APPENDIX G   SLOPE STABILITY ANALYSIS
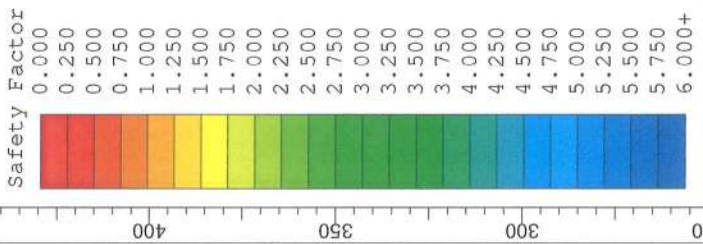
SLOPE STABILITY SUMMARY

Youngdahl performed a slope stability analysis to calculate the stability of the proposed slope configurations. The slope model used was based on our observations of the soil and rock conditions revealed during a subsurface exploration using a HQ core rig, and from the material properties observed in the Gopher Ridge Geologic unit from two quarries within the region mining the same geologic unit. Our analysis was performed using Slide™ software utilizing the GLE/Mortgenstern-Price, Bishop, and Spencer methods. *"Slide is slope stability analysis program for all types of soil and rock slopes. Slide includes built-in finite element groundwater seepage analysis, probabilistic analysis, multi-scenario modeling, and support design.*

The stability of a slope is evaluated by calculating its "factor of safety". The factor of safety is a ratio obtained by dividing the resisting forces (i.e., the strength of the material comprising the slope) by the driving forces (resulting from the slope gradient, groundwater, and earthquake loading). If the factor of safety is greater than 1, the slope is considered to be stable. A factor of safety less than 1 means the slope is considered to be unstable, and a factor of safety equal to 1 indicates being on the edge of failure. Typically, when evaluating slope stability, a static minimum factor of safety of 1.5 is considered to account for variability in groundwater, subsurface soil and rock conditions, and laboratory test results. A factor of safety of 1.2 is considered for pseudo-static conditions. (earthquakes)

Our slope stability analysis was based on a the following assumptions and variables, including: the unit weight of the underlying unit is consistent at 170lbs/cubic foot, the friction angle (phi angle) of the material is estimated to be at 45 degrees with 500 pound per square foot cohesion, and free flowing fractures noted on well data completion reports and exploratory borings in the Gopher Ridge Volcanics geologic unit modelled. The unit was classified using a rock mass classification system which uses rock structure rating and rock geomechanics classification system rating. Considering rock structure rating, the unit is a hard to very hard metamorphosed andesite that is massive to slightly folded/faulted. The joint pattern was on average moderate to blocky and becoming massive at depth, ranging from 1-2 feet and over 4 feet. Anticipated groundwater flow is estimated to be none to negligible from tight or cemented joints. Using the geomechanics classification system the estimated point load strength is 4 to 10 MPa, Rock Quality Designation (RQD) at 75%-100%, slightly rough surfaces between joints to healed fractures, and groundwater estimated less than 10 gallons per minute yields good to very good rock to withstand the slopes modelled below. Based on our assumptions, we modelled the east facing slope in Phase 1, west facing slope in Phase 5, and Phase 5 inter-bench slopes with factors of safety of 3.788, 2.298, and greater than 9, respectively. The proposed slope angles of 1H:1V overall and inter-bench angles of 0.5H:1V are estimated to remain stable based on our assumptions. We recommend performing the analysis based on structural geology data collected annually

to ensure the proposed configuration is feasible. Details of our analysis are attached below.

Safety Factor

| 0.000 |
| 0.250 |
| 0.500 |
| 0.750 |
| 1.000 |
| 1.250 |
| 1.500 |
| 1.750 |
| 2.000 |
| 2.250 |
| 2.500 |
| 2.750 |
| 3.000 |
| 3.250 |
| 3.500 |
| 3.750 |
| 4.000 |
| 4.250 |
| 4.500 |
| 4.750 |
| 5.000 |
| 5.250 |
| 5.500 |
| 5.750 |
| 6.000+ |

2.297

Method Name	Min FS
Bishop simplified	2.299
Spencer	2.298
GLE / Morgenstern-Price	2.297
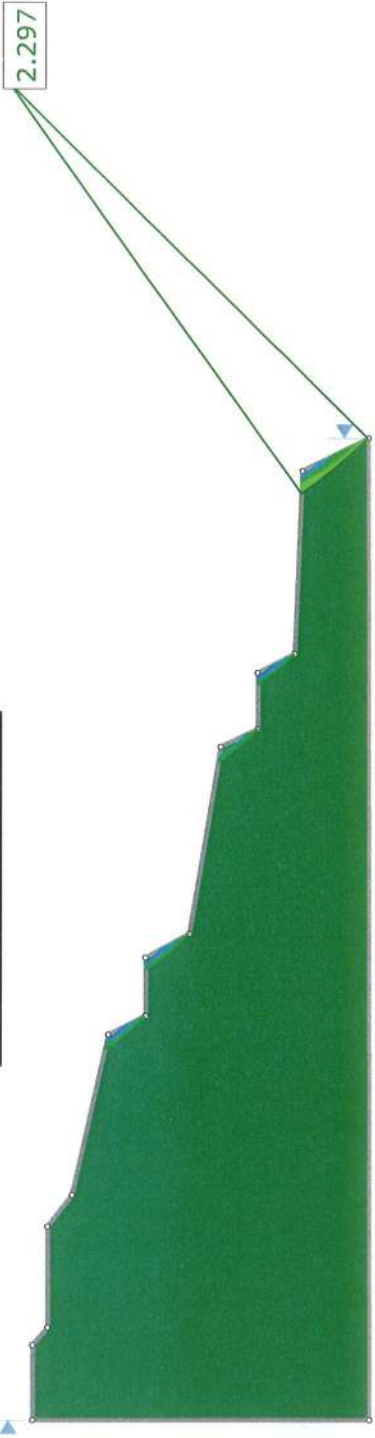
Pilgrim Rock Quarry- Phase 1 East Facing Slope

Project	
Analysis Description	
Bishop, Spencer, and GLE/Morgenstern-Price Analysis Methods	
Drawn By	Scale	Company
Kenneth A. Williams, P.G.	1:600	Youngdahl Consulting Group, Inc.
Date	File Name
1/25/2018, 8:57:31 AM	Bench Slope Stability Phase 1.slmd

rocscience

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

File Name:	Bench Slope Stability Phase 1.slmd - Group 1 - Scenario 1
Last saved with Slide version:	7.03
Project Title:	SLIDE - An Interactive Slope Stability Program
Date Created:	1/25/2018, 8:57:31 AM

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Failure Direction:	Left to Right
Data Output:	Standard
Maximum Material Properties:	20
Maximum Support Properties:	20

Analysis Options

Slices Type:	Vertical

Analysis Methods Used	
	Bishop simplified
GLE/Morgenstern-Price with interslice force function:	Half Sine
	Spencer

Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

SLIDE 7.030

Random Numbers

Pseudo-random Seed: 10116
Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Slope Search
Number of Surfaces:	5000
Upper Angle:	-45
Lower Angle:	-45
Composite Surfaces:	Disabled
Reverse Curvature:	Invalid Surfaces
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Material Properties

Property	Gopher Ridge Volcanics
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	170
Cohesion [psf]	500
Friction Angle [deg]	45
Water Surface	None
Ru Value	0

Probabilistic Analysis Input

General Settings

Sensitivity Analysis:	Off
Probabilistic Analysis:	On
Sampling Method:	Latin-Hypercube
Number of Samples:	1000
Analysis Type:	Global Minimum

Variables

List Of Coordinates

External Boundary

X	Y
731.781	227.841
682.158	229.944
677.147	239.741
661.875	239.741
657.099	249.662
606.506	257.957
600.191	269.678
584.438	269.678
579.43	279.659
536.022	289.384
527.537	295.993
500.223	295.993
495.416	300.072
475.064	300.072
475.064	209.666
740.711	209.958
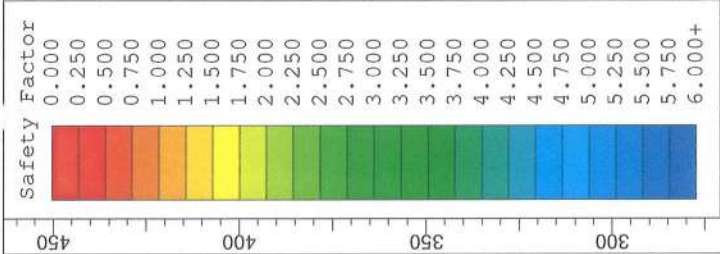
Method Name	Min FS
Bishop simplified	3.775
Spencer	3.794
GLE / Morgenstern-Price	3.794

Shear Strength: 456.74

Shear Strength: 4267

3.775

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

rocscience
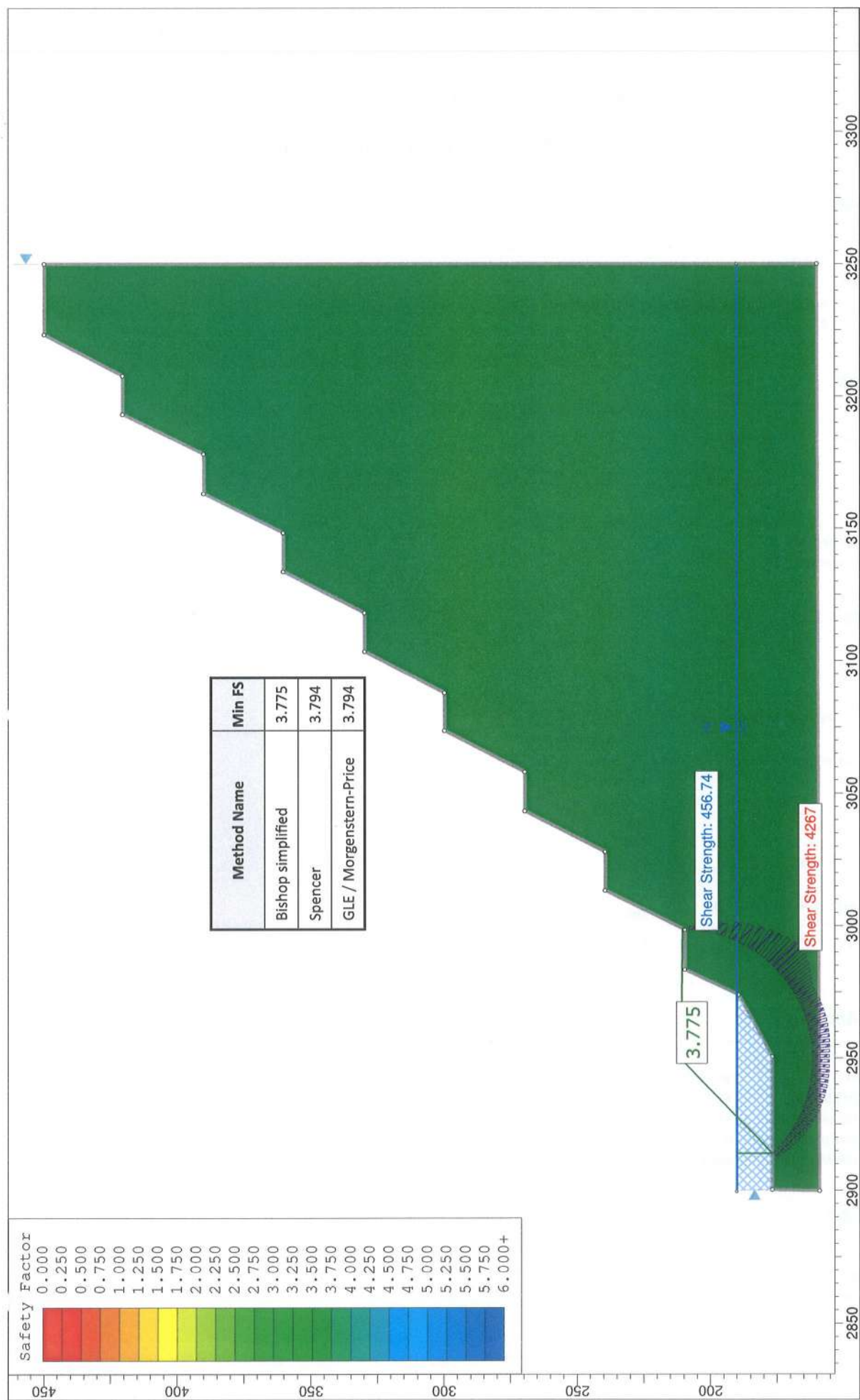
Project	Pilgrim Rock Quarry- Phase 5 West Facing Slope		
Analysis Description	Bishop, Spencer, and GLE/Morgenstern-Price Analysis Methods		
Drawn By	Kenneth A. Williams, P.G.	Scale 1:600	Company Youngdahl Consulting Group, Inc.
Date	1/19/2018, 2:20:58 PM		File Name Slide1.slim

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

File Name:	Slide1
Slide Modeler Version:	7.03
Project Title:	SLIDE - An Interactive Slope Stability Program
Date Created:	1/19/2018, 2:20:58 PM

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Failure Direction:	Right to Left
Data Output:	Standard
Maximum Material Properties:	20
Maximum Support Properties:	20

Analysis Options

Slices Type:	Vertical

Analysis Methods Used	
	Bishop simplified
GLE/Morgenstern-Price with interslice force function:	Half Sine
	Spencer

Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Slope Search
Number of Surfaces:	5000
Upper Angle:	-45
Lower Angle:	-45
Composite Surfaces:	Disabled
Reverse Curvature:	Invalid Surfaces
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No

Material Properties

Property	Gopher Ridger Volcanics
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	170
Cohesion [psf]	500
Friction Angle [deg]	45
Water Surface	Water Table
Hu Value	1

Global Minimums

Method: bishop simplified

FS	3.774810
Center:	2949.504, 211.105
Radius:	49.448
Left Slip Surface Endpoint:	2913.943, 176.747
Right Slip Surface Endpoint:	2998.948, 210.567
Left Slope Intercept:	2913.943 190.086
Right Slope Intercept:	2998.948 210.567
Resisting Moment:	1.26856e+007 lb-ft
Driving Moment:	3.3606e+006 lb-ft
Total Slice Area:	2114.7 ft2
Surface Horizontal Width:	85.0052 ft
Surface Average Height:	24.8773 ft

Method: spencer

FS	3.793900
Center:	2949.504, 211.105
Radius:	49.448
Left Slip Surface Endpoint:	2913.943, 176.747
Right Slip Surface Endpoint:	2998.948, 210.567
Left Slope Intercept:	2913.943 190.086
Right Slope Intercept:	2998.948 210.567
Resisting Moment:	1.27498e+007 lb-ft
Driving Moment:	3.3606e+006 lb-ft
Resisting Horizontal Force:	203569 lb
Driving Horizontal Force:	53656.9 lb
Total Slice Area:	2114.7 ft2
Surface Horizontal Width:	85.0052 ft
Surface Average Height:	24.8773 ft

Method: gle/morgenstern-price

FS	3.794450
Center:	2949.504, 211.105
Radius:	49.448
Left Slip Surface Endpoint:	2913.943, 176.747
Right Slip Surface Endpoint:	2998.948, 210.567
Left Slope Intercept:	2913.943 190.086
Right Slope Intercept:	2998.948 210.567
Resisting Moment:	1.27516e+007 lb-ft
Driving Moment:	3.3606e+006 lb-ft
Resisting Horizontal Force:	203573 lb
Driving Horizontal Force:	53650.2 lb
Total Slice Area:	2114.7 ft2
Surface Horizontal Width:	85.0052 ft
Surface Average Height:	24.8773 ft

Valid / Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 116
Number of Invalid Surfaces: 4884

Error Codes:

Error Code -103 reported for 1538 surfaces
Error Code -105 reported for 1 surface
Error Code -106 reported for 14 surfaces
Error Code -108 reported for 13 surfaces
Error Code -112 reported for 3 surfaces
Error Code -114 reported for 3315 surfaces

Method: spencer

Number of Valid Surfaces: 110
Number of Invalid Surfaces: 4890

Error Codes:

Error Code -103 reported for 1538 surfaces
Error Code -105 reported for 1 surface
Error Code -106 reported for 14 surfaces
Error Code -108 reported for 19 surfaces
Error Code -112 reported for 3 surfaces
Error Code -114 reported for 3315 surfaces

Method: gle/morgenstern-price

Number of Valid Surfaces: 110
Number of Invalid Surfaces: 4890

Error Codes:

Error Code -103 reported for 1538 surfaces
Error Code -105 reported for 1 surface
Error Code -106 reported for 14 surfaces
Error Code -108 reported for 19 surfaces
Error Code -112 reported for 3 surfaces
Error Code -114 reported for 3315 surfaces

Error Codes

The following errors were encountered during the computation:

-103 = Two surface / slope intersections, but one or more surface / nonslope external polygon intersections lie between them. This usually occurs when the slip surface extends past the bottom of the soil region, but may also occur on a benched slope model with two sets of Slope Limits.

-105 = More than two surface / slope intersections with no valid slip surface.

-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

-114 = Surface with Reverse Curvature.

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 3.77481

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.7089	1667.15	-44.5945	Gopher Ridger Volcanics	500	45	211.805	799.523	1184.45	884.922	299.524	975.618	90.6962
2	1.7089	2134.41	-41.8743	Gopher Ridger Volcanics	500	45	265.346	1001.63	1486.92	985.286	501.63	1249.05	263.764
3	1.7089	2559.85	-39.2656	Gopher Ridger Volcanics	500	45	311.547	1176.03	1752.7	1076.67	676.032	1498.02	421.346
4	1.7089	2948.14	-36.751	Gopher Ridger Volcanics	500	45	351.765	1327.85	1987.92	1160.07	827.847	1725.23	565.163
5	1.7089	3302.94	-34.3164	Gopher Ridger Volcanics	500	45	386.961	1460.7	2196.98	1236.28	960.7	1932.85	696.571
6	1.7089	3627.19	-31.9507	Gopher Ridger Volcanics	500	45	417.838	1577.26	2383.19	1305.92	1077.27	2122.59	816.675
7	1.7089	3923.27	-29.6445	Gopher Ridger Volcanics	500	45	444.934	1679.54	2549.06	1369.52	1179.54	2295.85	926.33
8	1.7089	4193.15	-27.3901	Gopher Ridger Volcanics	500	45	468.662	1769.11	2696.6	1427.49	1269.11	2453.78	1026.29
9	1.7089	4438.47	-25.1809	Gopher Ridger Volcanics	500	45	489.354	1847.22	2827.4	1480.18	1347.22	2597.33	1117.15
10	1.7089	4660.6	-23.0111	Gopher Ridger Volcanics	500	45	507.271	1914.85	2942.75	1527.89	1414.86	2727.31	1199.42
11	1.7089	4860.69	-20.8757	Gopher Ridger Volcanics	500	45	522.633	1972.84	3043.71	1570.87	1472.84	2844.39	1273.52
12	1.7089	5039.72	-18.7702	Gopher Ridger Volcanics	500	45	535.616	2021.85	3131.18	1609.33	1521.85	2949.15	1339.82
13	1.7089	5198.51	-16.6908	Gopher Ridger Volcanics	500	45	546.375	2062.46	3205.89	1643.43	1562.46	3042.07	1398.64
14	1.7089	5337.75	-14.6338	Gopher Ridger	500	45	555.027	2095.12	3268.47	1673.34	1595.13	3123.54	1450.2

				Volcanics									
15	1.7089	5458.04	-12.596	Gopher Ridger Volcanics	500	45	561.687	2120.26	3319.43	1699.18	1620.25	3193.92	1494.74
16	1.7089	5559.84	-10.5742	Gopher Ridger Volcanics	500	45	566.436	2138.19	3359.24	1721.05	1638.19	3253.49	1532.44
17	1.7089	5643.57	-8.56573	Gopher Ridger Volcanics	500	45	569.356	2149.21	3388.24	1739.03	1649.21	3302.48	1563.45
18	1.7089	5709.54	-6.56779	Gopher Ridger Volcanics	500	45	570.511	2153.57	3406.77	1753.2	1653.57	3341.08	1587.88
19	1.7089	5757.99	-4.57785	Gopher Ridger Volcanics	500	45	569.952	2151.46	3415.07	1763.61	1651.46	3369.43	1605.82
20	1.7089	5789.11	-2.59344	Gopher Ridger Volcanics	500	45	567.727	2143.06	3413.35	1770.29	1643.06	3387.64	1617.35
21	1.7089	5803.01	-0.612134	Gopher Ridger Volcanics	500	45	563.872	2128.51	3401.79	1773.28	1628.51	3395.77	1622.49
22	1.7089	5828.07	1.36844	Gopher Ridger Volcanics	500	45	562.786	2124.41	3396.98	1772.57	1624.41	3410.43	1637.86
23	1.7089	5962.41	3.35064	Gopher Ridger Volcanics	500	45	579.351	2186.94	3455.12	1768.18	1686.94	3489.04	1720.86
24	1.7089	6094.68	5.33688	Gopher Ridger Volcanics	500	45	596.229	2250.65	3510.73	1760.07	1750.66	3566.42	1806.35
25	1.7089	6209.54	7.32958	Gopher Ridger Volcanics	500	45	611.104	2306.8	3555.03	1748.24	1806.79	3633.63	1885.39
26	1.7089	6306.81	9.33125	Gopher Ridger Volcanics	500	45	623.978	2355.4	3588.02	1732.62	1855.4	3690.55	1957.93
27	1.7089	6386.2	11.3445	Gopher Ridger Volcanics	500	45	634.858	2396.47	3609.63	1713.16	1896.47	3737	2023.84
28	1.7089	6447.38	13.372	Gopher Ridger Volcanics	500	45	643.736	2429.98	3619.76	1689.79	1929.97	3772.79	2083
29	1.7089	6489.9	15.4168	Gopher Ridger Volcanics	500	45	650.589	2455.85	3618.26	1662.41	1955.85	3797.67	2135.26
30	1.7089	6513.25	17.482	Gopher Ridger Volcanics	500	45	655.397	2474	3604.91	1630.91	1974	3811.33	2180.42
31	1.7089	6516.81	19.5709	Gopher Ridger Volcanics	500	45	658.118	2484.27	3579.44	1595.17	1984.27	3813.4	2218.23
32	1.7089	6499.82	21.6872	Gopher Ridger Volcanics	500	45	658.706	2486.49	3541.5	1555.01	1986.49	3803.46	2248.45
33	1.7089	6461.43	23.8352	Gopher Ridger Volcanics	500	45	657.103	2480.44	3490.68	1510.25	1980.43	3780.98	2270.73
34	1.7089	6400.57	26.0195	Gopher Ridger Volcanics	500	45	653.23	2465.82	3426.49	1460.67	1965.82	3745.37	2284.7
35	1.7089	6316.03	28.2452	Gopher Ridger Volcanics	500	45	647.002	2442.31	3348.31	1406	1942.31	3695.89	2289.89
36	1.7089	6486.53	30.5186	Gopher Ridger Volcanics	500	45	675.878	2551.31	3397.23	1345.92	2051.31	3795.65	2449.73
37	1.7089	7215.57	32.8465	Gopher Ridger Volcanics	500	45	778.699	2939.44	3719.51	1280.07	2439.44	4222.24	2942.17
38	1.7089	7939.08	35.2373	Gopher Ridger Volcanics	500	45	878.693	3316.9	4024.89	1207.99	2816.9	4645.59	3437.6
39	1.7089	8630.99	37.701	Gopher Ridger Volcanics	500	45	972.208	3669.9	4299.01	1129.11	3169.9	5050.45	3921.34
40	1.7089	9288.11	40.2497	Gopher Ridger Volcanics	500	45	1058.6	3996.01	4538.78	1042.77	3496.01	5434.94	4392.17
41	1.7089	9853	42.8987	Gopher Ridger Volcanics	500	45	1130.39	4267	4715.11	948.087	3767.02	5765.48	4817.39
42	1.7089	9614.85	45.6672	Gopher Ridger Volcanics	500	45	1100.81	4155.36	4499.33	843.97	3655.36	5626.08	4782.11
43	1.7089	9079.4	48.5808	Gopher Ridger Volcanics	500	45	1035.75	3909.75	4138.71	728.96	3409.75	5312.75	4583.79
44	1.7089	8484.01	51.6743	Gopher Ridger Volcanics	500	45	964.957	3642.53	3743.62	601.074	3142.54	4964.34	4363.27
45	1.7089	7815.52	54.9973	Gopher Ridger Volcanics	500	45	887.144	3348.8	3306.28	457.486	2848.8	4573.13	4115.65
46	1.7089	7053.97	58.6256	Gopher Ridger Volcanics	500	45	800.332	3021.1	2815.01	293.912	2521.1	4127.49	3833.58
47	1.7089	6166.26	62.6858	Gopher Ridger	500	45	701.227	2647	2250.24	103.238	2147	3608.01	3504.78

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
				Volcanics									
48	1.56234	4704.96	67.1782	Gopher Ridger Volcanics	500	45	570.813	2154.71	1654.71	0	1654.71	3011.18	3011.18
49	1.56234	3552.73	72.5289	Gopher Ridger Volcanics	500	45	398.976	1506.06	1006.06	0	1006.06	2273.68	2273.68
50	1.56234	1361.1	82.4609	Gopher Ridger Volcanics	500	45	120.997	456.74	-43.2598	0	-43.2598	870.979	870.979

Global Minimum Query (spencer) - Safety Factor: 3.7939

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.7089	1667.15	-44.5945	Gopher Ridger Volcanics	500	45	340.824	1293.05	1677.97	884.922	793.052	1341.94	457.019
2	1.7089	2134.41	-41.8743	Gopher Ridger Volcanics	500	45	404.589	1534.97	2020.25	985.286	1034.97	1657.57	672.279
3	1.7089	2559.85	-39.2656	Gopher Ridger Volcanics	500	45	454.712	1725.13	2301.79	1076.67	1225.12	1930.07	853.401
4	1.7089	2948.14	-36.751	Gopher Ridger Volcanics	500	45	494.916	1877.66	2537.73	1160.07	1377.66	2168.15	1008.08
5	1.7089	3302.94	-34.3164	Gopher Ridger Volcanics	500	45	527.539	2001.43	2737.71	1236.28	1501.43	2377.63	1141.35
6	1.7089	3627.19	-31.9507	Gopher Ridger Volcanics	500	45	554.126	2102.3	2908.23	1305.92	1602.31	2562.63	1256.71
7	1.7089	3923.27	-29.6445	Gopher Ridger Volcanics	500	45	575.756	2184.36	3053.88	1369.52	1684.36	2726.21	1356.69
8	1.7089	4193.15	-27.3901	Gopher Ridger Volcanics	500	45	593.205	2250.56	3178.05	1427.49	1750.56	2870.7	1443.21
9	1.7089	4438.47	-25.1809	Gopher Ridger Volcanics	500	45	607.056	2303.11	3283.29	1480.18	1803.11	2997.88	1517.7
10	1.7089	4660.6	-23.0111	Gopher Ridger Volcanics	500	45	617.747	2343.67	3371.57	1527.89	1843.68	3109.21	1581.32
11	1.7089	4860.69	-20.8757	Gopher Ridger Volcanics	500	45	625.631	2373.58	3444.45	1570.87	1873.58	3205.85	1634.98
12	1.7089	5039.72	-18.7702	Gopher Ridger Volcanics	500	45	630.979	2393.87	3503.2	1609.33	1893.87	3288.76	1679.43
13	1.7089	5198.51	-16.6908	Gopher Ridger Volcanics	500	45	634.02	2405.41	3548.85	1643.43	1905.42	3358.74	1715.31
14	1.7089	5337.75	-14.6338	Gopher Ridger Volcanics	500	45	634.938	2408.89	3582.23	1673.34	1908.89	3416.44	1743.1
15	1.7089	5458.04	-12.596	Gopher Ridger Volcanics	500	45	633.881	2404.88	3604.06	1699.18	1904.88	3462.42	1763.24
16	1.7089	5559.84	-10.5742	Gopher Ridger Volcanics	500	45	630.984	2393.89	3614.93	1721.05	1893.88	3497.14	1776.09
17	1.7089	5643.57	-8.56573	Gopher Ridger Volcanics	500	45	626.348	2376.3	3615.33	1739.03	1876.3	3520.99	1781.96
18	1.7089	5709.54	-6.56779	Gopher Ridger Volcanics	500	45	620.069	2352.48	3605.69	1753.2	1852.49	3534.29	1781.09
19	1.7089	5757.99	-4.57785	Gopher Ridger Volcanics	500	45	612.228	2322.73	3586.34	1763.61	1822.73	3537.32	1773.71
20	1.7089	5789.11	-2.59344	Gopher Ridger Volcanics	500	45	602.889	2287.3	3557.59	1770.29	1787.3	3530.28	1759.99
21	1.7089	5803.01	-0.612134	Gopher Ridger Volcanics	500	45	592.114	2246.42	3519.69	1773.28	1746.41	3513.36	1740.08
22	1.7089	5828.07	1.36844	Gopher Ridger Volcanics	500	45	597.514	2266.91	3539.48	1772.57	1766.91	3553.76	1781.19
23	1.7089	5962.41	3.35064	Gopher Ridger Volcanics	500	45	616.302	2338.19	3606.37	1768.18	1838.19	3642.45	1874.27
24	1.7089	6094.68	5.33688	Gopher Ridger Volcanics	500	45	625.562	2373.32	3633.4	1760.07	1873.33	3691.84	1931.77
25	1.7089	6209.54	7.32958	Gopher Ridger Volcanics	500	45	632.787	2400.73	3648.96	1748.24	1900.72	3730.35	1982.11
26	1.7089	6306.81	9.33125	Gopher Ridger Volcanics	500	45	638.016	2420.57	3653.18	1732.62	1920.56	3758.02	2025.4
27	1.7089	6386.2	11.3445	Gopher Ridger Volcanics	500	45	641.29	2432.99	3646.15	1713.16	1932.99	3774.81	2061.65

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
28	1.7089	6447.38	13.372	Volcanics Gopher Ridger Volcanics	500	45	642.632	2438.08	3627.87	1689.79	1938.08	3780.64	2090.85
29	1.7089	6489.9	15.4168	Gopher Ridger Volcanics	500	45	642.062	2435.92	3598.33	1662.41	1935.92	3775.39	2112.98
30	1.7089	6513.25	17.482	Gopher Ridger Volcanics	500	45	639.59	2426.54	3557.45	1630.91	1926.54	3758.89	2127.98
31	1.7089	6516.81	19.5709	Gopher Ridger Volcanics	500	45	635.212	2409.93	3505.1	1595.17	1909.93	3730.92	2135.75
32	1.7089	6499.82	21.6872	Gopher Ridger Volcanics	500	45	628.92	2386.06	3441.07	1555.01	1886.06	3691.19	2136.18
33	1.7089	6461.43	23.8352	Gopher Ridger Volcanics	500	45	620.702	2354.88	3365.13	1510.25	1854.88	3639.34	2129.09
34	1.7089	6400.57	26.0195	Gopher Ridger Volcanics	500	45	610.525	2316.27	3276.94	1460.67	1816.27	3574.97	2114.3
35	1.7089	6316.03	28.2452	Gopher Ridger Volcanics	500	45	598.358	2270.11	3176.11	1406	1770.11	3497.56	2091.56
36	1.7089	6486.53	30.5186	Gopher Ridger Volcanics	500	45	619.708	2351.11	3197.03	1345.92	1851.11	3562.33	2216.41
37	1.7089	7215.57	32.8465	Gopher Ridger Volcanics	500	45	711.034	2697.59	3477.66	1280.07	2197.59	3936.71	2656.64
38	1.7089	7939.08	35.2373	Gopher Ridger Volcanics	500	45	798.785	3030.51	3738.49	1207.99	2530.5	4302.75	3094.76
39	1.7089	8630.99	37.701	Gopher Ridger Volcanics	500	45	879.095	3335.2	3964.31	1129.11	2835.2	4643.78	3514.67
40	1.7089	9288.11	40.2497	Gopher Ridger Volcanics	500	45	951.411	3609.56	4152.33	1042.77	3109.56	4957.75	3914.98
41	1.7089	9853	42.8987	Gopher Ridger Volcanics	500	45	1008.99	3828	4276.08	948.087	3328	5213.65	4265.56
42	1.7089	9614.85	45.6672	Gopher Ridger Volcanics	500	45	974.277	3696.31	4040.28	843.97	3196.31	5037.52	4193.55
43	1.7089	9079.4	48.5808	Gopher Ridger Volcanics	500	45	908.587	3447.09	3676.04	728.96	2947.08	4705.94	3976.98
44	1.7089	8484.01	51.6743	Gopher Ridger Volcanics	500	45	839.181	3183.77	3284.85	601.074	2683.77	4346.46	3745.38
45	1.7089	7815.52	54.9973	Gopher Ridger Volcanics	500	45	765.363	2903.71	2861.19	457.486	2403.71	3954.14	3496.65
46	1.7089	7053.97	58.6256	Gopher Ridger Volcanics	500	45	686.107	2603.02	2396.94	293.912	2103.02	3522.09	3228.18
47	1.7089	6166.26	62.6858	Gopher Ridger Volcanics	500	45	599.837	2275.72	1878.95	103.238	1775.72	3040.41	2937.17
48	1.56234	4704.96	67.1782	Gopher Ridger Volcanics	500	45	486.723	1846.58	1346.58	0	1346.58	2503.22	2503.22
49	1.56234	3552.73	72.5289	Gopher Ridger Volcanics	500	45	339.532	1288.15	788.15	0	788.15	1866.91	1866.91
50	1.56234	1361.1	82.4609	Gopher Ridger Volcanics	500	45	127.67	484.369	-15.6314	0	-15.6314	949.032	949.032

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 3.79445

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	1.7089	1667.15	-44.5945	Gopher Ridger Volcanics	500	45	218.619	829.538	1214.46	884.922	329.539	998.915	113.993
2	1.7089	2134.41	-41.8743	Gopher Ridger Volcanics	500	45	291.175	1104.85	1590.14	985.286	604.849	1329.12	343.829
3	1.7089	2559.85	-39.2656	Gopher Ridger Volcanics	500	45	359.026	1362.3	1938.97	1076.67	862.305	1645.48	568.805
4	1.7089	2948.14	-36.751	Gopher Ridger Volcanics	500	45	421.937	1601.02	2261.09	1160.07	1101.02	1946.01	785.936
5	1.7089	3302.94	-34.3164	Gopher Ridger Volcanics	500	45	479.635	1819.95	2556.23	1236.28	1319.95	2228.85	992.568
6	1.7089	3627.19	-31.9507	Gopher Ridger Volcanics	500	45	531.845	2018.06	2823.99	1305.92	1518.07	2492.29	1186.37
7	1.7089	3923.27	-29.6445	Gopher Ridger Volcanics	500	45	578.329	2194.44	3063.97	1369.52	1694.45	2734.84	1365.32

				Volcanics									
8	1.7089	4193.15	-27.3901	Gopher Ridger Volcanics	500	45	618.901	2348.39	3275.88	1427.49	1848.39	2955.21	1527.72
9	1.7089	4438.47	-25.1809	Gopher Ridger Volcanics	500	45	653.444	2479.46	3459.64	1480.18	1979.46	3152.42	1672.24
10	1.7089	4660.6	-23.0111	Gopher Ridger Volcanics	500	45	681.914	2587.49	3615.38	1527.89	2087.49	3325.77	1797.88
11	1.7089	4860.69	-20.8757	Gopher Ridger Volcanics	500	45	704.345	2672.6	3743.47	1570.87	2172.6	3474.85	1903.98
12	1.7089	5039.72	-18.7702	Gopher Ridger Volcanics	500	45	720.85	2735.23	3844.56	1609.33	2235.23	3599.58	1990.25
13	1.7089	5198.51	-16.6908	Gopher Ridger Volcanics	500	45	731.613	2776.07	3919.5	1643.43	2276.07	3700.13	2056.7
14	1.7089	5337.75	-14.6338	Gopher Ridger Volcanics	500	45	736.884	2796.07	3969.42	1673.34	2296.08	3777.01	2103.67
15	1.7089	5458.04	-12.596	Gopher Ridger Volcanics	500	45	736.974	2796.41	3995.59	1699.18	2296.41	3830.91	2131.73
16	1.7089	5559.84	-10.5742	Gopher Ridger Volcanics	500	45	732.241	2778.45	3999.49	1721.05	2278.44	3862.8	2141.75
17	1.7089	5643.57	-8.56573	Gopher Ridger Volcanics	500	45	723.074	2743.67	3982.7	1739.03	2243.67	3873.79	2134.76
18	1.7089	5709.54	-6.56779	Gopher Ridger Volcanics	500	45	709.903	2693.69	3946.89	1753.2	2193.69	3865.16	2111.96
19	1.7089	5757.99	-4.57785	Gopher Ridger Volcanics	500	45	693.16	2630.16	3893.77	1763.61	2130.16	3838.27	2074.66
20	1.7089	5789.11	-2.59344	Gopher Ridger Volcanics	500	45	673.286	2554.75	3825.05	1770.29	2054.76	3794.55	2024.26
21	1.7089	5803.01	-0.612134	Gopher Ridger Volcanics	500	45	650.724	2469.14	3742.41	1773.28	1969.13	3735.46	1962.18
22	1.7089	5828.07	1.36844	Gopher Ridger Volcanics	500	45	648.9	2462.22	3734.79	1772.57	1962.22	3750.3	1977.73
23	1.7089	5962.41	3.35064	Gopher Ridger Volcanics	500	45	658.541	2498.8	3766.98	1768.18	1998.8	3805.53	2037.35
24	1.7089	6094.68	5.33688	Gopher Ridger Volcanics	500	45	654.076	2481.86	3741.93	1760.07	1981.86	3803.03	2042.96
25	1.7089	6209.54	7.32958	Gopher Ridger Volcanics	500	45	647.177	2455.68	3703.92	1748.24	1955.68	3787.16	2038.92
26	1.7089	6306.81	9.33125	Gopher Ridger Volcanics	500	45	638.245	2421.79	3654.41	1732.62	1921.79	3759.28	2026.66
27	1.7089	6386.2	11.3445	Gopher Ridger Volcanics	500	45	627.648	2381.58	3594.74	1713.16	1881.58	3720.66	2007.5
28	1.7089	6447.38	13.372	Gopher Ridger Volcanics	500	45	615.72	2336.32	3526.11	1689.79	1836.32	3672.48	1982.69
29	1.7089	6489.9	15.4168	Gopher Ridger Volcanics	500	45	602.762	2287.15	3449.56	1662.41	1787.15	3615.78	1953.37
30	1.7089	6513.25	17.482	Gopher Ridger Volcanics	500	45	589.023	2235.02	3365.94	1630.91	1735.03	3551.45	1920.54
31	1.7089	6516.81	19.5709	Gopher Ridger Volcanics	500	45	574.726	2180.77	3275.94	1595.17	1680.77	3480.26	1885.09
32	1.7089	6499.82	21.6872	Gopher Ridger Volcanics	500	45	560.039	2125.04	3180.05	1555.01	1625.04	3402.77	1847.76
33	1.7089	6461.43	23.8352	Gopher Ridger Volcanics	500	45	545.093	2068.33	3078.58	1510.25	1568.33	3319.39	1809.14
34	1.7089	6400.57	26.0195	Gopher Ridger Volcanics	500	45	529.971	2010.95	2971.62	1460.67	1510.95	3230.33	1769.66
35	1.7089	6316.03	28.2452	Gopher Ridger Volcanics	500	45	514.715	1953.06	2859.06	1406	1453.06	3135.57	1729.57
36	1.7089	6486.53	30.5186	Gopher Ridger Volcanics	500	45	534.731	2029.01	2874.93	1345.92	1529.01	3190.14	1844.22
37	1.7089	7215.57	32.8465	Gopher Ridger Volcanics	500	45	626.852	2378.56	3158.63	1280.07	1878.56	3563.33	2283.26
38	1.7089	7939.08	35.2373	Gopher Ridger Volcanics	500	45	718.394	2725.91	3433.89	1207.99	2225.9	3941.37	2733.38
39	1.7089	8630.99	37.701	Gopher Ridger Volcanics	500	45	805.88	3057.87	3686.99	1129.11	2557.88	4309.87	3180.76
40	1.7089	9288.11	40.2497	Gopher Ridger Volcanics	500	45	889.183	3373.96	3916.72	1042.77	2873.95	4669.46	3626.69

				Volcanics									
41	1.7089	9853	42.8987	Gopher Ridger Volcanics	500	45	961.815	3649.56	4097.65	948.087	3149.56	4991.38	4043.29
42	1.7089	9614.85	45.6672	Gopher Ridger Volcanics	500	45	943.702	3580.83	3924.8	843.97	3080.83	4890.74	4046.77
43	1.7089	9079.4	48.5808	Gopher Ridger Volcanics	500	45	895.395	3397.53	3626.49	728.96	2897.53	4641.43	3912.47
44	1.7089	8484.01	51.6743	Gopher Ridger Volcanics	500	45	843.959	3202.36	3303.43	601.074	2702.36	4371.08	3770.01
45	1.7089	7815.52	54.9973	Gopher Ridger Volcanics	500	45	787.7	2988.89	2946.38	457.486	2488.89	4071.22	3613.73
46	1.7089	7053.97	58.6256	Gopher Ridger Volcanics	500	45	724.102	2747.57	2541.48	293.912	2247.57	3728.94	3435.03
47	1.7089	6166.26	62.6858	Gopher Ridger Volcanics	500	45	649.043	2462.76	2066	103.238	1962.76	3322.73	3219.49
48	1.56234	4704.96	67.1782	Gopher Ridger Volcanics	500	45	540.608	2051.31	1551.31	0	1551.31	2836	2836
49	1.56234	3552.73	72.5289	Gopher Ridger Volcanics	500	45	387.258	1469.43	969.432	0	969.432	2199.82	2199.82
50	1.56234	1361.1	82.4609	Gopher Ridger Volcanics	500	45	121.432	460.769	-39.2306	0	-39.2306	878.299	878.299

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 3.77481
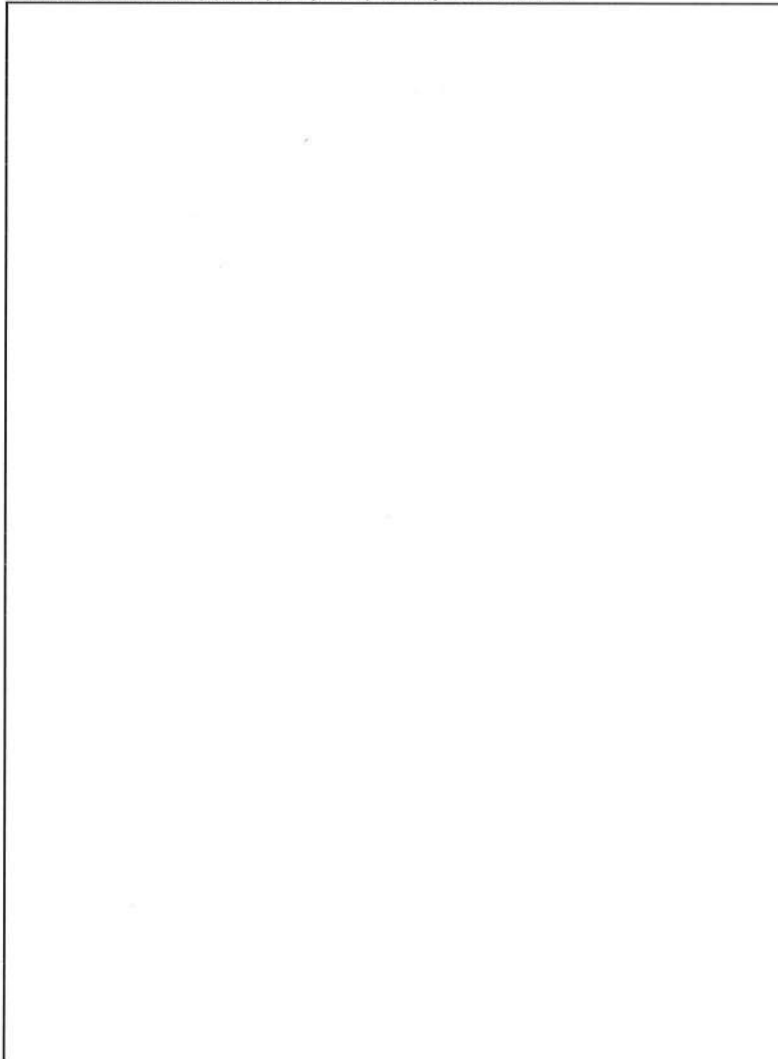
Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	2913.94	176.747	5551.38	0	0
2	2915.65	175.062	2357.68	0	0
3	2917.36	173.53	5089.08	0	0
4	2919.07	172.133	8070.14	0	0
5	2920.78	170.857	11208.3	0	0
6	2922.49	169.691	14432.4	0	0
7	2924.2	168.625	17686.6	0	0
8	2925.91	167.652	20926.2	0	0
9	2927.61	166.767	24114.9	0	0
10	2929.32	165.963	27223	0	0
11	2931.03	165.238	30225.9	0	0
12	2932.74	164.586	33102.9	0	0
13	2934.45	164.005	35836.9	0	0
14	2936.16	163.493	38413.5	0	0
15	2937.87	163.047	40820.6	0	0
16	2939.58	162.665	43048.3	0	0
17	2941.29	162.346	45088.1	0	0
18	2942.99	162.088	46933.5	0	0
19	2944.7	161.891	48578.9	0	0
20	2946.41	161.755	50020.4	0	0
21	2948.12	161.677	51255	0	0
22	2949.83	161.659	52281	0	0
23	2951.54	161.7	53539.7	0	0
24	2953.25	161.8	54896.3	0	0
25	2954.96	161.96	56013.7	0	0
26	2956.67	162.179	56882.1	0	0
27	2958.37	162.46	57493.2	0	0
28	2960.08	162.803	57839.5	0	0
29	2961.79	163.209	57914.7	0	0
30	2963.5	163.68	57713.7	0	0
31	2965.21	164.219	57232.5	0	0
32	2966.92	164.826	56468.2	0	0
33	2968.63	165.506	55419.3	0	0
34	2970.34	166.261	54085.9	0	0
35	2972.05	167.095	52469.5	0	0
36	2973.75	168.013	50573.6	0	0
37	2975.46	169.02	48326	0	0
38	2977.17	170.124	45553.4	0	0
39	2978.88	171.331	42196.6	0	0
40	2980.59	172.652	38180.1	0	0
41	2982.3	174.098	33423.5	0	0
42	2984.01	175.686	27868.4	0	0
43	2985.72	177.435	21879.9	0	0
44	2987.43	179.372	15633.4	0	0
45	2989.13	181.534	9189.71	0	0
46	2990.84	183.975	2637.72	0	0
47	2992.55	186.777	-3883.19	0	0
48	2994.26	190.086	-10130.4	0	0
49	2995.82	193.799	-15381.9	0	0
50	2997.39	198.763	-19752.3	0	0
51	2998.95	210.567	0	0	0

Global Minimum Query (spencer) - Safety Factor: 3.7939

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	2913.94	176.747	5551.38	0	0
2	2915.65	175.062	3409.17	635.607	10.561
3	2917.36	173.53	7194.9	1341.42	10.561
4	2919.07	172.133	11187	2085.7	10.561
5	2920.78	170.857	15270.6	2847.05	10.561
6	2922.49	169.691	19364.8	3610.38	10.561
7	2924.2	168.625	23410.6	4364.68	10.561
8	2925.91	167.652	27363.7	5101.71	10.561
9	2927.61	166.767	31190.6	5815.2	10.561
10	2929.32	165.963	34865.2	6500.28	10.561
11	2931.03	165.238	38367	7153.17	10.561
12	2932.74	164.586	41680.2	7770.88	10.561
13	2934.45	164.005	44792.2	8351.08	10.561
14	2936.16	163.493	47693.2	8891.95	10.561
15	2937.87	163.047	50375.9	9392.1	10.561
16	2939.58	162.665	52834.5	9850.49	10.561
17	2941.29	162.346	55065.2	10266.4	10.561
18	2942.99	162.088	57065.3	10639.3	10.561
19	2944.7	161.891	58833.5	10969	10.5611
20	2946.41	161.755	60369.7	11255.4	10.561
21	2948.12	161.677	61674.5	11498.6	10.561
22	2949.83	161.659	62749.9	11699.1	10.561
23	2951.54	161.7	64061.1	11943.6	10.561
24	2953.25	161.8	65464.7	12205.3	10.561
25	2954.96	161.96	66611.5	12419.1	10.561
26	2956.67	162.179	67495.3	12583.9	10.561
27	2958.37	162.46	68111	12698.7	10.561
28	2960.08	162.803	68454.7	12762.7	10.561
29	2961.79	163.209	68523.6	12775.6	10.561
30	2963.5	163.68	68316.3	12736.9	10.561
31	2965.21	164.219	67832.5	12646.7	10.561
32	2966.92	164.826	67073.1	12505.1	10.561
33	2968.63	165.506	66040.5	12312.6	10.561
34	2970.34	166.261	64738.6	12069.9	10.561
35	2972.05	167.095	63172.9	11778	10.561
36	2973.75	168.013	61350.9	11438.3	10.561
37	2975.46	169.02	59207.9	11038.7	10.561
38	2977.17	170.124	56585.2	10549.8	10.561
39	2978.88	171.331	53436.2	9962.68	10.561
40	2980.59	172.652	49701.2	9266.31	10.561
41	2982.3	174.098	45318.7	8449.24	10.561
42	2984.01	175.686	40251.5	7504.51	10.561
43	2985.72	177.435	34848	6497.08	10.561
44	2987.43	179.372	29278.8	5458.75	10.561
45	2989.13	181.534	23610.4	4401.94	10.561
46	2990.84	183.975	17935.1	3343.83	10.561
47	2992.55	186.777	12389.4	2309.89	10.561
48	2994.26	190.086	7196.4	1341.7	10.561
49	2995.82	193.799	2956.79	551.266	10.561
50	2997.39	198.763	-425.402	-79.3121	10.561
51	2998.95	210.567	0	0	0

Global Minimum Query (gle/morgenstern-price) - Safety Factor: 3.79445

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	2913.94	176.747	5551.38	0	0
2	2915.65	175.062	2419.53	40.1407	0.950466
3	2917.36	173.53	5352.7	177.252	1.89663
4	2919.07	172.133	8674.53	429.446	2.8342
5	2920.78	170.857	12280.5	806.844	3.759
6	2922.49	169.691	16081.2	1312.77	4.66693
7	2924.2	168.625	19999.2	1944.75	5.55406
8	2925.91	167.652	23966.6	2695.3	6.41656
9	2927.61	166.767	27924	3552.82	7.25089
10	2929.32	165.963	31819.5	4502.31	8.05362
11	2931.03	165.238	35607.9	5526.16	8.82163
12	2932.74	164.586	39250.4	6604.87	9.55197
13	2934.45	164.005	42714.1	7717.8	10.242
14	2936.16	163.493	45971.8	8843.78	10.8892
15	2937.87	163.047	49001.3	9961.77	11.4914
16	2939.58	162.665	51785.5	11051.4	12.0466
17	2941.29	162.346	54311.8	12093.5	12.5531
18	2942.99	162.088	56571.7	13070.4	13.0094
19	2944.7	161.891	58560.5	13966.2	13.414
20	2946.41	161.755	60276.9	14767.4	13.7659
21	2948.12	161.677	61722.7	15462.5	14.064
22	2949.83	161.659	62902.2	16042.6	14.3077
23	2951.54	161.7	64293.2	16622.9	14.4963
24	2953.25	161.8	65752.9	17163.1	14.6292
25	2954.96	161.96	66931.1	17566.8	14.7062
26	2956.67	162.179	67827.4	17828.4	14.727
27	2958.37	162.46	68443.1	17945.2	14.6918
28	2960.08	162.803	68781.2	17916.6	14.6003
29	2961.79	163.209	68845.5	17744.5	14.4531
30	2963.5	163.68	68641.2	17433	14.2503
31	2965.21	164.219	68174.2	16988.3	13.9925
32	2966.92	164.826	67450.7	16418.3	13.6804
33	2968.63	165.506	66477.9	15733	13.3149
34	2970.34	166.261	65263.3	14943.5	12.8968
35	2972.05	167.095	63814.7	14062.8	12.4276
36	2973.75	168.013	62141	13104.7	11.9084
37	2975.46	169.02	60177.4	12069.3	11.3409
38	2977.17	170.124	57763	10942.5	10.7269
39	2978.88	171.331	54844.4	9738.12	10.0684
40	2980.59	172.652	51350.7	8471.42	9.36781
41	2982.3	174.098	47202.8	7161.94	8.62751
42	2984.01	175.686	42338.5	5837.5	7.85027
43	2985.72	177.435	37084.8	4579.13	7.0391
44	2987.43	179.372	31589.1	3430.11	6.1972
45	2989.13	181.534	25888.7	2414.38	5.32799
46	2990.84	183.975	20043.7	1554.65	4.43515
47	2992.55	186.777	14157.8	871.514	3.52252
48	2994.26	190.086	8429.96	381.922	2.59403
49	2995.82	193.799	3514.39	106.443	1.73483
50	2997.39	198.763	-693.128	-10.5141	0.869056
51	2998.95	210.567	0	0	0

List Of Coordinates

Water Table

X	Y
2899.62	190.086
3250.15	190.086

External Boundary

X	Y
2900.24	176.747
2899.89	159.019
3250.15	159.97
3250.15	449.88
3223.37	449.88
3207.8	420.38
3193.19	420.38
3178.23	389.913
3163.23	389.913
3148.37	360.203
3133.72	360.203
3118.15	329.726
3103.57	329.726
3087.95	299.67
3073.67	299.67
3058.12	269.607
3043.32	269.607
3027.95	239.415
3013.37	239.415
2998.49	209.657
2983.47	209.657
2973.98	189.42
2950.55	176.747

Critical Seismic Coefficient
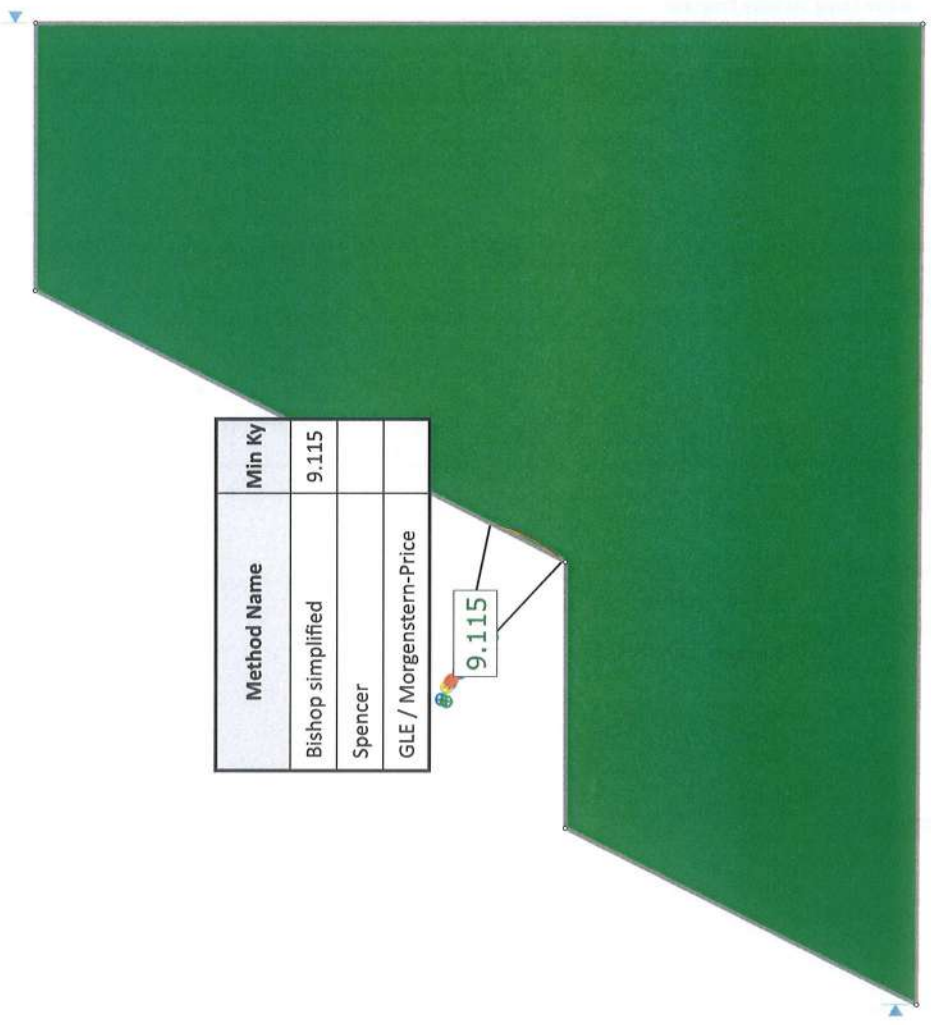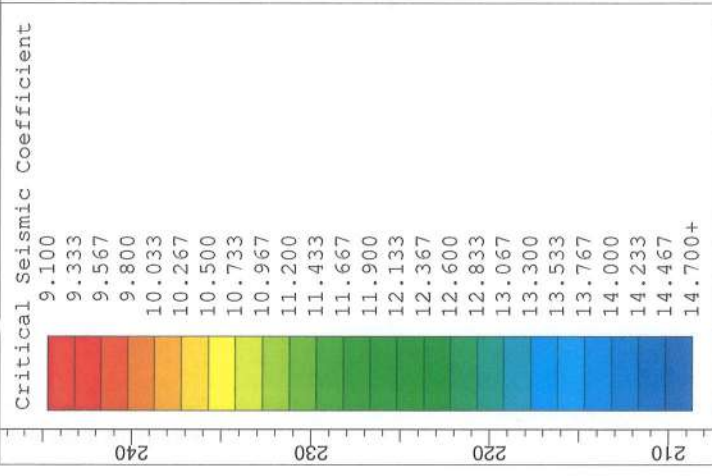
Method Name	Min Ky
Bishop simplified	9.115
Spencer	
GLE / Morgenstern-Price	

9.115

9.100
9.333
9.567
9.800
10.033
10.267
10.500
10.733
10.967
11.200
11.433
11.667
11.900
12.133
12.367
12.600
12.833
13.067
13.300
13.533
13.767
14.000
14.233
14.467
14.700+

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

File Name:	Bench Slope Stability.slmd - Group 1 - Scenario 1
Slide Modeler Version:	7.03
Project Title:	SLIDE - An Interactive Slope Stability Program
Date Created:	1/19/2018, 2:20:58 PM

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Failure Direction:	Right to Left
Data Output:	Standard
Maximum Material Properties:	20
Maximum Support Properties:	20

Analysis Options

Slices Type:	Vertical

Analysis Methods Used	
	Bishop simplified
GLE/Morgenstern-Price with interslice force function:	Half Sine
	Spencer

Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft3]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3

Surface Options

Surface Type:	Circular
Search Method:	Slope Search
Number of Surfaces:	5000
Upper Angle:	-45
Lower Angle:	-45
Composite Surfaces:	Disabled
Reverse Curvature:	Invalid Surfaces
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic

Advanced seismic analysis:	Yes
Locate surface with minimum critical horizontal seismic acceleration (Ky):	Yes
Target factor of safety:	1.3
Using Newmark analysis:	No
Staged pseudostatic analysis:	No

Material Properties

Property	Gopher Ridger Volcanics
Color	
Strength Type	Mohr-Coulomb
Unit Weight [lbs/ft3]	170
Cohesion [psf]	500
Friction Angle [deg]	45
Water Surface	None
Ru Value	0

Global Minimums

Method: bishop simplified

	Ky	9.115290
Center:		2992.084, 215.742
Radius:		8.462
Left Slip Surface Endpoint:		2998.285, 209.985
Right Slip Surface Endpoint:		3000.376, 214.057
Resisting Moment:		6863.25 lb-ft
Driving Moment:		6863.25 lb-ft
Total Slice Area:		0.965604 ft2
Surface Horizontal Width:		2.09102 ft
Surface Average Height:		0.461786 ft

Method: spencer

Resisting Moment:	0 lb-ft
Driving Moment:	0 lb-ft
Resisting Horizontal Force:	0 lb
Driving Horizontal Force:	0 lb
Total Slice Area:	0 ft2
Surface Horizontal Width:	0 ft
Surface Average Height:	0 ft

Method: gle/morgenstern-price

Resisting Moment:	0 lb-ft
Driving Moment:	0 lb-ft
Resisting Horizontal Force:	0 lb
Driving Horizontal Force:	0 lb
Total Slice Area:	0 ft2
Surface Horizontal Width:	0 ft
Surface Average Height:	0 ft

Valid / Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 19
Number of Invalid Surfaces: 4981

Error Codes:

Error Code -103 reported for 1009 surfaces
Error Code -105 reported for 1 surface
Error Code -106 reported for 15 surfaces
Error Code -108 reported for 136 surfaces
Error Code -111 reported for 6 surfaces
Error Code -112 reported for 222 surfaces
Error Code -114 reported for 3592 surfaces

Method: spencer

Number of Valid Surfaces: 0
Number of Invalid Surfaces: 5000

Error Codes:

Error Code -103 reported for 1009 surfaces
Error Code -105 reported for 1 surface
Error Code -106 reported for 15 surfaces
Error Code -108 reported for 155 surfaces
Error Code -111 reported for 6 surfaces
Error Code -112 reported for 222 surfaces
Error Code -114 reported for 3592 surfaces

Method: gle/morgenstern-price

Number of Valid Surfaces: 0
Number of Invalid Surfaces: 5000

Error Codes:

Error Code -103 reported for 1009 surfaces
Error Code -105 reported for 1 surface
Error Code -106 reported for 15 surfaces
Error Code -108 reported for 155 surfaces
Error Code -111 reported for 6 surfaces
Error Code -112 reported for 222 surfaces
Error Code -114 reported for 3592 surfaces

Error Codes

The following errors were encountered during the computation:

-103 = Two surface / slope intersections, but one or more surface / nonslope external polygon intersections lie between them. This usually occurs when the slip surface extends past the bottom of the soil region, but may also occur on a benched slope model with two sets of Slope Limits.
-105 = More than two surface / slope intersections with no valid slip surface.
-106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which

may result from too many slices, or too small a slip region.

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

-111 = safety factor equation did not converge

-112 = The coefficient M-Alpha = cos(alpha)(1+tan(alpha)tan(phi)/F) < 0.2 for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

-114 = Surface with Reverse Curvature.

Slice Data

Global Minimum Query (bishop simplified) - Critical Seismic Coefficient: 9.11529

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	0.0418204	0.128197	47.335	Gopher Ridger Volcanics	500	45	274.229	274.229	-225.771	0	-225.771	71.7726	71.7726
2	0.0418204	0.382203	47.7545	Gopher Ridger Volcanics	500	45	275.683	275.683	-224.317	0	-224.317	79.2343	79.2343
3	0.0418204	0.631372	48.1775	Gopher Ridger Volcanics	500	45	277.01	277.01	-222.99	0	-222.99	86.5834	86.5834
4	0.0418204	0.875584	48.6039	Gopher Ridger Volcanics	500	45	278.208	278.208	-221.792	0	-221.792	93.8165	93.8165
5	0.0418204	1.11471	49.034	Gopher Ridger Volcanics	500	45	279.275	279.275	-220.725	0	-220.725	100.929	100.929
6	0.0418204	1.34863	49.4678	Gopher Ridger Volcanics	500	45	280.211	280.211	-219.79	0	-219.79	107.922	107.922
7	0.0418204	1.57718	49.9055	Gopher Ridger Volcanics	500	45	281.011	281.011	-218.989	0	-218.989	114.788	114.788
8	0.0418204	1.80024	50.3472	Gopher Ridger Volcanics	500	45	281.675	281.675	-218.326	0	-218.326	121.523	121.523
9	0.0418204	2.01764	50.7931	Gopher Ridger Volcanics	500	45	282.2	282.2	-217.801	0	-217.801	128.126	128.126
10	0.0418204	2.22922	51.2432	Gopher Ridger Volcanics	500	45	282.583	282.583	-217.418	0	-217.418	134.588	134.588
11	0.0418204	2.43481	51.6978	Gopher Ridger Volcanics	500	45	282.822	282.822	-217.178	0	-217.178	140.909	140.909
12	0.0418204	2.63423	52.157	Gopher Ridger Volcanics	500	45	282.914	282.914	-217.086	0	-217.086	147.081	147.081
13	0.0418204	2.82728	52.6211	Gopher Ridger Volcanics	500	45	282.857	282.857	-217.143	0	-217.143	153.101	153.101
14	0.0418204	3.01376	53.09	Gopher Ridger Volcanics	500	45	282.647	282.647	-217.352	0	-217.352	158.962	158.962
15	0.0418204	3.19345	53.5642	Gopher Ridger Volcanics	500	45	282.281	282.281	-217.718	0	-217.718	164.658	164.658
16	0.0418204	3.36613	54.0437	Gopher Ridger Volcanics	500	45	281.757	281.757	-218.243	0	-218.243	170.185	170.185
17	0.0418204	3.53154	54.5288	Gopher Ridger Volcanics	500	45	281.069	281.069	-218.93	0	-218.93	175.534	175.534
18	0.0418204	3.68943	55.0198	Gopher Ridger Volcanics	500	45	280.216	280.216	-219.785	0	-219.785	180.699	180.699
19	0.0418204	3.83952	55.5168	Gopher Ridger Volcanics	500	45	279.191	279.191	-220.809	0	-220.809	185.673	185.673
20	0.0418204	3.98151	56.0202	Gopher Ridger Volcanics	500	45	277.993	277.993	-222.007	0	-222.007	190.448	190.448
21	0.0418204	4.11508	56.5303	Gopher Ridger Volcanics	500	45	276.615	276.615	-223.385	0	-223.385	195.015	195.015
22	0.0418204	4.23988	57.0473	Gopher Ridger Volcanics	500	45	275.053	275.053	-224.947	0	-224.947	199.364	199.364
23	0.0418204	4.35555	57.5716	Gopher Ridger Volcanics	500	45	273.302	273.302	-226.699	0	-226.699	203.485	203.485
24	0.0418204	4.46168	58.1036	Gopher Ridger Volcanics	500	45	271.356	271.356	-228.643	0	-228.643	207.37	207.37
25	0.0418204	4.55785	58.6437	Gopher Ridger Volcanics	500	45	269.21	269.21	-230.79	0	-230.79	211.004	211.004

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
26	0.0418204	4.64357	59.1922	Gopher Ridger Volcanics	500	45	266.857	266.857	-233.143	0	-233.143	214.376	214.376
27	0.0418204	4.71835	59.7497	Gopher Ridger Volcanics	500	45	264.29	264.29	-235.71	0	-235.71	217.471	217.471
28	0.0418204	4.78163	60.3167	Gopher Ridger Volcanics	500	45	261.503	261.503	-238.498	0	-238.498	220.276	220.276
29	0.0418204	4.8328	60.8936	Gopher Ridger Volcanics	500	45	258.486	258.486	-241.514	0	-241.514	222.772	222.772
30	0.0418204	4.87119	61.4813	Gopher Ridger Volcanics	500	45	255.231	255.231	-244.769	0	-244.769	224.942	224.942
31	0.0418204	4.89606	62.0802	Gopher Ridger Volcanics	500	45	251.73	251.73	-248.271	0	-248.271	226.767	226.767
32	0.0418204	4.9066	62.6912	Gopher Ridger Volcanics	500	45	247.971	247.971	-252.029	0	-252.029	228.224	228.224
33	0.0418204	4.90191	63.3151	Gopher Ridger Volcanics	500	45	243.943	243.943	-256.057	0	-256.057	229.288	229.288
34	0.0418204	4.88097	63.9528	Gopher Ridger Volcanics	500	45	239.634	239.634	-260.366	0	-260.366	229.931	229.931
35	0.0418204	4.84264	64.6054	Gopher Ridger Volcanics	500	45	235.03	235.03	-264.971	0	-264.971	230.121	230.121
36	0.0418204	4.78566	65.274	Gopher Ridger Volcanics	500	45	230.115	230.115	-269.885	0	-269.885	229.824	229.824
37	0.0418204	4.70855	65.9601	Gopher Ridger Volcanics	500	45	224.873	224.873	-275.127	0	-275.127	229	229
38	0.0418204	4.60967	66.6651	Gopher Ridger Volcanics	500	45	219.285	219.285	-280.716	0	-280.716	227.605	227.605
39	0.0418204	4.48708	67.3908	Gopher Ridger Volcanics	500	45	213.327	213.327	-286.672	0	-286.672	225.581	225.581
40	0.0418204	4.33856	68.1393	Gopher Ridger Volcanics	500	45	206.977	206.977	-293.023	0	-293.023	222.872	222.872
41	0.0418204	4.16149	68.9131	Gopher Ridger Volcanics	500	45	200.204	200.204	-299.796	0	-299.796	219.399	219.399
42	0.0418204	3.95275	69.715	Gopher Ridger Volcanics	500	45	192.976	192.976	-307.024	0	-307.024	215.079	215.079
43	0.0418204	3.7086	70.5486	Gopher Ridger Volcanics	500	45	185.253	185.253	-314.746	0	-314.746	209.806	209.806
44	0.0418204	3.42446	71.4181	Gopher Ridger Volcanics	500	45	176.99	176.99	-323.01	0	-323.01	203.455	203.455
45	0.0418204	3.09462	72.3289	Gopher Ridger Volcanics	500	45	168.128	168.128	-331.872	0	-331.872	195.86	195.86
46	0.0418204	2.71187	73.2876	Gopher Ridger Volcanics	500	45	158.598	158.598	-341.401	0	-341.401	186.819	186.819
47	0.0418204	2.26674	74.3033	Gopher Ridger Volcanics	500	45	148.313	148.313	-351.688	0	-351.688	176.071	176.071
48	0.0418204	1.74652	75.3879	Gopher Ridger Volcanics	500	45	137.155	137.155	-362.845	0	-362.845	163.247	163.247
49	0.0418204	1.13328	76.5583	Gopher Ridger Volcanics	500	45	124.968	124.968	-375.032	0	-375.032	147.839	147.839
50	0.0418204	0.400389	77.8395	Gopher Ridger Volcanics	500	45	111.527	111.527	-388.473	0	-388.473	129.087	129.087

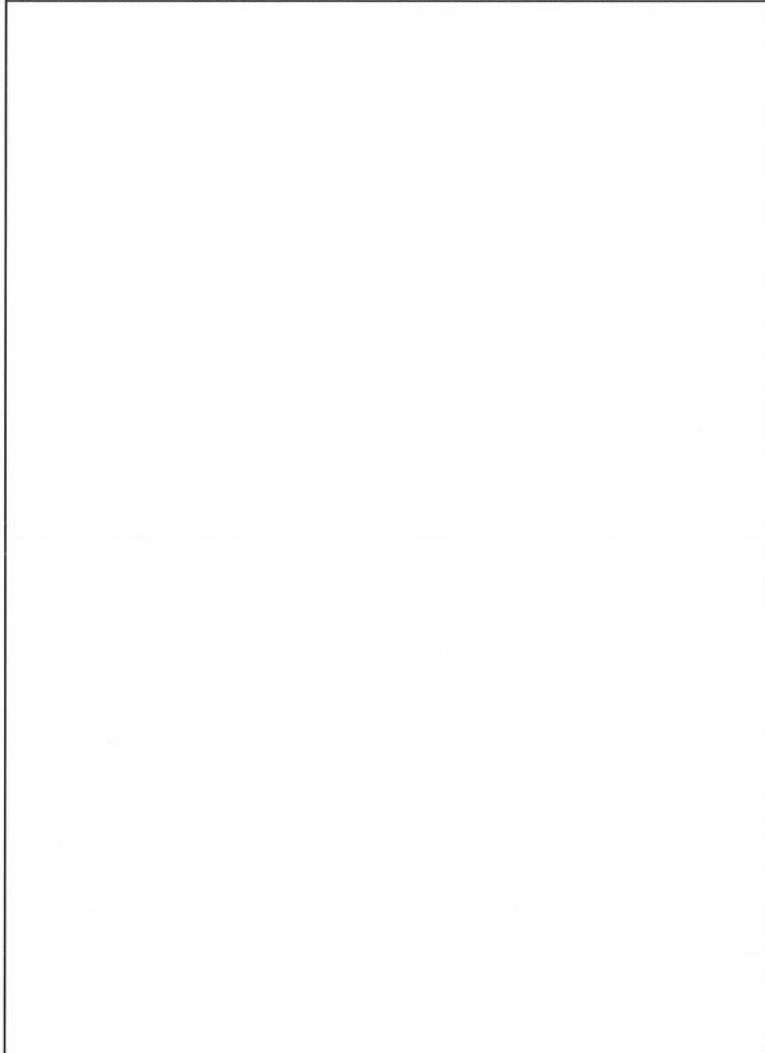**Query 1 (bishop simplified) - Critical Seismic Coefficient: 9.11529**

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]	Base Vertical Stress [psf]	Effective Vertical Stress [psf]
1	0.0418204	0.128197	47.335	Gopher Ridger Volcanics	500	45	274.229	274.229	-225.771	0	-225.771	71.7726	71.7726
2	0.0418204	0.382203	47.7545	Gopher Ridger Volcanics	500	45	275.683	275.683	-224.317	0	-224.317	79.2343	79.2343
3	0.0418204	0.631372	48.1775	Gopher Ridger Volcanics	500	45	277.01	277.01	-222.99	0	-222.99	86.5834	86.5834
4	0.0418204	0.875584	48.6039	Gopher Ridger Volcanics	500	45	278.208	278.208	-221.792	0	-221.792	93.8165	93.8165
5	0.0418204	1.11471	49.034	Gopher Ridger Volcanics	500	45	279.275	279.275	-220.725	0	-220.725	100.929	100.929
6	0.0418204	1.34863	49.4678	Gopher Ridger Volcanics	500	45	280.211	280.211	-219.79	0	-219.79	107.922	107.922

				Volcanics									
7	0.0418204	1.57718	49.9055	Gopher Ridger Volcanics	500	45	281.011	281.011	-218.989	0	-218.989	114.788	114.788
8	0.0418204	1.80024	50.3472	Gopher Ridger Volcanics	500	45	281.675	281.675	-218.326	0	-218.326	121.523	121.523
9	0.0418204	2.01764	50.7931	Gopher Ridger Volcanics	500	45	282.2	282.2	-217.801	0	-217.801	128.126	128.126
10	0.0418204	2.22922	51.2432	Gopher Ridger Volcanics	500	45	282.583	282.583	-217.418	0	-217.418	134.588	134.588
11	0.0418204	2.43481	51.6978	Gopher Ridger Volcanics	500	45	282.822	282.822	-217.178	0	-217.178	140.909	140.909
12	0.0418204	2.63423	52.157	Gopher Ridger Volcanics	500	45	282.914	282.914	-217.086	0	-217.086	147.081	147.081
13	0.0418204	2.82728	52.6211	Gopher Ridger Volcanics	500	45	282.857	282.857	-217.143	0	-217.143	153.101	153.101
14	0.0418204	3.01376	53.09	Gopher Ridger Volcanics	500	45	282.647	282.647	-217.352	0	-217.352	158.962	158.962
15	0.0418204	3.19345	53.5642	Gopher Ridger Volcanics	500	45	282.281	282.281	-217.718	0	-217.718	164.658	164.658
16	0.0418204	3.36613	54.0437	Gopher Ridger Volcanics	500	45	281.757	281.757	-218.243	0	-218.243	170.185	170.185
17	0.0418204	3.53154	54.5288	Gopher Ridger Volcanics	500	45	281.069	281.069	-218.93	0	-218.93	175.534	175.534
18	0.0418204	3.68943	55.0198	Gopher Ridger Volcanics	500	45	280.216	280.216	-219.785	0	-219.785	180.699	180.699
19	0.0418204	3.83952	55.5168	Gopher Ridger Volcanics	500	45	279.191	279.191	-220.809	0	-220.809	185.673	185.673
20	0.0418204	3.98151	56.0202	Gopher Ridger Volcanics	500	45	277.993	277.993	-222.007	0	-222.007	190.448	190.448
21	0.0418204	4.11508	56.5303	Gopher Ridger Volcanics	500	45	276.615	276.615	-223.385	0	-223.385	195.015	195.015
22	0.0418204	4.23988	57.0473	Gopher Ridger Volcanics	500	45	275.053	275.053	-224.947	0	-224.947	199.364	199.364
23	0.0418204	4.35555	57.5716	Gopher Ridger Volcanics	500	45	273.302	273.302	-226.699	0	-226.699	203.485	203.485
24	0.0418204	4.46168	58.1036	Gopher Ridger Volcanics	500	45	271.356	271.356	-228.643	0	-228.643	207.37	207.37
25	0.0418204	4.55785	58.6437	Gopher Ridger Volcanics	500	45	269.21	269.21	-230.79	0	-230.79	211.004	211.004
26	0.0418204	4.64357	59.1922	Gopher Ridger Volcanics	500	45	266.857	266.857	-233.143	0	-233.143	214.376	214.376
27	0.0418204	4.71835	59.7497	Gopher Ridger Volcanics	500	45	264.29	264.29	-235.71	0	-235.71	217.471	217.471
28	0.0418204	4.78163	60.3167	Gopher Ridger Volcanics	500	45	261.503	261.503	-238.498	0	-238.498	220.276	220.276
29	0.0418204	4.8328	60.8936	Gopher Ridger Volcanics	500	45	258.486	258.486	-241.514	0	-241.514	222.772	222.772
30	0.0418204	4.87119	61.4813	Gopher Ridger Volcanics	500	45	255.231	255.231	-244.769	0	-244.769	224.942	224.942
31	0.0418204	4.89606	62.0802	Gopher Ridger Volcanics	500	45	251.73	251.73	-248.271	0	-248.271	226.767	226.767
32	0.0418204	4.9066	62.6912	Gopher Ridger Volcanics	500	45	247.971	247.971	-252.029	0	-252.029	228.224	228.224
33	0.0418204	4.90191	63.3151	Gopher Ridger Volcanics	500	45	243.943	243.943	-256.057	0	-256.057	229.288	229.288
34	0.0418204	4.88097	63.9528	Gopher Ridger Volcanics	500	45	239.634	239.634	-260.366	0	-260.366	229.931	229.931
35	0.0418204	4.84264	64.6054	Gopher Ridger Volcanics	500	45	235.03	235.03	-264.971	0	-264.971	230.121	230.121
36	0.0418204	4.78566	65.274	Gopher Ridger Volcanics	500	45	230.115	230.115	-269.885	0	-269.885	229.824	229.824
37	0.0418204	4.70855	65.9601	Gopher Ridger Volcanics	500	45	224.873	224.873	-275.127	0	-275.127	229	229
38	0.0418204	4.60967	66.6651	Gopher Ridger Volcanics	500	45	219.285	219.285	-280.716	0	-280.716	227.605	227.605
39	0.0418204	4.48708	67.3908	Gopher Ridger Volcanics	500	45	213.327	213.327	-286.672	0	-286.672	225.581	225.581

40	0.0418204	4.33856	68.1393	Gopher Ridger Volcanics	500	45	206.977	206.977	-293.023	0	-293.023	222.872	222.872
41	0.0418204	4.16149	68.9131	Gopher Ridger Volcanics	500	45	200.204	200.204	-299.796	0	-299.796	219.399	219.399
42	0.0418204	3.95275	69.715	Gopher Ridger Volcanics	500	45	192.976	192.976	-307.024	0	-307.024	215.079	215.079
43	0.0418204	3.7086	70.5486	Gopher Ridger Volcanics	500	45	185.253	185.253	-314.746	0	-314.746	209.806	209.806
44	0.0418204	3.42446	71.4181	Gopher Ridger Volcanics	500	45	176.99	176.99	-323.01	0	-323.01	203.455	203.455
45	0.0418204	3.09462	72.3289	Gopher Ridger Volcanics	500	45	168.128	168.128	-331.872	0	-331.872	195.86	195.86
46	0.0418204	2.71187	73.2876	Gopher Ridger Volcanics	500	45	158.598	158.598	-341.401	0	-341.401	186.819	186.819
47	0.0418204	2.26674	74.3033	Gopher Ridger Volcanics	500	45	148.313	148.313	-351.688	0	-351.688	176.071	176.071
48	0.0418204	1.74652	75.3879	Gopher Ridger Volcanics	500	45	137.155	137.155	-362.845	0	-362.845	163.247	163.247
49	0.0418204	1.13328	76.5583	Gopher Ridger Volcanics	500	45	124.968	124.968	-375.032	0	-375.032	147.839	147.839
50	0.0418204	0.400389	77.8395	Gopher Ridger Volcanics	500	45	111.527	111.527	-388.473	0	-388.473	129.087	129.087

Interslice Data

Global Minimum Query (bishop simplified) - Critical Seismic Coefficient: 9.11529

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	2998.29	209.985	0	0	0
2	2998.33	210.03	17.8962	0	0
3	2998.37	210.076	33.6086	0	0
4	2998.41	210.123	47.1848	0	0
5	2998.45	210.17	58.6741	0	0
6	2998.49	210.218	68.1272	0	0
7	2998.54	210.267	75.5964	0	0
8	2998.58	210.317	81.1361	0	0
9	2998.62	210.368	84.8021	0	0
10	2998.66	210.419	86.6526	0	0
11	2998.7	210.471	86.7477	0	0
12	2998.75	210.524	85.1498	0	0
13	2998.79	210.578	81.9235	0	0
14	2998.83	210.632	77.1363	0	0
15	2998.87	210.688	70.858	0	0
16	2998.91	210.745	63.1616	0	0
17	2998.95	210.802	54.1231	0	0
18	2999	210.861	43.8218	0	0
19	2999.04	210.921	32.3407	0	0
20	2999.08	210.982	19.7665	0	0
21	2999.12	211.044	6.1903	0	0
22	2999.16	211.107	-8.29243	0	0
23	2999.21	211.172	-23.5812	0	0
24	2999.25	211.237	-39.5703	0	0
25	2999.29	211.305	-56.1479	0	0
26	2999.33	211.373	-73.196	0	0
27	2999.37	211.443	-90.5895	0	0
28	2999.41	211.515	-108.196	0	0
29	2999.46	211.588	-125.872	0	0
30	2999.5	211.664	-143.469	0	0
31	2999.54	211.74	-160.824	0	0
32	2999.58	211.819	-177.763	0	0
33	2999.62	211.9	-194.1	0	0
34	2999.67	211.984	-209.631	0	0
35	2999.71	212.069	-224.136	0	0
36	2999.75	212.157	-237.376	0	0
37	2999.79	212.248	-249.088	0	0
38	2999.83	212.342	-258.981	0	0
39	2999.87	212.439	-266.733	0	0
40	2999.92	212.539	-271.984	0	0
41	2999.96	212.643	-274.33	0	0
42	3000	212.752	-273.31	0	0
43	3000.04	212.865	-268.395	0	0
44	3000.08	212.983	-258.97	0	0
45	3000.13	213.108	-244.311	0	0
46	3000.17	213.239	-223.548	0	0
47	3000.21	213.378	-195.614	0	0
48	3000.25	213.527	-159.169	0	0
49	3000.29	213.688	-112.473	0	0
50	3000.33	213.863	-53.1611	0	0
51	3000.38	214.057	0	0	0

Query 1 (bishop simplified) - Critical Seismic Coefficient: 9.11529

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	2998.29	209.985	0	0	0
2	2998.33	210.03	17.8962	0	0
3	2998.37	210.076	33.6086	0	0
4	2998.41	210.123	47.1848	0	0
5	2998.45	210.17	58.6741	0	0
6	2998.49	210.218	68.1272	0	0
7	2998.54	210.267	75.5964	0	0
8	2998.58	210.317	81.1361	0	0
9	2998.62	210.368	84.8021	0	0
10	2998.66	210.419	86.6526	0	0
11	2998.7	210.471	86.7477	0	0
12	2998.75	210.524	85.1498	0	0
13	2998.79	210.578	81.9235	0	0
14	2998.83	210.632	77.1363	0	0
15	2998.87	210.688	70.858	0	0
16	2998.91	210.745	63.1616	0	0
17	2998.95	210.802	54.1231	0	0
18	2999	210.861	43.8218	0	0
19	2999.04	210.921	32.3407	0	0
20	2999.08	210.982	19.7665	0	0
21	2999.12	211.044	6.1903	0	0
22	2999.16	211.107	-8.29243	0	0
23	2999.21	211.172	-23.5812	0	0
24	2999.25	211.237	-39.5703	0	0
25	2999.29	211.305	-56.1479	0	0
26	2999.33	211.373	-73.196	0	0
27	2999.37	211.443	-90.5895	0	0
28	2999.41	211.515	-108.196	0	0
29	2999.46	211.588	-125.872	0	0
30	2999.5	211.664	-143.469	0	0
31	2999.54	211.74	-160.824	0	0
32	2999.58	211.819	-177.763	0	0
33	2999.62	211.9	-194.1	0	0
34	2999.67	211.984	-209.631	0	0
35	2999.71	212.069	-224.136	0	0
36	2999.75	212.157	-237.376	0	0
37	2999.79	212.248	-249.088	0	0
38	2999.83	212.342	-258.981	0	0
39	2999.87	212.439	-266.733	0	0
40	2999.92	212.539	-271.984	0	0
41	2999.96	212.643	-274.33	0	0
42	3000	212.752	-273.31	0	0
43	3000.04	212.865	-268.395	0	0
44	3000.08	212.983	-258.97	0	0
45	3000.13	213.108	-244.311	0	0
46	3000.17	213.239	-223.548	0	0
47	3000.21	213.378	-195.614	0	0
48	3000.25	213.527	-159.169	0	0
49	3000.29	213.688	-112.473	0	0
50	3000.33	213.863	-53.1611	0	0
51	3000.38	214.057	0	0	0

List Of Coordinates

External Boundary

X	Y
2973.32	190.173
3028.59	189.906
3028.59	239.557
3013.47	239.557
2998.21	209.846
2983.22	209.846