Appendix G

Geology and Soils

Appendix G.1

Geotechnical Engineering Investigation

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Celebrating 50 YEARS OF SERVICE
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October 10, 2017
Updated February 19, 2021
File Number 21155

1111 Sunset Boulevard, LLC
c/o Palisades Capital Partners
631 Wilshire Boulevard, Suite 4C
Santa Monica, California 90401

Attention: Mr. Brian Falls

Subject: Updated Geotechnical Engineering Investigation
Proposed Mixed-Use Development
1111 Sunset Boulevard, Los Angeles, California

References: *Reports by Geotechnologies, Inc.:*
Geotechnical Opinion, dated March 13, 2017;
Geotechnical Engineering Investigation, dated October 10, 2017, revised November 22, 2019;
Response to City of Los Angeles Soils and Geology Report Review Letter, dated May 24, 2018, revised June 25, 2018.

Reports by Others:
Converse Foundation Engineering Company, Foundation Investigation, dated October 3, 1960, Project No. 60-451-A;
Pioneer Soils Engineering, Soil and Geology Investigation, dated June 24, 1997, Project No 1677-FG;
Geosyntec Consultants, Methane Report, dated February 2018, updated February 4, 2021, Project Number SC0808D;
Geosyntec Consultants, December 17, 2020, updated February 4, 2021, Oil Well Report, No project number.

Communications from City of L.A., Department of Building and Safety, Grading Division:
Geology and Soils Report Review Letter, dated January 31, 2018, LOG#101530;
Geology and Soils Report Review Letter, dated May 13, 2020, LOG#101530-01;
Geology and Soils Report Review Letter, dated May 19, 2020, LOG#101530-02.

Dear Mr. Falls:

This letter transmits the Updated Geotechnical Engineering Investigation for the subject site prepared by Geotechnologies, Inc. This report provides geotechnical recommendations for the development of the site, including earthwork, seismic design, retaining walls, excavations, shoring and foundation design. Engineering for the proposed project should not begin until approval of the geotechnical investigation is granted by the local building official. Significant changes in the geotechnical recommendations may result due to the building department review process.

This report is provided as a standalone comprehensive report prepared as a response to the Geology and Soils Report Review Letter issued by the City of Los Angeles, dated May 19, 2020. This report includes all exploration, laboratory testing, and most recent project recommendations in compliance with the 2020 Los Angeles Building Code. Responses to the referenced review letters dated January 31, 2018, May 13, 2020 and May 19, 2020 are also incorporated with this report. Included in the Appendix of this report are copies of the review letters and itemized responses to each comment. The response to each comment includes a reference to where in the main body of the report the item is addressed.

The validity of the recommendations presented herein is dependent upon review of the geotechnical aspects of the project during construction by this firm. The subsurface conditions described herein have been projected from limited subsurface exploration and laboratory testing. The exploration and testing presented in this report should in no way be construed to reflect any variations which may occur between the exploration locations or which may result from changes in subsurface conditions.

Should you have any questions please contact this office.

Respectfully submitted,
GEOTECHNOLOGIES, INC.

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UPDATED GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED MIXED-USE DEVELOPMENT
1111 SUNSET BOULEVARD
LOS ANGELES, CALIFORNIA

INTRODUCTION

This report presents the results of the geotechnical engineering investigation performed on the subject site. The purpose of this investigation was to identify the distribution and engineering properties of the geologic materials underlying the site, and to provide geotechnical recommendations for the design of the proposed development.

This investigation included drilling of ten borings, excavation of five test pits, collection of representative soil samples, laboratory testing, engineering analysis, and review of available geotechnical engineering information and the preparation of this report. The exploratory borings and test pits locations are shown on the enclosed Plot Plan. Soil reports prepared by other consultants for the site were also reviewed by this firm.

This office has previously provided a geotechnical consultation on the subject site. The report dated March 13, 2017 addressed the impact of the proposed demolition of a two-story office building and a 1-story church located on the site.

SITE CONDITIONS

The site is located at 1111 Sunset Boulevard in the City of Los Angeles, California. The site is approximately 6.27 acres in area and has an irregular shape. It is bounded by “The Elysian”-a residential building, and White Knoll Drive to the north, by Alpine Street to the east, by Beaudry Avenue to the south, and by Sunset Boulevard to the west. The site is shown relative to topographic features on the attached Vicinity Map. The enclosed Plot Plan shows the existing site conditions as well as the existing ground elevations.

Current ground surface elevations range from 381 feet above mean sea level at the southwest corner of the site to 432 feet along White Knoll Drive at the northeast corner of the site. The total elevation difference is 51 feet with an overall site gradient of 10 to 1 (horizontal to vertical). Locally slope inclinations are as steep as 2 to 1.

The site is occupied by three vacant structures: courtyard building (3 stories in height), administration building (2 stories in height), and church (1 story n height). A bridge connects the parking area to the administration building. The balance of the site is developed with retaining walls, asphalt paved parking lot and planter areas. The neighboring, offsite development consists of a combination of commercial and residential structures.

Adjacent to and north of the site is the Elysian, a 9-story residential structure. The Elysian has a basement with a finish floor elevation of 417.12 feet. The attached Cross Section A-A' shows the location and finish floor level of the Elysian in respect to the existing site grade. The structure is supported by a mix of spread footings and belled caissons.

Drainage across the site appears from north to south. The vegetation on the site consists of trees, planters, and grass areas.

PROPOSED DEVELOPMENT

Information concerning the proposed development was furnished by the client and the office of Skidmore, Owings & Merrill, LLP, the project architect. The 1111 Sunset Project (Project) is a mixed-use development proposed to be constructed on a 6.27-acre site (Project Site) that is currently developed with three vacant structures that are situated generally in the center and along the western area of the lot and the Elysian apartment building situated generally along the northern portion of the lot, which is not part of the Project. The Project Site also includes surface parking and circulation areas generally located on the eastern half of the Project Site. The proposed development layout is shown on the attached Project Summary map.

The Project proposes two potential development scenarios—the Mixed Use Development Scenario and the Hotel Development Scenario. Under the Mixed Use Development Scenario, up to 737 residential units (including up to 76 restricted affordable housing units), up to 180 hotel rooms, up to 48,000 square feet of office space, and up to 95,000 square feet of general commercial floor area are proposed. Under the No-Hotel Development Scenario, a maximum of up to 827 residential units (including up to 76 restricted affordable housing units) would be constructed along with up to 48,000 square feet of office space, and up to 95,000 square feet of general commercial floor area. The additional residential units (under the No-Hotel Development Scenario) would be located in the Sunset Building and would replace the 180 hotel rooms proposed by the Mixed Use Development Scenario. The Project would comprise a maximum of 994,982 square feet of floor area; when accounting for the existing Elysian apartment building to remain and the existing vacant buildings to be removed, the Project Site would include 1,105,318 square feet of floor area upon completion.

The Project's design would remain consistent with either scenario. Under either development scenario, the proposed uses would be built above a screened six-level parking podium, which would be partially below grade and partially above grade within four primary structures, including two residential towers (referred to as Tower A and Tower B), a hotel/residential tower (referred to as the Sunset Building), and a commercial building that could contain office, retail, restaurant, and parking uses (referred to as the Courtyard Building). Separate from the four primary structures, three low-rise, non-residential structures would be oriented towards Sunset Boulevard and Beaudry Avenue. A portion of the proposed residential uses would be provided in low-rise residential buildings dispersed throughout the eastern and southern portions of the Project Site around the base of the two residential towers. Office and commercial uses could be provided in the lower floors of these low-rise residential buildings. The Project would feature a landscaped central courtyard area called The Hill, which would provide 30,000 square feet of open space, passive recreation amenities, and long-distance views of the Downtown Los Angeles skyline and beyond.

The Project will be constructed in two or three phases. The structures are listed in construction phase order below are shown on the attached Plot Plan. The Phase I development will consist of a parking structure that will be located adjacent to the existing residential structure, the “Elysian.” Phase II will consist of a podium-style structure supporting several low to high rise structures. Phase III will consist of a residential tower and low residential buildings constructed adjacent to the podium-style structure. The owner is also considering constructing the project in two phases. The two phase approach would simply combine Phase II and III together. The following list summarizes the proposed structures that will be located on the site. Additional detail of each building location is shown on the attached Conceptual Grading Plan.

PHASE I

The Elysian Parking Structure - Five stories over two levels of subterranean parking. This structure will be located on the south side of the Elysian residential building and be constructed before the existing at-grade parking areas are demolished for the remainder of the project. This structure is planned to be for the exclusive use of the Elysian residents. The finish floor elevation of the parking structure will be approximately 412 feet above mean sea level.

PHASE II

This portion of the project consists of a mass-excavated, multi-level basement with a podium level that supports the following buildings:

Courtyard Building – Three stories (one retail story and two office stories) over five subterranean parking levels for a total height of 62 feet. The finish floor elevation will be 364 feet above mean sea level.

Sunset Building – 12 stories over two levels of subterranean parking at a total height of 200 feet. The finish floor elevation will be 359 feet.

Tower A – 49 stories over two to six levels of subterranean parking for a total height of 562 feet. The finish floor elevation will be 359 feet.

Residential Area – Multiple, low-rise residential buildings over two levels of subterranean parking for a total height of 61 feet. The finish floor elevation will be 406 feet.

Sunset Terrace – Multiple, low-rise retail buildings over a grocery store with two levels of subterranean parking for a total height of 61 feet. The finish floor elevation will be 364 feet.

Garden Area – Garden fountains and traffic circle on the podium level (not shown on Plot Plan).

The excavation will be surcharged by the Phase I parking structure. The adjacent Phase II basement shoring and retaining wall will incorporate the surcharge from the parking structure.

PHASE III

Tower B – 30 stories of residential units over six levels of subterranean parking for a total height of 365 feet. This building may also be supported on a podium. The building will have a finish floor elevation of 359 feet, which is 5 feet lower than the Phase II podium finish floor.

Residential Area – Multiple, low-rise residential buildings over two levels of subterranean parking. These buildings will have finish floor elevations of 406 and 416 feet that are 42 and 52 feet above the Phase II Podium structure. The podium excavation walls will incorporate the surcharge from the residential buildings.

The development will extend to the property line limits and will have several patio and garden terraces to connect the elevation differences. All of the terraces will be supported with walls or retaining walls.

It is estimated that column loads will range between 1,500 and 4,000 kips. Wall loads are estimated to be between 20 and 70 kips per lineal foot. Grading will consist of excavations up to 64 feet in depth for the proposed subterranean parking levels and foundation elements.

Any changes in the design of the project or location of any structure, as outlined in this report, should be reviewed by this office. The recommendations contained in this report should not be considered valid until reviewed and modified or reaffirmed, in writing, subsequent to such review.

BACKGROUND RESEARCH

Geotechnologies performed research at the Department of Building and Safety for prior geotechnical reports at, and in the vicinity of the subject site. The onsite and offsite reports obtained by this office are summarized below. The approximate location of the offsite geotechnical investigations is shown on the attached "Location Map of Offsite Geotechnical Investigations by Others." A complete electronic PDF copy of each report is provided in a CD for reference. Geotechnologies concurs with the conclusions and recommendations of the reports and accepts professional responsibility for the use of any data from others.

ONSITE REPORTS

Converse Foundation Engineering Company, report dated 3 October 1960. Foundation Investigation, Proposed Headquarters Building, Metropolitan Water District, 1111 Sunset Boulevard, Los Angeles, California, Project No. 60-451-A.

The report by Converse Foundation Engineering Company indicates that eleven borings were drilled to depths between 8 and 25 feet by using bucket auger drilling equipment. A Plot Plan showing boring locations was not included in the report. This firm checked the available permit file at the City of Los Angeles Department of Building and Safety and did not identify a map in the permit files.

The report identified fill, which contained large amounts of brick and concrete rubble on the west side of the site. The fill extended to a depth of as much as 15 feet. The location and status of this fill is not known. Siltstone and sandstone of the Puente (identified as Modelo Formation in the report) was identified as weathered and highly fractured. Cemented zones in the bedrock were described in the boring logs Groundwater or seepage was not identified in the borings.

Pioneer Soils Engineering, report dated June 24, 1997, Soils and Geology Investigation, Proposed Sanctuary & Gymnasium Building Additions, Holly Hill Community Church, 1111 Sunset Boulevard, Los Angeles, California, Project No. 1677-FG.

Pioneer Soils Engineering excavated four test pits and four borings to depths of 5 to 12 feet. The boring and test pit locations were at the southwest side of the site, next to Sunset Boulevard. Fill up seven feet was encountered as well as natural colluvial soil consisting of silt and clayey silt and clay was encountered. The colluvium was up to eight feet in thickness. Bedrock consisting of siltstone, tuffaceous siltstone and sandstone was encountered. The bedrock was described as moderately fractured and moderately to highly weathered. Bedding was relatively uniformly oriented with dips to the southeast from 65 to 75 degrees. Groundwater was not encountered in the test pits or borings. The borings are shown on the attached Plot Plan and Geologic Map. Copies of the Boring logs are also included.

ADR Environmental Group, Inc., Subsurface Investigation Report, report dated May 7, 2015, Project Number Line 01-15-006.CA (A).

This report describes the findings of a soil and soil vapor investigation to identify the presence of environmental concerns in the vicinity of the former oil wells located on the site. The investigation found that the site has been impacted by former oil well activities at the site. Methane gas was detected in the vicinity of one of the oil wells and that reabandonment may be necessary. Additional methane gas testing was recommended prior to new construction at the site.

Geotechnologies, Inc., report dated March 1, 2017, Geotechnical Opinion, Demolition of 1-Story Church and 2-Story Office Building, Proposed Mixed Use Development, 1111 Sunset Boulevard, Los Angeles, California, File No. 21155.

This letter was prepared to identify the impact of demolition of the existing buildings adjacent to The Elysian. It was the finding of Geotechnologies, that demolition of the 1-story Church and 3-story office building will not have a geotechnical impact to The Elysian located at 1115 Sunset Boulevard. As of the date of this report the demolition has not yet begun.

Geosyntec Consultants, report dated February 2018, updated February 4, 2021, Methane Report, 1111 Sunset Boulevard, Project Number SC0808A.

The report identifies that the site is located within a City of Los Angeles-designated Methane Zone. Structures located in such zone will be required to include a methane mitigation system. The reports references and earlier subsurface investigation by the firm Linear City, LLC. The report dated May 2015 performed soil vapor sampling on the site. The results indicated that methane concentrations of 44.4 percent were identified. This concentration is equivalent to a Methane Designation Level V. The new structures will be required to incorporate a Level V Mitigation system that will include a sub-slab ventilation system and an impervious membrane on the underside of the slab or mat. Mitigation controls consisting of gas detectors, mechanical ventilation and alarm system will be needed. In addition, paved areas will require venting. See the referenced report for detailed recommendations.

Geosyntec Consultants, report dated December 17, 2020, updated February 4, 2021, Oil Well Report, 1111 Sunset Boulevard, Los Angeles, California, No File No.

This report evaluated the compliance of the onsite oil wells with current regulations required by the California Geologic Energy Management Division (CalGEM) formerly known as the Division of Oil, Gas and Geothermal Resources (DOGGR). Six wells were identified to have been drilled on the site by CalGEM map. Well-specific abandonment records could not be found. Based on an interview with CalGEM personnel, it is unlikely that the onsite wells were abandoned to current requirements. A geophysical survey was performed in an attempt to identify the well locations. The survey did not identify the potential location of any oil wells. A soil and site management plan will be prepared to address the location of wells and abandonment procedures, when encountered during mass grading activities.

OFFSITE REPORTS

Leighton and Associates, October 30, 1987, Grading Plan Review for Lots 3 through 7, Tract 3791, 1130 Sunset Boulevard, Los Angeles, California, Project No. 3871287-01.

Three trenches were excavated to depths ranging from 6 to 12 feet. Bedrock of the Puente Formation was identified in each test pit. Bedding dips consistently from the southeast to the southwest from 26 to 39 degrees. The bedrock orientations and descriptions are similar to those identified on the subject site and are correlative with local geologic structural trends. A fault trending N75E was observed in Test Pit TP-2 the fault offset bedrock with reverse movement with the north block down. The fault did not offset the overlying colluvial soils.

It should be noted that the fault observed in the Test Pit TP-2 is oriented nearly perpendicular to fault mapped by Dibblee which has an orientation of N20W. It is the opinion of this firm that the observed fault and mapped faults are not related and do not represent and increased seismic risk to the subject site.

T.K. Engineering, March 3, 1981, Engineering Geologic Investigation, Addendum and Report for Proposed 2-Story Office Building, 1176 Sunset Boulevard, Los Angeles, California, Job No. 80-287-F.

This report was prepared as an addendum to an earlier report dated December 19, 1980. The earlier report was not available in the City records. A Geology and Location Map was included with the report. An existing cut and three test pits were mapped as part of this investigation. The report identified uniform, south-dipping bedding consistent with regional trends on the north side of the site. However, bedding dips to the west and northwest on the south end of the site. The bedding change is gradual and attributed to a syncline, not faulting. No evidence of faulting was observed in a cut slope that extends nearly the length of the site.

City of Los Angeles, April 15, 1981, untitled review letter, no log number available.

Applied Earth Sciences, April 1, 2014, Geotechnical Investigation, Proposed Live-Work Building Project, Lots 6 and 7 of Tract No. 3791, 1144–1148 Sunset Boulevard, Los Angeles, California, Project No. 14-317-22.

Four test pits and two borings were excavated. Work by a previous consultant (Allwest Geoscience, July 21, 2004) was referenced. The report by Allwest was not available in the City records.

Bedding dips to the south and southwest at angles ranging from 28 to 32 degrees. These orientations are consistent with trends in the site vicinity. No indications of faulting were noted in the boring logs or Geologic Map and Site Plan.

T.K. Engineering Corp., October 8, 1988, Preliminary Soil Investigation Report, Proposed Foundation Repair, 633-641 North Boylston Street, Los Angeles, California, Job No. 88-329F.

This investigation included excavation of two test pits. The geologic descriptions were not in sufficient detail to permit commentary on bedding or faulting.

T.K. Engineering Corp, April 14, 1989, Preliminary Soils Investigation Report, Proposed 3-Unit Apartment, 633 N. Boylston Street, Los Angeles, California, Job No. 88-829FG.

The Geologic Outfit, April 5, 1989, Engineering Geologic Investigation Report, Proposed Apartment Site, 633 Boylston Street, Los Angeles, California, Project No. 742.

These two reports were prepared concurrently. Four test pits were excavated. Bedrock of the Puente Formation was identified in the test pits dipping to the southeast at 25 and 36 degrees. The bedding orientations are consistent with local trends. No indications of faulting were noted on the logs or Geologic Map.

LOCAL GEOLOGY

The site is located in the Elysian Hills located to the north of downtown Los Angeles (Lamar, 1970). The Elysian Hills are characterized by low, rolling topography and are underlain by Tertiary-age, interlayered siltstone and sandstone of the Puente Formation. Bedding orientation in the Elysian Hills is very uniform dipping from 20 to 60 degrees to the south and southwest (Lamar, 1970). Three local geology maps reflecting the work of Lamar (1970), Dibblee (1989), and Yerkes, (1977) are attached to this report.

The bedrock bedding orientation is relatively uniform, however, small unnamed faults have been mapped in the area. According to the geologic map prepared by Lamar (1970) and Yerkes (1977), an unnamed fault is shown trending in a northeast-southwest direction and clips the southwest corner of the site. The unnamed fault is not considered active according to the criteria of the Alquist-Priolo Earthquake Fault Zoning Act is therefore not designated with an Earthquake Fault Zone. This area was excavated with several borings and a trench by this firm and Pioneer Soils Engineering. Evidence of a fault was not observed in the excavations.

City of Los Angeles Oil Field

The site is located within the City of Los Angeles Oil Field. Based on a geologic map by Lamar (1970), the field is approximately 18,500 feet long and 1,000 feet wide and is elongated in an east-west direction. The oil is contained in the Puente Formation and seeps at the ground surface at the northern edge of the field. Samples taken from Boring 2 by this firm, at depths of 60 and 65 feet identified naturally occurring tar.

OIL WELLS

Based on a Well Location Map from the California Division of Oil and Gas and Geothermal Resources (2001) six oil wells were drilled on the southern and eastern sides of the site. The wells are indicted to have encountered oil and have been plugged and abandoned. A copy of this map is attached to this report, as the Oil Well Location Map. The same six wells are shown on a map included in the Oil Well Report by Geosyntec Consultants (Geosyntec Consultants, 2021). The well locations are based on an online database from the California Geologic Energy Management Division (CalGEM). Based on the findings by Geosyntec, the wells will likely require abandonment procedures consistent with current regulations. A soil and site management plan will be prepared to identify the well locations and provide recommendations for well abandonment procedures.

GEOTECHNICAL EXPLORATION

FIELD EXPLORATION

The site was explored on July 25 through July 31, 2017 and March 10 through 20, 2018 by drilling 10 borings and excavating five test pits. The depth of the borings ranged between 50 and 70 feet below the existing site grade. The depth of the exploratory test pits was between 8 and 22 feet below the existing site grade. Borings 1 through 4, and 6 through 10 were drilled with the aid of a truck-mounted drilling rig equipped with a 24-inch diameter bucket-auger. Following excavation, the bucket auger-drilled borings were downhole logged by a geologist. CAL/OSHA procedures regarding ventilation, fall protection, lighting, communications and sidewall stability were followed during downhole logging of the borings.

Boring 5 was drilled with the aid of a truck-mounted drilling rig equipped with 8-inch diameter hollow-stem augers.

Soil and rock samples were obtained at approximately five foot intervals. Downhole logging was performed in the borings by cleaning a continuous strip of the boring wall. The soil samples also supplemented the boring log descriptions.

Test Pits TP-1 through TP-4were excavated with the aid of hand tools and deepened with a 5–inch diameter hand-auger. TP-5 was excavated with a backhoe equipped with a 24-inch wide bucket.

The borings extended to a depth approximately 20 feet below the proposed finish floor at the boring location. Boring B9 encountered a very hard surface and was unsuccessful to extend tot eh desired depth after several attempts. It was determined that the area in the vicinity of Boring B9 was formerly a large, concrete-lined fountain. Boring B10 and Test Pit TP5 were excavated in order to clarify the reversal bedding orientations that were originally reported in Test Pit 4.

The boring and test pit locations are shown on the Plot Plan and on the Geologic Map. The geologic materials encountered are logged on Plates A-1 through A-15. Graphic logs of the borings were not prepared. However, a graphic log of Test Pit 5 was prepared and is attached as Plate 15.

The locations of the borings and the test pits were determined by hand measurement from hardscape features shown on the attached Plot Plan. Elevations of the explorations were determined by interpolation of the elevation contours shown on the Plot Plan. The location and elevation of the exploratory excavations should be considered accurate only to the degree implied by the method used.

Geologic Materials

Asphalt concrete pavement between 4 and 5 inches thick was encountered in the many borings. Base material consisting of silty sand with gravel underlies the asphalt.

Fill soil was encountered in all borings to depths of 0.5 and 10.5 feet. Fill soils consist of silty sand and sandy silt, which is yellowish brown, dark brown, and grayish brown, and moist. As previously discussed, the boring logs from Converse Foundation Company describe fill soils that contain abundant construction debris. The borings drilled by this firm did not encounter debris in the fill.

Natural colluvium consisting of sandy lean clay, silty sand, and sandy silt, which are dark brown and dark gray, moist, firm to stiff or medium dense were identified in some of the borings. The colluvium ranges in thickness from 1 to 5 feet in the borings drilled by this firm. The colluvium was identified in Boring 5 and Test Pits 1 and 4, found on the south side of the site.

Old alluvium was unidentified in Test Pit 1 and consists of poorly graded sand and well-graded sand, which is dark brown on color, moist, medium dense to dense, with some cobbles (up to 4 inches in size). The old alluvium was identified to be 4 feet in thickness in Test Pit 1, but the test pit was terminated before reaching the base of this material.

Sedimentary bedrock from the Puente Formation was encountered in all the borings and most of the test pits. The Puente Formation consist of clayey siltstone and sandstone that is yellowish brown to olive gray and orange brown in color, moist, and moderately hard. The rock is well bedded and parts easily along bedding planes. The occasionally hard concretions were identified as well as gypsum crystals. The rock is moderately weathered. In Boring 2, some naturally occurring tar was identified in the sample. No tuff beds (identified by Pioneer Soils) were identified in the excavations by tis firm. It should be noted that Lamar (1970) does not report the presence of tuff beds in his descriptions of the Puente Formation.

The bedrock dips uniformly to the south-southeast and south-southwest from 30 to 78 degrees over most of the site. However, the bedding steepens from 54 to 75 degrees to the southeast, approaching Beaudry Avenue. Bedding in Test Pit TP4 reverses in direction to the northwest, dipping 25 and 27 degrees.

More detailed soil profiles may be obtained from the individual Boring Logs and the Test Pit Logs.

Unnamed Fault

Test Pit TP5 and Boring B10 were excavated in order to clarify the reversal of bedding identified in the earlier excavated Boring B4. The excavation locations are shown on the attached Geologic Map. Test Pit TP5 was up to 8 feet in depth and exposed a continuous section of bedrock 165 feet long. The trench was excavated along a service road between Borings B10 and B4. A diagrammatic representation of the test pit is presented on Plate 15.

Bedding in Test Pit TP5 and Borings B4 and B10 uniformly to the south in the excavations. The bedding steepens from 30 to 70 degrees at the northern end of the Test Pit TP5 (Stations 1+00 to 1+65). No offsets, sheared, polished, crushed rock zones, or reversals of bedding were noted in any of the test pits or borings excavated for this project.

Test Pit TP4 was logged to a depth 11 feet and the two reported bedding orientations were taken from oriented samples and not from direct observation of the bedrock. It is the conclusion of this firm that the sample orientation was reversed during handling and misinterpreted bedding attitude was reported. The bedding attitudes have been changed on the attached excavation log and Geologic Map to reflect bedding orientations to the south.

Based on review of the geotechnical work performed by other consultants on the site (as discussed in the response to Comment 4 above), no other indications of faulting or folding on the site were reported. Therefore, it is the conclusion of this firm that the fault, as shown on the geologic map by Lamar (1970), does not bisect the site.

A report prepared by Leighton & Associates (for 1130 Sunset Boulevard, located across Sunset Boulevard) identified a fault in Test Pit T-2 with the fault trending N75E. The fault offset bedrock with reverse movement with the north block down. The fault did not offset the overlying colluvial soils. The orientation of the fault reported by Lamar strikes N23W, nearly perpendicular to each other. It is the opinion that the faults are unrelated.

If the fault identified on identified on 1130 Sunset is projected eastward, it would intersect the site between Boring B10 and the Station 1+65 of Test Pit TP5 and Boring B4. As mentioned earlier, no indication of faulting was identified in the borings or Test Pit TP5.

Groundwater

Water seepage was encountered only in the borings and is summarized in the following table. Water seepage is generally limited in extent, specific in location, and finite in volume. However, it could be conservatively considered as a groundwater elevation.

Boring Number	Ground Surface Elevation (feet)	Depth of Excavation (feet)	Depth to Water Seepage (feet)	Elevation of Seepage (feet)
B1	422.5	50	29, 46	393.5, 376.5
B2	411.5	67.5	35, 60	376.5, 351.5
B3	424.0	68	39, 62	385, 362
B4	400.5	35	16	384.5
B5	406.5	70	N/A	N/A
B6	426.7	80	34	392.7
B7	412.5	69	N/A	N/A
B8	409.0	70	N/A	N/A
B9-A,B,C	Various	9.5	N/A	N/A
B10	413.8	70	38	375.8

N/A: water was not encountered.

The attached Cross Sections A-A’ through D-D’ show the locations of water seepage where encountered in the borings. The highest elevation of encountered seepage is 393.5 feet above mean sea level corresponding to a depth of 29 feet in Boring 1. The shallowest depth where seepage was encountered was in Boring 4 at a depth of 16 feet, corresponding to elevation 384.5 feet. Since the site elevations range from 432 to 381 feet, a singular ground water elevation is not realistic across the site. It is the recommendation of this firm that a recommended depth below the ground surface is appropriate for design.

The historically highest groundwater level is indicated to be 20 feet below the ground surface according to the Seismic Hazards Zone Report (CDMG, 2006). This depth to groundwater is appropriate for design across the site. The historically highest ground water elevation is shown on the attached Cross Sections A-A’ through D-D’.

The composition of the bedrock is relatively fine grained, so water is present only in the sand beds and in the infrequent fractures and joints in the rock. The source of water in the rock is from rainfall, irrigation and water pipe leaks. Water will enter the site from up dip direction (the north) and along bedding (east and west). Groundwater is not likely to enter the site down dip of bedding (from the south).

It should be noted that Sunset Boulevard was likely a natural drainage course prior to development of the area. The flow of water along Sunset Boulevard is from north to south and perpendicular to bedding strike. Where water in the former canyon encounters the sandstone beds, water will likely flow along the strike of bedding and towards the site. It is anticipated that the highest water flow rate will occur on the western wall of the site at depths approximately 20 feet below the sidewalk elevation.

During excavation for the subterranean levels, ground water is expected to be heaviest when first encountered, then diminish quickly as water is drained from the bedrock. A sustained flow of 10 to 20 gallons per minute across the entire site should be anticipated. It the opinion of this firm, groundwater seepage can be captured in trenches and sumps at the base of the excavation. A comprehensive dewatering program with dewatering wells is not considered necessary; however, a dewatering consultant should be retained to provide additional dewatering recommendations.

Where the proposed structure has a finish floor elevation 20 feet or more below the existing ground surface, the proposed structure should utilize a hydrostatic design.

Based on review of California Geological Survey Seismic Hazard Zone Report of the Los Angeles 7.5 Minute Quadrangle (SHZR 029), no water levels contours are shown nearby to the site. The nearest water contour is shown to be approximately 0.7 mile to the south. This observation indicates that the rock is not considered water-bearing. A copy of this plate, Historically Highest Groundwater Levels Map, is included herein.

The nearest water level contour is shown as 20 feet below the ground surface. For design purposes, water should be considered at this depth. Where the structure extends below this level, the structure should be designed with a wall drainage system or designed to accommodate the lateral and vertical hydrostatic forces.

Fluctuations in the level of groundwater may occur due to variations in rainfall, temperature, and other factors not evident at the time of the measurements reported herein. Fluctuations also may occur across the site. High groundwater levels can result in changed conditions.

Caving

Caving was not observed during exploration. Where large diameter excavations encounter granular and cohesionless soils, such as in the old alluvial soils, caving may occur.

Methane

The site is located in a City of Los Angeles designated Methane Zone (City of Los Angeles, 2003). A copy of the Methane Zone Risk Map is attached.

The presence of methane at the site as was further evaluated by Geosyntec Consultants (Geosyntec, 2021). According to the report, methane testing was performed by the firm Linear City, LLC. The report dated May 2015 indicated that the proposed structures will be required to incorporate a Level V Mitigation system. Please refer to the summary of this report in the section "Onsite Reports" for further discussion. The reviewer is also directed to the referenced report for detailed recommendations by Geosyntec Consultants.

SEISMIC EVALUATION

REGIONAL GEOLOGIC SETTING

The subject site is located in the northern portion of the Peninsular Ranges Geomorphic Province. The Peninsular Ranges are characterized by northwest-trending blocks of mountain ridges and sediment-floored valleys. The dominant geologic structural features are northwest trending fault zones that either die out to the northwest or terminate at east-trending reverse faults that form the southern margin of the Transverse Ranges.

The Los Angeles Basin is located at the northern end of the Peninsular Ranges Geomorphic Province. The basin is bounded by the east and southeast by the Santa Ana Mountains and San

Joaquin Hills, to the northwest by the Santa Monica Mountains. Over 22 million years ago the Los Angeles basin was a deep marine basin formed by tectonic forces between the North American and Pacific plates. Since that time, over 5 miles of marine and non-marine sedimentary rock as well as intrusive and extrusive igneous rocks have filled the basin. During the last 2 million years, defined by the Pleistocene and Holocene epochs, the Los Angeles basin and surrounding mountain ranges have been uplifted to form the present day landscape. Erosion of the surrounding mountains has resulted in deposition of unconsolidated sediments in low-lying areas by rivers such as the Los Angeles River. Areas that have experienced subtle uplift have been eroded with gullies.

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.

Unnamed Fault

The geologic maps by Lamar (1970) and Yerkes (1977) indicates an unnamed fault is located on the western side of the site. The fault is oriented northwest to with right lateral motion. The unnamed fault is not designated with an Earthquake Fault Zone according to the Earthquake Fault Zone Act (Hart and Bryant, 2005).

The fault does not appear to offset Quaternary terrace deposits located 0.6 mile to the southeast of the site. The evidence for the presence of this fault is not readily apparent. Some possible indications of a fault may be local minor folding on the west side of Sunset Boulevard.

Raymond Hill Fault

The Raymond Fault is a significant regional fault with a California Geological Survey Earthquake Fault Zone designation (Hart and Bryant, 2007). As shown on the Earthquake Fault Zone Map for the Los Angeles Quadrangle, the Raymond Fault and its associated Earthquake Fault Zone are located approximately 4 miles north of the site.

The Raymond Fault extends for 25 km from the Los Angeles River eastward to Sierra Madre. The fault is both left lateral and reverse motion. This fault is capable of 6.8 Magnitude (Mw) earthquake and may have been responsible for the 1991 Sierra Madre (Mw 5.8) and the 1988 Pasadena (Mw 4.9) Earthquakes. 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.

The westward continuation of the Raymond Fault across the Los Angeles River valley, and possible connection with the Hollywood Fault has been shown in various locations. Most of these fault representations are shown as concealed and have been poorly constrained.

Puente Hills Thrust Fault

The Puente Hill Thrust Fault underlies the downtown Los Angeles area to Brea (in northern Orange County) and overlies the Elysian Park Thrust. The 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 Santa Fe Springs segment of the fault is believed to be the causative fault of the October 1, 1987 Whittier Narrows Earthquake (Shaw et al., 2002). Postulated earthquake scenarios for the fault include single segment fault ruptures capable of producing an earthquake of magnitude 6.5 to 6.6 (Mw) and a multiple segment fault rupture capable of producing an earthquake of magnitude 7.1 (Mw).

The Puente Hills Thrust fault is defined based on seismic reflection profiles, petroleum well data, and precisely located seismicity (Shaw et al., 2002). The fault is not exposed at the ground surface and does not present a potential for surface fault rupture. This fault has not been designated with an Earthquake Fault zone (Hart and Bryant, 1999). However, based on deformation of late Quaternary age sediments above this fault system and the occurrence of the Whittier Narrows earthquake, the fault is considered an active fault capable of generating future earthquakes beneath the Los Angeles Basin. An average slip rate of 0.03 inches per year and a maximum magnitude of 7.1 are estimated by the California Geological Survey (2003) for the Puente Hills Thrust.

SEISMIC HAZARDS AND DESIGN CONSIDERATIONS

The primary geologic hazard at the site is moderate to strong ground motion (acceleration) caused by an earthquake on any of the local or regional faults. The potential for other earthquake-induced hazards was also evaluated including surface rupture, liquefaction, dynamic settlement, inundation and landsliding.

Surface Rupture

Surface rupture is defined as displacement which occurs along the surface trace of the causative fault during an earthquake. Based on research of available literature, the surface trace of known active or potentially active faults do not 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. The unnamed fault is not considered active by any of the governing agencies: therefore, it is not considered at risk of rupture.

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.

The Seismic Hazard Maps for the Los Angeles Quadrangle of the State of California (CDMG, 1999), does not classify the site as part of the potentially "Liquefiable" area. In addition, the proposed structure will be supported on the siltstone bedrock which, due to its long tectonic history and moderately hard consistency is not considered liquefiable. Therefore, the potential for liquefaction settlement at the site is considered to be negligible.

Dynamic Dry 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.

The proposed project will be supported on the moderately hard bedrock of the Puente Formation. As a result, seismic settlement of the proposed structures is considered remote.

Tsunamis, Seiches and Flooding

Tsunamis are large ocean waves generated by sudden water displacement caused by a submarine earthquake, landslide, or volcanic eruption. Review of the County of Los Angeles Flood and Inundation Hazards Map, Leighton (1990), indicates the site does not lie within the mapped tsunami inundation boundaries.

Seiches are oscillations generated in enclosed bodies of water which can be caused by ground shaking associated with an earthquake. No major water-retaining structures are located immediately up gradient from the project site. Therefore, the risk of flooding from a seismically-induced seiche is considered to be remote.

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.

Landsliding

The attached Geologic Maps by Lamar (1970), Dibblee (1989) and Yerkes (1977) do not show the presence of mapped landslides. In addition, the site reconnaissance did not reveal indications of landslides such as cracks in pavement, tilted walls, or scarps. Since the site will be shored and excavated, leaving no natural slopes, the potential for landsliding is considered remote.

CONCLUSIONS AND RECOMMENDATIONS

Based upon the exploration, laboratory testing, and research, it is the finding of Geotechnologies, Inc. that construction of the proposed Project is considered feasible from a geotechnical engineering standpoint provided the advice and recommendations presented herein are followed and implemented during construction.

The site is underlain by fill soil that is up to 10 1/2 feet thick. Underlying the fill are relatively thin accumulations of fine-grained Colluvium and coarse-grained Old Alluvium. Well bedded clayey siltstone and sandstone of the Puente Formation underlies the entire site. Bedding the Puente Formation dips moderately south-southeast and south-southwest from 30 to 78 degrees. However, at the southern side of the site, bedding dips south-southeast and south-southwest from 50 to 75 degrees. Hard concretions should be anticipated during excavation and may be up to several feet in dimension.

A local reversal of bedding is noted in Test Pit TP-4 at the northwest side of the site. Bedding dips to the northwest approximately 25 and 27 degrees. A similar orientation of rock was not noted in Test Pit TP-5. Grading in this area will require the observation of a geologist.

The site is located in the Los Angeles City Oil Field; up to six oil wells may be located on the site. The wells must be located and abandoned according to current CalGEM (formerly known as DOGGR) requirements.

Seepage from the bedrock will likely be encountered below elevation 393 feet. It is anticipated that during construction, the rate of water seepage will diminish with time. Conventional dewatering will not be necessary, however seepage water will require collection and disposal.

The permanent structure may be designed for the hydrostatic uplift and lateral loads caused by the seepage water. As an option, the structure may be designed with a wall drainage system. For permanent conditions, the historically highest groundwater level should be considered at a depth of 20 feet below the ground surface. The water surface should be considered to vary with the ground surface.

The fill soil, colluvium, and old alluvium are not suitable for support of the proposed structures. The proposed excavations for the proposed subterranean parking levels will vary approximately between 22 and 64 feet in depth below the existing grade. It is anticipated that excavation of the proposed subterranean levels will remove the fill and the surficial soils and expose the sedimentary bedrock. Proposed structures shall bear exclusively into bedrock. All foundation systems shall bear in the same material.

Due to the well bedded structure of the rock and the moderate to steep inclination of the bedding, care should be taken to plan cuts in the rock no steeper than the angle of bedding. Where there is insufficient space, excavations should be shored. Excavation walls that will have a roughly east-west trend and have a face with a southern exposure will have a greater lateral load due to the daylighted bedding. Two other walls should be considered to have a greater load due to daylighted bedding. They will be:

- The northeast-southwest trending wall along White Knoll Avenue from Sunset Boulevard to the Elysian.
- Northwest-southeast trending wall from the Elysian to the projection with Beaudry Avenue.

The attached “Plan Showing Cuts with Daylighted Bedding” shows the location of the referenced daylighted cuts.

Due to the load surcharge caused by daylighted bedding and the proposed parking structure for the Elysian (Phase I), it is recommended that the 50 foot high cut for the north shoring wall for the proposed Courtyard Structure (Phase II) be instrumented with inclinometers to monitor performance. Monitoring may cease when the project reaches the P1 level. This condition is shown on Cross Section A-A’.

The proposed structures may be supported on conventional foundations bearing in the sedimentary bedrock. However, the structure will require the installation of drains to eliminate hydrostatic pressures. If the structure will be designed to accommodate hydrostatic pressures, a mat foundation will be required.

Sulfate tests of the bedrock ranged from less than 0.1 percent to greater than 0.20%. It is the recommendation of this firm that Type IV cement be used for all concrete in contact with the geologic materials.

Two inclinometers should be installed on the south side of the proposed Elysian parking structure (Phase I). The south-facing wall will be almost 50 feet in depth, have daylighted bedding and will be surcharged by the proposed parking structure. The inclinometer should extend to a depth of 20 feet below the bottom of the adjacent shoring piles. The location of the proposed inclinometers are shown on the attached “Plan Showing Cuts with Daylighted Bedding.”

Smaller structures, such as property line walls, trash enclosures, or any small miscellaneous structures not connected to the main structures, may bear in a compacted fill blanket or into the dense alluvial soils. All foundations for structures should bear on the same material.

SEQUENCE OF CONSTRUCTION

Prior to begging construction, the existing structures will be demolished and the site will be grubbed. The at-grade parking lot, on the northeast side of the site will remain for parking for the Elysian tenants.

The proposed development will be constructed in two or three phases. The first phase of work will be construction of the parking structure located adjacent to the Elysian. Once complete, the tenants will park in the structure and the remaining at-grade parking areas will be cleared and grubbed.

The Phase II portion of the project includes excavation of most of the remaining portion of the site. Shoring will be installed around the perimeter of the proposed excavation to be followed by mass excavation of the site. Once the main podium structure is complete, construction of the Proposed Courtyard Building, Tower A, and Sunset Terrace area will occur on the Podium. Work will begin on the Phase III portion of the site.

The Phase III portion of the project is located on the east side of the site. The project will begin will installation of additional shoring and mass excavation of the remaining portion of the site. The podium level will be constructed for support of Tower B, and some of the Garden Terraces Residential structures. The Low-Rise Residential Structures will be constructed at-grade.

Consideration is being given to combine construction of the Phase II and II portions of the project. This firm finds no unique geotechnical issues would arise if such a sequence is selected.

As a rule, all excavations should be shored prior to removal of soil and rock. Were a daylight bedding condition occurs and shoring is not utilized, the excavation face should be inclined to the angle of bedding.

If any cast-in-place friction piles are considered for support, and shoring tiebacks are to be placed beneath the pile-supported structure, it is the recommendation of this firm that the friction piles be installed first. The basis for this recommendation is that the consequences of encountering a tensioned tieback in a pile excavation are greater than encountering a friction pile in a tieback excavation. This condition may occur during construction of Phase I- the Elysian Parking structure.

SEISMIC DESIGN CONSIDERATIONS

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 of Soft Rock" Profile, according to Table 20.3-1 of ASCE 7-10, and ASCE 7-16. This information and the site coordinates were input into the OSHPD seismic utility program at https://seismicmaps.org in order to calculate ground motion parameters for the site.

CALIFORNIA BUILDING CODE SEISMIC PARAMETERS	
California Building Code/Los Angeles Building Code	2019/2020
ASCE Design Standard	7-16
Risk Category	II
Site Class	C
Mapped Spectral Acceleration at Short Periods (S_S)	2.017g
Site Coefficient (F_a)	1.2
Maximum Considered Earthquake Spectral Response for Short Periods (S_{MS})	2.42g
Five-Percent Damped Design Spectral Response Acceleration at Short Periods (S_{DS})	1.613g
Mapped Spectral Acceleration at One-Second Period (S_1)	0.719g
Site Coefficient (F_v)	1.4
Maximum Considered Earthquake Spectral Response for One-Second Period (S_{M1})	1.007g
Five-Percent Damped Design Spectral Response Acceleration for One-Second Period (S_{D1})	0.671g

FILL SOILS

The maximum depth of fill encountered on the site by this firm was 10½ feet. Locally deeper fill up to 15 feet was identified by others. This material and any fill generated during demolition should be removed during the excavation of the subterranean levels and removed from the site.

EXPANSIVE SOILS

The onsite geologic materials are in the very low to low expansion range. The Expansion Index was found to be between 17 and 43 for representative soil samples. Recommended reinforcing is noted in the "Foundation Design" and "Slabs On Grade" sections of this report.

WATER-SOLUBLE SULFATES

The Portland cement portion of concrete is subject to attack when exposed to water-soluble sulfates. Usually the two most common sources of exposure are from soil and marine environments. The source of natural sulfate minerals in soils include the sulfates of calcium, magnesium, sodium, and potassium. When these minerals interact and dissolve in subsurface water, a sulfate concentration is created, which will react with exposed concrete. Over time sulfate attack will destroy improperly proportioned concrete well before the end of its intended service life.

The water-soluble sulfate content of the onsite geologic materials was tested by California Test 417. The water-soluble sulfate content was determined to be less than 0.1% percentage by weight for most of the soils tested. However, two samples below depth of 57.5 feet were found to have a sulfate concentration greater than 0.20 percentage by weight therefore, Type I cement should be utilized for footings.

CONSTRUCTION DEWATERING

The California Geological Survey Seismic Hazard Zone Report of the Los Angeles 7.5 Minute Quadrangle (SHZR 029) does not provide water depth contours in the site vicinity. The lack of contours indicates that the rock is non-water bearing. However seepage water was identified in the borings and will be encountered in the excavation. The quantity and rate of flow will be limited. Based on the findings from the subsurface investigation, water should be anticipated as a series of seeps, the shallowest occurring at elevation 393 feet above mean sea level. It should be noted that water will not be encountered at a uniform level across the site. Since the excavation extends to elevation 359 feet above mean sea level, water will be encountered in the excavation. However, conventional dewatering will not be necessary, but seepage will require collection and disposal.

GRADING GUIDELINES

The following guidelines are provided for any miscellaneous site grading which may be required as part of the proposed development.

Site Preparation

- A thorough search should be made for possible underground utilities and/or structures. Any existing or abandoned utilities or structures located within the footprint of the proposed grading should be removed or relocated as appropriate.
- All vegetation, existing fill, and soft or disturbed geologic materials should be removed from the areas to receive controlled fill. All existing fill materials and any disturbed geologic materials resulting from grading operations shall be completely removed and properly recompacted prior to foundation excavation.
- Any vegetation or associated root system located within the footprint of the proposed structures should be removed during grading.
- Subsequent to the indicated removals, the exposed grade shall be scarified to a depth of six inches, moistened to optimum moisture content, and recompacted in excess of the minimum required comparative density.
- The excavated areas shall be observed by the geotechnical engineer prior to placing compacted fill.

Compaction

The City of Los Angeles Department of Building and Safety requires a minimum 90 percent of the maximum density, except for cohesionless soils having less than 15 percent finer than 0.005 millimeters, which shall be compacted to a minimum 95 percent of the maximum density in accordance with the most recent revision of the Los Angeles Building Code (2020). Based on observation of the borings and samples, it is the opinion of this firm that fill derived from the on-site soil and bedrock will not require 95% relative compaction.

All fill should be mechanically compacted in layers not more than 8 inches thick. All fill shall be compacted to at least 90 percent of the maximum laboratory density for the materials used. The maximum density shall be determined by the laboratory operated by Geotechnologies, Inc. using the test method described in the most recent revision of ASTM D 1557.

Field observation and testing shall be performed by a representative of the geotechnical 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 a minimum of 90 percent compaction is obtained.

Acceptable Materials

The excavated onsite materials are considered satisfactory for reuse in the controlled fills as long as any debris and/or organic matter is removed.

Any imported materials shall be observed and tested by the representative of the geotechnical engineer prior to use in fill areas. Imported materials should contain sufficient fines so as to be relatively impermeable and result in a stable subgrade when compacted. Any required import materials should consist of geologic materials with an expansion index of less than 30. The water-soluble sulfate content of the import materials should be less than 0.1% percentage by weight.

Imported materials should be free from chemical or organic substances which could affect the proposed development.

Utility Trench Backfill

Utility trenches should be backfilled with controlled fill. The utility should be bedded with clean sands at least one foot over the crown. The remainder of the backfill may be onsite soil compacted to 90 percent of the laboratory maximum density. Utility trench backfill should be tested by representatives of this firm in accordance with the most recent revision of ASTM D-1557.

Shrinkage and Bulking

Shrinkage results when a volume of soil removed at one density is compacted to a higher density. Bulking occurs when rock is removed and replaced at a lower density. It is anticipated that the bedrock will be used as the primary material for grading. The net result of grading will result in a bulking factor of approximately 5 percent when excavating and recompacting the excavated bedrock to an average comparative compaction of 92 percent.

Weather Related Grading Considerations

When rain is forecast all fill that has been spread and awaits compaction shall be properly compacted prior to stopping work for the day or prior to stopping due to inclement weather. These fills, once compacted, shall have the surface sloped to drain to an area where water can be removed.

Temporary drainage devices should be installed to collect and transfer excess water to the street in non-erosive drainage devices. Drainage should not be allowed to pond anywhere on the site, and especially not against any foundation or retaining wall. Drainage should not be allowed to flow uncontrolled over any descending slope.

Work may start again, after a period of rainfall, once the site has been reviewed by a representative of this office. Any soils saturated by the rain shall be removed and aerated so that the moisture content will fall within three percent of the optimum moisture content.

Surface materials previously compacted before the rain shall be scarified, brought to the proper moisture content and recompacted prior to placing additional fill, if considered necessary by a representative of this firm.

Geotechnical Observations and Testing During Grading

Geotechnical observations and testing during grading are considered to be a continuation of the geotechnical investigation. It is critical that the geotechnical aspects of the project be reviewed by representatives of Geotechnologies, Inc. (or the Engineer of Record) during the construction process. Compliance with the design concepts, specifications or recommendations during construction requires review by this firm during the course of construction. Any fill which is placed should be observed, tested, and verified if used for engineered purposes. Please advise this office at least twenty-four hours prior to any required site visit.

FOUNDATION DESIGN

This development will consist of several buildings with subterranean parking levels of varying depth. Based on the design concept, most of the proposed buildings will be constructed over a podium structure; except for a portion of the proposed Low-Rise Residential buildings located on the southeast side of the site that will be constructed at-grade. Geotechnologies, Inc. provides several options for the foundation design.

Conventional Foundations

Conventional foundations for the proposed structures must bear in the bedrock. All conventional foundations for a structure should bear in the same material.

Continuous foundations may be designed for a bearing capacity of 7,000 pounds per square foot, and should be a minimum of 12 inches in width, 24 inches in depth below the lowest adjacent grade and 18 inches into the recommended bearing material.

Column foundations may be designed for a bearing capacity of 8,000 pounds per square foot, and should be a minimum of 24 inches in width, 24 inches in depth below the lowest adjacent grade and 18 inches into the recommended bearing material.

The bearing capacity increase for each additional foot of width is 250 pounds per square foot. The bearing capacity increase for each additional foot of depth is 800 pounds per square foot. The maximum recommended bearing capacity is 10,000 pounds per square foot.

A factor of safety of 3 was utilized in determining the allowable bearing capacities. The bearing values indicated above are 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. Since the recommended bearing value is a net value, the weight of concrete in the foundations may be taken as 50 pounds per cubic foot and the weight of the soil backfill may be neglected when determining the downward load on the foundations.

The proposed foundation plan shall be reviewed by this office when it achieves more definition, so that the recommendations contained herein may be modified or reaffirmed subsequent to such review, as necessary.

Conventional Foundations Adjacent to Buildings or Property Lines

Conventional foundations to be constructed adjacent to existing structures should be deepened to extend below a 1:1 plane of foundation action projected up from the bottom of the existing foundation or it is recommended that new foundation should match the depth of the existing foundation and should bear solely in the bedrock. Where foundation excavations will leave an adjacent foundation unsupported, the foundation excavation should be slot cut as described in the "Temporary Excavations" sections of this report.

Foundation Reinforcement

Based on City of Los Angeles minimum requirements, all continuous foundations should be reinforced with a minimum of four #4 steel bars. Two should be placed near the top of the foundation, and two should be placed near the bottom.

Lateral Design

Resistance to lateral loading may be provided by friction acting at the base of foundations and by passive earth pressure. An allowable coefficient of friction of 0.35 may be used with the dead load forces.

Passive geologic pressure for the sides of foundations poured against undisturbed or recompacted soil may be computed as an equivalent fluid having a density of 300 pounds per cubic foot with a maximum earth pressure of 3,000 pounds per square foot. The passive and friction components may be combined for lateral resistance without reduction. A one-third increase in the passive value may be used for short duration loading such as wind or seismic forces.

Foundation Settlement

All conventional footings are expected to bear in the bedrock. The maximum settlement is expected to be ½ inch and occur below the heaviest loaded columns. Differential settlement is not expected to exceed ¼ inch.

Miscellaneous Foundations

Foundations for small miscellaneous outlying structures, such as property line fence walls, planters, exterior canopies, and trash enclosures, which will not be tied-in to the proposed structures, may be supported on conventional foundations bearing in the bedrock or a compacted fill blanket. Wall footings may be designed for a bearing value of 1,500 pounds per square foot, and should be a minimum of 12 inches in width, 18 inches in depth below the lowest adjacent grade and 18 inches into the recommended bearing material. No bearing value increases are recommended.

Since the recommended bearing capacity is a net value, the weight of concrete in the foundations may be taken as 50 pounds per cubic foot and the weight of the soil backfill may be neglected when determining the downward load on the foundations.

Foundation Observations

It is critical that all foundation excavations are observed by a representative of this firm to verify penetration into the recommended bearing materials. The observation should be performed prior to the placement of reinforcement. Foundations should be deepened to extend into satisfactory geologic materials, if necessary. Foundation excavations should be cleaned of all loose soils prior to placing steel and concrete. Any required foundation backfill should be mechanically compacted, flooding is not permitted.

Mat Foundation

Mat foundations bearing exclusively in the bedrock may be used for building support. The mat should be designed for hydrostatic uplift measured from a depth of 20 feet.

An average bearing pressure of 6,000 pounds per square foot is anticipated. The mat foundation may be designed utilizing a modulus of subgrade reaction of 350 pounds per cubic inch. This value is a unit value for use with a one-foot square footing. The modulus should be reduced in accordance with the following equation when used with larger foundations.

$$K = K_1 * [(B + 1) / (2 * B)]^2$$

Where: K = Reduced Subgrade Modulus
K1 = Unit Subgrade Modulus
B = Foundation Width (feet)

The bearing values indicated above are 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. Since the recommended bearing value is a net value, the weight of concrete in the foundations may be taken as 50 pounds per cubic foot and the weight of the soil backfill may be neglected when determining the downward load on the foundations.

Lateral Design for Mat Foundation

Resistance to lateral loading may be provided by soil friction, and by the passive resistance of the soils. A coefficient of friction of 0.35 may be used with the dead load forces between footings and the underlying supporting soils.

Passive earth pressure for the sides of footings poured against undisturbed soil may be computed as an equivalent fluid having a density of 400 pounds per cubic foot, with a maximum earth pressure of 4,000 pounds per square foot. When combining passive and friction for lateral resistance, the passive component should be reduced by one third. A one-third increase in the passive value may be used for wind or seismic loads. A minimum safety factor of 2 has been utilized in determining the allowable passive pressure.

Foundation Settlement

The majority of the foundation settlement is expected to occur on initial application of loading. It is anticipated that total settlement between 1 to 1½ inches will occur below the more heavily loaded central core portions of the mat foundation beneath the tower. Settlement on the edges of the mat foundation are expected to be between ½ to ¾ inch.

Friction Piles

Deep foundations may be used to support the proposed Elysian parking structure in order to avoid the surcharge on the proposed subterranean podium retaining walls. The location of the piles should be carefully coordinated with the location of any tiebacks in the area to avoid interference.

Friction piles located in the vicinity of the adjacent proposed subterranean structures and adjacent footings should be designed to derive support only within the native soils below a 1:1 (h:v) surcharge plane projected upward from the bottom of the lowest adjacent subterranean level or footings. In addition, the upper section of the piles shall be sleeved to prevent skin friction from developing within the 1:1 (h:v) surcharge plane projected upward from the bottom of the lowest adjacent subterranean level.

Drilled Cast-in-Place Friction Piles

The proposed friction piles may be proportioned utilizing the enclosed Friction Pile Capacity Chart and the Lateral Load Capacity Charts. The friction pile capacities are mathematically determined using a safety factor of 2. For ultimate compression and tension design, the pile capacities may be doubled. Uplift capacity may be designed using 50 percent of the downward capacity. All friction piles should be tied together with grade beams or structural slabs. Where pile groups are required, the piles should be spaced a minimum of 3 diameters on centers. If so spaced, there will be no reduction in the downward capacity of the piles due to group action.

A one-third increase may be used for transient loading such as wind or seismic forces. The capacities presented are based on the strength of the soils. The compressive and tensile strength of the pile sections should be checked to verify the structural capacity of the piles.

Lateral Design for Pile Foundation

Lateral loads may be resisted by the piles, and by the passive resistance of the bedrock against the pile caps and grade beams. The passive resistance of the bedrock against pile caps and grade beams may be assumed as an equivalent fluid having a density of 400 pounds per cubic foot with a maximum earth pressure of 4,000 pounds per square foot. A one-third increase in this value may be used for wind or seismic loads. The passive resistance of the piles and the passive resistance of the bedrock against pile caps and grade beams may be combined without reduction in determining the total lateral resistance.

Maximum recommended allowable lateral capacities for ¼-inch deflection for single, isolated, fixed-head and free-head piles are presented in the Appendix. No factors of safety have been applied to the lateral load values calculated to induce ¼-inch lateral deflection.

Single isolated piles may be classified as piles spaced at or greater than 8 diameters on center. For pile groups where piles will be spaced closer than 8 diameters on center in the direction of loading, the following reduction factor may be utilized to determine the allowable lateral pile capacities to maintain a ¼-inch pile deflection.

Pile Spacing*	**Percentage of Lateral Passive Resistance**
7B	70%
6B	55%
5B	45%
4B	38%
3B	33%

* B is the diameter of the proposed piles

Lateral capacities provided are for drilled, cast-in-place concrete piles, penetrating the materials encountered during the course of this investigation. Assumed as part of these lateral capacity calculations are a concrete modulus of elasticity of at least 3,000,000 pounds per square inch (psi), and minimum total pile depth of 40 feet.

A one-third increase may be used for transient loading such as wind or seismic forces. The capacities presented are based on the strength of the soils. The compressive and tensile strength of the pile sections should be checked to verify the structural capacity of the piles.

Lateral Design for Piles Adjacent to Existing Basement

Where piles, pile caps, and grade beams are located adjacent to the existing neighboring basements within a 1:1 (h:v) surcharge plane projected upward from the bottom of the lowest adjacent subterranean level, they should not be utilized for lateral support in the direction perpendicular to the subterranean structures. Lateral capacity in the direction parallel to the existing neighboring basements shall be reduced by one half.

As an alternative, the proposed piles may be designed to derive lateral capacity from the native soils below the bottom of the existing neighboring basements. In order to prevent lateral loads from the proposed piles surcharging the existing neighboring basements, the upper section of the pile above the basement level shall be provided with a sleeve/casing. As an alternative the adjacent retaining wall can be designed to accommodate the surcharge pressure.

Installation of Drilled Cast-in-Place Friction Piles

Difficult drilling conditions were encountered during exploration in some of the borings due to seepage and moderately hard bedrock and concretions.

Caving of drilled borings is not anticipated due to the moderately hard consistency of the bedrock. Closely spaced piles should be drilled and filled alternately, with the concrete permitted to set at least overnight before drilling an adjacent hole. Pile excavations should be filled with concrete as soon after drilling and inspection as possible; the shafts should not be left open overnight. The concrete should be placed with special equipment so that the concrete is not allowed to fall freely more than 5 feet and to prevent concrete from striking the walls of the excavations and possible causing caving.

If the water level in a boring exceeds three inches, a concrete pump shall be used to place the concrete into the bottom of the hole. A tremie pipe shall consist of a water-tight tube having a diameter of not less than 4 inches and connected to a concrete pump. The tube shall be equipped with a device that will close the discharge end and prevent water from entering the tube while it is being charged with concrete. The tremie shall be supported so as to permit free movement of the discharge end over the entire top surface of the work and to permit rapid lowering when necessary to retard or stop the flow of concrete. The discharge end shall be closed at the start of the work to prevent water entering the tube and shall be entirely sealed at all times, except when the concrete is being placed. The tremie tube shall be kept full of concrete. The flow shall be continuous until the work is completed and the resulting concrete seal shall be monolithic and homogeneous. The tip of the tremie tube shall always be kept about five feet below the surface of the concrete and definite steps and safeguards should be taken to insure that the tip of the tremie tube is never raised above the surface of the concrete.

A special concrete mix should be used for concrete to be placed below water. The design shall provide for concrete with a strength of 1,000 psi over the initial job specification. An admixture that reduces the problem of segregation of paste/aggregates and dilution of paste shall be included. The slump shall be commensurate to any research report for the admixture, provided that it shall also be the minimum for a reasonable consistency for placing when water is present.

Settlement

The total settlement of pile-supported foundations is not expected to exceed ½ inch. Differential settlement is expected to be less than ¼ inch.

RETAINING WALL DESIGN

Some of the retaining walls will incur a surcharge loads due to the orientation of bedding. Bedding dips to the south-southwest from 30 to 75 degrees and will surcharge walls that have a southern exposure. Walls with west, north or east exposure will have bedding that is oblique to the face of the wall and will not have a surcharge. The exception to this recommendation will be the wall along the east side of the site between White Knoll Avenue and Beaudry Avenue. Bedding will have an out of slope component that should be considered daylighted for purposes of shoring design.

Walls greater than 20 feet in depth will require the inclusion of a hydrostatic force.

Cantilever retaining walls supporting a level backslope may be designed utilizing a triangular distribution of active earth pressure. Restrained retaining walls may be designed utilizing a triangular distribution of at-rest earth pressure.

The lateral loads are separated into daylighted or oblique bedding conditions. The retaining and shoring walls that will have daylighted bedding conditions are shown on the attached Plan Showing Cuts with Daylighted Bedding. Hydrostatic loads are also included in the table. The summary tables are presented below and the calculation sheets are attached to this report.

LATERAL RETAINING WALL PRESSURE
DAYLIGHTED BEDDING ORIENTATION ON SOUTH-FACING EXCAVATIONS
See “Plan Showing Cuts with Daylighted Bedding Plan” Where Applicable

Height of Retaining Wall (feet)	Cantilever Retaining Wall Triangular Distribution of Active Earth Pressure (pcf)	Restrained and Drained Retaining Wall Triangular Distribution of At-Rest Earth Pressure (pcf)	Restrained and Undrained Retaining Wall Triangular Distribution of At-Rest Earth Pressure (pcf)
Up to 10	43	97	97*
10 to 20	65	97	97*
20 to 30	74	97	112
30 to 40	N.A.	97	112
40 to 50	N.A.	97	112
50 to 60	N.A.	97	112
60 to 70	N.A.	97	112
70 to 80	N.A.	97	112

*Note: wall must have drainage at 20’ depth to be valid. Otherwise, hydrostatic loads must be used.

LATERAL RETAINING WALL PRESSURE
OBLIQUE BEDDING ORIENTATION
(WEST, NORTH AND EAST WALL EXPOSURES)

Height of Retaining Wall (feet)	Cantilever Retaining Wall Triangular Distribution of Active Earth Pressure (pcf)	Restrained and Drained Retaining Wall Triangular Distribution of At-Rest Earth Pressure (pcf)	Restrained and Undrained Retaining Wall Triangular Distribution of At-Rest Earth Pressure (pcf)
Up to 10	26	59	59*
10 to 20	40	59	59*
20 to 30	45	59	93
30 to 40	N.A.	59	93
40 to 50	N.A.	59	93
50 to 60	N.A.	59	93
60 to 70	N.A.	59	93
70 to 80	N.A.	59	93

*Note: wall must have drainage at 20’ depth to be valid. Otherwise, hydrostatic loads must be used.

The lateral earth pressures recommended above for retaining walls assume that a permanent drainage system will be installed so that external water pressure will not be developed against the walls. Additional active pressure should be added for a surcharge condition due to sloping ground, vehicular traffic and the adjacent structures.

The upper ten feet of the retaining wall adjacent to streets, driveways or parking areas should be designed to resist a uniform lateral pressure of 100 pounds per square foot, acting as a result of an assumed 300 pounds per square foot surcharge behind the walls due to normal street traffic. If the traffic is kept back at least ten feet from the retaining walls, the traffic surcharge may be neglected. Foundations may be designed using the allowable bearing capacities, friction, and passive earth pressure found in the “Foundation Design” section above.

Dynamic (Seismic) Earth Pressure

Retaining walls exceeding 6 feet in height shall be designed to resist the additional earth pressure caused by seismic ground shaking. A triangular pressure distribution should be utilized for the additional seismic loads, with an equivalent fluid pressure of 29 pounds per cubic foot. When using the load combination, the greater of the seismic earth pressure and the active pressure or the At-rest pressure should be used for that depth interval. The seismic load should be made to the hydrostatic load shown on the previous tables. The comparison is made in the following tables:

SEISMIC WALL PRESSURE
DAYLIGHTED BEDDING CONDITION
(All Pressure Distributions are Triangular)
See "Plan Showing Cuts with Daylighted Bedding Plan" Where Applicable

Wall Height (feet)	**Active pressure (pcf)**	**Active + Seismic (pcf)**	**At-Rest (pcf)**
Up to 10	43	(43 + 29) = 72	97*
10 to 20	65	94	97*
20 to 30	74	103*	97
30 to 40	78	107*	97
40 to 50	81	110*	97
50 to 60	83	112*	97
60 to 70	84	113*	97
70 to 80	85	114*	97

Note: * denotes value to be used in design

SEISMIC WALL PRESSURE OBLIQUE BEDDING CONDITION (All Pressure Distributions are Triangular)			
Wall Height (feet)	**Active pressure (pcf)**	**Active + Seismic (pcf)**	**At-Rest (pcf)**
Up to 10	26	(26 + 29) = 55	59*
10 to 20	40	69	78*
20 to 30	45	74	78*
30 to 40	47	76	78*
40 to 50	49	78	78*
50 to 60	50	79*	78
60 to 70	50	79*	78
70 to 80	51	80*	78

Note: * denotes value to be used in design

Surcharge from Adjacent Structures

As indicated herein, additional active pressure should be added for a surcharge condition due to sloping ground, vehicular traffic or adjacent structures for retaining walls and shoring design.

The following surcharge equation provided in the LADBS Information Bulletin Document No. P/BC 2008-83, may be utilized to determine the surcharge loads on basement walls and shoring system for existing structures located within the 1:1 (h:v) surcharge influence zone of the excavation and basement.

Resultant lateral force: $R = (0.3*P*h^2)/(x^2+h^2)$

Location of lateral resultant: $d = x*[(x^2/h^2+1)*\tan^{-1}(h/x)-(x/h)]$

Where:

R = resultant lateral force measured in pounds per foot of wall width.
P = resultant surcharge loads of continuous or isolated footings measured in pounds per foot of length parallel to the wall.
x = distance of resultant load from back face of wall measured in feet.
h = depth below point of application of surcharge loading to top of wall footing measured in feet.
d = depth of lateral resultant below point of application of surcharge loading measure in feet.
$\tan^{-1}(h/x)$ = the angle in radians whose tangent is equal to h/x.

The structural engineer and shoring engineer may use this equation to determine the surcharge loads based on the loading of the adjacent structures located within the surcharge influence zone.

Waterproofing

Moisture effecting retaining walls is one of the most common post construction complaints. Poorly applied or omitted waterproofing can lead to efflorescence or standing water inside the building. Efflorescence is a process in which a powdery substance is produced on the surface of the concrete by the evaporation of water. The white powder usually consists of soluble salts such as gypsum, calcite, or common salt. Efflorescence is common to retaining walls and does not affect their strength or integrity.

It is recommended that retaining walls be waterproofed. Waterproofing design and inspection of its installation is not the responsibility of the geotechnical engineer. A qualified waterproofing consultant should be retained in order to recommend a product or method which would provide protection to below grade walls.

Retaining Wall Drainage

All retaining walls shall be provided with a subdrain in order to minimize the potential for future hydrostatic pressure buildup behind the proposed retaining walls. Subdrains may consist of four-inch diameter perforated pipes, placed with perforations facing down. The pipe shall be encased in at least one-foot of gravel around the pipe. The gravel may consist of three-quarter inch to one inch crushed rocks.

A compacted fill blanket or other seal shall be provided at the surface. Retaining walls may be backfilled with gravel adjacent to the wall to within 2 feet of the ground surface. The onsite earth materials are acceptable for use as retaining wall backfill as long as they are compacted to a minimum of 90 percent of the maximum density as determined by ASTM D 1557-02 or equivalent.

Certain types of subdrain pipe are not acceptable to the various municipal agencies, it is recommended that prior to purchasing subdrainage pipe, the type and brand is cleared with the proper municipal agencies. Subdrainage pipes should outlet to an acceptable location.

Where retaining walls are to be constructed adjacent to property lines there is usually not enough space for emplacement of a standard pipe and gravel drainage system. Under these circumstances, the use of a flat drainage produce is acceptable. However, the City of Los Angeles only permits the used of flat drainage products if used in conjunction with a conventional rockpockets or back drain system. The use of such a product should be researched with the building official.

The lateral earth pressures recommended above for retaining walls assume that a permanent drainage system will be installed so that external water pressure will not be developed against the walls. If a drainage system is not provided, the walls should be designed to resist an external hydrostatic pressure due to water in addition to the lateral earth pressure. In any event, it is recommended that retaining walls be waterproofed.

Retaining Wall Backfill

Any required backfill should be mechanically compacted in layers not more than 8 inches thick, to at least 90 percent of the maximum density obtainable by the ASTM Designation D 1557 method of compaction. Flooding should not be permitted. Proper compaction of the backfill will be necessary to reduce settlement of overlying walks and paving. Some settlement of required backfill should be anticipated, and any utilities supported therein should be designed to accept differential settlement, particularly at the points of entry to the structure.

Proper compaction of the backfill will be necessary to reduce settlement of overlying walks and paving. Some settlement of required backfill should be anticipated, and any utilities supported therein should be designed to accept differential settlement, particularly at the points of entry to the structure.

Sump Pump Design

The purpose of the recommended permanent retaining wall backdrainage system is to relieve hydrostatic pressure. Water seepage was encountered at different depths, between 16 and 62 feet below grade in the borings. This water seepage represents a flow within thin layers of sand within the bedrock. Therefore, this water seepage should be added to any potential irrigation waters and precipitation. Additionally, the proposed site grading is such that all drainage is directed to the streets and the structure has been designed with adequate non-erosive drainage devices.

Based on these considerations, the permanent retaining wall backdrainage system is not expected to experience an appreciable flow of water. For the purposes of sump pump design, a flow rate of 10 gallons per minute may be assumed.

TEMPORARY EXCAVATIONS

It is anticipated that excavations for this development extend as much as 64 feet in depth for the proposed subterranean levels and foundation elements. The excavations are expected to expose fill, colluvium, old alluvium and sedimentary bedrock. All of the materials, with the exception of daylighted bedrock, are suitable for vertical excavations up to five feet where not surcharged by adjacent traffic or structures.

Proposed footings next to The Elysian will require temporary shoring. It is recommended that the proposed foundation plans be reviewed by this firm, so that the design for temporary shoring or slot cuts during foundation excavations may be evaluated.

Where sufficient space is available, temporary unsurcharged embankments (where not exposing daylighted bedrock) could be cut at a uniform 1:1 (h:v) slope gradient to a maximum depth equal to the depth the excavation to a maximum depth of 30 feet. A uniform sloped excavation does not have a vertical component.

Where sloped embankments are utilized, the top of the slopes should be barricaded to prevent vehicles and storage loads surcharging the slopes within a horizontal distance equal to the depth of the excavation. If the temporary construction embankments are to be maintained during the rainy season, berms are suggested along the tops of the slopes where necessary to prevent runoff water from entering the excavation and eroding the slope faces. The soils exposed in the cut slopes should be inspected during excavation by personnel from this office so that modifications of the slopes can be made if variations in the soil conditions occur.

Where the horizontal distance from the edge of the proposed excavation to the neighboring structures is less than or equal to the depth of the excavation, the proposed excavation should be made in 8 foot slots by the A-B-C slot cut methods.

Daylighted Bedrock

As described earlier in this report, bedrock dips to the south-southeast and south-southwest from 30 to 78 degrees. Temporary cuts in the bedrock may not be made steeper than the angle of bedding. Where the reversal in bedding dip occurs, this recommendation applies.

Excavations Adjacent to Buildings or Property Lines

Where foundation excavations will leave an adjacent foundation unsupported, the foundation excavation should be slot cut. The slot cutting method employs the earth as a buttress and allows the earth excavation to proceed in phases. Alternate "A" slots of 8 feet may be worked. The remaining earth buttresses ("B" and "C" slots) should each be 8 feet in width for a combined intervening length of 16 feet. The foundation should be poured in the "A" slots before the "B" slots are excavated. After completing the foundation in the "B" slots, finally the "C" slots may be excavated.

Excavation Observations

It is critical that the rock exposed in the cut slopes are observed by a representative of Geotechnologies, Inc. (or the geotechnical engineer of record) during excavation so that modifications of the slopes can be made if variations in the geologic material conditions occur. Many building officials require that temporary excavations should be made during the continuous observations of the geotechnical engineer. All excavations should be stabilized within 30 days of initial excavation.

SHORING DESIGN

The following information on the design and installation of the shoring is as complete as possible at this time. It is suggested that a review of the final shoring plans and specifications be made by this office prior to bidding or negotiating with a shoring contractor be made.

One method of shoring would consist of steel soldier piles, placed in drilled holes and backfilled with concrete. The soldier piles may be designed as cantilevers or laterally braced utilizing drilled tie-back anchors or raker braces.

Soldier Piles

Drilled cast-in-place soldier piles should be placed no closer than 2 diameters on center. The minimum diameter of the piles is 18 inches. Structural concrete should be used for the soldier piles below the excavation; lean-mix concrete may be employed above that level. As an alternative, lean-mix concrete may be used throughout the pile where the reinforcing consists of a wideflange section. The slurry must be of sufficient strength to impart the lateral bearing pressure developed by the wideflange section to the earth materials. For design purposes, an allowable passive value for the earth materials below the bottom plane of excavation may be assumed to be 600 pounds per square foot per foot. To develop the full lateral value, provisions should be implemented to assure firm contact between the soldier piles and the undisturbed earth materials.

The frictional resistance between the soldier piles and retained earth material may be used to resist the vertical component of the anchor load. The coefficient of friction may be taken as 0.35 based on uniform contact between the steel beam and lean-mix concrete and retained earth. The portion of soldier piles below the plane of excavation may also be employed to resist the downward loads. The downward capacity may be determined using a frictional resistance of 600 pounds per square foot. The minimum depth of embedment for shoring piles is 5 feet below the bottom of the footing excavation, or 7 feet below the bottom of excavated plane, whichever is deeper.

Casing may be required should caving be experienced in the saturated earth materials. If casing is used, extreme care should be employed so that the pile is not pulled apart as the casing is withdrawn. At no time should the distance between the surface of the concrete and the bottom of the casing be less than 5 feet.

Piles placed below water greater than 3 inches in depth, will require the use of a tremie to place the concrete into the bottom of the hole. A tremie shall consist of a water-tight tube having a diameter of not less than 4 inches and be connected to a concrete pump. The tube shall be equipped with a device that will close the discharge end and prevent water from entering the tube while it is being charged with concrete. The tremie shall be supported so as to permit free movement of the discharge end over the entire top surface of the work and to permit rapid lowering when necessary to retard or stop the flow of concrete. The discharge end shall be closed at the start of the work to prevent water entering the tube and shall be entirely sealed at all times, except when the concrete is being placed. The tremie tube shall be kept full of concrete. The flow shall be continuous until the work is completed and the resulting concrete seal shall be monolithic and homogeneous. The tip of the tremie tube shall always be kept about five feet below the surface of the concrete and definite steps and safeguards should be taken to insure that the tip of the tremie tube is never raised above the surface of the concrete.

A special concrete mix should be used for concrete to be placed below water. The design shall provide for concrete with a strength of 1,000 psi over the initial job specification. An admixture that reduces the problem of segregation of paste/aggregates and dilution of paste shall be included. The slump shall be commensurate to any research report for the admixture, provided that it shall also be the minimum for a reasonable consistency for placing when water is present.

Lagging

Soldier piles and anchors should be designed for the full anticipated pressures. Due to the cohesionless nature of the underlying earth materials, lagging will be required throughout the entire depth of the excavation. Due to arching in the geologic materials, the pressure on the lagging will be less. It is recommended that the lagging should be designed for the full design pressure but be limited to a maximum of 400 pounds per square foot. It is recommended that a representative of this firm observe the installation of lagging to insure uniform support of the excavated embankment.

Lateral Pressures

Shoring wall loads will be affected by the orientation of bedding. Bedding dips to the south-southeast and south-southwest from 30 to 78 degrees and will surcharge walls that have a southern exposure. Walls with and west, north or east exposure will have bedding that is oblique to the face of the wall and will not have a surcharge. The exception to this recommendation will be the wall along the east side of the site between White Knoll Avenue and Beaudry Avenue. Bedding will have an out of slope component that should be considered daylighted for purposes of shoring design.

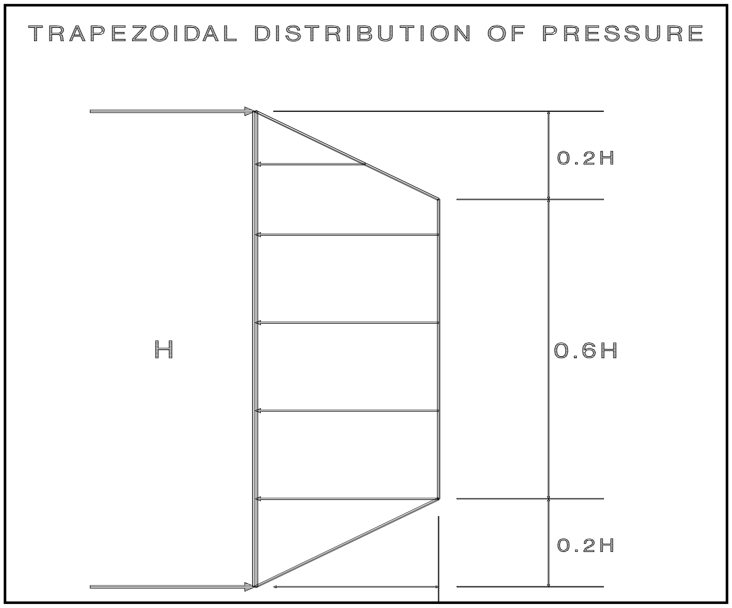
A triangular distribution of lateral earth pressure should be utilized for the design of cantilevered shoring system. A trapezoidal distribution of lateral earth pressure would be appropriate where shoring is to be restrained at the top by bracing or tie backs. The design of trapezoidal distribution of pressure is shown in the diagram below. Equivalent fluid pressures for the design of cantilevered and restrained shoring are presented in the following table:

LATERAL SHORING WALL PRESSURES **DAYLIGHTED BEDDING ORIENTATION** See "Plan Showing Cuts with Daylighted Bedding" Where Applicable		
Height of Shoring Wall (feet)	Cantilever Shoring System Equivalent Fluid Pressure (pcf) Triangular Distribution of Pressure	Restrained Shoring System Lateral Earth Pressure (psf)* Trapezoidal Distribution of Pressure
Up to 10	32	20H
10 to 20	56	35H
20 to 30	65	41H
30 to 40	N.A.	44H
40 to 50	N.A.	46H
50 to 60	N.A.	48H
60 to 70	N.A.	48H
70 to 80	N.A.	49H
80 to 90	N.A.	49H

*Where H is the height of the shoring in feet.

LATERAL SHORING WALL PRESSURES **OBLIQUE BEDDING ORIENTATION** (WEST, NORTH AND EAST WALL EXPOSURES)		
Height of Shoring Wall (feet)	Cantilever Shoring System Equivalent Fluid Pressure (pcf) Triangular Distribution of Pressure	Restrained Shoring System Lateral Earth Pressure (psf)* Trapezoidal Distribution of Pressure
Up to 20	30	19H
20 to 30	36	23H
30 to 40	N.A.	24H
40 to 50	N.A.	26H
50 to 60	N.A.	27H
60 to 70	N.A.	28H
70 to 80	N.A.	29H
80 to 90	N.A.	30H

*Where H is the height of the shoring in feet.



Where a combination of sloped embankment and shoring is utilized, the pressure will be greater and must be determined for each combination. Additional active pressures should be applied where the shoring will be surcharged by adjacent traffic or structures.

The upper ten feet of the retaining wall adjacent to streets, driveways or parking areas should be designed to resist a uniform lateral pressure of 100 pounds per square foot, acting as a result of an assumed 300 pounds per square foot surcharge behind the walls due to normal street traffic. If the traffic is kept back at least ten feet from the retaining walls, the traffic surcharge may be neglected. Foundations may be designed using the allowable bearing capacities, friction, and passive earth pressure found in the “Foundation Design” section above.

Tied-Back Anchors

Tied-back anchors may be used to resist lateral loads. Friction anchors are recommended. The shallowest dip of an unsupported bedding plane should be considered as the active wedge for shoring walls with daylighted bedding conditions. The shallowest dip occurs on the north side of the site (southern exposure) and is inclined 30 degrees from the horizontal. An active wedge of 60 degrees (from the vertical) should be used. For all excavations that are not daylighted and active wedge of 35 degrees (from the vertical) may be used. Friction anchors should extend a minimum of 20 feet beyond the potentially active wedge.

Drilled friction anchors may be designed for a skin friction of 600 pounds per square foot. Pressure grouted anchor may be designed for a skin friction of 2,500 pounds per square foot. Where belled anchors are utilized, the capacity of belled anchors may be designed by assuming the diameter of the bonded zone is equivalent to the diameter of the bell. Only the frictional resistance developed beyond the active wedge would be effective in resisting lateral loads.

It is recommended that at least 3 of the initial anchors have their capacities tested to 200 percent of their design capacities for a 24-hour period to verify their design capacity. The total deflection during this test should not exceed 12 inches. The anchor deflection should not exceed 0.75 inches during the 24 hour period, measured after the 200 percent load has been applied.

All anchors should be tested to at least 150 percent of design load. The total deflection during this test should not exceed 12 inches. The rate of creep under the 150 percent test load should not exceed 0.1 inch over a 15 minute period in order for the anchor to be approved for the design loading.

After a satisfactory test, each anchor should be locked-off at the design load. This should be verified by rechecking the load in the anchor. The load should be within 10 percent of the design load. Where satisfactory tests are not attained, the anchor diameter and/or length should be increased or additional anchors installed until satisfactory test results are obtained. The installation and testing of the anchors should be observed by the geotechnical engineer. Minor caving during drilling of the anchors should be anticipated.

Anchor Installation

Tied-back anchors may be installed between 20 and 40 degrees below the horizontal. Caving of the anchor shafts, particularly within sand deposits, should be anticipated and the following provisions should be implemented in order to minimize such caving. The anchor shafts should be filled with concrete by pumping from the tip out, and the concrete should extend from the tip of the anchor to the active wedge. It is recommended that the portion of the anchor shaft within the active wedge be backfilled with sand before testing the anchor. This portion of the shaft should be filled tightly and flush with the face of the excavation. The sand backfill should be placed by pumping; the sand may contain a small amount of cement to facilitate pumping.

Deflection

It is difficult to accurately predict the amount of deflection of a shored embankment. It should be realized that some deflection will occur. It is estimated that the deflection could be on the order of one inch at the top of the shored embankment. If greater deflection occurs during construction, additional bracing may be necessary to minimize settlement of adjacent buildings and utilities in adjacent street and alleys. If desired to reduce the deflection, a greater active pressure could be used in the shoring design. Where internal bracing is used, the rakers should be tightly wedged to minimize deflection. The proper installation of the raker braces and the wedging will be critical to the performance of the shoring.

The City of Los Angeles Department of Building and Safety requires limiting shoring deflection to ½ inch at the top of the shored embankment where a structure is within a 1:1 plane projected up from the base of the excavation. A maximum deflection of 1-inch has been allowed provided there are no structures within a 1:1 plane drawn upward from the base of the excavation.

Raker Brace Foundations

An allowable bearing pressure of 4,000 pounds per square foot may be used for the design a raker foundations. This bearing pressure is based on a raker foundation a minimum of 4 feet in width and length as well as 4 feet in depth. The base of the raker foundations should be horizontal. Care should be employed in the positioning of raker foundations so that they do not interfere with the foundations for the proposed structure.

Monitoring

Because of the depth of the excavation, some method of monitoring the performance of the shoring system is recommended. The monitoring should consist of periodic surveying of the lateral and vertical locations of the tops of all soldier piles and the lateral movement along the entire lengths of selected soldier piles. Also, some means of periodically checking the load on selected anchors will be necessary, where applicable.

Some movement of the shored embankments should be anticipated as a result of the relatively deep excavation. It is recommended that photographs of the existing buildings on the adjacent properties be made during construction to record any movements for use in the event of a dispute.

INCLINOMETERS

Due to the depth of the excavation for Phase II, the presence of an existing structure at the top of the excavation (The Elysian Parking Structure), and the daylighted bedding orientation, it is recommended that inclinometers be installed at the southeast and southwest corners of the Elysian parking structure. The purpose of inclinometers will be to measure deflection along the face of the shoring where conventional survey methods cannot be employed.

The inclinometer installation should occur when the shoring piles are installed. Inclinometer readings should be performed each at 10 foot excavation depth as the excavation proceeds. The readings should be performed by Geotechnologies, Inc. (or the Engineer of Record) until the structure reaches the podium level.

Shoring Observations

It is critical that the installation of shoring is observed by a representative of Geotechnologies, Inc. (or Engineer of Record). Many building officials require that shoring installation should be performed during continuous observation of a representative of the geotechnical engineer. The observations insure that the recommendations of the geotechnical report are implemented and so that modifications of the recommendations can be made if variations in the geologic material or groundwater conditions warrant. The observations will allow for a report to be prepared on the installation of shoring for the use of the local building official, where necessary.

SLABS ON GRADE

Concrete Slabs-on Grade

Concrete floor slabs should be a minimum of 5 inches in thickness. Slabs-on-grade should be cast over undisturbed bedrock or properly controlled fill materials but not a combination of both. Any geologic materials loosened or over-excavated should be wasted from the site or properly compacted to 90 percent of the maximum dry density. The depth of fill beneath a slab need not exceed 12 inches.

Outdoor Concrete Slab

Outdoor concrete flatwork should be a minimum of 4 inches in thickness. Outdoor concrete flatwork should be cast over undisturbed bedrock or properly controlled fill materials. Any geologic materials loosened or over-excavated should be wasted from the site or properly compacted to 90 percent of the maximum dry density.

Design of Slabs That Receive Moisture-Sensitive Floor Coverings

Geotechnologies, Inc. does not practice in the field of moisture vapor transmission evaluation and mitigation. Therefore, it is recommended that a qualified consultant be engaged to evaluate the general and specific moisture vapor transmission paths and any impact on the proposed construction. The qualified consultant should provide recommendations for mitigation of potential adverse impacts of moisture vapor transmission on various components of the structure.

Where dampness would be objectionable, it is recommended that the floor slabs should be waterproofed. A qualified waterproofing consultant should be retained in order to recommend a product or method which would provide protection for concrete slabs-on-grade.

All concrete slabs-on-grade should be supported on vapor retarder. The design of the slab and the installation of the vapor retarder should comply with the most recent revisions of ASTM E 1643 and ASTM E 1745. The vapor retarder should comply with ASTM E 1745 Class A requirements.

Where a vapor retarder is used, a low-slump concrete should be used to minimize possible curling of the slabs. The barrier can be covered with a layer of trimmable, compactible, granular fill, where it is thought to be beneficial. See ACI 302.2R-32, Chapter 7 for information on the placement of vapor retarders and the use of a fill layer.

Concrete Crack Control

The recommendations presented in this report are intended to reduce the potential for cracking of concrete slabs-on-grade due to settlement. However even where these recommendations have been implemented, foundations, stucco walls and concrete slabs-on-grade may display some cracking due to minor soil movement and/or concrete shrinkage. The occurrence of concrete cracking may be reduced and/or controlled by limiting the slump of the concrete used, proper concrete placement and curing, and by placement of crack control joints at reasonable intervals, in particular, where re-entrant slab corners occur.

For standard control of concrete cracking, a maximum crack control joint spacing of 15 feet should not be exceeded. Lesser spacings would provide greater crack control. Joints at curves and angle points are recommended. The crack control joints should be installed as soon as practical following concrete placement. Crack control joints should extend a minimum depth of one-fourth the slab thickness. Construction joints should be designed by a structural engineer.

Complete removal of the existing fill soils beneath outdoor flatwork such as walkways or patio areas, is not required, however, due to the rigid nature of concrete, some cracking, a shorter design life and increased maintenance costs should be anticipated. In order to provide uniform support beneath the flatwork it is recommended that a minimum of 12 inches of the exposed subgrade beneath the flatwork be scarified and recompacted to 90 percent relative compaction.

Slab Reinforcing

Concrete slabs-on-grade should be reinforced with a minimum of #4 steel bars on 16-inch centers each way. Outdoor flatwork should be reinforced with a minimum of #3 steel bars on 18-inch centers each way.

PAVEMENTS

Asphalt Concrete Paving

Prior to placing paving, the existing grade should be scarified to a depth of 12 inches, moistened as required to obtain optimum moisture content, and recompacted to 90 percent of the maximum density as determined by the most recent revision of ASTM D 1557. The required paving and thickness will depend on the expected wheel loads and service (traffic index). We have conservatively assumed an R-value of 40 for the subgrade soils. The R-value of the compacted fill should be confirmed during grading. The client should be aware that removal of all existing fill in the area of new paving is not required, however, pavement constructed in this manner will most likely have a shorter design life and increased maintenance costs. The following pavement sections are recommended:

Service	Asphalt Pavement Thickness (Inches)	Base Course (Inches)
Passenger Cars	3.0	4
Moderate Truck	4.0	6
Heavy Truck	6.0	9

Aggregate base should be compacted to a minimum of 95 percent of the most recent revision of ASTM D 1557 laboratory maximum dry density. Base materials should conform with Sections 200-2.2 or 200-2.4 of the “Standard Specifications for Public Works Construction”, (Green Book), latest edition.

The performance of pavement is highly dependent upon providing positive surface drainage away from the edges. Ponding of water on or adjacent to pavement can result in saturation of the subgrade materials and subsequent pavement distress. If planter islands are planned, the perimeter curb should extend a minimum of 12 inches below the bottom of the aggregate base.

Concrete Pavement

Concrete paving may be used on the project. Portland cement concrete paving sections were determined in accordance with procedures developed by the Portland Cement Association. Concrete paving sections for a range of Traffic Indices are presented in the following table. We have assumed that the portland cement concrete will have a compressive strength of at least 3,000 pounds per square inch.

Service	Concrete Pavement Thickness (Inches)	Base Course (Inches)
Passenger Cars	6.5	4
Moderate Truck	7.0	4
Heavy Truck	7.5	4

The occurrence of concrete cracking may be reduced and/or controlled by limiting the slump of the concrete used, proper concrete placement and curing, and by placement of crack control joints at reasonable intervals, in particular, where re-entrant slab corners occur.

For standard control of concrete cracking, a maximum crack control joint spacing of 15 feet should not be exceeded. Lesser spacings would provide greater crack control. Joints at curves and angle points are recommended. The crack control joints should be installed as soon as practical following concrete placement. Crack control joints should extend a minimum depth of one-fourth the slab thickness. Construction joints should be designed by a structural engineer. Concrete paving should be reinforced with a minimum of #3 steel bars on 18-inch centers each way.

Aggregate base should be compacted to a minimum of 95 percent of the most recent revision of ASTM D 1557 laboratory maximum dry density. Base materials should conform with Sections

200-2.2 or 200-2.4 of the "Standard Specifications for Public Works Construction", (Green Book), latest edition.

SITE DRAINAGE

Proper surface drainage is critical to the future performance of the project. Saturation of a soil can cause it to lose internal shear strength and increase its compressibility, resulting in a change in the designed engineering properties. Proper site drainage should be maintained at all times.

All site drainage should be collected and transferred to the street in non-erosive drainage devices. The proposed structure should be provided with roof drainage. Discharge from downspouts, roof drains and scuppers should not be permitted on unprotected soils within five feet of the building perimeter. Drainage should not be allowed to pond anywhere on the site, and especially not against any foundation or retaining wall. Drainage should not be allowed to flow uncontrolled over any descending slope. Planters which are located within a distance equal to the depth of a retaining wall should be sealed to prevent moisture adversely affecting the wall. Planters which are located within five feet of a foundation should be sealed to prevent moisture affecting the earth materials supporting the foundation.

STORMWATER DISPOSAL

Introduction

Recently regulatory agencies have been requiring the disposal of a certain amount of stormwater generated on a site by infiltration into the site soils. Increasing the moisture content of a soil can cause it to lose internal shear strength and increase its compressibility, resulting in a change in the designed engineering properties. This means that any overlying structure, including buildings, pavements and concrete flatwork, could sustain damage due to saturation of the subgrade soils. Structures serviced by subterranean levels could be adversely impacted by stormwater disposal by increasing the design fluid pressures on retaining walls and causing leaks in the walls. Proper site drainage is critical to the performance of any structure in the built environment.

The site is entirely underlain by sedimentary bedrock of the Puente Formation. This bedrock does not transmit water readily due to its fine grained composition. Therefore, it is the opinion of this firm that stormwater infiltration at this site is not feasible.

When infiltration of stormwater into the subgrade soils is not advisable, most Building Officials have allowed the stormwater to be filtered through soils in planter areas. Once the water has been filtered through a planter it may be released into the storm drain system. It is recommended that overflow pipes are incorporated into the design of the discharge system in the planters to prevent flooding. In addition, the planters shall be sealed and waterproofed to prevent leakage. Please be advised that adverse impact to landscaping and periodic maintenance may result due to excessive water and contaminants discharged into the planters.

It is recommended that the design team (including the structural engineer, waterproofing consultant, plumbing engineer, and landscape architect) be consulted in regard to the design and construction of potential infiltration systems.

DESIGN REVIEW

Engineering of the proposed project should not begin until approval of the geotechnical report by the Los Angeles Department of Building and Safety is obtained in writing. Significant changes in the geotechnical recommendations may result during the building department review process.

It is recommended that the geotechnical aspects of the project be reviewed by this firm during the design process. This review provides assistance to the design team by providing specific recommendations for particular cases, as well as review of the proposed construction to evaluate whether the intent of the recommendations presented herein are satisfied.

CONSTRUCTION MONITORING

Geotechnical observations and testing during construction are considered to be a continuation of the geotechnical investigation. It is critical that this firm (or geotechnical engineer of record) review the geotechnical aspects of the project during the construction process. Compliance with the design concepts, specifications or recommendations during construction requires review by this firm during the course of construction. All foundations should be observed by a representative of this firm prior to placing concrete or steel. Any fill which is placed should be observed, tested, and verified if used for engineered purposes. Please advise Geotechnologies, Inc. at least twenty-four hours prior to any required site visit.

If conditions encountered during construction appear to differ from those disclosed herein, notify Geotechnologies, Inc. immediately so the need for modifications may be considered in a timely manner.

It is the responsibility of the contractor to ensure that all excavations and trenches are properly sloped or shored. All temporary excavations should be cut and maintained in accordance with applicable OSHA rules and regulations.

EXCAVATION CHARACTERISTICS

The exploration performed for this investigation is limited to the geotechnical excavations described. Direct exploration of the entire site would not be economically feasible. The owner, design team and contractor must understand that differing excavation and drilling conditions may be encountered based on boulders, gravel, oversize materials, groundwater and many other conditions. Fill materials, especially when they were placed without benefit of modern grading codes, regularly contain materials which could impede efficient grading and drilling. Southern California sedimentary bedrock is known to contain variable layers which reflect differences in depositional environment. Such layers may include abundant gravel, cobbles and boulders.

Similarly bedrock can contain concretions. Concretions are typically lenticular and follow the bedding. They are formed by mineral deposits. Concretions can be very hard. Excavation and drilling in these areas may require full size equipment and coring capability. The contractor should be familiar with the site and the geologic materials in the vicinity.

CLOSURE AND LIMITATIONS

The purpose of this report is to aid in the design and completion of the described project. Implementation of the advice presented in this report is intended to reduce certain risks associated with construction projects. The professional opinions and geotechnical advice contained in this report are sought because of special skill in engineering and geology and were prepared in accordance with generally accepted geotechnical engineering practice. Geotechnologies, Inc. has a duty to exercise the ordinary skill and competence of members of the engineering profession. Those who hire Geotechnologies, Inc. are not justified in expecting infallibility, but can expect reasonable professional care and competence.

The scope of the geotechnical services provided did not include any environmental site assessment for the presence or absence of organic substances, hazardous/toxic materials in the soil, surface water, groundwater, or atmosphere, or the presence of wetlands.

Proper compaction is necessary to reduce settlement of overlying improvements. Some settlement of compacted fill should be anticipated. Any utilities supported therein should be designed to accept differential settlement. Differential settlement should also be considered at the points of entry to the structure.

The City of Los Angeles does not require corrosion testing. However, if corrosion sensitive improvements are planned, it is recommended that a comprehensive corrosion study should be commissioned. The study will develop recommendations to avoid premature corrosion of buried pipes and concrete structures in direct contact with the soils.

GEOTECHNICAL TESTING

Classification and Sampling

The soil is continuously logged by a representative of this firm and classified by visual examination in accordance with the Unified Soil Classification system. The field classification is verified in the laboratory, also in accordance with the Unified Soil Classification System. Laboratory classification may include visual examination, Atterberg Limit Tests and grain size distribution. The final classification is shown on the boring logs.

Samples of the geologic materials encountered in the exploratory excavations were collected and transported to the laboratory. Undisturbed samples of soil are obtained at frequent intervals. Unless noted on the boring logs as an SPT sample, samples acquired while utilizing a hollow-stem auger drill rig are obtained by driving a thin-walled, California Modified Sampler with successive 30-inch drops of a 140-pound hammer. The soil is retained in brass rings of 2.50 inches outside diameter and 1.00 inch in height. The central portion of the samples are stored in close fitting, waterproof containers for transportation to the laboratory. Samples noted on the excavation logs as SPT samples are obtained in accordance with the most recent revision of ASTM D 1586. Samples are retained for 30 days after the date of the geotechnical report.

Moisture and Density Relationships

The field moisture content and dry unit weight are determined for each of the undisturbed soil samples, and the moisture content is determined for SPT samples by the most recent revision of ASTM D 4959 or ASTM D 4643. This information is useful in providing a gross picture of the soil consistency between exploration locations and any local variations. The dry unit weight is determined in pounds per cubic foot and shown on the "Boring Logs", A-Plates. The field moisture content is determined as a percentage of the dry unit weight.

Direct Shear Testing

Shear tests are performed by the most recent revision of ASTM D 3080 with a strain controlled, direct shear machine manufactured by Soil Test, Inc. or a Direct Shear Apparatus manufactured by GeoMatic, Inc. The rate of deformation is approximately 0.025 inches per minute. Each sample is sheared under varying confining pressures in order to determine the Mohr-Coulomb shear strength parameters of the cohesion intercept and the angle of internal friction. Samples are generally tested in an artificially saturated condition. Depending upon the sample location and future site conditions, samples may be tested at field moisture content. The shear strengths are plotted a shear diagram is drawn that considers the lowest failure envelope. The results are plotted on the "Shear Test Diagram," B-Plates.

The most recent revision of ASTM 3080 limits the particle size to 10 percent of the diameter of the direct shear test specimen. The sheared sample is inspected by the laboratory technician running the test. The inspection is performed by splitting the sample along the sheared plane and observing the soils exposed on both sides. Where oversize particles are observed in the shear plane, the results are discarded and the test run again with a fresh sample.

For remolded samples, the disturbed sample is returned to field moisture content and the desired density is determined from vertically adjacent samples. The appropriate weight of soil is then measured and added to the rings in several lifts, a hydraulic press is used as necessary to add soil to the rings. A total of three rings are made at a time. The soil samples are then wetted to saturation.

Shear test data for remolded and single direct shear results are peak values. For remolded samples the ultimate values are presented.

Remolded shear tests were performed on bag samples obtained during downhole logging of Boring B8. The samples represent the weakest clayey siltstone material observed any of the recently drilled borings. Three rings of each sample were remolded at field moisture content to the density of undisturbed samples taken above and below the bag sample. Each ring sample was sheared 5 times at a given normal stress. The other two remolded samples were sheared 5 times at higher normal stresses. Once saturated, one ring sample is sheared and realigned five times at a specific normal pressure at deformation of 0.025 inches per minute. The process is repeated for higher normal loads. The resheared samples represent a conservative estimate of the along bedding strength.

On the laboratory test plates, where a range of depth is shown (i.e. B1 @ 1-5’) the sample is a disturbed bag sample. Where a discrete depth is provided (i.e. B1 @ 10’) the sample was taken with the California-Modified sampler. The only exception occurs in Boring 8 where discrete depth bag samples were taken at depth of 38 feet and 64 feet. These samples were remolded and resheared and represent along-bedding strengths.

Saturated or field moisture conditions are indicted on the lower left corner of the shear plates. All shear testing was performed as an undisturbed sample unless indicated in the title of the plate located at the top of the page as resheared or remolded.

Consolidation Testing

Settlement predictions of the soil's behavior under load are made on the basis of the consolidation tests using the most recent revision of ASTM D 2435. The consolidation apparatus is designed to receive a single one-inch high ring. Loads are applied in several increments in a geometric progression, and the resulting deformations are recorded at selected time intervals. Porous stones are placed in contact with the top and bottom of each specimen to permit addition and release of pore fluid. Samples are generally tested at increased moisture content to determine the effects of water on the bearing soil. The normal pressure at which the water is added is noted on the drawing. Results are plotted on the "Consolidation Test," C-Plates.

Expansion Index Testing

The expansion tests performed on the remolded samples are in accordance with the Expansion Index testing procedures, as described in the most recent revision of ASTM D4829. The soil sample is compacted into a metal ring at a saturation degree of 50 percent. The ring sample is then placed in a consolidometer, under a vertical confining pressure of 1 lbf/square inch and inundated with distilled water. The deformation of the specimen is recorded for a period of 24 hour or until the rate of deformation becomes less than 0.0002 inches/hour, whichever occurs first. The expansion index, EI, is determined by dividing the difference between final and initial height of the ring sample by the initial height, and multiplied by 1,000. Results are presented on the D-Plates.

Laboratory Compaction Characteristics

The maximum dry unit weight and optimum moisture content of a soil are determined by use of the most recent revision of ASTM D 1557. A soil at a selected moisture content is placed in five layers into a mold of given dimensions, with each layer compacted by 25 blows of a 10 pound hammer dropped from a distance of 18 inches subjecting the soil to a total compactive effort of about 56,000 pounds per cubic foot. The resulting dry unit weight is determined. The procedure is repeated for a sufficient number of moisture contents to establish a relationship between the dry unit weight and the water content of the soil. The data when plotted represent a curvilinear relationship known as the compaction curve. The values of optimum moisture content and modified maximum dry unit weight are determined from the compaction curve. Results are presented on the D-Plates.

Sulfate Testing

Sulfate tests of the bedrock are presented on Plate D. Sulfate tests of the bedrock ranged from less than 0.1 percent to greater than 0.20%. It is the recommendation of this firm that Type IV cement be used for all concrete in contact with the geologic materials.

Grain Size Distribution

These tests cover the quantitative determination of the distribution of particle sizes in soils. Sieve analysis is used to determine the grain size distribution of the soil larger than the Number 200 sieve. The most recent revision of ASTM D 422 is used to determine particle sizes smaller than the Number 200 sieve. The grain size distributions are plotted on the E-Plates.

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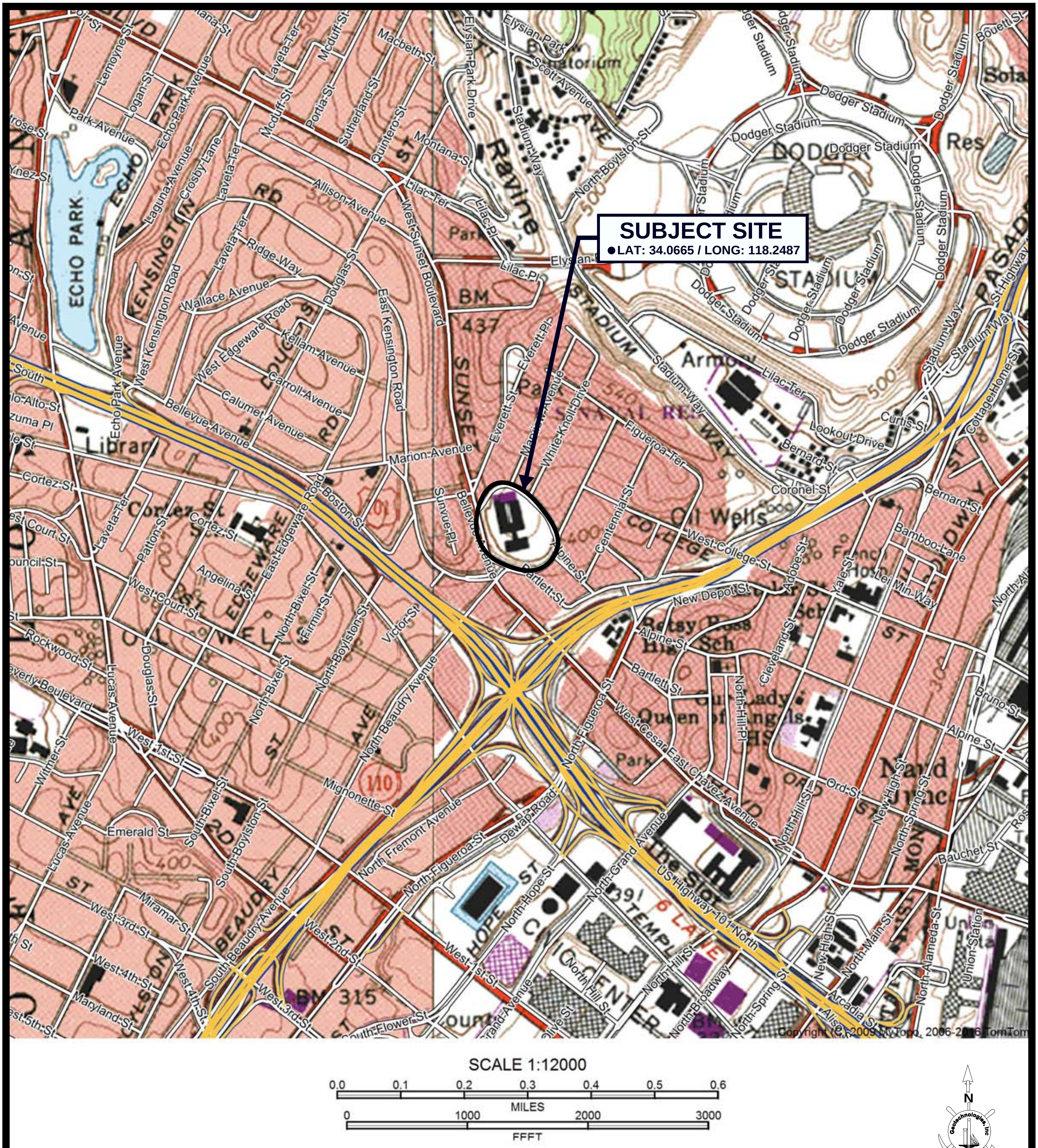

REFERENCE: U.S.G.S. TOPOGRAPHIC MAPS, 7.5 MINUTE SERIES,
LOS ANGELES, CA QUADRANGLE

VICINITY MAP

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Consulting Geotechnical Engineers

1111 SUNSET BLVD., LLC

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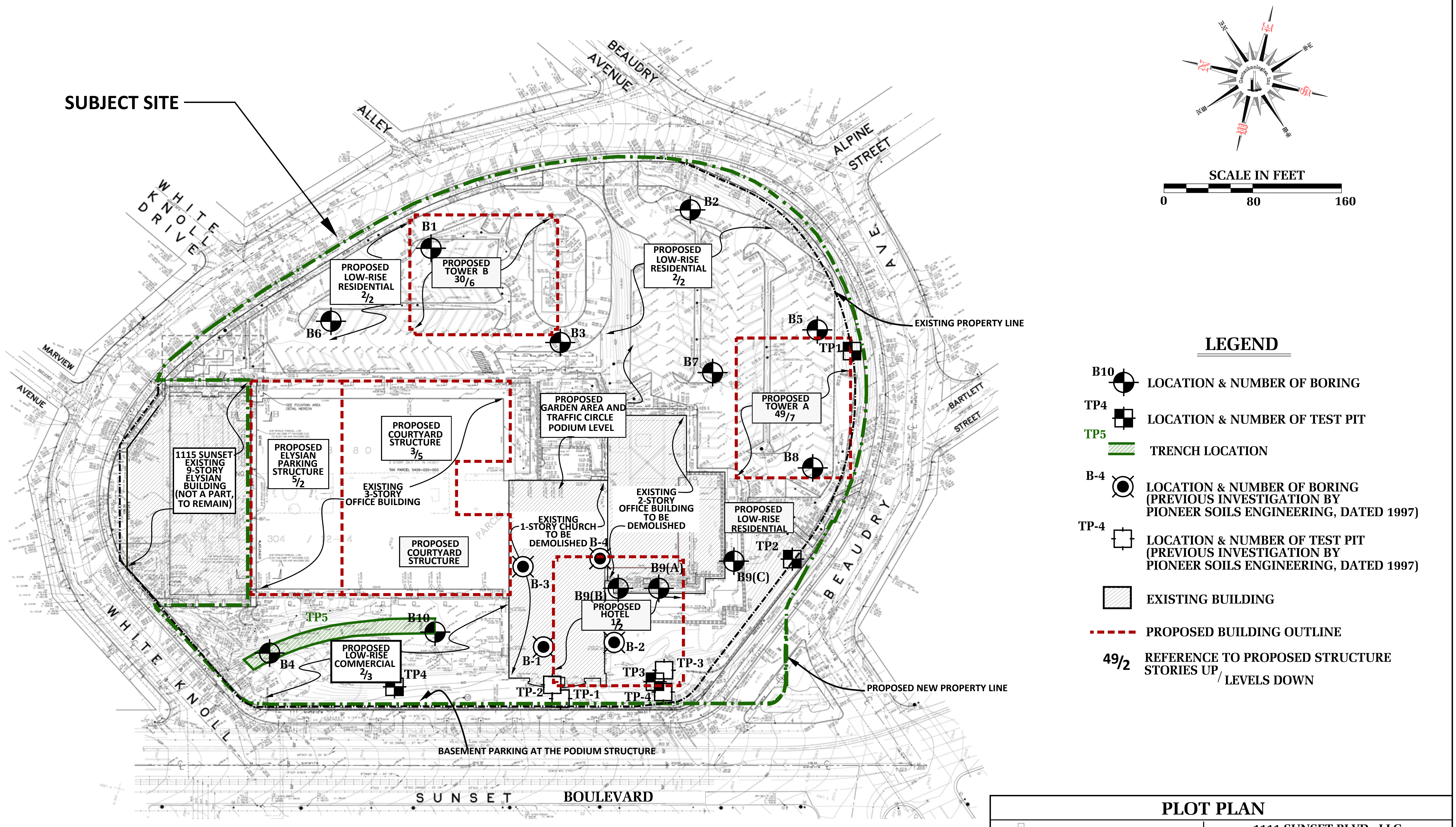

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PLOT PLAN

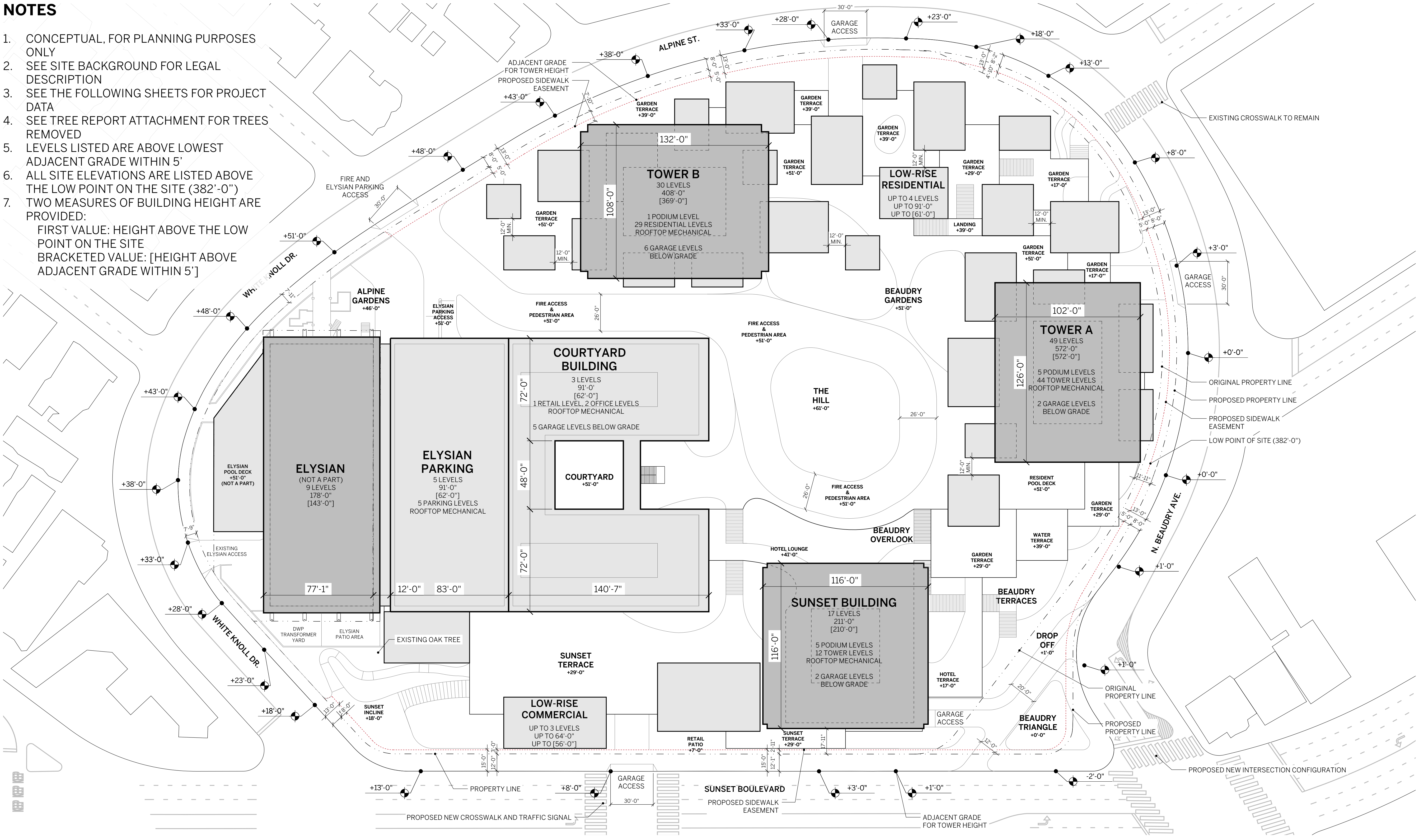
Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BLVD., LLC
1111 SUNSET BLVD., LOS ANGELES

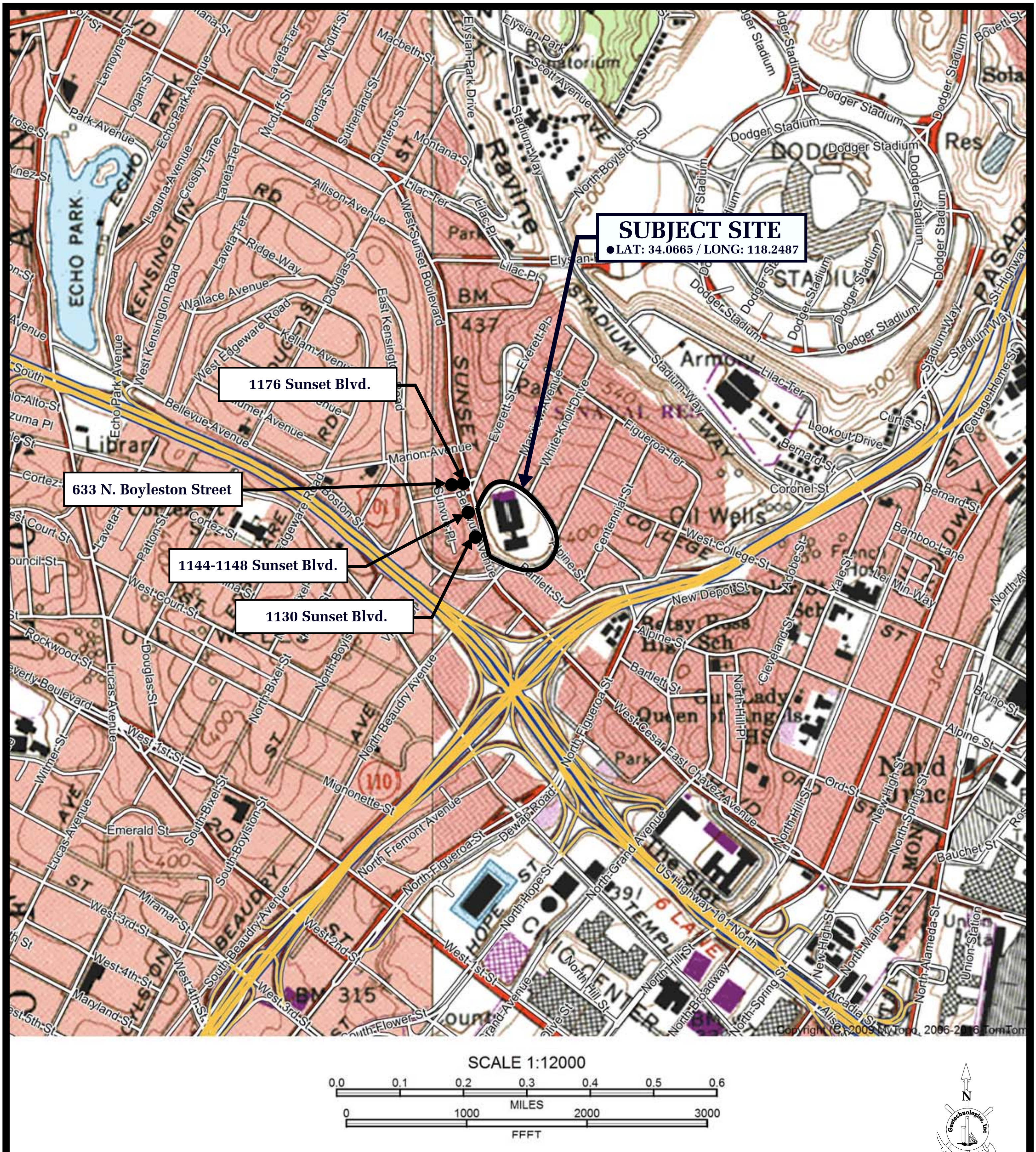
FILE No. 21155	DRAWN BY: TC
DATE: May 2018	

NOTES

1. CONCEPTUAL, FOR PLANNING PURPOSES ONLY
2. SEE SITE BACKGROUND FOR LEGAL DESCRIPTION
3. SEE THE FOLLOWING SHEETS FOR PROJECT DATA
4. SEE TREE REPORT ATTACHMENT FOR TREES REMOVED
5. LEVELS LISTED ARE ABOVE LOWEST ADJACENT GRADE WITHIN 5'
6. ALL SITE ELEVATIONS ARE LISTED ABOVE THE LOW POINT ON THE SITE (382'-0")
7. TWO MEASURES OF BUILDING HEIGHT ARE PROVIDED:
   FIRST VALUE: HEIGHT ABOVE THE LOW POINT ON THE SITE
   BRACKETED VALUE: [HEIGHT ABOVE ADJACENT GRADE WITHIN 5']



PLOT PLAN
1/64"=1'-0"



REFERENCE: U.S.G.S. TOPOGRAPHIC MAPS, 7.5 MINUTE SERIES,
LOS ANGELES, CA QUADRANGLE

LOCATION MAP OF OFFSITE GEOTECHNICAL INVESTIGATIONS BY OTHERS

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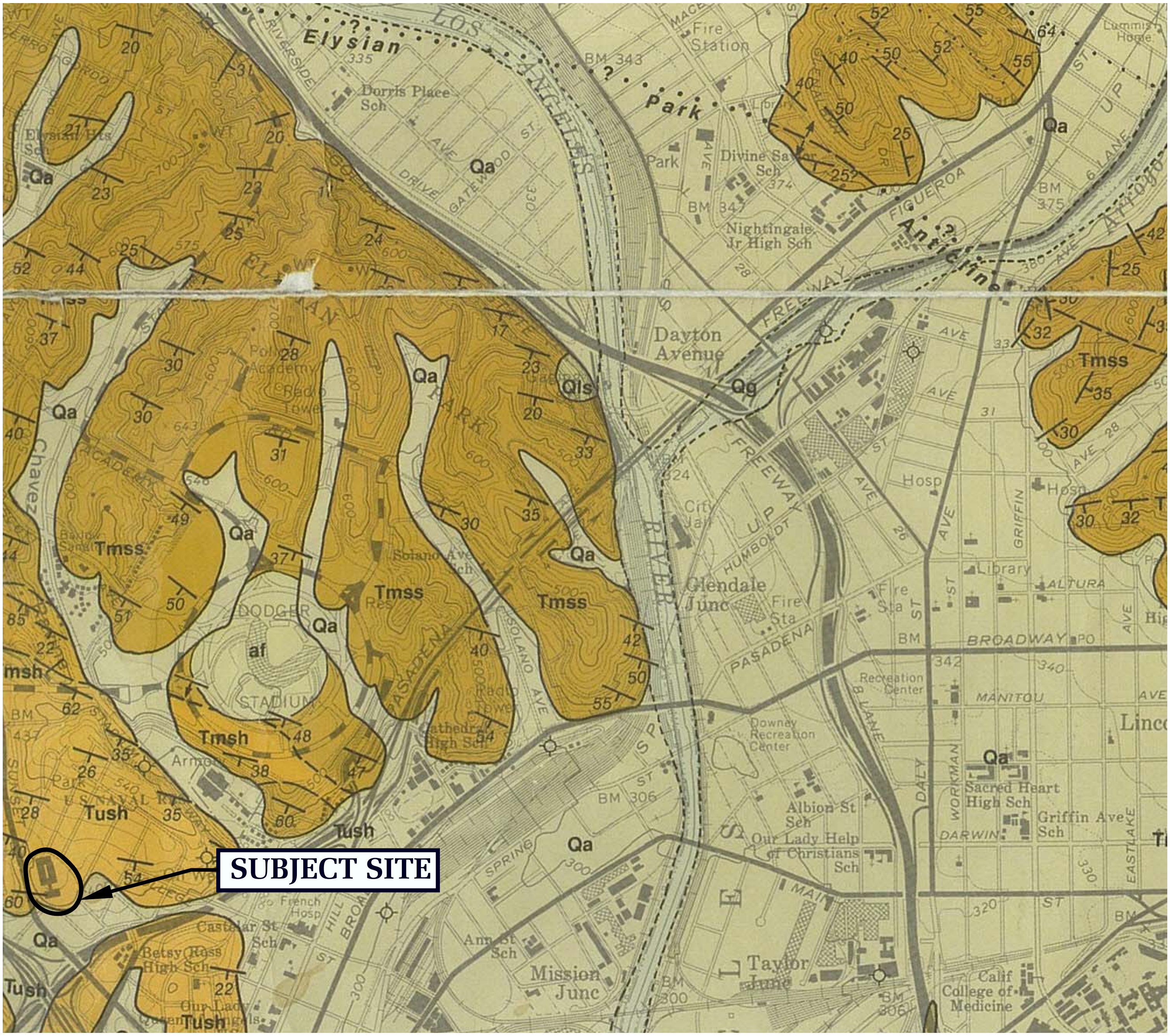
FILE NO. 21155



SCALE IN FEET
0 500 1000 2000

LEGEND

Qg: Surficial Sediments: stream channel deposits of gravel, sand and silt
Qa: Surficial Sediments: alluvium; unconsolidated floodplain deposits
Qls: Landslide Debris
Tush: Unnamed Shale: gray to light borwn, thin-bedded, silty clay shale
Tmsh: Monterey Formation: white-weathering, thin-bedded, platy, siliceous shale
Tmss: Monterey Formation: tan to light gray semi-friable arkosic sandstone

◄--+--- Folds - arrow on axial trace of fold indicates direction of plunge
—••••? Fault - dashed where indefinite or inferred, dotted where concealed, queried where existence is doubtful

REFERENCE: DIBBLEE, T.W., (1989) GEOLOGIC MAP OF THE LOS ANGELES QUADRANGLE (#DF-22)

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LOCAL GEOLOGIC MAP - DIBBLEE

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Consulting Geotechnical Engineers

1111 SUNSET BLVD.

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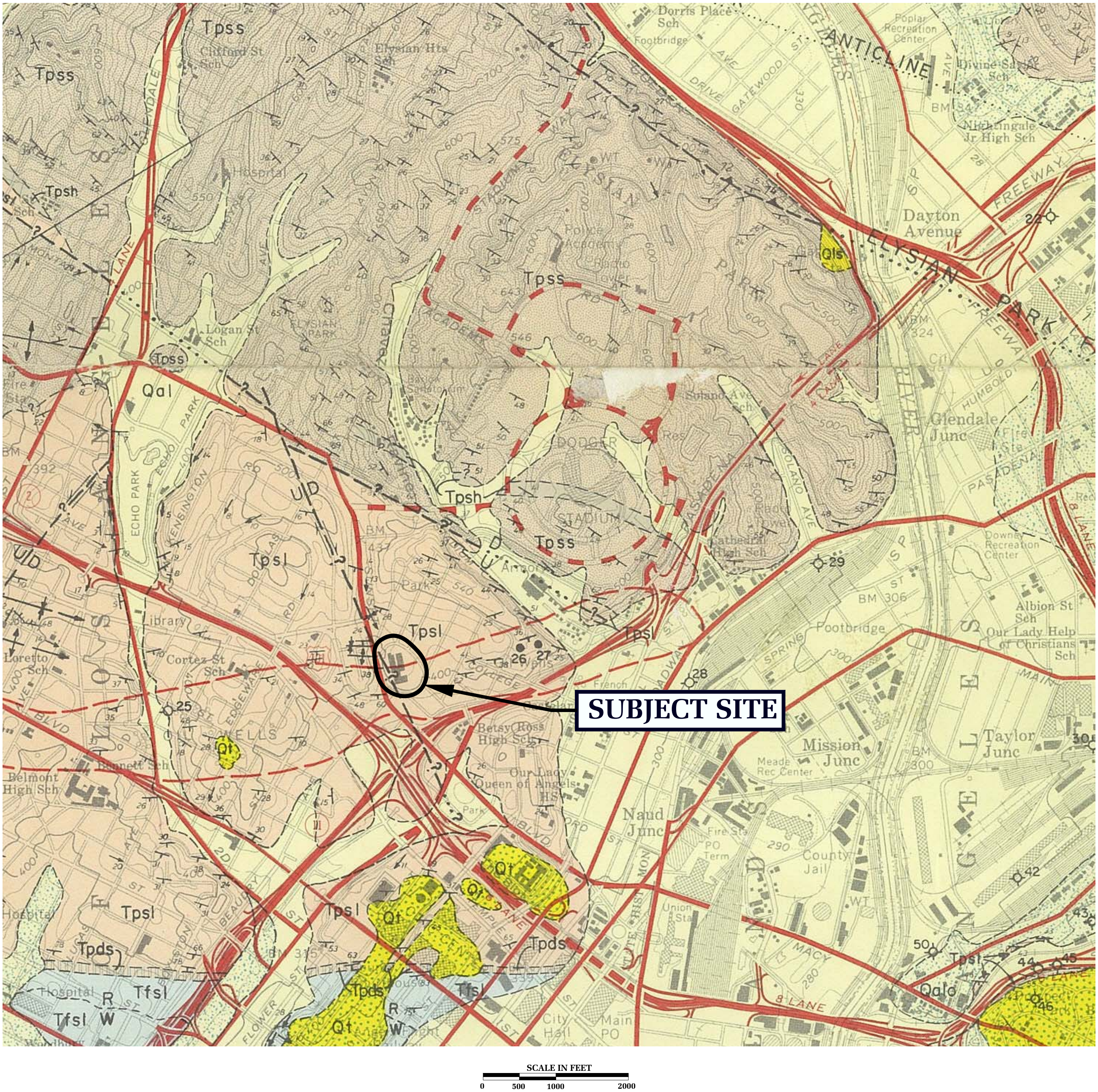

LEGEND

Qal: Alluvium: silt, sand & gravel

Tpsl: Puente Formation: Siltstone, well bedded, light brown and light gray

Tpsh: Puente Formation: Shale, well bedded, light gray, siliceous

Tpss: Puente Formation: Sandstone, well bedded, medium-course grained

◄--┼--- Folds - arrow on axial trace of fold indicates direction of plunge

—••••? Fault - dashed where indefinite or inferred, dotted where concealed, queried where existence is doubtful

REFERENCE: LAMAR, D.L., (1970) GEOLOGIC MAP OF THE ELYSIAN PARK - REPETTO HILLS AREA (SP 101)

LOCAL GEOLOGIC MAP - LAMAR

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BLVD.

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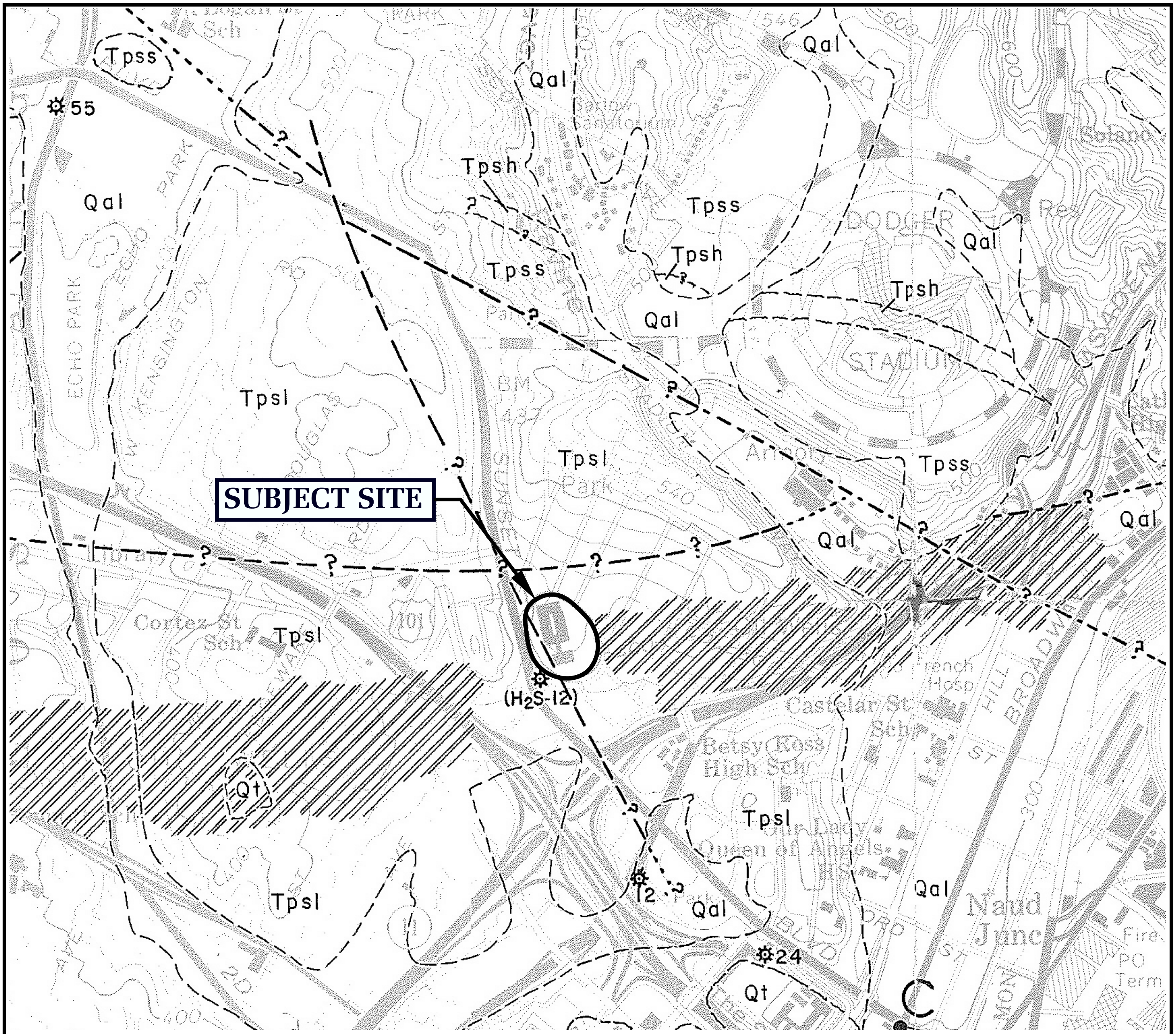

SCALE IN MILES

0 1/2 1 MI

LEGEND

Qal	Surficial Deposits: Alluvium, silty to sandy gravel
Qt	Surficial Deposits: Terrace deposits, slightly consolidated gravel
Tpsl	Puente Formation: siltstone and very fine-grained sandstone
⚙	Boring or well penetrated shallow petroleum deposits (gas, free oil, or tar); number gives subsurface depth
———----?--	Long dash, approx. located; short dash, location inferred; queried where doubtful
	Approximate boundary of exposed bedrock

REFERENCE: YERKES, TINSLEY, WILLIAMS, McMANUS; ASPECTS OF TUNNELING (DEPTH OF BEDROCK), 1977 (USGS MF-866, SHEET 2 OF 5)

LOCAL GEOLOGIC MAP - YERKES

Geotechnologies, Inc.
Consulting Geotechnical Engineers

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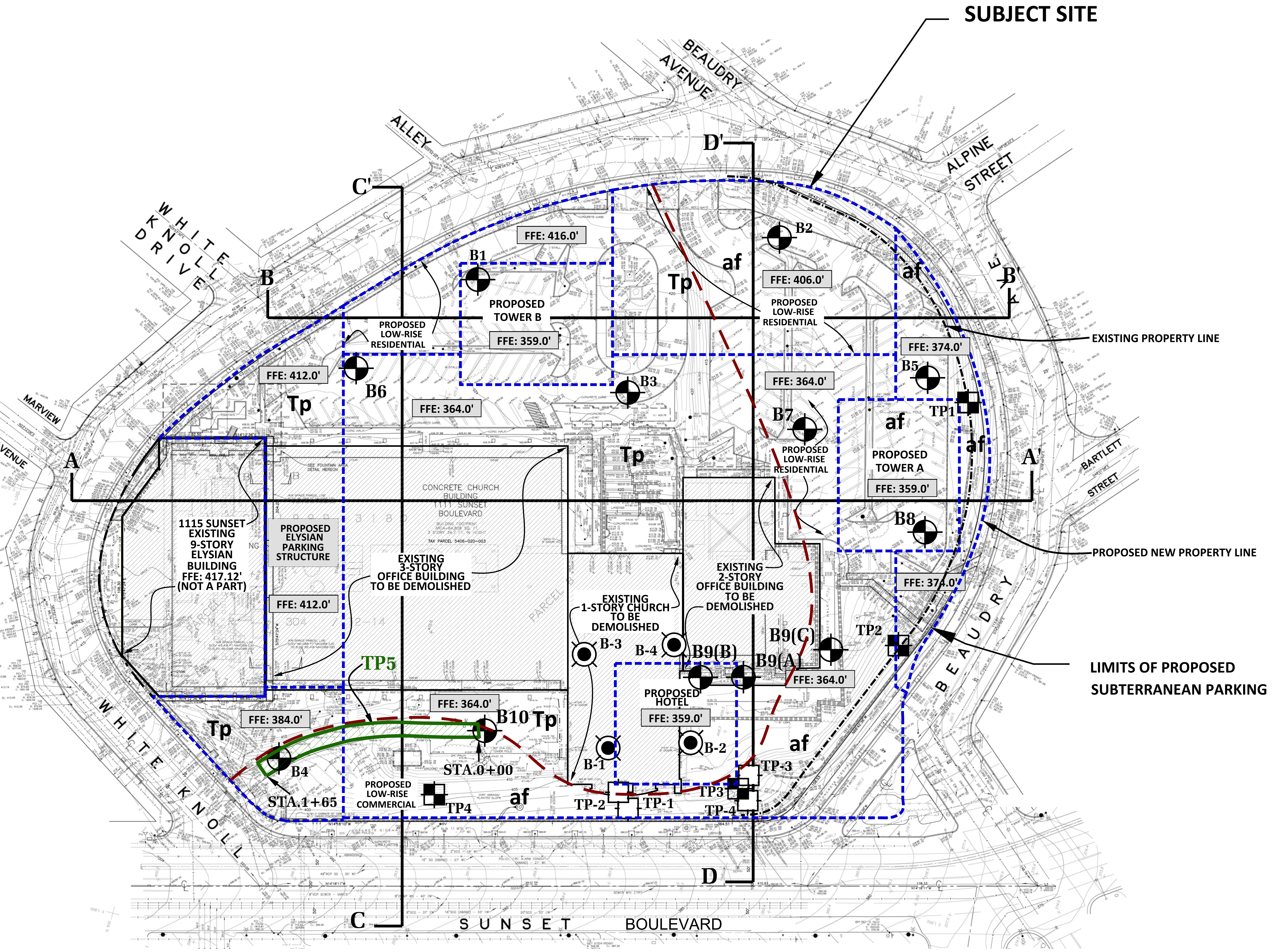
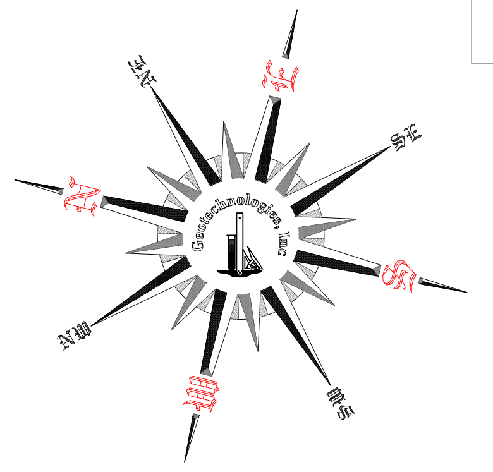
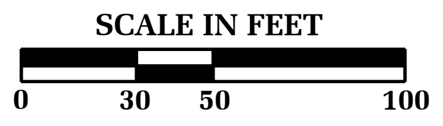


LEGEND

B10 ⊕	LOCATION & NUMBER OF BORING
TP5	TRENCH LOCATION
TP4	LOCATION & NUMBER OF TEST PIT
B-4	LOCATION & NUMBER OF BORING (PREVIOUS INVESTIGATION BY PIONEER SOILS ENGINEERING, DATED 1997)
TP-4	LOCATION & NUMBER OF TEST PIT (PREVIOUS INVESTIGATION BY PIONEER SOILS ENGINEERING, DATED 1997)
▨	EXISTING BUILDING
	GEOLOGIC CONTACT
	BOUNDARY LINES OF BASEMENT ELEVATIONS
D D'	CROSS-SECTION LOCATION
af	ARTIFICIAL FILL
Qcol	COLLUVIUM
Qoal	OLD ALLUVIUM
Tp	BEDROCK (PUENTE FORMATION): WELL BEDDED SILTSTONE & SANDSTONE
@ 26' ▼	SEEPAGE AND DEPTH
31	BEDDING STRIKE & DIP
88	FRACTURE STRIKE & DIP





EXCAVATION BY GEOTECHNOLOGIES, INC.

B1
GS 422.5'
0-1' af
1-50' Tp
@ 5' 58
@ 8' 35
@ 11' 34
@ 16' 35
@ 19' 37
@ 22' 35
@ 29' ▼
@ 29' 36
@ 37' 36
@ 43' 35
@ 46' ▽
TD 50'

B2
GS 411.5'
0-10.5' af
10.5-67.5' Tp
@ 11.5' 58
@ 19' 54
@ 35' ▽
@ 60' ▽
TD 67.5'

B3
GS 424'
0-1' af
1-68' Tp
@ 3' 65
@ 8' 47
@ 9' 55
@ 15' 48
@ 21' 31
@ 25' 31
@ 30' 47
@ 31' 68
@ 36' 54
@ 39' ▽
@ 40' 49
@ 49' 49
@ 55' 48
@ 55' 88
@ 57' 58
@ 62' ▽
TD 68'

B4
GS 400.5'
0-5' af
5-35' Tp
@ 6' 53
@ 12' 40
@ 14' 39
@ 16' ▽
TD 35'

B5
GS 406.5'
0-8' af
8-9' Qcol
9-70' Tp
@ 42.5' 67
TD 70'
NW

B6
GS 426.7'
0-3' af
3-80' Tp
@ 3' 32
@ 12' 33
@ 15' 33
@ 19' 30
@ 23' 34
@ 29' 31
@ 32' 32
@ 34' 33
@ 34' ▼
@ 37' 34
@ 42' 31
@ 44' 31
TD 80'

B7
GS 412.5'
0-5' af
5-69' Tp
@ 5' 60
@ 11' 61
@ 16' 58
@ 22' 52
@ 27' 55
@ 32' 48
@ 37' 50
@ 40' 51
@ 43' 53
@ 47' 54
@ 50' 52
@ 57' 65
@ 62' 67
TD 69' NW

B8
GS 409.0'
0-16' af
16-70' Tp
@ 13' 45
@ 14' 58
@ 22' 54
@ 27' 50
@ 34' 60
@ 38' 58
@ 39' 59
@ 45' 62
@ 46' 60
@ 60' 72
@ 64' 59
TD 70'
NW

B9A
GS at grade
0-2' af
TD 2'
NW

B9B
GS at grade
0-2' af
TD 2'
NW

B9C
GS at grade
0-9.5' af
TD 9.5'
NW

B10
GS 413.8'
0-5' af
5-70' Tp
@ 5' 37
@ 10' 38
@ 16' 38
@ 20' 39
@ 26' 40
@ 30' 40
@ 35' 41
@ 38' ▽
@ 40' 42
@ 50' 44
@ 55' 48
@ 60' 43
TD 70'

TP1
GS 393'
0-5' af
5-10' Qcol
10-14' Qoal
TD 14'
NW

TP2
GS 398'
0-1.5' af
1.5-8' Tp
@ 2.5' 75
@ 5' 78
TD 8'
NW

TP3
GS 395'
0-5' af
5-9' Tp
@ 7' 62
TD 9'
NW

TP4
GS 406'
0-10' af
10-15' Qcol
15-22' Tp
@ 19' 25
@ 21' 27
TD 22'
NW

TP5
0-8+' af
2-6' Qcol
2-8+ Tp
@ 4' 42
@ 6.5' 37
@ 6' 39
@ 5' 38
@ 5' 38
@ 4' 29
@ 4' 33
@ 6' 32
@ 4.5' 31
@ 5' 31
@ 5.5' 33
@ 4' 30
@ 4.5' 40
@ 6' 45
@ 5' 45
@ 5.5' 52
@ 7' 78
@ 7' 70
@ 4' 64
@ 3' 70
TD 8' NW

EXCAVATION BY PIONEER SOILS ENGINEERING

B-1
GS 408.5'
0-6' af
6-8' Tp
TD 8'
NW

B-2
GS 406'
0-2.5' af
2.5-5' Tp
TD 5'
NW

B-3
GS ?
0-7' af
7-10' Tp
TD 10'
NW

B-4
GS ?
0-5.5' af
5.5-7' Tp
TD 7'
NW

TP-1
GS 397'
0-2' af
2-10' Qcol
10-12' Tp
TD 12'
NW

TP-2
GS 402'
0-3' af
3-10' Qcol
10-12.5' Tp
@ 10' 75
TD 11.5'
NW

TP-3
GS 396'
0-6.5' af
6.5-9' Tp
@ 7' 70
TD 9'
NW

TP-4
GS 395'
0-7' af
7-8.5' Tp
@ 8' 65
TD 8.5'
NW

GS: GROUND SURFACE ELEVATION (FEET)
TD: TOTAL DEPTH
NW: NO WATER

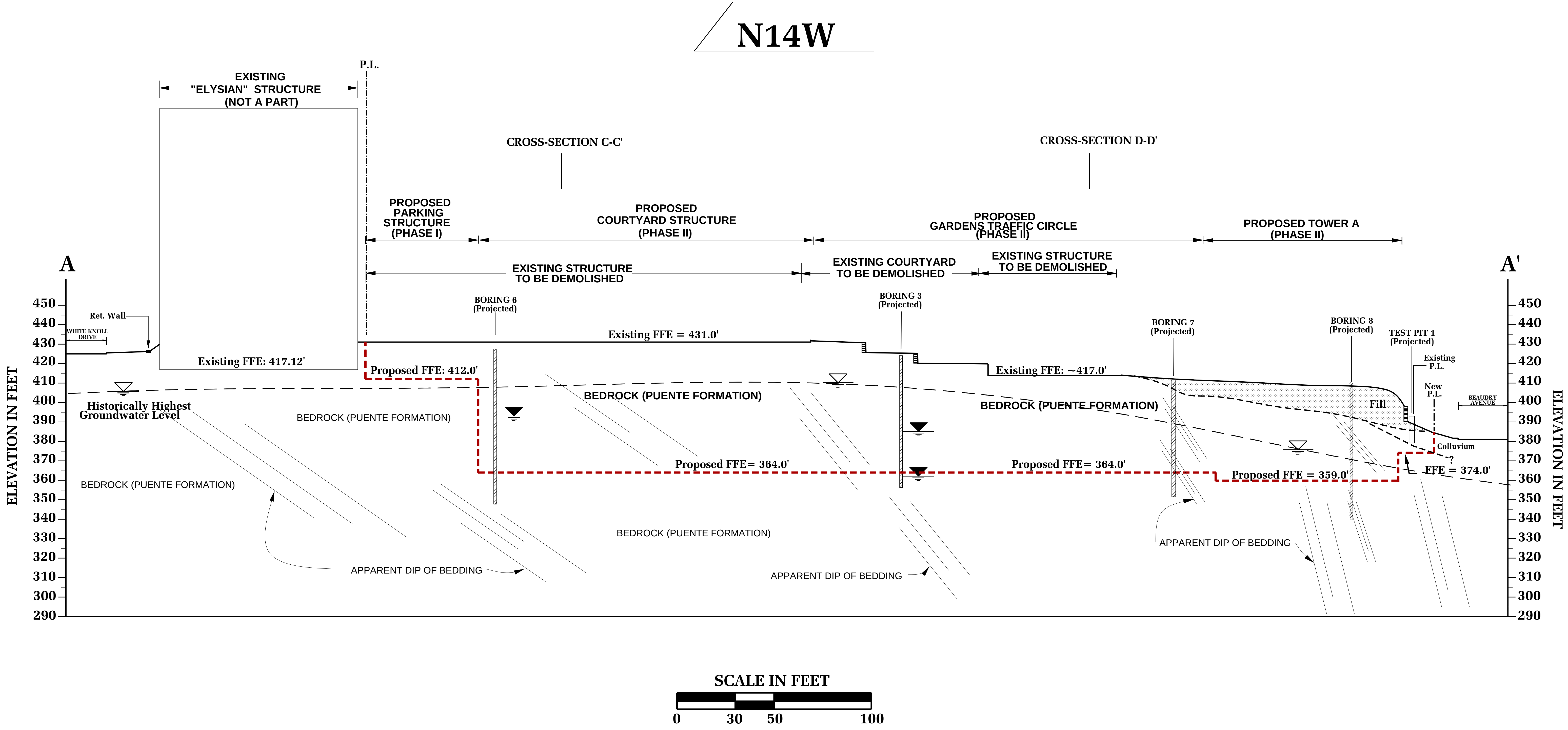
REFERENCES:
ALTA/ARCHITECTURAL DESIGN SURVEY BY HENNON SURVEYING & MAPPING, INC., DATED FEBRUARY 12, 2016;
EXCAVATION EXHIBIT EX-1 PREPARED BY KPFF, DATED NOVEMBER 1, 2017

GEOLOGIC MAP

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BLVD., LLC
1111 SUNSET BLVD., LOS ANGELES

FILE No. 21155
DRAWN BY: TC
DATE: MAY 2018



CROSS-SECTION A-A'

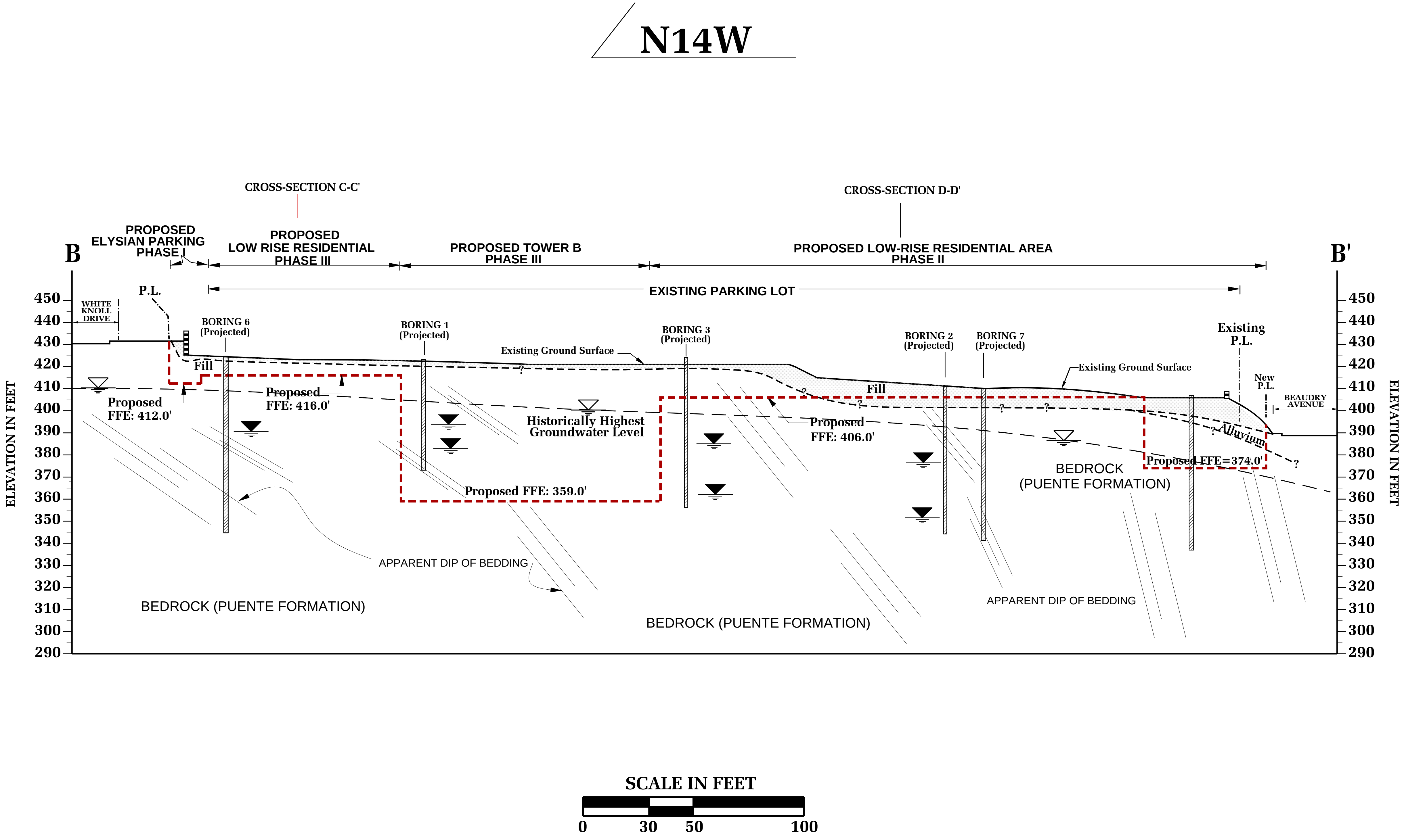
Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BLVD., LLC
1111 SUNSET BLVD., LOS ANGELES

FILE No. 21155	DRAWN BY: TC
DATE: May 2018	

REFERENCES: EXCAVATION EXHIBIT EX-1 PREPARED BY KPFF
DATED NOVEMBER 1, 2017

ALTA/ARCHITECTURAL DESIGN SURVEY BY HENNON SURVEYING & MAPPING, INC.
DATED FEBRUARY 12, 2016



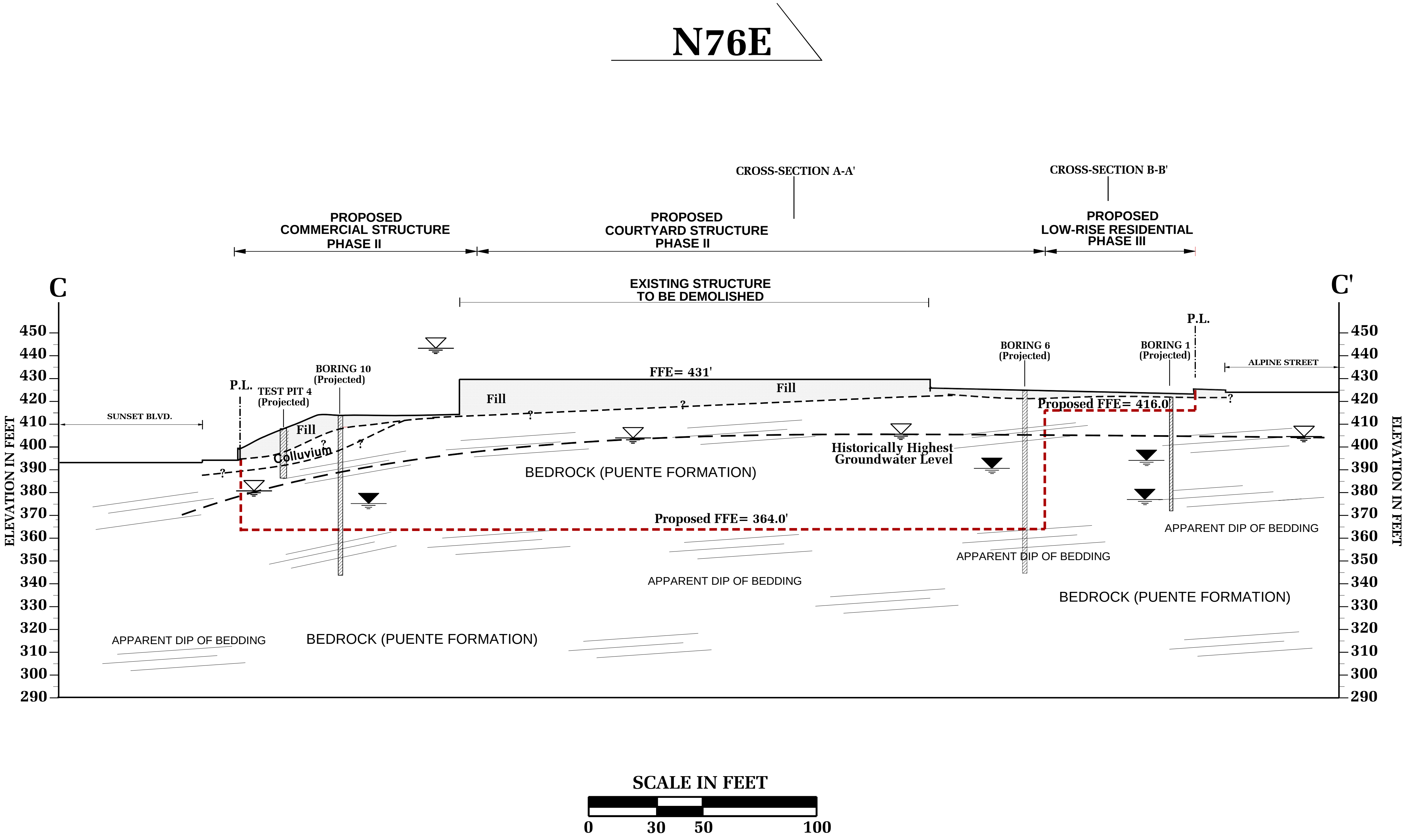
CROSS-SECTION B-B'

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BLVD., LLC
1111 SUNSET BLVD., LOS ANGELES

FILE No. 21155	DRAWN BY: TC
DATE: April 2018	

REFERENCES:
EXCAVATION EXHIBIT EX-1 PREPARED BY KPFF, DATED NOVEMBER 1, 2017
ALTA/ARCHITECTURAL DESIGN SURVEY BY HENNON SURVEYING & MAPPING, INC., DATED FEBRUARY 12, 2016.



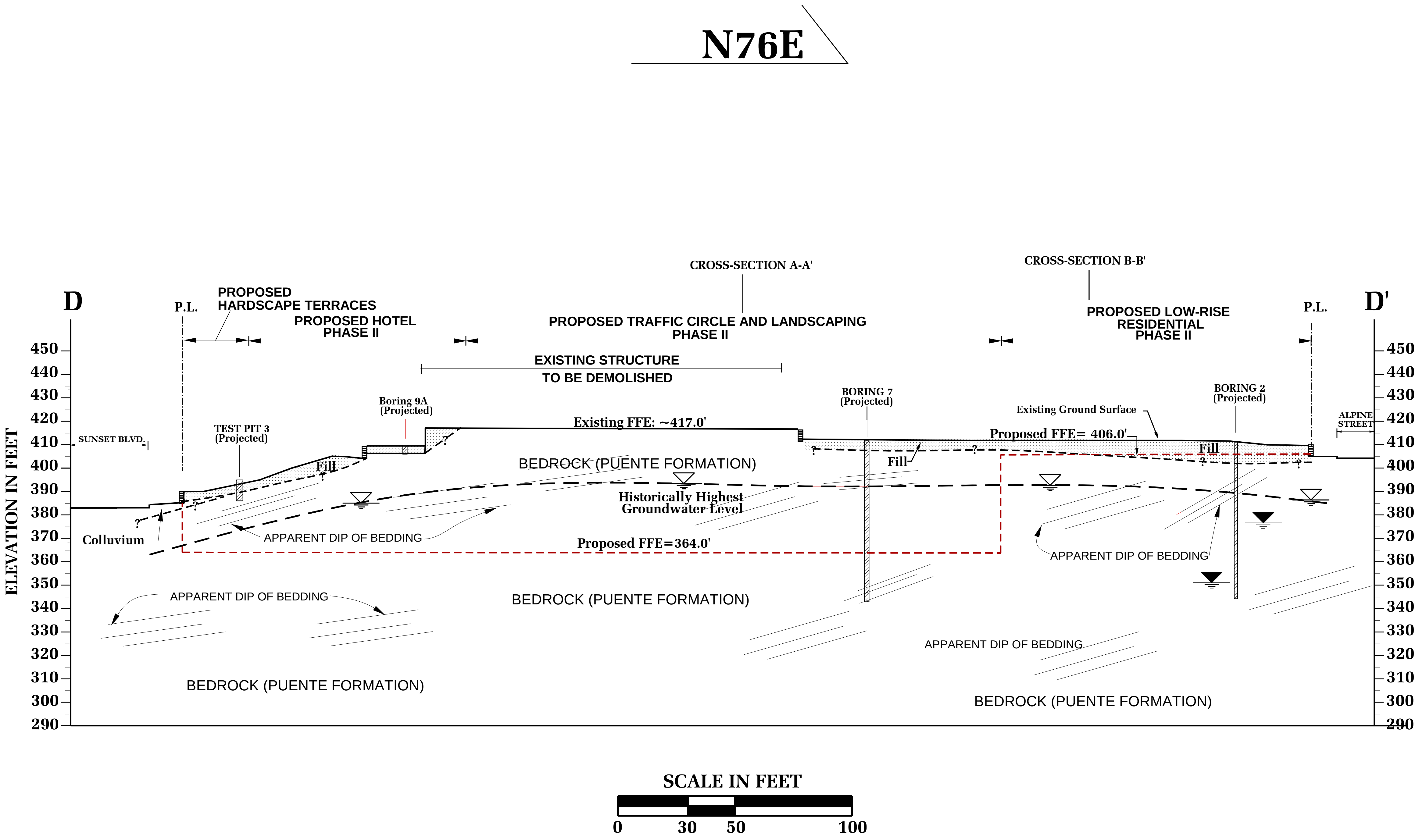
REFERENCES:
EXCAVATION EXHIBIT EX-1 PREPARED BY KPFF, DATED NOVEMBER 1, 2017;
ALTA/ARCHITECTURAL DESIGN SURVEY BY HENNON SURVEYING & MAPPING, INC., DATED FEBRUARY 12, 2016.

CROSS-SECTION C-C'

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BLVD., LLC
1111 SUNSET BLVD., LOS ANGELES

FILE No. 21155	**DRAWN BY: TC**
DATE: MAY 2018	



REFERENCES:
EXCAVATION EXHIBIT EX-1 PREPARED BY KPFF, DATED NOVEMBER 1, 2017;
ALTA/ARCHITECTURAL DESIGN SURVEY BY HENNON SURVEYING & MAPPING, INC., DATED FEBRUARY 12, 2016.

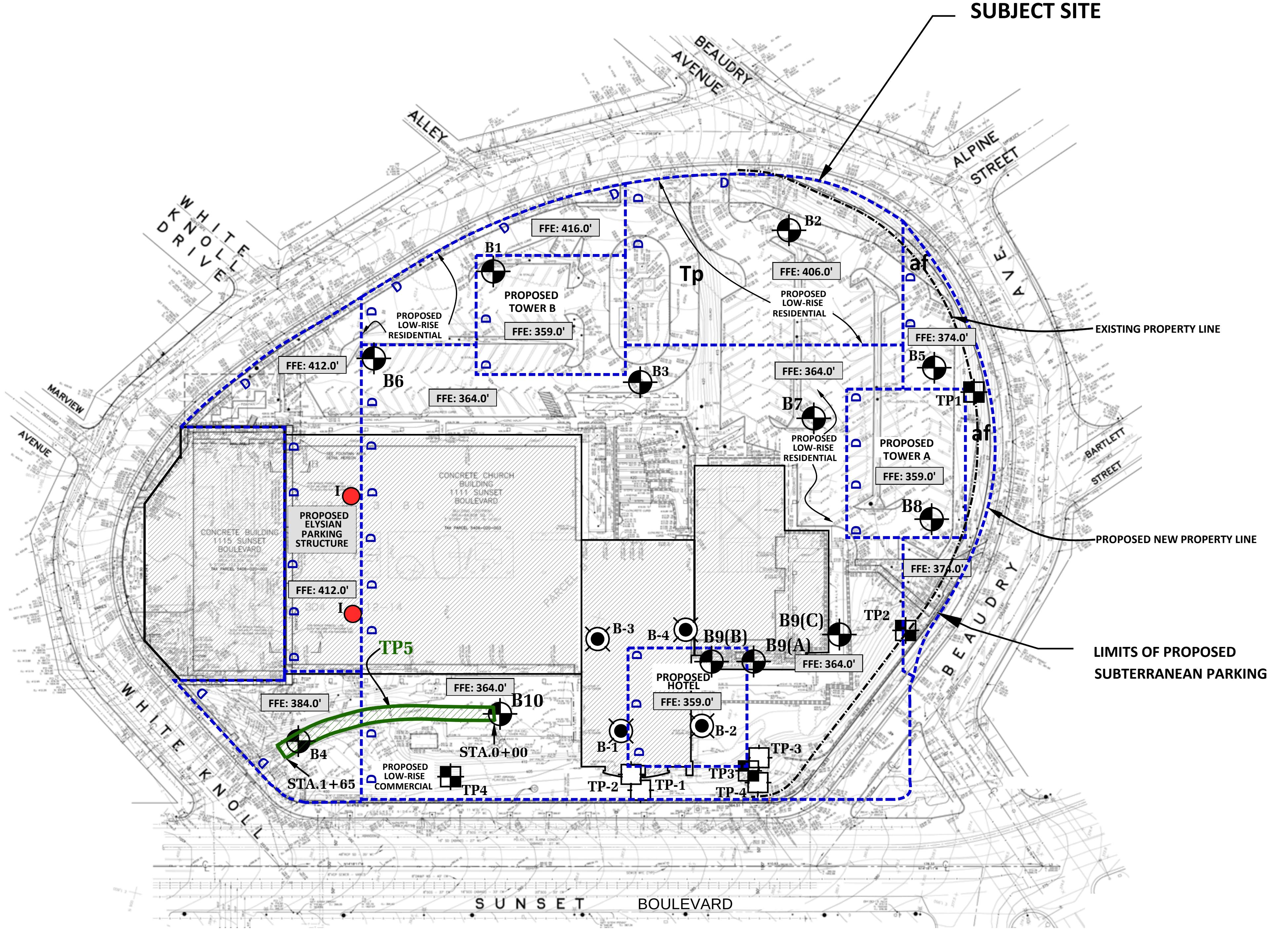
CROSS-SECTION D-D'

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BLVD., LLC
1111 SUNSET BLVD., LOS ANGELES

FILE No. 21155 | **DRAWN BY: TC**

DATE: May 2018



EXCAVATION BY GEOTECHNOLOGIES, INC.

B1
GS 422.5'
0-1' af
1-50' Tp
@ 5' 58
@ 8' 35
@ 11' 34
@ 16' 35
@ 19' 37
@ 22' 35
@ 29' ▼
@ 29' 36
@ 37' 36
@ 43' 35
@ 46' ▼
TD 50'

B2
GS 411.5'
0-10.5' af
10.5-67.5' Tp
@ 11.5' 58
@ 19' 54
@ 35' ▼
@ 60' ▼
TD 67.5'

B3
GS 424'
0-1' af
1-68' Tp
@ 3' 65
@ 8' 47
@ 9' 55
@ 15' 48
@ 21' 31
@ 25' 31
@ 30' 47
@ 31' 68
@ 36' 54
@ 39' ▼
@ 40' 49
@ 49' 49
@ 55' 48
@ 55' 88
@ 57' 58
@ 62' ▼
TD 68'

B4
GS 400.5'
0-5' af
5-35' Tp
@ 6' 53
@ 12' 40
@ 14' 39
@ 16' ▼
TD 35'

B5
GS 406.5'
0-8' af
8-9' Qcol
9-70' Tp
@ 42.5' 67
TD 70'
NW

B6
GS 426.7'
0-3' af
3-80' Tp
@ 3' 32
@ 12' 33
@ 15' 33
@ 19' 30
@ 23' 34
@ 29' 31
@ 32' 32
@ 34' 33
@ 34' ▼
@ 37' 34
@ 42' 31
@ 44' 31
TD 80'

B7
GS 412.5'
0-5' af
5-69' Tp
@ 5' 60
@ 11' 61
@ 16' 58
@ 22' 52
@ 27' 55
@ 32' 48
@ 37' 50
@ 40' 51
@ 43' 53
@ 47' 54
@ 50' 52
@ 57' 65
@ 62' 67
TD 69' NW

B8
GS 409.0'
0-16' af
16-70' Tp
@ 13' 45
@ 14' 58
@ 22' 54
@ 27' 50
@ 34' 60
@ 38' 58
@ 39' 59
@ 45' 62
@ 46' 60
@ 60' 72
@ 64' 59
TD 70'
NW

B9A
GS at grade
0-2' af
TD 2'
NW

B9B
GS at grade
0-2' af
TD 2'
NW

B9C
GS at grade
0-9.5' af
TD 9.5'
NW

B10
GS 413.8'
0-5' af
5-70' Tp
@ 5' 37
@ 10' 38
@ 16' 38
@ 20' 39
@ 26' 40
@ 30' 40
@ 35' 41
@ 38' ▼
@ 40' 42
@ 50' 44
@ 55' 48
@ 60' 43
TD 70'

TP1
GS 393'
0-5' af
5-10' Qcol
10-14' Qoal
TD 14'
NW

TP2
GS 398'
0-1.5' af
1.5-8' Tp
@ 2.5' 75
@ 5' 78
TD 8'
NW

TP3
GS 395'
0-5' af
5-9' Tp
@ 7' 62
TD 9'
NW

TP4
GS 406'
0-10' af
10-15' Qcol
15-22' Tp
@ 19' 25
@ 21' 27
TD 22'
NW

TP5
0-8+' af
2-6' Qcol
2-8+ Tp
@ 4' 42
@ 6.5' 37
@ 6' 39
@ 5' 38
@ 5' 38
@ 4' 29
@ 4' 33
@ 6' 32
@ 4.5' 31
@ 5' 31
@ 5.5' 33
@ 4' 30
@ 4.5' 40
@ 6' 45
@ 5' 45
@ 5.5' 52
@ 7' 78
@ 7' 70
@ 4' 64
@ 3' 70
NW

EXCAVATION BY PIONEER SOILS ENGINEERING

B-1
GS 408.5'
0-6' af
6-8' Tp
TD 8'
NW

B-2
GS 406'
0-2.5' af
2.5-5' Tp
TD 5'
NW

B-3
GS ?
0-7' af
7-10' Tp
TD 10'
NW

B-4
GS ?
0-5.5' af
5.5-7' Tp
TD 7'
NW

TP-1
GS 397'
0-2' af
2-10' Qcol
10-12' Tp
TD 12'
NW

TP-2
GS 402'
0-3' af
3-10' Qcol
10-12.5' Tp
@ 10' 75
TD 11.5'
NW

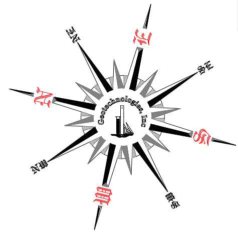
TP-3
GS 396'
0-6.5' af
6.5-9' Tp
@ 7' 70
TD 9'
NW

TP-4
GS 395'
0-7' af
7-8.5' Tp
@ 8' 65
TD 8.5'
NW

GS: GROUND SURFACE ELEVATION (FEET) TD: TOTAL DEPTH NW: NO WATER

LEGEND

B10 ⊕	LOCATION & NUMBER OF BORING
TP5	TRENCH LOCATION
TP4	LOCATION & NUMBER OF TEST PIT
B-4	LOCATION & NUMBER OF BORING (PREVIOUS INVESTIGATION BY PIONEER SOILS ENGINEERING, DATED 1997)
TP-4 ☐	LOCATION & NUMBER OF TEST PIT (PREVIOUS INVESTIGATION BY PIONEER SOILS ENGINEERING, DATED 1997)
▨	EXISTING BUILDING
I ●	LOCATION OF PROPOSED INCLINOMETER
	BOUNDARY LINES OF BASEMENT ELEVATIONS
D D D	PROPOSED CUT WITH DAYLIGHTED BEDDING
af	ARTIFICIAL FILL
Qcol	COLLUVIUM
Qoal	OLD ALLUVIUM
Tp	BEDROCK (PUENTE FORMATION): WELL BEDDED SILTSTONE & SANDSTONE
@ 26' ▼	SEEPAGE AND DEPTH
31	BEDDING STRIKE & DIP
88	FRACTURE STRIKE & DIP



SCALE IN FEET
0 30 50 100 150 200

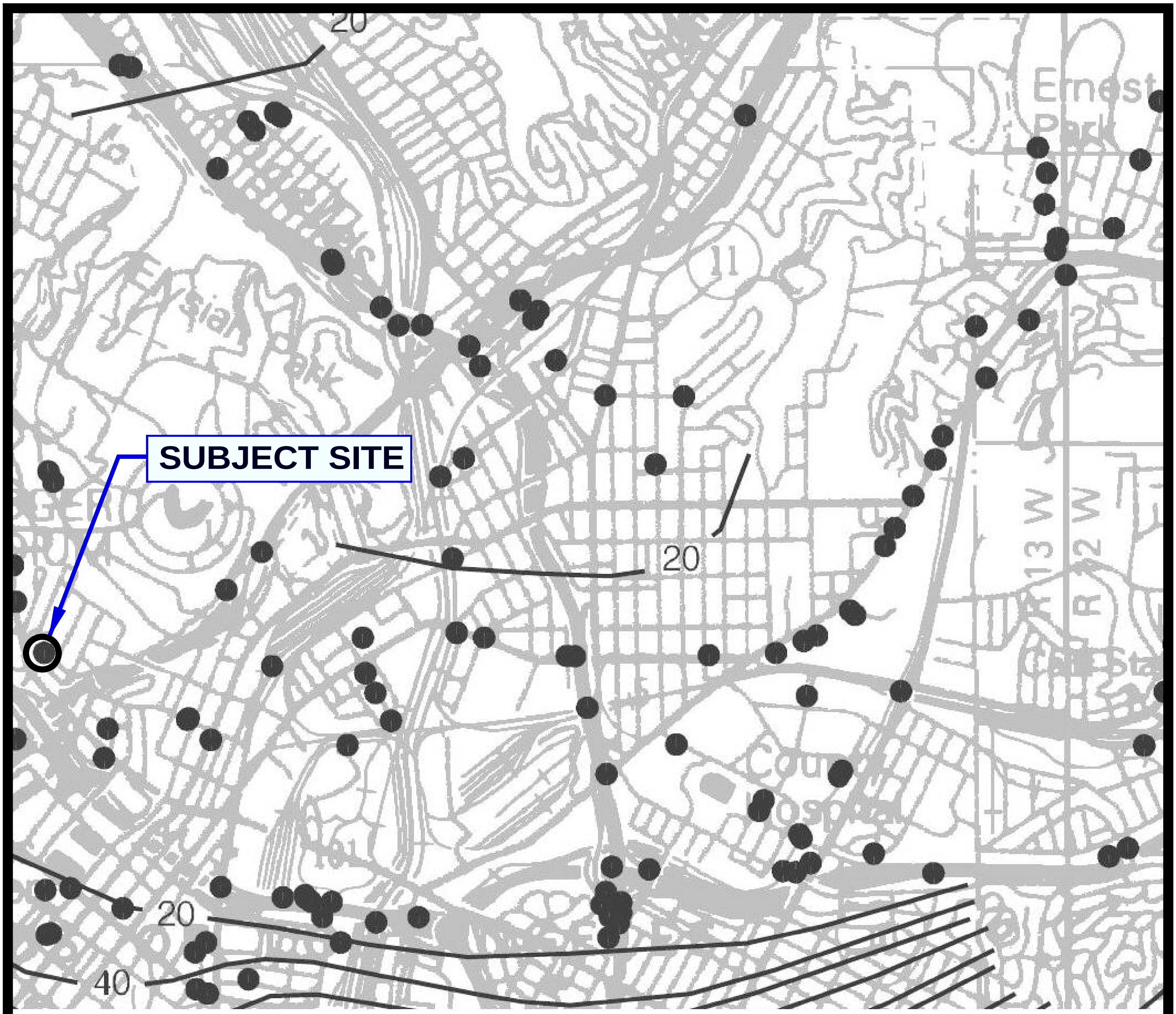
REFERENCES:
ALTA/ARCHITECTURAL DESIGN SURVEY BY HENNON SURVEYING & MAPPING, INC., DATED FEBRUARY 12, 2016;
EXCAVATION EXHIBIT EX-1 PREPARED BY KPFF, DATED NOVEMBER 1, 2017

PLAN SHOWING CUTS WITH DAYLIGHTED BEDDING

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BLVD., LLC
1111 SUNSET BLVD., LOS ANGELES

FILE No. 21155
DRAWN BY: TC
DATE: MAY 2018



20 Depth to groundwater in feet

REFERENCE: CDMG, SEISMIC HAZARD ZONE REPORT, 029
LOS ANGELES 7.5 - MINUTE QUADRANGLE, LOS ANGELES COUNTY, CALIFORNIA (1998, REVISED 2006)

HISTORICALLY HIGHEST GROUNDWATER LEVELS

Geotechnologies, Inc.
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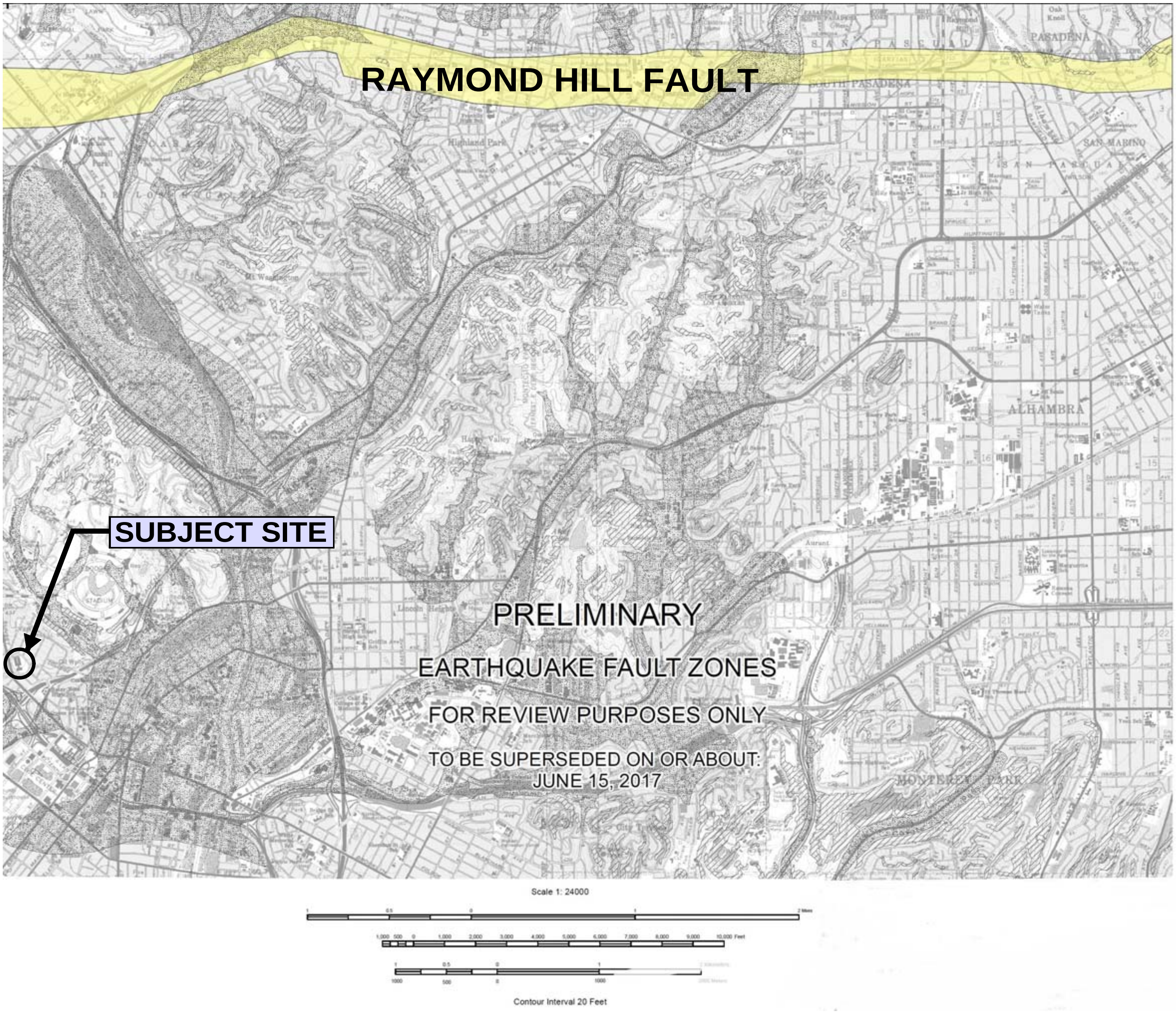
1111 SUNSET BLVD., LLC

FILE NO. 21155



○——○ **Alquist-Priolo Earthquake Fault Zone**

REFERENCE: EARTHQUAKE FAULT ZONES, LOS ANGELES QUADRANGLE,
CALIFORNIA GEOLOGICAL SURVEY, JUNE 2017

EARTHQUAKE FAULT ZONE

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Consulting Geotechnical Engineers

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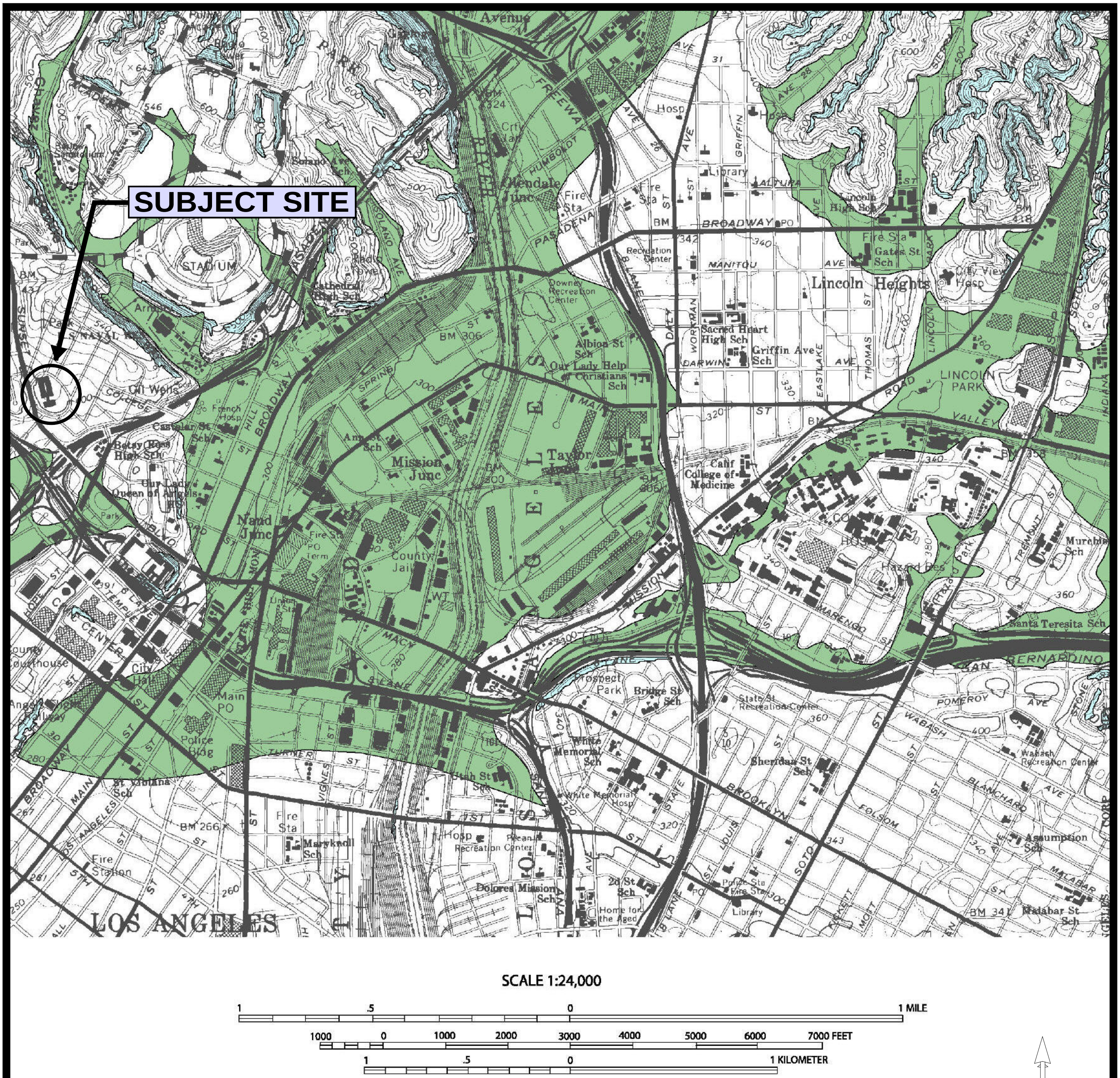
FILE NO. 21155



🟩 **LIQUEFACTION AREA**

REFERENCE: **SEISMIC HAZARD ZONES, LOS ANGELES QUADRANGLE OFFICIAL MAP (CDMG, 1999)**

SEISMIC HAZARD ZONE MAP

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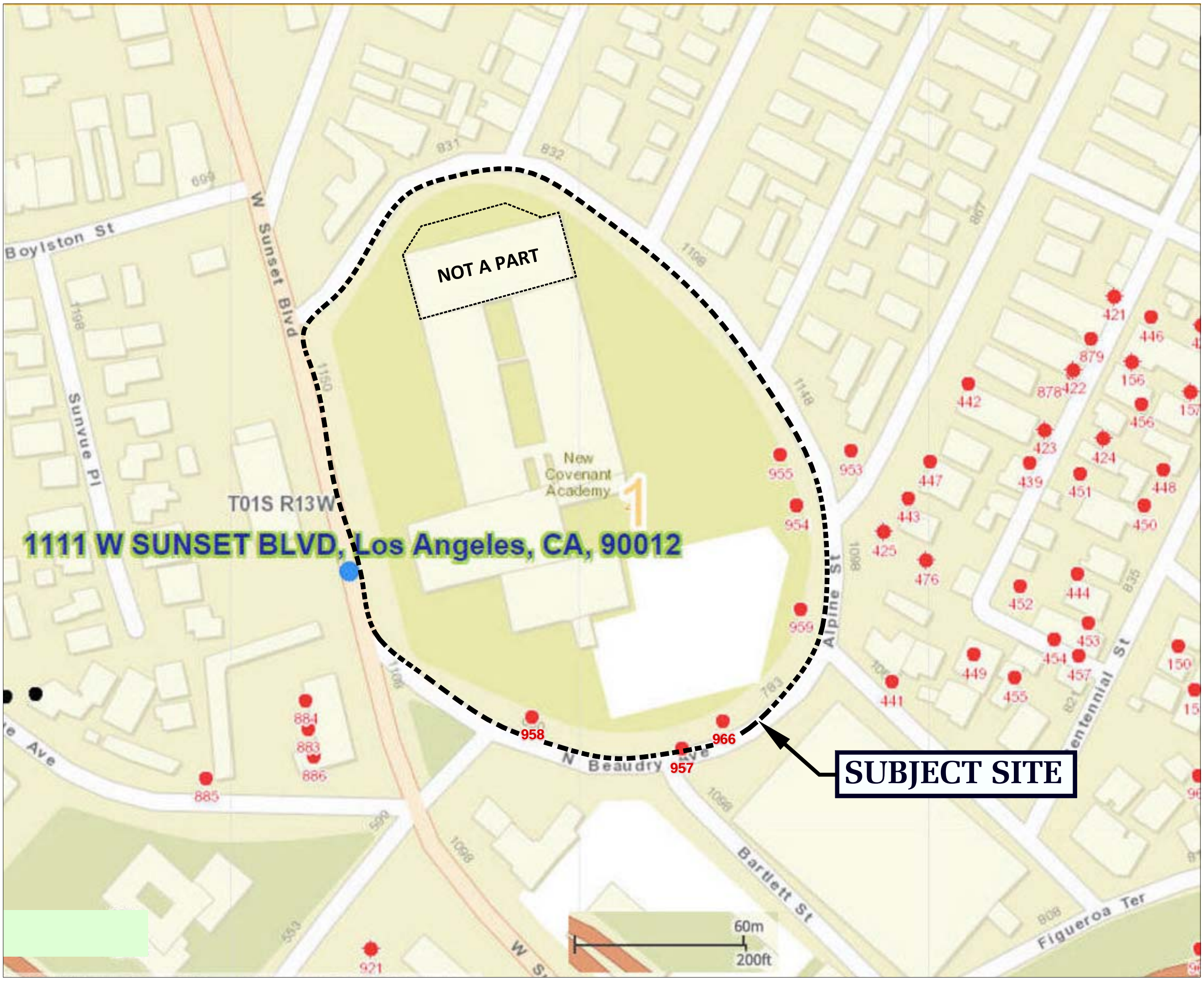
Consulting Geotechnical Engineers

1111 SUNSET BLVD., LLC

FILE NO. 21155



OIL WELL LEGEND

API NO.	OPERATOR, WELL NO.
958	Oceanic Oil Co., #7
957	Oceanic Oil Co., #6
956	Oceanic Oil Co., #5
959	Oceanic Oil Co., #4
954	Oceanic Oil Co., #3
955	Oceanic Oil Co., #2

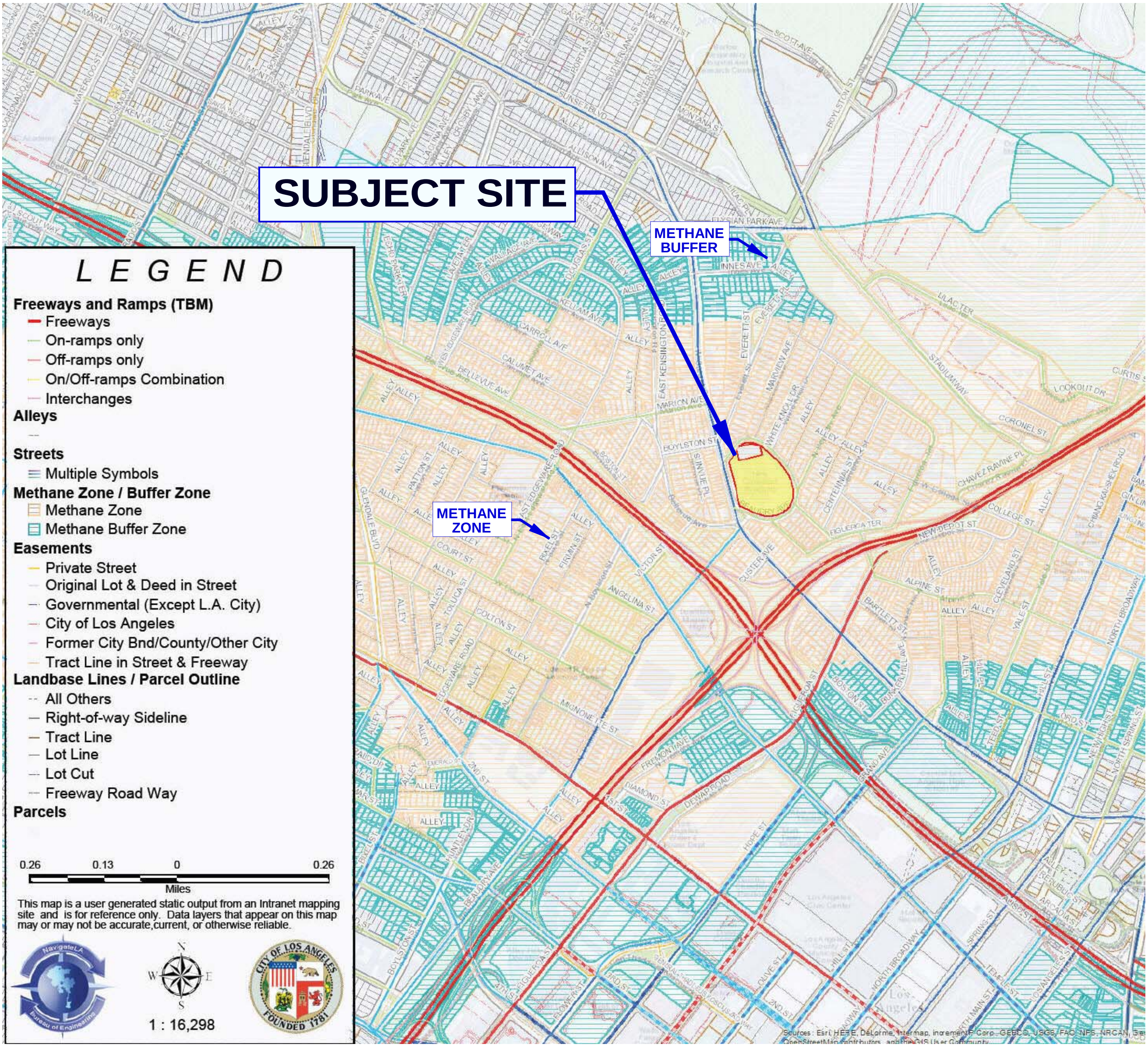
REFERENCE: DIVISION OF OIL, GAS & GEOTHERMAL RESOURCES WELL FINDER, STATE OF CALIFORNIA, 2014

OIL WELL LOCATION MAP

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BLVD.

FILE NO. 21155



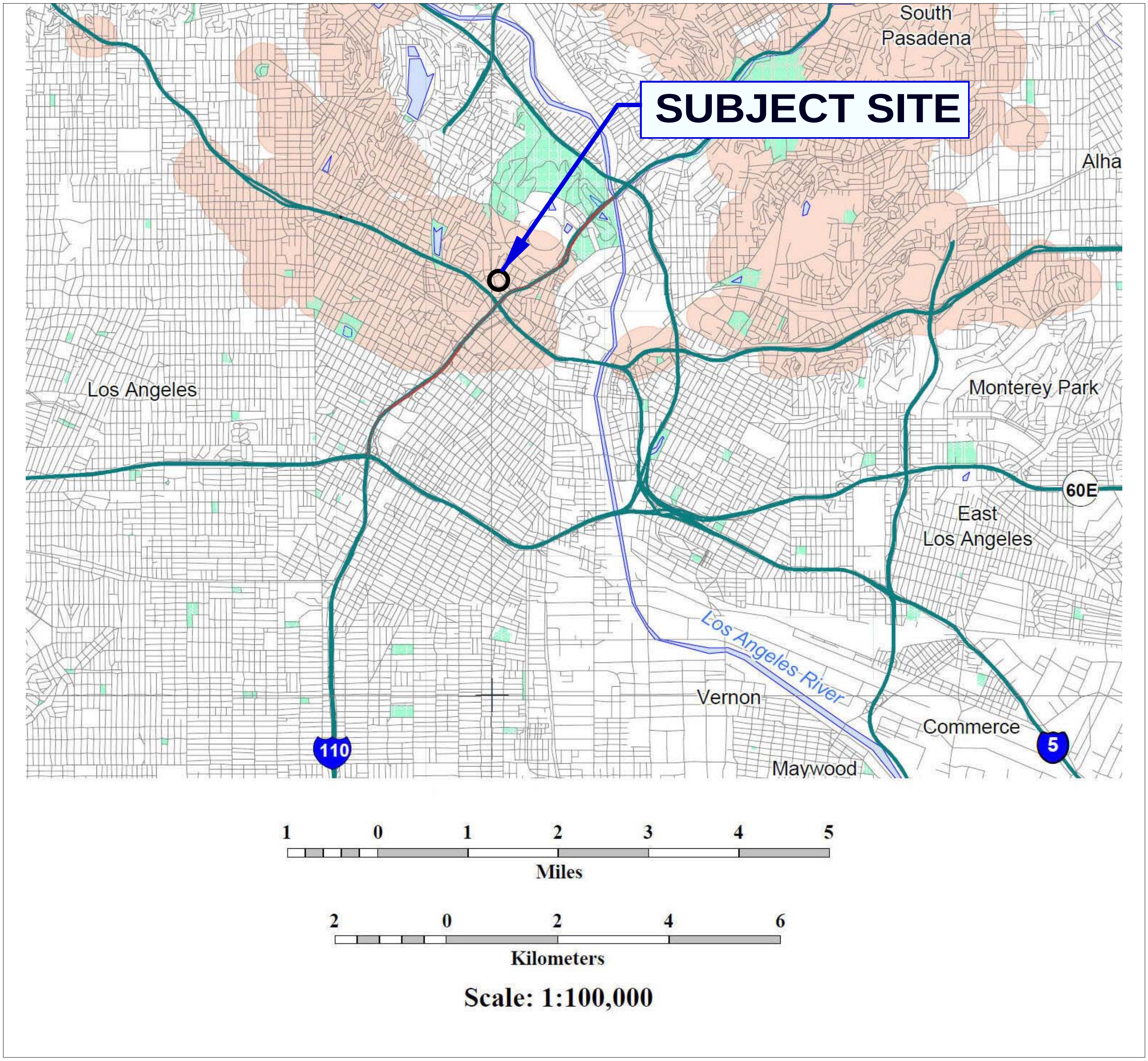
REFERENCE: http://navigatela.lacity.org/NavigateLA/

METHANE ZONE RISK MAP

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BLVD.

FILE NO. 21155



EXPLANATION

Radon Potential Zoning Definitions:

- 🟥 High Potential for Indoor Radon Levels Above 4.0 Picocuries per Liter
- ▨ High Potential for Indoor-Radon Levels Above 4.0 Picocuries per Liter in Recent Alluvium (High - Qa)
- 🟧 Moderate Potential for Indoor Radon Levels Above 4.0 Picocuries per Liter
- ☐ Low Potential for Indoor Radon Levels Above 4.0 Picocuries per Liter
- ○ Special Test Areas - Areas where National Uranium Resource Evaluation (NURE) Project airborne radiometric data suggest rocks and soils contain higher than typical amounts of uranium but where indoor-radon data are currently unavailable. Follow-up indoor-radon testing is recomended for buildings in these areas.

Map Features

- ▒ Airport
- 🟩 Park
- ▨ National Forest

REFERENCE: RADON POTENTIAL ZONE MAP FOR SOUTHERN L.A. COUNTY; R. CHURCHILL (JANUARY 2005)

RADON ZONE MAP

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BLVD., LLC

FILE NO. 21155

BORING LOG NUMBER 1

Sunset Boulevard, LLC **Date: 07/25/17** **Elevation: 422.5'***

File No. 21155 **Method: 24-inch diameter Bucket Auger**

km

*Reference: Survey by Hennon Surveying and Mapping, dated 2/12/16

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt Parking Lot
				0 --		5-inch Thick Asphalt over 3-inch Thick Base
				-		
1	16	19.5	102.8	1 --		
				-		FILL: Sandy Silt, yellow and dark brown, moist, stiff
				2 --		
				-		BEDROCK (PUENTE FORMATION): Siltstone, yellowish brown, moist, hard, well bedded, fissile
				3 --		
				-		
				4 --		
				-		@5' Bedding [E-W, 58S]
5	12	6.4	111.0	5 --		
				-		Siltstone interbedded with Sandstone, yellowish brown and orange brown mottled, moist, medium hard, fine grained
				6 --		
				-		
				7 --		
				-		
				8 --		@ 8' Bedding [E-W, 35S]
				-		
				9 --		
				-		
10	8	16.9	104.1	10 --		
				-		olive brown and grayish brown mottled
				11 --		@ 11' Bedding [E-W, 34S]
				-		
				12 --		
				-		
				13 --		
				-		
				14 --		
				-		
15	12	18.6	103.6	15 --		
				-		Interbedded Siltstone and Sandstone, yellow and olive grayish brown, moist, medium hard
				16 --		
				-		@ 16' Bedding [N85E, 35SE]
				17 --		
				-		@ 17½' Concretion 1½" thick
				18 --		
				-		
				19 --		@ 19' Bedding [E-W, 37S]
				-		
20	15	24.6	100.8	20 --		
				-		olive gray to orange and yellow mottled, moist, medium hard
				21 --		
				-		
				22 --		@ 22' Bedding [N85E, 35SE]
				-		
				23 --		
				-		
				24 --		
				-		
25	24	17.3	105.2	25 --		
				-		

BORING LOG NUMBER 1

Sunset Boulevard, LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				26 --		
				-		
				27 --		
				-		
				28 --		
				-		
				29 --		@ 29' Seepage
				-		
30	35	21.2	100.0	30 --		Siltstone, olive gray to orange brown, laminations, brittle,
				-		Bedding [N85E, 36SE]
				31 --		
				-		
				32 --		
				-		
				33 --		
				-		
				34 --		
				-		
35	40	20.4	103.3	35 --		more lamination
				-		
				36 --		
				-		
				37 --		@ 37' Bedding [N85E, 36SE]
				-		
				38 --		
				-		
				39 --		
				-		
40	39	19.8	107.5	40 --		
				-		Siltstone to Sandstone, orange brown and yellow mottled,
				41 --		very moist, medium hard
				-		
				42 --		
				-		
				43 --		@ 43' Bedding [N85E, 35SE]
				-		
				44 --		NOTE: The stratification lines represent the approximate
				-		boundary between earth types; the transition may be gradual.
45	23/6"	29.7	92.3	45 --		Used 24-inch diameter Bucket Auger
	33/4"			-		12-inch drop of Kelly Bar
				46 --		Modified California Sampler used unless otherwise noted
				-		Downhole logged by Geologist
				47 --		
				-		Kelly Weights:
				48 --		0-25' 2400 lbs.
				-		25-44' 1550 lbs.
				49 --		44-62' 850 lbs.
				-		62-70' 1900 lbs.
50	25/6"	23.9	102.4	50 --		
	30/3"			-		Total Depth 50 feet
						Seepage at 29 feet and 46 feet
						Fill to 1 foot

BORING LOG NUMBER 2

Sunset Boulevard, LLC **Date: 07/27/17** **Elevation: 411.5'***

File No. 21155 **Method: 24-inch diameter Bucket Auger**

km

*Reference: Survey by Hennon Surveying and Mapping, dated 2/12/16

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt Driveway
				0 --		4-inch Thick Asphalt over 10-inch Thick Base
				-		
				1 --		
				-		FILL: Silty Sand, mottled gray and light gray, gravel sized
				2 --		Siltstone pieces, firm
				-		
				3 --		
				-		
				4 --		
				-		
5	3	19.5	108.7	5 --		Sandy to Clayey Silt, dark gray, moist, stiff
				-		
				6 --		
				-		
				7 --		
				-		
				8 --		
				-		
				9 --		
				-		
10	6	23.8	99.9	10 --		
				-		
				11 --		BEDROCK (PUENTE FORMATION): Interbedded Siltstone
				-		and Sandstone, yellowish brown to olive gray, moist, medium
				12 --		hard, very weathered, abundant white caliche streaks
				-		
				13 --		@ 11½' Bedding [N85E, 58SE]
				-		
				14 --		
				-		
15	6	19.5	105.4	15 --		
				-		olive gray and orange brown mottled, laminated, fine Sand
				16 --		
				-		
				17 --		
				-		
				18 --		
				-		
				19 --		@ 19' Bedding [N10W, 54SW]
				-		orange brown and olive brown mottled
20	12	16.5	113.6	20 --		@ 20' stopped downhole log due to odor
				-		
				21 --		
				-		
				22 --		
				-		
				23 --		
				-		
				24 --		
				-		
25	17	21.1	105.1	25 --		
				-		Siltstone to Sandstone, olive brown and yellowish brown
						mottled, very moist, medium hard

BORING LOG NUMBER 2

Sunset Boulevard, LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				26 --		
				-		
				27 --		
				-		
				28 --		
				-		
				29 --		
				-		
30	21	18.8	109.9	30 --		
				-		Sandstone, olive brown and yellowish brown mottled, very moist, fine grained
				31 --		
				-		
				32 --		
				-		
				33 --		
				-		
				34 --		
				-		@ 35' Water Seepage
35	12	27.3	97.8	35 --		
				-		Siltstone, orange brown and olive brown, fine Sand
				36 --		
				-		
				37 --		
				-		
				38 --		
				-		
				39 --		
				-		
40	20	17.7	104.3	40 --		
				-		Siltstone interbedded with Sandstone, gray to yellowish brown, very moist, fine Sand
				41 --		
				-		
				42 --		
				-		
				43 --		
				-		
				44 --		
				-		
45	52	22.4	101.8	45 --		
				-		Siltstone interbedded with Sandstone, dark brown, moist, medium hard
				46 --		
				-		
				47 --		
				-		
				48 --		
				-		
				49 --		
				-		
50	20/6"	15.4	112.2	50 --		
	50/4"			-		Siltstone, dark brown, some fine Sand

BORING LOG NUMBER 2

Sunset Boulevard, LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				51 --		
				-		
				52 --		
				-		
				53 --		
				-		
				54 --		
				-		
55	40	20.5	104.2	55 --		
				-		Siltstone, dark brown, laminated, fine Sand, some Clay
				56 --		
				-		
				57 --		
				-		
				58 --		
				-		
				59 --		
				-		
60	60	20.2	105.6	60 --		
				-		dark brown to black, tar content
				61 --		
				-		
				62 --		
				-		
				63 --		
				-		
				64 --		
				-		
65	51	14.1	116.5	65 --		
				-		
				66 --		
				-		
				67 --		
				-		
				68 --		Total Depth 67½ feet
				-		Seepage at 35 feet and 60 feet
				69 --		Fill to 10½ feet
				-		
				70 --		
				-		NOTE: The stratification lines represent the approximate
				71 --		boundary between earth types; the transition may be gradual.
				-		Used 24-inch diameter Bucket Auger
				72 --		12-inch drop of Kelly Bar
				-		Modified California Sampler used unless otherwise noted
				73 --		Downhole logged by Geologist to 20 feet
				-		
				74 --		Kelly Weights:
				-		0-25' 2400 lbs.
				75 --		25-44' 1550 lbs.
				-		44-62' 850 lbs.
						62-70' 1900 lbs.

BORING LOG NUMBER 3

Sunset Boulevard, LLC **Date: 07/26/17** **Elevation: 424'***

File No. 21155 **Method: 24-inch diameter Bucket Auger**

km

*Reference: Survey by Hennon Surveying and Mapping, dated 2/12/16

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt Driveway
				0 --		4-inch Thick Asphalt over 3-inch Thick Base
				-		
				1 --		
				-		FILL: Silty Sand, grayish brown, roots (up to 1/4" in size)
				2 --		
2.5	13	12.2	98.0	-		BEDROCK (PUENTE FORMATION): Siltstone, light yellowish brown, moist, soft to medium hard, abundant mica
				3 --		
				-		
				4 --		Siltstone to Sandstone, yellowish brown, moist, medium hard
				-		
5	16	7.3	105.0	5 --		@ 3' Bedding [N05W, 65SW], beds ¼ to 1" thick, Sandstone is friable
				-		
				6 --		
				-		
				7 --		
				-		
				8 --		@ 8' Bedding [N76E, 47SE]
				-		
				9 --		@ 9' Bedding [N7SE, 55SE]
				-		
10	8	17.7	103.7	10 --		
				-		light olive and orange brown mottled, some Clay
				11 --		
				-		
				12 --		@ 12' Concretions to 3" in Sandstone beds, very hard
				-		
				13 --		
				-		
				14 --		
				-		
15	13	6.5	113.3	15 --		@ 15' Bedding [N82E, 47SE] Sandstone to Siltstone, light gray to orange brown, fine grained
				-		
				16 --		
				-		
				17 --		
				-		
				18 --		
				-		
				19 --		
				-		
20	11	25.8	99.6	20 --		
				-		
				21 --		@ 21' Bedding [N87E, 31SE] Siltstone, gray and orange brown mottled
				-		
				22 --		
				-		
				23 --		
				-		
				24 --		
				-		
25	20	11.2	107.5	25 --		@ 25' Bedding [N86E, 31SE] Clayey Siltstone with Sandstone, reddish brown and gray, medium hard, fine grained
				-		

BORING LOG NUMBER 3

Sunset Boulevard, LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				26 --		
				-		
				27 --	— —	— — — — — — — — — — —
				-		scattered concretions to 4" in Sandstone
				28 --		
				-		
				29 --		
				-		
30	25	13.4	115.9	30 --	— —	— — — — — — — — — — —
				-		very moist, orange brown and gray mottled, fine grained
				31 --		@ 30' Bedding [N77E, 47SE], concretions in Sandstone to 6" thick
				-		@ 31' 1" offset in bedding
				32 --		Fracture [N63E, 68NW]
				-		Concretions along fracture
				33 --		
				-		
				34 --		
				-		
35	16	24.3	100.5	35 --	— —	— — — — — — — — — — —
				-		thin laminations
				36 --		@ 36' Bedding [N86E, 54SE]
				-		
				37 --		@ 37' Seepage
				-		
				38 --		
				-		
				39 --		
				-		
40	30	18.0	113.1	40 --		@ 40' Bedding [N80E, 49SE] orange brown, Sandstone beds,
				-		friable 2" thick
				41 --		
				-		
				42 --		
				-		
				43 --		
				-		
				44 --		
				-		
45	25/6"	23.6	101.8	45 --	— —	— — — — — — — — — — —
	35/4"			-		Siltstone to Sandstone, dark brown, moist, hard
				46 --		
				-		
				47 --		
				-		
				48 --		
				-		
				49 --		@ 49' Bedding [N82E, 49SE]
				-		
50	25/6"	17.3	109.3	50 --	— —	— — — — — — — — — — —
	30/4"			-		dark olive brown, fine grained

BORING LOG NUMBER 3

Sunset Boulevard, LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				51 --		
				-		
				52 --		
				-		
				53 --		
				-		
				54 --		
				-		
55	20/6"	22.7	102.2	55 --		
	30/4"			-		Siltstone, dark brown and orange brown mottled
				56 --		@ 55' Bedding [N82E, 48SE], 1" offset in bedding east side up
				-		1" offset in bedding east side up
				57 --		@ 55' fracture [N-S, 88W]
				-		@ 57': 9"-thick concretion
				58 --		Bedding [E-W, 58S]
				-		
				59 --		
				-		
60	20/6"	24.9	99.6	60 --		
	30/4"			-		Sandier, some Clay, fine grained
				61 --		
				-		
				62 --		
				-		
				63 --		
				-		
				64 --		
				-		
65	40	25.2	97.1	65 --		
				-		Siltstone, dark brown to black, fine Sand
				66 --		
				-		
				67 --		
				-		
68	40	20.9	102.1	68 --		
				-		Total Depth 68 feet
				69 --		Seepage at 39 feet and 62 feet
				-		Fill to 1 foot
				70 --		
				-		
				71 --		NOTE: The stratification lines represent the approximate
				-		boundary between earth types; the transition may be gradual.
				72 --		Used 24-inch diameter Bucket Auger
				-		12-inch drop of Kelly Bar
				73 --		Modified California Sampler used unless otherwise noted
				-		Downhole logged by Geologist to 20 feet
				74 --		
				-		Kelly Weights:
				75 --		0-25' 2400 lbs.
				-		25-44' 1550 lbs.
						44-62' 850 lbs.
						62-70' 1900 lbs.

BORING LOG NUMBER 4

Sunset Boulevard, LLC **Date: 07/28/17** **Elevation: 400.5'***

File No. 21155 **Method: 24-inch diameter Bucket Auger**

km

*Reference: Survey by Hennon Surveying and Mapping, dated 2/12/16

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Northwest Descending Concrete Driveway
				0 --		6-inch Thick Concrete, No Base
				-		
				1 --		FILL: Sandy Silt, dark and yellowish brown, moist
				-		
				2 --		
				-		
				3 --		
				-		
				4 --		
				-		
5	4	23.8	97.1	5 --		
				-		BEDROCK (PUENTE FORMATION): Interbedded Siltstone
				6 --		and Sandstone, yellowish brown and white mottled, moist,
				-		medium hard, well bedded
				7 --		@ 6' Bedding [N80E, 55SE]
				-		
				8 --		
				-		
				9 --		
				-		
10	5	19.8	101.3	10 --		
				-		Siltstone, grayish brown and orange brown mottled, moist,
				11 --		medium hard, some Clay, some rootlets
				-		
				12 --		@ 12' Bedding [N80E, 40SE]
				-		
				13 --		
				-		
				14 --		@ 14' Bedding [N80E, 39SE]
				-		
15	7	23.3	100.2	15 --		
				-		olive brown and orange brown mottled, some Clay, fine Sand
				16 --		chert layer ½" thick
				-		@ 16' Seepage
				17 --		
				-		
				18 --		
				-		
				19 --		
				-		
20	20	26.5	97.0	20 --		
				-		Sandstone, olive gray to dark brown, very moist, hard, fine
				21 --		grained
				-		
				22 --		
				-		
				23 --		
				-		
				24 --		
				-		
25	4	20.5	105.2	25 --		
				-		Sandstone interbedded with Siltstone, olive gray and yellowish
						brown mottled, moist, medium hard, fine grained

BORING LOG NUMBER 4

Sunset Boulevard, LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				26 --		
				-		
				27 --		
				-		
				28 --		
				-		
				29 --		
				-		
30	47	14.3	119.6	30 --	– –	– – – – – – – – –
				-		Siltstone, yellowish brown, very moist, fine grained, some Clay
				31 --		
				-		
				32 --		
				-		
				33 --		
				-		
				34 --		
				-		
35	21	23.9	100.8	35 --		
				-		Total Depth 35 feet
				36 --		Downhole logging terminated due to heavy seepage
				-		Heavy Seepage at 16 feet
				37 --		Fill to 5 feet
				-		
				38 --		
				-		NOTE: The stratification lines represent the approximate
				39 --		boundary between earth types; the transition may be gradual.
				-		
				40 --		Used 24-inch diameter Bucket Auger
				-		12-inch drop of Kelly Bar
				41 --		Modified California Sampler used unless otherwise noted
				-		
				42 --		Kelly Weights:
				-		0-25' 2400 lbs.
				43 --		25-44' 1550 lbs.
				-		44-62' 850 lbs.
				44 --		62-70' 1900 lbs.
				-		
				45 --		
				-		
				46 --		
				-		
				47 --		
				-		
				48 --		
				-		
				49 --		
				-		
				50 --		
				-		

BORING LOG NUMBER 5

Sunset Boulevard, LLC **Date: 07/31/17** **Elevation: 406.5'***

File No. 21155 **Method: 8-inch diameter Hollow Stem Auger**

km

*Reference: Survey by Hennon Surveying and Mapping, dated 2/12/16

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt Driveway
				0 --		5-inch Thick Asphalt, No Base
				-		
				1 --		FILL: Sandy Silt, dark yellowish brown, moist
				-		
				2 --		
2.5	28	16.5	110.9	-		
				3 --		Sandy Silt, yellowish brown and dark brown, moist, fine grained
				-		
				4 --		
				-		
5	16	17.8	SPT	5 --		
				-		Silty Sand to Sandy Silt, dark brown, moist, fine grained
				6 --		
				-		
				7 --		
7.5	31	22.8	100.4	-		
				8 --		
				-	CL	COLLUVIUM: Sandy Lean Clay, dark brown, moist, very stiff, minor caliche, fine Sand
				9 --		
				-		
10	16	20.3	SPT	10 --		BEDROCK (PUENTE FORMATION): Interbedded Siltstone and Sandstone, yellowish brown and olive brown mottled, moist, medium hard, fine Sand
				-		
				11 --		
				-		
				12 --		
12.5	49	20.8	103.7	-		
				13 --		yellow and light brown mottled, some Clay
				-		
				14 --		
				-		
15	28	21.9	SPT	15 --		
				-		Siltstone, yellow and brown mottled, some gypsum, some Clay
				16 --		
				-		
				17 --		
17.5	63	23.2	102.6	-		
				18 --		some gypsum crystal, Bedding [N85E, 55S] oriented sample
				-		
				19 --		
				-		
20	30	22.2	SPT	20 --		
				-		cemented layers
				21 --		
				-		
				22 --		
22.5	68	24.8	99.9	-		
				23 --		Siltstone, yellowish brown, moist, medium hard, some Clay
				-		
				24 --		
				-		
25	31	23.4	SPT	25 --		
				-		

BORING LOG NUMBER 5

Sunset Boulevard, LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				26 --		
				-		
				27 --		
27.5	72	23.2	101.0	-		
				28 --		light brown, calcium strings
				-		
				29 --		
				-		
30	40	20.9	SPT	30 --		
				-		some Clay
				31 --		
				-		
				32 --		
32.5	73	22.7	101.7	-		
				33 --		more thin laminar calcium strings
				-		
				34 --		
				-		
35	44	22.4	SPT	35 --		
				-		more Clayey
				36 --		
				-		
				37 --		
37.5	78	19.1	105.1	-		
				38 --		Siltstone, gray to dark gray, moist, hard, some Clay
				-		
				39 --		
				-		
40	45	19.6	SPT	40 --		
				-		cemented
				41 --		
				-		
				42 --		
42.5	40/6"	18.8	107.3	-		
	50/5"			43 --		Siltstone, dark gray, moist, hard
				-		Bedding [N90E, 67S] oriented sample
				44 --		
				-		
45	44	17	SPT	45 --		
				-		
				46 --		
				-		
				47 --		
47.5	39/6"	19.9	105.4	-		
	50/3"			48 --		
				-		
				49 --		
				-		
50	72	18.7	SPT	50 --		
				-		Bedding [N90E, 80S] oriented sample

BORING LOG NUMBER 5

Sunset Boulevard, LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		
				51 --		
				-		
				52 --		
52.5	100/8"	16.8	107.0	-		
				53 --		
				-		
				54 --		
				-		
55	83	16.3	SPT	55 --		
				-		
				56 --		
				-		
				57 --		
57.5	100/8"	14.8	113.3	-		
				58 --		
				-		
				59 --		
				-		
60	48	16.4	SPT	60 --		
				-		
				61 --		
				-		
				62 --		
62.5	100/8"	16.1	111.7	-	- - - - -	- - - - - - - - - - - - - - - - -
				63 --		Siltstone, gray to dark gray, medium hard
				-		
				64 --		
				-		
65	70	15.5	SPT	65 --		
				-		
				66 --		
				-		
				67 --		
67.5	100/8"	13.4	107.7	-	- - - - -	- - - - - - - - - - - - - - - - -
				68 --		dark gray to grayish black, fine Sand
				-		
				69 --		
				-		
70	51	22.5	SPT	70 --		
				-		Total Depth 70 feet
				71 --		No Water
				-		Fill to 8 feet
				72 --		
				-		
				73 --		NOTE: The stratification lines represent the approximate
				-		boundary between earth types; the transition may be gradual.
				74 --		
				-		Used 8-inch diameter Hollow-Stem Auger
				75 --		140-lb. Automatic Hammer, 30-inch drop
				-		Modified California Sampler used unless otherwise noted
						Hydrocarbon odor at 67.5 feet below ground surface

BORING LOG NUMBER 6

1111 Sunset Blvd., LLC **Date: 03/20/18** **Elevation: 426.7'***

File No. 21155 **Method: 24-inch Bucket Auger**

km

***Reference: Survey by Hennon Surveying and Mapping, dated 2/12/16**

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt for Parking
				0 --		FILL: Sandy Silt, dark brown, moist, stiff
				-		
				1 --		
				-		
				2 --		
				-		
				3 --		
				-		BEDROCK (PUENTE FORMATION): Siltstone to Sandstone, dark and yellowish brown, moist, moderately hard
				4 --		
				-		
5	3/3	11.6	95.3	5 --		@ 3' Bedding: [N75E, 32S]
				-		
				6 --		
				-		
				7 --		
				-		
				8 --		Silicified layer about 6"-8", very hard
				-		
				9 --		
				-		
10	2/6	18.9	101.6	10 --		
				-		Siltstone to Sandstone, dark and light brown, moist, moderately hard to hard
				11 --		
				-		
				12 --		@ 12' Bedding: [N80E, 33S]
				-		
				13 --		
				-		
				14 --		
				-		
				15 --		@ 15' Bedding: [N87E, 33S]
				-		
				16 --		
				-		
				17 --		
				-		
				18 --		
				-		
				19 --		@ 19' Bedding: [N85E, 30S]
				-		
20	13/16	4.6	127.1	20 --		
				-		Silicified Sandstone, dark brown, slightly moist, very hard
				21 --		
				-		
				22 --		
				-		Sandstone, dark and yellowish brown, moist, very hard
				23 --		@ 23' Bedding: [N87E, 34S]
				-		
				24 --		
				-		
				25 --		
				-		

BORING LOG NUMBER 6

1111 Sunset Blvd., LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		Sandstone, dark and yellowish brown, moist, very hard
				26 --		
				-		
				27 --		
				-		
				28 --		
				-		
				29 --		@ 29' Bedding: [N90E, 31S]
				-		
30	4/7	20.1	108.4	30 --		
				-		
				31 --		
				-		
				32 --		@ 32' Bedding: [N86E, 32S]
				-		
				33 --		
				-		
				34 --		@ 34' Bedding: [N87E, 33S], water seepage
				-		
				35 --		
				-		
				36 --		
				-		
				37 --		@ 37' Bedding: [N88E, 34S]
				-		
				38 --		
				-		
				39 --		
				-		
40	3/5	22.1	103.4	40 --		
				-		
				41 --		
				-		
				42 --		@ 42' Bedding: [90E, 31S]
				-		
				43 --		
				-		
				44 --		@ 44' Bedding: [N90E, 31S]
				-		
				45 --		
				-		
				46 --		
				-		
				47 --		water @ 47' at completion of drilling
				-		
				48 --		
				-		
				49 --		
				-		
50	3/4	26.1	98.4	50 --		
				-		

BORING LOG NUMBER 6

1111 Sunset Blvd., LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		**Sandstone, dark and yellowish brown, moist, very hard**
				51 --		
				-		
				52 --		
				-		
				53 --		
				-		
				54 --		
				-		
				55 --		
				-		
				56 --		
				-		
				57 --		
				-		
				58 --		
				-		
				59 --		
				-		
60	10/19	22.3	104.3	60 --		
				-		
				61 --		
				-		
				62 --		
				-		
				63 --		
				-		
				64 --		
				-		
				65 --		
				-		
				66 --		
				-		
				67 --		
				-		
				68 --		
				-		
				69 --		
				-		
70	14/27	24.9	103.2	70 --		
				-		
				71 --		
				-		
				72 --		
				-		
				73 --		
				-		
				74 --		
				-		
				75 --		
				-		

BORING LOG NUMBER 6

1111 Sunset Blvd., LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		Sandstone, dark and yellowish brown, moist, very hard
				76 --		
				-		
				77 --		
				-		
				78 --		
				-		
				79 --		
				-		
80	13/32	39.5	91.9	80 --		
				-		Total Depth 80 feet
				81 --		Water Seepage at 34 feet, water at 47 feet at completion of
				-		drilling
				82 --		Fill to 3 feet
				-		
				83 --		
				-		NOTE: The stratification lines represent the approximate
				84 --		boundary between earth types; the transition may be gradual.
				-		
				85 --		Used 24-inch diameter Bucket Auger
				-		12-inch drop of Kelly Bar
				86 --		Modified California Sampler used unless otherwise noted
				-		Downhole logged by Geologist
				87 --		
				-		Kelly Weights:
				88 --		0 - 26': 3390 lbs.
				-		26' - 52': 2230 lbs.
				89 --		52' - 80': 1197 lbs.
				-		
				90 --		
				-		
				91 --		
				-		
				92 --		
				-		
				93 --		
				-		
				94 --		
				-		
				95 --		
				-		
				96 --		
				-		
				97 --		
				-		
				98 --		
				-		
				99 --		
				-		
				100 --		
				-		

BORING LOG NUMBER 7

1111 Sunset Blvd., LLC **Date: 03/15/18** **Elevation: 412.5'***

File No. 21155 **Method: 24-inch Bucket Auger**

km

*Reference: Survey by Hennon Surveying and Mapping, dated 2/12/16

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Asphalt for Parking
				0 --		FILL: Sandy Silt, dark and yellowish brown, moist, stiff
				-		
				1 --		
				-		
				2 --		
				-		
				3 --		
				-		
				4 --		
				-		
5	3/5	7.8	103.0	5 --		
				-		BEDROCK (PUENTE FORMATION): Siltstone to Sandstone,
				6 --		dark and yellowish brown, moist, moderately hard
				-		
				7 --		@ 5' Bedding: [N80E, 60S]
				-		
				8 --		
				-		
				9 --		
				-		
10	3/4	9.3	114.5	10 --		
				-		
				11 --		@ 11' Bedding: [N80E, 61S]
				-		
				12 --		
				-		
				13 --		
				-		
				14 --		
				-		
				15 --		
				-		
				16 --		@ 16' Bedding: [N85E, 58S]
				-		
				17 --		
				-		
				18 --		
				-		
				19 --		
				-		
20	2/3	22.0	104.9	20 --		
				-		
				21 --		
				-		
				22 --		@ 22' Bedding: [N80E, 52S]
				-		
				23 --		
				-		
				24 --		
				-		
				25 --		
				-		

BORING LOG NUMBER 7

1111 Sunset Blvd., LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		**Siltstone to Sandstone, dark and yellowish brown, moist, moderately hard**
				26 --		
				-		
				27 --		@ 27' Bedding: [N75E, 55S]
				-		
				28 --		
				-		
				29 --		
				-		
30	2/4	18.3	108.3	30 --		
				-		
				31 --		
				-		
				32 --		@ 32' Bedding: [N82E, 48S]
				-		
				33 --		
				-		
				34 --		
				-		
				35 --		
				-		
				36 --		
				-		
				37 --		@ 37' Bedding: [N75E, 50S]
				-		
				38 --		
				-		
				39 --		
				-		
40	3/6	23.4	103.6	40 --		@ 40' Bedding: [N90E, 51S]
				-		
				41 --		
				-		
				42 --		
				-		
				43 --		@ 43' Bedding: [N87E, 53S]
				-		
				44 --		
				-		
				45 --		
				-		
				46 --		
				-		
				47 --		@ 47' Bedding: [N85E, 54S]
				-		
				48 --		
				-		
				49 --		
				-		
50	3/4	26.0	102.0	50 --		@ 50' Bedding: [N83E, 52S]
				-		

BORING LOG NUMBER 7

1111 Sunset Blvd., LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		Siltstone to Sandstone, dark and yellowish brown, moist,
				51 --		moderately hard
				-		
				52 --		
				-		
				53 --		
				-		
				54 --		
				-		
				55 --		
				-		
				56 --		
				-		
				57 --		@ 57' Bedding: [N85E, 65S]
				-		
				58 --		
				-		
				59 --		
				-		
60	6/21	24.1	103.0	60 --	— —	— — — — — — — — — — -
				-		Siltstone and Sandstone, dark and gray, moist, moderately hard
				61 --		
				-		
				62 --		@ 62' Bedding: [N80E, 67S]
				-		
				63 --		
				-		
				64 --		
				-		
				65 --		
				-		
				66 --		
				-		
				67 --		
				-		
68	6/18	18.8	106.2	68 --		
				-		
				69 --		
				-		Total Depth 69 feet
				70 --		No Water
				-		Fill to 5 feet
				71 --		
				-		NOTE: The stratification lines represent the approximate
				72 --		boundary between earth types; the transition may be gradual.
				-		Used 24-inch diameter Bucket Auger
				73 --		12-inch drop of Kelly Bar
				-		Modified California Sampler used unless otherwise noted
				74 --		Downhole logged by Geologist
				-		Kelly Weights:
				75 --		0 - 26': 3390 lbs.
				-		26' - 52': 2230 lbs.
						52' - 69': 1197 lbs.

BORING LOG NUMBER 8

1111 Sunset Blvd., LLC **Date: 03/12/18** **Elevation: 409.0'***

File No. 21155 **Method: 24-inch Bucket Auger**

km

*Reference: Survey by Hennon Surveying and Mapping, dated 2/12/16

Sample	Blows	Moisture	Dry Density	Depth in	USCS	Description
Depth ft.	per ft.	content %	p.c.f.	feet	Class.	Surface Conditions: Asphalt for Parking
				0 --		4-inch Asphalt, No Base
				-		
				1 --		FILL: Sandy Silt, dark brown, moist, stiff, minor brick fragments
				-		
				2 --		
				-		
				3 --		
				-		
				4 --		
				-		
5	2/6"	13.5	112.0	5 --		
	3/6"			-		
				6 --		
				-		
				7 --		
				-		
				8 --		
				-		
				9 --		
				-		
10	3/6"	16.0	107.8	10 --		
				-		
				11 --		Sandy Silt, dark brown, moist, stiff
				-		
				12 --		
				-		
				13 --		@ 13' Bedding: [N85E, 45S]
				-		
				14 --		@ 14' Bedding: [N90E, 58S]
				-		
15	2/3	11.0	86.6	15 --		
				-		
				16 --		
				-		BEDROCK (PUENTE FORMATION): Siltstone, yellow and grayish brown, moist, moderately hard
				17 --		
				-		
				18 --		
				-		
				19 --		
				-		
20	2/2	16.9	107.2	20 --		
				-		
				21 --		
				-		
				22 --		@ 22' Bedding: [N75E, 54SE]
				-		
				23 --		
				-		
				24 --		
				-		
25	2/2	15.0	106.3	25 --		
				-		

BORING LOG NUMBER 8

1111 Sunset Blvd., LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		Siltstone, yellow and grayish brown, moist, moderately hard
				26 --		
				-		
				27 --		@ 27' Bedding: [N90E, 50S]
				-		
				28 --		
				-		
				29 --		
				-		
30	3/4	24.0	102.3	30 --		
				-		
				31 --		
				-		
				32 --		
				-		
				33 --		
				-		
				34 --		@ 34' Bedding: [N90E, 60S]
				-		
35	3/6	24.1	100.7	35 --		
				-		
				36 --		
				-		
				37 --		
				-		
				38 --		@ 38' Bedding: [N90E, 58S]
				-		
				39 --		@ 39' Bedding: [N85E, 59SE]
				-		
40	5/6	23.5	103.3	40 --		
				-		Siltstone, dark brown and gray, moist, moderately hard to hard
				41 --		
				-		
				42 --		
				-		
				43 --		
				-		
				44 --		
				-		
45	4/6	20.0	106.4	45 --		@ 45' Bedding: [N85W, 62S]
				-		
				46 --		@ 46' Bedding: N60E, 60SE]
				-		
				47 --		
				-		
				48 --		
				-		
				49 --		
				-		
50	3/5	19.5	108.7	50 --		
				-		

BORING LOG NUMBER 8

1111 Sunset Blvd., LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		Siltstone, dark brown and gray, moist, moderately hard to hard
				51 --		
				-		
				52 --		
				-		
				53 --		
				-		
				54 --		
				-		
55	7/21	18.5	109.5	55 --		
				-		
				56 --		
				-		
				57 --		
				-		
				58 --		
				-		
				59 --		
				-		
60	6/16	17.6	109.9	60 --		@ 60' Bedding: [N81E, 72SE]
				-		
				61 --		
				-		
				62 --		
				-		
				63 --		
				-		
				64 --		@ 64' Bedding: [N81W, 59NE]
				-		
65	8/12	17.9	104.2	65 --		
				-		
				66 --		
				-		
				67 --		
				-		
				68 --		
				-		
				69 --		
				-		
70	6/9	11.4	119.4	70 --		
				-		Total Depth 70 feet; No Water; Fill to 16 feet
				71 --		
				-		
				72 --		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual. Used 24-inch diameter Bucket Auger 12-inch drop of Kelly Bar Modified California Sampler used unless otherwise noted Downhole logged by Geologist Kelly Weights: 0 - 26': 3390 lbs. 26' - 52': 2230 lbs. 52' - 69': 1197 lbs.
				-		
				73 --		
				-		
				74 --		
				-		
				75 --		
				-		

BORING LOG NUMBER 9A

1111 Sunset Blvd., LLC **Date: 04/10/18**

File No. 21155 **Method: 24-inch diameter Bucket Auger**

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Planter Area
				0 --		FILL: Silty Sand, dark brown, moist, medium dense, fine grained
				-		
				1 --		
				-		
				2 --		
				-		Total Depth 2 feet by refusal hitting Concrete
				3 --		No Water
				-		Fill to 2 feet
				4 --		
				-		
				5 --		NOTE: The stratification lines represent the approximate
				-		boundary between earth types; the transition may be gradual.
				6 --		
				-		Used 24-inch diameter Bucket Auger
				7 --		1315-lb. Hammer, 12-inch drop
				-		Modified California Sampler used unless otherwise noted
				8 --		
				-		
				9 --		
				-		
				10 --		
				-		
				11 --		
				-		
				12 --		
				-		
				13 --		
				-		
				14 --		
				-		
				15 --		
				-		
				16 --		
				-		
				17 --		
				-		
				18 --		
				-		
				19 --		
				-		
				20 --		
				-		
				21 --		
				-		
				22 --		
				-		
				23 --		
				-		
				24 --		
				-		
				25 --		
				-		

BORING LOG NUMBER 9B

1111 Sunset Blvd., LLC **Date: 04/10/18**

File No. 21155 **Method: 24-inch diameter Bucket Auger**

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
						Surface Conditions: Planter Area
				0 --		FILL: Silty Sand, dark and yellowish brown, moist, medium
				-		dense, fine grained
				1 --		
				-		
				2 --		
				-		Total Depth 2 feet by refusal hitting Concrete and Rebar
				3 --		No Water
				-		Fill to 2 feet
				4 --		
				-		
				5 --		NOTE: The stratification lines represent the approximate
				-		boundary between earth types; the transition may be gradual.
				6 --		
				-		Used 24-inch diameter Bucket Auger
				7 --		1315-lb. Hammer, 12-inch drop
				-		Modified California Sampler used unless otherwise noted
				8 --		
				-		
				9 --		
				-		
				10 --		
				-		
				11 --		
				-		
				12 --		
				-		
				13 --		
				-		
				14 --		
				-		
				15 --		
				-		
				16 --		
				-		
				17 --		
				-		
				18 --		
				-		
				19 --		
				-		
				20 --		
				-		
				21 --		
				-		
				22 --		
				-		
				23 --		
				-		
				24 --		
				-		
				25 --		
				-		

BORING LOG NUMBER 9C

1111 Sunset Blvd., LLC **Date: 04/10/18**

File No. 21155 **Method: 24-inch diameter Bucket Auger**

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Concrete Slab
				0 --		FILL: Silty Sand to Sandy Silt, dark and yellowish brown, moist,
				-		medium dense, fine grained, stiff
				1 --		
				-		
				2 --		
				-		
				3 --		
				-		
				4 --		
				-		
5	2/12"			5 --		
				-		
				6 --		concrete footing 12" thick
				-		
				7 --		
				-		
				8 --		
				-		
				9 --		
				-		
				10 --		Total Depth 9½ feet by refusal hitting Concrete and Rebar
				-		No Water
				11 --		Fill to 9½ feet
				-		
				12 --		
				-		NOTE: The stratification lines represent the approximate
				13 --		boundary between earth types; the transition may be gradual.
				-		
				14 --		Used 24-inch diameter Bucket Auger
				-		1315-lb. Hammer, 12-inch drop
				15 --		Modified California Sampler used unless otherwise noted
				-		
				16 --		
				-		
				17 --		
				-		
				18 --		
				-		
				19 --		
				-		
				20 --		
				-		
				21 --		
				-		
				22 --		
				-		
				23 --		
				-		
				24 --		
				-		
				25 --		
				-		

BORING LOG NUMBER 10

1111 Sunset Blvd., LLC **Date: 03/19/18** **Elevation: 413.8'***

File No. 21155 **Method: 24-inch Bucket Auger**

km

*Reference: Survey by Hennon Surveying and Mapping, dated 2/12/16

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Concrete for Parking
				0 --		??-inch Concrete, No Base
				-		
				1 --		FILL: Sandy Silt, dark and yellowish brown, moist, stiff
				-		
				2 --		
				-		
				3 --		
				-		
				4 --		
				-		
5	4/6"	8.8	101.3	5 --		
	9/6"			-		BEDROCK (PUENTE FORMATION): Siltstone to Sandstone,
				6 --		dark and yellowish brown, moist, moderately hard to hard
				-		@ 5' Bedding: [N85E, 37S]
				7 --		
				-		
				8 --		
				-		
				9 --		
				-		
10	4/5	15.7	95.4	10 --		@ 10' Bedding: [N85E, 38S]
				-		
				11 --		
				-		
				12 --		
				-		
				13 --		
				-		
				14 --		
				-		
				15 --		
				-		
				16 --		@ 16' Bedding: [N87E, 38S]
				-		
				17 --		
				-		
				18 --		
				-		
				19 --		
				-		
20	4/5	9.9	101.8	20 --		@ 20' Bedding: [N90E, 39S]
				-		
				21 --		
				-		
				22 --		
				-		
				23 --		
				-		
				24 --		
				-		
				25 --		
				-		

BORING LOG NUMBER 10

1111 Sunset Blvd., LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		**Siltstone to Sandstone, dark and yellowish brown, moist,**
				26 --		**moderately hard to hard**
				-		**@ 26' Bedding: [N87E, 40S]**
				27 --		
				-		
				28 --		
				-		
				29 --		
				-		
30	8/10	23.6	102.4	30 --		**@ 30' Bedding: [N86E, 40SE]**
				-		
				31 --		
				-		
				32 --		
				-		
				33 --		
				-		
				34 --		
				-		
				35 --		**@ 35' Bedding: [N82W, 41SW]**
				-		
				36 --		
				-		
				37 --		
				-		
				38 --		
				-		
				39 --		
				-		
40	5/13	14.5	111.4	40 --		**@ 40' Bedding: [N89W, 44SW]**
				-		
				41 --		**Siltstone to Sandstone, dark and gray, moist, moderately hard**
				-		
				42 --		
				-		
				43 --		
				-		
				44 --		
				-		
				45 --		
				-		
				46 --		
				-		
				47 --		
				-		
				48 --		
				-		
				49 --		
				-		
50	5/7	22.7	100.1	50 --		**@ 50' Bedding: [N87W, 48SW]**
				-		

BORING LOG NUMBER 10

1111 Sunset Blvd., LLC

File No. 21155

km

Sample Depth ft.	Blows per ft.	Moisture content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description
				-		Siltstone to Sandstone, dark and gray, moist, moderately hard
				51 --		
				-		
				52 --		
				-		
				53 --		
				-		
				54 --		
				-		
				55 --		@ 55' Bedding: [N88E, 43SE]
				-		
				56 --		
				-		
				57 --		
				-		
				58 --		
				-		
				59 --		
				-		
60	6/15	23.8	98.3	60 --		
				-		Siltstone interbedded with Sandstone, gray to dark gray, moist, moderately hard
				61 --		
				-		
				62 --		@ 60' Bedding: [N90E, 42S]
				-		
				63 --		
				-		
				64 --		
				-		Kelly Weights:
				65 --		0 - 26': 3390 lbs.
				-		26' - 52': 2230 lbs.
				66 --		52' - 70': 1197 lbs.
				-		
				67 --		
				-		
				68 --		
				-		
				69 --		
				-		Siltstone, gray to dark gray, moist, moderately hard to hard
70	9	18.0	105.9	70 --		
	21/5"			-		Total Depth 70 feet
				71 --		Heavy Water Seepage at 38 feet
				-		Fill to 5 feet
				72 --		
				-		
				73 --		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
				-		
				74 --		
				-		Used 24-inch diameter Bucket Auger
				75 --		12-inch drop of Kelly Bar
				-		Modified California Sampler used unless otherwise noted
						Downhole logged by Geologist

LOG OF TEST PIT NUMBER 1

Sunset Boulevard, LLC **Drilling Date: 07/31/17** **Elevation: 393'***

File No. 21155 **Method: Hand Dug Test Pit**

km

*Reference: Survey by Hennon Surveying and Mapping, dated 2/12/16

Sample Depth ft.	Moisture Content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Moderate South Descending Slope, Annual Grasses
			0 --		FILL: Sandy Silt, dark brown, moist, stiff, minor brick fragments
			-		
			1 --		
			-		
			2 --		
			-		
3	5.0	103.3	3 --		
			-		Silty Sand to Sand, dark gray, moist, medium dense, fine to medium grained
			4 --		
			-		
5	10.8	102.4	5 --		
			-	SP	COLLUVIUM: Sand, dark gray, moist, medium dense, fine to medium grained
			6 --		
			-		
			7 --		
			-		
8	7.2	114.5	8 --		
			-	SM	Silty Sand, dark brown, moist, medium dense, fine grained
			9 --		
			-		
			10 --		
10.5	5.1	115.7	-	SP/SW	OLD ALLUVIUM: Sand to Gravelly Sand, dark brown, moist, medium dense to dense, fine to coarse grained, cobbles (up to 4" in size)
			11 --		
			-		
			12 --		
			-		
			13 --		
13.5	0.7	130.1	-		
			14 --		
			-		Total Depth 14 feet
			15 --		No Water
			-		Fill to 5 feet
			16 --		
			-		
			17 --		NOTE: The stratification lines represent the approximate boundary between earth types; the transition may be gradual.
			-		
			18 --		
			-		Test Pit Downhole Logged by a Geologist
			19 --		Used Hand Tools and Hand Sampler
			-		Bedrock not encountered
			20 --		
			-		
			21 --		
			-		
			22 --		
			-		
			23 --		
			-		
			24 --		
			-		
			25 --		
			-		

LOG OF TEST PIT NUMBER 2

Sunset Boulevard, LLC **Drilling Date: 07/27/17** **Elevation: 398'***

File No. 21155 **Method: Hand Dug Test Pit**

km *Reference: Survey by Hennon Surveying and Mapping, dated 2/12/16

Sample Depth ft.	Moisture Content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Moderate Southwesterly Descending Slope
			0 --		FILL: Sandy Silt, dark brown, moist, stiff
			-		
			1 --		
			-		
2	17.9	91.3	2 --		BEDROCK (PUENTE FORMATION): Interbedded Siltstone and Sandstone,
			-		dark and yellowish brown, moist, medium hard, moderately well bedded
			3 --		@ 2½' Bedding [N75E, 75S]
			-		
4	15.4	92.1	4 --		
			-		
			5 --		@ 5' Bedding [N75E, 78S]
			-		
			6 --		
			-		
7	14.8	87.7	7 --		
			-		
			8 --		
			-		Total Depth 8 feet
			9 --		No Water
			-		Fill to 1½ feet
			10 --		
			-		
			11 --		NOTE: The stratification lines represent the approximate
			-		boundary between earth types; the transition may be gradual.
			12 --		
			-		Test Pit Downhole Logged by a Geologist
			13 --		Used Hand Tools and Hand Sampler
			-		
			14 --		
			-		
			15 --		
			-		
			16 --		
			-		
			17 --		
			-		
			18 --		
			-		
			19 --		
			-		
			20 --		
			-		
			21 --		
			-		
			22 --		
			-		
			23 --		
			-		
			24 --		
			-		
			25 --		
			-		

LOG OF TEST PIT NUMBER 3

Sunset Boulevard, LLC **Drilling Date: 07/27/17** **Elevation: 395'***

File No. 21155 **Method: Hand Dug Test Pit**

km *Reference: Survey by Hennon Surveying and Mapping, dated 2/12/16

Sample Depth ft.	Moisture Content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Moderate Westerly Descending Slope
			0 --		FILL: Sandy Silt, dark brown, moist, stiff
			-		
1	12.1	82.5	1 --		
			-		
			2 --		
			-		
3	12.1	91.9	3 --		
			-		
			4 --		
			-		
5	11.3	100.2	5 --		
			-		BEDROCK (PUENTE FORMATION): Interbedded Siltstone and Sandstone,
			6 --		dark gray, moist, medium hard
			-		
			7 --		@ 7' Bedding [N85E, 62SE]
			-		
			8 --		
			-		
9	14.8	99.5	9 --		
			-		Total Depth 9 feet
			10 --		No Water
			-		Fill to 5 feet
			11 --		
			-		
			12 --		NOTE: The stratification lines represent the approximate
			-		boundary between earth types; the transition may be gradual.
			13 --		
			-		Test Pit Downhole Logged by a Geologist
			14 --		Used Hand Tools and Hand Sampler
			-		
			15 --		
			-		
			16 --		
			-		
			17 --		
			-		
			18 --		
			-		
			19 --		
			-		
			20 --		
			-		
			21 --		
			-		
			22 --		
			-		
			23 --		
			-		
			24 --		
			-		
			25 --		
			-		

LOG OF TEST PIT NUMBER 4

Sunset Boulevard, LLC **Drilling Date: 07/26/17** **Elevation: 406'***

File No. 21155 **Method: Hand Dug Test Pit**

km

*Reference: Survey by Hennon Surveying and Mapping, dated 2/12/16

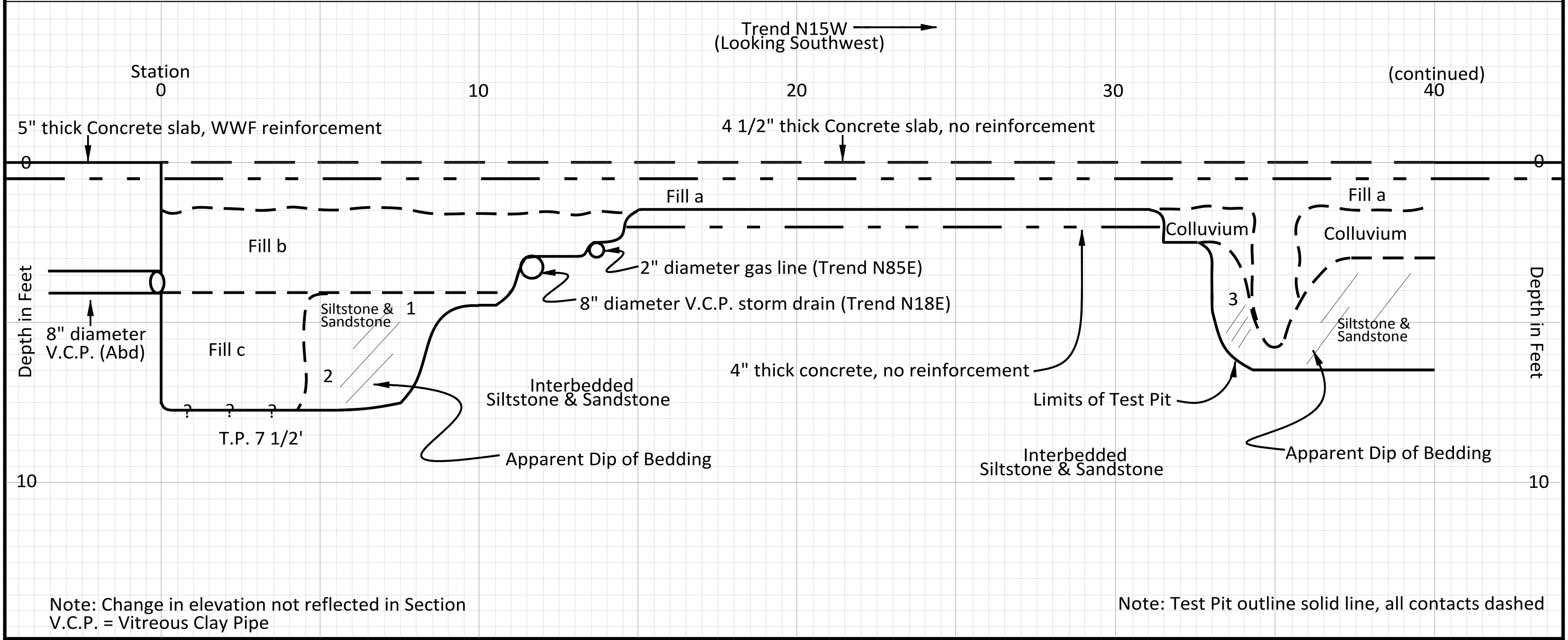
Sample Depth ft.	Moisture Content %	Dry Density p.c.f.	Depth in feet	USCS Class.	Description Surface Conditions: Moderate Westerly Descending Slope, Scattered Trees
			0 --		FILL: Sandy Silt, dark brown, moist, stiff
			-		
			1 --		
			-		
2	12.1	86.7	2 --		
			-		Sandy Silt to Silty Sand, dark brown, moist, medium dense, fine grained, stiff
			3 --		
			-		
4	11.1	93.9	4 --		
			-		
			5 --		
			-		
			6 --		
			-		
7	13.2	89.4	7 --		
			-		
			8 --		
			-		
			9 --		
			-		
10	14.6	98.2	10 --		
			-	SM/ML	COLLUVIUM: Silty Sand to Sandy Silt, dark brown, moist, medium dense,
			11 --		fine grained, stiff
			-		
			12 --		
			-		
			13 --		
			-		
			14 --		
			-		
15	20.1	95.0	15 --		
			-		BEDROCK (PUENTE FORMATION): Interbedded Siltstone and Sandstone,
			16 --		dark yellowish brown, moist, medium hard
			-		
17	17.8	86.0	17 --		
			-		
			18 --		
			-		
			19 --		@ 19' Bedding [N60E, 25S]
			-		
20	25.6	87.8	20 --		
			-		
21	28.8	82.2	21 --		@ 21' Bedding [N60E, 27S]
			-		
			22 --		
			-		Total Depth 22 feet; No Water; Fill to 10 feet
			23 --		
			-		
			24 --		NOTE: The stratification lines represent the approximate
			-		boundary between earth types; the transition may be gradual.
			25 --		Test Pit Downhole Logged by a Geologist to 11 feet
			-		Test Pit Deepened with Hand Auger to 22 feet
					Used Hand Tools and Hand Sampler

		Equipment Used: Backhoe with 24" wide Bucket	Attitude:
Description:	Fill a	Sandy Clay, dark brown, moist, abundant roots to 1/2"	1. @ 4' Bedding N90E, 42SE
	Fill b	Sandy Clay, dark gray to black, moist, firm, abundant roots to 1/2", cobbles to 6", pieces of Asphalt up to 1"	2. @ 6 1/2' Bedding N90E, 37SE
	Fill c	Clayey Silt, dark brown, moist, firm porous with holes up to 1/10", pieces of Siltstone to 1", bottom not reached	3. @ 6' Bedding N86E, 39SE
Bedrock (Puente Formation)		Interbedded Siltstone and Sandstone, brown and yellowish brown, moist, medium hard, well bedded, beds up to 1/4" to 6" thick, moderately fissile, weathered	

Scale: 1" = 5'

GRAPHIC DESCRIPTION

Trend:



Note: Change in elevation not reflected in Section
V.C.P. = Vitreous Clay Pipe

Note: Test Pit outline solid line, all contacts dashed

TEST PIT 5

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BOULEVARD, LLC

FILE NO.: 21155

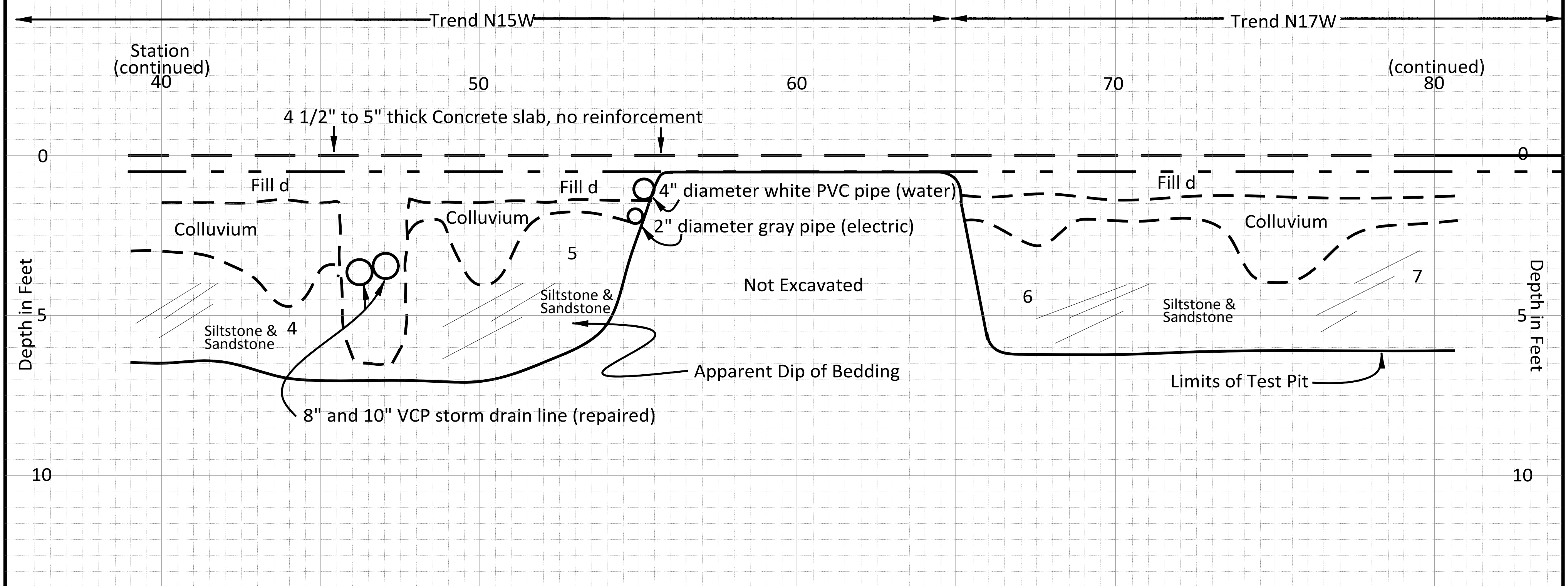
PLATE: 15-A

Equipment Used: Backhoe with 24" wide Bucket	Attitude:
Description: Fill d Sandy to Silty Clay with few of gravel up to 3", grayish brown, moist, firm	4. @ 5' Bedding N82E, 38SE
Colluvium Silty Clay, dark gray to black, firm, moist, abundant roots up to 1/2", porous up to 1/16"	5. @ 4' Bedding N76E, 29SE
Bedrock (Puente Formation) Interbedded Siltstone and Sandstone, yellowish brown to brown, moist, moderately hard, well bedded, moderately	6. @ 4' Bedding N75E, 33SE
fissile, weathered	
	7. @ 6' Bedding N75E, 32SE

Scale: 1" = 5'

GRAPHIC DESCRIPTION

Trend:



Note: Change in elevation not reflected in Section

Note: Test Pit outline solid line, all contacts dashed

TEST PIT 5

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BOULEVARD, LLC

FILE NO.: 21155

PLATE: 15-B

Equipment Used: Backhoe with 24" wide Bucket

Attitude:

Description:

Fill d Sandy to Silty Clay with gravel and brick fragments up to 3", grayish brown, moist, firm

Colluvium Silty Sand, dark gray to dark brown, firm, moist, abundant roots up to 1/2", porous

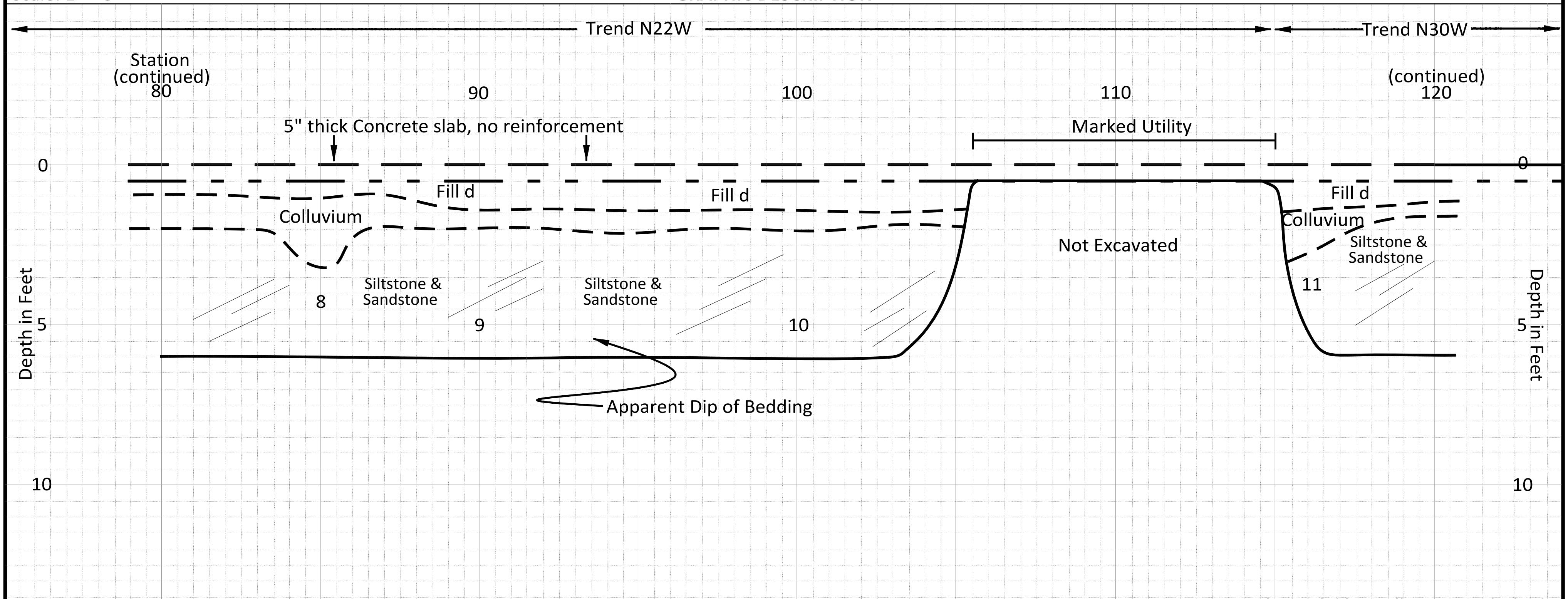
Bedrock (Puente Formation) Interbedded Siltstone and Sandstone, light brown, reddish brown, and olive gray, slightly moist, moderately hard, well bedded, moderately fissile, occasional beds of Siliceous Siltstone, weathered

8. @ 4 1/2' Bedding N70E, 31SE
9. @ 5' Bedding N70E, 31SE
10. @ 5 1/2' Bedding N70E, 33SE
11. @ 4' Bedding N85E, 30SE

Scale: 1" = 5'

GRAPHIC DESCRIPTION

Trend:



Note: Change in elevation not reflected in Section

Note: Test Pit outline solid line, all contacts dashed

TEST PIT 5

Geotechnologies, Inc.

Consulting Geotechnical Engineers

1111 SUNSET BOULEVARD, LLC

FILE NO.: 21155

PLATE: 15-C

Equipment Used: Backhoe with 24" wide Bucket

Attitude:

Description:

Fill e Silty Sand, mottled orange brown and grayish brown, slightly mosit, soft to firm, pieces of concrete up to 8"

Colluvium Silty Sand, dark gray to dark brown, firm, moist, abundant roots up to 1/2", porous

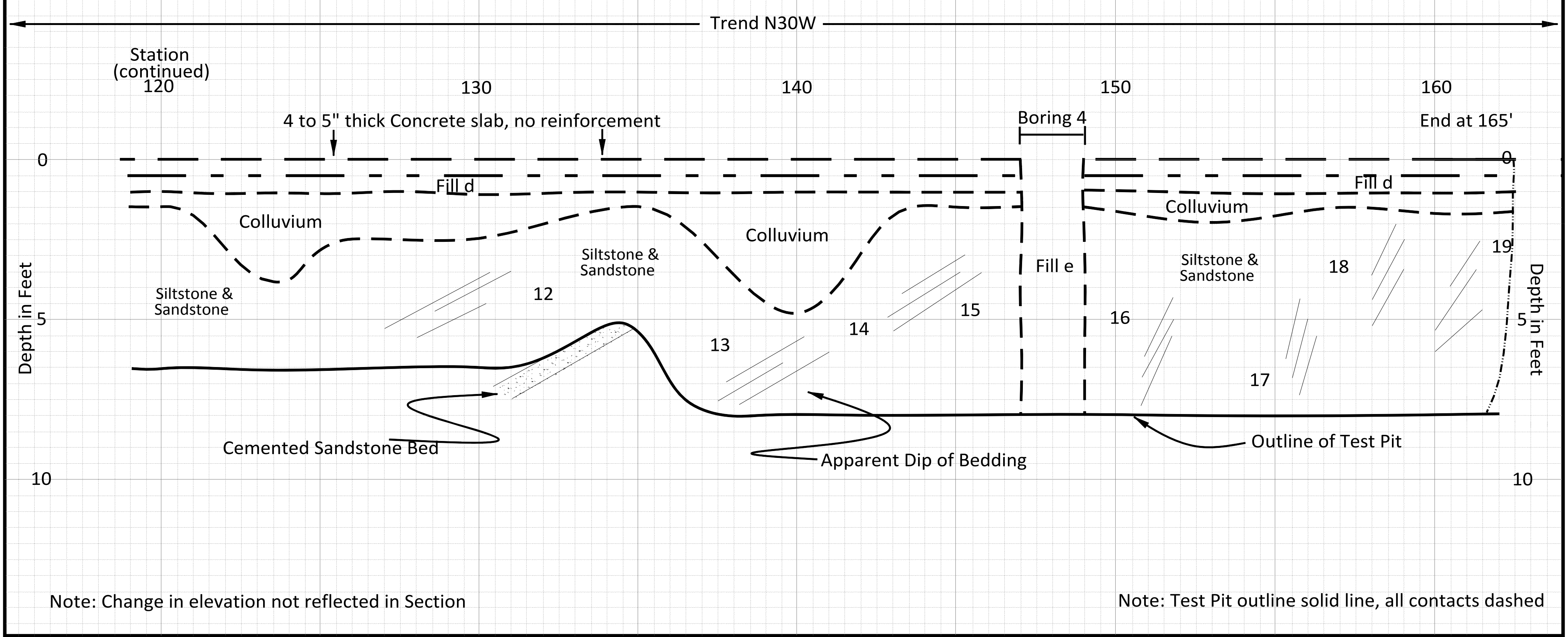
Bedrock (Puente Formation) Interbedded Siltstone and Sandstone, light brown, reddish brown, and olive gray, slightly moist, moderately hard, well bedded, moderately fissile, occasional beds of Siliceous Siltstone, weathered

12. @ 4 1/2' Bedding N75E, 40SE
13. @ 6' Bedding N75E, 45SE
14. @ 5' Bedding N90E, 45SE
15. @ 5 1/2' Bedding N90E, 52SE
16. @ 7' Bedding N89E, 78SE
17. @ 7' Bedding N87E, 70SE
18. @ 4' Bedding N77E, 64SE
19. @ 3' Bedding N80E, 70SE

Scale: 1" = 5'

GRAPHIC DESCRIPTION

Trend:



Note: Change in elevation not reflected in Section

Note: Test Pit outline solid line, all contacts dashed

TEST PIT 5

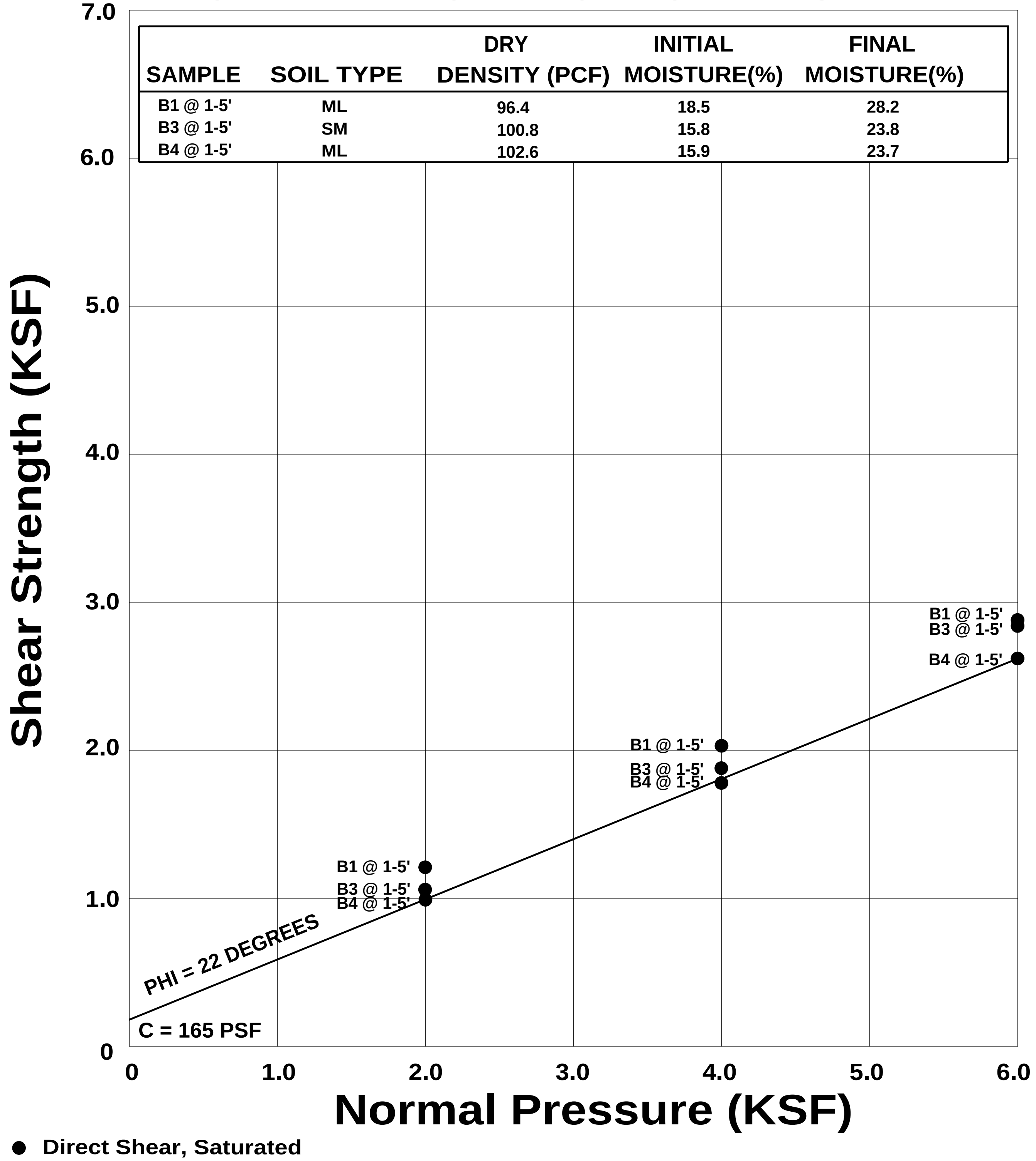
Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BOULEVARD, LLC

FILE NO.: **21155**

PLATE: **15-D**

BULK SAMPLE REMOLDED TO 90 PERCENT OF THE MAXIMUM LABORATORY DENSITY



SAMPLE	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE(%)	FINAL MOISTURE(%)
B1 @ 1-5'	ML	96.4	18.5	28.2
B3 @ 1-5'	SM	100.8	15.8	23.8
B4 @ 1-5'	ML	102.6	15.9	23.7

SHEAR TEST DIAGRAM

Geotechnologies, Inc.
Consulting Geotechnical Engineers

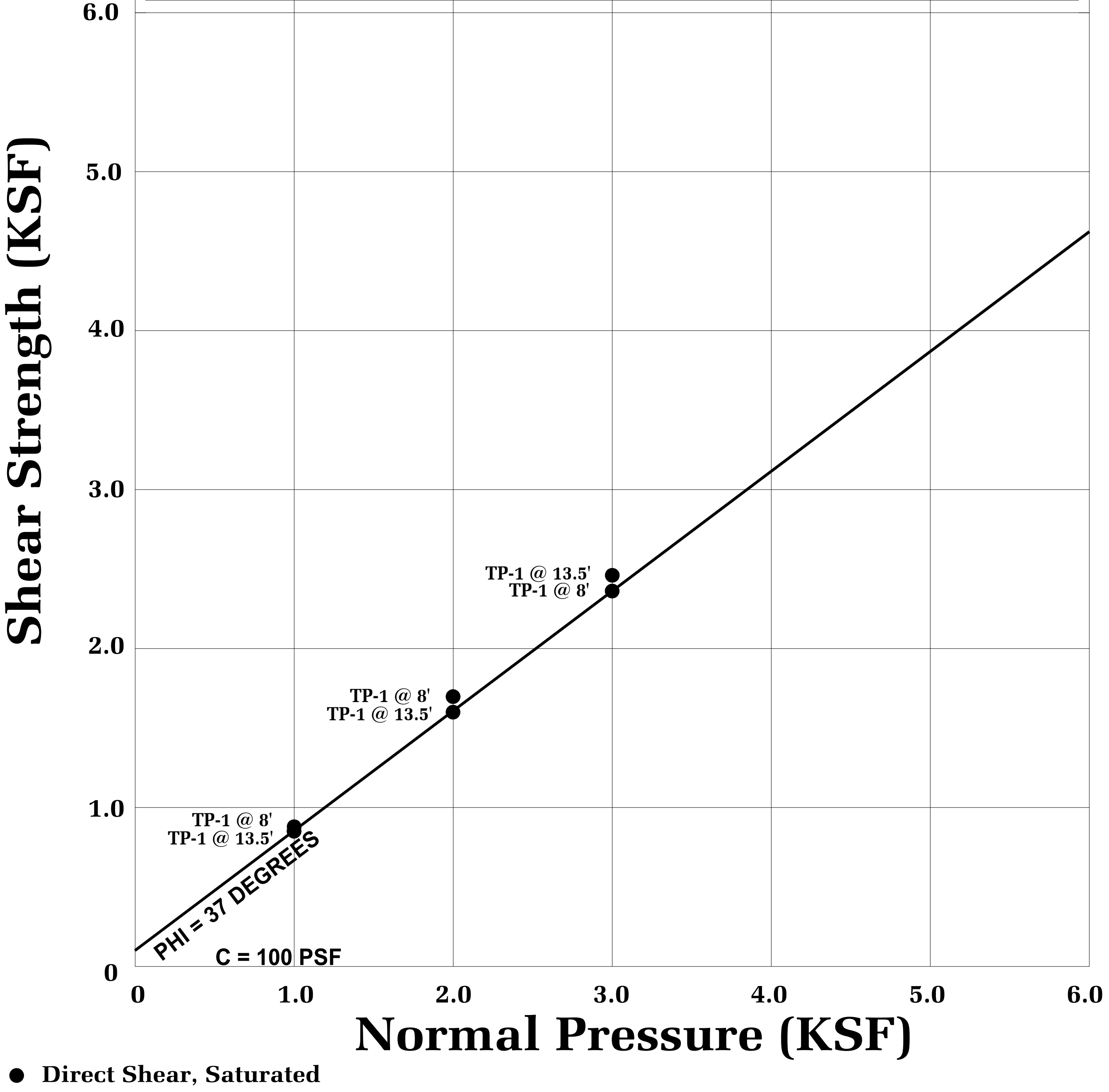
1111 SUNSET BLVD, LLC

FILE NO. 21155

PLATE: B-1

COLLUVIUM

SAMPLE	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE(%)	FINAL MOISTURE(%)
TP-1 @ 8'	SM	114.5	7.2	11.6
TP-1 @ 13.5'	SP/SW	130.1	0.7	13.3



SHEAR TEST DIAGRAM

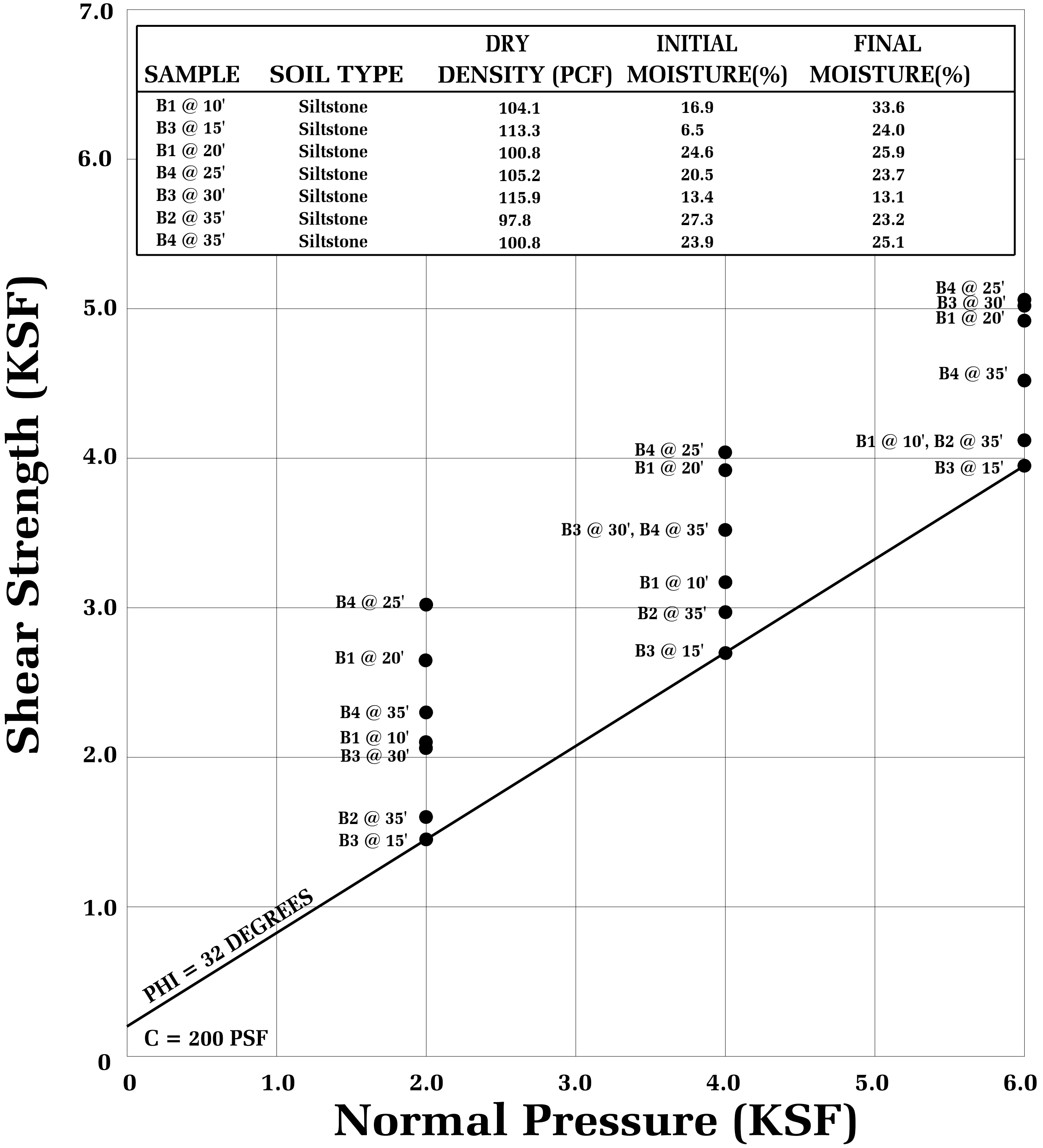
Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 Sunset Blvd., LLC

FILE NO. 21155

PLATE: B-2

BEDROCK
CROSS BEDDED STRENGTH



SAMPLE	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE(%)	FINAL MOISTURE(%)
B1 @ 10'	Siltstone	104.1	16.9	33.6
B3 @ 15'	Siltstone	113.3	6.5	24.0
B1 @ 20'	Siltstone	100.8	24.6	25.9
B4 @ 25'	Siltstone	105.2	20.5	23.7
B3 @ 30'	Siltstone	115.9	13.4	13.1
B2 @ 35'	Siltstone	97.8	27.3	23.2
B4 @ 35'	Siltstone	100.8	23.9	25.1

● Direct Shear, Saturated

SHEAR TEST DIAGRAM

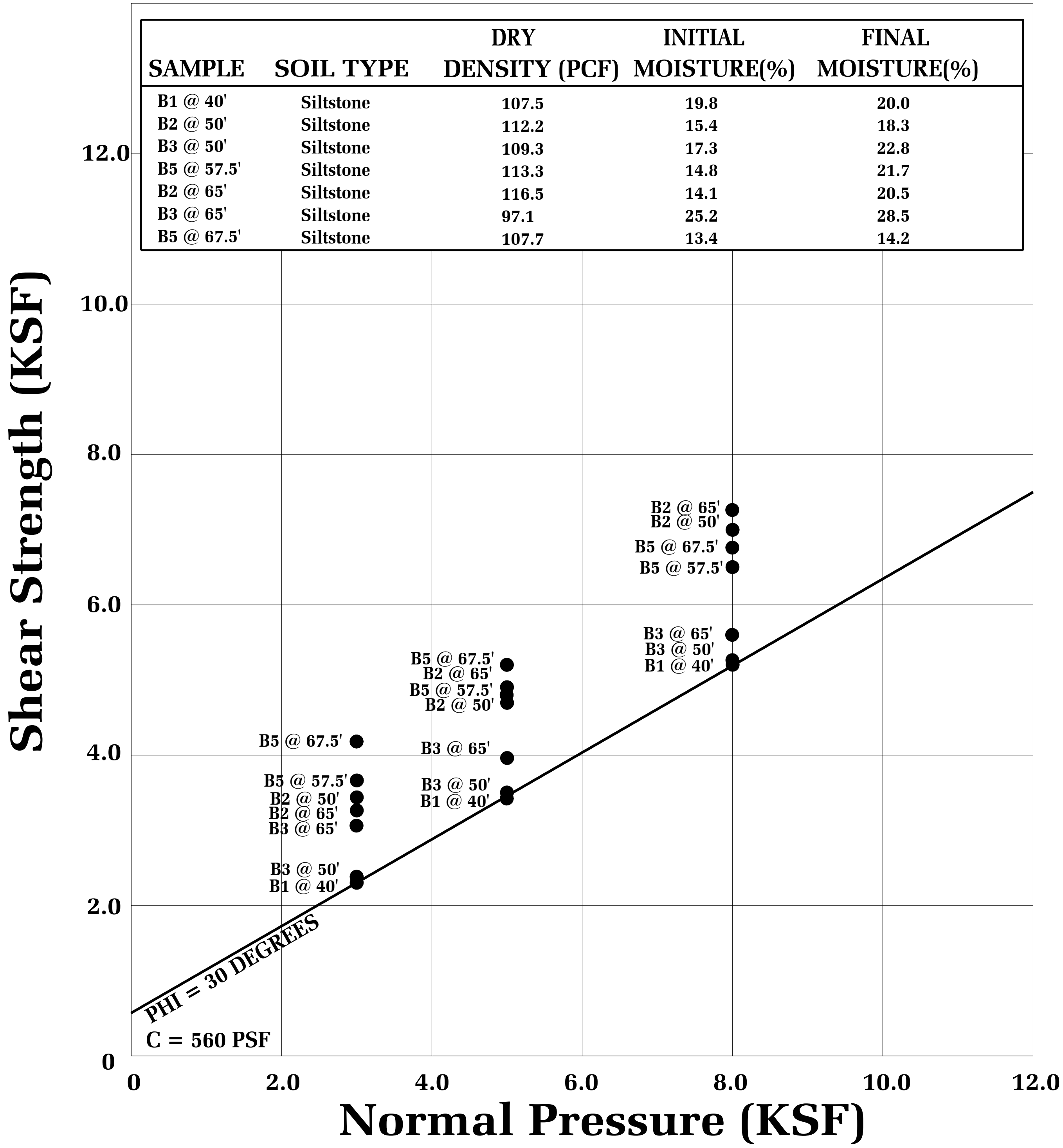
Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 Sunset Blvd., LLC

FILE NO. 21155

PLATE: B-3

BEDROCK
CROSS BEDDING STRENGTH



SAMPLE	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE(%)	FINAL MOISTURE(%)
B1 @ 40'	Siltstone	107.5	19.8	20.0
B2 @ 50'	Siltstone	112.2	15.4	18.3
B3 @ 50'	Siltstone	109.3	17.3	22.8
B5 @ 57.5'	Siltstone	113.3	14.8	21.7
B2 @ 65'	Siltstone	116.5	14.1	20.5
B3 @ 65'	Siltstone	97.1	25.2	28.5
B5 @ 67.5'	Siltstone	107.7	13.4	14.2

● Direct Shear, Saturated

SHEAR TEST DIAGRAM

Geotechnologies, Inc.
Consulting Geotechnical Engineers

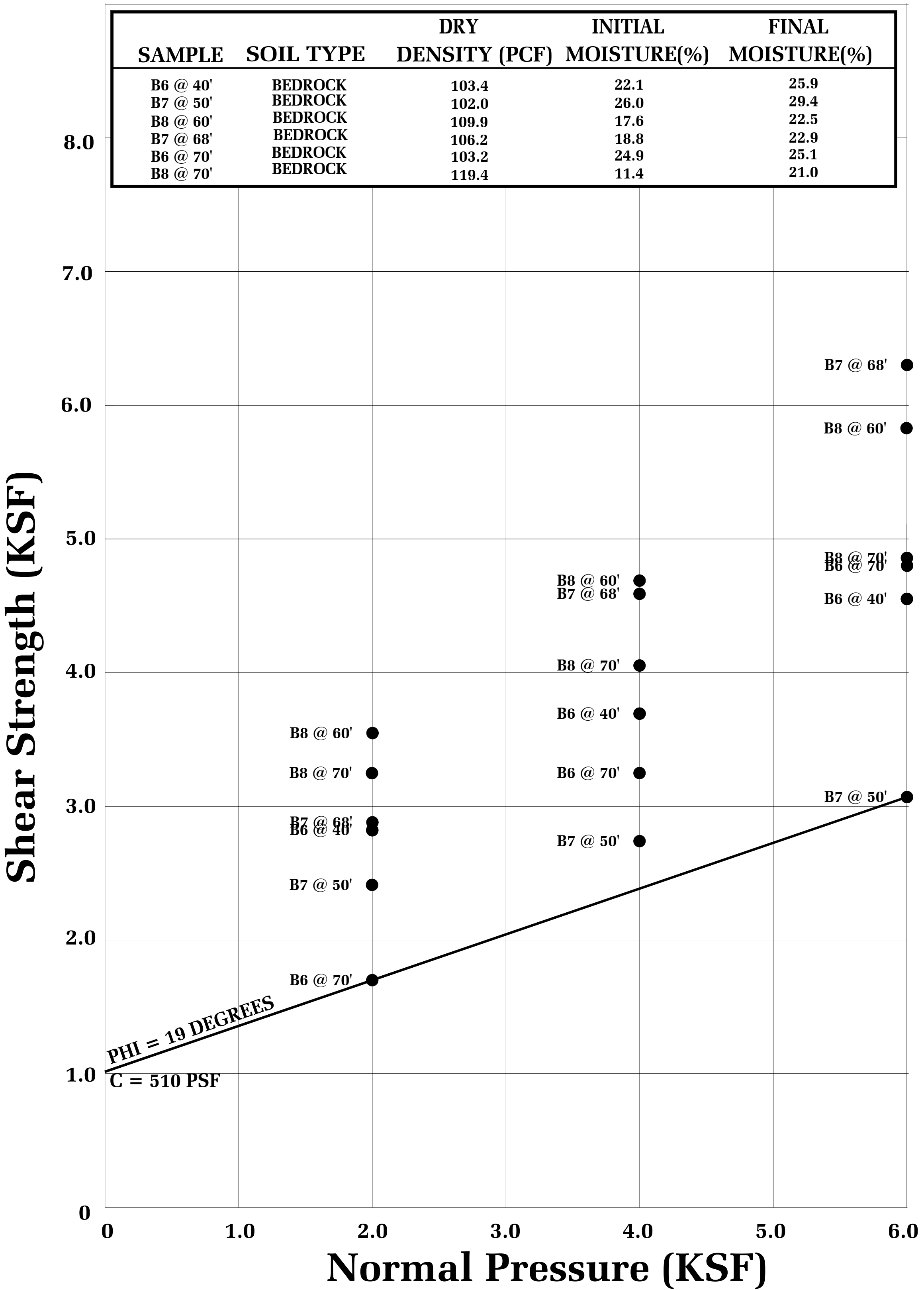
1111 Sunset Blvd., LLC

FILE NO. 21155

PLATE: B-4

BEDROCK
CROSS BEDDING STRENGTH

SAMPLE	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE(%)	FINAL MOISTURE(%)
B6 @ 40'	BEDROCK	103.4	22.1	25.9
B7 @ 50'	BEDROCK	102.0	26.0	29.4
B8 @ 60'	BEDROCK	109.9	17.6	22.5
B7 @ 68'	BEDROCK	106.2	18.8	22.9
B6 @ 70'	BEDROCK	103.2	24.9	25.1
B8 @ 70'	BEDROCK	119.4	11.4	21.0



● Direct Shear, Saturated

SHEAR TEST DIAGRAM

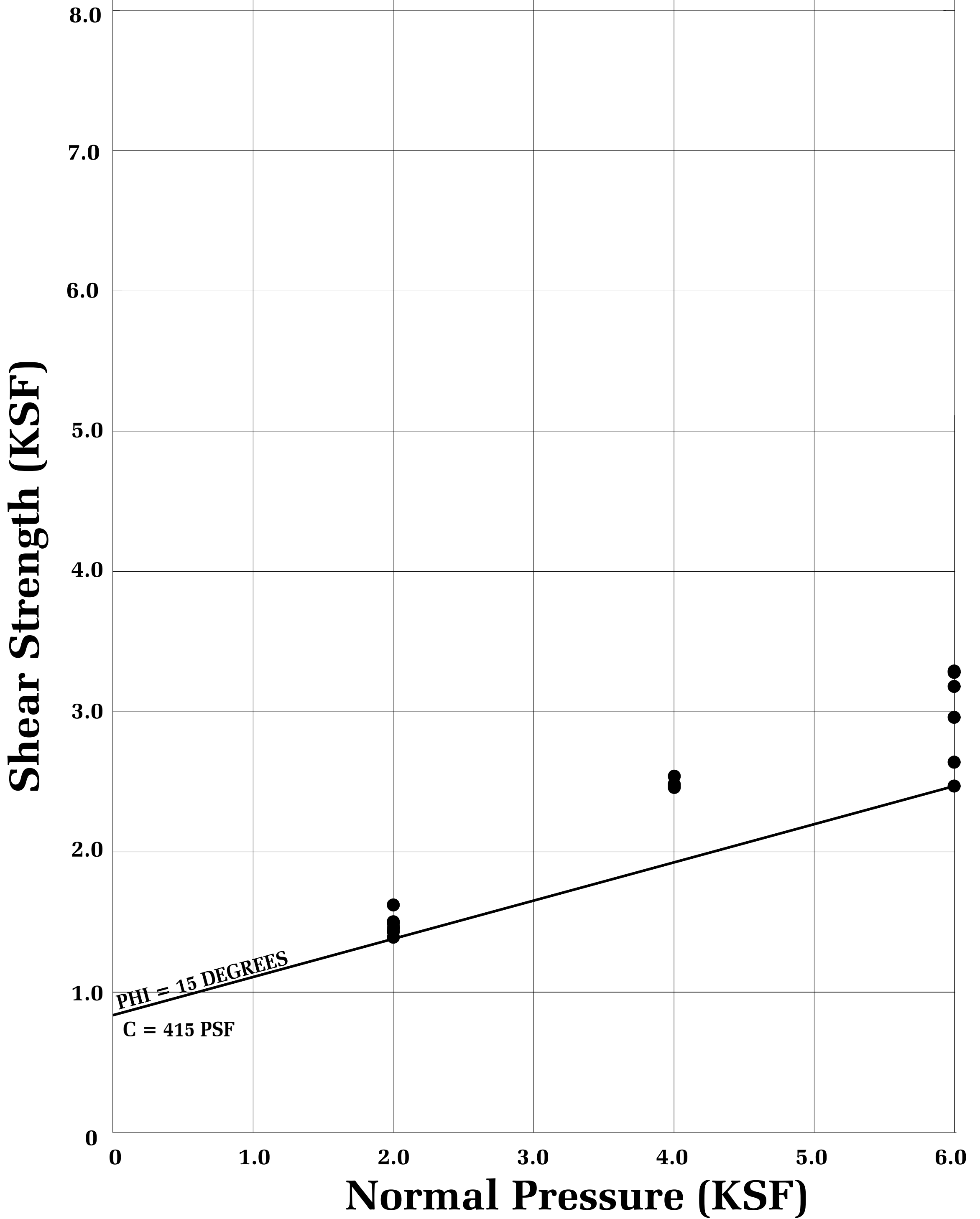
Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BOULEVARD, LLC
1111 SUNSET BLVD., LOS ANGELES

FILE NO. 21155 | PLATE: B-5

BEDROCK - REMOLDED
SAMPLE RESHEARED 5 TIMES

SAMPLE	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE(%)	FINAL MOISTURE(%)
B8 @ 38'	BEDROCK	124.9	24.3	29.6



● **Direct Shear, Saturated**

SHEAR TEST DIAGRAM

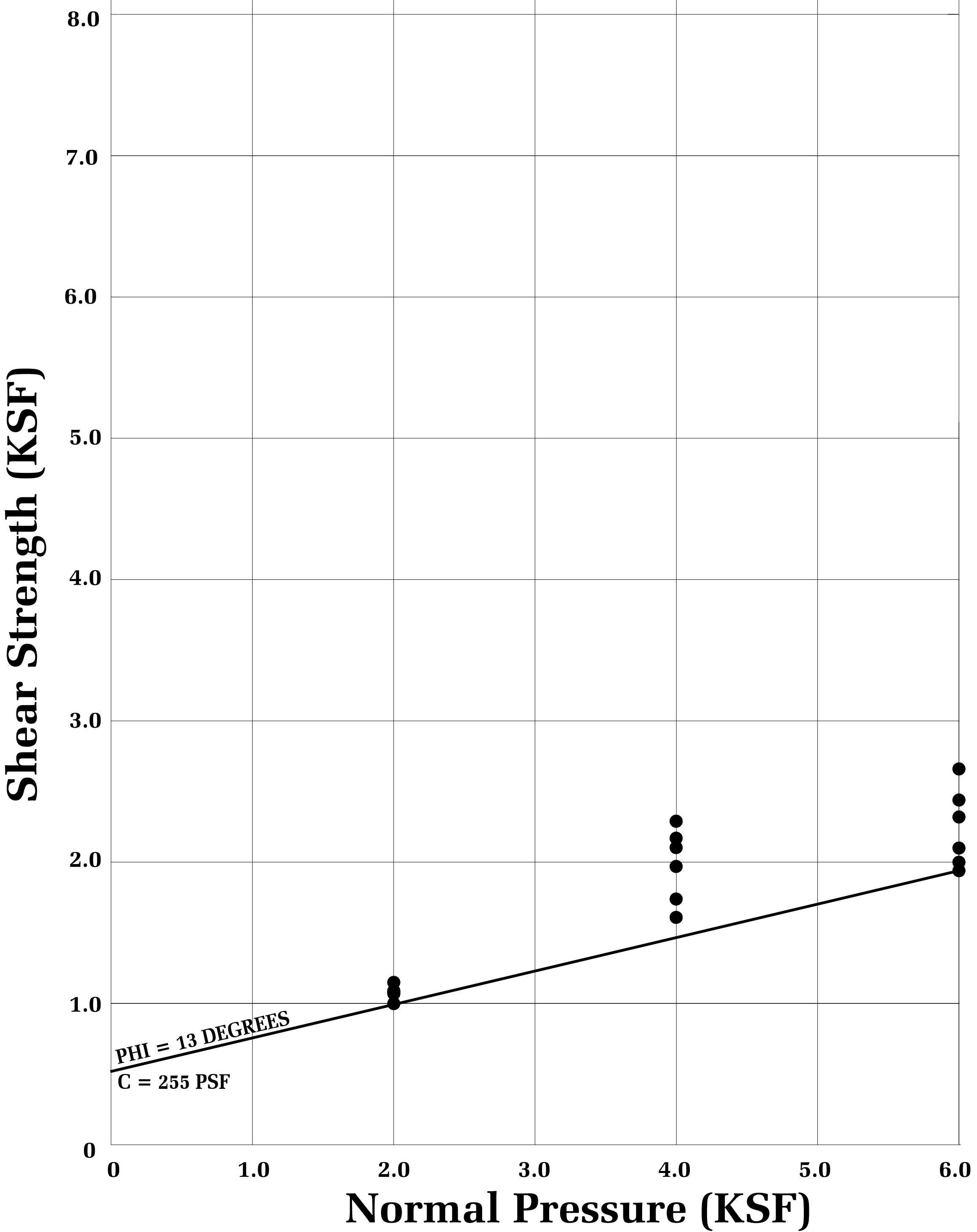
Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BOULEVARD, LLC
1111 SUNSET BLVD., LOS ANGELES

FILE NO. 21155	**PLATE: B-6**

BEDROCK-REMOLDED
SAMPLE RESHEARED 5 TIMES

SAMPLE	SOIL TYPE	DRY DENSITY (PCF)	INITIAL MOISTURE(%)	FINAL MOISTURE(%)
B8 @ 64'	BEDROCK	129.3	18.5	24.0



● **Direct Shear, Saturated**

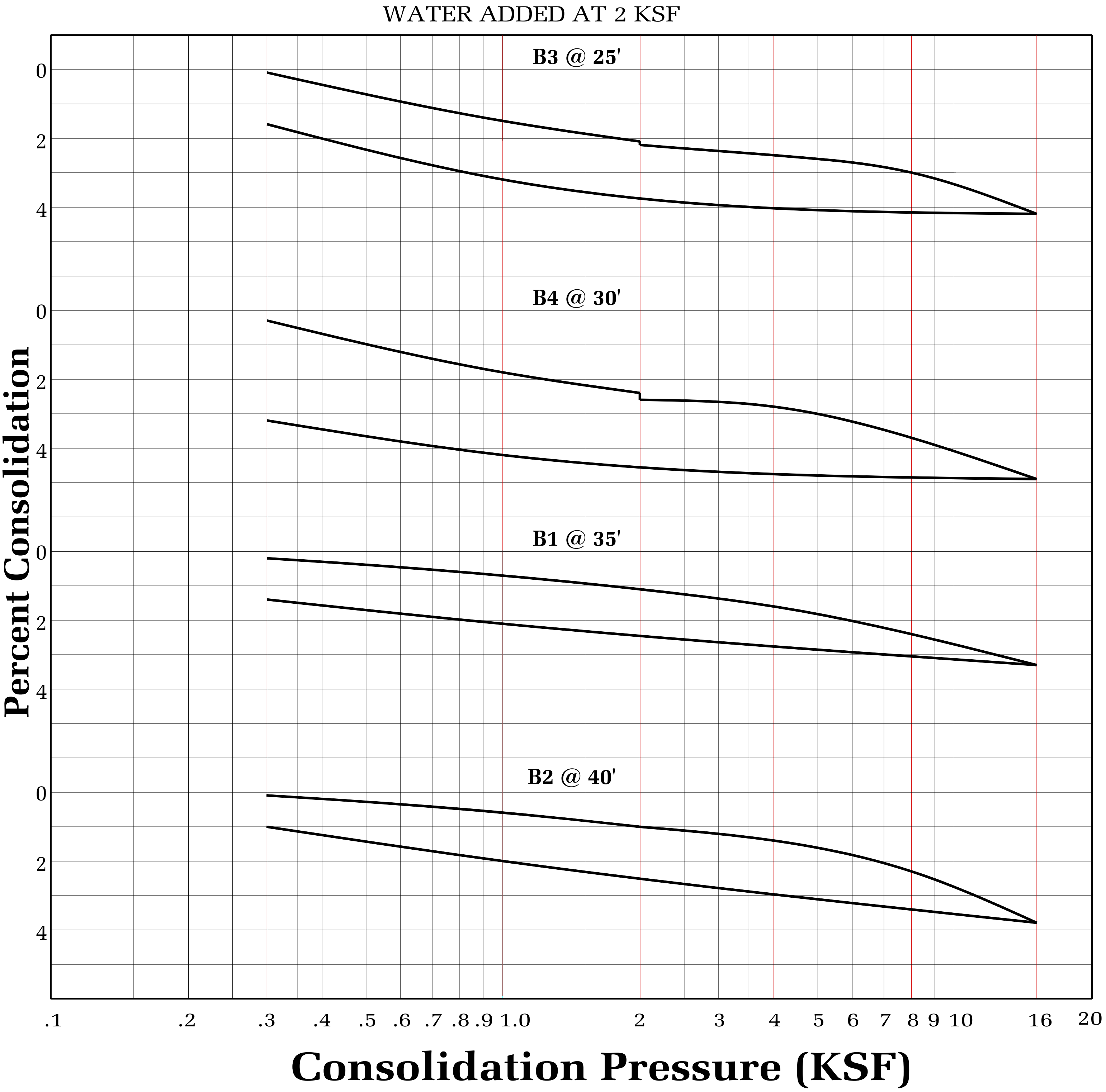
SHEAR TEST DIAGRAM

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BOULEVARD, LLC
1111 SUNSET BLVD., LOS ANGELES

FILE NO. 21155

PLATE: B-7



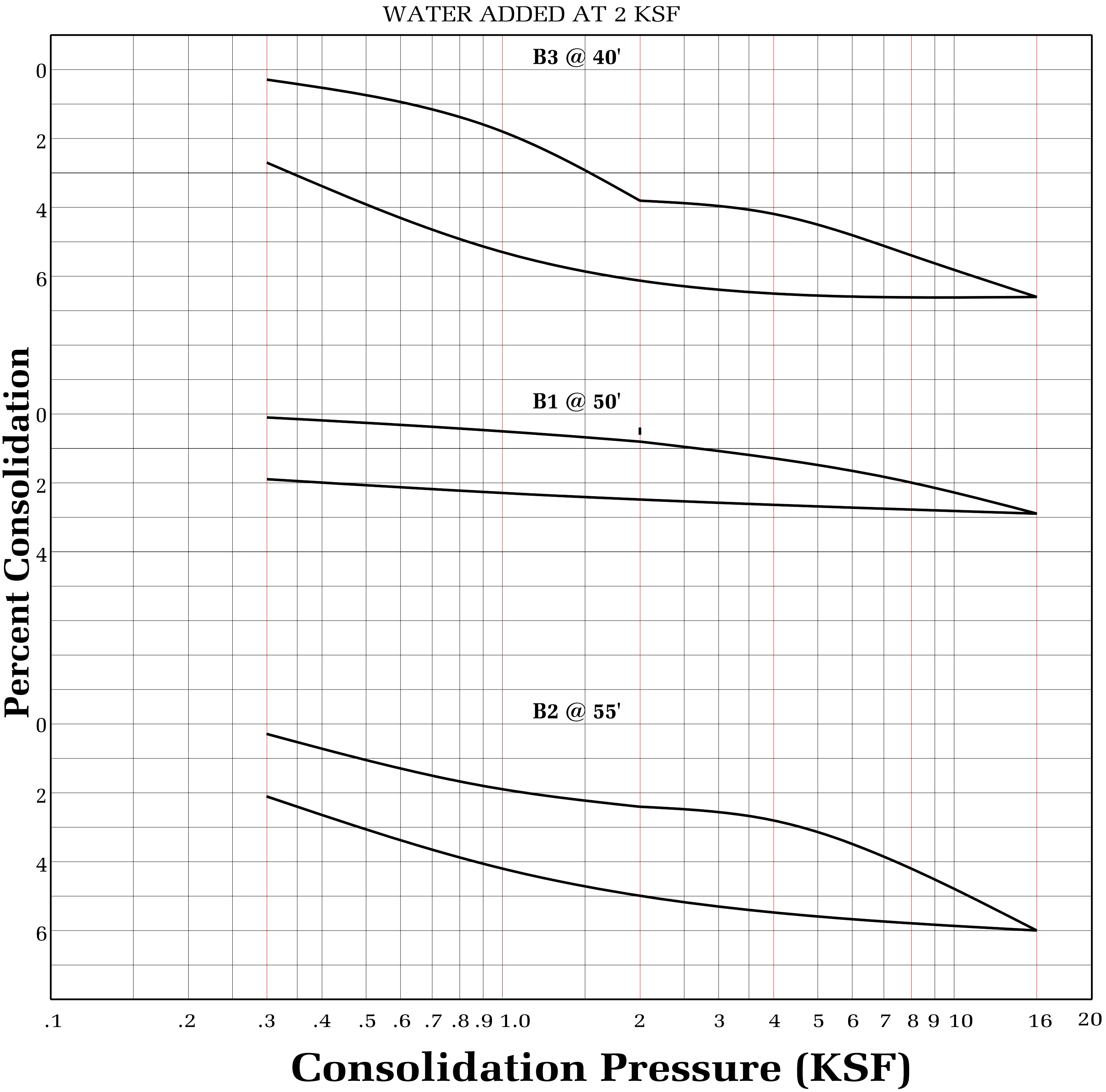
CONSOLIDATION TEST

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BLVD., LLC.
1111 SUNSET BLVD., LOS ANGELES

FILE NO. 21155

PLATE: C-1



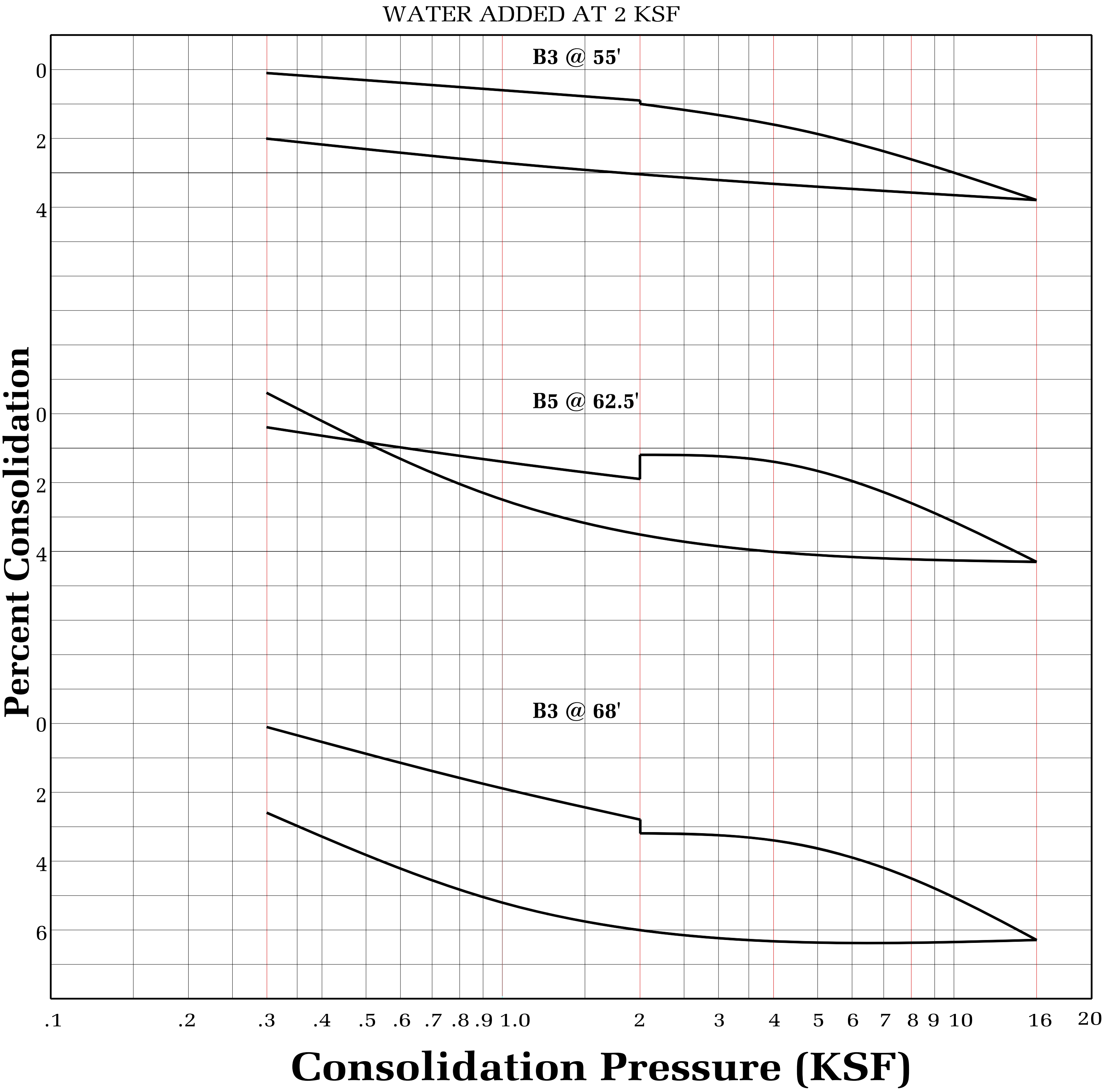
CONSOLIDATION TEST

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BLVD., LLC.
1111 SUNSET BLVD., LOS ANGELES

FILE NO. 21155

PLATE: C-2



CONSOLIDATION TEST

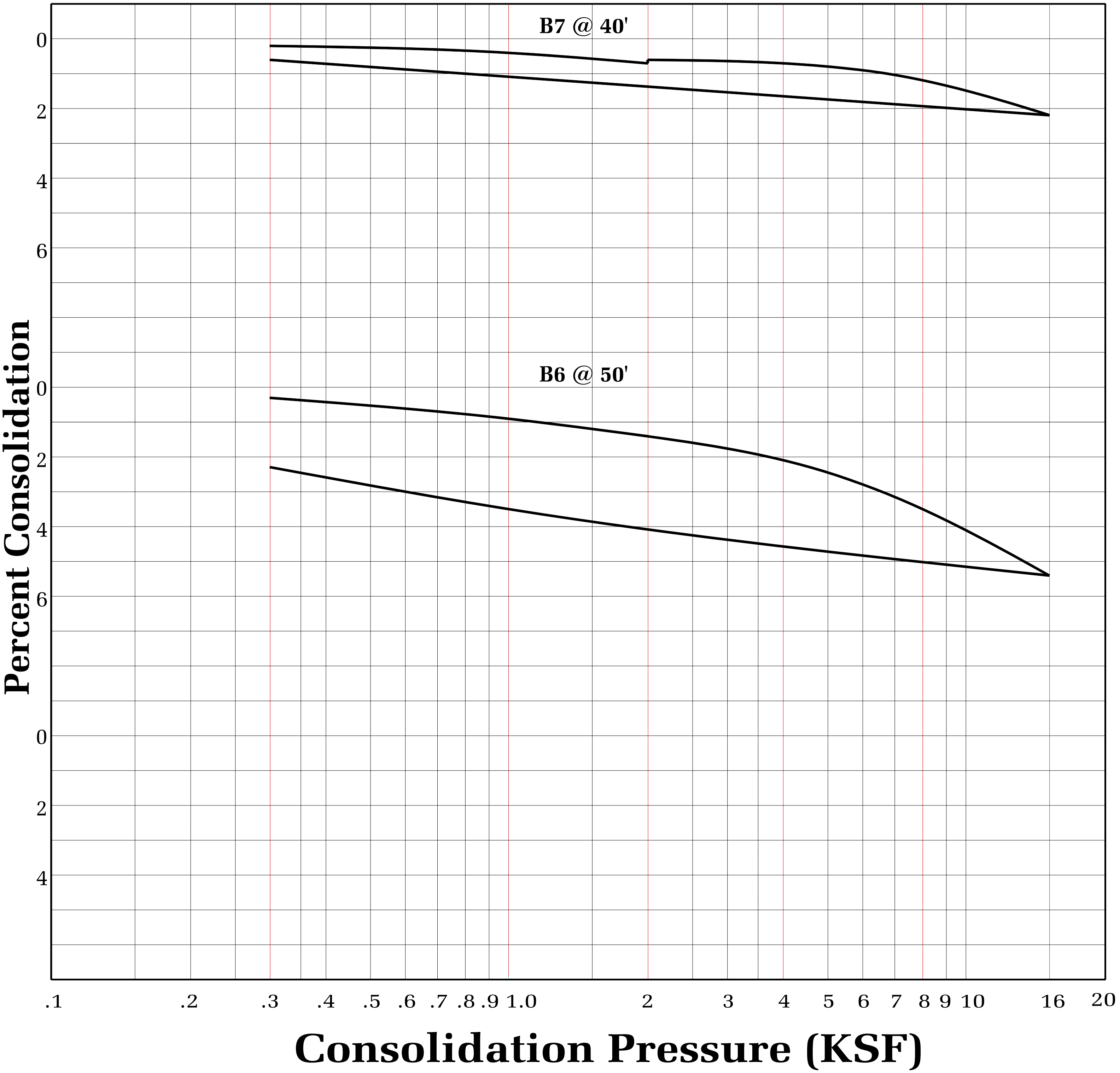
Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BLVD., LLC.
1111 SUNSET BLVD., LOS ANGELES

FILE NO. 21155

PLATE: C-3

WATER ADDED AT 2 KSF



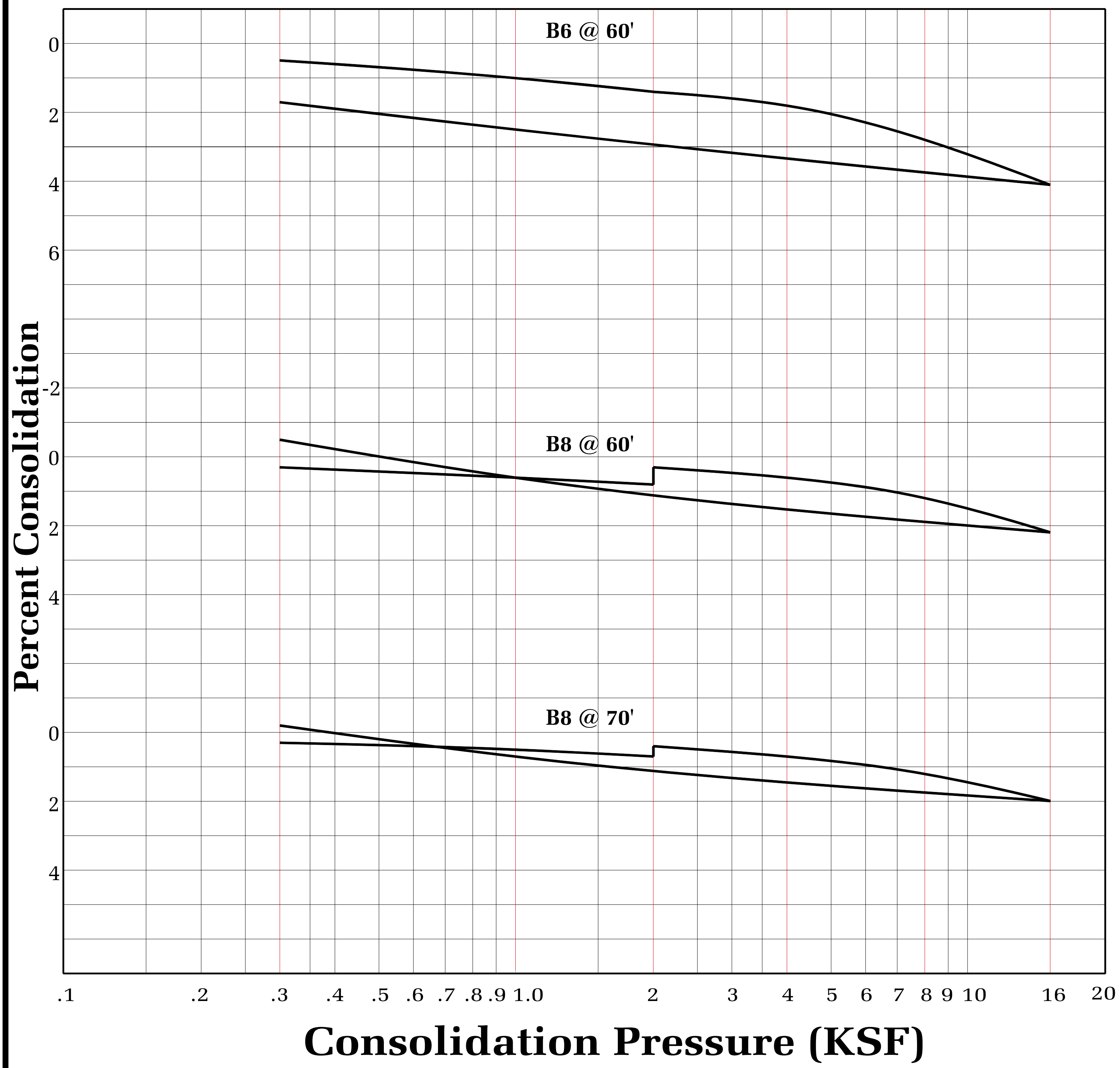
CONSOLIDATION TEST

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BOULEVARD, LLC
1111 SUNSET BLVD., LOS ANGELES

FILE NO. 21155

PLATE: C-4


WATER ADDED AT 2 KSF

CONSOLIDATION TEST

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BOULEVARD, LLC
1111 SUNSET BLVD., LOS ANGELES

FILE NO. 21155

PLATE: C-5

ASTM D 1557

SAMPLE	B1 @ 1- 5'	B3 @ 1- 5'	B4 @ 1-5'
SOIL TYPE:	SM/SHALE	SM/SHALE	SM/SHALE
MAXIMUM DENSITY pcf.	107.1	112.0	114.0
OPTIMUM MOISTURE %	18.5	15.8	15.9

ASTM D 4829

SAMPLE	B1 @ 1- 5'	B3 @ 1- 5'	B4 @ 1-5'
SOIL TYPE:	SM/SHALE	SM/SHALE	SM/SHALE
EXPANSION INDEX UBC STANDARD 18-2	35	17	43
EXPANSION CHARACTER	LOW	VERY LOW	LOW

SULFATE CONTENT

SAMPLE	B1 @ 35'	B1 @ 40'	B1 @ 50'	B1 @ 1'- 5'	B3 @ 1'- 5'	B4 @ 1'- 5'
SULFATE CONTENT: (percentage by weight)	< 0.10 %	< 0.10 %	< 0.10 %	< 0.10 %	< 0.10 %	< 0.10 %

SAMPLE	TP4 @ 1'- 5'	B3 @ 40'	B3 @ 55'	B3 @ 68'	B5 @ 57.5'	B5 @ 70'
SULFATE CONTENT: (percentage by weight)	< 0.10 %	< 0.10 %	< 0.10 %	< 0.20 %	> 0.20 %	> 0.20 %

COMPACTION/EXPANSION DATA SHEET

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BLVD., LLC.
1111 SUNSET BLVD., LOS ANGELES

FILE NO. 21155

PLATE: D-1

SULFATE CONTENT

SAMPLE	B6 @ 50'	B6 @ 60'	B8 @ 70'
SULFATE CONTENT: (percentage by weight)	< 0.10%	< 0.10%	> 0.20%

COMPACTION/EXPANSION/SULFATE DATA SHEET

Geotechnologies, Inc.
Consulting Geotechnical Engineers

1111 SUNSET BOULEVARD, LLC
1111 SUNSET BLVD., LOS ANGELES

FILE NO. 21155 **PLATE: D-2**

LOG OF TEST PIT 1

DIGGING EQUIPMENT: Hand Tools
DRIVING WEIGHT: 50 lbs w/24" drop
PIT DIMENSION: L 4' X 4' W

DATE EXCAVATED: 6/2 to 6/6/97
SURFACE ELEVATION: 397'±

DEPTH IN FEET	UND.	BULK	N	USC	MATERIAL DESCRIPTION	GEO-STRUCT'R	γ	MC	S	RC
-					FILL, silt, clayey, sli. sandy, numerous roots, brown, mod. compact					
-	■		18	ML-CL	COLLUVIUM, silt, clayey to silty clay, sli. porous, num. roots, dark-brown, firm		91	25.3		
-										
-					sand, very fine, silty, sli. clayey, massive, numerous roots, brown, compact					
5	■		24				101	19.1		
-										
-										
-										
-										
10					BEDROCK, tuff, silty to tuffaceous silty, very fine-grained, sandstone, massive, sli. to moderately indurated, highly weathered, tan, dense					
-										
-	■		39				95	23.4		
-										
-										
15										
-										
-										
-										
-					Total depth 12'					
20					No Groundwater					
-					No Caving					
-										
-										
-										
25										

LEGEND: B = bedding; J = joint; F = fault; SS = slide surface;
γ = dry unit weight(pcf); MC = moisture content(%);
S = degree of saturation(%); RC = relative compaction(%);
N = blows per foot; USC = unified soil classification

Proposed Sanctuary and Gymnasium buildings
1111 Sunset Blvd.
Los Angeles, California

PROJECT NO.: 1677-FG
PLATE: A-1

PIONEER SOILS ENGINEERING, INC.
CONSULTANT FOUNDATION ENGINEERS & ENGINEERING GEOLOGIST

LOG OF TEST PIT 2

DIGGING EQUIPMENT: Hand Tools
DRIVING WEIGHT: 50 lbs w/24" drop
PIT DIMENSION: L 5' x 4' W

DATE EXCAVATED: 6/1 to 6/6/97
SURFACE ELEVATION: 402'±

DEPTH IN FEET	UND.	BULK	N	USC	MATERIAL DESCRIPTION	GEO-STRUCT'R	γ	MC	S	RC
-					FILL, silt, sandy, sli. clayey, sli. gravelly, minor trash, mod. porous, num. roots, yellow-brown, sli. to mod. compact					
-	■		20				98	15.0		
-				ML	COLLUVIUM, silt, sli. clayey to clayey, sli. sandy, massive, numerous roots, dark brown to brown, moderately stiff					
-										
5										
-	■		23				104	19.8		
-										
-										
-										
10						N 70°E				
-	■		43		BEDROCK, siltstone, sandy siltstone and tuffaceous siltstone, mod. thin bedded, well indurated, mod. fractured, mod. weathered, brown to yellow-brown to tan, very firm	75°S	90	23.5		
-										
-										
-										
15										
-										
-										
-										
-										
20					Total depth 11.5'					
-					No Groundwater					
-					No Caving					
-										
-										
25										

LEGEND: B = bedding; J = joint; F = fault; SS = slide surface;
γ = dry unit weight(pcf); MC = moisture content(%);
S = degree of saturation(%); RC = relative compaction(%);
N = blows per foot; USC = unified soil classification

Proposed Sanctuary and Gymnasium Buildings
1111 Sunset Blvd.
Los Angeles, California

PROJECT NO.: 1677-FG
PLATE: A-2

PIONEER SOILS ENGINEERING, INC.
CONSULTANT FOUNDATION ENGINEERS & ENGINEERING GEOLOGIST

LOG OF TEST PIT 3

DIGGING EQUIPMENT: Hand Tools
DRIVING WEIGHT: 50 lbs w/24" drop
PIT DIMENSION: L 4' x 2½' W

DATE EXCAVATED: 6/1 to 6/6/97
SURFACE ELEVATION: 396'±

DEPTH IN FEET	UND.	BULK	N	USC	MATERIAL DESCRIPTION	GEO-STRUCT'R	γ	MC	S	RC
					FILL, silt, sandy to silty, very fine sand, sli. gravelly, some concrete & bricks, crudely layered, mod. porous, num. roots, brown to light brown, mod. compact					
5										
					BEDROCK, siltstone, sandy siltstone & silty, very fine-grained sandstone, mod. thin to thin-bedded, mod. well indurated, mod. fractured, mod. weathered, brown to tan to light gray, firm to very firm	N 78° E 70S				
	■		38				95	20.1		
10										
15										
					Total depth 9' No Groundwater No Caving					
20										
25										

LEGEND: B = bedding; J = joint; F = fault; SS = slide surface;
γ = dry unit weight(pcf); MC = moisture content(%);
S = degree of saturation(%); RC = relative compaction(%);
N = blows per foot; USC = unified soil classification

Proposed Sanctuary & Gymnasium Buildings
1111 Sunset Blvd.
Los Angeles, California

PROJECT NO.: 1677-FG
PLATE: A-3

PIONEER SOILS ENGINEERING, INC.
CONSULTANT FOUNDATION ENGINEERS & ENGINEERING GEOLOGIST

LOG OF TEST PIT 4

DIGGING EQUIPMENT: Hand tools
DRIVING WEIGHT: 50 lbs w/24" drop
PIT DIMENSION: L 3½' x 3' W

DATE EXCAVATED: 6/1 to 6/6/97
SURFACE ELEVATION: 395'±

DEPTH IN FEET	UND.	BULK	N	USC	MATERIAL DESCRIPTION	GEO-STRUCT'R	γ	MC	S	RC
					FILL, silt, sandy to sli. silty, fine sand, sli. gravelly, minor metal & concrete pieces, crudely layered, mod. porous, num. roots, brown to dark brown, sli. to mod. firm					
	■		17				101	18.2		
5										
					BEDROCK, sandstone, very fine-grained, silty to tuffaceous, mod. thick-bedded, mod. indurated, highly weathered, lt. gray to tan, dense	N 75° E 65°S				
	■		39				95	13.9		
10										
15										
					Total depth 8.5' No Groundwater No Caving					
20										
25										

LEGEND: B = bedding; J = joint; F = fault; SS = slide surface;
γ = dry unit weight(pcf); MC = moisture content(%);
S = degree of saturation(%); RC = relative compaction(%);
N = blows per foot; USC = unified soil classification

Proposed Sanctuary & Gymnasium Buildings
1111 Sunset Blvd.
Los Angeles, California

PROJECT NO.: 1677-FG
PLATE: A-4

PIONEER SOILS ENGINEERING, INC.
CONSULTANT FOUNDATION ENGINEERS & ENGINEERING GEOLOGIST

LOG OF BORING 1

DRILLING EQUIPMENT: 8" Ø power-driven hand auger
DRIVING WEIGHT: 50 lbs w/24" drop

DATE DRILLED: 5/30/97
SURFACE ELEVATION: 408.5'±

DEPTH IN FEET	UND.	BULK	N	USC	MATERIAL DESCRIPTION	γ	MC	S	RC
					FILL, silt, clayey, w/scattered brick fragments, scatt. roots, brown to dark brown, mod. firm				
	■		19		sli. sandy, scatt. concrete chunks & siltstone fragments	88	18.0		
5									
	■		39		BEDROCK, sandstone, fine to medium-grained, massive highly weathered, tan, dense	97	11.3		
10									
15									
					End of boring @ 8' No Groundwater No Caving				
20									
25									

LEGEND: B = bedding; J = joint; F = fault; SS = slide surface;
γ = dry unit weight(pcf); MC = moisture content(%);
S = degree of saturation(%); RC = relative compaction(%);
N = blows per foot; USC = unified soil classification

Proposed Sanctuary & Gymnasium Buildings
1111 Sunset Blvd.
Los Angeles, California

PROJECT NO.: 1677-FG

PLATE: A-5

PIONEER SOILS ENGINEERING, INC.

CONSULTANT FOUNDATION ENGINEERS & ENGINEERING GEOLOGIST

LOG OF BORING 2

DRILLING EQUIPMENT: 8" Ø power-driven hand auger
DRIVING WEIGHT: 50 lbs w/24" drop

DATE DRILLED 5/30/97
SURFACE ELEVATION: 406'±

DEPTH IN FEET	UND.	BULK	N	USC	MATERIAL DESCRIPTION	γ	MC	S	RC
					FILL, silt, clayey, sandy, scattered roots, brown to dark brown, firm to mod. firm				
	■		18			97	10.3		
					BEDROCK, sandstone, fine-grained & siltstone, highly weathered, yellow-brown				
	■		46			93	19.3		
5									
10									
					End of boring @ 5'				
15					No Groundwater				
					No Caving				
20									
25									

LEGEND: B = bedding; J = joint; F = fault; SS = slide surface;
γ = dry unit weight(pcf); MC = moisture content(%);
S = degree of saturation(%); RC = relative compaction(%);
N = blows per foot; USC = unified soil classification

Proposed Sanctuary & Gymnasium Buildings
1111 Sunset Blvd.
Los Angeles, California

PROJECT NO.: 1677-FG

PLATE: A-6

PIONEER SOILS ENGINEERING, INC.
CONSULTANT FOUNDATION ENGINEERS & ENGINEERING GEOLOGIST

LOG OF BORING 3

DRILLING EQUIPMENT: 8" Ø power-driven hand auger
DRIVING WEIGHT: 50 lbs w/24" drop

DATE DRILLED: 5/30/97
SURFACE ELEVATION:

DEPTH IN FEET	UND.	BULK	N	USC	MATERIAL DESCRIPTION	γ	MC	S	RC
					FILL, silt, clayey, w/scatt. brick fragments, scatt. roots, dark brown to brown, mod. firm				
	■		20		sli. sandy, scatt. concrete chunks & siltstone fragments	104	18.3		
5									
	■		37		BEDROCK, sandstone, very fine-grained, silty, massive, gray, highly weathered	95	17.6		
10									
					End of boring @ 10' No Groundwater No Caving				
15									
20									
25									

LEGEND: B = bedding; J = joint; F = fault; SS = slide surface;
γ = dry unit weight(pcf); MC = moisture content(%);
S = degree of saturation(%); RC = relative compaction(%);
N = blows per foot; USC = unified soil classification

Proposed Sanctuary & Gymnasium Buildings
1111 Sunset Blvd.
Los Angeles, California

PROJECT NO.: 1677-FG
PLATE: A-7

PIONEER SOILS ENGINEERING, INC.
CONSULTANT FOUNDATION ENGINEERS & ENGINEERING GEOLOGIST

LOG OF BORING 4

DRILLING EQUIPMENT: 8" Ø power-driven hand auger
DRIVING WEIGHT: 50 lbs w/24" drop

DATE DRILLED: 5/30/97
SURFACE ELEVATION:

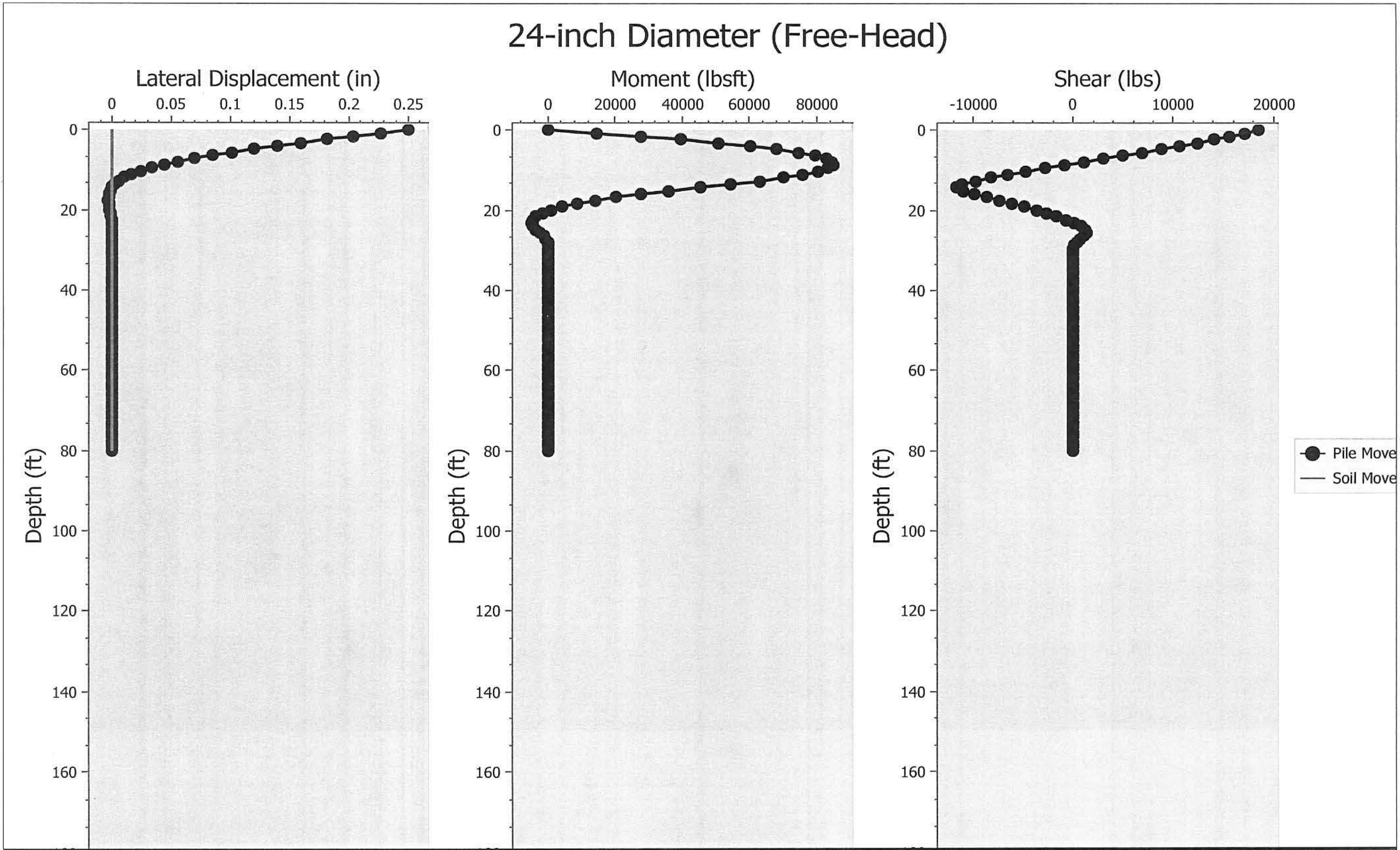
DEPTH IN FEET	UND.	BULK	N	USC	MATERIAL DESCRIPTION	γ	MC	S	RC
-					FILL, silt, sandy, scatt. gravels, scatt. concrete chunks, brown to dark brown, mod. firm				
-									
-	■		20			102	16.9		
-									
5					firm				
-	■		38		BEDROCK, sandstone, fine- to medium-grained & siltstone, highly weathered, lt. yellow-brown, dense	95	24.0		
-									
-									
-									
10									
-									
-									
-									
-					End of boring @ 7'				
15					No Groundwater				
-					No Caving				
-									
-									
-									
20									
-									
-									
-									
-									
25									

LEGEND: B = bedding; J = joint; F = fault; SS = slide surface;
γ = dry unit weight(pcf); MC = moisture content(%);
S = degree of saturation(%); RC = relative compaction(%);
N = blows per foot; USC = unified soil classification

Proposed Sanctuary & Gymnasium Buildings
1111 Sunset Blvd.
Los Angeles, California

PROJECT NO.: 1677-FG
PLATE: A-8

PIONEER SOILS ENGINEERING, INC.
CONSULTANT FOUNDATION ENGINEERS & ENGINEERING GEOLOGIST

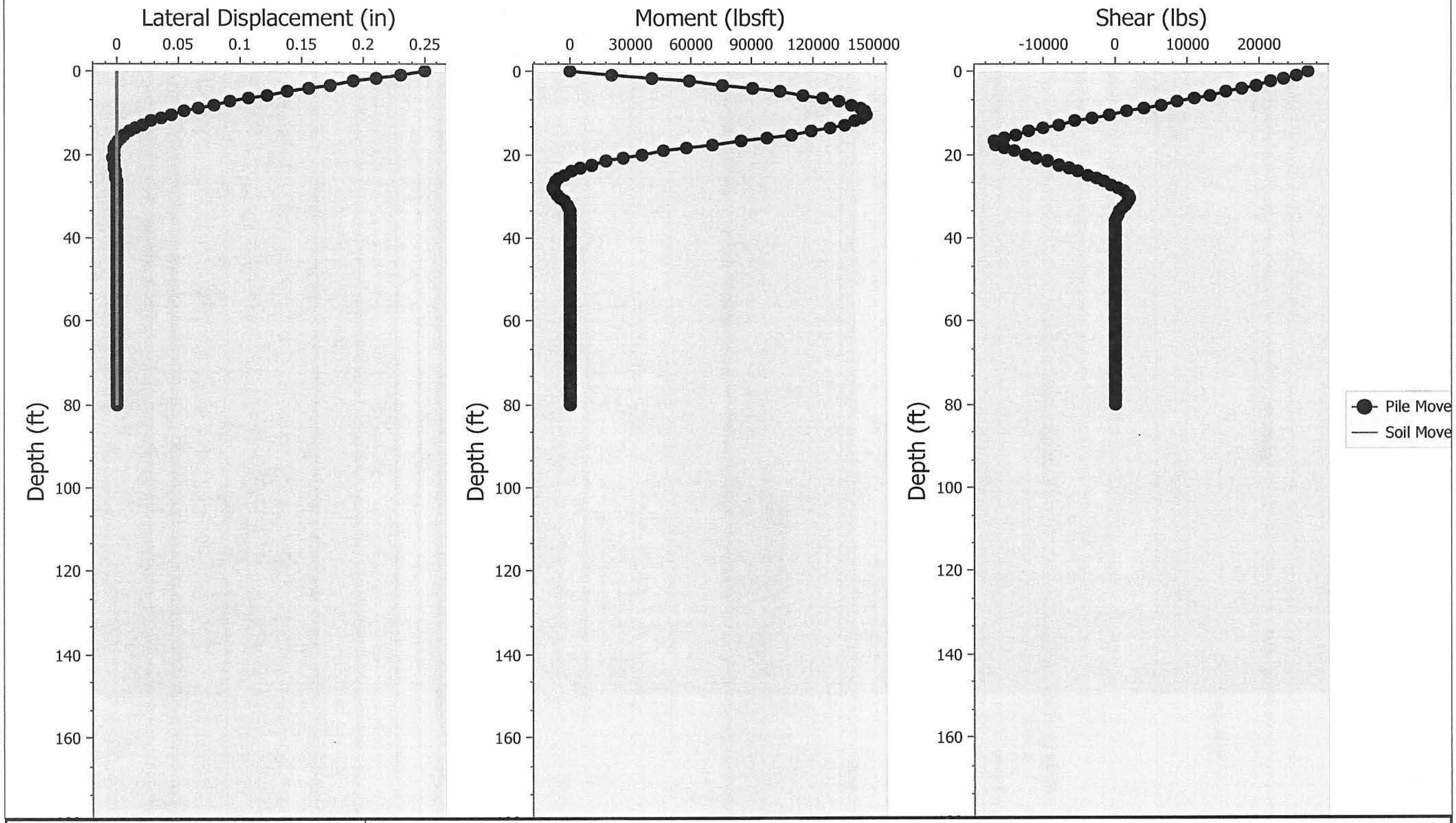


GEOTECHNOLOGIES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

RSPILE 1.006

Project	1111 Sunset Blvd.		
Analysis Description	Proposed Courtyard Buildings		
Drawn By	WL	*Company*	Geotechnologies, Inc.
Date	9/18/2017, 10:20:05 AM	*File Name*	21155_Courtyard.rspile

30-inch Diameter (Free-Head)

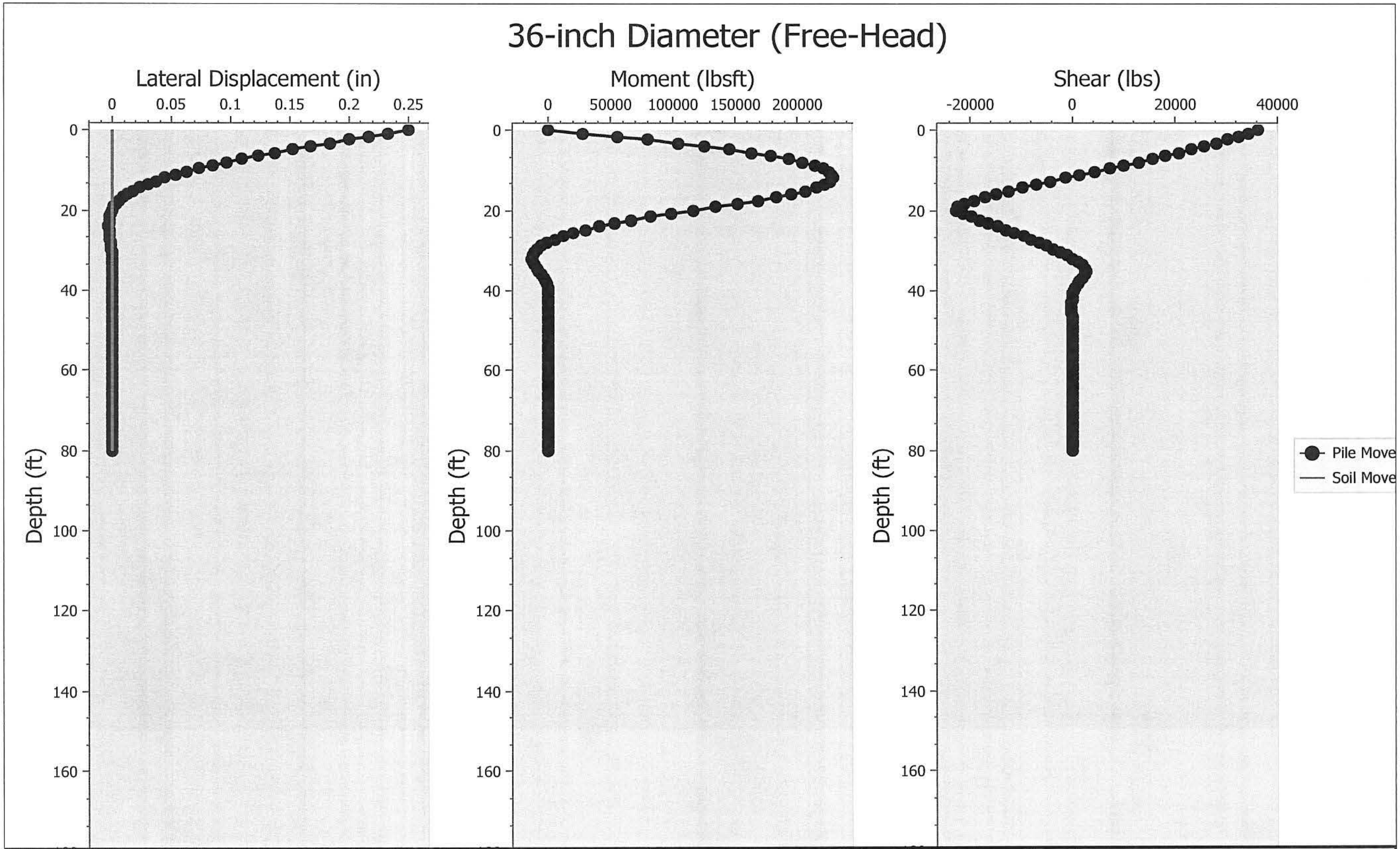


Project	1111 Sunset Blvd.
Analysis Description	Proposed Courtyard Buildings

Drawn By	WL	*Company*	Geotechnologies, Inc.
Date	9/18/2017, 10:20:05 AM	*File Name*	21155_Courtyard.rspile

GEOTECHNOLOGIES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

RSPILE 1.006



GEOTECHNOLOGIES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

RSPILE 1.006

Project: 1111 Sunset Blvd.

Analysis Description: Proposed Courtyard Buildings

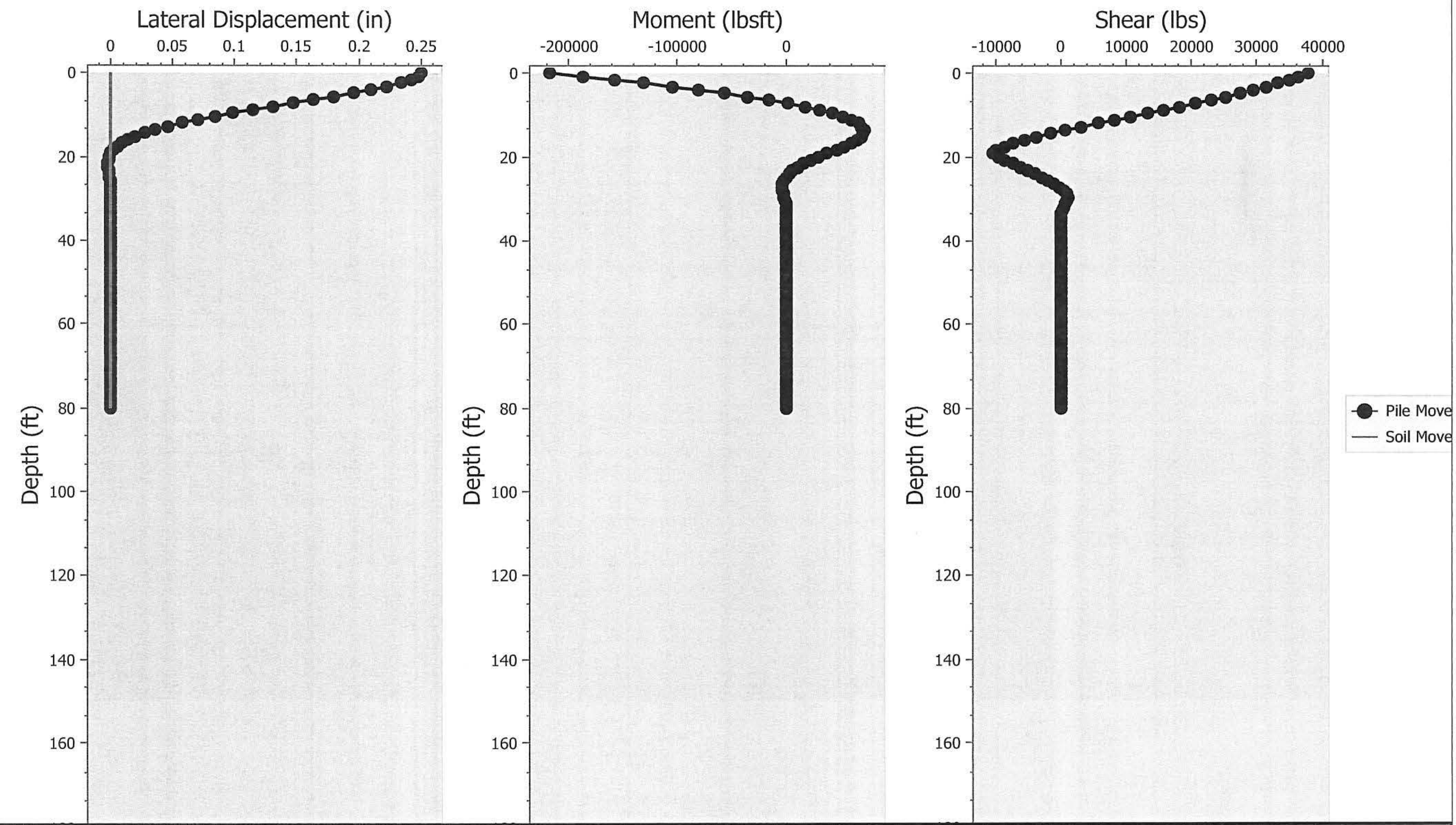
Drawn By: WL

Company: Geotechnologies, Inc.

Date: 9/18/2017, 10:20:05 AM

File Name: 21155_Courtyard.rspile

24-inch Diameter (Fixed-Head)



GEOTECHNOLOGIES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

RSPILE 1.006

Project
1111 Sunset Blvd.

Analysis Description
Proposed Courtyard Buildings

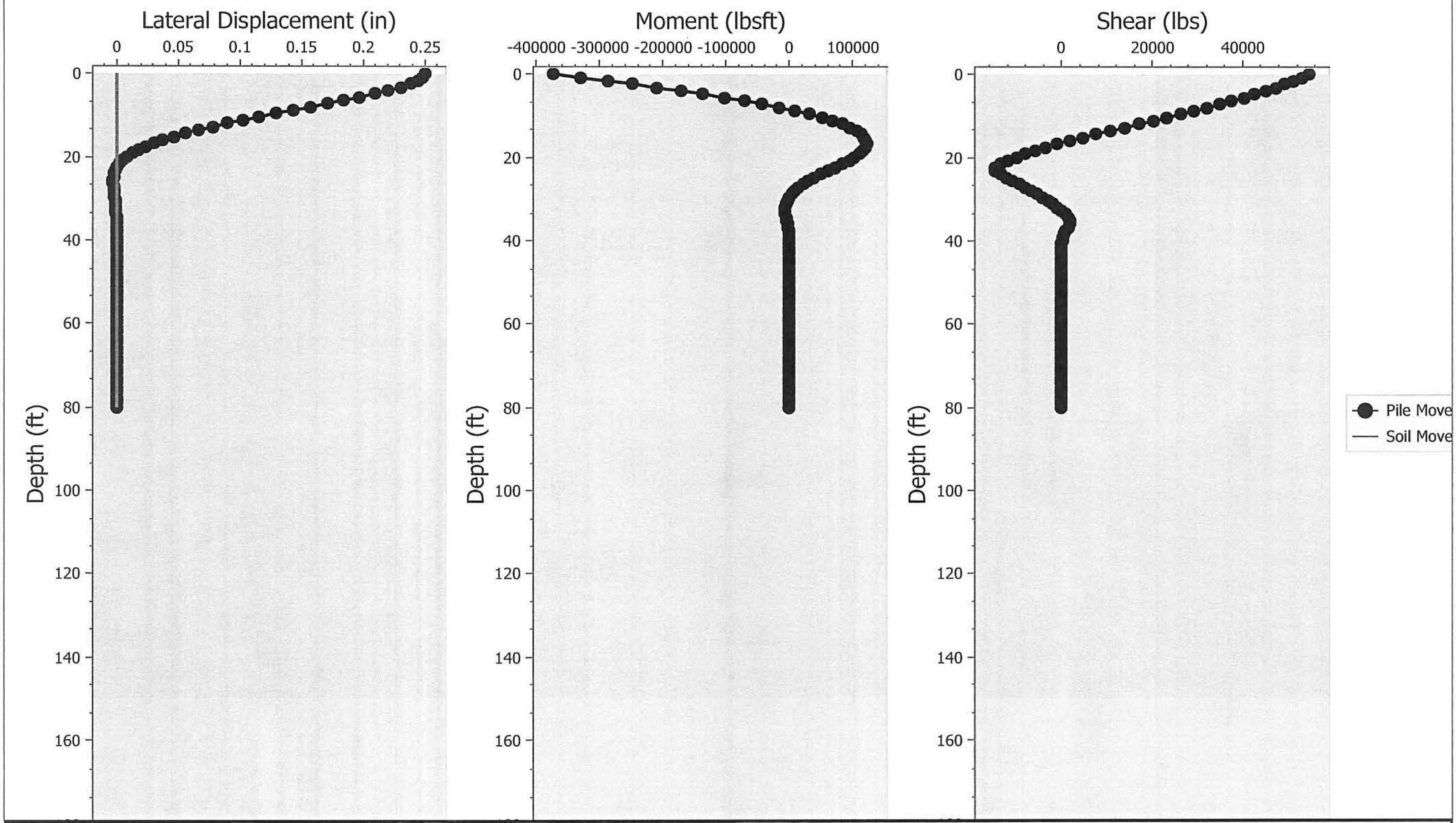
Drawn By
WL

Company
Geotechnologies, Inc.

Date
9/18/2017, 10:20:05 AM

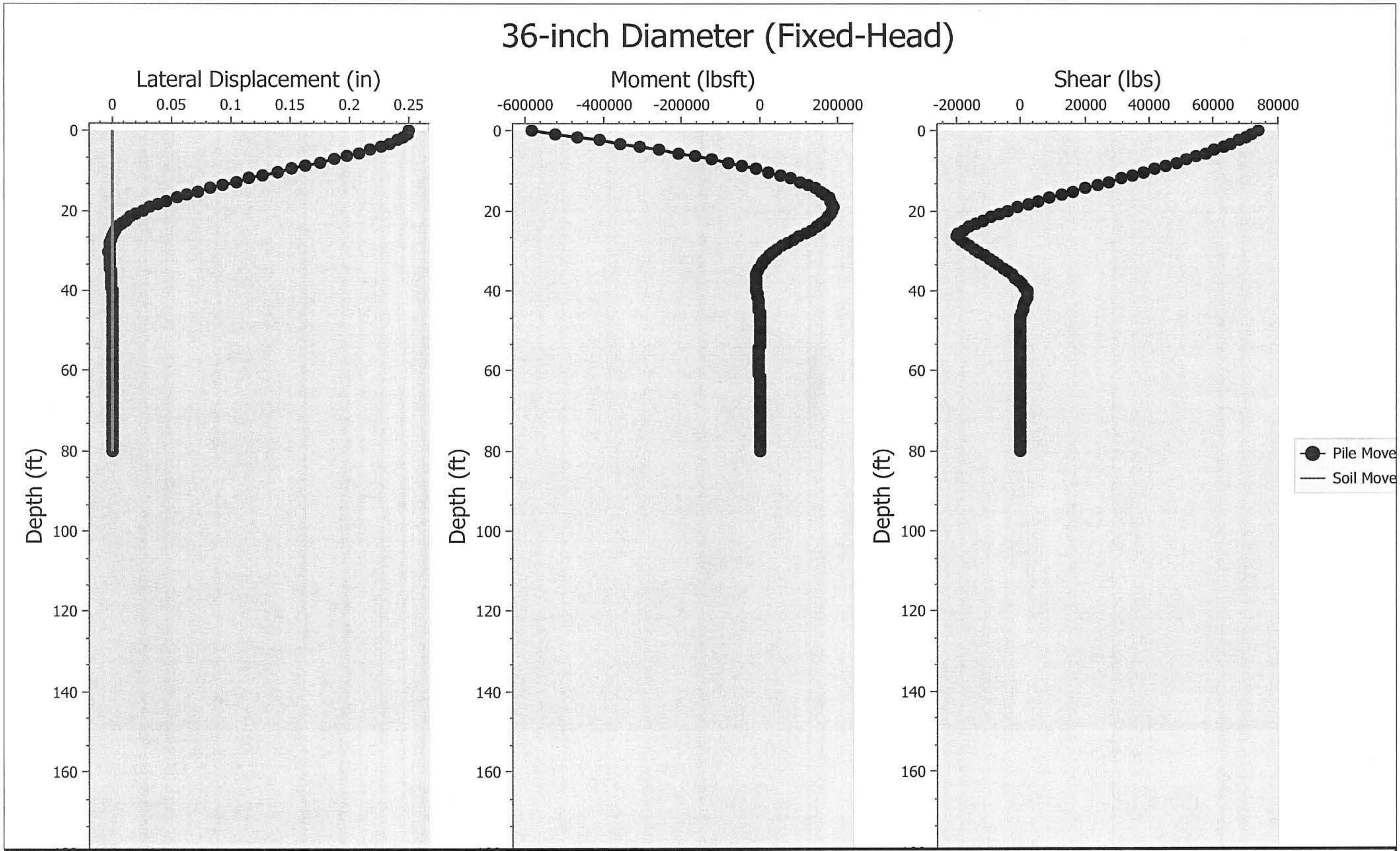
File Name
21155_Courtyard_(Fixed Head).rspile

30-inch Diameter (Fixed-Head)



GEOTECHNOLOGIES, INC.
CONSULTING GEOTECHNICAL ENGINEERS
RSPILE 1.006

Project	1111 Sunset Blvd.		
Analysis Description	Proposed Courtyard Buildings		
Drawn By	WL	*Company*	Geotechnologies, Inc.
Date	9/18/2017, 10:20:05 AM	*File Name*	21155_Courtyard_(Fixed Head).rspile



GEOTECHNOLOGIES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

RSPILE 1.006

Project	1111 Sunset Blvd.		
Analysis Description	Proposed Courtyard Buildings		
Drawn By	WL	*Company*	Geotechnologies, Inc.
Date	9/18/2017, 10:20:05 AM	*File Name*	21155_Courtyard_(Fixed Head).rspile

File NO. 21155 1111 Sunset Boulevard

Latitude, Longitude: 34.0665, -118.2487

Date	6/12/2020, 12:05:43 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	C - Very Dense Soil and Soft Rock

Type	Value	Description
S_S	2.017	MCE$_R$ ground motion. (for 0.2 second period)
S_1	0.719	MCE$_R$ ground motion. (for 1.0s period)
S_{MS}	2.42	Site-modified spectral acceleration value
S_{M1}	1.007	Site-modified spectral acceleration value
S_{DS}	1.613	Numeric seismic design value at 0.2 second SA
S_{D1}	0.671	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	D	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	1.4	Site amplification factor at 1.0 second
PGA	0.867	MCE$_G$ peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	1.04	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	2.017	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	2.256	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.478	Factored deterministic acceleration value. (0.2 second)
S1RT	0.719	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.804	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.78	Factored deterministic acceleration value. (1.0 second)
PGAd	0.999	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.894	Mapped value of the risk coefficient at short periods
C_{R1}	0.895	Mapped value of the risk coefficient at a period of 1 s

Geotechnologies, Inc.

Project: 1111 Sunset LLC
File No.: 21155
Sample: Bedrock
Depth: 0-5 feet

SHRINKAGE CALCULATIONS

Properties of In-situ Soils (Borrow)

. Dry Density = 103.9 pcf
Moisture Content = 13.9 %
Density Gravity Water = 62.4 pcf
Specific Gravity of Solids = 2.66

Calculations

VOL.		**Borrow**		WT.
	0.141	AIR	0.00	
0.992	0.230	WATER	14.32	103.04
	0.621	SOLIDS	103.04	

Properties of Engineered Fill Soils

Percent compaction = 92.0 %
Maximum Dry Density = 112.0 pcf
Dry Density = 103.0 pcf
Optimum Moisture Content = 15.8 %

Calculations

VOL.		**Fill**		WT.
	0.118	AIR	0.00	
1.000	0.261	WATER	16.28	119.32
	0.621	SOLIDS	103.04	

Shrinkage = -0.8%

Geotechnologies, Inc.

Project: 1111 Sunset Blvd., LLC
File No.: 21155
Description: Foundation Pile Design

Drilled Friction Pile Capacity Calculation

Input Data:

Unit Weight of Overlying Soil Layer	γ_1	0	pcf
Thickness of Overlying Soil Layer	H_1	0	feet
Unit Weight of Bearing Strata	γ_2	125	pcf
Friction Angle of Bearing Strata	ϕ_2	30	degrees
Friction Angle between Pile and Soil	δ	22.5	degrees
Cohesion of Bearing Strata	c_2	560	psf
Adhesion	c_A	500	psf
Minimum Embedment into Bearing Strata	H_2	30	feet
Unit Weight of Water	γ_w	62.4	pcf
Depth to Groundwater from Pile Cap	H_w	0	feet

Pile Design:

Drilled <<Driven/Drilled
Circular <<Circular/Square Pile

Pile Dimension:

24 inch diameter pile
30 inch diameter pile
36 inch diameter pile

Critical Depth Limit (Dc):

20 B

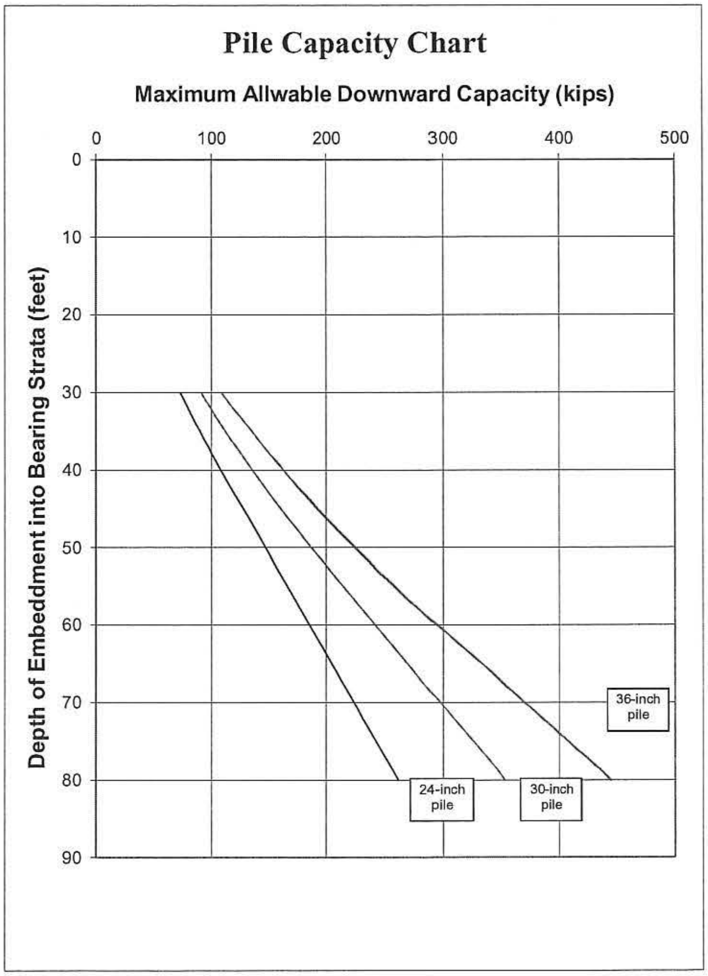
Lateral Earth Pressure Coefficient: $K_{HC} = 0.70$

Applied Factor of Safety: $FS = 2$

Factored Skin Friction $f_s/FS = [K_{HC}*\sigma'_v*(\tan \delta)]/FS$ **or** $fs/FS = c_A/FS$

Pile Capacity:

Total Depth of Pile (feet)	Depth of Embeddment into Bearing Strata (feet)	Maximum Allowable Downward Pile Capacity Capacity of 24 inch diameter pile (kips)	Capacity of 30 inch diameter pile (kips)	Capacity of 36 inch diameter pile (kips)
30	30	72.8	91.0	109.2
31	31	76.1	95.1	114.1
32	32	79.5	99.3	119.2
33	33	82.9	103.6	124.3
34	34	86.4	108.0	129.5
35	35	89.9	112.4	134.9
36	36	93.5	116.9	140.2
37	37	97.2	121.4	145.7
38	38	100.9	126.1	151.3
39	39	104.6	130.8	156.9
40	40	108.4	135.6	162.7
41	41	112.3	140.4	168.5
42	42	116.2	145.3	174.4
43	43	120.0	150.3	180.4
44	44	123.9	155.4	186.5
45	45	127.7	160.5	192.6
46	46	131.6	165.7	198.9
47	47	135.4	171.0	205.2
48	48	139.3	176.4	211.6
49	49	143.1	181.8	218.1
50	50	147.0	187.3	224.7
51	51	150.8	192.8	231.4
52	52	154.7	198.3	238.2
53	53	158.5	203.9	245.0
54	54	162.4	209.4	251.9
55	55	166.2	214.9	259.0
56	56	170.1	220.4	266.1
57	57	173.9	226.0	273.3
58	58	177.8	231.5	280.5
59	59	181.6	237.0	287.9
60	60	185.5	242.5	295.3
61	61	189.3	248.1	302.8
62	62	193.2	253.6	310.3
63	63	197.0	259.1	317.8
64	64	200.9	264.7	325.3
65	65	204.7	270.2	332.8
66	66	208.6	275.7	340.3
67	67	212.4	281.2	347.8
68	68	216.3	286.8	355.2
69	69	220.1	292.3	362.7
70	70	224.0	297.8	370.2
71	71	227.9	303.3	377.7
72	72	231.7	308.9	385.2
73	73	235.6	314.4	392.7
74	74	239.4	319.9	400.2
75	75	243.3	325.5	407.7
76	76	247.1	331.0	415.1
77	77	251.0	336.5	422.6
78	78	254.8	342.0	430.1
79	79	258.7	347.6	437.6
80	80	262.5	353.1	445.1



Note: 1. Minimum pile embeddment depth of 30 feet
2. Uplift capacity may be designed using 50% of the downward capacity
3. Pile should be spaced a minimum of 3 diameters on center
4. See text of report for pile details and installation recommendations

Geotechnologies, Inc.

Project: 2111 SUNSET Boulevard, LLC
File No.: 21155
Geologic Material Bedrock, ~~daylighted~~ oblique orientation

Soil Weight	γ	125	pcf
Internal Friction Angle	ϕ	32	degrees
Cohesion	c	200	psf
Height of Retaining Wall	H	80	feet

Cantilever Retaining Wall Design based on At Rest Earth Pressure

$\sigma'_h = K_o\sigma'_v$

$K_o = 1 - \sin\phi$ 0.470

$\sigma'_v = \gamma H$ 10000.0 psf

$\sigma'_h =$ 4700.8 psf

EFP = 58.8 pcf

$P_o =$ 188032.3 lbs/ft (based on a triangular distribution of pressure)

Design wall for an EFP of 59 pcf

Restrained Wall Design based on At Rest Earth Pressure

$P_o =$ 188032.3 lbs/ft

$\sigma'_{h,\,max} =$ 36.7 H (based on a trapezoidal distribution of pressure)

$\sigma'_{h,\,max} =$ 2350.4 psf

Design restrained wall for 38 H

Geotechnologies, Inc.

Project: 2111 Sunset, LLC
File No.: 21155
Description: Oblique Bedding

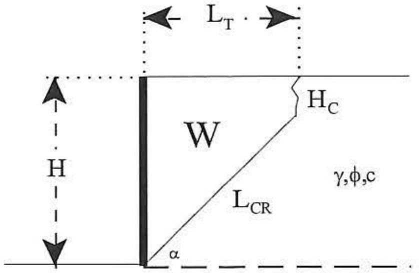
Retaining Wall Design with Level Backfill
(Vector Analysis)

Input:

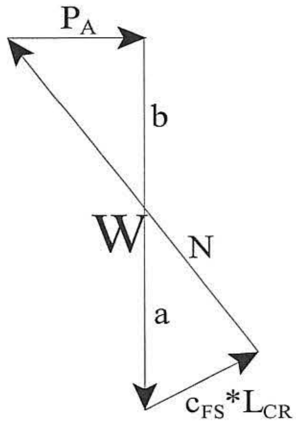
Retaining Wall Height	(H)	10.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	32.0 degrees
Cohesion of Retained Soils	(c)	200.0 psf
Factor of Safety	(FS)	1.50

28

Factored Parameters:	(ϕ_{FS})	22.6 degrees
	(c_{FS})	133.3 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) $feet^2$	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
30	8.8	19	2353.8	2.3	2209.7	144.1	18.7
31	7.9	32	3946.1	4.1	3477.7	468.4	69.0
32	7.1	39	4930.7	5.4	4101.4	829.2	137.0
33	6.5	44	5541.1	6.4	4371.2	1169.9	214.4
34	6.0	47	5911.3	7.1	4441.3	1470.0	296.0
35	5.6	49	6122.1	7.7	4397.7	1724.4	378.6
36	5.3	50	6224.3	8.1	4289.8	1934.5	460.3
37	5.0	50	6251.2	8.4	4146.8	2104.4	539.7
38	4.7	50	6225.0	8.6	3986.4	2238.6	616.0
39	4.5	49	6161.0	8.8	3819.2	2341.8	688.5
40	4.3	49	6069.9	8.9	3651.7	2418.3	757.1
41	4.1	48	5959.5	8.9	3487.7	2471.8	821.5
42	4.0	47	5835.1	9.0	3329.6	2505.5	881.6
43	3.9	46	5701.0	9.0	3178.5	2522.4	937.3
44	3.8	44	5560.0	9.0	3035.1	2524.9	988.7
45	3.7	43	5414.3	9.0	2899.4	2514.9	1035.8
46	3.6	42	5265.8	8.9	2771.4	2494.4	1078.6
47	3.5	41	5115.5	8.9	2650.8	2464.7	1117.2
48	3.4	40	4964.4	8.8	2537.3	2427.2	1151.7
49	3.4	39	4813.3	8.8	2430.4	2382.9	1182.1
50	3.3	37	4662.7	8.7	2329.8	2332.9	1208.5
51	3.3	36	4512.9	8.6	2235.0	2277.9	1230.8
52	3.3	35	4364.2	8.6	2145.7	2218.6	1249.3
53	3.2	34	4216.9	8.5	2061.3	2155.6	1263.9
54	3.2	33	4071.0	8.4	1981.6	2089.4	1274.6
55	3.2	31	3926.7	8.3	1906.2	2020.5	1281.5



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A, max}$ 1281.5 | lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of wall)

$EFP = 2*P_A/H^2$

EFP 25.6 pcf

Design Wall for an Equivalent Fluid Pressure: 26 pcf

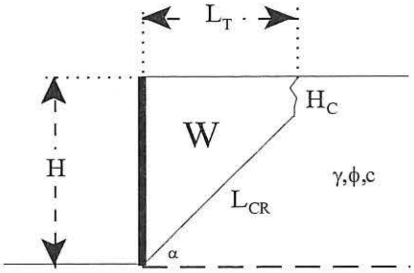
Geotechnologies, Inc.

Project: 1111 Sunset Blvd., LLC
File No.: 21155
Description: ~~Retaining Walls up to 20 feet~~ OBLIQUE BENDING

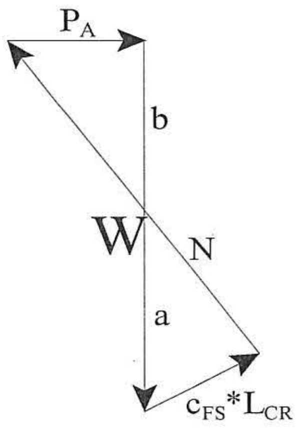
Retaining Wall Design with Level Backfill
(Vector Analysis)

Input:

Retaining Wall Height	(H)	20.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	32.0 degrees
Cohesion of Retained Soils	(c)	200.0 psf
Factor of Safety	(FS)	1.50
Factored Parameters:	(ϕ_{FS})	22.6 degrees
	(c_{FS})	133.3 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
44	3.8	200	24976.1	23.4	7894.4	17081.7	6688.9
45	3.7	193	24164.3	23.1	7470.2	16694.2	6875.5
46	3.6	187	23372.4	22.8	7082.4	16290.0	7044.1
47	3.5	181	22600.1	22.6	6727.1	15873.1	7195.1
48	3.4	175	21847.0	22.3	6400.7	15446.3	7329.3
49	3.4	169	21112.5	22.0	6100.2	15012.2	7447.0
50	3.3	163	20395.8	21.8	5823.0	14572.9	7548.8
51	3.3	158	19696.4	21.5	5566.5	14129.8	7635.0
52	3.3	152	19013.3	21.2	5328.9	13684.4	7705.9
53	3.2	147	18346.0	21.0	5108.3	13237.8	7761.7
54	3.2	142	17693.7	20.7	4903.0	12790.8	7802.7
55	3.2	136	17055.6	20.5	4711.5	12344.1	7829.1
56	3.2	131	16431.0	20.3	4532.7	11898.3	7840.8
57	3.2	127	15819.2	20.0	4365.4	11453.8	7838.0
58	3.2	122	15219.6	19.8	4208.5	11011.1	7820.7
59	3.2	117	14631.5	19.6	4061.1	10570.4	7788.7
60	3.2	112	14054.1	19.3	3922.3	10131.8	7742.0
61	3.3	108	13487.1	19.1	3791.4	9695.7	7680.4
62	3.3	103	12929.7	18.9	3667.6	9262.0	7603.7
63	3.3	99	12381.3	18.7	3550.4	8830.9	7511.6
64	3.4	95	11841.4	18.5	3439.0	8402.5	7403.7
65	3.5	90	11309.5	18.3	3332.9	7976.6	7279.7
66	3.5	86	10785.1	18.0	3231.6	7553.5	7139.1
67	3.6	82	10267.5	17.8	3134.5	7133.0	6981.4
68	3.7	78	9756.4	17.6	3041.1	6715.2	6806.0
69	3.8	74	9251.1	17.4	2950.9	6300.1	6612.2



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 7840.81 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of wall)

$EFP = 2*P_A/H^2$

EFP 39.2 pcf

Design Wall for an Equivalent Fluid Pressure: 40 pcf

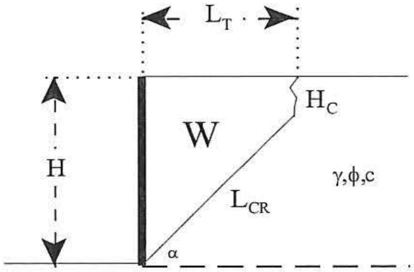
Geotechnologies, Inc.

Project: 1111 Sunset Blvd., LLC
File No.: 21155
Description: ~~Retaining Walls up to 30 feet~~ BEDROCK, OBLIQUE BEDDING

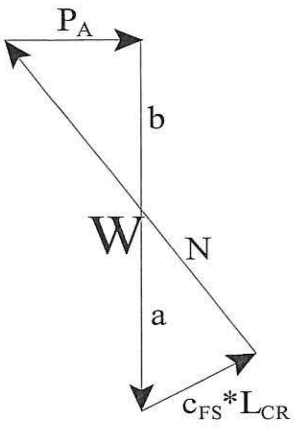
Retaining Wall Design with Level Backfill
(Vector Analysis)

Input:

Retaining Wall Height	(H)	30.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	32.0 degrees
Cohesion of Retained Soils	(c)	200.0 psf
Factor of Safety	(FS)	1.50
Factored Parameters:	(ϕ_{FS})	22.6 degrees
	(c_{FS})	133.3 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) $feet^2$	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
44	3.8	459	57336.5	37.8	12753.7	44582.8	17457.8
45	3.7	443	55414.3	37.3	12040.9	43373.4	17863.4
46	3.6	428	53550.2	36.7	11393.4	42156.8	18229.2
47	3.5	414	51741.2	36.2	10803.4	40937.9	18556.8
48	3.4	400	49984.6	35.7	10264.1	39720.5	18847.4
49	3.4	386	48277.7	35.3	9770.0	38507.6	19102.3
50	3.3	373	46617.7	34.8	9316.1	37301.6	19322.4
51	3.3	360	45002.1	34.4	8898.1	36104.0	19508.7
52	3.3	347	43428.5	33.9	8512.2	34916.3	19661.8
53	3.2	335	41894.6	33.5	8155.2	33739.4	19782.4
54	3.2	323	40398.2	33.1	7824.3	32573.9	19871.0
55	3.2	311	38937.1	32.7	7516.9	31420.2	19927.9
56	3.2	300	37509.4	32.3	7230.8	30278.6	19953.2
57	3.2	289	36113.2	32.0	6964.1	29149.2	19947.2
58	3.2	278	34746.8	31.6	6714.9	28031.9	19909.7
59	3.2	267	33408.3	31.2	6481.7	26926.7	19840.7
60	3.2	257	32096.3	30.9	6263.1	25833.3	19739.9
61	3.3	246	30809.2	30.6	6057.7	24751.5	19606.8
62	3.3	236	29545.6	30.2	5864.5	23681.0	19441.0
63	3.3	226	28304.0	29.9	5682.4	22621.6	19241.8
64	3.4	217	27083.1	29.6	5510.4	21572.7	19008.5
65	3.5	207	25881.7	29.3	5347.5	20534.1	18740.0
66	3.5	198	24698.5	29.0	5193.0	19505.5	18435.3
67	3.6	188	23532.4	28.7	5046.1	18486.3	18093.2
68	3.7	179	22382.2	28.4	4906.0	17476.2	17712.3
69	3.8	170	21246.8	28.1	4771.9	16474.9	17290.9



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 19953.22 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of wall)

$EFP = 2*P_A/H^2$

EFP 44.3 pcf

Design Wall for an Equivalent Fluid Pressure: 45 pcf

Geotechnologies, Inc.

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Geologic Material Bedrock, Daylighted

Soil Weight	γ	125 pcf
Internal Friction Angle	ϕ	13 degrees
Cohesion	c	255 psf
Height of Retaining Wall	H	80 feet

Cantilever Retaining Wall Design based on At Rest Earth Pressure

$\sigma'_h = K_o\sigma'_v$

$K_o = 1 - \sin\phi$ 0.775

$\sigma'_v = \gamma H$ 10000.0 psf

$\sigma'_h =$ 7750.5 psf

EFP = 96.9 pcf

$P_o =$ 310019.6 lbs/ft (based on a triangular distribution of pressure)

Design wall for an EFP of 97 pcf

Restrained Wall Design based on At Rest Earth Pressure

$P_o =$ 310019.6 lbs/ft

$\sigma'_{h,\,max} =$ 60.6 H (based on a trapezoidal distribution of pressure)

$\sigma'_{h,\,max} =$ 3875.2 psf

Design restrained wall for 61 H

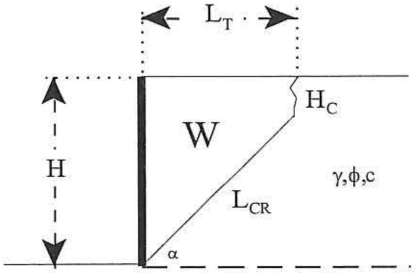
Geotechnologies, Inc.

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Description: Bedrock Daylighted

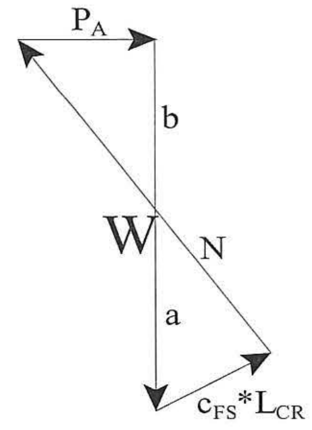
Retaining Wall Design with Level Backfill
(Vector Analysis)

Input:

Retaining Wall Height	(H)	10.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.50
Factored Parameters:	(ϕ_{FS})	8.7 degrees
	(c_{FS})	170.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	3.4	53	6596.3	10.3	3334.4	3261.9	1979.4
41	3.3	51	6388.8	10.2	3197.6	3191.3	2013.6
42	3.3	49	6185.9	10.0	3068.9	3117.0	2043.6
43	3.3	48	5987.5	9.9	2947.9	3039.6	2069.6
44	3.2	46	5793.6	9.7	2834.0	2959.6	2091.7
45	3.2	45	5604.1	9.6	2726.6	2877.4	2109.8
46	3.2	43	5418.7	9.5	2625.3	2793.5	2124.2
47	3.2	42	5237.5	9.3	2529.5	2708.0	2134.8
48	3.2	40	5060.2	9.2	2438.9	2621.4	2141.7
49	3.2	39	4886.7	9.0	2353.0	2533.7	2145.0
50	3.2	38	4716.9	8.9	2271.5	2445.3	2144.5
51	3.2	36	4550.4	8.8	2194.1	2356.3	2140.4
52	3.2	35	4387.2	8.6	2120.3	2266.9	2132.5
53	3.2	34	4227.2	8.5	2050.0	2177.2	2121.0
54	3.2	33	4070.1	8.4	1982.7	2087.3	2105.6
55	3.2	31	3915.7	8.2	1918.3	1997.4	2086.5
56	3.3	30	3763.9	8.1	1856.5	1907.4	2063.5
57	3.3	29	3614.6	8.0	1797.0	1817.6	2036.5
58	3.3	28	3467.6	7.8	1739.6	1728.0	2005.4
59	3.4	27	3322.7	7.7	1684.1	1638.6	1970.2
60	3.4	25	3179.7	7.6	1630.2	1549.5	1930.6
61	3.5	24	3038.5	7.4	1577.7	1460.8	1886.6
62	3.6	23	2898.9	7.3	1526.3	1372.5	1838.1
63	3.6	22	2760.7	7.1	1475.9	1284.8	1784.7
64	3.7	21	2623.8	7.0	1426.1	1197.7	1726.4
65	3.8	20	2488.0	6.8	1376.8	1111.2	1663.0



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 2145.0 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of wall)

$EFP = 2*P_A/H^2$

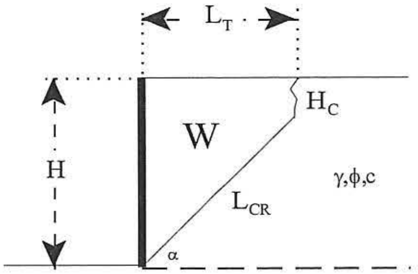
EFP 42.9 pcf

Design Wall for an Equivalent Fluid Pressure: 43 pcf

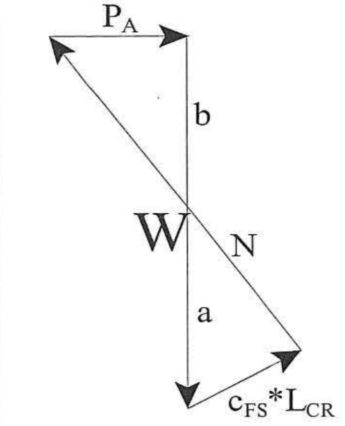
Retaining Wall Design with Level Backfill
(Vector Analysis)

Input:

Retaining Wall Height	(H)	20.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.50
Factored Parameters:	(ϕ_{FS})	8.7 degrees
	(c_{FS})	170.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	3.4	232	28941.7	25.9	8373.1	20568.6	12481.4
41	3.3	224	27958.3	25.4	7997.0	19961.2	12594.7
42	3.3	216	27009.9	25.0	7648.7	19361.3	12693.9
43	3.3	209	26094.5	24.5	7325.4	18769.1	12779.5
44	3.2	202	25209.8	24.1	7024.9	18184.9	12851.9
45	3.2	195	24354.1	23.7	6745.1	17608.9	12911.5
46	3.2	188	23525.4	23.4	6484.2	17041.2	12958.5
47	3.2	182	22722.2	23.0	6240.4	16481.8	12993.2
48	3.2	176	21942.8	22.6	6012.3	15930.5	13015.8
49	3.2	169	21185.9	22.3	5798.6	15387.2	13026.3
50	3.2	164	20450.0	22.0	5598.1	14851.9	13024.8
51	3.2	158	19733.9	21.6	5409.6	14324.2	13011.3
52	3.2	152	19036.3	21.3	5232.2	13804.1	12985.7
53	3.2	147	18356.3	21.0	5065.0	13291.3	12947.9
54	3.2	142	17692.7	20.7	4907.1	12785.6	12897.8
55	3.2	136	17044.6	20.5	4757.8	12286.8	12835.0
56	3.3	131	16411.0	20.2	4616.5	11794.5	12759.3
57	3.3	126	15791.0	19.9	4482.4	11308.7	12670.3
58	3.3	121	15183.9	19.6	4354.9	10829.0	12567.7
59	3.4	117	14588.8	19.4	4233.6	10355.2	12450.8
60	3.4	112	14005.0	19.1	4117.9	9887.1	12319.1
61	3.5	107	13431.7	18.9	4007.3	9424.5	12171.9
62	3.6	103	12868.4	18.6	3901.3	8967.1	12008.5
63	3.6	99	12314.3	18.4	3799.4	8514.8	11827.9
64	3.7	94	11768.8	18.1	3701.3	8067.5	11629.3
65	3.8	90	11231.2	17.8	3606.4	7624.8	11411.4



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 13026.3 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of wall)

$EFP = 2*P_A/H^2$

EFP 65.1 pcf

Design Wall for an Equivalent Fluid Pressure: 65 pcf

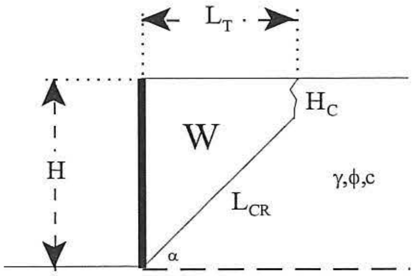
Geotechnologies, Inc.

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Description: Bedrock Daylighted

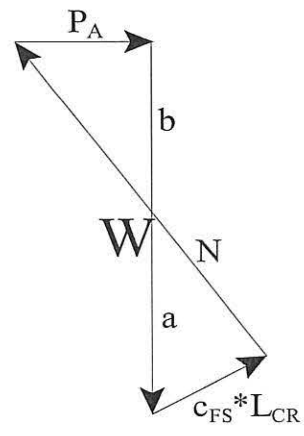
Retaining Wall Design with Level Backfill
(Vector Analysis)

Input:

Retaining Wall Height	(H)	30.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.50
Factored Parameters:	(ϕ_{FS})	8.7 degrees
	(c_{FS})	170.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) $feet^2$	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	3.4	529	66184.0	41.4	13411.8	52772.2	32023.1
41	3.3	511	63907.3	40.6	12796.5	51110.8	32248.7
42	3.3	494	61716.6	39.9	12228.4	49488.2	32446.0
43	3.3	477	59606.0	39.2	11702.9	47903.1	32616.3
44	3.2	461	57570.1	38.5	11215.8	46354.3	32760.2
45	3.2	445	55604.1	37.9	10763.6	44840.4	32878.6
46	3.2	430	53703.2	37.3	10343.1	43360.1	32972.0
47	3.2	415	51863.3	36.7	9951.3	41912.0	33040.9
48	3.2	401	50080.4	36.1	9585.8	40494.6	33085.7
49	3.2	387	48351.1	35.5	9244.3	39106.8	33106.5
50	3.2	373	46671.8	35.0	8924.7	37747.2	33103.5
51	3.2	360	45039.6	34.5	8625.2	36414.5	33076.7
52	3.2	348	43451.5	34.0	8344.1	35107.4	33025.9
53	3.2	335	41904.9	33.6	8080.0	33824.9	32950.9
54	3.2	323	40397.2	33.1	7831.5	32565.7	32851.3
55	3.2	311	38926.1	32.7	7597.3	31328.7	32726.6
56	3.3	300	37489.4	32.2	7376.4	30113.0	32576.2
57	3.3	289	36085.0	31.8	7167.7	28917.3	32399.3
58	3.3	278	34711.1	31.4	6970.3	27740.8	32195.0
59	3.4	267	33365.7	31.0	6783.2	26582.5	31962.2
60	3.4	256	32047.2	30.7	6605.6	25441.5	31699.7
61	3.5	246	30753.9	30.3	6436.9	24317.0	31406.0
62	3.6	236	29484.3	29.9	6276.3	23208.1	31079.5
63	3.6	226	28237.0	29.6	6123.0	22113.9	30718.4
64	3.7	216	27010.4	29.2	5976.5	21033.9	30320.4
65	3.8	206	25803.4	28.9	5836.1	19967.2	29883.2



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A, max}$ 33106.5 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of wall)

$EFP = 2*P_A/H^2$

EFP 73.6 pcf

Design Wall for an Equivalent Fluid Pressure: 74 pcf

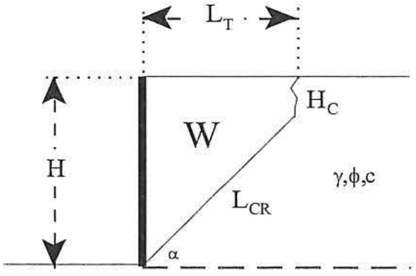
Geotechnologies, Inc.

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Description: Bedrock Daylighted

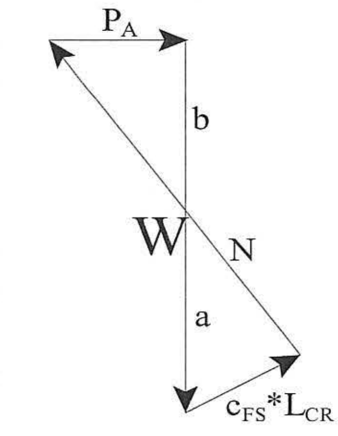
Retaining Wall Design with Level Backfill
(Vector Analysis)

Input:

Retaining Wall Height	(H)	40.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.50
Factored Parameters:	(ϕ_{FS})	8.7 degrees
	(c_{FS})	170.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	3.4	947	118323.2	57.0	18450.5	99872.7	60604.6
41	3.3	914	114235.9	55.9	17595.9	96639.9	60975.6
42	3.3	882	110305.9	54.8	16808.1	93497.7	61300.1
43	3.3	852	106522.1	53.9	16080.3	90441.8	61580.0
44	3.2	823	102874.6	52.9	15406.7	87467.9	61816.5
45	3.2	795	99354.1	52.0	14782.1	84572.0	62011.0
46	3.2	768	95952.1	51.2	14202.0	81750.1	62164.5
47	3.2	741	92660.8	50.3	13662.2	78998.6	62277.8
48	3.2	716	89473.1	49.6	13159.3	76313.9	62351.4
49	3.2	691	86382.4	48.8	12689.9	73692.5	62385.6
50	3.2	667	83382.4	48.1	12251.2	71131.2	62380.7
51	3.2	644	80467.7	47.4	11840.7	68627.0	62336.7
52	3.2	621	77632.8	46.7	11456.0	66176.8	62253.2
53	3.2	599	74872.9	46.1	11095.0	63777.9	62130.0
54	3.2	577	72183.4	45.5	10755.9	61427.5	61966.3
55	3.2	556	69560.2	44.9	10436.8	59123.3	61761.3
56	3.3	536	66999.1	44.3	10136.4	56862.7	61514.1
57	3.3	516	64496.6	43.8	9853.1	54643.5	61223.2
58	3.3	496	62049.1	43.2	9585.6	52463.5	60887.2
59	3.4	477	59653.3	42.7	9332.7	50320.6	60504.3
60	3.4	458	57306.3	42.2	9093.4	48212.9	60072.3
61	3.5	440	55004.9	41.7	8866.5	46138.4	59588.9
62	3.6	422	52746.6	41.3	8651.2	44095.4	59051.2
63	3.6	404	50528.7	40.8	8446.6	42082.1	58456.1
64	3.7	387	48348.7	40.4	8251.7	40097.0	57799.9
65	3.8	370	46204.3	39.9	8065.8	38138.5	57078.6



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 62385.6 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of wall)

$EFP = 2*P_A/H^2$

EFP 78.0 pcf

Design Wall for an Equivalent Fluid Pressure: 78 pcf

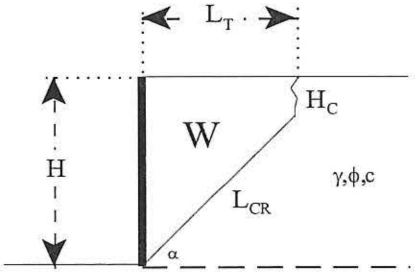
Geotechnologies, Inc.

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Description: Bedrock Daylighted

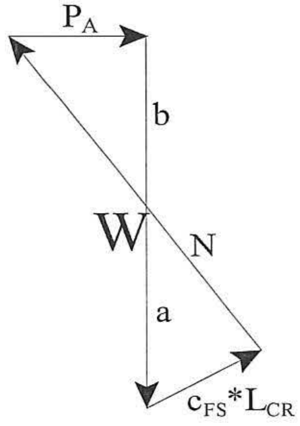
Retaining Wall Design with Level Backfill
(Vector Analysis)

Input:

Retaining Wall Height	(H)	50.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.50
Factored Parameters:	(ϕ_{FS})	8.7 degrees
	(c_{FS})	170.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) $feet^2$	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	3.4	1483	185359.4	72.5	23489.2	161870.2	98225.8
41	3.3	1432	178944.1	71.1	22395.4	156548.7	98775.4
42	3.3	1382	172777.8	69.8	21387.8	151390.0	99256.2
43	3.3	1335	166842.9	68.5	20457.8	146385.1	99670.6
44	3.2	1289	161123.2	67.3	19597.6	141525.6	100020.9
45	3.2	1245	155604.1	66.2	18800.6	136803.5	100309.0
46	3.2	1202	150272.1	65.1	18060.9	132211.2	100536.3
47	3.2	1161	145114.8	64.0	17373.1	127741.7	100703.9
48	3.2	1121	140120.8	63.0	16732.7	123388.1	100812.9
49	3.2	1082	135279.8	62.0	16135.5	119144.2	100863.6
50	3.2	1045	130581.8	61.1	15577.8	115004.0	100856.3
51	3.2	1008	126018.0	60.3	15056.3	110961.8	100791.1
52	3.2	973	121580.1	59.4	14567.9	107012.2	100667.5
53	3.2	938	117260.3	58.6	14110.0	103150.3	100485.0
54	3.2	904	113051.4	57.8	13680.3	99371.2	100242.7
55	3.2	872	108946.8	57.1	13276.4	95670.5	99939.2
56	3.3	840	104940.2	56.4	12896.3	92043.9	99573.0
57	3.3	808	101025.8	55.7	12538.4	88487.4	99142.2
58	3.3	778	97198.0	55.0	12200.9	84997.1	98644.5
59	3.4	748	93451.7	54.4	11882.2	81569.5	98077.2
60	3.4	718	89782.2	53.8	11581.1	78201.1	97437.1
61	3.5	689	86184.8	53.2	11296.2	74888.7	96720.5
62	3.6	661	82655.3	52.6	11026.2	71629.1	95923.4
63	3.6	634	79189.5	52.0	10770.1	68419.4	95041.0
64	3.7	606	75783.7	51.5	10526.9	65256.8	94067.8
65	3.8	579	72434.1	50.9	10295.5	62138.6	92997.6



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$
$b = W-a$
$P_A = b*\tan(\alpha-\phi_{FS})$
$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A, max}$ 100863.6 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of wall)

$EFP = 2*P_A/H^2$
EFP 80.7 pcf

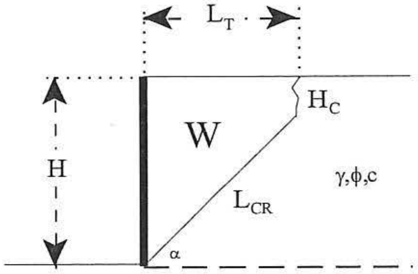
Design Wall for an Equivalent Fluid Pressure: 81 pcf

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Description: Bedrock Daylighted

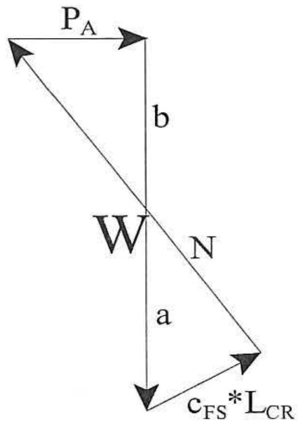
Retaining Wall Design with Level Backfill
(Vector Analysis)

Input:

Retaining Wall Height	(H)	60.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.50
Factored Parameters:	(ϕ_{FS})	8.7 degrees
	(c_{FS})	170.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) $feet^2$	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	3.4	2138	267292.4	88.1	28527.9	238764.5	144886.7
41	3.3	2064	258031.9	86.4	27194.9	230837.1	145648.2
42	3.3	1993	249132.4	84.7	25967.6	223164.9	146314.1
43	3.3	1925	240568.2	83.2	24835.2	215733.0	146888.1
44	3.2	1859	232315.9	81.7	23788.5	208527.4	147373.4
45	3.2	1795	224354.1	80.3	22819.1	201535.0	147772.3
46	3.2	1733	216663.2	79.0	21919.8	194743.4	148087.1
47	3.2	1674	209225.2	77.7	21084.0	188141.2	148319.3
48	3.2	1616	202023.6	76.5	20306.2	181717.4	148470.2
49	3.2	1560	195043.2	75.3	19581.1	175462.1	148540.4
50	3.2	1506	188269.9	74.2	18904.4	169365.5	148530.3
51	3.2	1454	181690.7	73.1	18271.8	163418.9	148440.0
52	3.2	1402	175293.5	72.1	17679.8	157613.7	148268.9
53	3.2	1353	169067.1	71.1	17125.1	151942.1	148016.2
54	3.2	1304	163001.2	70.2	16604.6	146396.6	147680.5
55	3.2	1257	157086.1	69.3	16115.9	140970.2	147260.2
56	3.3	1211	151312.7	68.4	15656.3	135656.4	146753.0
57	3.3	1165	145672.5	67.6	15223.8	130448.8	146156.3
58	3.3	1121	140157.8	66.8	14816.2	125341.6	145466.8
59	3.4	1078	134760.9	66.0	14431.8	120329.1	144680.8
60	3.4	1036	129475.0	65.3	14068.8	115406.2	143793.9
61	3.5	994	124293.6	64.6	13725.8	110567.8	142801.0
62	3.6	954	119210.3	63.9	13401.2	105809.1	141696.3
63	3.6	914	114219.4	63.2	13093.7	101125.7	140473.2
64	3.7	875	109315.3	62.6	12802.1	96513.2	139124.0
65	3.8	836	104492.8	62.0	12525.2	91967.6	137640.0



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A, max}$ 148540.4 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of wall)

$EFP = 2*P_A/H^2$

EFP 82.5 pcf

Design Wall for an Equivalent Fluid Pressure: 83 pcf

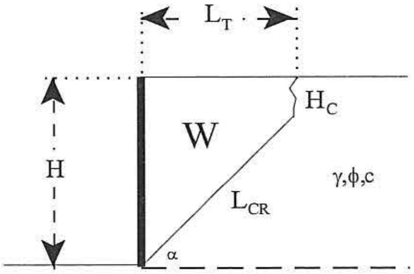
Geotechnologies, Inc.

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Description: Bedrock Daylighted

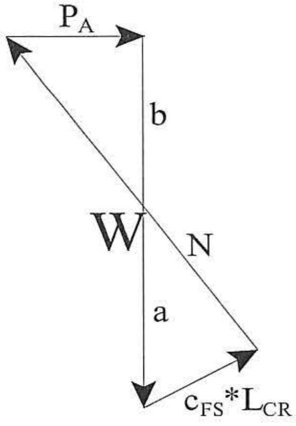
Retaining Wall Design with Level Backfill
(Vector Analysis)

Input:

Retaining Wall Height	(H)	70.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.50
Factored Parameters:	(ϕ_{FS})	8.7 degrees
	(c_{FS})	170.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) $feet^2$	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	3.4	2913	364122.4	103.6	33566.6	330555.8	200587.3
41	3.3	2812	351499.4	101.6	31994.3	319505.0	201593.8
42	3.3	2715	339369.7	99.7	30547.3	308822.4	202474.0
43	3.3	2622	327698.2	97.9	29212.7	298485.5	203232.6
44	3.2	2532	316452.7	96.1	27979.4	288473.3	203873.9
45	3.2	2445	305604.1	94.4	26837.6	278766.5	204401.1
46	3.2	2361	295125.4	92.9	25778.7	269346.7	204817.1
47	3.2	2280	284992.1	91.4	24794.9	260197.1	205123.9
48	3.2	2201	275181.5	89.9	23879.6	251301.8	205323.3
49	3.2	2125	265672.8	88.5	23026.8	242646.0	205416.1
50	3.2	2052	256446.7	87.2	22230.9	234215.8	205402.8
51	3.2	1980	247485.6	86.0	21487.3	225998.3	205283.4
52	3.2	1910	238772.9	84.8	20791.7	217981.2	205057.3
53	3.2	1842	230293.4	83.6	20140.1	210153.3	204723.3
54	3.2	1776	222032.8	82.5	19529.0	202503.8	204279.8
55	3.2	1712	213978.0	81.5	18955.4	195022.6	203724.3
56	3.3	1649	206116.5	80.5	18416.3	187700.2	203054.0
57	3.3	1587	198436.9	79.5	17909.1	180527.8	202265.4
58	3.3	1527	190928.4	78.6	17431.5	173496.9	201354.1
59	3.4	1469	183580.8	77.7	16981.3	166599.5	200315.2
60	3.4	1411	176384.7	76.8	16556.6	159828.2	199142.8
61	3.5	1355	169331.2	76.0	16155.4	153175.8	197830.3
62	3.6	1299	162411.7	75.2	15776.2	146635.5	196369.8
63	3.6	1245	155618.3	74.5	15417.3	140201.0	194752.6
64	3.7	1192	148943.6	73.7	15077.3	133866.3	192968.5
65	3.8	1139	142380.3	73.0	14754.8	127625.4	191006.0



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$
$b = W-a$
$P_A = b*\tan(\alpha-\phi_{FS})$
$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 205416.1 | lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of wall)

$EFP = 2*P_A/H^2$
EFP 83.8 pcf

Design Wall for an Equivalent Fluid Pressure: 84 pcf

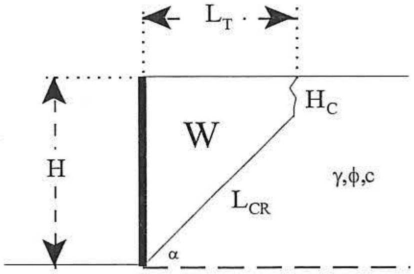
Geotechnologies, Inc.

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Description: Bedrock Daylighted

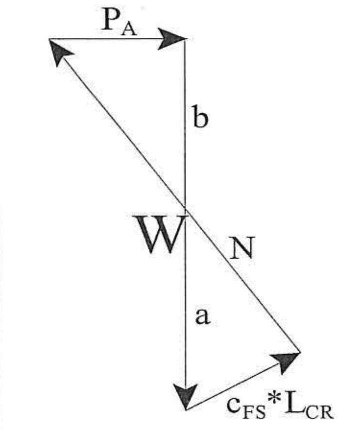
Retaining Wall Design with Level Backfill
(Vector Analysis)

Input:

Retaining Wall Height	(H)	80.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.50
Factored Parameters:	(ϕ_{FS})	8.7 degrees
	(c_{FS})	170.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	3.4	3807	475849.3	119.2	38605.3	437244.0	265327.7
41	3.3	3675	459346.4	116.9	36793.8	422552.6	266612.3
42	3.3	3548	443489.6	114.6	35127.0	408362.6	267735.7
43	3.3	3426	428232.7	112.5	33590.2	394642.6	268704.0
44	3.2	3308	413533.7	110.5	32170.3	381363.4	269522.4
45	3.2	3195	399354.1	108.6	30856.1	368498.0	270195.3
46	3.2	3085	385658.7	106.8	29637.6	356021.2	270726.2
47	3.2	2979	372415.3	105.0	28505.8	343909.5	271117.8
48	3.2	2877	359594.3	103.4	27453.1	332141.2	271372.2
49	3.2	2777	347168.4	101.8	26472.4	320696.0	271490.6
50	3.2	2681	335112.3	100.3	25557.5	309554.8	271473.7
51	3.2	2587	323402.9	98.9	24702.9	298700.0	271321.3
52	3.2	2496	312018.5	97.5	23903.6	288114.9	271032.8
53	3.2	2408	300939.1	96.2	23155.1	277784.0	270606.6
54	3.2	2321	290146.2	94.9	22453.4	267692.8	270040.5
55	3.2	2237	279622.4	93.7	21794.9	257827.5	269331.5
56	3.3	2155	269351.7	92.5	21176.2	248175.5	268476.1
57	3.3	2075	259318.9	91.4	20594.4	238724.4	267469.5
58	3.3	1996	249509.9	90.4	20046.8	229463.1	266306.4
59	3.4	1919	239911.5	89.4	19530.9	220380.7	264980.3
60	3.4	1844	230511.3	88.4	19044.3	211467.0	263483.8
61	3.5	1770	221297.6	87.5	18585.0	202712.6	261808.3
62	3.6	1698	212259.4	86.6	18151.1	194108.3	259943.9
63	3.6	1627	203386.3	85.7	17740.8	185645.5	257879.2
64	3.7	1557	194668.5	84.9	17352.5	177316.0	255601.4
65	3.8	1489	186096.6	84.0	16984.5	169112.1	253095.5



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$
$b = W-a$
$P_A = b*\tan(\alpha-\phi_{FS})$
$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 271490.6 | lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of wall)

$EFP = 2*P_A/H^2$
EFP 84.8 pcf

Design Wall for an Equivalent Fluid Pressure: 85 pcf

Geotechnologies, Inc.

Project: 1111 Sunset Boulevard

File No.: 21155

Seismically Induced Lateral Soil Pressure on Retaining Wall

Input:

Height of Retaining Wall:	(H)	80.0	feet
Retained Soil Unit Weight:	(γ)	125.0	pcf
Peak Ground Acceleration	(PGAm)	1.040	g
Horizontal Ground Acceleration: (1/2 of 2/3*PGAm)	(kh)	0.35	g

Seismic Increment (ΔP_{AE}):

$\Delta P_{AE} = (0.5*\gamma*H^2)*(0.75*k_h)$

$\Delta P_{AE} =$ 104000.0 lbs/ft

Force applied at 0.6H above the base of the wall
Transfer load to 2/3 of the height of the wall

$T*(2/3)*H = \Delta P_{AE}*0.6*H$

T = 93600.0 lbs/ft

$EFP = 2*T/H^2$

EFP = 29.3 pcf Triangular shape

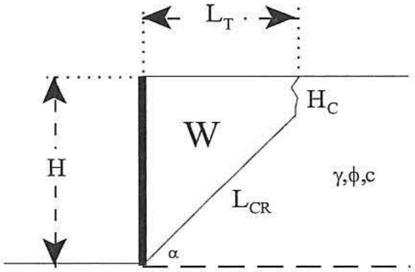
Geotechnologies, Inc.

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Description: Bedrock Daylighted

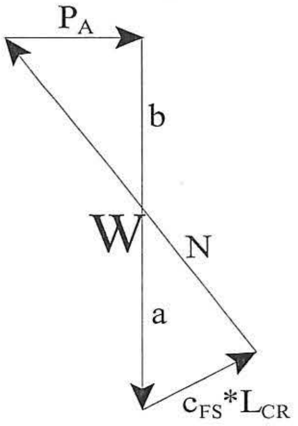
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	10.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.25
Factored Parameters:	(ϕ_{FS})	10.5 degrees
	(c_{FS})	204.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) $feet^2$	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	4.2	49	6103.2	8.9	3640.4	2462.8	1395.4
41	4.2	47	5930.4	8.9	3499.5	2430.9	1434.0
42	4.1	46	5758.0	8.8	3365.3	2392.6	1468.3
43	4.1	45	5586.6	8.7	3237.7	2348.9	1498.4
44	4.0	43	5416.6	8.6	3116.3	2300.3	1524.6
45	4.0	42	5248.3	8.5	3000.9	2247.4	1546.7
46	4.0	41	5081.9	8.4	2890.9	2191.0	1564.9
47	4.0	39	4917.6	8.3	2786.3	2131.3	1579.2
48	3.9	38	4755.4	8.2	2686.5	2068.9	1589.6
49	3.9	37	4595.4	8.0	2591.3	2004.1	1596.2
50	3.9	36	4437.6	7.9	2500.3	1937.3	1599.0
51	3.9	34	4281.9	7.8	2413.3	1868.6	1598.0
52	3.9	33	4128.4	7.7	2330.0	1798.4	1593.1
53	3.9	32	3976.9	7.6	2249.9	1727.0	1584.5
54	4.0	31	3827.4	7.5	2172.9	1654.5	1572.0
55	4.0	29	3679.8	7.3	2098.8	1581.0	1555.6
56	4.0	28	3534.0	7.2	2027.1	1506.9	1535.3
57	4.1	27	3389.8	7.1	1957.6	1432.2	1511.1
58	4.1	26	3247.2	7.0	1890.2	1357.0	1482.8
59	4.2	25	3106.1	6.8	1824.5	1281.6	1450.4
60	4.2	24	2966.2	6.7	1760.2	1206.0	1413.8
61	4.3	23	2827.5	6.5	1697.1	1130.4	1373.0
62	4.4	22	2689.8	6.4	1634.9	1054.9	1327.9
63	4.5	20	2552.9	6.2	1573.3	979.6	1278.3
64	4.6	19	2416.7	6.1	1511.9	904.7	1224.3
65	4.7	18	2280.9	5.9	1450.6	830.3	1165.6



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A, max}$ 1599.0 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

EFP 32.0 pcf

Design Shoring for an Equivalent Fluid Pressure: 32 pcf

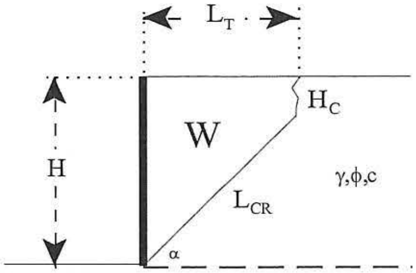
Geotechnologies, Inc.

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Description: Bedrock Daylighted

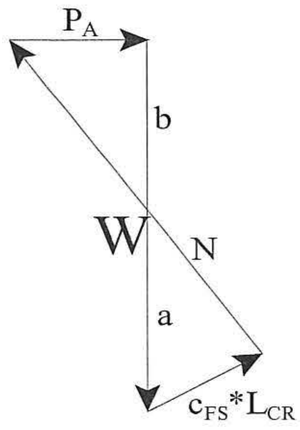
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	20.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.25
Factored Parameters:	(ϕ_{FS})	10.5 degrees
	(c_{FS})	204.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) $feet^2$	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	4.2	228	28448.6	24.5	9971.2	18477.4	10469.2
41	4.2	220	27499.8	24.1	9517.8	17982.0	10607.3
42	4.1	213	26582.0	23.7	9097.4	17484.6	10729.6
43	4.1	206	25693.5	23.3	8706.9	16986.6	10836.5
44	4.0	199	24832.8	23.0	8343.6	16489.2	10928.7
45	4.0	192	23998.3	22.6	8005.1	15993.2	11006.5
46	4.0	186	23188.6	22.3	7689.2	15499.4	11070.2
47	4.0	179	22402.3	21.9	7393.8	15008.5	11120.2
48	3.9	173	21638.0	21.6	7117.2	14520.8	11156.6
49	3.9	167	20894.5	21.3	6857.8	14036.7	11179.6
50	3.9	161	20170.7	21.0	6614.2	13556.5	11189.3
51	3.9	156	19465.4	20.7	6385.1	13080.3	11185.7
52	3.9	150	18777.5	20.4	6169.2	12608.3	11168.9
53	3.9	145	18106.1	20.1	5965.4	12140.6	11138.8
54	4.0	140	17450.1	19.8	5772.9	11677.2	11095.1
55	4.0	134	16808.7	19.5	5590.5	11218.2	11037.8
56	4.0	129	16181.0	19.3	5417.6	10763.4	10966.6
57	4.1	125	15566.2	19.0	5253.3	10312.9	10881.2
58	4.1	120	14963.5	18.7	5096.8	9866.7	10781.1
59	4.2	115	14372.2	18.5	4947.6	9424.6	10666.0
60	4.2	110	13791.5	18.2	4804.8	8986.7	10535.3
61	4.3	106	13220.8	18.0	4668.0	8552.7	10388.5
62	4.4	101	12659.3	17.7	4536.6	8122.8	10224.8
63	4.5	97	12106.5	17.4	4409.8	7696.7	10043.5
64	4.6	92	11561.6	17.2	4287.2	7274.4	9843.6
65	4.7	88	11024.2	16.9	4168.2	6855.9	9624.4



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$
$b = W-a$
$P_A = b*\tan(\alpha-\phi_{FS})$
$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A, max}$ 11189.3 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$
EFP 55.9 pcf

Design Shoring for an Equivalent Fluid Pressure: 56 pcf

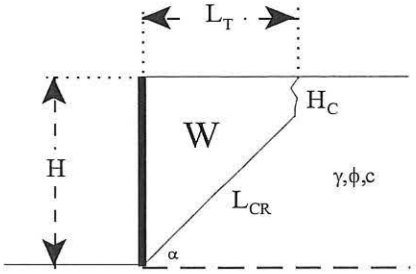
Geotechnologies, Inc.

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Description: Bedrock Daylighted

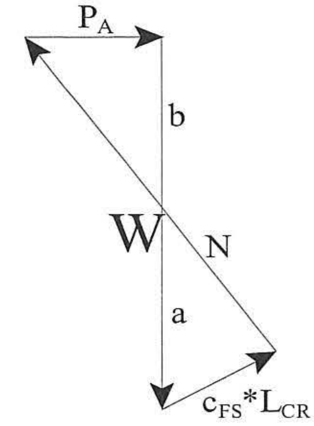
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	30.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.25
Factored Parameters:	(ϕ_{FS})	10.5 degrees
	(c_{FS})	204.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) $feet^2$	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	4.2	526	65690.9	40.1	16302.1	49388.8	27983.5
41	4.2	508	63448.8	39.3	15536.1	47912.7	28263.0
42	4.1	490	61288.6	38.7	14829.4	46459.2	28510.1
43	4.1	474	59205.0	38.0	14176.1	45028.9	28726.1
44	4.0	458	57193.1	37.4	13570.9	43622.2	28912.0
45	4.0	442	55248.3	36.8	13009.4	42238.9	29068.8
46	4.0	427	53366.4	36.2	12487.4	40879.0	29197.2
47	4.0	412	51543.4	35.6	12001.3	39542.1	29297.7
48	3.9	398	49775.6	35.1	11547.9	38227.7	29371.0
49	3.9	384	48059.8	34.5	11124.4	36935.4	29417.3
50	3.9	371	46392.6	34.0	10728.1	35664.4	29436.8
51	3.9	358	44771.1	33.6	10356.8	34414.3	29429.7
52	3.9	346	43192.7	33.1	10008.4	33184.3	29395.8
53	3.9	333	41654.6	32.6	9681.0	31973.7	29335.1
54	4.0	321	40154.5	32.2	9372.8	30781.8	29247.3
55	4.0	310	38690.2	31.8	9082.3	29607.9	29131.9
56	4.0	298	37259.4	31.3	8808.1	28451.3	28988.4
57	4.1	287	35860.2	30.9	8548.9	27311.3	28816.1
58	4.1	276	34490.7	30.5	8303.4	26187.3	28614.2
59	4.2	265	33149.1	30.1	8070.7	25078.4	28381.6
60	4.2	255	31833.7	29.8	7849.5	23984.2	28117.4
61	4.3	244	30542.9	29.4	7639.0	22903.9	27820.0
62	4.4	234	29275.2	29.0	7438.3	21837.0	27488.0
63	4.5	224	28029.2	28.7	7246.4	20782.8	27119.6
64	4.6	214	26803.3	28.3	7062.5	19740.8	26712.9
65	4.7	205	25596.3	28.0	6885.8	18710.4	26265.7



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 29436.8 | lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

EFP 65.4 pcf

Design Shoring for an Equivalent Fluid Pressure: 65 pcf

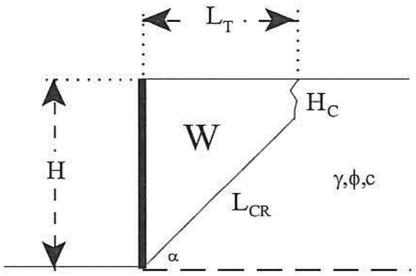
Geotechnologies, Inc.

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Description: Bedrock Daylighted

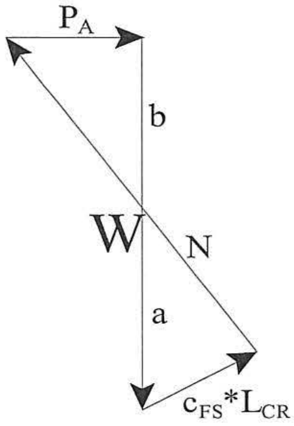
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	40.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.25
Factored Parameters:	(ϕ_{FS})	10.5 degrees
	(c_{FS})	204.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	4.2	943	117830.1	55.6	22632.9	95197.2	53938.3
41	4.2	910	113777.4	54.6	21554.4	92223.0	54400.9
42	4.1	879	109877.9	53.6	20561.4	89316.5	54809.8
43	4.1	849	106121.1	52.7	19645.2	86475.9	55167.0
44	4.0	820	102497.5	51.8	18798.2	83699.3	55474.4
45	4.0	792	98998.3	50.9	18013.6	80984.7	55733.6
46	4.0	765	95615.2	50.1	17285.6	78329.7	55945.7
47	4.0	739	92340.9	49.3	16608.8	75732.1	56111.9
48	3.9	713	89168.3	48.5	15978.6	73189.7	56232.9
49	3.9	689	86091.0	47.8	15390.9	70700.1	56309.4
50	3.9	665	83103.2	47.1	14842.0	68261.1	56341.6
51	3.9	642	80199.2	46.4	14328.6	65870.6	56329.8
52	3.9	619	77373.9	45.8	13847.6	63526.3	56273.9
53	3.9	597	74622.6	45.1	13396.5	61226.1	56173.6
54	4.0	576	71940.8	44.5	12972.7	58968.1	56028.5
55	4.0	555	69324.3	44.0	12574.0	56750.2	55837.8
56	4.0	534	66769.1	43.4	12198.6	54570.5	55600.7
57	4.1	514	64271.8	42.9	11844.5	52427.3	55315.8
58	4.1	495	61828.7	42.3	11510.0	50318.7	54981.9
59	4.2	475	59436.7	41.8	11193.7	48243.0	54597.3
60	4.2	457	57092.8	41.3	10894.2	46198.6	54159.9
61	4.3	438	54794.0	40.8	10610.0	44184.0	53667.6
62	4.4	420	52537.5	40.4	10340.0	42197.6	53117.5
63	4.5	403	50320.9	39.9	10082.9	40238.0	52506.9
64	4.6	385	48141.6	39.4	9837.8	38303.8	51832.1
65	4.7	368	45997.2	39.0	9603.5	36393.7	51089.5



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\max}$ 56341.6 | lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

EFP 70.4 pcf

Design Shoring for an Equivalent Fluid Pressure: 70 pcf

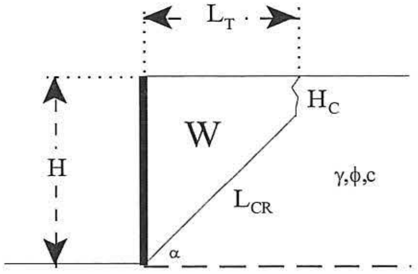
Geotechnologies, Inc.

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Description: Bedrock Daylighted

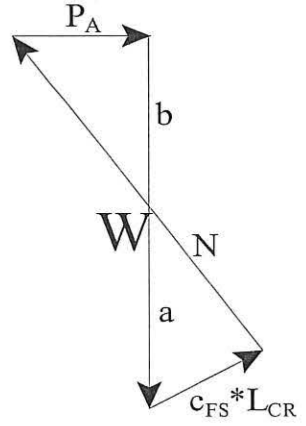
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	50.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.25
Factored Parameters:	(ϕ_{FS})	10.5 degrees
	(c_{FS})	204.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	4.2	1479	184866.3	71.2	28963.8	155902.5	88333.7
41	4.2	1428	178485.6	69.8	27572.8	150912.9	89021.2
42	4.1	1379	172349.8	68.6	26293.5	146056.4	89628.7
43	4.1	1332	166441.9	67.3	25114.4	141327.5	90159.4
44	4.0	1286	160746.1	66.2	24025.5	136720.6	90616.0
45	4.0	1242	155248.3	65.0	23017.9	132230.4	91000.8
46	4.0	1199	149935.2	64.0	22083.8	127851.5	91315.8
47	4.0	1158	144794.9	63.0	21216.3	123578.6	91562.6
48	3.9	1119	139816.0	62.0	20409.3	119406.7	91742.3
49	3.9	1080	134988.4	61.0	19657.5	115330.9	91855.8
50	3.9	1042	130302.5	60.2	18955.9	111346.6	91903.6
51	3.9	1006	125749.5	59.3	18300.4	107449.2	91886.1
52	3.9	971	121321.2	58.5	17686.9	103634.4	91803.1
53	3.9	936	117010.0	57.7	17112.0	99898.0	91654.3
54	4.0	902	112808.8	56.9	16572.6	96236.2	91438.8
55	4.0	870	108710.9	56.2	16065.8	92645.1	91155.7
56	4.0	838	104710.2	55.5	15589.1	89121.1	90803.5
57	4.1	806	100801.0	54.8	15140.1	85660.9	90380.4
58	4.1	776	96977.6	54.1	14716.7	82261.0	89884.5
59	4.2	746	93235.2	53.5	14316.8	78918.3	89313.0
60	4.2	717	89568.7	52.9	13938.8	75629.9	88663.1
61	4.3	688	85973.8	52.3	13580.9	72392.9	87931.2
62	4.4	660	82446.2	51.7	13241.6	69204.5	87113.4
63	4.5	632	78981.7	51.1	12919.5	66062.2	86205.1
64	4.6	605	75576.5	50.6	12613.1	62963.5	85201.2
65	4.7	578	72227.0	50.0	12321.1	59905.9	84095.8



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 91903.6 | lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

EFP 73.5 pcf

Design Shoring for an Equivalent Fluid Pressure: 74 pcf

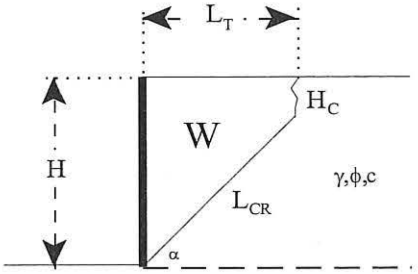
Geotechnologies, Inc.

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Description: Bedrock Daylighted

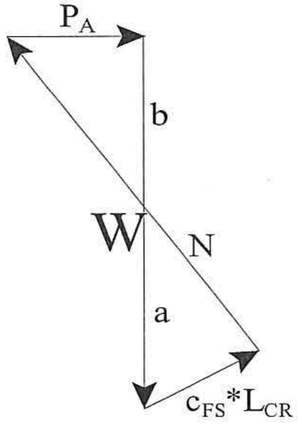
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	60.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.25
Factored Parameters:	(ϕ_{FS})	10.5 degrees
	(c_{FS})	204.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) $feet^2$	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	4.2	2134	266799.3	86.7	35294.6	231504.7	131169.6
41	4.2	2061	257573.5	85.1	33591.1	223982.4	132123.8
42	4.1	1990	248704.5	83.5	32025.5	216678.9	132966.8
43	4.1	1921	240167.2	82.0	30583.6	209583.6	133703.2
44	4.0	1856	231938.8	80.6	29252.8	202686.0	134336.7
45	4.0	1792	223998.3	79.2	28022.1	195976.1	134870.6
46	4.0	1731	216326.3	77.9	26882.0	189444.4	135307.5
47	4.0	1671	208905.3	76.6	25823.8	183081.5	135649.8
48	3.9	1614	201718.8	75.4	24840.0	176878.8	135899.1
49	3.9	1558	194751.9	74.3	23924.1	170827.8	136056.5
50	3.9	1504	187990.6	73.2	23069.8	164920.8	136122.9
51	3.9	1451	181422.2	72.2	22272.1	159150.1	136098.6
52	3.9	1400	175034.6	71.2	21526.1	153508.5	135983.5
53	3.9	1351	168816.9	70.2	20827.5	147989.4	135777.0
54	4.0	1302	162758.6	69.3	20172.5	142586.1	135478.1
55	4.0	1255	156850.2	68.4	19557.6	137292.6	135085.4
56	4.0	1209	151082.7	67.5	18979.6	132103.1	134596.8
57	4.1	1164	145447.7	66.7	18435.7	127012.0	134009.9
58	4.1	1119	139937.4	65.9	17923.3	122014.1	133321.7
59	4.2	1076	134544.3	65.1	17439.9	117104.4	132528.7
60	4.2	1034	129261.6	64.4	16983.5	112278.1	131626.7
61	4.3	993	124082.6	63.7	16551.9	107530.7	130610.9
62	4.4	952	119001.2	63.0	16143.3	102857.9	129475.6
63	4.5	912	114011.6	62.3	15756.0	98255.5	128214.5
64	4.6	873	109108.2	61.7	15388.4	93719.8	126820.3
65	4.7	834	104285.7	61.1	15038.8	89246.9	125284.6



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$
$b = W-a$
$P_A = b*\tan(\alpha-\phi_{FS})$
$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 136122.9 |lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

EFP 75.6 pcf

Design Shoring for an Equivalent Fluid Pressure: 76 pcf

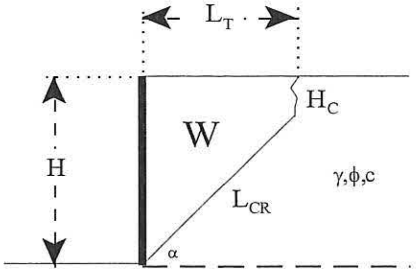
Geotechnologies, Inc.

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Description: Bedrock Daylighted

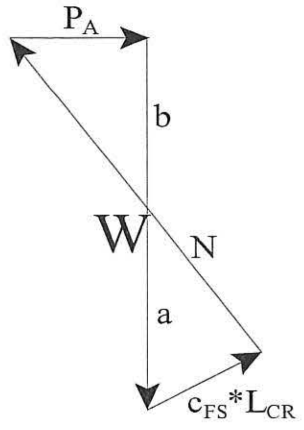
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	70.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.25
Factored Parameters:	(ϕ_{FS})	10.5 degrees
	(c_{FS})	204.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) $feet^2$	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	4.2	2909	363629.3	102.3	41625.5	322003.8	182446.0
41	4.2	2808	351040.9	100.3	39609.4	311431.5	183708.7
42	4.1	2712	338941.7	98.4	37757.6	301184.2	184824.2
43	4.1	2618	327297.2	96.7	36052.8	291244.4	185798.4
44	4.0	2529	316075.7	95.0	34480.1	281595.6	186636.5
45	4.0	2442	305248.3	93.3	33026.4	272221.9	187342.8
46	4.0	2358	294788.6	91.8	31680.2	263108.4	187920.9
47	4.0	2277	284672.1	90.3	30431.3	254240.8	188373.6
48	3.9	2199	274876.6	88.9	29270.8	245605.9	188703.3
49	3.9	2123	265381.4	87.5	28190.6	237190.8	188911.6
50	3.9	2049	256167.5	86.3	27183.7	228983.7	188999.4
51	3.9	1978	247217.1	85.0	26243.9	220973.3	188967.3
52	3.9	1908	238514.1	83.8	25365.3	213148.8	188815.0
53	3.9	1840	230043.1	82.7	24543.0	205500.1	188541.9
54	4.0	1774	221790.2	81.6	23772.4	198017.8	188146.5
55	4.0	1710	213742.1	80.6	23049.3	190692.7	187626.9
56	4.0	1647	205886.5	79.6	22370.1	183516.4	186980.6
57	4.1	1586	198212.1	78.6	21731.3	176480.8	186204.2
58	4.1	1526	190708.0	77.7	21129.9	169578.1	185293.7
59	4.2	1467	183364.2	76.8	20563.0	162801.2	184244.5
60	4.2	1409	176171.3	76.0	20028.2	156143.1	183051.0
61	4.3	1353	169120.2	75.1	19522.9	149597.3	181706.6
62	4.4	1298	162202.6	74.3	19045.0	143157.6	180204.1
63	4.5	1243	155410.5	73.6	18592.6	136817.9	178534.8
64	4.6	1190	148736.4	72.8	18163.6	130572.8	176689.2
65	4.7	1137	142173.2	72.1	17756.4	124416.8	174656.0



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 188999.4 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

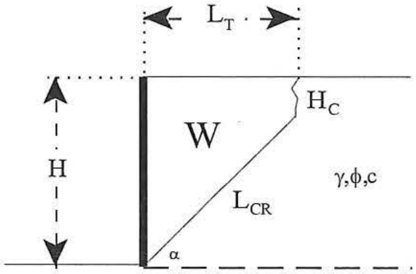
EFP 77.1 pcf

Design Shoring for an Equivalent Fluid Pressure: 77 pcf

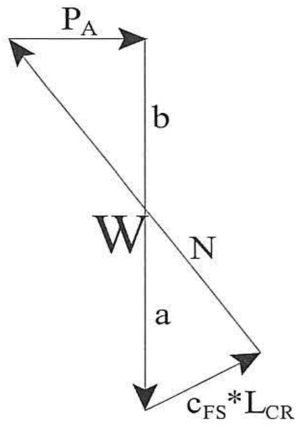
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	80.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.25
Factored Parameters:	(ϕ_{FS})	10.5 degrees
	(c_{FS})	204.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) $feet^2$	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	4.2	3803	475356.2	117.8	47956.3	427399.9	242162.9
41	4.2	3671	458887.9	115.6	45627.7	413260.2	243775.9
42	4.1	3544	443061.6	113.4	43489.6	399572.1	245200.7
43	4.1	3423	427831.8	111.3	41522.0	386309.8	246445.1
44	4.0	3305	413156.6	109.4	39707.4	373449.3	247515.5
45	4.0	3192	398998.3	107.5	38030.7	360967.6	248417.5
46	4.0	3083	385321.9	105.7	36478.4	348843.5	249155.8
47	4.0	2977	372095.4	104.0	35038.8	337056.6	249734.0
48	3.9	2874	359289.5	102.4	33701.5	325588.0	250155.0
49	3.9	2775	346877.1	100.8	32457.2	314419.9	250421.0
50	3.9	2679	334833.1	99.3	31297.6	303535.4	250533.1
51	3.9	2585	323134.4	97.9	30215.6	292918.8	250492.1
52	3.9	2494	311759.6	96.5	29204.6	282555.1	250297.7
53	3.9	2406	300688.8	95.2	28258.5	272430.3	249948.9
54	4.0	2319	289903.5	94.0	27372.3	262531.2	249443.9
55	4.0	2235	279386.5	92.8	26541.1	252845.4	248780.4
56	4.0	2153	269121.7	91.6	25760.6	243361.1	247954.9
57	4.1	2073	259094.1	90.5	25026.9	234067.1	246963.3
58	4.1	1994	249289.5	89.5	24336.5	224953.0	245800.5
59	4.2	1918	239694.9	88.5	23686.1	216008.8	244460.3
60	4.2	1842	230297.9	87.5	23072.8	207225.0	242935.7
61	4.3	1769	221086.7	86.6	22493.9	198592.8	241218.5
62	4.4	1696	212050.4	85.7	21946.7	190103.6	239298.9
63	4.5	1625	203178.5	84.8	21429.1	181749.4	237166.3
64	4.6	1556	194461.4	83.9	20938.9	173522.4	234808.0
65	4.7	1487	185889.5	83.1	20474.0	165415.5	232209.9



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A, max}$ 250533.1 | lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

EFP 78.3 pcf

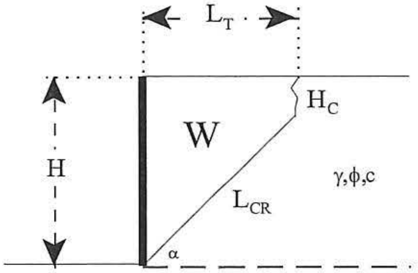
Design Shoring for an Equivalent Fluid Pressure: 78 pcf

Geotechnologies, Inc.
Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Description: Bedrock Daylighted

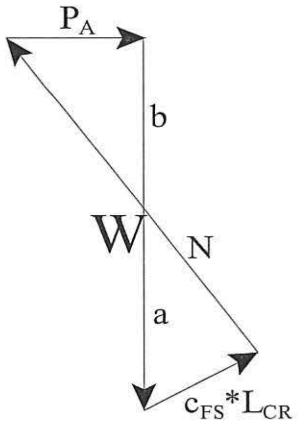
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	90.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	13.0 degrees
Cohesion of Retained Soils	(c)	255.0 psf
Factor of Safety	(FS)	1.25
Factored Parameters:	(ϕ_{FS})	10.5 degrees
	(c_{FS})	204.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
40	4.2	4816	601980.0	133.4	54287.2	547692.8	310320.4
41	4.2	4649	581114.6	130.8	51646.0	529468.5	312325.4
42	4.1	4489	561064.2	128.3	49221.6	511842.6	314096.5
43	4.1	4334	541770.9	126.0	46991.1	494779.8	315643.1
44	4.0	4185	523181.7	123.7	44934.7	478247.1	316973.6
45	4.0	4042	505248.3	121.6	43034.9	462213.4	318094.7
46	4.0	3903	487926.3	119.6	41276.6	446649.7	319012.3
47	4.0	3769	471175.1	117.7	39646.3	431528.8	319730.9
48	3.9	3640	454957.4	115.8	38132.2	416825.3	320254.2
49	3.9	3514	439238.8	114.0	36723.7	402515.1	320584.7
50	3.9	3392	423987.4	112.4	35411.5	388575.9	320724.1
51	3.9	3273	409174.0	110.8	34187.4	374986.6	320673.1
52	3.9	3158	394771.2	109.2	33043.8	361727.4	320431.5
53	3.9	3046	380753.9	107.8	31974.1	348779.9	319998.0
54	4.0	2937	367098.7	106.3	30972.2	336126.5	319370.4
55	4.0	2830	353783.6	105.0	30032.9	323750.7	318545.7
56	4.0	2726	340788.2	103.7	29151.1	311637.1	317519.8
57	4.1	2625	328093.6	102.5	28322.5	299771.1	316287.3
58	4.1	2525	315681.9	101.3	27543.1	288138.8	314841.9
59	4.2	2428	303536.4	100.1	26809.2	276727.1	313176.2
60	4.2	2333	291641.3	99.1	26117.5	265523.9	311281.1
61	4.3	2240	279982.0	98.0	25464.8	254517.2	309146.3
62	4.4	2148	268544.5	97.0	24848.4	243696.1	306760.1
63	4.5	2059	257315.6	96.0	24265.7	233049.9	304108.8
64	4.6	1970	246282.9	95.1	23714.2	222568.7	301176.7
65	4.7	1883	235434.7	94.2	23191.7	212243.0	297946.3



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\max}$ 320724.1 | lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

EFP 79.2 pcf

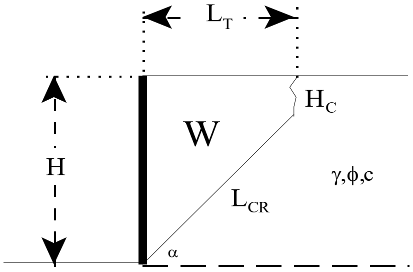
Design Shoring for an Equivalent Fluid Pressure: 79 pcf

Geotechnologies, Inc.
Project: 1111 "Sunset Boulevard
File No.: 21155
Description: Bedrock- Oblique Bedding

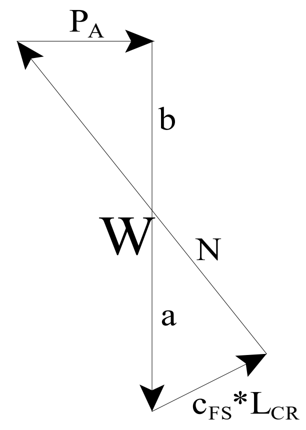
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	20.00	feet
Unit Weight of Retained Soils	(γ)	125.0	pcf
Friction Angle of Retained Soils	(ϕ)	32.0	degrees
Cohesion of Retained Soils	(c)	200.0	psf
Factor of Safety	(FS)	1.25	
Factored Parameters:	(ϕ_{FS})	26.6	degrees
	(c_{FS})	160.0	psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) $feet^2$	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
30	22.0	-74	-9257.1	-4.1	-9705.1	448.0	0.0
31	17.3	85	10638.4	5.3	9854.5	783.9	60.9
32	14.2	158	19722.6	10.9	16405.7	3317.0	315.9
33	12.2	194	24238.4	14.4	18340.5	5897.9	665.7
34	10.7	212	26523.5	16.7	18449.9	8073.6	1054.3
35	9.5	221	27609.0	18.3	17811.2	9797.8	1453.8
36	8.6	224	28004.7	19.3	16881.2	11123.5	1849.4
37	7.9	224	27984.6	20.1	15864.6	12120.1	2233.1
38	7.3	222	27705.7	20.6	14854.8	12850.9	2600.5
39	6.8	218	27262.4	20.9	13893.9	13368.5	2949.0
40	6.4	214	26713.9	21.1	12998.8	13715.1	3277.4
41	6.1	209	26098.2	21.2	12174.1	13924.1	3585.4
42	5.8	204	25440.7	21.2	11418.5	14022.2	3872.8
43	5.5	198	24758.4	21.2	10728.1	14030.3	4139.9
44	5.3	193	24062.9	21.1	10097.7	13965.2	4387.1
45	5.1	187	23362.3	21.0	9521.9	13840.4	4614.7
46	5.0	181	22662.0	20.9	8995.4	13666.7	4823.5
47	4.8	176	21966.0	20.8	8513.2	13452.8	5013.7
48	4.7	170	21277.0	20.6	8070.9	13206.0	5186.0
49	4.6	165	20596.5	20.4	7664.4	12932.1	5340.7
50	4.5	159	19926.0	20.3	7290.2	12635.8	5478.4
51	4.4	154	19266.0	20.1	6944.8	12321.2	5599.5
52	4.3	149	18617.0	19.9	6625.5	11991.5	5704.2
53	4.3	144	17979.1	19.7	6329.6	11649.4	5792.9
54	4.2	139	17352.2	19.5	6055.0	11297.2	5865.9
55	4.2	134	16736.4	19.3	5799.5	10936.9	5923.3



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 5923.3 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

EFP 29.6 pcf

Design Shoring for an Equivalent Fluid Pressure: 30 pcf

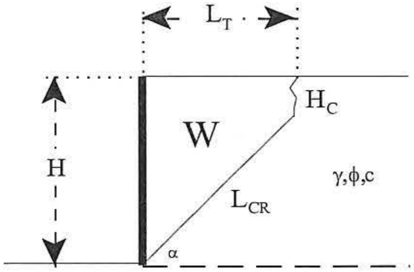
Geotechnologies, Inc.

Project: 1111 Sunset Blvd., LLC
File No.: 21155
Description: ~~Shoring Walls up to 30 feet~~ — Oblique Bracing

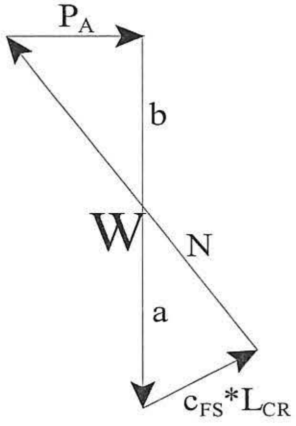
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	30.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	32.0 degrees
Cohesion of Retained Soils	(c)	200.0 psf
Factor of Safety	(FS)	1.25
Factored Parameters:	(ϕ_{FS})	26.6 degrees
	(c_{FS})	160.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
45	5.1	437	54612.3	35.2	15920.6	38691.7	12900.8
46	5.0	423	52839.8	34.8	14973.2	37866.6	13364.5
47	4.8	409	51107.1	34.4	14116.6	36990.5	13785.9
48	4.7	395	49414.6	34.1	13339.5	36075.1	14166.5
49	4.6	382	47761.8	33.7	12632.3	35129.5	14507.8
50	4.5	369	46147.9	33.3	11986.7	34161.1	14811.0
51	4.4	357	44571.8	32.9	11395.8	33176.0	15077.0
52	4.3	344	43032.1	32.6	10853.4	32178.8	15307.0
53	4.3	332	41527.6	32.2	10354.3	31173.4	15501.6
54	4.2	320	40056.7	31.9	9893.8	30162.9	15661.5
55	4.2	309	38617.8	31.5	9468.1	29149.8	15787.4
56	4.2	298	37209.6	31.2	9073.5	28136.0	15879.6
57	4.1	287	35830.4	30.8	8707.1	27123.3	15938.5
58	4.1	276	34478.8	30.5	8366.0	26112.9	15964.2
59	4.1	265	33153.5	30.2	8047.8	25105.7	15957.0
60	4.2	255	31852.9	29.8	7750.4	24102.5	15916.7
61	4.2	245	30575.8	29.5	7471.9	23103.9	15843.1
62	4.2	235	29320.8	29.2	7210.4	22110.5	15736.2
63	4.2	225	28086.7	28.9	6964.4	21122.4	15595.4
64	4.3	215	26872.3	28.6	6732.4	20139.9	15420.3
65	4.4	205	25676.4	28.3	6513.1	19163.2	15210.3
66	4.4	196	24497.8	28.0	6305.4	18192.4	14964.5
67	4.5	187	23335.3	27.7	6107.9	17227.4	14682.3
68	4.6	178	22188.0	27.4	5919.7	16268.3	14362.5
69	4.7	168	21054.6	27.1	5739.5	15315.1	14004.1
70	4.9	159	19934.2	26.7	5566.6	14367.6	13605.7



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 15964.23 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

EFP 35.5 pcf

Design Shoring for an Equivalent Fluid Pressure: 36 pcf

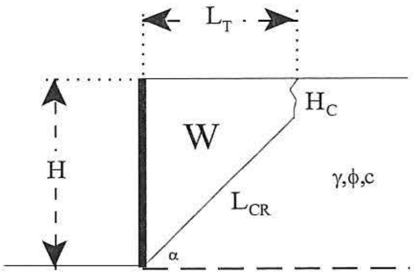
Geotechnologies, Inc.

Project: 1111 Sunset Blvd., LLC
File No.: 21155
Description: ~~Shoring Walls up to 40 feet~~ Bedrock, Oblique Bedding

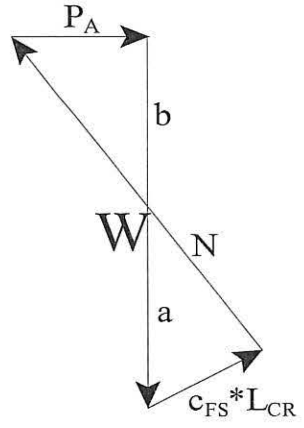
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	40.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	32.0 degrees
Cohesion of Retained Soils	(c)	200.0 psf
Factor of Safety	(FS)	1.25
Factored Parameters:	(ϕ_{FS})	26.6 degrees
	(c_{FS})	160.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
46	5.0	761	95088.7	48.7	20951.1	74137.6	26165.8
47	4.8	735	91904.7	48.1	19720.1	72184.6	26902.2
48	4.7	710	88807.3	47.5	18608.1	70199.1	27566.9
49	4.6	686	85793.1	46.9	17600.1	68192.9	28162.4
50	4.5	663	82858.5	46.4	16683.3	66175.2	28691.1
51	4.4	640	79999.8	45.8	15846.8	64153.0	29154.8
52	4.3	618	77213.4	45.3	15081.3	62132.1	29555.3
53	4.3	596	74495.6	44.7	14378.9	60116.7	29894.2
54	4.2	575	71842.9	44.2	13732.7	58110.3	30172.7
55	4.2	554	69251.9	43.7	13136.7	56115.3	30391.7
56	4.2	534	66719.3	43.2	12585.7	54133.6	30552.2
57	4.1	514	64242.0	42.7	12075.3	52166.7	30654.7
58	4.1	495	61816.9	42.3	11601.3	50215.5	30699.5
59	4.1	476	59441.1	41.8	11160.4	48280.7	30686.9
60	4.2	457	57112.0	41.4	10749.3	46362.7	30616.7
61	4.2	439	54826.8	41.0	10365.2	44461.6	30488.8
62	4.2	421	52583.1	40.5	10005.7	42577.4	30302.7
63	4.2	403	50378.5	40.1	9668.5	40710.0	30057.6
64	4.3	386	48210.6	39.7	9351.6	38859.0	29752.7
65	4.4	369	46077.3	39.3	9053.1	37024.2	29386.9
66	4.4	352	43976.5	38.9	8771.4	35205.1	28958.7
67	4.5	335	41906.1	38.5	8504.8	33401.3	28466.7
68	4.6	319	39864.1	38.2	8251.9	31612.2	27908.9
69	4.7	303	37848.7	37.8	8011.2	29837.4	27283.3
70	4.9	287	35857.9	37.4	7781.5	28076.3	26587.4
71	5.0	271	33889.9	37.0	7561.4	26328.4	25818.5



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$
$b = W-a$
$P_A = b*\tan(\alpha-\phi_{FS})$
$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 30699.51 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$
EFP 38.4 pcf

Design Shoring for an Equivalent Fluid Pressure: 39 pcf

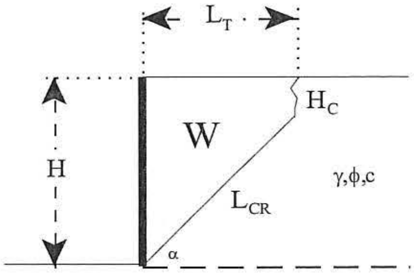
Geotechnologies, Inc.

Project: 1111 Sunset Blvd., LLC
File No.: 21155
Description: ~~Shoring Walls up to 50 feet~~ Bedrock, Oblique Bedding

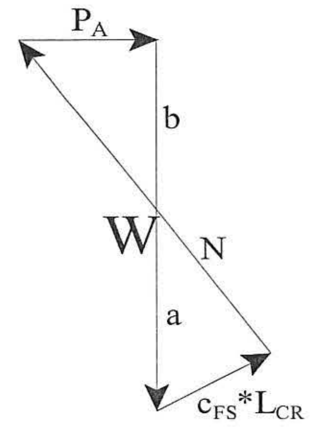
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	50.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	32.0 degrees
Cohesion of Retained Soils	(c)	200.0 psf
Factor of Safety	(FS)	1.25
Factored Parameters:	(ϕ_{FS})	26.6 degrees
	(c_{FS})	160.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
45	5.1	1237	154612.3	63.5	28717.9	125894.4	41976.5
46	5.0	1195	149408.7	62.6	26928.9	122479.7	43227.4
47	4.8	1155	144358.7	61.8	25323.5	119035.2	44362.8
48	4.7	1116	139455.0	61.0	23876.7	115578.3	45387.1
49	4.6	1078	134690.4	60.2	22568.0	112122.5	46304.5
50	4.5	1040	130057.8	59.4	21379.9	108677.9	47118.7
51	4.4	1004	125550.2	58.7	20297.8	105252.4	47832.6
52	4.3	969	121160.7	58.0	19309.2	101851.5	48449.3
53	4.3	935	116883.0	57.3	18403.5	98479.5	48970.8
54	4.2	902	112710.9	56.6	17571.5	95139.5	49399.4
55	4.2	869	108638.6	55.9	16805.2	91833.4	49736.5
56	4.2	837	104660.4	55.3	16097.9	88562.5	49983.4
57	4.1	806	100771.2	54.7	15443.5	85327.7	50141.0
58	4.1	776	96965.8	54.1	14836.7	82129.1	50210.0
59	4.1	746	93239.5	53.5	14272.9	78966.6	50190.6
60	4.2	717	89587.9	52.9	13748.1	75839.8	50082.7
61	4.2	688	86006.7	52.4	13258.6	72748.1	49885.8
62	4.2	660	82491.8	51.9	12801.0	69690.7	49599.4
63	4.2	632	79039.3	51.4	12372.7	66666.6	49222.3
64	4.3	605	75645.6	50.9	11970.8	63674.8	48753.0
65	4.4	578	72307.2	50.4	11593.1	60714.0	48189.9
66	4.4	552	69020.6	49.9	11237.4	57783.2	47530.8
67	4.5	526	65782.8	49.4	10901.7	54881.1	46773.2
68	4.6	501	62590.6	48.9	10584.1	52006.5	45914.0
69	4.7	476	59441.0	48.5	10282.9	49158.1	44950.1
70	4.9	451	56331.2	48.0	9996.5	46334.7	43877.5



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$
$b = W-a$
$P_A = b*\tan(\alpha-\phi_{FS})$
$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 50210.01 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$
EFP 40.2 pcf

Design Shoring for an Equivalent Fluid Pressure: 41 pcf

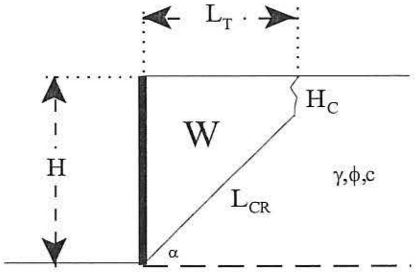
Geotechnologies, Inc.

Project: 1111 Sunset Blvd., LLC
File No.: 21155
Description: ~~Shoring Walls up to 60 feet~~ Bedrock, Oblique Bedding

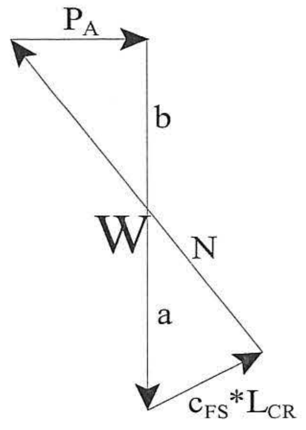
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	60.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	32.0 degrees
Cohesion of Retained Soils	(c)	200.0 psf
Factor of Safety	(FS)	1.25
Factored Parameters:	(ϕ_{FS})	26.6 degrees
	(c_{FS})	160.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
45	5.1	1787	223362.3	77.6	35116.5	188245.7	62766.1
46	5.0	1726	215799.8	76.5	32906.8	182893.0	64549.4
47	4.8	1668	208469.1	75.5	30926.9	177542.1	66167.5
48	4.7	1611	201357.8	74.4	29145.3	172212.4	67627.1
49	4.6	1556	194453.9	73.4	27535.8	166918.1	68934.1
50	4.5	1502	187745.9	72.5	26076.5	161669.5	70093.8
51	4.4	1450	181222.8	71.5	24748.8	156474.0	71110.7
52	4.3	1399	174874.1	70.6	23537.1	151337.0	71988.8
53	4.3	1350	168689.9	69.8	22428.1	146261.8	72731.5
54	4.2	1301	162660.7	68.9	21410.3	141250.4	73341.6
55	4.2	1254	156777.9	68.1	20473.8	136304.0	73821.5
56	4.2	1208	151032.9	67.3	19610.1	131422.8	74173.1
57	4.1	1163	145417.9	66.6	18811.7	126606.2	74397.5
58	4.1	1119	139925.5	65.9	18072.1	121853.5	74495.7
59	4.1	1076	134548.7	65.2	17385.5	117163.2	74468.1
60	4.2	1034	129280.8	64.5	16746.9	112533.8	74314.4
61	4.2	993	124115.4	63.8	16151.9	107963.5	74034.2
62	4.2	952	119046.8	63.2	15596.4	103450.4	73626.4
63	4.2	913	114069.2	62.6	15076.8	98992.3	73089.5
64	4.3	873	109177.2	62.0	14590.1	94587.1	72421.3
65	4.4	835	104365.8	61.4	14133.1	90232.7	71619.5
66	4.4	797	99630.1	60.8	13703.4	85926.7	70680.8
67	4.5	760	94965.5	60.3	13298.6	81666.9	69601.7
68	4.6	723	90367.4	59.7	12916.3	77451.1	68377.8
69	4.7	687	85831.7	59.2	12554.6	73277.1	67004.4
70	4.9	651	81354.1	58.7	12211.4	69142.7	65475.9



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 74495.72 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

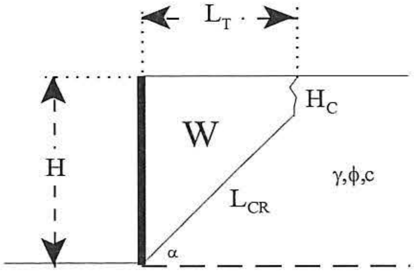
EFP 41.4 pcf

Design Shoring for an Equivalent Fluid Pressure: 42 pcf

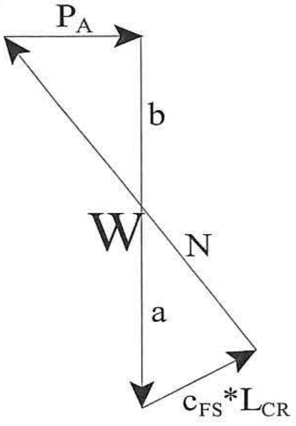
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	70.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	32.0 degrees
Cohesion of Retained Soils	(c)	200.0 psf
Factor of Safety	(FS)	1.25
Factored Parameters:	(ϕ_{FS})	26.6 degrees
	(c_{FS})	160.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) $feet^2$	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
45	5.1	2437	304612.3	91.8	41515.2	263097.1	87723.5
46	5.0	2354	294262.0	90.4	38884.7	255377.3	90131.7
47	4.8	2274	284235.9	89.1	36530.4	247705.6	92316.5
48	4.7	2196	274515.6	87.9	34413.9	240101.7	94287.0
49	4.6	2121	265083.4	86.7	32503.7	232579.8	96051.2
50	4.5	2047	255922.8	85.5	30773.0	225149.7	97616.4
51	4.4	1976	247017.8	84.4	29199.8	217818.0	98988.8
52	4.3	1907	238353.6	83.3	27765.0	210588.5	100173.8
53	4.3	1839	229916.1	82.3	26452.7	203463.4	101176.1
54	4.2	1774	221692.3	81.3	25249.1	196443.2	101999.4
55	4.2	1709	213669.7	80.3	24142.4	189527.3	102647.0
56	4.2	1647	205836.7	79.4	23122.3	182714.4	103121.3
57	4.1	1585	198182.3	78.5	22179.9	176002.4	103424.1
58	4.1	1526	190696.2	77.7	21307.4	169388.7	103556.6
59	4.1	1467	183368.6	76.8	20498.1	162870.5	103519.3
60	4.2	1410	176190.5	76.0	19745.8	156444.7	103312.0
61	4.2	1353	169153.0	75.3	19045.3	150107.8	102933.9
62	4.2	1298	162248.2	74.5	18391.7	143856.4	102383.7
63	4.2	1244	155468.1	73.8	17781.0	137687.1	101659.2
64	4.3	1190	148805.5	73.1	17209.3	131596.2	100757.6
65	4.4	1138	142253.3	72.4	16673.1	125580.2	99675.5
66	4.4	1086	135804.9	71.8	16169.5	119635.5	98408.7
67	4.5	1036	129454.0	71.1	15695.5	113758.6	96952.3
68	4.6	986	123194.5	70.5	15248.5	107946.0	95300.3
69	4.7	936	117020.6	69.9	14826.3	102194.4	93446.3
70	4.9	887	110926.7	69.3	14426.4	96500.3	91382.7



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$

$b = W-a$

$P_A = b*\tan(\alpha-\phi_{FS})$

$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 103557 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

EFP 42.3 pcf

Design Shoring for an Equivalent Fluid Pressure: 43 pcf

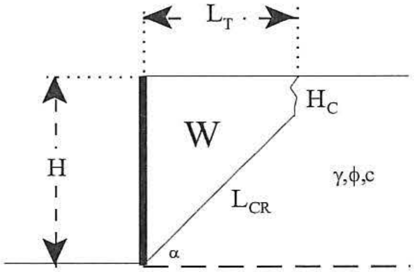
Geotechnologies, Inc.

Project: 1111 Sunset Blvd., LLC
File No.: 21155
Description: ~~Shoring Walls up to 80 feet~~ Bedrock, Oblique Bedding

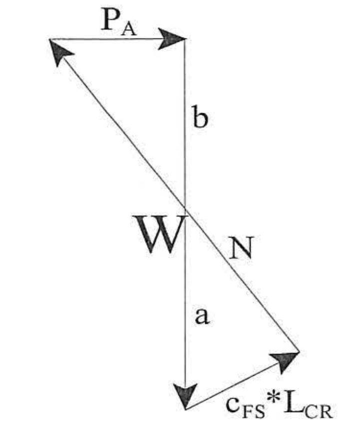
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	80.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	32.0 degrees
Cohesion of Retained Soils	(c)	200.0 psf
Factor of Safety	(FS)	1.25
Factored Parameters:	(ϕ_{FS})	26.6 degrees
	(c_{FS})	160.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
46	5.0	3078	384795.3	104.3	44862.5	339932.8	119974.3
47	4.8	2973	371659.2	102.8	42133.8	329525.4	122809.6
48	4.7	2871	358928.5	101.4	39682.5	319245.9	125366.6
49	4.6	2773	346579.1	99.9	37471.5	309107.6	127655.8
50	4.5	2677	334588.4	98.6	35469.6	299118.7	129686.6
51	4.4	2583	322935.0	97.3	33650.8	289284.2	131467.2
52	4.3	2493	311599.1	96.0	31992.9	279606.2	133004.5
53	4.3	2404	300561.8	94.8	30477.3	270084.5	134304.7
54	4.2	2318	289805.7	93.7	29088.0	260717.7	135372.7
55	4.2	2235	279314.2	92.5	27811.0	251503.2	136212.8
56	4.2	2153	269071.9	91.5	26634.5	242437.4	136828.1
57	4.1	2073	259064.3	90.4	25548.1	233516.1	137220.9
58	4.1	1994	249277.7	89.4	24542.8	224734.9	137392.8
59	4.1	1918	239699.3	88.5	23610.6	216088.7	137344.4
60	4.2	1843	230317.0	87.6	22744.6	207572.4	137075.4
61	4.2	1769	221119.5	86.7	21938.6	199180.9	136585.0
62	4.2	1697	212095.9	85.8	21187.1	190908.9	135871.2
63	4.2	1626	203236.1	85.0	20485.2	182751.0	134931.4
64	4.3	1556	194530.4	84.2	19828.5	174701.9	133761.8
65	4.4	1488	185969.6	83.5	19213.1	166756.5	132358.0
66	4.4	1420	177545.1	82.7	18635.5	158909.6	130714.5
67	4.5	1354	169248.5	82.0	18092.4	151156.2	128824.9
68	4.6	1289	161072.0	81.3	17580.8	143491.2	126681.5
69	4.7	1224	153007.9	80.6	17097.9	135909.9	124275.8
70	4.9	1160	145048.9	80.0	16641.4	128407.5	121597.8
71	5.0	1098	137188.1	79.3	16208.6	120979.5	118636.4



Design Equations (Vector Analysis):

$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$
$b = W-a$
$P_A = b*\tan(\alpha-\phi_{FS})$
$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 137393 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$
EFP 42.9 pcf

Design Shoring for an Equivalent Fluid Pressure: 43 pcf

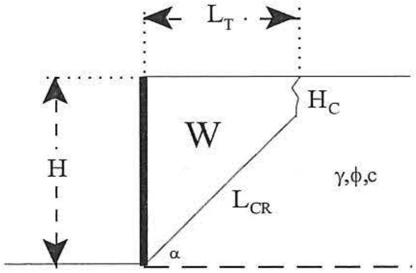
Geotechnologies, Inc.

Project: 1111 Sunset Blvd., LLC
File No.: 21155
Description: ~~Shoring Walls up to 90 feet~~ — Bedrock, Oblique Bedding

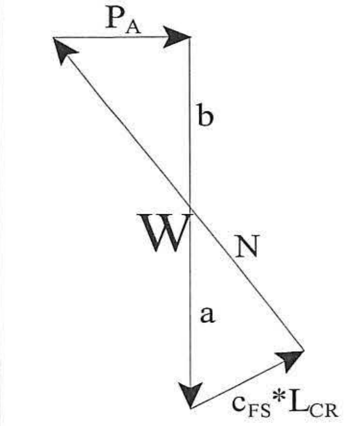
Shoring Design with Level Backfill
(Vector Analysis)

Input:

Shoring Height	(H)	90.00 feet
Unit Weight of Retained Soils	(γ)	125.0 pcf
Friction Angle of Retained Soils	(ϕ)	32.0 degrees
Cohesion of Retained Soils	(c)	200.0 psf
Factor of Safety	(FS)	1.25
Factored Parameters:	(ϕ_{FS})	26.6 degrees
	(c_{FS})	160.0 psf



Failure Angle (α) degrees	Height of Tension Crack (H_C) feet	Area of Wedge (A) feet^2	Weight of Wedge (W) lbs/lineal foot	Length of Failure Plane (L_{CR}) feet	a lbs/lineal foot	b lbs/lineal foot	Active Pressure (P_A) lbs/lineal foot
46	5.0	3899	487399.8	118.2	50840.4	436559.4	154077.3
47	4.8	3766	470738.9	116.5	47737.2	423001.7	157647.0
48	4.7	3637	454596.4	114.8	44951.2	409645.3	160866.1
49	4.6	3512	438940.8	113.2	42439.4	396501.4	163747.9
50	4.5	3390	423742.7	111.6	40166.2	383576.5	166304.3
51	4.4	3272	408974.6	110.2	38101.8	370872.8	168545.6
52	4.3	3157	394610.7	108.7	36220.8	358389.8	170480.7
53	4.3	3045	380626.9	107.3	34502.0	346125.0	172117.3
54	4.2	2936	367000.8	106.0	32926.8	334074.0	173461.6
55	4.2	2830	353711.2	104.8	31479.6	322231.7	174519.0
56	4.2	2726	340738.4	103.5	30146.7	310591.7	175293.4
57	4.1	2625	328063.8	102.4	28916.3	299147.5	175787.8
58	4.1	2525	315670.0	101.2	27778.2	287891.9	176004.1
59	4.1	2428	303540.7	100.2	26723.2	276817.5	175943.2
60	4.2	2333	291660.5	99.1	25743.5	265917.0	175604.7
61	4.2	2240	280014.9	98.1	24832.0	255182.9	174987.5
62	4.2	2149	268590.1	97.2	23982.4	244607.6	174089.1
63	4.2	2059	257373.2	96.2	23189.3	234183.9	172906.1
64	4.3	1971	246352.0	95.4	22447.7	223904.3	171434.0
65	4.4	1884	235514.8	94.5	21753.1	213761.7	169667.0
66	4.4	1799	224850.7	93.7	21101.5	203749.2	167598.3
67	4.5	1715	214349.0	92.9	20489.2	193859.8	165219.6
68	4.6	1632	203999.8	92.1	19913.0	184086.8	162521.4
69	4.7	1550	193793.4	91.3	19369.6	174423.8	159492.8
70	4.9	1470	183720.8	90.6	18856.3	164864.4	156121.3
71	5.0	1390	173773.0	89.9	18370.4	155402.5	152392.7



Design Equations (Vector Analysis):
$a = c_{FS}*L_{CR}*\sin(90+\phi_{FS})/\sin(\alpha-\phi_{FS})$
$b = W-a$
$P_A = b*\tan(\alpha-\phi_{FS})$
$EFP = 2*P_A/H^2$

Maximum Active Pressure Resultant

$P_{A,\ max}$ 176004 lbs/lineal foot

Equivalent Fluid Pressure (per lineal foot of shoring)

$EFP = 2*P_A/H^2$

EFP 43.5 pcf

Design Shoring for an Equivalent Fluid Pressure: **44 pcf**

Geotechnologies, Inc.

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Geologic Material Bedrock, Daylighted, undrained

Soil Weight	γ	63 pcf
Internal Friction Angle	ϕ	13 degrees
Cohesion	c	255 psf
Height of Retaining Wall	H	80 feet

Cantilever Retaining Wall Design based on At Rest Earth Pressure

$\sigma'_h = K_o\sigma'_v$

$K_o = 1 - \sin\phi$ 0.775
$\sigma'_v = \gamma H$ 5040.0 psf

$\sigma'_h =$ 3906.2 psf
EFP = 48.8 pcf
$P_o =$ 156249.9 lbs/ft (based on a triangular distribution of pressure)

Design wall for an EFP of 49 pcf + $\overset{\text{hydrostatic}}{62.4}$ = 111.4 say 112 pcf

Geotechnologies, Inc.

Project: 1111 Sunset Boulevard, LLC
File No.: 21155
Geologic Material Bedrock, oblique bedding, undrained

Soil Weight	γ	63 pcf
Internal Friction Angle	ϕ	32 degrees
Cohesion	c	200 psf
Height of Retaining Wall	H	80 feet

Cantilever Retaining Wall Design based on At Rest Earth Pressure

$\sigma'_h = K_o\sigma'_v$

$K_o = 1 - \sin\phi$ 0.470
$\sigma'_v = \gamma H$ 5040.0 psf

$\sigma'_h =$ 2369.2 psf
EFP = 29.6 pcf
$P_o =$ 94768.3 lbs/ft (based on a triangular distribution of pressure)

Design wall for an EFP of 30 pcf + hydrostatic 62.4 = 92.4 say 93 pcf

Geotechnologies, Inc.

Tiebacks Calculations

(Ref: Bowles, 1982)

Project: 1111 Sunset Blvd.
File No. 21155

Soil Parameters:

Weight of Soil	γ	125.00	*lbs/ft³*
Friction Angle	ϕ	32.00	*degrees*
Cohesion	c	200.00	*lbs/ft²*
Tieback Angle	α	40.00	*degrees*

Design Assumptions:

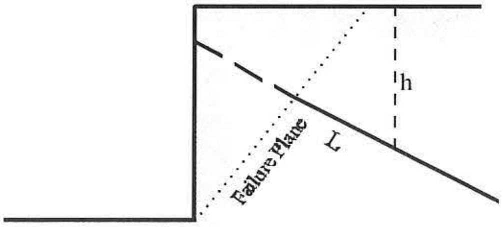
Diameter of Grout	d	1.00	*feet*
Length of Embeddment	L	20.00	*feet*
Depth to midpoint of Embeddment	h	12.00	*feet*
Earth Pressure Coefficient	K	0.65	
Factor of Safety Applied	F.S.	1.50	

Ultimate Resistance:	R_{ult}	53.91	*kips*

Eq: $pi*d*\gamma*L*h*cos(a)*tan(\phi)+c*pi*d*L$

Allowable Resistance:	$R_{allow} = R_{ult}/F.S.$	35.94	*kips*
Allowable Skin Friction:	$R_{allow}/2/pi/r/L$	572.01	*psf*

Allowable Skin Friction Design Value **600** ***psf***



2

Geotechnologies, Inc.

Project: 1111 Sunset Blvd.
File No.: 21155
Description: Slot Cut

Slot Cut Calculation

Input:

Height of Slots	(H)	10.0	feet
Unit Weight of Soils	(γ)	120.0	pcf
Friction Angle of Soils	(ϕ)	32.0	degrees
Cohesion of Soils	(c)	200.0	psf
Factor of Safety	(FS)	1.25	

Factor of Safety = Resistance Force/Driving Force

Coefficient of Lateral Earth Pressure At-Rest	K_o	0.5

Surcharge Pressure:

Line Load	(q_L)	3000.0	plf
Distance Away from Edge of Excavation	(X)	0.0	feet

Design Equations

$b = H/(\tan \alpha)$

$A = 0.5*H*b$

$W = 0.5*H*b*\gamma$ *(per lineal foot of slot width)*

$F_1 = d*W*(\sin \alpha)*(\cos \alpha)$

$F_2 = d*L$

$R_1 = d*[W*(\cos^2 \alpha)*(\tan \phi)+(c*b)]$

$R_2 = 2*\Delta F$

$\Delta F = A*[1/3*\gamma*H*K_o*(\tan \phi)+c]$

FS = Resistance Force/Driving Force

$FS = (R_1+R_2)/(F_1+F_2)$

Failure Angle (α) degrees	Base Width of Failure Wedge (b) feet	Area of Failure Wedge (A) feet2	Weight of Failure Wedge (W) lbs/lineal foot	**Driving Force** Wedge + Surcharge per lineal foot of Slot Wdith	**Resisting Force** Failure Wedge per lineal foot of Slot Width	**Resisting Force** Side Resistance Force (ΔF) lbs	Allowable Width of Slots* (d) feet
45	10.0	50	6000.0	4500.0	4811.9	16748.6	42.4
46	9.7	48	5794.1	4394.4	4583.1	16173.9	36.4
47	9.3	47	5595.1	4287.1	4363.1	15618.3	32.1
48	9.0	45	5402.4	4178.2	4151.6	15080.5	28.7
49	8.7	43	5215.7	4067.9	3948.2	14559.3	26.1
50	8.4	42	5034.6	3956.3	3752.6	14053.7	24.0
51	8.1	40	4858.7	3843.5	3564.4	13562.7	22.2
52	7.8	39	4687.7	3729.7	3383.4	13085.4	20.8
53	7.5	38	4521.3	3615.0	3209.3	12621.0	19.5
54	7.3	36	4359.3	3499.5	3041.9	12168.6	18.5
55	7.0	35	4201.2	3383.5	2880.8	11727.5	17.6
56	6.7	34	4047.1	3267.0	2726.0	11297.1	16.8
57	6.5	32	3896.4	3150.1	2577.1	10876.7	16.2
58	6.2	31	3749.2	3033.1	2434.0	10465.7	15.6
59	6.0	30	3605.2	2916.0	2296.6	10063.6	15.1
60	5.8	29	3464.1	2799.0	2164.5	9669.8	14.6
61	5.5	28	3325.9	2682.3	2037.7	9283.9	14.3
62	5.3	27	3190.3	2566.0	1916.0	8905.4	13.9
63	5.1	25	3057.2	2450.2	1799.2	8533.8	13.6
64	4.9	24	2926.4	2335.0	1687.1	8168.8	13.4
65	4.7	23	2797.8	2220.7	1579.7	7810.0	13.2
66	4.5	22	2671.4	2107.3	1476.7	7457.0	13.0
67	4.2	21	2546.8	1995.0	1378.1	7109.4	12.9
68	4.0	20	2424.2	1884.0	1283.7	6766.9	12.7
69	3.8	19	2303.2	1774.3	1193.3	6429.2	12.7
70	3.6	18	2183.8	1666.0	1106.9	6096.0	12.6

Critical Slot Width with Factor of Safety equal or exceeding 1.5:

d_{allow} 12.6 feet

The proposed excavation may be made using the A-B-C Slot-Cutting Method with a Maximum Allowable Slot Width of 8 Feet, and up to 10 Feet in Height, with a Factor of Safety Equal or Exceeding 1.25.

BOARD OF
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GEOLOGY AND SOILS REPORT REVIEW LETTER

January 31, 2018

LOG # 101530
SOILS/GEOLOGY FILE - 2

1111 Sunset Boulevard, LLC
11766 Wilshire Boulevard, Suite 1150
Los Angeles, CA 90025

TRACT: PM 1999-3180
LOT: B
LOCATION: 1111 W. Sunset Boulevard

CURRENT REFERENCE REPORT/LETTER	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Geology/Soils Report	21155	10/10/2017 (Rev. 1/10/2018)	Geotechnologies
Oversized Documents	``	`` ``	

The Grading Division of the Department of Building and Safety has reviewed the referenced report that provides recommendations for the proposed demolition of all site improvements; and, construction of two up to 49-story towers, hotel, and low rise residential buildings over 7-stories of subterranean parking. Shoring and retaining walls are anticipated to be up to 70 feet below grade.

The earth materials at the subsurface exploration locations consist of up to 10.5 feet of uncertified fill underlain by up to 5 feet of colluvium, greater than 4 feet of old alluvium and Puente Formation bedrock. The Puente Formation bedrock includes interbedded tuff, siltstone, and sandstone dipping to the south between 31 and 78 degrees. A west plunging syncline was also identified on the west side of the proposed development and an unnamed fault has been mapped through the west portion of the proposed development. According to the consultants (pg. 16), "*historically highest groundwater level should be considered at a depth of 20 feet below the ground surface*" and the highest groundwater level was found at 16 feet depth in the borings.

The consultants recommend to support the proposed structures on conventional, mat-type and/or drilled-pile foundations bearing in competent bedrock. According to the consultants, the fill, colluvium, and old alluvium are not suitable for support of the proposed structures.

The review of the subject report cannot be completed because the stability or safety of the proposed development cannot be determined at this time. The review will be continued upon submittal of an addendum to the reports which includes, but need not be limited to, the following:

(Note: Numbers in parenthesis ( ) refer to applicable sections of the 2017 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. Please provide a complete project description and clarify the number of stories for each structure. Note: The tract map indicates up to 49 stories and the report indicates up to 45 stories.

2. What are the proposed site grades? Will any slopes be part of the proposed project?

3. Clarify the finished floor elevation of the existing "Elysian" 9-story structure at 1115 Sunset Boulevard (number & depth of any subterranean levels), and show the structure including any basement on the cross section(s).

4. It appears that a complete electronic copy of the researched reports was not provided and offsite adjacent reports were not researched for data. Research, review and reference all existing records at the Research Division of the Department of Building and Safety for the **subject and adjacent properties** and incorporate the existing geologic data into the current evaluation. Include for review purposes a **complete electronic PDF copy** (including report text, figures, exploration logs, geologic map, cross-sections and lab data) of the previous reports and the Department's review letters. Summarize previous investigations-conclusions-recommendations, and department approvals. The consultants shall provide a statement that referenced previous reports were reviewed, that they either concur with or do not concur with the findings contained therein, and that they will accept professional responsibility for the use of any data from others.

5. 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 (7006.3.2). The geologic map and cross-sections shall show all existing and proposed structures, property lines, lithologic contacts, natural slopes, graded slopes, exploration data and location/height of all proposed retaining walls.

6. From the boring logs it appears that the stratification lines were based upon drive samples. Were the sidewalls of the downhole borings cleaned to expose bedding, joints, fractures, faults, etc.? Was a graphic log of the downhole borings and test pits prepared? What bedrock unit/structure was causing the seeps? What are the weakest beds at the site and were they sampled perpendicular to bedding to obtain re-shear direct shear test results?

7. Based on the exploration data, the bedding orientation in the area is dipping to the south. Where the bedrock orientation dips toward an excavation, unsupported beds would likely surcharge the proposed basement and retaining walls on the north side of the proposed structures. In addition, previous consultants identified tuff beds at the subject site. Additional deeper exploration shall rule out the presence of weaker rock types that may be located behind the proposed walls. Enough exploration shall be performed to identify the weakest bedrock layers that will be exposed by all the retaining walls at the site. Cal/OSHA regulations regarding shaft/tunnel safety (including air monitoring, supplied air, ventilation, etc.) shall be implemented prior to anyone entering deep borings or test pits.

8. An unnamed fault appears to traverse the western portion of the site and a syncline has been identified at the site. In addition, folded bedding (anticlines and synclines) were mapped by Lamar on the Local Geologic Map. Provide additional exploration to determine the location of the fault and the orientation of the bedding affecting the subject site.

9. As the subject lot is "egg shaped" and the location of the proposed retaining walls and shoring are not clearly depicted, it is unclear which walls/shoring will be surcharged by adverse bedding conditions. For each retaining wall/shoring, provide a label denoting whether adverse bedding recommendations are recommended.

10. Provide temporary and permanent ground water control recommendations. Note: The Department requires that in the event the proposed depth below grade of the lowest building finish floor level will be near or below the historically highest ground water level or the current ground water level, temporary and permanent ground water control recommendations shall be provided.

11. The residual shear (re-shear) strength shall be used where potential slip along bedding/foliation planes is analyzed as required in Information Bulletin P/BC 2017-049. 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. Note: It appears that shears from the remolded samples were used in the analyses instead of re-shears (see Plate B-1).

12. Revise the temporary excavation, shoring, and retaining wall calculations and recommendations considering the weakest adverse bedding conditions.

13. Provide the soils engineers/geologists recommendations for the sequence of construction.

14. Identify all laboratory samples including: location and depth that the sample was obtained; type of material; undisturbed, trimmed or remolded sample; saturated or field moisture condition; and sample orientation per P/BC 2017-049.

15. Provide a detailed description of shear test procedures used.

16. Provide clarification of the reported shear test values as peak, ultimate or re-sheared along the weakest bedding plane per P/BC 2017-049.

17. Historic high groundwater appears to be mapped shallower than 20 feet and the highest groundwater level was found at 16 feet in the borings. As the proposed basement levels appear to be approximately 70 feet below grade, provide recommendations for hydrostatic design of the retaining walls and uplift of the basement floor slabs considering the groundwater levels shallower than 16 feet.

18. Provide tie-back anchor recommendations considering the southerly bedding dip angles that range from 31 to 78 degrees with respect to the 35 degree potentially active wedge assumed by the consultant.

19. Show the location of the inclinometers recommended to be installed at the southeast and southwest corners of the 3-story structure. Do the consultants mean adjacent to the 9-story existing residential structure?

20. Please clarify the recommended bearing materials. Page 16 indicates old alluvium is not suitable for support of the proposed structures and page 17 indicates that smaller improvements on a compacted fill blanket may bear on old alluvium.

The geologist and soils engineer shall prepare a report containing an itemized response to the review items indicated in this letter. If clarification concerning the review letter is necessary, the report review engineer and/or geologist may be contacted. Two copies of the response report, including one unbound wet-signed original for archiving purposes, a pdf-copy of the complete report in a CD or flash drive, and the appropriate fees will be required for submittal.

CASEY LEE JENSEN	GLEN RAAD
Engineering Geologist Associate III	Geotechnical Engineer I

CLJ/GR:clj/gr
Log No. 101530
213-482-0480

cc: Geotechnologies, Inc., Project Consultant
LA District Office

Geotechnologies, Inc.
Consulting Geotechnical Engineers

439 Western Avenue
Glendale, California 91201-2837
818.240.9600 • Fax 818.240.9675

May 24, 2018
Updated July 1, 2020
File Number 21155

1111 Sunset Boulevard, LLC
c/o Palisades Capital Partners
11766 Wilshire Boulevard, Suite 1150
Los Angeles, California 90025

Attention: Mr. Brian Falls

Subject: Updated Response to City of Los Angeles Geology
and Soils Report Review Letter dated January 31, 2018
Proposed Mixed-Use Development
1111 Sunset Boulevard, Los Angeles, California

References: *Reports by Geotechnologies, Inc.:*
Geotechnical Opinion, dated March 13, 2017;
Geotechnical Engineering Investigation, dated October 10, 2017, revised November 22, 2019;
Response to City of Los Angeles Soils and Geology Report Review Letter, dated May 24, 2018, revised June 25, 2018;
Updated Geotechnical Engineering Investigation, dated June 15, 2020.

Reports by Others:
Converse Foundation Engineering Company, Foundation Investigation, dated October 3, 1960, Project No. 60-451-A;
Pioneer Soils Engineering, Soil and Geology Investigation, dated June 24, 1997, Project No. 1677-FG;
Geosyntec Consultants, Methane Report (Draft), dated April 2016, Project No. SC0808.

Communications from City of L.A., Department of Building and Safety, Grading Division:
Geology and Soils Report Review Letter, dated January 31, 2018, LOG#101530;
Geology and Soils Report Review Letter, dated May 13, 2020, LOG#101530-01;
Geology and Soils Report Review Letter, dated May 19, 2020, LOG#101530-02.

Dear Mr. Falls:

This letter was prepared in the format requested by the city reviewer in the review letter dated May 19, 2020. Instead of providing a stand-along response to the reviewer's comments, this letter makes reference to the location in the Updated Geotechnical Engineering Investigation, dated June 15, where the response is found. The comments labeled 1 through 20 are repeated below and the corresponding responses by this firm follow. A copy of the review letter is also enclosed for reference.

Comment 1. *Please provide a complete project description and clarify the number of stories for each structure. Note: The tract map indicates up to 49 stories and the report indicates up to 45 stories.*

Response: The response is found in the section titled “Proposed Development” beginning on page 2. The location of the structures can be found on the attached Plot Plan and the Conceptual Grading Plan.

Comment 2. *What are the proposed site grades? Will any slopes be part of the proposed project?*

Response: The proposed site grades and building descriptions are also found in the section titled “Proposed Development” beginning on page 2. The site grades, both existing and proposed, are also illustrated on the Cross Sections A-A’, B-B‘, C-C’, and D-D’. The location of the cross sections is shown on the Geologic Map.

Comment 3. *Clarify the finished floor elevation of the existing “Elysian” 9-story structure at 1115 Sunset Boulevard (number & depth of any subterranean levels), and show the structure including any basement on the cross sections(s).*

Response: The existing Elysian building is described in the “Site Conditions” section beginning on page 1. The Geologic Map and Cross Section A-A’ (drawn through the Elysian”) also show the finish floor elevation relative to the proposed development.

Comment 4. *It appears that a complete electronic copy of the researched reports was not provided and offsite adjacent reports were not researched for data. Research, review and reference all existing records at the Research Division of the Department of Building and Safety for the subject and adjacent properties and incorporate the existing geologic data into the current evaluation. Include for review purposes a complete electronic PDF copy (including report text, figures, exploration logs, geologic map, cross-sections and lab data) of the previous reports and the Department’s review letters. Summarize previous investigations-conclusions-recommendations, and department approvals. The consultants shall provide a statement that referenced previous reports were reviewed, that they either concur with or do not concur with the findings contained therein, and that they will accept professional responsibility for the use of any data from others.*

Response: The reports are described in the “Background Research” section beginning on page 6. The reports are grouped into either “Onsite Reports” or “Offsite Reports” sections. The subsurface borings or test pits excavated on site are show on the Geologic Map. The offsite reports are shown relative to the Project on the attached map, Location Map of Offsite Geotechnical Investigations by Others. All of the referenced reports by others are included in the attached CD.

The requested statement is found on in the "Background Research" section on page 5.

Comment 5. *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 (7006.3.2). The geologic map and cross-sections shall show all existing and proposed structures, property lines, lithologic contacts, natural slopes, graded slopes, exploration data and location/height of all proposed retaining walls.*

Response: In the Appendix of the report, a Project Summary map prepared by the Architect shows the layout of the proposed structures. The Geologic Map shows the existing buildings and elevations contours relative to the proposed structures. Standard geologic information such as cross sections and geology are also shown. Cross Sections A-A', B-B', C-C', and D-D' show subsurface geologic information as well as proposed excavation limits. Proposed graded slopes nd individual retaining walls are not shown as such detail has not yet been determined.

Comment 6. *From the boring logs it appears that the stratification lines were based upon drive samples. Were the sidewalls of the downhole borings cleaned to expose bedding, joints, fractures, faults, etc.? Was a graphic log of the downhole borings and test pits prepared? What bedrock unit/structure was causing the seeps? What are the weakest beds at the site and were they sampled perpendicular to bedding to obtain re-shear direct shear test results?*

Response: A description of the logging procedure is found in the section titled "Field Exploration", beginning on Page 12. A graphic log was prepared only for Test Pit TP-5 that is included in the report as Plate A-15.

A description of the seepage observations is found in the section labeled "Groundwater" beginning on page 16.

Comment 7. *Based on the exploration data, the bedding orientation in the area is dipping to the south. Where the bedrock orientation dips toward an excavation, unsupported beds would likely surcharge the proposed basement and retaining walls on the north side of the proposed structures. In addition, previous consultants identified tuff beds at the subject site. Additional deeper exploration shall rule out the presence of weaker rock types that may be located behind the proposed walls. Enough exploration shall be performed to identify the weakest bedrock layers that will be exposed by all the retaining walls at the site. Cal/OSHA regulations regarding shaft/tunnel safety (including air monitoring, supplied air, ventilation, etc.) shall be implemented prior to anyone entering deep borings or test pits.*

Response: Five additional borings were drilled and a trench was excavated since the preparation of the original report. A description of the geologic materials and their distribution can be found in the section titled “Geologic Materials” beginning on page 13.

Comment 8. An unnamed fault appears to traverse the western portion of the site and a syncline has been identified at the site. In addition, folded bedding (anticlines and synclines) were mapped by Lamar on the Local Geologic Map. Provide additional exploration to determine the location of the fault and the orientation of the bedding affecting the subject site.

Response: A description of the unnamed fault is presented on page 15 of the report in the section titled “Unnamed Fault”.

Comment 9. As the subject lot is “egg shaped” and the location of the proposed retaining walls and shoring are not clearly depicted, it is unclear which walls/shoring will be surcharged by adverse bedding conditions. For each retaining wall/shoring, provide a label denoting whether adverse bedding recommendations are recommended.

Response: The report includes a diagram in the Appendix: “Plan Showing Cuts with Daylighted Bedding” that illustrates where such geologic conditions occur.

Comment 10. Provide temporary and permanent ground water control recommendations. Note: The Department requires that in the event the proposed depth below grade of the lowest building finish floor level will be near or below the historically highest ground water level or the current ground water level, temporary and permanent ground water control recommendations shall be provided.

Response: The presence and depth of water is discussed in the “Groundwater” section found on page 16. The groundwater elevation is illustrated on the attached Cross Sections A-A’, B-B’, C-C’, and D-D’. The “Conclusions and Recommendations” section found on Page 24 describes the construction dewatering and hydrostatic design considerations. More detailed recommendations are presented in the “Construction Dewatering” section found on Page 30. The “Mat Foundation” section on page 38 describes the need for a hydrostatic design for structures with basements greater than 20 feet in depth. Permanent dewatering is not recommended for this site due to the presence of naturally-occurring tar.

Comment 11. The residual shear (re-shear) strength shall be used where potential slip along bedding/foliation planes is analyzed as required in Information Bulletin P/BC 2017-049. 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. Note: It *appears that shears from the remolded samples were used in the analyses instead of re-shears (see Plate B-1).*

Response: A discussion of the lab testing procedure is presented in the section “Direct Shear Testing” found on Page 69.

Comment 12. Revise the temporary excavations, shoring, and retaining wall calculations and recommendations considering the weakest adverse bedding conditions.

Response: The wall loading recommendations have been revised based on the results of the along-bedding direct shear testing. The new retaining wall recommendations are found beginning on page 43 in the “Retaining Wall Design” section. Updated shoring wall recommendations are presented on page 53, in the “Lateral Pressures” section. The calculation sheets are included in the Appendix of the report.

Comment 13. Provide the soils engineers/geologists recommendations for the sequence of construction.

Response: On page 27, section “Sequence of Construction” is found.

Comment 14. Identify all laboratory samples including: location and depth that the sample was obtained; type of material; undisturbed, trimmed or remolded sample; saturated or field moisture conditions; and sample orientation per P/BC 2017-049.

Response: Soil samples were collected from the field exploration by using a California-Modified split-spoon sampler lined with 2.5-inch diameter brass rings or disturbed bag samples. The sample depths are shown on each log.

In the Appendix, on the laboratory test plates B-1 through B-7, C-1 through , C-5 D-1 and D-2 where a range of depth is shown (i.e. B1 @ 1-5’) the sample is a disturbed bag sample. Where a discrete depth is provided (i.e. B1 @ 10’) the sample was taken with the California-Modified sampler. The only exception occurs in Boring 8 where bag samples from a discrete depth were taken at depths of 38 feet and 64 feet.

Saturated or field moisture conditions are indicted on the lower left corner of the shear plates. All shear testing was performed as an undisturbed sample unless indicated in the title of the plate located at the top of the page as resheared or remolded. Additional consolidation test were performed using recently acquired samples. The results are presented on Plates C-1 though C-5 found in the Appendix.

Sulfate tests of the bedrock are presented on Plates D-1 and D-2 found in the Appendix. Sulfate tests of the bedrock ranged from less than 0.1 percent to greater than 0.20%. These findings are corroborated in the referenced report. It is the recommendation of this firm that Type V cement be used for all concrete in contact with the geologic materials.

Comment 15. Provide a detailed description of shear test procedures used.

Response: The shear test procedure is discussed in the section "Direct Shear Testing" beginning on page 71.

Comment 16. Provide clarification of the reported shear test values as peak, ultimate or re-sheared along the weakest bedding plane per P/BC 2017-049.

Response: Shear test data for remolded and single direct shear results are peak values. For remolded samples the ultimate values are presented.

Comment 17. Historic high groundwater appears to be mapped shallower than 20 feet and the highest groundwater level was found at 16 feet in the borings. As the proposed basement levels appears to be approximately 70 feet below grade, provide recommendations for hydrostatic design of the retaining walls and uplift of the basements floor slabs considering the groundwater levels shallower than 16 feet.

Response: Due to the significant elevation change across the site (51 feet), a singular groundwater elevation is not valid. The historically high groundwater was established at 20 feet below grade. It is the recommendation of this firm that this depth below the ground surface be used. The recommendations are found in the "Groundwater" section beginning on page 16.

Comment 18. Provide tie-back anchor recommendations considering the southerly bedding dip angles that range from 31 to 78 degrees with respect to the 35 degree potentially active wedge assumed by the consultant.

Response: Tieback anchor recommendations are found beginning on Page 57 in the "Tied-Back Anchors" section.

Comment 19. Show the location of the inclinometers recommended to be installed at the southeast and southwest corners of the 3-story structure. Do the consultants mean adjacent to the 9-story existing residential structure?

Response: Two inclinometers should be installed on the south side of the proposed Elysian parking structure (constructed during Phase I). The proposed inclinometers are shown on the attached "Plan Showing Cuts with Daylighted Bedding" found in the Appendix. The recommendations are found in the "Inclinometers" section on page 60.

Comment 20. *Please clarify the recommended bearing materials. Page 16 indicates old alluvium is not suitable for support of the proposed structures and page 17 indicates that the smaller improvements on a compacted fill blanket may bear on old alluvium.*

Response: The main structures are to be supported exclusively in the bedrock. The recommendations for foundation design are located in the "Conventional Foundations" section beginning on page 35 and beginning on page 38 in the "Mat Foundation" section. The "Miscellaneous Foundations" section on page 37 describes the bearing materials for small walls and enclosures.

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.

REINARD T KNUR
No 2755
Exp. 12/31/20

REINARD T. KNUR
NO. 1547
CERTIFIED ENGINEERING GEOLOGIST

REINARD T. KNUR
G.E. 2755, C.E.G. 1547

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CITY OF LOS ANGELES
CALIFORNIA

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MAYOR

DEPARTMENT OF
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OSAMA YOUNAN, P.E.
GENERAL MANAGER
SUPERINTENDENT OF BUILDING

GEOLOGY AND SOILS REPORT REVIEW LETTER

May 13, 2020

LOG # 101530-01
SOILS/GEOLOGY FILE - 2

1111 Sunset Boulevard, LLC
11766 Wilshire Boulevard, Suite 1150
Los Angeles, CA 90025

PROPOSED LEGAL: VTT-80315, Lots 1-18 (1 ground, 17 airspace)
CURRENT LEGAL: PM 1999-3180, Lot B
LOCATION: 1111 W. Sunset Boulevard

CURRENT REFERENCE REPORT/LETTER	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Response Report	21155	05/24/2018 (Rev. 6/25/2018)	Geotechnologies, Inc.

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Review Letter	101530	01/31/2018	LADBS
Geology/Soils Report	21155	10/10/2017 (Rev. 1/10/2018)	Geotechnologies, Inc.

The Grading Division of the Department of Building and Safety has reviewed the referenced reports that provide recommendations for the proposed demolition of all site improvements; and, construction of two up to 49-story towers, hotel, and low rise residential buildings over 7-stories of subterranean parking, as described on pages 1 and 2 and shown on the cross sections A to D in the 06/25/2018 report. Shoring and/or retaining walls are anticipated to be up to 90 feet below grade.

The earth materials at the subsurface exploration locations consist of up to 10.5 feet of uncertified fill underlain by up to 5 feet of colluvium, greater than 4 feet of old alluvium and Puente Formation bedrock. The Puente Formation bedrock includes interbedded tuff, siltstone, and sandstone dipping to the south between 25 and 80 degrees. According to the consultants, "*historically highest groundwater level should be considered at a depth of 20 feet below the ground surface*" and the highest groundwater level was found at 16 feet depth in the borings.

The consultants recommend to support the proposed structures on conventional, mat-type and/or drilled-pile foundations bearing in competent bedrock. According to the consultants, the fill, colluvium, and old alluvium are not suitable for support of the proposed structures.

As of January 1, 2020, the City of Los Angeles has adopted the new 2020 Los Angeles Building Code (LABC). The 2020 LABC requirements will apply to all projects where the permit application submittal date is after January 1, 2020.

The review of the referenced reports cannot be completed because the stability or safety of the proposed development cannot be determined at this time. The review will be continued upon submittal of an addendum to the reports which includes, but need not be limited to, the following:

(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. In the event the permit application submittal date is after January 1, 2020, then provide updated recommendations to be in conformance with the 2020 LABC.

2. The at-rest pressures (EFP) shown on page 16 of the 06/25/2018 report appear to be less than those shown on page 14 (112 pcf for daylighted bedding) and page 15 (93 pcf for oblique bedding) for hydrostatic conditions. Revise the EFP's on page 16 such that the minimum at-rest pressures are consistent with those shown on pages 14 and 15.

3. The structure(s) are recommended by the consultant to be designed to resist the hydrostatic pressures that would develop due to the historic high groundwater level, determined to be 20 feet below the ground surface by the consultants. However, groundwater level was found at 16 feet in the borings (B-4). The consultants state that a nearby boring (B-10) found water at 34 feet. Boring 10 appears to be about 150 feet away from B-4 and drilled about 8 months later.

   Provide extensive subsurface exploration and study to determine the highest groundwater level, or design the structure/basement retaining walls to resist the hydrostatic pressures that would develop if the groundwater level rose to the ground surface.

The geologist and soils engineer shall prepare a report containing an itemized response to the review items indicated in this letter. If clarification concerning the review letter is necessary, the report review engineer and/or geologist may be contacted. Two copies of the response report, including one unbound wet-signed original for archiving purposes, a pdf-copy of the complete report in a CD or flash drive, and the appropriate fees will be required for submittal.

FOR
CASEY LEE JENSEN
Engineering Geologist Associate III

GLEN RAAD
Geotechnical Engineer I

CLJ/GR:clj/gr
Log No. 101530-01
213-482-0480

cc: Geotechnologies, Inc., Project Consultant
planning.majorprojects@lacity.org
LA District Office

Geotechnologies, Inc.
Consulting Geotechnical Engineers

439 Western Avenue
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818.240.9600 • Fax 818.240.9675

July 1, 2020
File No. 21155

1111 Sunset Boulevard, LLC
c/o Palisades Capital Partners
11766 Wilshire Boulevard Suite 1150
Los Angeles, California 90025

Attention: Brian Falls

Subject: Response to City of Los Angeles, Department of Building and Safety,
Soils Report Review Letter dated May 13, 2020
Proposed Mixed-Use Development
1111 Sunset Boulevard, Los Angeles, California

References: *Reports by Geotechnologies, Inc.:*
Geotechnical Opinion, dated March 13, 2017;
Geotechnical Engineering Investigation, dated October 10, 2017, revised November 22, 2019;
Response to City of Los Angeles Soils and Geology Report Review Letter, dated May 24, 2018, revised June 25, 2018;
Updated Geotechnical Engineering Investigation, dated June 15, 2020.

Reports by Others:
Converse Foundation Engineering Company, Foundation Investigation, dated October 3, 1960, Project No. 60-451-A;
Pioneer Soils Engineering, Soil and Geology Investigation, dated June 24, 1997, Project No 1677-FG;
Geosyntec Consultants, Methane Report (Draft), dated April 2016, Project Number SC0808.

Communications from City of L.A., Department of Building and Safety, Grading Division:
Geology and Soils Report Review Letter, dated January 31, 2018, LOG#101530;
Geology and Soils Report Review Letter, dated May 13, 2020, LOG#101530-01;
Geology and Soils Report Review Letter, dated May 19, 2020, LOG#101530-02.

Dear Mr. Falls,

This firm is in receipt of the referenced Soils Report Review Letter, dated May 13, 2020, issued by the City of Los Angeles, Department of Building and Safety. Therein, three comments are made which requires input from this office. The comment is repeated below and the response immediately follows. A copy of the correction letter has been enclosed for reference.

Comment 1: *In the event the permit application submittal date is after January I, 2020, then provide updated recommendations to be in conformance with the 2020 LABC.*

Response: The updated report is in conformation with the 2019 CBC and the 2020 LABC.

Comment 2: *The at-rest pressures (EFP) shown on page 16 of the 06/25/2018 report appear to be less than those shown on page 14 (112 pcf for daylighted bedding) and page 15 (93 pcf for oblique bedding) for hydrostatic conditions. Revise the EFP's on page 16 such that the minimum at-rest pressures are consistent with those shown on pages 14 and 15.*

Response: The wall pressures have been updated in the updated report. The retaining wall pressures may be found beginning on page 43 in the "Retaining Wall Design" section.

Comment 3: *The structure(s) are recommended by the consultant to be designed to resist the hydrostatic pressures that would develop due to the historic high ground water level, determined to be 20 feet below the ground surface by the consultants. However, groundwater level was found at 16 feet in the borings (B-4). The consultants state that a nearby boring (B- 10) found water at 34 feet. Boring 10 appears to be about 150 feet away from B-4 and drilled about 8 months later.*

Provide extensive subsurface exploration and study to determine the highest groundwater level, or design the structure/basement retaining walls to resist the hydrostatic pressures that would develop if the ground water level rose to the ground surface.

Response: The groundwater occurrence is discussed in the updated report beginning on page 16 in the "Groundwater" section.

Geotechnologies, Inc. appreciates the opportunity to provide our services on this project. Should you have any questions, please do not hesitate to contact this office.

Respectfully submitted,
GEOTECHNOLOGIES, INC.

REINARD T KNUR
No 2755
Exp. 12/31/20

REINARD T. KNUR
NO. 1547

REINARD T. KNUR
G.E 2755, C.E.G 1547

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Distribution: (4) Addressee

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BOARD OF
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GENERAL MANAGER
SUPERINTENDENT OF BUILDING

GEOLOGY AND SOILS REPORT REVIEW LETTER

May 19, 2020

LOG # 101530-02
SOILS/GEOLOGY FILE - 2

1111 Sunset Boulevard, LLC
11766 Wilshire Boulevard, Suite 1150
Los Angeles, CA 90025

PROPOSED LEGAL: VTT-80315, Lots 1-18 (1 ground, 17 airspace)
CURRENT LEGAL: PM 1999-3180, Lot B
LOCATION: 1111 W. Sunset Boulevard

CURRENT REFERENCE REPORT/LETTER	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Geology/Soils Report	21155	10/10/2017(Rev. 11/22/2019)	Geotechnologies, Inc.

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Review Letter	101530-01	05/13/2020	LADBS
Response Report	21155	05/24/2018 (Rev. 6/25/2018)	Geotechnologies, Inc.
Dept. Review Letter	101530	01/31/2018	LADBS
Geology/Soils Report	21155	10/10/2017 (Rev. 1/10/2018)	Geotechnologies, Inc.

The Grading Division of the Department of Building and Safety has reviewed the referenced reports that provide recommendations for the proposed demolition of all site improvements; and, construction of a mixed-use development with two up to 49-story residential towers, hotel, and low rise residential buildings over 6-levels of a podium parking structure above/below grade, as described on page 2 of the 10/10/2017 (revised 11/22/2019) report. Shoring and/or retaining walls are anticipated to be up to 90 feet below grade per the consultant's recommendations.

The earth materials at the subsurface exploration locations consist of up to 10.5 feet of uncertified fill underlain by up to 5 feet of colluvium, greater than 4 feet of old alluvium and Puente Formation bedrock. The Puente Formation bedrock includes interbedded tuff, siltstone, and sandstone dipping to the south between 25 and 80 degrees. According to the consultants, "*historically highest groundwater level should be considered at a depth of 20 feet below the ground surface*" and the highest groundwater level was found at 16 feet depth (elevation 393.5) in the borings.

The consultants recommend to support the proposed structures on conventional, mat-type and/or drilled-pile foundations bearing in competent bedrock. According to the consultants, the fill, colluvium, and old alluvium are not suitable for support of the proposed structures.

As of January 1, 2020, the City of Los Angeles has adopted the new 2020 Los Angeles Building Code (LABC). The 2020 LABC requirements will apply to all projects where the permit application submittal date is after January 1, 2020.

The review of the referenced reports cannot be completed because the stability or safety of the proposed development cannot be determined at this time. The review will be continued upon submittal of an addendum to the reports which includes, but need not be limited to, the following:

(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 latest report submitted for review dated 10/10/2017 (Rev. 11/22/2019) does not appear to reference all the previous reports submitted for review by the consultants, and appears to revert to the original 10/10/2017 (Rev. 1/10/2018) report that was issued a review letter by the Grading Division. In addition, all the revised dated and conflicting reports are confusing to the reviewers. Provide a new standalone report dated after this review letter which references all previous reports/review letters and provides all exploration, laboratory testing, and the current project recommendations.

2. The report requested in item 1 shall have an appendix that provides an itemized response to the 01/31/2018 review letter. The appendix responses shall include reference to where in the main body of the report the item is addressed.

3. The report requested in item 1 shall have an appendix that provides an itemized response to the 05/13/2020 review letter. The appendix responses shall include reference to where in the main body of the report the item is addressed.

4. Provide a geologic map that is based upon the proposed Tract Map and at the scale of the original map.

5. Clarify the heights of all proposed buildings and number of floor levels above and below grade.

6. Clarify which of the seismic parameters that are presented on page 19 of the current report will be applicable to the subject site. Update recommendations accordingly.

The geologist and soils engineer shall prepare a report containing an itemized response to the review items indicated in this letter. If clarification concerning the review letter is necessary, the report review engineer and/or geologist may be contacted. Two copies of the response report, including one unbound wet-signed original for archiving purposes, a pdf-copy of the complete report in a CD or flash drive, and the appropriate fees will be required for submittal.

FOR

CASEY LEE JENSEN
Engineering Geologist Associate III

GLEN RAAD
Geotechnical Engineer I

Log No. 101530-02
213-482-0480

cc: Geotechnologies, Inc., Project Consultant
planning.majorprojects@lacity.org
LA District Office

Geotechnologies, Inc.
Consulting Geotechnical Engineers

439 Western Avenue
Glendale, California 91201-2837
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July 1, 2020
File No. 21155

1111 Sunset Boulevard, LLC
c/o Palisades Capital Partners
11766 Wilshire Boulevard Suite 1150
Los Angeles, California 90025

Attention: Brian Falls

Subject: Response to City of Los Angeles, Department of Building and Safety, Soils Report Review Letter dated May 19, 2020
Proposed Mixed-Use Development
1111 Sunset Boulevard, Los Angeles, California

References: *Reports by Geotechnologies, Inc.:*
Geotechnical Opinion, dated March 13, 2017;
Geotechnical Engineering Investigation, dated October 10, 2017, revised November 22, 2019;
Response to City of Los Angeles Soils and Geology Report Review Letter, dated May 24, 2018, revised June 25, 2018;
Updated Geotechnical Engineering Investigation, dated June 15, 2020.

Reports by Others:
Converse Foundation Engineering Company, Foundation Investigation, dated October 3, 1960, Project No. 60-451-A;
Pioneer Soils Engineering, Soil and Geology Investigation, dated June 24, 1997, Project No 1677-FG;
Geosyntec Consultants, Methane Report (Draft), Dated April 2016, Project Number SC0808.

Communications from City of L.A., Department of Building and Safety, Grading Division:
Geology and Soils Report Review Letter, dated January 31, 2018, LOG#101530;
Geology and Soils Report Review Letter, dated May 13, 2020, LOG#101530-01;
Geology and Soils Report Review Letter, dated May 19, 2020, LOG#101530-02.

Dear Mr. Falls

This firm is in receipt of the referenced Soils Report Review Letter, dated May 19, 2020, issued by the City of Los Angeles, Department of Building and Safety. Therein, six comments are made which requires input from this office. The comment is repeated below and the response immediately follows. A copy of the correction letter has been enclosed for reference.

Comment 1: *The latest report submitted for review dated 10/10/2017 (Rev. 1 1/22/2019) does not appear to reference all the previous reports submitted for review by the consultants, and appears to revert to the original 10/10/20 17 (Rev. 1/ 10/2018) report that was issued a review letter by the Grading Division. In addition, all the* *revised dated and conflicting reports are confusing to the reviewers. Provide a new standalone report dated after this review letter which references all previous reports/review letters and provides all exploration, laboratory testing, and the current project recommendations.*

Response: A new standalone report has been prepared dated July 1, 2020. The report includes all subsurface work and laboratory testing as well as updated project recommendations.

Comment 2: *The report requested in item 1 shall have an appendix that provides an itemized response to the 01/13/2018 review letter. The appendix responses shall include reference to where in the main body of the report the item is addressed*

Response: The updated report includes the letter with the itemized responses as an attachment.

Comment 3: *The report requested in item 1 shall have an appendix that provides an itemized response to the 05/13/2020 review letter. The appendix responses shall include reference to where in the main body of the report the item is addressed.*

Response: The updated report includes the letter with the itemized responses as an attachment.

Comment 4: *Provide a geologic map that is based upon the proposed Tract Map and at the scale of the original map.*

Response: The Geologic Map, attached to the report, is at a scale of 1 inch=50 feet.

Comment 5: *Clarify the heights of all proposed buildings and number of floor levels above and below grade.*

Response: The updated report includes a description of all of the proposed buildings in the "Proposed Development" section of the report beginning on page 2.

Comment 6: *Clarify which of the seismic parameters that are presented on page 19 of the current report will be applicable to the subject site. Update recommendations accordingly.*

Response: The updated Seismic parameters are found beginning on page 29 under the table headed with "California Building Code Seismic Parameters". The 2019 California Building Code (2020 Los Angeles Building Code) is used.

Geotechnologies, Inc. appreciates the opportunity to provide our services on this project. Should you have any questions, please do not hesitate to contact this office.

Respectfully submitted,
GEOTECHNOLOGIES, INC.

REINARD T. KNUR
G.E 2755, C.E.G 1547

REINARD T KNUR
No 2755
Exp. 12/31/20

REINARD T. KNUR
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Appendix G.2

Geology and Soils Review Letter

BOARD OF
BUILDING AND SAFETY COMMISSIONERS

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SUPERINTENDENT OF BUILDING

JOHN WEIGHT
EXECUTIVE OFFICER

GEOLOGY AND SOILS REPORT REVIEW LETTER

July 31, 2020

LOG # 101530-03
SOILS/GEOLOGY FILE - 2

1111 Sunset Boulevard, LLC
11766 Wilshire Boulevard, Suite 1150
Los Angeles, CA 90025

PROPOSED LEGAL: VTT-80315, Lots 1-18 (1 ground, 17 airspace)
CURRENT LEGAL: PM 1999-3180, Lot B
LOCATION: 1111 W. Sunset Boulevard

CURRENT REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Geology/Soils Report	21155	10/10/2017 (Rev. 7/1/2020)	Geotechnologies, Inc.
Oversized Document	"	"	"
Response Report (5/19/20)	"	07/01/2020	"
Response Report (5/13/20)	"	"	"
Response Report (1/31/18)	"	05/24/2018 (Rev. 7/1/2020)	"

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Review Letter	101530-02	05/19/2020	LADBS
Geology/Soils Report	21155	10/10/2017(Rev. 11/22/2019)	Geotechnologies, Inc.
Dept. Review Letter	101530-01	05/13/2020	LADBS
Response Report	21155	05/24/2018 (Rev. 6/25/2018)	Geotechnologies, Inc.
Dept. Review Letter	101530	01/31/2018	LADBS
Geology/Soils Report	21155	10/10/2017 (Rev. 1/10/2018)	Geotechnologies, Inc.

The Grading Division of the Department of Building and Safety has reviewed the referenced reports that provide recommendations for the proposed demolition of all site improvements; and, construction of a mixed-use development with two up to 49-story residential towers, hotel, and low rise residential buildings over 6-levels of a podium parking structure above/below grade, as described on pages 2 to 6 of the 10/10/2017 (revised 07/01/2020) report. Shoring and/or retaining walls are anticipated to be up to 90 feet below grade per the consultant's recommendations.

The earth materials at the subsurface exploration locations consist of up to 10.5 feet of uncertified fill underlain by up to 5 feet of colluvium, greater than 4 feet of old alluvium and Puente Formation bedrock. The Puente Formation bedrock includes interbedded tuff, siltstone, and sandstone dipping to the south between 25 and 80 degrees. According to the consultants, "*historically highest* *groundwater level should be considered at a depth of 20 feet below the ground surface*" and the highest groundwater level was found at 16 feet depth and elevation 393.5 feet in the borings. According to the consultants (see pg. 25 of the 10/10/2017, revised 7/1/2020 report), "*seepage from bedrock will likely be encountered below elevation 393 feet.*"

The consultants recommend to support the proposed structures on conventional, mat-type and/or drilled-pile foundations bearing in competent bedrock. According to the consultants, the fill, colluvium, and old alluvium are not suitable for support of the proposed structures. The structure(s) are recommended by the consultant to be designed to resist the hydrostatic pressures that would develop due to the historic high groundwater level, determined to be 20 feet below the ground surface by the consultants (see pg. 18 of the 10/10/2017 updated 7/1/2020 report).

As of January 1, 2020, the City of Los Angeles has adopted the new 2020 Los Angeles Building Code (LABC). The 2020 LABC requirements will apply to all projects where the permit application submittal date is after January 1, 2020.

The review of the referenced reports cannot be completed because the stability or safety of the proposed development cannot be determined at this time. The review will be continued upon submittal of an addendum to the reports which includes, but need not be limited to, the following:

(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 consultants indicated that the proposed development is shown on the "Project Summary" map; however, the proposed grades between select spot elevations are not shown on this map. 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 (7006.3.2). As previously requested, the geologic map shall show all proposed structures and location/height of all proposed retaining walls.

2. Provide a geologic map that is based upon the proposed Tract Map and at the scale of the original map. Note: The Tract Map shall show all proposed site grades for a project within the Hillside Grading Area.

3. On page 30 of the 10/10/2017 updated 7/1/2020 report, the consultants state, "The lack of contours indicates that the rock is non-water bearing." Provide clarification and justification for this statement. Note: The historic high groundwater map indicates that the subject site is located within an area designated as having a historic high groundwater greater than 10 feet and less than 20 feet below the ground surface. In addition, well points to support the groundwater elevation between 10 and 20 feet are also located on the historic high groundwater map.

4. The structure(s) are recommended by the consultant to be designed to resist the hydrostatic pressures that would develop due to the historic high groundwater level, determined to be 20 feet below the ground surface by the consultants (see pg. 18 of the 10/10/2017 updated 7/1/2020 report). However, according to the historic high groundwater map, the subject site is located within an area designated as having a historic high groundwater greater than 10 feet and less than 20 feet below the ground surface and groundwater level was found at

16 feet in the borings (B-4). The consultants state that a nearby boring (B-10) found water at 34 feet, however, Boring 10 appears to be about 150 feet away from B-4 and drilled about 8 months later.

Provide justification, extensive subsurface exploration and study to determine the highest groundwater level, or design the structure/basement retaining walls to resist the hydrostatic pressures that would develop if the groundwater level rose to the ground surface.

Note: It has been the department's experience that adding subdrain outlets and collector pipes through the subterranean walls mid structure causes design changes and reduction in parking spaces.

5. For clarification purposes, provide a pressure diagrams showing separately the static, seismic and at-rest pressures from the earth materials, and the hydrostatic pressure on the basement walls for the daylighted bedding and oblique conditions.

   Note: The at-rest pressures (EFP) below the adopted HHGW of 20 feet (between 20 and 50 feet) shown on page 46 (of the 10/10/2017 updated 7/1/2020 report) appear to be less than the EFP of 112 pcf shown on page 44 for the undrained daylighted bedding condition. Similarly, for the oblique bedding condition below a depth of 20 feet as shown on page 47 for hydrostatic conditions is less than those shown on page 45.

   Revise the EFP's on pages 46 and 47 such that the minimum pressures are consistent with those shown on pages 44 and 45 (i.e., for the daylighted bedding and oblique conditions, it appears that the EFP should be 112 pcf for the daylighted bedding condition between 20 and 50 feet & 93 pcf for the oblique condition below a depth of 20 feet).

6. Per page 33 of the 10/10/2017 updated 7/1/2020 report the consultants provide a net bulking factor of 5 percent when excavating and compacting the bedrock to 92 percent relative compaction. Per IB P/BC 2020-113, provide average shrinkage factors for materials to be compacted at the site and average bulking factors for materials to be exported from the site.

The geologist and soils engineer shall prepare a report containing an itemized response to the review items indicated in this letter. If clarification concerning the review letter is necessary, the report review engineer and/or geologist may be contacted. Two copies of the response report, including one unbound wet-signed original for archiving purposes, a pdf-copy of the complete report in a CD or flash drive, and the appropriate fees will be required for submittal.

CASEY LEE JENSEN
Engineering Geologist Associate III

GLEN RAAD
Geotechnical Engineer I

CLJ/GR:clj/gr
Log No. 101530-03
213-482-0480

cc: Geotechnologies, Inc., Project Consultant
planning.majorprojects@lacity.org
LA District Office

CITY OF LOS ANGELES
DEPARTMENT OF BUILDING AND SAFETY
Grading Division

District	LA	Log No.	101530-03

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: PM 1999-3181 VTT-80315
Block: Lots: B (1-18)

2. PROJECT ADDRESS:
1111 W. SUNSET BLVD., LA

3. OWNER: 1111 SUNSET BOULEVARD, LLC
Address: 11766 WILSHIRE BLVD., STE 1150
City: Los Angeles, CA Zip: 90025
Phone (Daytime):

4. APPLICANT Geotechnologies, Inc.
Address: 439 Western Avenue
City: Glendale, CA Zip: 91201
Phone (Daytime): 818-240-9600
E-mail address: aalcocer@geoteq.com

5. Report(s) Prepared by: Geotechnologies, Inc. File No. 21155

6. Report Date(s): 10-10-17 Upd. 7-01-20

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)
Geotechnical Engineering Investigation dated October 10, 2017 revised November 22, 2019

9. Previous Department actions? ☐ YES if yes, provide dates and attach a copy to expedite processing.
Dates: 01-31-18 (Log# 101530) 05-13-20 (Log #101530-01) 05-19-20 (Log # 101530-02)

10. Applicant Signature: Reinard Knur Position: Geotechnical Engineer

(DEPARTMENT USE ONLY)

REVIEW REQUESTED	FEES	REVIEW REQUESTED		FEES
☐ Soils Engineering		No. of Lots		
☐ Geology		No. of Acres		
☒ Combined Soils Engr. & Geol.	363.00	☐ Division of Land		
☐ Supplemental		Other		
☐ Combined Supplemental		☒ Expedite		181.50
☐ Import-Export Route		☒ Response to Correction		
Cubic Yards:		☐ Expedite ONLY		
		Sub-total		544.50
		Surcharges		129.80
		TOTAL FEE		674.30

Fee Due: $674.30
Fee Verified By: HLP Date: 7/9/20
(Cashier Use Only)

Los Angeles Department of Building and Safety
Metro 4th Floor 07/10/2020 1:54:39 PM
User ID: athomas
Receipt Ref Nbr: 2020192001-114
Transaction ID: 2020192001-114-1
GRADING REPORT $363.00
SYSTEMS DEV SURCH $32.67
GEN PLAN MAINT SURCH $38.12
DEV SERV CENTER SURCH $16.34
CITY PLAN SURCH $32.67
PLAN APPROVAL FEE $181.50
MISC OTHER $10.00
Amount Paid: $674.30
PCIS Number: NA
Job Address: 1111 W Sunset Blvd
Owners Name: 1111 Sunset Blvd, LLC

ACTION BY:

THE REPORT IS: ☐ NOT APPROVED

☐ APPROVED WITH CONDITIONS ☐ BELOW ☐ ATTACHED

For Geology Date

For Soils Date

Appendix G.3

Geology and Soils Approval Letter

CITY OF LOS ANGELES
INTER-DEPARTMENTAL CORRESPONDENCE

GEOLOGY AND SOILS REPORT APPROVAL LETTER

November 6, 2020

LOG # 101530-04
SOILS/GEOLOGY FILE - 2

To: Vincent P. Bertoni, AICP, Deputy Advisory Agency
Department of City Planning
200 N. Spring Street, 7th Floor, Room 750
planning.majorprojects@lacity.org

From: Jesus Adolfo Acosta, Grading Division Chief
Department of Building and Safety

PROPOSED LEGAL: VTT-80315, Lots 1-18 (1 ground, 17 airspace)
CURRENT LEGAL: PM 1999-3180, Lot B
LOCATION: 1111 W. Sunset Boulevard

CURRENT REFERENCE REPORT/LETTER	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Response Report	21155	8/27/2020 (Rev. 10/16/2020)	Geotechnologies, Inc.
Oversized Documents	``	``	``

PREVIOUS REFERENCE REPORT/LETTER(S)	REPORT No.	DATE OF DOCUMENT	PREPARED BY
Dept. Review Letter	101530-03	07/31/2020	LADBS
Geology/Soils Report	21155	10/10/2017 (Rev. 7/1/2020)	Geotechnologies, Inc.
Response Report (5/19/20)	``	07/01/2020	``
Response Report (5/13/20)	``	``	``
Response Report (1/31/18)	``	05/24/2018 (Rev. 7/1/2020)	``
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The Grading Division of the Department of Building and Safety has reviewed the referenced reports that provide recommendations for the proposed demolition of all site improvements; and, construction of a mixed-use development with two up to 49-story residential towers, hotel, and low rise residential buildings over 6-levels of a podium parking structure above/below grade, as described on pages 2 to 6 of the 10/10/2017 (revised 07/01/2020) report. Shoring and/or retaining walls are anticipated to be up to 90 feet below grade per the consultant's recommendations.

The earth materials at the subsurface exploration locations consist of up to 10.5 feet of uncertified fill underlain by up to 5 feet of colluvium, greater than 4 feet of old alluvium and Puente Formation bedrock. The Puente Formation bedrock includes interbedded tuff, siltstone, and sandstone dipping to the south between 25 and 80 degrees.

The consultants recommend to support the proposed structures on conventional, mat-type and/or drilled-pile foundations bearing in competent bedrock. According to the consultants, the fill, colluvium, and old alluvium are not suitable for support of the proposed structures. The structure(s) are recommended by the consultant to be designed to resist the hydrostatic pressures up to the ground surface.

As of January 1, 2020, the City of Los Angeles has adopted the new 2020 Los Angeles Building Code (LABC). The 2020 LABC requirements will apply to all projects where the permit application submittal date is after January 1, 2020.

Vesting Tentative Tract Map No. 80315 and 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 entire site shall be brought up to the current Code standard (7005.9).

2. All recommendations of the reports by Geotechnologies, Inc. dated 10/10/2017 (Rev. 1/10/2018), 05/24/2018 rev. 06/25/2018, 10/10/2017 (Rev. 11/22/2019), 05/24/2018 (Rev. 7/1/2020), 07/01/2020 (2 reports), 10/10/2017 (Rev. 7/1/2020) and 8/27/2020 (Rev. 10/16/2020) signed by Reinard T. Knur, GE 2755/CEG 1547, which are in addition to or more restrictive than the conditions contained herein shall also be incorporated into the plans for the project. (7006.1)

3. Conformance with the Zoning Code Section 12.21 C8, which limits the heights and number of retaining walls, will be determined during structural plan check.

4. Approval shall be obtained from the Department of Public Works, Bureau of Engineering, Development Services and Permits Program for the proposed removal of support and/or retaining of slopes adjoining to public way (3307.3.2).

   201 N. Figueroa Street 3rd Floor, LA (213) 482-7045

5. Secure the notarized written consent from all owners upon whose property proposed grading/construction access is to extend, in the event off-site grading and/or access for construction purposes is required (7006.6). The consent shall be included as part of the final plans.

6. In the event tie-back anchors are utilized for shoring purposes, then provide a notarized letter from all adjoining property owners allowing tie-back anchors on their property (7006.6).

7. 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 that clearly indicates 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).

8. 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.

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

10. All graded, brushed or bare slopes shall be planted with low-water consumption, native-type plant varieties to protect slopes against erosion (7012).

11. All new graded slopes shall be no steeper than 2H:1V (7010.2 & 7011.2).

12. Prior to the issuance of any permit, an accurate volume determination shall be made and included in the final plans, with regard to the amount of earth material to be exported from the site. For grading involving import or export of more than 1000 cubic yards of earth materials within the grading hillside area, approval is required by the Board of Building and Safety. Application for approval of the haul route must be filed with the Board of Building and Safety Commission Office. Processing time for application is approximately 8 weeks to hearing plus 10-day appeal period.

13. 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.

14. Existing uncertified fill shall not be used for support of footings, concrete slabs or new fill (1809.2, 7011.3).

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

16. 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 cubic yards (7007.1).

    201 N. Figueroa Street 3rd Floor, LA (213) 482-7045

17. All loose foundation excavation material shall be removed prior to commencement of framing. Slopes disturbed by construction activities shall be restored (7005.3).

18. 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).

19. Temporary excavations that remove lateral support to the public way, adjacent property, or adjacent structures shall be supported by shoring or constructed using ABC slot cuts, as recommended. 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)

20. 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).

21. The soils engineer shall review and approve the shoring plans prior to issuance of the permit (3307.3.2).

22. Prior to the issuance of the permits, the soils engineer and/or the structural designer shall evaluate the surcharge loads used in the report calculations for the design of the retaining walls and shoring. If the surcharge loads used in the calculations do not conform to the actual surcharge loads, the soil engineer shall submit a supplementary report with revised recommendations to the Department for approval.

23. Unsurcharged temporary excavations exposing unsupported geology and/or unsupported bedding planes shall be trimmed back along the lowest unsupported plane or at a 1H:1V slope inclination, whichever is flatter, or shored, as recommended.

24. Unsurcharged temporary excavation may be cut vertical up to 5 feet, as recommended. Excavations over 5 feet up to 30 feet shall be trimmed back at a uniform gradient not exceeding 1:1, from top to bottom of excavation, as recommended.

25. Shoring shall be designed for the lateral earth pressures specified in the section titled "Shoring Walls" starting on page 53 of the 10/10/2017 (Rev. 07/01/2020) report; all surcharge loads shall be included into the design.

26. Shoring shall be designed for a maximum lateral deflection of 1 inch, provided there are no structures within a 1:1 plane projected up from the base of the excavation. Where a structure is within a 1:1 plane projected up from the base of the excavation, shoring shall be designed for a maximum lateral deflection of ½ inch, or to a lower deflection determined by the consultant that does not present any potential hazard to the adjacent structure.

27. A shoring monitoring program shall be implemented to the satisfaction of the soils engineer.

28. Surcharged ABC slot-cut method (see pgs. 36 & 52 of the 10/10/2017 (Rev. 07/01/2020) report) may be used for temporary excavations with each slot-cut not exceeding 10 feet in height and not exceeding 8 feet in width, as recommended. The surcharge load shall not exceed the value given in the report. The soils engineer shall determine the clearance between the excavation and the existing foundation. The soils engineer shall verify in the field if the existing earth materials are stable in the slot-cut excavation. Each slot shall be inspected by the soils engineer and approved in writing prior to any worker access.

29. All foundations shall derive entire support from competent bedrock, as recommended and approved by the geologist and soils engineer by inspection.

30. Footings for miscellaneous small outlying structures, such as property line walls and trash enclosures, not to be tied-in to the proposed buildings, shall derive entire support from native undisturbed soils or properly placed fill soils, as recommended.

31. This letter approves exclusively the option in which the structure is designed to withstand hydrostatic pressures, as a measure to control groundwater under permanent conditions.

32. The lowest level subterranean slab or mat shall be designed to resist uplift hydrostatic pressures that would develop if the groundwater level rose to the ground surface, and the below-grade building walls shall be designed to resist the hydrostatic pressure that would develop if the groundwater level rose to the ground surface, as recommended on page 6 of the 8/27/2020 (Rev. 10/16/2020) report.

33. In the event dewatering is needed, the area shall be de-watered under the direction of the consultants prior to beginning the excavations below the groundwater level. Note that a permit from the State of California Regional Water Quality Control Board and Department of Public Works shall be obtained to discharge the water into a storm drain.

201 N. Figueroa Street 3rd Floor, LA	(213) 482-7045
320 W. 4th Street, Suite 200	(213) 576-6600 (LARWQB

34. 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); for pools the setback shall be one-fourth the vertical height of the slope, but need not exceed 7.5 feet (1808.7.3).

35. 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.

36. 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).

37. Existing uncertified fill shall not be used for lateral support of deep foundations (1810.2.1).

38. Slabs placed on approved compacted fill shall be at least 5 inches thick, as recommended, and shall be reinforced with ½-inch diameter (#4) reinforcing bars spaced a maximum of 16 inches on center each way.

39. Concrete floor slabs placed on expansive soil shall be placed on a 4-inch fill of coarse aggregate or on a moisture barrier membrane. The slabs shall be at least 5 inches thick, as recommended, and shall be reinforced with ½-inch diameter (#4) reinforcing bars spaced a maximum of 16 inches on center each way.

40. The seismic design shall be based on a Site Class C, as recommended on page 29 in the 10/10/2017 (revised 07/01/2020) report. All other seismic design parameters shall be reviewed by LADBS building plan check.

41. Retaining walls shall be designed for the lateral earth pressures specified on page 8 of the 8/27/2020 (Rev. 10/16/2020) report. Note: Where two or more separate stacked retaining walls/shoring (the upper wall/s surcharges the lower wall/s) are proposed, the lower wall/s shall be designed for the combined height of the wall itself and the upper wall/s. All surcharge loads shall be included into the design.

42. The retaining wall lateral earth pressures shall not be less than the Equivalent fluid pressures (EFP) shown in Table 1 of Information Bulletin P/BC 2020-083.

43. Retaining walls higher than 6 feet shall be designed for lateral earth pressure due to earthquake motions as specified on pages 7 & 8 of the 8/27/2020 (Rev. 10/16/2020) report (1803.5.12).

    Note: Lateral earth pressure due to earthquake motions shall be in addition to static lateral earth pressures and other surcharge pressures. The height of a stacked retaining wall shall be considered as the summation of the heights of each wall.

44. 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).

45. 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).

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

47. Basement walls and floors shall be waterproofed/damp-proofed with an LA City approved "Below-grade" waterproofing/damp-proofing material with a research report number (104.2.6).

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

49. Where the ground water table is lowered and maintained at an elevation not less than 6 inches below the bottom of the lowest floor, or where hydrostatic pressures will not occur, the floor and basement walls shall be damp-proofed. Where a hydrostatic pressure condition exists, and the design does not include a ground-water control system, basement walls and floors shall be waterproofed. (1803.5.4, 1805.1.3, 1805.2, 1805.3)

50. The structures shall be connected to the public sewer system per P/BC 2020-027.

51. 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; water shall not be dispersed on to descending slopes without specific approval from the Grading Division and the consulting geologist and soils engineer (7013.10).

52. An on-site storm water infiltration system at the subject site shall not be implemented, as recommended.

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

54. Sprinkler plans for irrigation shall be submitted and approved by the Mechanical Plan Check Section (7012.3.1).

55. Any recommendations prepared by the geologist and/or the soils engineer for correction of geological hazards found during grading shall be submitted to the Grading Division of the Department for approval prior to use in the field (7008.2, 7008.3).

56. The geologist and 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).

57. 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 bedrock in a written field memorandum. (1803.5.5, 1705.1.2)

58. 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)

59. 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; pile installation; protection fences; and, dust and traffic control will be scheduled (108.9.1).

60. Installation of shoring, 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).

61. The installation and testing of tie-back anchors shall comply with the recommendations included in the reports or the standard sheets titled "Requirement for Tie-back Earth Anchors", whichever is more restrictive. [Research Report #23835]

62. 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).

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

clj/G.R.

CLJ/GR:clj/gr
Log No. 101530-04
213-482-0480

cc: 1111 Sunset Boulevard, LLC, Owner
Geotechnologies, Inc., Project Consultant
planning.majorprojects@lacity.org
LA District Office

CITY OF LOS ANGELES
DEPARTMENT OF BUILDING AND SAFETY
Grading Division

District VN | Log No. 101530-4

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: PM 1999-3181
Block: Lots: B

2. PROJECT ADDRESS:
1111 W. SUNSET BLVD., LA

3. OWNER: 1111 SUNSET BOULEVARD, LLC
Address: 11766 WILSHIRE BLVD., STE 1150
City: Los Angeles, CA Zip: 90025
Phone (Daytime):

4. APPLICANT Geotechnologies, Inc.
Address: 439 Western Avenue
City: Glendale, CA Zip: 91201
Phone (Daytime): 818-240-9600
E-mail address: aalcocer@geoteq.com

5. Report(s) Prepared by: Geotechnologies, Inc. File No. 21155

6. Report Date(s): August 27,2020

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)
Geotechnical Engineering Investigation dated October 10, 2017 revised November 22, 2019

9. Previous Department actions? ☐ YES if yes, provide dates and attach a copy to expedite processing.
Dates: 01-31-18 (Log# 101530) 05-13-20 (Log #101530-01) 05-19-20 (Log # 101530-02) 07-31-20 (Log#101530-03)

10. Applicant Signature: Position: Project Geologist

(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	
☐ Supplemental		Other	
☐ Combined Supplemental		☒ Expedite	181.50
☐ Import-Export Route		☒ Response to Correction	363.00
Cubic Yards:		☐ Expedite ONLY	
		Sub-total	544.50
		Surcharges	129.80
		TOTAL FEE	674.30

Fee Due: 674.30
Fee Verified By: Am Date: 8/31/2020
(Cashier Use Only)

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Los Angeles Department of Building
and Safety
Metro 4th Floor 08/31/2020 3:54:25
PM
User ID: rrodriguez
Receipt Ref Nbr: 2020244001-154
Transaction ID: 2020244001-154-1
GRADING REPORT $363.00
SYSTEMS DEV SURCH $32.67
GEN PLAN MAINT SURCH $38.12
DEV SERV CENTER SURCH $16.34
CITY PLAN SURCH $32.67
PLAN APPROVAL FEE $181.50
MISC OTHER $10.00
Amount Paid:        $674.30
PCIS Number: NA
Job Address: 1111 W. Sunset Blvd.
Owners Name: 1111 Sunset Boulevard,
 LLC
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ACTION BY:

THE REPORT IS: ☐ NOT APPROVED
☐ APPROVED WITH CONDITIONS ☐ BELOW ☐ ATTACHED

For Geology Date

For Soils Date

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request will provide reasonable accommodation to ensure equal access to its programs, services and activities.