

Appendix E

Geotechnical Reports, Addenda, and LADBS Approval Letters

- Schick Geotechnical, Inc. Geology/Soils Report (SG 6684-W), April 4, 2014.
- CY Geotech, Inc., Laboratory Test Report (CYG 14-7088), February 28, 2014.
- City of Los Angeles, Department of Building and Safety, Geology and Soils Report Approval Letter, signed by: Edmond Lee, Engineering Geologist Associate II and Ying Liu, Geotechnical Engineer I, July 24, 2015.
- Schick Geotechnical, Inc., Response to City Correction Letter (SG 6684-W), April 16, 2016.
- City of Los Angeles, Department of Building and Safety, Geology and Soils Report Approval Letter, signed by: Edmond Lee, Engineering Geologist Associate II and Ying Liu, Geotechnical Engineer I, June 17, 2016.
- City of Los Angeles, Department of Building and Safety, Geology and Soils Report Approval Letter, signed by: Edmond Lee, Engineering Geologist Associate II and Ying Liu, Geotechnical Engineer I, September 13, 2016.
- Schick Geotechnical, Inc., Addendum Geologic and Soils Engineering Exploration, 1501 Marlay Drive (SG 6684-W), December 17, 2018.
- City of Los Angeles, Department of Building and Safety, Geology and Soils Report Approval Letter, signed by: Edmond Lee, Engineering Geologist Associate II and Ying Liu, Geotechnical Engineer I, April 24, 2019.
- Schick Geotechnical Inc., Addendum Geologic and Soils Engineering Exploration, Revised Retaining Wall Analyses and Kinematic Analysis, 1501 Marlay Drive (SG 6684-W), June 19, 2020.
- City of Los Angeles, Department of Building and Safety, Geology and Soils Report Approval Letter, signed by: Edmond Lee, Engineering Geologist Associate II and Ying Liu, Geotechnical Engineer I, July 22, 2020.

Geologic and Soils Engineering Exploration

Proposed Residence

1501 Marlay Drive

Lot 1, Tract 12204

Los Angeles, California

for

Mr. Coleman

SG 6684-W

April 4, 2014

SCHICK GEOTECHNICAL, INC.

Geology and Soils Engineering, Specializing in Residential Hillside Properties

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Geologic and Soils Engineering Exploration

Proposed Residence

1501 Marlay Drive

Lot 1, Tract 12204

Los Angeles, California

INTRODUCTION

The following report summarizes the findings of our geologic and soils engineering exploration performed on the rear portion of the site. The purpose of this report is to evaluate the nature, distribution, engineering properties, and geologic structure of the earth materials underlying the site and is limited to the area of the proposed residence.

Intent

It is the intent of this report only to aid in the design and completion of the proposed project. Implementation of the "Conclusions and Recommendations" section of this report is intended to reduce certain risks associated with construction projects. The professional opinions and geotechnical advice contained in this report are subject to the general conditions described in the "Notice" section of this report.

EXPLORATION

The scope of this report is based on the proposed plan to construct a single family residence. This report is limited to the area of the proposed residence, as shown on the enclosed Geologic Map and

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Cross Sections. The field exploration was conducted in January 2008 with the aid of hand labor and field geologic mapping. It included mapping of the cut face and obtaining samples of the bedrock. The bedrock samples were returned to the laboratory of C. Y. Geotech, Inc. for the enclosed testing and analysis. Office tasks included laboratory testing, engineering analysis, and the preparation of this report. Procedures and results of the laboratory testing are presented in Appendix I. Surface geologic conditions are shown on the enclosed Geologic Map. Subsurface distribution of the earth materials, and the proposed project are shown on the enclosed Sections. The site was revisited in February 2014, and remains as described herein.

PROPOSED PROJECT

Information concerning the proposed project provided by Paul H. Coleman, Architect, and was used as a guide for the preparation of this report. It is proposed to construct a residence adjacent to Marlay Drive, as shown on the enclosed Geologic Map and Section. Structural engineering and grading plans have not been prepared and await the conclusions and recommendations of this exploration.

SITE DESCRIPTION

The subject property consists of a partially graded hillside vacant lot north of Marlay Drive, on the south flank of the Santa Monica Mountains, Los Angeles, California. Past grading associated with construction of the level pad consisted of making a non-conforming cut on the south side of the level pad. The site ascends above the street at gradients ranging from 1:1 to 2:1 to the offsite ½:1 slope adjacent to the south side of Woods Drive. Surface drainage is by sheet flow runoff down the contours to the south to the street. Seeps and springs were not encountered during the exploration.

EARTH MATERIALS

Fill

The previous offsite grading apparently included placing up to 10 feet of fill over the upper portion of the subject property. The fill consists of silty sand which is medium brown, dry to slightly moist, medium dense, and contains rock fragments.

Bedrock

Bedrock exposed on the cut slope face and underlying the site consists of granite. The granite bedrock is light gray brown, moderately hard to hard, massive, discontinuously jointed, moderately fractured, and moderately weathered.

SEISMIC CONDITIONS

The Southern California region is located within a tectonically active portion of the earth's crust which has produced both small and sizeable earthquakes throughout recorded history and before. As the earth's crust continuously adjusts itself, stresses and strains are built up along discontinuities, referred to as faults. Faults can be generally classified as active, potentially active, or inactive. Faults are considered active if they have produced seismic activity within the past 11,000 years. Faults are considered potentially active if there has been seismic activity along the fault between 11,000 and 1,000,000 years. Inactive faults have not produced any seismic activity within the past 1,000,000 years. In an effort to better inform the public regarding seismic risk, the State of California passed the Alquist-Priolo Special Studies Act in 1972 following the 1971 San Fernando Earthquake. Active faults within the state were identified and zones were established limiting construction within the zones. Following the damaging 1989 Loma Prieta Earthquake, the state enacted the Seismic Hazard Mapping Act (SHMA) in 1990. The Department of Conservation was

empowered to prepare a set of maps designating areas within Los Angeles and a portion of Ventura Counties which are susceptible to seismic slope instability and liquefaction. Recently, real estate disclosure laws have been modified to require disclosure if a property is affected by the Alquist-Priolo Earthquake Fault Zoning Act and the Seismic Hazard Mapping Act. As of March 1, 1998, either the Local Option Real Estate Transfer disclosure Statement or The Natural Hazard Disclosure Statement is required for disclosures.

The subject property is not located within any special study zone (Alquist-Priolo Act, 1972) and no known active fault crosses the site. Active and potentially active faults in the vicinity of the subject property are listed in the following Table I. Following the 1994 Northridge Earthquake, the Department of Conservation, Division of Mines and Geology established areas which are considered to be susceptible to seismically-induced slope failure and liquefaction. These seismic safety zones were published as a series of maps, initially released in 1996. Strong ground motion associated with large earthquakes can cause natural and manufactured slopes to become unstable and experience slumping, landsliding or block failure. The L.A.D.B.S. Parcel Profile Report indicates that the site is located within a zone considered susceptible to seismically-induced slope failure.

The following table lists known active faults within the southern California area which could theoretically produce a sizable earthquake during the expected occupancy period of the property. UBC categories have been established for active faults in accordance with Table 16-U in the 1997 UBC. Faults within category A exhibit magnitudes greater than or equal to 7.0 and slip rates greater than or equal to 5mm/year and have a high rate of seismic activity. Category B faults exhibit magnitudes up to magnitude 7.0, but with slip rates less than 5mm/year. Category C faults exhibit magnitudes less than 6.5 and slip rates less than 2mm/year and have a low rate of seismic activity.

The following fault distances were obtained using GPS Visualizer and EQFault.

(Site Latitude 34.1015; Site Longitude -118.3699)

Fault	UBC Category	Distance from Site (miles)	Maximum Credible Earthquake (Richter Magnitude)*	Risk of Earthquake during Occupancy
<i>San Andreas</i>	A	34.4	8.0	moderate
<i>Newport-Inglewood</i>	B	5.0	6.9	low to moderate
<i>Malibu</i>	B	10.4	6.7	low
<i>Santa Monica</i>	B	3.2	6.6	low
<i>Hollywood</i>	B	1.9	6.7	low
<i>Raymond</i>	B	8.8	6.5	low to moderate
<i>Sierra Madre</i>	B	14.3	6.7	moderate
<i>Santa Susana</i>	B	18.2	6.6	low to moderate
<i>Compton Thrust</i>	B	10.4	6.3	low to moderate
<i>Simi-Santa Rosa</i>	B	28.3	6.7	low
<i>Verdugo</i>	B	9.9	6.7	low
<i>Elysian Park Thrust</i>	B	11.8	6.7	moderate
<i>Palos Verdes</i>	B	14.0	7.1	low
<i>Oak Ridge</i>	B	27.8	6.9	low
<i>Unknown fault</i>	?	?	?	moderate

Table I - Active Faults within the Los Angeles - Ventura County area

* Data obtained from Los Angeles County Seismic Safety Element, 1990; Annual Technical Report, July 1994, Southern California Earthquake Center; Seismic Hazards Study of Ventura County, 1975; and ICBO publication, Maps of Known Active Fault Near-Source Zones, California Division of Mines and Geology, 1998.

HISTORIC EARTHQUAKES

1971 Sylmar Earthquake

On February 9, 1971, a Richter Magnitude 6.4 earthquake occurred along a frontal fault system of the San Gabriel Mountains. In general, one-story buildings performed substantially better than two-story buildings and much better than combination one and two-story buildings. There was no noticeable difference between the performance of concrete-slab floors and wood-joint floors. Considerable damage was experienced by unreinforced masonry structures. Local characteristics of the underlying soils played a significant role in structural performance during the earthquake.

1994 Northridge Earthquake

The subject property is located approximately 11.7 miles southeast of the epicenter of the January 17, 1994 Northridge earthquake which measured 6.7 on the Richter magnitude scale. No evidence of significant earthquake related damage was reported.

FUTURE SEISMICITY

All of southern California is subject to periodic ground shaking from earthquake activity. Sites and structures can experience significant damage during strong seismic shaking. Foundation conditions and the seismic/structural design of the structure greatly affect how the structures will perform during earthquake loading. Significant damage can occur to the site and structures during a strong seismic event.

Seismic Design

The seismic factors listed in the following table can be used in the structural design. The seismic factors were determined based on the findings of the field exploration and in accordance with 2007

California Building Code and City of Los Angeles Building Code.

Seismic Factors for IBC System	Value	Reference (IBC)
Site Class	C	Table 1613.5.2
Mapped Spectral Response Acceleration at 0.2 second Period (S_s)	1.845g	Figure 1613.5(3)
Mapped Spectral Response Acceleration at 1.0 second Period (S_1)	0.600g	Figure 1613.5(4)
Site Coefficient F_a	1.0	Table 1613.5.3 (1)
Site Coefficient F_v	1.3	Table 1613.5.3 (2)
Maximum Considered Earthquake Spectral Response Acceleration at 0.2 second Period (S_{ms})	1.845g	Equation 16.36
Maximum Considered Earthquake Spectral Response Acceleration at 1.0 second Period (S_{m1})	0.780g	Equation 16.37
Design Spectral Response Acceleration at 0.2 second Period (S_{ds})	1.230g	Equation 16.38
Design Spectral Response Acceleration at 1.0 second Period (S_{d1})	0.520g	Equation 16.39
Seismic Design Category	D	CBC 1613.5.6 (1) 1613.5.6 (2)

Due to the nature and density of the earth materials underlying the subject property and the depth to groundwater, earthquake induced liquefaction, consolidation and differential settlement are not likely to occur on the site. Therefore, earthquake induced landslides are not likely to occur on the site.

SLOPE STABILITY

The gross stability of the slope above the residence was analyzed using Bishop's method. The analysis shows that the slope is grossly stable with a factor of safety in excess of 1.5, after the proposed retaining walls have been built as recommended herein. The calculations are based upon shear tests of samples believed to represent the weakest bedrock encountered during exploration.

CONCLUSIONS AND RECOMMENDATIONS

Based upon the exploration, it is the finding of SGI that construction of the proposed residence is feasible from a preliminary geologic and soils engineering standpoint provided the advice and recommendations contained in this report are included in the plans and are implemented during construction. The bearing material is the competent granite bedrock.

The upper, offsite, portion of the site is a steeper gradient than that allowed by the Code. In order to provide protection from potential raveling and rockfall, it is recommended that the upper portion of the site be provided with a 10-foot high impact wall designed for (125 pcf/ft).

FOUNDATION DESIGN

Spread Footings

Continuous and/or pad footings may be used to support the proposed residence provided they are founded into bedrock. 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 Passive Earth Pressure (psf)
Bedrock	12	4,000	0.5	600	6,000

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.

Deepened Foundations - Friction Piles

Friction piles should be a minimum of 24 inches in diameter and a minimum of 8 feet into the competent bedrock. Piles may be assumed fixed at 3 feet into the competent bedrock. The piles may be designed for a skin friction of 800 pounds per square foot for that portion of pile in contact with the bedrock. All piles should be tied in two horizontal directions with grade beams.

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 bedrock. Passive earth pressure may be computed as an equivalent fluid having a density of 600 pounds per cubic foot. The maximum allowable earth pressure is 6,000 pounds per square foot. For design of isolated piles, the allowable passive earth pressure may be increased by 100 percent.

RETAINING WALLS

External retaining walls at the sides of the residence with a horizontal backslope, may be designed for an equivalent fluid pressure of 62 pounds per cubic foot. Retaining walls with a up to a 1:1 backslope should be designed for an equivalent fluid pressure of 80 pounds per cubic foot. The upper retaining wall located north of the residence should be designed for impact for an equivalent fluid pressure of 125 pounds per cubic foot. Retaining walls must be provided with a subdrain

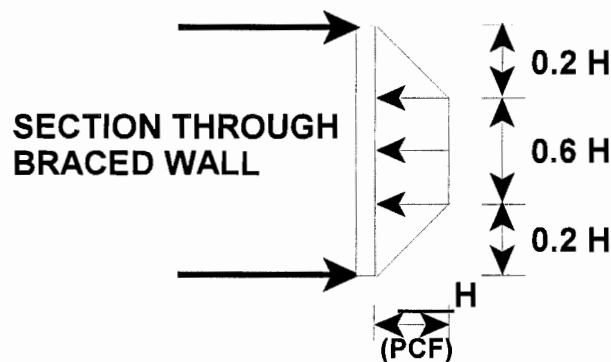
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covered with a minimum of 12 inches of 3/4-inch crushed gravel. Subdrains should rest on a bed of gravel about 6 inches thick. Cantilevered retaining walls are designed to deflect up to 1% their total height upon loading. The deflection can affect nearby hard scape. Retaining wall footings may be sized per the "Deepened Foundations" and "Spread Footings" sections of this report.

Restrained Retaining Wall

Basement retaining walls with a horizontal backslope (east and west walls), restrained at both the top and bottom, may be designed for trapezoidal loading, per the diagram, where 'H' is the total design height. The equivalent fluid pressure for a horizontal backslope is $39H$ pounds per square foot per linear foot of width. The equivalent fluid pressure for the north basement wall with up to a 1:1 backslope, restrained at both the top and bottom, may be designed for trapezoidal loading for $50H$, per square foot per linear foot of width.



Temporary Retaining Wall Excavations

Temporary excavations will be required to construct the proposed retaining walls. Vertical excavations removing lateral support from any adjacent site or structure will require the use of soldier piles. The geologist should be present during grading to see temporary slopes.

Soldier Piles

Soldier piles should be designed per the enclosed calculations. Soldier piles should be a minimum of 24 inches in diameter and a minimum of 8 feet into bedrock, below the future excavation bottom. Piles may be assumed fixed at 3 feet into bedrock, below the future excavation bottom. The piles may be designed for a skin friction of 800 pounds per square foot for that portion of pile in contact with the bedrock, below the future excavation bottom. Soldier piles should be spaced 10 feet on center and may be incorporated into the final wall design. The soldier piles may be designed per the retaining wall recommendations contained herein. Passive earth pressure may be computed as an equivalent fluid having a density of 600 pounds per cubic foot, below the future excavation bottom. The maximum allowable earth pressure is 6,000 pounds per square foot. For design of isolated piles, the allowable passive earth pressure may be increased by 100 percent. Piles spaced more than 3 pile diameters on center may be considered isolated.

Waterproofing

Walls located below grade are susceptible to moisture penetration and no waterproofing system can guarantee 100% protection. The most effective means of providing protection against moisture penetration is application of a waterproofing system on the backside of the retaining wall, prior to backfilling. It is recommended that the foundation contractor provide recommendations for proven waterproofing systems to be utilized.

Retaining Wall Backfill

Retaining wall backfill should be compacted to a minimum of 90 percent of the maximum density as determined by ASTM D 1557-12 or equivalent. If the earth materials contain less than 15 percent clay, the compaction must be a minimum of 95 percent of the maximum density. Where access

between the retaining wall and the temporary excavation prevents the use of compaction equipment, retaining walls should be backfilled with 3/4-inch crushed gravel to within 2 feet of the ground surface. Where the area between the wall and the excavation exceeds 24 inches, the gravel must be vibrated or wheel-rolled, and tested for compaction. The upper 2 feet of backfill above the gravel should consist of a compacted fill blanket to the surface.

Foundation Settlement

Settlement of the foundation system is expected to occur on initial application of loading. A settlement of 1/4 to 1/2 inch may occur, however, differential settlement should not exceed 1/4 inch.

Excavation Characteristics

The test pits did not encounter hard to excavate bedrock. Excavation difficulty is a function of degree of weathering and amount of fracturing within the bedrock. Hard areas occur at random locations and depths and may be encountered during foundation excavation. Should a hard area be encountered, coring or the use of jackhammers will likely be necessary. Groundwater and natural seepage were not encountered during the exploration of either site.

DRAINAGE

Pad and roof drainage must be collected and transferred to the street or approved location in non-erosive drainage devices. Drainage must not be allowed to pond on the pad or against any foundation or retaining wall.

PLAN REVIEW

Formal plans ready for submittal to the Building Department must be reviewed by SGI, and must

conform with the current building Code. Any change in scope of the project may require additional geotechnical and engineering work.

SITE OBSERVATION

It is required that the foundation and wall excavations be observed by the geologist prior to placing forms, concrete, or steel. The City of Los Angeles requires that the entire length of subdrain behind retaining walls is observed by a representative of this office. All gravel backfill above the subdrain must be observed by a representative of SGI prior to placing a minimum of two feet of controlled fill as a cap. Please advise SGI at least 24 hours prior to any required site visit. All approved plans and permits must be at the site. Should the observations reveal any unforeseen hazard or problem, the geologist will provide additional recommendations. Please advise SGI at least 24 hours prior to any required site visit. All approved plans and permits must be at the site for review.

CONSTRUCTION SITE MAINTENANCE

It is the responsibility of the contractor to maintain a safe construction site per the applicable CAL-OSHA requirements.

Please call this office with any questions. This report and the exploration are subject to the following NOTICE. Please read the Notice carefully, as it limits our liability.

NOTICE

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 us and the conclusions and recommendations are modified or reaffirmed after such review. The subsurface conditions, excavation characteristics, and earth materials described herein and shown on the enclosed cross section have been projected from excavations on the site as indicated and should in no way be construed to reflect any variations that may occur between these 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 or recommendations during construction requires the review of the engineering geologist and geotechnical engineer during the course of construction.

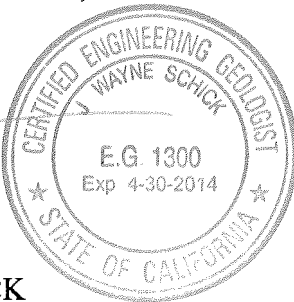
THE EXPLORATION WAS PERFORMED ONLY ON A PORTION OF THE SITE, AND CANNOT BE CONSIDERED AS INDICATIVE OF THE PORTIONS OF THE SITE NOT EXPLORED.

This report is issued and made for the sole use and benefit of the client, is not transferable and is as of the exploration date. Any liability in connection herewith shall not exceed the fee for the exploration. No warranty, expressed or implied, is made or intended in connection with the above exploration or by the furnishing of this report or by any other oral or written statement.

THIS REPORT WAS PREPARED ON THE BASIS OF THE PLOT PLAN FURNISHED, AND WAS PREPARED. FINAL PLANS MUST BE REVIEWED BY THIS OFFICE AS ADDITIONAL GEOTECHNICAL WORK MAY BE REQUIRED.

SGI has reviewed, concurs with, and accepts responsibility for the enclosed laboratory testing performed by C. Y. Geotech, Inc. The laboratory test results included in Appendix I were used in preparation of this report.

Respectfully submitted,



WAYNE SCHICK
C.E.G. 1300



JOHN TSAO
P.E. 46886

Enc: Appendix I - Laboratory Testing
Vicinity Map
Regional Geologic Map
Table I
Geologic Map and Sections
Calculations

xc: (4) Addressee

TABLE I - LOG OF TEST PITS

Test Pit Number	Depth (Feet)	Description
1	0 - 2	Fill: Silty Sand; medium brown, dry to slightly moist, medium dense
	2 - 5	Bedrock: Granite; medium grey-brown, moderately hard to hard with depth, massive, moderately fractured, moderately weathered End at 5 feet; No Water; No Caving
2	0 - 10	Fill: Silty Sand; medium brown, dry to slightly moist, medium dense
	10 - 13	Bedrock: Granite; medium grey-brown, moderately hard to hard with depth, massive, moderately fractured, moderately weathered End at 13 feet; No Water; No Caving
3	0 - 10	Fill: Silty Sand; medium brown, dry to slightly moist, medium dense
	10 - 14	Bedrock: Granite; medium grey-brown, moderately hard to hard with depth, massive, moderately fractured, moderately weathered End at 14 feet; No Water; No Caving

C. Y. GEOTECH, INC.

Engineering Geology and Geotechnical Engineering

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February 28, 2014

P. N. CYG-14-7088

LABORATORY TESTING SERVICES

As requested by Mr. Wayne Schick of Schick Geotechnical, Inc. (SG), C. Y. Geotech (CYG) , Inc. has performed the laboratory tests as listed in Table 1 for SG project SG 6684-W, at 1501 N. Marlay Drive, Los Angeles, California. The testing procedures of ASTM (American Society for Testing and Materials) Standards were followed in the laboratory tests. The CYG laboratory is certified by the City of Los Angeles Department of Building and Safety.

Client Name: Schick Geotechnical, Inc.
Project Name: SG/ Coleman
SG Project No: SG 6684-W
Project Address: 1501 N. Marlay Drive, Los Angeles, California

The type and quantity of laboratory tests are listed in Table 1. The results of laboratory tests are summarized in Table 2 and Plate DS-1. If you have any questions regarding the laboratory testing, please do not hesitate to call us.

Very truly yours,
C. Y. Geotech, Inc.



John T. Tsao
RCE 46886



TEST PROCEDURES

Moisture-Density Test

Onsite soil was classified in the field and laboratory in accordance with the USCS (Unified Soil Classification System) classification system. Moisture contents are performed in general accordance with ASTM Test Designation D2216. Unit weights were determined in general accordance with ASTM Test Designation D2937. The results of moisture-density test is listed in Table 2.

Direct Shear Test

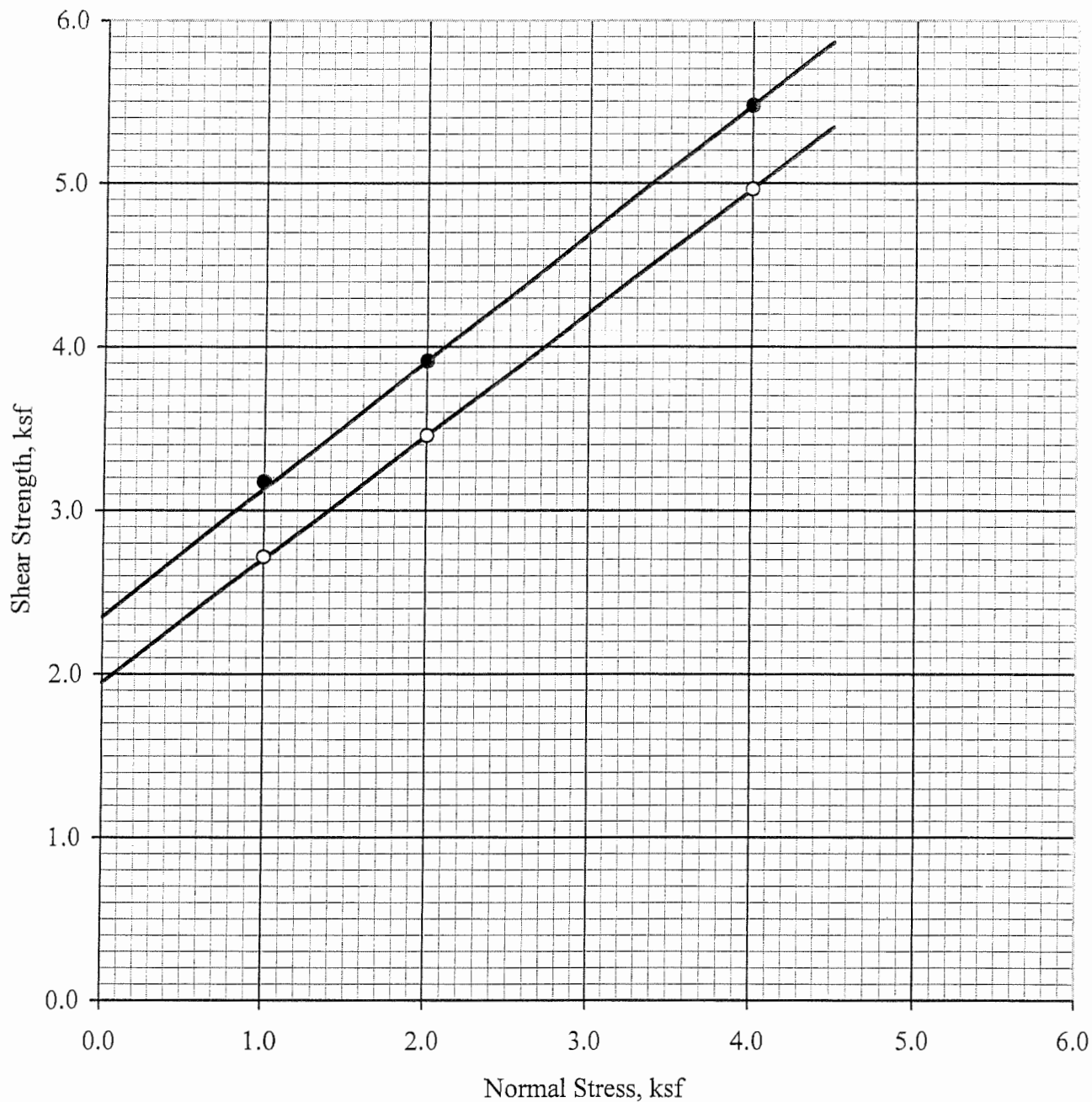
One direct shear test was performed on selected rock sample to determine the shear strength parameters of onsite Soil. The direct shear test was performed in accordance with ASTM Standard D-3080 by using a strain control type direct shear machine and under an artificially saturated condition. The samples were submerged into water for one or two days to saturate the samples prior to testing. The samples were tested under the following procedures: 1) the sample is placed in the shear box and then a selected normal stress is applied to the specimen, 2) the sample is compressed by the normal stress until an equilibrium state is reached, 3) the sample is sheared under a constant rate of shear displacement of 0.004 inches per minute, 4) the peak value of shear strength during shearing was recorded as the peak shear strength, 5) back-shear the sample to the original position and then reshear the sample to record the peak value as the ultimate shear strength. Three samples were tested with different normal loads following the abovementioned testing procedures. The results were plotted on a normal-stress vs. shearing strength diagram to determine the shear strength parameters: cohesion and angle of internal friction. The results of direct shear test are presented on Plate DS-1.

Table 1. Type and Quantity of Laboratory Test

Laboratory Test	Quantity	ASTM Standard
Density and Moisture Content	1	D-2216-05
Direct Shear Test	1	D-3080-04

Table 2. Results of the Dry Density-Moisture Content Test

Location	Depth ft	Soils Description	Dry Density, pcf	Moisture Content, %
Onsite	----	Light brown granite	150	1



- Peak - At Saturation Moisture Content
- Ultimate - At Saturation Moisture Content

$C = 2350 \text{ psf}$ $\phi = 38^\circ$
 $C = 1950 \text{ psf}$ $\phi = 37^\circ$

Field Dry Density = 150 pcf
 Field Moisture Content = 1 %
 Saturation Moisture Content = 3 %

Boring : Onsite
 Depth : -- --
 Description : Light brown granite

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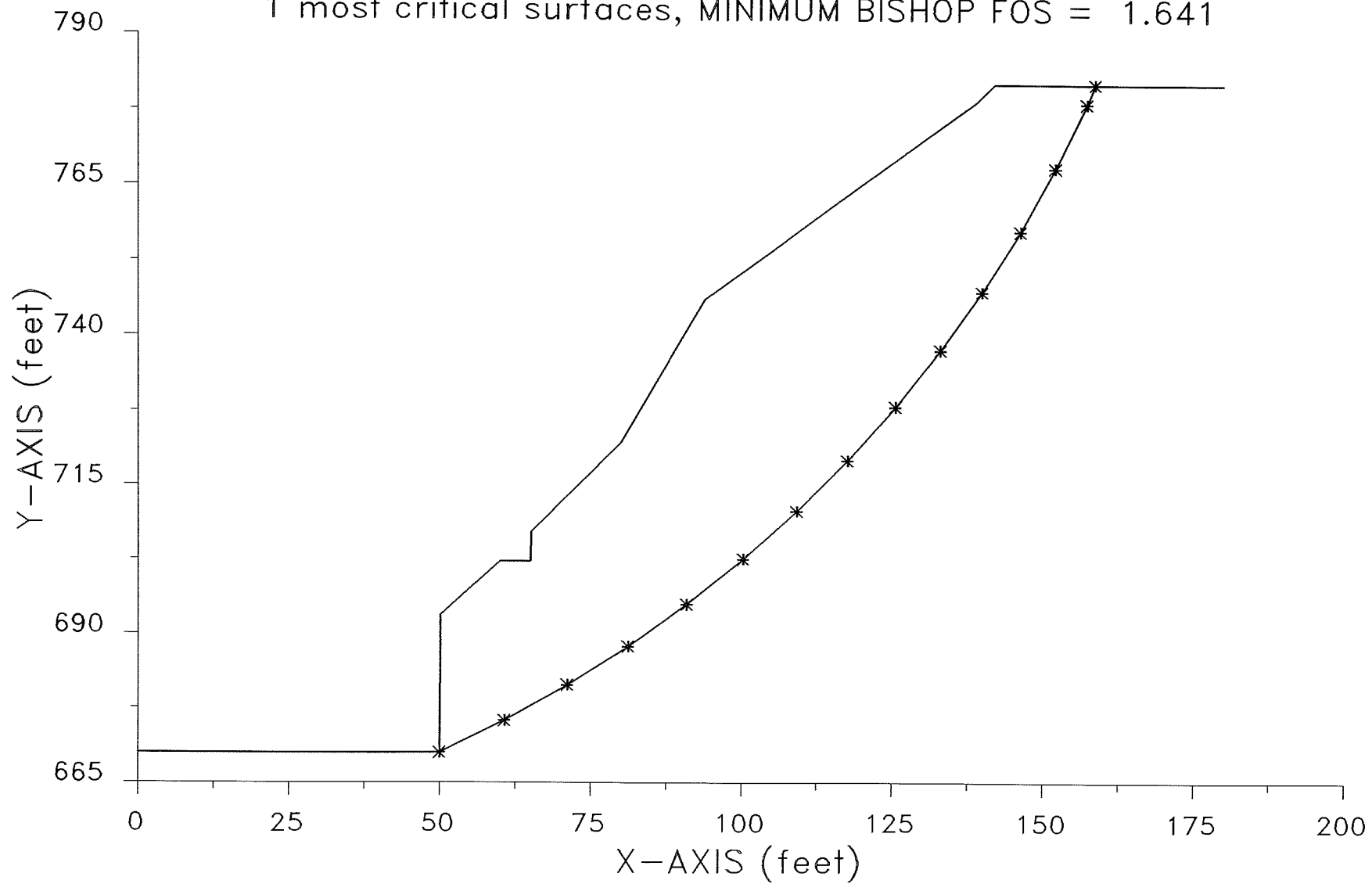
Date : 02-2014

P.N. No.: CYG-14-7088

Shear Diagram

A-A' \ Circular \ Static

1 most critical surfaces, MINIMUM BISHOP FOS = 1.641



Problem Description : A-A'\Circular\Static

SEGMENT BOUNDARY COORDINATES

10 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	670.0	50.0	670.0	1
2	50.0	670.0	50.1	693.0	1
3	50.1	693.0	60.0	702.0	1
4	60.0	702.0	65.0	702.0	1
5	65.0	702.0	65.1	707.0	1
6	65.1	707.0	80.0	722.0	1
7	80.0	722.0	94.0	746.0	1
8	94.0	746.0	139.0	779.0	1
9	139.0	779.0	142.0	782.0	1
10	142.0	782.0	180.0	782.0	1

ISOTROPIC Soil Paramcters

1 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pressure Constant (psf)	Water Surface No.
1	155.0	155.0	1950.0	37.00	.000	.0	0

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

1000 trial surfaces will be generated and analyzed.

1000 Surfaces initiate from each of 1 points equally spaced along the ground surface between x = 50.0 ft

and x = 50.0 ft

Each surface terminates between x = 70.0 ft

and x = 180.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *
12.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS :

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees

Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 15 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	50.00	670.00
2	60.74	675.35
3	71.17	681.29
4	81.26	687.79
5	90.97	694.83
6	100.28	702.40
7	109.17	710.47
8	117.60	719.01
9	125.55	728.00
10	132.99	737.41
11	139.90	747.22
12	146.27	757.39
13	152.07	767.90
14	157.28	778.71
15	158.65	782.00

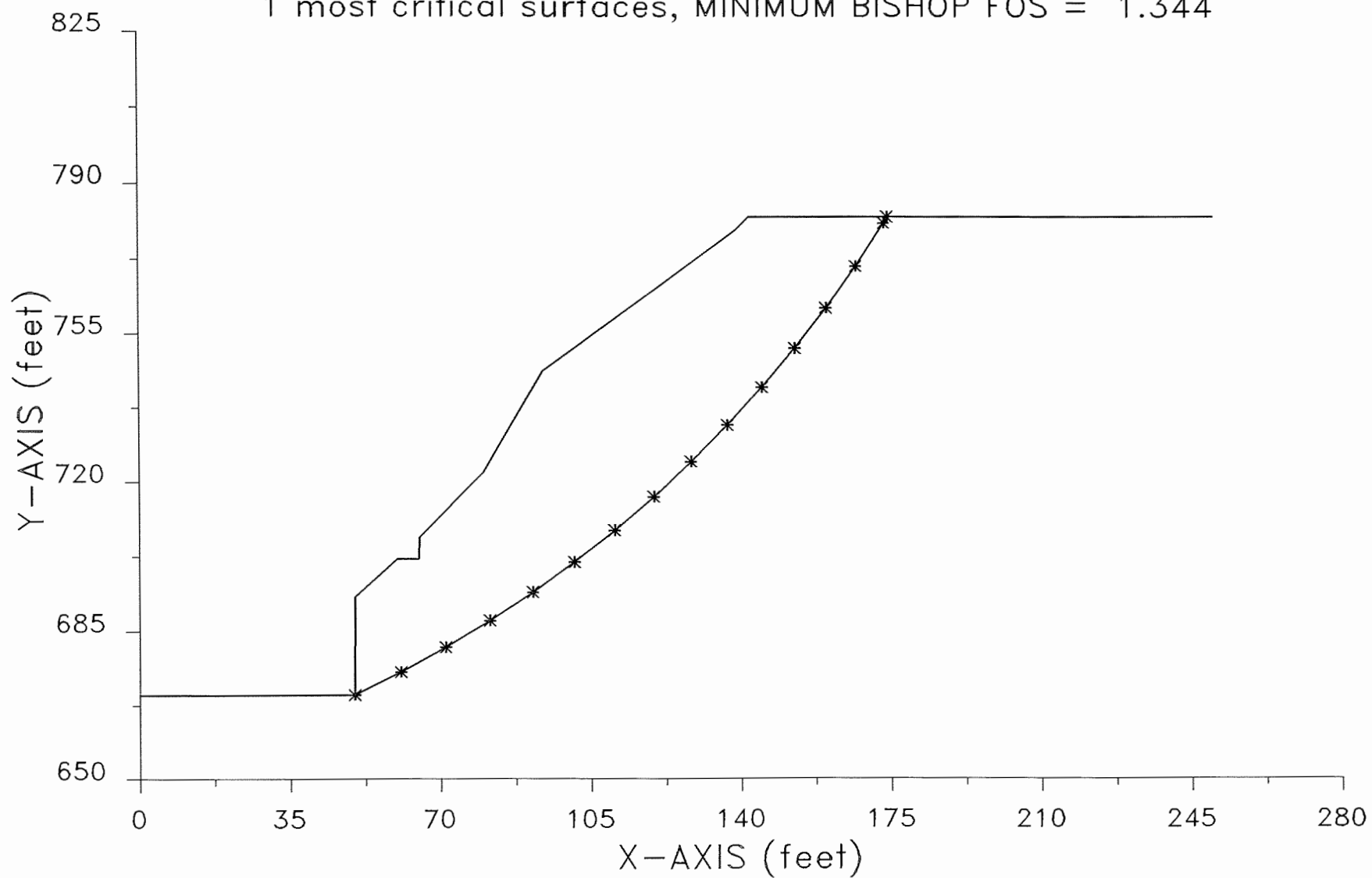
**** Simplified BISHOP FOS = 1.641 ****

The following is a summary of the TEN most critical surfaces
Problem Description : A-A'\Circular\Static

	FOS (BISHOP)	Circle x-coord (ft)	Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.641	-42.12	868.19	218.55	50.00	158.65	1.391E+08
2.	1.641	-41.82	866.92	217.28	50.00	158.11	1.374E+08
3.	1.641	-32.98	858.07	205.57	50.00	157.91	1.319E+08
4.	1.642	-49.00	881.82	233.81	50.00	162.34	1.543E+08
5.	1.642	-53.03	878.32	232.41	50.00	158.41	1.448E+08
6.	1.643	-48.27	881.96	233.64	50.00	162.81	1.553E+08
7.	1.644	-33.41	866.41	213.38	50.00	162.48	1.450E+08
8.	1.644	-62.22	896.57	252.84	50.00	163.10	1.652E+08
9.	1.644	-21.20	844.02	188.02	50.00	156.23	1.211E+08
10.	1.645	-20.21	845.33	188.87	50.00	157.63	1.242E+08

A-A' \ Circular \ Seismic

1 most critical surfaces, MINIMUM BISHOP FOS = 1.344



Problem Description : A-A'\Circular\Seismic

SEGMENT BOUNDARY COORDINATES

10 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	670.0	50.0	670.0	1
2	50.0	670.0	50.1	693.0	1
3	50.1	693.0	60.0	702.0	1
4	60.0	702.0	65.0	702.0	1
5	65.0	702.0	65.1	707.0	1
6	65.1	707.0	80.0	722.0	1
7	80.0	722.0	94.0	746.0	1
8	94.0	746.0	139.0	779.0	1
9	139.0	779.0	142.0	782.0	1
10	142.0	782.0	250.0	782.0	1

ISOTROPIC Soil Parameters

1 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	152.0	155.0	2350.0	38.00	.000	.0	0

A horizontal earthquake loading coefficient
of .238 has been assigned

A vertical earthquake loading coefficient
of .000 has been assigned

A critical failure surface searching method, using a random
technique for generating CIRCULAR surfaces has been specified.

1000 trial surfaces will be generated and analyzed.

1000 Surfaces initiate from each of 1 points equally spaced
along the ground surface between x = 50.0 ft
and x = 50.0 ft

Each surface terminates between x = 70.0 ft
and x = 250.0 ft

Unless further limitations were imposed, the minimum elevation
at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *
12.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS :

The first segment of each failure surface will be inclined
within the angular range defined by :

Lower angular limit := -45.0 degrees

Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface
is specified by 16 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	50.00	670.00
2	60.73	675.37
3	71.24	681.17
4	81.50	687.39
5	91.49	694.04
6	101.20	701.09
7	110.61	708.53
8	119.71	716.35
9	128.49	724.54
10	136.91	733.08
11	144.98	741.96
12	152.68	751.17
13	160.00	760.68
14	166.91	770.49
15	173.42	780.57
16	174.27	782.00

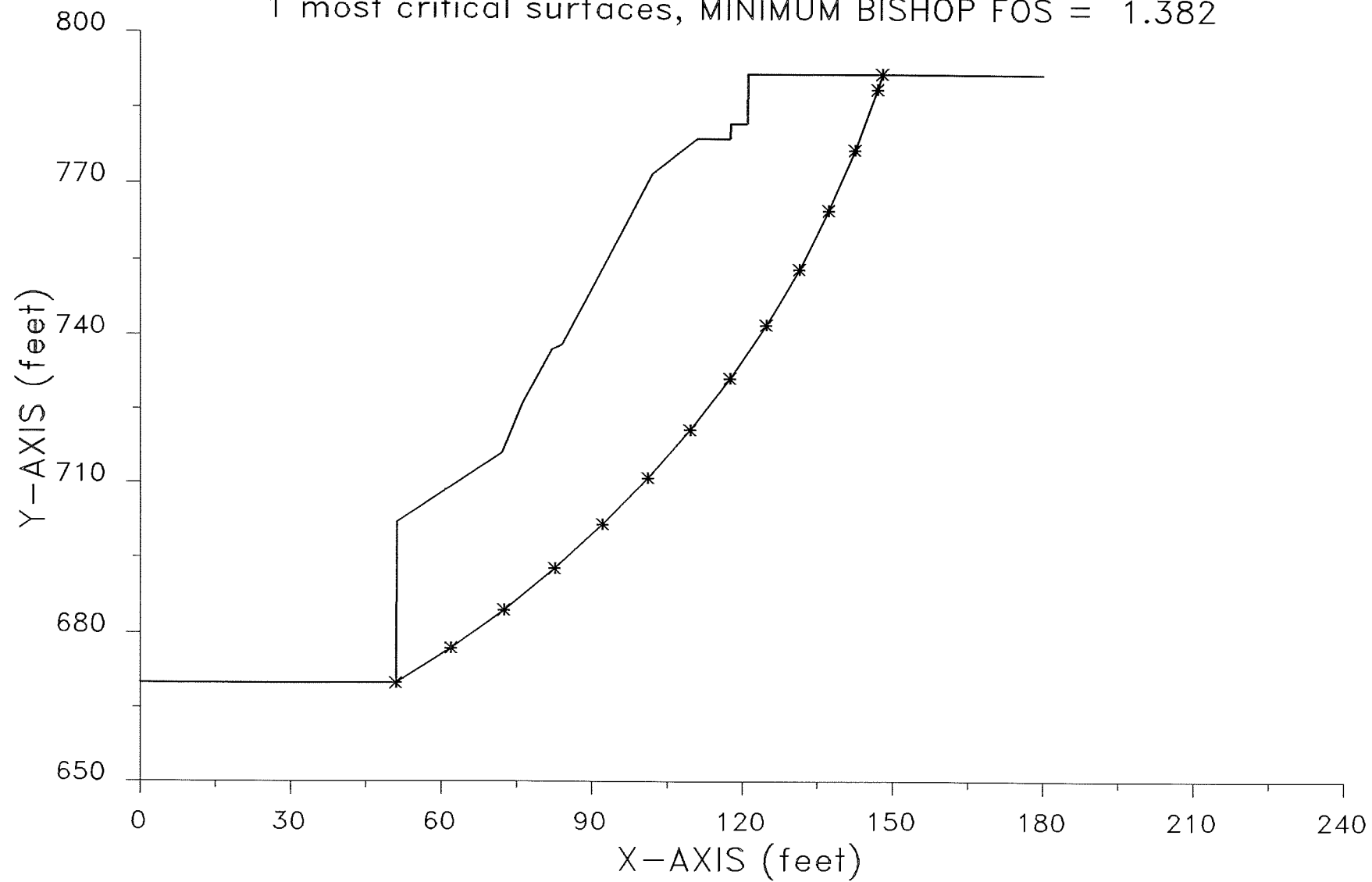
**** Simplified BISHOP FOS = 1.344 ****

The following is a summary of the TEN most critical surfaces
Problem Description : A-A'\Circular\Seismic

	FOS (BISHOP)	Circle Center x-coord y-coord (ft) (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.344	-75.25 933.98	292.18	50.00	174.27	2.146E+08
2.	1.344	-50.20 909.48	259.60	50.00	175.88	2.001E+08
3.	1.346	-48.01 892.08	242.74	50.00	168.30	1.723E+08
4.	1.346	-79.04 931.12	291.26	50.00	171.14	2.056E+08
5.	1.347	-50.94 893.32	245.07	50.00	167.33	1.713E+08
6.	1.348	-31.76 878.35	223.82	50.00	170.24	1.668E+08
7.	1.348	-29.97 875.62	220.63	50.00	169.81	1.641E+08
8.	1.349	-121.44 998.18	370.26	50.00	179.10	2.763E+08
9.	1.352	-46.10 881.31	232.14	50.00	163.64	1.565E+08
10.	1.353	-19.31 865.45	207.37	50.00	170.51	1.589E+08

B-B' \ Circular \ Static

1 most critical surfaces, MINIMUM BISHOP FOS = 1.382



Problem Description : B-B'\Circular\Static

SEGMENT BOUNDARY COORDINATES

13 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	670.0	51.0	670.0	1
2	51.0	670.0	51.1	702.0	1
3	51.1	702.0	72.0	716.0	1
4	72.0	716.0	76.0	726.0	1
5	76.0	726.0	82.0	737.0	1
6	82.0	737.0	84.0	738.0	1
7	84.0	738.0	102.0	772.0	1
8	102.0	772.0	111.0	779.0	1
9	111.0	779.0	117.5	779.0	1
10	117.5	779.0	117.6	782.0	1
11	117.6	782.0	121.0	782.0	1
12	121.0	782.0	121.1	792.0	1
13	121.1	792.0	180.0	792.0	1

ISOTROPIC Soil Parameters

1 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pressure Constant (psf)	Water Surface No.
1	155.0	155.0	1950.0	37.00	.000	.0	0

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

1000 trial surfaces will be generated and analyzed.

1000 Surfaces initiate from each of 1 points equally spaced along the ground surface between x = 51.0 ft

and x = 51.0 ft

Each surface terminates between x = 62.0 ft

and x = 180.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *
13.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS :

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees

Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 14 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	51.00	670.00
2	61.97	676.97
3	72.52	684.58
4	82.59	692.80
5	92.15	701.60
6	101.18	710.95
7	109.64	720.83
8	117.50	731.18
9	124.73	741.99
10	131.30	753.20
11	137.20	764.78
12	142.41	776.70
13	146.90	788.90
14	147.83	792.00

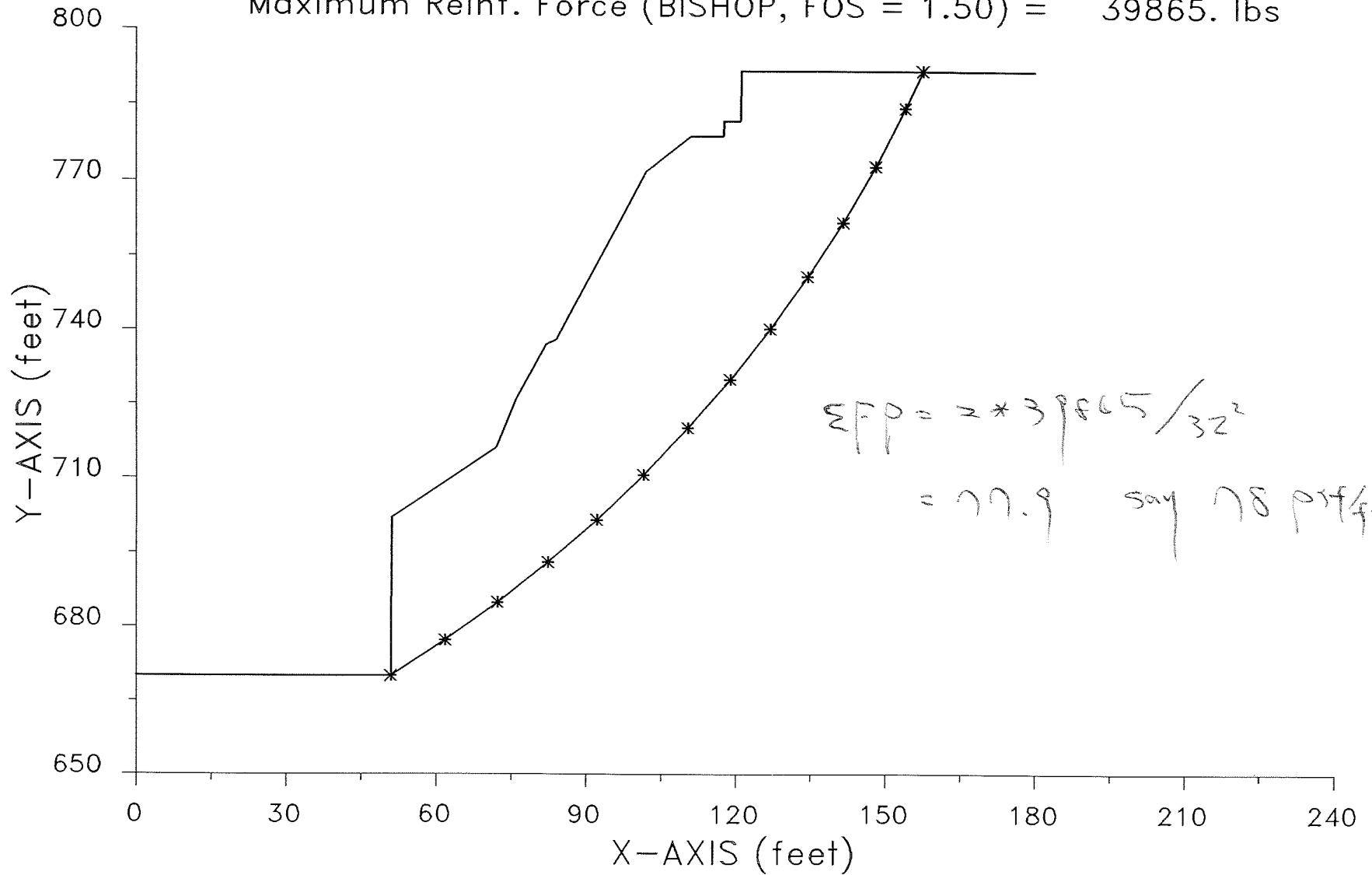
**** Simplified BISHOP FOS = 1.382 ****

The following is a summary of the TEN most critical surfaces
Problem Description : B-B'\Circular\Static

	FOS (BISHOP)	Circle Center x-coord y-coord (ft) (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.382	-60.98 858.44	219.21	51.00	147.83	1.355E+08
2.	1.383	-67.41 866.56	229.47	51.00	149.53	1.438E+08
3.	1.384	-53.55 847.00	205.57	51.00	144.49	1.229E+08
4.	1.384	-46.65 846.01	201.28	51.00	147.16	1.264E+08
5.	1.385	-95.88 895.10	268.78	51.00	152.26	1.686E+08
6.	1.387	-106.24 901.02	279.46	51.00	151.00	1.706E+08
7.	1.387	-36.65 834.13	186.07	51.00	144.51	1.150E+08
8.	1.387	-107.61 901.95	281.00	51.00	150.91	1.711E+08
9.	1.387	-36.44 832.22	184.28	51.00	143.35	1.122E+08
10.	1.387	-35.64 831.41	183.19	51.00	143.21	1.115E+08

B-B' \ Circular \ Static \ FS=1.5

Maximum Reinf. Force (BISHOP, FOS = 1.50) = 39865. lbs



Problem Description : B-B'\Circular\Static\FS=1.5

SEGMENT BOUNDARY COORDINATES

13 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	670.0	51.0	670.0	1
2	51.0	670.0	51.1	702.0	1
3	51.1	702.0	72.0	716.0	1
4	72.0	716.0	76.0	726.0	1
5	76.0	726.0	82.0	737.0	1
6	82.0	737.0	84.0	738.0	1
7	84.0	738.0	102.0	772.0	1
8	102.0	772.0	111.0	779.0	1
9	111.0	779.0	117.5	779.0	1
10	117.5	779.0	117.6	782.0	1
11	117.6	782.0	121.0	782.0	1
12	121.0	782.0	121.1	792.0	1
13	121.1	792.0	180.0	792.0	1

ISOTROPIC Soil Parameters

1 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Unit Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pore Pressure Constant (psf)	Water Surface No.
1	155.0	155.0	1950.0	37.00	.000	.0	0

REINFORCED SLOPE ANALYSIS

The analysis will be performed to determine the critical surface that requires the largest amount of reinforcing force to satisfy:

Minimum (required) FOS = 1.500
Resultant at Elevation = 670.00 feet

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

1000 trial surfaces will be generated and analyzed.

1000 Surfaces initiate from each of 1 points equally spaced along the ground surface between x = 51.0 ft

and x = 51.0 ft

Each surface terminates between x = 62.0 ft

and x = 180.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *
13.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS :

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees

Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :

* * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface is specified by 14 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	51.00	670.00
2	61.84	677.18
3	72.33	684.85
4	82.47	692.99
5	92.21	701.60
6	101.55	710.64
7	110.46	720.11
8	118.93	729.97
9	126.93	740.22
10	134.45	750.82
11	141.47	761.76
12	147.98	773.01
13	153.97	784.55
14	157.41	792.00

 ** Maximum Required Reinforcement Force = 3.9865E+04 (lb) **
 ** Simplified BISHOP FOS = 1.500 (for above reinforcement) **

The following is a summary of the TEN most critical surfaces
 Problem Description : B-B'\Circular\Static\FS=1.5

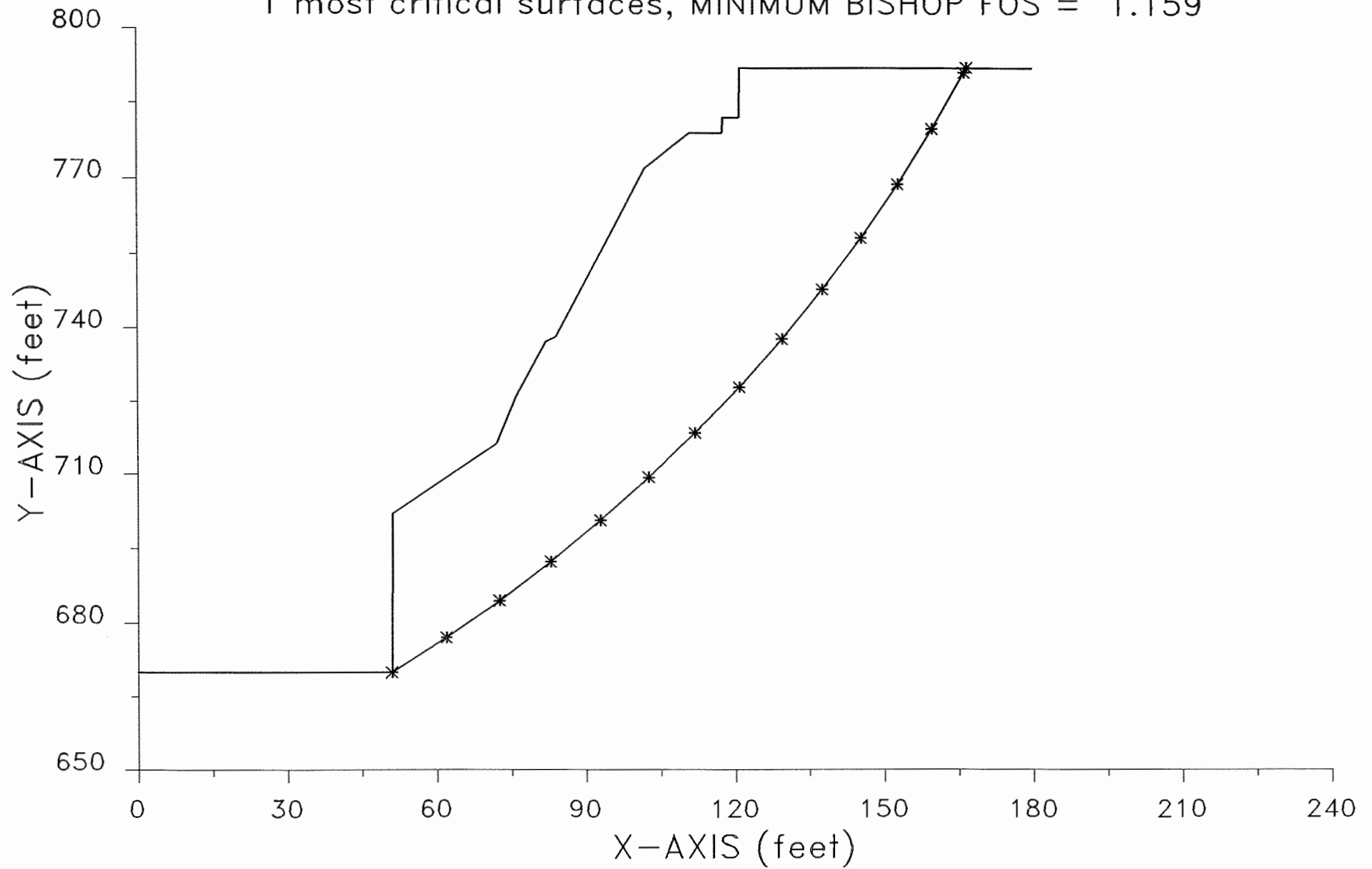
REINFORCING FORCES calculated for minimum FOS = 1.500 and
 reinforcing force resultant at elevation = 670.00 feet

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	Reinf. Force (lb)	Circle x-coord (ft)	Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	39865.	-99.20	908.6	281.9	51.0	157.4	1.355E+08
2.	39840.	-101.27	909.8	284.1	51.0	157.1	1.358E+08
3.	39350.	-53.45	860.8	217.6	51.0	152.8	1.048E+08
4.	39336.	-95.88	895.1	268.8	51.0	152.3	1.217E+08
5.	39310.	-52.84	859.9	216.4	51.0	152.5	1.040E+08
6.	39194.	-67.41	866.6	229.5	51.0	149.5	1.040E+08
7.	39188.	-51.65	859.5	215.5	51.0	152.9	1.043E+08
8.	39046.	-51.11	860.4	216.0	51.0	153.7	1.056E+08
9.	38923.	-98.18	914.7	286.6	51.0	160.8	1.431E+08
10.	38431.	-60.98	858.4	219.2	51.0	147.8	9.804E+07

B-B' \ Circular \ Seismic

1 most critical surfaces, MINIMUM BISHOP FOS = 1.159



Problem Description : B-B'\Circular\Seismic

SEGMENT BOUNDARY COORDINATES

13 SURFACE boundary segments

Segment No.	x-left (ft)	y-left (ft)	x-right (ft)	y-right (ft)	Soil Unit Below Segment
1	.0	670.0	51.0	670.0	1
2	51.0	670.0	51.1	702.0	1
3	51.1	702.0	72.0	716.0	1
4	72.0	716.0	76.0	726.0	1
5	76.0	726.0	82.0	737.0	1
6	82.0	737.0	84.0	738.0	1
7	84.0	738.0	102.0	772.0	1
8	102.0	772.0	111.0	779.0	1
9	111.0	779.0	117.5	779.0	1
10	117.5	779.0	117.6	782.0	1
11	117.6	782.0	121.0	782.0	1
12	121.0	782.0	121.1	792.0	1
13	121.1	792.0	180.0	792.0	1

ISOTROPIC Soil Parameters

1 Soil unit(s) specified

Soil Unit No.	Unit Weight Moist (pcf)	Weight Sat. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Parameter Ru	Pressure Constant (psf)	Water Surface No.
1	152.0	155.0	2350.0	38.00	.000	.0	0

A horizontal earthquake loading coefficient of .238 has been assigned

A vertical earthquake loading coefficient of .000 has been assigned

A critical failure surface searching method, using a random technique for generating CIRCULAR surfaces has been specified.

1000 trial surfaces will be generated and analyzed.

1000 Surfaces initiate from each of 1 points equally spaced along the ground surface between x = 51.0 ft

and x = 51.0 ft

Each surface terminates between x = 62.0 ft

and x = 180.0 ft

Unless further limitations were imposed, the minimum elevation at which a surface extends is y = .0 ft

* * * * * DEFAULT SEGMENT LENGTH SELECTED BY XSTABL * * * * *
13.0 ft line segments define each trial failure surface.

ANGULAR RESTRICTIONS :

The first segment of each failure surface will be inclined within the angular range defined by :

Lower angular limit := -45.0 degrees

Upper angular limit := (slope angle - 5.0) degrees

Factors of safety have been calculated by the :
 * * * * * SIMPLIFIED BISHOP METHOD * * * * *

The most critical circular failure surface
 is specified by 15 coordinate points

Point No.	x-surf (ft)	y-surf (ft)
1	51.00	670.00
2	61.94	677.02
3	72.60	684.47
4	82.94	692.34
5	92.97	700.62
6	102.65	709.29
7	111.98	718.34
8	120.94	727.76
9	129.52	737.53
10	137.70	747.63
11	145.47	758.05
12	152.82	768.78
13	159.73	779.79
14	166.20	791.06
15	166.69	792.00

**** Simplified BISHOP FOS = 1.159 ****

The following is a summary of the TEN most critical surfaces
 Problem Description : B-B'\Circular\Seismic

	FOS (BISHOP)	Circle x-coord (ft)	Center y-coord (ft)	Radius (ft)	Initial x-coord (ft)	Terminal x-coord (ft)	Resisting Moment (ft-lb)
1.	1.159	-119.09	947.19	325.21	51.00	166.69	2.350E+08
2.	1.159	-110.01	930.60	306.33	51.00	163.14	2.139E+08
3.	1.160	-100.38	921.52	293.56	51.00	163.04	2.065E+08
4.	1.160	-128.07	949.16	331.66	51.00	163.97	2.306E+08
5.	1.160	-122.25	941.06	321.70	51.00	162.80	2.216E+08
6.	1.160	-137.24	970.39	354.50	51.00	169.06	2.599E+08
7.	1.160	-98.18	914.69	286.58	51.00	160.76	1.967E+08
8.	1.161	-135.99	974.08	356.97	51.00	171.00	2.678E+08
9.	1.161	-132.41	970.56	352.10	51.00	171.00	2.648E+08
10.	1.162	-147.36	964.11	354.75	51.00	162.81	2.403E+08

Equivalent Fluid Pressure (Free Body Diagram Method)

Program Made by C. Y. Geotech, Inc.

Project Name:

SG-6684-W 23 feet Retaining Wall / Level Backfill (Bedrock)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of the Retaining Wall	=	23 feet
Angle of Slope Above Retaining Wall	=	0 degree
Dip Angle of Critical Wedge	=	58 degree

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	155 pcf
Cohesion	=	1950 psf
Friction Angle	=	37 degree
Mobilized Cohesion	=	1300.0 psf
Mobilized Friction Angle	=	26.7 degree

REQUIRED FACTOR OF SAFETY	=	1.5
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RESULTS

Dip Angle of Critical Slip Surface	=	58 degree
Total Weight of Active Wedge	=	25618 lbs
Frictional Resistance ($C_m * L$)	=	35257 lbs
Required External Force for Wall	=	-21290 lbs
Required Equivalent Fluid Pressure	=	-80.5 psf/ft

** Rankine Wedge is not the most critical wedge **

RECOMMENDED EFP VALUE:

Triangular-Distributed EFP	=	30 psf/ft
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WEDGE SLOPE STABILITY FOR LATERAL FORCE

Program Made by C. Y. Geotech, Inc.

Project Name:

SG-6684-W 23 feet Retaining Wall / Level Backfill / Seismic (Bedrock)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of Retaining Wall	=	23 feet
Angle of Slope Above Retaining Wall	=	0 degree
Dip Angle of Critical Wedge	=	59 degree
Length of Slip Surface	=	26.83 ft

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	152 pcf
Cohesion (C)	=	2350 psf
Friction Angle (ϕ)	=	38 degree
Mobilized Cohesion (C_m)	=	2136.4 psf
Mobilized Friction Angle (ϕ_m)	=	35.4 degree

Required Factor of Safety = 1.1

Seismic Coefficient = 0.246
(Half of Peak Ground Acceleration)

Calculations:

Dip Angle of Critical Slip Surface = 59 degree

Total Weight of Critical Wedge = 24157 lbs

Frictional Resistance ($C_m \times L$) = $2136.4 \times 26.83 = 57324$ lbs

Unbalanced Lateral Force

$$= [24157 - 57324 \times \cos(31)] \times \tan(59 - 35.4) - 57324 \times \sin(31) + 24157 \times 0.246 \times 1.1$$
$$= -33882 \text{ lbs}$$

Stabilization Force for Seismic Condition < 0

EFP for Seismic Condition < 0

(EFP for Static Condition = 30 psf/ft)

EFP recommended for static condition is critical than seismic condition

Equivalent Fluid Pressure (Free Body Diagram Method)

Program Made by C. Y. Geotech, Inc.

Project Name:

SG-6684-W 23 feet Retaining Wall / 45 ° Slope (Bedrock)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of the Retaining Wall	=	23 feet
Angle of Slope Above Retaining Wall	=	45 degree
Dip Angle of Critical Wedge	=	64 degree

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	155 pcf
Cohesion	=	1950 psf
Friction Angle	=	37 degree
Mobilized Cohesion	=	1300.0 psf
Mobilized Friction Angle	=	26.7 degree

REQUIRED FACTOR OF SAFETY	=	1.5
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RESULTS

Dip Angle of Critical Slip Surface	=	64 degree
Total Weight of Active Wedge	=	39034 lbs
Frictional Resistance (Cm * L)	=	64940 lbs
Required External Force for Wall	=	-43211 lbs
Required Equivalent Fluid Pressure	=	-163.4 psf/ft

RECOMMENDED EFP AND LF :

Triangular-Distributed EFP	=	80 psf/ft
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WEDGE SLOPE STABILITY FOR LATERAL FORCE

Program Made by C. Y. Geotech, Inc.

Project Name:

SG-6684-W 23 feet Retaining Wall / 45 ° Slope / Seismic (Bedrock)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of Retaining Wall	=	23 feet
Angle of Slope Above Retaining Wall	=	45 degree
Dip Angle of Critical Wedge	=	64 degree
Length of Slip Surface	=	49.95 ft

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	152 pcf
Cohesion (C)	=	2350 psf
Friction Angle (ϕ)	=	38 degree
Mobilized Cohesion (C_m)	=	2136.4 psf
Mobilized Friction Angle (ϕ_m)	=	35.4 degree

Required Factor of Safety = 1.1

Seismic Coefficient = 0.246
(Half of Peak Ground Acceleration)

Calculations:

Dip Angle of Critical Slip Surface = 64 degree

Total Weight of Critical Wedge = 38278 lbs

Frictional Resistance ($C_m \times L$) = $2136.4 \times 49.95 = 106720$ lbs

Unbalanced Lateral Force

$$= [38278 - 106720 \times \cos(26)] \times \tan(64 - 35.4) - 106720 \times \sin(26) + 38278 \times 0.246 \times 1.1$$
$$= -68748 \text{ lbs}$$

Stabilization Force for Seismic Condition < 0

EFP for Seismic Condition < 0

(EFP for Static Condition = 80 psf/ft)

EFP recommended for static condition is critical than seismic condition

Equivalent Fluid Pressure (Free Body Diagram Method)

Program Made by C. Y. Geotech, Inc.

Project Name:

SG-6684-W 32 feet Retaining Wall / Level Backfill (Bedrock)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of the Retaining Wall	=	32 feet
Angle of Slope Above Retaining Wall	=	0 degree
Dip Angle of Critical Wedge	=	58 degree

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	155 pcf
Cohesion	=	1950 psf
Friction Angle	=	37 degree
Mobilized Cohesion	=	1300.0 psf
Mobilized Friction Angle	=	26.7 degree

REQUIRED FACTOR OF SAFETY = 1.5

RESULTS

Dip Angle of Critical Slip Surface	=	58 degree
Total Weight of Active Wedge	=	49590 lbs
Frictional Resistance ($C_m * L$)	=	49054 lbs
Required External Force for Wall	=	-21132 lbs
Required Equivalent Fluid Pressure	=	-41.3 psf/ft

**** Rankine Wedge is not the most critical wedge ****

RECOMMENDED EFP VALUE:

Triangular-Distributed EFP = 30 psf/ft

WEDGE SLOPE STABILITY FOR LATERAL FORCE

Program Made by C. Y. Geotech, Inc.

Project Name:

SG-6684-W 32 feet Retaining Wall / Level Backfill / Seismic (Bedrock)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of Retaining Wall	=	32 feet
Angle of Slope Above Retaining Wall	=	0 degree
Dip Angle of Critical Wedge	=	58 degree
Length of Slip Surface	=	37.73 ft

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	152 pcf
Cohesion (C)	=	2350 psf
Friction Angle (ϕ)	=	38 degree
Mobilized Cohesion (C_m)	=	2136.4 psf
Mobilized Friction Angle (ϕ_m)	=	35.4 degree

Required Factor of Safety = 1.1

Seismic Coefficient = 0.246
(Half of Peak Ground Acceleration)

Calculations:

Dip Angle of Critical Slip Surface = 58 degree

Total Weight of Critical Wedge = 48630 lbs

Frictional Resistance ($C_m \times L$) = $2136.4 \times 37.73 = 80613$ lbs

Unbalanced Lateral Force

$$= [48630 - 80613 \times \cos(32)] \times \tan(58 - 35.4) - 80613 \times \sin(32) + 48630 \times 0.246 \times 1.1$$
$$= -37759 \text{ lbs}$$

Stabilization Force for Seismic Condition < 0

EFP for Seismic Condition < 0

(EFP for Static Condition = 30 psf/ft)

EFP recommended for static condition is critical than seismic condition

Equivalent Fluid Pressure (Free Body Diagram Method)

Program Made by C. Y. Geotech, Inc.

Project Name:

SG-6684-W 32 feet Retaining Wall / 33.7 ° Slope (Bedrock)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of the Retaining Wall	=	32 feet
Angle of Slope Above Retaining Wall	=	33.7 degree
Dip Angle of Critical Wedge	=	64 degree

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	155 pcf
Cohesion	=	1950 psf
Friction Angle	=	37 degree
Mobilized Cohesion	=	1300.0 psf
Mobilized Friction Angle	=	26.7 degree

REQUIRED FACTOR OF SAFETY = 1.5

RESULTS

Dip Angle of Critical Slip Surface	=	64 degree
Total Weight of Active Wedge	=	57366 lbs
Frictional Resistance ($C_m * L$)	=	68597 lbs
Required External Force for Wall	=	-33341 lbs
Required Equivalent Fluid Pressure	=	-65.1 psf/ft

**** Rankine Wedge is not the most critical wedge ****

RECOMMENDED EFP VALUE:

Triangular-Distributed EFP = 55 psf/ft

WEDGE SLOPE STABILITY FOR LATERAL FORCE

Program Made by C. Y. Geotech, Inc.

Project Name:

SG-6684-W 32 feet Retaining Wall / 33.7 ° Slope / Seismic (Bedrock)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of Retaining Wall	=	32 feet
Angle of Slope Above Retaining Wall	=	33.7 degree
Dip Angle of Critical Wedge	=	64 degree
Length of Slip Surface	=	52.77 ft

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	152 pcf
Cohesion (C)	=	2350 psf
Friction Angle (ϕ)	=	38 degree
Mobilized Cohesion (C_m)	=	2136.4 psf
Mobilized Friction Angle (ϕ_m)	=	35.4 degree

Required Factor of Safety = 1.1

Seismic Coefficient = 0.246
(Half of Peak Ground Acceleration)

Calculations:

Dip Angle of Critical Slip Surface = 64 degree

Total Weight of Critical Wedge = 56256 lbs

Frictional Resistance ($C_m \times L$) = $2136.4 \times 52.77 = 112730$ lbs

Unbalanced Lateral Force

$$= [56256 - 112730 \times \cos(26)] \times \tan(64 - 35.4) - 112730 \times \sin(26) + 56256 \times 0.246 \times 1.1$$
$$= -60114 \text{ lbs}$$

Stabilization Force for Seismic Condition < 0

EFP for Seismic Condition < 0

(EFP for Static Condition = 55 psf/ft)

EFP recommended for static condition is critical than seismic condition

Equivalent Fluid Pressure (Free Body Diagram Method)

Program Made by C. Y. Geotech, Inc.

Project Name:

SG-6684-W 23 feet Subterraneous Wall / Level Backfill (Bedrock)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of the Subterraneous Wall	=	23 feet
Angle of Slope Above Subterraneous Wall	=	0 degree
Dip Angle of Critical Wedge	=	58 degree

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	155 pcf
Cohesion	=	1950 psf
Friction Angle	=	37 degree
Mobilized Cohesion	=	1300.0 psf
Mobilized Friction Angle	=	26.7 degree

REQUIRED FACTOR OF SAFETY	=	1.5
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RESULTS

Dip Angle of Critical Slip Surface	=	58 degree
Total Weight of Active Wedge	=	25618 lbs
Frictional Resistance (Cm * L)	=	35257 lbs
Required External Force for Wall	=	-21290 lbs
Required Equivalent Fluid Pressure	=	-80.5 psf/ft
Triangular-Distributed EFP (Using Jaky Formula)	=	$155 \times [1 - \sin(37)] = 62 \text{ psf/ft}$

RECOMMENDED EFP AND LF :

Triangular-Distributed EFP	=	62 psf/ft
Trapezoidal-Distributed LF	=	$[EFP(Tri) / 1.6] \times H = 39 H \text{ psf/ft}$

WEDGE SLOPE STABILITY FOR LATERAL FORCE

Program Made by C. Y. Geotech, Inc.

Project Name:

SG-6684-W 23 feet Subterraneous Wall / Level Backfill / Seismic (Bedrock)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of Retaining Wall	=	23 feet
Angle of Slope Above Retaining Wall	=	0 degree
Dip Angle of Critical Wedge	=	59 degree
Length of Slip Surface	=	26.83 ft

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	152 pcf
Cohesion (C)	=	2350 psf
Friction Angle (ϕ)	=	38 degree
Mobilized Cohesion (C_m)	=	2136.4 psf
Mobilized Friction Angle (ϕ_m)	=	35.4 degree

Required Factor of Safety = 1.1

Seismic Coefficient = 0.246
(Half of Peak Ground Acceleration)

Calculations:

Dip Angle of Critical Slip Surface = 59 degree

Total Weight of Critical Wedge = 24157 lbs

Frictional Resistance ($C_m \times L$) = $2136.4 \times 26.83 = 57324$ lbs

Unbalanced Lateral Force

$$= [24157 - 57324 \times \cos(31)] \times \tan(59 - 35.4) - 57324 \times \sin(31) + 24157 \times 0.246 \times 1.1$$
$$= -33882 \text{ lbs}$$

Stabilization Force for Seismic Condition < 0

EFP for Seismic Condition < 0

(EFP for Static Condition = 62 psf/ft)

EFP recommended for static condition is critical than seismic condition

Equivalent Fluid Pressure (Free Body Diagram Method)

Program Made by C. Y. Geotech, Inc.

Project Name:

SG-6684-W 23 feet Subterraneous Wall / 45 ° Slope (Bedrock)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of the Subterraneous Wall	=	23 feet
Angle of Slope Above Subterraneous Wall	=	45 degree
Dip Angle of Critical Wedge	=	64 degree

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	155 pcf
Cohesion	=	1950 psf
Friction Angle	=	37 degree
Mobilized Cohesion	=	1300.0 psf
Mobilized Friction Angle	=	26.7 degree

REQUIRED FACTOR OF SAFETY	=	1.5
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RESULTS

Dip Angle of Critical Slip Surface	=	64 degree
Total Weight of Active Wedge	=	39034 lbs
Frictional Resistance ($C_m * L$)	=	64940 lbs
Required External Force for Wall	=	-43211 lbs
Required Equivalent Fluid Pressure	=	-163.4 psf/ft
Triangular-Distributed EFP (Using Jaky Formula)	=	$155 \times [1 - \sin(37)] = 62 \text{ psf/ft}$

RECOMMENDED EFP AND LF :

Triangular-Distributed EFP	=	62 psf/ft
Trapezoidal-Distributed LF	=	$[EFP(Tri) / 1.6] \times H = 39 H \text{ psf/ft}$

WEDGE SLOPE STABILITY FOR LATERAL FORCE

Program Made by C. Y. Geotech, Inc.

Project Name:

SG-6684-W 23 feet Subterraneous Wall / 45 ° Slope / Seismic (Bedrock)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of Retaining Wall	=	23 feet
Angle of Slope Above Retaining Wall	=	45 degree
Dip Angle of Critical Wedge	=	64 degree
Length of Slip Surface	=	49.95 ft

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	152 pcf
Cohesion (C)	=	2350 psf
Friction Angle (ϕ)	=	38 degree
Mobilized Cohesion (C_m)	=	2136.4 psf
Mobilized Friction Angle (ϕ_m)	=	35.4 degree

Required Factor of Safety = 1.1

Seismic Coefficient = 0.246
(Half of Peak Ground Acceleration)

Calculations:

Dip Angle of Critical Slip Surface = 64 degree

Total Weight of Critical Wedge = 38278 lbs

Frictional Resistance ($C_m \times L$) = $2136.4 \times 49.95 = 106720$ lbs

Unbalanced Lateral Force

$$= [38278 - 106720 \times \cos(26)] \times \tan(64 - 35.4) - 106720 \times \sin(26) + 38278 \times 0.246 \times 1.1$$
$$= -68748 \text{ lbs}$$

Stabilization Force for Seismic Condition < 0

EFP for Seismic Condition < 0

(EFP for Static Condition = 62 psf/ft)

EFP recommended for static condition is critical than seismic condition

Equivalent Fluid Pressure (Free Body Diagram Method)

Program Made by C. Y. Geotech, Inc.

Project Name:

SG-6684-W 32 feet Subterraneous Wall / Level Backfill (Bedrock)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of the Subterraneous Wall	=	32 feet
Angle of Slope Above Subterraneous Wall	=	0 degree
Dip Angle of Critical Wedge	=	58 degree

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	155 pcf
Cohesion	=	1950 psf
Friction Angle	=	37 degree
Mobilized Cohesion	=	1300.0 psf
Mobilized Friction Angle	=	26.7 degree

REQUIRED FACTOR OF SAFETY	=	1.5
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RESULTS

Dip Angle of Critical Slip Surface	=	58 degree
Total Weight of Active Wedge	=	49590 lbs
Frictional Resistance ($C_m * L$)	=	49054 lbs
Required External Force for Wall	=	-21132 lbs
Required Equivalent Fluid Pressure	=	-41.3 psf/ft
Triangular-Distributed EFP (Using Jaky Formula)	=	$155 \times [1 - \sin(37)] = 62 \text{ psf/ft}$

RECOMMENDED EFP AND LF :

Triangular-Distributed EFP	=	62 psf/ft
Trapezoidal-Distributed LF	=	$[EFP(Tri) / 1.6] \times H = 39 H \text{ psf/ft}$

WEDGE SLOPE STABILITY FOR LATERAL FORCE

Program Made by C. Y. Geotech, Inc.

Project Name:

SG-6684-W 32 feet Subterraneous Wall / Level Backfill / Seismic (Bedrock)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of Retaining Wall	=	32 feet
Angle of Slope Above Retaining Wall	=	0 degree
Dip Angle of Critical Wedge	=	58 degree
Length of Slip Surface	=	37.73 ft

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	152 pcf
Cohesion (C)	=	2350 psf
Friction Angle (ϕ)	=	38 degree
Mobilized Cohesion (C_m)	=	2136.4 psf
Mobilized Friction Angle (ϕ_m)	=	35.4 degree

Required Factor of Safety = 1.1

Seismic Coefficient = 0.246
(Half of Peak Ground Acceleration)

Calculations:

Dip Angle of Critical Slip Surface = 58 degree

Total Weight of Critical Wedge = 48630 lbs

Frictional Resistance ($C_m \times L$) = $2136.4 \times 37.73 = 80613$ lbs

Unbalanced Lateral Force

$$= [48630 - 80613 \times \cos(32)] \times \tan(58 - 35.4) - 80613 \times \sin(32) + 48630 \times 0.246 \times 1.1$$
$$= -37759 \text{ lbs}$$

Stabilization Force for Seismic Condition < 0

EFP for Seismic Condition < 0

(EFP for Static Condition = 62 psf/ft)

EFP recommended for static condition is critical than seismic condition

Equivalent Fluid Pressure (Free Body Diagram Method)

Program Made by C. Y. Geotech, Inc.

Project Name:

SG-6684-W 32 feet Subterraneous Wall / 33.7 ° Slope (Bedrock)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of the Subterraneous Wall	=	32 feet
Angle of Slope Above Subterraneous Wall	=	33.7 degree
Dip Angle of Critical Wedge	=	63 degree

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	155 pcf
Cohesion	=	1950 psf
Friction Angle	=	37 degree
Mobilized Cohesion	=	1300.0 psf
Mobilized Friction Angle	=	26.7 degree

REQUIRED FACTOR OF SAFETY	=	1.5
----------------------------------	---	-----

RESULTS

Dip Angle of Critical Slip Surface	=	63 degree
Total Weight of Active Wedge	=	61249 lbs
Frictional Resistance (Cm * L)	=	70720 lbs
Required External Force for Wall	=	-33403 lbs
Required Equivalent Fluid Pressure	=	-65.2 psf/ft
Triangular-Distributed EFP (Using Jaky Formula)	=	$155 \times [1 - \sin(37)] = 62 \text{ psf/ft}$

RECOMMENDED EFP AND LF :

Triangular-Distributed EFP	=	62 psf/ft
Trapezoidal-Distributed LF	=	$[EFP(Tri) / 1.6] \times H = 39 \text{ H psf/ft}$

WEDGE SLOPE STABILITY FOR LATERAL FORCE

Program Made by C. Y. Geotech, Inc.

Project Name:

SG-6684-W 32 feet Subterranean Wall / 33.7 ° Slope / Seismic (Bedrock)

GEOMETRY OF CRITICAL ACTIVE WEDGE:

Height of Retaining Wall	=	32 feet
Angle of Slope Above Retaining Wall	=	33.7 degree
Dip Angle of Critical Wedge	=	64 degree
Length of Slip Surface	=	52.77 ft

SHEAR STRENGTH PARAMETERS:

Unit Weight	=	152 pcf
Cohesion (C)	=	2350 psf
Friction Angle (ϕ)	=	38 degree
Mobilized Cohesion (Cm)	=	2136.4 psf
Mobilized Friction Angle (ϕ_m)	=	35.4 degree

Required Factor of Safety = 1.1

Seismic Coefficient = 0.246
(Half of Peak Ground Acceleration)

Calculations:

Dip Angle of Critical Slip Surface = 64 degree

Total Weight of Critical Wedge = 56256 lbs

Frictional Resistance (Cm $\times$ L) = 2136.4 $\times$ 52.77 = 112730 lbs

Unbalanced Lateral Force

$$= [56256 - 112730 \times \cos(26)] \times \tan(64 - 35.4) - 112730 \times \sin(26) + 56256 \times 0.246 \times 1.1$$
$$= -60114 \text{ lbs}$$

Stabilization Force for Seismic Condition < 0

EFP for Seismic Condition < 0

(EFP for Static Condition = 62 psf/ft)

EFP recommended for static condition is critical than seismic condition

REGIONAL GEOLOGIC MAP

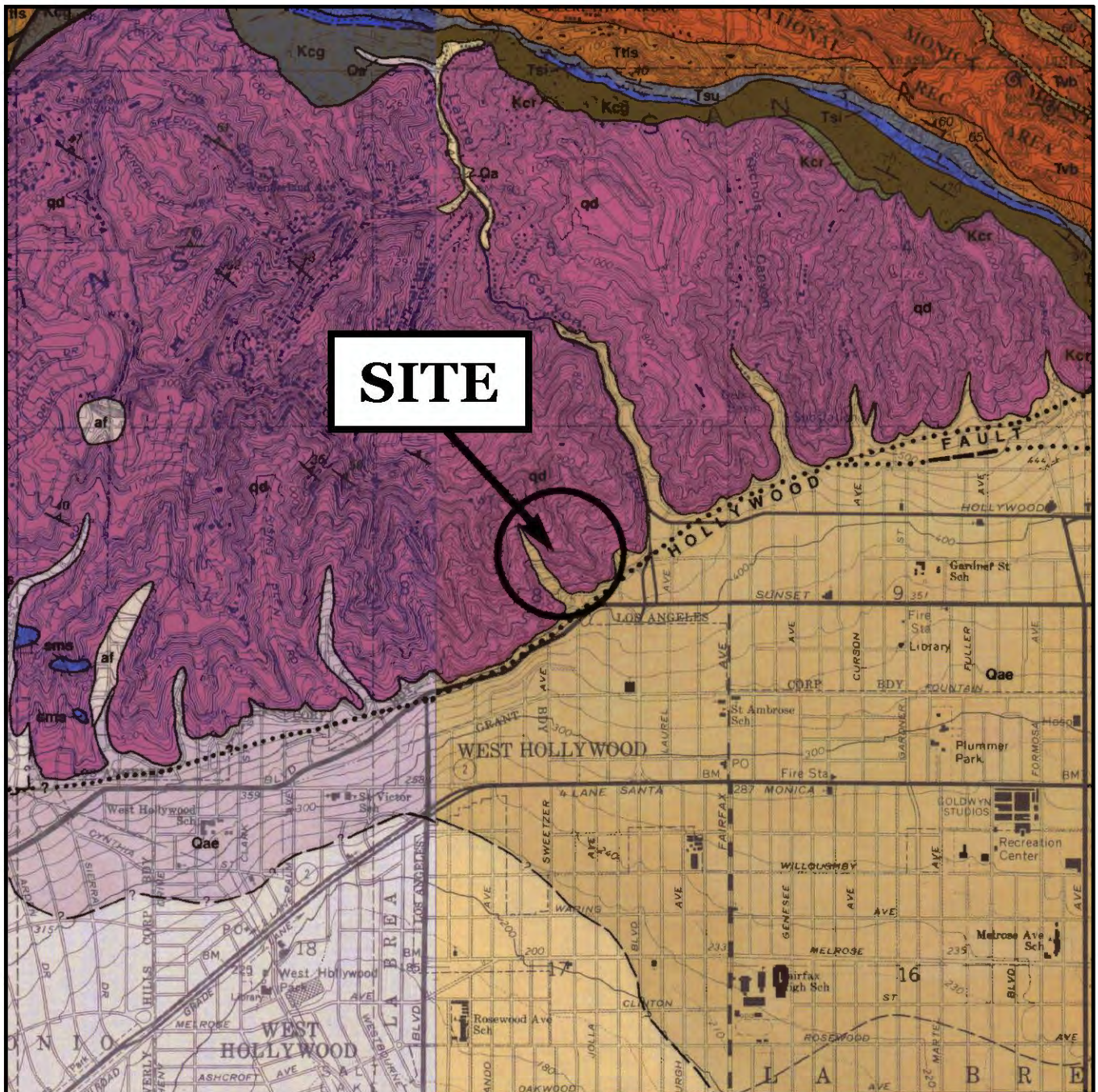


REFERENCE: Geologic Map of the Hollywood and Beverly Hills Quadrangles, Los Angeles, California, by Thomas W. Dibblee, Jr., 1991.

ADDRESS: 1501 N. Marlay Drive

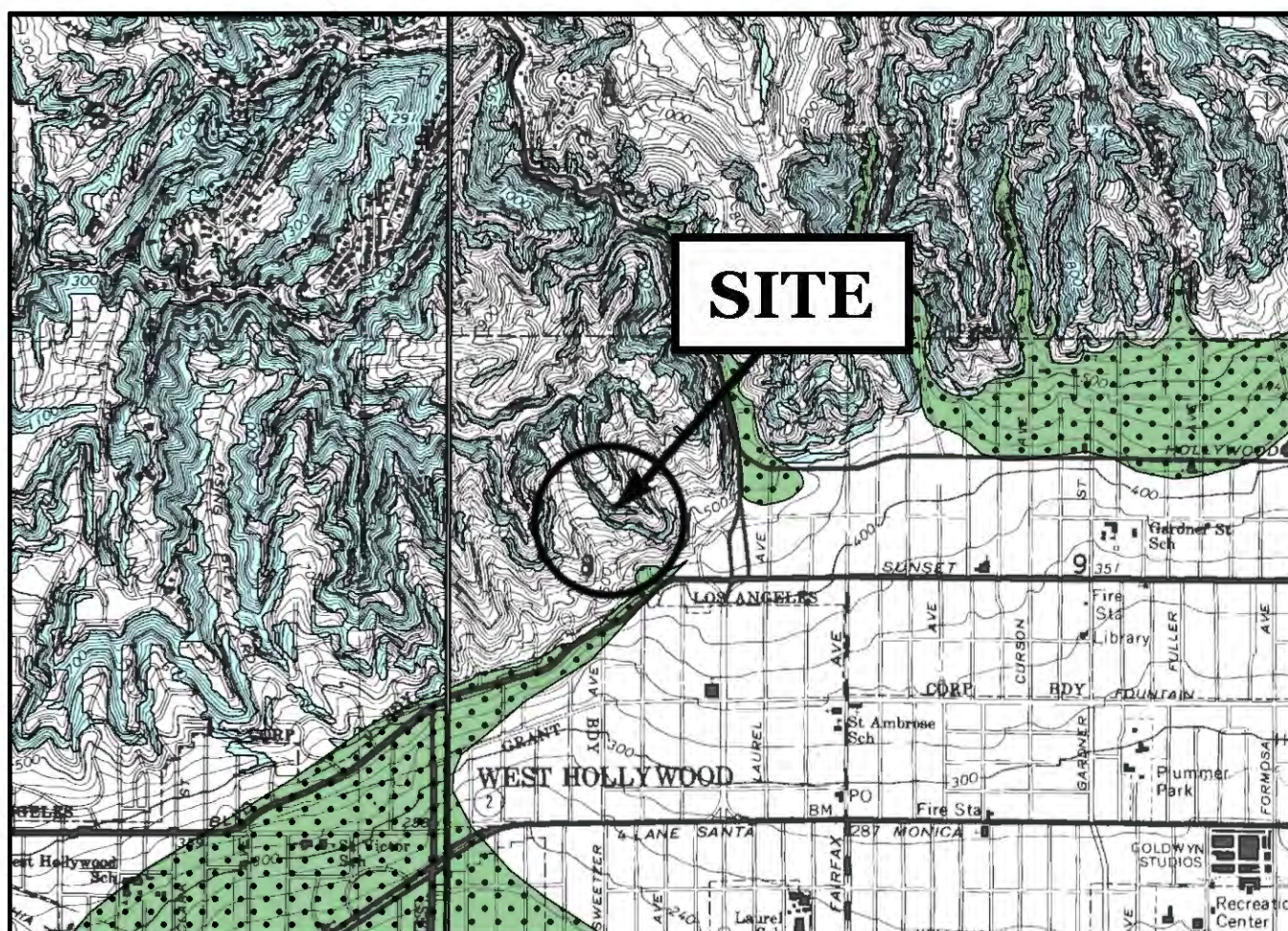
CLIENT: Coleman

JOB: SG 6684-W



Schick GEOTECHNICAL, INC.

JOB: SG 6684-W



Areas where historic occurrences of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693 would be required.



Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693 would be required.

VICINITY MAP

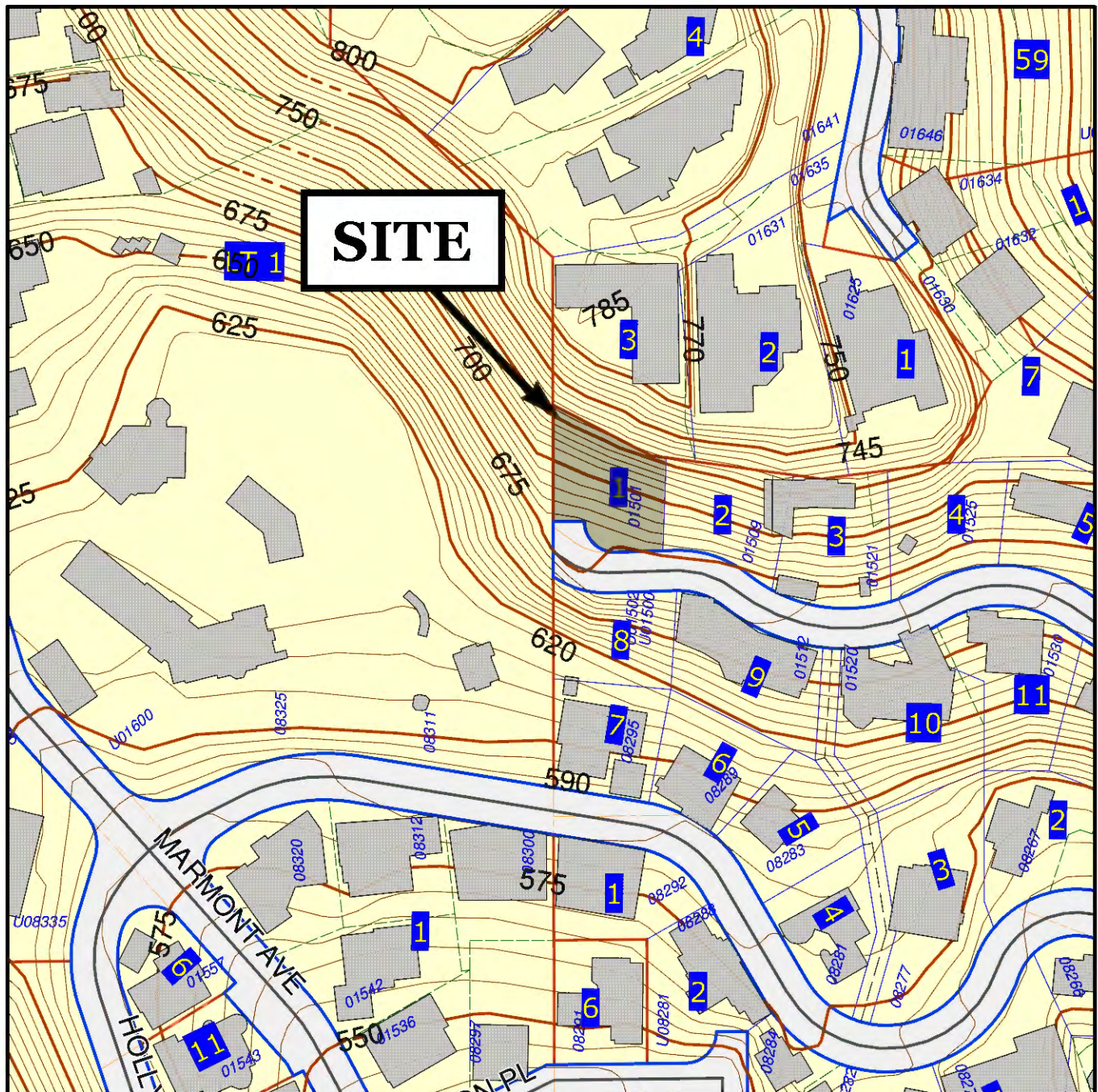


REFERENCE: City of Los Angeles Bureau of Engineering, NavigateLA website, Portion of District Map 148.5 A 175.
SCALE: 1" = 100'

ADDRESS: 1501 N. Marlay Drive

CLIENT: Coleman

JOB: SG 6684-W



RADON POTENTIAL MAP



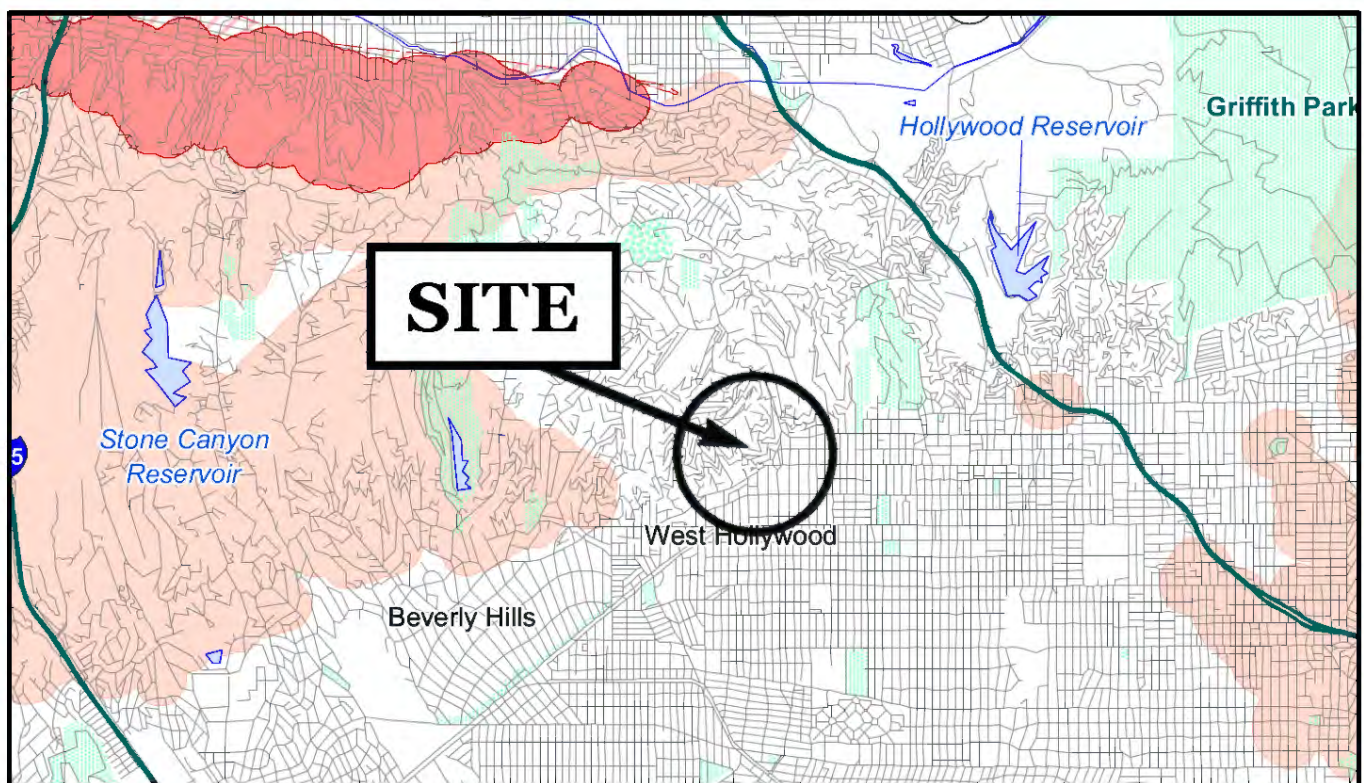
REFERENCE: Portion of Radon Potential Zone Map for Southern Los Angeles County, California, prepared by Ron Churchill of the California Geologic Survey, dated January 2005.

SCALE: 1 : 100,000

ADDRESS: 1501 N. Marlay Drive

CLIENT: Coleman

JOB: SG 6684-W



RADON POTENTIAL ZONING DEFINITIONS

-  High potential for indoor radon levels above 4.0 picocuries per liter
-  High potential for indoor radon levels above 4.0 picocuries per liter in recent alluvium (High – Qa)
-  Low potential for indoor radon levels above 4.0 picocuries per liter
-  Special Test Areas – Areas where National Uranium Resource Evaluation (NURE) Project airborne radiometric data suggest rocks and soils contain higher than typical amounts of uranium but where indoor-radon data are currently unavailable. Follow-up indoor-radon testing is recommended for buildings in these areas.

REGIONAL GEOLOGIC MAP

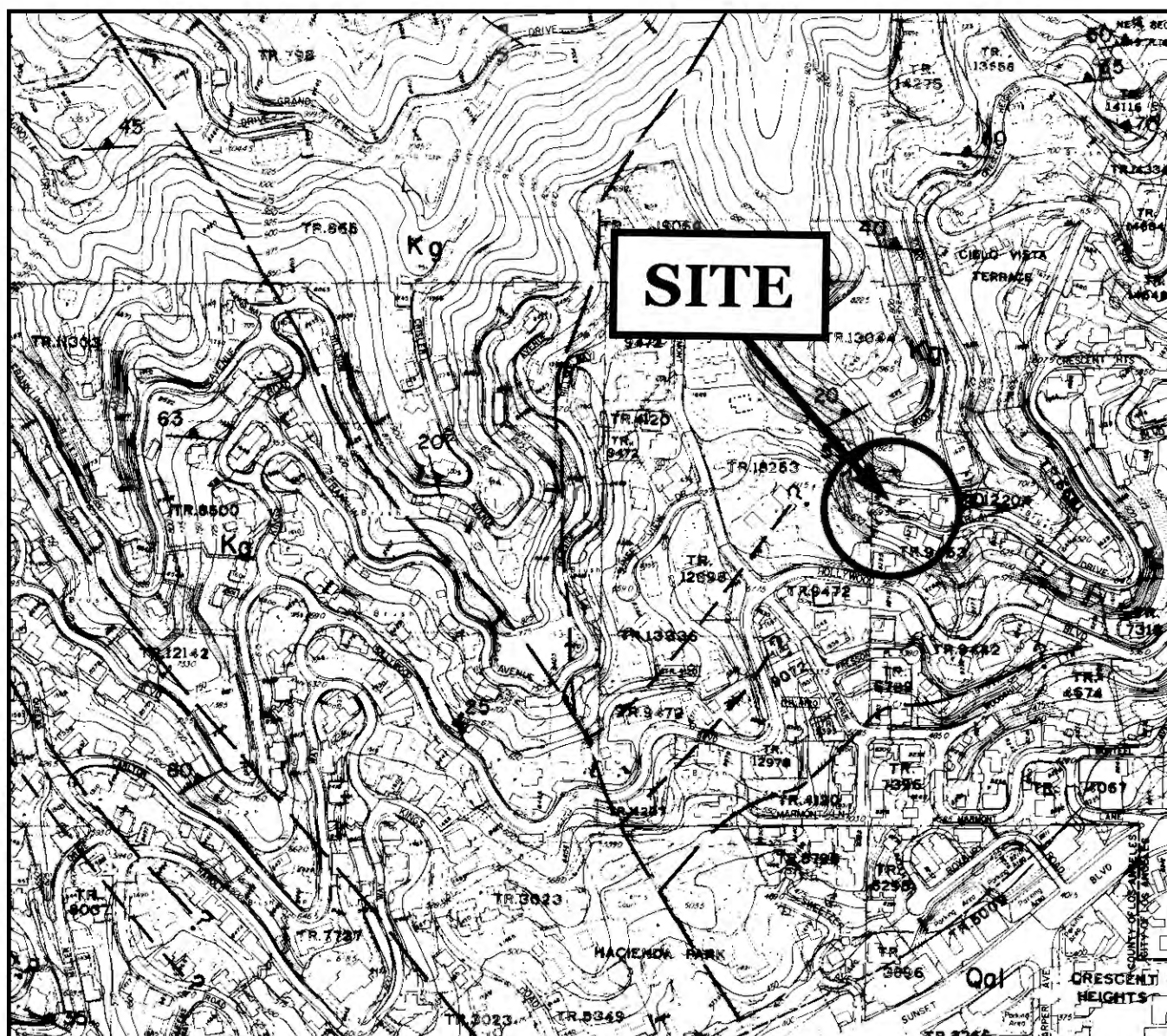


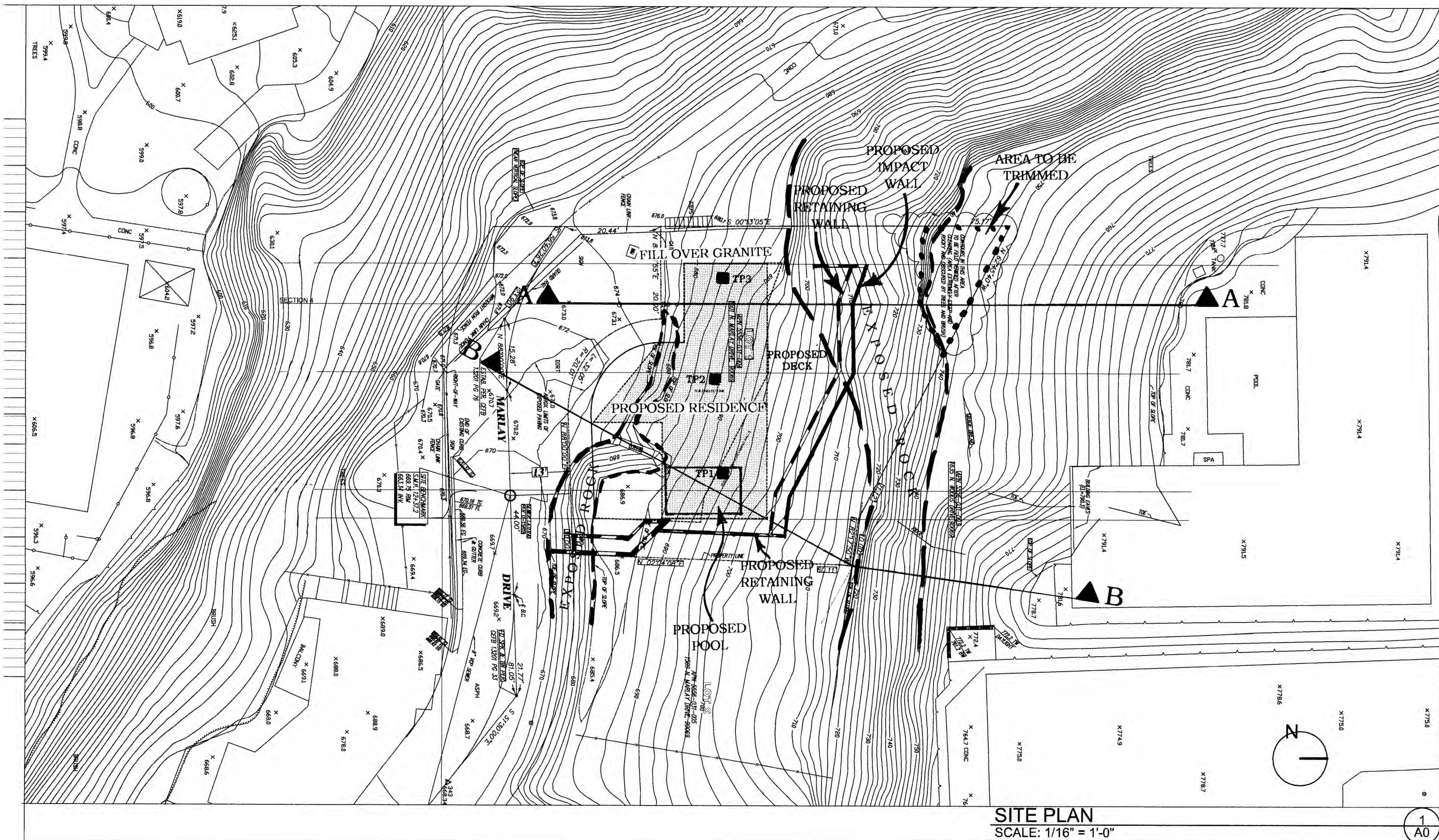
REFERENCE: Geologic Maps, Santa Monica Mountains, Los Angeles, California, #200.
SCALE: 1" = 400'

ADDRESS: 1501 N. Marlay Drive

CLIENT: Coleman

JOB: SG 6684-W



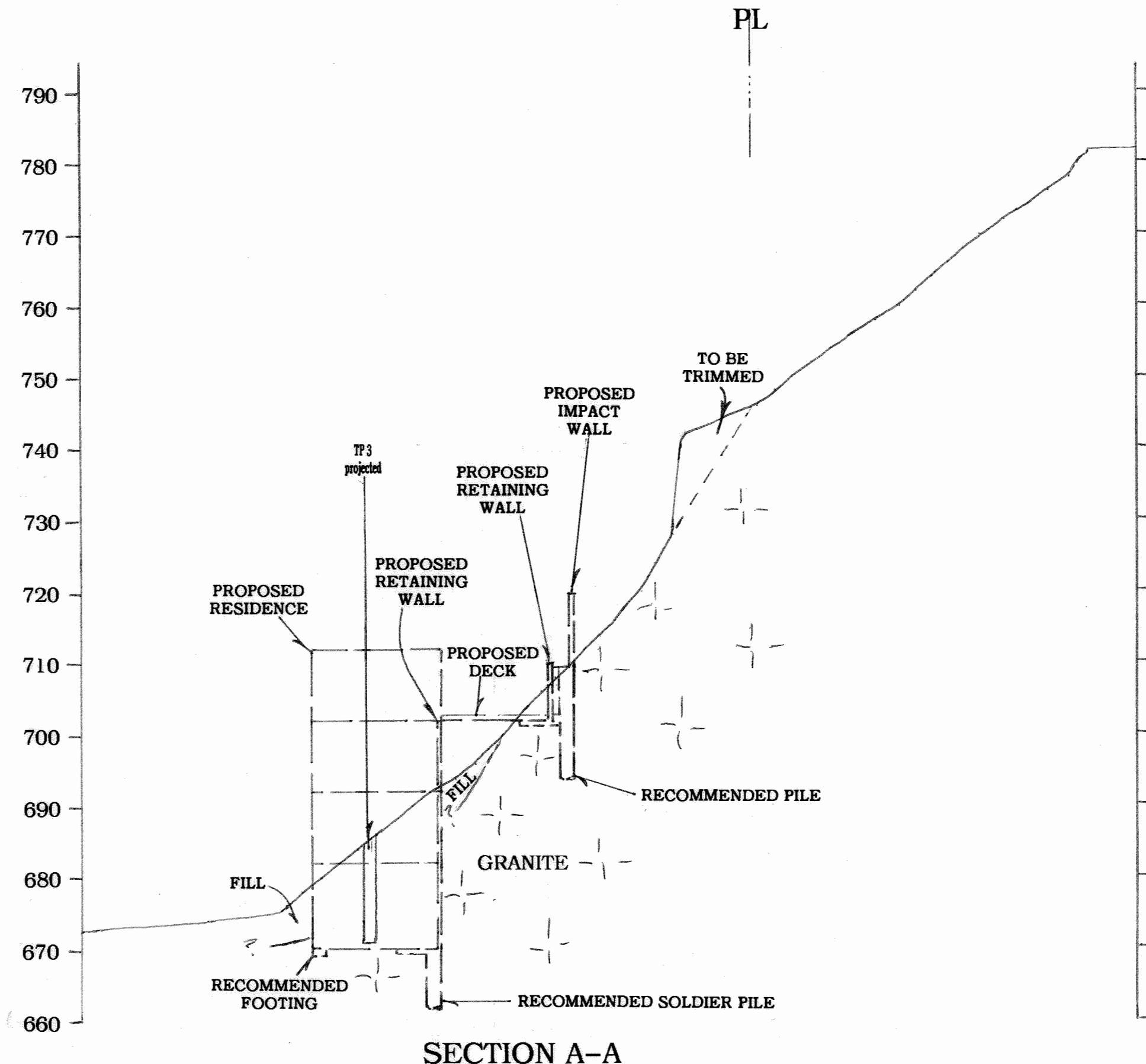


SCHICK GEOTECHNICAL, INC.
Geology and Soils Engineering

GEOLOGIC MAP

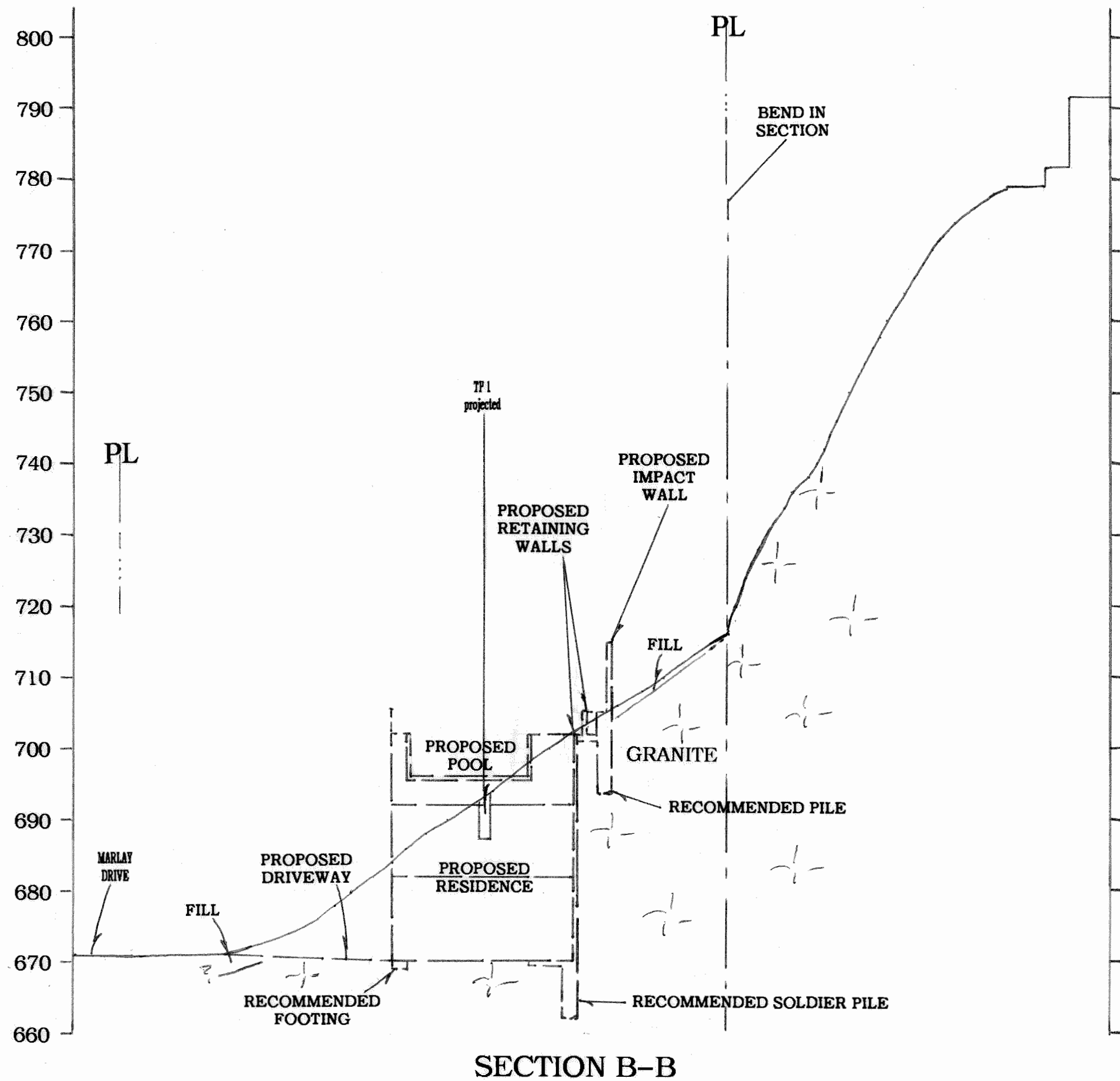
TP3 ■ LOCATION AND NUMBER OF HAND-DUG TEST PITS

SPRING STREET, SUITE 636 LOS ANGELES CALIFORNIA 90013 213 700 2297 PAUL@LUCCOL.COM



SECTION A-A

DATE: MAR 2014
 DRAWN: ACT
 SCALE: 1"=16'
 JOB: COLEMAN



SCHICK GEOTECHNICAL, INC.

~
Geology and Soils Engineering
Specializing in Residential
Hillside Properties

April 16, 2016
SG 6684-W

Sara Schusterow
1855 Egret Way
Boca Raton, FL 33496

Subject

Response to City Correction Letter
1501 Marlay Drive
Lot 1, Tract 12204
Los Angeles, California

References:

Geologic and Soils Engineering Exploration, Proposed Residence, 1501 Marlay Drive, Lot 1, Tract 12204, Los Angeles, California," dated April 4, 2015;
City of Los Angeles Department of Building and Safety, Grading Division, Correction Letter, Log #89091, dated July 24, 2015.

Dear Ms. Schusterow:

Per your request, SGI has prepared the following response to the City Correction Letter.

Response to Review Item 1.

The requested research has been performed (see enclosures).

Response to Review Item 2.

Numerous reports were prepared for the site and adjacent sites, with the same general conclusions, that the site is feasible for construction from a geologic and soils engineering standpoint. The referenced reports mapped similar discontinuous joints which were reported generally favorably oriented for the gross stability of the site. The reports all agree that an impact wall is needed to provide protection from the offsite ascending non-conforming cut slope. SGI concurs with the findings of the referenced reports in this regard. The City of Los Angeles issued an approval letter for the site on June 16, 2006 for the construction of a single family. The lot remains the same as described in the referenced report.

Response to Review Item 3.

SGI has reviewed and concurs with the findings of the referenced reports. The only data used from the referenced reports is the mapped geologic structure, which has been shown on the enclosed Geologic Map. The City of Los Angeles issued an approval letter for the adjacent site to the east, 1509 Marlay, on July 2, 2003 for the construction of a single family residence.

Response to Review Item 4.

- a. The requested mapping was performed and is shown on the enclosed Geologic Map, in addition to showing the geologic structure from the referenced reports.

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- b. The granitic rock exposed on the site is generally massive, however, has four major sets of joint planes (see enclosed Figure 1). The joint planes are weathered but no significant infillings. The joint planes have no measurable uniform spacing. No other continuous planes of structural weakness such as a fault plane or shear zones was observed on the ascending cut slope face.

The joint planes mapped on the slope face are stereo-projected on the equal-angle stereonet, as shown on Figures 1 and 2. Both mechanic feasibility analyses which qualitatively evaluate the potential of rock wedge failure and kinematic feasibility analyses which quantitatively evaluate the potential of rock wedge failure were performed. Four major joint sets are shown on Figure 1. As shown on Figure 2, most of potential rock wedges with potential sliding planes along the joint planes or sliding plunge along the intersections of joint planes are mechanically infeasible. However, the potential rock wedge failures sliding along the joint plane of joint set #4, the intersection line of joint sets #4 and #2, and the intersection line of joint sets #4 and #1 are mechanically feasible.

- c. Also as shown on Figure 2, the potential slide along the intersection line of joint sets #4 and #1 is kinematic infeasible due to its low dip angle. The kinematic study indicated that the potential rock wedge failure along the joint plane of joint set #4 has a factor of safety less than 1.0 and the potential rock wedge failure along the intersection line of joint sets #4 and #2 has a factor of safety between 1.0 and 1.5 (see Figure 2).

Although the stereographic projection analyses indicated potential rock wedge failures along the joint plane of joint set #4 and the intersection line of joint sets #4 and #2, the occurrence of a large rock wedge failure in a single event is low due to the low discontinuity of the joint planes and the weathering nature of onsite granitic rock. Instead of the occurrence of a large rock wedge failure in a single event, the rock wedge failure will act as a progressive failure of small rock wedges. Due to the weathering nature of onsite granitic rock and the city regulations that rock bolting can only be considered as a remedial mitigation measure for slope stabilization, the use of rock bolting for the subject project is not recommended. It is recommended that a high impact wall be constructed in the rear yard area to prevent the bouncing of small rock wedges over the top of the wall to damage the proposed single family residence and the rear yard steep ascending slope be protected by the installation of heavy duty wire netting on the slope face. The other purpose of the impact wall is to provide the proposed single family residence with the code required building clearance.

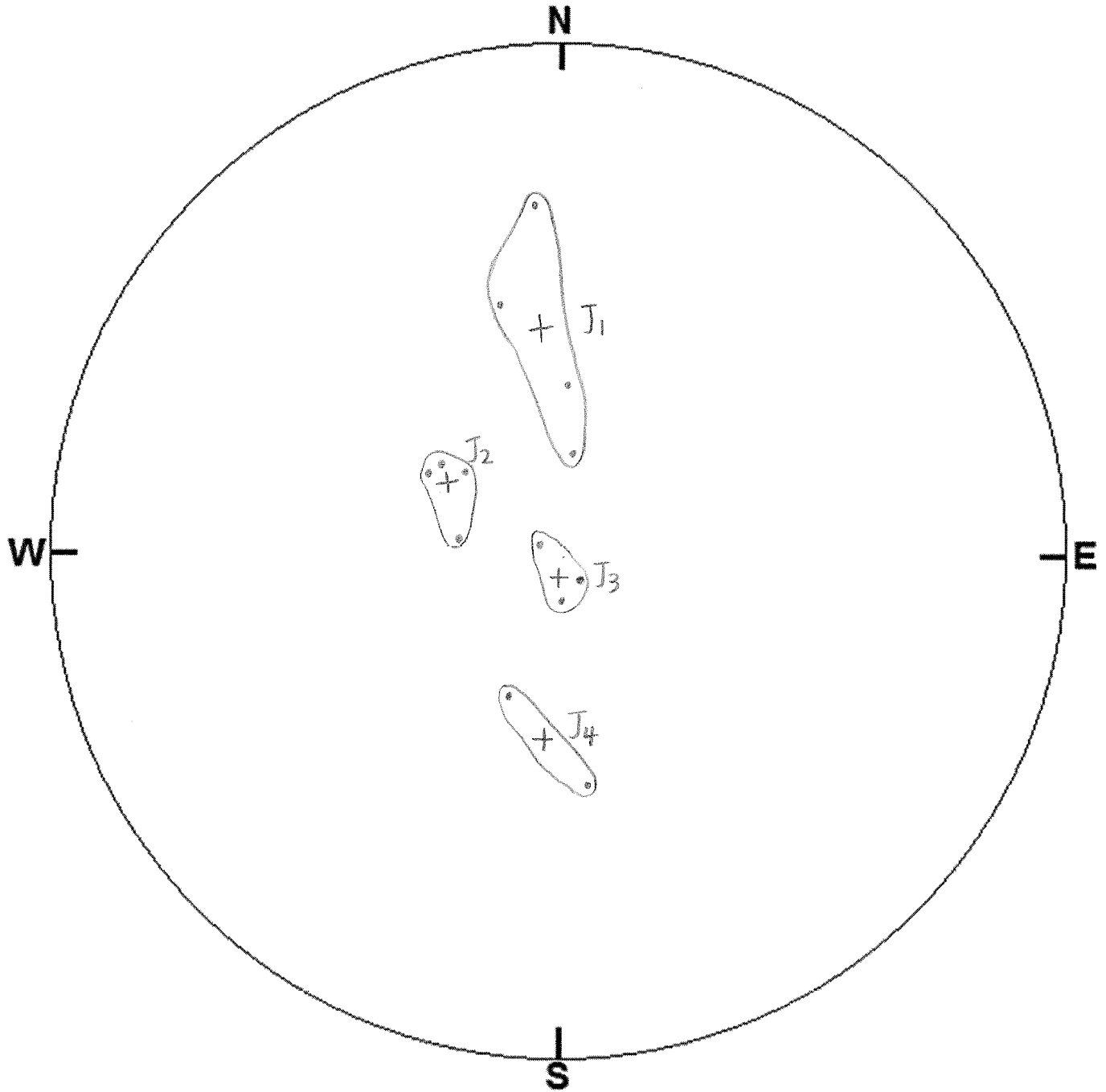
The building Code requires that building structure be provided with a level building clearance between the building wall and the toe of any adjacent ascending slope steeper than 3:1. The required Code building clearance is one half of the height of the ascending slope to a maximum 15 feet (see Figure 3). The clearance distance for swimming pool can be reduced to be 1/4 of the height of the adjacent ascending slope with a maximum of 7.5 feet measured horizontally from the building wall to the toe of the adjacent ascending slope. For retained slopes, the face of the retaining wall can be considered as the toe of the slope.

Impact Wall

The stereographic project indicated that the occurrence of significant rock wedge failure along

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J1: Projection Center of Group 1(N85E/42N)

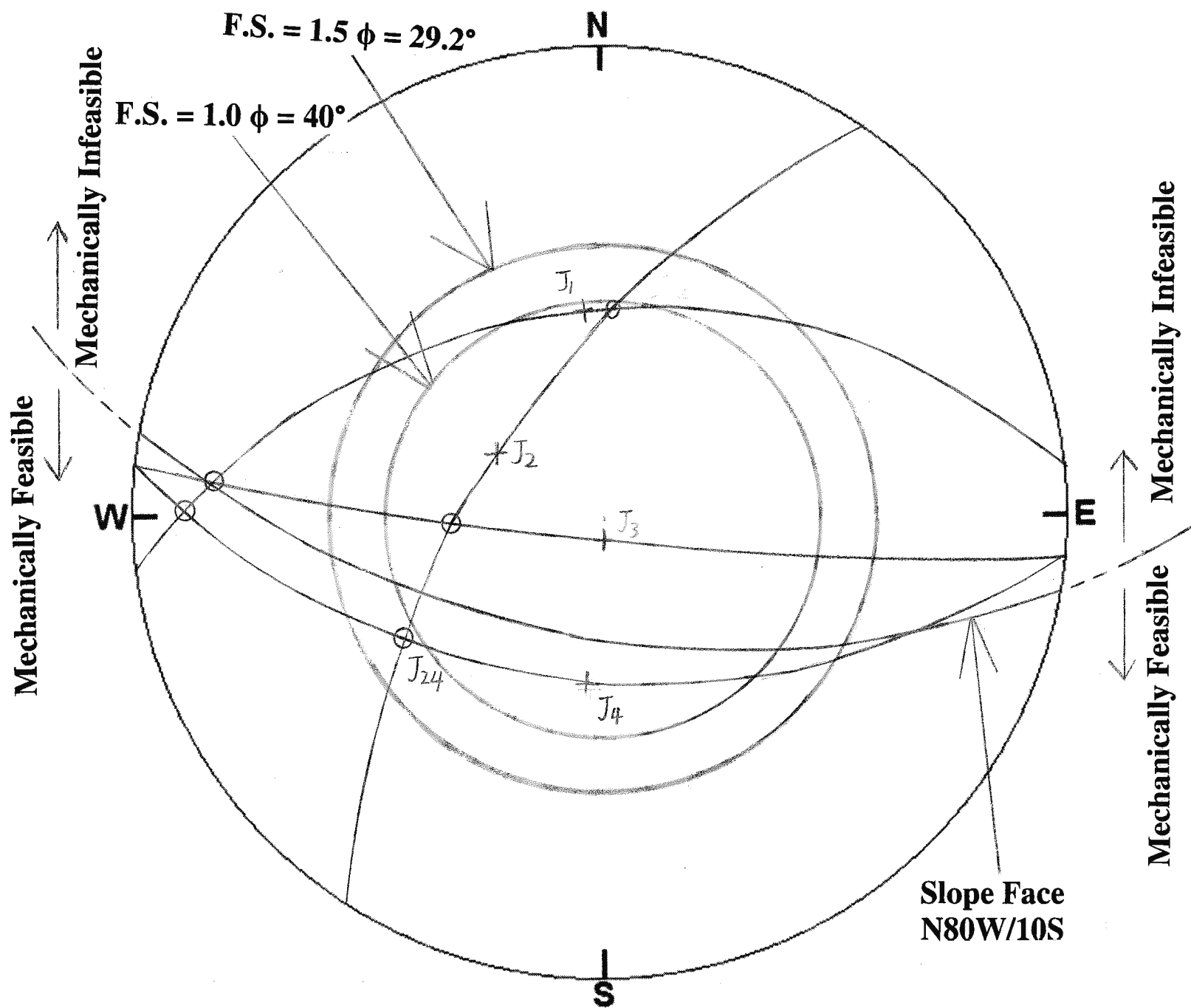
J2: Projection Center of Group 2(N30E/60N)

J3: Projection Center of Group 3(N85W/85S)

J4: Projection Center of Group 4(N85W/50S)

• **Projection of Joint Attitude**

Figure 1



J_{24} (N33W/36S) is the intersection of J_2 and J_4 ($1.0 < FS < 1.5$)

Friction Angle of Joint Plane: 40°

Slope Angle of Cut Face: 60°

+ Potential wedge failure sliding along joint plane

○ Potential wedge failure sliding along intersection of joint plane

Figure 2

joint planes and the intersections of joint planes are mechanically infeasible. The gross slope stability analyses also indicated factor of safety greater than the minimum code requirements for both static and seismic stability conditions. Therefore, a retaining wall is not required to stabilize the slope for potential gross or wedge failure. An impact wall up to 20 feet high as shown on geologic cross sections A-A' and B-B' is required to provide the proposed single family residence with the required building code clearance from the toe of the adjacent slope to prevent damage to the residence from possible impact caused by raveling resulting from small rock wedges falling from the steep slope. The recommended impact wall should be designed for an equivalent fluid pressure of 125 psf/ft.

Rock Slope Netting

The entire slope should be 'scaled' to remove loose debris, then provided with heavy gauge chain link (5/8" wire rope anchors 20' double leg, made by Geobrugg North America, LLC), properly anchored to the top, middle, and bottom of the slope with rock bolts.

An affidavit should be filed with the Los Angeles County Recorder's Office to inform future owners that the slope may experience raveling and block failure and that the back side of the impact wall will require periodic maintenance.

Response to Review Item 5.

The scale for the previous Geologic Map and Section was provided by the architect. The revised Geologic Map and Section are presented at the corrected scale.

Response to Review Item 6.

See response to 4a and 4b.

Response to Review Item 7.

The portion of the non-conforming street cut which is not supported by the residence will be excavated and then supported by a designed retaining wall.

Response to Review Item 8.

See response to 4a and 4b. The recommended 20-foot high impact wall with the recommended chain-link fencing is considered to be adequate remedial protection. The 20-foot high impact wall will also provide the proposed single family residence with the code required building clearance.

Response to Review Item 9.

See response to 4a, 4b and 8. The 20-foot high impact wall will provide the proposed single family residence with the code required building clearance.

Respectfully submitted



WAYNE SCHICK
C.E.G. 1300



PAUL CAI
P.E. 80352



Enc:

Geologic Map and Section
City of Los Angeles Correction Letter
City Research Documents

xc: (4) Addressee

SCHICK GEOTECHNICAL, INC.

7650 Haskell Avenue, Suite D, Van Nuys, California 91406 Ph (818) 905-8011 Fx (818) 905-8115

RESEARCH

The following documents were obtained from the City of Los Angeles Building Department:

Geologic Report, Proposed Residence, 1501 Marlay Drive, Los Angeles, California, prepared by Dr. James E. Slosson, dated January 23, 1959 - not available;

Soil Report, Proposed Residence, 1501 Marlay Drive, Los Angeles, California, prepared by Pacific Soils Engineering, Inc., dated January 24, 1963 *"Foliation mapped within outcrops on and adjacent to the site exhibits a dominant strike in an east-west direction accompanied by dips to the north ranging from 1 to 36 degrees. Foliation depicted on the referenced geologic map prepared by the city of Los Angeles (1960) and Dibblee (1991) strikes in a northeast direction accompanied by dips to the north west ranging from 20 to 55 degrees."* - not available;

"Addendum Geologic and Soils Engineering Report, Proposed Single Family Residence, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated July 25, 1980;

"Geologic and Soils Engineering Report, Proposed Single Family Residence, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated June 19, 1987;

"Justification of Private Sewerage System, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated December 7, 1987;

"Additional Information, Proposed Residence, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated December 7, 1987;

"Additional Information, Temporary Excavations and Retaining Walls, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated February 9, 1987;

"Geologic and Soils Engineering Exploration, Proposed Structural Slab, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated April 29, 1988;

"Potential for Mudflow, Proposed Private Street 1093, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated May 19, 1988;

Report for 1501-1509 Marlay Drive, Los Angeles, California, prepared by Applied Earth Sciences, dated July 25, 1988 (*"The joints within the rock at this site are considered not to be continuous." "However, surficial block failures along unsupported joints on to oversteepened slopes are common within typical rock. Therefore, as part of the proposed development, impact walls should be constructed behind the proposed buildings in order to protect the proposed residential structures against surficial block failures."*);

City of Los Angeles Department of Building and Safety Grading Division, Review Letter Log #5757, dated August 1, 1988;

City of Los Angeles Department of Building and Safety Grading Division, Review Letter Log #7152, dated November 1, 1988;

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #27705, dated March 12, 1992;

City of Los Angeles Department of Building and Safety Grading Division, Approval Letter Log #29208, dated July 7, 1992;

“Report of Preliminary Engineering Geologic Investigation, Proposed Construction of Two Single-family Residences, 1501 Marlay Drive, Los Angeles, California,” prepared by Pacific Geology Consultants, Inc., dated October 15, 1998 (shows joints dipping 50 degrees south mapped on offsite property to north, and foliation and joints dipping steeply to the north on the south portion of the site);

“Geotechnical Engineering Investigation Report, Two Proposed Single-Family Residences, 1501 and 1509 Marlay Drive, Los Angeles, California,” prepared by Coastline Geotechnical Consultants, Inc., dated September 28, 1998- not available;

“Geotechnical Engineering Update Report, Proposed New Residence, 1501 Marlay Drive, Los Angeles, California,” prepared by Coastline Geotechnical Consultants, Inc., dated October 28, 1998;

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #28497, dated September 2, 1999;

“Supplemental Engineering Geologic Investigation, Response to the City of Los Angeles grading Section Review Letter, Proposed Construction of Two Single-Family Residences, 1501 Marlay Drive, Los Angeles, California,” prepared by Pacific Geology Consultants, Inc., dated September 14, 1999;

“Reply to Geotechnical Engineering Review Sheet from the City of Los Angeles dated September 2, 1999, Proposed Two Single Family Residences, 1501 and 1509 Marlay Drive, Los Angeles, California,” prepared by Coastline Geotechnical Consultants, dated September 15, 1999;

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #28497-01, dated October 7, 1999;

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #37767, dated September 24, 2002;

“Geotechnical Addendum Report, Response to City of Los Angeles Review Sheet, Proposed Residence, 1501 Marlay Drive, Los Angeles, California,” prepared by Gorian, dated September 27, 2002;

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #37767-01, dated November 22, 2002;

“Geotechnical Addendum Report No. 2, Response to City of Los Angeles Review Sheet, Proposed Residence, 1501 Marlay Drive, Los Angeles, California,” prepared by Gorian, dated May 5, 2003. “*As discussed above, adversely-oriented planar bedrock features are not present.*”;

City of Los Angeles Department of Building and Safety Grading Division, Approval Letter Log #37767-02, dated July 2, 2003;

“Geotechnical Engineering Update Report, Proposed New Residence, 1501 Marlay Drive, Los Angeles, California,” prepared by Coastline Geotechnical Consultants, Inc., dated April 14, 2005;

SCHICK GEOTECHNICAL, INC.

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“Update Letter - Proposed Single-family Residence, 1501 Marlay Drive, Los Angeles, California,” prepared by Pacific Geology Consultants, Inc., dated July 19, 2005. (*“Foliation mapped within outcrops on and adjacent to the site exhibits a dominant east-west strike accompanied by dips to the north ranging from 1 to 36 degrees. Foliation depicted on the referenced geologic maps prepared by the city of Los Angeles (1960) and Dibblee (1991) strikes in a northeast direction accompanied by dips to north west ranging from 20 to 55 degrees. Joints mapped along cut slopes generally possessed east-west strikes accompanied by moderate to steep dips to the north and south.”*);

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #49691, dated November 15, 2005;

“Addendum I: Response to City of Los Angeles Correction Letter, 1501 Marlay Drive, Los Angeles, California,” prepared by Subsurface Designs Inc., dated December 8, 2005. *“This office has reviewed reports prepared by Gorian & Associates prepared from 2002 and 2003. According to their reports, foliation is included in a northerly direction at low to steep angles (3 to 45 degrees). The mapped declination in foliation is similar to that reported by Pacific Geology Consultants (1998). The mapped declination in foliation plane dip is into the ascending slope area, a condition considered favorable with respect to long term stability of the slope. Daylighted foliation was not reported by Gorian & Associates or Pacific Geology Consultants.” “Joints mapped along cut slopes generally possessed east-west strikes accompanied by moderate to steep dips to the north and south. Coastline Geotechnical Consultants has performed stability analyses along the ascending slope taking into account the mapped declination in joint sets.”*;

“Response to City Geology and Soils Review Letter, 1501 Marlay Drive, Los Angeles, California,” prepared by Coastline Geotechnical Consultants, Inc., dated January 30, 2006;

City of Los Angeles Department of Building and Safety Grading Division, **Approval Letter** Log #49691-01, dated June 16, 2006;

“Geologic and Soils Engineering Exploration, Proposed Soil Nail Retaining Wall, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California,” prepared by Irvine Geotechnical, Inc., dated December 30, 2011 (*“the bedrock is generally massive and lacks significant structural planes.”*);

City of Los Angeles Department of Building and Safety Grading Division, Approval Letter Log #76299, dated March 7, 2012.

BOARD OF
BUILDING AND SAFETY
COMMISSIONERS

VAN AMBATIELOS
PRESIDENT

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JOSELYN GEAGA-ROSENTHAL
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CITY OF LOS ANGELES
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ERIC GARCETTI
MAYOR

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

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

FRANK BUSH
EXECUTIVE OFFICER

GEOLOGY AND SOILS REPORT CORRECTION LETTER

July 24, 2015

LOG # 89091
SOILS/GEOLOGY FILE - 2
LAN

Sara Schusterow
1855 Egret Way
Boca Raton, FL 33496

TRACT: 12204
LOT(S): 1
LOCATION: 1501 N. Marlay Drive

<u>CURRENT REFERENCE</u> <u>REPORT/LETTER(S)</u>	<u>REPORT</u> <u>No.</u>	<u>DATE(S) OF</u> <u>DOCUMENT</u>	<u>PREPARED BY</u>
Geology/Soils Report	SG 6684-W	04/04/2014	Schick Geotechnical, Inc.
Laboratory Test Report	CYG 14-7088	02/28/2014	CY Geotech, Inc.

The Grading Division of the Department of Building and Safety has reviewed the referenced report(s) providing recommendations for the proposed four-story residence and swimming pool with associated retaining walls. The residence will be cut into the hillside with retaining walls ranging up to about 32 feet in height. The subject site consists of an ascending slope about 110 feet in height from Marlay Drive to the adjacent lots on Woods Drive. The slope ascends at gradients of about 1½:1 (H:V) to locally near vertical. Subsurface exploration performed by the consultant consisted of three test pits supplemented with surface mapping of the bedrock. No geologic structure, such as joints and fractures, were mapped or reported by the consultant. The earth materials at the subsurface exploration locations consist of up to 10 feet of uncertified fill underlain by granite bedrock. The consultants recommend to support the proposed structures on conventional and/or drilled-pile foundations bearing on competent bedrock.

The site is located in a designated seismically induced landslide hazard zone as shown on the "Seismic Hazard Zones" map issued by the State of California.

The review of the subject reports can not be completed at this time and will be continued upon submittal of an addendum to the report which shall include, but not be limited to, the following:

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

1. Research, review and reference all existing records at the Research Division of the Department of Building and Safety for the subject and adjacent properties and incorporate the existing geologic data into the current evaluation. Include for review purposes a complete copy (including exploration logs, geologic map, cross-sections and lab data) of the previous reports and the Department's review letters. Electronic copies of the records are encouraged.
2. Summarize previous investigations/conclusions/recommendations, department approvals and clarify if construction as proposed, was achieved.
3. The consultants shall provide a statement that referenced previous reports were reviewed, that they either concur with or do not concur with the findings contained therein, and that they will accept professional responsibility for the use of any data from others.
4. For rock slopes 1:1 (H:V) or steeper, provide additional geologic mapping and analysis that incorporates, but not limited to, the following:
 - a. Detailed mapping and description of discontinuities along the existing cut slope; such as bedding planes, lithologic contacts, joints, fractures, and faults, with characteristics such as orientation, spacing, presence of infilling or openness, continuity, etc.
 - b. Kinematic analysis of discontinuities relative to the slope face, using stereographic methods to assess potential planar, wedge and topple type failures.
 - c. Slope stability analysis of the potential failures using appropriate methods for type of failure identified from the kinematic analysis.
5. Verify the scale of the geologic map and indicate the correct scale on the map. Scaled measurements from the map do not correspond to the indicated map scale of 1" = 16'.
6. Show on the geologic map and legend the geologic units encountered on the site and show the geologic structure of the bedrock including joints and fractures for the kinematic analyses requested.
7. Clearly show by labeling the extent of the proposed driveway and clarify if any portion of the oversteep road cut along Marlay Drive will remain. If any portion of the oversteep road cut along Marlay Drive will remain, provide recommendations to address the slope as required by the building code.
8. Provide a detailed discussion on the potential for raveling and rockfall. Provide justification and/or calculations that the use of a 10-foot high impact wall will be sufficient to protect the proposed development from raveling and rockfall.
9. Provide code required building setbacks.

The geologist and soils engineer shall prepare a report containing the corrections indicated in this letter. The report shall be in the form of an itemized response. It is recommended that once all correction items have been addressed in a response report, to contact the report review engineer

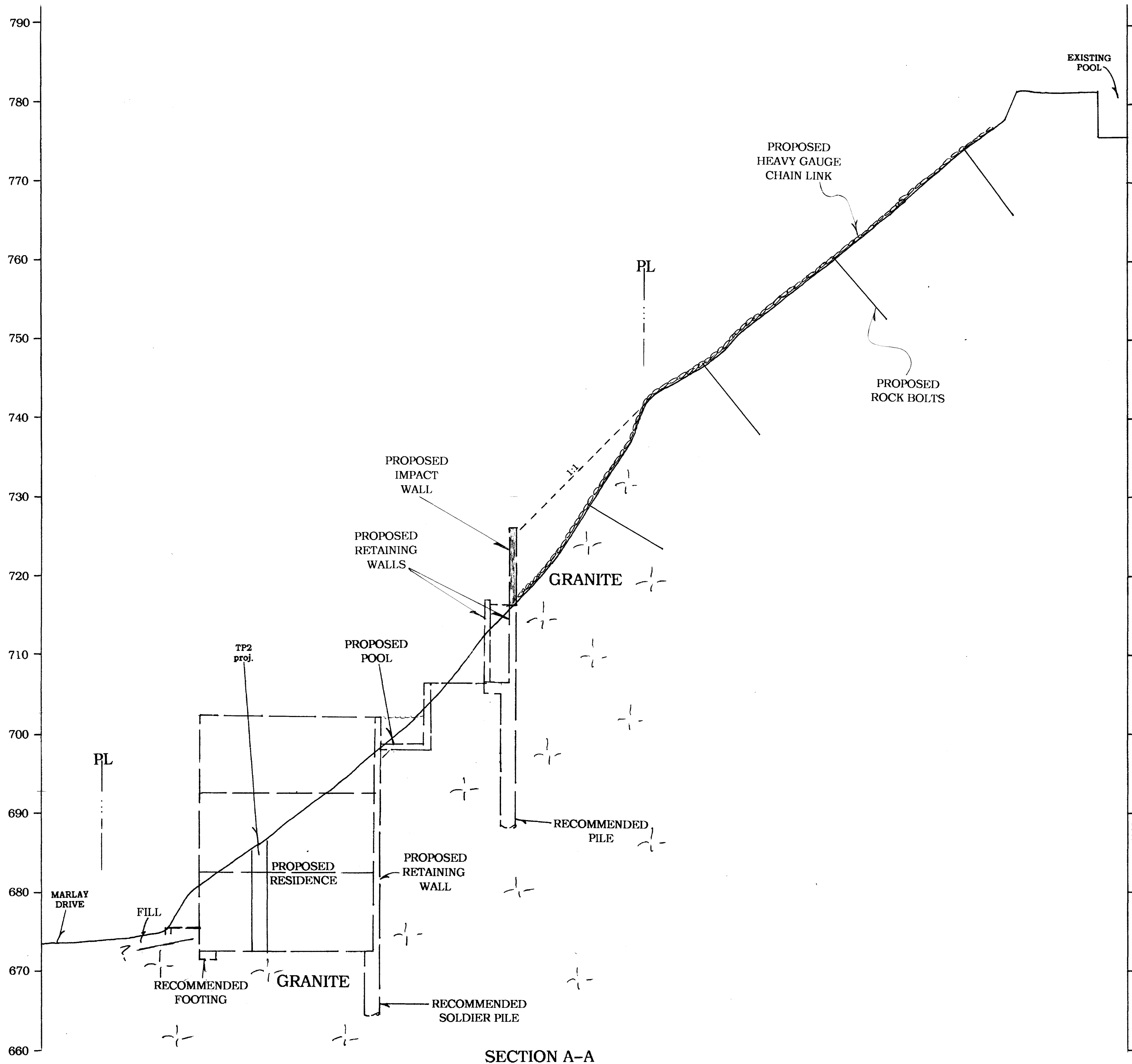
and/or geologist to schedule a verification appointment to demonstrate compliance with all the corrections. Do not schedule an appointment until all corrections have been addressed. Bring three copies of the response report, including one unbound wet-signed original for microfilming in the event that the report is found to be acceptable.


EDMOND LEE
Engineering Geologist Associate II


YING LIU
Geotechnical Engineer I

EL/YL:el/yl
Log No. 89091
213-482-0480

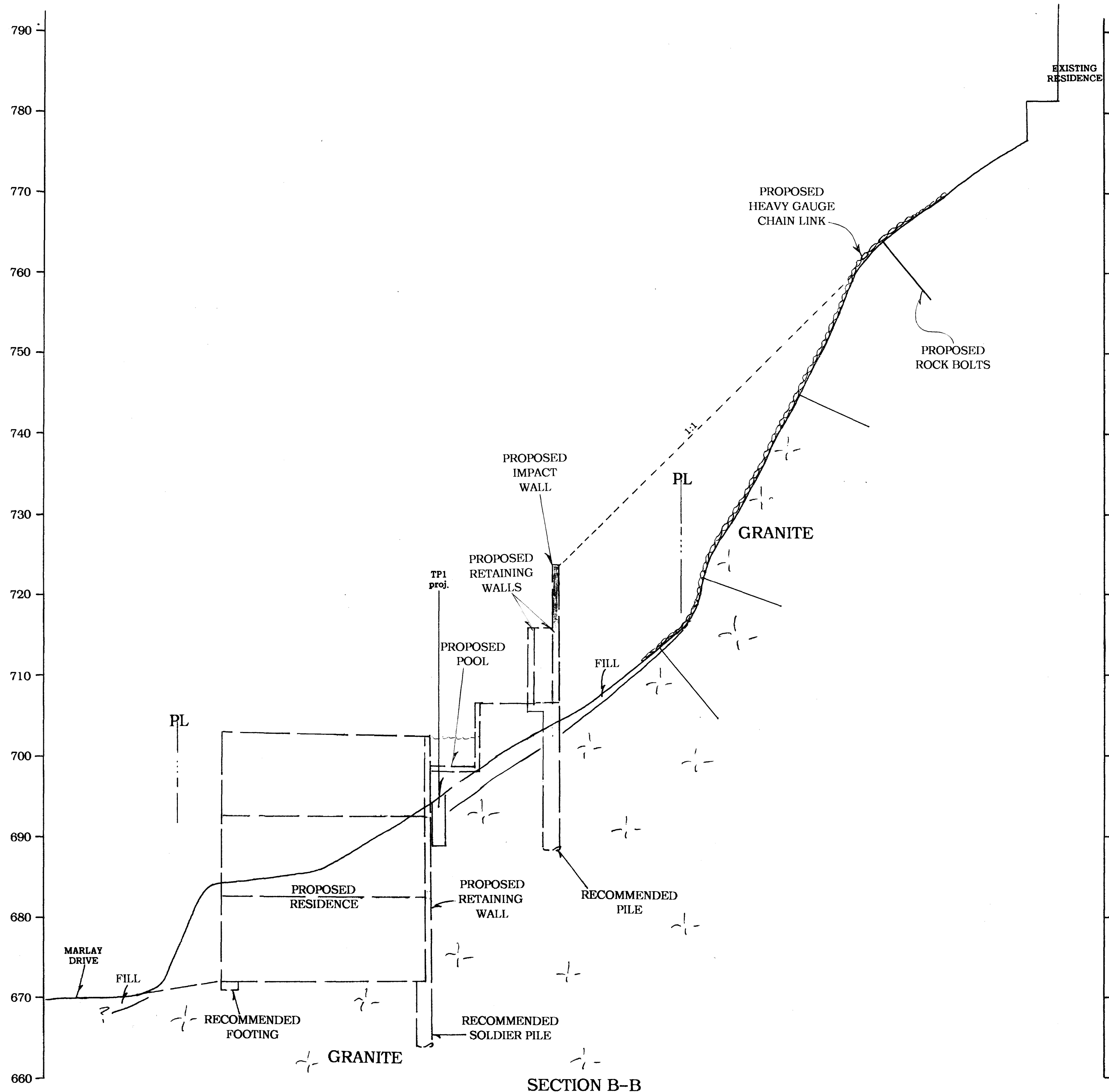
cc: Steven A. Williams, Applicant
Schick Geotechnical, Inc., Project Consultant
LA District Office



SCHICK GEOTECHNICAL, INC.
Geology and Soils Engineering

REVISED
APR 2016
DATE: AUG 2015
DRAWN: ACT
SCALE: 1"=8'
JOB: COLEMAN

SG 6684-W



SCHICK GEOTECHNICAL, INC.
Geology and Soils Engineering

REVISED
 APR 2016
 DATE: AUG 2015
 DRAWN: ACT
 SCALE: 1"=8'
 JOB: COLEMAN

SG 6684-W



GEOLOGY AND SOILS REPORT APPROVAL LETTER

June 17, 2016

LOG # 89091-01
SOILS/GEOLOGY FILE - 2
LAN

Sara Schusterow
7650 Haskell Avenue
Los Angeles, CA 91406

TRACT: 12204
LOT(S): 1
LOCATION: 1501 N. Marlay Drive

<u>CURRENT REFERENCE REPORT/LETTER(S)</u>	<u>REPORT No.</u>	<u>DATE(S) OF DOCUMENT</u>	<u>PREPARED BY</u>
Addendum Report	SG 6684-W	04/16/2016	Schick Geotechnical, Inc.
Oversized Docs.	"	"	"
Request for Modification	24409	06/17/2016	LADBS

<u>PREVIOUS REFERENCE REPORT/LETTER(S)</u>	<u>REPORT No.</u>	<u>DATE(S) OF DOCUMENT</u>	<u>PREPARED BY</u>
Dept. Correction Letter	89091	07/24/2015	LADBS
Geology/Soils Report	SG 6684-W	04/04/2014	Schick Geotechnical, Inc.
Laboratory Test Report	CYG 14-7088	02/28/2014	CY Geotech, Inc.

The Grading Division of the Department of Building and Safety has reviewed the referenced reports providing recommendations for the proposed four-story residence and swimming pool with associated retaining walls. The residence will be cut into the hillside with retaining walls ranging up to about 32 feet in height. The subject site consists of an ascending slope about 110 feet in height from Marlay Drive to the adjacent lots on Woods Drive. The slope ascends at gradients of about 1½:1 (H:V) to locally near vertical. Subsurface exploration performed by the consultant consisted of three test pits supplemented with surface mapping of the bedrock. No geologic structure, such as joints and fractures, were mapped or reported by the consultant. The earth materials at the subsurface exploration locations consist of up to 10 feet of uncertified fill underlain by granite bedrock. The consultants recommend to support the proposed structures on conventional and/or drilled-pile foundations bearing on competent bedrock.

A Request for a Modification of Building Ordinances (RFM File No. 24409) has been filed and approved for the proposed impact wall and rock netting to achieve a setback that is not in full conformance with the Building Code.

The site is located in a designated seismically induced landslide hazard zone as shown on the "Seismic Hazard Zones" map issued by the State of California. The above reports include an acceptable seismic slope stability analysis and the requirements of the 2014 City of Los Angeles Building Code, have been satisfied.

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

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

1. Approval shall be obtained from the Department of Public Works, Bureau of Engineering, Constituent Service Division for the proposed removal of support and/or retaining of slopes adjoining to public way. (3307.3.2)
201 N. Figueroa Street 3rd Floor, LA (213) 482-7045
2. Secure the written consent from all owners upon whose property the proposed grading is to extend. (7006.6)
3. The geologist and soils engineer shall review and approve the detailed plans prior to issuance of any permits. This approval shall be by signature on the plans that clearly indicates the geologist and soils engineer have reviewed the plans prepared by the design engineer and that the plans include the recommendations contained in their reports. (7006.1)
4. All recommendations of the reports that are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.
5. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans. Submit one copy of the above reports to the Building Department Plan Checker prior to issuance of the permit. (7006.1)
6. A grading permit shall be obtained for all structural fill and retaining wall backfill. (106.1.2)
7. Prior to the issuance of any permit, an accurate volume determination shall be made and included in the final plans, with regard to the amount of earth material to be exported from the site. For grading involving import or export of more than 1000 cubic yards of earth materials within the grading hillside area, approval is required by the Board of Building and Safety. Application for approval of the haul route must be filed with the Board of Building and Safety Commission Office. Processing time for application is approximately 8 weeks to hearing plus 10-day appeal period.
8. Secure the notarized written consent from all owners upon whose property proposed grading/construction access is to extend, in the event off-site grading and/or access for construction purposes is required. The consent shall be included as part of the final plans. (7006.6)
9. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557. Where cohesionless soil having less than 15 percent finer than 0.005 millimeters is used for fill, it shall be compacted to a minimum of 95 percent relative compaction based on maximum dry density (D1556). Placement of gravel in lieu of compacted fill is allowed only if complying with Section 91.7011.3 of the Code. (7011.3)
10. Existing uncertified fill shall not be used for support of footings, concrete slabs or new fill. (1809.2)
11. Drainage in conformance with the provisions of the Code shall be maintained during and subsequent to construction. (7013.12)
12. Grading shall be scheduled for completion prior to the start of the rainy season, or detailed temporary erosion control plans shall be filed in a manner satisfactory to the Grading Division of the

Department and the Department of Public Works, Bureau of Engineering, B-Permit Section, for any grading work in excess of 200 cu yd. (7007.1)
201 N. Figueroa Street 3rd Floor, LA (213) 482-7045

13. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the State Construction Safety Orders enforced by the State Division of Industrial Safety. (3301.1)
14. Temporary excavations that remove lateral support to the public way, adjacent property, or adjacent structures shall be supported by shoring. Note: Lateral support shall be considered to be removed when the excavation extends below a plane projected downward at an angle of 45 degrees from the bottom of a footing of an existing structure, from the edge of the public way or an adjacent property. (3307.3.1)
15. Where any excavation, not addressed in the approved reports, would remove lateral support (as defined in 3307.3.1) from a public way, adjacent property or structures, a supplemental report shall be submitted to the Grading Division of the Department containing recommendations for shoring, underpinning, and sequence of construction. Report shall include a plot plan and cross-section(s) showing the construction type, number of stories, and location of adjacent structures, and analysis incorporating all surcharge loads that demonstrate an acceptable factor of safety against failure. (7006.2 & 3307.3.2)
16. Prior to the issuance of any permit which authorizes an excavation where the excavation is to be of a greater depth than are the walls or foundation of any adjoining building or structure and located closer to the property line than the depth of the excavation, the owner of the subject site shall provide the Department with evidence that the adjacent property owner has been given a 30-day written notice of such intent to make an excavation. (3307.1)
17. The soils engineer shall review and approve the shoring plans prior to issuance of the permit. (3307.3.2)
18. Prior to the issuance of the permits, the soils engineer and the structural designer shall evaluate all applicable surcharge loads for the design of the retaining walls and shoring.
19. All temporary vertical excavations shall be shored as recommended.
20. Shoring shall be designed for the lateral earth pressures specified for retaining walls starting on page 10 of the 04/04/2016 report; all surcharge loads shall be included into the design.
21. Shoring shall be designed for a maximum lateral deflection of 1 inch, provided there are no structures within a 1:1 plane projected up from the base of the excavation. Where a structure is within a 1:1 plane projected up from the base of the excavation, shoring shall be designed for a maximum lateral deflection of ½ inch, or to a lower deflection determined by the consultant that does not present any potential hazard to the adjacent structure.
22. A shoring monitoring program shall be implemented to the satisfaction of the soils engineer.
23. All foundations shall derive entire support from competent bedrock, as recommended and approved by the geologist and soils engineer by inspection.
24. Foundations adjacent to a descending slope steeper than 3:1 (H:V) in gradient shall be a minimum distance of one-third the vertical height of the slope but need not exceed 40 feet measured horizontally from the footing bottom to the face of the slope (1808.7.2); for pools the foundation setback shall be one-sixth the slope height to a maximum of 20 feet (1808.7.3). Where the slope is

steeper than 1:1, the required setback shall be measured from an imaginary plane 45 degrees to the horizontal, projected upward from the toe of the slope.

25. Unless as approved by RFM for a specific slope, buildings adjacent to ascending slopes steeper than 3:1 (H:V) in gradient shall be set back from the toe of the slope a level distance equal to one-half the vertical height of the slope, but need not exceed 15 feet (1808.7.1); for pools the set back shall be one-fourth the vertical height of the slope, but need not exceed 7.5 feet (1808.7.3). Where the slope is steeper than 1:1, the toe of the slope shall be assumed to be at the intersection of a horizontal plane drawn from the top of the foundation and a plane drawn tangent to the slope at an angle of 45 degrees to the horizontal.
26. Pile caisson and/or isolated foundation ties are required by Code Sections 1809.13 and/or 1810.3.13. Exceptions and modification to this requirement are provided in Information Bulletin P/BC 2014-030.
27. Pile and/or caisson shafts shall be designed for a lateral load of 1000 pounds per linear foot of shaft exposed to fill, soil and weathered bedrock. (P/BC 2014-050)
28. The design passive pressure shall be neglected for a portion of the pile with a set back distance (horizontal set back) less than five feet from fill, soil or weathered bedrock contact plane with bedrock.
29. When water over 3 inches in depth is present in drilled pile holes, a concrete mix with a strength of 1000 p.s.i. over the design p.s.i. shall be tremied from the bottom up; an admixture that reduces the problem of segregation of paste/aggregates and dilution of paste shall be included. (1808.8.3)
30. Existing uncertified fill shall not be used for lateral support of deep foundation. (1810.2.1)
31. Slabs placed on approved compacted fill shall be at least 3½ inches thick and shall be reinforced with ½-inch diameter (#4) reinforcing bars spaced maximum of 16 inches on center each way.
32. The seismic design shall be based on a Site Class C as recommended. All other seismic design parameters shall be reviewed by LADBS building plan check.
33. Retaining walls shall be designed for the lateral earth pressures specified in the section titled "Retaining Walls" starting on page 10 of the 04/04/2016 report. Note: Where two separate stacked retaining walls (the upper wall surcharges the lower wall) are proposed, the lower of the 2 walls shall be designed for the combined height of the 2 walls.
34. Basement walls and other walls in which horizontal movement is restricted at the top shall be designed for at-rest pressure as specified on page 11 of the 04/04/2016 report (1610.1). All surcharge loads shall be included into the design.
35. The rear impact wall shall be designed for a minimum EFP of 125 PCF as recommended.
36. The recommended equivalent fluid pressure (EFP) for the proposed retaining wall shall apply from the top of the freeboard to the bottom of the wall footing.
37. All retaining walls shall be provided with a standard surface backdrain system and all drainage shall be conducted to the street in an acceptable manner and in a non-erosive device. (7013.11)
38. With the exception of retaining walls designed for hydrostatic pressure, all retaining walls shall be provided with a subdrain system to prevent possible hydrostatic pressure behind the wall. Prior to issuance of any permit, the retaining wall subdrain system recommended in the soil report shall be

incorporated into the foundation plan which shall be reviewed and approved by the soils engineer of record. (1805.4)

39. Installation of the subdrain system shall be inspected and approved by the soils engineer of record and the City grading/building inspector. (108.9)
40. Basement walls and floors shall be waterproofed/damp-proofed with an L.A. City approved "Below-grade" waterproofing/damp-proofing material with a research report number. (104.2.6)
41. Prefabricated drainage composites (Miradrain) (Geotextiles) may be only used in addition to traditionally accepted methods of draining retained earth.
42. The proposed swimming pool shall be designed for a freestanding condition.(1808.7.3)
43. The structure shall be connected to the public sewer system. (P/BC 2014-027)
44. All roof and pad drainage shall be conducted to the street in an acceptable manner; water shall not be dispersed on to descending slopes without specific approval from the Grading Division and the consulting geologist and soils engineer. (7013.10)
45. All concentrated drainage shall be conducted in an approved device and disposed of in a manner approved by the LADBS. (7013.10)
46. Sprinkler plans for irrigation shall be submitted and approved by the Mechanical Plan Check Section (7012.3.1).
47. Any recommendations prepared by the geologist and/or the soils engineer for correction of geological hazards found during grading shall be submitted to the Grading Division of the Department for approval prior to utilization in the field. (7008.2, 7008.3)
48. The geologist and soils engineer shall inspect all excavations to determine that conditions anticipated in the report have been encountered and to provide recommendations for the correction of hazards found during grading. (7008 & 1705.6)
49. All friction pile or caisson drilling and installation shall be performed under the inspection and approval of the geologist and soils engineer. The geologist shall indicate the distance that friction piles or caissons penetrate into competent bedrock in a written field memorandum. (1803.5.5, 1704.9)
50. Prior to the pouring of concrete, a representative of the consulting soils engineer shall inspect and approve the footing excavations. He/She shall post a notice on the job site for the LADBS Building Inspector and the Contractor stating that the work so inspected meets the conditions of the report, but that no concrete shall be poured until the City Building Inspector has also inspected and approved the footing excavations. A written certification to this effect shall be filed with the Grading Division of the Department upon completion of the work. (108.9 & 7008.2)
51. Prior to excavation, an initial inspection shall be called with LADBS Inspector at which time sequence of construction, shoring, pile installation, protection fences and dust and traffic control will be scheduled. (108.9.1)
52. Installation of shoring, underpinning, slot cutting excavations and/or pile installation shall be performed under the inspection and approval of the soils engineer and deputy grading inspector. (1705.6)

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



EDMOND LEE
Engineering Geologist Associate II



YING LIU
Geotechnical Engineer I

Log No. 89091-01
213-482-0480

cc: Schick Geotechnical, Inc., Project Consultant
LA District Office



GEOLOGY AND SOILS REPORT APPROVAL LETTER

September 13, 2016

LOG # 94536
SOILS/GEOLOGY FILE - 2
LAN

Sara Schusterow
7650 Haskell Avenue
Los Angeles, CA 91406

TRACT: 12204
LOT(S): 1
LOCATION: 1501 N. Marlay Drive

<u>CURRENT REFERENCE REPORT/LETTER(S)</u>	<u>REPORT No.</u>	<u>DATE(S) OF DOCUMENT</u>	<u>PREPARED BY</u>
Addendum Report	SG 6684-W	08/05/2016	Schick Geotechnical, Inc.
Oversized Docs.	..	..	..

<u>PREVIOUS REFERENCE REPORT/LETTER(S)</u>	<u>REPORT No.</u>	<u>DATE(S) OF DOCUMENT</u>	<u>PREPARED BY</u>
Dept. Approval Letter	89091-01	06/17/2016	LADBS
Request for Modification	24409	06/17/2016	LADBS
Addendum Report	SG 6684-W	04/16/2016	Schick Geotechnical, Inc.
Dept. Correction Letter	89091	07/24/2015	LADBS
Geology/Soils Report	SG 6684-W	04/04/2014	Schick Geotechnical, Inc.
Laboratory Test Report	CYG 14-7088	02/28/2014	CY Geotech, Inc.

The Grading Division of the Department of Building and Safety has reviewed the referenced reports providing recommendations for the proposed three-story residence, swimming pool, and associated retaining walls. The current development remains similar to the residence previously addressed by the consultant. The upper level has been eliminated and a new basement level is proposed below a portion of the residence. The swimming pool has also been reduced in size.

The Department previously conditionally approved the above referenced reports dated 04/04/2014 and 04/16/2016 for the proposed structure in a letter dated 06/17/2016, Log #89091-01.

The site is located in a designated seismically induced landslide hazard zone as shown on the Seismic Hazard Zones map issued by the State of California. The above reports include an acceptable seismic slope stability analysis and the requirements of the 2014 City of Los Angeles Building Code have been satisfied.

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

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

1. All conditions of the above referenced Department approval letter shall apply except as specifically modified herein.
2. Shoring shall be designed for the lateral earth pressures specified for retaining walls starting on page 3 of the 08/05/2016 report; all surcharge loads shall be included into the design.
3. Retaining walls shall be designed for the lateral earth pressures specified starting on page 1 of the 08/05/2016 report. Note: Where two separate stacked retaining walls (the upper wall surcharges the lower wall) are proposed, the lower of the 2 walls shall be designed for the combined height of the 2 walls.
4. Basement walls and other walls in which horizontal movement is restricted at the top shall be designed for at-rest pressure as specified on page 2 of the 08/05/2016 report (1610.1). All surcharge loads shall be included into the design.



EDMOND LEE
Engineering Geologist Associate II



YING LIU
Geotechnical Engineer I

Log No. 94536
213-482-0480

cc: Schick Geotechnical, Inc., Project Consultant
LA District Office

SCHICK GEOTECHNICAL, INC.

~
Geology and Soils Engineering
Specializing in Residential
Hillside Properties

December 17, 2018
SG 6684-W

Sara Schusterow
1855 Egret Way
Boca Raton, FL 33496

Subject

Addendum Geologic and Soils Engineering
Exploration
1501 Marlay Drive
Lot 1, Tract 12204
Los Angeles, California

References:

Geologic and Soils Engineering Exploration, Proposed Residence, 1501 Marlay Drive, Lot 1, Tract 12204, Los Angeles, California,” dated April 4, 2015;
City of Los Angeles Department of Building and Safety, Grading Division, Correction Letter, Log #89091, dated July 24, 2015;
“Response to City Correction Letter, 1501 Marlay Drive, Lot 1, Tract 12204, Los Angeles, California,” dated April 13, 2016;
City of Los Angeles Department of Building and Safety, Grading Division, Approval Letter, Log #89091-01, dated June 17, 2016;
Addendum Geologic and Soils Engineering Exploration, Proposed Basement, 1501 Marlay Drive, Lot 1, Tract 12204, Los Angeles, California,” dated August 5, 2016; City of Los Angeles Department of Building and Safety, Grading Division, Approval Letter, Log #94536, dated September 13, 2016.

Dear Ms. Schusterow:

Per your request, SGI has prepared the following Addendum Geologic and Soils Engineering report to provide revised recommendations.

The previously recommended two walls have been redesigned as one impact wall (125pcf), as shown on the enclosed Geologic Map and Section. The pool location has been moved to the north, adjacent to the impact wall. The pool wall is to be structurally independent of the impact wall.

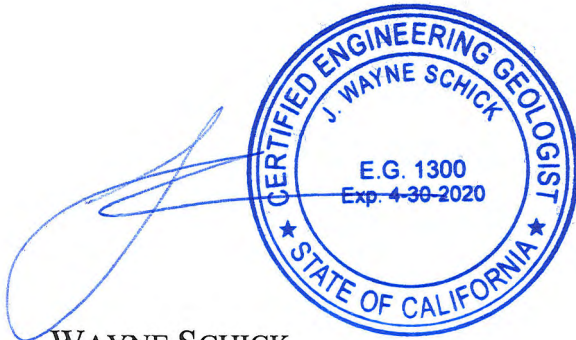
The remainder of the recommendations contained in the referenced reports remain applicable.

December 17, 2018

SG 6684-W

Page 2

Respectfully submitted,



WAYNE SCHICK
C.E.G. 1300



FRANK MISCIONE
P.E. C69031

Enc:

Geologic Map and Section (revised)
City of Los Angeles Approval Letter
City Research Documents

xc: (3) Addressee

SCHICK GEOTECHNICAL, INC.

7650 Haskell Avenue, Suite D, Van Nuys, California 91406 Ph (818) 905-8011 Fx (818) 905-8115

RESEARCH

The following documents were obtained from the City of Los Angeles Building Department:

Geologic Report, Proposed Residence, 1501 Marlay Drive, Los Angeles, California, prepared by Dr. James E. Slosson, dated January 23, 1959 - not available;

Soil Report, Proposed Residence, 1501 Marlay Drive, Los Angeles, California, prepared by Pacific Soils Engineering, Inc., dated January 24, 1963 *"Foliation mapped within outcrops on and adjacent to the site exhibits a dominant strike in an east-west direction accompanied by dips to the north ranging from 1 to 36 degrees. Foliation depicted on the referenced geologic map prepared by the city of Los Angeles (1960) and Dibblee (1991) strikes in a northeast direction accompanied by dips to the north west ranging from 20 to 55 degrees."* - not available;

"Addendum Geologic and Soils Engineering Report, Proposed Single Family Residence, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated July 25, 1980;

"Geologic and Soils Engineering Report, Proposed Single Family Residence, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated June 19, 1987;

"Justification of Private Sewerage System, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated December 7, 1987;

"Additional Information, Proposed Residence, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated December 7, 1987;

"Additional Information, Temporary Excavations and Retaining Walls, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated February 9, 1987;

"Geologic and Soils Engineering Exploration, Proposed Structural Slab, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated April 29, 1988;

"Potential for Mudflow, Proposed Private Street 1093, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated May 19, 1988;

Report for 1501-1509 Marlay Drive, Los Angeles, California, prepared by Applied Earth Sciences, dated July 25, 1988 (*"The joints within the rock at this site are considered not to be continuous." "However, surficial block failures along unsupported joints on to oversteepened slopes are common within typical rock. Therefore, as part of the proposed development, impact walls should be constructed behind the proposed buildings in order to protect the proposed residential structures against surficial block failures."*);

City of Los Angeles Department of Building and Safety Grading Division, Review Letter Log #5757, dated August 1, 1988;

City of Los Angeles Department of Building and Safety Grading Division, Review Letter Log #7152, dated November 1, 1988;

SCHICK GEOTECHNICAL, INC.

7650 Haskell Avenue, Suite D, Van Nuys, California 91406 Ph (818) 905-8011 Fx (818) 905-8115

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #27705, dated March 12, 1992;

City of Los Angeles Department of Building and Safety Grading Division, Approval Letter Log #29208, dated July 7, 1992;

“Report of Preliminary Engineering Geologic Investigation, Proposed Construction of Two Single-family Residences, 1501 Marlay Drive, Los Angeles, California,” prepared by Pacific Geology Consultants, Inc., dated October 15, 1998 (shows joints dipping 50 degrees south mapped on offsite property to north, and foliation and joints dipping steeply to the north on the south portion of the site);

“Geotechnical Engineering Investigation Report, Two Proposed Single-Family Residences, 1501 and 1509 Marlay Drive, Los Angeles, California,” prepared by Coastline Geotechnical Consultants, Inc., dated September 28, 1998- not available;

“Geotechnical Engineering Update Report, Proposed New Residence, 1501 Marlay Drive, Los Angeles, California,” prepared by Coastline Geotechnical Consultants, Inc., dated October 28, 1998;

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #28497, dated September 2, 1999;

“Supplemental Engineering Geologic Investigation, Response to the City of Los Angeles grading Section Review Letter, Proposed Construction of Two Single-Family Residences, 1501 Marlay Drive, Los Angeles, California,” prepared by Pacific Geology Consultants, Inc., dated September 14, 1999;

“Reply to Geotechnical Engineering Review Sheet from the City of Los Angeles dated September 2, 1999, Proposed Two Single Family Residences, 1501 and 1509 Marlay Drive, Los Angeles, California,” prepared by Coastline Geotechnical Consultants, dated September 15, 1999;

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #28497-01, dated October 7, 1999;

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #37767, dated September 24, 2002;

“Geotechnical Addendum Report, Response to City of Los Angeles Review Sheet, Proposed Residence, 1501 Marlay Drive, Los Angeles, California,” prepared by Gorian, dated September 27, 2002;

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #37767-01, dated November 22, 2002;

“Geotechnical Addendum Report No. 2, Response to City of Los Angeles Review Sheet, Proposed Residence, 1501 Marlay Drive, Los Angeles, California,” prepared by Gorian, dated May 5, 2003. *“As discussed above, adversely-oriented planar bedrock features are not present.”*;

City of Los Angeles Department of Building and Safety Grading Division, Approval Letter Log #37767-02, dated July 2, 2003;

“Geotechnical Engineering Update Report, Proposed New Residence, 1501 Marlay Drive, Los Angeles, California,” prepared by Coastline Geotechnical Consultants, Inc., dated April 14, 2005;

SCHICK GEOTECHNICAL, INC.

7650 Haskell Avenue, Suite D, Van Nuys, California 91406 Ph (818) 905-8011 Fx (818) 905-8115

“Update Letter - Proposed Single-family Residence, 1501 Marlay Drive, Los Angeles, California,” prepared by Pacific Geology Consultants, Inc., dated July 19, 2005. (*“Foliation mapped within outcrops on and adjacent to the site exhibits a dominant east-west strike accompanied by dips to the north ranging from 1 to 36 degrees. Foliation depicted on the referenced geologic maps prepared by the city of Los Angeles (1960) and Dibblee (1991) strikes in a northeast direction accompanied by dips to north west ranging from 20 to 55 degrees. Joints mapped along cut slopes generally possessed east-west strikes accompanied by moderate to steep dips to the north and south.”*);

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #49691, dated November 15, 2005;

“Addendum I: Response to City of Los Angeles Correction Letter, 1501 Marlay Drive, Los Angeles, California,” prepared by Subsurface Designs Inc., dated December 8, 2005. *“This office has reviewed reports prepared by Gorian & Associates prepared from 2002 and 2003. According to their reports, foliation in included in a northerly direction at low to steep angles (3 to 45 degrees). The mapped declination in foliation is similar to that reported by Pacific Geology Consultants (1998). The mapped declination in foliation plane dip is into the ascending slope area, a condition considered favorable with respect to long term stability of the slope. Daylighted foliation was not reported by Gorian & Associates or Pacific Geology Consultants.” “Joints mapped along cut slopes generally possessed east-west strikes accompanied by moderate to steep dips to the north and south. Coastline Geotechnical Consultants has performed stability analyses along the ascending slope taking into account the mapped declination in joint sets.”*;

“Response to City Geology and Soils Review Letter, 1501 Marlay Drive, Los Angeles, California,” prepared by Coastline Geotechnical Consultants, Inc., dated January 30, 2006;

City of Los Angeles Department of Building and Safety Grading Division, **Approval Letter** Log #49691-01, dated June 16, 2006;

“Geologic and Soils Engineering Exploration, Proposed Soil Nail Retaining Wall, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California,” prepared by Irvine Geotechnical, Inc., dated December 30, 2011 (*“the bedrock is generally massive and lacks significant structural planes.”*);

City of Los Angeles Department of Building and Safety Grading Division, Approval Letter Log #76299, dated March 7, 2012.

VAN AMBATIELOS
PRESIDENT

E. FELICIA BRANNON
VICE-PRESIDENT

JOSELYN GEAGA-ROSENTHAL
GEORGE HOVAGUIMIAN
JAVIER NUNEZ



ERIC GARCETTI
MAYOR

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

FRANK BUSH
EXECUTIVE OFFICER

GEOLOGY AND SOILS REPORT APPROVAL LETTER

June 17, 2016

LOG # 89091-01
SOILS/GEOLOGY FILE - 2
LAN

Sara Schusterow
7650 Haskell Avenue
Los Angeles, CA 91406

TRACT: 12204
LOT(S): 1
LOCATION: 1501 N. Marlay Drive

<u>CURRENT REFERENCE REPORT/LETTER(S)</u>	<u>REPORT No.</u>	<u>DATE(S) OF DOCUMENT</u>	<u>PREPARED BY</u>
Addendum Report	SG 6684-W	04/16/2016	Schick Geotechnical, Inc.
Oversized Docs.	"	"	"
Request for Modification	24409	06/17/2016	LADBS

<u>PREVIOUS REFERENCE REPORT/LETTER(S)</u>	<u>REPORT No.</u>	<u>DATE(S) OF DOCUMENT</u>	<u>PREPARED BY</u>
Dept. Correction Letter	89091	07/24/2015	LADBS
Geology/Soils Report	SG 6684-W	04/04/2014	Schick Geotechnical, Inc.
Laboratory Test Report	CYG 14-7088	02/28/2014	CY Geotech, Inc.

The Grading Division of the Department of Building and Safety has reviewed the referenced reports providing recommendations for the proposed four-story residence and swimming pool with associated retaining walls. The residence will be cut into the hillside with retaining walls ranging up to about 32 feet in height. The subject site consists of an ascending slope about 110 feet in height from Marlay Drive to the adjacent lots on Woods Drive. The slope ascends at gradients of about 1½:1 (H:V) to locally near vertical. Subsurface exploration performed by the consultant consisted of three test pits supplemented with surface mapping of the bedrock. No geologic structure, such as joints and fractures, were mapped or reported by the consultant. The earth materials at the subsurface exploration locations consist of up to 10 feet of uncertified fill underlain by granite bedrock. The consultants recommend to support the proposed structures on conventional and/or drilled-pile foundations bearing on competent bedrock.

A Request for a Modification of Building Ordinances (RFM File No. 24409) has been filed and approved for the proposed impact wall and rock netting to achieve a setback that is not in full conformance with the Building Code.

The site is located in a designated seismically induced landslide hazard zone as shown on the "Seismic Hazard Zones" map issued by the State of California. The above reports include an acceptable seismic slope stability analysis and the requirements of the 2014 City of Los Angeles Building Code, have been satisfied.

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

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

1. Approval shall be obtained from the Department of Public Works, Bureau of Engineering, Constituent Service Division for the proposed removal of support and/or retaining of slopes adjoining to public way. (3307.3.2)
201 N. Figueroa Street 3rd Floor, LA (213) 482-7045
2. Secure the written consent from all owners upon whose property the proposed grading is to extend. (7006.6)
3. The geologist and soils engineer shall review and approve the detailed plans prior to issuance of any permits. This approval shall be by signature on the plans that clearly indicates the geologist and soils engineer have reviewed the plans prepared by the design engineer and that the plans include the recommendations contained in their reports. (7006.1)
4. All recommendations of the reports that are in addition to or more restrictive than the conditions contained herein shall be incorporated into the plans.
5. A copy of the subject and appropriate referenced reports and this approval letter shall be attached to the District Office and field set of plans. Submit one copy of the above reports to the Building Department Plan Checker prior to issuance of the permit. (7006.1)
6. A grading permit shall be obtained for all structural fill and retaining wall backfill. (106.1.2)
7. Prior to the issuance of any permit, an accurate volume determination shall be made and included in the final plans, with regard to the amount of earth material to be exported from the site. For grading involving import or export of more than 1000 cubic yards of earth materials within the grading hillside area, approval is required by the Board of Building and Safety. Application for approval of the haul route must be filed with the Board of Building and Safety Commission Office. Processing time for application is approximately 8 weeks to hearing plus 10-day appeal period.
8. Secure the notarized written consent from all owners upon whose property proposed grading/construction access is to extend, in the event off-site grading and/or access for construction purposes is required. The consent shall be included as part of the final plans. (7006.6)
9. All man-made fill shall be compacted to a minimum 90 percent of the maximum dry density of the fill material per the latest version of ASTM D 1557. Where cohesionless soil having less than 15 percent finer than 0.005 millimeters is used for fill, it shall be compacted to a minimum of 95 percent relative compaction based on maximum dry density (D1556). Placement of gravel in lieu of compacted fill is allowed only if complying with Section 91.7011.3 of the Code. (7011.3)
10. Existing uncertified fill shall not be used for support of footings, concrete slabs or new fill. (1809.2)
11. Drainage in conformance with the provisions of the Code shall be maintained during and subsequent to construction. (7013.12)
12. Grading shall be scheduled for completion prior to the start of the rainy season, or detailed temporary erosion control plans shall be filed in a manner satisfactory to the Grading Division of the

Department and the Department of Public Works, Bureau of Engineering, B-Permit Section, for any grading work in excess of 200 cu yd. (7007.1)
201 N. Figueroa Street 3rd Floor, LA (213) 482-7045

13. The applicant is advised that the approval of this report does not waive the requirements for excavations contained in the State Construction Safety Orders enforced by the State Division of Industrial Safety. (3301.1)
14. Temporary excavations that remove lateral support to the public way, adjacent property, or adjacent structures shall be supported by shoring. Note: Lateral support shall be considered to be removed when the excavation extends below a plane projected downward at an angle of 45 degrees from the bottom of a footing of an existing structure, from the edge of the public way or an adjacent property. (3307.3.1)
15. Where any excavation, not addressed in the approved reports, would remove lateral support (as defined in 3307.3.1) from a public way, adjacent property or structures, a supplemental report shall be submitted to the Grading Division of the Department containing recommendations for shoring, underpinning, and sequence of construction. Report shall include a plot plan and cross-section(s) showing the construction type, number of stories, and location of adjacent structures, and analysis incorporating all surcharge loads that demonstrate an acceptable factor of safety against failure. (7006.2 & 3307.3.2)
16. Prior to the issuance of any permit which authorizes an excavation where the excavation is to be of a greater depth than are the walls or foundation of any adjoining building or structure and located closer to the property line than the depth of the excavation, the owner of the subject site shall provide the Department with evidence that the adjacent property owner has been given a 30-day written notice of such intent to make an excavation. (3307.1)
17. The soils engineer shall review and approve the shoring plans prior to issuance of the permit. (3307.3.2)
18. Prior to the issuance of the permits, the soils engineer and the structural designer shall evaluate all applicable surcharge loads for the design of the retaining walls and shoring.
19. All temporary vertical excavations shall be shored as recommended.
20. Shoring shall be designed for the lateral earth pressures specified for retaining walls starting on page 10 of the 04/04/2016 report; all surcharge loads shall be included into the design.
21. Shoring shall be designed for a maximum lateral deflection of 1 inch, provided there are no structures within a 1:1 plane projected up from the base of the excavation. Where a structure is within a 1:1 plane projected up from the base of the excavation, shoring shall be designed for a maximum lateral deflection of ½ inch, or to a lower deflection determined by the consultant that does not present any potential hazard to the adjacent structure.
22. A shoring monitoring program shall be implemented to the satisfaction of the soils engineer.
23. All foundations shall derive entire support from competent bedrock, as recommended and approved by the geologist and soils engineer by inspection.
24. Foundations adjacent to a descending slope steeper than 3:1 (H:V) in gradient shall be a minimum distance of one-third the vertical height of the slope but need not exceed 40 feet measured horizontally from the footing bottom to the face of the slope (1808.7.2); for pools the foundation setback shall be one-sixth the slope height to a maximum of 20 feet (1808.7.3). Where the slope is

steeper than 1:1, the required setback shall be measured from an imaginary plane 45 degrees to the horizontal, projected upward from the toe of the slope.

25. Unless as approved by RFM for a specific slope, buildings adjacent to ascending slopes steeper than 3:1 (H:V) in gradient shall be set back from the toe of the slope a level distance equal to one-half the vertical height of the slope, but need not exceed 15 feet (1808.7.1); for pools the set back shall be one-fourth the vertical height of the slope, but need not exceed 7.5 feet (1808.7.3). Where the slope is steeper than 1:1, the toe of the slope shall be assumed to be at the intersection of a horizontal plane drawn from the top of the foundation and a plane drawn tangent to the slope at an angle of 45 degrees to the horizontal.
26. Pile caisson and/or isolated foundation ties are required by Code Sections 1809.13 and/or 1810.3.13. Exceptions and modification to this requirement are provided in Information Bulletin P/BC 2014-030.
27. Pile and/or caisson shafts shall be designed for a lateral load of 1000 pounds per linear foot of shaft exposed to fill, soil and weathered bedrock. (P/BC 2014-050)
28. The design passive pressure shall be neglected for a portion of the pile with a set back distance (horizontal set back) less than five feet from fill, soil or weathered bedrock contact plane with bedrock.
29. When water over 3 inches in depth is present in drilled pile holes, a concrete mix with a strength of 1000 p.s.i. over the design p.s.i. shall be tremied from the bottom up; an admixture that reduces the problem of segregation of paste/aggregates and dilution of paste shall be included. (1808.8.3)
30. Existing uncertified fill shall not be used for lateral support of deep foundation. (1810.2.1)
31. Slabs placed on approved compacted fill shall be at least 3½ inches thick and shall be reinforced with ½-inch diameter (#4) reinforcing bars spaced maximum of 16 inches on center each way.
32. The seismic design shall be based on a Site Class C as recommended. All other seismic design parameters shall be reviewed by LADBS building plan check.
33. Retaining walls shall be designed for the lateral earth pressures specified in the section titled "Retaining Walls" starting on page 10 of the 04/04/2016 report. Note: Where two separate stacked retaining walls (the upper wall surcharges the lower wall) are proposed, the lower of the 2 walls shall be designed for the combined height of the 2 walls.
34. Basement walls and other walls in which horizontal movement is restricted at the top shall be designed for at-rest pressure as specified on page 11 of the 04/04/2016 report (1610.1). All surcharge loads shall be included into the design.
35. The rear impact wall shall be designed for a minimum EFP of 125 PCF as recommended.
36. The recommended equivalent fluid pressure (EFP) for the proposed retaining wall shall apply from the top of the freeboard to the bottom of the wall footing.
37. All retaining walls shall be provided with a standard surface backdrain system and all drainage shall be conducted to the street in an acceptable manner and in a non-erosive device. (7013.11)
38. With the exception of retaining walls designed for hydrostatic pressure, all retaining walls shall be provided with a subdrain system to prevent possible hydrostatic pressure behind the wall. Prior to issuance of any permit, the retaining wall subdrain system recommended in the soil report shall be

incorporated into the foundation plan which shall be reviewed and approved by the soils engineer of record. (1805.4)

39. Installation of the subdrain system shall be inspected and approved by the soils engineer of record and the City grading/building inspector. (108.9)
40. Basement walls and floors shall be waterproofed/damp-proofed with an L.A. City approved "Below-grade" waterproofing/damp-proofing material with a research report number. (104.2.6)
41. Prefabricated drainage composites (Miradrain) (Geotextiles) may be only used in addition to traditionally accepted methods of draining retained earth.
42. The proposed swimming pool shall be designed for a freestanding condition.(1808.7.3)
43. The structure shall be connected to the public sewer system. (P/BC 2014-027)
44. All roof and pad drainage shall be conducted to the street in an acceptable manner; water shall not be dispersed on to descending slopes without specific approval from the Grading Division and the consulting geologist and soils engineer. (7013.10)
45. All concentrated drainage shall be conducted in an approved device and disposed of in a manner approved by the LADBS. (7013.10)
46. Sprinkler plans for irrigation shall be submitted and approved by the Mechanical Plan Check Section (7012.3.1).
47. Any recommendations prepared by the geologist and/or the soils engineer for correction of geological hazards found during grading shall be submitted to the Grading Division of the Department for approval prior to utilization in the field. (7008.2, 7008.3)
48. The geologist and soils engineer shall inspect all excavations to determine that conditions anticipated in the report have been encountered and to provide recommendations for the correction of hazards found during grading. (7008 & 1705.6)
49. All friction pile or caisson drilling and installation shall be performed under the inspection and approval of the geologist and soils engineer. The geologist shall indicate the distance that friction piles or caissons penetrate into competent bedrock in a written field memorandum. (1803.5.5, 1704.9)
50. Prior to the pouring of concrete, a representative of the consulting soils engineer shall inspect and approve the footing excavations. He/She shall post a notice on the job site for the LADBS Building Inspector and the Contractor stating that the work so inspected meets the conditions of the report, but that no concrete shall be poured until the City Building Inspector has also inspected and approved the footing excavations. A written certification to this effect shall be filed with the Grading Division of the Department upon completion of the work. (108.9 & 7008.2)
51. Prior to excavation, an initial inspection shall be called with LADBS Inspector at which time sequence of construction, shoring, pile installation, protection fences and dust and traffic control will be scheduled. (108.9.1)
52. Installation of shoring, underpinning, slot cutting excavations and/or pile installation shall be performed under the inspection and approval of the soils engineer and deputy grading inspector. (1705.6)

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



EDMOND LEE
Engineering Geologist Associate II



YING LIU
Geotechnical Engineer I

Log No. 89091-01
213-482-0480

cc: Schick Geotechnical, Inc., Project Consultant
LA District Office



GEOLOGY AND SOILS REPORT APPROVAL LETTER

September 13, 2016

LOG # 94536
SOILS/GEOLOGY FILE - 2
LAN

Sara Schusterow
7650 Haskell Avenue
Los Angeles, CA 91406

TRACT: 12204
LOT(S): 1
LOCATION: 1501 N. Marlay Drive

<u>CURRENT REFERENCE REPORT/LETTER(S)</u>	<u>REPORT No.</u>	<u>DATE(S) OF DOCUMENT</u>	<u>PREPARED BY</u>
Addendum Report	SG 6684-W	08/05/2016	Schick Geotechnical, Inc.
Oversized Docs.	"	"	"

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Laboratory Test Report	CYG 14-7088	02/28/2014	CY Geotech, Inc.

The Grading Division of the Department of Building and Safety has reviewed the referenced reports providing recommendations for the proposed three-story residence, swimming pool, and associated retaining walls. The current development remains similar to the residence previously addressed by the consultant. The upper level has been eliminated and a new basement level is proposed below a portion of the residence. The swimming pool has also been reduced in size.

The Department previously conditionally approved the above referenced reports dated 04/04/2014 and 04/16/2016 for the proposed structure in a letter dated 06/17/2016, Log #89091-01.

The site is located in a designated seismically induced landslide hazard zone as shown on the Seismic Hazard Zones map issued by the State of California. The above reports include an acceptable seismic slope stability analysis and the requirements of the 2014 City of Los Angeles Building Code have been satisfied.

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

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

1. All conditions of the above referenced Department approval letter shall apply except as specifically modified herein.
2. Shoring shall be designed for the lateral earth pressures specified for retaining walls starting on page 3 of the 08/05/2016 report; all surcharge loads shall be included into the design.
3. Retaining walls shall be designed for the lateral earth pressures specified starting on page 1 of the 08/05/2016 report. Note: Where two separate stacked retaining walls (the upper wall surcharges the lower wall) are proposed, the lower of the 2 walls shall be designed for the combined height of the 2 walls.
4. Basement walls and other walls in which horizontal movement is restricted at the top shall be designed for at-rest pressure as specified on page 2 of the 08/05/2016 report (1610.1). All surcharge loads shall be included into the design.



EDMOND LEE
Engineering Geologist Associate II



YING LIU
Geotechnical Engineer I

Log No. 94536
213-482-0480

cc: Schick Geotechnical, Inc., Project Consultant
LA District Office

SCHICK GEOTECHNICAL, INC.
GEOLOGIC MAP

TP3 LOCATION AND NUMBER OF HAND-DUG TEST PITS
53 STRIKE AND DIP OF DISCONTINUOUS JOINTS



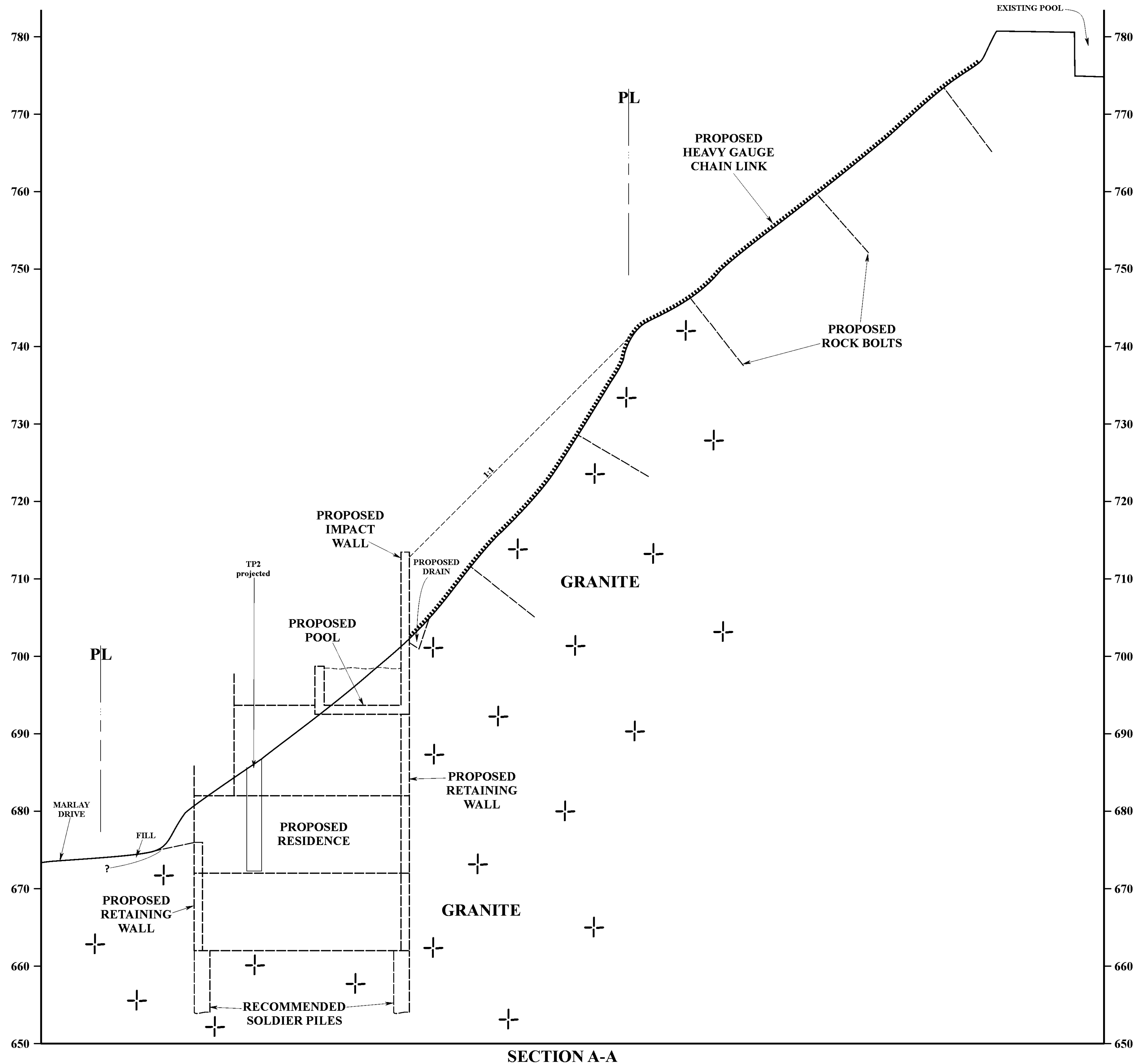
SITE SURVEY
SCALE: 1/8" = 1'-0"

4
C1.0

SITE SURVEY
26 JUNE, 2015

PAUL COLEMAN, ARCHITECT
2812 PYRENEES DRIVE, ALHAMBRA CALIFORNIA 91803
Hillside Residence
1501 Marlay Drive
Los Angeles, California 90069

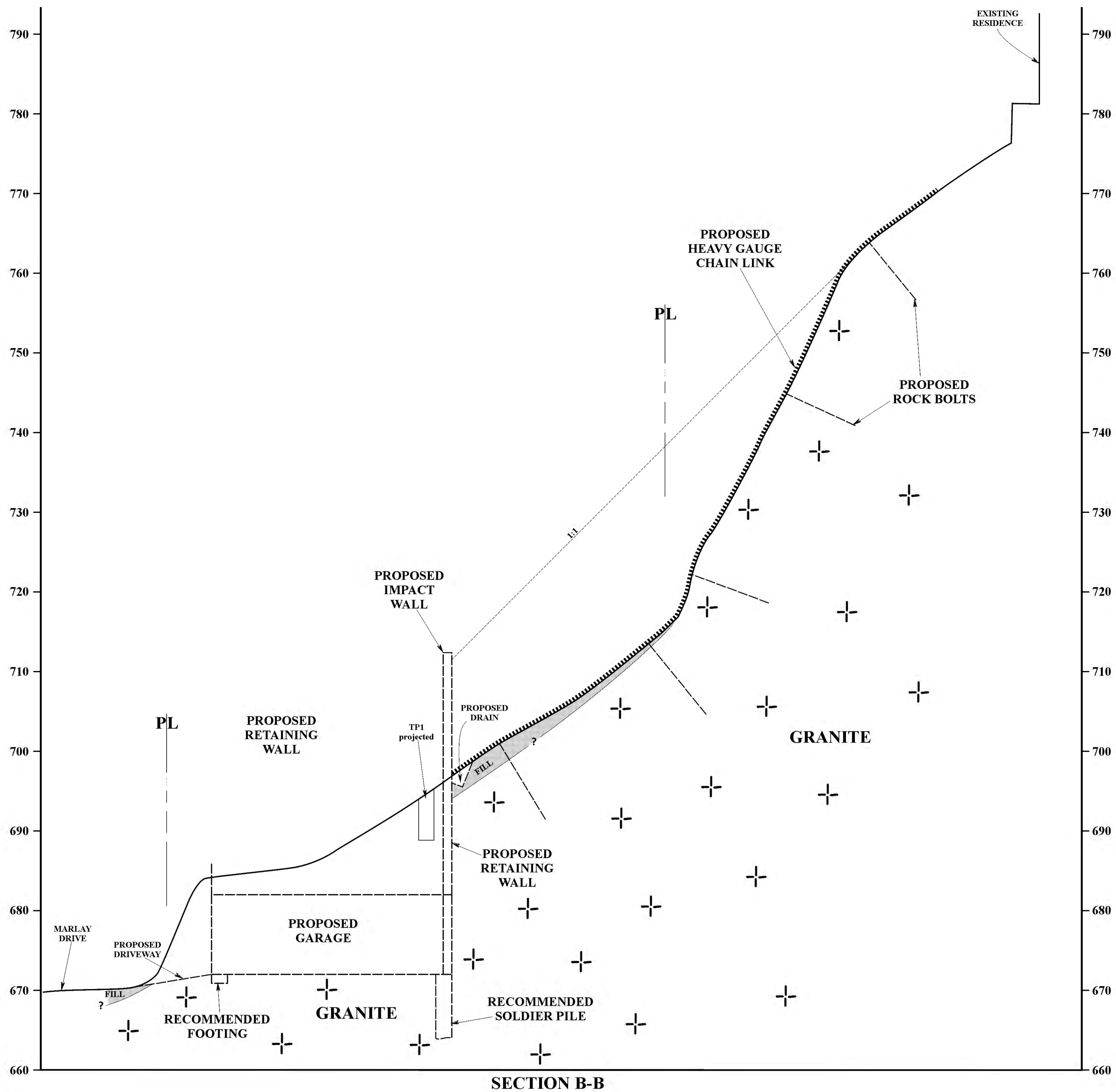
PAUL@LUCCOL.COM
213 700 2297



SCHICK GEOTECHNICAL, INC.

DATE: Dec 2018
DRAWN: ACT
SCALE: 1" = 8'
JOB: Coleman

SG 6684-W



SCHICK GEOTECHNICAL, INC.



GEOLOGY AND SOILS REPORT APPROVAL LETTER

April 24, 2019

LOG # 107803
SOILS/GEOLOGY FILE - 2
LAN

Sara Schusterow
7650 Haskell Avenue, Suite D
Los Angeles, CA 91406

TRACT: 12204
LOT(S): 1
LOCATION: 1501 N. Marlay Drive

<u>CURRENT REFERENCE</u> <u>REPORT/LETTER(S)</u>	<u>REPORT</u> <u>No.</u>	<u>DATE OF</u> <u>DOCUMENT</u>	<u>PREPARED BY</u>
Addendum Report	SG 6684-W	12/17/2018	Schick Geotechnical, Inc.
Oversized Doc(s).	"	"	"

<u>PREVIOUS REFERENCE</u> <u>REPORT/LETTER(S)</u>	<u>REPORT</u> <u>No.</u>	<u>DATE OF</u> <u>DOCUMENT</u>	<u>PREPARED BY</u>
Dept. Approval Letter	94536	09/13/2016	LADBS
Addendum Report	SG 6684-W	08/05/2016	Schick Geotechnical, Inc.
Dept. Approval Letter	89091-01	06/17/2016	LADBS
Request for Modification	24409	06/17/2016	LADBS
Addendum Report	SG 6684-W	04/16/2016	Schick Geotechnical, Inc.
Dept. Correction Letter	89091	07/24/2015	LADBS
Geology/Soils Report	SG 6684-W	04/04/2014	Schick Geotechnical, Inc.
Laboratory Test Report	CYG 14-7088	02/28/2014	CY Geotech, Inc.

The Grading Division of the Department of Building and Safety has reviewed the referenced addendum report addressing revisions to the proposed rear retaining/impact wall. According to the report, the rear retaining wall will consist of a single wall that will be incorporated as the rear wall of the proposed residence which has been revised and a portion relocated further north on the property. The proposed swimming pool has also been moved to the northwest corner of the building. The consultant states that the recommendation presented in the above-referenced reports remain applicable. The reports had been reviewed by the Department and conditionally approved in letters dated 06/17/2016, Log #89091-01 and 09/13/2019, Log #94536.

The site is located in a designated seismically induced landslide hazard zone as shown on the Seismic Hazard Zones map issued by the State of California. The above reports included an

acceptable seismic slope stability analysis and the requirements of the 2017 City of Los Angeles Building Code have been satisfied.

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

(Note: Numbers in parenthesis () refer to applicable sections of the 2017 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. All conditions of the above referenced Department approval letters dated 06/17/2016, Log #89091-01 and 09/13/2019, Log #94536, shall apply.


EDMOND LEE
Engineering Geologist Associate III


YING LIU
Geotechnical Engineer II

Log No. 107803
213-482-0480

cc: Schick Geotechnical, Inc., Project Consultant
LA District Office

SCHICK GEOTECHNICAL, INC.

~
Geology and Soils Engineering

June 19, 2020
SG 6684-W

Sara Schusterow
1855 Egret Way
Boca Raton, FL 33496

Subject

Addendum Geologic and Soils Engineering
Exploration
Revised Retaining Wall Analyses and
Kinematic Analysis
1501 Marlay Drive
Lot 1, Tract 12204
Los Angeles, California

References:

“Geologic and Soils Engineering Exploration, Proposed Soil Nail Retaining Wall, Lot 2, ARB 1, Tract 13044, Lot 3, ARB 1, Tract 1044, 1631 Woods Drive / 1635 Woods Drive, Los Angeles, California,” prepared by Irvine Geotechnical, Inc., dated December 30, 2011 ((contiguous sites above);

City of Los Angeles Department of Building and Safety, Approval Letter, Log #76299, dated March 7, 2012;

“Geologic and Soils Engineering Exploration, Proposed Residence, 1501 Marlay Drive, Lot 1, Tract 12204, Los Angeles, California,” dated April 4, 2014;

City of Los Angeles Department of Building and Safety, Grading Division, Correction Letter, Log #89091, dated July 24, 2015;

“Response to City Correction Letter, 1501 Marlay Drive, Lot 1, Tract 12204, Los Angeles, California,” dated April 13, 2016;

City of Los Angeles Department of Building and Safety, Grading Division, Approval Letter, Log #89091-01, dated June 17, 2016;

“Addendum Geologic and Soils Engineering Exploration, Proposed Basement, 1501 Marlay Drive, Lot 1, Tract 12204, Los Angeles, California,” dated August 5, 2016;

City of Los Angeles Department of Building and Safety, Grading Division, Approval Letter, Log #94536, dated September 13, 2016;

“Addendum Geologic and Soils Engineering Exploration, Proposed Basement, 1501 Marlay Drive, Lot 1, Tract 12204, Los Angeles, California,” dated December 17, 2018;

City of Los Angeles Department of Building and Safety, Grading Division, Approval Letter, Log #107803, dated April 24, 2019.

Dear Ms. Schusterow:

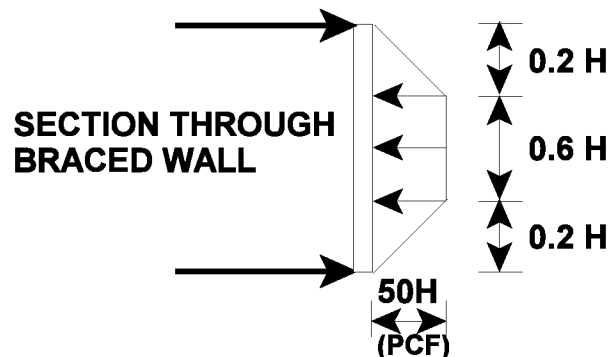
Per your request, SGI has prepared the following Addendum Geologic and Soils Engineering report

to provide revised recommendations for the ascending slope and to update the retaining wall analyses to conform with the new seismic code (ASCE 7). The research of the available records for the contiguous sites to the north was performed and is enclosed for review. The approved report was prepared to provide slope stabilization with soil nails for the slope located between 1631 Woods Drive and 1635 Woods Drive. The Property Activity Report does not indicate that the work was performed.

It is no longer proposed to provide the entire ascending slope with chain link, due to the lack of cooperation from the contiguous property owner above. The previously approved Kinematic Analysis has been replaced with the enclosed kinematic analysis. The analysis indicates that the ascending cut slope is kinematically stable. The previously recommended chain link was intended to provide additional protection, in addition to the 20-foot high impact wall. It is now recommended that the north property line be provided with additional protection, with a 8-foot high heavy gauge chain link fence with tie-backs.

The previously recommended two impact walls were redesigned as one impact wall (125pcf), as shown on the enclosed Geologic Map and Section (from approved report).

Subterranean retaining walls up to 55 feet high may be designed for an equivalent fluid pressure of 95 pounds per cubic foot (static plus seismic). The equivalent fluid pressure for trapezoidal loading is $50H$, per square foot per linear foot of width.



Temporary Retaining Wall Excavations

Temporary excavations will be required to construct the proposed subterranean walls. Vertical excavations will require the use of soldier piles. Soldier piles should be spaced a maximum of 8 feet on center. Soldier piles must be completed prior to making excavations and may be incorporated into the final wall design. The lagging should be installed in 5-foot vertical intervals for safety. The space between the lagging and cut face must be provided with slurry. The geologist must be present during grading to see temporary slopes. A deputy grading inspector is required.

SCHICK GEOTECHNICAL, INC.

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Soldier Piles

Soldier piles should be designed per the retaining wall recommendations and incorporated in the final wall design with shotcrete. Soldier piles should be a minimum of 24 inches in diameter and a minimum of 10 feet into bedrock, below the future excavation bottom. Piles may be assumed fixed at 3 feet into bedrock, below the future excavation bottom. The piles may be designed for a skin friction of 800 pounds per square foot for that portion of pile in contact with the bedrock, below the future excavation bottom. Soldier piles should be spaced 8 feet on center. The soldier piles may be designed per the retaining wall recommendations contained herein.

Passive earth pressure may be computed as an equivalent fluid having a density of 600 pounds per cubic foot, below the future excavation bottom. The maximum allowable earth pressure is 6,000 pounds per square foot. For design of isolated piles, the allowable passive earth pressure may be increased by 100 percent. Piles spaced more than 2.5 pile diameters on center may be considered isolated. Any anticipated superimposed loading within a 1:1 plane projected upward from the base of the wall, except retained earth materials, should be considered as surcharge and provided for in the design. The Project Structural Engineer should incorporate any anticipated superimposed loading in the design of the retaining walls. The excavations should be provided with lagging and slurry backfill. The piles with lagging may be incorporated into the final wall design.

DEFLECTION

It is difficult to accurately predict the amount of deflection of a shored embankment. Due to the proximity of the offsite structures, it is recommended that the structural engineer design the temporary shoring piles and the retaining walls to prevent any deflection. To reduce deflection of the shoring piles, a greater active pressure could be used in the shoring design. Survey control markers should be provided prior to construction, which should be periodically monitored by the surveyor during construction. A pre-construction 'survey' is required to photograph and document the surrounding structures and site conditions.

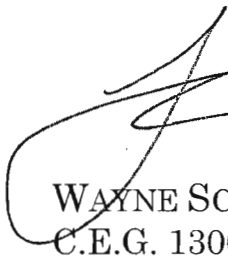
LAGGING

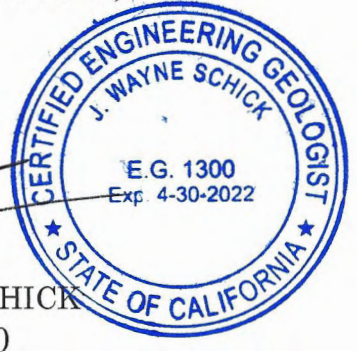
It is anticipated that lagging will be required between the shoring piles for the full height of the proposed excavation. Lagging should consist of treated lumber and be backfilled with lean-mix concrete to ensure full contact between the excavated soils and lagging boards. The shoring piles should be designed for the full anticipated lateral pressure. The pressure on the lagging, however, will be less due to arching in the soils. The lagging should be designed for the recommended earth pressure but limited to a maximum value of 400 psf.

Sequence of Construction

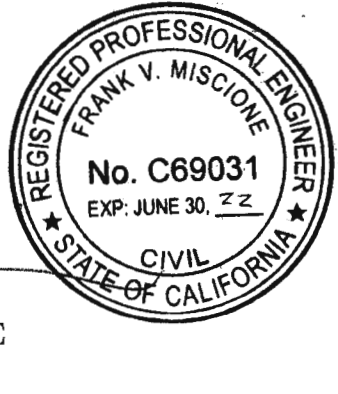
The soldier piles should be completed prior to making any vertical excavations. The subterranean retaining walls should be constructed by placing the lagging from the top down as the excavation is made, for safety. The lagging and excavation should proceed in 5 foot vertical intervals, with lagging placed after each 5-foot vertical excavation.

Respectfully submitted,


WAYNE SCHICK
C.E.G. 1300




FRANK MISCIONE
P.E. C69031



Enc:

Geologic Map and Section (revised)
City of Los Angeles Approval Letter
Kinematic Analysis
Research Documents

xc: (3) Addressee

Seismic Design

The seismic factors were determined based on the findings of the field exploration and in accordance with the U.S.G.S. Seismic Design map parameters.

Seismic Factors	Value	Reference
Site Class	C	Chapter 20 of ASCE 7
Mapped Spectral Response Acceleration at 0.2 second Period (S_s)	2.128g	Figure 1613.3.1(1) / CBC
Mapped Spectral Response Acceleration at 1.0 second Period (S_1)	0.764g	Figure 1613.3.1(2) / CBC
Site Coefficient F_a	1.2	Table 1613.3.3(1) / CBC
Site Coefficient F_v	1.4	Table 1613.3.3(2) / CBC
Maximum Considered Earthquake Spectral Response Acceleration at 0.2 second Period (S_{ms})	2.554g	Equation 16-37/CBC
Maximum Considered Earthquake Spectral Response Acceleration at 1.0 second Period (S_{m1})	1.069g	Equation 16-38 / CBC
Design Spectral Response Acceleration at 0.2 second Period (S_{ds})	1.702g	Equation 16-39 / CBC
Design Spectral Response Acceleration at 1.0 second Period (S_{d1})	0.713g	Equation 16-40 / CBC
Seismic Design Category	E	Chapter 20 of ASCE 7

Due to the nature and density of the earth materials underlying the subject property and the depth to groundwater, earthquake induced liquefaction, consolidation and differential settlement are not likely to occur on the site.

RESEARCH

The following documents were obtained from the City of Los Angeles Building Department:

Geologic Report, Proposed Residence, 1501 Marlay Drive, Los Angeles, California, prepared by Dr. James E. Slosson, dated January 23, 1959 - not available;

Soil Report, Proposed Residence, 1501 Marlay Drive, Los Angeles, California, prepared by Pacific Soils Engineering, Inc., dated January 24, 1963 *"Foliation mapped within outcrops on and adjacent to the site exhibits a dominant strike in an east-west direction accompanied by dips to the north ranging from 1 to 36 degrees. Foliation depicted on the referenced geologic map prepared by the city of Los Angeles (1960) and Dibblee (1991) strikes in a northeast direction accompanied by dips to the north west ranging from 20 to 55 degrees."* - not available;

"Addendum Geologic and Soils Engineering Report, Proposed Single Family Residence, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated July 25, 1980;

"Geologic and Soils Engineering Report, Proposed Single Family Residence, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated June 19, 1987;

"Justification of Private Sewerage System, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated December 7, 1987;

"Additional Information, Proposed Residence, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated December 7, 1987;

"Additional Information, Temporary Excavations and Retaining Walls, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated February 9, 1987;

"Geologic and Soils Engineering Exploration, Proposed Structural Slab, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated April 29, 1988;

"Potential for Mudflow, Proposed Private Street 1093, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California," prepared by Kovacs-Byer and Associates, Inc., dated May 19, 1988;

Report for 1501-1509 Marlay Drive, Los Angeles, California, prepared by Applied Earth Sciences, dated July 25, 1988 (*"The joints within the rock at this site are considered not to be continuous." "However, surficial block failures along unsupported joints on to oversteepened slopes are common within typical rock. Therefore, as part of the proposed development, impact walls should be constructed behind the proposed buildings in order to protect the proposed residential structures against surficial block failures."*);

City of Los Angeles Department of Building and Safety Grading Division, Review Letter Log #5757, dated August 1, 1988;

City of Los Angeles Department of Building and Safety Grading Division, Review Letter Log #7152, dated November 1, 1988;

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #27705, dated March 12, 1992;

SCHICK GEOTECHNICAL, INC.

7650 Haskell Avenue, Suite D, Van Nuys, California 91406 Ph (818) 905-8011 Fx (818) 905-8115

City of Los Angeles Department of Building and Safety Grading Division, Approval Letter Log #29208, dated July 7, 1992;

“Report of Preliminary Engineering Geologic Investigation, Proposed Construction of Two Single-family Residences, 1501 Marlay Drive, Los Angeles, California,” prepared by Pacific Geology Consultants, Inc., dated October 15, 1998 (shows joints dipping 50 degrees south mapped on offsite property to north, and foliation and joints dipping steeply to the north on the south portion of the site);

“Geotechnical Engineering Investigation Report, Two Proposed Single-Family Residences, 1501 and 1509 Marlay Drive, Los Angeles, California,” prepared by Coastline Geotechnical Consultants, Inc., dated September 28, 1998- not available;

“Geotechnical Engineering Update Report, Proposed New Residence, 1501 Marlay Drive, Los Angeles, California,” prepared by Coastline Geotechnical Consultants, Inc., dated October 28, 1998;

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #28497, dated September 2, 1999;

“Supplemental Engineering Geologic Investigation, Response to the City of Los Angeles grading Section Review Letter, Proposed Construction of Two Single-Family Residences, 1501 Marlay Drive, Los Angeles, California,” prepared by Pacific Geology Consultants, Inc., dated September 14, 1999;

“Reply to Geotechnical Engineering Review Sheet from the City of Los Angeles dated September 2, 1999, Proposed Two Single Family Residences, 1501 and 1509 Marlay Drive, Los Angeles, California,” prepared by Coastline Geotechnical Consultants, dated September 15, 1999;

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #28497-01, dated October 7, 1999;

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #37767, dated September 24, 2002;

“Geotechnical Addendum Report, Response to City of Los Angeles Review Sheet, Proposed Residence, 1501 Marlay Drive, Los Angeles, California,” prepared by Gorian, dated September 27, 2002;

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #37767-01, dated November 22, 2002;

“Geotechnical Addendum Report No. 2, Response to City of Los Angeles Review Sheet, Proposed Residence, 1501 Marlay Drive, Los Angeles, California,” prepared by Gorian, dated May 5, 2003. *“As discussed above, adversely-oriented planar bedrock features are not present.”*;

City of Los Angeles Department of Building and Safety Grading Division, Approval Letter Log #37767-02, dated July 2, 2003;

“Geotechnical Engineering Update Report, Proposed New Residence, 1501 Marlay Drive, Los Angeles, California,” prepared by Coastline Geotechnical Consultants, Inc., dated April 14, 2005;

“Update Letter - Proposed Single-family Residence, 1501 Marlay Drive, Los Angeles, California,” prepared by Pacific Geology Consultants, Inc., dated July 19, 2005. (*“Foliation mapped within outcrops on and*

adjacent to the site exhibits a dominant east-west strike accompanied by dips to the north ranging from 1 to 36 degrees. Foliation depicted on the referenced geologic maps prepared by the city of Los Angeles (1960) and Dibblee (1991) strikes in a northeast direction accompanied by dips to north west ranging from 20 to 55 degrees. Joints mapped along cut slopes generally possessed east-west strikes accompanied by moderate to steep dips to the north and south.”);

City of Los Angeles Department of Building and Safety Grading Division, Correction Letter Log #49691, dated November 15, 2005;

“Addendum I: Response to City of Los Angeles Correction Letter, 1501 Marlay Drive, Los Angeles, California,” prepared by Subsurface Designs Inc., dated December 8, 2005. *“This office has reviewed reports prepared by Gorian & Associates prepared from 2002 and 2003. According to their reports, foliation is included in a northerly direction at low to steep angles (3 to 45 degrees). The mapped declination in foliation is similar to that reported by Pacific Geology Consultants (1998). The mapped declination in foliation plane dip is into the ascending slope area, a condition considered favorable with respect to long term stability of the slope. Daylighted foliation was not reported by Gorian & Associates or Pacific Geology Consultants.” “Joints mapped along cut slopes generally possessed east-west strikes accompanied by moderate to steep dips to the north and south. Coastline Geotechnical Consultants has performed stability analyses along the ascending slope taking into account the mapped declination in joint sets.”;*

“Response to City Geology and Soils Review Letter, 1501 Marlay Drive, Los Angeles, California,” prepared by Coastline Geotechnical Consultants, Inc., dated January 30, 2006;

City of Los Angeles Department of Building and Safety Grading Division, **Approval Letter** Log #49691-01, dated June 16, 2006;

“Geologic and Soils Engineering Exploration, Proposed Soil Nail Retaining Wall, Lot 2, Tract 13044, 1631 Woods Drive, Los Angeles, California,” prepared by Irvine Geotechnical, Inc., dated December 30, 2011 (*“the bedrock is generally massive and lacks significant structural planes.”;*

City of Los Angeles Department of Building and Safety Grading Division, Approval Letter Log #76299, dated March 7, 2012.



GEOLOGY AND SOILS REPORT APPROVAL LETTER

April 24, 2019

LOG # 107803
SOILS/GEOLOGY FILE - 2
LAN

Sara Schusterow
7650 Haskell Avenue, Suite D
Los Angeles, CA 91406

TRACT: 12204
LOT(S): 1
LOCATION: 1501 N. Marlay Drive

<u>CURRENT REFERENCE</u> <u>REPORT/LETTER(S)</u>	<u>REPORT</u> <u>No.</u>	<u>DATE OF</u> <u>DOCUMENT</u>	<u>PREPARED BY</u>
Addendum Report	SG 6684-W	12/17/2018	Schick Geotechnical, Inc.
Oversized Doc(s).	"	"	"

<u>PREVIOUS REFERENCE</u> <u>REPORT/LETTER(S)</u>	<u>REPORT</u> <u>No.</u>	<u>DATE OF</u> <u>DOCUMENT</u>	<u>PREPARED BY</u>
Dept. Approval Letter	94536	09/13/2016	LADBS
Addendum Report	SG 6684-W	08/05/2016	Schick Geotechnical, Inc.
Dept. Approval Letter	89091-01	06/17/2016	LADBS
Request for Modification	24409	06/17/2016	LADBS
Addendum Report	SG 6684-W	04/16/2016	Schick Geotechnical, Inc.
Dept. Correction Letter	89091	07/24/2015	LADBS
Geology/Soils Report	SG 6684-W	04/04/2014	Schick Geotechnical, Inc.
Laboratory Test Report	CYG 14-7088	02/28/2014	CY Geotech, Inc.

The Grading Division of the Department of Building and Safety has reviewed the referenced addendum report addressing revisions to the proposed rear retaining/impact wall. According to the report, the rear retaining wall will consist of a single wall that will be incorporated as the rear wall of the proposed residence which has been revised and a portion relocated further north on the property. The proposed swimming pool has also been moved to the northwest corner of the building. The consultant states that the recommendation presented in the above-referenced reports remain applicable. The reports had been reviewed by the Department and conditionally approved in letters dated 06/17/2016, Log #89091-01 and 09/13/2019, Log #94536.

The site is located in a designated seismically induced landslide hazard zone as shown on the Seismic Hazard Zones map issued by the State of California. The above reports included an

acceptable seismic slope stability analysis and the requirements of the 2017 City of Los Angeles Building Code have been satisfied.

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

(Note: Numbers in parenthesis () refer to applicable sections of the 2017 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. All conditions of the above referenced Department approval letters dated 06/17/2016, Log #89091-01 and 09/13/2019, Log #94536, shall apply.


EDMOND LEE
Engineering Geologist Associate III


YING LIU
Geotechnical Engineer II

Log No. 107803
213-482-0480

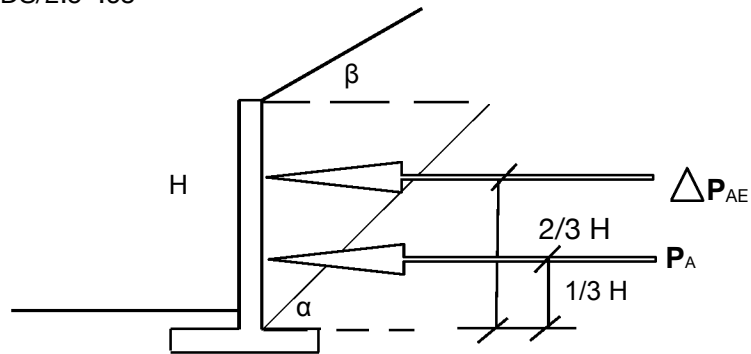
cc: Schick Geotechnical, Inc., Project Consultant
LA District Office

Spectral Combined Seismic/Static Load

Ref: Navy Design Manual 7.2 (NAVFAC)

ASSUMPTION

C = 2350 Cohesion of soil (psf)
 ϕ = 38 Internal angle of friction (degrees)
 γ = 152 Saturated unit weight of soil (pcf)
H = 55 Height of wall (feet)
 β = 33
SDS/2.5=.68



$$K_h = .5 \cdot (\text{SDS}/2.5) = 0.34$$

$$K_a = 0.36$$

$$P_A = .5 \cdot \gamma \cdot K_a \cdot (H)^2 = 85 \text{ kips}$$

$$\text{Moment Arm} = H/3 \quad 18.3 \text{ ft}$$

$$P_E = 3/8 \cdot K_h \cdot \lambda \cdot H^2 \quad 1.2 \text{ kips}$$

$$\text{Moment Arm} = .6H \quad 59.0 \text{ ft}$$

Earthquake Design=95 pcf

At-Rest Pressure=58.4 pcf

EFP1=56 pcf slope backfill

EFP2=39 pcf

Client: Schusterow
Project Number: SG 6684-W
Project Location: 1501 Marlay Drive

SGI

Kinematic Analysis

A kinematic analysis was performed of the steep bedrock slopes within and adjacent to the property. Steep bedrock slopes ranging in height from 10 to 25 feet and in gradient from 1:1 (45 degrees) to 0.8:1 (51 degrees) are present on the northern portion of the property. Offsite and above the steep slopes, the terrain flattens to between 3:1 and 2:1. Steep road cuts are also located along the southern property line and Marlay Drive. The road cuts are 10 to 15 feet in height and 0.8:1 in gradient. The slopes generally face south between azimuths 170 to 200 degrees.

Joints observed and mapped were spaced 6 to 12 feet apart and not considered persistent (do not penetrate deeply into the slope beyond the slope face). The joints are closed and do not contain infilling of soil or clay. There is no evidence of planar failures, wedge failures, pop-outs, or direct toppling failures that may have occurred on the slope. Other discontinuity planes such as bedding planes, foliation, faults, contacts, or any features that otherwise separate intact rock masses were not observed at the site or mapped.

A kinematic analysis was performed using stereographic methods and the software program DIPS, v6.017 by RocScience, Inc. A friction angle (ϕ) of 34 degrees and a slope gradient of 51 degrees were assumed for the bedrock for conservatism. Azimuth directions of 170 to 200 degrees were analyzed for potential failure modes of planar sliding, wedge sliding, direct toppling, and flexural toppling.

Flexural Toppling Failures

Flexural toppling failures are kinematically feasible for the critical slopes on the site. The most critical azimuth for potential failures is 175 degrees.

A flexural toppling failure, which occurs when the rock masses rotate as a function of parallel discontinuities, is feasible when the following conditions are satisfied:

- There must be a set of discontinuity planes that dips into the slope at an angle that is sufficiently high to allow inter-layer (flexural) slip.
- The dip direction of the discontinuity planes (flexural slip planes) must be within 20 degrees of the dip of the slope face.
- Additional discontinuities must be present that isolate the steeply-dipping discontinuities into discrete blocks.
- Steeply-dipping planes need to be present roughly orthogonal to the slope.

- There is a set of discontinuity planes inclined toward the slope that forms the base of the potentially-toppling rock mass.

It should be noted that flexural toppling failures are typical of steeply-dipping and thinly-bedded shale or slate slopes, but not granitic bedrock. There is no evidence of flexural toppling failures at the site. Any flexural toppling failures would be shallow. An impact/retaining wall is recommended to mitigate the potential hazard to the residence.

Direct Toppling

Direct toppling failures are kinematically feasible for the critical slopes on the site. The most critical azimuth for potential failures is 200 degrees.

Direct toppling failures occur when the following conditions are present:

- There must be two sets of discontinuities present that dip steeply into the slope to form prismatic blocks or columns.
- A third discontinuity must be present to form a base of the blocks.
- The width/height ratio of the blocks must be such that the center of gravity is located outside the base of the block.

The DIPS program determined that all of the conditions were met. Steeply dipping discontinuities are present that intersect in a way that could create prismatic blocks and there is a potential basal discontinuity. However, due to the geometry of the slope and because of the spacing of jointing (6 to 12 feet) the potential prismatic blocks are so steep that the center of gravity could not be outside the base. Thus, direct toppling failures are not considered feasible for the site.

Direct toppling failures are most common to highly jointed brittle sandstone and columnar basalt exposed in vertical mining excavations or along wave-cut coastal bluffs. An impact/retaining wall is recommended to mitigate the potential hazard to the residence.

Planar Failures

Planar failures are kinematically feasible for slopes on the site, with the most critical azimuth being 175 degrees. However, the potential planes are generally parallel to sub-parallel to the slope face and the joint sets are not considered persistent and through going to form planes. Thus, failures would be shallow and limited to outer slope face. An impact/retaining wall is recommended to mitigate the potential hazard to the residence.

Wedge Failures

Wedge failures are kinematically feasible for the south-facing slopes, with 180 degrees being the most critical azimuth.

The safety factor for potential wedge failures was computed using a computer program SWEDGE 7.007, developed by Rocscience. Using all of the discontinuities mapped on the site, the computer programs searched 4,950 wedge combinations to determine wedges unsupported out of the south-facing (azimuth 180 degrees) 51-degree slopes. The safety factor of the potential wedge combinations was computed, with a lowest safety factor of 2.37. Cohesion was ignored and a friction angle of 34 degrees was assumed along discontinuities for the calculations. The great circles of the critical failure wedge are plotted on the stereonet. The shape of the failure wedge is shown on the graphical output.

Dips Analysis Information

1501 MARLEY DRIVE

Project Summary

File Name: Schick Marlay
 Last saved with Dips version: 6.017
 Project Title: 1501 MARLEY DRIVE
 Analysis: KINEMATIC STABILITY --> AZIMUTHS 170-200
 Date Created: 5/6/2020, 1:20:39 PM

General Settings:

Data Format: Dip / Dip Direction
 Magnetic Declination (E pos): 0°
 Multiple Data Flag (Quantity): OFF
 Extra Data Columns: 0
 Poles: 30
 Entries: 30

Traverses:

No traverse information available.

Global Mean

	Dip	Dip Direction
Unweighted	42.76	146.77
Weighted	42.76	146.77

Global Best Fit

	Unweighted		
	Dip	Dip Direction	Eigenvalue
S1	75.49	160.51	0.693280
S2	78.18	67.41	0.175210
S3	18.88	299.70	0.131510

Woodcock S1 / S3 = 3.957
 Woodcock K = 4.794
 Woodcock C = 1.375

	Weighted		
	Dip	Dip Direction	Eigenvalue
S1	75.49	160.51	0.693280
S2	78.18	67.41	0.175210
S3	18.88	299.70	0.131510

Woodcock S1 / S3 = 3.957
 Woodcock K = 4.794
 Woodcock C = 1.375

Intersections:

Intersection Type	Number
Grid Data Planes	435
User and Mean Set (Unweighted) Planes	0
User and Mean Set (Weighted) Planes	0
User Planes	0
Mean Set (Unweighted) Planes	0
Mean Set (Weighted) Planes	0

Kinematic Analysis:

Slope Dip: S1
 Slope Dip Direction: 180
 Friction Angle: 34°
 Lateral Limit Angle: 20°

Planar Sliding

Planar Sliding	Critical	%	Total
All Vectors	3	10.00%	30

Planar Sliding (No Limits)

Planar Sliding	Critical	%	Total
All Vectors	3	10.00%	30

Wedge Sliding

Critical 1 = Wedge Sliding (Both Planes)
 Critical 2 = Wedge Sliding (One Planes)

Intersection Type	Critical 1	%	Critical 2	%	Total
Grid Data Plane Intersections	15	3.45%	40	9.20%	435
User and Mean Set (Unweighted) Plane Intersections	No results				
User and Mean Set (Weighted) Plane Intersections	No results				
User Plane Intersections	No results				
Mean Set Plane (Unweighted) Intersections	No results				
Mean Set Plane (Weighted) Intersections	No results				

Flexural Toppling

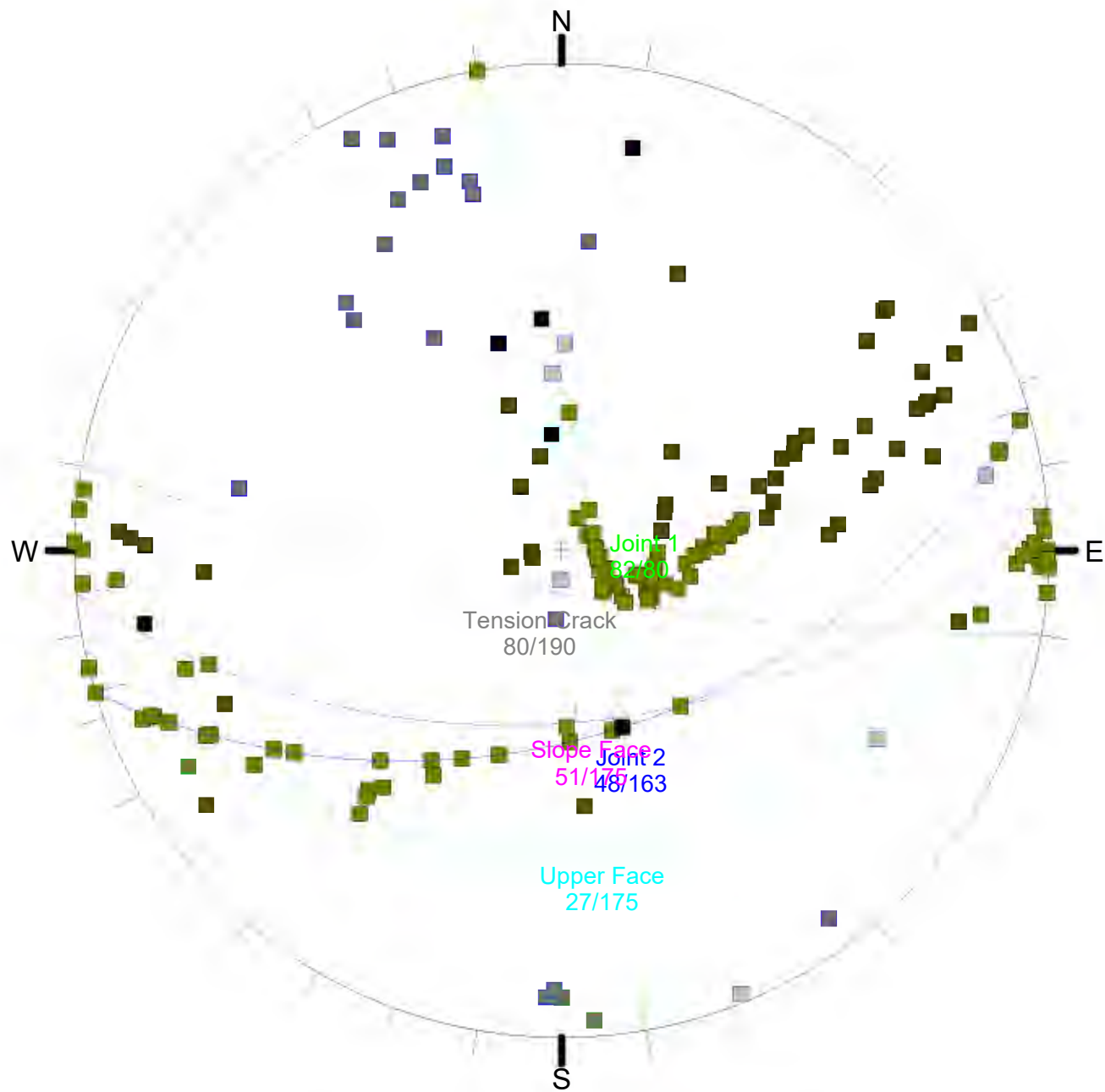
Flexural Toppling	Critical	%	Total
All Vectors	4	13.33%	30

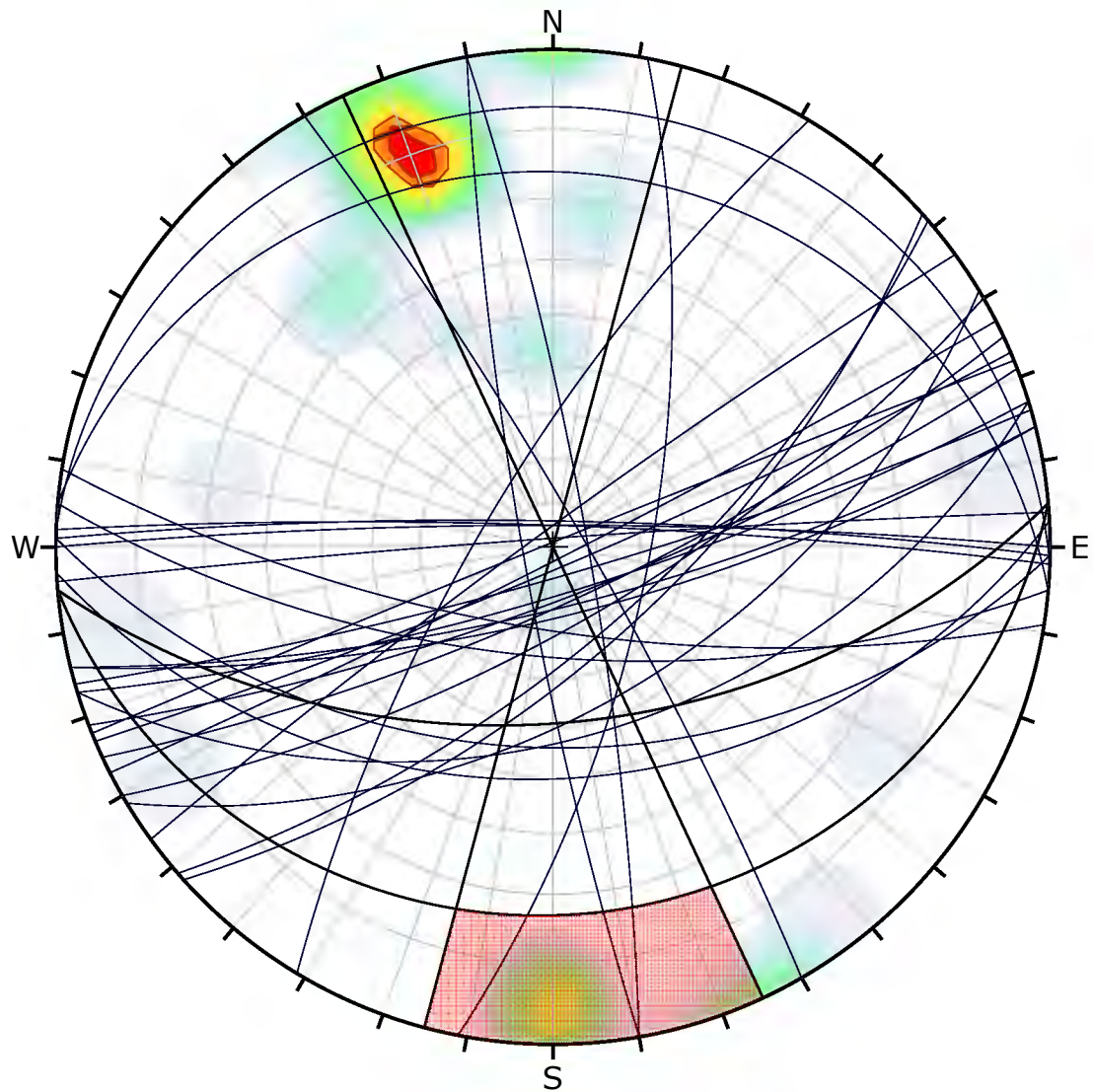
Direct Toppling

Base Plane	Critical	%	Total
All Vectors	3	10.00%	30

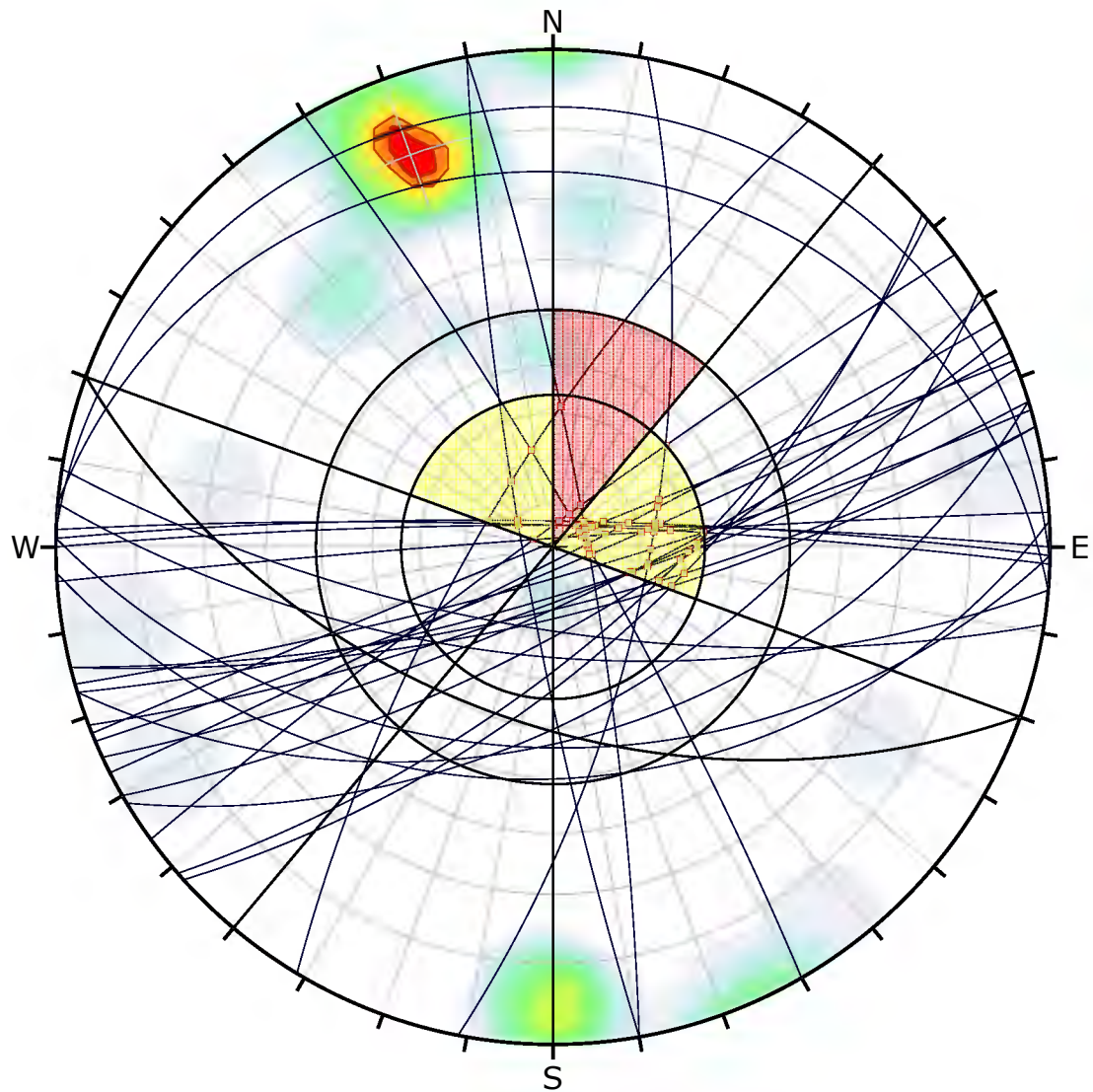
Critical 1 = Direct Toppling (Intersection)
 Critical 2 = Oblique Toppling (Intersection)

Intersection Type	Critical 1	%	Critical 2	%	Total
Grid Data Plane Intersections	6	1.38%	47	10.80%	435
User and Mean Set (Unweighted) Plane Intersections	No results				
User and Mean Set (Weighted) Plane Intersections	No results				
User Plane Intersections	No results				
Mean Set Plane (Unweighted) Intersections	No results				
Mean Set Plane (Weighted) Intersections	No results				





Color	Density Concentrations			
	0.00	-	2.00	
	2.00	-	4.00	
	4.00	-	6.00	
	6.00	-	8.00	
	8.00	-	10.00	
	10.00	-	12.00	
	12.00	-	14.00	
	14.00	-	16.00	
	16.00	-	18.00	
	18.00	-	20.00	
Maximum Density		19.30%		
Contour Data		Pole Vectors		
Contour Distribution		Fisher		
Counting Circle Size		1.0%		
Kinematic Analysis		Flexural Toppling		
Slope Dip		51		
Slope Dip Direction		175		
Friction Angle		34°		
Lateral Limits		20°		
		Critical	Total	%
Flexural Toppling (All)		5	30	16.67%
Plot Mode		Pole Vectors		
Vector Count		30 (30 Entries)		
Hemisphere		Lower		
Projection		Equal Angle		



Symbol	Feature
■	Critical Intersection

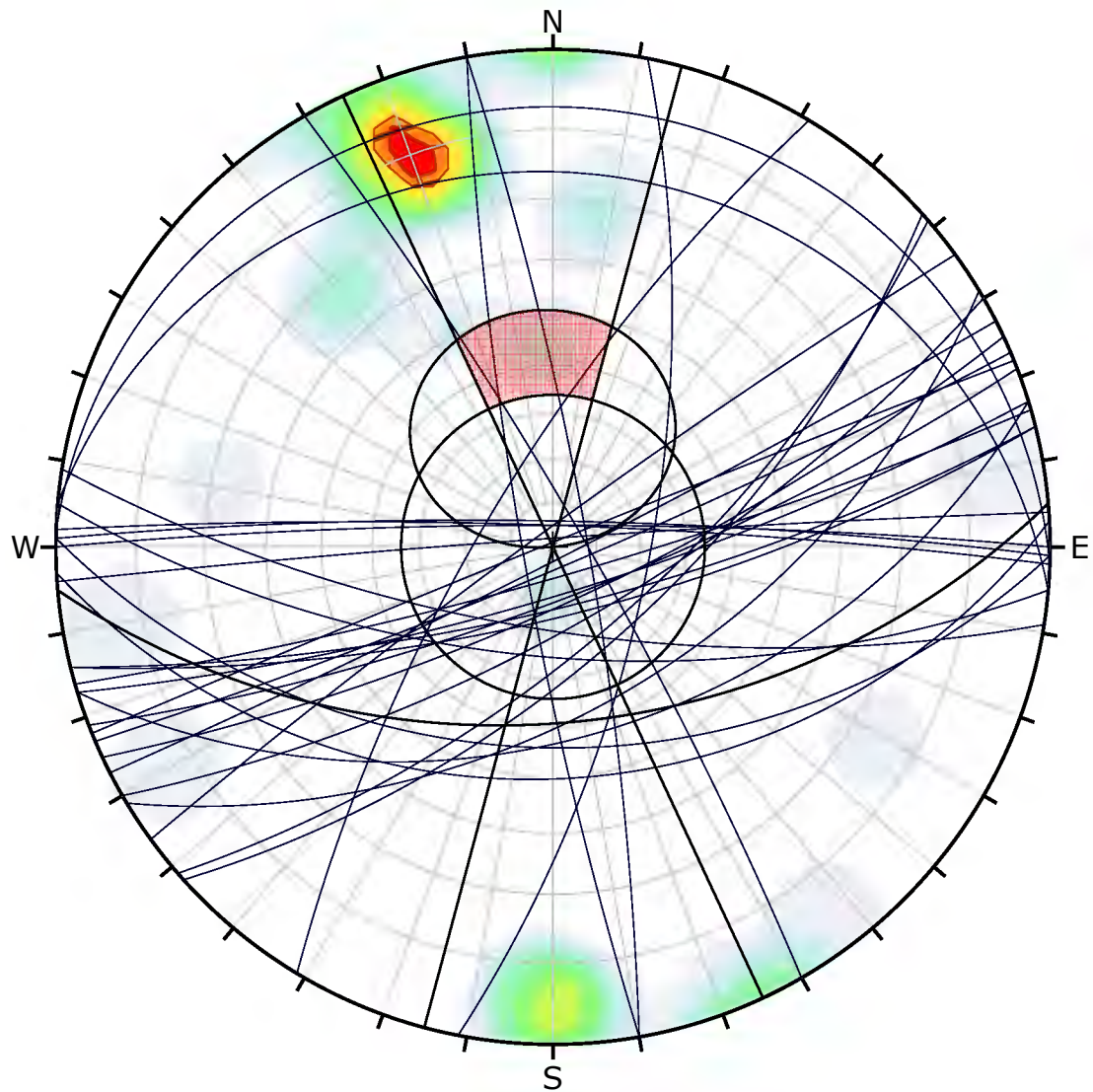
Color	Density Concentrations
	0.00 - 2.00
	2.00 - 4.00
	4.00 - 6.00
	6.00 - 8.00
	8.00 - 10.00
	10.00 - 12.00
	12.00 - 14.00
	14.00 - 16.00
	16.00 - 18.00
	18.00 - 20.00

Maximum Density	19.30%
Contour Data	Pole Vectors
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Direct Toppling
Slope Dip	51
Slope Dip Direction	200
Friction Angle	34°
Lateral Limits	20°

	Critical	Total	%
Direct Toppling (Intersection)	8	435	1.84%
Oblique Toppling (Intersection)	57	435	13.10%
Base Plane (All)	1	30	3.33%

Plot Mode	Pole Vectors
Vector Count	30 (30 Entries)
Intersection Mode	Grid Data Planes
Intersections Count	435
Hemisphere	Lower
Projection	Equal Angle



Color	Density Concentrations			
	0.00	-	2.00	
	2.00	-	4.00	
	4.00	-	6.00	
	6.00	-	8.00	
	8.00	-	10.00	
	10.00	-	12.00	
	12.00	-	14.00	
	14.00	-	16.00	
	16.00	-	18.00	
	18.00	-	20.00	
Maximum Density		19.30%		
Contour Data		Pole Vectors		
Contour Distribution		Fisher		
Counting Circle Size		1.0%		
Kinematic Analysis		Planar Sliding		
Slope Dip		51		
Slope Dip Direction		175		
Friction Angle		34°		
Lateral Limits		20°		
		Critical	Total	%
Planar Sliding (All)		3	30	10.00%
Plot Mode		Pole Vectors		
Vector Count		30 (30 Entries)		
Hemisphere		Lower		
Projection		Equal Angle		

SWedge Analysis Information

SWEDGE - Surface Wedge Stability Analysis

Project Summary

File Name Swedge1
 Project Title SWEDGE - Surface Wedge Stability Analysis
 Analysis MARLAY DRIVE
 Date Created 5/6/2020, 2:00:59 PM

Analysis Results

Analysis Type - Combinations

Number of Combinations 4950
 Number of Valid Wedges 153
 Number of Invalid Wedges 4797
 Number of Failed Wedges 0
 Number of Stable Wedges 153

Current Wedge Data - Min FS Wedge

Safety Factor 2.37447
 Wedge Height (On Slope) [ft] 25
 Bench Width (On Upper Face) [ft] 1.31331
 Wedge Volume [ft3] 50.4621
 Wedge Weight [lbs] 7317
 Wedge Area (joint1) [ft2] 18.3979
 Wedge Area (joint2) [ft2] 126.815
 Wedge Area (slope) [ft2] 124.271
 Wedge Area (upper face) [ft2] 5.69402
 Wedge Area (tension crack) [ft2] 5.66737

Effective Normal and Strength Properties

	Joint 1	Joint 2
Effective Normal Force [lbs]	0.000	4896.028
Effective Normal Stress [psf]	0.000	38.608
Shear Strength [psf]	0.000	26.041
Strength due to Waviness [psf]	0.000	75.772

Driving Force [lbs] 5437.59
 Resisting Force [lbs] 12911.4

Failure Mode

Sliding on joint2

Joint Sets 1&2 Line of Intersection

Plunge [deg]	Trend [deg]	Length [ft]
47.983	161.026	30.304

Trace Lengths

	Slope Face [ft]	Upper Face [ft]
Joint 1	32.602	0.000
Joint 2	34.706	3.597
Tension Crack	N/A	4.683

Persistence

Joint 1 [ft] 32.6024

Joint 2 [ft] 34.9083

Intersection Angles

	Slope Face	Upper Face
Joint 1 & Joint 2	12.689	12.689
Joint 1 & Crest	99.352	99.352
Joint 2 & Crest	67.958	67.958
Joint 1 & Tension Crack	N/A	116.426
Joint 2 & Tension Crack	N/A	137.463

Dip and Dip Direction

	Dip [deg]	Dip Direction [deg]
Joint Set 1	82.000	80.000
Joint Set 2	48.000	163.000
Slope	51.000	175.000
Upper Face	27.000	175.000
Tension Crack	80.000	190.000

Joint Set 1 Data

Cohesion [psf] 0
Friction Angle [deg] 34
Waviness Angle [deg] 63

Joint Set 2 Data

Cohesion [psf] 0
Friction Angle [deg] 34
Waviness Angle [deg] 63

Slope Data

Slope Height [ft]	25
Bench Width [ft]	60
Rock Unit Weight [lbs/ft3]	145
Water Pressures in the Slope	NO
Overhanging Slope Face	NO
Externally Applied Force	NO
Tension Crack	YES

Tension Crack Data

Location	Minimizes Factor of Safety
Trace Length [ft]	1e-06

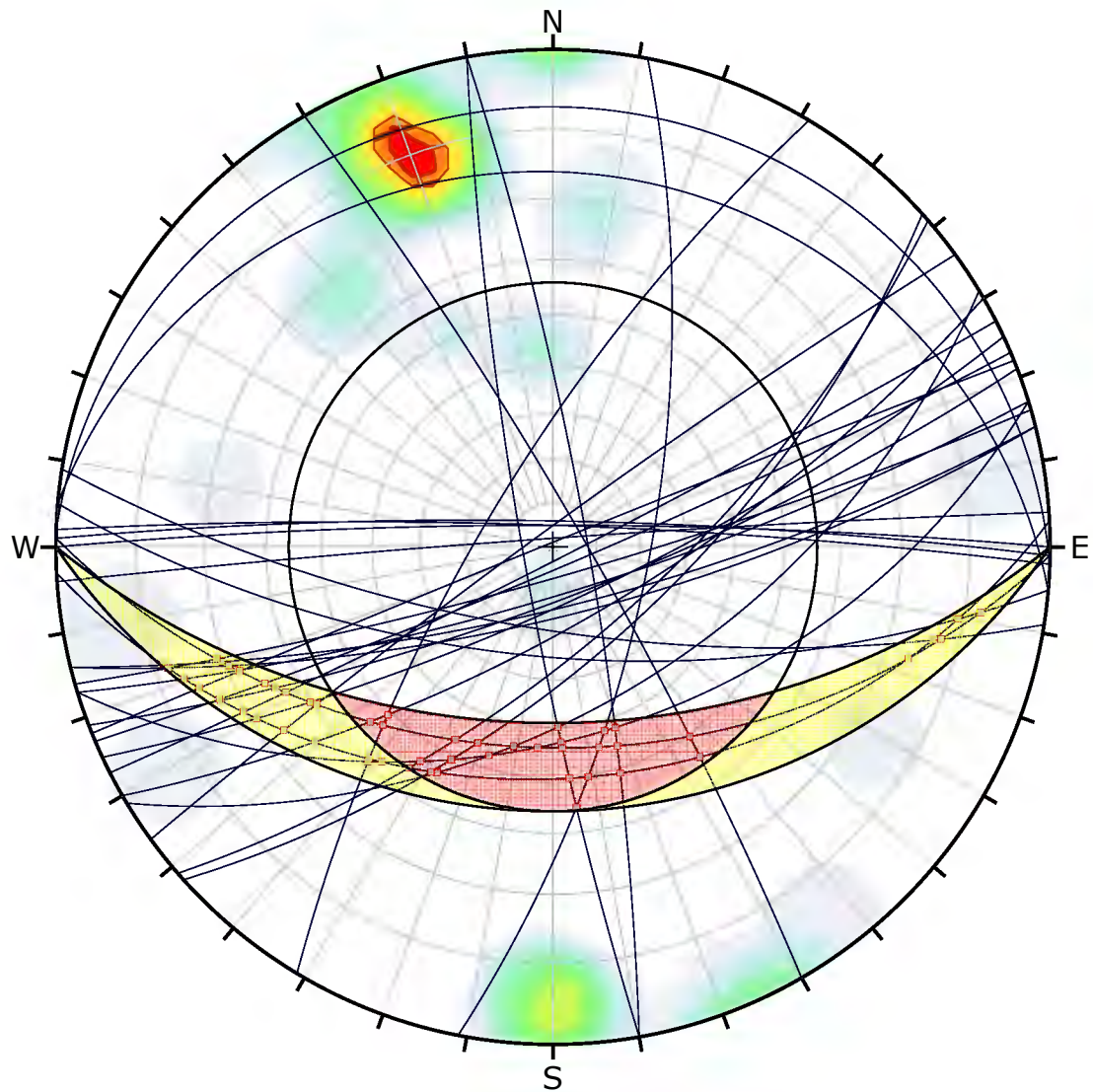
Wedge Vertices - Min FS Wedge

Coordinates in Easting,Northing,Up Format
 1=Joint1, 2=Joint2, 3=Upper Face, 4=Slope, 5=Tension Crack

Point	East	North	Up
124	0.000	0.000	0.000
134	-7.042	19.706	25.000
234	-14.739	19.032	25.000
135	-7.042	19.706	25.000
125	-6.595	19.182	22.514
235	-11.585	20.627	25.669

Spill Width Parameters

Swelling Factor	1.5
Angle of Repose of Failed Material	38 deg



Symbol	Feature			
■	Critical Intersection			
Color		Density Concentrations		
		0.00	-	2.00
		2.00	-	4.00
		4.00	-	6.00
		6.00	-	8.00
		8.00	-	10.00
		10.00	-	12.00
		12.00	-	14.00
		14.00	-	16.00
		16.00	-	18.00
		18.00	-	20.00
Maximum Density		19.30%		
Contour Data		Pole Vectors		
Contour Distribution		Fisher		
Counting Circle Size		1.0%		
Kinematic Analysis		Wedge Sliding		
Slope Dip		51		
Slope Dip Direction		180		
Friction Angle		34°		
		Critical	Total	%
Wedge Sliding		55	435	12.64%
Plot Mode		Pole Vectors		
Vector Count		30 (30 Entries)		
Intersection Mode		Grid Data Planes		
Intersections Count		435		
Hemisphere		Lower		
Projection		Equal Angle		

Factor of Safety: 2.3745



Top



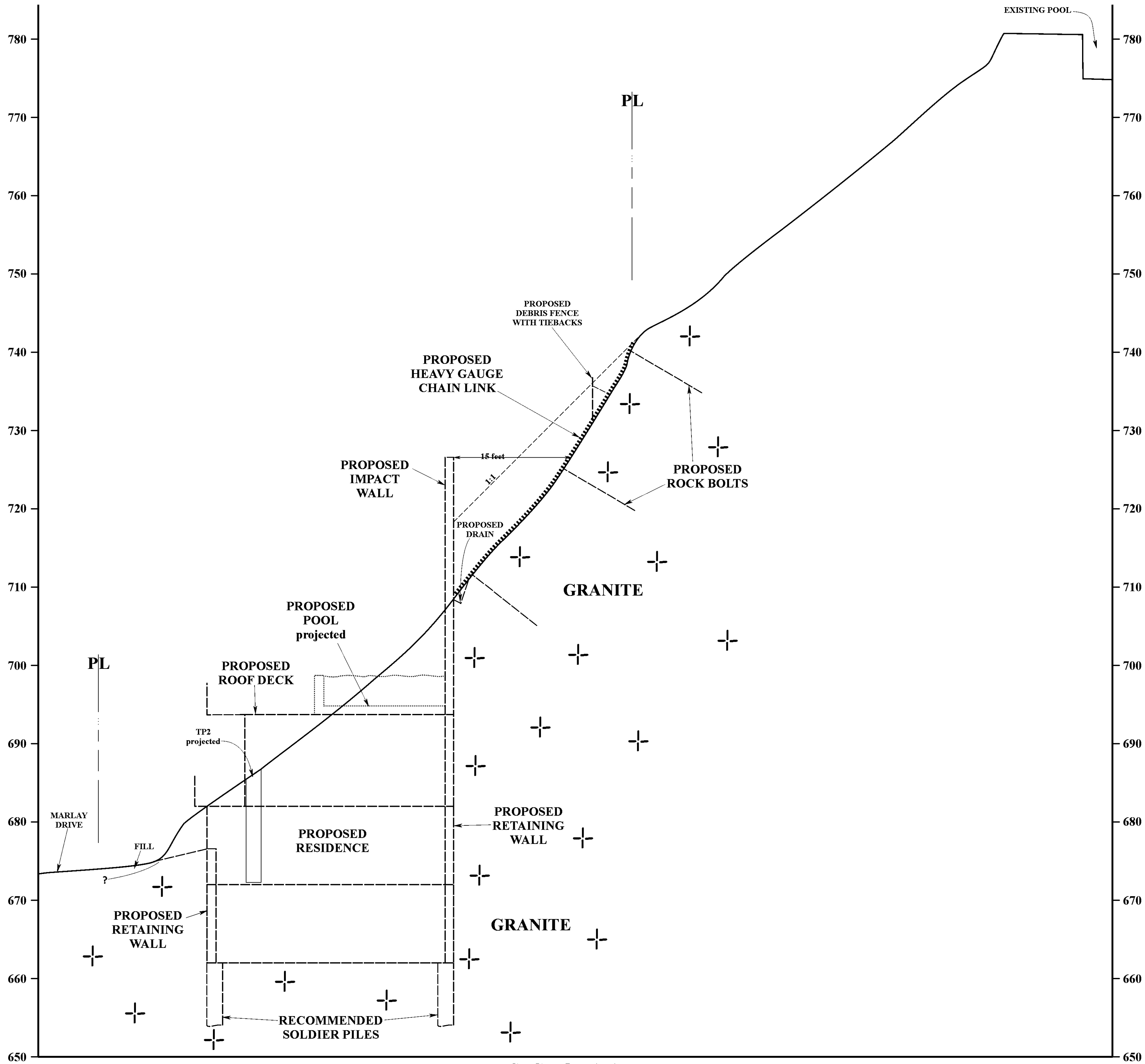
Perspective



Front



Side



SECTION A-A

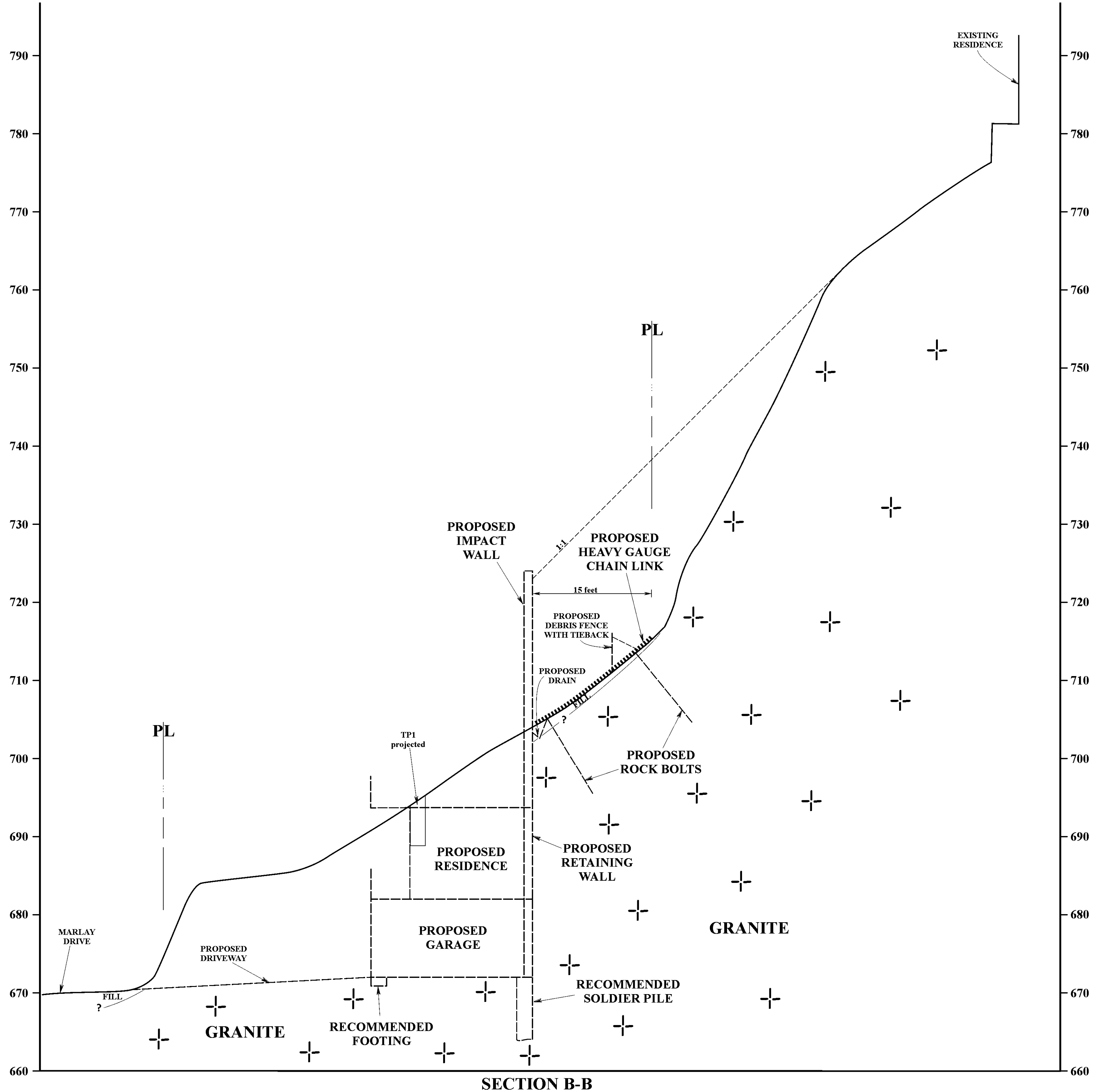
SCHICK GEOTECHNICAL, INC.

REVISED
May 2020

REVISED
Feb 2019

DATE: Dec 2018
DRAWN: ACT
SCALE: 1" = 8'
JOB: Coleman

SG 6684-W



SCHICK GEOTECHNICAL, INC.

REVISED
May 2020

REVISED
Feb 2019

DATE: Dec 2018
DRAWN: ACT
SCALE: 1" = 8'
JOB: Coleman

SG 6684-W

VAN AMBATIELOS
PRESIDENT

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VICE PRESIDENT

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ERIC GARCETTI
MAYOR

OSAMA YOUNAN, P.E.
GENERAL MANAGER
SUPERINTENDENT OF BUILDING

GEOLOGY AND SOILS REPORT APPROVAL LETTER

July 22, 2020

LOG # 113780
SOILS/GEOLOGY FILE - 2
LAN

Sara Schusterow
1855 Egret Way
Boca Raton, FL 33496

TRACT: 12204
LOT(S): 1
LOCATION: 1501 N. Marlay Drive

<u>CURRENT REFERENCE</u> <u>REPORT/LETTER(S)</u>	<u>REPORT</u> <u>No.</u>	<u>DATE OF</u> <u>DOCUMENT</u>	<u>PREPARED BY</u>
Addendum Report	SG 6684-W	06/19/2020	Schick Geotechnical, Inc.
Oversized Doc(s).	"	"	"

<u>PREVIOUS REFERENCE</u> <u>REPORT/LETTER(S)</u>	<u>REPORT</u> <u>No.</u>	<u>DATE OF</u> <u>DOCUMENT</u>	<u>PREPARED BY</u>
Dept. Approval Letter	107803	04/24/2019	LADBS
Addendum Report	SG 6684-W	12/17/2018	Schick Geotechnical, Inc.
Dept. Approval Letter	94536	09/13/2016	LADBS
Addendum Report	SG 6684-W	08/05/2016	Schick Geotechnical, Inc.
Dept. Approval Letter	89091-01	06/17/2016	LADBS
Request for Modification	24409	06/17/2016	LADBS
Addendum Report	SG 6684-W	04/16/2016	Schick Geotechnical, Inc.
Dept. Correction Letter	89091	07/24/2015	LADBS
Geology/Soils Report	SG 6684-W	04/04/2014	Schick Geotechnical, Inc.
Laboratory Test Report	CYG 14-7088	02/28/2014	CY Geotech, Inc.

The Grading Division of the Department of Building and Safety has reviewed the referenced addendum report providing revised retaining wall recommendations and slope mitigation measures. According to the report, the proposed rock netting will extend only to the property boundary and will not include the remaining offsite portion of the slope as had been previously proposed. A revised kinematic analysis had been provided. The location proposed residence and rear retaining/impact walls remain unchanged. The consultant recommended a new debris fence as an alternative to extending the rock netting offsite.

The subject property was recently investigated by the consultant in 2019 to address revisions to the proposed rear retaining/impact wall. At the time, the rear retaining wall was revised to a single wall that would be incorporated as the rear wall of the proposed residence which, itself, had been revised and relocated further north on the property. The proposed swimming pool had also been moved to the northwest corner of the building. The consultant stated that the recommendations presented in the prior reports remained

applicable. The reports had been reviewed by the Department and conditionally approved in letters dated 06/17/2016, Log #89091-01, dated 09/13/2019, Log #94536, and dated 04/24/2019, Log #107803.

The site is located in a designated seismically induced landslide hazard zone as shown on the Seismic Hazard Zones map issued by the State of California. The above reports include an acceptable seismic slope stability analysis and the requirements of the 2020 City of Los Angeles Building Code have been satisfied.

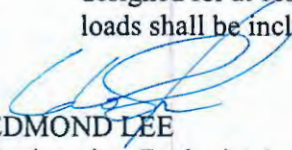
The referenced report is acceptable, provided the following conditions are complied with during site development:

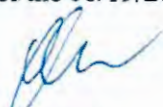
(Note: Numbers in parenthesis () refer to applicable sections of the 2020 City of LA Building Code. P/BC numbers refer the applicable Information Bulletin. Information Bulletins can be accessed on the internet at LADBS.ORG.)

1. All conditions of the above referenced Department approval letter shall apply except as specifically modified herein. All references to prior building code sections and information bulletins in the referenced Department approval letters shall be deemed to reference the current applicable building code sections and information bulletins.
2. Shoring shall be designed for the lateral earth pressures specified in the section titled "Soldier Piles" starting on page 3 of the 06/19/2020 report. All surcharge loads shall be included into the design.
3. A shoring monitoring program shall be implemented to the satisfaction of the soils engineer.
4. Retaining walls higher than 6 feet shall be designed for lateral earth pressure due to earthquake motions as specified on page 2 of the 06/19/2020 report (1803.5.12).

Note: Lateral earth pressure due to earthquake motions shall be in addition to static lateral earth pressures and other surcharge pressures. The height of a stacked retaining wall shall be considered as the summation of the heights of each wall.

5. Basement walls and other walls in which horizontal movement is restricted at the top shall be designed for at-rest pressure as specified on page 2 of the 06/19/2020 report (1610.1). All surcharge loads shall be included into the design.


EDMOND LEE
Engineering Geologist Associate III


YING LIU
Geotechnical Engineer II

Log No. 113780
213-482-0480

cc: Schick Geotechnical, Inc., Project Consultant
LA District Office

APPLICATION FOR REVIEW OF TECHNICAL REPORTS

- A. Address all communications to the Grading Division, LADBS, 221 N. Figueroa St., 12th Fl., Los Angeles, CA 90012
Telephone No. (213)482-0480.
B. Submit two copies (three for subdivisions) of reports, one "pdf" copy of the report on a CD-Rom or flash drive,
and one copy of application with items "1" through "10" completed.
C. Check should be made to the City of Los Angeles.

1. LEGAL DESCRIPTION

Tract: 12204
Block: _____ Lots: 1
3. OWNER: Sara Schusterow
Address: 1855 Egret Way
City: Boca Raton, FL Zip: 33496
Phone (Daytime): N/A
E-mail address: _____

2. PROJECT ADDRESS:

1501 Marlay Drive, Los Angeles, California 90069
4. APPLICANT SGI
Address: 7650 Haskell Avenue, Suite D
City: Van Nuys Zip: 91406
Phone (Daytime): (818) 905-8011
E-mail address: reception@schickgeotechnical.com

5. Report(s) Prepared by:
Schick Geotechnical, Inc. (SGI)

6. Report Date(s): June 19, 2020

7. Status of project: ☒ Proposed ☐ Under Construction ☐ Storm Damage
8. Previous site reports? ☒ Yes If yes, give date(s) and name of company who prepared report(s)
12/30/11 by Irvine Geotechnical, Inc., 4/4/2014 by SGI, 4/13/2016 by SGI, 8/5/2016 by SGI, 12/17/2018 by SGI
9. Previous Department actions? ☒ Yes If yes, provide dates and attach a copy to expedite processing.
Dates: 3/7/2012, 7/24/2015, 6/17/2016, 9/13/2016, 4/24/2019

10. Application Signature: Mami Sussman Position: Office Manager

REVIEW REQUESTED		FEES	
☐ Soils Engineering		No. of Lots	
☐ Geology		No. of Acres	
☐ Combined Soils Engr. & Geol.		☐ Division of Land	
☐ Supplemental		☐ Other: Compaction	
☒ Combined Supplemental	<u>363.00</u>	☐ Expedite	
☐ Import-Export Route		☐ Response to Correct.	
Cubic Yards: _____		☐ Expedite ONLY	
		Sub-total	<u>363.00</u>
		One-Stop Surcharge	<u>89.86</u>
		TOTAL FEE	<u>452.86</u>

ACTION BY:
THE REPORT IS: ☐ NOT APPROVED
☐ APPROVED WITH CONDITIONS ☐ BELOW

For Geology _____
For Soils _____

☐ ATTACHED

Date

Date

Fee Due: 452.86
Fee Verified By: CM Date: 7-1-2020
(Cashier Use Only)

Los Angeles Department of Building
and Safety
Van Nuys 07/02/2020 11:13:49 AM
User ID: sgron
Receipt Ref Nbr: 2020184003-18
Transaction ID: 2020184003-18-1
GRADING REPORT \$363.00
SYSTEMS DEV SURCH \$21.78
GEN PLAN MAINT SURCH \$25.41
DEV SERV CENTER SURCH \$10.89
CITY PLAN SURCH \$21.78
MISC OTHER \$10.00
Amount Paid: \$452.86
PCIS Number: N/A
Job Address: 1501 Marlay Drive
Owners Name: SGI