BYER GEOTECHNICAL, INC.

June 14, 2022
BG 23025

ABS Properties, Inc.
℅ ABS Burbank, LLC
5500 Hollywood Boulevard, 4th Floor - West Wing
Los Angeles, California 90028

Attention: Ms. Sylvie Tran

Subject

Transmittal of Geotechnical Engineering Exploration Update #2
Proposed Seven-Story Mixed-Use Building
Assessor's Parcel No. 2464-001-019
3000 West Empire Avenue
Burbank, California

Dear Ms. Tran:

Byer Geotechnical has completed our update report #2 dated June 14, 2022, which describes the geotechnical engineering conditions with respect to the proposed project. The reviewing agency for this document is the City of Burbank, Building Division. The reviewing agency requires two unbound copies, one with wet signature. Copies of the report have been distributed as follows:

(4) Addressee (E-mail and Mail)
(1) ABS Properties, Inc., Attention: Samir Srivastava (E-mail)

It is our understanding that you or your representative will file the report with the City of Burbank. Please review the report carefully prior to submittal to the governmental agency. Questions concerning the report should be directed to the undersigned. Byer Geotechnical appreciates the opportunity to offer our consultation and advice on this project.

Very truly yours,
BYER GEOTECHNICAL, INC.

Raffi S. Babayan
Senior Project Engineer

BYER GEOTECHNICAL, INC.

GEOTECHNICAL ENGINEERING EXPLORATION UPDATE #2

PROPOSED SEVEN-STORY MIXED-USE BUILDING

ASSESSOR'S PARCEL NO. 2464-001-019

3000 WEST EMPIRE AVENUE

BURBANK, CALIFORNIA

FOR ABS PROPERTIES, INC., % ABS BURBANK, LLC

BYER GEOTECHNICAL, INC., PROJECT NUMBER BG 23025

JUNE 14, 2022

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GEOTECHNICAL ENGINEERING EXPLORATION UPDATE #2
PROPOSED SEVEN-STORY MIXED-USE BUILDING
ASSESSOR'S PARCEL NO. 2464-001-019
3000 WEST EMPIRE AVENUE
BURBANK, CALIFORNIA
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INTRODUCTION

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

PROPOSED PROJECT

The current scope of the proposed project was determined from consultation with Ms. Sylvie Tran and the preliminary plans prepared by the Cuningham Group, dated August 27, 2021. Final plans have not been prepared and await the conclusions and recommendations of this report. The project consists of construction of a seven-story, at-grade mixed-use building. The building is planned to be constructed at grade. As an alternative, one subterranean parking level is also contemplated. The footprint of the proposed building are planned to occupy almost the entire site, as shown on the enclosed Site Plan. Retaining walls ranging from 10 to 14 feet high are planned to support the excavation for the contemplated subterranean parking level. Foundation loads are expected to be moderate to high. A fire access lane is planned adjacent to the east, west, and south property boundaries, as shown on the enclosed Site Plan. The existing one-story commercial/industrial building and associated improvements are to be removed from the site.

PRIOR WORK

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

> *Geotechnical Engineering Exploration, Proposed Twenty-Two-Story Mixed-Use Building over Four Subterranean Parking Levels, Assessor's Parcel No. 2464-001-019, 3000 West Empire Avenue, Burbank, California*, dated September 5, 2019; and

> *Geotechnical Engineering Exploration Update, Proposed Seven-Story Mixed-Use Building over One Subterranean Parking Level, Assessor's Parcel No. 2464-001-019, 3000 West Empire Avenue, Burbank, California*, dated February 17, 2022.

The 2019 study included drilling six borings to approximate depths of 30.2 to 70.1 feet at the locations shown on the enclosed Site Plan. A seventh boring was drilled in 2021 for the referenced update. A copy of laboratory test results is enclosed in Appendix I. It is our understanding that the above-referenced reports have not been submitted to the City of Burbank Building Department.

The data contained in the above-referenced reports was reviewed and considered as part of our work on this project.

EXPLORATION

Exploration was conducted using techniques normally applied to this type of project in this setting. This report is limited to the area of the exploration and the proposed project as shown on the enclosed Site Plan. The scope of this exploration did not include an assessment of general site environmental conditions for the presence of contaminants in the earth materials and groundwater. Conditions affecting portions of the property outside the area explored are beyond the scope of this report.

Exploration was originally conducted on March 21 and 22, 2019, with the aid of a hollow-stem auger drill rig. It included drilling six borings (B1 - B6) at approximate depths of 30.2 to 70.1 feet below existing grade. A supplemental exploration was conducted on October 12, 2021, which included drilling one boring (B7) to an approximate depth of 41.5 feet below existing grade. Samples of the earth materials were obtained and delivered to our soils engineering laboratory for testing and analysis. The borings tailings were visually logged by the project soils engineer. Following drilling, logging, and sampling, the borings were backfilled, mechanically tamped, and patched with asphalt.

Office tasks included laboratory testing of selected soil samples, review of published maps and photos for the area, review of our files, review of agency files, preparation of cross sections, preparation of the Site Plan, engineering analysis, and preparation of this report. Earth materials exposed in the borings are described on the enclosed Log of Borings. Appendices I and II contain discussions of the laboratory testing procedures and results. The proposed project and the locations of the borings are shown on the enclosed Site Plan.

SITE DESCRIPTION

The subject property consists of an irregularly-shaped, relatively-level, and partially-graded parcel located in the southeast portion of the San Fernando Valley, in the city of Burbank, Los Angeles County, California (34.1915° N Latitude, 118.3434° W Longitude). As depicted on the enclosed Aerial Vicinity Map, the property is bounded by Empire Avenue on the north, a concrete-lined drainage channel and a railroad track on the south, a one-story commercial building and associated parking lot on the east, and a one-story industrial facility on the west. The property is located approximately one-half of a mile southwest of the Golden State (5) Freeway and 2.6 miles north of the Ventura (134) Freeway. A one-story commercial/industrial building currently occupies the majority of the site. Asphalt-paved driveways comprise the remaining portions of the site around the building. The surrounding area has been developed with commercial establishments along Empire Avenue, as well as single- and multi-family residential buildings.

Past grading on the site has consisted of placing fill to create a level pad for the existing building and driveways. Vegetation on the site is sparse and consists of narrow planter areas and a few trees in front of the building. Surface drainage is by sheetflow runoff down the contours of the land to the south.

The site was revisited by the undersigned on June 8, 2022, to observe the current conditions. The site has remained in the same condition described above.

GROUNDWATER

Groundwater was not encountered in the borings that extended to a maximum depth of 70.1 feet below existing grade. In *Seismic Hazard Zone Report 016,* the California Geological Survey (CGS) has estimated the historically-highest groundwater level at the site was about 47 feet below ground surface (CGS, 1998), as shown on the enclosed Historic-High Groundwater Map.

Seasonal fluctuations in groundwater levels occur due to variations in climate, irrigation, development, and other factors not evident at the time of the exploration. Groundwater levels may also differ across the site. Groundwater can saturate earth materials causing subsidence or instability of slopes.

EARTH MATERIALS

Fill (Afu)

Fill, associated with previous site grading, underlies the subject site to a maximum observed depth of 6½ feet in Boring 4. Greater depths of fill may occur locally. The fill consists of silty sand that is brown to dark olive-brown, slightly moist to moist, and loose. The fill contains trace amounts of asphalt and concrete debris, as well as rock fragments. The existing fill is not suitable for support of any type of structure. Based on the current configuration of the proposed building, the existing fill is expected to be entirely removed during the excavation for the subterranean parking level.

Alluvium (Qa)

Natural alluvium typical for this portion of the San Fernando Valley underlies the subject site and was encountered in the borings. The alluvium generally consists of a thick layer of sand that is generally light olive-brown to light olive-gray, slightly moist to dry, and loose to medium dense in the upper 12½ feet, becoming medium dense to very dense below, with varying amounts of fine- to coarse-grained gravel. A sandy gravel layer was encountered at the bottom of Boring 5, between the depths of 65 and 70 feet, that is light gray, slightly moist to dry, and very dense, with some cobbles.

GEOTECHNICAL CHARACTERISTICS

In-Situ Percolation Testing

In-situ percolation testing was conducted in Boring 7, which was excavated to a depth of 40 feet below existing grade. The purpose of this test was to determine the infiltration rate and evaluate the infiltration characteristics of the earth materials underlying the subject site. The test was performed in accordance with the Administrative Manual of the County of Los Angeles, Department of Public Works, Section GS200.2, dated June 30, 2021. Following drilling and sampling, a PVC pipe was inserted into the boring, covered with a filter sock, and surrounded with the onsite excavated soil cuttings. The upper 10 feet of the pipe was solid and the lower 30 feet was screened to allow water infiltration below 10 feet. The boring was then presoaked, utilizing water from the drill rig, and was allowed to set for at least 2½ hours. Following presoaking, a falling-head percolation test was conducted. The test consisted of ceasing the flow of water into the boring and measuring the drop of the water surface (head) at 30-minute intervals. The test was repeated eight times.

The results of the infiltration rate calculations are shown on the enclosed Calculation Sheet #1. Based on the results of *in-situ* percolation testing, the calculated infiltration rate for the earth materials between the depths of 10 and 40 feet is estimated to be 0.85 inches-per-hour (6×10^{-4} centimeters-per-second). The calculations incorporate a reduction factor of 3 based on the guidelines of the Administrative Manual.

GENERAL SEISMIC CONSIDERATIONS

Regional Faulting

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

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

The known regional local active and potentially-active faults that could produce the most significant ground shaking on the site include the Verdugo, Santa Monica, and Hollywood Faults. Fifty faults were found within a 100-kilometer-radius search area from the site using EZ-FRISK V8.07 computer program. The results of seismic-source analysis are listed in Appendix III. The closest mapped "active" fault is the Verdugo Fault, a Type B fault that is located 2.4 kilometers (1.5 miles) northeast of the site. The Verdugo Fault is capable of producing a maximum moment magnitude of 6.9 and an average slip rate of 0.5 ± 0.5 millimeters per year (Cao et al., 2003). The San Andreas Fault, a Type A fault, is located 45.2 kilometers (28.1 miles) northeast of the site. General locations of regional active faults with respect to the subject site are shown on the enclosed Regional Fault Map (Appendix III).

Seismic Design Coefficients

The following table lists the applicable seismic coefficients for the project based on the California Building Code:

SEISMIC COEFFICIENTS (2019 California Building Code - Based on ASCE 7-16 Standard)		
Latitude = 34.1915° N Longitude = 118.3434° W	Short Period (0.2s)	One-Second Period
Earth Materials and Site Class from Table 20.3.3, ASCE Standard 7-16	Alluvium - D	
Mapped Spectral Accelerations from Figures 22-1 and 22-2	S_s = 1.996 (g)	S_1 = 0.660 (g)
Site Coefficients from Tables 11.4-1 and 11.4-2	F_A = 1.0	F_V = 1.7
Maximum Considered Spectral Response Accelerations from Equations 11.4-1 and 11.4-2	S_{MS} = 1.996 (g)	S_{M1} = 1.125 (g)
Design Spectral Response Accelerations from Equations 11.4-3 and 11.4-4	S_{DS} = 1.331 (g)	S_{D1} = 0.750 (g)
Maximum Considered Earthquake Geometric Mean (MCE_G) Peak Ground Acceleration, adjusted for Site Class effects	PGA_M = 0.902 (g)	

Reference: American Society for Civil Engineers, **ASCE 7 Hazard Tool,** https://asce7hazardtool.online/

The mapped spectral response acceleration parameter for the site for a 1-second period (S_1) is less than 0.75g. The design spectral response acceleration parameters for the site for a 1-second period (S_{D1}) is greater than 0.20g, and/or the short period (S_{DS}) is greater than 0.50g. Therefore, the project is considered to be in Seismic Design Category D.

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

Seismic Hazard Deaggregation Analysis

A probabilistic seismic hazard deaggregation analysis was performed on the subject site. Seismic parameters were determined using currently-available earthquake and fault information utilizing data from the United States Geological Survey (USGS) National Seismic Hazard Mapping Project (USGS, 2022). An averaging of four Next Generation Attenuation relations (Abrahamson-et al (2014) NGA West 2 USGS 2014; Boore-et al (2014) NGA West 2 USGS 2014; Campbell-Bozorgnia (2014) NGA West 2 USGS 2014, and Chiou-Youngs (2014) NGA West 2 USGS 2014) was incorporated in the analysis. An average shear-wave velocity (Vs30) of 259 meters-per-second (Site Class D) was used in the analysis. Hazard deaggregation indicates a predominant modal earthquake magnitude of 6.9 (Mw) at a modal distance of 10.8 kilometers. The Peak Horizontal Ground Acceleration (PHGA) with a 10-percent probability of exceedance in 50 years is estimated to be 0.52g on the subject site. These ground motions could occur at the site during the life of the project. Results of the analysis are graphically presented in the enclosed "Seismic Hazard Deaggregation Chart" (Appendix III).

Liquefaction

The CGS has not mapped the site within an area where historic occurrence of liquefaction or geological, geotechnical, and groundwater conditions indicate a potential for permanent ground displacement such that mitigation as defined in Public Resources Code Section 2693 (c) would be required (CGS, 1999), as shown on the enclosed Seismic Hazard Zones Map.

Seiches and Tsunamis

Seiches are large waves generated in enclosed bodies of water, such as lakes and reservoirs, in response to ground shaking. Tsunamis are waves generated in large bodies of water by fault displacement or major ground movement. The site is not located near any lake or reservoir. Furthermore, the site is at an average elevation of 658 feet above mean sea level and is located approximately 15 miles from the shoreline. Therefore, the risk to the project from seiches or tsunamis is considered to be nil.

CONCLUSIONS AND RECOMMENDATIONS

General Findings

The conclusions and recommendations of this exploration are based upon review of the preliminary plans, review of published maps, seven previous borings, research of available records, laboratory testing, engineering analysis, and years of experience performing similar studies on similar sites. It is the finding of Byer Geotechnical, Inc., that development of the proposed project is feasible from a geotechnical engineering standpoint, provided the advice and recommendations contained in this report are included in the plans and are implemented during construction.

The recommended bearing materials for an at-grade building are future compacted fill, and firm natural alluvium with a subterranean garage is planned. The following recommendations should be incorporated into the design of the project based on the final configuration of the proposed building. The earth materials underlying the subject site are expected to exhibit a very low expansion potential.

Seven - Story, At-Grade Mixed-Use Building

A mat foundation is recommended to support a proposed seven-story, at-grade mixed-use building. The mat foundation should be founded in future compacted fill. The upper 12½ feet of the subsurface earth materials should be removed and replaced as certified compacted fill in accordance with the guidelines included in the "Site Preparation - Removals" section below. Due to the close proximity of the footprint of the proposed building to the north property boundary, temporary shoring using soldier piles and lagging will be required to support temporary excavations and facilitate the removal and recompaction adjacent to the north property line.

As an alternative to the removal and recompaction, cast-in-place, concrete friction piles may be used to support the proposed building. The existing fill should be removed and replaced as certified compacted fill for support of the concrete slab-on-grade. The existing fill was encountered to depths of 2½ to 6 feet thick in the borings.

Seven - Story Mixed-Use Building over One Subterranean Parking Level

Conventional foundations may be used to support a proposed seven-story building over one subterranean parking level. Geotechnical issues affecting the project include temporary excavations ranging from 13 to 17 feet in height, including an estimate of the foundation embedment depth. Temporary excavations sloped at 1:1 may be used to facilitate the construction of the east, west, and south subterranean retaining wall construction. Temporary shoring consisting of soldier piles with continuous lagging is recommended to facilitate the construction of the north subterranean retaining wall, adjacent to Empire Avenue. Recommendations for temporary shoring are included in the "Temporary Excavations" section of this report.

SITE PREPARATION - REMOVALS

Surficial materials consisting of existing fill and soft alluvium are present on the site. Remedial grading is recommended to improve site conditions for constructing an at-grade building. The upper 12½ feet of the earth materials, which includes the existing fill and soft alluvium, should be removed to firm alluvium and replaced as certified compacted fill to support the future mat foundation for an on-grade building. The following general grading specifications may be used in preparation of the grading plan and job specifications. Byer Geotechnical would appreciate the opportunity of reviewing the plans to ensure that these recommendations are included. The grading contractor should be provided with a copy of this report.

A. The area to receive compacted fill should be prepared by removing all vegetation, demolition debris, existing fill, and soft alluvium. The exposed excavated area should be observed by the soils engineer/geologist prior to placing compacted fill. Removal depths can be found in the "Site Preparation - Removals" section above. The exposed grade should be scarified to a depth of six inches, moistened to optimum moisture content, and recompacted to 90 percent of the maximum dry density.

B. The proposed building site shall be excavated to a minimum depth of 12½ feet below the existing grade. The excavation shall not extend beyond the footprint of the mat foundation. The excavated areas shall be observed by the soils engineer/geologist prior to placing compacted fill.

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

D. The moisture content of the fill should be near the optimum moisture content. When the moisture content of the fill is too wet or dry of optimum, the fill shall be moisture conditioned and mixed until the proper moisture is attained.

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

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

G. The change in volume of excavated and recompacted soil varies according to soil type and location. An estimated shrinkage value of 10 to 15 percent is expected during grading. These estimates do not include shrinkage due to removal of vegetation, demolition debris, and oversized material.

FOUNDATION DESIGN

Spread Footings

Continuous and/or pad footings may be used to support a proposed seven-story building over one subterranean parking level, provided they are founded in firm alluvium. Continuous footings should be a minimum of 12 inches in width. Pad footings should be a minimum of 24-inches square. The following chart contains the recommended design parameters.

Bearing Material	Minimum Embedment Depth of Footing (Inches)	Vertical Bearing (psf)	Coefficient of Friction	Passive Earth Pressure (pcf)	Maximum Earth Pressure (psf)
Alluvium	24	2,000	0.38	220	5,500

Increases in the bearing value are allowable at a rate of 400 pounds-per-square-foot for each additional foot of footing width or depth to a maximum of 5,500 pounds-per-square-foot. For bearing calculations, the weight of the concrete in the footing may be neglected.

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

Footings adjacent to retaining walls should be deepened below a 1:1 plane from the bottom of the lower retaining wall, or the footings should be designed as grade beams to bridge from the wall to the l:l plane.

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

Mat Foundation

A mat foundation is recommended to support the proposed seven-story, at-grade building, without a subterranean parking level, provided it is founded in future compacted fill. The minimum thickness of the mat should be 12 inches. The structural engineer may require a greater thickness. The following chart contains the recommended design parameters.

Bearing Material	Minimum Embedment Depth of Mat (Inches)	Vertical Bearing (psf)	Coefficient of Friction	Passive Earth Pressure (pcf)	Maximum Earth Pressure (psf)
Future Compacted Fill	12	2,000	0.40	280	2,000

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

The bottom of the mat foundation should be free from loose material and construction debris, and should be approved by the geotechnical engineer prior to placing forms, steel, or concrete.

Modulus of Subgrade Reaction

The allowable modulus of subgrade reaction, k_l, is 400 kips-per-cubic-foot for a 12-inch by 12-inch footing. The modulus should be reduced for larger footings, such as the proposed mat. For rectangular footings of dimensions B x L, the following formula may be used (Bowles, 1996):

$$k_s = k_l * (m + 0.5) / (1.5 * m)$$

where k_s = Modulus of subgrade reaction for a full-size mat foundation, and
$m = L / B$.
L = Length of Mat Foundation (feet)
B = Width of Mat Foundation (feet)

Friction Piles - Axial Capacity

As an alternative to a mat foundation, cast-in-place, concrete friction piles may be used to support a proposed seven-story, at-grade building. Piles should be a minimum of 24 inches in diameter and a minimum of 15 feet into the alluvium. The structural engineer may design piles that are deeper or larger in diameter depending on final loads. Piles may be assumed fixed into the alluvium at the point of fixity depths indicated in Table 1, titled "Results of Lateral Pile Analysis" below. The piles may be designed per the enclosed allowable skin friction values (see Chart #1, Appendix III) for that portion of pile in contact with the alluvium. Piles spaced more than three-pile diameters center-to-center may be considered isolated for axial capacity. The axial capacity of piles placed in a group closer than three-pile diameters should be reduced. The pile-group-efficiency factor shown in the following table should be applied for the total axial capacity of the individual piles:

Pile Group Efficiency Table - Axial Capacity			
Pile Spacing (in pile diameter "D")	Group Efficiency*		
	2 Piles	3 Piles	4 Piles
2.50 D	88%	80%	76%
2.25 D	87%	78%	73%
2.00 D	85%	75%	70%
1.75 D	83%	72%	67%
1.50 D	81%	69%	63%
1.25 D	79%	64%	57%

** Reference: Converse-Labarre Equation, Bowles, Foundation Analysis and Design, 1997.*

Should groundwater be encountered in the pile excavations, it should be pumped out, or the water may be displaced by pumping concrete from the bottom with a hose. The tip of the hose shall be kept at least five feet below the concrete surface during pumping. When concrete is placed below water, the mix should be adjusted to achieve at least 1,000 pounds-per-square-inch more than the required strength.

Uplift Forces

The allowable uplift skin resistance should be taken as one-half the allowable downward skin friction values shown on the enclosed Allowable Pile Axial Capacity Chart (Appendix III).

Friction Piles - Lateral Capacity

The skin friction values 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. Resistance to lateral loading may be provided by passive earth pressure within the alluvium.

Passive earth pressure may be computed as an equivalent fluid having a density of 220 pounds-per-cubic-foot for the alluvium. The maximum allowable earth pressure is 5,500 pounds-per-square-foot. For design of isolated piles, the allowable passive and maximum earth pressures may be increased by 100 percent. Piles spaced more than eight-pile diameters center-to-center may be considered isolated for lateral capacity in the direction of the lateral movement.

Shear force and bending moment analyses are provided for lateral displacements of one-fourth and one-half of an inch. Twenty-four, 30-, 36-, and 42inch-diameter piles were analyzed using fixed-head and free-head conditions. The results of lateral pile-load analyses are included in Appendix III. The results are for a single, isolated pile under short-term lateral loading, with no load reduction applied for pile group effect. The analyses were performed using *LPILE 2018.10.09* software by Ensoft, Inc. (Reese and Wang, 1997), which solves the beam of an elastic foundation problem using independent nonlinear lateral springs, commonly referred to as p-y curves, to model the relationship between soil resistance and pile deflection. Bending stiffness of these cast-in-place concrete piles was modeled using the gross section stiffness for 3,000 pounds-per-square-inch concrete. Pile length and shear force estimates for the specified lateral displacements and loading conditions are presented in the following tables:

TABLE 1: RESULTS OF LATERAL PILE ANALYSIS (SINGLE PILE)							
Pile Diameter (inches)	Lateral Deflection (inches)	Fixed-Head Loading Condition (Figures 1, 2, 3, & 4)			Free-Head Loading Condition (Figures 5, 6, 7, & 8)		
		Maximum Shear Force (kips)	Maximum Bending Moment (in-kips)	Point of Fixity (feet)	Maximum Shear Force (kips)	Maximum Bending Moment (in-kips)	Point of Fixity (feet)
24	¼	98.5	5,072.7	8.5	40.0	1,908.1	5.5
	½	147.0	8,499.0	9.5	57.6	3,243.2	6.5
30	¼	154.5	9,160.3	10.0	63.7	3,404.6	6.5
	½	228.6	15,239.4	11.0	92.4	5,798.7	7.5
36	¼	223.1	14,859.5	11.5	91.7	5,416.3	7.0
	½	328.4	24,633.3	12.5	135.0	9,357.9	8.5
36	¼	304.0	22,367.8	12.5	122.1	7,935.9	8.0
	½	446.9	37,047.9	14.0	185.2	14,059.5	9.0

* Point of fixity is measured from the base of pile cap. All piles should be embedded a minimum of 15 feet into the alluvium below the excavation (see "Friction Piles - Axial Capacity" section of this report).

The lateral capacity of piles placed in a group closer than eight-pile diameters should be reduced. The pile-group-efficiency factor shown in the following table should be applied for the total lateral capacity of the individual piles:

Pile Group Efficiency Table - Lateral Capacity	
Pile Spacing (in pile dimension "D")	Group Efficiency
7 D	85%
6 D	80%
5 D	70%
4 D	60%
3 D	40%

Foundation Settlement

Settlement of the foundation system is expected to occur on initial application of loading. Total and differential settlement values for different types of foundation systems are listed in the following table.

STATIC SETTLEMENT VALUES			
Type of Foundation	Total Settlement (Inches)	Differential Settlement (Inches)	Building Configuration
Conventional Spread Footings	0.5 - 1.0	0.5	Seven-Story Building over One Subterranean Level
Mat Foundation	1.8 - 2.8	0.5	Seven-Story, At-Grade Building
Friction Piles	0.5 - 1.0	0.5	Seven-Story, At-Grade Building

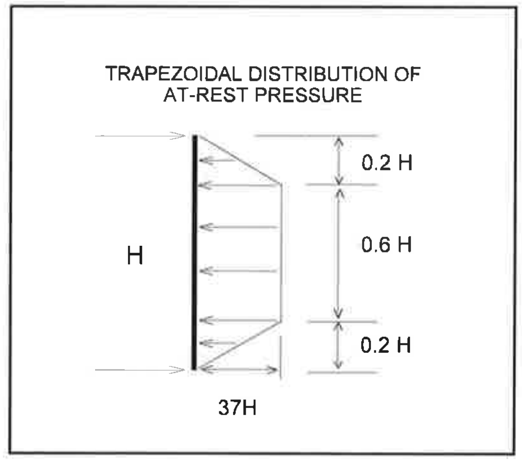
The differential settlement is estimated within a horizontal distance of 30 feet.

RETAINING WALLS

General Design

Cantilever retaining walls up to 10 feet high with a level backslope may be designed for an active equivalent fluid pressure of 44 pounds-per-cubic-foot (see Calculation Sheet #2a). Retaining walls should be provided with a subdrain or weepholes covered with a minimum of 12 inches of ¾-inch crushed gravel.

Subterranean retaining walls, which will be restrained, should be designed for the at-rest lateral earth pressure of 37H, where H is the height of the wall (see Calculation Sheet #3a). The diagram illustrates the trapezoidal distribution of earth pressure. The design earth pressures assume that the walls are free draining.



Surcharge loads from adjacent traffic and buildings should be applied in the design of the subterranean retaining walls. Surcharge loads may be calculated using NAVFAC DM-7.02 Design Manual, or an equivalent method.

Subterranean retaining walls should be provided with a subdrain or gravel pockets covered with a minimum of 12 inches of ¾-inch crushed gravel. An alternative subdrain system consisting of Miradrain and gravel pockets connected to a solid pipe may be used behind the subterranean retaining walls. A sump pump may be required for basement subdrains. The gravel pockets should be excavated to penetrate the slurry backfill behind the lagging to ensure contact with the earth materials behind the lagging.

Seismic Load

The results of seismic calculations indicate that no additional seismic loading is required on the cantilever and restrained subterranean retaining walls, since the calculated seismic thrusts are less than the design active and at-rest thrusts for a retained height of up to 14 feet (see Calculation Sheets #2Sa and #3Sa).

Backfill

Retaining wall backfill should be compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM D 1557-12, or equivalent. Where access between the retaining wall and the temporary excavation prevents the use of compaction equipment, retaining walls should be backfilled with ¾-inch crushed gravel to within two feet of the ground surface. Where the area between the wall and the excavation exceeds 18 inches, the gravel must be vibrated or wheel-rolled, and tested for compaction. The upper two feet of backfill above the gravel should consist of a compacted-fill blanket to the surface. Restrained walls should not be backfilled until the restraining system is in place.

Foundation Design

Subterranean retaining wall footings may be sized per the "Spread Footings" section of this report.

Retaining Wall Deflection

It should be noted that non-restrained retaining walls can deflect up to one percent of their height in response to loading. This deflection is normal and results in lateral movement and settlement of the backfill toward the wall. The zone of influence is within a 1:1 plane from the bottom of the wall. Hard surfaces or footings placed on the retaining wall backfill should be designed to avoid the effects of differential settlement from this movement. Decking that caps a retaining wall should be provided with a flexible joint to allow for the normal deflection of the retaining wall. Decking that does not cap a retaining wall should not be tied to the wall. The space between the wall and the deck will require periodic caulking to prevent moisture intrusion into the retaining wall backfill.

TEMPORARY EXCAVATIONS

Temporary excavations will be required to prepare a compacted-fill pad or to construct the subterranean parking level of the proposed building. The excavations are expected to range from 12½ to 17 feet in height, including an estimate of the foundation embedment depth, and will expose fill over alluvium. The fill and alluvium should be trimmed to 1:1 behind the east, west, and south subterranean retaining walls.

Excavations removing support from the north property line and public right-of-way will require the use of temporary shoring such as closely spaced soldier piles. Design values for temporary shoring can be found in the "Soldier Piles" section below.

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

Soldier Piles

Drilled, cast-in-place concrete soldier piles may be utilized as temporary shoring to remove and recompact the fill and soft alluvium and to construct the north retaining wall of the subterranean parking level and to support existing offsite improvements. The soldier piles should be a minimum of 18 inches in diameter and a minimum of 10 feet into the alluvium below the excavation. Piles may be assumed fixed at three feet into the alluvium and below the excavation. The soldier piles may be designed for a skin friction of 500 pounds-per-square-foot for that portion of pile in contact with the alluvium below the excavation. Soldier piles should be spaced a maximum of eight feet on center. Shoring spacing may be increased up to 10 feet on center in local areas such as ramp approaches and corners of shoring.

The soldier piles may be designed for an active equivalent fluid pressure of 39 pounds-per-cubic-foot (see Calculation Sheet #4). The equivalent fluid pressure should be multiplied by the pile spacing. If the soldier piles are to be designed as friction piles as well, they should be designed per the "Friction Piles - Axial Capacity" and "Friction Piles - Lateral Capacity" sections of this report. Where a combination of sloped embankment and shoring is used, the pressure will be greater and must be determined for each combination.

Lateral Design

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

Passive earth pressure may be computed as an equivalent fluid having a density of 220 pounds-per-cubic-foot. The maximum allowable earth pressure is 5,500 pounds-per-square-foot. For design of isolated piles, the allowable passive and maximum earth pressures may be increased by 100 percent. Soldier piles spaced more than 2½-pile diameters on center may be considered isolated.

Rakers

Rakers may be used to internally brace the soldier piles. The raker bracing could be supported laterally by temporary concrete footings (deadmen) or by the permanent interior footings. For design of temporary footings or deadmen, poured with the bearing surface normal to rakers inclined at 45 degrees, a bearing value of 5,500 pounds-per-square-foot may be used, provided the shallowest point of the footing is at least one foot below the lowest adjacent grade. For design of vertical deadmen, a bearing value of 3,900 pounds-per-square-foot may be used for the bottom of the footing. The vertical wall of the footing will provide a passive earth pressure of 220 pounds-per-cubic-foot. A friction of 0.38 may be used along the base of the deadman.

Lagging

Continuous lagging is recommended between the soldier piles. The soldier piles should be designed for the full anticipated lateral pressure. However, the pressure on the lagging will be less due to arching in the soils. Lagging should be designed for the recommended earth pressure, but may be limited to a maximum value of 400 pounds-per-square-foot. The space behind lagging should be backfilled with cement slurry. Lagging should be placed behind the front flange of the shoring steel I-beams.

Deflection

Some deflection of the shored embankment should be anticipated. Where shoring is planned adjacent to existing structures, it is recommended that lateral deflection not exceed one-half of an inch. For shoring not surcharged by a structure, the allowable deflection is deferred to the structural engineer. If greater deflection occurs during construction, additional bracing or anchors may be necessary to minimize deflection. If desired to reduce the deflection of the shoring, a greater active pressure could be used in the shoring design.

FLOOR SLABS

Floor slabs should be cast over approved compacted fill if the building is planned on-grade, and/or undisturbed firm alluvium if a subterranean level is planned beneath the proposed building. Floor slabs should be reinforced with a minimum of #4 bars on 16-inch centers, each way. Slabs that will be provided with a floor covering should be protected by a polyethylene plastic vapor barrier. The barrier should be sandwiched between the layers of sand, about two inches each, to prevent punctures and aid in the concrete cure. A low-slump concrete may be used to minimize possible curling of the slab. The concrete should be allowed to cure properly before placing vinyl or other moisture-sensitive floor covering.

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

EXTERIOR CONCRETE DECKS

Decking should be cast over an approved compacted subgrade and reinforced with a minimum of #3 bars placed 18 inches on center, each way. Decking that caps a retaining wall should be provided with a flexible joint to allow for the normal one to two percent deflection of the retaining wall. Decking that does not cap a retaining wall should not be tied to the wall. The space between the wall and the deck will require periodic caulking to prevent moisture intrusion into the retaining wall backfill. The subgrade should be moistened prior to placing concrete.

PAVING

Prior to placing paving in the proposed fire access lane, the existing fill should be removed and replaced as certified compacted fill. The exposed natural subgrade should be scarified, moistened as required to obtain optimum moisture content, and recompacted to 90 percent of the maximum dry density, as determined by ASTM D 1557-12. Trench backfill below paving should be compacted to 90 percent of the maximum dry density. Irrigation water should be prevented from migrating under paving.

A representative bulk sample of the existing fill was obtained from Boring 6 for laboratory testing to determine the Expansion Index (see Appendix I). The results indicate an Expansion Index (EI) value of 8 (very low). Based on a correlation with the EI values, a preliminary R-value of 60 is considered appropriate for design of flexible pavement at the subject site. Based on the Caltrans Design Procedures (Cal Test 301), flexible pavement sections may consist of the following for the Traffic Indices (TI) indicated.

Type of Vehicle (TI)	Asphalt Concrete (AC) Pavement Thickness (Inches)	Class II Aggregate Base Thickness (Inches)
Passenger Vehicles (5)	3.0	4.0
Moderate Trucks (6)	3.5	4.0
Fire Engine (9)	5.5	4.0

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

The Class II aggregate base and top one foot of subgrade should be compacted to a minimum of 95 percent of maximum dry density. Crushed aggregate base should meet the requirements of "Greenbook" (Standard Specification for Public Works Construction) Section 200-2.2.

CEMENT TYPE AND CORROSION PROTECTION

A representative sample of the near-surface soil was obtained during field exploration for laboratory testing. Corrosion test results are included in Appendix I. The results indicate that concrete structures in contact with the soils onsite will have negligible exposure to water-soluble sulfates in the soil. According to Tables 19.3.1.1 and 19.3.2.1 of Section 19.3 of the ACI 318-14 Code, Type II cement may be used for concrete construction.

The results of the laboratory testing also indicate that the near-surface soil onsite is considered moderately corrosive to ferrous metals. The corrosion information presented in Appendix I of this report should be provided to the underground utility subcontractor.

DRAINAGE

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

Low Impact Development (LID) Requirements

The following recommendations shall be incorporated into the design and construction of a drywell infiltration system.

- The drywell should be planned beneath the finish floor of the subterranean parking level or beneath the compacted fill pad.

- The upper 10 feet minimum of the drywell shaft should be sealed to avoid any lateral water infiltration and soil saturation immediately below the foundation system. The annular space around the sealed shaft should be backfilled with a minimum of 2-sack cement slurry. The bottom portion of the shaft below the sealed shaft should be backfilled with a minimum of 3/4-inch crushed rocks.

- A geotextile fabric liner should be placed alongside the perimeter of the drywell shaft to separate the permeable gravel fill and the surrounding soil.

- The horizontal distance between the edge of the infiltration system and any adjacent property line or public right-of-way should be at least 10 feet.

- The distance between the edge of the infiltration system and any adjacent structural foundations should be a minimum of 10 feet.

- The infiltration system shall be designed to overflow to the sump pump at the lowest subterranean parking level in case the capacity is exceeded.

- Since the infiltration system is planned below the subterranean parking level, vehicular surcharge should be considered in the design and construction of the system.

- The exposed excavated area should be observed by the soils engineer to verify natural alluvium is exposed prior to construction of the infiltration system.

Byer Geotechnical should be provided with the final design plans to verify the location of the infiltration system and to provide additional recommendations, if necessary, depending on the type of the infiltration system to be installed.

Irrigation

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

WATERPROOFING

Interior and exterior retaining walls are subject to moisture intrusion, seepage, and leakage, and should be waterproofed. Waterproofing paints, compounds, or sheeting can be effective if properly installed. Equally important is the use of a subdrain that daylights to the atmosphere. The subdrain should be covered with ¾-inch crushed gravel to help the collection of water. Landscape areas above the wall should be sealed or properly drained to prevent moisture contact with the wall or saturation of wall backfill.

PLAN REVIEW

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

SITE OBSERVATIONS DURING CONSTRUCTION

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

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

FINAL REPORTS

The geotechnical engineer will prepare interim and final compaction reports upon request. The geologist will prepare reports summarizing pile excavations.

CONSTRUCTION SITE MAINTENANCE

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

GENERAL CONDITIONS AND NOTICE

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

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

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

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

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

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

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

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

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

Respectfully submitted,
BYER GEOTECHNICAL, INC.

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RSB:RIZ:cj
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ENCLOSURES AND DISTRIBUTION

Enc: List of References
- Appendix I - Byer Geotechnical, Inc., Excerpts from Report dated September 5, 2019
  - Laboratory Testing (2 Pages)
  - Shear Test Diagram #1
  - Consolidation Curves #1 - #7 (7 Pages)
  - Log of Borings 1 - 6 (15 Pages)
- Appendix II - Laboratory Testing and Log of Boring, Report dated February 17, 2022
  - Laboratory Testing
  - Shear Test Diagram #2
  - Consolidation Curves #8 and #9 (2 Pages)
  - Log of Borings B7 (2 Pages)
- Appendix III - Calculations and Figures
  - Seismic Sources (2 Pages)
  - Seismic Hazard Deaggregation Chart (2 Pages)
  - *In-Situ* Percolation Test Calculation Sheet #1
  - Retaining Wall Calculation Sheets #2 and #3 (8 Pages)
  - Shoring Pile Calculation Sheet #4 (2 Pages)
  - Allowable Pile Axial Capacity Chart #1
  - Lateral Pile Capacity Figures #1 - #8 (16 Pages)
  - Aerial Vicinity Map
  - Regional Topographic Map
  - Historic Topographic Map
  - Regional Geologic Map
  - Regional Fault Map
  - Seismic Hazard Zones Map
  - Historic-High Groundwater Map

In Pocket: Site Plan
Sections A and B (One Sheet)

xc: (4) Addressee (E-mail and Mail)
(1) ABS Properties, Inc., Attention: Samir Srivastava (E-mail)

LABORATORY TESTING

Undisturbed and bulk samples of the existing fill and alluvium were obtained from Boring 7 and transported to the laboratory for testing and analysis. The samples were obtained by driving a ring-lined, barrel sampler conforming to ASTM D 3550-01 with successive drops of the sampler. Experience has shown that sampling causes some disturbance of the sample. However, the test results remain within a reasonable range. The samples were retained in brass rings of 2.50 inches outside diameter and 1.00 inch in height. The samples were stored in close fitting, waterproof containers for transportation to the laboratory.

Moisture-Density

The dry density of the samples was determined using the procedures outlined in ASTM D 2937-10. The moisture content of the samples was determined using the procedures outlined in ASTM D 2216-10. The results are shown on the enclosed Log of Boring 7.

Shear Tests

Shear tests were performed on samples of future compacted fill using the procedures outlined in ASTM D 3080-11 and a strain controlled, direct-shear machine manufactured by Soil Test, Inc. The rate of deformation was 0.025 inch per minute. The samples were tested in an artificially saturated condition. Following the shear test, the moisture content of the samples was determined to verify saturation. The results are plotted on the enclosed Shear Test Diagram.

Consolidation

Consolidation tests were performed on *in situ* samples of the alluvium and future compacted fill using the procedures outlined in ASTM D 2435-11. Results are graphed on the enclosed Consolidation Curves.

REFERENCES

Bedrosian, T. L., et al. (2010), **Geologic Compilation of Quaternary Surficial Deposits in Southern California**, Special Report 217 (Revised).

California Building Standards Commission (2019), **2019 California Building Code,** Based on the 2018 International Building Code (IBC), Title 24, Part 2, Vol. 1 and 2.

California Department of Conservation (1999), **State of California, Seismic Hazard Zones, Burbank Quadrangle**, Official Map, Division of Mines and Geology.

California Department of Conservation (1998, updated 2001), **Seismic Hazard Zone Report 016, Seismic Hazard Zone Report for the Burbank 7.5-Minute Quadrangle, Los Angeles County, California**.

California Department of Conservation (2008), **Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California.**

California Geological Survey (Formerly California Division of Mines and Geology), 2000, **Digital Images of Official Maps of Alquist-Priolo Earthquake Fault Zones, Southern Region,** DMG CD 2000-003.

California Geological Survey, 2014, **Official Map, Earthquake Zones of Required Investigation, Hollywood Quadrangle, Los Angeles, California**, Released November 6, 2014.

Cao, T., et al. (2003), **The Revised 2002 California Probabilistic Seismic Hazard Maps**, June, 2003.

County of Los Angeles (2014), **Low Impact Development Standards Manual**, February 2014.

Dibblee, T. W. (1991), **Geologic Map of the Sunland and Burbank (North ½) Quadrangles, Los Angeles County, California**, 1:24,000 scale, Dibblee Foundation, Santa Barbara, California, Map DF-32.

ICBO (1998), **Maps of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada.**

Jennings, C. W., and Bryant, W. A. (2010), **Fault Activity Map of California**, California Geological Survey, 150th Anniversary, Map No. 6.

U.S. Geological Survey, **Geologic Hazards Science Center, U. S. Seismic Design Maps,** http://earthquake.usgs.gov/designmaps/us/application.php.

Software

EZ-FRISK 8.07, Fugro Consultants, Inc.
LPILE 2018.10.09, Ensoft, Inc., Reese and Wang, 1997.

APPENDIX I

Byer Geotechnical, Inc., Excerpts from Report dated September 5, 2019

LABORATORY TESTING

Undisturbed and bulk samples of the existing fill and alluvium were obtained from the borings and transported to the laboratory for testing and analysis. The samples were obtained by driving a ring-lined, barrel sampler conforming to ASTM D 3550-01 with successive drops of the sampler. Experience has shown that sampling causes some disturbance of the sample. However, the test results remain within a reasonable range. The samples were retained in brass rings of 2.50 inches outside diameter and 1.00 inch in height. The samples were stored in close fitting, waterproof containers for transportation to the laboratory.

Moisture-Density

The dry density of the samples was determined using the procedures outlined in ASTM D 2937-10. The moisture content of the samples was determined using the procedures outlined in ASTM D 2216-10. The results are shown on the enclosed Log of Borings.

Maximum Density

The maximum dry density and optimum moisture content of the future compacted fill were determined using the procedures outlined in ASTM D 1557-12, a five-layer standard. The results are shown in the following table:

Boring	Depth (Feet)	Earth Material	Soil Type and Color	Maximum Density (pcf)	Optimum Moisture %	Expansion Index
6	0 - 10	Fill/ Alluvium	Silty Sand Olive-Brown	121.0	14.0	8 - Very Low

Expansion Test

To find the expansiveness of the soil, a swell test was performed using the procedures outlined in ASTM D 4829-11. Based upon the testing, the near-surface soil is expected to exhibit a very low expansion potential.

LABORATORY TESTING (Continued)

Shear Tests

Shear tests were performed on samples of the alluvium using the procedures outlined in ASTM D 3080-11 and a strain controlled, direct-shear machine manufactured by Soil Test, Inc. The rate of deformation was 0.025 inch per minute. The samples were tested in an artificially saturated condition. Following the shear test, the moisture content of the samples was determined to verify saturation. The results are plotted on the enclosed Shear Test Diagram.

Consolidation

Consolidation tests were performed on *in situ* samples of the alluvium using the procedures outlined in ASTM D 2435-11. Results are graphed on the enclosed Consolidation Curves.

Corrosion

A representative sample of the near-surface was transported to Environmental Geotechnology Laboratory for chemical testing. The testing was performed in accordance with Caltrans Standards 643 (pH), 422 (Chloride Content), 417 (Sulfate Content), and 532 (Resistivity). The results of the testing are reported in the following table:

CHEMICAL TEST RESULTS TABLE

Sample	Depth (Feet)	pH	Chloride (PPM)	Sulfate (%)	Resistivity (Ohm-cm)
B6	0 - 10	7.2	180	0.004	6,200

The chloride and sulfate contents of the soil are negligible and not a factor in corrosion. The pH is near neutral and not a factor. The resistivity indicates that the soil is considered moderately corrosive to ferrous metals.

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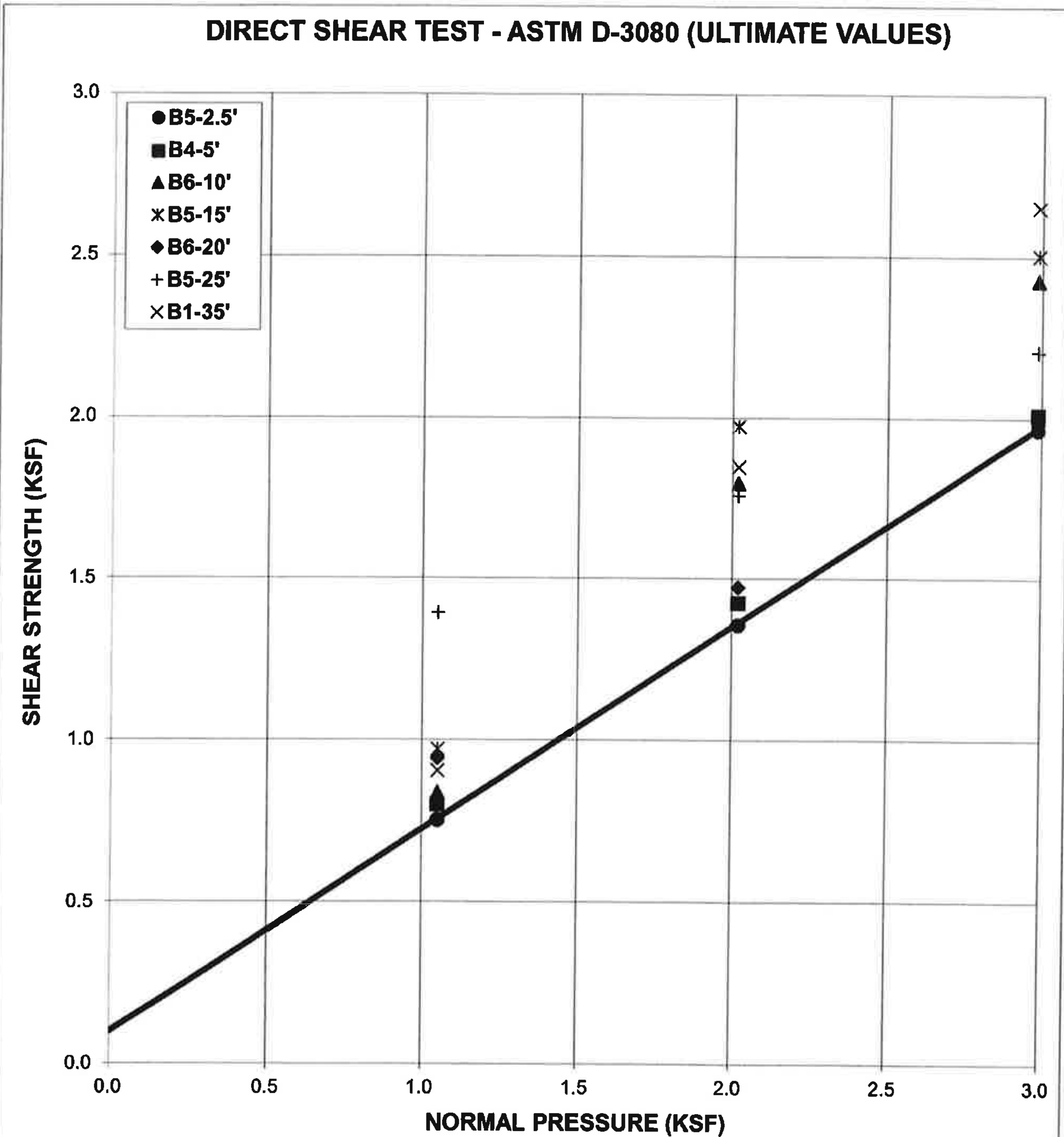
SHEAR TEST DIAGRAM #1

BG: 23025 ENGINEER: RSB
CLIENT: ABS Burbank, LLC

EARTH MATERIAL: Alluvium

Phi Angle =	32.0	degrees	Average Moisture Content	18.8%
Cohesion =	100	psf	Average Dry Density (pcf)	110.6
			Average Saturation	100%



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CONSOLIDATION CURVE #1

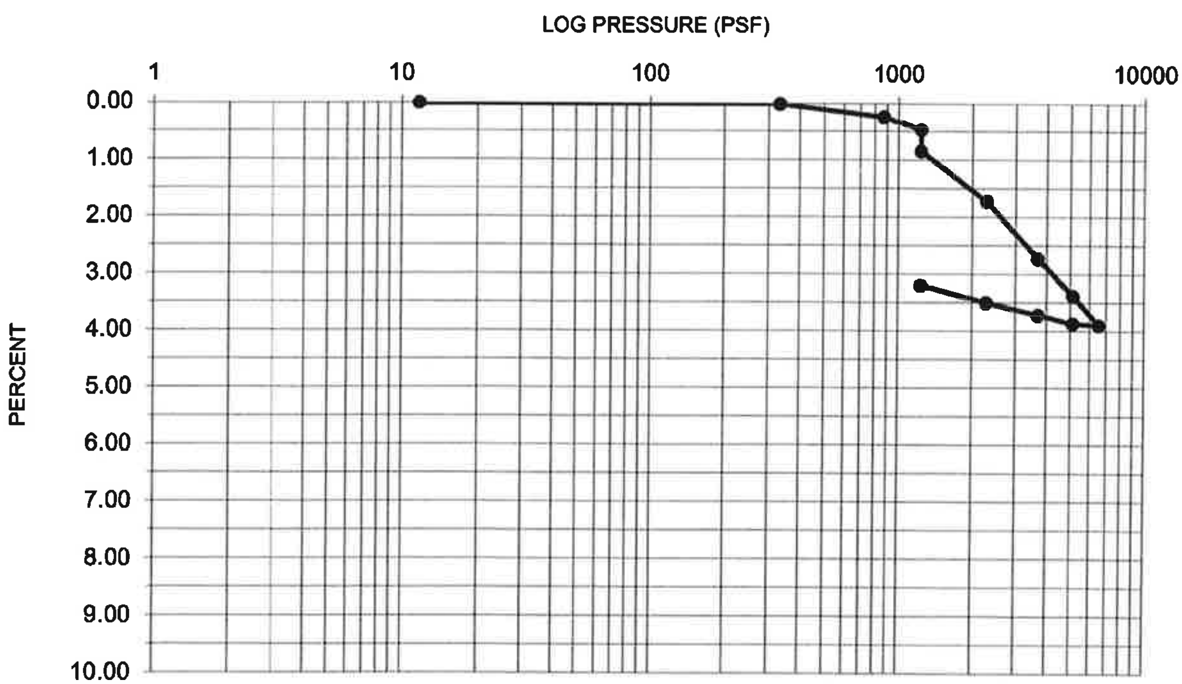
BG: 23025 ENGINEER: RSB

CLIENT: ABS Burbank, LLC

Earth Material:	Alluvium
Sample Location:	B4-10'
Dry Weight (pcf):	111.6
Initial Moisture:	2.1%
Initial Saturation:	11.5%
Water Added at (psf)	1237

Specific Gravity:	2.65
Initial Void Ratio:	0.48
Compression Index (Cc):	0.072
Recompression Index (Cr):	0.017

CONSOLIDATION DIAGRAM (ASTM D 2435-11)



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CONSOLIDATION CURVE #2

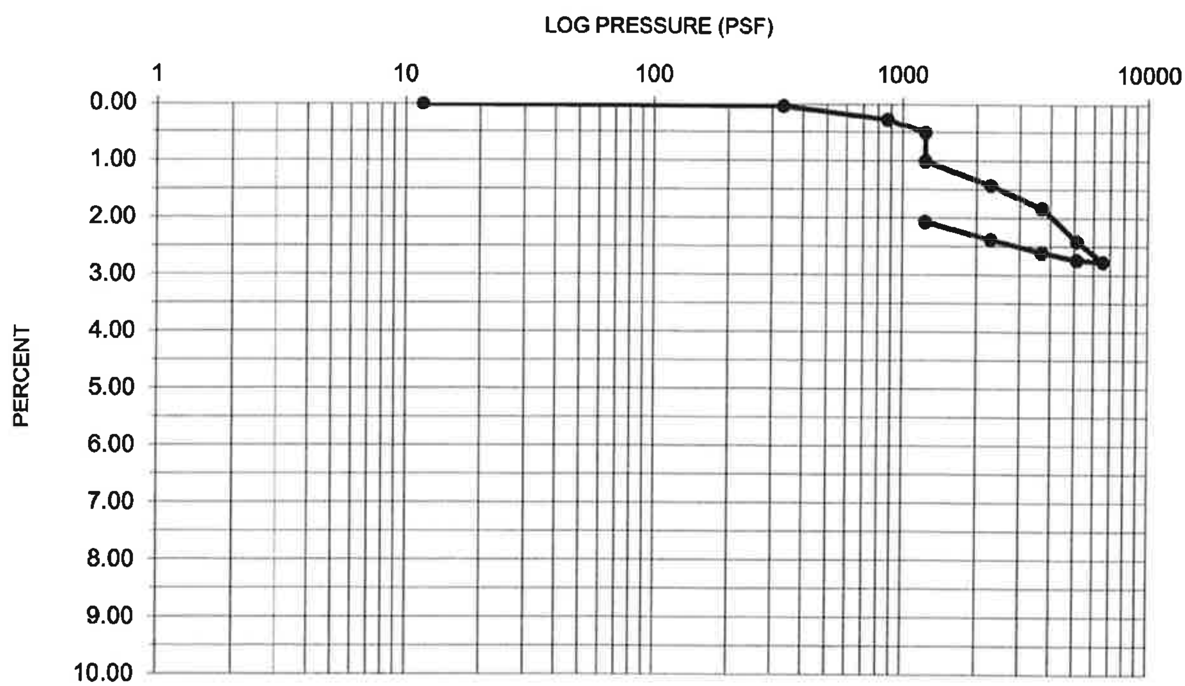
BG: 23025 ENGINEER: RSB

CLIENT: ABS Burbank, LLC

Earth Material:	Alluvium
Sample Location:	B5-15'
Dry Weight (pcf):	122.9
Initial Moisture:	1.2%
Initial Saturation:	9.2%
Water Added at (psf)	1237

Specific Gravity:	2.65
Initial Void Ratio:	0.35
Compression Index (Cc):	0.055
Recompression Index (Cr):	0.016

CONSOLIDATION DIAGRAM (ASTM D 2435-11)



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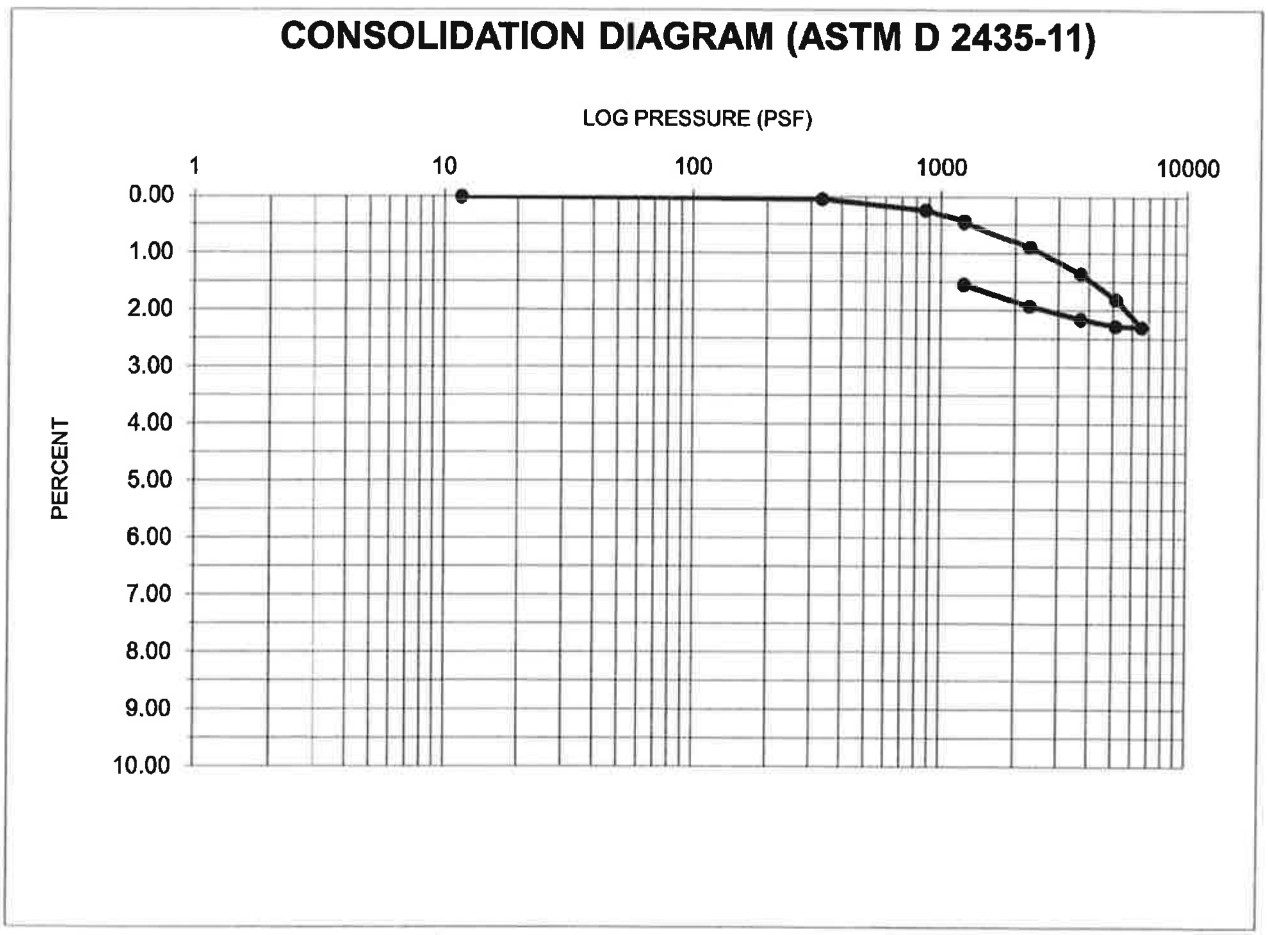
CONSOLIDATION CURVE #3

BG: **23025** ENGINEER: **RSB**

CLIENT: **ABS Burbank, LLC**

Earth Material:	Alluvium
Sample Location:	B2-20'
Dry Weight (pcf):	104.4
Initial Moisture:	7.4%
Initial Saturation:	33.6%
Water Added at (psf)	1237

Specific Gravity:	2.65
Initial Void Ratio:	0.58
Compression Index (Cc):	0.073
Recompression Index (Cr):	0.023



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CONSOLIDATION CURVE #4

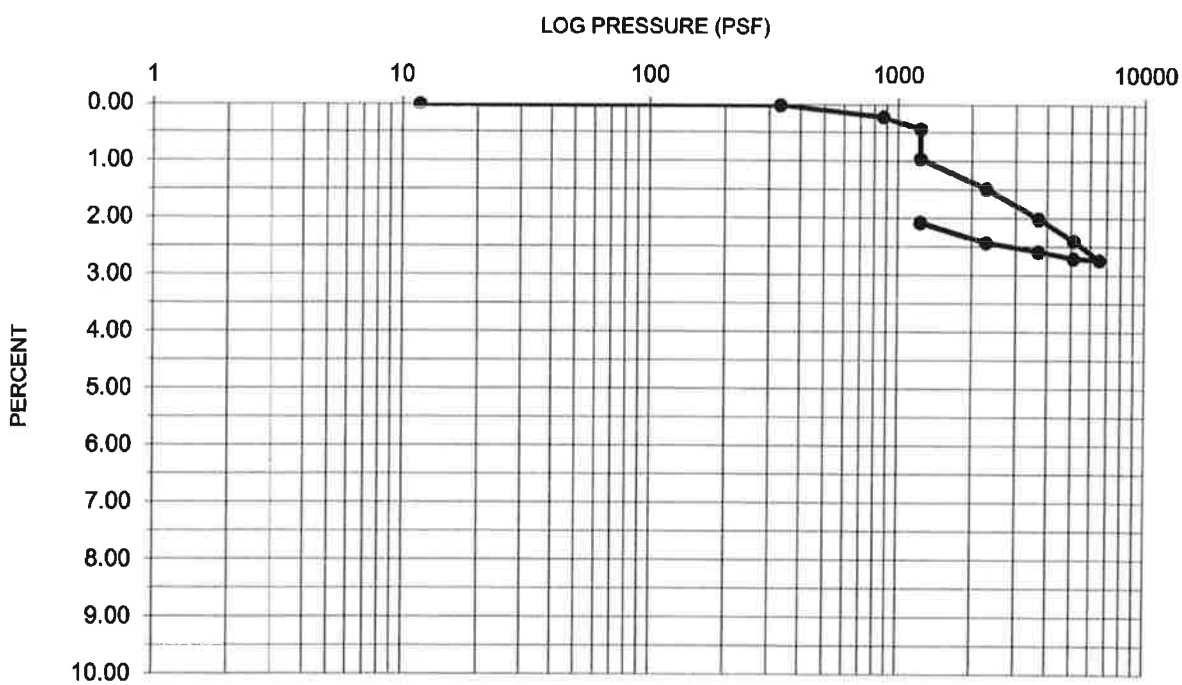
BG: **23025** ENGINEER: **RSB**

CLIENT: **ABS Burbank, LLC**

Earth Material:	Alluvium
Sample Location:	B1-25'
Dry Weight (pcf):	111.3
Initial Moisture:	3.4%
Initial Saturation:	18.6%
Water Added at (psf)	1237

Specific Gravity:	2.65
Initial Void Ratio:	0.49
Compression Index (Cc):	0.047
Recompression Index (Cr):	0.020

CONSOLIDATION DIAGRAM (ASTM D 2435-11)



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GEOTECHNICAL
INC.

1461 E. CHEVY CHASE DRIVE, #200, GLENDALE, CA 91206
tel 818.549.9959 fax 818.543.3747

CONSOLIDATION CURVE #5

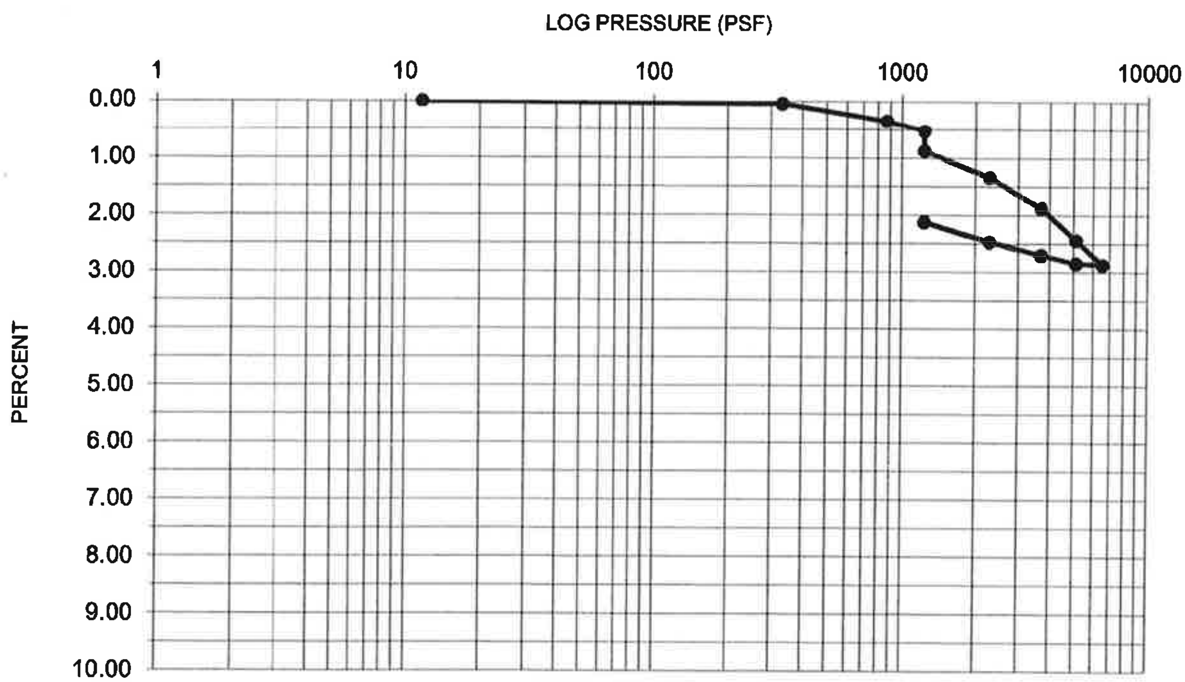
BG: **23025** ENGINEER: **RSB**

CLIENT: **ABS Burbank, LLC**

Earth Material:	Alluvium
Sample Location:	B6-30'
Dry Weight (pcf):	115.6
Initial Moisture:	1.8%
Initial Saturation:	11.1%
Water Added at (psf)	1237

Specific Gravity:	2.65
Initial Void Ratio:	0.43
Compression Index (Cc):	0.058
Recompression Index (Cr):	0.019

CONSOLIDATION DIAGRAM (ASTM D 2435-11)



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CONSOLIDATION CURVE #6

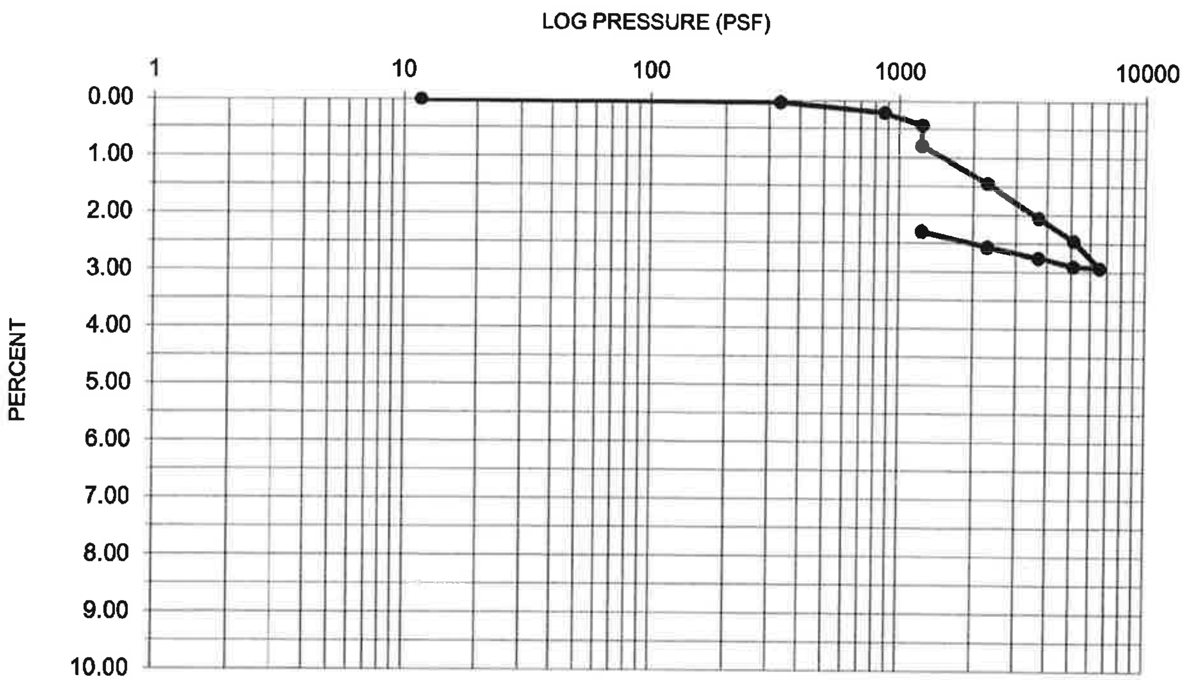
BG: 23025 ENGINEER: RSB

CLIENT: ABS Burbank, LLC

Earth Material:	Alluvium
Sample Location:	B5-35'
Dry Weight (pcf):	124.2
Initial Moisture:	5.4%
Initial Saturation:	38.9%
Water Added at (psf)	1237

Specific Gravity:	2.75
Initial Void Ratio:	0.38
Compression Index (Cc):	0.062
Recompression Index (Cr):	0.015

CONSOLIDATION DIAGRAM (ASTM D 2435-11)



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CONSOLIDATION CURVE #7

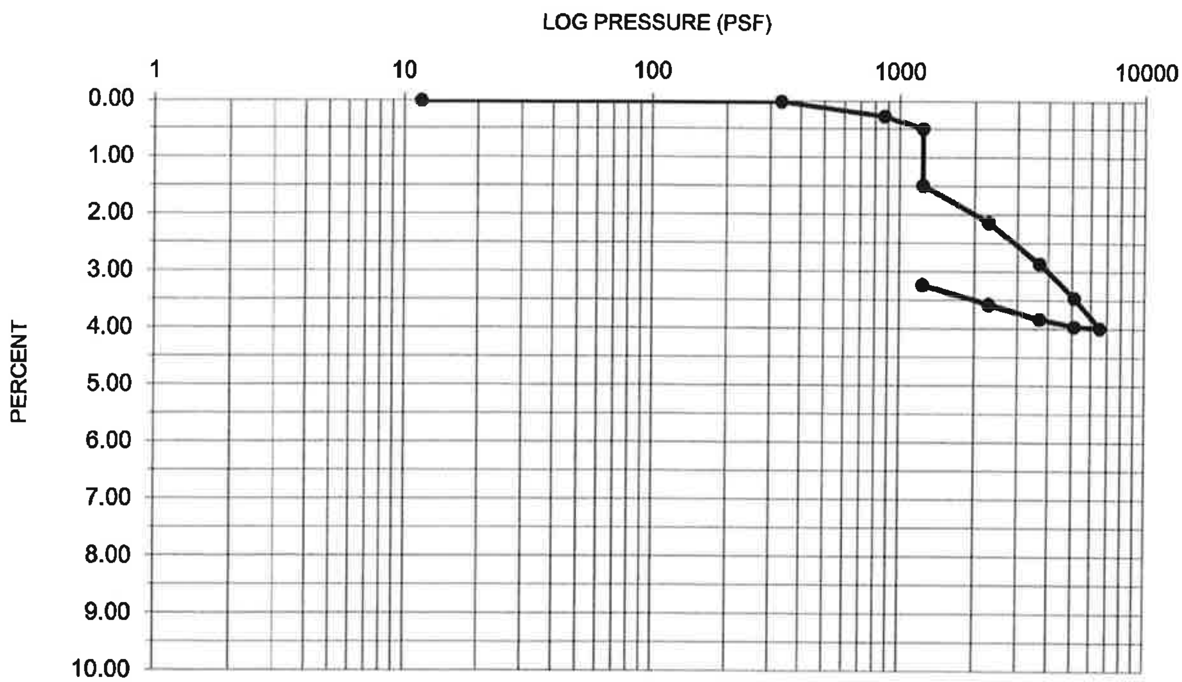
BG: 23025 ENGINEER: RSB

CLIENT: ABS Burbank, LLC

Earth Material:	Alluvium
Sample Location:	B6-40'
Dry Weight (pcf):	127.3
Initial Moisture:	1.9%
Initial Saturation:	16.8%
Water Added at (psf)	1237

Specific Gravity:	2.65
Initial Void Ratio:	0.30
Compression Index (Cc):	0.065
Recompression Index (Cr):	0.017

CONSOLIDATION DIAGRAM (ASTM D 2435-11)



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LOG OF BORING B1

BG No. 23025

CLIENT ABS Burbank, LLC REPORT DATE 9/5/19 DRILL DATE 3/21/19

PROJECT LOCATION 3000 West Empire Avenue, Burbank, CA LOGGED BY RSB

CONTRACTOR Martini Drilling DRILLING METHOD Hollow-Stem Auger HOLE SIZE 8-inch diameter

DRIVE WEIGHT 140-Pound Automatic Hammer HAMMER DROP 30 Inches ELEV. TOP OF HOLE 657 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	0	Surface: 4" asphalt over 10" base (driveway.								
655		(SM) **FILL (Afu):** 1.2' - 2.5': Silty SAND, dark olive-brown, moist, fine to medium sand, trace asphalt and concrete debris, some fine gravel.		SM						
	5	(SM) 5': Top 12": Silty SAND, dark olive-brown, moist, loose, fine sand, trace medium to coarse sand, trace rock fragments		SM	R1	3 3 4	13.3	111.8	73.5	
650		(SM) **ALLUVIUM (Qa):** Bottom 6": Silty SAND, light olive-brown, slightly moist, loose, fine sand.		SM						
	10	(SM) 10': Silty SAND, light olive-brown, slightly moist, loose, fine sand.		SM	S1	3 3 3	8.4			
645										
	15	(SP) 15': SAND, light olive-gray, slightly moist to dry, medium dense, fine sand, some medium to coarse sand, trace fine to coarse gravel to 2" angular to subrounded.		SP	R2	14 16 19	1.2	115.1	6.9	
640										
	20	(SP) 20': SAND, light olive-brown, slightly moist to dry, medium dense to dense, fine to medium sand, some coarse sand, trace fine to coarse gravel to 1.5" angular to subrounded.		SP	S2	6 9 13	1.6			
635										
	25									

Ring Sample

Standard Penetration Test

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LOG OF BORING B1

BG No. 23025

CLIENT ABS Burbank, LLC **REPORT DATE** 9/5/19 **DRILL DATE** 3/21/19
PROJECT LOCATION 3000 West Empire Avenue, Burbank, CA **LOGGED BY** RSB
CONTRACTOR Martini Drilling **DRILLING METHOD** Hollow-Stem Auger **HOLE SIZE** 8-inch diameter
DRIVE WEIGHT 140-Pound Automatic Hammer **HAMMER DROP** 30 Inches **ELEV. TOP OF HOLE** 657 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	25	(SP) 25': SAND, light olive-brown to olive-brown, slightly moist, medium dense, fine sand, trace medium to coarse sand, some fines.		SP	R3	5 7 15	3.4	111.3	18.5	Consolidation
630										
	30	(SP) 30': SAND, light olive-brown, slightly moist to dry, dense, fine to medium sand, some coarse sand, trace fine gravel to 3/4" angular.		SP	S3	9 17 17	2			
625										
	35	(SP) 35': SAND, light olive-brown, slightly moist, very dense, fine to medium sand, some coarse sand, some fine to coarse gravel to 1.5" angular.		SP	R4	14 30 50	2.7	118.2	18.1	Direct Shear
620										
	40	(SP) 40': SAND with gravel, light olive-gray, slightly moist to dry, medium dense, fine to medium sand, some coarse sand, fine to coarse gravel to 1.5" angular.		SP	S4	12 15 8	1.3			
615										
	45	(SP) 45': SAND with gravel, light olive-gray, slightly moist to dry, medium dense to dense, fine to medium sand, some coarse sand, fine to coarse gravel to 1" angular.		SP	R5	17 20 26	2.5	115.6	15.4	Consolidation
610										
	50									

Ring Sample   Standard Penetration Test

BORING LOG BYER BY RSB - GINT STD US BYER.GDT - 9/5/19 11:31 - P:\23000 - 23999\23025 ABS BURBANK_3000 W EMPIRE AVE\23025 BORING LOGS.GPJ

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LOG OF BORING B1

BG No. 23025

CLIENT	ABS Burbank, LLC	**REPORT DATE**	9/5/19	**DRILL DATE**	3/21/19
PROJECT LOCATION	3000 West Empire Avenue, Burbank, CA			**LOGGED BY**	RSB
CONTRACTOR	Martini Drilling	**DRILLING METHOD**	Hollow-Stem Auger	**HOLE SIZE**	8-inch diameter
DRIVE WEIGHT	140-Pound Automatic Hammer	**HAMMER DROP**	30 Inches	**ELEV. TOP OF HOLE**	657 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	50	(SP) 50': Gravelly SAND, light olive-gray, slightly moist to dry, very dense, fine to medium sand, some coarse sand, fine to coarse gravel to 2" angular to subrounded.		SP	R6	19 34 50/4"	1.1	115.4	6.7	
605										
	55	(SP) 55': SAND, light olive-gray, slightly moist to dry, dense, fine to medium sand, trace coarse sand.		SP	R7	19 25 28	2.8	112.8	15.6	

End at 56.5 Feet; No Groundwater; Fill to 6 Feet.

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Ring Sample   Standard Penetration Test

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LOG OF BORING B2

BG No. 23025

CLIENT ABS Burbank, LLC REPORT DATE 9/5/19 DRILL DATE 3/21/19

PROJECT LOCATION 3000 West Empire Avenue, Burbank, CA LOGGED BY RSB

CONTRACTOR Martini Drilling DRILLING METHOD Hollow-Stem Auger HOLE SIZE 8-inch diameter

DRIVE WEIGHT 140-Pound Automatic Hammer HAMMER DROP 30 Inches ELEV. TOP OF HOLE 656 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	0	Surface: 4" asphalt over 5" base (driveway).								
655		(SM) **FILL (Afu):** 0.8' - 2.5': Silty SAND, dark olive-brown, slightly moist, fine sand, trace medium sand, some tiny crushed rock fragments.		SM						
		(SM) 2.5': Silty SAND, dark olive-brown, slightly moist, medium dense, fine sand, trace medium sand, trace asphalt and concrete debris.		SM	S1	5 5 5	8.9			
650	5	(SP) **ALLUVIUM (Qa):** 5': SAND, olive-brown, slightly moist to moist, medium dense, fine sand, some medium to coarse sand, trace fine gravel to 3/4" angular.		SP	R1	5 7 10	7.3	118.5	49	
		(SP) 7.5': SAND, light olive-brown, slightly moist to moist, loose, fine sand, some medium sand, some silt.		SP	S2	2 2 2	10.5			
645	10	(SM) 10': Silty SAND, olive-brown, moist, loose, fine sand, trace medium sand.		SM	R2	2 3 5	6.9	106.1	32.8	
640	15	(SP) 15': SAND, light olive-brown, slightly moist, medium dense, fine sand, some medium to coarse sand, some fine to coarse gravel to 1.5" angular to subrounded.		SP	S3	5 7 9	2.7			
635	20	(SP) 20': SAND, olive-brown, slightly moist to moist, medium dense, fine sand, some fines.		SP	R3	5 9 11	7.4	104.4	33.5	Consolidation
	25									

Standard Penetration Test   Ring Sample

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LOG OF BORING B2

BG No. 23025

CLIENT ABS Burbank, LLC REPORT DATE 9/5/19 DRILL DATE 3/21/19

PROJECT LOCATION 3000 West Empire Avenue, Burbank, CA LOGGED BY RSB

CONTRACTOR Martini Drilling DRILLING METHOD Hollow-Stem Auger HOLE SIZE 8-inch diameter

DRIVE WEIGHT 140-Pound Automatic Hammer HAMMER DROP 30 Inches ELEV. TOP OF HOLE 656 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
630	25	(SP) 25': SAND, light olive-brown, slightly moist, medium dense, fine sand, some medium sand.		SP	S4	5 8 8	3.9			
625	30	(SP) 30': SAND, light olive-gray, slightly moist, medium dense, fine sand, some medium sand.		SP	R4	9 16 25	3.6	110	19	

End at 31.5 Feet; No Groundwater; Fill to 5 Feet.

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Standard Penetration Test

Ring Sample

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LOG OF BORING B3

BG No. 23025

CLIENT ABS Burbank, LLC **REPORT DATE** 9/5/19 **DRILL DATE** 3/22/19

PROJECT LOCATION 3000 West Empire Avenue, Burbank, CA **LOGGED BY** RSB

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

DRIVE WEIGHT 140-Pound Automatic Hammer **HAMMER DROP** 30 Inches **ELEV. TOP OF HOLE** 654 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	0	Surface: 3.5" asphalt over 8" base (driveway).								
		(SM) **FILL (Afu):** 1' - 2.5': Silty SAND, dark olive-brown, moist, fine sand.		SM						
		(SP) 2.5': SAND, light olive-brown, slightly moist to moist, loose, fine sand, trace medium sand, trace asphalt debris.		SP	R1	4 4 5	6.3	107.4	30.9	
650		(SP) **4': ALLUVIUM (Qa):**		SP						
	5	(SP) 5': SAND, olive-gray, slightly moist to moist, loose, fine sand, trace medium to coarse sand, trace fines.		SP	S1	1 1 1	10.3			
		(SP) 7.5': SAND, olive-brown, slightly moist to moist, loose, fine sand, trace fines.		SP	R2	2 4 5	9	102.8	38.9	
645	10	(SP) 10': SAND, light olive-brown, slightly moist, loose, fine sand.		SP	S2	2 3 4	7.7			
640	15	(SP) 15': SAND, light olive-gray, slightly moist, medium dense, fine sand, some medium to coarse sand, trace fine to coarse gravel to 1" angular to subrounded.		SP	R3	15 19 20	1.8	116.5	11.4	
635	20	(SM) 20': Silty SAND, olive-brown, moist, medium dense, fine sand, some medium sand.		SM	S3	2 4 6	15.7			
630	25									

Ring Sample
Standard Penetration Test

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LOG OF BORING B3

BG No. 23025

CLIENT ABS Burbank, LLC | REPORT DATE 9/5/19 | DRILL DATE 3/22/19

PROJECT LOCATION 3000 West Empire Avenue, Burbank, CA | LOGGED BY RSB

CONTRACTOR Martini Drilling | DRILLING METHOD Hollow-Stem Auger | HOLE SIZE 8-inch diameter

DRIVE WEIGHT 140-Pound Automatic Hammer | HAMMER DROP 30 Inches | ELEV. TOP OF HOLE 654 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	25	(SP) 25': SAND, light olive-brown, slightly moist to dry, medium dense, fine to medium sand, some coarse sand, trace fine gravel to 3/4" angular.		SP	R4	8 15 23	3.5	110.9	18.9	
625										
	30	(SP) 30': SAND, light olive-brown, slightly moist to dry, medium dense, fine to medium sand, some coarse sand, trace fine to coarse gravel to 1" angular.		SP	S4	9 11 14	3.9			
620										
	35	(SP) 35': SAND, light olive-brown, slightly moist to dry, dense, fine to medium sand, some coarse sand, some fine to coarse gravel to 2" angular to subrounded.		SP	R5	12 22 29	3.1	119.9	21.6	
615										
	40	(SP) 40': SAND, light olive-brown, slightly moist to dry, medium dense, fine to medium sand, some coarse sand, trace fine to coarse gravel to 1" angular.		SP	S5	5 8 8	6.6			

End at 41.5 Feet; No Groundwater; Fill to 4 Feet.

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Ring Sample | Standard Penetration Test

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LOG OF BORING B4

CLIENT ABS Burbank, LLC **REPORT DATE** 9/5/19 **DRILL DATE** 3/22/19

PROJECT LOCATION 3000 West Empire Avenue, Burbank, CA **LOGGED BY** RSB

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

DRIVE WEIGHT 140-Pound Automatic Hammer **HAMMER DROP** 30 Inches **ELEV. TOP OF HOLE** 654 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	0	Surface: 3" asphalt over 4" base (driveway).							
		(SM) **FILL (Afu):** 0.6' - 2.5': Silty SAND, dark olive-brown, moist, fine to medium sand, with fine to coarse gravel to 2" angular to subrounded, trace concrete debris.	SM						
650		(SM) 2.5': Top 6": Silty SAND, dark olive-brown, moist, loose, fine to medium sand, some concrete debris and rock fragments. (SP) Bottom 12": SAND, olive-brown, slightly moist to moist, loose, fine sand, trace medium sand.	SM SP	S1	2 1 2	7.4			
	5	(SP) 5': SAND, light olive-brown, slightly moist to dry, medium dense, fine sand, some medium to coarse sand, trace fine to coarse gravel to 1" angular to subrounded.	SP	R1	2 4 6	5.1	108	25.2	Direct Shear
		(SP) **ALLUVIUM (Qa):**	SP						
645		(SP) 7.5': SAND, light olive-brown, slightly moist, loose, fine sand, some fines.	SP	S2	3 2 1	13.4			
	10	(SM) 10': Silty SAND, light olive-gray, slightly moist to dry, loose, fine sand, some medium sand.	SM	R2	3 2 4	2.1	111.6	11.6	Consolidation
640	15	(SP) 15': Gravelly SAND, light olive-gray, slightly moist to dry, dense, fine to medium sand, some coarse sand, fine to coarse gravel to 3" angular to subrounded, abundant gravel at 17 to 18 feet.	SP	S3	8 15 19	2.4			
635	20	(SP) 20': From cuttings: Gravelly SAND, light olive-gray, slightly moist to dry, very dense, fine to medium sand, some coarse sand, fine to coarse gravel to 3" angular to subrounded.	SP	R3	16 42 50				No Recovery
630	25								

Standard Penetration Test   Ring Sample

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LOG OF BORING B4

BG No. 23025

CLIENT ABS Burbank, LLC REPORT DATE 9/5/19 DRILL DATE 3/22/19

PROJECT LOCATION 3000 West Empire Avenue, Burbank, CA LOGGED BY RSB

CONTRACTOR Martini Drilling DRILLING METHOD Hollow-Stem Auger HOLE SIZE 8-inch diameter

DRIVE WEIGHT 140-Pound Automatic Hammer HAMMER DROP 30 Inches ELEV. TOP OF HOLE 654 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	25	(SP) 25': From cuttings: Gravelly SAND, light olive-gray, slightly moist to dry, dense to very dense, fine to medium sand, some coarse sand, fine to coarse gravel to 3" angular to subrounded.		SP	S4	50/5"				No Recovery
625										
	30	(SP) 30': From cuttings: Gravelly SAND, light olive-gray, slightly moist to dry, very dense, fine to medium sand, some coarse sand, trace fine to coarse gravel to 3" angular to subrounded.		SP	R4	50/2"				No Recovery

End at 30.2 Feet; No Groundwater; Fill to 6.5 Feet.

Standard Penetration Test   Ring Sample

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LOG OF BORING B5

BG No. 23025

CLIENT ABS Burbank, LLC REPORT DATE 9/5/19 DRILL DATE 3/22/19

PROJECT LOCATION 3000 West Empire Avenue, Burbank, CA LOGGED BY RSB

CONTRACTOR Martini Drilling DRILLING METHOD Hollow-Stem Auger HOLE SIZE 8-inch diameter

DRIVE WEIGHT 140-Pound Automatic Hammer HAMMER DROP 30 Inches ELEV. TOP OF HOLE 655 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
655	0	Surface: 2" asphalt over 4" base (driveway).								
		(SM) **FILL (Afu):** 0.5' - 2.5': Silty SAND, dark olive-brown, slightly moist to moist, fine sand, trace fine gravel.		SM						
		(SP) **ALLUVIUM (Qa):** 2.5': SAND, light olive-brown, slightly moist, loose, fine sand, trace medium sand.		SP	R1	4 7 7	6.8	106.4	32.6	Direct Shear
650	5	(SP) 5': SAND, light olive-brown, slightly moist, loose, fine sand, trace medium sand, trace fines.		SP	S1	2 3 3	3.5			
		(SM) 7.5': Silty SAND, light olive-brown, slightly moist, loose, fine sand.		SM	R2	3 4 6	4.1	103.8	18.2	
645	10	(SM) 10': Silty SAND, light olive-brown, slightly moist, loose, fine sand, trace medium sand.		SM	S2	2 2 3	14.6			
640	15	(SP) 15': SAND, tan to light olive-gray, slightly moist to dry, medium dense to dense, fine to medium sand, some coarse sand, some fine to coarse gravel to 1" angular to subrounded.		SP	R3	9 19 25	1.2	122.9	9.4	Direct Shear, Consolidation
635	20	(SP) 20': SAND, light olive-brown, slightly moist to dry, medium dense, fine sand, some medium sand, trace fine to coarse gravel to 1" angular.		SP	S3	3 5 10	5.3			
630	25									

Ring Sample Standard Penetration Test

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LOG OF BORING B5

BG No. 23025

CLIENT ABS Burbank, LLC | REPORT DATE 9/5/19 | DRILL DATE 3/22/19

PROJECT LOCATION 3000 West Empire Avenue, Burbank, CA | LOGGED BY RSB

CONTRACTOR Martini Drilling | DRILLING METHOD Hollow-Stem Auger | HOLE SIZE 8-inch diameter

DRIVE WEIGHT 140-Pound Automatic Hammer | HAMMER DROP 30 Inches | ELEV. TOP OF HOLE 655 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
630	25	(SP) 25': SAND with gravel, light olive-brown, slightly moist, dense, fine to medium sand, some coarse sand, fine to coarse gravel to 2" angular to subrounded.		SP	R4	7 18 30	3.4	112.5	19.2	Direct Shear
625	30	(SP) 30': SAND, light olive-brown, slightly moist, medium dense to dense, fine to medium sand, some coarse sand, some fine gravel to 1/2" angular.		SP	S4	7 12 14	4.4			
620	35	(SP) 35': SAND, olive-brown, slightly moist, medium dense to dense, fine sand, trace medium sand.		SP	R5	10 11 31	5.4	124.2	43.1	Consolidation
615	40	(SP) 40': SAND, light olive-gray, slightly moist to dry, dense to very dense, fine to medium sand, some coarse sand, some fine to coarse gravel to 2" angular to subrounded.		SP	R6	16 30 46	2.7	113.4	15.7	
610	45	(SP) 45': SAND, light olive-gray, slightly moist to dry, dense, fine to medium sand, some coarse sand, some fine to coarse gravel to 2" angular to subrounded.		SP	S5	11 16 19	3.7			
605	50									

Ring Sample | Standard Penetration Test

BORING LOG BYER BY RSB - GINT STD US BYER.GDT - 9/5/19 11:31 - P:\23000 - 23999\23025 ABS BURBANK_3000 W EMPIRE AVE\23025 BORING LOGS.GPJ

BYER GEOTECHNICAL, INC.

1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
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LOG OF BORING B5

BG No. 23025

CLIENT ABS Burbank, LLC **REPORT DATE** 9/5/19 **DRILL DATE** 3/22/19

PROJECT LOCATION 3000 West Empire Avenue, Burbank, CA **LOGGED BY** RSB

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

DRIVE WEIGHT 140-Pound Automatic Hammer **HAMMER DROP** 30 Inches **ELEV. TOP OF HOLE** 655 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
605	50	(SW) 50': Gravelly SAND, light olive-gray, slightly moist to dry, very dense, fine to coarse sand, fine to coarse gravel to 1.5" angular to subrounded.		SW	R7	23 30 50	2.5	116.5	15.5	
600	55	(SP) 55': SAND, light olive-gray, slightly moist to dry, dense to very dense, fine sand, some medium to coarse sand, trace fine gravel to 3/4" angular.		SP	R8	20 30 42	2.6	110.6	14	Consolidation
595	60	(SP) 60': SAND, light olive-brown, slightly moist, very dense, fine sand, some medium to coarse sand.		SP	R9	23 39 50	5	111.8	27.6	Consolidation
590	65	(GW) 65': From cuttings: Sandy GRAVEL, light gray, slightly moist to dry, very dense, fine to coarse gravel to 3" angular to subrounded, fine to coarse sand, some cobbles to 4" subrounded.		GW	R10	50/2"				No Recovery
585	70	(GW) 70': Sampler bounced.		GW	R11	50/1"				No Recovery

End at 70.1 Feet; No Groundwater; Fill to 2.5 Feet.

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Ring Sample   Standard Penetration Test

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LOG OF BORING B6

BG No. 23025

CLIENT ABS Burbank, LLC REPORT DATE 9/5/19 DRILL DATE 3/22/19
PROJECT LOCATION 3000 West Empire Avenue, Burbank, CA LOGGED BY RSB
CONTRACTOR Martini Drilling DRILLING METHOD Hollow-Stem Auger HOLE SIZE 8-inch diameter
DRIVE WEIGHT 140-Pound Automatic Hammer HAMMER DROP 30 Inches ELEV. TOP OF HOLE 658 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	0	Surface: 2" asphalt over 4" base (driveway).								
		(SM) **FILL (Afu):** 0.5' - 2.5': Silty SAND, dark olive-brown, moist, fine sand, some gravel.		SM						
655		(SM) **ALLUVIUM (Qa):** 2.5': Silty SAND, olive-brown, slightly moist, loose, fine to medium sand, trace coarse sand, trace fine gravel.		SM	S1	2 3 4	5.2			
	5	(SP) 5': SAND, light olive-brown, slightly moist to dry, loose, fine sand, trace medium to coarse sand.		SP	Bag1 R1	3 5 6	2.5	107	12.3	Max, EI, Corrosion Suite
650		(SP) 7.5': SAND, light olive-gray, slightly moist to dry, loose, fine to medium, some coarse sand, trace fine gravel to 3/4" angular.		SP	S2	2 2 3	5.3			
	10	(SP) 10': SAND, light olive-gray, slightly moist to dry, medium dense, fine sand, some medium to coarse sand, trace fine gravel to 1/2" angular.		SP	R2	5 9 9	1.2	100.6	4.9	Direct Shear
645										
	15	(SP) 15': SAND, light gray, slightly moist to dry, medium dense, fine to medium sand, some coarse sand, some fine to coarse gravel to 1.5" angular to subrounded.		SP	S3	6 10 14	1.1			
640										
	20	(SP) 20': SAND, light olive-brown, slightly moist to dry, medium dense, fine sand, some fine to coarse gravel at tip of sampler.		SP	R3	22 15 24	2.6	105.9	12.2	Direct Shear
635										
	25									

Bulk Sample | Standard Penetration Test | Ring Sample

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LOG OF BORING B6

BG No. 23025

CLIENT ABS Burbank, LLC REPORT DATE 9/5/19 DRILL DATE 3/22/19

PROJECT LOCATION 3000 West Empire Avenue, Burbank, CA LOGGED BY RSB

CONTRACTOR Martini Drilling DRILLING METHOD Hollow-Stem Auger HOLE SIZE 8-inch diameter

DRIVE WEIGHT 140-Pound Automatic Hammer HAMMER DROP 30 Inches ELEV. TOP OF HOLE 658 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	25	(SP) 25': SAND, light olive-gray, slightly moist to dry, medium dense, fine to medium sand, some coarse sand, some fine to coarse gravel to 1.5" angular to subrounded.		SP	S4	11 12 11	1.4			
630										
	30	(SW) 30': SAND, light olive-gray, slightly moist to dry, dense, fine to coarse sand, some fine to coarse gravel to 1.5" angular.		SW	R4	11 18 30	1.8	115.7	10.8	Consolidation
625										
	35	(SP) 35': SAND, light olive-gray, slightly moist to dry, medium dense, fine to medium sand, some coarse sand, some fine to coarse gravel to 1.5" angular.		SP	S5	8 11 12	2.2			
620										
	40	(SW) 40': Gravelly SAND, light olive-gray, slightly moist to dry, dense to very dense, fine to coarse sand, fine to coarse gravel to 2" angular to subrounded.		SW	R5	13 32 46	1.9	127.3	16.6	Consolidation
615										
	45	(SW) 45': Gravelly SAND, light olive-gray, slightly moist to dry, very dense, fine to coarse sand, fine to coarse gravel to 2" angular to subrounded.		SW	R6	17 36 47	2.3	115.8	14.5	
610										
	50									

Bulk Sample | Standard Penetration Test | Ring Sample

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LOG OF BORING B6

BG No. 23025

CLIENT ABS Burbank, LLC REPORT DATE 9/5/19 DRILL DATE 3/22/19

PROJECT LOCATION 3000 West Empire Avenue, Burbank, CA LOGGED BY RSB

CONTRACTOR Martini Drilling DRILLING METHOD Hollow-Stem Auger HOLE SIZE 8-inch diameter

DRIVE WEIGHT 140-Pound Automatic Hammer HAMMER DROP 30 Inches ELEV. TOP OF HOLE 658 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 6 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	50	(SW) 50': Gravelly SAND, light olive-gray, slightly moist to dry, very dense, fine to coarse sand, fine to coarse gravel to 2" angular to subrounded.		SW	R7	44 50/5"	1.5	122	10.9	

End at 51 Feet; No Groundwater; Fill to 2.5 Feet.

Bulk Sample | Standard Penetration Test | Ring Sample

APPENDIX II

Laboratory Testing and Log of Boring, Report dated February 17, 2022

LABORATORY TESTING

Undisturbed and bulk samples of the existing fill and alluvium were obtained from Boring 7 and transported to the laboratory for testing and analysis. The samples were obtained by driving a ring-lined, barrel sampler conforming to ASTM D 3550-01 with successive drops of the sampler. Experience has shown that sampling causes some disturbance of the sample. However, the test results remain within a reasonable range. The samples were retained in brass rings of 2.50 inches outside diameter and 1.00 inch in height. The samples were stored in close fitting, waterproof containers for transportation to the laboratory.

Moisture-Density

The dry density of the samples was determined using the procedures outlined in ASTM D 2937-10. The moisture content of the samples was determined using the procedures outlined in ASTM D 2216-10. The results are shown on the enclosed Log of Boring 7.

Shear Tests

Shear tests were performed on samples of future compacted fill using the procedures outlined in ASTM D 3080-11 and a strain controlled, direct-shear machine manufactured by Soil Test, Inc. The rate of deformation was 0.025 inch per minute. The samples were tested in an artificially saturated condition. Following the shear test, the moisture content of the samples was determined to verify saturation. The results are plotted on the enclosed Shear Test Diagram.

Consolidation

Consolidation tests were performed on *in situ* samples of the alluvium and future compacted fill using the procedures outlined in ASTM D 2435-11. Results are graphed on the enclosed Consolidation Curves.

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SHEAR TEST DIAGRAM #2

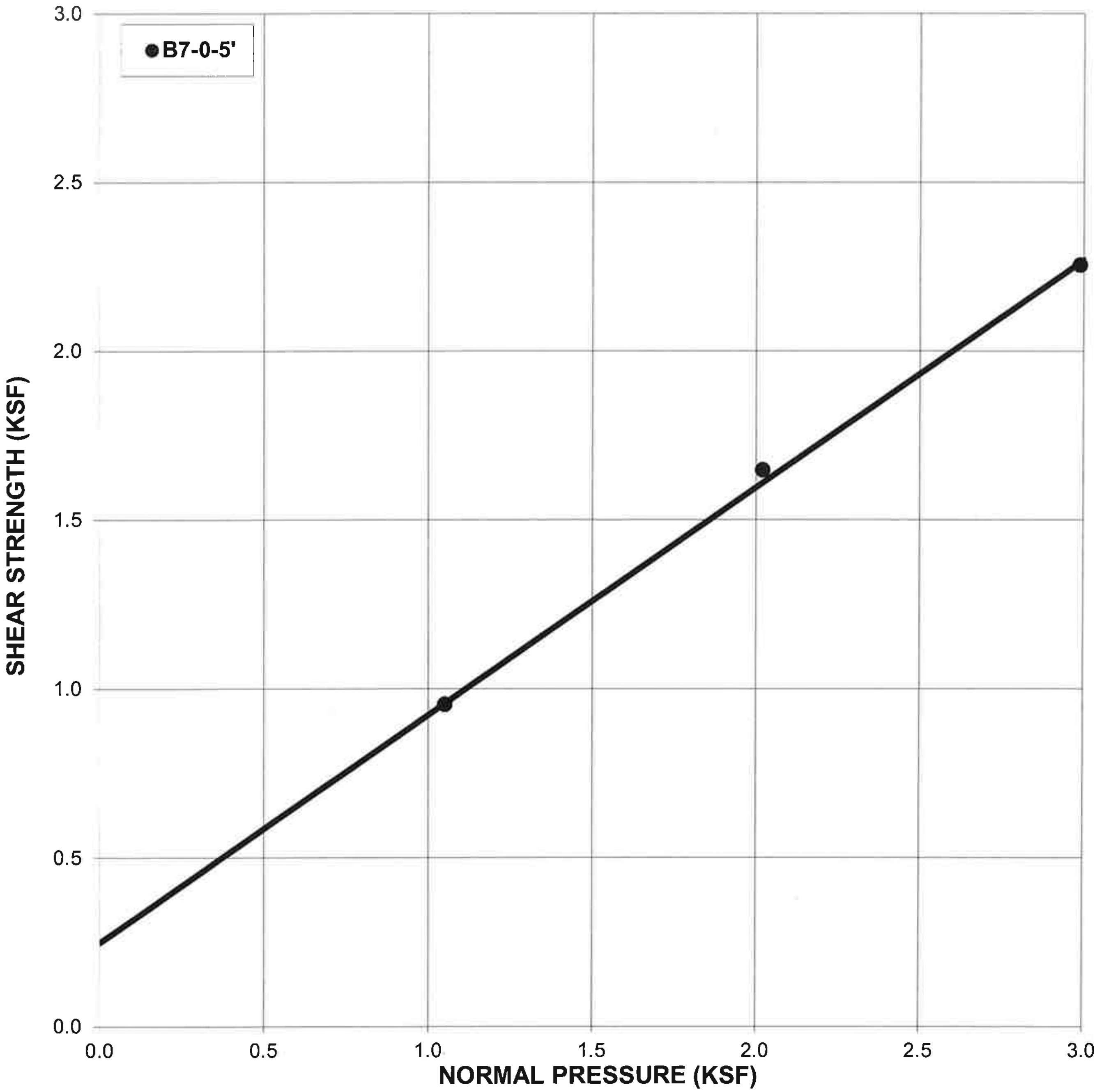
BG: 23025 ENGINEER: JHP
CLIENT: ABS Properties, Inc.

EARTH MATERIAL: **Future Compacted Fill (Remolded to 90% Relative Compaction)**

Phi Angle = 34.0 degrees
Cohesion = 250 psf

Moisture Content 19.0%
Dry Density (pcf) 108.9
Saturation 97%

DIRECT SHEAR TEST - ASTM D-3080 (ULTIMATE VALUES)



BYER GEOTECHNICAL INC.

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CONSOLIDATION CURVE #8

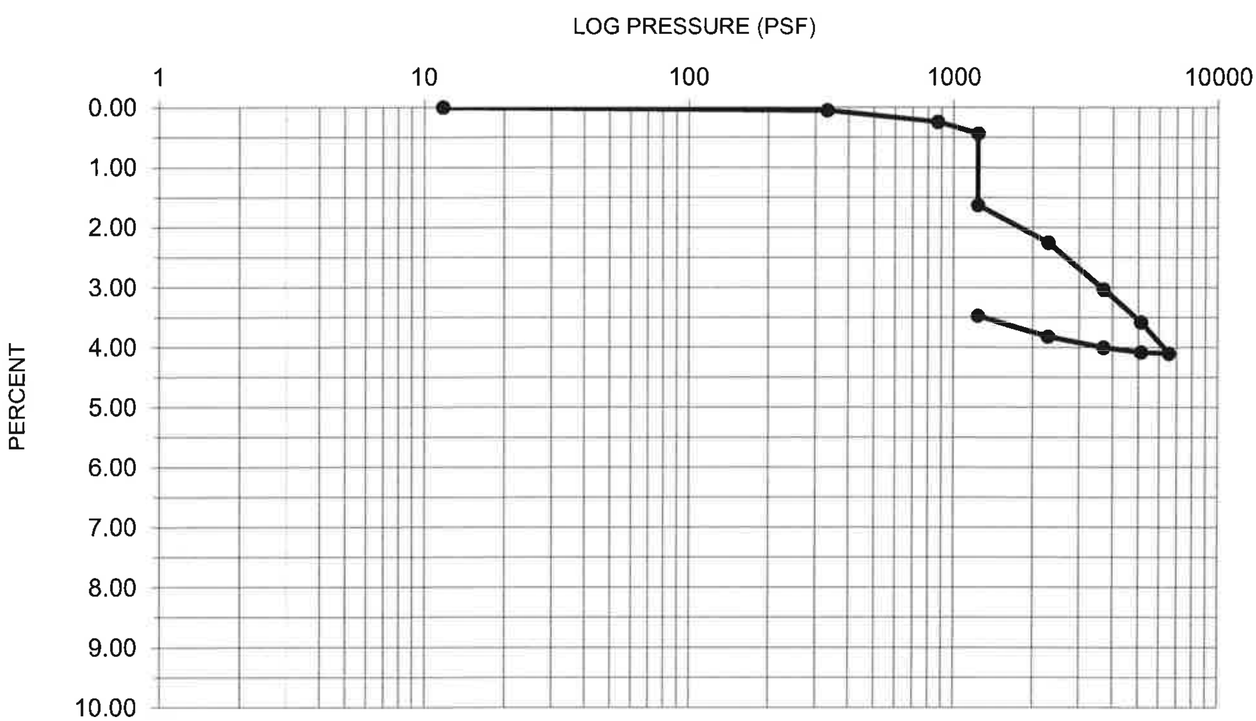
BG: **23025** ENGINEER: **JHP**

CLIENT: **ABS Properties, Inc.**

Earth Material:	Alluvium
Sample Location:	B7-5'
Dry Weight (pcf):	107.8
Initial Moisture:	7.6%
Initial Saturation:	37.7%
Water Added at (psf)	1237

Specific Gravity:	2.65
Initial Void Ratio:	0.53
Compression Index (Cc):	0.075
Recompression Index (Cr):	0.020

CONSOLIDATION DIAGRAM (ASTM D 2435-11)



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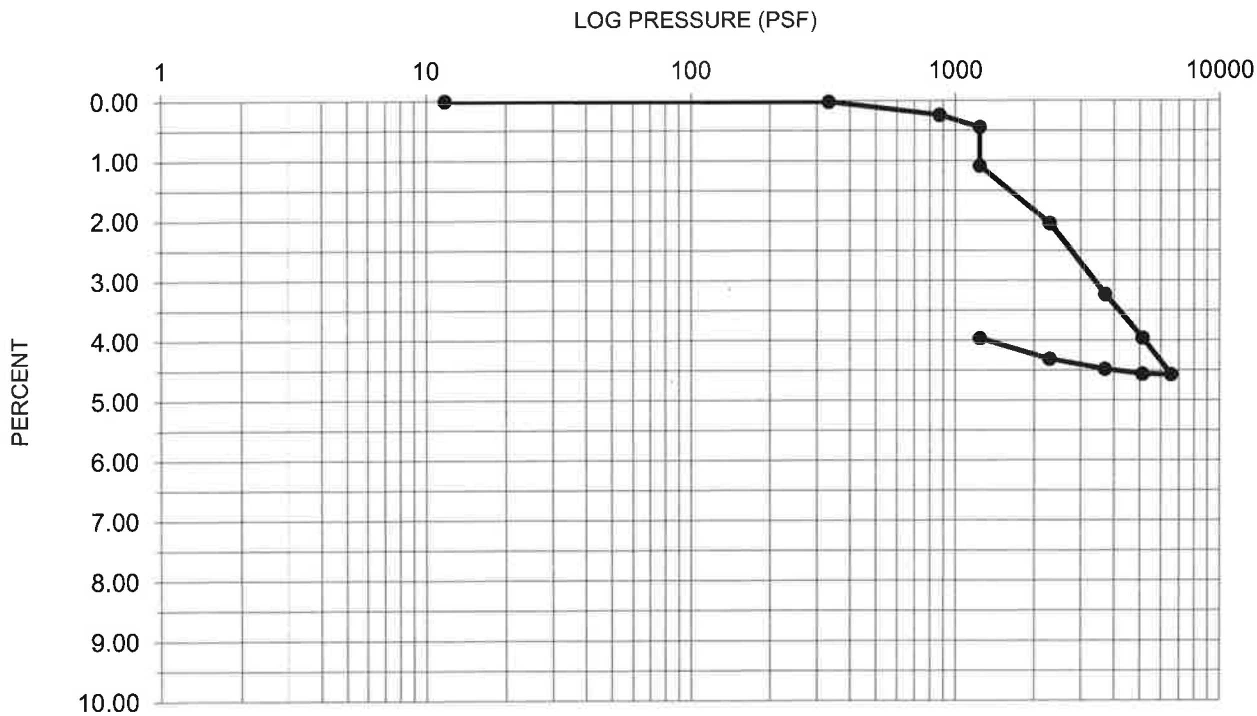
CONSOLIDATION CURVE #9

BG: **23025** ENGINEER: **JHP**

CLIENT: **ABS Properties, Inc.**

Earth Material:	Future Compacted Fill		
Sample Location:	B7 0-5'	Specific Gravity:	2.65
Dry Weight (pcf):	108.9	Initial Void Ratio:	0.52
Initial Moisture:	14.0%	Compression Index (Cc):	0.087
Initial Saturation:	71.6%	Recompression Index (Cr):	0.020
Water Added at (psf)	1237		

CONSOLIDATION DIAGRAM (ASTM D 2435-11)



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LOG OF BORING B7

BG No. 23025

CLIENT ABS Properties, Inc. REPORT DATE 2/17/22 DRILL DATE 10/12/21

PROJECT LOCATION 3000 West Empire Avenue, Burbank, CA LOGGED BY RSB

CONTRACTOR Whitcomb Drilling DRILLING METHOD Hollow-Stem Auger HOLE SIZE 8-inch diameter

DRIVE WEIGHT 140-Pound Automatic Hammer HAMMER DROP 30 Inches ELEV. TOP OF HOLE 353 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 12 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	0	Surface: 3" asphalt over 4" base (driveway).							
		(SM) **FILL (Afu):** 0.5' - 2.5': Silty SAND, brown, dry to slightly moist, fine to medium sand, some fine gravel.	SM						
350		(SM) **4': ALLUVIUM (Qa):** 2.5': SAND, olive- and grayish-brown, dry to slightly moist, loose, fine to medium sand, trace fine gravel.	SM	R1	7 9 9	7.6	107.8	38	Remolded Shear, Remolded Consolidation
	5	(SM) 5': SAND, olive-brown, dry to slightly moist, loose, fine to medium sand, trace fine gravel.	SM	R2	3 5 5	6.4	105	29	Consolidation
345		(ML) 7.5': Sandy SILT, olive-brown, slightly moist to moist, medium stiff, fine to medium sand.	ML	R3	3 5 7	20.5	102.8	89	
	10	(ML) 10': Sandy SILT, olive-brown, slightly moist to moist, medium stiff, fine to medium sand.	ML	R4	3 3 3	17.1	110.3	91	
340		(SP) 12.5': SAND, tan, dry, medium dense, fine to medium sand, some coarse sand.	SP	R5	10 17 28	2.2	114.6	13	
	15	(SW) 15': SAND, light yellowish-brown, dry, medium dense, fine to coarse sand, trace fine gravel.	SW	R6	6 15 16	2.6	114.5	16	
335									
	20	(SW) 20': SAND, light yellowish-brown, dry, medium dense, fine to coarse sand, trace fine gravel.	SW	R7	8 14 19	4.2	106.4	20	
330									
	25								

■ Ring Sample

BYER GEOTECHNICAL, INC.

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LOG OF BORING B7

BG No. 23025

CLIENT ABS Properties, Inc. REPORT DATE 2/17/22 DRILL DATE 10/12/21

PROJECT LOCATION 3000 West Empire Avenue, Burbank, CA LOGGED BY RSB

CONTRACTOR Whitcomb Drilling DRILLING METHOD Hollow-Stem Auger HOLE SIZE 8-inch diameter

DRIVE WEIGHT 140-Pound Automatic Hammer HAMMER DROP 30 Inches ELEV. TOP OF HOLE 353 ft

ELEVATION (ft)	DEPTH (ft)	EARTH MATERIAL DESCRIPTION	GRAPHIC SYMBOL	USCS UNIT	SAMPLE TYPE & NUMBER	BLOW COUNT (Per 12 Inches)	MOISTURE CONTENT (%)	DRY UNIT WT. (pcf)	SATURATION (%)	TYPE OF TEST
	25	(SW) 25': SAND, light yellowish-brown, dry, medium dense, fine to coarse sand, trace fine gravel.		SW	R8	16 19 27	4.1	113.6	24	
325										
	30	(SW) 30': No recovery		SW	R9	50/5"				
320										
	35	(SW) 35': SAND, yellowish-brown, dry, very dense, fine to coarse sand, trace fine gravel.		SW	R10	19 39 50/3"	2.2	123.5	17	
315										
	40	(SW) 40': SAND, yellowish-brown, dry, very dense, fine to coarse sand, trace fine gravel.		SW	R11	19 21 27	2.4	127.1	22	

End at 41.5 Feet; No Groundwater; Fill to 2.5 Feet.

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■ Ring Sample

APPENDIX III

Calculations and Figures

SEISMIC SOURCES
EZ-FRISK V8.07

DETERMINISTIC CALCULATION
OF PEAK GROUND ACCELERATION BASED ON DIGITIZED FAULT DATA

BG: 23025
CLIENT: ABS Properties, Inc.
ANALYSIS DATE: 2/14/2022
ENGINEER: RSB
PROJECT DESCRIPTION: Proposed 7-Story Building over One Subterranean Parkinng Level

SITE COORDINATES: LATITUDE: 34.1915
LONGITUDE: -118.3434

SEARCH RADIUS: 100 km

ATTENUATION RELATIONS:
Abrahamson-et al (2014) NGA West 2 USGS 2014
Boore-et al (2014) NGA West 2 USGS 2014
Campbell-Bozorgnia (2014) NGA West 2 USGS 2014
Chiou-Youngs (2014) NGA West 2 USGS 2014

SEISMIC SOURCE SUMMARY
DETERMINISTIC SITE PARAMETERS

FAULT NAME	APPROXIMATE DISTANCE		MAXIMUM EATHQUAKE MAGNITUDE	PEAK GROUND ACCELERATION
	(km)	(mi)	(Mw)	(g)
Verdugo	2.4	1.5	6.9	0.769
Santa Monica	7.9	4.9	7.4	0.956
Hollywood	8.8	5.5	6.7	0.624
Sierra Madre (San Fernando)	9.5	5.9	6.7	0.492
Sierra Madre Connected	9.5	5.9	7.3	0.567
Sierra Madre	9.5	5.9	7.2	0.555
Elysian Park (Upper)	10.2	6.4	6.7	0.543
Puente Hills (LA)	13.4	8.3	7.0	0.557
Raymond	13.5	8.4	6.8	0.430
Northridge	14.8	9.2	6.9	0.570
Puente Hills	15.1	9.4	7.1	0.531
San Gabriel	15.2	9.5	7.3	0.441
Newport-Inglewood	17.0	10.6	7.5	0.438
Santa Susana, alt 1	20.3	12.6	6.9	0.329
Puente Hills (Santa Fe Springs)	23.5	14.6	6.7	0.344
Malibu Coast	24.0	14.9	7.0	0.310
Anacapa-Dume	25.9	16.1	7.2	0.336

FAULT NAME	APPROXIMATE DISTANCE		MAXIMUM EATHQUAKE MAGNITUDE	PEAK GROUND ACCELERATION
	(km)	(mi)	(Mw)	(g)
Clamshell-Sawpit	29.2	18.2	6.7	0.238
Holser, alt 1	30.2	18.8	6.8	0.245
Palos Verdes	31.5	19.6	7.3	0.275
Palos Verdes Connected	31.5	19.6	7.7	0.326
Simi-Santa Rosa	34.8	21.6	6.9	0.216
Elsinore	34.8	21.7	7.9	0.328
Puente Hills (Coyote Hills)	38.1	23.7	6.9	0.220
Oak Ridge Connected	40.1	24.9	7.4	0.258
Oak Ridge (Onshore)	41.1	25.5	7.2	0.233
San Jose	44.9	27.9	6.7	0.154
Southern San Andreas	45.2	28.1	8.2	0.326
San Cayetano	47.1	29.3	7.2	0.196
Chino	53.3	33.1	6.8	0.133
Cucamonga	54.1	33.6	6.7	0.127
Santa Ynez (East)	64.7	40.2	7.2	0.144
Santa Ynez Connected	65.0	40.4	7.4	0.162
San Joaquin Hills	67.0	41.6	7.1	0.138
Imp Extensional Gridded, Char, Normal	50.6	31.5	7.0	0.149
Imp Extensional Gridded, Char, Strike Slip	50.6	31.5	7.0	0.177
Imp Extensional Gridded, GR, Normal	50.6	31.5	7.0	0.149
Imp Extensional Gridded, GR, Strike Slip	50.6	31.5	7.0	0.177
San Jacinto	72.5	45.0	7.9	0.197
Ventura-Pitas Point	75.2	46.8	7.0	0.113
Pitas Point Connected	75.2	46.8	7.3	0.138
Mission Ridge-Arroyo Parida-Santa Ana	79.7	49.6	6.9	0.096
Cleghorn	81.9	50.9	6.8	0.085
Oak Ridge (Offshore)	82.3	51.2	7.0	0.099
Garlock	85.3	53.0	7.7	0.155
Channel Islands Thrust	86.8	53.9	7.3	0.130
Pleito	87.5	54.4	7.1	0.100
Santa Cruz Island	87.5	54.4	7.2	0.104
Red Mountain	89.8	55.8	7.4	0.120
North Frontal (West)	99.7	62.0	7.2	0.091

50 Faults found within a 100 km Search Radius.

Closest Fault to the Site: Verdugo Distance = 2.43 km (1.51mi)

Largest Peak Ground Acceleration: 0.956 g

The San Andreas Fault is Located Aproximately 45.2 km (28.1 mi) from the Site.

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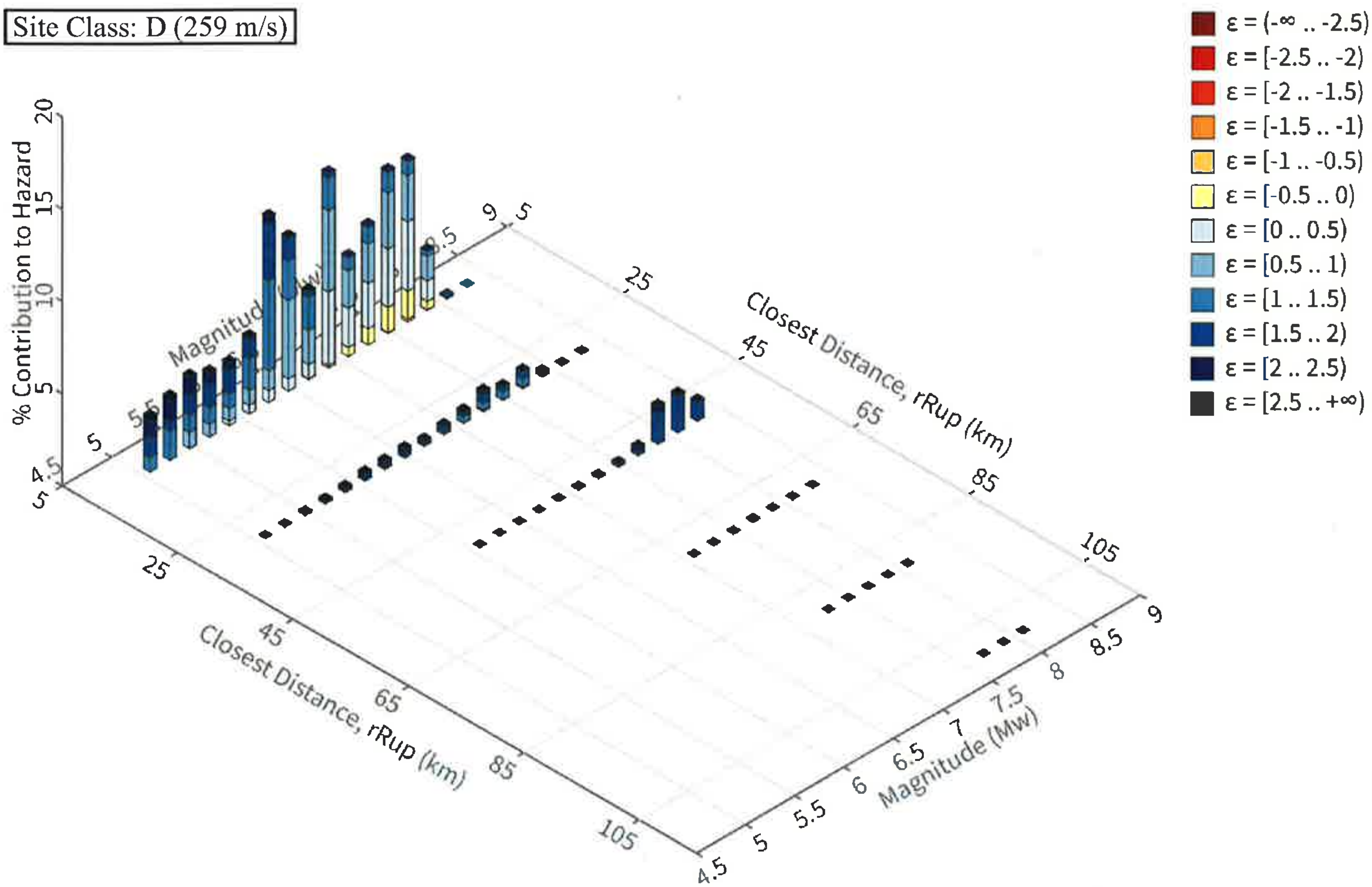
SEISMIC HAZARD DEAGGREGATION CHART
(Probability of Exceedance: 10% in 50 years)

BG: 23025 CLIENT: ABS PROPERTIES, INC.

ENGINEER: RSB

REFERENCE: USGS, 2022, Earthquake Hazards Program - Unified Hazard Tool, Seismic Hazard Deaggregation, Conterminous U.S. 2014 (update) (v4.2.0) Edition, https://earthquake.usgs.gov/hazards/interactive/.

Site Class: D (259 m/s)



Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 475 yrs
Exceedance rate: 0.0021052632 yr^{-1}
PGA ground motion: 0.52398835 g

Recovered targets

Return period: 507.52457 yrs
Exceedance rate: 0.0019703479 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.14 %

Mode (largest m-r bin)

m: 6.9
r: 10.75 km
ε₀: 0.66 σ
Contribution: 10.54 %

Mode (largest m-r-ε₀ bin)

m: 6.32
r: 12.57 km
ε₀: 1.3 σ
Contribution: 4.88 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

SEISMIC HAZARD DEAGGREGATION CHART
(Probability of Exceedance: 10% in 50 years)

BG: 23025

Deaggregation Contributors

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
UC33brAvg_FM32	System							37.86
Hollywood [1]		8.78	6.98	0.34	118.322°W	34.115°N	166.86	6.49
Santa Susana East (connector) [1]		12.83	6.58	1.24	118.419°W	34.292°N	328.07	3.29
Santa Monica alt 2 [0]		8.10	7.37	0.04	118.298°W	34.114°N	154.11	2.77
Santa Susana alt 2 [0]		14.47	6.96	1.28	118.345°W	34.321°N	359.41	2.74
San Andreas (Mojave S) [5]		45.16	8.04	1.81	118.138°W	34.561°N	24.58	2.62
Sierra Madre (San Fernando) [0]		10.62	7.62	0.62	118.334°W	34.286°N	4.77	2.55
Verdugo [2]		3.73	7.49	0.04	118.327°W	34.219°N	25.67	2.06
Puente Hills (LA) [1]		11.52	7.09	0.47	118.325°W	34.054°N	173.83	1.56
Mission Hills 2011 [0]		11.29	7.03	0.83	118.419°W	34.270°N	321.46	1.41
Compton [4]		17.48	7.55	0.51	118.608°W	34.022°N	232.33	1.22
Northridge [4]		14.63	7.18	0.78	118.383°W	34.298°N	342.88	1.16
Elysian Park (Upper) [2]		9.93	6.76	0.72	118.294°W	34.121°N	149.71	1.12
UC33brAvg_FM31	System							34.07
Hollywood [1]		8.78	7.20	0.26	118.322°W	34.115°N	166.86	5.33
Elysian Park (Upper) [2]		9.93	6.68	0.73	118.294°W	34.121°N	149.71	3.41
Santa Susana East (connector) [1]		12.83	6.87	1.06	118.419°W	34.292°N	328.07	2.98
Sierra Madre (San Fernando) [0]		10.62	7.58	0.63	118.334°W	34.286°N	4.77	2.69
San Andreas (Mojave S) [5]		45.16	8.04	1.81	118.138°W	34.561°N	24.58	2.62
Verdugo [2]		3.73	7.51	0.02	118.327°W	34.219°N	25.67	2.37
Mission Hills 2011 [0]		11.29	6.52	1.24	118.419°W	34.270°N	321.46	2.08
Northridge [4]		14.63	7.19	0.71	118.383°W	34.298°N	342.88	1.60
Compton [4]		17.48	7.39	0.58	118.608°W	34.022°N	232.33	1.51
Newport-Inglewood alt 1 [8]		17.04	6.75	1.59	118.389°W	34.044°N	194.37	1.04
UC33brAvg_FM32 (opt)	Grid							14.09
PointSourceFinite: -118.343, 34.241		7.34	5.69	1.09	118.343°W	34.241°N	0.00	1.56
PointSourceFinite: -118.343, 34.241		7.34	5.69	1.09	118.343°W	34.241°N	0.00	1.56
PointSourceFinite: -118.343, 34.232		6.81	5.63	1.03	118.343°W	34.232°N	0.00	1.10
PointSourceFinite: -118.343, 34.232		6.81	5.63	1.03	118.343°W	34.232°N	0.00	1.10
UC33brAvg_FM31 (opt)	Grid							13.98
PointSourceFinite: -118.343, 34.241		7.34	5.69	1.09	118.343°W	34.241°N	0.00	1.59
PointSourceFinite: -118.343, 34.241		7.34	5.69	1.09	118.343°W	34.241°N	0.00	1.59
PointSourceFinite: -118.343, 34.232		6.81	5.63	1.03	118.343°W	34.232°N	0.00	1.08
PointSourceFinite: -118.343, 34.232		6.81	5.63	1.03	118.343°W	34.232°N	0.00	1.08

In-Situ Percolation Test Results - Boring Test Procedure

Calculation Sheet #: 1

BG No.: 23025
Client: ABS Properties, Inc.
Project Name: Proposed Seven-Story, At-Grade Mixed-Use Building

Date Excavated: 10/12/2021
Date Tested: 10/12/2021
Tested by: JHP

Input Data:

Boring No.	Date of Presoak	Time of Presoak	Top of Perforation Depth (ft)	Perc Hole Depth (ft)	Approx. Hole Diam. (in)	Pipe ID (in)
B7*	10/12/21	10:02 AM	10	40	9	2

Soil Distribution

0 - 7.5 ft: Silty SAND (SM)
7.5 - 10 ft: Sandy SILT (ML)
10 - 40 ft: Sand (SP/SW)

Falling Head Percolation Test Data and Results:

Test Number	Initial Time of Reading	Final Time of Reading	Elapsed Time (min.)	Initial Water Depth d_1, (ft)	Surface Area (sq-ft)	Final Water Depth (ft)	Water Level Drop Δd, (ft)	Initial Vol. of Water (cu-ft)	Final Vol. of Water (cu-ft)	Vol. of Water Discharge (cu-ft)	Rate of Discharge (Gal/hr)	Infiltration Rate (in./hr.)
1	12:23:00	12:33:00	10	30.0	71.1	9.0	21.0	13.3	4.0	9.3	416.4	9.39
2	12:36:00	12:46:00	10	30.0	71.1	21.5	8.5	13.3	9.5	3.8	168.6	3.80
3	12:49:00	12:59:00	10	30.0	71.1	21.0	9.0	13.3	9.3	4.0	178.5	4.02
4	13:05:00	13:15:00	10	30.0	71.1	17.7	12.3	13.3	7.8	5.4	243.9	5.50
5	13:20:00	13:30:00	10	30.0	71.1	23.1	6.9	13.3	10.2	3.0	136.8	3.09
6	13:35:00	13:45:00	10	30.0	71.1	24.2	5.8	13.3	10.7	2.6	115.0	2.59
7	13:48:00	13:58:00	10	30.0	71.1	24.2	5.8	13.3	10.7	2.6	115.0	2.59
8	14:00:00	14:10:00	10	30.0	71.1	24.3	5.7	13.3	10.7	2.5	113.0	2.55
											Reduction Factor (Administrative Manual) =	**3**
											Calculated Infiltration Rate (in/hr) =	**0.85**

*** See Site Plan for boring location.**

Reference: County of Los Angeles, 2021, Administrative Manual, Guidelines for Geotechnical Investigation and Reporting, Low Impact Development Stormwater Infiltration, Department of Public Works, GS200.1, dated June 30, 2021.

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RETAINING WALL CALCULATION

BG **23025** CLIENT: **ABS Properties, Inc.**
CONSULTANT: **RSB**
SHEET: **#2a**
Cantilevered Retaining Wall

CALCULATE THE DESIGN PRESSURE FOR PROPOSED CANTILEVERED RETAINING WALL. USE THE GENERAL TRIAL WEDGE METHOD*. APPLY THE SAFETY FACTOR TO THE COHESION AND PHI ANGLE. THE RETAINED HEIGHT, BACKSLOPE GEOMETRY, AND SURCHARGE CONDITIONS, ARE LISTED BELOW. ASSUME THE BACKFILL IS SATURATED WITH NO EXCESS HYDROSTATIC PRESSURE.

* FIND THE WEDGE, CHARACTERIZED BY A SINGLE STRAIGHT SLIP PLANE AND A VERTICAL TENSION CRACK, THAT MAXIMIZES THE UNBALANCED PRESSURE. MAKE NO ASSUMPTION ABOUT TENSION CRACK DEPTH. ALLOW ANY BACKSLOPE GEOMETRY AND SURCHARGE CONDITION. VARY X- AND Y-COORDINATES OF BOTTOM OF TENSION CRACK. USE PRIMARY GRID AND SECONDARY SEARCH WINDOW TO FOCUS SEARCH. USE METHODOLOGY DESCRIBED IN NAVFAC DESIGN MANUAL 7.02, 1986, PP. 59-70, AND US ARMY TECHNICAL REPORT ITL-92-11 (1992), P. 79 AND APPENDIX A.

CALCULATION INPUT

Earth Material	Alluvium
Shear Diagram	#1
Cohesion, Coh	100.0 psf
Phi Angle, φ	32.0 degrees
Density, γ	125.0 pcf
Anisotropic Strength Function	NO
Restraining Device	RETAINING WALL
Type	CANTILEVERED
Retained Height, H	10 feet
Wall Friction Angle, δ	0 degrees
External Surcharge	NO
General Backslope Condition*	level
Loading	STATIC
Calculation Safety Factor, FS	1.5

* Critical wedge 'sees' only portion of regional backslope

CALCULATION OUTPUT

Trial Wedges Analyzed, Initial Search Grid	963 trials
Trial Wedges Analyzed, Secondary Search Window	441 trials
Critical Failure Angle, α	56.3 degrees
Area of Critical Wedge	32.5 square feet
Length of Critical Failure Plane, L	10.1 feet
Depth of Critical Tension Crack	1.6 feet
Horizontal Upslope Distance to Critical Tension Crack	5.6 feet
Effective Backslope on Critical Wedge, β_{eff}	0.0 degrees
Factored Phi Angle on Slip Plane, φ'	22.6 degrees
Factored Cohesion on Critical Slip Plane, C'	66.7 psf
Weight of Critical Wedge, W	4,060 pounds
External Surcharge on Critical Wedge, V	0 pounds
Static Gravitational Driving Force, W'	4,060 pounds
Mobilized Cohesive Force, C'L	673 pounds
Mobilized Frictional Force, R	4,207 pounds
Calculated Unbalanced Force, P	1,960 pounds
Calculated Horizontal Unbalanced Force, P_h	1,960 pounds
Calculated Equivalent Fluid Pressure	39.2 pcf

RECOMMENDED DESIGN PARAMETERS

Design Equivalent Fluid Pressure, EFP	44.0 pcf
Design Horizontal Force	2,200 pounds

BACKSLOPE GEOMETRY AND SURCHARGE CONDITIONS*

(dist , elev)	(X , Y)	H (ft)	β (deg)	surcharge
(0,0)	(0,0)	10		
(0,10)	(0,10)			
(1,10)	(1,10)			
(2,10)	(2,10)			
(18,10)	(18,10)			
(20,10)	(20,10)			
(25,10)	(25,10)			

* X is the upslope distance from the wall; Y is the vertical distance above the base of the wall; H is wall height; β is backslope. H, β, and surcharge apply to section between two coordinates. Only first 20 coordinates are shown.

CONCLUSIONS

THE CALCULATION INDICATES THAT THE PROPOSED CANTILEVERED RETAINING WALL, WITH A RETAINED HEIGHT OF UP TO 10 FEET, MAY BE DESIGNED FOR AN EQUIVALENT FLUID PRESSURE (EFP) OF 44 POUNDS PER CUBIC FOOT.

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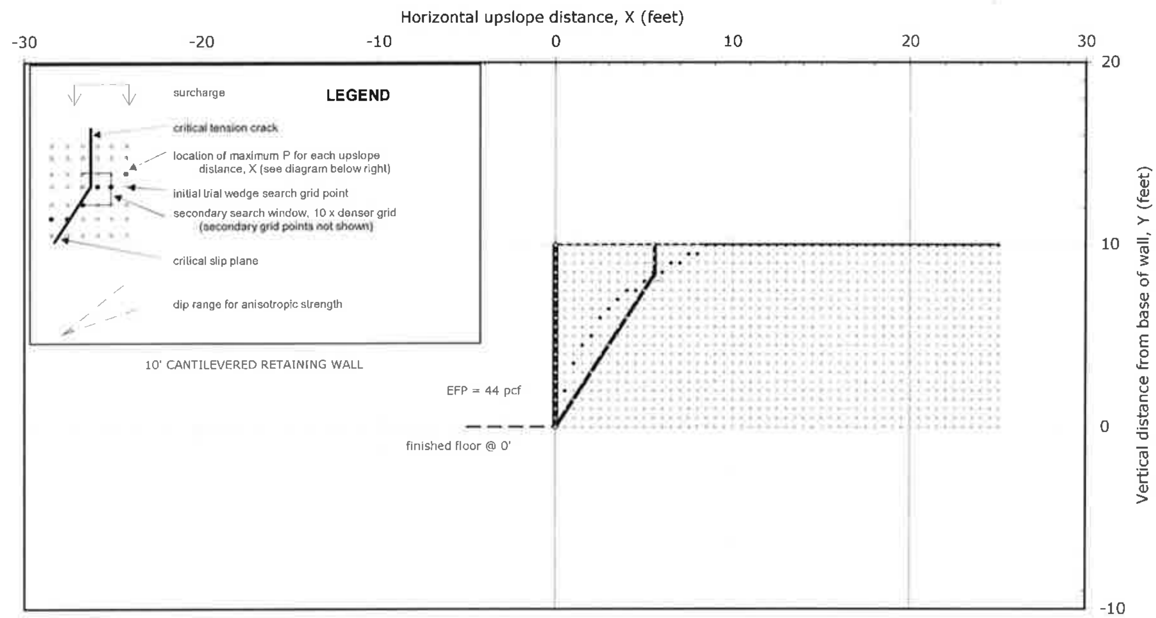
RETAINING WALL CALCULATION

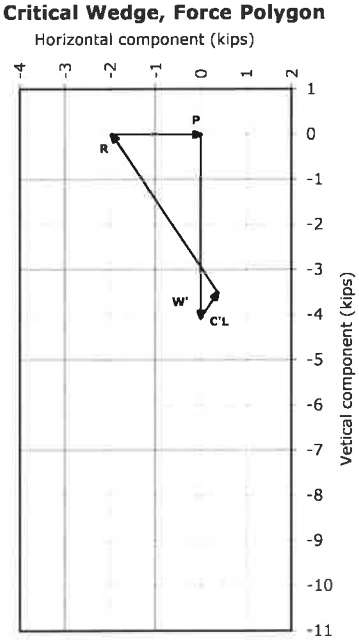
BG: **23025** CLIENT: **ABS Properties, Inc.**
CONSULTANT: **RSB**
SHEET: **#2b**
Cantilevered Retaining Wall

Cross Section and Critical Active Wedge



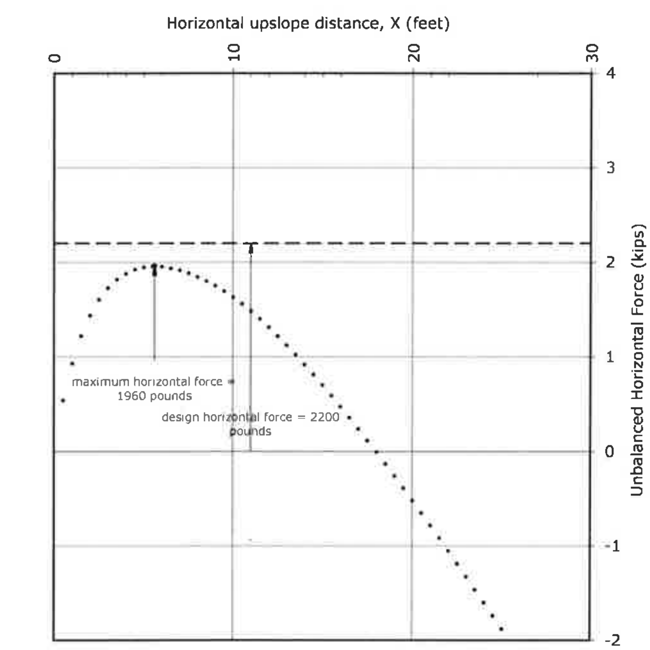
The cross section shows the surface geometry; surcharges; the range of dip for any defined anisotropic strength function; the critical trial wedge; the initial search grid; and the secondary search window. Each grid point defines the upslope coordinate of the slip plane and bottom coordinate of tension crack for a trial wedge. For each for upslope distance, X, the grid point for which the horizontal unbalanced pressure, Ph, is maximum is shown in black. The critical wedge has the maximum horizontal unbalanced pressure of all trial wedges.

Critical Wedge, Force Polygon



The polygon shows the static (gravitational) driving force, W'; the mobilized cohesive force, C'L; the mobilized frictional force, R; and the unbalanced pressure, P, for the critical wedge.

Trial Wedge, Unbalanced Horizontal Force, Ph (kips)



The maximum calculated horizontal unbalanced pressure, Ph, is plotted for each upslope distance, X. The location of the maximum Ph for each X is indicated in the cross section, above. All points from initial search grid and maximum from secondary search window are plotted.

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RETAINING WALL CALCULATION

BG **23025** CLIENT: **ABS Properties, Inc.**
CONSULTANT: **RSB**
SHEET: **#2Sa**
Cantilevered Retaining Wall

CALCULATE THE DESIGN PRESSURE FOR PROPOSED CANTILEVERED RETAINING WALL. USE THE GENERAL TRIAL WEDGE METHOD*. APPLY THE SAFETY FACTOR TO THE COHESION AND PHI ANGLE. THE RETAINED HEIGHT, BACKSLOPE GEOMETRY, AND SURCHARGE CONDITIONS, ARE LISTED BELOW. ASSUME THE BACKFILL IS SATURATED WITH NO EXCESS HYDROSTATIC PRESSURE. USE THE PSEUDO-STATIC (MONONOBE-OKABE) METHOD FOR SEISMIC LOADING.

* FIND THE WEDGE, CHARACTERIZED BY A SINGLE STRAIGHT SLIP PLANE AND A VERTICAL TENSION CRACK, THAT MAXIMIZES THE UNBALANCED PRESSURE. MAKE NO ASSUMPTION ABOUT TENSION CRACK DEPTH. ALLOW ANY BACKSLOPE GEOMETRY AND SURCHARGE CONDITION. VARY X- AND Y-COORDINATES OF BOTTOM OF TENSION CRACK. USE PRIMARY GRID AND SECONDARY SEARCH WINDOW TO FOCUS SEARCH. USE METHODOLOGY DESCRIBED IN NAVFAC DESIGN MANUAL 7.02, 1986, PP. 59-70, AND US ARMY TECHNICAL REPORT ITL-92-11 (1992), P. 79 AND APPENDIX A.

CALCULATION INPUT

Earth Material	Alluvium
Shear Diagram	#1
Cohesion, Coh	100.0 psf
Phi Angle, φ	32.0 degrees
Density, γ	125.0 pcf
Anisotropic Strength Function	NO
Restraining Device	RETAINING WALL
Type	CANTILEVERED
Retained Height, H	10 feet
Wall Friction Angle, δ	0 degrees
External Surcharge	NO
General Backslope Condition*	level
Loading	SEISMIC
PGA_M	0.90 g

Pseudostatic Coefficients:

horizontal , K_h***	0.30 g
vertical, K_v****	0.00 g
Calculation Safety Factor, FS	1

* Critical wedge 'sees' only portion of regional backslope

*** Calculated using methodology of Abrahamson and Silva (1986)

**** Kv > 0 indicates downward acceleration and upward inertial force

CALCULATION OUTPUT

Trial Wedges Analyzed, Initial Search Grid	963 trials
Trial Wedges Analyzed, Secondary Search Window	441 trials
Critical Failure Angle, α	53.1 degrees
Area of Critical Wedge	36.0 square feet
Length of Critical Failure Plane, L	10.0 feet
Depth of Critical Tension Crack	2.0 feet
Horizontal Upslope Distance to Critical Tension Crack	6.0 feet
Effective Backslope on Critical Wedge, β_{eff}	0.0 degrees
Factored Phi Angle on Slip Plane, φ'	32.0 degrees
Factored Cohesion on Critical Slip Plane, C'	100.0 psf
Weight of Critical Wedge, W	4,500 pounds
External Surcharge on Critical Wedge, V	0 pounds
Pseudo-Static (Gravitational + Dynamic) Driving Force, Wd	4,699 pounds
Mobilized Cohesive Force, C'L	1,000 pounds
Mobilized Frictional Force, R	3,967 pounds
Calculated Unbalanced Force, P	2,183 pounds
Calculated Horizontal Unbalanced Force, P_h	2,183 pounds

RECOMMENDED DESIGN PARAMETERS

Calculated Pseudo-Static Horizontal Force	2,183 pounds
Recommended Static Horizontal Force from sheet 2a	2,200 pounds

BACKSLOPE GEOMETRY AND SURCHARGE CONDITIONS*

(dist , elev)	(X , Y)	H (ft)	β (deg)	surcharge
(0,0)	(0,0)	10		
(0,10)	(0,10)			
(1,10)	(1,10)			
(2,10)	(2,10)			
(18,10)	(18,10)			
(20,10)	(20,10)			
(25,10)	(25,10)			

* X is the upslope distance from the wall; Y is the vertical distance above the base of the wall; H is wall height; β is backslope. H, β, and surcharge apply to section between two coordinates. Only first 20 coordinates are shown.

CONCLUSIONS

THE CALCULATED STATIC FORCE EXCEEDS THE CALCULATED PSEUDO-STATIC FORCE. THEREFORE, THE RECOMMENDED DESIGN PARAMETERS ON SHEET 2A ARE SUFFICIENT.

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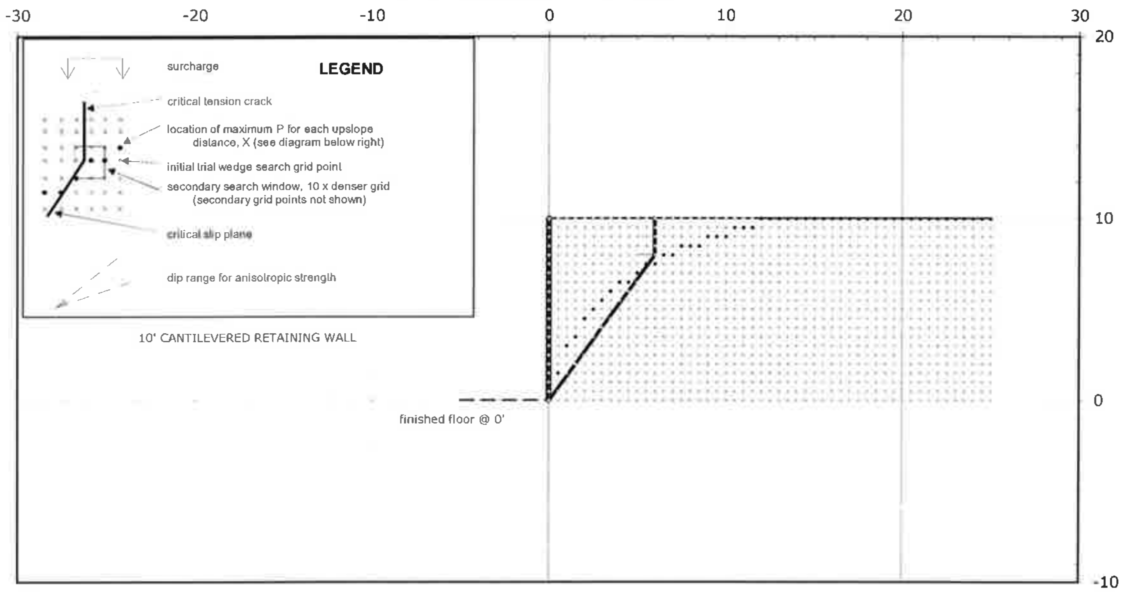
RETAINING WALL CALCULATION

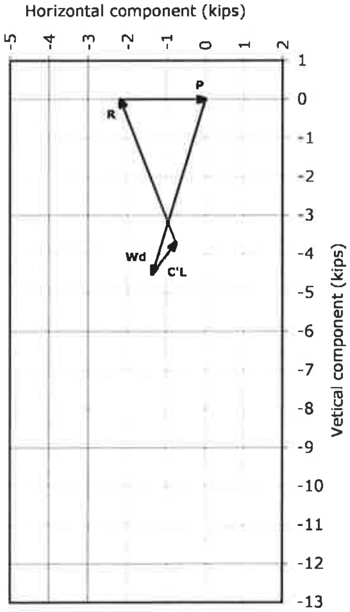
BG: **23025** CLIENT: **ABS Properties, Inc.**
CONSULTANT: **RSB**
SHEET: **#2Sb**
Cantilevered Retaining Wall

Cross Section and Critical Active Wedge



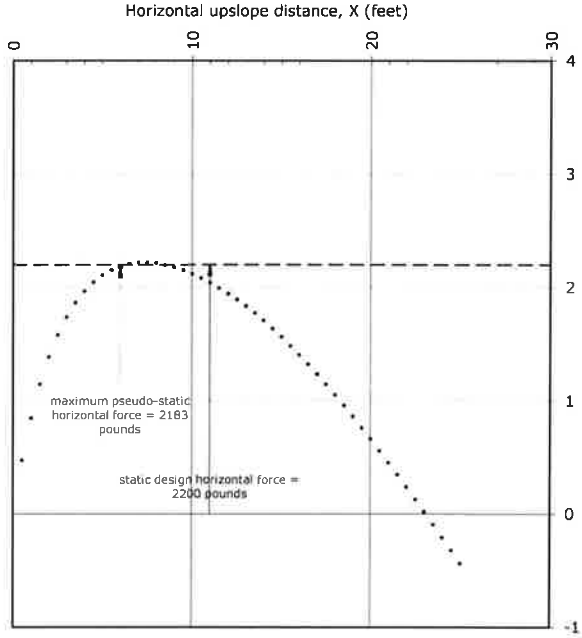
The cross section shows the surface geometry; surcharges; the range of dip for any defined anisotropic strength function; the critical trial wedge; the initial search grid; and the secondary search window. Each grid point defines the upslope coordinate of the slip plane and bottom coordinate of tension crack for a trial wedge. For each for upslope distance, X, the grid point for which the horizontal unbalanced pressure, Ph, is maximum is shown in black. The critical wedge has the maximum horizontal unbalanced pressure of all trial wedges.

Critical Wedge, Force Polygon



The polygon shows the pseudo-static (gravitational and dynamic) driving force, Wd; the mobilized cohesive force, C'L; the mobilized frictional force, R; and the unbalanced pressure, P, for the critical wedge.

Trial Wedge, Unbalanced Horizontal Force, Ph (kips)



The maximum calculated horizontal unbalanced pressure, Ph, is plotted for each upslope distance, X. The location of the maximum Ph for each X is indicated in the cross section, above. All points from initial search grid and maximum from secondary search window are plotted.

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RETAINING WALL CALCULATION

BG **23025** CLIENT: **ABS Properties, Inc.**
CONSULTANT: **RSB**
SHEET: **#3a**
Restrained Retaining Wall

CALCULATE THE DESIGN PRESSURE FOR PROPOSED RESTRAINED RETAINING WALL. USE THE GENERAL TRIAL WEDGE METHOD*. APPLY THE SAFETY FACTOR TO THE COHESION AND PHI ANGLE. THE RETAINED HEIGHT, BACKSLOPE GEOMETRY, AND SURCHARGE CONDITIONS, ARE LISTED BELOW. ASSUME THE BACKFILL IS SATURATED WITH NO EXCESS HYDROSTATIC PRESSURE.

* FIND THE WEDGE, CHARACTERIZED BY A SINGLE STRAIGHT SLIP PLANE AND A VERTICAL TENSION CRACK, THAT MAXIMIZES THE UNBALANCED PRESSURE. MAKE NO ASSUMPTION ABOUT TENSION CRACK DEPTH. ALLOW ANY BACKSLOPE GEOMETRY AND SURCHARGE CONDITION. VARY X- AND Y-COORDINATES OF BOTTOM OF TENSION CRACK. USE PRIMARY GRID AND SECONDARY SEARCH WINDOW TO FOCUS SEARCH. USE METHODOLOGY DESCRIBED IN NAVFAC DESIGN MANUAL 7.02, 1986, PP. 59-70, AND US ARMY TECHNICAL REPORT ITL-92-11 (1992), P. 79 AND APPENDIX A.

CALCULATION INPUT

Earth Material	Alluvium
Shear Diagram	#1
Cohesion, Coh	100.0 psf
Phi Angle, φ	32.0 degrees
Density, γ	125.0 pcf
Anisotropic Strength Function	NO
Restraining Device	RETAINING WALL
Type	RESTRAINED
Retained Height, H	14 feet
Wall Friction Angle, δ	0 degrees
External Surcharge	NO
General Backslope Condition*	level
Loading	STATIC
Calculation Safety Factor, FS	1.5

* Critical wedge 'sees' only portion of regional backslope

BACKSLOPE GEOMETRY AND SURCHARGE CONDITIONS*

(dist., elev)	(X, Y)	H (ft)	β (deg)	surcharge
(0,0)	(0,0)	14		
(0,14)	(0,14)			
(1,14)	(1,14)			
(2,14)	(2,14)			
(18,14)	(18,14)			
(20,14)	(20,14)			
(25,14)	(25,14)			

* X is the upslope distance from the wall; Y is the vertical distance above the base of the wall; H is wall height; β is backslope. H, β, and surcharge apply to section between two coordinates. Only first 20 coordinates are shown.

CALCULATION OUTPUT

Trial Wedges Analyzed, Initial Search Grid	1371 trials
Trial Wedges Analyzed, Secondary Search Window	441 trials
Critical Failure Angle, α	56.4 degrees
Area of Critical Wedge	64.4 square feet
Length of Critical Failure Plane, L	14.9 feet
Depth of Critical Tension Crack	1.6 feet
Horizontal Upslope Distance to Critical Tension Crack	8.3 feet
Effective Backslope on Critical Wedge, β_{eff}	0.0 degrees
Factored Phi Angle on Slip Plane, φ'	22.6 degrees
Factored Cohesion on Critical Slip Plane, C'	66.7 psf
Weight of Critical Wedge, W	8,044 pounds
External Surcharge on Critical Wedge, V	0 pounds
Static Gravitational Driving Force, W'	8,044 pounds
Mobilized Cohesive Force, C'L	993 pounds
Mobilized Frictional Force, R	8,680 pounds
Calculated Unbalanced Force, P	4,272 pounds
Calculated Horizontal Unbalanced Force, P_h	4,272 pounds
Calculated Trapezoidal Design Pressure *	27.2 H psf
Calculated At-Rest Equivalent Fluid Pressure **	58.8 pcf
Calculated At-Rest Trapezoidal Earth Pressure *	36.7 H psf

RECOMMENDED DESIGN PARAMETERS

Trapezoidal Design Pressure, TDP*	37 H psf
Design Horizontal Force	5,802 pounds

* H is restrained height, see report for diagram of trapezoidal pressure distribution
** at-rest equivalent fluid pressure is calculated as: γ (1- sin(φ))

CONCLUSIONS

THE CALCULATION INDICATES THAT THE PROPOSED RESTRAINED RETAINING WALL, WITH A RETAINED HEIGHT OF UP TO 14 FEET, MAY BE DESIGNED FOR A TRAPEZOIDAL DESIGN PRESSURE (TDP) OF 37 H POUNDS PER SQUARE FOOT, WHERE H IS THE RETAINED HEIGHT. SEE REPORT FOR DIAGRAM OF TRAPEZOIDAL PRESSURE DISTRIBUTION.

THE STATIC DESIGN IS GOVERNED BY THE AT-REST CONDITION.

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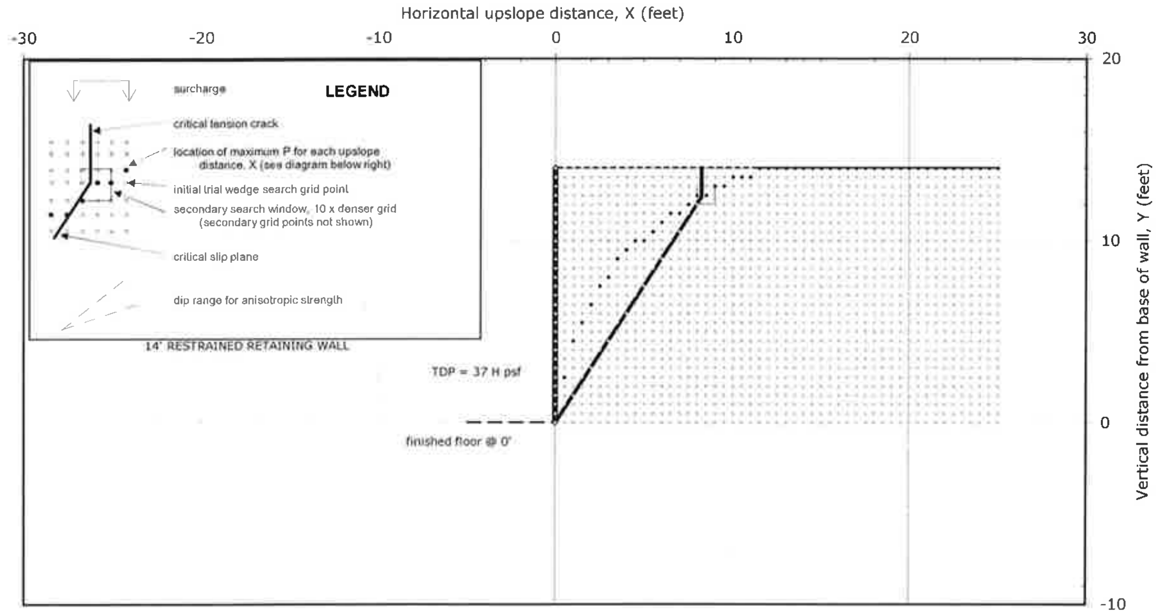
RETAINING WALL CALCULATION

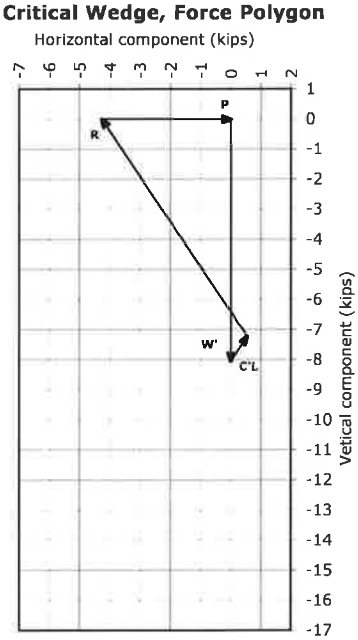
BG: **23025** CLIENT: **ABS Properties, Inc.**
CONSULTANT: **RSB**
SHEET: **#3b**
Restrained Retaining Wall

Cross Section and Critical Active Wedge



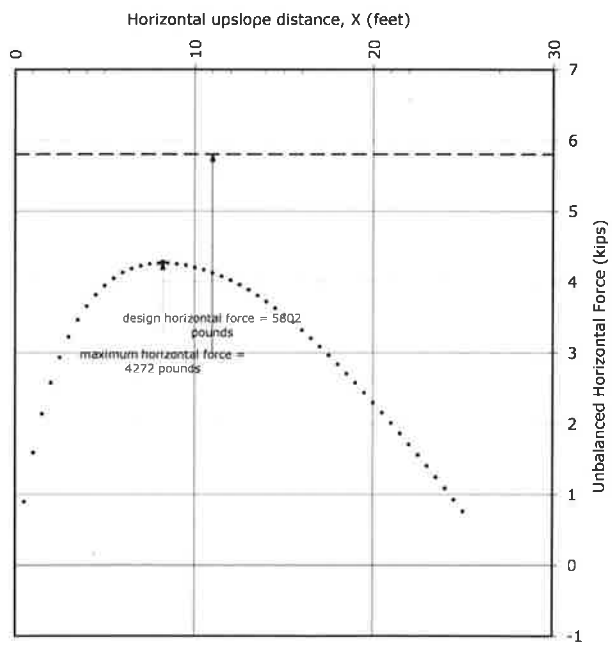
The cross section shows the surface geometry; surcharges; the range of dip for any defined anisotropic strength function; the critical trial wedge; the initial search grid; and the secondary search window. Each grid point defines the upslope coordinate of the slip plane and bottom coordinate of tension crack for a trial wedge. For each for upslope distance, X, the grid point for which the horizontal unbalanced pressure, Ph, is maximum is shown in black. The critical wedge has the maximum horizontal unbalanced pressure of all trial wedges.

Critical Wedge, Force Polygon



The polygon shows the static (gravitational) driving force, W'; the mobilized cohesive force, C'L; the mobilized frictional force, R; and the unbalanced pressure, P, for the critical wedge.

Trial Wedge, Unbalanced Horizontal Force, Ph (kips)



The maximum calculated horizontal unbalanced pressure, Ph, is plotted for each upslope distance, X. The location of the maximum Ph for each X is indicated in the cross section, above. All points from initial search grid and maximum from secondary search window are plotted.

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RETAINING WALL CALCULATION

BG **23025** CLIENT: **ABS Properties, Inc.**
CONSULTANT: **RSB**
SHEET: **#3Sa**
Restrained Retaining Wall

CALCULATE THE DESIGN PRESSURE FOR PROPOSED RESTRAINED RETAINING WALL. USE THE GENERAL TRIAL WEDGE METHOD*. APPLY THE SAFETY FACTOR TO THE COHESION AND PHI ANGLE. THE RETAINED HEIGHT, BACKSLOPE GEOMETRY, AND SURCHARGE CONDITIONS, ARE LISTED BELOW. ASSUME THE BACKFILL IS SATURATED WITH NO EXCESS HYDROSTATIC PRESSURE. USE THE PSEUDO-STATIC (MONONOBE-OKABE) METHOD FOR SEISMIC LOADING.

* FIND THE WEDGE, CHARACTERIZED BY A SINGLE STRAIGHT SLIP PLANE AND A VERTICAL TENSION CRACK, THAT MAXIMIZES THE UNBALANCED PRESSURE. MAKE NO ASSUMPTION ABOUT TENSION CRACK DEPTH. ALLOW ANY BACKSLOPE GEOMETRY AND SURCHARGE CONDITION. VARY X- AND Y-COORDINATES OF BOTTOM OF TENSION CRACK. USE PRIMARY GRID AND SECONDARY SEARCH WINDOW TO FOCUS SEARCH. USE METHODOLOGY DESCRIBED IN NAVFAC DESIGN MANUAL 7.02, 1986, PP. 59-70, AND US ARMY TECHNICAL REPORT ITL-92-11 (1992), P. 79 AND APPENDIX A.

CALCULATION INPUT

Earth Material	Alluvium
Shear Diagram	#1
Cohesion, Coh	100.0 psf
Phi Angle, φ	32.0 degrees
Density, γ	125.0 pcf
Anisotropic Strength Function	NO
Restraining Device	RETAINING WALL
Type	RESTRAINED
Retained Height, H	14 feet
Wall Friction Angle, δ	0 degrees
External Surcharge	NO
General Backslope Condition*	level
Loading	SEISMIC
PGA_M	0.90 g
Pseudostatic Coefficients:	
horizontal, K_h***	0.30 g
vertical, K_v****	0.00 g
Calculation Safety Factor, FS	1

* Critical wedge 'sees' only portion of regional backslope

*** Calculated using methodology of Abrahamson and Silva (1986)
**** Kv > 0 indicates downward acceleration and upward inertial force

CALCULATION OUTPUT

Trial Wedges Analyzed, Initial Search Grid	1371 trials
Trial Wedges Analyzed, Secondary Search Window	441 trials
Critical Failure Angle, α	53.1 degrees
Area of Critical Wedge	72.0 square feet
Length of Critical Failure Plane, L	15.0 feet
Depth of Critical Tension Crack	2.0 feet
Horizontal Upslope Distance to Critical Tension Crack	9.0 feet
Effective Backslope on Critical Wedge, β_{eff}	0.0 degrees
Factored Phi Angle on Slip Plane, φ'	32.0 degrees
Factored Cohesion on Critical Slip Plane, C'	100.0 psf
Weight of Critical Wedge, W	9,000 pounds
External Surcharge on Critical Wedge, V	0 pounds
Pseudo-Static (Gravitational + Dynamic) Driving Force, Wd	9,398 pounds
Mobilized Cohesive Force, C'L	1,500 pounds
Mobilized Frictional Force, R	8,362 pounds
Calculated Unbalanced Force, P	4,820 pounds
Calculated Horizontal Unbalanced Force, P_h	4,820 pounds

RECOMMENDED DESIGN PARAMETERS

Calculated Pseudo-Static Horizontal Force	4,820 pounds
Recommended Static Horizontal Force from sheet 3a	5,802 pounds

BACKSLOPE GEOMETRY AND SURCHARGE CONDITIONS*

(dist., elev)	(X, Y)	H (ft)	β (deg)	surcharge
(0,0)	(0,0)	14		
(0,14)	(0,14)			
(1,14)	(1,14)			
(2,14)	(2,14)			
(18,14)	(18,14)			
(20,14)	(20,14)			
(25,14)	(25,14)			

* X is the upslope distance from the wall; Y is the vertical distance above the base of the wall; H is wall height; β is backslope. H, β, and surcharge apply to section between two coordinates. Only first 20 coordinates are shown.

CONCLUSIONS

THE CALCULATED STATIC FORCE EXCEEDS THE CALCULATED PSEUDO-STATIC FORCE. THEREFORE, THE RECOMMENDED DESIGN PARAMETERS ON SHEET 3A ARE SUFFICIENT.

BYER GEOTECHNICAL INC.

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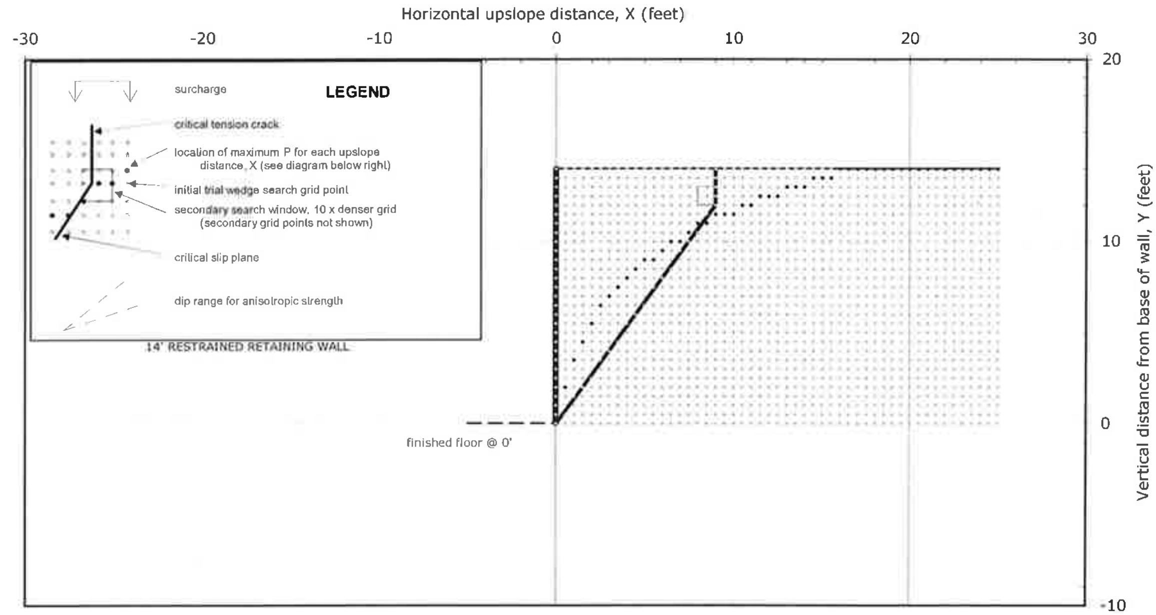
RETAINING WALL CALCULATION

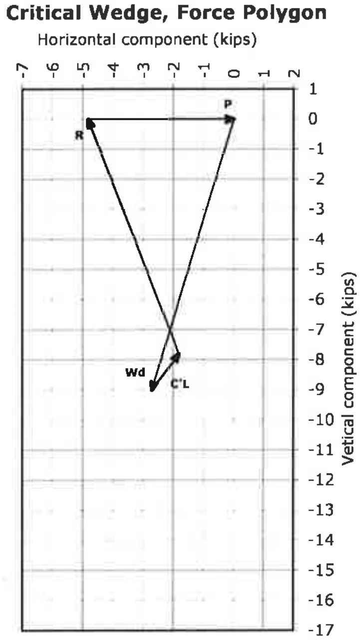
BG: **23025** CLIENT: **ABS Properties, Inc.**
CONSULTANT: **RSB**
SHEET: **#3Sb**
Restrained Retaining Wall

Cross Section and Critical Active Wedge



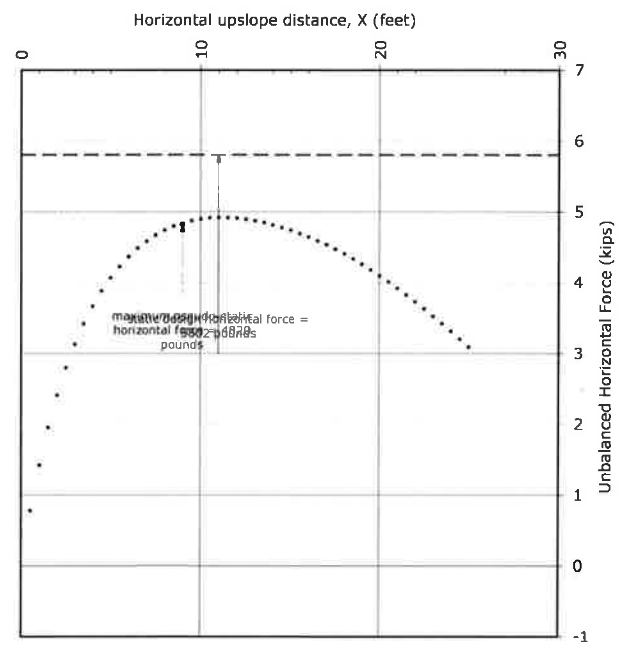
The cross section shows the surface geometry; surcharges; the range of dip for any defined anisotropic strength function; the critical trial wedge; the initial search grid; and the secondary search window. Each grid point defines the upslope coordinate of the slip plane and bottom coordinate of tension crack for a trial wedge. For each for upslope distance, X, the grid point for which the horizontal unbalanced pressure, Ph, is maximum is shown in black. The critical wedge has the maximum horizontal unbalanced pressure of all trial wedges.

Critical Wedge, Force Polygon



The polygon shows the pseudo-static (gravitational and dynamic) driving force, Wd; the mobilized cohesive force, C'L; the mobilized frictional force, R; and the unbalanced pressure, P, for the critical wedge.

Trial Wedge, Unbalanced Horizontal Force, Ph (kips)



The maximum calculated horizontal unbalanced pressure, Ph, is plotted for each upslope distance, X. The location of the maximum Ph for each X is indicated in the cross section, above. All points from initial search grid and maximum from secondary search window are plotted.

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SHORING PILE CALCULATION

BG **23025** CLIENT: **ABS Properties, Inc.**
CONSULTANT: **RSB**
SHEET: **#4a**
Cantilevered Shoring Pile

CALCULATE THE DESIGN PRESSURE FOR PROPOSED CANTILEVERED SHORING PILE. USE THE GENERAL TRIAL WEDGE METHOD*. APPLY THE SAFETY FACTOR TO THE COHESION AND PHI ANGLE. THE RETAINED HEIGHT, BACKSLOPE GEOMETRY, AND SURCHARGE CONDITIONS, ARE LISTED BELOW. ASSUME THE BACKFILL IS SATURATED WITH NO EXCESS HYDROSTATIC PRESSURE.

* FIND THE WEDGE, CHARACTERIZED BY A SINGLE STRAIGHT SLIP PLANE AND A VERTICAL TENSION CRACK, THAT MAXIMIZES THE UNBALANCED PRESSURE. MAKE NO ASSUMPTION ABOUT TENSION CRACK DEPTH. ALLOW ANY BACKSLOPE GEOMETRY AND SURCHARGE CONDITION. VARY X- AND Y-COORDINATES OF BOTTOM OF TENSION CRACK. USE PRIMARY GRID AND SECONDARY SEARCH WINDOW TO FOCUS SEARCH. USE METHODOLOGY DESCRIBED IN NAVFAC DESIGN MANUAL 7.02, 1986, PP. 59-70, AND US ARMY TECHNICAL REPORT ITL-92-11 (1992), P. 79 AND APPENDIX A.

CALCULATION INPUT

Earth Material	Alluvium
Shear Diagram	#1
Cohesion, Coh	100.0 psf
Phi Angle, φ	32.0 degrees
Density, γ	125.0 pcf
Anisotropic Strength Function	NO
Restraining Device	SHORING PILE
Type	CANTILEVERED
Retained Height, H	17 feet
Wall Friction Angle, δ	0 degrees
External Surcharge	see below
General Backslope Condition*	level
Loading	STATIC
Calculation Safety Factor, FS	1.25

* Critical wedge 'sees' only portion of regional backslope

CALCULATION OUTPUT

Trial Wedges Analyzed, Initial Search Grid	1743 trials
Trial Wedges Analyzed, Secondary Search Window	441 trials
Critical Failure Angle, α	53.7 degrees
Area of Critical Wedge	106.3 square feet
Length of Critical Failure Plane, L	21.1 feet
Depth of Critical Tension Crack	0.0 feet
Horizontal Upslope Distance to Critical Tension Crack	12.5 feet
Effective Backslope on Critical Wedge, β_{eff}	0.0 degrees
Factored Phi Angle on Slip Plane, φ'	26.6 degrees
Factored Cohesion on Critical Slip Plane, C'	80.0 psf
Weight of Critical Wedge, W	13,281 pounds
External Surcharge on Critical Wedge, V	926 pounds
Static Gravitational Driving Force, W'	14,208 pounds
Mobilized Cohesive Force, C'L	1,688 pounds
Mobilized Frictional Force, R	14,434 pounds
Calculated Unbalanced Force, P	5,578 pounds
Calculated Horizontal Unbalanced Force, P_h	5,578 pounds
Calculated Equivalent Fluid Pressure	38.6 pcf

RECOMMENDED DESIGN PARAMETERS

Design Equivalent Fluid Pressure, EFP	39.0 pcf
Design Horizontal Force	5,636 pounds

BACKSLOPE GEOMETRY AND SURCHARGE CONDITIONS*

(dist., elev)	(X, Y)	H (ft)	β (deg)	surcharge
(0,0)	(0,0)	17		
(0,17)	(0,17)			
(10,17)	(10,17)			Uniform Load: 300 psf
(15,17)	(15,17)			
(18,17)	(18,17)			
(20,17)	(20,17)			
(30,17)	(30,17)			

* X is the upslope distance from the wall; Y is the vertical distance above the base of the wall; H is wall height; β is backslope. H, β, and surcharge apply to section between two coordinates. Only first 20 coordinates are shown.

CONCLUSIONS

THE CALCULATION INDICATES THAT THE PROPOSED CANTILEVERED SHORING PILE, WITH A RETAINED HEIGHT OF UP TO 17 FEET, MAY BE DESIGNED FOR AN EQUIVALENT FLUID PRESSURE (EFP) OF 39 POUNDS PER CUBIC FOOT. FOR PILES, THE PRESSURE SHOULD BE MULTIPLIED BY THE PILE SPACING.

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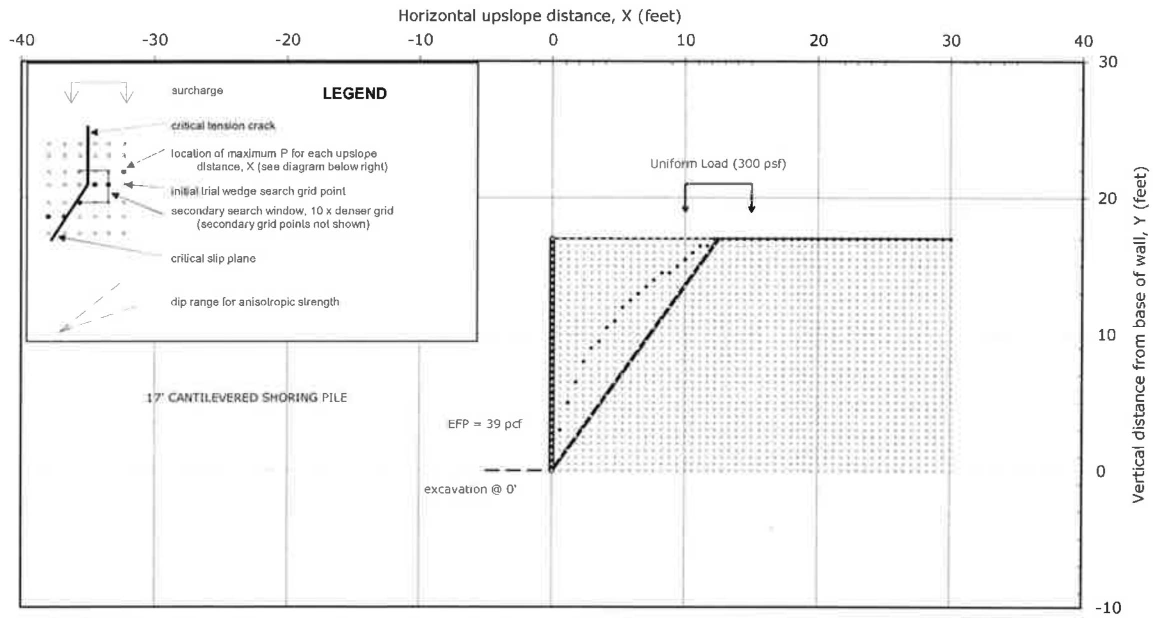
SHORING PILE CALCULATION

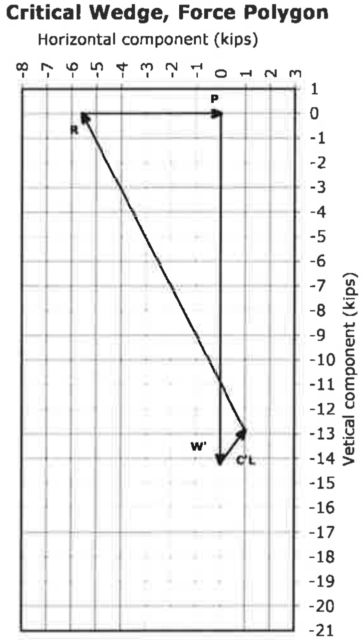
BG: **23025** CLIENT: **ABS Properties, Inc.**
CONSULTANT: **RSB**
SHEET: **#4b**
Cantilevered Shoring Pile

Cross Section and Critical Active Wedge



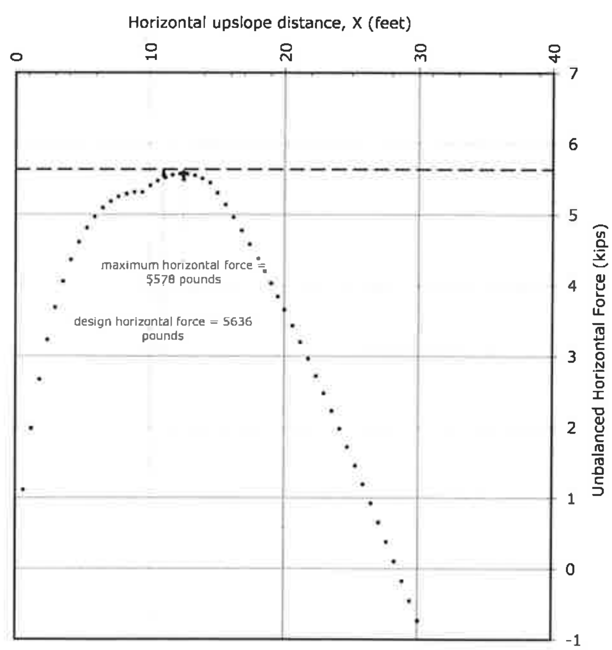
The cross section shows the surface geometry; surcharges; the range of dip for any defined anisotropic strength function; the critical trial wedge; the initial search grid; and the secondary search window. Each grid point defines the upslope coordinate of the slip plane and bottom coordinate of tension crack for a trial wedge. For each for upslope distance, X, the grid point for which the horizontal unbalanced pressure, Ph, is maximum is shown in black. The critical wedge has the maximum horizontal unbalanced pressure of all trial wedges.

Critical Wedge, Force Polygon



The polygon shows the static (gravitational) driving force, W'; the mobilized cohesive force, C'L; the mobilized frictional force, R; and the unbalanced pressure, P, for the critical wedge.

Trial Wedge, Unbalanced Horizontal Force, Ph (kips)



The maximum calculated horizontal unbalanced pressure, Ph, is plotted for each upslope distance, X. The location of the maximum Ph for each X is indicated in the cross section, above. All points from initial search grid and maximum from secondary search window are plotted.

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ALLOWABLE PILE AXIAL CAPACITY

BG: 23025 ENGINEER: RSB
CLIENT: ABS Properties, Inc.

CHART # 1

References: - *Bowels, J. E., 1997, Foundation Analysis and Design, Fifth Edition, International Edition, Ch. 16.*
- *Das, B. M., 1990, Principles of Foundation Engineering, 2nd Edition, Ch. 8, pp. 444-460.*
- *NAVFAC, 1986, Foundations & Earth Structures, Design Manual 7.02, Ch. 5, Section 3.*

Soil Properties

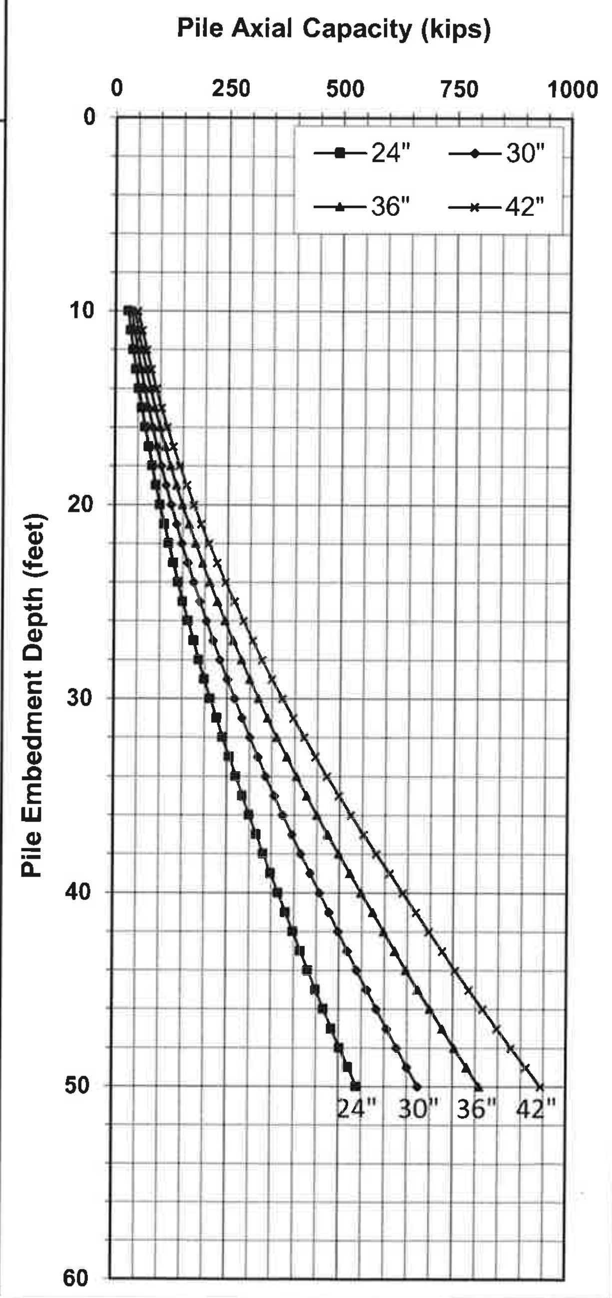
Depth		Cu	Phi	Density	Earth Material	Shear Test #
From	To	(psf)	(deg)	(pcf)		
10	50	100	32	125	Alluvium	1

Depth of Groundwater: No GW

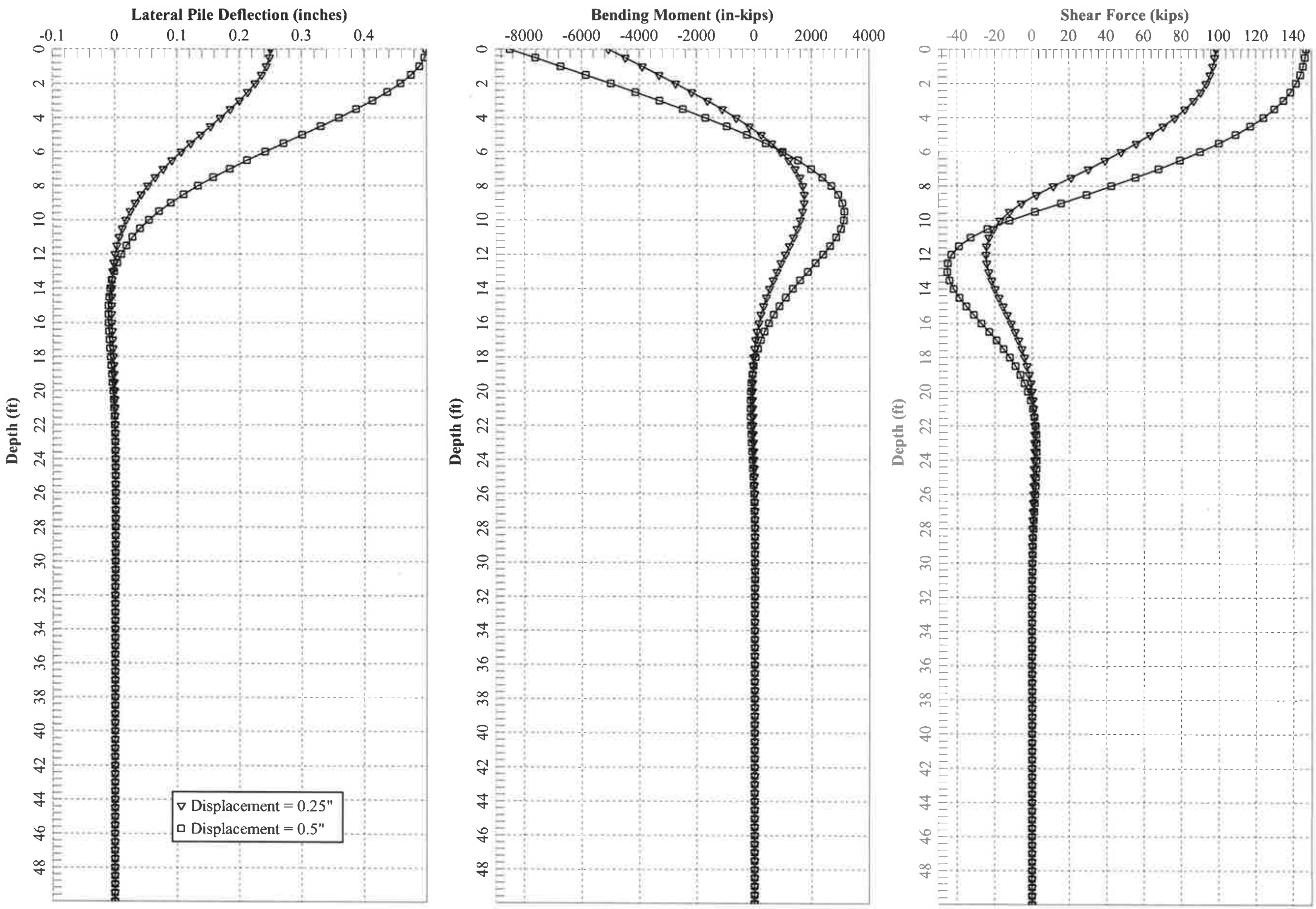
Pile Properties

Type: Drilled Pile
Material: Concrete
Shape: Circular
End Bearing: Yes
Diameters: **24,30,36,42 Inches**
Factor of Safety: 2
Overburden Pressure: 0 psf

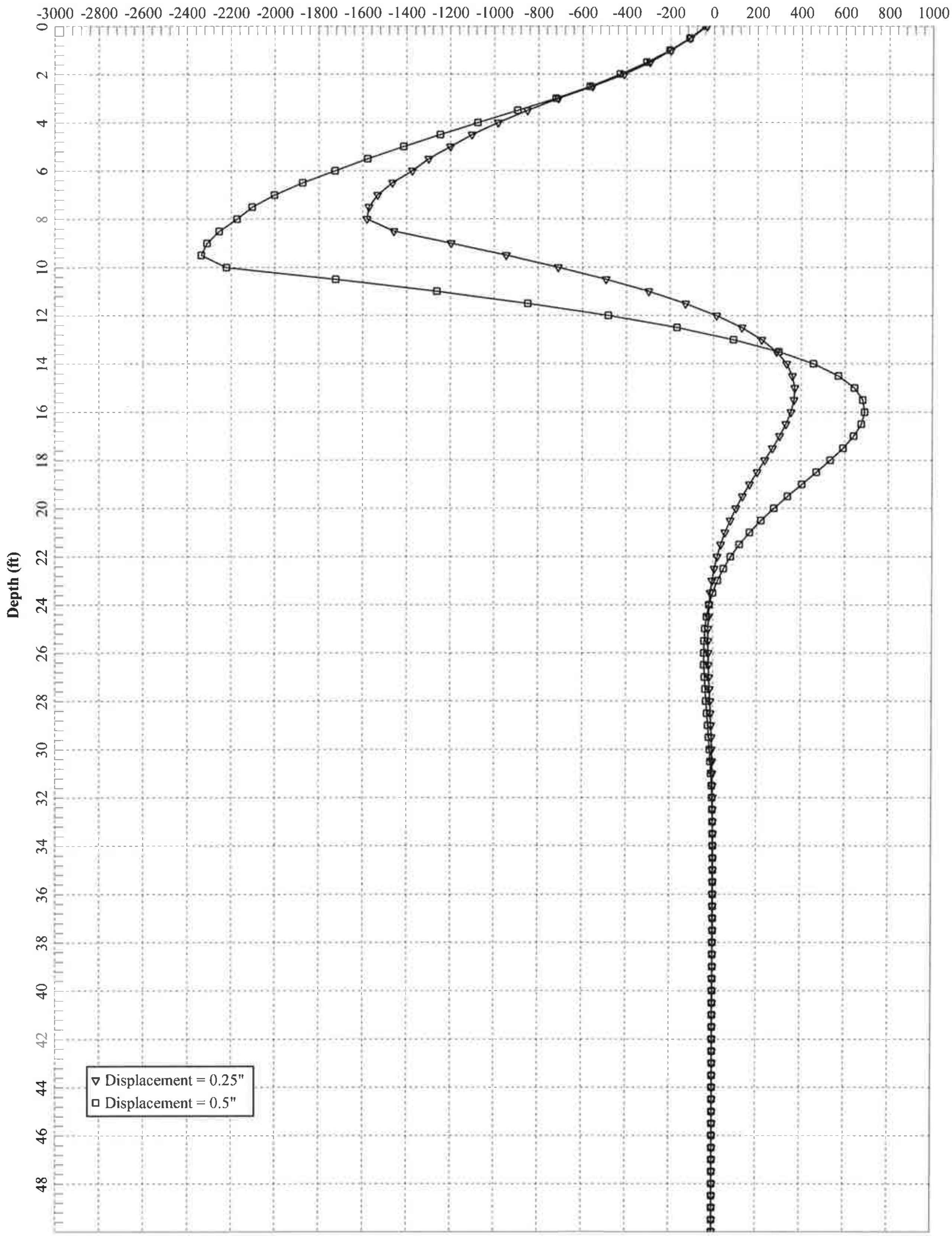
Pile Embedment Depth (feet)	Average Skin Friction (psf)	Total Capacity 24" (kips)	Total Capacity 30" (kips)	Total Capacity 36" (kips)	Total Capacity42" (kips)
10	446.7	28.1	35.1	42.1	49.1
11	482.0	33.3	41.6	50.0	58.3
12	517.0	39.0	48.7	58.5	68.2
13	551.6	45.1	56.3	67.6	78.8
14	585.9	51.5	64.4	77.3	90.2
15	619.8	58.4	73.0	87.6	102.2
16	653.4	65.7	82.1	98.5	115.0
17	686.1	73.3	91.6	109.9	128.2
18	721.0	81.5	101.9	122.3	142.7
19	755.8	90.2	112.8	135.3	157.9
20	790.5	99.3	124.2	149.0	173.8
21	825.0	108.8	136.1	163.3	190.5
22	859.3	118.8	148.5	178.2	207.9
23	893.5	129.1	161.4	193.7	226.0
24	927.6	139.9	174.8	209.8	244.8
25	961.5	151.0	188.8	226.5	264.3
26	995.2	162.6	203.2	243.9	284.5
27	1028.9	174.5	218.2	261.8	305.4
28	1062.3	186.9	233.6	280.3	327.1
29	1095.7	199.6	249.6	299.5	349.4
30	1128.9	212.8	266.0	319.2	372.4
31	1161.9	226.3	282.9	339.5	396.0
32	1194.8	240.2	300.3	360.3	420.4
33	1227.5	254.5	318.2	381.8	445.4
34	1260.1	269.2	336.5	403.8	471.1
35	1292.6	284.3	355.3	426.4	497.4
36	1324.9	299.7	374.6	449.5	524.4
37	1357.1	315.5	394.4	473.2	552.1
38	1389.1	331.7	414.6	497.5	580.4
39	1420.9	348.2	435.2	522.3	609.3
40	1452.7	365.1	456.4	547.6	638.9
41	1481.0	381.5	476.9	572.3	667.7
42	1507.5	397.8	497.3	596.7	696.2
43	1533.9	414.4	518.0	621.6	725.2
44	1560.1	431.3	539.1	647.0	754.8
45	1586.3	448.5	560.6	672.8	784.9
46	1612.4	466.0	582.5	699.0	815.6
47	1638.4	483.8	604.8	725.8	846.7
48	1664.4	502.0	627.5	753.0	878.4
49	1690.3	520.4	650.5	780.6	910.7
50	1716.0	539.1	673.9	808.7	943.4



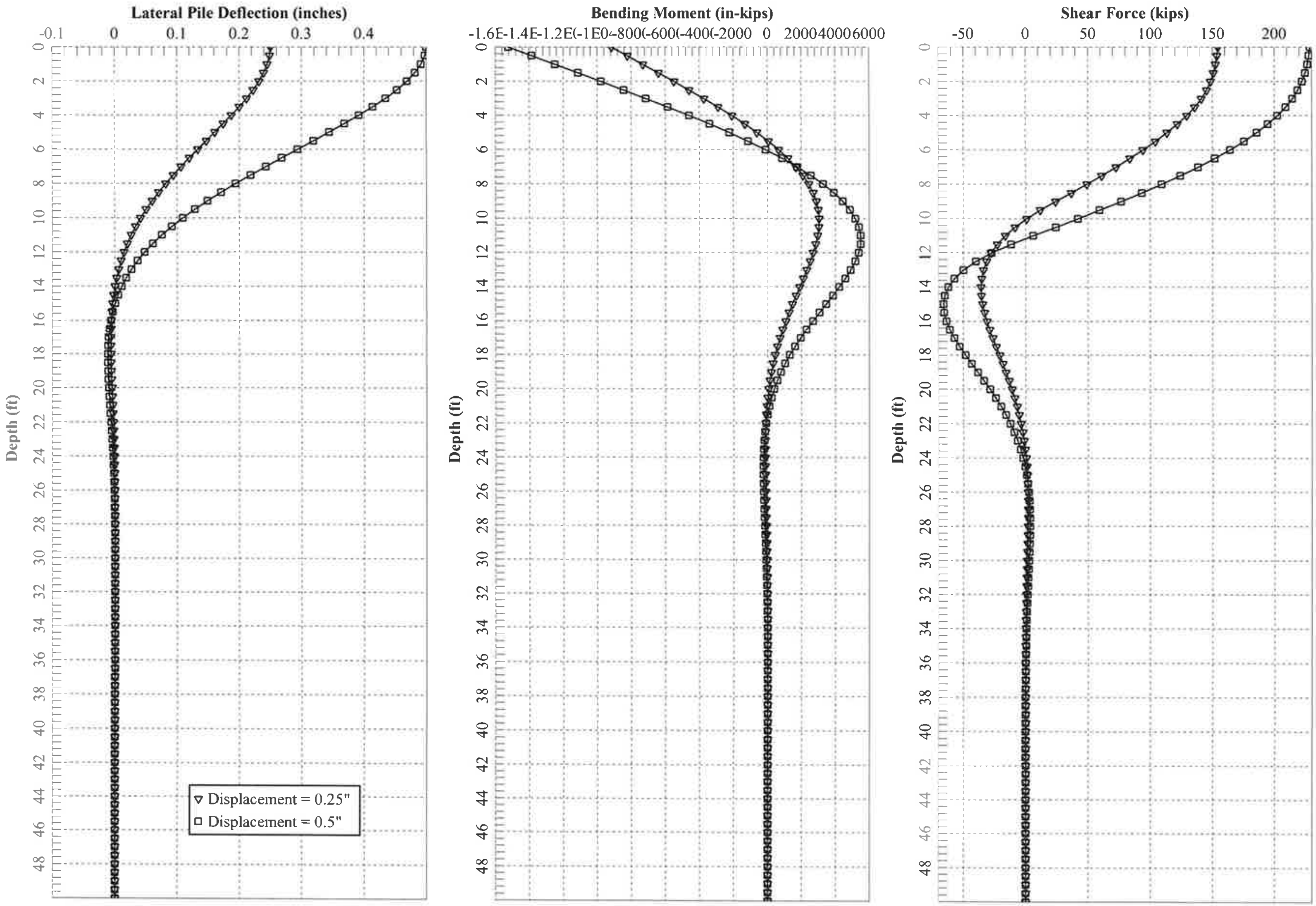
BG 23025 - ABS Properties, Inc. - LPILE - 24" Dia. - Fixed Head - Single Pile - Fig. 1a



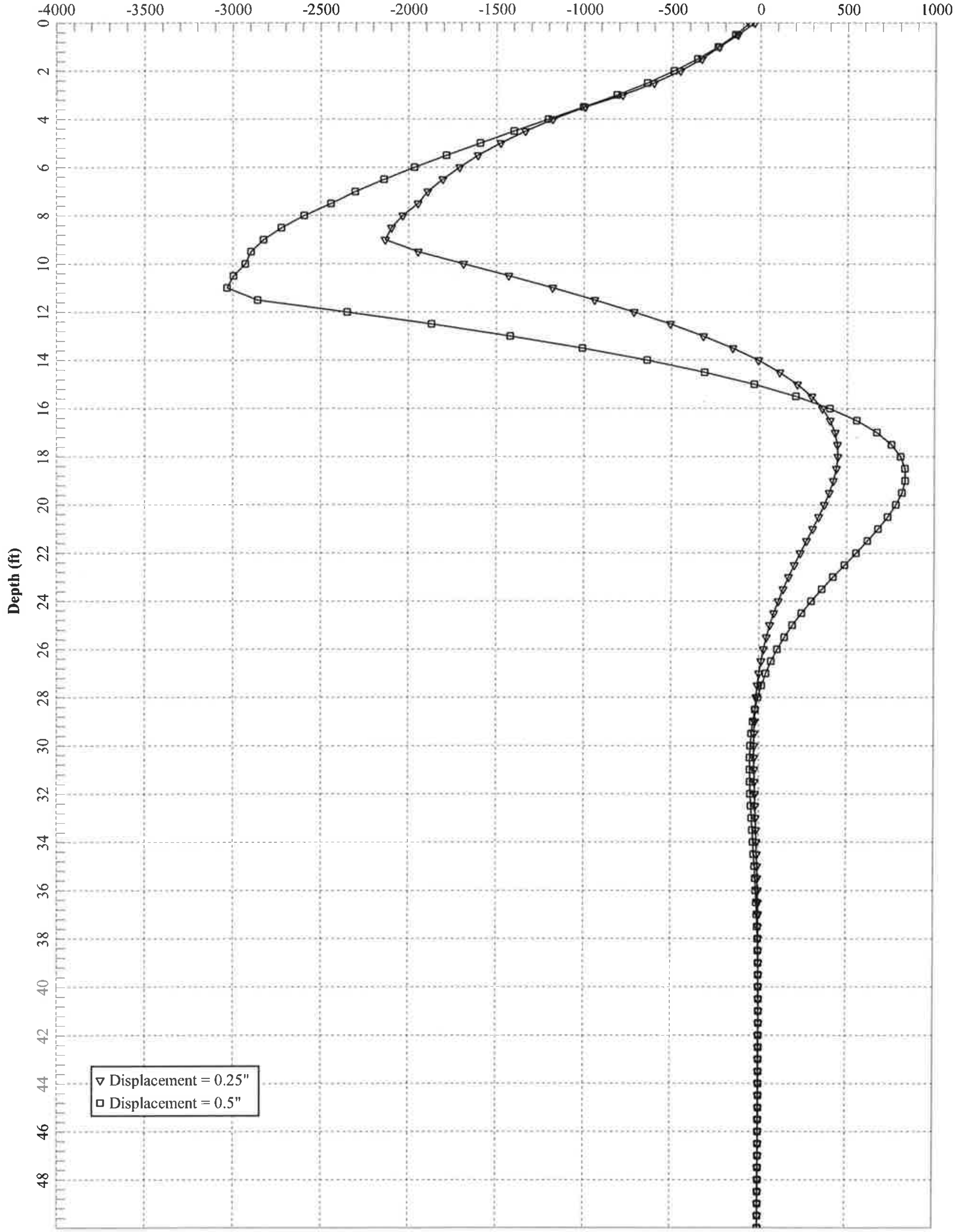
BG 23025 - ABS Properties, Inc. - LPILE - 24" Dia. - Fixed Head - Single Pile - Fig. 1b
Mobilized Soil Reaction (lb/in)



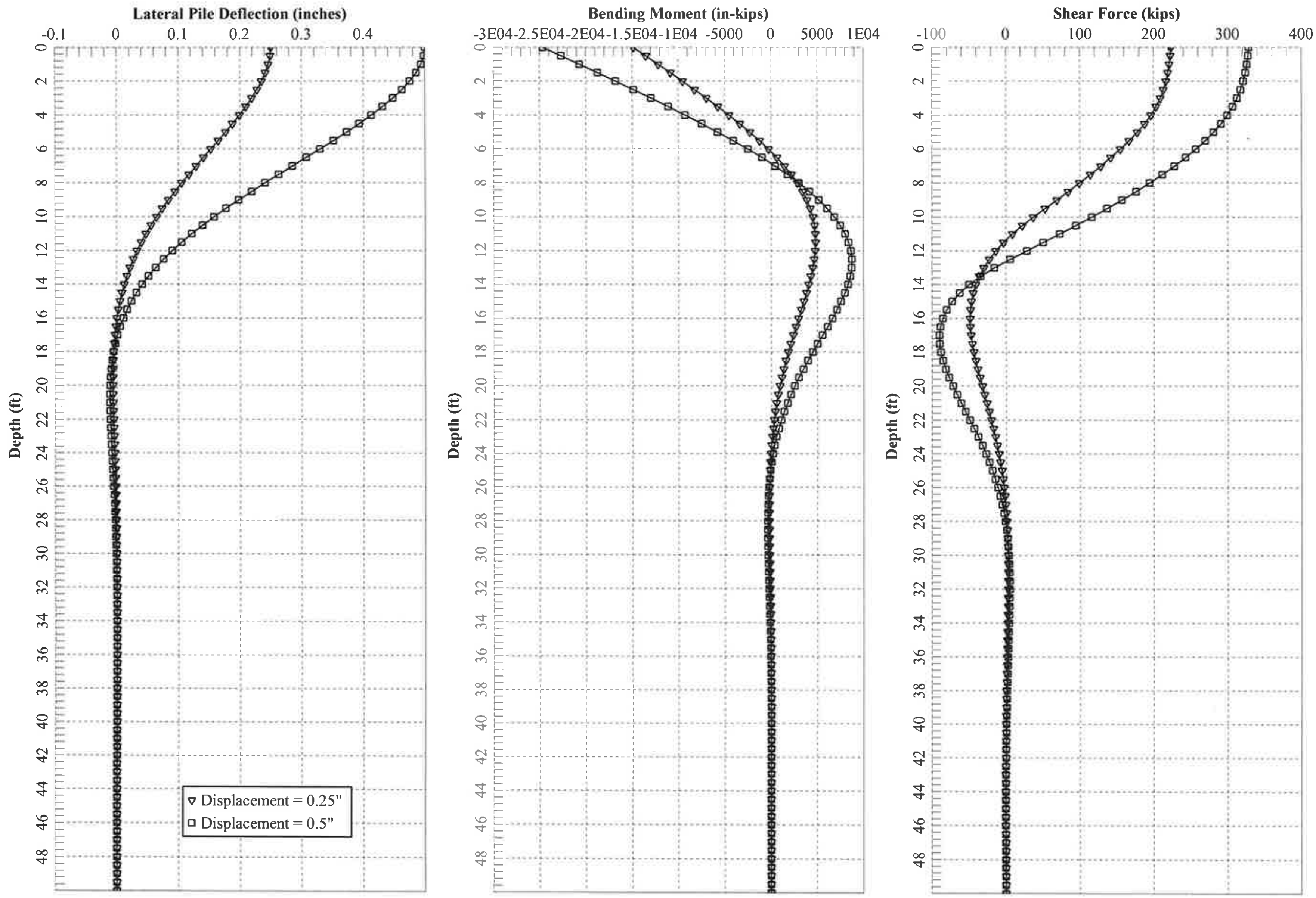
BG 23025 - ABS Properties, Inc. - LPILE - 30" Dia. - Fixed Head - Single Pile - Fig. 2a



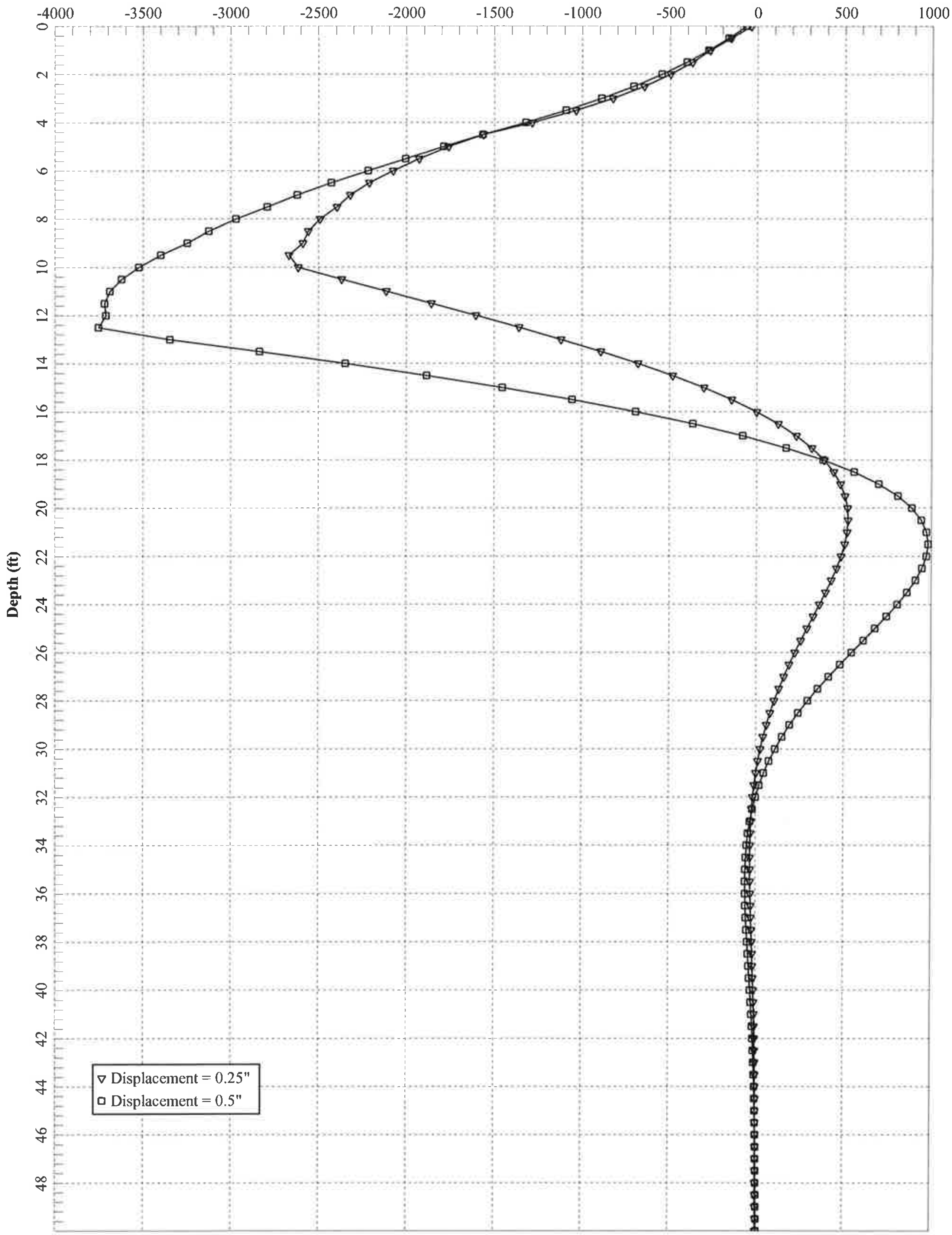
BG 23025 - ABS Properties, Inc. - LPILE - 30" Dia. - Fixed Head - Single Pile - Fig. 2b
Mobilized Soil Reaction (lb/in)



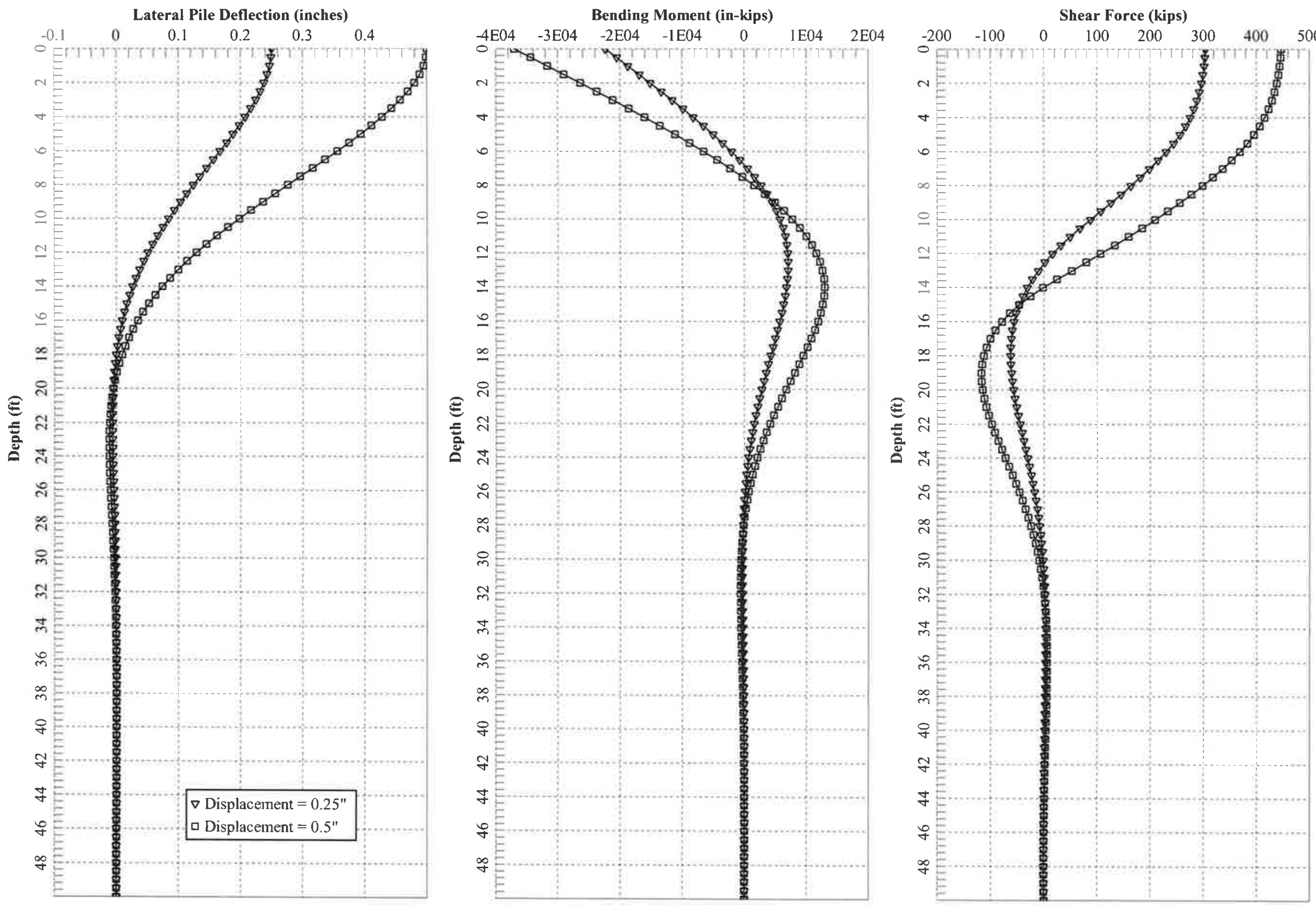
BG 23025 - ABS Properties, Inc. - LPILE - 36" Dia. - Fixed Head - Single Pile - Fig. 3a



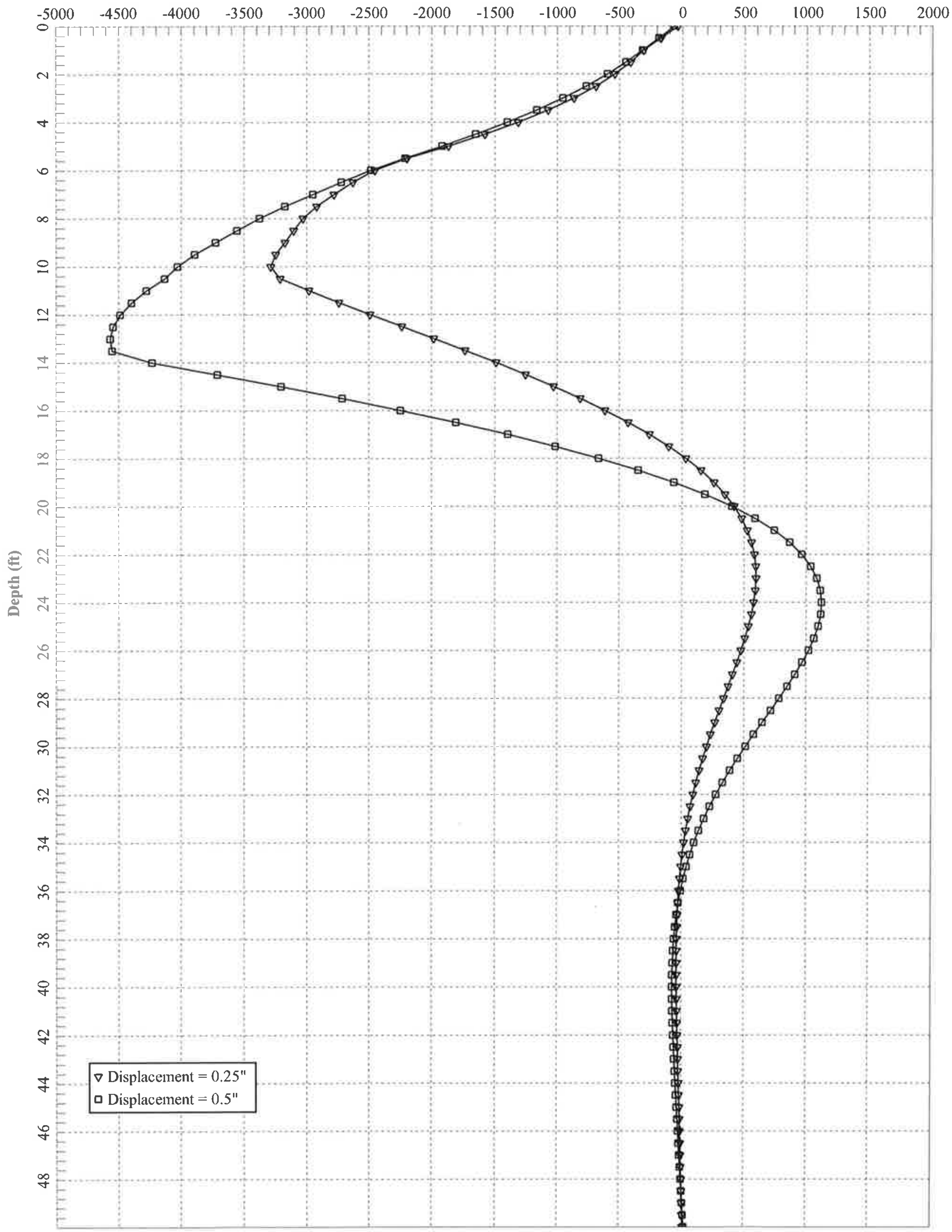
BG 23025 - ABS Properties, Inc. - LPILE - 36" Dia. - Fixed Head - Single Pile - Fig. 3b
Mobilized Soil Reaction (lb/in)



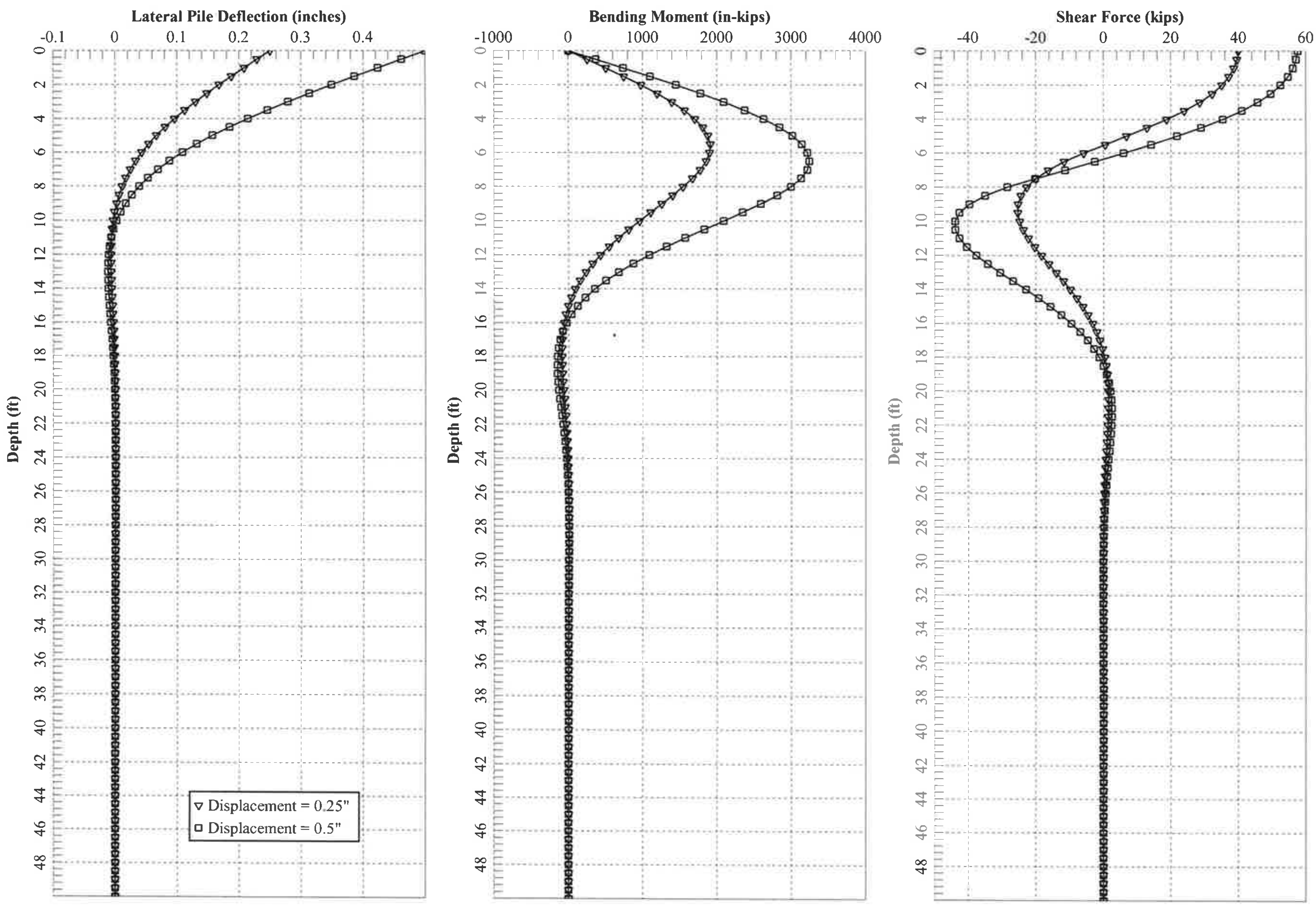
BG 23025 - ABS Properties, Inc. - LPILE - 42" Dia. - Fixed Head - Single Pile - Fig. 4a



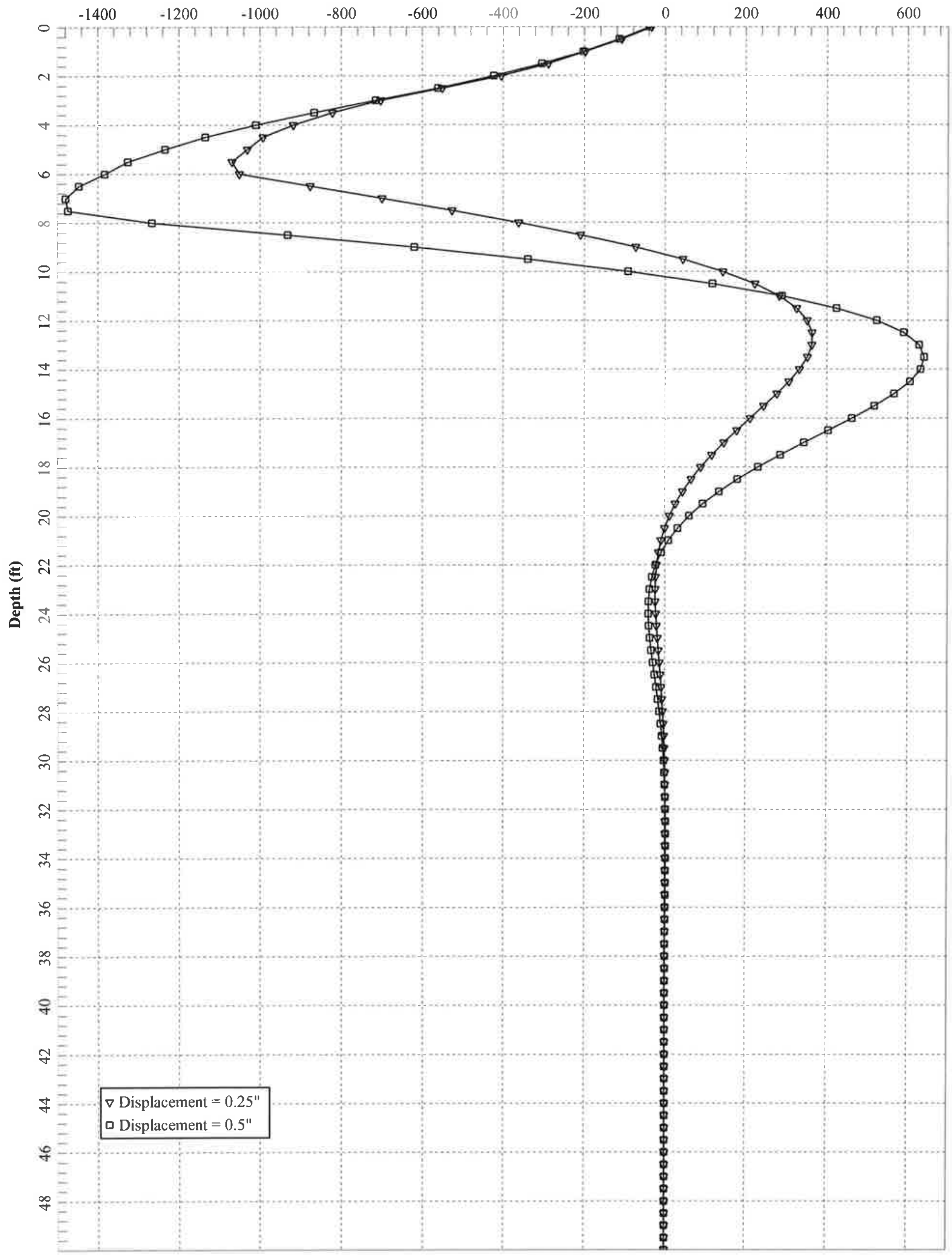
BG 23025 - ABS Properties, Inc. - LPILE - 42" Dia. - Fixed Head - Single Pile - Fig. 4b
Mobilized Soil Reaction (lb/in)



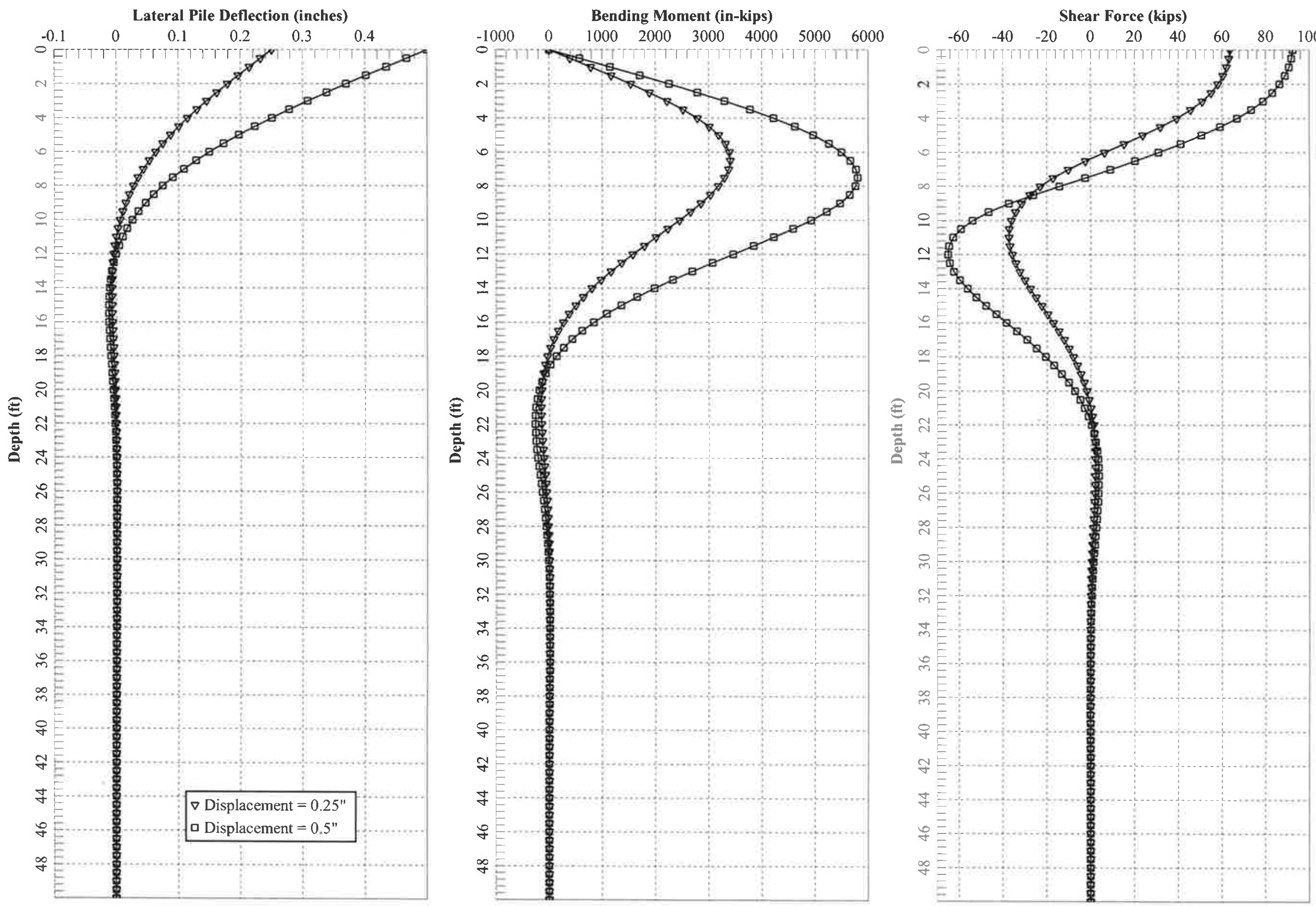
BG 23025 - ABS Properties, Inc. - LPILE - 24" Dia. - Free Head - Single Pile - Fig. 5a



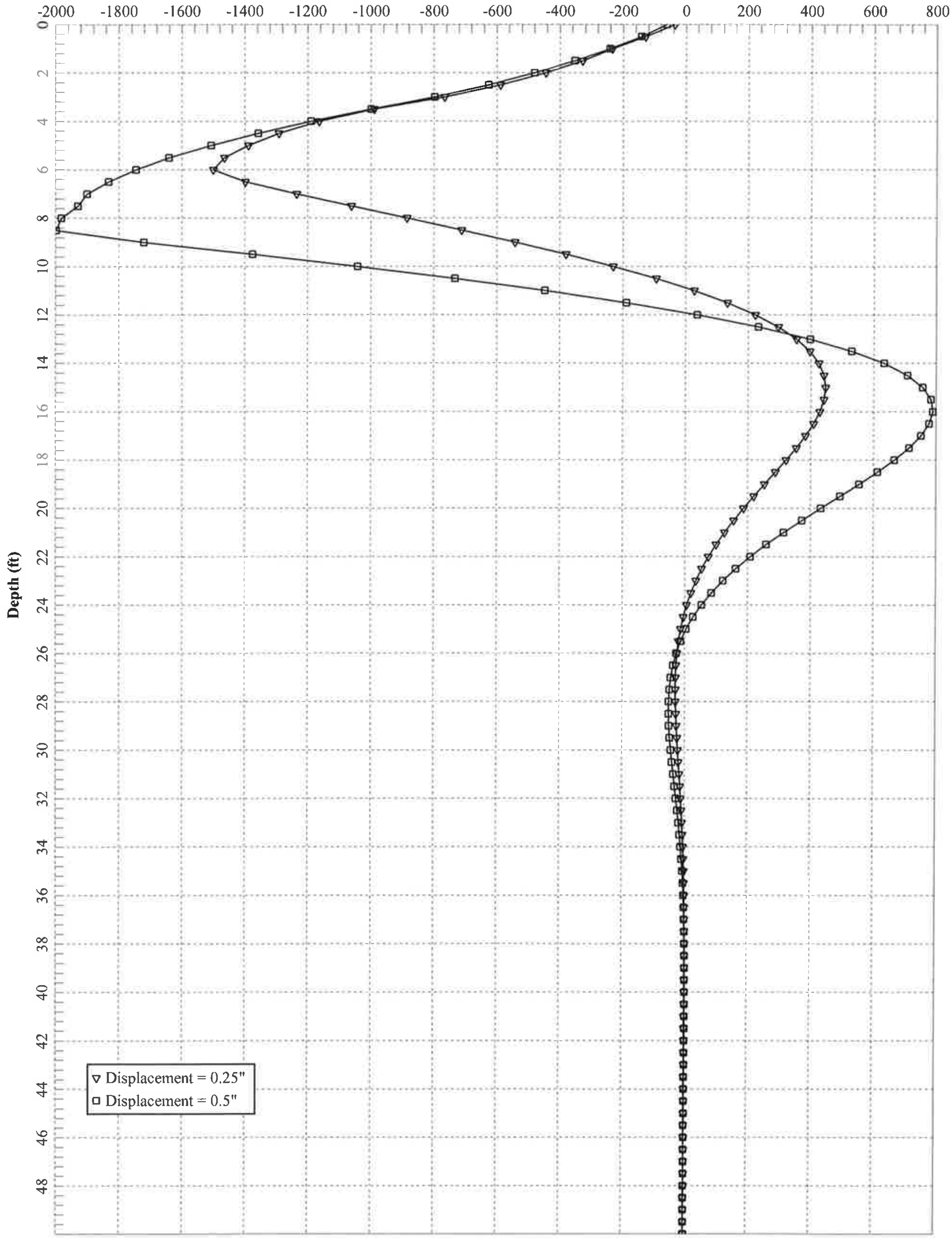
BG 23025 - ABS Properties, Inc. - LPILE - 24" Dia. - Free Head - Single Pile - Fig. 5b
Mobilized Soil Reaction (lb/in)



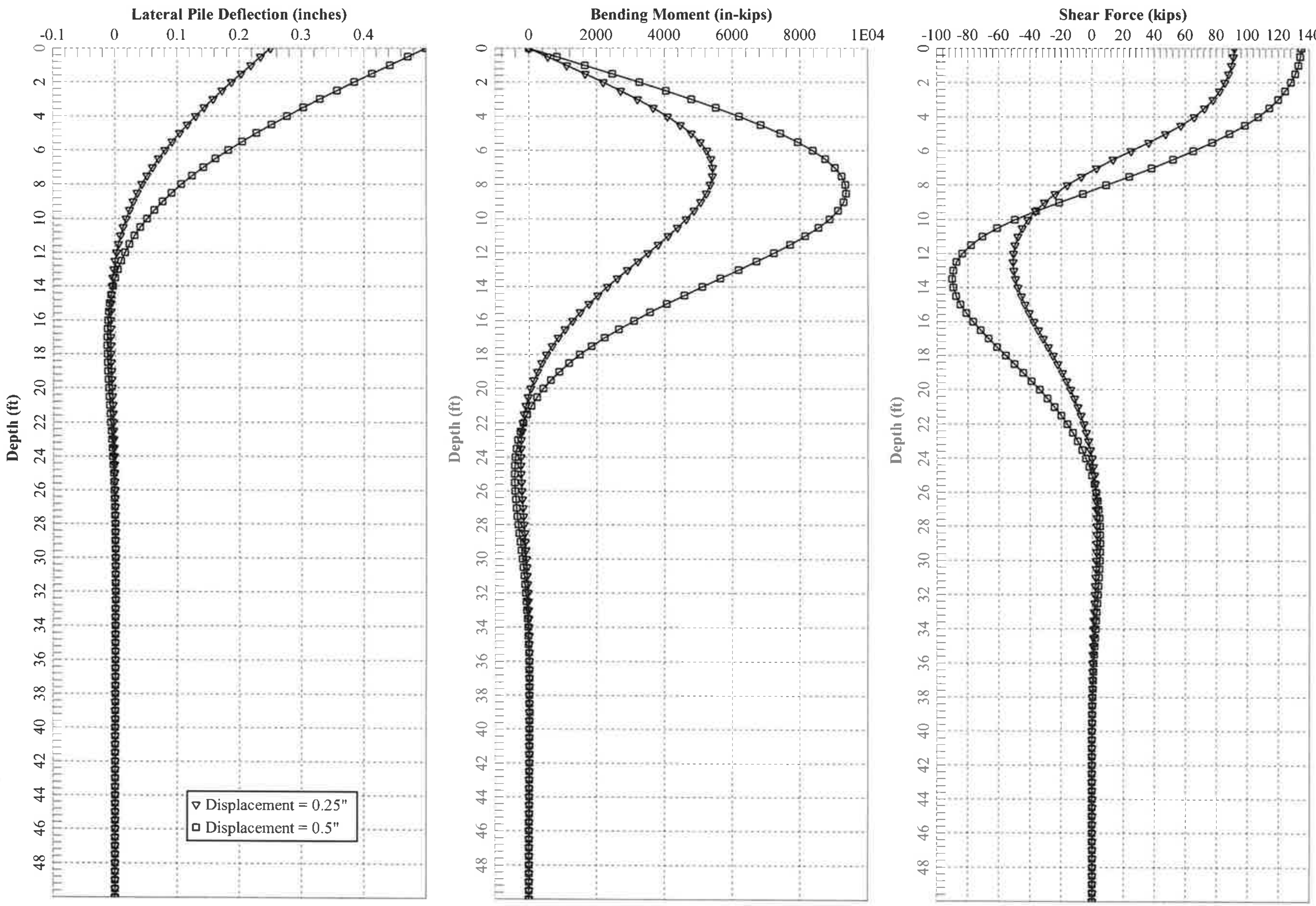
BG 23025 - ABS Properties, Inc. - LPILE - 30" Dia. - Free Head - Single Pile - Fig. 6a



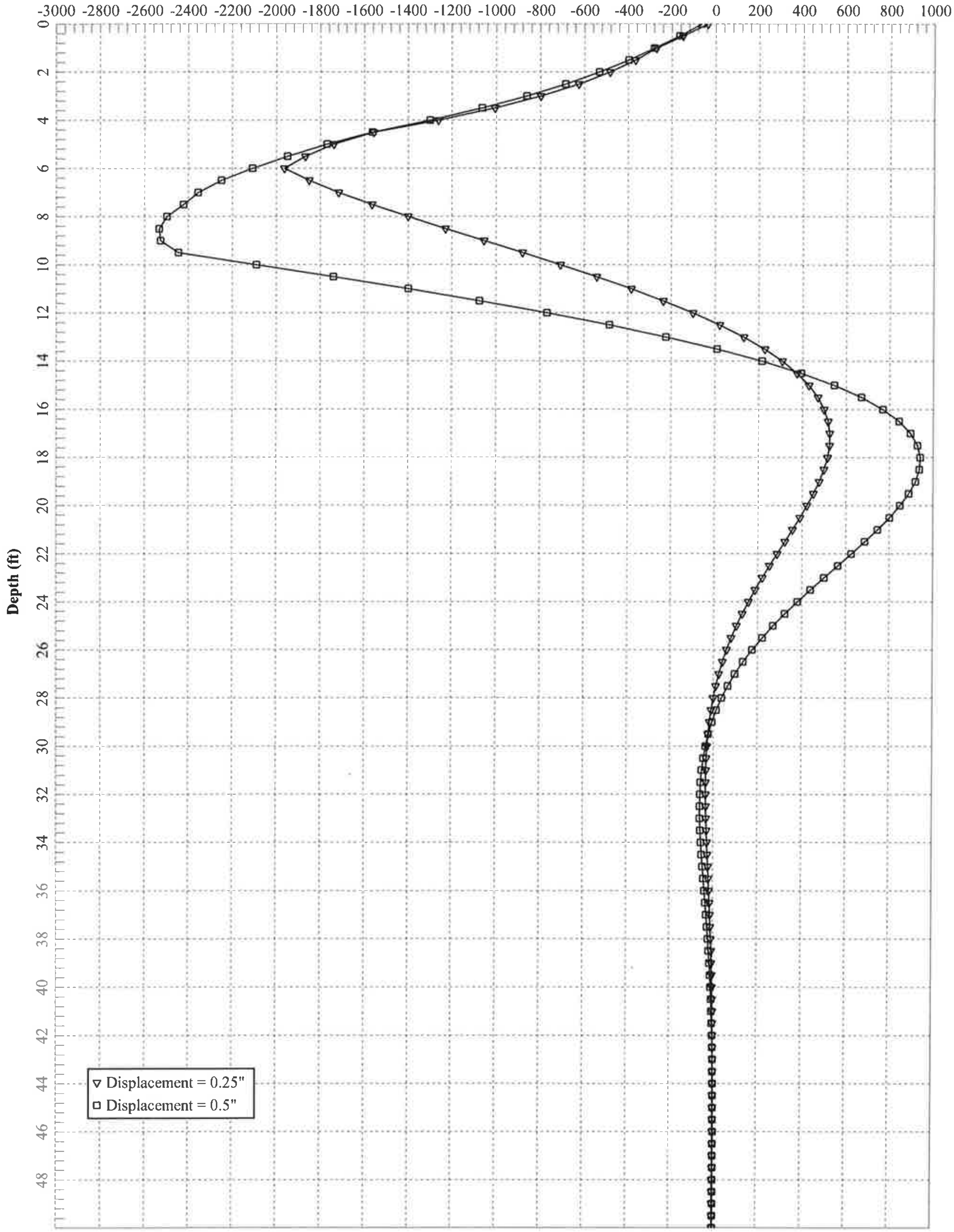
BG 23025 - ABS Properties, Inc. - LPILE - 30" Dia. - Free Head - Single Pile - Fig. 6b
Mobilized Soil Reaction (lb/in)



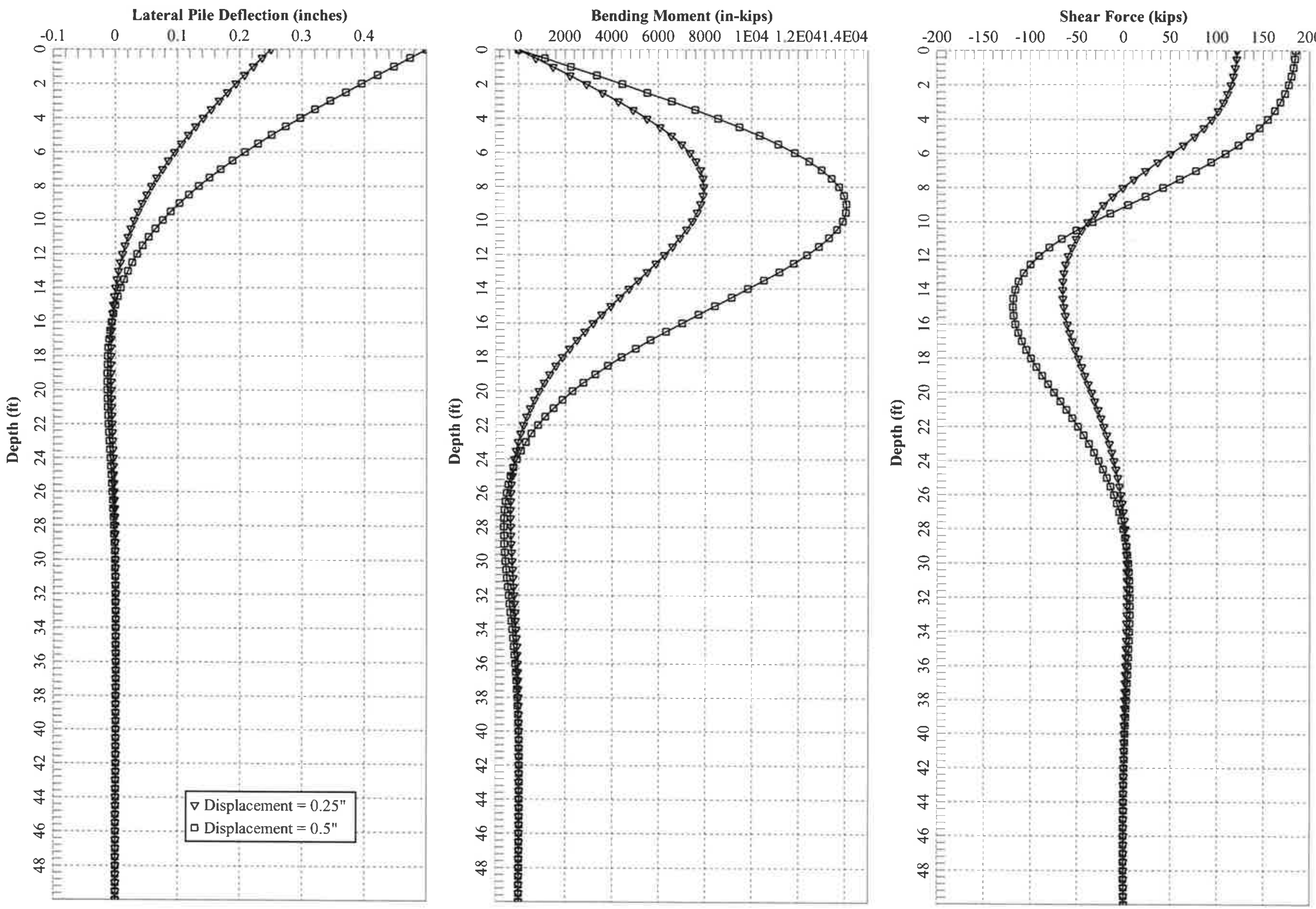
BG 23025 - ABS Properties, Inc. - LPILE - 36" Dia. - Free Head - Single Pile - Fig. 7a



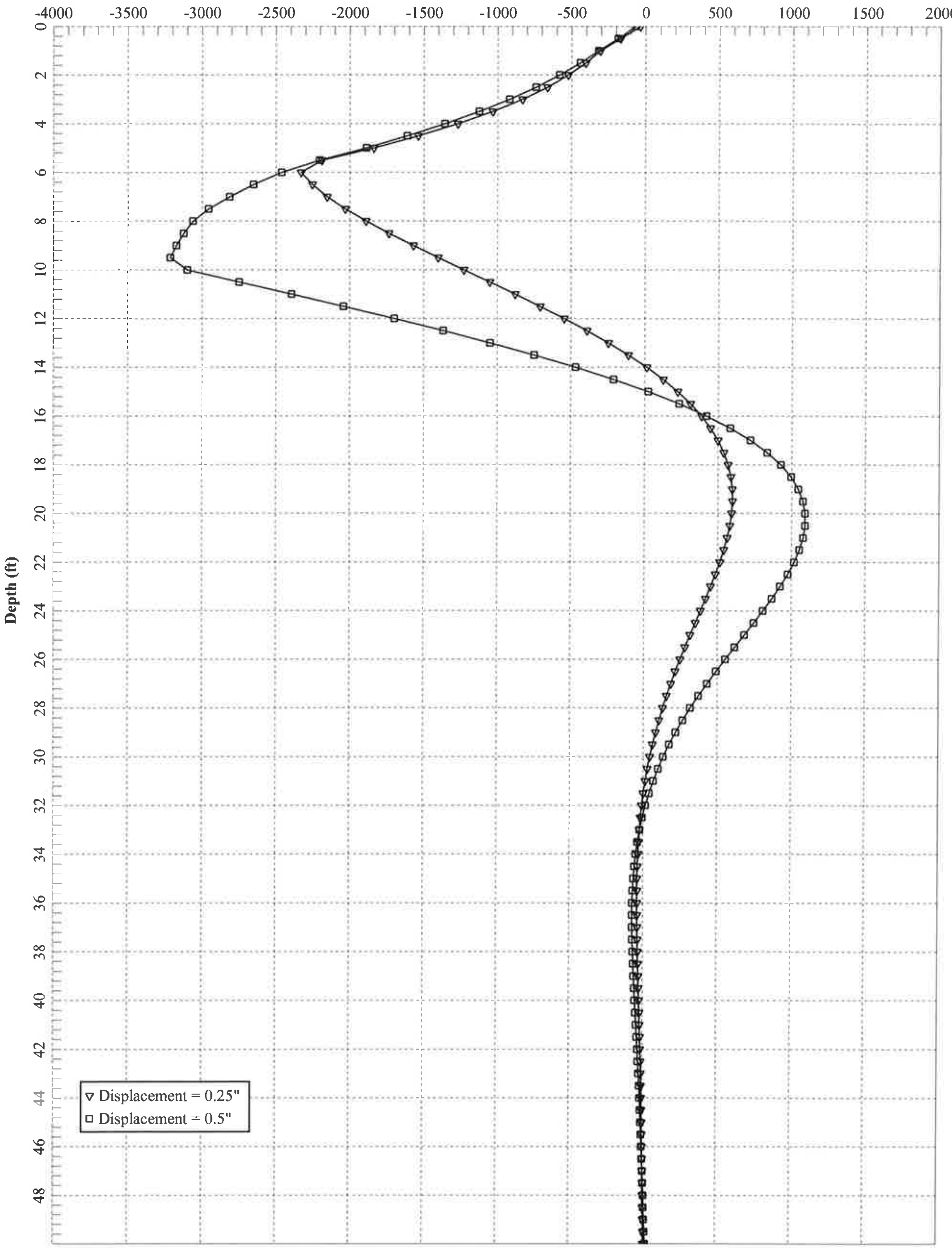
BG 23025 - ABS Properties, Inc. - LPILE - 36" Dia. - Free Head - Single Pile - Fig. 7b
Mobilized Soil Reaction (lb/in)



BG 23025 - ABS Properties, Inc. - LPILE - 42" Dia. - Free Head - Single Pile - Fig. 8a



BG 23025 - ABS Properties, Inc. - LPILE - 42" Dia. - Free Head - Single Pile - Fig. 8b
Mobilized Soil Reaction (lb/in)



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AERIAL VICINITY MAP

BG: 23025	ABS PROPERTIES, INC.
CONSULTANT : JHP/RSB	SCALE: 1" = 100'
DRAWN BY : AS	

REFERENCE: LOS ANGELES COUNTY DEPARTMENT OF REGIONAL PLANNING, GIS-NET, 2013, http://gis.planning.lacounty.gov/GIS-NET_Public/Viewer.html

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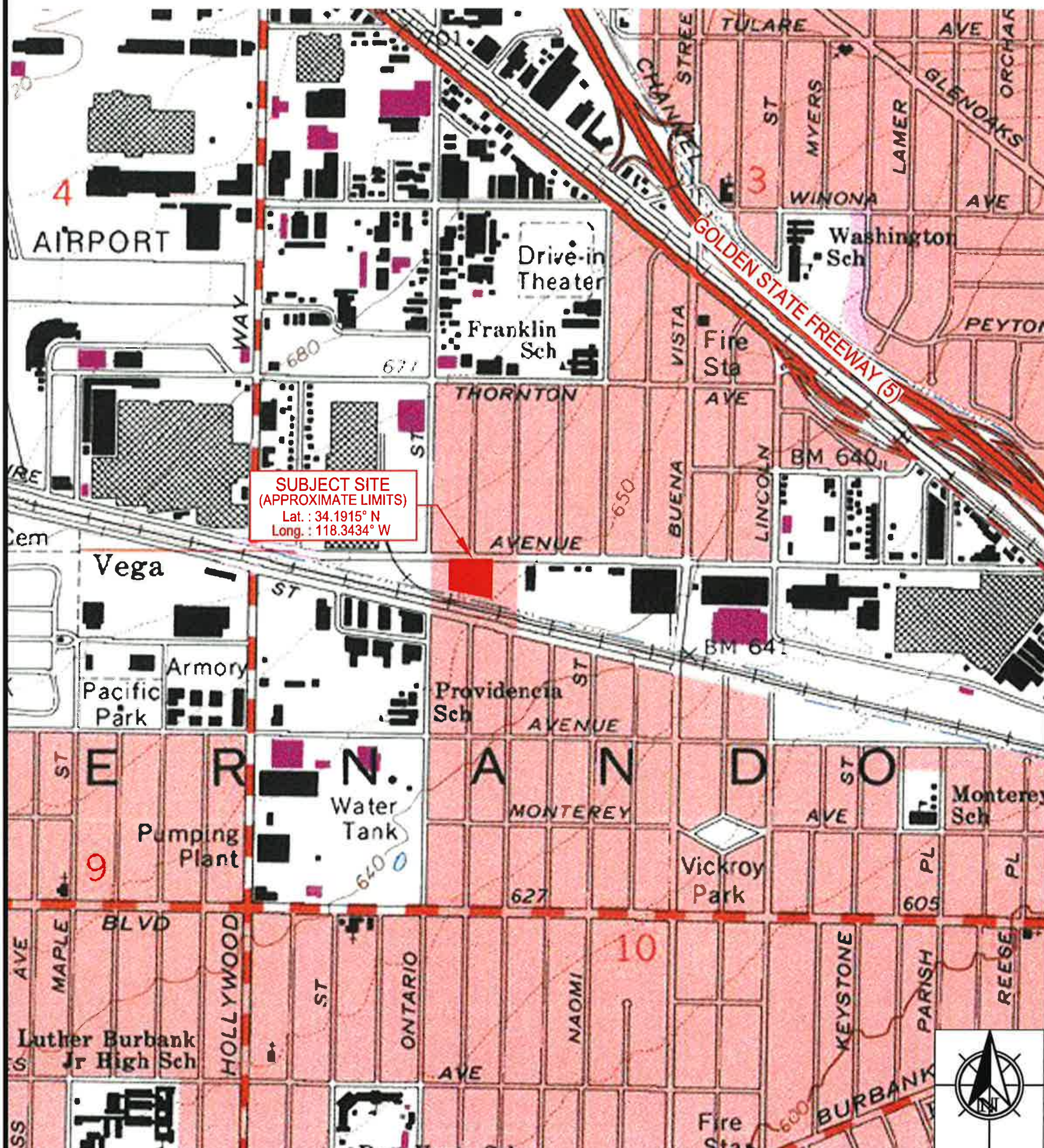
REGIONAL TOPOGRAPHIC MAP

BG: 23025	ABS PROPERTIES, INC.
CONSULTANT : JHP/RSB	SCALE: 1" = 1000'
DRAWN BY : AS	

REFERENCE: USGS TOPOGRAPHIC MAP, BURBANK 7.5-MINUTE SERIES QUADRANGLE, LOS ANGELES COUNTY, CALIFORNIA CREATED 1964.



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HISTORIC TOPOGRAPHIC MAP

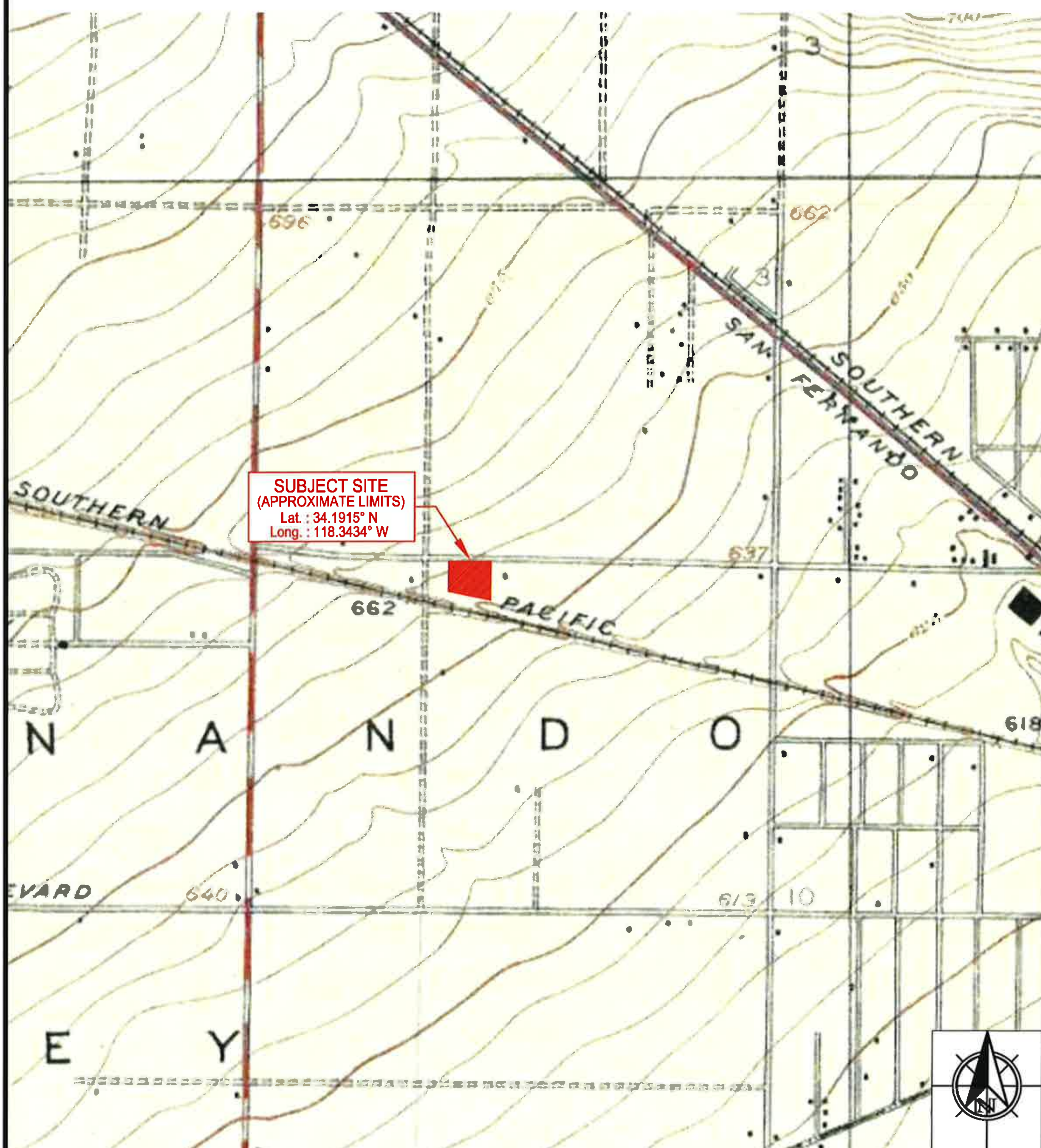
BG: 23025 ABS PROPERTIES, INC.

CONSULTANT : JHP/RSB

DRAWN BY : AS

SCALE: 1" = 1000'

REFERENCE: USGS TOPOGRAPHIC MAP, BURBANK 6-MINUTE SERIES QUADRANGLE, LOS ANGELES COUNTY, CALIFORNIA CREATED 1942.



CAD FILE: S:\LandProjects\23025 ABS Burbank_3000 W Empire Ave\DWG\HISTORIC TOPOGRAPHIC MAP.dwg PLOT DATE/TIME: 11/19/2021 - 2:34pm

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INC.
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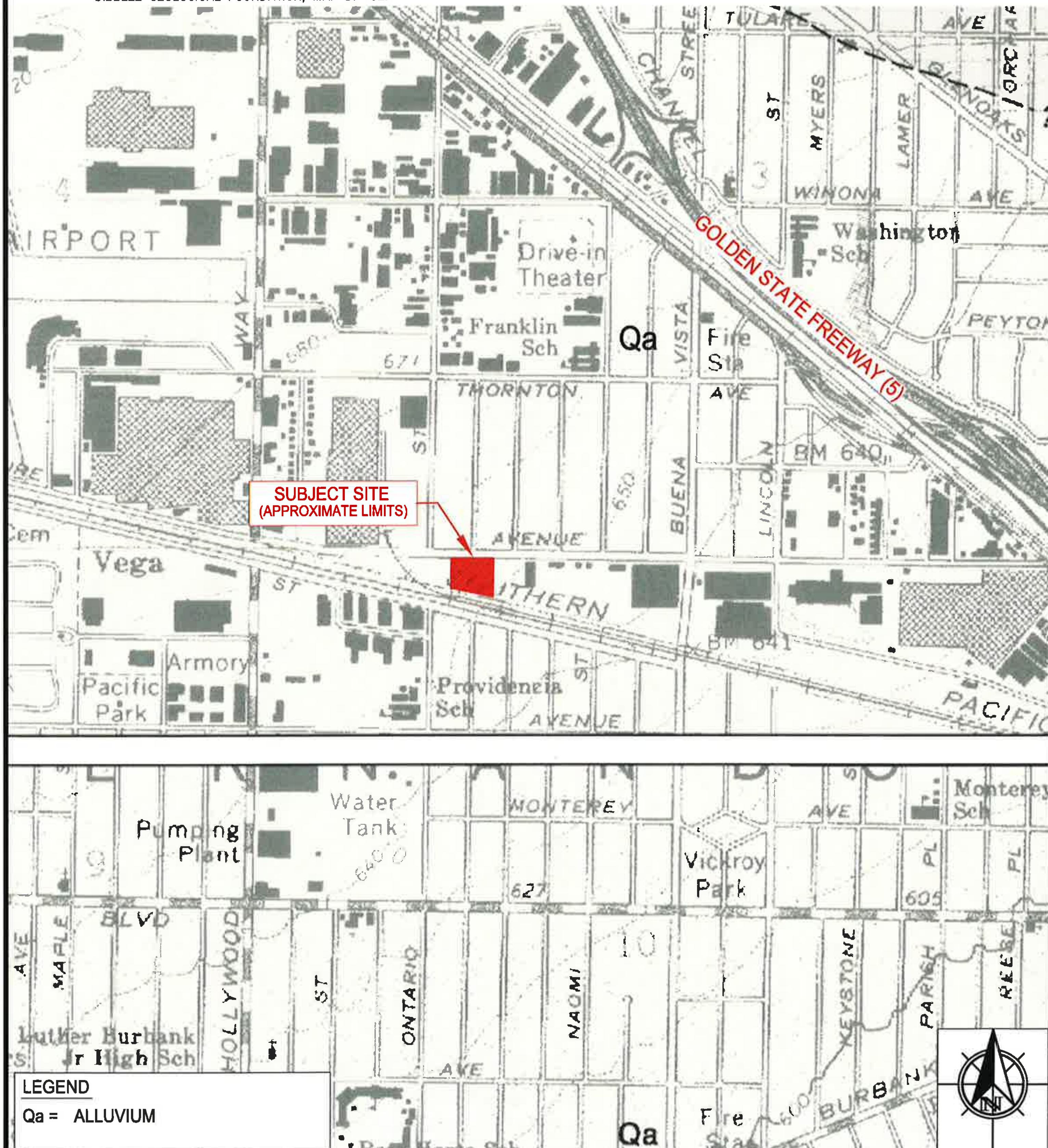
REGIONAL GEOLOGIC MAP

BG: 23025 ABS PROPERTIES, INC.

CONSULTANT : JHP/RSB	SCALE: 1" = 1000'
DRAWN BY : AS	

REFERENCE: DIBBLEE, T.W. (1991), GEOLOGIC MAP OF THE SUNLAND AND BURBANK (NORTH 1/2) QUADRANGLES, LOS ANGELES, CALIFORNIA
DIBBLEE GEOLOGICAL FOUNDATION, MAP DF-32.



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

REGIONAL FAULT MAP

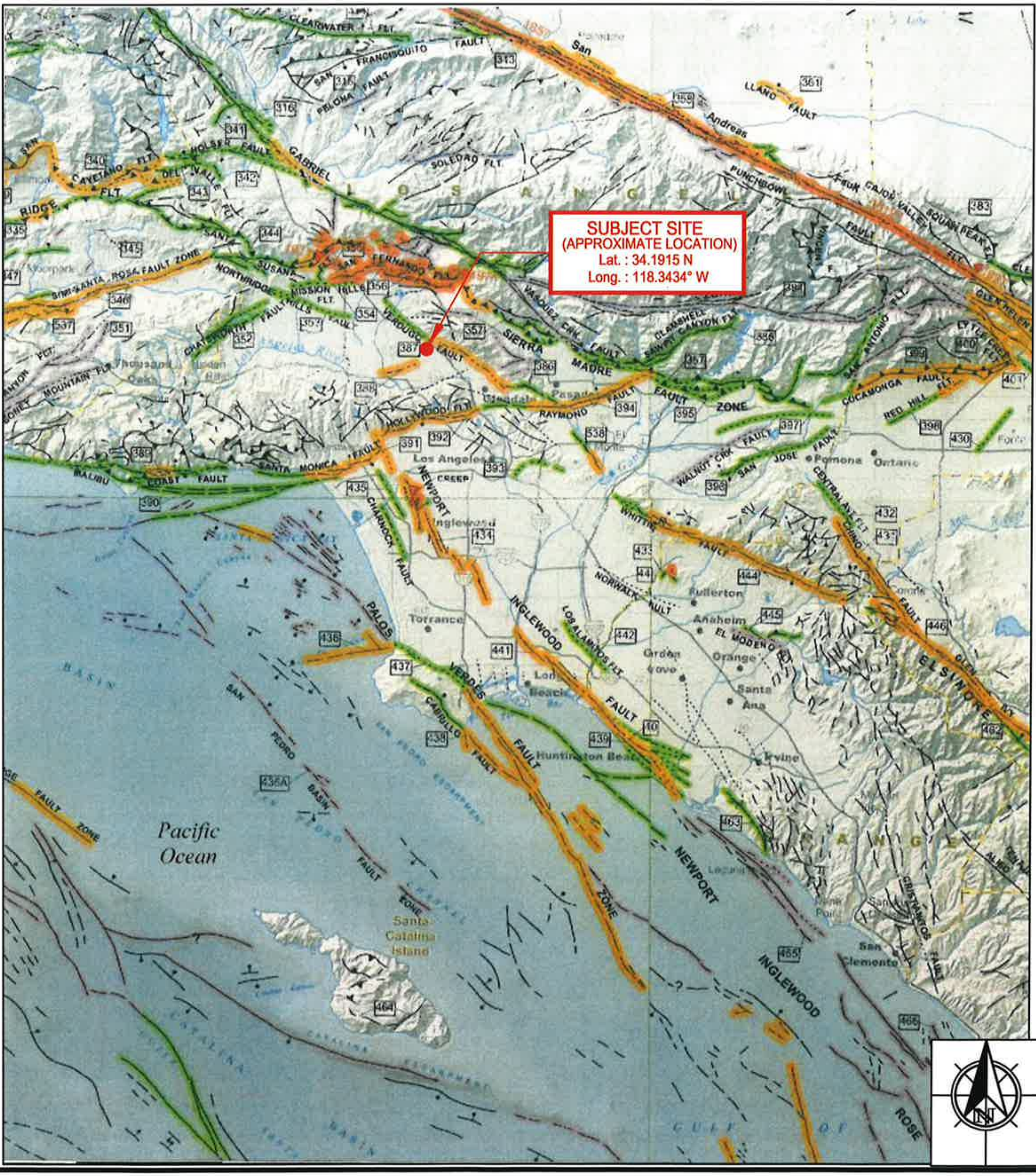
BG: 23025 ABS PROPERTIES, INC.

CONSULTANT : JHP/RSB

DRAWN BY : AS

SCALE: 1" = 12 MILES

REFERENCE: JENNINGS, C.W., AND BRYANT, W.A., 2010, FAULT ACTIVITY MAP OF CALIFORNIA GEOLOGICAL SURVEY, 150th ANNIVERSARY, MAP No 6.



PLOT DATE/TIME: 11/19/2021 - 2:35pm

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

SEISMIC HAZARD ZONES MAP

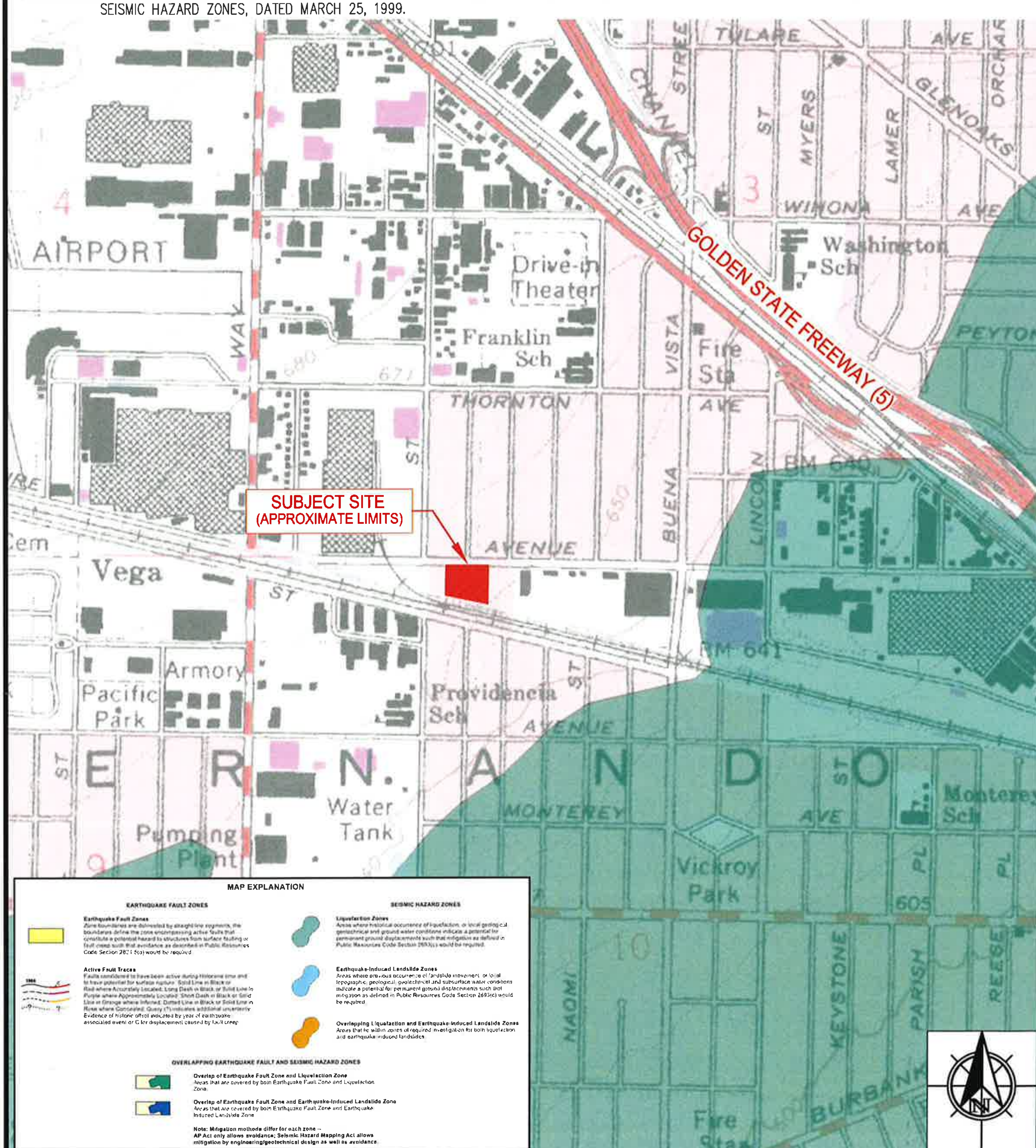
BG: 23025 ABS PROPERTIES, INC.

CONSULTANT : JHP/RSB

DRAWN BY : AS

SCALE: 1" = 1000'

REFERENCE: EARTHQUAKE ZONES OF REQUIRED INVESTIGATION BURBANK QUADRANGLE; EARTHQUAKE FAULT ZONES, DATED JANUARY 01, 1979 AND SEISMIC HAZARD ZONES, DATED MARCH 25, 1999.



CAD FILE: S:\LandProjects\23025 ABS Burbank_3000 W Empire Ave\DWG\SEISMIC HAZARD ZONES MAP.dwg PLOT DATE/TIME: 11/19/2021 – 2:35pm

BYER GEOTECHNICAL INC.

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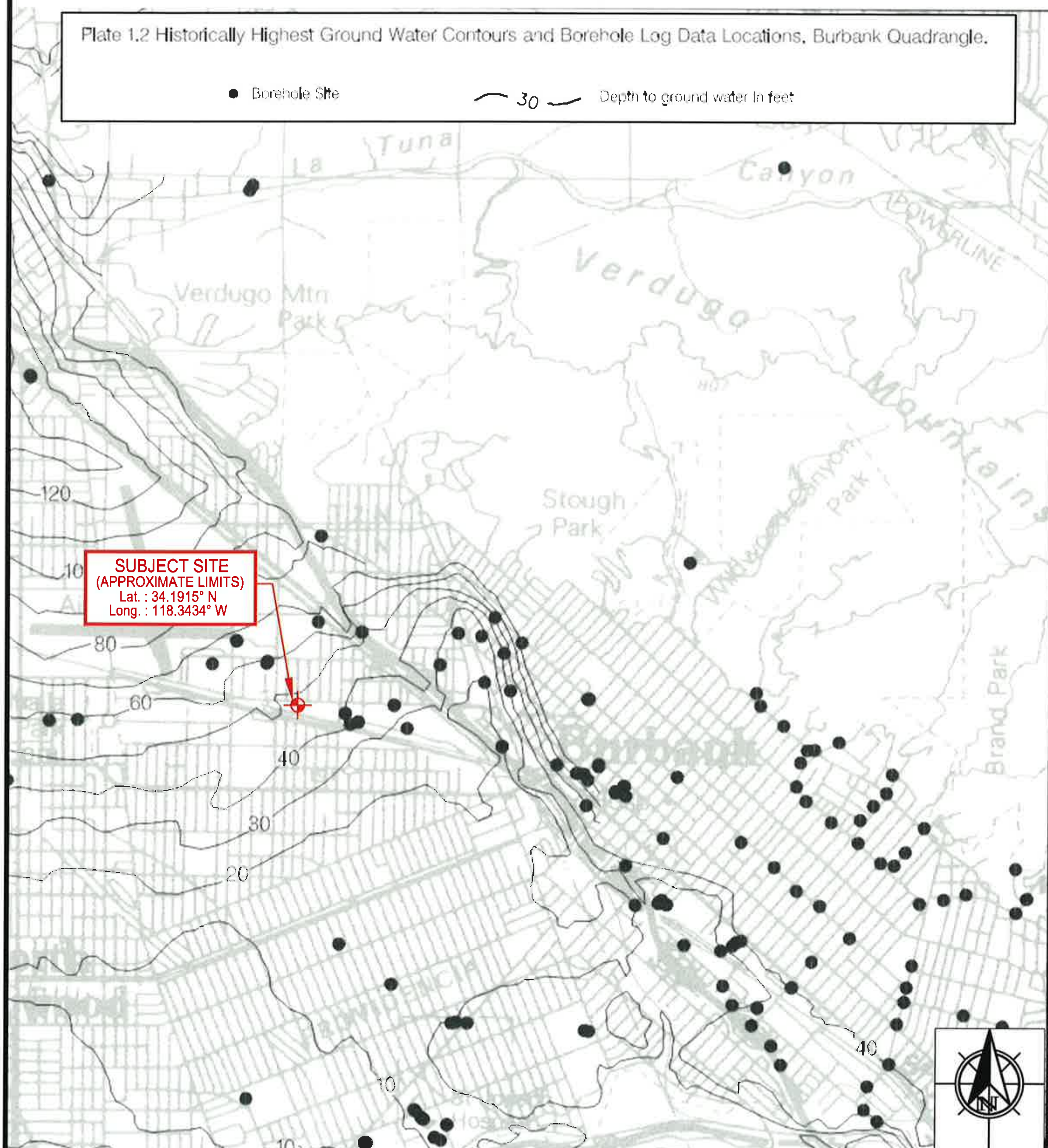
818.549.9959 TEL
818.543.3747 FAX

HISTORIC-HIGH GROUNDWATER MAP

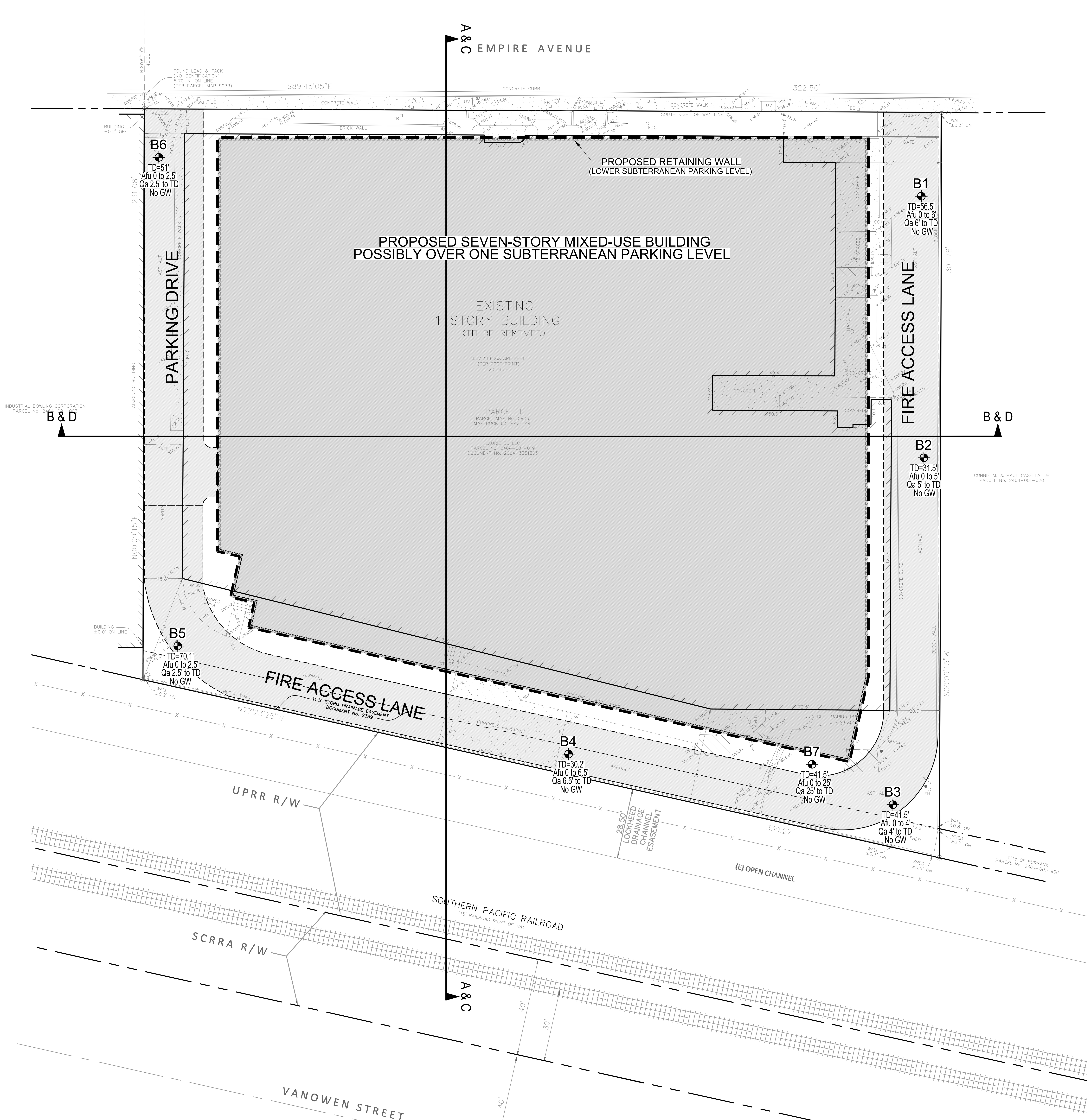
BG: 23025	ABS PROPERTIES, INC.
CONSULTANT : JHP/RIZ	SCALE: 1" = 4000'
DRAWN BY : AS	

REFERENCE: – CGS, 1998, Seismic Hazard Zone Report for the Burbank 7.5–Minute Quadrangle, Los Angeles County, California, Seismic Hazard Zone Report 016.



LEGEND

B1-B6 ⯁	LOCATION AND NUMBER OF HOLLOW-STEM AUGER BORING (REPORT DATED 09/05/2019)
TD=51'	TOTAL DEPTH (FEET)
Afu 0 to 2.5'	DEPTH OF FILL (FEET)
Qa 2.5' to TD	DEPTH OF ALLUVIUM (FEET)
No GW	NO GROUNDWATER ENCOUNTERED
B7 ⯁	LOCATION AND NUMBER OF HOLLOW-STEM AUGER BORING (THIS STUDY)
TD=41.5'	TOTAL DEPTH (FEET)
Afu 0 to 25'	DEPTH OF FILL (FEET)
Qa 25' to TD	DEPTH OF ALLUVIUM (FEET)
No GW	NO GROUNDWATER ENCOUNTERED



REFERENCE: TOPOGRAPHIC SURVEY PREPARED BY ERIC S. CANTRELL, DATED 07/19/2019 AND PROPOSED PLAN BY CUNINGHAM, DATED 08/27/2021.

JUNE 14, 2022

BYER GEOTECHNICAL INC.
1461 E. CHEVY CHASE DR., SUITE 200
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818.549.9959 TEL
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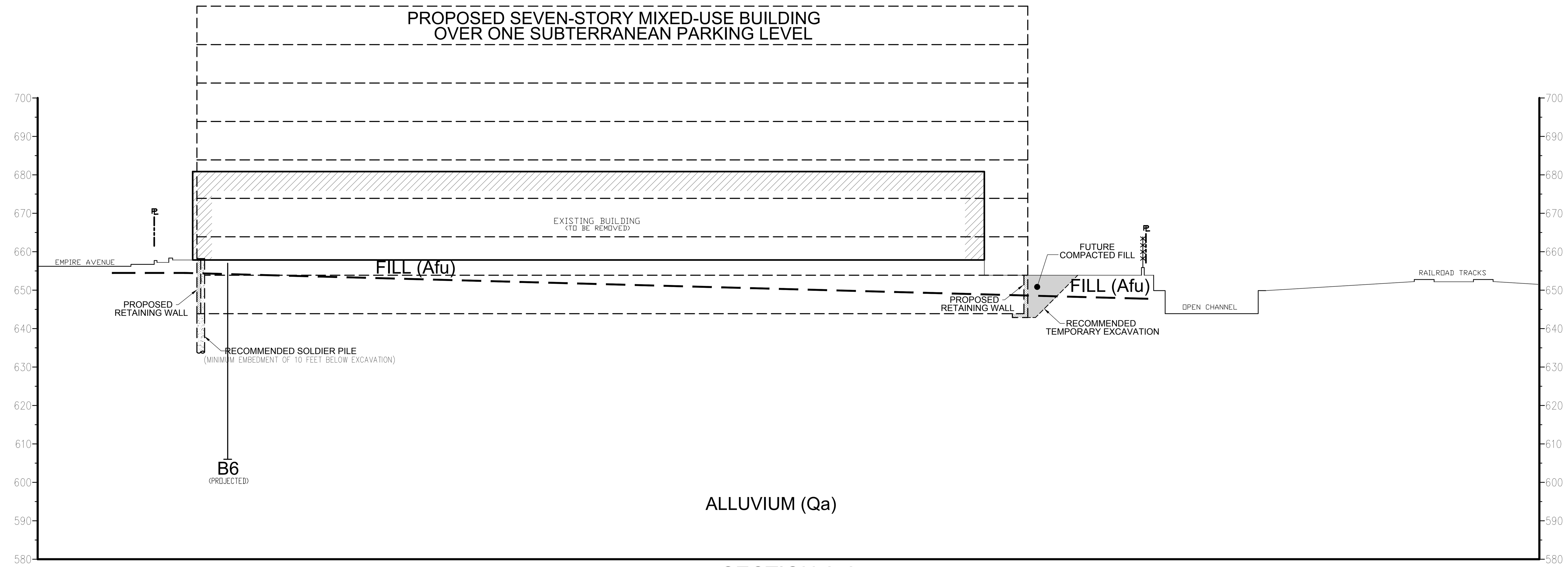
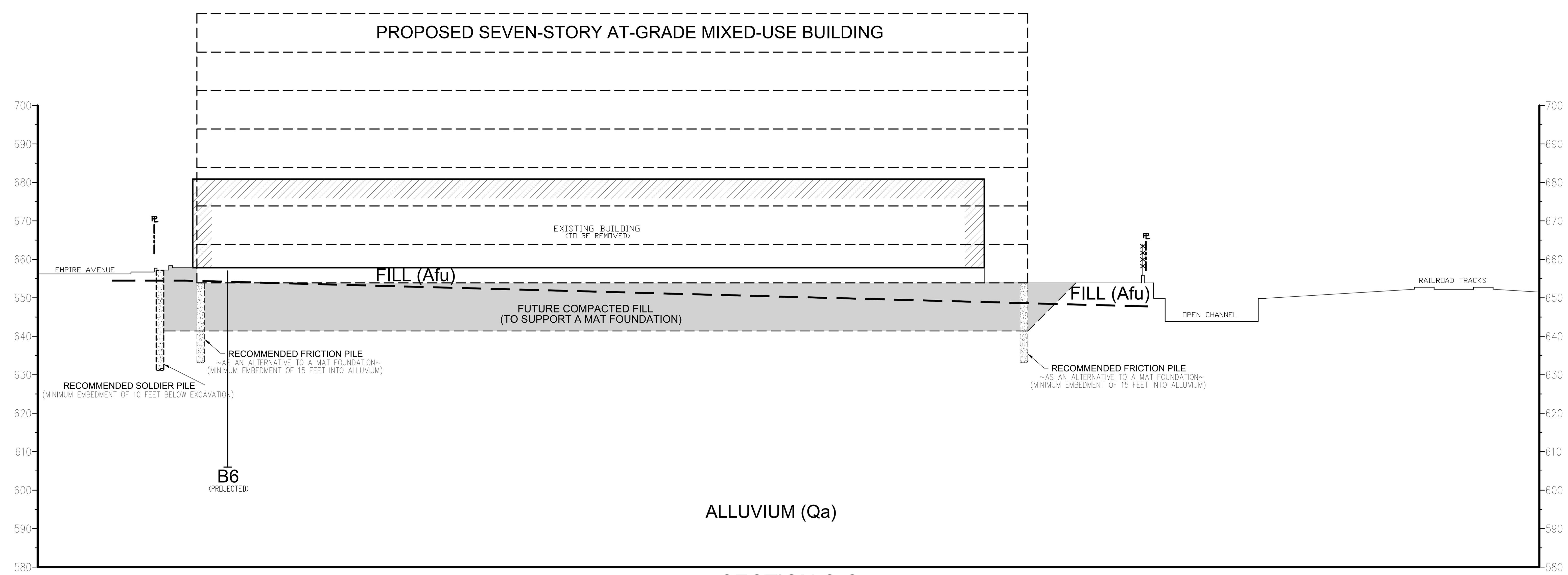
SITE PLAN	
BG: 23025	ABS PROPERTIES, INC.
CONSULTANT: RSB/JHP	SCALE: 1" = 20'
DRAWN BY: AS	



SECTION A-A



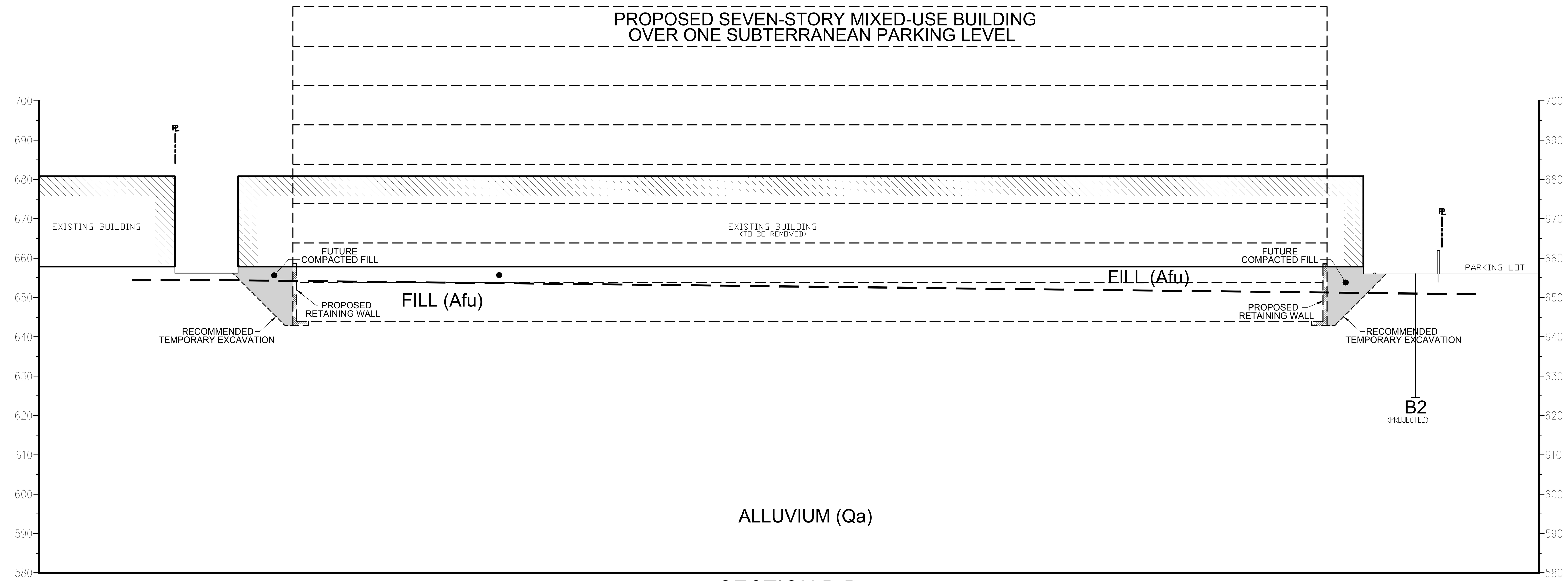
SECTION C-C

JUNE 14, 2022

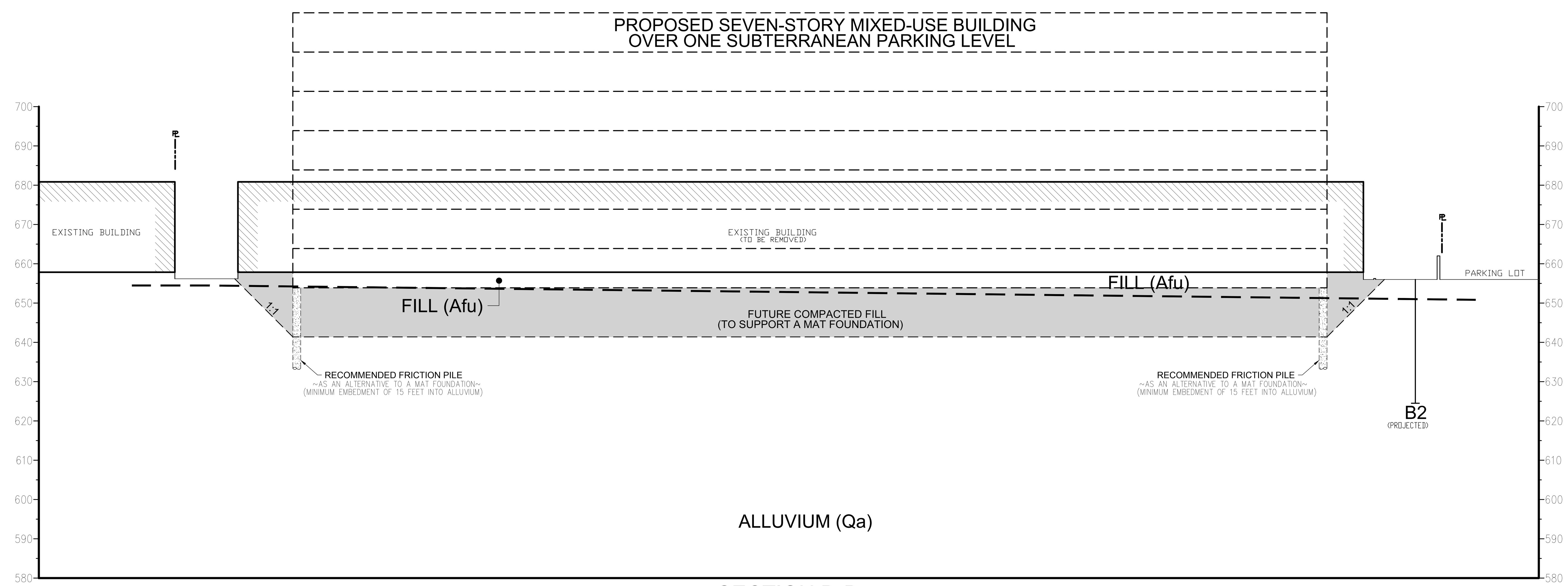
BYER
GEOTECHNICAL
INC.
1461 E. CHEVY CHASE DR., SUITE 200
GLENDALE, CA 91206
818.549.9959 TEL
818.543.3747 FAX

SECTIONS A & C

BG: 23025	ABS PROPERTIES, INC.
CONSULTANT: RSB	
DRAWN BY: AS	SCALE: 1" = 20'



SECTION B-B



SECTION D-D

JUNE 14, 2022

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

SECTIONS B & D

BG: 23025 ABS PROPERTIES, INC.

CONSULTANT : RSB

DRAWN BY : AS

SCALE: 1" = 20'