



LGC Valley, Inc.

Geotechnical Consulting

***SUPPLEMENTAL GEOTECHNICAL
INVESTIGATION REPORT
FOR A PROPOSED RESIDENTIAL DEVELOPMENT,
CITY OF SANTA ANA, CALIFORNIA***

Dated: December 16, 2021

Project No. 213031-01

Prepared For:

***FRH Realty LLC.
5355 Mira Sorrento Place, Suite 100
San Diego, CA 92121***



LGC Valley, Inc.

Geotechnical Consulting

December 16, 2021

Project No. 213031-01

Mr. Ed McCoy
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5355 Mira Sorrento Place, Suite 100
San Diego, California 92121

Subject: Supplemental Geotechnical Investigation Report for a Proposed Residential Development, City of Santa Ana, California

In accordance with your request, LGC Valley, Inc. (LGC) has performed a supplemental geotechnical investigation for a proposed residential development located at 1901 and 1971 E. 4th Street and 515 and 525 Cabrillo Park Drive in the city of Santa Ana, County of Orange, California. The purpose of our supplemental investigation was to provide updated geotechnical recommendations for a proposed residential development, evaluate the conceptual site development plan, geotechnical conditions, review geotechnical and geologic data and maps pertinent to the site, and prepare a report indicating our findings, conclusions, opinions, and recommendations for site development. This report presents the results of our subsurface investigation, and geotechnical analysis of the collected data, grading construction and other relevant geotechnical aspects of the project, and provides our conclusions, opinions including recommendations for stormwater infiltration design and recommendations with respect to site development.


Based on the results of our geotechnical evaluation and review, it is our opinion that the proposed site development is feasible from a geotechnical standpoint, provided the recommendations included in this report are incorporated into the project plans and specifications, and followed during site grading and construction.

LGC has reviewed the laboratory test data, procedures and results performed by EGLAB, Inc. (EGL), with respect to the subject site and concurs with and accepts responsibility as geotechnical engineer of record for their work (laboratory testing).


If you have any questions regarding our report, please contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,

LGC VALLEY, INC.


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1.0 INTRODUCTION

1.1 Purpose and Scope of Services

The purpose of this supplemental investigation was to identify and evaluate the existing geologic and geotechnical conditions at the site and provide preliminary geotechnical design criteria for the proposed development. Recommendations for grading construction, preliminary foundation design for the proposed structures, stormwater infiltration design and other relevant aspects of the proposed development are included herein to address the identified site geotechnical conditions. This report includes the results of our site exploration, laboratory testing, and engineering evaluation, and provides our conclusions, opinions and recommendations with respect to site development.

These items plus other geotechnical conditions are discussed and addressed within this document.

Our scope of services for preparation of this document included:

- Review of available geotechnical reports, geologic maps and other documents relevant to the site (Appendix A).
- Perform a site visit to evaluate the existing conditions and mark the geotechnical boring locations.
- A subsurface investigation including the excavation, sampling, and logging of three small-diameter exploratory borings. The borings are labeled B-LGC-1 through B-LGC-3. Logs of the borings are presented in Appendix B, and their approximate locations are depicted on the Boring Location Map (Figure 2). All the excavations were sampled and logged under the supervision of a licensed geologist from our firm. The borings were excavated to evaluate the general characteristics of the subsurface conditions on the site including classification of site soils, determination of depth to groundwater, and to obtain representative soil samples.
- Laboratory testing of representative soil samples obtained during our subsurface investigation (Appendix C).
- Perform geotechnical analyses and evaluation of the data.
- Preparation of this report presenting our findings, conclusions, opinions and recommendations with respect to the evaluated geologic and geotechnical conditions at the site.

1.2 Site and Project Description

The subject site is a rectangular shaped approximately 9-acre site located at the northeast corner of the intersection of E. 4th street and Cabrillo Park Drive in the City of Santa Ana, California. The site is bounded by a baseball field to the north, East Cabrillo Park Drive to the west, East 4th street to the south, and a parking lots and commercial/office buildings to the east (Figure 1, Site Location Map). The entrance into the site is of Cabrillo Park Drive.

Based on our review, the site is currently occupied by four commercial structures and asphalt pavement. Two buildings are located at the southeast and southwest corners, one at the northwest corner and one at middle of the east border. It is surrounded by an asphaltic parking lot.

It is our understanding that the proposed development will be consisting of 3-story townhomes in the north area (Area 1 - shown in blue) and a five-story wrap with parking structure in the south area (Area 2 - shown in yellow) as shown on the Boring Location Map (Figure 2). Future grading of the site is anticipated to consist of minor design cuts and fills in order to achieve finish grades. Appurtenant structures, carports, parking areas, driveways, storm water filtration systems, landscaping, and associated utilities will also be constructed to support the new development.

1.3 Subsurface Investigation and Laboratory Testing

Our subsurface investigation was performed on November 22nd, 2021 and consisted of three hollow stem auger borings (B-LGC-1 through B-LGC-3). The geotechnical borings were all excavated to a depth of approximately 51.5 feet below the existing grade. The approximate locations of the borings are shown on the Boring Location Map (Figure 2). Based on a review of the seismic hazard zone maps prepared by the California Geological Survey (CGS, 2002), the site is not located within a seismic hazard area for potential liquefaction, but is located near a liquefaction hazard area, and has a historic high groundwater elevation of approximately 40 feet below the existing ground surface. Therefore, to evaluate the liquefaction and seismically induced dry sand settlement potentials, LGC advanced all three borings to depths of up to approximately 51.5 feet below the ground surface, and collected samples and SPT blow counts at 2.5-foot intervals. These borings were also used to evaluate the consolidation potential, hydro-collapse potential, and to characterize the near-surface geotechnical characteristics of the site. The borings were sampled and logged from the surface under the supervision of a licensed Engineering Geologist/Geotechnical Engineer from LGC.

During the subsurface investigation, representative bulk and relatively undisturbed samples were collected for laboratory testing. Laboratory testing was performed by EGLAB, Inc. (EGL). Laboratory testing was performed on representative soil samples and included moisture and density tests, maximum density and optimum moisture content, grain size distribution, Atterberg Limits, expansion, direct shear, consolidation, collapse, and corrosion testing. A summary of the test procedures and printouts of the laboratory test results are presented in Appendix C. The moisture and density test results were presented on the boring logs included in Appendix B.

The previous subsurface investigations performed by Alta California Geotechnical, Inc. (ACG) were performed on July 7, 2021 and consisted of the excavation of eight geotechnical hollow stem auger borings (B-1 through B-8) and three percolation test borings (P-1 through P-3). The geotechnical borings were excavated to a depth of approximately 26 feet while the percolation test borings were excavated to an approximate depth of 5 feet. Approximate locations of the previous borings are included on the Boring Location Map (Figure 2). The logs of the borings are included in Appendix B of this report.

During the previous subsurface investigation, representative bulk and relatively undisturbed samples were collected for laboratory testing by ACG. Laboratory testing was performed on representative soil samples and included in-situ moisture and density tests, maximum density and optimum moisture content, grain size distribution, expansion, consolidation, and corrosion testing. The previous laboratory test results are also presented in Appendix C. The moisture and density test results were presented on the boring logs included in Appendix B.



LGC

Figure 1:
Site Location Map
FF / Santa Ana
City of Santa Ana, California

Project Name	Santa Ana
Project No.	213031-01
Eng.	BIH/MW
Scale	Not to scale
Date	12/16/21

2.0 GEOTECHNICAL CONDITIONS

2.1 Regional and Local Geology

The subject site is located in Santa Ana within the Peninsular Ranges geomorphic province of southern California which is characterized by northwest trending elongated mountain ranges and valleys that are truncated by the Transverse Ranges Geomorphic Province to the north and extend south into Baja California. The site lies within a valley area near the western flank of the Santa Ana Mountains and is underlain by flat-lying basin sediments and Holocene or modern fluvial deposits. The site lies on quaternary younger alluvium which consist of silty sand, sand and clays.

2.2 Site-Specific Geology

The subject site is composed of existing fills placed as a part of the previous site development underlain by quaternary younger alluvium. A detailed description is as follows:

2.2.1 Quaternary Alluvium (Qal)

Quaternary alluvium consisted of reddish-brown sandy clays, clayey sands, sandy silts and silty clays and were found to be damp and were soft to stiff and/or loose to dense to the maximum explored depth of approximately 51.5 feet.

2.3 Geologic Structure

The site is composed of flat-lying quaternary younger alluvium. The quaternary younger alluvium is interpreted as generally massive with some poorly defined, gradational, lithologic changes between soil types.

2.4 Landslides

There are no slopes within the vicinity of the site; therefore, there is no landslide hazard.

2.5 Groundwater

No groundwater was encountered in our geotechnical borings to a depth of 51.5 feet, or the previous geotechnical borings by others to depths of 26 feet. Historic high groundwater is considered at a depth greater than 40 feet below the existing site grades per the Seismic Hazard Zone Report for the Tustin Quadrangle (SHZR 012, 1998). As such, groundwater is not anticipated to pose problems during site development.

2.6 Surface Water

Based on our review of local maps, sheet flow is to the southwest. Surface water runoff relative to project design is the purview of the project civil engineer and should be directed away from planned structures.

2.7 Seismicity, Faulting and Related Effects

2.7.1 Seismicity

The main seismic parameters to be considered when discussing the potential for earthquake-induced damage are the distances to the causative faults, earthquake magnitudes, and expected ground accelerations. We have performed site-specific analysis based on these seismic parameters for the site and the onsite geologic conditions. The results of our analysis are discussed in terms of the potential seismic events that could be produced by the maximum probable earthquakes. A maximum probable earthquake is the maximum earthquake likely to occur given the known tectonic framework.

Elsinore fault is located approximately 14 miles to the northeast, the El Modeno Fault is located approximately 5 miles northeast of the site and the Newport-Inglewood Fault is located approximately 7.1 miles to the southwest. All of these faults have the capability of causing significant shaking at the site.

2.7.2 Seismic Design Criteria

The site seismic characteristics were evaluated per the guidelines set forth in Chapter 16, Section 1613 of the 2019 California Building Code (CBC) and ASCE 7-16. Representative site coordinates for the subject site of latitude 33.7494° N and longitude -117.8397° W were utilized in our analyses. The maximum considered earthquake (MCE) spectral response accelerations (S_{MS} and S_{M1}) and adjusted design spectral response acceleration parameters (S_{DS} and S_{D1}) for Site Class D are provided in the following Table 1.

Table 1
Seismic Design Parameters

Selected Parameters from 2019 CBC, Section 1613 - Earthquake Loads	Seismic Design Values
Site Class per Chapter 20 of ASCE 7	D*
Risk-Targeted Spectral Acceleration for Short Periods (S_S)	1.288g
Risk-Targeted Spectral Accelerations for 1-Second Periods (S_1)	0.459g
Site Coefficient F_a per Table 1613.2.3(1)	1.0
Site Coefficient F_v per Table 1613.2.3(2)	1.841
Site Modified Spectral Acceleration for Short Periods (S_{MS}) for Site Class D [Note: $S_{MS} = F_a S_S$]	1.288g
Site Modified Spectral Acceleration for 1-Second Periods (S_{M1}) for Site Class D [Note: $S_{M1} = F_v S_1$]	0.845
Design Spectral Acceleration for Short Periods (S_{DS}) for Site Class D [Note: $S_{DS} = (2/3)S_{MS}$]	0.858g
Design Spectral Acceleration for 1-Second Periods (S_{D1}) for Site Class D [Note: $S_{D1} = (2/3)S_{M1}$]	0.56333
Seismic Design Category (per Section 1613.2.5)	D
C_{RS} (Mapped Risk Coefficient at 0.2 sec, Per ASCE 7 Chapter 22 -Figure 22-18A)	0.935
C_{R1} (Mapped Risk Coefficient at 1 sec, Per ASCE 7 Chapter 22 – Figure 22-19A)	0.928

*Structures on Site Class D sites with S_1 greater than or equal to 0.2, provided the value of the seismic response coefficient C_s is determined by Eq. (12.8-2) for values of $T \leq 1.5T_s$ and taken as equal to 1.5 times the value computed in accordance with either Eq. (12.8-3) for $T_L \geq T > 1.5T_s$ or Eq. (12.8-4) for $T > T_L$.

Section 1803.5.12 of the 2019 CBC (per Section 11.8.3 of ASCE 7) states that the maximum considered earthquake ground motions, Peak Ground Acceleration (PGA) should be used for the geotechnical evaluations. The PGA_M for the site is equal to 0.593g (USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2).

A deaggregation of the PGA based on a 2,475-year average return period indicates that an earthquake magnitude of 7.71 at a distance of approximately 14.62 km (9.1 mi) from the site would contribute the most to this ground motion (USGS, 2014).

2.7.3 Faulting

Based on our review of geologic and Earthquake Fault Zone maps, the subject site is not located within a Special Studies Zone (Hart and Bryant, 1997) and no active faults are mapped projecting through the subject site. The possibility of damage due to ground rupture from earthquake fault rupture is considered low since active faults are not known to cross the site.

Secondary effects of seismic shaking resulting from large earthquakes on the major faults in the southern California region, which may affect the site, include soil liquefaction and dynamic settlement. Other secondary seismic effects include shallow ground rupture, and seiches and tsunamis. In general, these secondary effects of seismic shaking are a possibility throughout the Southern California region and are dependant on the distance between the site and causative fault and the onsite geology. The major active faults that could produce these secondary effects is the Elsinore-Whittier, Newport-Inglewood, and San Andreas faults, among others, surround the site.

A discussion of liquefaction and these secondary effects is provided in the following sections.

2.7.4 Shallow Ground Rupture

Shallow ground rupture due to active faulting is not likely to occur on site due to the distance from likely seismic events. Therefore, this phenomenon is not considered a significant hazard, although it is a possibility at any site.

2.7.5 Liquefaction and Dry Sand Settlement

Liquefaction is a seismic phenomenon in which loose, saturated, granular soils behave similarly to a fluid when subject to high-intensity ground shaking. Liquefaction occurs when three general conditions exist: 1) shallow groundwater; 2) low density non-cohesive (granular) soils; and 3) high-intensity ground motion. Liquefaction is typified by a buildup of pore-water pressure in the affected soil layer to a point where a total loss of shear strength occurs, causing the soil to behave as a liquid. Studies indicate that saturated, loose to medium dense, near surface cohesionless soils exhibit the highest liquefaction potential, while dry, dense, cohesionless soils and cohesive soils exhibit low to negligible liquefaction potential.

Based on a review of seismic hazard zone map for the Tustin Quadrangle and Orange Quadrangle prepared by the California Geological Survey (CGS, 2002), the site is not located within a State of California Seismic Hazard Zone mapped liquefaction hazard area. Effects of liquefaction on level ground include potential seismic settlement, sand boils, ground oscillation, and bearing capacity failures below structures.

Historic high groundwater elevation is greater than 40 feet below the ground surface near the location of the subject site (CGS, 2002). No groundwater was encountered in the borings to a depth of 51.5 feet. A conservative groundwater depth of 40 feet was utilized in the liquefaction analysis.

Our evaluation utilized the information collected from the excavations and laboratory test results, along with utilizing the more recent studies as indicated in SP 117A by Bray and Sancio, 2006 as a screening tool to determine if the encountered fine grained soils (clays) are susceptible to liquefaction and analyzed as such. Our evaluation included performing grain size distribution, Atterberg limit, and moisture content testing on representative fine-grained layers (i.e. clayey/silty Sands) encountered within the geotechnical borings excavated on-site. The laboratory test results indicated that the encountered fine-grained layers have a plasticity index of 5, 7, 10 and 12, and moisture contents less than 85 percent of the liquid limit and is considered as being susceptible to liquefaction.

The liquefaction analysis was performed using the LiquefyPro program with a user provided factor of safety of 1.0. The liquefaction analysis was performed considering a minimum 5-foot remedial removal and recompaction and the existing condition below with the highest historic groundwater elevation at a depth of 40 feet below the ground surface.

The liquefaction analysis was performed using the following input data:

- Groundwater at a depth of 40 feet below the ground surface during seismic event, and boring groundwater at elevations ranging 51.5 feet.
- A Peak Horizontal Ground Acceleration ($PGAM$) of 0.593g for a Design Earthquake Magnitude of 7.71.
- Fines content as determined from laboratory testing during this investigation.
- The hammer used for determining blow-counts for both the ring and SPT sampling was an auto-trip hammer with a 140 lb weight and a 30-inch drop. Therefore, based on the type of hammer used, an energy correction factor (CE) of 1.3 is considered acceptable for use in the analysis.

Based on our site evaluation, liquefaction analysis, and our professional opinion, there is a potential for specific layers to liquefy between a depth of 44 to 51.5 feet below the existing site grades.

During a strong seismic event, seismically induced settlement can occur within loose to moderately dense, dry or saturated granular soil. Settlement caused by ground shaking is often non-uniformly distributed, which can result in differential settlement. Based on blow counts and in-situ densities, the native alluvial soils between a depth of 5 to 40 feet below the existing ground surface are susceptible to seismically induced dry sand settlements and were evaluated in our analysis.

Based on the results of the liquefaction/seismically induced settlement analysis, we estimated the amount of total liquefaction-induced and dry sand settlement possible for the design conditions is approximately 3-inches or less, and a differential settlement of approximately 1.5-inches. We estimated these settlements based on the procedures proposed by Tokimatsu and Seed (1987). The graphical output of our liquefaction analysis which also shows the graphical output of seismically induced saturated and dry sand settlement is included in Appendix D.

2.7.6 Tsunamis and Seiches

Based on the elevation of the proposed development at the site with respect to sea level and its distance from large open bodies of water, the potential of seiche and/or tsunami is considered to be nil.

2.8 Settlement

Several components of settlement were considered in evaluating the total settlement at the site including seismic settlement of the underlying alluvium, hydro-collapse settlement of alluvium, and settlement of foundations due to foundation loads.

Hydro-collapse potential of the underlying fill and alluvium was evaluated based upon available geotechnical data including in-situ densities and hydro-collapse test results. Hydro-collapse potential of the underlying materials is considered negligible (i.e. less than 0.5%). Hence, the hydro-consolidation settlement potential of the underlying alluvium is considered negligible.

As previously discussed, seismic settlement of the alluvium at the site was evaluated and is expected to be on the order of approximately 3 inches, or less. Seismic settlement of engineered compacted fill is assumed to be negligible. Therefore, differential seismic induced settlements of up to 1.5 inches should be considered in the foundation design. This seismic settlement should be added to other settlement components due to static loads.

Structures planned at the site are expected to be of conventional wood-frame construction or concrete for the parking structure. Foundation settlements due to static column loads with the recommended remedial removals provided herein are expected to be minor, on the order of 1-inch, or less.

2.9 Slope Stability

No significant permanent slopes currently exist onsite or are planned for the subject site, therefore slope stability is not considered an issue with respect to site development.

2.10 Laboratory Testing

Laboratory testing of the onsite soils was performed on representative samples obtained from the borings and included moisture and density tests, maximum density and optimum moisture content, grain size distribution, Atterberg Limits, expansion, direct shear, consolidation, collapse, and corrosion testing. Laboratory testing was performed by EGLAB, Inc. (EGL). LGC has reviewed the laboratory test data, procedures and results performed by EGL with respect to the subject site and concurs with and accepts responsibility as geotechnical engineer of record for their work (laboratory testing). A discussion of the tests performed, and printout of the laboratory test results are presented in Appendix C. The moisture and density test results are presented on the boring logs in Appendix B.

Preliminary expansion potential testing of the upper site soils from sample collected as a part of this study indicated expansion index of 101, "High" (per ASTM D4829). Sulfate testing indicated soluble sulfate content of 0.009 percent ("Negligible" per ACI 318R-14 Table 19.3.2.1).

A corrosion suite (pH, resistivity, and chloride content) was also performed on a sample obtained from the geotechnical boring to estimate the corrosion potential of onsite soils. The resistivity tests resulted in a minimum resistivity of 2,100 ohm-centimeters, a pH of 7.76, and chloride content of 130 ppm.

Test results are provided in Appendix C. These results/assumptions should be confirmed at the completion of site grading.

Results of the previous laboratory testing (by ACG) performed during the previous site investigation indicated expansion index ranging from 69 to 94 (Medium to High Expansion potentials), soluble sulfate content of non-detectible to 0.017%, Minimum Resistivities ranging from 680 to 1,700 ohm-cm, Chloride content of 15 to 65 ppm, and pH ranging from 7.94 to 8.04. Previous testing also included maximum density and optimum moisture tests, consolidation, and grain size distribution. The previous test results are included in Appendix C of this report.

2.11 Percolation Testing

Preliminary percolation testing was performed as a part of the previous site investigations (by ACG), a discussion and the results of the preliminary testing (by ACG, 2021) is provided herein. It is our understanding that the project may utilize infiltration systems for storm water disposal. Details of the system are not known at this time.

Shallow infiltration testing was performed in three (3) five-foot-deep borings (P-1 through P-3) located across the site. The location of the percolation tests is shown on the attached Figure 2. The following discussion and information are from the referenced report. The testing was performed in general accordance with the County of Orange Technical Guidance Document. The three test wells were presoaked at least 24 hours prior to testing. During testing, the water level readings were recorded every 30 minutes until the readings stabilized. The data was then adjusted to provide an infiltration rate utilizing the Porchet Method. The resulting infiltration rates are presented in Table 2. The results do not include a factor of safety.

Table 2
Summary of Infiltration Testing (No Factor of Safety)

Test Designation	P-1	P-2	P-3
Approximate Depth of Test	5 ft	5 ft	5 ft
Time Interval	30 minutes	30 minutes	30 minutes
Radius of Test Hole	4 inches	4 inches	4 inches
Tested Infiltration Rate	4.1 (in/hr)	5.0 (in/hr)	6.2 (in/hr)

3.0 CONCLUSIONS

Based on the results of our geotechnical evaluation and review, it is our opinion that the proposed site development is feasible from a geotechnical standpoint, provided the following recommendations included in this report are incorporated into the project plans and specifications, and followed during site grading and construction. Our geotechnical conclusions are as follows:

- The site is not located within an Earthquake Fault Zone.
- No groundwater was encountered in our geotechnical borings across the site. We do not anticipate that the site excavation will encounter groundwater. Design groundwater should be considered at a depth of below 40 feet below the existing grades.
- The site is not located within an area deemed to have a potential for liquefaction (CGS, 2002). Based on our site assessment, liquefaction potential is low and subsequent seismically induced settlement was found to be on the order of 3 inches or less.
- Total static (1 inch or less) and seismically induced settlements (3 inches or less) of up to 4 inches with differential settlements of up to 2 inches in 30 feet should be considered in the foundation design.
- Based on the subsurface exploration and our review, the site is underlain by alluvium. The existing fills and alluvial soils are considered potentially compressible/collapsible in the upper approximately 5 to 10 feet.
- The anticipated site excavation and the proposed construction will not have an adverse impact on the adjacent properties.
- Active or potentially active faults are not known to exist on the site.
- Laboratory test results of the onsite soils indicate a medium to high expansion potential. For preliminary design purposes a high expansion potential should be considered in foundation design.
- Laboratory test results of the onsite soils indicate negligible soluble sulfate contents and should be considered corrosive to metals.
- Laboratory test results of the onsite soils indicate a negligible potential of hydro-collapse underlying the recommended remedial removals.
- The onsite soils below recommended remedial grading/excavation depths have a low potential for static settlement (i.e., slightly compressible).
- From a geotechnical perspective, the existing onsite soils are suitable for use as fill, provided they are relatively free from rocks (larger than 6 inches in maximum dimension), construction debris, and organic material.

Percolation testing conclusions are as follows:

- From a geotechnical perspective, allowing storm water to infiltrate the onsite soil in concentrated areas increases the potential for settlement, liquefaction, and water-related damage to structures/improvements, such as wet or pumping subgrade, and should be avoided where possible. If infiltration systems are required on this site, care should be taken in designing systems that control the storm water as much as possible.
- Preliminary infiltration testing was conducted at the site as part of the previous site investigation by ACG. Based on the previous testing and results by ACG, site infiltration rates for P-1 through P-3 were calculated to be 4.1-inches per hour, 5.0-inches per hour and 6.2-inches per hour, respectively. The results do not include a factor of safety. Test P-1 through P-3 were conducted in silty sand lenses of the younger fan deposits at approximately 5-feet below the ground surface.

- No groundwater was encountered during our investigation to a depth of approximately 51 feet below the ground surface. The historic high ground water is greater than 40 feet below the ground surface (CDMG, 1998). Nearby groundwater wells indicate groundwater is deeper than 100-feet. Based on the infiltration rates of the underlying soil, infiltration-type WQMP's are likely feasible for project within the depths tested. The Project Geotechnical Consultant should review the final WQMP design prior to construction.
- Any proposed infiltration well should be setback a minimum of 10 feet from the property line.
- Proposed stormwater infiltration is not anticipated to adversely impact soil structure interaction, provided that the percolation area is setback a minimum of 10 feet from any building or wall foundations.
- The infiltration facility shall be designed to overflow to the street in the event that the drainage capacity is exceeded or in case of future failure to adequately infiltrate
- The proper use and maintenance of the drainage systems are critical to maintain the useful design life per the guidelines set forth by the drain manufacturer.
- The subject site was reviewed from a liquefaction perspective that used groundwater at the historic high of 40 feet below the ground surface. The proposed structures will be designed with this in mind. The proposed stormwater infiltration will not have an adverse effect to the proposed site development from a liquefaction standpoint.

4.0 RECOMMENDATIONS

4.1 Site Earthwork

We anticipate that earthwork at the site will consist of site preparation, demolition of existing buildings, removal or abandonment of existing utilities crossing the site, and the removal of existing pavement areas, followed by remedial removals and site grading followed by construction of slab-on-grade type foundations for the proposed residential structures and parking structure, installation of utilities, subsequently followed by paving/pouring of driveways and streets.

We recommend that earthwork onsite be performed in accordance with the recommendations herein, the City of Santa Ana, and the General Earthwork and Grading Specifications for Rough Grading included in Appendix E. In case of conflict, the recommendations in the following sections shall supersede those included as part of Appendix E.

4.1.1 Site Preparation

Prior to grading of areas to receive structural fill or engineered structures, all ground surfaces should be cleared of obstructions, any existing debris and stripped of vegetation. Heavy vegetation and debris should be removed and properly disposed of offsite. All debris from any demolition activities at the site should also be removed and disposed off-site. Holes or depressions resulting from the removal of buried obstructions should be replaced with compacted fill.

Following remedial removals, areas to receive fill should be scarified to a minimum depth of 12 inches, brought to a near-optimum moisture condition, and recompact to at least 90 percent relative compaction (based on American Standard of Testing and Materials [ASTM] Test Method D1557).

4.1.2 Removal and Recompaction

As discussed in Section 2.2, the upper portion of the site is underlain by potentially compressible/collapsible or unsuitable soils (i.e. existing fills and younger alluvium), which may settle under the addition of water, under the surcharge of fill and/or foundation loads. Compressible materials not removed by the planned grading should be excavated to competent material and replaced with compacted fill soils. We anticipate removals across the apartment and townhome sites to be approximately 5 feet in depth below existing grade or a minimum of 3-feet below proposed residential buildings footing bottom elevations, and up to 10 feet below existing grade, for the parking structure area, or a minimum of 3-feet below the parking structure foundations, whichever is deeper, to remove unsuitable fills and alluvium; however, other localized, deeper removals should be anticipated where deemed necessary by the geotechnical consultant based on observations during grading. Removal bottoms should be scarified to a minimum depth of 12 inches, brought to at least optimum-moisture content, and recompact. Compacted fills placed underlying the townhomes/apartment structures and parking structure should be compacted to minimum relative compactions of 90 and 95 percent, respectively. The fill prism beneath the building footings should extend downward at a 1:1 (horizontal to vertical) slope from the outside edge of the footing bottoms. The removals should extend a minimum of 5 feet beyond the building perimeters. In general, the intent of the remedial removals is to remove all undocumented fills, and unsuitable alluvium.

Compressible materials, within areas planned to support pavement or other appurtenant structures outside of the proposed building footprints, should be excavated to competent material and replaced with compacted fill soils. We anticipate these removals on the site to be on the order of approximately 3 feet below existing grade or 2-foot below any footings; however, localized, deeper removals should be anticipated where deemed necessary by the geotechnical consultant based on observations during grading. Removal bottoms should be scarified to a minimum depth of 12 inches, brought to at least optimum-moisture content, and recompacted.

Based on our site investigation groundwater was not encountered to the maximum explored depth of 51.0 feet below the existing site grades and groundwater is not anticipated to be encountered during site excavation.

From a geotechnical perspective, material that is removed may be placed as fill provided the material is relatively free from rocks (greater than 6 inches in maximum dimension), organic material and construction debris, is moisture-conditioned or dried (as needed) to obtain above-optimum moisture content, and then recompacted prior to additional fill placement or construction.

4.1.3 Shrinkage/Bulking

Based on the site soils, bulking is not anticipated at the site. The preliminary estimated shrinkage factors of approximately 10 percent for the alluvium may be used for consideration of earthwork calculations. These are preliminary rough estimates which will vary with depth of removal, stripping losses, field conditions at the time of grading, etc. In addition, handling losses are not included in the estimates.

4.1.4 Temporary Excavation Stability

Due to the recommended depth of remedial removals below existing grades (approximately 5 to 10 feet), the temporary stability of the excavations along the perimeter of the site needs to be considered. In general, all excavations should be performed in accordance with project plans, specifications, and all Occupational Safety and Health Administration (OSHA) requirements. Excavations should be laid back or shored in accordance with OSHA requirements before personnel or equipment are allowed to enter. Soil conditions should be mapped and frequently checked by a representative of LGC to verify conditions are as anticipated. The contractor shall be responsible for providing the “competent person” required by OSHA standards to evaluate soil conditions. Close coordination with the geotechnical engineer should be maintained to facilitate construction while providing safe excavations. Excavation safety is the responsibility of the contractor.

Temporary excavations maybe cut vertically up to five feet. Excavations over five feet should be slot-cut, shored, or cut no steeper than 1H: 1V (horizontal, H: vertical, V) slope gradient. Surface water should be diverted away from the exposed cut, and not be allowed to pond on top of the excavations. Temporary cuts should not be left open for an extended period of time. Planned temporary conditions should be reviewed by the geotechnical consultant of record in order to reduce the potential for sidewall failure. The geotechnical consultant may provide recommendations for controlling the length of sidewall exposed.

Where sufficient space is not available for sloped cuts directly adjacent to existing structures or improvements the cut shall be performed by the A-B-C slot method as outlined below.

1. The banks of the excavation shall be made at 1H:1V or a combination of vertical cut and a 1H :1V.
2. Vertical cuts, not exceeding 8 feet in width are made in the locations of the first slot "A".
3. Back-fill and compact the first slot.
4. The second adjacent slot, "B" is excavated.
5. Back-fill and compact the second slot.
6. Then the third slot "C" is excavated.
7. Back-fill and compact the third slot.
8. Repeat the above steps until all the required excavations are performed adjacent to the existing improvements.

4.1.5 Temporary Shoring (If Necessary)

The following preliminary geotechnical parameters may be utilized by the shoring consultant for design of the temporary shoring system. Temporary shoring is generally considered to have a service life of two years or less. The geotechnical conditions outside of the perimeter of the proposed structure have not been investigated as part of this report. The recommendations provided herein with regard to shoring of the proposed excavation are based on assumed conditions, extrapolated from the data gathered from our site investigations. The shoring designer should independently evaluate the parameters provided, and conduct an additional investigation if they consider necessary.

Prior to construction, the contractor should verify underground clearance of any existing utility lines or structures that must be removed or protected in place during construction, or may conflict with any proposed shoring system. Any tieback anchors and/or soil nails that extend beyond the site property limits will require permission from the adjacent property owner. Special attention will be required to protect existing settlement sensitive improvement in close proximity to the proposed excavation, such as any adjacent structures or streets located along the boundary of the site.

Typical cantilever temporary shoring, where deflection of the shoring will not impact the performance of adjacent structures or streets, may be designed using the active equivalent fluid pressures of 40 pounds per square foot (psf) per foot of depth (or pcf). Braced (i.e. internal bracing -rakers) or tied-back shoring is recommended in areas where the shoring will be located close to existing structures or streets in order to limit shoring defections or required due to the proposed depth of excavation. Braced or tied-back shoring with a level backfill may be designed using an active trapezoidal soil pressure of $24H$ in pounds per square foot (psf), where H is equal to the depth in feet of the excavation being shored (shape of the trapezoid should be $0.2H$, $0.6H$, $0.2H$). Any building, equipment, or traffic loads located within a 1:1 (horizontal to vertical) projection from the base of the shoring should be added to the applicable lateral earth pressure. A minimum additional uniform lateral pressure of 100 psf for the upper 10 feet should be added to the appropriate lateral earth pressures to account for typical vehicle traffic loading. The proposed shoring should be designed for a maximum shoring deflection of up to 1-inch adjacent to the street (non-surcharged condition) and up to a maximum of 0.5-inches adjacent to existing buildings (surcharged condition).

In addition, the above noted lateral earth pressures for temporary shoring does not include hydrostatic pressures since the current groundwater level was encountered below the anticipated depth of the subterranean structure. Consideration should be given to increasing the provided lateral earth pressures and/or design factors of safety in order to further limit shoring deflections and subsequent potential impacts on adjacent structures and improvements, as necessary.

If temporary gravity grouted tie-backs are used anchors may be designed using a preliminary bond stress of 400 pounds per square foot (psf), and if pressure/post-grouted tieback anchors are used, anchors may be designed using a preliminary bond stress of up to 2,500 pounds per square foot (psf). However, the tieback designer should make an independent evaluation in order to verify the preliminary bond stress is adequate for site conditions. Tieback bond stress should be verified by field testing. Tieback anchors should minimally be designed, constructed, and tested in accordance with the requirements of the Post-Tensioning Institute (PTI). For design purposes, tieback should obtain their load-carrying capacity from the soil behind a plane taken to be 3 horizontal feet from the bottom of the shoring facing and inclined at an angle of 60 degrees measured from the horizontal extending to the top of the excavation. Passive resistance of soldier piles may be assumed to be an equivalent fluid pressure of 350 pcf to a maximum value of 3,500 psf. The passive earth pressure may be increased by 100 percent for isolated piles. Piles with spacing greater than 3 times of pile diameter can be considered as isolated piles. In order to develop the full lateral resistance, firm contact between the soldier pile and undisturbed soils must be assured. For vertical shoring capacity, an allowable skin friction of 500 psf may be used for the portion of pier below the proposed development excavation. End bearing should be neglected. Drilling of shafts for soldier piles may require casing or drilling mud to prevent caving.

The components of the shoring system should be designed by a California licensed structural and/or civil engineer specializing in the design of shoring systems. Field pullout testing should be performed during construction to verify the estimated pullout resistance used in the design and/or post grout tubes should be used to ensure adequate design capacities are obtained. Ultimately, it is the specialty contractor's responsibility to obtain the required pullout capacity, which may require design and/or field modifications.

LGC should review the shoring plans prior to construction to verify that geotechnical recommendations are properly implemented into the project plans

It is highly recommended that a program of documentation and monitoring be devised and put into practice before the onset of any groundwork. The contractor should establish survey points on the shoring, adjacent streets, and neighboring buildings within 100 feet of the excavation perimeter prior to any excavation. These survey points should be used to monitor the movement of the shoring and existing improvements during construction excavation.

The monitoring program should include, but not necessarily be limited to detailed documentation of the existing improvements, buildings and utilities around the excavation, with particular attention to any distress that is already present prior to the start of work.

A licensed surveyor should be retained to establish monuments on the shoring and the surrounding ground prior to excavation. Such monuments should be monitored for horizontal and vertical movement during construction. Results of the monitoring program should be provided immediately to the project structural (shoring) engineer and LGC for review and evaluation.

4.1.6 Fill Placement and Compaction

From a geotechnical perspective, the onsite soils are suitable for use as compacted fill, provided they are screened of rocks greater than 6 inches in maximum dimension, organic material, and construction debris. Areas prepared to receive structural fill and/or other surface improvements should be scarified to a minimum depth of 6 inches, brought to at least optimum-moisture content, and recompacted to at least 90 percent relative compaction (based on ASTM Test Method D1557). The compacted fills underlying the proposed parking structure should be compacted to a minimum relative compaction of 95 percent. The optimum lift thickness to produce a uniformly compacted fill will depend on the type and size of compaction equipment used. In general, fill should be placed in uniform lifts generally not exceeding 8 inches in loose thickness. Placement and compaction of fill should be performed in accordance with local grading ordinances under the observation and testing of the geotechnical consultant.

In general, oversized material shall not be placed within 10 vertical feet of finish grade or within 2 feet of future utilities or underground construction. Rebar should be removed from concrete rubble prior to burial or mixing with fill. Oversize material may be incorporated into design fills in accordance with our standard grading details. Pulverized asphalt concrete paving or crushed Portland cement concrete from demolition of the existing improvements may be mixed in the fills in a 80/20 blend (with the 20 percent being crushed asphalt or concrete) with no material over 6-inches in maximum dimension; or be placed in a rock disposal.

If possible, import soils should contain no materials over 6 inches in maximum dimension and have a low expansion potential.

4.1.7 Trench Backfill and Compaction

The onsite soils may generally be suitable as trench backfill provided, they are screened of rocks and other material over 6 inches in diameter and organic matter. Trench backfill should be compacted in uniform lifts (generally not exceeding 8 inches in compacted thickness) by mechanical means to at least 90 percent relative compaction (per ASTM Test Method D1557).

If trenches are shallow and the use of conventional equipment may result in damage to the utilities; clean sand, having sand equivalent (SE) of 30 or greater, should be used to bed and shade the utilities. Sand backfill should be densified. The densification may be accomplished by jetting or flooding and then tamping to ensure adequate compaction. A representative from LGC should observe, probe, and test the backfill to verify compliance with the project specifications.

4.2 Foundations

4.2.1 General

Preliminary recommendations for foundation design and foundation construction are presented herein. When the structural loads for the proposed structures are known they should be provided to our office to verify the recommendations presented herein.

The following foundation recommendations are provided for support of anticipated at grade residential structures, and parking structure: conventional, post-tension, and Mat slab foundations, for use as needed. For preliminary design purposes a high expansion potential should be considered for design. The as-graded soil conditions should be verified as the completion of grading.

The information and recommendations presented in this section are not meant to supersede design by the project structural engineer or civil engineer specializing in the structural design nor impede those recommendations by a corrosion consultant. Should conflict arise, modifications to the foundation design provided herein can be provided.

4.2.2 Soil Bearing

Proposed minor site at-grade improvements may be supported on spread footings provided that the earthwork recommendations outlined in this report are properly implemented. An allowable soil bearing pressure of 1,500 psf may be used for the design of footings placed in compacted fill having a minimum width of 12 inches and minimum embedment of 24 inches below lowest adjacent ground surface. This value may be increased by 300 psf for each additional foot of embedment and 100 psf for each additional foot of foundation width to a maximum value of 3,000 psf. These allowable bearing pressures are applicable for level (ground slope equal to or flatter than 5H:1V) conditions only.

Bearing values indicated above are for total dead loads and frequently applied live loads. The above vertical bearing may be increased by one-third for short durations of loading which will include the effect of wind or seismic forces.

4.2.3 Conventional Foundations

Footings for proposed structures should have minimum depths (below lowest adjacent finish grade) of 24 inches for exterior footings and 18 inches for interior footings, for one, two, and three/four story structures for the anticipated high expansion potential (91-130 Expansion Index).

Shallow foundations may be designed for a maximum allowable bearing capacity of 2,500 lb/ft² (gross), for the design of footings placed in compacted fill having a minimum width of 12 inches and minimum embedment of 24 inches below lowest adjacent ground surface. Shallow foundations for continuous footings should be a minimum of 12, 15, and 18 inches wide for one, two, and three/four story structures, respectively, and spread footings 24 inches wide founded into compacted fill or competent native soils. A factor of safety greater than 3 was used in evaluating the above bearing capacity values. This value may be increased by

300 psf for each additional foot of embedment and 100 psf for each additional foot of foundation width to a maximum value of 4,000 psf. An effective plasticity index of 25, for the on-site soils, may be used in the foundation design.

Lateral forces on footings may be resisted by passive earth resistance and friction at the bottom of the footing. Foundations may be designed for a coefficient of friction of 0.35, and a passive earth pressure of 250 lb/ft²/ft. The passive earth pressure incorporates a factor of safety of about 1.5.

All footing excavations should be cut square and level and should be free of sloughed materials and trash. Subgrade soils should be pre-moistened for the assumed low expansion potential (to be confirmed at the end of grading).

The subgrade should be moisture-conditioned and proof-rolled just prior to construction to provide a firm, relatively unyielding surface, especially if the surface has been loosened by the passage of construction traffic.

Subgrade soils should be pre-saturated to 1.3 times optimum moisture content to a depth of 24 inches for a high expansion potential. The minimum thickness of the floor slabs should be at least 5 inches, and joints should be provided per usual practice.

The underslab moisture retarder (i.e. an equivalent capillary break method) should consist of a 15-mil thick polyolefin (or equivalent) in conformance with ASTM E 1745 Class A material underlain by a minimum 1-inch of sand, as needed. The sand layer requirements above the vapor barrier are the purview of the foundation engineer/structural engineer and should be provided in accordance with ACI Publication 302 "Guide for Concrete Floor and Slab Construction". These recommendations must be confirmed (and/or altered) by the foundation engineer, based upon the performance expectations of the foundation. Ultimately, the design of the moisture retarder system and recommendations for concrete placement and curing are the purview of the foundation engineer, in consideration of the project requirements provided by the architect and developer.

4.2.4 Post-Tension Foundations

Based on the site geotechnical conditions and provided the remedial recommendations provided herein are implemented, the site may be considered suitable for the support of the anticipated structures using a post-tensioned slab-on-grade foundation system for high expansion potential (91 to 130 Expansion Index). The following section summarizes our recommendations for the foundation system. The post-tension parameters provided in Table 3 are based on the expansion potential only, and do not incorporate any increase for seismically induced settlements.

TABLE 3
Preliminary Geotechnical Parameters for Post-Tensioned Foundation Design

Parameter	Value
Expansion Classification (Assumed to be confirmed at the completion of grading):	High Expansion
Thornthwaite Moisture Index (From Figure 3.3):	-20
Constant Soil Suction (From Figure 3.4):	PF 3.6
Center Lift Edge moisture variation distance (from Figure 3.6), e_m : Center lift, y_m :	<u>Medium</u> 9.0 feet 0.66 inches
Edge Lift Edge moisture variation distance (from Figure 3.6), e_m : Edge lift, y_m :	<u>Medium</u> 5.0 feet 1.6 inches
Soluble Sulfate Content for Design of Concrete Mix in Contact with Site Soils in Accordance with American Concrete Institute standard 318, Section 4.3:	Assume Negligible Exposure (to be confirmed at the completion of grading)
Corrosivity of Earth Materials to Ferrous Metals:	Corrosive
Modulus of Subgrade Reaction, k (assuming presaturation as indicated below):	85 pci (high)
Additional Recommendations: 1. Presaturate slab subgrade to at least optimum-moisture content or to 1.3 times optimum moisture, to minimum depths of 24 inches below ground surface, respectively for high expansion potentials. 2. Install a 15-mil moisture/vapor barrier (or equivalent) moisture/vapor barrier in direct contact with the concrete (unless superseded by the Structural/Post-tension engineer*) with 1 to 2 inches of sand below the moisture/vapor barrier. 3. Minimum perimeter foundation embedment below finish grade for moisture cut off should be 24 inches for high expansion potentials. 4. Minimum slab thickness should be 5 inches.	

* The above sand and Visqueen recommendations are traditionally included with geotechnical foundation recommendations although they are generally not a major factor influencing the geotechnical performance of the foundation. The sand and Visqueen requirements are the purview of the foundation engineer/corrosion engineer (in accordance with ACI Publication 302 "Guide for Concrete Floor and Slab Construction") and the homebuilder to ensure that the concrete cures more evenly than it would otherwise, is protected from corrosive environments, and moisture penetration of through the floor is acceptable to future homeowners. Therefore, the above recommendations may be superseded by the requirements of the previously mentioned parties.

4.2.5 Mat Foundation

A mat foundation can be used for support of proposed residential buildings. An allowable soil bearing pressure of 1,250 psf may be used for the design of the mat at the surface under the slab area.

The allowable bearing value is for total dead loads and frequently applied live loads and may be increased by one-third for short durations of loading which will include the effect of wind or seismic forces. A coefficient of vertical subgrade reaction, k , of 85 pounds per cubic inch (pci) may be used to evaluate the pressure distribution beneath the mat foundation.

The magnitude of total and differential settlements of the mat foundation will be a function of the structural design and stiffness of the mat. Based on assumed structural loads, we estimate that total static settlement will be on the order of an inch at the center of the mat foundation. Post construction differential settlement can be taken as one-half of the maximum estimated settlement

Resistance to lateral loads can be provided by friction acting at the base of foundations and by passive earth pressure. Foundations may be designed for a coefficient of friction of 0.35.

Coordination with the structural engineer will be required in order to ensure structural loads are adequately distributed throughout the mat foundation to avoid localized stress concentrations resulting in potential settlement. The foundation plan should be reviewed by LGC to confirm preliminary estimated total and differential static settlements.

4.2.6 Foundation Settlement

Based on our current understanding of the project, the results of our site investigation and the recommended remedial grading with shallow foundations embedded into compacted fills or competent native soils, we estimate the post-construction static settlement of the site to be less than 1 inch with a differential settlement of approximately of 0.5-inches in 30 feet. Post-construction settlements should also include the estimated differential seismically induced settlements of 1.5-inches in 30 feet. For a total static and seismically induced differential settlement of up 2-inches in 30 feet.

4.3 Lateral Earth Pressures for Retaining Walls

The following lateral earth pressures may be used for the design of any future site retaining walls, if any. Due to the variable nature of onsite soils, we recommend site retaining walls be backfilled with select soils or clean sand having a sand equivalence of greater than 30. Select soils should consist of clean, granular soils (less than 15 percent passing the No. 200 sieve) of very low expansion potential (expansion index 20 or less based on U.B.C. 18-2). The recommended lateral pressures for clean sand or approved select soils for level or sloping backfill are presented in Table 4.

TABLE 4
Lateral Earth Pressures for Retaining Walls

Conditions	Equivalent Fluid Weight (pcf)	
	Level Backfill	2:1 Backfill Sloping Upwards
	Approved Select Material	Approved Select Material
Active	35	50
At Rest	55	80
Passive	250	—

For design purposes, the recommended equivalent fluid pressure for each case for walls founded above the static ground water and backfilled with approved select soils is provided in Table 4. The equivalent fluid pressure values assume free-draining conditions. If conditions other than those assumed above are anticipated, the equivalent fluid pressure values should be provided on an individual-case basis by the geotechnical engineer. Surcharge loading effects from the adjacent structures should be evaluated by the geotechnical and structural engineers. Retaining wall structures should be provided with appropriate drainage and appropriately waterproofed. The outlet pipe should be sloped to drain to a suitable outlet. Typical wall drainage design is illustrated on Figure 3. It should be noted that the recommended subdrain does not provide protection against seepage through the face of the wall and/or efflorescence. Efflorescence is generally a white crystalline powder (discoloration) that results when water, which contains soluble salts, migrates over a period of time through the face of a retaining wall and evaporates. If such seepage or efflorescence is undesirable, retaining walls should be waterproofed to reduce this potential.

For sliding resistance, a friction coefficient of 0.35 may be used at the concrete and soil interface. Wall footings should be designed in accordance with structural considerations. Refer to Sections 4.2.2 for allowable soil bearing.

4.4 Preliminary Pavement Recommendations

Asphaltic Concrete

Based on a preliminary R-value of 5, we recommend the following preliminary minimum street sections for Traffic Indices of 5, 6, and 7 (Table 5). These recommendations should be confirmed with R-value testing of representative near-surface soils at the completion of grading. Final street sections should be confirmed by the project civil engineer based upon the projected Traffic Index. In addition, additional sections can be provided based on other traffic indices.

Table 5
Preliminary Pavement Design Sections

Assumed Traffic Index	5	6	7
R-Value Subgrade	5	5	5
AC Thickness	3.5 inches	4.0 inches	5 inches
Base Thickness	9.0 inches	12.0 inches	14.0 inches

The aggregate base material should conform to the specifications for Crushed Aggregate Base or Crushed Miscellaneous Base (Standard Specifications for Public Works Construction –SSPWC Section 200-2). The subgrade should achieve a minimum relative compaction of 90 percent. The base material should be compacted to achieve a minimum relative compaction of 95 percent. Base and subgrade materials should be moisture-conditioned to a relatively uniform moisture content at or slightly over optimum.

Portland Cement Concrete Pavement

Portland Cement Concrete Pavement (PCCP) may be designed using a minimum of 8-inches of Portland cement concrete over 6-inches of compacted aggregate base. The modulus of rupture of the concrete should be a minimum of 500 pounds per square inch (psi) at 28 days. Contraction joints should be placed at maximum 15-foot spacing. Where the outer edge of a concrete pavement connects to an asphalt pavement, the concrete slab should be thickened by 50 percent at a taper not to exceed a slope of 1 in 10. This section is only applicable for passenger car driveway areas and should be thickened if heavy truck loading is anticipated. In addition, additional sections can be provided based on other desired anticipated traffic loadings.

The aggregate base material should conform to the specifications for Crushed Aggregate Base or Crushed Miscellaneous Base (Standard Specifications for Public Works Construction –SSPWC Section 200-2). The subgrade should achieve a minimum relative compaction of 90 percent. The base material should be compacted to achieve a minimum relative compaction of 95 percent. Base and subgrade materials should be moisture-conditioned to a relatively uniform moisture content at or slightly over optimum.

Vehicular Concrete Pavers

Vehicular pavers are typically 3-1/8 inches in thickness and are underlain by 1-inch of sand.

Based on ASCE 58-10 for interlocking pavers, considering a Traffic Index (TI) of 6 and an R-value of 5 for the subgrade soils, we recommend the following base section underlying the proposed pavers. The proposed pavers and sand should be underlain by a minimum of 18-inches of aggregate base. As an alternative interlocking pavers and sand bedding can also be placed directly on the design asphaltic concrete base course over aggregate base, considering a TI of 6, or can be placed on a minimum of 5-inches of concrete over 6 inches of aggregate base. The design pavement sections provided herein are considered suitable to support the imposed loads from a fire apparatus.

The aggregate base material should conform to the specifications for Crushed Aggregate Base or Crushed Miscellaneous Base (Standard Specifications for Public Works Construction –SSPWC Section 200-2). The subgrade should achieve a minimum relative compaction of 90 percent per ASTM- D1557. The base material should be compacted to achieve a minimum relative compaction of 95 percent. Base and subgrade materials should be moisture-conditioned to a relatively uniform moisture content at or slightly over optimum.

Fire lane Turf Block

Turf block should be per manufactures specifications. For preliminary recommendations turf block should have a minimum thickness of 4 inches and a minimum 28-day compressive strength of 3,000 psi. The turf block pavement should be underlain by a minimum of 18-inches of aggregate base. The aggregate base material should conform to the specifications for Crushed Aggregate Base or Crushed Miscellaneous Base (Standard Specifications for Public Works Construction –SSPWC Section 200-2). The subgrade should achieve a minimum relative compaction of 90 percent per ASTM- D1557. The base material should be compacted to achieve a minimum relative compaction of 95 percent. Base and subgrade materials should be moisture-conditioned to a relatively uniform moisture content at or slightly over optimum.

4.5 Corrosivity to Concrete and Metal

The National Association of Corrosion Engineers (NACE) defines corrosion as “a deterioration of a substance or its properties because of a reaction with its environment.” From a geotechnical viewpoint, the “environment” is the prevailing foundation soils and the “substances” are the reinforced concrete foundations or various buried metallic elements such as rebar, piles, pipes, etc., which are in direct contact with or within close vicinity of the foundation soil.

In general, soil environments that are detrimental to concrete have high concentrations of soluble sulfates and/or pH values of less than 5.5. ACI 318R-14 Table 19.3.2.1, provides specific guidelines for the concrete mix design when the soluble sulfate content of the soils exceeds 0.1 percent by weight or 1,000 ppm. The minimum amount of chloride ions in the soil environment that are corrosive to steel, either in the form of reinforcement protected by concrete cover, or plain steel substructures such as steel pipes or piles, is 500 ppm per California Test 532.

Based on site soil testing, the onsite soils are classified as having a negligible sulfate exposure condition in accordance with ACI 318R-14 Table 19.3.2.1. As a preliminary recommendation due to results of sulfate content testing, concrete in contact with onsite soils should be designed in accordance with ACI 318R-14 Table 19.3.2.1 for the So/negligible category. It is also our opinion that onsite soils should be preliminarily considered corrosive to buried metals. The client and/or other members of the design team should consider this potential as they determine necessary. LGC is not a corrosion consultant and does not provide recommendations related to corrosion.

4.6 Nonstructural Concrete Flatwork

Concrete Flatwork

Concrete flatwork (such as walkways, patios, entryways, etc.) have a high potential for cracking due to changes in soil volume related to soil-moisture fluctuations because these slabs are typically much thinner than foundation slabs and are not reinforced with the same dynamic as foundation elements. To reduce the potential for excessive cracking and lifting, concrete should be designed in accordance with the minimum guidelines outlined below in Table 6. These guidelines will reduce the potential for irregular cracking and promote cracking along construction joints, but will not eliminate all cracking or lifting. Thickening the concrete and/or adding additional reinforcement will further reduce cosmetic distress.

TABLE 6
Nonstructural Concrete Flatwork

Minimum Thickness (in.)	4
Presaturation	Presoak to 12 inches
Reinforcement	No. 3 at 24 inches on centers or 6x6 No. 6 x No. 6 WWM
Crack Control Joints	Saw cut or deep open tool joint to a minimum of 1/3 the concrete thickness
Maximum Joint Spacing	5 feet

Pedestrian Concrete Pavers

Concrete pavers should be installed per manufactures recommendations. The following are considered minimum recommendations for the concrete pavers and are not meant to supersede more restrictive manufactures recommendations. Concrete pavers should be designed to be underlain by a minimum of 1 inch of leveling sand over a minimum of approximately 4-inches of compacted aggregate base.

The subgrade should achieve a minimum relative compaction of 90 percent. The base material should be compacted to achieve a minimum relative compaction of 95 percent. Base and subgrade materials should be moisture-conditioned to a relatively uniform moisture content at or slightly over optimum.

Tile Pavers

Tile pavers should be installed per manufactures recommendations. The following are considered minimum recommendations for the tile pavers and are not meant to supersede more restrictive manufactures recommendations. Tile pavers should be designed to be underlain by a minimum of 4 inches thick concrete reinforced with No. 3 rebar at 24-inches on center each way or 6x6 No. 6 x No. 6 WWM over a minimum of approximately 4-inches of compacted aggregate base.

The subgrade should achieve a minimum relative compaction of 90 percent. The base material should be compacted to achieve a minimum relative compaction of 95 percent. Base and subgrade materials should be moisture-conditioned to a relatively uniform moisture content at or slightly over optimum. Refer to manufacturer's specification if a vapor barrier should be installed.

4.7 Swimming Pool

The proposed pool and associated improvements should be constructed in accordance with the attached Figure 4, Geotechnical Guidelines for Swimming Pool Construction. Pool excavation will occur in newly placed compacted fills and is anticipated to be relatively uniform. Consideration should be given to the high expansive potential of onsite soils in design of the pool, and associated decking. Also concrete in contact with onsite soils should be designed in accordance with the So/negligible category of ACI 318R-14 Table 19.3.2.1.

Due to inherent differences in supporting capacity and expansive potential of different layers of the alluvium/fill, it is undesirable to have structures partially supported on soils having different geotechnical characteristics or materials having different engineering characteristics. If a cut/fill transition or expansive soil condition exists, the cut portion of the transition or expansive soil should be excavated (usually impractical for pool/spa construction), or the pool/spa can be designed with additional reinforcement and/or a thicker shell in order to cope with potential differences in supporting capacity and expansive potential.

Excavation and subsequent fill placement for pool including the placement of drains, outlets, waterproofing, etc. should be performed under the observation and testing of a geotechnical consultant. Observation and testing should be performed by the geotechnical consultant during pool excavation to verify that the exposed soil conditions are consistent with the design assumptions.

Concrete flatwork adjacent to the pool should be a minimum of 5 inches thick reinforced with No. 3 rebar at 24-inches on center each way with a 18-inch deep perimeter cut-off footing. Construction joints or weakened plane joints should be provided in all flatwork to a minimum depth of 1.5 inches at frequent internals (5 feet or less). The concrete slab should be underlain by a minimum of 4 inches of clean sand or base. Presoaking of the subgrade should be performed to a minimum depth of 12 inches. The subgrade should be inclined so that any moisture that seeps through cracks in the concrete due to irrigation, rain, or pool splash will be directed away from the pool.

4.8 Control of Surface Water and Drainage Control

Positive drainage of surface water away from structures is very important. No water should be allowed to pond adjacent to buildings. Positive drainage may be accomplished by providing drainage away from buildings at a gradient of at least 2 percent for a distance of at least 5 feet, and further maintained by a swale or drainage path at a gradient of at least 1 percent. Where necessary, drainage paths may be shortened by use of area drains and collector pipes.

Planters with open bottoms adjacent to buildings should be avoided. Planters should not be designed adjacent to buildings unless provisions for drainage, such as catch basins, liners, and/or area drains, are made. Overwatering must be avoided.

4.9 Construction Observation and Testing

The recommendations provided in this report are based on limited subsurface observations and geotechnical analysis. The interpolated subsurface conditions should be checked in the field during construction by a representative of LGC.

Geotechnical observation and testing should be performed by the geotechnical consultant during site excavations, subgrade for slab/foundation, backfill of utility trenches, preparation of any subgrade and placement of aggregate base, or when any unusual soil conditions are encountered at the site. Grading plans, foundation plans, and final project drawings should be reviewed by this office prior to construction.

5.0 LIMITATIONS

Our services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable engineers and geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report. The samples taken and submitted for laboratory testing, the observations made, and the in-situ field testing performed are believed representative of the entire project; however, soil and geologic conditions revealed by excavation may be different than our preliminary findings. If this occurs, the changed conditions must be evaluated by the project soils engineer and geologist and design(s) adjusted as required or alternate design(s) recommended.

This report is issued with the understanding that it is the responsibility of the owner, or of his/her representative, to ensure that the information and recommendations contained herein are brought to the attention of the architect and/or project engineer and incorporated into the plans, and the necessary steps are taken to see that the contractor and/or subcontractor properly implements the recommendations in the field. The contractor and/or subcontractor should notify the owner if they consider any of the recommendations presented herein to be unsafe.

The findings of this report are valid as of the present date. However, changes in the conditions of a property can and do occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties.

In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control.

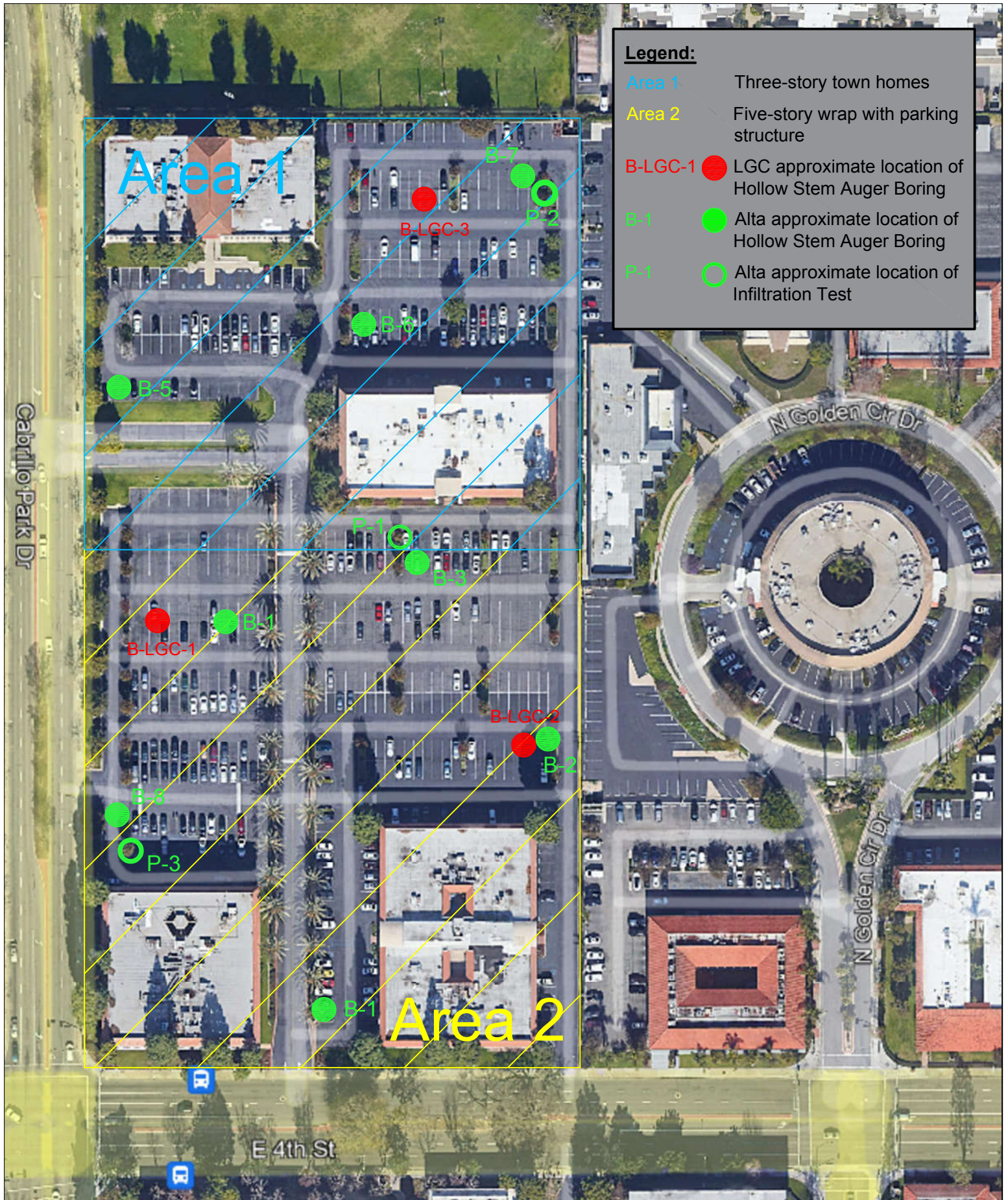
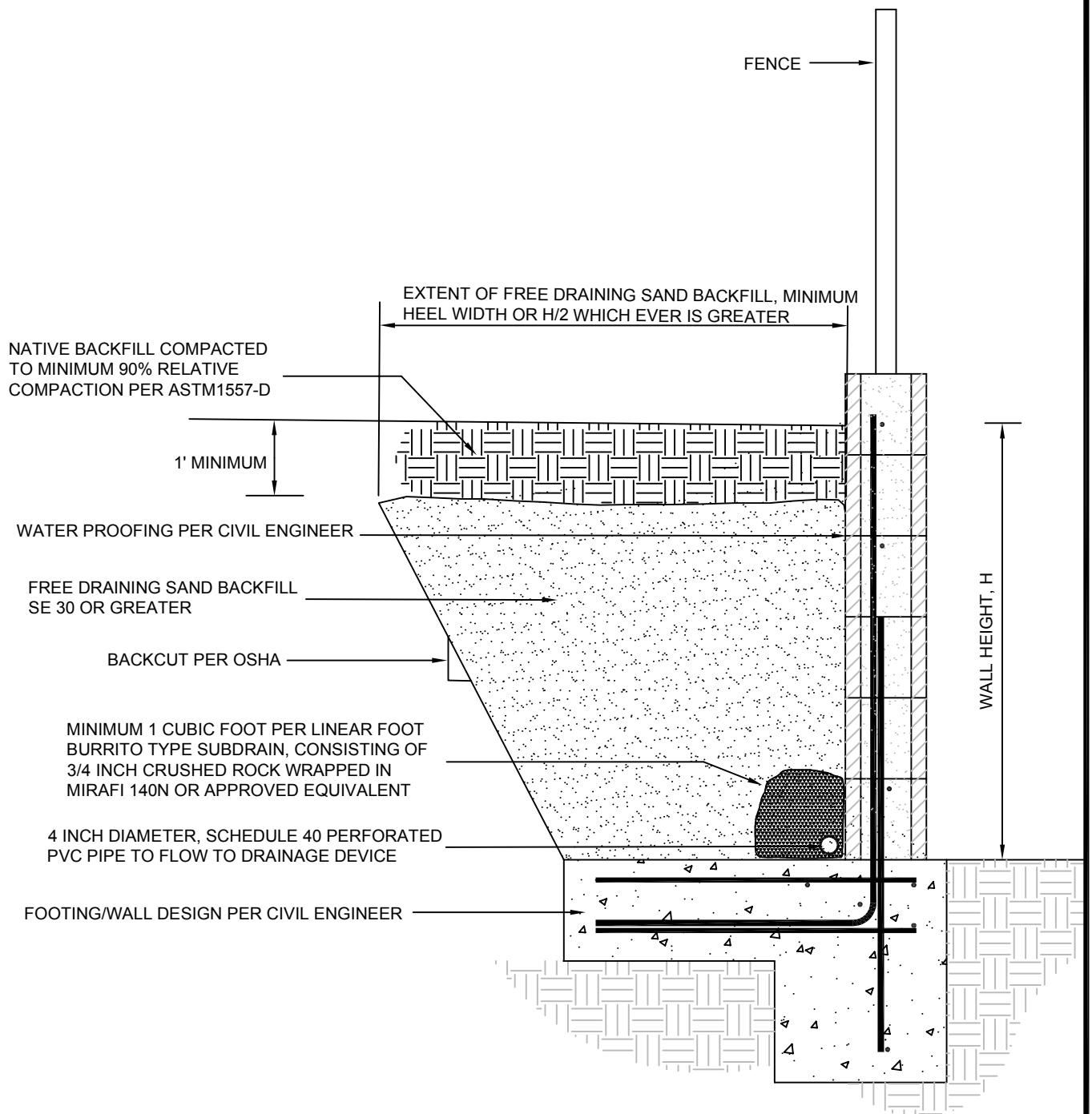


Figure 2: Boring Location Map	
FF / Santa Ana City of Santa Ana, California	

Project Name	Santa Ana
Project No.	213031-01
Eng.	BIH/MW
Scale	Not to scale
Date	12/16/21



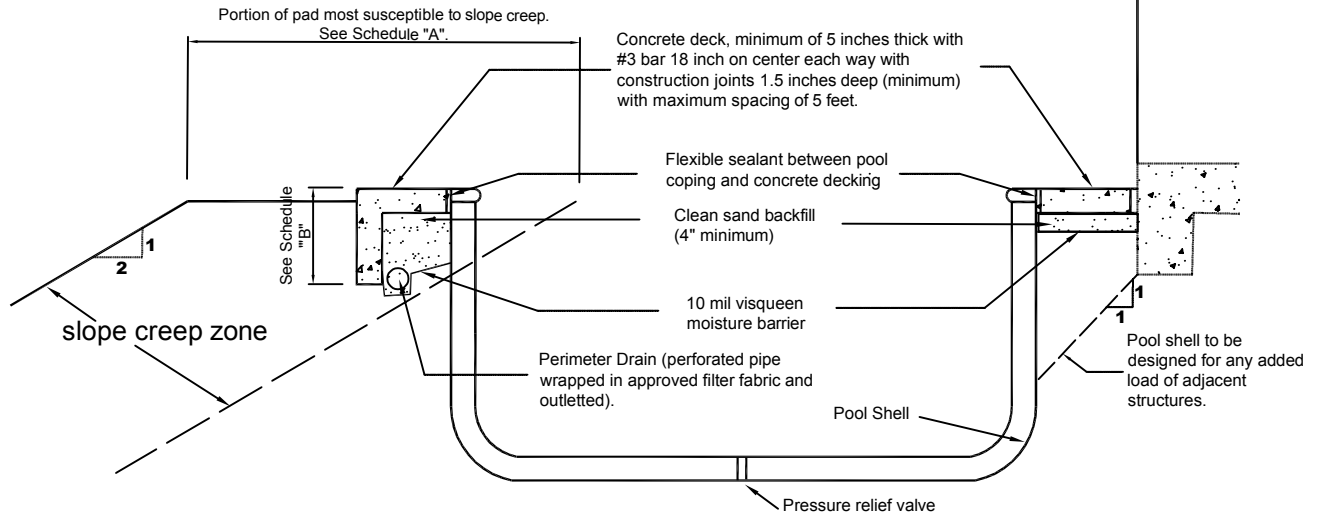
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Figure 3
Retaining Wall
Detail, Sand
Backfill

Project Name	FF / Santa Ana
Project No.	213031-01
Eng.	BIH/MW
Scale	Not To Scale
Date	12/16/21

SCHEDULE

Expansion Index	Depth of moisture cut-off footing distance "B"	Slope creep zone distance "A"	Lateral Equivalent Fluid Pressure (pcf)
low-very low	8 inches	7 feet	60
medium	12 inches	10 feet	85
high	18 inches	15 feet	105
very high	24 inches	20 feet	125



For pools adjacent to descending slopes, the pool shell should be designed assuming total loss of soil support for the portion of the pool located within the assumed "creep zone". For design purposes, the creep zone should be considered to extend a distance "A" from the top of slope (see schedule "A" above). The creep zone should be considered as parallel to the slope face.

Concrete flatwork adjacent to the pool should be a minimum of 5 inches thick reinforced with No. 3 rebar at 18-inches on center each way with a perimeter cut-off footing per the above schedule. Construction joints or weakened plane joints should be provided in all flatwork to a minimum depth of 1.5 inches at frequent internals (5 feet or less). The concrete slab should be underlain by a minimum of 4 inches of clean sand underlain in turn by a 10-mil Visqueen barrier. Presoaking of the subgrade prior to placing the Visqueen barrier should be performed in accordance with the recommendations included in the project geotechnical report. The presoaking should saturate the subgrade to a minimum depth of 12 inches. The subgrade below the Visqueen barrier should be inclined so that any moisture that seeps through cracks in the concrete due to irrigation, rain, or pool splash will be directed away from the pool. A perforated pipe wrapped in approved filter fabric should be installed to transport the collected moisture away from the pool area. The drain pipe is not considered necessary for soils of low to medium expansion potential. The contractor must ensure that the Visqueen is properly lapped, sealed and not punctured during construction.

All pool design should be performed by a qualified designer, using the equivalent fluid pressures shown in the schedule.

A geotechnical consultant should be contacted to review the final design which is based on the recommendations of this detail. This is not a design document and has been provided for INFORMATIONAL PURPOSES ONLY unless stamped and signed by LGC and pertaining to a specific pool.

To reduce the potential of lifting and cracking of the pool decking, landscape planters should not be located in islands within the decking unless they are lined with a waterproof membrane and provided with a subdrainage system to prevent moisture variations below the decking.

The pool shell should be designed to account for any additional loading due to improvements (building, raised planters, etc.)

Raised planters should not be located at the top of slopes unless specially designed by the geotechnical consultant.

The recommendations above will not eliminate all movement of the pool and associated improvements, however they should reduce the degree of movement, and promote cracking along construction joints, not flatwork.

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Figure 4 **Geotechnical Guidelines** **for Swimming Pool** **Construction**

Project Name	FF / Santa Ana
Project No.	213031-01
Eng.	BIH/MW
Scale	Not to Scale
Date	12/16/21

APPENDIX A

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APPENDIX A

References (cont.)

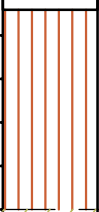
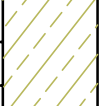
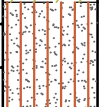
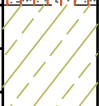
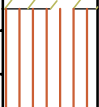
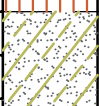
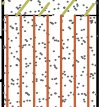
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APPENDIX B



Boring Logs

Geotechnical Boring Log B-1

Date: November 22, 2021	Page: 1 of 2
Project Name: FF/Santa Ana	Project Number: 213031-01
Drilling Company: Martini Drilling	Type of Rig: Hollow Stem
Drive Weight: 140 pounds	Drop: 30 inches Hole Dia: 8 inches
Elevation of Top of Hole: 148 Feet	Hole Location: See Geotechnical Map

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
								Logged By: MET Sampled By: MET	
148	0		#A @ 1'-3'				ML	AC 5" No Base Alluvium: @2.5': slightly reddish-brown very fine sandy SILT; medium stiff, damp	COR
			1	7	--	--			
143	5		2	11	--	--	CL	@5': slightly reddish-brown very fine sandy CLAY; medium stiff, damp	SA
			3	9	100.6	5.1	SM	@7.5': slightly reddish-brown very fine to silty SAND; loose, damp	CN
138	10		4	12	102.7	23.3	CL	@10': medium brown very fine silty to sandy CLAY; medium stiff, moist	
			5	11	--	--	ML	@12.5': slightly reddish-brown very fine sandy SILT; medium stiff, damp	
133	15		6	4	--	--	SC	@15': red-brown fine to clayey SAND; very loose, damp; minor gravel	SA
			7	21	114.6	4.1	SM	@17.5': red-brown fine to medium SAND; medium dense, damp; minor coarse fraction	CN
128	20		8	18	--	--	SP	@20': medium brown to pale yellow-brown medium to coarse SAND; medium dense, damp	SA
			9	17	109.5	11.3	ML	@22.5': slightly reddish-brown very fine sandy SILT; stiff, damp	
123	25		10	6	--	--	ML/CL	@25': red-brown to medium brown very fine to clayey SILT to silty CLAY; medium stiff, damp	
			11	5	--	--	CL	@27.5': medium brown silty CLAY; medium stiff, moist	SA
118	30								


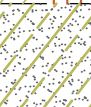
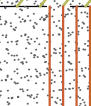
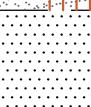
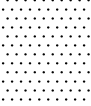
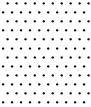
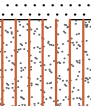
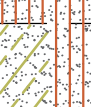
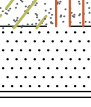
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 = Ring Sample
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LGC VALLEY, INC.
 THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Geotechnical Boring Log B-1

Date: November 22, 2021	Page: 2 of 2
Project Name: FF/Santa Ana	Project Number: 213031-01
Drilling Company: Martini Drilling	Type of Rig: Hollow Stem
Drive Weight: 140 pounds	Drop: 30 inches Hole Dia: 8 inches
Elevation of Top of Hole: 148 Feet	Hole Location: See Geotechnical Map

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
								Logged By: MET Sampled By: MET	
118	30		12	5	--	--	CL/ML	Alluvium: @30': red-brown to medium brown very fine to silty CLAY to clayey SILT; medium stiff, moist	SA
			13	7	--	--	SC	@32.5': reddish-brown sandy to clayey SAND; loose, damp	
113	35		14	14	--	--	SP/SM	@35': pale yellow-brown to red-brown fine to medium SAND; medium dense, damp; minor clay @36': encountered rocks	SA
			15	71	--	--	SW	@37.5': pale yellow-brown to red-brown fine to gravelly SAND; very dense, slightly damp; rocks in sampler	SA
108	40		16	35	--	--		@40': medium brown to red-brown medium to coarse SAND; dense, damp; minor gravel	
			17	38	--	--		@42.5': becomes slightly silty	
103	45		18	32	--	7.5	SM	@45': red-brown silty to medium SAND; dense, damp; minor gravel	SA
			19	28	--	16.1	SC/SM	@47.5': red-brown clayey SAND to silty SAND; medium dense to stiff, slightly damp to damp	SHA, AL
98	50		20	43	--	--	SW	@50': pale yellow-brown to red-brown fine to gravelly SAND; dense, slightly damp	
								Total Depth = 51.5 Feet No Ground Water Encountered Backfilled 11/22/2021 with Native Soil	
93	55								

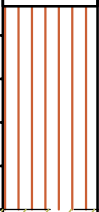
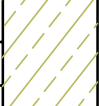
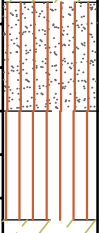


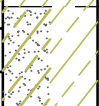

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Geotechnical Boring Log B-2

Date: November 22, 2021	Page: 1 of 2
Project Name: FF/Santa Ana	Project Number: 213031-01
Drilling Company: Martini Drilling	Type of Rig: Hollow Stem
Drive Weight: 140 pounds	Drop: 30 inches Hole Dia: 8 inches
Elevation of Top of Hole: 148 Feet	Hole Location: See Geotechnical Map

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
								Logged By: MET Sampled By: MET	
148	0		#A @ 1'-5'				ML	AC 4" No Base Alluvium: @2.5': slightly reddish-brown very fine sandy SILT; medium stiff, damp	FI
			1	8	--	--			
143	5		2	12	--	--	CL	@5': Slightly reddish-brown sandy CLAY; medium stiff, damp; minor organic	SA
			3	16	101	5.3	SM	@7.5': red-brown fine to silty SAND; loose, damp	
138	10		4	20	98.3	2.6	ML	@10': red-brown very fine sandy SILT; stiff, damp; minor gravel; minor organics	CN
			5	14	--	--	CL	@12.5': red-brown to pale yellow-brown fine to medium sandy CLAY to red-brown very fine to silty CLAY; stiff, damp; minor coarse fraction	
133	15		6	14	--	--			
			7	14	--	--			
128	20		8	15	--	--			SA
			9	15	--	--			
123	25		10	15	--	--			
			11	15	--	--	SC/CL	@27.5': red-brown clayey to medium SAND to sandy CLAY; medium dense to stiff, damp; rare coarse fraction	
118	30								



 = Ring Sample
 = SPT

LGC VALLEY, INC.
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 SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS
 LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE
 ACTUAL CONDITIONS ENCOUNTERED.

Geotechnical Boring Log B-2										
Date: November 22, 2021						Page: 2 of 2				
Project Name: FF/Santa Ana						Project Number: 213031-01				
Drilling Company: Martini Drilling						Type of Rig: Hollow Stem				
Drive Weight: 140 pounds						Drop: 30 inches		Hole Dia: 8 inches		
Elevation of Top of Hole: 148 Feet						Hole Location: See Geotechnical Map				
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION		Type of Test
								Logged By: MET Sampled By: MET		
118	30		12	X	13	--	--	CL	Alluvium: @30': red-brown clayey to sandy CLAY; stiff, damp; rare coarse fraction	SA
			13	X	14	--	--	CL	@32.5': red-brown fine sandy CLAY; stiff, damp	
113	35		14	X	18	--	--	SC/CL	@35': red-brown clayey to medium SAND to sandy CLAY; medium dense to very stiff, damp; rare gravel	SA
			15	X	53	--	--	SW	@37.5': pale yellow-brown to red-brown fine to gravelly SAND; very dense, slightly damp	
108	40		16	X	22	--	--	SC	@40': red-brown silty to clayey SAND; medium dense, damp; rare coarse fraction	
			17	X	25	--	--	SW/ML	@42.5': pale yellow-brown fine to gravelly SAND to red-brown fine to sandy SILT; medium dense to very stiff, slightly damp	
103	45		18	X	27	--	--		@45': pale yellow-brown medium to gravelly SAND to red-brown very fine to clayey SILT; medium dense to very stiff, slightly damp	AL
			19	X	23	--	17.4	CL	@47.5': red-brown silty to medium CLAY to sandy CLAY; very stiff, damp; minor gravel	
98	50		20	X	8	--	21.1	CL	@50': red-brown fine sandy to silty CLAY; medium stiff, damp to moist	SHA
93	55							Total Depth = 51.5 Feet No Ground Water Encountered Backfilled 11/22/2021 with Native Soil		

= Ring Sample
 = SPT

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIOND ENCOUNTERED.

Geotechnical Boring Log B-3

Date: November 22, 2021	Page: 1 of 2
Project Name: FF/Santa Ana	Project Number: 213031-01
Drilling Company: Martini Drilling	Type of Rig: Hollow Stem
Drive Weight: 140 pounds	Drop: 30 inches Hole Dia: 8 inches
Elevation of Top of Hole: 148 Feet	Hole Location: See Geotechnical Map

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
								Logged By: MET Sampled By: MET	
148	0		#A @ 1'-5'				ML	AC 5" No Base Alluvium: @2.5': medium brown fine sandy SILT; soft, slightly damp; rare calcium carbonate veining	RDS MAX
			1	6	--	--			
143	5		2	7	96.2	23.6		@5': medium stiff	CN
			3	18	--	--	SC	@7.5': red-brown fine to clayey SAND; medium stiff, damp	SA
138	10		4	17	101.3	5.3	SW	@10': red-brown fine to medium SAND; medium stiff, damp; rare coarse fraction	
			5	7	--	--	CL	@12.5': red-brown fine to very fine sandy CLAY; medium stiff, damp	
133	15		6	10	108.4	9.6			
			7	5	--	--			SHA
128	20		8	13	--	13.8		@20': gains minor gravel	AL
			9	15	--	--		@22.5': becomes stiff	
123	25		10	39	--	--	SM	@25': red-brown fine to silty SAND; medium dense, damp; rare coarse fraction	
			11	27	--	--			
118	30								


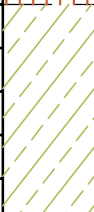
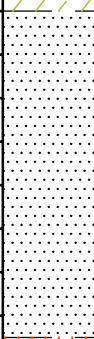

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Geotechnical Boring Log B-3

Date: November 22, 2021	Page: 2 of 2
Project Name: FF/Santa Ana	Project Number: 213031-01
Drilling Company: Martini Drilling	Type of Rig: Hollow Stem
Drive Weight: 140 pounds	Drop: 30 inches Hole Dia: 8 inches
Elevation of Top of Hole: 148 Feet	Hole Location: See Geotechnical Map

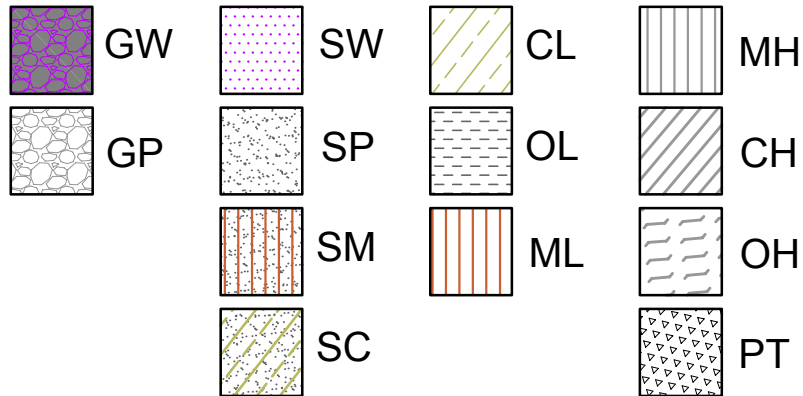
Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
								Logged By: MET Sampled By: MET	
118	30		12	22	--	--	ML	Alluvium: @30': red-brown very fine SILT; stiff, moist @32.5': becomes slightly clayey	SA
			13	16	--	--			
113	35		14	15	--	--	CL	@35': red-brown silty CLAY; stiff, damp @37.5': gains minor gravel	SA
			15	12	--	--			
108	40		16	67	--	--	SW	@40': pale yellow-brown to red-brown fine to medium gravelly SAND; very dense, slightly damp @42.5': becomes dense	SHA
			17	49	--	--			
103	45		18	63	--	--		@45': becomes very dense	SHA
			19	22	--	16.7	ML	@47.5': red-brown very fine clayey SILT; very stiff, damp	
98	50		20	18	--	--	ML	@50': red-brown very fine to clayey SILT; very stiff, damp; minor coarse fraction	AL
93	55							Total Depth = 51.5 Feet No Ground Water Encountered Backfilled 11/22/2021 with Native Soil	



 = Ring Sample
 = SPT

LGC VALLEY, INC.
 THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

Key to Boring Logs



APPROXIMATE GROUNDWATER LEVEL

Symbol	Laboratory Test
SA	Sieve Analysis
H	Hydrometer Analysis
SHA	Sieve & Hydrometer Analysis
-200	Percent Passing #200 Sieve
AL	Atterburge Limits
MAX	Maximum Density
DS	Undisturbed Direct Shear
RDS	Remolded Direct Shear
TRI	Triaxial Shear
EI	Expansion Index
P	Permeability
CN	Consolidation
COL	Collapse
UC	Unconfined Compression
S	Sulfate Content
pHR	pH & Resistivity
COR	Corrosion Suite (pH, Resistivity, Chloride, Sulfate)
RV	R-Value

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions		grf	ltr	Description	Major Divisions	grf	ltr	Description
Coarse Grained Soils	Gravel and Gravelly Soils		GW	Well-graded gravels or gravel sand mixtures, little or no fines	Fine Grained Soils	Silts And Clays LL, <50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
			GP	Poorly-graded gravels or gravel sand mixture, little or no fines			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			GM	Silty gravels, gravel-sand-silt mixtures			OL	Organic silts and organic silt-clays of low plasticity
			GC	Clayey gravels, gravel-sand-clay mixtures			MH	Inorganic silts, micaceous or diatomaceous fine or silty soils, elastic silts
	Sand and Sandy Soils		SW	Well-graded sands or gravelly sands, little or no fines		Silts And Clays LL, <50	VH	Inorganic clays of high plasticity, fat clays
			SP	Poorly-graded sands or gravelly sands, little or no fines			OH	Organic clays of medium to high plasticity
			SM	Silty sands, sand-silt mixtures			PT	Peat and other highly organic soils
			SC	Clayey sands, and-clay mixtures				

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

PARTICLE SIZE LIMITS

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		

RELATIVE DENSITY

Sands and Gravels	Blows/Foot (SPT)
Very Loose	<4
Loose	4-10
Medium Dense	11-30
Dense	31-50
Very Dense	>50

CONSISTENCY CLASSIFICATION

Silts and Clays	Criteria
Very Soft	Thumb penetrates soil >1 in.
Soft	Thumb penetrates soil 1 in.
Firm	Thumb penetrates soil 1/4 in.
Stiff	Readily indented with thumbnail
Very Stiff	Thumbnail will not indent soil

HARDNESS

Bedrock
Soft
Moderately Hard
Hard
Very Hard

LABORATORY TESTS

Symbol	Test
DS	Direct Shear
DSR	Direct Shear (Remolded)
CON	Sieve Analysis
SA	Maximum Density
MAX	Resistance (R) Value
RV	Expansion Index
EI	Sand Equivalent
SE	Atterberg Limits
AL	Chemical Analysis
CHEM	Hydrometer Analysis
HY	

SOIL MOISTURE

Increasing Visual Moisture Content
Dry - Dry to touch
Moist - Damp, but no visible free water
wet - Visible free water

SIZE PROPORTIONS

Trace - <5%
Few - 5 to 10%
Some - 15 to 25%



GEOTECHNICAL BORING LOG

SHEET 1 OF 1

PROJECT NO. 1-0396
 DATE STARTED 7/7/21
 DATE FINISHED 7/7/21
 DRILLER 2R Drilling Inc.
 TYPE OF DRILL RIG 8" Hollow Stem Auger

PROJECT NAME 4th St. and Cabrilla Park Dr.
 GROUND ELEV. 140
 GW DEPTH (FT)
 DRIVE WT. 140lbs
 DROP 30 in.

BORING DESIG. B-1
 LOGGED BY FR
 NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT- URATION (%)	OTHER TESTS
140					SM	4" Asphalt over no base. YOUNGER FAN DEPOSITS (Qyf): SILTY SAND, fine to medium grained, brown, moist, medium dense, few clay.				
5	135	R	16		ML	@5.0ft. SANDY SILT, light brown to brown, moist, stiff.	7.2	100	29	
					SM	@6.0ft. SILTY SAND, fine to medium grained, brown, moist, medium dense.				
10	130	R	16				3.7	98	14	CON, HY
15	125	R	21			@15.0ft. trace fine to coarse gravel <1".	8.5	121	61	
20	120	R	19				10.8	110	56	
25	115	R	23			@25.0ft. trace clay, trace fine to coarse gravel <1".	14.1	110	75	
TOTAL DEPTH 26.0 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED										
SAMPLE TYPES: <input checked="" type="checkbox"/> RING (DRIVE) SAMPLE <input type="checkbox"/> SPT (SPLIT SPOON) SAMPLE <input type="checkbox"/> BULK SAMPLE <input type="checkbox"/> TUBE SAMPLE						<input checked="" type="checkbox"/> GROUNDWATER <input checked="" type="checkbox"/> SEEPAGE J: JOINTING C: CONTACT B: BEDDING F: FAULT S: SHEAR RS: RUPTURE SURFACE	Alta California Geotechnical, Inc. P.N. 1-0396 PLATE B-1			

GEOTECHNICAL BORING LOG

SHEET 1 OF 1

PROJECT NO. 1-0396
 DATE STARTED 7/7/21
 DATE FINISHED 7/7/21
 DRILLER 2R Drilling Inc.
 TYPE OF DRILL RIG 8" Hollow Stem Auger

PROJECT NAME 4th St. and Cabrilla Park Dr.
 GROUND ELEV. 141
 GW DEPTH (FT)
 DRIVE WT. 140lbs
 DROP 30 in.

BORING DESIG. B-2
 LOGGED BY FR
 NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT- URATION (%)	OTHER TESTS
140		B			ML	4" Asphalt over no base. YOUNGER FAN DEPOSITS (Qyf): CLAYEY SILT w/SAND, brown, moist, firm, fine to medium grained sand				MAX, EI, HY, CHEM
5		R	21		SM	@5.0ft. SILTY SAND, fine to medium grained, moist, medium dense trace roots.	10.1	108	51	
10		R	22			@10.0ft. few fine to coarse gravel <1".	2.4			
15		R	19				8.3	110	44	
20		R	14				8.8	104	40	
25		R	24				12.7	110	66	
115						TOTAL DEPTH 26.0 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED				

SAMPLE TYPES:
☒ RING (DRIVE) SAMPLE
☒ SPT (SPLIT SPOON) SAMPLE
☒ BULK SAMPLE ☐ TUBE SAMPLE

▼ GROUNDWATER
 ► SEEPAGE
 J: JOINTING C: CONTACT
 B: BEDDING F: FAULT
 S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0396

PLATE B-2

GEOTECHNICAL BORING LOG

SHEET 1 OF 1

PROJECT NO. 1-0396
 DATE STARTED 7/7/21
 DATE FINISHED 7/7/21
 DRILLER 2R Drilling Inc.
 TYPE OF DRILL RIG 8" Hollow Stem Auger

PROJECT NAME 4th St. and Cabrilla Park Dr.
 GROUND ELEV. 143
 GW DEPTH (FT)
 DRIVE WT. 140lbs
 DROP 30 in.

BORING DESIG. B-3
 LOGGED BY FR
 NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT- URATION (%)	OTHER TESTS
					SM	4" Asphalt over no base. YOUNGER FAN DEPOSITS (Qyf): SILTY SAND, fine to medium grained, brown, moist, medium dense, few clay.				
140										
5		R	6			@5.0ft. loose, trace roots.	10.9	103	48	
135										
10		R	21			@10.0ft. No Recovery				
130										
15		R	15				12.2	110	64	
125										
20		R	15			@20.0ft. trace clay.	10.6	100	43	
120										
25		R	21			@25.0ft. trace fine gravel <1/2".	18.6	101	77	
TOTAL DEPTH 26.0 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED										
SAMPLE TYPES: <input checked="" type="checkbox"/> RING (DRIVE) SAMPLE <input type="checkbox"/> SPT (SPLIT SPOON) SAMPLE <input type="checkbox"/> BULK SAMPLE <input type="checkbox"/> TUBE SAMPLE						<input checked="" type="checkbox"/> GROUNDWATER <input checked="" type="checkbox"/> SEEPAGE J: JOINTING C: CONTACT B: BEDDING F: FAULT S: SHEAR RS: RUPTURE SURFACE	Alta California Geotechnical, Inc. P.N. 1-0396 PLATE B-3			

GEOTECHNICAL BORING LOG

SHEET 1 OF 1

PROJECT NO. 1-0396
 DATE STARTED 7/7/21
 DATE FINISHED 7/7/21
 DRILLER 2R Drilling Inc.
 TYPE OF DRILL RIG 8" Hollow Stem Auger

PROJECT NAME 4th St. and Cabrilla Park Dr.
 GROUND ELEV. 143
 GW DEPTH (FT)
 DRIVE WT. 140lbs
 DROP 30 in.

BORING DESIG. B-4
 LOGGED BY FR
 NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT- URATION (%)	OTHER TESTS
					SM	3" Asphalt over no base. YOUNGER FAN DEPOSITS (Qyf): SILTY SAND, fine to medium grained, brown, moist, medium dense, few clay.				
140										
5		R	10		SC	@5.0ft. CLAYEY SAND, fine grained, brown, moist, loose.	18.6	107	90	
					SM	@6.0ft. SILTY SAND, fine to medium grained, brown, moist, loose.				
135										
10		R	8				14.1	104	63	
130										
15		R	17			@15.0ft. medium dense.	16.7	114	99	
125										
20		R	16				13.5	97	51	
120										
25		R	16				18.8	105	87	
						TOTAL DEPTH 26.0 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED				
SAMPLE TYPES: <input checked="" type="checkbox"/> RING (DRIVE) SAMPLE <input checked="" type="checkbox"/> SPT (SPLIT SPOON) SAMPLE <input checked="" type="checkbox"/> BULK SAMPLE <input type="checkbox"/> TUBE SAMPLE						<input checked="" type="checkbox"/> GROUNDWATER <input checked="" type="checkbox"/> SEEPAGE J: JOINTING C: CONTACT B: BEDDING F: FAULT S: SHEAR RS: RUPTURE SURFACE	Alta California Geotechnical, Inc. P.N. 1-0396 PLATE B-4			

GEOTECHNICAL BORING LOG

SHEET 1 OF 1

PROJECT NO. 1-0396
 DATE STARTED 7/7/21
 DATE FINISHED 7/7/21
 DRILLER 2R Drilling Inc.
 TYPE OF DRILL RIG 8" Hollow Stem Auger

PROJECT NAME 4th St. and Cabrilla Park Dr.
 GROUND ELEV. 145
 GW DEPTH (FT)
 DRIVE WT. 140lbs
 DROP 30 in.

BORING DESIG. B-5
 LOGGED BY FR
 NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT- URATION (%)	OTHER TESTS
145						5" Asphalt over no base.				
		R	9		SM	YOUNGER FAN DEPOSITS (Qyf): SILTY SAND, fine to medium grained, brown, moist, loose, few clay.	15.6	105	71	
5	140	R	10			@5.0ft. trace roots.	11.7	104	53	
10	135	R	9			@10.0ft. trace fine gravel <1/2".	14.9	110	78	
15	130	R	10			@15.0ft. fine to coarse grained, loose, few fine to coarse gravel <1.5".	15.6	108	78	
20	125	R	72		SM	@20.0ft. SILTY SAND with GRAVEL, fine to coarse grained, brown, moist, very dense, fine gravel <1/2".	3.2			
25	120	R	16			@25.0ft. No Recovery.				
TOTAL DEPTH 26.0 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED										
SAMPLE TYPES: <input checked="" type="checkbox"/> RING (DRIVE) SAMPLE <input type="checkbox"/> SPT (SPLIT SPOON) SAMPLE <input type="checkbox"/> BULK SAMPLE <input type="checkbox"/> TUBE SAMPLE						<input checked="" type="checkbox"/> GROUNDWATER <input checked="" type="checkbox"/> SEEPAGE J: JOINTING C: CONTACT B: BEDDING F: FAULT S: SHEAR RS: RUPTURE SURFACE	Alta California Geotechnical, Inc. P.N. 1-0396 PLATE B-5			

GEOTECHNICAL BORING LOG

SHEET 1 OF 1

PROJECT NO. 1-0396
 DATE STARTED 7/7/21
 DATE FINISHED 7/7/21
 DRILLER 2R Drilling Inc.
 TYPE OF DRILL RIG 8" Hollow Stem Auger

PROJECT NAME 4th St. and Cabrilla Park Dr.
 GROUND ELEV. 144
 GW DEPTH (FT)
 DRIVE WT. 140lbs
 DROP 30 in.

BORING DESIG. B-6
 LOGGED BY FR
 NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT- URATION (%)	OTHER TESTS
		B			SM	4" Asphalt over no base.				
140		R	15		SM	YOUNGER FAN DEPOSITS (Qyf): CLAYEY SILT w/SAND, brown, moist, firm, fine to medium grained sand				MAX, EI, HY, CHEM
5						@5.0ft. SILTY SAND, fine to medium grained, brown, moist, medium dense	6.8	107	33	CON, HY
135		R	18			@10.0ft. No Recovery.				
10										
130		R	16				11.8	111	65	
15										
125		R	17				9.9	104	45	
20										
120		R	17			@25.0ft. trace clay.	13.0	114	77	
25						TOTAL DEPTH 26.0 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED				

SAMPLE TYPES:

- ☒ RING (DRIVE) SAMPLE
☒ SPT (SPLIT SPOON) SAMPLE
☒ BULK SAMPLE ☐ TUBE SAMPLE

- ▼ GROUNDWATER
 ► SEEPAGE
 J: JOINTING C: CONTACT
 B: BEDDING F: FAULT
 S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0396

PLATE B-6

GEOTECHNICAL BORING LOG

SHEET 1 OF 1

PROJECT NO. 1-0396
 DATE STARTED 7/7/21
 DATE FINISHED 7/7/21
 DRILLER 2R Drilling Inc.
 TYPE OF DRILL RIG 8" Hollow Stem Auger

PROJECT NAME 4th St. and Cabrilla Park Dr.
 GROUND ELEV. 148
 GW DEPTH (FT)
 DRIVE WT. 140lbs
 DROP 30 in.

BORING DESIG. B-7
 LOGGED BY FR
 NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT- URATION (%)	OTHER TESTS
					SM	5" Asphalt over no base. YOUNGER FAN DEPOSITS (Qyf): SILTY SAND, fine to medium grained, brown, moist, medium dense, few clay. @2.5ft. loose @5.0ft. few clay. @15.0ft. medium dense. @25.0ft. trace fine to coarse gravel <1.5". TOTAL DEPTH 26.0 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED				
145		R	6				24.1	94	85	
5		R	8				8.5	110	45	
140										
10		R	9				10.1	97	38	
135										
15		R	15				12.1	115	73	
130										
20		R	12				9.0	103	39	
125										
25		R	18				11.6	111	63	

SAMPLE TYPES:
☒ RING (DRIVE) SAMPLE
☐ SPT (SPLIT SPOON) SAMPLE
☐ BULK SAMPLE ☐ TUBE SAMPLE

▼ GROUNDWATER
 ► SEEPAGE
 J: JOINTING C: CONTACT
 B: BEDDING F: FAULT
 S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0396

PLATE B-7

GEOTECHNICAL BORING LOG

SHEET 1 OF 1

PROJECT NO. 1-0396
 DATE STARTED 7/7/21
 DATE FINISHED 7/7/21
 DRILLER 2R Drilling Inc.
 TYPE OF DRILL RIG 8" Hollow Stem Auger

PROJECT NAME 4th St. and Cabrilla Park Dr.
 GROUND ELEV. 142
 GW DEPTH (FT)
 DRIVE WT. 140lbs
 DROP 30 in.

BORING DESIG. B-8
 LOGGED BY FR
 NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT- URATION (%)	OTHER TESTS
					SM	4" Asphalt over no base. YOUNGER FAN DEPOSITS (Qyf): SILTY SAND, fine to medium grained, brown, moist, medium dense, few clay. @2.5ft. trace roots.	14.8	98	57	
5		R	8			@5.0ft. loose, trace fine to coarse gravel <1.5".	10.8	103	47	
10		R	7		SC	@10.0ft. CLAYEY SAND, fine to medium grained, brown, moist, loose.	17.5	108	87	
15		R	9		SM	@15.0ft. SILTY SAND, fine to medium grained, brown, moist, loose, trace fine gravel <1/2".	9.6	110	51	
20		R	21		SP	@20.0ft. No Recovery, SAND, fine to coarse grained, brown, slightly moist, medium dense, few fine gravel <1/2", few silt.				
25		R	15		SM	@25.0ft. SILTY SAND, fine to medium grained, brown, moist, medium dense, trace clay. TOTAL DEPTH 26.0 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED	19.5	102	82	
SAMPLE TYPES: <input checked="" type="checkbox"/> RING (DRIVE) SAMPLE <input checked="" type="checkbox"/> SPT (SPLIT SPOON) SAMPLE <input checked="" type="checkbox"/> BULK SAMPLE <input type="checkbox"/> TUBE SAMPLE						<input checked="" type="checkbox"/> GROUNDWATER <input checked="" type="checkbox"/> SEEPAGE J: JOINTING C: CONTACT B: BEDDING F: FAULT S: SHEAR RS: RUPTURE SURFACE	Alta California Geotechnical, Inc. P.N. 1-0396 PLATE B-8			

GEOTECHNICAL BORING LOG

SHEET 1 OF 1

PROJECT NO. 1-0396
 DATE STARTED 7/7/21
 DATE FINISHED 7/7/21
 DRILLER 2R Drilling Inc.
 TYPE OF DRILL RIG 8" Hollow Stem Auger

PROJECT NAME 4th St. and Cabrilla Park Dr.
 GROUND ELEV. 145
 GW DEPTH (FT)
 DRIVE WT. 140lbs
 DROP 30 in.

BORING DESIG. P-1
 LOGGED BY FR
 NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT- URATION (%)	OTHER TESTS
145					SM	<p>YOUNGER FAN DEPOSITS(Qyf): SILTY SAND, fine to medium grained, brown, moist, medium dense, few clay.</p>				
5	140					<p>@5.0ft. loose, trace roots.</p> <p>TOTAL DEPTH 5.0 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED</p>				

SAMPLE TYPES:

☒ RING (DRIVE) SAMPLE

☒ SPT (SPLIT SPOON) SAMPLE

☒ BULK SAMPLE ☐ TUBE SAMPLE

▼ GROUNDWATER
 ► SEEPAGE

J: JOINTING C: CONTACT
 B: BEDDING F: FAULT
 S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0396 PLATE B-9

SHEET 1 OF 1

BORING DESIG.	P-2
LOGGED BY	FR
NOTE	

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT- URATION (%)	OTHER TESTS
5	145				SM	<p><u>YOUNGER FAN DEPOSITS</u>(Qyf): SILTY SAND, fine to medium grained, brown, moist, loose, few clay.</p> <p>@5.0ft. few clay.</p> <p>TOTAL DEPTH 5.0 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED</p>				

SAMPLE TYPES:

☐ RING (DRIVE) SAMPLE
☐ SPT (SPLIT SPOON) SAMPLE
☐ BULK SAMPLE
☐ TUBE SAMPLE

▼ GROUNDWATER
▶ SEEPAGE

J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.
P.N. 1-0396

PLATE B-10

GEOTECHNICAL BORING LOG

SHEET 1 OF 1

PROJECT NO. 1-0396
 DATE STARTED 7/7/21
 DATE FINISHED 7/7/21
 DRILLER 2R Drilling Inc.
 TYPE OF DRILL RIG 8" Hollow Stem Auger

PROJECT NAME 4th St. and Cabrilla Park Dr.
 GROUND ELEV. 142
 GW DEPTH (FT)
 DRIVE WT. 140lbs
 DROP 30 in.

BORING DESIG. P-3
 LOGGED BY FR
 NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT- URATION (%)	OTHER TESTS
140					SM	<p>YOUNGER FAN DEPOSITS(Qyf): SILTY SAND, fine to medium grained, brown, moist, medium dense, few clay.</p> <p>@5.0ft. loose, trace fine to coarse gravel <1.5".</p> <p>TOTAL DEPTH 5.0 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED</p>				
5										

SAMPLE TYPES:

☒ RING (DRIVE) SAMPLE

☒ SPT (SPLIT SPOON) SAMPLE

☒ BULK SAMPLE ☐ TUBE SAMPLE

▼ GROUNDWATER

▶ SEEPAGE

J: JOINTING C: CONTACT

B: BEDDING F: FAULT

S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0396

PLATE B-11

APPENDIX C

Laboratory Testing Results by EGLAB, Inc.

Laboratory testing was performed by EGLAB, Inc. The laboratory testing program was directed towards providing quantitative data relating to the relevant engineering properties of the soils. Samples considered representative of site conditions were tested in general accordance with American Society for Testing and Materials (ASTM) procedure and/or California Test Methods (CTM), where applicable. The following summary is a brief outline of the test type and the results are presented on the following pages. LGC has reviewed the laboratory test data, procedures and results performed by EGLAB, Inc. (EGL) with respect to the subject site and concurs with and accepts responsibility as geotechnical engineer of record for their work (laboratory testing).

Moisture and Density Determination Tests: Moisture content (ASTM D2216) and dry density determinations (ASTM D2937) were performed on relatively undisturbed samples obtained from the test borings and/or trenches. The results of these tests are presented in the boring logs. Where applicable, only moisture content was determined from undisturbed or disturbed samples.

Soil Classification: Soils were classified according the Unified Soil Classification System (USCS) in accordance with ASTM Test Methods D2487 and D2488. This system uses relies on the Atterberg Limits and grain size distribution of a soil. The soil classifications (or group symbol) are shown on the laboratory test data, and boring logs.

Expansion Index: The expansion potential of selected samples were evaluated by the Expansion Index Test, U.B.C. Standard No. 18-2 and/or ASTM D4829. Specimens are molded under a given compactive energy to approximately the optimum moisture content and approximately 50 percent saturation or approximately 90 percent relative compaction. The prepared 1-inch-thick by 4-inch-diameter specimens are loaded to an equivalent 144 psf surcharge and are inundated with tap water until volumetric equilibrium is reached.

Sample Location	Sample Description	Expansion Index	Expansion Potential
B-LGC-2 @1-5'	Sandy SILT	101	High

Maximum Density Tests: The maximum dry density and optimum moisture content of typical materials were determined in accordance with ASTM D1557.

Sample Location	Sample Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
B-LGC-3 @ 1-5'	Sandy CLAY	122.5	12.5

Atterberg Limits: The liquid and plastic limits (“Atterberg Limits”) were determined in accordance with ASTM Test Method D4318 for engineering classification of fine-grained material.

Sample Location	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)
B-LGC-1 @45'	Non-Plastic	Non-Plastic	Non-Plastic
B-LGC-1 @47.5'	21	16	5
B-LGC-2 @47.5'	25	18	7
B-LGC-3 @20'	29	17	12
B-LGC-3 @50'	27	17	10

Chloride Content: Chloride content was tested in accordance with Caltrans Test Method (CTM) 422. The results are presented below:

Sample Location	Chloride Content, ppm
B-LGC-1 @1-5'	130

Soluble Sulfates: The soluble sulfate contents of selected samples were determined by standard geotechnical methods (CTM 417). The soluble sulfate content is used to determine the appropriate cement type and maximum water-cement ratios. The test results are presented in the table below:

Sample Location	Sample Description	Sulfate Content (%)*	Sulfate Exposure**
B-LGC-1 @1-5'	Clayey SAND	0.009	Negligible/S0

*Expressed as the percentage of water-soluble sulfate (SO₄) in soil, percentage by weight.

** ACI 318R-14 Table 19.3.1.1

Minimum Resistivity and pH Tests: Minimum resistivity and pH tests were performed in general accordance with CTM 643 and standard geochemical methods. The electrical resistivity of a soil is a measure of its resistance to the flow of electrical current. As a results of soil's resistivity decreases corrosivity increases. The results are presented in the table below:

Sample Location	Sample Description	pH	Minimum Resistivity (ohms-cm)
LGC B-1 @1-5'	Clayey Sand	7.76	2100

Consolidation: Consolidation tests were performed on selected, relatively undisturbed ring samples (Modified ASTM Test Method D2435). Samples (2.42 inches in diameter and 1 inch in height) were placed in a consolidometer and increasing loads were applied. The samples were allowed to consolidate under “double drainage” and total deformation for each loading step was recorded. The percent consolidation for each load step was recorded as the ratio of the amount of vertical compression to the original sample height

Grain Size Distribution: Representative samples were dried, weighed, and soaked in water until individual soil particles were separated (per ASTM D421) and then washed on a No. 200 sieve. The portion retained on the No. 200 sieve was dried and then sieved on a U.S. Standard brass sieve set in accordance with ASTM D422 (CTM 202).

Sample Location	% Passing # 200 Sieve	% Clay	D ₅₀
B-LGC-1 @5'	42.8	-	0.1
B-LGC-1 @15'	34	-	0.19
B-LGC-1 @20'	2.5	-	0.48
B-LGC-1 @27.5'	68.1	-	-
B-LGC-1 @32.5'	37.3	-	0.15
B-LGC-1 @35'	8.6	-	0.34
B-LGC-1 @47.5'	42.8	13.4	0.13
B-LGC-2 @5'	56.4	-	-
B-LGC-2 @20'	64.6	-	-
B-LGC-2 @30'	55.6	-	-
B-LGC-2 @40'	48.3	-	0.08
B-LGC-2 @50'	57.3	17.9	0.56
B-LGC-3 @7.5'	32.4	-	0.24
B-LGC-3 @17.5'	70.6	24.9	0.23
B-LGC-3 @35'	72.9	-	-
B-LGC-3 @50'	52.8	14.3	0.66

Hydro-consolidation: Hydro-consolidation tests (collapse) were performed on selected, relatively undisturbed ring samples (ASTM D4546). Samples were placed in a consolidometer and a load approximately equal to the in-situ overburden pressure was applied. Water was then added to the sample and the percent hydro-consolidation under the applied load was measured. The percent for the load was calculated as the ratio of the amount of vertical deformation to the original sample height. The percent hydroconsolidation is presented in the following graphs.

SUMMARY OF LABORATORY TEST RESULTS

PROJECT NAME: FF / Santa Ana

EGLAB JOB NO.: 21-059-022

PROJECT NO.: 213031-01

CLIENT: LGC Valley, Inc.

DATE: 12/15/2021

SUMMARIZED BY: JT

BORING NO.	SAMPLE NO.	DEPTH (in.)	MOISTURE CONTENT ASTM D2216 (%)	DRY DENSITY ASTM D2937 (PCF)	ATTERBERG LIMITS ASTM D4318 *(LL,PL,PI)
B-1	4	10.0	23.3	102.7	
B-1	9	22.5	11.3	109.5	
B-1	18	45.0	7.5		Non Plastic
B-1	19	47.5	16.1		21,16,5
B-2	3	7.5	5.3	101.0	
B-2	19	47.5	17.4		25,18,7
B-2	20	50.0	21.1		
B-3	4	10.0	5.3	101.3	
B-3	6	15.0	9.6	108.4	
B-3	8	20.0	13.8		29,17,12
B-3	19	47.5	16.7		
B-3	20	50.0			27,17,10

*LL,PL,PI = LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX

SUMMARY OF CORROSION TEST RESULTS

PROJECT NAME: FF / Santa Ana

EGLAB JOB NO.: 21-059-022

PROJECT NO.: 213031-01

CLIENT: LGC Valley, Inc.

DATE: 12/14/2021

Summarized By: JT

BORING NO.	SAMPLE NO.	DEPTH (ft)	pH CalTrans 643	Chloride Content CalTrans 422 (ppm)	Sulfate Content CalTrans 417 (% by weight)	Minimum Resistivity CalTrans 643 (ohm-cm)
B-1	A	1.0-3.0	7.76	130	0.009	2,100

SUMMARY OF LABORATORY TEST RESULTS
EXPANSION INDEX

PROJECT NAME: FF / Santa Ana

EGLAB JOB NO.: 21-059-022

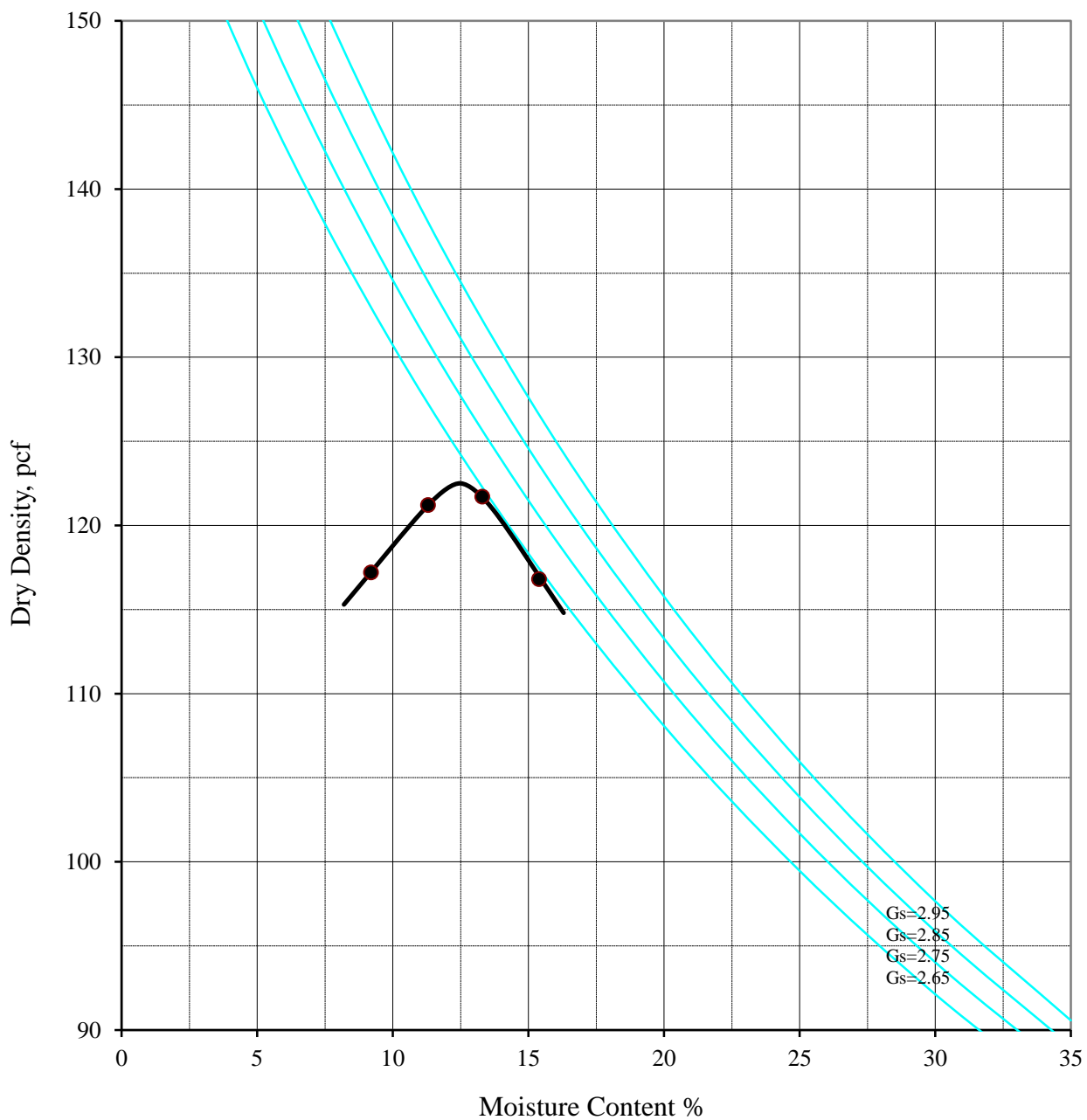
PROJECT NO.: 213031-01

CLIENT: LGC Valley, Inc.

DATE: 12/15/2021

SUMMARIZED BY: JT

BORING NO.	SAMPLE NO.	DEPTH (ft)	EXPANSION INDEX ASTM D 4829
B-2	A	1.0-5.0	101



Method "A"

Maximum Dry Density = **122.5** pcf

Optimum Moisture Content = **12.5** %

EGLAB, INC.

Modified Proctor
(ASTM D1557)

Boring No: B-3

Sample: A

Depth : 1.0-5.0 feet

Description : Sandy clay (CL), very dark grayish brown, trace of gravel

Project Name:

FF / Santa Ana

Client Name:

LGC Valley, Inc.

Job No.:

213031-01

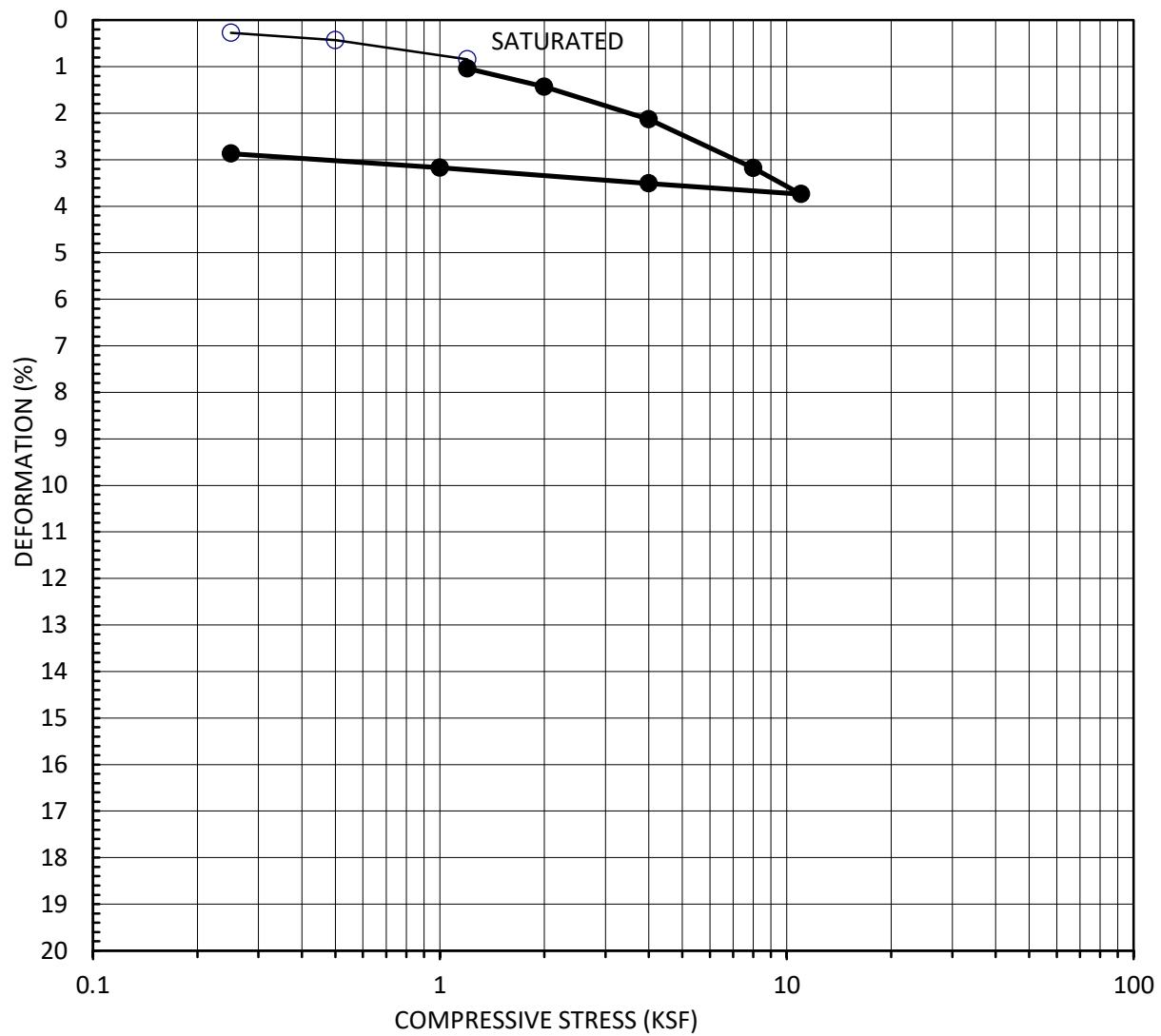
EGLAB Project No.:

21-059-022

Date :

Dec-21

Figure



Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density (PCF)	Init. Void Ratio
○	B-1	3	7.5	SM	5.1	100.6	0.675

Project Name:

FF / Santa Ana

Client:

LGC Valley, Inc.

Job No.:

213031-01

EGLAB Project No.: 21-059-022

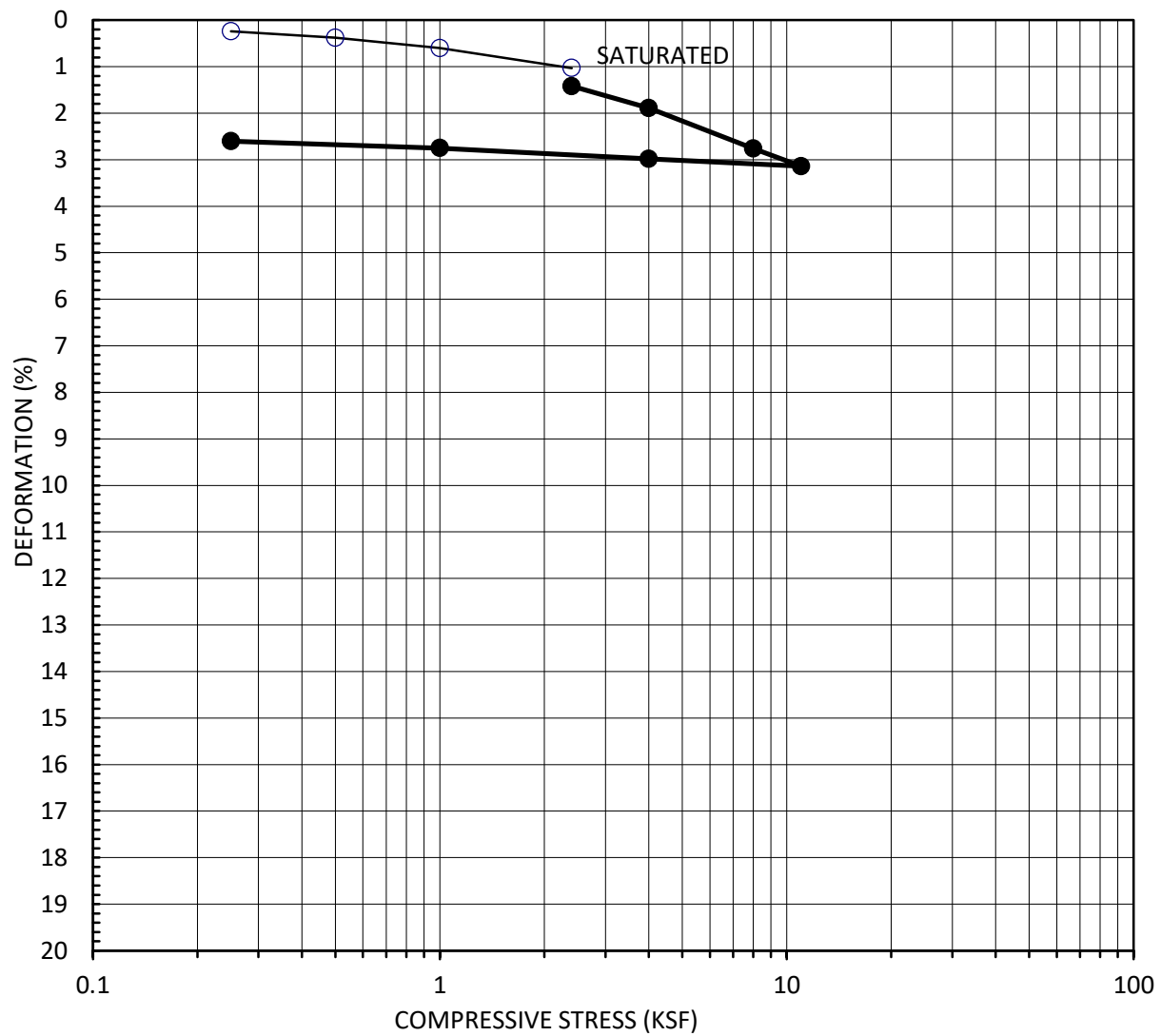
EGLAB, INC.

CONSOLIDATION

12/21

(ASTM D2435)

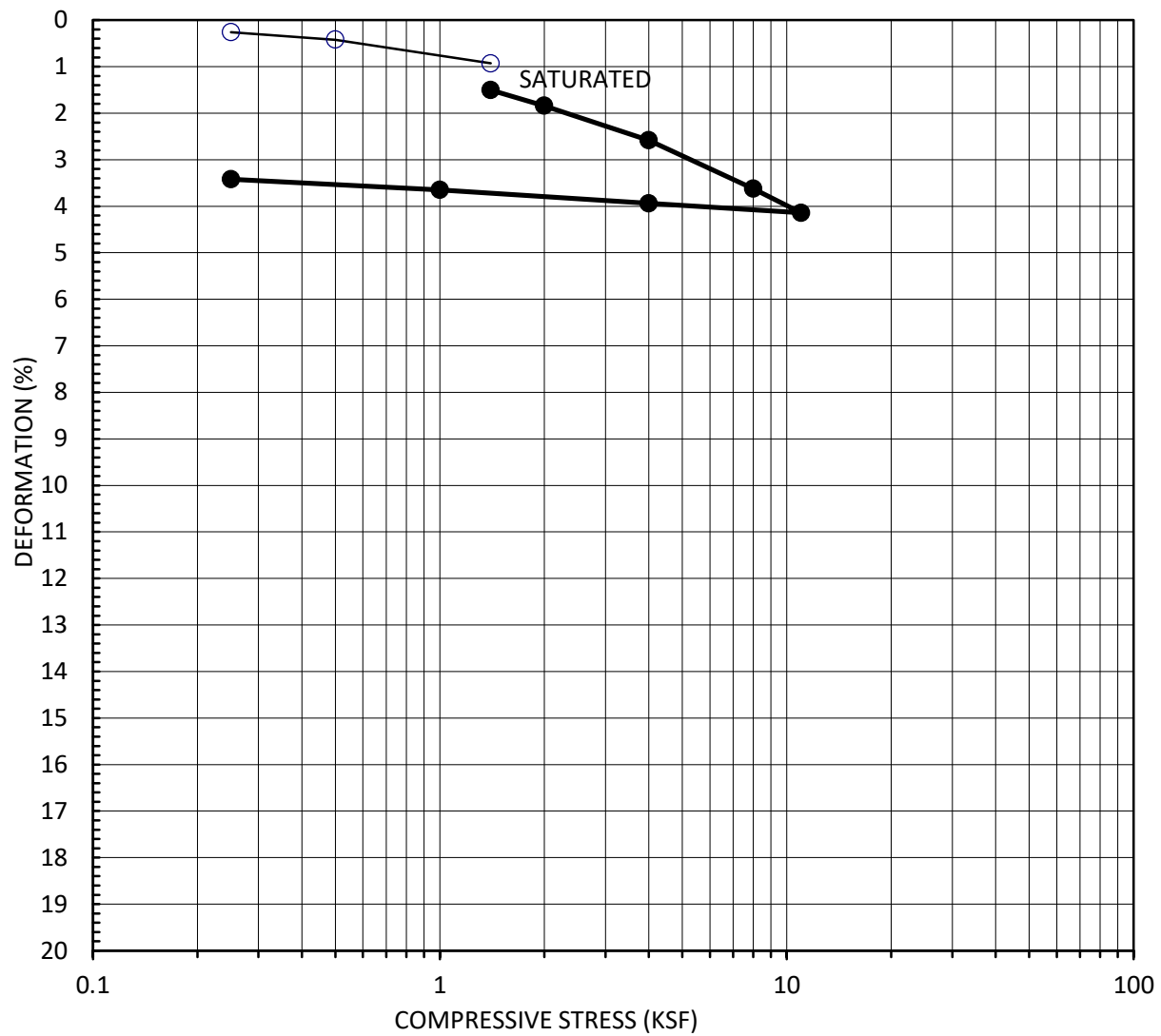
Figure



Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density (PCF)	Init. Void Ratio
○	B-1	7	17.5	SM	4.1	114.6	0.470

EGLAB, INC.	Project Name: FF / Santa Ana Client: LGC Valley, Inc. Job No.: 213031-01 EGLAB Project No.: 21-059-022
	CONSOLIDATION 12/21 (ASTM D2435)

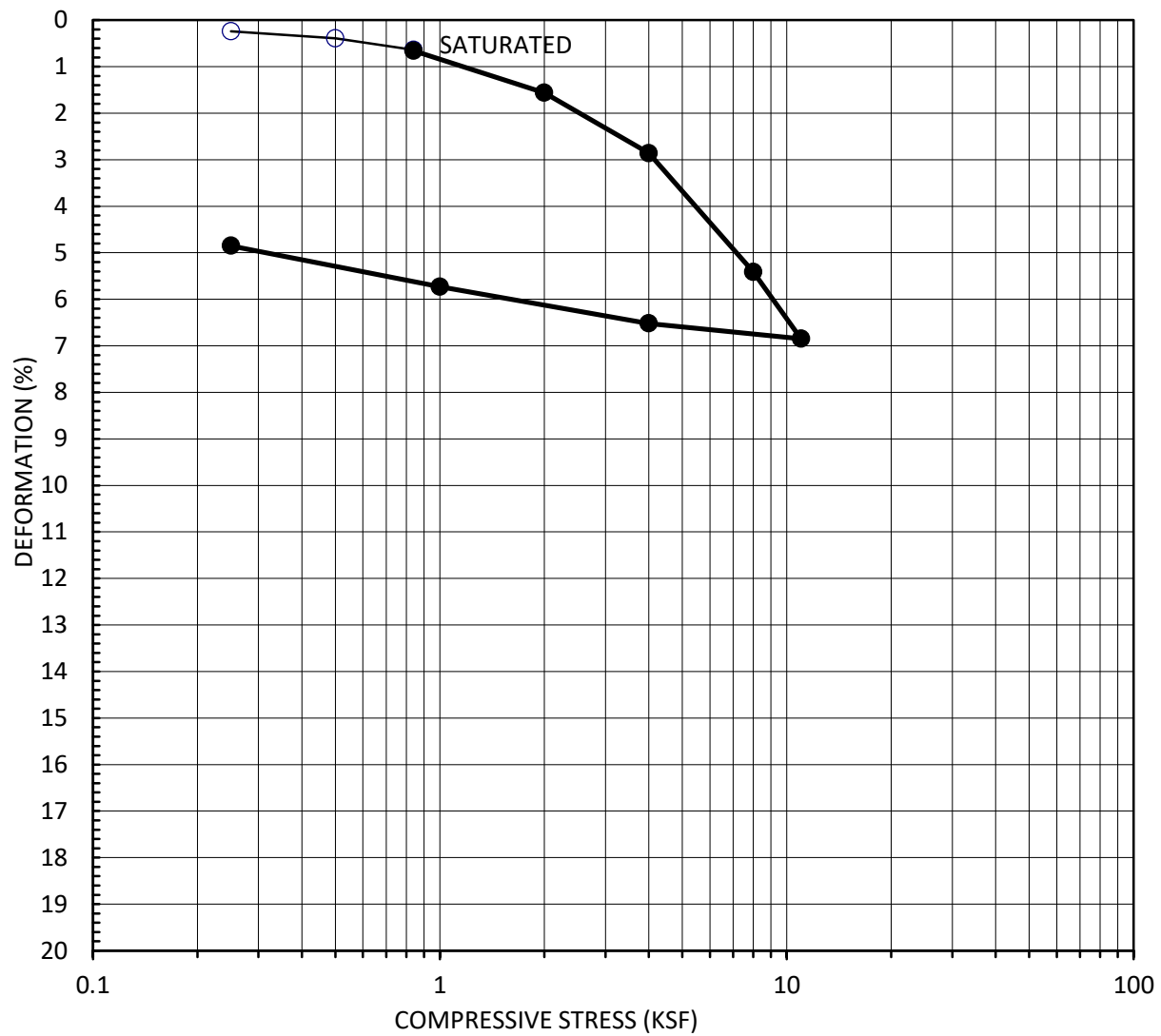
Figure



Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density (PCF)	Init. Void Ratio
○	B-2	4	10.0	SM	2.6	98.3	0.714

EGLAB, INC.	Project Name: FF / Santa Ana Client: LGC Valley, Inc. Job No.: 213031-01 EGLAB Project No.: 21-059-022
	CONSOLIDATION 12/21 (ASTM D2435)

Figure



Symbol	Boring No.	Sample No.	Depth (Ft.)	Soil Type	Init. Moisture Content (%)	Init. Dry Density (PCF)	Init. Void Ratio
○	B-3	2	5.0	ML	23.6	96.2	0.752

EGLAB, INC.

Project Name:

FF / Santa Ana

Client:

LGC Valley, Inc.

Job No.:

213031-01

EGLAB Project No.:

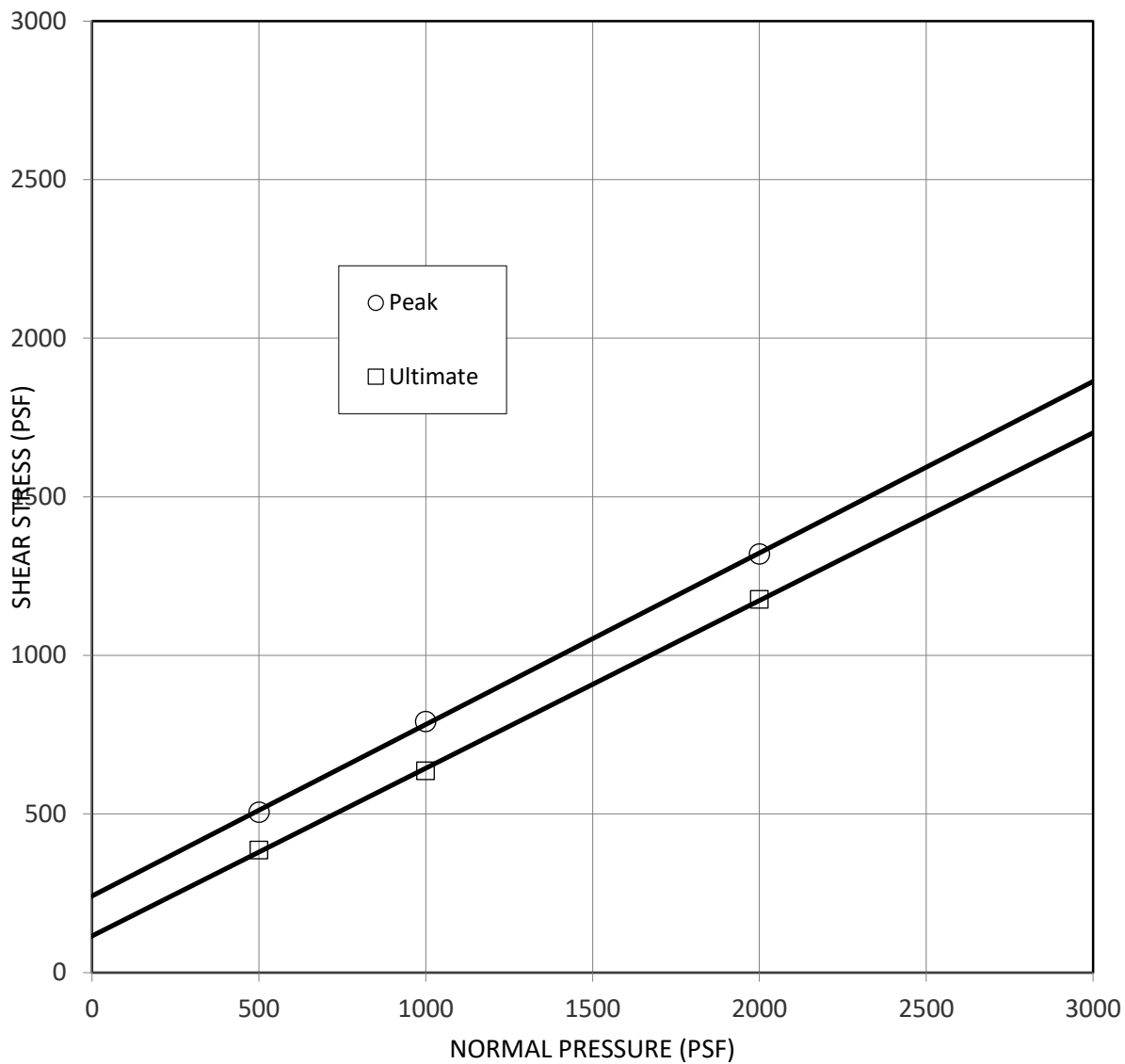
21-059-022

CONSOLIDATION

12/21

(ASTM D2435)

Figure



Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
B-3	A	1.0-5.0	Bulk	CL	○	242	28
					□	116	28

Note: Sample was remolded to **90 %** maximum relative density and optimum moisture

Maximum Dry Density: **122.5 pcf**

Optimum Moisture: **12.5 %**

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)
500	12.5	22.7
1000	12.5	21.5
2000	12.5	20.8

EGLAB, INC.	Project Address: FF / Santa Ana	
	Client:	LGC Valley, Inc.
	Project No.:	213031-01
EGLAB Project No.: 21-059-022		

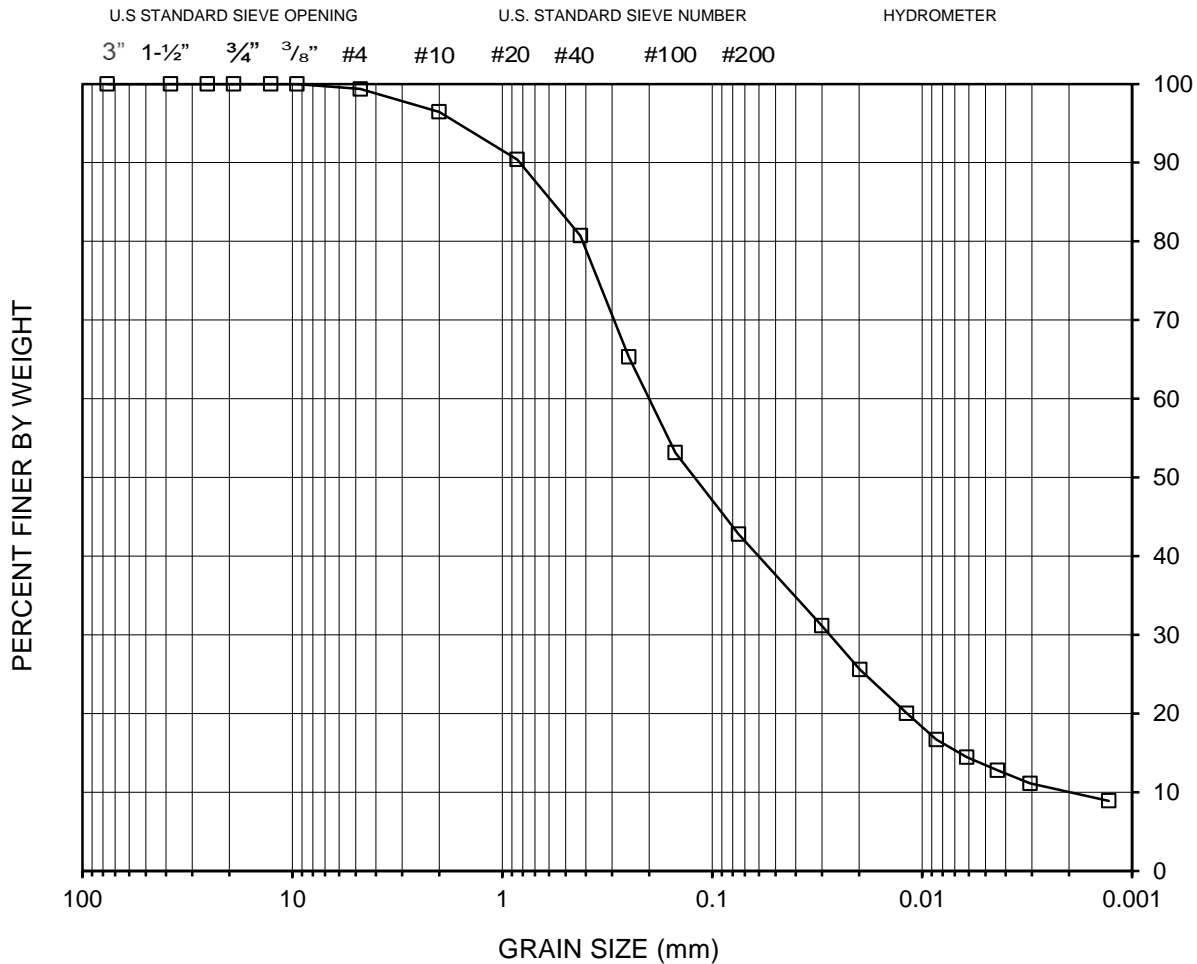
DIRECT SHEAR

12/21

(ASTM D3080)

Figure

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARS	MEDIUM	FINE	



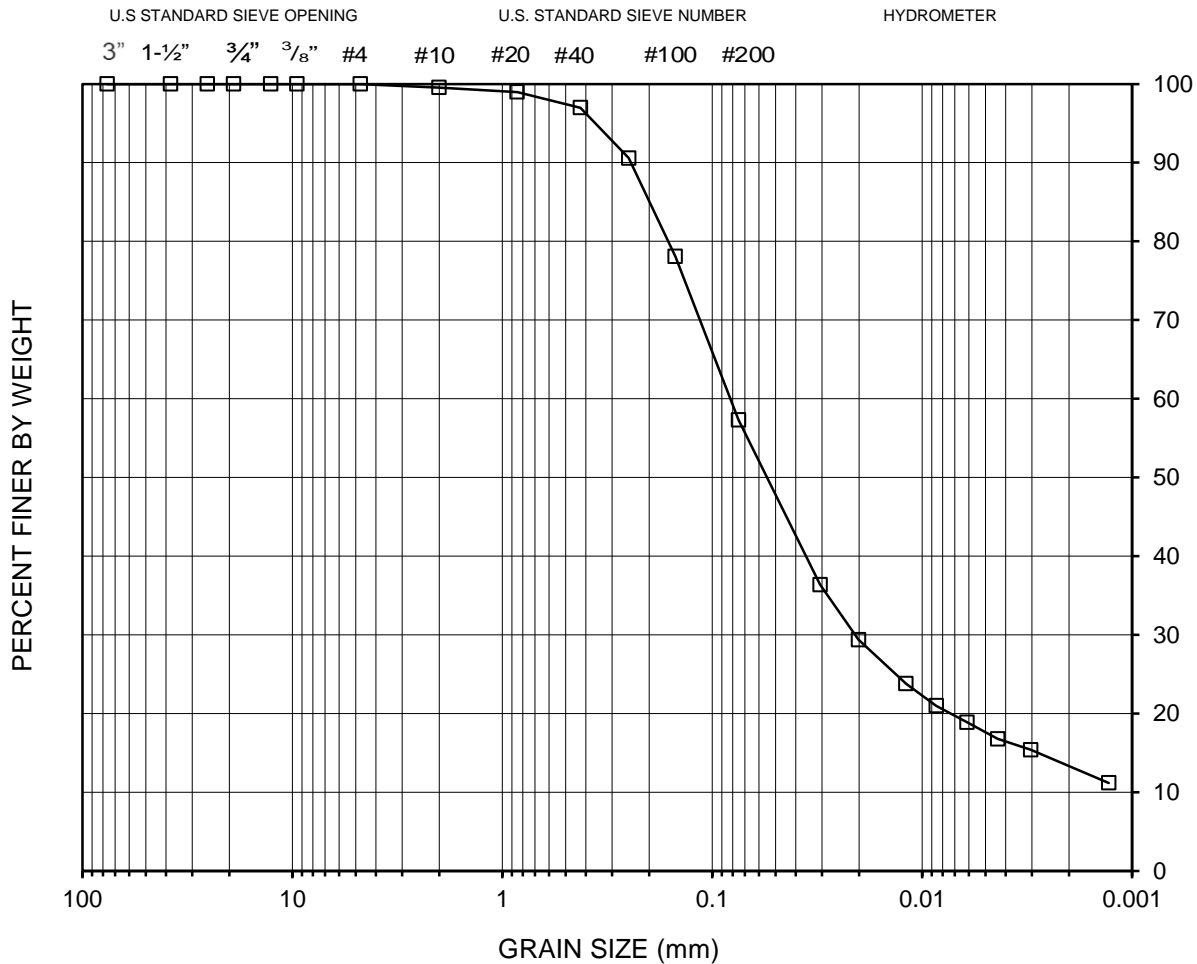
SYMBOL	BORING No.	SAMPLE No.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	B-1	19	47.5	SPT	SC-SM	21	5

Clay	13.4%
Gravel / Sand	57.2%
Silt	29.4%

EGLAB, INC.	Project Name: FF / Santa Ana
	Client: LGC Valley, Inc. Job No.: 213031-01 EGLAB Project No.: 21-059-022
GRAINSIZE DISTRIBUTION CURVE	
12/15/21	FIGURE

(ASTM D422)

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARS	MEDIUM	FINE	

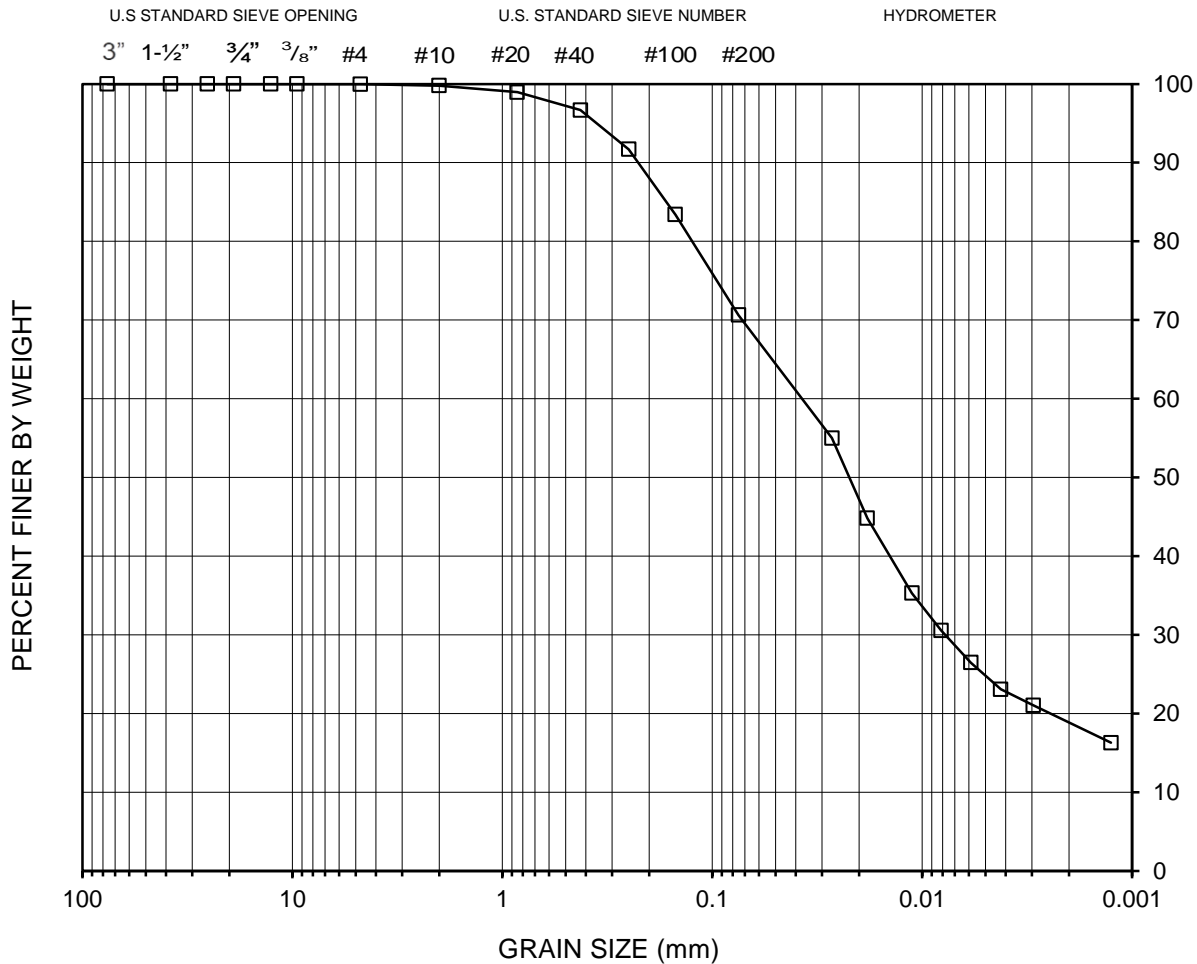


SYMBOL	BORING No.	SAMPLE No.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	B-2	20	50.0	SPT	CL	N/A	N/A

Clay	17.9%
Gravel / Sand	42.7%
Silt	39.4%

EGLAB, INC.	Project Name: FF / Santa Ana
	Client: LGC Valley, Inc. Job No.: 213031-01 EGLAB Project No.: 21-059-022
GRAINSIZE DISTRIBUTION CURVE (ASTM D422)	
12/15/21	FIGURE

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARS	MEDIUM	FINE	

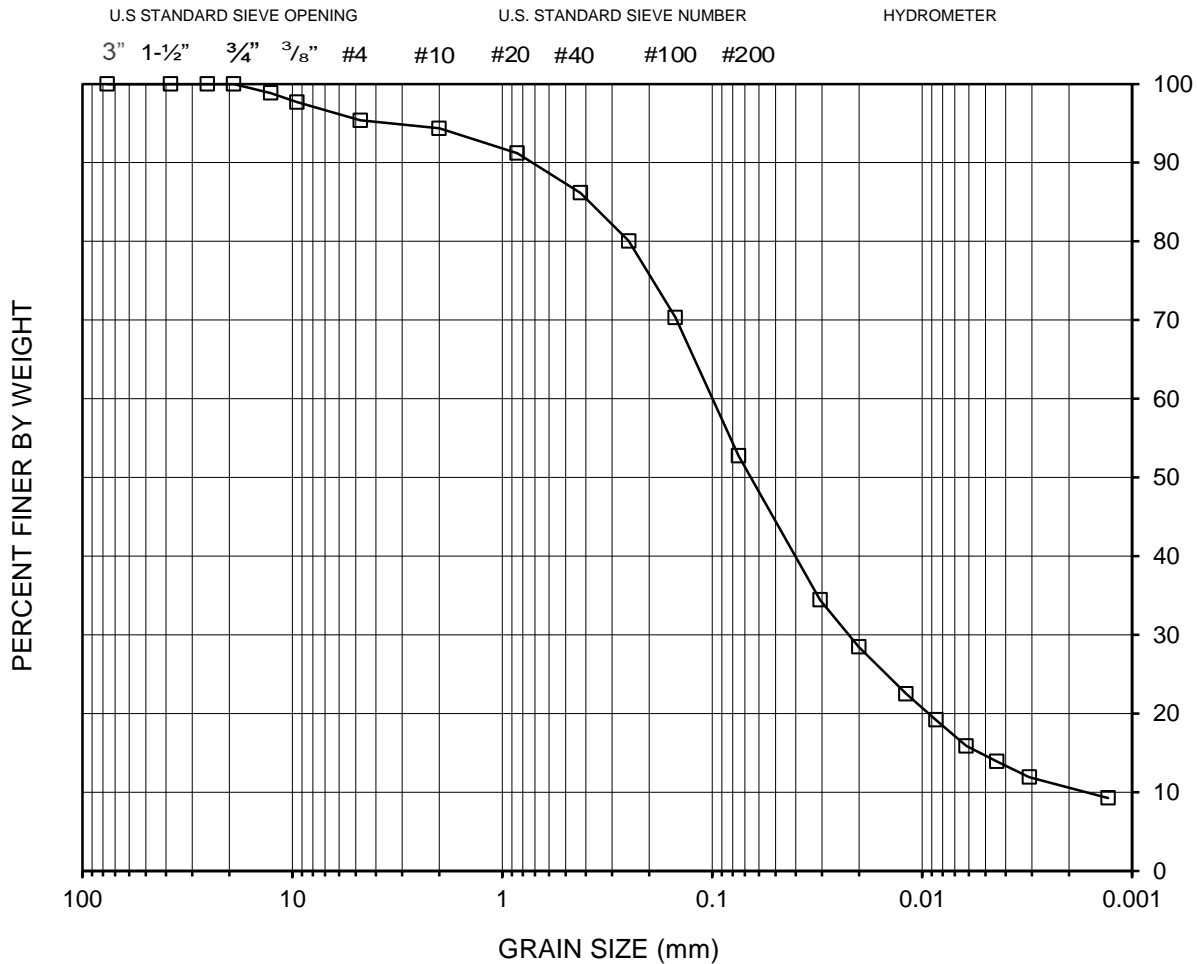


SYMBOL	BORING No.	SAMPLE No.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	B-3	7	17.5	SPT	CL	N/A	N/A

Clay	24.9%
Gravel / Sand	29.4%
Silt	45.7%

EGLAB, INC.	Project Name: FF / Santa Ana
	Client: LGC Valley, Inc. Job No.: 213031-01 EGLAB Project No.: 21-059-022
GRAINSIZE DISTRIBUTION CURVE (ASTM D422)	
12/15/21	FIGURE

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARS	MEDIUM	FINE	



SYMBOL	BORING No.	SAMPLE No.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	B-3	19	47.5	SPT	ML	N/A	N/A

Clay	14.3%
Gravel / Sand	47.2%
Silt	38.5%

EGLAB, INC.	Project Name: FF / Santa Ana
	Client: LGC Valley, Inc. Job No.: 213031-01 EGLAB Project No.: 21-059-022
GRAINSIZE DISTRIBUTION CURVE	
12/15/21	FIGURE

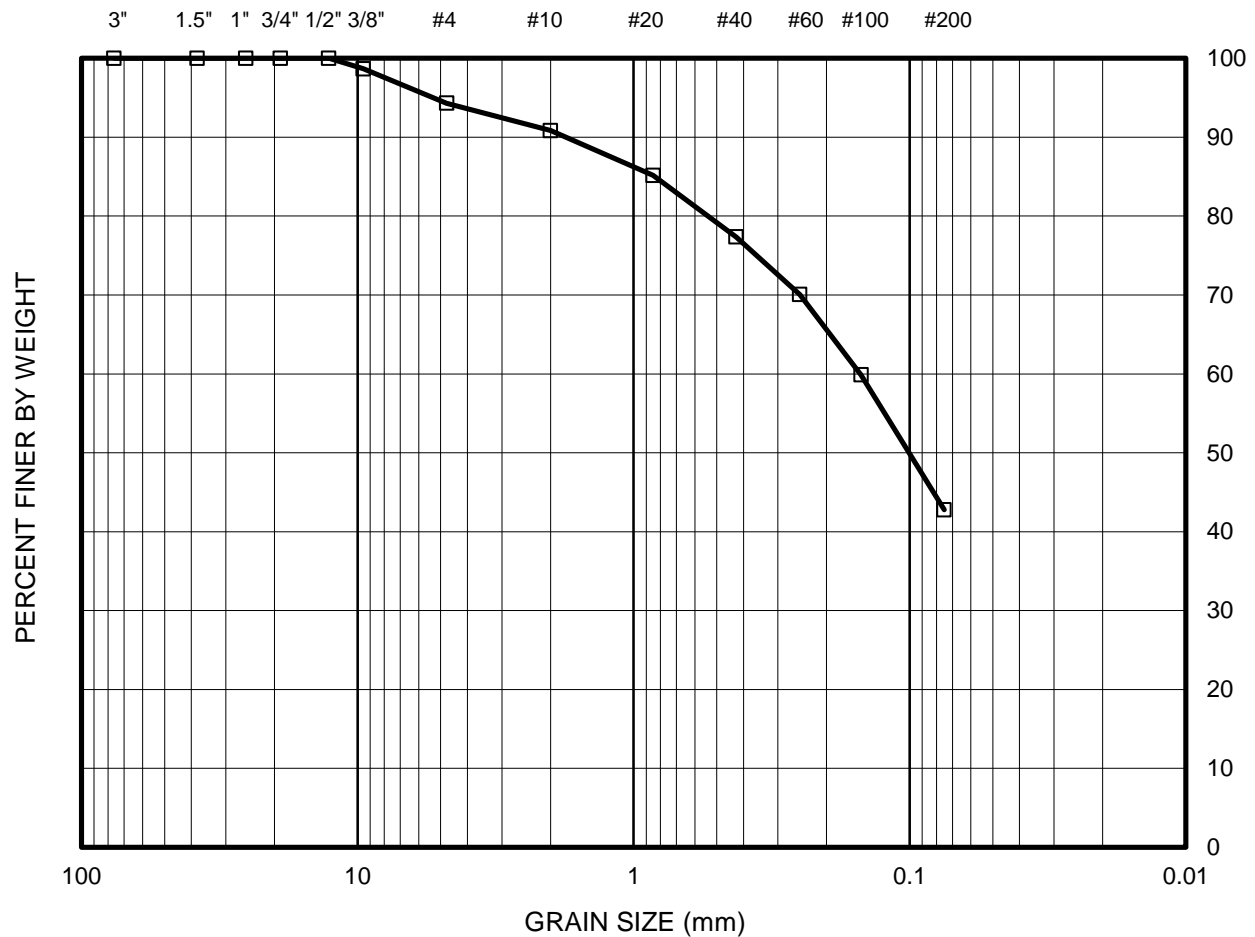
(ASTM D422)

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE OPENING

U.S. STANDARD SIEVE NUMBER

HYDROMETER



SYMBOL	BORING NO.	SAMPLE NO.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	B-1	2	5.0	Ring	SC	N/A	N/A

Gravel:	5.7%
Sand:	51.5%
Fine:	42.8%

EGLAB, INC.

Project Name:

FF / Santa Ana

Client Job No.: 213031-01

Client Name: LGC Valley, Inc.

EGLAB Project No.: 21-059-022

GRAIN SIZE DISTRIBUTION CURVE

12/15/21

(ASTM D422)

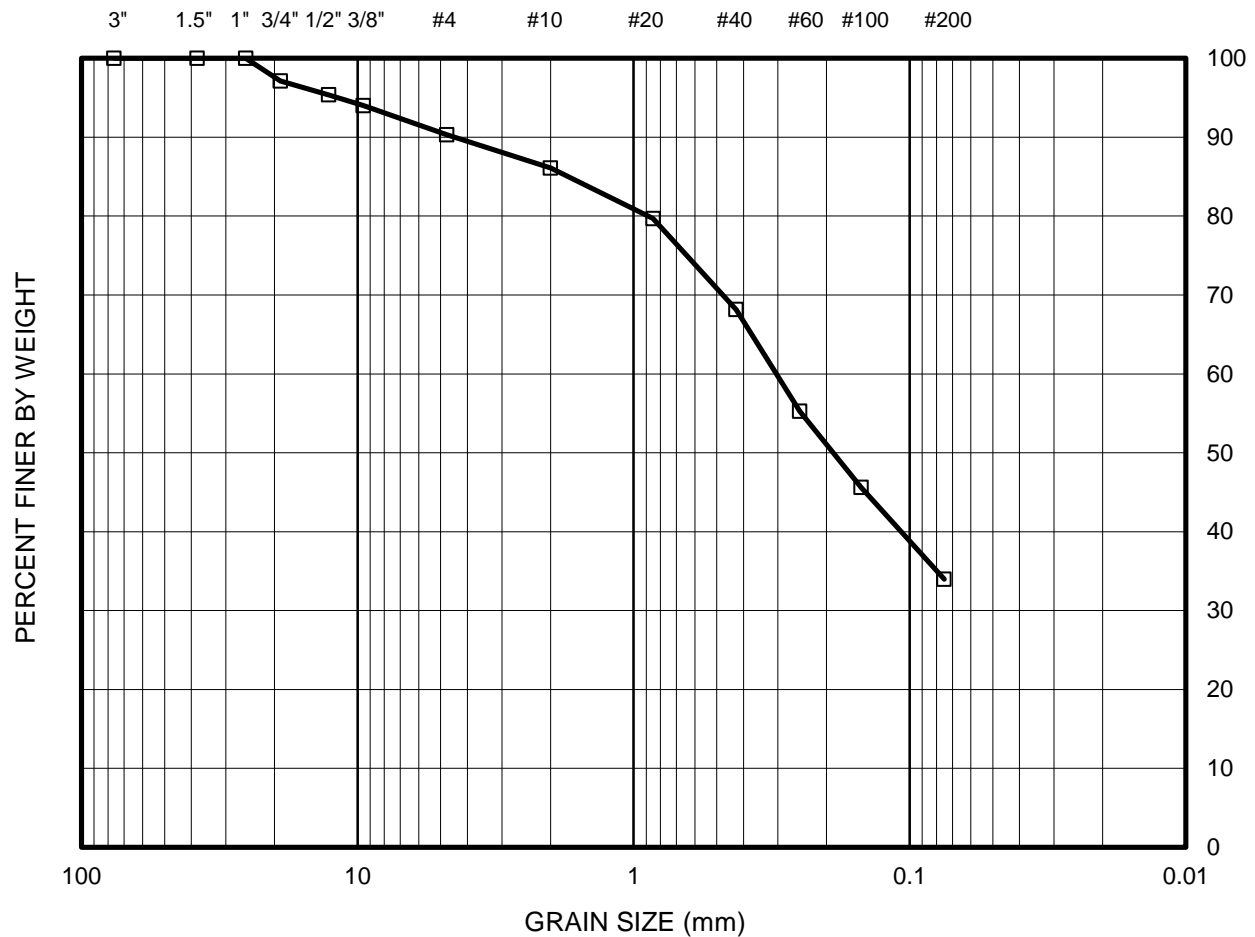
FIGURE

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE OPENING

U.S. STANDARD SIEVE NUMBER

HYDROMETER



SYMBOL	BORING NO.	SAMPLE NO.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	B-1	6	15.0	SPT	SC	N/A	N/A

Gravel:	9.7%
Sand:	56.3%
Fine:	34.0%

EGLAB, INC.

Project Name:

FF / Santa Ana

Client Job No.: 213031-01

Client Name: LGC Valley, Inc.

EGLAB Project No.: 21-059-022

GRAIN SIZE DISTRIBUTION CURVE

12/15/21

(ASTM D422)

FIGURE

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE OPENING

U.S. STANDARD SIEVE NUMBER

HYDROMETER



SYMBOL	BORING NO.	SAMPLE NO.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	B-1	8	20.0	SPT	SP	N/A	N/A

Gravel:	3.7%
Sand:	93.8%
Fine:	2.5%

EGLAB, INC.

Project Name:

FF / Santa Ana

Client Job No.: 213031-01

Client Name: LGC Valley, Inc.

EGLAB Project No.: 21-059-022

GRAIN SIZE DISTRIBUTION CURVE

12/15/21

(ASTM D422)

FIGURE

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE OPENING

U.S. STANDARD SIEVE NUMBER

HYDROMETER



SYMBOL	BORING NO.	SAMPLE NO.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	B-1	11	27.5	SPT	CL	N/A	N/A

Gravel:	0.0%
Sand:	31.9%
Fine:	68.1%

EGLAB, INC.

Project Name:

FF / Santa Ana

Client Job No.: 213031-01

Client Name: LGC Valley, Inc.

EGLAB Project No.: 21-059-022

GRAIN SIZE DISTRIBUTION CURVE

12/15/21

(ASTM D422)

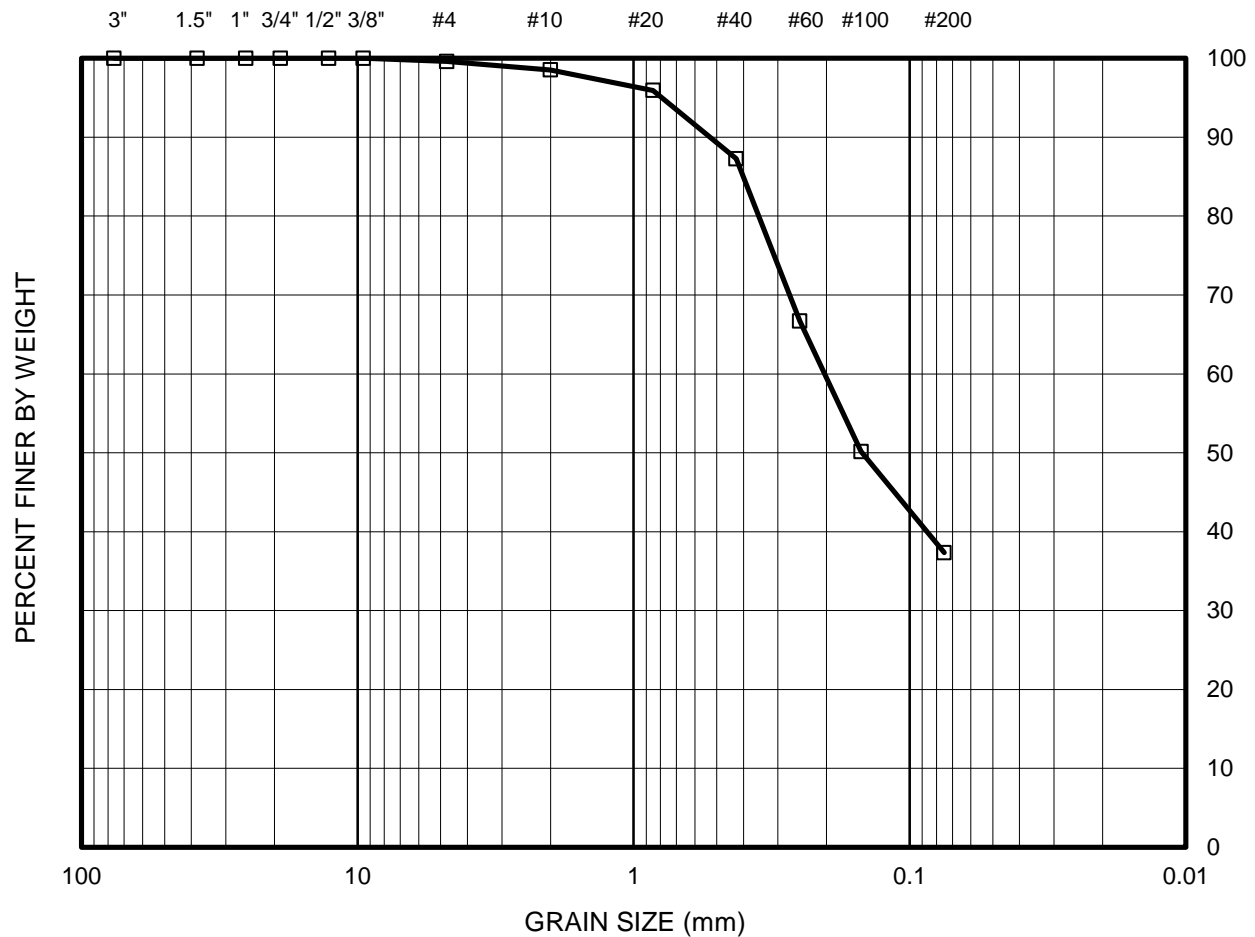
FIGURE

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE OPENING

U.S. STANDARD SIEVE NUMBER

HYDROMETER



SYMBOL	BORING NO.	SAMPLE NO.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	B-1	13	32.5	SPT	SC	N/A	N/A

Gravel:	0.4%
Sand:	62.3%
Fine:	37.3%

EGLAB, INC.

Project Name:

FF / Santa Ana

Client Job No.: 213031-01

Client Name: LGC Valley, Inc.

EGLAB Project No.: 21-059-022

**GRAIN SIZE
DISTRIBUTION CURVE**

12/15/21

(ASTM D422)

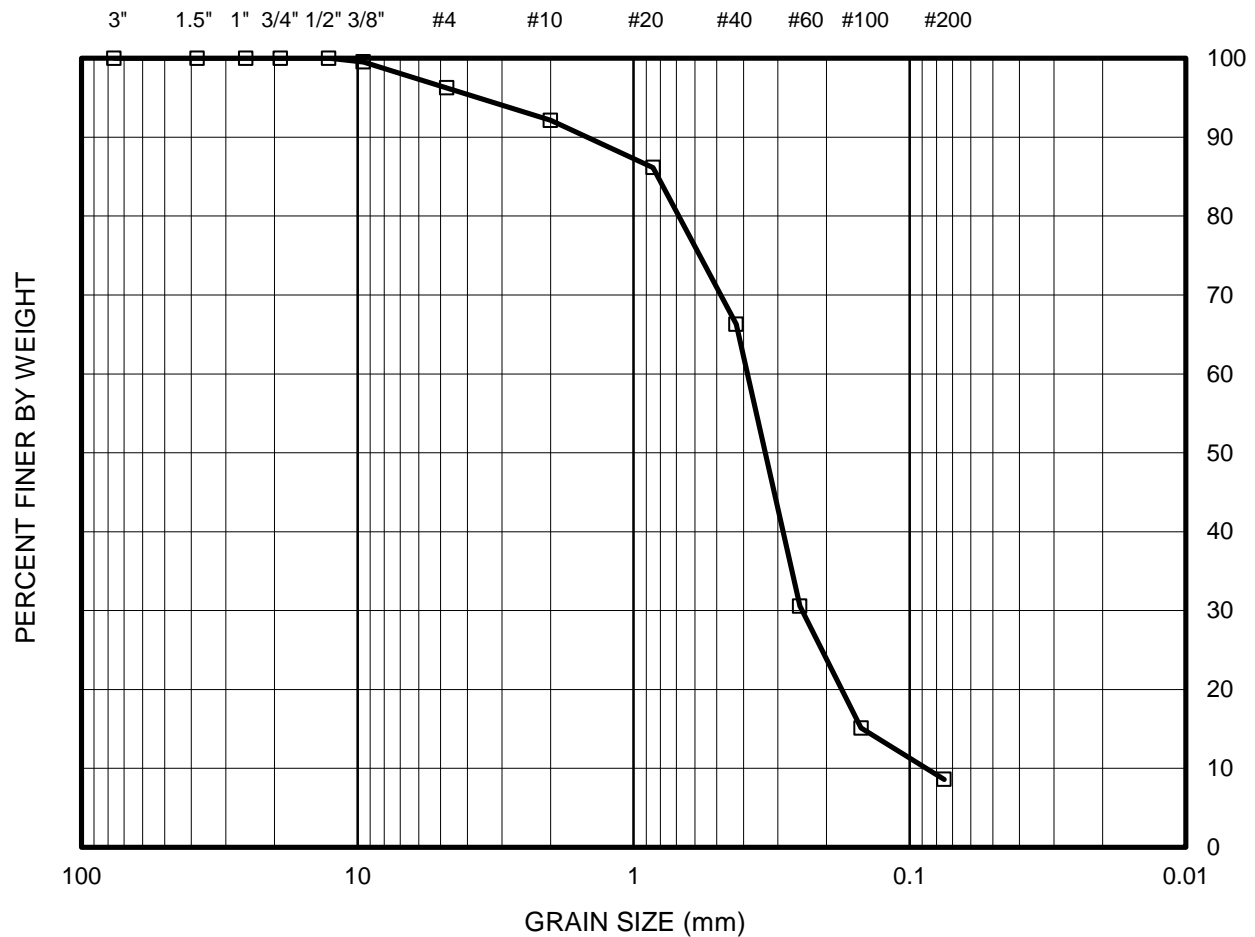
FIGURE

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE OPENING

U.S. STANDARD SIEVE NUMBER

HYDROMETER



SYMBOL	BORING NO.	SAMPLE NO.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	B-1	14	35.0	SPT	SP-SM	N/A	N/A

Gravel:	3.8%
Sand:	87.6%
Fine:	8.6%

EGLAB, INC.

Project Name:

FF / Santa Ana

Client Job No.: 213031-01

Client Name: LGC Valley, Inc.

EGLAB Project No.: 21-059-022

GRAIN SIZE DISTRIBUTION CURVE

12/15/21

(ASTM D422)

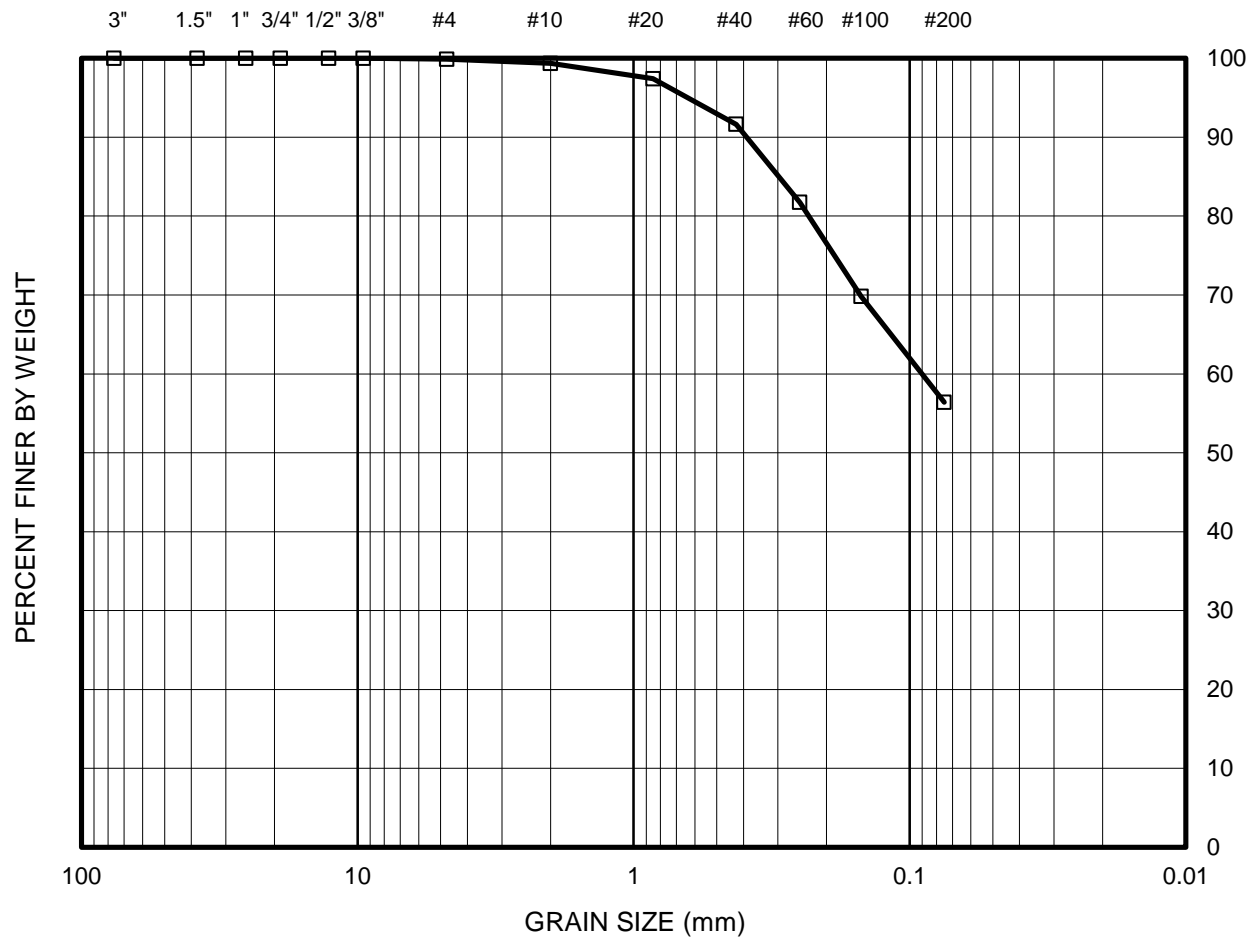
FIGURE

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE OPENING

U.S. STANDARD SIEVE NUMBER

HYDROMETER



SYMBOL	BORING NO.	SAMPLE NO.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	B-2	2	5.0	Ring	CL	N/A	N/A

Gravel:	0.1%
Sand:	43.5%
Fine:	56.4%

EGLAB, INC.

Project Name:

FF / Santa Ana

Client Job No.: 213031-01

Client Name: LGC Valley, Inc.

EGLAB Project No.: 21-059-022

GRAIN SIZE DISTRIBUTION CURVE

12/15/21

(ASTM D422)

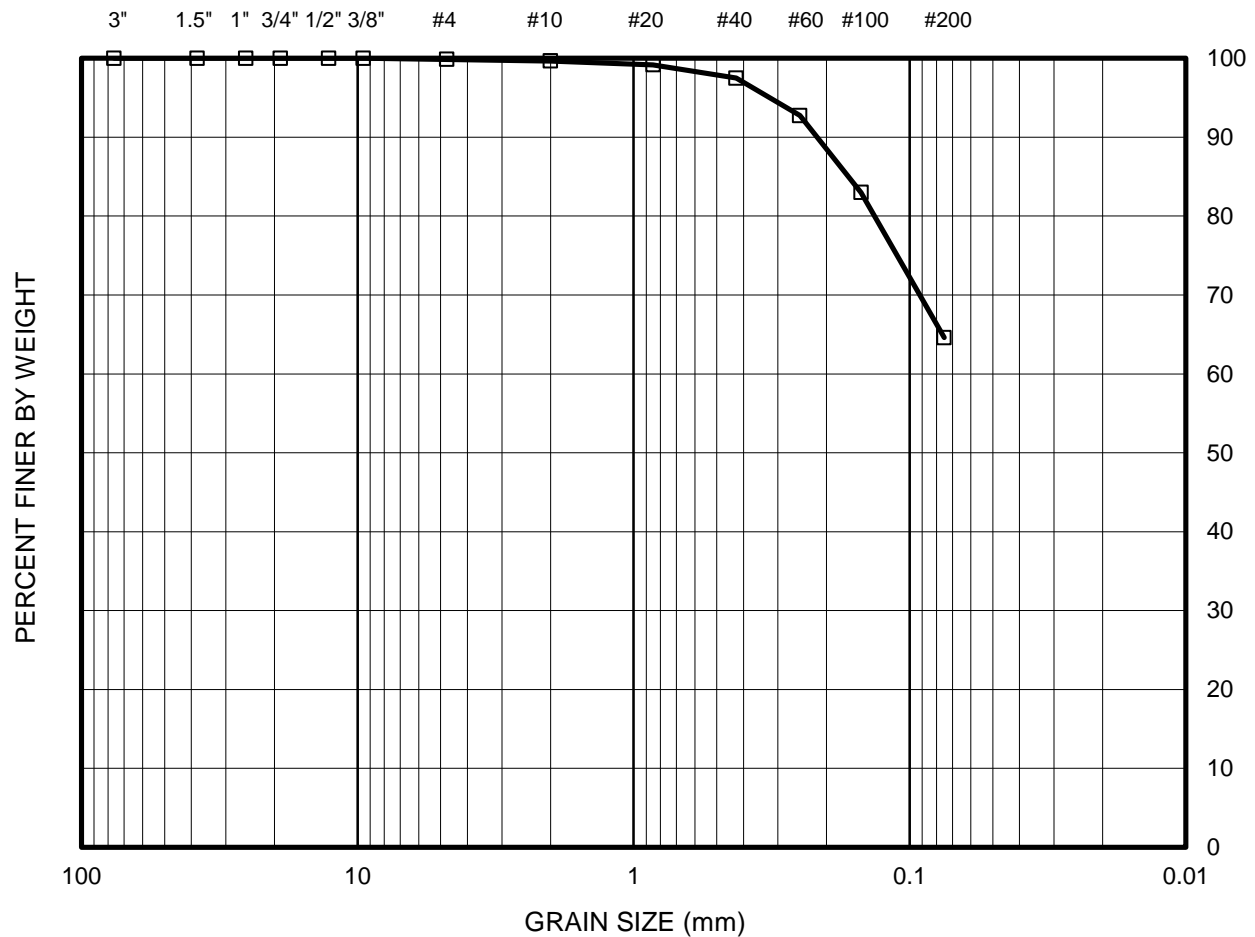
FIGURE

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE OPENING

U.S. STANDARD SIEVE NUMBER

HYDROMETER



SYMBOL	BORING NO.	SAMPLE NO.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	B-2	8	20.0	SPT	CL	N/A	N/A

Gravel:	0.1%
Sand:	35.3%
Fine:	64.6%

EGLAB, INC.

Project Name:

FF / Santa Ana

Client Job No.: 213031-01

Client Name: LGC Valley, Inc.

EGLAB Project No.: 21-059-022

GRAIN SIZE DISTRIBUTION CURVE

12/15/21

(ASTM D422)

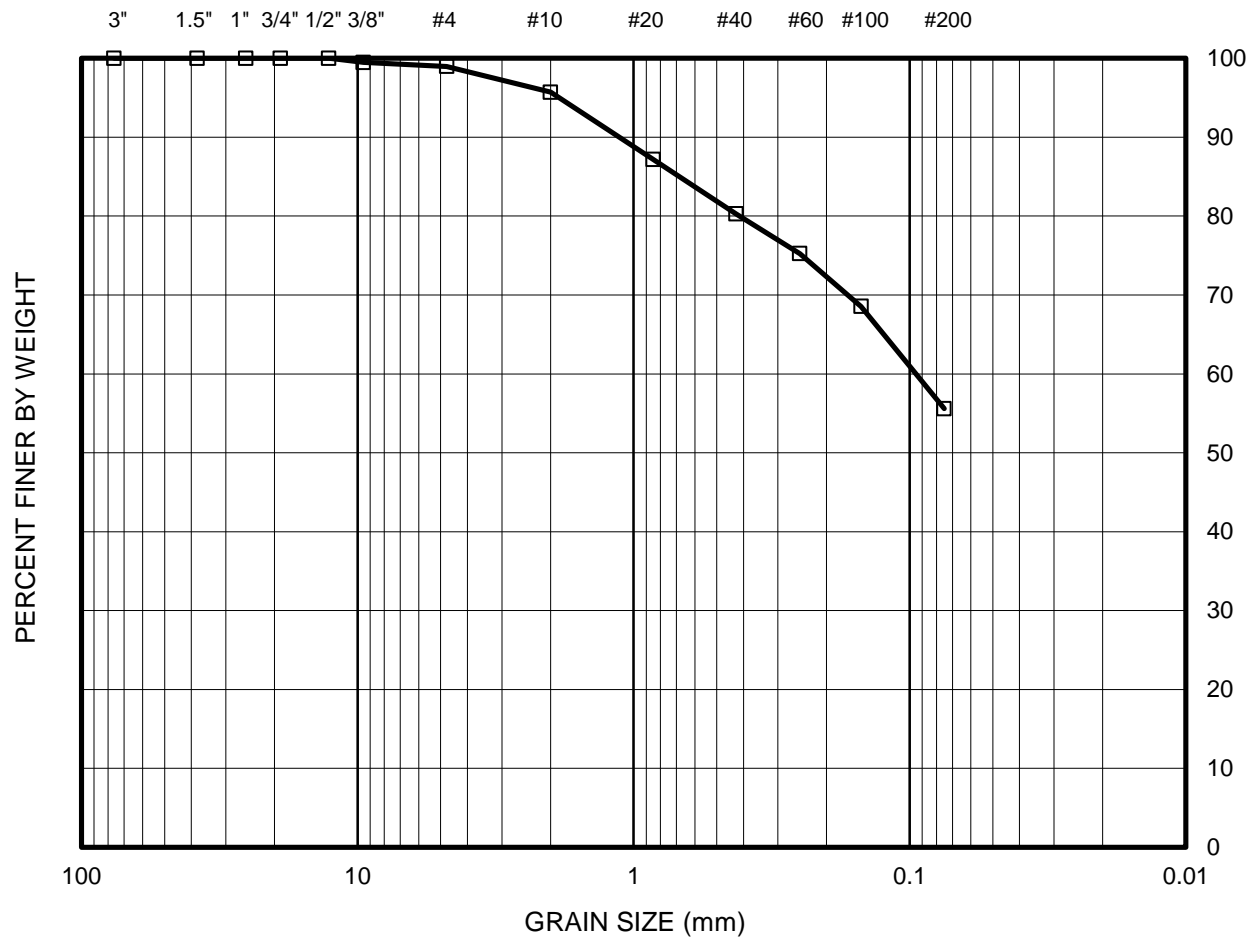
FIGURE

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE OPENING

U.S. STANDARD SIEVE NUMBER

HYDROMETER



SYMBOL	BORING NO.	SAMPLE NO.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	B-2	12	30.0	SPT	CL	N/A	N/A

Gravel:	1.0%
Sand:	43.4%
Fine:	55.6%

EGLAB, INC.

Project Name:

FF / Santa Ana

Client Job No.: 213031-01

Client Name: LGC Valley, Inc.

EGLAB Project No.: 21-059-022

GRAIN SIZE DISTRIBUTION CURVE

12/15/21

(ASTM D422)

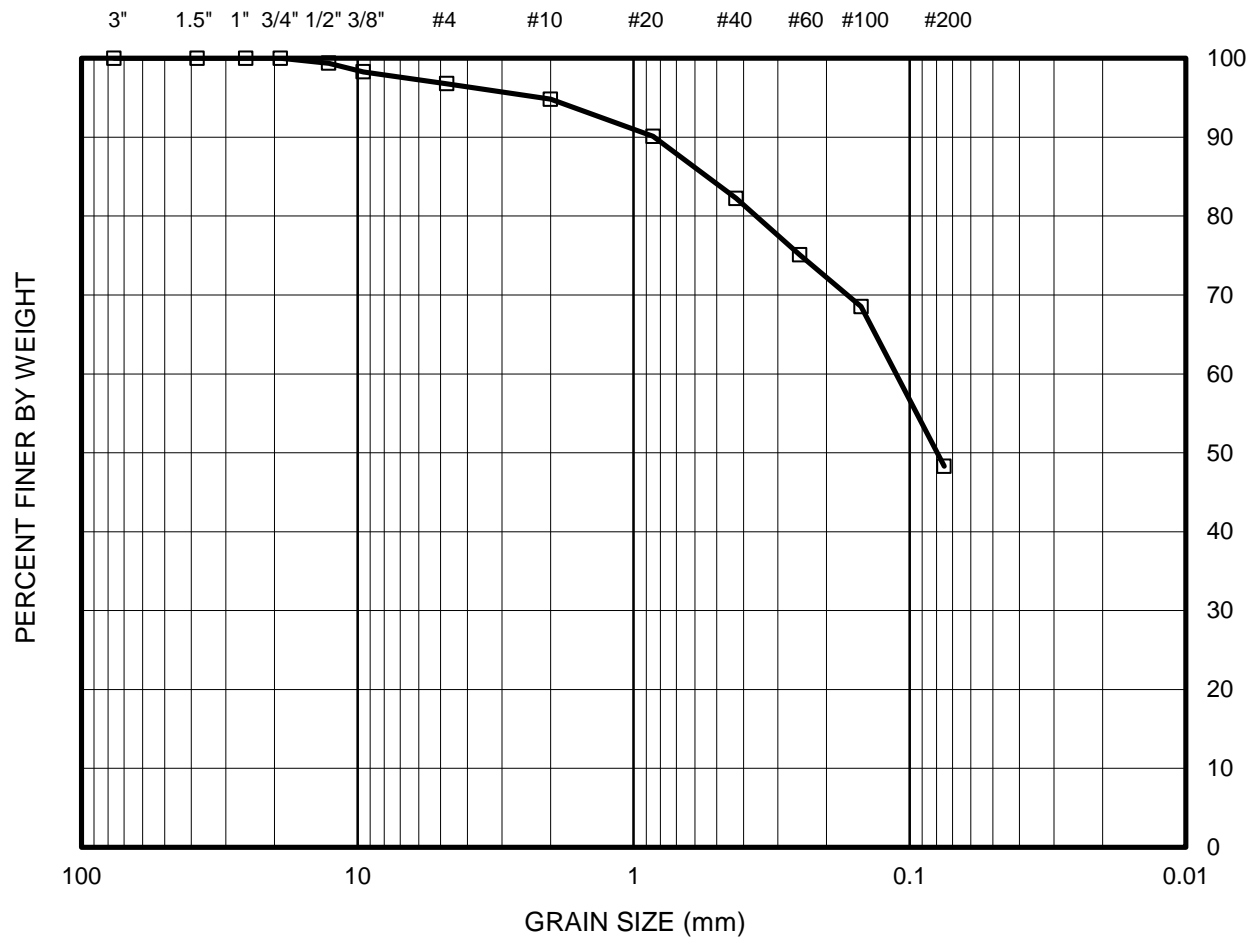
FIGURE

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE OPENING

U.S. STANDARD SIEVE NUMBER

HYDROMETER



SYMBOL	BORING NO.	SAMPLE NO.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	B-2	16	40.0	SPT	SC	N/A	N/A

Gravel:	3.2%
Sand:	48.5%
Fine:	48.3%

EGLAB, INC.

Project Name:

FF / Santa Ana

Client Job No.: 213031-01

Client Name: LGC Valley, Inc.

EGLAB Project No.: 21-059-022

GRAIN SIZE DISTRIBUTION CURVE

12/15/21

(ASTM D422)

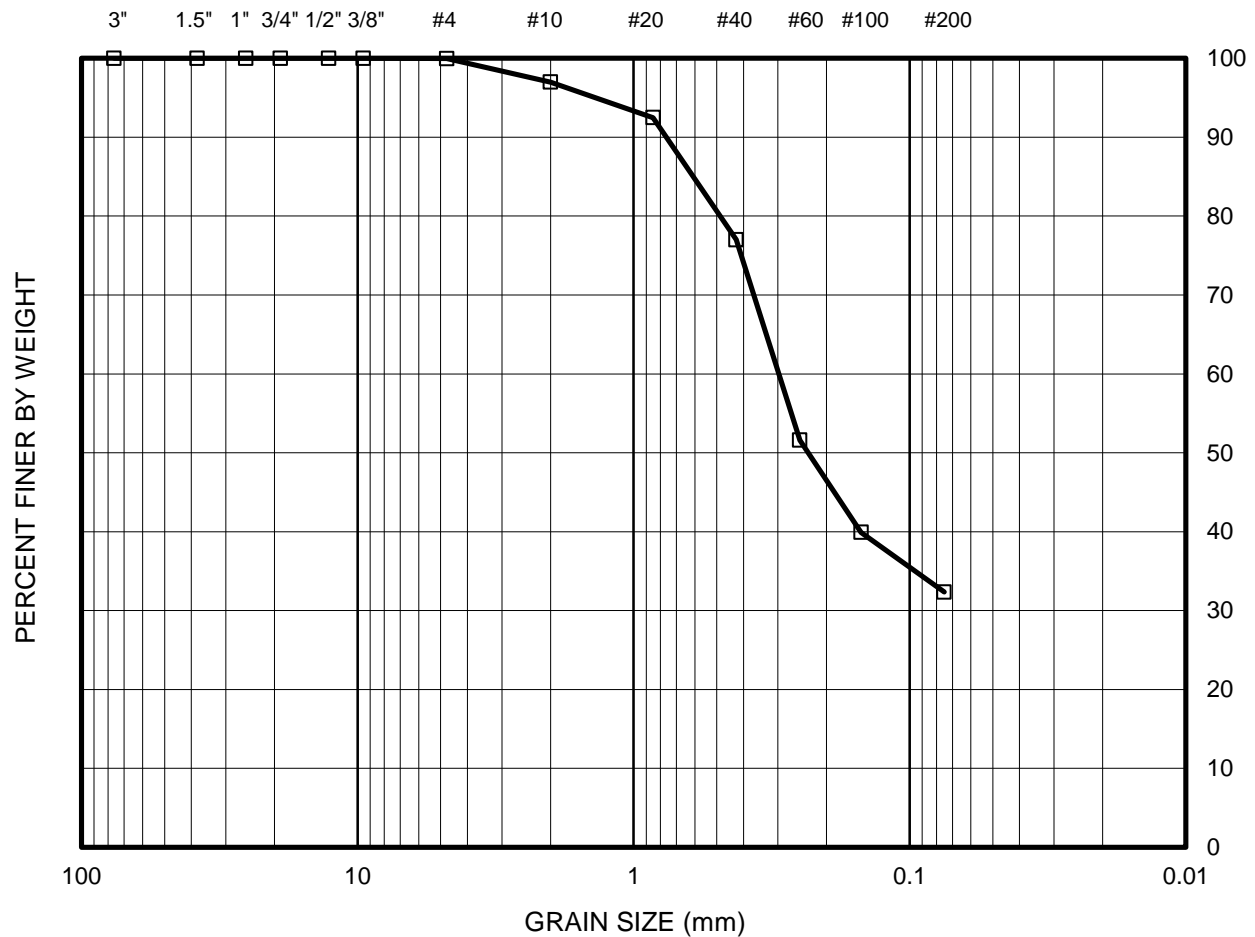
FIGURE

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE OPENING

U.S. STANDARD SIEVE NUMBER

HYDROMETER



SYMBOL	BORING NO.	SAMPLE NO.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	B-3	3	7.5	Ring	SC	N/A	N/A

Gravel:	0.0%
Sand:	67.6%
Fine:	32.4%

EGLAB, INC.

Project Name:

FF / Santa Ana

Client Job No.: 213031-01

Client Name: LGC Valley, Inc.

EGLAB Project No.: 21-059-022

GRAIN SIZE DISTRIBUTION CURVE

12/15/21

(ASTM D422)

FIGURE

GRAVEL		SAND			SILT OR CLAY
COARSE	FINE	COARSE	MEDIUM	FINE	

U.S. STANDARD SIEVE OPENING

U.S. STANDARD SIEVE NUMBER

HYDROMETER



SYMBOL	BORING NO.	SAMPLE NO.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
□	B-3	14	35.0	SPT	CL	N/A	N/A

Gravel:	0.6%
Sand:	26.5%
Fine:	72.9%

EGLAB, INC.

Project Name:

FF / Santa Ana

Client Job No.: 213031-01

Client Name: LGC Valley, Inc.

EGLAB Project No.: 21-059-022

**GRAIN SIZE
DISTRIBUTION CURVE**

12/15/21

(ASTM D422)

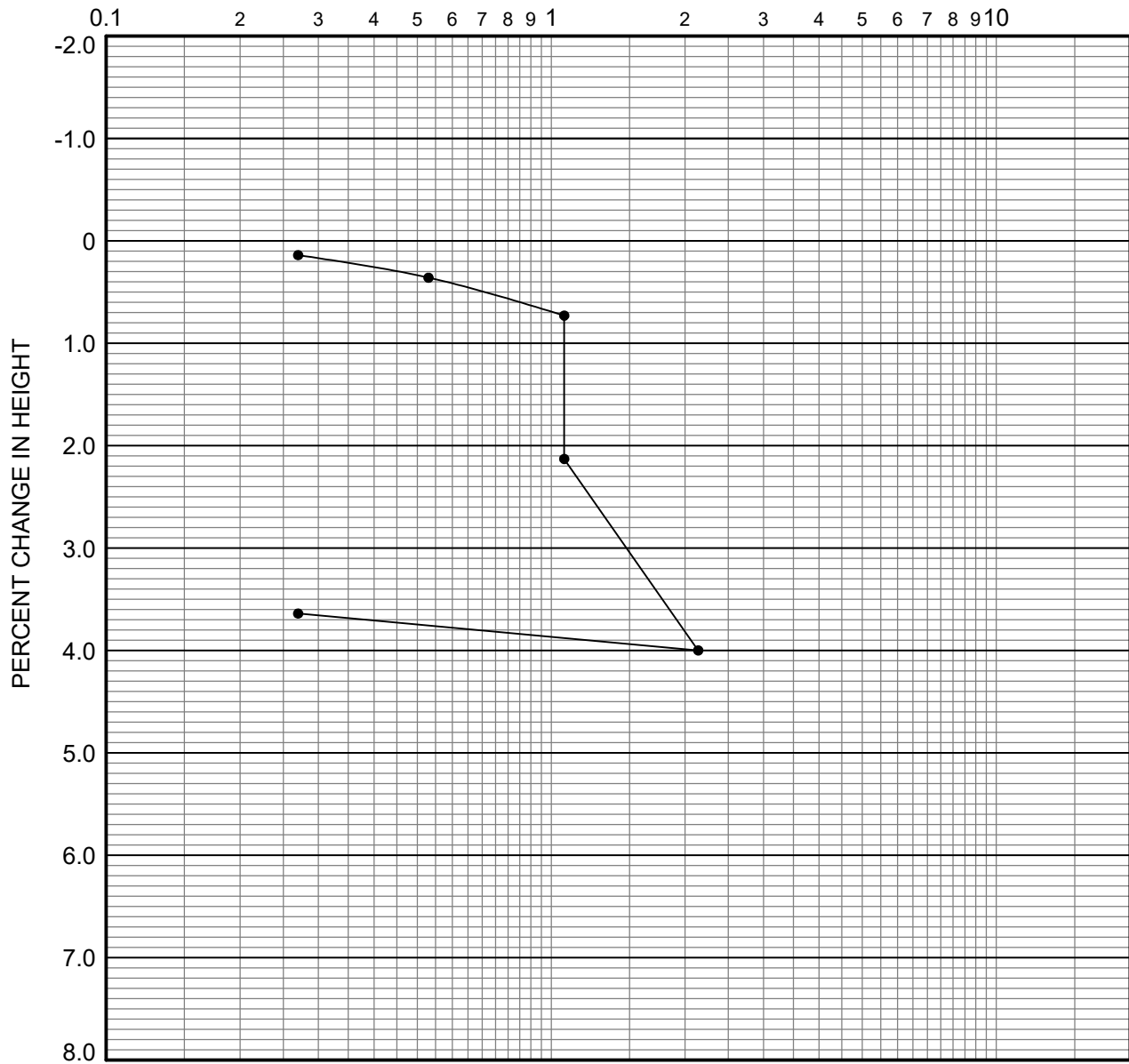
FIGURE

TABLE C
SUMMARY OF LABORATORY TEST DATA
P.N. 1-0396

Boring/Pit No.	Depth (Feet)	Soil Description	Group Symbol - Unified Soil Classification System	Maximum Dry Density		Direct Shear	Grain Size Analysis				Expansion Index	Sulfate Content (%)	Consolidation	Other Tests Remarks
				Maximum Density (pcf)	Optimum Moisture (%)		Gravel (% + No. 4 Screen)	% Sand	% Silt (0.074 to 0.005mm)	% Clay (-0.005 mm)				
B-1	10	Silty Sand (Qyf)	SM	-	-	-	0	80	14	6	-	-	See Plate C-1	-
B-2	1-4	Clayey Silt w/Sand (Qyf)	ML	117.2	13.7	-	1	21	40	38	94	ND	-	Min. Resistivity: 1,700 OHM-CM Chloride: 15ppm PH: 7.94
B-6	1-4	Clayey Silt w/Sand (Qyf)	ML	123.7	10.8	-	2	29	39	30	69	0.017	-	Min. Resistivity: 680 OHM-CM Chloride: 65ppm PH: 8.04
B-6	5	Silty Sand (Qyf)	SM	-	-	-	0	66	21	13	-	-	See Plate C-2	-

Alta California Geotechnical, Inc.

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-1	10.0	98	3.7	14	20	SM	Silty Sand (Qyf)

REMARKS: WATER ADDED AT 1.07 TSF

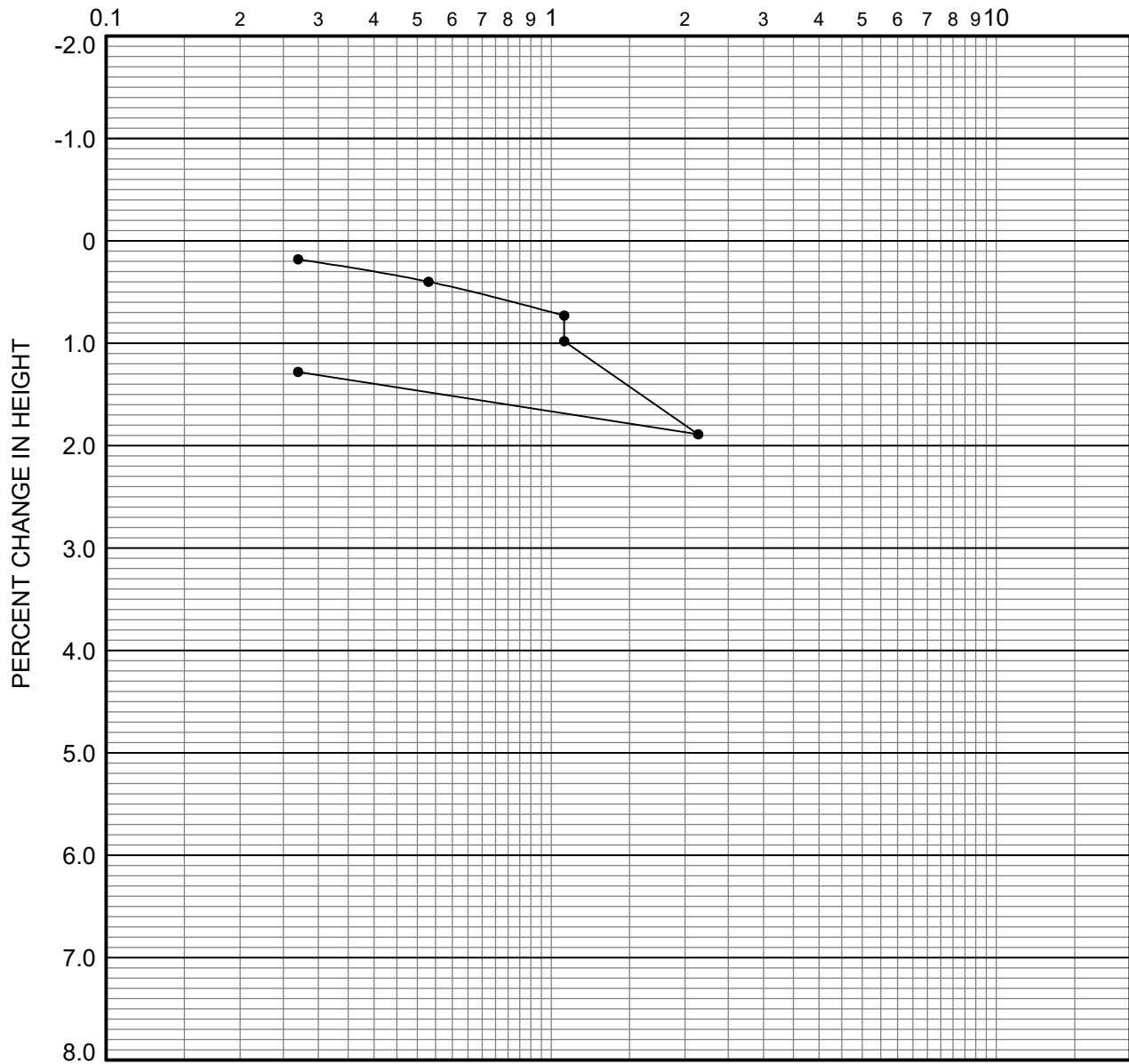
CONSOLIDATION CURVE

Alta California Geotechnical, Inc.

P.N. 1-0396

PLATE C-1

COMPRESSIVE STRESS IN TSF



boring	depth (ft.)	dry density (pcf)	in situ moist. (%)	in situ satur. (%)	-200 sieve (%)	group symbol	typical names
B-6	5.0	107	6.8	33	34	SM	Silty Sand (Qyf)

REMARKS: WATER ADDED AT 1.07 TSF

CONSOLIDATION CURVE

Alta California Geotechnical, Inc.

P.N. 1-0396

PLATE C-2

APPENDIX D

Liquefaction Analysis and Dry Sand Settlement

PARAMETERS USED IN LIQUEFACTION ANALYSIS

LGC Geotechnical Borings

B-LGC-1

Depth of Sample (ft)	Depth to Base (ft)	Field Blow Count	Dry Density (PCF)	Liquid Limit (%)	Plasticity Index (%)	Moisture Content (%)	% passing #200	% clay (0.005mm)	Soil Type	Not Liquefiable Based on Lab/Samples
0	5		107				101		ML	R&R
5	7.5	7.3	107				42.8		CL	
7.5	10	6	107			5.1	42.8		SM	
10	12.5	8	107			23.3	68.1		CL	
12.5	15	7.3	107				68.1		ML	
15	17.5	4	107				34		SC	
17.5	20	14	107			4.1	42.8		SM	
20	22.5	18	107				2.5		SP	
22.5	25	11.3	107			11.3	68.1		ML	
25	27.5	6	107				68.1		ML/CL	
27.5	30	5	107				68.1		CL	
30	32.5	5	107				68.1		CL/ML	
32.5	35	7	107				37.3		SC	
35	37.5	14	107				8.6		SP/SM	
37.5	40	71	107				8.6		SW	
40	42.5	35	107				8.6		SW	
42.5	45	38	107				8.6		SW	
45	47.5	32	107	NP	NP	7.5	8.6		SM	
47.5	50	28	107	21	5	16.1	42.8	13.4	SC/SM	
50	51.5	43	107				8.6		SW	

Note:

PI : PI greater than 12 is non-liquefiable.

NP: Non-plastic

LL/M.C. : Moisture content is less than 85% of Liquid Limit, therefore non-liquefiable.

R&R : Removal and recompaction of fill.

Ring sample blow counts reduced by a factor of 0.67.

% passing #200 equal 101 is non-liquefiable

PARAMETERS USED IN LIQUEFACTION ANALYSIS

LGC Geotechnical Borings

B-LGC-2

Depth of Sample (ft)	Depth to Base (ft)	Field Blow Count	Dry Density (PCF)	Liquid Limit (%)	Plasticity Index (%)	Moisture Content (%)	% passing #200	% clay (0.005mm)	Soil Type	Not Liquefiable Based on Lab/Samples
0	5		100				101		ML	R&R
5	7.5	8	100				56.4		CL	
7.5	10	10.7	100			5.3	57.3		SM	
10	12.5	13.3	100			2.6	57.3		ML	
12.5	15	14	100				64.6		CL	
15	17.5	14	100				64.6		CL	
17.5	20	14	100				64.6		CL	
20	22.5	15	100				64.6		CL	
22.5	25	15	100				64.6		CL	
25	27.5	15	100				64.6		CL	
27.5	30	15	100				56.4		SC/CL	
30	32.5	13	100				55.6		CL	
32.5	35	14	100				55.6		CL	
35	37.5	18	100				55.6		SC/CL	
37.5	40	53	100				5		SW	
40	42.5	22	100				48.3		SC	
42.5	45	25	100				48.3		SW/ML	
45	47.5	27	100				48.3		SW/ML	
47.5	50	23	100	25	7	17.4	57.3		CL	
50	51.5	8	100			21.1	57.3	17.9	CL/ML	

Note:

PI : PI greater than 12 is non-liquefiable.

NP: Non-plastic

LL/M.C. : Moisture content is less than 85% of Liquid Limit, therefore non-liquefiable.

R&R : Removal and recompaction of fill.

Ring sample blow counts reduced by a factor of 0.67.

% passing #200 equal 101 is non-liquefiable

PARAMETERS USED IN LIQUEFACTION ANALYSIS

LGC Geotechnical Borings

B-LGC-3

Depth of Sample (ft)	Depth to Base (ft)	Field Blow Count	Dry Density (PCF)	Liquid Limit (%)	Plasticity Index (%)	Moisture Content (%)	% passing #200	% clay (0.005mm)	Soil Type	Not Liquefiable Based on Lab/Samples
0	5		102				101		ML	R&R
5	7.5	4.7	102			23.6	70.6		ML	
7.5	10	12.0	102				32.4		SC	
10	12.5	11.4	102			5.3	5		SW	
12.5	15	4.7	102			9.6	70.6		CL	
15	17.5	6.7	102				70.6		CL	
17.5	20	5	102				70.6	24.9	CL	
20	22.5	8.7	102	29	12	13.8	70.6		CL	
22.5	25	15	102				70.6		CL	
25	27.5	26	102				32.4		SM	
27.5	30	27	102				32.4		SM	
30	32.5	14.7	102				70.6		ML	
32.5	35	16	102				70.6		ML	
35	37.5	15	102				72.9		CL	
37.5	40	12	102				72.9		CL	
40	42.5	67	102				5		SW	
42.5	45	49	102				5		SW	
45	47.5	63	102				5		SW	
47.5	50	22	102			16.7	52.8	14.3	ML	
50	51.5	18	102	27	10		70.6		ML	

Note:

PI : PI greater than 12 is non-liquefiable.

NP: Non-plastic

LL/M.C. : Moisture content is less than 85% of Liquid Limit, therefore non-liquefiable.

R&R : Removal and recompaction of fill.

Ring sample blow counts reduced by a factor of 0.67.

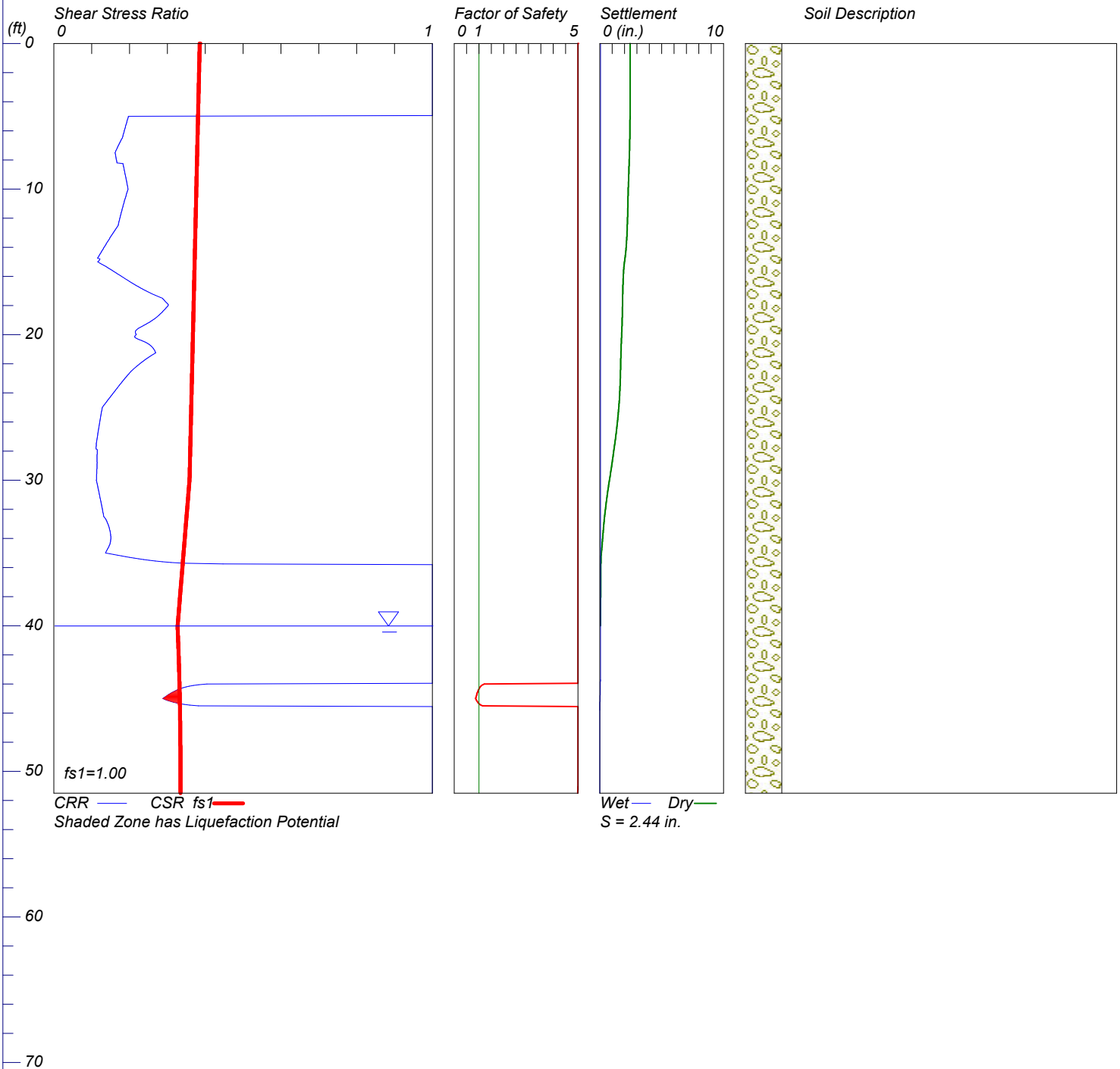
% passing #200 equal 101 is non-liquefiable

LIQUEFACTION ANALYSIS

FF/Santa Ana

Hole No.=B-LGC-1 Water Depth=40 ft Surface Elev.=148

Magnitude=7.71
Acceleration=0.593g



B-LGC-1.sum

LIQUEFACTION ANALYSIS CALCULATION SHEET

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Input File Name: \\DC1\Public2\FINAL PROJECTS\FAIRFIELD DEVELOPMENT\Santa
Ana\Liquefaction\B-LGC-1.liq
Title: FF/Santa Ana
Subtitle: 213031-01

Surface Elev.=148
Hole No.=B-LGC-1
Depth of Hole= 51.5 ft
Water Table during Earthquake= 40.0 ft
Water Table during In-Situ Testing= 51.5 ft
Max. Acceleration= 0.59 g
Earthquake Magnitude= 7.7

Input Data:

Surface Elev.=148
Hole No.=B-LGC-1
Depth of Hole=51.5 ft
Water Table during Earthquake= 40.0 ft
Water Table during In-Situ Testing= 51.5 ft
Max. Acceleration=0.59 g
Earthquake Magnitude=7.7

Earthquake Magnitude=7.7

2. Settlement Analysis Method: Tokimatsu / Seed
3. Fines Correction for Liquefaction: Idriss/Seed (SPT only)
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio,
7. Borehole Diameter,
8. Sampling Method,
9. User request factor of safety (apply to CSR) , User= 1.0
Plot one CSR curve (fs1=User)
10. Use Curve Smoothing: Yes*

Ce = 1.3
Cb= 1
Cs= 1

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.0	0.0	107.0	NoLiq
5.0	7.3	107.0	42.8
7.5	6.0	107.0	42.8
10.0	8.0	107.0	68.1
12.5	7.3	107.0	68.1
15.0	4.0	107.0	34.0
17.5	14.0	107.0	42.8
20.0	18.0	107.0	2.5
22.5	11.3	107.0	68.1
25.0	6.0	107.0	68.1

			B-LGC-1.sum
27.5	5.0	107.0	68.1
30.0	5.0	107.0	68.1
32.5	7.0	107.0	37.3
35.0	14.0	107.0	8.6
37.5	71.0	107.0	8.6
40.0	35.0	107.0	8.6
42.5	38.0	107.0	8.6
45.0	32.0	107.0	8.6
47.5	28.0	107.0	42.8
50.0	43.0	107.0	8.6
51.5	43.0	107.0	8.6

Output Results:

Settlement of saturated sands=0.05 in.

Settlement of dry sands=2.39 in.

Total settlement of saturated and dry sands=2.44 in.

Differential Settlement=1.222 to 1.613 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	2.00	0.39	5.00	0.05	2.39	2.44
0.05	2.00	0.39	5.00	0.05	2.39	2.44
0.10	2.00	0.39	5.00	0.05	2.39	2.44
0.15	2.00	0.39	5.00	0.05	2.39	2.44
0.20	2.00	0.39	5.00	0.05	2.39	2.44
0.25	2.00	0.39	5.00	0.05	2.39	2.44
0.30	2.00	0.39	5.00	0.05	2.39	2.44
0.35	2.00	0.39	5.00	0.05	2.39	2.44
0.40	2.00	0.39	5.00	0.05	2.39	2.44
0.45	2.00	0.39	5.00	0.05	2.39	2.44
0.50	2.00	0.39	5.00	0.05	2.39	2.44
0.55	2.00	0.38	5.00	0.05	2.39	2.44
0.60	2.00	0.38	5.00	0.05	2.39	2.44
0.65	2.00	0.38	5.00	0.05	2.39	2.44
0.70	2.00	0.38	5.00	0.05	2.39	2.44
0.75	2.00	0.38	5.00	0.05	2.39	2.44
0.80	2.00	0.38	5.00	0.05	2.39	2.44
0.85	2.00	0.38	5.00	0.05	2.39	2.44
0.90	2.00	0.38	5.00	0.05	2.39	2.44
0.95	2.00	0.38	5.00	0.05	2.39	2.44
1.00	2.00	0.38	5.00	0.05	2.39	2.44
1.05	2.00	0.38	5.00	0.05	2.39	2.44
1.10	2.00	0.38	5.00	0.05	2.39	2.44
1.15	2.00	0.38	5.00	0.05	2.39	2.44
1.20	2.00	0.38	5.00	0.05	2.39	2.44
1.25	2.00	0.38	5.00	0.05	2.39	2.44
1.30	2.00	0.38	5.00	0.05	2.39	2.44
1.35	2.00	0.38	5.00	0.05	2.39	2.44
1.40	2.00	0.38	5.00	0.05	2.39	2.44
1.45	2.00	0.38	5.00	0.05	2.39	2.44
1.50	2.00	0.38	5.00	0.05	2.39	2.44
1.55	2.00	0.38	5.00	0.05	2.39	2.44
1.60	2.00	0.38	5.00	0.05	2.39	2.44
1.65	2.00	0.38	5.00	0.05	2.39	2.44
1.70	2.00	0.38	5.00	0.05	2.39	2.44
1.75	2.00	0.38	5.00	0.05	2.39	2.44
1.80	2.00	0.38	5.00	0.05	2.39	2.44
1.85	2.00	0.38	5.00	0.05	2.39	2.44
1.90	2.00	0.38	5.00	0.05	2.39	2.44
1.95	2.00	0.38	5.00	0.05	2.39	2.44
2.00	2.00	0.38	5.00	0.05	2.39	2.44

B-LGC-1.sum

[illegible]

				B-LGC-1. sum		
5.20	0.19	0.38	5.00	0.05	2.39	2.44
5.25	0.19	0.38	5.00	0.05	2.39	2.44
5.30	0.19	0.38	5.00	0.05	2.39	2.44
5.35	0.19	0.38	5.00	0.05	2.39	2.44
5.40	0.19	0.38	5.00	0.05	2.39	2.44
5.45	0.19	0.38	5.00	0.05	2.39	2.44
5.50	0.19	0.38	5.00	0.05	2.39	2.44
5.55	0.19	0.38	5.00	0.05	2.39	2.44
5.60	0.19	0.38	5.00	0.05	2.39	2.44
5.65	0.19	0.38	5.00	0.05	2.39	2.44
5.70	0.19	0.38	5.00	0.05	2.38	2.44
5.75	0.19	0.38	5.00	0.05	2.38	2.43
5.80	0.19	0.38	5.00	0.05	2.38	2.43
5.85	0.19	0.38	5.00	0.05	2.38	2.43
5.90	0.19	0.38	5.00	0.05	2.38	2.43
5.95	0.19	0.38	5.00	0.05	2.38	2.43
6.00	0.19	0.38	5.00	0.05	2.38	2.43
6.05	0.19	0.38	5.00	0.05	2.38	2.43
6.10	0.19	0.38	5.00	0.05	2.38	2.43
6.15	0.18	0.38	5.00	0.05	2.38	2.43
6.20	0.18	0.38	5.00	0.05	2.38	2.43
6.25	0.18	0.38	5.00	0.05	2.38	2.43
6.30	0.18	0.38	5.00	0.05	2.38	2.43
6.35	0.18	0.38	5.00	0.05	2.37	2.43
6.40	0.18	0.38	5.00	0.05	2.37	2.43
6.45	0.18	0.38	5.00	0.05	2.37	2.42
6.50	0.18	0.38	5.00	0.05	2.37	2.42
6.55	0.18	0.38	5.00	0.05	2.37	2.42
6.60	0.18	0.38	5.00	0.05	2.37	2.42
6.65	0.18	0.38	5.00	0.05	2.37	2.42
6.70	0.18	0.38	5.00	0.05	2.37	2.42
6.75	0.18	0.38	5.00	0.05	2.37	2.42
6.80	0.17	0.38	5.00	0.05	2.37	2.42
6.85	0.17	0.38	5.00	0.05	2.37	2.42
6.90	0.17	0.38	5.00	0.05	2.36	2.42
6.95	0.17	0.38	5.00	0.05	2.36	2.41
7.00	0.17	0.38	5.00	0.05	2.36	2.41
7.05	0.17	0.38	5.00	0.05	2.36	2.41
7.10	0.17	0.38	5.00	0.05	2.36	2.41
7.15	0.17	0.38	5.00	0.05	2.36	2.41
7.20	0.17	0.38	5.00	0.05	2.36	2.41
7.25	0.17	0.38	5.00	0.05	2.36	2.41
7.30	0.17	0.38	5.00	0.05	2.35	2.41
7.35	0.16	0.38	5.00	0.05	2.35	2.40
7.40	0.16	0.38	5.00	0.05	2.35	2.40
7.45	0.16	0.38	5.00	0.05	2.35	2.40
7.50	0.16	0.38	5.00	0.05	2.35	2.40
7.55	0.16	0.38	5.00	0.05	2.35	2.40
7.60	0.16	0.38	5.00	0.05	2.34	2.39
7.65	0.16	0.38	5.00	0.05	2.34	2.39
7.70	0.16	0.38	5.00	0.05	2.34	2.39
7.75	0.16	0.38	5.00	0.05	2.34	2.39
7.80	0.16	0.38	5.00	0.05	2.34	2.39
7.85	0.16	0.38	5.00	0.05	2.33	2.39
7.90	0.16	0.38	5.00	0.05	2.33	2.38
7.95	0.17	0.38	5.00	0.05	2.33	2.38
8.00	0.17	0.38	5.00	0.05	2.33	2.38
8.05	0.17	0.38	5.00	0.05	2.33	2.38
8.10	0.17	0.38	5.00	0.05	2.32	2.38
8.15	0.17	0.38	5.00	0.05	2.32	2.37
8.20	0.17	0.38	5.00	0.05	2.32	2.37
8.25	0.18	0.38	5.00	0.05	2.32	2.37
8.30	0.18	0.38	5.00	0.05	2.32	2.37

				B-LGC-1. sum		
8.35	0.18	0.38	5.00	0.05	2.31	2.37
8.40	0.18	0.38	5.00	0.05	2.31	2.36
8.45	0.18	0.38	5.00	0.05	2.31	2.36
8.50	0.18	0.38	5.00	0.05	2.31	2.36
8.55	0.18	0.38	5.00	0.05	2.31	2.36
8.60	0.19	0.38	5.00	0.05	2.31	2.36
8.65	0.19	0.38	5.00	0.05	2.30	2.36
8.70	0.19	0.38	5.00	0.05	2.30	2.35
8.75	0.19	0.38	5.00	0.05	2.30	2.35
8.80	0.19	0.38	5.00	0.05	2.30	2.35
8.85	0.19	0.38	5.00	0.05	2.30	2.35
8.90	0.19	0.38	5.00	0.05	2.30	2.35
8.95	0.19	0.38	5.00	0.05	2.29	2.34
9.00	0.19	0.38	5.00	0.05	2.29	2.34
9.05	0.19	0.38	5.00	0.05	2.29	2.34
9.10	0.19	0.38	5.00	0.05	2.29	2.34
9.15	0.19	0.38	5.00	0.05	2.29	2.34
9.20	0.19	0.38	5.00	0.05	2.28	2.33
9.25	0.19	0.38	5.00	0.05	2.28	2.33
9.30	0.19	0.38	5.00	0.05	2.28	2.33
9.35	0.19	0.38	5.00	0.05	2.28	2.33
9.40	0.19	0.38	5.00	0.05	2.28	2.33
9.45	0.19	0.38	5.00	0.05	2.27	2.32
9.50	0.19	0.38	5.00	0.05	2.27	2.32
9.55	0.19	0.38	5.00	0.05	2.27	2.32
9.60	0.19	0.38	5.00	0.05	2.27	2.32
9.65	0.19	0.38	5.00	0.05	2.26	2.32
9.70	0.19	0.38	5.00	0.05	2.26	2.31
9.75	0.19	0.38	5.00	0.05	2.26	2.31
9.80	0.19	0.38	5.00	0.05	2.26	2.31
9.85	0.20	0.38	5.00	0.05	2.25	2.31
9.90	0.20	0.38	5.00	0.05	2.25	2.30
9.95	0.20	0.38	5.00	0.05	2.25	2.30
10.00	0.20	0.38	5.00	0.05	2.25	2.30
10.05	0.20	0.38	5.00	0.05	2.24	2.30
10.10	0.19	0.38	5.00	0.05	2.24	2.29
10.15	0.19	0.38	5.00	0.05	2.24	2.29
10.20	0.19	0.38	5.00	0.05	2.24	2.29
10.25	0.19	0.38	5.00	0.05	2.24	2.29
10.30	0.19	0.38	5.00	0.05	2.24	2.29
10.35	0.19	0.38	5.00	0.05	2.24	2.29
10.40	0.19	0.38	5.00	0.05	2.24	2.29
10.45	0.19	0.38	5.00	0.05	2.23	2.29
10.50	0.19	0.38	5.00	0.05	2.23	2.28
10.55	0.19	0.38	5.00	0.05	2.23	2.28
10.60	0.19	0.38	5.00	0.05	2.23	2.28
10.65	0.19	0.38	5.00	0.05	2.23	2.28
10.70	0.19	0.38	5.00	0.05	2.23	2.28
10.75	0.19	0.38	5.00	0.05	2.23	2.28
10.80	0.19	0.38	5.00	0.05	2.23	2.28
10.85	0.19	0.38	5.00	0.05	2.22	2.28
10.90	0.19	0.38	5.00	0.05	2.22	2.27
10.95	0.19	0.38	5.00	0.05	2.22	2.27
11.00	0.18	0.38	5.00	0.05	2.22	2.27
11.05	0.18	0.38	5.00	0.05	2.22	2.27
11.10	0.18	0.38	5.00	0.05	2.22	2.27
11.15	0.18	0.38	5.00	0.05	2.22	2.27
11.20	0.18	0.38	5.00	0.05	2.22	2.27
11.25	0.18	0.38	5.00	0.05	2.21	2.27
11.30	0.18	0.38	5.00	0.05	2.21	2.26
11.35	0.18	0.38	5.00	0.05	2.21	2.26
11.40	0.18	0.38	5.00	0.05	2.21	2.26
11.45	0.18	0.38	5.00	0.05	2.21	2.26

B-LGC-1. sum						
11.50	0.18	0.38	5.00	0.05	2.21	2.26
11.55	0.18	0.38	5.00	0.05	2.21	2.26
11.60	0.18	0.38	5.00	0.05	2.20	2.25
11.65	0.18	0.37	5.00	0.05	2.20	2.25
11.70	0.18	0.37	5.00	0.05	2.20	2.25
11.75	0.18	0.37	5.00	0.05	2.20	2.25
11.80	0.18	0.37	5.00	0.05	2.20	2.25
11.85	0.18	0.37	5.00	0.05	2.20	2.25
11.90	0.18	0.37	5.00	0.05	2.19	2.25
11.95	0.17	0.37	5.00	0.05	2.19	2.24
12.00	0.17	0.37	5.00	0.05	2.19	2.24
12.05	0.17	0.37	5.00	0.05	2.19	2.24
12.10	0.17	0.37	5.00	0.05	2.19	2.24
12.15	0.17	0.37	5.00	0.05	2.19	2.24
12.20	0.17	0.37	5.00	0.05	2.18	2.23
12.25	0.17	0.37	5.00	0.05	2.18	2.23
12.30	0.17	0.37	5.00	0.05	2.18	2.23
12.35	0.17	0.37	5.00	0.05	2.18	2.23
12.40	0.17	0.37	5.00	0.05	2.18	2.23
12.45	0.17	0.37	5.00	0.05	2.17	2.23
12.50	0.17	0.37	5.00	0.05	2.17	2.22
12.55	0.17	0.37	5.00	0.05	2.17	2.22
12.60	0.17	0.37	5.00	0.05	2.17	2.22
12.65	0.17	0.37	5.00	0.05	2.17	2.22
12.70	0.16	0.37	5.00	0.05	2.16	2.21
12.75	0.16	0.37	5.00	0.05	2.16	2.21
12.80	0.16	0.37	5.00	0.05	2.16	2.21
12.85	0.16	0.37	5.00	0.05	2.16	2.21
12.90	0.16	0.37	5.00	0.05	2.15	2.21
12.95	0.16	0.37	5.00	0.05	2.15	2.20
13.00	0.16	0.37	5.00	0.05	2.15	2.20
13.05	0.16	0.37	5.00	0.05	2.15	2.20
13.10	0.15	0.37	5.00	0.05	2.14	2.20
13.15	0.15	0.37	5.00	0.05	2.14	2.19
13.20	0.15	0.37	5.00	0.05	2.14	2.19
13.25	0.15	0.37	5.00	0.05	2.14	2.19
13.30	0.15	0.37	5.00	0.05	2.13	2.18
13.35	0.15	0.37	5.00	0.05	2.13	2.18
13.40	0.15	0.37	5.00	0.05	2.13	2.18
13.45	0.15	0.37	5.00	0.05	2.12	2.17
13.50	0.14	0.37	5.00	0.05	2.12	2.17
13.55	0.14	0.37	5.00	0.05	2.12	2.17
13.60	0.14	0.37	5.00	0.05	2.11	2.16
13.65	0.14	0.37	5.00	0.05	2.11	2.16
13.70	0.14	0.37	5.00	0.05	2.10	2.16
13.75	0.14	0.37	5.00	0.05	2.10	2.15
13.80	0.14	0.37	5.00	0.05	2.10	2.15
13.85	0.14	0.37	5.00	0.05	2.09	2.14
13.90	0.14	0.37	5.00	0.05	2.09	2.14
13.95	0.13	0.37	5.00	0.05	2.08	2.13
14.00	0.13	0.37	5.00	0.05	2.08	2.13
14.05	0.13	0.37	5.00	0.05	2.07	2.12
14.10	0.13	0.37	5.00	0.05	2.07	2.12
14.15	0.13	0.37	5.00	0.05	2.06	2.11
14.20	0.13	0.37	5.00	0.05	2.06	2.11
14.25	0.13	0.37	5.00	0.05	2.05	2.10
14.30	0.13	0.37	5.00	0.05	2.05	2.10
14.35	0.12	0.37	5.00	0.05	2.04	2.09
14.40	0.12	0.37	5.00	0.05	2.03	2.09
14.45	0.12	0.37	5.00	0.05	2.03	2.08
14.50	0.12	0.37	5.00	0.05	2.02	2.07
14.55	0.12	0.37	5.00	0.05	2.01	2.07
14.60	0.12	0.37	5.00	0.05	2.01	2.06

B-LGC-1. sum						
14.65	0.12	0.37	5.00	0.05	2.00	2.05
14.70	0.12	0.37	5.00	0.05	1.99	2.04
14.75	0.12	0.37	5.00	0.05	1.98	2.04
14.80	0.12	0.37	5.00	0.05	1.98	2.03
14.85	0.12	0.37	5.00	0.05	1.97	2.02
14.90	0.12	0.37	5.00	0.05	1.96	2.01
14.95	0.12	0.37	5.00	0.05	1.95	2.01
15.00	0.12	0.37	5.00	0.05	1.95	2.00
15.05	0.12	0.37	5.00	0.05	1.94	1.99
15.10	0.12	0.37	5.00	0.05	1.93	1.98
15.15	0.13	0.37	5.00	0.05	1.92	1.97
15.20	0.13	0.37	5.00	0.05	1.92	1.97
15.25	0.13	0.37	5.00	0.05	1.91	1.96
15.30	0.14	0.37	5.00	0.05	1.90	1.96
15.35	0.14	0.37	5.00	0.05	1.90	1.95
15.40	0.14	0.37	5.00	0.05	1.89	1.94
15.45	0.15	0.37	5.00	0.05	1.89	1.94
15.50	0.15	0.37	5.00	0.05	1.88	1.94
15.55	0.15	0.37	5.00	0.05	1.88	1.93
15.60	0.15	0.37	5.00	0.05	1.88	1.93
15.65	0.16	0.37	5.00	0.05	1.87	1.92
15.70	0.16	0.37	5.00	0.05	1.87	1.92
15.75	0.16	0.37	5.00	0.05	1.86	1.92
15.80	0.17	0.37	5.00	0.05	1.86	1.91
15.85	0.17	0.37	5.00	0.05	1.86	1.91
15.90	0.17	0.37	5.00	0.05	1.85	1.91
15.95	0.18	0.37	5.00	0.05	1.85	1.90
16.00	0.18	0.37	5.00	0.05	1.85	1.90
16.05	0.18	0.37	5.00	0.05	1.85	1.90
16.10	0.19	0.37	5.00	0.05	1.84	1.89
16.15	0.19	0.37	5.00	0.05	1.84	1.89
16.20	0.19	0.37	5.00	0.05	1.84	1.89
16.25	0.19	0.37	5.00	0.05	1.84	1.89
16.30	0.20	0.37	5.00	0.05	1.83	1.88
16.35	0.20	0.37	5.00	0.05	1.83	1.88
16.40	0.20	0.37	5.00	0.05	1.83	1.88
16.45	0.21	0.37	5.00	0.05	1.83	1.88
16.50	0.21	0.37	5.00	0.05	1.82	1.88
16.55	0.21	0.37	5.00	0.05	1.82	1.87
16.60	0.22	0.37	5.00	0.05	1.82	1.87
16.65	0.22	0.37	5.00	0.05	1.82	1.87
16.70	0.22	0.37	5.00	0.05	1.82	1.87
16.75	0.23	0.37	5.00	0.05	1.82	1.87
16.80	0.23	0.37	5.00	0.05	1.81	1.87
16.85	0.23	0.37	5.00	0.05	1.81	1.86
16.90	0.24	0.37	5.00	0.05	1.81	1.86
16.95	0.24	0.37	5.00	0.05	1.81	1.86
17.00	0.24	0.37	5.00	0.05	1.81	1.86
17.05	0.25	0.37	5.00	0.05	1.81	1.86
17.10	0.25	0.37	5.00	0.05	1.81	1.86
17.15	0.26	0.37	5.00	0.05	1.80	1.85
17.20	0.26	0.37	5.00	0.05	1.80	1.85
17.25	0.26	0.37	5.00	0.05	1.80	1.85
17.30	0.27	0.37	5.00	0.05	1.80	1.85
17.35	0.27	0.37	5.00	0.05	1.80	1.85
17.40	0.28	0.37	5.00	0.05	1.80	1.85
17.45	0.28	0.37	5.00	0.05	1.80	1.85
17.50	0.29	0.37	5.00	0.05	1.79	1.85
17.55	0.29	0.37	5.00	0.05	1.79	1.84
17.60	0.29	0.37	5.00	0.05	1.79	1.84
17.65	0.29	0.37	5.00	0.05	1.79	1.84
17.70	0.29	0.37	5.00	0.05	1.79	1.84
17.75	0.30	0.37	5.00	0.05	1.79	1.84

				B-LGC-1. sum		
17.80	0.30	0.37	5.00	0.05	1.79	1.84
17.85	0.30	0.37	5.00	0.05	1.79	1.84
17.90	0.30	0.37	5.00	0.05	1.79	1.84
17.95	0.30	0.37	5.00	0.05	1.78	1.84
18.00	0.30	0.37	5.00	0.05	1.78	1.83
18.05	0.30	0.37	5.00	0.05	1.78	1.83
18.10	0.30	0.37	5.00	0.05	1.78	1.83
18.15	0.30	0.37	5.00	0.05	1.78	1.83
18.20	0.30	0.37	5.00	0.05	1.78	1.83
18.25	0.29	0.37	5.00	0.05	1.78	1.83
18.30	0.29	0.37	5.00	0.05	1.78	1.83
18.35	0.29	0.37	5.00	0.05	1.78	1.83
18.40	0.29	0.37	5.00	0.05	1.77	1.83
18.45	0.29	0.37	5.00	0.05	1.77	1.82
18.50	0.28	0.37	5.00	0.05	1.77	1.82
18.55	0.28	0.37	5.00	0.05	1.77	1.82
18.60	0.28	0.37	5.00	0.05	1.77	1.82
18.65	0.28	0.37	5.00	0.05	1.77	1.82
18.70	0.28	0.37	5.00	0.05	1.77	1.82
18.75	0.27	0.37	5.00	0.05	1.77	1.82
18.80	0.27	0.37	5.00	0.05	1.76	1.81
18.85	0.27	0.37	5.00	0.05	1.76	1.81
18.90	0.27	0.37	5.00	0.05	1.76	1.81
18.95	0.26	0.37	5.00	0.05	1.76	1.81
19.00	0.26	0.37	5.00	0.05	1.76	1.81
19.05	0.26	0.37	5.00	0.05	1.76	1.81
19.10	0.26	0.37	5.00	0.05	1.75	1.81
19.15	0.25	0.37	5.00	0.05	1.75	1.80
19.20	0.25	0.37	5.00	0.05	1.75	1.80
19.25	0.25	0.37	5.00	0.05	1.75	1.80
19.30	0.24	0.37	5.00	0.05	1.75	1.80
19.35	0.24	0.37	5.00	0.05	1.75	1.80
19.40	0.24	0.37	5.00	0.05	1.74	1.79
19.45	0.23	0.37	5.00	0.05	1.74	1.79
19.50	0.23	0.37	5.00	0.05	1.74	1.79
19.55	0.22	0.37	5.00	0.05	1.74	1.79
19.60	0.22	0.37	5.00	0.05	1.74	1.79
19.65	0.22	0.37	5.00	0.05	1.73	1.78
19.70	0.22	0.37	5.00	0.05	1.73	1.78
19.75	0.22	0.37	5.00	0.05	1.73	1.78
19.80	0.22	0.37	5.00	0.05	1.73	1.78
19.85	0.22	0.37	5.00	0.05	1.72	1.77
19.90	0.22	0.37	5.00	0.05	1.72	1.77
19.95	0.22	0.37	5.00	0.05	1.72	1.77
20.00	0.22	0.37	5.00	0.05	1.71	1.77
20.05	0.22	0.37	5.00	0.05	1.71	1.76
20.10	0.21	0.37	5.00	0.05	1.71	1.76
20.15	0.21	0.37	5.00	0.05	1.71	1.76
20.20	0.21	0.37	5.00	0.05	1.70	1.75
20.25	0.22	0.37	5.00	0.05	1.70	1.75
20.30	0.22	0.37	5.00	0.05	1.70	1.75
20.35	0.23	0.37	5.00	0.05	1.70	1.75
20.40	0.23	0.37	5.00	0.05	1.69	1.74
20.45	0.24	0.37	5.00	0.05	1.69	1.74
20.50	0.24	0.37	5.00	0.05	1.69	1.74
20.55	0.24	0.37	5.00	0.05	1.69	1.74
20.60	0.25	0.37	5.00	0.05	1.68	1.74
20.65	0.25	0.37	5.00	0.05	1.68	1.73
20.70	0.25	0.37	5.00	0.05	1.68	1.73
20.75	0.26	0.37	5.00	0.05	1.68	1.73
20.80	0.26	0.37	5.00	0.05	1.68	1.73
20.85	0.26	0.37	5.00	0.05	1.67	1.73
20.90	0.26	0.37	5.00	0.05	1.67	1.72

				B-LGC-1. sum		
20.95	0.26	0.37	5.00	0.05	1.67	1.72
21.00	0.26	0.37	5.00	0.05	1.67	1.72
21.05	0.27	0.37	5.00	0.05	1.67	1.72
21.10	0.27	0.37	5.00	0.05	1.67	1.72
21.15	0.27	0.37	5.00	0.05	1.66	1.71
21.20	0.27	0.37	5.00	0.05	1.66	1.71
21.25	0.27	0.37	5.00	0.05	1.66	1.71
21.30	0.27	0.37	5.00	0.05	1.66	1.71
21.35	0.26	0.37	5.00	0.05	1.66	1.71
21.40	0.26	0.37	5.00	0.05	1.65	1.71
21.45	0.26	0.37	5.00	0.05	1.65	1.70
21.50	0.25	0.37	5.00	0.05	1.65	1.70
21.55	0.25	0.37	5.00	0.05	1.65	1.70
21.60	0.25	0.37	5.00	0.05	1.65	1.70
21.65	0.25	0.37	5.00	0.05	1.65	1.70
21.70	0.24	0.37	5.00	0.05	1.64	1.69
21.75	0.24	0.37	5.00	0.05	1.64	1.69
21.80	0.24	0.37	5.00	0.05	1.64	1.69
21.85	0.23	0.37	5.00	0.05	1.64	1.69
21.90	0.23	0.37	5.00	0.05	1.64	1.69
21.95	0.23	0.37	5.00	0.05	1.64	1.69
22.00	0.23	0.37	5.00	0.05	1.64	1.69
22.05	0.22	0.37	5.00	0.05	1.64	1.69
22.10	0.22	0.37	5.00	0.05	1.63	1.69
22.15	0.22	0.37	5.00	0.05	1.63	1.68
22.20	0.22	0.37	5.00	0.05	1.63	1.68
22.25	0.22	0.37	5.00	0.05	1.63	1.68
22.30	0.21	0.37	5.00	0.05	1.63	1.68
22.35	0.21	0.37	5.00	0.05	1.63	1.68
22.40	0.21	0.37	5.00	0.05	1.63	1.68
22.45	0.21	0.37	5.00	0.05	1.63	1.68
22.50	0.20	0.37	5.00	0.05	1.62	1.67
22.55	0.20	0.37	5.00	0.05	1.62	1.67
22.60	0.20	0.37	5.00	0.05	1.62	1.67
22.65	0.20	0.37	5.00	0.05	1.62	1.67
22.70	0.20	0.37	5.00	0.05	1.62	1.67
22.75	0.20	0.37	5.00	0.05	1.62	1.67
22.80	0.19	0.36	5.00	0.05	1.61	1.67
22.85	0.19	0.36	5.00	0.05	1.61	1.66
22.90	0.19	0.36	5.00	0.05	1.61	1.66
22.95	0.19	0.36	5.00	0.05	1.61	1.66
23.00	0.19	0.36	5.00	0.05	1.61	1.66
23.05	0.19	0.36	5.00	0.05	1.61	1.66
23.10	0.18	0.36	5.00	0.05	1.60	1.65
23.15	0.18	0.36	5.00	0.05	1.60	1.65
23.20	0.18	0.36	5.00	0.05	1.60	1.65
23.25	0.18	0.36	5.00	0.05	1.60	1.65
23.30	0.18	0.36	5.00	0.05	1.60	1.65
23.35	0.18	0.36	5.00	0.05	1.59	1.64
23.40	0.18	0.36	5.00	0.05	1.59	1.64
23.45	0.17	0.36	5.00	0.05	1.59	1.64
23.50	0.17	0.36	5.00	0.05	1.59	1.64
23.55	0.17	0.36	5.00	0.05	1.58	1.64
23.60	0.17	0.36	5.00	0.05	1.58	1.63
23.65	0.17	0.36	5.00	0.05	1.58	1.63
23.70	0.17	0.36	5.00	0.05	1.58	1.63
23.75	0.16	0.36	5.00	0.05	1.57	1.63
23.80	0.16	0.36	5.00	0.05	1.57	1.62
23.85	0.16	0.36	5.00	0.05	1.57	1.62
23.90	0.16	0.36	5.00	0.05	1.57	1.62
23.95	0.16	0.36	5.00	0.05	1.56	1.61
24.00	0.16	0.36	5.00	0.05	1.56	1.61
24.05	0.16	0.36	5.00	0.05	1.56	1.61

				B-LGC-1. sum		
24.10	0.15	0.36	5.00	0.05	1.56	1.61
24.15	0.15	0.36	5.00	0.05	1.55	1.60
24.20	0.15	0.36	5.00	0.05	1.55	1.60
24.25	0.15	0.36	5.00	0.05	1.55	1.60
24.30	0.15	0.36	5.00	0.05	1.54	1.59
24.35	0.15	0.36	5.00	0.05	1.54	1.59
24.40	0.15	0.36	5.00	0.05	1.54	1.59
24.45	0.14	0.36	5.00	0.05	1.53	1.58
24.50	0.14	0.36	5.00	0.05	1.53	1.58
24.55	0.14	0.36	5.00	0.05	1.52	1.57
24.60	0.14	0.36	5.00	0.05	1.52	1.57
24.65	0.14	0.36	5.00	0.05	1.52	1.57
24.70	0.14	0.36	5.00	0.05	1.51	1.56
24.75	0.14	0.36	5.00	0.05	1.51	1.56
24.80	0.13	0.36	5.00	0.05	1.50	1.55
24.85	0.13	0.36	5.00	0.05	1.50	1.55
24.90	0.13	0.36	5.00	0.05	1.49	1.54
24.95	0.13	0.36	5.00	0.05	1.49	1.54
25.00	0.13	0.36	5.00	0.05	1.48	1.53
25.05	0.13	0.36	5.00	0.05	1.48	1.53
25.10	0.13	0.36	5.00	0.05	1.47	1.52
25.15	0.13	0.36	5.00	0.05	1.47	1.52
25.20	0.13	0.36	5.00	0.05	1.46	1.51
25.25	0.13	0.36	5.00	0.05	1.46	1.51
25.30	0.13	0.36	5.00	0.05	1.45	1.50
25.35	0.13	0.36	5.00	0.05	1.45	1.50
25.40	0.13	0.36	5.00	0.05	1.44	1.49
25.45	0.12	0.36	5.00	0.05	1.44	1.49
25.50	0.12	0.36	5.00	0.05	1.43	1.48
25.55	0.12	0.36	5.00	0.05	1.43	1.48
25.60	0.12	0.36	5.00	0.05	1.42	1.47
25.65	0.12	0.36	5.00	0.05	1.41	1.46
25.70	0.12	0.36	5.00	0.05	1.41	1.46
25.75	0.12	0.36	5.00	0.05	1.40	1.45
25.80	0.12	0.36	5.00	0.05	1.40	1.45
25.85	0.12	0.36	5.00	0.05	1.39	1.44
25.90	0.12	0.36	5.00	0.05	1.38	1.44
25.95	0.12	0.36	5.00	0.05	1.38	1.43
26.00	0.12	0.36	5.00	0.05	1.37	1.42
26.05	0.12	0.36	5.00	0.05	1.37	1.42
26.10	0.12	0.36	5.00	0.05	1.36	1.41
26.15	0.12	0.36	5.00	0.05	1.35	1.40
26.20	0.12	0.36	5.00	0.05	1.35	1.40
26.25	0.12	0.36	5.00	0.05	1.34	1.39
26.30	0.12	0.36	5.00	0.05	1.33	1.39
26.35	0.12	0.36	5.00	0.05	1.33	1.38
26.40	0.12	0.36	5.00	0.05	1.32	1.37
26.45	0.12	0.36	5.00	0.05	1.31	1.37
26.50	0.12	0.36	5.00	0.05	1.31	1.36
26.55	0.12	0.36	5.00	0.05	1.30	1.35
26.60	0.12	0.36	5.00	0.05	1.29	1.35
26.65	0.12	0.36	5.00	0.05	1.29	1.34
26.70	0.12	0.36	5.00	0.05	1.28	1.33
26.75	0.12	0.36	5.00	0.05	1.27	1.32
26.80	0.12	0.36	5.00	0.05	1.27	1.32
26.85	0.12	0.36	5.00	0.05	1.26	1.31
26.90	0.12	0.36	5.00	0.05	1.25	1.30
26.95	0.12	0.36	5.00	0.05	1.24	1.30
27.00	0.12	0.36	5.00	0.05	1.24	1.29
27.05	0.11	0.36	5.00	0.05	1.23	1.28
27.10	0.11	0.36	5.00	0.05	1.22	1.27
27.15	0.11	0.36	5.00	0.05	1.21	1.27
27.20	0.11	0.36	5.00	0.05	1.21	1.26

				B-LGC-1.sum		
27.25	0.11	0.36	5.00	0.05	1.20	1.25
27.30	0.11	0.36	5.00	0.05	1.19	1.24
27.35	0.11	0.36	5.00	0.05	1.18	1.23
27.40	0.11	0.36	5.00	0.05	1.18	1.23
27.45	0.11	0.36	5.00	0.05	1.17	1.22
27.50	0.11	0.36	5.00	0.05	1.16	1.21
27.55	0.11	0.36	5.00	0.05	1.15	1.20
27.60	0.11	0.36	5.00	0.05	1.14	1.19
27.65	0.11	0.36	5.00	0.05	1.13	1.18
27.70	0.11	0.36	5.00	0.05	1.13	1.18
27.75	0.11	0.36	5.00	0.05	1.12	1.17
27.80	0.11	0.36	5.00	0.05	1.11	1.16
27.85	0.11	0.36	5.00	0.05	1.10	1.15
27.90	0.11	0.36	5.00	0.05	1.09	1.14
27.95	0.11	0.36	5.00	0.05	1.08	1.13
28.00	0.11	0.36	5.00	0.05	1.08	1.13
28.05	0.11	0.36	5.00	0.05	1.07	1.12
28.10	0.11	0.36	5.00	0.05	1.06	1.11
28.15	0.11	0.36	5.00	0.05	1.05	1.10
28.20	0.11	0.36	5.00	0.05	1.04	1.09
28.25	0.11	0.36	5.00	0.05	1.04	1.09
28.30	0.11	0.36	5.00	0.05	1.03	1.08
28.35	0.11	0.36	5.00	0.05	1.02	1.07
28.40	0.11	0.36	5.00	0.05	1.01	1.06
28.45	0.11	0.36	5.00	0.05	1.00	1.05
28.50	0.11	0.36	5.00	0.05	0.99	1.05
28.55	0.11	0.36	5.00	0.05	0.99	1.04
28.60	0.11	0.36	5.00	0.05	0.98	1.03
28.65	0.11	0.36	5.00	0.05	0.97	1.02
28.70	0.11	0.36	5.00	0.05	0.96	1.01
28.75	0.11	0.36	5.00	0.05	0.95	1.00
28.80	0.11	0.36	5.00	0.05	0.94	0.99
28.85	0.11	0.36	5.00	0.05	0.94	0.99
28.90	0.11	0.36	5.00	0.05	0.93	0.98
28.95	0.11	0.36	5.00	0.05	0.92	0.97
29.00	0.11	0.36	5.00	0.05	0.91	0.96
29.05	0.11	0.36	5.00	0.05	0.90	0.95
29.10	0.11	0.36	5.00	0.05	0.89	0.94
29.15	0.11	0.36	5.00	0.05	0.88	0.93
29.20	0.11	0.36	5.00	0.05	0.87	0.93
29.25	0.11	0.36	5.00	0.05	0.87	0.92
29.30	0.11	0.36	5.00	0.05	0.86	0.91
29.35	0.11	0.36	5.00	0.05	0.85	0.90
29.40	0.11	0.36	5.00	0.05	0.84	0.89
29.45	0.11	0.36	5.00	0.05	0.83	0.88
29.50	0.11	0.36	5.00	0.05	0.82	0.87
29.55	0.11	0.36	5.00	0.05	0.81	0.86
29.60	0.11	0.36	5.00	0.05	0.80	0.85
29.65	0.11	0.36	5.00	0.05	0.79	0.84
29.70	0.11	0.36	5.00	0.05	0.78	0.83
29.75	0.11	0.36	5.00	0.05	0.77	0.83
29.80	0.11	0.36	5.00	0.05	0.77	0.82
29.85	0.11	0.36	5.00	0.05	0.76	0.81
29.90	0.11	0.36	5.00	0.05	0.75	0.80
29.95	0.11	0.36	5.00	0.05	0.74	0.79
30.00	0.11	0.36	5.00	0.05	0.73	0.78
30.05	0.11	0.36	5.00	0.05	0.72	0.77
30.10	0.11	0.36	5.00	0.05	0.71	0.76
30.15	0.11	0.36	5.00	0.05	0.70	0.75
30.20	0.11	0.36	5.00	0.05	0.69	0.74
30.25	0.11	0.36	5.00	0.05	0.68	0.73
30.30	0.11	0.36	5.00	0.05	0.67	0.72
30.35	0.12	0.36	5.00	0.05	0.66	0.71

B-LGC-1.sum						
30.40	0.12	0.36	5.00	0.05	0.65	0.71
30.45	0.12	0.36	5.00	0.05	0.65	0.70
30.50	0.12	0.36	5.00	0.05	0.64	0.69
30.55	0.12	0.36	5.00	0.05	0.63	0.68
30.60	0.12	0.36	5.00	0.05	0.62	0.67
30.65	0.12	0.36	5.00	0.05	0.61	0.66
30.70	0.12	0.36	5.00	0.05	0.60	0.65
30.75	0.12	0.36	5.00	0.05	0.59	0.65
30.80	0.12	0.36	5.00	0.05	0.59	0.64
30.85	0.12	0.36	5.00	0.05	0.58	0.63
30.90	0.12	0.36	5.00	0.05	0.57	0.62
30.95	0.12	0.36	5.00	0.05	0.56	0.61
31.00	0.12	0.36	5.00	0.05	0.55	0.60
31.05	0.12	0.36	5.00	0.05	0.54	0.60
31.10	0.12	0.35	5.00	0.05	0.54	0.59
31.15	0.12	0.35	5.00	0.05	0.53	0.58
31.20	0.12	0.35	5.00	0.05	0.52	0.57
31.25	0.12	0.35	5.00	0.05	0.51	0.56
31.30	0.12	0.35	5.00	0.05	0.51	0.56
31.35	0.12	0.35	5.00	0.05	0.50	0.55
31.40	0.12	0.35	5.00	0.05	0.49	0.54
31.45	0.12	0.35	5.00	0.05	0.48	0.53
31.50	0.12	0.35	5.00	0.05	0.48	0.53
31.55	0.12	0.35	5.00	0.05	0.47	0.52
31.60	0.13	0.35	5.00	0.05	0.46	0.51
31.65	0.13	0.35	5.00	0.05	0.45	0.50
31.70	0.13	0.35	5.00	0.05	0.45	0.50
31.75	0.13	0.35	5.00	0.05	0.44	0.49
31.80	0.13	0.35	5.00	0.05	0.43	0.48
31.85	0.13	0.35	5.00	0.05	0.42	0.48
31.90	0.13	0.35	5.00	0.05	0.42	0.47
31.95	0.13	0.35	5.00	0.05	0.41	0.46
32.00	0.13	0.35	5.00	0.05	0.40	0.45
32.05	0.13	0.35	5.00	0.05	0.40	0.45
32.10	0.13	0.35	5.00	0.05	0.39	0.44
32.15	0.13	0.35	5.00	0.05	0.38	0.43
32.20	0.13	0.35	5.00	0.05	0.38	0.43
32.25	0.13	0.35	5.00	0.05	0.37	0.42
32.30	0.13	0.35	5.00	0.05	0.36	0.41
32.35	0.13	0.35	5.00	0.05	0.36	0.41
32.40	0.13	0.35	5.00	0.05	0.35	0.40
32.45	0.13	0.35	5.00	0.05	0.34	0.39
32.50	0.13	0.35	5.00	0.05	0.34	0.39
32.55	0.13	0.35	5.00	0.05	0.33	0.38
32.60	0.14	0.35	5.00	0.05	0.32	0.37
32.65	0.14	0.35	5.00	0.05	0.32	0.37
32.70	0.14	0.35	5.00	0.05	0.31	0.36
32.75	0.14	0.35	5.00	0.05	0.31	0.36
32.80	0.14	0.35	5.00	0.05	0.30	0.35
32.85	0.14	0.35	5.00	0.05	0.29	0.34
32.90	0.14	0.35	5.00	0.05	0.29	0.34
32.95	0.14	0.35	5.00	0.05	0.28	0.33
33.00	0.14	0.35	5.00	0.05	0.28	0.33
33.05	0.14	0.35	5.00	0.05	0.27	0.32
33.10	0.14	0.35	5.00	0.05	0.27	0.32
33.15	0.14	0.35	5.00	0.05	0.26	0.31
33.20	0.15	0.35	5.00	0.05	0.26	0.31
33.25	0.15	0.35	5.00	0.05	0.25	0.30
33.30	0.15	0.35	5.00	0.05	0.25	0.30
33.35	0.15	0.35	5.00	0.05	0.24	0.29
33.40	0.15	0.35	5.00	0.05	0.24	0.29
33.45	0.15	0.35	5.00	0.05	0.23	0.28
33.50	0.15	0.35	5.00	0.05	0.23	0.28

B-LGC-1.sum						
33.55	0.15	0.35	5.00	0.05	0.22	0.27
33.60	0.15	0.35	5.00	0.05	0.22	0.27
33.65	0.15	0.35	5.00	0.05	0.21	0.26
33.70	0.15	0.35	5.00	0.05	0.21	0.26
33.75	0.15	0.35	5.00	0.05	0.20	0.25
33.80	0.15	0.35	5.00	0.05	0.20	0.25
33.85	0.15	0.35	5.00	0.05	0.19	0.24
33.90	0.15	0.35	5.00	0.05	0.19	0.24
33.95	0.15	0.35	5.00	0.05	0.18	0.23
34.00	0.15	0.35	5.00	0.05	0.18	0.23
34.05	0.15	0.35	5.00	0.05	0.17	0.22
34.10	0.15	0.35	5.00	0.05	0.17	0.22
34.15	0.15	0.35	5.00	0.05	0.16	0.22
34.20	0.15	0.35	5.00	0.05	0.16	0.21
34.25	0.15	0.35	5.00	0.05	0.15	0.21
34.30	0.15	0.34	5.00	0.05	0.15	0.20
34.35	0.15	0.34	5.00	0.05	0.15	0.20
34.40	0.15	0.34	5.00	0.05	0.14	0.19
34.45	0.15	0.34	5.00	0.05	0.14	0.19
34.50	0.15	0.34	5.00	0.05	0.13	0.18
34.55	0.15	0.34	5.00	0.05	0.13	0.18
34.60	0.14	0.34	5.00	0.05	0.12	0.17
34.65	0.14	0.34	5.00	0.05	0.12	0.17
34.70	0.14	0.34	5.00	0.05	0.11	0.16
34.75	0.14	0.34	5.00	0.05	0.10	0.16
34.80	0.14	0.34	5.00	0.05	0.10	0.15
34.85	0.14	0.34	5.00	0.05	0.09	0.14
34.90	0.14	0.34	5.00	0.05	0.09	0.14
34.95	0.14	0.34	5.00	0.05	0.08	0.13
35.00	0.14	0.34	5.00	0.05	0.08	0.13
35.05	0.15	0.34	5.00	0.05	0.07	0.12
35.10	0.16	0.34	5.00	0.05	0.06	0.12
35.15	0.17	0.34	5.00	0.05	0.06	0.11
35.20	0.18	0.34	5.00	0.05	0.06	0.11
35.25	0.19	0.34	5.00	0.05	0.05	0.10
35.30	0.20	0.34	5.00	0.05	0.05	0.10
35.35	0.21	0.34	5.00	0.05	0.05	0.10
35.40	0.22	0.34	5.00	0.05	0.05	0.10
35.45	0.24	0.34	5.00	0.05	0.04	0.10
35.50	0.25	0.34	5.00	0.05	0.04	0.09
35.55	0.27	0.34	5.00	0.05	0.04	0.09
35.60	0.29	0.34	5.00	0.05	0.04	0.09
35.65	0.31	0.34	5.00	0.05	0.04	0.09
35.70	0.34	0.34	5.00	0.05	0.04	0.09
35.75	0.45	0.34	5.00	0.05	0.04	0.09
35.80	1.80	0.34	5.00	0.05	0.04	0.09
35.85	1.80	0.34	5.00	0.05	0.03	0.09
35.90	1.80	0.34	5.00	0.05	0.03	0.08
35.95	1.80	0.34	5.00	0.05	0.03	0.08
36.00	1.80	0.34	5.00	0.05	0.03	0.08
36.05	1.80	0.34	5.00	0.05	0.03	0.08
36.10	1.80	0.34	5.00	0.05	0.03	0.08
36.15	1.80	0.34	5.00	0.05	0.03	0.08
36.20	1.80	0.34	5.00	0.05	0.03	0.08
36.25	1.80	0.34	5.00	0.05	0.03	0.08
36.30	1.80	0.34	5.00	0.05	0.03	0.08
36.35	1.80	0.34	5.00	0.05	0.03	0.08
36.40	1.80	0.34	5.00	0.05	0.03	0.08
36.45	1.80	0.34	5.00	0.05	0.03	0.08
36.50	1.80	0.34	5.00	0.05	0.03	0.08
36.55	1.80	0.34	5.00	0.05	0.03	0.08
36.60	1.80	0.34	5.00	0.05	0.03	0.08
36.65	1.80	0.34	5.00	0.05	0.03	0.08

				B-LGC-1.sum		
36.70	1.80	0.34	5.00	0.05	0.03	0.08
36.75	1.80	0.34	5.00	0.05	0.03	0.08
36.80	1.79	0.34	5.00	0.05	0.03	0.08
36.85	1.79	0.34	5.00	0.05	0.03	0.08
36.90	1.79	0.34	5.00	0.05	0.02	0.08
36.95	1.79	0.34	5.00	0.05	0.02	0.08
37.00	1.79	0.34	5.00	0.05	0.02	0.08
37.05	1.79	0.34	5.00	0.05	0.02	0.07
37.10	1.79	0.34	5.00	0.05	0.02	0.07
37.15	1.79	0.34	5.00	0.05	0.02	0.07
37.20	1.79	0.34	5.00	0.05	0.02	0.07
37.25	1.79	0.34	5.00	0.05	0.02	0.07
37.30	1.79	0.34	5.00	0.05	0.02	0.07
37.35	1.79	0.34	5.00	0.05	0.02	0.07
37.40	1.79	0.34	5.00	0.05	0.02	0.07
37.45	1.79	0.34	5.00	0.05	0.02	0.07
37.50	1.79	0.33	5.00	0.05	0.02	0.07
37.55	1.79	0.33	5.00	0.05	0.02	0.07
37.60	1.79	0.33	5.00	0.05	0.02	0.07
37.65	1.79	0.33	5.00	0.05	0.02	0.07
37.70	1.79	0.33	5.00	0.05	0.02	0.07
37.75	1.79	0.33	5.00	0.05	0.02	0.07
37.80	1.79	0.33	5.00	0.05	0.02	0.07
37.85	1.79	0.33	5.00	0.05	0.02	0.07
37.90	1.78	0.33	5.00	0.05	0.02	0.07
37.95	1.78	0.33	5.00	0.05	0.02	0.07
38.00	1.78	0.33	5.00	0.05	0.02	0.07
38.05	1.78	0.33	5.00	0.05	0.02	0.07
38.10	1.78	0.33	5.00	0.05	0.02	0.07
38.15	1.78	0.33	5.00	0.05	0.02	0.07
38.20	1.78	0.33	5.00	0.05	0.02	0.07
38.25	1.78	0.33	5.00	0.05	0.02	0.07
38.30	1.78	0.33	5.00	0.05	0.02	0.07
38.35	1.78	0.33	5.00	0.05	0.02	0.07
38.40	1.78	0.33	5.00	0.05	0.02	0.07
38.45	1.78	0.33	5.00	0.05	0.02	0.07
38.50	1.78	0.33	5.00	0.05	0.02	0.07
38.55	1.78	0.33	5.00	0.05	0.01	0.07
38.60	1.78	0.33	5.00	0.05	0.01	0.07
38.65	1.78	0.33	5.00	0.05	0.01	0.06
38.70	1.78	0.33	5.00	0.05	0.01	0.06
38.75	1.78	0.33	5.00	0.05	0.01	0.06
38.80	1.78	0.33	5.00	0.05	0.01	0.06
38.85	1.78	0.33	5.00	0.05	0.01	0.06
38.90	1.78	0.33	5.00	0.05	0.01	0.06
38.95	1.77	0.33	5.00	0.05	0.01	0.06
39.00	1.77	0.33	5.00	0.05	0.01	0.06
39.05	1.77	0.33	5.00	0.05	0.01	0.06
39.10	1.77	0.33	5.00	0.05	0.01	0.06
39.15	1.77	0.33	5.00	0.05	0.01	0.06
39.20	1.77	0.33	5.00	0.05	0.01	0.06
39.25	1.77	0.33	5.00	0.05	0.01	0.06
39.30	1.77	0.33	5.00	0.05	0.01	0.06
39.35	1.77	0.33	5.00	0.05	0.01	0.06
39.40	1.77	0.33	5.00	0.05	0.01	0.06
39.45	1.77	0.33	5.00	0.05	0.01	0.06
39.50	1.77	0.33	5.00	0.05	0.01	0.06
39.55	1.77	0.33	5.00	0.05	0.01	0.06
39.60	1.77	0.33	5.00	0.05	0.01	0.06
39.65	1.77	0.33	5.00	0.05	0.01	0.06
39.70	1.77	0.33	5.00	0.05	0.01	0.06
39.75	1.77	0.33	5.00	0.05	0.00	0.06
39.80	1.77	0.33	5.00	0.05	0.00	0.05

B-LGC-1.sum

[illegible]

				B-LGC-1. sum		
43.00	1.74	0.33	5.00	0.05	0.00	0.05
43.05	1.74	0.33	5.00	0.05	0.00	0.05
43.10	1.74	0.33	5.00	0.05	0.00	0.05
43.15	1.74	0.33	5.00	0.05	0.00	0.05
43.20	1.74	0.33	5.00	0.05	0.00	0.05
43.25	1.74	0.33	5.00	0.05	0.00	0.05
43.30	1.74	0.33	5.00	0.05	0.00	0.05
43.35	1.74	0.33	5.00	0.05	0.00	0.05
43.40	1.74	0.33	5.00	0.05	0.00	0.05
43.45	1.73	0.33	5.00	0.05	0.00	0.05
43.50	1.73	0.33	5.00	0.05	0.00	0.05
43.55	1.73	0.33	5.00	0.05	0.00	0.05
43.60	1.73	0.33	5.00	0.05	0.00	0.05
43.65	1.73	0.33	5.00	0.05	0.00	0.05
43.70	1.73	0.33	5.00	0.05	0.00	0.05
43.75	1.73	0.33	5.00	0.05	0.00	0.05
43.80	1.73	0.33	5.00	0.05	0.00	0.05
43.85	1.73	0.33	5.00	0.05	0.00	0.05
43.90	1.73	0.33	5.00	0.05	0.00	0.05
43.95	1.73	0.33	5.00	0.05	0.00	0.05
44.00	0.40	0.33	1.22	0.05	0.00	0.05
44.05	0.38	0.33	1.15	0.05	0.00	0.05
44.10	0.37	0.33	1.11	0.05	0.00	0.05
44.15	0.36	0.33	1.08	0.04	0.00	0.04
44.20	0.35	0.33	1.05	0.04	0.00	0.04
44.25	0.34	0.33	1.03	0.04	0.00	0.04
44.30	0.34	0.33	1.01	0.04	0.00	0.04
44.35	0.33	0.33	1.00*	0.04	0.00	0.04
44.40	0.33	0.33	0.98*	0.04	0.00	0.04
44.45	0.32	0.33	0.97*	0.04	0.00	0.04
44.50	0.32	0.33	0.96*	0.04	0.00	0.04
44.55	0.31	0.33	0.95*	0.04	0.00	0.04
44.60	0.31	0.33	0.94*	0.03	0.00	0.03
44.65	0.31	0.33	0.93*	0.03	0.00	0.03
44.70	0.30	0.33	0.92*	0.03	0.00	0.03
44.75	0.30	0.33	0.91*	0.03	0.00	0.03
44.80	0.30	0.33	0.90*	0.03	0.00	0.03
44.85	0.30	0.33	0.89*	0.03	0.00	0.03
44.90	0.29	0.33	0.88*	0.03	0.00	0.03
44.95	0.29	0.33	0.87*	0.02	0.00	0.02
45.00	0.29	0.33	0.87*	0.02	0.00	0.02
45.05	0.29	0.33	0.88*	0.02	0.00	0.02
45.10	0.30	0.33	0.89*	0.01	0.00	0.01
45.15	0.30	0.33	0.91*	0.01	0.00	0.01
45.20	0.31	0.33	0.93*	0.01	0.00	0.01
45.25	0.32	0.33	0.95*	0.01	0.00	0.01
45.30	0.32	0.33	0.97*	0.01	0.00	0.01
45.35	0.33	0.33	1.00*	0.01	0.00	0.01
45.40	0.34	0.33	1.03	0.01	0.00	0.01
45.45	0.36	0.33	1.08	0.01	0.00	0.01
45.50	0.38	0.33	1.15	0.00	0.00	0.00
45.55	1.72	0.33	5.00	0.00	0.00	0.00
45.60	1.72	0.33	5.00	0.00	0.00	0.00
45.65	1.72	0.33	5.00	0.00	0.00	0.00
45.70	1.72	0.33	5.00	0.00	0.00	0.00
45.75	1.72	0.33	5.00	0.00	0.00	0.00
45.80	1.71	0.33	5.00	0.00	0.00	0.00
45.85	1.71	0.33	5.00	0.00	0.00	0.00
45.90	1.71	0.33	5.00	0.00	0.00	0.00
45.95	1.71	0.33	5.00	0.00	0.00	0.00
46.00	1.71	0.33	5.00	0.00	0.00	0.00
46.05	1.71	0.33	5.00	0.00	0.00	0.00
46.10	1.71	0.33	5.00	0.00	0.00	0.00

B-LGC-1.sum

[illegible]

				B-LGC-1.sum		
49.30	1.69	0.33	5.00	0.00	0.00	0.00
49.35	1.69	0.33	5.00	0.00	0.00	0.00
49.40	1.69	0.33	5.00	0.00	0.00	0.00
49.45	1.69	0.33	5.00	0.00	0.00	0.00
49.50	1.68	0.33	5.00	0.00	0.00	0.00
49.55	1.68	0.33	5.00	0.00	0.00	0.00
49.60	1.68	0.33	5.00	0.00	0.00	0.00
49.65	1.68	0.33	5.00	0.00	0.00	0.00
49.70	1.68	0.33	5.00	0.00	0.00	0.00
49.75	1.68	0.33	5.00	0.00	0.00	0.00
49.80	1.68	0.33	5.00	0.00	0.00	0.00
49.85	1.68	0.33	5.00	0.00	0.00	0.00
49.90	1.68	0.33	5.00	0.00	0.00	0.00
49.95	1.68	0.33	5.00	0.00	0.00	0.00
50.00	1.68	0.33	5.00	0.00	0.00	0.00
50.05	1.68	0.33	5.00	0.00	0.00	0.00
50.10	1.68	0.33	5.00	0.00	0.00	0.00
50.15	1.68	0.33	5.00	0.00	0.00	0.00
50.20	1.68	0.33	5.00	0.00	0.00	0.00
50.25	1.68	0.33	5.00	0.00	0.00	0.00
50.30	1.68	0.33	5.00	0.00	0.00	0.00
50.35	1.68	0.33	5.00	0.00	0.00	0.00
50.40	1.68	0.33	5.00	0.00	0.00	0.00
50.45	1.68	0.33	5.00	0.00	0.00	0.00
50.50	1.68	0.33	5.00	0.00	0.00	0.00
50.55	1.68	0.33	5.00	0.00	0.00	0.00
50.60	1.68	0.33	5.00	0.00	0.00	0.00
50.65	1.68	0.33	5.00	0.00	0.00	0.00
50.70	1.68	0.33	5.00	0.00	0.00	0.00
50.75	1.67	0.33	5.00	0.00	0.00	0.00
50.80	1.67	0.33	5.00	0.00	0.00	0.00
50.85	1.67	0.33	5.00	0.00	0.00	0.00
50.90	1.67	0.33	5.00	0.00	0.00	0.00
50.95	1.67	0.33	5.00	0.00	0.00	0.00
51.00	1.67	0.33	5.00	0.00	0.00	0.00
51.05	1.67	0.33	5.00	0.00	0.00	0.00
51.10	1.67	0.33	5.00	0.00	0.00	0.00
51.15	1.67	0.33	5.00	0.00	0.00	0.00
51.20	1.67	0.33	5.00	0.00	0.00	0.00
51.25	1.67	0.33	5.00	0.00	0.00	0.00
51.30	1.67	0.33	5.00	0.00	0.00	0.00
51.35	1.67	0.33	4.99	0.00	0.00	0.00
51.40	1.67	0.33	4.99	0.00	0.00	0.00
51.45	1.67	0.33	4.99	0.00	0.00	0.00
51.50	1.67	0.33	4.99	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 Depth = ft, Stress or Pressure = tsf (atm), Unit Weight =
pcf, Settlement = in.

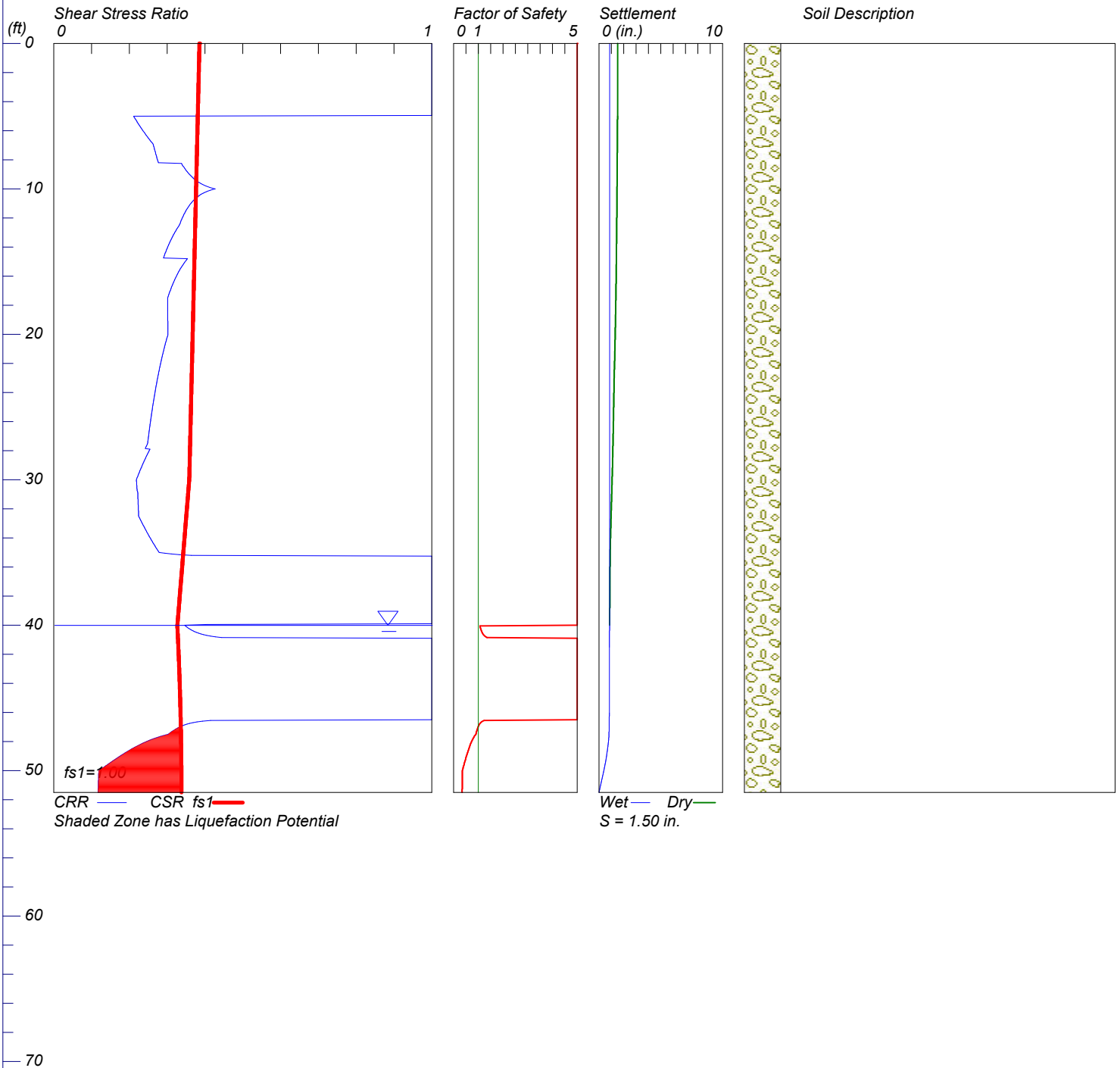
CRRm	Cyclic resistance ratio from soils
CSRfs	Cyclic stress ratio induced by a given earthquake (with user
request factor of safety)	
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRfs
S_sat	Settlement from saturated sands
S_dry	Settlement from dry sands
S_all	Total settlement from saturated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

LIQUEFACTION ANALYSIS

FF/Santa Ana

Hole No.=B-LGC-2 Water Depth=40 ft Surface Elev.=148

Magnitude=7.71
Acceleration=0.593g



LIQUEFACTION ANALYSIS CALCULATION SHEET

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Input File Name: \\DC1\Public2\FINAL PROJECTS\FAIRFIELD DEVELOPMENT\Santa
Ana\Liquefaction\B-LGC-2.liq
Title: FF/Santa Ana
Subtitle: 213031-01

Surface Elev.=148
Hole No.=B-LGC-2
Depth of Hole= 51.5 ft
Water Table during Earthquake= 40.0 ft
Water Table during In-Situ Testing= 51.5 ft
Max. Acceleration= 0.59 g
Earthquake Magnitude= 7.7

Input Data:

Surface Elev.=148
Hole No.=B-LGC-2
Depth of Hole=51.5 ft
Water Table during Earthquake= 40.0 ft
Water Table during In-Situ Testing= 51.5 ft
Max. Acceleration=0.59 g
Earthquake Magnitude=7.7

Earthquake Magnitude=7.7

2. Settlement Analysis Method: Tokimatsu / Seed
3. Fines Correction for Liquefaction: Idriss/Seed (SPT only)
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio,
7. Borehole Diameter,
8. Sampling Method,
9. User request factor of safety (apply to CSR) , User= 1.0
Plot one CSR curve (fs1=User)
10. Use Curve Smoothing: Yes*

Ce = 1.3
Cb= 1
Cs= 1

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.0	0.0	100.0	NoLiq
5.0	8.0	100.0	56.4
7.5	10.7	100.0	57.3
10.0	13.3	100.0	57.3
12.5	14.0	100.0	64.6
15.0	14.0	100.0	64.6
17.5	14.0	100.0	64.6
20.0	15.0	100.0	64.6
22.5	15.0	100.0	64.6
25.0	15.0	100.0	64.6

			B-LGC-2.sum
27.5	15.0	100.0	56.4
30.0	13.0	100.0	55.6
32.5	14.0	100.0	55.6
35.0	18.0	100.0	55.6
37.5	53.0	100.0	5.0
40.0	22.0	100.0	48.3
42.5	25.0	100.0	48.3
45.0	27.0	100.0	48.3
47.5	23.0	100.0	57.3
50.0	8.0	100.0	57.3
51.5	8.0	100.0	57.3

Output Results:

Settlement of saturated sands=0.86 in.

Settlement of dry sands=0.64 in.

Total settlement of saturated and dry sands=1.50 in.

Differential Settlement=0.751 to 0.991 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	2.00	0.39	5.00	0.86	0.64	1.50
0.05	2.00	0.39	5.00	0.86	0.64	1.50
0.10	2.00	0.39	5.00	0.86	0.64	1.50
0.15	2.00	0.39	5.00	0.86	0.64	1.50
0.20	2.00	0.39	5.00	0.86	0.64	1.50
0.25	2.00	0.39	5.00	0.86	0.64	1.50
0.30	2.00	0.39	5.00	0.86	0.64	1.50
0.35	2.00	0.39	5.00	0.86	0.64	1.50
0.40	2.00	0.39	5.00	0.86	0.64	1.50
0.45	2.00	0.39	5.00	0.86	0.64	1.50
0.50	2.00	0.39	5.00	0.86	0.64	1.50
0.55	2.00	0.38	5.00	0.86	0.64	1.50
0.60	2.00	0.38	5.00	0.86	0.64	1.50
0.65	2.00	0.38	5.00	0.86	0.64	1.50
0.70	2.00	0.38	5.00	0.86	0.64	1.50
0.75	2.00	0.38	5.00	0.86	0.64	1.50
0.80	2.00	0.38	5.00	0.86	0.64	1.50
0.85	2.00	0.38	5.00	0.86	0.64	1.50
0.90	2.00	0.38	5.00	0.86	0.64	1.50
0.95	2.00	0.38	5.00	0.86	0.64	1.50
1.00	2.00	0.38	5.00	0.86	0.64	1.50
1.05	2.00	0.38	5.00	0.86	0.64	1.50
1.10	2.00	0.38	5.00	0.86	0.64	1.50
1.15	2.00	0.38	5.00	0.86	0.64	1.50
1.20	2.00	0.38	5.00	0.86	0.64	1.50
1.25	2.00	0.38	5.00	0.86	0.64	1.50
1.30	2.00	0.38	5.00	0.86	0.64	1.50
1.35	2.00	0.38	5.00	0.86	0.64	1.50
1.40	2.00	0.38	5.00	0.86	0.64	1.50
1.45	2.00	0.38	5.00	0.86	0.64	1.50
1.50	2.00	0.38	5.00	0.86	0.64	1.50
1.55	2.00	0.38	5.00	0.86	0.64	1.50
1.60	2.00	0.38	5.00	0.86	0.64	1.50
1.65	2.00	0.38	5.00	0.86	0.64	1.50
1.70	2.00	0.38	5.00	0.86	0.64	1.50
1.75	2.00	0.38	5.00	0.86	0.64	1.50
1.80	2.00	0.38	5.00	0.86	0.64	1.50
1.85	2.00	0.38	5.00	0.86	0.64	1.50
1.90	2.00	0.38	5.00	0.86	0.64	1.50
1.95	2.00	0.38	5.00	0.86	0.64	1.50
2.00	2.00	0.38	5.00	0.86	0.64	1.50

B-LGC-2.sum

[illegible]

				B-LGC-2.sum		
5.20	0.22	0.38	5.00	0.86	0.64	1.50
5.25	0.22	0.38	5.00	0.86	0.64	1.50
5.30	0.22	0.38	5.00	0.86	0.64	1.50
5.35	0.22	0.38	5.00	0.86	0.64	1.50
5.40	0.22	0.38	5.00	0.86	0.64	1.50
5.45	0.22	0.38	5.00	0.86	0.64	1.50
5.50	0.22	0.38	5.00	0.86	0.64	1.50
5.55	0.22	0.38	5.00	0.86	0.64	1.50
5.60	0.23	0.38	5.00	0.86	0.64	1.50
5.65	0.23	0.38	5.00	0.86	0.64	1.50
5.70	0.23	0.38	5.00	0.86	0.64	1.50
5.75	0.23	0.38	5.00	0.86	0.64	1.50
5.80	0.23	0.38	5.00	0.86	0.64	1.49
5.85	0.23	0.38	5.00	0.86	0.64	1.49
5.90	0.23	0.38	5.00	0.86	0.64	1.49
5.95	0.23	0.38	5.00	0.86	0.63	1.49
6.00	0.24	0.38	5.00	0.86	0.63	1.49
6.05	0.24	0.38	5.00	0.86	0.63	1.49
6.10	0.24	0.38	5.00	0.86	0.63	1.49
6.15	0.24	0.38	5.00	0.86	0.63	1.49
6.20	0.24	0.38	5.00	0.86	0.63	1.49
6.25	0.24	0.38	5.00	0.86	0.63	1.49
6.30	0.24	0.38	5.00	0.86	0.63	1.49
6.35	0.25	0.38	5.00	0.86	0.63	1.49
6.40	0.25	0.38	5.00	0.86	0.63	1.49
6.45	0.25	0.38	5.00	0.86	0.63	1.49
6.50	0.25	0.38	5.00	0.86	0.63	1.49
6.55	0.25	0.38	5.00	0.86	0.63	1.49
6.60	0.25	0.38	5.00	0.86	0.63	1.49
6.65	0.25	0.38	5.00	0.86	0.63	1.49
6.70	0.26	0.38	5.00	0.86	0.63	1.49
6.75	0.26	0.38	5.00	0.86	0.63	1.49
6.80	0.26	0.38	5.00	0.86	0.63	1.49
6.85	0.26	0.38	5.00	0.86	0.63	1.49
6.90	0.26	0.38	5.00	0.86	0.63	1.49
6.95	0.26	0.38	5.00	0.86	0.63	1.49
7.00	0.26	0.38	5.00	0.86	0.63	1.48
7.05	0.26	0.38	5.00	0.86	0.63	1.48
7.10	0.26	0.38	5.00	0.86	0.63	1.48
7.15	0.27	0.38	5.00	0.86	0.62	1.48
7.20	0.27	0.38	5.00	0.86	0.62	1.48
7.25	0.27	0.38	5.00	0.86	0.62	1.48
7.30	0.27	0.38	5.00	0.86	0.62	1.48
7.35	0.27	0.38	5.00	0.86	0.62	1.48
7.40	0.27	0.38	5.00	0.86	0.62	1.48
7.45	0.27	0.38	5.00	0.86	0.62	1.48
7.50	0.27	0.38	5.00	0.86	0.62	1.48
7.55	0.27	0.38	5.00	0.86	0.62	1.48
7.60	0.27	0.38	5.00	0.86	0.62	1.48
7.65	0.27	0.38	5.00	0.86	0.62	1.48
7.70	0.27	0.38	5.00	0.86	0.62	1.48
7.75	0.27	0.38	5.00	0.86	0.62	1.48
7.80	0.27	0.38	5.00	0.86	0.62	1.48
7.85	0.27	0.38	5.00	0.86	0.62	1.48
7.90	0.27	0.38	5.00	0.86	0.62	1.48
7.95	0.27	0.38	5.00	0.86	0.62	1.48
8.00	0.27	0.38	5.00	0.86	0.62	1.48
8.05	0.27	0.38	5.00	0.86	0.62	1.48
8.10	0.28	0.38	5.00	0.86	0.62	1.48
8.15	0.28	0.38	5.00	0.86	0.62	1.47
8.20	0.28	0.38	5.00	0.86	0.62	1.47
8.25	0.34	0.38	5.00	0.86	0.61	1.47
8.30	0.34	0.38	5.00	0.86	0.61	1.47

				B-LGC-2.sum		
8.35	0.34	0.38	5.00	0.86	0.61	1.47
8.40	0.34	0.38	5.00	0.86	0.61	1.47
8.45	0.34	0.38	5.00	0.86	0.61	1.47
8.50	0.34	0.38	5.00	0.86	0.61	1.47
8.55	0.35	0.38	5.00	0.86	0.61	1.47
8.60	0.35	0.38	5.00	0.86	0.61	1.47
8.65	0.35	0.38	5.00	0.86	0.61	1.47
8.70	0.35	0.38	5.00	0.86	0.61	1.47
8.75	0.35	0.38	5.00	0.86	0.61	1.47
8.80	0.35	0.38	5.00	0.86	0.61	1.47
8.85	0.35	0.38	5.00	0.86	0.61	1.47
8.90	0.36	0.38	5.00	0.86	0.61	1.47
8.95	0.36	0.38	5.00	0.86	0.61	1.47
9.00	0.36	0.38	5.00	0.86	0.61	1.47
9.05	0.36	0.38	5.00	0.86	0.61	1.47
9.10	0.36	0.38	5.00	0.86	0.61	1.47
9.15	0.36	0.38	5.00	0.86	0.61	1.47
9.20	0.37	0.38	5.00	0.86	0.61	1.47
9.25	0.37	0.38	5.00	0.86	0.61	1.47
9.30	0.37	0.38	5.00	0.86	0.61	1.47
9.35	0.37	0.38	5.00	0.86	0.61	1.46
9.40	0.38	0.38	5.00	0.86	0.61	1.46
9.45	0.38	0.38	5.00	0.86	0.61	1.46
9.50	0.38	0.38	5.00	0.86	0.61	1.46
9.55	0.38	0.38	5.00	0.86	0.60	1.46
9.60	0.39	0.38	5.00	0.86	0.60	1.46
9.65	0.39	0.38	5.00	0.86	0.60	1.46
9.70	0.39	0.38	5.00	0.86	0.60	1.46
9.75	0.40	0.38	5.00	0.86	0.60	1.46
9.80	0.40	0.38	5.00	0.86	0.60	1.46
9.85	0.41	0.38	5.00	0.86	0.60	1.46
9.90	0.41	0.38	5.00	0.86	0.60	1.46
9.95	0.42	0.38	5.00	0.86	0.60	1.46
10.00	0.43	0.38	5.00	0.86	0.60	1.46
10.05	0.42	0.38	5.00	0.86	0.60	1.46
10.10	0.41	0.38	5.00	0.86	0.60	1.46
10.15	0.41	0.38	5.00	0.86	0.60	1.46
10.20	0.40	0.38	5.00	0.86	0.60	1.46
10.25	0.40	0.38	5.00	0.86	0.60	1.46
10.30	0.39	0.38	5.00	0.86	0.60	1.46
10.35	0.39	0.38	5.00	0.86	0.60	1.46
10.40	0.39	0.38	5.00	0.86	0.60	1.46
10.45	0.39	0.38	5.00	0.86	0.60	1.46
10.50	0.38	0.38	5.00	0.86	0.60	1.45
10.55	0.38	0.38	5.00	0.86	0.60	1.45
10.60	0.38	0.38	5.00	0.86	0.59	1.45
10.65	0.38	0.38	5.00	0.86	0.59	1.45
10.70	0.37	0.38	5.00	0.86	0.59	1.45
10.75	0.37	0.38	5.00	0.86	0.59	1.45
10.80	0.37	0.38	5.00	0.86	0.59	1.45
10.85	0.37	0.38	5.00	0.86	0.59	1.45
10.90	0.37	0.38	5.00	0.86	0.59	1.45
10.95	0.36	0.38	5.00	0.86	0.59	1.45
11.00	0.36	0.38	5.00	0.86	0.59	1.45
11.05	0.36	0.38	5.00	0.86	0.59	1.45
11.10	0.36	0.38	5.00	0.86	0.59	1.45
11.15	0.36	0.38	5.00	0.86	0.59	1.45
11.20	0.36	0.38	5.00	0.86	0.59	1.45
11.25	0.36	0.38	5.00	0.86	0.59	1.45
11.30	0.35	0.38	5.00	0.86	0.59	1.45
11.35	0.35	0.38	5.00	0.86	0.59	1.45
11.40	0.35	0.38	5.00	0.86	0.59	1.45
11.45	0.35	0.38	5.00	0.86	0.59	1.45

				B-LGC-2.sum		
11.50	0.35	0.38	5.00	0.86	0.59	1.45
11.55	0.35	0.38	5.00	0.86	0.59	1.45
11.60	0.35	0.38	5.00	0.86	0.59	1.44
11.65	0.35	0.37	5.00	0.86	0.59	1.44
11.70	0.35	0.37	5.00	0.86	0.59	1.44
11.75	0.34	0.37	5.00	0.86	0.58	1.44
11.80	0.34	0.37	5.00	0.86	0.58	1.44
11.85	0.34	0.37	5.00	0.86	0.58	1.44
11.90	0.34	0.37	5.00	0.86	0.58	1.44
11.95	0.34	0.37	5.00	0.86	0.58	1.44
12.00	0.34	0.37	5.00	0.86	0.58	1.44
12.05	0.34	0.37	5.00	0.86	0.58	1.44
12.10	0.34	0.37	5.00	0.86	0.58	1.44
12.15	0.34	0.37	5.00	0.86	0.58	1.44
12.20	0.34	0.37	5.00	0.86	0.58	1.44
12.25	0.34	0.37	5.00	0.86	0.58	1.44
12.30	0.34	0.37	5.00	0.86	0.58	1.44
12.35	0.33	0.37	5.00	0.86	0.58	1.44
12.40	0.33	0.37	5.00	0.86	0.58	1.44
12.45	0.33	0.37	5.00	0.86	0.58	1.44
12.50	0.33	0.37	5.00	0.86	0.58	1.44
12.55	0.33	0.37	5.00	0.86	0.58	1.44
12.60	0.33	0.37	5.00	0.86	0.58	1.43
12.65	0.33	0.37	5.00	0.86	0.58	1.43
12.70	0.33	0.37	5.00	0.86	0.58	1.43
12.75	0.33	0.37	5.00	0.86	0.57	1.43
12.80	0.32	0.37	5.00	0.86	0.57	1.43
12.85	0.32	0.37	5.00	0.86	0.57	1.43
12.90	0.32	0.37	5.00	0.86	0.57	1.43
12.95	0.32	0.37	5.00	0.86	0.57	1.43
13.00	0.32	0.37	5.00	0.86	0.57	1.43
13.05	0.32	0.37	5.00	0.86	0.57	1.43
13.10	0.32	0.37	5.00	0.86	0.57	1.43
13.15	0.32	0.37	5.00	0.86	0.57	1.43
13.20	0.32	0.37	5.00	0.86	0.57	1.43
13.25	0.31	0.37	5.00	0.86	0.57	1.43
13.30	0.31	0.37	5.00	0.86	0.57	1.43
13.35	0.31	0.37	5.00	0.86	0.57	1.43
13.40	0.31	0.37	5.00	0.86	0.57	1.43
13.45	0.31	0.37	5.00	0.86	0.57	1.43
13.50	0.31	0.37	5.00	0.86	0.57	1.42
13.55	0.31	0.37	5.00	0.86	0.57	1.42
13.60	0.31	0.37	5.00	0.86	0.56	1.42
13.65	0.31	0.37	5.00	0.86	0.56	1.42
13.70	0.31	0.37	5.00	0.86	0.56	1.42
13.75	0.31	0.37	5.00	0.86	0.56	1.42
13.80	0.30	0.37	5.00	0.86	0.56	1.42
13.85	0.30	0.37	5.00	0.86	0.56	1.42
13.90	0.30	0.37	5.00	0.86	0.56	1.42
13.95	0.30	0.37	5.00	0.86	0.56	1.42
14.00	0.30	0.37	5.00	0.86	0.56	1.42
14.05	0.30	0.37	5.00	0.86	0.56	1.42
14.10	0.30	0.37	5.00	0.86	0.56	1.42
14.15	0.30	0.37	5.00	0.86	0.56	1.42
14.20	0.30	0.37	5.00	0.86	0.56	1.42
14.25	0.30	0.37	5.00	0.86	0.56	1.41
14.30	0.30	0.37	5.00	0.86	0.56	1.41
14.35	0.30	0.37	5.00	0.86	0.55	1.41
14.40	0.30	0.37	5.00	0.86	0.55	1.41
14.45	0.29	0.37	5.00	0.86	0.55	1.41
14.50	0.29	0.37	5.00	0.86	0.55	1.41
14.55	0.29	0.37	5.00	0.86	0.55	1.41
14.60	0.29	0.37	5.00	0.86	0.55	1.41

B-LGC-2.sum						
14.65	0.29	0.37	5.00	0.86	0.55	1.41
14.70	0.29	0.37	5.00	0.86	0.55	1.41
14.75	0.29	0.37	5.00	0.86	0.55	1.41
14.80	0.35	0.37	5.00	0.86	0.55	1.41
14.85	0.35	0.37	5.00	0.86	0.55	1.41
14.90	0.35	0.37	5.00	0.86	0.55	1.41
14.95	0.35	0.37	5.00	0.86	0.55	1.41
15.00	0.35	0.37	5.00	0.86	0.55	1.40
15.05	0.35	0.37	5.00	0.86	0.55	1.40
15.10	0.34	0.37	5.00	0.86	0.54	1.40
15.15	0.34	0.37	5.00	0.86	0.54	1.40
15.20	0.34	0.37	5.00	0.86	0.54	1.40
15.25	0.34	0.37	5.00	0.86	0.54	1.40
15.30	0.34	0.37	5.00	0.86	0.54	1.40
15.35	0.34	0.37	5.00	0.86	0.54	1.40
15.40	0.34	0.37	5.00	0.86	0.54	1.40
15.45	0.34	0.37	5.00	0.86	0.54	1.40
15.50	0.33	0.37	5.00	0.86	0.54	1.40
15.55	0.33	0.37	5.00	0.86	0.54	1.40
15.60	0.33	0.37	5.00	0.86	0.54	1.40
15.65	0.33	0.37	5.00	0.86	0.54	1.40
15.70	0.33	0.37	5.00	0.86	0.54	1.40
15.75	0.33	0.37	5.00	0.86	0.54	1.39
15.80	0.33	0.37	5.00	0.86	0.53	1.39
15.85	0.33	0.37	5.00	0.86	0.53	1.39
15.90	0.33	0.37	5.00	0.86	0.53	1.39
15.95	0.33	0.37	5.00	0.86	0.53	1.39
16.00	0.32	0.37	5.00	0.86	0.53	1.39
16.05	0.32	0.37	5.00	0.86	0.53	1.39
16.10	0.32	0.37	5.00	0.86	0.53	1.39
16.15	0.32	0.37	5.00	0.86	0.53	1.39
16.20	0.32	0.37	5.00	0.86	0.53	1.39
16.25	0.32	0.37	5.00	0.86	0.53	1.39
16.30	0.32	0.37	5.00	0.86	0.53	1.39
16.35	0.32	0.37	5.00	0.86	0.53	1.39
16.40	0.32	0.37	5.00	0.86	0.53	1.38
16.45	0.32	0.37	5.00	0.86	0.53	1.38
16.50	0.32	0.37	5.00	0.86	0.52	1.38
16.55	0.31	0.37	5.00	0.86	0.52	1.38
16.60	0.31	0.37	5.00	0.86	0.52	1.38
16.65	0.31	0.37	5.00	0.86	0.52	1.38
16.70	0.31	0.37	5.00	0.86	0.52	1.38
16.75	0.31	0.37	5.00	0.86	0.52	1.38
16.80	0.31	0.37	5.00	0.86	0.52	1.38
16.85	0.31	0.37	5.00	0.86	0.52	1.38
16.90	0.31	0.37	5.00	0.86	0.52	1.38
16.95	0.31	0.37	5.00	0.86	0.52	1.38
17.00	0.31	0.37	5.00	0.86	0.52	1.37
17.05	0.31	0.37	5.00	0.86	0.52	1.37
17.10	0.31	0.37	5.00	0.86	0.51	1.37
17.15	0.31	0.37	5.00	0.86	0.51	1.37
17.20	0.31	0.37	5.00	0.86	0.51	1.37
17.25	0.30	0.37	5.00	0.86	0.51	1.37
17.30	0.30	0.37	5.00	0.86	0.51	1.37
17.35	0.30	0.37	5.00	0.86	0.51	1.37
17.40	0.30	0.37	5.00	0.86	0.51	1.37
17.45	0.30	0.37	5.00	0.86	0.51	1.37
17.50	0.30	0.37	5.00	0.86	0.51	1.37
17.55	0.30	0.37	5.00	0.86	0.51	1.36
17.60	0.30	0.37	5.00	0.86	0.51	1.36
17.65	0.30	0.37	5.00	0.86	0.50	1.36
17.70	0.30	0.37	5.00	0.86	0.50	1.36
17.75	0.30	0.37	5.00	0.86	0.50	1.36

				B-LGC-2.sum		
17.80	0.30	0.37	5.00	0.86	0.50	1.36
17.85	0.30	0.37	5.00	0.86	0.50	1.36
17.90	0.30	0.37	5.00	0.86	0.50	1.36
17.95	0.30	0.37	5.00	0.86	0.50	1.36
18.00	0.30	0.37	5.00	0.86	0.50	1.36
18.05	0.30	0.37	5.00	0.86	0.50	1.36
18.10	0.30	0.37	5.00	0.86	0.50	1.35
18.15	0.30	0.37	5.00	0.86	0.49	1.35
18.20	0.30	0.37	5.00	0.86	0.49	1.35
18.25	0.30	0.37	5.00	0.86	0.49	1.35
18.30	0.30	0.37	5.00	0.86	0.49	1.35
18.35	0.30	0.37	5.00	0.86	0.49	1.35
18.40	0.30	0.37	5.00	0.86	0.49	1.35
18.45	0.30	0.37	5.00	0.86	0.49	1.35
18.50	0.30	0.37	5.00	0.86	0.49	1.35
18.55	0.30	0.37	5.00	0.86	0.49	1.34
18.60	0.30	0.37	5.00	0.86	0.49	1.34
18.65	0.30	0.37	5.00	0.86	0.48	1.34
18.70	0.30	0.37	5.00	0.86	0.48	1.34
18.75	0.30	0.37	5.00	0.86	0.48	1.34
18.80	0.30	0.37	5.00	0.86	0.48	1.34
18.85	0.30	0.37	5.00	0.86	0.48	1.34
18.90	0.30	0.37	5.00	0.86	0.48	1.34
18.95	0.30	0.37	5.00	0.86	0.48	1.34
19.00	0.30	0.37	5.00	0.86	0.48	1.34
19.05	0.30	0.37	5.00	0.86	0.48	1.33
19.10	0.30	0.37	5.00	0.86	0.47	1.33
19.15	0.30	0.37	5.00	0.86	0.47	1.33
19.20	0.30	0.37	5.00	0.86	0.47	1.33
19.25	0.30	0.37	5.00	0.86	0.47	1.33
19.30	0.30	0.37	5.00	0.86	0.47	1.33
19.35	0.30	0.37	5.00	0.86	0.47	1.33
19.40	0.30	0.37	5.00	0.86	0.47	1.33
19.45	0.30	0.37	5.00	0.86	0.47	1.33
19.50	0.30	0.37	5.00	0.86	0.47	1.32
19.55	0.30	0.37	5.00	0.86	0.46	1.32
19.60	0.30	0.37	5.00	0.86	0.46	1.32
19.65	0.30	0.37	5.00	0.86	0.46	1.32
19.70	0.30	0.37	5.00	0.86	0.46	1.32
19.75	0.30	0.37	5.00	0.86	0.46	1.32
19.80	0.30	0.37	5.00	0.86	0.46	1.32
19.85	0.30	0.37	5.00	0.86	0.46	1.32
19.90	0.30	0.37	5.00	0.86	0.46	1.32
19.95	0.30	0.37	5.00	0.86	0.46	1.31
20.00	0.30	0.37	5.00	0.86	0.45	1.31
20.05	0.30	0.37	5.00	0.86	0.45	1.31
20.10	0.30	0.37	5.00	0.86	0.45	1.31
20.15	0.30	0.37	5.00	0.86	0.45	1.31
20.20	0.30	0.37	5.00	0.86	0.45	1.31
20.25	0.30	0.37	5.00	0.86	0.45	1.31
20.30	0.30	0.37	5.00	0.86	0.45	1.31
20.35	0.30	0.37	5.00	0.86	0.45	1.30
20.40	0.30	0.37	5.00	0.86	0.44	1.30
20.45	0.30	0.37	5.00	0.86	0.44	1.30
20.50	0.30	0.37	5.00	0.86	0.44	1.30
20.55	0.30	0.37	5.00	0.86	0.44	1.30
20.60	0.30	0.37	5.00	0.86	0.44	1.30
20.65	0.30	0.37	5.00	0.86	0.44	1.30
20.70	0.29	0.37	5.00	0.86	0.44	1.30
20.75	0.29	0.37	5.00	0.86	0.44	1.29
20.80	0.29	0.37	5.00	0.86	0.43	1.29
20.85	0.29	0.37	5.00	0.86	0.43	1.29
20.90	0.29	0.37	5.00	0.86	0.43	1.29

				B-LGC-2.sum		
20.95	0.29	0.37	5.00	0.86	0.43	1.29
21.00	0.29	0.37	5.00	0.86	0.43	1.29
21.05	0.29	0.37	5.00	0.86	0.43	1.29
21.10	0.29	0.37	5.00	0.86	0.43	1.29
21.15	0.29	0.37	5.00	0.86	0.43	1.28
21.20	0.29	0.37	5.00	0.86	0.42	1.28
21.25	0.29	0.37	5.00	0.86	0.42	1.28
21.30	0.29	0.37	5.00	0.86	0.42	1.28
21.35	0.29	0.37	5.00	0.86	0.42	1.28
21.40	0.29	0.37	5.00	0.86	0.42	1.28
21.45	0.29	0.37	5.00	0.86	0.42	1.28
21.50	0.29	0.37	5.00	0.86	0.42	1.27
21.55	0.29	0.37	5.00	0.86	0.41	1.27
21.60	0.29	0.37	5.00	0.86	0.41	1.27
21.65	0.29	0.37	5.00	0.86	0.41	1.27
21.70	0.29	0.37	5.00	0.86	0.41	1.27
21.75	0.28	0.37	5.00	0.86	0.41	1.27
21.80	0.28	0.37	5.00	0.86	0.41	1.26
21.85	0.28	0.37	5.00	0.86	0.40	1.26
21.90	0.28	0.37	5.00	0.86	0.40	1.26
21.95	0.28	0.37	5.00	0.86	0.40	1.26
22.00	0.28	0.37	5.00	0.86	0.40	1.26
22.05	0.28	0.37	5.00	0.86	0.40	1.26
22.10	0.28	0.37	5.00	0.86	0.40	1.26
22.15	0.28	0.37	5.00	0.86	0.40	1.25
22.20	0.28	0.37	5.00	0.86	0.39	1.25
22.25	0.28	0.37	5.00	0.86	0.39	1.25
22.30	0.28	0.37	5.00	0.86	0.39	1.25
22.35	0.28	0.37	5.00	0.86	0.39	1.25
22.40	0.28	0.37	5.00	0.86	0.39	1.25
22.45	0.28	0.37	5.00	0.86	0.39	1.24
22.50	0.28	0.37	5.00	0.86	0.38	1.24
22.55	0.28	0.37	5.00	0.86	0.38	1.24
22.60	0.28	0.37	5.00	0.86	0.38	1.24
22.65	0.28	0.37	5.00	0.86	0.38	1.24
22.70	0.28	0.37	5.00	0.86	0.38	1.24
22.75	0.28	0.37	5.00	0.86	0.38	1.23
22.80	0.28	0.36	5.00	0.86	0.37	1.23
22.85	0.28	0.36	5.00	0.86	0.37	1.23
22.90	0.28	0.36	5.00	0.86	0.37	1.23
22.95	0.28	0.36	5.00	0.86	0.37	1.23
23.00	0.27	0.36	5.00	0.86	0.37	1.23
23.05	0.27	0.36	5.00	0.86	0.37	1.22
23.10	0.27	0.36	5.00	0.86	0.36	1.22
23.15	0.27	0.36	5.00	0.86	0.36	1.22
23.20	0.27	0.36	5.00	0.86	0.36	1.22
23.25	0.27	0.36	5.00	0.86	0.36	1.22
23.30	0.27	0.36	5.00	0.86	0.36	1.22
23.35	0.27	0.36	5.00	0.86	0.36	1.22
23.40	0.27	0.36	5.00	0.86	0.36	1.22
23.45	0.27	0.36	5.00	0.86	0.36	1.22
23.50	0.27	0.36	5.00	0.86	0.36	1.22
23.55	0.27	0.36	5.00	0.86	0.36	1.21
23.60	0.27	0.36	5.00	0.86	0.35	1.21
23.65	0.27	0.36	5.00	0.86	0.35	1.21
23.70	0.27	0.36	5.00	0.86	0.35	1.21
23.75	0.27	0.36	5.00	0.86	0.35	1.21
23.80	0.27	0.36	5.00	0.86	0.35	1.21
23.85	0.27	0.36	5.00	0.86	0.35	1.21
23.90	0.27	0.36	5.00	0.86	0.35	1.21
23.95	0.27	0.36	5.00	0.86	0.35	1.21
24.00	0.27	0.36	5.00	0.86	0.35	1.21
24.05	0.27	0.36	5.00	0.86	0.35	1.21

				B-LGC-2.sum		
24.10	0.27	0.36	5.00	0.86	0.35	1.20
24.15	0.27	0.36	5.00	0.86	0.34	1.20
24.20	0.27	0.36	5.00	0.86	0.34	1.20
24.25	0.27	0.36	5.00	0.86	0.34	1.20
24.30	0.27	0.36	5.00	0.86	0.34	1.20
24.35	0.27	0.36	5.00	0.86	0.34	1.20
24.40	0.27	0.36	5.00	0.86	0.34	1.20
24.45	0.26	0.36	5.00	0.86	0.34	1.20
24.50	0.26	0.36	5.00	0.86	0.34	1.20
24.55	0.26	0.36	5.00	0.86	0.34	1.20
24.60	0.26	0.36	5.00	0.86	0.34	1.19
24.65	0.26	0.36	5.00	0.86	0.34	1.19
24.70	0.26	0.36	5.00	0.86	0.33	1.19
24.75	0.26	0.36	5.00	0.86	0.33	1.19
24.80	0.26	0.36	5.00	0.86	0.33	1.19
24.85	0.26	0.36	5.00	0.86	0.33	1.19
24.90	0.26	0.36	5.00	0.86	0.33	1.19
24.95	0.26	0.36	5.00	0.86	0.33	1.19
25.00	0.26	0.36	5.00	0.86	0.33	1.19
25.05	0.26	0.36	5.00	0.86	0.33	1.19
25.10	0.26	0.36	5.00	0.86	0.33	1.18
25.15	0.26	0.36	5.00	0.86	0.33	1.18
25.20	0.26	0.36	5.00	0.86	0.32	1.18
25.25	0.26	0.36	5.00	0.86	0.32	1.18
25.30	0.26	0.36	5.00	0.86	0.32	1.18
25.35	0.26	0.36	5.00	0.86	0.32	1.18
25.40	0.26	0.36	5.00	0.86	0.32	1.18
25.45	0.26	0.36	5.00	0.86	0.32	1.18
25.50	0.26	0.36	5.00	0.86	0.32	1.18
25.55	0.26	0.36	5.00	0.86	0.32	1.18
25.60	0.26	0.36	5.00	0.86	0.32	1.17
25.65	0.26	0.36	5.00	0.86	0.31	1.17
25.70	0.26	0.36	5.00	0.86	0.31	1.17
25.75	0.26	0.36	5.00	0.86	0.31	1.17
25.80	0.26	0.36	5.00	0.86	0.31	1.17
25.85	0.26	0.36	5.00	0.86	0.31	1.17
25.90	0.26	0.36	5.00	0.86	0.31	1.17
25.95	0.26	0.36	5.00	0.86	0.31	1.17
26.00	0.26	0.36	5.00	0.86	0.31	1.17
26.05	0.26	0.36	5.00	0.86	0.31	1.16
26.10	0.26	0.36	5.00	0.86	0.31	1.16
26.15	0.26	0.36	5.00	0.86	0.30	1.16
26.20	0.25	0.36	5.00	0.86	0.30	1.16
26.25	0.25	0.36	5.00	0.86	0.30	1.16
26.30	0.25	0.36	5.00	0.86	0.30	1.16
26.35	0.25	0.36	5.00	0.86	0.30	1.16
26.40	0.25	0.36	5.00	0.86	0.30	1.16
26.45	0.25	0.36	5.00	0.86	0.30	1.16
26.50	0.25	0.36	5.00	0.86	0.30	1.16
26.55	0.25	0.36	5.00	0.86	0.30	1.15
26.60	0.25	0.36	5.00	0.86	0.29	1.15
26.65	0.25	0.36	5.00	0.86	0.29	1.15
26.70	0.25	0.36	5.00	0.86	0.29	1.15
26.75	0.25	0.36	5.00	0.86	0.29	1.15
26.80	0.25	0.36	5.00	0.86	0.29	1.15
26.85	0.25	0.36	5.00	0.86	0.29	1.15
26.90	0.25	0.36	5.00	0.86	0.29	1.15
26.95	0.25	0.36	5.00	0.86	0.29	1.14
27.00	0.25	0.36	5.00	0.86	0.28	1.14
27.05	0.25	0.36	5.00	0.86	0.28	1.14
27.10	0.25	0.36	5.00	0.86	0.28	1.14
27.15	0.25	0.36	5.00	0.86	0.28	1.14
27.20	0.25	0.36	5.00	0.86	0.28	1.14

				B-LGC-2.sum		
27.25	0.25	0.36	5.00	0.86	0.28	1.14
27.30	0.25	0.36	5.00	0.86	0.28	1.14
27.35	0.25	0.36	5.00	0.86	0.28	1.14
27.40	0.25	0.36	5.00	0.86	0.28	1.13
27.45	0.25	0.36	5.00	0.86	0.27	1.13
27.50	0.25	0.36	5.00	0.86	0.27	1.13
27.55	0.25	0.36	5.00	0.86	0.27	1.13
27.60	0.25	0.36	5.00	0.86	0.27	1.13
27.65	0.25	0.36	5.00	0.86	0.27	1.13
27.70	0.24	0.36	5.00	0.86	0.27	1.13
27.75	0.24	0.36	5.00	0.86	0.27	1.13
27.80	0.24	0.36	5.00	0.86	0.27	1.12
27.85	0.24	0.36	5.00	0.86	0.26	1.12
27.90	0.25	0.36	5.00	0.86	0.26	1.12
27.95	0.25	0.36	5.00	0.86	0.26	1.12
28.00	0.25	0.36	5.00	0.86	0.26	1.12
28.05	0.25	0.36	5.00	0.86	0.26	1.12
28.10	0.25	0.36	5.00	0.86	0.26	1.12
28.15	0.25	0.36	5.00	0.86	0.26	1.12
28.20	0.25	0.36	5.00	0.86	0.26	1.11
28.25	0.25	0.36	5.00	0.86	0.25	1.11
28.30	0.25	0.36	5.00	0.86	0.25	1.11
28.35	0.25	0.36	5.00	0.86	0.25	1.11
28.40	0.24	0.36	5.00	0.86	0.25	1.11
28.45	0.24	0.36	5.00	0.86	0.25	1.11
28.50	0.24	0.36	5.00	0.86	0.25	1.11
28.55	0.24	0.36	5.00	0.86	0.25	1.11
28.60	0.24	0.36	5.00	0.86	0.25	1.10
28.65	0.24	0.36	5.00	0.86	0.24	1.10
28.70	0.24	0.36	5.00	0.86	0.24	1.10
28.75	0.24	0.36	5.00	0.86	0.24	1.10
28.80	0.24	0.36	5.00	0.86	0.24	1.10
28.85	0.24	0.36	5.00	0.86	0.24	1.10
28.90	0.24	0.36	5.00	0.86	0.24	1.10
28.95	0.24	0.36	5.00	0.86	0.24	1.09
29.00	0.23	0.36	5.00	0.86	0.23	1.09
29.05	0.23	0.36	5.00	0.86	0.23	1.09
29.10	0.23	0.36	5.00	0.86	0.23	1.09
29.15	0.23	0.36	5.00	0.86	0.23	1.09
29.20	0.23	0.36	5.00	0.86	0.23	1.09
29.25	0.23	0.36	5.00	0.86	0.23	1.09
29.30	0.23	0.36	5.00	0.86	0.23	1.08
29.35	0.23	0.36	5.00	0.86	0.22	1.08
29.40	0.23	0.36	5.00	0.86	0.22	1.08
29.45	0.23	0.36	5.00	0.86	0.22	1.08
29.50	0.23	0.36	5.00	0.86	0.22	1.08
29.55	0.23	0.36	5.00	0.86	0.22	1.08
29.60	0.22	0.36	5.00	0.86	0.22	1.08
29.65	0.22	0.36	5.00	0.86	0.21	1.07
29.70	0.22	0.36	5.00	0.86	0.21	1.07
29.75	0.22	0.36	5.00	0.86	0.21	1.07
29.80	0.22	0.36	5.00	0.86	0.21	1.07
29.85	0.22	0.36	5.00	0.86	0.21	1.07
29.90	0.22	0.36	5.00	0.86	0.21	1.07
29.95	0.22	0.36	5.00	0.86	0.20	1.06
30.00	0.22	0.36	5.00	0.86	0.20	1.06
30.05	0.22	0.36	5.00	0.86	0.20	1.06
30.10	0.22	0.36	5.00	0.86	0.20	1.06
30.15	0.22	0.36	5.00	0.86	0.20	1.06
30.20	0.22	0.36	5.00	0.86	0.20	1.06
30.25	0.22	0.36	5.00	0.86	0.19	1.05
30.30	0.22	0.36	5.00	0.86	0.19	1.05
30.35	0.22	0.36	5.00	0.86	0.19	1.05

B-LGC-2.sum						
30.40	0.22	0.36	5.00	0.86	0.19	1.05
30.45	0.22	0.36	5.00	0.86	0.19	1.05
30.50	0.22	0.36	5.00	0.86	0.19	1.04
30.55	0.22	0.36	5.00	0.86	0.18	1.04
30.60	0.22	0.36	5.00	0.86	0.18	1.04
30.65	0.22	0.36	5.00	0.86	0.18	1.04
30.70	0.22	0.36	5.00	0.86	0.18	1.04
30.75	0.22	0.36	5.00	0.86	0.18	1.04
30.80	0.22	0.36	5.00	0.86	0.18	1.03
30.85	0.22	0.36	5.00	0.86	0.17	1.03
30.90	0.22	0.36	5.00	0.86	0.17	1.03
30.95	0.22	0.36	5.00	0.86	0.17	1.03
31.00	0.22	0.36	5.00	0.86	0.17	1.03
31.05	0.22	0.36	5.00	0.86	0.17	1.03
31.10	0.22	0.35	5.00	0.86	0.17	1.02
31.15	0.22	0.35	5.00	0.86	0.16	1.02
31.20	0.22	0.35	5.00	0.86	0.16	1.02
31.25	0.22	0.35	5.00	0.86	0.16	1.02
31.30	0.22	0.35	5.00	0.86	0.16	1.02
31.35	0.22	0.35	5.00	0.86	0.16	1.02
31.40	0.22	0.35	5.00	0.86	0.16	1.01
31.45	0.22	0.35	5.00	0.86	0.15	1.01
31.50	0.22	0.35	5.00	0.86	0.15	1.01
31.55	0.22	0.35	5.00	0.86	0.15	1.01
31.60	0.22	0.35	5.00	0.86	0.15	1.01
31.65	0.22	0.35	5.00	0.86	0.15	1.01
31.70	0.22	0.35	5.00	0.86	0.15	1.00
31.75	0.22	0.35	5.00	0.86	0.14	1.00
31.80	0.22	0.35	5.00	0.86	0.14	1.00
31.85	0.22	0.35	5.00	0.86	0.14	1.00
31.90	0.22	0.35	5.00	0.86	0.14	1.00
31.95	0.22	0.35	5.00	0.86	0.14	1.00
32.00	0.22	0.35	5.00	0.86	0.14	0.99
32.05	0.22	0.35	5.00	0.86	0.13	0.99
32.10	0.22	0.35	5.00	0.86	0.13	0.99
32.15	0.22	0.35	5.00	0.86	0.13	0.99
32.20	0.22	0.35	5.00	0.86	0.13	0.99
32.25	0.22	0.35	5.00	0.86	0.13	0.99
32.30	0.22	0.35	5.00	0.86	0.13	0.98
32.35	0.22	0.35	5.00	0.86	0.12	0.98
32.40	0.22	0.35	5.00	0.86	0.12	0.98
32.45	0.22	0.35	5.00	0.86	0.12	0.98
32.50	0.22	0.35	5.00	0.86	0.12	0.98
32.55	0.23	0.35	5.00	0.86	0.12	0.98
32.60	0.23	0.35	5.00	0.86	0.12	0.97
32.65	0.23	0.35	5.00	0.86	0.11	0.97
32.70	0.23	0.35	5.00	0.86	0.11	0.97
32.75	0.23	0.35	5.00	0.86	0.11	0.97
32.80	0.23	0.35	5.00	0.86	0.11	0.97
32.85	0.23	0.35	5.00	0.86	0.11	0.97
32.90	0.23	0.35	5.00	0.86	0.11	0.96
32.95	0.23	0.35	5.00	0.86	0.10	0.96
33.00	0.23	0.35	5.00	0.86	0.10	0.96
33.05	0.24	0.35	5.00	0.86	0.10	0.96
33.10	0.24	0.35	5.00	0.86	0.10	0.96
33.15	0.24	0.35	5.00	0.86	0.10	0.96
33.20	0.24	0.35	5.00	0.86	0.10	0.95
33.25	0.24	0.35	5.00	0.86	0.09	0.95
33.30	0.24	0.35	5.00	0.86	0.09	0.95
33.35	0.24	0.35	5.00	0.86	0.09	0.95
33.40	0.24	0.35	5.00	0.86	0.09	0.95
33.45	0.24	0.35	5.00	0.86	0.09	0.95
33.50	0.24	0.35	5.00	0.86	0.09	0.95

				B-LGC-2.sum		
33.55	0.25	0.35	5.00	0.86	0.09	0.94
33.60	0.25	0.35	5.00	0.86	0.08	0.94
33.65	0.25	0.35	5.00	0.86	0.08	0.94
33.70	0.25	0.35	5.00	0.86	0.08	0.94
33.75	0.25	0.35	5.00	0.86	0.08	0.94
33.80	0.25	0.35	5.00	0.86	0.08	0.94
33.85	0.25	0.35	5.00	0.86	0.08	0.94
33.90	0.25	0.35	5.00	0.86	0.08	0.93
33.95	0.25	0.35	5.00	0.86	0.07	0.93
34.00	0.25	0.35	5.00	0.86	0.07	0.93
34.05	0.26	0.35	5.00	0.86	0.07	0.93
34.10	0.26	0.35	5.00	0.86	0.07	0.93
34.15	0.26	0.35	5.00	0.86	0.07	0.93
34.20	0.26	0.35	5.00	0.86	0.07	0.93
34.25	0.26	0.35	5.00	0.86	0.07	0.92
34.30	0.26	0.34	5.00	0.86	0.06	0.92
34.35	0.26	0.34	5.00	0.86	0.06	0.92
34.40	0.26	0.34	5.00	0.86	0.06	0.92
34.45	0.27	0.34	5.00	0.86	0.06	0.92
34.50	0.27	0.34	5.00	0.86	0.06	0.92
34.55	0.27	0.34	5.00	0.86	0.06	0.92
34.60	0.27	0.34	5.00	0.86	0.06	0.92
34.65	0.27	0.34	5.00	0.86	0.06	0.91
34.70	0.27	0.34	5.00	0.86	0.05	0.91
34.75	0.27	0.34	5.00	0.86	0.05	0.91
34.80	0.27	0.34	5.00	0.86	0.05	0.91
34.85	0.28	0.34	5.00	0.86	0.05	0.91
34.90	0.28	0.34	5.00	0.86	0.05	0.91
34.95	0.28	0.34	5.00	0.86	0.05	0.91
35.00	0.28	0.34	5.00	0.86	0.05	0.91
35.05	0.29	0.34	5.00	0.86	0.05	0.90
35.10	0.31	0.34	5.00	0.86	0.04	0.90
35.15	0.33	0.34	5.00	0.86	0.04	0.90
35.20	0.36	0.34	5.00	0.86	0.04	0.90
35.25	1.83	0.34	5.00	0.86	0.04	0.90
35.30	1.83	0.34	5.00	0.86	0.04	0.90
35.35	1.83	0.34	5.00	0.86	0.04	0.90
35.40	1.83	0.34	5.00	0.86	0.04	0.90
35.45	1.83	0.34	5.00	0.86	0.04	0.90
35.50	1.83	0.34	5.00	0.86	0.04	0.90
35.55	1.83	0.34	5.00	0.86	0.04	0.90
35.60	1.83	0.34	5.00	0.86	0.04	0.90
35.65	1.83	0.34	5.00	0.86	0.04	0.89
35.70	1.83	0.34	5.00	0.86	0.04	0.89
35.75	1.83	0.34	5.00	0.86	0.04	0.89
35.80	1.83	0.34	5.00	0.86	0.03	0.89
35.85	1.83	0.34	5.00	0.86	0.03	0.89
35.90	1.83	0.34	5.00	0.86	0.03	0.89
35.95	1.83	0.34	5.00	0.86	0.03	0.89
36.00	1.83	0.34	5.00	0.86	0.03	0.89
36.05	1.82	0.34	5.00	0.86	0.03	0.89
36.10	1.82	0.34	5.00	0.86	0.03	0.89
36.15	1.82	0.34	5.00	0.86	0.03	0.89
36.20	1.82	0.34	5.00	0.86	0.03	0.89
36.25	1.82	0.34	5.00	0.86	0.03	0.89
36.30	1.82	0.34	5.00	0.86	0.03	0.89
36.35	1.82	0.34	5.00	0.86	0.03	0.89
36.40	1.82	0.34	5.00	0.86	0.03	0.89
36.45	1.82	0.34	5.00	0.86	0.03	0.89
36.50	1.82	0.34	5.00	0.86	0.03	0.89
36.55	1.82	0.34	5.00	0.86	0.03	0.89
36.60	1.82	0.34	5.00	0.86	0.03	0.89
36.65	1.82	0.34	5.00	0.86	0.03	0.89

B-LGC-2.sum						
36.70	1.82	0.34	5.00	0.86	0.03	0.89
36.75	1.82	0.34	5.00	0.86	0.03	0.89
36.80	1.82	0.34	5.00	0.86	0.03	0.89
36.85	1.82	0.34	5.00	0.86	0.03	0.89
36.90	1.82	0.34	5.00	0.86	0.03	0.89
36.95	1.82	0.34	5.00	0.86	0.03	0.89
37.00	1.82	0.34	5.00	0.86	0.03	0.88
37.05	1.82	0.34	5.00	0.86	0.03	0.88
37.10	1.82	0.34	5.00	0.86	0.03	0.88
37.15	1.81	0.34	5.00	0.86	0.03	0.88
37.20	1.81	0.34	5.00	0.86	0.02	0.88
37.25	1.81	0.34	5.00	0.86	0.02	0.88
37.30	1.81	0.34	5.00	0.86	0.02	0.88
37.35	1.81	0.34	5.00	0.86	0.02	0.88
37.40	1.81	0.34	5.00	0.86	0.02	0.88
37.45	1.81	0.34	5.00	0.86	0.02	0.88
37.50	1.81	0.33	5.00	0.86	0.02	0.88
37.55	1.81	0.33	5.00	0.86	0.02	0.88
37.60	1.81	0.33	5.00	0.86	0.02	0.88
37.65	1.81	0.33	5.00	0.86	0.02	0.88
37.70	1.81	0.33	5.00	0.86	0.02	0.88
37.75	1.81	0.33	5.00	0.86	0.02	0.88
37.80	1.81	0.33	5.00	0.86	0.02	0.88
37.85	1.81	0.33	5.00	0.86	0.02	0.88
37.90	1.81	0.33	5.00	0.86	0.02	0.88
37.95	1.81	0.33	5.00	0.86	0.02	0.88
38.00	1.81	0.33	5.00	0.86	0.02	0.88
38.05	1.81	0.33	5.00	0.86	0.02	0.88
38.10	1.81	0.33	5.00	0.86	0.02	0.88
38.15	1.81	0.33	5.00	0.86	0.02	0.88
38.20	1.81	0.33	5.00	0.86	0.02	0.88
38.25	1.80	0.33	5.00	0.86	0.02	0.88
38.30	1.80	0.33	5.00	0.86	0.02	0.88
38.35	1.80	0.33	5.00	0.86	0.02	0.88
38.40	1.80	0.33	5.00	0.86	0.02	0.88
38.45	1.80	0.33	5.00	0.86	0.02	0.88
38.50	1.80	0.33	5.00	0.86	0.02	0.87
38.55	1.80	0.33	5.00	0.86	0.02	0.87
38.60	1.80	0.33	5.00	0.86	0.02	0.87
38.65	1.80	0.33	5.00	0.86	0.02	0.87
38.70	1.80	0.33	5.00	0.86	0.01	0.87
38.75	1.80	0.33	5.00	0.86	0.01	0.87
38.80	1.80	0.33	5.00	0.86	0.01	0.87
38.85	1.80	0.33	5.00	0.86	0.01	0.87
38.90	1.80	0.33	5.00	0.86	0.01	0.87
38.95	1.80	0.33	5.00	0.86	0.01	0.87
39.00	1.80	0.33	5.00	0.86	0.01	0.87
39.05	1.80	0.33	5.00	0.86	0.01	0.87
39.10	1.80	0.33	5.00	0.86	0.01	0.87
39.15	1.80	0.33	5.00	0.86	0.01	0.87
39.20	1.80	0.33	5.00	0.86	0.01	0.87
39.25	1.80	0.33	5.00	0.86	0.01	0.87
39.30	1.80	0.33	5.00	0.86	0.01	0.87
39.35	1.80	0.33	5.00	0.86	0.01	0.87
39.40	1.79	0.33	5.00	0.86	0.01	0.87
39.45	1.79	0.33	5.00	0.86	0.01	0.87
39.50	1.79	0.33	5.00	0.86	0.01	0.87
39.55	1.79	0.33	5.00	0.86	0.01	0.87
39.60	1.79	0.33	5.00	0.86	0.01	0.87
39.65	1.79	0.33	5.00	0.86	0.01	0.87
39.70	1.79	0.33	5.00	0.86	0.01	0.86
39.75	1.79	0.33	5.00	0.86	0.01	0.86
39.80	1.79	0.33	5.00	0.86	0.00	0.86

B-LGC-2.sum						
39.85	1.79	0.33	5.00	0.86	0.00	0.86
39.90	1.79	0.33	5.00	0.86	0.00	0.86
39.95	0.41	0.33	5.00	0.86	0.00	0.86
40.00	0.35	0.33	5.00	0.86	0.00	0.86
40.05	0.35	0.33	1.07	0.86	0.00	0.86
40.10	0.35	0.33	1.07	0.86	0.00	0.86
40.15	0.35	0.33	1.08	0.86	0.00	0.86
40.20	0.36	0.33	1.09	0.86	0.00	0.86
40.25	0.36	0.33	1.10	0.86	0.00	0.86
40.30	0.36	0.33	1.11	0.85	0.00	0.85
40.35	0.37	0.33	1.12	0.85	0.00	0.85
40.40	0.37	0.33	1.13	0.85	0.00	0.85
40.45	0.37	0.33	1.14	0.85	0.00	0.85
40.50	0.38	0.33	1.15	0.85	0.00	0.85
40.55	0.38	0.33	1.17	0.85	0.00	0.85
40.60	0.39	0.33	1.19	0.85	0.00	0.85
40.65	0.40	0.33	1.21	0.85	0.00	0.85
40.70	0.40	0.33	1.23	0.85	0.00	0.85
40.75	0.41	0.33	1.26	0.85	0.00	0.85
40.80	0.43	0.33	1.30	0.85	0.00	0.85
40.85	0.44	0.33	1.35	0.85	0.00	0.85
40.90	1.78	0.33	5.00	0.84	0.00	0.84
40.95	1.78	0.33	5.00	0.84	0.00	0.84
41.00	1.78	0.33	5.00	0.84	0.00	0.84
41.05	1.78	0.33	5.00	0.84	0.00	0.84
41.10	1.78	0.33	5.00	0.84	0.00	0.84
41.15	1.78	0.33	5.00	0.84	0.00	0.84
41.20	1.78	0.33	5.00	0.84	0.00	0.84
41.25	1.78	0.33	5.00	0.84	0.00	0.84
41.30	1.78	0.33	5.00	0.84	0.00	0.84
41.35	1.78	0.33	5.00	0.84	0.00	0.84
41.40	1.78	0.33	5.00	0.84	0.00	0.84
41.45	1.78	0.33	5.00	0.84	0.00	0.84
41.50	1.78	0.33	5.00	0.84	0.00	0.84
41.55	1.78	0.33	5.00	0.84	0.00	0.84
41.60	1.78	0.33	5.00	0.84	0.00	0.84
41.65	1.78	0.33	5.00	0.84	0.00	0.84
41.70	1.77	0.33	5.00	0.84	0.00	0.84
41.75	1.77	0.33	5.00	0.84	0.00	0.84
41.80	1.77	0.33	5.00	0.84	0.00	0.84
41.85	1.77	0.33	5.00	0.84	0.00	0.84
41.90	1.77	0.33	5.00	0.84	0.00	0.84
41.95	1.77	0.33	5.00	0.84	0.00	0.84
42.00	1.77	0.33	5.00	0.84	0.00	0.84
42.05	1.77	0.33	5.00	0.84	0.00	0.84
42.10	1.77	0.33	5.00	0.84	0.00	0.84
42.15	1.77	0.33	5.00	0.84	0.00	0.84
42.20	1.77	0.33	5.00	0.84	0.00	0.84
42.25	1.77	0.33	5.00	0.84	0.00	0.84
42.30	1.77	0.33	5.00	0.84	0.00	0.84
42.35	1.77	0.33	5.00	0.84	0.00	0.84
42.40	1.77	0.33	5.00	0.84	0.00	0.84
42.45	1.77	0.33	5.00	0.84	0.00	0.84
42.50	1.77	0.33	5.00	0.84	0.00	0.84
42.55	1.77	0.33	5.00	0.84	0.00	0.84
42.60	1.77	0.33	5.00	0.84	0.00	0.84
42.65	1.77	0.33	5.00	0.84	0.00	0.84
42.70	1.77	0.33	5.00	0.84	0.00	0.84
42.75	1.77	0.33	5.00	0.84	0.00	0.84
42.80	1.77	0.33	5.00	0.84	0.00	0.84
42.85	1.76	0.33	5.00	0.84	0.00	0.84
42.90	1.76	0.33	5.00	0.84	0.00	0.84
42.95	1.76	0.33	5.00	0.84	0.00	0.84

[illegible]

				B-LGC-2.sum		
46.15	1.74	0.34	5.00	0.84	0.00	0.84
46.20	1.74	0.34	5.00	0.83	0.00	0.83
46.25	1.74	0.34	5.00	0.83	0.00	0.83
46.30	1.74	0.34	5.00	0.83	0.00	0.83
46.35	1.74	0.34	5.00	0.83	0.00	0.83
46.40	1.74	0.34	5.00	0.83	0.00	0.83
46.45	1.74	0.34	5.00	0.83	0.00	0.83
46.50	1.73	0.34	5.00	0.83	0.00	0.83
46.55	0.41	0.34	1.24	0.83	0.00	0.83
46.60	0.39	0.34	1.17	0.83	0.00	0.83
46.65	0.38	0.34	1.13	0.83	0.00	0.83
46.70	0.37	0.34	1.10	0.83	0.00	0.83
46.75	0.36	0.34	1.07	0.83	0.00	0.83
46.80	0.35	0.34	1.05	0.82	0.00	0.82
46.85	0.35	0.34	1.03	0.82	0.00	0.82
46.90	0.34	0.34	1.02	0.82	0.00	0.82
46.95	0.34	0.34	1.00	0.82	0.00	0.82
47.00	0.33	0.34	0.99*	0.82	0.00	0.82
47.05	0.33	0.34	0.98*	0.82	0.00	0.82
47.10	0.33	0.34	0.97*	0.82	0.00	0.82
47.15	0.32	0.34	0.96*	0.82	0.00	0.82
47.20	0.32	0.34	0.95*	0.82	0.00	0.82
47.25	0.32	0.34	0.94*	0.82	0.00	0.82
47.30	0.31	0.34	0.93*	0.81	0.00	0.81
47.35	0.31	0.34	0.92*	0.81	0.00	0.81
47.40	0.31	0.34	0.91*	0.81	0.00	0.81
47.45	0.31	0.34	0.91*	0.81	0.00	0.81
47.50	0.30	0.34	0.90*	0.81	0.00	0.81
47.55	0.30	0.34	0.88*	0.81	0.00	0.81
47.60	0.29	0.34	0.86*	0.80	0.00	0.80
47.65	0.28	0.34	0.84*	0.80	0.00	0.80
47.70	0.28	0.34	0.82*	0.80	0.00	0.80
47.75	0.27	0.34	0.80*	0.79	0.00	0.79
47.80	0.26	0.34	0.79*	0.79	0.00	0.79
47.85	0.26	0.34	0.77*	0.78	0.00	0.78
47.90	0.25	0.34	0.76*	0.78	0.00	0.78
47.95	0.25	0.34	0.74*	0.77	0.00	0.77
48.00	0.25	0.34	0.73*	0.76	0.00	0.76
48.05	0.24	0.34	0.72*	0.76	0.00	0.76
48.10	0.24	0.34	0.70*	0.75	0.00	0.75
48.15	0.23	0.34	0.69*	0.74	0.00	0.74
48.20	0.23	0.34	0.68*	0.74	0.00	0.74
48.25	0.22	0.34	0.67*	0.73	0.00	0.73
48.30	0.22	0.34	0.66*	0.72	0.00	0.72
48.35	0.22	0.34	0.64*	0.72	0.00	0.72
48.40	0.21	0.34	0.63*	0.71	0.00	0.71
48.45	0.21	0.34	0.62*	0.70	0.00	0.70
48.50	0.21	0.34	0.61*	0.69	0.00	0.69
48.55	0.20	0.34	0.60*	0.69	0.00	0.69
48.60	0.20	0.34	0.59*	0.68	0.00	0.68
48.65	0.20	0.34	0.58*	0.67	0.00	0.67
48.70	0.19	0.34	0.57*	0.66	0.00	0.66
48.75	0.19	0.34	0.56*	0.65	0.00	0.65
48.80	0.19	0.34	0.56*	0.65	0.00	0.65
48.85	0.18	0.34	0.55*	0.64	0.00	0.64
48.90	0.18	0.34	0.54*	0.63	0.00	0.63
48.95	0.18	0.34	0.53*	0.62	0.00	0.62
49.00	0.18	0.34	0.52*	0.61	0.00	0.61
49.05	0.17	0.34	0.51*	0.60	0.00	0.60
49.10	0.17	0.34	0.50*	0.59	0.00	0.59
49.15	0.17	0.34	0.49*	0.58	0.00	0.58
49.20	0.16	0.34	0.49*	0.57	0.00	0.57
49.25	0.16	0.34	0.48*	0.56	0.00	0.56

B-LGC-2.sum						
49.30	0.16	0.34	0.47*	0.55	0.00	0.55
49.35	0.16	0.34	0.46*	0.54	0.00	0.54
49.40	0.15	0.34	0.45*	0.53	0.00	0.53
49.45	0.15	0.34	0.44*	0.52	0.00	0.52
49.50	0.15	0.34	0.44*	0.51	0.00	0.51
49.55	0.14	0.34	0.43*	0.50	0.00	0.50
49.60	0.14	0.34	0.42*	0.49	0.00	0.49
49.65	0.14	0.34	0.41*	0.48	0.00	0.48
49.70	0.14	0.34	0.40*	0.46	0.00	0.46
49.75	0.13	0.34	0.39*	0.45	0.00	0.45
49.80	0.13	0.34	0.39*	0.44	0.00	0.44
49.85	0.13	0.34	0.38*	0.43	0.00	0.43
49.90	0.12	0.34	0.37*	0.42	0.00	0.42
49.95	0.12	0.34	0.36*	0.40	0.00	0.40
50.00	0.12	0.34	0.35*	0.39	0.00	0.39
50.05	0.12	0.34	0.35*	0.38	0.00	0.38
50.10	0.12	0.34	0.35*	0.37	0.00	0.37
50.15	0.12	0.34	0.35*	0.35	0.00	0.35
50.20	0.12	0.34	0.35*	0.34	0.00	0.34
50.25	0.12	0.34	0.35*	0.33	0.00	0.33
50.30	0.12	0.34	0.35*	0.31	0.00	0.31
50.35	0.12	0.34	0.35*	0.30	0.00	0.30
50.40	0.12	0.34	0.35*	0.29	0.00	0.29
50.45	0.12	0.34	0.35*	0.27	0.00	0.27
50.50	0.12	0.34	0.35*	0.26	0.00	0.26
50.55	0.12	0.34	0.35*	0.25	0.00	0.25
50.60	0.12	0.34	0.35*	0.24	0.00	0.24
50.65	0.12	0.34	0.35*	0.22	0.00	0.22
50.70	0.12	0.34	0.35*	0.21	0.00	0.21
50.75	0.12	0.34	0.35*	0.20	0.00	0.20
50.80	0.12	0.34	0.35*	0.18	0.00	0.18
50.85	0.12	0.34	0.35*	0.17	0.00	0.17
50.90	0.12	0.34	0.35*	0.16	0.00	0.16
50.95	0.12	0.34	0.35*	0.14	0.00	0.14
51.00	0.12	0.34	0.35*	0.13	0.00	0.13
51.05	0.12	0.34	0.35*	0.12	0.00	0.12
51.10	0.12	0.34	0.35*	0.10	0.00	0.10
51.15	0.12	0.34	0.35*	0.09	0.00	0.09
51.20	0.12	0.34	0.35*	0.08	0.00	0.08
51.25	0.12	0.34	0.35*	0.07	0.00	0.07
51.30	0.12	0.34	0.35*	0.05	0.00	0.05
51.35	0.12	0.34	0.35*	0.04	0.00	0.04
51.40	0.12	0.34	0.35*	0.03	0.00	0.03
51.45	0.12	0.34	0.35*	0.01	0.00	0.01
51.50	0.12	0.34	0.35*	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 Depth = ft, Stress or Pressure = tsf (atm), Unit weight =
pcf, Settlement = in.

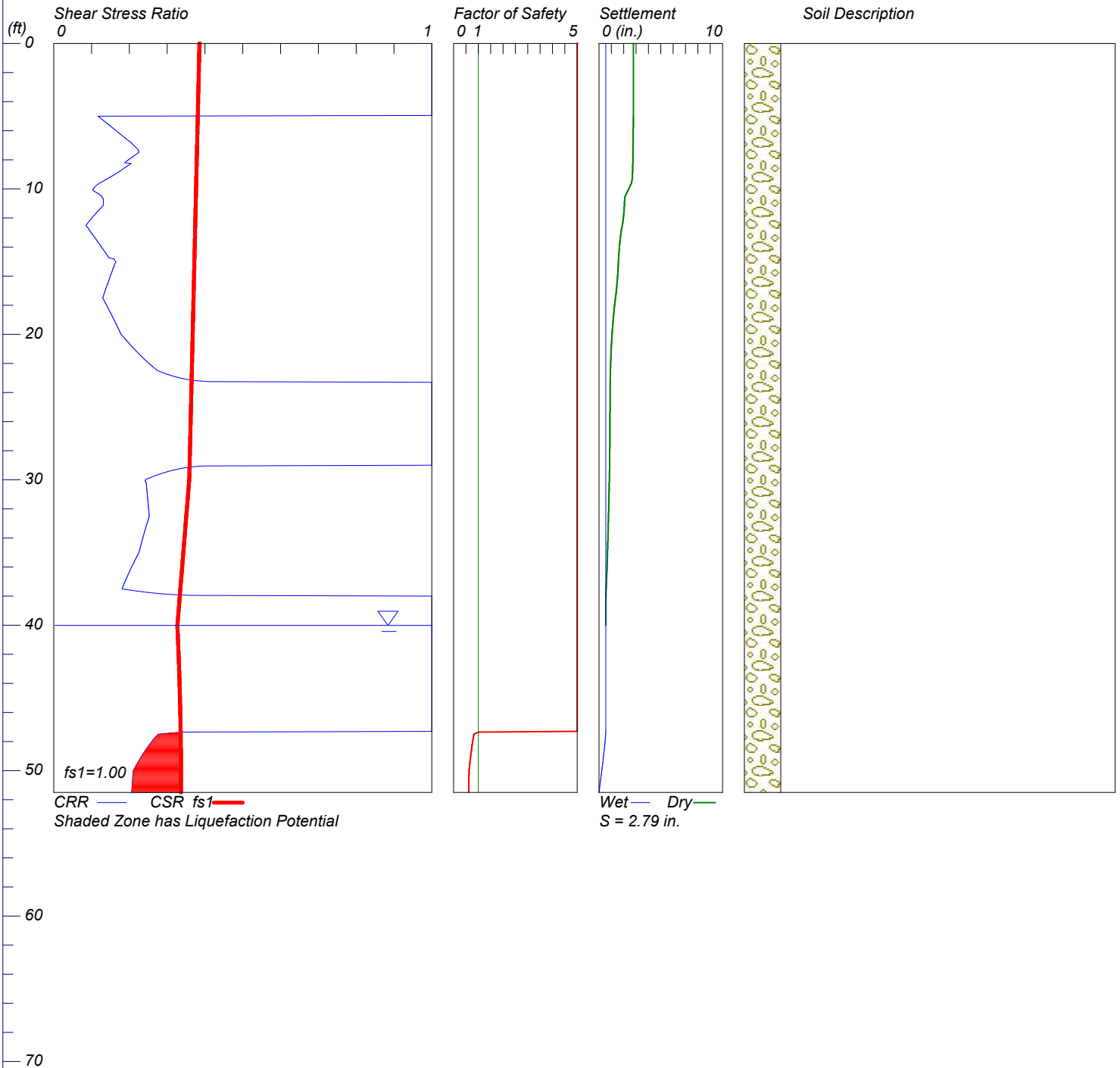
CRRm	Cyclic resistance ratio from soils
CSRfs	Cyclic stress ratio induced by a given earthquake (with user
request factor of safety)	
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRfs
S_sat	Settlement from saturated sands
S_dry	Settlement from dry sands
S_all	Total settlement from saturated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

LIQUEFACTION ANALYSIS

FF/Santa Ana

Hole No.=B-LGC-3 Water Depth=40 ft Surface Elev.=148

Magnitude=7.71
Acceleration=0.593g



B-LGC-3.sum

LIQUEFACTION ANALYSIS CALCULATION SHEET

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Input File Name: \\DC1\Public2\FINAL PROJECTS\FAIRFIELD DEVELOPMENT\Santa
Ana\Liquefaction\B-LGC-3.liq
Title: FF/Santa Ana
Subtitle: 213031-01

Surface Elev.=148
Hole No.=B-LGC-3
Depth of Hole= 51.5 ft
Water Table during Earthquake= 40.0 ft
Water Table during In-Situ Testing= 51.5 ft
Max. Acceleration= 0.59 g
Earthquake Magnitude= 7.7

Input Data:

Surface Elev.=148
Hole No.=B-LGC-3
Depth of Hole=51.5 ft
Water Table during Earthquake= 40.0 ft
Water Table during In-Situ Testing= 51.5 ft
Max. Acceleration=0.59 g
Earthquake Magnitude=7.7

Earthquake Magnitude=7.7

2. Settlement Analysis Method: Tokimatsu / Seed
3. Fines Correction for Liquefaction: Idriss/Seed (SPT only)
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio,
7. Borehole Diameter,
8. Sampling Method,
9. User request factor of safety (apply to CSR) , User= 1.0
Plot one CSR curve (fs1=User)
10. Use Curve Smoothing: Yes*

Ce = 1.3
Cb= 1
Cs= 1

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.0	0.0	102.0	NoLiq
5.0	4.7	102.0	70.6
7.5	12.0	102.0	32.4
10.0	11.4	102.0	5.0
12.5	4.7	102.0	70.6
15.0	6.7	102.0	70.6
17.5	5.0	102.0	70.6
20.0	8.7	102.0	70.6
22.5	15.0	102.0	70.6
25.0	26.0	102.0	32.4

			B-LGC-3.sum
27.5	27.0	102.0	32.4
30.0	14.7	102.0	70.6
32.5	16.0	102.0	70.6
35.0	15.0	102.0	72.9
37.5	12.0	102.0	72.9
40.0	67.0	102.0	5.0
42.5	49.0	102.0	5.0
45.0	63.0	102.0	5.0
47.5	22.0	102.0	52.8
50.0	18.0	102.0	70.6
51.5	18.0	102.0	70.6

Output Results:

Settlement of saturated sands=0.54 in.

Settlement of dry sands=2.25 in.

Total settlement of saturated and dry sands=2.79 in.

Differential Settlement=1.397 to 1.844 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	2.00	0.39	5.00	0.54	2.25	2.79
0.05	2.00	0.39	5.00	0.54	2.25	2.79
0.10	2.00	0.39	5.00	0.54	2.25	2.79
0.15	2.00	0.39	5.00	0.54	2.25	2.79
0.20	2.00	0.39	5.00	0.54	2.25	2.79
0.25	2.00	0.39	5.00	0.54	2.25	2.79
0.30	2.00	0.39	5.00	0.54	2.25	2.79
0.35	2.00	0.39	5.00	0.54	2.25	2.79
0.40	2.00	0.39	5.00	0.54	2.25	2.79
0.45	2.00	0.39	5.00	0.54	2.25	2.79
0.50	2.00	0.39	5.00	0.54	2.25	2.79
0.55	2.00	0.38	5.00	0.54	2.25	2.79
0.60	2.00	0.38	5.00	0.54	2.25	2.79
0.65	2.00	0.38	5.00	0.54	2.25	2.79
0.70	2.00	0.38	5.00	0.54	2.25	2.79
0.75	2.00	0.38	5.00	0.54	2.25	2.79
0.80	2.00	0.38	5.00	0.54	2.25	2.79
0.85	2.00	0.38	5.00	0.54	2.25	2.79
0.90	2.00	0.38	5.00	0.54	2.25	2.79
0.95	2.00	0.38	5.00	0.54	2.25	2.79
1.00	2.00	0.38	5.00	0.54	2.25	2.79
1.05	2.00	0.38	5.00	0.54	2.25	2.79
1.10	2.00	0.38	5.00	0.54	2.25	2.79
1.15	2.00	0.38	5.00	0.54	2.25	2.79
1.20	2.00	0.38	5.00	0.54	2.25	2.79
1.25	2.00	0.38	5.00	0.54	2.25	2.79
1.30	2.00	0.38	5.00	0.54	2.25	2.79
1.35	2.00	0.38	5.00	0.54	2.25	2.79
1.40	2.00	0.38	5.00	0.54	2.25	2.79
1.45	2.00	0.38	5.00	0.54	2.25	2.79
1.50	2.00	0.38	5.00	0.54	2.25	2.79
1.55	2.00	0.38	5.00	0.54	2.25	2.79
1.60	2.00	0.38	5.00	0.54	2.25	2.79
1.65	2.00	0.38	5.00	0.54	2.25	2.79
1.70	2.00	0.38	5.00	0.54	2.25	2.79
1.75	2.00	0.38	5.00	0.54	2.25	2.79
1.80	2.00	0.38	5.00	0.54	2.25	2.79
1.85	2.00	0.38	5.00	0.54	2.25	2.79
1.90	2.00	0.38	5.00	0.54	2.25	2.79
1.95	2.00	0.38	5.00	0.54	2.25	2.79
2.00	2.00	0.38	5.00	0.54	2.25	2.79

GC-3.sum

[illegible]

				B-LGC-3.sum		
5.20	0.13	0.38	5.00	0.54	2.24	2.79
5.25	0.13	0.38	5.00	0.54	2.24	2.79
5.30	0.13	0.38	5.00	0.54	2.24	2.79
5.35	0.13	0.38	5.00	0.54	2.24	2.78
5.40	0.14	0.38	5.00	0.54	2.24	2.78
5.45	0.14	0.38	5.00	0.54	2.24	2.78
5.50	0.14	0.38	5.00	0.54	2.24	2.78
5.55	0.14	0.38	5.00	0.54	2.23	2.78
5.60	0.15	0.38	5.00	0.54	2.23	2.78
5.65	0.15	0.38	5.00	0.54	2.23	2.78
5.70	0.15	0.38	5.00	0.54	2.23	2.78
5.75	0.15	0.38	5.00	0.54	2.23	2.77
5.80	0.16	0.38	5.00	0.54	2.23	2.77
5.85	0.16	0.38	5.00	0.54	2.23	2.77
5.90	0.16	0.38	5.00	0.54	2.23	2.77
5.95	0.16	0.38	5.00	0.54	2.23	2.77
6.00	0.16	0.38	5.00	0.54	2.23	2.77
6.05	0.17	0.38	5.00	0.54	2.22	2.77
6.10	0.17	0.38	5.00	0.54	2.22	2.77
6.15	0.17	0.38	5.00	0.54	2.22	2.77
6.20	0.17	0.38	5.00	0.54	2.22	2.77
6.25	0.18	0.38	5.00	0.54	2.22	2.77
6.30	0.18	0.38	5.00	0.54	2.22	2.77
6.35	0.18	0.38	5.00	0.54	2.22	2.76
6.40	0.18	0.38	5.00	0.54	2.22	2.76
6.45	0.19	0.38	5.00	0.54	2.22	2.76
6.50	0.19	0.38	5.00	0.54	2.22	2.76
6.55	0.19	0.38	5.00	0.54	2.22	2.76
6.60	0.19	0.38	5.00	0.54	2.22	2.76
6.65	0.20	0.38	5.00	0.54	2.21	2.76
6.70	0.20	0.38	5.00	0.54	2.21	2.76
6.75	0.20	0.38	5.00	0.54	2.21	2.76
6.80	0.20	0.38	5.00	0.54	2.21	2.76
6.85	0.21	0.38	5.00	0.54	2.21	2.76
6.90	0.21	0.38	5.00	0.54	2.21	2.76
6.95	0.21	0.38	5.00	0.54	2.21	2.76
7.00	0.21	0.38	5.00	0.54	2.21	2.76
7.05	0.21	0.38	5.00	0.54	2.21	2.75
7.10	0.22	0.38	5.00	0.54	2.21	2.75
7.15	0.22	0.38	5.00	0.54	2.21	2.75
7.20	0.22	0.38	5.00	0.54	2.21	2.75
7.25	0.22	0.38	5.00	0.54	2.21	2.75
7.30	0.22	0.38	5.00	0.54	2.21	2.75
7.35	0.22	0.38	5.00	0.54	2.21	2.75
7.40	0.22	0.38	5.00	0.54	2.21	2.75
7.45	0.22	0.38	5.00	0.54	2.20	2.75
7.50	0.23	0.38	5.00	0.54	2.20	2.75
7.55	0.22	0.38	5.00	0.54	2.20	2.75
7.60	0.22	0.38	5.00	0.54	2.20	2.75
7.65	0.22	0.38	5.00	0.54	2.20	2.75
7.70	0.21	0.38	5.00	0.54	2.20	2.75
7.75	0.21	0.38	5.00	0.54	2.20	2.75
7.80	0.21	0.38	5.00	0.54	2.20	2.75
7.85	0.21	0.38	5.00	0.54	2.20	2.74
7.90	0.20	0.38	5.00	0.54	2.20	2.74
7.95	0.20	0.38	5.00	0.54	2.20	2.74
8.00	0.20	0.38	5.00	0.54	2.20	2.74
8.05	0.20	0.38	5.00	0.54	2.20	2.74
8.10	0.19	0.38	5.00	0.54	2.19	2.74
8.15	0.19	0.38	5.00	0.54	2.19	2.74
8.20	0.19	0.38	5.00	0.54	2.19	2.74
8.25	0.20	0.38	5.00	0.54	2.19	2.74
8.30	0.20	0.38	5.00	0.54	2.19	2.74

				B-LGC-3.sum		
8.35	0.20	0.38	5.00	0.54	2.19	2.73
8.40	0.20	0.38	5.00	0.54	2.19	2.73
8.45	0.19	0.38	5.00	0.54	2.19	2.73
8.50	0.19	0.38	5.00	0.54	2.19	2.73
8.55	0.19	0.38	5.00	0.54	2.18	2.73
8.60	0.18	0.38	5.00	0.54	2.18	2.73
8.65	0.18	0.38	5.00	0.54	2.18	2.73
8.70	0.18	0.38	5.00	0.54	2.18	2.73
8.75	0.18	0.38	5.00	0.54	2.18	2.72
8.80	0.17	0.38	5.00	0.54	2.18	2.72
8.85	0.17	0.38	5.00	0.54	2.17	2.72
8.90	0.17	0.38	5.00	0.54	2.17	2.72
8.95	0.16	0.38	5.00	0.54	2.17	2.71
9.00	0.16	0.38	5.00	0.54	2.17	2.71
9.05	0.16	0.38	5.00	0.54	2.16	2.71
9.10	0.16	0.38	5.00	0.54	2.16	2.71
9.15	0.15	0.38	5.00	0.54	2.16	2.70
9.20	0.15	0.38	5.00	0.54	2.15	2.70
9.25	0.15	0.38	5.00	0.54	2.15	2.69
9.30	0.14	0.38	5.00	0.54	2.14	2.69
9.35	0.14	0.38	5.00	0.54	2.13	2.68
9.40	0.14	0.38	5.00	0.54	2.13	2.67
9.45	0.13	0.38	5.00	0.54	2.12	2.66
9.50	0.13	0.38	5.00	0.54	2.11	2.65
9.55	0.13	0.38	5.00	0.54	2.09	2.64
9.60	0.12	0.38	5.00	0.54	2.07	2.62
9.65	0.12	0.38	5.00	0.54	2.05	2.60
9.70	0.12	0.38	5.00	0.54	2.03	2.57
9.75	0.11	0.38	5.00	0.54	2.00	2.55
9.80	0.11	0.38	5.00	0.54	1.97	2.52
9.85	0.11	0.38	5.00	0.54	1.95	2.49
9.90	0.11	0.38	5.00	0.54	1.92	2.46
9.95	0.11	0.38	5.00	0.54	1.89	2.43
10.00	0.10	0.38	5.00	0.54	1.86	2.40
10.05	0.10	0.38	5.00	0.54	1.83	2.37
10.10	0.10	0.38	5.00	0.54	1.80	2.34
10.15	0.11	0.38	5.00	0.54	1.77	2.31
10.20	0.11	0.38	5.00	0.54	1.74	2.29
10.25	0.11	0.38	5.00	0.54	1.71	2.26
10.30	0.12	0.38	5.00	0.54	1.68	2.23
10.35	0.12	0.38	5.00	0.54	1.66	2.20
10.40	0.12	0.38	5.00	0.54	1.63	2.18
10.45	0.12	0.38	5.00	0.54	1.61	2.15
10.50	0.13	0.38	5.00	0.54	1.58	2.13
10.55	0.13	0.38	5.00	0.54	1.56	2.10
10.60	0.13	0.38	5.00	0.54	1.54	2.08
10.65	0.13	0.38	5.00	0.54	1.53	2.08
10.70	0.13	0.38	5.00	0.54	1.53	2.08
10.75	0.13	0.38	5.00	0.54	1.53	2.07
10.80	0.13	0.38	5.00	0.54	1.53	2.07
10.85	0.13	0.38	5.00	0.54	1.52	2.07
10.90	0.13	0.38	5.00	0.54	1.52	2.06
10.95	0.13	0.38	5.00	0.54	1.52	2.06
11.00	0.13	0.38	5.00	0.54	1.51	2.06
11.05	0.13	0.38	5.00	0.54	1.51	2.06
11.10	0.13	0.38	5.00	0.54	1.51	2.05
11.15	0.13	0.38	5.00	0.54	1.51	2.05
11.20	0.13	0.38	5.00	0.54	1.50	2.05
11.25	0.13	0.38	5.00	0.54	1.50	2.04
11.30	0.13	0.38	5.00	0.54	1.50	2.04
11.35	0.12	0.38	5.00	0.54	1.49	2.04
11.40	0.12	0.38	5.00	0.54	1.49	2.03
11.45	0.12	0.38	5.00	0.54	1.49	2.03

B-LGC-3.sum						
11.50	0.12	0.38	5.00	0.54	1.48	2.03
11.55	0.12	0.38	5.00	0.54	1.48	2.02
11.60	0.11	0.38	5.00	0.54	1.47	2.02
11.65	0.11	0.37	5.00	0.54	1.47	2.01
11.70	0.11	0.37	5.00	0.54	1.46	2.01
11.75	0.11	0.37	5.00	0.54	1.46	2.00
11.80	0.11	0.37	5.00	0.54	1.45	2.00
11.85	0.11	0.37	5.00	0.54	1.45	1.99
11.90	0.10	0.37	5.00	0.54	1.44	1.99
11.95	0.10	0.37	5.00	0.54	1.44	1.98
12.00	0.10	0.37	5.00	0.54	1.43	1.98
12.05	0.10	0.37	5.00	0.54	1.42	1.97
12.10	0.10	0.37	5.00	0.54	1.42	1.96
12.15	0.10	0.37	5.00	0.54	1.41	1.95
12.20	0.09	0.37	5.00	0.54	1.40	1.95
12.25	0.09	0.37	5.00	0.54	1.39	1.94
12.30	0.09	0.37	5.00	0.54	1.38	1.93
12.35	0.09	0.37	5.00	0.54	1.37	1.92
12.40	0.09	0.37	5.00	0.54	1.36	1.91
12.45	0.09	0.37	5.00	0.54	1.35	1.90
12.50	0.09	0.37	5.00	0.54	1.34	1.89
12.55	0.09	0.37	5.00	0.54	1.33	1.88
12.60	0.09	0.37	5.00	0.54	1.32	1.86
12.65	0.09	0.37	5.00	0.54	1.31	1.85
12.70	0.09	0.37	5.00	0.54	1.30	1.84
12.75	0.09	0.37	5.00	0.54	1.29	1.83
12.80	0.09	0.37	5.00	0.54	1.28	1.82
12.85	0.09	0.37	5.00	0.54	1.27	1.81
12.90	0.10	0.37	5.00	0.54	1.26	1.80
12.95	0.10	0.37	5.00	0.54	1.25	1.79
13.00	0.10	0.37	5.00	0.54	1.24	1.79
13.05	0.10	0.37	5.00	0.54	1.23	1.78
13.10	0.10	0.37	5.00	0.54	1.22	1.77
13.15	0.10	0.37	5.00	0.54	1.22	1.76
13.20	0.10	0.37	5.00	0.54	1.21	1.75
13.25	0.11	0.37	5.00	0.54	1.20	1.75
13.30	0.11	0.37	5.00	0.54	1.19	1.74
13.35	0.11	0.37	5.00	0.54	1.19	1.73
13.40	0.11	0.37	5.00	0.54	1.18	1.72
13.45	0.11	0.37	5.00	0.54	1.17	1.72
13.50	0.11	0.37	5.00	0.54	1.17	1.71
13.55	0.11	0.37	5.00	0.54	1.16	1.70
13.60	0.12	0.37	5.00	0.54	1.15	1.70
13.65	0.12	0.37	5.00	0.54	1.15	1.69
13.70	0.12	0.37	5.00	0.54	1.14	1.69
13.75	0.12	0.37	5.00	0.54	1.14	1.68
13.80	0.12	0.37	5.00	0.54	1.13	1.67
13.85	0.12	0.37	5.00	0.54	1.12	1.67
13.90	0.12	0.37	5.00	0.54	1.12	1.66
13.95	0.13	0.37	5.00	0.54	1.11	1.66
14.00	0.13	0.37	5.00	0.54	1.11	1.65
14.05	0.13	0.37	5.00	0.54	1.10	1.65
14.10	0.13	0.37	5.00	0.54	1.10	1.64
14.15	0.13	0.37	5.00	0.54	1.09	1.64
14.20	0.13	0.37	5.00	0.54	1.09	1.63
14.25	0.13	0.37	5.00	0.54	1.08	1.63
14.30	0.13	0.37	5.00	0.54	1.08	1.63
14.35	0.14	0.37	5.00	0.54	1.08	1.62
14.40	0.14	0.37	5.00	0.54	1.07	1.62
14.45	0.14	0.37	5.00	0.54	1.07	1.61
14.50	0.14	0.37	5.00	0.54	1.06	1.61
14.55	0.14	0.37	5.00	0.54	1.06	1.60
14.60	0.14	0.37	5.00	0.54	1.06	1.60

				B-LGC-3.sum		
14.65	0.14	0.37	5.00	0.54	1.05	1.60
14.70	0.14	0.37	5.00	0.54	1.05	1.59
14.75	0.15	0.37	5.00	0.54	1.04	1.59
14.80	0.16	0.37	5.00	0.54	1.04	1.58
14.85	0.16	0.37	5.00	0.54	1.04	1.58
14.90	0.16	0.37	5.00	0.54	1.03	1.58
14.95	0.16	0.37	5.00	0.54	1.03	1.58
15.00	0.16	0.37	5.00	0.54	1.03	1.57
15.05	0.16	0.37	5.00	0.54	1.03	1.57
15.10	0.16	0.37	5.00	0.54	1.02	1.57
15.15	0.16	0.37	5.00	0.54	1.02	1.56
15.20	0.16	0.37	5.00	0.54	1.02	1.56
15.25	0.16	0.37	5.00	0.54	1.01	1.56
15.30	0.16	0.37	5.00	0.54	1.01	1.56
15.35	0.16	0.37	5.00	0.54	1.01	1.55
15.40	0.16	0.37	5.00	0.54	1.00	1.55
15.45	0.16	0.37	5.00	0.54	1.00	1.55
15.50	0.16	0.37	5.00	0.54	1.00	1.54
15.55	0.16	0.37	5.00	0.54	0.99	1.54
15.60	0.16	0.37	5.00	0.54	0.99	1.54
15.65	0.15	0.37	5.00	0.54	0.99	1.53
15.70	0.15	0.37	5.00	0.54	0.98	1.53
15.75	0.15	0.37	5.00	0.54	0.98	1.52
15.80	0.15	0.37	5.00	0.54	0.98	1.52
15.85	0.15	0.37	5.00	0.54	0.97	1.52
15.90	0.15	0.37	5.00	0.54	0.97	1.51
15.95	0.15	0.37	5.00	0.54	0.96	1.51
16.00	0.15	0.37	5.00	0.54	0.96	1.50
16.05	0.15	0.37	5.00	0.54	0.96	1.50
16.10	0.15	0.37	5.00	0.54	0.95	1.50
16.15	0.15	0.37	5.00	0.54	0.95	1.49
16.20	0.15	0.37	5.00	0.54	0.94	1.49
16.25	0.15	0.37	5.00	0.54	0.94	1.48
16.30	0.15	0.37	5.00	0.54	0.93	1.48
16.35	0.14	0.37	5.00	0.54	0.93	1.47
16.40	0.14	0.37	5.00	0.54	0.92	1.47
16.45	0.14	0.37	5.00	0.54	0.92	1.46
16.50	0.14	0.37	5.00	0.54	0.91	1.46
16.55	0.14	0.37	5.00	0.54	0.91	1.45
16.60	0.14	0.37	5.00	0.54	0.90	1.45
16.65	0.14	0.37	5.00	0.54	0.90	1.44
16.70	0.14	0.37	5.00	0.54	0.89	1.44
16.75	0.14	0.37	5.00	0.54	0.89	1.43
16.80	0.14	0.37	5.00	0.54	0.88	1.43
16.85	0.14	0.37	5.00	0.54	0.88	1.42
16.90	0.14	0.37	5.00	0.54	0.87	1.42
16.95	0.14	0.37	5.00	0.54	0.86	1.41
17.00	0.14	0.37	5.00	0.54	0.86	1.40
17.05	0.14	0.37	5.00	0.54	0.85	1.40
17.10	0.13	0.37	5.00	0.54	0.85	1.39
17.15	0.13	0.37	5.00	0.54	0.84	1.38
17.20	0.13	0.37	5.00	0.54	0.83	1.38
17.25	0.13	0.37	5.00	0.54	0.83	1.37
17.30	0.13	0.37	5.00	0.54	0.82	1.36
17.35	0.13	0.37	5.00	0.54	0.81	1.36
17.40	0.13	0.37	5.00	0.54	0.80	1.35
17.45	0.13	0.37	5.00	0.54	0.80	1.34
17.50	0.13	0.37	5.00	0.54	0.79	1.33
17.55	0.13	0.37	5.00	0.54	0.78	1.33
17.60	0.13	0.37	5.00	0.54	0.77	1.32
17.65	0.13	0.37	5.00	0.54	0.77	1.31
17.70	0.13	0.37	5.00	0.54	0.76	1.30
17.75	0.13	0.37	5.00	0.54	0.75	1.30

				B-LGC-3.sum		
17.80	0.14	0.37	5.00	0.54	0.75	1.29
17.85	0.14	0.37	5.00	0.54	0.74	1.28
17.90	0.14	0.37	5.00	0.54	0.73	1.28
17.95	0.14	0.37	5.00	0.54	0.72	1.27
18.00	0.14	0.37	5.00	0.54	0.72	1.26
18.05	0.14	0.37	5.00	0.54	0.71	1.26
18.10	0.14	0.37	5.00	0.54	0.71	1.25
18.15	0.14	0.37	5.00	0.54	0.70	1.24
18.20	0.14	0.37	5.00	0.54	0.69	1.24
18.25	0.14	0.37	5.00	0.54	0.69	1.23
18.30	0.15	0.37	5.00	0.54	0.68	1.23
18.35	0.15	0.37	5.00	0.54	0.67	1.22
18.40	0.15	0.37	5.00	0.54	0.67	1.21
18.45	0.15	0.37	5.00	0.54	0.66	1.21
18.50	0.15	0.37	5.00	0.54	0.66	1.20
18.55	0.15	0.37	5.00	0.54	0.65	1.20
18.60	0.15	0.37	5.00	0.54	0.65	1.19
18.65	0.15	0.37	5.00	0.54	0.64	1.18
18.70	0.15	0.37	5.00	0.54	0.63	1.18
18.75	0.15	0.37	5.00	0.54	0.63	1.17
18.80	0.16	0.37	5.00	0.54	0.62	1.17
18.85	0.16	0.37	5.00	0.54	0.62	1.16
18.90	0.16	0.37	5.00	0.54	0.61	1.16
18.95	0.16	0.37	5.00	0.54	0.61	1.15
19.00	0.16	0.37	5.00	0.54	0.60	1.15
19.05	0.16	0.37	5.00	0.54	0.60	1.14
19.10	0.16	0.37	5.00	0.54	0.59	1.14
19.15	0.16	0.37	5.00	0.54	0.59	1.13
19.20	0.16	0.37	5.00	0.54	0.58	1.13
19.25	0.16	0.37	5.00	0.54	0.58	1.12
19.30	0.17	0.37	5.00	0.54	0.57	1.12
19.35	0.17	0.37	5.00	0.54	0.57	1.11
19.40	0.17	0.37	5.00	0.54	0.56	1.11
19.45	0.17	0.37	5.00	0.54	0.56	1.11
19.50	0.17	0.37	5.00	0.54	0.56	1.10
19.55	0.17	0.37	5.00	0.54	0.55	1.10
19.60	0.17	0.37	5.00	0.54	0.55	1.09
19.65	0.17	0.37	5.00	0.54	0.54	1.09
19.70	0.17	0.37	5.00	0.54	0.54	1.08
19.75	0.17	0.37	5.00	0.54	0.53	1.08
19.80	0.17	0.37	5.00	0.54	0.53	1.07
19.85	0.18	0.37	5.00	0.54	0.53	1.07
19.90	0.18	0.37	5.00	0.54	0.52	1.07
19.95	0.18	0.37	5.00	0.54	0.52	1.06
20.00	0.18	0.37	5.00	0.54	0.51	1.06
20.05	0.18	0.37	5.00	0.54	0.51	1.05
20.10	0.18	0.37	5.00	0.54	0.50	1.05
20.15	0.18	0.37	5.00	0.54	0.50	1.05
20.20	0.18	0.37	5.00	0.54	0.50	1.04
20.25	0.19	0.37	5.00	0.54	0.49	1.04
20.30	0.19	0.37	5.00	0.54	0.49	1.03
20.35	0.19	0.37	5.00	0.54	0.49	1.03
20.40	0.19	0.37	5.00	0.54	0.48	1.03
20.45	0.19	0.37	5.00	0.54	0.48	1.02
20.50	0.20	0.37	5.00	0.54	0.48	1.02
20.55	0.20	0.37	5.00	0.54	0.47	1.02
20.60	0.20	0.37	5.00	0.54	0.47	1.01
20.65	0.20	0.37	5.00	0.54	0.47	1.01
20.70	0.20	0.37	5.00	0.54	0.46	1.01
20.75	0.20	0.37	5.00	0.54	0.46	1.01
20.80	0.21	0.37	5.00	0.54	0.46	1.00
20.85	0.21	0.37	5.00	0.54	0.45	1.00
20.90	0.21	0.37	5.00	0.54	0.45	1.00

				B-LGC-3.sum		
20.95	0.21	0.37	5.00	0.54	0.45	0.99
21.00	0.21	0.37	5.00	0.54	0.45	0.99
21.05	0.21	0.37	5.00	0.54	0.44	0.99
21.10	0.22	0.37	5.00	0.54	0.44	0.99
21.15	0.22	0.37	5.00	0.54	0.44	0.98
21.20	0.22	0.37	5.00	0.54	0.44	0.98
21.25	0.22	0.37	5.00	0.54	0.43	0.98
21.30	0.22	0.37	5.00	0.54	0.43	0.98
21.35	0.23	0.37	5.00	0.54	0.43	0.97
21.40	0.23	0.37	5.00	0.54	0.43	0.97
21.45	0.23	0.37	5.00	0.54	0.42	0.97
21.50	0.23	0.37	5.00	0.54	0.42	0.97
21.55	0.23	0.37	5.00	0.54	0.42	0.96
21.60	0.24	0.37	5.00	0.54	0.42	0.96
21.65	0.24	0.37	5.00	0.54	0.41	0.96
21.70	0.24	0.37	5.00	0.54	0.41	0.96
21.75	0.24	0.37	5.00	0.54	0.41	0.95
21.80	0.24	0.37	5.00	0.54	0.41	0.95
21.85	0.25	0.37	5.00	0.54	0.41	0.95
21.90	0.25	0.37	5.00	0.54	0.40	0.95
21.95	0.25	0.37	5.00	0.54	0.40	0.95
22.00	0.25	0.37	5.00	0.54	0.40	0.94
22.05	0.25	0.37	5.00	0.54	0.40	0.94
22.10	0.26	0.37	5.00	0.54	0.39	0.94
22.15	0.26	0.37	5.00	0.54	0.39	0.94
22.20	0.26	0.37	5.00	0.54	0.39	0.94
22.25	0.26	0.37	5.00	0.54	0.39	0.93
22.30	0.27	0.37	5.00	0.54	0.39	0.93
22.35	0.27	0.37	5.00	0.54	0.39	0.93
22.40	0.27	0.37	5.00	0.54	0.38	0.93
22.45	0.27	0.37	5.00	0.54	0.38	0.93
22.50	0.28	0.37	5.00	0.54	0.38	0.92
22.55	0.28	0.37	5.00	0.54	0.38	0.92
22.60	0.28	0.37	5.00	0.54	0.38	0.92
22.65	0.29	0.37	5.00	0.54	0.37	0.92
22.70	0.30	0.37	5.00	0.54	0.37	0.92
22.75	0.30	0.37	5.00	0.54	0.37	0.92
22.80	0.31	0.36	5.00	0.54	0.37	0.92
22.85	0.31	0.36	5.00	0.54	0.37	0.92
22.90	0.32	0.36	5.00	0.54	0.37	0.92
22.95	0.33	0.36	5.00	0.54	0.37	0.91
23.00	0.33	0.36	5.00	0.54	0.37	0.91
23.05	0.34	0.36	5.00	0.54	0.37	0.91
23.10	0.35	0.36	5.00	0.54	0.37	0.91
23.15	0.36	0.36	5.00	0.54	0.37	0.91
23.20	0.38	0.36	5.00	0.54	0.37	0.91
23.25	0.41	0.36	5.00	0.54	0.37	0.91
23.30	1.86	0.36	5.00	0.54	0.37	0.91
23.35	1.86	0.36	5.00	0.54	0.36	0.91
23.40	1.86	0.36	5.00	0.54	0.36	0.91
23.45	1.86	0.36	5.00	0.54	0.36	0.91
23.50	1.86	0.36	5.00	0.54	0.36	0.91
23.55	1.86	0.36	5.00	0.54	0.36	0.91
23.60	1.86	0.36	5.00	0.54	0.36	0.91
23.65	1.86	0.36	5.00	0.54	0.36	0.91
23.70	1.86	0.36	5.00	0.54	0.36	0.91
23.75	1.86	0.36	5.00	0.54	0.36	0.91
23.80	1.86	0.36	5.00	0.54	0.36	0.90
23.85	1.86	0.36	5.00	0.54	0.36	0.90
23.90	1.86	0.36	5.00	0.54	0.36	0.90
23.95	1.86	0.36	5.00	0.54	0.36	0.90
24.00	1.86	0.36	5.00	0.54	0.36	0.90
24.05	1.86	0.36	5.00	0.54	0.36	0.90

				B-LGC-3.sum		
24.10	1.86	0.36	5.00	0.54	0.36	0.90
24.15	1.86	0.36	5.00	0.54	0.36	0.90
24.20	1.86	0.36	5.00	0.54	0.36	0.90
24.25	1.86	0.36	5.00	0.54	0.36	0.90
24.30	1.86	0.36	5.00	0.54	0.35	0.90
24.35	1.86	0.36	5.00	0.54	0.35	0.90
24.40	1.86	0.36	5.00	0.54	0.35	0.90
24.45	1.86	0.36	5.00	0.54	0.35	0.90
24.50	1.86	0.36	5.00	0.54	0.35	0.90
24.55	1.86	0.36	5.00	0.54	0.35	0.90
24.60	1.86	0.36	5.00	0.54	0.35	0.90
24.65	1.86	0.36	5.00	0.54	0.35	0.90
24.70	1.86	0.36	5.00	0.54	0.35	0.90
24.75	1.86	0.36	5.00	0.54	0.35	0.90
24.80	1.86	0.36	5.00	0.54	0.35	0.90
24.85	1.86	0.36	5.00	0.54	0.35	0.90
24.90	1.86	0.36	5.00	0.54	0.35	0.90
24.95	1.86	0.36	5.00	0.54	0.35	0.89
25.00	1.86	0.36	5.00	0.54	0.35	0.89
25.05	1.86	0.36	5.00	0.54	0.35	0.89
25.10	1.86	0.36	5.00	0.54	0.35	0.89
25.15	1.86	0.36	5.00	0.54	0.35	0.89
25.20	1.86	0.36	5.00	0.54	0.35	0.89
25.25	1.86	0.36	5.00	0.54	0.35	0.89
25.30	1.86	0.36	5.00	0.54	0.35	0.89
25.35	1.86	0.36	5.00	0.54	0.35	0.89
25.40	1.86	0.36	5.00	0.54	0.35	0.89
25.45	1.86	0.36	5.00	0.54	0.35	0.89
25.50	1.86	0.36	5.00	0.54	0.35	0.89
25.55	1.86	0.36	5.00	0.54	0.35	0.89
25.60	1.86	0.36	5.00	0.54	0.35	0.89
25.65	1.86	0.36	5.00	0.54	0.34	0.89
25.70	1.86	0.36	5.00	0.54	0.34	0.89
25.75	1.86	0.36	5.00	0.54	0.34	0.89
25.80	1.86	0.36	5.00	0.54	0.34	0.89
25.85	1.86	0.36	5.00	0.54	0.34	0.89
25.90	1.86	0.36	5.00	0.54	0.34	0.89
25.95	1.86	0.36	5.00	0.54	0.34	0.89
26.00	1.86	0.36	5.00	0.54	0.34	0.89
26.05	1.86	0.36	5.00	0.54	0.34	0.89
26.10	1.86	0.36	5.00	0.54	0.34	0.89
26.15	1.86	0.36	5.00	0.54	0.34	0.89
26.20	1.86	0.36	5.00	0.54	0.34	0.89
26.25	1.86	0.36	5.00	0.54	0.34	0.89
26.30	1.86	0.36	5.00	0.54	0.34	0.88
26.35	1.86	0.36	5.00	0.54	0.34	0.88
26.40	1.86	0.36	5.00	0.54	0.34	0.88
26.45	1.86	0.36	5.00	0.54	0.34	0.88
26.50	1.86	0.36	5.00	0.54	0.34	0.88
26.55	1.86	0.36	5.00	0.54	0.34	0.88
26.60	1.86	0.36	5.00	0.54	0.34	0.88
26.65	1.86	0.36	5.00	0.54	0.34	0.88
26.70	1.86	0.36	5.00	0.54	0.34	0.88
26.75	1.86	0.36	5.00	0.54	0.34	0.88
26.80	1.86	0.36	5.00	0.54	0.34	0.88
26.85	1.86	0.36	5.00	0.54	0.34	0.88
26.90	1.86	0.36	5.00	0.54	0.34	0.88
26.95	1.86	0.36	5.00	0.54	0.34	0.88
27.00	1.86	0.36	5.00	0.54	0.33	0.88
27.05	1.86	0.36	5.00	0.54	0.33	0.88
27.10	1.86	0.36	5.00	0.54	0.33	0.88
27.15	1.86	0.36	5.00	0.54	0.33	0.88
27.20	1.86	0.36	5.00	0.54	0.33	0.88

				B-LGC-3.sum		
27.25	1.86	0.36	5.00	0.54	0.33	0.88
27.30	1.86	0.36	5.00	0.54	0.33	0.88
27.35	1.86	0.36	5.00	0.54	0.33	0.88
27.40	1.86	0.36	5.00	0.54	0.33	0.88
27.45	1.86	0.36	5.00	0.54	0.33	0.88
27.50	1.86	0.36	5.00	0.54	0.33	0.88
27.55	1.86	0.36	5.00	0.54	0.33	0.88
27.60	1.86	0.36	5.00	0.54	0.33	0.87
27.65	1.86	0.36	5.00	0.54	0.33	0.87
27.70	1.86	0.36	5.00	0.54	0.33	0.87
27.75	1.86	0.36	5.00	0.54	0.33	0.87
27.80	1.86	0.36	5.00	0.54	0.33	0.87
27.85	1.86	0.36	5.00	0.54	0.33	0.87
27.90	1.86	0.36	5.00	0.54	0.33	0.87
27.95	1.86	0.36	5.00	0.54	0.33	0.87
28.00	1.86	0.36	5.00	0.54	0.33	0.87
28.05	1.86	0.36	5.00	0.54	0.33	0.87
28.10	1.86	0.36	5.00	0.54	0.33	0.87
28.15	1.86	0.36	5.00	0.54	0.33	0.87
28.20	1.86	0.36	5.00	0.54	0.32	0.87
28.25	1.86	0.36	5.00	0.54	0.32	0.87
28.30	1.86	0.36	5.00	0.54	0.32	0.87
28.35	1.86	0.36	5.00	0.54	0.32	0.87
28.40	1.86	0.36	5.00	0.54	0.32	0.87
28.45	1.86	0.36	5.00	0.54	0.32	0.87
28.50	1.86	0.36	5.00	0.54	0.32	0.87
28.55	1.86	0.36	5.00	0.54	0.32	0.87
28.60	1.86	0.36	5.00	0.54	0.32	0.87
28.65	1.86	0.36	5.00	0.54	0.32	0.86
28.70	1.86	0.36	5.00	0.54	0.32	0.86
28.75	1.86	0.36	5.00	0.54	0.32	0.86
28.80	1.86	0.36	5.00	0.54	0.32	0.86
28.85	1.86	0.36	5.00	0.54	0.32	0.86
28.90	1.86	0.36	5.00	0.54	0.32	0.86
28.95	1.86	0.36	5.00	0.54	0.32	0.86
29.00	1.86	0.36	5.00	0.54	0.31	0.86
29.05	0.40	0.36	5.00	0.54	0.31	0.86
29.10	0.37	0.36	5.00	0.54	0.31	0.86
29.15	0.35	0.36	5.00	0.54	0.31	0.86
29.20	0.34	0.36	5.00	0.54	0.31	0.86
29.25	0.33	0.36	5.00	0.54	0.31	0.86
29.30	0.32	0.36	5.00	0.54	0.31	0.85
29.35	0.31	0.36	5.00	0.54	0.31	0.85
29.40	0.31	0.36	5.00	0.54	0.31	0.85
29.45	0.30	0.36	5.00	0.54	0.31	0.85
29.50	0.29	0.36	5.00	0.54	0.31	0.85
29.55	0.29	0.36	5.00	0.54	0.30	0.85
29.60	0.28	0.36	5.00	0.54	0.30	0.85
29.65	0.28	0.36	5.00	0.54	0.30	0.85
29.70	0.27	0.36	5.00	0.54	0.30	0.85
29.75	0.27	0.36	5.00	0.54	0.30	0.85
29.80	0.26	0.36	5.00	0.54	0.30	0.84
29.85	0.26	0.36	5.00	0.54	0.30	0.84
29.90	0.25	0.36	5.00	0.54	0.30	0.84
29.95	0.25	0.36	5.00	0.54	0.30	0.84
30.00	0.24	0.36	5.00	0.54	0.29	0.84
30.05	0.24	0.36	5.00	0.54	0.29	0.84
30.10	0.24	0.36	5.00	0.54	0.29	0.84
30.15	0.24	0.36	5.00	0.54	0.29	0.83
30.20	0.24	0.36	5.00	0.54	0.29	0.83
30.25	0.24	0.36	5.00	0.54	0.29	0.83
30.30	0.24	0.36	5.00	0.54	0.28	0.83
30.35	0.25	0.36	5.00	0.54	0.28	0.83

				B-LGC-3.sum		
30.40	0.25	0.36	5.00	0.54	0.28	0.83
30.45	0.25	0.36	5.00	0.54	0.28	0.83
30.50	0.25	0.36	5.00	0.54	0.28	0.82
30.55	0.25	0.36	5.00	0.54	0.28	0.82
30.60	0.25	0.36	5.00	0.54	0.28	0.82
30.65	0.25	0.36	5.00	0.54	0.27	0.82
30.70	0.25	0.36	5.00	0.54	0.27	0.82
30.75	0.25	0.36	5.00	0.54	0.27	0.82
30.80	0.25	0.36	5.00	0.54	0.27	0.82
30.85	0.25	0.36	5.00	0.54	0.27	0.81
30.90	0.25	0.36	5.00	0.54	0.27	0.81
30.95	0.25	0.36	5.00	0.54	0.27	0.81
31.00	0.25	0.36	5.00	0.54	0.26	0.81
31.05	0.25	0.36	5.00	0.54	0.26	0.81
31.10	0.25	0.35	5.00	0.54	0.26	0.81
31.15	0.25	0.35	5.00	0.54	0.26	0.81
31.20	0.25	0.35	5.00	0.54	0.26	0.80
31.25	0.25	0.35	5.00	0.54	0.26	0.80
31.30	0.25	0.35	5.00	0.54	0.26	0.80
31.35	0.25	0.35	5.00	0.54	0.25	0.80
31.40	0.25	0.35	5.00	0.54	0.25	0.80
31.45	0.25	0.35	5.00	0.54	0.25	0.80
31.50	0.25	0.35	5.00	0.54	0.25	0.80
31.55	0.25	0.35	5.00	0.54	0.25	0.79
31.60	0.25	0.35	5.00	0.54	0.25	0.79
31.65	0.25	0.35	5.00	0.54	0.25	0.79
31.70	0.25	0.35	5.00	0.54	0.25	0.79
31.75	0.25	0.35	5.00	0.54	0.24	0.79
31.80	0.25	0.35	5.00	0.54	0.24	0.79
31.85	0.25	0.35	5.00	0.54	0.24	0.79
31.90	0.25	0.35	5.00	0.54	0.24	0.78
31.95	0.25	0.35	5.00	0.54	0.24	0.78
32.00	0.25	0.35	5.00	0.54	0.24	0.78
32.05	0.25	0.35	5.00	0.54	0.24	0.78
32.10	0.25	0.35	5.00	0.54	0.23	0.78
32.15	0.25	0.35	5.00	0.54	0.23	0.78
32.20	0.25	0.35	5.00	0.54	0.23	0.78
32.25	0.25	0.35	5.00	0.54	0.23	0.77
32.30	0.25	0.35	5.00	0.54	0.23	0.77
32.35	0.25	0.35	5.00	0.54	0.23	0.77
32.40	0.25	0.35	5.00	0.54	0.23	0.77
32.45	0.25	0.35	5.00	0.54	0.22	0.77
32.50	0.25	0.35	5.00	0.54	0.22	0.77
32.55	0.25	0.35	5.00	0.54	0.22	0.77
32.60	0.25	0.35	5.00	0.54	0.22	0.76
32.65	0.25	0.35	5.00	0.54	0.22	0.76
32.70	0.25	0.35	5.00	0.54	0.22	0.76
32.75	0.25	0.35	5.00	0.54	0.22	0.76
32.80	0.25	0.35	5.00	0.54	0.21	0.76
32.85	0.25	0.35	5.00	0.54	0.21	0.76
32.90	0.25	0.35	5.00	0.54	0.21	0.76
32.95	0.25	0.35	5.00	0.54	0.21	0.75
33.00	0.25	0.35	5.00	0.54	0.21	0.75
33.05	0.25	0.35	5.00	0.54	0.21	0.75
33.10	0.25	0.35	5.00	0.54	0.21	0.75
33.15	0.25	0.35	5.00	0.54	0.20	0.75
33.20	0.24	0.35	5.00	0.54	0.20	0.75
33.25	0.24	0.35	5.00	0.54	0.20	0.75
33.30	0.24	0.35	5.00	0.54	0.20	0.74
33.35	0.24	0.35	5.00	0.54	0.20	0.74
33.40	0.24	0.35	5.00	0.54	0.20	0.74
33.45	0.24	0.35	5.00	0.54	0.19	0.74
33.50	0.24	0.35	5.00	0.54	0.19	0.74

				B-LGC-3.sum		
33.55	0.24	0.35	5.00	0.54	0.19	0.74
33.60	0.24	0.35	5.00	0.54	0.19	0.74
33.65	0.24	0.35	5.00	0.54	0.19	0.73
33.70	0.24	0.35	5.00	0.54	0.19	0.73
33.75	0.24	0.35	5.00	0.54	0.19	0.73
33.80	0.24	0.35	5.00	0.54	0.18	0.73
33.85	0.24	0.35	5.00	0.54	0.18	0.73
33.90	0.24	0.35	5.00	0.54	0.18	0.73
33.95	0.24	0.35	5.00	0.54	0.18	0.72
34.00	0.24	0.35	5.00	0.54	0.18	0.72
34.05	0.24	0.35	5.00	0.54	0.18	0.72
34.10	0.23	0.35	5.00	0.54	0.17	0.72
34.15	0.23	0.35	5.00	0.54	0.17	0.72
34.20	0.23	0.35	5.00	0.54	0.17	0.72
34.25	0.23	0.35	5.00	0.54	0.17	0.71
34.30	0.23	0.34	5.00	0.54	0.17	0.71
34.35	0.23	0.34	5.00	0.54	0.17	0.71
34.40	0.23	0.34	5.00	0.54	0.16	0.71
34.45	0.23	0.34	5.00	0.54	0.16	0.71
34.50	0.23	0.34	5.00	0.54	0.16	0.71
34.55	0.23	0.34	5.00	0.54	0.16	0.70
34.60	0.23	0.34	5.00	0.54	0.16	0.70
34.65	0.23	0.34	5.00	0.54	0.16	0.70
34.70	0.23	0.34	5.00	0.54	0.15	0.70
34.75	0.23	0.34	5.00	0.54	0.15	0.70
34.80	0.23	0.34	5.00	0.54	0.15	0.70
34.85	0.23	0.34	5.00	0.54	0.15	0.69
34.90	0.23	0.34	5.00	0.54	0.15	0.69
34.95	0.23	0.34	5.00	0.54	0.15	0.69
35.00	0.23	0.34	5.00	0.54	0.14	0.69
35.05	0.22	0.34	5.00	0.54	0.14	0.69
35.10	0.22	0.34	5.00	0.54	0.14	0.69
35.15	0.22	0.34	5.00	0.54	0.14	0.68
35.20	0.22	0.34	5.00	0.54	0.14	0.68
35.25	0.22	0.34	5.00	0.54	0.14	0.68
35.30	0.22	0.34	5.00	0.54	0.13	0.68
35.35	0.22	0.34	5.00	0.54	0.13	0.68
35.40	0.22	0.34	5.00	0.54	0.13	0.67
35.45	0.22	0.34	5.00	0.54	0.13	0.67
35.50	0.22	0.34	5.00	0.54	0.13	0.67
35.55	0.21	0.34	5.00	0.54	0.12	0.67
35.60	0.21	0.34	5.00	0.54	0.12	0.67
35.65	0.21	0.34	5.00	0.54	0.12	0.67
35.70	0.21	0.34	5.00	0.54	0.12	0.66
35.75	0.21	0.34	5.00	0.54	0.12	0.66
35.80	0.21	0.34	5.00	0.54	0.11	0.66
35.85	0.21	0.34	5.00	0.54	0.11	0.66
35.90	0.21	0.34	5.00	0.54	0.11	0.66
35.95	0.21	0.34	5.00	0.54	0.11	0.65
36.00	0.21	0.34	5.00	0.54	0.11	0.65
36.05	0.21	0.34	5.00	0.54	0.10	0.65
36.10	0.20	0.34	5.00	0.54	0.10	0.65
36.15	0.20	0.34	5.00	0.54	0.10	0.64
36.20	0.20	0.34	5.00	0.54	0.10	0.64
36.25	0.20	0.34	5.00	0.54	0.10	0.64
36.30	0.20	0.34	5.00	0.54	0.09	0.64
36.35	0.20	0.34	5.00	0.54	0.09	0.64
36.40	0.20	0.34	5.00	0.54	0.09	0.63
36.45	0.20	0.34	5.00	0.54	0.09	0.63
36.50	0.20	0.34	5.00	0.54	0.08	0.63
36.55	0.20	0.34	5.00	0.54	0.08	0.63
36.60	0.20	0.34	5.00	0.54	0.08	0.62
36.65	0.19	0.34	5.00	0.54	0.08	0.62

B-LGC-3.sum						
36.70	0.19	0.34	5.00	0.54	0.07	0.62
36.75	0.19	0.34	5.00	0.54	0.07	0.62
36.80	0.19	0.34	5.00	0.54	0.07	0.61
36.85	0.19	0.34	5.00	0.54	0.07	0.61
36.90	0.19	0.34	5.00	0.54	0.06	0.61
36.95	0.19	0.34	5.00	0.54	0.06	0.61
37.00	0.19	0.34	5.00	0.54	0.06	0.60
37.05	0.19	0.34	5.00	0.54	0.06	0.60
37.10	0.19	0.34	5.00	0.54	0.05	0.60
37.15	0.19	0.34	5.00	0.54	0.05	0.60
37.20	0.19	0.34	5.00	0.54	0.05	0.59
37.25	0.18	0.34	5.00	0.54	0.05	0.59
37.30	0.18	0.34	5.00	0.54	0.04	0.59
37.35	0.18	0.34	5.00	0.54	0.04	0.59
37.40	0.18	0.34	5.00	0.54	0.04	0.58
37.45	0.18	0.34	5.00	0.54	0.04	0.58
37.50	0.18	0.33	5.00	0.54	0.03	0.58
37.55	0.19	0.33	5.00	0.54	0.03	0.57
37.60	0.21	0.33	5.00	0.54	0.03	0.57
37.65	0.22	0.33	5.00	0.54	0.03	0.57
37.70	0.23	0.33	5.00	0.54	0.02	0.57
37.75	0.25	0.33	5.00	0.54	0.02	0.57
37.80	0.27	0.33	5.00	0.54	0.02	0.57
37.85	0.29	0.33	5.00	0.54	0.02	0.56
37.90	0.32	0.33	5.00	0.54	0.02	0.56
37.95	0.36	0.33	5.00	0.54	0.02	0.56
38.00	1.80	0.33	5.00	0.54	0.02	0.56
38.05	1.80	0.33	5.00	0.54	0.01	0.56
38.10	1.80	0.33	5.00	0.54	0.01	0.56
38.15	1.80	0.33	5.00	0.54	0.01	0.56
38.20	1.80	0.33	5.00	0.54	0.01	0.56
38.25	1.80	0.33	5.00	0.54	0.01	0.56
38.30	1.80	0.33	5.00	0.54	0.01	0.56
38.35	1.80	0.33	5.00	0.54	0.01	0.56
38.40	1.80	0.33	5.00	0.54	0.01	0.56
38.45	1.80	0.33	5.00	0.54	0.01	0.56
38.50	1.80	0.33	5.00	0.54	0.01	0.55
38.55	1.80	0.33	5.00	0.54	0.01	0.55
38.60	1.79	0.33	5.00	0.54	0.01	0.55
38.65	1.79	0.33	5.00	0.54	0.01	0.55
38.70	1.79	0.33	5.00	0.54	0.01	0.55
38.75	1.79	0.33	5.00	0.54	0.01	0.55
38.80	1.79	0.33	5.00	0.54	0.01	0.55
38.85	1.79	0.33	5.00	0.54	0.01	0.55
38.90	1.79	0.33	5.00	0.54	0.01	0.55
38.95	1.79	0.33	5.00	0.54	0.01	0.55
39.00	1.79	0.33	5.00	0.54	0.01	0.55
39.05	1.79	0.33	5.00	0.54	0.01	0.55
39.10	1.79	0.33	5.00	0.54	0.01	0.55
39.15	1.79	0.33	5.00	0.54	0.01	0.55
39.20	1.79	0.33	5.00	0.54	0.01	0.55
39.25	1.79	0.33	5.00	0.54	0.00	0.55
39.30	1.79	0.33	5.00	0.54	0.00	0.55
39.35	1.79	0.33	5.00	0.54	0.00	0.55
39.40	1.79	0.33	5.00	0.54	0.00	0.55
39.45	1.79	0.33	5.00	0.54	0.00	0.55
39.50	1.79	0.33	5.00	0.54	0.00	0.55
39.55	1.79	0.33	5.00	0.54	0.00	0.55
39.60	1.79	0.33	5.00	0.54	0.00	0.55
39.65	1.79	0.33	5.00	0.54	0.00	0.55
39.70	1.79	0.33	5.00	0.54	0.00	0.55
39.75	1.78	0.33	5.00	0.54	0.00	0.55
39.80	1.78	0.33	5.00	0.54	0.00	0.55

[illegible]

[illegible]

				B-LGC-3.sum		
46.15	1.73	0.33	5.00	0.54	0.00	0.54
46.20	1.73	0.33	5.00	0.54	0.00	0.54
46.25	1.73	0.33	5.00	0.54	0.00	0.54
46.30	1.73	0.33	5.00	0.54	0.00	0.54
46.35	1.73	0.33	5.00	0.54	0.00	0.54
46.40	1.73	0.34	5.00	0.54	0.00	0.54
46.45	1.73	0.34	5.00	0.54	0.00	0.54
46.50	1.73	0.34	5.00	0.54	0.00	0.54
46.55	1.73	0.34	5.00	0.54	0.00	0.54
46.60	1.73	0.34	5.00	0.54	0.00	0.54
46.65	1.73	0.34	5.00	0.54	0.00	0.54
46.70	1.73	0.34	5.00	0.54	0.00	0.54
46.75	1.73	0.34	5.00	0.54	0.00	0.54
46.80	1.72	0.34	5.00	0.54	0.00	0.54
46.85	1.72	0.34	5.00	0.54	0.00	0.54
46.90	1.72	0.34	5.00	0.54	0.00	0.54
46.95	1.72	0.34	5.00	0.54	0.00	0.54
47.00	1.72	0.34	5.00	0.54	0.00	0.54
47.05	1.72	0.34	5.00	0.54	0.00	0.54
47.10	1.72	0.34	5.00	0.54	0.00	0.54
47.15	1.72	0.34	5.00	0.54	0.00	0.54
47.20	1.72	0.34	5.00	0.54	0.00	0.54
47.25	1.72	0.34	5.00	0.54	0.00	0.54
47.30	1.72	0.34	5.00	0.54	0.00	0.54
47.35	0.35	0.34	1.04	0.54	0.00	0.54
47.40	0.31	0.34	0.93*	0.54	0.00	0.54
47.45	0.29	0.34	0.87*	0.54	0.00	0.54
47.50	0.28	0.34	0.82*	0.54	0.00	0.54
47.55	0.27	0.34	0.82*	0.54	0.00	0.54
47.60	0.27	0.34	0.81*	0.53	0.00	0.53
47.65	0.27	0.34	0.81*	0.53	0.00	0.53
47.70	0.27	0.34	0.80*	0.52	0.00	0.52
47.75	0.27	0.34	0.80*	0.52	0.00	0.52
47.80	0.27	0.34	0.79*	0.51	0.00	0.51
47.85	0.26	0.34	0.79*	0.51	0.00	0.51
47.90	0.26	0.34	0.78*	0.50	0.00	0.50
47.95	0.26	0.34	0.78*	0.50	0.00	0.50
48.00	0.26	0.34	0.77*	0.49	0.00	0.49
48.05	0.26	0.34	0.77*	0.49	0.00	0.49
48.10	0.26	0.34	0.76*	0.48	0.00	0.48
48.15	0.25	0.34	0.76*	0.48	0.00	0.48
48.20	0.25	0.34	0.75*	0.47	0.00	0.47
48.25	0.25	0.34	0.75*	0.46	0.00	0.46
48.30	0.25	0.34	0.75*	0.46	0.00	0.46
48.35	0.25	0.34	0.74*	0.45	0.00	0.45
48.40	0.25	0.34	0.74*	0.45	0.00	0.45
48.45	0.25	0.34	0.73*	0.44	0.00	0.44
48.50	0.25	0.34	0.73*	0.43	0.00	0.43
48.55	0.24	0.34	0.73*	0.43	0.00	0.43
48.60	0.24	0.34	0.72*	0.42	0.00	0.42
48.65	0.24	0.34	0.72*	0.41	0.00	0.41
48.70	0.24	0.34	0.71*	0.41	0.00	0.41
48.75	0.24	0.34	0.71*	0.40	0.00	0.40
48.80	0.24	0.34	0.71*	0.39	0.00	0.39
48.85	0.24	0.34	0.70*	0.39	0.00	0.39
48.90	0.23	0.34	0.70*	0.38	0.00	0.38
48.95	0.23	0.34	0.69*	0.37	0.00	0.37
49.00	0.23	0.34	0.69*	0.37	0.00	0.37
49.05	0.23	0.34	0.69*	0.36	0.00	0.36
49.10	0.23	0.34	0.68*	0.35	0.00	0.35
49.15	0.23	0.34	0.68*	0.35	0.00	0.35
49.20	0.23	0.34	0.68*	0.34	0.00	0.34
49.25	0.23	0.34	0.67*	0.33	0.00	0.33

B-LGC-3.sum						
49.30	0.23	0.34	0.67*	0.33	0.00	0.33
49.35	0.22	0.34	0.67*	0.32	0.00	0.32
49.40	0.22	0.34	0.66*	0.31	0.00	0.31
49.45	0.22	0.34	0.66*	0.31	0.00	0.31
49.50	0.22	0.34	0.66*	0.30	0.00	0.30
49.55	0.22	0.34	0.65*	0.29	0.00	0.29
49.60	0.22	0.34	0.65*	0.29	0.00	0.29
49.65	0.22	0.34	0.65*	0.28	0.00	0.28
49.70	0.22	0.34	0.64*	0.27	0.00	0.27
49.75	0.22	0.34	0.64*	0.26	0.00	0.26
49.80	0.21	0.34	0.64*	0.26	0.00	0.26
49.85	0.21	0.34	0.63*	0.25	0.00	0.25
49.90	0.21	0.34	0.63*	0.24	0.00	0.24
49.95	0.21	0.34	0.63*	0.23	0.00	0.23
50.00	0.21	0.34	0.62*	0.23	0.00	0.23
50.05	0.21	0.34	0.62*	0.22	0.00	0.22
50.10	0.21	0.34	0.62*	0.21	0.00	0.21
50.15	0.21	0.34	0.62*	0.20	0.00	0.20
50.20	0.21	0.34	0.62*	0.20	0.00	0.20
50.25	0.21	0.34	0.62*	0.19	0.00	0.19
50.30	0.21	0.34	0.62*	0.18	0.00	0.18
50.35	0.21	0.34	0.62*	0.17	0.00	0.17
50.40	0.21	0.34	0.62*	0.17	0.00	0.17
50.45	0.21	0.34	0.62*	0.16	0.00	0.16
50.50	0.21	0.34	0.62*	0.15	0.00	0.15
50.55	0.21	0.34	0.62*	0.14	0.00	0.14
50.60	0.21	0.34	0.62*	0.14	0.00	0.14
50.65	0.21	0.34	0.62*	0.13	0.00	0.13
50.70	0.21	0.34	0.62*	0.12	0.00	0.12
50.75	0.21	0.34	0.62*	0.11	0.00	0.11
50.80	0.21	0.34	0.62*	0.11	0.00	0.11
50.85	0.21	0.34	0.62*	0.10	0.00	0.10
50.90	0.21	0.34	0.62*	0.09	0.00	0.09
50.95	0.21	0.34	0.62*	0.08	0.00	0.08
51.00	0.21	0.34	0.62*	0.08	0.00	0.08
51.05	0.21	0.34	0.62*	0.07	0.00	0.07
51.10	0.21	0.34	0.62*	0.06	0.00	0.06
51.15	0.21	0.34	0.61*	0.05	0.00	0.05
51.20	0.21	0.34	0.61*	0.05	0.00	0.05
51.25	0.21	0.34	0.61*	0.04	0.00	0.04
51.30	0.21	0.34	0.61*	0.03	0.00	0.03
51.35	0.21	0.34	0.61*	0.02	0.00	0.02
51.40	0.21	0.34	0.61*	0.02	0.00	0.02
51.45	0.21	0.34	0.61*	0.01	0.00	0.01
51.50	0.21	0.34	0.61*	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 Depth = ft, Stress or Pressure = tsf (atm), Unit weight =
pcf, Settlement = in.

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

APPENDIX E

LGC VALLEY, INC.

General Earthwork and Grading Specifications For Rough Grading

1.0 General

1.1 Intent: These General Earthwork and Grading Specifications are for the grading and earthwork shown on the approved grading plan(s) and/or indicated in the geotechnical report(s). These Specifications are a part of the recommendations contained in the geotechnical report(s). In case of conflict, the specific recommendations in the geotechnical report shall supersede these more general Specifications. Observations of the earthwork by the project Geotechnical Consultant during the course of grading may result in new or revised recommendations that could supersede these specifications or the recommendations in the geotechnical report(s).

1.2 The Geotechnical Consultant of Record: Prior to commencement of work, the owner shall employ a qualified Geotechnical Consultant of Record (Geotechnical Consultant). The Geotechnical Consultant shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of the grading.

Prior to commencement of grading, the Geotechnical Consultant shall review the "work plan" prepared by the Earthwork Contractor (Contractor) and schedule sufficient personnel to perform the appropriate level of observation, mapping, and compaction testing.

During the grading and earthwork operations, the Geotechnical Consultant shall observe, map, and document the subsurface exposures to verify the geotechnical design assumptions. If the observed conditions are found to be significantly different than the interpreted assumptions during the design phase, the Geotechnical Consultant shall inform the owner, recommend appropriate changes in design to accommodate the observed conditions, and notify the review agency where required.

The Geotechnical Consultant shall observe the moisture-conditioning and processing of the subgrade and fill materials and perform relative compaction testing of fill to confirm that the attained level of compaction is being accomplished as specified. The Geotechnical Consultant shall provide the test results to the owner and the Contractor on a routine and frequent basis.

- 1.3 The Earthwork Contractor:** The Earthwork Contractor (Contractor) shall be qualified, experienced, and knowledgeable in earthwork logistics, preparation and processing of ground to receive fill, moisture-conditioning and processing of fill, and compacting fill. The Contractor shall review and accept the plans, geotechnical report(s), and these Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing the grading in accordance with the project plans and specifications. The Contractor shall prepare and submit to the owner and the Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of “equipment” of work and the estimated quantities of daily earthwork contemplated for the site prior to commencement of grading. The Contractor shall inform the owner and the Geotechnical Consultant of changes in work schedules and updates to the work plan at least 24 hours in advance of such changes so that appropriate personnel will be available for observation and testing. . The Contractor shall not assume that the Geotechnical Consultant is aware of all grading operations.

The Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish the earthwork in accordance with the applicable grading codes and agency ordinances, these Specifications, and the recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of the Geotechnical Consultant, unsatisfactory conditions, such as unsuitable soil, improper moisture condition, inadequate compaction, insufficient buttress key size, adverse weather, etc., are resulting in a quality of work less than required in these specifications, the Geotechnical Consultant shall reject the work and may recommend to the owner that construction be stopped until the conditions are rectified. It is the contractor’s sole responsibility to provide proper fill compaction.

2.0 Preparation of Areas to be Filled

- 2.1 Clearing and Grubbing:** Vegetation, such as brush, grass, roots, and other deleterious material shall be sufficiently removed and properly disposed of in a method acceptable to the owner, governing agencies, and the Geotechnical Consultant.

The Geotechnical Consultant shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 1 percent of organic materials (by volume). No fill lift shall contain more than 10 percent of organic matter. Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the Contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area.

As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant, etc.) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminate dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fines and/or imprisonment, and shall not be allowed. The contractor is responsible for all hazardous waste relating to his work. The Geotechnical Consultant does not have expertise in this area. If hazardous waste is a concern, then the Client should acquire the services of a qualified environmental assessor.

- 2.2 Processing:** Existing ground that has been declared satisfactory for support of fill by the Geotechnical Consultant shall be scarified to a minimum depth of 6 inches. Existing ground that is not satisfactory shall be overexcavated as specified in the following section. Scarification shall continue until soils are broken down and free from oversize material and the working surface is reasonably uniform, flat, and free from uneven features that would inhibit uniform compaction.
- 2.3 Overexcavation:** In addition to removals and overexcavations recommended in the approved geotechnical report(s) and the grading plan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured or otherwise unsuitable ground shall be overexcavated to competent ground as evaluated by the Geotechnical Consultant during grading.
- 2.4 Benching:** Where fills are to be placed on ground with slopes steeper than 5:1 (horizontal to vertical units), the ground shall be stepped or benched. Please see the Standard Details for a graphic illustration. The lowest bench or key shall be a minimum of 15 feet wide and at least 2 feet deep, into competent material as evaluated by the Geotechnical Consultant. Other benches shall be excavated a minimum height of 4 feet into competent material or as otherwise recommended by the Geotechnical Consultant. Fill placed on ground sloping flatter than 5:1 shall also be benched or otherwise overexcavated to provide a flat subgrade for the fill.
- 2.5 Evaluation/Acceptance of Fill Areas:** All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive fill. The Contractor shall obtain a written acceptance from the Geotechnical Consultant prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys, and benches.

3.0 Fill Material

- 3.1 General:** Material to be used as fill shall be essentially free from organic matter and other deleterious substances evaluated and accepted by the Geotechnical Consultant prior to placement. Soils of poor quality, such as those with unacceptable gradation, high expansion potential, or low strength shall be placed in areas acceptable to the Geotechnical Consultant or mixed with other soils to achieve satisfactory fill material.

- 3.2 **Oversize:** Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 8 inches, shall not be buried or placed in fill unless location, materials, and placement methods are specifically accepted by the Geotechnical Consultant. Placement operations shall be such that nesting of oversized material does not occur and such that oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 vertical feet of finish grade or within 2 feet of future utilities or underground construction.
- 3.3 **Import:** If importing of fill material is required for grading, proposed import material shall meet the requirements of Section 3.1. The potential import source shall be given to the Geotechnical Consultant at least 48 hours (2 working days) before importing begins so that its suitability can be determined and appropriate tests performed.

4.0 **Fill Placement and Compaction**

- 4.1 **Fill Layers:** Approved fill material shall be placed in areas prepared to receive fill (per Section 3.0) in near-horizontal layers not exceeding 8 inches in loose thickness. The Geotechnical Consultant may accept thicker layers if testing indicates the grading procedures can adequately compact the thicker layers. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.
- 4.2 **Fill Moisture Conditioning:** Fill soils shall be watered, dried back, blended, and/or mixed, as necessary to attain a relatively uniform moisture content at or slightly over optimum. Maximum density and optimum soil moisture content tests shall be performed in accordance with the American Society of Testing and Materials (ASTM Test Method D1557-91).
- 4.3 **Compaction of Fill:** After each layer has been moisture-conditioned, mixed, and evenly spread, it shall be uniformly compacted to not less than 90 percent of maximum dry density (ASTM Test Method D1557-91). Compaction equipment shall be adequately sized and be either specifically designed for soil compaction or of proven reliability to efficiently achieve the specified level of compaction with uniformity.
- 4.4 **Compaction of Fill Slopes:** In addition to normal compaction procedures specified above, compaction of slopes shall be accomplished by backrolling of slopes with sheepsfoot rollers at increments of 3 to 4 feet in fill elevation, or by other methods producing satisfactory results acceptable to the Geotechnical Consultant. Upon completion of grading, relative compaction of the fill, out to the slope face, shall be at least 90 percent of maximum density per ASTM Test Method D1557-91.

- 4.5 Compaction Testing:** Field tests for moisture content and relative compaction of the fill soils shall be performed by the Geotechnical Consultant. Location and frequency of tests shall be at the Consultant's discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations shall be selected to verify adequacy of compaction levels in areas that are judged to be prone to inadequate compaction (such as close to slope faces and at the fill/bedrock benches).
- 4.6 Frequency of Compaction Testing:** Tests shall be taken at intervals not exceeding 2 feet in vertical rise and/or 1,000 cubic yards of compacted fill soils embankment. In addition, as a guideline, at least one test shall be taken on slope faces for each 5,000 square feet of slope face and/or each 10 feet of vertical height of slope. The Contractor shall assure that fill construction is such that the testing schedule can be accomplished by the Geotechnical Consultant. The Contractor shall stop or slow down the earthwork construction if these minimum standards are not met.
- 4.7 Compaction Test Locations:** The Geotechnical Consultant shall document the approximate elevation and horizontal coordinates of each test location. The Contractor shall coordinate with the project surveyor to assure that sufficient grade stakes are established so that the Geotechnical Consultant can determine the test locations with sufficient accuracy. At a minimum, two grade stakes within a horizontal distance of 100 feet and vertically less than 5 feet apart from potential test locations shall be provided.

5.0 Subdrain Installation

Subdrain systems shall be installed in accordance with the approved geotechnical report(s), the grading plan, and the Standard Details. The Geotechnical Consultant may recommend additional subdrains and/or changes in subdrain extent, location, grade, or material depending on conditions encountered during grading. All subdrains shall be surveyed by a land surveyor/civil engineer for line and grade after installation and prior to burial. Sufficient time should be allowed by the Contractor for these surveys.

6.0 Excavation

Excavations, as well as over-excavation for remedial purposes, shall be evaluated by the Geotechnical Consultant during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by the Geotechnical Consultant based on the field evaluation of exposed conditions during grading. Where fill-over-cut slopes are to be graded, the cut portion of the slope shall be made, evaluated, and accepted by the Geotechnical Consultant prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by the Geotechnical Consultant.

7.0 Trench Backfills

- 7.1** The Contractor shall follow all OHSA and Cal/OSHA requirements for safety of trench excavations.
- 7.2** All bedding and backfill of utility trenches shall be done in accordance with the applicable provisions of Standard Specifications of Public Works Construction. Bedding material shall have a Sand Equivalent greater than 30 (SE>30). The bedding shall be placed to 1 foot over the top of the conduit and densified by jetting. Backfill shall be placed and densified to a minimum of 90 percent of maximum from 1 foot above the top of the conduit to the surface.
- 7.3** The jetting of the bedding around the conduits shall be observed by the Geotechnical Consultant.
- 7.4** The Geotechnical Consultant shall test the trench backfill for relative compaction. At least one test should be made for every 300 feet of trench and 2 feet of fill.
- 7.5** Lift thickness of trench backfill shall not exceed those allowed in the Standard Specifications of Public Works Construction unless the Contractor can demonstrate to the Geotechnical Consultant that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method.