

Submittal Review



Munjoy Heights
 JN 1047
 79 Walnut Street, Portland, Maine, 04101

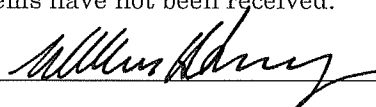
Submittal # 7 (Spec. 323223, Sub. 1)
 Revision #
 Date Submitted: 3/6/2014
 Date Returned: 3/13/2014

Client/Owner		Engineers/Architects	
Company	Contact	Company	Contact
Redfern Munjoy LLC	Jonathan Culley	Acorn Engineering, Inc. PO Box 3372 Portland, Maine, 04104	Will Savage, PE Project Manager 207.775.2655 wsavage@acorn-engineering.com

Description of Item Submitted: **Retaining Wall Global Stability Analysis**
 Sheet/Specification Page: Summit Geoengineering Services Slope Stability Analysis dated March 10, 2014.

<input type="checkbox"/> Approved	<input type="checkbox"/> Revise as Noted
<input checked="" type="checkbox"/> Approved as Noted	<input type="checkbox"/> Rejected
<input type="checkbox"/> Revise and Resubmit	

The Consultant's (Acorn Engineering) review was performed only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Modifications or comments made on the submittal/shop drawings during this review do not relieve the contractor from compliance with the requirements of the plans and specifications. This review shall not include review of the accuracy or completeness of details, such as quantities, dimensions, weights or gauges, fabrication processes, construction means or methods, coordination of the work with other trades or construction safety precautions, all of which are the sole responsibility of the Contractor. Review of a specific item shall not indicate that the Consultant has reviewed the entire assembly of which the item is a component. The Consultant shall not be responsible for any deviations from the Contract Documents not brought to the attention of the Consultant in writing by the Contractor. The Consultant shall not be required to review partial submissions or those for which submissions of correlated items have not been received.

Signature:  Date: 3/13/14

Notes:

- 1) Acorn Engineering's submittal review does not include a review of the wall design, dimensions, calculations, global stability analysis and the design of the temporary soil restraint measures provided by Summit Geoengineering Services.



March 10, 2014
SGS #13217

Andrew McCrum
Precast Concrete Products of Maine
139 Main Street
Topsham, Maine 04086

Reference: Slope Stability Analysis, Munjoy Heights
Walnut Street, Portland, Maine

Dear Andy;

Summit performed a global slope stability analysis at the two critical locations for the Munjoy Heights project. The locations, labeled Section 1 and Section 2 are shown on the attached site grading plan C-30. The pictorial and numerical results of the stability analyses are also attached.

The global slope stability analysis was performed by Summit using Slide v6, published by Rocscience. All proposed constructed elements intersected by the cross section line were included in the model, including the subsurface detention system (full water level), proposed building foundations, and MSE and GRAVITY retaining walls. Both the static and seismic conditions were analyzed. All possible failure surfaces were analyzed using the Bishop Simplified and Janbu Simplified methods.

We note that the stability analyses were performed using the Stone Strong retaining wall system, previously designed by SGS.

The critical failure surfaces are shown on the attached figures. The minimum safety factors are summarized below.

LOCATION	ANALYSIS	SAFETY FACTOR	
		Static	Seismic
Section 1	Overall Stability	1.42	1.32
	Foundation & Retaining Wall	1.36	1.32
Section 2	Overall Stability	1.35	1.17

In all cases the minimum requirements of 1.3 for static conditions and 1.1 for seismic conditions were met.

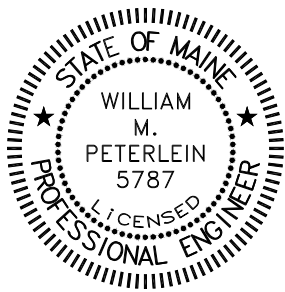


We appreciate the opportunity to assist you with this phase of the project. If there are any questions, please do not hesitate to contact me.

Respectfully Submitted
Summit Geoengineering Services, Inc.

A handwritten signature in blue ink that reads "William M. Peterlein".

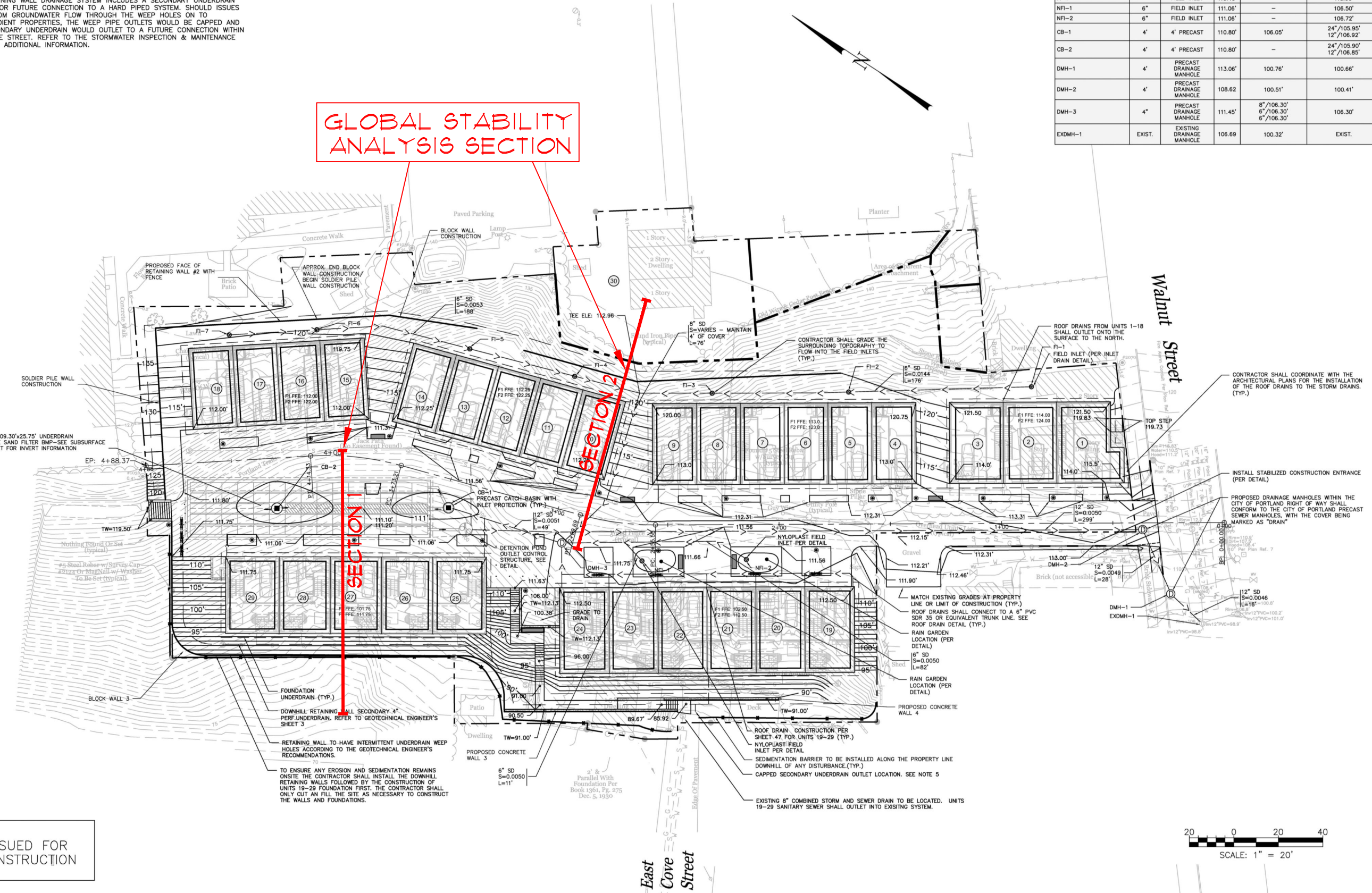
William M. Peterlein, P.E.
President & Principal Engineer



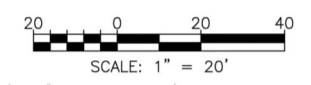
- NOTE:
1. ALL DISTURBED AND PROPOSED SLOPES NOT COVERED WITH MULCH AND GREATER THAN 3:1 SHALL BE STABILIZED WITH 4" OF LOAM SEED AND EROSION CONTROL BLANKETS SC150BN BY NORTH AMERICAN GREEN OR APPROVED EQUAL.
 2. ALL DISTURBED AND PROPOSED SLOPES TO BE COVERED WITH MULCH AND GREATER THAN 3:1 SHALL BE TEMPORARILY STABILIZED WITH EROSION CONTROL BLANKETS SC150BN BY NORTH AMERICAN GREEN OR APPROVED EQUAL.
 3. THE UNDERDRAIN ASSOCIATED WITH THE UPHILL RETAINING WALLS AND FOUNDATION UNDERDRAIN FOR UNITS 1-18 SHALL OUTLET DOWNSTREAM OF THE UNDERDRAINED SUBSURFACE SAND FILTER'S OUTLET CONTROL STRUCTURE.
 4. ALL STORM DRAIN PIPES SHALL CONFORM TO CITY OF PORTLAND TECHNICAL MANUAL SECTION 2.5.2.
 5. THE RETAINING WALL DRAINAGE SYSTEM INCLUDES A SECONDARY UNDERDRAIN SYSTEM FOR FUTURE CONNECTION TO A HARD PIPED SYSTEM. SHOULD ISSUES ARISE FROM GROUNDWATER FLOW THROUGH THE WEEP HOLES ON TO DOWNGRADIENT PROPERTIES, THE WEEP PIPE OUTLETS WOULD BE CAPPED AND THE SECONDARY UNDERDRAIN WOULD OUTLET TO A FUTURE CONNECTION WITHIN EAST COVE STREET. REFER TO THE STORMWATER INSPECTION & MAINTENANCE PLAN FOR ADDITIONAL INFORMATION.

DRAINAGE STRUCTURE SCHEDULE					
STRUCTURE	SIZE	TYPE	RIM	INV. IN	INV. OUT
FI-1	-	FIELD INLET	121.00'	-	115.50'
FI-2	-	FIELD INLET	120.40'	114.90'	114.90'
FI-3	-	FIELD INLET	120.40'	114.30'	114.30'
FI-4	-	FIELD INLET	121.90'	113.16'	113.16'
FI-5	-	FIELD INLET	121.90'	113.32'	113.32'
FI-6	-	FIELD INLET	119.40'	113.70'	113.70'
FI-7	-	FIELD INLET	119.40'	-	113.90'
NFI-1	6"	FIELD INLET	111.06'	-	106.50'
NFI-2	6"	FIELD INLET	111.06'	-	106.72'
CB-1	4'	4' PRECAST	110.80'	106.05'	24"/105.95' 12"/106.92'
CB-2	4'	4' PRECAST	110.80'	-	24"/105.90' 12"/106.85'
DMH-1	4'	PRECAST DRAINAGE MANHOLE	113.06'	100.76'	100.66'
DMH-2	4'	PRECAST DRAINAGE MANHOLE	108.62	100.51'	100.41'
DMH-3	4"	PRECAST DRAINAGE MANHOLE	111.45'	8"/106.30' 6"/106.30'	106.30'
EXDMH-1	EXIST.	EXISTING DRAINAGE MANHOLE	106.69	100.32'	EXIST.

GLOBAL STABILITY ANALYSIS SECTION



ISSUED FOR CONSTRUCTION



ISSUED FOR	DATE	BY
CITY SUBMISSION	12/27/13	WHS
WORKSHOP #2	WHS	11/12/13
FINAL SUBMISSION	12/27/13	WHS
MAINE DEP MCGP	12/19/13	WHS
CONDITIONS APPROVAL	12/17/13	WHS
FINAL COND. APPROVAL	2/21/14	WHS
CONSTRUCTION	2/21/14	WHS
REVISION	DATE	BY
STAFF COMMENTS	WHS	12/27/13

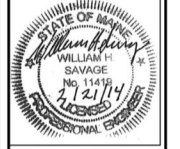
DRAWING NAME: GRADING, DRAINAGE & EROSION CONTROL PLAN
PROJECT NAME: MUNJOY HEIGHTS
CLIENT: REDFERN MUNJOY, LLC.
P.O. BOX 8816, PORTLAND, MAINE 04104

ACCOR ENGINEERING, INC.
ENGINEERING, INC.

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM ACCOR ENGINEERING, INC. ANY CHANGES SHALL BE THE USER'S RESPONSIBILITY TO VERIFY.

ACCOR ENGINEERING, INC.
P.O. BOX 1370
PORTLAND, ME 04104
(207) 775-2625

FILE: 1047_CIVIL
DATE: 11/05/13
JN: 1047
SCALE: 1"=20'
DESIGN BY: WHS
DRAWN BY: ZRJ

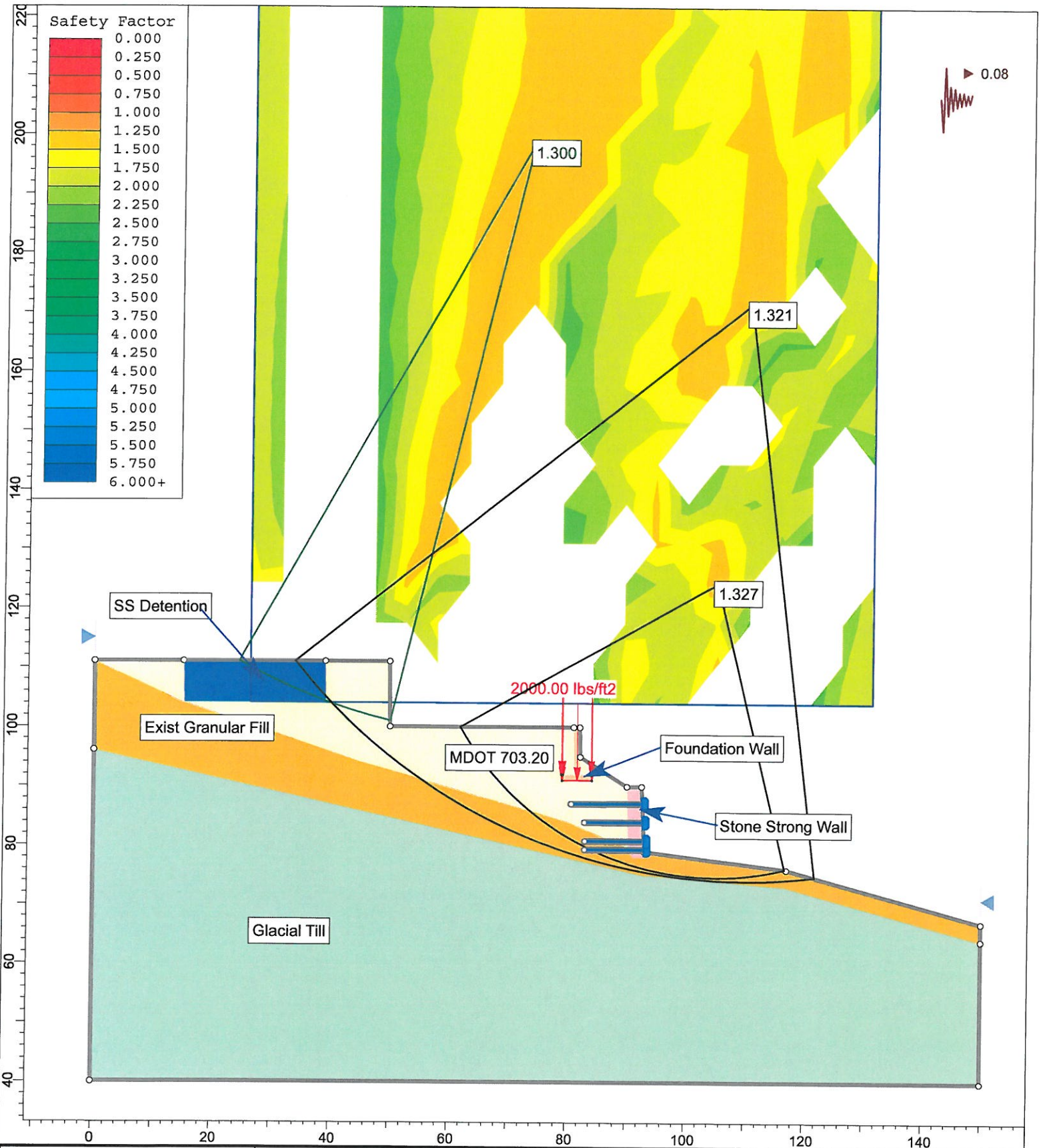


CHECKED BY: WHS

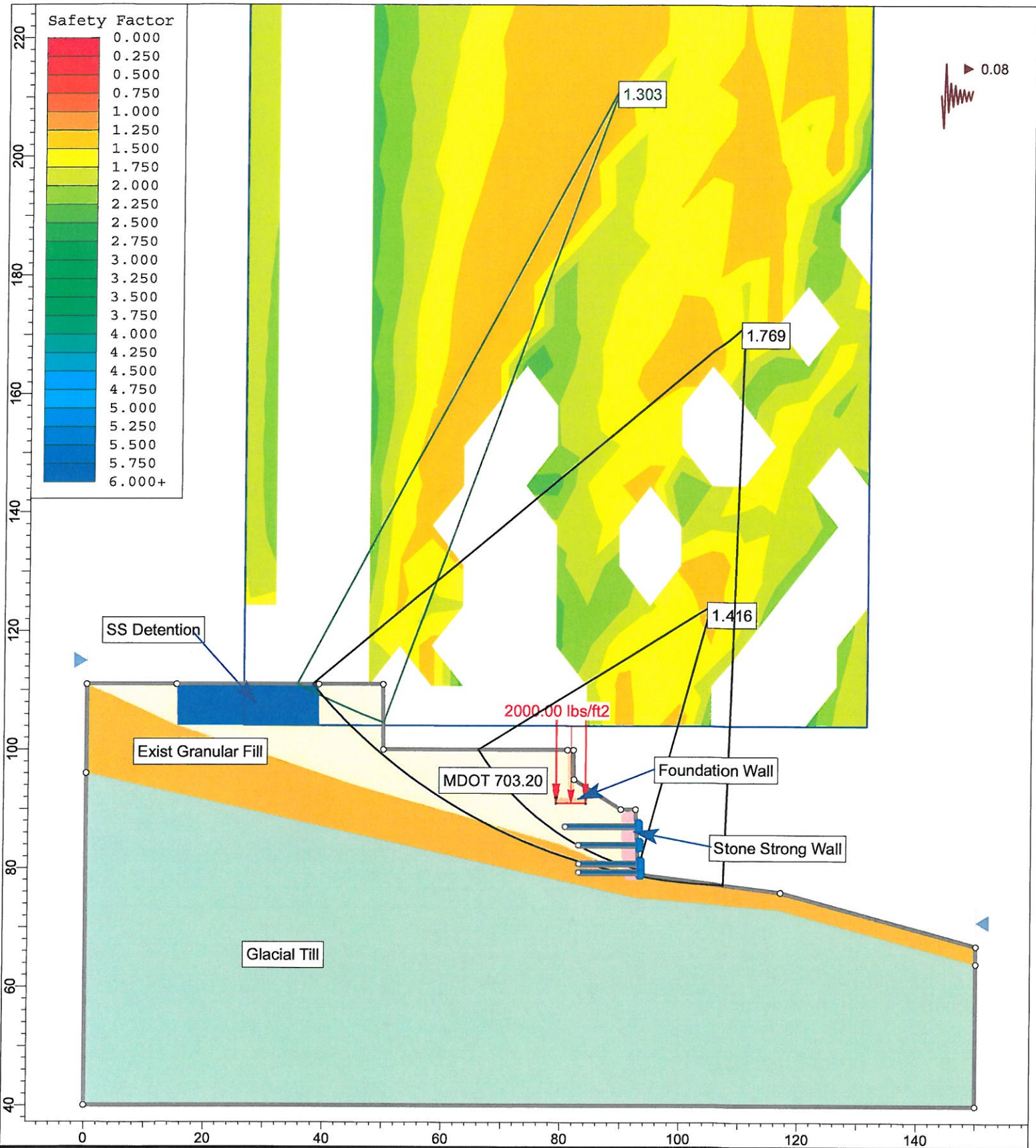
DRAWING NO.
C-30



SLOPE STABILITY ANALYSIS RESULTS
SECTION 1



	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 1 - Static ^{SEISMIC} - Stone Strong - Bishop		
	<i>Drawn By</i>	<i>Scale</i> 1:260	<i>Company</i> Summit Geoenengineering Services
	<i>Date</i> 1/7/2014, 8:33:22 AM	<i>File Name</i> Section 1 - SEISMIC.slim	



Munjoy Heights - #13217			
<i>Analysis Description</i>		SECTION 1 - Static ^{Seismic} Stone Strong - Janbu	
<i>Drawn By</i>	<i>Scale</i>	<i>Company</i>	Summit Geoengineering Services
<i>Date</i>	1/7/2014, 8:33:22 AM	<i>File Name</i>	Section 1 - SEISMIC.slim



Slide Analysis Information

Munjoy Heights #13067.1

Project Summary

File Name: Section 1 - SEISMIC
Slide Modeler Version: 6.026
Project Title: Munjoy Heights #13067.1
Analysis: SECTION 1 - SEISMIC ANALYSIS
Company: Summit Geoengineering Services
Date Created: 1/7/2014, 8:33:22 AM

General Settings

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

Analysis Options


Analysis Methods Used

Bishop simplified
Janbu simplified

Number of slices: 25
Tolerance: 0.005
Maximum number of iterations: 50
Check $m\alpha < 0.2$: Yes
Apply support forces to interslice boundaries: Yes
Discard data for surfaces with FS below: 1.3
Discard data for surfaces with FS above: 2.5
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces

	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 2 - Seismic - Stone Strong - Janbu/Bishop		
	<i>Drawn By</i>	<i>Scale</i>	<i>Company</i> Summit Geoengineering Services
	<i>Date</i> 1/7/2014, 8:33:22 AM	<i>File Name</i> Section 1 - SEISMIC.slim	

Pore Fluid Unit Weight: 62.4 lbs/ft³
 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: Grid Search
 Radius Increment: 10
 Composite Surfaces: Disabled
 Reverse Curvature: Create Tension Crack
 Minimum Elevation: Not Defined
 Minimum Depth: Not Defined







Loading


Seismic Load Coefficient (Horizontal): 0.08
 1 Distributed Load present

Distributed Load 1

Distribution: Constant
 Magnitude [psf]: 2000
 Orientation: Vertical

Material Properties

Property	Inported Fill (MDOT 703.20)	Native Glacial Till	Foundation Wall	Existing Granular Fill - Proofrolled	Retaining Wall	water
Color						
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft ³]	130	124	150	130	127	62.4
Cohesion [psf]	0.02	2000	10000	0.02	1257	0.02
Friction Angle [deg]	35	35	45	32	35	1
Water Surface	None	None	None	None	None	None
Ru Value	0	0	0	0	0	0

	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 2 - Seismic - Stone Strong - Janbu/Bishop		
	<i>Drawn By</i>	<i>Scale</i>	<i>Company</i> Summit Geoengineering Services
	<i>Date</i> 1/7/2014, 8:33:22 AM	<i>File Name</i> Section 1 - SEISMIC.slim	

Support Properties

Support 1

Support Type: GeoTextile
Force Application: Active
Force Orientation: Parallel to Reinforcement
Anchorage: Slope Face
Shear Strength Model: Linear
Strip Coverage: 100 percent
Tensile Strength: 5000 lb/ft
Pullout Strength Adhesion: 0.8 psf
Pullout Strength Friction Angle: 40 degrees

Global Minimums

Method: bishop simplified

FS: 1.300340
Center: 73.624, 198.551
Radius: 100.419
Left Slip Surface Endpoint: 24.443, 111.000
Right Slip Surface Endpoint: 49.991, 100.953
Resisting Moment=764888 lb-ft
Driving Moment=588220 lb-ft
Total Slice Area=145.129 ft²


Method: janbu simplified

FS: 1.303140
Center: 89.366, 212.056
Radius: 114.565
Left Slip Surface Endpoint: 35.397, 111.000
Right Slip Surface Endpoint: 49.959, 104.483
Resisting Horizontal Force=3487.15 lb
Driving Horizontal Force=2675.96 lb
Total Slice Area=50.2131 ft²

Valid / Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 1001
Number of Invalid Surfaces: 3850

	Munjoy Heights - #13217		
	SECTION 2 - Seismic - Stone Strong - Janbu/Bishop		
	Drawn By	Scale	Company
	Date	File Name	
	1/7/2014, 8:33:22 AM	Summit Geoengineering Services	Section 1 - SEISMIC.slim

Error Codes:

Error Code -97 reported for 3575 surfaces
Error Code -100 reported for 1 surface
Error Code -103 reported for 12 surfaces
Error Code -106 reported for 24 surfaces
Error Code -107 reported for 66 surfaces
Error Code -112 reported for 172 surfaces

Method: Janbu Simplified

Number of Valid Surfaces: 1114
Number of Invalid Surfaces: 3737

Error Codes:

Error Code -97 reported for 3461 surfaces
Error Code -100 reported for 1 surface
Error Code -103 reported for 12 surfaces
Error Code -106 reported for 24 surfaces
Error Code -107 reported for 66 surfaces
Error Code -112 reported for 173 surfaces

Error Codes


The following errors were encountered during the computation:

- 97 = Factor of safety is out of valid range set by user.
- 100 = Both surface / slope intersections are on the same horizontal surface. In general, this will give a very high or infinite factor of safety (zero driving force), if calculated.
- 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.
- 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.
- 107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.
- 112 = The coefficient $M\text{-}\alpha = \cos(\alpha)(1 + \tan(\alpha)\tan(\phi))/F < 0.2$ 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.

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.30034


Slice Number	Width [ft]	Weight [lbs]	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]
1	1.04667	18.9336	water	0.02	1	0.2563	0.333277	17.9476	0	17.9476

	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 2 - Seismic - Stone Strong - Janbu/Bishop		
	<i>Drawn By</i>	<i>Scale</i>	<i>Company</i> Summit Geoengineering Services
	<i>Date</i> 1/7/2014, 8:33:22 AM	<i>File Name</i> Section 1 - SEISMIC.slim	

2	1.04667	56.2738	water	0.02	1	0.731805	0.951595	53.371	0	53.371
3	1.04667	92.5699	water	0.02	1	1.1942	1.55287	87.818	0	87.818
4	1.04667	127.841	water	0.02	1	1.64372	2.1374	121.306	0	121.306
5	1.04667	162.106	water	0.02	1	2.0806	2.70549	153.851	0	153.851
6	1.04667	195.382	water	0.02	1	2.50504	3.2574	185.471	0	185.471
7	1.04667	227.687	water	0.02	1	2.91724	3.7934	216.177	0	216.177
8	1.04667	259.034	water	0.02	1	3.31739	4.31373	245.988	0	245.988
9	1.04667	289.44	water	0.02	1	3.70567	4.81863	274.913	0	274.913
10	1.04667	318.92	water	0.02	1	4.08226	5.30833	302.968	0	302.968
11	1.04667	347.485	water	0.02	1	4.44732	5.78303	330.164	0	330.164
12	1.04667	375.149	water	0.02	1	4.80101	6.24295	356.513	0	356.513
13	1.04667	401.925	water	0.02	1	5.14347	6.68826	382.024	0	382.024
14	1.04667	449.794	water	0.02	1	5.75521	7.48373	427.597	0	427.597
15	0.990453	891.496	Inported Fill (MDOT 703.20)	0.02	35	406.047	527.999	754.033	0	754.033
16	0.990453	936.685	Inported Fill (MDOT 703.20)	0.02	35	428.904	557.721	796.48	0	796.48
17	0.990453	980.38	Inported Fill (MDOT 703.20)	0.02	35	451.292	586.833	838.057	0	838.057
18	0.990453	1022.6	Inported Fill (MDOT 703.20)	0.02	35	473.209	615.332	878.757	0	878.757
19	0.990453	1063.35	Inported Fill (MDOT 703.20)	0.02	35	494.651	643.214	918.576	0	918.576
20	0.990453	1102.66	Inported Fill (MDOT 703.20)	0.02	35	515.616	670.476	957.51	0	957.51
21	0.990453	1140.53	Inported Fill (MDOT 703.20)	0.02	35	536.101	697.113	995.553	0	995.553
22	0.990453	1176.98	Inported Fill (MDOT 703.20)	0.02	35	556.101	723.121	1032.7	0	1032.7
23	0.990453	1212.02	Inported Fill (MDOT 703.20)	0.02	35	575.616	748.497	1068.94	0	1068.94
24	0.990453	1245.66	Inported Fill (MDOT 703.20)	0.02	35	594.641	773.236	1104.27	0	1104.27
25	0.990453	1218.27	Inported Fill (MDOT 703.20)	0.02	35	584.551	760.115	1085.53	0	1085.53

Global Minimum Query (janbu simplified) - Safety Factor: 1.30314

Slice Number	Width [ft]	Weight [lbs]	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]
1	0.60486	6.05222	water	0.02	1	0.148321	0.193283	9.92735	0	9.92735
2	0.60486	18.0697	water	0.02	1	0.412613	0.537692	29.6585	0	29.6585
3	0.60486	29.914	water	0.02	1	0.673149	0.877208	49.1094	0	49.1094
4	0.60486	41.5867	water	0.02	1	0.929961	1.21187	68.2824	0	68.2824


	Munjoy Heights - #13217				
	SECTION 2 - Seismic - Stone Strong - Janbu/Bishop				
	Drawn By		Scale		Company
					Summit Geoenengineering Services
Date			1/7/2014, 8:33:22 AM		File Name
					Section 1 - SEISMIC.slim

5	0.60486	53.0895	water	0.02	1	1.18309	1.54173	87.1799	0	87.1799
6	0.60486	66.087	water	0.02	1	1.46914	1.9145	108.536	0	108.536
7	0.575407	149.282	Inported Fill (MDOT 703.20)	0.02	35	110.566	144.083	205.743	0	205.743
8	0.575407	170.039	Inported Fill (MDOT 703.20)	0.02	35	126.308	164.597	235.041	0	235.041
9	0.575407	190.502	Inported Fill (MDOT 703.20)	0.02	35	141.92	184.942	264.096	0	264.096
10	0.575407	210.673	Inported Fill (MDOT 703.20)	0.02	35	157.402	205.117	292.91	0	292.91
11	0.575407	230.553	Inported Fill (MDOT 703.20)	0.02	35	172.753	225.121	321.479	0	321.479
12	0.575407	250.146	Inported Fill (MDOT 703.20)	0.02	35	187.972	244.954	349.803	0	349.803
13	0.575407	269.453	Inported Fill (MDOT 703.20)	0.02	35	203.06	264.616	377.883	0	377.883
14	0.575407	288.476	Inported Fill (MDOT 703.20)	0.02	35	218.016	284.105	405.715	0	405.715
15	0.575407	307.218	Inported Fill (MDOT 703.20)	0.02	35	232.839	303.422	433.303	0	433.303
16	0.575407	325.68	Inported Fill (MDOT 703.20)	0.02	35	247.529	322.565	460.641	0	460.641
17	0.575407	343.865	Inported Fill (MDOT 703.20)	0.02	35	262.085	341.534	487.734	0	487.734
18	0.575407	361.774	Inported Fill (MDOT 703.20)	0.02	35	276.509	360.33	514.576	0	514.576
19	0.575407	379.41	Inported Fill (MDOT 703.20)	0.02	35	290.798	378.95	541.168	0	541.168
20	0.575407	396.773	Inported Fill (MDOT 703.20)	0.02	35	304.952	397.395	567.511	0	567.511
21	0.575407	413.867	Inported Fill (MDOT 703.20)	0.02	35	318.972	415.665	593.601	0	593.601
22	0.575407	430.692	Inported Fill (MDOT 703.20)	0.02	35	332.855	433.757	619.441	0	619.441
23	0.575407	447.25	Inported Fill (MDOT 703.20)	0.02	35	346.604	451.673	645.028	0	645.028
24	0.575407	463.543	Inported Fill (MDOT 703.20)	0.02	35	360.216	469.412	670.362	0	670.362
25	0.575407	454.472	Inported Fill (MDOT 703.20)	0.02	35	354.134	461.486	659.042	0	659.042

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.30034


X	Y	Interslice	Interslice	Interslice
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	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 2 - Seismic - Stone Strong - Janbu/Bishop		
	<i>Drawn By</i>	<i>Scale</i>	<i>Company</i> Summit Geoengineering Services
	<i>Date</i> 1/7/2014, 8:33:22 AM	<i>File Name</i> Section 1 - SEISMIC.slim	

Number	coordinate [ft]	coordinate - Bottom [ft]	Normal Force [lbs]	Shear Force [lbs]	Force Angle [degrees]
1	24.443	111	0	0	0
2	25.4896	110.42	11.6526	0	0
3	26.5363	109.857	45.4721	0	0
4	27.583	109.309	99.7374	0	0
5	28.6296	108.776	172.814	0	0
6	29.6763	108.259	263.149	0	0
7	30.723	107.757	369.266	0	0
8	31.7697	107.27	489.76	0	0
9	32.8163	106.798	623.295	0	0
10	33.863	106.339	768.597	0	0
11	34.9097	105.895	924.456	0	0
12	35.9563	105.464	1089.72	0	0
13	37.003	105.048	1263.28	0	0
14	38.0497	104.645	1444.09	0	0
15	39.0964	104.255	1640.77	0	0
16	40.0868	103.898	1579.54	0	0
17	41.0773	103.553	1505.17	0	0
18	42.0677	103.219	1416.83	0	0
19	43.0582	102.897	1313.74	0	0
20	44.0486	102.586	1195.15	0	0
21	45.0391	102.286	1060.36	0	0
22	46.0295	101.998	908.692	0	0
23	47.02	101.72	739.53	0	0
24	48.0104	101.454	552.284	0	0
25	49.0009	101.198	346.403	0	0
26	49.9913	100.953	0	0	0

Global Minimum Query (janbu simplified) - Safety Factor: 1.30314

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	35.3974	111	0	0	0
2	36.0022	110.679	3.57822	0	0
3	36.6071	110.363	14.1492	0	0
4	37.2119	110.052	31.4342	0	0
5	37.8168	109.745	55.1618	0	0
6	38.4217	109.442	85.0673	0	0
7	39.0265	109.144	121.818	0	0
8	39.6019	108.865	127.649	0	0
9	40.1773	108.589	133.342	0	0
10	40.7527	108.317	138.659	0	0

	Munjoy Heights - #13217		
	Analysis Description SECTION 2 - Seismic - Stone Strong - Janbu/Bishop		
	Drawn By	Scale	Company Summit Geoengineering Services
	Date 1/7/2014, 8:33:22 AM	File Name Section 1 - SEISMIC.slim	

11	41.3281	108.05	143.369	0	0
12	41.9035	107.786	147.243	0	0
13	42.479	107.526	150.061	0	0
14	43.0544	107.27	151.606	0	0
15	43.6298	107.017	151.667	0	0
16	44.2052	106.769	150.038	0	0
17	44.7806	106.524	146.519	0	0
18	45.356	106.282	140.912	0	0
19	45.9314	106.045	133.026	0	0
20	46.5068	105.811	122.674	0	0
21	47.0822	105.581	109.674	0	0
22	47.6576	105.354	93.8484	0	0
23	48.233	105.131	75.0228	0	0
24	48.8084	104.911	53.0285	0	0
25	49.3838	104.695	27.7005	0	0
26	49.9592	104.483	0	0	0


List Of Coordinates

Line Load

X	Y
79.1998	92
79	92
79.1	91
84.1	91
84	92
83.9796	92

External Boundary

X	Y
0	96
0	40
150	40
150	64
150	67
117	76
93	79
92.5	90
90	90
82.1	95

	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 2 - Seismic - Stone Strong - Janbu/Bishop		
	<i>Drawn By</i>	<i>Scale</i>	<i>Company</i> Summit Geoengineering Services
	<i>Date</i> 1/7/2014, 8:33:22 AM	<i>File Name</i> Section 1 - SEISMIC.slim	

82	100
81	100
50	100
49.9	111
39	111
15	111
0	111

Material Boundary

X	Y
15	111
15.1	104
39.1	104
39	111

Material Boundary

X	Y
0	96
93	75
117	73
150	64

Material Boundary

X	Y
81	100
81.2	92
79	92
79.1	91
84.1	91
84	92
82.1	92
82.1	95

Material Boundary

X	Y
90	90
90.156	79.684

Munjoy Heights - #13217



Analysis Description

SECTION 2 - Seismic - Stone Strong - Janbu/Bishop

Drawn By

Scale

Company

Summit Geoengineering Services

Date

1/7/2014, 8:33:22 AM

File Name

Section 1 - SEISMIC.slim

Material Boundary

X	Y
0	111
15.1	104
45	94
80	84
90.156	79.684
91	78
93	78
93	79

Munjoy Heights - #13217

Analysis Description

SECTION 2 - Seismic - Stone Strong - Janbu/Bishop

Drawn By

Scale

Company

Summit Geoengineering Services

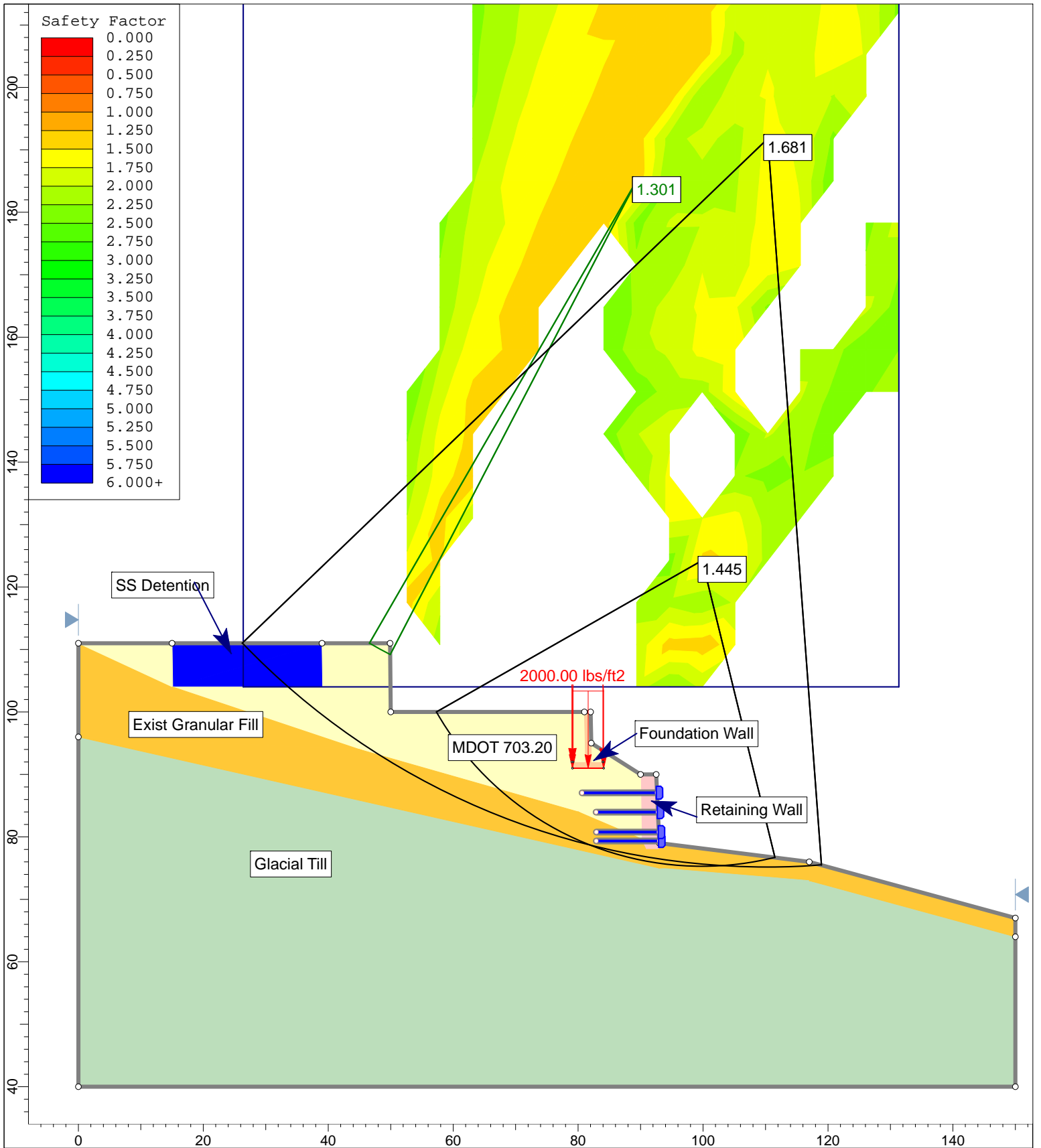
Date

1/7/2014, 8:33:22 AM

File Name

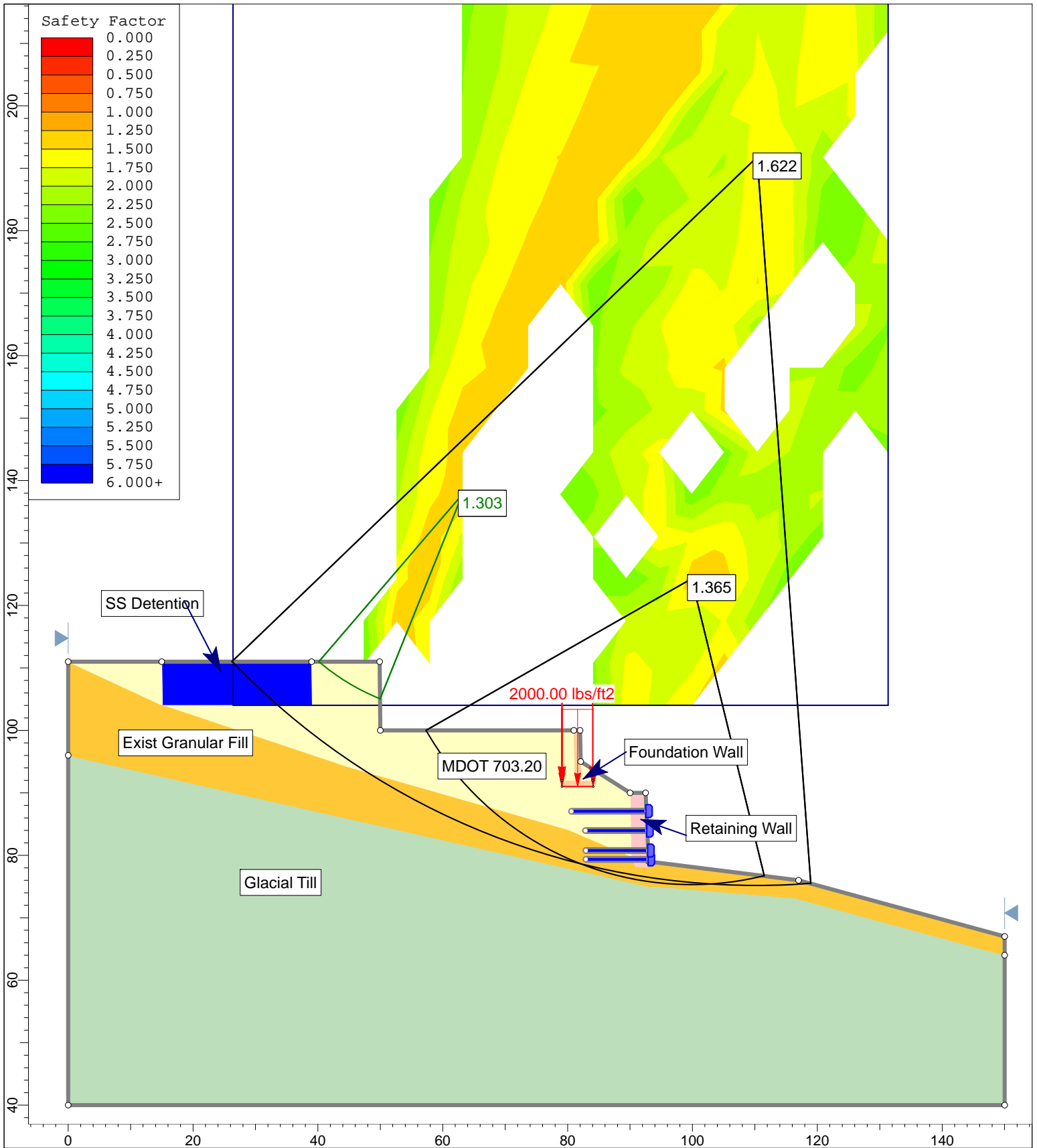
Section 1 - SEISMIC.slim






Munjoy Heights - #13217			
<i>Analysis Description</i>		SECTION 1 - Static - Stone Strong - Bishop	
<i>Drawn By</i>		<i>Scale</i> 1:247	<i>Company</i> Summit Geoengineering Services
<i>Date</i>		1/7/2014, 8:33:22 AM	<i>File Name</i> Section 1 - STATIC.slim





Munjoy Heights - #13217			
SECTION 1 - Static - Stone Strong - Janbu			
	Drawn By	Scale 1:247	Company Summit Geoenengineering Services
	Date	1/7/2014, 8:33:22 AM	File Name Section 1 - STATIC.slim

Slide Analysis Information

Munjoy Heights #13067.1

Project Summary

File Name: Section 1 - STATIC
Slide Modeler Version: 6.026
Project Title: Munjoy Heights #13067.1
Analysis: SECTION 1 - SEISMIC ANALYSIS
Company: Summit Geoengineering Services
Date Created: 1/7/2014, 8:33:22 AM

General Settings

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

Analysis Options


Analysis Methods Used

Bishop simplified
Janbu simplified

Number of slices: 25
Tolerance: 0.005
Maximum number of iterations: 50
Check $m\alpha < 0.2$: Yes
Apply support forces to interslice boundaries: Yes
Discard data for surfaces with FS below: 1.3
Discard data for surfaces with FS above: 2.5
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces

	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 1 - Static - Stone Strong - Janbu/Bishop		
	<i>Drawn By</i>	<i>Scale</i>	<i>Company</i> Summit Geoengineering Services
	<i>Date</i> 1/7/2014, 8:33:22 AM	<i>File Name</i> Section 1 - STATIC.slim	

Pore Fluid Unit Weight: 62.4 lbs/ft³
 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: Grid Search
 Radius Increment: 10
 Composite Surfaces: Disabled
 Reverse Curvature: Create Tension Crack
 Minimum Elevation: Not Defined
 Minimum Depth: Not Defined







Loading


1 Distributed Load present

Distributed Load 1

Distribution: Constant
 Magnitude [psf]: 2000
 Orientation: Vertical

Material Properties

Property	Inported Fill (MDOT 703.20)	Native Glacial Till	Foundation Wall	Existing Granular Fill - Proofrolled	Retaining Wall	water
Color						
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft ³]	130	124	150	130	127	62.4
Cohesion [psf]	0.02	2000	10000	0.02	1257	0.02
Friction Angle [deg]	35	35	45	32	35	1
Water Surface	None	None	None	None	None	None
Ru Value	0	0	0	0	0	0

	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 1 - Static - Stone Strong - Janbu/Bishop		
	<i>Drawn By</i>	<i>Scale</i>	<i>Company</i> Summit Geoengineering Services
	<i>Date</i> 1/7/2014, 8:33:22 AM	<i>File Name</i> Section 1 - STATIC.slim	

Support Properties

Support 1

Support Type: GeoTextile
Force Application: Active
Force Orientation: Parallel to Reinforcement
Anchorage: Slope Face
Shear Strength Model: Linear
Strip Coverage: 100 percent
Tensile Strength: 5000 lb/ft
Pullout Strength Adhesion: 0.8 psf
Pullout Strength Friction Angle: 40 degrees

Global Minimums

Method: bishop simplified

FS: 1.300850
Center: 89.366, 185.045
Radius: 85.513
Left Slip Surface Endpoint: 46.589, 111.000
Right Slip Surface Endpoint: 49.917, 109.175
Resisting Moment=21102.6 lb-ft
Driving Moment=16222.1 lb-ft
Total Slice Area=3.07546 ft²

Method: janbu simplified


FS: 1.302820
Center: 63.129, 137.774
Radius: 35.284
Left Slip Surface Endpoint: 40.150, 111.000
Right Slip Surface Endpoint: 49.954, 105.043
Resisting Horizontal Force=2305.49 lb
Driving Horizontal Force=1769.62 lb
Total Slice Area=32.6298 ft²

Valid / Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 616
Number of Invalid Surfaces: 4235

Error Codes:

	Munjoy Heights - #13217		
	SECTION 1 - Static - Stone Strong - Janbu/Bishop		
	Drawn By	Scale	Company
	Date	File Name	
	1/7/2014, 8:33:22 AM	Summit Geoengineering Services	Section 1 - STATIC.slim

Error Code -97 reported for 3647 surfaces
 Error Code -100 reported for 1 surface
 Error Code -103 reported for 12 surfaces
 Error Code -106 reported for 24 surfaces
 Error Code -107 reported for 302 surfaces
 Error Code -108 reported for 84 surfaces
 Error Code -112 reported for 165 surfaces

Method: Janbu Simplified

Number of Valid Surfaces: 679
 Number of Invalid Surfaces: 4172

Error Codes:

Error Code -97 reported for 3584 surfaces
 Error Code -100 reported for 1 surface
 Error Code -103 reported for 12 surfaces
 Error Code -106 reported for 24 surfaces
 Error Code -107 reported for 302 surfaces
 Error Code -108 reported for 84 surfaces
 Error Code -112 reported for 165 surfaces

Error Codes

The following errors were encountered during the computation:

- 97 = Factor of safety is out of valid range set by user.
- 100 = Both surface / slope intersections are on the same horizontal surface. In general, this will give a very high or infinite factor of safety (zero driving force), if calculated.
- 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.
- 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.
- 107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.
- 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 $M\text{-Alpha} = \cos(\alpha)(1 + \tan(\alpha)\tan(\phi))/F < 0.2$ 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.


Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.30085

Slice Number	Width [ft]	Weight [lbs]	Base Material	Base Cohesion	Base Friction Angle	Shear Stress	Shear Strength	Base Normal Stress	Pore Pressure	Effective Normal Stress
Munjoy Heights - #13217										
<i>Analysis Description</i> SECTION 1 - Static - Stone Strong - Janbu/Bishop										
<i>Drawn By</i>					<i>Scale</i>		<i>Company</i> Summit Geoengineering Services			
<i>Date</i> 1/7/2014, 8:33:22 AM						<i>File Name</i> Section 1 - STATIC.slim				




					[degrees]				[psf]			[psf]
1	0.133119	0.664069	Inported Fill (MDOT 703.20)	0.02	35	2.0627	2.68326	3.80353	0	3.80353		
2	0.133119	1.98945	Inported Fill (MDOT 703.20)	0.02	35	6.16214	8.01602	11.4195	0	11.4195		
3	0.133119	3.30934	Inported Fill (MDOT 703.20)	0.02	35	10.2526	13.3371	19.0187	0	19.0187		
4	0.133119	4.62375	Inported Fill (MDOT 703.20)	0.02	35	14.334	18.6464	26.6013	0	26.6013		
5	0.133119	5.93269	Inported Fill (MDOT 703.20)	0.02	35	18.4064	23.944	34.167	0	34.167		
6	0.133119	7.23618	Inported Fill (MDOT 703.20)	0.02	35	22.4698	29.2298	41.716	0	41.716		
7	0.133119	8.53424	Inported Fill (MDOT 703.20)	0.02	35	26.5241	34.5039	49.2481	0	49.2481		
8	0.133119	9.82689	Inported Fill (MDOT 703.20)	0.02	35	30.5694	39.7662	56.7635	0	56.7635		
9	0.133119	11.1141	Inported Fill (MDOT 703.20)	0.02	35	34.6056	45.0167	64.262	0	64.262		
10	0.133119	12.396	Inported Fill (MDOT 703.20)	0.02	35	38.6327	50.2554	71.7436	0	71.7436		
11	0.133119	13.6725	Inported Fill (MDOT 703.20)	0.02	35	42.6508	55.4823	79.2082	0	79.2082		
12	0.133119	14.9436	Inported Fill (MDOT 703.20)	0.02	35	46.6598	60.6974	86.656	0	86.656		
13	0.133119	16.2095	Inported Fill (MDOT 703.20)	0.02	35	50.6596	65.9006	94.087	0	94.087		
14	0.133119	17.4699	Inported Fill (MDOT 703.20)	0.02	35	54.6503	71.0919	101.502	0	101.502		
15	0.133119	18.7251	Inported Fill (MDOT 703.20)	0.02	35	58.632	76.2714	108.898	0	108.898		
16	0.133119	19.975	Inported Fill (MDOT 703.20)	0.02	35	62.6045	81.439	116.279	0	116.279		
17	0.133119	21.2197	Inported Fill (MDOT 703.20)	0.02	35	66.5678	86.5947	123.642	0	123.642		
18	0.133119	22.459	Inported Fill (MDOT 703.20)	0.02	35	70.522	91.7385	130.987	0	130.987		
19	0.133119	23.6932	Inported Fill (MDOT 703.20)	0.02	35	74.467	96.8704	138.317	0	138.317		
20	0.133119	24.9221	Inported Fill (MDOT 703.20)	0.02	35	78.4026	101.99	145.628	0	145.628		
21	0.133119	26.1457	Inported Fill (MDOT 703.20)	0.02	35	82.3292	107.098	152.924	0	152.924		
22	0.133119	27.3642	Inported Fill (MDOT 703.20)	0.02	35	86.2467	112.194	160.201	0	160.201		
23	0.133119	28.5775	Inported Fill (MDOT 703.20)	0.02	35	90.1549	117.278	167.462	0	167.462		

Munjoy Heights - #13217			
		Analysis Description SECTION 1 - Static - Stone Strong - Janbu/Bishop	
		Drawn By	Scale
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		Section 1 - STATIC.slim	

24	0.133119	29.7856	Inported Fill (MDOT 703.20)	0.02	35	94.0539	122.35	174.706	0	174.706
25	0.133119	29.0197	Inported Fill (MDOT 703.20)	0.02	35	91.7216	119.316	170.373	0	170.373

Query 1 (bishop simplified) - Safety Factor: 1.44499


Slice Number	Width [ft]	Weight [lbs]	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]
1	2.0122	422.431	Inported Fill (MDOT 703.20)	0.02	35	57.2493	82.7246	118.114	0	118.114
2	2.0122	1205.18	Inported Fill (MDOT 703.20)	0.02	35	174.539	252.207	360.16	0	360.16
3	2.0122	1879.45	Inported Fill (MDOT 703.20)	0.02	35	286.902	414.57	592.039	0	592.039
4	2.0122	2470.6	Inported Fill (MDOT 703.20)	0.02	35	394.028	569.366	813.111	0	813.111
5	2.0122	2994.62	Inported Fill (MDOT 703.20)	0.02	35	495.956	716.651	1023.46	0	1023.46
6	2.20673	3819.17	Existing Granular Fill - Proofrolled	0.02	32	549.958	794.684	1271.73	0	1271.73
7	2.20673	4318.42	Existing Granular Fill - Proofrolled	0.02	32	640.788	925.932	1481.77	0	1481.77
8	2.20673	4762.23	Existing Granular Fill - Proofrolled	0.02	32	726.143	1049.27	1679.15	0	1679.15
9	2.20673	5156.71	Existing Granular Fill - Proofrolled	0.02	32	806.275	1165.06	1864.46	0	1864.46
10	2.20673	5506.59	Existing Granular Fill - Proofrolled	0.02	32	881.411	1273.63	2038.2	0	2038.2
11	2.20673	5846.74	Existing Granular Fill - Proofrolled	0.02	32	1845.57	2666.83	4267.79	0	4267.79
12	2.20673	5765.62	Existing Granular Fill - Proofrolled	0.02	32	1701.42	2458.54	3934.45	0	3934.45
13	2.20673	4581.39	Existing Granular Fill - Proofrolled	0.02	32	1568.98	2267.16	3628.18	0	3628.18
14	2.20673	4357.5	Existing Granular Fill - Proofrolled	0.02	32	758.206	1095.6	1753.29	0	1753.29
15	2.20673	4125.97	Existing Granular Fill - Proofrolled	0.02	32	731.957	1057.67	1692.59	0	1692.59
16	2.20673	3920.68	Existing Granular Fill - Proofrolled	0.02	32	708.939	1024.41	1639.37	0	1639.37
17	2.20673	2448.41	Existing Granular Fill - Proofrolled	0.02	32	451.19	651.965	1043.33	0	1043.33
18	2.20673	921.983	Existing Granular Fill - Proofrolled	0.02	32	173.155	250.207	400.382	0	400.382
19	2.20673	892.199	Existing Granular Fill - Proofrolled	0.02	32	170.778	246.772	394.886	0	394.886
20	2.20673	833.729	Existing Granular Fill - Proofrolled	0.02	32	162.686	235.08	376.175	0	376.175
21	2.20673	746.701	Existing Granular Fill - Proofrolled	0.02	32	148.588	214.708	343.573	0	343.573

	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 1 - Static - Stone Strong - Janbu/Bishop		
	<i>Drawn By</i>	<i>Scale</i>	<i>Company</i> Summit Geoenengineering Services
	<i>Date</i> 1/7/2014, 8:33:22 AM	<i>File Name</i> Section 1 - STATIC.slim	

22	2.20673	631.065	Existing Granular Fill - Proofrolled	0.02	32	128.125	185.14	296.254	0	296.254
23	2.20673	486.597	Existing Granular Fill - Proofrolled	0.02	32	100.865	145.749	233.215	0	233.215
24	2.20673	312.887	Existing Granular Fill - Proofrolled	0.02	32	66.2736	95.7647	153.223	0	153.223
25	2.20673	109.329	Existing Granular Fill - Proofrolled	0.02	32	23.695	34.239	54.7618	0	54.7618

Query 2 (bishop simplified) - Safety Factor: 1.68059


Slice Number	Width [ft]	Weight [lbs]	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]
1	3.6666	417.811	water	0.02	1	1.18319	1.98846	112.773	0	112.773
2	3.6666	1218.6	water	0.02	1	3.43127	5.76656	329.22	0	329.22
3	3.66339	2332.22	Inported Fill (MDOT 703.20)	0.02	35	196.581	330.372	471.791	0	471.791
4	3.66339	4604.92	Inported Fill (MDOT 703.20)	0.02	35	396.273	665.972	951.077	0	951.077
5	3.66339	6766.86	Inported Fill (MDOT 703.20)	0.02	35	593.659	997.697	1424.83	0	1424.83
6	3.66339	7960.28	Inported Fill (MDOT 703.20)	0.02	35	711.113	1195.09	1706.74	0	1706.74
7	3.72351	6382.92	Existing Granular Fill - Proofrolled	0.02	32	520.599	874.913	1400.12	0	1400.12
8	3.72351	4936.14	Existing Granular Fill - Proofrolled	0.02	32	408.711	686.875	1099.2	0	1099.2
9	3.72351	5893.88	Existing Granular Fill - Proofrolled	0.02	32	495.081	832.028	1331.49	0	1331.49
10	3.72351	6770.28	Existing Granular Fill - Proofrolled	0.02	32	576.606	969.038	1550.75	0	1550.75
11	3.72351	7569.46	Existing Granular Fill - Proofrolled	0.02	32	653.318	1097.96	1757.08	0	1757.08
12	3.72351	8294.92	Existing Granular Fill - Proofrolled	0.02	32	725.251	1218.85	1950.53	0	1950.53
13	3.72351	8949.7	Existing Granular Fill - Proofrolled	0.02	32	792.406	1331.71	2131.15	0	2131.15
14	3.72351	9536.35	Existing Granular Fill - Proofrolled	0.02	32	854.807	1436.58	2298.97	0	2298.97
15	3.72351	10209.7	Existing Granular Fill - Proofrolled	0.02	32	1620.25	2722.97	4357.62	0	4357.62
16	3.72351	7950.71	Existing Granular Fill - Proofrolled	0.02	32	1355.32	2277.73	3645.08	0	3645.08
17	3.72351	6893.09	Existing Granular Fill - Proofrolled	0.02	32	640.364	1076.19	1722.24	0	1722.24
18	3.72351	6117.57	Existing Granular Fill - Proofrolled	0.02	32	574.994	966.33	1546.42	0	1546.42
19	3.72351	1259.41	Existing Granular Fill - Proofrolled	0.02	32	119.765	201.276	322.078	0	322.078

	Munjoy Heights - #13217		
	Analysis Description SECTION 1 - Static - Stone Strong - Janbu/Bishop		
	Drawn By	Scale	Company Summit Geoengineering Services
	Date 1/7/2014, 8:33:22 AM	File Name Section 1 - STATIC.slim	

20	3.72351	1231.67	Existing Granular Fill - Proofrolled	0.02	32	118.494	199.14	318.658	0	318.658
21	3.72351	1161.82	Existing Granular Fill - Proofrolled	0.02	32	113.082	190.044	304.103	0	304.103
22	3.72351	1033.98	Existing Granular Fill - Proofrolled	0.02	32	101.823	171.122	273.82	0	273.82
23	3.72351	848.44	Existing Granular Fill - Proofrolled	0.02	32	84.5429	142.082	227.346	0	227.346
24	3.72351	605.327	Existing Granular Fill - Proofrolled	0.02	32	61.044	102.59	164.146	0	164.146
25	3.72351	267.89	Existing Granular Fill - Proofrolled	0.02	32	27.3504	45.9648	73.5269	0	73.5269

Global Minimum Query (janbu simplified) - Safety Factor: 1.30282


Slice Number	Width [ft]	Weight [lbs]	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]
1	0.392175	8.45457	Inported Fill (MDOT 703.20)	0.02	35	7.98061	10.3973	14.8204	0	14.8204
2	0.392175	25.1186	Inported Fill (MDOT 703.20)	0.02	35	23.906	31.1452	44.4514	0	44.4514
3	0.392175	41.3008	Inported Fill (MDOT 703.20)	0.02	35	39.6498	51.6565	73.7445	0	73.7445
4	0.392175	57.0179	Inported Fill (MDOT 703.20)	0.02	35	55.2089	71.9272	102.694	0	102.694
5	0.392175	72.2849	Inported Fill (MDOT 703.20)	0.02	35	70.5809	91.9542	131.296	0	131.296
6	0.392175	87.1161	Inported Fill (MDOT 703.20)	0.02	35	85.7632	111.734	159.545	0	159.545
7	0.392175	101.525	Inported Fill (MDOT 703.20)	0.02	35	100.755	131.265	187.438	0	187.438
8	0.392175	115.523	Inported Fill (MDOT 703.20)	0.02	35	115.553	150.545	214.972	0	214.972
9	0.392175	129.123	Inported Fill (MDOT 703.20)	0.02	35	130.157	169.571	242.145	0	242.145
10	0.392175	142.335	Inported Fill (MDOT 703.20)	0.02	35	144.566	188.343	268.952	0	268.952
11	0.392175	155.169	Inported Fill (MDOT 703.20)	0.02	35	158.777	206.858	295.395	0	295.395
12	0.392175	167.634	Inported Fill (MDOT 703.20)	0.02	35	172.791	225.116	321.47	0	321.47
13	0.392175	179.741	Inported Fill (MDOT 703.20)	0.02	35	186.606	243.114	347.175	0	347.175
14	0.392175	191.496	Inported Fill (MDOT 703.20)	0.02	35	200.222	260.853	372.508	0	372.508
			Inported Fill (MDOT 703.20)							

	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 1 - Static - Stone Strong - Janbu/Bishop		
	<i>Drawn By</i>	<i>Scale</i>	<i>Company</i> Summit Geoenengineering Services
	<i>Date</i> 1/7/2014, 8:33:22 AM	<i>File Name</i> Section 1 - STATIC.slim	

16	0.392175	213.985	703.20) Inported Fill (MDOT 703.20)	0.02	35	226.852	295.547	422.056	0	422.056
17	0.392175	224.733	Inported Fill (MDOT 703.20)	0.02	35	239.864	312.5	446.267	0	446.267
18	0.392175	235.159	Inported Fill (MDOT 703.20)	0.02	35	252.675	329.19	470.103	0	470.103
19	0.392175	245.269	Inported Fill (MDOT 703.20)	0.02	35	265.284	345.617	493.562	0	493.562
20	0.392175	255.069	Inported Fill (MDOT 703.20)	0.02	35	277.688	361.778	516.643	0	516.643
21	0.392175	264.566	Inported Fill (MDOT 703.20)	0.02	35	289.89	377.674	539.345	0	539.345
22	0.392175	273.763	Inported Fill (MDOT 703.20)	0.02	35	301.886	393.303	561.666	0	561.666
23	0.392175	282.666	Inported Fill (MDOT 703.20)	0.02	35	313.678	408.666	583.608	0	583.608
24	0.392175	291.28	Inported Fill (MDOT 703.20)	0.02	35	325.264	423.761	605.165	0	605.165
25	0.392175	278.641	Inported Fill (MDOT 703.20)	0.02	35	313.085	407.893	582.504	0	582.504

Query 1 (janbu simplified) - Safety Factor: 1.36531


Slice Number	Width [ft]	Weight [lbs]	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]
1	2.0122	422.431	Inported Fill (MDOT 703.20)	0.02	35	59.0696	80.6483	115.149	0	115.149
2	2.0122	1205.18	Inported Fill (MDOT 703.20)	0.02	35	180.489	246.424	351.9	0	351.9
3	2.0122	1879.45	Inported Fill (MDOT 703.20)	0.02	35	297.239	405.823	579.547	0	579.547
4	2.0122	2470.6	Inported Fill (MDOT 703.20)	0.02	35	408.893	558.266	797.258	0	797.258
5	2.0122	2994.62	Inported Fill (MDOT 703.20)	0.02	35	515.424	703.713	1004.98	0	1004.98
6	2.20673	3819.17	Existing Granular Fill - Proofrolled	0.02	32	573.107	782.469	1252.18	0	1252.18
7	2.20673	4318.42	Existing Granular Fill - Proofrolled	0.02	32	668.627	912.883	1460.89	0	1460.89
8	2.20673	4762.23	Existing Granular Fill - Proofrolled	0.02	32	758.612	1035.74	1657.49	0	1657.49
9	2.20673	5156.71	Existing Granular Fill - Proofrolled	0.02	32	843.296	1151.36	1842.53	0	1842.53
10	2.20673	5506.59	Existing Granular Fill - Proofrolled	0.02	32	922.897	1260.04	2016.45	0	2016.45
11	2.20673	5846.74	Existing Granular Fill - Proofrolled	0.02	32	1934.5	2641.19	4226.74	0	4226.74
12	2.20673	5765.62	Existing Granular Fill - Proofrolled	0.02	32	1785.26	2437.44	3900.68	0	3900.68

	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 1 - Static - Stone Strong - Janbu/Bishop		
	<i>Drawn By</i>	<i>Scale</i>	<i>Company</i> Summit Geoengineering Services
	<i>Date</i> 1/7/2014, 8:33:22 AM		<i>File Name</i> Section 1 - STATIC.slim

13	2.20673	4581.39	Existing Granular Fill - Proofrolled	0.02	32	1647.98	2250	3600.73	0	3600.73
14	2.20673	4357.5	Existing Granular Fill - Proofrolled	0.02	32	797.196	1088.42	1741.8	0	1741.8
15	2.20673	4125.97	Existing Granular Fill - Proofrolled	0.02	32	770.374	1051.8	1683.2	0	1683.2
16	2.20673	3920.68	Existing Granular Fill - Proofrolled	0.02	32	746.915	1019.77	1631.94	0	1631.94
17	2.20673	2448.41	Existing Granular Fill - Proofrolled	0.02	32	475.851	649.684	1039.68	0	1039.68
18	2.20673	921.983	Existing Granular Fill - Proofrolled	0.02	32	182.811	249.594	399.402	0	399.402
19	2.20673	892.199	Existing Granular Fill - Proofrolled	0.02	32	180.497	246.434	394.345	0	394.345
20	2.20673	833.729	Existing Granular Fill - Proofrolled	0.02	32	172.137	235.02	376.079	0	376.079
21	2.20673	746.701	Existing Granular Fill - Proofrolled	0.02	32	157.402	214.902	343.883	0	343.883
22	2.20673	631.065	Existing Granular Fill - Proofrolled	0.02	32	135.891	185.533	296.883	0	296.883
23	2.20673	486.597	Existing Granular Fill - Proofrolled	0.02	32	107.115	146.245	234.009	0	234.009
24	2.20673	312.887	Existing Granular Fill - Proofrolled	0.02	32	70.4759	96.2215	153.954	0	153.954
25	2.20673	109.329	Existing Granular Fill - Proofrolled	0.02	32	25.2342	34.4525	55.1034	0	55.1034

Query 2 (janbu simplified) - Safety Factor: 1.62233

Slice Number	Width [ft]	Weight [lbs]	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]
1	3.6666	417.811	water	0.02	1	1.22523	1.98772	112.73	0	112.73
2	3.6666	1218.6	water	0.02	1	3.55327	5.76458	329.107	0	329.107
3	3.66339	2332.22	Inported Fill (MDOT 703.20)	0.02	35	201.729	327.271	467.363	0	467.363
4	3.66339	4604.92	Inported Fill (MDOT 703.20)	0.02	35	406.879	660.092	942.681	0	942.681
5	3.66339	6766.86	Inported Fill (MDOT 703.20)	0.02	35	609.875	989.418	1413.01	0	1413.01
6	3.66339	7960.28	Inported Fill (MDOT 703.20)	0.02	35	730.912	1185.78	1693.44	0	1693.44
7	3.72351	6382.92	Existing Granular Fill - Proofrolled	0.02	32	535.702	869.085	1390.8	0	1390.8
8	3.72351	4936.14	Existing Granular Fill - Proofrolled	0.02	32	420.758	682.608	1092.37	0	1092.37
9	3.72351	5893.88	Existing Granular Fill - Proofrolled	0.02	32	509.896	827.22	1323.8	0	1323.8
10	3.72351	6770.28	Existing Granular Fill - Proofrolled	0.02	32	594.114	963.849	1542.45	0	1542.45


	Munjoy Heights - #13217		
	Analysis Description SECTION 1 - Static - Stone Strong - Janbu/Bishop		
	Drawn By	Scale	Company Summit Geoenengineering Services
	Date 1/7/2014, 8:33:22 AM	File Name Section 1 - STATIC.slim	

11	3.72351	7569.46	Existing Granular Fill - Proofrolled	0.02	32	673.439	1092.54	1748.39	0	1748.39
12	3.72351	8294.92	Existing Granular Fill - Proofrolled	0.02	32	747.887	1213.32	1941.69	0	1941.69
13	3.72351	8949.7	Existing Granular Fill - Proofrolled	0.02	32	817.472	1326.21	2122.35	0	2122.35
14	3.72351	9536.35	Existing Granular Fill - Proofrolled	0.02	32	882.2	1431.22	2290.39	0	2290.39
15	3.72351	10209.7	Existing Granular Fill - Proofrolled	0.02	32	1672.83	2713.89	4343.1	0	4343.1
16	3.72351	7950.71	Existing Granular Fill - Proofrolled	0.02	32	1399.86	2271.03	3634.39	0	3634.39
17	3.72351	6893.09	Existing Granular Fill - Proofrolled	0.02	32	661.672	1073.45	1717.86	0	1717.86
18	3.72351	6117.57	Existing Granular Fill - Proofrolled	0.02	32	594.365	964.256	1543.1	0	1543.1
19	3.72351	1259.41	Existing Granular Fill - Proofrolled	0.02	32	123.85	200.925	321.514	0	321.514
20	3.72351	1231.67	Existing Granular Fill - Proofrolled	0.02	32	122.585	198.874	318.233	0	318.233
21	3.72351	1161.82	Existing Granular Fill - Proofrolled	0.02	32	117.034	189.868	303.819	0	303.819
22	3.72351	1033.98	Existing Granular Fill - Proofrolled	0.02	32	105.425	171.034	273.681	0	273.681
23	3.72351	848.44	Existing Granular Fill - Proofrolled	0.02	32	87.5716	142.07	227.328	0	227.328
24	3.72351	605.327	Existing Granular Fill - Proofrolled	0.02	32	63.2584	102.626	164.204	0	164.204
25	3.72351	267.89	Existing Granular Fill - Proofrolled	0.02	32	28.3553	46.0017	73.5862	0	73.5862

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.30085


Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	46.5886	111	0	0	0
2	46.7217	110.923	0.0182935	0	0
3	46.8549	110.847	0.0736666	0	0
4	46.988	110.771	0.161212	0	0
5	47.1211	110.695	0.276062	0	0
6	47.2542	110.619	0.413383	0	0
7	47.3873	110.544	0.568383	0	0
8	47.5205	110.469	0.736304	0	0

	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 1 - Static - Stone Strong - Janbu/Bishop		
	<i>Drawn By</i>	<i>Scale</i>	<i>Company</i> Summit Geoengineering Services
	<i>Date</i> 1/7/2014, 8:33:22 AM	<i>File Name</i> Section 1 - STATIC.slim	

9	47.6536	110.395	0.912426	0	0
10	47.7867	110.321	1.09207	0	0
11	47.9198	110.247	1.27058	0	0
12	48.0529	110.173	1.44334	0	0
13	48.186	110.1	1.60579	0	0
14	48.3192	110.027	1.75339	0	0
15	48.4523	109.954	1.88161	0	0
16	48.5854	109.882	1.98601	0	0
17	48.7185	109.81	2.06213	0	0
18	48.8516	109.738	2.10558	0	0
19	48.9848	109.666	2.11199	0	0
20	49.1179	109.595	2.07702	0	0
21	49.251	109.524	1.99637	0	0
22	49.3841	109.454	1.86578	0	0
23	49.5172	109.384	1.68101	0	0
24	49.6504	109.314	1.43785	0	0
25	49.7835	109.244	1.13214	0	0
26	49.9166	109.175	0	0	0

Query 1 (bishop simplified) - Safety Factor: 1.44499

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	57.3093	100	0	0	0
2	59.3215	96.7702	266.373	0	0
3	61.3337	94.0154	907.623	0	0
4	63.3459	91.615	1751.87	0	0
5	65.3581	89.4956	2682.89	0	0
6	67.3703	87.6085	3617.09	0	0
7	69.577	85.7655	4748.21	0	0
8	71.7837	84.1279	5761.78	0	0
9	73.9905	82.6714	6606.2	0	0
10	76.1972	81.3777	7240.51	0	0
11	78.4039	80.2322	7631.56	0	0
12	80.6107	79.2238	7865.64	0	0
13	82.8174	78.3434	7577.82	0	0
14	85.0241	77.5838	6874.29	0	0
15	87.2309	76.9391	6332.76	0	0
16	89.4376	76.4047	5623.3	0	0
17	91.6443	75.9769	4761.34	0	0
18	93.8511	75.6529	4104.43	0	0
19	96.0578	75.4307	3811.58	0	0
20	98.2645	75.3089	3483.12	0	0

	Munjoy Heights - #13217					
	<i>Analysis Description</i> SECTION 1 - Static - Stone Strong - Janbu/Bishop					
	<i>Drawn By</i>		<i>Scale</i>	<i>Company</i> Summit Geoengineering Services		
	<i>Date</i> 1/7/2014, 8:33:22 AM			<i>File Name</i> Section 1 - STATIC.slim		


21	100.471	75.2867	3132.75	0	0
22	102.678	75.3639	2778.55	0	0
23	104.885	75.5412	2443.53	0	0
24	107.091	75.8194	2156.22	0	0
25	109.298	76.2005	1951.69	0	0
26	111.505	76.6869	0	0	0

Query 2 (bishop simplified) - Safety Factor: 1.68059

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	26.2215	111	0	0	0
2	29.8881	107.348	407.542	0	0
3	33.5547	104	1497.11	0	0
4	37.2181	100.926	2227.96	0	0
5	40.8815	98.0952	3469.47	0	0
6	44.5449	95.4869	5012.72	0	0
7	48.2082	93.0834	6512.03	0	0
8	51.9317	90.835	7723.12	0	0
9	55.6553	88.7701	8472.24	0	0
10	59.3788	86.8778	9149.8	0	0
11	63.1023	85.149	9685.48	0	0
12	66.8258	83.5758	10019	0	0
13	70.5493	82.1516	10098.8	0	0
14	74.2728	80.8705	9880.81	0	0
15	77.9963	79.7277	9327.79	0	0
16	81.7198	78.7189	7695.34	0	0
17	85.4433	77.8407	5854.05	0	0
18	89.1668	77.09	4764.44	0	0
19	92.8903	76.4644	3592.7	0	0
20	96.6138	75.9617	3309.01	0	0
21	100.337	75.5804	2989.64	0	0
22	104.061	75.3194	2648.29	0	0
23	107.784	75.1778	2308.24	0	0
24	111.508	75.1551	1998.85	0	0
25	115.231	75.2514	1755.93	0	0
26	118.955	75.4668	0	0	0

Global Minimum Query (janbu simplified) - Safety Factor: 1.30282


Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	40.1498	111	0	0	0
2	40.542	110.668	1.79088	0	0

	Munjoy Heights - #13217				
	<i>Analysis Description</i> SECTION 1 - Static - Stone Strong - Janbu/Bishop				
	<i>Drawn By</i>		<i>Scale</i>	<i>Company</i> Summit Geoengineering Services	
	<i>Date</i> 1/7/2014, 8:33:22 AM			<i>File Name</i> Section 1 - STATIC.slim	

3	40.9341	110.346	6.74693	0	0
4	41.3263	110.034	14.2885	0	0
5	41.7185	109.73	23.8717	0	0
6	42.1107	109.435	34.9857	0	0
7	42.5028	109.148	47.1498	0	0
8	42.895	108.869	59.9116	0	0
9	43.2872	108.599	72.8442	0	0
10	43.6794	108.336	85.5451	0	0
11	44.0715	108.08	97.634	0	0
12	44.4637	107.832	108.752	0	0
13	44.8559	107.591	118.558	0	0
14	45.2481	107.357	126.731	0	0
15	45.6402	107.13	132.966	0	0
16	46.0324	106.91	136.974	0	0
17	46.4246	106.696	138.482	0	0
18	46.8168	106.488	137.229	0	0
19	47.2089	106.287	132.971	0	0
20	47.6011	106.092	125.473	0	0
21	47.9933	105.902	114.514	0	0
22	48.3855	105.719	99.8844	0	0
23	48.7776	105.542	81.3839	0	0
24	49.1698	105.37	58.824	0	0
25	49.562	105.204	32.0254	0	0
26	49.9542	105.043	0	0	0

Query 1 (janbu simplified) - Safety Factor: 1.36531


Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	57.3093	100	0	0	0
2	59.3215	96.7702	253.079	0	0
3	61.3337	94.0154	859.437	0	0
4	63.3459	91.615	1652.63	0	0
5	65.3581	89.4956	2519.77	0	0
6	67.3703	87.6085	3379.45	0	0
7	69.577	85.7655	4422.89	0	0
8	71.7837	84.1279	5340.17	0	0
9	73.9905	82.6714	6080.66	0	0
10	76.1972	81.3777	6604.06	0	0
11	78.4039	80.2322	6877.75	0	0
12	80.6107	79.2238	6872.3	0	0
13	82.8174	78.3434	6367.99	0	0
14	85.0241	77.5838	5467.65	0	0

	Munjoy Heights - #13217				
	<i>Analysis Description</i> SECTION 1 - Static - Stone Strong - Janbu/Bishop				
	<i>Drawn By</i>		<i>Scale</i>	<i>Company</i> Summit Geoengineering Services	
	<i>Date</i> 1/7/2014, 8:33:22 AM			<i>File Name</i> Section 1 - STATIC.slim	

15	87.2309	76.9391	4831.9	0	0
16	89.4376	76.4047	4031.88	0	0
17	91.6443	75.9769	3082.21	0	0
18	93.8511	75.6529	2369.24	0	0
19	96.0578	75.4307	2054.68	0	0
20	98.2645	75.3089	1704.53	0	0
21	100.471	75.2867	1333.13	0	0
22	102.678	75.3639	959.316	0	0
23	104.885	75.5412	606.91	0	0
24	107.091	75.8194	305.483	0	0
25	109.298	76.2005	91.3347	0	0
26	111.505	76.6869	0	0	0

Query 2 (janbu simplified) - Safety Factor: 1.62233

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	26.2215	111	0	0	0
2	29.8881	107.348	407.229	0	0
3	33.5547	104	1495.97	0	0
4	37.2181	100.926	2193.87	0	0
5	40.8815	98.0952	3371.8	0	0
6	44.5449	95.4869	4823.37	0	0
7	48.2082	93.0834	6216.47	0	0
8	51.9317	90.835	7349.08	0	0
9	55.6553	88.7701	8038.23	0	0
10	59.3788	86.8778	8644.86	0	0
11	63.1023	85.149	9099.58	0	0
12	66.8258	83.5758	9342.93	0	0
13	70.5493	82.1516	9324.05	0	0
14	74.2728	80.8705	8999.52	0	0
15	77.9963	79.7277	8332.61	0	0
16	81.7198	78.7189	6485.72	0	0
17	85.4433	77.8407	4465.84	0	0
18	89.1668	77.09	3292.02	0	0
19	92.8903	76.4644	2044.67	0	0
20	96.6138	75.9617	1745.2	0	0
21	100.337	75.5804	1410.14	0	0
22	104.061	75.3194	1053.73	0	0
23	107.784	75.1778	699.995	0	0
24	111.508	75.1551	379.116	0	0
25	115.231	75.2514	127.801	0	0
26	118.955	75.4668	0	0	0

	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 1 - Static - Stone Strong - Janbu/Bishop		
	<i>Drawn By</i>	<i>Scale</i>	<i>Company</i> Summit Geoengineering Services
	<i>Date</i> 1/7/2014, 8:33:22 AM		<i>File Name</i> Section 1 - STATIC.slim

List Of Coordinates

Line Load

X	Y
79.1998	92
79	92
79.1	91
84.1	91
84	92
83.9796	92

External Boundary

X	Y
0	96
0	40
150	40
150	64
150	67
117	76
93	79
92.5	90
90	90
82.1	95
82	100
81	100
50	100
49.9	111
39	111
15	111
0	111

Material Boundary

X	Y
15	111
15.1	104
39.1	104
39	111

Munjoy Heights - #13217

Analysis Description

SECTION 1 - Static - Stone Strong - Janbu/Bishop

Drawn By

Scale

Company

Summit Geoengineering Services

Date

1/7/2014, 8:33:22 AM

File Name

Section 1 - STATIC.slim



Material Boundary

X	Y
0	96
93	75
117	73
150	64

Material Boundary

X	Y
81	100
81.2	92
79	92
79.1	91
84.1	91
84	92
82.1	92
82.1	95

Material Boundary

X	Y
90	90
90.156	79.684

Material Boundary

X	Y
0	111
15.1	104
45	94
80	84
90.156	79.684
91	78
93	78
93	79

Munjoy Heights - #13217

Analysis Description

SECTION 1 - Static - Stone Strong - Janbu/Bishop

Drawn By

Scale

Company

Summit Geoengineering Services

Date

1/7/2014, 8:33:22 AM

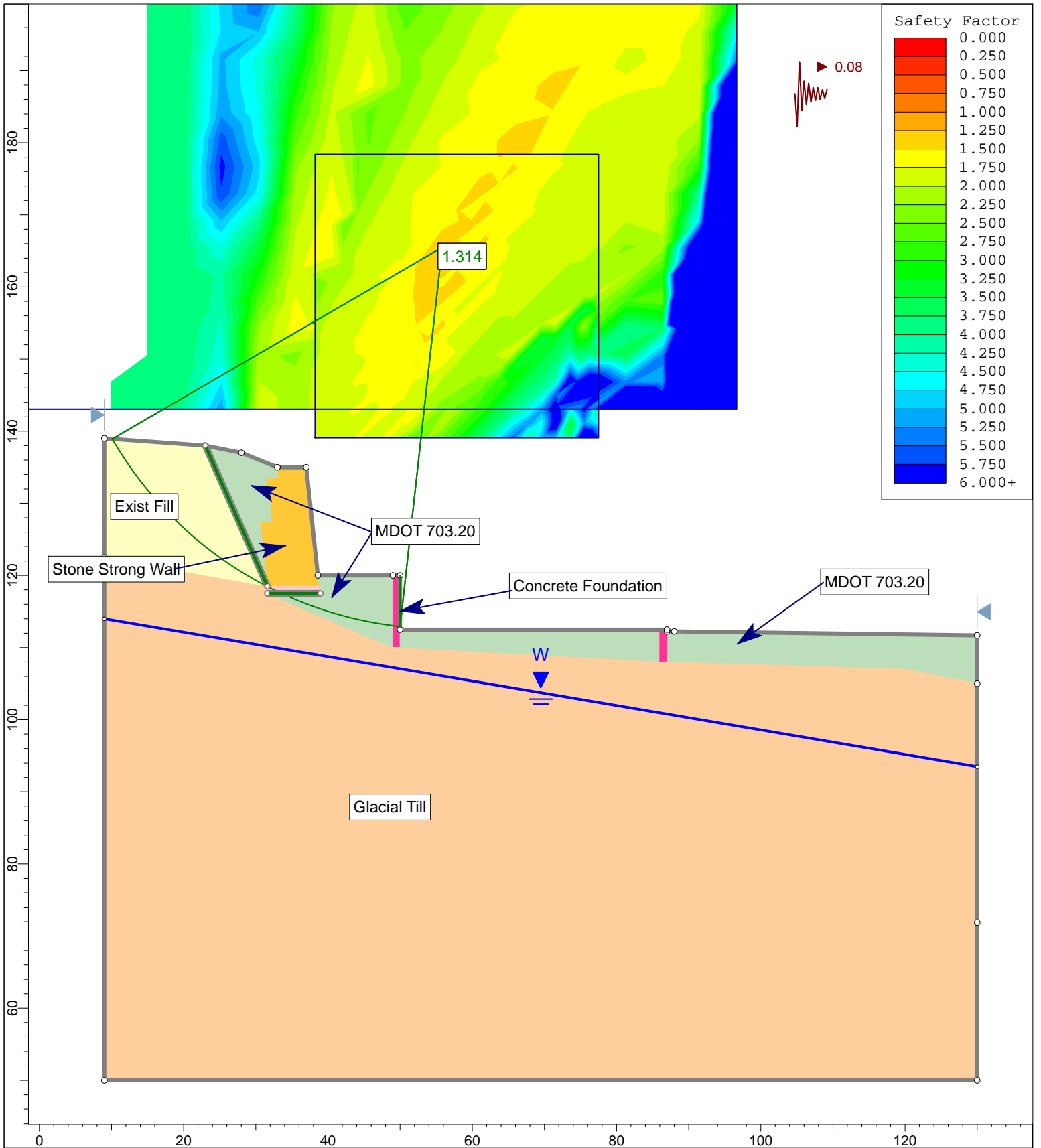
File Name

Section 1 - STATIC.slim





SLOPE STABILITY ANALYSIS RESULTS
SECTION 2



Munjoy Heights - #13217

Analysis Description

SECTION 2 - Seismic - Stone Strong - Bishop

Drawn By

Scale 1:214

Company

Summit Geoengineering Services

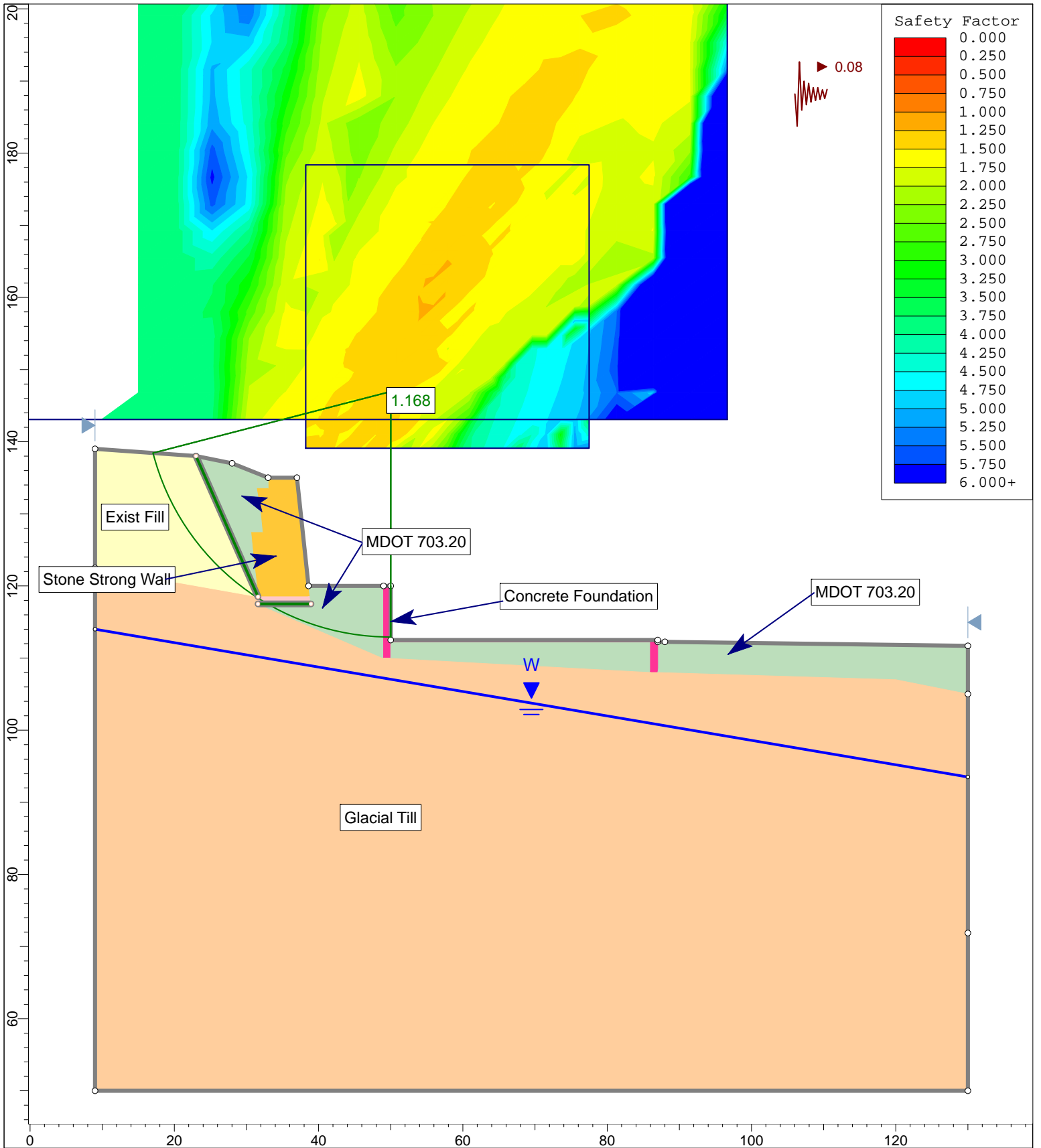
Date

3/10/2014, 10:29:25 AM


File Name

Section 2 - SEISMIC.slim





Munjoy Heights - #13217

	<i>Analysis Description</i> SECTION 2 - Seismic - Stone Strong - Janbu		
	<i>Drawn By</i>	<i>Scale</i> 1:214	<i>Company</i> Summit Geoengineering Services
	<i>Date</i> 3/10/2014, 10:29:25 AM		<i>File Name</i> Section 2 - SEISMIC.slim

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

File Name: Section 2 - SEISMIC
Slide Modeler Version: 6.026
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 3/10/2014, 10:29:25 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

Analysis Methods Used


Bishop simplified
Janbu simplified

Number of slices: 25
Tolerance: 0.005
Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft³
Advanced Groundwater Method: None

Random Numbers

	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 2 - Seismic - Stone Strong - Bishop/Janbu		
	<i>Drawn By</i>	<i>Scale</i>	<i>Company</i> Summit Geoengineering Services
	<i>Date</i> 3/10/2014, 10:29:25 AM	<i>File Name</i> Section 2 - SEISMIC.slim	

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







Surface Options

Surface Type: Circular
 Search Method: Grid Search
 Radius Increment: 10
 Composite Surfaces: Enabled
 Reverse Curvature: Invalid Surfaces
 Minimum Elevation: Not Defined
 Minimum Depth: Not Defined

Loading

Seismic Load Coefficient (Horizontal): 0.08


Material Properties

Property	Existing Fill	MDOT 703.20	Glacial Till	Stone Strong	Crushed Stone	Concrete
Color						
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	120	130	124	127	110	150
Cohesion [psf]	0.02	0.02	2000	1250	0	5000
Friction Angle [deg]	30	35	35	35	45	45
Water Surface	None	None	Water Table	None	None	None
Hu Value			1			
Ru Value	0	0		0	0	0

Support Properties

Support 2

Support Type: GeoTextile
 Force Application: Active
 Force Orientation: Bisector of Parallel and Tangent
 Anchorage: None
 Shear Strength Model: Linear
 Strip Coverage: 100 percent
 Tensile Strength: 500 lb/ft
 Pullout Strength Adhesion: 5 psf

	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 2 - Seismic - Stone Strong - Bishop/Janbu		
	<i>Drawn By</i>	<i>Scale</i>	<i>Company</i> Summit Geoengineering Services
	<i>Date</i> 3/10/2014, 10:29:25 AM	<i>File Name</i> Section 2 - SEISMIC.slim	

Global Minimums

Method: bishop simplified

FS: 1.314030
Center: 55.829, 165.474
Radius: 52.896
Left Slip Surface Endpoint: 10.080, 138.923
Right Slip Surface Endpoint: 50.000, 112.900
Left Slope Intercept: 10.080 138.923
Right Slope Intercept: 50.000 120.000
Resisting Moment=1.95925e+006 lb-ft
Driving Moment=1.49102e+006 lb-ft
Total Slice Area=423.822 ft²

Method: janbu simplified

FS: 1.167780
Center: 50.003, 146.946
Radius: 34.051
Left Slip Surface Endpoint: 17.035, 138.426
Right Slip Surface Endpoint: 50.000, 112.895
Left Slope Intercept: 17.035 138.426
Right Slope Intercept: 50.000 120.000
Resisting Horizontal Force=28671.8 lb
Driving Horizontal Force=24552.5 lb
Total Slice Area=363.623 ft²

Valid / Invalid Surfaces

Method: bishop simplified


Number of Valid Surfaces: 8542
Number of Invalid Surfaces: 1369

Error Codes:

Error Code -106 reported for 40 surfaces
Error Code -107 reported for 10 surfaces
Error Code -108 reported for 9 surfaces
Error Code -112 reported for 23 surfaces
Error Code -1000 reported for 1287 surfaces

Method: janbu simplified

Number of Valid Surfaces: 7995

	Munjoy Heights - #13217		
	Analysis Description SECTION 2 - Seismic - Stone Strong - Bishop/Janbu		
	Drawn By	Scale	Company Summit Geoengineering Services
	Date 3/10/2014, 10:29:25 AM	File Name	Section 2 - SEISMIC.slim

Number of Invalid Surfaces: 1916

Error Codes:

- Error Code -106 reported for 40 surfaces
- Error Code -107 reported for 10 surfaces
- Error Code -108 reported for 568 surfaces
- Error Code -112 reported for 11 surfaces
- Error Code -1000 reported for 1287 surfaces

Error Codes

The following errors were encountered during the computation:

- 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.
- 107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.
- 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.
- 1000 = No valid slip surfaces are generated at a grid center. Unable to draw a surface.

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.31403

Slice Number	Width [ft]	Weight [lbs]	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]
1	1.64488	250.037	Existing Fill	0.02	30	39.1568	51.4532	89.0848	0	89.0848
2	1.64488	719.807	Existing Fill	0.02	30	118.382	155.558	269.4	0	269.4
3	1.64488	1135.31	Existing Fill	0.02	30	194.454	255.519	442.537	0	442.537
4	1.64488	1507.13	Existing Fill	0.02	30	267.253	351.179	608.227	0	608.227
5	1.64488	1842.55	Existing Fill	0.02	30	336.803	442.569	766.515	0	766.515
6	1.64488	2146.81	Existing Fill	0.02	30	403.185	529.797	917.602	0	917.602
7	1.64488	2423.85	Existing Fill	0.02	30	466.505	613.001	1061.71	0	1061.71
8	1.64488	2676.87	Existing Fill	0.02	30	526.898	692.36	1199.17	0	1199.17
9	1.64488	2916.98	Existing Fill	0.02	30	586.221	770.312	1334.18	0	1334.18
10	1.64488	3142.45	Existing Fill	0.02	30	643.921	846.132	1465.51	0	1465.51
11	1.64488	3349.3	Existing Fill	0.02	30	698.978	918.478	1590.81	0	1590.81
12	1.64488	3497.42	Existing Fill	0.02	30	742.663	975.882	1690.24	0	1690.24
13	1.64488	3591.09	Existing Fill	0.02	30	775.279	1018.74	1764.48	0	1764.48
14	0.136728	300.165	Glacial Till	2000	35	2111.65	2774.77	1106.49	0	1106.49
15	1.9474	4256.52	Crushed Stone	0	45	1180.64	1551.4	1551.4	0	1551.4

Munjoy Heights - #13217			
<i>Analysis Description</i>		SECTION 2 - Seismic - Stone Strong - Bishop/Janbu	
<i>Drawn By</i>		<i>Scale</i>	<i>Company</i> Summit Geoengineering Services
<i>Date</i>		3/10/2014, 10:29:25 AM	<i>File Name</i> Section 2 - SEISMIC.slim



16	1.71696	3871.64	MDOT 703.20	0.02	35	972.641	1278.08	1825.26	0	1825.26
17	1.71696	4033.47	MDOT 703.20	0.02	35	1031.73	1355.72	1936.14	0	1936.14
18	1.71696	2468.63	MDOT 703.20	0.02	35	642.662	844.477	1206.01	0	1206.01
19	1.71696	1078.68	MDOT 703.20	0.02	35	285.704	375.424	536.132	0	536.132
20	1.71696	1199.08	MDOT 703.20	0.02	35	323.025	424.464	606.169	0	606.169
21	1.71696	1301.88	MDOT 703.20	0.02	35	356.645	468.642	669.26	0	669.26
22	1.71696	1391.04	MDOT 703.20	0.02	35	387.455	509.128	727.082	0	727.082
23	1.71696	1466.88	MDOT 703.20	0.02	35	415.392	545.837	779.51	0	779.51
24	1.71696	1529.66	MDOT 703.20	0.02	35	440.381	578.674	826.404	0	826.404
25	1	1055.94	Concrete	5000	45	4222.49	5548.48	548.483	0	548.483

Global Minimum Query (janbu simplified) - Safety Factor: 1.16778

Slice Number	Width [ft]	Weight [lbs]	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]
1	1.41373	354.369	Existing Fill	0.02	30	49.6561	57.9874	100.402	0	100.402
2	1.41373	958.47	Existing Fill	0.02	30	162.349	189.588	328.342	0	328.342
3	1.41373	1406.49	Existing Fill	0.02	30	265.499	310.044	536.976	0	536.976
4	1.41373	1770.24	Existing Fill	0.02	30	360.494	420.978	729.121	0	729.121
5	1.41373	2080.68	Existing Fill	0.02	30	449.234	524.606	908.608	0	908.608
6	1.41373	2356.14	Existing Fill	0.02	30	533.617	623.147	1079.29	0	1079.29
7	1.41373	2598.59	Existing Fill	0.02	30	612.94	715.779	1239.73	0	1239.73
8	1.41373	2812.01	Existing Fill	0.02	30	687.294	802.608	1390.12	0	1390.12
9	1.41373	2966.43	Existing Fill	0.02	30	748.474	874.053	1513.87	0	1513.87
10	1.41373	3080.77	Existing Fill	0.02	30	800.17	934.423	1618.43	0	1618.43
11	0.427754	945.526	Glacial Till	2000	35	2183.34	2549.66	784.993	0	784.993
12	1.30321	2880.12	Crushed Stone	0	45	1184.02	1382.67	1382.67	0	1382.67
13	1.3414	3023.58	MDOT 703.20	0.02	35	1015.95	1186.41	1694.34	0	1694.34
14	1.3414	3145.17	MDOT 703.20	0.02	35	1084.48	1266.43	1808.62	0	1808.62
15	1.3414	3254.62	MDOT 703.20	0.02	35	1150.43	1343.45	1918.61	0	1918.61
16	1.3414	2393.63	MDOT 703.20	0.02	35	866.67	1012.08	1445.37	0	1445.37
17	1.3414	966.757	MDOT 703.20	0.02	35	358.338	418.46	597.594	0	597.594
18	1.3414	990.493	MDOT 703.20	0.02	35	375.66	438.688	626.483	0	626.483
19	1.3414	1055.05	MDOT 703.20	0.02	35	409.302	477.975	682.59	0	682.59
20	1.3414	1109.47	MDOT 703.20	0.02	35	440.182	514.036	734.092	0	734.092
21	1.3414	1154.04	MDOT 703.20	0.02	35	468.223	546.782	780.86	0	780.86
22	1.3414	1188.99	MDOT 703.20	0.02	35	493.335	576.107	822.74	0	822.74
23	1.3414	1214.48	MDOT 703.20	0.02	35	515.416	601.892	859.559	0	859.559
24	1.3414	1230.63	MDOT 703.20	0.02	35	534.343	623.995	891.132	0	891.132
25	1	1064.62	Concrete	5000	45	5128.44	5988.89	988.889	0	988.889

Interslice Data

Munjoy Heights - #13217			
<i>Analysis Description</i>		SECTION 2 - Seismic - Stone Strong - Bishop/Janbu	
<i>Drawn By</i>		<i>Scale</i>	<i>Company</i> Summit Geoenengineering Services
<i>Date</i>		3/10/2014, 10:29:25 AM	<i>File Name</i> Section 2 - SEISMIC.slim



Global Minimum Query (bishop simplified) - Safety Factor: 1.31403

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	10.0798	138.923	0	0	0
2	11.7247	136.272	191.943	0	0
3	13.3696	133.928	686.82	0	0
4	15.0144	131.827	1388.54	0	0
5	16.6593	129.926	2227.24	0	0
6	18.3042	128.193	3150.01	0	0
7	19.9491	126.608	4115.49	0	0
8	21.594	125.151	5090.58	0	0
9	23.2389	123.81	6048.31	0	0
10	24.8837	122.575	6969.09	0	0
11	26.5286	121.435	7834.87	0	0
12	28.1735	120.384	8628.57	0	0
13	29.8184	119.415	9327.27	0	0
14	31.4633	118.524	9915.04	0	0
15	31.6	118.453	9729.41	0	0
16	33.5474	117.5	8769.55	0	0
17	35.2644	116.739	8802.62	0	0
18	36.9813	116.05	8693.78	0	0
19	38.6983	115.429	8540.03	0	0
20	40.4152	114.874	8434.87	0	0
21	42.1322	114.382	8275.72	0	0
22	43.8491	113.952	8056.85	0	0
23	45.5661	113.583	7773.33	0	0
24	47.283	113.273	7421.39	0	0
25	49	113.021	6998.3	0	0
26	50	112.9	0	0	0

Global Minimum Query (janbu simplified) - Safety Factor: 1.16778

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	17.0349	138.426	0	0	0
2	18.4487	134.147	387.752	0	0
3	19.8624	131.102	1234.78	0	0
4	21.2761	128.664	2281.52	0	0
5	22.6899	126.612	3409.43	0	0
6	24.1036	124.84	4551.43	0	0
7	25.5173	123.283	5665.34	0	0
8	26.9311	121.903	6718.14	0	0

Munjoy Heights - #13217

Analysis Description

SECTION 2 - Seismic - Stone Strong - Bishop/Janbu

Drawn By

Scale

Company

Summit Geoengineering Services

Date

3/10/2014, 10:29:25 AM

File Name

Section 2 - SEISMIC.slim



9	28.3448	120.671	7684.55	0	0
10	29.7585	119.567	8535.31	0	0
11	31.1722	118.576	9254.4	0	0
12	31.6	118.296	8615.53	0	0
13	32.9032	117.5	7923.02	0	0
14	34.2446	116.761	8054.67	0	0
15	35.586	116.098	8051.27	0	0
16	36.9274	115.506	7904.62	0	0
17	38.2688	114.981	7692.38	0	0
18	39.6102	114.52	7564.58	0	0
19	40.9516	114.12	7390.41	0	0
20	42.293	113.779	7158.42	0	0
21	43.6344	113.496	6864.91	0	0
22	44.9758	113.268	6507.08	0	0
23	46.3172	113.095	6082.94	0	0
24	47.6586	112.976	5591.35	0	0
25	49	112.91	5031.98	0	0
26	50	112.895	0	0	0


List Of Coordinates

Water Table

X	Y
9	114
130	93.5022

External Boundary

X	Y
9	50
130	50
130	71.878
130	105
130	111.7
88	112.25
87	112.25
87	112.5
50	112.5
50	120
49	120
38.6	120

	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 2 - Seismic - Stone Strong - Bishop/Janbu		
	<i>Drawn By</i>	<i>Scale</i>	<i>Company</i> Summit Geoengineering Services
	<i>Date</i> 3/10/2014, 10:29:25 AM		<i>File Name</i> Section 2 - SEISMIC.slim

37	135
33	135
28	137
23	138
9	139
9	122.5

Material Boundary

X	Y
31.6	118.5
30.9	124.5
30.6	127.5
32.3	127.5
32	130.5
31.5	133.5
33	133.5
33	135

Material Boundary

X	Y
49	120
49	110
50	110
50	112.25
50.8001	112.25
86	112.25
87	112.25

Material Boundary

X	Y
50	112.5
87	112.25

Material Boundary

X	Y
23	138
31.6	118.5

Munjoy Heights - #13217



<i>Analysis Description</i>			SECTION 2 - Seismic - Stone Strong - Bishop/Janbu		
<i>Drawn By</i>		<i>Scale</i>	<i>Company</i> Summit Geoengineering Services		
<i>Date</i>			3/10/2014, 10:29:25 AM		<i>File Name</i> Section 2 - SEISMIC.slim

Material Boundary

X	Y
86	112.25
86	108
87	108
87	112.25

Material Boundary

X	Y
87	108
120	107
130	105

Material Boundary

X	Y
9	122.5
31.6	118.5

Material Boundary

X	Y
31.6	118.5
31.6	117.5
38.943	117.5
38.8	118.5
31.6	118.5

Material Boundary

X	Y
38.6	120
38.8	118.5

Material Boundary

X	Y
31.6	117.5
49	110
86	108

Munjoy Heights - #13217

Analysis Description

SECTION 2 - Seismic - Stone Strong - Bishop/Janbu

Drawn By

Scale

Company

Summit Geoengineering Services

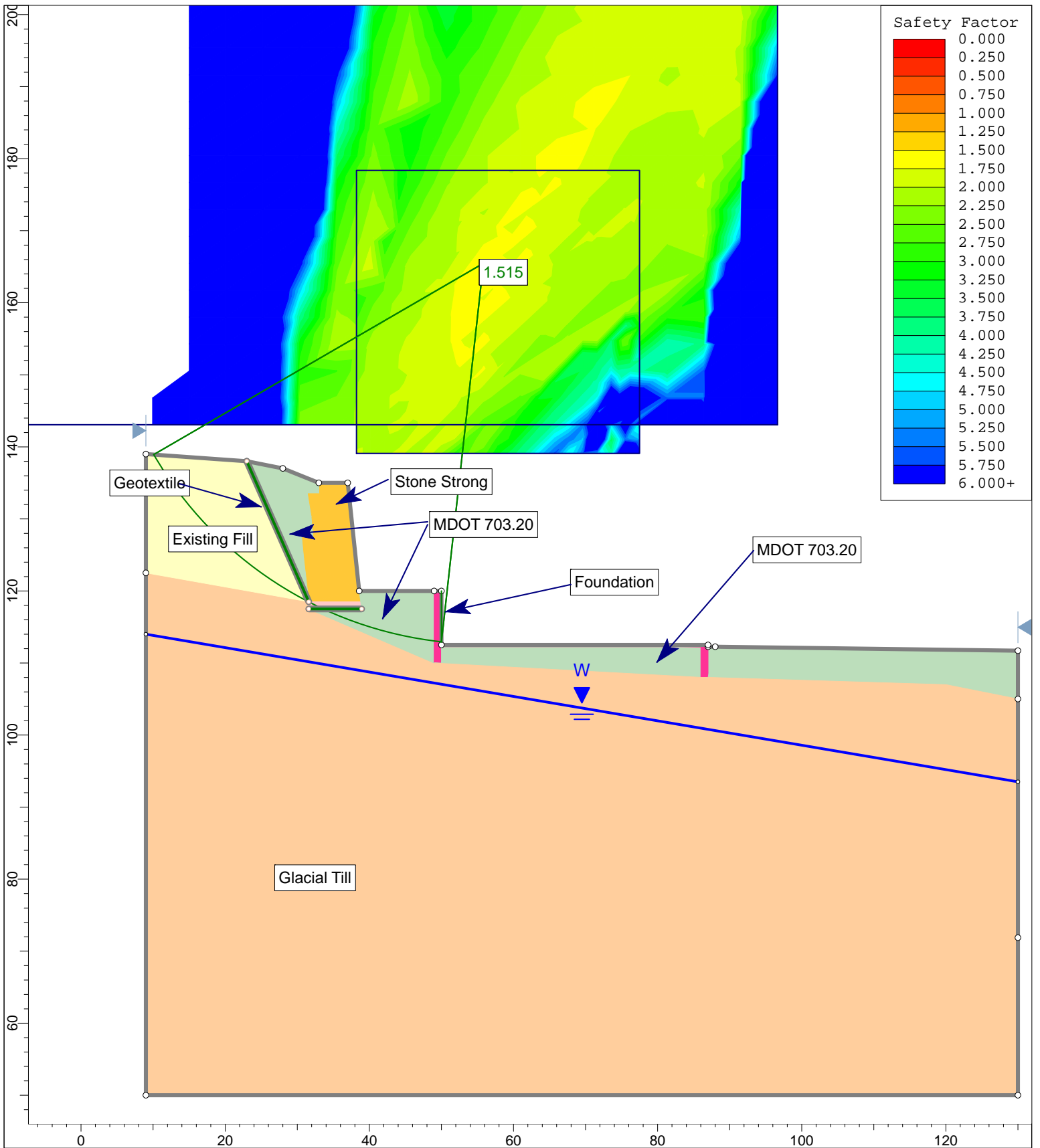
Date

3/10/2014, 10:29:25 AM

File Name

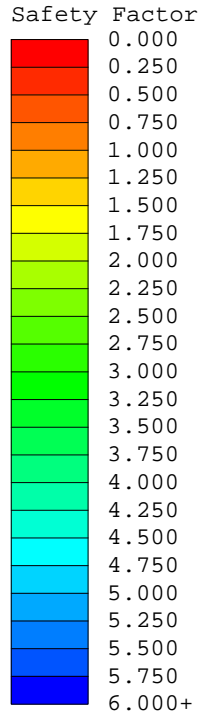
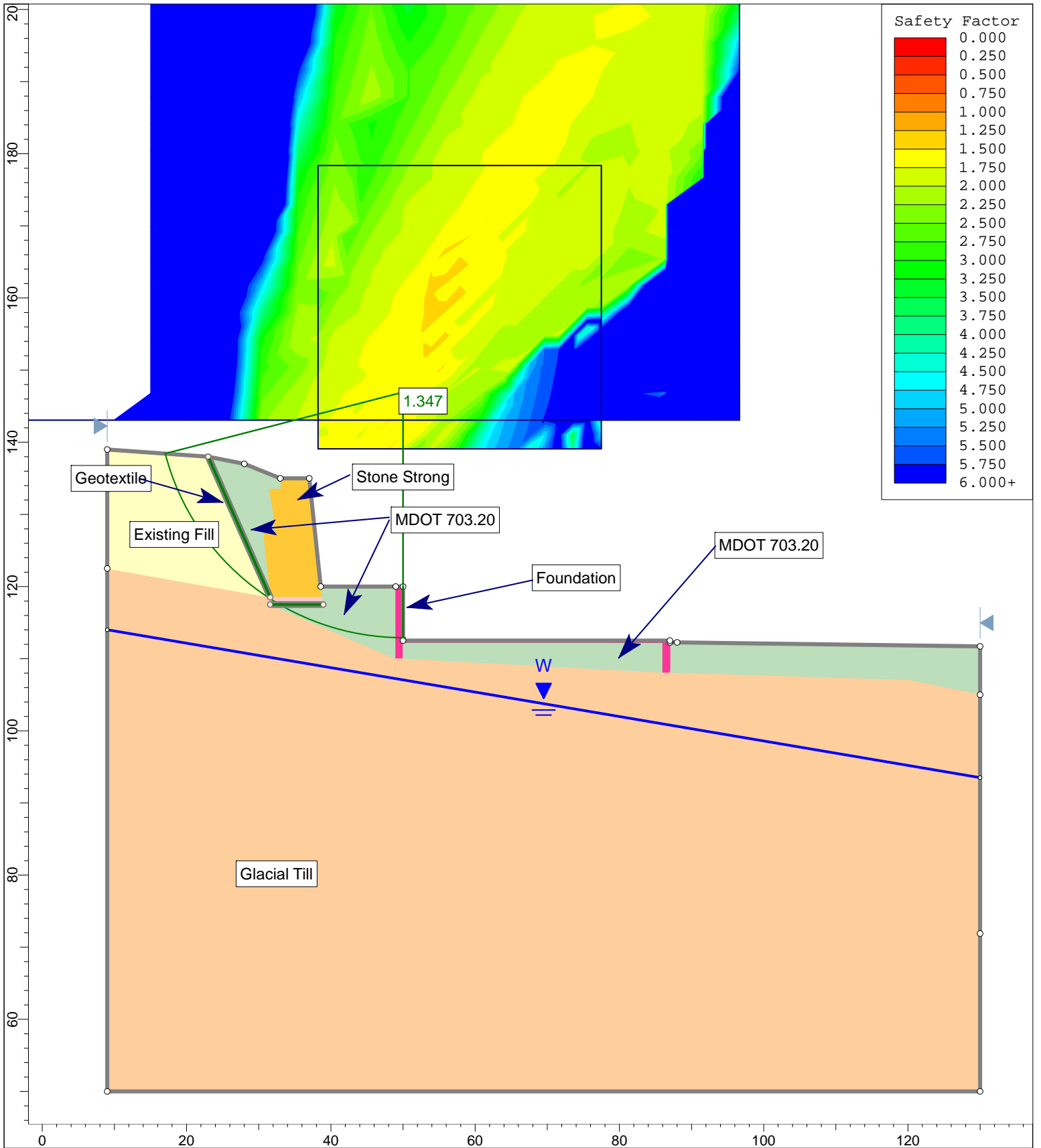
Section 2 - SEISMIC.slim





Munjoy Heights - #13217			
<i>Analysis Description</i>		SECTION 2 - Static - Stone Strong - Bishop	
<i>Drawn By</i>		<i>Scale</i> 1:214	<i>Company</i> Summit Geoengineering Services
<i>Date</i> 3/10/2014, 10:29:25 AM		<i>File Name</i> Section 2 - STATIC w geotextile.slim	





	Munjoy Heights - #13217		
	SECTION 2 - Static - Stone Strong - Janbu		
	Drawn By	Scale 1:214	Company Summit Geoengineering Services
	Date 3/10/2014, 10:29:25 AM	File Name Section 2 - STATIC w geotextile.slim	

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

File Name: Section 2 - STATIC w geotextile
Slide Modeler Version: 6.026
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 3/10/2014, 10:29:25 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

Analysis Methods Used


Bishop simplified
Janbu simplified

Number of slices: 25
Tolerance: 0.005
Maximum number of iterations: 50
Check malpha < 0.2: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
Pore Fluid Unit Weight: 62.4 lbs/ft³
Advanced Groundwater Method: None

Random Numbers







	Munjoy Heights - #13217		
	<i>Analysis Description</i> SECTION 2 - Static - Stone Strong - Bishop		
	<i>Drawn By</i>	<i>Scale</i>	<i>Company</i> Summit Geoengineering Services
	<i>Date</i> 3/10/2014, 10:29:25 AM	<i>File Name</i> Section 2 - STATIC w geotextile.slim	

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

Surface Options

Surface Type: Circular
 Search Method: Grid Search
 Radius Increment: 10
 Composite Surfaces: Enabled
 Reverse Curvature: Invalid Surfaces
 Minimum Elevation: Not Defined
 Minimum Depth: Not Defined

Material Properties


Property	Existing Fill	MDOT 703.20	Glacial Till	Stone Strong	Crushed Stone	Concrete
Color						
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft ³]	120	130	124	127	110	150
Cohesion [psf]	0.02	0.02	2000	1250	0	5000
Friction Angle [deg]	30	35	35	35	45	45
Water Surface	None	None	Water Table	None	None	None
Hu Value			1			
Ru Value	0	0		0	0	0

Support Properties

Support 2

Support Type: GeoTextile
 Force Application: Active
 Force Orientation: Bisector of Parallel and Tangent
 Anchorage: None
 Shear Strength Model: Linear
 Strip Coverage: 100 percent
 Tensile Strength: 500 lb/ft
 Pullout Strength Adhesion: 5 psf
 Pullout Strength Friction Angle: 40 degrees

Global Minimums

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Method: bishop simplified

FS: 1.515470
Center: 55.829, 165.474
Radius: 52.896
Left Slip Surface Endpoint: 10.080, 138.923
Right Slip Surface Endpoint: 50.000, 112.900
Left Slope Intercept: 10.080 138.923
Right Slope Intercept: 50.000 120.000
Resisting Moment=2.01176e+006 lb-ft
Driving Moment=1.32748e+006 lb-ft
Total Slice Area=423.822 ft²

Method: janbu simplified

FS: 1.347360
Center: 50.003, 146.946
Radius: 34.051
Left Slip Surface Endpoint: 17.035, 138.426
Right Slip Surface Endpoint: 50.000, 112.895
Left Slope Intercept: 17.035 138.426
Right Slope Intercept: 50.000 120.000
Resisting Horizontal Force=29447.2 lb
Driving Horizontal Force=21855.5 lb
Total Slice Area=363.623 ft²

Valid / Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 8439
Number of Invalid Surfaces: 1472

Error Codes:


Error Code -106 reported for 40 surfaces
Error Code -107 reported for 78 surfaces
Error Code -108 reported for 39 surfaces
Error Code -112 reported for 28 surfaces
Error Code -1000 reported for 1287 surfaces

Method: janbu simplified

Number of Valid Surfaces: 7861
Number of Invalid Surfaces: 2050

Error Codes:

Error Code -106 reported for 40 surfaces
Error Code -107 reported for 78 surfaces

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Error Code -108 reported for 627 surfaces
 Error Code -112 reported for 18 surfaces
 Error Code -1000 reported for 1287 surfaces

Error Codes

The following errors were encountered during the computation:

- 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.
- 107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.
- 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 $M\text{-Alpha} = \cos(\alpha)(1 + \tan(\alpha)\tan(\phi))/F < 0.2$ 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.
- 1000 = No valid slip surfaces are generated at a grid center. Unable to draw a surface.

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.51547

Slice Number	Width [ft]	Weight [lbs]	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]
1	1.64488	250.037	Existing Fill	0.02	30	35.9045	54.4122	94.2101	0	94.2101
2	1.64488	719.807	Existing Fill	0.02	30	108.106	163.832	283.731	0	283.731
3	1.64488	1135.31	Existing Fill	0.02	30	176.95	268.163	464.438	0	464.438
4	1.64488	1507.13	Existing Fill	0.02	30	242.439	367.409	636.336	0	636.336
5	1.64488	1842.55	Existing Fill	0.02	30	304.673	461.723	799.691	0	799.691
6	1.64488	2146.81	Existing Fill	0.02	30	363.786	551.307	954.859	0	954.859
7	1.64488	2423.85	Existing Fill	0.02	30	419.917	636.372	1102.19	0	1102.19
8	1.64488	2676.87	Existing Fill	0.02	30	473.223	717.155	1242.12	0	1242.12
9	1.64488	2916.98	Existing Fill	0.02	30	525.396	796.222	1379.06	0	1379.06
10	1.64488	3142.45	Existing Fill	0.02	30	575.955	872.843	1511.77	0	1511.77
11	1.64488	3349.3	Existing Fill	0.02	30	624.002	945.657	1637.89	0	1637.89
12	1.64488	3497.42	Existing Fill	0.02	30	661.775	1002.9	1737.05	0	1737.05
13	1.64488	3591.09	Existing Fill	0.02	30	689.608	1045.08	1810.1	0	1810.1
14	0.136728	300.165	Glacial Till	2000	35	1884.33	2855.65	1222	0	1222
15	1.9474	4256.52	Crushed Stone	0	45	1061.49	1608.66	1608.66	0	1608.66
16	1.71696	3871.64	MDOT 703.20	0.02	35	865.019	1310.91	1872.14	0	1872.14
17	1.71696	4033.47	MDOT 703.20	0.02	35	915.742	1387.78	1981.93	0	1981.93
18	1.71696	2468.63	MDOT 703.20	0.02	35	569.297	862.752	1232.11	0	1232.11
19	1.71696	1078.68	MDOT 703.20	0.02	35	252.594	382.799	546.665	0	546.665
20	1.71696	1199.08	MDOT 703.20	0.02	35	285.032	431.958	616.869	0	616.869

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21	1.71696	1301.88	MDOT 703.20	0.02	35	314.082	475.982	679.747	0	679.747
22	1.71696	1391.04	MDOT 703.20	0.02	35	340.544	516.084	737.013	0	737.013
23	1.71696	1466.88	MDOT 703.20	0.02	35	364.371	552.193	788.583	0	788.583
24	1.71696	1529.66	MDOT 703.20	0.02	35	385.512	584.232	834.344	0	834.344
25	1	1055.94	Concrete	5000	45	3701.99	5610.26	610.255	0	610.255


Global Minimum Query (janbu simplified) - Safety Factor: 1.34736

Slice Number	Width [ft]	Weight [lbs]	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]
1	1.41373	354.369	Existing Fill	0.02	30	46.8115	63.0719	109.209	0	109.209
2	1.41373	958.47	Existing Fill	0.02	30	151.197	203.717	352.814	0	352.814
3	1.41373	1406.49	Existing Fill	0.02	30	245.297	330.503	572.414	0	572.414
4	1.41373	1770.24	Existing Fill	0.02	30	331.044	446.036	772.524	0	772.524
5	1.41373	2080.68	Existing Fill	0.02	30	410.483	553.068	957.909	0	957.909
6	1.41373	2356.14	Existing Fill	0.02	30	485.506	654.152	1132.99	0	1132.99
7	1.41373	2598.59	Existing Fill	0.02	30	555.57	748.553	1296.5	0	1296.5
8	1.41373	2812.01	Existing Fill	0.02	30	620.833	836.485	1448.8	0	1448.8
9	1.41373	2966.43	Existing Fill	0.02	30	673.962	908.07	1572.79	0	1572.79
10	1.41373	3080.77	Existing Fill	0.02	30	718.383	967.921	1676.46	0	1676.46
11	0.427754	945.526	Glacial Till	2000	35	1966.76	2649.93	928.195	0	928.195
12	1.30321	2880.12	Crushed Stone	0	45	1075.91	1449.64	1449.65	0	1449.65
13	1.3414	3023.58	MDOT 703.20	0.02	35	910.967	1227.4	1752.88	0	1752.88
14	1.3414	3145.17	MDOT 703.20	0.02	35	969.756	1306.61	1866	0	1866
15	1.3414	3254.62	MDOT 703.20	0.02	35	1025.97	1382.35	1974.17	0	1974.17
16	1.3414	2393.63	MDOT 703.20	0.02	35	770.856	1038.62	1483.27	0	1483.27
17	1.3414	966.757	MDOT 703.20	0.02	35	317.881	428.3	611.648	0	611.648
18	1.3414	990.493	MDOT 703.20	0.02	35	332.366	447.817	639.52	0	639.52
19	1.3414	1055.05	MDOT 703.20	0.02	35	361.169	486.624	694.942	0	694.942
20	1.3414	1109.47	MDOT 703.20	0.02	35	387.372	521.93	745.361	0	745.361
21	1.3414	1154.04	MDOT 703.20	0.02	35	410.922	553.66	790.679	0	790.679
22	1.3414	1188.99	MDOT 703.20	0.02	35	431.752	581.725	830.762	0	830.762
23	1.3414	1214.48	MDOT 703.20	0.02	35	449.781	606.017	865.455	0	865.455
24	1.3414	1230.63	MDOT 703.20	0.02	35	464.917	626.41	894.579	0	894.579
25	1	1064.62	Concrete	5000	45	4452.38	5998.97	998.965	0	998.965

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.51547


Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]

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1	10.0798	138.923	0	0	0
2	11.7247	136.272	190.757	0	0
3	13.3696	133.928	678.183	0	0
4	15.0144	131.827	1363.29	0	0
5	16.6593	129.926	2174.87	0	0
6	18.3042	128.193	3059.52	0	0
7	19.9491	126.608	3975.91	0	0
8	21.594	125.151	4891.24	0	0
9	23.2389	123.81	5779.07	0	0
10	24.8837	122.575	6620.21	0	0
11	26.5286	121.435	7397.14	0	0
12	28.1735	120.384	8093.55	0	0
13	29.8184	119.415	8688.54	0	0
14	31.4633	118.524	9168.2	0	0
15	31.6	118.453	8997.25	0	0
16	33.5474	117.5	7979.22	0	0
17	35.2644	116.739	7919.87	0	0
18	36.9813	116.05	7715.73	0	0
19	38.6983	115.429	7504.59	0	0
20	40.4152	114.874	7374.9	0	0
21	42.1322	114.382	7189.28	0	0
22	43.8491	113.952	6942.68	0	0
23	45.5661	113.583	6630.84	0	0
24	47.283	113.273	6250.61	0	0
25	49	113.021	5799.93	0	0
26	50	112.9	0	0	0

Global Minimum Query (janbu simplified) - Safety Factor: 1.34736

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	17.0349	138.426	0	0	0
2	18.4487	134.147	401.196	0	0
3	19.8624	131.102	1262.13	0	0
4	21.2761	128.664	2311.8	0	0
5	22.6899	126.612	3429.42	0	0
6	24.1036	124.84	4547.95	0	0
7	25.5173	123.283	5625.9	0	0
8	26.9311	121.903	6631.37	0	0
9	28.3448	120.671	7540.3	0	0
10	29.7585	119.567	8325.45	0	0
11	31.1722	118.576	8972.6	0	0
12	31.6	118.296	8391.89	0	0

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13	32.9032	117.5	7665.13	0	0
14	34.2446	116.761	7740.68	0	0
15	35.586	116.098	7679.41	0	0
16	36.9274	115.506	7474.14	0	0
17	38.2688	114.981	7220.25	0	0
18	39.6102	114.52	7076.44	0	0
19	40.9516	114.12	6886.93	0	0
20	42.293	113.779	6639.98	0	0
21	43.6344	113.496	6332.47	0	0
22	44.9758	113.268	5962.17	0	0
23	46.3172	113.095	5527.71	0	0
24	47.6586	112.976	5028.54	0	0
25	49	112.91	4464.94	0	0
26	50	112.895	0	0	0


List Of Coordinates

Water Table

X	Y
9	114
130	93.5022

External Boundary

X	Y
9	50
130	50
130	71.878
130	105
130	111.7
88	112.25
87	112.25
87	112.5
50	112.5
50	120
49	120
38.6	120
37	135
33	135
28	137
23	138

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9	139
9	122.5

Material Boundary

X	Y
31.6	118.5
30.9	124.5
30.6	127.5
32.3	127.5
32	130.5
31.5	133.5
33	133.5
33	135

Material Boundary

X	Y
49	120
49	110
50	110
50	112.25
50.8001	112.25
86	112.25
87	112.25

Material Boundary

X	Y
50	112.5
87	112.25

Material Boundary

X	Y
23	138
31.6	118.5

Material Boundary

X	Y
86	112.25
86	108

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87	108
87	112.25

Material Boundary

X	Y
87	108
120	107
130	105

Material Boundary

X	Y
9	122.5
31.6	118.5

Material Boundary


X	Y
31.6	118.5
31.6	117.5
38.943	117.5
38.8	118.5
31.6	118.5

Material Boundary

X	Y
38.6	120
38.8	118.5

Material Boundary

X	Y
31.6	117.5
49	110
86	108

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