

Fault 98.3'-98.7' CC4-33

Clay Gouge



Margin



CC4-34

Fault 98.3'-98.7'

Clay Gouge ----->



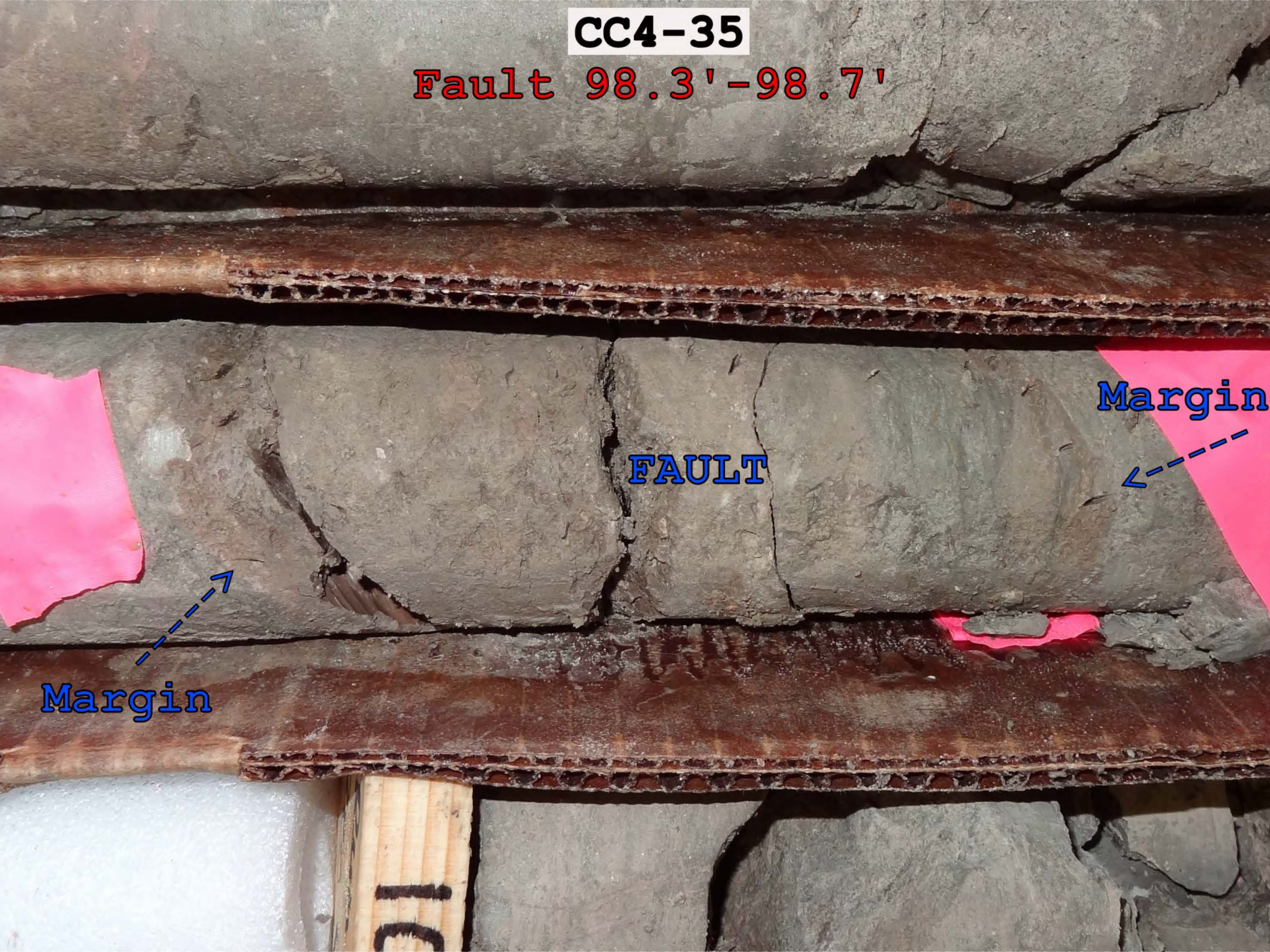
CC4-35

Fault 98.3'-98.7'

FAULT

Margin

Margin



CC4-36

Fault 98.3'-98.7'

Margin

FAULT

Margin

101

CC4-37

Fault 98.3'-98.7'

FAULT

Margin

Margin

101



CC4-38

Fault 98.3'-98.7'

Margin

FAULT



Margin

10

CC4-39

Fault 98.3'-98.7'

Margin



Margin



CC4-40

Fault 98.3'-98.7'

FAULT

↑
Margin

←
Margin

CC4-41

Fault Edge @ 98.7'



CC4-42

Fault 98.3'-98.7'

Apparent Slickensides

A close-up photograph of a hand holding a rock sample. The rock is dark grey to black and has a rough, irregular shape. The surface of the rock is covered with numerous fine, parallel, light-colored lines that run vertically, giving it a textured appearance. These lines are identified as 'Apparent Slickensides'. The background is dark and out of focus.

CC4-43:105'-115'

Fractured

Bedding Plane Shear @106.2

106

Fractured

Fractured

111

115

CC4-44

Bedding Plane Shear @ 106.2'

←----- Remolded Clay Gouge



CC4-45

Bedding Plane Shear @ 106.2'



Highly Remolded Clay Gouge

CC4-46

Bedding Plane Shear @ 106.2'

Highly Remolded Clay



CC4-47

Bedding Plane Shear @ 106.2'

Highly Remolded Clay



CC5-1:4'-18.5'

Qt

8.5

18.5

6

11

CC5-2:18.6'-31'



CC5-3:31'-41'

33

34

36
Run 2

38.5

39.5

41

CC5-4 : 41' - 46

43.25

46

42.5

CC5-5:49'-58'

51

56

CC5-6:59'-69'

61

66

Qt



To

CC5-7:69'-79'



CC5-8:79'-89'

Fractured

Poorly Developed BPS @86



Fractured

CC5-9

Poorly Developed
Bedding Plane Shear @86'



CC5-10:89'-99'



Bentonite Bed

Fractured

91

CC5-11:99'-105'

Fractured

101

105

APPENDIX

B

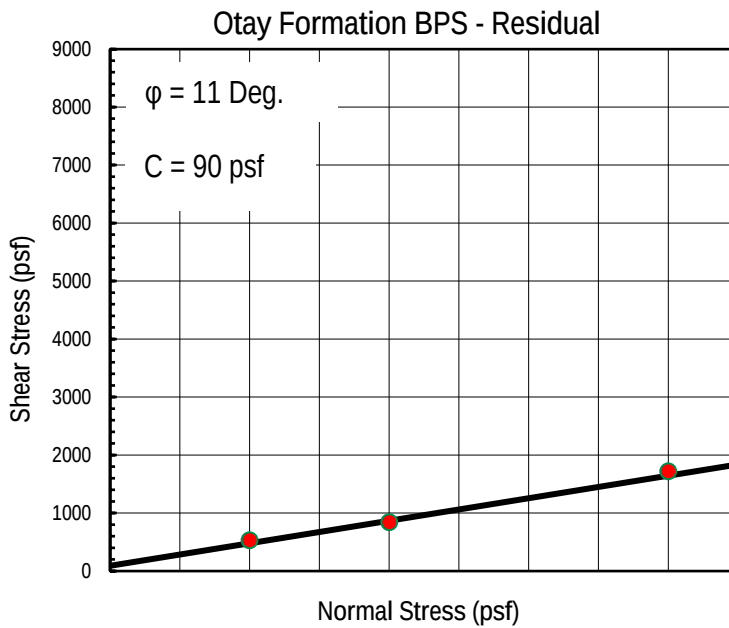
APPENDIX B

LABORATORY TESTING

Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM) or other suggested procedures. Selected samples were tested for compaction characteristics and direct shear strength. The results of these tests are summarized on the following table and figures.

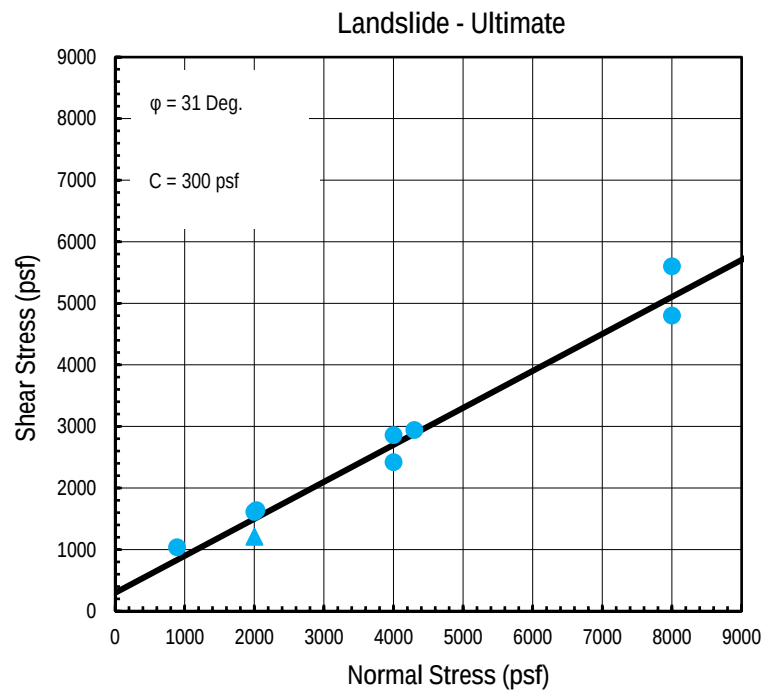
SUMMARY OF LABORATORY MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT TEST RESULTS ASTM D 1557

Sample No.	Description	Maximum Dry Density (pcf)	Optimum Moisture Content (% dry wt.)
LB6-2	Light brown, Silty, fine to coarse SAND with gravel	132.9	8.5
LB8-5	Light gray, Silty, fine to medium SAND	110.9	17.2
LB10-6	Grayish brown, Clayey/Sandy SILT with trace gravel	111.3	16.5



RCM		

SHEAR PLOTS		
BEYER BLVD SOUTHWEST VILLAGE SAN DIEGO, CALIFORNIA		
DATE 02-15-2022	PROJECT NO. 06847-42-05	FIG. B-1



RCM		

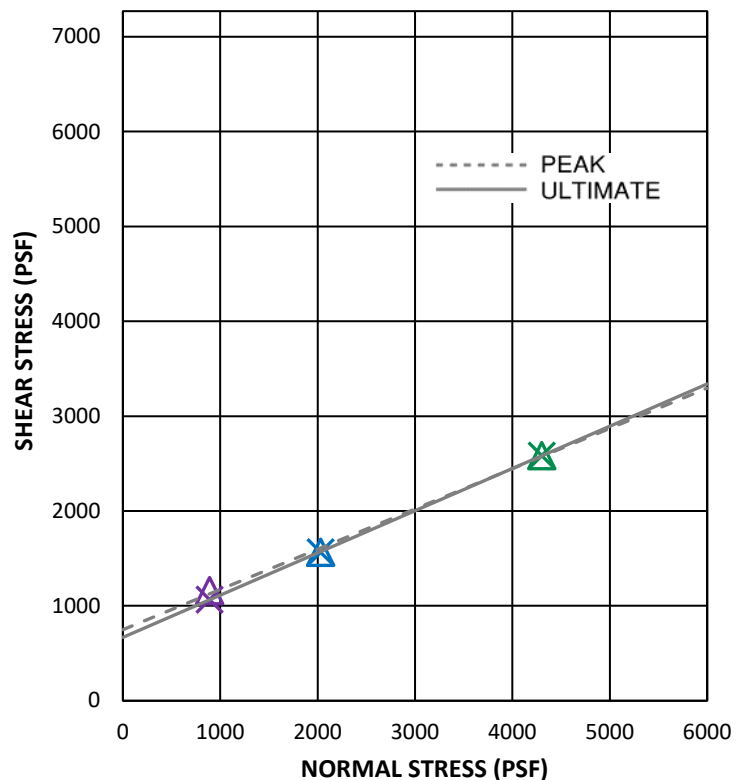
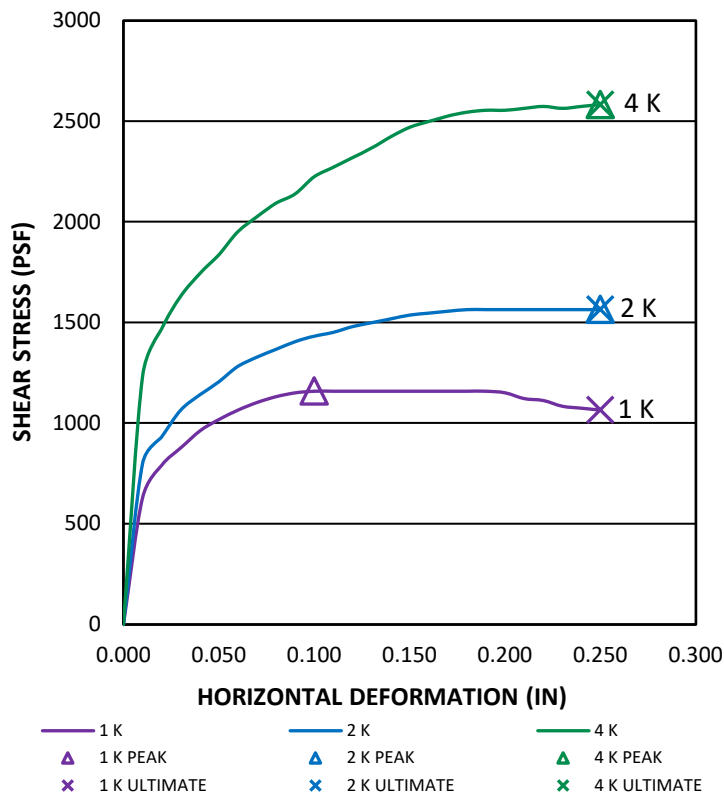
SHEAR PLOTS		
BEYER BLVD SOUTHWEST VILLAGE SAN DIEGO, CALIFORNIA		
DATE 02-15-2022	PROJECT NO. 06847-42-05	FIG. B-2

SAMPLE NO.: **LB6-2** GEOLOGIC UNIT: **Qls**
 SAMPLE DEPTH (FT): **28'-30'** NATURAL/REMOLDED: **R**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	1 K	2 K	4 K	AVERAGE
ACTUAL NORMAL STRESS (PSF):	890	2030	4300	--
WATER CONTENT (%):	10.9	11.4	12.3	11.6
DRY DENSITY (PCF):	117.6	116.6	115.8	116.7

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	1 K	2 K	4 K	AVERAGE
WATER CONTENT (%):	17.6	19.8	19.7	19.0
PEAK SHEAR STRESS (PSF):	1160	1565	2583	--
ULT.-E.O.T. SHEAR STRESS (PSF):	1065	1565	2583	--

RESULTS		
PEAK	COHESION, C (PSF)	750
	FRICTION ANGLE (DEGREES)	23
ULTIMATE	COHESION, C (PSF)	670
	FRICTION ANGLE (DEGREES)	24



GEOCON
 INCORPORATED



GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
 PHONE 858 558-6900 - FAX 858 558-6159

DIRECT SHEAR - ASTM D 3080

BEYER BLVD

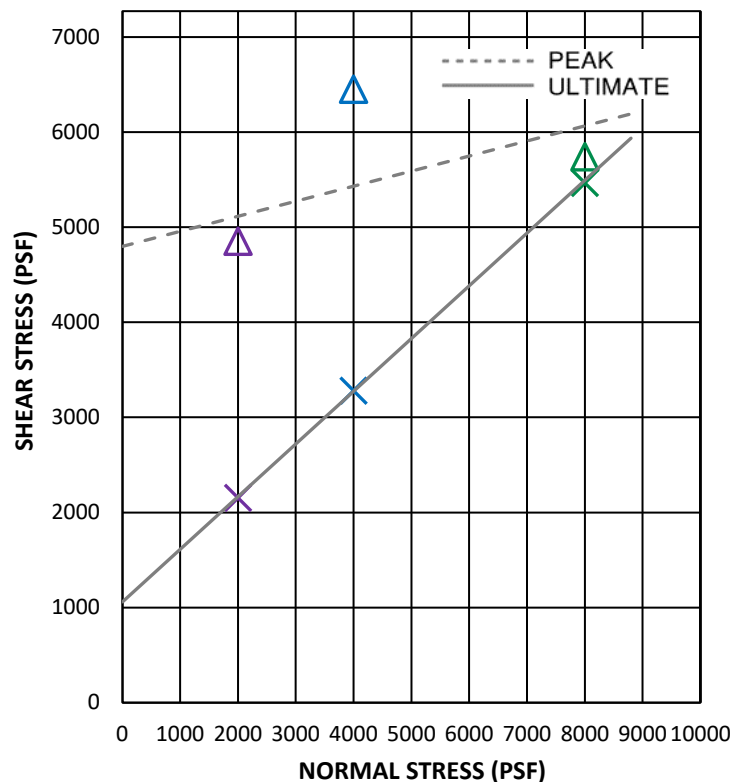
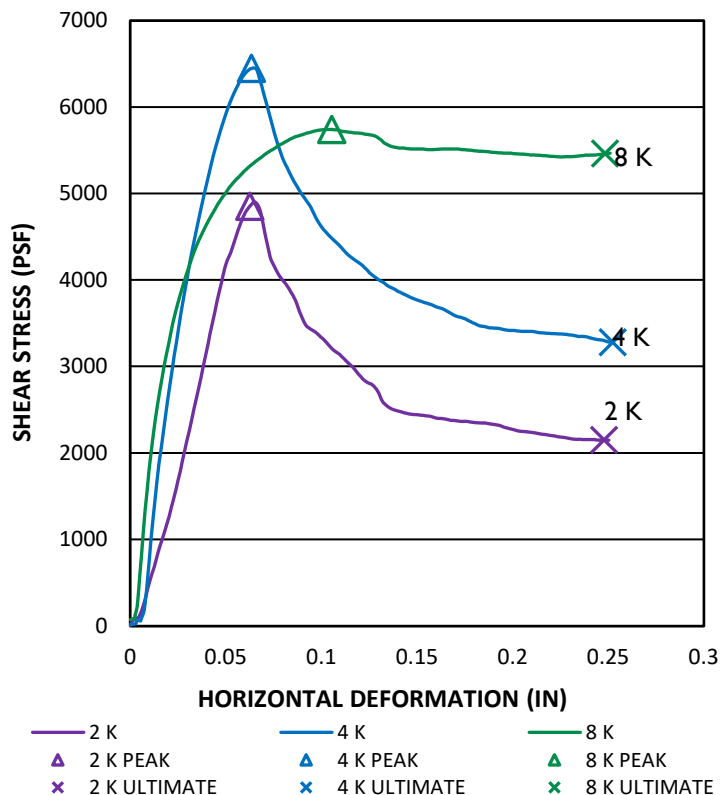
PROJECT NO.: 6847-42-05

SAMPLE NO.: **LB7-10 @ 50'** GEOLOGIC UNIT: **To**
 SAMPLE DEPTH (FT): **50'** NATURAL/REMOLDED: **N**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
ACTUAL NORMAL STRESS (PSF):	2000	4000	8000	--
WATER CONTENT (%):	23.0	21.1	24.9	23.0
DRY DENSITY (PCF):	101.0	104.0	93.3	99.4

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
WATER CONTENT (%):	26.1	24.0	30.5	26.9
PEAK SHEAR STRESS (PSF):	4853	6449	5740	--
ULT.-E.O.T. SHEAR STRESS (PSF):	2152	3280	5464	--

RESULTS		
PEAK	COHESION, C (PSF)	4800
	FRICTION ANGLE (DEGREES)	9
ULTIMATE	COHESION, C (PSF)	1060
	FRICTION ANGLE (DEGREES)	29



GEOCON
 INCORPORATED



GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
 PHONE 858 558-6900 - FAX 858 558-6159

DIRECT SHEAR - ASTM D 3080

BEYER BLVD

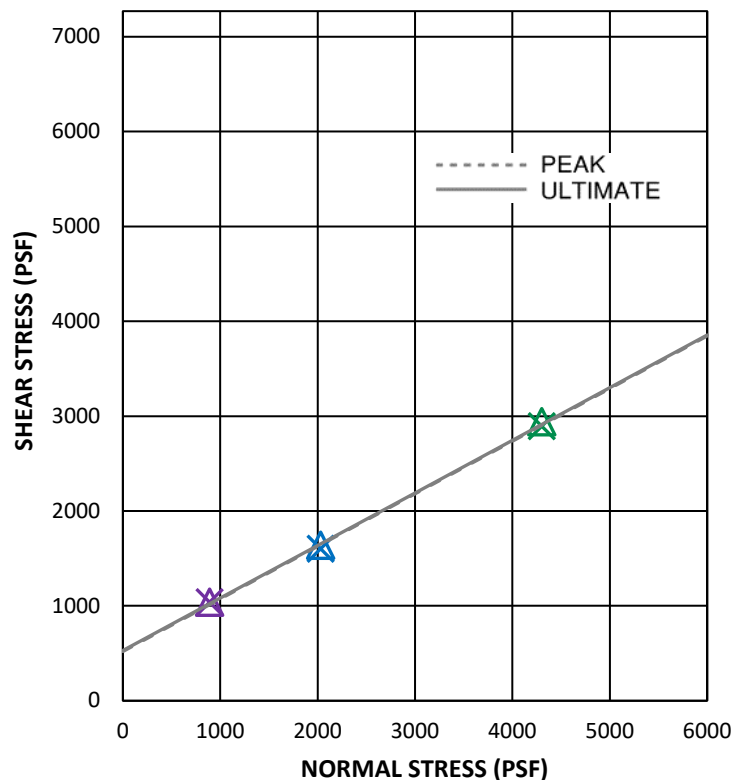
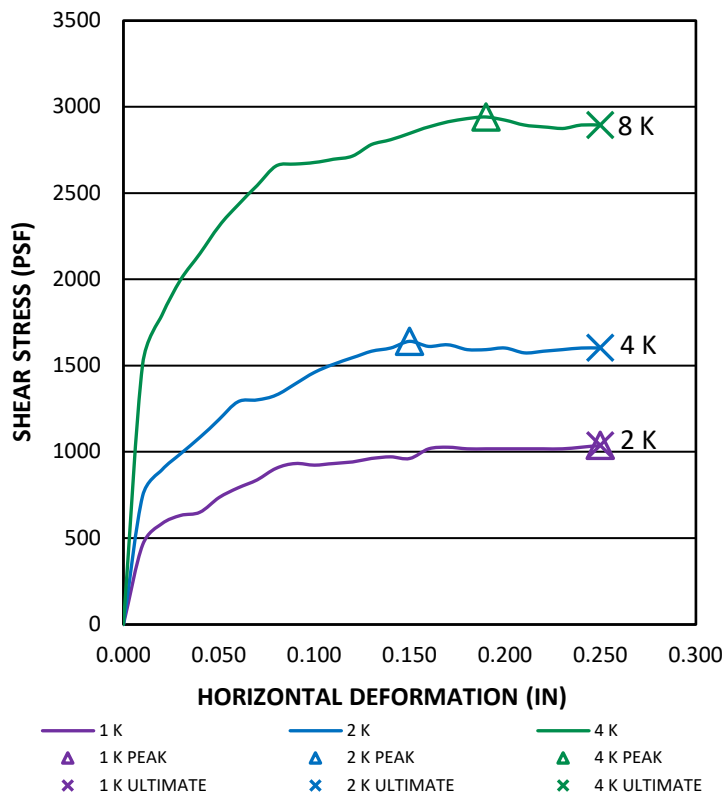
PROJECT NO.: 6847-42-05

SAMPLE NO.: **LB8-3** GEOLOGIC UNIT: **Qls**
 SAMPLE DEPTH (FT): **10** NATURAL/REMOLDED: **N**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	1 K	2 K	4 K	AVERAGE
ACTUAL NORMAL STRESS (PSF):	890	2030	4300	--
WATER CONTENT (%):	8.0	7.7	8.3	8.0
DRY DENSITY (PCF):	114.5	105.5	110.9	110.3

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	1 K	2 K	4 K	AVERAGE
WATER CONTENT (%):	17.7	19.2	18.8	18.5
PEAK SHEAR STRESS (PSF):	1037	1640	2941	--
ULT.-E.O.T. SHEAR STRESS (PSF):	1037	1603	2894	--

RESULTS		
PEAK	COHESION, C (PSF)	520
	FRICTION ANGLE (DEGREES)	29
ULTIMATE	COHESION, C (PSF)	530
	FRICTION ANGLE (DEGREES)	29



GEOCON
INCORPORATED



GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
 PHONE 858 558-6900 - FAX 858 558-6159

DIRECT SHEAR - ASTM D 3080

BEYER BLVD

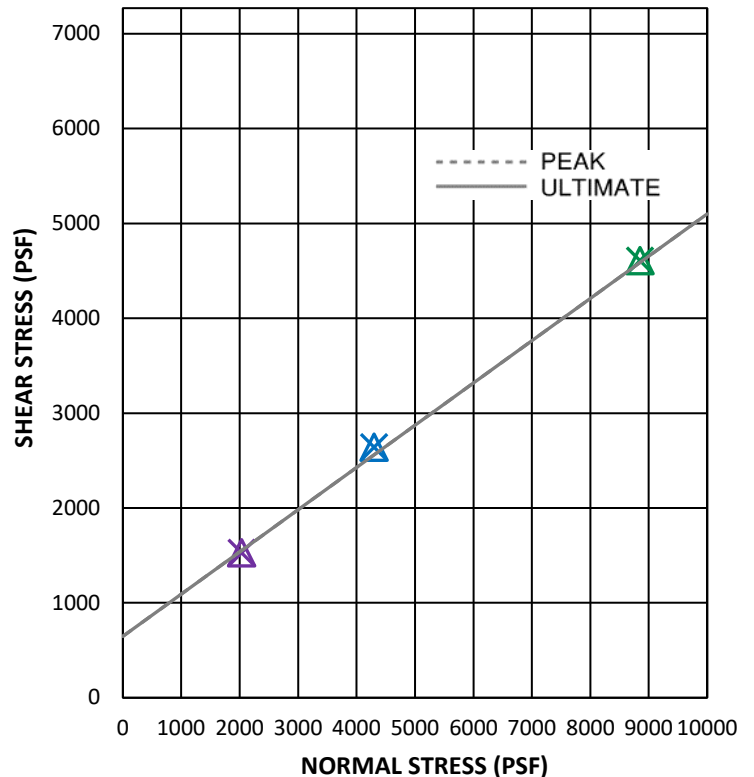
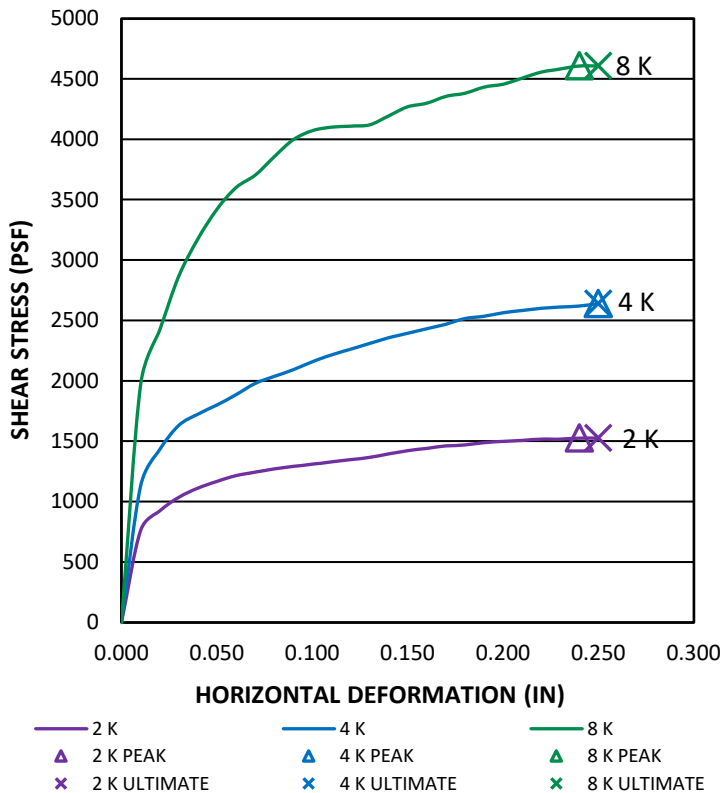
PROJECT NO.: 6847-42-05

SAMPLE NO.: **LB 8-5** GEOLOGIC UNIT: **To**
 SAMPLE DEPTH (FT): **16'-20'** NATURAL/REMOLDED: **R**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
ACTUAL NORMAL STRESS (PSF):	2030	4300	8850	--
WATER CONTENT (%):	11.5	11.8	11.1	11.5
DRY DENSITY (PCF):	99.9	100.1	100.2	100.1

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
WATER CONTENT (%):	25.1	24.8	24.9	24.9
PEAK SHEAR STRESS (PSF):	1527	2640	4608	--
ULT.-E.O.T. SHEAR STRESS (PSF):	1527	2640	4608	--

RESULTS		
PEAK	COHESION, C (PSF)	650
	FRICTION ANGLE (DEGREES)	24
ULTIMATE	COHESION, C (PSF)	650
	FRICTION ANGLE (DEGREES)	24



DIRECT SHEAR - ASTM D 3080

GEOCON
 INCORPORATED



GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
 PHONE 858 558-6900 - FAX 858 558-6159

BEYER BLVD

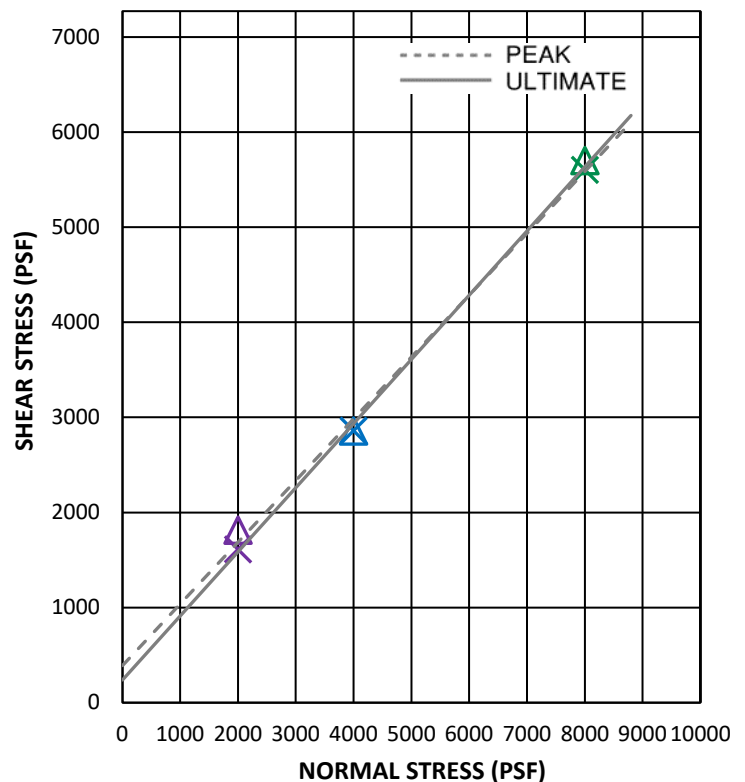
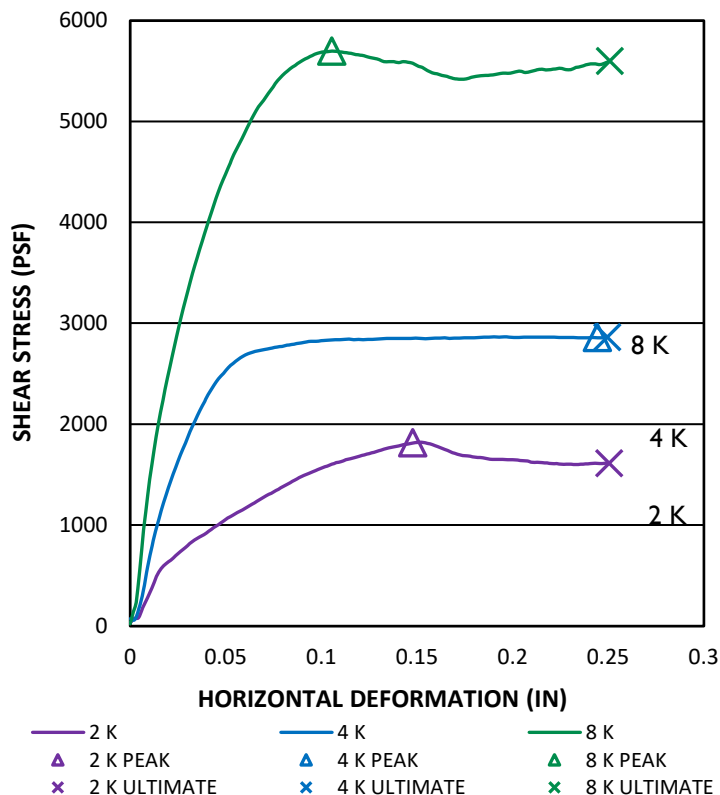
PROJECT NO.: 6847-42-05

SAMPLE NO.: **LB8-6** GEOLOGIC UNIT: **Qls**
 SAMPLE DEPTH (FT): **20'** NATURAL/REMODELED: **N**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
ACTUAL NORMAL STRESS (PSF):	2000	4000	8000	--
WATER CONTENT (%):	9.8	19.2	13.4	14.1
DRY DENSITY (PCF):	113.6	105.9	114.3	111.3

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
WATER CONTENT (%):	21.6	28.5	24.8	24.9
PEAK SHEAR STRESS (PSF):	1814	2857	5698	--
ULT.-E.O.T. SHEAR STRESS (PSF):	1612	2860	5601	--

RESULTS		
PEAK	COHESION, C (PSF)	390
	FRICTION ANGLE (DEGREES)	33
ULTIMATE	COHESION, C (PSF)	240
	FRICTION ANGLE (DEGREES)	34



GEOCON
INCORPORATED



GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
 PHONE 858 558-6900 - FAX 858 558-6159

DIRECT SHEAR - ASTM D 3080

BEYER BLVD

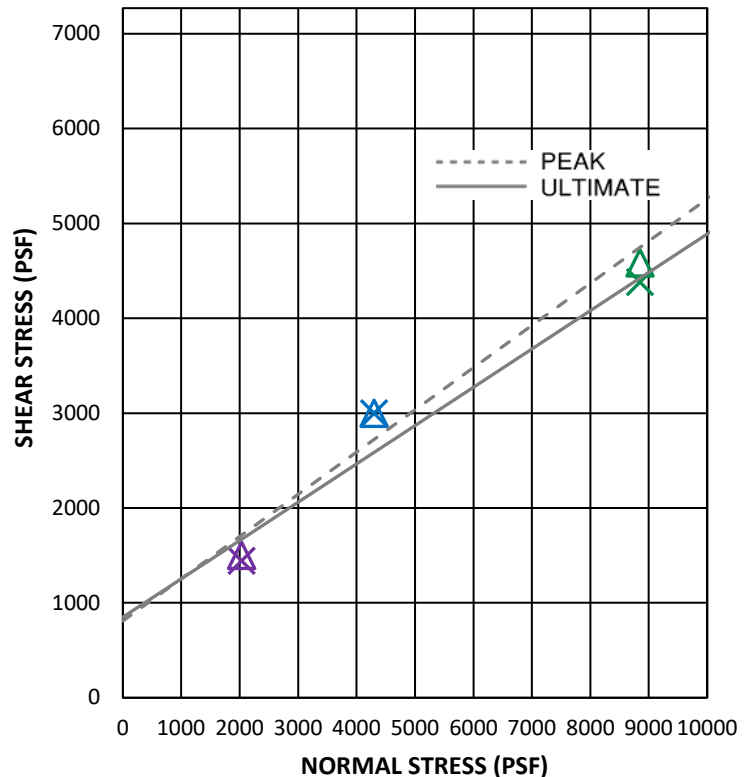
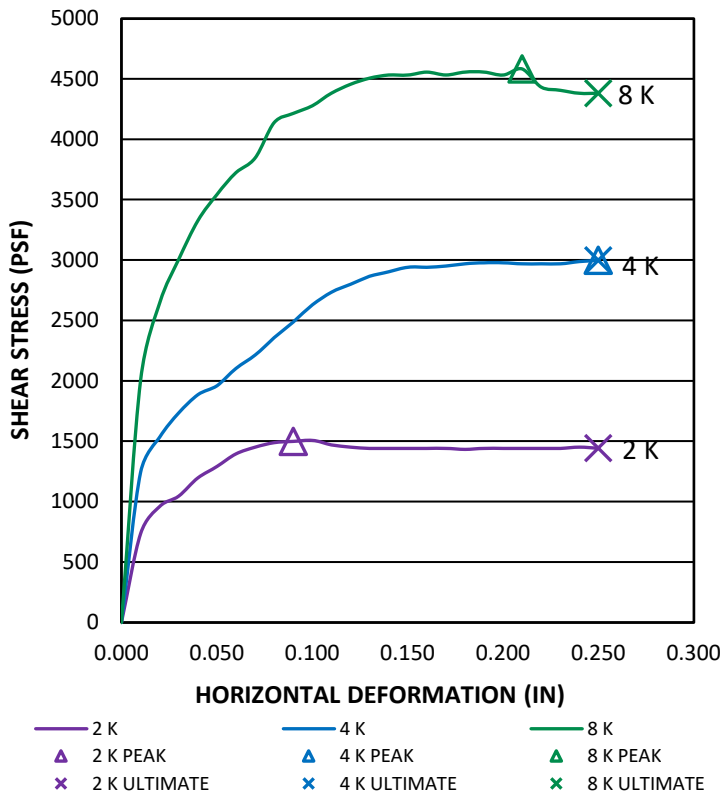
PROJECT NO.: 6847-42-05

SAMPLE NO.: **LB8-10 @ 35'** GEOLOGIC UNIT: **35'**
 SAMPLE DEPTH (FT): **To** NATURAL/REMOLDED: **N**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
ACTUAL NORMAL STRESS (PSF):	890	2030	4300	--
WATER CONTENT (%):	11.5	12.1	18.7	14.1
DRY DENSITY (PCF):	105.9	111.1	107.0	108.0

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
WATER CONTENT (%):	28.2	24.0	30.1	27.4
PEAK SHEAR STRESS (PSF):	1499	2998	4583	--
ULT.-E.O.T. SHEAR STRESS (PSF):	1442	2998	4382	--

RESULTS		
PEAK	COHESION, C (PSF)	810
	FRICTION ANGLE (DEGREES)	24
ULTIMATE	COHESION, C (PSF)	850
	FRICTION ANGLE (DEGREES)	22



DIRECT SHEAR - ASTM D 3080

GEOCON
INCORPORATED



GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
 PHONE 858 558-6900 - FAX 858 558-6159

BEYER BLVD

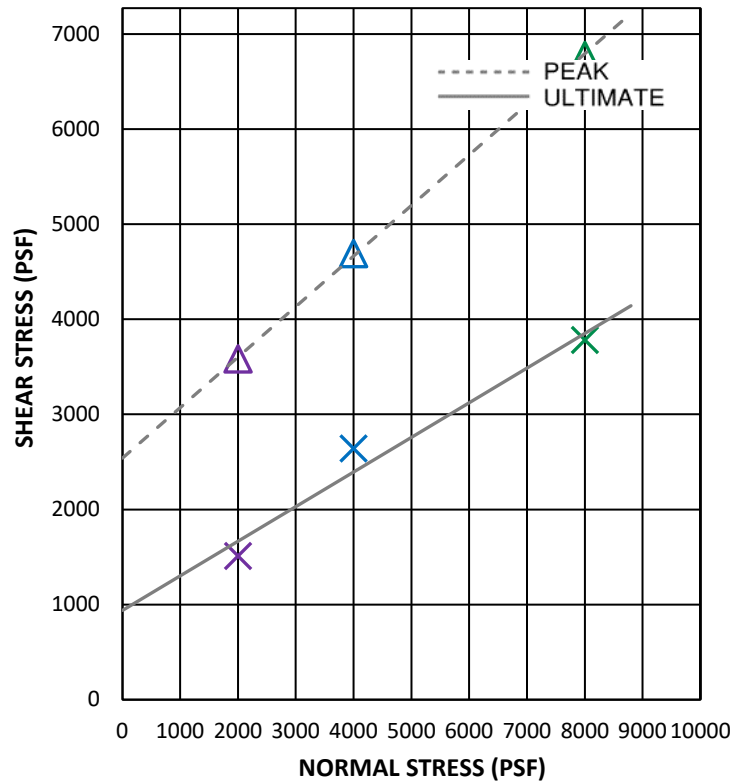
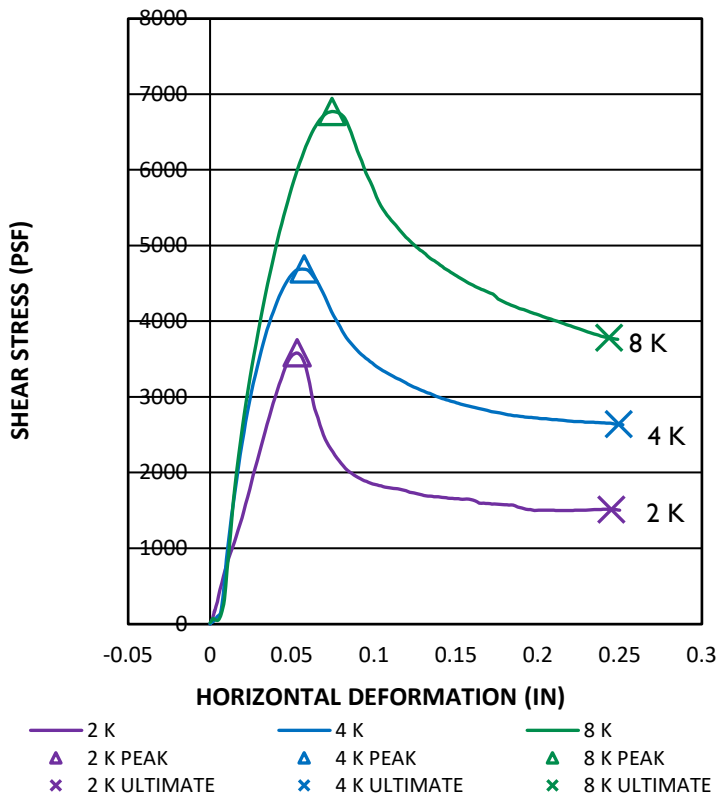
PROJECT NO.: 6847-42-05

SAMPLE NO.: **LB8-11** GEOLOGIC UNIT: **To**
 SAMPLE DEPTH (FT): **40** NATURAL/REMODELED: **N**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
ACTUAL NORMAL STRESS (PSF):	2000	4000	8000	--
WATER CONTENT (%):	16.3	22.6	22.1	20.3
DRY DENSITY (PCF):	111.5	101.7	102.4	105.2

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
WATER CONTENT (%):	20.4	27.0	25.9	24.4
PEAK SHEAR STRESS (PSF):	3582	4690	6772	--
ULT.-E.O.T. SHEAR STRESS (PSF):	1511	2639	3780	--

RESULTS		
PEAK	COHESION, C (PSF)	2540
	FRICTION ANGLE (DEGREES)	28
ULTIMATE	COHESION, C (PSF)	940
	FRICTION ANGLE (DEGREES)	20



DIRECT SHEAR - ASTM D 3080

BEYER BLVD

PROJECT NO.: 6847-42-05

GEOCON
INCORPORATED



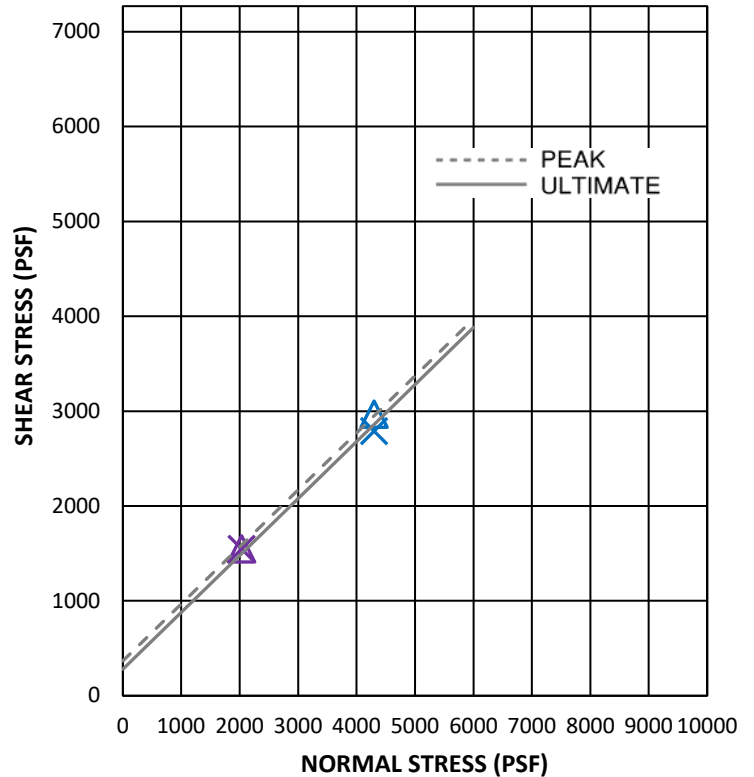
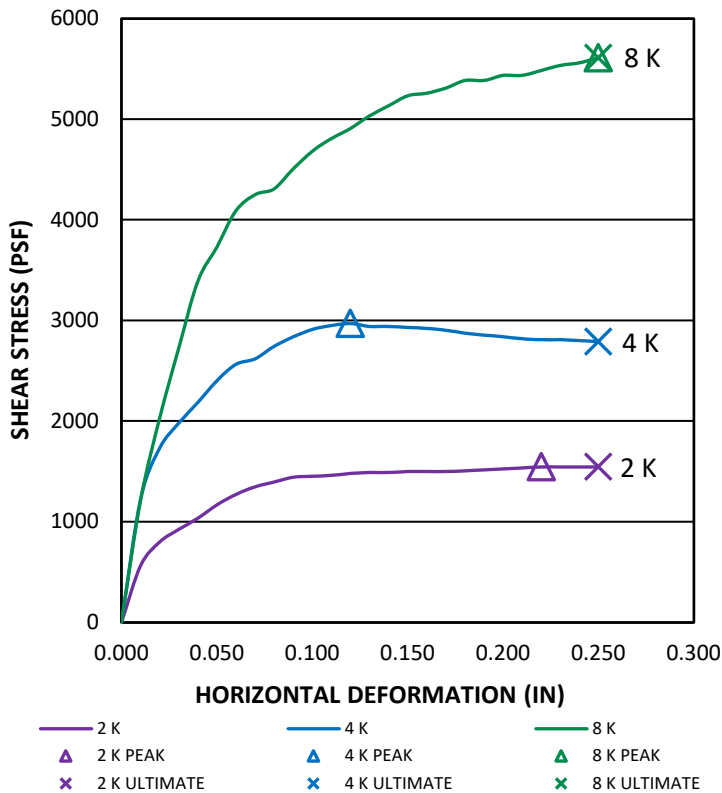
GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
 PHONE 858 558-6900 - FAX 858 558-6159

SAMPLE NO.: **LB9-7** GEOLOGIC UNIT: **To**
 SAMPLE DEPTH (FT): **35'** NATURAL/REMOLDED: **N**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
ACTUAL NORMAL STRESS (PSF):	2030	4300	8850	--
WATER CONTENT (%):	4.2	5.1	8.0	5.8
DRY DENSITY (PCF):	99.1	105.3	85.8	96.8

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
WATER CONTENT (%):	21.1	19.2	32.9	24.4
PEAK SHEAR STRESS (PSF):	1546	2970	5611	--
ULT.-E.O.T. SHEAR STRESS (PSF):	1546	2790	5611	--

RESULTS		
PEAK	COHESION, C (PSF)	370
	FRICTION ANGLE (DEGREES)	31
ULTIMATE	COHESION, C (PSF)	280
	FRICTION ANGLE (DEGREES)	31



DIRECT SHEAR - ASTM D 3080

GEOCON
INCORPORATED



GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
 PHONE 858 558-6900 - FAX 858 558-6159

BEYER BLVD

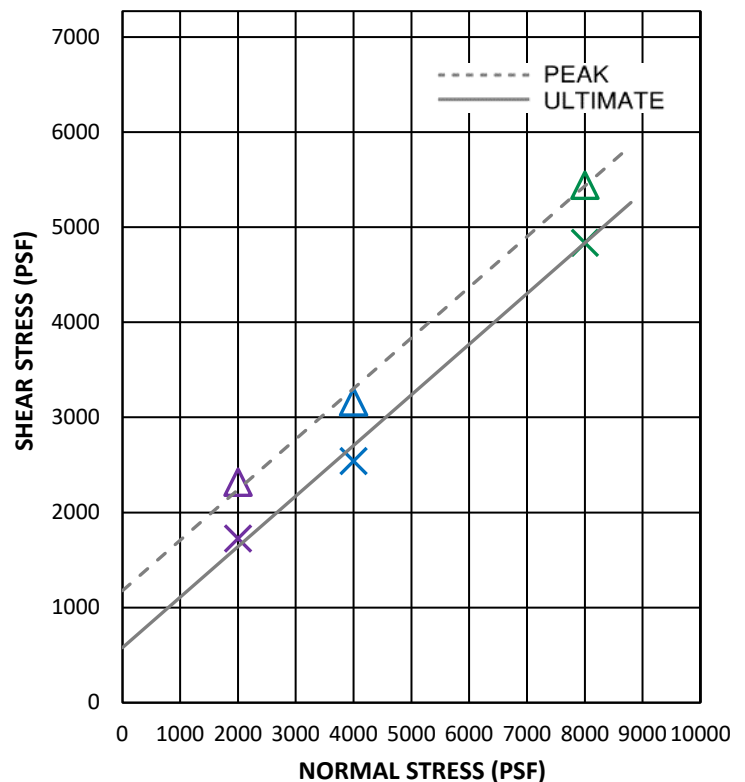
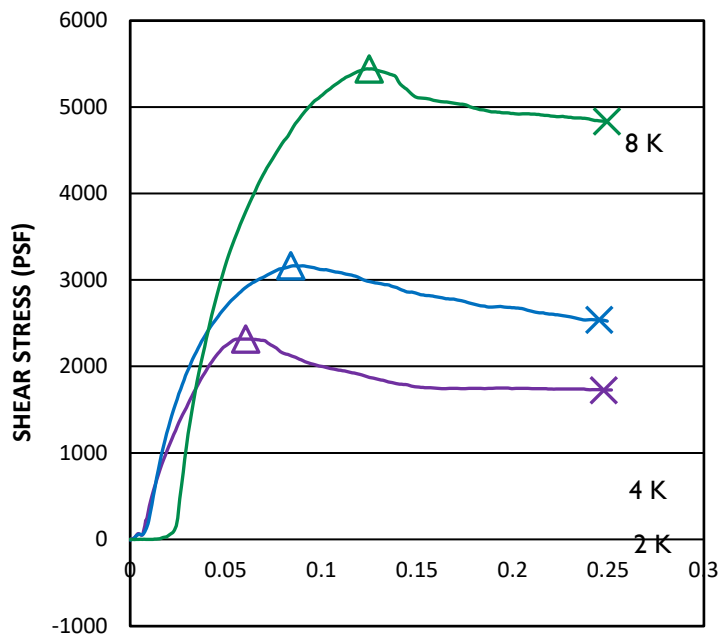
PROJECT NO.: 6847-42-05

SAMPLE NO.: **LB10-5** GEOLOGIC UNIT: **To**
 SAMPLE DEPTH (FT): **30** NATURAL/REMOLDED: **N**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
ACTUAL NORMAL STRESS (PSF):	2000	4000	8000	--
WATER CONTENT (%):	16.6	17.3	17.0	17.0
DRY DENSITY (PCF):	113.1	115.0	115.1	114.4

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
WATER CONTENT (%):	22.1	25.4	25.3	24.2
PEAK SHEAR STRESS (PSF):	2318	3163	5441	--
ULT.-E.O.T. SHEAR STRESS (PSF):	1726	2539	4833	--

RESULTS		
PEAK	COHESION, C (PSF)	1180
	FRICTION ANGLE (DEGREES)	28
ULTIMATE	COHESION, C (PSF)	580
	FRICTION ANGLE (DEGREES)	28



HORIZONTAL DEFORMATION (IN)

— 2 K — 4 K — 8 K
 ▲ 2 K PEAK ▲ 4 K PEAK ▲ 8 K PEAK
 x 2 K ULTIMATE x 4 K ULTIMATE x 8 K ULTIMATE

DIRECT SHEAR - ASTM D 3080

GEOCON
 INCORPORATED



GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
 PHONE 858 558-6900 - FAX 858 558-6159

BEYER BLVD

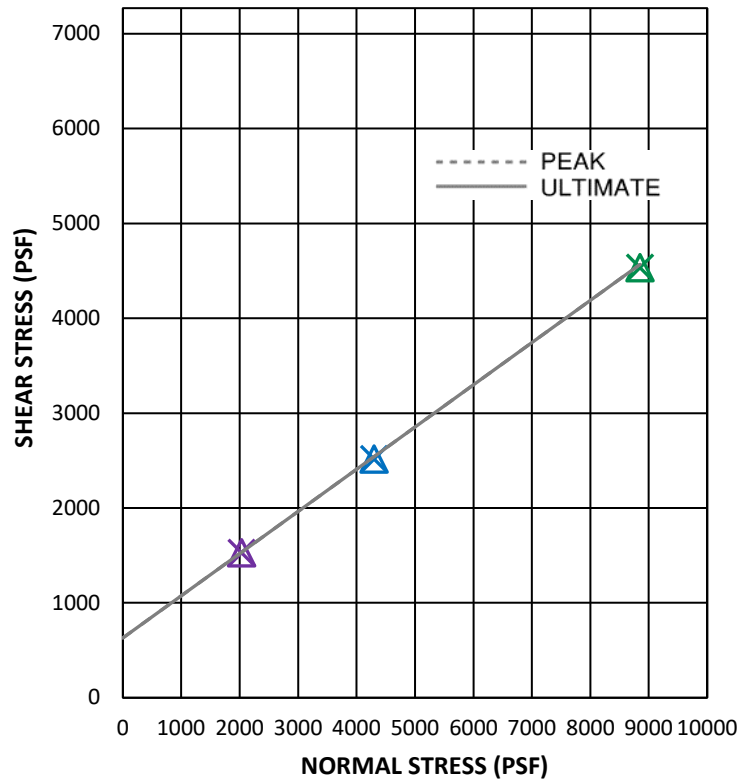
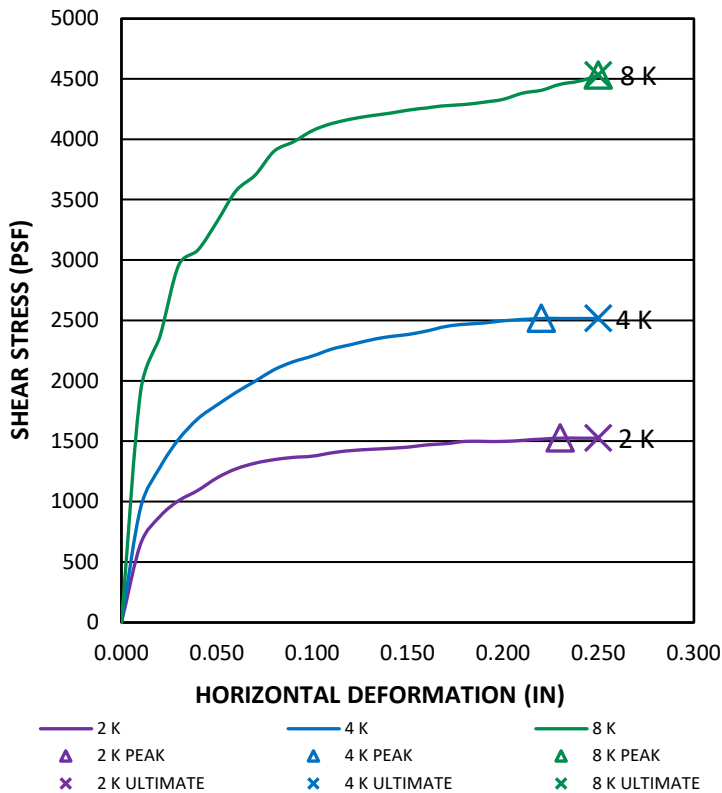
PROJECT NO.: 6847-42-05

SAMPLE NO.: **LB 10-6** GEOLOGIC UNIT: **To**
 SAMPLE DEPTH (FT): **31'-35'** NATURAL/REMOLDED: **R**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
ACTUAL NORMAL STRESS (PSF):	2030	4300	8850	--
WATER CONTENT (%):	16.5	16.2	16.4	16.4
DRY DENSITY (PCF):	100.9	100.4	100.5	100.6

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
WATER CONTENT (%):	25.9	26.3	26.9	26.4
PEAK SHEAR STRESS (PSF):	1527	2517	4532	--
ULT.-E.O.T. SHEAR STRESS (PSF):	1527	2517	4532	--

RESULTS		
PEAK	COHESION, C (PSF)	630
	FRICTION ANGLE (DEGREES)	24
ULTIMATE	COHESION, C (PSF)	630
	FRICTION ANGLE (DEGREES)	24



DIRECT SHEAR - ASTM D 3080

GEOCON
 INCORPORATED



GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
 PHONE 858 558-6900 - FAX 858 558-6159

BEYER BLVD

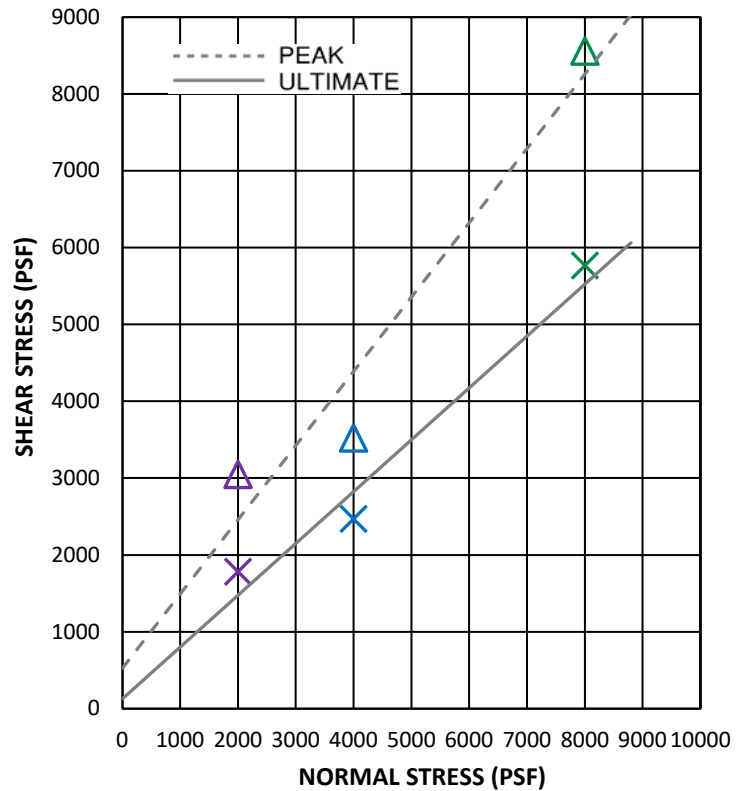
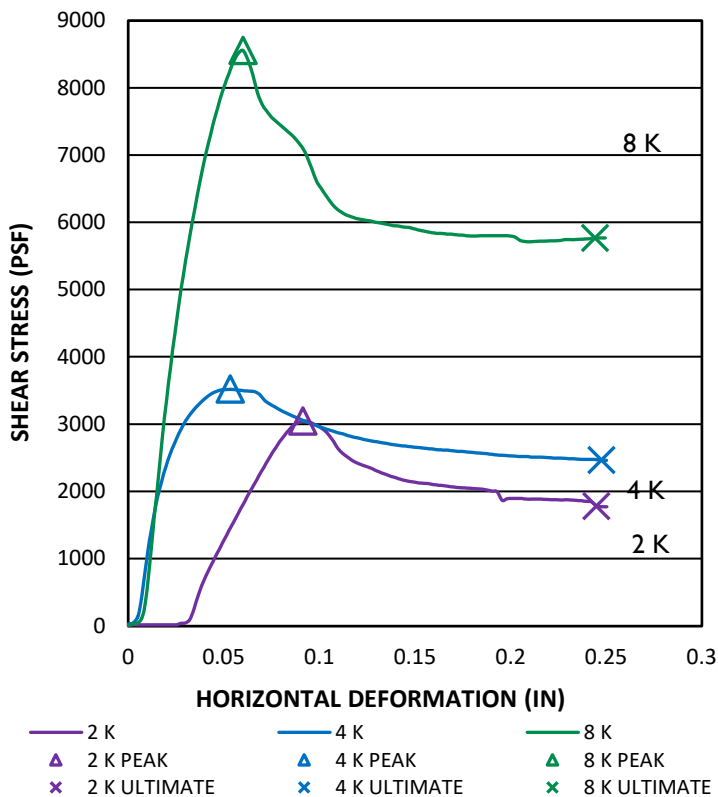
PROJECT NO.: 6847-42-05

SAMPLE NO.: **LB10-8** GEOLOGIC UNIT: **TO**
 SAMPLE DEPTH (FT): **40'** NATURAL/REMOLDED: **N**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
ACTUAL NORMAL STRESS (PSF):	2000	4000	8000	--
WATER CONTENT (%):	17.7	40.0	15.3	24.4
DRY DENSITY (PCF):	102.5	78.2	109.5	96.7

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
WATER CONTENT (%):	24.1	45.1	21.1	30.1
PEAK SHEAR STRESS (PSF):	3046	3520	8556	--
ULT.-E.O.T. SHEAR STRESS (PSF):	1781	2467	5766	--

RESULTS		
PEAK	COHESION, C (PSF)	530
	FRICTION ANGLE (DEGREES)	44
ULTIMATE	COHESION, C (PSF)	130
	FRICTION ANGLE (DEGREES)	34



DIRECT SHEAR - ASTM D 3080

GEOCON
 INCORPORATED



GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
 PHONE 858 558-6900 - FAX 858 558-6159

BEYER BLVD

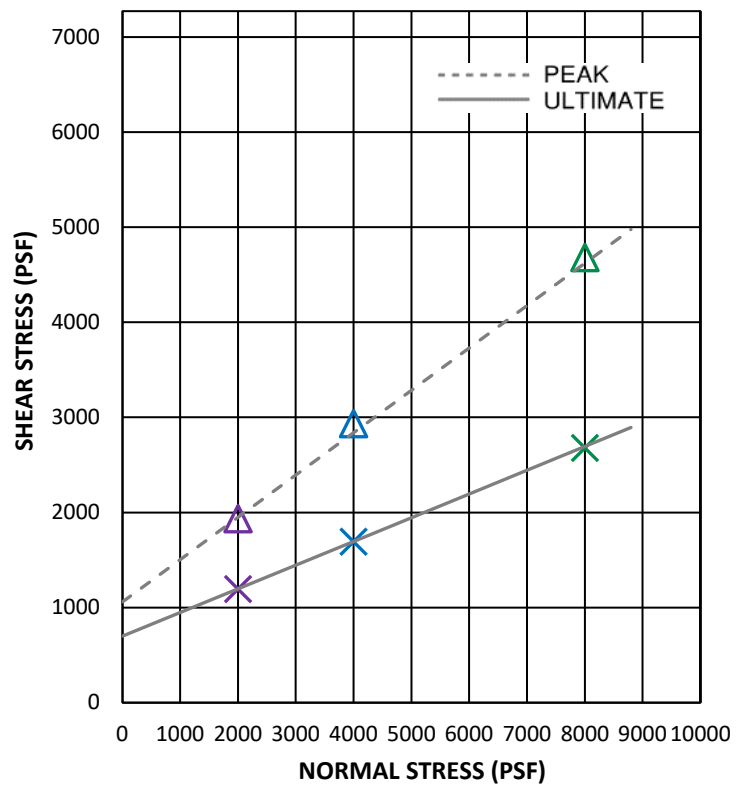
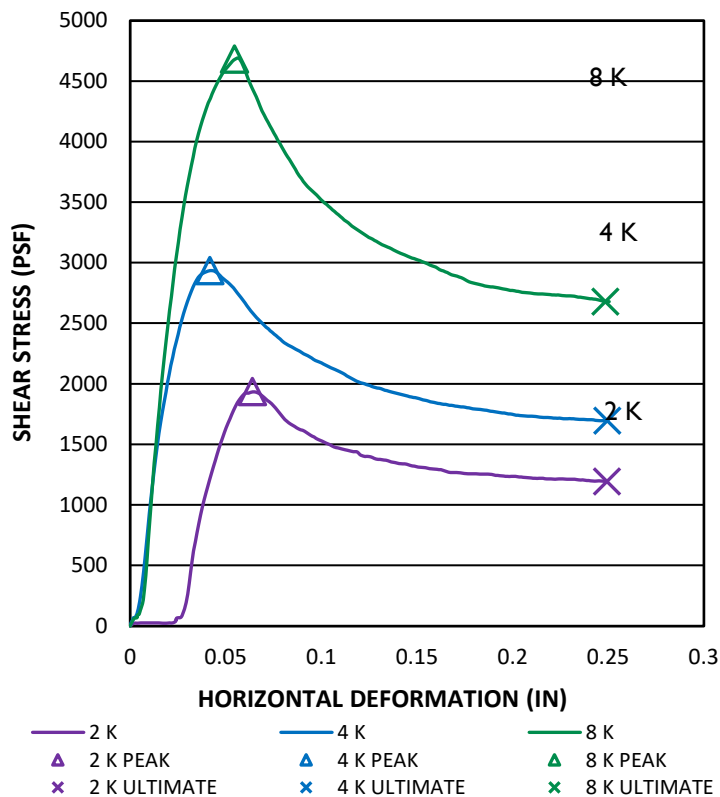
PROJECT NO.: 6847-42-05

SAMPLE NO.: **LB10-17** GEOLOGIC UNIT: **To (BPS)**
 SAMPLE DEPTH (FT): **90** NATURAL/REMOLDED: **N**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
ACTUAL NORMAL STRESS (PSF):	2000	4000	8000	--
WATER CONTENT (%):	54.7	55.6	52.8	54.3
DRY DENSITY (PCF):	63.5	63.7	63.7	63.7

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
WATER CONTENT (%):	60.5	61.4	58.0	60.0
PEAK SHEAR STRESS (PSF):	1934	2935	4681	--
ULT.-E.O.T. SHEAR STRESS (PSF):	1193	1693	2678	--

RESULTS		
PEAK	COHESION, C (PSF)	1060
	FRICTION ANGLE (DEGREES)	24
ULTIMATE	COHESION, C (PSF)	700
	FRICTION ANGLE (DEGREES)	14



GEOCON
INCORPORATED



GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
 PHONE 858 558-6900 - FAX 858 558-6159

DIRECT SHEAR - ASTM D 3080

BEYER BLVD

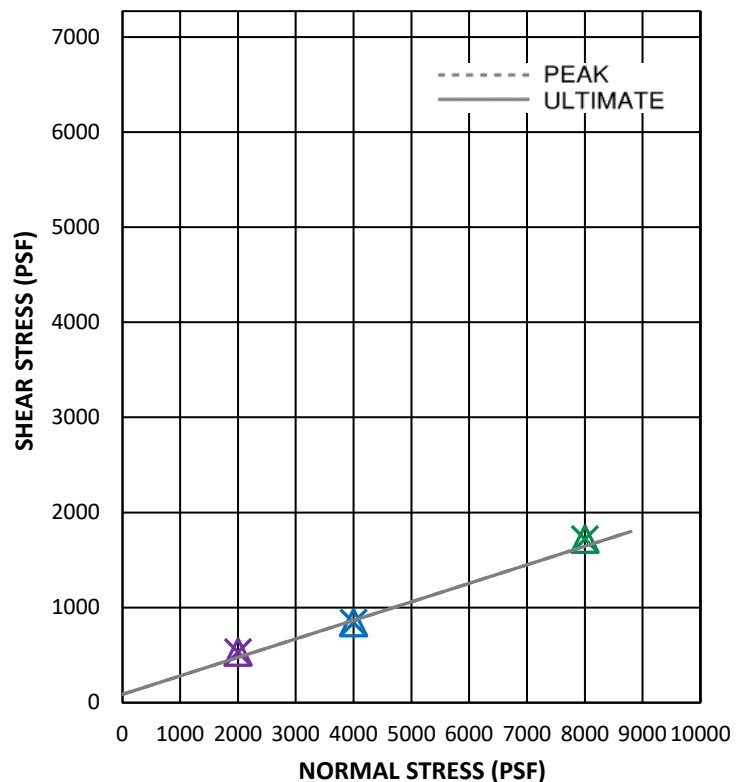
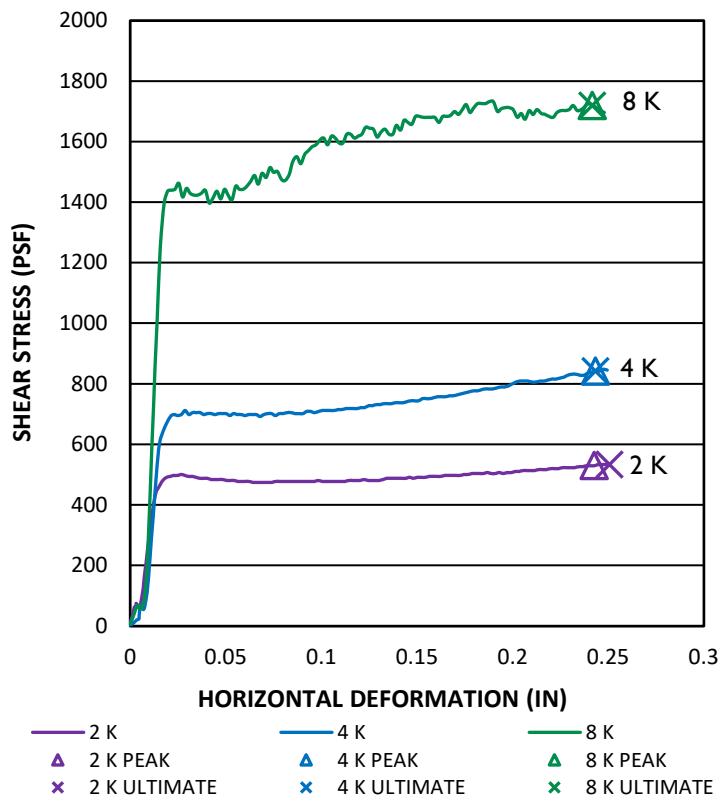
PROJECT NO.: 6847-42-05

SAMPLE NO.: **LB10-17** GEOLOGIC UNIT: **To (BPS)**
 SAMPLE DEPTH (FT): **90** NATURAL/REMOLDED: **R-Residual**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
ACTUAL NORMAL STRESS (PSF):	2000	4000	8000	--
WATER CONTENT (%):	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
DRY DENSITY (PCF):	0.0	0.0	0.0	0.0

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
WATER CONTENT (%):	#VALUE!	#VALUE!	#VALUE!	#VALUE!
PEAK SHEAR STRESS (PSF):	530	842	1719	--
ULT.-E.O.T. SHEAR STRESS (PSF):	533	842	1719	--

RESULTS		
PEAK	COHESION, C (PSF)	90
	FRICTION ANGLE (DEGREES)	11
ULTIMATE	COHESION, C (PSF)	90
	FRICTION ANGLE (DEGREES)	11



RESIDUAL SHEAR - ASTM D 3080

GEOCON
INCORPORATED



GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
 PHONE 858 558-6900 - FAX 858 558-6159

BEYER BLVD

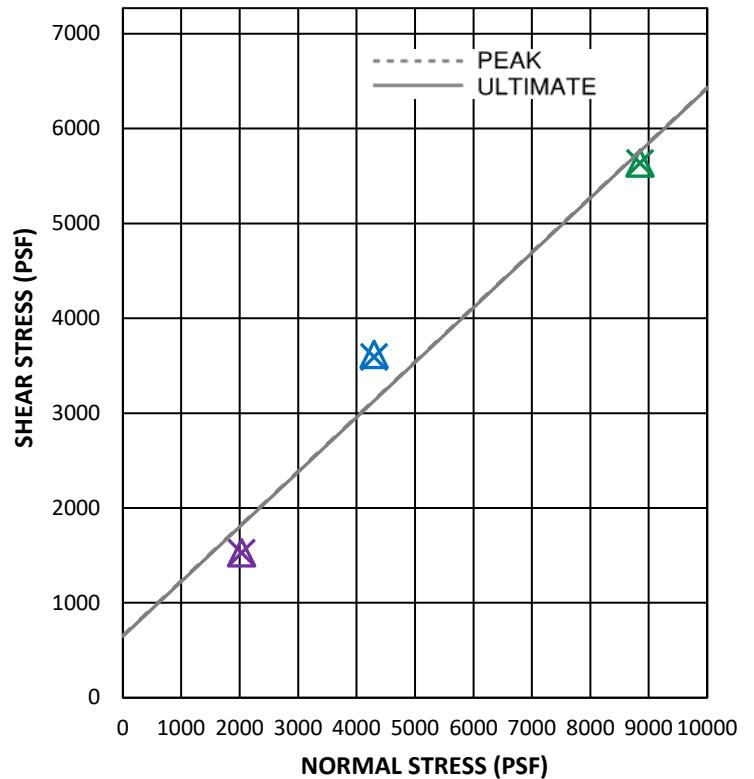
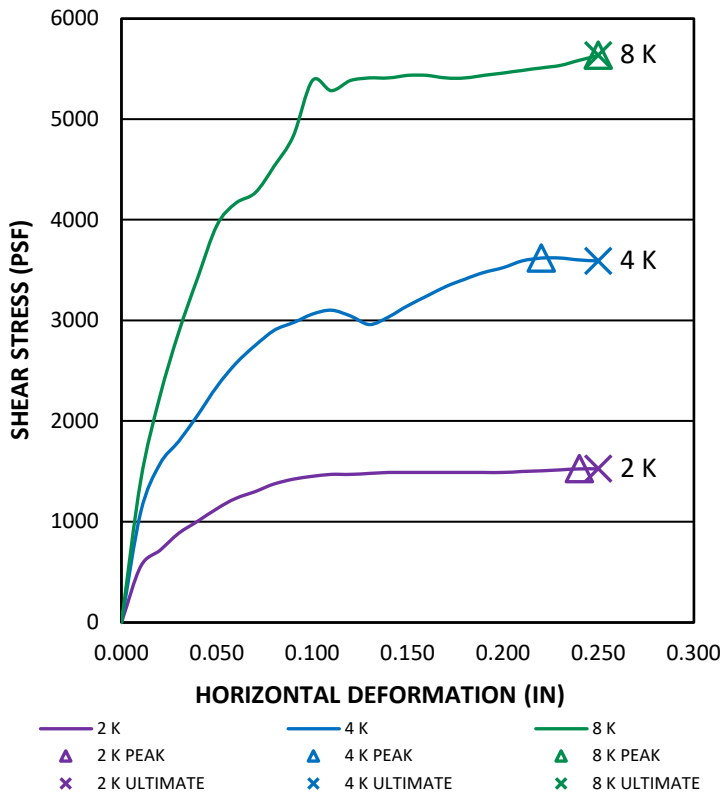
PROJECT NO.: 6847-42-05

SAMPLE NO.: **LB 11-8** GEOLOGIC UNIT: **To**
 SAMPLE DEPTH (FT): **30'** NATURAL/REMOLDED: **N**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
ACTUAL NORMAL STRESS (PSF):	2030	4300	8850	--
WATER CONTENT (%):	4.4	4.7	4.7	4.6
DRY DENSITY (PCF):	94.8	107.1	96.1	99.3

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
WATER CONTENT (%):	25.0	19.1	24.3	22.8
PEAK SHEAR STRESS (PSF):	1527	3620	5636	--
ULT.-E.O.T. SHEAR STRESS (PSF):	1527	3592	5636	--

RESULTS		
PEAK	COHESION, C (PSF)	660
	FRICTION ANGLE (DEGREES)	30
ULTIMATE	COHESION, C (PSF)	650
	FRICTION ANGLE (DEGREES)	30



DIRECT SHEAR - ASTM D 3080

GEOCON
INCORPORATED



GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
 PHONE 858 558-6900 - FAX 858 558-6159

BEYER BLVD

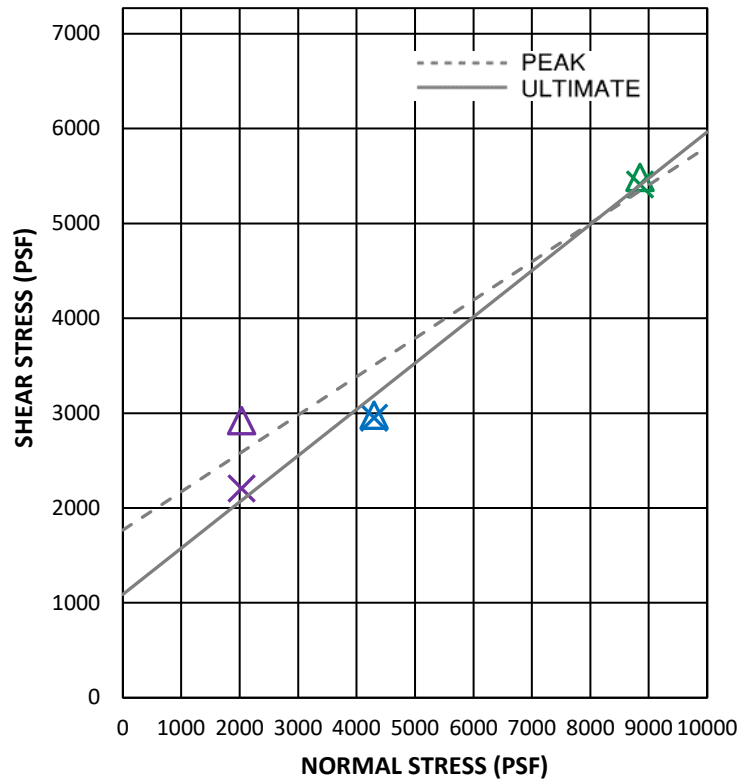
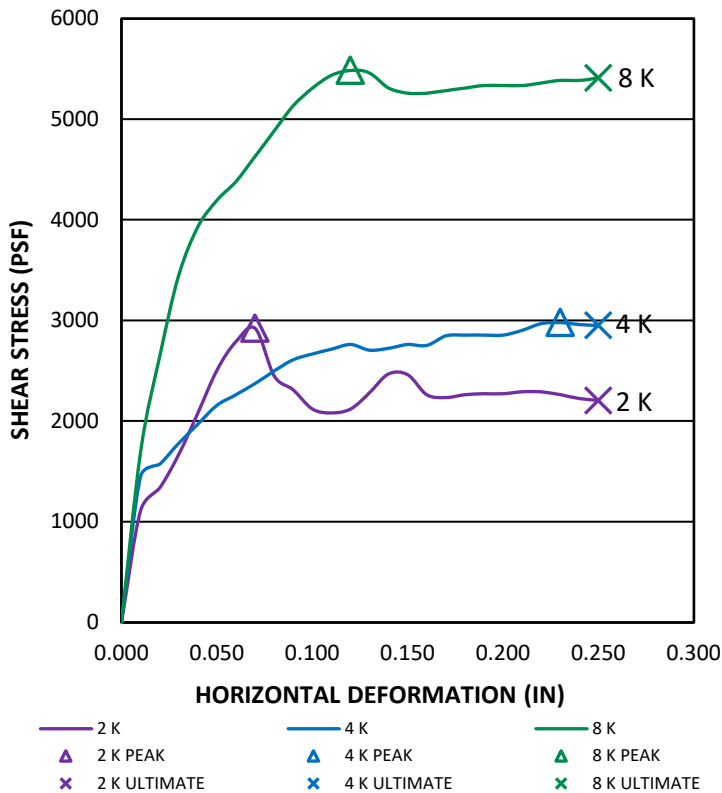
PROJECT NO.: 6847-42-05

SAMPLE NO.: **LB11-10** GEOLOGIC UNIT: **To**
 SAMPLE DEPTH (FT): **40'** NATURAL/REMOLDED: **N**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
ACTUAL NORMAL STRESS (PSF):	2030	4300	8850	--
WATER CONTENT (%):	11.6	10.1	10.6	10.8
DRY DENSITY (PCF):	118.5	109.8	111.4	113.3

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
WATER CONTENT (%):	16.8	19.0	18.7	18.2
PEAK SHEAR STRESS (PSF):	2922	2979	5486	--
ULT.-E.O.T. SHEAR STRESS (PSF):	2206	2951	5410	--

RESULTS		
PEAK	COHESION, C (PSF)	1770
	FRICTION ANGLE (DEGREES)	22
ULTIMATE	COHESION, C (PSF)	1090
	FRICTION ANGLE (DEGREES)	26



DIRECT SHEAR - ASTM D 3080

GEOCON
INCORPORATED



GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
 PHONE 858 558-6900 - FAX 858 558-6159

BEYER BLVD

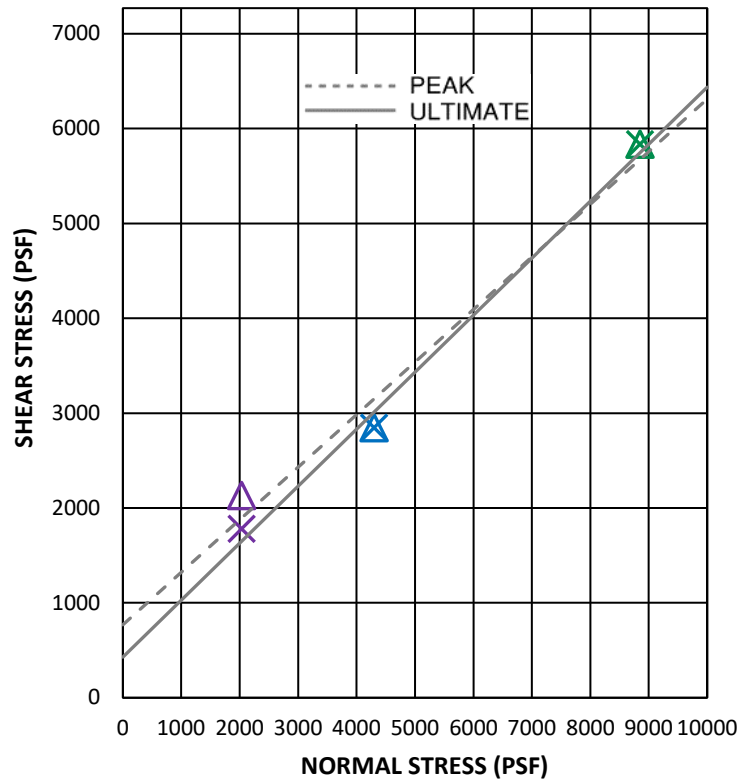
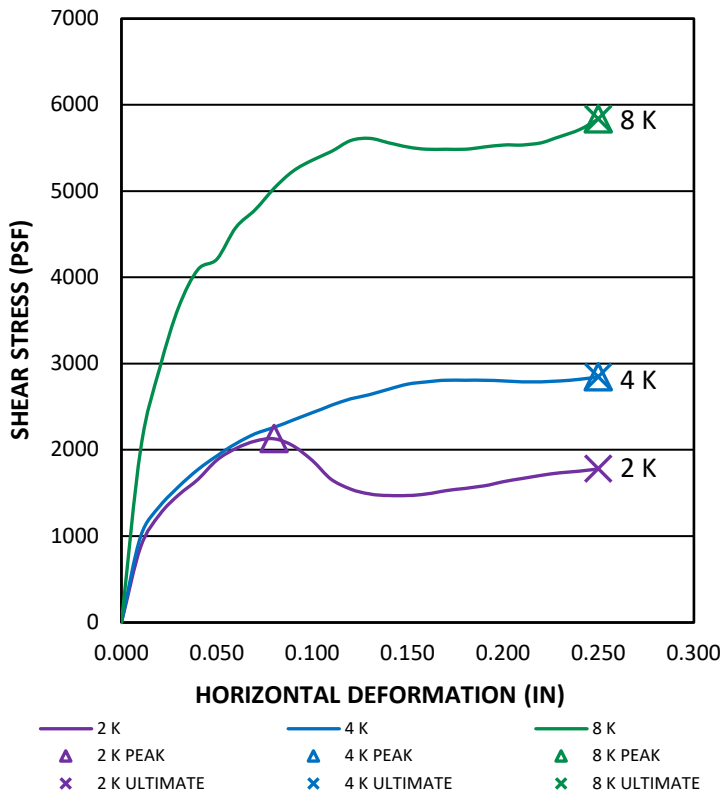
PROJECT NO.: 6847-42-05

SAMPLE NO.: **LB11-11** GEOLOGIC UNIT: **To**
 SAMPLE DEPTH (FT): **45'** NATURAL/REMOLDED: **N**

INITIAL CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
ACTUAL NORMAL STRESS (PSF):	2030	4300	8850	--
WATER CONTENT (%):	1.9	3.1	2.0	2.3
DRY DENSITY (PCF):	114.8	97.4	106.5	106.3

AFTER TEST CONDITIONS				
NORMAL STRESS TEST LOAD	2 K	4 K	8 K	AVERAGE
WATER CONTENT (%):	14.4	23.0	17.4	18.3
PEAK SHEAR STRESS (PSF):	2131	2847	5837	--
ULT.-E.O.T. SHEAR STRESS (PSF):	1782	2847	5837	--

RESULTS		
PEAK	COHESION, C (PSF)	770
	FRICTION ANGLE (DEGREES)	29
ULTIMATE	COHESION, C (PSF)	430
	FRICTION ANGLE (DEGREES)	31



DIRECT SHEAR - ASTM D 3080

GEOCON
 INCORPORATED

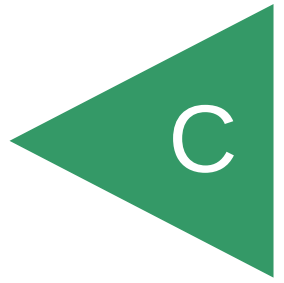


GEOTECHNICAL CONSULTANTS
 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121-2974
 PHONE 858 558-6900 - FAX 858 558-6159

BEYER BLVD

PROJECT NO.: 6847-42-05

APPENDIX



APPENDIX C

SLOPE STABILITY ANALYSIS FOR BEYER BOULEVARD

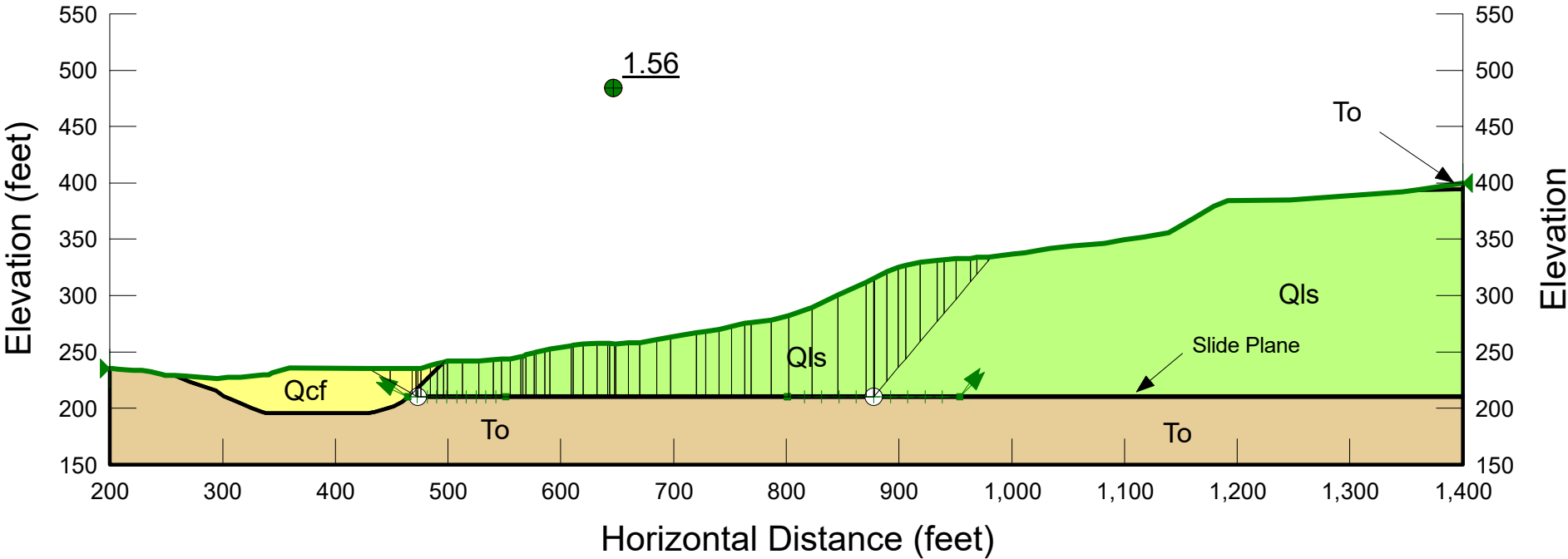
FOR

**SOUTHWEST VILLAGE
VESTING TENTATIVE MAP
SAN DIEGO, CALIFORNIA**

PROJECT NO.06847-42-05

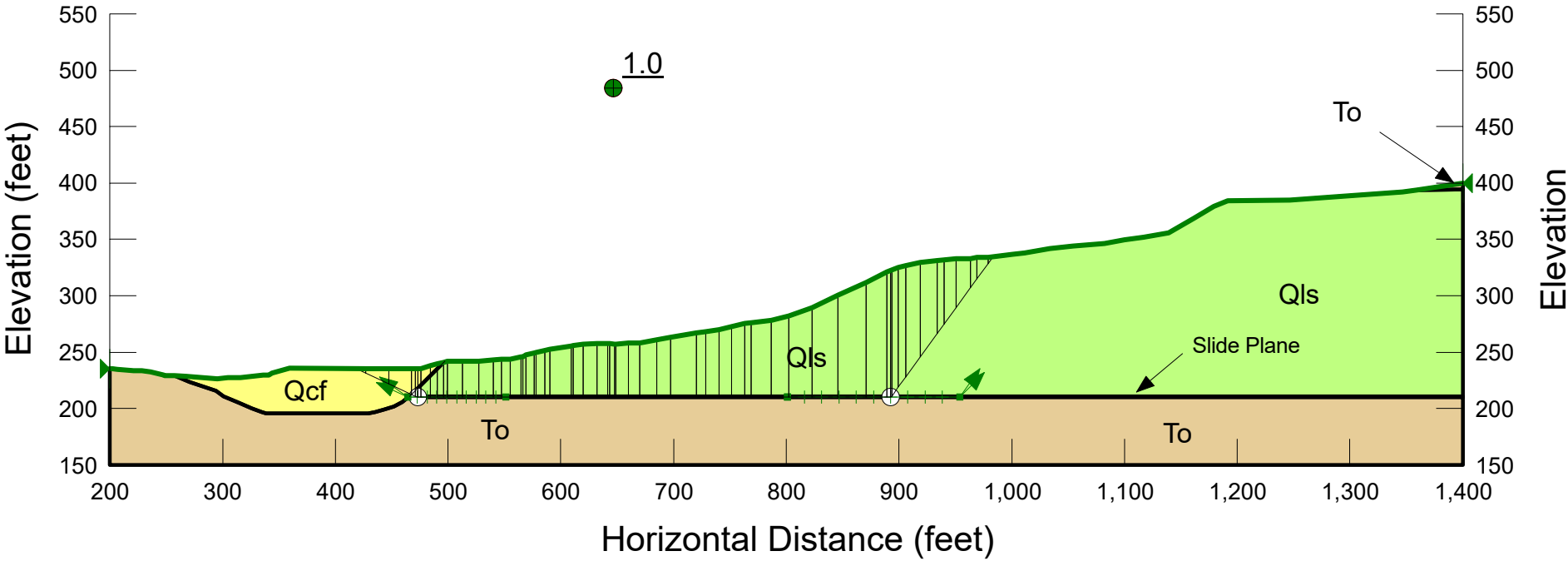
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section A-A'
 Analysis: Proposed condition with alluvial removal

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29



Beyer Boulevard Extension
South Otay Mesa
Project No. 06847-42-05
Date: 02/14/2022
Cross Section A-A'
Analysis: Proposed condition with alluvial removal - Seismic
Horz Seismic Coef.: 0.101

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
■	Qcf	130	300	25
■	Qls	130	300	31
■	Slide Plane	110	0	8
■	To	130	400	29





Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project Beyer Boulevard
 Project Number 06847-42-05
 Date 02/14/22
 File Name AA-1_Proposed

Computed By RCM

Peak Ground Acceleration (Firm Rock), MHA_r , g	0.21	10% in 50 years
Modal Magnitude, M	6.1	
Modal Distance, r, km	11.1	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y/g	NA	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	NA	<--
Max Vertical Distance, H (Feet)	NA	<--
Is Slide X-Area > 25,000ft ² (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5-95 med}$, sec	6.670	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ϵ_T	0.437	
Mean Square Period, T_m , sec	0.550	

Initial Screening with MHEA = $MHA = k_{max}g$

k_y/MHA	NA
$f_{EQ}(u=5cm) = (NRF/3.477) * (1.87 - \log(u/((MHA_r/g) * NRF * D_{5-95})))$	0.4798
$k_{EQ} = feq(MHA_r)/g$	0.101
Factor of Safety in Slope Analysis Using k_{EQ}	1.00

Passes Initial Screening Analysis

Approximation of Seismic Demand

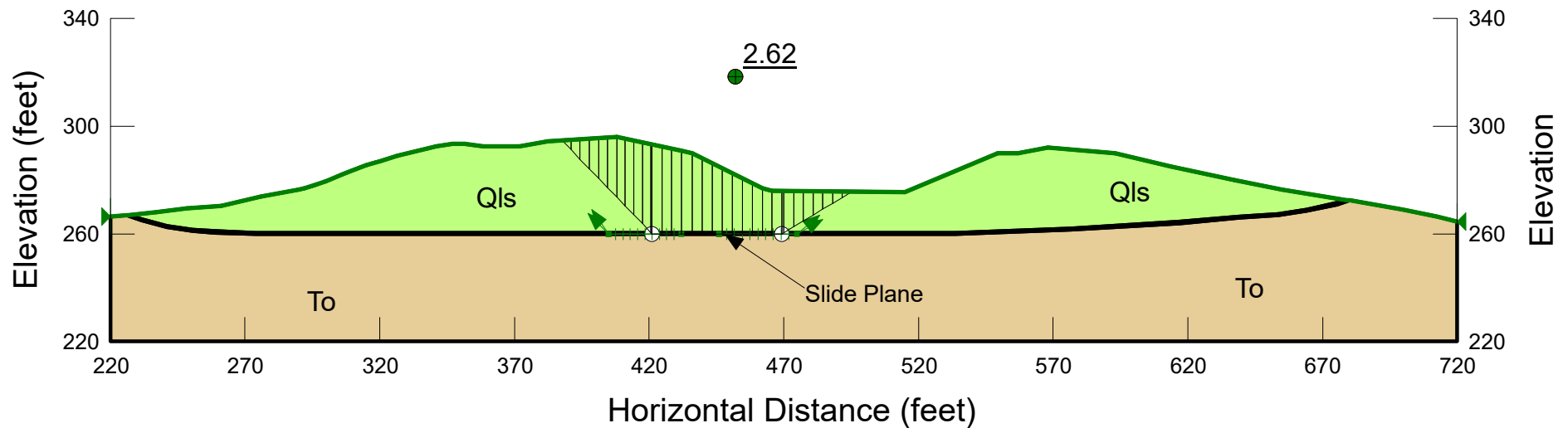
Period of Sliding Mass, $T_s = 4H/V_s$, sec	NA
T_s/T_m	NA
$MHEA/(MHA * NRF)$	NA
$NRF = 0.6225 + 0.9196 \exp(-2.25 * MHA_r/g)$	1.20
$MHEA/g$	NA
$k_y/MHEA = k_y/k_{max}$	NA
Normalized Displacement, Normu	NA

Estimated Displacement, u (cm) NA

FIGURE C-1B

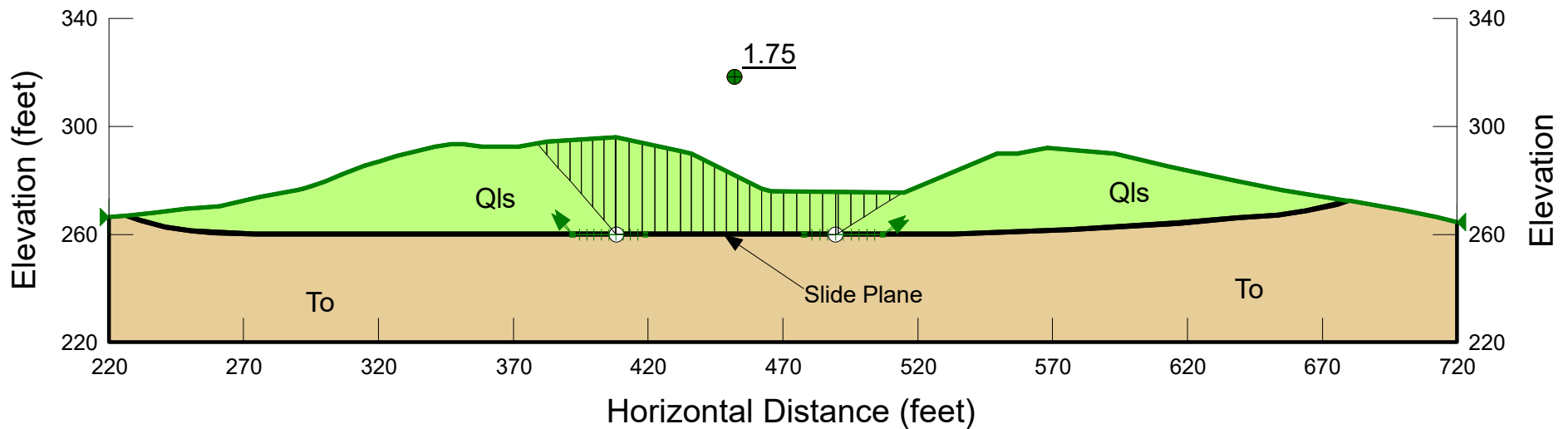
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section B-B'
 Analysis: Proposed - South Slope

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
■	Qls	130	300	31
■	Slide Plane	110	0	8
■	To	130	400	29



Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section B-B'
 Analysis: Proposed - South Slope (Seismic)
 Horz Seismic Coef.: 0.101

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
■	Qls	130	300	31
■	Slide Plane	110	0	8
■	To	130	400	29





Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project Beyer Boulevard
 Project Number 06847-42-05
 Date 02/14/22
 File Name BB-1_Proposed-South

Computed By RCM

Peak Ground Acceleration (Firm Rock), MHA_r , g	0.21	10% in 50 years
Modal Magnitude, M	6.1	
Modal Distance, r, km	11.1	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y/g	NA	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	NA	<--
Max Vertical Distance, H (Feet)	NA	<--
Is Slide X-Area > 25,000ft ² (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5-95 med}$, sec	6.670	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m , sec	0.550	

Initial Screening with $MHEA = MHA = k_{max}g$

k_y/MHA	NA
$f_{EQ}(u=5cm) = (NRF/3.477) * (1.87 - \log(u/((MHA_r/g) * NRF * D_{5-95})))$	0.4798
$k_{EQ} = feq(MHA_r)/g$	0.101
Factor of Safety in Slope Analysis Using k_{EQ}	1.75

Passes Initial Screening Analysis

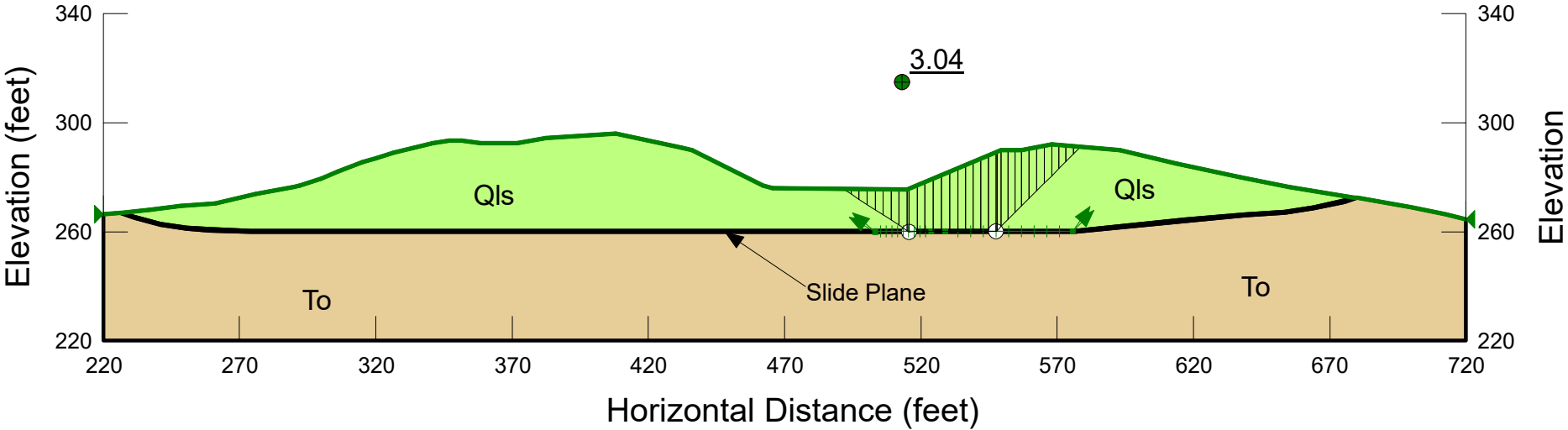
Approximation of Seismic Demand

Period of Sliding Mass, $T_s = 4H/V_s$, sec	NA
T_s/T_m	NA
$MHEA/(MHA * NRF)$	NA
$NRF = 0.6225 + 0.9196 \exp(-2.25 * MHA_r/g)$	1.20
$MHEA/g$	NA
$k_y/MHEA = k_y/k_{max}$	NA
Normalized Displacement, Normu	NA
Estimated Displacement, u (cm)	NA

FIGURE C-2B

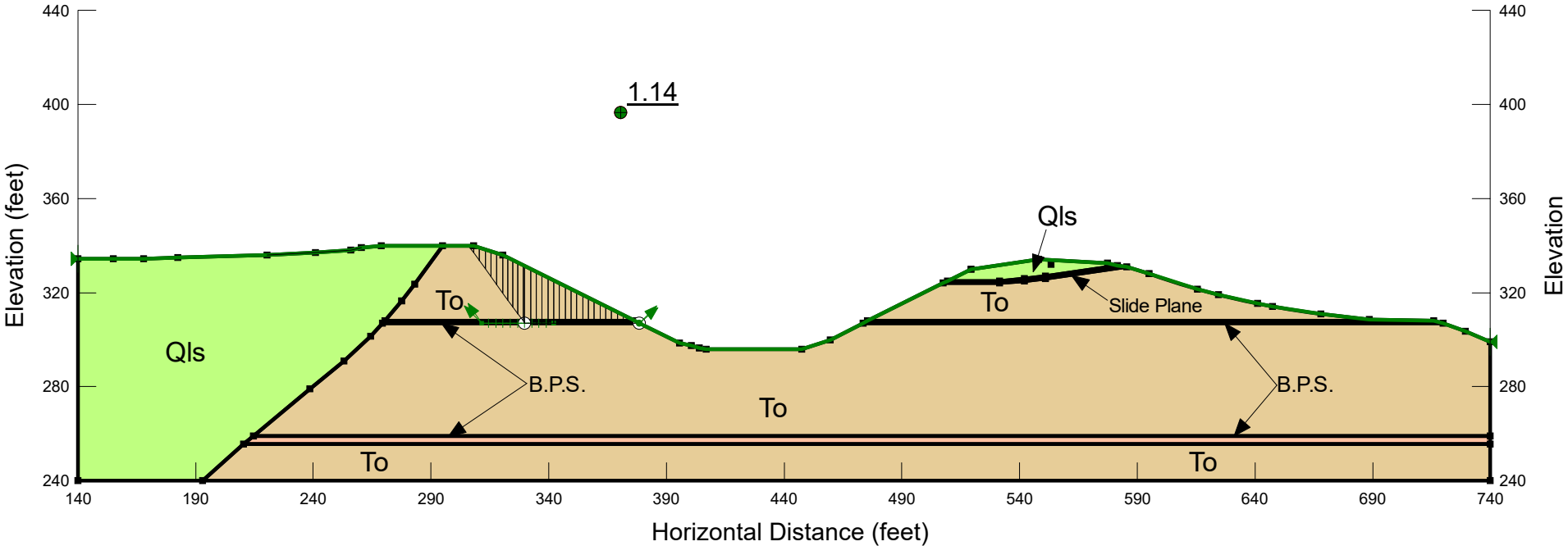
Beyer Boulevard Extension
South Otay Mesa
Project No. 06847-42-05
Date: 02/14/2022
Cross Section B-B'
Analysis: Proposed - North Slope

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
■	Qls	130	300	31
■	Slide Plane	110	0	8
■	To	130	400	29



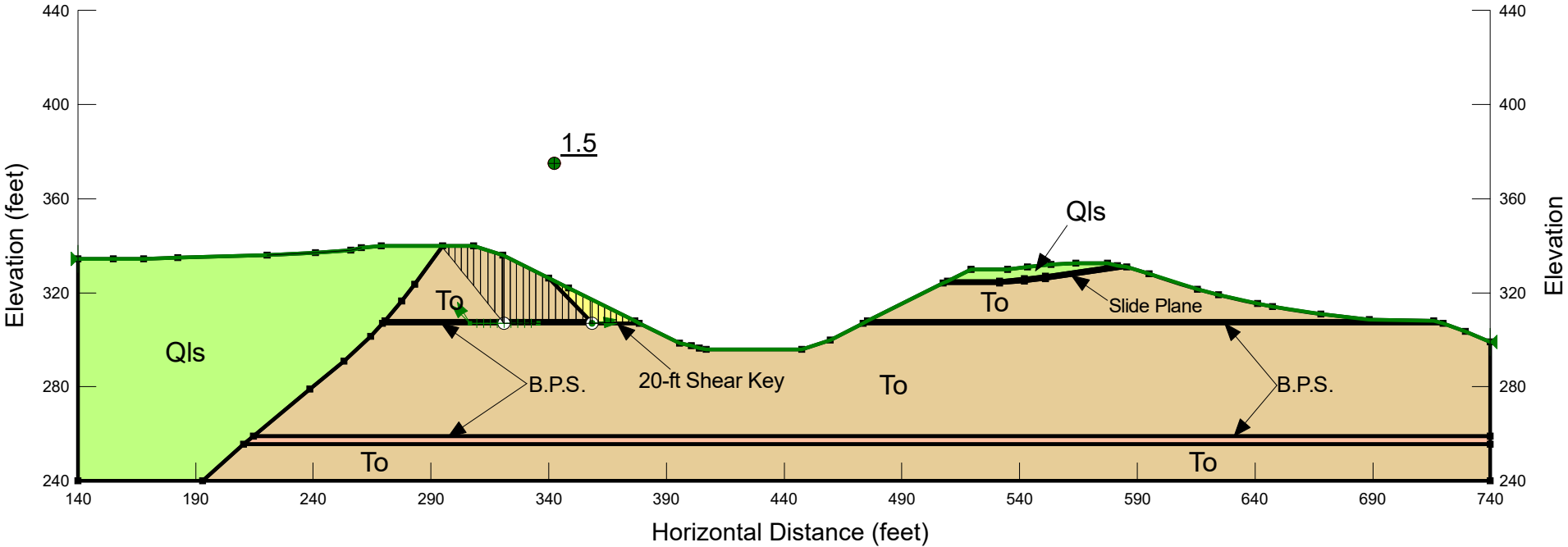
Beyer Boulevard Extension
South Otay Mesa
Project No. 06847-42-05
Date: 02/14/2022
Cross Section C-C'
Analysis: Proposed - Failure on Upper BPS

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29
	To-Shear	110	0	8



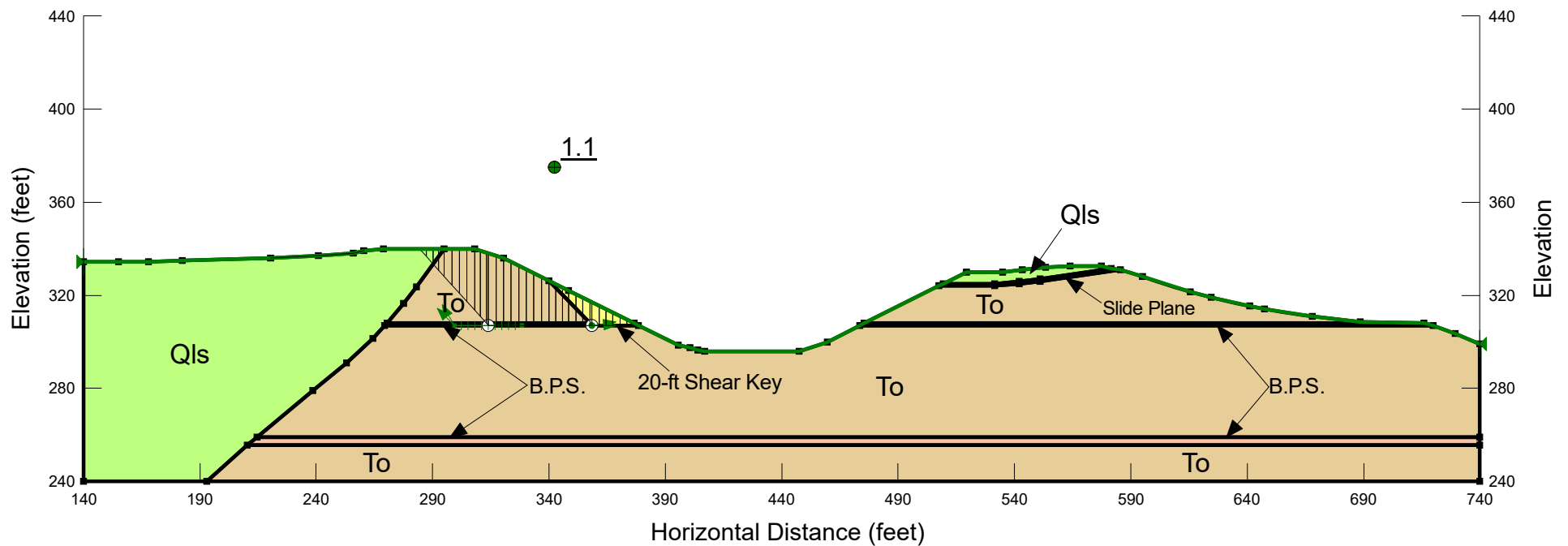
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section C-C'
 Analysis: Proposed - Failure on Upper BPS with 20-ft buttress

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29
	To-Shear	110	0	8



Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section C-C'
 Analysis: Proposed - Seismic
 Horz Seismic Coef.: 0.101

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29
	To-Shear	110	0	8





Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project Beyer Boulevard
 Project Number 06847-42-05
 Date 02/14/22
 File Name CC-2_Proposed-Upper(S)_FS1.5_Seismic

Computed By RCM

Peak Ground Acceleration (Firm Rock), MHA_r , g	0.21	10% in 50 years
Modal Magnitude, M	6.1	
Modal Distance, r, km	11.1	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y /g	NA	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	NA	<--
Max Vertical Distance, H (Feet)	NA	<--
Is Slide X-Area > 25,000ft ² (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5-95 med}$, sec	6.670	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m , sec	0.550	

Initial Screening with $MHEA = MHA = k_{max}g$

k_y/MHA	NA
$f_{EQ}(u=5cm) = (NRF/3.477) * (1.87 - \log(u/((MHA_r/g) * NRF * D_{5-95})))$	0.4798
$k_{EQ} = feq(MHA_r)/g$	0.101
Factor of Safety in Slope Analysis Using k_{EQ}	1.10

Passes Initial Screening Analysis

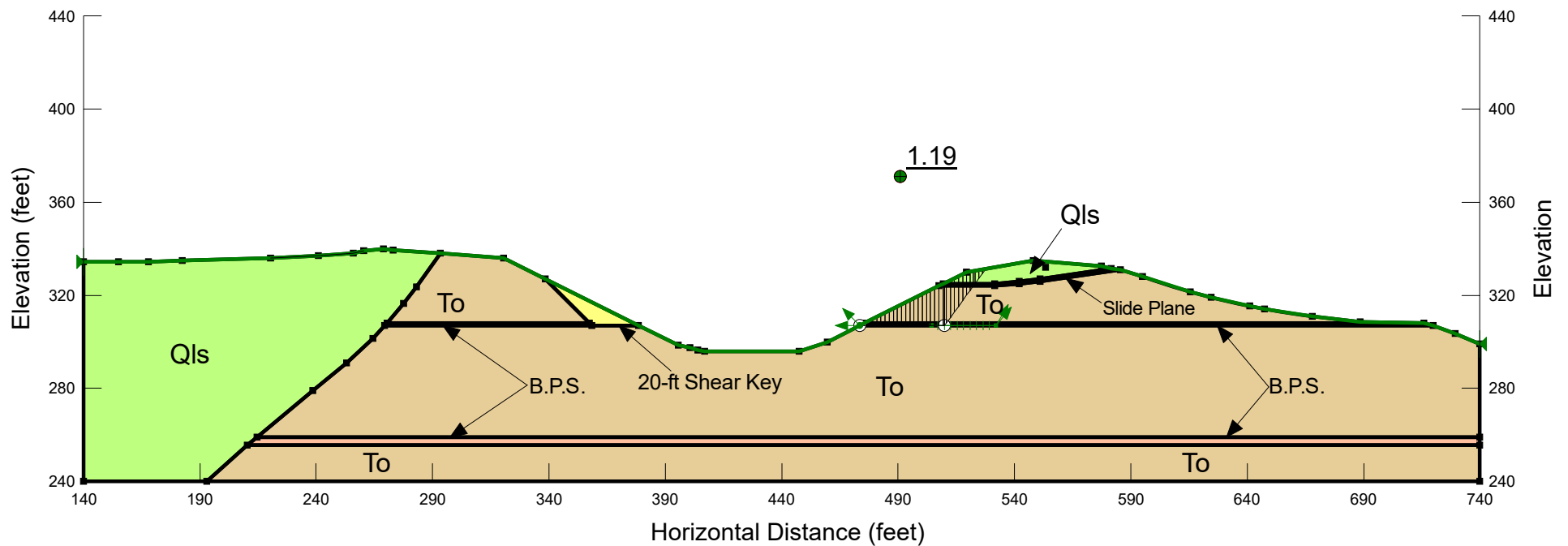
Approximation of Seismic Demand

Period of Sliding Mass, $T_s = 4H/V_s$, sec	NA
T_s/T_m	NA
$MHEA/(MHA * NRF)$	NA
$NRF = 0.6225 + 0.9196 \exp(-2.25 * MHA_r/g)$	1.20
$MHEA/g$	NA
$k_y/MHEA = k_y/k_{max}$	NA
Normalized Displacement, Normu	NA
Estimated Displacement, u (cm)	NA

FIGURE C-5B

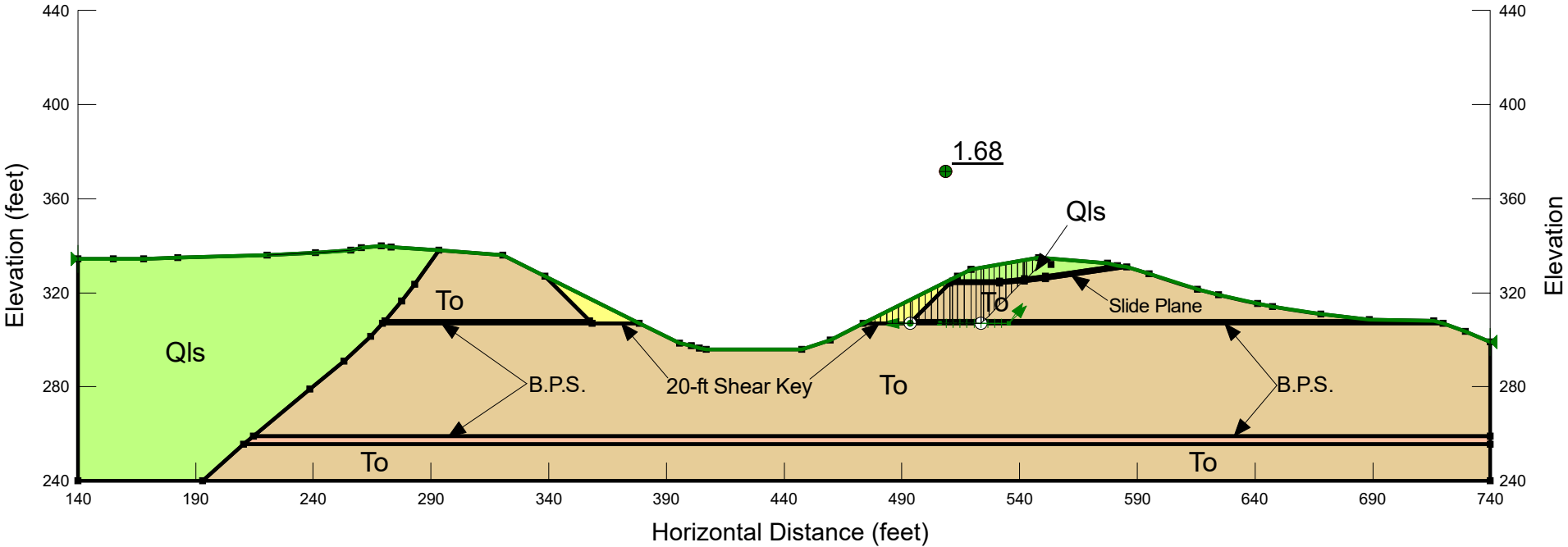
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section C-C'
 Analysis: Proposed - Failure on Upper BPS

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29
	To-Shear	110	0	8



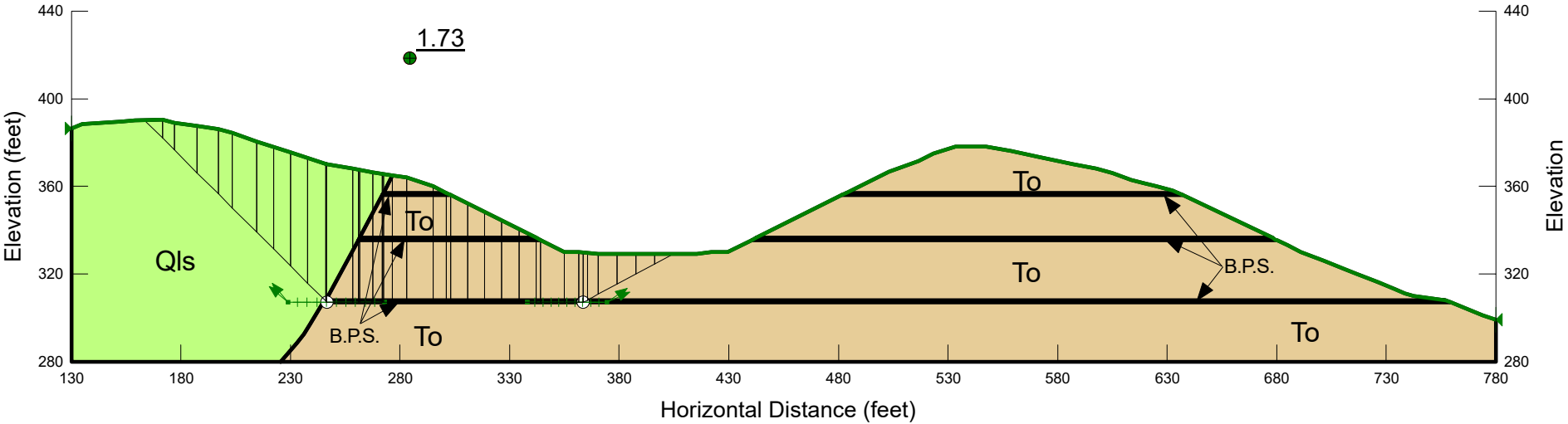
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section C-C'
 Analysis: Proposed- Failure on Upper BPS with 20-ft buttress

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29
	To-Shear	110	0	8



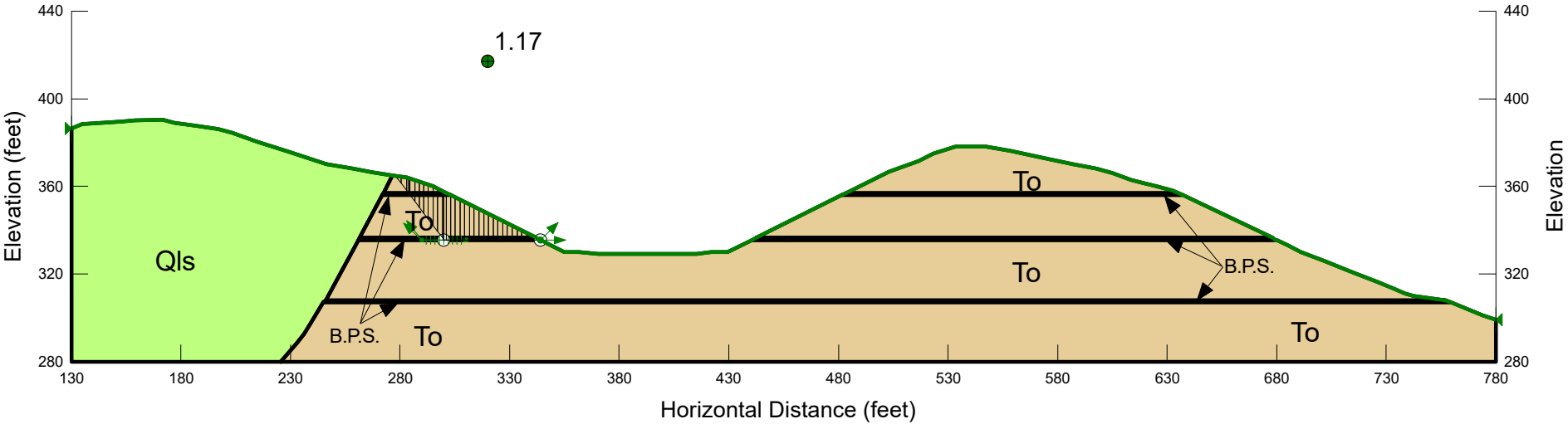
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 01/26/2022
 Cross Section D-D'
 Analysis: Proposed-Lower(S)

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8



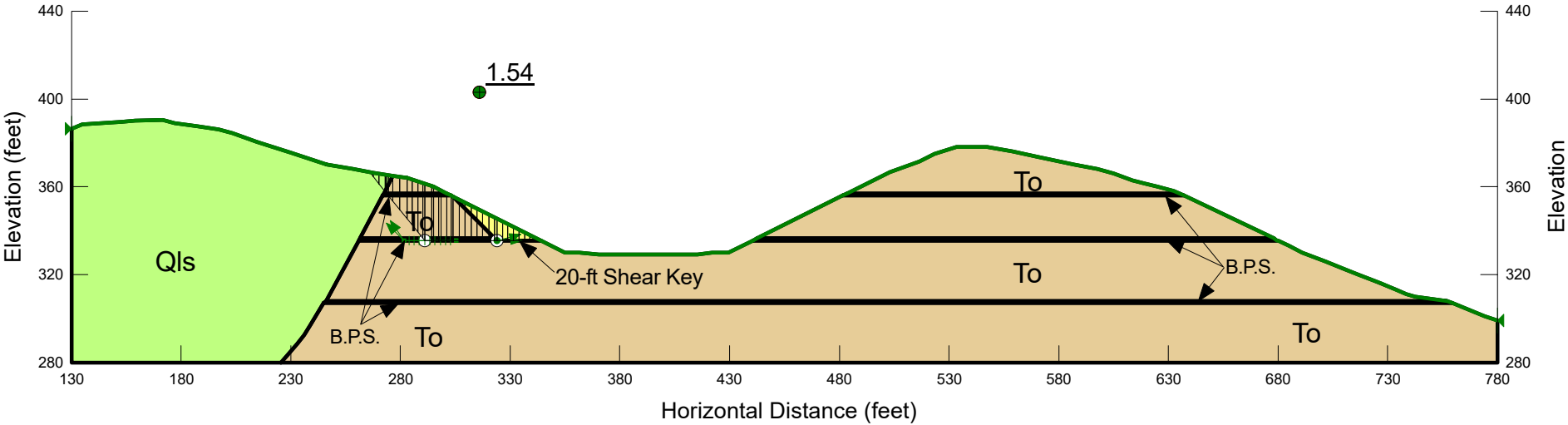
Beyer Boulevard Extension
South Otay Mesa
Project No. 06847-42-05
Date: 02/13/2022
Cross Section D-D'
Analysis: Proposed-Middle(S)

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
■	Qls	130	300	31
■	To	130	400	29
■	To-Shear	110	0	8



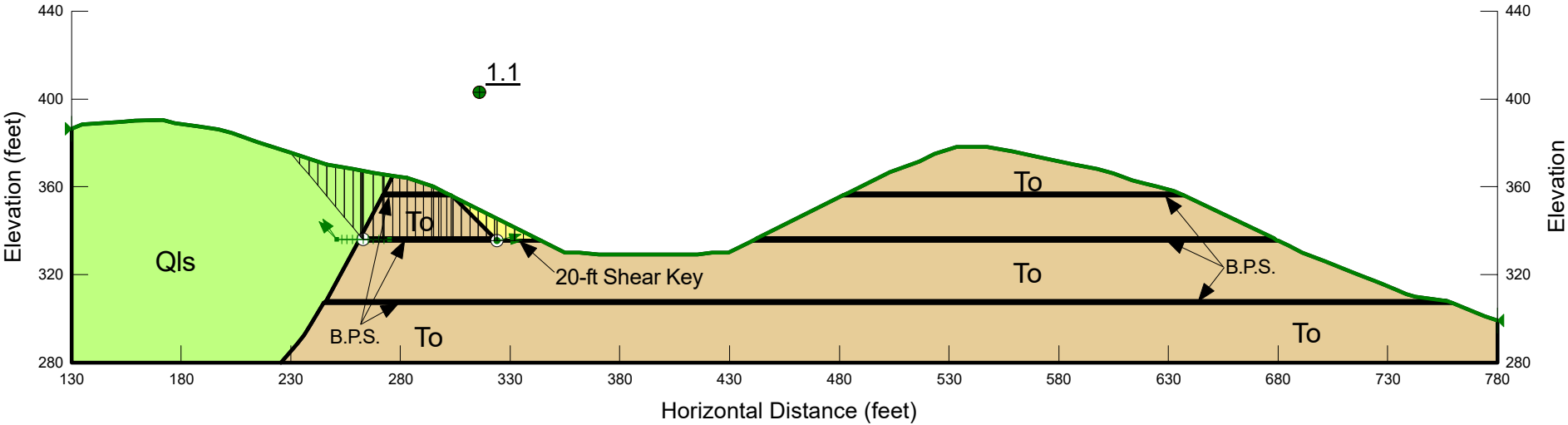
Beyer Boulevard Extension
South Otay Mesa
Project No. 06847-42-05
Date: 02/13/2022
Cross Section D-D'
Analysis: Proposed-Middle(S) with 20-ft buttress

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8



Beyer Boulevard Extension
South Otay Mesa
Project No. 06847-42-05
Date: 02/14/2022
Cross Section D-D'
Analysis: Proposed-Middle(S) with 20-ft buttress

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8





Seismic Slope Stability Evaluation

Input Data in Shaded Areas

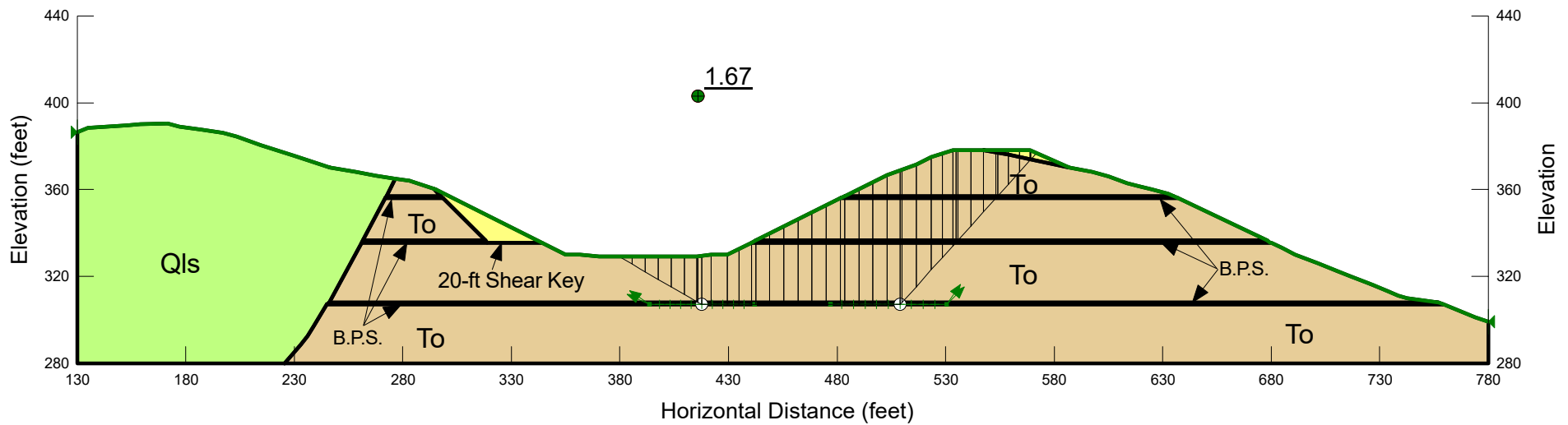
Project	Beyer Boulevard	Computed By	RCM
Project Number	06847-42-05		
Date	02/14/22		
File Name	DD-04_Proposed-Middle(S)_FS1.5_Seismic		

Peak Ground Acceleration (Firm Rock), MHA_r , g	0.21	10% in 50 years	
Modal Magnitude, M	6.1		
Modal Distance, r, km	11.1		
Site Condition, S (0 for rock, 1 for soil)	1		
Yield Acceleration, k_y /g	NA	<-- Enter Value or NA for Screening Analysis	
Shear Wave Velocity, V_s (ft/sec)	NA	<--	
Max Vertical Distance, H (Feet)	NA	<--	
Is Slide X-Area > 25,000ft ² (Y/N)	N	<-- Use "N" for Buttress Fills	
Correction for horizontal incoherence	1.0		
Duration, D_{5-95} med, sec	6.670		
Coefficient, C_1	0.5190		
Coefficient, C_2	0.0837		
Coefficient, C_3	0.0019		
Standard Error, ε_T	0.437		
Mean Square Period, T_m , sec	0.550		
Initial Screening with $MHEA = MHA = k_{max}g$			
k_y/MHA	NA	Approximation of Seismic Demand	
$f_{EQ}(u=5cm) = (NRF/3.477) * (1.87 - \log(u/((MHA_r/g) * NRF * D_{5-95})))$	0.4798	Period of Sliding Mass, $T_s = 4H/V_s$, sec	NA
$k_{EQ} = feq(MHA_r)/g$	0.101	T_s/T_m	NA
Factor of Safety in Slope Analysis Using k_{EQ}	1.10	$MHEA/(MHA * NRF)$	NA
Passes Initial Screening Analysis		$NRF = 0.6225 + 0.9196 \exp(-2.25 * MHA_r/g)$	1.20
		$MHEA/g$	NA
		$k_y/MHEA = k_y/k_{max}$	NA
		Normalized Displacement, Normu	NA
		Estimated Displacement, u (cm)	NA

FIGURE C-10B

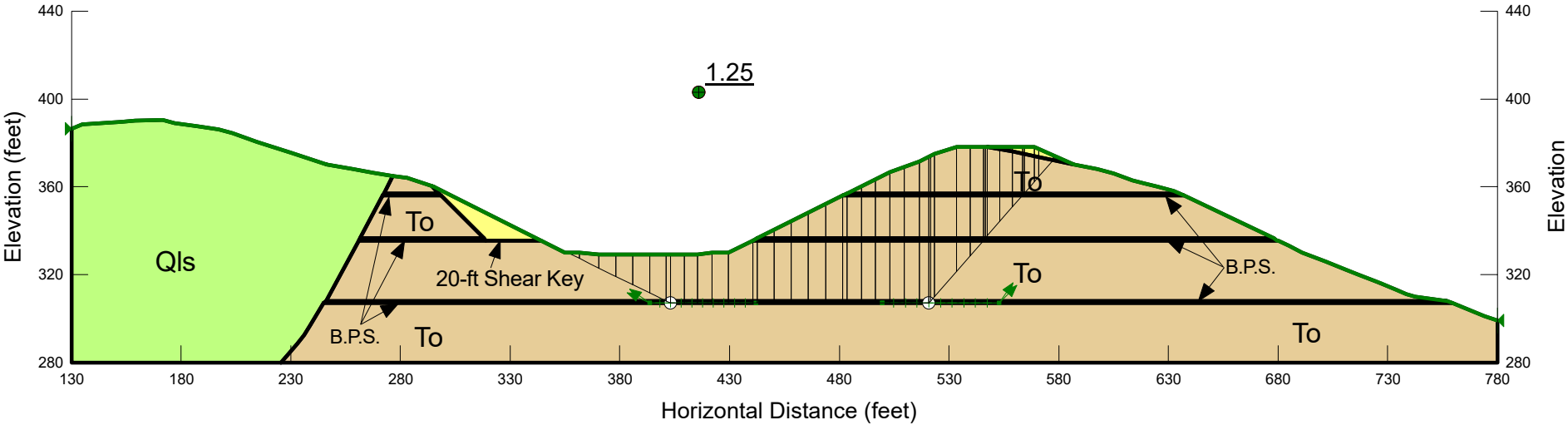
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section D-D'
 Analysis: Proposed-Lower(N)

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8



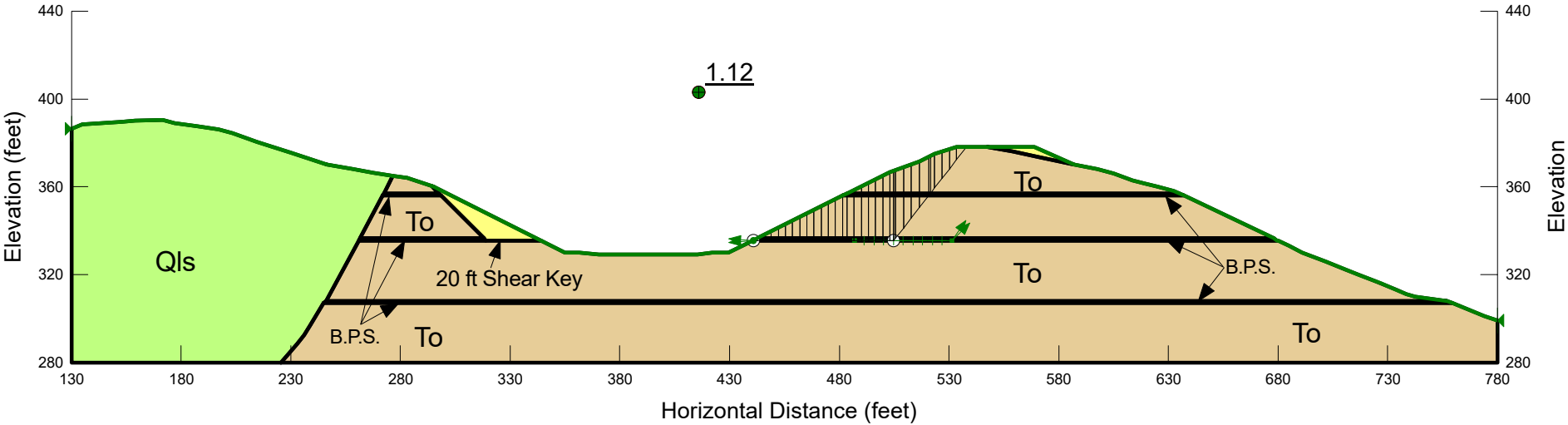
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section D-D'
 Analysis: Proposed-Lower(N) - Seismic
 Horz Seismic Coef.: 0.101

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8



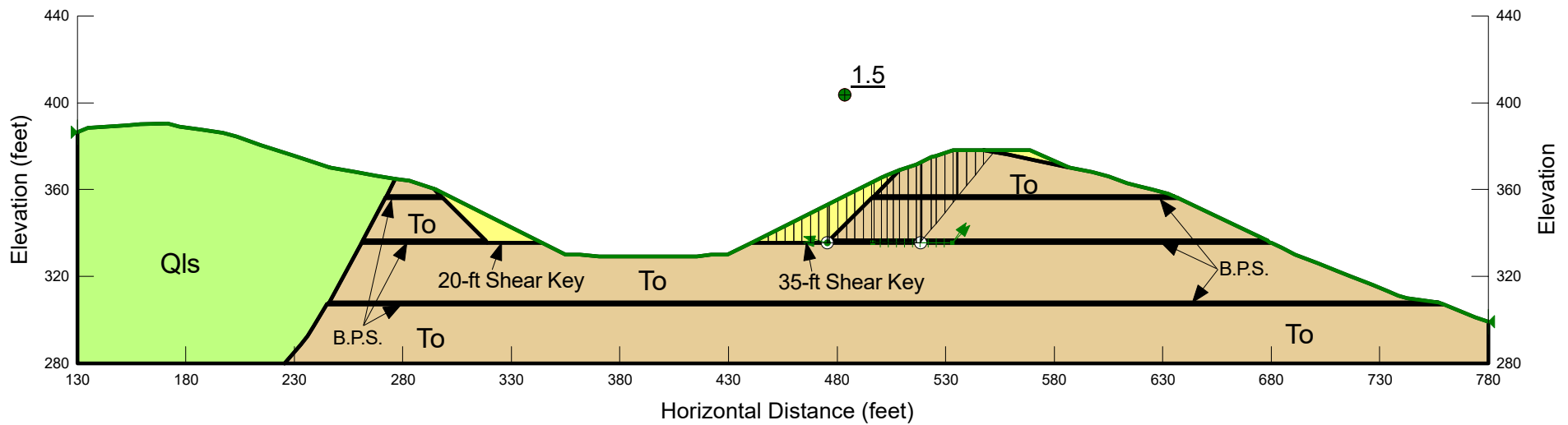
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section D-D'
 Analysis: Proposed-Middle(N)

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8



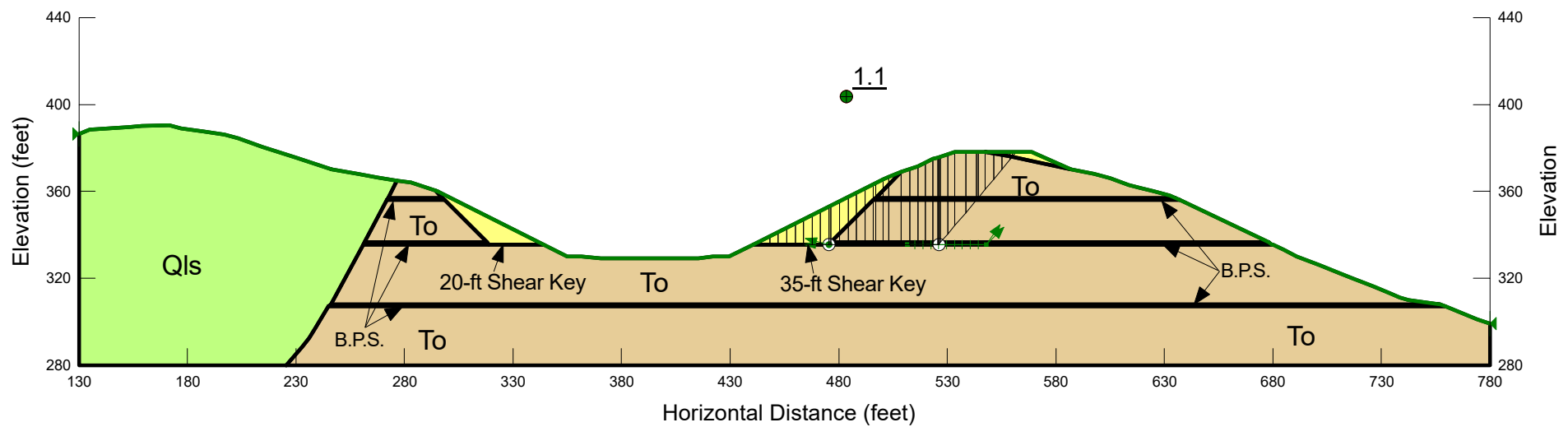
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section D-D'
 Analysis: Proposed-Middle(N) with 35-ft buttress

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8



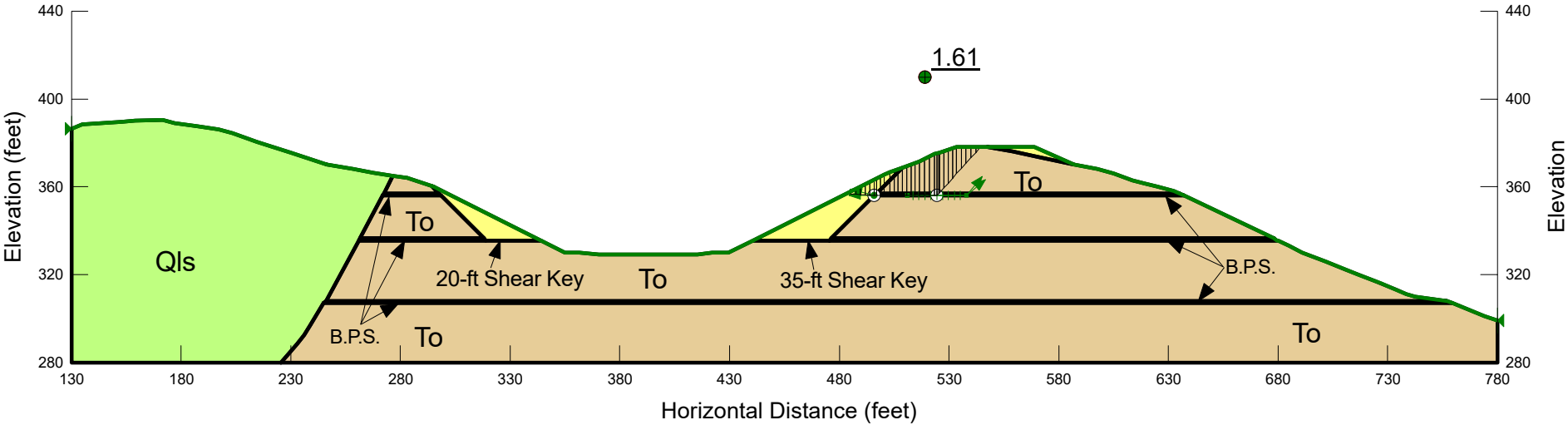
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section D-D'
 Analysis: Proposed-Middle(N) - Seismic
 Horz Seismic Coef.: 0.101

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8



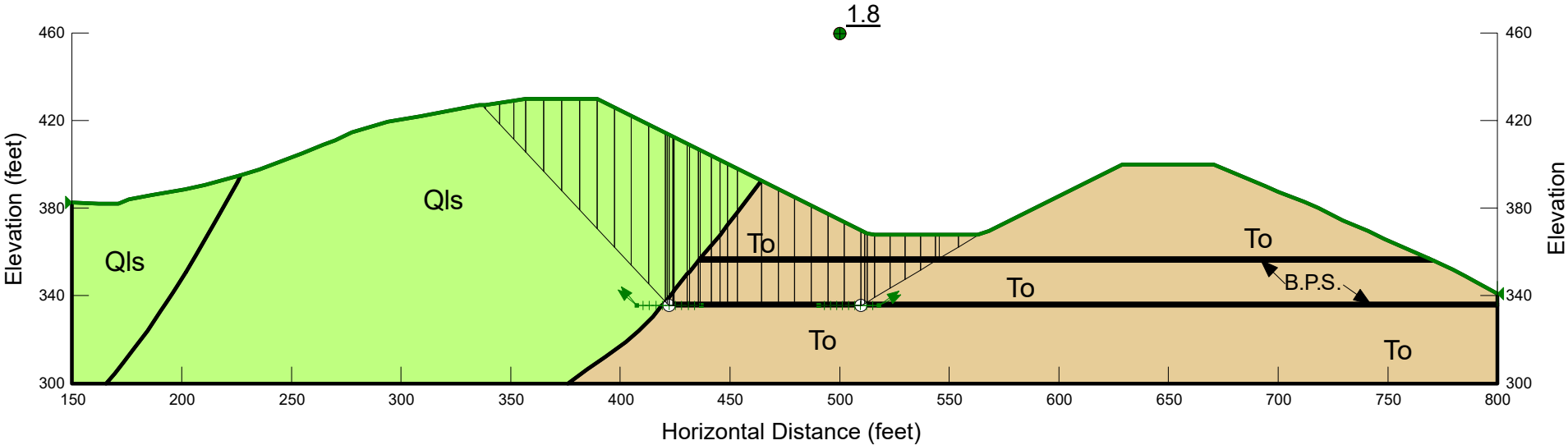
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section D-D'
 Analysis: Proposed-Upper(N)

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	To	130	360	25
	To-Shear	110	0	8



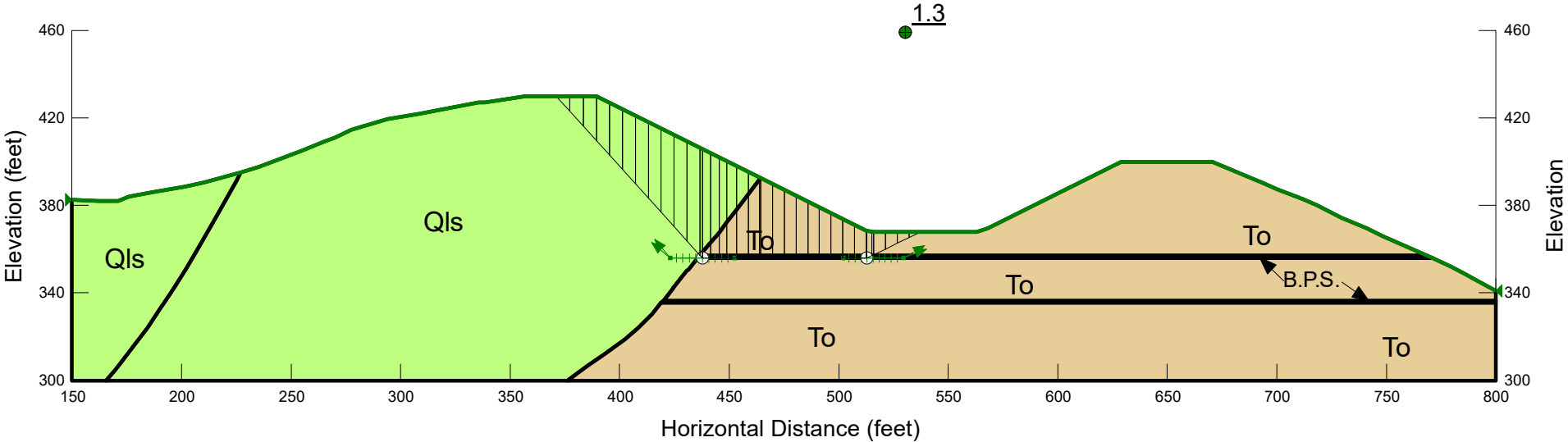
Beyer Boulevard Extension
South Otay Mesa
Project No. 06847-42-05
Date: 02/13/2022
Cross Section E-E'
Analysis: Proposed-To Lower(S)

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8



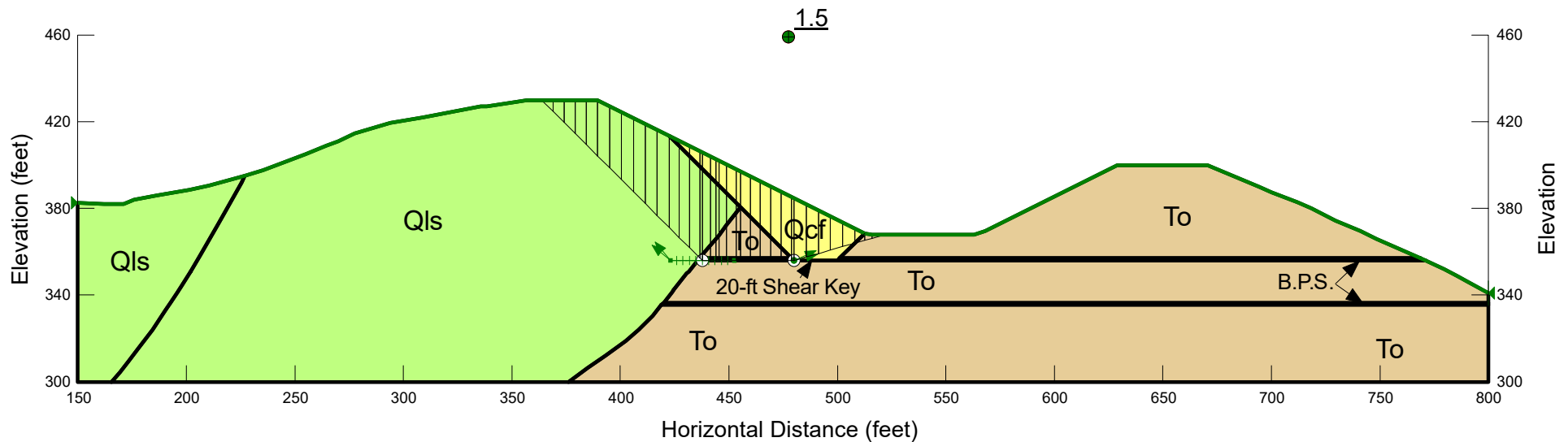
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/13/2022
 Cross Section E-E'
 Analysis: Proposed-To Upper(S)

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8



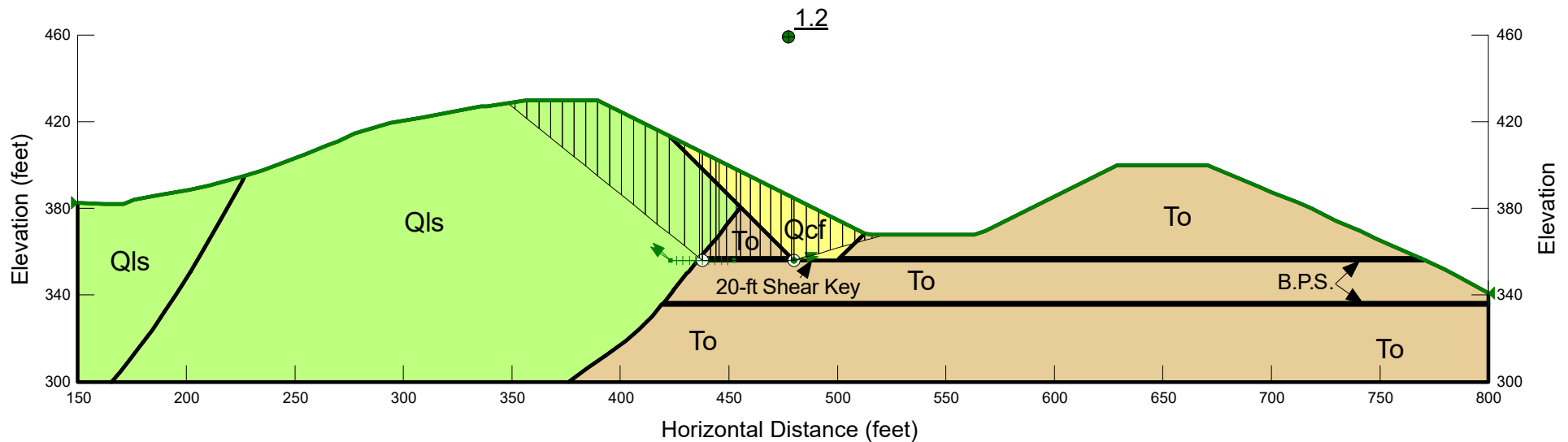
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/13/2022
 Cross Section E-E'
 Analysis: Proposed-To Upper(S) with 20-ft Shear Key

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8



Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section E-E'
 Analysis: Proposed-To Upper(S) - Seismic
 Horz Seismic Coef.: 0.101

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8





Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project Beyer Boulevard
 Project Number 06847-42-05
 Date 02/14/22
 File Name EE-06_Proposed-Upper (S) - Seismic

Computed By RCM

Peak Ground Acceleration (Firm Rock), MHA_r , g	0.21	10% in 50 years
Modal Magnitude, M	6.1	
Modal Distance, r, km	11.1	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y /g	NA	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	NA	<--
Max Vertical Distance, H (Feet)	NA	<--
Is Slide X-Area > 25,000ft ² (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5-95 med}$, sec	6.670	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m , sec	0.550	

Initial Screening with $MHEA = MHA = k_{max}g$

k_y/MHA	NA
$f_{EQ}(u=5cm) = (NRF/3.477) * (1.87 - \log(u/((MHA_r/g) * NRF * D_{5-95})))$	0.4798
$k_{EQ} = feq(MHA_r)/g$	0.101
Factor of Safety in Slope Analysis Using k_{EQ}	1.20

Passes Initial Screening Analysis

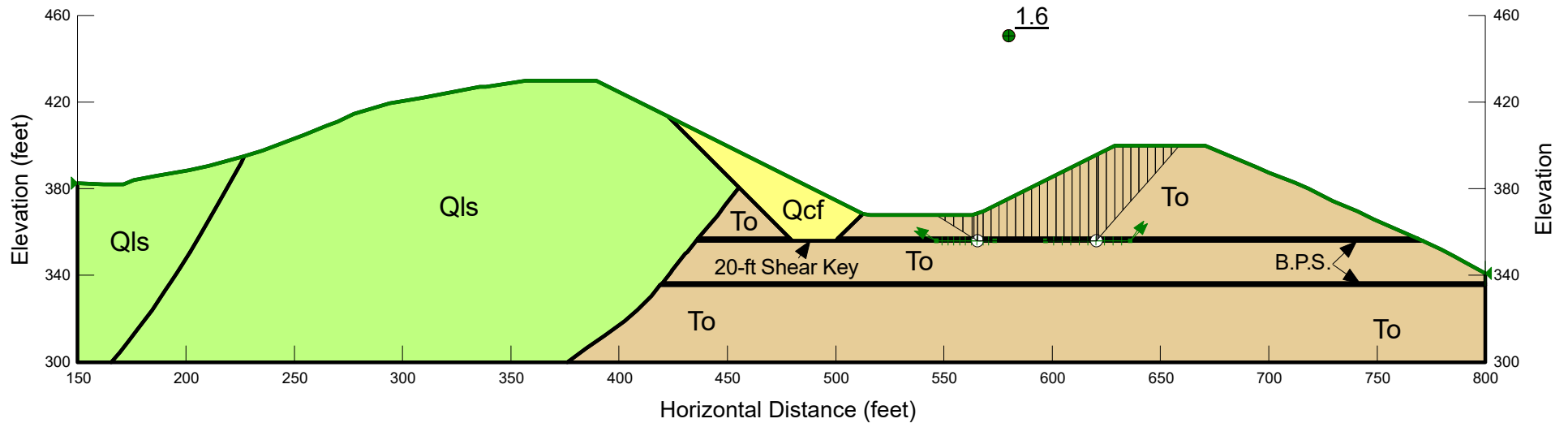
Approximation of Seismic Demand

Period of Sliding Mass, $T_s = 4H/V_s$, sec	NA
T_s/T_m	NA
$MHEA/(MHA * NRF)$	NA
$NRF = 0.6225 + 0.9196 \exp(-2.25 * MHA_r/g)$	1.20
$MHEA/g$	NA
$k_y/MHEA = k_y/k_{max}$	NA
Normalized Displacement, Normu	NA
Estimated Displacement, u (cm)	NA

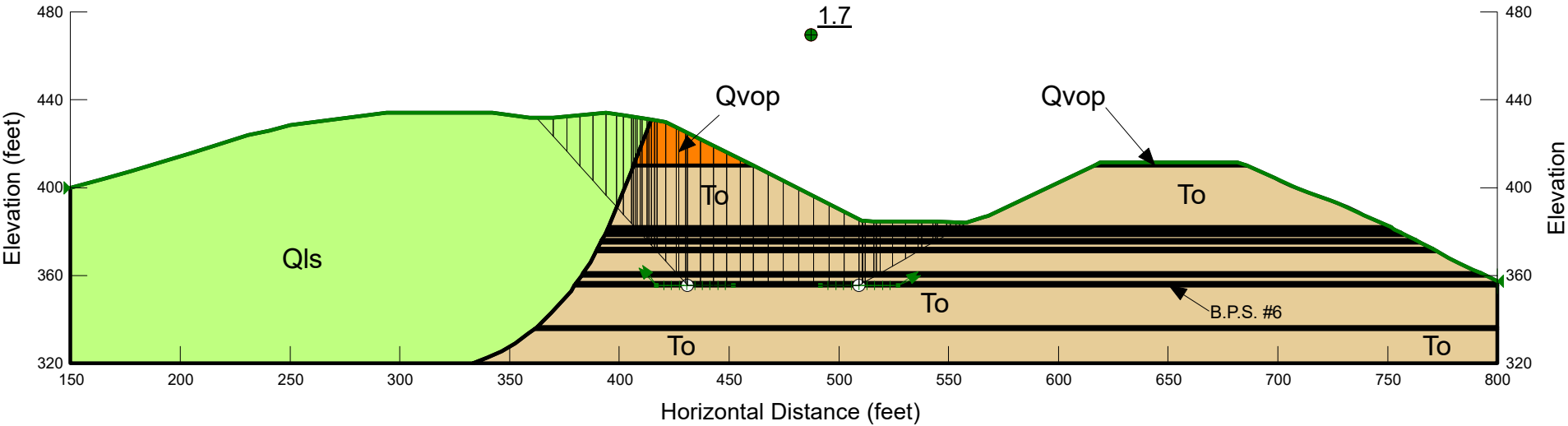
FIGURE C-17B

Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/13/2022
 Cross Section E-E'
 Analysis: Proposed-To Upper(N)

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8

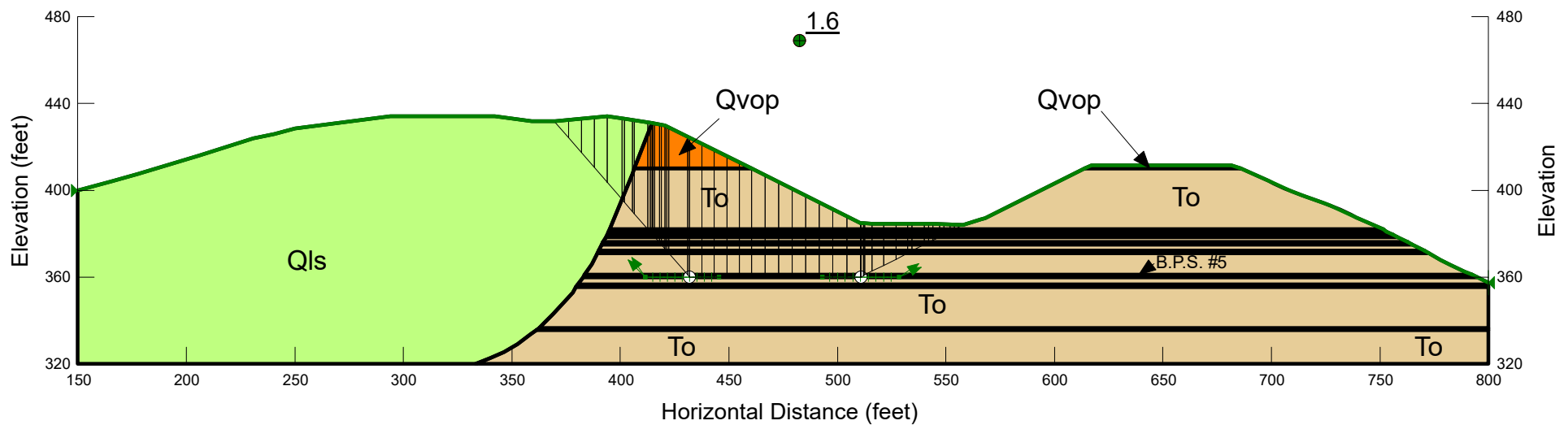


Beyer Boulevard Extension
South Otay Mesa
Project No. 06847-42-05
Date: 02/13/2022
Cross Section F-F'
Analysis: Proposed-South BPS #6



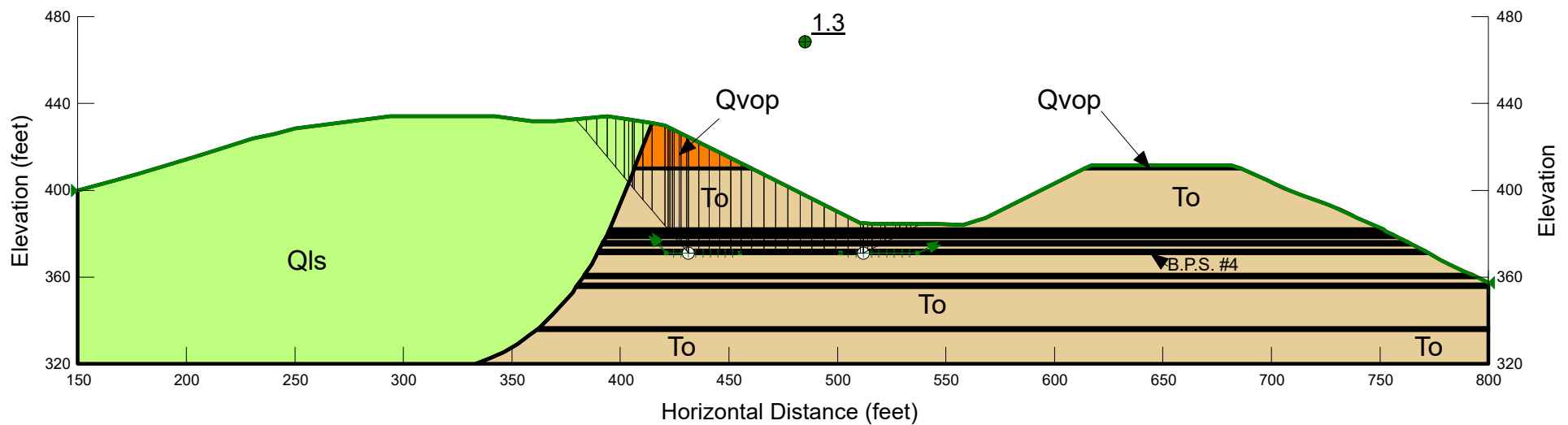
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/13/2022
 Cross Section F-F'
 Analysis: Proposed-South BPS #5

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qls	130	300	31
	Qvop	130	600	31
	To	130	400	29
	To-Shear	110	0	8



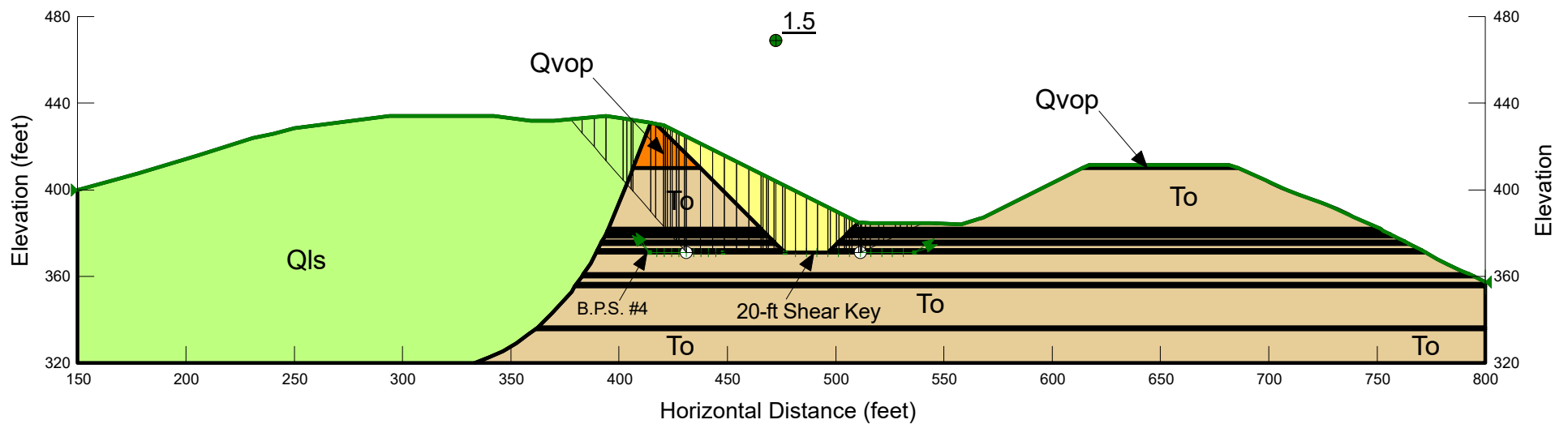
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/13/2022
 Cross Section F-F'
 Analysis: Proposed-South BPS #4

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qls	125	250	31
	Qvop	130	600	31
	To	130	400	29
	To-Shear	110	0	8



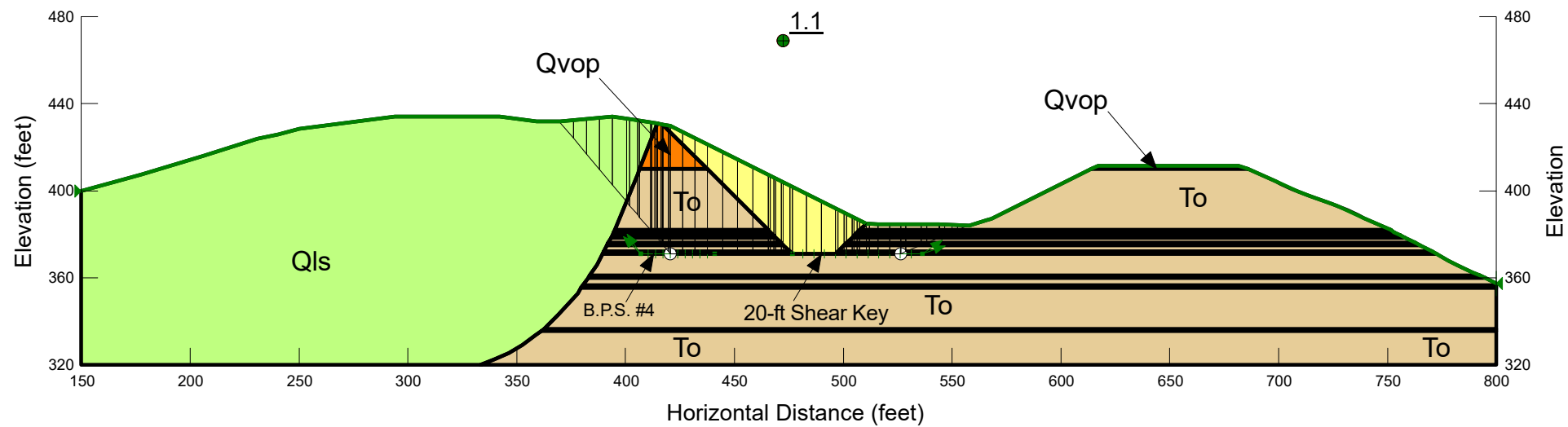
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/13/2022
 Cross Section F-F'
 Analysis: Proposed-South BPS #4 with 20-ft Shear Key

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Qvop	125	600	31
	To	130	400	29
	To-Shear	110	0	8



Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section F-F'
 Analysis: Proposed-South BPS #4 - Seismic
 Horz Seismic Coef.: 0.101

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Qvop	125	600	31
	To	130	400	29
	To-Shear	110	0	8





Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project Beyer Boulevard
 Project Number 06847-42-05
 Date 02/14/22
 File Name FF-04A_Proposed-South BPS#4_PS1.5_Seismic

Computed By RCM

Peak Ground Acceleration (Firm Rock), MHA_r , g	0.21	10% in 50 years
Modal Magnitude, M	6.1	
Modal Distance, r, km	11.1	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y/g	NA	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	NA	<--
Max Vertical Distance, H (Feet)	NA	<--
Is Slide X-Area > 25,000ft ² (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5-95 med}$, sec	6.670	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m , sec	0.550	

Initial Screening with $MHEA = MHA = k_{max}g$

k_y/MHA	NA
$f_{EQ}(u=5cm) = (NRF/3.477) * (1.87 - \log(u/((MHA_r/g) * NRF * D_{5-95})))$	0.4798
$k_{EQ} = feq(MHA_r)/g$	0.101
Factor of Safety in Slope Analysis Using k_{EQ}	1.10

Passes Initial Screening Analysis

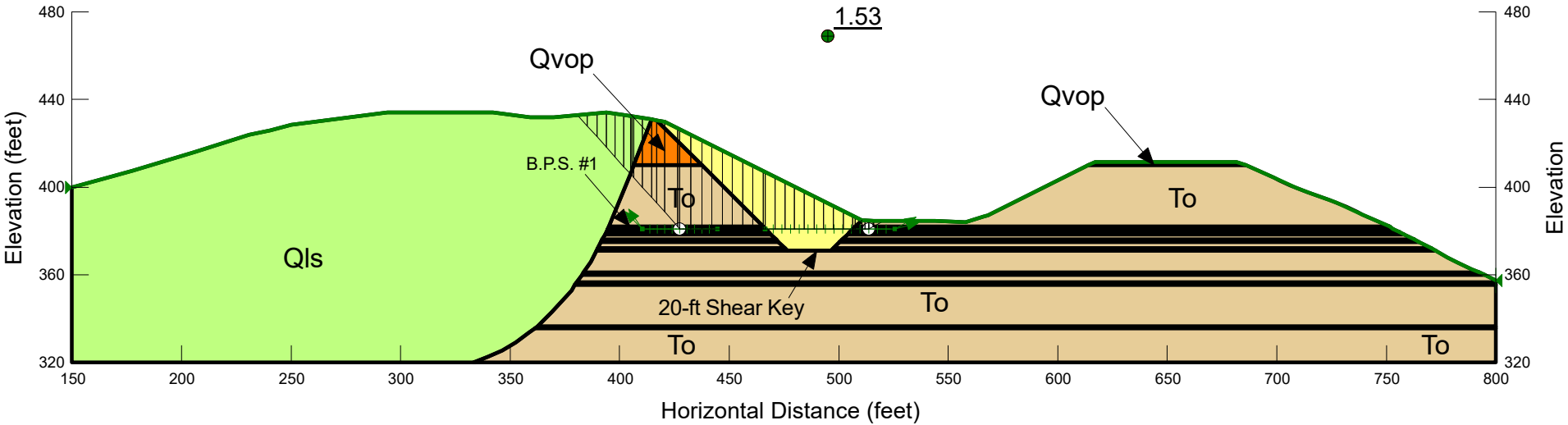
Approximation of Seismic Demand

Period of Sliding Mass, $T_s = 4H/V_s$, sec	NA
T_s/T_m	NA
$MHEA/(MHA * NRF)$	NA
$NRF = 0.6225 + 0.9196 \exp(-2.25 * MHA_r/g)$	1.20
$MHEA/g$	NA
$k_y/MHEA = k_y/k_{max}$	NA
Normalized Displacement, Normu	NA
Estimated Displacement, u (cm)	NA

FIGURE C-22B

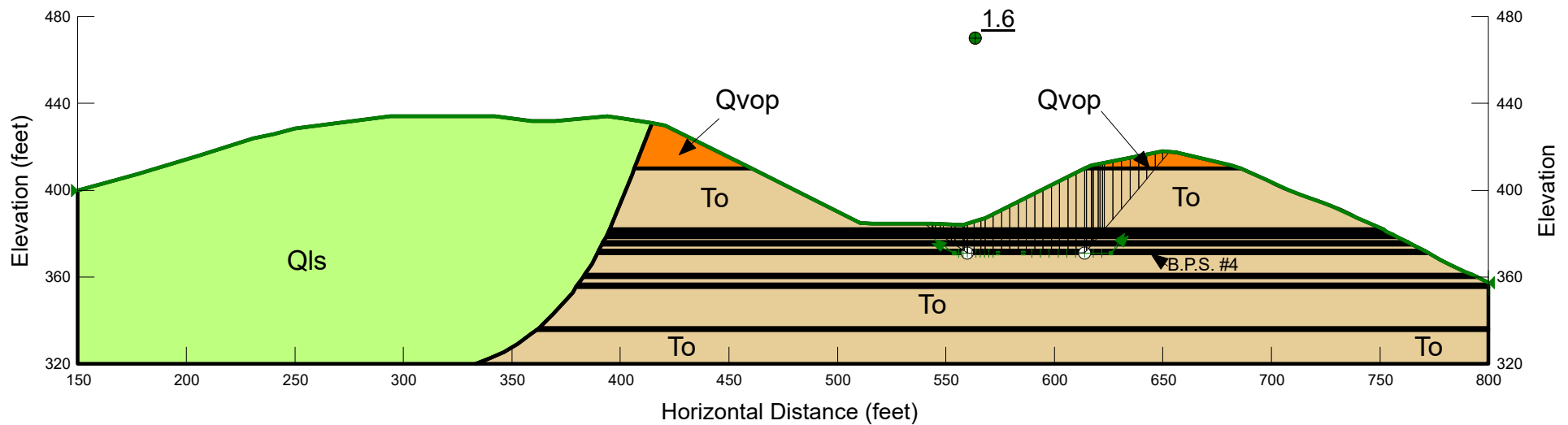
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/13/2022
 Cross Section F-F'
 Analysis: Proposed-South BPS #1

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Qvop	130	600	31
	To	130	400	29
	To-Shear	110	0	8



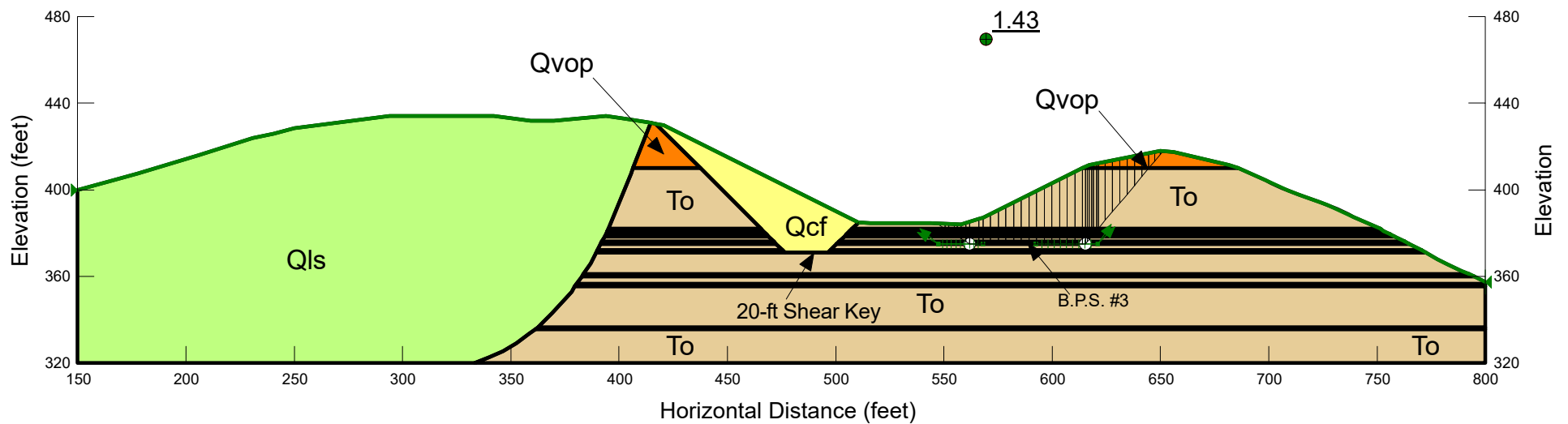
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section F-F'
 Analysis: Proposed-North BPS #4

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
■	Qls	130	300	31
■	Qvop	130	600	31
■	To	130	400	29
■	To-Shear	110	0	8



Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section F-F'
 Analysis: Proposed-North BPS #3

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Qvop	130	600	31
	To	130	400	29
	To-Shear	110	0	8



Beyer Boulevard Extension
South Otay Mesa

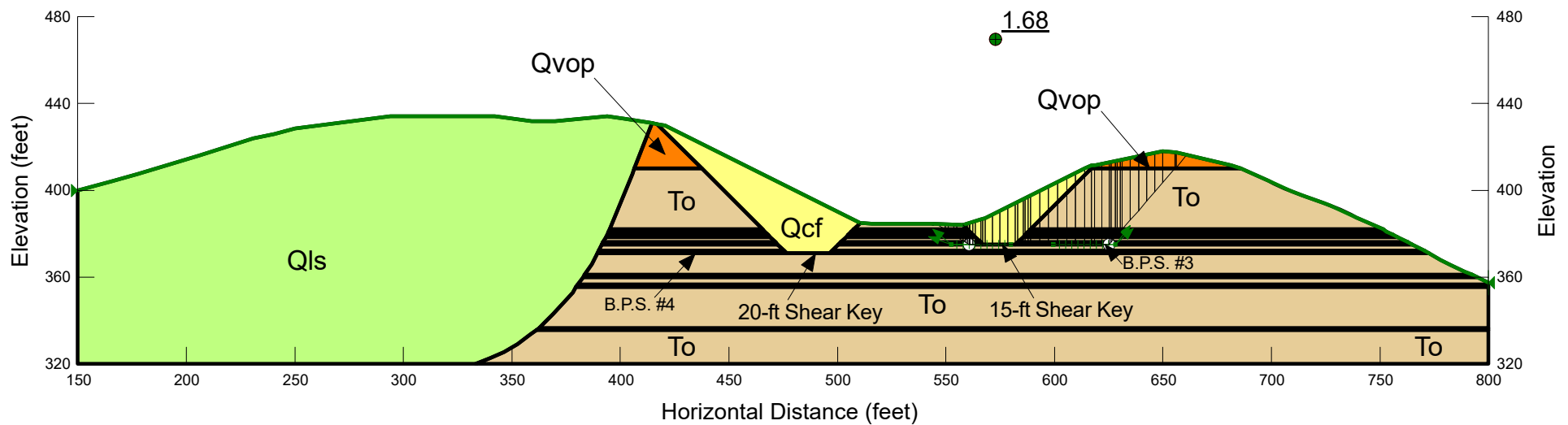
Project No. 06847-42-05

Date: 02/14/2022

Cross Section F-F'

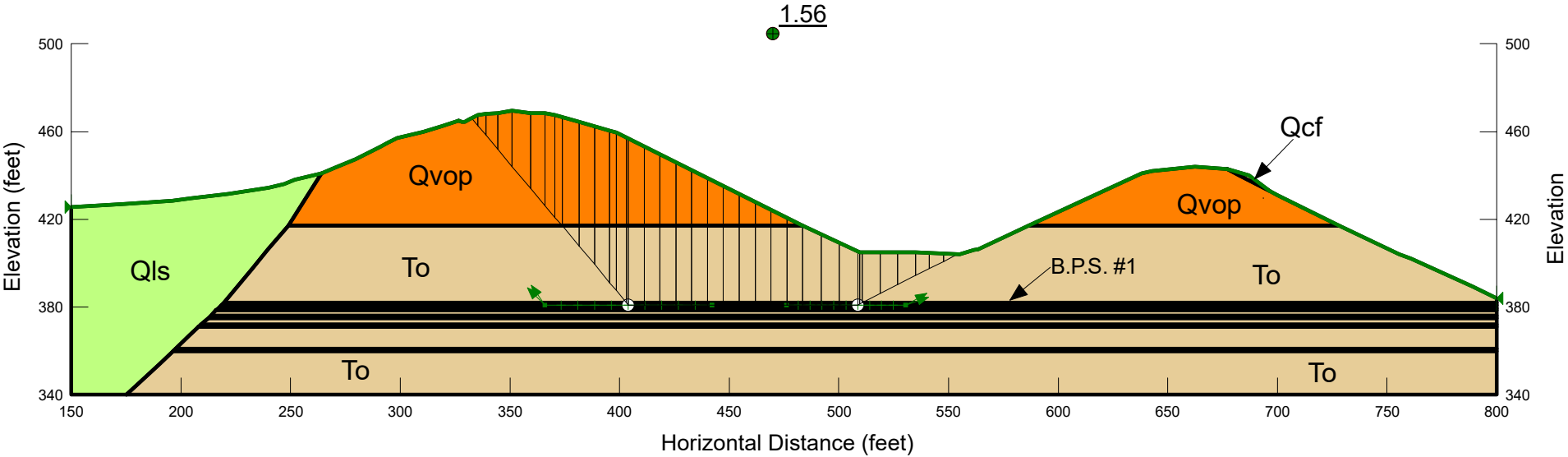
Analysis: Proposed-North BPS #3 with 15-ft Shear Key

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Qvop	130	600	31
	To	130	400	29
	To-Shear	110	0	8



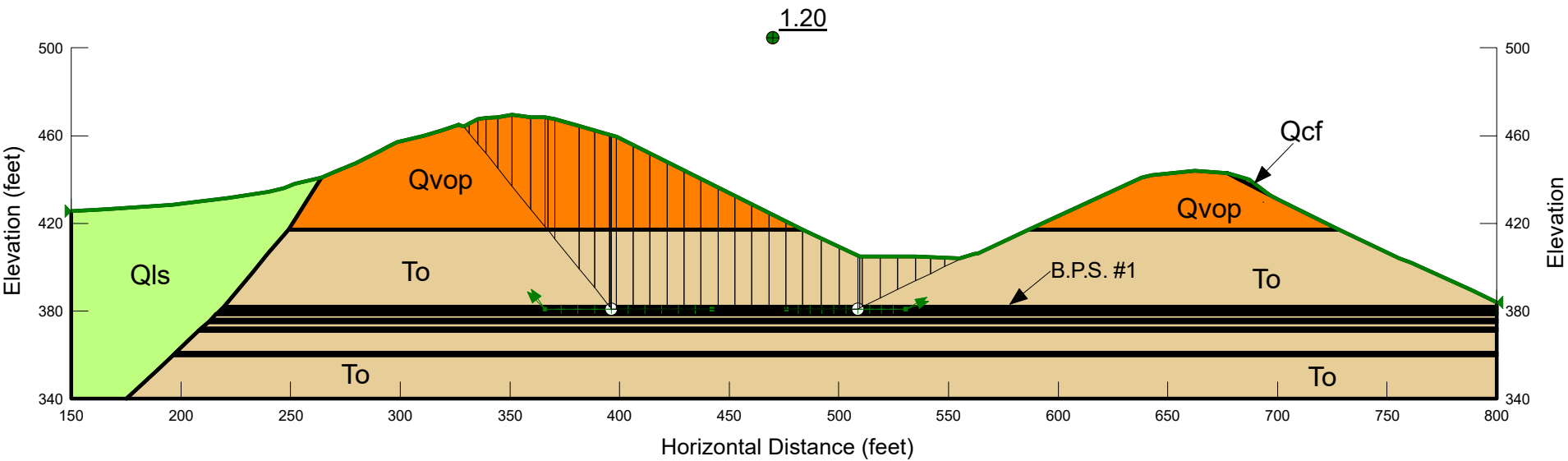
Beyer Boulevard Extension
South Otay Mesa
Project No. 06847-42-05
Date: 02/14/2022
Cross Section G-G'
Analysis: Proposed-South BPS #1

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Qvop	130	600	31
	To	130	400	29
	To-Shear	110	0	8



Beyer Boulevard Extension
South Otay Mesa
Project No. 06847-42-05
Date: 02/14/2022
Cross Section G-G'
Analysis: Proposed-South BPS #1 - Seismic
Horz Seismic Coef.: 0.101

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Qvop	130	600	31
	To	130	400	29
	To-Shear	110	0	8





Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project Beyer Boulevard
 Project Number 06847-42-05
 Date 02/14/22
 File Name GG-01_Proposed-South BPS#1_blk_Seismic

Computed By RCM

Peak Ground Acceleration (Firm Rock), MHA_r , g	0.21	10% in 50 years
Modal Magnitude, M	6.1	
Modal Distance, r, km	11.1	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y/g	NA	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	NA	<--
Max Vertical Distance, H (Feet)	NA	<--
Is Slide X-Area > 25,000ft ² (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5-95 med}$, sec	6.670	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m , sec	0.550	

Initial Screening with $MHEA = MHA = k_{max}g$

k_y/MHA	NA
$f_{EQ}(u=5cm) = (NRF/3.477) * (1.87 - \log(u/((MHA_r/g) * NRF * D_{5-95})))$	0.4798
$k_{EQ} = feq(MHA_r)/g$	0.101
Factor of Safety in Slope Analysis Using k_{EQ}	1.20

Passes Initial Screening Analysis

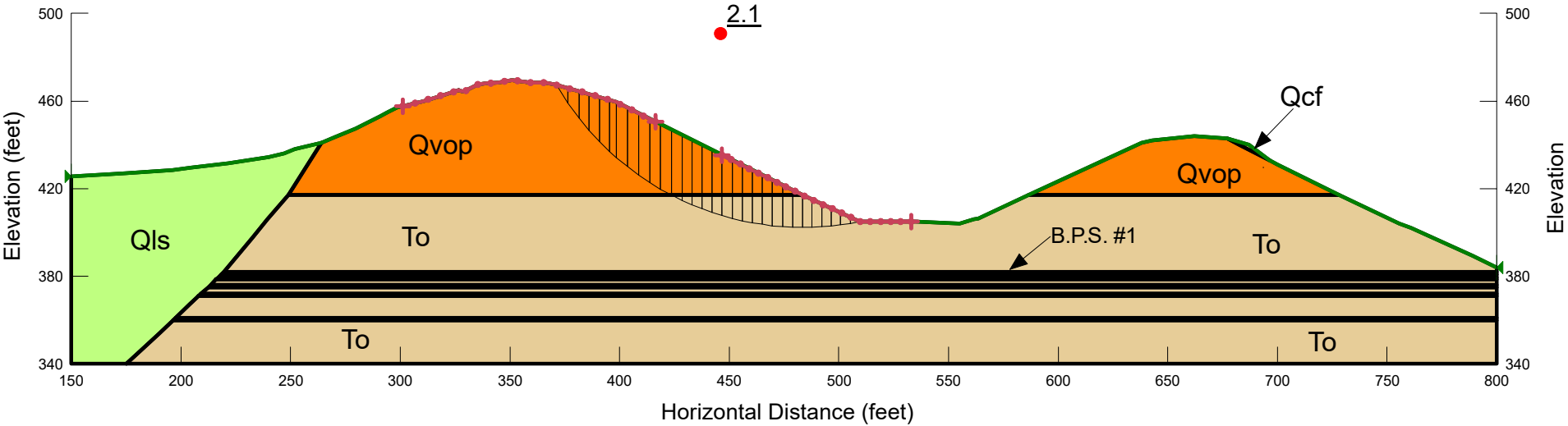
Approximation of Seismic Demand

Period of Sliding Mass, $T_s = 4H/V_s$, sec	NA
T_s/T_m	NA
$MHEA/(MHA * NRF)$	NA
$NRF = 0.6225 + 0.9196 \exp(-2.25 * MHA_r/g)$	1.20
$MHEA/g$	NA
$k_y/MHEA = k_y/k_{max}$	NA
Normalized Displacement, Normu	NA
Estimated Displacement, u (cm)	NA

FIGURE C-27B

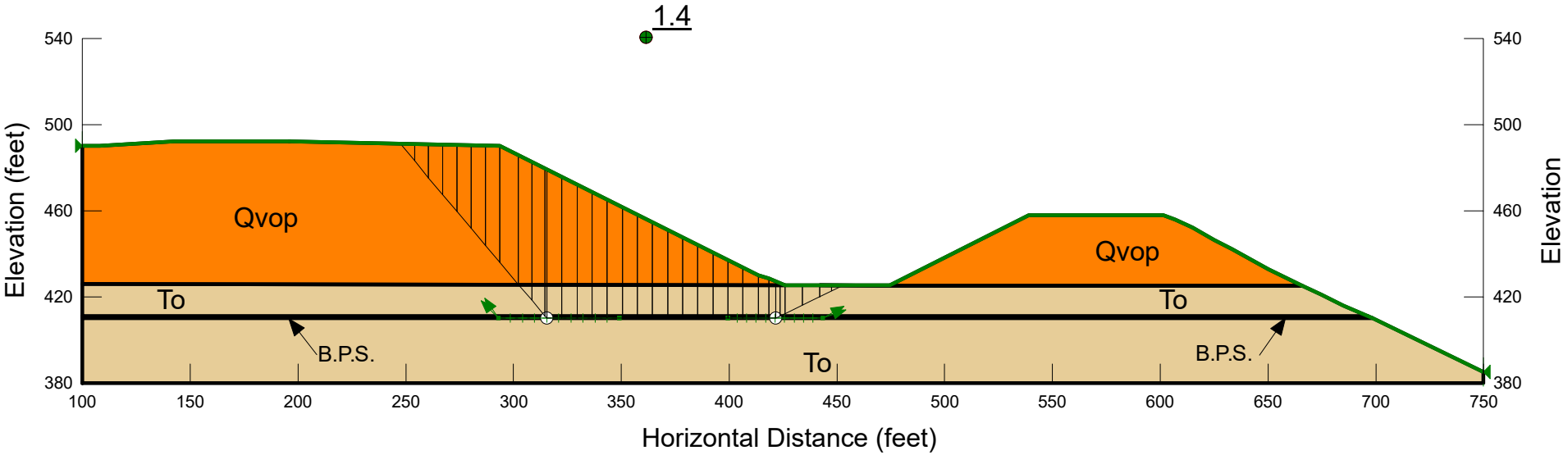
Beyer Boulevard Extension
South Otay Mesa
Project No. 06847-42-05
Date: 02/14/2022
Cross Section G-G'
Analysis: Proposed-South BPS #1

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Qvop	125	600	31
	To	130	400	29
	To-Shear	110	0	8



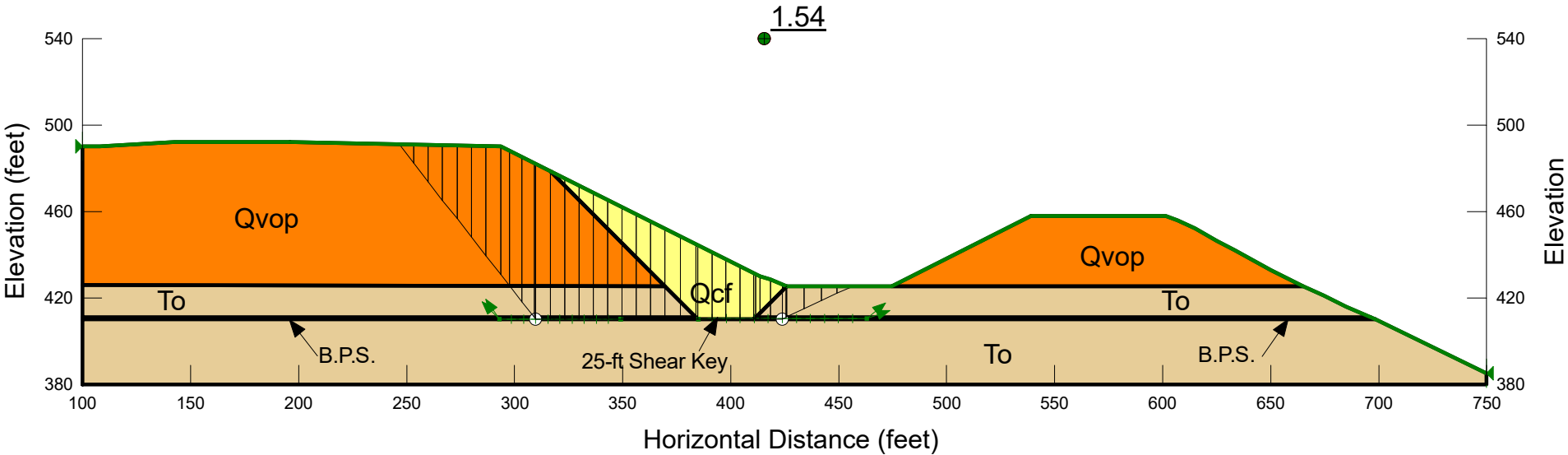
Beyer Boulevard Extension
South Otay Mesa
Project No. 06847-42-05
Date: 02/13/2022
Cross Section H-H'
Analysis: Proposed-South

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qvop	130	600	31
	To	130	400	29
	To-Shear	110	0	8



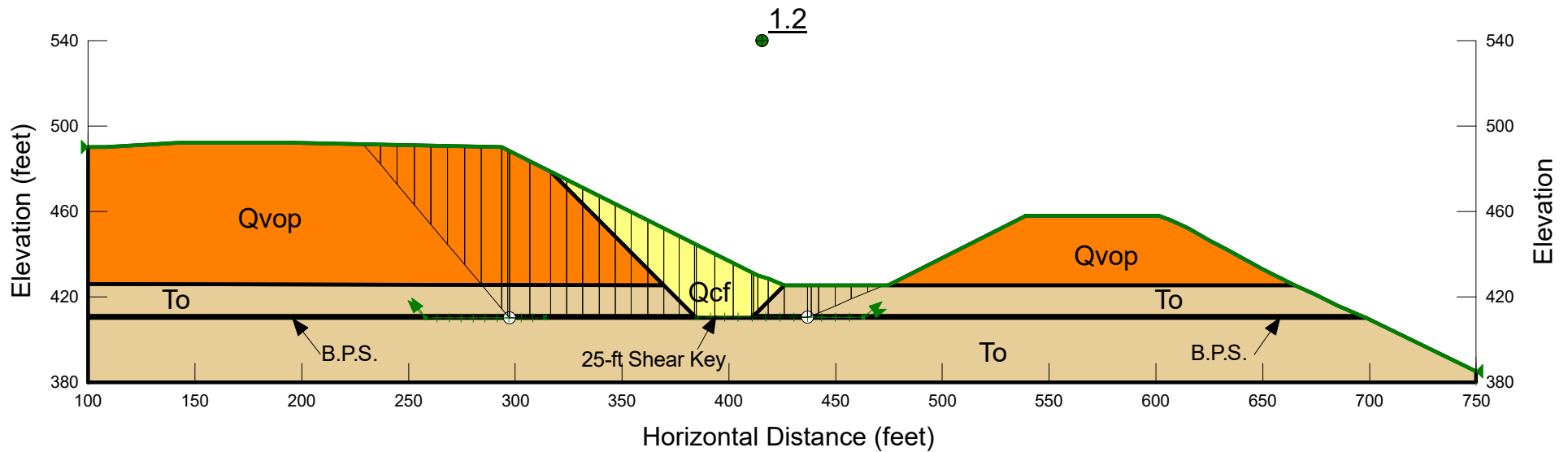
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/13/2022
 Cross Section H-H'
 Analysis: Proposed-South with 25-ft Shear Key

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qvop	130	600	31
	To	130	400	29
	To-Shear	110	0	8



Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section H-H'
 Analysis: Proposed-South Seismic
 Horz Seismic Coef.: 0.101

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qvop	130	600	31
	To	130	400	29
	To-Shear	110	0	8





Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project Beyer Boulevard
 Project Number 06847-42-05
 Date 02/14/22
 File Name HH-02A_Proposed-South_FS.1.5_Seismic

Computed By RCM

Peak Ground Acceleration (Firm Rock), MHA_r , g	0.21	10% in 50 years
Modal Magnitude, M	6.1	
Modal Distance, r, km	11.1	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y/g	NA	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	NA	<--
Max Vertical Distance, H (Feet)	NA	<--
Is Slide X-Area > 25,000ft ² (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5-95 med}$, sec	6.670	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m , sec	0.550	

Initial Screening with $MHEA = MHA = k_{max}g$

k_y/MHA	NA
$f_{EQ}(u=5cm) = (NRF/3.477) * (1.87 - \log(u/((MHA_r/g) * NRF * D_{5-95})))$	0.4798
$k_{EQ} = feq(MHA_r)/g$	0.101
Factor of Safety in Slope Analysis Using k_{EQ}	1.20

Passes Initial Screening Analysis

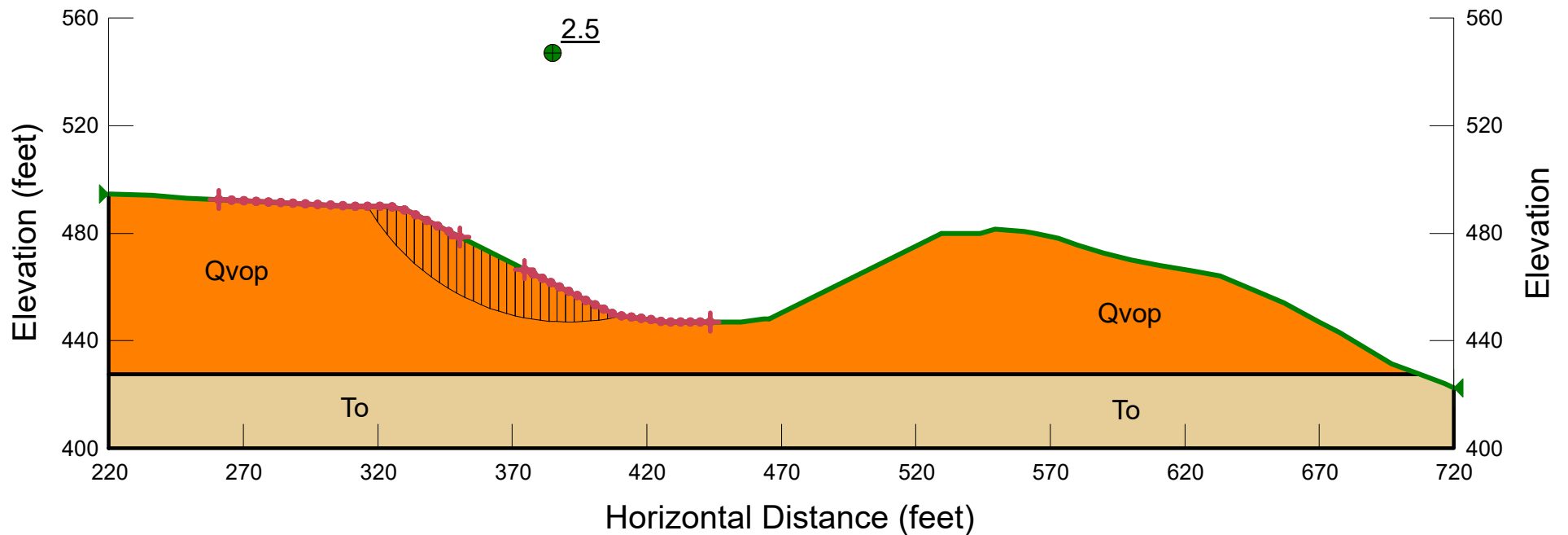
Approximation of Seismic Demand

Period of Sliding Mass, $T_s = 4H/V_s$, sec	NA
T_s/T_m	NA
$MHEA/(MHA * NRF)$	NA
$NRF = 0.6225 + 0.9196 \exp(-2.25 * MHA_r/g)$	1.20
$MHEA/g$	NA
$k_y/MHEA = k_y/k_{max}$	NA
Normalized Displacement, Normu	NA
Estimated Displacement, u (cm)	NA

FIGURE C-30B

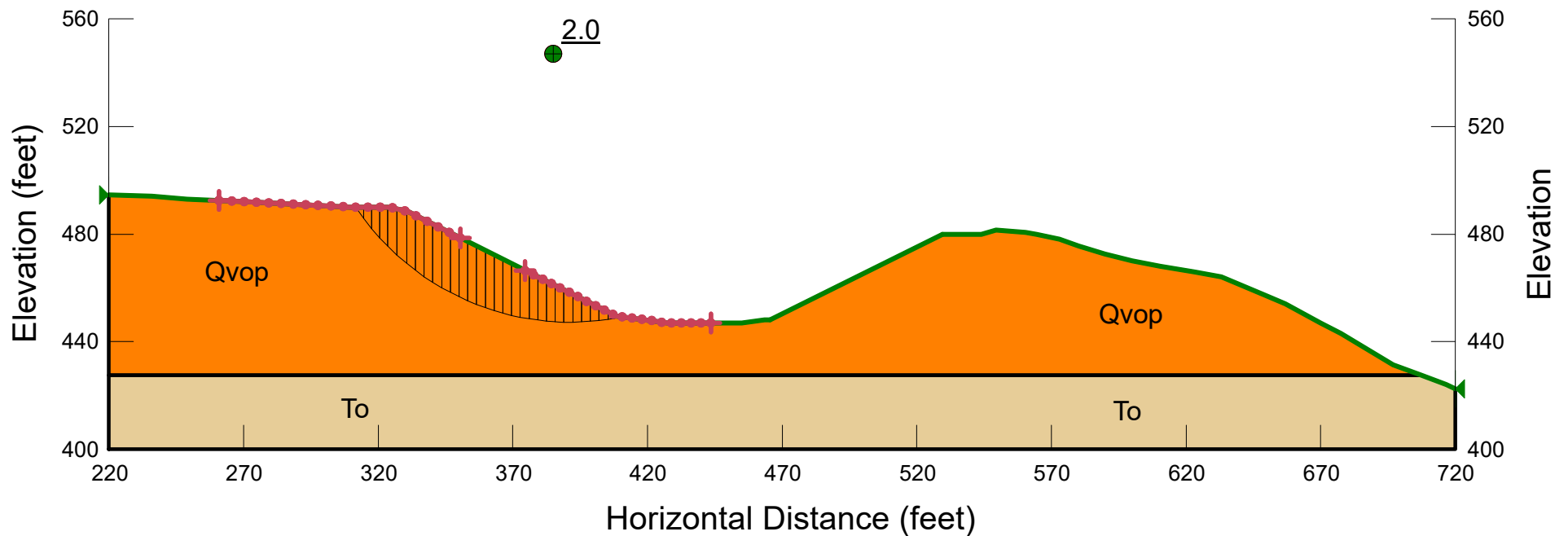
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/13/2022
 Cross Section I-I'
 Analysis: Proposed-South

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
Orange	Qvop	130	600	31
Light Tan	To	130	400	29



Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section I-I'
 Analysis: Proposed-South Seismic
 Horz Seismic Coef.: 0.101

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
■	Qvop	130	600	31
■	To	130	400	29





Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project Beyer Boulevard
 Project Number 06847-42-05
 Date 02/14/22
 File Name II-01_Proposed-South Slope_Seismic

Computed By RCM

Peak Ground Acceleration (Firm Rock), MHA_r , g	0.21	10% in 50 years
Modal Magnitude, M	6.1	
Modal Distance, r, km	11.1	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y/g	NA	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	NA	<--
Max Vertical Distance, H (Feet)	NA	<--
Is Slide X-Area > 25,000ft ² (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5-95 med}$, sec	6.670	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m , sec	0.550	

Initial Screening with $MHEA = MHA = k_{max}g$

k_y/MHA	NA
$f_{EQ}(u=5cm) = (NRF/3.477) * (1.87 - \log(u/((MHA_r/g) * NRF * D_{5-95})))$	0.4798
$k_{EQ} = feq(MHA_r)/g$	0.101
Factor of Safety in Slope Analysis Using k_{EQ}	2.00

Passes Initial Screening Analysis

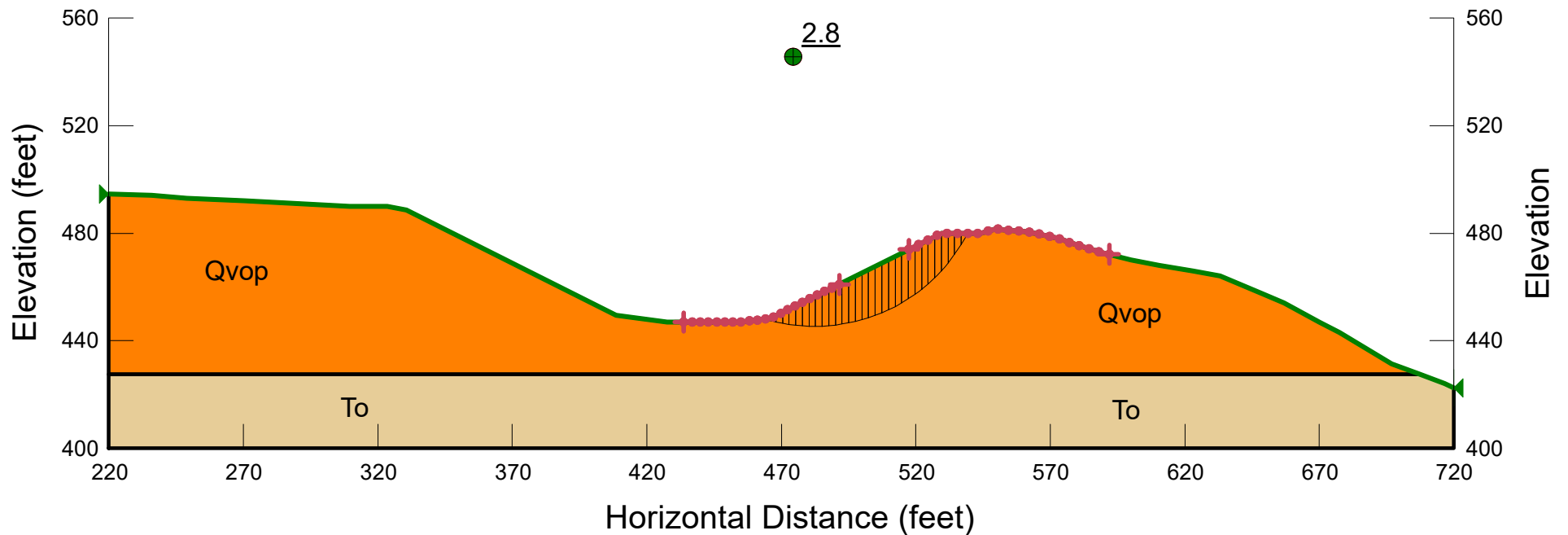
Approximation of Seismic Demand

Period of Sliding Mass, $T_s = 4H/V_s$, sec	NA
T_s/T_m	NA
$MHEA/(MHA * NRF)$	NA
$NRF = 0.6225 + 0.9196 \exp(-2.25 * MHA_r/g)$	1.20
$MHEA/g$	NA
$k_y/MHEA = k_y/k_{max}$	NA
Normalized Displacement, Normu	NA
Estimated Displacement, u (cm)	NA

FIGURE C-31B

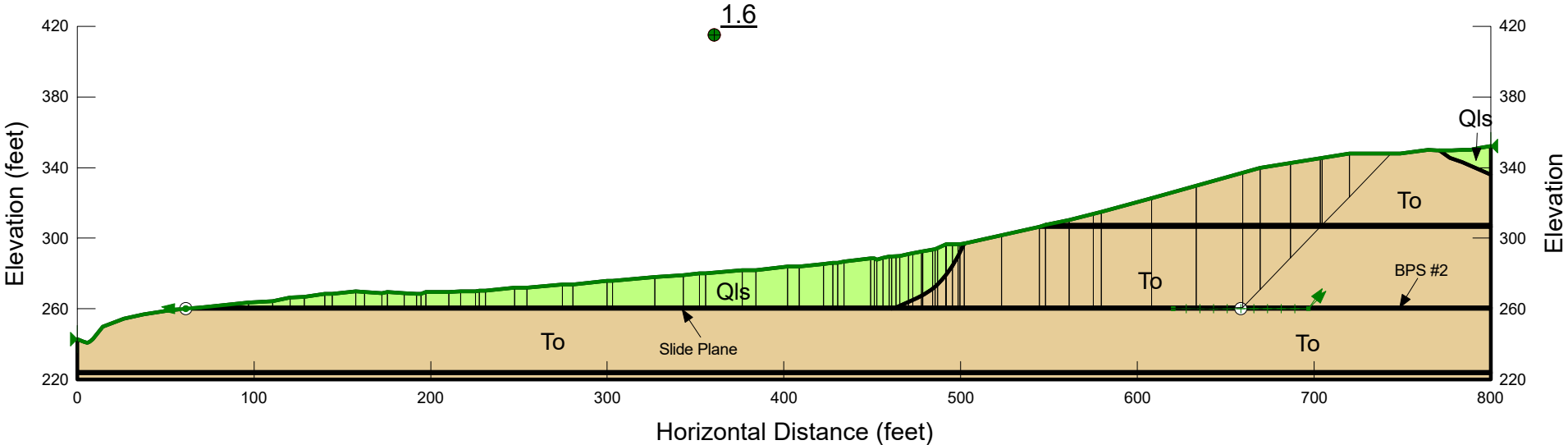
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/13/2022
 Cross Section I-I'
 Analysis: Proposed-North

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
■	Qvop	130	600	31
■	To	130	400	29



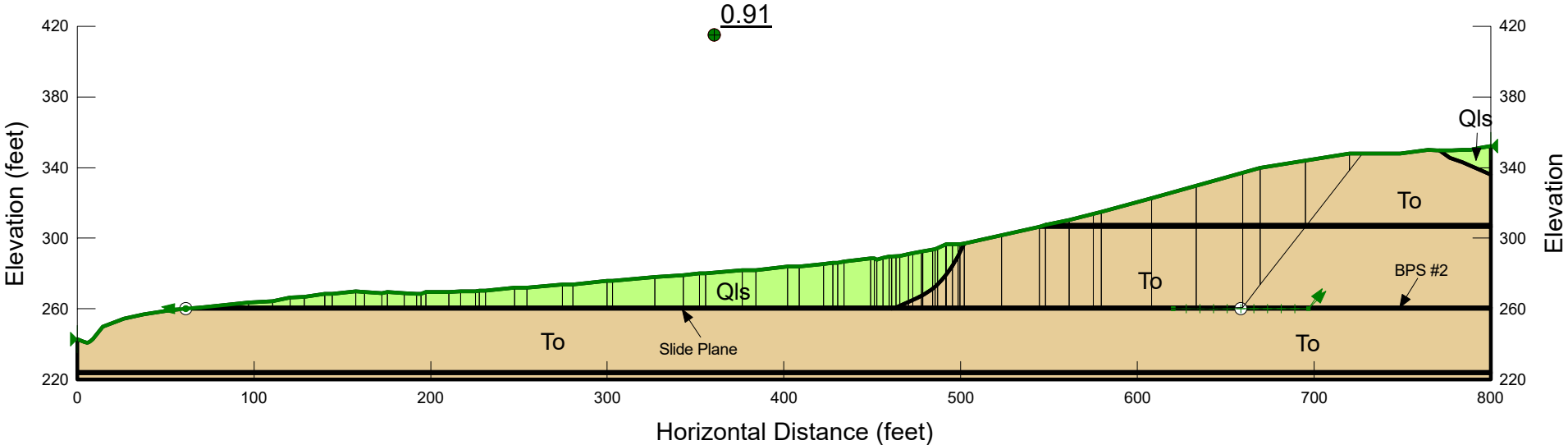
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section J-J'
 Analysis: Proposed-BPS #2

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8



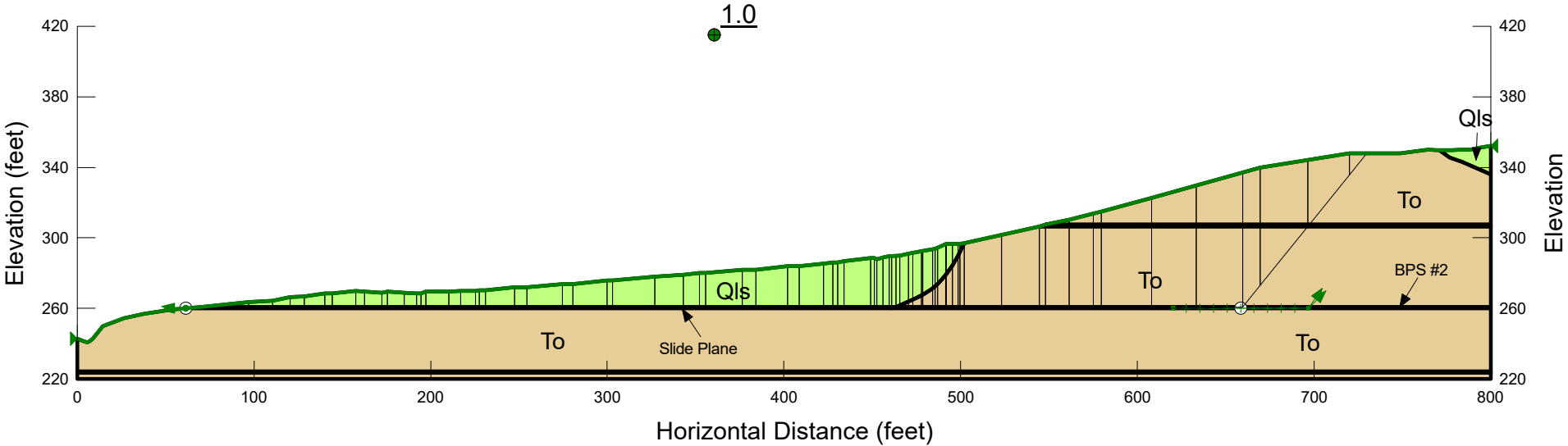
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section J-J'
 Analysis: Proposed-BPS #2

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8



Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section J-J'
 Analysis: Proposed-BPS #2 Seismic - Yield Acceleration Determination
 Horz Seismic Coef.: 0.08

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8





Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project Beyer Boulevard
 Project Number 06847-42-05
 Date 02/14/22
 File Name JJ-01_Proposed-BPS#2_Seismic

Computed By RCM

Peak Ground Acceleration (Firm Rock), MHA_r , g	0.21	10% in 50 years
Modal Magnitude, M	6.1	
Modal Distance, r, km	11.1	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y /g	0.08	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	1761	<--
Max Vertical Distance, H (Feet)	90	<--
Is Slide X-Area > 25,000ft ² (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, D_{5-95} med, sec	6.670	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m , sec	0.550	

Initial Screening with $MHEA = MHA = k_{max}g$

k_y/MHA	0.3810
$f_{EQ}(u=5cm) = (NRF/3.477) * (1.87 - \log(u/((MHA_r/g) * NRF * D_{5-95})))$	0.4798
$k_{EQ} = feq(MHA_r)/g$	0.101
Factor of Safety in Slope Analysis Using k_{EQ}	0.91

Fails Initial Screening Analysis

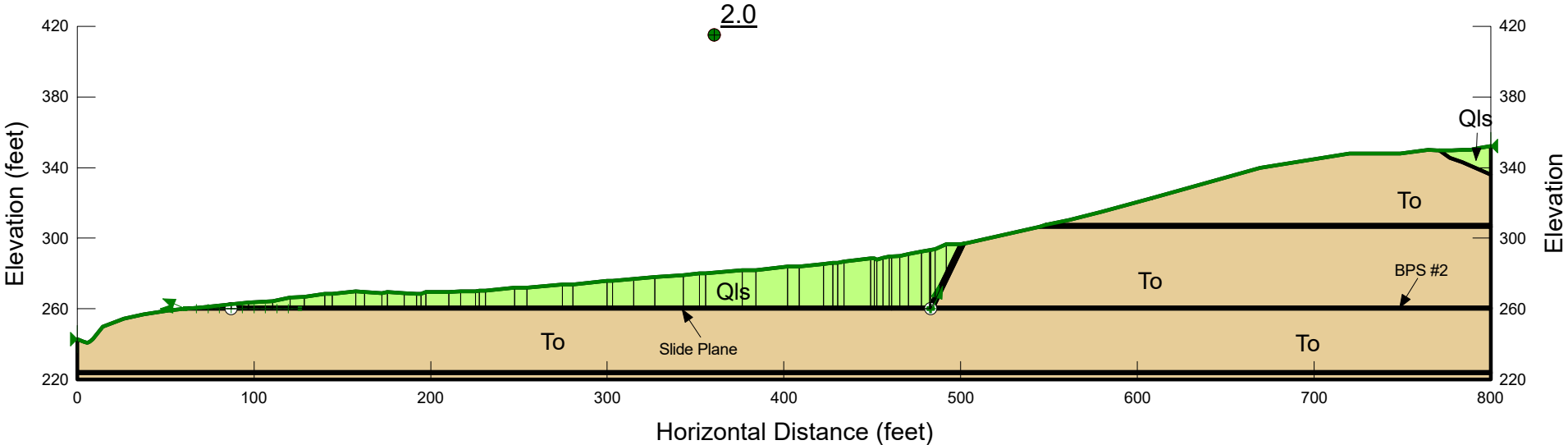
Approximation of Seismic Demand

Period of Sliding Mass, $T_s = 4H/V_s$, sec	0.204
T_s/T_m	0.37
$MHEA/(MHA * NRF)$	1.000
$NRF = 0.6225 + 0.9196 \exp(-2.25 * MHA_r/g)$	1.20
$MHEA/g$	0.25
$k_y/MHEA = k_y/k_{max}$	0.32
Normalized Displacement, Normu	5.8
Estimated Displacement, u (cm)	10

FIGURE C-33C

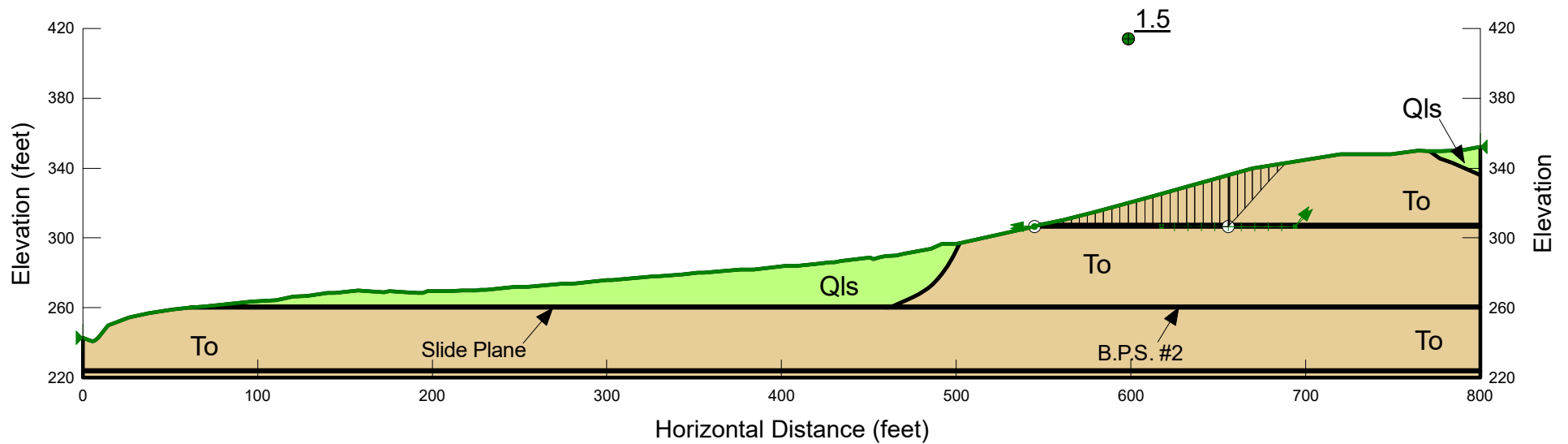
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section J-J'
 Analysis: Proposed-BPS #2

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29
	To-Shear	110	0	8



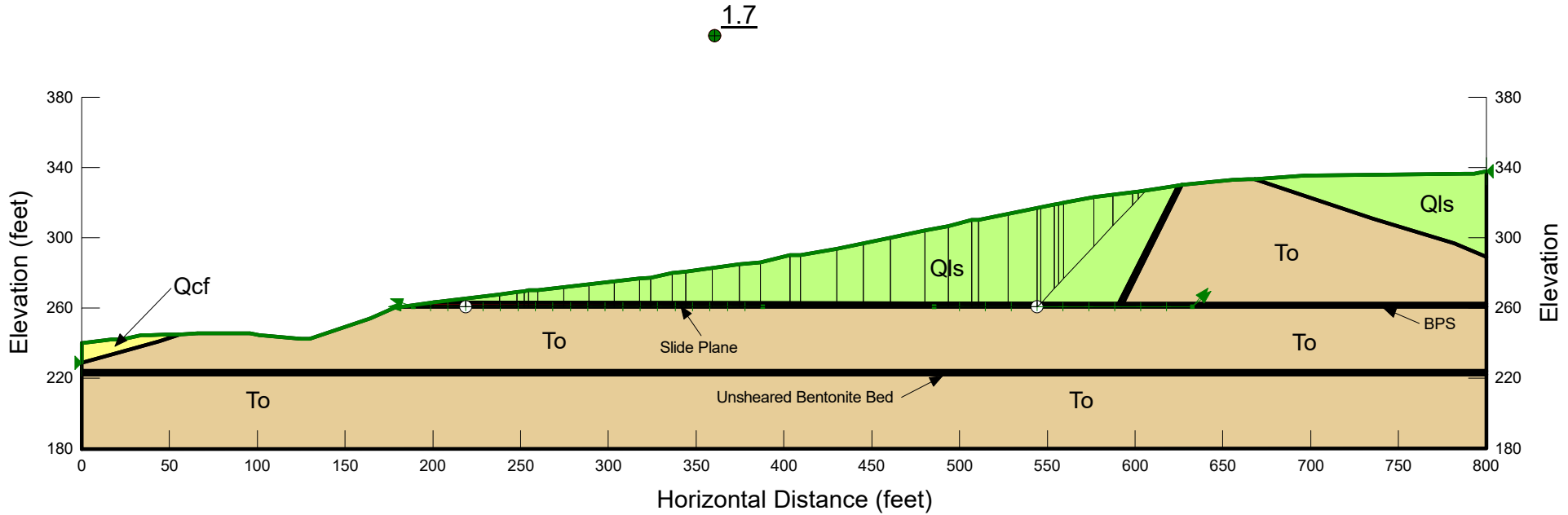
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section J-J'
 Analysis: Proposed-BPS #1

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qls	130	300	31
	To	130	400	29
	To-Shear	110	0	8



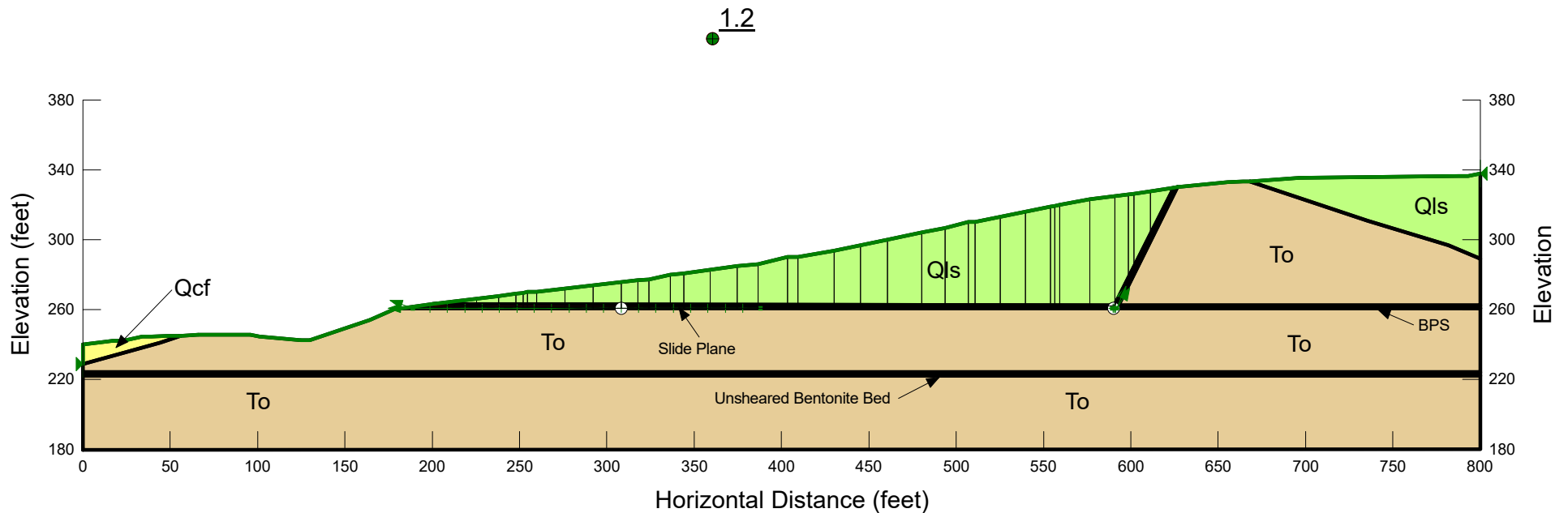
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section L-L'
 Analysis: Proposed-Slide and BPS

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29
	Tob	130	560	16
	To-Shear	110	0	8



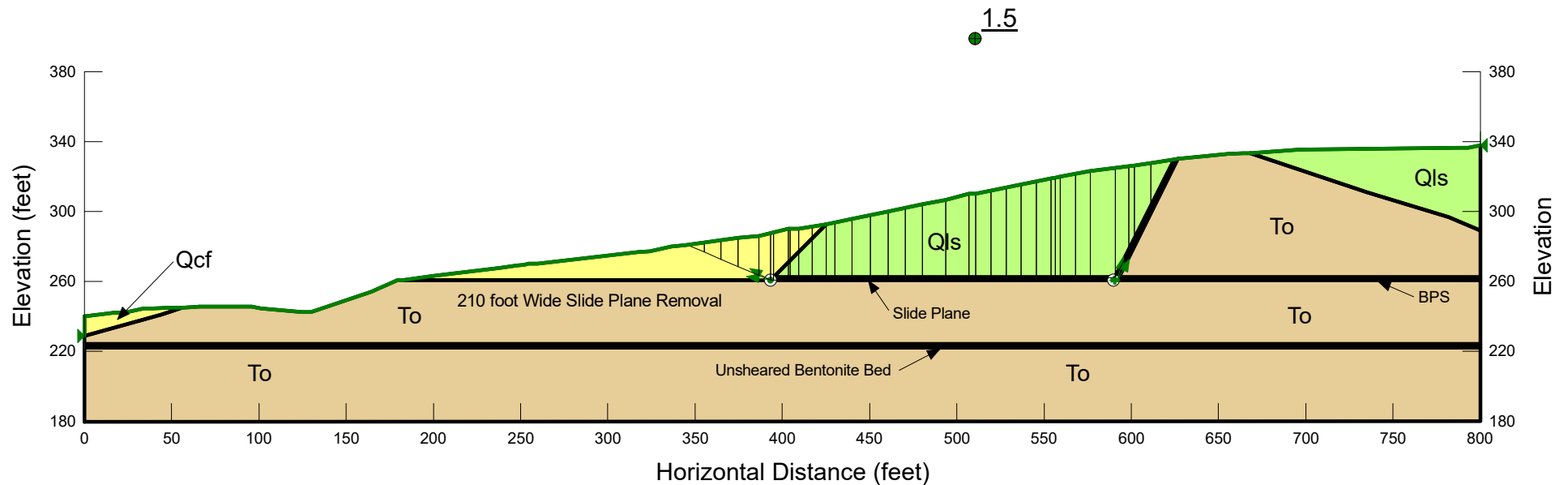
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section L-L'
 Analysis: Proposed - Failure up Slide Plane

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29
	Tob	130	560	16
	To-Shear	110	0	8



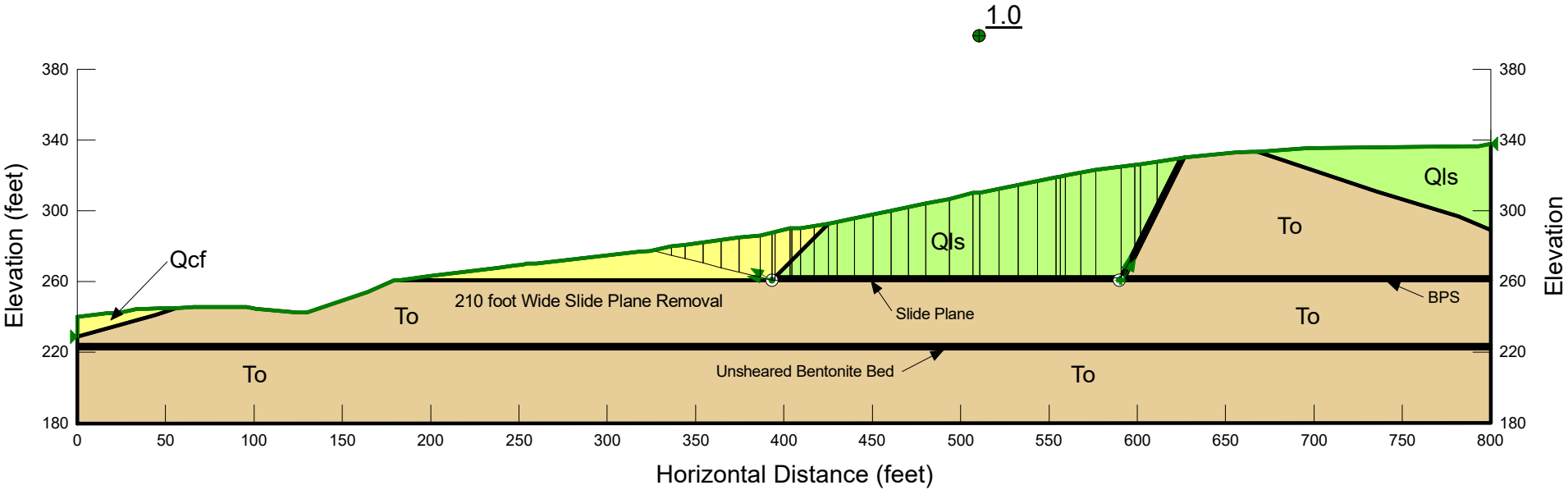
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section L-L'
 Analysis: Proposed - with 210 foot Wide Buttress

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29
	Tob	130	560	16
	To-Shear	110	0	8



Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section L-L'
 Analysis: Proposed - Seismic
 Horz Seismic Coef.: 0.101

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29
	Tob	130	560	16
	To-Shear	110	0	8





Seismic Slope Stability Evaluation

Input Data in Shaded Areas

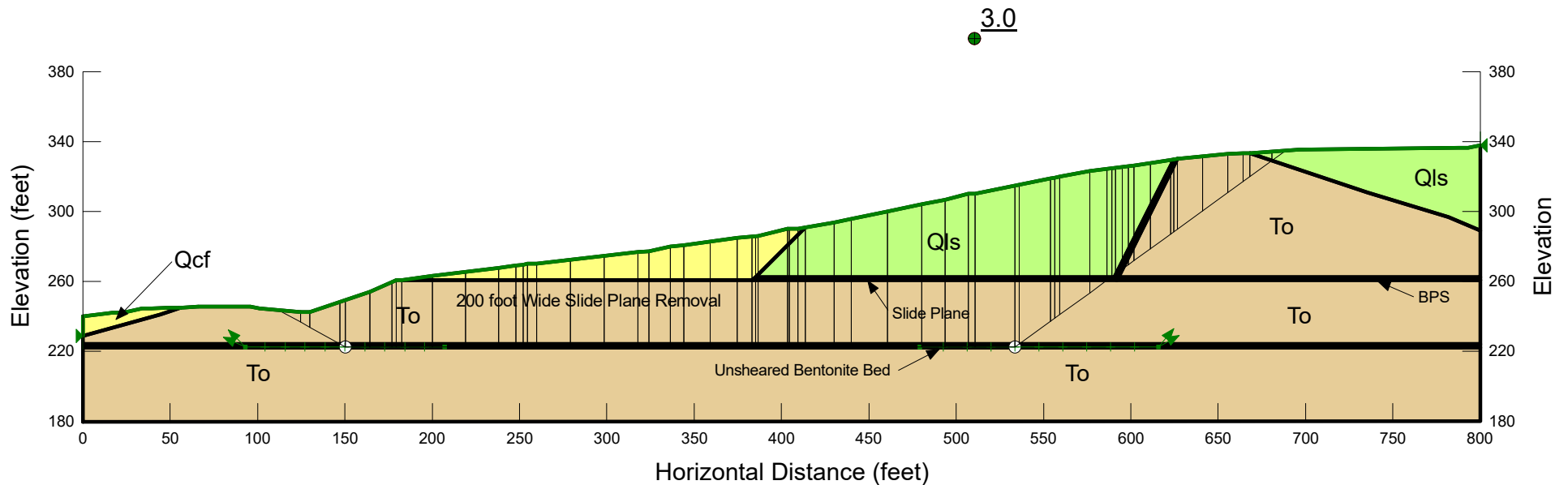
Project	Beyer Boulevard	Computed By	RCM
Project Number	06847-42-05		
Date	02/14/22		
File Name	LL-03_Proposed_Failure Up Slide_FS15_Seismic		

Peak Ground Acceleration (Firm Rock), MHA_r , g	0.21	10% in 50 years	
Modal Magnitude, M	6.1		
Modal Distance, r, km	11.1		
Site Condition, S (0 for rock, 1 for soil)	1		
Yield Acceleration, k_y/g	NA	<-- Enter Value or NA for Screening Analysis	
Shear Wave Velocity, V_s (ft/sec)	NA	<--	
Max Vertical Distance, H (Feet)	NA	<--	
Is Slide X-Area > 25,000ft ² (Y/N)	N	<-- Use "N" for Buttress Fills	
Correction for horizontal incoherence	1.0		
Duration, $D_{5-95 med}$, sec	6.670		
Coefficient, C_1	0.5190		
Coefficient, C_2	0.0837		
Coefficient, C_3	0.0019		
Standard Error, ε_T	0.437		
Mean Square Period, T_m , sec	0.550		
Initial Screening with $MHEA = MHA = k_{max}g$			
k_y/MHA	NA	Approximation of Seismic Demand	
$f_{EQ}(u=5cm) = (NRF/3.477) * (1.87 - \log(u/((MHA_r/g) * NRF * D_{5-95})))$	0.4798	Period of Sliding Mass, $T_s = 4H/V_s$, sec	NA
$k_{EQ} = f_{eq}(MHA_r)/g$	0.101	T_s/T_m	NA
Factor of Safety in Slope Analysis Using k_{EQ}	1.00	$MHEA/(MHA * NRF)$	NA
Passes Initial Screening Analysis		$NRF = 0.6225 + 0.9196 \exp(-2.25 * MHA_r/g)$	1.20
		$MHEA/g$	NA
		$k_y/MHEA = k_y/k_{max}$	NA
		Normalized Displacement, Normu	NA
		Estimated Displacement, u (cm)	NA

FIGURE C-38B

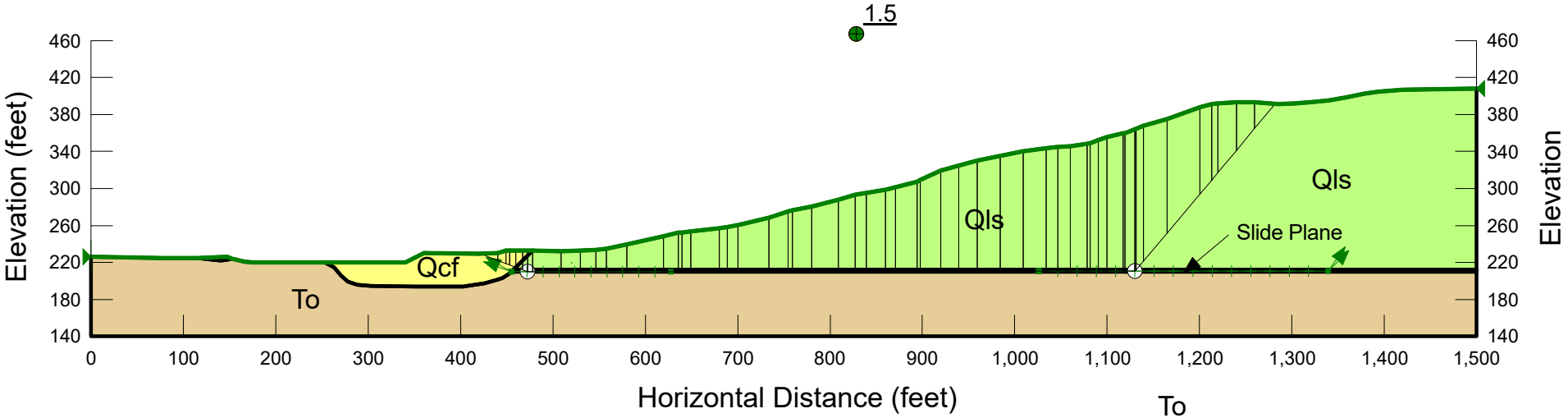
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section L-L'
 Analysis: Proposed - Failure on Tob

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29
	Tob	130	560	16
	To-Shear	110	0	8



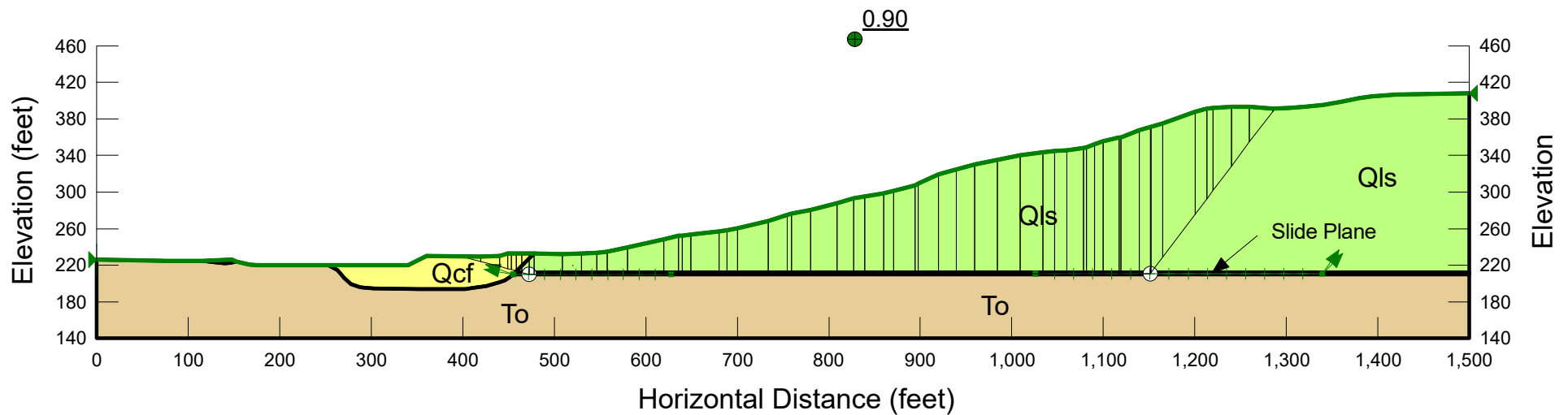
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/13/2022
 Cross Section M-M'
 Analysis: Proposed condition with alluvial removal

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Qvop	130	600	31
	Slide Plane	110	0	8
	To	130	400	29



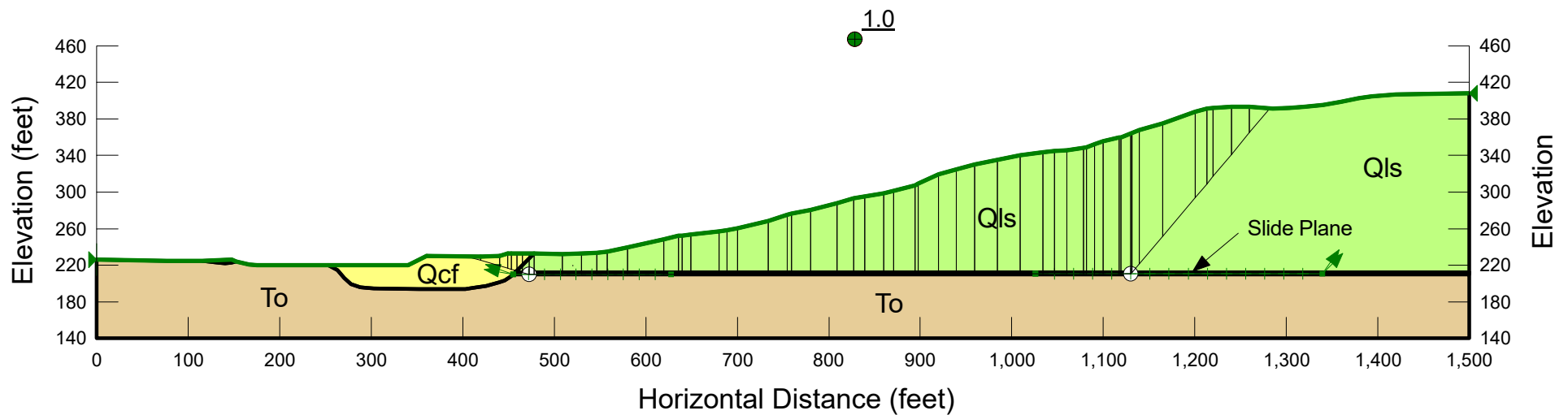
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section M-M'
 Analysis: Proposed condition - Seismic
 Horz Seismic Coef.: 0.101

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Qvop	130	600	31
	Slide Plane	110	0	8
	To	130	400	29



Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section M-M'
 Analysis: Proposed condition - Seismic (Yield Acceleration)
 Horz Seismic Coef.: 0.08

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Qvop	130	600	31
	Slide Plane	110	0	8
	To	130	400	29





Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project Beyer Boulevard
 Project Number 06847-42-05
 Date 02/14/22
 File Name MM-1A_Proosed_Seismic

Computed By RCM

Peak Ground Acceleration (Firm Rock), MHA_r , g	0.21	10% in 50 years
Modal Magnitude, M	6.1	
Modal Distance, r, km	11.1	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y /g	0.08	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	1761	<--
Max Vertical Distance, H (Feet)	190	<--
Is Slide X-Area > 25,000ft ² (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5-95 med}$, sec	6.670	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m , sec	0.550	

Initial Screening with $MHEA = MHA = k_{max}g$

k_y/MHA	0.3810
$f_{EQ}(u=5cm) = (NRF/3.477) * (1.87 - \log(u/((MHA_r/g) * NRF * D_{5-95})))$	0.4798
$k_{EQ} = feq(MHA_r)/g$	0.101
Factor of Safety in Slope Analysis Using k_{EQ}	0.90

Fails Initial Screening Analysis

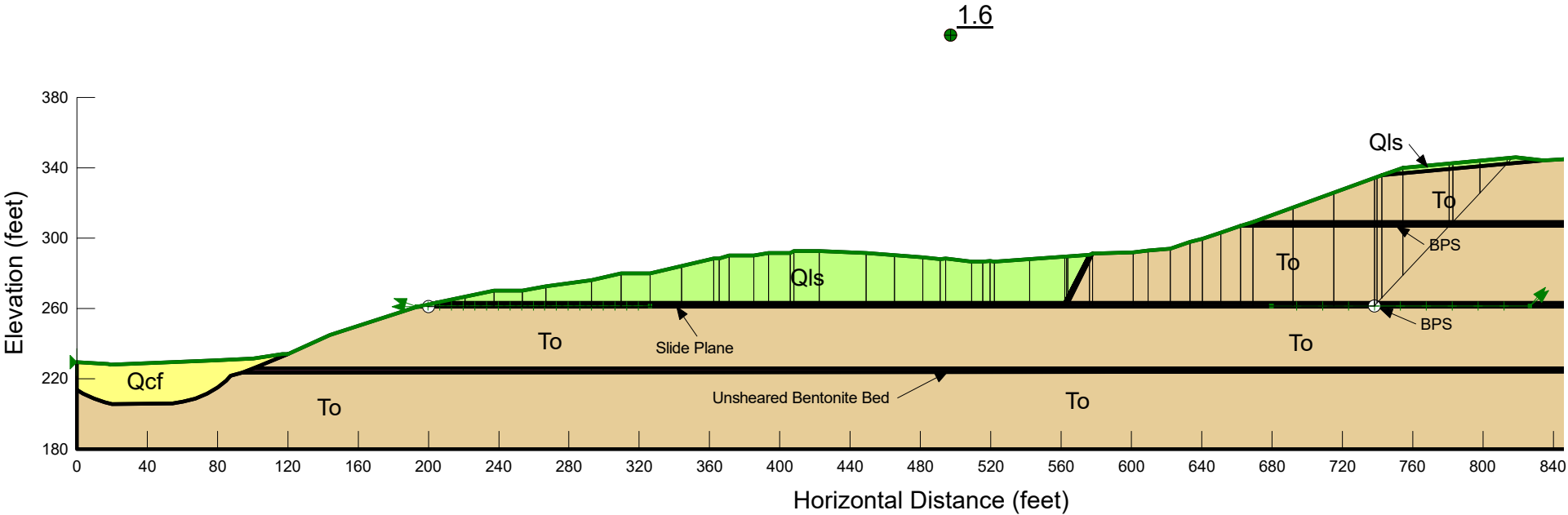
Approximation of Seismic Demand

Period of Sliding Mass, $T_s = 4H/V_s$, sec	0.432
T_s/T_m	0.78
$MHEA/(MHA * NRF)$	0.648
$NRF = 0.6225 + 0.9196 \exp(-2.25 * MHA_r/g)$	1.20
$MHEA/g$	0.16
$k_y/MHEA = k_y/k_{max}$	0.49
Normalized Displacement, Normu	1.4
Estimated Displacement, u (cm)	2

FIGURE C-40C

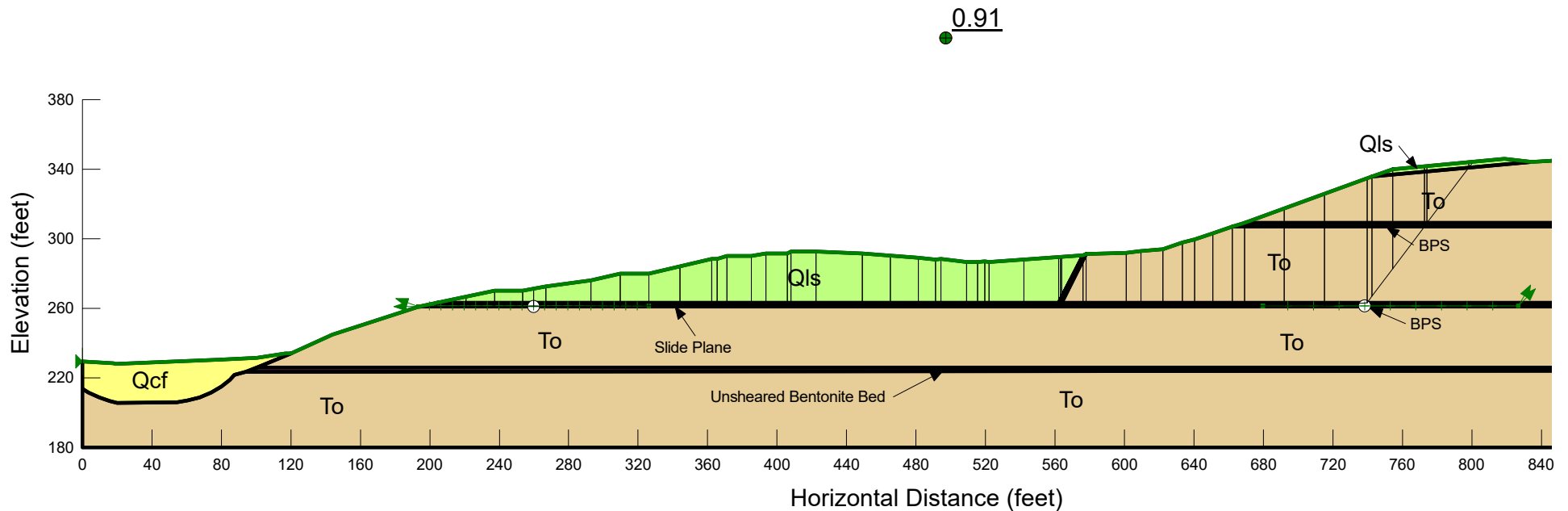
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/13/2022
 Cross Section N-N'
 Analysis: Proposed-Slide and BPS

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29
	Tob	130	560	16
	To-Shear	110	0	8



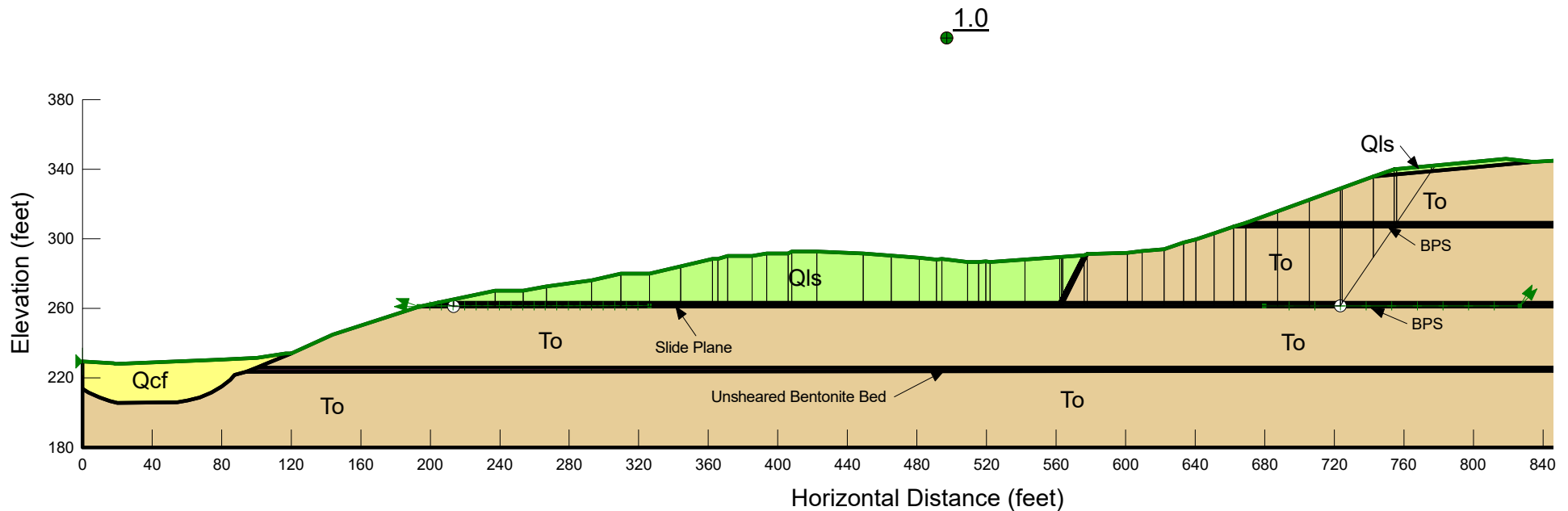
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section N-N'
 Analysis: Proposed-Seismic
 Horz Seismic Coef.: 0.101

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29
	Tob	130	560	16
	To-Shear	110	0	8



Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section N-N'
 Analysis: Proposed-Seismic(Yield Acceleration)
 Horz Seismic Coef.: 0.08

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29
	Tob	130	560	16
	To-Shear	110	0	8





Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project Beyer Boulevard
 Project Number 06847-42-05
 Date 02/14/22
 File Name NN-01_Proosed_Slide-BPS_Seismic

Computed By RCM

Peak Ground Acceleration (Firm Rock), MHA_r , g	0.21	10% in 50 years
Modal Magnitude, M	6.1	
Modal Distance, r, km	11.1	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y/g	0.08	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	1761	<--
Max Vertical Distance, H (Feet)	97	<--
Is Slide X-Area > 25,000ft ² (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5-95 med}$, sec	6.670	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m , sec	0.550	

Initial Screening with $MHEA = MHA = k_{max}g$

k_y/MHA	0.3810
$f_{EQ}(u=5cm) = (NRF/3.477) * (1.87 - \log(u/((MHA_r/g) * NRF * D_{5-95})))$	0.4798
$k_{EQ} = feq(MHA_r)/g$	0.101
Factor of Safety in Slope Analysis Using k_{EQ}	0.91

Fails Initial Screening Analysis

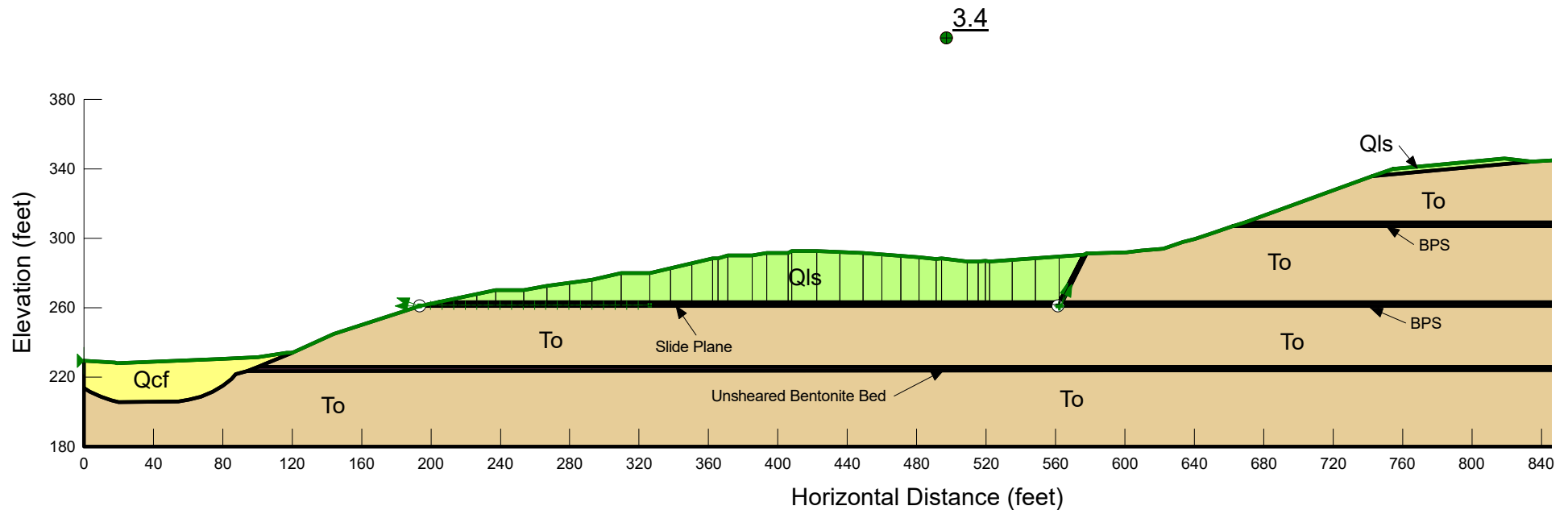
Approximation of Seismic Demand

Period of Sliding Mass, $T_s = 4H/V_s$, sec	0.220
T_s/T_m	0.40
$MHEA/(MHA * NRF)$	1.000
$NRF = 0.6225 + 0.9196 \exp(-2.25 * MHA_r/g)$	1.20
$MHEA/g$	0.25
$k_y/MHEA = k_y/k_{max}$	0.32
Normalized Displacement, Normu	5.8
Estimated Displacement, u (cm)	10

FIGURE C-41C

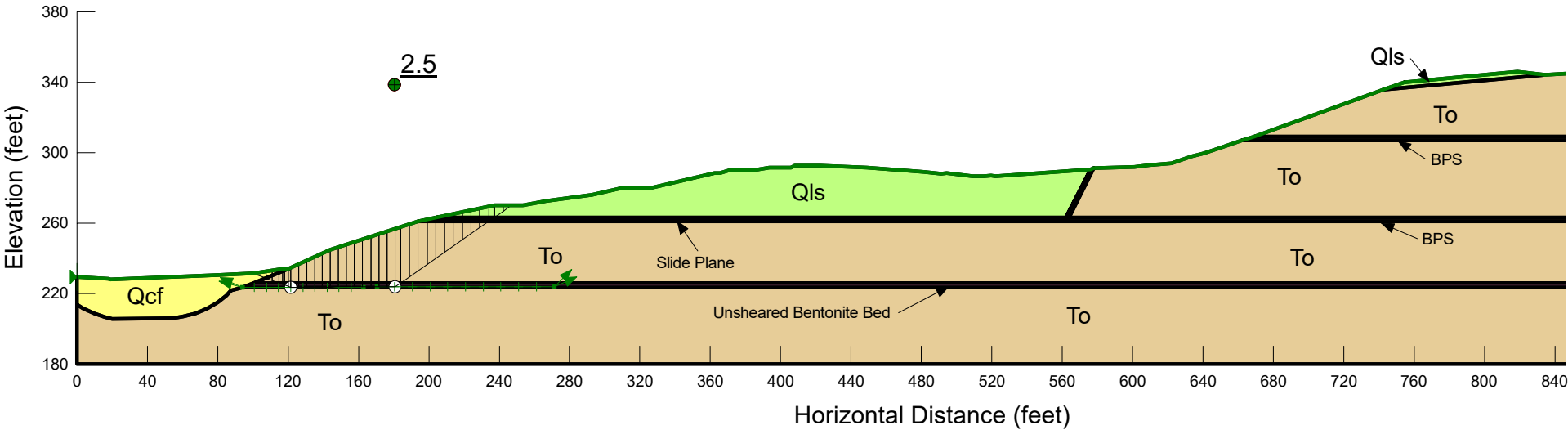
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/13/2022
 Cross Section N-N'
 Analysis: Failure up Slide Plane

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29
	Tob	130	560	16
	To-Shear	110	0	8



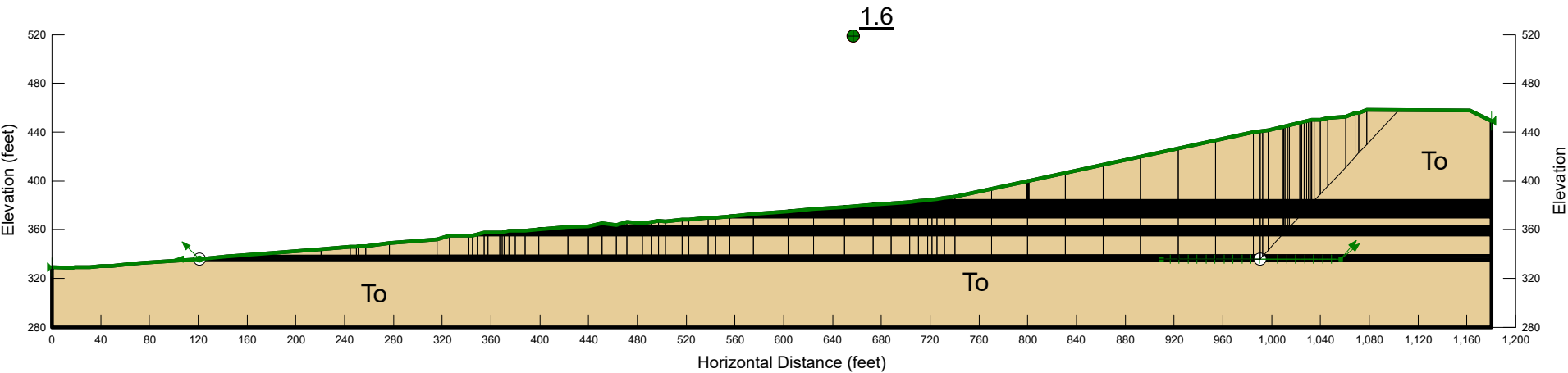
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/13/2022
 Cross Section N-N'
 Analysis: Failure on Tob

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf	130	300	25
	Qls	130	300	31
	Slide Plane	110	0	8
	To	130	400	29
	Tob	130	560	16
	To-Shear	110	0	8



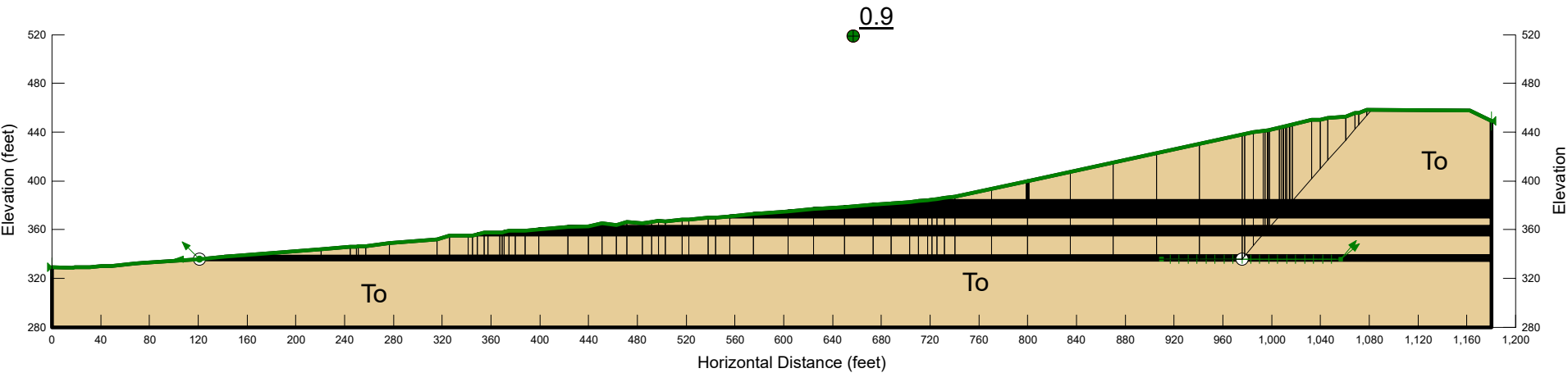
Beyer Boulevard Extension
South Otay Mesa
Project No. 06847-42-05
Date: 02/13/2022
Cross Section O-O'
Analysis: Proposed-Failure on Lower BPS

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	To	130	400	29
	To-Shear	110	0	8



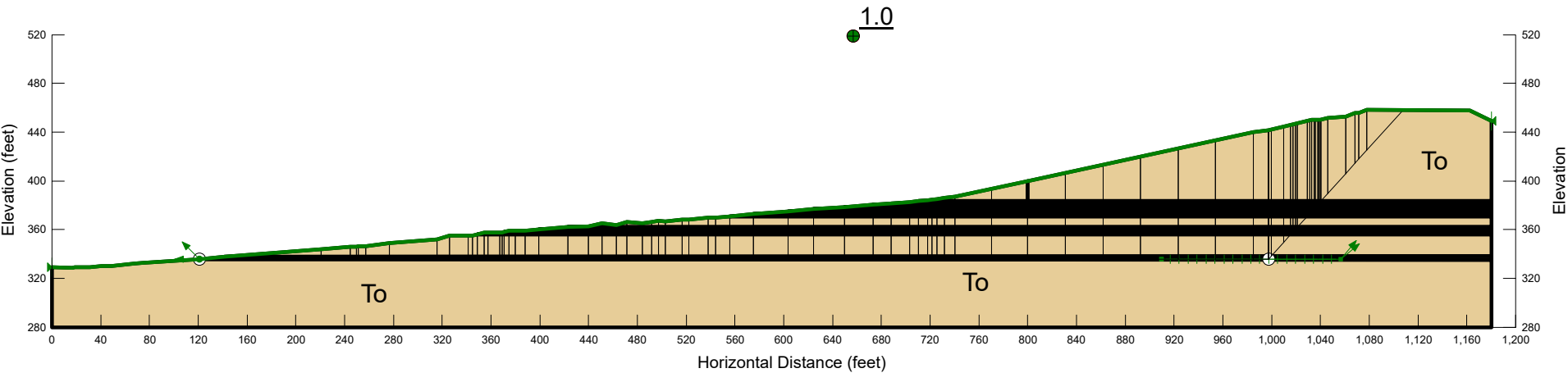
Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section O-O'
 Analysis: Proposed - Seismic
 Horz Seismic Coef.: 0.101

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	To	130	400	29
	To-Shear	110	0	8



Beyer Boulevard Extension
 South Otay Mesa
 Project No. 06847-42-05
 Date: 02/14/2022
 Cross Section O-O'
 Analysis: Proposed - Seismic (Yield Acceleration)
 Horz Seismic Coef.: 0.08

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	To	130	400	29
	To-Shear	110	0	8





Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project Beyer Boulevard
 Project Number 06847-42-05
 Date 02/14/22
 File Name 00-01_Proposed (extended)_Seismic

Computed By RCM

Peak Ground Acceleration (Firm Rock), MHA_r , g	0.21	10% in 50 years
Modal Magnitude, M	6.1	
Modal Distance, r, km	11.1	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y /g	0.08	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	1761	<--
Max Vertical Distance, H (Feet)	124	<--
Is Slide X-Area > 25,000ft ² (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5-95 med}$, sec	6.670	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m , sec	0.550	

Initial Screening with $MHEA = MHA = k_{max}g$

k_y/MHA	0.3810
$f_{EQ}(u=5cm) = (NRF/3.477) * (1.87 - \log(u/((MHA_r/g) * NRF * D_{5-95})))$	0.4798
$k_{EQ} = feq(MHA_r)/g$	0.101
Factor of Safety in Slope Analysis Using k_{EQ}	0.90

Fails Initial Screening Analysis

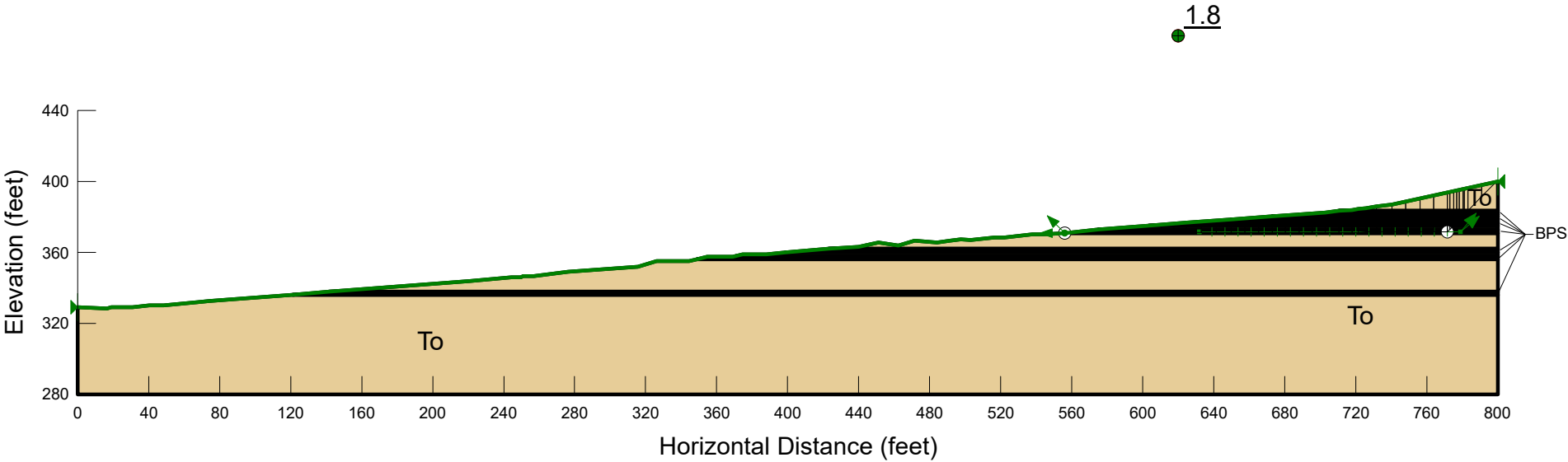
Approximation of Seismic Demand

Period of Sliding Mass, $T_s = 4H/V_s$, sec	0.282
T_s/T_m	0.51
$MHEA/(MHA * NRF)$	0.905
$NRF = 0.6225 + 0.9196 \exp(-2.25 * MHA_r/g)$	1.20
$MHEA/g$	0.23
$k_y/MHEA = k_y/k_{max}$	0.35
Normalized Displacement, Normu	4.4
Estimated Displacement, u (cm)	7

FIGURE C-44C

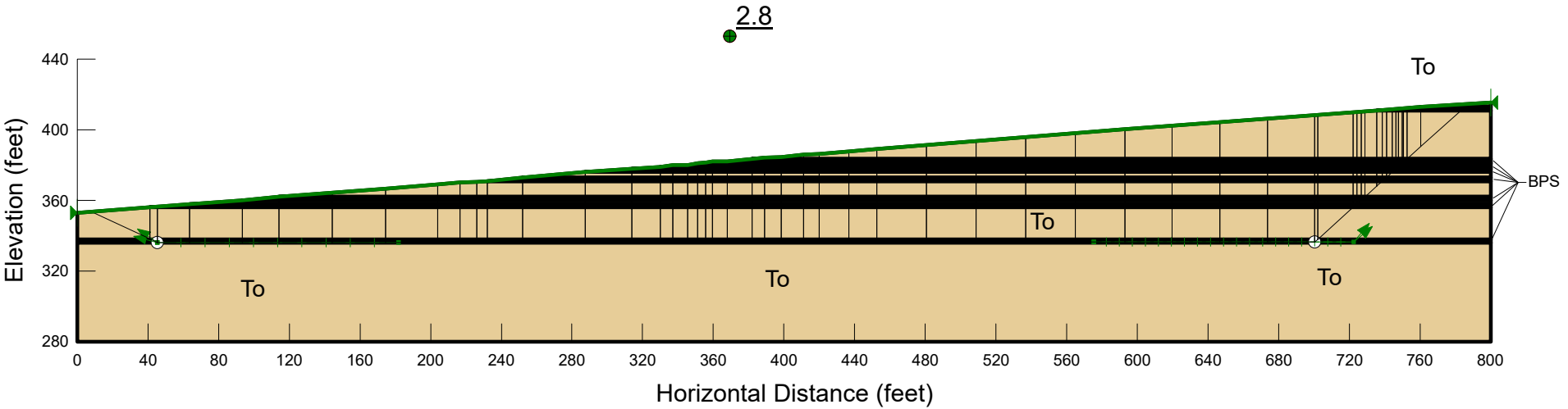
Beyer Boulevard Extension
South Otay Mesa
Project No. 06847-42-05
Date: 02/13/2022
Cross Section O-O"
Analysis: Proposed - Failure on Upper BPS

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	To	130	400	29
	To-Shear	110	0	8



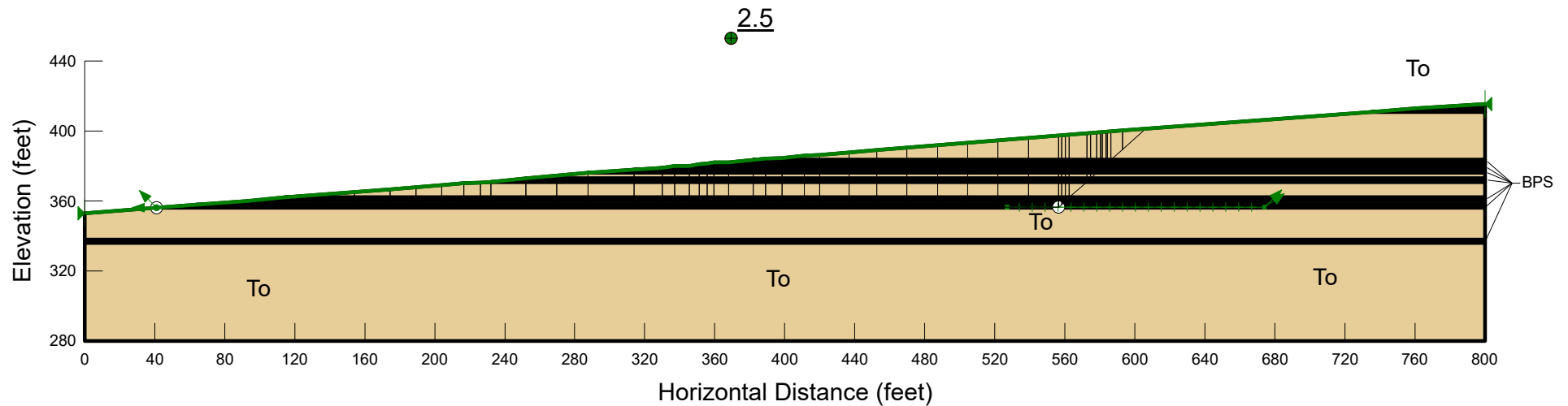
Beyer Boulevard Extension
South Otay Mesa
Project No. 06847-42-05
Date: 02/13/2022
Cross Section P-P"
Analysis: Proposed - Failure on Lower BPS

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	To	130	400	29
	To-Shear	110	0	8



Analysis: Proposed - Failure on Middle BPS

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	To	130	400	29
	To-Shear	110	0	8



Beyer Boulevard Extension

South Otay Mesa

Project No. 06847-42-05

Date: 02/14/2022

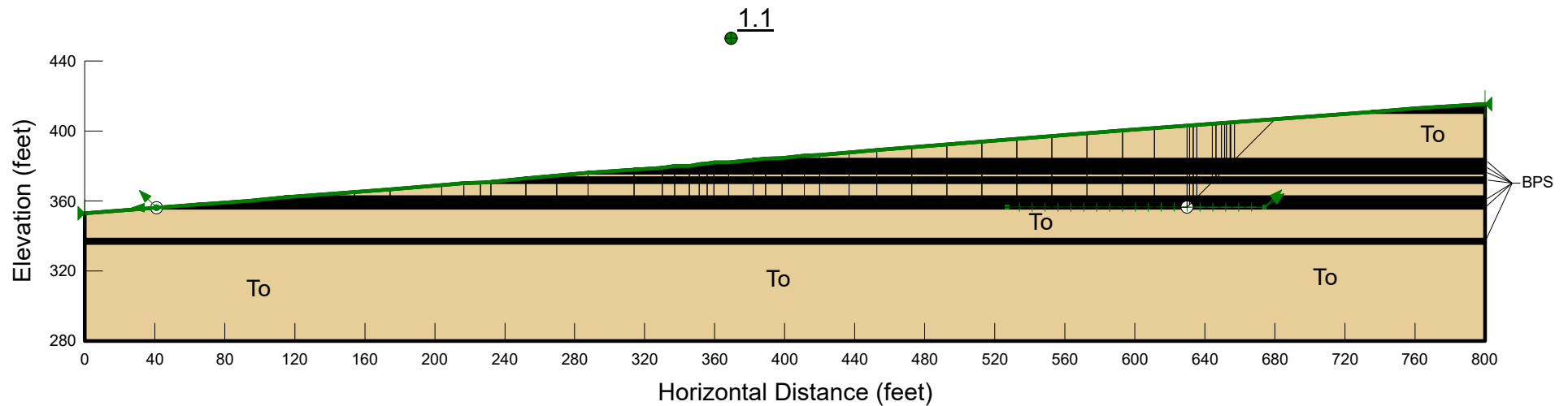
Cross Section P-P''

Analysis: Proposed - Seismic

Horz Seismic Coef.: 0.101

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
-------	------	-------------------	-----------------	----------

	To	130	400	29
	To-Shear	110	0	8





Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project Beyer Boulevard
 Project Number 06847-42-05
 Date 02/14/22
 File Name PP-02_Proposed_Seismic

Computed By RCM

Peak Ground Acceleration (Firm Rock), MHA_r , g	0.21	10% in 50 years
Modal Magnitude, M	6.1	
Modal Distance, r, km	11.1	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y /g	NA	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	NA	<--
Max Vertical Distance, H (Feet)	NA	<--
Is Slide X-Area > 25,000ft ² (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, D_{5-95} , sec	6.670	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m , sec	0.550	

Initial Screening with $MHEA = MHA = k_{max}g$

k_y/MHA	NA
$f_{EQ}(u=5cm) = (NRF/3.477) * (1.87 - \log(u/((MHA_r/g) * NRF * D_{5-95})))$	0.4798
$k_{EQ} = feq(MHA_r)/g$	0.101
Factor of Safety in Slope Analysis Using k_{EQ}	1.10

Passes Initial Screening Analysis

Approximation of Seismic Demand

Period of Sliding Mass, $T_s = 4H/V_s$, sec	NA
T_s/T_m	NA
$MHEA/(MHA * NRF)$	NA
$NRF = 0.6225 + 0.9196 \exp(-2.25 * MHA_r/g)$	1.20
$MHEA/g$	NA
$k_y/MHEA = k_y/k_{max}$	NA
Normalized Displacement, Normu	NA
Estimated Displacement, u (cm)	NA

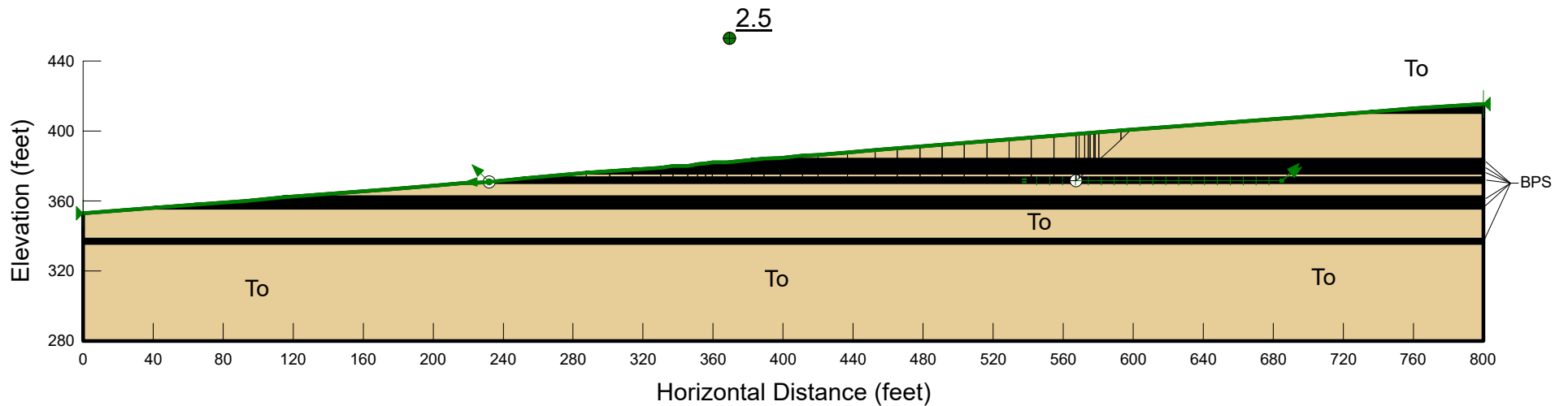
FIGURE C-47B

Beyer Boulevard Extension South Otay Mesa

Date: 02/13/2022

Analysis: Proposed - Failure on Upper BPS

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	To	130	400	29
	To-Shear	110	0	8



Beyer Boulevard Extension
South Otay Mesa
Project No. 06847-42-05
Date: 02/13/2022
Cross Section P-P"
Analysis: Proposed - Failure on Upper BPS

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	To	130	400	29
	To-Shear	110	0	8

