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

31 May 2023

Mr. Kevin Javaheri
c/o Marengo Morton Architects **Job No. 21-13556**
Attn: Mr. Claude-Anthony Marengo
Via Email: CAMarengo@m2a.io

Subject: **Addendum to the Report of Preliminary Geotechnical Investigation and Geologic Fault Investigation and Response to the City of San Diego Geotechnical Review**
Proposed Javaheri Residence
2072 Via Casa Alta
La Jolla, California

Dear Mr. Javaheri:

In accordance with your request, ***Geotechnical Exploration, Inc***. herein responds to the City of San Diego LDR-Geology cycle issues with respect to the proposed project (see attached *References* for more details). For clarity purposes, we include the comments and responses to them.

Issue No. 9: *Demonstrate the site will have a factor of safety of 1.5 or greater with respect to gross and surficial slope stability following completion of the project. Provide slope stability analyses consistent with the geologic cross sections. (From Cycle 2)*

Response: We are providing a slope stability analysis based on cross section A-A' through the site. Based on our revised gross and surficial slope stability analysis, the site has a factor of safety of 1.5 or greater and a factor of safety of at least 1.15 in seismic loading analysis. Refer to attached Figure Nos. I and II for the geologic cross section through the site and Appendix A for slope stability analysis.

Issue No. 11: *The City's Guidelines for Geotechnical Reports indicate that if the depth of saturation used in the surficial slope stability analysis is less than 5 feet, the shallower depth must be justified. (From Cycle 2)*

Response: Our field investigation did not expose surficial deposits such as slopewash or topsoils greater than 3 feet in depth, or wet or saturated conditions in our excavations. Our exploratory trench T-1 excavation uncovered dense, very stiff and slightly moist Very Old Paralic Deposits Unit 11, very stiff to hard and slightly moist Ardath Shale, and dense and slightly moist Cabrillo Formation. We recommend that the site be provided with proper surface drainage to prevent water runoff from the improvements. Our shallow slope stability analysis included formational soils that are dense and very stiff to hard, and no water penetration of more than 1.5 feet in depth into formational soils is anticipated.

Issue No. 19: *Please note, geotechnical documents submitted for a PTS Hybrid digital project must be uploaded using any of the "Geotechnical" PDF file name options available (do not use "Applicant Responses" file name for any geotechnical document). Please note, geotechnical documents that are uploaded incorrectly or with any PDF file name option other than "Geotechnical" are unacceptable as record documents and will require a resubmittal to upload correctly.*

Response: Noted.

Issue No. 20: *The previous LDR-Geology review comments that have not been cleared remain applicable and require additional clarification. (New Issue)*

Response: Noted.

The project's geotechnical consultant must submit a geotechnical addendum or update letter for the purpose of an environmental review that specifically addresses the proposed development plans, previous open review comments, and the following:

Issue No. 21: *Provide an updated geologic/geotechnical map that circumscribes the limits of anticipated remedial grading to delineate the anticipated footprint of the project. (New Issue)*

Response: Attached as Figure No. I is an updated geologic/geotechnical map that circumscribes the limits of anticipated remedial grading to delineate the anticipated footprint of the project.

Issue No. 22: *Provide an updated representative geologic/geotechnical cross section that shows the geologic structure, bedding, and/or apparent dips as documented in the subsurface exploration logs. (New Issue)*

Response: Attached as Figure No. II is an updated representative geologic/geotechnical cross section that shows the geologic structure, bedding, and/or apparent dips as documented in the subsurface exploration logs.

Issue No. 23: *Provide a revised Exploratory Trench T-1 log and remove all references to Geologic Cross-Section A-A'. Those references appear to be inaccurate and are confusing. The project's geotechnical consultant could consider simply labeling the trench limits with North and South.* (*New Issue)*

Response: Attached as Figure No. III is a revised Exploratory Trench T-1 log with north and south labeling and no reference to geologic cross section A-A'.

Issue No. 24: *The project's geotechnical consultant should clarify if their stability analysis presented in the submitted report included site-specific bedding and geologic structure data. As per the City's Guidelines for Geotechnical Reports, describe the stability analysis and discuss the results. The description should include the method of analysis, specified material profile, and specified search areas for critical failure paths. Where multiple slope stability analyses are conducted, a tabulated summary of the analyses and results should be provided.* (*New Issue)*

Response: The slope stability analysis, presented here as Appendix A, includes site-specific bedding and geologic structure data as well as the method of analysis, specified material profile, and specified search areas for critical failure paths. A tabulated summary of the analyses and results is also provided in Appendix A.

Issue No. 25: *The applicant should please note that the available information is not sufficient to allow a reliable assessment of the level of risk and extent of hazard to which this property and the proposed improvements constructed thereon may be subject because of potential geologic hazards. Therefore, a "Notice of Geologic and Geotechnical Conditions" will need to be recorded against the property prior to approval of the entitlement application. (New Issue)*

Response*:* A "Notice of Geologic and Geotechnical Conditions" will be recorded against the property prior to the request for approval of the entitlement application.

***Issue No. 26*:** *The applicant should contact the Geology Section for a draft of the Notice. The Geology Section will need the full name of the owner(s), APN, street address, and full legal description of the subject site to complete the draft document. (New Issue)*

Response*:* Noted.

***Issue No. 27*:** *The project's designer should add a text box on the title page of the development plans that includes the following information: Notice of Geologic and Geotechnical Condition Document No. _____, Date Recorded_____ (New Issue)*

Response*:* Noted.

***Issue No. 28*:** *Once the "Notice of Geotechnical and Geotechnical Conditions" is recorded, the text box on the plans must be updated with the appropriate information. (New Issue)*

Response*:* Noted.

This opportunity to be of service is sincerely appreciated. Should you have any questions concerning the following report, please do not hesitate to contact us. Reference to our **Job No. 21-13556** will expedite a response to your inquiries.

Respectfully submitted,

GEOTECHNICAL EXPLORATION, INC.

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

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

REFERENCES

City of San Diego, 2018, City of San Diego Guidelines for Geotechnical Reports www.sandiego.gov/development-services.

City of San Diego Development Services Department, 2023, LDR-Geology Cycle Issues, Project No. 698915 – L64A-0003B.

Geotechnical Exploration Inc. (GEI) 2022, Report of Preliminary Geotechnical Investigation and Geologic Fault Investigation, Proposed Javaheri Residence, 2072 Via Casa Alta, La Jolla, California, Job No. 21-13556, dated July 28, 2022.

Geotechnical Exploration Inc. (GEI) 2022, Report of Geologic Reconnaissance, Javaheri Residence, 2072 Via Casa Alta, La Jolla, California, Job No. 21-13556, dated March 8, 2022.

REFERENCE: 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.

REFERENCE: This Plot Plan was prepared from and existing PROPOSED SITE PLAN by MARENGO MORTON ARCHITECTS dated 11/05/2021 and from on-site field reconnaissance and subsurface investigation performed by GEI.

Marengo Morton Architects
7724 Girard Ave
Second Floor
La Jolla, CA 92037
Tel. (858) 459-3769
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Michael Morton AIA
Claude Anthony Marengo Dean

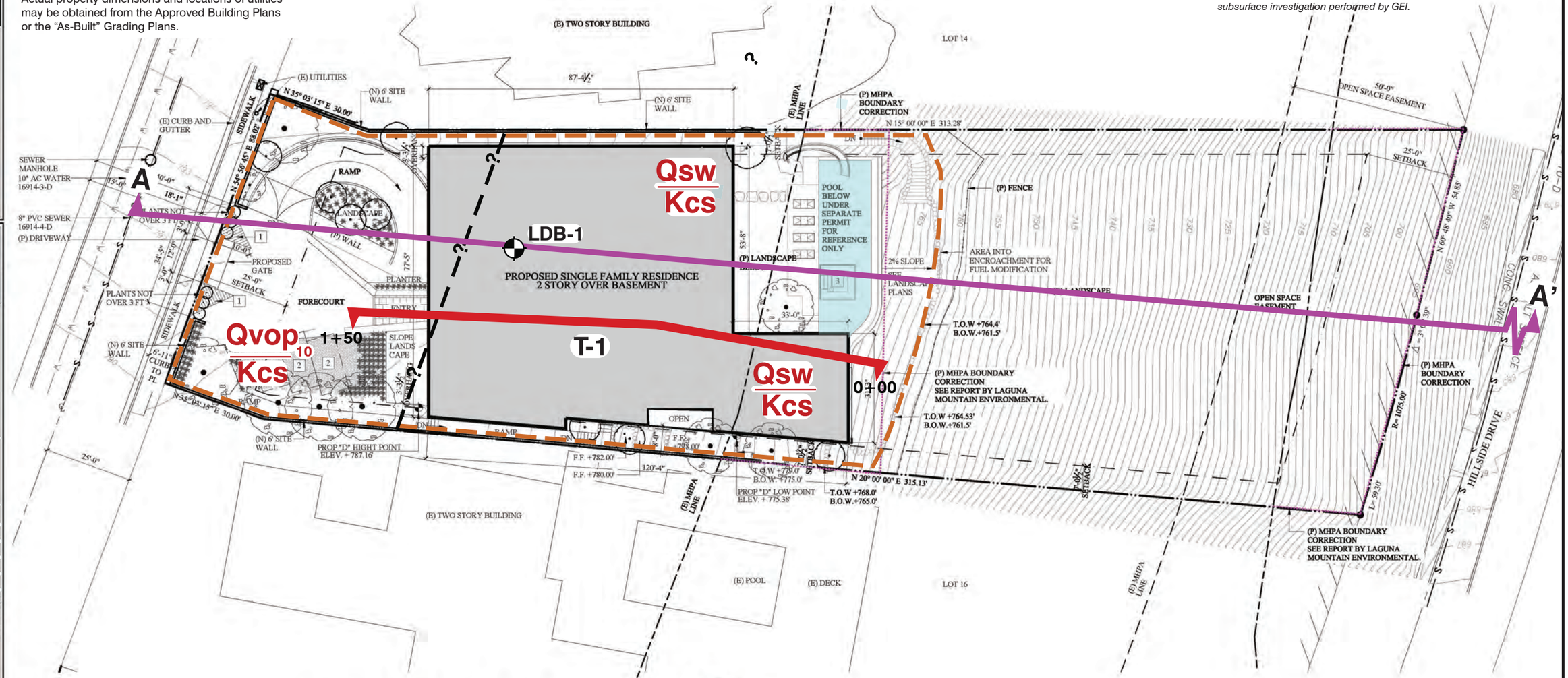
LICENSED ARCHITECT — ROBERT RENE ARMIJO — C-19371 — RENEWAL 04/30/2023 — STATE OF CALIFORNIA

SAOTA

JAVAHERI RESIDENCE
2072 VIA CASA ALTA
La Jolla, CA 92037

09/14/2021	PROJECT START
11/05/2021	1ST SUBMITTAL
PHASE	COASTAL
PROJECT NO	2021-22
REVIEWED BY	CAM
DRAWN BY	MS
DATE	11/05/2021

SHEET TITLE: PROPOSED SITE PLAN
A 010



PROPOSED SITE PLAN
0 8' 16' 32'
GRAPHIC SCALE
(1" = 30')

LEGEND

- T-1 (1+50 — 0+00): Approximate Location of Exploratory Trench with Station Numbers
- LDB-1: Approximate Location of Large Diameter Boring
- Approximate Limits of Remedial Grading
- A — A': Geologic Cross Section
- Location of Proposed Structures
- Location of Proposed Swimming Pool

GEOLOGIC LEGEND

- **Qsw** Slopewash
- **Qvop 10** Very Old Paralic Deposits, Unit 10
- **Kcs** Cabrillo Formation - sandstone
- Approximate Geologic Contact

PLOT PLAN AND SITE SPECIFIC GEOLOGIC MAP

Javaheri Residence
2072 Via Casa Alta
La Jolla, CA.
Figure No. I
Job No. 21-13556

Geotechnical Exploration, Inc.

May 2023

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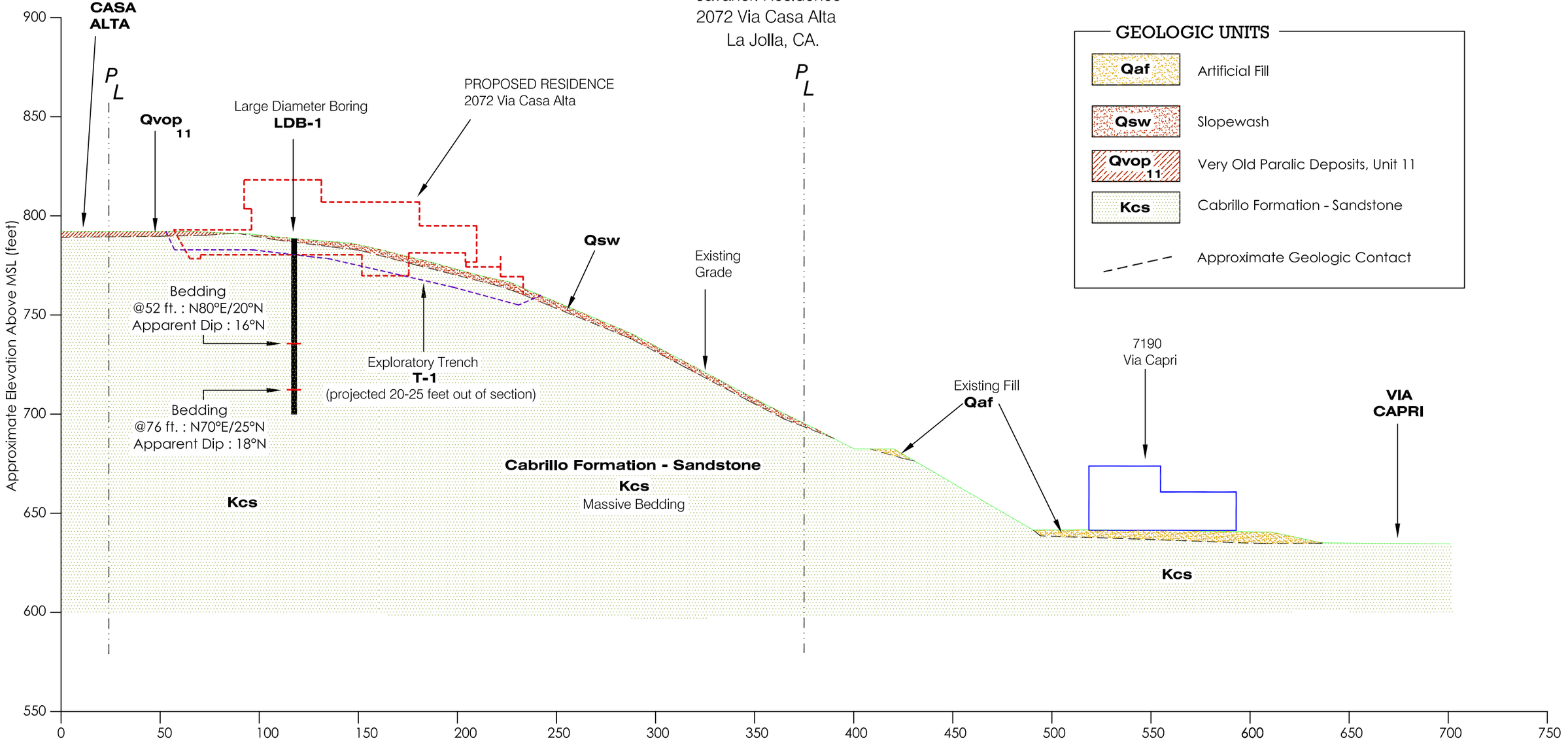
GEOLOGIC CROSS-SECTION A-A'

A — **N26°E** → — **A'**

Javaheri Residence
2072 Via Casa Alta
La Jolla, CA.



GEOLOGIC UNITS

Qaf	Artificial Fill
Qsw	Slopewash
Qvop 11	Very Old Paralic Deposits, Unit 11
Kcs	Cabrillo Formation - Sandstone
- - - -	Approximate Geologic Contact

Scale: 1" = 50'
(Horizontal and Vertical)

NOTE: This Geologic Cross Section 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.

Figure No. II
Job No. 21-13556

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May 2023

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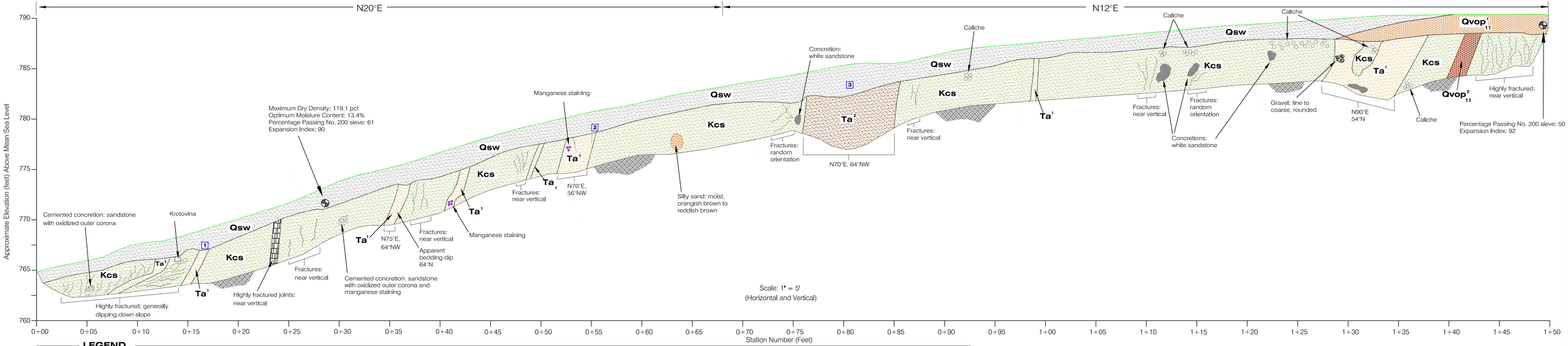
EXPLORATORY TRENCH T-1

East Side Wall

North — **South**



LEGEND

Qsw	SLOPEWASH:	SANDY FAT CLAY (CH). Very stiff. Moist. Dark brown.	Ta1	ARDATH SHALE:	SANDY SILT (ML). Very stiff. Slightly moist. Yellowish brown to light gray to reddish brown. Blocky structure. Friable.
Qvop1 11	Very Old Paralic Deposits, Unit 11 ARGILLIC TERRACE MATERIALS:	LEAN CLAY/CLAYEY SAND (CL/SC). Fine-to coarse-grained sand. Dense/very stiff. Slightly moist. Dark reddish brown.	Ta2	ARDATH SHALE:	LEAN CLAY (CL). Very stiff to hard. Slightly moist. Yellowish brown to light gray to orangish brown. Blocky structure. Friable. Indurated.
Qvop2 11	Very Old Paralic Deposits, Unit 11 TERRACE MATERIALS:	SILTY GRAVEL WITH SAND (GM). Fine - to coarse - grained. Dense. Dry to slightly moist. Reddish brown to orangish brown. Approx. 40% rounded fine to coarse gravels and cobbles up to 6" diameter.	Kcs	CABRILLO SANDSTONE:	SILTY SAND (SM). Fine - to medium - grained. Dense. Slightly moist. Yellowish brown. Micaceous.

Approximate Geologic Contact

3 Carbon 14 Sample Location

Bulk Sample Location

NOTE: This Exploratory Trench Section 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.

Javaheri Residence
2072 Via Casa Alta
La Jolla, CA.
Figure No. III
Job No. 21-13556

Geotechnical Exploration, Inc.

May 2023

21-13556-T1-AA

APPENDIX A

SLOPE STABILITY CALCULATIONS WITH SLIDE 6 COMPUTER PROGRAM

JAVAHERI RESIDENCE

Job No. 21-13556

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 was used for the circular method and Spencer method was used for the block stability analysis as the basis for calculations when using circular slide surfaces for analysis through the site geologic cross sections.

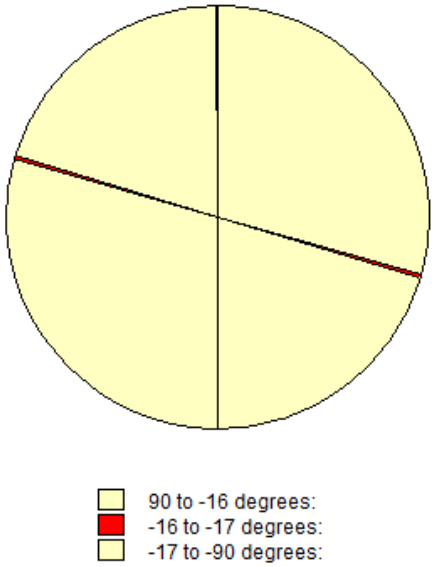
The program calculates the factor of safety against shear failure for potential slide surfaces over a selected range. We chose the range of slide surfaces where failures are most likely to occur. The printout shows a block with contours of different colors and shades for the circular failures that correspond to the different factors of safety calculated that can be obtained for the analyzed range of slide surfaces for Section A-A', which include 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. For the block failures, the print out shows the center of rotations for the block glides. The green surface displayed in the print out is the lowest factor of safety value. Direct shear test results from the on-site soils were performed and were used for the gross slope stability analysis. Shear strength values were conservatively adjusted based on our geotechnical and geologic opinions from our experience with similar soil materials.

The static gross and surficial slope stability factors of safety were calculated and yielded a factor of safety value above 1.5 and greater. In the block analysis, values were assigned to bedding material for the 16- and 18-degree apparent dips as shown:

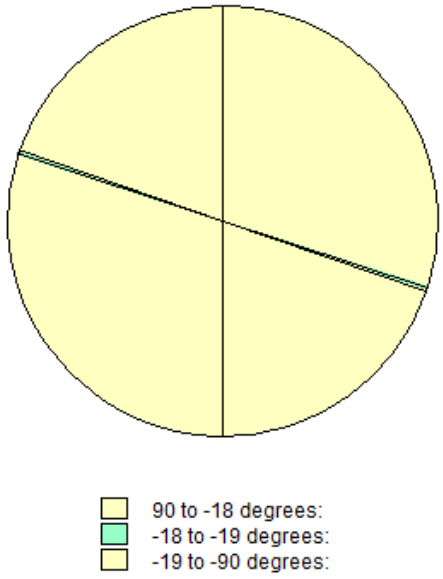
16° BEDDING MATERIAL		125	Mohr-Coulomb	150	16	None	0	
18° BEDDING MATERIAL		125	Mohr-Coulomb	150	18	None	0	

The values were then combined into one layer as shown to the following layers to add the anisotropy to the soil layer:

APPARENT DIP 16°		125	Generalized Anisotropic			None	0	User Defined 1



APPARENT DIP 18°		125	Generalized Anisotropic			None	0	User Defined 2



The yellow layer shown on the circle is the Cabrillo formation.

Cabrillo Formation Sandstone (Kcs)		125	Mohr-Coulomb	750	26	None	0

Once the static gross stability was determined, 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 slopewash using a geotechnical accepted equation for infinite slopes with a saturated upper layer. The calculations were performed by assuming that the upper 3.28 feet (1m) of those soils were saturated. Based on the cited literature in our surficial slope stability calculations, the surficial failures are likely to occur in the upper 3.28 foot (1m) soil wedge.

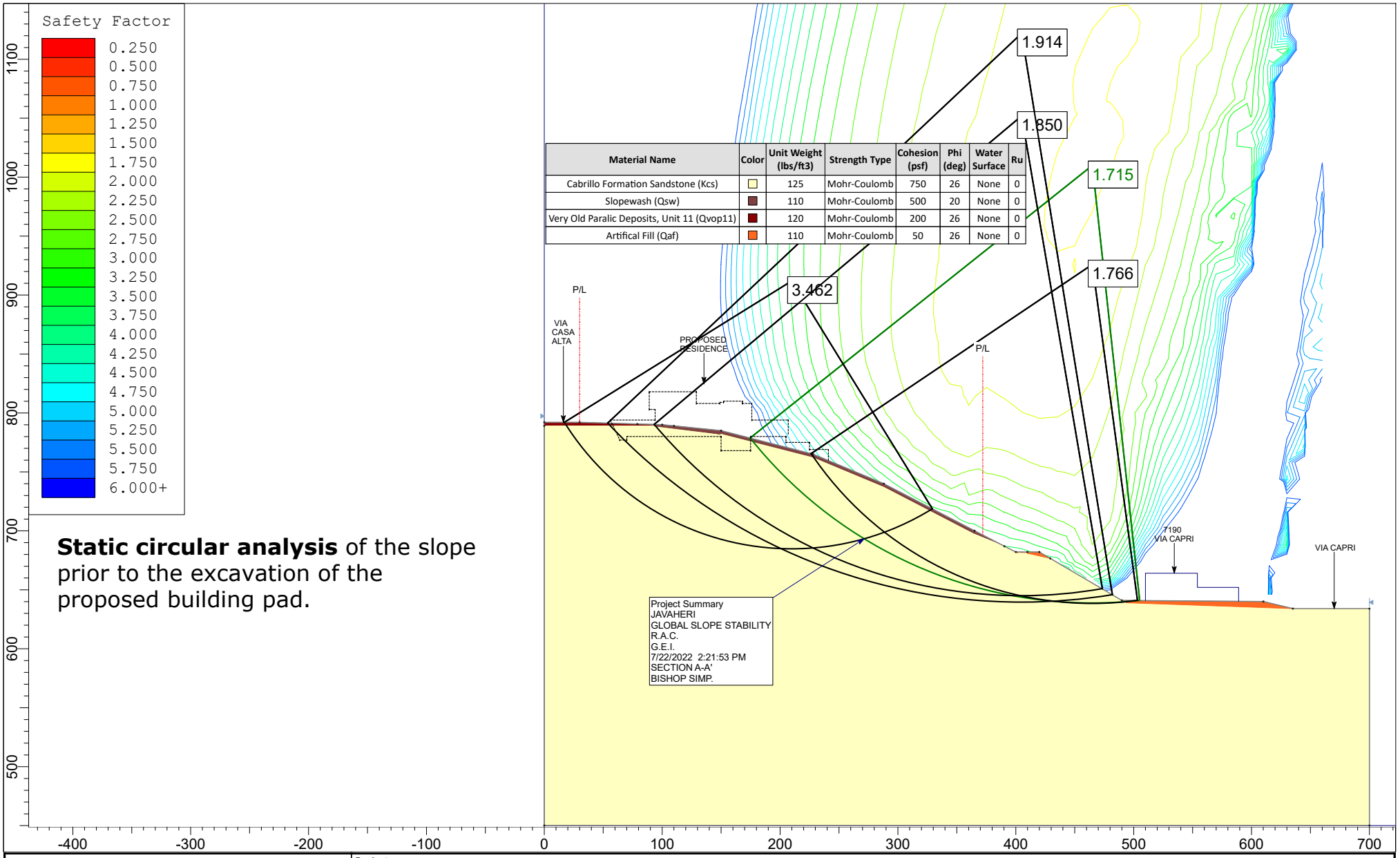
RESULTS SUMMARY

Global Stability

Analysis No.	Method-Type	Condition	Lowest FOS
S(A)_01	Bishop-Circular	Static	1.715
S(A)_01w_0.15g	Bishop-Circular	Seismic	1.224
S(A)_02	Bishop-Circular	Static	1.686
S(A)_02w_0.15g	Bishop-Circular	Seismic	1.215
S(A)_03	Spencer-Block	Static	1.748
S(A)_03w_0.15g	Spencer-Block	Seismic	1.171
S(A)_04	Spencer-Block	Static	1.781
S(A)_04w_0.15g	Spencer-Block	Seismic	1.279
S(A)_05	Spencer-Block	Static	1.842
S(A)_05w_0.15g	Spencer-Block	Seismic	1.295

Surficial Stability

Analysis Name	Method Type	Factor of Safety (FOS)
Surficial Analysis	Infinite Slope Analysis	3.735



Static circular analysis of the slope prior to the excavation of the proposed building pad.

Geotechnical Exploration, Inc.	Project: JAVAHERI		**SECTION A-A'**
	Analysis Description: GLOBAL SLOPE STABILITY		
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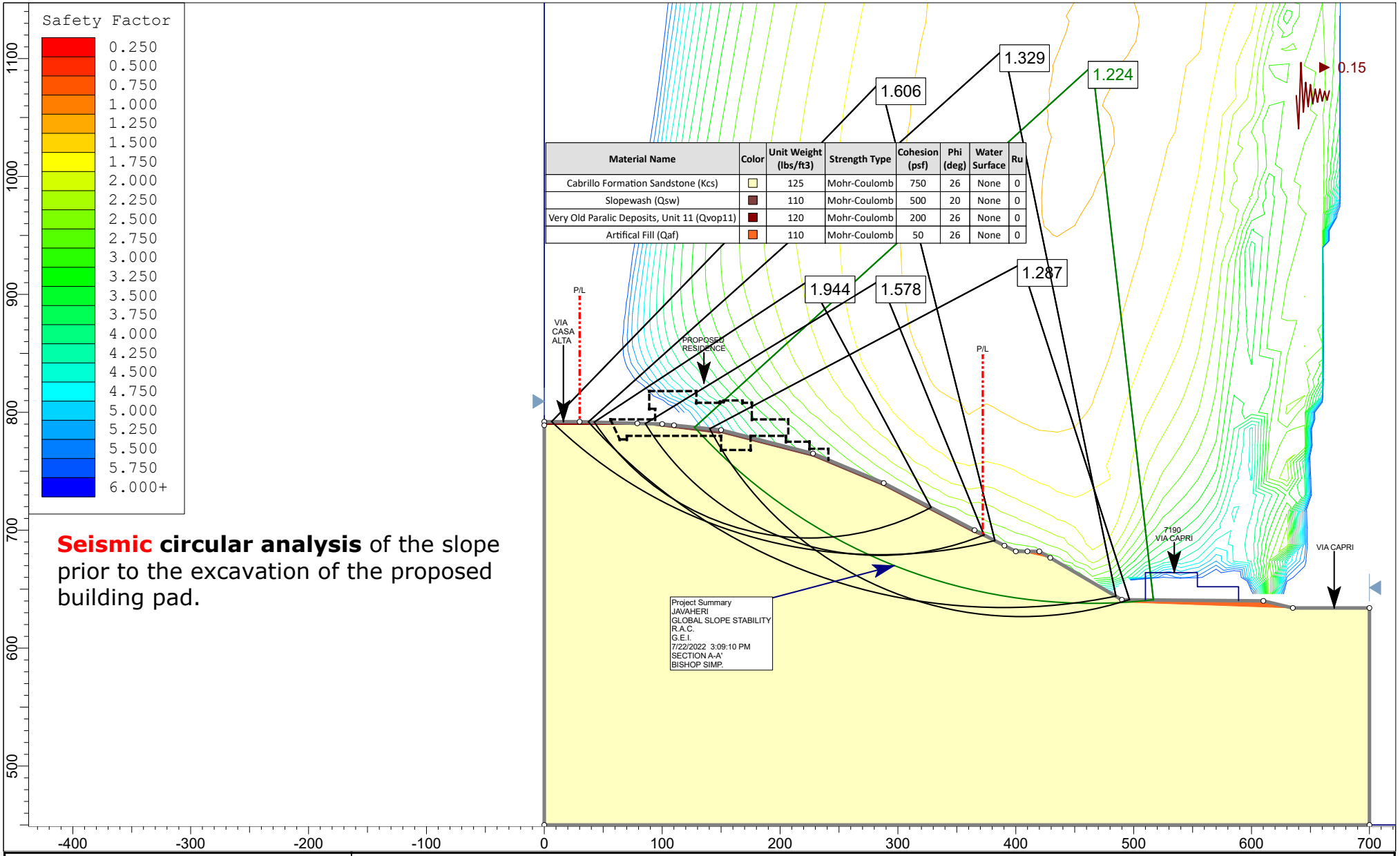
SLIDEINTERPRET 6.039



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Cabrillo Formation Sandstone (Kcs)		125	Mohr-Coulomb	750	26	None	0
Slopewash (Qsw)		110	Mohr-Coulomb	500	20	None	0
Very Old Paralic Deposits, Unit 11 (Qvop11)		120	Mohr-Coulomb	200	26	None	0
Artifical Fill (Qaf)		110	Mohr-Coulomb	50	26	None	0

Seismic circular analysis of the slope prior to the excavation of the proposed building pad.

Geotechnical Exploration, Inc.

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Project	JAVAHERI		**SECTION A-A'**
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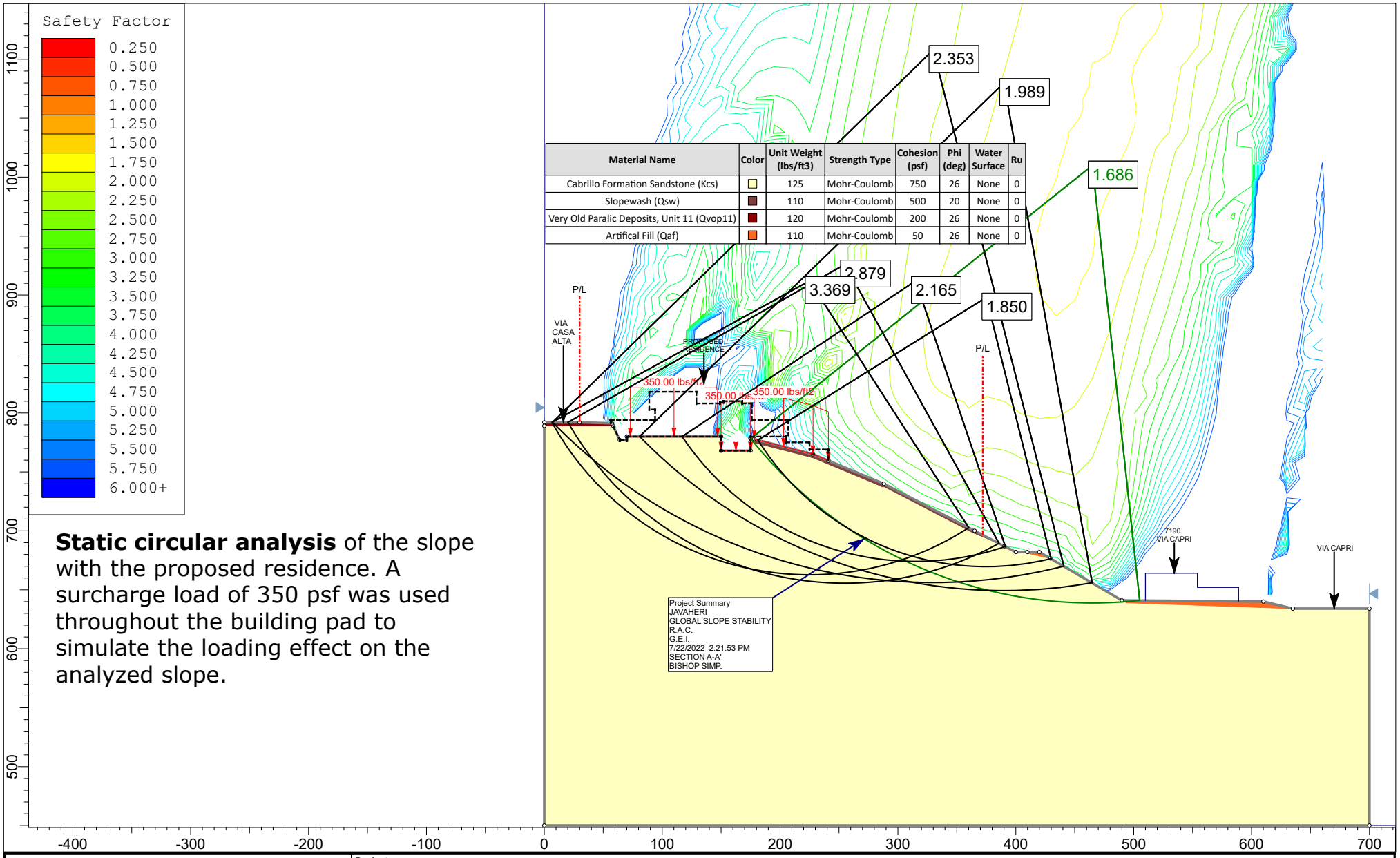

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Cabrillo Formation Sandstone (Kcs)		125	Mohr-Coulomb	750	26	None	0
Slopewash (Qsw)		110	Mohr-Coulomb	500	20	None	0
Very Old Paralic Deposits, Unit 11 (Qvop11)		120	Mohr-Coulomb	200	26	None	0
Artifical Fill (Qaf)		110	Mohr-Coulomb	50	26	None	0

Static circular analysis of the slope with the proposed residence. A surcharge load of 350 psf was used throughout the building pad to simulate the loading effect on the analyzed slope.

Geotechnical Exploration, Inc.	Project: JAVAHERI		**SECTION A-A'**
	Analysis Description: GLOBAL SLOPE STABILITY		
	Drawn By: R.A.C.	Scale: 1:1350	Company: G.E.I.
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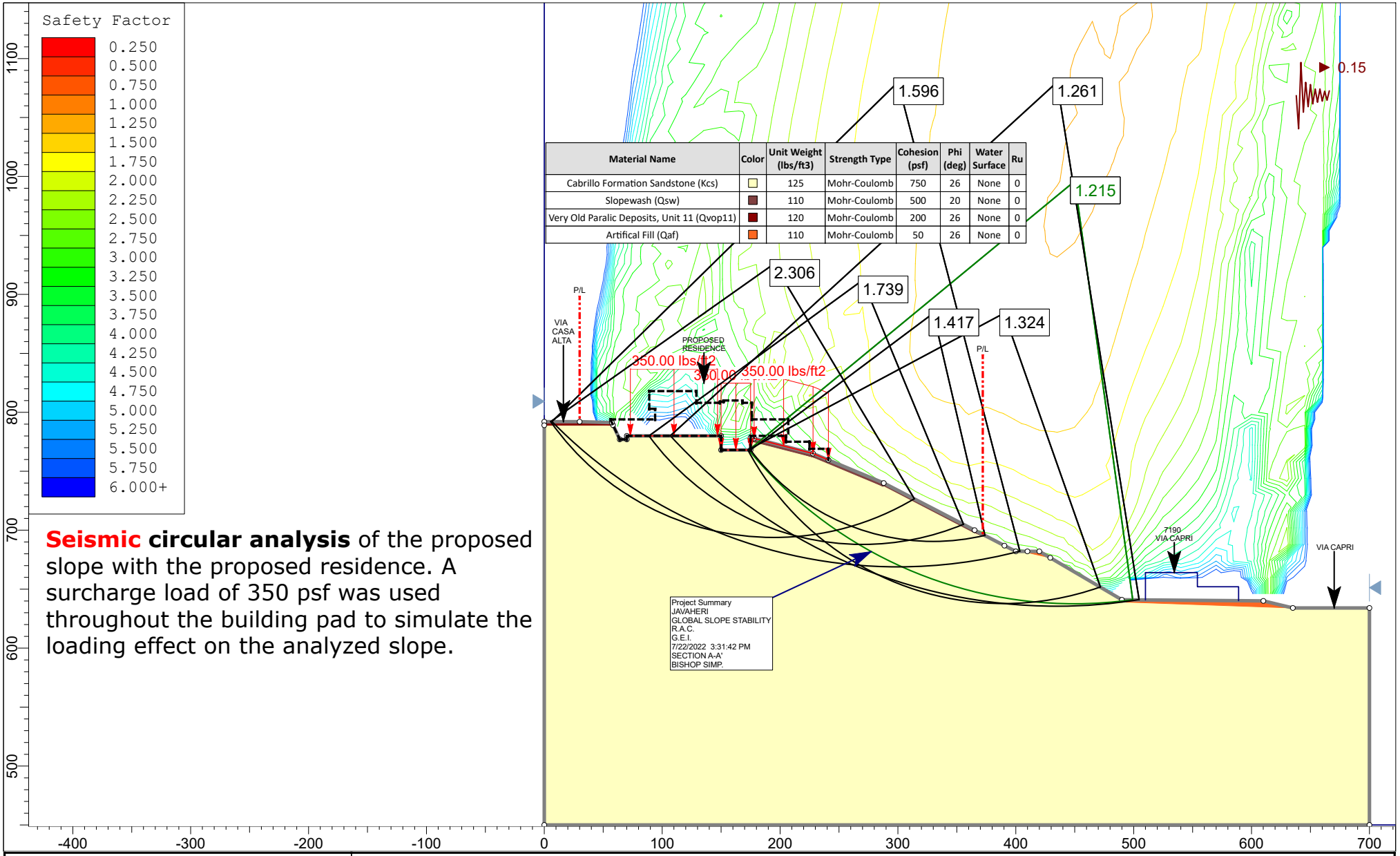

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru
Cabrillo Formation Sandstone (Kcs)		125	Mohr-Coulomb	750	26	None	0
Slopewash (Qsw)		110	Mohr-Coulomb	500	20	None	0
Very Old Paralic Deposits, Unit 11 (Qvop11)		120	Mohr-Coulomb	200	26	None	0
Artifical Fill (Qaf)		110	Mohr-Coulomb	50	26	None	0

Seismic circular analysis of the proposed slope with the proposed residence. A surcharge load of 350 psf was used throughout the building pad to simulate the loading effect on the analyzed slope.

Geotechnical Exploration, Inc.	Project: JAVAHERI		**SECTION A-A'**
	Analysis Description: GLOBAL SLOPE STABILITY		
	Drawn By: R.A.C.	Scale: 1:1350	Company: G.E.I.
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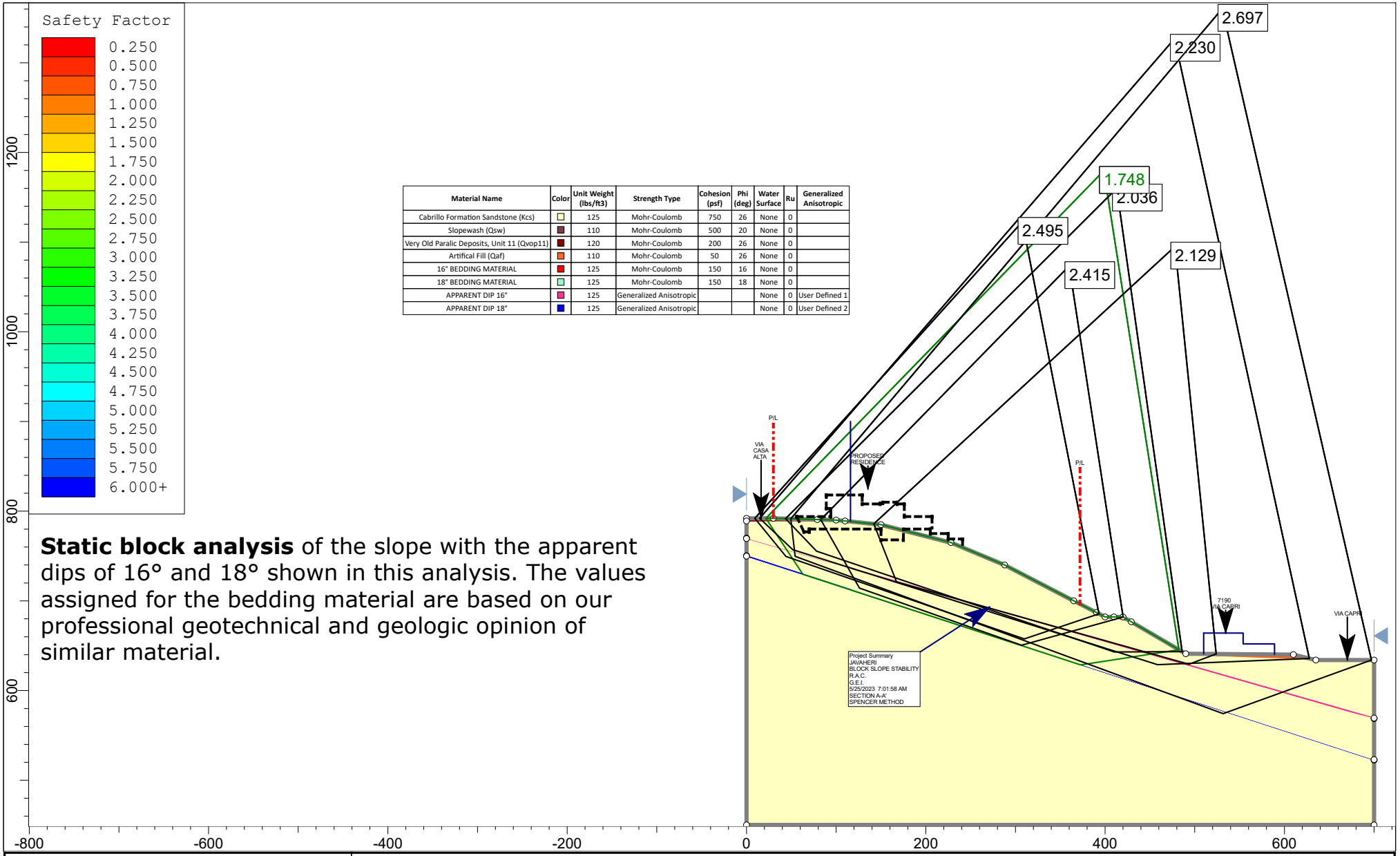

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru	Generalized Anisotropic
Cabrillo Formation Sandstone (Kcs)		125	Mohr-Coulomb	750	26	None	0	
Slopewash (Qsw)		110	Mohr-Coulomb	500	20	None	0	
Very Old Paralic Deposits, Unit 11 (Qvop11)		120	Mohr-Coulomb	200	26	None	0	
Artifical Fill (Qaf)		110	Mohr-Coulomb	50	26	None	0	
16° BEDDING MATERIAL		125	Mohr-Coulomb	150	16	None	0	
18° BEDDING MATERIAL		125	Mohr-Coulomb	150	18	None	0	
APPARENT DIP 16°		125	Generalized Anisotropic			None	0	User Defined 1
APPARENT DIP 18°		125	Generalized Anisotropic			None	0	User Defined 2

Static block analysis of the slope with the apparent dips of 16° and 18° shown in this analysis. The values assigned for the bedding material are based on our professional geotechnical and geologic opinion of similar material.

Geotechnical Exploration, Inc.

SLIDEINTERPRET 6.039

Project	JAVAHERI		**SECTION A-A'**
Analysis Description	BLOCK SLOPE STABILITY		
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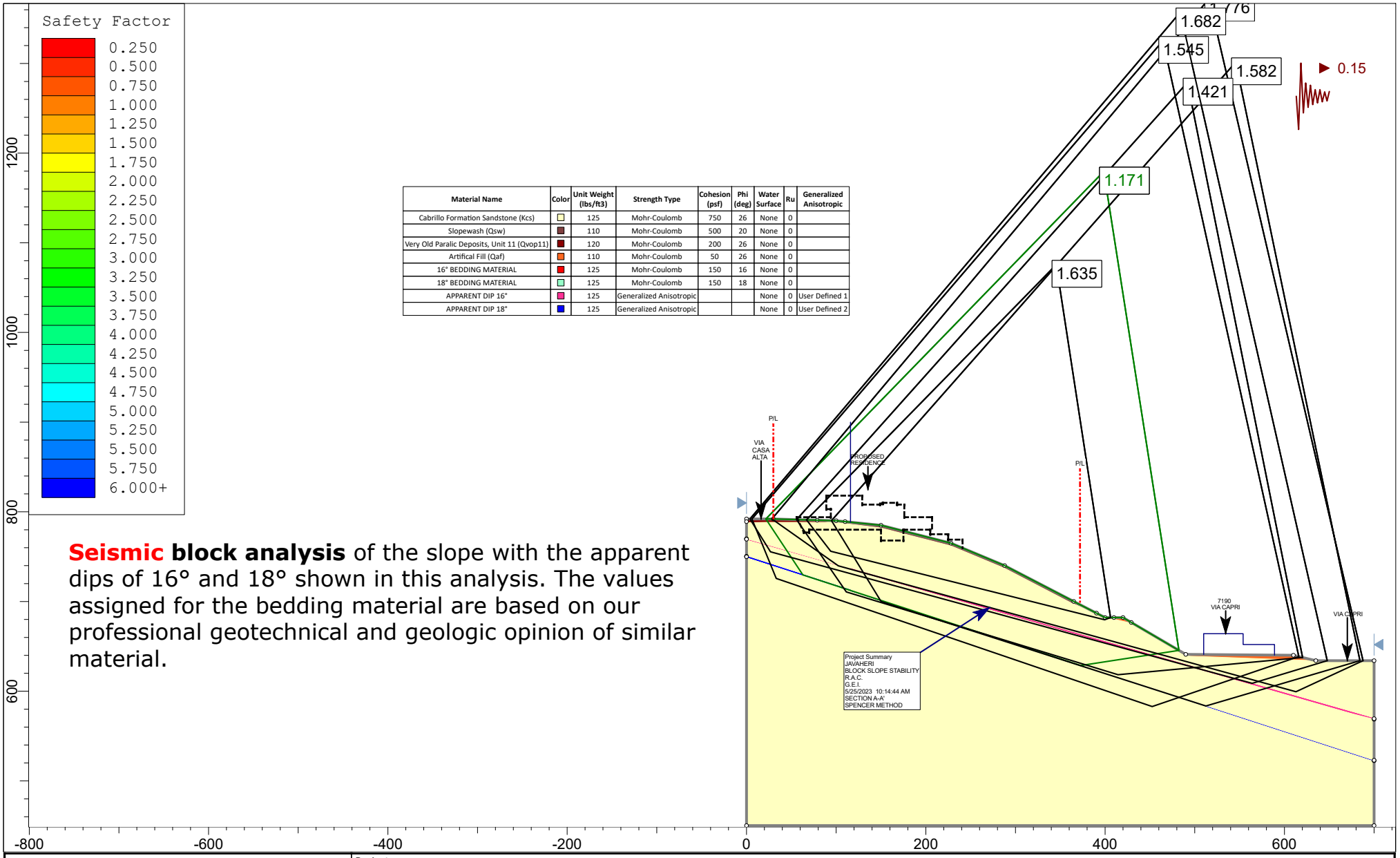

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru	Generalized Anisotropic
Cabrillo Formation Sandstone (Kcs)		125	Mohr-Coulomb	750	26	None	0	
Slopewash (Qsw)		110	Mohr-Coulomb	500	20	None	0	
Very Old Paralic Deposits, Unit 11 (Qvop11)		120	Mohr-Coulomb	200	26	None	0	
Artifical Fill (Qaf)		110	Mohr-Coulomb	50	26	None	0	
16° BEDDING MATERIAL		125	Mohr-Coulomb	150	16	None	0	
18° BEDDING MATERIAL		125	Mohr-Coulomb	150	18	None	0	
APPARENT DIP 16°		125	Generalized Anisotropic			None	0	User Defined 1
APPARENT DIP 18°		125	Generalized Anisotropic			None	0	User Defined 2

Seismic block analysis of the slope with the apparent dips of 16° and 18° shown in this analysis. The values assigned for the bedding material are based on our professional geotechnical and geologic opinion of similar material.

Geotechnical Exploration, Inc.

SLIDEINTERPRET 6.039

Project	JAVAHERI		SECTION A-A'
Analysis Description	BLOCK SLOPE STABILITY		
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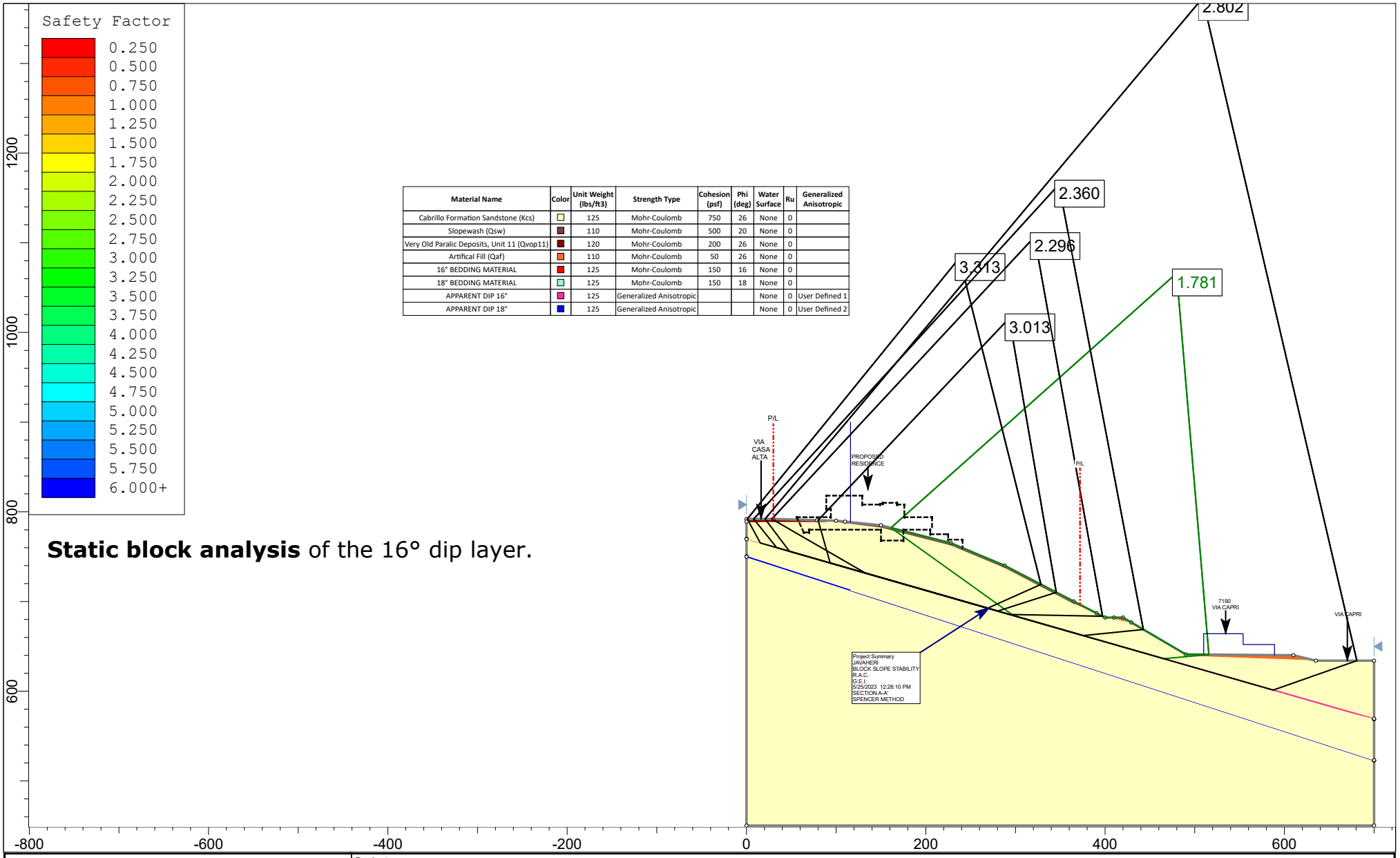

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru	Generalized Anisotropic
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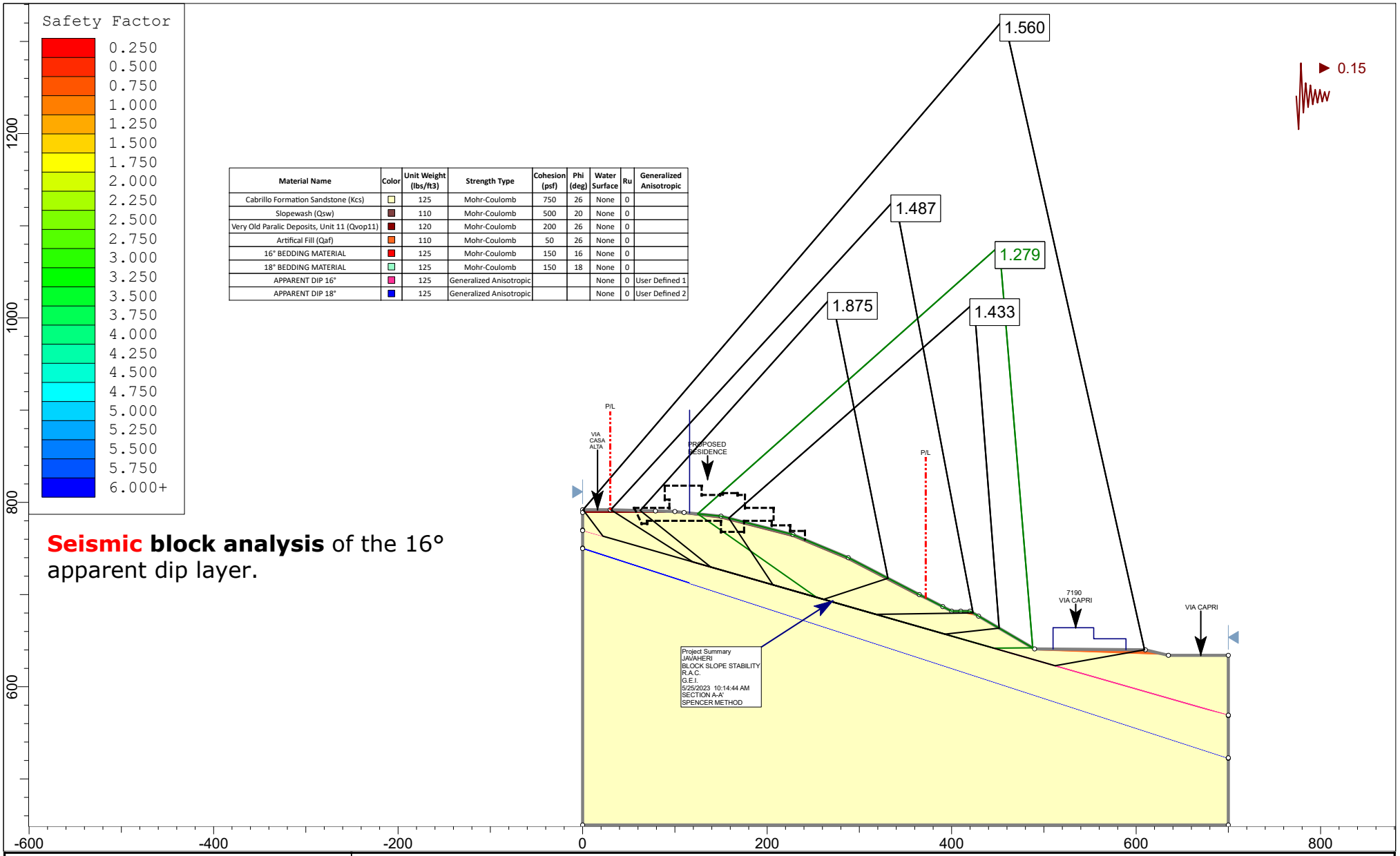
16° BEDDING MATERIAL		125	Mohr-Coulomb	150	16	None	0	
18° BEDDING MATERIAL		125	Mohr-Coulomb	150	18	None	0	
APPARENT DIP 16°		125	Generalized Anisotropic			None	0	User Defined 1
APPARENT DIP 18°		125	Generalized Anisotropic			None	0	User Defined 2

Static block analysis of the 16° dip layer.

Geotechnical Exploration, Inc.

SLIDEINTERPRET 6.039

Project	JAVAHERI		**SECTION A-A'**
Analysis Description	BLOCK SLOPE STABILITY		
Drawn By	R.A.C.	*Scale* 1:1775	*Company* G.E.I.
Date	5/25/2023 12:28:10 PM		*File Name* JOB NO. 21-13556_S(A)_04.slim



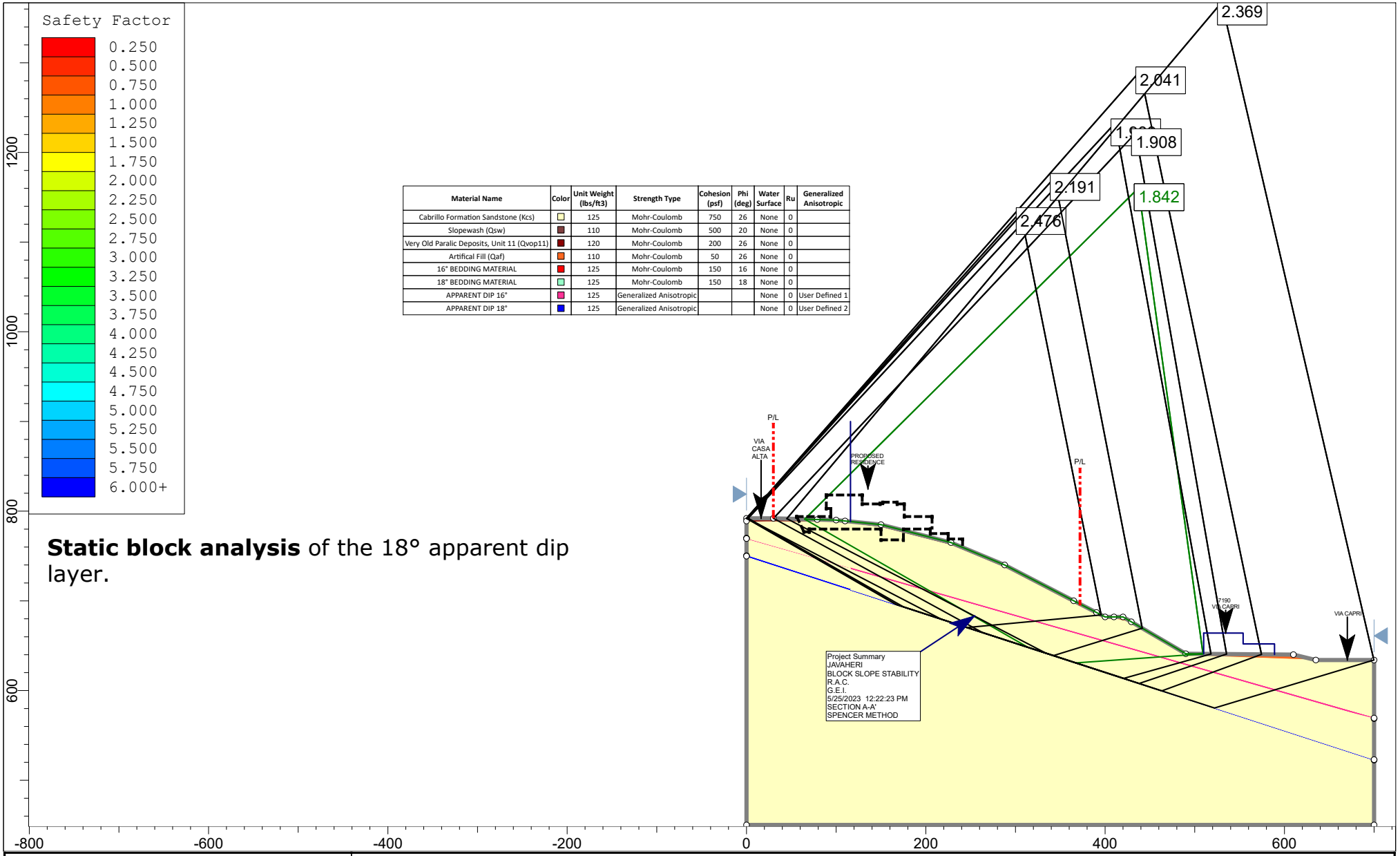
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru	Generalized Anisotropic
Cabrillo Formation Sandstone (Kcs)		125	Mohr-Coulomb	750	26	None	0	
Slopewash (Qsw)		110	Mohr-Coulomb	500	20	None	0	
Very Old Paralic Deposits, Unit 11 (Qvop11)		120	Mohr-Coulomb	200	26	None	0	
Artifical Fill (Qaf)		110	Mohr-Coulomb	50	26	None	0	
16° BEDDING MATERIAL		125	Mohr-Coulomb	150	16	None	0	
18° BEDDING MATERIAL		125	Mohr-Coulomb	150	18	None	0	
APPARENT DIP 16°		125	Generalized Anisotropic			None	0	User Defined 1
APPARENT DIP 18°		125	Generalized Anisotropic			None	0	User Defined 2

Seismic block analysis of the 16° apparent dip layer.

Geotechnical Exploration, Inc.

SLIDEINTERPRET 6.039

Project	JAVAHERI		**SECTION A-A'**
Analysis Description	BLOCK SLOPE STABILITY		
Drawn By	R.A.C.	*Scale* 1:1725	*Company* G.E.I.
Date	5/25/2023 10:14:44 AM		*File Name* JOB NO. 21-13556_S(A)_04w_0.15gSHAKE.slim



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru	Generalized Anisotropic
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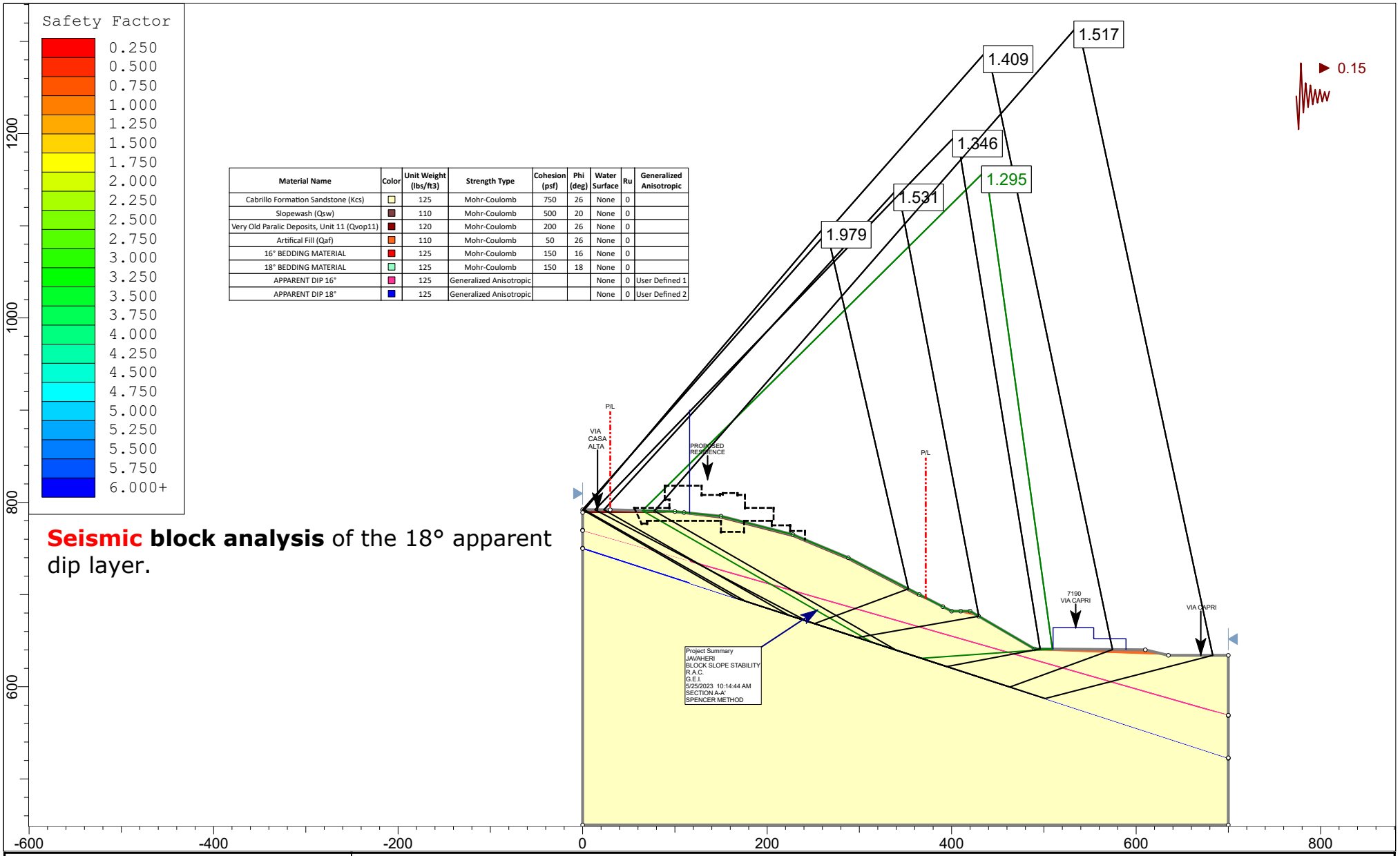
Artifical Fill (Qaf)		110	Mohr-Coulomb	50	26	None	0	
16° BEDDING MATERIAL		125	Mohr-Coulomb	150	16	None	0	
18° BEDDING MATERIAL		125	Mohr-Coulomb	150	18	None	0	
APPARENT DIP 16°		125	Generalized Anisotropic			None	0	User Defined 1
APPARENT DIP 18°		125	Generalized Anisotropic			None	0	User Defined 2

Static block analysis of the 18° apparent dip layer.

Geotechnical Exploration, Inc.

SLIDEINTERPRET 6.039

Project	JAVAHERI		**SECTION A-A'**
Analysis Description	BLOCK SLOPE STABILITY		
Drawn By	R.A.C.	*Scale* 1:1775	*Company* G.E.I.
Date	5/25/2023 12:22:23 PM		*File Name* JOB NO. 21-13556_S(A)_05.slim



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Water Surface	Ru	Generalized Anisotropic
Cabrillo Formation Sandstone (Kcs)		125	Mohr-Coulomb	750	26	None	0	
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18° BEDDING MATERIAL		125	Mohr-Coulomb	150	18	None	0	
APPARENT DIP 16°		125	Generalized Anisotropic			None	0	User Defined 1
APPARENT DIP 18°		125	Generalized Anisotropic			None	0	User Defined 2

Seismic block analysis of the 18° apparent dip layer.

Geotechnical Exploration, Inc.

SLIDEINTERPRET 6.039

Project	JAVAHERI		**SECTION A-A'**
Analysis Description	BLOCK SLOPE STABILITY		
Drawn By	R.A.C.	*Scale* 1:1725	*Company* G.E.I.
Date	5/25/2023 10:14:44 AM		*File Name* JOB NO. 21-13556_S(A)_05w_0.15gSHAKE.slim

SURFICIAL FAILURE

EQUATION 1

$$FOS = \frac{c' + (\gamma_T - \gamma_W) z_W \cos(\alpha)^2 \tan \varphi'}{\gamma_T z_W \sin \alpha \cos \alpha}$$

γ_t	γ_w	γ'	z_w
pcf	pcf	pcf	ft
110	62.4	47.6	3.28

SURFICIAL SLOPE STABILITY ANALYSIS IS BASED ON EQUATION (1) FOR THE CALCULATED VALUES. Reference: Abramson L.W., Lee T.S., Sharma S., Boyce G.M., 2002, Slope Stability and Stabilziation Methods, 2nd Edition, John Wiley and Sons, Inc.,

SECTION A-A'				
SOIL TYPE	c (psf)	ϕ'(°)	α(°)	F.O.S.
SLOPEWASH (Q_{sw})	500	20	27	3.735

1 meter = 3.28 feet

Special Publication 117A (2008, page 27): for infinite slope analysis, the minimum assumed depth of soil saturation is the smaller of either a depth of one meter or depth to firm bedrock.

α	The slope angle; (inclination angle) with respect to the horizontal plane
ϕ'	The effective friction angle of the soil
c'	The effective cohesion of the soil
γ_t	The total unit weight (Soil with moisture)
γ_w	The unit weight of the water
γ'	Submerged unit weight of the soil (Saturated unit weight - unit weight of water)
z_w	Vertical depth of the saturated soil
F.O.S.	Factor of Safety

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