Geotechnical Exploration, Inc.
SOIL AND FOUNDATION ENGINEERING ● GROUNDWATER ● ENGINEERING GEOLOGY

16 March 2020

La Jolla Reserve, LLC
c/o Coston Architects, Inc.
8415 La Jolla Boulevard, Suite 4
La Mesa, CA 91942
Attn: Mr. Kent Coston

Job No. 16-11251

Subject: **Response to City of San Diego Cycle Review Comments LDR-Geology: Project No. 508125, Cycle Issue 11**
Proposed Foxhill Residence
7007 Country Club Drive
La Jolla, California

Dear Mr. Coston:

In accordance with your request, ***Geotechnical Exploration, Inc***. herein responds to City of San Diego LDR-Geology review comments in a memo with a completion date of September 18, 2019, regarding the planned residential (guesthouse) project at the subject property. The reviewer has reviewed our *"Report of Limited Geotechnical Investigation Proposed Storm Water BMPs,"* dated April 20, 2017; *"Development Plans – Foxhill Guest Quarters, 7007 Country Club Drive, San Diego, CA 92037,"* prepared by Coston Architects, Inc., dated July 9, 2019 (their project no. 1575.03); and *conceptual grading plans* prepared by Snipes-Dye Associates, dated June 6, 2019.

COMMENTS AND RESPONSES

Issue No. 3: *Submit an addendum geotechnical report or update letter that specifically addresses the proposed development for the purposes of environmental review and the following: (Outstanding Issue from Cycle 2)*

GEI Response: We are providing this addendum update letter for the subject site that specifically addresses the proposed development for the purposes of environmental review and the following issues.

Issue No. 4: The project's geotechnical consultant must circumscribe the area of remedial grading recommended on the geologic/geotechnical map. (Outstanding Issue from Cycle 2)

GEI Response: We have included a site specific geologic/geotechnical map that circumscribes the area of recommended remedial grading on a topographic-based map with this update letter as Figure No. Ia.

Issue No. 5: Provide geologic/geotechnical cross-sections representative of the site conditions and proposed grading. (Outstanding Issue from Cycle 2)

GEI Response: We have included geologic/geotechnical cross-sections representative of the site conditions and proposed grading from the referenced architectural and grading plans with this update letter as Figure Nos. IIa-b. In addition, we have included a revised geologic cross-section D-D' from our *"Report of Preliminary Geotechnical and Geologic Investigation, Copley Press Residential Project,"* dated November 16, 2011, of the adjacent parcel (APN 352-300-04-00) and a portion of the subject site. Please, refer to Figure Nos. Ia-b for the geologic cross-section locations on the Plot Plans with Site-Specific Geology. Refer to Figure No. IIc for the revised Geologic Cross-Section D-D'.

Issue No. 6: According to the San Diego Seismic Safety Study Geologic Hazard Maps, a portion of the access road for the guesthouse is located in geologic hazard category 22, indicating potential slope instability, possible or conjectured landslide. Clarify if the site or any portion of the site is located on or adjacent to a landslide. Provide the rationale and site-specific physical evidence used to support a determination regarding the presence or absence of landsliding at the site. (Outstanding Issue from Cycle 2)

GEI Response: We understand a portion of the proposed access road for the residence is located in Geologic Hazard Category (GHC) Zone 22. Based upon our recent and previous site exploration, downhole logging of a large diameter boring for our *"Report of Preliminary Geotechnical and Geologic Investigation,"* dated November 16, 2011 (adjacent parcel,), our geologic traverse across the site, review of the geologic map (Kennedy and Tan, 2008), review of the referenced City of San Diego Seismic Safety Study -- Geologic Hazards Map Sheet 29 and stereo-pair aerial photographs (4-11-53, AXN-8M-1 and 2), there are no known or suspected ancient landslides in the vicinity of the subject site. Please, refer to Appendix A for the Geologic Hazards Map and Legend.

Along with geologic cross-sections A-A' and B-B' provided for this update letter, we have included a revised geologic cross-section D-D' and exploratory boring (B-1) log for the adjacent parcel from our *"Report of Preliminary Geotechnical and Geologic Investigation,"* dated November 16, 2011. Please, refer to Figure Nos. Ia-b for the geologic cross-section locations on the Plot Plans with Site-Specific Geology. Refer

to Figure Nos. IIa-c for Geologic Cross-Sections. Refer to Appendix B for details of exploratory boring B-1.

Issue No. 7: The project's geotechnical consultant must provide a professional opinion that the site will have a factor-of- safety of 1.5 or greater, for both gross and surficial, following project completion. (Outstanding Issue from Cycle 2)

GEI Response: Attached to this addendum update letter are the slope stability calculations addressing the global and surficial stability after the completion of the proposed development. We performed global and surficial stability along geologic cross-section B-B'. Refer to Appendix C for slope stability calculations. The global stability yielded a factor of safety of 1.5 or greater for static conditions, and a factor of safety of 1.5 or greater under seismic conditions. Surficial failure analysis yielded a factor of safety greater than 1.5. Please, refer to Figure Nos. Ia-b for the geologic cross-section locations on the Plot Plans with Site-Specific Geology. Refer to Figure Nos. IIa-c for Geologic Cross-Sections.

If you have further questions regarding this letter, please contact our office. Reference to our **Job No. 16-11251** will help expedite a response to your inquiry.

Respectfully submitted,

GEOTECHNICAL EXPLORATION, INC.

Jaime A. Cerros, P.E.
R.C.E. 34422/G.E. 2007
Senior Geotechnical Engineer

Leslie D. Reed, President
C.E.G. 999/P.G. 3391

Steve Osetek
Senior Staff Geologist

GEOLOGIC LEGEND

Qaf	Artificial Fill
Qvop 11	Very Old Paralic Deposits (unit 11)
Tsc/Ta	Tertiary Scripps Formation/ Ardath Shale (undifferentiated)
	Approximate Geologic Contact

REFERENCE: This Plot Plan was prepared from an existing Conceptual Grading Plan by SNIPES-DYE ASSOCIATES dated 6-4-2019 and from on-site field reconnaissance performed by GEI.

NOTE: This Plot Plan is not to be used for legal purposes. Locations and dimensions are approximate. Actual property dimensions and locations of utilities may be obtained from the Approved Building Plans or the "As-Built" Grading Plans.

SCALE: 1" = 20'

LEGEND

A — A'	Approximate Location of Geologic Cross Section
D — D'	Approximate Location of Geologic Cross Section (2011 Investigation)
T-3	Approximate Location of Exploratory Trench
	Approximate Limits of Remedial Grading

PROPOSED 2-STORY RESIDENCE
2ND FLOOR = 542.00 F.F.
1ST FLOOR = 530.00 F.F.
529.5 PAD

PARCEL 1
299,440 SF. 46.87 AC) GROSS
271,860 SF. (6.24 AC) NET

PARCEL 2
83,139 SF. (1.90 AC) GROSS
77,009 SF. (1.77 AC) NET

PARCEL 3
P.M. 21906
APN 352-300-11

LOT 1263
1M 36
N 352-300-04

LOT 6 MAP 2167 APN 352-280-05
LOT 7 MAP 2167 APN 352-280-06
LOT 8 MAP 2167 APN 352-280-07
LOT 9 MAP 2167 APN 352-280-08
LOT 10 MAP 2167 APN 352-280-09

PVT. BIOFILTRATION BASIN 514.5 F.G. 1,204 S.F.
PVT. BIOFILTRATION BASIN 512.0 F.G. 368 S.F.
PVT. BIOFILTRATION BASIN 497.0 F.G. 245 S.F.

POOL HOUSE 520.00 G.F.
COVERED PATIO 520.00 F.F.
POOL
SPA

T-1 T-2 T-3

PROPOSED PARCEL LINE (TYP)
LIMIT OF GRADING (TYP)
PROPOSED 10' PVT. SEWER EASEMENT
EXIST. 4" SEWER MAIN TO REMAIN
CONNECT TO EXIST. 4" SEWER (500.00 IE ±)
REMOVE EXIST. CURB & MATCH TO EXIST. CONC.
PROPOSED POOL EQUIPMENT
PROPOSED PVT. STORM DRAIN EASEMENT
PVT. ROCK SWALE
DRILL 0.7" DIA. HOLE IN CAP (TYP.)
DRILL 0.4" DIA. HOLE IN CAP (TYP.)
DRILL 0.5" DIA. HOLE IN CAP (TYP.)

LANE
COUNTRY CLUB DRIVE

CONCEPTUAL GRADING PLAN
FOXHILL, TENTATIVE PARCEL MAP
7007 COUNTRY CLUB DRIVE
LA JOLLA, CA 92037

SNIPES-DYE ASSOCIATES
8348 CENTER DRIVE, SUITE E, LA MESA, CA 91942-2910 (619) 697-9234, FAX (619) 460-2033

C-2

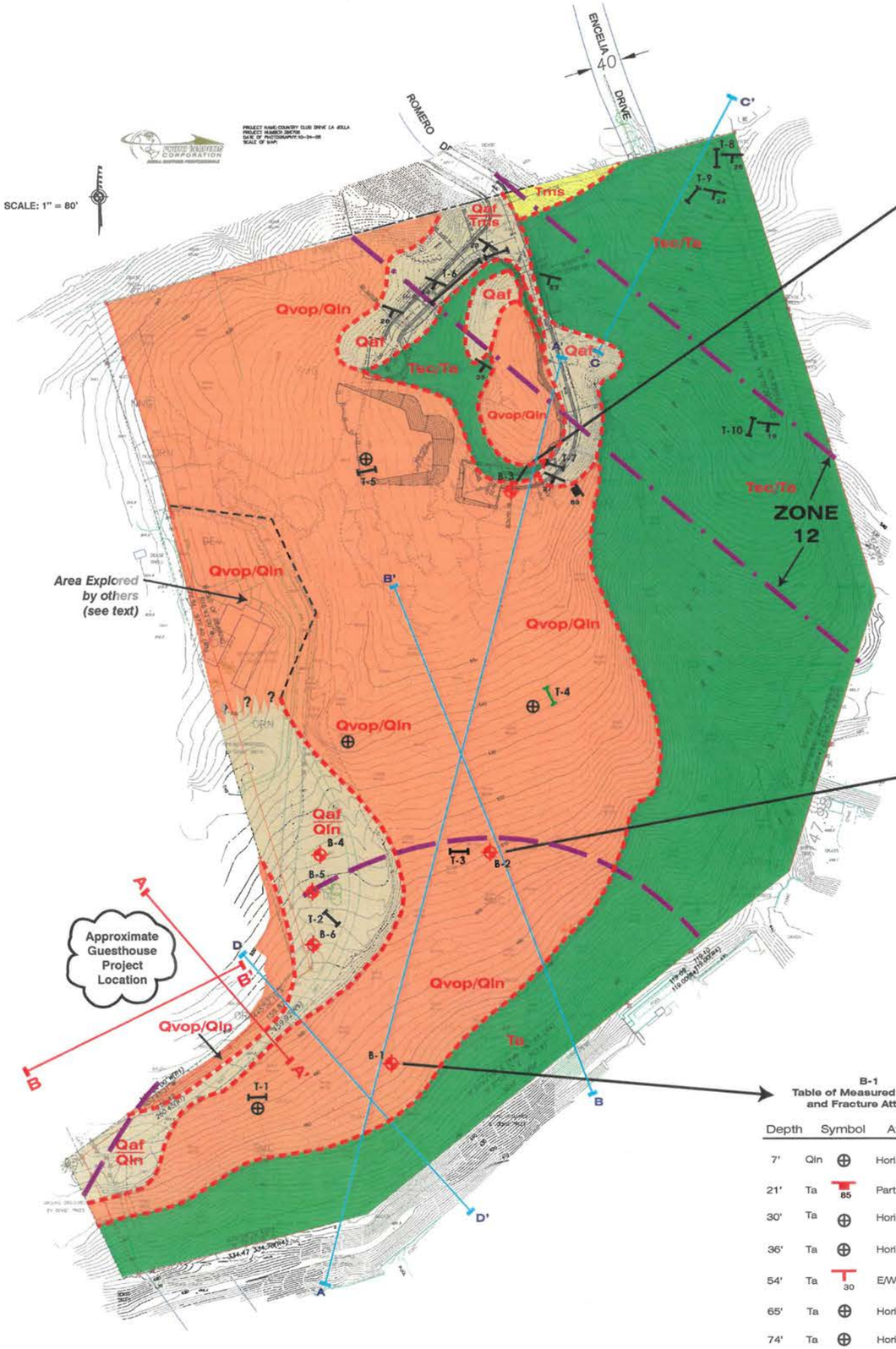
PLOT PLAN AND SITE SPECIFIC GEOLOGIC MAP

Foxhill Residence
7007 Country Club Drive
La Jolla, CA.
Figure No. Ia
Job Number 16-11256

Geotechnical Exploration, Inc.

March 2020

16-11256-20-scale.ai



B-3
Table of Measured Bedding and Fracture Attitudes

Depth	Symbol	Attitude/Feature
4'3"	Qln 8	N/S Strike 80°W Gravel Lag S80W Vertical Clay-filled Joint
4'3"	Tsc/Ta 9	N20W9°S Mineralized Band
16'3"	Tsc/Ta 4	S80W4°S N Color Band
20'6"	Tsc/Ta 23	N30W23°S Iron Mineralization/clay Module Bed
25'8"	Tsc/Ta ⊕	Horizontal Color Band
26'2"	Tsc/Ta ⊕	Horizontal Color Band
29'	Tsc/Ta 28	N60W23°S 1/2" Thick Sand-filled Fracture
29'9"	Tsc/Ta ⊕	Horizontal Color Band
32'	Tsc/Ta 28	N60W28°S Concentric Color Band
36'9"	Tsc/Ta 23	N55W23°S Band Laminae
41'4"	Tsc/Ta 10	N60E10°N Iron Module Bed
44'5"	Tsc/Ta 25	N10W25°N Iron Mineralized Bed
47'3"	Tsc/Ta 24	E/W Strike 24°S Concentrically Banded Sands
51'1"	Tsc/Ta 24	N60W24°S Sand Bed
67'2"	Tsc/Ta 20	E/W Strike 20° S Sand Bed
69'5"	Tsc/Ta 30	E/W Strike 30° S Sand Laminae
76'2"	Tsc/Ta 25	E/W Strike 25° S Clay Bed
76'-86'	Tsc/Ta 23	E/W Strike 23° S Clay and Sand Beds

B-2
Table of Measured Bedding and Fracture Attitudes

Depth	Symbol	Attitude/Feature
11'	Qln 10	E/W Strike 10° S Gravel Lag
15'5"	Ta 7	E/W Strike 7°S Color Band
19'3"	Ta 80	N25E80°N Mineralized Joint Surface
21'	Ta 10	N80W10°S Color Bands
23'4"	Ta 10	N80W10°S Color Band
29'	Ta 18	N72W18°S Color Band
31'	Ta 10	N80W10°S Color Band
35'	Ta 5	E/W Strike 5°S Color Band
37'2"	Ta 10	N80W10°S Color Band
41'4"	Ta 10	N80W10°S Color Band

B-1
Table of Measured Bedding and Fracture Attitudes

Depth	Symbol	Attitude/Feature
7'	Qln ⊕	Horizontal
21'	Ta 85	Parting Surface E/W Strike 85°S
30'	Ta ⊕	Horizontal Color Band
36'	Ta ⊕	Horizontal Color Band
54'	Ta 30	E/W Strike 30°S
65'	Ta ⊕	Horizontal Color Band
74'	Ta ⊕	Horizontal Color Band

LEGEND

- T-1 — Exploratory Trench Location
- B-3 — Exploratory Boring Location
- Approximate Geologic Contact
- Qaf — Artificial Fill
- Qvop/Qln — Qvop = Very Old Paralic Deposits/ Qln = Quaternary Lindavista Formation
- Tsc/Ta — Tertiary Scripps Formation/Ardath Shale Undifferentiated
- Ta — Tertiary Ardath Formation
- Tms — Tertiary Mount Soledad Formation
- 65 — Strike and Dip Joints
- 24 — Strike and Dip of Bedding
- Vertical/Subvertical Joint
- ⊕ — Horizontal/Subhorizontal Bedding
- D — D' — Line of Cross Section
- City of San Diego GeoHazard Zone 22
- City of San Diego GeoHazard Zone 12
- B — B' — Line of Cross Section for Proposed Guesthouse (updated)

(UPDATED) SITE PLAN AND GEOLOGIC MAP

Foxhill Residence
7007 Country Club Drive
La Jolla, CA.
Figure No. Ib
Job No. 16-11251

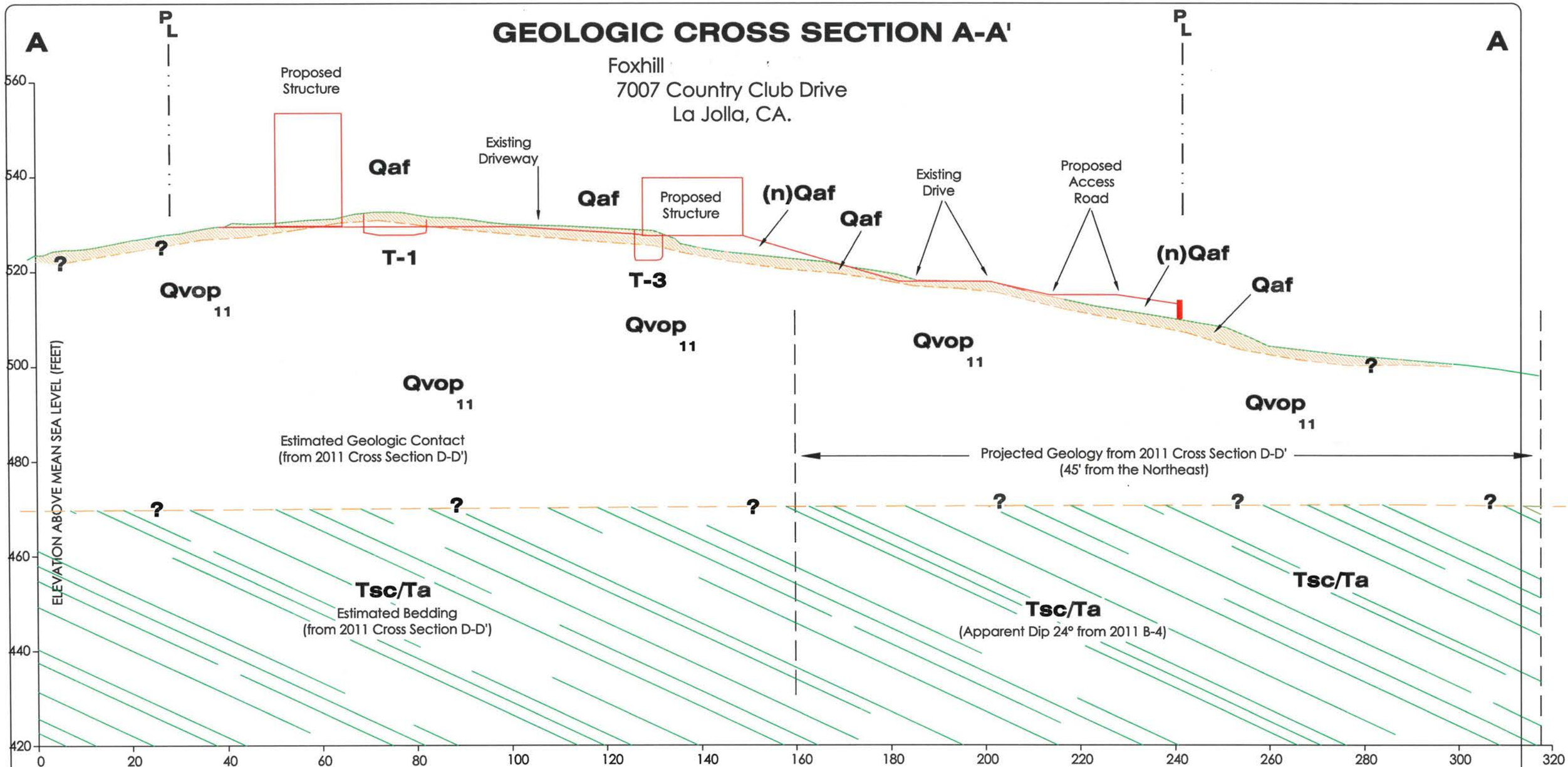
Geotechnical Exploration, Inc.
November 2011
(updated October 2016)

(Revised March 2020)

16-11251-IIb.ai

GEOLOGIC CROSS SECTION A-A'

Foxhill
7007 Country Club Drive
La Jolla, CA.



EXISTING GRADE
PROPOSED GRADE
APPROXIMATE GEOLOGIC CONTACT

Qaf ARTIFICIAL FILL
(n)Qaf NEW ARTIFICIAL FILL
Qvop 11 VERY OLD PARALIC DEPOSITS (Unit 11)
Tsc/Ta SCRIPPS/ARDATH SHALE (undifferentiated)

16-11251-AA

Figure No. IIa
Job No. 16-11251

Geotechnical Exploration, Inc.

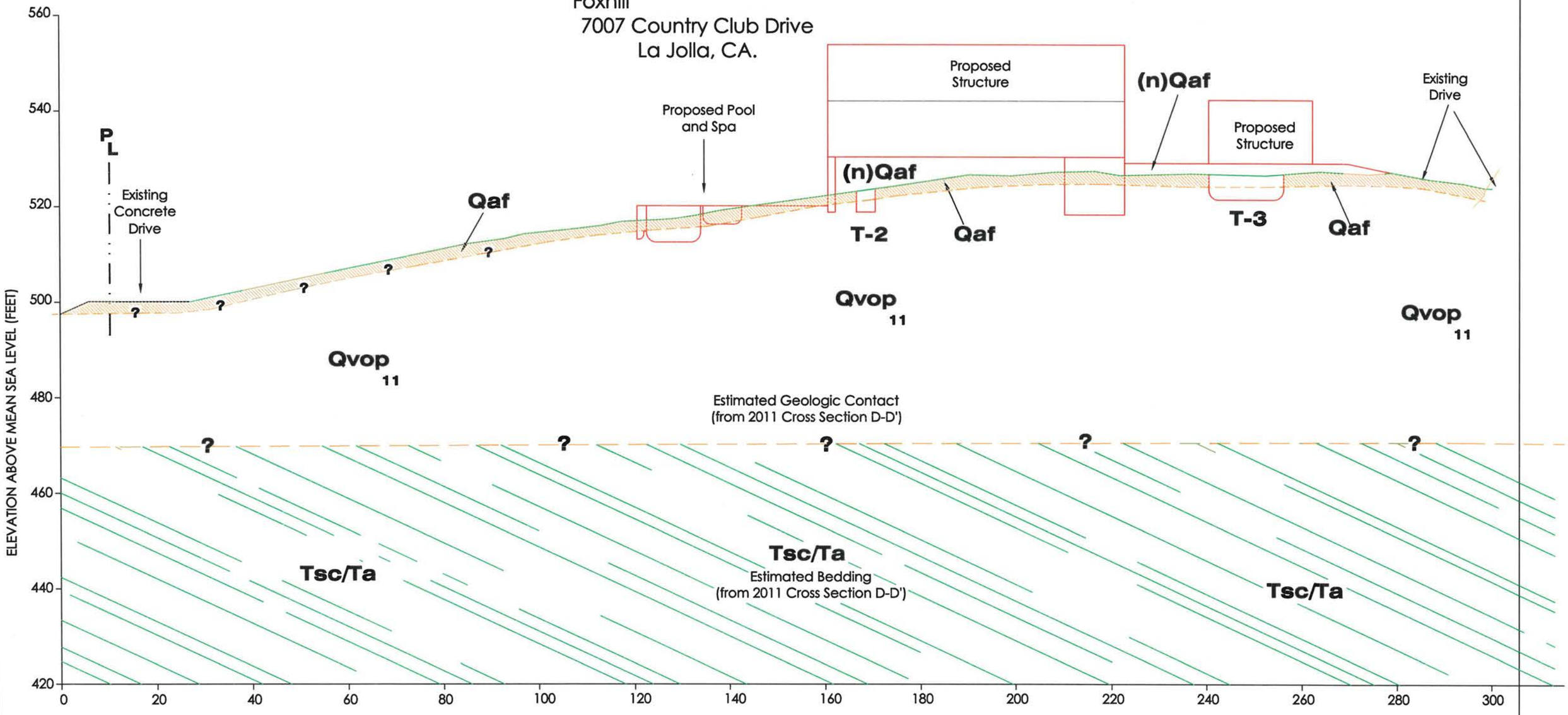
March 2020

GEOLOGIC CROSS SECTION B-B'

B

B'

Foxhill
7007 Country Club Drive
La Jolla, CA.



SCALE: 1" = 20' (H & V)

EXISTING GRADE

PROPOSED GRADE

APPROXIMATE GEOLOGIC CONTACT

Qaf ARTIFICIAL FILL

(n)Qaf NEW ARTIFICIAL FILL

Qvop 11 VERY OLD PARALIC DEPOSITS (Unit 11)

Tsc/Ta SCRIPPS/ARDATH SHALE (undifferentiated)

Figure No. IIb
Job No. 16-11251

Geotechnical Exploration, Inc.

March 2020

16-11251-AA

CROSS SECTION D-D'

Foxhill
7007 Country Club Drive
La Jolla, CA.

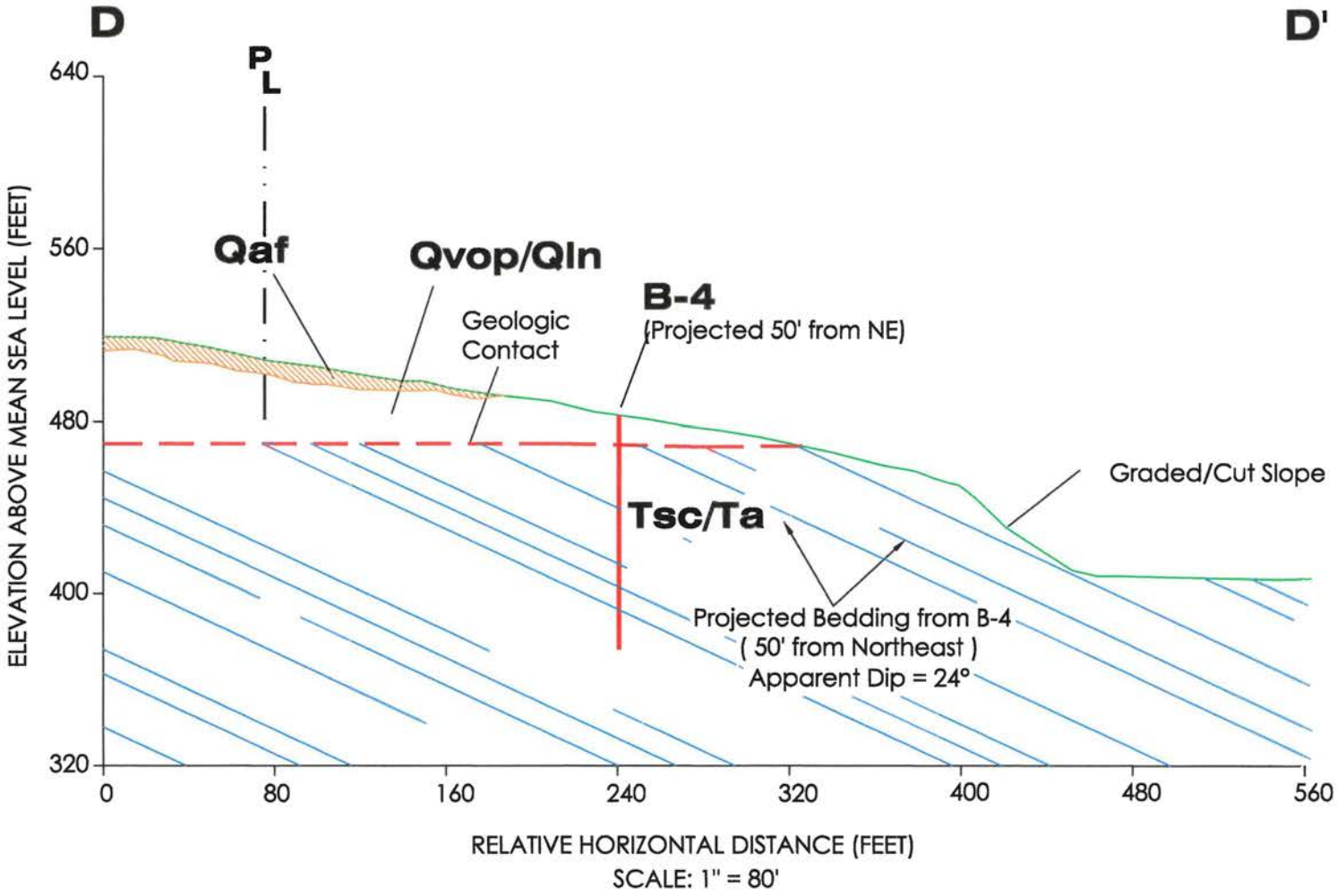


Figure No. IIc
Job No. 16-11251

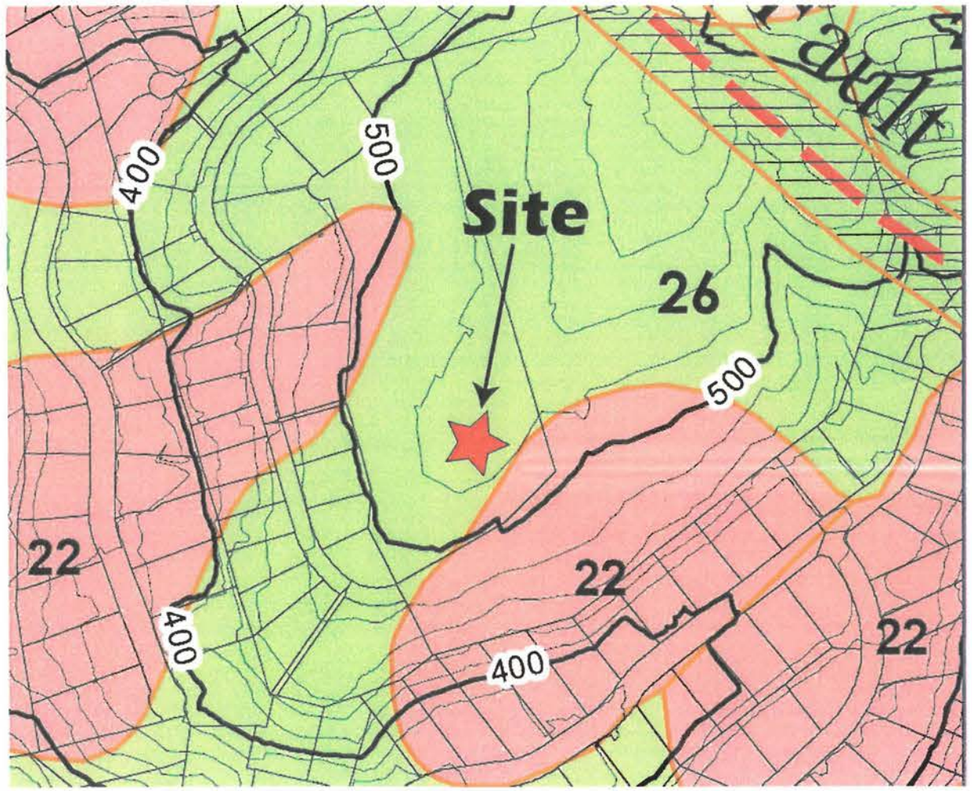
Geotechnical Exploration, Inc.
November 2011
(Revised March 2020)

16-11251-DD-2020

APPENDIX A

Excerpt from Geologic Hazards Map-Sheet 29

Excerpted from City of San Diego
Seismic Safety Study
Geologic/Hazards and Faults
Sheet 29



Foxhill Residence
7007 Country Club Drive
La Jolla, CA.

LEGEND

Geologic Hazard Categories

FAULT ZONES
- 11 Active, Alquist-Priolo Earthquake Fault Zone
- 12 Potentially Active, Inactive, Presumed Inactive, or Activity Unknown
- 13 Downtown special fault zone

LANDSLIDES
- 21 Confirmed, known, or highly suspected
- 22 Possible or conjectured

SLIDE-PRONE FORMATIONS
- 23 Friars: neutral or favorable geologic structure
- 24 Friars: unfavorable geologic structure
- 25 Ardath: neutral or favorable geologic structure
- 26 Ardath: unfavorable geologic structure
- 27 Otay, Sweetwater, and others

LIQUEFACTION
- 31 High Potential -- shallow groundwater major drainages, hydraulic fills
- 32 Low Potential -- fluctuating groundwater minor drainages

COASTAL BLUFFS
- 41 Generally unstable Numerous landslides, high steep bluffs, severe erosion, unfavorable geologic structure
- 42 Generally unstable Unfavorable bedding plains, high erosion
- 43 Generally unstable Unfavorable jointing, local high erosion
- 44 Moderately stable Mostly stable formations, local high erosion
- 45 Moderately stable Some minor landslides, minor erosion
- 46 Moderately stable Some unfavorable geologic structure, minor or no erosion
- 47 Generally stable Favorable geologic structure, minor or no erosion, no landslides
- 48 Generally stable Broad beach areas, developed harbor

OTHER TERRAIN
- 51 Level mesas -- underlain by terrace deposits and bedrock nominal risk
- 52 Other level areas, gently sloping to steep terrain, favorable geologic structure, Low risk
- 53 Level or sloping terrain, unfavorable geologic structure, Low to moderate risk
- 54 Steeply sloping terrain, unfavorable or fault controlled geologic structure, Moderate risk
- 55 Modified terrain (graded sites) Nominal risk

Water (Bays and Lakes)

FAULTS
- Fault
- Inferred Fault
- Concealed Fault
- Shear Zone

City of San Diego
SEISMIC SAFETY STUDY
Geologic Hazards and Faults

Development Services Department

DATE: 4/3/2008

Job No. 16-11251

Geotechnical Exploration, Inc.

APPENDIX B

Boring Excavation Log

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Truck-mounted Bucket/Auger Drill Rig	**30-inch diameter boring**	**9-1-11**
SURFACE ELEVATION	**GROUNDWATER/ SEEPAGE DEPTH**	**LOGGED BY**
± 481' Mean Sea Level	**Not Encountered**	**DCV/ LDR**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color)	U.S.C.S.	IN-PLACE MOISTURE (%)	IN-PLACE DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	MAXIMUM DRY DENSITY (pcf)	DENSITY (% of M.D.D.)	EXPAN. + (%) CONSOL. -	EXPANSION INDEX	BLOW COUNTS/FT.	SAMPLE O.D. (INCHES)
0			**SILTY SAND**. Medium dense. Moist. Medium brown.	SM									
2		1	**FILL (Qaf)** **SILTY SAND**, with roots to 1/4" in diameter. Medium dense. Dry. Pale brown.	SM	11.2	113.4							
4			**SLOPEWASH (Qsw)**	SC									
6			**CLAYEY SAND**. Dense. Damp. Brown to yellow-brown and gold-brown.	SM	4.3						67		
8			**LINDAVISTA FORMATION (Qln)** -- 40% passing #200 sieve.										
10			**SILTY SAND**. Medium dense. Dry. Yellow-brown.	CL									
12			**LINDAVISTA FORMATION (Qln)** **COBBLE LAYER**, from 8'-8'8", @ 8'4"-8'8" -- rounded large gravel/ cobble to 6" diameter in medium brown sand.										
14			**LINDAVISTA FORMATION (Qln)** eroded surface; unconformable contact.										
16			**CLAYSTONE/ MUDSTONE**, with minor sand. Hard. Damp to moist. Gray to light brown with dark mineral coating on parting surfaces.										
18			**ARDATH SHALE FORMATION (Ta)** @ 13' -- extremely uniform; massive. @ 14' -- change from light brown to greenish brown; horizontal, less sand. -- 98% passing #200 sieve. @ 21' -- E-W strike, 85°S dip on parting surface; similar perpendicular set. @ 22'-23' -- cobble in spoils.										
20													
22													
24													
26													

EXPLORATION LOG 9977 COPLEY.GPJ GEO_EXPL.GDT 8/1/12

- PERCHED WATER TABLE
- LOOSE BAG SAMPLE
- [1] IN-PLACE SAMPLE
- MODIFIED CALIFORNIA SAMPLE
- [S] FIELD DENSITY TEST
- STANDARD PENETRATION TEST

JOB NAME		
The Reserve		
SITE LOCATION		
7007 Country Club Drive, La Jolla, CA		
JOB NUMBER	REVIEWED BY	LOG No.
10-9977	**LDR/JAC**	**B-1**
FIGURE NUMBER	Geotechnical Exploration, Inc.	
IIIa		

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Truck-mounted Bucket/Auger Drill Rig	**30-inch diameter boring**	**9-1-11**
SURFACE ELEVATION	**GROUNDWATER/ SEEPAGE DEPTH**	**LOGGED BY**
± 481' Mean Sea Level	**Not Encountered**	**DCV/ LDR**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color)	U.S.C.S.	IN-PLACE MOISTURE (%)	IN-PLACE DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	MAXIMUM DRY DENSITY (pcf)	DENSITY (% of M.D.D.)	EXPAN. + (%) CONSOL. -	EXPANSION INDEX	BLOW COUNTS/FT.	SAMPLE O.D. (INCHES)
30			**CLAYSTONE/ MUDSTONE**, with minor sand. Hard. Damp to moist. Gray to light brown with dark mineral coating on parting surfaces.	CL									
32			**ARDATH SHALE FORMATION (Ta)** @ 30'7" -- 2" thick dark color band underlain by 1" thick light color band; horizontal.										
34													
36			@ 36'1" -- 1" thick light brown color band; horizontal.										
38			@ 37' -- thin minor parting surfaces with gypsum coatings.										
40													
42			-- 98% passing #200 sieve.		5.6								
44													
46													
48		2	@ 48'9" -- 1" thick dark color band; horizontal.		18.8	111.5							
50													
52			@ 51'1" -- 1" thick light color band; horizontal.										
54			-- 96% passing #200 sieve. @ 55'10" -- 1" thick light color band, E-W										

EXPLORATION LOG 9977 COPLEY.GPJ GEO_EXPL.GDT 8/1/12

- PERCHED WATER TABLE
- LOOSE BAG SAMPLE
- [1] IN-PLACE SAMPLE
- MODIFIED CALIFORNIA SAMPLE
- [S] FIELD DENSITY TEST
- STANDARD PENETRATION TEST

JOB NAME		
The Reserve		
SITE LOCATION		
7007 Country Club Drive, La Jolla, CA		
JOB NUMBER	REVIEWED BY	LOG No.
10-9977	**LDR/JAC**	**B-1**
FIGURE NUMBER	Geotechnical Exploration, Inc.	
IIIb		

EQUIPMENT	DIMENSION & TYPE OF EXCAVATION	DATE LOGGED
Truck-mounted Bucket/Auger Drill Rig	**30-inch diameter boring**	**9-1-11**
SURFACE ELEVATION	**GROUNDWATER/ SEEPAGE DEPTH**	**LOGGED BY**
± 481' Mean Sea Level	**Not Encountered**	**DCV/ LDR**

DEPTH (feet)	SYMBOL	SAMPLE	FIELD DESCRIPTION AND CLASSIFICATION DESCRIPTION AND REMARKS (Grain size, Density, Moisture, Color)	U.S.C.S.	IN-PLACE MOISTURE (%)	IN-PLACE DRY DENSITY (pcf)	OPTIMUM MOISTURE (%)	MAXIMUM DRY DENSITY (pcf)	DENSITY (% of M.D.D.)	EXPAN. + (%) CONSOL. -	EXPANSION INDEX	BLOW COUNTS/FT.	SAMPLE O.D. (INCHES)
			strike, 30°S dip.	CL									
58			**CLAYSTONE/ MUDSTONE**, with minor sand. Hard. Damp to moist. Gray to light brown with dark mineral coating on parting surfaces.										
60			**ARDATH SHALE FORMATION (Ta)**										
62			@ 59'-60' -- bucket auger cutting pattern change; 1' thick concretionary mass, lightly to moderately cemented; horizontal.										
		3			16.7	115.5							
64													
			@ 65' -- 2" thick light color band; horizontal.										
66													
68		4			18.3	115.9							
70			-- 94% passing #200 sieve.		18.3								
72													
74			@ 74' -- bucket auger cutting pattern change; horizontal.										
76													
78													
80			No seeps. No caving.										
82			Bottom @ 80'										

EXPLORATION LOG 9977 COPLEY.GPJ GEO_EXPL.GDT 8/1/12

- PERCHED WATER TABLE
- LOOSE BAG SAMPLE
- [1] IN-PLACE SAMPLE
- MODIFIED CALIFORNIA SAMPLE
- [S] FIELD DENSITY TEST
- STANDARD PENETRATION TEST

JOB NAME
The Reserve

SITE LOCATION
7007 Country Club Drive, La Jolla, CA

JOB NUMBER
10-9977

REVIEWED BY
LDR/JAC

FIGURE NUMBER
IIIc

Geotechnical Exploration, Inc.

LOG No.
B-1

APPENDIX C

Slope Stability Analysis

APPENDIX C

SLOPE STABILITY CALCULATIONS WITH SLIDE 6 COMPUTER PROGRAM

FOXHILL ESTATES

Job No. 16-11251

We performed gross slope stability calculations using the *SLIDE 6* program by Roc Science. The program is a limit equilibrium method, slope stability program that allows the use of several slope stability methods to calculate the factors of safety against shear failure. On this project, the Bishop Simplified method was used as the basis for calculations when using circular slide surfaces for analysis through the site geologic cross sections.

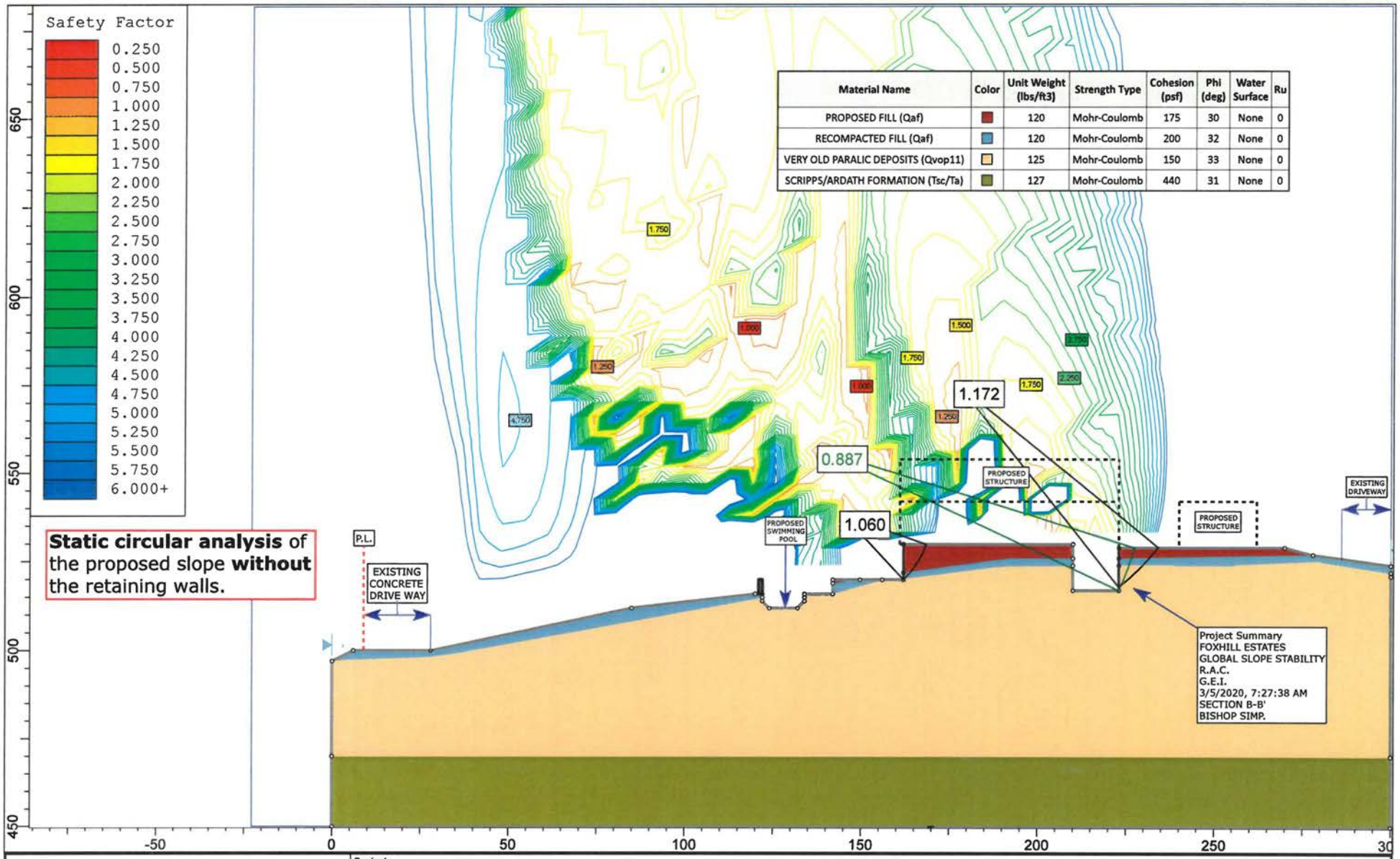
The program calculates the factor of safety against shear failure for potential slide surfaces over a selected range. We chose the range of slide surfaces where failures are most likely to occur. The printout shows a block with contour lines of different colors and shades that correspond to the different factors of safety calculated that can be obtained for the analyzed range of slide surfaces for Section B-B', which includes, in our professional opinion, the most unfavorable slope conditions at the site (see attached printouts). The green circular surface displayed in the printout is the lowest possible factor of safety located within the specified search range of each analysis. Soil strength values, geometry, and water conditions (seepage was not encountered) used in the program were based on geological information at the site, obtained by our project geologist. Direct shear test results from the on-site formational soils were performed and were used for the gross slope stability analysis. Shear strength values were conservatively adjusted.

The static gross stability factors of safety were calculated and yielded a factor of safety value above 1.5 and greater with the inclusion of the basement retaining wall.

For section B-B, the analysis consisted of analyzing the existing slope excluding and including the retaining walls. In the analysis which include the retaining walls, a surcharge of 250 psf was applied to simulate the load of the building. A cantilevered equivalent lateral fluid pressure of 45 pcf was applied to the swimming pool shell and basement retaining wall, and a cantilevered pressure of 42 pcf was applied to the exterior retaining located adjacent to the swimming pool.

Once the static gross stability was determined for each section, a seismic analysis was performed for the same analyzed sections. The seismic analysis yielded a factor of safety value above 1.15 as required by the City of San Diego and the State of California.

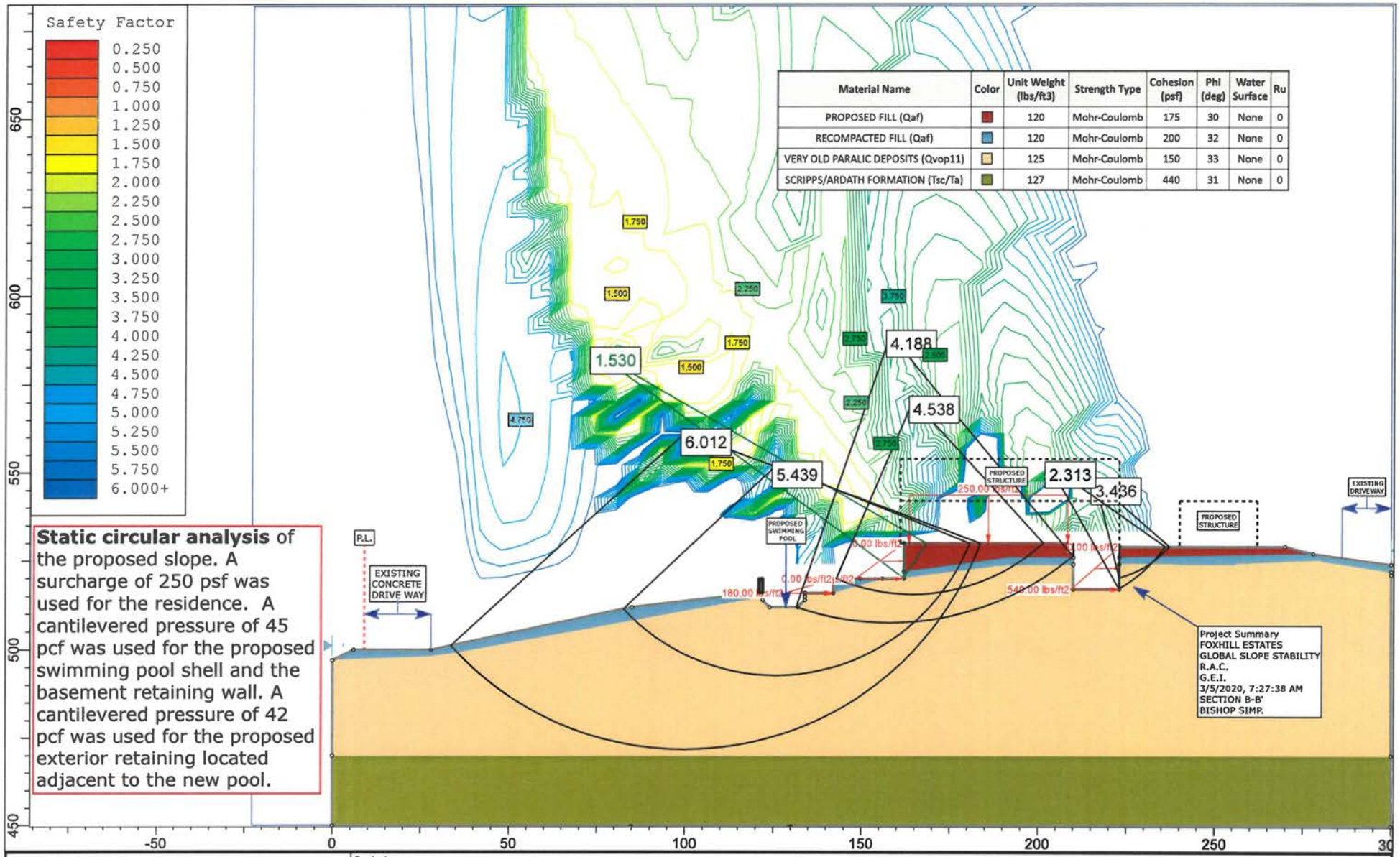
The surficial slope stability calculations were performed on the slope face using a geotechnical accepted equation for infinite slopes with a saturated upper layer. The calculations were performed by assuming that the upper 5 feet of those soils were saturated. Based on the current existing slope, the calculations yielded the Factor of Safety against shear failure above 1.50 for a sliding block 5 feet high against the soil shear strength frictional and cohesion strength opposing the driving force. The slope is considered adequate against surficial failures.



Geotechnical Exploration, Inc.

SLIDEINTERPRET 6.039

Project	FOXHILL ESTATES				
Analysis Description	GLOBAL SLOPE STABILITY				
Drawn By	R.A.C.	Scale	1:450	Company	G.E.I.
Date	3/5/2020, 7:27:38 AM			File Name	JOB NO. 16-11251_S(B)_01.slim

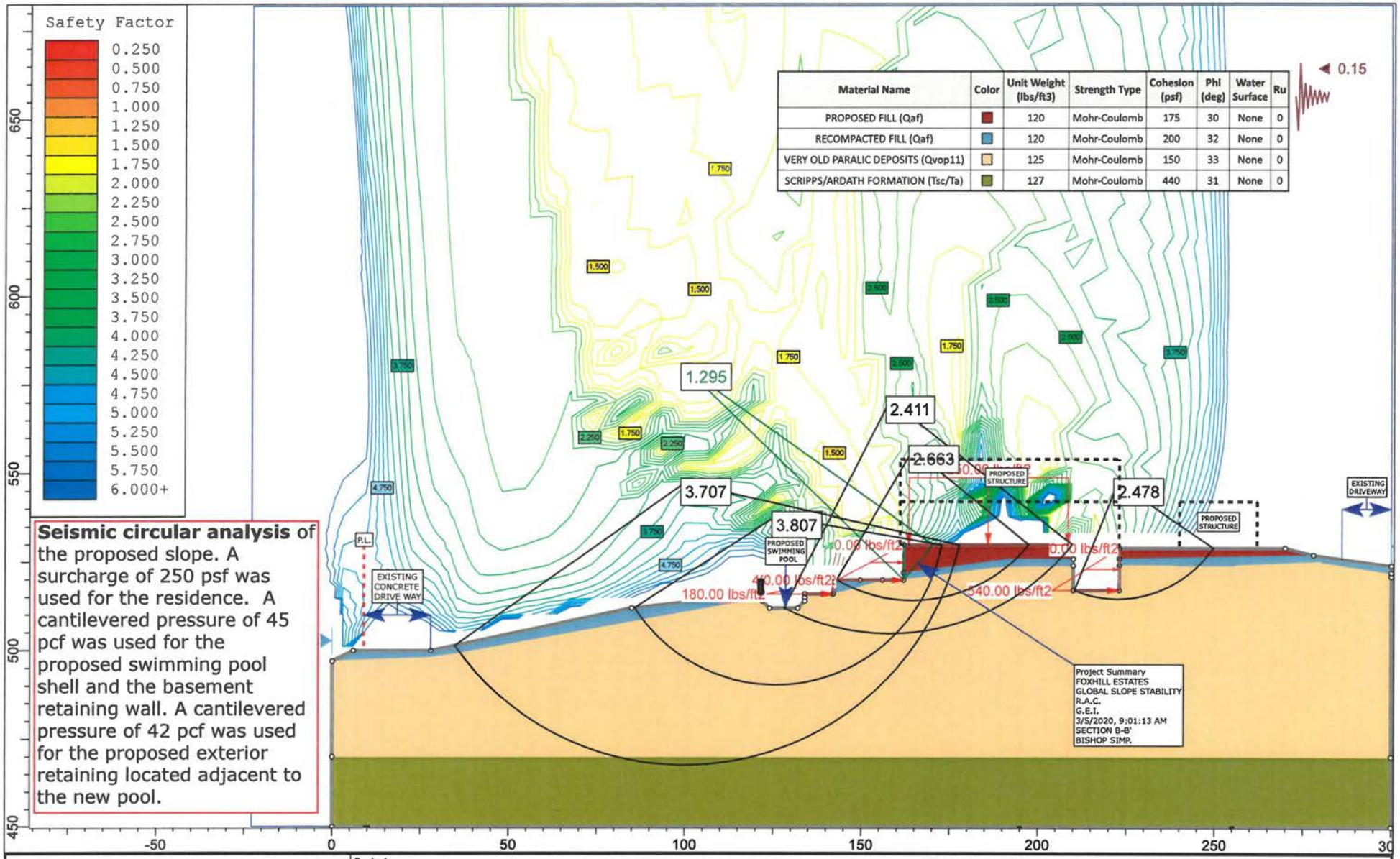


Static circular analysis of the proposed slope. A surcharge of 250 psf was used for the residence. A cantilevered pressure of 45 pcf was used for the proposed swimming pool shell and the basement retaining wall. A cantilevered pressure of 42 pcf was used for the proposed exterior retaining located adjacent to the new pool.

Geotechnical Exploration, Inc.

SLIDEINTERPRET 6.039

Project	FOXHILL ESTATES		
Analysis Description	GLOBAL SLOPE STABILITY		
Drawn By	R.A.C.	Scale 1:450	Company G.E.I.
Date	3/5/2020, 7:27:38 AM		File Name JOB NO. 16-11251_S(B)_02.slim

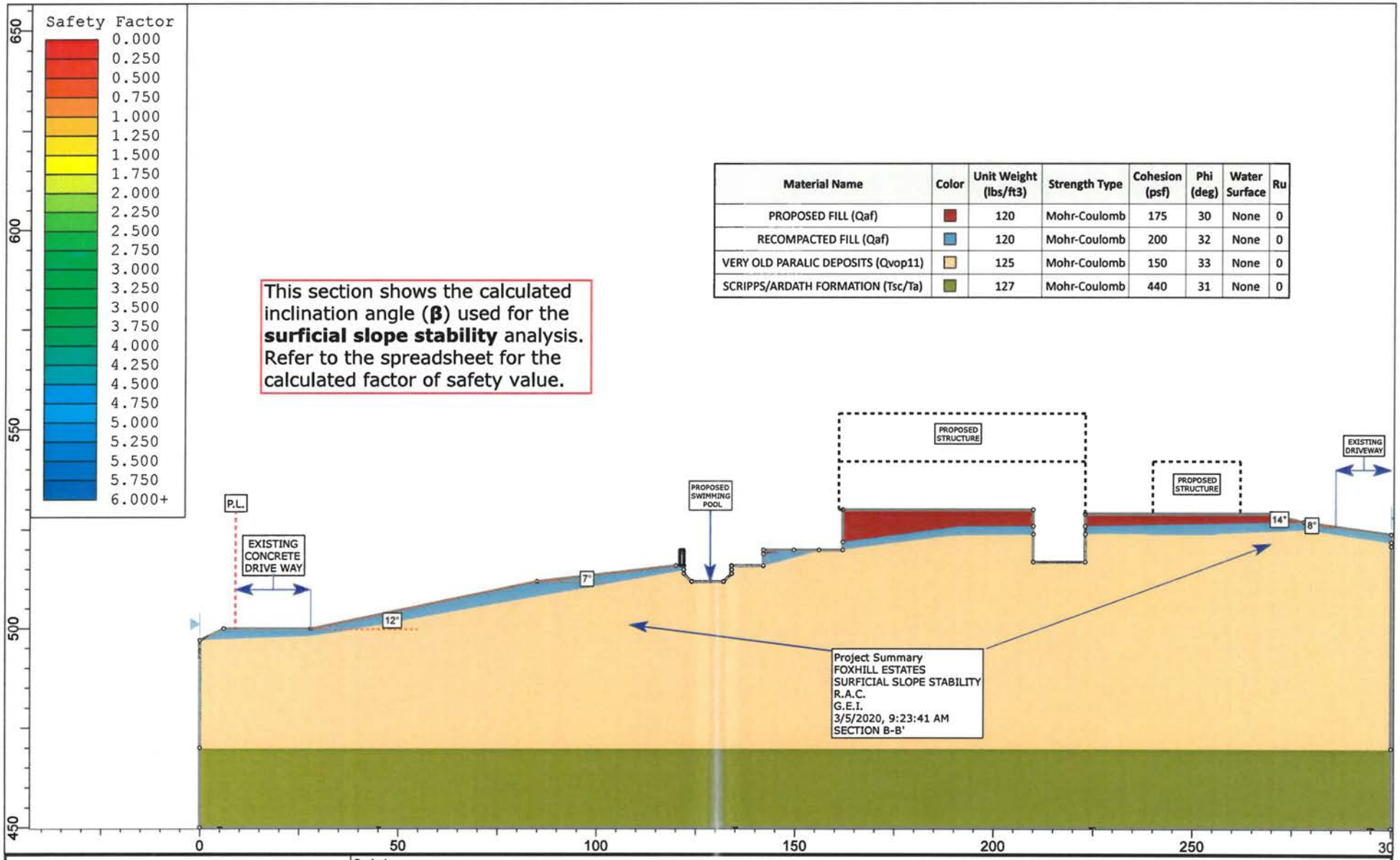


Seismic circular analysis of the proposed slope. A surcharge of 250 psf was used for the residence. A cantilevered pressure of 45 pcf was used for the proposed swimming pool shell and the basement retaining wall. A cantilevered pressure of 42 pcf was used for the proposed exterior retaining located adjacent to the new pool.

Geotechnical Exploration, Inc.

SLIDEINTERPRET 6.039

Project	FOXHILL ESTATES			
Analysis Description	GLOBAL SLOPE STABILITY			
Drawn By	R.A.C.	Scale	1:450	Company G.E.I.
Date	3/5/2020, 9:01:13 AM			File Name JOB NO. 16-11251_S(B)_02w_0.15gSHAKE.slim



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
PROPOSED FILL (Qaf)		120	Mohr-Coulomb	175	30	None	0
RECOMPACTED FILL (Qaf)		120	Mohr-Coulomb	200	32	None	0
VERY OLD PARALIC DEPOSITS (Qvop11)		125	Mohr-Coulomb	150	33	None	0
SCRIPPS/ARDATH FORMATION (Tsc/Ta)		127	Mohr-Coulomb	440	31	None	0

This section shows the calculated inclination angle (**β**) used for the **surficial slope stability** analysis. Refer to the spreadsheet for the calculated factor of safety value.

Geotechnical Exploration, Inc.

SLIDEINTERPRET 6.039

Project	FOXHILL ESTATES			**SECTION B-B'**
Analysis Description	SURFICIAL SLOPE STABILITY			
Drawn By	R.A.C.	Scale	1:400	Company G.E.I.
Date	3/5/2020, 9:23:41 AM			File Name JOB NO. 16-11251_S(B)_03.slim

SURFICIAL FAILURE

EQUATION 1

$$F.S. = \left(\frac{C}{\gamma_{sat} \times H \times \cos(\beta) \times \sin(\beta)}\right) + \left(\frac{\gamma'}{\gamma_{sat}} * \frac{\tan(\varphi)}{\tan(\beta)}\right)$$

γ_{sat}	γ_{water}	γ'	H
pcf	pcf	pcf	ft
130	62.4	67.6	5

SURFICIAL SLOPE STABILITY ANALYSIS IS BASED ON EQUATION (1) FOR THE CALCULATED VALUES.

SECTION B-B'				
SOIL TYPE	C (psf)	ϕ(°)	β(°)	F.O.S.
RECOMPACTED FILL (Q_{af})	200	32	12	3.042
RECOMPACTED FILL (Qaf)	200	32	7	5.190
PROPOSED FILL (Q_{af})	175	30	14	2.351
RECOMPACTED FILL (Qaf)	200	32	8	4.545

β	Slope inclination with respect to the horizontal plane
ϕ	Friction angle of the soil
C	Cohesion of the soil
γ_{sat}	Saturated unit weight of the soil
γ'	Submerged unit weight of the soil
H	Thickness of the saturated soil layer
F.O.S.	Factor of Safety

The Factor of Safety values are **ABOVE** 1.50 and are adequate.