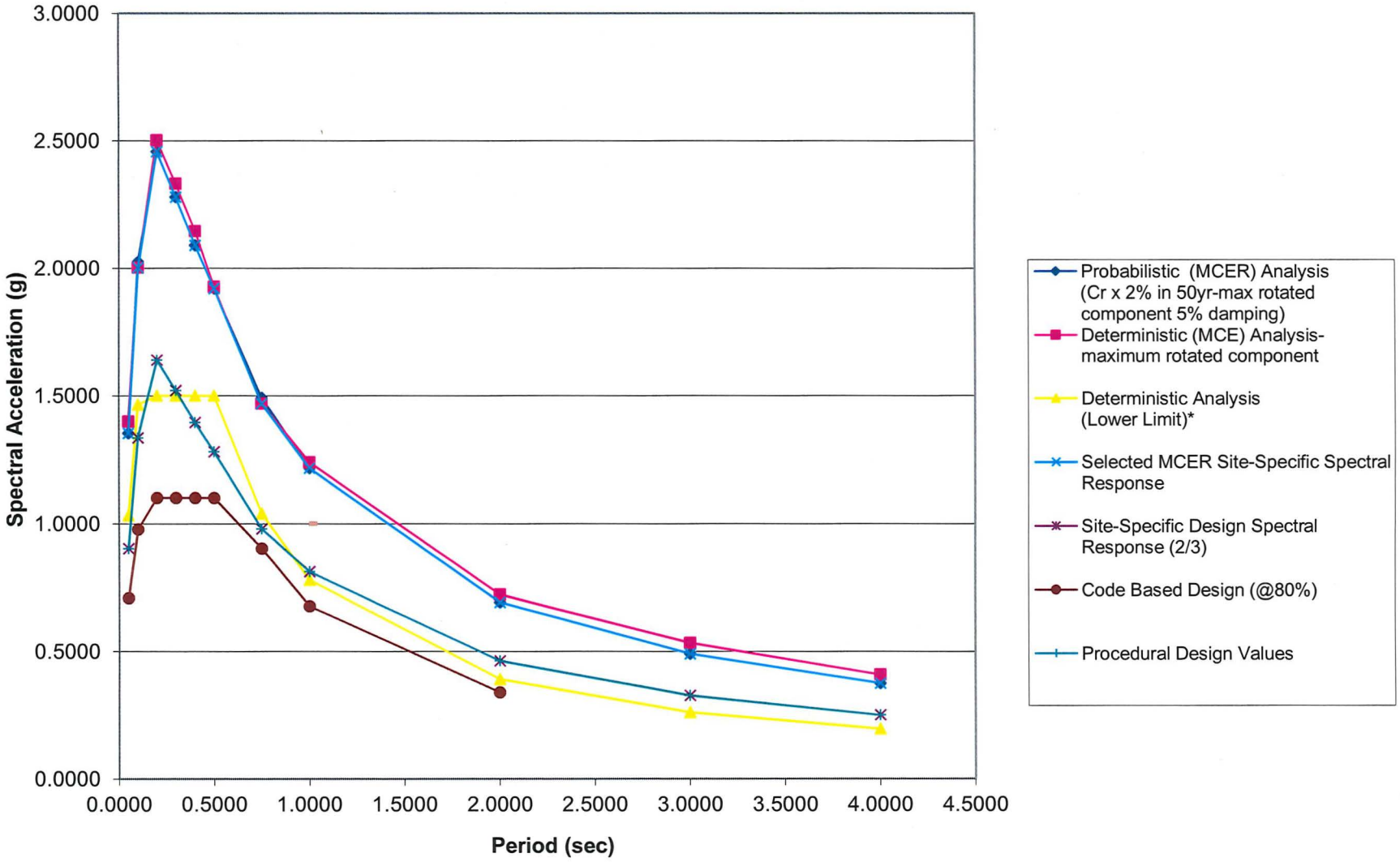
CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

SITE SPECIFIC GROUND MOTION SPECTRA TABLE

FIRE STATION #25 AND PARK IMPROVEMENTS
City of San Mateo
San Mateo, California

PROJECT NO.	DATE	DRAWING NO.
1295.5	March 2017	22

Site Specific Ground Motion Spectra Graph:
City of San Mateo, Fire Station #25 and Park Improvements, San Mateo, CA



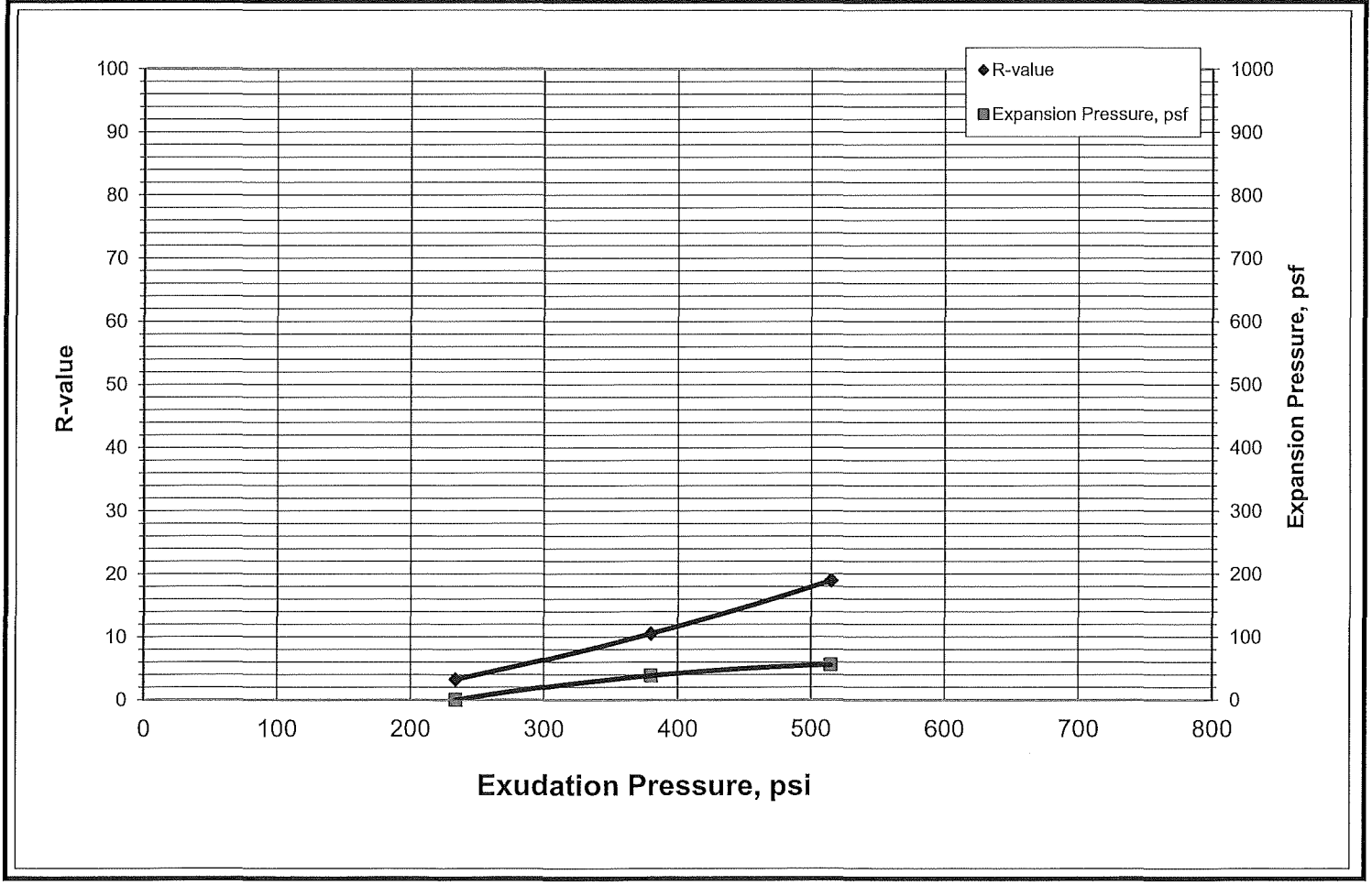
DRAWING NO. 23

R-value Test Report (Caltrans 301)

Job No.:	018-871	**Date:**	10/05/16	**Initial Moisture,**	13.4
Client:	Cleary Consultants	**Tested**	PJ	**R-value**	6
Project:	1295.5 City of San Mateo - Fire Station #25 and Park Improvements	**Reduced**	RU		
Sample	1-6 @ 0.5-3'	**Checked**	DC	**Expansion Pressure**	20 psf
Soil Type:	Reddish Brown Sandy CLAY				

Specimen Number	A	B	C	D
Exudation Pressure, psi	515	234	380	
Prepaired Weight, grams	1200	1200	1200	
Final Water Added, grams/cc	45	112	69	
Weight of Soil & Mold, grams	3155	3114	3154	
Weight of Mold, grams	2113	2084	2098	
Height After Compaction, in.	2.46	2.57	2.56	
Moisture Content, %	17.7	24.0	19.9	
Dry Density, pcf	109.1	98.0	104.3	
Expansion Pressure, psf	56	0	39	
Stabilometer @ 1000				
Stabilometer @ 2000	123	150	135	
Turns Displacement	3.13	5.00	4.05	
R-value	19	3	11	

Remarks:



DRAWING NO. 24

Corrosivity Tests Summary

CTL # 018-871 Date: 10/4/2016 Tested By: PJ Checked: PJ

Client: Cleary Consultants, Inc Project: City of San Mateo - Fire Station #25 and Park Improvements Proj. No: 1295.5

Remarks:

Sample Location or ID			Resistivity @ 15.5 °C (Ohm-cm)			Chloride	Sulfate		pH	ORP (Redox)		Sulfide	Moisture	Soil Visual Description
			As Rec.	Min	Sat.	mg/kg	mg/kg	%				Qualitative	At Test	
						Dry Wt.	Dry Wt.	Dry Wt.		E_H (mv)	At Test	by Lead	%	
Boring	Sample, No.	Depth, ft.	ASTM G57	Cal 643	ASTM G57	ASTM D4327	ASTM D4327	ASTM D4327	ASTM G51	ASTM G200	Temp °C	Acetate Paper	ASTM D2216	
1-6	-	0.5-3.0	-	-	2,415	8	32	0.0032	7.0	48	22	-	9.7	Olive Brown Sandy CLAY

DRAWING NO. 25

APPENDIX A

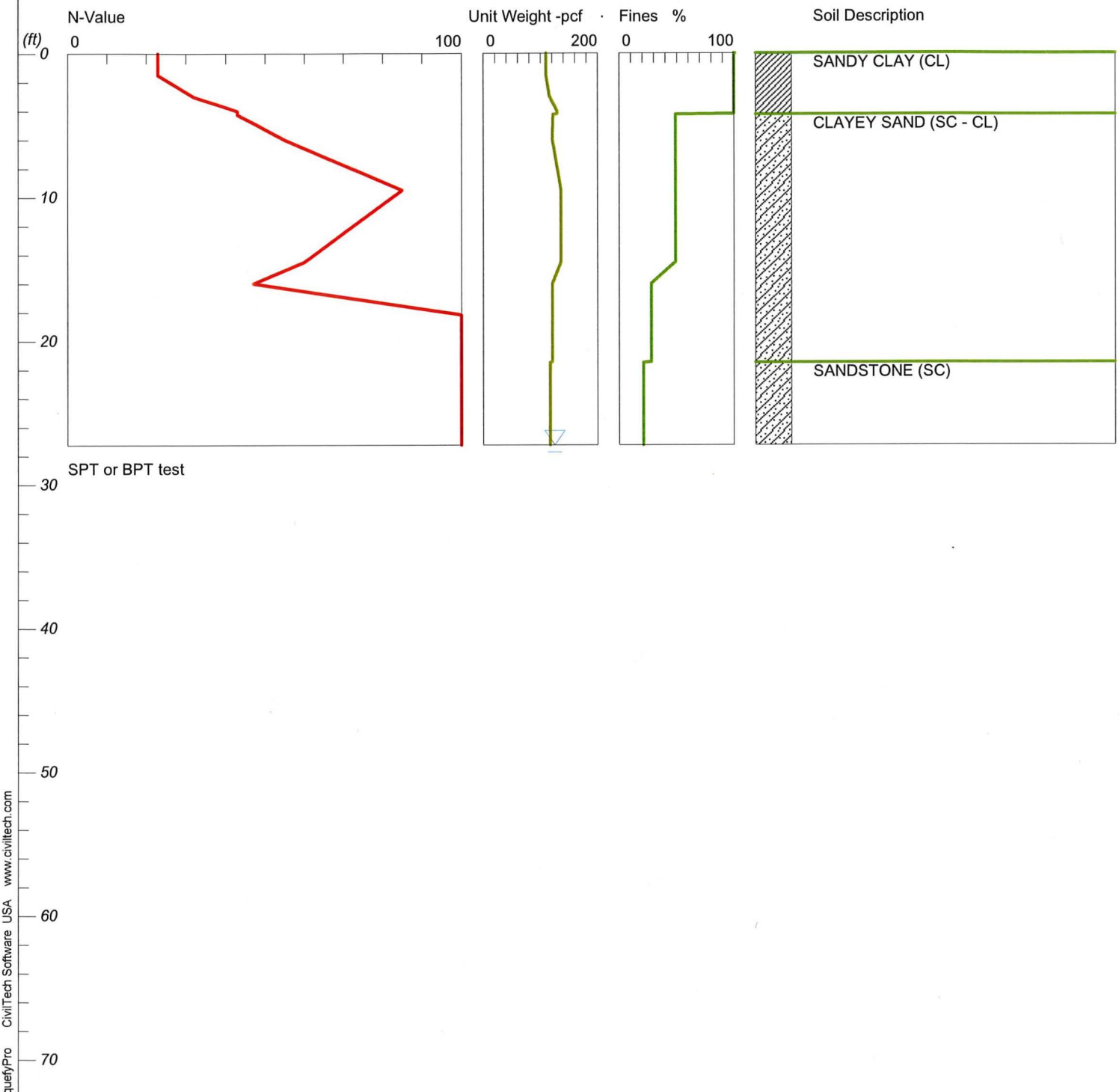
**City of San Mateo, Fire Station #25 and Park Improvments,
Liquefaction and Dry Settlement Analyses and Calculations,
EB-1, EB-3 and EB-6, Drilled September 20 and 21, 2016**

LIQUEFACTION ANALYSIS

FIRE STATION #25

Hole No.=EB-1 Water Depth=27.25 ft

Magnitude=8.5
Acceleration=0.806g

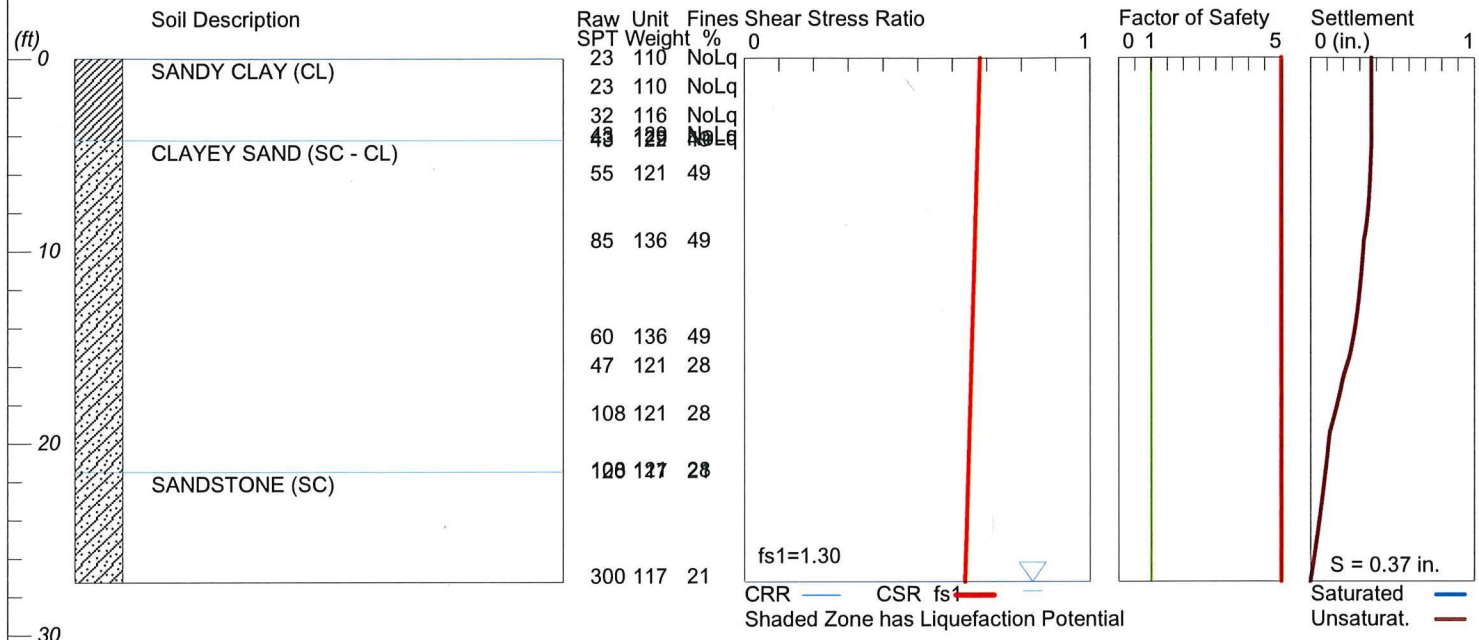


LIQUEFACTION ANALYSIS

FIRE STATION #25

Hole No.=EB-1 Water Depth=27.25 ft

Magnitude=8.5
Acceleration=0.806g



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LIQUEFACTION ANALYSIS SUMMARY
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Licensed to , 10/3/2016 11:39:25 AM

Input File Name: \\GRANT-PC\Grant Roughs\Liquefy Pro Data Files grant\1295.5 City of San Mateo, Fire Station #25, EB-1.liq
Title: FIRE STATION #25
Subtitle: City of San Mateo

Surface Elev.=
Hole No.=EB-1
Depth of Hole= 27.25 ft
Water Table during Earthquake= 27.25 ft
Water Table during In-Situ Testing= 27.25 ft
Max. Acceleration= 0.81 g
Earthquake Magnitude= 8.50

Input Data:
Surface Elev.=
Hole No.=EB-1
Depth of Hole=27.25 ft
Water Table during Earthquake= 27.25 ft
Water Table during In-Situ Testing= 27.25 ft
Max. Acceleration=0.81 g
Earthquake Magnitude=8.50
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
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 %
0.00	23.00	110.00	NoLiq
1.50	23.00	110.00	NoLiq
3.00	32.00	116.00	NoLiq
4.00	43.00	129.00	NoLiq
4.20	43.00	129.00	NoLiq
4.25	43.00	122.00	49.00
6.00	55.00	121.00	49.00
9.50	85.00	136.00	49.00
14.50	60.00	136.00	49.00
16.00	47.00	121.00	28.00
18.50	108.00	121.00	28.00
21.45	108.00	121.00	28.00
21.50	120.00	117.00	21.00
27.00	300.00	117.00	21.00

Output Results:
Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=0.37 in.
Total Settlement of Saturated and Unsaturated Sands=0.37 in.
Differential Settlement=0.186 to 0.245 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.

0.00	2.00	0.68	5.00	0.00	0.37	0.37
0.05	2.00	0.68	5.00	0.00	0.37	0.37
0.10	2.00	0.68	5.00	0.00	0.37	0.37
0.15	2.00	0.68	5.00	0.00	0.37	0.37
0.20	2.00	0.68	5.00	0.00	0.37	0.37
0.25	2.00	0.68	5.00	0.00	0.37	0.37
0.30	2.00	0.68	5.00	0.00	0.37	0.37
0.35	2.00	0.68	5.00	0.00	0.37	0.37
0.40	2.00	0.68	5.00	0.00	0.37	0.37
0.45	2.00	0.68	5.00	0.00	0.37	0.37
0.50	2.00	0.68	5.00	0.00	0.37	0.37
0.55	2.00	0.68	5.00	0.00	0.37	0.37
0.60	2.00	0.68	5.00	0.00	0.37	0.37
0.65	2.00	0.68	5.00	0.00	0.37	0.37
0.70	2.00	0.68	5.00	0.00	0.37	0.37
0.75	2.00	0.68	5.00	0.00	0.37	0.37
0.80	2.00	0.68	5.00	0.00	0.37	0.37
0.85	2.00	0.68	5.00	0.00	0.37	0.37
0.90	2.00	0.68	5.00	0.00	0.37	0.37
0.95	2.00	0.68	5.00	0.00	0.37	0.37
1.00	2.00	0.68	5.00	0.00	0.37	0.37
1.05	2.00	0.68	5.00	0.00	0.37	0.37
1.10	2.00	0.68	5.00	0.00	0.37	0.37
1.15	2.00	0.68	5.00	0.00	0.37	0.37
1.20	2.00	0.68	5.00	0.00	0.37	0.37
1.25	2.00	0.68	5.00	0.00	0.37	0.37
1.30	2.00	0.68	5.00	0.00	0.37	0.37
1.35	2.00	0.68	5.00	0.00	0.37	0.37
1.40	2.00	0.68	5.00	0.00	0.37	0.37
1.45	2.00	0.68	5.00	0.00	0.37	0.37
1.50	2.00	0.68	5.00	0.00	0.37	0.37
1.55	2.00	0.68	5.00	0.00	0.37	0.37
1.60	2.00	0.68	5.00	0.00	0.37	0.37
1.65	2.00	0.68	5.00	0.00	0.37	0.37
1.70	2.00	0.68	5.00	0.00	0.37	0.37
1.75	2.00	0.68	5.00	0.00	0.37	0.37
1.80	2.00	0.68	5.00	0.00	0.37	0.37
1.85	2.00	0.68	5.00	0.00	0.37	0.37
1.90	2.00	0.68	5.00	0.00	0.37	0.37
1.95	2.00	0.68	5.00	0.00	0.37	0.37
2.00	2.00	0.68	5.00	0.00	0.37	0.37
2.05	2.00	0.68	5.00	0.00	0.37	0.37
2.10	2.00	0.68	5.00	0.00	0.37	0.37
2.15	2.00	0.68	5.00	0.00	0.37	0.37
2.20	2.00	0.68	5.00	0.00	0.37	0.37
2.25	2.00	0.68	5.00	0.00	0.37	0.37
2.30	2.00	0.68	5.00	0.00	0.37	0.37
2.35	2.00	0.68	5.00	0.00	0.37	0.37
2.40	2.00	0.68	5.00	0.00	0.37	0.37
2.45	2.00	0.68	5.00	0.00	0.37	0.37
2.50	2.00	0.68	5.00	0.00	0.37	0.37
2.55	2.00	0.68	5.00	0.00	0.37	0.37
2.60	2.00	0.68	5.00	0.00	0.37	0.37
2.65	2.00	0.68	5.00	0.00	0.37	0.37
2.70	2.00	0.68	5.00	0.00	0.37	0.37
2.75	2.00	0.68	5.00	0.00	0.37	0.37
2.80	2.00	0.68	5.00	0.00	0.37	0.37
2.85	2.00	0.68	5.00	0.00	0.37	0.37
2.90	2.00	0.68	5.00	0.00	0.37	0.37
2.95	2.00	0.68	5.00	0.00	0.37	0.37
3.00	2.00	0.68	5.00	0.00	0.37	0.37
3.05	2.00	0.68	5.00	0.00	0.37	0.37
3.10	2.00	0.68	5.00	0.00	0.37	0.37
3.15	2.00	0.68	5.00	0.00	0.37	0.37
3.20	2.00	0.68	5.00	0.00	0.37	0.37
3.25	2.00	0.68	5.00	0.00	0.37	0.37
3.30	2.00	0.68	5.00	0.00	0.37	0.37
3.35	2.00	0.68	5.00	0.00	0.37	0.37
3.40	2.00	0.68	5.00	0.00	0.37	0.37
3.45	2.00	0.68	5.00	0.00	0.37	0.37
3.50	2.00	0.68	5.00	0.00	0.37	0.37
3.55	2.00	0.68	5.00	0.00	0.37	0.37
3.60	2.00	0.68	5.00	0.00	0.37	0.37

3.65	2.00	0.68	5.00	0.00	0.37	0.37
3.70	2.00	0.68	5.00	0.00	0.37	0.37
3.75	2.00	0.68	5.00	0.00	0.37	0.37
3.80	2.00	0.68	5.00	0.00	0.37	0.37
3.85	2.00	0.67	5.00	0.00	0.37	0.37
3.90	2.00	0.67	5.00	0.00	0.37	0.37
3.95	2.00	0.67	5.00	0.00	0.37	0.37
4.00	2.00	0.67	5.00	0.00	0.37	0.37
4.05	2.00	0.67	5.00	0.00	0.37	0.37
4.10	2.00	0.67	5.00	0.00	0.37	0.37
4.15	2.00	0.67	5.00	0.00	0.37	0.37
4.20	2.00	0.67	5.00	0.00	0.37	0.37
4.25	1.45	0.67	5.00	0.00	0.37	0.37
4.30	1.45	0.67	5.00	0.00	0.37	0.37
4.35	1.45	0.67	5.00	0.00	0.37	0.37
4.40	1.45	0.67	5.00	0.00	0.37	0.37
4.45	1.45	0.67	5.00	0.00	0.37	0.37
4.50	1.45	0.67	5.00	0.00	0.37	0.37
4.55	1.45	0.67	5.00	0.00	0.37	0.37
4.60	1.45	0.67	5.00	0.00	0.37	0.37
4.65	1.45	0.67	5.00	0.00	0.37	0.37
4.70	1.45	0.67	5.00	0.00	0.37	0.37
4.75	1.45	0.67	5.00	0.00	0.37	0.37
4.80	1.45	0.67	5.00	0.00	0.37	0.37
4.85	1.45	0.67	5.00	0.00	0.37	0.37
4.90	1.45	0.67	5.00	0.00	0.37	0.37
4.95	1.45	0.67	5.00	0.00	0.37	0.37
5.00	1.45	0.67	5.00	0.00	0.37	0.37
5.05	1.45	0.67	5.00	0.00	0.37	0.37
5.10	1.45	0.67	5.00	0.00	0.37	0.37
5.15	1.45	0.67	5.00	0.00	0.37	0.37
5.20	1.45	0.67	5.00	0.00	0.37	0.37
5.25	1.45	0.67	5.00	0.00	0.37	0.37
5.30	1.45	0.67	5.00	0.00	0.37	0.37
5.35	1.45	0.67	5.00	0.00	0.37	0.37
5.40	1.45	0.67	5.00	0.00	0.37	0.37
5.45	1.45	0.67	5.00	0.00	0.37	0.37
5.50	1.45	0.67	5.00	0.00	0.37	0.37
5.55	1.45	0.67	5.00	0.00	0.37	0.37
5.60	1.45	0.67	5.00	0.00	0.37	0.37
5.65	1.45	0.67	5.00	0.00	0.37	0.37
5.70	1.45	0.67	5.00	0.00	0.37	0.37
5.75	1.45	0.67	5.00	0.00	0.36	0.36
5.80	1.45	0.67	5.00	0.00	0.36	0.36
5.85	1.45	0.67	5.00	0.00	0.36	0.36
5.90	1.45	0.67	5.00	0.00	0.36	0.36
5.95	1.45	0.67	5.00	0.00	0.36	0.36
6.00	1.45	0.67	5.00	0.00	0.36	0.36
6.05	1.45	0.67	5.00	0.00	0.36	0.36
6.10	1.45	0.67	5.00	0.00	0.36	0.36
6.15	1.45	0.67	5.00	0.00	0.36	0.36
6.20	1.45	0.67	5.00	0.00	0.36	0.36
6.25	1.45	0.67	5.00	0.00	0.36	0.36
6.30	1.45	0.67	5.00	0.00	0.36	0.36
6.35	1.45	0.67	5.00	0.00	0.36	0.36
6.40	1.45	0.67	5.00	0.00	0.36	0.36
6.45	1.45	0.67	5.00	0.00	0.36	0.36
6.50	1.45	0.67	5.00	0.00	0.36	0.36
6.55	1.45	0.67	5.00	0.00	0.36	0.36
6.60	1.45	0.67	5.00	0.00	0.36	0.36
6.65	1.45	0.67	5.00	0.00	0.36	0.36
6.70	1.45	0.67	5.00	0.00	0.36	0.36
6.75	1.45	0.67	5.00	0.00	0.36	0.36
6.80	1.45	0.67	5.00	0.00	0.36	0.36
6.85	1.45	0.67	5.00	0.00	0.36	0.36
6.90	1.45	0.67	5.00	0.00	0.36	0.36
6.95	1.45	0.67	5.00	0.00	0.36	0.36
7.00	1.45	0.67	5.00	0.00	0.36	0.36
7.05	1.45	0.67	5.00	0.00	0.36	0.36
7.10	1.45	0.67	5.00	0.00	0.36	0.36
7.15	1.45	0.67	5.00	0.00	0.36	0.36
7.20	1.45	0.67	5.00	0.00	0.36	0.36
7.25	1.45	0.67	5.00	0.00	0.36	0.36
7.30	1.45	0.67	5.00	0.00	0.36	0.36

7.35	1.45	0.67	5.00	0.00	0.36	0.36
7.40	1.45	0.67	5.00	0.00	0.35	0.35
7.45	1.45	0.67	5.00	0.00	0.35	0.35
7.50	1.45	0.67	5.00	0.00	0.35	0.35
7.55	1.45	0.67	5.00	0.00	0.35	0.35
7.60	1.45	0.67	5.00	0.00	0.35	0.35
7.65	1.45	0.67	5.00	0.00	0.35	0.35
7.70	1.45	0.67	5.00	0.00	0.35	0.35
7.75	1.45	0.67	5.00	0.00	0.35	0.35
7.80	1.45	0.67	5.00	0.00	0.35	0.35
7.85	1.45	0.67	5.00	0.00	0.35	0.35
7.90	1.45	0.67	5.00	0.00	0.35	0.35
7.95	1.45	0.67	5.00	0.00	0.35	0.35
8.00	1.45	0.67	5.00	0.00	0.35	0.35
8.05	1.45	0.67	5.00	0.00	0.35	0.35
8.10	1.45	0.67	5.00	0.00	0.35	0.35
8.15	1.45	0.67	5.00	0.00	0.35	0.35
8.20	1.45	0.67	5.00	0.00	0.35	0.35
8.25	1.45	0.67	5.00	0.00	0.35	0.35
8.30	1.45	0.67	5.00	0.00	0.35	0.35
8.35	1.45	0.67	5.00	0.00	0.34	0.34
8.40	1.45	0.67	5.00	0.00	0.34	0.34
8.45	1.45	0.67	5.00	0.00	0.34	0.34
8.50	1.45	0.67	5.00	0.00	0.34	0.34
8.55	1.45	0.67	5.00	0.00	0.34	0.34
8.60	1.45	0.67	5.00	0.00	0.34	0.34
8.65	1.45	0.67	5.00	0.00	0.34	0.34
8.70	1.45	0.67	5.00	0.00	0.34	0.34
8.75	1.45	0.67	5.00	0.00	0.34	0.34
8.80	1.45	0.67	5.00	0.00	0.34	0.34
8.85	1.45	0.67	5.00	0.00	0.34	0.34
8.90	1.45	0.67	5.00	0.00	0.34	0.34
8.95	1.45	0.67	5.00	0.00	0.34	0.34
9.00	1.45	0.67	5.00	0.00	0.33	0.33
9.05	1.45	0.67	5.00	0.00	0.33	0.33
9.10	1.45	0.67	5.00	0.00	0.33	0.33
9.15	1.45	0.67	5.00	0.00	0.33	0.33
9.20	1.45	0.67	5.00	0.00	0.33	0.33
9.25	1.45	0.67	5.00	0.00	0.33	0.33
9.30	1.45	0.67	5.00	0.00	0.33	0.33
9.35	1.45	0.67	5.00	0.00	0.33	0.33
9.40	1.45	0.67	5.00	0.00	0.33	0.33
9.45	1.45	0.67	5.00	0.00	0.32	0.32
9.50	1.45	0.67	5.00	0.00	0.32	0.32
9.55	1.45	0.67	5.00	0.00	0.32	0.32
9.60	1.45	0.67	5.00	0.00	0.32	0.32
9.65	1.45	0.67	5.00	0.00	0.32	0.32
9.70	1.45	0.67	5.00	0.00	0.32	0.32
9.75	1.45	0.67	5.00	0.00	0.32	0.32
9.80	1.45	0.67	5.00	0.00	0.32	0.32
9.85	1.45	0.67	5.00	0.00	0.32	0.32
9.90	1.45	0.67	5.00	0.00	0.32	0.32
9.95	1.45	0.67	5.00	0.00	0.32	0.32
10.00	1.45	0.67	5.00	0.00	0.32	0.32
10.05	1.45	0.67	5.00	0.00	0.32	0.32
10.10	1.45	0.67	5.00	0.00	0.32	0.32
10.15	1.45	0.66	5.00	0.00	0.32	0.32
10.20	1.45	0.66	5.00	0.00	0.32	0.32
10.25	1.45	0.66	5.00	0.00	0.32	0.32
10.30	1.45	0.66	5.00	0.00	0.32	0.32
10.35	1.45	0.66	5.00	0.00	0.32	0.32
10.40	1.45	0.66	5.00	0.00	0.32	0.32
10.45	1.45	0.66	5.00	0.00	0.32	0.32
10.50	1.45	0.66	5.00	0.00	0.32	0.32
10.55	1.45	0.66	5.00	0.00	0.32	0.32
10.60	1.45	0.66	5.00	0.00	0.31	0.31
10.65	1.45	0.66	5.00	0.00	0.31	0.31
10.70	1.45	0.66	5.00	0.00	0.31	0.31
10.75	1.45	0.66	5.00	0.00	0.31	0.31
10.80	1.45	0.66	5.00	0.00	0.31	0.31
10.85	1.45	0.66	5.00	0.00	0.31	0.31
10.90	1.45	0.66	5.00	0.00	0.31	0.31
10.95	1.45	0.66	5.00	0.00	0.31	0.31
11.00	1.45	0.66	5.00	0.00	0.31	0.31

11.05	1.45	0.66	5.00	0.00	0.31	0.31
11.10	1.45	0.66	5.00	0.00	0.31	0.31
11.15	1.45	0.66	5.00	0.00	0.31	0.31
11.20	1.45	0.66	5.00	0.00	0.31	0.31
11.25	1.45	0.66	5.00	0.00	0.31	0.31
11.30	1.45	0.66	5.00	0.00	0.31	0.31
11.35	1.45	0.66	5.00	0.00	0.31	0.31
11.40	1.45	0.66	5.00	0.00	0.31	0.31
11.45	1.45	0.66	5.00	0.00	0.31	0.31
11.50	1.45	0.66	5.00	0.00	0.31	0.31
11.55	1.45	0.66	5.00	0.00	0.31	0.31
11.60	1.45	0.66	5.00	0.00	0.30	0.30
11.65	1.45	0.66	5.00	0.00	0.30	0.30
11.70	1.45	0.66	5.00	0.00	0.30	0.30
11.75	1.45	0.66	5.00	0.00	0.30	0.30
11.80	1.45	0.66	5.00	0.00	0.30	0.30
11.85	1.45	0.66	5.00	0.00	0.30	0.30
11.90	1.45	0.66	5.00	0.00	0.30	0.30
11.95	1.45	0.66	5.00	0.00	0.30	0.30
12.00	1.45	0.66	5.00	0.00	0.30	0.30
12.05	1.45	0.66	5.00	0.00	0.30	0.30
12.10	1.45	0.66	5.00	0.00	0.30	0.30
12.15	1.45	0.66	5.00	0.00	0.30	0.30
12.20	1.45	0.66	5.00	0.00	0.30	0.30
12.25	1.45	0.66	5.00	0.00	0.30	0.30
12.30	1.45	0.66	5.00	0.00	0.30	0.30
12.35	1.45	0.66	5.00	0.00	0.30	0.30
12.40	1.45	0.66	5.00	0.00	0.30	0.30
12.45	1.45	0.66	5.00	0.00	0.29	0.29
12.50	1.45	0.66	5.00	0.00	0.29	0.29
12.55	1.45	0.66	5.00	0.00	0.29	0.29
12.60	1.45	0.66	5.00	0.00	0.29	0.29
12.65	1.45	0.66	5.00	0.00	0.29	0.29
12.70	1.45	0.66	5.00	0.00	0.29	0.29
12.75	1.45	0.66	5.00	0.00	0.29	0.29
12.80	1.45	0.66	5.00	0.00	0.29	0.29
12.85	1.45	0.66	5.00	0.00	0.29	0.29
12.90	1.45	0.66	5.00	0.00	0.29	0.29
12.95	1.45	0.66	5.00	0.00	0.29	0.29
13.00	1.45	0.66	5.00	0.00	0.29	0.29
13.05	1.45	0.66	5.00	0.00	0.29	0.29
13.10	1.45	0.66	5.00	0.00	0.29	0.29
13.15	1.45	0.66	5.00	0.00	0.28	0.28
13.20	1.45	0.66	5.00	0.00	0.28	0.28
13.25	1.45	0.66	5.00	0.00	0.28	0.28
13.30	1.45	0.66	5.00	0.00	0.28	0.28
13.35	1.45	0.66	5.00	0.00	0.28	0.28
13.40	1.45	0.66	5.00	0.00	0.28	0.28
13.45	1.45	0.66	5.00	0.00	0.28	0.28
13.50	1.45	0.66	5.00	0.00	0.28	0.28
13.55	1.45	0.66	5.00	0.00	0.28	0.28
13.60	1.45	0.66	5.00	0.00	0.28	0.28
13.65	1.45	0.66	5.00	0.00	0.28	0.28
13.70	1.45	0.66	5.00	0.00	0.28	0.28
13.75	1.45	0.66	5.00	0.00	0.28	0.28
13.80	1.45	0.66	5.00	0.00	0.27	0.27
13.85	1.45	0.66	5.00	0.00	0.27	0.27
13.90	1.45	0.66	5.00	0.00	0.27	0.27
13.95	1.45	0.66	5.00	0.00	0.27	0.27
14.00	1.45	0.66	5.00	0.00	0.27	0.27
14.05	1.45	0.66	5.00	0.00	0.27	0.27
14.10	1.45	0.66	5.00	0.00	0.27	0.27
14.15	1.45	0.66	5.00	0.00	0.27	0.27
14.20	1.45	0.66	5.00	0.00	0.27	0.27
14.25	1.45	0.66	5.00	0.00	0.27	0.27
14.30	1.45	0.66	5.00	0.00	0.27	0.27
14.35	1.45	0.66	5.00	0.00	0.26	0.26
14.40	1.45	0.66	5.00	0.00	0.26	0.26
14.45	1.45	0.66	5.00	0.00	0.26	0.26
14.50	1.45	0.66	5.00	0.00	0.26	0.26
14.55	1.45	0.66	5.00	0.00	0.26	0.26
14.60	1.45	0.66	5.00	0.00	0.26	0.26
14.65	1.45	0.66	5.00	0.00	0.26	0.26
14.70	1.45	0.66	5.00	0.00	0.26	0.26

14.75	1.45	0.66	5.00	0.00	0.26	0.26
14.80	1.45	0.66	5.00	0.00	0.25	0.25
14.85	1.45	0.66	5.00	0.00	0.25	0.25
14.90	1.45	0.66	5.00	0.00	0.25	0.25
14.95	1.45	0.66	5.00	0.00	0.25	0.25
15.00	1.45	0.66	5.00	0.00	0.25	0.25
15.05	1.45	0.66	5.00	0.00	0.25	0.25
15.10	1.45	0.66	5.00	0.00	0.25	0.25
15.15	1.45	0.66	5.00	0.00	0.25	0.25
15.20	1.45	0.66	5.00	0.00	0.25	0.25
15.25	1.45	0.66	5.00	0.00	0.24	0.24
15.30	1.45	0.66	5.00	0.00	0.24	0.24
15.35	1.45	0.66	5.00	0.00	0.24	0.24
15.40	1.45	0.66	5.00	0.00	0.24	0.24
15.45	1.45	0.66	5.00	0.00	0.24	0.24
15.50	1.45	0.66	5.00	0.00	0.24	0.24
15.55	1.45	0.66	5.00	0.00	0.24	0.24
15.60	1.45	0.66	5.00	0.00	0.23	0.23
15.65	1.45	0.66	5.00	0.00	0.23	0.23
15.70	1.45	0.66	5.00	0.00	0.23	0.23
15.75	1.45	0.66	5.00	0.00	0.23	0.23
15.80	1.45	0.66	5.00	0.00	0.23	0.23
15.85	1.45	0.66	5.00	0.00	0.23	0.23
15.90	1.45	0.66	5.00	0.00	0.22	0.22
15.95	1.45	0.66	5.00	0.00	0.22	0.22
16.00	1.45	0.66	5.00	0.00	0.22	0.22
16.05	1.45	0.66	5.00	0.00	0.22	0.22
16.10	1.45	0.66	5.00	0.00	0.22	0.22
16.15	1.45	0.66	5.00	0.00	0.21	0.21
16.20	1.45	0.66	5.00	0.00	0.21	0.21
16.25	1.45	0.66	5.00	0.00	0.21	0.21
16.30	1.45	0.66	5.00	0.00	0.21	0.21
16.35	1.45	0.66	5.00	0.00	0.21	0.21
16.40	1.45	0.66	5.00	0.00	0.21	0.21
16.45	1.45	0.65	5.00	0.00	0.20	0.20
16.50	1.45	0.65	5.00	0.00	0.20	0.20
16.55	1.45	0.65	5.00	0.00	0.20	0.20
16.60	1.45	0.65	5.00	0.00	0.20	0.20
16.65	1.45	0.65	5.00	0.00	0.20	0.20
16.70	1.45	0.65	5.00	0.00	0.20	0.20
16.75	1.45	0.65	5.00	0.00	0.20	0.20
16.80	1.45	0.65	5.00	0.00	0.19	0.19
16.85	1.45	0.65	5.00	0.00	0.19	0.19
16.90	1.45	0.65	5.00	0.00	0.19	0.19
16.95	1.45	0.65	5.00	0.00	0.19	0.19
17.00	1.45	0.65	5.00	0.00	0.19	0.19
17.05	1.45	0.65	5.00	0.00	0.19	0.19
17.10	1.45	0.65	5.00	0.00	0.19	0.19
17.15	1.45	0.65	5.00	0.00	0.19	0.19
17.20	1.45	0.65	5.00	0.00	0.18	0.18
17.25	1.45	0.65	5.00	0.00	0.18	0.18
17.30	1.45	0.65	5.00	0.00	0.18	0.18
17.35	1.45	0.65	5.00	0.00	0.18	0.18
17.40	1.45	0.65	5.00	0.00	0.18	0.18
17.45	1.45	0.65	5.00	0.00	0.18	0.18
17.50	1.45	0.65	5.00	0.00	0.18	0.18
17.55	1.45	0.65	5.00	0.00	0.18	0.18
17.60	1.45	0.65	5.00	0.00	0.17	0.17
17.65	1.45	0.65	5.00	0.00	0.17	0.17
17.70	1.45	0.65	5.00	0.00	0.17	0.17
17.75	1.45	0.65	5.00	0.00	0.17	0.17
17.80	1.45	0.65	5.00	0.00	0.17	0.17
17.85	1.45	0.65	5.00	0.00	0.17	0.17
17.90	1.45	0.65	5.00	0.00	0.17	0.17
17.95	1.45	0.65	5.00	0.00	0.16	0.16
18.00	1.45	0.65	5.00	0.00	0.16	0.16
18.05	1.45	0.65	5.00	0.00	0.16	0.16
18.10	1.45	0.65	5.00	0.00	0.16	0.16
18.15	1.45	0.65	5.00	0.00	0.16	0.16
18.20	1.45	0.65	5.00	0.00	0.16	0.16
18.25	1.45	0.65	5.00	0.00	0.16	0.16
18.30	1.45	0.65	5.00	0.00	0.15	0.15
18.35	1.45	0.65	5.00	0.00	0.15	0.15
18.40	1.45	0.65	5.00	0.00	0.15	0.15

18.45	1.45	0.65	5.00	0.00	0.15	0.15
18.50	1.45	0.65	5.00	0.00	0.15	0.15
18.55	1.45	0.65	5.00	0.00	0.15	0.15
18.60	1.45	0.65	5.00	0.00	0.15	0.15
18.65	1.45	0.65	5.00	0.00	0.14	0.14
18.70	1.45	0.65	5.00	0.00	0.14	0.14
18.75	1.45	0.65	5.00	0.00	0.14	0.14
18.80	1.45	0.65	5.00	0.00	0.14	0.14
18.85	1.45	0.65	5.00	0.00	0.14	0.14
18.90	1.45	0.65	5.00	0.00	0.14	0.14
18.95	1.45	0.65	5.00	0.00	0.13	0.13
19.00	1.45	0.65	5.00	0.00	0.13	0.13
19.05	1.45	0.65	5.00	0.00	0.13	0.13
19.10	1.45	0.65	5.00	0.00	0.13	0.13
19.15	1.45	0.65	5.00	0.00	0.13	0.13
19.20	1.45	0.65	5.00	0.00	0.13	0.13
19.25	1.45	0.65	5.00	0.00	0.12	0.12
19.30	1.45	0.65	5.00	0.00	0.12	0.12
19.35	1.45	0.65	5.00	0.00	0.12	0.12
19.40	1.45	0.65	5.00	0.00	0.12	0.12
19.45	1.45	0.65	5.00	0.00	0.12	0.12
19.50	1.45	0.65	5.00	0.00	0.12	0.12
19.55	1.45	0.65	5.00	0.00	0.12	0.12
19.60	1.45	0.65	5.00	0.00	0.12	0.12
19.65	1.45	0.65	5.00	0.00	0.11	0.11
19.70	1.45	0.65	5.00	0.00	0.11	0.11
19.75	1.45	0.65	5.00	0.00	0.11	0.11
19.80	1.45	0.65	5.00	0.00	0.11	0.11
19.85	1.45	0.65	5.00	0.00	0.11	0.11
19.90	1.45	0.65	5.00	0.00	0.11	0.11
19.95	1.45	0.65	5.00	0.00	0.11	0.11
20.00	1.45	0.65	5.00	0.00	0.11	0.11
20.05	1.45	0.65	5.00	0.00	0.11	0.11
20.10	1.45	0.65	5.00	0.00	0.11	0.11
20.15	1.45	0.65	5.00	0.00	0.11	0.11
20.20	1.45	0.65	5.00	0.00	0.11	0.11
20.25	1.45	0.65	5.00	0.00	0.11	0.11
20.30	1.45	0.65	5.00	0.00	0.11	0.11
20.35	1.45	0.65	5.00	0.00	0.11	0.11
20.40	1.45	0.65	5.00	0.00	0.11	0.11
20.45	1.45	0.65	5.00	0.00	0.10	0.10
20.50	1.45	0.65	5.00	0.00	0.10	0.10
20.55	1.45	0.65	5.00	0.00	0.10	0.10
20.60	1.45	0.65	5.00	0.00	0.10	0.10
20.65	1.45	0.65	5.00	0.00	0.10	0.10
20.70	1.45	0.65	5.00	0.00	0.10	0.10
20.75	1.45	0.65	5.00	0.00	0.10	0.10
20.80	1.45	0.65	5.00	0.00	0.10	0.10
20.85	1.45	0.65	5.00	0.00	0.10	0.10
20.90	1.45	0.65	5.00	0.00	0.10	0.10
20.95	1.45	0.65	5.00	0.00	0.10	0.10
21.00	1.45	0.65	5.00	0.00	0.10	0.10
21.05	1.45	0.65	5.00	0.00	0.10	0.10
21.10	1.45	0.65	5.00	0.00	0.10	0.10
21.15	1.45	0.65	5.00	0.00	0.10	0.10
21.20	1.45	0.65	5.00	0.00	0.10	0.10
21.25	1.45	0.65	5.00	0.00	0.09	0.09
21.30	1.45	0.65	5.00	0.00	0.09	0.09
21.35	1.45	0.65	5.00	0.00	0.09	0.09
21.40	1.45	0.65	5.00	0.00	0.09	0.09
21.45	1.45	0.65	5.00	0.00	0.09	0.09
21.50	1.45	0.65	5.00	0.00	0.09	0.09
21.55	1.45	0.65	5.00	0.00	0.09	0.09
21.60	1.45	0.65	5.00	0.00	0.09	0.09
21.65	1.45	0.65	5.00	0.00	0.09	0.09
21.70	1.45	0.65	5.00	0.00	0.09	0.09
21.75	1.45	0.65	5.00	0.00	0.09	0.09
21.80	1.45	0.65	5.00	0.00	0.09	0.09
21.85	1.45	0.65	5.00	0.00	0.09	0.09
21.90	1.45	0.65	5.00	0.00	0.09	0.09
21.95	1.45	0.65	5.00	0.00	0.08	0.08
22.00	1.45	0.65	5.00	0.00	0.08	0.08
22.05	1.45	0.65	5.00	0.00	0.08	0.08
22.10	1.45	0.65	5.00	0.00	0.08	0.08

22.15	1.45	0.65	5.00	0.00	0.08	0.08
22.20	1.45	0.65	5.00	0.00	0.08	0.08
22.25	1.45	0.65	5.00	0.00	0.08	0.08
22.30	1.45	0.65	5.00	0.00	0.08	0.08
22.35	1.45	0.65	5.00	0.00	0.08	0.08
22.40	1.45	0.65	5.00	0.00	0.08	0.08
22.45	1.45	0.65	5.00	0.00	0.08	0.08
22.50	1.45	0.65	5.00	0.00	0.08	0.08
22.55	1.45	0.65	5.00	0.00	0.08	0.08
22.60	1.45	0.65	5.00	0.00	0.08	0.08
22.65	1.45	0.65	5.00	0.00	0.08	0.08
22.70	1.45	0.65	5.00	0.00	0.07	0.07
22.75	1.45	0.64	5.00	0.00	0.07	0.07
22.80	1.45	0.64	5.00	0.00	0.07	0.07
22.85	1.45	0.64	5.00	0.00	0.07	0.07
22.90	1.45	0.64	5.00	0.00	0.07	0.07
22.95	1.45	0.64	5.00	0.00	0.07	0.07
23.00	1.45	0.64	5.00	0.00	0.07	0.07
23.05	1.45	0.64	5.00	0.00	0.07	0.07
23.10	1.45	0.64	5.00	0.00	0.07	0.07
23.15	1.45	0.64	5.00	0.00	0.07	0.07
23.20	1.45	0.64	5.00	0.00	0.07	0.07
23.25	1.45	0.64	5.00	0.00	0.07	0.07
23.30	1.45	0.64	5.00	0.00	0.07	0.07
23.35	1.45	0.64	5.00	0.00	0.06	0.06
23.40	1.45	0.64	5.00	0.00	0.06	0.06
23.45	1.45	0.64	5.00	0.00	0.06	0.06
23.50	1.45	0.64	5.00	0.00	0.06	0.06
23.55	1.45	0.64	5.00	0.00	0.06	0.06
23.60	1.45	0.64	5.00	0.00	0.06	0.06
23.65	1.45	0.64	5.00	0.00	0.06	0.06
23.70	1.45	0.64	5.00	0.00	0.06	0.06
23.75	1.45	0.64	5.00	0.00	0.06	0.06
23.80	1.45	0.64	5.00	0.00	0.06	0.06
23.85	1.45	0.64	5.00	0.00	0.06	0.06
23.90	1.45	0.64	5.00	0.00	0.06	0.06
23.95	1.45	0.64	5.00	0.00	0.06	0.06
24.00	1.45	0.64	5.00	0.00	0.05	0.05
24.05	1.45	0.64	5.00	0.00	0.05	0.05
24.10	1.45	0.64	5.00	0.00	0.05	0.05
24.15	1.45	0.64	5.00	0.00	0.05	0.05
24.20	1.45	0.64	5.00	0.00	0.05	0.05
24.25	1.45	0.64	5.00	0.00	0.05	0.05
24.30	1.45	0.64	5.00	0.00	0.05	0.05
24.35	1.45	0.64	5.00	0.00	0.05	0.05
24.40	1.45	0.64	5.00	0.00	0.05	0.05
24.45	1.45	0.64	5.00	0.00	0.05	0.05
24.50	1.45	0.64	5.00	0.00	0.05	0.05
24.55	1.45	0.64	5.00	0.00	0.05	0.05
24.60	1.45	0.64	5.00	0.00	0.05	0.05
24.65	1.45	0.64	5.00	0.00	0.04	0.04
24.70	1.45	0.64	5.00	0.00	0.04	0.04
24.75	1.45	0.64	5.00	0.00	0.04	0.04
24.80	1.45	0.64	5.00	0.00	0.04	0.04
24.85	1.45	0.64	5.00	0.00	0.04	0.04
24.90	1.45	0.64	5.00	0.00	0.04	0.04
24.95	1.45	0.64	5.00	0.00	0.04	0.04
25.00	1.45	0.64	5.00	0.00	0.04	0.04
25.05	1.45	0.64	5.00	0.00	0.04	0.04
25.10	1.45	0.64	5.00	0.00	0.04	0.04
25.15	1.45	0.64	5.00	0.00	0.04	0.04
25.20	1.45	0.64	5.00	0.00	0.04	0.04
25.25	1.45	0.64	5.00	0.00	0.03	0.03
25.30	1.45	0.64	5.00	0.00	0.03	0.03
25.35	1.45	0.64	5.00	0.00	0.03	0.03
25.40	1.45	0.64	5.00	0.00	0.03	0.03
25.45	1.45	0.64	5.00	0.00	0.03	0.03
25.50	1.45	0.64	5.00	0.00	0.03	0.03
25.55	1.45	0.64	5.00	0.00	0.03	0.03
25.60	1.45	0.64	5.00	0.00	0.03	0.03
25.65	1.45	0.64	5.00	0.00	0.03	0.03
25.70	1.45	0.64	5.00	0.00	0.03	0.03
25.75	1.45	0.64	5.00	0.00	0.03	0.03
25.80	1.45	0.64	5.00	0.00	0.03	0.03

25.85	1.45	0.64	5.00	0.00	0.02	0.02
25.90	1.45	0.64	5.00	0.00	0.02	0.02
25.95	1.45	0.64	5.00	0.00	0.02	0.02
26.00	1.45	0.64	5.00	0.00	0.02	0.02
26.05	1.45	0.64	5.00	0.00	0.02	0.02
26.10	1.45	0.64	5.00	0.00	0.02	0.02
26.15	1.45	0.64	5.00	0.00	0.02	0.02
26.20	1.45	0.64	5.00	0.00	0.02	0.02
26.25	1.45	0.64	5.00	0.00	0.02	0.02
26.30	1.45	0.64	5.00	0.00	0.02	0.02
26.35	1.46	0.64	5.00	0.00	0.02	0.02
26.40	1.46	0.64	5.00	0.00	0.02	0.02
26.45	1.46	0.64	5.00	0.00	0.01	0.01
26.50	1.46	0.64	5.00	0.00	0.01	0.01
26.55	1.46	0.64	5.00	0.00	0.01	0.01
26.60	1.46	0.64	5.00	0.00	0.01	0.01
26.65	1.46	0.64	5.00	0.00	0.01	0.01
26.70	1.46	0.64	5.00	0.00	0.01	0.01
26.75	1.46	0.64	5.00	0.00	0.01	0.01
26.80	1.46	0.64	5.00	0.00	0.01	0.01
26.85	1.46	0.64	5.00	0.00	0.01	0.01
26.90	1.46	0.64	5.00	0.00	0.01	0.01
26.95	1.46	0.64	5.00	0.00	0.01	0.01
27.00	1.45	0.64	5.00	0.00	0.00	0.00
27.05	1.45	0.64	5.00	0.00	0.00	0.00
27.10	1.45	0.64	5.00	0.00	0.00	0.00
27.15	1.45	0.64	5.00	0.00	0.00	0.00
27.20	1.45	0.64	5.00	0.00	0.00	0.00
27.25	1.45	0.64	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.

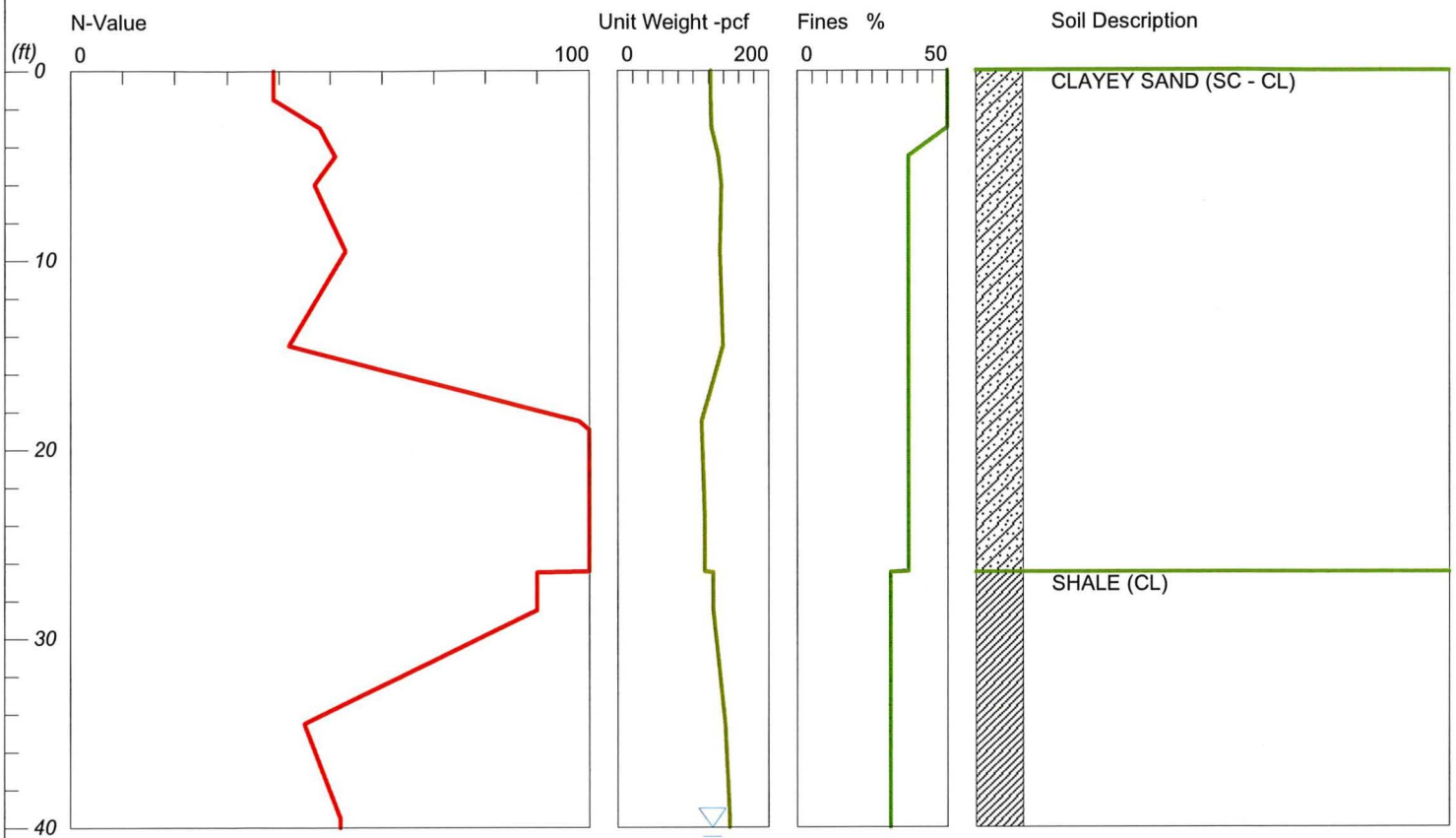
1 atm (atmosphere) = 1 tsf (ton/ft2)
CRRm Cyclic resistance ratio from soils
CSRsf Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S. Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat Settlement from saturated sands
S_dry Settlement from Unsaturated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

LIQUEFACTION ANALYSIS

FIRE STATION #25

Hole No.=EB-3 Water Depth=40.00 ft

Magnitude=8.5
Acceleration=0.806g

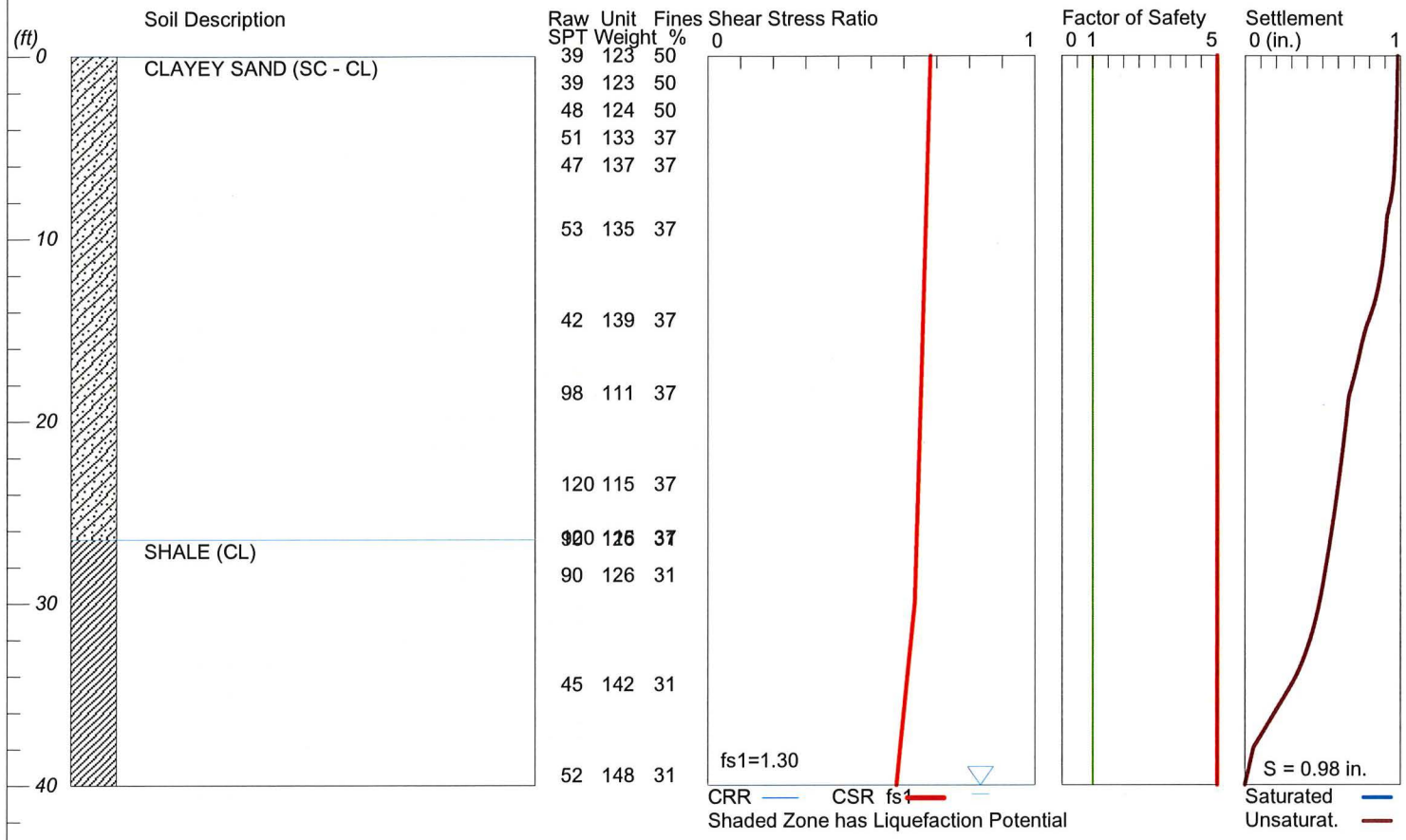


LIQUEFACTION ANALYSIS

FIRE STATION #25

Hole No.=EB-3 Water Depth=40.00 ft

Magnitude=8.5
Acceleration=0.806g



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LIQUEFACTION ANALYSIS SUMMARY

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Input File Name: \\GRANT-PC\Grant Roughs\Liquefy Pro Data Files grant\1295.5 City of San Mateo, Fire Station #25, EB-3.liq
Title: FIRE STATION #25
Subtitle: City of San Mateo

Surface Elev.=
Hole No.=EB-3
Depth of Hole= 40.00 ft
Water Table during Earthquake= 40.00 ft
Water Table during In-Situ Testing= 40.00 ft
Max. Acceleration= 0.81 g
Earthquake Magnitude= 8.50

Input Data:
Surface Elev.=
Hole No.=EB-3
Depth of Hole=40.00 ft
Water Table during Earthquake= 40.00 ft
Water Table during In-Situ Testing= 40.00 ft
Max. Acceleration=0.81 g
Earthquake Magnitude=8.50
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
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 %
0.00	39.00	123.00	50.00
1.50	39.00	123.00	50.00
3.00	48.00	124.00	50.00
4.50	51.00	133.00	37.00
6.00	47.00	137.00	37.00
9.50	53.00	135.00	37.00
14.50	42.00	139.00	37.00
18.50	98.00	111.00	37.00
23.50	120.00	115.00	37.00
26.45	120.00	115.00	37.00
26.50	90.00	126.00	31.00
28.50	90.00	126.00	31.00
34.50	45.00	142.00	31.00
39.50	52.00	148.00	31.00

Output Results:
Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=0.98 in.
Total Settlement of Saturated and Unsaturated Sands=0.98 in.
Differential Settlement=0.491 to 0.648 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.

0.00	1.45	0.68	5.00	0.00	0.98	0.98
0.05	1.45	0.68	5.00	0.00	0.98	0.98
0.10	1.45	0.68	5.00	0.00	0.98	0.98
0.15	1.45	0.68	5.00	0.00	0.98	0.98
0.20	1.45	0.68	5.00	0.00	0.98	0.98
0.25	1.45	0.68	5.00	0.00	0.98	0.98
0.30	1.45	0.68	5.00	0.00	0.98	0.98
0.35	1.45	0.68	5.00	0.00	0.98	0.98
0.40	1.45	0.68	5.00	0.00	0.98	0.98
0.45	1.45	0.68	5.00	0.00	0.98	0.98
0.50	1.45	0.68	5.00	0.00	0.98	0.98
0.55	1.45	0.68	5.00	0.00	0.98	0.98
0.60	1.45	0.68	5.00	0.00	0.98	0.98
0.65	1.45	0.68	5.00	0.00	0.98	0.98
0.70	1.45	0.68	5.00	0.00	0.98	0.98
0.75	1.45	0.68	5.00	0.00	0.98	0.98
0.80	1.45	0.68	5.00	0.00	0.98	0.98
0.85	1.45	0.68	5.00	0.00	0.98	0.98
0.90	1.45	0.68	5.00	0.00	0.98	0.98
0.95	1.45	0.68	5.00	0.00	0.98	0.98
1.00	1.45	0.68	5.00	0.00	0.98	0.98
1.05	1.45	0.68	5.00	0.00	0.98	0.98
1.10	1.45	0.68	5.00	0.00	0.98	0.98
1.15	1.45	0.68	5.00	0.00	0.98	0.98
1.20	1.45	0.68	5.00	0.00	0.98	0.98
1.25	1.45	0.68	5.00	0.00	0.98	0.98
1.30	1.45	0.68	5.00	0.00	0.98	0.98
1.35	1.45	0.68	5.00	0.00	0.98	0.98
1.40	1.45	0.68	5.00	0.00	0.98	0.98
1.45	1.45	0.68	5.00	0.00	0.98	0.98
1.50	1.45	0.68	5.00	0.00	0.98	0.98
1.55	1.45	0.68	5.00	0.00	0.98	0.98
1.60	1.45	0.68	5.00	0.00	0.98	0.98
1.65	1.45	0.68	5.00	0.00	0.98	0.98
1.70	1.45	0.68	5.00	0.00	0.98	0.98
1.75	1.45	0.68	5.00	0.00	0.98	0.98
1.80	1.45	0.68	5.00	0.00	0.98	0.98
1.85	1.45	0.68	5.00	0.00	0.98	0.98
1.90	1.45	0.68	5.00	0.00	0.98	0.98
1.95	1.45	0.68	5.00	0.00	0.98	0.98
2.00	1.45	0.68	5.00	0.00	0.98	0.98
2.05	1.45	0.68	5.00	0.00	0.98	0.98
2.10	1.45	0.68	5.00	0.00	0.98	0.98
2.15	1.45	0.68	5.00	0.00	0.98	0.98
2.20	1.45	0.68	5.00	0.00	0.98	0.98
2.25	1.45	0.68	5.00	0.00	0.98	0.98
2.30	1.45	0.68	5.00	0.00	0.98	0.98
2.35	1.45	0.68	5.00	0.00	0.98	0.98
2.40	1.45	0.68	5.00	0.00	0.98	0.98
2.45	1.45	0.68	5.00	0.00	0.98	0.98
2.50	1.45	0.68	5.00	0.00	0.98	0.98
2.55	1.45	0.68	5.00	0.00	0.98	0.98
2.60	1.45	0.68	5.00	0.00	0.98	0.98
2.65	1.45	0.68	5.00	0.00	0.98	0.98
2.70	1.45	0.68	5.00	0.00	0.98	0.98
2.75	1.45	0.68	5.00	0.00	0.98	0.98
2.80	1.45	0.68	5.00	0.00	0.98	0.98
2.85	1.45	0.68	5.00	0.00	0.98	0.98
2.90	1.45	0.68	5.00	0.00	0.98	0.98
2.95	1.45	0.68	5.00	0.00	0.98	0.98
3.00	1.45	0.68	5.00	0.00	0.98	0.98
3.05	1.45	0.68	5.00	0.00	0.98	0.98
3.10	1.45	0.68	5.00	0.00	0.98	0.98
3.15	1.45	0.68	5.00	0.00	0.97	0.97
3.20	1.45	0.68	5.00	0.00	0.97	0.97
3.25	1.45	0.68	5.00	0.00	0.97	0.97
3.30	1.45	0.68	5.00	0.00	0.97	0.97
3.35	1.45	0.68	5.00	0.00	0.97	0.97
3.40	1.45	0.68	5.00	0.00	0.97	0.97
3.45	1.45	0.68	5.00	0.00	0.97	0.97
3.50	1.45	0.68	5.00	0.00	0.97	0.97
3.55	1.45	0.68	5.00	0.00	0.97	0.97
3.60	1.45	0.68	5.00	0.00	0.97	0.97

3.65	1.45	0.68	5.00	0.00	0.97	0.97
3.70	1.45	0.68	5.00	0.00	0.97	0.97
3.75	1.45	0.68	5.00	0.00	0.97	0.97
3.80	1.45	0.68	5.00	0.00	0.97	0.97
3.85	1.45	0.67	5.00	0.00	0.97	0.97
3.90	1.45	0.67	5.00	0.00	0.97	0.97
3.95	1.45	0.67	5.00	0.00	0.97	0.97
4.00	1.45	0.67	5.00	0.00	0.97	0.97
4.05	1.45	0.67	5.00	0.00	0.97	0.97
4.10	1.45	0.67	5.00	0.00	0.97	0.97
4.15	1.45	0.67	5.00	0.00	0.97	0.97
4.20	1.45	0.67	5.00	0.00	0.97	0.97
4.25	1.45	0.67	5.00	0.00	0.97	0.97
4.30	1.45	0.67	5.00	0.00	0.97	0.97
4.35	1.45	0.67	5.00	0.00	0.97	0.97
4.40	1.45	0.67	5.00	0.00	0.97	0.97
4.45	1.45	0.67	5.00	0.00	0.97	0.97
4.50	1.45	0.67	5.00	0.00	0.97	0.97
4.55	1.45	0.67	5.00	0.00	0.97	0.97
4.60	1.45	0.67	5.00	0.00	0.97	0.97
4.65	1.45	0.67	5.00	0.00	0.97	0.97
4.70	1.45	0.67	5.00	0.00	0.97	0.97
4.75	1.45	0.67	5.00	0.00	0.97	0.97
4.80	1.45	0.67	5.00	0.00	0.97	0.97
4.85	1.45	0.67	5.00	0.00	0.97	0.97
4.90	1.45	0.67	5.00	0.00	0.97	0.97
4.95	1.45	0.67	5.00	0.00	0.97	0.97
5.00	1.45	0.67	5.00	0.00	0.97	0.97
5.05	1.45	0.67	5.00	0.00	0.97	0.97
5.10	1.45	0.67	5.00	0.00	0.97	0.97
5.15	1.45	0.67	5.00	0.00	0.97	0.97
5.20	1.45	0.67	5.00	0.00	0.97	0.97
5.25	1.45	0.67	5.00	0.00	0.97	0.97
5.30	1.45	0.67	5.00	0.00	0.97	0.97
5.35	1.45	0.67	5.00	0.00	0.97	0.97
5.40	1.45	0.67	5.00	0.00	0.97	0.97
5.45	1.45	0.67	5.00	0.00	0.97	0.97
5.50	1.45	0.67	5.00	0.00	0.97	0.97
5.55	1.45	0.67	5.00	0.00	0.96	0.96
5.60	1.45	0.67	5.00	0.00	0.96	0.96
5.65	1.45	0.67	5.00	0.00	0.96	0.96
5.70	1.45	0.67	5.00	0.00	0.96	0.96
5.75	1.45	0.67	5.00	0.00	0.96	0.96
5.80	1.45	0.67	5.00	0.00	0.96	0.96
5.85	1.45	0.67	5.00	0.00	0.96	0.96
5.90	1.45	0.67	5.00	0.00	0.96	0.96
5.95	1.45	0.67	5.00	0.00	0.96	0.96
6.00	1.45	0.67	5.00	0.00	0.96	0.96
6.05	1.45	0.67	5.00	0.00	0.96	0.96
6.10	1.45	0.67	5.00	0.00	0.96	0.96
6.15	1.45	0.67	5.00	0.00	0.96	0.96
6.20	1.45	0.67	5.00	0.00	0.96	0.96
6.25	1.45	0.67	5.00	0.00	0.96	0.96
6.30	1.45	0.67	5.00	0.00	0.96	0.96
6.35	1.45	0.67	5.00	0.00	0.96	0.96
6.40	1.45	0.67	5.00	0.00	0.96	0.96
6.45	1.45	0.67	5.00	0.00	0.96	0.96
6.50	1.45	0.67	5.00	0.00	0.96	0.96
6.55	1.45	0.67	5.00	0.00	0.96	0.96
6.60	1.45	0.67	5.00	0.00	0.96	0.96
6.65	1.45	0.67	5.00	0.00	0.96	0.96
6.70	1.45	0.67	5.00	0.00	0.96	0.96
6.75	1.45	0.67	5.00	0.00	0.96	0.96
6.80	1.45	0.67	5.00	0.00	0.96	0.96
6.85	1.45	0.67	5.00	0.00	0.95	0.95
6.90	1.45	0.67	5.00	0.00	0.95	0.95
6.95	1.45	0.67	5.00	0.00	0.95	0.95
7.00	1.45	0.67	5.00	0.00	0.95	0.95
7.05	1.45	0.67	5.00	0.00	0.95	0.95
7.10	1.45	0.67	5.00	0.00	0.95	0.95
7.15	1.45	0.67	5.00	0.00	0.95	0.95
7.20	1.45	0.67	5.00	0.00	0.95	0.95
7.25	1.45	0.67	5.00	0.00	0.95	0.95
7.30	1.45	0.67	5.00	0.00	0.95	0.95

7.35	1.45	0.67	5.00	0.00	0.95	0.95
7.40	1.45	0.67	5.00	0.00	0.95	0.95
7.45	1.45	0.67	5.00	0.00	0.95	0.95
7.50	1.45	0.67	5.00	0.00	0.95	0.95
7.55	1.45	0.67	5.00	0.00	0.94	0.94
7.60	1.45	0.67	5.00	0.00	0.94	0.94
7.65	1.45	0.67	5.00	0.00	0.94	0.94
7.70	1.45	0.67	5.00	0.00	0.94	0.94
7.75	1.45	0.67	5.00	0.00	0.94	0.94
7.80	1.45	0.67	5.00	0.00	0.94	0.94
7.85	1.45	0.67	5.00	0.00	0.94	0.94
7.90	1.45	0.67	5.00	0.00	0.94	0.94
7.95	1.45	0.67	5.00	0.00	0.94	0.94
8.00	1.45	0.67	5.00	0.00	0.94	0.94
8.05	1.45	0.67	5.00	0.00	0.93	0.93
8.10	1.45	0.67	5.00	0.00	0.93	0.93
8.15	1.45	0.67	5.00	0.00	0.93	0.93
8.20	1.45	0.67	5.00	0.00	0.93	0.93
8.25	1.45	0.67	5.00	0.00	0.93	0.93
8.30	1.45	0.67	5.00	0.00	0.93	0.93
8.35	1.45	0.67	5.00	0.00	0.93	0.93
8.40	1.45	0.67	5.00	0.00	0.92	0.92
8.45	1.45	0.67	5.00	0.00	0.92	0.92
8.50	1.45	0.67	5.00	0.00	0.92	0.92
8.55	1.45	0.67	5.00	0.00	0.92	0.92
8.60	1.45	0.67	5.00	0.00	0.92	0.92
8.65	1.45	0.67	5.00	0.00	0.92	0.92
8.70	1.45	0.67	5.00	0.00	0.92	0.92
8.75	1.45	0.67	5.00	0.00	0.92	0.92
8.80	1.45	0.67	5.00	0.00	0.91	0.91
8.85	1.45	0.67	5.00	0.00	0.91	0.91
8.90	1.45	0.67	5.00	0.00	0.91	0.91
8.95	1.45	0.67	5.00	0.00	0.91	0.91
9.00	1.45	0.67	5.00	0.00	0.91	0.91
9.05	1.45	0.67	5.00	0.00	0.91	0.91
9.10	1.45	0.67	5.00	0.00	0.91	0.91
9.15	1.45	0.67	5.00	0.00	0.91	0.91
9.20	1.45	0.67	5.00	0.00	0.91	0.91
9.25	1.45	0.67	5.00	0.00	0.91	0.91
9.30	1.45	0.67	5.00	0.00	0.91	0.91
9.35	1.45	0.67	5.00	0.00	0.91	0.91
9.40	1.45	0.67	5.00	0.00	0.91	0.91
9.45	1.45	0.67	5.00	0.00	0.91	0.91
9.50	1.45	0.67	5.00	0.00	0.91	0.91
9.55	1.45	0.67	5.00	0.00	0.91	0.91
9.60	1.45	0.67	5.00	0.00	0.91	0.91
9.65	1.45	0.67	5.00	0.00	0.91	0.91
9.70	1.45	0.67	5.00	0.00	0.91	0.91
9.75	1.45	0.67	5.00	0.00	0.90	0.90
9.80	1.45	0.67	5.00	0.00	0.90	0.90
9.85	1.45	0.67	5.00	0.00	0.90	0.90
9.90	1.45	0.67	5.00	0.00	0.90	0.90
9.95	1.45	0.67	5.00	0.00	0.90	0.90
10.00	1.45	0.67	5.00	0.00	0.90	0.90
10.05	1.45	0.67	5.00	0.00	0.90	0.90
10.10	1.45	0.67	5.00	0.00	0.90	0.90
10.15	1.45	0.66	5.00	0.00	0.90	0.90
10.20	1.45	0.66	5.00	0.00	0.90	0.90
10.25	1.45	0.66	5.00	0.00	0.90	0.90
10.30	1.45	0.66	5.00	0.00	0.90	0.90
10.35	1.45	0.66	5.00	0.00	0.90	0.90
10.40	1.45	0.66	5.00	0.00	0.90	0.90
10.45	1.45	0.66	5.00	0.00	0.90	0.90
10.50	1.45	0.66	5.00	0.00	0.90	0.90
10.55	1.45	0.66	5.00	0.00	0.90	0.90
10.60	1.45	0.66	5.00	0.00	0.90	0.90
10.65	1.45	0.66	5.00	0.00	0.89	0.89
10.70	1.45	0.66	5.00	0.00	0.89	0.89
10.75	1.45	0.66	5.00	0.00	0.89	0.89
10.80	1.45	0.66	5.00	0.00	0.89	0.89
10.85	1.45	0.66	5.00	0.00	0.89	0.89
10.90	1.45	0.66	5.00	0.00	0.89	0.89
10.95	1.45	0.66	5.00	0.00	0.89	0.89
11.00	1.45	0.66	5.00	0.00	0.89	0.89

11.05	1.45	0.66	5.00	0.00	0.89	0.89
11.10	1.45	0.66	5.00	0.00	0.89	0.89
11.15	1.45	0.66	5.00	0.00	0.89	0.89
11.20	1.45	0.66	5.00	0.00	0.89	0.89
11.25	1.45	0.66	5.00	0.00	0.89	0.89
11.30	1.45	0.66	5.00	0.00	0.88	0.88
11.35	1.45	0.66	5.00	0.00	0.88	0.88
11.40	1.45	0.66	5.00	0.00	0.88	0.88
11.45	1.45	0.66	5.00	0.00	0.88	0.88
11.50	1.45	0.66	5.00	0.00	0.88	0.88
11.55	1.45	0.66	5.00	0.00	0.88	0.88
11.60	1.45	0.66	5.00	0.00	0.88	0.88
11.65	1.45	0.66	5.00	0.00	0.88	0.88
11.70	1.45	0.66	5.00	0.00	0.88	0.88
11.75	1.45	0.66	5.00	0.00	0.88	0.88
11.80	1.45	0.66	5.00	0.00	0.88	0.88
11.85	1.45	0.66	5.00	0.00	0.88	0.88
11.90	1.45	0.66	5.00	0.00	0.87	0.87
11.95	1.45	0.66	5.00	0.00	0.87	0.87
12.00	1.45	0.66	5.00	0.00	0.87	0.87
12.05	1.45	0.66	5.00	0.00	0.87	0.87
12.10	1.45	0.66	5.00	0.00	0.87	0.87
12.15	1.45	0.66	5.00	0.00	0.87	0.87
12.20	1.45	0.66	5.00	0.00	0.87	0.87
12.25	1.45	0.66	5.00	0.00	0.87	0.87
12.30	1.45	0.66	5.00	0.00	0.87	0.87
12.35	1.45	0.66	5.00	0.00	0.87	0.87
12.40	1.45	0.66	5.00	0.00	0.86	0.86
12.45	1.45	0.66	5.00	0.00	0.86	0.86
12.50	1.45	0.66	5.00	0.00	0.86	0.86
12.55	1.45	0.66	5.00	0.00	0.86	0.86
12.60	1.45	0.66	5.00	0.00	0.86	0.86
12.65	1.45	0.66	5.00	0.00	0.86	0.86
12.70	1.45	0.66	5.00	0.00	0.86	0.86
12.75	1.45	0.66	5.00	0.00	0.86	0.86
12.80	1.45	0.66	5.00	0.00	0.85	0.85
12.85	1.45	0.66	5.00	0.00	0.85	0.85
12.90	1.45	0.66	5.00	0.00	0.85	0.85
12.95	1.45	0.66	5.00	0.00	0.85	0.85
13.00	1.45	0.66	5.00	0.00	0.85	0.85
13.05	1.45	0.66	5.00	0.00	0.85	0.85
13.10	1.45	0.66	5.00	0.00	0.85	0.85
13.15	1.45	0.66	5.00	0.00	0.84	0.84
13.20	1.45	0.66	5.00	0.00	0.84	0.84
13.25	1.45	0.66	5.00	0.00	0.84	0.84
13.30	1.45	0.66	5.00	0.00	0.84	0.84
13.35	1.45	0.66	5.00	0.00	0.84	0.84
13.40	1.45	0.66	5.00	0.00	0.84	0.84
13.45	1.45	0.66	5.00	0.00	0.84	0.84
13.50	1.45	0.66	5.00	0.00	0.83	0.83
13.55	1.45	0.66	5.00	0.00	0.83	0.83
13.60	1.45	0.66	5.00	0.00	0.83	0.83
13.65	1.45	0.66	5.00	0.00	0.83	0.83
13.70	1.45	0.66	5.00	0.00	0.83	0.83
13.75	1.45	0.66	5.00	0.00	0.83	0.83
13.80	1.45	0.66	5.00	0.00	0.82	0.82
13.85	1.45	0.66	5.00	0.00	0.82	0.82
13.90	1.45	0.66	5.00	0.00	0.82	0.82
13.95	1.45	0.66	5.00	0.00	0.82	0.82
14.00	1.45	0.66	5.00	0.00	0.82	0.82
14.05	1.45	0.66	5.00	0.00	0.81	0.81
14.10	1.45	0.66	5.00	0.00	0.81	0.81
14.15	1.45	0.66	5.00	0.00	0.81	0.81
14.20	1.45	0.66	5.00	0.00	0.81	0.81
14.25	1.45	0.66	5.00	0.00	0.81	0.81
14.30	1.45	0.66	5.00	0.00	0.80	0.80
14.35	1.45	0.66	5.00	0.00	0.80	0.80
14.40	1.45	0.66	5.00	0.00	0.80	0.80
14.45	1.45	0.66	5.00	0.00	0.80	0.80
14.50	1.45	0.66	5.00	0.00	0.80	0.80
14.55	1.45	0.66	5.00	0.00	0.79	0.79
14.60	1.45	0.66	5.00	0.00	0.79	0.79
14.65	1.45	0.66	5.00	0.00	0.79	0.79
14.70	1.45	0.66	5.00	0.00	0.79	0.79

14.75	1.45	0.66	5.00	0.00	0.78	0.78
14.80	1.45	0.66	5.00	0.00	0.78	0.78
14.85	1.45	0.66	5.00	0.00	0.78	0.78
14.90	1.45	0.66	5.00	0.00	0.78	0.78
14.95	1.45	0.66	5.00	0.00	0.78	0.78
15.00	1.45	0.66	5.00	0.00	0.78	0.78
15.05	1.45	0.66	5.00	0.00	0.77	0.77
15.10	1.45	0.66	5.00	0.00	0.77	0.77
15.15	1.45	0.66	5.00	0.00	0.77	0.77
15.20	1.45	0.66	5.00	0.00	0.77	0.77
15.25	1.45	0.66	5.00	0.00	0.77	0.77
15.30	1.45	0.66	5.00	0.00	0.77	0.77
15.35	1.45	0.66	5.00	0.00	0.76	0.76
15.40	1.45	0.66	5.00	0.00	0.76	0.76
15.45	1.45	0.66	5.00	0.00	0.76	0.76
15.50	1.45	0.66	5.00	0.00	0.76	0.76
15.55	1.45	0.66	5.00	0.00	0.76	0.76
15.60	1.45	0.66	5.00	0.00	0.76	0.76
15.65	1.45	0.66	5.00	0.00	0.76	0.76
15.70	1.45	0.66	5.00	0.00	0.75	0.75
15.75	1.45	0.66	5.00	0.00	0.75	0.75
15.80	1.45	0.66	5.00	0.00	0.75	0.75
15.85	1.45	0.66	5.00	0.00	0.75	0.75
15.90	1.45	0.66	5.00	0.00	0.75	0.75
15.95	1.45	0.66	5.00	0.00	0.75	0.75
16.00	1.45	0.66	5.00	0.00	0.75	0.75
16.05	1.45	0.66	5.00	0.00	0.74	0.74
16.10	1.45	0.66	5.00	0.00	0.74	0.74
16.15	1.45	0.66	5.00	0.00	0.74	0.74
16.20	1.45	0.66	5.00	0.00	0.74	0.74
16.25	1.45	0.66	5.00	0.00	0.74	0.74
16.30	1.45	0.66	5.00	0.00	0.74	0.74
16.35	1.45	0.66	5.00	0.00	0.74	0.74
16.40	1.45	0.66	5.00	0.00	0.74	0.74
16.45	1.45	0.65	5.00	0.00	0.73	0.73
16.50	1.45	0.65	5.00	0.00	0.73	0.73
16.55	1.45	0.65	5.00	0.00	0.73	0.73
16.60	1.45	0.65	5.00	0.00	0.73	0.73
16.65	1.45	0.65	5.00	0.00	0.73	0.73
16.70	1.45	0.65	5.00	0.00	0.73	0.73
16.75	1.45	0.65	5.00	0.00	0.73	0.73
16.80	1.45	0.65	5.00	0.00	0.72	0.72
16.85	1.45	0.65	5.00	0.00	0.72	0.72
16.90	1.45	0.65	5.00	0.00	0.72	0.72
16.95	1.45	0.65	5.00	0.00	0.72	0.72
17.00	1.45	0.65	5.00	0.00	0.72	0.72
17.05	1.45	0.65	5.00	0.00	0.72	0.72
17.10	1.45	0.65	5.00	0.00	0.72	0.72
17.15	1.45	0.65	5.00	0.00	0.71	0.71
17.20	1.45	0.65	5.00	0.00	0.71	0.71
17.25	1.45	0.65	5.00	0.00	0.71	0.71
17.30	1.45	0.65	5.00	0.00	0.71	0.71
17.35	1.45	0.65	5.00	0.00	0.71	0.71
17.40	1.45	0.65	5.00	0.00	0.71	0.71
17.45	1.45	0.65	5.00	0.00	0.71	0.71
17.50	1.45	0.65	5.00	0.00	0.70	0.70
17.55	1.45	0.65	5.00	0.00	0.70	0.70
17.60	1.45	0.65	5.00	0.00	0.70	0.70
17.65	1.45	0.65	5.00	0.00	0.70	0.70
17.70	1.45	0.65	5.00	0.00	0.70	0.70
17.75	1.45	0.65	5.00	0.00	0.70	0.70
17.80	1.45	0.65	5.00	0.00	0.70	0.70
17.85	1.45	0.65	5.00	0.00	0.69	0.69
17.90	1.45	0.65	5.00	0.00	0.69	0.69
17.95	1.45	0.65	5.00	0.00	0.69	0.69
18.00	1.45	0.65	5.00	0.00	0.69	0.69
18.05	1.45	0.65	5.00	0.00	0.69	0.69
18.10	1.45	0.65	5.00	0.00	0.69	0.69
18.15	1.45	0.65	5.00	0.00	0.68	0.68
18.20	1.45	0.65	5.00	0.00	0.68	0.68
18.25	1.45	0.65	5.00	0.00	0.68	0.68
18.30	1.45	0.65	5.00	0.00	0.68	0.68
18.35	1.45	0.65	5.00	0.00	0.68	0.68
18.40	1.45	0.65	5.00	0.00	0.68	0.68

18.45	1.45	0.65	5.00	0.00	0.67	0.67
18.50	1.45	0.65	5.00	0.00	0.67	0.67
18.55	1.45	0.65	5.00	0.00	0.67	0.67
18.60	1.45	0.65	5.00	0.00	0.67	0.67
18.65	1.45	0.65	5.00	0.00	0.67	0.67
18.70	1.45	0.65	5.00	0.00	0.67	0.67
18.75	1.45	0.65	5.00	0.00	0.67	0.67
18.80	1.45	0.65	5.00	0.00	0.67	0.67
18.85	1.45	0.65	5.00	0.00	0.67	0.67
18.90	1.45	0.65	5.00	0.00	0.67	0.67
18.95	1.45	0.65	5.00	0.00	0.66	0.66
19.00	1.45	0.65	5.00	0.00	0.66	0.66
19.05	1.45	0.65	5.00	0.00	0.66	0.66
19.10	1.45	0.65	5.00	0.00	0.66	0.66
19.15	1.45	0.65	5.00	0.00	0.66	0.66
19.20	1.45	0.65	5.00	0.00	0.66	0.66
19.25	1.45	0.65	5.00	0.00	0.66	0.66
19.30	1.45	0.65	5.00	0.00	0.66	0.66
19.35	1.45	0.65	5.00	0.00	0.66	0.66
19.40	1.45	0.65	5.00	0.00	0.66	0.66
19.45	1.45	0.65	5.00	0.00	0.66	0.66
19.50	1.45	0.65	5.00	0.00	0.66	0.66
19.55	1.45	0.65	5.00	0.00	0.66	0.66
19.60	1.45	0.65	5.00	0.00	0.66	0.66
19.65	1.45	0.65	5.00	0.00	0.66	0.66
19.70	1.45	0.65	5.00	0.00	0.66	0.66
19.75	1.45	0.65	5.00	0.00	0.65	0.65
19.80	1.45	0.65	5.00	0.00	0.65	0.65
19.85	1.45	0.65	5.00	0.00	0.65	0.65
19.90	1.45	0.65	5.00	0.00	0.65	0.65
19.95	1.45	0.65	5.00	0.00	0.65	0.65
20.00	1.45	0.65	5.00	0.00	0.65	0.65
20.05	1.45	0.65	5.00	0.00	0.65	0.65
20.10	1.45	0.65	5.00	0.00	0.65	0.65
20.15	1.45	0.65	5.00	0.00	0.65	0.65
20.20	1.45	0.65	5.00	0.00	0.65	0.65
20.25	1.45	0.65	5.00	0.00	0.65	0.65
20.30	1.45	0.65	5.00	0.00	0.65	0.65
20.35	1.45	0.65	5.00	0.00	0.65	0.65
20.40	1.45	0.65	5.00	0.00	0.65	0.65
20.45	1.45	0.65	5.00	0.00	0.65	0.65
20.50	1.45	0.65	5.00	0.00	0.64	0.64
20.55	1.45	0.65	5.00	0.00	0.64	0.64
20.60	1.45	0.65	5.00	0.00	0.64	0.64
20.65	1.45	0.65	5.00	0.00	0.64	0.64
20.70	1.45	0.65	5.00	0.00	0.64	0.64
20.75	1.45	0.65	5.00	0.00	0.64	0.64
20.80	1.45	0.65	5.00	0.00	0.64	0.64
20.85	1.45	0.65	5.00	0.00	0.64	0.64
20.90	1.45	0.65	5.00	0.00	0.64	0.64
20.95	1.45	0.65	5.00	0.00	0.64	0.64
21.00	1.45	0.65	5.00	0.00	0.64	0.64
21.05	1.45	0.65	5.00	0.00	0.64	0.64
21.10	1.45	0.65	5.00	0.00	0.64	0.64
21.15	1.45	0.65	5.00	0.00	0.64	0.64
21.20	1.45	0.65	5.00	0.00	0.64	0.64
21.25	1.45	0.65	5.00	0.00	0.63	0.63
21.30	1.45	0.65	5.00	0.00	0.63	0.63
21.35	1.45	0.65	5.00	0.00	0.63	0.63
21.40	1.45	0.65	5.00	0.00	0.63	0.63
21.45	1.45	0.65	5.00	0.00	0.63	0.63
21.50	1.45	0.65	5.00	0.00	0.63	0.63
21.55	1.45	0.65	5.00	0.00	0.63	0.63
21.60	1.45	0.65	5.00	0.00	0.63	0.63
21.65	1.45	0.65	5.00	0.00	0.63	0.63
21.70	1.45	0.65	5.00	0.00	0.63	0.63
21.75	1.45	0.65	5.00	0.00	0.63	0.63
21.80	1.45	0.65	5.00	0.00	0.63	0.63
21.85	1.45	0.65	5.00	0.00	0.63	0.63
21.90	1.45	0.65	5.00	0.00	0.63	0.63
21.95	1.45	0.65	5.00	0.00	0.62	0.62
22.00	1.45	0.65	5.00	0.00	0.62	0.62
22.05	1.45	0.65	5.00	0.00	0.62	0.62
22.10	1.45	0.65	5.00	0.00	0.62	0.62

22.15	1.45	0.65	5.00	0.00	0.62	0.62
22.20	1.45	0.65	5.00	0.00	0.62	0.62
22.25	1.45	0.65	5.00	0.00	0.62	0.62
22.30	1.45	0.65	5.00	0.00	0.62	0.62
22.35	1.45	0.65	5.00	0.00	0.62	0.62
22.40	1.45	0.65	5.00	0.00	0.62	0.62
22.45	1.45	0.65	5.00	0.00	0.62	0.62
22.50	1.45	0.65	5.00	0.00	0.62	0.62
22.55	1.45	0.65	5.00	0.00	0.62	0.62
22.60	1.45	0.65	5.00	0.00	0.62	0.62
22.65	1.45	0.65	5.00	0.00	0.61	0.61
22.70	1.45	0.65	5.00	0.00	0.61	0.61
22.75	1.45	0.64	5.00	0.00	0.61	0.61
22.80	1.45	0.64	5.00	0.00	0.61	0.61
22.85	1.45	0.64	5.00	0.00	0.61	0.61
22.90	1.45	0.64	5.00	0.00	0.61	0.61
22.95	1.45	0.64	5.00	0.00	0.61	0.61
23.00	1.45	0.64	5.00	0.00	0.61	0.61
23.05	1.45	0.64	5.00	0.00	0.61	0.61
23.10	1.45	0.64	5.00	0.00	0.61	0.61
23.15	1.45	0.64	5.00	0.00	0.61	0.61
23.20	1.45	0.64	5.00	0.00	0.61	0.61
23.25	1.45	0.64	5.00	0.00	0.61	0.61
23.30	1.45	0.64	5.00	0.00	0.60	0.60
23.35	1.45	0.64	5.00	0.00	0.60	0.60
23.40	1.45	0.64	5.00	0.00	0.60	0.60
23.45	1.45	0.64	5.00	0.00	0.60	0.60
23.50	1.45	0.64	5.00	0.00	0.60	0.60
23.55	1.45	0.64	5.00	0.00	0.60	0.60
23.60	1.45	0.64	5.00	0.00	0.60	0.60
23.65	1.45	0.64	5.00	0.00	0.60	0.60
23.70	1.45	0.64	5.00	0.00	0.60	0.60
23.75	1.45	0.64	5.00	0.00	0.60	0.60
23.80	1.45	0.64	5.00	0.00	0.60	0.60
23.85	1.45	0.64	5.00	0.00	0.60	0.60
23.90	1.45	0.64	5.00	0.00	0.60	0.60
23.95	1.45	0.64	5.00	0.00	0.59	0.59
24.00	1.45	0.64	5.00	0.00	0.59	0.59
24.05	1.45	0.64	5.00	0.00	0.59	0.59
24.10	1.45	0.64	5.00	0.00	0.59	0.59
24.15	1.45	0.64	5.00	0.00	0.59	0.59
24.20	1.45	0.64	5.00	0.00	0.59	0.59
24.25	1.45	0.64	5.00	0.00	0.59	0.59
24.30	1.45	0.64	5.00	0.00	0.59	0.59
24.35	1.45	0.64	5.00	0.00	0.59	0.59
24.40	1.45	0.64	5.00	0.00	0.59	0.59
24.45	1.45	0.64	5.00	0.00	0.59	0.59
24.50	1.45	0.64	5.00	0.00	0.59	0.59
24.55	1.45	0.64	5.00	0.00	0.58	0.58
24.60	1.45	0.64	5.00	0.00	0.58	0.58
24.65	1.45	0.64	5.00	0.00	0.58	0.58
24.70	1.45	0.64	5.00	0.00	0.58	0.58
24.75	1.45	0.64	5.00	0.00	0.58	0.58
24.80	1.45	0.64	5.00	0.00	0.58	0.58
24.85	1.45	0.64	5.00	0.00	0.58	0.58
24.90	1.45	0.64	5.00	0.00	0.58	0.58
24.95	1.45	0.64	5.00	0.00	0.58	0.58
25.00	1.45	0.64	5.00	0.00	0.58	0.58
25.05	1.45	0.64	5.00	0.00	0.58	0.58
25.10	1.45	0.64	5.00	0.00	0.58	0.58
25.15	1.45	0.64	5.00	0.00	0.57	0.57
25.20	1.45	0.64	5.00	0.00	0.57	0.57
25.25	1.45	0.64	5.00	0.00	0.57	0.57
25.30	1.45	0.64	5.00	0.00	0.57	0.57
25.35	1.45	0.64	5.00	0.00	0.57	0.57
25.40	1.45	0.64	5.00	0.00	0.57	0.57
25.45	1.45	0.64	5.00	0.00	0.57	0.57
25.50	1.45	0.64	5.00	0.00	0.57	0.57
25.55	1.45	0.64	5.00	0.00	0.57	0.57
25.60	1.45	0.64	5.00	0.00	0.57	0.57
25.65	1.45	0.64	5.00	0.00	0.57	0.57
25.70	1.45	0.64	5.00	0.00	0.56	0.56
25.75	1.45	0.64	5.00	0.00	0.56	0.56
25.80	1.46	0.64	5.00	0.00	0.56	0.56

25.85	1.46	0.64	5.00	0.00	0.56	0.56
25.90	1.46	0.64	5.00	0.00	0.56	0.56
25.95	1.46	0.64	5.00	0.00	0.56	0.56
26.00	1.46	0.64	5.00	0.00	0.56	0.56
26.05	1.46	0.64	5.00	0.00	0.56	0.56
26.10	1.46	0.64	5.00	0.00	0.56	0.56
26.15	1.46	0.64	5.00	0.00	0.56	0.56
26.20	1.46	0.64	5.00	0.00	0.56	0.56
26.25	1.46	0.64	5.00	0.00	0.56	0.56
26.30	1.46	0.64	5.00	0.00	0.55	0.55
26.35	1.46	0.64	5.00	0.00	0.55	0.55
26.40	1.46	0.64	5.00	0.00	0.55	0.55
26.45	1.45	0.64	5.00	0.00	0.55	0.55
26.50	1.45	0.64	5.00	0.00	0.55	0.55
26.55	1.45	0.64	5.00	0.00	0.55	0.55
26.60	1.45	0.64	5.00	0.00	0.55	0.55
26.65	1.45	0.64	5.00	0.00	0.55	0.55
26.70	1.45	0.64	5.00	0.00	0.55	0.55
26.75	1.45	0.64	5.00	0.00	0.55	0.55
26.80	1.45	0.64	5.00	0.00	0.55	0.55
26.85	1.45	0.64	5.00	0.00	0.54	0.54
26.90	1.45	0.64	5.00	0.00	0.54	0.54
26.95	1.45	0.64	5.00	0.00	0.54	0.54
27.00	1.45	0.64	5.00	0.00	0.54	0.54
27.05	1.45	0.64	5.00	0.00	0.54	0.54
27.10	1.45	0.64	5.00	0.00	0.54	0.54
27.15	1.45	0.64	5.00	0.00	0.54	0.54
27.20	1.45	0.64	5.00	0.00	0.54	0.54
27.25	1.45	0.64	5.00	0.00	0.54	0.54
27.30	1.45	0.64	5.00	0.00	0.54	0.54
27.35	1.45	0.64	5.00	0.00	0.53	0.53
27.40	1.45	0.64	5.00	0.00	0.53	0.53
27.45	1.45	0.64	5.00	0.00	0.53	0.53
27.50	1.45	0.64	5.00	0.00	0.53	0.53
27.55	1.45	0.64	5.00	0.00	0.53	0.53
27.60	1.44	0.64	5.00	0.00	0.53	0.53
27.65	1.44	0.64	5.00	0.00	0.53	0.53
27.70	1.44	0.64	5.00	0.00	0.53	0.53
27.75	1.44	0.64	5.00	0.00	0.53	0.53
27.80	1.44	0.64	5.00	0.00	0.53	0.53
27.85	1.44	0.64	5.00	0.00	0.53	0.53
27.90	1.44	0.64	5.00	0.00	0.52	0.52
27.95	1.44	0.64	5.00	0.00	0.52	0.52
28.00	1.44	0.64	5.00	0.00	0.52	0.52
28.05	1.44	0.64	5.00	0.00	0.52	0.52
28.10	1.44	0.64	5.00	0.00	0.52	0.52
28.15	1.44	0.64	5.00	0.00	0.52	0.52
28.20	1.44	0.64	5.00	0.00	0.52	0.52
28.25	1.44	0.64	5.00	0.00	0.52	0.52
28.30	1.44	0.64	5.00	0.00	0.52	0.52
28.35	1.44	0.64	5.00	0.00	0.52	0.52
28.40	1.44	0.64	5.00	0.00	0.51	0.51
28.45	1.44	0.64	5.00	0.00	0.51	0.51
28.50	1.44	0.64	5.00	0.00	0.51	0.51
28.55	1.44	0.64	5.00	0.00	0.51	0.51
28.60	1.44	0.64	5.00	0.00	0.51	0.51
28.65	1.44	0.64	5.00	0.00	0.51	0.51
28.70	1.44	0.64	5.00	0.00	0.51	0.51
28.75	1.43	0.64	5.00	0.00	0.51	0.51
28.80	1.43	0.64	5.00	0.00	0.51	0.51
28.85	1.43	0.64	5.00	0.00	0.51	0.51
28.90	1.43	0.64	5.00	0.00	0.50	0.50
28.95	1.43	0.64	5.00	0.00	0.50	0.50
29.00	1.43	0.64	5.00	0.00	0.50	0.50
29.05	1.43	0.63	5.00	0.00	0.50	0.50
29.10	1.43	0.63	5.00	0.00	0.50	0.50
29.15	1.43	0.63	5.00	0.00	0.50	0.50
29.20	1.43	0.63	5.00	0.00	0.50	0.50
29.25	1.43	0.63	5.00	0.00	0.50	0.50
29.30	1.43	0.63	5.00	0.00	0.50	0.50
29.35	1.43	0.63	5.00	0.00	0.49	0.49
29.40	1.43	0.63	5.00	0.00	0.49	0.49
29.45	1.43	0.63	5.00	0.00	0.49	0.49
29.50	1.43	0.63	5.00	0.00	0.49	0.49

29.55	1.43	0.63	5.00	0.00	0.49	0.49
29.60	1.43	0.63	5.00	0.00	0.49	0.49
29.65	1.43	0.63	5.00	0.00	0.49	0.49
29.70	1.43	0.63	5.00	0.00	0.49	0.49
29.75	1.43	0.63	5.00	0.00	0.49	0.49
29.80	1.43	0.63	5.00	0.00	0.48	0.48
29.85	1.43	0.63	5.00	0.00	0.48	0.48
29.90	1.42	0.63	5.00	0.00	0.48	0.48
29.95	1.42	0.63	5.00	0.00	0.48	0.48
30.00	1.42	0.63	5.00	0.00	0.48	0.48
30.05	1.42	0.63	5.00	0.00	0.48	0.48
30.10	1.42	0.63	5.00	0.00	0.48	0.48
30.15	1.42	0.63	5.00	0.00	0.48	0.48
30.20	1.42	0.63	5.00	0.00	0.47	0.47
30.25	1.42	0.63	5.00	0.00	0.47	0.47
30.30	1.42	0.63	5.00	0.00	0.47	0.47
30.35	1.42	0.63	5.00	0.00	0.47	0.47
30.40	1.42	0.63	5.00	0.00	0.47	0.47
30.45	1.42	0.63	5.00	0.00	0.47	0.47
30.50	1.42	0.63	5.00	0.00	0.47	0.47
30.55	1.42	0.63	5.00	0.00	0.47	0.47
30.60	1.42	0.63	5.00	0.00	0.46	0.46
30.65	1.42	0.63	5.00	0.00	0.46	0.46
30.70	1.42	0.63	5.00	0.00	0.46	0.46
30.75	1.42	0.63	5.00	0.00	0.46	0.46
30.80	1.42	0.63	5.00	0.00	0.46	0.46
30.85	1.42	0.63	5.00	0.00	0.46	0.46
30.90	1.42	0.63	5.00	0.00	0.46	0.46
30.95	1.42	0.63	5.00	0.00	0.45	0.45
31.00	1.41	0.63	5.00	0.00	0.45	0.45
31.05	1.41	0.63	5.00	0.00	0.45	0.45
31.10	1.41	0.63	5.00	0.00	0.45	0.45
31.15	1.41	0.63	5.00	0.00	0.45	0.45
31.20	1.41	0.63	5.00	0.00	0.45	0.45
31.25	1.41	0.63	5.00	0.00	0.45	0.45
31.30	1.41	0.63	5.00	0.00	0.44	0.44
31.35	1.41	0.63	5.00	0.00	0.44	0.44
31.40	1.41	0.63	5.00	0.00	0.44	0.44
31.45	1.41	0.63	5.00	0.00	0.44	0.44
31.50	1.41	0.62	5.00	0.00	0.44	0.44
31.55	1.41	0.62	5.00	0.00	0.44	0.44
31.60	1.41	0.62	5.00	0.00	0.43	0.43
31.65	1.41	0.62	5.00	0.00	0.43	0.43
31.70	1.41	0.62	5.00	0.00	0.43	0.43
31.75	1.41	0.62	5.00	0.00	0.43	0.43
31.80	1.41	0.62	5.00	0.00	0.43	0.43
31.85	1.41	0.62	5.00	0.00	0.43	0.43
31.90	1.41	0.62	5.00	0.00	0.42	0.42
31.95	1.41	0.62	5.00	0.00	0.42	0.42
32.00	1.41	0.62	5.00	0.00	0.42	0.42
32.05	1.41	0.62	5.00	0.00	0.42	0.42
32.10	1.41	0.62	5.00	0.00	0.42	0.42
32.15	1.40	0.62	5.00	0.00	0.42	0.42
32.20	1.40	0.62	5.00	0.00	0.41	0.41
32.25	1.40	0.62	5.00	0.00	0.41	0.41
32.30	1.40	0.62	5.00	0.00	0.41	0.41
32.35	1.40	0.62	5.00	0.00	0.41	0.41
32.40	1.40	0.62	5.00	0.00	0.41	0.41
32.45	1.40	0.62	5.00	0.00	0.40	0.40
32.50	1.40	0.62	5.00	0.00	0.40	0.40
32.55	1.40	0.62	5.00	0.00	0.40	0.40
32.60	1.40	0.62	5.00	0.00	0.40	0.40
32.65	1.40	0.62	5.00	0.00	0.40	0.40
32.70	1.40	0.62	5.00	0.00	0.39	0.39
32.75	1.40	0.62	5.00	0.00	0.39	0.39
32.80	1.40	0.62	5.00	0.00	0.39	0.39
32.85	1.40	0.62	5.00	0.00	0.39	0.39
32.90	1.40	0.62	5.00	0.00	0.39	0.39
32.95	1.40	0.62	5.00	0.00	0.38	0.38
33.00	1.40	0.62	5.00	0.00	0.38	0.38
33.05	1.40	0.62	5.00	0.00	0.38	0.38
33.10	1.40	0.62	5.00	0.00	0.38	0.38
33.15	1.40	0.62	5.00	0.00	0.37	0.37
33.20	1.40	0.62	5.00	0.00	0.37	0.37

33.25	1.40	0.62	5.00	0.00	0.37	0.37
33.30	1.39	0.62	5.00	0.00	0.37	0.37
33.35	1.39	0.61	5.00	0.00	0.37	0.37
33.40	1.39	0.61	5.00	0.00	0.36	0.36
33.45	1.39	0.61	5.00	0.00	0.36	0.36
33.50	1.39	0.61	5.00	0.00	0.36	0.36
33.55	1.39	0.61	5.00	0.00	0.36	0.36
33.60	1.39	0.61	5.00	0.00	0.35	0.35
33.65	1.39	0.61	5.00	0.00	0.35	0.35
33.70	1.39	0.61	5.00	0.00	0.35	0.35
33.75	1.39	0.61	5.00	0.00	0.34	0.34
33.80	1.39	0.61	5.00	0.00	0.34	0.34
33.85	1.39	0.61	5.00	0.00	0.34	0.34
33.90	1.39	0.61	5.00	0.00	0.34	0.34
33.95	1.39	0.61	5.00	0.00	0.33	0.33
34.00	1.39	0.61	5.00	0.00	0.33	0.33
34.05	1.39	0.61	5.00	0.00	0.33	0.33
34.10	1.39	0.61	5.00	0.00	0.32	0.32
34.15	1.39	0.61	5.00	0.00	0.32	0.32
34.20	1.39	0.61	5.00	0.00	0.32	0.32
34.25	1.39	0.61	5.00	0.00	0.32	0.32
34.30	1.39	0.61	5.00	0.00	0.31	0.31
34.35	1.39	0.61	5.00	0.00	0.31	0.31
34.40	1.38	0.61	5.00	0.00	0.31	0.31
34.45	1.38	0.61	5.00	0.00	0.30	0.30
34.50	1.38	0.61	5.00	0.00	0.30	0.30
34.55	1.38	0.61	5.00	0.00	0.30	0.30
34.60	1.38	0.61	5.00	0.00	0.29	0.29
34.65	1.38	0.61	5.00	0.00	0.29	0.29
34.70	1.38	0.61	5.00	0.00	0.28	0.28
34.75	1.38	0.61	5.00	0.00	0.28	0.28
34.80	1.38	0.61	5.00	0.00	0.28	0.28
34.85	1.38	0.61	5.00	0.00	0.27	0.27
34.90	1.38	0.61	5.00	0.00	0.27	0.27
34.95	1.38	0.61	5.00	0.00	0.27	0.27
35.00	1.38	0.61	5.00	0.00	0.26	0.26
35.05	1.38	0.61	5.00	0.00	0.26	0.26
35.10	1.38	0.61	5.00	0.00	0.26	0.26
35.15	1.38	0.60	5.00	0.00	0.25	0.25
35.20	1.38	0.60	5.00	0.00	0.25	0.25
35.25	1.38	0.60	5.00	0.00	0.25	0.25
35.30	1.38	0.60	5.00	0.00	0.24	0.24
35.35	1.38	0.60	5.00	0.00	0.24	0.24
35.40	1.38	0.60	5.00	0.00	0.24	0.24
35.45	1.38	0.60	5.00	0.00	0.23	0.23
35.50	1.37	0.60	5.00	0.00	0.23	0.23
35.55	1.37	0.60	5.00	0.00	0.23	0.23
35.60	1.37	0.60	5.00	0.00	0.22	0.22
35.65	1.37	0.60	5.00	0.00	0.22	0.22
35.70	1.37	0.60	5.00	0.00	0.21	0.21
35.75	1.37	0.60	5.00	0.00	0.21	0.21
35.80	1.37	0.60	5.00	0.00	0.21	0.21
35.85	1.37	0.60	5.00	0.00	0.20	0.20
35.90	1.37	0.60	5.00	0.00	0.20	0.20
35.95	1.37	0.60	5.00	0.00	0.20	0.20
36.00	1.37	0.60	5.00	0.00	0.19	0.19
36.05	1.37	0.60	5.00	0.00	0.19	0.19
36.10	1.37	0.60	5.00	0.00	0.19	0.19
36.15	1.37	0.60	5.00	0.00	0.18	0.18
36.20	1.37	0.60	5.00	0.00	0.18	0.18
36.25	1.37	0.60	5.00	0.00	0.18	0.18
36.30	1.37	0.60	5.00	0.00	0.17	0.17
36.35	1.37	0.60	5.00	0.00	0.17	0.17
36.40	1.37	0.60	5.00	0.00	0.17	0.17
36.45	1.37	0.60	5.00	0.00	0.16	0.16
36.50	1.37	0.60	5.00	0.00	0.16	0.16
36.55	1.37	0.60	5.00	0.00	0.15	0.15
36.60	1.37	0.60	5.00	0.00	0.15	0.15
36.65	1.36	0.60	5.00	0.00	0.15	0.15
36.70	1.36	0.60	5.00	0.00	0.14	0.14
36.75	1.36	0.60	5.00	0.00	0.14	0.14
36.80	1.36	0.60	5.00	0.00	0.14	0.14
36.85	1.36	0.60	5.00	0.00	0.13	0.13
36.90	1.36	0.60	5.00	0.00	0.13	0.13

36.95	1.36	0.59	5.00	0.00	0.13	0.13
37.00	1.36	0.59	5.00	0.00	0.12	0.12
37.05	1.36	0.59	5.00	0.00	0.12	0.12
37.10	1.36	0.59	5.00	0.00	0.12	0.12
37.15	1.36	0.59	5.00	0.00	0.11	0.11
37.20	1.36	0.59	5.00	0.00	0.11	0.11
37.25	1.36	0.59	5.00	0.00	0.10	0.10
37.30	1.36	0.59	5.00	0.00	0.10	0.10
37.35	1.36	0.59	5.00	0.00	0.10	0.10
37.40	1.36	0.59	5.00	0.00	0.09	0.09
37.45	1.36	0.59	5.00	0.00	0.09	0.09
37.50	1.36	0.59	5.00	0.00	0.09	0.09
37.55	1.36	0.59	5.00	0.00	0.08	0.08
37.60	1.36	0.59	5.00	0.00	0.08	0.08
37.65	1.36	0.59	5.00	0.00	0.08	0.08
37.70	1.36	0.59	5.00	0.00	0.07	0.07
37.75	1.36	0.59	5.00	0.00	0.07	0.07
37.80	1.35	0.59	5.00	0.00	0.07	0.07
37.85	1.35	0.59	5.00	0.00	0.06	0.06
37.90	1.35	0.59	5.00	0.00	0.06	0.06
37.95	1.35	0.59	5.00	0.00	0.05	0.05
38.00	1.35	0.59	5.00	0.00	0.05	0.05
38.05	1.35	0.59	5.00	0.00	0.05	0.05
38.10	1.35	0.59	5.00	0.00	0.05	0.05
38.15	1.35	0.59	5.00	0.00	0.05	0.05
38.20	1.35	0.59	5.00	0.00	0.05	0.05
38.25	1.35	0.59	5.00	0.00	0.05	0.05
38.30	1.35	0.59	5.00	0.00	0.05	0.05
38.35	1.35	0.59	5.00	0.00	0.04	0.04
38.40	1.35	0.59	5.00	0.00	0.04	0.04
38.45	1.35	0.59	5.00	0.00	0.04	0.04
38.50	1.35	0.59	5.00	0.00	0.04	0.04
38.55	1.35	0.59	5.00	0.00	0.04	0.04
38.60	1.35	0.59	5.00	0.00	0.04	0.04
38.65	1.35	0.59	5.00	0.00	0.04	0.04
38.70	1.35	0.59	5.00	0.00	0.03	0.03
38.75	1.35	0.58	5.00	0.00	0.03	0.03
38.80	1.35	0.58	5.00	0.00	0.03	0.03
38.85	1.35	0.58	5.00	0.00	0.03	0.03
38.90	1.35	0.58	5.00	0.00	0.03	0.03
38.95	1.34	0.58	5.00	0.00	0.03	0.03
39.00	1.34	0.58	5.00	0.00	0.03	0.03
39.05	1.34	0.58	5.00	0.00	0.03	0.03
39.10	1.34	0.58	5.00	0.00	0.02	0.02
39.15	1.34	0.58	5.00	0.00	0.02	0.02
39.20	1.34	0.58	5.00	0.00	0.02	0.02
39.25	1.34	0.58	5.00	0.00	0.02	0.02
39.30	1.34	0.58	5.00	0.00	0.02	0.02
39.35	1.34	0.58	5.00	0.00	0.02	0.02
39.40	1.34	0.58	5.00	0.00	0.02	0.02
39.45	1.34	0.58	5.00	0.00	0.01	0.01
39.50	1.34	0.58	5.00	0.00	0.01	0.01
39.55	1.34	0.58	5.00	0.00	0.01	0.01
39.60	1.34	0.58	5.00	0.00	0.01	0.01
39.65	1.34	0.58	5.00	0.00	0.01	0.01
39.70	1.34	0.58	5.00	0.00	0.01	0.01
39.75	1.34	0.58	5.00	0.00	0.01	0.01
39.80	1.34	0.58	5.00	0.00	0.01	0.01
39.85	1.34	0.58	5.00	0.00	0.00	0.00
39.90	1.34	0.58	5.00	0.00	0.00	0.00
39.95	1.34	0.58	5.00	0.00	0.00	0.00
40.00	1.34	0.58	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.

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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

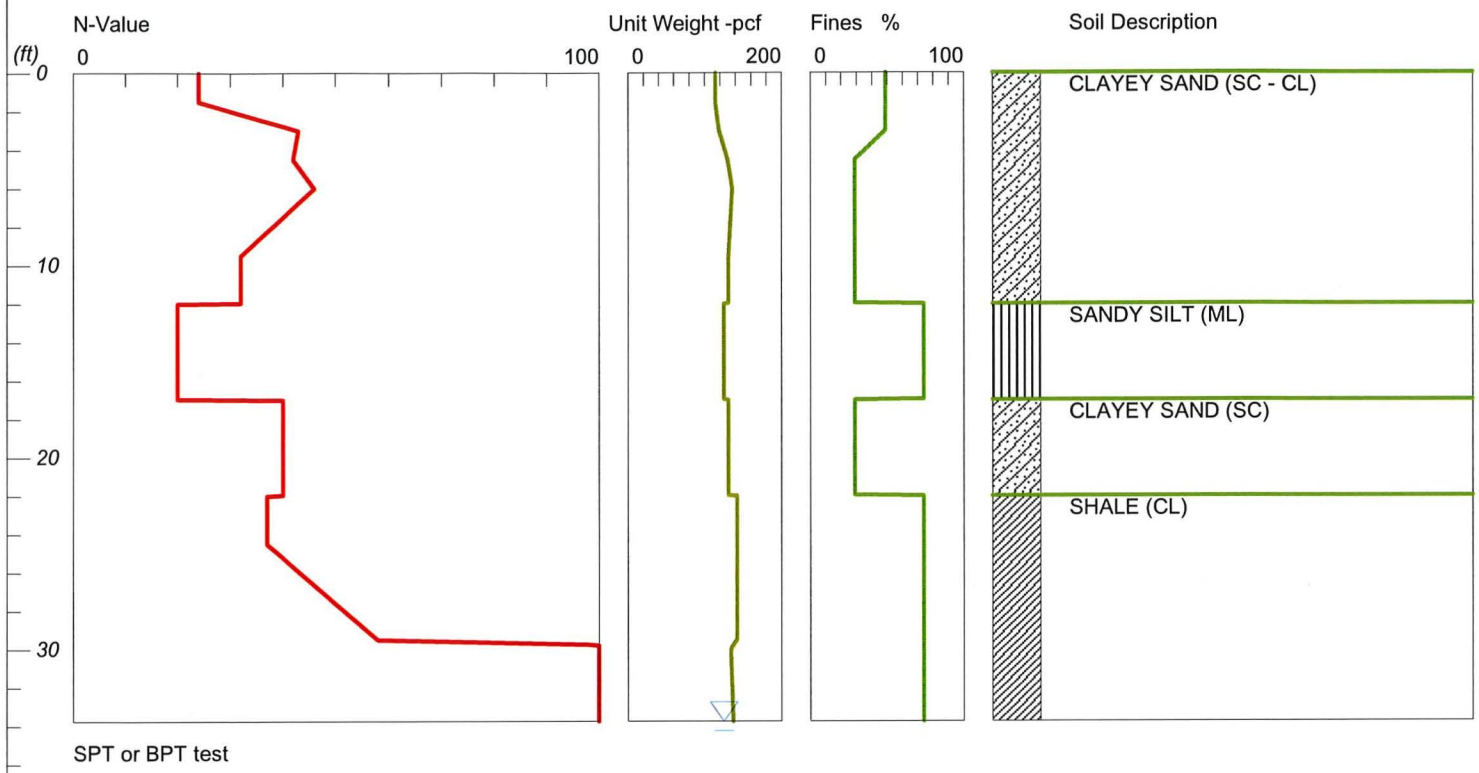
S_sat	Settlement from saturated sands
S_dry	Settlement from Unsaturated Sands
S_all	Total Settlement from Saturated and Unsaturated Sands
NoLiq	No-Liquefy Soils

LIQUEFACTION ANALYSIS

FIRE STATION #25

Hole No.=EB-6 Water Depth=33.75 ft

Magnitude=8.5
Acceleration=0.806g



SPT or BPT test

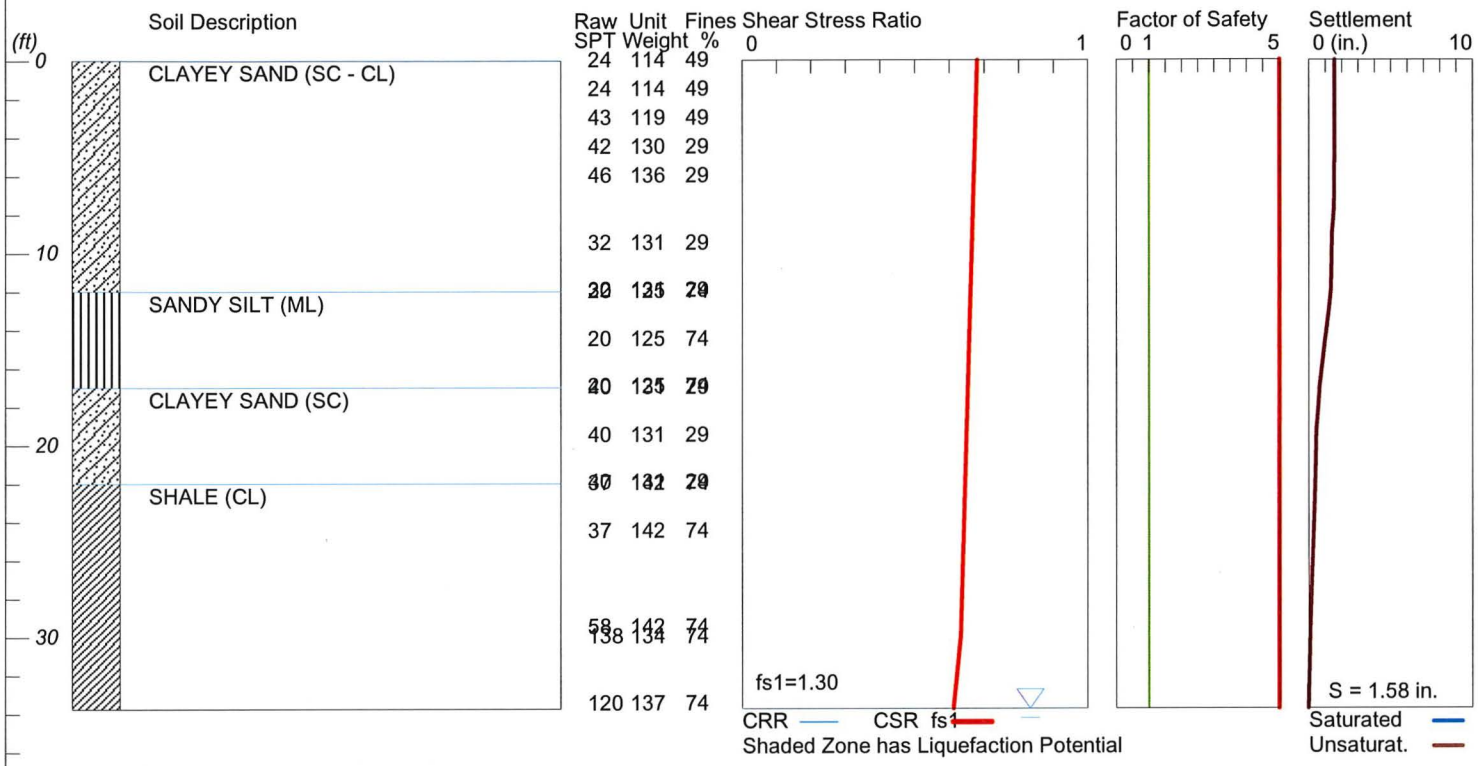
40
50
60
70

LIQUEFACTION ANALYSIS

FIRE STATION #25

Hole No.=EB-6 Water Depth=33.75 ft

Magnitude=8.5
Acceleration=0.806g



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LIQUEFACTION ANALYSIS SUMMARY
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Input File Name: \\GRANT-PC\Grant Roughs\Liquefy Pro Data Files grant\1295.5 City of San Mateo, Fire Station #25, EB-6.liq
Title: FIRE STATION #25
Subtitle: City of San Mateo

Surface Elev.=
Hole No.=EB-6
Depth of Hole= 33.75 ft
Water Table during Earthquake= 33.75 ft
Water Table during In-Situ Testing= 33.75 ft
Max. Acceleration= 0.81 g
Earthquake Magnitude= 8.50

Input Data:
Surface Elev.=
Hole No.=EB-6
Depth of Hole=33.75 ft
Water Table during Earthquake= 33.75 ft
Water Table during In-Situ Testing= 33.75 ft
Max. Acceleration=0.81 g
Earthquake Magnitude=8.50
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
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 %
0.00	24.00	114.00	49.00
1.50	24.00	114.00	49.00
3.00	43.00	119.00	49.00
4.50	42.00	130.00	29.00
6.00	46.00	136.00	29.00
9.50	32.00	131.00	29.00
11.95	32.00	131.00	29.00
12.00	20.00	125.00	74.00
14.50	20.00	125.00	74.00
16.95	20.00	125.00	74.00
17.00	40.00	131.00	29.00
19.50	40.00	131.00	29.00
21.95	40.00	131.00	29.00
22.00	37.00	142.00	74.00
24.50	37.00	142.00	74.00
29.50	58.00	142.00	74.00
30.00	138.00	134.00	74.00
33.50	120.00	137.00	74.00

Output Results:
Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=1.58 in.
Total Settlement of Saturated and Unsaturated Sands=1.58 in.

Differential Settlement=0.789 to 1.041 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	1.45	0.68	5.00	0.00	1.58	1.58
0.05	1.45	0.68	5.00	0.00	1.58	1.58
0.10	1.45	0.68	5.00	0.00	1.58	1.58
0.15	1.45	0.68	5.00	0.00	1.58	1.58
0.20	1.45	0.68	5.00	0.00	1.58	1.58
0.25	1.45	0.68	5.00	0.00	1.58	1.58
0.30	1.45	0.68	5.00	0.00	1.58	1.58
0.35	1.45	0.68	5.00	0.00	1.58	1.58
0.40	1.45	0.68	5.00	0.00	1.58	1.58
0.45	1.45	0.68	5.00	0.00	1.58	1.58
0.50	1.45	0.68	5.00	0.00	1.58	1.58
0.55	1.45	0.68	5.00	0.00	1.58	1.58
0.60	1.45	0.68	5.00	0.00	1.58	1.58
0.65	1.45	0.68	5.00	0.00	1.58	1.58
0.70	1.45	0.68	5.00	0.00	1.58	1.58
0.75	1.45	0.68	5.00	0.00	1.58	1.58
0.80	1.45	0.68	5.00	0.00	1.58	1.58
0.85	1.45	0.68	5.00	0.00	1.58	1.58
0.90	1.45	0.68	5.00	0.00	1.58	1.58
0.95	1.45	0.68	5.00	0.00	1.58	1.58
1.00	1.45	0.68	5.00	0.00	1.58	1.58
1.05	1.45	0.68	5.00	0.00	1.58	1.58
1.10	1.45	0.68	5.00	0.00	1.58	1.58
1.15	1.45	0.68	5.00	0.00	1.58	1.58
1.20	1.45	0.68	5.00	0.00	1.58	1.58
1.25	1.45	0.68	5.00	0.00	1.58	1.58
1.30	1.45	0.68	5.00	0.00	1.58	1.58
1.35	1.45	0.68	5.00	0.00	1.58	1.58
1.40	1.45	0.68	5.00	0.00	1.57	1.57
1.45	1.45	0.68	5.00	0.00	1.57	1.57
1.50	1.45	0.68	5.00	0.00	1.57	1.57
1.55	1.45	0.68	5.00	0.00	1.57	1.57
1.60	1.45	0.68	5.00	0.00	1.57	1.57
1.65	1.45	0.68	5.00	0.00	1.57	1.57
1.70	1.45	0.68	5.00	0.00	1.57	1.57
1.75	1.45	0.68	5.00	0.00	1.57	1.57
1.80	1.45	0.68	5.00	0.00	1.57	1.57
1.85	1.45	0.68	5.00	0.00	1.57	1.57
1.90	1.45	0.68	5.00	0.00	1.57	1.57
1.95	1.45	0.68	5.00	0.00	1.57	1.57
2.00	1.45	0.68	5.00	0.00	1.57	1.57
2.05	1.45	0.68	5.00	0.00	1.57	1.57
2.10	1.45	0.68	5.00	0.00	1.57	1.57
2.15	1.45	0.68	5.00	0.00	1.57	1.57
2.20	1.45	0.68	5.00	0.00	1.57	1.57
2.25	1.45	0.68	5.00	0.00	1.57	1.57
2.30	1.45	0.68	5.00	0.00	1.57	1.57
2.35	1.45	0.68	5.00	0.00	1.57	1.57
2.40	1.45	0.68	5.00	0.00	1.57	1.57
2.45	1.45	0.68	5.00	0.00	1.57	1.57
2.50	1.45	0.68	5.00	0.00	1.57	1.57
2.55	1.45	0.68	5.00	0.00	1.57	1.57
2.60	1.45	0.68	5.00	0.00	1.57	1.57
2.65	1.45	0.68	5.00	0.00	1.57	1.57
2.70	1.45	0.68	5.00	0.00	1.57	1.57
2.75	1.45	0.68	5.00	0.00	1.57	1.57
2.80	1.45	0.68	5.00	0.00	1.57	1.57
2.85	1.45	0.68	5.00	0.00	1.57	1.57
2.90	1.45	0.68	5.00	0.00	1.57	1.57
2.95	1.45	0.68	5.00	0.00	1.57	1.57
3.00	1.45	0.68	5.00	0.00	1.57	1.57
3.05	1.45	0.68	5.00	0.00	1.57	1.57
3.10	1.45	0.68	5.00	0.00	1.57	1.57
3.15	1.45	0.68	5.00	0.00	1.57	1.57
3.20	1.45	0.68	5.00	0.00	1.57	1.57
3.25	1.45	0.68	5.00	0.00	1.57	1.57
3.30	1.45	0.68	5.00	0.00	1.57	1.57
3.35	1.45	0.68	5.00	0.00	1.57	1.57
3.40	1.45	0.68	5.00	0.00	1.57	1.57

3.45	1.45	0.68	5.00	0.00	1.57	1.57
3.50	1.45	0.68	5.00	0.00	1.57	1.57
3.55	1.45	0.68	5.00	0.00	1.57	1.57
3.60	1.45	0.68	5.00	0.00	1.57	1.57
3.65	1.45	0.68	5.00	0.00	1.57	1.57
3.70	1.45	0.68	5.00	0.00	1.57	1.57
3.75	1.45	0.68	5.00	0.00	1.57	1.57
3.80	1.45	0.68	5.00	0.00	1.57	1.57
3.85	1.45	0.67	5.00	0.00	1.57	1.57
3.90	1.45	0.67	5.00	0.00	1.57	1.57
3.95	1.45	0.67	5.00	0.00	1.57	1.57
4.00	1.45	0.67	5.00	0.00	1.57	1.57
4.05	1.45	0.67	5.00	0.00	1.57	1.57
4.10	1.45	0.67	5.00	0.00	1.56	1.56
4.15	1.45	0.67	5.00	0.00	1.56	1.56
4.20	1.45	0.67	5.00	0.00	1.56	1.56
4.25	1.45	0.67	5.00	0.00	1.56	1.56
4.30	1.45	0.67	5.00	0.00	1.56	1.56
4.35	1.45	0.67	5.00	0.00	1.56	1.56
4.40	1.45	0.67	5.00	0.00	1.56	1.56
4.45	1.45	0.67	5.00	0.00	1.56	1.56
4.50	1.45	0.67	5.00	0.00	1.56	1.56
4.55	1.45	0.67	5.00	0.00	1.56	1.56
4.60	1.45	0.67	5.00	0.00	1.56	1.56
4.65	1.45	0.67	5.00	0.00	1.56	1.56
4.70	1.45	0.67	5.00	0.00	1.56	1.56
4.75	1.45	0.67	5.00	0.00	1.56	1.56
4.80	1.45	0.67	5.00	0.00	1.56	1.56
4.85	1.45	0.67	5.00	0.00	1.56	1.56
4.90	1.45	0.67	5.00	0.00	1.56	1.56
4.95	1.45	0.67	5.00	0.00	1.56	1.56
5.00	1.45	0.67	5.00	0.00	1.56	1.56
5.05	1.45	0.67	5.00	0.00	1.56	1.56
5.10	1.45	0.67	5.00	0.00	1.56	1.56
5.15	1.45	0.67	5.00	0.00	1.56	1.56
5.20	1.45	0.67	5.00	0.00	1.56	1.56
5.25	1.45	0.67	5.00	0.00	1.56	1.56
5.30	1.45	0.67	5.00	0.00	1.56	1.56
5.35	1.45	0.67	5.00	0.00	1.56	1.56
5.40	1.45	0.67	5.00	0.00	1.56	1.56
5.45	1.45	0.67	5.00	0.00	1.56	1.56
5.50	1.45	0.67	5.00	0.00	1.56	1.56
5.55	1.45	0.67	5.00	0.00	1.56	1.56
5.60	1.45	0.67	5.00	0.00	1.56	1.56
5.65	1.45	0.67	5.00	0.00	1.56	1.56
5.70	1.45	0.67	5.00	0.00	1.56	1.56
5.75	1.45	0.67	5.00	0.00	1.56	1.56
5.80	1.45	0.67	5.00	0.00	1.56	1.56
5.85	1.45	0.67	5.00	0.00	1.56	1.56
5.90	1.45	0.67	5.00	0.00	1.56	1.56
5.95	1.45	0.67	5.00	0.00	1.56	1.56
6.00	1.45	0.67	5.00	0.00	1.55	1.55
6.05	1.45	0.67	5.00	0.00	1.55	1.55
6.10	1.45	0.67	5.00	0.00	1.55	1.55
6.15	1.45	0.67	5.00	0.00	1.55	1.55
6.20	1.45	0.67	5.00	0.00	1.55	1.55
6.25	1.45	0.67	5.00	0.00	1.55	1.55
6.30	1.45	0.67	5.00	0.00	1.55	1.55
6.35	1.45	0.67	5.00	0.00	1.55	1.55
6.40	1.45	0.67	5.00	0.00	1.55	1.55
6.45	1.45	0.67	5.00	0.00	1.55	1.55
6.50	1.45	0.67	5.00	0.00	1.55	1.55
6.55	1.45	0.67	5.00	0.00	1.55	1.55
6.60	1.45	0.67	5.00	0.00	1.55	1.55
6.65	1.45	0.67	5.00	0.00	1.55	1.55
6.70	1.45	0.67	5.00	0.00	1.55	1.55
6.75	1.45	0.67	5.00	0.00	1.55	1.55
6.80	1.45	0.67	5.00	0.00	1.55	1.55
6.85	1.45	0.67	5.00	0.00	1.55	1.55
6.90	1.45	0.67	5.00	0.00	1.55	1.55
6.95	1.45	0.67	5.00	0.00	1.55	1.55
7.00	1.45	0.67	5.00	0.00	1.54	1.54
7.05	1.45	0.67	5.00	0.00	1.54	1.54
7.10	1.45	0.67	5.00	0.00	1.54	1.54

7.15	1.45	0.67	5.00	0.00	1.54	1.54
7.20	1.45	0.67	5.00	0.00	1.54	1.54
7.25	1.45	0.67	5.00	0.00	1.54	1.54
7.30	1.45	0.67	5.00	0.00	1.54	1.54
7.35	1.45	0.67	5.00	0.00	1.54	1.54
7.40	1.45	0.67	5.00	0.00	1.54	1.54
7.45	1.45	0.67	5.00	0.00	1.53	1.53
7.50	1.45	0.67	5.00	0.00	1.53	1.53
7.55	1.45	0.67	5.00	0.00	1.53	1.53
7.60	1.45	0.67	5.00	0.00	1.53	1.53
7.65	1.45	0.67	5.00	0.00	1.53	1.53
7.70	1.45	0.67	5.00	0.00	1.52	1.52
7.75	1.45	0.67	5.00	0.00	1.52	1.52
7.80	1.45	0.67	5.00	0.00	1.52	1.52
7.85	1.45	0.67	5.00	0.00	1.52	1.52
7.90	1.45	0.67	5.00	0.00	1.51	1.51
7.95	1.45	0.67	5.00	0.00	1.51	1.51
8.00	1.45	0.67	5.00	0.00	1.51	1.51
8.05	1.45	0.67	5.00	0.00	1.50	1.50
8.10	1.45	0.67	5.00	0.00	1.50	1.50
8.15	1.45	0.67	5.00	0.00	1.49	1.49
8.20	1.45	0.67	5.00	0.00	1.49	1.49
8.25	1.45	0.67	5.00	0.00	1.48	1.48
8.30	1.45	0.67	5.00	0.00	1.48	1.48
8.35	1.45	0.67	5.00	0.00	1.48	1.48
8.40	1.45	0.67	5.00	0.00	1.47	1.47
8.45	1.45	0.67	5.00	0.00	1.47	1.47
8.50	1.45	0.67	5.00	0.00	1.46	1.46
8.55	1.45	0.67	5.00	0.00	1.46	1.46
8.60	1.45	0.67	5.00	0.00	1.45	1.45
8.65	1.45	0.67	5.00	0.00	1.45	1.45
8.70	1.45	0.67	5.00	0.00	1.44	1.44
8.75	1.45	0.67	5.00	0.00	1.44	1.44
8.80	1.45	0.67	5.00	0.00	1.44	1.44
8.85	1.45	0.67	5.00	0.00	1.43	1.43
8.90	1.45	0.67	5.00	0.00	1.43	1.43
8.95	1.45	0.67	5.00	0.00	1.42	1.42
9.00	1.45	0.67	5.00	0.00	1.42	1.42
9.05	1.45	0.67	5.00	0.00	1.41	1.41
9.10	1.45	0.67	5.00	0.00	1.41	1.41
9.15	1.45	0.67	5.00	0.00	1.41	1.41
9.20	1.45	0.67	5.00	0.00	1.41	1.41
9.25	1.45	0.67	5.00	0.00	1.41	1.41
9.30	1.45	0.67	5.00	0.00	1.41	1.41
9.35	1.45	0.67	5.00	0.00	1.41	1.41
9.40	1.45	0.67	5.00	0.00	1.41	1.41
9.45	1.45	0.67	5.00	0.00	1.41	1.41
9.50	1.45	0.67	5.00	0.00	1.40	1.40
9.55	1.45	0.67	5.00	0.00	1.40	1.40
9.60	1.45	0.67	5.00	0.00	1.40	1.40
9.65	1.45	0.67	5.00	0.00	1.40	1.40
9.70	1.45	0.67	5.00	0.00	1.40	1.40
9.75	1.45	0.67	5.00	0.00	1.40	1.40
9.80	1.45	0.67	5.00	0.00	1.40	1.40
9.85	1.45	0.67	5.00	0.00	1.40	1.40
9.90	1.45	0.67	5.00	0.00	1.40	1.40
9.95	1.45	0.67	5.00	0.00	1.40	1.40
10.00	1.45	0.67	5.00	0.00	1.40	1.40
10.05	1.45	0.67	5.00	0.00	1.39	1.39
10.10	1.45	0.67	5.00	0.00	1.39	1.39
10.15	1.45	0.66	5.00	0.00	1.39	1.39
10.20	1.45	0.66	5.00	0.00	1.39	1.39
10.25	1.45	0.66	5.00	0.00	1.39	1.39
10.30	1.45	0.66	5.00	0.00	1.39	1.39
10.35	1.45	0.66	5.00	0.00	1.39	1.39
10.40	1.45	0.66	5.00	0.00	1.39	1.39
10.45	1.45	0.66	5.00	0.00	1.39	1.39
10.50	1.45	0.66	5.00	0.00	1.38	1.38
10.55	1.45	0.66	5.00	0.00	1.38	1.38
10.60	1.45	0.66	5.00	0.00	1.38	1.38
10.65	1.45	0.66	5.00	0.00	1.38	1.38
10.70	1.45	0.66	5.00	0.00	1.38	1.38
10.75	1.45	0.66	5.00	0.00	1.38	1.38
10.80	1.45	0.66	5.00	0.00	1.38	1.38

10.85	1.45	0.66	5.00	0.00	1.38	1.38
10.90	1.45	0.66	5.00	0.00	1.38	1.38
10.95	1.45	0.66	5.00	0.00	1.37	1.37
11.00	1.45	0.66	5.00	0.00	1.37	1.37
11.05	1.45	0.66	5.00	0.00	1.37	1.37
11.10	1.45	0.66	5.00	0.00	1.37	1.37
11.15	1.45	0.66	5.00	0.00	1.37	1.37
11.20	1.45	0.66	5.00	0.00	1.37	1.37
11.25	1.45	0.66	5.00	0.00	1.37	1.37
11.30	1.45	0.66	5.00	0.00	1.36	1.36
11.35	1.45	0.66	5.00	0.00	1.36	1.36
11.40	1.45	0.66	5.00	0.00	1.36	1.36
11.45	1.45	0.66	5.00	0.00	1.36	1.36
11.50	1.45	0.66	5.00	0.00	1.36	1.36
11.55	1.45	0.66	5.00	0.00	1.36	1.36
11.60	1.45	0.66	5.00	0.00	1.36	1.36
11.65	1.45	0.66	5.00	0.00	1.35	1.35
11.70	1.45	0.66	5.00	0.00	1.35	1.35
11.75	1.45	0.66	5.00	0.00	1.35	1.35
11.80	1.45	0.66	5.00	0.00	1.35	1.35
11.85	1.45	0.66	5.00	0.00	1.35	1.35
11.90	1.45	0.66	5.00	0.00	1.35	1.35
11.95	1.45	0.66	5.00	0.00	1.34	1.34
12.00	1.45	0.66	5.00	0.00	1.34	1.34
12.05	1.45	0.66	5.00	0.00	1.34	1.34
12.10	1.45	0.66	5.00	0.00	1.33	1.33
12.15	1.45	0.66	5.00	0.00	1.33	1.33
12.20	1.45	0.66	5.00	0.00	1.32	1.32
12.25	1.45	0.66	5.00	0.00	1.32	1.32
12.30	1.45	0.66	5.00	0.00	1.31	1.31
12.35	1.45	0.66	5.00	0.00	1.31	1.31
12.40	1.45	0.66	5.00	0.00	1.30	1.30
12.45	1.45	0.66	5.00	0.00	1.29	1.29
12.50	1.45	0.66	5.00	0.00	1.29	1.29
12.55	1.45	0.66	5.00	0.00	1.28	1.28
12.60	1.45	0.66	5.00	0.00	1.28	1.28
12.65	1.45	0.66	5.00	0.00	1.27	1.27
12.70	1.45	0.66	5.00	0.00	1.26	1.26
12.75	1.45	0.66	5.00	0.00	1.26	1.26
12.80	1.45	0.66	5.00	0.00	1.25	1.25
12.85	1.45	0.66	5.00	0.00	1.24	1.24
12.90	1.45	0.66	5.00	0.00	1.24	1.24
12.95	1.45	0.66	5.00	0.00	1.23	1.23
13.00	1.45	0.66	5.00	0.00	1.22	1.22
13.05	1.45	0.66	5.00	0.00	1.22	1.22
13.10	1.45	0.66	5.00	0.00	1.21	1.21
13.15	1.45	0.66	5.00	0.00	1.20	1.20
13.20	1.45	0.66	5.00	0.00	1.19	1.19
13.25	1.45	0.66	5.00	0.00	1.19	1.19
13.30	1.45	0.66	5.00	0.00	1.18	1.18
13.35	1.45	0.66	5.00	0.00	1.17	1.17
13.40	1.45	0.66	5.00	0.00	1.17	1.17
13.45	1.45	0.66	5.00	0.00	1.16	1.16
13.50	1.45	0.66	5.00	0.00	1.15	1.15
13.55	1.45	0.66	5.00	0.00	1.14	1.14
13.60	1.45	0.66	5.00	0.00	1.14	1.14
13.65	1.45	0.66	5.00	0.00	1.13	1.13
13.70	1.45	0.66	5.00	0.00	1.12	1.12
13.75	1.45	0.66	5.00	0.00	1.12	1.12
13.80	1.45	0.66	5.00	0.00	1.11	1.11
13.85	1.45	0.66	5.00	0.00	1.10	1.10
13.90	1.45	0.66	5.00	0.00	1.09	1.09
13.95	1.45	0.66	5.00	0.00	1.09	1.09
14.00	1.45	0.66	5.00	0.00	1.08	1.08
14.05	1.45	0.66	5.00	0.00	1.07	1.07
14.10	1.45	0.66	5.00	0.00	1.06	1.06
14.15	1.45	0.66	5.00	0.00	1.06	1.06
14.20	1.45	0.66	5.00	0.00	1.05	1.05
14.25	1.45	0.66	5.00	0.00	1.04	1.04
14.30	1.45	0.66	5.00	0.00	1.03	1.03
14.35	1.45	0.66	5.00	0.00	1.03	1.03
14.40	1.45	0.66	5.00	0.00	1.02	1.02
14.45	1.45	0.66	5.00	0.00	1.01	1.01
14.50	1.45	0.66	5.00	0.00	1.00	1.00

14.55	1.45	0.66	5.00	0.00	1.00	1.00
14.60	1.45	0.66	5.00	0.00	0.99	0.99
14.65	1.45	0.66	5.00	0.00	0.98	0.98
14.70	1.45	0.66	5.00	0.00	0.97	0.97
14.75	1.45	0.66	5.00	0.00	0.97	0.97
14.80	1.45	0.66	5.00	0.00	0.96	0.96
14.85	1.45	0.66	5.00	0.00	0.95	0.95
14.90	1.45	0.66	5.00	0.00	0.95	0.95
14.95	1.45	0.66	5.00	0.00	0.94	0.94
15.00	1.45	0.66	5.00	0.00	0.93	0.93
15.05	1.45	0.66	5.00	0.00	0.93	0.93
15.10	1.45	0.66	5.00	0.00	0.92	0.92
15.15	1.45	0.66	5.00	0.00	0.91	0.91
15.20	1.45	0.66	5.00	0.00	0.91	0.91
15.25	1.45	0.66	5.00	0.00	0.90	0.90
15.30	1.45	0.66	5.00	0.00	0.89	0.89
15.35	1.45	0.66	5.00	0.00	0.89	0.89
15.40	1.45	0.66	5.00	0.00	0.88	0.88
15.45	1.45	0.66	5.00	0.00	0.87	0.87
15.50	1.45	0.66	5.00	0.00	0.87	0.87
15.55	1.45	0.66	5.00	0.00	0.86	0.86
15.60	1.45	0.66	5.00	0.00	0.85	0.85
15.65	1.45	0.66	5.00	0.00	0.85	0.85
15.70	1.45	0.66	5.00	0.00	0.84	0.84
15.75	1.45	0.66	5.00	0.00	0.83	0.83
15.80	1.45	0.66	5.00	0.00	0.83	0.83
15.85	1.45	0.66	5.00	0.00	0.82	0.82
15.90	1.45	0.66	5.00	0.00	0.81	0.81
15.95	1.45	0.66	5.00	0.00	0.81	0.81
16.00	1.45	0.66	5.00	0.00	0.80	0.80
16.05	1.45	0.66	5.00	0.00	0.79	0.79
16.10	1.45	0.66	5.00	0.00	0.79	0.79
16.15	1.45	0.66	5.00	0.00	0.78	0.78
16.20	1.45	0.66	5.00	0.00	0.77	0.77
16.25	1.45	0.66	5.00	0.00	0.76	0.76
16.30	1.45	0.66	5.00	0.00	0.76	0.76
16.35	1.45	0.66	5.00	0.00	0.75	0.75
16.40	1.45	0.66	5.00	0.00	0.74	0.74
16.45	1.45	0.65	5.00	0.00	0.74	0.74
16.50	1.45	0.65	5.00	0.00	0.73	0.73
16.55	1.45	0.65	5.00	0.00	0.72	0.72
16.60	1.45	0.65	5.00	0.00	0.72	0.72
16.65	1.45	0.65	5.00	0.00	0.71	0.71
16.70	1.45	0.65	5.00	0.00	0.70	0.70
16.75	1.45	0.65	5.00	0.00	0.69	0.69
16.80	1.45	0.65	5.00	0.00	0.69	0.69
16.85	1.45	0.65	5.00	0.00	0.68	0.68
16.90	1.45	0.65	5.00	0.00	0.67	0.67
16.95	1.45	0.65	5.00	0.00	0.67	0.67
17.00	1.45	0.65	5.00	0.00	0.66	0.66
17.05	1.45	0.65	5.00	0.00	0.66	0.66
17.10	1.45	0.65	5.00	0.00	0.65	0.65
17.15	1.45	0.65	5.00	0.00	0.65	0.65
17.20	1.45	0.65	5.00	0.00	0.65	0.65
17.25	1.45	0.65	5.00	0.00	0.64	0.64
17.30	1.45	0.65	5.00	0.00	0.64	0.64
17.35	1.45	0.65	5.00	0.00	0.63	0.63
17.40	1.45	0.65	5.00	0.00	0.63	0.63
17.45	1.45	0.65	5.00	0.00	0.63	0.63
17.50	1.45	0.65	5.00	0.00	0.62	0.62
17.55	1.45	0.65	5.00	0.00	0.62	0.62
17.60	1.45	0.65	5.00	0.00	0.62	0.62
17.65	1.45	0.65	5.00	0.00	0.61	0.61
17.70	1.45	0.65	5.00	0.00	0.61	0.61
17.75	1.45	0.65	5.00	0.00	0.60	0.60
17.80	1.45	0.65	5.00	0.00	0.60	0.60
17.85	1.45	0.65	5.00	0.00	0.60	0.60
17.90	1.45	0.65	5.00	0.00	0.59	0.59
17.95	1.45	0.65	5.00	0.00	0.59	0.59
18.00	1.45	0.65	5.00	0.00	0.58	0.58
18.05	1.45	0.65	5.00	0.00	0.58	0.58
18.10	1.45	0.65	5.00	0.00	0.58	0.58
18.15	1.45	0.65	5.00	0.00	0.57	0.57
18.20	1.45	0.65	5.00	0.00	0.57	0.57

18.25	1.45	0.65	5.00	0.00	0.56	0.56
18.30	1.45	0.65	5.00	0.00	0.56	0.56
18.35	1.45	0.65	5.00	0.00	0.55	0.55
18.40	1.45	0.65	5.00	0.00	0.55	0.55
18.45	1.45	0.65	5.00	0.00	0.54	0.54
18.50	1.45	0.65	5.00	0.00	0.54	0.54
18.55	1.45	0.65	5.00	0.00	0.53	0.53
18.60	1.45	0.65	5.00	0.00	0.53	0.53
18.65	1.45	0.65	5.00	0.00	0.52	0.52
18.70	1.45	0.65	5.00	0.00	0.52	0.52
18.75	1.45	0.65	5.00	0.00	0.52	0.52
18.80	1.45	0.65	5.00	0.00	0.51	0.51
18.85	1.45	0.65	5.00	0.00	0.51	0.51
18.90	1.45	0.65	5.00	0.00	0.50	0.50
18.95	1.45	0.65	5.00	0.00	0.50	0.50
19.00	1.45	0.65	5.00	0.00	0.49	0.49
19.05	1.45	0.65	5.00	0.00	0.49	0.49
19.10	1.45	0.65	5.00	0.00	0.48	0.48
19.15	1.45	0.65	5.00	0.00	0.48	0.48
19.20	1.45	0.65	5.00	0.00	0.47	0.47
19.25	1.45	0.65	5.00	0.00	0.47	0.47
19.30	1.45	0.65	5.00	0.00	0.47	0.47
19.35	1.45	0.65	5.00	0.00	0.47	0.47
19.40	1.45	0.65	5.00	0.00	0.46	0.46
19.45	1.45	0.65	5.00	0.00	0.46	0.46
19.50	1.45	0.65	5.00	0.00	0.46	0.46
19.55	1.45	0.65	5.00	0.00	0.46	0.46
19.60	1.45	0.65	5.00	0.00	0.46	0.46
19.65	1.45	0.65	5.00	0.00	0.46	0.46
19.70	1.45	0.65	5.00	0.00	0.46	0.46
19.75	1.45	0.65	5.00	0.00	0.46	0.46
19.80	1.45	0.65	5.00	0.00	0.46	0.46
19.85	1.45	0.65	5.00	0.00	0.45	0.45
19.90	1.45	0.65	5.00	0.00	0.45	0.45
19.95	1.45	0.65	5.00	0.00	0.45	0.45
20.00	1.45	0.65	5.00	0.00	0.45	0.45
20.05	1.45	0.65	5.00	0.00	0.45	0.45
20.10	1.45	0.65	5.00	0.00	0.45	0.45
20.15	1.45	0.65	5.00	0.00	0.45	0.45
20.20	1.45	0.65	5.00	0.00	0.45	0.45
20.25	1.45	0.65	5.00	0.00	0.44	0.44
20.30	1.45	0.65	5.00	0.00	0.44	0.44
20.35	1.45	0.65	5.00	0.00	0.44	0.44
20.40	1.45	0.65	5.00	0.00	0.44	0.44
20.45	1.45	0.65	5.00	0.00	0.44	0.44
20.50	1.45	0.65	5.00	0.00	0.44	0.44
20.55	1.45	0.65	5.00	0.00	0.44	0.44
20.60	1.45	0.65	5.00	0.00	0.44	0.44
20.65	1.45	0.65	5.00	0.00	0.43	0.43
20.70	1.45	0.65	5.00	0.00	0.43	0.43
20.75	1.45	0.65	5.00	0.00	0.43	0.43
20.80	1.45	0.65	5.00	0.00	0.43	0.43
20.85	1.45	0.65	5.00	0.00	0.43	0.43
20.90	1.45	0.65	5.00	0.00	0.43	0.43
20.95	1.45	0.65	5.00	0.00	0.43	0.43
21.00	1.45	0.65	5.00	0.00	0.42	0.42
21.05	1.45	0.65	5.00	0.00	0.42	0.42
21.10	1.45	0.65	5.00	0.00	0.42	0.42
21.15	1.45	0.65	5.00	0.00	0.42	0.42
21.20	1.45	0.65	5.00	0.00	0.42	0.42
21.25	1.45	0.65	5.00	0.00	0.42	0.42
21.30	1.45	0.65	5.00	0.00	0.42	0.42
21.35	1.45	0.65	5.00	0.00	0.42	0.42
21.40	1.45	0.65	5.00	0.00	0.41	0.41
21.45	1.45	0.65	5.00	0.00	0.41	0.41
21.50	1.45	0.65	5.00	0.00	0.41	0.41
21.55	1.45	0.65	5.00	0.00	0.41	0.41
21.60	1.45	0.65	5.00	0.00	0.41	0.41
21.65	1.45	0.65	5.00	0.00	0.41	0.41
21.70	1.45	0.65	5.00	0.00	0.41	0.41
21.75	1.45	0.65	5.00	0.00	0.40	0.40
21.80	1.45	0.65	5.00	0.00	0.40	0.40
21.85	1.45	0.65	5.00	0.00	0.40	0.40
21.90	1.45	0.65	5.00	0.00	0.40	0.40

21.95	1.45	0.65	5.00	0.00	0.40	0.40
22.00	1.45	0.65	5.00	0.00	0.40	0.40
22.05	1.45	0.65	5.00	0.00	0.39	0.39
22.10	1.45	0.65	5.00	0.00	0.39	0.39
22.15	1.45	0.65	5.00	0.00	0.39	0.39
22.20	1.45	0.65	5.00	0.00	0.39	0.39
22.25	1.45	0.65	5.00	0.00	0.39	0.39
22.30	1.45	0.65	5.00	0.00	0.39	0.39
22.35	1.45	0.65	5.00	0.00	0.38	0.38
22.40	1.45	0.65	5.00	0.00	0.38	0.38
22.45	1.45	0.65	5.00	0.00	0.38	0.38
22.50	1.45	0.65	5.00	0.00	0.38	0.38
22.55	1.45	0.65	5.00	0.00	0.38	0.38
22.60	1.45	0.65	5.00	0.00	0.38	0.38
22.65	1.45	0.65	5.00	0.00	0.37	0.37
22.70	1.45	0.65	5.00	0.00	0.37	0.37
22.75	1.45	0.64	5.00	0.00	0.37	0.37
22.80	1.45	0.64	5.00	0.00	0.37	0.37
22.85	1.45	0.64	5.00	0.00	0.37	0.37
22.90	1.45	0.64	5.00	0.00	0.37	0.37
22.95	1.45	0.64	5.00	0.00	0.36	0.36
23.00	1.45	0.64	5.00	0.00	0.36	0.36
23.05	1.45	0.64	5.00	0.00	0.36	0.36
23.10	1.45	0.64	5.00	0.00	0.36	0.36
23.15	1.45	0.64	5.00	0.00	0.36	0.36
23.20	1.45	0.64	5.00	0.00	0.36	0.36
23.25	1.45	0.64	5.00	0.00	0.35	0.35
23.30	1.45	0.64	5.00	0.00	0.35	0.35
23.35	1.45	0.64	5.00	0.00	0.35	0.35
23.40	1.45	0.64	5.00	0.00	0.35	0.35
23.45	1.45	0.64	5.00	0.00	0.35	0.35
23.50	1.45	0.64	5.00	0.00	0.34	0.34
23.55	1.45	0.64	5.00	0.00	0.34	0.34
23.60	1.45	0.64	5.00	0.00	0.34	0.34
23.65	1.45	0.64	5.00	0.00	0.34	0.34
23.70	1.45	0.64	5.00	0.00	0.34	0.34
23.75	1.45	0.64	5.00	0.00	0.33	0.33
23.80	1.45	0.64	5.00	0.00	0.33	0.33
23.85	1.45	0.64	5.00	0.00	0.33	0.33
23.90	1.45	0.64	5.00	0.00	0.33	0.33
23.95	1.45	0.64	5.00	0.00	0.33	0.33
24.00	1.45	0.64	5.00	0.00	0.33	0.33
24.05	1.45	0.64	5.00	0.00	0.32	0.32
24.10	1.45	0.64	5.00	0.00	0.32	0.32
24.15	1.45	0.64	5.00	0.00	0.32	0.32
24.20	1.45	0.64	5.00	0.00	0.32	0.32
24.25	1.45	0.64	5.00	0.00	0.31	0.31
24.30	1.45	0.64	5.00	0.00	0.31	0.31
24.35	1.45	0.64	5.00	0.00	0.31	0.31
24.40	1.45	0.64	5.00	0.00	0.31	0.31
24.45	1.45	0.64	5.00	0.00	0.31	0.31
24.50	1.45	0.64	5.00	0.00	0.30	0.30
24.55	1.45	0.64	5.00	0.00	0.30	0.30
24.60	1.45	0.64	5.00	0.00	0.30	0.30
24.65	1.45	0.64	5.00	0.00	0.30	0.30
24.70	1.45	0.64	5.00	0.00	0.30	0.30
24.75	1.45	0.64	5.00	0.00	0.29	0.29
24.80	1.45	0.64	5.00	0.00	0.29	0.29
24.85	1.45	0.64	5.00	0.00	0.29	0.29
24.90	1.45	0.64	5.00	0.00	0.29	0.29
24.95	1.45	0.64	5.00	0.00	0.29	0.29
25.00	1.45	0.64	5.00	0.00	0.28	0.28
25.05	1.45	0.64	5.00	0.00	0.28	0.28
25.10	1.45	0.64	5.00	0.00	0.28	0.28
25.15	1.45	0.64	5.00	0.00	0.28	0.28
25.20	1.46	0.64	5.00	0.00	0.27	0.27
25.25	1.46	0.64	5.00	0.00	0.27	0.27
25.30	1.46	0.64	5.00	0.00	0.27	0.27
25.35	1.46	0.64	5.00	0.00	0.27	0.27
25.40	1.46	0.64	5.00	0.00	0.27	0.27
25.45	1.46	0.64	5.00	0.00	0.26	0.26
25.50	1.46	0.64	5.00	0.00	0.26	0.26
25.55	1.46	0.64	5.00	0.00	0.26	0.26
25.60	1.46	0.64	5.00	0.00	0.26	0.26

25.65	1.46	0.64	5.00	0.00	0.26	0.26
25.70	1.45	0.64	5.00	0.00	0.25	0.25
25.75	1.45	0.64	5.00	0.00	0.25	0.25
25.80	1.45	0.64	5.00	0.00	0.25	0.25
25.85	1.45	0.64	5.00	0.00	0.25	0.25
25.90	1.45	0.64	5.00	0.00	0.25	0.25
25.95	1.45	0.64	5.00	0.00	0.24	0.24
26.00	1.45	0.64	5.00	0.00	0.24	0.24
26.05	1.45	0.64	5.00	0.00	0.24	0.24
26.10	1.45	0.64	5.00	0.00	0.24	0.24
26.15	1.45	0.64	5.00	0.00	0.24	0.24
26.20	1.45	0.64	5.00	0.00	0.23	0.23
26.25	1.45	0.64	5.00	0.00	0.23	0.23
26.30	1.45	0.64	5.00	0.00	0.23	0.23
26.35	1.45	0.64	5.00	0.00	0.23	0.23
26.40	1.45	0.64	5.00	0.00	0.23	0.23
26.45	1.45	0.64	5.00	0.00	0.22	0.22
26.50	1.45	0.64	5.00	0.00	0.22	0.22
26.55	1.45	0.64	5.00	0.00	0.22	0.22
26.60	1.45	0.64	5.00	0.00	0.22	0.22
26.65	1.45	0.64	5.00	0.00	0.22	0.22
26.70	1.44	0.64	5.00	0.00	0.21	0.21
26.75	1.44	0.64	5.00	0.00	0.21	0.21
26.80	1.44	0.64	5.00	0.00	0.21	0.21
26.85	1.44	0.64	5.00	0.00	0.21	0.21
26.90	1.44	0.64	5.00	0.00	0.21	0.21
26.95	1.44	0.64	5.00	0.00	0.20	0.20
27.00	1.44	0.64	5.00	0.00	0.20	0.20
27.05	1.44	0.64	5.00	0.00	0.20	0.20
27.10	1.44	0.64	5.00	0.00	0.20	0.20
27.15	1.44	0.64	5.00	0.00	0.19	0.19
27.20	1.44	0.64	5.00	0.00	0.19	0.19
27.25	1.44	0.64	5.00	0.00	0.19	0.19
27.30	1.44	0.64	5.00	0.00	0.19	0.19
27.35	1.44	0.64	5.00	0.00	0.19	0.19
27.40	1.44	0.64	5.00	0.00	0.18	0.18
27.45	1.44	0.64	5.00	0.00	0.18	0.18
27.50	1.44	0.64	5.00	0.00	0.18	0.18
27.55	1.44	0.64	5.00	0.00	0.18	0.18
27.60	1.44	0.64	5.00	0.00	0.18	0.18
27.65	1.44	0.64	5.00	0.00	0.17	0.17
27.70	1.43	0.64	5.00	0.00	0.17	0.17
27.75	1.43	0.64	5.00	0.00	0.17	0.17
27.80	1.43	0.64	5.00	0.00	0.17	0.17
27.85	1.43	0.64	5.00	0.00	0.17	0.17
27.90	1.43	0.64	5.00	0.00	0.16	0.16
27.95	1.43	0.64	5.00	0.00	0.16	0.16
28.00	1.43	0.64	5.00	0.00	0.16	0.16
28.05	1.43	0.64	5.00	0.00	0.16	0.16
28.10	1.43	0.64	5.00	0.00	0.16	0.16
28.15	1.43	0.64	5.00	0.00	0.16	0.16
28.20	1.43	0.64	5.00	0.00	0.15	0.15
28.25	1.43	0.64	5.00	0.00	0.15	0.15
28.30	1.43	0.64	5.00	0.00	0.15	0.15
28.35	1.43	0.64	5.00	0.00	0.15	0.15
28.40	1.43	0.64	5.00	0.00	0.15	0.15
28.45	1.43	0.64	5.00	0.00	0.14	0.14
28.50	1.43	0.64	5.00	0.00	0.14	0.14
28.55	1.43	0.64	5.00	0.00	0.14	0.14
28.60	1.43	0.64	5.00	0.00	0.14	0.14
28.65	1.43	0.64	5.00	0.00	0.14	0.14
28.70	1.43	0.64	5.00	0.00	0.14	0.14
28.75	1.42	0.64	5.00	0.00	0.13	0.13
28.80	1.42	0.64	5.00	0.00	0.13	0.13
28.85	1.42	0.64	5.00	0.00	0.13	0.13
28.90	1.42	0.64	5.00	0.00	0.13	0.13
28.95	1.42	0.64	5.00	0.00	0.13	0.13
29.00	1.42	0.64	5.00	0.00	0.12	0.12
29.05	1.42	0.63	5.00	0.00	0.12	0.12
29.10	1.42	0.63	5.00	0.00	0.12	0.12
29.15	1.42	0.63	5.00	0.00	0.12	0.12
29.20	1.42	0.63	5.00	0.00	0.12	0.12
29.25	1.42	0.63	5.00	0.00	0.11	0.11
29.30	1.42	0.63	5.00	0.00	0.11	0.11

29.35	1.42	0.63	5.00	0.00	0.11	0.11
29.40	1.42	0.63	5.00	0.00	0.11	0.11
29.45	1.42	0.63	5.00	0.00	0.11	0.11
29.50	1.42	0.63	5.00	0.00	0.11	0.11
29.55	1.42	0.63	5.00	0.00	0.10	0.10
29.60	1.42	0.63	5.00	0.00	0.10	0.10
29.65	1.42	0.63	5.00	0.00	0.10	0.10
29.70	1.42	0.63	5.00	0.00	0.10	0.10
29.75	1.42	0.63	5.00	0.00	0.10	0.10
29.80	1.41	0.63	5.00	0.00	0.10	0.10
29.85	1.41	0.63	5.00	0.00	0.10	0.10
29.90	1.41	0.63	5.00	0.00	0.09	0.09
29.95	1.41	0.63	5.00	0.00	0.09	0.09
30.00	1.41	0.63	5.00	0.00	0.09	0.09
30.05	1.41	0.63	5.00	0.00	0.09	0.09
30.10	1.41	0.63	5.00	0.00	0.09	0.09
30.15	1.41	0.63	5.00	0.00	0.09	0.09
30.20	1.41	0.63	5.00	0.00	0.09	0.09
30.25	1.41	0.63	5.00	0.00	0.09	0.09
30.30	1.41	0.63	5.00	0.00	0.09	0.09
30.35	1.41	0.63	5.00	0.00	0.08	0.08
30.40	1.41	0.63	5.00	0.00	0.08	0.08
30.45	1.41	0.63	5.00	0.00	0.08	0.08
30.50	1.41	0.63	5.00	0.00	0.08	0.08
30.55	1.41	0.63	5.00	0.00	0.08	0.08
30.60	1.41	0.63	5.00	0.00	0.08	0.08
30.65	1.41	0.63	5.00	0.00	0.08	0.08
30.70	1.41	0.63	5.00	0.00	0.08	0.08
30.75	1.41	0.63	5.00	0.00	0.07	0.07
30.80	1.41	0.63	5.00	0.00	0.07	0.07
30.85	1.41	0.63	5.00	0.00	0.07	0.07
30.90	1.41	0.63	5.00	0.00	0.07	0.07
30.95	1.40	0.63	5.00	0.00	0.07	0.07
31.00	1.40	0.63	5.00	0.00	0.07	0.07
31.05	1.40	0.63	5.00	0.00	0.07	0.07
31.10	1.40	0.63	5.00	0.00	0.07	0.07
31.15	1.40	0.63	5.00	0.00	0.07	0.07
31.20	1.40	0.63	5.00	0.00	0.06	0.06
31.25	1.40	0.63	5.00	0.00	0.06	0.06
31.30	1.40	0.63	5.00	0.00	0.06	0.06
31.35	1.40	0.63	5.00	0.00	0.06	0.06
31.40	1.40	0.63	5.00	0.00	0.06	0.06
31.45	1.40	0.63	5.00	0.00	0.06	0.06
31.50	1.40	0.62	5.00	0.00	0.06	0.06
31.55	1.40	0.62	5.00	0.00	0.06	0.06
31.60	1.40	0.62	5.00	0.00	0.05	0.05
31.65	1.40	0.62	5.00	0.00	0.05	0.05
31.70	1.40	0.62	5.00	0.00	0.05	0.05
31.75	1.40	0.62	5.00	0.00	0.05	0.05
31.80	1.40	0.62	5.00	0.00	0.05	0.05
31.85	1.40	0.62	5.00	0.00	0.05	0.05
31.90	1.40	0.62	5.00	0.00	0.05	0.05
31.95	1.40	0.62	5.00	0.00	0.05	0.05
32.00	1.40	0.62	5.00	0.00	0.04	0.04
32.05	1.39	0.62	5.00	0.00	0.04	0.04
32.10	1.39	0.62	5.00	0.00	0.04	0.04
32.15	1.39	0.62	5.00	0.00	0.04	0.04
32.20	1.39	0.62	5.00	0.00	0.04	0.04
32.25	1.39	0.62	5.00	0.00	0.04	0.04
32.30	1.39	0.62	5.00	0.00	0.04	0.04
32.35	1.39	0.62	5.00	0.00	0.04	0.04
32.40	1.39	0.62	5.00	0.00	0.03	0.03
32.45	1.39	0.62	5.00	0.00	0.03	0.03
32.50	1.39	0.62	5.00	0.00	0.03	0.03
32.55	1.39	0.62	5.00	0.00	0.03	0.03
32.60	1.39	0.62	5.00	0.00	0.03	0.03
32.65	1.39	0.62	5.00	0.00	0.03	0.03
32.70	1.39	0.62	5.00	0.00	0.03	0.03
32.75	1.39	0.62	5.00	0.00	0.03	0.03
32.80	1.39	0.62	5.00	0.00	0.02	0.02
32.85	1.39	0.62	5.00	0.00	0.02	0.02
32.90	1.39	0.62	5.00	0.00	0.02	0.02
32.95	1.39	0.62	5.00	0.00	0.02	0.02
33.00	1.39	0.62	5.00	0.00	0.02	0.02

33.05	1.39	0.62	5.00	0.00	0.02	0.02
33.10	1.39	0.62	5.00	0.00	0.02	0.02
33.15	1.39	0.62	5.00	0.00	0.02	0.02
33.20	1.38	0.62	5.00	0.00	0.01	0.01
33.25	1.38	0.62	5.00	0.00	0.01	0.01
33.30	1.38	0.62	5.00	0.00	0.01	0.01
33.35	1.38	0.61	5.00	0.00	0.01	0.01
33.40	1.38	0.61	5.00	0.00	0.01	0.01
33.45	1.38	0.61	5.00	0.00	0.01	0.01
33.50	1.38	0.61	5.00	0.00	0.01	0.01
33.55	1.38	0.61	5.00	0.00	0.01	0.01
33.60	1.38	0.61	5.00	0.00	0.00	0.00
33.65	1.38	0.61	5.00	0.00	0.00	0.00
33.70	1.38	0.61	5.00	0.00	0.00	0.00
33.75	1.38	0.61	5.00	0.00	0.00	0.00

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* 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.

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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