

APPENDIX F

Geotechnical Letter



Leighton and Associates, Inc.
A LEIGHTON GROUP COMPANY

October 14, 2019

Project No. 12107.003

WP West Acquisitions, LLC
c/o Wood Partners
7700 Irvine Center Drive, Suite 600
Irvine, California, 92618

Attention: Ms. Yael Victoria Suneson

Subject: Geotechnical Response to The Bodhi Group Review Comments – Alta Oceanside Mixed Use Development, Oceanside, California.

In accordance with your request, Leighton and Associates, Inc., (Leighton) has prepared this response to The Bodhi Group Review Comments – Alta Oceanside Mixed Use Development, Oceanside, California, dated August 27, 2019. For clarity, The Bodhi Group review comments are italicized in accordance with the order presented on this review letter. It should also be noted that comments addressed below are specific to the geotechnical aspects of the project and other comments for other disciplines are not addressed in this letter.

Review Comment

The draft report should be updated and signed as the Final geotechnical reports by the Project geotechnical consultant:

Response

The Geotechnical Report by Leighton for the Alta Oceanside Project, South of Costa Pacific Way, West of North Coast Highway, Oceanside, California, was finalized and signed on January 18, 2019.

Review Comment

There is no discussion of the slope on the northern and northwest corner of the Site. The final report should include the slope characteristics and condition, the slope's surficial and gross stability, and the potential for the slope to affect Project construction.

Response

Based on available data and Leighton's previous studies (See Appendix A), the existing slope on the northern and northwest corner was graded as a cut slope for the construction of Costa Pacific Way for the existing condominium complex that is located at 1019 Costa Pacifica Way, Oceanside, California. The subject cut slope, was cut within Older Paralic Deposits, was graded at a 2:1 (Horizontal to Vertical), or flatter, is generally stable assuming proper construction and maintenance.

Slope Stability

As requested, Leighton has evaluated and analyzed for gross stability and surficial stability using the computer program Slide 6.0 (RocScience, 2018). Geologic Cross-section B-B' was utilized for our analysis which is included herein as Figure 3. Location of geologic cross-section is indicated on that attached Geotechnical Map (Figure 1). The parameters utilized in our slope stability analysis are presented on Table 1 and were based on our geotechnical investigations, our experience with similar soil types, and our professional judgment. A discussion of the results of the slope stability analyses is presented below.

Table 1 Slope Stability Soil Parameters			
Material	Unit Weight (pcf)	Friction Angle (degrees)	Cohesion (psf)
Artificial Fill (Compacted)	125	30	100
Quaternary Older Paralic Deposits	130	33	150

Gross Stability: Engineering analysis of the proposed 2:1 (horizontal to vertical), or flatter, cut slope up to a height of approximately 26 feet indicates the deep-seated stability of the slope, in general, is stable from a geotechnical standpoint. The results of

our stability analysis indicate that cut slope have a static and seismic factor-of-safety (FOS) in excess of 1.5 for gross stability. The results of our global slope stability analysis performed in preparation to the response letter is included as Appendix B.

Surficial Stability:

An analysis of surficial stability was also performed for the existing cut slope on the northern and northwest corner with Old Paralic Deposits material. Our analysis indicates that the existing and proposed northern and northwest cut slope at a 2:1 (horizontal to vertical), or flatter, gradient exhibit an adequate FOS (i.e., ≥ 1.5) against surficial failure, provided that the slope is properly maintained, under normal conditions and rainfall. The results of our surficial slope stability analysis performed in preparation to the response letter is included as Appendix B

Based on the above analyses, it is Leighton's professional opinion that the existing cut slope located on the northern and northwest corner will not adversely affect the proposed project provided the recommendations provided herein and within the geotechnical updated report (Leighton, 2019) are incorporated into the design and construction of the proposed improvements.

Review Comment

Information in the report indicates that San Onofre Breccia was encountered in borings B-3 (1991) and B-3 (2015), while San Mateo Formation was encountered in boring HAS-3 (Leighton 2018). These formations are described as being difficult to excavate. The impact that these formations might have on the development has not been discussed. It is recommended to clarify the underlying formation, and their depth across the Site. It will be useful to include one or more geologic cross-sections showing the anticipate subsurface conditions across the Site. The cross-sections should include data from the soil borings and test pits. It will be useful to show the relationship between the proposed construction and the slope discussed above.

Response

Based on additional review of the available data, boring logs, and review of the Geologic Map of the Oceanside Quadrangle (Kennedy and Tan 2007), the underlying formation below the Old Paralic Deposits within the Site boundaries is the San Onofre Breccia and Leighton has updated the attached figures to include the San Onofre Breccia. Additionally, the attached Geologic Cross-Section A-A' Figure 2, shows the approximate

depth to the underlying San Onofre Breccia.

In order to reduce the potential for differential settlement between cut and fill materials, the entire cut portion of cut/fill transitions beneath the proposed building and/or structures should be overexcavated to a minimum depth of 3 feet below finish grade, or to a maximum ratio of fill thickness of 3:1 (maximum to minimum), and replaced with compacted fill. The recommended overexcavation should extend at least 5 feet beyond the proposed footprint of the buildings and/or structures and the recommended overexcavation depth is shown on attached Geologic Cross Section A-A' (Figure 2).

Based on the proposed preliminary grading plan, the San Onofre Breccia is not anticipated to be encountered during grading. However, if encountered during deep utility construction (i.e. greater than 10 feet) excavations may be difficult in some areas. Local heavy ripping or breaking may be required if very dense/cemented zones within the San Onofre Breccia is encountered.

Review Comment

Consistent with recommendations by Max/Okubo (2018), the Project geotechnical consultant should review final Site Grading and Foundation plans and confirm that the plans are in general conformance with the conclusions and recommendations in the final geotechnical report:

Response

Acknowledged. Once Final project plans have been formulated, the Site Grading and Foundation plans should be reviewed by Leighton and confirm that the plans are in general conformance with the conclusions and recommendations in the final geotechnical report.

If you have any questions regarding this letter, please do not hesitate to contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,

LEIGHTON AND ASSOCIATES, INC.



William D. Olson

William D. Olson, RCE 45289
Associate Engineer



Mike D. Jensen

Mike D. Jensen, CEG 2457
Senior Project Geologist



Bryan E. Voss

Bryan E. Voss, PG 8709
Senior Project Geologist

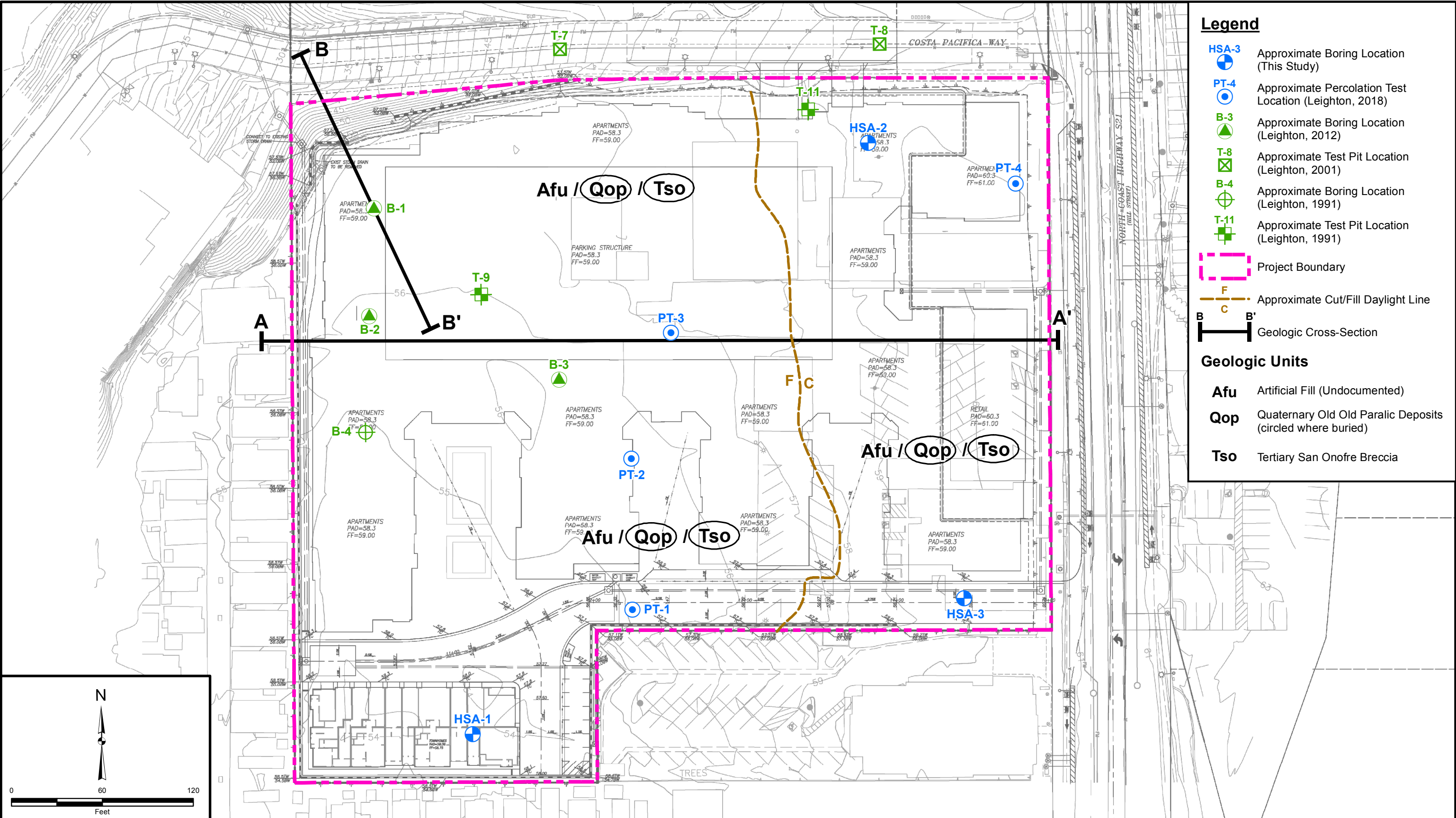
Distribution (1) Digital Copy

Figures: Figure 1 - Geotechnical Map - Rear of Text
 Figure 2 - Geologic Cross-Section A-A
 Figure 3 - Geologic Cross-Section B-B'

Appendices: Appendix A- References
 Appendix B- Slope Stability Analyses

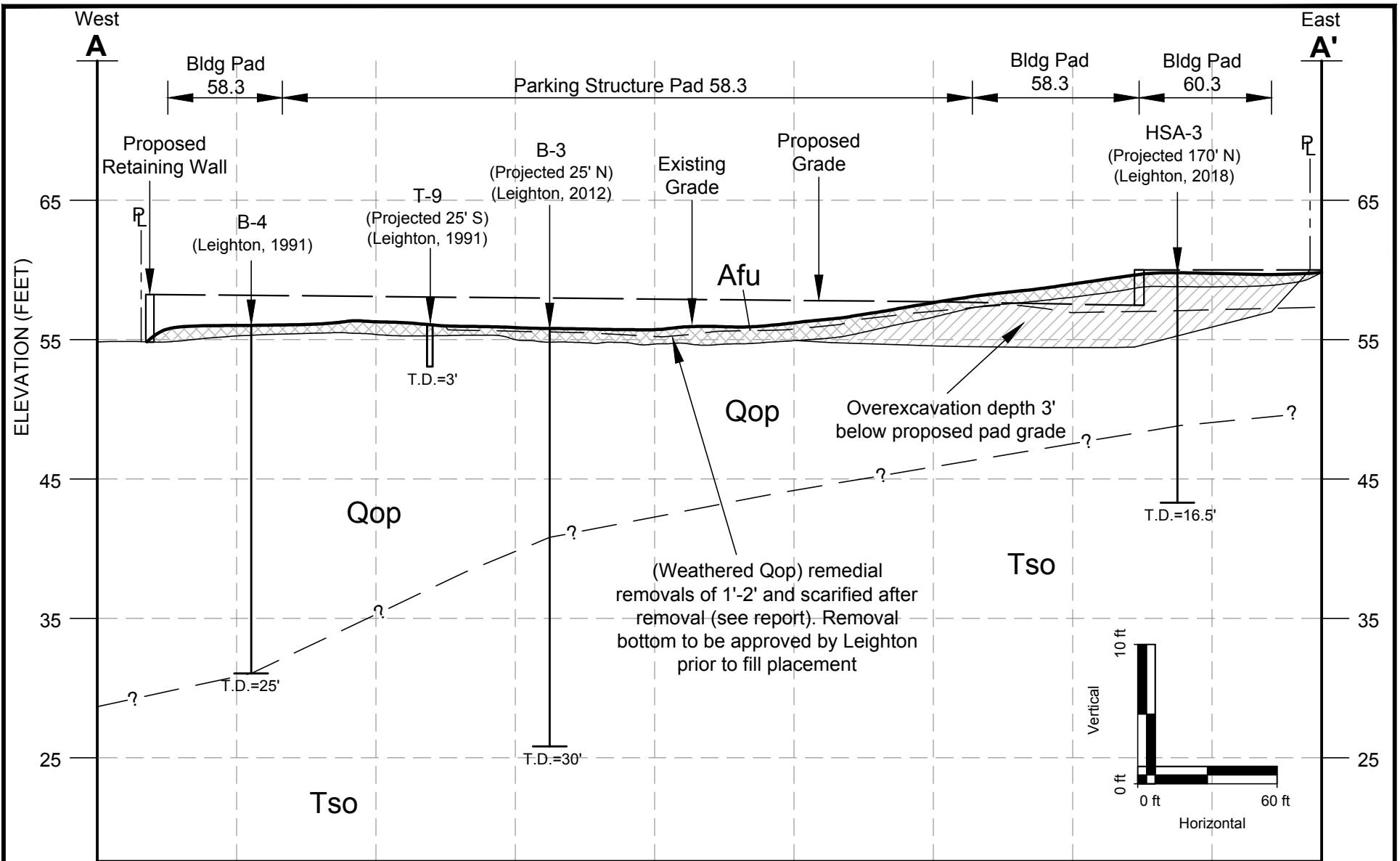
Distribution: (1) email only

FIGURES



Project: 12107.003 Eng/Geol: BEV
Scale: 1" = 60' Date: October 2019
Base Map: Civil Base by Hunsaker & Associates, 1/3/2019.
Author: Leighton Geomatics (mmurphy)

GEOTECHNICAL MAP
North Coast Apartments
Oceanside, California



See Figure 1 for Legend

Project: 12107.003	Eng/Geol: BEV
Scale: 1"=60'H 1"=10'V	Date: October 2019
Reference:	
Author: MAM	

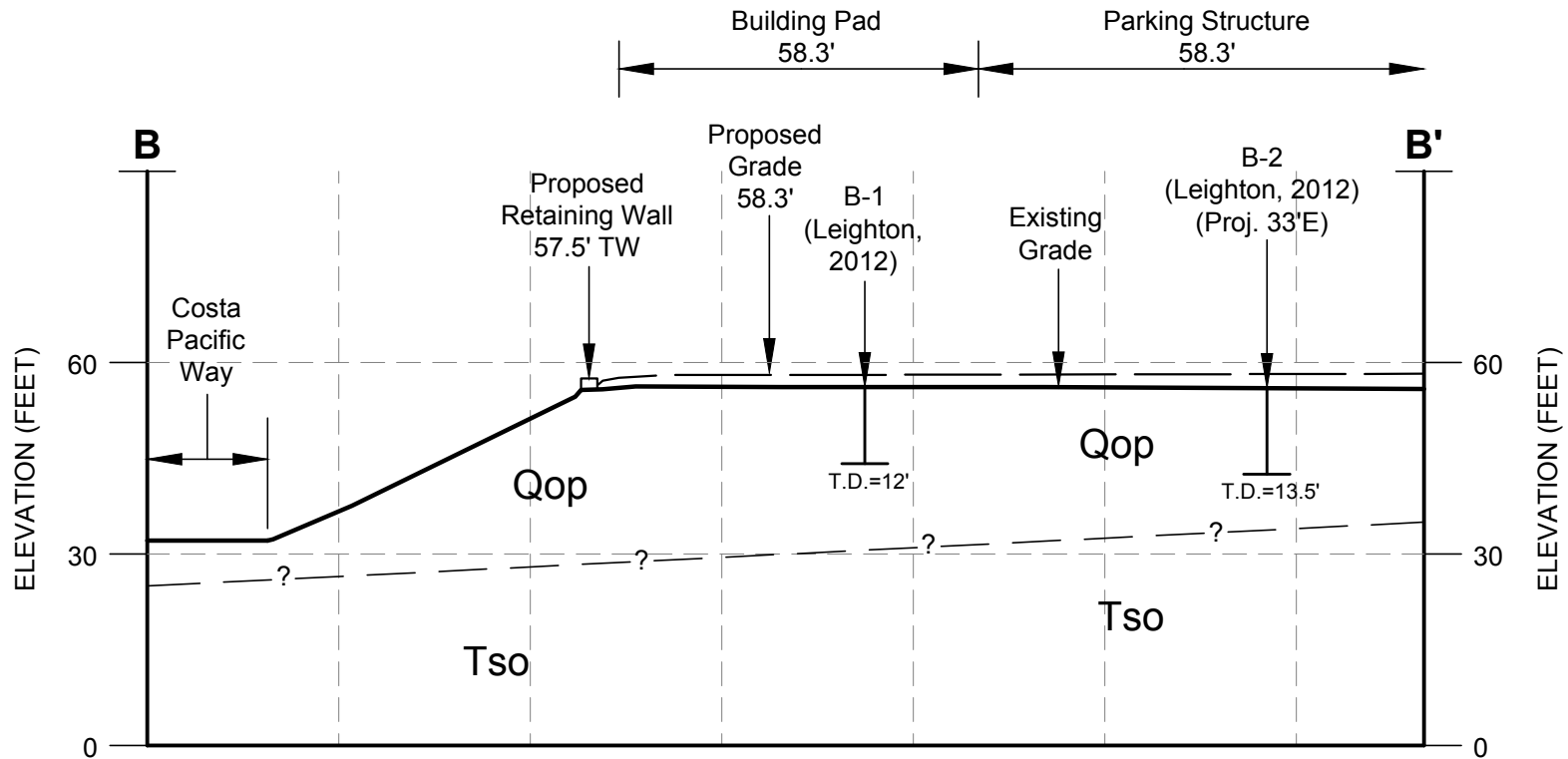
GEOLOGIC CROSS-SECTION A-A'

North Coast Apartments
Oceanside, California

Figure 2



Leighton



See Figure 1 for Legend

Project: 12107.003	Eng/Geol: BEV
Scale: 1"=30'	Date: October 2019
Reference:	
Author: MAM	

GEOLOGIC CROSS-SECTION B-B'

North Coast Apartments
Oceanside, California

Figure 3



Leighton

APPENDIX A

REFERENCES

APPENDIX A

Kennedy, M.P., and Tan, S.S., 2007, Geologic Map of the Oceanside Quadrangle, California, California Geologic Survey, 1:100,000 scale.

Leighton and Associates, 2019, Geotechnical Update Report, Proposed Alta Oceanside Project, South of Costa Pacific Way, West of North Coast Highway, Oceanside, California, Project No. 12107.003, Dated January 18.

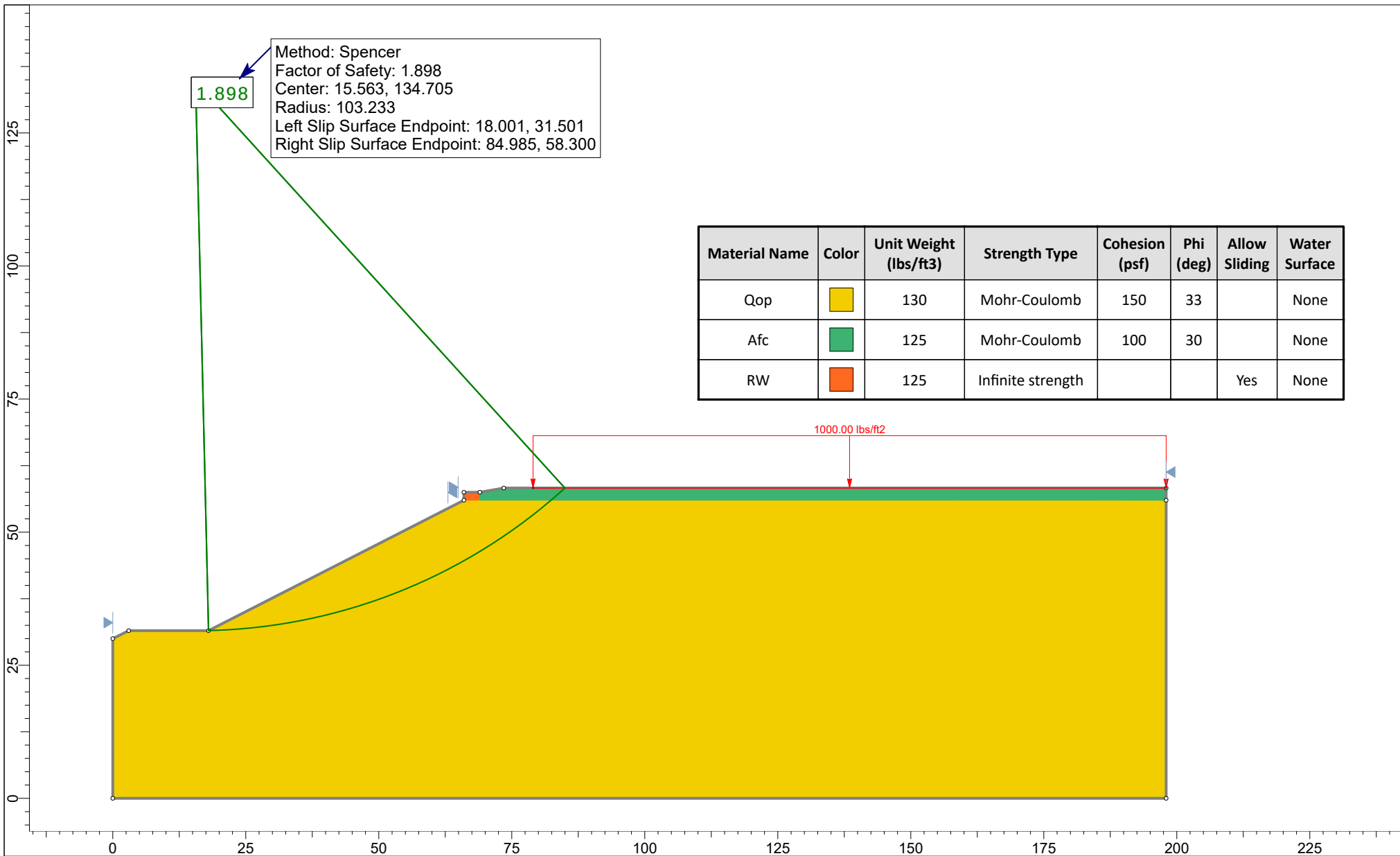
Leighton and Associates, 2012, Geotechnical Update Report, Proposed Seacliffe Terrace Condominiums, 1.6-Acre Property South of Costa Pacific Way, West of North Coast Highway, Oceanside, California, Project No. 042593-001, Dated May 16, Revised dated March 13.

———, 2001, Preliminary Geotechnical Investigation, Reconnaissance Terrace, South of the San Luis Rey River and East of Railroad Right of Way, Oceanside, California, Project No. 040259-001, dated March 23.

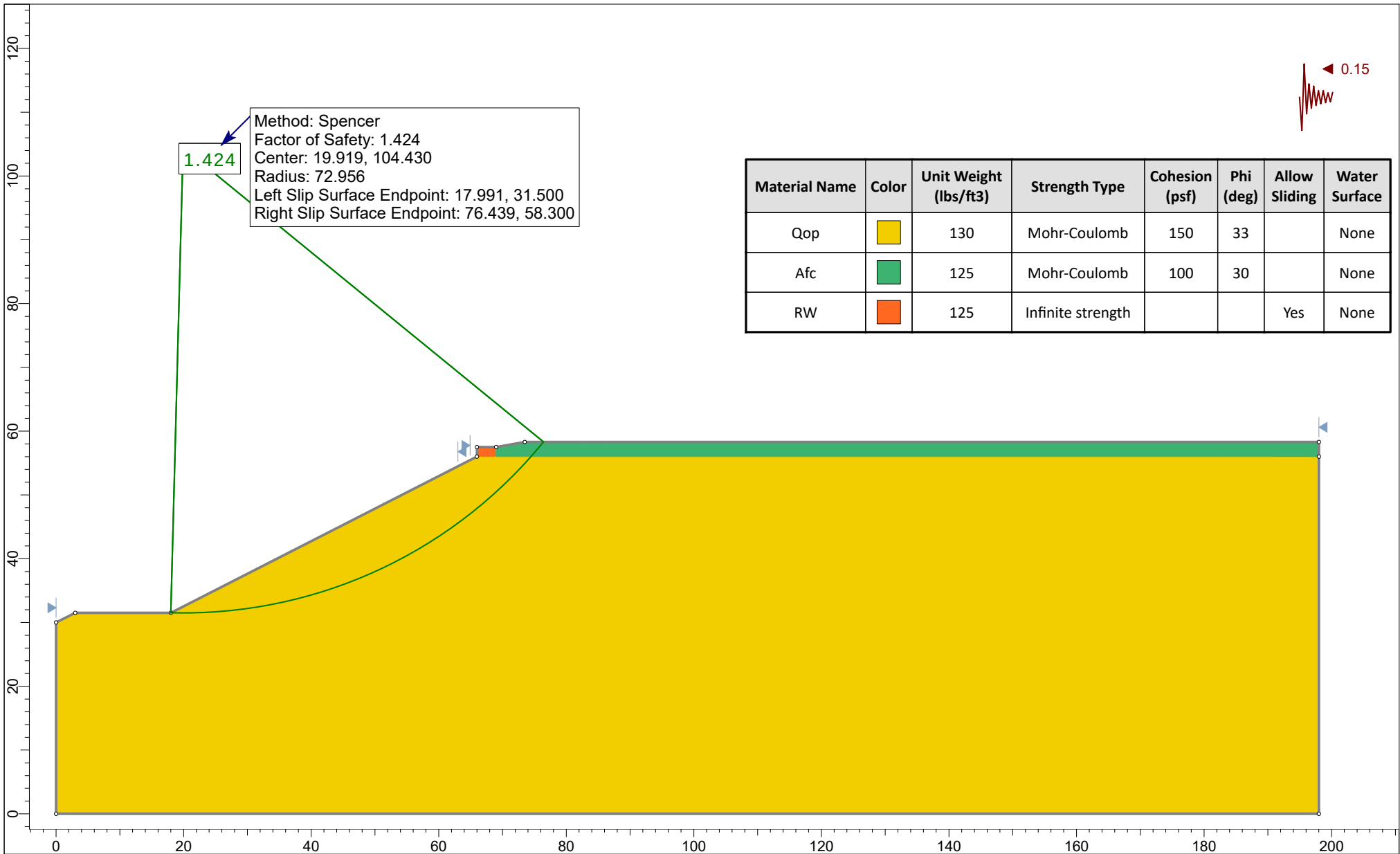
The Bodhi Group 2019, Review of Geotechnical Report, Alta Oceanside Mixed Use Development, Oceanside, California, Project No. 9136001, Dated August 27.

APPENDIX B

SLOPE STABILITY ANALYSES

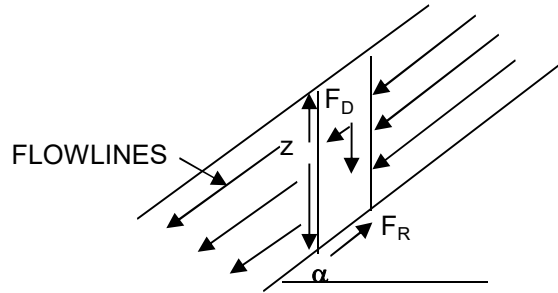


	Project			12107.003 ALTA Oceanside		
	Analysis Description			Slope stability analysis		
	Drawn By	Ocean	Scale	1:300	Company	Leighton Associates, Inc
	Date	10/8/2019, 11:59:29 AM			File Name	12107.003.slmd



	Project			12107.003 ALTA Oceanside		
	Analysis Description			Slope stability analysis		
	Drawn By	Ocean	Scale	1:250	Company	Leighton Associates, Inc
	Date	10/8/2019, 11:59:29 AM			File Name	12107.003.slmd

SURFICIAL SLOPE STABILITY ANALYSIS



Project No.: 12107.003

Case: 2H:1V Slope / Old Paralic Deposits

Depth of Saturation (ft), Z	=	3
Buoyant Unit Weight of Soil (pcf), γ_b	=	67.6
Total Unit Weight of Soil (pcf), γ_t	=	130
Slope Angle, α	=	26.6
Angle of Internal Friction, ϕ	=	33
Cohesion (psf), c	=	150

Force Tending To Cause Movement:

$$F_D = Z\gamma_t \sin 2\alpha / 2 = \mathbf{156.14 \text{ lb/ft}}$$

Force Tending To Resist Movement:

$$F_R = Z\gamma_b \cos^2 \alpha \tan \phi + (c) = \mathbf{255.30 \text{ lb/ft}}$$

$$\mathbf{F.S.}: \frac{2Z\gamma_b \cos^2 \alpha \tan \phi + 2c}{Z\gamma_t \sin 2\alpha}$$

$$\mathbf{F.S. = 1.64}$$

SURFICIAL STABILITY

Project Name : ALTA Oceanside

Project Number : 12107.003

Designed/Checked : Ocean/WDO

