Appendix 7

Geology and Soils

Appendix 7.1

Preliminary Geotechnical Investigation

Prepared for

Mirman School of Gifted Children
16100 Mulholland Drive
Los Angeles, California 90049

PRELIMINARY GEOTECHNICAL INVESTIGATION

PROPOSED MIRMAN SCHOOL LEARNING CENTER
LOS ANGELES, CALIFORNIA

Prepared by

Geosyntec consultants

engineers | scientists | innovators

2355 Northside Drive, Suite 250
San Diego, California 92108

Project Number SC0984

January 20, 2021

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Proposed Mirman School Learning Center
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2355 Northside Drive, Suite 250
San Diego, California 92108

This report was prepared and reviewed by the undersigned.

Dennis Kilian, P.G., C.E.G.
Project Geologist

Jerko Kocijan, Ph.D., P.E., G.E.
Principal Engineer

Project Number: SC0984

January 20, 2021

PROFESSIONAL GEOLOGIST
DENNIS A. KILIAN
No. 2672
CERTIFIED
ENGINEERING
GEOLOGIST
Exp. 8/31/22
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
JERKO KOCIJAN
No. 2969
Exp. 12/31/21
GEOTECHNICAL
STATE OF CALIFORNIA

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LIST OF ACRONYMS AND ABBREVIATIONS

ACI	American Concrete Institute
ALTA	American Land Title Association
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
bgs	below (existing) ground surface
CalGEM	Geologic Energy Management Division
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	State of California Department of Transportation
CBC	California Building Code
CGS	California Geological Survey
CIDH	cast-in-drilled hole
CLSM	Controlled Low Strength Materials
CTI	California Testing & Inspections
FEMA	Federal Emergency Management Agency
Geosyntec	Geosyntec Consultants
km	kilometer
LAR	Limited Access Rig
M	moment magnitude
mm	millimeters
PCC	Portland cement concrete
pcf	pounds per cubic foot
pci	pounds per cubic inch
ppm	parts per million
psf	pounds per square foot
SE	sand equivalency
SPT	standard penetration test
R-Value	Resistance value for pavement design
NI-RCFZ	Newport-Inglewood Rose Canyon fault zone
USGS	United States Geological Survey

1. INTRODUCTION

Geosyntec Consultants, Inc. (Geosyntec) respectfully presents this preliminary geotechnical investigation report for the proposed improvements at The Mirman School for Gifted Children (Mirman) located at 16180 Mulholland Dr., Los Angeles, CA 90049 (Site, Figure 1). This report provides the results of the geotechnical investigation to address the geologic conditions at the proposed location for site improvements. The goal of the investigation was to assess subsurface soil materials and their properties to evaluate their suitability for support of the proposed improvements and provide preliminary recommendations for foundation design and remedial grading. This report is intended to supplement the environmental clearance for the proposed improvements pursuant to the California Environmental Quality Act (CEQA).

Based on our investigation, the site is considered suitable for the intended use based upon the preliminary recommendations provided herein. When final plans for the proposed improvements become available, they should be reviewed by the project soils engineer and engineering geologist of record. A separate geotechnical report will be prepared to provide design level values for development once plans have been finalized.

1.1 Site and Project Description

The existing Mirman School campus is located on the south side of Mulholland Drive in the Sherman Oaks area of Los Angeles, California. The site is currently developed with existing one- and two-story classrooms, an auditorium, and related campus structures. An approximately 100-foot-high slope descends from the east at an approximate 1½ to 1 (horizontal to vertical) gradient towards the site. Retaining walls along the slope create terraced garden areas and walkways. Existing improvements in the site area include a church-owned parking lot to the west and private schools to the northwest and southeast. Residential homes are located north of the campus, across Mulholland Drive.

Based on our understanding, the proposed improvements include a new, approximately 16,000-square foot, two-story classroom building along with associated site improvements. Additional ancillary improvements include a new campus quadrangle to the north of the classroom building, a new plaza, yard, and paved access to the south of the new building, a new courtyard between the existing campus and the new building, and a new garden hillside terrace to the east of the building. A subterranean Contech or similar tank for stormwater (capture and re-use) is proposed beneath the new quadrangle. A small entrance pavilion at the campus pedestrian gate and enlargement of the existing transformer enclosure is also proposed, as well as a new playground area.

1.2 Previous Site Geotechnical Reports

Previous geotechnical reports have been completed at the site by others. Reports provided to Geosyntec for review include:

- 2011, "Supplemental Geotechnical Recommendations for Proposed Athletic Field and Restroom Building for The Mirman School", Los Angeles, California. Dated February 10, 2011 by Shannon & Wilson, Inc.
- 2014, "Geologic and Soils Engineering Exploration Update", Los Angeles, California. Dated July 31, 2014 by Byer Geotechnical, Inc.
- 2016, "Addendum Geologic and Soils Engineering Exploration Update", Los Angeles, California. Dated October 14, 2016 by Byer Geotechnical, Inc.
- 2016, "Compaction Report", Los Angeles, California. Dated September 28, 2016 by Byer Geotechnical, Inc.
- 2018, "Environmental Impact Report, Evaluation of Soils and Geology Issues. Proposed Improvements to Mirman School", Los Angeles, California. Dated August 21, 2018 by Geotechnologies, Inc.

The preliminary recommendations provided herein supersede any recommendations for this specific project that may be presented in the reports referenced above. Geotechnical reports considered pertinent to this investigation are included in Appendix C.

1.3 Report Organization

This report provides a summary of the geologic conditions at the site and the results of geotechnical analysis for the proposed improvements. Specifically, the results of the investigation were used to develop preliminary recommendations regarding:

- Grading concepts/site preparation recommendations;
- Allowable soil bearing capacities;
- Soil unit weights;
- Soil pressures;
- Soil friction coefficients;
- Deep foundation capacities;
- Recommended pavement sections; and
- Other necessary geotechnical design parameters.

2. FIELD INVESTIGATION AND LABORATORY TESTING

2.1 Field Investigation

Geosyntec advanced and sampled five, 8-inch hollow-stem auger borings with a track-mounted limited access drill rig (LAR) and truck-mounted CME 95 drill rig on November 1 and November 2, 2019, respectively. The locations of the explorations are shown in Figure 2. The borings were advanced to approximate depths ranging from 21.5 feet below ground surface (bgs) in Boring GSB-1 and SVP-2 to 32 feet bgs in SVP-1. Bulk soil samples were collected from soil cuttings, and driven soil samples were obtained with standard penetration test (SPT) and Modified California samplers at approximate 5-foot intervals during drilling. Subsurface conditions were logged in accordance with ASTM D2488. Groundwater was not encountered in any of the borings. Geologic boring logs are presented in Appendix A.

Locations of relevant previous explorations by others are also included in Figure 2. While our recommendations are primarily based on borings performed for this study, the data by others were reviewed.

3. GEOTECHNICAL LABORATORY TESTING

Laboratory tests were conducted on selected soil samples for classification purposes and to evaluate physical properties and engineering characteristics. Select soil samples were tested by California Testing & Inspections (CTI). The geotechnical laboratory tests were performed in general accordance with the testing procedures of ASTM International or other generally accepted test methods. The geotechnical laboratory testing included:

Laboratory Tests	ASTM Designation
Particle Size Analysis	D6913
Expansion Index	D4829
Atterberg Limits	D4318
R-Value	D2844
Direct Shear	D3080
Corrosion Potential	CTM CA Test 532/643
In-place Moisture and Density	D2937/D2216

The results of the laboratory tests are presented in Appendix B.

4. GEOLOGY

4.1 Regional Geology

The Site lies within the Santa Monica Mountains, which are an eastward-plunging anticline with a core of Jurassic slate and schist. Tertiary sedimentary rocks traditionally overlie the metamorphic slate and schist. The Transverse Ranges Geomorphic Province is typically characterized by east-west trending mountains where the northern and southern boundaries are formed by reverse fault scarps. The convergent deformational features of the Transverse Ranges are a result of north-south shortening due to tectonic plates. This has resulted in local folding and uplift of the mountains along with a propagation of thrust faults as well as blind thrusts. Intervening valleys have been filled with sediments originating from bordering mountains.

4.2 Previous Grading

Based on a review of historical aerial imagery and topographic maps, a southwest-northeast trending canyon/drainage previously existed beneath the site. Historical topographic maps (Netronline, 2019) indicate up to 60 feet of elevation difference along the axis of the previous drainage to existing elevations. Mass grading of the area filled the canyon/drainage prior to 1972, where aerial imagery shows the first structures at the school site (Netronline, 2019). This grading may have been performed in conjunction with operations at the previous landfill located west of the site. Documentation of the fill placement was not discovered during our site research, and it is unknown if the fill was placed under observation and testing or other engineering controls.

In 2016, Byer Geotechnical completed placement, grading, and compaction testing in the northeastern portion of the site at the basketball courts, playground, and athletic building. According to the report, soils were tested to at least 90% of the maximum dry density and above optimum moisture content. Documentation of grading for the other existing campus improvements was not provided or discovered, and soil conditions beneath existing structures is unknown.

4.3 Subsurface Conditions

According to mapping by Dibblee and Ehrenspeck (1991) as well as Yerkes, R.F. et al. (2005), tan to light gray semi-friable, bedded sandstone of the lower member Modelo Formation (Tmss) underlies the site. A geologic map of the Site region is shown on Figure 3.

Based on observations during the explorations performed at the site in addition to document review (Byer, 2014), Quaternary Previously Placed Fill soils ranging from 7 to 34 feet in thickness were observed to overlie the Tertiary Modelo Formation in the proposed improvement area. The geologic materials encountered are described below.

4.3.1 Quaternary Previously Placed Fill (Undocumented)

Previously Placed Fill soils, considered to be undocumented, were observed to approximately 15 feet below grade during Geosyntec explorations. Nearby relevant borings previously performed by Byer in 2014 indicate undocumented fill to depths of from 7 to 34 feet bgs. Fill soils generally consist of medium dense, moist, fine- to medium-grained, silty sand. Fill depths beneath the proposed classroom building are anticipated to vary from 0 to 35 feet bgs, with the deepest fill expected below the southwest corner of the proposed structure.

Based on a review of the as-graded report for the site (Byer, 2016), the fill soils in the northern portion of the site are considered to have been placed and compacted under observation and testing by a qualified geotechnical engineer. However, fill soils in the proposed improvement area for this report are considered undocumented. As noted by the City of Los Angeles in 2014 (Byer, 2016), the undocumented fill material underlying the site is not suitable for foundation purposes.

4.3.2 Tertiary Modelo Formation, Sandstone Unit

The Modelo Formation observed in the borings logged by Geosyntec was encountered beneath the fill soils to the maximum explored depth of 32 feet bgs. The Modelo Formation was observed to consist of hard, damp, pale yellow/brown, shale and mudstone, as well as dense to very dense clayey and silty sandstone. Descriptions of the Modelo Formation encountered in previous borings by others at the site are consistent with Geosyntec observations. Generally, the depth to the Modelo Formation beneath the fill soils in the site area increases to the north, towards the axis of the previously filled drainage.

4.3.3 Groundwater

Groundwater was not encountered during the recent explorations. While groundwater conditions may vary, especially during and after periods of sustained precipitation or irrigation, it is not generally anticipated to affect the completed improvements. Site drainage should be designed, constructed, and maintained as per the recommendations of the project civil engineer or architect of record, as necessary. Additional recommendations may be needed if groundwater is encountered during construction.

5. GEOLOGIC HAZARDS

5.1 Seismic Setting

Our review of published geologic mapping and literature indicated that no faults cross or project toward the general site area (Lindvall et al., 1995). Faults in Southern California are generally classified as “active” or “potentially active,” based on evidence of recent activity. “Active” faults have historically produced earthquakes and shown evidence of movement within the last 11,000 years. The closest known active fault is the Hollywood Fault, which is part of the Transverse Ranges Southern Boundary fault system. The Hollywood Fault is located approximately 5.5 miles southeast of the site and trends east to west along the base of the Santa Monica Mountains (Dolan et al., 1997). Studies in the area indicate an estimated slip rate of between 1.0 and 5.0 millimeters (mm) per year.

The nearest segment of the Santa Monica fault is located approximately 5.8 miles due south of the site. This fault is part of the Transverse Ranges Southern Boundary fault system, extending east from the coastline in Pacific Palisades through Santa Monica and West Los Angeles. Studies in the area indicate an estimated slip rate of between 1.0 and 5.0 mm per year.

The Newport-Inglewood Rose Canyon Fault Zone (NI-RCFZ) is located 8.0 miles to the southwest of the site. This zone extends southeastward from West Los Angeles, across the Los Angeles Basin, to Newport Beach, and offshore beyond San Diego. Studies in the area indicate an estimated slip rate of between 1.0 and 5.0 mm per year.

The closest regional faults considered capable of producing earthquakes of magnitude 4 or greater are indicated in the table below:

TABLE 5.3 NEARBY FAULTS

Fault Name	Distance and Direction from Site [a]	Maximum Moment Magnitude [b]
Hollywood	5.5 miles southeast	6.7
Santa Monica	5.8 miles south	7.4
NI-RCFZ, North LA Basin Section	8 miles southwest	7.5
Sierra Madre Fault Zone	10 miles north	6.7

Notes:

a. Distances are from the 2014 Update of the United States National Seismic Hazard Maps: U.S. Geological Survey Open-File Report 2014-1091 [Petersen et al., 2014].
b. Maximum moment magnitude values reported by California Geological Survey OFR 96-08 Appendix A, revised 2003 [Petersen et al., 1996].

The locations of regional faults and historic earthquake epicenters within 100 kilometers (km) of the Site are shown in Figure 4.

5.2 Fault Ground Rupture

The potential for fault surface rupture is generally considered to be significant along "active" faults and to a lesser degree along "potentially active" faults. A review of published geologic maps indicates that there are no known (mapped) active or potentially active faults which project toward, across, or are located within the immediate vicinity of the project Site. Furthermore, the Site is not within an Alquist-Priolo Act designated Earthquake Fault Zone as delineated by the State of California (ZIMAS, 2020). Therefore, it is our opinion that the potential for fault surface rupture at the site is low.

5.3 Strong Ground Shaking

The site, like all of Southern California, is situated within a seismically active region and will likely experience moderate to severe ground shaking in response to a large magnitude earthquake occurring on a local or more distant active fault during the expected lifespan of the school. As a result, seismically induced ground shaking would occur in response to an earthquake occurring on a nearby fault, such as the active Santa Monica or Hollywood Fault. Damage to site structures may occur during a strong ground shaking event; however, design of the proposed structures in accordance with applicable City of Los Angeles Building Code provisions, as will be required prior to issuance of construction permits, could mitigate the potential effects of such strong ground shaking. Moreover, the site and proposed improvements are not anticipated to increase the risk of strong ground shaking or have an effect on adjacent properties in the event of seismically induced ground shaking. Site-specific seismic design recommendations are presented in Section 5.

5.4 Expansive Soils

Laboratory Expansion Index testing and observations during drilling indicate that near-surface site soils possess a very low to low expansion potential. Atterberg Limits testing and visual observation of Modelo Formation materials indicate silts and clays of low plasticity. Highly expansive clays were not observed during the explorations or by others; therefore, they are not anticipated to impact the proposed improvements. If expansive clays are encountered during grading or construction, Geosyntec should be contacted to provide additional grading and/or foundation recommendations as appropriate.

5.5 Liquefaction and Seismic Settlement Evaluation

Liquefaction occurs when saturated fine-grained sands or silts lose their physical strength during earthquake-induced shaking and behave like a liquid. This is due to loss of point-to-point grain contact and transfer of normal stress to the pore water. Liquefaction potential varies with water level, soil type, material gradation, relative density, and probable intensity and duration of ground shaking. The site is not mapped within a designated liquefaction zone (ZIMAS, 2020). Because groundwater was not encountered within soil zone and significant presence of groundwater is not expected within the soil zone, liquefaction is not considered in the design.

Seismic settlement can occur with or without liquefaction; it results from densification of loose soils. The proposed new additions are underlain with medium-dense to dense fill and very dense formation materials. Some seismic settlements may occur within looser zones of undocumented fill. However, because the structure will be founded on deep foundations embedded into competent materials below the undocumented fill, seismic compression of undocumented fill is not considered in the design.

5.6 Landsliding

Review of the Seismic Hazards Zones Map for the Van Nuys Quadrangle (CGS, 1998) shows that the locations of the proposed structures are not mapped within an area susceptible to landsliding. However, the slope to the northeast of the proposed improvements along Mulholland Drive is mapped within a “Zone of Required Investigation” for landslides. (ZIMAS, 2020). Byer Geotechnical (2014) performed a stability analysis on the slope for a previous development on the site and reported a safety factor in excess of 1.5 for static and 1.0 for pseudo static conditions, respectively, indicating the risk of a seismically induced landslide to be low. The Byer Geotechnical (2014) report was reviewed and approved by the City of Los Angeles Department of Building and Safety (Log #84193 Dated March 3, 2015). Accordingly, additional analyses were not performed as part of this study.

Unfavorable or out of slope bedding was not observed in the slopes adjacent to the proposed improvements. Based on as-graded conditions and existing slope drainage elements observed, slope instability is not considered a hazard. In addition, the proposed improvements are not anticipated to contribute to on-site or off-site slope failure.

5.7 Corrosive Soils

The results of the corrosion testing are presented in Appendix B.

Chemical testing was performed on select soil from Boring GSB-2 at 0 to 5 feet bgs to evaluate the potential effects that site soils may have on concrete foundations and various types of buried metallic utilities. Soil environments detrimental to concrete generally have elevated levels of soluble sulfates and/or pH levels less than 5.5. According to American Concrete Institute (ACI) Table 318 4.3.1, specific guidelines have been provided for concrete where concentrations of soluble sulfate (SO4) in soil exceed 0.1 percent by weight. These guidelines include low water, cement ratios, increased compressive strength, and specific cement-type requirements.

Based on the results of sulfate and pH testing, site soils should generally have a negligible corrosion potential to Portland cement concrete (PCC) improvements.

A minimum resistivity value less than 5,000 ohm-cm and/or soluble chloride levels in excess of 200 ppm generally indicate a corrosive environment to buried metallic utilities and untreated conduits. Based on the resistivity values of soil sampled during the explorations, site materials are anticipated to have a severe corrosion potential for buried uncoated/unprotected metallic conduits. Based on these findings, at a minimum, the use of buried plastic piping or conduits would appear logical and beneficial, where feasible.

Geosyntec does not practice corrosion engineering. Therefore, a corrosion engineer or other qualified consultant could be contacted if additional corrosion analysis is desired.

5.8 Sedimentation and Erosion

Grading and earthwork at the site for the proposed improvements could contribute to the potential for erosion and sedimentation. Grading during the rainy season (generally November through April) or when heavy precipitation is anticipated, should be conducted under the guidance of an erosion control plan per the City of Los Angeles stormwater management requirements. Grading performed in compliance of the minimum code requirements would reduce the impacts related to sedimentation and erosion to a less than significant level.

5.9 Flooding, Tsunamis, and Seiches

Other potential geologic hazards evaluated for the site include floods, seiches, and tsunamis. According to the Federal Emergency Management Agency (FEMA) online flood hazard mapping (online at: msc.fema.gov), the site is located within Zone X, noted as an “Area of Minimal Flood Hazard.” In addition, recent ALTA surveys indicate that the site is not mapped within a 50- or 100-year floodplain.

Tsunamis are seismically induced waves generated by sudden movements of the ocean bottom during submarine earthquakes, landslides, or volcanic activity. Seiches are similarly generated, but are oscillating waves within bodies of water such as reservoirs, lakes, or bays. Based on the physiographic setting of this site, the distance to the ocean or other large bodies of water, and the elevation of the site, it is our opinion that the potential for flooding from seismically induced tsunamis and seiches is very low.

5.10 Oil Fields and Oil Wells

According to a review of Well Finder, an interactive online database of oil fields and oil wells provided by the Department of Conservation, Geologic Energy Management Division (CalGEM) (online at: http://maps.conservation.ca.gov/doggr/wellfinder), the site is not located within an oil field. In addition, no oil or gas wells have been identified at the site or in the site area. The nearest oil and gas wells are located approximately three miles west of the site. Oil wells or oil fields are not anticipated to impact the site.

5.11 Regional Subsidence

The site is not mapped within a zone of known subsidence due to oil, groundwater, or other fluid withdraw. Subsidence due to extraction or excavation is not considered to have an impact on the site or proposed improvements.

5.12 City of Los Angeles Methane Zone

Based on a review of the ZIMAS online mapping tool (at: http://zimas.lacity.org/), the site is not located within a City of Los Angeles Methane Zone or Methane Buffer Zone.

6. CONCLUSIONS AND RECOMMENDATIONS

The conclusions and preliminary design recommendations presented herein for the design of the project are based on our current understanding of the proposed improvements, review of the as-graded geotechnical report for the site by others, and results of our field investigation, laboratory testing, engineering and geologic analyses, and professional judgment. It is anticipated that the proposed new classroom building will be supported on a deep foundation and grade beam system, as recommended herein. Preliminary design values are provided to assess the feasibility of development using conventional construction methods and best practices. A separate geotechnical report will be prepared to provide design level values for development once plans have been finalized.

In our opinion, the site is suitable for the construction of the project without the hazard of landslide, slippage, or settlement, provided the recommendations of this report are incorporated into planning, design, detailed design, and construction.

6.1 Earthwork

The City of Los Angeles issued a letter of approval (2004) for a soils report completed by Van Beveren & Butelo (2004) for the school's athletic field that discusses the undocumented fill in the southern portion of the site. The letter states that existing uncertified fill shall not be used for support of footings, concrete slabs, or new fill and recommends that all footings shall be founded in either bedrock or certified compacted fill. As previously stated, it is unknown whether the fill soil beneath the proposed improvement area was placed under observation and testing and should therefore be considered "undocumented." "Certified" or "engineered" fill is defined as fill meeting the material, placement, and compaction recommendations presented in this document. Earthwork should be performed in accordance with the recommendations of this report, the Standard Specifications for Public Works Construction "Greenbook," and California Occupational Safety and Health Administration (Cal/OSHA) safety requirements. A preconstruction meeting should be held at the site with Mirman School, the contractor, civil engineer, and geotechnical engineer in attendance. Existing improvements to remain should be protected in place during earthwork construction.

6.1.1 Site Clearing and Demolition

Prior to grading, the site should be cleared of any existing improvements that are not to remain. Objectionable materials, such as construction debris and vegetation not suitable for structural backfill, should be properly disposed of off site.

6.1.2 Remedial Grading and Site Preparation

Based on the explorations performed for this investigation and a review of the as-graded report for the site, the proposed improvement area is underlain by fill soil up to 35 feet bgs. The existing fill soils are considered to be unacceptable for support of new structural improvements.

Excavations in proposed pavement, flatwork, or other shallow non-structural improvement areas should be conducted to a minimum depth of 18 inches below final grade. If encountered, localized areas of loose and potentially compressible material or highly expansive clays could require overexcavation to deeper elevations, based on conditions observed during grading. Where feasible, overexcavations should extend at least two feet laterally beyond the limits of the proposed improvements. Removals should not encroach within a 1:1 (horizontal: vertical) plane beneath existing foundations.

Loose or soft soil, or soil disturbed by demolition activities within the proposed grading area, as identified by the geotechnical consultant during grading and foundation excavation, should be excavated or scarified as required, moisture conditioned, and then recompacted before placing additional fill or preparing subgrade. Soil containing organic or other deleterious matter, if encountered, should be removed from the site and properly disposed.

6.1.3 Fill Materials

Granular soils derived from the on-site materials are anticipated to be suitable for reuse on the site as compacted fill, provided they are properly blended, moisture conditioned, and compacted as per the recommendations of this report Soil materials should be screened of organics and materials generally greater than three inches in maximum dimension. Irreducible materials greater than three inches in maximum dimension should generally not be used in shallow fills (within three feet of proposed grades).

Imported fill beneath structures, flatwork, and pavements should have an Expansion Index of 50 or less (ASTM D 4829). Imported fill soils for use in structural or slope areas should be evaluated before being imported to the site.

6.1.4 Fill Placement and Compaction

Areas to receive new fill, including bottoms of overexcavations, should be scarified a minimum of six inches, moisture conditioned to above optimum moisture content, and compacted as recommended herein. Removal bottoms should be observed and documented by Geosyntec prior to placing additional fill.

Fill soils placed at the site should be moisture conditioned to a minimum of three percent above the optimum moisture content prior to compaction. The optimum lift thickness for fill soil will depend on the type of compaction equipment used. Generally, backfill should be placed in uniform layers that do not exceed 8-inch loose lifts for heavy equipment compaction and 4-inch loose lifts for hand-held equipment compaction. Each lift of fill should be compacted to a minimum 90 percent relative compaction unless otherwise specified. Relative compaction is defined as the ratio (in percent) of the in-place dry density to the maximum dry density determined using the latest version of ASTM D1557 as the compaction standard. Fill placed should demonstrate a moisture content a minimum of 3 percent above optimum moisture content, as determined with ASTM D1557. Class 2 aggregate base and the upper one foot of subgrade beneath parking and drive areas should be compacted to a minimum relative compaction of 95 percent.

6.1.5 Bulking and Shrinkage

If grading is performed as recommended herein, we anticipate that the range of material shrinkage and bulking is less than 10 percent.

6.1.6 Pumping Soil

Pumping of soils during loading, such as during earthwork operations, is likely when soils are saturated or close to saturated. Conventional strategies to address pumping soils include bridging pumping soils with geotextile material or crushed rock, and removal and replacement with drier and/or more granular material.

6.2 Surface Drainage

Surface drainage should be planned to prevent ponding and promote the drainage of surface water away from structure foundations, slabs, edges of pavements and sidewalks, and towards suitable collection, storage, and discharge facilities. Paved and aggregate-surfaced areas should be sloped to drain water away from structures and pavements at a minimum gradient of 1 percent, and unpaved areas should be finish graded with a minimum slope of 2 percent away from structures and pavements. Stormwater collected by roof drainage systems should be discharged at suitable locations away from the structures to reduce the possibility of saturation of foundation soil. Even when these measures are taken, experience has shown that a shallow groundwater or surface-water condition can develop in areas where no such water condition existed before site development.

6.3 Temporary Construction Slopes

The following preliminary recommended slopes should be relatively stable against deep-seated failure, but may experience localized sloughing. On-site soils are considered Type B and Type C soils, with recommended slope ratios as set forth in Table 6.3.

TABLE 6.3
RECOMMENDED TEMPORARY SLOPE RATIOS

SOIL TYPE	SLOPE RATIO (Horizontal: vertical)	MAXIMUM HEIGHT
B (Modelo Formation)	1:1 (OR FLATTER)	10 Feet
C (Previously Placed Fill)	1.5:1 (OR FLATTER)	10 Feet

Stability of temporary cuts is the responsibility of the Contractor. Actual field conditions and soil type designations must be verified by a "competent person" while excavations exist, according to Cal/OSHA regulations. In addition, the above sloping recommendations do not allow for surcharge loading at the top of slopes by vehicular traffic, equipment, or materials. Appropriate surcharge setbacks must be maintained from the top of all unshored slopes.

6.4 CBC Seismic Design Parameters

Seismic design parameters were identified by establishing the Site Class based on the soil properties at the site and calculating the site coefficients and parameters using the United States Geological Survey (USGS) Seismic Design Maps application and site coordinates of 34.129 degrees latitude and -118.484 degrees longitude. These values are intended for the design of structures to resist the effects of earthquake ground motion. The seismic ground motion values listed in the table below were derived in accordance with ASCE 7-16 Standard, Chapter 11, for Site Class C and the 2019 CBC. Mapped ground motion parameters SS and S1 were obtained using the SEAOC/OSHPD Seismic Design Maps Tool (https://seismicmaps.org/). The seismic design parameters are summarized in Table 6.4.

TABLE 6.4
SEISMIC GROUND MOTION VALUES

PARAMETER	VALUE	CBC REFERENCE (2019)
Approximate Site Latitude	34.12916 N	-
Approximate Site Longitude	118.48397 W	-
Site Class	C	ASCE 7, Chapter 20
Mapped Spectral Response Acceleration Parameter, S_S	1.913	Figure 1613.2.1 (1)
Mapped Spectral Response Acceleration Parameter, S_1	0.682	Figure 1613.2.1 (2)
Seismic Coefficient, F_a	1.2	Table 1613.2.3 (1)
Seismic Coefficient, F_v	1.4	Table 1613.2.3 (2)
MCE Spectral Response Acceleration Parameter, S_{MS}	2.295	Section 1613.2.3
MCE Spectral Response Acceleration Parameter, S_{M1}	0.954	Section 1613.2.3
Design Spectral Response Acceleration, Parameter S_{DS}	1.530	Section 1613.2.4
Design Spectral Response Acceleration, Parameter S_{D1}	0.636	Section 1613.2.4
Long-Period Transition Period	8 sec	-
Peak Ground Acceleration PGA_M	0.96	ASCE 7, Section 11.8.3

6.5 Deep Foundations

Deep foundations are recommended for support of the proposed structures at the site. Deep foundations may consist of cast-in-drilled hole (CIDH) piers, auger-cast piles, or driven piles. Based on the proposed improvements and materials anticipated beneath the site area, a CIDH and grade beam foundation system is recommended for support of the proposed structures.

Competent Tertiary Modelo Formation has a downward loading resistance of 9,000 pounds per square foot (psf) and a unit weight of 135 pounds per cubic foot (pcf) (Vallejo and Ferrer, 2011). The subsurface stratigraphy should be modeled based on the cross sections presented in Figures 2A and 2B.

Piers should be embedded a minimum of three feet into competent dense formational material, as observed and confirmed by the geotechnical engineer of record. Properly founded piers that are extended to a depth of at least seven feet below grade and three feet into dense formational materials may be designed for an allowable end bearing pressure of 9,000 psf plus 500-psf skin friction for the portion of the pier in dense formational material. Skin friction for the upper portions of piers in existing fill materials should be disregarded. To provide resistance for design lateral loads for caissons and grade beams, an equivalent passive fluid weight of 100 pcf from 12 inches below adjacent grade to competent dense formational materials, and 450 pounds per cubic foot, up to a maximum pressure of 5,000 psf for competent dense formational materials may be utilized. A one-third increase to all above values may be utilized for short-term load evaluations. Due to soil arching, lateral loads on caissons may be applied over a dimension equal to two caisson diameters. If elastic lateral design is utilized, a lateral subgrade reaction value (k) of 75 pounds per cubic inch (pci) for the portion of for caissons and grade beams in existing fill materials, and 225 pci for the portion of caissons and grade beams in dense formational materials is recommended. The weight of the concrete in caissons may also be disregarded for loading purposes, unless needed for uplift resistance.

A reinforced concrete grade beam should generally span between caissons to 23W2 to provide additional support of the proposed structures. However, where loads will be entirely supported by the caissons, the necessity for grade beams should be determined by the structural engineer.

All caisson excavations should be observed by Geosyntec during excavation to evaluate the recommended bearing material and embedment depth. The bottom of each caisson should be devoid of any loose debris, slough, or water prior to steel cage placement and should remain clean until placement of the concrete. Excessive caving of caisson drill holes during drilling may occur, but is not generally anticipated. Gravelly, cobbly, and/or very dense and cemented materials also have the potential to impact drilling at the site.

Grade beams may be installed to distribute structural loads or resist lateral loads, as necessary, and in accordance with the recommendations provided herein. Grade beams should not be depended upon for vertical load resistance, unless they bear upon competent formational materials. All caisson and grade beam reinforcement should be designed and detailed per the structural engineer.

6.5.1 Settlement

Total settlement of drilled shafts designed with the allowable bearing pressures is expected not to exceed 1 inch, while differential settlements between foundations are expected not to exceed approximately ½ inch. The anticipated settlement values are considered acceptable provided that construction is performed per the recommendations of this report and in compliance with local building codes and regulations.

6.5.2 Group Effects

Construction of deep foundations in groups can reduce the available axial capacity of drilled piers due to the relaxation of the soil within the adjacent foundation excavation. Deep foundation groups can also demonstrate lower lateral capacity due to overlapping loads from adjacent piles within a group. Deep foundation groups can also demonstrate increased settlement due to the deeper zone of influence for the group than that of a single shaft.

Piers spaced closer than four foundation diameters (center to center) can have a total axial (downward and uplift) capacity less than the sum of the capacities of the individual piers. For design, we recommend a group efficiency factor for axial design of 0.65 and 1.0 for center-to-center spacing of 2.5 diameters and 4.0 diameters or more, respectively. Axial resistance group efficiency factors for intermediate spacing can be determined by linear interpolation between the noted values.

Piers spaced closer than six foundation diameters (center to center) can have a total lateral capacity less than the sum of the capacities of the individual piers. For design, we recommend a group efficiency factor for lateral design of 0.50, 0.65, 0.85, and 1.0 for center-to-center spacing of 3, 4, 5, and 6 diameters or more, respectively. Lateral resistance group efficiency factors for intermediate spacing can be determined by linear interpolation between the noted values.

6.6 Shallow Foundations

The following recommendations are for preliminary design purposes only. Shallow foundations are considered suitable for use at the site where existing Previously Placed Fill thicknesses are anticipated to be less than five feet beneath the proposed structural improvements and can be excavated to competent formational soils and recompacted as engineered fill. These foundation recommendations should be re-evaluated after review of the project grading and foundation plans and after completion of rough grading of the building pad area. Upon completion of rough pad grading, the Expansion Index of near surface soils should be verified, and these recommendations should be updated, as necessary. Foundation recommendations presented herein are based on the generally anticipated low-expansion potential of properly blended and moisture conditioned site soils (Expansion Index of less than 50). The values herein generally provide a minimum factor of safety of 2.5 or greater.

6.6.1 Footing Dimensions and Embedment

The minimum recommended shallow foundation embedment depth is 15 inches below lowest adjacent subgrade for spread or continuous foundations embedded a minimum of six inches in formational materials or entirely in engineered fill soil. Continuous footings should be at least 15 inches wide; isolated footings should be at least 24 inches in least dimension. The structural designer should determine the footing embedment, size, and reinforcement based on anticipated loads and estimated settlements. Structures and equipment foundations should not span a transition across different soil strata (i.e., engineered fill and formational soil).

6.6.2 Allowable Foundation Pressure

Shallow foundations with the recommended minimum dimensions and embedment within engineered fill or formational materials may be designed for an allowable vertical bearing pressure of 3,000 psf. These allowable bearing pressure values may be increased by 250 psf for each additional six inches of embedment, up to a maximum bearing pressure of 3,500 psf. These values may be increased by one-third for short-term wind and seismic loading.

6.6.3 Allowable Lateral Resistance

Resistance to lateral loads on shallow foundations may be provided by passive resistance along the outside face of footings and frictional resistance along the bottom of footings. The allowable passive resistance may be taken as equivalent to a fluid weighing 250 pcf for footings poured neat against engineered fill.

An allowable friction coefficient of 0.30 may be used with the dead load to compute the frictional resistance of footings.

The upper 12 inches of soil should be neglected in passive pressure calculations in areas where there will be no hardscape that extends from the outside edge of the footing to a horizontal distance equal to three times the footing depth. The resistance from passive pressure should also be neglected where utilities or similar excavations may occur in the future.

6.6.4 Settlement

The settlement of a shallow foundation for a given allowable bearing pressure depends on the size, shape, and embedment depth of the foundation, the relative compaction and stiffness of the engineered fill, and the saturation and density of the undocumented fill or native materials below.

Total settlement (excluding seismically induced settlement) based on the remedial grading recommendations and maximum recommended allowable bearing pressure is anticipated to be less than 1 inch for shallow foundations spanning less than 25 feet. Differential settlements between adjacent footings are expected to be approximately half the estimated total settlements over 30 feet. The majority of settlement due to structural loads should occur during or shortly after construction. The anticipated settlement values are considered acceptable provided that construction is performed per the recommendations of this report and in compliance with local building codes and regulations.

6.6.5 Foundation Setback

Footings for structures should be designed such that the horizontal distance from the face of adjacent slopes to the outer edge of footings is at least 10 feet. In addition, footings should be founded beneath a 1:1 plane extended up from the nearest bottom edge of adjacent trenches and/or excavations. Deepening of affected footings may be a suitable means of attaining the prescribed setbacks.

6.6.6 Modulus of Subgrade Reaction

We recommend a modulus of subgrade reaction of 145 pci for engineered fill and 400 pci for Modelo Formation materials (bedrock).

6.7 Retaining Walls

Various retaining walls up to approximately three feet in height, as well as building envelope walls along the southern portion of the proposed classroom building, are proposed. Lateral loads acting against retaining walls may be resisted by friction between the footings and the supporting compacted fill soil and/or formational materials or passive pressure acting against structures. If frictional resistance is used, an allowable coefficient of friction of 0.28 (total frictional resistance equals the coefficient of friction multiplied by the dead load) is recommended for concrete cast directly against compacted fill. A design passive resistance value of 250 psf per foot of depth (with a maximum value of 3,000 psf) may be used. The allowable lateral resistance can be taken as the sum of the frictional resistance and the passive resistance, provided the passive resistance does not exceed two-thirds of the total allowable resistance. Retaining walls should not be underlain by Previously Placed (Undocumented) Fill as defined by a 1:1 plane extending downward from the foundation bottom outer edges.

Active lateral earth pressure conditions are applicable for walls that are not fixed at the top and where approximately ¼ inch of movement at the top of the wall per 5 feet of wall height is acceptable. Retaining walls less than ten feet high and backfilled with granular soils may be designed using the equivalent fluid weights given below.

TABLE 6.7 EQUIVALENT FLUID UNIT WEIGHTS (pcf)		
WALL TYPE	LEVEL BACKFILL	SLOPE BACKFILL 2:1 (HORIZONTAL: VERTICAL)
CANTILEVER WALL (YIELDING)	35	48
RESTRAINED WALL	60	75

Lateral pressures on cantilever retaining walls (yielding walls) due to seismic earthquake motions may be calculated based upon previous work by Seed and Whitman (1970). The total lateral thrust against a properly drained and backfilled cantilever retaining wall above the groundwater level can be expressed as:

$$P_{AE} = P_A + \Delta P_{AE}$$

For non-yielding (or "restrained") walls, the total lateral thrust may be similarly calculated based on work by Wood (1973):

$$P_{KE} = P_K + \Delta P_{KE}$$

Where

P_A/b = Static Active Earth Pressure = $G_h H^2/2$
P_K/b = Static Restrained Wall Earth Pressure = $G_h H^2/2$
ΔP_{AE} = Dynamic Active Earth Pressure Increment = (3/8) k_h $\gamma H^2/2$
ΔP_{KE} = Dynamic Restrained Earth Pressure Increment = k_h $\gamma H^2/2$
b = unit length of wall (usually 1 foot)
k_h = 2/3 PGA_m (PGA_m given previously)
G_h = Equivalent Fluid Unit Weight (given previously)
H = Total Height of the retained soil
γ = Total Unit Weight of Soil ≈ 135 pounds per cubic foot

The static and increment of dynamic earth pressure in both cases may be applied with a line of action located at H/3 above the bottom of the wall (SEAOC, 2013). For retaining walls in which the backfill is subject to traffic surcharging, loads should be designed to resist an additional uniform lateral pressure of 100 psf (from an assumed 300 psf surcharge behind the walls due to normal street traffic). If traffic is kept back from the wall a minimum of ten feet or a distance equal to the height of wall, whichever is greater, the traffic surcharge may be neglected.

The values provided assume non-expansive backfill soil and free-draining conditions. Measures should be implemented to prevent hydraulic pressure buildup behind all retaining walls. Drainage measures should include free-draining backfill materials and sloped, perforated drains. These drains should discharge to an appropriate location, per the project civil engineer.

6.8 Interior Concrete Slabs

Interior concrete slabs-on-grade can only be used in areas where undocumented fill has been removed and replaced with engineered fill. The interior concrete slabs shall be structural slabs in areas underlined by undocumented fill. General recommendations for slabs are presented below. Structural slabs shall be design by the structural engineer.

Concrete slabs should be designed for the anticipated loading by the structural engineer. Slabs-on-grade should measure at least five inches in thickness. Minimum slab-on-grade reinforcement should consist of No. 4 reinforcing bars, placed on maximum 18-inch centers, each way, at or above mid-slab height, but with proper concrete cover. Slabs subjected to heavier loads or traffic may require thicker slab sections and/or increased reinforcement. A 145-pci subgrade modulus is considered suitable for elastic design of minimally embedded improvements such as slabs-on-grade. Slab-on-grade subgrade areas should be maintained at a minimum three percent above optimum moisture content or be brought to three percent above optimum moisture content just prior to placement of underlayment or concrete.

In moisture-sensitive floor areas, a suitable vapor retarder of at least 15-mil thickness (with all laps or penetrations sealed or taped) overlying a four-inch layer of consolidated crushed aggregate or gravel (with a Sand Equivalency [SE] of 30 or more) should generally be installed, unless a more detailed underlayment is provided by the project structural engineer or architect of record. Special care should be taken by the contractor so that a uniform thickness of aggregate is maintained to achieve uniformity in the concrete thickness for the slab. This recommended protection is generally considered typical in the industry. If proposed floor areas or coverings are considered especially sensitive to moisture emissions, additional recommendations from a specialty consultant could be obtained. Geosyntec is not an expert at preventing moisture penetration through slabs. A qualified architect or other experienced professional should be contacted if moisture penetration is a more significant concern

We recommend that isolation joints be provided where slabs-on-grade abut walls or columns. Isolation joints should be designed to separate the floor from the abutting element to allow each part to move independently. Crack control or expansion/ contraction joints should be provided at spacing appropriate for the slab thickness and the maximum concrete aggregate size, but should be provided at regular intervals not exceeding approximately 15 feet, each way.

6.9 Utility Trenches

Utilities should be placed above and outside the envelope defined by 1:1 (horizontal to vertical) lines drawn outward and down from the bottom edge of foundations. Trench backfill is defined as material placed in a trench starting 6 inches above the pipe, and bedding is all material placed in a trench below the backfill. Pipe trench backfill should conform to the recommendations presented in this report and Section 306-1.3 of the "Greenbook." Unless concrete bedding is required around utility pipes, free-draining clean sand should be used as bedding. Pavement and subgrade requirements provided in Section 5.11 should be incorporated for trench backfill. Compaction of backfill by water jetting should not be permitted.

6.10 Exterior Flatwork

To reduce the potential for cracking in exterior flatwork for non-traffic areas caused by minor movement of subgrade soils and typical concrete shrinkage, it is recommended that such flatwork measure a minimum 4.5 inches thick and be installed with crack-control joints at appropriate spacing as designed by the project architect. Additionally, it is recommended that flatwork be installed with at least No. 4 reinforcing bars on maximum 18-inch centers, each way, at above mid-height of slab, but with proper concrete cover or other reinforcement per the project consultants. Doweling of flatwork joints at critical pathways or similar could also be beneficial in resisting minor subgrade movements.

All subgrades should be prepared according to the earthwork recommendations previously given before placing concrete. Positive drainage should be established and maintained next to all flatwork

6.11 <u>Pavements</u>

Pavement sections provided are based on preliminary Resistance "R"-Value results, estimated traffic indices, and the assumption that the upper foot of compacted fill subgrade and overlying aggregate base materials are properly compacted to a minimum 95% relative compaction at a minimum of three percent above optimum moisture content (as per ASTM D 1557). Beneath proposed pavement areas, loose or otherwise unsuitable soils are to be removed to the depth of competent underlying material, as recommended in Section 5.2.2. Actual R-Value should be determined following grading of subgrade areas, and the pavement sections should be modified, as appropriate.

TABLE 6.11
RECOMMENDED AC OR PCC PAVEMENT SECTION THICKNESSES

Traffic Area	Traffic Index	Preliminary Subgrade R-Value	Asphalt		Portland Concrete Pavements on (INCHES)
			AC Thickness (INCHES)	CalTrans Class II or Crushed Miscellaneous Aggregate Base Thickness (INCHES)	
Auto Parking and Light Drive Areas	5.0	34	3.0 OR 3.5	6 OR 5	7
Access Road/ Fire Access Road	6.0	34	3.0 OR 4.0	8 OR 6	7

1. Fire Access road capable of supporting 75,000-pound truck/apparatus.
2. Caltrans Class 2 aggregate base or "Greenbook" Processed Miscellaneous Base.
3. Concrete should have a modulus of rupture of at least 650 psi.

4. If permeable pavers are used in either of the above traffic areas, they should be underlain by a relatively impermeable liner, a perforated drainpipe to suitable outlet, and Class 2 Permeable Material with thicknesses equal to 20% greater than the above Class 2 Aggregate Base.

Asphalt-paved areas should be designed, constructed, and maintained in accordance with, for example, the recommendations of the Asphalt Institute, or other widely recognized authority. Concrete paved areas should be designed and constructed in accordance with the recommendations of the ACI or other widely recognized authority, particularly regarding thickened edges, joints, and drainage.

6.12 Controlled Low Strength Materials (CLSM)

Controlled Low Strength Materials (CLSM) may possibly be used in lieu of compacted soils below foundations, within building pads, and/or adjacent to retaining walls or other structures, provided the appropriate geotechnical recommendations are also incorporated. Minimum overexcavation depths recommended herein beneath bottom of footings, slabs, flatwork, and other areas may be applicable beneath CLSM if/where CLSM is to be used, and excavation bottoms should be observed by Geosyntec prior to placement of CLSM. Prior to CLSM placement, the excavation should be free of debris, loose soil materials, and water. Once specific areas to utilize CLSM have been determined, Geosyntec should review the locations to determine if additional recommendations are appropriate.

The allowable soil bearing pressure and coefficient of friction provided for foundations on engineering fill should still govern foundation design. CLSM may not be used in lieu of structural concrete where required by the structural engineer. Because of relatively limited expected thickness of CLSM, the differential settlements between foundation supported on engineered fill and CLSM are expected to be below one-half inch.

CLSM should consist of a minimum two-sack cement/sand slurry with a minimum 28-day compressive strength of 100 psi (or equal to or greater than the maximum allowable short-term soil bearing pressure provided herein, whichever is higher) as determined by ASTM D4832. If re-excavation is anticipated, the compressive strength of CLSM should generally be limited to a maximum of 150 psi per 229R-99. Where re-excavation is required, two-sack cement/sand slurry may generally be used to help limit the compressive strength. A minimum of one test (two cylinders) should be performed for each 50 cubic yards or faction thereof of CLSM placed. All testing shall be performed by a City of Los Angeles approved testing agency.

At the completion of CLSM placement, a report shall be submitted to the Los Angeles Department of Building and Safety, Grading Division for approval. The report shall contain, but need not be limited to, a plot plan showing the lateral and vertical extent of CLSM placement, bottom observation and approval, concrete deputy approvals, load tickets, and test results. The report shall be prepared and stamped by the licensed civil engineer for the project.

7. CONSTRUCTION CONSIDERATIONS

7.1 Reuse of Existing Fill Soils and Formational Soils

The existing fill soils and formational soils excavated and intended to be reused as engineered fill should also be screened for the presence of contamination and potential for reuse. No visual or olfactory observations of potential contamination were observed in soil samples and cuttings from the geotechnical borings advanced by Geosyntec. However, this does not preclude the possibility that impacted soil or groundwater is present at the site.

During remedial grading, we recommend maintaining separate stockpiles for materials potentially meeting and not meeting the fill criteria and for potentially impacted soils, if needed.

7.2 Construction Observation and Testing

Grain size distribution tests, laboratory compaction tests, Atterberg limits tests, and expansion index tests are recommended during construction to evaluate fill material suitability and compaction requirements. Soil analytical testing may also be required if impacted soils are suspected.

Variations in subsurface conditions will likely be encountered during construction at the Site. To permit correlation between the investigation data, design, and the conditions encountered during construction, and to provide conformance with the plans and specifications as originally contemplated, we recommend that Geosyntec be retained to provide observations of earthwork construction operations, including observation of remedial grading excavations, and to provide quality control testing of fill and backfill placement and compaction.

8. LIMITATIONS

The geotechnical investigation for this project observed only a small portion of the pertinent subsurface conditions. The recommendations made herein assume that soil conditions do not deviate appreciably from those found during the current field investigation and the referenced previous investigations by others. This geotechnical investigation report has been prepared in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in this area. The conclusions contained in this report are based solely on the analysis of the conditions observed by Geosyntec personnel. We cannot make any assurances concerning the completeness of the data presented to us. Environmental characterization of soil and groundwater was beyond the scope of this investigation.

No warranty, expressed or implied, is made regarding the professional opinions expressed in this report. Site grading and earthwork, subgrade preparation under paved areas, and foundation excavations should be observed by a qualified engineer or geologist to verify that the site conditions are as anticipated. If actual conditions are found to differ from those described in the report, or if new information regarding the site is obtained, Geosyntec should be notified and additional recommendations, if required, will be provided. Geosyntec is not liable for any use of the information contained in this report by persons other than Mirman School, Johnson Favaro (Project Architect), or their subconsultants, or the use of information in this report for any purposes other than referenced in this report without the expressed, written consent of Geosyntec.

California, including Los Angeles County, is an area of high seismic risk. It is generally considered economically unfeasible to design structures to resist earthquake loadings without damage. Proposed structures designed in accordance with the recommendations presented in this report could experience damage if subjected to strong earthquake shaking.

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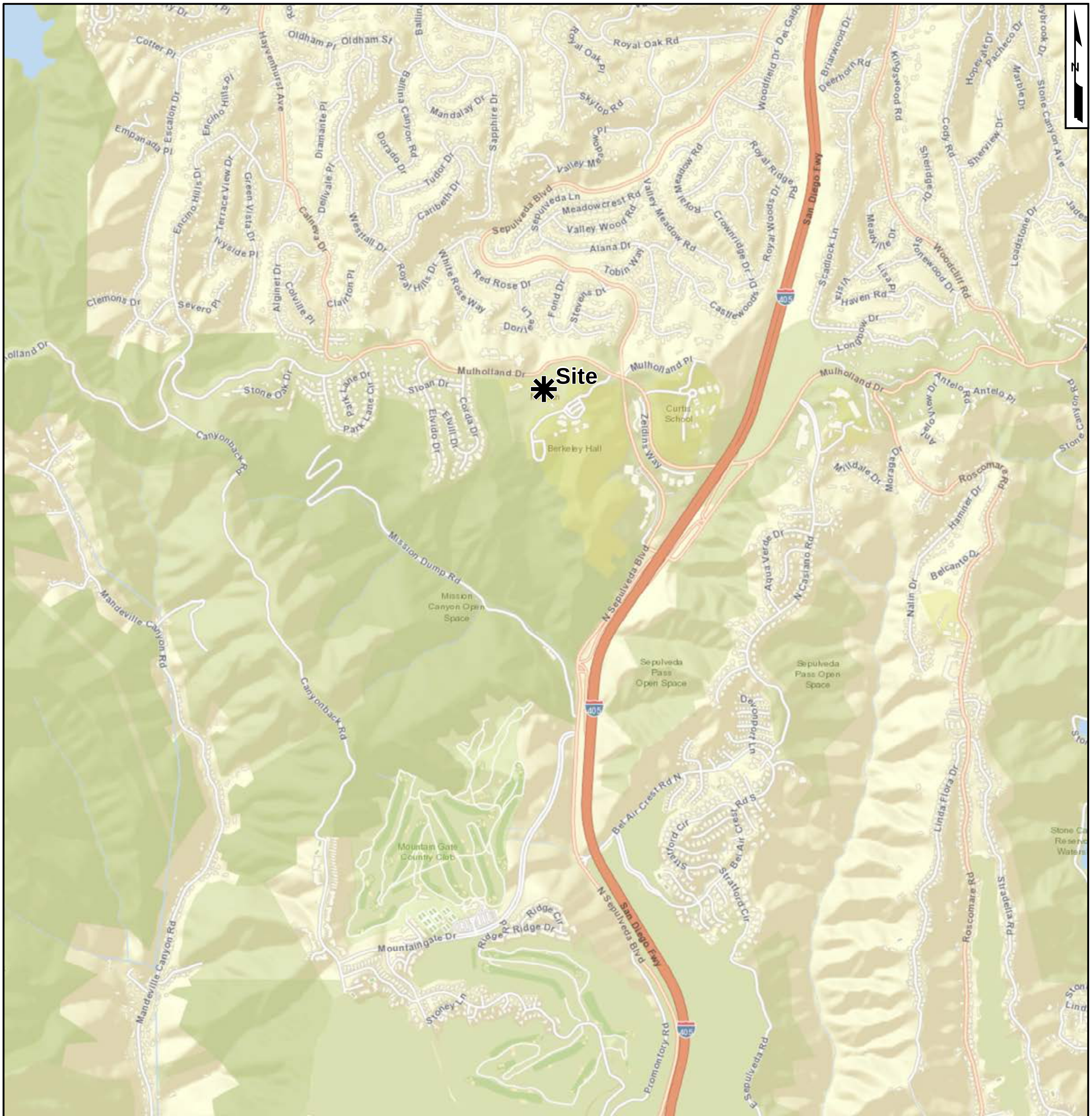
FIGURES



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Site Location

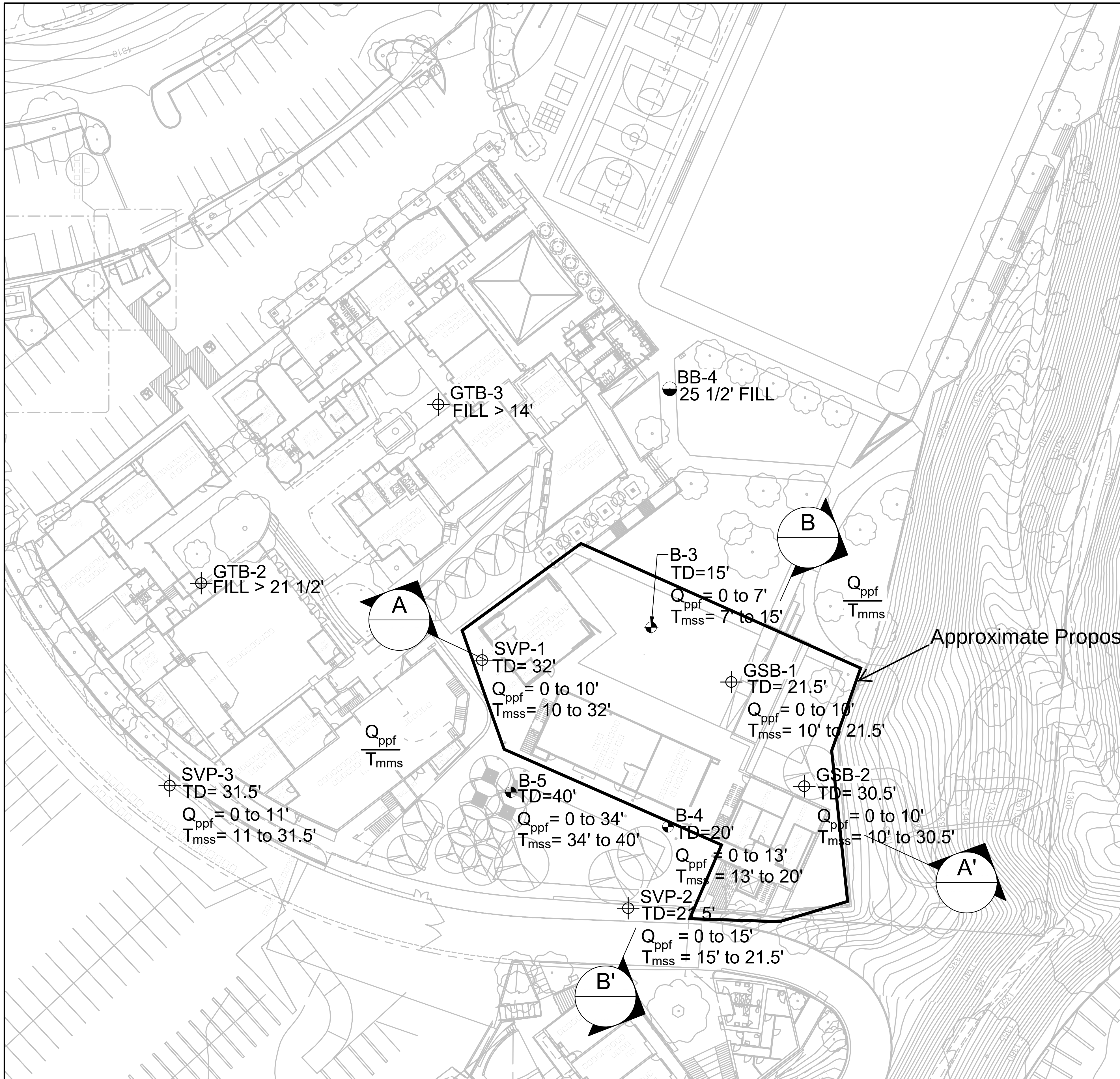
Mirman School Phase 1 Learning Center
16180 Mulholland Drive, Los Angeles, CA 90049

Geosyntec consultants

Figure

1

SC0984A	December 2019



LEGEND

BB-2	AUGER BORING BY BYER GEOTECHNICAL, 2014
BB-4	BUCKET-AUGER BORING BY VAN BEVEREN & BUTELO, REPORT DATE 9/1/04
GTB-2	GEOTECHNOLOGIES, INC, 2018 HAND AUGER BORING
SVP-1	GEOSYNTEC, 2019 SOIL VAPOR PROBE
GSB-1	GEOSYNTEC, 2019 GEOTECHNICAL BORING
Q_{ppf}	QUATERNARY PREVIOUSLY PLACED FILL OVERLYING
T_{mss}	TERTIARY MODELO FORMATION, SANDSTONE UNIT
A' A	GEOLOGIC CROSS SECTION

N

0 50'
SCALE IN FEET

EXPLORATION LOCATION / GEOLOGIC MAP
MIRMAN SCHOOL LEARNING CENTER
16100 MULHOLLAND DRIVE
LOS ANGELES, CALIFORNIA 90049

Geosyntec consultants

FIGURE 2

PROJECT NO: SC0984A | DECEMBER 2019

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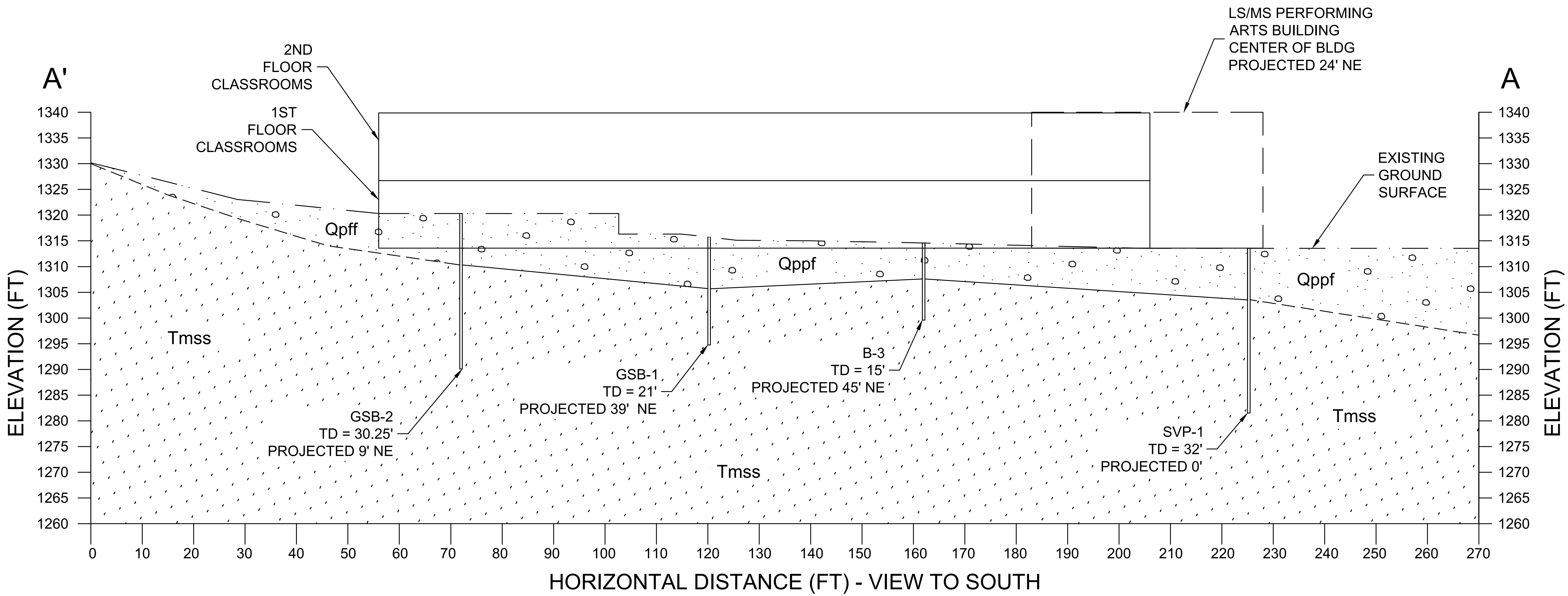

SECTION A'-A
MIRMAN SCHOOL LEARNING CENTER
16100 MULHOLLAND DRIVE
LOS ANGELES, CALIFORNIA 90049

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FIGURE 2A

PROJECT NO: SC0984A | DECEMBER 2019

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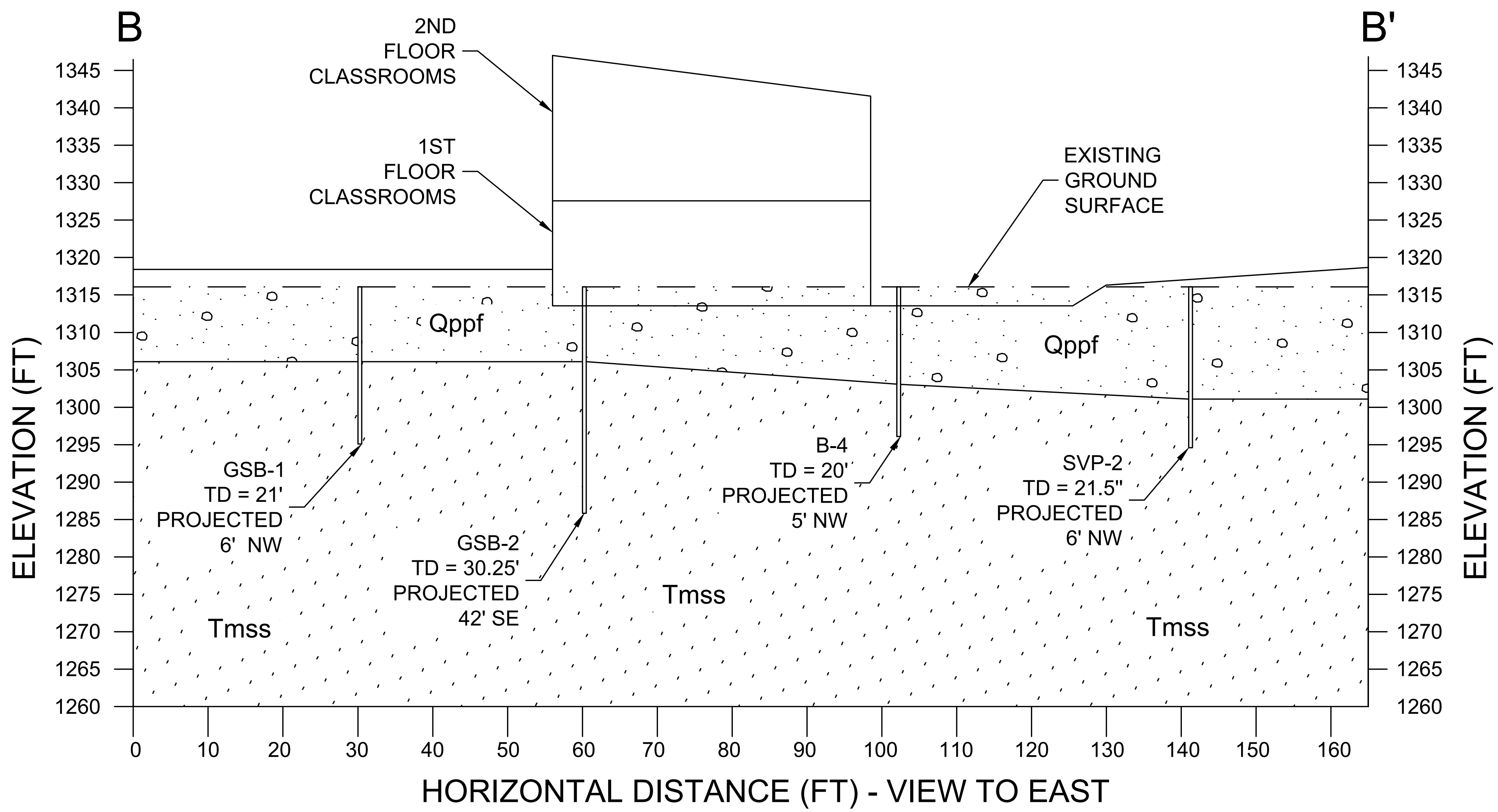

SECTION B-B'
MIRMAN SCHOOL LEARNING CENTER
16100 MULHOLLAND DRIVE
LOS ANGELES, CALIFORNIA 90049

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FIGURE 2B

PROJECT NO: SC0984A | DECEMBER 2019

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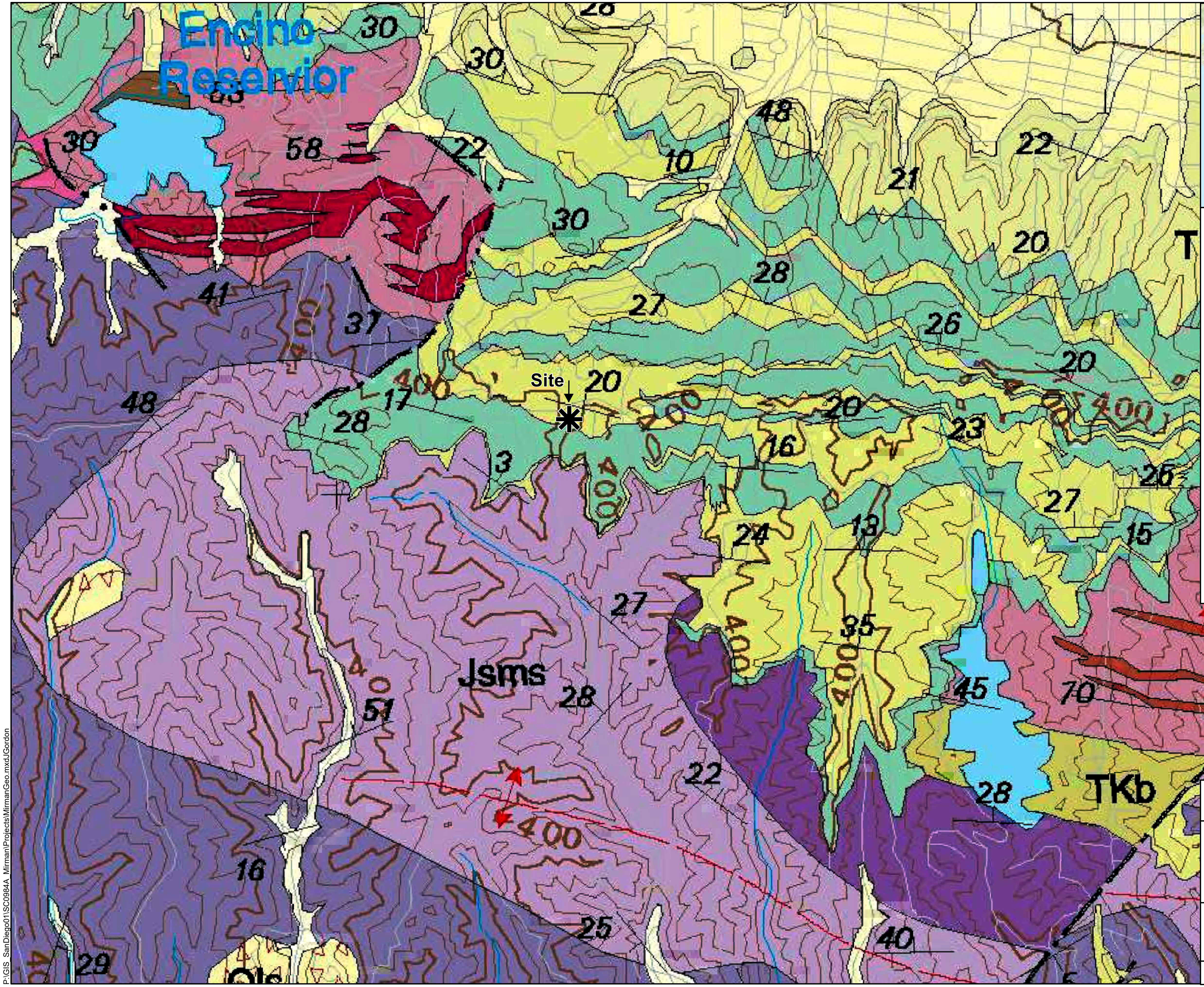

Regional Geologic Map

Mirman School Learning Center
16180 Mulholland Drive, Los Angeles, CA 90049

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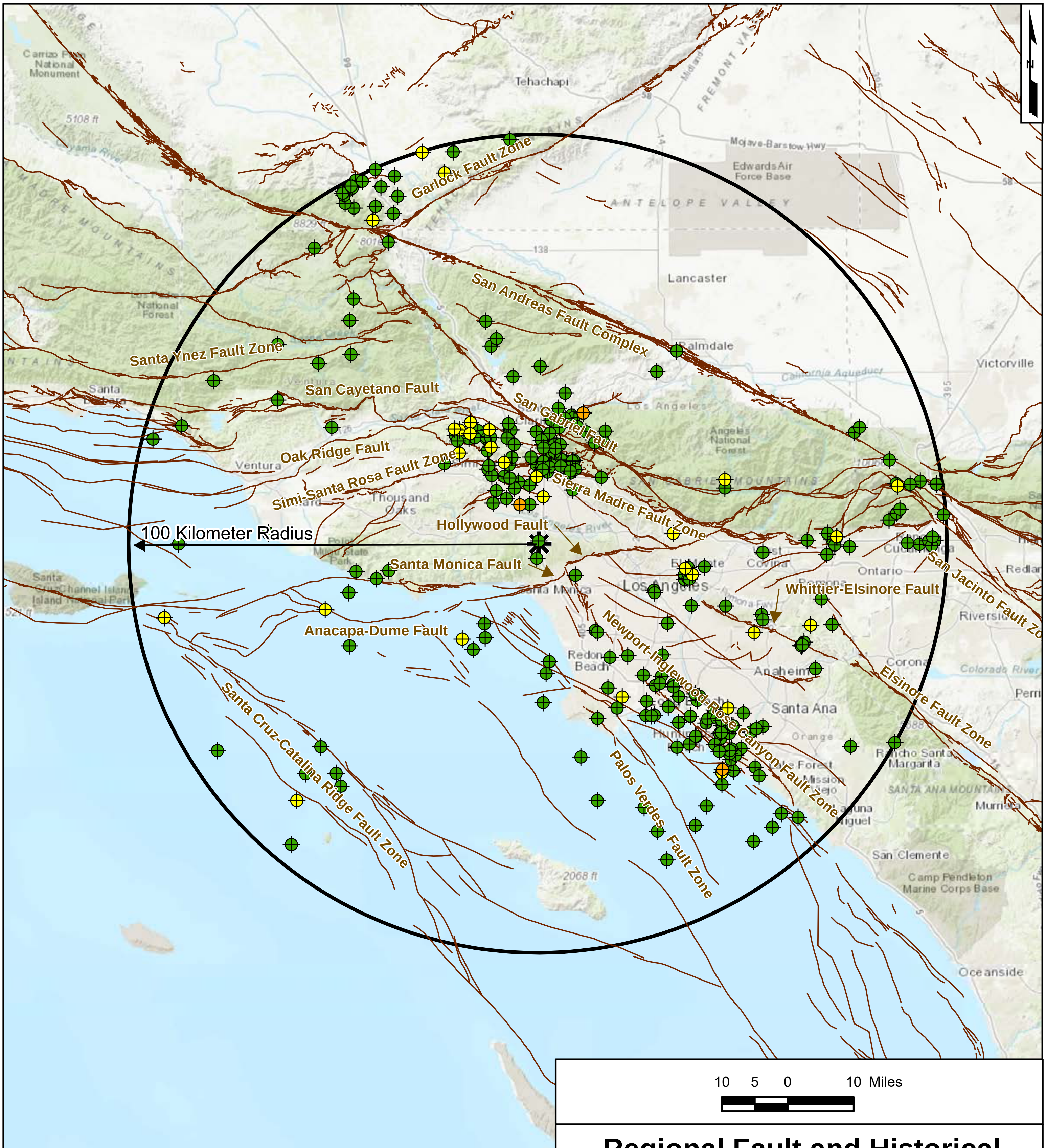
Figure 3

SC0984A | December 2019



Reported Earthquake Magnitudes 1932 - 2019

- 6.0 - 6.99
- 5.0 - 5.99
- 4.0 - 4.99
- Site
- Fault

Data Source: Southern California Earthquake Data Center and U.S. Geological Survey and California Geological Survey, 2006, Quaternary fault and fold database for the United States, 2019, from USGS web site: http//earthquake.usgs.gov/hazards/qfaults/.

Regional Fault and Historical Earthquake Epicenter Map

MIRMAN SCHOOL LEARNING CENTER

16180 Mulholland Drive, Los Angeles, CA 90049

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SC0984A	December 2019	Figure 4

APPENDIX A

Geotechnical Boring Logs

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2100 Main St
Suite 150
Huntington Beach, CA 92648
Tel: (714) 969-0800
Fax: (714) 969-0820

GS FORM: WELL BORE 01/04

BOREHOLE LOG

BORING GSB-1 — **SHEET** 1 **OF** 1
START DRILL DATE Nov 1, 19
FINISH DRILL DATE Nov 1, 19
LOCATION Los Angeles, CA
PROJECT Mirman School
NUMBER SC0984A

ELEVATION DATA:
GROUND SURF. (Ft)
TOP OF CASING (Ft)
DATUM

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE NO.	TYPE	BLOW COUNT	RECOVERY (%)	PID/FID (ppm)	TIME (00:00)	COMMENTS 1) Rig Behavior 2) Air Monitoring
0	Quarternary Previously Placed Fill (Qppf): 0-8 ft bgs: SILTY SAND with trace GRAVEL (SM); brown (10YR, 5/3); dry; 5-80-15			No groundwater observed.								Hand auger to 5 ft bgs.
5						S-1		9 11 15				Bulk sample S-1 taken from 5 ft bgs.
8	8 ft bgs: CLAYEY SAND (SC); dark brown (10YR, 3/3); moist; 15-60-25											
10	Tertiary Modelo Formation, Sandstone Unit (Tmss): 10 ft bgs: SILTY SAND; brown (10YR, 5/3); fine to medium sand (0-60-40)					M-1		3 54/3"				Native at approximately 10 ft bgs.
15						M-2		32 50/4"				
20						S-2		15 33 45				
21	21 ft bgs: As above; finer sand; oxidized											Total depth = 21.5 ft bgs
25												
30												

CONTRACTOR Choice Drilling
EQUIPMENT Track Rig LAR
DRILL MTHD Hollow Stem Auger
DIAMETER 8-inch
LOGGER B.Swanson **REVIEWER** D. Kilian

NORTHING
EASTING
COORDINATE SYSTEM:

NOTES:
S-1 = bulk samples; M-# = Cal Mod samples

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

Geosyntec consultants	2100 Main St Suite 150 Huntington Beach, CA 92648 Tel: (714) 969-0800 Fax: (714) 969-0820	BORING GSB-2 — SHEET 1 OF 2 START DRILL DATE Nov 1, 19 FINISH DRILL DATE Nov 1, 19 LOCATION Los Angeles, CA PROJECT Mirman School NUMBER SC0984A ELEVATION DATA: GROUND SURF. (Ft) TOP OF CASING (Ft) DATUM
GS FORM: WELL BORE 01/04	**BOREHOLE LOG**	

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE NO.	TYPE	BLOW COUNT	RECOVERY (%)	PID/FID (ppm)	TIME (00:00)	COMMENTS 1) Rig Behavior 2) Air Monitoring
	Quarternary Previously Placed Fill (Qppf):			No groundwater observed.								Hand auger to 5 ft bgs.
	3 ft bgs: SILTY SAND with GRAVEL (SM); olive brown (2.5Y, 4/3); moist; fine to medium sand (15-70-15)					S-1		4 5 7				Bulk sample S-1 taken from 3 ft bgs.
5	6 ft bgs: As above; no GRAVEL; brownish yellow (10YR, 6/8); 0-80-20					M-1		10 17 50				
10	Tertiary Modelo Formation, Sandstone Unit (Tmss): 10 ft bgs: SILTY SAND with GRAVEL (SM); brownish yellow (10YR, 6/8); moist; fine to medium sand (10-80-10)					M-2		45 50/3"				Native at approximately 10 ft bgs.
15	15 ft bgs: As above; no GRAVEL; dry; 0-70-30					M-3		50/5"				
20	20 ft bgs: SHALE/MUDSTONE with fine SAND and GRAVEL; yellowish red (5YR, 4/6); dry; fine sand and sub angular gravel; high strength					M-4		27 50/5"				
25	25 ft bgs: As above; dark brown (10YR, 3/3)					M-5		50/3"				
30												

CONTRACTOR Choice Drilling
EQUIPMENT Track Rig LAR
DRILL MTHD Hollow Stem Auger
DIAMETER 8-inch
LOGGER B.Swanson **REVIEWER** D. Kilian

NORTHING
EASTING
COORDINATE SYSTEM:

NOTES:
S-1 = bulk samples; M-# = Cal Mod samples

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Geosyntec consultants
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Suite 150
Huntington Beach, CA 92648
Tel: (714) 969-0800
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GS FORM: WELL BORE 01/04

BOREHOLE LOG

BORING	GSB-2		SHEET 2 OF 2
START DRILL DATE	Nov 1, 19	ELEVATION DATA:	
FINISH DRILL DATE	Nov 1, 19	GROUND SURF. (Ft)	
LOCATION	Los Angeles, CA	TOP OF CASING (Ft)	
PROJECT	Mirman School	DATUM	
NUMBER	SC0984A		

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE NO.	TYPE	BLOW COUNT	RECOVERY (%)	PID/FID (ppm)	TIME (00:00)	COMMENTS 1) Rig Behavior 2) Air Monitoring
								33 50/1"				Total depth = 30.58 ft bgs
35												
40												
45												
50												
55												
60												

CONTRACTOR	Choice Drilling	NORTHING	
EQUIPMENT	Track Rig LAR	EASTING	
DRILL MTHD	Hollow Stem Auger	COORDINATE SYSTEM:	
DIAMETER	8-inch		
LOGGER	B.Swanson	REVIEWER	D. Kilian

NOTES:
S-1 = bulk samples; M-# = Cal Mod samples

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

Geosyntec consultants

2100 Main St
Suite 150
Huntington Beach, CA 92648
Tel: (714) 969-0800
Fax: (714) 969-0820

GS FORM: WELL BORE 01/04

BOREHOLE LOG

BORING SVP-1 **SHEET** 1 **OF** 2
START DRILL DATE Nov 1, 19
FINISH DRILL DATE Nov 1, 19
LOCATION Los Angeles, CA
PROJECT Mirman School
NUMBER SC0984A

ELEVATION DATA:
GROUND SURF. (Ft)
TOP OF CASING (Ft)
DATUM

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE NO.	TYPE	BLOW COUNT	RECOVERY (%)	PID/FID (ppm)	TIME (00:00)	COMMENTS 1) Rig Behavior 2) Air Monitoring
	Quarternary Previously Placed Fill (Qppf):			No groundwater observed.								Hand auger to 5 ft bgs.
	3 ft bgs: SILTY SAND with trace GRAVEL (SM); brown (10YR, 5/3); dry; fine to medium sand (5-80-15)					S-1		4 5 6				Bulk sample S-1 taken from 3 ft bgs.
5	5 ft bgs: As above; moist with GRAVEL (10-75-15)					M-1		11 13 21				
10	Tertiary Modelo Formation, Sandstone Unit (Tmss):					M-2		28 37 50/5"				Native at approximately 10 ft bgs. Alternating sand and mudstone layers.
	10 ft bgs: CLAYEY SAND with GRAVEL (SC); dark brown (10YR, 3/3); moist; fine sand (15-60-25)											
	11 ft bgs: SILTY SAND (SM); brown (10YR, 5/3); dry; medium sand (0-60-40); high strength ; micas											
15	15 ft bgs: CLAYEY SAND (SC); olive-gray (5Y, 4/1); moist; fine to med sand (0-50-50)					M-3		16 19 35				
20						M-4		50/6"				
	21 ft bgs: SILTY SAND (SM); reddish brown (5YR, 4/6); dry; fine to medium sand (0-60-40)											
25						M-5		50/4"				
	25.5 ft bgs: SILTY SAND (SM); brown-brownish yellow (10YR, 5/3); dry; 0-60-40; high strength											
30												

CONTRACTOR Choice Drilling
EQUIPMENT Track Rig LAR
DRILL MTHD Hollow Stem Auger
DIAMETER 8-inch
LOGGER B.Swanson **REVIEWER** D. Kilian

NORTHING
EASTING
COORDINATE SYSTEM:

NOTES:
S-1 = bulk samples; M-# = Cal Mod samples

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

Geosyntec consultants

2100 Main St
Suite 150
Huntington Beach, CA 92648
Tel: (714) 969-0800
Fax: (714) 969-0820

GS FORM: WELL BORE 01/04

BOREHOLE LOG

BORING SVP-1 **SHEET** 2 **OF** 2
START DRILL DATE Nov 1, 19
FINISH DRILL DATE Nov 1, 19
LOCATION Los Angeles, CA
PROJECT Mirman School
NUMBER SC0984A

ELEVATION DATA:
GROUND SURF. (Ft)
TOP OF CASING (Ft)
DATUM

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE: SAMPLE NO.	SAMPLE: TYPE	SAMPLE: BLOW COUNT	SAMPLE: RECOVERY (%)	SAMPLE: PID/FID (ppm)	SAMPLE: TIME (00:00)	COMMENTS 1) Rig Behavior 2) Air Monitoring
						M-6		50/4"				
												Total depth = 32 ft bgs
35												
40												
45												
50												
55												
60												

CONTRACTOR Choice Drilling
EQUIPMENT Track Rig LAR
DRILL MTHD Hollow Stem Auger
DIAMETER 8-inch
LOGGER B.Swanson **REVIEWER** D. Kilian

NORTHING
EASTING
COORDINATE SYSTEM:

NOTES:
S-1 = bulk samples; M-# = Cal Mod samples

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

Geosyntec consultants
2100 Main St
Suite 150
Huntington Beach, CA 92648
Tel: (714) 969-0800
Fax: (714) 969-0820

GS FORM: WELL BORE 01/04

BOREHOLE LOG

BORING	SVP-2	**SHEET**	1 OF 1
START DRILL DATE	Nov 1, 19	**ELEVATION DATA:**	
FINISH DRILL DATE	Nov 1, 19	**GROUND SURF. (Ft)**	
LOCATION	Los Angeles, CA	**TOP OF CASING (Ft)**	
PROJECT	Mirman School	**DATUM**	
NUMBER	SC0984A		

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE NO.	TYPE	BLOW COUNT	RECOVERY (%)	PID/FID (ppm)	TIME (00:00)	COMMENTS 1) Rig Behavior 2) Air Monitoring
0	Quarternary Previously Placed Fill (Qppf): 0-5.5 ft bgs: SILTY SAND with trace GRAVEL (SM); brown (10YR, 5/3); moist; fine sand and angular gravel (5-80-15)			No groundwater observed.								Hand auger to 5 ft bgs.
5						S-1		3 4 5				Bulk sample S-1 taken from 5 ft bgs.
5.5	5.5 ft bgs: CLAYEY SAND (SC); dark brown (10YR, 3/3); moist; low to medium plasticity; 10-60-30											
10	10 ft bgs: As above with more fines (0-50-50)					M-1		11 21 23				
15	Tertiary Modelo Formation, Sandstone Unit (Tmss): 15 ft bgs: CLAYEY SAND (SC); dark brown (10YR, 3/3); moist (0-70-30)					M-2		15 17 21				Native at approximately 15 ft bgs.
20	20 ft bgs: SHALE with alternating SAND layers; brown (10YR, 5/3), dry							32 38 50/4"				
21.5												Total depth = 21.5 ft bgs
25												
30												

CONTRACTOR	Choice Drilling	**NORTHING**	
EQUIPMENT	Track Rig LAR	**EASTING**	
DRILL MTHD	Hollow Stem Auger	**COORDINATE SYSTEM:**	
DIAMETER	8-inch		
LOGGER	B.Swanson	**REVIEWER**	D. Kilian

NOTES:
S-1 = bulk samples; M-# = Cal Mod samples

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

Geosyntec consultants
2100 Main St
Suite 150
Huntington Beach, CA 92648
Tel: (714) 969-0800
Fax: (714) 969-0820

GS FORM: WELL BORE 01/04

BOREHOLE LOG

BORING	SVP-3	SHEET	1 OF 2
START DRILL DATE	Nov 2, 19	ELEVATION DATA:	
FINISH DRILL DATE	Nov 2, 19	GROUND SURF. (Ft)	
LOCATION	Los Angeles, CA	TOP OF CASING (Ft)	
PROJECT	Mirman School	DATUM	
NUMBER	SC0984A		

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE NO.	TYPE	BLOW COUNT	RECOVERY (%)	PID/FID (ppm)	TIME (00:00)	COMMENTS 1) Rig Behavior 2) Air Monitoring
0	Quarternary Previously Placed Fill (Qppf):			No groundwater observed.								
	3 ft bgs: Clayey SAND with trace GRAVEL (SC); yellowish-reddish brown (5YR, 4/6); moist; fine sand (5-40-55)											
5	5 ft bgs: Silty SAND with trace GRAVEL (SM); brown (10YR, 5/3); moist; fine sand (5-60-35)					S-1		3 4 5				Hand auger to 5 ft bgs. Bulk sample S-1 taken from 5 ft bgs.
10						M-1		4 19 27				
	Tertiary Modelo Formation, Sandstone Unit (Tmss):											Native at approximately 11 ft bgs.
	11 ft bgs: As above with more SAND and no GRAVEL (SM); olive grey (5YR, 4/1); fine to medium sand (0-85-15)											
15						S-2		11 12 15				
20	20 ft bgs: As above; oxidized					M-2		11 20 32				
25	25 ft bgs: Mudstone (SC); dark brown-reddish brown (10YR, 3/3-10R, 3/6); dry; 5-40-55; high strength					S-2		6 8 8				
30												

CONTRACTOR Choice Drilling
EQUIPMENT CME95
DRILL MTHD Hollow Stem Auger
DIAMETER 8-inch
LOGGER B.Swanson
REVIEWER D. Kilian
NORTHING
EASTING
COORDINATE SYSTEM:

NOTES:
S-1 = bulk samples; M-# = Cal Mod samples

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

Geosyntec consultants
2100 Main St
Suite 150
Huntington Beach, CA 92648
Tel: (714) 969-0800
Fax: (714) 969-0820

GS FORM: WELL BORE 01/04

BOREHOLE LOG

BORING SVP-3 **SHEET** 2 **OF** 2
START DRILL DATE Nov 2, 19
FINISH DRILL DATE Nov 2, 19
LOCATION Los Angeles, CA
PROJECT Mirman School
NUMBER SC0984A

ELEVATION DATA:
GROUND SURF. (Ft)
TOP OF CASING (Ft)
DATUM

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE NO.	TYPE	BLOW COUNT	RECOVERY (%)	PID/FID (ppm)	TIME (00:00)	COMMENTS 1) Rig Behavior 2) Air Monitoring
						S-3		11 9 13				Total depth = 31.5 ft bgs
	25-30 ft bgs: Alternating sand and mudstone layers											
35												
40												
45												
50												
55												
60												

CONTRACTOR Choice Drilling
EQUIPMENT CME95
DRILL MTHD Hollow Stem Auger
DIAMETER 8-inch
LOGGER B.Swanson **REVIEWER** D. Kilian
NORTHING
EASTING
COORDINATE SYSTEM:

NOTES:
S-1 = bulk samples; M-# = Cal Mod samples

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

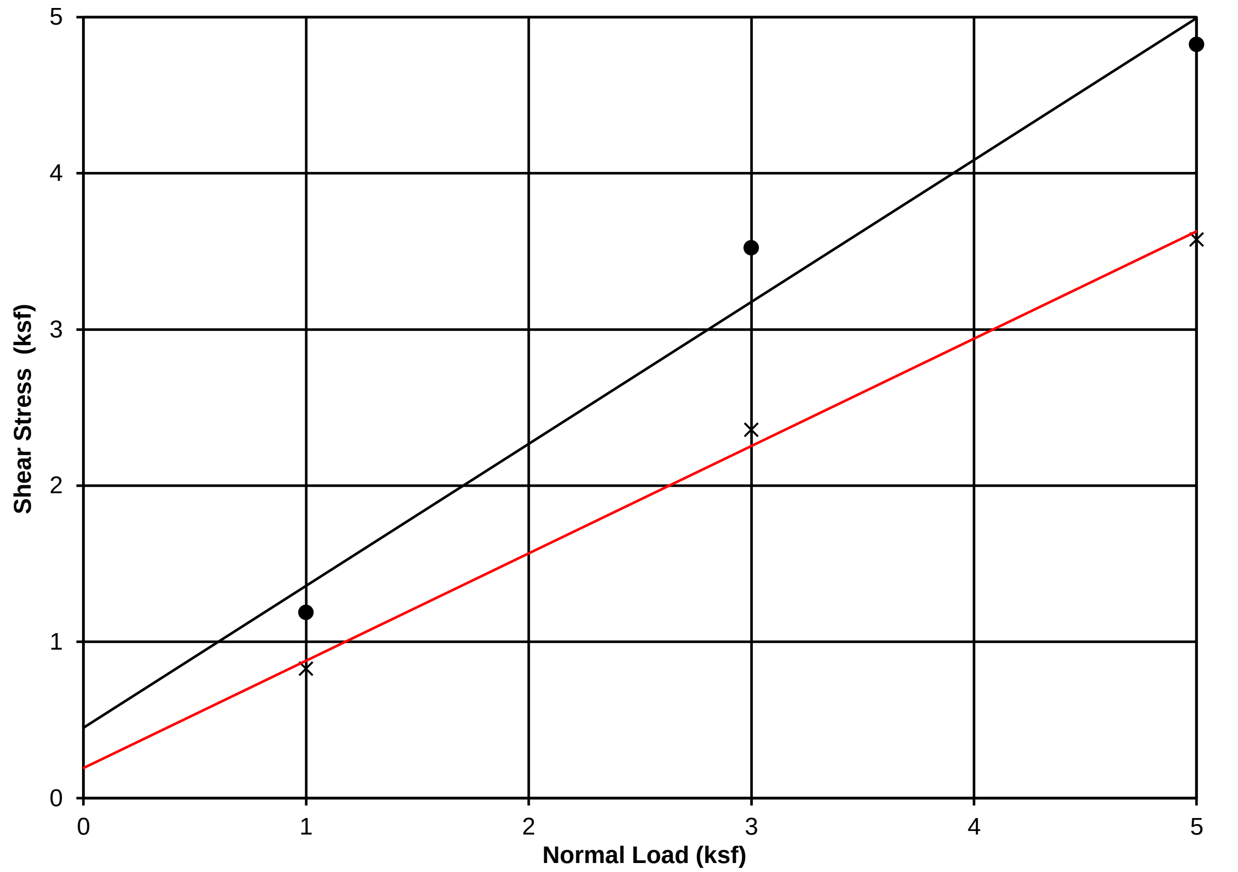
Geosyntec
consultants

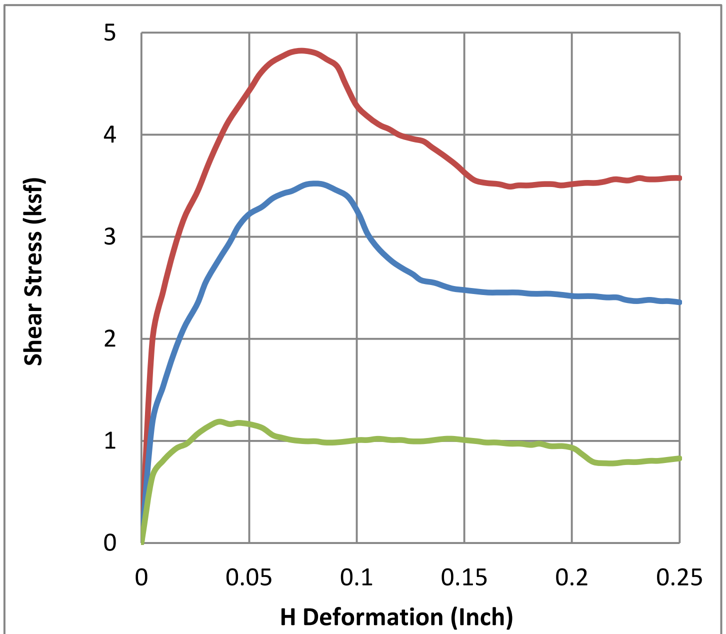
APPENDIX B

Geotechnical Laboratory Results

Table B-1
SUMMARY OF GEOTECHNICAL LABORATORY TEST RESULTS
Mirman School of Gifted Children
Los Angeles, California

Boring No.	Sample Depth in Feet From	To	USCS	Moisture (%)	Dry Density (pcf)	Laboratory Compaction Optimum Moisture (%)	Maximum Dry Density (pcf)	Grain Size Analyses Gravel (%)	Sand (%)	Fines (%)	Atterberg Limits LL (%)	PI (%)	PL (%)	Chloride (ppm)	Resistivity (Ω-cm)	pH	Sulfate (ppm)	R-Value	EI
GSB-1	3.0	5.0	SM	12.4	-	-	-	4	61	35	-	-	-	-	-	-	-	-	4
GSB-1	15.0	15.5	SM	9.8	-	-	-	0	83.5	16.5	-	-	-	-	-	-	-	-	-
SVP-1	5.0	5.5	SM	18.3	104.0	-	-	40	39.9	20.1	-	-	-	-	-	-	-	-	-
SVP-1	15.0	15.5	SM	21.6	102.8	-	-	7	48	45	-	-	-	-	-	-	-	-	-
SVP-1	30.0	30.5	SM	18.3	-	-	-	12	60	28	-	-	-	-	-	-	-	-	-
GSB-2	0.0	5.0	SC	-	-	-	-	-	-	-	-	-	-	41	1981	8.7	40	-	-
GSB-2	5.0	5.5	SC	14.3	115.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GSB-2	10.0	10.5	SM	10.7	119.3	-	-	1	78	21	-	-	-	-	-	-	-	-	-
GSB-2	20.0	21.0	SM	-	-	-	-	-	-	-	37	5	31	-	-	-	-	-	-
GSB-2	25.0	25.5	SM	-	-	-	-	-	-	-	45	17	29	-	-	-	-	-	-
SVP-2	5.0	5.5	SC	-	101.6	-	-	-	-	-	-	-	-	-	-	-	-	34	-





BORING No:	SVP-1
Sample No:	466
Depth:	10'
Description:	(SC)
Undisturbed	Undisturbed
Saturated	Yes
Consolidated	Yes

CONFINED PRESSURE-KSF	1	3	5
WET DENSITY-PCF	118.7	123.4	122.2
MOISTURE CONT. %	19%	18%	18%
DRY DENSITY-PCF	100.0	104.4	103.8
INITIAL SATURATION %	76%	82%	79%
FINAL MOISTURE CONT. %	22%	21%	20%

Peak ϕ (deg)	42
Residual ϕ (deg)	34
Peak cohesion (ksf)	0.5
Residual cohesion (ksf)	0.2

California Testing & Inspections
Material Testing & Geotechnical Laboratory
www.Caltestinspection.com Tel:213-748-4900
15957 Vermont Av
Paramount, CA 90723

ASTM D 3080 DIRECT SHEAR TEST RESULTS
Geosyntec - Mirman School
SVP-1

PROJECT NO.	DATE	SAMPLE #
SC0984A	11/22/2019	466

DSHEAR 466 B-2,M-2

APPENDIX C

Previous Reports

BYER GEOTECHNICAL, INC.

July 31, 2014
BG 21339

The Mirman School
16180 Mulholland Drive
Los Angeles, California 90049

Attention: Mr. David Royal

Subject

Transmittal of Geologic and Soils Engineering Exploration Update
Proposed School Building and Athletic Field
Lot A, Parcel Map 4816
16100 Mulholland Drive
Los Angeles, California

Gentlepersons:

As requested, Byer Geotechnical has updated our report dated July 13, 2011. The updated report replaces the previously e-mailed report. All copies of the July 13, 2011, report should be discarded. The reviewing agency for this document is the City of Los Angeles, Department of Building and Safety (LADBS). The reviewing agency requires three unbound copies, one with a wet signatures, a CD (PDF format), an application form, and a filing fee. Copies of the report have been distributed as follows:

(1) Addressee (E-mail and Mail)
(4) Johnson Favaro, Attention: Ingrid Dennert (E-mail and Mail)

It is our understanding that Johnson Favaro will file the report with the LADBS. Please review the report carefully prior to submittal to the governmental agency. Questions concerning the report should be directed to the project consultant. Byer Geotechnical appreciates the opportunity to offer our consultation and advice on this project.

Very truly yours,
BYER GEOTECHNICAL, INC.

FOR James E. Tucker
Project Consultant

BYER GEOTECHNICAL, INC.

GEOLOGIC AND SOILS ENGINEERING EXPLORATION UPDATE

PROPOSED SCHOOL BUILDING AND ATHLETIC FIELD

LOT A, PARCEL MAP 4816

16100 MULHOLLAND DRIVE

LOS ANGELES, CALIFORNIA

FOR THE MIRMAN SCHOOL

BYER GEOTECHNICAL, INC., PROJECT NUMBER BG 21339

JULY 31, 2014

1461 East Chevy Chase Drive, Suite 200 • Glendale, California 91206 • tel 818.549.9959 • fax 818.543.3747 • www.byergeo.com

GEOLOGIC AND SOILS ENGINEERING EXPLORATION UPDATE
PROPOSED SCHOOL BUILDING AND ATHLETIC FIELD
LOT A, PARCEL MAP 4816
16100 MULHOLLAND DRIVE
LOS ANGELES, CALIFORNIA
FOR THE MIRMAN SCHOOL
BYER GEOTECHNICAL, INC., PROJECT NUMBER BG 21339
JULY 31, 2014

INTRODUCTION

This report has been prepared per our signed Agreement and summarizes findings of Byer Geotechnical, Inc., geologic and soils engineering exploration update performed on the site. The purpose of this study is to evaluate the nature, distribution, engineering properties, relative stability, and geologic structure of the earth materials underlying the site with respect to development of the site. This report is intended to assist in the design and completion of the proposed project and to reduce geotechnical risks that may affect the project. The professional opinions and advice presented in this report are based upon commonly accepted exploration standards and are subject to the AGREEMENT with TERMS AND CONDITIONS, and the GENERAL CONDITIONS AND NOTICE section of this report. No warranty is expressed or implied by the issuing of this report.

PROPOSED PROJECT

The scope of the proposed project was determined from the preliminary plans prepared by Jeffrey M. Kalban & Associates Architecture, Inc. The current project consists of demolishing the existing temporary buildings, grading to create an athletic field and parking, and construction of a one-story school building, as shown on the enclosed Geologic Map.

PREVIOUS EXPLORATION

Exploration was conducted by Van Beveren & Butelo, Inc. (VB&B), on July 26 and August 3, 2002, and Februry 26, 2003, with the aid of a bucket-auger drill rig and hand labor. It included excavating two test pits and drilling four borings to depths of 5 to 27½ feet. Samples of the earth materials were obtained and delivered to their soils engineering laboratory for testing and analysis. The site was observed on June 1, 2011, by the Byer Geotechnical project geologist.

Office tasks included review of published maps and photos for the area, review of our files, review of agency files, preparation of cross sections, preparation of the Geologic Map, engineering analysis, and preparation of this report. Earth materials exposed in the test pits and borings by VB&B are described on the enclosed test pit logs and boring logs.

The proposed project, surface geologic conditions, and the locations of the test pits and borings are shown on the enclosed Geologic Map. Subsurface distribution of the earth materials, projected geologic structure, and the proposed project are shown on Sections A and B. Section B forms the basis for the slope stability calculations.

PRIOR WORK

Agency records contain the following geotechnical reports, which were prepared by **Law/Crandall, Inc.**:

> *Report of Geotechnical Investigation, Proposed Nursery School, 16100 Mulholland Drive, Los Angeles, California, for the Stephen S. Wise Temple,* dated July 30, 1991; and

> *Final Report, Geotechnical Inspection Services, Stephen S. Wise Temple Nursery School, Tract PM 4816, Lot A, 16100 Mulholland Drive, Los Angeles, California, for Stephen S. Wise Temple,* report dated December 7, 1992;

The compaction report dated December 7, 1992, was reviewed and approved by the City of Los Angeles, Department of Building and Safety (LADBS), in a letter dated December 16, 1992.

Agency records contain the following geotechnical report prepared by **Van Beveren & Butelo, Inc.**:

> *Report of Geotechnical Investigation, Proposed Athletic Field, 16100 Mulholland Drive, Los Angeles, California,* dated September 1, 2004.

The report was reviewed and approved by the LADBS in a letter dated October 27, 2004. Copies of the LADBS approval letters are enclosed.

The geologic data and laboratory test results contained in the referenced geotechnical reports by Law/Crandall, Inc., and Van Beveren & Buleto, Inc., have been reviewed. Byer Geotechnical concurs with their findings and laboratory test results and agrees to assume geotechnical responsibility for their use with respect to the proposed project.

SCOPE OF WORK

Byer Geotechnical drilled, logged, and sampled two eight-inch-diameter hollow-stem-auger borings (B1 and B2) on May 28, 2014, at the locations shown on the enclosed Geologic Map. The borings were drilled to approximate depths of 6½ and 11½ feet below existing grade. The boring tailings were visually logged by the project soils engineer. The purpose of these borings was to conduct an *in-situ* percolation test to determine the appropriate percolation rate on the subject site. The locations and depths of the borings were selected in coordination with the client. Earth materials exposed in the borings are described on the enclosed Log of Borings. Following drilling, logging, and sampling, a percolation test was conducted as described in the "Percolation Testing" section of this report. Upon completion of *in-situ* percolation testing, the borings were backfilled. The *in-situ* percolation test was performed utilizing water from the drill rig. Office tasks included review of our files, preparation of the Percolation Map, engineering analysis, and preparation of this report.

SITE DESCRIPTION

The subject property consists of a graded hillside parcel on the crest of the Santa Monica Mountains, in the city of Los Angeles, California (34.1298° N Latitude, 118.4837° W Longitude). It is located on the south side of Mulholland Drive, approximately one-half of a mile west of the San Diego (405) Freeway. The site is developed with one-story temporary school buildings, a parking lot, and play areas on a large level pad. The temporary buildings are surrounded by raised-wood walkways. A retaining wall up to 10 feet high is located on the eastern portion of the pad. A 100-foot-high, 1½:1 cut slope ascends offsite to the east of the retaining wall. The slope has two drainage terraces approximately one-third and two-thirds of the way up the slope. Private schools are located to the east and west of the property. A church is located to the north of Mulholland Drive.

Past grading on the site has consisted of cut-and-fill operations during development of the site. Grading was performed in 1992 under the observation of Law/Crandall, Inc.

Vegetation on the site consists of planter areas around the buildings and a modest assemblage of native chaparral on the slope to the east. Surface drainage is by sheetflow runoff down the contours of the land to the west.

GROUNDWATER

Groundwater was not encountered in the VB&B and BG borings to a maximum depth of 27½ feet below existing grade. Seasonal fluctuations in groundwater levels occur due to variations in climate, irrigation, development, and other factors not evident at the time of the exploration. Groundwater levels may also differ across the site. Groundwater can saturate earth materials causing subsidence or instability of slopes.

EARTH MATERIALS

Compacted Fill

Compacted fill, associated with previous grading, underlies the western portion of the site to a maximum observed depth of 25½ feet in Boring BB4. Greater depths of fill may occur locally. The fill placement and compaction were observed, tested, and certified by Law/Crandall, Inc., in their compaction report dated December 7, 1992. The compaction report for primary structural fill was approved by the LADBS in a letter dated December 16, 1992. A copy of the letter is enclosed. The compacted fill consists of silty sand and sandy silt, which is grayish-brown, and dense, with sandstone and siltstone fragments.

Bedrock

Bedrock underlying the site and encountered in the borings and test pits consists of sandstone with some siltstone and shale beds mapped as part of the Modelo Formation. The bedrock is also exposed in cut slopes on the eastern portion of the site. The bedrock is yellowish-brown to gray-brown, hard, and thinly to thickly bedded.

GEOLOGIC STRUCTURE

The bedrock described above is common to this area of the eastern Santa Monica Mountains and the geologic structure is consistent with regional trends. The regional structure consists of beds, which strike generally east and dip shallowly to the north (see Regional Geologic Map). Bedding planes mapped at the site strike N60W to N70W and dip 14 to 20 degrees to the northeast.

The geologic structure of the bedrock is favorably oriented for stability of the site and proposed project.

GENERAL SEISMIC CONSIDERATIONS

The subject property is located in an active seismic region. Moderate to strong earthquakes can occur on numerous local faults. The United States Geological Survey, California Geological Survey (CGS), private consultants, and universities have been studying earthquakes in southern California for several decades. Early studies were directed toward earthquake prediction and estimation of the effects of strong ground shaking. Studies indicate that earthquake prediction is not practical and not sufficiently accurate to benefit the general public. Governmental agencies now require earthquake resistant structures. The purpose of the code seismic-design parameters is to prevent collapse during strong ground shaking. Cosmetic damage should be expected.

Southern California faults are classified as "active" or "potentially active." Faults from past geologic periods of mountain building that do not display evidence of recent offset are considered "potentially active." Faults that have historically produced earthquakes or show evidence of movement within the past 11,000 years are known as "active faults." No known active faults cross the subject property, and the property is not located within a currently-designated Alquist-Priolo Earthquake Fault Zone (CGS, 2000). Therefore, the potential for future surface rupture onsite is expected to be very low.

The following table lists the applicable 2014 City of Los Angeles Building Code seismic coefficients for the project:

SEISMIC COEFFICIENTS (2014 City of Los Angeles Building Code - Based on ASCE Standard 7-10)		
Latitude = 34.1298° N Longitude = 118.4837° W	Short Period (0.2s)	One-Second Period
Earth Materials and Site Class from Table 1613.5.2 and Section 1613.5.2	Bedrock - C	
Spectral Accelerations from Figures 1613.5(3) and 1613.5(4) and USGS	S_s = 2.158 (g)	S_1 = 0.754 (g)
Site Coefficients from Tables 1613.5.3 (1) and 1613.5.3 (2) and USGS	F_A = 1.0	F_V = 1.3
Spectral Response Accelerations from Equations 16-36 and 16-37	S_{MS} = 2.158 (g)	S_{M1} = 0.980 (g)
Design Accelerations from Equations 16-38 and 16-39	S_{DS} = 1.439 (g)	S_{D1} = 0.653 (g)

Reference: U.S. Geological Survey, **Earthquake Hazards Program, Seismic Design Values for Buildings,** http://earthquake.usgs.gov/hazards/design/buildings.php.

The mapped spectral response acceleration parameter for the site for a 1-second period (S_1) is greater than 0.75g. Therefore, the project is considered to be in Seismic Design Category E.

The principal seismic hazard to the proposed project is strong ground shaking from earthquakes produced by local faults. Modern, well-constructed buildings are designed to resist ground shaking through the use of shear panels, moment frames, and reinforcement. Additional precautions may be taken, including strapping water heaters and securing furniture to walls and floors. It is likely that the subject property will be shaken by future earthquakes produced in southern California.

Ground Motion

Probabilistic seismic hazard deaggregation analysis was performed on the subject site. Seismic parameters were determined using currently available earthquake and fault information utilizing data from the United States Geological Survey (USGS) National Seismic Hazard Mapping Project (USGS, 2008). An averaging of three Next Generation Attenuation relations (Chiou-Youngs, 2008; Boore-Atkinson, 2008; and Campbell-Bozorgnia, 2008) were incorporated in the analysis. A shear-wave velocity (Vs30) of 660 meters-per-second (Site Class C) was used in the analysis. Hazard deaggregation indicates a predominant mean earthquake magnitude of 6.72 (Mw) at a mean distance of 14.0 kilometers. The Peak Horizontal Ground Acceleration (PHGA) with a 10-percent probability of exceedance in 50 years is estimated to be 0.42g on the subject site. These ground motions could occur at the site during the life of the project. Results of the analysis are graphically presented in the enclosed "Seismic Hazard Deaggregation Chart" figure (Appendix II).

Pseudo-static seismic coefficients (k_h) were derived according to the screening procedure described in Blake and others (2002) and referenced in SP117A, pages 28 - 31, using the seismically-induced ground motion parameters derived above. For a tolerable slope displacement (u) of 5 centimeters (2 inches), the seismicity factor (f_{eq}) is equal to 0.51, and the horizontal pseudo-static seismic coefficient (k_h) is equal to 0.21g. For a tolerable slope displacement (u) of 15 centimeters (6 inches), the seismicity factor (f_{eq}) is equal to 0.37, and the horizontal pseudo-static seismic coefficient (k_h) is equal to 0.16g.

LIQUEFACTION

The CGS has not mapped the site within an area where historic occurrence of liquefaction or geological, geotechnical, and groundwater conditions indicate a potential for permanent ground displacement such that mitigation as defined in Public Resources Code Section 2693 (c) would be required.

The subject property is underlain by compacted fill and bedrock, which are not considered subject to liquefaction.

SLOPE STABILITY

Gross Stability

The CGS has not designated the property within a state zone requiring seismic landslide investigation per Public Resources Code, Section 2693 (c). However, offsite of the slope, to the east of the property, is within a Zone of Required Investigation for earthquake-induced landsliding.

Slopes analyzed for stability include a 100-foot-high, 1½:1 cut slope. The gross stability of the slope was analyzed using a computerized version of Simplified Bishop's Method (*Slide 6.0,* Rocscience, Inc., 2010).

The analysis shows that the existing slope is grossly stable with a factor of safety in excess of 1.5 for static conditions and 1.0 for pseudo static (seismic) conditions (see Appendix II). The calculations use the shear tests of samples believed to be representative of the strength of the bedrock encountered during exploration. The cross section used is the most critical for the slopes analyzed.

PERCOLATION TESTING

Upon completion of drilling and logging Borings B1 and B2 on May 28, 2014, the borings were presoaked to the full depth, utilizing water from the drill rig, and allowed to set for at least 30 minutes. Following presoaking, a falling-head percolation test was conducted in the borings. The test consisted of ceasing the flow of water into the boring and measuring the drop of the water surface (head) at 10-minute intervals for a period of 2½ hours in Boring 1 and one hour in Boring 2.

A graphical representation of the field test results and results of the infiltration rate calculations are shown on the enclosed Percolation Chart, and Tables 1a and 1b. The calculations are based on the methodology provided in the Administrative Manual of the County of Los Angeles, Department of Public Works.

Based on the results of the *in-situ* percolation testing, the bedrock underlying the subject site exhibits very poor percolation characteristics. The infiltration rate is expected to be on the order of 0.24 inch-per-hour (1.69×10^{-4} centimeters-per-second, see Percolation Chart), which is less than the minimum rate (0.5 inch-per-hour) required by the Administrative Manual and the City of Los Angeles.

CONCLUSIONS AND RECOMMENDATIONS

General Findings

The conclusions and recommendations of this update report are based upon review of the preliminary plans, review of published maps, the previous four borings and two test pits by VB&B, the recent two borings by Byer Geotechnical, field geologic mapping, research of available records, laboratory testing, engineering analysis, and years of experience performing similar studies on similar sites. It is the finding of Byer Geotechnical, Inc., that development of the proposed project is feasible from a geologic and soils engineering standpoint, provided the advice and recommendations contained in this report are included in the plans and are implemented during construction.

The northern portion of the proposed school building is underlain by a thin layer (two feet) of compacted fill (see Boring BB1). The compacted fill deepens to the south. In order to provide a uniform bearing material, it is recommended that the upper five feet of earth materials underlying the area of the proposed school building be removed and replaced as a certified compacted-fill blanket.

The recommended bearing material is a future compacted-fill blanket, placed both on bedrock and previously-certified compacted fill. Conventional foundations may be used to support the proposed school building. Soils to be exposed at finished grade are expected to exhibit a low expansion potential.

The proposed parking lot area is underlain by compacted fill and bedrock. The bedrock exhibits a very low permeability characteristic. In general, percolation into fill materials is not recommended. Therefore, use of infiltration pits, trenches, and permeable pavers are not recommended on the subject site.

SITE PREPARATION - REMOVALS

The upper five feet of earth materials underlying the area of the proposed school building should be removed and replaced as certified compacted fill. The following general grading specifications may be used in preparation of the grading plan and job specifications. Byer Geotechnical would appreciate the opportunity of reviewing the plans to ensure that these recommendations are included. The grading contractor should be provided with a copy of this report.

A. The area to receive compacted fill should be prepared by removing all vegetation, demolition debris, and upper five feet of earth materials. The exposed excavated area should be observed by the soils engineer/geologist prior to placing compacted fill. The exposed grade should be scarified to a depth of six inches, moistened to optimum moisture content, and recompacted to 90 percent of the maximum dry density.

B. The proposed building site shall be excavated to a minimum depth of three feet below the bottom of all footings. The excavation shall extend beyond the edge of the exterior footing a minimum of three feet or to the depth of fill below the footing. The excavated areas shall be observed by the soils engineer/geologist prior to placing compacted fill.

C. Fill, consisting of soil approved by the soils engineer, shall be placed in horizontal lifts, moistened as required, and compacted in six-inch layers with suitable compaction equipment. The excavated onsite materials are considered satisfactory for reuse in the controlled fills. Any imported fill shall be observed by the soils engineer prior to use in fill areas. Rocks larger than six inches in diameter shall not be used in the fill.

D. The fill shall be compacted to at least 90 percent of the maximum laboratory dry density for the material used. The maximum density shall be determined by ASTM D 1557-12 or equivalent.

E. Field observation and testing shall be performed by the soils engineer during grading to assist the contractor in obtaining the required degree of compaction and the proper moisture content. Where compaction is less than required, additional compactive effort shall be made with adjustment of the moisture content, as necessary, until 90 percent relative compaction is obtained. A minimum of one compaction test is required for each 500 cubic yards or two vertical feet of fill placed.

Excavation Characteristics

The bedrock was penetrated by the borings to 27½ feet in boring BB3. Excavation difficulty is a function of the degree of weathering and amount of fracturing within the bedrock. The bedrock generally becomes harder and more difficult to excavate with increasing depth. Hard, cemented layers are also known to occur at random locations and depths and may be encountered during foundation excavation. Should a hard, cemented layer be encountered, coring or the use of jackhammers may be necessary.

FOUNDATION DESIGN

Spread Footings

Continuous and/or pad footings may be used to support the proposed school building, provided they are founded in future compacted fill. Continuous footings should be a minimum of 12 inches in width. Pad footings should be a minimum of 24-inches square. The following chart contains the recommended design parameters.

Bearing Material	Minimum Embedment Depth of Footing (Inches)	Vertical Bearing (psf)	Coefficient of Friction	Passive Earth Pressure (pcf)	Maximum Earth Pressure (psf)
Future Compacted Fill	24	2,000	0.30	250	4,000

Increases in the bearing value are allowable at a rate of 400 pounds-per-square-foot for each additional foot of footing width or depth to a maximum of 4,000 pounds-per-square-foot. For bearing calculations, the weight of the concrete in the footing may be neglected.

The bearing value shown above is for the total of dead and frequently applied live loads and may be increased by one-third for short duration loading, which includes the effects of wind or seismic forces. When combining passive and friction for lateral resistance, the passive component should be reduced by one-third.

All continuous footings should be reinforced with a minimum of four #4 steel bars: two placed near the top, and two near the bottom of the footings. Footings should be cleaned of all loose soil, moistened, free of shrinkage cracks, and approved by the geotechnical engineer prior to placing forms, steel, or concrete.

Foundation Settlement

Settlement of the foundation system is expected to occur on initial application of loading. A total settlement of one-fourth to one-half of an inch may be anticipated. Differential settlement should not exceed one-fourth of an inch.

TEMPORARY EXCAVATIONS

Temporary excavations will be required during grading to prepare a compacted-fill pad for the proposed school building. The excavations will be up to five feet in height and will expose existing compacted fill over bedrock. The compacted fill and bedrock are capable of maintaining vertical excavations up to five feet. Where vertical excavations exceed five feet in height, the upper portion should be trimmed to 1:1 (45 degrees).

The geologist should be present during grading to see temporary slopes. All excavations should be stabilized within 30 days of initial excavation. Water should not be allowed to pond on top of the excavations nor to flow toward them. No vehicular surcharge should be allowed within three feet of the top of the cut.

FLOOR SLABS

Floor slabs should be cast over future compacted fill placed in accordance with the "Site Preparation - Removals" section of this report. Floor slabs should be reinforced with a minimum of #4 bars on 16-inch centers, each way.

Slabs that will be provided with a floor covering should be protected by a polyethylene plastic vapor barrier. The barrier should be sandwiched between the layers of sand, about two inches each, to prevent punctures and aid in the concrete cure. A low-slump concrete may be used to minimize possible curling of the slab. The concrete should be allowed to cure properly before placing vinyl or other moisture sensitive floor covering.

It should be noted that cracking of concrete slabs is common. The cracking occurs because concrete shrinks as it cures. Control joints, which are commonly used in exterior decking to control such cracking, are normally not used in interior slabs. The reinforcement recommended above is intended to reduce cracking and its proper placement is critical to the performance of the slab. The minor shrinkage cracks, which often form in interior slabs, generally do not present a problem when carpeting, linoleum, or wood floor coverings are used. The slab cracks can, however, lead to surface cracks in brittle floor coverings such as ceramic tile.

EXTERIOR CONCRETE DECKS

Decking should be cast over future compacted fill placed in accordance with the "Site Preparation - Removals" section of this report. Decking should be reinforced with a minimum of #3 bars placed 18 inches on center, each way. Subgrades should be moistened prior to placing concrete.

PAVING

Prior to placing paving, the existing grade should be scarified to a depth of six inches, moistened as required to obtain optimum moisture content, and recompacted to 90 percent of the maximum dry density, as determined by ASTM D 1557-12. Trench backfill below paving should be compacted to 90 percent of the maximum dry density. Irrigation water should be prevented from migrating under paving.

For rigid concrete pavement, four inches of concrete with four inches of aggregate base can be used. Concrete should be reinforced for heavy load application.

The following table shows the recommended pavement sections:

Service	Pavement Thickness (Inches)	Base Course (Inches)
Light Passenger Cars and Moderate Trucks	3	4

DRAINAGE

Control of site drainage is important for the performance of the proposed project. Roof gutters are recommended. Pad and roof drainage should be collected and transferred to the street or approved location in non-erosive drainage devices. Drainage should not be allowed to pond on the pad or against any foundation or retaining wall. Drainage should not be allowed to flow uncontrolled over any descending slope. Planters located within retaining wall backfill should be sealed to prevent moisture intrusion into the backfill. Drainage control devices require periodic cleaning, testing, and maintenance to remain effective.

Irrigation

Control of irrigation water is a necessary part of site maintenance. Soggy ground and perched water may result if irrigation water is excessively applied. Irrigation systems should be adjusted to provide the minimum water needed. Adjustments should be made for changes in climate and rainfall.

Infiltration Pit

Typically, infiltration systems are utilized in areas underlain by pervious granular earth materials that have high percolation characteristics. In addition, infiltration systems are normally planned at least 10 feet from adjacent property lines or public right-of-way, and 15 feet from a 1:1 plane projected from the bottom of adjacent structural foundations. Since the site is underlain by compacted fill, and bedrock that exhibits very poor percolation characteristics, infiltration pits are not recommended on the subject site.

As an alternative, a biofiltration system may be installed on the site in accordance with the City of Los Angeles Best Management Practices (City of Los Angeles, 2011). A planter box may be used to capture and treat storm-water runoff through different soil layers before discharging water to the street storm drain. The planter box should be an impermeable structure that is equipped with an underdrain to prevent water infiltration to the underlying subsurface earth materials. Planter boxes may be situated above ground and placed adjacent to buildings. Planter boxes should be designed as freestanding and for an inward equivalent fluid pressure of 43 pounds-per-cubic-foot. This fluid pressure includes possible vehicular surcharge. Byer Geotechnical, Inc., should be provided with the final plans to verify the location of the planter boxes.

PLAN REVIEW

Formal plans ready for submittal to the building department should be reviewed by Byer Geotechnical. Any change in scope of the project may require additional work.

SITE OBSERVATIONS DURING CONSTRUCTION

The building department requires that the geotechnical engineer provide site observations during grading and construction. Foundation excavations should be observed and approved by the geotechnical engineer or geologist prior to placing steel, forms, or concrete. The soils engineer/ geologist should observe bottoms for fill and compaction of fill. All fill that is placed should be approved by the geotechnical engineer and the building department prior to use for support of structural footings and floor slabs.

Please advise Byer Geotechnical, Inc., at least 24 hours prior to any required site visit. The building department stamped plans, the permits, and the geotechnical reports should be at the job site and available to our representative. The project consultant will perform the observation and post a notice at the job site with the findings. This notice should be given to the agency inspector.

FINAL REPORTS

The geotechnical engineer will prepare interim and final compaction reports upon request.

CONSTRUCTION SITE MAINTENANCE

It is the responsibility of the contractor to maintain a safe construction site. The area should be fenced and warning signs posted. All excavations must be covered and secured. Soil generated by foundation excavations should be either removed from the site or placed as compacted fill. Soil should not be spilled over any descending slope. Workers should not be allowed to enter any unshored trench excavations over five feet deep. Water shall not be allowed to saturate open footing trenches.

GENERAL CONDITIONS AND NOTICE

This report and the exploration are subject to the following conditions. Please read this section carefully; it limits our liability.

In the event of any changes in the design or location of any structure, as outlined in this report, the conclusions and recommendations contained herein may not be considered valid unless the changes are reviewed by Byer Geotechnical, Inc., and the conclusions and recommendations are modified or reaffirmed after such review.

The subsurface conditions, excavation characteristics, and geologic structure described herein have been projected from test excavations on the site and may not reflect any variations that occur between these test excavations or that may result from changes in subsurface conditions.

Fluctuations in the level of groundwater may occur due to variations in rainfall, temperature, irrigation, and other factors not evident at the time of the measurements reported herein. Fluctuations also may occur across the site. High groundwater levels can be extremely hazardous. Saturation of earth materials can cause subsidence or slippage of the site.

If conditions encountered during construction appear to differ from those disclosed herein, notify us immediately so we may consider the need for modifications. Compliance with the design concepts, specifications, and recommendations requires the review of the engineering geologist and geotechnical engineer during the course of construction.

THE EXPLORATION WAS PERFORMED ONLY ON A PORTION OF THE SITE, AND CANNOT BE CONSIDERED AS INDICATIVE OF THE PORTIONS OF THE SITE NOT EXPLORED.

This report, issued and made for the sole use and benefit of the client, is not transferable. Any liability in connection herewith shall not exceed the Phase I fee for the exploration and report or a negotiated fee per the Agreement. No warranty is expressed, implied, or intended in connection with the exploration performed or by the furnishing of this report.

THIS REPORT WAS PREPARED ON THE BASIS OF THE PRELIMINARY DEVELOPMENT PLAN FURNISHED. FINAL PLANS SHOULD BE REVIEWED BY THIS OFFICE AS ADDITIONAL GEOTECHNICAL WORK MAY BE REQUIRED.

Byer Geotechnical appreciates the opportunity to provide our service on this project. Any questions concerning the data or interpretation of this report should be directed to the undersigned.

Respectfully submitted,
BYER GEOTECHNICAL, INC.

James Tucker

James E. Tucker
P. G. 6628

REGISTERED PROFESSIONAL ENGINEER RAFFI S. BABAYAN No. 72168 Exp. JUNE 30, 16 CIVIL STATE OF CALIFORNIA

ENGINEERING GEOLOGIST ROBERT I. ZWEIGLER E. G. 1210 Exp. 11/30/16 STATE OF CALIFORNIA

Raffi S. Babayan
P. E. 72168

Robert I. Zweigler
E. G. 1210/G. E. 2120

REGISTERED PROFESSIONAL ENGINEER ROBERT I. ZWEIGLER No. 2120 Exp. 06-30-16 GEOTECHNICAL STATE OF CALIFORNIA

JET:RSB:RIZ:mh
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Enc: LADBS, conditional approval letters dated December 16, 1992, and October 27, 2004 (4 Pages)
Appendix I - Van Beveren & Butelo, Inc., excerpts from report dated September 1, 2004
Shear Test Diagrams (2 Pages)
Test Pits Logs (2 Pages)
Borings Logs 1 - 4 (4 Pages)
Appendix II - Log of Borings, Calculations, and Figures
Log of Borings 1 and 2 by Byer Geotechnical (2 Pages)
PSH Deaggregation on NEHRP C Rock, Figure
Slope Stability Calculation Sheets (8 Pages)
Percolation Chart and Tables 1a and 1b (3 Pages)
Vicinity Map
Regional Geologic Map
Regional Topographic Map
Section C

In Pocket: Geologic Map
Sections A & B (1 Sheet)

xc: (1) Addressee (E-mail and Mail)
(4) Johnson Favaro, Attention: Ingrid Dennert (E-mail and Mail)

CITY OF LOS ANGELES
CALIFORNIA

TOM BRADLEY
MAYOR

RECEIVED
Law/Crandall, Inc.
JAN 07 1993
File: 191083.B0
WJ ☒ JH
HO ☒ GH

DEPARTMENT OF
BUILDING AND SAFETY
407, CITY HALL
LOS ANGELES, CA 90012-4869

WARREN V. O'BRIEN
GENERAL MANAGER

TIMOTHY TAYLOR
EXECUTIVE OFFICER

DATE 12-16-92

(COMPACTION FILE - 5)

06#31334

NAME STEPHEN S. WISE TEMPLE
ADDRESS 15500 STEPHEN S. WISE DR.
CITY L.A. ST CA ZIP 90077

TRACT: PM 4816 PERMIT: 91LA79387
BLOCK: — DM #: 159B141
LOT(S): A CTY REF #: PM 155-5/9
LOCATION: 16100 MULHOLLAND DR.

SUBJECT: PRIMARY STRUCTURAL FILL

FILL SOIL CLASSIFICATION, PER TABLE 29-B: SILTY SAND
LOTS HAVING COMPACTED FILL: A

Soils Compaction Report No. L91083.B, dated 12/7/92, prepared by LAW/CRANDALL, INC. (NURSERY SCHOOL SITE).

Approval is granted for compacted fill constructed on the above lots as described in the compaction report. Approval is limited to the area shown in the report and by the following requirements:

A. Compacted fill shall extend beyond the footings a minimum distance equal to the depth of fill below the footings.
B. Continuous footing bearing pressure for all structures shall not exceed a value of 2000 psf at 24 inches minimum, below approved compacted surface.
C. Isolated footing bearing pressure for all structures shall not exceed a value of 2000 psf at 24 inches minimum, below approved compacted surface.
D. Dwelling foundations located partially or wholly upon compacted fill ground shall meet the requirements of Section 91.2907(j).
E. Building or structure footings shall be located a distance of one-third (1/3) of the vertical height of the slope with a minimum of 5 feet and a maximum of 40 feet, measured horizontally from the slope surface to the lower edge of the footing per Code Section 91.2907(d).
F. The soil engineer shall inspect the footing excavations to determine that they are founded in the recommended strata before calling the Department for footing inspection.
G. Slope erosion control, planting, and irrigation of fill slopes, and run-off control are required as per Code Sections 91.7007 and 91.7008.
H. ______________________________

LARRY WESTPHAL
Chief of Grading Division

S. Mizuki
Grading Engineer
485-3435 - LA Office
989-8211 - VN Office

TGRPSF/GR

cc: M. IWAOKA - WLA
LAW/CRANDALL

NOTE: A grading oversized document is/is not attached to the Compaction Report. (Document Type 92)

APPROVAL IS FOR FILL AT NORTHERN PORTION OF PROPOSED BUILDING & AT PARKING AREA (FIELD DENSITY TESTS #39-47). PREVIOUS DEPARTMENT LETTER DATED 11-26-91 APPROVED REMAINDER OF FILL (TESTS # 1-38).

CITY OF LOS ANGELES

CALIFORNIA

JAMES K. HAHN
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

ANDREW A. ADELMAN, P.E.
GENERAL MANAGER
RAYMOND CHAN
EXECUTIVE OFFICER

GEOLOGY/SOIL REPORT APPROVAL LETTER

October 27, 2004

Log # 45237
SOILS/GEOLOGY FILE - 2

Stephen S. Wise Temple
15500 Stephen S. Wise Dr
Los Angeles, CA 90077

TRACT: PM4816
LOT: A
LOCATION: 16100 Mulholland Dr

CURRENT REFERENCE REPORT/LETTER(S)	REPORT NO.	DATE(S) OF DOCUMENT	PREPARED BY
Geology/Soil Report	02-040.3	09/01/04	Van Beveren&Butelo
Ovrszd Doc	"	"	"

PREVIOUS REFERENCED REPORT/LETTER(S)	REPORT NO.	DATE(S) OF DOCUMENT	PREPARED BY
Geology/Soil Report	02-040.3	10/13/03	Van Beveren&Butelo
Dept Approval letter	41654	11/18/03	LADBS

The referenced report concerning the recommendations for a proposed athletic field, retaining walls and a field house has been reviewed by the Grading Division of the Department of Building and Safety. The report recommends supporting the retaining walls on conventional footings or CIDH piles founded in bedrock, and the field house on conventional footings founded in compacted fill. The recommended downward capacities of the CIDH piles (Figure 3) are not provided in the report. Therefore, only conventional footings are approved for supporting the proposed structures. The report provide no copies of the Department's approval of the existing fill. The existing fill is therefore considered as uncertified fill and shall not be used for support of new fill or footings.

The report is acceptable, provided the following conditions are complied with during site development:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2002 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. In the event drilled cast-in-place concrete piles are used for supporting the retaining walls, a supplementary report shall be submitted to the Department providing recommendations on the bearing capacities of the piles.

2. The geologist and soils engineer shall review and approve the detailed plans prior to issuance of any permits. This approval shall be by signature on the plans which clearly indicates that the geologist

and soils engineer have reviewed the plans prepared by the design engineer and that the plans include the recommendations contained in their reports.

3. All recommendations of the reports which are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

4. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans. Submit one copy of the above reports to the Building Department Plan Checker prior to issuance of the permit. (7006.1)

5. A grading permit shall be obtained. (106.1.2)

6. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557. Where cohesionless soil having less than 15 percent finer than 0.005 millimeters is used for fill, it shall be compacted to a minimum of 95 percent relative compaction based on maximum dry density (D1556). Placement of gravel in lieu of compacted fill is allowed only if complying with Section 91.7011.3 of the Code.(7011.3)

7. All new graded slopes shall be no steeper than 2:1.

8. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the State Construction Safety Orders enforced by the State Division of Industrial Safety. (3301.1)

9. Temporary excavations in bedrock up to 15 feet in height shall be no steeper than 1/2:1, as recommended in page 18 of the report 9/1/04.

10. Temporary excavations exposing unsupported bedding planes shall be trimmed along the lowest unsupported bedding plane.

11. Existing uncertified fill shall not be used for support of footings, concrete slabs or new fill.

12. All Footings shall founded in either bedrock, or certified compacted fill.

13. Slab-on-uncertified fill shall be designed as a structural slab.(7011.3 & 1806.1)

14. The LABC Soil Type underlying the site is S_C. The minimum horizontal distance to known seismic sources shall be in accordance with the "Maps of Known Active Fault Near Source Zones" published by ICBO. (1636A)

15. Retaining walls up to a maximum height of 15 feet shall be designed for the minimum equivalent fluid pressures as recommended in page 17 of the report dated 9/1/04.

16. The recommended equivalent fluid pressure (EFP) for the proposed retaining wall shall apply from the top of the freeboard to the bottom of the wall footing.

17. All retaining walls shall be provided with a standard surface backdrain system and all drainage shall be conducted to the street in an acceptable manner and in a non-erosive device. (7013.11)

18. All retaining walls shall be provided with a subdrain system to prevent possible hydrostatic pressure behind the wall. Prior to issuance of any permit, the retaining wall subdrain system recommended in the soil report shall be incorporated into the foundation plan which shall be reviewed and approved by the soils engineer of record.(7015.5 & 108.9)

19. Installation of the subdrain system shall be inspected and approved by the soils engineer of record and the City grading/building inspector. (7015.5 & 108.9)

20. Prefabricated drainage composites (Miradrain) (Geotextiles) may be only used in addition to traditionally accepted methods of draining retained earth.

21. All roof and pad drainage shall be conducted to the street in an acceptable manner. (7013.10)

22. The geologist and soil engineer shall inspect all excavations to determine that conditions anticipated in the report have been encountered and to provide recommendations for the correction of hazards found during grading. (7008.3)

23. Prior to the pouring of concrete, a representative of the consulting soils engineer shall inspect and approve the footing excavations. He shall post a notice on the job site for the LADBS Building Inspector and the Contractor stating that the work so inspected meets the conditions of the report, but that no concrete shall be poured until the City Building Inspector has also inspected and approved the footing excavations. A written certification to this effect shall be filed with the Grading Division of the Department upon completion of the work. (108.9 & 7008.2)

24. Prior to the placing of compacted fill, a representative of the consulting soils engineer shall inspect and approve the bottom excavations. He shall post a notice on the job site for the LADBS Grading Inspector and the Contractor stating that the soil inspected meets the conditions of the report, but that no fill shall be placed until the LADBS Grading Inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be filed in the final compaction report filed with the Grading Engineering Division of the Department. All fill shall be placed under the inspection and approval of the soils engineer. A compaction report together with the approved soil report and Department approval letter shall be submitted to the Grading Engineering Division of the Department upon completion of the compaction. The engineer's certificate of compliance shall include the grading permit number and the legal description as described in the permit (7011.3).

DANA PREVOST
Engineering Geologist II

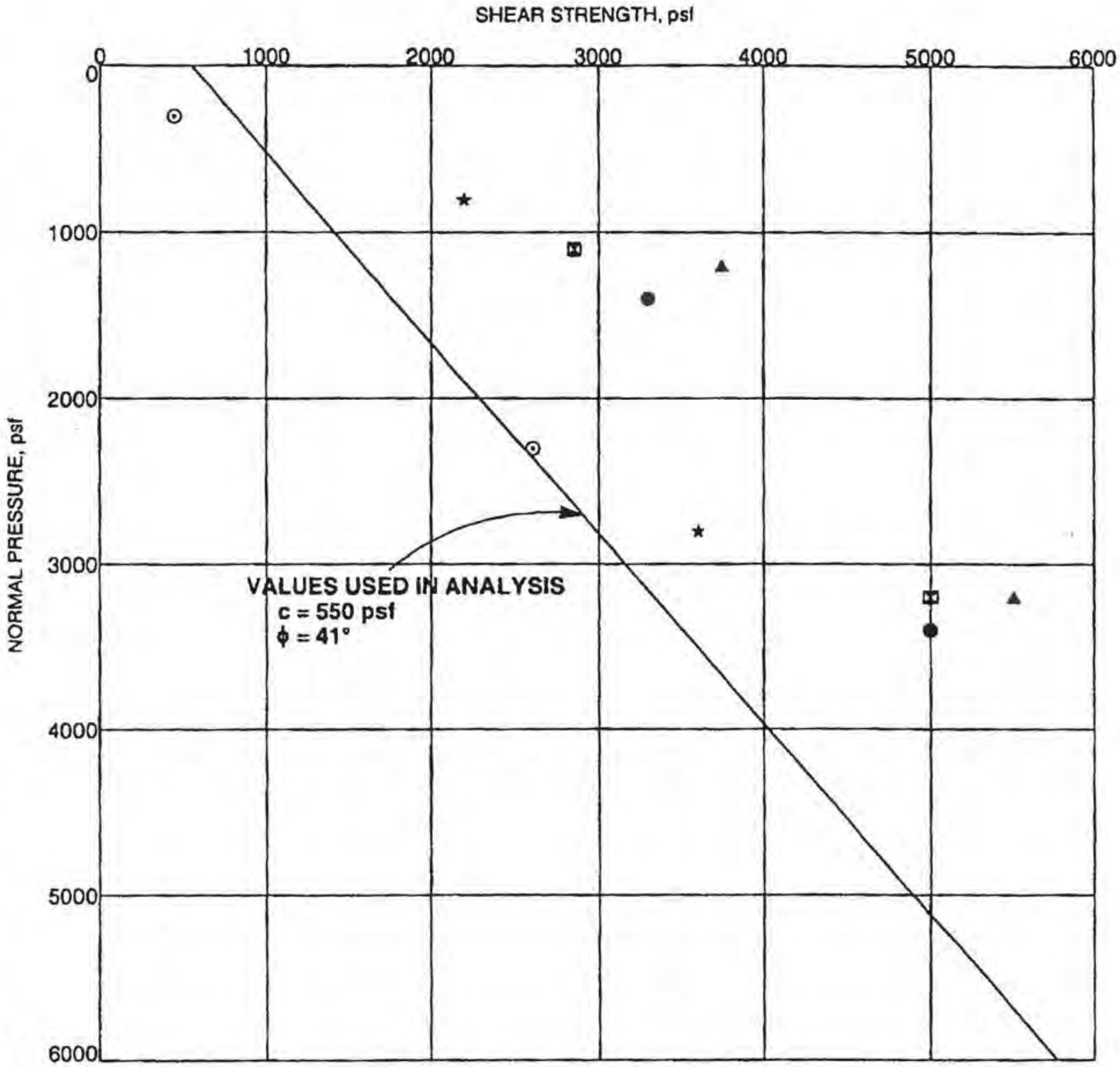
RAPHAEL CHENG
Geotechnical Engineer I

45237
(213) 482-0480

cc: Van Beveren & Butelo
WLA District Office

APPENDIX I

Van Beveren & Butelo, Inc., excerpts from report dated September 1, 2004



NOTE: "*" indicates sample was soaked to near saturation prior to testing.

	Specimen Identification	Classification	c	ϕ	
●	Boring 1 at 4½	SANDSTONE	2110	40	
⊠	Boring 2 at 3	SANDSTONE	1724	46	*
▲	Boring 2 at 13	SANDSTONE	2700	41	
★	Boring 3 at 7½	SANDSTONE	1640	35	
⊙	Boring 6 at 2½	SANDSTONE	128	47	*
✪	Boring 6 at 12½	SANDSTONE	180	36	*

DIRECT SHEAR TEST DATA

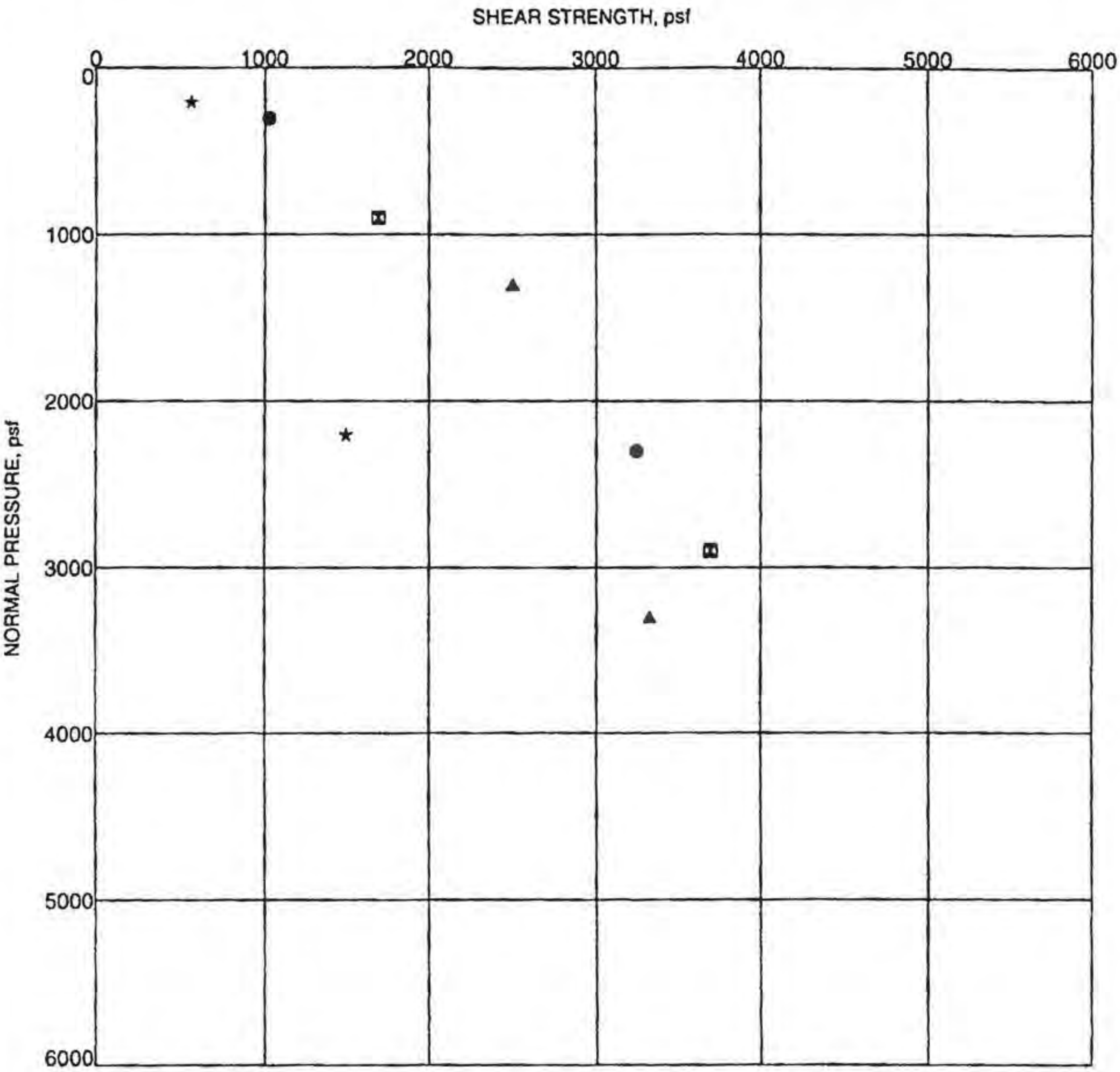
BEDROCK (PEAK STRENGTH, CROSS BEDDING)

VAN BEVEREN & BUTELO, INC.

DIRECT_SHEAR_6 SWT-3.GPJ VB_B.GDT 7/1/03

1010420200516779

FIGURE A-4.1



NOTE: "*" indicates sample was soaked to near saturation prior to testing.

	Specimen Identification	Classification	c	φ	
●	Boring 4 at 3	FILL - SILTY SAND AND SANDY SILT	735	45	*
⊠	Boring 4 at 9	FILL - SILTY SAND AND SANDY SILT	800	45	
▲	Boring 4 at 13	FILL -SILTY SAND AND SANDY SILT	2045	19	
★	Boring 5 at 2½	FILL - SILTY SAND AND SANDY SILT	466	25	*

DIRECT SHEAR TEST DATA

FILL (PEAK STRENGTH, UNDISTURBED SAMPLES)

DIRECT_SHEAR_8 SWT-3.GPJ VB_B.GDT 7/1/03

VAN BEVEREN & BUTELO, INC.

FIGURE A-4.2

JOB 02-040 DATE 10-07-03 D SM / VL CHKD. F.A.

PIT 1

Date Logged: 7-26-02

Logged By: SM

Equipment Used: Hand Labor

Elevation: 1332 feet MSL

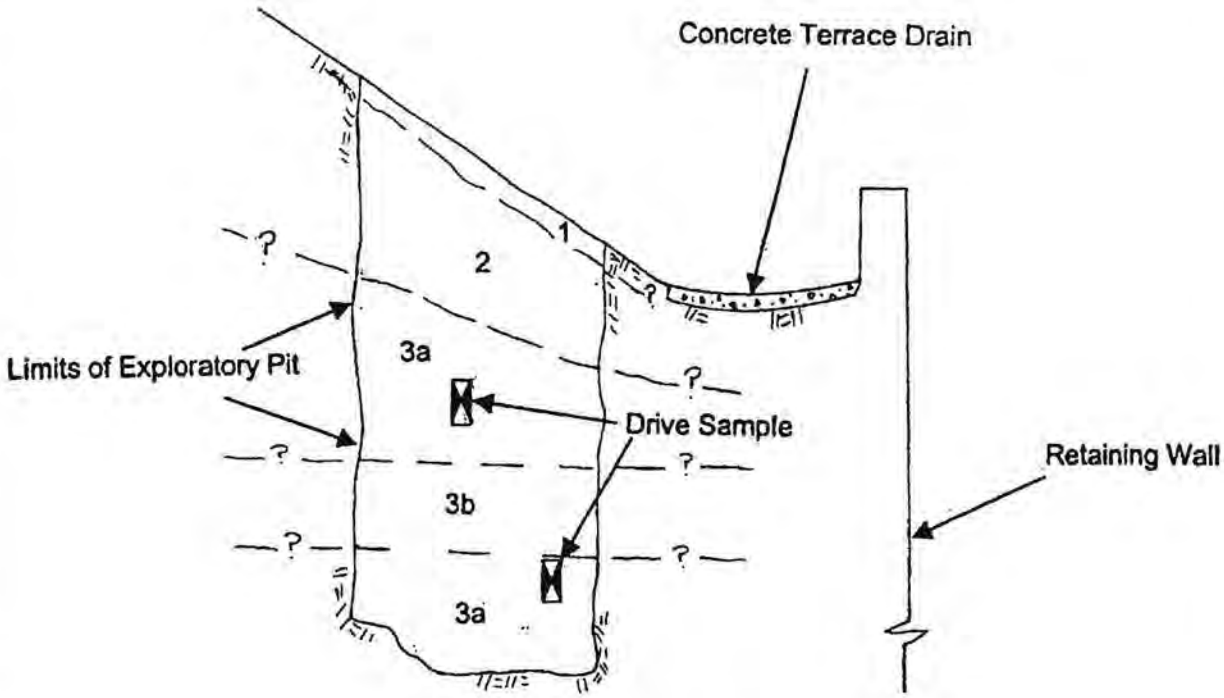
Materials Encountered:

1) Landscape layer

2) Fill - Sand (SP) and Silty Sand (SM) - fine to medium, abundant sandstone and siltstone fragments, abundant rootlets, some construction debris, light brown to yellowish brown

3a) Modelo Formation - Sandstone - fine grained, massive, slightly weathered, some iron oxide staining , light yellowish brown

3b) Modelo Formation - Interbedded Siltstone and Sandstone - thinly bedded, slightly fractured, some charcoal, gray (Siltstone) and light yellowish brown (Sandstone)



VIEW SOUTH

Scale: 1" = 2'

VAN BEVEREN & BUTELO, INC.

PIT 2

Date Logged: 7-26-02

Logged By: SM

Equipment Used: Hand Labor

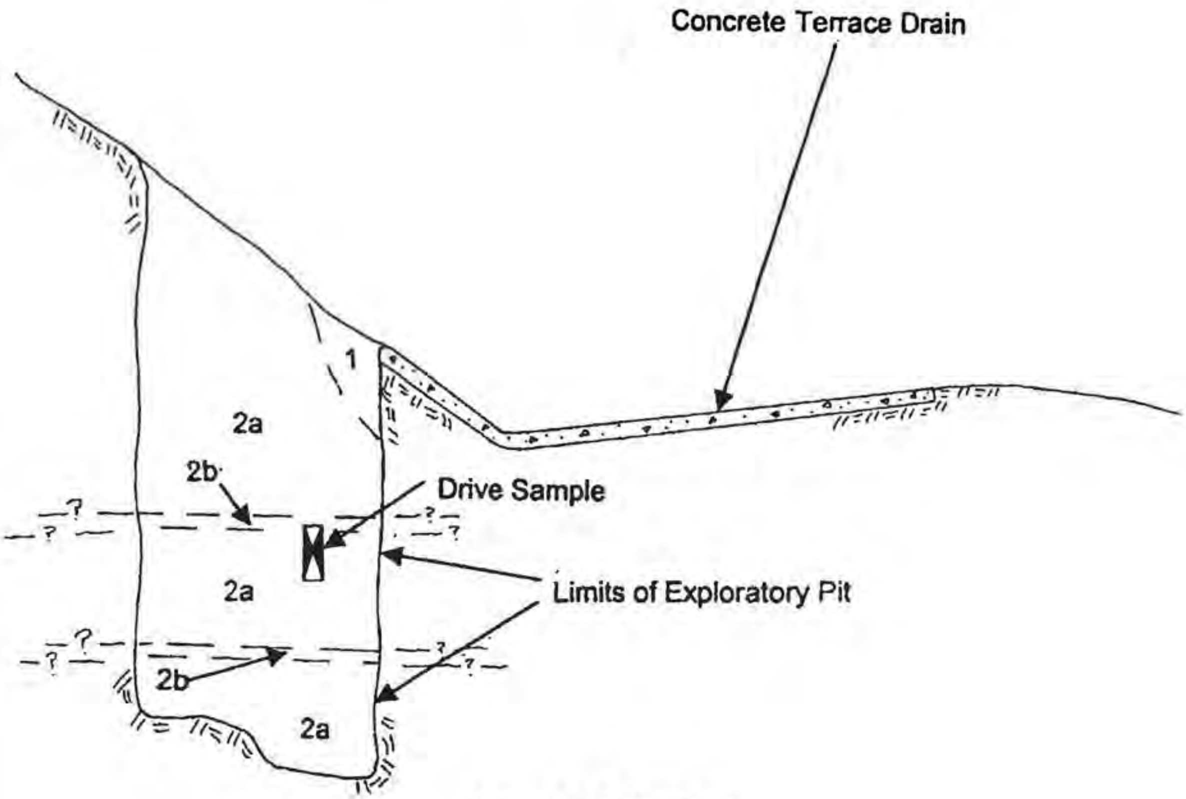
Elevation: 1326 feet MSL

Materials Encountered:

1) Fill - Silty Sand (SM) - fine to medium, abundant sandstone fragments, abundant rootlets, light yellowish brown

2a) Modelo Formation - Sandstone - fine grained, massive, slightly weathered, light yellowish brown

2b) Modelo Formation - Interbedded Siltstone and Sandstone - thinly bedded, slightly fractured, gray (Siltstone) and light yellowish brown (Sandstone)



VIEW SOUTH

Scale: 1" = 2'

VAN BEVEREN & BUTELO, INC.

JOB 02-040 DATE 10-7-03 D. SM / VL CHKD. FA

BORING 1

Drilled Date(s): August 3, 2002

Equipment Used: Bucket Rig (24-inch-dia. auger)

Depth to Water: 24½ feet

Driving Weight and Drop: 3,615 lbs. / 12 inches

SURFACE ELEVATION: 1312 feet MSL

ELEVATION (feet)	DEPTH (feet)	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	N VALUE (SPT)	BLOW COUNT (blows/foot)	SAMPLE LOCATION	Description
							6" Asphalt Concrete, 4" Base Course
1310		12.1	120		7	⊠	FILL SM - SILTY SAND - fine, some asphalt debris, yellowish brown
							MODELO FORMATION SANDSTONE - cemented, some iron oxide stains, yellowish brown
	5	12.4	104		5	⊠	
1305							reddish brown
	10	12.6	109		8	⊠	
1300							layer of clay - abundant charcoal
	15	19.3	110		8	⊠	
1295							layer of black shale - bedded, dark gray to black
	20	16.0	113		9	⊠	
1290							light and dark gray
	25	20.7	105		--	⊠	END OF BORING AT 25 FEET.
1285							
	30						
1280							
	35						
1275							
	40						

Notes:

1) Fill to 2 feet.

2) Groundwater measured at a depth of 24½ feet, 10 minutes after completion of drilling.

3) Boring backfilled with soil cuttings, tamped, and patched with asphalt.

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

Job No: 02-040.3 By: FA Date: 4-10-2003 Checked: Printed: 8-15-03 [LOG OF BORING DRIVE WT; SWT-3.GPJ]

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

FIGURE A-1.1

1010420200516779

BORING 2

Drilled Date(s): August 3, 2002
Equipment Used: Bucket Rig (24-inch-dia. auger)
Depth to Water: Not Encountered
Driving Weight and Drop: 3,615 lbs. / 12 inches

SURFACE ELEVATION: 1313 feet MSL

ELEVATION (feet)	DEPTH (feet)	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	N VALUE (SPT)	BLOW COUNT (blows/foot)	SAMPLE LOCATION	Description
		--	--		5	⊠	**FILL** SM - SILTY SAND - fine, grayish brown
1310		18.9	102		11	⊠	**MODELO FORMATION** SANDSTONE - cemented, massive with some siltstone interbeds (up to 2 inches thick), some iron oxide stains, yellowish brown
	5						thin silty interbeds (up to 2 inches thick)
1305		11.9	104		9	⊠	
	10						
1300		18.2	107		9	⊠	charcoal fragment
	15						
1295		14.0	110		12	⊠	
	20						SILTSTONE - grayish brown
1290		12.5	112		11	⊠	
	25						**END OF BORING AT 24 FEET.**
1285	30						
1280	35						
1275	40						

Notes:

1) Fill to 1½ feet.
2) Groundwater not encountered.
3) Boring backfilled with soil cuttings and tamped.

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

Job No: 02-040.3 By: FA Date: 4-10-2003 Checked: JK Printed: 8-15-03 [LOG OF BORING DRIVE WT; SWT-3.GPJ]

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

FIGURE A-1.2

BORING 3

Drilled Date(s): August 3, 2002

Equipment Used: Bucket Rig (24-inch-dia. auger)

Depth to Water: Not Encountered

Driving Weight and Drop: 3,615 lbs. / 12 inches

SURFACE ELEVATION: 1317 feet MSL

ELEVATION (feet)	DEPTH (feet)	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	N VALUE (SPT)	BLOW COUNT (blows/foot)	SAMPLE LOCATION	DESCRIPTION
							4" Asphalt Concrete, 6" Base Course
		15.0	108		14	⧓	**FILL** SM - SILTY SAND - fine, yellowish brown
1315							**MODELO FORMATION** SANDSTONE - fine grained, cemented, massive with some siltstone interbeds, some iron oxide stains, yellowish brown
	5						
1310		10.5	109		7	⧓	
	10						
1305		14.7	113		10	⧓	
	15						
1300		12.5	111		10	⧓	
	20						
1295		11.7	109		8	⧓	
							Bedding: N81W, 28N
	25						
1290		16.5	109		9	⧓	grayish brown
							END OF BORING AT 28 FEET.
	30						
1285							
	35						
1280							
	40						

Notes:

1) Fill to 2 feet.

2) Groundwater not encountered.

3) Boring backfilled with soil cuttings, tamped, and patched with asphalt.

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

Job No: 02-040.3 By: FA Date: 4-10-2003 Checked: [signature] Printed: 8-15-03 [LOG OF BORING DRIVE WT; SWT-3.GPJ]

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

FIGURE A-1.3

BORING 4

Drilled Date(s): August 3, 2002

Equipment Used: Hollow-Stem Auger (8-inch-dia.)

Depth to Water: Not Encountered

Driving Weight and Drop: 140 lbs. / 30 inches

SURFACE ELEVATION: 1314 feet MSL

ELEVATION (feet)	DEPTH (feet)	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	N VALUE (SPT)	BLOW COUNT (blows/foot)	SAMPLE LOCATION
		22.0	101		66	⧗
1310	5	12.3	107		77	⧗
		17.3	109		60	⧗
1305		18.4	102		60	⧗
	10	17.9	105		65	⧗
		19.0	104		45	⧗
1300	15	18.7	108		52	⧗
		17.4	104		45	⧗
1295		19.6	101		40	⧗
	20	15.5	113		116	⧗
1290		19.8	106		75	⧗
	25	15.6	103		82	⧗
		--	--		60	⊠
1285	30					
1280	35					
1275	40					

6" Sand - fine, light yellowish brown (Sandbox)

FILL

SM/ML - SILTY SAND and SANDY SILT - sand is fine, few sandstone and siltstone fragments, mottled grayish brown and brown

MODELO FORMATION

SANDSTONE - fine, cemented, thinly bedded, some iron oxide stains, grayish brown

(No Sample Recovery)

END OF BORING AT 27¼ FEET.

Notes:

1) Fill to 25½ feet.

2) Groundwater not encountered. Sample wet at 15 feet.

3) Boring backfilled with soil cuttings and tamped.

Job No: 02-040.3 By: FA Date: 4-10-2003 Checked: [signature] Printed: 8-15-03 [LOG OF BORING DRIVE WT; SWT-3.GPJ]

The log of subsurface conditions shown hereon applies only at the specific boring location and at the date indicated. It is not warranted to be representative of subsurface conditions at other locations and times.

LOG OF BORING

VAN BEVEREN & BUTELO, INC.

FIGURE A-1.4

APPENDIX II

Log of Borings, Calculations, and Figures

BYER GEOTECHNICAL, INC.

1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

LOG OF BORING B1

BG No. 21339

CLIENT The Mirman School **REPORT DATE** 7/31/14 **DRILL DATE** 5/28/14

PROJECT LOCATION 16100 Mulholland Drive, Los Angeles, California **LOGGED BY** JHP

CONTRACTOR 2R Drilling **DRILLING METHOD** Hollow-Stem Auger **HOLE SIZE** 8-inch diameter

DRIVE WEIGHT 140-Pound Automatic Hammer **HAMMER DROP** 30 Inches **ELEV. TOP OF HOLE**

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	0	Surface: 3 inches of asphalt over 3 inches of base (parking lot)								
		(SM) **ARTIFICIAL FILL (Afu):** 0.25'-2.5': Silty SAND with gravel, olive-brown, moist, fine sand, some coarse sand, fine gravel up to 2 inches sub-rounded.		SM						
		At 2': BEDROCK (Tmss): 2.5': Sandstone, reddish-brown, moist, dense, fine-grained, highly weathered.			S1	14 20 20	20.4			
	5	5': Sandstone, brown, moist, dense, fine-grained, moderately weathered.			S2	12 18 23	9.3			
		7.5': Sandstone, brown, moist, very dense, fine-grained.			S3	15 32 50/5"	17.4			
	10	10': Sandstone, brown, moist, very dense, fine-grained.			S4	18 26 42	11.2			

End at 11.5 Feet; No Groundwater; Fill to 2.5 Feet.

Standard Penetration Test

BYER GEOTECHNICAL, INC.

1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

LOG OF BORING B2

BG No. 21339

CLIENT The Mirman School **REPORT DATE** 7/31/14 **DRILL DATE** 1/28/14

PROJECT LOCATION 16100 Mulholland Drive, Los Angeles, California **LOGGED BY** JHP

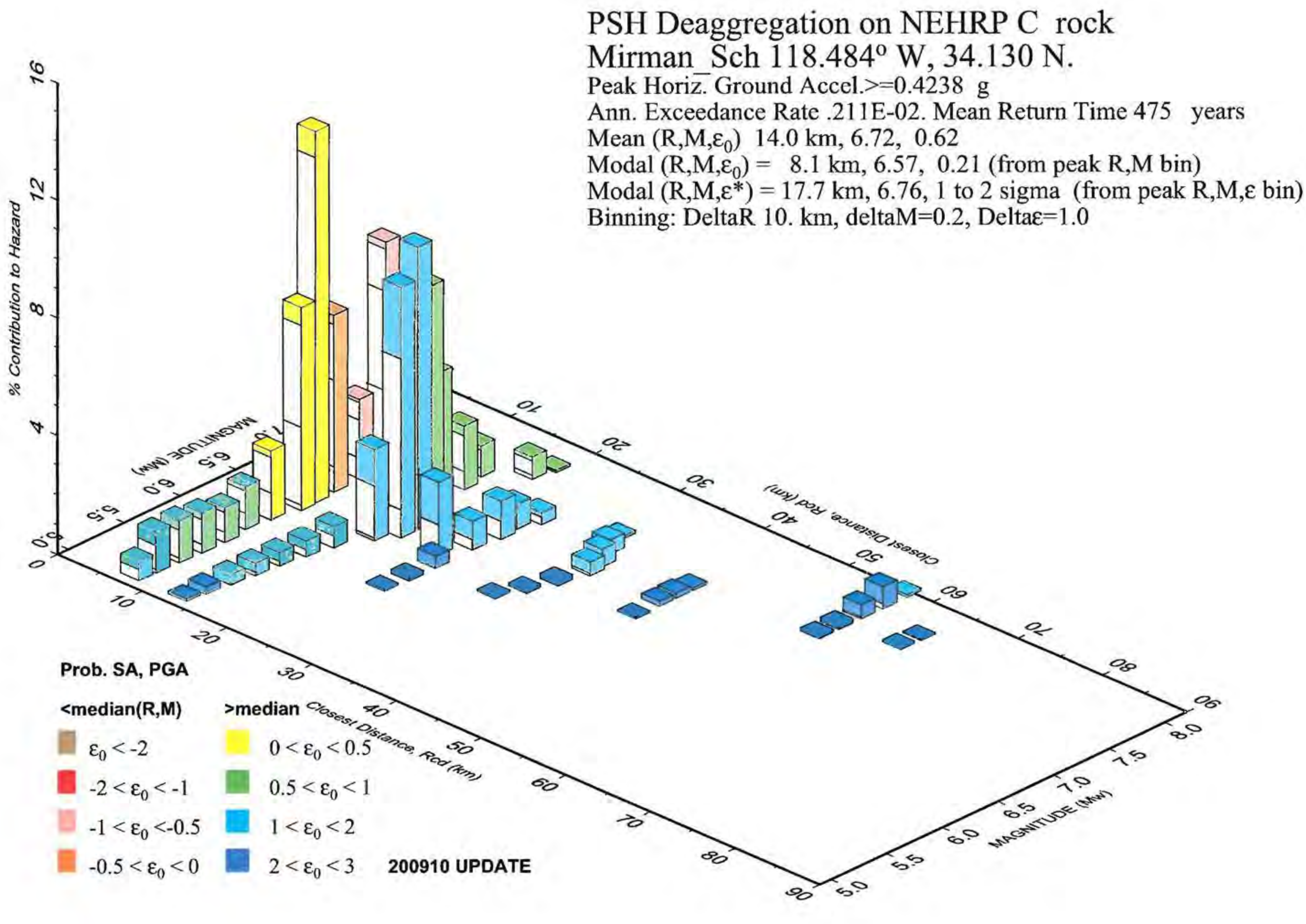
CONTRACTOR 2R Drilling **DRILLING METHOD** Hollow-Stem Auger **HOLE SIZE** 8-inch diameter

DRIVE WEIGHT 140-Pound Automatic Hammer **HAMMER DROP** 30 Inches **ELEV. TOP OF HOLE**

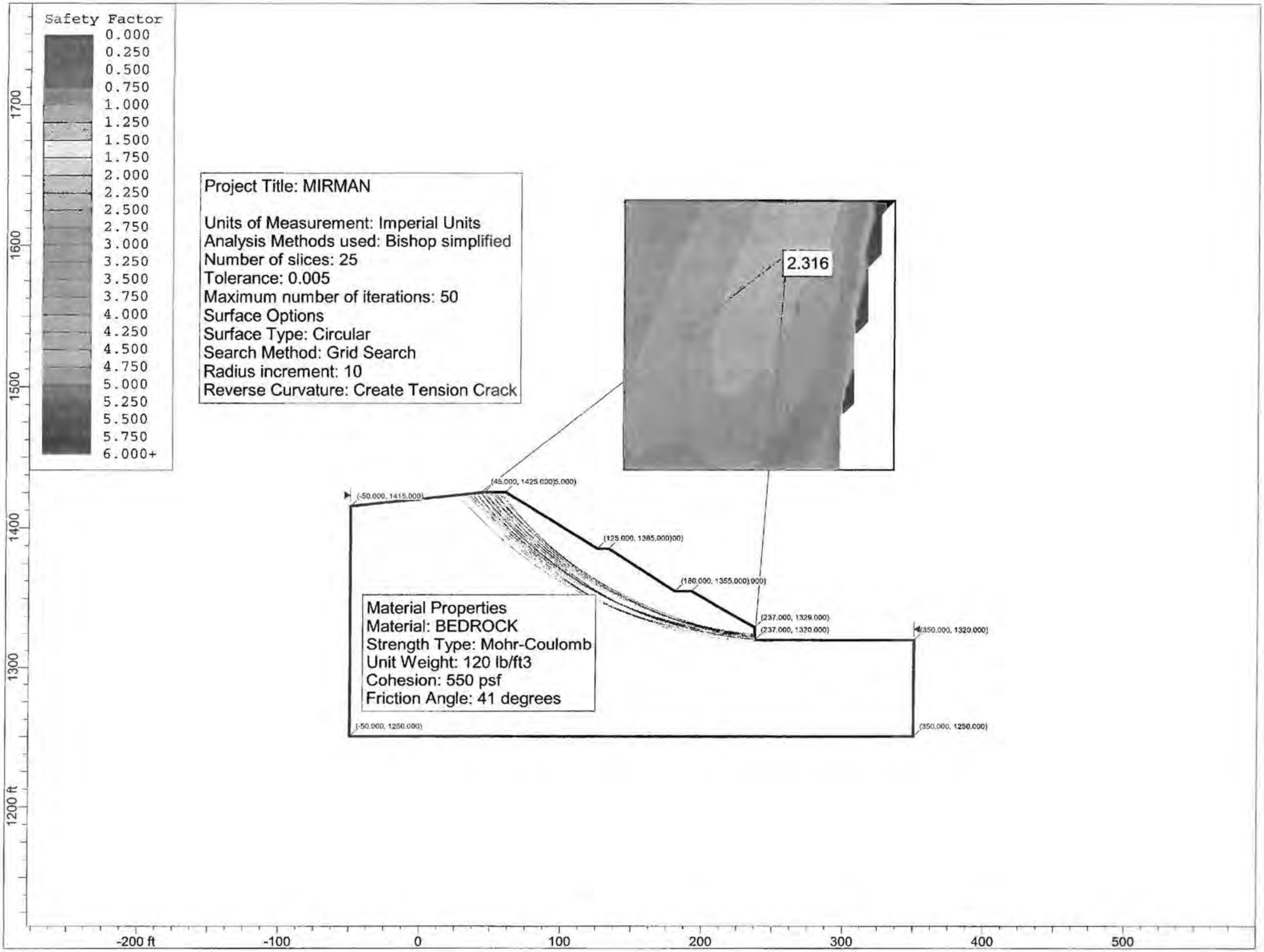
ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	0	(SM) Surface: Soil (planter area) **ARTIFICIAL FILL (Afu):** 0-2.5': Silty SAND with gravel, olive-brown, moist, fine sand, fine gravel up to 1/2 inch sub-rounded.		SM						
		BEDROCK (Tmss): 2.5': Sandstone, reddish-brown, moist, very loose, fine sand, trace medium sand, fine-grained, highly weathered.			S1	1 1 1	16.6			
	5	5': Sandstone, olive-brown, moist, dense, fine sand, fine-grained, moderately weathered.			S2	6 18 20	20.3			

End at 6.5 Feet; No Groundwater; Fill to 2.5 Feet.

Standard Penetration Test



GMT 2014 Jul 30 15:51:03 Distance (R), magnitude (M), epsilon (E0,E) deaggregation for a site on rock with average vs= 660. m/s top 30 m. USGS CGHT PSHA2008 UPDATE Bins with lt 0.05% contrib. omitted



Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+
Project Title: MIRMAN
Units of Measurement: Imperial Units
Analysis Methods used: Bishop simplified
Number of slices: 25
Tolerance: 0.005
Maximum number of iterations: 50
Surface Options
Surface Type: Circular
Search Method: Grid Search
Radius increment: 10
Reverse Curvature: Create Tension Crack
2.316
(-50.000, 1415.000)
(45.000, 1425.000)5.000)
(125.000, 1385.000)00)
(180.000, 1355.000)000)
(237.000, 1329.000)
(237.000, 1320.000)
(350.000, 1320.000)
Material Properties
Material: BEDROCK
Strength Type: Mohr-Coulomb
Unit Weight: 120 lb/ft3
Cohesion: 550 psf
Friction Angle: 41 degrees
(-50.000, 1250.000)
(350.000, 1250.000)
1700
1600
1500
1400
1300
1200 ft
-200 ft
-100
0
100
200
300
400
500

Slide Analysis Information

Document Name

File Name: MIRMAN

Project Settings

Project Title: MIRMAN
BG 21339
Failure Direction: Left to Right
Units of Measurement: Imperial Units
Pore Fluid Unit Weight: 62.4 lb/ft3
Groundwater Method: Water Surfaces
Data Output: Standard
Calculate Excess Pore Pressure: Off
Allow Ru with Water Surfaces or Grids: Off
Random Numbers: Pseudo-random Seed
Random Number Seed: 10116
Random Number Generation Method: Park and Miller v.3

Analysis Methods

Analysis Methods used:
Bishop simplified

Number of slices: 25
Tolerance: 0.005
Maximum number of iterations: 50

Surface Options

Surface Type: Circular
Search Method: Grid Search
Radius increment: 10
Composite Surfaces: Disabled
Reverse Curvature: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

Material: BEDROCK
Strength Type: Mohr-Coulomb
Unit Weight: 120 lb/ft3
Cohesion: 550 psf
Friction Angle: 41 degrees
Water Surface: None

Global Minimums

Method: bishop simplified
FS: 2.316230
Center: 258.507, 1594.268
Radius: 274.692
Left Slip Surface Endpoint: 42.381, 1424.724
Right Slip Surface Endpoint: 237.000, 1320.420
Left Slope Intercept: 42.381 1424.724
Right Slope Intercept: 237.000 1329.000
Resisting Moment=1.62264e+008 lb-ft
Driving Moment=7.00553e+007 lb-ft

Valid / Invalid Surfaces

Method: bishop simplified
Number of Valid Surfaces: 4217
Number of Invalid Surfaces: 634
Error Codes:
Error Code -103 reported for 14 surfaces
Error Code -106 reported for 1 surface
Error Code -108 reported for 619 surfaces

Error Codes

The following errors were encountered during the computation:

-103 = Two surface / slope intersections, but one or more surface / nonslope external polygon intersections lie between them. This usually occurs when the slip surface extends past the bottom of the soil region, but may also occur on a benched slope model with two sets of Slope Limits.

-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

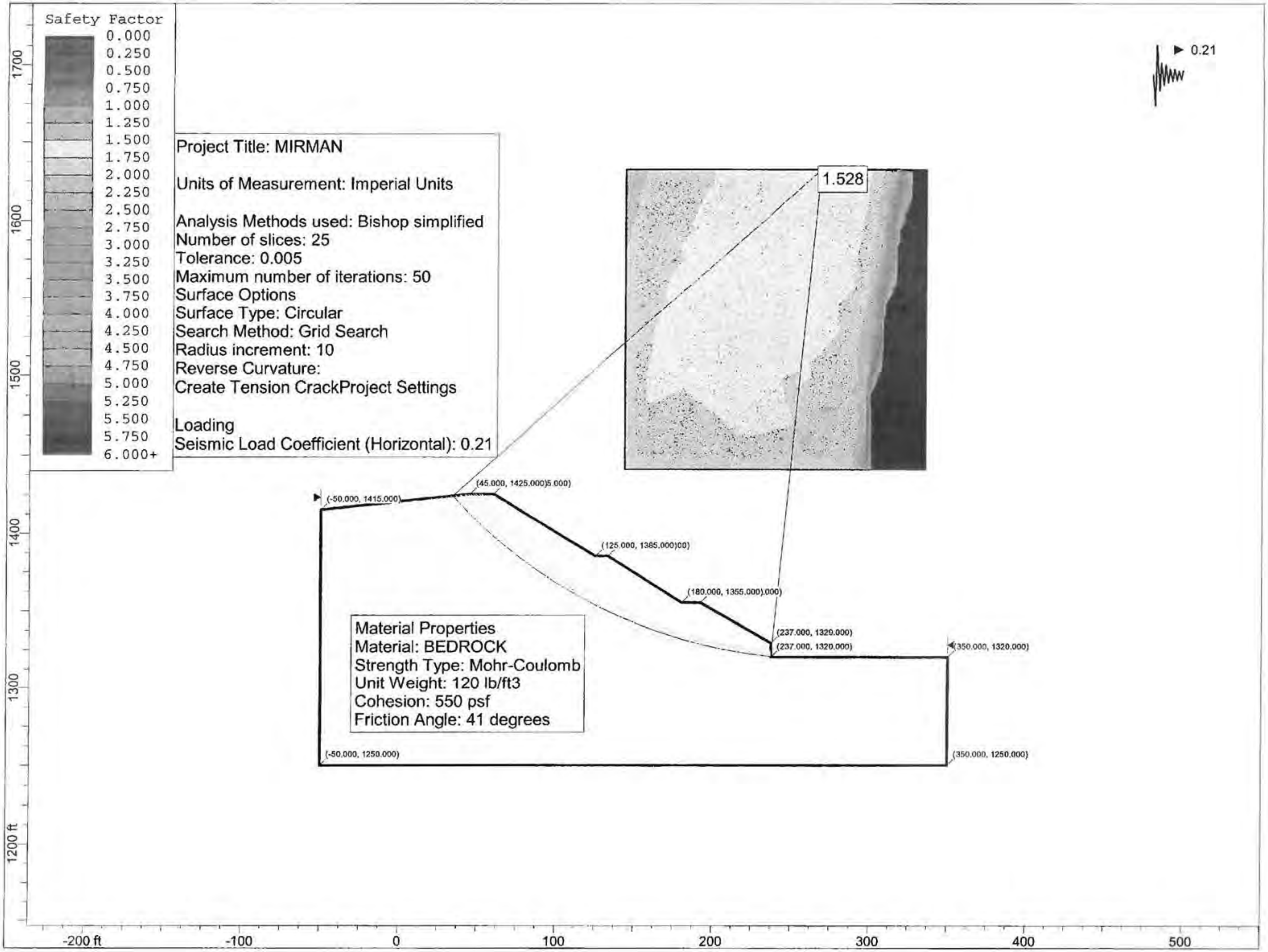
List of All Coordinates

Search Grid

143.373	1440.756
335.264	1440.756
335.264	1632.647
143.373	1632.647

External Boundary

-50.000	1250.000
350.000	1250.000
350.000	1320.000
237.000	1320.000
237.000	1329.000
192.000	1355.000
180.000	1355.000
133.000	1385.000
125.000	1385.000
60.000	1425.000
45.000	1425.000
-50.000	1415.000



Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+
Project Title: MIRMAN
Units of Measurement: Imperial Units
Analysis Methods used: Bishop simplified
Number of slices: 25
Tolerance: 0.005
Maximum number of iterations: 50
Surface Options
Surface Type: Circular
Search Method: Grid Search
Radius increment: 10
Reverse Curvature:
Create Tension CrackProject Settings
Loading
Seismic Load Coefficient (Horizontal): 0.21
0.21
1.528
(-50.000, 1415.000)
(45.000, 1425.000)5.000)
(125.000, 1385.000)00)
(180.000, 1355.000).000)
(237.000, 1320.000)
(237.000, 1320.000)
(350.000, 1320.000)
Material Properties
Material: BEDROCK
Strength Type: Mohr-Coulomb
Unit Weight: 120 lb/ft3
Cohesion: 550 psf
Friction Angle: 41 degrees
(-50.000, 1250.000)
(350.000, 1250.000)
1700
1600
1500
1400
1300
1200 ft
-200 ft
-100
0
100
200
300
400
500

Slide Analysis Information

Document Name

File Name: MIRMANSEISMIC

Project Settings

Project Title: MIRMAN
BG 21339
Failure Direction: Left to Right
Units of Measurement: Imperial Units
Pore Fluid Unit Weight: 62.4 lb/ft3
Groundwater Method: Water Surfaces
Data Output: Standard
Calculate Excess Pore Pressure: Off
Allow Ru with Water Surfaces or Grids: Off
Random Numbers: Pseudo-random Seed
Random Number Seed: 10116
Random Number Generation Method: Park and Miller v.3

Analysis Methods

Analysis Methods used:
Bishop simplified

Number of slices: 25
Tolerance: 0.005
Maximum number of iterations: 50

Surface Options

Surface Type: Circular
Search Method: Grid Search
Radius increment: 10
Composite Surfaces: Disabled
Reverse Curvature: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Loading

Seismic Load Coefficient (Horizontal): 0.21

Material Properties

Material: BEDROCK
Strength Type: Mohr-Coulomb
Unit Weight: 120 lb/ft3
Cohesion: 550 psf
Friction Angle: 41 degrees
Water Surface: None

Global Minimums

Method: bishop simplified
FS: 1.527570
Center: 268.102, 1632.647
Radius: 313.744
Left Slip Surface Endpoint: 33.937, 1423.835
Right Slip Surface Endpoint: 237.000, 1320.448
Left Slope Intercept: 33.937 1423.835
Right Slope Intercept: 237.000 1329.000
Resisting Moment=1.82456e+008 lb-ft
Driving Moment=1.19442e+008 lb-ft

Valid / Invalid Surfaces

Method: bishop simplified
Number of Valid Surfaces: 4836
Number of Invalid Surfaces: 15
Error Codes:
Error Code -103 reported for 14 surfaces
Error Code -106 reported for 1 surface

Error Codes

The following errors were encountered during the computation:

-103 = Two surface / slope intersections, but one or more surface / nonslope external polygon intersections lie between them. This usually occurs when the slip surface extends past the bottom of the soil region, but may also occur on a benched slope model with two sets of Slope Limits.

-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.

List of All Coordinates

Search Grid

143.373	1440.756
335.264	1440.756
335.264	1632.647
143.373	1632.647

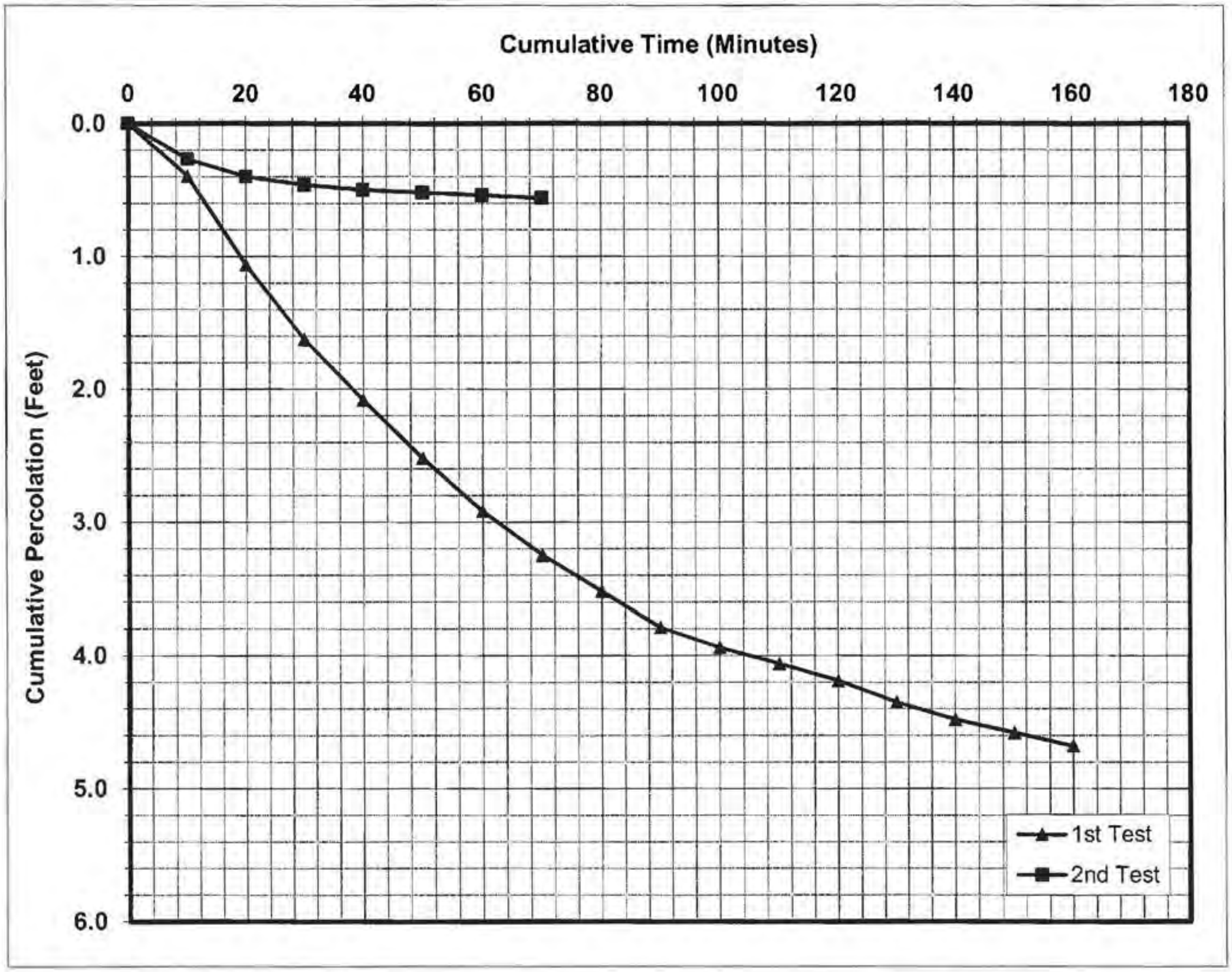
External Boundary

-50.000	1250.000
350.000	1250.000
350.000	1320.000
237.000	1320.000
237.000	1329.000
192.000	1355.000
180.000	1355.000
133.000	1385.000
125.000	1385.000
60.000	1425.000
45.000	1425.000
-50.000	1415.000

BYER
GEOTECHNICAL,
INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

PERCOLATION CHART

BG: **21339** ENGINEER: **JHP/RSB**
CLIENT: **THE MIRMAN SCHOOL**
REPORT DATE:



Percolation Calculations:

Initial Time (min.):	80.0	Ave. Initial Drop (ft):	3.52
Final Time (min.):	160.0	Ave. Final Drop (ft):	4.68
Elapsed Time (min.):	80.0	Change in Drop (ft):	1.16
		Boring Diameter (in.):	8.00
		Initial Depth of Water (ft):	9.00

Boring No.:	B1*
Date Drilled:	5/28/14
Date Tested:	5/28/14
Tested by:	JHP/RSB
Depth:	9.0 ft

Preadjusted Percolation Rate =	10.4	in./hr
Reduction Factor (Rf) =	26.3	
Infiltration Rate =	**0.40**	**in/hr**

This rate represents the upper nine feet of earth materials.

Reference: Administrative Manual, County of Los Angeles, Department of Public Works, Geotechnical and Materials Engineering Division, Publication GS200.1, Dated June 1, 2011.

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Table 1a - Percolation Test Results

Report Date:
Date Excavated: 5/28/2014
Date Tested: 5/28/2014
Tested by: JHP/RSB

BG No.: 21339
Client: THE MIRMAN SCHOOL
Project Name: PROPOSED SCHOOL BUILDING AND ATHLETIC FIELD

General Information:

Test Name	Date of Presoak	Time of Presoak	Top of Boring Depth (ft)	Perc Hole Depth (ft)	Approximate Perc Hole Diam. (in.)	Pipe ID (in.)
B1*	5/28/14	11:50 AM	0	9	8	N/A

Soil Distribution

0 - 2 ft: Silty Sand (SM)
2 - 9 ft: Bedrock (Tmss)

Falling Head Percolation Test Data and Results Summary:

Test Number	Initial Time of Reading	Final Time of Reading	Elapsed Time (sec)	Cumulative Time (min)	Initial Depth to Water (ft)	Final Depth to Water (ft)	Change in Drop (ft)	Percent Increase in Drop (%)
	12:24:00	12:34:00	600	10.0	0.00	0.40	0.40	-
	12:34:00	12:44:00	600	20.0	0.40	1.06	0.67	168.99
	12:44:00	12:54:00	600	30.0	1.06	1.63	0.56	52.94
	12:54:00	13:04:00	600	40.0	1.63	2.08	0.46	28.00
	13:04:00	13:14:00	600	50.0	2.08	2.52	0.44	21.15
	13:14:00	13:24:00	600	60.0	2.52	2.92	0.40	15.87
	13:24:00	13:34:00	600	70.0	2.92	3.25	0.33	11.30
	13:34:00	13:44:00	600	80.0	3.25	3.52	0.54	16.62
	13:44:00	13:54:00	600	90.0	3.79	3.79	0.15	3.96
	13:54:00	14:04:00	600	100.0	3.94	3.94	0.12	3.05
	14:04:00	14:14:00	600	110.0	4.06	4.06	0.13	3.20
	14:14:00	14:24:00	600	120.0	4.19	4.19	0.16	3.82
	14:24:00	14:34:00	600	130.0	4.35	4.35	0.13	2.99
	14:34:00	14:44:00	600	140.0	4.48	4.48	0.10	2.23
	14:44:00	14:54:00	600	150.0	4.58	4.58	0.10	2.18
	14:54:00	15:04:00	600	160.0	4.68	4.68	-4.68	-100.00

* see Geologic Map for boring location.

BYER GEOTECHNICAL, INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
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Table 1a - Percolation Test Results

Report Date:
Date Excavated: 5/28/2014
Date Tested: 5/28/2014
Tested by: JHP/RSB

BG No.: 21339
Client: THE MIRMAN SCHOOL
Project Name: PROPOSED SCHOOL BUILDING AND ATHLETIC FIELD

General Information:

Test Name	Date of Presoak	Time of Presoak	Top of Boring Depth (ft)	Perc Hole Depth (ft)	Approximate Perc Hole Diam. (in.)	Pipe ID (in.)
B2*	5/28/14	1:58 PM	0	4.75	8	N/A

Soil Distribution
0 - 2.5 ft: Silty Sand (SM)
2.5 - 4.75 ft: Bedrock (Tmss)

Falling Head Percolation Test Data and Results Summary:

Test Number	Initial Time of Reading	Final Time of Reading	Elapsed Time (sec)	Cumulative Time (min)	Initial Depth to Water (ft)	Final Depth to Water (ft)	Change in Drop (ft)	Percent Increase in Drop (%)
	14:29:00	14:39:00	600	10.0	0.00	0.27	0.27	-
	14:39:00	14:49:00	600	20.0	0.27	0.40	0.13	48.15
	14:49:00	14:59:00	600	30.0	0.40	0.46	0.06	15.00
	14:59:00	15:09:00	600	40.0	0.46	0.50	0.04	8.70
	15:09:00	15:19:00	600	50.0	0.50	0.52	0.02	4.00
	15:19:00	15:29:00	600	60.0	0.52	0.54	0.02	3.85
	15:29:00	15:39:00	600	70.0	0.54	0.56	0.02	3.70

* see Geologic Map for boring location.

BYER GEOTECHNICAL INC.

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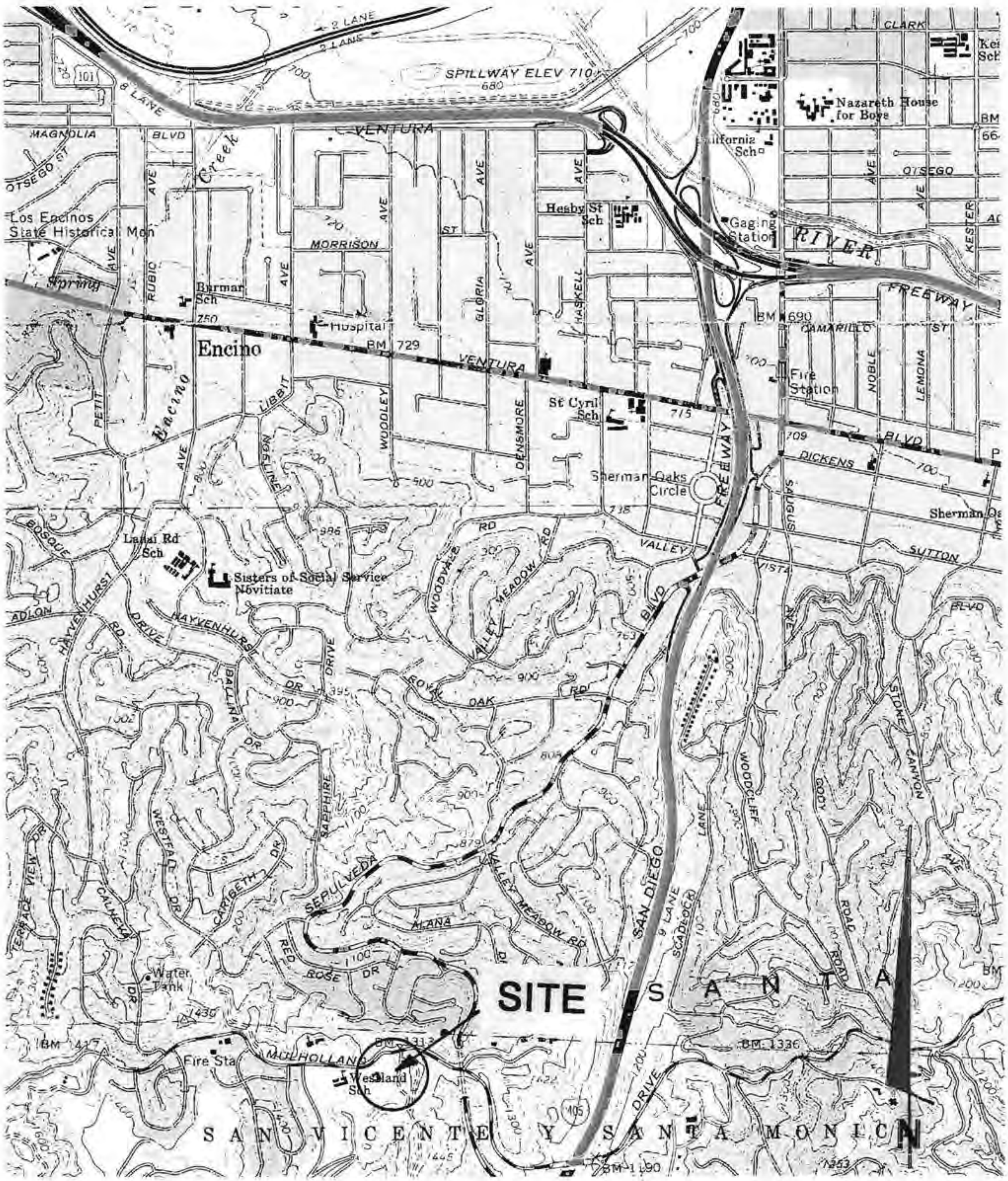
tel 818.549.9959 fax 818.543.3747

VICINITY MAP

CLIENT: MIRMAN SCHOOL

GEOLOGIST: JET BG: 21339 SCALE: 1" = 2000'

Reference: U.S.G.S. Topographic Map of the Beverly Hills 7½ Minute Quadrangle.



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REGIONAL GEOLOGIC MAP

CLIENT: MIRMAN SCHOOL

GEOLOGIST: JET BG: 21339 SCALE: 1" = 2000'

Reference: *Geologic Map of the Beverly Hills and Van Nuys (South ½) Quadrangles,* Dibblee, 1991.

BYER GEOTECHNICAL INC.

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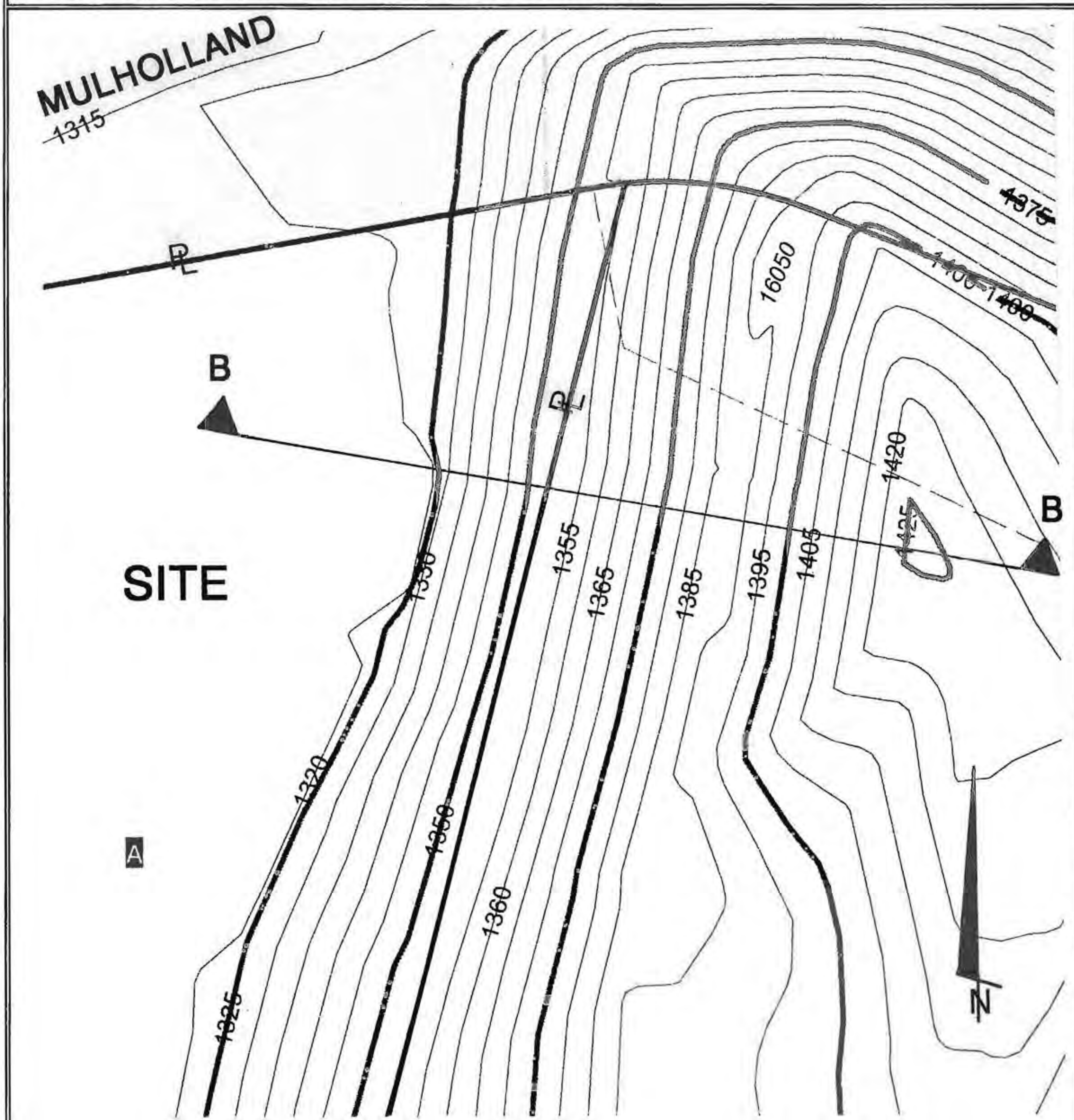
tel 818.549.9959 fax 818.543.3747

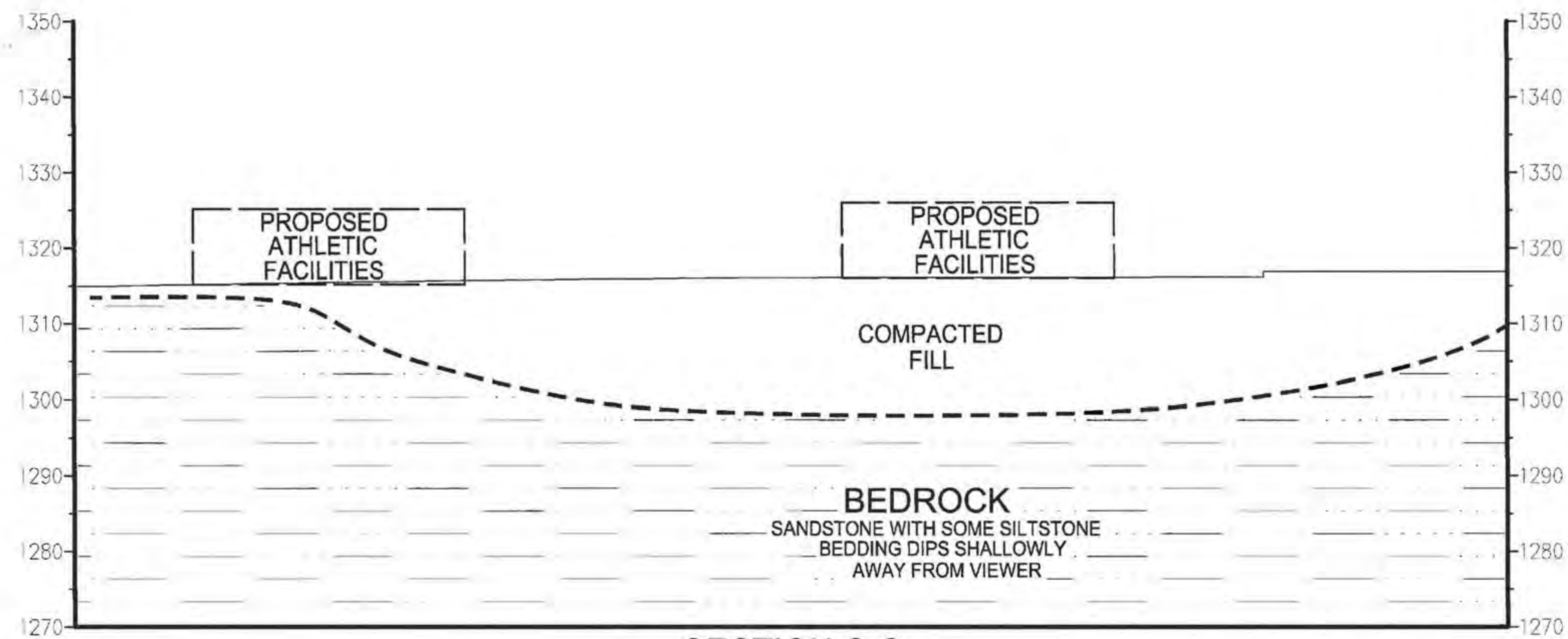
REGIONAL TOPOGRAPHIC MAP

CLIENT: MIRMAN SCHOOL

GEOLOGIST: JET BG: 21339 SCALE: 1" = 50'

Reference: *City of Los Angeles Navigate LA, December 2000 contour lines.*

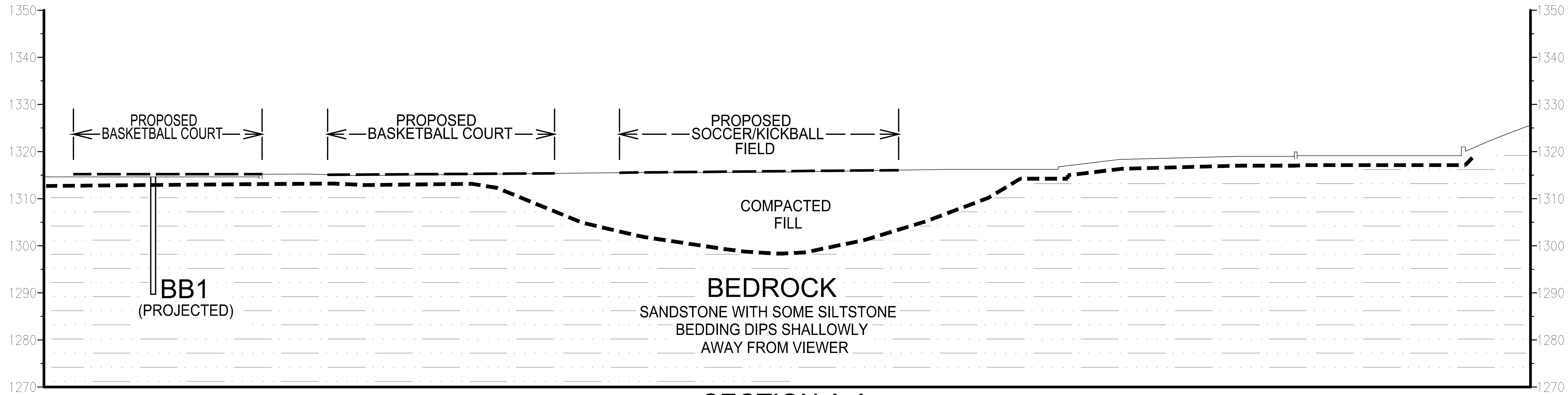




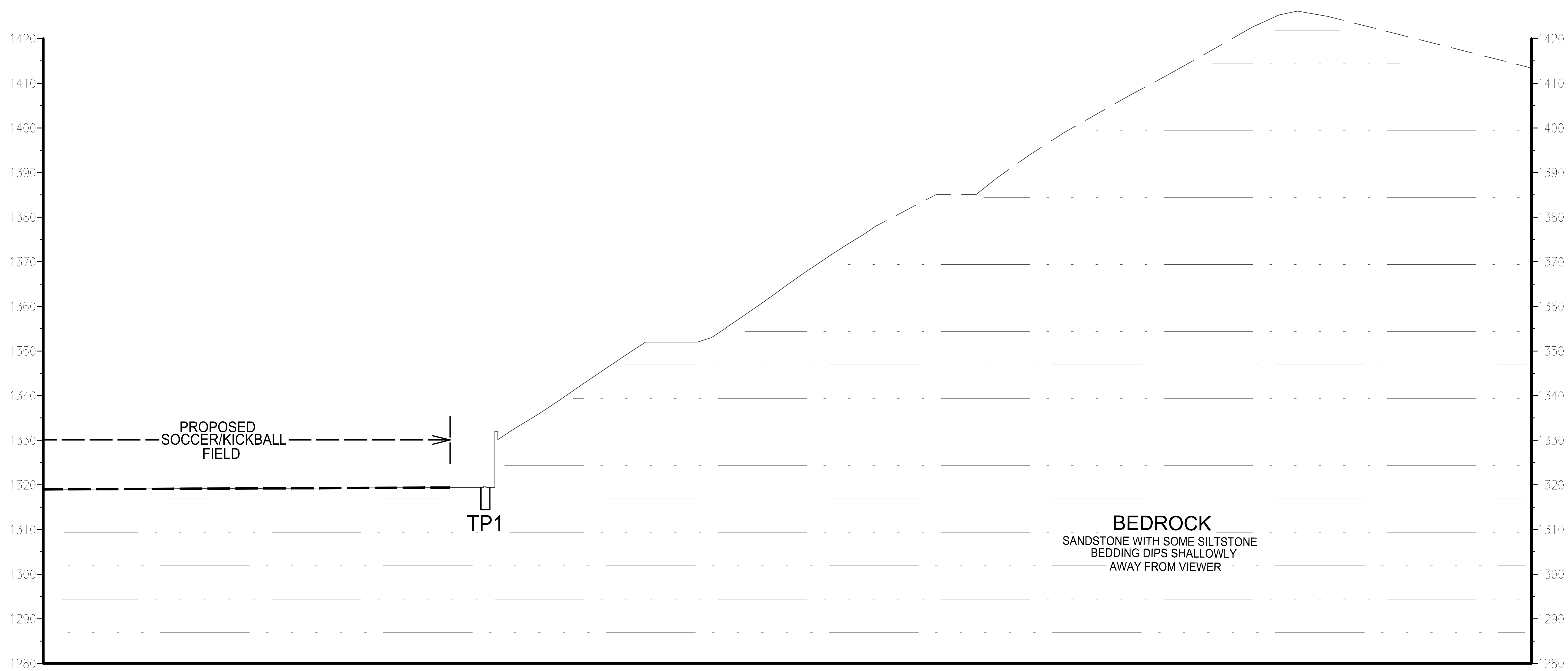
SECTION C-C

BYER GEOTECHNICAL INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

SECTION C	
BG: 21339 THE MIRMAN SCHOOL	
CONSULTANT: JET	SCALE: 1" = 20'



SECTION A-A



SECTION B-B

JULY 31, 2014

BYER GEOTECHNICAL INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

SECTIONS A & B

BG: 21339 THE MIRMAN SCHOOL

CONSULTANT: JET | SCALE: 1" = 20'

LEGEND
B2 LOCATION AND NUMBER OF HOLLOW-STEM AUGER BORING BY BYER GEOTECHNICAL (THIS STUDY)
TD=6.5' TOTAL DEPTH (FEET)
Afu 0 to 2.5' DEPTH OF FILL (FEET)
Tmss 2.5' to TD DEPTH OF BEDROCK (FEET)
No GW NO GROUNDWATER ENCOUNTERED
BB4 LOCATION AND NUMBER OF BUCKET-AUGER BORING BY VAN BEVEREN & BUTELO, REPORT DATE 9/1/04
25 ½' FILL DEPTH OF FILL NOTED
TP2 LOCATION AND NUMBER OF HAND DUG TEST PIT BY VAN BEVEREN & BUTELO, REPORT DATE 9/1/04
STRIKE AND DIP OF BEDDING
GEOLOGIC CONTACT
C C LINE OF CROSS SECTION
MULHOLLAND DRIVE
MULHOLLAND DRIVE
PROPOSED PLAYGROUND AREA
PROPOSED BASKETBALL COURT
PROPOSED BASKETBALL COURT
PROPOSED BASKETBALL COURT
PROPOSED PARKING
PROPOSED ATHLETIC FACILITIES
PROPOSED ATHLETIC FACILITIES
EXISTING BUILDING
EXISTING BUILDING
THIN FILL OVER BEDROCK
COMPACTED FILL
PROPOSED SOCCER/KICKBALL FIELD
PROPOSED PLAYGROUND AREA
BEDROCK
BB1 2' FILL
B2 TD=6.5' Afu 0 to 2.5' Tmss 2.5' to TD No GW
BB2 1 ½' FILL
B1 TD=11.5' Afu 0 to 2' Tmss 2' to TD No GW
BB3 2' FILL
BB4 25 ½' FILL
TP1
TP2
GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.
REFERENCE: TOPOGRAPHIC SURVEY PREPARED BY IACOBELLIS & ASSOCIATES, INC. DATED 08/21/2013.
JULY 31, 2014
BYER GEOTECHNICAL INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX
GEOLOGIC MAP
BG: 21339 THE MIRMAN SCHOOL
CONSULTANT: JET
SCALE: 1" = 20'

BYER GEOTECHNICAL, INC.

October 14, 2016
BG 21339

The Mirman School
16180 Mulholland Drive
Los Angeles, California 90049

Attention: Mr. David Royal

Subject

Transmittal of Addendum Geologic and Soils Engineering Exploration Update
Revised Foundation Recommendations
Proposed Physical Education Storage Building
Lot A, Parcel Map 4816
16100 Mulholland Drive
Los Angeles, California

Gentlepersons:

Byer Geotechnical has prepared this addendum geologic and soils engineering exploration update, dated October 14, 2016, to provide revised recommendations for design and construction of the foundation system of the proposed physical education storage building. The reviewing agency for this document is the City of Los Angeles, Department of Building and Safety (LADBS). The reviewing agency requires two unbound copies, one with a wet signature, a CD (PDF format), an application form, and a filing fee. Copies of the report have been distributed as follows:

(1) Addressee (E-mail and Mail)
(3) Johnson Favaro Architecture, Attention: Nick Martinez (E-mail and Mail)
(1) Nabih Youssef Structural Engineers, Attention: Daniel Ahkiam (E-mail)

It is our understanding that Johnson Favaro Architecture will file the report and CD with the LADBS. Please review the report carefully prior to submittal to the governmental agency. Questions concerning the report should be directed to the undersigned. Byer Geotechnical appreciates the opportunity to offer our consultation and advice on this project.

Very truly yours,
BYER GEOTECHNICAL, INC.

Raffi S. Babayan
Senior Project Engineer

BYER GEOTECHNICAL, INC.

October 14, 2016
BG 21339

The Mirman School
16180 Mulholland Drive
Los Angeles, California 90049

Attention: Mr. David Royal

Subject

Addendum Geologic and Soils Engineering Exploration Update
Revised Foundation Recommendations
Proposed Physical Education Storage Building
Lot A, Parcel Map 4816
16100 Mulholland Drive
Los Angeles, California

References: Reports by Byer Geotechnical, Inc.:

Geologic and Soils Engineering Update, Proposed Athletic Field, Parking, and School Building, Lot A, Parcel Map 4816, 16100 Mulholland Drive, Los Angeles, California, dated July 13, 2011;

Geologic and Soils Engineering Exploration Update, Proposed School Building and Athletic Field, Lot A, Parcel Map 4816, 16100 Mulholland Drive, Los Angeles, California, dated July 31, 2014;

Geologic and Soils Engineering Exploration Update, Proposed School Buildings and Athletic Field, Lot A, Parcel Map 4816, 16100 Mulholland Drive, Los Angeles, California, dated February 3, 2015;

Compaction Report, Retaining Wall Backfill and Proposed Athletic Field, Grading Permit # 15030 - 10000 - 01096, Parcel A, Parcel Map 4816, 16100 Mulholland Drive, Los Angeles, California, dated September 18, 2015;

Geologic and Soils Engineering Memorandum, Review of Low-Impact Development (LID) Plan, Proposed Physical Education and Office/Restroom Buildings and Basketball Courts, Lot A, Parcel Map 4816, 16100 Mulholland Drive, Los Angeles, California, dated August 1, 2016; and

Compaction Report, Retention Basin, Sports Courts, Playground Area, and Building Pad Backfills, Grading Permit # 16030 - 30000 - 02173, Parcel A, Parcel Map 4816, 16100 Mulholland Drive, Los Angeles, California, dated September 28, 2016.

Responses by the City of Los Angeles, Department of Building and Safety:

Geology and Soils Report Approval Letters, Log # 87193, dated March 3, 2015, and Log # 94214, dated August 5, 2016; and

Compaction Report Approval List for Non Structural Fill, Log # 90127, dated September 23, 2015.

Gentlepersons:

Byer Geotechnical has prepared this addendum geologic and soils engineering exploration update to provide revised recommendations for design and construction of the foundation system for the proposed physical education storage building. This report is based on our conversation with Mr. David Royal, Mr. Nick Martinez of Johnson Favaro Architecture (JFA), and Mr. Daniel Ahkiam of Nabih Youssef Structural Engineers. The Site Plan, Sheet A1.11, prepared by JFA, dated June 30, 2016, was considered during the preparation of this addendum report.

Recommendations for the use of conventional foundations bearing into future compacted fill to be placed over the existing 1992 certified compacted fill for the proposed physical education storage building were provided in the referenced report dated February 3, 2015. Based on a test pit excavated on October 3, 2016, within the footprint of the proposed building, the subject area is not underlain by certified compacted fill, but is underlain by about 10 feet of uncertified fill that is not suitable for support of a future compacted fill and conventional footings. Bedrock underlies the uncertified fill. In addition, a buried tank was encountered adjacent to the southwest corner of the footprint of the proposed physical education storage building, as shown on the enclosed Notice of Field Observation dated October 3, 2016. The project superintendent indicates the buried tank is expected to be 12 to 15 feet deep. Apparently, the 1992 certified fill was excavated in this area to install the tank. Removal and recompaction of the 10 to 15 feet of fill is not feasible. An existing structure is close by, which would be undermined. Therefore, as an alternative, it is recommended that the physical education storage building be founded on friction piles bearing in the bedrock.

FOUNDATION DESIGN

A deepened foundation system, consisting of cast-in-place concrete friction piles and grade beams, is recommended to support the proposed physical education storage building. Piles should be a minimum of 24 inches in diameter and a minimum of eight feet into the bedrock. Piles may be assumed fixed at three feet into the bedrock. The piles may be designed for a skin friction of 700 pounds-per-square-foot for that portion of pile in contact with the bedrock. All piles should be tied in two horizontal directions with grade beams. Piles spaced more than 3-pile diameters center-to-center may be considered isolated for axial capacity. The structural engineer may design piles that are deeper or larger in diameter depending on final loads.

Lateral Design

The friction value is for the total of dead and frequently applied live loads and may be increased by one-third for short duration loading, which includes the effects of wind or seismic forces. Resistance to lateral loading may be provided by passive earth pressure within the uncertified fill and bedrock.

Passive earth pressure may be computed as an equivalent fluid having a density of 100 pounds-per-cubic-foot for the uncertified fill and 400 pounds-per-cubic-foot for the bedrock. The maximum allowable earth pressure is 1,000 pounds-per-square-foot for the uncertified and 5,000 pounds-per-square-foot for the bedrock. For design of isolated piles, the allowable passive and maximum earth pressures may be increased by 100 percent. Piles spaced more than 8-pile diameters on center may be considered isolated for lateral capacity.

Foundation Settlement

Settlement of the pile foundation system is expected to occur on initial application of loading. A total static settlement of 0.25 to 0.50 inch may be anticipated. Differential static settlement should not exceed 0.25 inch across the footprint of the proposed building.

FLOOR SLAB

The floor slab of the proposed building should be structurally designed to bridge between the piles and grade beams. Slabs that will be provided with a floor covering should be protected by a polyethylene plastic vapor barrier. The barrier should be sandwiched between the layers of sand, about two inches each, to prevent punctures and aid in the concrete cure. A low-slump concrete may be used to minimize possible curling of the slab. The concrete should be allowed to cure properly before placing vinyl or other moisture-sensitive floor covering.

It should be noted that cracking of concrete slabs is common. The cracking occurs because concrete shrinks as it cures. Control joints, which are commonly used in exterior decking to control such cracking, are normally not used in interior slabs. The reinforcement recommended above is intended to reduce cracking and its proper placement is critical to the performance of the slab. The minor shrinkage cracks, which often form in interior slabs, generally do not present a problem when carpeting, linoleum, or wood floor coverings are used. The slab cracks can, however, lead to surface cracks in brittle floor coverings such as ceramic tile.

TANK REMOVAL AND BACKFILL

It is recommended that the buried tank be removed and the excavation backfilled prior to commencement of pile excavations. The bottom of the excavation should be observed by a representative of Byer Geotechnical prior to placing backfill. The excavation should be backfilled with a two-sack cement slurry in accordance with the guidelines included in the LADBS Information Bulletin, P/BC 2014-121, dated January 1, 2014 (enclosed). The backfill material will be considered non-structural and will not be used for support of the concrete floor slab.

All other recommendations included in the above-referenced 2015 report remain valid and applicable to the proposed project.

Byer Geotechnical appreciates the opportunity to continue to provide our service on this project. Any questions concerning the data or interpretation of this report should be directed to the undersigned.

Respectfully submitted,
BYER GEOTECHNICAL, INC.

Raffi S. Babayan
P. E. 72168

REGISTERED PROFESSIONAL ENGINEER RAFFI S. BABAYAN No. 72168 Exp. June 30, 2018 CIVIL STATE OF CALIFORNIA

Robert I. Zweigler
E. G. 1210 / G. E. 2120

ENGINEERING GEOLOGIST ROBERT I. ZWEIGLER E. G. 1210 Exp. 11-30-18

REGISTERED PROFESSIONAL ENGINEER ROBERT I. ZWEIGLER No. 2120 Exp. 06-30-18 GEOTECHNICAL STATE OF CALIFORNIA

RSB:RIZ:mh
S:\FINAL\BG\21339_The_Mirman_School\21339_The_Mirman_School_Addendum_10.14.16.wpd

Enc: LADBS, conditional approval letters, dated March 3 and September 23, 2015, and August 5, 2016 (7 Pages)
LADBS Information Bulletin P/BC 2014-121 (3 Pages)
Notice of Field Observation, dated October 3, 2016

In Pocket: Updated Geologic Map

xc:
(1) Addressee (E-mail and Mail)
(3) Johnson Favaro Architecture, Attention: Nick Martinez (E-mail and Mail)
(1) Nabih Youssef Structural Engineers, Attention: Daniel Ahkiam (E-mail)

CITY OF LOS ANGELES
CALIFORNIA

ERIC GARCETTI
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

RAYMOND S. CHAN, C.E., S.E.
GENERAL MANAGER

FRANK BUSH
EXECUTIVE OFFICER

GEOLOGY AND SOILS REPORT APPROVAL LETTER

March 3, 2015

LOG # 87193
SOILS/GEOLOGY FILE - 2
LAN

The Mirman School for Gifted Children
16180 W. Mulholland Drive
Los Angeles, CA 90049

TRACT:	PM 4816
LOT:	A
LOCATION:	16100 W. Mulholland Drive

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE(S) OF DOCUMENT	PREPARED BY
Geology/Soil Report	BG 21339	07/31/2014	Byer Geotechnical, Inc.
Oversized Docs.	"	"	"

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE(S) OF DOCUMENT	PREPARED BY
Dept. Approval Letter (Compaction)	31334	12/16/1992	LADBS
Dept. Approval Letter	45237	10/27/2004	LADBS
Geology/Soil Report	02-040.3	09/01/2004	Van Beveren & Butelo
Dept Approval letter	41654	11/18/2003	LADBS
Geology/Soil Report	02-040.3	10/13/2003	Van Beveren & Butelo
Primary Structural Fill	31334	12/16/1992	LADBS

The Grading Division of the Department of Building and Safety has reviewed the referenced report providing recommendations for the proposed athletic field buildings, basketball court, soccer/kickball field and playground areas. The currently proposed construction is in addition to all previously proposed construction.

The Department previously conditionally approved the above referenced reports dated 10/13/2003 and 09/01/2004 for previously proposed construction in letters dated 11/18/2003 and 10/27/2004, Log #'s 41654 and 45237.

The earth materials at the subsurface exploration locations consist of up to and possibly greater than 25.5 feet of compacted fill underlain by Modelo Formation sandstone with some siltstone and shale bedrock. The area of the proposed improvements is generally flat and an approximately 100 foot high 1.5:1 cut slope with drainage terraces is located to the east of the proposed improvements.

The consultants recommend to support the proposed structures on conventional foundations bearing on a blanket of properly placed fill a minimum of 3 feet thick, placed both on bedrock and previously-certified fill (see Log# 31334).

Engineering analyses provided by Byer Geotechnical, Inc. is partially based on field and laboratory testing performed by Law/Crandall, Inc. and Van Beveren & Butelo. Byer Geotechnical, Inc. is accepting responsibility for use of the data in accordance to Code section 91.7008.5 of LABC.

The referenced report is acceptable, provided the following conditions are complied with during site development:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2014 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. Heave prone shales have been documented at other sites in the area of the subject lot. If heave prone shale is encountered during excavation, the consultant shall provide mitigation recommendations, as appropriate. Note: The undersigned geologist can be contacted for more information regarding the heave prone shales.

2. Since the site is underlain by compacted fill and bedrock with very poor percolation characteristics, infiltration pits are not recommended by the consultant on the subject site, and not approved in this letter.

3. The geologist and soils engineer shall review and approve the detailed plans prior to issuance of any permits. This approval shall be by signature on the plans which clearly indicates that the geologist and soils engineer have reviewed the plans prepared by the design engineer and that the plans include the recommendations contained in their reports. (7006.1)

4. All recommendations of the reports which are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

5. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans. Submit one copy of the above reports to the Building Department Plan Checker prior to issuance of the permit. (7006.1)

6. A grading permit shall be obtained for all structural fill and retaining wall backfill. (106.1.2)

7. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557. Where cohesionless soil having less than 15 percent finer than 0.005 millimeters is used for fill, it shall be compacted to a minimum of 95 percent relative compaction based on maximum dry density (D1556). Placement of gravel in lieu of compacted fill is allowed only if complying with Section 91.7011.3 of the Code. (7011.3)

8. New compacted fill shall extend beyond the footings a minimum distance equal to the depth of the fill below the bottom of footings or a minimum of three feet whichever is greater, as recommended. (7011.3)

9. Existing uncertified fill shall not be used for support of footings, concrete slabs or new fill. (1809.2)

10. Drainage in conformance with the provisions of the Code shall be maintained during and subsequent to construction. (7013.12)

11. Grading shall be scheduled for completion prior to the start of the rainy season, or detailed temporary erosion control plans shall be filed in a manner satisfactory to the Grading Division of the Department and the Department of Public Works, Bureau of Engineering, B-Permit Section, for any grading work in excess of 200 cu yd. (7007.1)
    1828 Sawtelle Blvd., 3rd Floor, West LA (310) 575-8388

12. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the State Construction Safety Orders enforced by the State Division of Industrial Safety. (3301.1)

13. Excavations shall not remove lateral support from a public way, adjacent property or an existing structure. Note: Lateral support shall be considered to be removed when the excavation extends below a plane projected downward at an angle of 45 degrees from the bottom of a footing of an existing structure, from the edge of the public way or an adjacent property. (3307.3.1)

14. A supplemental report shall be submitted to the Grading Division of the Department containing recommendations for shoring, underpinning, and sequence of construction in the event that any excavation would remove lateral support to the public way, adjacent property, or adjacent structures. A plot plan and cross-section(s) showing the construction type, number of stories, and location of the structures adjacent to the excavation shall be part of the excavation plans. (3307.3 & 7006.2)

15. Unsurcharged temporary excavations over 5 feet exposing soil shall be trimmed back at a gradient not exceeding 1:1.

16. All foundations shall derive entire support from a blanket of properly placed fill a minimum of 3 feet thick, placed both on bedrock and previously-certified fill, as recommended and approved by the geologist and soils engineer by inspection.

17. The seismic design shall be based on a Site Class C as recommended. All other seismic design parameters shall be reviewed by LADBS building plan check.

18. All roof and pad drainage shall be conducted to the street in an acceptable manner. (7013.10)

19. All concentrated drainage shall be conducted in an approved device and disposed of in a manner approved by the LADBS. (7013.10)

20. Prior to the pouring of concrete, a representative of the consulting soils engineer shall inspect and approve the footing excavations. The representative shall post a notice on the job site for the LADBS Building Inspector and the Contractor stating that the work so inspected meets the conditions of the report, but that no concrete shall be poured until the City Building

Inspector has also inspected and approved the footing excavations. A written certification to this effect shall be filed with the Grading Division of the Department upon completion of the work. (108.9 & 7008.2)

21. Prior to excavation, an initial inspection shall be called with LADBS Inspector at which time sequence of construction, protection fences and dust and traffic control will be scheduled. (108.9.1)

22. Site grading shall be performed under the inspection and approval of the soils engineer and deputy grading inspector. (1705.6)

23. Prior to the placing of compacted fill, a representative of the soils engineer shall inspect and approve the bottom excavations. The representative shall post a notice on the job site for the City Grading Inspector and the Contractor stating that the soil inspected meets the conditions of the report, but that no fill shall be placed until the LADBS Grading Inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be included in the final compaction report filed with the Grading Division of the Department. All fill shall be placed under the inspection and approval of the soils engineer. A compaction report together with the approved soil report and Department approval letter shall be submitted to the Grading Division of the Department upon completion of the compaction. In addition, an Engineer's Certificate of Compliance with the legal description as indicated in the grading permit and the permit number shall be included. (7011.3)

24. No footing/slab shall be poured until the compaction report is submitted and approved by the Grading Division of the Department.

CASEY LEE JENSEN
Engineering Geologist Associate II

J. ADOLFO ACOSTA
Geotechnical Engineer II

CLJ/JAA:clj/jaa
Log No. 87193
213-482-0480

cc: Ingrid Dennert, Johnson Favaro, Applicant
Byer Geotechnical, Inc., Project Consultant
WL District Office

CITY LA DBS
DEPARTMENT OF BUILDING AND SAFETY

City of Los Angeles
COMPACTION REPORT APPROVAL LIST
FOR NON STRUCTURAL FILL

LOG# 90127 DATE 9/23/2015 COMPACTION FILE - 5

JOB ADDRESS 16100 W. Mulholland DR DISTRICT OFFICE WLA

TRACT PM 4816 COUNTY REF. # BK 155-5/9

BLOCK N/A PERMIT No. 15030-10000-01096

LOT A ARB N/A

FILL SOILS CLASSIFICATION, PER TABLE 18.1.A : Silty SAND, GRAVELLY SAND

REPORT PREPARED BY: Byer Geotechnical DATED 9/18/2015

REPORT #: BG 21339

OVERSIZED DOCUMENTS X-REF ________ DATED ________

REVIEWED BY Brian Olm TELEPHONE 310-914-3936

The compaction report(s) have been reviewed by the Grading Section of the Department and have been found to be acceptable provided the proposed construction complies with the conditions specified in this letter. The approval of the reports does not permit the violation of any section of the Building Code, or other local ordinance or state law.

NOTE: Numbers in parenthesis ( ) refer to Code sections of the 1998 edition of the California Building Code, Information Bulletin (P/BC).

INSTRUCTIONS

- All of the following listed and circled conditions shall apply: 1

CONDITIONS FOR NON STRUCTURAL FILL:

1. The compacted fill is approved as a non-structural fill and shall not be used for the support of structures.

2. ~~Slope erosion control, planting and irrigating of fill slopes and run-off control are required for those areas outside the building on hillside areas per Sections 91.7012 and 91.7013 of the Los Angeles City Building Code.~~

3. ~~Interim report only.~~

CITY OF LOS ANGELES
CALIFORNIA

ERIC GARCETTI
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

FRANK BUSH
GENERAL MANAGER

GEOLOGY AND SOILS REPORT APPROVAL LETTER

August 5, 2016

LOG # 94214
SOILS/GEOLOGY FILE - 2
LAN-Exempt

The Mirman School for Gifted Children
16180 W. Mulholland Drive
Los Angeles, CA 90049

TRACT: PM 4816
LOT: A
LOCATION: 16100 W. Mulholland Drive

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Geology/Soils Report (gravel tank)	BG 21339	08/01/2016	Byer Geotechnical, Inc.
Request for Modification	24494	08/05/2016	LADBS

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Approval Letter	87193	03/03/2015	LADBS
Geology/Soil Report	BG 21339	07/31/2014	Byer Geotechnical, Inc.
Dept. Approval Letter (Compaction)	31334	12/16/1992	LADBS
Dept. Approval Letter	45237	10/27/2004	LADBS
Geology/Soil Report	02-040.3	09/01/2004	Van Beveren & Butelo
Dept Approval letter	41654	11/18/2003	LADBS
Geology/Soil Report	02-040.3	10/13/2003	Van Beveren & Butelo
Primary Structural Fill	31334	12/16/1992	LADBS

The Grading Division of the Department of Building and Safety has reviewed the current referenced report providing recommendations for the proposed 165 foot long by 16.5 foot wide by 4 foot thick gravel tank (3/8- to 1.5-inch aggregate wrapped with a 40-mil PVC geomembrane) located below 4 feet of fill and the proposed basketball court. The currently proposed construction is in addition to all previously proposed construction.

The above referenced request for modification (Mod # 24494) to allow the gravel tank (non-structural fill) below new fill and the proposed basketball court is approved by the Department. An affidavit (#20160927219) disclosing the location and that the non-structural fill may be subject to settlement was filed with the County Recorder's office.

The referenced report dated 08/01/2016 is acceptable, provided the following conditions are complied with during site development:

1. All conditions of the above referenced Department approval letters shall apply except as allowed by the request for modification.

2. The 3/8-inch to 1½-inch aggregate used for the gravel tank should meet requirements and testing of Section 200- Rock Materials of the Greenbook; and, be sound, durable, hard, resistant to abrasion and free from laminations, weak cleavage planes, the undesirable effects of weathering, and will not disintegrate from the action of air, water or the conditions to be met in handling and placing.

3. Final approval for the use of the geomembrane shall be secured during Plan Check.

4. The geomembrane shall be sealed, water tight and tested for leaks.

5. The construction of the proposed gravel tank shall be provided under the inspection and approval of the soils engineer.

6. An overflow outlet shall be provided to conduct water to the street in the event that the storage capacity of the gravel gallery is exceeded, as recommended.

7. Approval for the proposed storm-water storage system from the Bureau of Sanitation, Department of Public Works shall be secured.

CASEY LEE JENSEN
Engineering Geologist Associate II

J. ADOLFO ACOSTA
Geotechnical Engineer II

CLJ/JAA:clj/jaa
Log No. 94214
213-482-0480

cc: Steve Kaali, Applicant
Byer Geotechnical, Inc., Project Consultant
WL District Office

CONTROLLED LOW STRENGTH MATERIAL (CLSM)

This information bulletin provides a general guideline for using controlled low strength material (CLSM), generally known as slurry in the construction industry, in lieu of soil for backfill. The 2014 Los Angeles Building Code (LABC) allows the use of CLSM for the backfill of excavations under Section 1804.2, and for the support of foundations under Section 1804.6.

I. DEFINITION

CLSM is generally defined as a mixture of soil, aggregate, cement, water, and sometimes admixtures.

II. REQUIREMENTS FOR CLSM FOR STRUCTURAL SUPPORT OF FOOTINGS

A. Standard Requirements

1. CLSM shall be ready-mixed by a City of Los Angeles approved batch plant (http://www.ladbs.org/lic_apprvd_prod/fabricator_roster.pdf).

2, CLSM shall not be placed on uncertified fill, on incompetent natural soil, nor below water.

3. CLSM shall not be placed on a sloping surface with a gradient steeper than 5:1 (horizontal to vertical)

4. Testing is required to verify bearing capacity of the CLSM. Testing shall be under the continuous inspection of a concrete deputy inspector.

   Exception: Testing and a concrete deputy inspector are not required for CLSM providing support to Group U occupancies that are accessory to a residential occupancy, including, but not limited to, those listed in Section 312.1 of the LABC. This exception shall also include light poles and mechanical equipment pads. This exception only applies where a soil report has not been otherwise required by the Department or the design engineer. Where testing is not required, the minimum presumptive load bearing values from Table 1806.2 of the LABC may be used for foundation design. The cement content of the CLSM shall not be less than 188 pounds per cubic yard (2 sacks).

5. The excavation bottom shall be accepted by the soil engineer, when a soil report has been required, and the City Inspector prior to placing CLSM.

6. CSLM backfill is intended to replace soil backfill and may not be used as a substitute for concrete in the construction of surface drainage devices, or any building or structure.

7. A soil report is required.

   Exception: A soil report is not required for CLSM providing support to Group U occupancies that are accessory to a residential occupancy, including, but not limited to, those listed in Section 312.1 of the LABC. This exception shall also include light poles and mechanical equipment pads. This exception only applies where a soil report has not been otherwise required by the Department or the design engineer.

B. Soil Report Requirements

A soil report prepared by a licensed civil engineer shall be submitted to the Grading Division for review and approval prior to the placement of CLSM that will be used for support of footings. The report shall contain the following:

1. Specifications including, but not limited to, the required cement proportion, mix, and the water-cement ratio of the CLSM for the intended use. The cement content of the CLSM shall not be less than 188 pounds per cubic yard (2 sacks), unless recommended otherwise by the licensed civil engineer and accepted by the Department.

2. Specifications on how to prepare the site for the placement of the CLSM.

3. Test methods to determine the compressive strength and bearing capacity of the CLSM. The ultimate compressive strength of the CLSM shall be recommended in the report by the licensed civil engineer, but shall be no less than 100 pounds per square inch when tested on the 28th-day per ASTM D4832, Standard Test Method for Preparation and Testing of Controlled Low Strength Material Test Cylinders.

4. The allowable bearing capacity of the CLSM shall not exceed the allowable bearing capacity of the soil supporting the CLSM.

5. Field tests to determine the acceptance of the CLSM, and the number and frequency of the tests. There shall be a minimum of one test (two cylinders) for each 50 cubic yards or fraction thereof.

6. Address the differential settlement of footings that will be supported on a combination of CLSM and earth material.

7. Overexcavation for CLSM placement shall extend laterally beyond the footprint of any proposed footings as required for placement of compacted fill, unless justified otherwise by the soil engineer that footings will have adequate vertical and horizontal bearing capacity.

8. When CLSM is to be placed around or adjacent to any subdrain system, the method of placing the CLSM without affecting the proper functions of the subdrain system shall be addressed in the report.

C. Testing Requirements

1. All testing shall be performed by a City of Los Angeles approved testing agency (http://www.ladbs.org/lic_apprvd_prod/testing_agency.pdf).

2. Each load delivered on-site shall be accompanied by a load ticket to verify the mix design and an approved batch plant.

3. CLSM need not be compacted.

4. At the completion of CLSM placement, a report shall be submitted to the Grading Division for approval. The report shall contain, but need not be limited to, a plot plan showing the lateral and vertical extent of CLSM placement, bottom observation and approval, concrete deputy approvals, load tickets, and test results. The report shall be prepared and stamped by the licensed civil engineer for the project.

III. REQUIREMENTS FOR CLSM FOR NON-STRUCTURAL BACKFILL

The Department may approve the use of CLSM for non-structural backfill without the requirements stated above in section II, for cases such as retaining wall or temporary shoring backfill, backfill of utility trenches, and backfill around tanks or underground utility vaults, provided all of the following conditions are satisfied:

1. Approval by the City Inspector.

2. CLSM backfill shall be located in self-contained areas where it will not be used for vertical or lateral support of footings and no hazard will be created.

3. CLSM shall either be ready-mixed by a Los Angeles approved batch plant, or a Los Angeles approved deputy inspector shall be required for site batching and testing (at the rate of a minimum of one test per 10 cubic yards or fraction thereof).

4. When placed adjacent to any subdrain system, the subdrain system shall be protected from contamination by the CLSM. As a minimum the barrier shall consist of a 6 mil visqueen or better.

5. CSLM backfill is intended to replace soil backfill and may not be used as a substitute for concrete in the construction of surface drainage devices.

6. The cement content of the CLSM shall not be less than 188 pounds per cubic yard (2 sacks).

7. Additional testing may be required whenever there is evidence that any CLSM being placed does not conform to the criteria indicated in this bulletin.

Upper 6' was Demo'd.

BYER GEOTECHNICAL, INC.

NOTICE OF FIELD OBSERVATION

CLIENT: Mirman School DATE: 10/3/16 TIME: 1230 BG# 21339

LOCATION: 16180 Mulholland

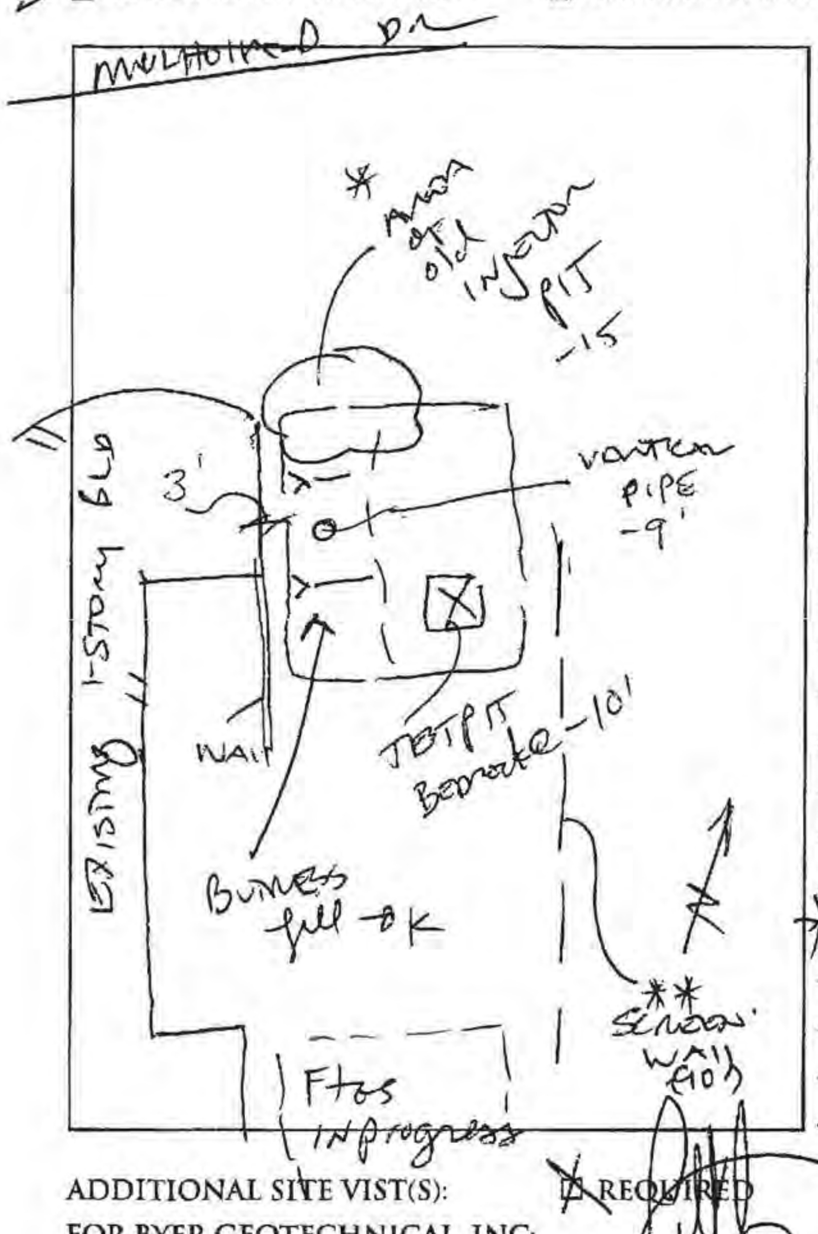
REQUESTED BY: Mike MET WITH: Mike

SPECIAL CONDITIONS: * Verify location of old injector pit.

(WEATHER, JOB SHUTDOWN, ADVICE IGNORED, SAFETY)

WE HAVE OBSERVED THE: * Area of North maintenance BLD. (25 x 27)

☐ ~~APPROVED PER THE PLANS~~ ☐ ~~CALL AGENCY INSPECTOR~~ ☐ ~~DISAPPROVED~~ ☑ SEE BELOW



GENERAL CONDITIONS OF APPROVAL:

Observed compacted buttress on west side of bottom removal.

Building & wall are now stable w/ buttress in place.

Due to the presents of deeper uncertified fills, it is recommended that friction piles be used to support maintenance building.
* Slab on grade should be redesigned as structural, supported by piles / grade beams.
An addendum geotechnical report is needed & will be prepared upon request.

ADDITIONAL SITE VIST(S): ☒ REQUIRED ☐ NOT REQUIRED

FOR BYER GEOTECHNICAL, INC: ____

HOURS: 2 (2 HOUR MINIMUM CHARGE) NOTICE LEFT WITH: Mike

1461 East Chevy Chase Drive, Suite 200 • Glendale, California 91206 • tel 818.549.9959 • fax 818.543.3747 • www.byergeo.com

** Screen wall to be on future compacted fill or bedrock per


LEGEND
B5 LOCATION AND NUMBER OF HOLLOW-STEM AUGER BORING BY BYER GEOTECHNICAL (THIS STUDY)
TD=6.5' TOTAL DEPTH (FEET)
Afu 0 to 2.5' DEPTH OF CERTIFIED COMPACTED FILL (FEET)
Tmss 2.5' to TD DEPTH OF BEDROCK (FEET)
No GW NO GROUNDWATER ENCOUNTERED
BB4 LOCATION AND NUMBER OF BUCKET-AUGER BORING BY VAN BEVEREN & BUTELO, REPORT DATE 9/1/04
25½' FILL DEPTH OF FILL NOTED
TP2 LOCATION AND NUMBER OF HAND DUG TEST PIT BY VAN BEVEREN & BUTELO, REPORT DATE 9/1/04
STRIKE AND DIP OF BEDDING
GEOLOGIC CONTACT (BYER GEOTECHNICAL, INC. ~ THIS STUDY)
GEOLOGIC CONTACT (LAW-CRANDALL, INC. ~ 1992)
LINE OF CROSS SECTION
MULHOLLAND DRIVE
PROPOSED PLAYGROUND AREA
BASKETBALL COURT (UNDER CONSTRUCTION)
PROPOSED PARKING
SUBJECT BUILDING (PROPOSED PHYSICAL EDUCATION STORAGE)
EXISTING BUILDING
THIN FILL OVER BEDROCK
COMPACTED FILL
SOCCER/KICKBALL FIELD
ATHLETIC BUILDING (UNDER CONSTRUCTION)
BEDROCK
BB1 2' FILL
B2 TD=6.5' Afu 0 to 2.5' Tmss 2.5' to TD No GW
BB2 1½' FILL
B1 TD=11.5' Afu 0 to 2' Tmss 2' to TD No GW
BB3 2' FILL
TP1
BB4 25½' FILL
TP2
B3 TD=15' Afu 0 to 7' Tmss 7' to 15'
B5 TD=40' Afu 0 to 34' Tmss 34' to 40'
B4 TD=20' Afu 0 to 13' Tmss 13' to 20'
MATCHLINE SEE SHEET
GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.
OCTOBER 14, 2016
FEBRUARY 03, 2015
BYER GEOTECHNICAL INC.
UPDATED GEOLOGIC MAP
BG: 21339 THE MIRMAN SCHOOL
CONSULTANT: JET
SCALE: 1" = 20'
REFERENCE: TOPOGRAPHIC SURVEY PREPARED BY IACOBELLIS AND ASSOCIATES, DATED 08/21/2013; AND SITE PLAN (SHEET A1.11) PREPARED BY JOHNSON FAVARO ARCHITECTURE & URBAN DESIGN, DATED 08/09/2016.

BYER GEOTECHNICAL, INC.

September 28, 2016
BG 21339

The Mirman School
16180 Mulholland Drive
Los Angeles, California 90049

Attention: Mr. David Royal

Subject

Transmittal Letter - Compaction Report
Proposed Retention Basin, Sports Courts, Playground Area, and Building Pad Backfills
Grading Permit # 16030 - 30000 - 02173
Parcel A, Parcel Map 4816
16100 West Mulholland Drive
Los Angeles, California

Gentlepersons:

Byer Geotechnical has completed our compaction report dated September 28, 2016, which describes the placement of retention basin, sports courts, playground area and PE/restroom building pad backfills. The reviewing agency for this document is the City of Los Angeles, Department of Building and Safety (LADBS). The reviewing agency requires two unbound copies, each with a wet signature, a CD (PDF format), an application form, and a filing fee. Copies of the report have been distributed as follows:

(1) Addressee (E-mail and Mail)
(1) Johnson Favaro, Attention: Ingrid Dennert (E-mail)
(2) City of Los Angeles, Department of Building and Safety

Byer Geotechnical will file the report with the LADBS and request expedited handling. Any questions concerning the report should be directed to the undersigned. Byer Geotechnical appreciates the opportunity to provide our service on this project.

Very truly yours,
BYER GEOTECHNICAL, INC.

Raffi S. Babayan
Senior Project Engineer

BYER GEOTECHNICAL, INC.

COMPACTION REPORT

RETENTION BASIN, SPORTS COURTS, PLAYGROUND AREA, AND

BUILDING PAD BACKFILLS

GRADING PERMIT # 16030 - 30000 - 02173

PARCEL A, PARCEL MAP 4816

16100 WEST MULHOLLAND DRIVE

LOS ANGELES, CALIFORNIA

FOR THE MIRMAN SCHOOL

BYER GEOTECHNICAL, INC., PROJECT NUMBER BG 21339

SEPTEMBER 28, 2016

1461 East Chevy Chase Drive, Suite 200 • Glendale, California 91206 • tel 818.549.9959 • fax 818.543.3747 • www.byergeo.com

COMPACTION REPORT

RETENTION BASIN, SPORTS COURTS, PLAYGROUND AREA, AND

BUILDING PAD BACKFILLS

GRADING PERMIT # 16030 - 30000 - 02173

PARCEL A, PARCEL MAP 4816

16100 WEST MULHOLLAND DRIVE

LOS ANGELES, CALIFORNIA

FOR THE MIRMAN SCHOOL

BYER GEOTECHNICAL, INC., PROJECT NUMBER BG 21339

SEPTEMBER 28, 2016

INTRODUCTION

This report summarizes results of compaction testing and field observations performed during grading of a portion of the site. The purpose of the compaction testing was to determine that the grading specification on the plan and the requirements of the City of Los Angeles Building Code were met. The results of the compaction tests are shown on "Table I" and the test locations are plotted on the enclosed Compaction Map.

Field observations and compaction testing were coordinated with Mr. Mike Williams of Blackwell Construction.

PRIOR WORK

The following geotechnical reports were prepared for the project by Byer Geotechnical, Inc.:

> *Geologic and Soils Engineering Update, Proposed Athletic Field, Parking, and School Building, Lot A, Parcel Map 4816, 16100 Mulholland Drive, Los Angeles, California,* dated June 28, 2011;

Geologic and Soils Engineering Exploration Update, Proposed School Building and Athletic Field, Lot A, Parcel Map 4816, 16100 Mulholland Drive, Los Angeles, California, dated February 3, 2015;

Compaction Report, Retaining Wall Backfill and Proposed Athletic Field, Grading Permit # 15030 - 10000 - 01096, Parcel A, Parcel Map 4816, 16100 West Mulholland Drive, Los Angeles, California, dated September 18, 2015; and

Geologic and Soils Engineering Memorandum, Review of Low-Impact Development (LID) Plan, Proposed Physical Education and Office/Restroom Buildings and Basketball Courts, Lot A, Parcel Map 4816, 16100 Mulholland Drive, Los Angeles, California, dated August 1, 2016.

The City of Los Angeles, Department of Building and Safety, reviewed the reports and issued the conditional approval letters dated March 3, 2015, September 23, 2015, and August 5, 2016.

SOIL CLASSIFICATION

The following soil type was used in the compacted fill:

Soil Type	Soil Description	Soil Color	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Expansion Index*
A	Silty Sand	Medium Brown	120.0	13.0	12 - Very Low

* Expansion Index as determined by Expansion Index Method (UBC Standard 29-2 or ASTM 4829-11).

The maximum density test was performed in accordance with ASTM D 1557-12.

PROJECT DESCRIPTION

The grading addressed in this report consisted of placing backfill on top of a retention basin that consists of a 170-foot-long by 17-foot-wide area that was over-excavated eight feet deep. The lower four feet was backfilled with crushed aggregate wrapped with fabric liner. The sports courts consist of a 40-foot-wide by 170-foot-long area that runs along the retention basin and was over-excavated 6 feet in the center and 2 feet on the north and south portions to expose the underlying bedrock. To the west of the sports courts, a playground area was over-excavated two feet, as shown on the enclosed Compaction Map. Also, a pad backfill for the physical education (PE) office/restroom building was excavated five feet deep at the location shown on the enclosed Compaction Map. The approved compacted fill will be used as primary structural fill supporting the building for the PE office/restroom building, secondary structural fill supporting the basketball courts and hardscape, and non-structural fill supporting landscaping.

GRADING

Areas to receive compacted fill were cleared of vegetation and debris. Prior to placing fill, the bottoms were observed, found to be in bedrock in the areas of the sports courts and playground area, and compacted fill in the area of the PE office/restroom building.

Prior to placing fill for the retention basin, sports courts, playground area, and PE office/restroom building pad, the existing fill was removed to bedrock and compacted fill. The existing compacted fill was removed to a minimum of three feet below the bottom of the footings for the proposed PE office/restroom building and extended three feet beyond the building footprint. The excavated soils were stockpiled for later placement as compacted fill. The bottoms were observed and approved by a representative of the soils engineer. The approved bottoms were scarified to a depth of six inches, moistened as required to achieve optimum moisture content, and recompacted to 90 percent of the maximum dry density.

Compaction

Fill was placed by means of a heavy-duty track excavator and track loader in loose lifts of about six inches, moistened as required to achieve optimum moisture content by means of a water hose, and compacted with a heavy duty sheepsfoot roller and track loader.

Field density tests were performed in accordance with ASTM D 1556-15. Field density tests as shown on "Table I" indicate that compacted fill was placed to a minimum of 90 percent of the maximum dry density.

The maximum vertical depth of fill is six feet, located in the sports courts area, as shown on the enclosed Compaction Map.

CONCLUSIONS AND RECOMMENDATIONS

Field density tests indicate that compacted fill was placed in a satisfactory manner and is suitable for support of the PE office/restroom building, playground area, and sports courts. The grading was performed according to the approved plan prepared by Johnson Favaro, Architecture and Urban Design.

FOUNDATION DESIGN

Spread Footings

Continuous and/or pad footings may be used to support the proposed school PE office/restroom building, provided they are founded in future compacted fill. Continuous footings should be a minimum of 12 inches in width. Pad footings should be a minimum of 24-inches square. The following chart contains the recommended design parameters.

Bearing Material	Minimum Embedment Depth of Footing (Inches)	Vertical Bearing (psf)	Coefficient of Friction	Passive Earth Pressure (pcf)	Maximum Earth Pressure (psf)
Approved Compacted Fill	24	2,000	0.30	250	4,000

Increases in the bearing value are allowable at a rate of 20 percent for each additional foot of footing width or depth to a maximum of 4,000 pounds-per-square-foot for the compacted fill and 8,000 pounds-per-square-foot for the bedrock. For bearing calculations, the weight of the concrete in the footing may be neglected.

The bearing value shown above is for the total of dead and frequently applied live loads and may be increased by one-third for short duration loading, which includes the effects of wind or seismic forces. When combining passive and friction for lateral resistance, the passive component should be reduced by one-third.

All continuous footings should be reinforced with a minimum of four #4 steel bars: two placed near the top and two near the bottom of the footings. Footings should be cleaned of all loose soil, moistened, free of shrinkage cracks, and approved by the geotechnical engineer prior to placing forms, steel, or concrete.

Foundation Settlement

Settlement of the foundation system is expected to occur on initial application of loading. A total settlement of one-half to one inch may be anticipated (see Calculation Sheets #2 and #3). Settlement of the footings founded in bedrock is negligible. Differential settlement should not exceed one-half of an inch.

DRAINAGE

Control of site drainage is important for the performance of the project. Pad and roof drainage should be collected and transferred to the street or an approved location in non-erosive drainage devices. Drainage should not be allowed to pond on the pad or against any foundation or retaining wall. Planters located within retaining wall backfill should be sealed to prevent moisture intrusion into the backfill. Drainage control devices require periodic cleaning, testing, and maintenance to remain effective.

SITE OBSERVATION

It is recommended that all foundation excavations be observed by the geotechnical engineer prior to placing forms, concrete, or steel. Any additional fill that is placed should be tested for compaction.

Please advise Byer Geotechnical at least 24 hours prior to any required site visit. All approved plans and permits should be at the job site and available.

ADDITIONAL GRADING

Fill that may be placed beyond the limits shown on the enclosed Compaction Map should be compacted with suitable equipment and observed by our representative. Byer Geotechnical, Inc., cannot be responsible for earth materials placed beyond the limits shown by test elevations on the enclosed Compaction Map. Fill placed below slabs, parkways, sidewalks, patios, driveways, parking lots, around footings, as retaining wall backfill, building wall backfill, garden wall backfill, and in utility trenches should be compacted. It is the responsibility of the contractor to place fill in accordance with the approved plans and specifications.

CONSTRUCTION SITE MAINTENANCE

It is the responsibility of the contractor to maintain a safe construction site. When excavations exist on a site, the area should be fenced and warning signs posted. All pile excavations must be properly covered and secured. Soil generated by foundation and subgrade excavations should be either removed from the site or properly placed as a certified compacted fill. Soil must not be spilled over any descending slope. Workers should not be allowed to enter any unshored trench excavations over five feet deep.

FINAL INSPECTION

Please advise Byer Geotechnical when the project is nearing completion. At this stage the engineer can observe the site to see that the recommendations contained in this report have been implemented during development of the project.

Byer Geotechnical appreciates the opportunity to provide our service on this project. Any questions concerning the data or interpretation of this report should be directed to the undersigned.

Respectfully submitted,
BYER GEOTECHNICAL, INC.

REGISTERED PROFESSIONAL ENGINEER
RAFFI S. BABAYAN
No. 72168
Exp. June 30, 2018
CIVIL
STATE OF CALIFORNIA

Raffi S. Babayan
P. E. 72168

MP:RSB:mh
S:\FINAL\BG\21339_The_Mirman_School\21339_The_Mirman_School_Compaction_Report_9.28.16.wpd

Enc: Table I - Field Density Tests (2 Pages)
Certificate of Compliance
Grading Permit # 16030 - 30000 - 02173 (3 Pages)

In Pocket: Compaction Map

xc: (1) Addressee (E-mail and Mail)
(1) Johnson Favaro, Attention: Ingrid Dennert (E-mail and Mail)
(2) City of Los Angeles, Department of Building and Safety (BG to Submit)

September 28, 2016
BG 21339

TABLE I

FIELD DENSITY TESTS

Test #	Date	Tech.	Location	Elevation (feet)	Moisture Content (%)	Dry Unit Weight (pcf)	Soil Type	Maximum Density (pcf)	Relative Compaction (%)
1N	9/8/16	MP	Retention Basin Backfill	1,313	9.98	115.3	A	120.0	96
1C	9/8/16	MP	Retention Basin Backfill	1,313	10.25	114.2	A	120.0	95
2N	9/8/16	MP	Retention Basin Backfill	1,313	11.04	111.9	A	120.0	93
3N	9/8/16	MP	Retention Basin Backfill	1,313	10.50	115.7	A	120.0	96
4N	9/8/16	MP	Retention Basin Backfill	1,313	12.07	110.1	A	120.0	92
5N	9/9/16	MP	Retention Basin Backfill	1,313	14.6	108.4	A	120.0	90
6N	9/9/16	MP	Retention Basin Backfill	1,315	12.32	108.4	A	120.0	90
7N	9/9/16	MP	Retention Basin Backfill	1,315	12.96	110.9	A	120.0	92
8N	9/12/16	MP	Retention Basin Backfill	1,315	11.20	116.1	A	120.0	97
9N	9/12/16	MP	Retention Basin Backfill	1,315	11.36	108.5	A	120.0	90
10N	9/12/16	MP	Retention Basin Backfill	1,315	9.69	111.2	A	120.0	93
11	9/12/16	MP	Compacted Fill Pad	1,310	14.45	108.5	A	120.0	90
12N	9/13/16	MP	Compacted Fill Pad	1,310	13.63	112.7	A	120.0	94
13N	9/13/16	MP	Compacted Fill Pad	1,312	12.22	110.6	A	120.0	92
14N	9/13/16	MP	Compacted Fill Pad	1,314	12.72	112.8	A	120.0	94
15N	9/13/16	MP	Compacted Fill Pad	1,312	13.23	110.7	A	120.0	92
16N	9/13/16	MP	Compacted Fill Pad	1,313	12.93	113.0	A	120.0	94
17N	9/13/16	MP	Compacted Fill Pad	1,315	12.60	108.1	A	120.0	90
18	9/13/16	MP	Compacted Fill Pad	1,315	12.00	111.4	A	120.0	93
19	9/21/16	CK	Sports Court Backfill	1,312	15.3	111.6	A	120.0	93
20	9/21/16	CK	Sports Court Backfill	1,314	14.6	110.3	A	120.0	92
21N	9/22/16	MP	Sports Court Backfill	1,315	9.72	110.0	A	120.0	92
22N	9/22/16	MP	Sports Court Backfill	1,315	8.86	110.2	A	120.0	92
23N	9/22/16	MP	Sports Court Backfill	1,315	9.38	108.1	A	120.0	90
24N	9/22/16	MP	Sports Court Backfill	1,315	7.53	109.1	A	120.0	91

TABLE I

FIELD DENSITY TESTS

Test #	Date	Tech.	Location	Elevation (feet)	Moisture Content (%)	Dry Unit Weight (pcf)	Soil Type	Maximum Density (pcf)	Relative Compaction (%)
25N	9/26/16	SS	Playground Backfill	1,313	11.9	113.4	A	120.0	95
26N	9/26/16	SS	Playground Backfill	1,315	12.2	115.6	A	120.0	96

N - Denotes Nuclear Density Test
C - Denotes Correlation Test

Note: Density tests without suffixes indicate sand cone tests.

GRADING DIVISION
CERTIFICATE OF COMPLIANCE
CITY OF LOS ANGELES/DEPT OF BUILDING & SAFETY

DATE: September 28, 2016

LOCATION OF FILL:TRACT: Parcel Map 4816 **BLOCK:** ________ **LOT:** Parcel A

JOB ADDRESS: 16100 West Mulholland Drive, Los Angeles, California

PROPERTY OWNER'S NAME: Mirman School for Gifted Children

PROPERTY OWNER'SADDRESS: 16180 Mulholland Drive, Los Angeles, California 90049

SOIL TESTING AGENCY: Byer Geotechnical, Inc. **PROJECT #:** BG 21339

PERMIT #: 16030 - 30000 - 02173 **DATE:** **WORK STARTED:** 8/30/16

WORK COMPLETED: 9/26/16

TO THE SUPERINTENDENT OF BUILDING:

I hereby certify that I have personally observed and tested the placement of compacted fill on the above described property, and, on the basis of these observations and test results, it is my professional opinion that the same was placed in conformity with the requirements of the City of Los Angeles Building Code.

Raffi S. Babayan
Civil Engineer (Print Name)

P. E. 72168
License #

REGISTERED PROFESSIONAL ENGINEER
RAFFI S. BABAYAN
No. 72168
Exp. June 30, 20 18
CIVIL
STATE OF CALIFORNIA

Civil Engineer Signature

Stamp

DO NOT AMEND, ALTER, CHANGE, DELETE, APPEND, OR ATTACH TO ANY PRINTED PORTION OF THIS CERTIFICATE AS IT WILL RENDER IT NULL AND VOID.

For the purpose of this certificate to "have personally observed and tested" shall include observations and testing performed by any person responsible to the licensed engineer of record signing this certificate. Where the observations and testing of all or a part of work above is delegated, full responsibility shall be assumed by the licensed engineer of record whose signature is affixed hereon.

16100 W Mulholland Dr

Permit #:
Plan Check #: B16WL01566
Event Code:

16030 - 30000 - 02173
Printed: 08/10/16 09:55 AM

Grading
Commercial
Regular Plan Check
Plan Check

City of Los Angeles - Department of Building and Safety

APPLICATION FOR GRADING PERMIT
AND GRADING CERTIFICATE

Issued on: 08/10/2016
Last Status: Issued
Status Date: 08/10/2016

1. TRACT	BLOCK	LOT(s)	ARB	COUNTY MAP REF #	PARCEL ID # (PIN #)	2. ASSESSOR PARCEL #
P M 4816		A		BK 155-5/9	159B141 389	4490 - 001 - 006

3. PARCEL INFORMATION

Airport Hazard Area - 550' Height Limit Above Elevation 747
Area Planning Commission - South Valley
LADBS Branch Office - WLA
Baseline Hillside Ordinance - Yes
Council District - 11

Community Plan Area - Brentwood - Pacific Palisades
Census Tract - 2623.01
District Map - 159B141
Energy Zone - 6
Fire District - VHFHSZ

Hillside Grading Area - YES
Hillside Ordinance - YES
Earthquake-Induced Landslide Area - Yes
Near Source Zone Distance - 5.1
Thomas Brothers Map Grid - 561-F7

ZONES(S): RE40-1-H

4. DOCUMENTS

ZI - ZI-1022	ZA - ZA-1992-726-CUZ	ORD - ORD-128730	HLSAREA - Yes
ZI - ZI-2438 Equine Keeping in the City of Lc	ZA - ZA-1993-146-CUZ-ZV-YV-PAD	ORD - ORD-132416	DTRM - DIR-2007-1308-DRB-SPP-MSP
ZA - ZA-1990-1117-CUZ	ZA - ZA-2008-1263-CU-ZAA-F	ORD - ORD-159292-SA106	CPC - CPC-18760
ZA - ZA-1991-810-ZV	SPA - Mulholland Scenic Parkway (Inner Cor	ORD - ORD-167943	CPC - CPC-2002-6583-SP

5. CHECKLIST ITEMS

6. PROPERTY OWNER, TENANT, APPLICANT INFORMATION

Owner(s):
MIRMAN SCHOOL FOR GIFTED CHILDREN
16180 MULHOLLAND DR, LOS ANGELES CA 90049 -

Tenant:

Applicant: (Relationship: Agent for Owner)
CHRIS DRIGAN -
23622 CALABASAS RD. #100, CALABASAS, CA. 91302 - (818) 317-1012

For Cashier's Use Only W/O #: 63002173

7. EXISTING USE

PROPOSED USE
(70) Grading - Hillside

8. DESCRIPTION OF WORK
Grading

9. # Bldgs on Site & Use:

10. APPLICATION PROCESSING INFORMATION

BLDG. PC By: Vladimir Arutyunyan
DAS PC By: Eddie Garin
OK for Cashier: Evelyn Fuentes
Coord. OK:
Signature: Evelyn Fuentes
Date: 08/10/2016

11. PROJECT VALUATION Final Fee Period

Permit Valuation: 2,310 cu yd
PC Valuation:

Sewer Cap ID:
Total Bond(s) Due: $15,290

12. ATTACHMENTS
Plot Plan

For inspection requests, call toll-free (888) LA4BUILD (524-2845). Outside LA County, call (213) 482-0000 or request inspections via www.ladbs.org. To speak to a Call Center agent, call 311. Outside LA County, call (213) 473-3231.

* P 1 6 0 3 0 3 0 0 0 0 0 2 1 7 3 F N *

LA M CA 101085175 8/10/2016 9:55:05 AM

GRADING PERMIT	$1,675.00
GRADING PLAN CHECK	$0.00
GRADING PLAN CHECK	$0.00
ONE STOP SURCH	$33.50
SYSTEMS DEVT FEE	$100.50
CITY PLANNING SURCH	$100.50
MISCELLANEOUS	$10.00
PLANNING GEN PLAN MAINT SURCH	$83.75
GRADING PLAN CHECK	$0.00
Sub Total:	$2,003.25

Permit #: 160303000002173
Building Card #: 2016LA68062
Receipt #: 0101618156

13. STRUCTURE INVENTORY (Note: Numeric measurement data in the format "number / number" implies "change in numeric value / total resulting numeric value") **16030 - 30000 - 02173**

(P) Cut: 1290 Cuyd
(P) Export: 1020 Cuyd
(P) Fill: 270 Cuyd

14. APPLICATION COMMENTS:

In the event that any box (i.e. 1-16) is filled to capacity, it is possible that additional information has been captured electronically and could not be printed due to space restrictions. Nevertheless the information printed exceeds that required by section 19825 of the Health and Safety Code of the State of California.

15. BUILDING RELOCATED FROM:

16. CONTRACTOR, ARCHITECT & ENGINEER NAME

	ADDRESS		CLASS	LICENSE #	PHONE #
(C) BLACKWELL CONSTRUCTION INC	12345 VENTURA BOULEVARD,	STUDIO CITY, CA 91604	B	406673	

PERMIT EXPIRATION/REFUNDS: This permit expires two years after the date of the permit issuance. This permit will also expire if no construction work is performed for a continuous period of 180 days (Sec. 98.0602 LAMC). Claims for refund of fees paid must be filed within one year from the date of expiration for permits granted by LADBS (Sec. 22.12 & 22.13 LAMC). The permittee may be entitled to reimbursement of permit fees if the Department fails to conduct an inspection within 60 days of receiving a request for final inspection (HS 17951).

17. LICENSED CONTRACTOR'S DECLARATION

I hereby affirm under penalty of perjury that I am licensed under the provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect. The following applies to B contractors only: I understand the limitations of Section 7057 of the Business and Professional Code related to my ability to take prime contracts or subcontracts involving specialty trades.

License Class: B License No.: 406673 Contractor: BLACKWELL CONSTRUCTION INC

18. WORKERS' COMPENSATION DECLARATION

I hereby affirm, under penalty of perjury, one of the following declarations:

(X) I have and will maintain a certificate of consent to self insure for workers' compensation, as provided for by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

( ) I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:

Carrier: STARSTONE NATIONAL INSURANCE C Policy Number: T10150311

( ) I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California, and agree that if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.

WARNING: FAILURE TO SECURE WORKERS' COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

19. ASBESTOS REMOVAL DECLARATION / LEAD HAZARD WARNING

I certify that notification of asbestos removal is either not applicable or has been submitted to the AQMD or EPA as per section 19827.5 of the Health and Safety Code. Information is available at (909) 396-2336 and the notification form at www.aqmd.gov. Lead safe construction practices are required when doing repairs that disturb paint in pre-1978 buildings due to the presence of lead per section 6716 and 6717 of the Labor Code. Information is available at Health Services for LA County at (800) 524-5323 or the State of California at (800) 597-5323 or www.dhs.ca.gov/childlead.

20. CONSTRUCTION LENDING AGENCY DECLARATION

I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued (Sec. 3097, Civil Code).

Lender's Name (If Any): Lender's Address :

21. FINAL DECLARATION

I certify that I have read this application INCLUDING THE ABOVE DECLARATIONS and state that the above information INCLUDING THE ABOVE DECLARATIONS is correct. I agree to comply with all city and county ordinances and state laws relating to building construction, and hereby authorize representatives of this city to enter upon the above-mentioned property for inspection purposes. I realize that this permit is an application for inspection and that it does not approve or authorize the work specified herein, and it does not authorize or permit any violation or failure to comply with any applicable law. Furthermore, neither the City of Los Angeles nor any board, department officer, or employee thereof, make any warranty, nor shall be responsible for the performance or results of any work described herein, nor the condition of the property nor the soil upon which such work is performed. I further affirm under penalty of perjury, that the proposed work will not destroy or unreasonably interfere with any access or utility easement belonging to others and located on my property, but in the event such work does destroy or unreasonably interfere with such easement, a substitute easement(s) satisfactory to the holder(s) of the easement will be provided (Sec. 91.0106.4.3.4 LAMC).

By signing below, I certify that:

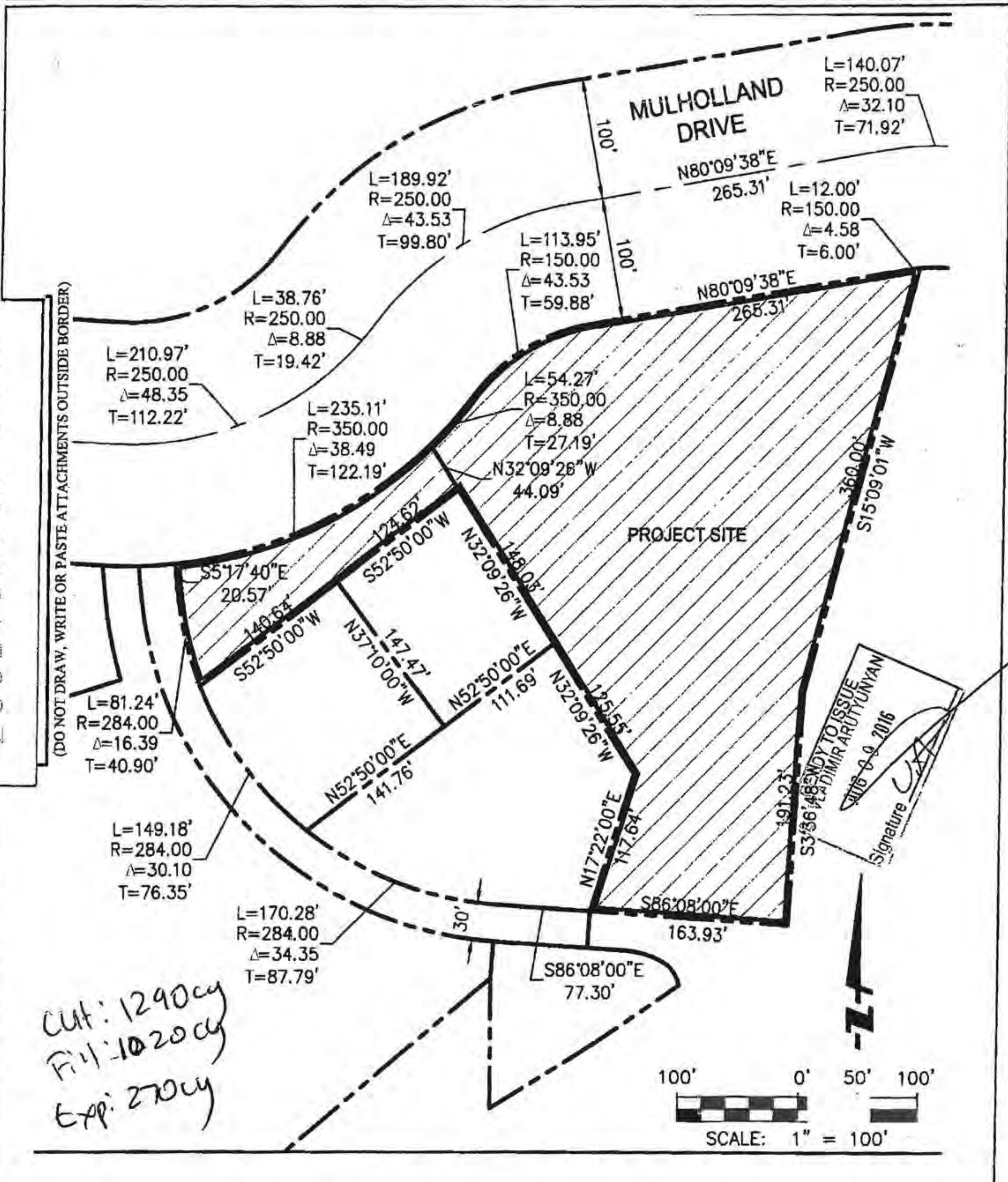
(1) I accept all the declarations above namely the Licensed Contractor's Declaration, Workers' Compensation Declaration, Asbestos Removal Declaration / Lead Hazard Warning, Construction Lending Agency Declaration, and Final Declaration; and

(2) This permit is being obtained with the consent of the legal owner of the property.

Print Name: JAMES KONIGSFELD Sign: Date: 08/10/2016 ☐ Contractor ☒ Authorized Agent

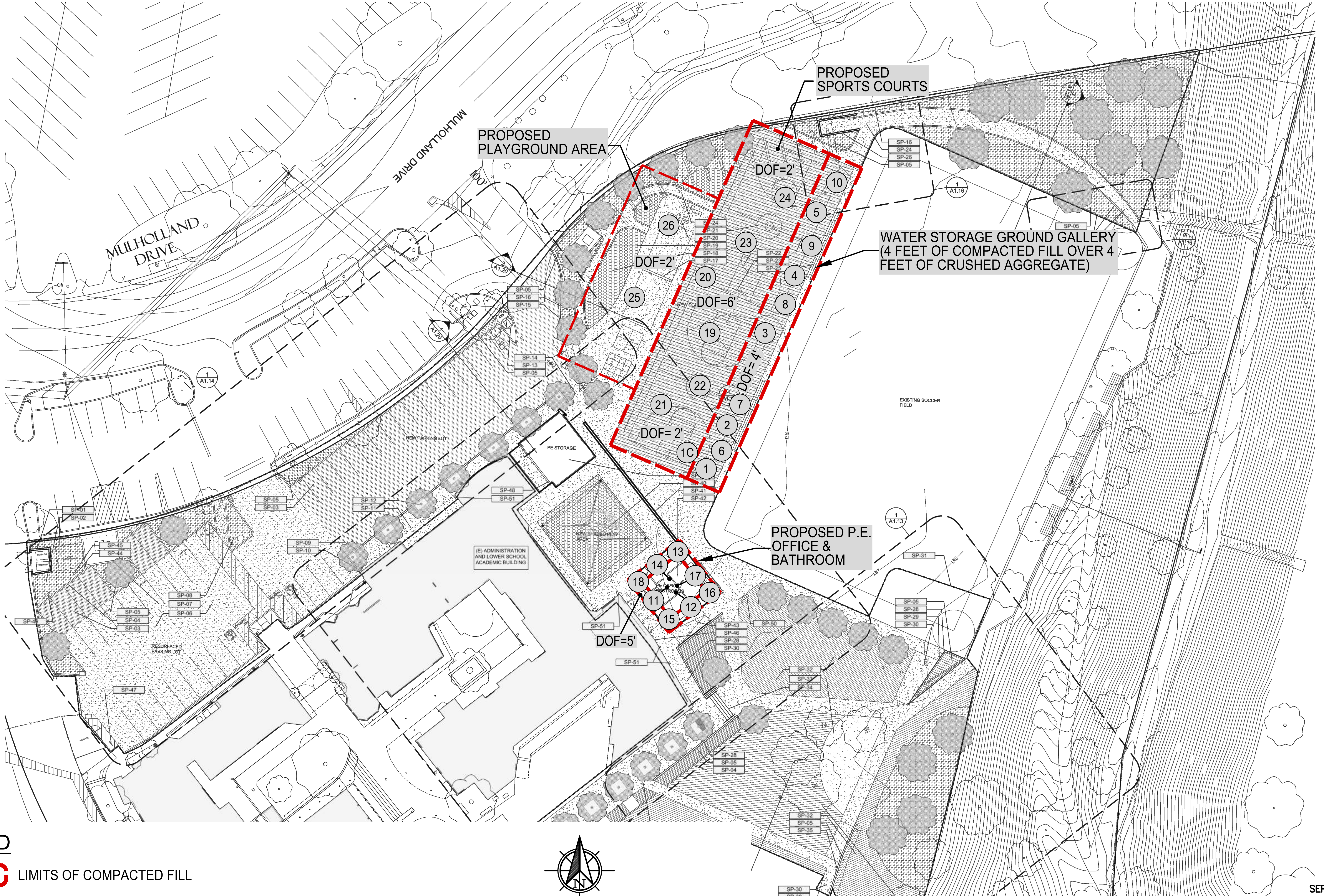
16100 W Mulholland Dr Permit Application # : **16030 - 30000 - 02173**

Grading Commercial Plan Check	City of Los Angeles - Department of Building and Safety **PLOT PLAN ATTACHMENT**	Plan Check #: B16WL01566FO Initiating Office: WEST LA Printed on: 04/14/16 19:10:06



1 0 5 0 8 1 6 2 0 1 6 1 5 2 3 7

COUNCIL DISTRICT: 11 INSPECTION DISTRICT: STGRDWI3 PLOT PLAN ATTACHMENT



LEGEND

LIMITS OF COMPACTED FILL

(26) LOCATION AND NUMBER OF FIELD DENSITY TEST BY BYER GEOTECHNICAL, INC.

DOF = DEPTH OF FILL (IN FEET)

GRAPHIC SCALE

40 30 20 10 0 20 40 80

(IN FEET)

REFERENCE: SITE PLAN DATED 05/20/2016 PREPARED BY JOHNSON FAVARO.

SEPTEMBER 28, 2016

BYER GEOTECHNICAL INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

COMPACTION MAP

BG:	21339 THE MIRMAN SCHOOL
CONSULTANT: RSB/MP	SCALE: 1" = 20'

PLOT DATE/TIME: 9/28/2016 – 10:21am

CAD FILE: S:\LandProjects\21339 THE MIRMAN SCHOOL\dwg\COMPACTION MAP_09282016.dwg

Appendix 7.2

Preliminary Geotechnical Investigation Addendum

Geosyntec consultants

Addendum 01 to
Preliminary Geotechnical Investigation Report

Response to Los Angeles Department of Building and Safety Geology and Soils Review

Proposed Mirman School Learning Center
Los Angeles, California

Prepared for

Mirman School for Gifted Children
16100 Mulholland Drive
Los Angeles, California 90049

Prepared by

Geosyntec Consultants, Inc.
2355 Northside Drive, Suite 250
San Diego, California 92108

This report was prepared and reviewed by the undersigned.

Dennis Kilian, P.G., C.E.G.
Project Geologist

Jerko Kocijan, Ph.D., P.E., G.E.
Principal Engineer

Project Number: SC0984

April 30, 2021

PROFESSIONAL GEOLOGIST DENNIS A. KILIAN No. 2672 CERTIFIED ENGINEERING GEOLOGIST Exp. 8/31/ STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER JERKO KOCIJAN No. 2969 Exp. 12/31/21 GEOTECHNICAL STATE OF CALIFORNIA

LIST OF FIGURES

LIST OF APPENDICES

LIST OF TABLES

RESPONSE TO COMMENTS

Geosyntec Consultants Inc. (Geosyntec) prepared a Geology and Soils Report[1] for the Mirman School for Gifted Children (the site, Figure 1) and submitted it to the City of Los Angeles Department of Building and Safety (LADBS) on behalf of Mirman School in January 2021. Review was performed by the Grading Division of LADBS and a Review Letter was issued to Mirman School. This Addendum 01 provides the following responses to the LADBS Geology and Soils Report Review Letter dated February 16, 2021, Log # 116076. The responses provided are itemized based on the numbered subject review comments.

1. *Provide a geologic map that is based upon conceptual grading or site development plans, to illustrate all proposed and existing contours relative to the planned grading and/or construction, along with all off-site slopes and conditions that could adversely affect the stability or safety of the site (2020 City of Los Angeles Building Code Section 7006.3.2).*

   Geosyntec Response: A revised Figure 2 is attached which includes proposed and existing contours as well as off-site slopes, new bedding orientations, and additional exploration locations.

2. *The proposed buildings are located at the toe of slopes steeper than 3H:1V. Provide recommendations and revise the plan(s) and cross sections(s) for providing the required building setback from the toe of the ascending slope as specified by Code Section 1808.7.1.*

   Geosyntec Response: Figure 2 as well as the Cross Sections (Figures 2A to 2E) have been updated to indicate a required minimum 15-foot setback from the toe of the ascending slope.

3. *The consultants reference reports by previous consultants. Summarize previous investigations/conclusions/recommendations, department approvals and clarify if construction as proposed and approved, was achieved.*

   Geosyntec Response:
   A list of site geotechnical reports and LADBS approval dates is included in the 2016 Byer Geotechnical Inc. letter titled, "Geologic and Soils Engineering Memorandum" which is attached in Appendix A. The following table summarizes the referenced reports as requested:

---

[1] Geosyntec 2021. Preliminary Geotechnical Investigation Report, Mirman School for Gifted Children, 16180 W. Mulholland Drive, Los Angeles, California.

Table 1. Summary of Referenced Reports						
Year	**Author**	**Title**	**Summary**	**LADBS Approval**	**LADBS Log No.**	**Approved Work Completed? (Yes/No)**
2004	Van Beveren & Butelo, Inc	Report of Geotechnical Investigation, Proposed Athletic Field	Geotechnical recommendations for the Athletic Field and associated improvements	10/27/2004	45237	Yes
2011	Shannon & Wilson, Inc.	Supplemental Geotechnical Recommendations for Proposed Athletic Field and Restroom Building for the Mirman School	Geotechnical recommendations for the existing site retaining walls, new retaining walls, and stormwater infiltration. The report discusses the geologic conditions and recommendations for lowering site grade and retaining wall loads.	Not Applicable (N/A)	N/A	N/A
2014	Byer Geotechnical	Geologic Soils Engineering Exploration Update	Update of the 2011 report listed above (by Shannon & Wilson, Inc.) for the proposed school building and athletic field.	03/03/2015	87193	Yes
2016	Byer Geotechnical	Compaction Report	As-graded compaction report of fill soils placed during grading of the sports and playground fields and building pad backfill	N/A	N/A	Yes
2016	Byer Geotechnical	Addendum Geologic and Soils Engineering Exploration Update	Addendum to the 2014 report listed above (by Byer Geotechnical) with revised recommendations for the physical education storage building foundations and athletic fields.	10/31/2016	95384	Yes
2018	Geotechnologies, Inc.	Environmental Impact Report, Evaluation of Soils and Geology Issues. Proposed Improvements to Mirman School	Environmental Impact Report which presents soil and geology information for the site to support the California Environmental Quality Act (CEQA) guidelines.	N/A	N/A	N/A

4. *Provide a geologic map and cross sections showing top and bottom of slopes; lithologic contacts; bedding attitudes; existing and proposed topographic profiles; existing and proposed structures; and, required Code setbacks (2020 City of Los Angeles Building Code [LABC] Section 7006.3.2).*

   Geosyntec Response: A revised Figure 2 as well as additional cross sections: C-C', D-D', and E-E' (Figures 2C to 2E) are attached to provide the requested information and to include the existing slope(s) east of the proposed structure.

5. *Provide geological cross sections illustrating existing and proposed grades and structures through the highest, steepest and geologically critical slopes that ascend above the proposed improvements.*

   Geosyntec Response: Additional cross sections: C-C', D-D', and E-E' (Figures 2C to 2E) are attached to provide the requested information and to include the existing slope(s) east of the proposed structure.

6. *The text of the report indicates "borings and test pits consist of sandstone with some siltstone and shale beds" however, the boring logs indicate silty sand, clayey sand, shale and mudstone. Please clarify the bedrock description. Are the soils descriptions part of the fill, native soils, or bedrock?*

   Geosyntec Response: A search of the document did not encounter reference to "siltstone", "shale beds" or "test pits". Test pits were not excavated at the site for the subject geotechnical investigation report by Geosyntec; however, test pits were excavated by Geosyntec on April 29, 2021 in response to these LADBS comments, and the lithology observed included sandstone, silty sandstone, mudstone, silty sand, topsoil, and fill/colluvium (likely of Tertiary Modelo Formation origin). These findings are summarized in Table 2.

   The onsite fill soils are described as "silty sand", as per Section 4.3.1 of the report, although there may be clayey sands encountered in the fill during grading as well. The Tertiary Modelo Formation (bedrock) is described as "shale and mudstone, as well as dense to very dense clayey and silty sandstone," as per Section 4.3.2 of the report. The boring logs have been revised for clarity to indicate that bedrock sandstones "excavate as" silty and clayey sands. Revised logs are provided as Appendix B.

7. *Verify the depth to competent bedrock with visual exploration by the project geologist. Cal/OSHA regulations regarding shaft/tunnel safety shall be implemented prior to anyone entering deep borings or test pits.*

Geosyntec Response: The depth to bedrock is as noted on the attached Figure 2 and shown on cross sections A-A' through E-E' (Figures 2A through 2E). The depths to bedrock were logged during Geosyntec site explorations within the proposed improvement area. As standard practice, depths will be confirmed during drilling of deep foundation elements.

8. *For the slopes that ascend above the proposed improvements, the geologist shall determine the bedrock orientation with test pit exploration and/or field mapping and show the strikes and dips on the map. Provide sampling of the weakest beds collected perpendicular to bedding for re-shear testing. Note: based on regional mapping, the bedding orientation in the area is dipping to the north. In general, this orientation could be adverse to the site's slope. If the bedrock orientation dips toward an excavation, unsupported beds would likely surcharge the proposed basement and retaining walls on the south side of the proposed structure. Deeper exploration shall rule out the presence of weaker rock types that may daylight in the slope and/or be located behind the proposed walls. Cal/OSHA regulations regarding shaft/tunnel safety shall be implemented prior to anyone entering deep borings or test pits.*

   Geosyntec Response: Site field explorations and slope mapping were performed by a Geosyntec geologist on March 29, 2021. Slope geologic conditions were observed at two outcrops and in four test pits. Orientations of bedrock (strike and dip) were measured in the two outcrops. The observations during field explorations are included in the attached Table 2. This investigation as well as previous mapping indicate site bedding orientations dipping to the northeast as shown on the revised Figure 2. The bedding orientations were generally in-slope and not considered adverse to any elements of the proposed improvements. Weak rock types were not observed in any of the Geosyntec explorations.

9. *It appears that the laboratory testing is provided by California Testing & Inspections. Provide a complete laboratory testing report prepared by a City of Los Angeles approved testing agency. The report shall be signed and stamped by the engineer in responsible charge of the testing and shall include the testing descriptions and procedures. Information Bulletin P/BC 2020-113.*

   Geosyntec Response: The laboratory is a City of Los Angeles approved testing agency (TA24779). Testing was performed by American Society for Testing and Materials (ASTM) methods. The signed laboratory testing report with a description of the tests performed is included in Appendix C.

10. *The residual (re-shear) strength shall be used where potential slip along bedding planes is analyzed as required in Information Bulletin P/BC 2020-049. The residual shear strength is the lowest strength reached at high shear deformations. Provide justification*

that samples reached the residual strength. Provide plots of each re-shear performed or clarifications.

Geosyntec Response: It is our opinion that slip along bedding planes is not a significant geohazard for the project site, therefore residual shear strength was not considered. Three cross-sections were analyzed to assess the stability of the adjacent slopes (Sections C-C', D-D', and E-E', shown on Figures 2C - 2E). These locations of the three sections (shown in Figure 2) were selected to capture the representative slope inclinations, heights and bedding. For higher slopes (Sections C-C' and D-D', shown on Figures 2C-2D), the bedding dips into the slope and along bedding sliding is not expected. For shorter/flatter slope areas (Section E-E', shown on Figure 2E), the overall bedding inclination does dip in the direction where it may be interpreted as out of slope bedding. However, the slope is relatively flat, and the bedrock is covered by a layer of surficial soils. Additionally, the uppermost bedrock unit is a thinly bedded sandstone, and within such a unit, weak bedding layers that would be representative of an along-bedding sliding hazard were not observed.

11. *Provide recommendations for shoring, underpinning, and sequence of construction in the event that any excavation would remove lateral support to the public way, adjacent property or an existing structure. A plot plan and cross section(s) showing the construction type, number of stories, and location of the structures adjacent to the excavation shall be part of the excavation plans.*

    Geosyntec Response: Shoring and underpinning are not proposed. Loss of lateral support is not anticipated. A public way, adjacent property, or existing structures are all anticipated to be greater than a 1:1 distance extending up from the bottom of proposed excavations. Excavations will be temporarily laid back or benched as necessary to ensure that lateral support is not compromised.

12. *Provide surficial stability analysis using appropriate shear strengths and soil thickness and indicate evaluated factor of safety.*

    Geosyntec Response: Existing slopes at the site are not anticipated to undergo significant grading. In addition, observations during mapping indicate that the slopes are performing adequately, and no signs of distress were observed.

    Surficial stability analyses were performed using an infinite slope solution with seepage parallel to the slope, an approved method listed in Information Bulletin P/BC 2020-049. The input parameters include slope inclination and depth of soil saturation, as well as soil shear strength properties. Per Information Bulletin P/BC 2020-049, the depth of saturation of 3 feet was used. Slope inclination of 3H:1V (horizontal:vertical) was selected as representative of continuously sloping conditions away from the development area (Section D-D', as shown on Figure 2D). While some localized areas of somewhat steeper sloping ground may occur at the site, they are limited in length and set back away from the proposed development (e.g., steeper portions at the top of Section C-C' [Figure 2C] which are setback about 80 feet from the site), and as such, it is our opinion that surficial stability of those areas is not relevant to the proposed site development.

The Factor of Safety (FS) was calculated using the following equation:

$$FS = \frac{c' + h(\gamma_{sat} - \gamma_w)(cos^2\beta)tan\phi'}{\gamma_{sat}hsin\beta cos\beta}$$

Where:
c' = apparent soil cohesion;
h = thickness of saturated soil (assumed 3 feet);
g_{sat} = saturated unit weight of soil (assumed 120 pounds per cubic foot [pcf]);
g_W = unit weight of water (62.4 pcf)
b = slope inclination (18.4 degrees)
f' – soil internal friction angle.

Surficial soils encountered on site are described as silty sand. Because the soil strength properties were not measured for the site soils, we performed calculations to assess minimum strength properties required to achieve a target factor of safety (FS) of 1.5. For the slope inclination of 3H:1V and apparent soil cohesion of 100 psf, the internal soil friction angle needs to be 22 degrees or higher for the FS value to be 1.5 or greater. Apparent soil cohesion of 100 psf is generally considered a reasonable estimate for surficial soils. If the apparent soil cohesion estimate is reduced to 75 psf, the minimum friction angle of 30 degrees is required to achieve FS of 1.5. Friction angle of 30 degrees is considered on the lower bound of the likely friction angle for silty sands, and friction angle of 22 degrees is significantly lower than any friction angle expected for silty sands.

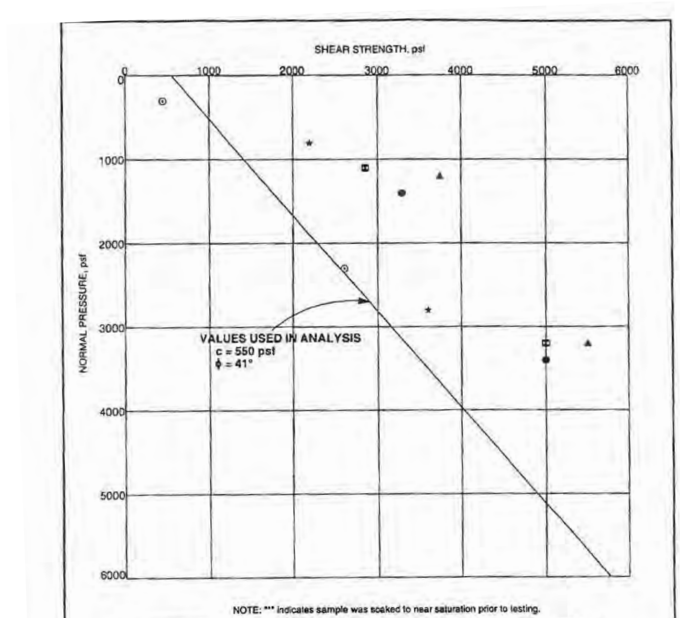
While shear strength testing was not performed on the sample of shallow soils on the slopes, Geotechnologies (2018) tested samples of the same general composited materials at the area along the toe of the slope. Eight direct shear tests on saturated silty sands (with some samples reported as borderline silty sand/sandy silt) were performed, indicating a lower bound shear strength envelope of 125 psf apparent cohesion and 35 degree friction angle. These results support the discussion of estimated apparent cohesion and friction angle parameters presented above. The Geotechnologies (2018) report is included as Appendix F. Geosyntec reviewed and concurs with the data of laboratory testing presented in the Geotechnologies (2018) report.

Therefore, the surficial stability requirements are expected to be met for the project site slopes adjacent to the development. Additionally, these slopes are existing slopes that have existed in their current state for an extended period of time, without any reported performance issues, to our knowledge. Slopes should be properly maintained and vegetated to reduce the potential for progressive surficial erosion.

13. *For the highest, steepest and geologically critical slopes provide slope stability calculations performed along an assumed plane that yields the lowest factor of safety and shall be based on shear strength parameters which represents the weakest material on the site. (Information Bulletin P/BC 2020-049).*

    Geosyntec Response: Slope stability analysis was performed for three sections along the sloping perimeter of the site. The sections selected are representative of varied site topography. The subsurface units were modeled by the project geologist based on the interpretation of the materials observed during site explorations and review of relevant geotechnical documents and mapping.

    The material properties were selected as follows:
    - Fill / Surficial Soil Materials – effective friction angle of 30 degrees and apparent cohesion of 100 psf – The stability of surficial soils is discussed under response to LADBS comment number 12, above. Small variations in the strength of surficial soils is not expected to impact the assessed FS of deeper-seated failure slopes.
    - Formation Materials:
        - Sandstone units of formation material – previous testing of the unit materials was performed in the general project area by Van Beveren & Butelo, Inc. (2014), and the data summary is presented in the figure below. The interpreted strength profile of 550 psf cohesion and 41 degree friction angle was used for slope stability analyses performed by Byer Geotechnical Inc. (2014), which was reviewed and approved by the Grading Division of LADBS. The 2014 Byer Geotechnical report was attached as Appendix A in the subject Geosyntec Investigation Report. Geosyntec reviewed and concurs with the data of laboratory testing presented in Van Beveren & Butelo, Inc. (2014). The two reference reports are listed in the Geology and Soils Report Approval Letter, Log # 87193, dated March 3, 2015, which is attached as Appendix A.



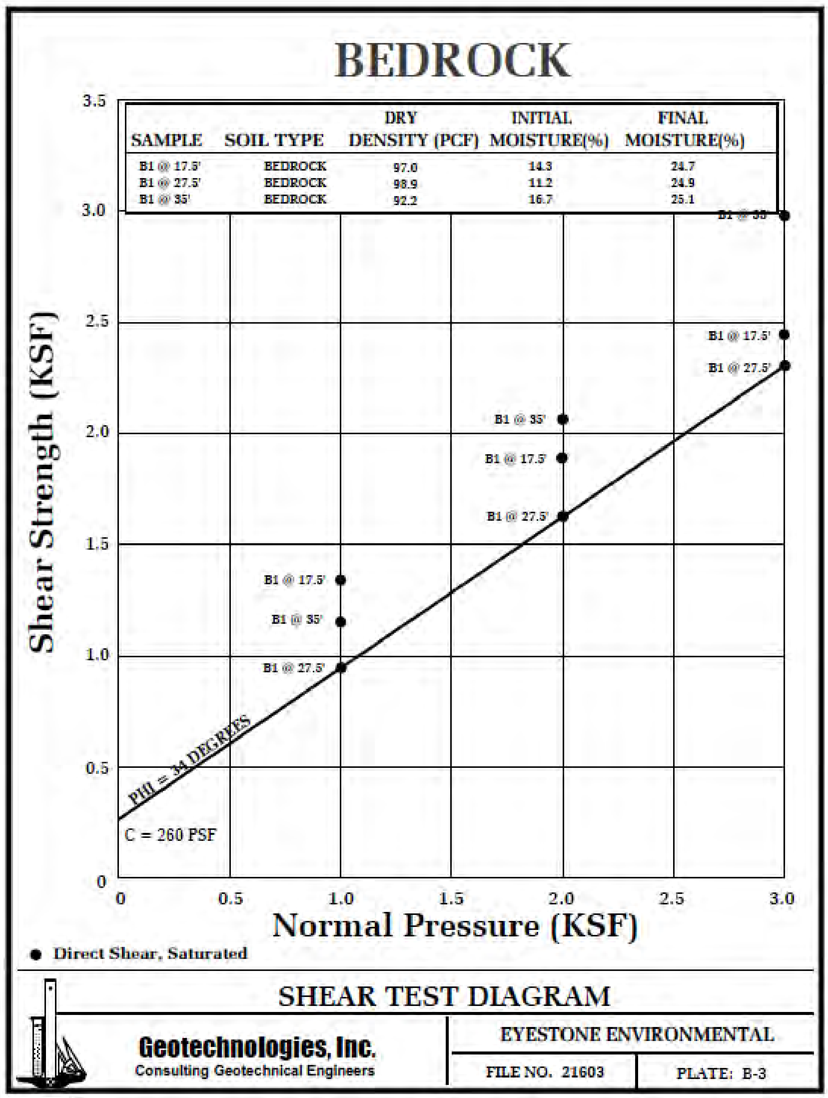
	Specimen Identification	Classification	c	ϕ	
●	Boring 1 at 4½	SANDSTONE	2110	40	
⊠	Boring 2 at 3	SANDSTONE	1724	46	*
▲	Boring 2 at 13	SANDSTONE	2700	41	
★	Boring 3 at 7½	SANDSTONE	1640	35	
⊙	Boring 6 at 2½	SANDSTONE	128	47	*
✪	Boring 6 at 12½	SANDSTONE	180	36	*

DIRECT SHEAR TEST DATA

BEDROCK (PEAK STRENGTH, CROSS BEDDING)

VAN BEVEREN & BUTELO, INC.

- Mudstone unit of formational material – previous testing of the mudstone (also referred to as siltstone in reports by others) was performed on samples from the project area by Geotechnologies (2018), and the data summary is presented in the figure below. The unit possesses an interpreted strength profile of 260 psf cohesion and a 34-degree friction angle. The 2018 Geotechnologies report is attached here as Appendix F. Geosyntec reviewed and concurs with the data of laboratory testing presented in Geotechnologies (2018). Geosyntec adopted the same strength envelope for the mudstone unit of the formational materials.



Considering all of the above information on the strength of the formational materials, and the fact that the formational unit can transition between sandstone and siltstone, the lower shear strength parameters of 34 degrees and 260 psf were used for all of the formational materials, as a conservative approach

The seismic coefficient was selected as follows using the following seismic design parameters: PGA = 0.52 g (2/3rds of PGA_M), M = 6.3 and R = 13 km. The M and R values were developed for the 475-year return period event, using the USGS interactive hazard website (https://earthquake.usgs.gov/hazards/interactive/) with output provided in Appendix D . Based on these values, the seismic coefficients for seismic slope stability analysis were estimated using procedures outlined in Special Publication 117, Guidelines for Evaluating and Mitigating Seismic Hazards in California, as required by Information Bulletin P/BC 2020-049. The values for estimated seismic coefficients are as follows:

- 5 cm threshold criteria – 0.46 x PGA = 0.46 x 0.52g = 0.24g (see image below taken from SP117 for selecting multiplier of 0.46) – Applicable for slope intersecting buildings
- 15 cm threshold criteria – 0.34 x PGA = 0.36 x 0.52g = 0.18g (see image below taken from SP117 for selecting multiplier of 0.34) – Applicable for other slopes

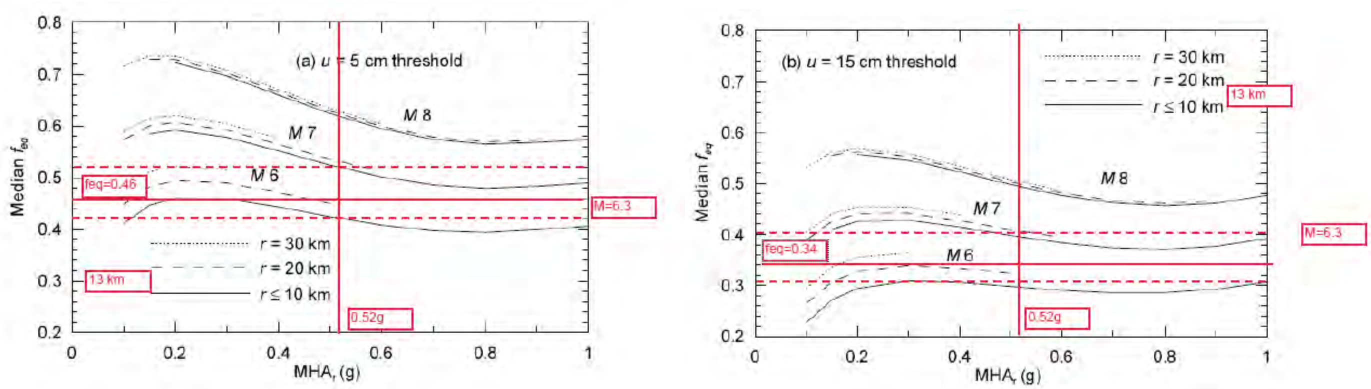


Figure 1. Values of f_{eq} as a Function of MHA_r, Magnitude and Distance for Threshold Displacements of (a) 5 cm and (b) 15 cm (Modified from Blake and others, 2002).

Slope stability analyses were performed using the computer program SLOPE/W with internally coded 2D limit equilibrium model using the Spencer Method. Results of the slope stability analyses are shown graphically in Appendix E and are summarized in the table below. As noted in the table, all analyses satisfy the minimum FS criteria for deep seated failure surface, for both static and seismic criteria. For Section C-C', some failure surface show factor of safety just under 1.0 for the seismic coefficient associated with the 5 cm movement, however, they are 50+ feet setback from the proposed building.

Table 2. Summary of Slope Stability Analyses Results

Section	Case	Calculated FS	Target FS	Pass / Fail	Note
C-C'	Static	1.56	1.5	Pass	-
	Seismic – 5 cm threshold	0.98	1	Pass (see note)	Failure surface with FS < 1 outside of the proposed building footprint, about 50+ feet away
	Seismic – 15 cm threshold	1.09	1	Pass	-
D-D'	Static	2.57	1.5	Pass	-
	Seismic – 5 cm threshold	1.41	1.5	Pass	-
	Seismic – 15 cm threshold	1.60	1	Pass	-
E-E'	Static	2.99	1.5	Pass	-
	Seismic – 5 cm threshold	1.75	1	Pass	-
	Seismic – 15 cm threshold	1.97	1	Pass	-

14. Revise the pseudo-static slope stability analysis to be in conformance with the most recent version of CGS Special Publication 117 (i.e. SP 117A), Guidelines for Evaluating and Mitigating Seismic Hazards in California (LABC Section 1803.7.2), and with the Department guidelines presented in the memorandum dated 07/16/2014 (in the event the consultant does not have the memorandum, the reviewers could be contacted to send it via email). Notes: (I) Ground motions used to evaluate liquefaction or slope stability shall be obtained based on methods prescribed in the 2020 LABC (refer to 1803.5. 12). Ground shaking hazard maps found in previous Seismic Hazard Zone Reports shall no longer be used to estimate ground shaking. The predominant earthquake magnitude distance pair may be obtained from the USGS Interactive Deaggregation web site: https://earthquake.usgs.gov/hazards/interactive/. (2) The seismic coefficient, keq, shall be derived based on a displacement of 5 cm where critical slip surfaces intersect stiff improvements, such as buildings or pools, otherwise a maximum displacement of 15 cm may be assumed. (3) A minimum safety factor of 1.0 is required.

    Geosyntec Response: See response to Comment 13.

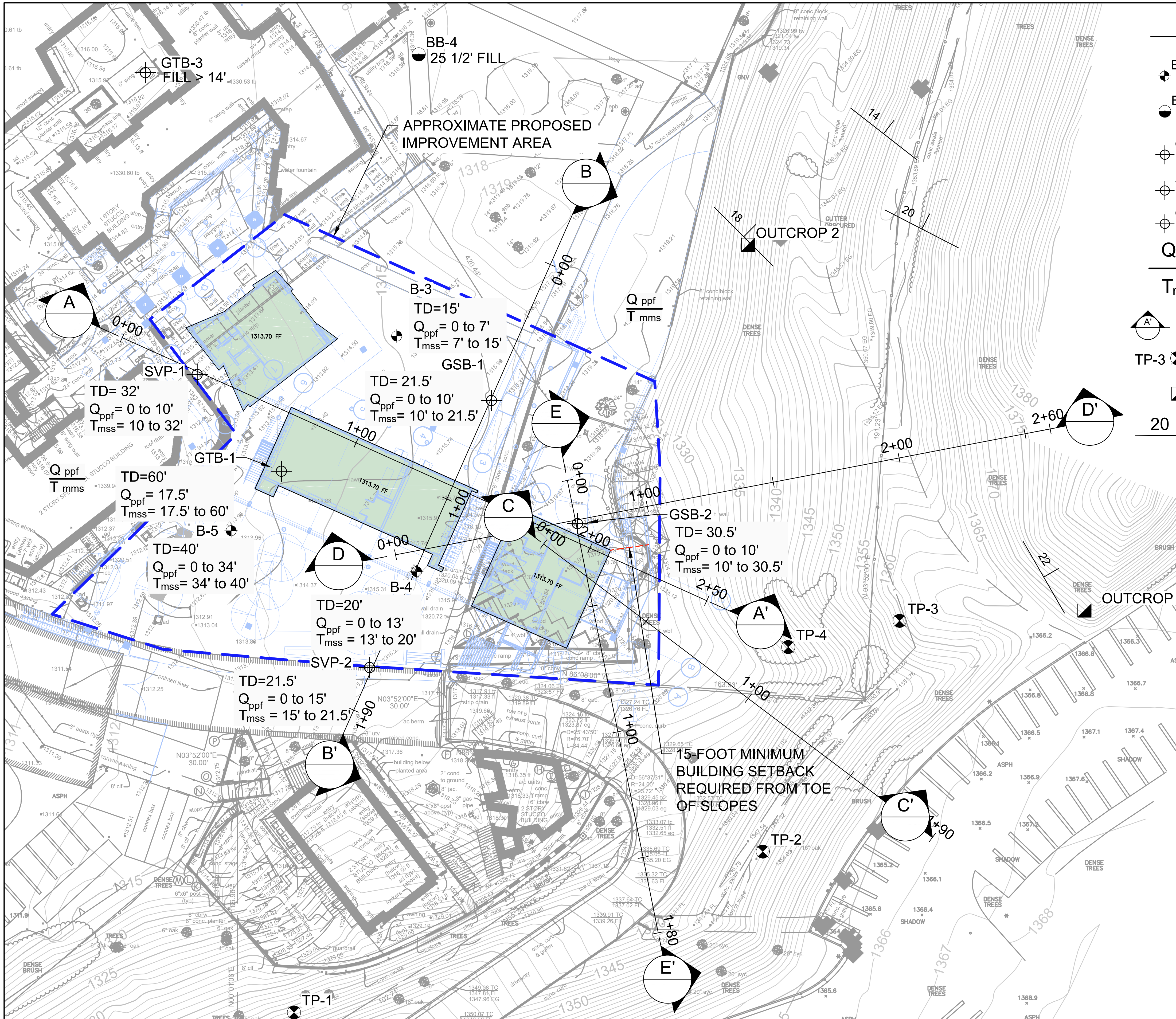
15. Submit a justification in accordance with code section 1613.2.2 of the 2020 Los Angeles Building Code for use of a Site Class C where up to 35 feet of fill will be located below the proposed improvements or provide recommendations for Site Class D.

    Geosyntec Response: The eastern portion of the structure is underlain by shallow Modelo formation materials considered acceptable as Site Class C based on N-values derived from blow count data. The fill soil depth is anticipated to increase to the west with bedrock material directly underlying it. Although fills up to 35 feet in depth may exist at the site, the fill thicknesses anticipated beneath the base of the structure do not exceed 15 to 20 feet. The entire structure is planned to be supported on bedrock with deepened foundations. Fill materials are not relied upon for support. Additionally, average N-values for the upper 100 feet of soil are estimated to be greater than 50 as required for Site Class C materials. The 2004 NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures (FEMA 450) states that for structures with basements supported on firm soils or rock below soft soils, it is reasonable to classify the site on the basis of the soils for rock below the mat, if it can be justified that the soft soils contribute very little to the response of the structure. It should also be noted that in the most recent code updates, the site class ground motion amplification coefficient Fa is higher for Site Class C than Site Class D, i.e., selecting Site Class C is conservative for structure with short period where design is controlled by short period portion of the response spectra.

16. The analysis shall include group effects on lateral behavior where center to center spacing of deep foundation elements in the direction of lateral force is less than eight times (not six times as recommended in the referenced report) the least horizontal dimension of an element. Revise recommendations accordingly.

    Geosyntec Response: Recommendations were provided in Section 6.5.2, of the Geology and Soils Report. The revised recommendations should read as follows: "Piers spaced closer than eight foundation diameters (center to center) can have a total lateral capacity less than the sum of the capacities of the individual piers. For design, we recommend a group efficiency factor for lateral design of 0.50, 0.65, 0.85, 0.90, 0.95, and 1.0 for center-to-center spacing of 3, 4, 5, 6, 7, and 8 diameters or more, respectively. Lateral resistance group efficiency factors for intermediate spacing can be determined by linear interpolation between the noted values."

FIGURES



LEGEND

BB-2	AUGER BORING BY BYER GEOTECHNICAL, 2014
BB-4	BUCKET-AUGER BORING BY VAN BEVEREN & BUTELO, REPORT DATE 9/1/04
GTB-2	GEOTECHNOLOGIES, INC, 2018 HAND AUGER BORING
SVP-1	GEOSYNTEC, 2019 SOIL VAPOR PROBE
GSB-1	GEOSYNTEC, 2019 GEOTECHNICAL BORING
$\frac{Q_{ppf}}{}$	QUATERNARY PREVIOUSLY PLACED FILL OVERLYING
T_{mss}	TERTIARY MODELO FORMATION, SANDSTONE UNIT
A' A	GEOLOGIC CROSS SECTION
TP-3	TEST PIT
	OUTCROP
20	STRIKE AND DIP OF BEDDING

0 40'

SCALE IN FEET

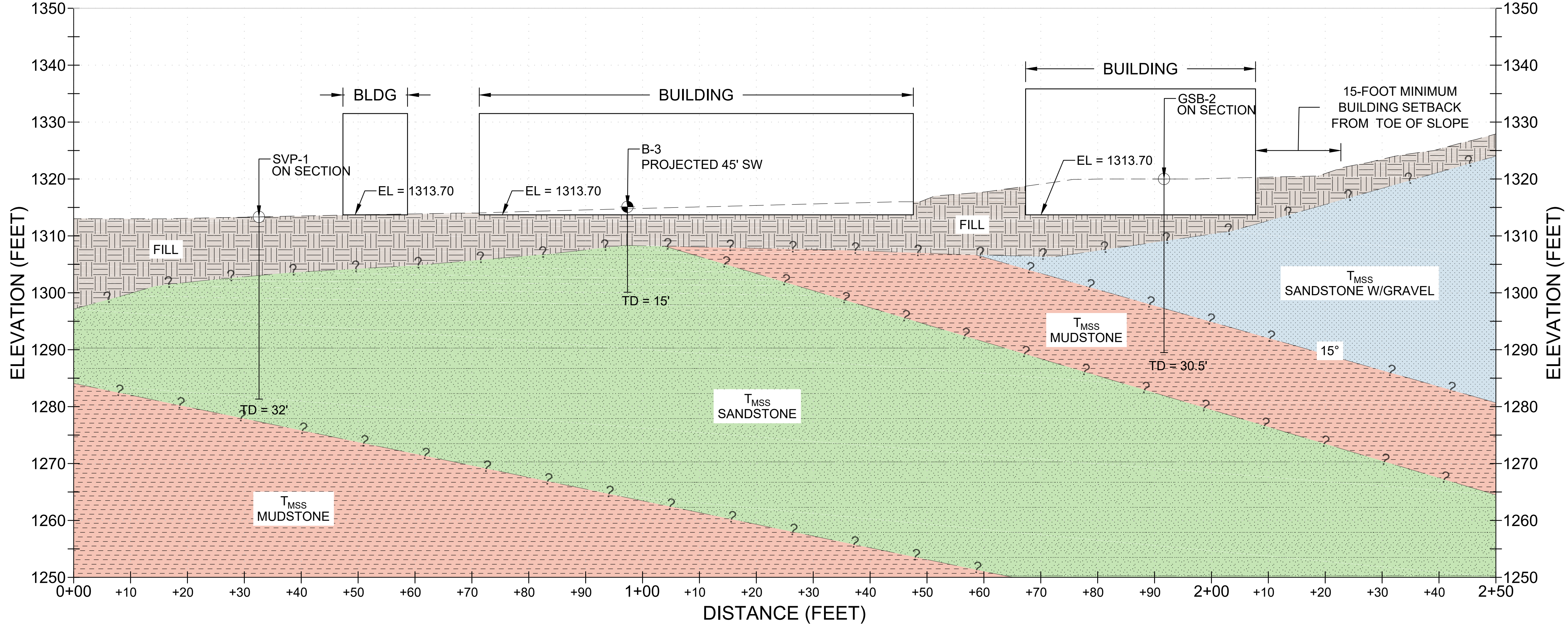
EXPLORATION LOCATION / GEOLOGIC MAP
PHASE I IMPROVEMENTS
MIRMAN SCHOOL LEARNING CENTER
16100 MULHOLLAND DRIVE
LOS ANGELES, CALIFORNIA 90049

Geosyntec consultants

FIGURE 2

PROJECT NO: SC0984A | APRIL 2021

P:\CADD\MIRMAN SCHOOL - SC0984A\FIGURES\SC0984A - MIRMAN SCHOOL -V4 - Last Saved by: JDuran on 4/30/21



CROSS SECTION A-A'

HORIZONTAL: 1" =20'

VERTICAL: 1" =20'

LEGEND

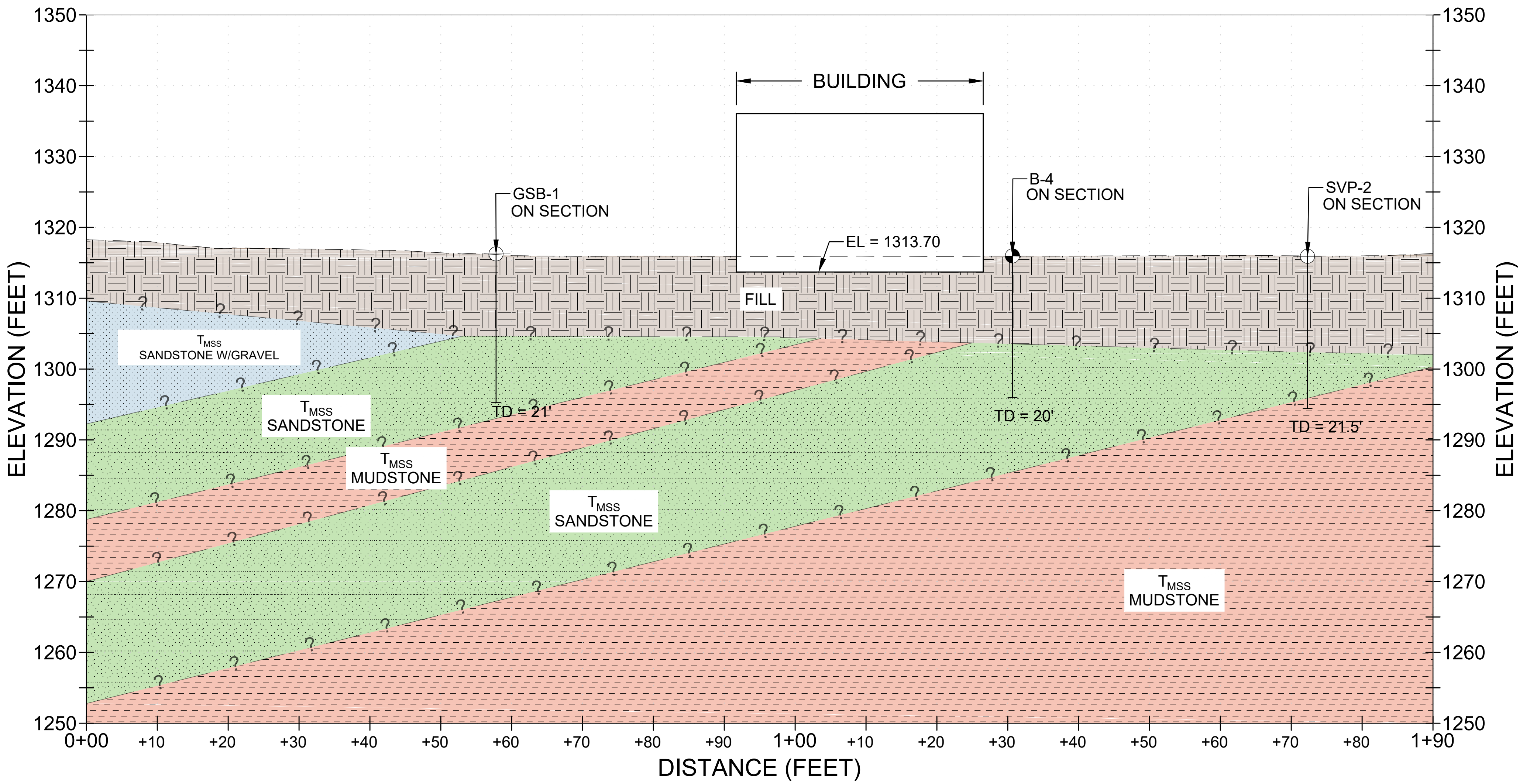
- GEOSYNTEC, 2019 GEOTECHNICAL BORING
- AUGER BORING BY BYER GEOTECHNICAL, 2014
- CONTACT
- FILL (OR NATIVE RESIDUAL SOILS WHERE MAPPED ON SLOPES)
- SANDSTONE WITH GRAVEL (SM)
- MUDSTONE (CL)
- SANDSTONE (SM/SC)

SECTION A-A'
MIRMAN SCHOOL LEARNING CENTER
16100 MULHOLLAND DRIVE
LOS ANGELES, CALIFORNIA 90049

Geosyntec consultants

FIGURE 2A

PROJECT NO: SC0984A | APRIL 2021



CROSS SECTION B-B'

HORIZONTAL: 1" =20'

VERTICAL: 1" =20'

LEGEND

- GEOSYNTEC, 2019 GEOTECHNICAL BORING
- AUGER BORING BY BYER GEOTECHNICAL, 2014
- ? CONTACT
- FILL (OR NATIVE RESIDUAL SOILS WHERE MAPPED ON SLOPES)
- SANDSTONE WITH GRAVEL (SM)
- MUDSTONE (CL)
- SANDSTONE (SM/SC)

SECTION B-B'
MIRMAN SCHOOL LEARNING CENTER
16100 MULHOLLAND DRIVE
LOS ANGELES, CALIFORNIA 90049

Geosyntec consultants

FIGURE 2B

PROJECT NO: SC0984A | APRIL 2021

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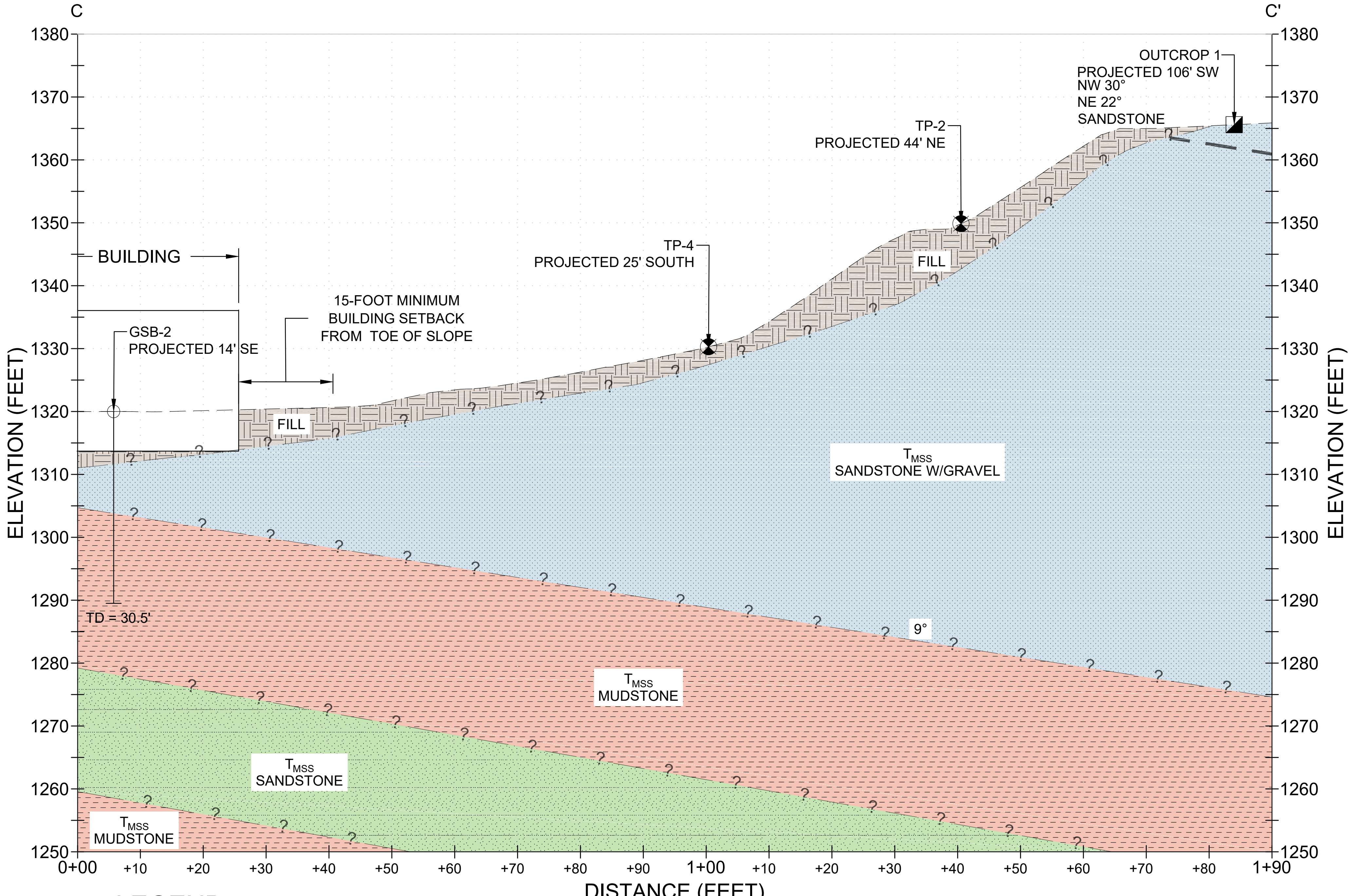

CROSS SECTION C-C'
HORIZONTAL: 1" =20'
VERTICAL: 1" =20'

LEGEND

- GEOSYNTEC, 2019 GEOTECHNICAL BORING
- AUGER BORING BY BYER GEOTECHNICAL, 2014
- ? CONTACT
- FILL (OR NATIVE RESIDUAL SOILS WHERE MAPPED ON SLOPES)
- SANDSTONE WITH GRAVEL (SM)
- MUDSTONE (CL)
- SANDSTONE (SM/SC)

SECTION C-C'
MIRMAN SCHOOL LEARNING CENTER
16100 MULHOLLAND DRIVE
LOS ANGELES, CALIFORNIA 90049

Geosyntec consultants

FIGURE 2C

PROJECT NO: SC0984A

APRIL 2021

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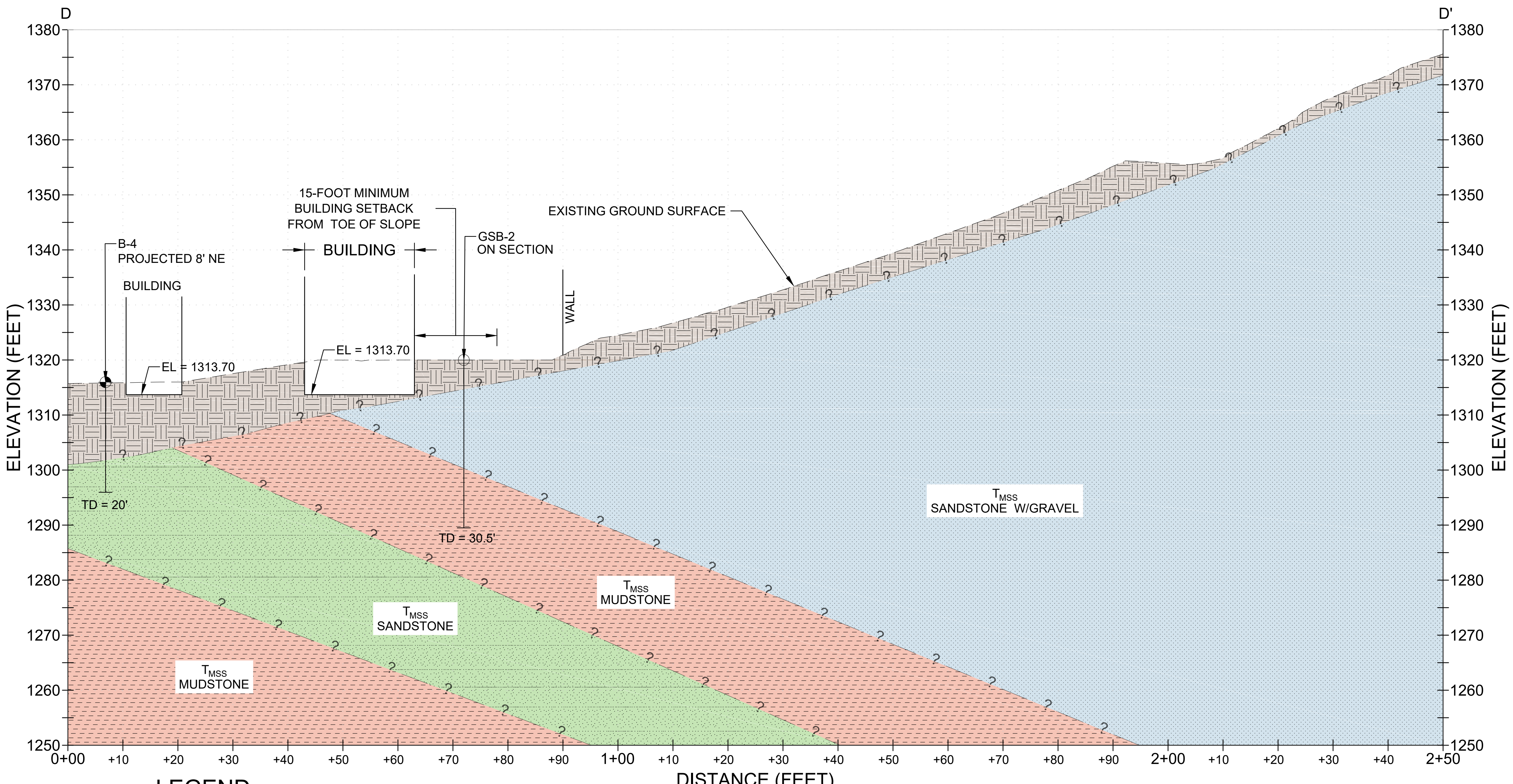

CROSS SECTION D-D'

HORIZONTAL: 1" =20'

VERTICAL: 1" =20'

LEGEND

- GEOSYNTEC, 2019 GEOTECHNICAL BORING
- AUGER BORING BY BYER GEOTECHNICAL, 2014
- ? CONTACT
- FILL (OR NATIVE RESIDUAL SOILS WHERE MAPPED ON SLOPES)
- SANDSTONE WITH GRAVEL (SM)
- MUDSTONE (CL)
- SANDSTONE (SM/SC)

SECTION D-D'
MIRMAN SCHOOL LEARNING CENTER
16100 MULHOLLAND DRIVE
LOS ANGELES, CALIFORNIA 90049

Geosyntec consultants

PROJECT NO: SC0984A | APRIL 2021

FIGURE 2D

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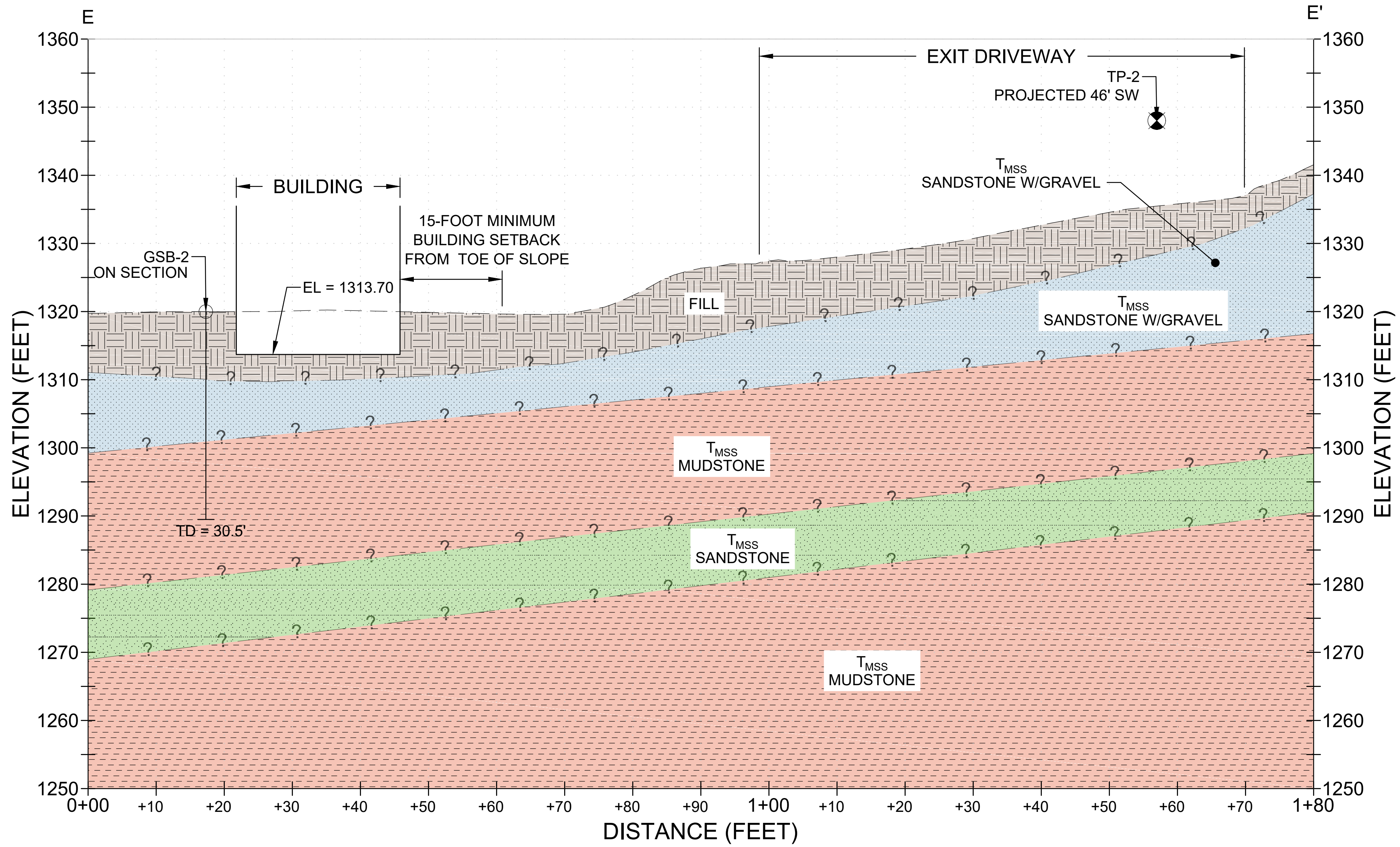


CROSS SECTION E-E'

HORIZONTAL: 1" =20'

VERTICAL: 1" =20'

LEGEND

- GEOSYNTEC, 2019 GEOTECHNICAL BORING
- AUGER BORING BY BYER GEOTECHNICAL, 2014
- ? CONTACT
- FILL (OR NATIVE RESIDUAL SOILS WHERE MAPPED ON SLOPES)
- SANDSTONE WITH GRAVEL (SM)
- MUDSTONE (CL)
- SANDSTONE (SM/SC)

SECTION E-E'
MIRMAN SCHOOL LEARNING CENTER
16100 MULHOLLAND DRIVE
LOS ANGELES, CALIFORNIA 90049

Geosyntec consultants

PROJECT NO: SC0984A | APRIL 2021

FIGURE 2E

Appendix A

LADBS Approved Reports

BYER GEOTECHNICAL, INC.

August 1, 2016
BG 21339

The Mirman School
16180 Mulholland Drive
Los Angeles, California 90049

Attention: Mr. David Royal

Subject

Transmittal of Addendum Geologic and Soils Engineering Memorandum
Review of Low-Impact Development (LID) Plan
Proposed Physical Education and Office/Restroom Buildings and Basketball Fields
Lot A, Parcel Map 4816
16100 Mulholland Drive
Los Angeles, California

Gentlepersons:

Byer Geotechnical has completed our geologic and soils engineering memorandum, dated August 1, 2016, which addresses the proposed storm-water storage and reuse system planned beneath the proposed basketball fields. The reviewing agency for this document is City of Los Angeles, Department of Building and Safety (LADBS). The reviewing agency requires three unbound copies, one with wet signatures, a CD (PDF format), an application form, and a filing fee. Copies of the report have been distributed as follows:

(1) Addressee (E-mail and Mail)
(3) Johnson Favaro Architecture, Attention: Nick Martinez (E-mail and Pick Up)

It is our understanding that Johnson Favaro Architecture will file the memorandum and the CD with the LADBS. Please review the report carefully prior to submittal to the governmental agency. Questions concerning the report should be directed to the undersigned. Byer Geotechnical appreciates the opportunity to offer our consultation and advice on this project.

Very truly yours,
BYER GEOTECHNICAL, INC.

Raffi S. Babayan
Senior Project Engineer

BYER GEOTECHNICAL, INC.

August 1, 2016
BG 21339

The Mirman School
16180 Mulholland Drive
Los Angeles, California 90049

Attention: Mr. David Royal

Subject

Geologic and Soils Engineering Memorandum
Review of Low-Impact Development (LID) Plan
Proposed Physical Education and Office/Restroom Buildings and Basketball Courts
Lot A, Parcel Map 4816
16100 Mulholland Drive
Los Angeles, California

References: Reports by Byer Geotechnical, Inc.:

Geologic and Soils Engineering Update, Proposed Athletic Field, Parking, and School Building, Lot A, Parcel Map 4816, 16100 Mulholland Drive, Los Angeles, California, dated June 28, 2011;

Geologic and Soils Engineering Exploration Update, Proposed School Building and Athletic Field, Lot A, Parcel Map 4816, 16100 Mulholland Drive, Los Angeles, California, dated July 31, 2014;

Geologic and Soils Engineering Exploration Update, Proposed School Building and Athletic Field, Lot A, Parcel Map 4816, 16100 Mulholland Drive, Los Angeles, California, dated February 3, 2015; and

Compaction Report, Retaining Wall Backfill and Proposed Athletic Field, Grading Permit # 15030 - 10000 - 01096, Parcel A, Parcel Map 4816, 16100 West Mulholland Drive, Los Angeles, California, dated September 18, 2015.

Responses by the City of Los Angeles, Department of Building and Safety (LADBS):

Geology and Soils Report Approval Letter, Log # 87193, dated March 3, 2013; and

Compaction Report Approval List, Log # 90127, dated September 23, 2015.

Dear Mr. Royal:

As requested by Mr. Nick Martinez of Johnson Favaro Architecture and Urban Planning (JFA), Byer Geotechnical has reviewed the proposed storm-water storage and reuse system planned on the subject site, as shown on the enclosed LID Plan, Sheet C1.03, and Details, Sheet C1.01A, prepared by JFA, dated May 12, 2016.

The proposed storm-water storage and reuse system will consist of a 165-foot-long by 16.5-foot-wide by 4-foot-thick gravel gallery that is planned beneath the east portion of the proposed basketball courts, as shown on Sheet C1.03. The gravel gallery will be backfilled with ⅜- to 1½-inch aggregate material and completely wrapped with a 40-mil PVC geomembrane. Three perforated eight-inch-diameter collection pipes are planned along the length of the gallery. Also, one eight-inch to three-inch diameter intake pipe is planned about a foot above the bottom. A four-foot-thick compacted-fill blanket will be placed atop the gravel gallery to support the concrete slab-on-grade for the proposed basketball courts. The gravel galley will be connected to a concrete diverter box (see Detail 9/C1.01A) and a pump for reuse of the stored water for irrigation. Excess water will discharge to the existing public storm drain via a high-flow pipe in case storage capacity of the gravel gallery is exceeded.

Byer Geotechnical has been asked to comment on the ability of the four-foot cap over the four-foot gravel gallery to support the proposed basketball courts. It should be emphasized that the performance of the concrete slab-on-grade of the proposed basketball courts is dependent upon the performance of the storm-water storage and reuse system, including the gravel gallery, pipes, and pump. The four pipes should be capable of supporting high loads without crushing or deformation. The coarse aggregate gravel galley fill material should be placed in thin lifts and densified in-place by vibration. The compacted-fill cap should be placed in thin lifts of six inches, moisture conditioned, and compacted to a minimum of 90 percent of the maximum dry density.

The suitability of the proposed storm-water storage and reuse system to perform as designed is deferred to the civil engineer of record.

All other recommendations contained in the above-referenced reports remain valid and applicable to the proposed project.

Byer Geotechnical appreciates the opportunity to continue to provide our service on this project. Any questions concerning the data or interpretation of this report should be directed to the undersigned.

Respectfully submitted,
BYER GEOTECHNICAL, INC.

Raffi S. Babayan
P. E. 72168

Robert I. Zweigler
E. G. 1210/G. E. 2120

RSB:RIZ:mh
P:\21000 - 21999\21339 The Mirman School\Drafts\21339 Addendum Update_Review of LID Plan.wpd

Enc: LADBS, Geology and Soils Report Approval Letter, dated March 3, 2015 (4 Pages)
LADBS, Compaction Report Approval List, dated September 23, 2015
Johnson Favaro Architecture, LID Plan, Sheet C1.03, dated May 12, 2016
Johnson Favaro Architecture, Details, Sheet C1.01A, dated May 12, 2016

xc: (1) Addressee (E-mail and Mail)
(3) Johnson Favaro Architecture, Attention: Nick Martinez (E-mail and Pick Up)

CITY OF LOS ANGELES
CALIFORNIA

ERIC GARCETTI
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

RAYMOND S. CHAN, C.E., S.E.
GENERAL MANAGER

FRANK BUSH
EXECUTIVE OFFICER

GEOLOGY AND SOILS REPORT APPROVAL LETTER

March 3, 2015

LOG # 87193
SOILS/GEOLOGY FILE - 2
LAN

The Mirman School for Gifted Children
16180 W. Mulholland Drive
Los Angeles, CA 90049

TRACT: PM 4816
LOT: A
LOCATION: 16100 W. Mulholland Drive

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE(S) OF DOCUMENT	PREPARED BY
Geology/Soil Report	BG 21339	07/31/2014	Byer Geotechnical, Inc.
Oversized Docs.	"	"	"

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE(S) OF DOCUMENT	PREPARED BY
Dept. Approval Letter (Compaction)	31334	12/16/1992	LADBS
Dept. Approval Letter	45237	10/27/2004	LADBS
Geology/Soil Report	02-040.3	09/01/2004	Van Beveren & Butelo
Dept Approval letter	41654	11/18/2003	LADBS
Geology/Soil Report	02-040.3	10/13/2003	Van Beveren & Butelo
Primary Structural Fill	31334	12/16/1992	LADBS

The Grading Division of the Department of Building and Safety has reviewed the referenced report providing recommendations for the proposed athletic field buildings, basketball court, soccer/kickball field and playground areas. The currently proposed construction is in addition to all previously proposed construction.

The Department previously conditionally approved the above referenced reports dated 10/13/2003 and 09/01/2004 for previously proposed construction in letters dated 11/18/2003 and 10/27/2004, Log #'s 41654 and 45237.

The earth materials at the subsurface exploration locations consist of up to and possibly greater than 25.5 feet of compacted fill underlain by Modelo Formation sandstone with some siltstone and shale bedrock. The area of the proposed improvements is generally flat and an approximately 100 foot high 1.5:1 cut slope with drainage terraces is located to the east of the proposed improvements.

The consultants recommend to support the proposed structures on conventional foundations bearing on a blanket of properly placed fill a minimum of 3 feet thick, placed both on bedrock and previously-certified fill (see Log# 31334).

Engineering analyses provided by Byer Geotechnical, Inc. is partially based on field and laboratory testing performed by Law/Crandall, Inc. and Van Beveren & Butelo. Byer Geotechnical, Inc. is accepting responsibility for use of the data in accordance to Code section 91.7008.5 of LABC.

The referenced report is acceptable, provided the following conditions are complied with during site development:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2014 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. Heave prone shales have been documented at other sites in the area of the subject lot. If heave prone shale is encountered during excavation, the consultant shall provide mitigation recommendations, as appropriate. Note: The undersigned geologist can be contacted for more information regarding the heave prone shales.

2. Since the site is underlain by compacted fill and bedrock with very poor percolation characteristics, infiltration pits are not recommended by the consultant on the subject site, and not approved in this letter.

3. The geologist and soils engineer shall review and approve the detailed plans prior to issuance of any permits. This approval shall be by signature on the plans which clearly indicates that the geologist and soils engineer have reviewed the plans prepared by the design engineer and that the plans include the recommendations contained in their reports. (7006.1)

4. All recommendations of the reports which are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

5. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans. Submit one copy of the above reports to the Building Department Plan Checker prior to issuance of the permit. (7006.1)

6. A grading permit shall be obtained for all structural fill and retaining wall backfill. (106.1.2)

7. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557. Where cohesionless soil having less than 15 percent finer than 0.005 millimeters is used for fill, it shall be compacted to a minimum of 95 percent relative compaction based on maximum dry density (D1556). Placement of gravel in lieu of compacted fill is allowed only if complying with Section 91.7011.3 of the Code. (7011.3)

8. New compacted fill shall extend beyond the footings a minimum distance equal to the depth of the fill below the bottom of footings or a minimum of three feet whichever is greater, as recommended. (7011.3)

9. Existing uncertified fill shall not be used for support of footings, concrete slabs or new fill. (1809.2)

10. Drainage in conformance with the provisions of the Code shall be maintained during and subsequent to construction. (7013.12)

11. Grading shall be scheduled for completion prior to the start of the rainy season, or detailed temporary erosion control plans shall be filed in a manner satisfactory to the Grading Division of the Department and the Department of Public Works, Bureau of Engineering, B-Permit Section, for any grading work in excess of 200 cu yd. (7007.1)
    1828 Sawtelle Blvd., 3rd Floor, West LA (310) 575-8388

12. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the State Construction Safety Orders enforced by the State Division of Industrial Safety. (3301.1)

13. Excavations shall not remove lateral support from a public way, adjacent property or an existing structure. Note: Lateral support shall be considered to be removed when the excavation extends below a plane projected downward at an angle of 45 degrees from the bottom of a footing of an existing structure, from the edge of the public way or an adjacent property. (3307.3.1)

14. A supplemental report shall be submitted to the Grading Division of the Department containing recommendations for shoring, underpinning, and sequence of construction in the event that any excavation would remove lateral support to the public way, adjacent property, or adjacent structures. A plot plan and cross-section(s) showing the construction type, number of stories, and location of the structures adjacent to the excavation shall be part of the excavation plans. (3307.3 & 7006.2)

15. Unsurcharged temporary excavations over 5 feet exposing soil shall be trimmed back at a gradient not exceeding 1:1.

16. All foundations shall derive entire support from a blanket of properly placed fill a minimum of 3 feet thick, placed both on bedrock and previously-certified fill, as recommended and approved by the geologist and soils engineer by inspection.

17. The seismic design shall be based on a Site Class C as recommended. All other seismic design parameters shall be reviewed by LADBS building plan check.

18. All roof and pad drainage shall be conducted to the street in an acceptable manner. (7013.10)

19. All concentrated drainage shall be conducted in an approved device and disposed of in a manner approved by the LADBS. (7013.10)

20. Prior to the pouring of concrete, a representative of the consulting soils engineer shall inspect and approve the footing excavations. The representative shall post a notice on the job site for the LADBS Building Inspector and the Contractor stating that the work so inspected meets the conditions of the report, but that no concrete shall be poured until the City Building

Inspector has also inspected and approved the footing excavations. A written certification to this effect shall be filed with the Grading Division of the Department upon completion of the work. (108.9 & 7008.2)

21. Prior to excavation, an initial inspection shall be called with LADBS Inspector at which time sequence of construction, protection fences and dust and traffic control will be scheduled. (108.9.1)

22. Site grading shall be performed under the inspection and approval of the soils engineer and deputy grading inspector. (1705.6)

23. Prior to the placing of compacted fill, a representative of the soils engineer shall inspect and approve the bottom excavations. The representative shall post a notice on the job site for the City Grading Inspector and the Contractor stating that the soil inspected meets the conditions of the report, but that no fill shall be placed until the LADBS Grading Inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be included in the final compaction report filed with the Grading Division of the Department. All fill shall be placed under the inspection and approval of the soils engineer. A compaction report together with the approved soil report and Department approval letter shall be submitted to the Grading Division of the Department upon completion of the compaction. In addition, an Engineer's Certificate of Compliance with the legal description as indicated in the grading permit and the permit number shall be included. (7011.3)

24. No footing/slab shall be poured until the compaction report is submitted and approved by the Grading Division of the Department.

CASEY LEE JENSEN
Engineering Geologist Associate II

J. ADOLFO ACOSTA
Geotechnical Engineer II

CLJ/JAA:clj/jaa
Log No. 87193
213-482-0480

cc: Ingrid Dennert, Johnson Favaro, Applicant
Byer Geotechnical, Inc., Project Consultant
WL District Office

LADBS
DEPARTMENT OF BUILDING AND SAFETY

City of Los Angeles
COMPACTION REPORT APPROVAL LIST
FOR NON STRUCTURAL FILL

LOG# 90127 DATE 9/23/2015 **COMPACTION FILE - 5**

JOB ADDRESS 16100 W. Mulholland DR DISTRICT OFFICE WLA

TRACT PM 4816 COUNTY REF. # BK 155-5/9

BLOCK N/A PERMIT No. 15030-10000-01096

LOT A ARB N/A

FILL SOILS CLASSIFICATION, PER TABLE 18.1.A : Silty SAND, GRAVELLY SAND

REPORT PREPARED BY: Byer Geotechnical DATED 9/18/2015

REPORT #: BG 21338

OVERSIZED DOCUMENTS X-REF ______ DATED ______

REVIEWED BY Brian Olm TELEPHONE 310-914-3936

The compaction report(s) have been reviewed by the Grading Section of the Department and have been found to be acceptable provided the proposed construction complies with the conditions specified in this letter. The approval of the reports does not permit the violation of any section of the Building Code, or other local ordinance or state law.

NOTE: Numbers in parenthesis ( ) refer to Code sections of the 1998 edition of the California Building Code, Information Bulletin (P/BC).

INSTRUCTIONS

- All of the following listed and circled conditions shall apply: 1

CONDITIONS FOR NON STRUCTURAL FILL:

1. The compacted fill is approved as a non-structural fill and shall not be used for the support of structures.
2. ~~Slope erosion control, planting and irrigating of fill slopes and run-off control are required for those areas outside the building on hillside areas per Sections 91.7012 and 91.7013 of the Los Angeles City Building Code.~~
3. ~~Interim report only.~~

LEGEND

PROJECT STUDY AREA
PROPERTY LINE P/L
LOT LINE
PROPOSED STORM DRAIN
PROPOSED SUB DRAIN
SLOT DRAIN
EXISTING STORM DRAIN
LANDSCAPE/GRASS
STORAGE GRAVEL GALLERY
X / AC — AREA DESIGNATION / AREA IN ACRES

NO DUMPING — DRAINS TO OCEAN
STENCIL ALL STORM DRAIN INLETS WITH STENCIL
A STORM DRAIN STENCIL

LID CONSTRUCTION NOTES

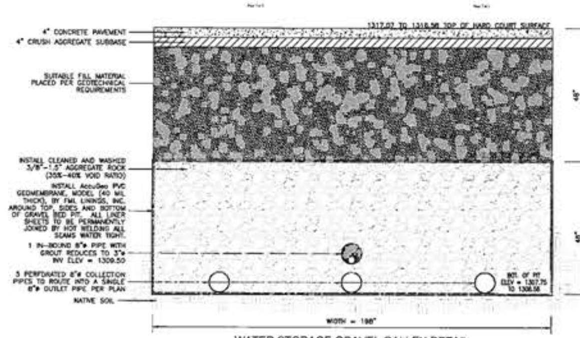
1. INSTALL STORM DRAIN STENCIL NEXT TO CATCH BASIN PER DETAIL "A" SHOWN HEREON.

SCALE: 1" = 20'

LID CAPTURE AND USE DESIGN CALCULATION

APPENDIX ITEM B

APPENDIX ITEM B



WATER STORAGE GRAVEL GALLEY DETAIL

PROJECT

THE MIRMAN SCHOOL FOR GIFTED CHILDREN

ATHLETIC FACILITIES

SITE ADDRESS:
16180 MULHOLLAND DRIVE
LOS ANGELES, CA 90049

OWNER ADDRESS:
16180 MULHOLLAND DRIVE
LOS ANGELES, CA 90049

ARCHITECT

JOHNSON FAVARO
Architecture and Urban Design

CONSULTANTS

CITY APPROVALS

No.	Issue	Date
	Plan Check Review 1	5-12-16
	100% CD	3-29-16
	100% DD Review	1-29-16

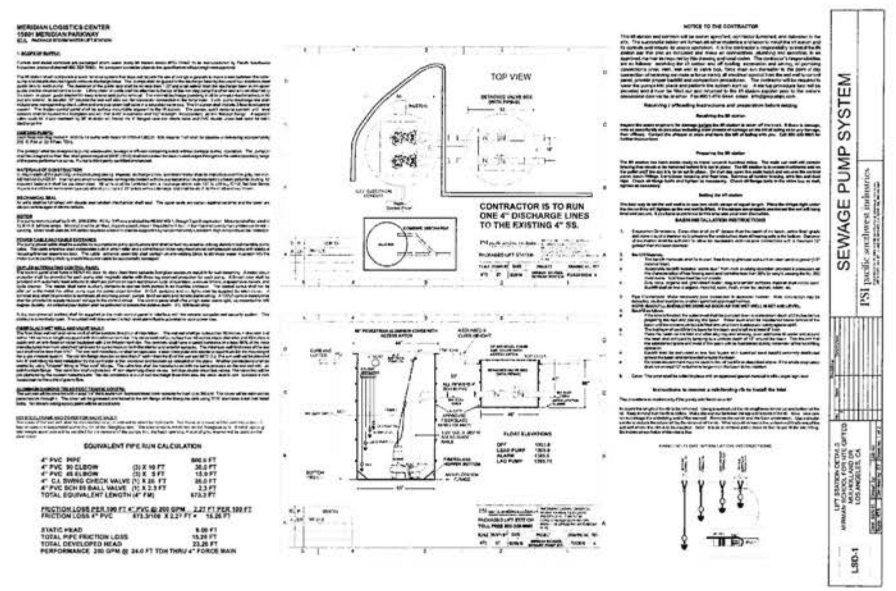
ISSUE / REVISIONS

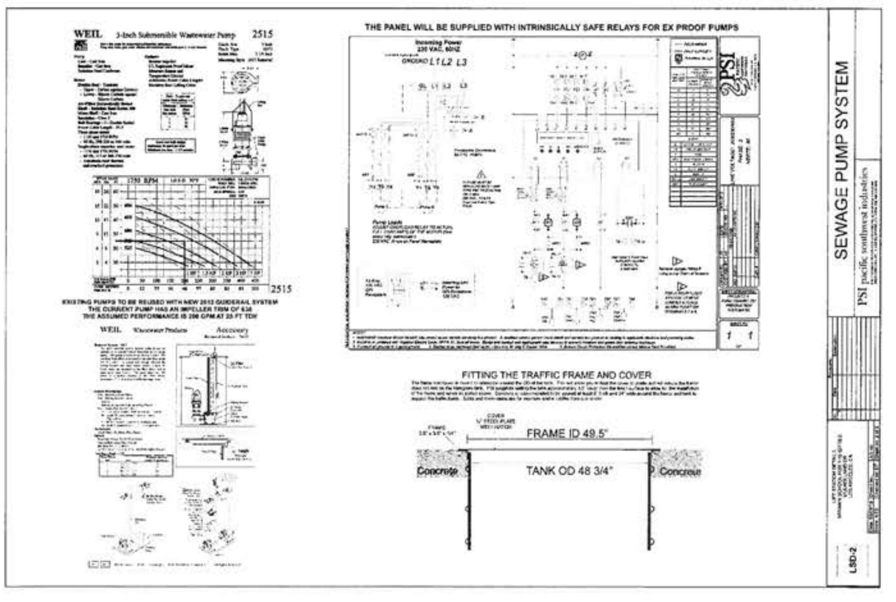
LID PLAN

DATE: MAY 12, 2016

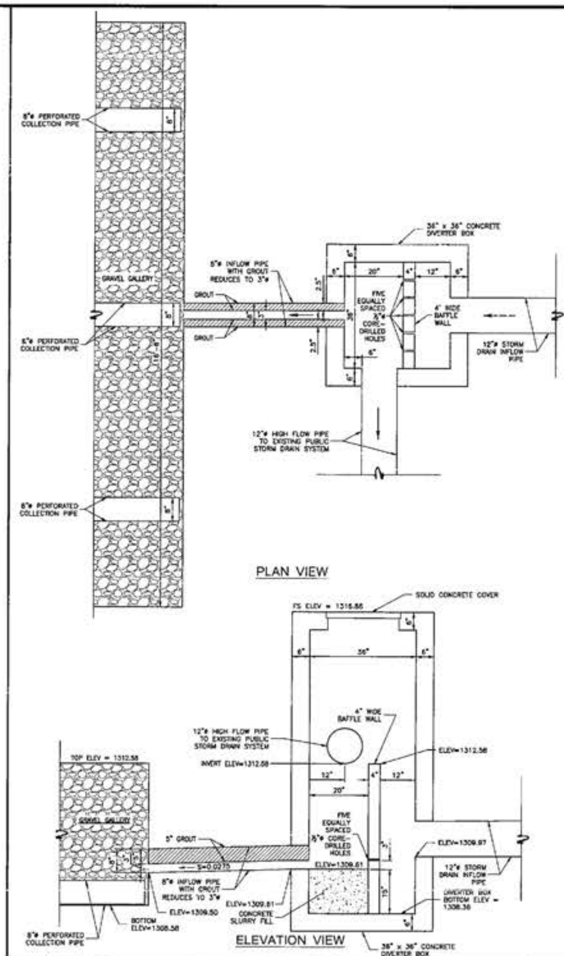
PROJECT # 1504

C1.03

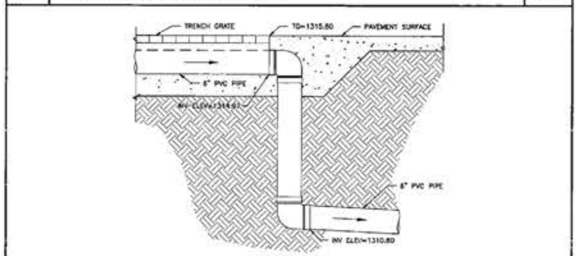




8 SEWER DUAL PUMP LIFT STATION SYSTEM, WET WELL, ELECTRIC POWER SYSTEM, AND DETACHED VALVE BOX DETAIL — SCALE: SEE DRAWING



9 3'x3' CONCRETE DIVERTER BOX DETAIL — NTS



10 SLOT DRAIN TO STORM DRAIN SYSTEM CONNECTION DETAIL — NTS

PROJECT

THE MIRMAN SCHOOL FOR GIFTED CHILDREN

ATHLETIC FACILITIES

SITE ADDRESS:
16100 MULHOLLAND DRIVE
LOS ANGELES, CA 90049

OWNER ADDRESS:
16180 MULHOLLAND DRIVE
LOS ANGELES, CA 90049

ARCHITECT

JOHNSON FAVARO
Architecture and Urban Design

CONSULTANTS

FUSCOE ENGINEERING, INC

NABIH YOUSSEF

THE OFFICE OF JAMES BURNETT

INTEGRAL

MGAC

ARCHITECT'S / ENGINEER'S STAMP

CITY APPROVALS

No.	Issue	Date
	Plan Check Review 1	5-12-16
	100% CD	3-29-16
	100% DD Review	1-29-16

ISSUE / REVISIONS

DETAILS

DATE MAY 12, 2016

PROJECT # 1004

SHEET

C1.01A

Appendix B

Geotechnical Boring Logs

Geosyntec consultants

2100 Main St
Suite 150
Huntington Beach, CA 92648
Tel: (714) 969-0800
Fax: (714) 969-0820

GS FORM: WELL BORE 01/04

BOREHOLE LOG

BORING GSB-1 **SHEET** 1 **OF** 1
START DRILL DATE Nov 1, 19
FINISH DRILL DATE Nov 1, 19
LOCATION Los Angeles, CA
PROJECT Mirman School
NUMBER SC0984A

ELEVATION DATA:
GROUND SURF. (Ft)
TOP OF CASING (Ft)
DATUM

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE NO.	TYPE	BLOW COUNT	RECOVERY (%)	PID/FID (ppm)	TIME (00:00)	COMMENTS 1) Rig Behavior 2) Air Monitoring
0	Quarternary Previously Placed Fill (Qppf): 0-8 ft bgs: SILTY SAND with trace GRAVEL (SM); brown (10YR, 5/3); dry; 5-80-15			No groundwater observed.								Hand auger to 5 ft bgs.
5						S-1		9 11 15				Bulk sample S-1 taken from 5 ft bgs.
8	8 ft bgs: CLAYEY SAND (SC); dark brown (10YR, 3/3); moist; 15-60-25											
10	Tertiary Modelo Formation, Sandstone Unit (Tmss): 10 ft bgs: SANDSTONE: brown (10YR, 5/3); fine to medium grained (0-60-40)					M-1		3 54/3"				Native at approximately 10 ft bgs.
15						M-2		32 50/4"				
20						S-2		15 33 45				
21	21 ft bgs: As above; finer sand; oxidized											Total depth = 21.5 ft bgs
25												
30												

CONTRACTOR Choice Drilling
EQUIPMENT Track Rig LAR
DRILL MTHD Hollow Stem Auger
DIAMETER 8-inch
LOGGER B.Swanson **REVIEWER** D. Kilian

NORTHING
EASTING
COORDINATE SYSTEM:

NOTES:
S-1 = bulk samples; M-# = Cal Mod samples

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

Geosyntec consultants
2100 Main St
Suite 150
Huntington Beach, CA 92648
Tel: (714) 969-0800
Fax: (714) 969-0820

GS FORM: WELL BORE 01/04

BOREHOLE LOG

BORING GSB-2

START DRILL DATE Nov 1, 19
FINISH DRILL DATE Nov 1, 19
LOCATION Los Angeles, CA
PROJECT Mirman School
NUMBER SC0984A

ELEVATION DATA:
GROUND SURF. (Ft)
TOP OF CASING (Ft)
DATUM

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE NO.	TYPE	BLOW COUNT	RECOVERY (%)	PID/FID (ppm)	TIME (00:00)	COMMENTS 1) Rig Behavior 2) Air Monitoring
0	Quarternary Previously Placed Fill (Qppf):			No groundwater observed.								Hand auger to 5 ft bgs.
3	3 ft bgs: SILTY SAND with GRAVEL (SM); olive brown (2.5Y, 4/3); moist; fine to medium sand (15-70-15)					S-1		4 5 7				Bulk sample S-1 taken from 3 ft bgs.
5						M-1		10 17 50				
6	6 ft bgs: As above; no GRAVEL; brownish yellow (10YR, 6/8); 0-80-20											
10	Tertiary Modelo Formation, Sandstone Unit (Tmss): 10 ft bgs: SANDSTONE; brownish yellow (10YR, 6/8); moist; fine to medium grained with gravel (10-80-10)					M-2		45 50/3"				Native at approximately 10 ft bgs.
15	15 ft bgs: As above; no gravel; dry; 0-70-30					M-3		50/5"				
20	20 ft bgs: MUDSTONE; yellowish red (5YR, 4/6); dry; fine sand and sub angular gravel; high strength					M-4		27 50/5"				
25	25 ft bgs: As above; dark brown (10YR, 3/3)					M-5		50/3"				
30												

CONTRACTOR Choice Drilling
EQUIPMENT Track Rig LAR
DRILL MTHD Hollow Stem Auger
DIAMETER 8-inch
LOGGER B.Swanson
REVIEWER D. Kilian

NORTHING
EASTING
COORDINATE SYSTEM:

NOTES:
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Huntington Beach, CA 92648
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GS FORM: WELL BORE 01/04

BOREHOLE LOG

BORING	GSB-2	SHEET	2 OF 2
START DRILL DATE	Nov 1, 19	ELEVATION DATA:	
FINISH DRILL DATE	Nov 1, 19	GROUND SURF. (Ft)	
LOCATION	Los Angeles, CA	TOP OF CASING (Ft)	
PROJECT	Mirman School	DATUM	
NUMBER	SC0984A		

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE NO.	TYPE	BLOW COUNT	RECOVERY (%)	PID/FID (ppm)	TIME (00:00)	COMMENTS 1) Rig Behavior 2) Air Monitoring
								33 50/1"				Total depth = 30.58 ft bgs
35												
40												
45												
50												
55												
60												

CONTRACTOR	Choice Drilling	NORTHING	
EQUIPMENT	Track Rig LAR	EASTING	
DRILL MTHD	Hollow Stem Auger	COORDINATE SYSTEM:	
DIAMETER	8-inch		
LOGGER	B.Swanson	REVIEWER	D. Kilian

NOTES:
S-1 = bulk samples; M-# = Cal Mod samples

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Geosyntec consultants
2100 Main St
Suite 150
Huntington Beach, CA 92648
Tel: (714) 969-0800
Fax: (714) 969-0820

GS FORM: WELL BORE 01/04

BOREHOLE LOG

BORING SVP-1 **SHEET** 1 **OF** 2
START DRILL DATE Nov 1, 19
FINISH DRILL DATE Nov 1, 19
LOCATION Los Angeles, CA
PROJECT Mirman School
NUMBER SC0984A

ELEVATION DATA:
GROUND SURF. (Ft)
TOP OF CASING (Ft)
DATUM

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE NO.	TYPE	BLOW COUNT	RECOVERY (%)	PID/FID (ppm)	TIME (00:00)	COMMENTS 1) Rig Behavior 2) Air Monitoring
0	Quarternary Previously Placed Fill (Qppf):			No groundwater observed.								Hand auger to 5 ft bgs.
3	3 ft bgs: SILTY SAND with trace GRAVEL (SM); brown (10YR, 5/3); dry; fine to medium sand (5-80-15)					S-1		4 5 6				Bulk sample S-1 taken from 3 ft bgs.
5	5 ft bgs: As above; moist with GRAVEL (10-75-15)					M-1		11 13 21				
10	Tertiary Modelo Formation, Sandstone Unit (Tmss):					M-2		28 37 50/5"				Native at approximately 10 ft bgs. Alternating sand and mudstone layers.
	10 ft bgs: SANDSTONE, clayey with gravel; dark brown (10YR, 3/3); moist; fine sand (15-60-25)											
	11 ft bgs: SANDSTONE, silty matrix; brown (10YR, 5/3); dry; medium sand (0-60-40); high strength ; micas											
15	15 ft bgs: SANDSTONE, clayey matrix; olive-gray (5Y, 4/1); moist; fine to med grained (0-50-50)					M-3		16 19 35				
20						M-4		50/6"				
21	21 ft bgs: SANDSTONE, silty matrix, reddish brown (5YR, 4/6); dry; fine to medium sand (0-60-40)											
25						M-5		50/4"				
25.5	25.5 ft bgs: SANDSTONE; clayey matrix, brown-brownish yellow (10YR, 5/3); dry; 0-60-40; high strength											
30												

CONTRACTOR Choice Drilling
EQUIPMENT Track Rig LAR
DRILL MTHD Hollow Stem Auger
DIAMETER 8-inch
LOGGER B.Swanson **REVIEWER** D. Kilian

NORTHING
EASTING
COORDINATE SYSTEM:

NOTES:
S-1 = bulk samples; M-# = Cal Mod samples

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

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Huntington Beach, CA 92648
Tel: (714) 969-0800
Fax: (714) 969-0820

GS FORM: WELL BORE 01/04

BOREHOLE LOG

BORING SVP-1 **SHEET** 2 **OF** 2
START DRILL DATE Nov 1, 19
FINISH DRILL DATE Nov 1, 19
LOCATION Los Angeles, CA
PROJECT Mirman School
NUMBER SC0984A

ELEVATION DATA:
GROUND SURF. (Ft)
TOP OF CASING (Ft)
DATUM

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE NO.	TYPE	BLOW COUNT	RECOVERY (%)	PID/FID (ppm)	TIME (00:00)	COMMENTS 1) Rig Behavior 2) Air Monitoring
						M-6		50/4"				
												Total depth = 32 ft bgs
35												
40												
45												
50												
55												
60												

CONTRACTOR Choice Drilling
EQUIPMENT Track Rig LAR
DRILL MTHD Hollow Stem Auger
DIAMETER 8-inch
LOGGER B.Swanson **REVIEWER** D. Kilian

NORTHING
EASTING
COORDINATE SYSTEM:

NOTES:
S-1 = bulk samples; M-# = Cal Mod samples

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Geosyntec consultants

2100 Main St
Suite 150
Huntington Beach, CA 92648
Tel: (714) 969-0800
Fax: (714) 969-0820

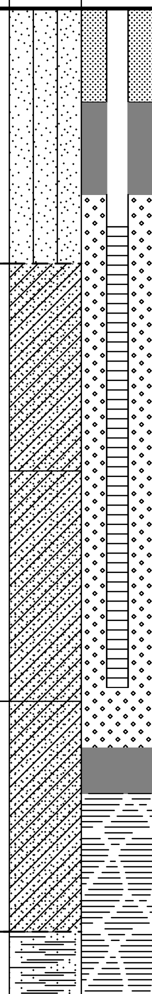
GS FORM: WELL BORE 01/04

BOREHOLE LOG

BORING SVP-2 **SHEET** 1 **OF** 1
START DRILL DATE Nov 1, 19
FINISH DRILL DATE Nov 1, 19
LOCATION Los Angeles, CA
PROJECT Mirman School
NUMBER SC0984A

ELEVATION DATA:
GROUND SURF. (Ft)
TOP OF CASING (Ft)
DATUM

DEPTH (ft-bgs)	DESCRIPTION: 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE NO.	TYPE	BLOW COUNT	RECOVERY (%)	PID/FID (ppm)	TIME (00:00)	COMMENTS: 1) Rig Behavior 2) Air Monitoring
0	Quarternary Previously Placed Fill (Qppf): 0-5.5 ft bgs: SILTY SAND with trace GRAVEL (SM); brown (10YR, 5/3); moist; fine sand and angular gravel (5-80-15)			No groundwater observed.								Hand auger to 5 ft bgs.
5	5.5 ft bgs: CLAYEY SAND (SC); dark brown (10YR, 3/3); moist; low to medium plasticity; 10-60-30					S-1		3 4 5				Bulk sample S-1 taken from 5 ft bgs.
10	10 ft bgs: As above with more fines (0-50-50)					M-1		11 21 23				
15	Tertiary Modelo Formation, Sandstone Unit (Tmss): Excavates as: 15 ft bgs: SANDSTONE, clayey matrix, dark brown (10YR, 3/3); moist (0-70-30)					M-2		15 17 21				Native at approximately 15 ft bgs.
20	20 ft bgs: MUDSTONE with alternating sand layers; brown (10YR, 5/3), dry							32 38 50/4"				Total depth = 21.5 ft bgs
25												
30												



CONTRACTOR Choice Drilling
EQUIPMENT Track Rig LAR
DRILL MTHD Hollow Stem Auger
DIAMETER 8-inch
LOGGER B.Swanson
REVIEWER D. Kilian
NORTHING
EASTING
COORDINATE SYSTEM:

NOTES:
S-1 = bulk samples; M-# = Cal Mod samples

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

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2100 Main St
Suite 150
Huntington Beach, CA 92648
Tel: (714) 969-0800
Fax: (714) 969-0820

GS FORM: WELL BORE 01/04

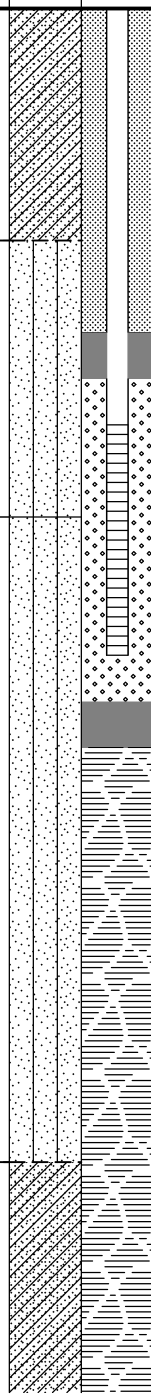
BOREHOLE LOG

BORING SVP-3
START DRILL DATE Nov 2, 19
FINISH DRILL DATE Nov 2, 19
LOCATION Los Angeles, CA
PROJECT Mirman School
NUMBER SC0984A

ELEVATION DATA:
GROUND SURF. (Ft)
TOP OF CASING (Ft)
DATUM

DEPTH (ft-bgs)	DESCRIPTION: 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE NO.	TYPE	BLOW COUNT	RECOVERY (%)	PID/FID (ppm)	TIME (00:00)	COMMENTS: 1) Rig Behavior 2) Air Monitoring
0	Quarternary Previously Placed Fill (Qppf): 3 ft bgs: Clayey SAND with trace GRAVEL (SC); yellowish-reddish brown (5YR, 4/6); moist; fine sand (5-40-55)	No groundwater observed.								
5	5 ft bgs: Silty SAND with trace GRAVEL (SM); brown (10YR, 5/3); moist; fine sand (5-60-35)			S-1		3 4 5				Hand auger to 5 ft bgs. Bulk sample S-1 taken from 5 ft bgs.
10				M-1		4 19 27				
11	Tertiary Modelo Formation, Sandstone Unit (Tmss): 11 ft bgs: SANDSTONE, silty matrix; olive grey (5YR, 4/1); fine to medium grained sand (0-85-15)									Native at approximately 11 ft bgs.
15				S-2		11 12 15				
20	20 ft bgs: As above; oxidized			M-2		11 20 32				
25	25 ft bgs: MUDSTONE; dark brown-reddish brown (10YR, 3/3-10R, 3/6); dry; 5-40-55; high strength			S-2		6 8 8				
30										

GRAPHIC LOG / WELL LOG



CONTRACTOR Choice Drilling
EQUIPMENT CME95
DRILL MTHD Hollow Stem Auger
DIAMETER 8-inch
LOGGER B.Swanson **REVIEWER** D. Kilian

NORTHING
EASTING
COORDINATE SYSTEM:

NOTES:
S-1 = bulk samples; M-# = Cal Mod samples

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

Geosyntec consultants

2100 Main St
Suite 150
Huntington Beach, CA 92648
Tel: (714) 969-0800
Fax: (714) 969-0820

GS FORM:
WELL BORE 01/04

BOREHOLE LOG

BORING	SVP-3	SHEET 2 OF 2	
START DRILL DATE	Nov 2, 19	ELEVATION DATA:	
FINISH DRILL DATE	Nov 2, 19	GROUND SURF. (Ft)	
LOCATION	Los Angeles, CA	TOP OF CASING (Ft)	
PROJECT	Mirman School	DATUM	
NUMBER	SC0984A		

DEPTH (ft-bgs)	DESCRIPTION 1) Unit/Formation, Mem. 2) USCS Name 3) Color 4) Moisture 5) Percent Grain Size 6) Plasticity 7) Density/Consistency 8) Structure 9) Other (Mineralization, Discoloration, Odor, etc.)	GRAPHIC LOG	WELL LOG	GROUNDWATER OR STRUCTURE	ELEVATION (ft)	SAMPLE: SAMPLE NO.	SAMPLE: TYPE	SAMPLE: BLOW COUNT	SAMPLE: RECOVERY (%)	SAMPLE: PID/FID (ppm)	SAMPLE: TIME (00:00)	COMMENTS 1) Rig Behavior 2) Air Monitoring
	25-30 ft bgs: Alternating sand and mudstone layers					S-3		11 9 13				Total depth = 31.5 ft bgs
35												
40												
45												
50												
55												
60												

CONTRACTOR Choice Drilling	NORTHING
EQUIPMENT CME95	EASTING
DRILL MTHD Hollow Stem Auger	COORDINATE SYSTEM:
DIAMETER 8-inch	
LOGGER B.Swanson	REVIEWER D. Kilian

NOTES:
S-1 = bulk samples; M-# = Cal Mod samples

SEE KEY SHEET FOR SYMBOLS AND ABBREVIATIONS

Appendix C

Geotechnical Laboratory Testing Report,
California Testing & Inspections

CALIFORNIA TESTING & INSPECTIONS
Geotechnical and Construction Materials Testing Laboratory

February 22, 2021

Attn.: Dennis Kilian
Geosyntec Consultant, Inc.

RE: Mirman School, Project #: SC0984A
Subject: Geotechnical Laboratory Testing Report

Dear Dennis,

Please find enclosed the laboratory test results completed in November 2019, for the soil samples corresponding to the Mirman School project.

- In-place Dry Density and Field Moisture (ASTM D2937)
- Direct Shear (ASTM D3080)
- Gradation (ASTM D6913)
- Expansion Index (ASTM D2487)
- Atterberg Limits (ASTM D4318)

All laboratory testing was completed at our laboratory approved by the City of Los Angeles TA24779.

If you have any question, please do not hesitate to contact our office at your earliest convenience.

Fabiola Jaque-Diaz, P.E.
Project Manager

REGISTERED PROFESSIONAL ENGINEER
FABIOLA JAQUE-DIAZ
C 76471
CIVIL
STATE OF CALIFORNIA

Encl. B1-B2-B3 Laboratory Test reports

15957 Vermont Ave, Paramount, CA 90723 | Tel (213) 748.4900
www.caltestinspection.com

CALIFORNIA TESTING & INSPECTIONS

Geotechnical and Construction Materials Testing Laboratory

Project:	Geosyntec - Mirman School	Date Tested:	11/13/2019
Project Number:	SC0984A	Tested By:	LV
Date:	11/22/2019	Completion Date:	11/14/2019
Sample ID:	466	Remarks:	

DESCRIPTION	Top 2 rings Reddish Brown Silty Sand, medium dense, moist / Bottom 4 rings Dark Brown Cement Clay, stiff, moist	Bottom Reddish Brown Sandy Silt, Moist / Top dark Olive Grey Cemented Clay, stiff, moist	Top Light Reddish Brown Silty Sand, medium dense, moist / Bottom Dark Reddish Brown Clayey Sand, Stiff, Moist	Top and Bottom Light Brown Silty Sand, medium dense / Middle 2 rings Reddish brown Cemented Clay, Stiff, dry					
BORING #	B-2 / M-1	B-2 / M-3	B-3 / M-1	B-3 / M-2					
DEPTH (ft)	5'-5.5'	15'-15.5'	5'-5.5'	10'-10.5'					
SAMPLE #	466	466	466	466					
HEIGHT OF SAMPLE	4	4	4	4					
WEIGHT OF SAMPLE (g)	777.99	755.45	788.21	790.24					
TARE (g)	361.7	87.47	99.14	98.27					
TARE + SAMPLE WET (g)	1248.3	386.18	703.15	391.19					
TARE + SAMPLE DRY (g)	1111.4	333.2	627.6	362.8					
MOISTURE CONTENT (%)	18.3	21.6	14.3	10.7					
DRY DENSITY (pcf)	104.0	102.8	115.2	119.3					
PASSING #200 (%)	NT	NT	NT	NT					

California Testing Inspections

Material Testing Geotechnical Laboratory

SUMMARY OF LABORATORY TEST RESULTS

Project Name:	**Geosyntec - Mirman School**	Date of Report :	11/22/19
Client:	**Geosyntec Consultants**	Project No. :	SC0984A
Attention To:	Dennis Kilian	Reported By:	L. Valle
Location:	See Below Date Sampled: 11/1/2019	Reviewed By:	F. Jaque-Diaz

Sample Number :	CTI#466	CTI#466	CTI#466	CTI#466	CTI#466	CTI#466
Sample Location :	B-1 / S-1	B-1 / M-2	B-2 / M-1	B-2 / M-3	B-2 / M-6	B-3 / M-2
Depth:	3-5'	15-15.5'	5-5.5'	15-15.5'	30-30.5'	10-10.5'
Gradation (ASTM D6913)						
Percent Passing Sieve Size						
2"						
1 ½"			100%			
1"			87%			
3/4"	100%		85%			
1/2"	99%		84%	100%		
3/8"	99%		82%	99%	100%	100%
#4	96%		78%	93%	88%	99%
#8	93%	100%	75%	86%	71%	98%
#16	91%	99%	72%	81%	61%	96%
#30	83%	96%	68%	76%	55%	91%
#50	67%	86%	60%	70%	51%	75%
#100	48%	51%	45%	58%	46%	46%
#200	35%	16.5%	30%	45%	28%	21%
Moisture content (ASTM D 2216)	12.4%	9.8%	18.2%	21.6%	18.3%	10.7%
Liquid Limit (ASTM D 4318)	NT	NT	NT	NT	NT	NT
Plastic limit (ASTM D 4318)	NT	NT	NT	NT	NT	NT
Plastic Index (ASTM D 4318)	NT	NT	NT	NT	NT	NT
Soil Clasification (ASTM D 2487)	Silty Sand (SM)	Silty Sand (SM)	(SM) Silty Sand with Gravel	(SM) Silty Sand	(SM) Silty Sand	(SM) Silty Sand
Proctor (ASTM D 1557)(pcf@%MC)	NT	NT	NT	NT	NT	NT
Expansion Index (ASTM D4829)	4	NT	NT	NT	NT	NT
Comments:			Cemented Clay	Cemented Clay	Cemented Clay	Cemented Clay

Comments: NP: Non-Plastic

NT: Not Tested

Test(s) performed in accordance with: ☑ ASTM ☐ AASHTO ☐ CAL-TEST METHOD

Signature

Fabiola Jaque-Diaz, P.E., Project Manager

Print Name/Title

11/22/2019

Date

SUMMARY OF LABORATORY TEST RESULTS

Project Name:	**Geosyntec - Mirman School**	Date of Report :	11/26/19
Client:	**Geosyntec Consultants**	Project No. :	SC0984A
Attention To:	Dennis Kilian	Reported By:	L. Valle
Location:	See Below — Date Sampled: 11/1/2019	Reviewed By:	F. Jaque-Diaz

Sample Number :	CTI#466	CTI#466				
Sample Location :	B-3 / M-4	B-3 / M-5				
Depth:	3-5'	15-15.5'				
Gradation (ASTM D6913)						
Percent Passing Sieve Size	NT	NT				
2"						
1 ½"						
1"						
3/4"						
1/2"						
3/8"						
#4						
#8						
#16						
#30						
#50						
#100						
#200						
Moisture content (ASTM D 2216)	NT	NT				
Liquid Limit (ASTM D 4318)	37%	45%				
Plastic limit (ASTM D 4318)	31%	29%				
Plastic Index (ASTM D 4318)	5%	17%				
Soil Clasification (ASTM D 2487)	(ML) Silt with Sand	(ML) Silt with Sand				
Proctor (ASTM D 1557)(pcf@%MC)	NT	NT				
Expansion Index (ASTM D4829)	NT	NT				
Comments:						

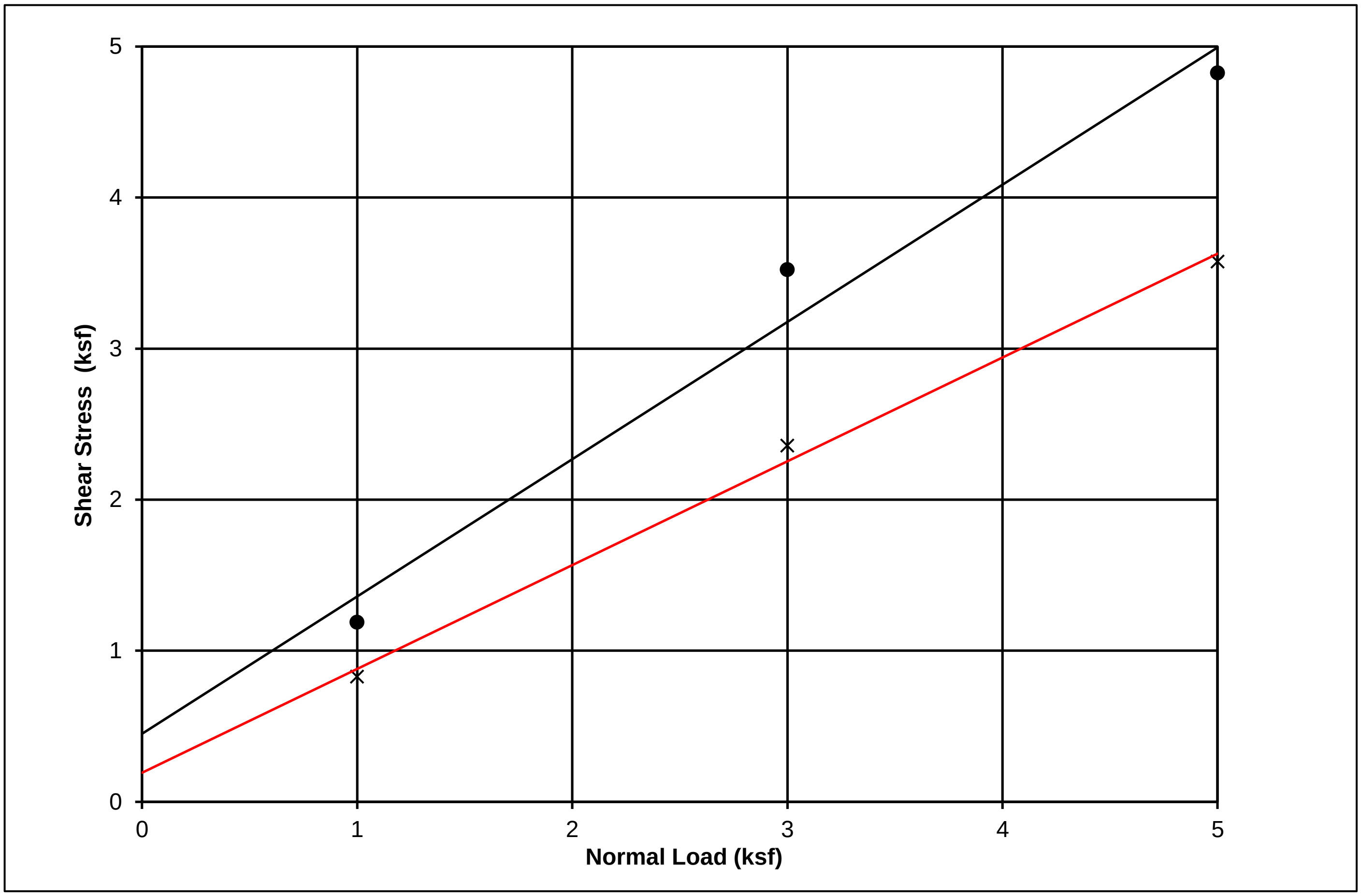
Comments: NP: Non-Plastic
NT: Not Tested

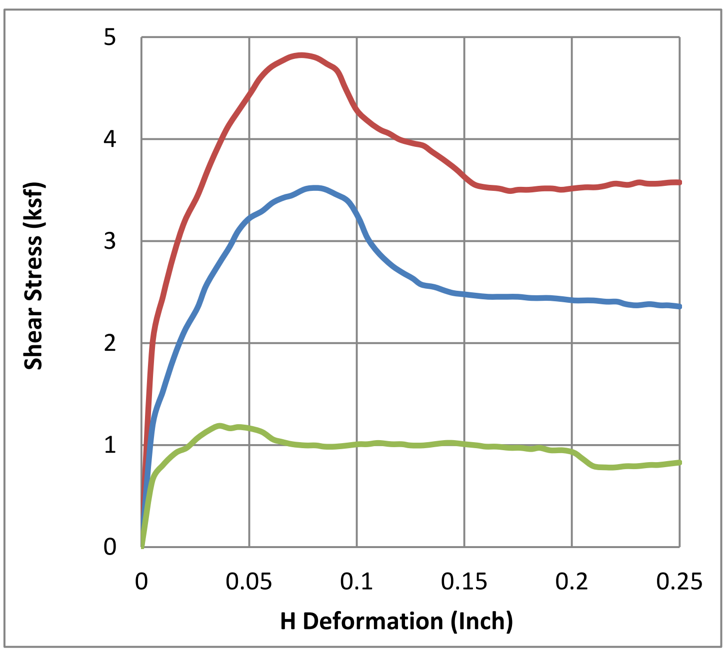
Test(s) performed in accordance with: ☑ ASTM ☐ AASHTO ☐ CAL-TEST METHOD

Signature

Fabiola Jaque-Diaz, P.E., Project Manager
Print Name/Title

11/26/2019
Date





BORING No:	B-2 / M-2
Sample No:	466
Depth:	10'
Description:	(SC)
Undisturbed	Undisturbed
Saturated	Yes
Consolidated	Yes

CONFINED PRESSURE-KSF	1	3	5
WET DENSITY-PCF	118.7	123.4	122.2
MOISTURE CONT. %	19%	18%	18%
DRY DENSITY-PCF	100.0	104.4	103.8
INITIAL SATURATION %	76%	82%	79%
FINAL MOISTURE CONT. %	22%	21%	20%

Peak ϕ (deg)	42
Residual ϕ (deg)	34
Peak cohesion (ksf)	0.5
Residual cohesion (ksf)	0.2

California Testing & Inspections
Material Testing & Geotechnical Laboratory
www.Caltestinspection.com Tel:213-748-4900
15957 Vermont Av
Paramount, CA 90723

ASTM D 3080 DIRECT SHEAR TEST RESULTS
Geosyntec - Mirman School
B-2 / M-2

PROJECT NO.	DATE
SC0984A	11/22/2019

SAMPLE #
466

Appendix D

USGS Unified Hazard Tool Output

U.S. Geological Survey - Earthquake Hazards Program

Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

Input

Edition

Dynamic: Conterminous U.S. 2014 (update…

Spectral Period

Peak Ground Acceleration

Latitude

Decimal degrees

34.129

Time Horizon

Return period in years

475

Longitude

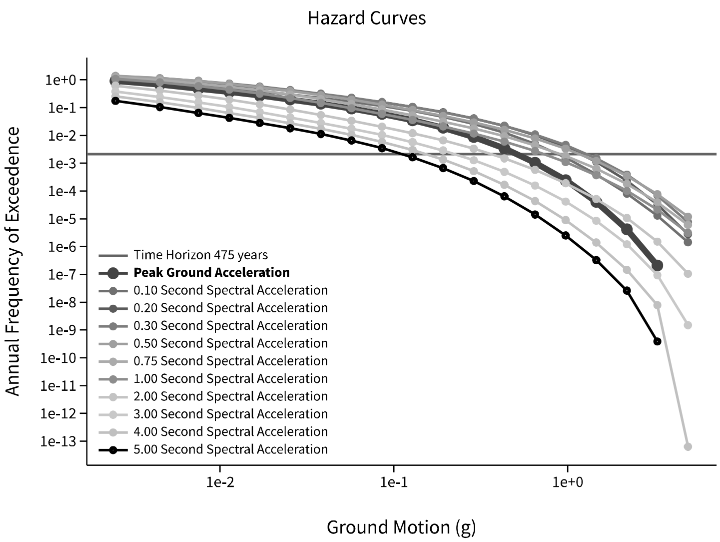
Decimal degrees, negative values for western longitudes

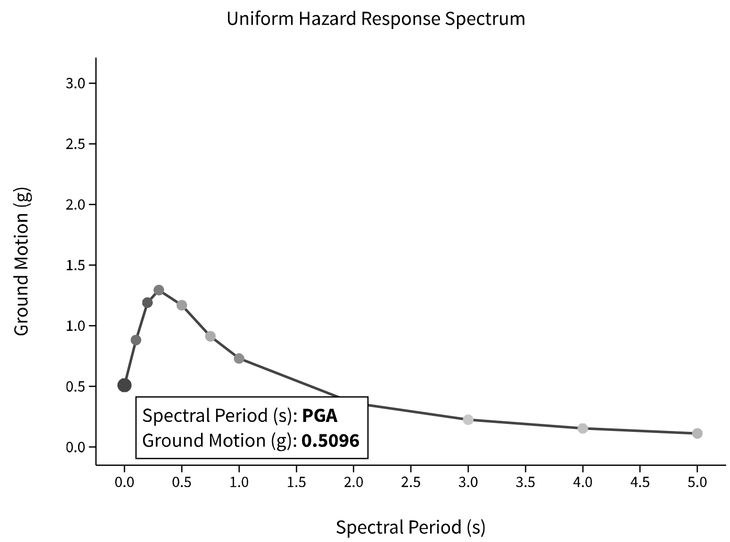
-118.484

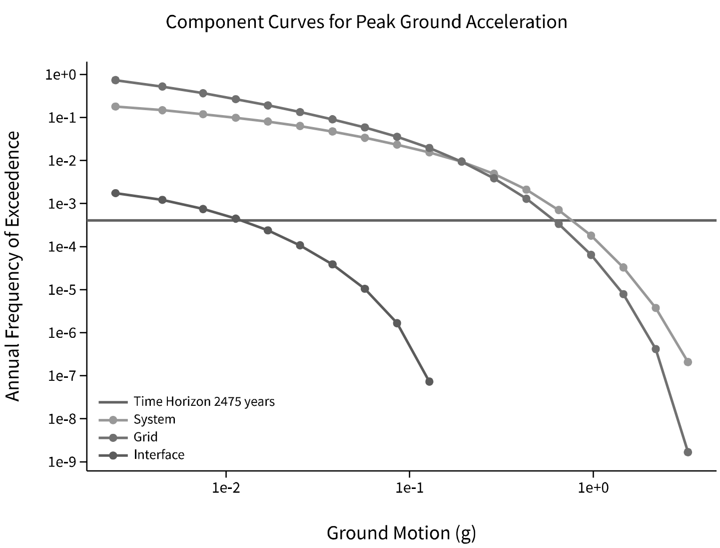
Site Class

259 m/s (Site class D)

Hazard Curve





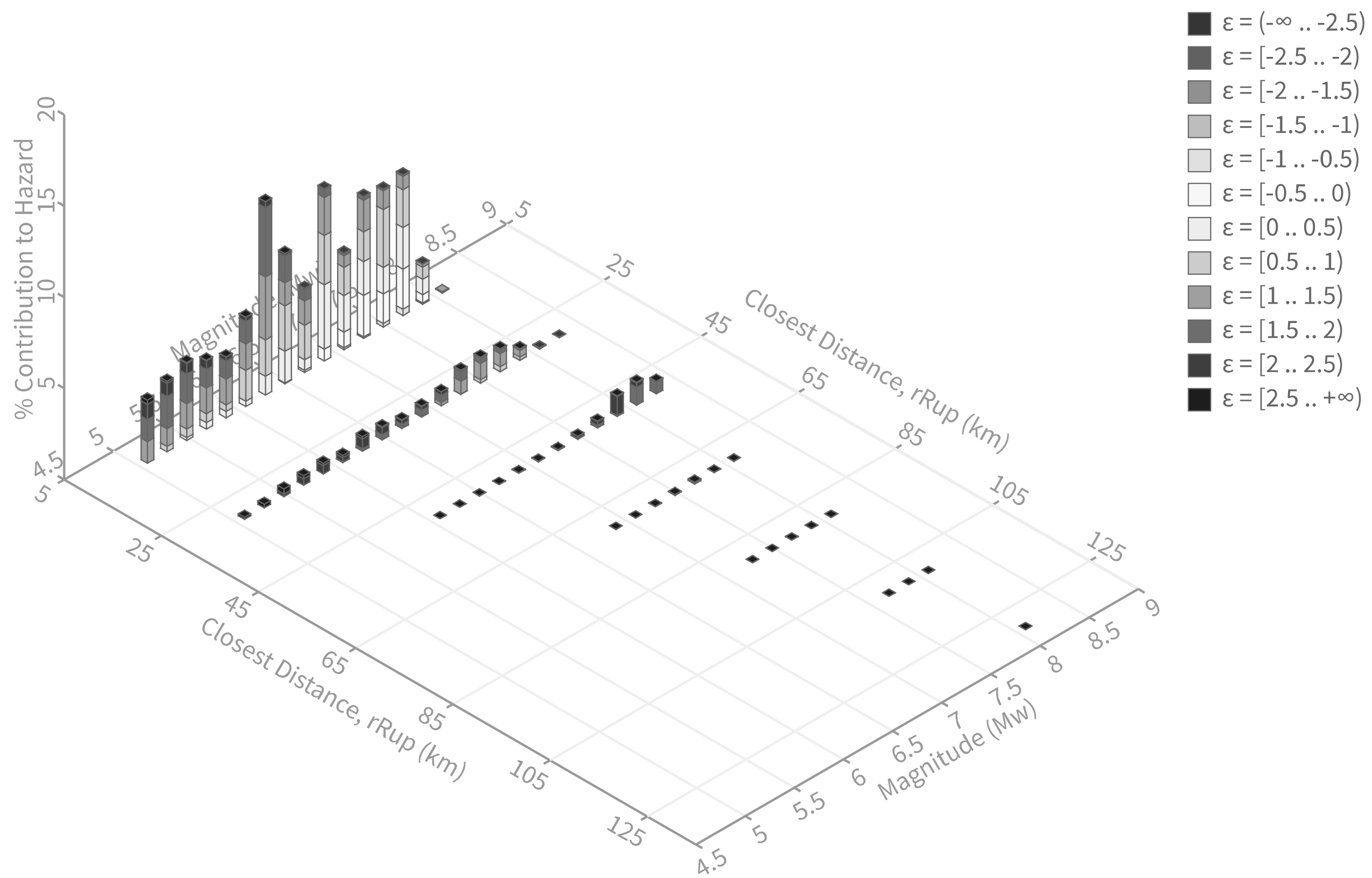


View Raw Data

^ Deaggregation

Component

Total



Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 475 yrs
Exceedance rate: 0.0021052632 yr^{-1}
PGA ground motion: 0.50962185 g

Recovered targets

Return period: 513.02478 yrs
Exceedance rate: 0.0019492236 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.09 %

Mean (over all sources)

m: 6.71
r: 14.86 km
ε_0: 1.04 σ

Mode (largest m-r bin)

m: 6.32
r: 12.95 km
ε_0: 1.22 σ
Contribution: 10.6 %

Mode (largest m-r-ε_0 bin)

m: 6.32
r: 15.39 km
ε_0: 1.68 σ
Contribution: 3.79 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

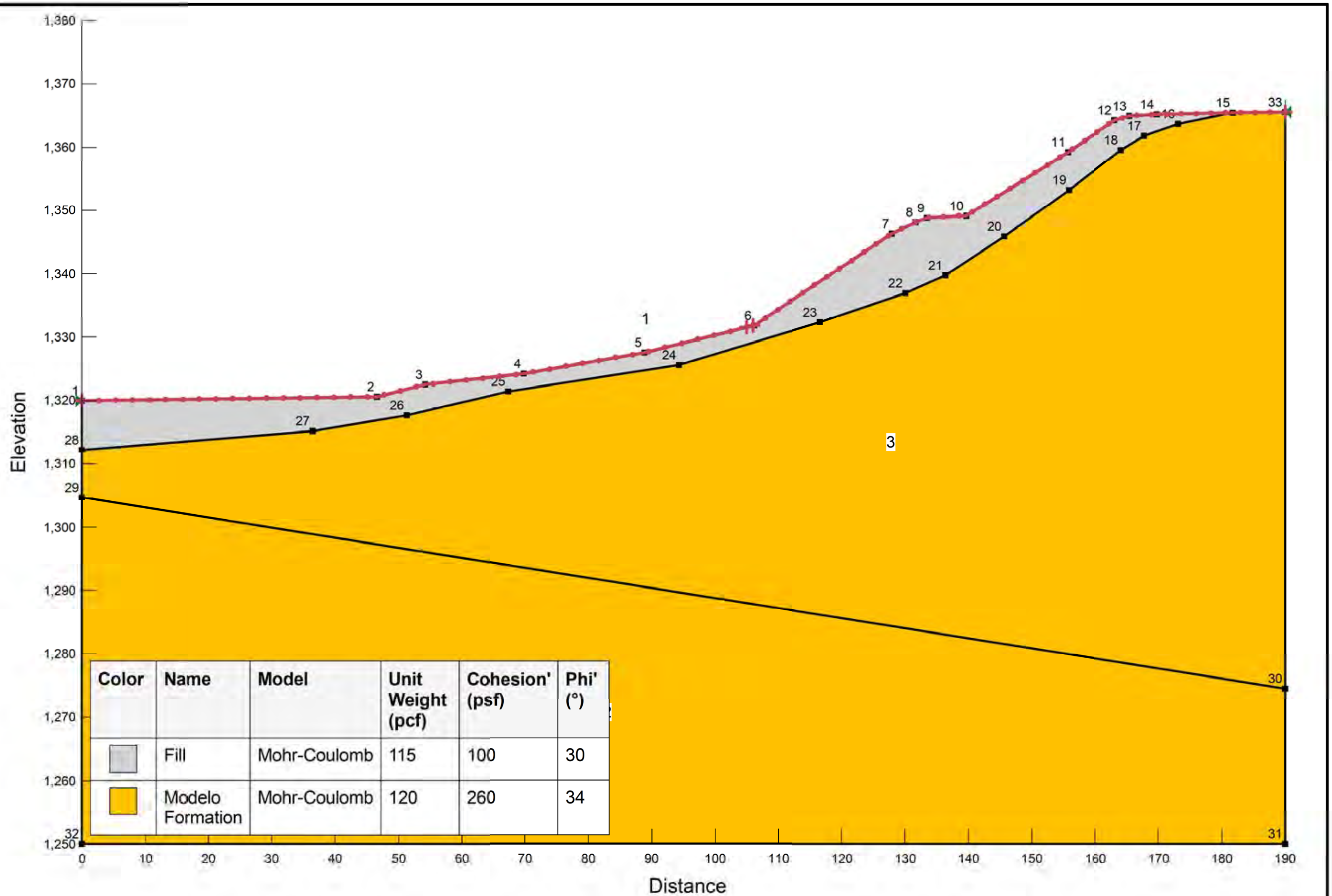
ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Deaggregation Contributors

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
UC33brAvg_FM32	System							35.34
Hollywood [2]		7.75	6.97	0.31	118.422°W	34.084°N	131.37	6.39
Santa Monica alt 2 [2]		7.62	7.10	-0.01	118.476°W	34.049°N	175.07	4.94
Santa Susana East (connector) [1]		16.57	6.68	1.13	118.419°W	34.292°N	18.15	4.10
Newport-Inglewood alt 2 [8]		12.99	6.72	1.27	118.390°W	34.043°N	137.58	1.65
San Andreas (Mojave S) [4]		56.81	8.05	2.01	118.231°W	34.595°N	24.08	1.55
Compton [4]		11.75	7.46	-0.03	118.608°W	34.022°N	223.83	1.46
Palos Verdes [15]		18.94	7.06	1.52	118.557°W	33.970°N	200.87	1.46
Malibu Coast alt 2 [0]		11.36	7.45	0.16	118.525°W	34.033°N	199.36	1.33
Northridge Hills [0]		13.98	7.66	0.74	118.445°W	34.250°N	14.94	1.27
Santa Susana alt 2 [3]		20.85	7.33	1.33	118.545°W	34.309°N	344.33	1.19
San Vicente [1]		10.14	6.88	0.63	118.402°W	34.075°N	128.11	1.09
Mission Hills 2011 [0]		16.86	7.11	1.05	118.419°W	34.270°N	20.73	1.03
UC33brAvg_FM31	System							29.73
Hollywood [2]		7.75	7.23	0.23	118.422°W	34.084°N	131.37	4.92
Santa Susana East (connector) [1]		16.57	7.05	0.96	118.419°W	34.292°N	18.15	3.88
Compton [4]		11.75	7.38	-0.01	118.608°W	34.022°N	223.83	2.95
Newport-Inglewood alt 1 [8]		12.99	6.67	1.31	118.389°W	34.044°N	137.35	2.13
San Andreas (Mojave S) [4]		56.81	8.05	2.01	118.231°W	34.595°N	24.08	1.55
Palos Verdes [15]		18.94	7.00	1.55	118.557°W	33.970°N	200.87	1.44
Northridge [4]		18.90	7.21	0.85	118.383°W	34.298°N	26.15	1.28
Northridge Hills [0]		13.98	7.67	0.74	118.445°W	34.250°N	14.94	1.26
UC33brAvg_FM32 (opt)	Grid							17.52
PointSourceFinite: -118.484, 34.205		9.32	5.79	1.28	118.484°W	34.205°N	0.00	2.84
PointSourceFinite: -118.484, 34.205		9.32	5.79	1.28	118.484°W	34.205°N	0.00	2.84
PointSourceFinite: -118.484, 34.160		6.14	5.66	0.86	118.484°W	34.160°N	0.00	1.95
PointSourceFinite: -118.484, 34.160		6.14	5.66	0.86	118.484°W	34.160°N	0.00	1.95
UC33brAvg_FM31 (opt)	Grid							17.40
PointSourceFinite: -118.484, 34.205		9.30	5.80	1.27	118.484°W	34.205°N	0.00	2.80
PointSourceFinite: -118.484, 34.205		9.30	5.80	1.27	118.484°W	34.205°N	0.00	2.80
PointSourceFinite: -118.484, 34.160		6.13	5.68	0.85	118.484°W	34.160°N	0.00	1.92
PointSourceFinite: -118.484, 34.160		6.13	5.68	0.85	118.484°W	34.160°N	0.00	1.92

Appendix E

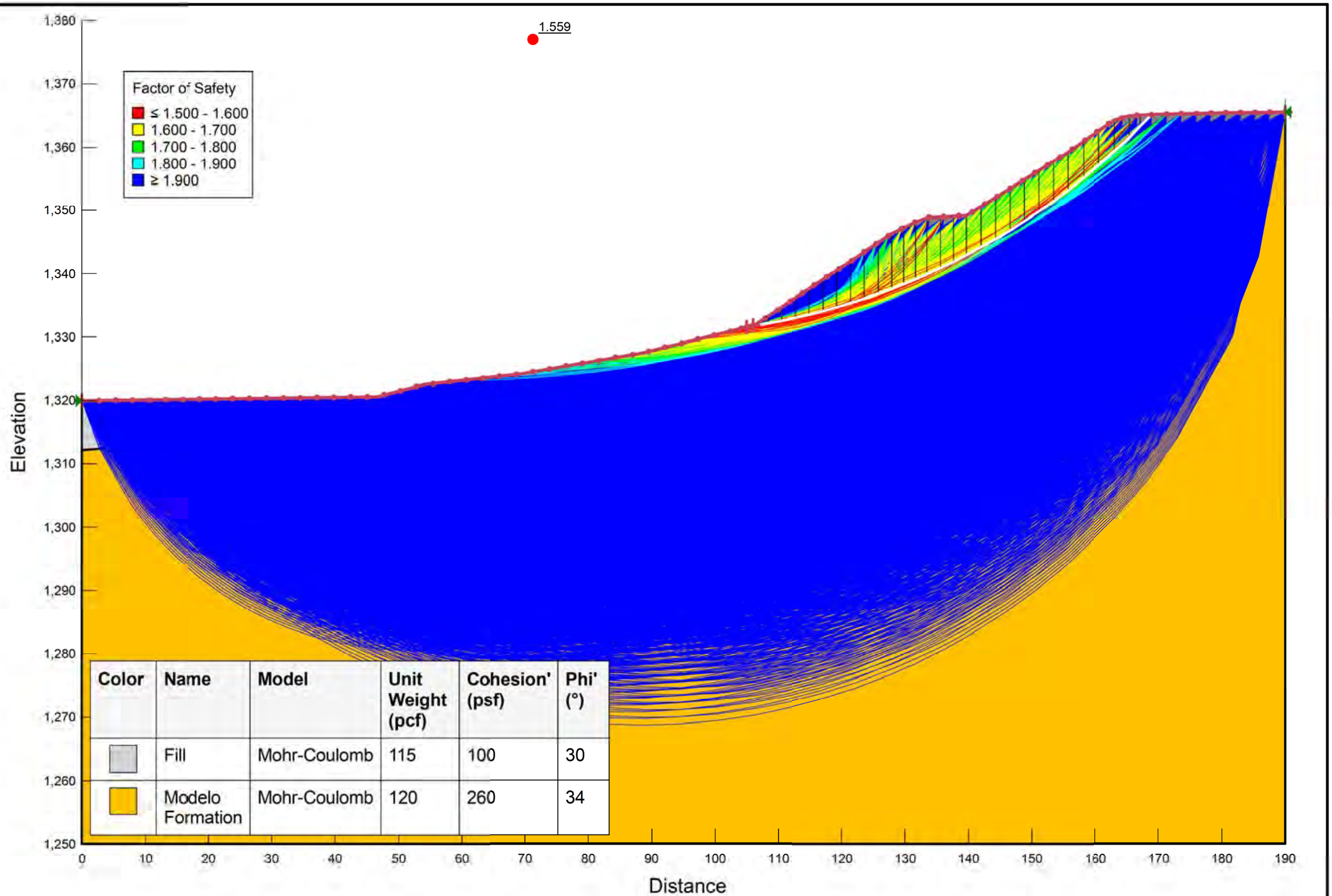
Graphical Representation of Slope Stability Analysis



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill	Mohr-Coulomb	115	100	30
	Modelo Formation	Mohr-Coulomb	120	260	34

C:\Users\JKocijan\Desktop\MirmanSchool\SectionC.gsz

Mirman Learning Center Geotechnical Investigation **Section C-C'**		Geosyntec consultants	Figure CC-1
04/30/2021	Project No. SC0984		



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill	Mohr-Coulomb	115	100	30
	Modelo Formation	Mohr-Coulomb	120	260	34

Mirman Learning Center Geotechnical Investigation

Section C-C'

04/30/2021	Project No. SC0984

Geosyntec consultants

Figure CC-2

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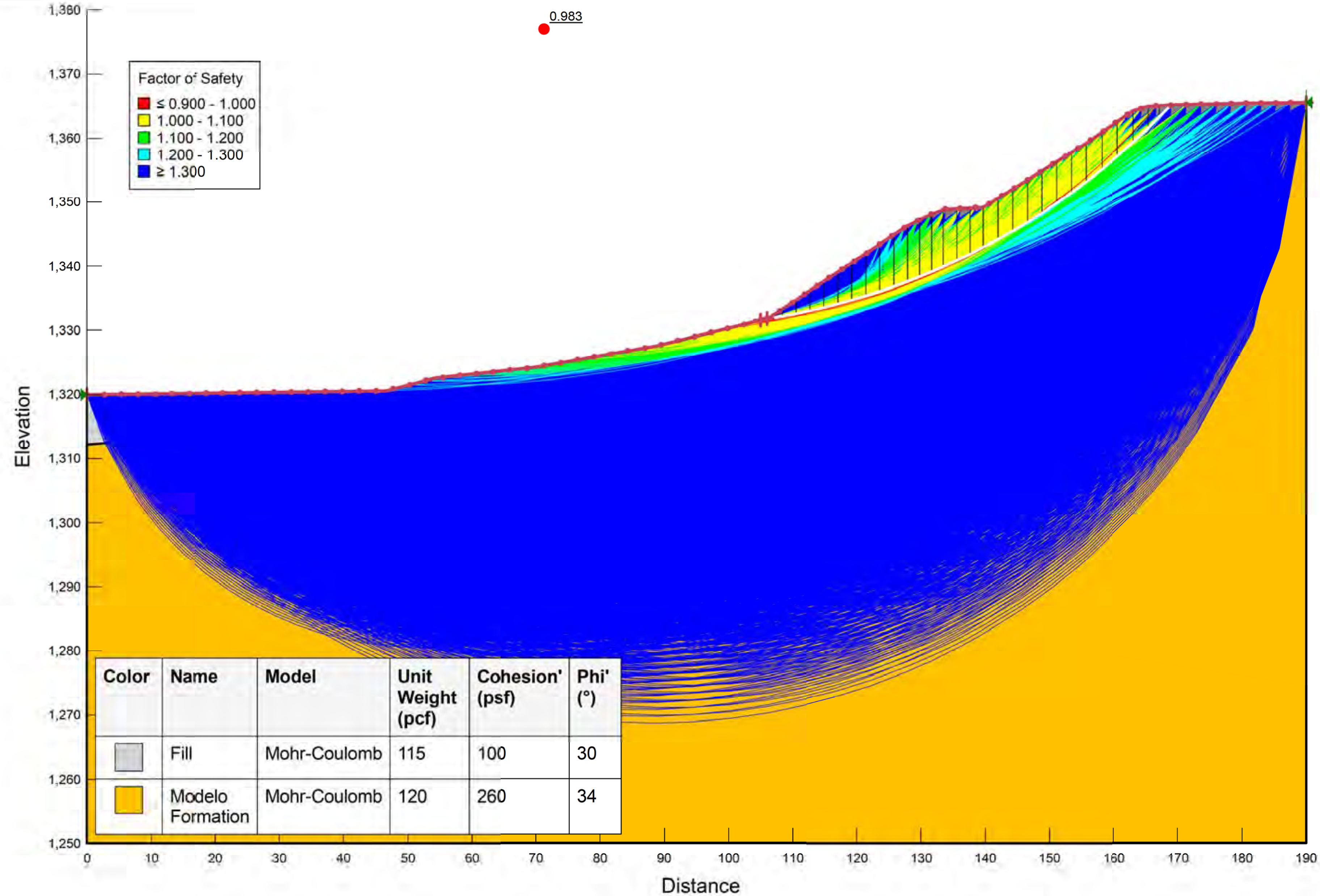

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill	Mohr-Coulomb	115	100	30
	Modelo Formation	Mohr-Coulomb	120	260	34

Mirman Learning Center Geotechnical Investigation

Section C-C' - Seismic 5 cm (kh=0.46xPGA=0.24g)

04/30/2021 | Project No. SC0984

Geosyntec consultants

Figure CC-3

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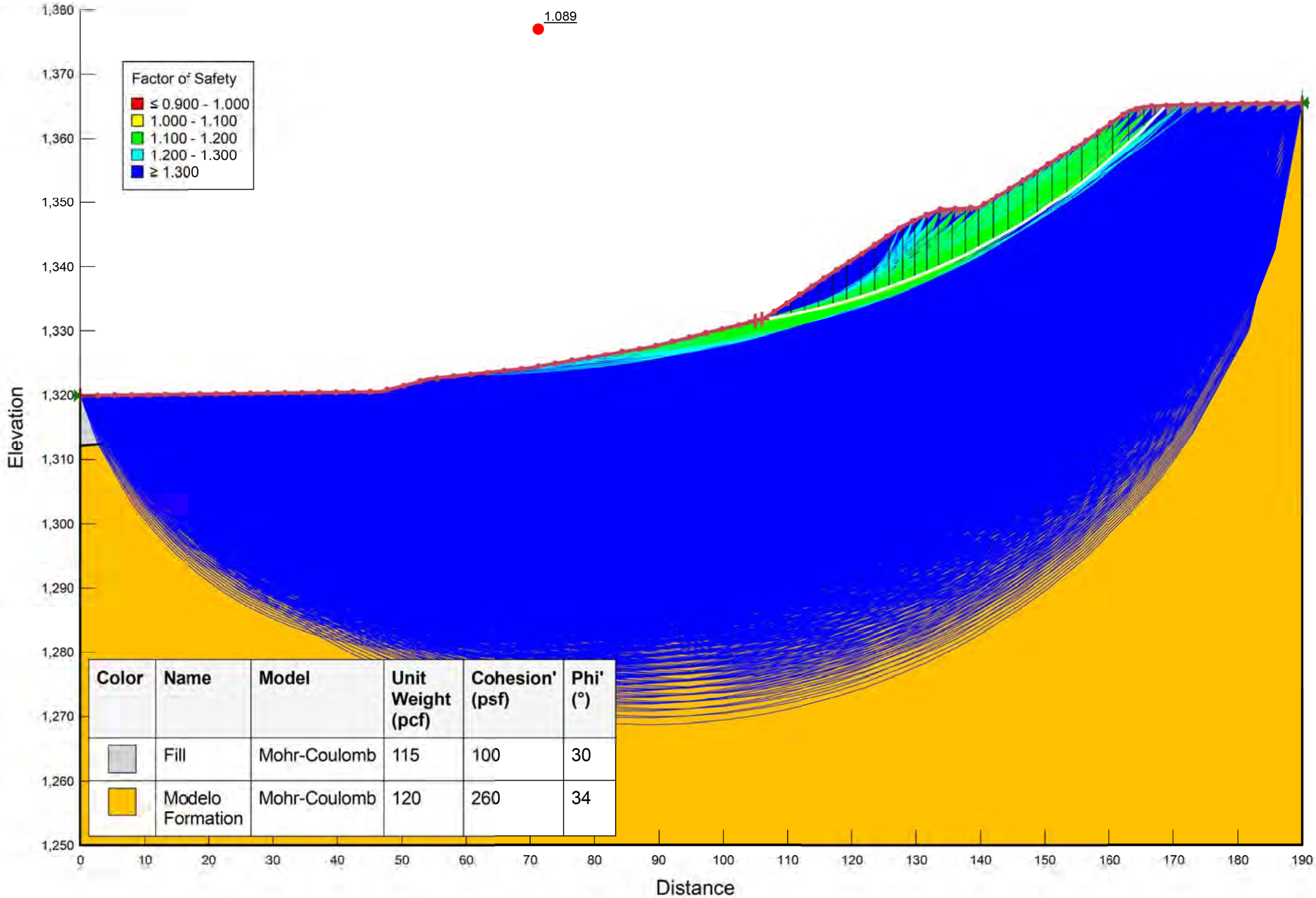

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill	Mohr-Coulomb	115	100	30
	Modelo Formation	Mohr-Coulomb	120	260	34

Mirman Learning Center Geotechnical Investigation **Section C-C' - Seismic 15 cm (kh=0.34xPGA=0.18g)**		Geosyntec consultants	Figure
04/30/2021	Project No. SC0984		CC-4

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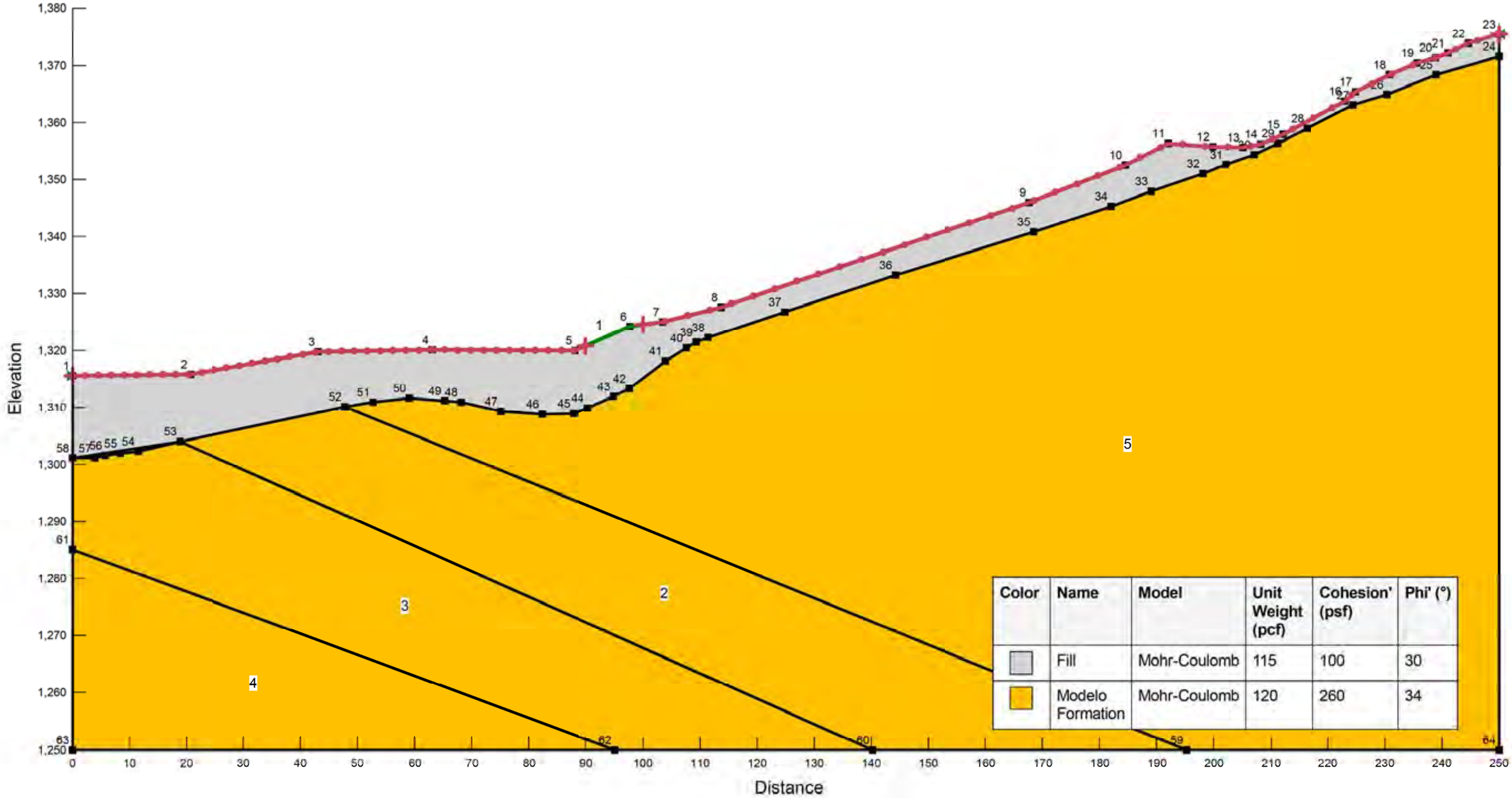

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill	Mohr-Coulomb	115	100	30
	Modelo Formation	Mohr-Coulomb	120	260	34

Mirman Learning Center Geotechnical Investigation

Section D-D' - Seismic 5 cm (kh=0.46xPGA=0.24g)

04/30/2021	Project No. SC0984

Geosyntec consultants

Figure DD-1

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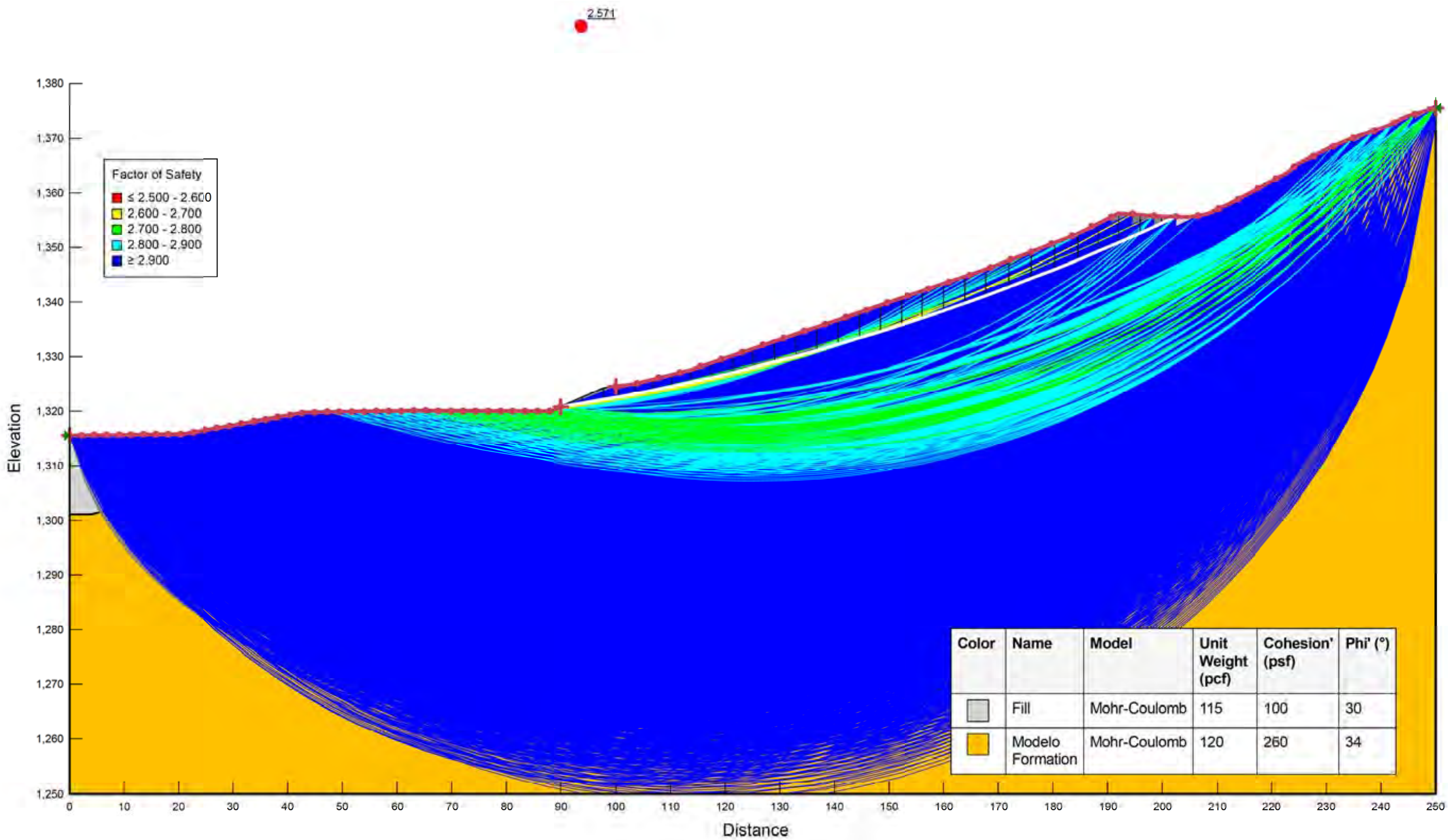

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill	Mohr-Coulomb	115	100	30
	Modelo Formation	Mohr-Coulomb	120	260	34

Mirman Learning Center Geotechnical Investigation

Section D-D'

04/30/2021

Project No. SC0984

Geosyntec consultants

Figure

DD-2

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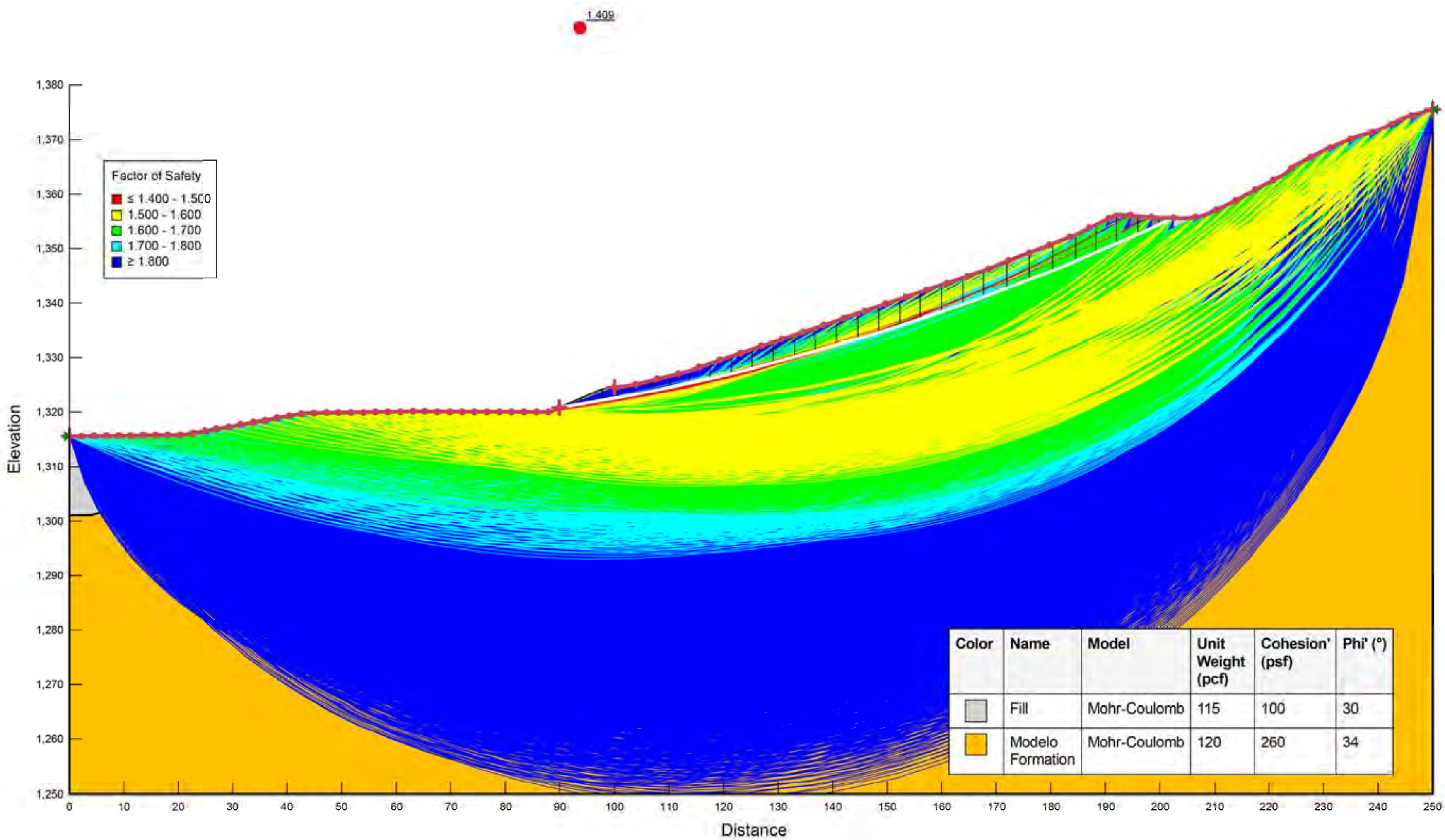


Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill	Mohr-Coulomb	115	100	30
	Modelo Formation	Mohr-Coulomb	120	260	34

C:\Users\JKocijan\Desktop\MirmanSchool\SectionD.gsz

Mirman Learning Center Geotechnical Investigation

Section D-D' - Seismic 5 cm (kh=0.46xPGA=0.24g)

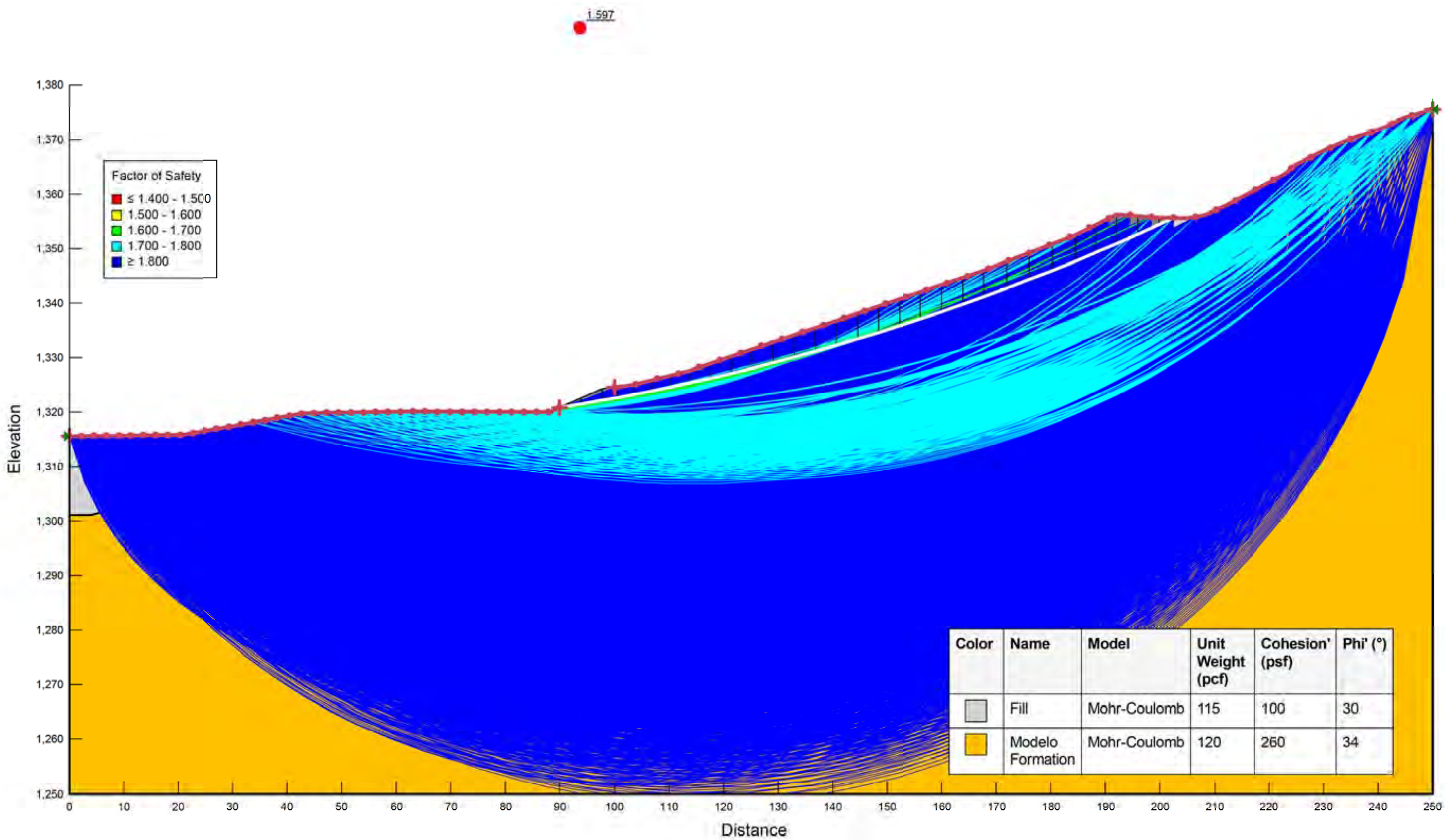
04/30/2021

Project No. SC0984

Geosyntec consultants

Figure

DD-3



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill	Mohr-Coulomb	115	100	30
	Modelo Formation	Mohr-Coulomb	120	260	34

C:\Users\JKocijan\Desktop\MirmanSchool\SectionD.gsz

Mirman Learning Center Geotechnical Investigation

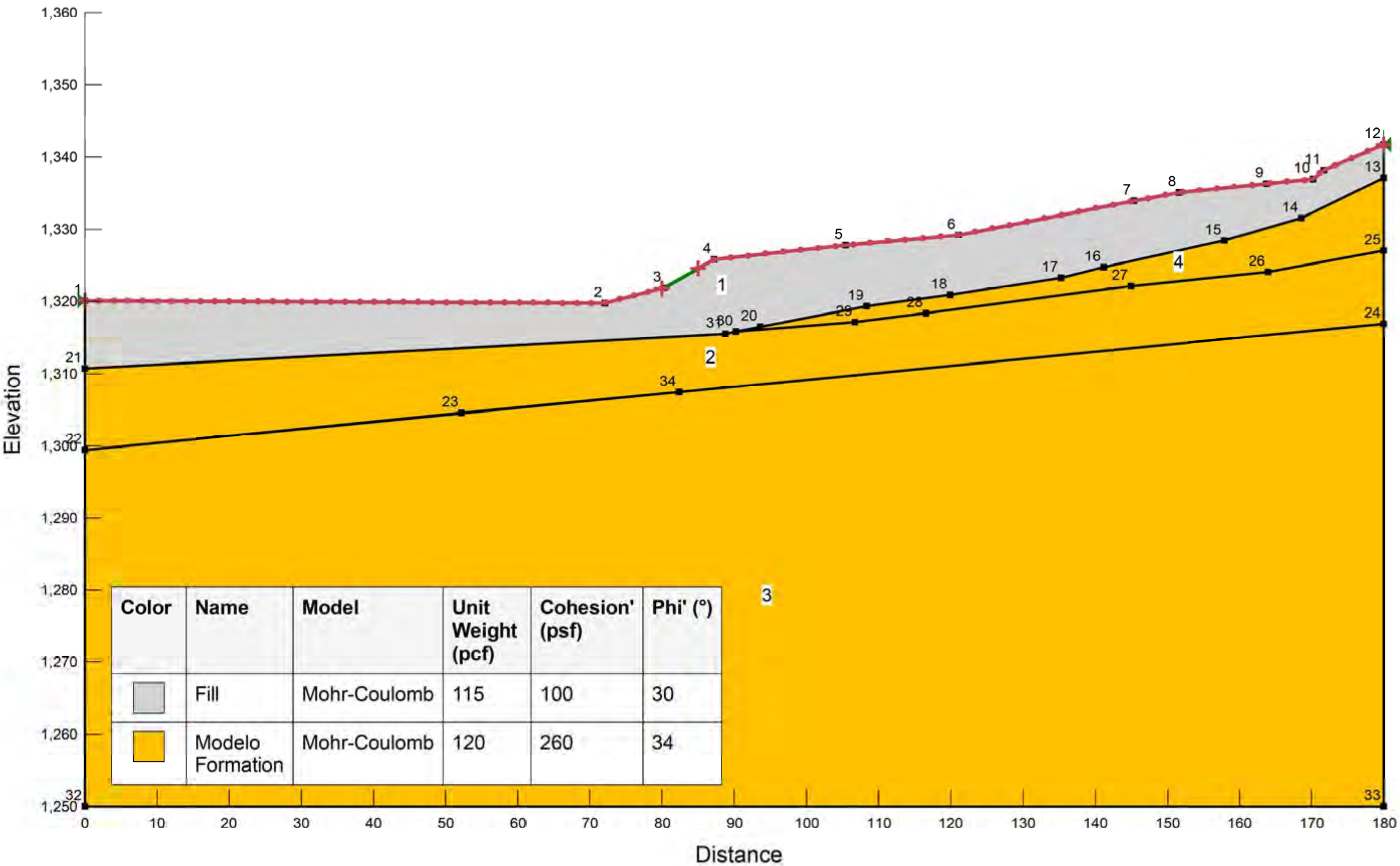
Section D-D' - Seismic 15 cm (kh=0.34xPGA=0.18g)

Geosyntec consultants

Figure DD-4

04/30/2021

Project No. SC0984



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill	Mohr-Coulomb	115	100	30
	Modelo Formation	Mohr-Coulomb	120	260	34

Mirman Learning Center Geotechnical Investigation

Section E-E'

04/28/2021

Project No. SC0984

Geosyntec consultants

Figure EE-1

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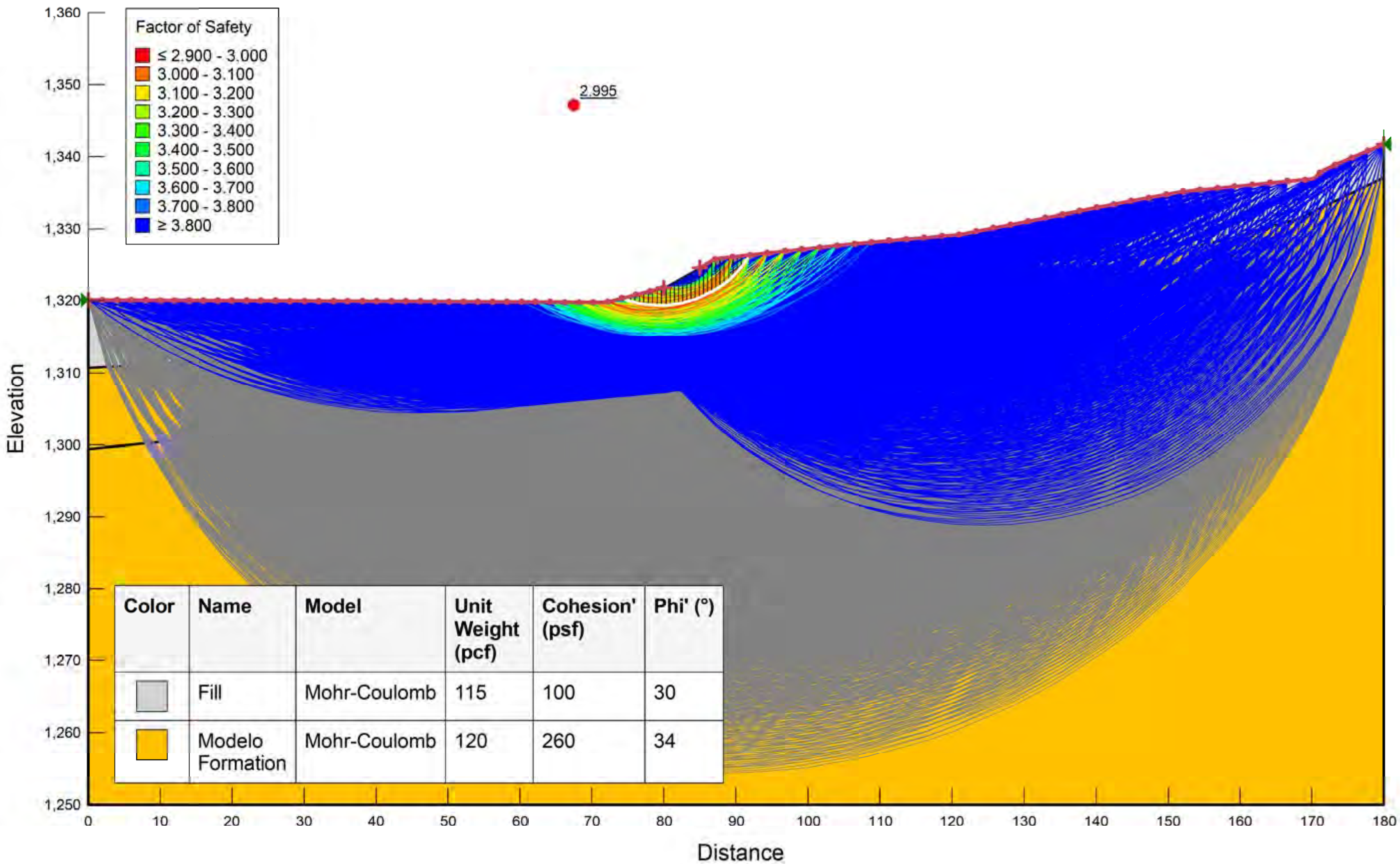


Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill	Mohr-Coulomb	115	100	30
	Modelo Formation	Mohr-Coulomb	120	260	34

Mirman Learning Center Geotechnical Investigation

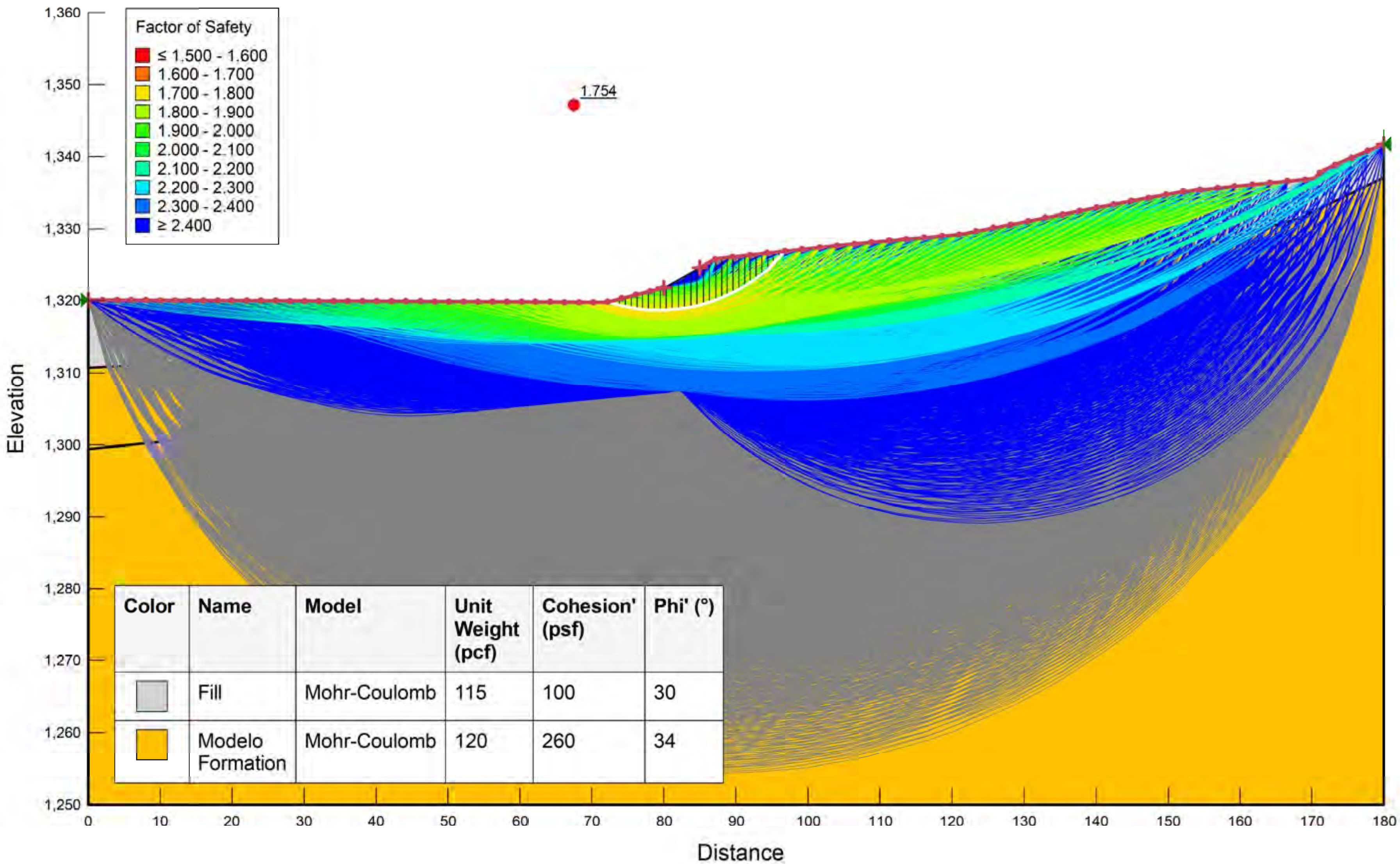
Section E-E'

04/30/2021 | Project No. SC0984

Geosyntec consultants

Figure EE-2

C:\Users\JKocijan\Desktop\MirmanSchool\SectionE.gsz



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
(grey)	Fill	Mohr-Coulomb	115	100	30
(yellow)	Modelo Formation	Mohr-Coulomb	120	260	34

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Mirman Learning Center Geotechnical Investigation

Section E-E' - Seismic 5 cm (kh=0.46xPGA=0.24g)

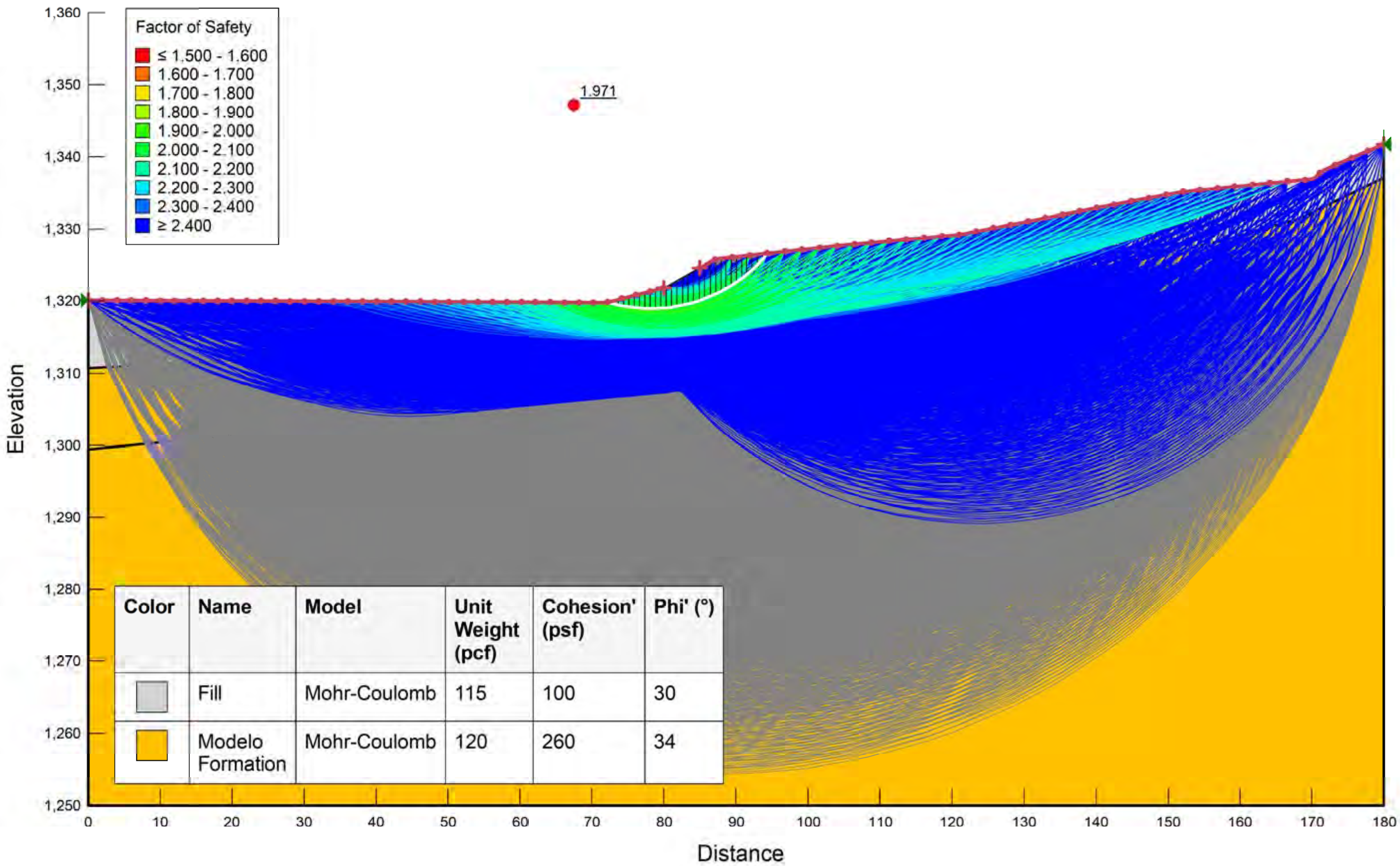
04/30/2021

Project No. SC0984

Geosyntec consultants

Figure

EE-3



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Fill	Mohr-Coulomb	115	100	30
	Modelo Formation	Mohr-Coulomb	120	260	34

Mirman Learning Center Geotechnical Investigation

Section E-E' - Seismic 15 cm (kh=0.34xPGA=0.18g)

04/30/2021

Project No. SC0984

Geosyntec consultants

Figure EE-4

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Appendix F

2018 Geotechnologies, Inc. EIR Report

Geotechnologies, Inc.
Consulting Geotechnical Engineers

439 Western Avenue
Glendale, California 91201-2837
818.240.9600 • Fax 818.240.9675

August 21, 2018
File Number 21603

Eyestone Environmental
2121 Rosecrans Avenue, Suite 3355
El Segundo, California 90245

Attention: Laura Rodriguez

Subject: Environmental Impact Report, Evaluation of Soils and Geology Issues
Proposed Improvements to Mirman School
16180 Mulholland Drive, Los Angeles, California

Ladies and Gentlemen:

1.0 INTRODUCTION

This document is intended to evaluate potential soil and geological issues for the proposed project, as required by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. This report includes information from subsurface exploration conducted by this firm, previous geotechnical documents prepared for the site, engineering analysis, review of published geologic data, review of available geotechnical engineering information and the preparation of this report.

2.0 SITE CONDITIONS

The Mirman School campus is located at 16180 Mulholland Drive, in the City of Los Angeles, California. The campus is bounded by Mulholland Drive to the north, Sepulveda Place to the east and south, and the Westland School campus to the west. The site is shown relate to nearby topographic features in the enclosed Vicinity Map.

The school campus is located on a relatively level terrace, surrounded by ascending slopes to the east and south. According to elevation contours provided in the Site Plan prepared by Johnson Favaro Architecture and Urban Design, the existing ground elevation observed across the campus ranges from 1310 feet at the northern portion of the campus, to 1320 at the eastern and southern portions of the campus. Based on information provided in the Research Section of this report, the existing terrace was created during previous site grading conducted in the 1960's and 1970's.

The existing educational buildings observed across the campus range between one and two stories in height, and are built at-grade. In addition, the campus is developed with two athletic fields and a paved parking lot. The enclosed Plot Plan shows the location of the existing developments. Vegetation across the campus consists of mature trees, bushes, shrubbery, and grass lawns. Drainage across the campus appears to be by sheetflow to the Mulholland Drive to the north.

The locations of the proposed improvements are currently occupied by an athletic field and planters.

3.0 PROJECT SCOPE

Preliminary information concerning the proposed development was obtained by review of the Site Plan prepared by Johnson Favaro Architecture and Urban Design, not dated, and the Learning Center plans also prepared by Johnson Favaro Architecture and Urban Design, dated January 1, 2015.

The proposed project consists of improvements to existing school structures and construction of a new academic building that would include classrooms, administrative space, and a multi-purpose room. This academic building is proposed to be two stories in height. The southern portion of the building would be serviced by a full subterranean level, while the northern portion would be built near the existing site grade. The location of this proposed academic building is shown in the enclosed Plot Plan.

Several single-story additions are being proposed. These additions would consist of a new food kiosk/lunch service building, as well as a new security pavilion at the entrance to the School. The location of these additions are shown in the enclosed Plot Plan. In total, approximately 2,158 square feet of existing floor area would be removed as part of the Project, and approximately 48,834 square feet of new floor area would be constructed, for a net increase of approximately 47,676 square feet of floor area.

The Project also includes the relocation of an existing fire road that serves adjoining Berkeley Hall School to the south of the Site. The existing fire road bisects the School's campus and separates the existing middle school building from the remainder of campus. The proposed new fire road would be relocated onto adjacent property owned by the Bel Air Presbyterian Church and Berkeley Hall School, located west and southwest of the Site.

The proposed structures and improvements will be designed in accordance with the provisions of the applicable City of Los Angeles Building Code.

4.0 RESEARCH

The following geotechnical document has been previously prepared for the subject site. A copy of this document was obtained by this firm from the City of Los Angeles, Department of Building and Safety, Data and Records Department.

> ***Kovacs-Byer and Associates, Inc., October 15, 1991, Geotechnical Engineering Investigation, Proposed Art Room Addition, 16180 Mulholland Drive, Los Angeles, California, Job Number KB 14587-S.***
>
> This report includes a section addressing previous site grading conducted within the Mirman School campus. According to the report, the site was graded in 1963 as part of a

massive grading project encompassing numerous surrounding properties. Subsequent to the 1963 grading, much smaller grading was conducted in 1970 and 1975 within the site limits. Fill placed in 1970 and 1975 was placed over the fill placed in 1963. The previous site grading was properly documented and summarized in compaction reports.

5.0 FIELD EXPLORATION

The site was explored on June 13, 2018 by excavating three borings. Boring B1 was excavated to a depth of 60 feet with the aid of a limited-access drilling rig, using 8-inch diameter hollowstem augers. Borings B2 and B3 were excavated to a depth of 21½ and 16 feet, respectively, with the aid of a 4-inch diameter hand auger.

Boring B1 was excavated within the location of the proposed academic building. Borings B2 and B3 were excavated within the area of the proposed single-story additions. The boring locations are shown on the enclosed Plot Plan, and interpretation of the geologic materials encountered is provided in the enclosed Boring Logs, Plates A-1 through A-3.

The location of exploratory excavations was determined from hardscape features shown on the attached Plot Plan. The location of the exploratory excavations should be considered accurate only to the degree implied by the method used.

6.0 GEOLOGIC MATERIALS

Fill:

Fill materials were observed in all three exploratory borings. In Boring B1, fill materials were observed to extend to a depth of 17½ feet below the existing grade. In Borings B2 and B3, fill materials were observed to the maximum excavated depth of 21½ and 16 feet respectively. The total depth of fill could not be stablished in Borings B2 and B3, because oversized materials prevented the hand auger from excavating deeper.

The fill materials observed in the exploratory borings consist of silty sand and sandy silt, which range from yellowish brown to dark gray in color, and are moist, medium dense to very dense, or stiff to very stiff, and fine grained.

Bedrock (Modelo Formation)

Bedrock of the Modelo Formation was identified in Boring B1, at a depth of 17½ feet below the existing grade. The observed bedrock consists of siltstone, with occasional sandstone, which range from yellowish brown to dark gray in color, moist, and moderately hard to hard.

More detailed descriptions of the earth materials encountered may be obtained from the enclosed log of the subsurface excavations.

7.0 GROUNDWATER

Groundwater was not encountered during exploration, conducted to a maximum depth of 60 feet below the existing grade. Based on review of the Van Nuys 7½ Minute Quadrangle Seismic Hazard Evaluation Report, Plate 1.2, Historically Highest Ground Water Contours (CDMG, 2005), the groundwater level contours are not well defined in the vicinity of the site. The closest groundwater elevation contour is located approximately 1½ mile to the north of the site, and corresponds to a depth of 40 feet. A copy of this plate is included in the Appendix as Historically Highest Groundwater Levels Map.

8.0 LOCAL GEOLOGY

The site is located in the Santa Monica Mountains. The Santa Monica Mountains, in the vicinity of the subject site, structurally are a north and eastward-plunging anticline with a core of Jurassic slate and schist. Tertiary sedimentary rocks unconformably overlie the metamorphic slate and schist. The Local Geologic Map presented in the Appendix of this report shows the geologic features in the vicinity of the site.

9.0 REGIONAL GEOLOGIC SETTINGS

The subject property is located in the Transverse Ranges Geomorphic Province. The Transverse Ranges are characterized by roughly east-west trending mountains and the northern and southern boundaries are formed by reverse fault scarps. The convergent deformational features of the Transverse Ranges are a result of north-south shortening due to plate tectonics. This has resulted in local folding and uplift of the mountains along with the propagation of thrust faults (including blind thrusts). The intervening valleys have been filled with sediments derived from the bordering mountains.

10.0 PRELIMINARY RECOMMENDATIONS

Based upon the exploration, laboratory testing, and research, it is the preliminary finding of Geotechnologies, Inc. that construction of the proposed structures is considered feasible from a geotechnical engineering standpoint. These recommendations are preliminary in nature because they are based on limited subsurface exploration. Additional subsurface geotechnical exploration, laboratory testing and engineering analysis will be required to prepare a geotechnical investigation required prior to issuance of building permits.

It is anticipated that the proposed academic building would be supported on a deep foundation system, consisting of drilled cast-in-place friction piles. The piles would be drilled through the existing fill material, in order to bear in the underlying bedrock. As an alternative, this structure could be supported on a conventional foundation system if all existing fill materials are properly removed and recompacted for the creation of a uniform compacted fill pad.

At this time, it is anticipated that the proposed single-story additions would be supported by conventional foundations, bearing in a newly built compacted fill pad.

The existing fill materials are suitable for unsurcharged vertical excavations up to a height of 5 feet. At this time, temporary excavations on the order of 12 to 17½ are anticipated for construction of the proposed academic building. Where sufficient space is available, unsurcharged temporary embankments may be cut at a 45-degree slope gradient, to a maximum height of 20 feet. If a temporary embankment is not desired, a temporary shoring system will have to be installed to provide a stable vertical excavation.

11.0 SOIL AND GEOLOGY ISSUES

a) Regional Faulting

Based on criteria established by the California Division of Mines and Geology (CDMG) now called California Geologic Survey (CGS), faults may be categorized as active, potentially active, or inactive. Active faults are those which show evidence of surface displacement within the last 11,000 years (Holocene-age). Potentially-active faults are those that show evidence of most recent surface displacement within the last 1.6 million years (Quaternary-age). Faults showing no evidence of surface displacement within the last 1.6 million years are considered inactive for most purposes, with the exception of design of some critical structures.

Buried thrust faults are faults without a surface expression but are a significant source of seismic activity. They are typically broadly defined based on the analysis of seismic wave recordings of hundreds of small and large earthquakes in the Southern California area. Due to the buried nature of these thrust faults, their existence is usually not known until they produce an earthquake. The risk for surface rupture potential of these buried thrust faults is inferred to be low (Leighton, 1990). However, the seismic risk of these buried structures in terms of recurrence and maximum potential magnitude is not well established. Therefore, the potential for surface rupture on these surface-verging splays at magnitudes higher than 6.0 cannot be precluded.

A list of faults located within 60 miles (100 kilometers) from the project sites has been provided in the enclosed table titled: Seismic Source Summary Table. This table is based on information provided by the USGS in their 2008 National Seismic Hazard Maps – Source Parameters database. The distances provided in this table are measured from a point selected near the center of the studio lot. A Southern California Fault Map has also been enclosed. The following sections describe some of the regional active faults, potentially active faults, and blind thrust faults.

i) Active Faults

Hollywood Fault

The Hollywood fault is part of the Transverse Ranges Southern Boundary fault system. The Hollywood fault is located approximately 5.42 miles east of the site. This fault trends east-west along the base of the Santa Monica Mountains from the West Beverly Hills Lineament in the West Hollywood–Beverly Hills area to the Los Feliz area of Los Angeles. The Hollywood fault is the eastern segment of the reverse oblique Santa Monica–Hollywood fault. Based on geomorphic evidence, stratigraphic correlation between exploratory borings, and fault trenching studies, this fault is classified as active.

Until recently, the approximately 9.3-mile long Hollywood fault was considered to be expressed as a series of linear ground-surface geomorphic expressions and south-facing ridges along the south margin of the eastern Santa Monica Mountains and the Hollywood Hills. Multiple recent fault rupture hazard investigations have shown that the Hollywood fault is located south of the ridges and bedrock outcroppings along portions of Sunset Boulevard. The Hollywood fault has not produced any damaging earthquakes during the historical period and has had relatively minor micro-seismic activity. It is estimated that the Hollywood fault is capable of producing a maximum 6.7 magnitude earthquake. In 2014, the California Geological Survey established an Earthquake Fault Zone for the Hollywood Fault.

Santa Monica Fault

Based on the USGS database, the nearest segment of the Santa Monica fault is located approximately 5.79 miles to the south of the site. The Santa Monica fault is a part of the Transverse Ranges Southern Boundary fault system, extending east from the coastline in Pacific Palisades through Santa Monica and West Los Angeles and merges with the Hollywood fault at the West Beverly Hills Lineament in Beverly Hills where its strike is northeast. It is believed that at least six surface ruptures have occurred in the past 50 thousand years. In addition, a well-documented surface rupture occurred between 10 and 17 thousand years ago, although a more recent earthquake probably occurred 1 to 3 thousand years ago. This leads to an average earthquake recurrence interval of 7 to 8 thousand years.[a] It is thought that the Santa Monica fault system may produce earthquakes with a maximum magnitude of 7.4.

Malibu Coast Fault

The Malibu Coast fault is part of the Transverse Ranges Southern Boundary fault system, a west-trending system of reverse, oblique-slip, and strike-slip faults that extends for more than approximately 124 miles along the southern edge of the Transverse Ranges and includes the Hollywood, Raymond, Anacapa–Dume, Malibu Coast, Santa Cruz Island, and Santa Rosa Island faults.

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[a] *Southern California Earthquake Center, a National Science Foundation and U.S. Geological Survey Center. Active Faults in the Los Angeles Metropolitan Region, www.scec.org/research/special/SCEC001activefaultsLA.pdf; accessed May 24, 2012.*

The Malibu Coast fault zone runs in an east-west orientation onshore subparallel to and along the shoreline for a linear distance of about 17 miles through the Malibu City limits, but also extends offshore to the east and west for a total length of approximately 37.5 miles. The onshore Malibu Coast fault zone involves a broad, wide zone of faulting and shearing as much as 1 mile in width. While the Malibu Coast Fault Zone has not been officially designated as an active fault zone by the State of California and no Special Studies Zones have been delineated along any part of the fault zone under the Alquist-Priolo Act of 1972, evidence for Holocene activity (movement in the last 11,000 years) has been established in several locations along individual fault splays within the fault zone. Due to such evidence, several fault splays within the onshore portion of the fault zone are identified as active.[b]

Large historic earthquakes along the Malibu Coast fault include the 1979, 5.2 magnitude earthquake and the 1989, 5.0 magnitude earthquake.[c] The Malibu Coast fault zone is approximately 7.35 miles southwest of the site and is believed to be capable of producing a maximum 7.0 magnitude earthquake.

<u>Newport-Inglewood Fault System</u>

The Newport-Inglewood fault system is located 8.02 miles to the southwest of the site. The Newport-Inglewood fault zone is a broad zone of discontinuous north to northwestern echelon faults and northwest to west trending folds. The fault zone extends southeastward from West Los Angeles, across the Los Angeles Basin, to Newport Beach and possibly offshore beyond San Diego (Barrows, 1974; Weber, 1982; Ziony, 1985).

The onshore segment of the Newport-Inglewood fault zone extends for about 37 miles from the Santa Ana River to the Santa Monica Mountains. Here it is overridden by, or merges with, the east-west trending Santa Monica zone of reverse faults.

The surface expression of the Newport-Inglewood fault zone is made up of a strikingly linear alignment of domal hills and mesas that rise on the order of 400 feet above the surrounding plains. From the northern end to its southernmost onshore expression, the Newport-Inglewood fault zone is made up of: Cheviot Hills, Baldwin Hills, Rosecrans Hills, Dominguez Hills, Signal Hill-Reservoir Hill, Alamitos Heights, Landing Hill, Bolsa Chica Mesa, Huntington Beach Mesa, and Newport Mesa. Several single and multiple fault strands, arranged in a roughly left stepping en echelon arrangement, make up the fault zone and account for the uplifted mesas.

[b] *City of Malibu Planning Department, Malibu General Plan, Chapter 5.0, Safety and Health Element, http://qcode.us/codes/malibu-general-plan/; accessed October 25, 2012.*
[c] *California Institute of Technology, Southern California Data Center. Chronological Earthquake Index, www.data.scec.org/significant/malibu1979.html; accessed October 25, 2012.*

The most significant earthquake associated with the Newport-Inglewood fault system was the Long Beach earthquake of 1933 with a magnitude of 6.3 on the Richter scale. It is believed that the Newport-Inglewood fault zone is capable of producing a 7.5 magnitude earthquake.

Verdugo Fault

The Verdugo Fault is located approximately 9.49 miles to the north of the site. The Verdugo Fault runs along the southwest edge of the Verdugo Mountains. The fault displays a reverse motion. According to Weber, et. al., (1980) 2 to 3 meter high scarps were identified in alluvial fan deposits in the Burbank and Glendale areas. Further to the northeast, in Sun Valley, a fault was reportedly identified at a depth of 40 feet in a sand and gravel pit. Although considered active by the County of Los Angeles, Department of Public Works (Leighton, 1990), and the United States Geological Survey, the fault is not designated with an Earthquake Fault Zone by the California Geological Survey. It is estimated that the Verdugo Fault is capable of producing a maximum 6.9 magnitude earthquake.

Sierra Madre Fault System

The Sierra Madre fault alone forms the southern tectonic boundary of the San Gabriel Mountains in the northern San Fernando Valley. It consists of a system of faults approximately 75 miles in length. The individual segments of the Sierra Madre fault system range up to 16 miles in length and display a reverse sense of displacement and dip to the north. The most recently active portions of the zone include the Mission Hills, Sylmar and Lakeview segments, which produced an earthquake in 1971 of magnitude 6.4. Tectonic rupture along the Lakeview Segment during the San Fernando Earthquake of 1971 produced displacements of approximately 2½ to 4 feet upward and southwestward.

It is believed that the Sierra Madre fault zone is capable of producing an earthquake of magnitude 7.3. The closest trace of the fault is located approximately 11.33 miles northeast of the site.

Palos Verdes Fault

Studies indicate that there are several active on-shore extensions of the strike-slip Palos Verdes fault, which is located approximately 11.76 miles south of the site. Geophysical data also indicate the off-shore extensions of the fault are active, offsetting Holocene age deposits. No historic large magnitude earthquakes are associated with this fault. However, the fault is considered active by the California Geological Survey. It is estimated that the Palos Verdes fault is capable of producing a maximum 7.7 magnitude earthquake.

Santa Susana Fault

The Santa Susana fault extends approximately 17 miles west-northwest from the northwest edge of the San Fernando Valley into Ventura County and is at the surface high on the south flank of the Santa Susana Mountains. The fault ends near the point where it overrides the south-side-up South strand of the Oak Ridge fault. The Santa Susana fault strikes northeast at the Fernando lateral ramp and turns east at the northern margin of the Sylmar Basin to become the Sierra Madre fault. This fault is exposed near the base of the San Gabriel Mountains for approximately 46 miles from the San Fernando Pass at the Fernando lateral ramp east to its intersection with the San Antonio Canyon fault in the eastern San Gabriel Mountains, east of which the range front is formed by the Cucamonga fault. The Santa Susana fault has not experienced any recent major ruptures except for a slight rupture during the 6.5 magnitude 1971 Sylmar earthquake.[d] The Santa Susana Fault is considered to be active by the County of Los Angeles. It is believed that the Santa Susana fault has the potential to produce a 6.9 magnitude earthquake. The closest trace of the fault is located approximately 12.29 miles north of the site.

Raymond Fault

The Raymond fault is located approximately 14.94 miles to the east of the site. The Raymond fault is an effective groundwater barrier which divides the San Gabriel Valley into groundwater sub-basins. Much of the geomorphic evidence for the Raymond fault has been obliterated by urbanization of the San Gabriel Valley. However, a discontinuous escarpment can be traced from Monrovia to the Arroyo Seco in South Pasadena. The very bold, "knife edge" escarpment in Monrovia parallel to Scenic Drive is believed to be a fault scarp of the Raymond fault. Trenching of the Raymond fault is reported to have revealed Holocene movement (Weaver and Dolan, 1997).

The recurrence interval for the Raymond fault is probably slightly less than 3,000 years, with the most recent documented event occurring approximately 1,600 years ago (Crook, et al, 1978). However, historical accounts of an earthquake that occurred in July 1855 as reported by Toppozada and others, 1981, places the epicenter of a Richter Magnitude 6 earthquake within the Raymond fault. It is believed that the Raymond fault is capable of producing a 6.8 magnitude earthquake. The Raymond Fault is considered active by the California Geological Survey.

[d] *California Institute of Technology, Southern California Data Center. Chronological Earthquake Index, www.data.scec.org/significant/santasusana.html; accessed May 24, 2012.*

San Gabriel Fault System

The San Gabriel fault system is located approximately 16.67 miles northeast of the site. The San Gabriel fault system comprises a series of subparallel, steeply north-dipping faults trending approximately north 40 degrees west with a right-lateral sense of displacement. There is also a small component of vertical dip-slip separation. The fault system exhibits a strong topographic expression and extends approximately 90 miles from San Antonio Canyon on the southeast to Frazier Mountain on the northwest. The estimated right lateral displacement on the fault varies from 34 miles (Crowell, 1982) to 40 miles (Ehlig, 1986), to 10 miles (Weber, 1982). Most scholars accept the larger displacement values and place the majority of activity between the Late Miocene and Late Pliocene Epochs of the Tertiary Era (65 to 1.8 million years before present).

Portions of the San Gabriel fault system are considered active by California Geological Survey. Recent seismic exploration in the Valencia area (Cotton and others, 1983; Cotton, 1985) has established Holocene offset. Radiocarbon data acquired by Cotton (1985) indicate that faulting in the Valencia area occurred between 3,500 and 1,500 years before present.

It is hypothesized by Ehlig (1986) and Stitt (1986) that the Holocene offset on the San Gabriel fault system is due to sympathetic (passive) movement as a result of north-south compression of the upper Santa Susana thrust sheet. Seismic evidence indicates that the San Gabriel fault system is truncated at depth by the younger, north-dipping Santa Susana-Sierra Madre faults (Oakeshott, 1975; Namson and Davis, 1988).

Whittier-Elsinore Fault System

The Whittier fault is located approximately 26.65 miles to the southeast of the site. The Whittier fault together with the Chino fault comprises the northernmost extension of the northwest trending Elsinore fault system. The mapped surface of the Whittier fault extends in a west-northwest direction for a distance of 20 miles from the Santa Ana River to the terminus of the Puente Hills. The Whittier fault is essentially a strike-slip, northeast dipping fault zone which also exhibits evidence of reverse movement along with en echelon[e] fault segments, en echelon folds and anatomizing (braided) fault segments. Right lateral offsets of stream drainages of up to 8800 feet (Durham and Yerkes, 1964) and vertical separation of the basement complex of 6,000 to 12,000 feet (Yerkes, 1972), have been documented. It is believed that the Whittier fault is capable of producing a 7.8 magnitude earthquake.

The Whittier Narrows earthquakes of October 1, 1987, and October 4, 1987, occurred in the area between the westernmost terminus of the mapped trace of the

[e] *En echelon refers to closely-spaced, parallel or subparallel, overlapping or step-like minor structural features.*

Whittier fault and the frontal fault system. The main 5.9 magnitude shock of October 1, 1987 was not caused by slip on the Whittier fault. The quake ruptured a gently dipping thrust fault with an east-west strike (Haukson, Jones, Davis and others, 1988). In contrast, the earthquake of October 4, 1987, is assumed to have occurred on the Whittier fault as focal mechanisms show mostly strike-slip movement with a small reverse component on a steeply dipping northwest striking plane (Haukson, Jones, Davis and others, 1988).

San Andreas Fault System

The San Andreas Fault system forms a major plate tectonic boundary along the western portion of North America. The system is predominantly a series of northwest trending faults characterized by a predominant right lateral sense of movement. At its closest point the San Andreas Fault system is located approximately 35.21 miles to the northeast of the site.

The San Andreas and associated faults have had a long history of inferred and historic earthquakes. Cumulative displacement along the system exceeds 150 miles in the past 25 million years (Jahns, 1973). Large historic earthquakes have occurred at Fort Tejon in 1857, at Point Reyes in 1906, and at Loma Prieta in 1989. Based on single-event rupture length, the maximum Richter magnitude earthquake is expected to be approximately 8.25 (Allen, 1968). The recurrence interval for large earthquakes on the southern portion of the fault system is on the order of 100 to 200 years.

ii) Potentially Active Faults

Anacapa-Dume Fault

The Anacapa–Dume fault, located approximately 8.49 miles to the northwest of the site, is a near-vertical offshore escarpment exceeding 600 meters locally, with a total length exceeding 62 miles. This fault is also part of the Transverse Ranges Southern Boundary fault system. It occurs as close as 3.6 miles offshore south of Malibu at its western end, but trends northeast where it merges with the offshore segments of the Santa Monica Fault Zone. It is believed that the Anacapa–Dume fault is responsible for generating the historic 1930 magnitude 5.2 Santa Monica earthquake, the 1973 magnitude 5.3 Point Mugu earthquake, and the 1979 and 1989 Malibu earthquakes, each of which possessed a magnitude of 5.0.[f] The Anacapa–Dume fault is thought to be capable of producing a maximum magnitude 7.2 earthquake.

[f] *City of Malibu Planning Department. Malibu General Plan, Chapter 5.0, Safety and Health Element, http://qcode.us/codes/malibu-general-plan/; accessed May 24, 2012.*

iii) Blind Thrusts Faults

Blind or buried thrust faults are faults without a surface expression but are a significant source of seismic activity. By definition, these faults have no surface trace, therefore the potential for ground surface rupture is considered remote. They are typically broadly defined based on the analysis of seismic wave recordings of hundreds of small and large earthquakes in the Southern California area. Due to the buried nature of these thrust faults, their existence is sometimes not known until they produce an earthquake. Two blind thrust faults in the Los Angeles metropolitan area are the Puente Hills blind thrust and the Elysian Park blind thrust. Another blind thrust fault of note is the Northridge fault located in the northwestern portion of the San Fernando Valley.

The Elysian Park anticline is thought to overlie the Elysian Park blind thrust. This fault has been estimated to cause an earthquake every 500 to 1,300 years in the magnitude range 6.2 to 6.7. The Elysian Park anticline is approximately 10.77 miles to the southeast of the site.

The Puente Hills blind thrust fault extends eastward from Downtown Los Angeles to the City of Brea in northern Orange County. The Puente Hills blind thrust fault includes three north-dipping segments, named from east to west as the Coyote Hills segment, the Santa Fe Springs segment, and the Los Angeles segment. These segments are overlain by folds expressed at the surface as the Coyote Hills, Santa Fe Springs Anticline, and the Montebello Hills. The Los Angeles segment of the Puente Hills blind thrust is located approximately 10.82 miles to the southeast of the site.

The Santa Fe Springs segment of the Puente Hills blind thrust fault is believed to be the cause of the October 1, 1987, Whittier Narrows Earthquake. Based on deformation of late Quaternary age sediments above this fault system and the occurrence of the Whittier Narrows earthquake, the Puente Hills blind thrust fault is considered an active fault capable of generating future earthquakes beneath the Los Angeles Basin. A maximum moment magnitude of 7.0 is estimated by researchers for the Puente Hills blind thrust fault.

The Mw 6.7 Northridge earthquake was caused by the sudden rupture of a previously unknown, blind thrust fault. This fault has since been named the Northridge Thrust, however it is also known in some of the literature as the Pico Thrust. It has been assigned a maximum magnitude of 6.9 and a 1,500 to 1,800 year recurrence interval. The Northridge thrust is located 13.81 miles to the northwest of the site.

b) Surface Ground Rupture

In 1972, the Alquist-Priolo Special Studies Zones Act (now known as the Alquist-Priolo Earthquake Fault Zoning Act) was passed into law. The Act defines "active" and "potentially active" faults utilizing the same aging criteria as that used by California Geological Survey (CGS). However, established state policy has been to zone only those faults which have direct evidence of movement within the last 11,000 years. It is this recency of fault movement that the CGS considers as a characteristic for faults that have a relatively high potential for ground rupture in the future.

CGS policy is to delineate a boundary from 200 to 500 feet wide on each side of the known fault trace based on the location precision, the complexity, or the regional significance of the fault. If a site lies within an Earthquake Fault Zone, a geologic fault rupture investigation must be performed that demonstrates that the proposed building site is not threatened by surface displacement from the fault before development permits may be issued.

Ground rupture is defined as surface displacement which occurs along the surface trace of the causative fault during an earthquake. Based on research of available literature and results of site reconnaissance, no known active or potentially active faults underlie the subject site. In addition, the subject site is not located within an Alquist-Priolo Earthquake Fault Zone. Based on these considerations, the potential for surface ground rupture at the subject site is considered low.

c) Seismicity

As with all of Southern California, the project site is subject to potential strong ground motion, should a moderate to strong earthquake occur on a local or regional fault. Design of any proposed structures on the site in accordance with the provisions of the applicable City of Los Angeles Building Code will mitigate the potential effects of strong ground shaking.

d) Deaggregated Seismic Source Parameters

The peak ground acceleration (PGA) and modal magnitude for the site was obtained from the USGS Probabilistic Seismic Hazard Deaggregation program (USGS, 2008). The parameters are based on a 2 percent in 50 years ground motion (2475 year return period). A shear wave velocity (Vs30) of 537 meters per second was utilized in the computation. The deaggregation program indicates a PGA of 0.80g and a modal magnitude of 7.3 for the site.

e) 2016 California Building Code Seismic Parameters

Based on information derived from the subsurface investigation, the subject site is classified as Site Class C, which corresponds to a "Very Dense Soil and Bedrock"

Profile, according to Table 20.3-1 of ASCE 7-10. This information and the site coordinates were input into the USGS U.S. Seismic Design Maps tool (Version 3.1.0) to calculate the ground motions for the site.

2016 CALIFORNIA BUILDING CODE SEISMIC PARAMETERS	
Site Class	C
Mapped Spectral Acceleration at Short Periods (S_S)	2.157g
Site Coefficient (F_a)	1.0
Maximum Considered Earthquake Spectral Response for Short Periods (S_{MS})	2.157g
Five-Percent Damped Design Spectral Response Acceleration at Short Periods (S_{DS})	1.438g
Mapped Spectral Acceleration at One-Second Period (S_1)	0.754g
Site Coefficient (F_v)	1.3
Maximum Considered Earthquake Spectral Response for One-Second Period (S_{M1})	0.980g
Five-Percent Damped Design Spectral Response Acceleration for One-Second Period (S_{D1})	0.653g

f) Liquefaction

Liquefaction is a phenomenon in which saturated silty to cohesionless soils below the groundwater table are subject to a temporary loss of strength due to the buildup of excess pore pressure during cyclic loading conditions such as those induced by an earthquake. Liquefaction-related effects include loss of bearing strength, amplified ground oscillations, lateral spreading, and flow failures.

Based on review of the Seismic Hazards Maps of the State of California (CDMG, 1998), the site is not located within a "Liquefiable" area. This determination is based on groundwater depth records, soil type and distance to a fault capable of producing a substantial earthquake. A copy of this map is included in the Appendix.

g) Dynamic Settlement

Seismically-induced settlement or compaction of dry or moist, cohesionless soils can be an effect related to earthquake ground motion. Such settlements are typically most damaging when the settlements are differential in nature across the length of structures.

Some seismically-induced settlement of the proposed structure should be expected as a result of strong ground-shaking, however, due to the uniform nature of the underlying geologic materials, excessive differential settlements are not expected to occur.

h) Regional Subsidence

The site is not located within a zone on known subsidence due to oil or other fluid withdrawal.

i) Landsliding

Based on review of the Seismic Hazards Zones Map for the Van Nuys 7.5-Minute Quadrangle (CDMG, 1998), a portion of the slope found to the east of the campus is indicated to be an "Earthquake-Induced landslide Area". A copy of this map is included in the Appendix as the "Seismic Hazard Zone Map". This landslide is mapped on an ascending slope, located outside the property limits. This "Earthquake-Induced landslide Area" is located approximately 300 feet away from the proposed structures. Based on this setback, it is the opinion of this firm that the probability of seismically-induced landslides, or associated effects, occurring in the immediate vicinity of the proposed structures is considered to be low.

j) Collapsible Soils

Based on results from consolidation testing, included in the Appendix as Plates C-1 and C-2, the soils to underlain the proposed structures would not be considered prone to hydroconsolidation.

k) Tsunamis, Seiches and Flooding

Tsunamis are large ocean waves generated by sudden water displacement caused by a submarine earthquake, landslide, or volcanic eruption. The site is high enough and far enough from the ocean to preclude being prone to hazards of a tsunami.

Review of the County of Los Angeles Flood and Inundation Hazards Map (Leighton, 1990), indicates the site does not lie within mapped inundation boundaries due to a seiche or a breached upgradient reservoir.

Review of the applicable Flood Insurance Rate Map indicates the site lies within an area of undetermined flood hazard. A copy of this map is enclosed.

l) City of Los Angeles Methane Zone

Based on review of the NavigateLA Website, developed by the City of Los Angeles, Bureau of Engineering, Department of Public Works, the subject site is not located within the limits of a City of Los Angeles Methane Zone or Methane Buffer Zone.

m) Oil Fields and Oil Wells

Based on review of the California State Division of Oil, Gas and Geothermal Resources (DOGGR) On-line Mapping System, the site is not located within the limits of an oil field. In addition, no oil or gas wells have been drilled at the site, or its vicinity. The nearest oil well was drilled approximately 3 miles to the north of the site.

n) Temporary Excavations

All required excavations are expected to be sloped, or properly shored, in accordance with the provisions of the applicable City of Los Angeles Building Code. Therefore, the project would not result in any on-site or off-site landslide.

o) Ground Failure

The proposed construction will not cause, or increase the potential for any seismic related ground failure on the project site or adjacent sites.

p) Expansive Soils

The onsite geologic materials were tested to be in the low to moderate expansion range. The Expansion Index was found to be between 46 and 60 for representative samples. Design of the proposed structures in accordance with the provisions of the applicable City of Los Angeles Building Code will mitigate the potential effects of moderately expansive soils.

q) Sedimentation and Erosion

Grading, excavation and other earth moving activities could potentially result in erosion and sedimentation. For any grading proposed in the site from November to April (generally considered the rainy season) an erosion control plan consistent with the City of Los Angeles requirements would need to be prepared. Compliance with minimum code requirements will render project impacts related to sedimentation and erosion less than significant.

r) Landform Alterations

The subject site is located within a previously graded terrace, and there are no significant hills, canyons, ravines, outcrops or other geologic or topographic features on the site. Therefore, any proposed project would not adversely affect any prominent geologic or topographic features.

s) Septic Tanks

It is the understanding of this firm that sewers are available at the site for wastewater disposal. No septic tanks or alternative disposal systems are necessary or anticipated for any future site projects.

The conditions identified in this document are typical of sites within this area of Los Angeles, and of a type that are routinely addressed through regulatory measures. Geotechnologies, Inc. appreciates the opportunity to provide our services on this project. Should you have any questions please contact this office.

Respectfully submitted,
GEOTECHNOLOGIES, INC.

REGISTERED PROFESSIONAL ENGINEER
GREGORIO VARELA
No. 81201
Exp. 9/30/19
CIVIL
STATE OF CALIFORNIA

GREGORIO VARELA
R.C.E. 81201

GV:ae

Enclosures: References
Vicinity Map
Plot Plan
Local Geologic Map
Historically Highest Groundwater Levels Plate
Seismic Source Summary Table
Southern California Fault Map
Seismic Hazard Zone Map
Flood Insurance Rate Map
Plates A-1 through A-3
Plates B-1 through B-3
Plates C-1 and C-2
Plate D

Distribution: (3) Addressee

E-mail to: [l.rodriguez@eyestoneeir.com]

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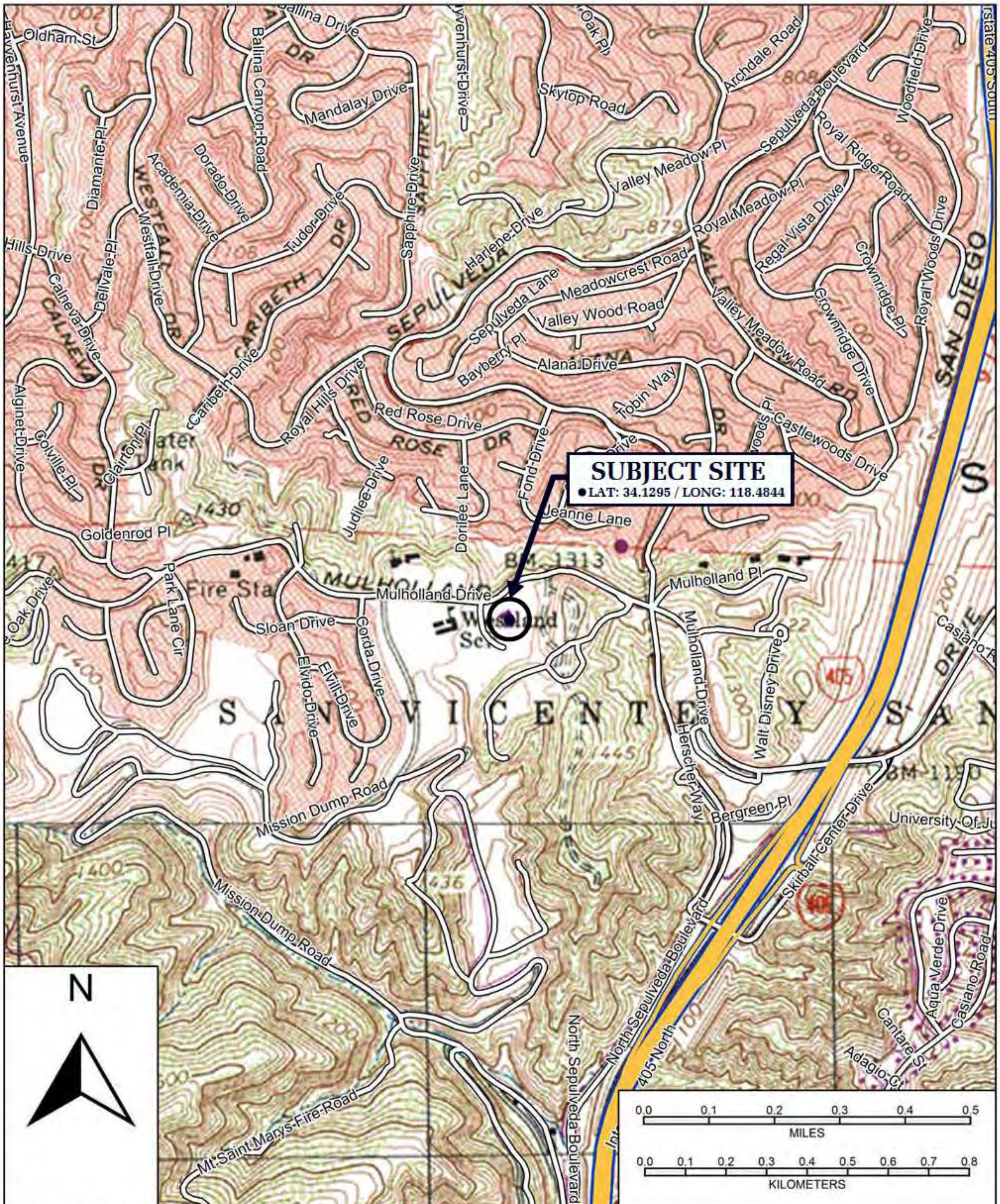

REFERENCE: U.S.G.S. TOPOGRAPHIC MAPS, 7.5 MINUTE SERIES,
VAN NUYS, CA QUADRANGLE

VICINITY MAP

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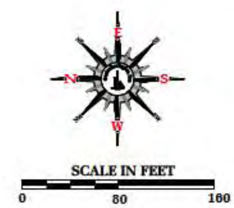
Consulting Geotechnical Engineers

EYESTONE ENVIRONMENTAL

FILE NO. 21603



LEGEND

B3 LOCATION & NUMBER OF BORING

PLOT PLAN

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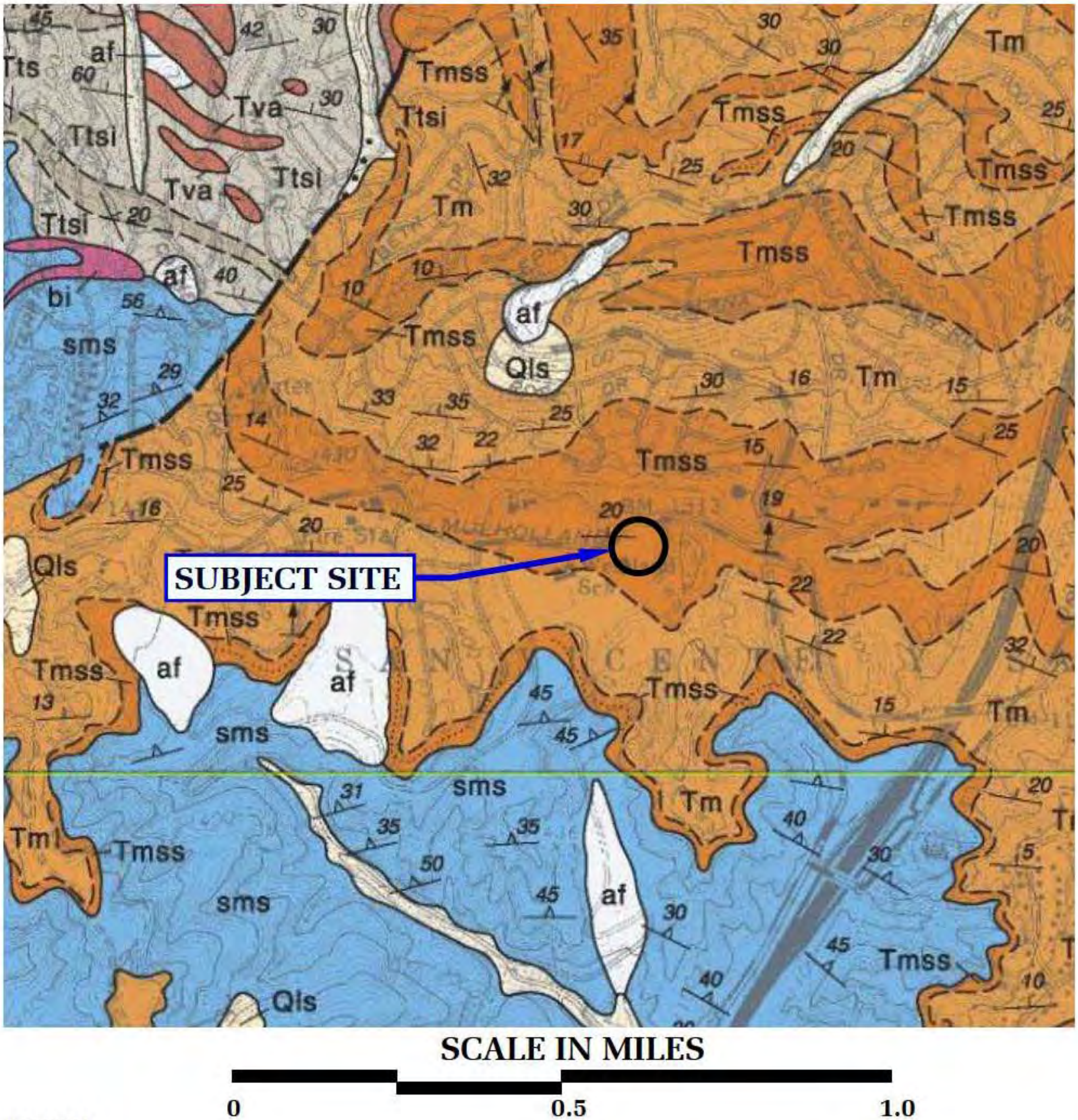
EYESTONE ENVIRONMENTAL

FILE No. 21603

DATE: August '18

REFERENCE: PHASE II SITE PLAN BY JOHNSON FAVARO ARCHITECTURE AND URBAN DESIGN
NOT DATED



LEGEND

af: Artificial cut and fill
Qls: Landslide Debris
Tm: Monterey Formation - white-weathering, thin bedded, platy dark brown siliceous shale
Tmss: Monterey Formation - tan to light gray, semi-friable bedded sandstone; locally includes interbedded shale
Ttsi: Middle Topanga Formation - mostly interbedded gray to tan semi-friable sandstone and gray micaceous claystone
Tva: Middle Topanga Formation - Basaltic volcanic rocks. Dark gray to black, fine grained, massive, rarely vesicular
Sms: Santa Monica Slate; dark bluish slate-phyllite. Weathers brown

REFERENCE: DIBBLEE T.W., 1991, #DF-31, GEOLOGIC MAP OF THE BEVERLY HILLS AND VAN NUYS (SOUTH 1/2) QUADRANGLES

LOCAL GEOLOGIC MAP

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EYESTONE ENVIRONMENTAL

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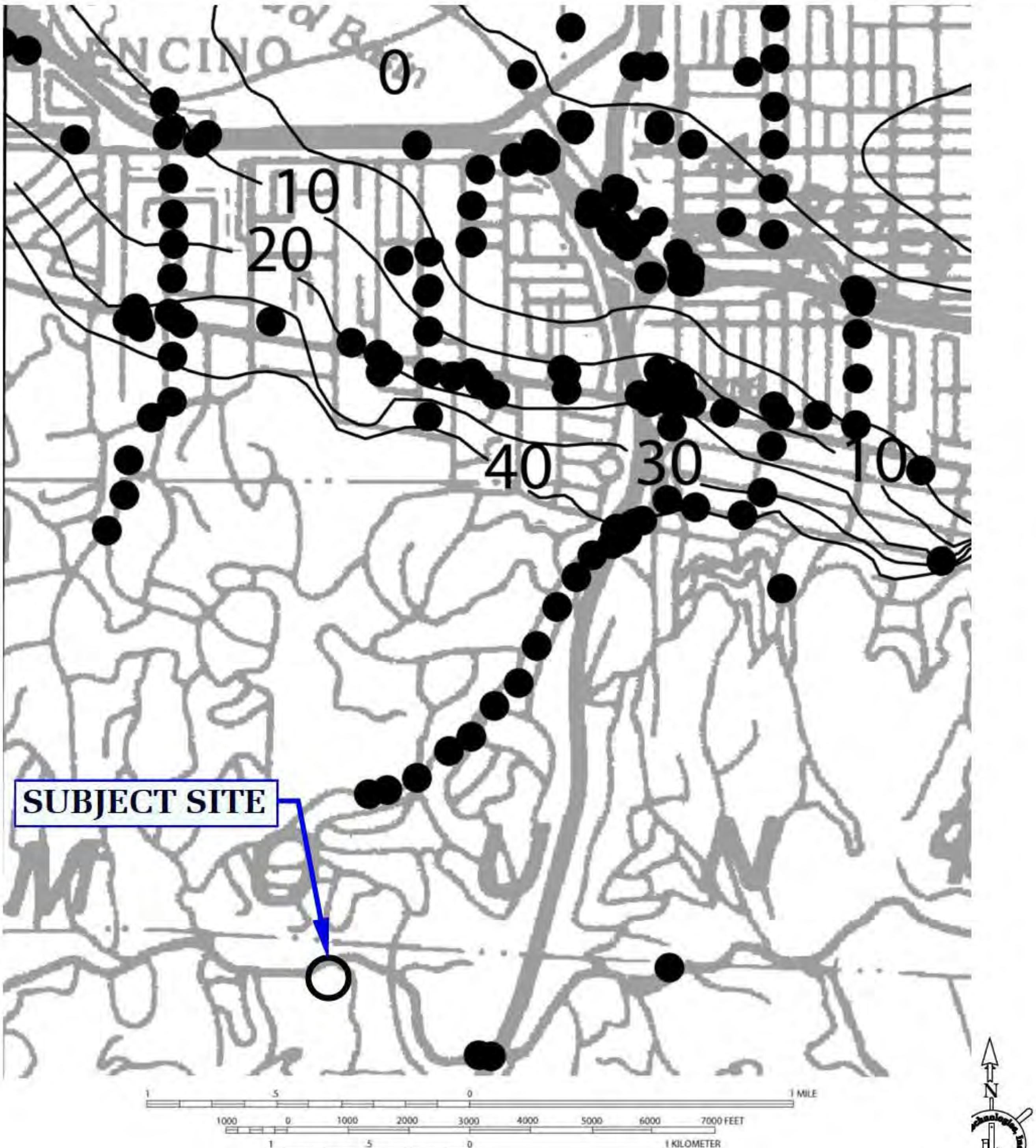

40 Depth to groundwater in feet

REFERENCE: CDMG, SEISMIC HAZARD ZONE REPORT, 08
VAN NUYS 7.5 - MINUTE QUADRANGLE, LOS ANGELES COUNTY, CALIFORNIA (1997, REVISED 2005)

HISTORICALLY HIGHEST GROUNDWATER LEVELS

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EYESTONE ENVIRONMENTAL

FILE No. 21603

SEISMIC SOURCE SUMMARY TABLE

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Eyestone Environmental

File No.: 21603

Based on USGS 2008 National Seismic Hazard Maps

Fault Name	Distance (Miles)	Preferred Dip (degrees)	Dip Direction	Slip Sense	Activity	Reference
Hollywood	5.42	70	N	strike slip	A (EFZ)	2
Santa Monica	5.79	44		strike slip	A (EFZ)	2
Malibu Coast	7.35	75	N	strike slip	A (EFZ)	2
Newport-Inglewood	8.02	88		strike slip	A (EFZ)	2
Anacapa-Dume	8.49	41	N	thrust	PA	3
Verdugo	9.49	55	NE	reverse	A	1,3
Elysian Park (Upper)	10.77	50	NE	reverse	-	1
Puente Hills (LA)	10.82	27	N	thrust	-	1
Sierra Madre (San Fernando)	11.33	45	N	reverse	A (EFZ)	2
Palos Verdes	11.76	90	V	strike slip	A	2
Santa Susana	12.29	55	N	reverse	A	3
Northridge	13.81	35	S	thrust	A	3
Sierra Madre	14.69	53	N	reverse	A	3
Raymond	14.94	79	N	strike slip	A (EFZ)	2
San Gabriel	16.67	61	N	strike slip	A (EFZ)	2
Simi-Santa Rosa	17.10	60		strike slip	A (EFZ)	2
Holser	20.18	58	S	reverse	-	1
Oak Ridge	23.01	53		reverse	-	1
San Cayetano	26.47	42	N	thrust	A (EFZ)	2
Elsinore (Whittier)	26.65	75	NE	strike slip	A (EFZ)	2
Clamshell-Sawpit	27.96	50	NW	reverse	PA	3
San Andreas	35.21	90	V	strike slip	A (EFZ)	2
San Jose	35.23	74	NW	strike slip	-	1
Santa Ynez	39.48	70		strike slip	A	2
Pitas Point	40.43	55		reverse	A (EFZ)	2
Ventura-Pitas Point	40.43	64	N	reverse	A (EFZ)	2
Chino	42.84	65	SW	strike slip		2
Cucamonga	43.26	45	N	reverse	A (EFZ)	2
San Joaquin Hills	43.55	23	SW	thrust	-	1
Channel Islands Thrust	45.28	20	N	thrust	-	1
Mission Ridge-Arroyo Parida	45.54	70	S	reverse	PA	2
Santa Cruz Island	45.68	90	V	strike slip	A	2
Red Mountain	49.14	56	N	reverse	A (EFZ)	2
Newport-Inglewood (Offshore)	49.47	90	V	Strike Slip	A	3
Garlock	53.02	90	V	strike slip	A (EFZ)	2
San Jacinto	53.80	90	V	strike slip	-	1
Gleghorn	59.68	90	V	Strike Slip	-	1
Pleito	59.94	46	S	Reverse	A (EFZ)	2

Reference:

1 = United States Geological Survey

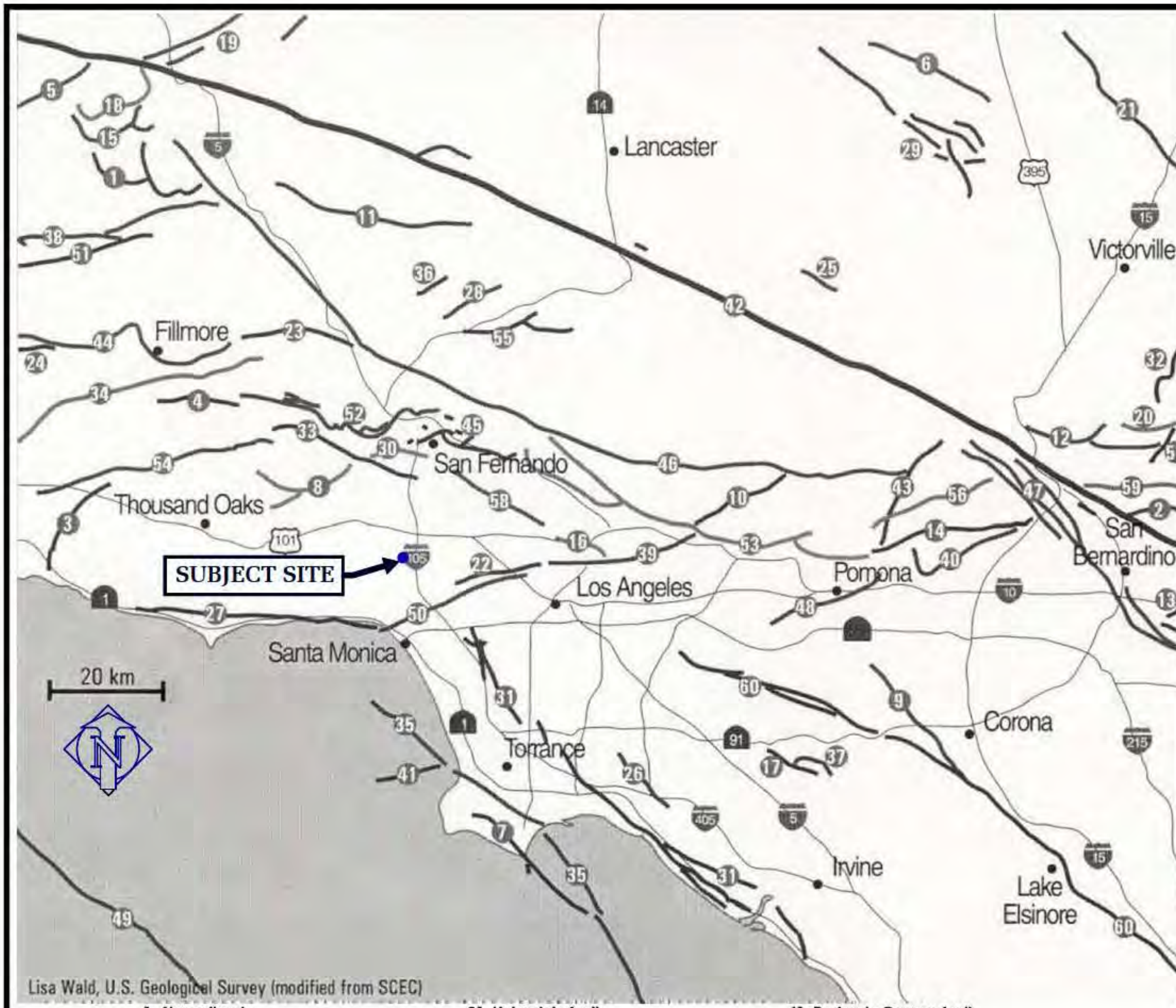
2 = California Geological Survey

3 = County of Los Angeles, Dept. of Public Works, 1990

A = Active

PA = Potentially Active

A (EFZ) = Active (Earthquake Fault Zone)



1 Alamo thrust
2 Arrowhead fault
3 Bailey fault
4 Big Mountain fault
5 Big Pine fault
6 Blake Ranch fault
7 Cabrillo fault
8 Chatsworth fault
9 Chino fault
10 Clamshell-Sawpit fault
11 Clearwater fault
12 Cleghorn fault
13 Crafton Hills fault zone
14 Cucamonga fault zone
15 Dry Creek fault
16 Eagle Rock fault
17 El Modeno fault
18 Frazier Mountain thrust
19 Garlock fault zone
20 Grass Valley fault
21 Helendale fault
22 Hollywood fault
23 Holser fault
24 Lion Canyon fault
25 Llano fault
26 Los Alamitos fault
27 Malibu Coast fault
28 Mint Canyon fault
29 Mirage Valley fault zone
30 Mission Hills fault
31 Newport Inglewood fault zone
32 North Frontal fault zone
33 Northridge Hills fault
34 Oak Ridge fault
35 Palos Verdes fault zone
36 Pelona fault
37 Peralta Hills fault
38 Pine Mountain fault
39 Raymond fault
40 Red Hill (Etiwanda Ave) fault
41 Redondo Canyon fault
42 San Andreas Fault
43 San Antonio fault
44 San Cayetano fault
45 San Fernando fault zone
46 San Gabriel fault zone
47 San Jacinto fault
48 San Jose fault
49 Santa Cruz-Santa Catalina Ridge f.z.
50 Santa Monica fault
51 Santa Ynez fault
52 Santa Susana fault zone
53 Sierra Madre fault zone
54 Simi fault
55 Soledad Canyon fault
56 Stoddard Canyon fault
57 Tunnel Ridge fault
58 Verdugo fault
59 Waterman Canyon fault
60 Whittier fault

REFERENCE: http://pasadena.wr.usgs.gov/info/images/LA%20Faults.pdf

SOUTHERN CALIFORNIA FAULT MAP

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EYESTONE ENVIRONMENTAL

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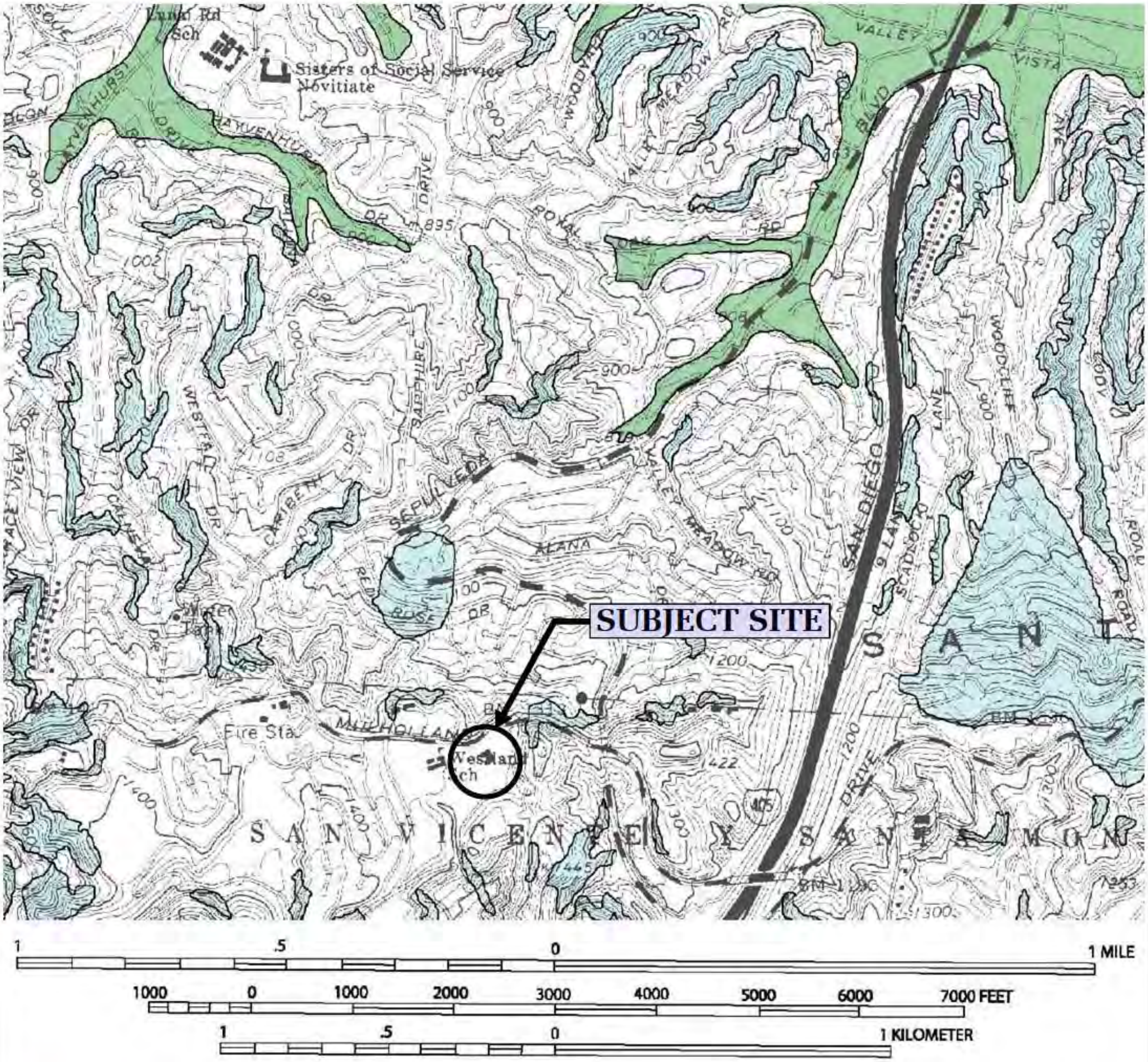


LIQUEFACTION AREA

EARTHQUAKE-INDUCED LANDSLIDE AREA

REFERENCE: SEISMIC HAZARD ZONES, VAN NUYS QUADRANGLE OFFICIAL MAP (CDMG, 1998)

SEISMIC HAZARD ZONE MAP

Geotechnologies, Inc.
Consulting Geotechnical Engineers

EYESTONE ENVIRONMENTAL

FILE NO. 21603

LEGEND

OTHER AREAS		Area of Undetermined Flood Hazard Zone D

FLOOD INSURANCE RATE MAP

Geotechnologies, Inc.
Consulting Geotechnical Engineers

EYESTONE ENVIRONMENTAL

FILE No. 21603

REFERENCE: FEMA FLOOD MAP NUMBER 06037C1315F
DATED 9/26/08

BORING LOG NUMBER 1

Eyestone Environmental | **Date: 06/13/18**

File No. 21603 | **Method: 8-inch diameter Hollow Stem Auger**

km/nk

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Lawn Area
				0		FILL: Silty Sand, dark brown, moist, medium dense, fine grained
				1		
				2		
3	28	20.2	105.1	3		Silty Sand to Sandy Silt, dark yellowish brown, stiff
				4		
5	16	22.7	SPT	5		Sandy Silt, dark gray
				6		
				7		
7.5	73	20.4	103.9			Silty Sand to Sandy Silt, gray to dark gray, dense
				8		
				9		
10	35	17.5	SPT	10		Silty Sand, dark gray, medium dense
				11		
				12		
12.5	28 50/5"	15.7	101.1			Silty Sand to Sand, gray to dark gray, very dense
				13		
				14		
15	71	13.0	SPT	15		Silty Sand to Sandy Silt, gray and dark brown, moist, very dense, very stiff
				16		
				17		
17.5	100/7"	14.3	97.0			BEDROCK (MODELO FORMATION): Siltstone, dark brown and yellowish brown, moist, hard
				18		
				19		
20	50/5"	15.4	SPT	20		
				21		
				22		
22.5	100/6"	17.9	85.3			Siltstone interbedded with Sandstone, dark yellowish brown, moist, hard
				23		
				24		
25	60/6"	14.1	SPT	25		

BORING LOG NUMBER 1

Eyestone Environmental

File No. 21603

km/nk

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				26		
				27		
27.5	100/7"	11.2	98.9			
				28		
				29		
30	38 50/1"	11.3	SPT	30		Sandstone, yellow and light brown, moist, moderately hard to hard
				31		
				32		
				33		
				34		
35	100/7.5"	16.7	92.2	35		Siltstone, gray to dark gray, moist, hard
				36		
				37		
				38		
				39		
40	100/8"	27.2	85.8	40		
				41		
				42		
				43		
				44		
45	100/7"	15.0	102.3	45		Siltstone, dark gray, moist, hard
				46		
				47		
				48		
				49		
50	100/7"	15.2	101.3	50		

BORING LOG NUMBER 1

Eyestone Environmental

File No. 21603
km/nk

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				51		
				52		
				53		
				54		
55	100/7"	17.8	91.0	55		
				56		
				57		
				58		
				59		
60	100/7"	12.8	87.0	60		
				61		Total Depth 60 feet No Water Fill to 17½ feet
				62		
				63		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				64		
				65		Used 8-inch diameter Hollow-Stem Auger 140-lb. Automatic Hammer, 30-inch drop Modified California Sampler used unless otherwise noted
				66		SPT=Standard Penetration Test
				67		
				68		
				69		
				70		
				71		
				72		
				73		
				74		
				75		

BORING LOG NUMBER 2

Eyestone Environmental **Date: 06/13/18**

File No. 21603 **Method: Hand Auger**

km/nk

Sample Depth ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Lawn Area
			0		FILL: Silty Sand, dark brown, moist, medium dense, fine grained
			1		
2	16.6	110.8	2		yellowish brown
			3		
4	16.9	107.9	4		Silty Sand to Sandy Silt, dark yellowish brown, medium dense, stiff
			5		
			6		
7	15.9	108.3	7		Silty Sand, gray and yellowish brown
			8		
			9		
10	25.3	100.2	10		Sandy Silt to Silty Sand, dark yellowish brown, medium dense, stiff
			11		
			12		
			13		
			14		
15	12.8	103.3	15		Silty Sand, yellowish brown
			16		
			17		
			18		
			19		
20	11.5	108.3	20		
			21		
			22		Total Depth 21½ feet by refusal No Water Fill to 21½ feet (Bottom of Fill not identified)
			23		
			24		
			25		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual. Used 4-inch diameter Hand-Augering Equipment; Hand Sampler

BORING LOG NUMBER 3

Eyestone Environmental | **Date: 06/13/18**

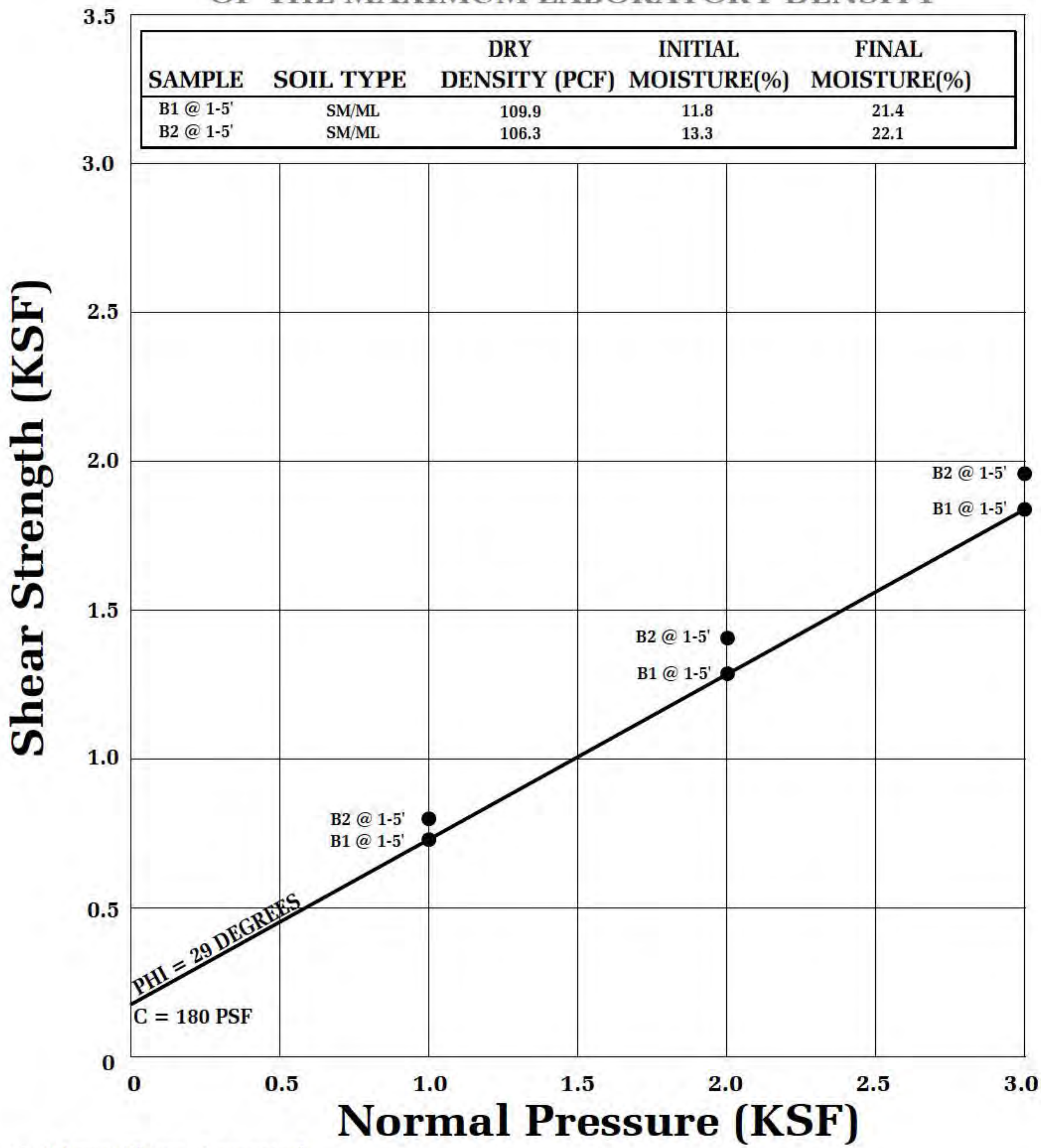
File No. 21603 | **Method: Hand Auger**

km/nk

Sample Depth ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Lawn Area
			0		FILL: Silty Sand, dark brown, moist, medium dense, fine grained
1	14.4	115.9	1		- - - - - - - - - -
					dark yellowish brown
			2		
3	18.4	109.3	3		
			4		
5	16.8	103.8	5		- - - - - - - - - -
					Silty Sand to Sand, dark gray
			6		
7	23.5	98.7	7		
					- - - - - - - - - -
			8		Silty Sand
			9		
10	27.2	89.4	10		- - - - - - - - - -
					Sandy Silt to Silty Sand, dark gray, stiff, medium dense
			11		
			12		
			13		
			14		
15	14.6	109.1	15		
			16		
					Total Depth 16 feet by refusal No Water Fill to 16 feet (Bottom of Fill not identified)
			17		
			18		
			19		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
			20		
			21		Used 4-inch diameter Hand-Augering Equipment; Hand Sampler
			22		
			23		
			24		
			25		

BULK SAMPLE REMOLDED TO 90 PERCENT OF THE MAXIMUM LABORATORY DENSITY

SAMPLE	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE(%)	FINAL MOISTURE(%)
B1 @ 1-5'	SM/ML	109.9	11.8	21.4
B2 @ 1-5'	SM/ML	106.3	13.3	22.1



● Direct Shear, Saturated

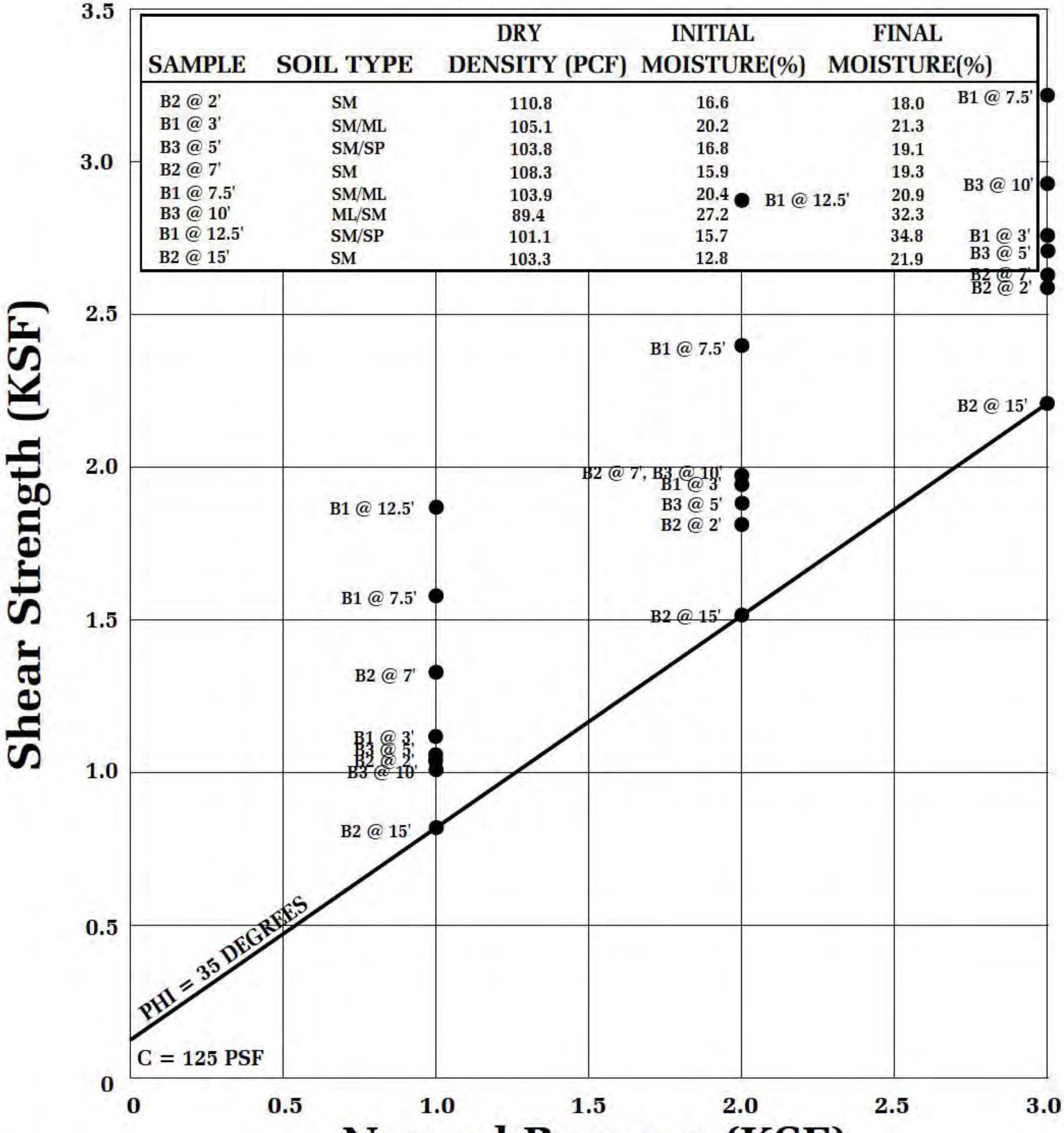
SHEAR TEST DIAGRAM

Geotechnologies, Inc.
Consulting Geotechnical Engineers

EYESTONE ENVIRONMENTAL	
FILE NO. 21603	PLATE: B-1

FILL MATERIALS

SAMPLE	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE(%)	FINAL MOISTURE(%)
B2 @ 2'	SM	110.8	16.6	18.0
B1 @ 3'	SM/ML	105.1	20.2	21.3
B3 @ 5'	SM/SP	103.8	16.8	19.1
B2 @ 7'	SM	108.3	15.9	19.3
B1 @ 7.5'	SM/ML	103.9	20.4	20.9
B3 @ 10'	ML/SM	89.4	27.2	32.3
B1 @ 12.5'	SM/SP	101.1	15.7	34.8
B2 @ 15'	SM	103.3	12.8	21.9



● Direct Shear, Saturated

SHEAR TEST DIAGRAM

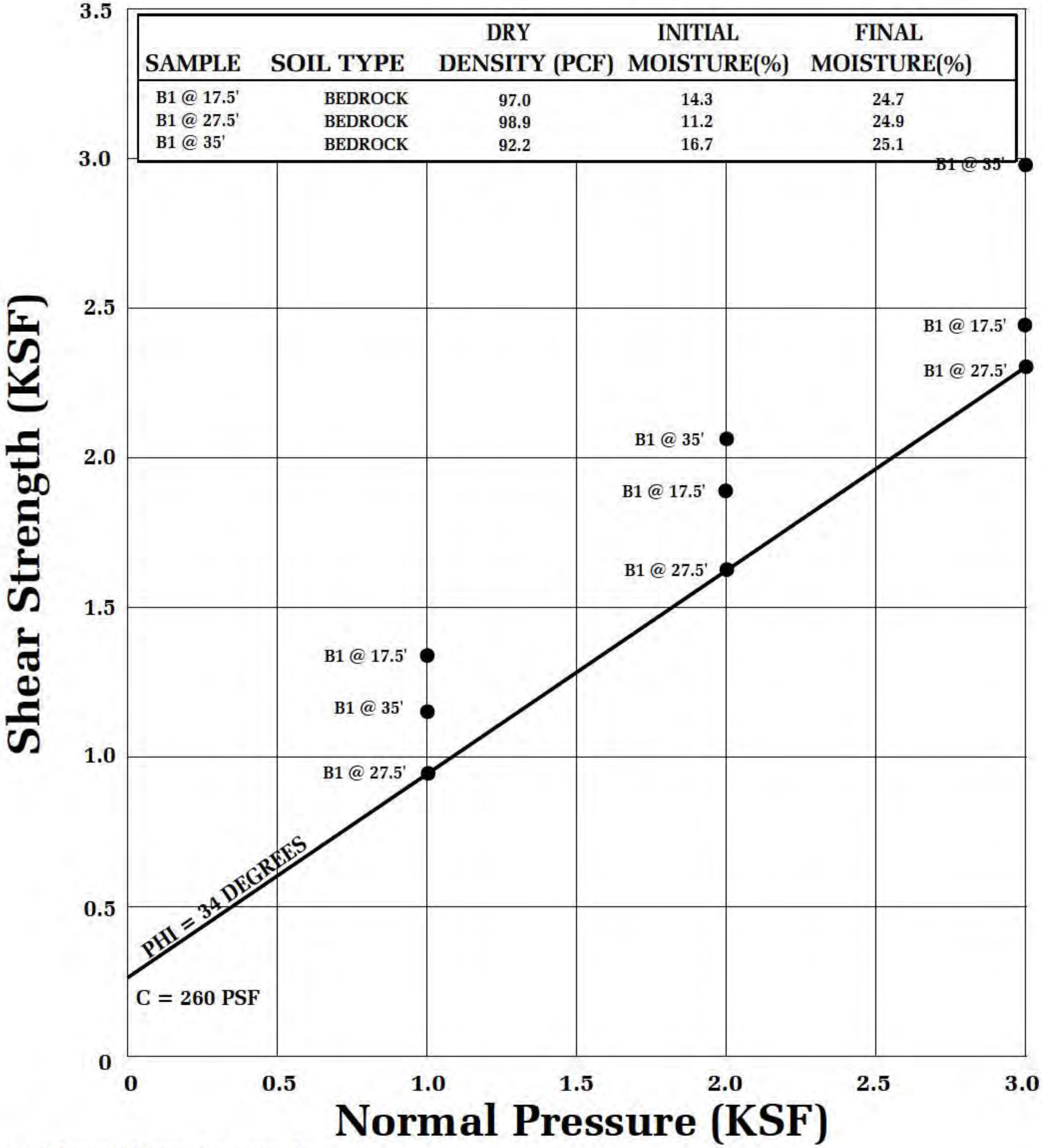
Geotechnologies, Inc.
Consulting Geotechnical Engineers

EYESTONE ENVIRONMENTAL

FILE NO. 21603 | PLATE: B-2

BEDROCK

SAMPLE	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE(%)	FINAL MOISTURE(%)
B1 @ 17.5'	BEDROCK	97.0	14.3	24.7
B1 @ 27.5'	BEDROCK	98.9	11.2	24.9
B1 @ 35'	BEDROCK	92.2	16.7	25.1



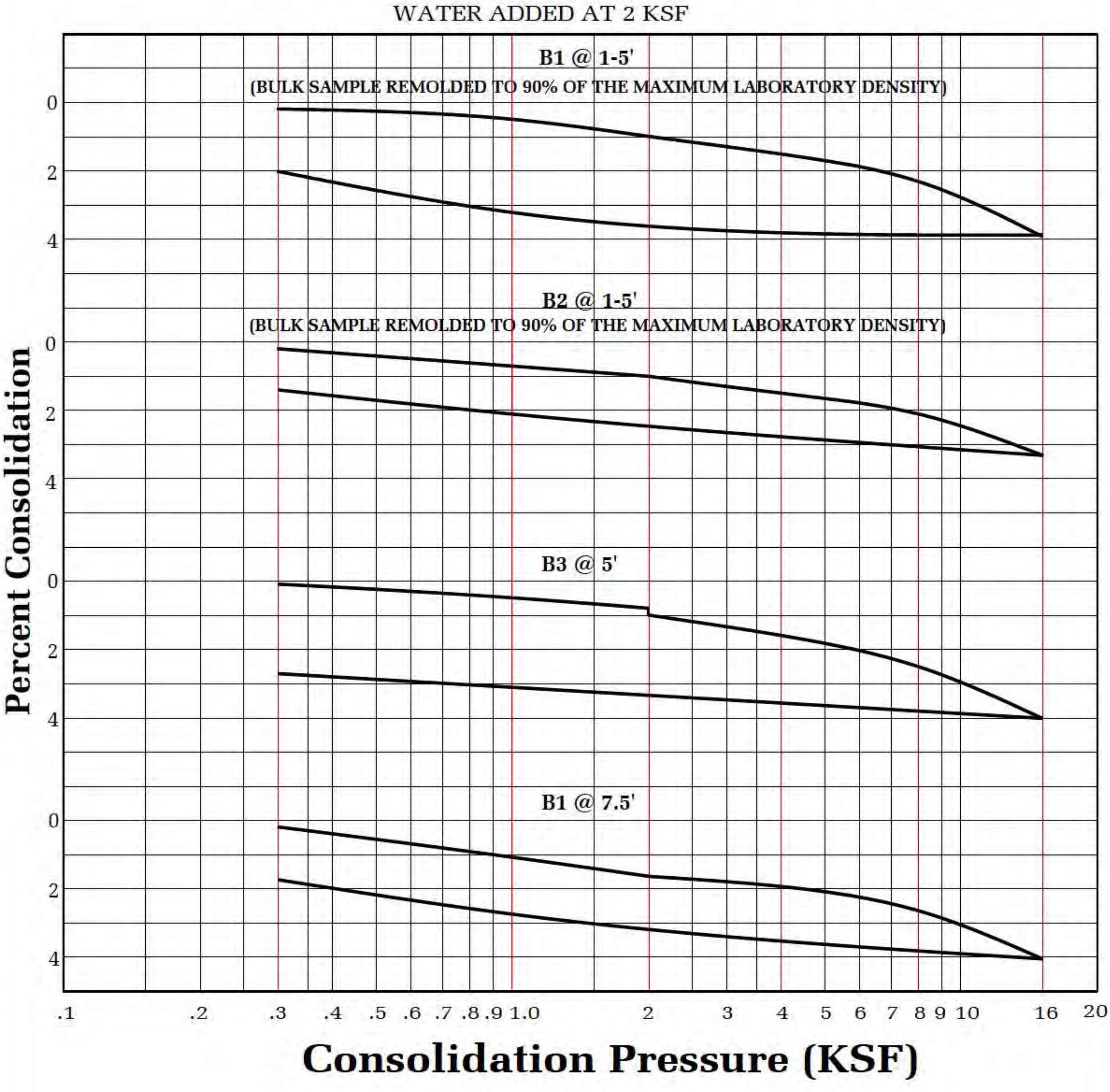
● Direct Shear, Saturated

SHEAR TEST DIAGRAM

Geotechnologies, Inc.
Consulting Geotechnical Engineers

EYESTONE ENVIRONMENTAL

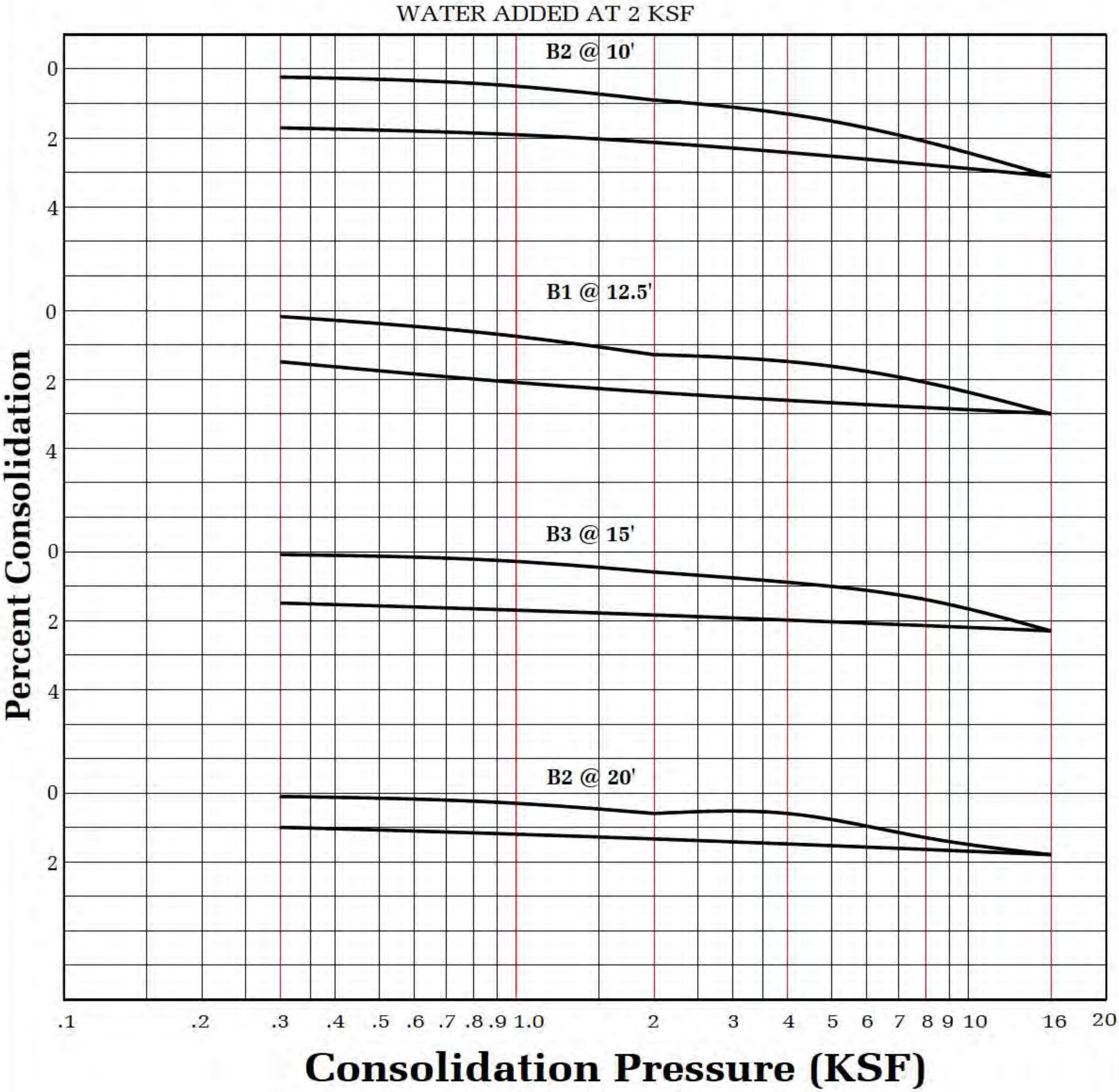
FILE NO. 21603 | PLATE: B-3



CONSOLIDATION TEST

Geotechnologies, Inc.
Consulting Geotechnical Engineers

EYESTONE ENVIRONMENTAL	
FILE NO. 21603	PLATE: C-1



CONSOLIDATION TEST

Geotechnologies, Inc.
Consulting Geotechnical Engineers

EYESTONE ENVIRONMENTAL	
FILE NO. 21603	PLATE: C-2

ASTM D-1557

SAMPLE	B1 @ 1-5'	B2 @ 1-5'
SOIL TYPE:	SM/ML	SM/ML
MAXIMUM DENSITY pcf.	122.1	118.1
OPTIMUM MOISTURE %	11.8	13.3

ASTM D 4829

SAMPLE	B1 @ 1-5'	B2 @ 1-5'
SOIL TYPE:	SM/ML	SM/ML
EXPANSION INDEX UBC STANDARD 18-2	60	46
EXPANSION CHARACTER	MODERATE	LOW

SULFATE CONTENT

SAMPLE	B1 @ 1-5'	B2 @ 1-5'
SULFATE CONTENT: (percentage by weight)	< 0.10%	< 0.10%

COMPACTION/EXPANSION/SULFATE DATA SHEET

Geotechnologies, Inc.
Consulting Geotechnical Engineers

EYESTONE ENVIRONMENTAL

FILE NO. 21603 | PLATE: D

TABLES

Table 3. Summary of Findings – 2021 Slope Mapping

Performed March 29, 2021

Mirman School for Gifted Children, Los Angeles, CA

Mapping Location ID	Approximate Latitude	Approximate Longitude	Strike; Dip	Material(s) Encountered
Outcrop 1	34.128952	-118.483001	N30W; 22NE	Tertiary Modelo Formation at surface, sandstone/silty sandstone
Outcrop 2	34.129343	-118.483437	N45W; 18NE	Tertiary Modelo Formation at surface, sandstone/silty sandstone
Test Pit 1	34.128517	-118.484018	-	**0 – 2 ft bgs**: Fill/Colluvium, mostly silty sand, likely local fill, evidence of angular fragments of Tertiary Modelo Formation at depth
Test Pit 2	34.128692	-118.483414	-	**0 - 0.75 ft bgs**: Topsoil, silty sand, relatively high fines **0.75 – 2 ft bgs**: Fill/Colluvium, silty sand and silty sandstone, likely colluvium of Tertiary Modelo Formation, evidence of angular fragments of Tertiary Modelo Formation at depth
Test Pit 3	34.128940	-118.483240	-	**0 - 0.25 ft bgs**: Topsoil, silty sand **0.25 – 2 ft bgs**: Fill/Colluvium, silty sand and silty sandstone, likely colluvium of sandy Tertiary Modelo Formation, evidence of large angular fragments of Tertiary Modelo Formation at depth
Test Pit 4	34.128912	-118.483383	-	**0 - 0.75 ft bgs**: Topsoil, silty sand **0.75 – 1 ft bgs**: Tertiary Modelo Formation, mudstone, bedding visible with orientations observed as similar to Outcrop 2

Notes:
ft bgs: foot or feet below ground surface
A “-“ indicates bedding orientations not measurable or observed

Appendix 7.3

LADBS Preliminary Geotechnical Investigation Approval Letter

CITY OF LOS ANGELES
CALIFORNIA

ERIC GARCETTI
MAYOR

DEPARTMENT OF
BUILDING AND SAFETY
201 NORTH FIGUEROA STREET
LOS ANGELES, CA 90012

OSAMA YOUNAN, P.E.
GENERAL MANAGER
SUPERINTENDENT OF BUILDING

JOHN WEIGHT
EXECUTIVE OFFICER

GEOLOGY AND SOILS REPORT APPROVAL LETTER

June 15, 2021

LOG # 116076-01
SOILS/GEOLOGY FILE - 2

The Mirman School for Gifted Children
16180 W. Mulholland Drive
Los Angeles, CA 90049

TRACT:	PM 4816	PM 1938
LOTS:	A, B (Arb. 1)	A (Arb. 1), B (Arb. 2)
LOCATION:	16100 W. Mulholland Drive (aka 16180 W. Mulholland Drive)	

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Addendum Report No. 1	SC0984	04/30/2021	Geosyntec Consultants, Inc.
Laboratory Test Report	SC0984A	02/22/2021	California Testing & Inspections

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Review Letter	116076	02/16/2021	LADBS
Geology/Soils Report	SC0984	01/20/2021	Geosyntec Consultants, Inc.

The Grading Division of the Department of Building and Safety has reviewed the referenced reports that provide recommendations for the proposed construction of a 16,000 square foot 2-story classroom building and retaining walls. The proposed improvements are located at the toe of an approximately 100 foot high up to 1.5H:1V slope. The earth materials at the subsurface exploration locations consist of up to 15 feet of uncertified fill estimated to be up to 35 feet thick underlain by Modelo Formation sandstone and mudstone bedrock that dips 14 to 22 degrees to the northeast. The consultants recommend to support the proposed structures on CIDH and grade beam / structural slab foundation system deriving support from competent bedrock.

The referenced reports are acceptable, provided the following conditions are complied with during site development:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2020 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. The soils engineer shall review and approve the detailed plans prior to issuance of any permit. This approval shall be by signature on the plans that clearly indicates the soils engineer has reviewed the plans prepared by the design engineer; and, that the plans included the recommendations contained in their reports (7006.1).

2. All recommendations of the reports that are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.

3. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans (7006.1). Submit one copy of the above reports to the Building Department Plan Checker prior to issuance of the permit.

4. A grading permit shall be obtained for all structural fill and retaining wall backfill (106.1.2).

5. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557. Where cohesionless soil having less than 15 percent finer than 0.005 millimeters is used for fill, it shall be compacted to a minimum of 95 percent relative compaction based on maximum dry density. Placement of gravel in lieu of compacted fill is only allowed if complying with LAMC Section 91.7011.3.

6. Existing uncertified fill shall not be used for support of footings, concrete slabs or new fill (1809.2, 7011.3).

7. Drainage in conformance with the provisions of the Code shall be maintained during and subsequent to construction (7013.12).

8. Controlled Low Strength Material, CLSM (slurry) shall satisfy the requirements specified in P/BC 2020-121.

9. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the General Safety Orders of the California Department of Industrial Relations (3301.1).

10. Excavations shall not remove lateral support from a public way, adjacent property or an existing structure. Note: Lateral support shall be considered to be removed when the excavation extends below a plane projected downward at an angle of 45 degrees from the bottom of a footing of an existing structure, from the edge of the public way or an adjacent property. (3307.3.1)

11. Prior to the issuance of any permit that authorizes an excavation where the excavation is to be of a greater depth than are the walls or foundation of any adjoining building or structure and located closer to the property line than the depth of the excavation, the owner of the subject site shall provide the Department with evidence that the adjacent property owner has been given a 30-day written notice of such intent to make an excavation (3307.1).

12. Prior to the issuance of the permits, the soils engineer and the structural designer shall evaluate all applicable surcharge loads for the design of the retaining walls and shoring.

13. Unsurcharged temporary excavations shall be trimmed back at a gradient not exceeding 1:1 in Modelo Formation, or 1.5(H):1(V) in fill, as recommended on page 13 of the 01/20/2021 report.

14. The proposed classroom building shall be supported on CIDH and grade beam / structural slab foundation system deriving support from competent bedrock, as recommended and shall be approved by the geologist and soils engineer by inspection.

15. Foundations adjacent to a descending slope steeper than 3:1 (horizontal to vertical) in gradient shall be a minimum distance of one-third the vertical height of the slope but need not exceed 40 feet measured horizontally from the footing bottom to the face of the slope (1808.7.2).

16. Buildings adjacent to ascending slopes steeper than 3H:1V in gradient shall be setback from the toe of the slope a level distance measured perpendicular to slope contours equal to one-half the vertical height of the slope, but need not exceed 15 feet (1808.7.1).

17. Pile caisson and/or isolated foundation ties are required by LAMC Sections 91.1809.13 and/or 91.1810.3.13. Exceptions and modification to this requirement are provided in Information Bulletin P/BC 2020-030.

18. When water is present in drilled pile holes, the concrete shall be tremied from the bottom up to ensure minimum segregation of the mix and negligible turbulence of the water (1808.8.3).

19. Existing uncertified fill shall not be used for lateral support of deep foundations (1810.2.1).

20. The seismic design shall be based on a Site Class D, as recommended. All other seismic design parameters shall be reviewed by LADBS building plan check. Note: Site Class C is ***not*** approved.

21. Retaining walls shall be designed for the lateral earth pressures specified in the section titled "Retaining Walls" starting on page 19 of the 01/20/2021 report. All surcharge loads shall be included into the design.

22. All retaining walls shall be provided with a standard surface backdrain system and all drainage shall be conducted in a non-erosive device to the street in an acceptable manner (7013.11).

23. With the exception of retaining walls designed for hydrostatic pressure, all retaining walls shall be provided with a subdrain system to prevent possible hydrostatic pressure behind the wall. Prior to issuance of any permit, the retaining wall subdrain system recommended in the soils report shall be incorporated into the foundation plan which shall be reviewed and approved by the soils engineer of record (1805.4).

24. Installation of the subdrain system shall be inspected and approved by the soils engineer of record and the City grading/building inspector (108.9).

25. Prefabricated drainage composites (Miradrain, Geotextiles) may be only used in addition to traditionally accepted methods of draining retained earth.

26. All roof, pad and deck drainage shall be conducted to the street in an acceptable manner in non-erosive devices or other approved location in a manner that is acceptable to the LADBS and the Department of Public Works (7013.10).

27. All concentrated drainage shall be conducted in an approved device and disposed of in a manner approved by the LADBS (7013.10).

28. Sprinkler plans for irrigation shall be submitted and approved by the Mechanical Plan Check Section (7012.3.1).

29. The soils engineer shall inspect all excavations to determine that conditions anticipated in the report have been encountered and to provide recommendations for the correction of hazards found during grading (7008, 1705.6 & 1705.8).

30. All friction pile or caisson drilling and excavations shall be performed under the inspection and approval of the geologist and soils engineer. The geologist shall indicate the distance that friction piles or caissons penetrate into competent [material] bedrock in a written field memorandum. (1803.5.5, 1705.1.2)

31. Prior to pouring concrete, a representative of the consulting soils engineer shall inspect and approve the footing excavations. The representative shall post a notice on the job site for the LADBS Inspector and the Contractor stating that the work inspected meets the conditions of the report. No concrete shall be poured until the LADBS Inspector has also inspected and approved the footing excavations. A written certification to this effect shall be filed with the Grading Division of the Department upon completion of the work. (108.9 & 7008.2)

32. Prior to excavation an initial inspection shall be called with the LADBS Inspector. During the initial inspection, the sequence of construction; [shoring; ABC slot cuts; underpinning; pile installation;] protection fences; and, dust and traffic control will be scheduled (108.9.1).

33. Installation of shoring, underpinning, slot cutting and/or pile excavations shall be performed under the inspection and approval of the soils engineer and deputy grading inspector (1705.6, 1705.8).

34. Prior to the placing of compacted fill, a representative of the soils engineer shall inspect and approve the bottom excavations. The representative shall post a notice on the job site for the LADBS Inspector and the Contractor stating that the soil inspected meets the conditions of the report. No fill shall be placed until the LADBS Inspector has also inspected and approved the bottom excavations. A written certification to this effect shall be included in the final compaction report filed with the Grading Division of the Department. All fill shall be placed under the inspection and approval of the soils engineer. A compaction report together with the approved soil report and Department approval letter shall be submitted to the Grading Division of the Department upon completion of the compaction. In addition, an Engineer's Certificate of Compliance with the legal description as indicated in the grading permit and the permit number shall be included (7011.3).

Casey Lee Jensen

CASEY LEE JENSEN
Engineering Geologist Associate III

YING LIU
Geotechnical Engineer II

CLJ/YL:clj/yl
Log No. 116076-01
213-482-0480

cc: Geosyntec Consultants, Inc., Project Consultant
WL District Office

CITY OF LOS ANGELES
DEPARTMENT OF BUILDING AND SAFETY
Grading Division

District	Log No. 116076

APPLICATION FOR REVIEW OF TECHNICAL REPORTS

INSTRUCTIONS

A. Address all communications to the Grading Division, LADBS, 221 N. Figueroa St., 12th Fl., Los Angeles, CA 90012 Telephone No. (213)482-0480.
B. Submit two copies (three for subdivisions) of reports, one "pdf" copy of the report on a CD-Rom or flash drive, and one copy of application with items "1" through "10" completed.
C. Check should be made to the City of Los Angeles.

1. LEGAL DESCRIPTION
Tract: See Attached for Property Legal Descriptions
Block: Lots:

2. PROJECT ADDRESS:
16180 Mulholland Drive, Los Angeles, CA 90049

3. OWNER: See Attached for Property Ownership
Address: See Attached for Mailing Addresses
City: Zip:
Phone (Daytime): Rick Benfield, (310) 476-2868 ext. 249

4. APPLICANT Bella Bakrania
Address: 9480 South Eastern Ave, Suite 217
City: Las Vegas Zip: 89123
Phone (Daytime): (702) 216-3294
E-mail address: bbakrania@geosyntec.com

5. Report(s) Prepared by: Geosyntec Consultants, Inc. 6. Report Date(s): 01/20/2021

7. Status of project: ☑ Proposed ☐ Under Construction ☐ Storm Damage
8. Previous site reports? ☑ YES if yes, give date(s) of report(s) and name of company who prepared report(s)
Several prior reports exist and have been provided as an appendix.
9. Previous Department actions? ☐ YES if yes, provide dates and attach a copy to expedite processing.
Dates:
10. Applicant Signature: Position: Consultant to Applicant, Senior Engineer

(DEPARTMENT USE ONLY)

REVIEW REQUESTED	FEES	REVIEW REQUESTED		FEES
☐ Soils Engineering		No. of Lots		
☐ Geology		No. of Acres		
☐ Combined Soils Engr. & Geol.		☐ Division of Land		726.00
☐ Supplemental		Other		
☐ Combined Supplemental		☑ Expedite		363.00
☐ Import-Export Route		☐ Response to Correction		
Cubic Yards:		☐ Expedite ONLY		
			Sub-total	1089.00
			Surcharges	249.58
			TOTAL FEE	1338.58

Fee Due: 1338.58
Fee Verified By: Date: 1.25.21
(Cashier Use Only)

Los Angeles Department of Building and Safety
Metro 4th Floor 02/01/2021 10:53:35 AM
User ID: nbaydaline
Receipt Ref Nbr: 2021032001-77
Transaction ID: 2021032001-77-1
GRADING REPORT $726.00
SYSTEMS DEV SURCH $65.34
GEN PLAN MAINT SURCH $76.23
DEV SERV CENTER SURCH $32.67
CITY PLAN SURCH $65.34
PLAN APPROVAL FEE $363.00
MISC OTHER $10.00
Amount Paid: $1,338.58
PCIS Number: NA
Job Address: 16180 Mulholland Dr.
Owners Name: NA

ACTION BY:

THE REPORT IS: ☐ NOT APPROVED ☐ APPROVED WITH CONDITIONS ☐ BELOW ☐ ATTACHED

For Geology Date

For Soils Date