APPENDIX B

SEISMIC STABILITY ANALYSIS

Seismic Stability Analysis
Molokai Integrated Solid Waste Facility
May 2019

Introduction

Molokai Integrated Solid Waste Facility (MISWF) is located within a "seismic impact zone", defined by Hawaii Administrative Rules (HAR) Section 11-58.1-13(e), as an area with a ten percent or greater probability of experiencing a horizontal acceleration, due to seismic shaking, of more than 0.10 g in a 250 year period. The United States Geological Survey (USGS) has classified the island of Molokai in UBC Seismic Zone 2B, defined as having a ten percent probability of exceeding a peak ground acceleration of 0.15 g in 50 years. (USGS, 2004a) USGS earthquake hazard maps estimate the peak horizontal ground acceleration in central Molokai to be 0.31 g with a 2% probability of occurrence in 50 years (See Figure 1). A probability of exceedance of 2% in 50 years is approximately equivalent to a probability of 10% in 250 years (USGS, 2004b), and represents an event expected to occur one time in approximately 2,400 years. (USGS, 1996)

HAR 1.58.1-13(e) prohibits municipal solid waste landfills to be constructed or expanded in a seismic impact zone unless the landfill operator or owner demonstrates that the containment structures of the landfill are designed to withstand the maximum horizontal acceleration due to an earthquake. A-Mehr, Inc. has prepared the following analysis to make the required demonstration.

Methodology

The analysis is based on a slope stability analysis of the landfill at the time when the landfill has reached its maximum permitted elevation, with design final grades at no steeper than 3:1 (horizontal: vertical) slope ratio as shown on Figure 1. A-Mehr, Inc. used the slope stability analysis computer program STABL6H to compute the static factor of safety and yield acceleration for three critical cross-sections, as shown on Figures 1 - 6. The program uses the Modified Bishop and Modified Janbu methods, to determine the location of the lowest factor of safety for failure planes through the liner system for static and pseudostatic conditions. The location with the lowest factor of safety was then analyzed using the more rigorous Spencer's Method of Slices, which produces more realistic results than the Modified Bishop and Janbu screening procedures.

The analysis was conducted according to procedures specified in the document "RCRA Subtitle D (248) Seismic Design Guidance for Municipal Solid Waste Facilities (U.S. Environmental Protection Agency, April 1995). The document provides a straightforward procedure for evaluating the seismic stability[1] of refuse slopes, as follows:

- Establish cross-sections and assign appropriate shear strength parameters.
- Conduct static stability analyses, using appropriate programs to search for the most critical locations in the cross-section to determine the lowest static factor of safety.
- Determine the seismic coefficient, k_s. The recommended value for k_s is 50% of the peak horizontal acceleration during the design earthquake.

[1] Seismic stability as evaluated in this report refers to stability against potential movements of significant volumes of refuse or soil, as distinguished from minor slippage of surface materials.

- Conduct pseudo-static stability analyses of the most critical locations for each cross-section, applying a horizontal load equivalent to the selected seismic coefficient k_s.
- If the resulting pseudo-static factor of safety is greater than 1.0, the seismic stability analysis is complete.

Input Data

The analysis requires shear strength properties to be assigned to each material in the system. Table 1 lists the components form the liner – waste system. Due to the shallow excavation of the landfill base grades (approximately 5 feet), liner components are the same on the floor and side slopes, except for the presence of leachate collection gravel on the floor. Table 2 lists the properties for each component and interface.

The seismic coefficient used in the pseudo-static stability analysis is 50% of the peak horizontal acceleration as recommended by USEPA (1995), and the design earthquake is 0.5 x 0.31 = 0.155g.

Table 1
System Components – From Bottom to Top

Prepared subgrade
One (1) foot of low permeability soil liner
80 mil HDPE textured (both sides) geomembrane
16 ounce/square yard nonwoven geotextile
12 inches leachate collection sand or gravel
16 ounce/square yard nonwoven geotextile
2 ft. sandy clay soil (operations layer)
Solid waste

The analysis were conducted for the most critical conditions, assuming a maximum slope ratio of 3:1 (horizontal: vertical). The analysis evaluated the cross-sections illustrated on Figure 1, with shear strength properties typical of solid waste and the soil and liner materials present at the landfill, including a refuse mass unit weight of 85 pounds per cubic foot (pcf) based on site-specific waste compaction and soil use data for MISWF, which is a conservatively high maximum weight typically used in the industry.

Appendix A presents the data and calculations used to estimate the site-specific refuse mass unit weight of 85 pcf. Table 2 summarizes the input values for the stability analyses.

Table 2
Shear Strength Properties for Gross Slope Stability Analysis

Material	Friction angle (degrees)	Cohesion (lb./sq. ft.)	Unit Weight (lb./cu. ft.)
Low permeability soil liner	25	250	126
Solid Waste	33	0	85
Liner System Low permeability soil liner vs. textured HDPE liner interface	18		63

Results

The computer output sheets for the STABL6H stability analyses are presented in Appendix B. The results are summarized in the following discussion.

Static Factor of Safety:

Each of the three cross-sections was evaluated for the analytical case using the material properties listed in Table 2. The liner system was assigned the properties of the most critical interface, the low permeability soil liner / textured HDPE interface.

All cross-sections were determined to have static factors of safety (FS) equal to or greater than 1.5 for all cases. As shown in Table 3, the lowest FS determined by Spencer's Method of analysis for each was:

Cross-section 1-1 2.39
Cross-section 2-2 2.06
Cross-section 3-3 1.80

Pseudostatic Analysis:

All cross-sections were determined to have pseudo-static factors of safety (FS) in excess of 1.0 when analyzed using the seismic coefficient k_s = 0.16g. As shown in Table 3, the lowest seismic FS values for each cross-section are:

Cross-section 1-1 1.35
Cross-section 2-2 1.34
Cross-section 3-3 1.06

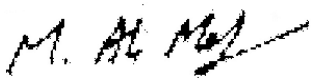
Table 3
Stability Analysis Results
Static and Pseudo-static Factors of Safety

Refuse Unit Weight (pcf)	Minimum Static Factor of Safety			Minimum Pseudo-static Factor of Safety		
	Cross-Section 1	Cross-Section 2	Cross-Section 3	Cross-Section 1	Cross-Section 2	Cross-Section 3
85	2.39	2.06	1.80	1.35	1.34	1.06

It should be noted that the analysis of gross slope stability was conducted using the interface shear strength of the textured HDPE against low-permeability soil liner, with a friction angle of 18 degrees for the lined areas of Phases 3, 4, 5 and 6. The unlined areas of Phases 1 and 2 were evaluated using parameters for low permeability soil, with a friction angle of 25 degrees and cohesion of 250 psf as indicated in Table 2. With seismic factors of safety greater than 1.0, it can be concluded there will be no permanent deformation of the liner system during the design seismic event.

Based on this analysis, we conclude that the containment system for the landfill is designed to resist the maximum horizontal acceleration from the design earthquake, and therefore meets the requirements of HAR 11-58.1-13(e).

Respectfully Submitted,



A-MEHR, INC.
M. Ali Mehrazarin, P.E.
Principal Engineer

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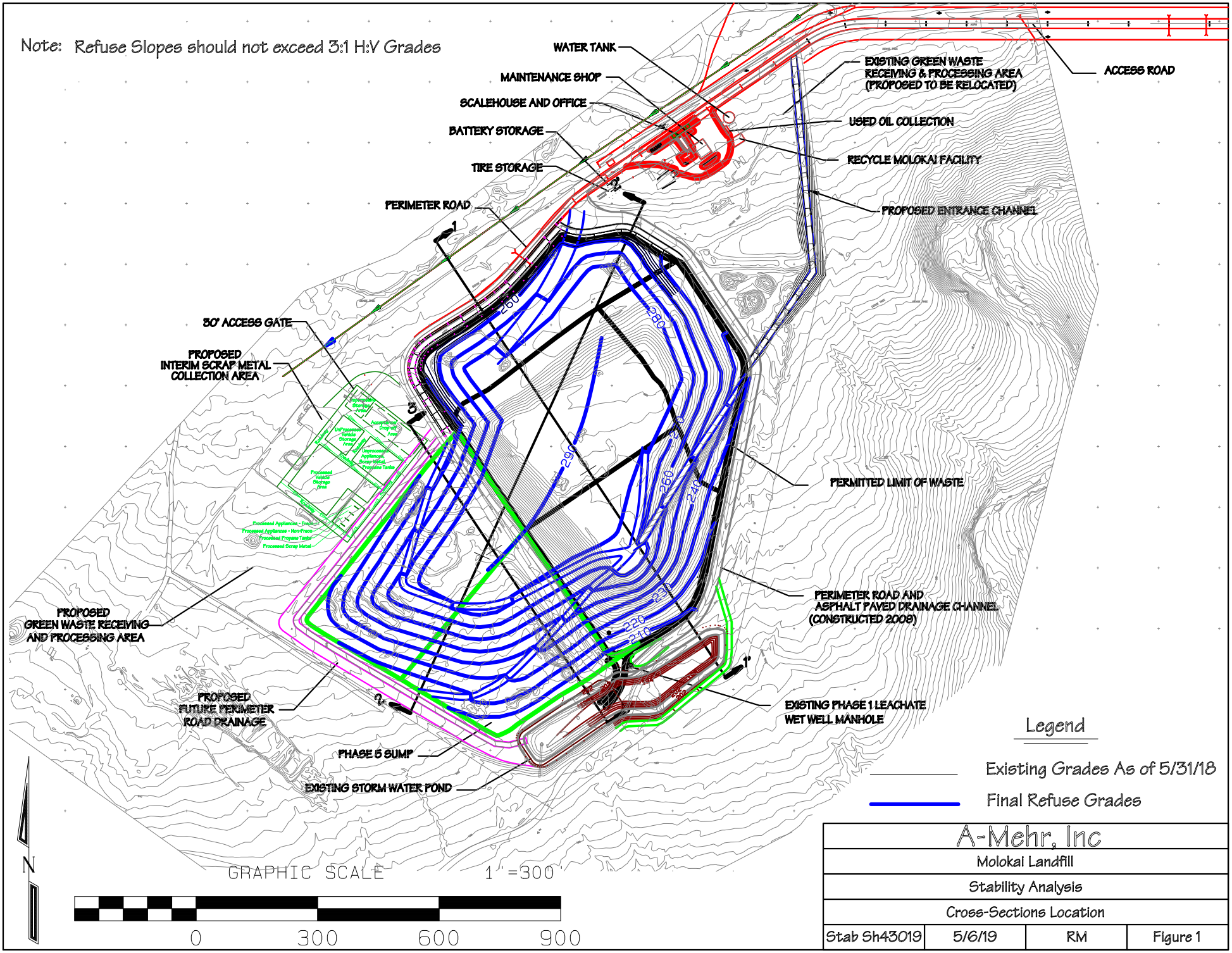
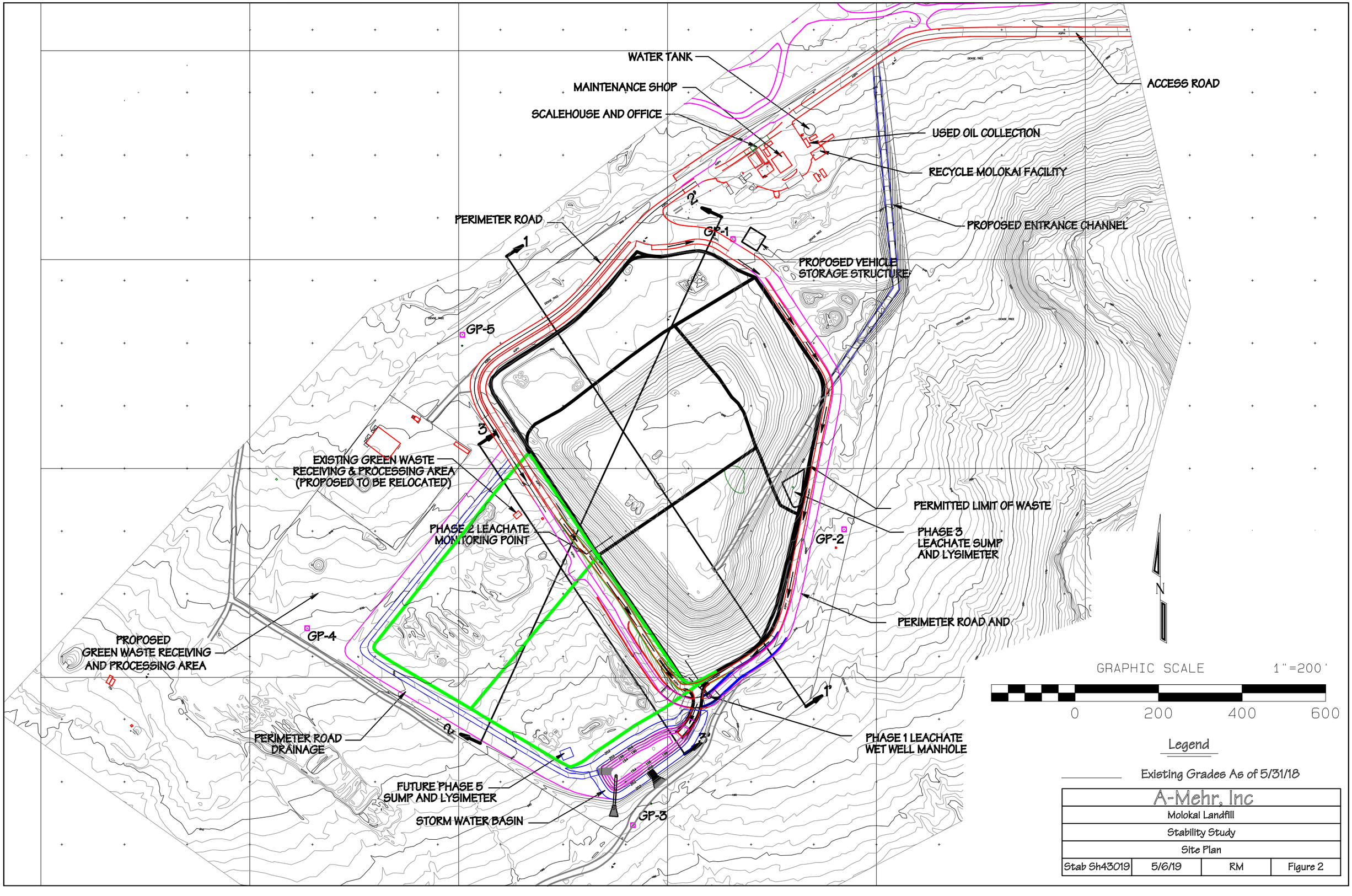
USGS, 1996. Hawaii Hazard Maps 1996. http://eqhazmaps.usgs.gov/html/his.html. United States Geological Survey website accessed June 2004

FIGURES



A-Mehr, Inc			
Molokai Landfill			
Stability Analysis			
Cross-Sections Location			
Stab Sh43019	5/6/19	RM	Figure 1



A-Mehr, Inc			
Molokai Landfill			
Stability Study			
Site Plan			
Stab Sh43019	5/6/19	RM	Figure 2

GRAPHIC SCALE 1"=200'

0 200 400 600

N

Legend

Existing Grades As of 5/31/18

Existing Phase 1, 2, 3 and 4 Liner Grades

Proposed Liner Grades (Phase 5 and 6)

A-Mehr, Inc			
Molokai Landfill			
Stability Study			
Liner Grades			
Stab Sh43019	5/6/19	RM	Figure 3

WATER TANK

MAINTENANCE SHOP

SCALEHOUSE AND OFFICE

BATTERY STORAGE

TIRE STORAGE

PERIMETER ROAD

30' ACCESS GATE

PROPOSED
INTERIM SCRAP METAL
COLLECTION AREA

PROPOSED
GREEN WASTE RECEIVING
AND PROCESSING AREA

PROPOSED
FUTURE PERIMETER
ROAD DRAINAGE

PHASE 5 SUMP

EXISTING STORM WATER POND

RECYCLE MOLOKAI FACILITY

PROPOSED ENTRANCE CHANNEL

PERMITTED LIMIT OF WASTE

PERIMETER ROAD AND
ASPHALT PAVED DRAINAGE CHANNEL
(CONSTRUCTED 2009)

EXISTING PHASE 1 LEACHATE
WET WELL MANHOLE

GRAPHIC SCALE 1"=200'

0 200 400 600

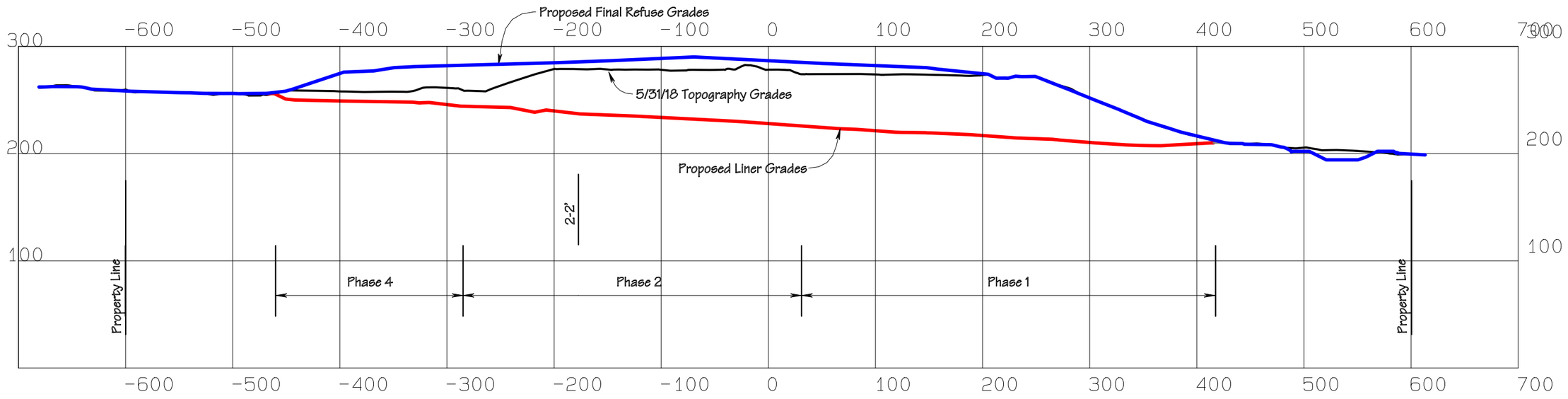
N

Legend

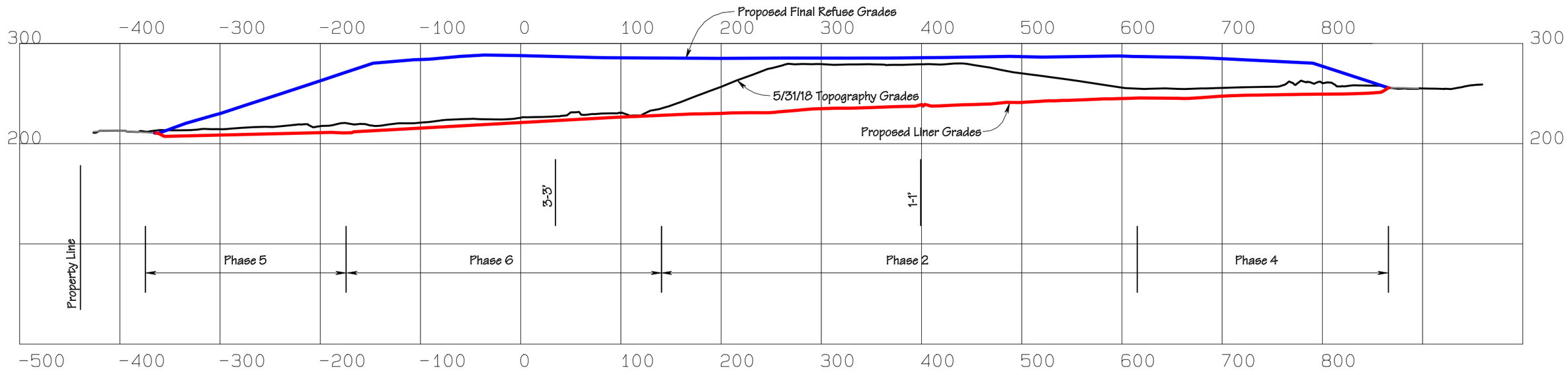
Existing Grades As of 5/31/18

Final Refuse Grades

A-Mehr, Inc			
Molokai Landfill			
Stability Study			
Final Refuse Grades			
Stab Sh43019	5/6/19	RM	Figure 4

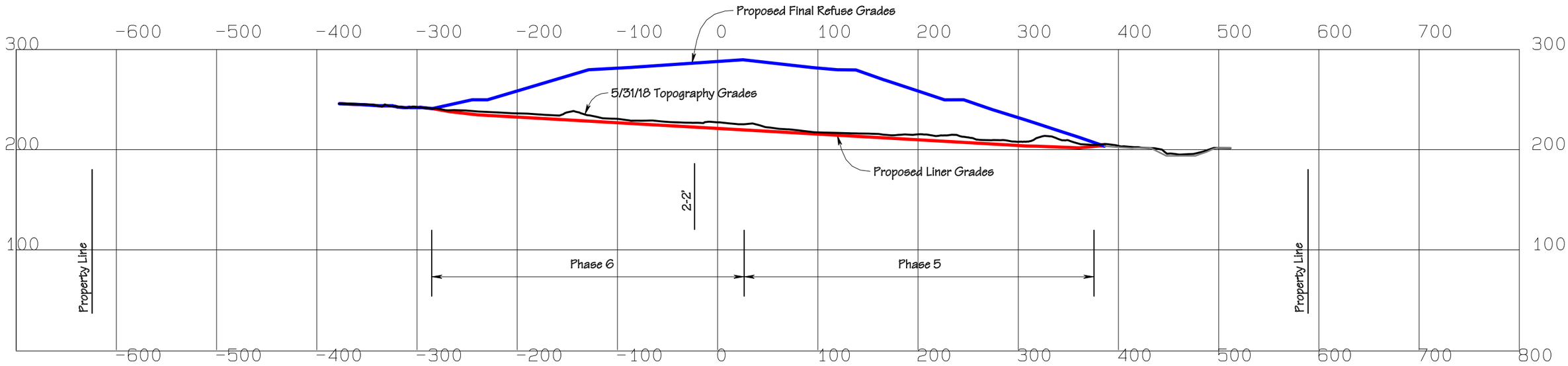


Cross-Section 1-1



Cross-Section 2-2

A-Mehr, Inc			
Molokai Landfill			
Stability Study			
Cross-Section 1-1' & 2-2'			
Stab Sh43019	5/6/19	RM	Figure 5



Cross-Section 3-3

A-Mehr, Inc			
Molokai Landfill			
Stability Study			
Cross-Section 3-3'			
Stab Sh43019	5/6/19	RM	Figure 6

APPENDIX A

SITE-SPECIFIC REFUSE MASS UNIT WEIGHT

MOLOKAI LANDFILL
SITE-SPECIFIC REFUSE MASS UNIT WEIGHT

Field Variables

AUF = Airspace Utilization Factor, pounds solid waste placed per cubic yard of landfill volume used (lb/cy)

Rs = Refuse:Soil Ratio, cubic yards of refuse placed per cubic yard of soil placed in the landfill

Ds = Density (unit weight) of soil, pounds/cubic foot (pcf)

Working Equations

Ww = pounds of waste per cubic foot of landfill volume used

Ww = AUF/27, pcf

Vs = volume fraction of soil in landfill refuse mass

Vs = (1/RS/[(1+RS)/RS] = 1/(1+RS) cf/cf

Ws = weight of soil per cubic foot of landfill refuse mass

Ws = Ds x Vs, pcf

Wr = total unit weight of waste and soil per cubic foot of landfill refuse mass

Wr = Ww + Ws

Therefore: **Wr = AUF/27 + Ds[1/(1+RS)]**

Data and Results

Data for AUF and SR is presented for three representative time periods in the Molokai Landfill Master Plan (A- Mehr, Inc., November 2009). The calculate refused mass unit weight (Wr) is calculated for each period as follows:

Period	AUF (lb/cy)	Rs	Ws (pcf)	Wr (pcf)
7/23/06 – 5/14/09	577	0.99:1	126	85
5/14/09 – 4/2/09	294	1.51:1	126	61
7/23/06 – 4/2/09	450	1.2:1	126	74

The calculated unit weight of 85 pcf for the combined three-year time period from July 2006 to May 2009 is a reasonable and conservative value for the site.

APPENDIX B

STABILITY ANALYSIS COMPUTER RESULTS

MOLOKAI INTEGRATED WASTE MANAGEMENT FACILITY
SLOPE STABILITY ANALYSIS RESULTS
PHASES 1-6 – MAY 2019

SCREENING ANALYSIS – MODIFIED BISHOP AND JANBU METHODS

REFUSE UNIT WEIGHT (PCF)	RUN NO.	CROSS-SECTION	STATIC ANALYSIS
			MINIMUM STATIC FACTOR OF SAFETY
			FS
85	Molf11-1cs	1-1’	3.53
85	Molf11-1	1-1’	>10
85	Molf11-2	1-1’	>10
85	Molf11-3s	1-1’	9.35
85	Molf11-4	1-1’	6.83
85	Molf11-5	1-1’	6.66
85	Molf11-6	1-1’	6.17
85	Molf11-7	1-1’	4.52
85	Molf11-8s	1-1’	3.11
85	Molf11-9	1-1’	5.54
85	Molf11r-1c	1’-1	2.39
85	Molf11r-1s	1’-1	8.95
85	Molf11r-2	1’-1	7.18
85	Molf11r-3	1’-1	6.68
85	Molf11r-4	1’-1	6.49
85	Molf11r-5s	1’-1	6.42
85	Molf11r-6s	1’-1	6.10
85	Molf11r-7s	1’-1	2.43
85	Molf11r-8s	1’-1	2.62
85	Molf11r-9	1’-1	2.81
85	Molf11r-10	1’-1	2.81
85	Molf22-1c	2-2’	2.17
85	Molf22-1	2-2’	8.48
85	Molf22-2	2-2’	7.97
85	Molf22-3	2-2’	7.62
85	Molf22-4s	2-2’	3.65
85	Molf22-5s	2-2’	2.16
85	Molf22-6s	2-2’	2.06
85	Molf22-7	2-2’	4.58
85	Molf22r-1c	2’-2	5.71
85	Molf22r-1	2’-2	>10
85	Molf22r-2	2’-2	>10
85	Molf22r-3	2’-2	>10
85	Molf22r-4s	2’-2	5.86
85	Molf22r-5s	2’-2	5.64
85	Molf22r-6s	2’-2	2.83
85	Molf22r-7	2’-2	6.23
85	Molf33-1c	3-3’	2.38
85	Molf33-1	3-3’	>10
85	Molf33-2	3-3’	>10
85	Molf33-3s	3-3’	2.71
85	Molf33-4	3-3’	3.42
85	Molf33r-1c	3’-3	1.95
85	Molf33r-1	3’-3	6.07
85	Molf33r-2s	3’-3	5.95
85	Molf33r-3s	3’-3	1.80
85	Molf33r-4s	3’-3	1.87
85	Molf33r-5s	3’-3	2.83

FINAL ANALYSIS – SPENCER'S METHOD OF SLICES

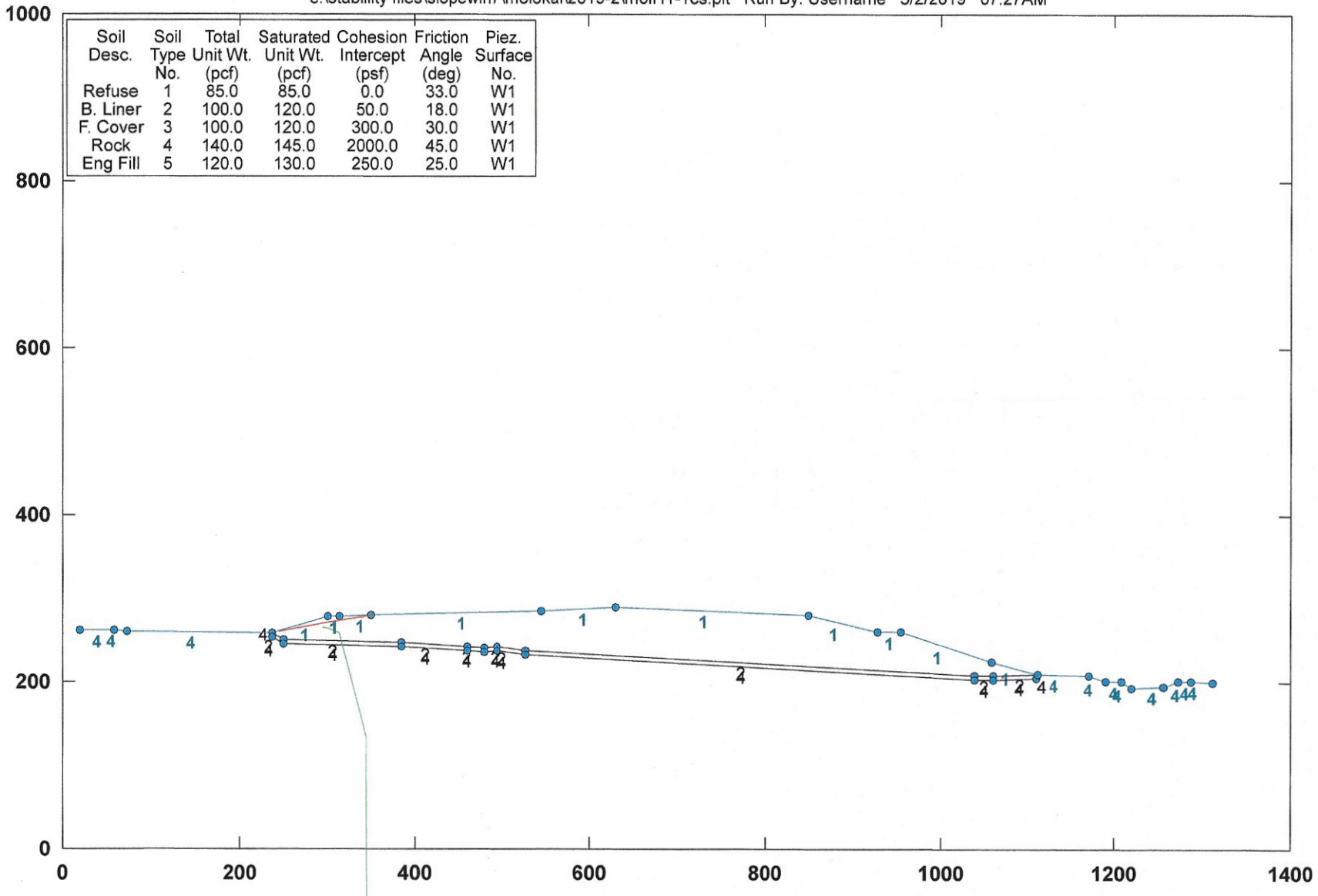
REFUSE UNIT WEIGHT (PCF)	RUN NO.	CROSS-SECTION	STATIC ANALYSIS	PSEUDO-STATIC ANALYSIS	
			MINIMUM STATIC FACTOR OF SAFETY	MINIMUM FACTOR OF SAFETY	YIELD ACCELERATION (G)
85	Molf11-1cs	1-1'	3.53	-	-
85	Molf11-1ce	1-1'	-	1.83	0.16
85	Molf11-1	1-1'	>10	-	-
85	Molf11-1e	1-1'	-	3.29	0.16
85	Molf11-2	1-1'	>10	-	-
85	Molf11-2e	1-1'	-	3.25	0.16
85	Molf11-3s	1-1'	9.35	-	-
85	Molf11-3e	1-1'	-	2.02	0.16
85	Molf11-4	1-1'	6.83	-	-
85	Molf11-4e	1-1'	-	2.77	0.16
85	Molf11-5	1-1'	6.66	-	-
85	Molf11-5e	1-1'	-	2.18	0.16
85	Molf11-6	1-1'	6.17	-	-
85	Molf11-6e	1-1'	-	1.90	0.16
85	Molf11-7	1-1'	4.52	-	-
85	Molf11-7e	1-1'	-	1.75	0.16
85	Molf11-8s	1-1'	3.11	-	-
85	Molf11-8e	1-1'	-	2.55	0.16
85	Molf11-9	1-1'	5.54	-	-
85	Molf11-9e	1-1'	-	3.60	0.16
85	Molf11r-1c	1'-1	2.39	-	-
85	Molf11r-1ce	1'-1	-	1.35	0.16
85	Molf11r-1s	1'-1	8.95	-	-
85	Molf11r-1e	1'-1	-	2.29	0.16
85	Molf11r-2	1'-1	7.18	-	-
85	Molf11r-2e	1'-1	-	2.22	0.16
85	Molf11r-3	1'-1	6.68	-	-
85	Molf11r-3e	1'-1	-	2.22	0.16
85	Molf11r-4	1'-1	6.49	-	-
85	Molf11r-4e	1'-1	-	2.30	0.16
85	Molf11r-5s	1'-1	6.42	-	-
85	Molf11r-5e	1'-1	-	2.18	0.16
85	Molf11r-6s	1'-1	6.10	-	-
85	Molf11r-6e	1'-1	-	2.15	0.16
85	Molf11r-7s	1'-1	2.43	-	-
85	Molf11r-7e	1'-1	-	1.40	0.16
85	Molf11r-8s	1'-1	2.62	-	-
85	Molf11r-8e	1'-1	-	1.91	0.16
85	Molf11r-9	1'-1	2.81	-	-
85	Molf11r-9e	1'-1	-	1.76	0.16
85	Molf11r-10	1'-1	2.81	-	-
85	Molf11r-10e	1'-1	-	1.76	0.16
85	Molf22-1c	2-2'	2.17	-	-
85	Molf22-1ce	2-2'	-	1.29	0.16
85	Molf22-1	2-2'	8.48	-	-
85	Molf22-1e	2-2'	-	1.71	0.16
85	Molf22-2	2-2'	7.97	-	-
85	Molf22-2e	2-2'	-	2.02	0.16
85	Molf22-3	2-2'	7.62	-	-
85	Molf22-3e	2-2'	-	2.15	0.16
85	Molf22-4s	2-2'	3.65	-	-
85	Molf22-4e	2-2'	-	1.41	0.16

85	Molf22-5s	2-2’	2.16	-	-
85	Molf22-5e	2-2’	-	1.37	0.16
85	Molf22-6s	2-2’	2.06	-	-
85	Molf22-6e	2-2’	-	1.34	0.16
85	Molf22-7	2-2’	4.58	-	-
85	Molf22-7e	2-2’	-	4.67	0.16
85	Molf22r-1c	2’-2	5.71	-	-
85	Molf22r-1ce	2-2’	-	1.95	0.16
85	Molf22r-1	2’-2	>10	-	-
85	Molf22r- 1e	2’-2	-	2.90	0.16
85	Molf22r-2	2’-2	>10	-	-
85	Molf22r-2e	2’-2	-	2.61	0.16
85	Molf22r-3	2’-2	>10	-	-
85	Molf22r-3e	2’-2	-	2.11	0.16
85	Molf22r-4s	2’-2	5.86	-	-
85	Molf22r-4e	2’-2	-	1.83	0.16
85	Molf22r-5s	2’-2	5.64	-	-
85	Molf22r-5e	2’-2	-	1.79	0.16
85	Molf22r-6s	2’-2	2.83	-	-
85	Molf22r-6e	2’-2	-	1.66	0.16
85	Molf22r-7	2’-2	6.23	-	-
85	Molf22r-7e	2’-2	-	4.12	0.16
85	Molf33-1c	3-3’	2.38	-	-
85	Molf33-1ce	3-3’	-	1.44	0.16
85	Molf33-1	3-3’	>10	-	-
85	Molf33-1e	3-3’	-	3.53	0.16
85	Molf33-2	3-3’	>10	-	-
85	Molf33-2e	3-3’	-	3.22	0.16
85	Molf33-3s	3-3’	2.71	-	-
85	Molf33-3e	3-3’	-	1.58	0.16
85	Molf33-4	3-3’	3.42	-	-
85	Molf33-4e	3-3’	-	2.08	0.16
85	Molf33r-1c	3’-3	1.95	-	-
85	Molf33r-1ce	3’-3	-	1.15	0.16
85	Molf33r-1	3’-3	6.07	-	-
85	Molf33r-1e	3’-3	-	1.56	0.16
85	Molf33r-2s	3’-3	5.95	-	-
85	Molf33r-2e	3’-3	-	1.54	0.16
85	Molf33r-3s	3’-3	1.80	-	-
85	Molf33r-3e	3’-3	-	1.06	0.16
85	Molf33r-4s	3’-3	1.87	-	-
85	Molf33r-4e	3’-3	-	1.10	0.16
85	Molf33r-5s	3’-3	2.83	-	-
85	Molf33r-5e	3’-3	-	1.57	0.16

MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-1cs.plt Run By: Username 5/2/2019 07:27AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



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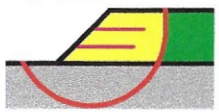
Factor Of Safety Is Calculated By Spencer`s Method of Slices

STED



MOLF - Slope Stability Section 1-1 Static

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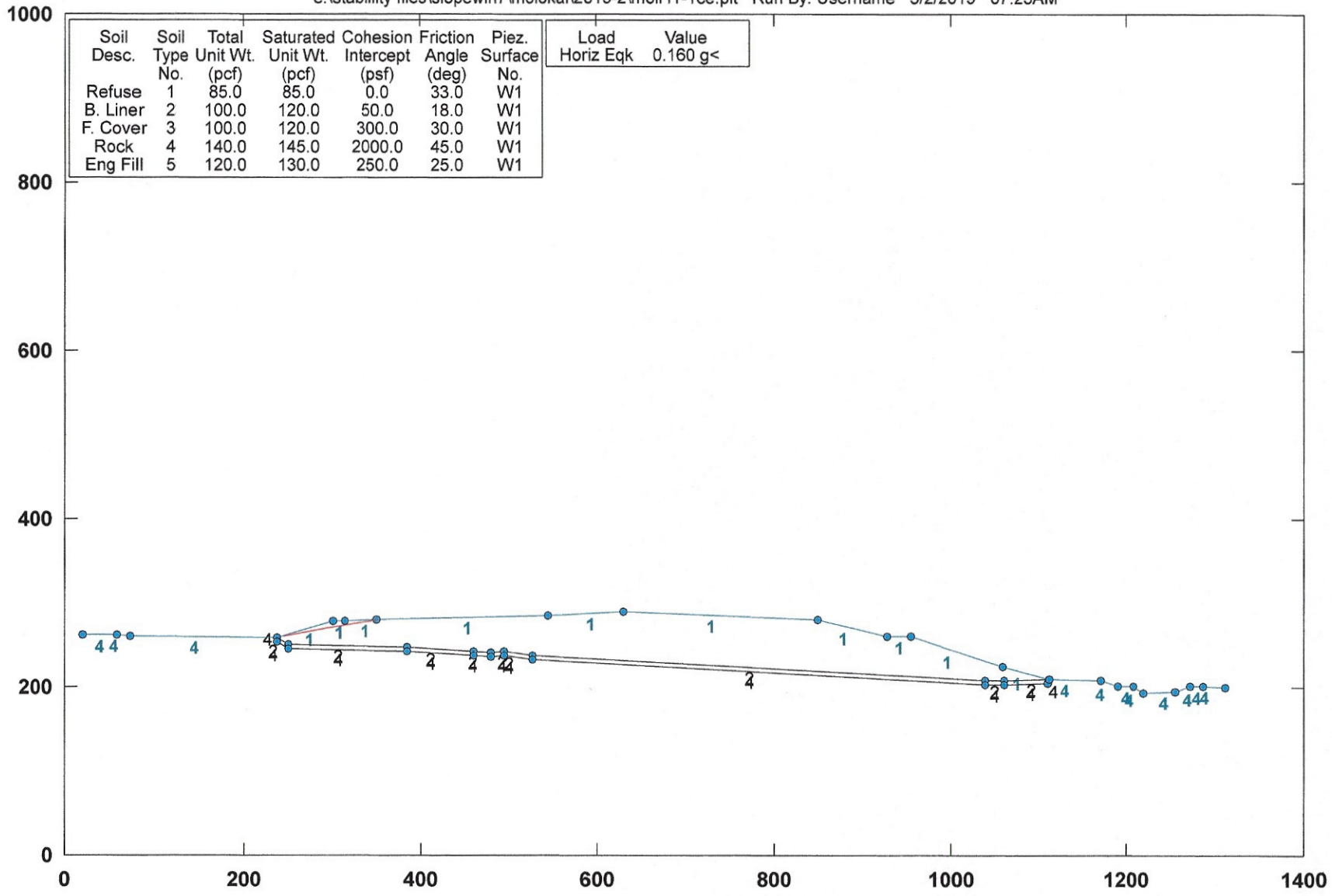
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

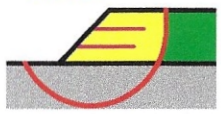
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=1.83

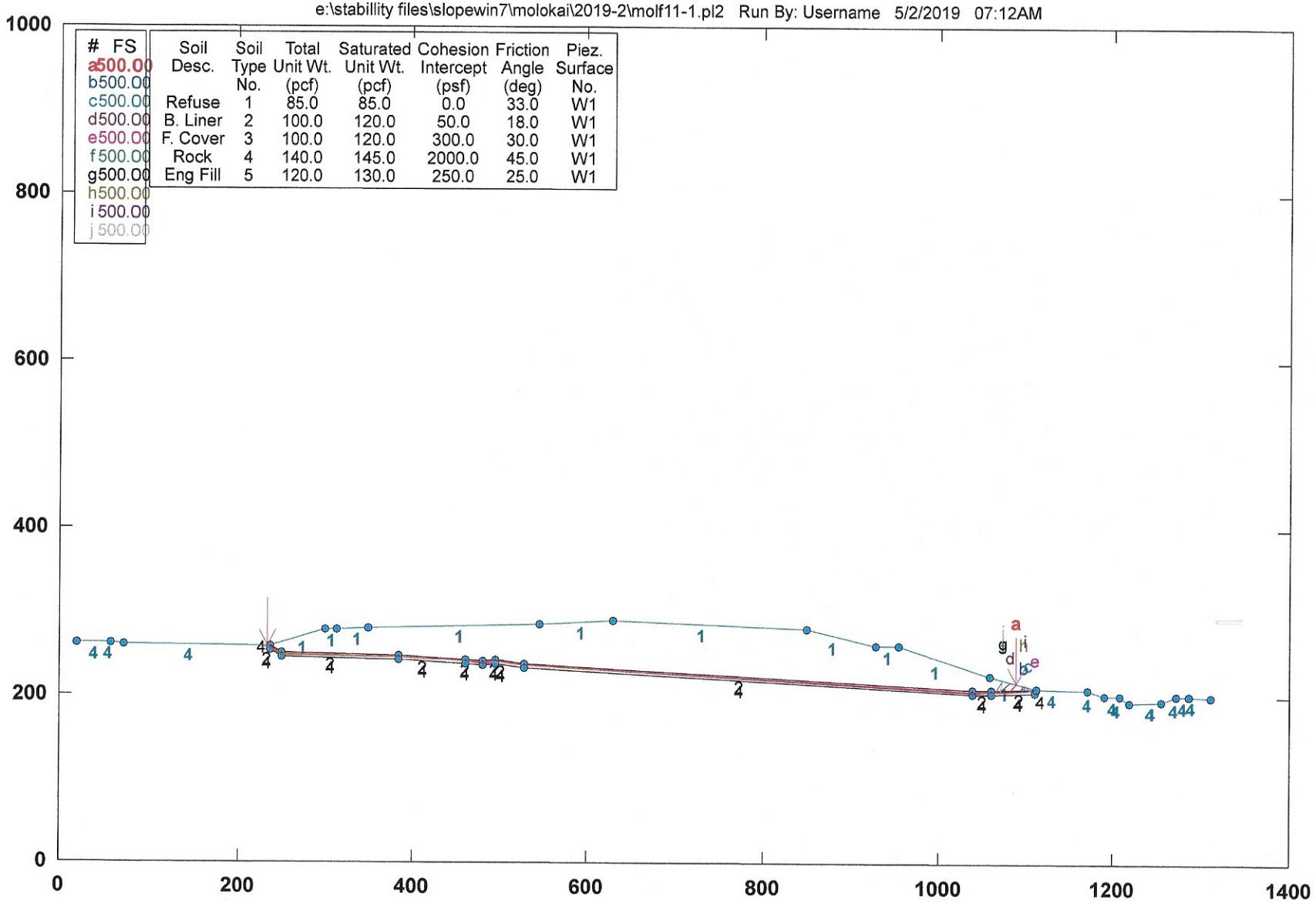
Factor Of Safety Is Calculated By The Modified Bishop Method

STED



MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-1.pl2 Run By: Username 5/2/2019 07:12AM

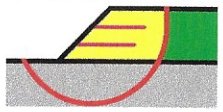


# FS	Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
a500.00							
b500.00							
c500.00	Refuse	1	85.0	85.0	0.0	33.0	W1
d500.00	B. Liner	2	100.0	120.0	50.0	18.0	W1
e500.00	F. Cover	3	100.0	120.0	300.0	30.0	W1
f500.00	Rock	4	140.0	145.0	2000.0	45.0	W1
g500.00	Eng Fill	5	120.0	130.0	250.0	25.0	W1
h500.00							
i500.00							
j500.00							

PCSTABL5M/si FSmin=500.00

Safety Factors Are Calculated By The Modified Janbu Method

STED

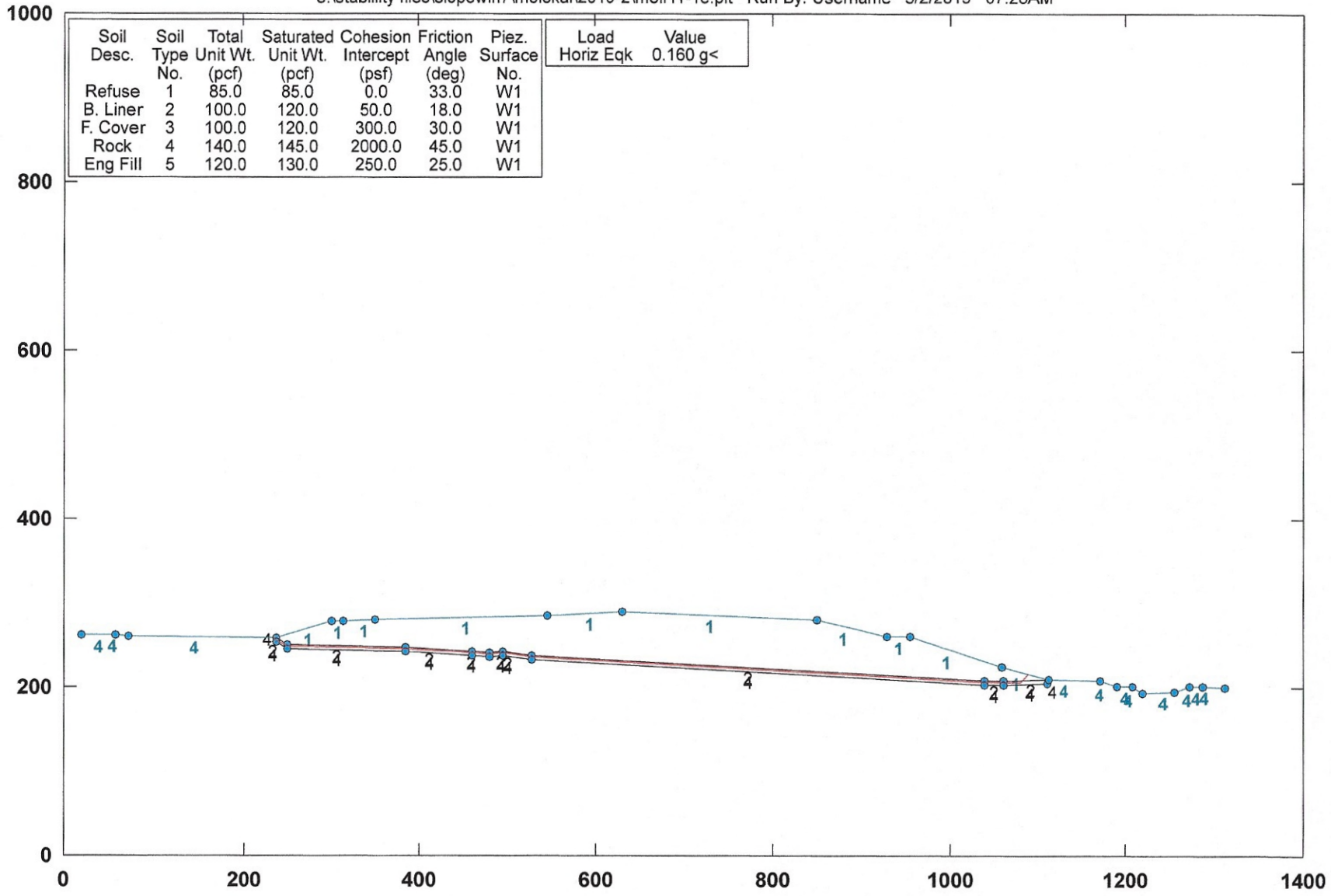


MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-1e.plt Run By: Username 5/2/2019 07:28AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

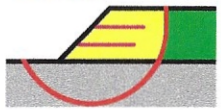
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=3.29

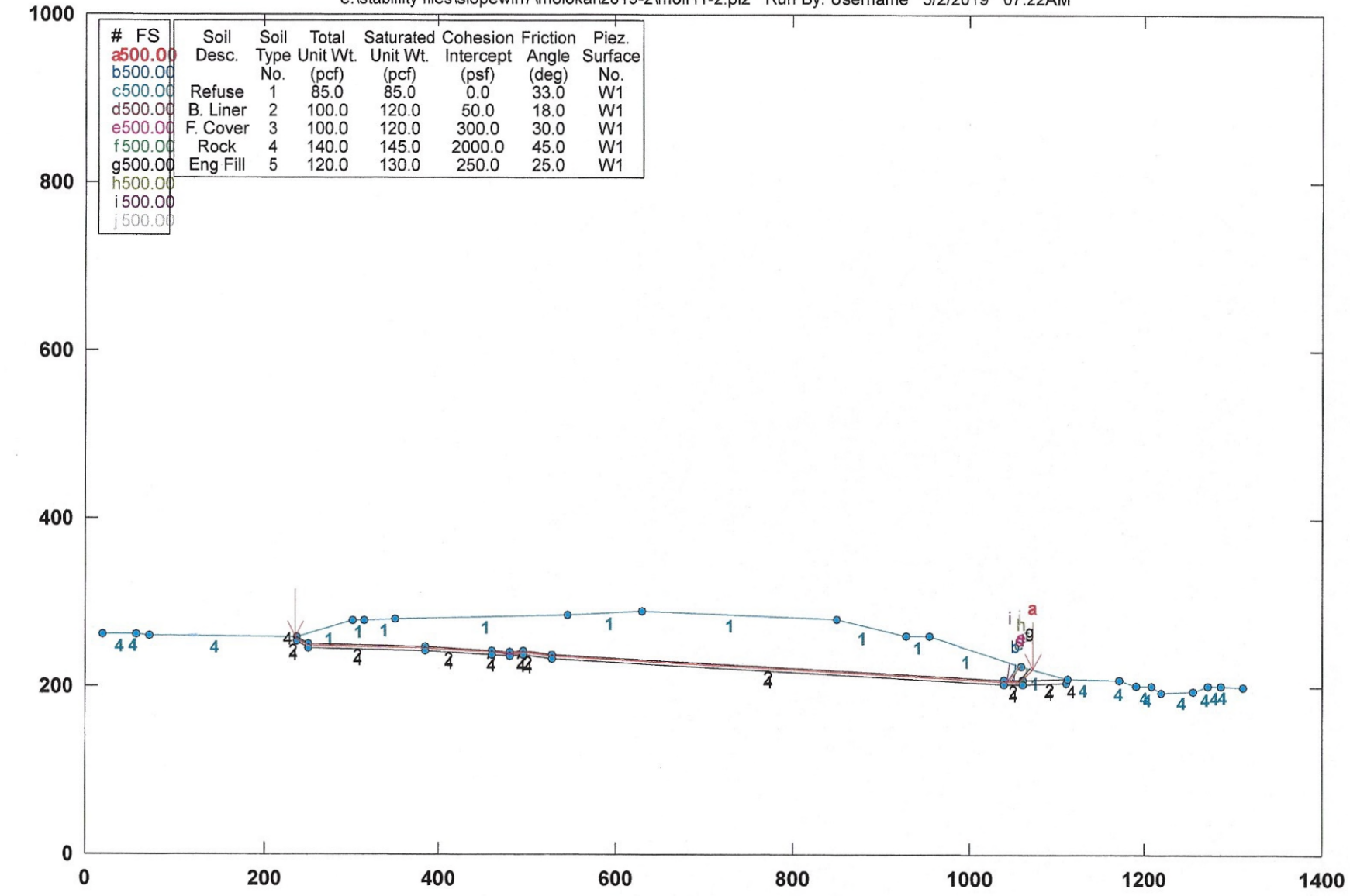
Factors of Safety Calculated by Janbu Method

STED



MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-2.pl2 Run By: Username 5/2/2019 07:22AM



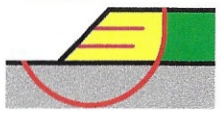
#	FS
a	500.00
b	500.00
c	500.00
d	500.00
e	500.00
f	500.00
g	500.00
h	500.00
i	500.00
j	500.00

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

PCSTABL5M/si FSmin=500.00

Safety Factors Are Calculated By The Modified Janbu Method

STED

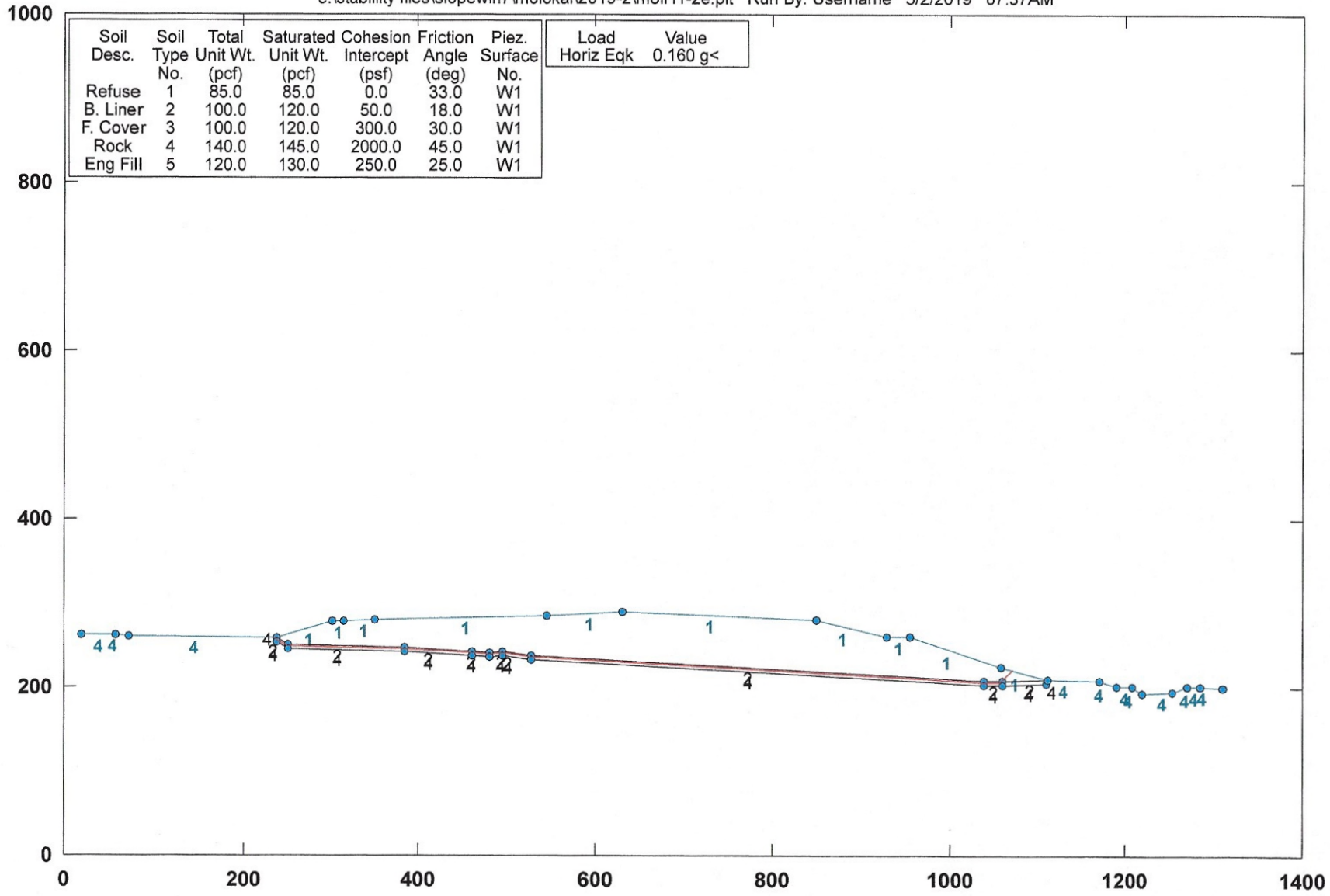


MOLF - Slope Stability Section 1-1 Pesudo-Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-2e.plt Run By: Username 5/2/2019 07:37AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

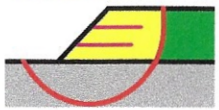
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=3.25

Factors of Safety Calculated by Janbu Method

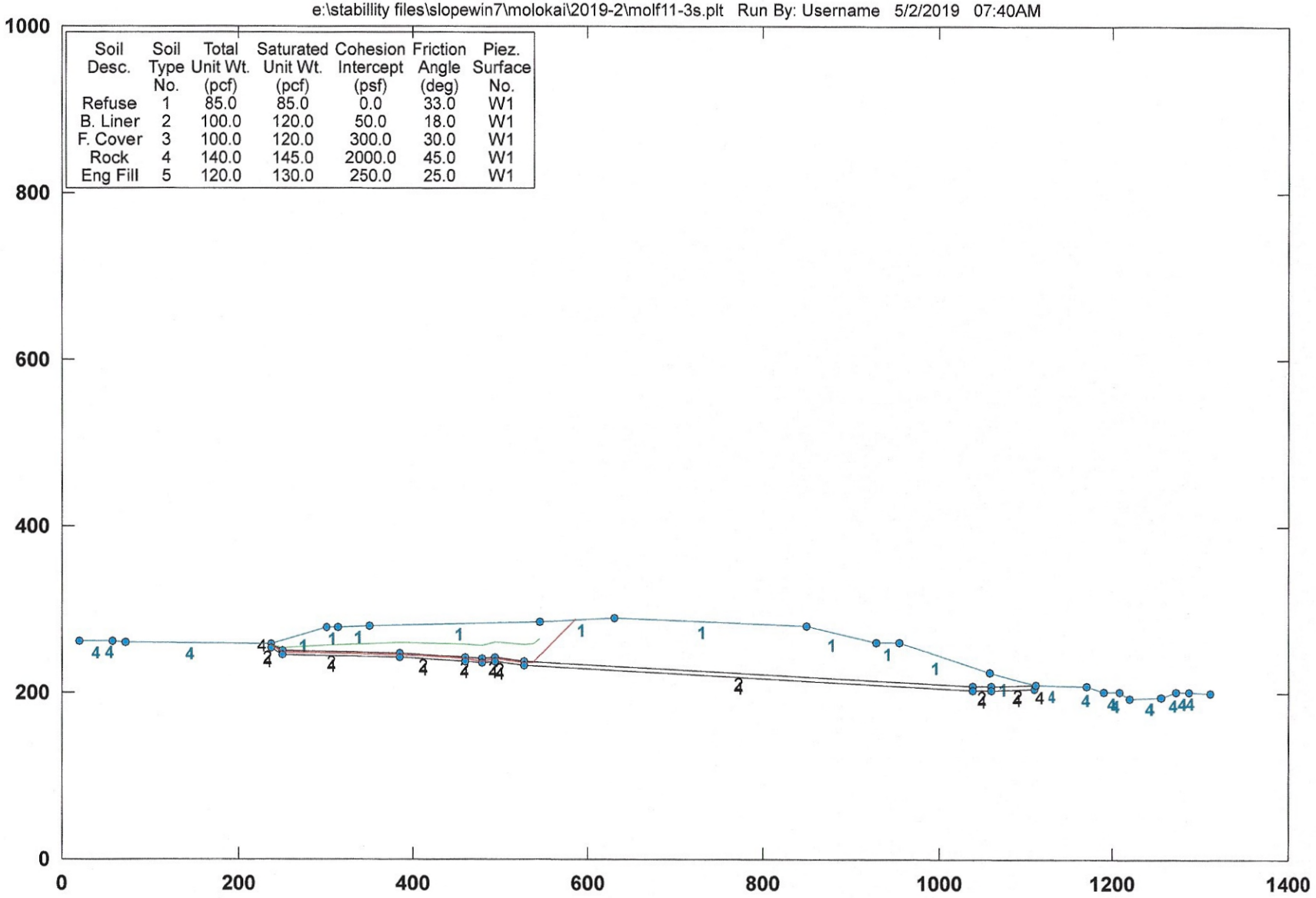
STED



MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-3s.plt Run By: Username 5/2/2019 07:40AM

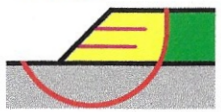
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=9.35

Factor Of Safety Is Calculated By Spencer`s Method of Slices

STED

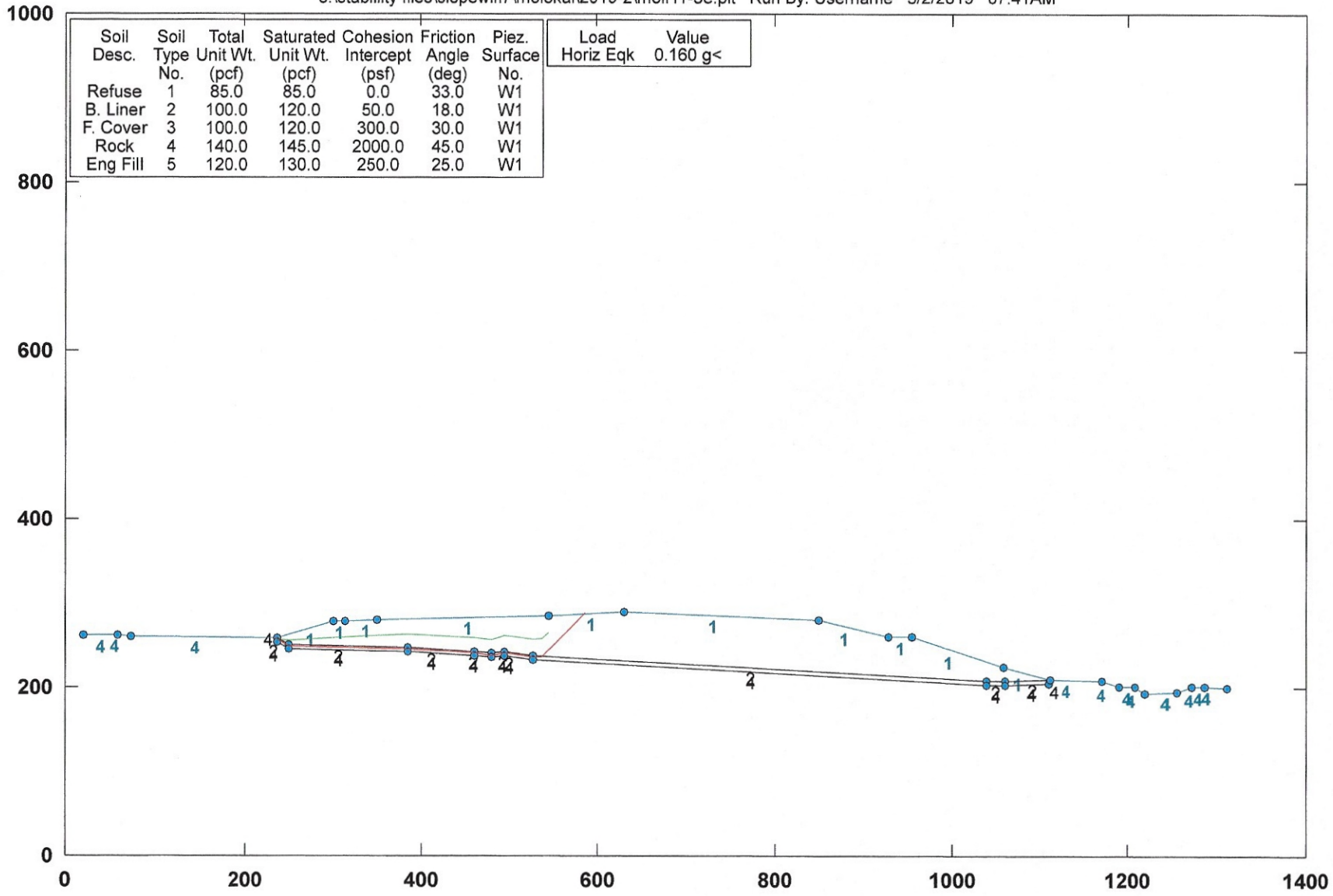


MOLF - Slope Stability Section 1-1 Pesudo-Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-3e.plt Run By: Username 5/2/2019 07:41AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

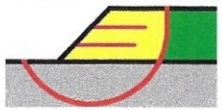
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=2.02

Factor Of Safety Is Calculated By Spencer`s Method of Slices

STED

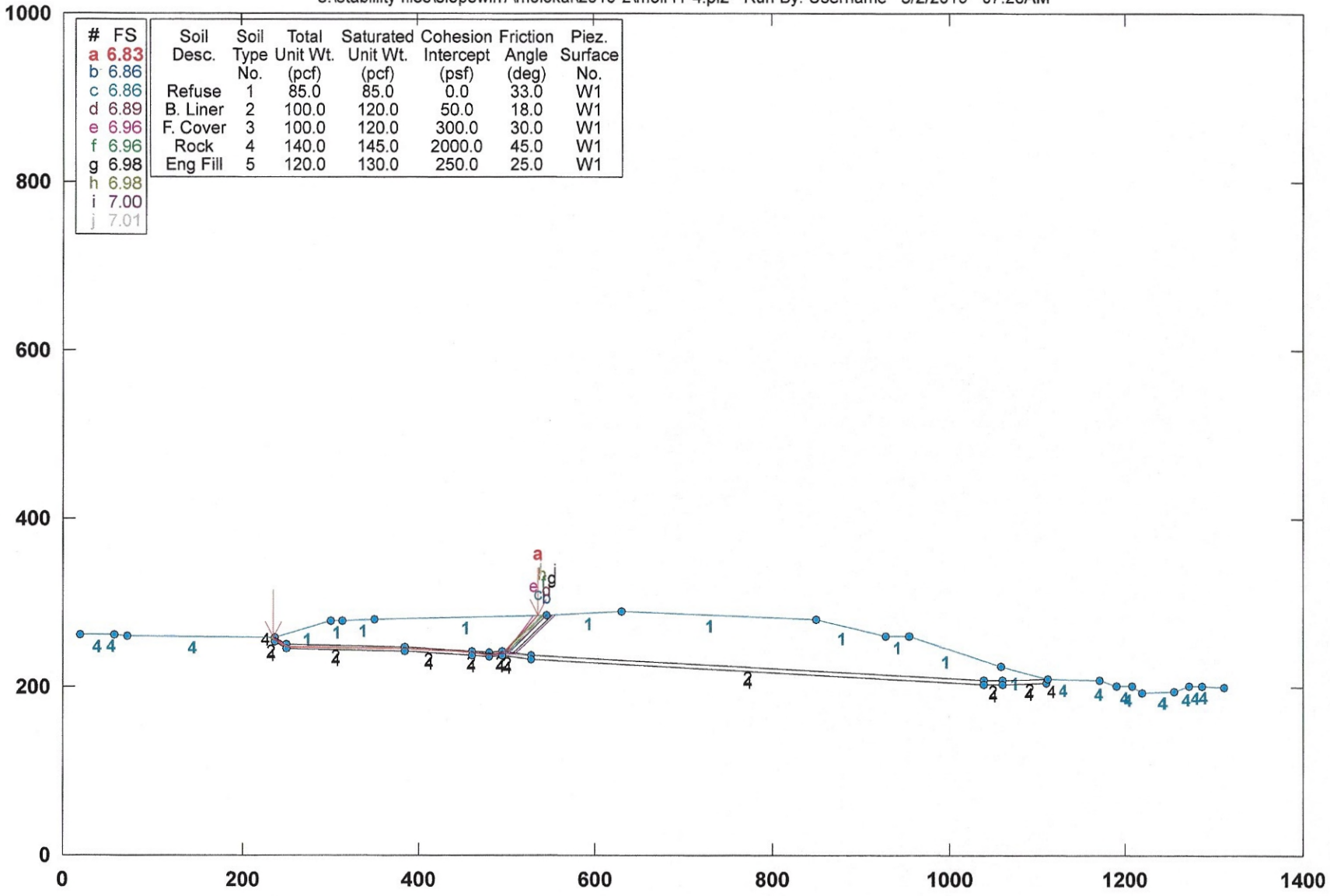


MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-4.pl2 Run By: Username 5/2/2019 07:20AM

#	FS
a	6.83
b	6.86
c	6.86
d	6.89
e	6.96
f	6.96
g	6.98
h	6.98
i	7.00
j	7.01

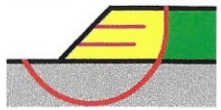
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=6.83

Safety Factors Are Calculated By The Modified Janbu Method

STED

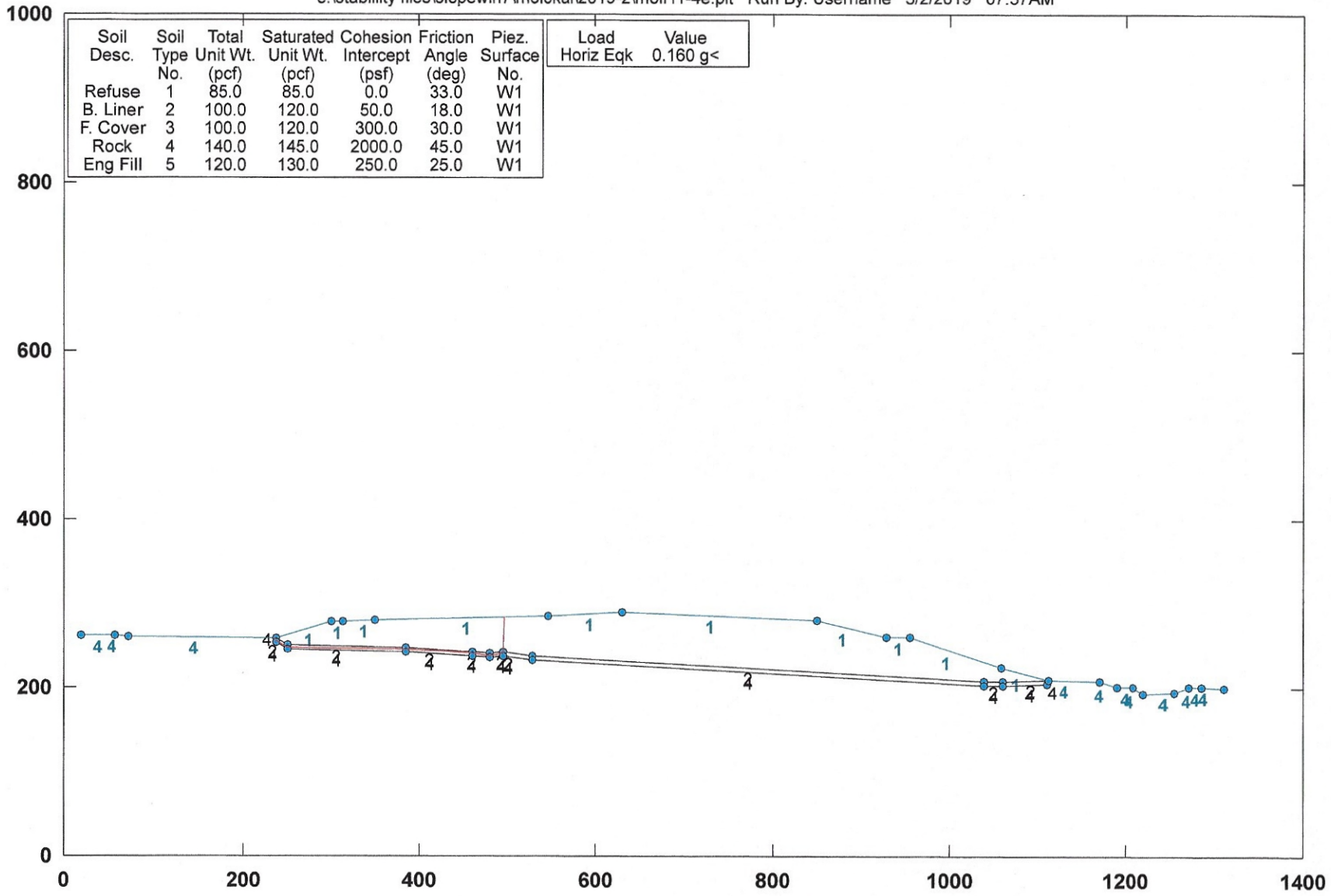


MOLF - Slope Stability Section 1-1 Pesudo-Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-4e.plt Run By: Username 5/2/2019 07:57AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

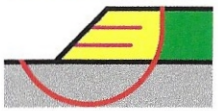
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=2.77

Factors of Safety Calculated by Janbu Method

STED

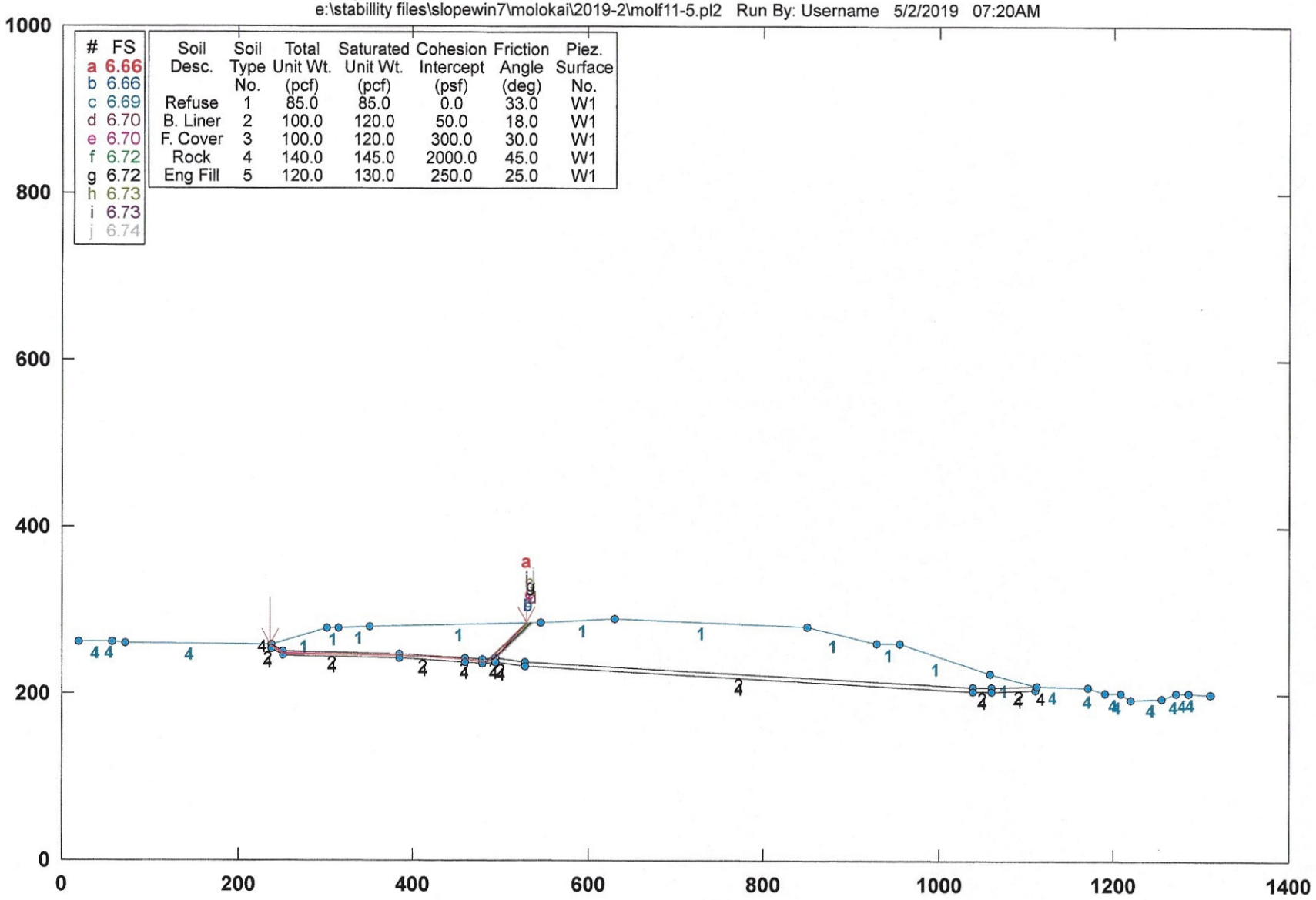


MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-5.pl2 Run By: Username 5/2/2019 07:20AM

#	FS
a	6.66
b	6.66
c	6.69
d	6.70
e	6.70
f	6.72
g	6.72
h	6.73
i	6.73
j	6.74

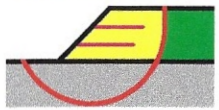
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=6.66

Safety Factors Are Calculated By The Modified Janbu Method

STED

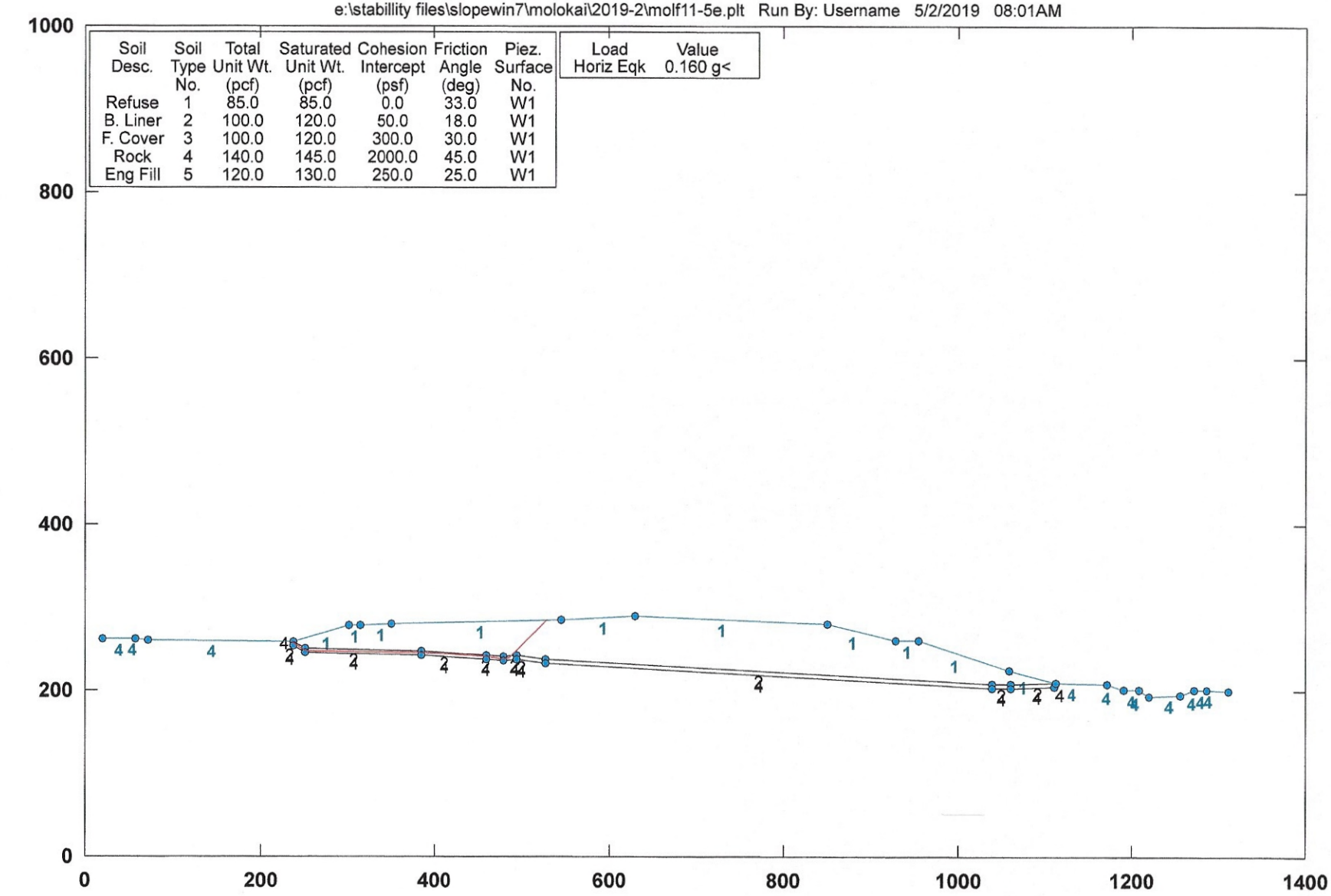


MOLF - Slope Stability Section 1-1 Pesudo-Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-5e.plt Run By: Username 5/2/2019 08:01AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

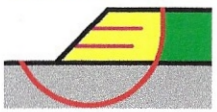
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=2.18

Factor Of Safety Is Calculated By The Modified Bishop Method

STED

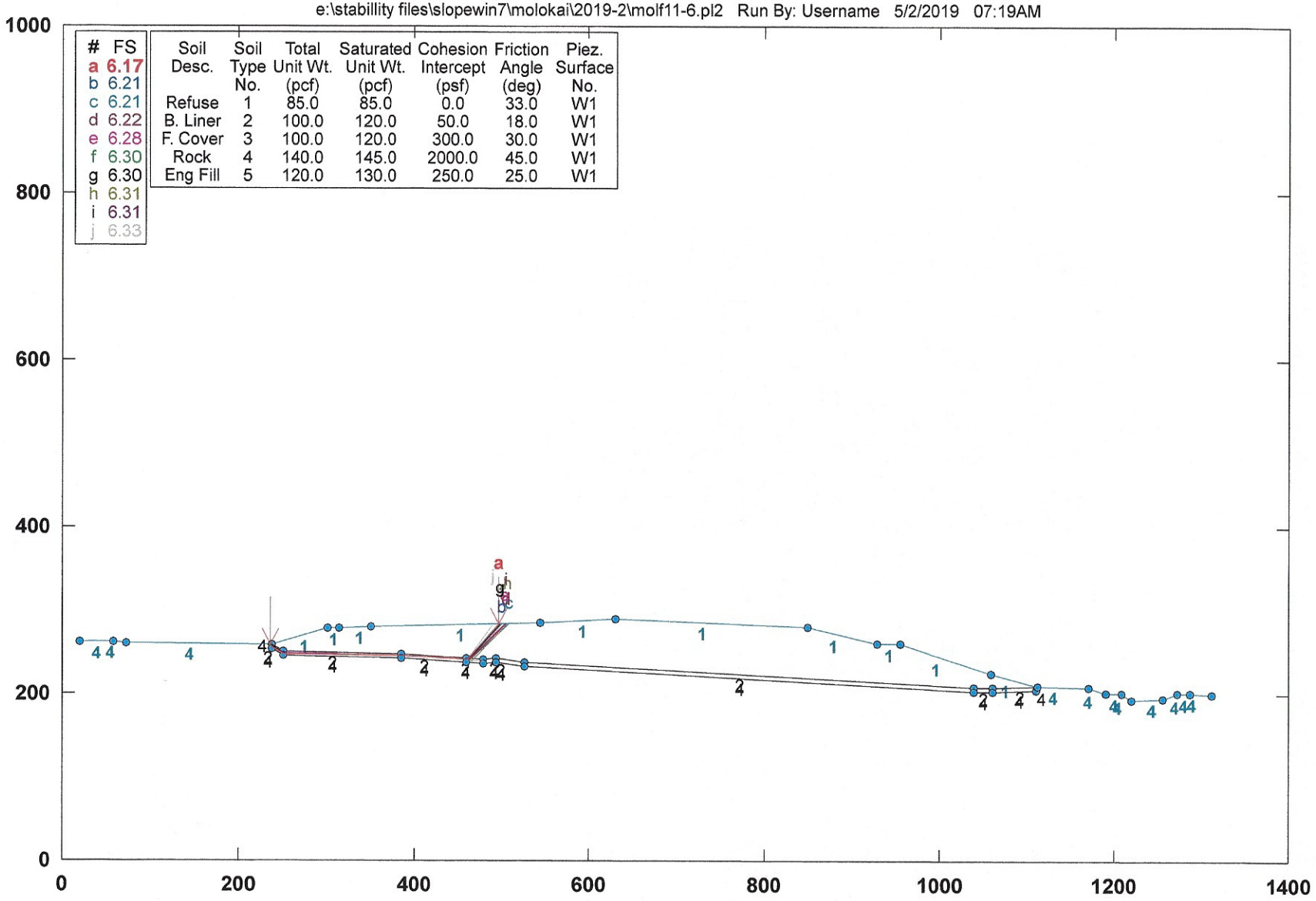


MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-6.pl2 Run By: Username 5/2/2019 07:19AM

#	FS
a	6.17
b	6.21
c	6.21
d	6.22
e	6.28
f	6.30
g	6.30
h	6.31
i	6.31
j	6.33

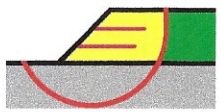
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=6.17

Safety Factors Are Calculated By The Modified Janbu Method

STED

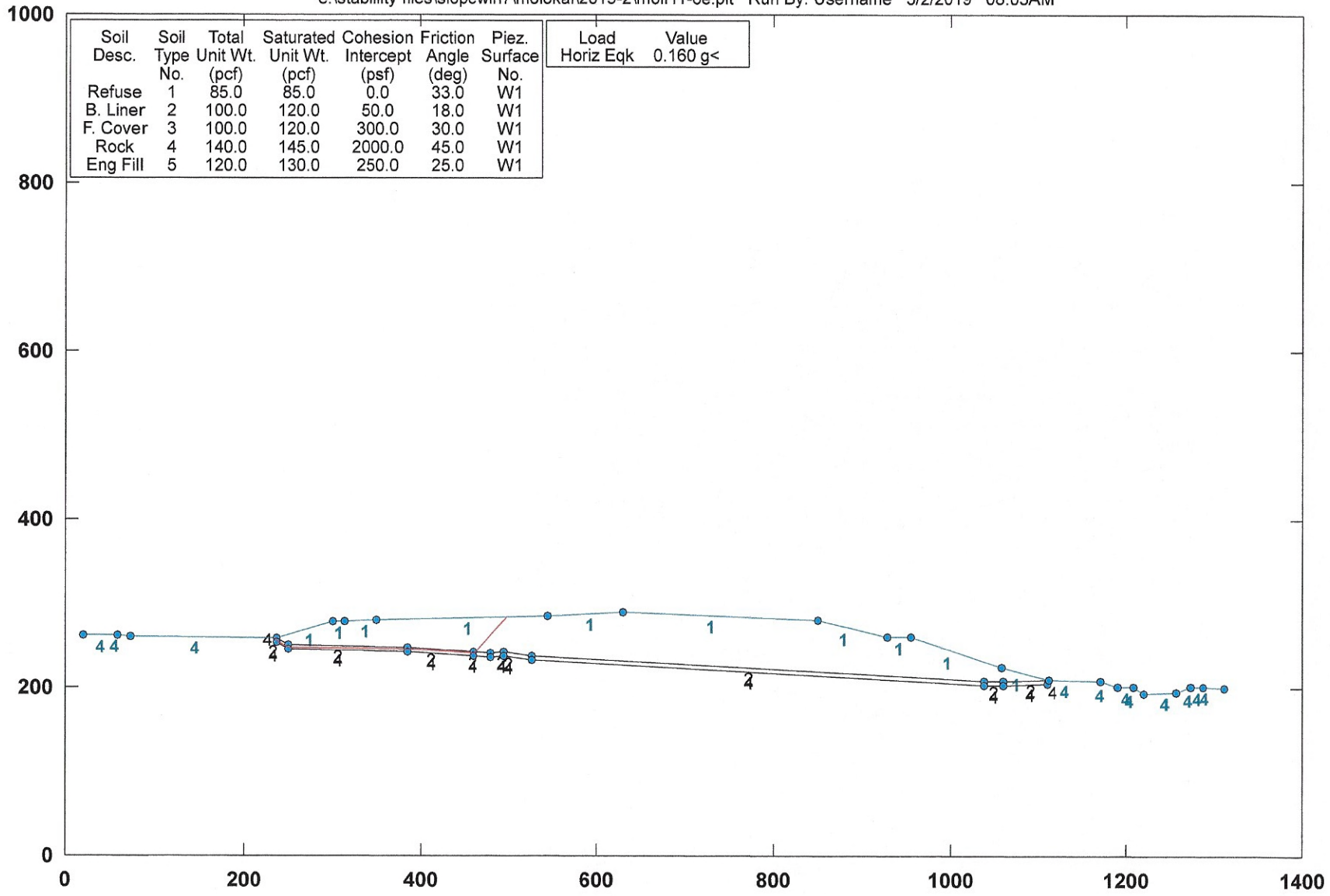


MOLF - Slope Stability Section 1-1 Pesudo-Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-6e.plt Run By: Username 5/2/2019 08:05AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

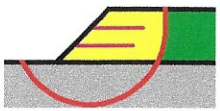
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=1.90

Factors of Safety Calculated by Janbu Method

STED

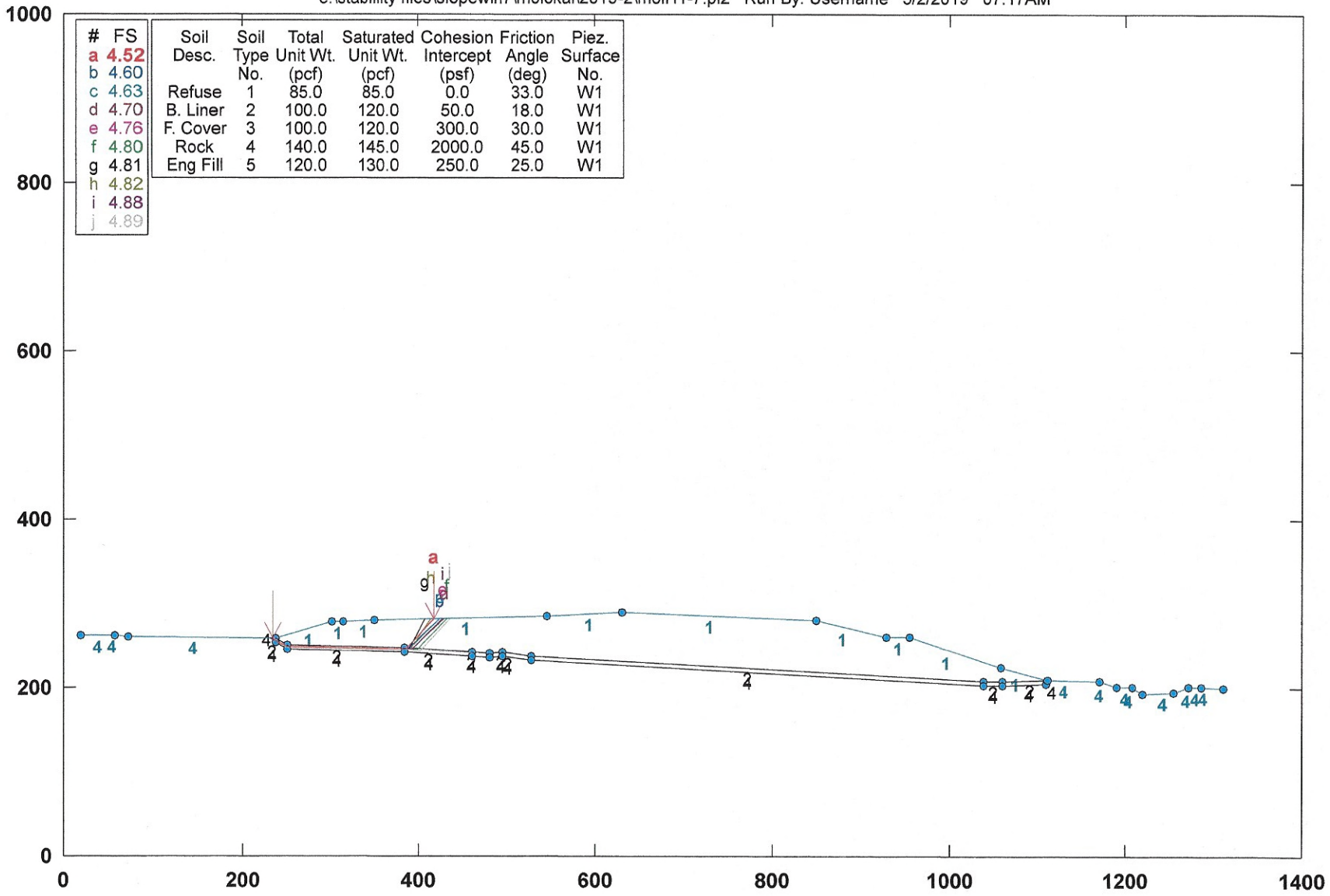


MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-7.pl2 Run By: Username 5/2/2019 07:17AM

#	FS
a	4.52
b	4.60
c	4.63
d	4.70
e	4.76
f	4.80
g	4.81
h	4.82
i	4.88
j	4.89

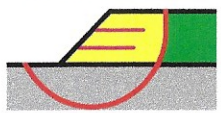
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=4.52

Safety Factors Are Calculated By The Modified Janbu Method

STED

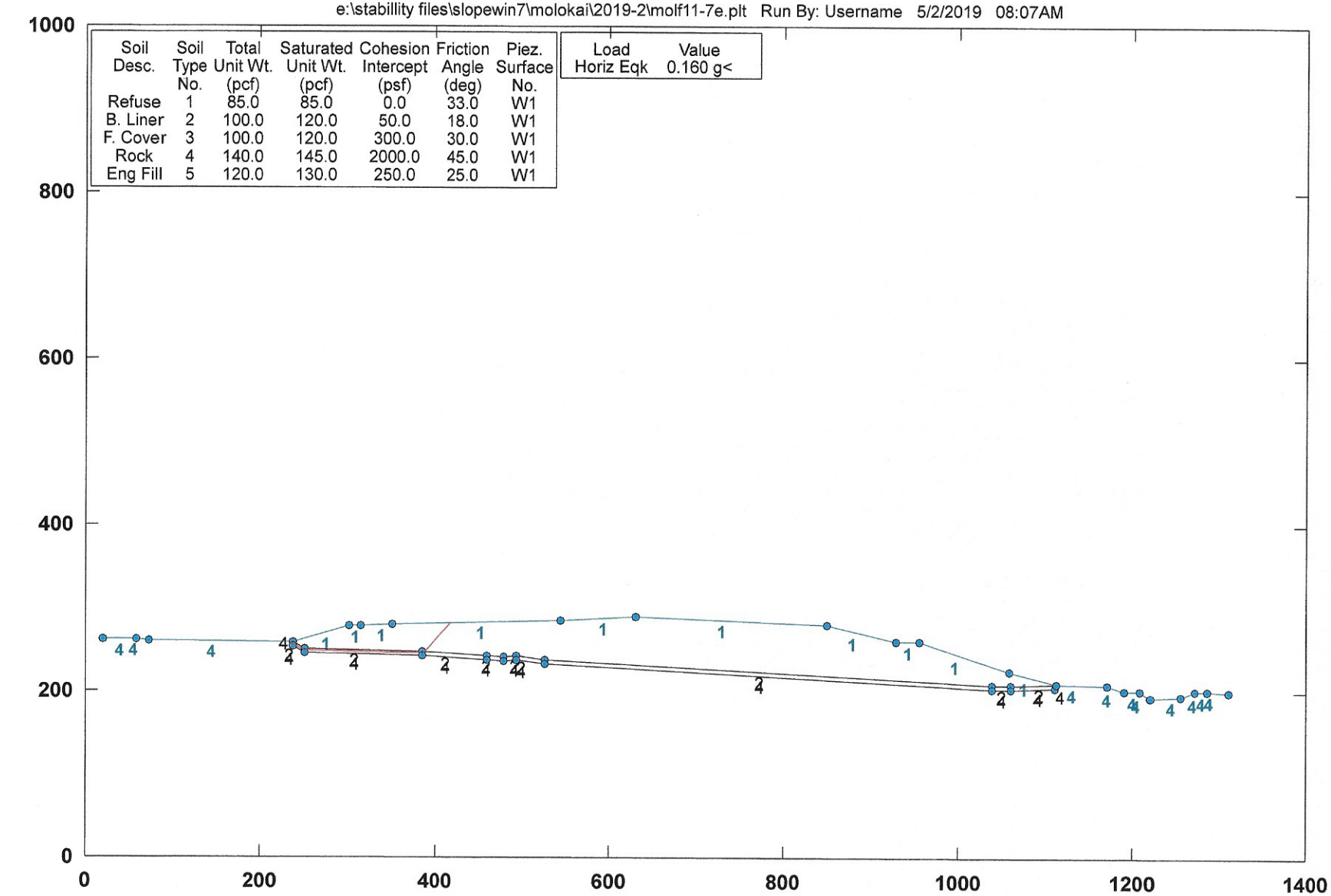


MOLF - Slope Stability Section 1-1 Pesudo-Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-7e.plt Run By: Username 5/2/2019 08:07AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

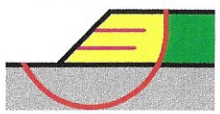
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=1.75

Factors of Safety Calculated by Janbu Method

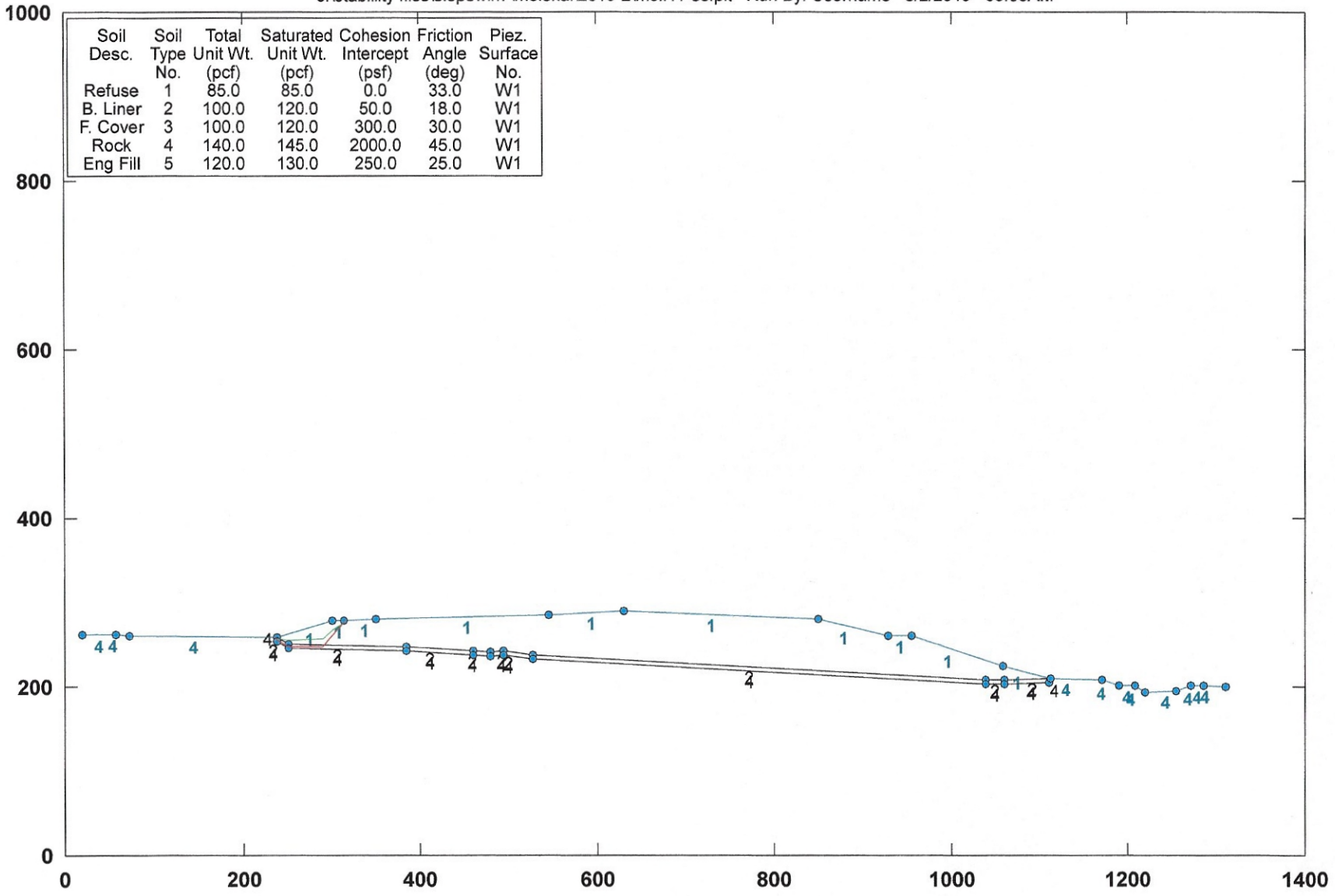
STED



MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-8s.plt Run By: Username 5/2/2019 08:08AM

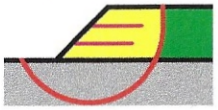
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=3.11

Factor Of Safety Is Calculated By Spencer`s Method of Slices

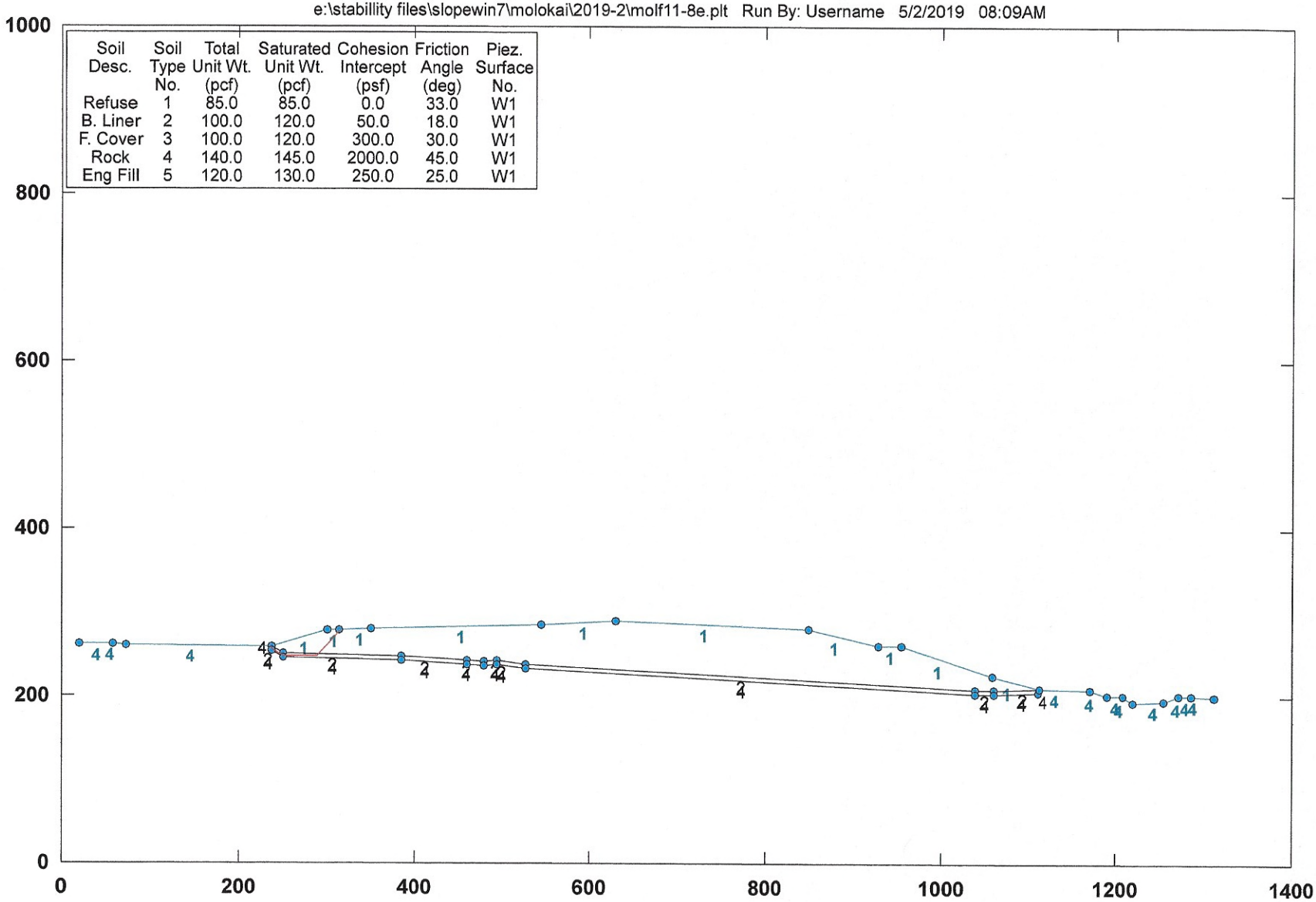
STED



MOLF - Slope Stability Section 1-1 Pesudo-Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-8e.plt Run By: Username 5/2/2019 08:09AM

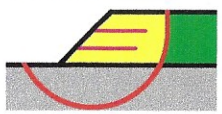
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=2.55

Factors of Safety Calculated by Janbu Method

STED

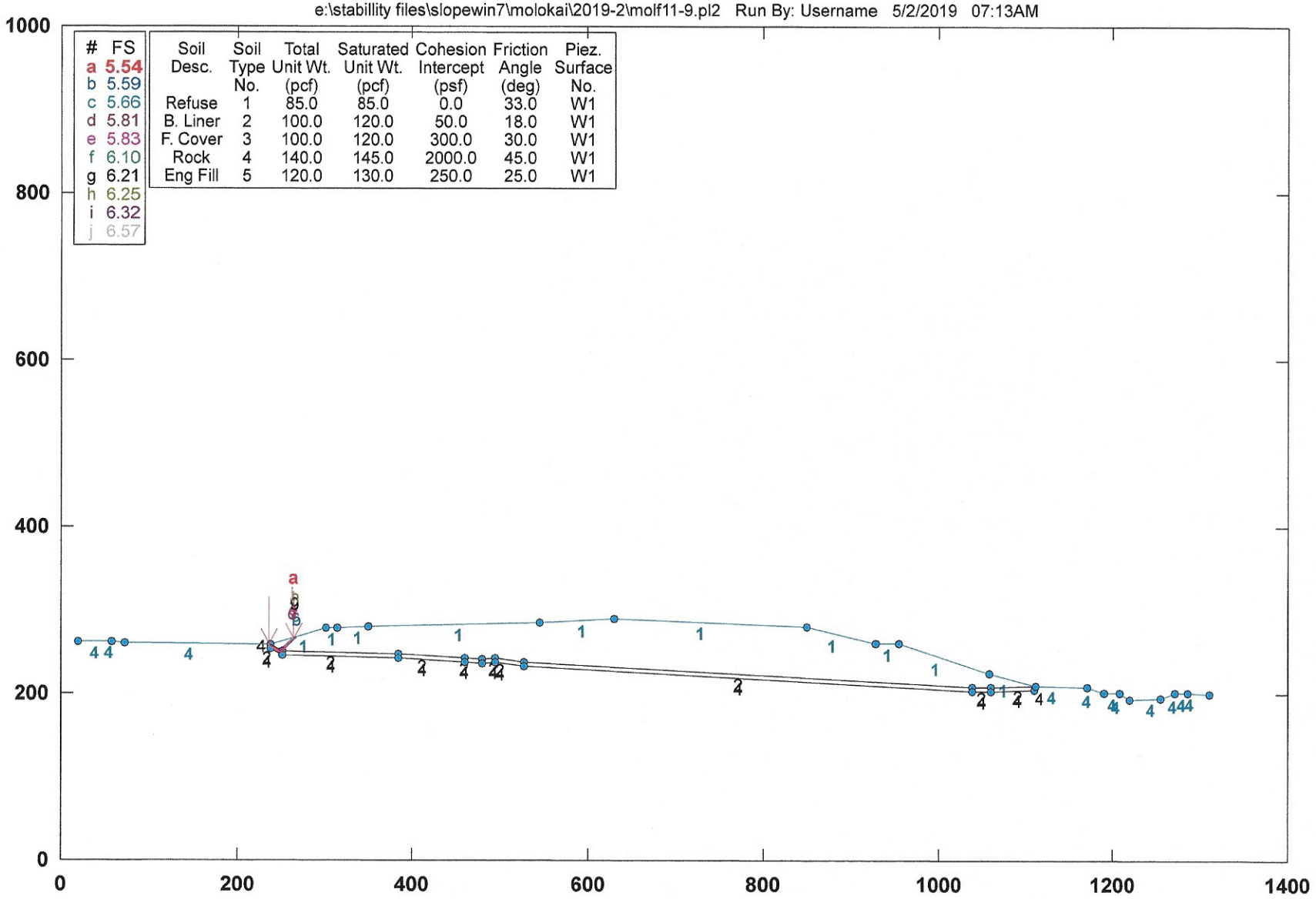


MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-9.pl2 Run By: Username 5/2/2019 07:13AM

#	FS
a	5.54
b	5.59
c	5.66
d	5.81
e	5.83
f	6.10
g	6.21
h	6.25
i	6.32
j	6.57

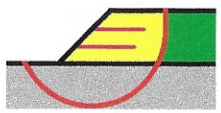
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=5.54

Safety Factors Are Calculated By The Modified Janbu Method

STED

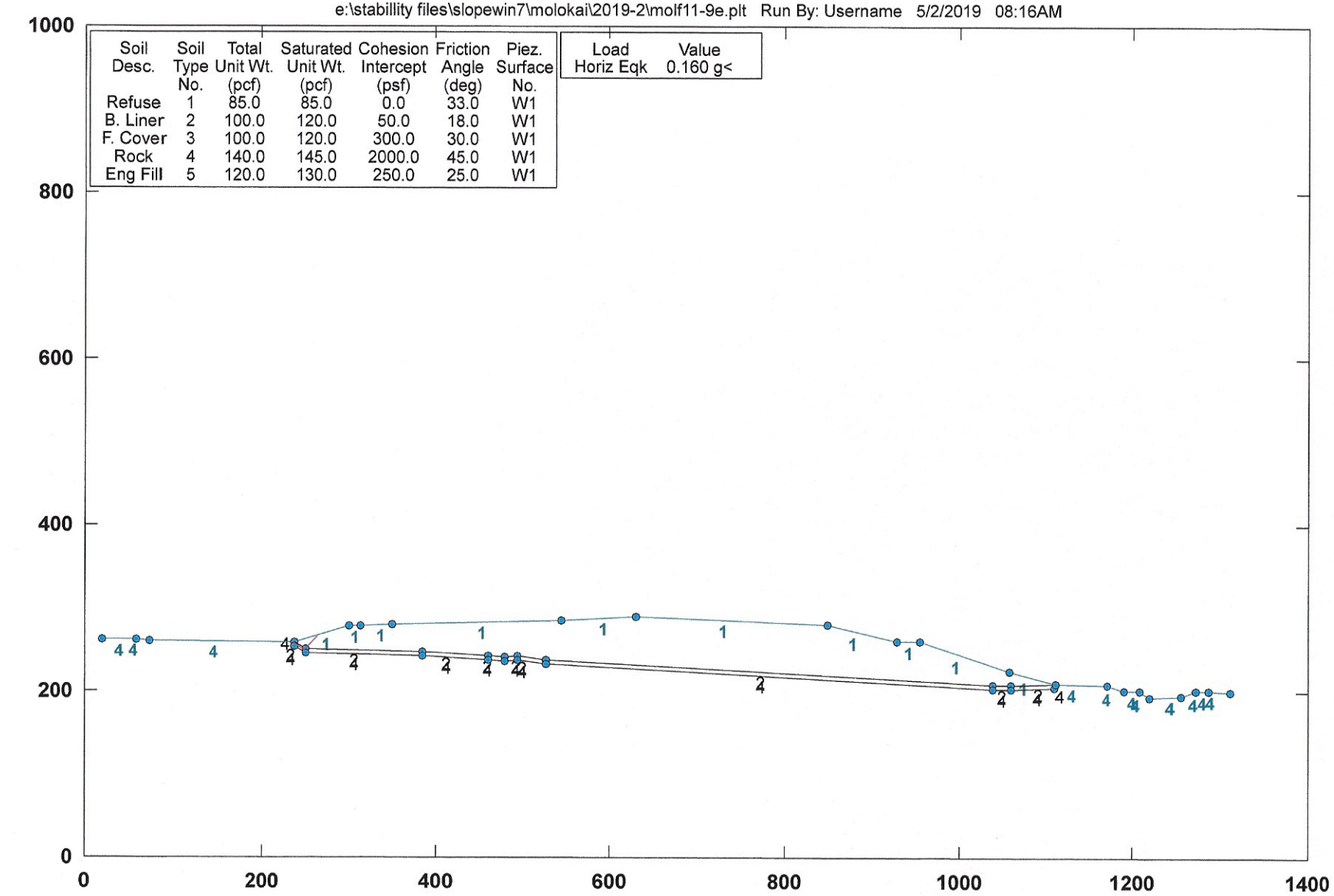


MOLF - Slope Stability Section 1-1 Pesudo-Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11-9e.plt Run By: Username 5/2/2019 08:16AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

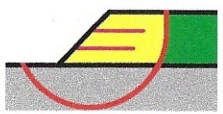
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=3.60

Factors of Safety Calculated by Janbu Method

STED

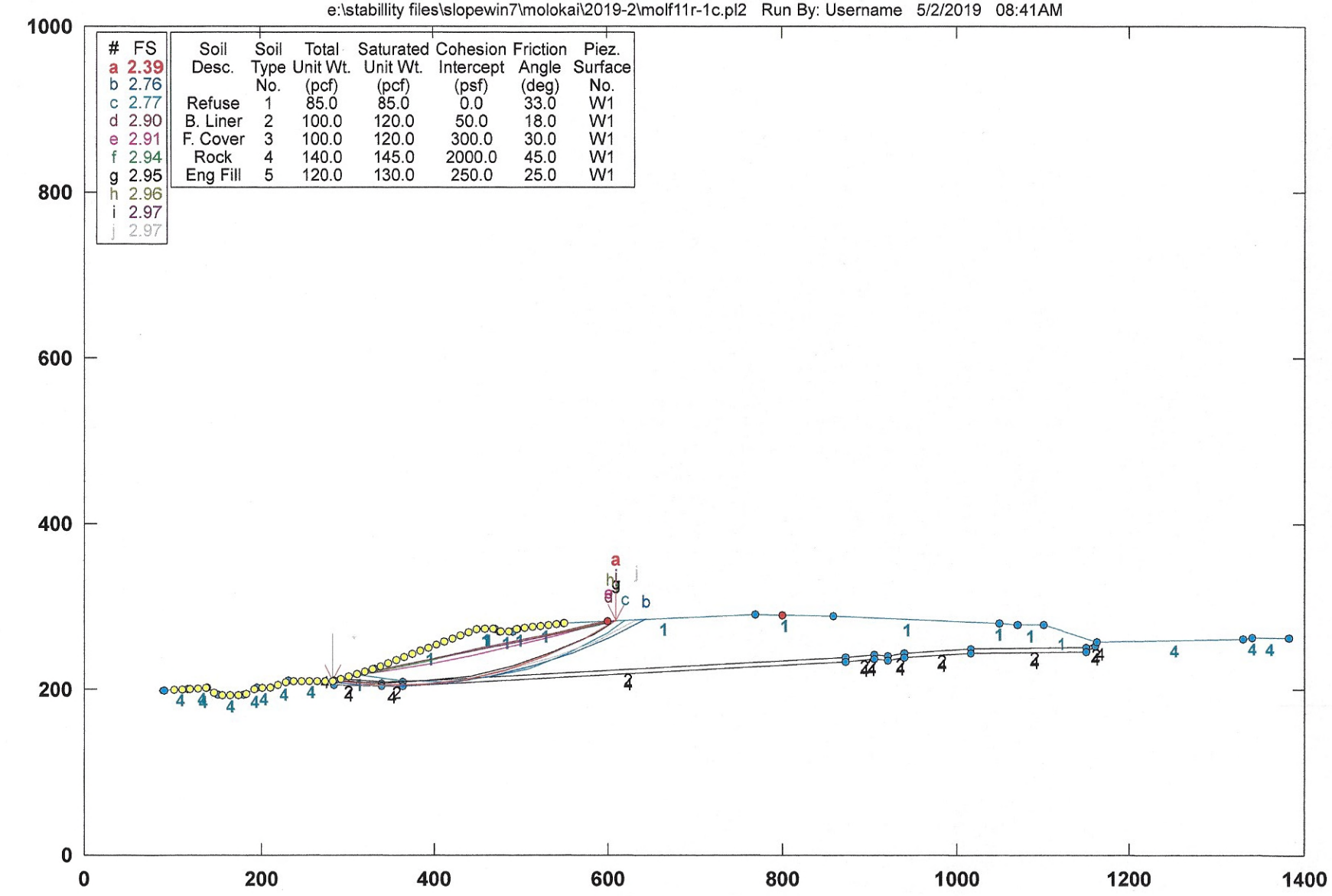


MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11r-1c.pl2 Run By: Username 5/2/2019 08:41AM

#	FS
a	2.39
b	2.76
c	2.77
d	2.90
e	2.91
f	2.94
g	2.95
h	2.96
i	2.97
j	2.97

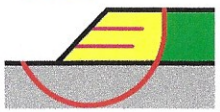
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=2.39

Safety Factors Are Calculated By The Modified Bishop Method

STED

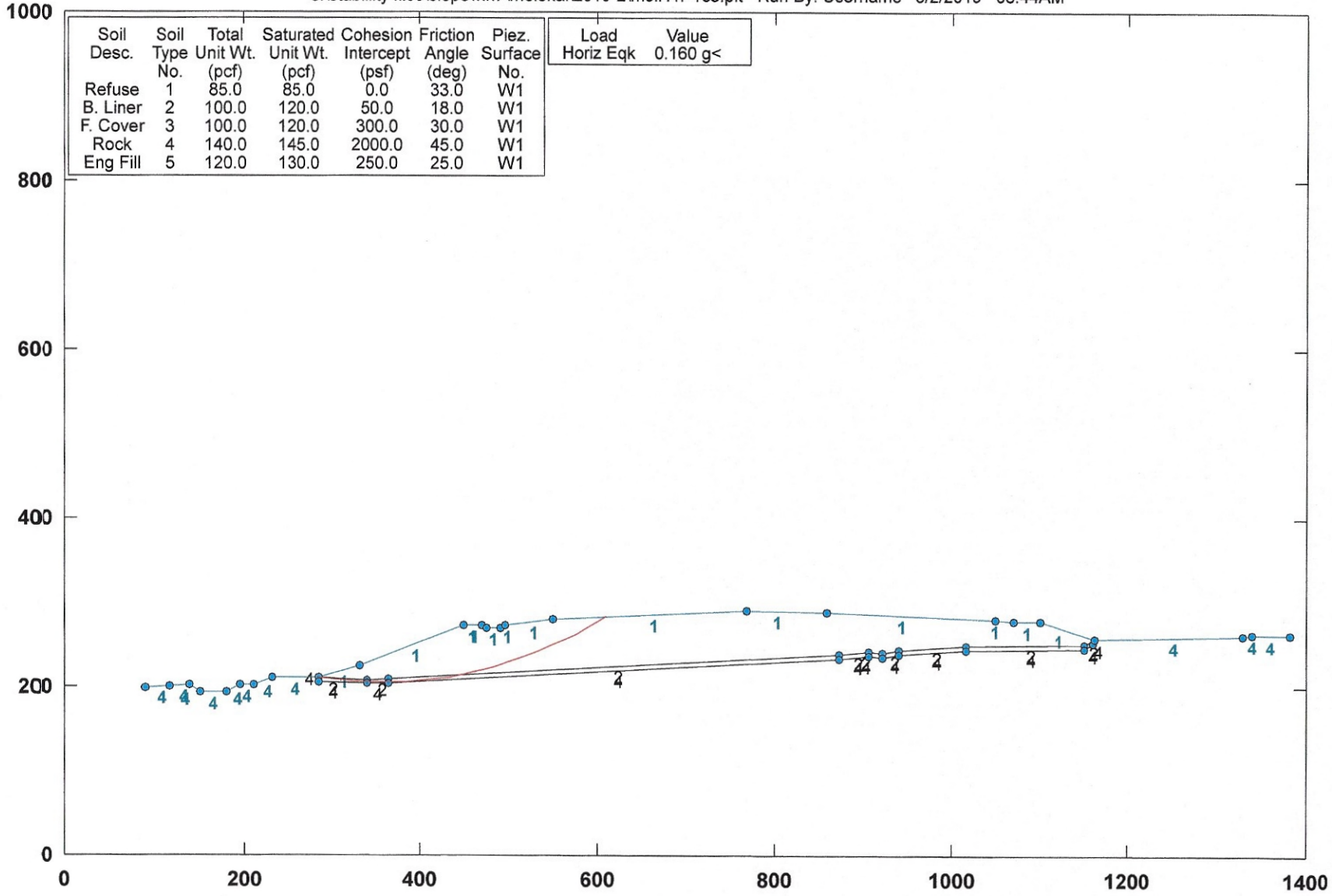


MOLF - Slope Stability Section 1-1 Pesudo-Static

e:\stabillity files\slopewin7\molokai\2019-2\molf11r-1ce.plt Run By: Username 5/2/2019 08:44AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

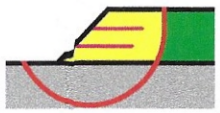
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=1.35

Factor Of Safety Is Calculated By The Modified Bishop Method

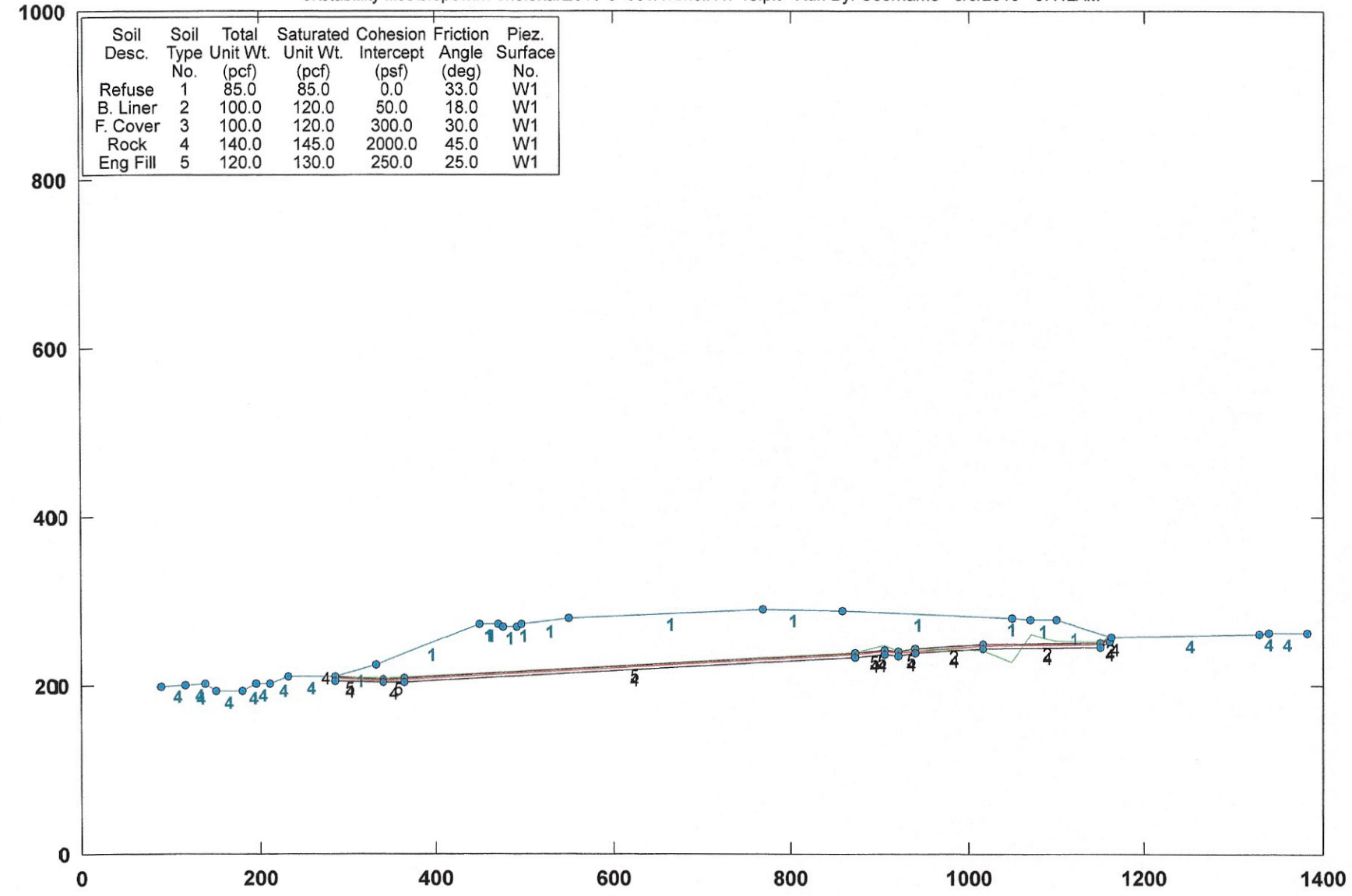
STED



MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-3 85\11r\molf11r-1s.plt Run By: Username 5/6/2019 07:12AM

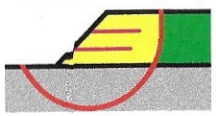
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=8.95

Factor Of Safety Is Calculated By Spencer`s Method of Slices

STED

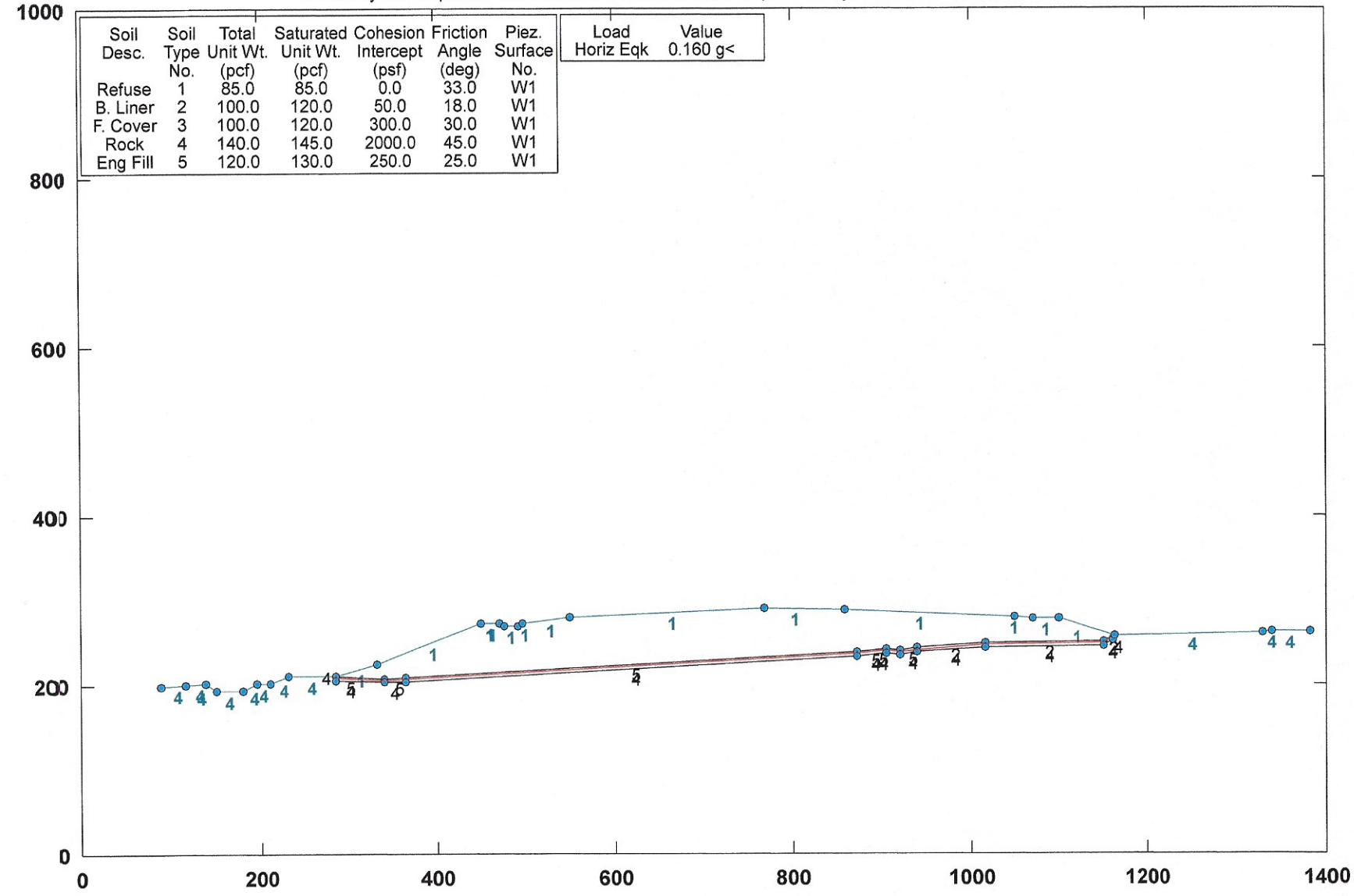


MOLF - Slope Stability Section 1-1 Pseudo-Static

e:\stabillity files\slopewin7\molokai\2019-3 85\11r\molf11r-1e.plt Run By: Username 5/6/2019 07:10AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

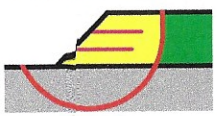
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=2.29

Factors of Safety Calculated by Janbu Method

STED

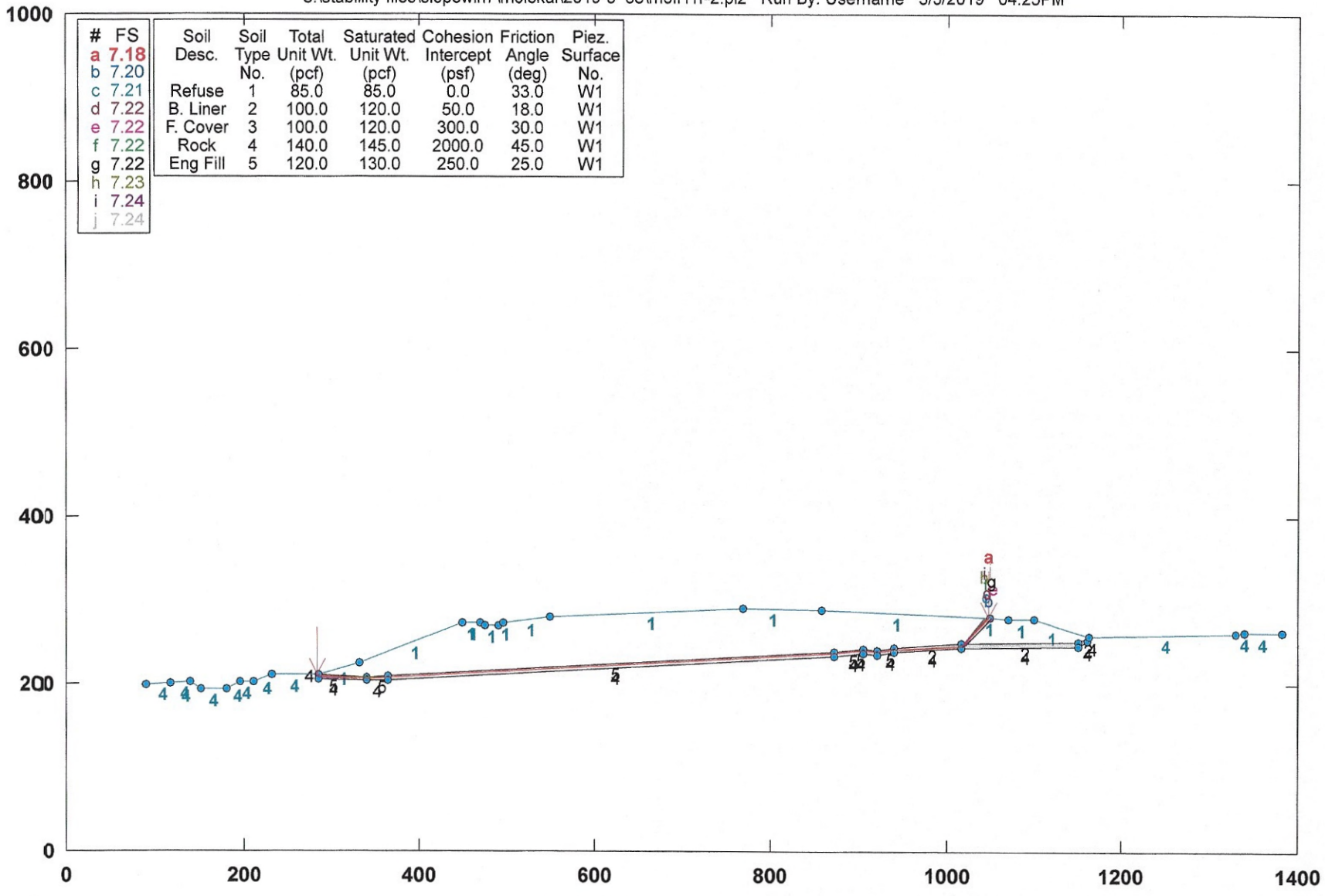


MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-3 85\molf11r-2.pl2 Run By: Username 5/3/2019 04:25PM

#	FS
a	7.18
b	7.20
c	7.21
d	7.22
e	7.22
f	7.22
g	7.22
h	7.23
i	7.24
j	7.24

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=7.18

Safety Factors Are Calculated By The Modified Janbu Method

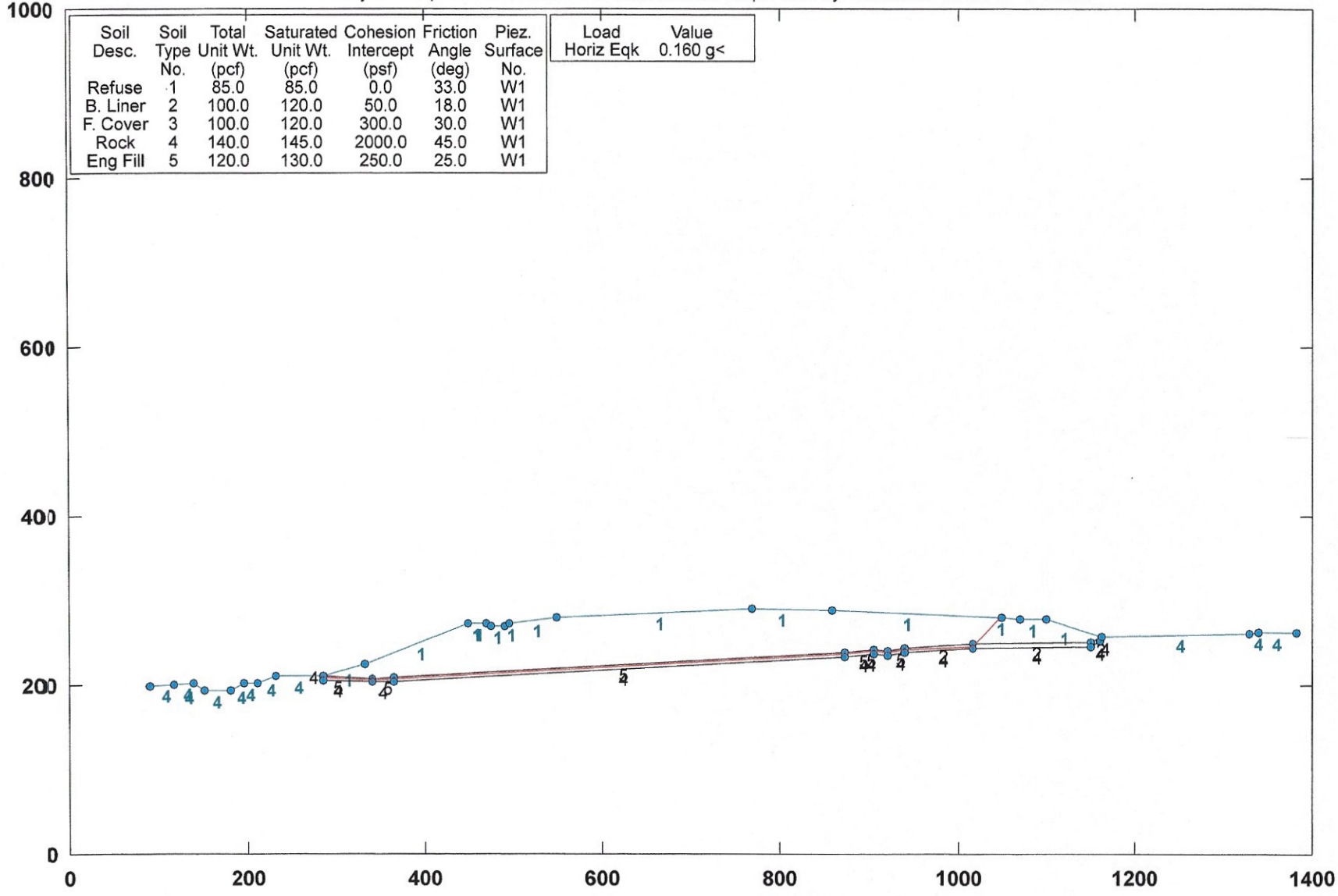
STED

MOLF - Slope Stability Section 1-1 Pseudo-Static

e:\stabillity files\slopewin7\molokai\2019-3 85\11r\molf11r-2e.plt Run By: Username 5/6/2019 07:17AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

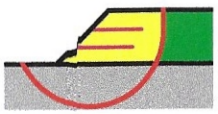
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=2.22

Factors of Safety Calculated by Janbu Method

STED

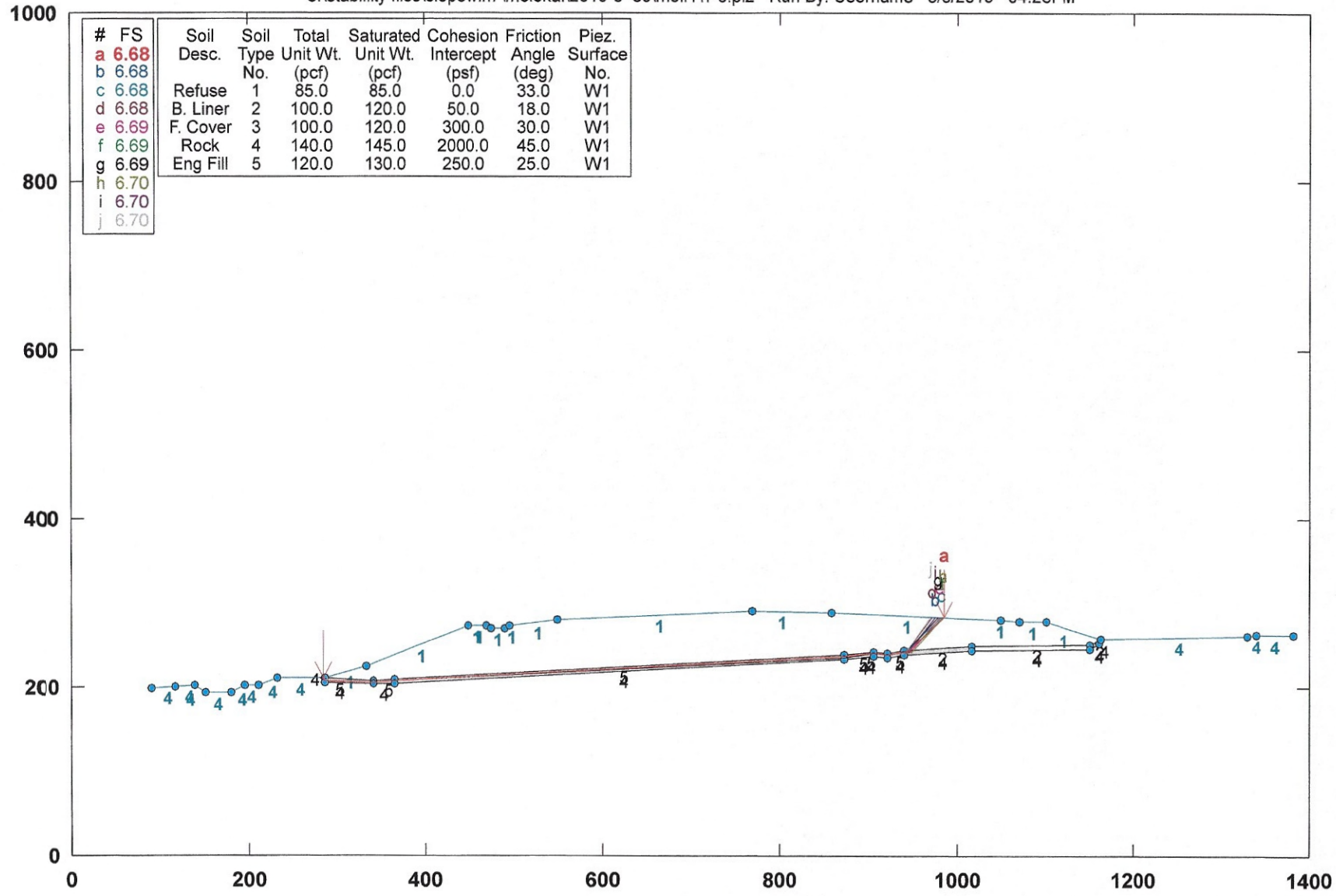


MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-3 85\molf11r-3.pl2 Run By: Username 5/3/2019 04:26PM

#	FS
a	6.68
b	6.68
c	6.68
d	6.68
e	6.69
f	6.69
g	6.69
h	6.70
i	6.70
j	6.70

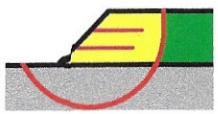
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=6.68

Safety Factors Are Calculated By The Modified Janbu Method

STED

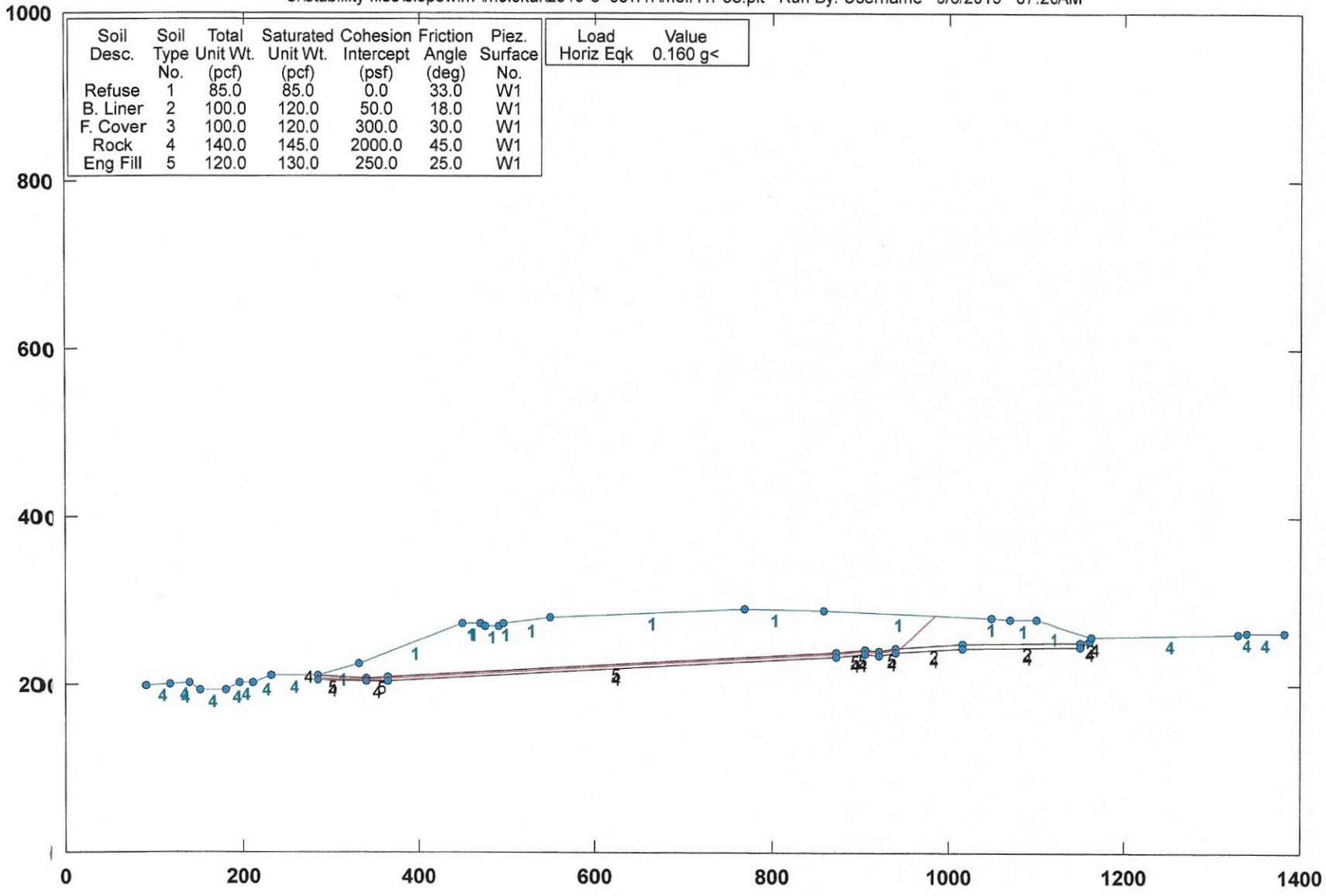


MOLF - Slope Stability Section 1-1 Pseudo-Static

e:\stabillity files\slopewin7\molokai\2019-3 85\11r\molf11r-3e.plt Run By: Username 5/6/2019 07:20AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

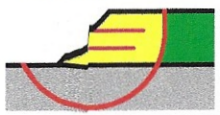
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=2.22

Factors of Safety Calculated by Janbu Method

STED

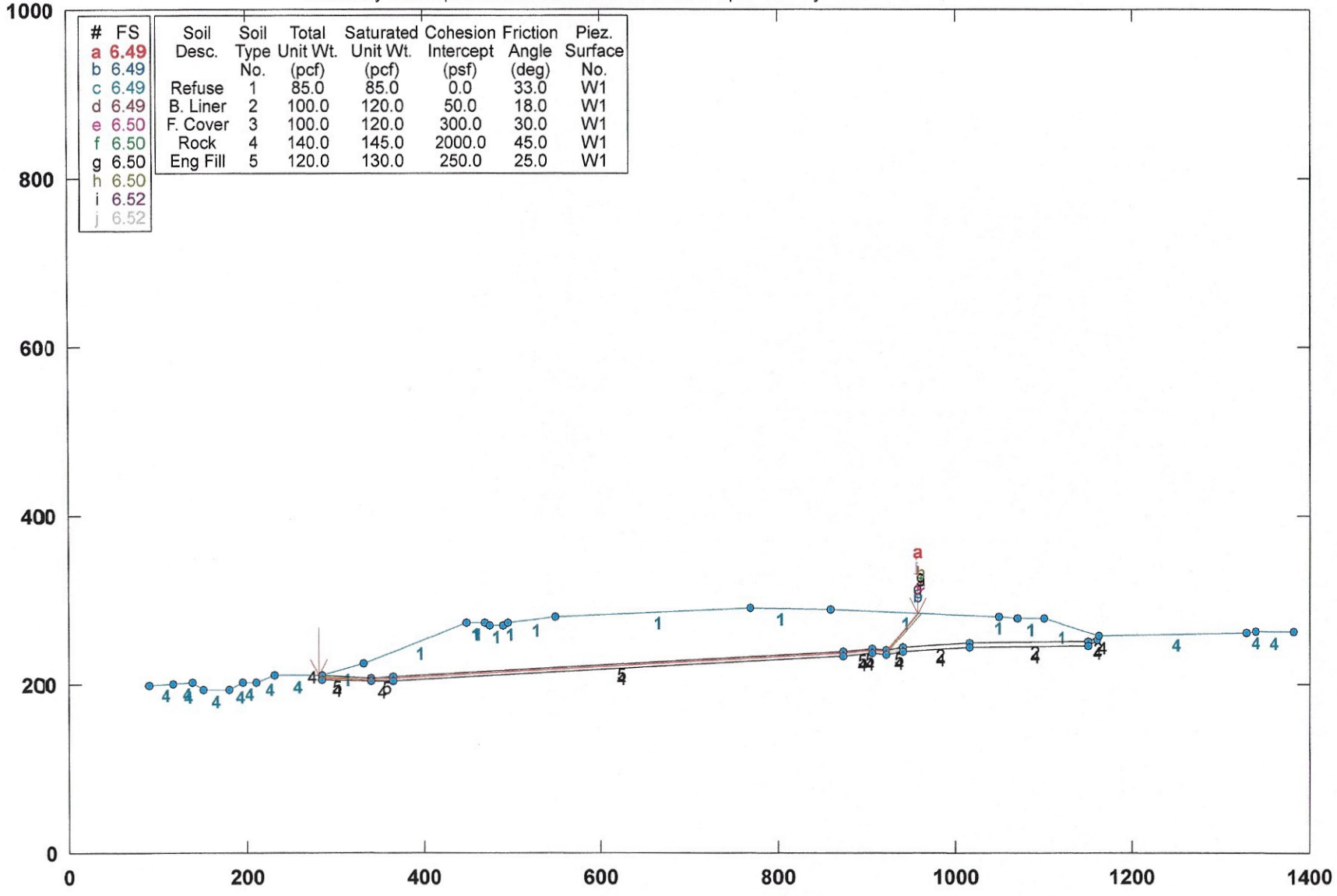


MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-3 85\molf11r-4.pl2 Run By: Username 5/3/2019 04:27PM

#	FS
a	6.49
b	6.49
c	6.49
d	6.49
e	6.50
f	6.50
g	6.50
h	6.50
i	6.52
j	6.52

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=6.49

Safety Factors Are Calculated By The Modified Janbu Method

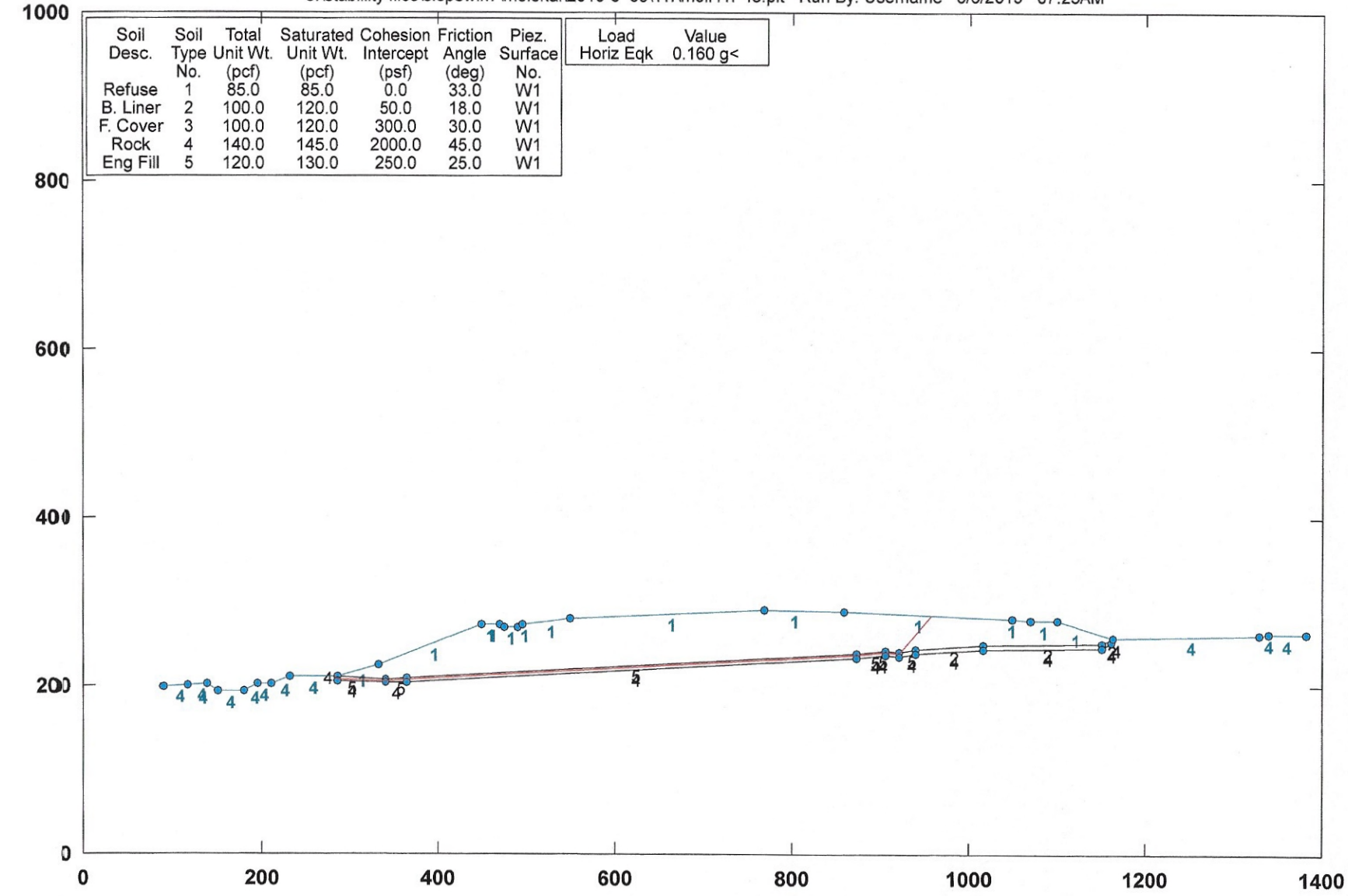
STED

MOLF - Slope Stability Section 1-1 Pseudo-Static

e:\stabillity files\slopewin7\molokai\2019-3 85\11r\molf11r-4e.plt Run By: Username 5/6/2019 07:25AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

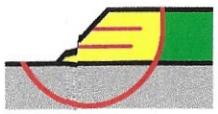
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=2.30

Factor Of Safety Is Calculated By The Modified Bishop Method

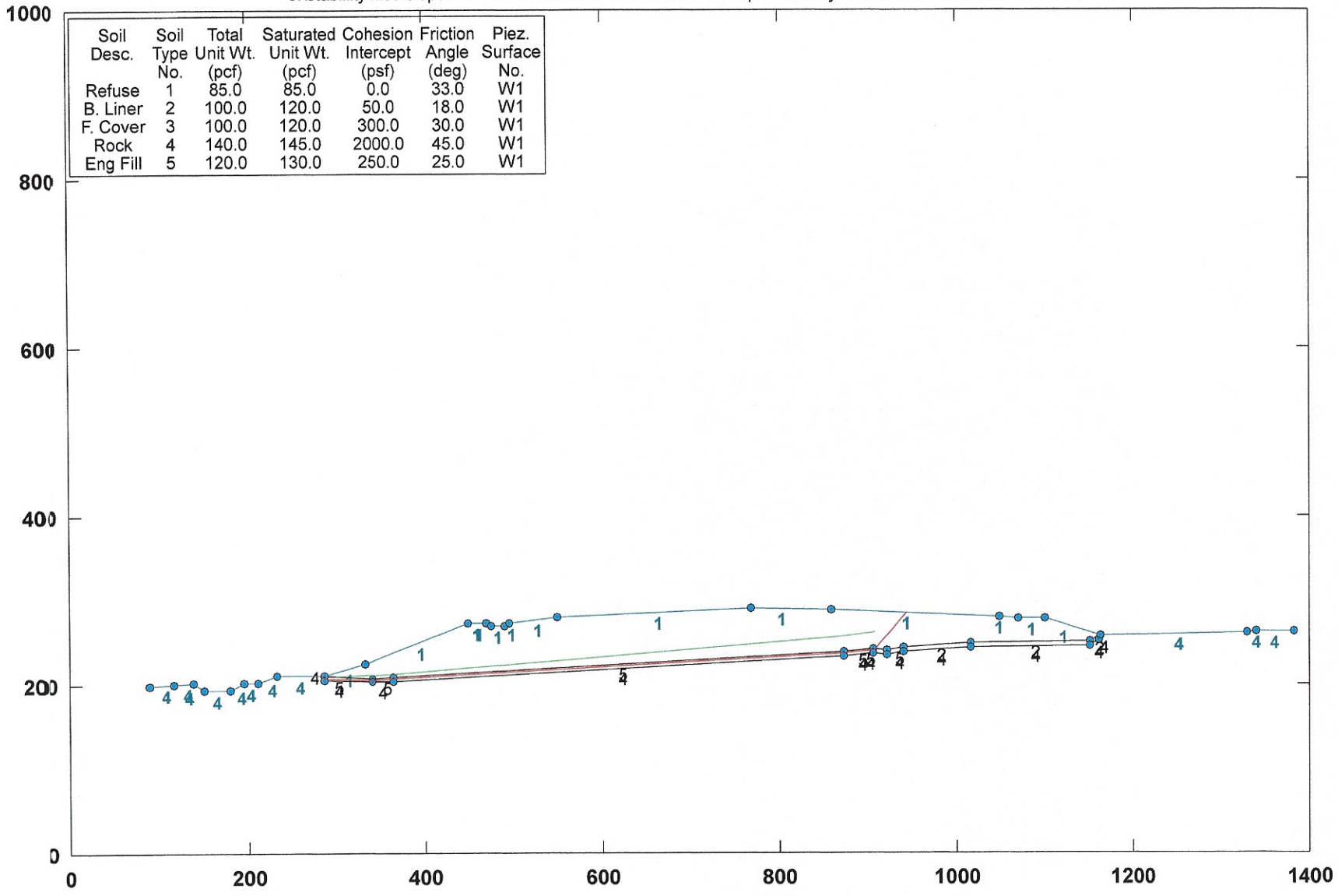
STED



MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-3 85\11r\molf11r-5s.plt Run By: Username 5/6/2019 07:27AM

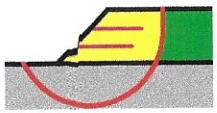
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=6.42

Factor Of Safety Is Calculated By Spencer`s Method of Slices

STED

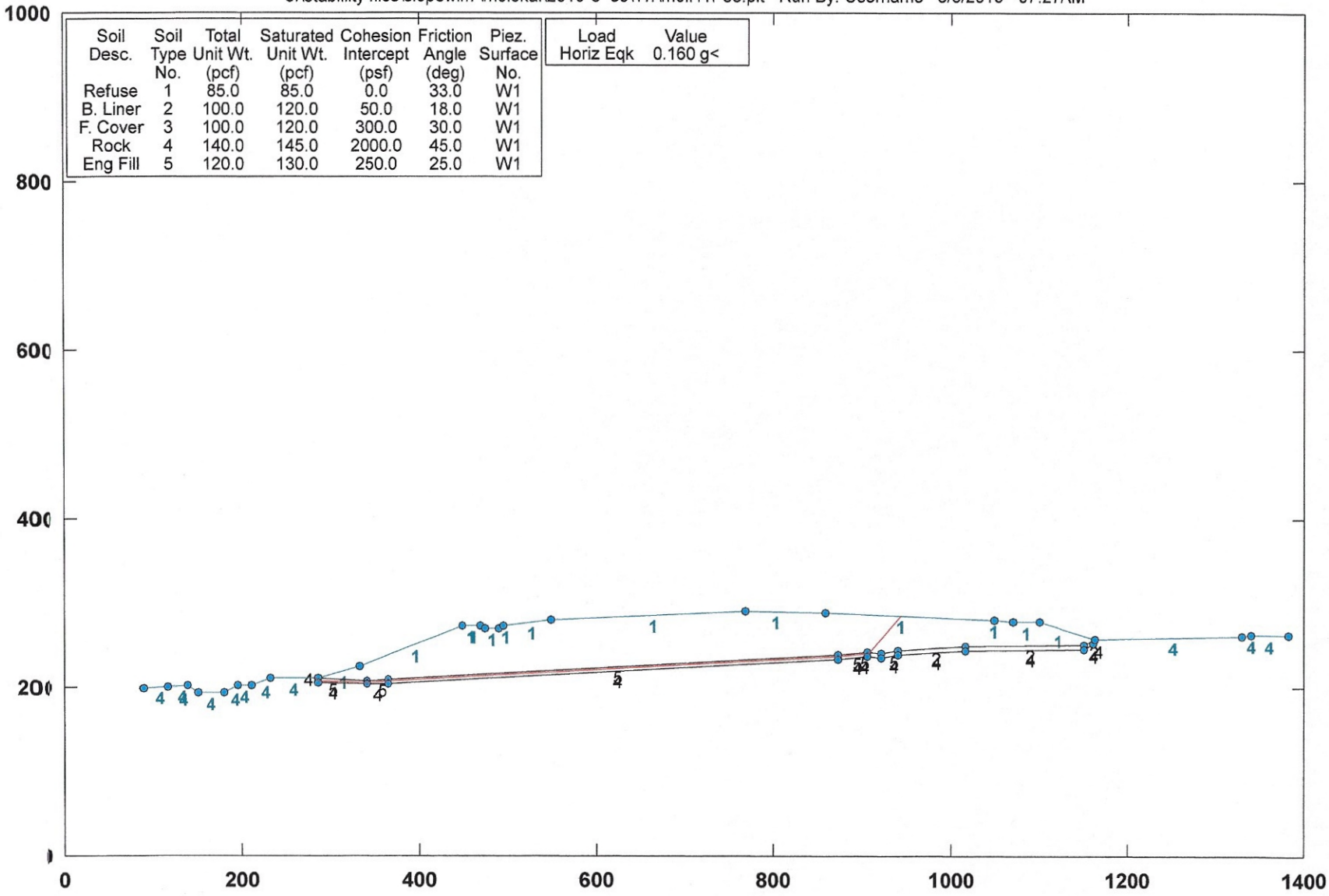


MOLF - Slope Stability Section 1-1 Pseudo-Static

e:\stabillity files\slopewin7\molokai\2019-3 85\11r\molf11r-5e.plt Run By: Username 5/6/2019 07:27AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

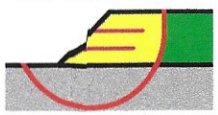
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=2.18

Factors of Safety Calculated by Janbu Method

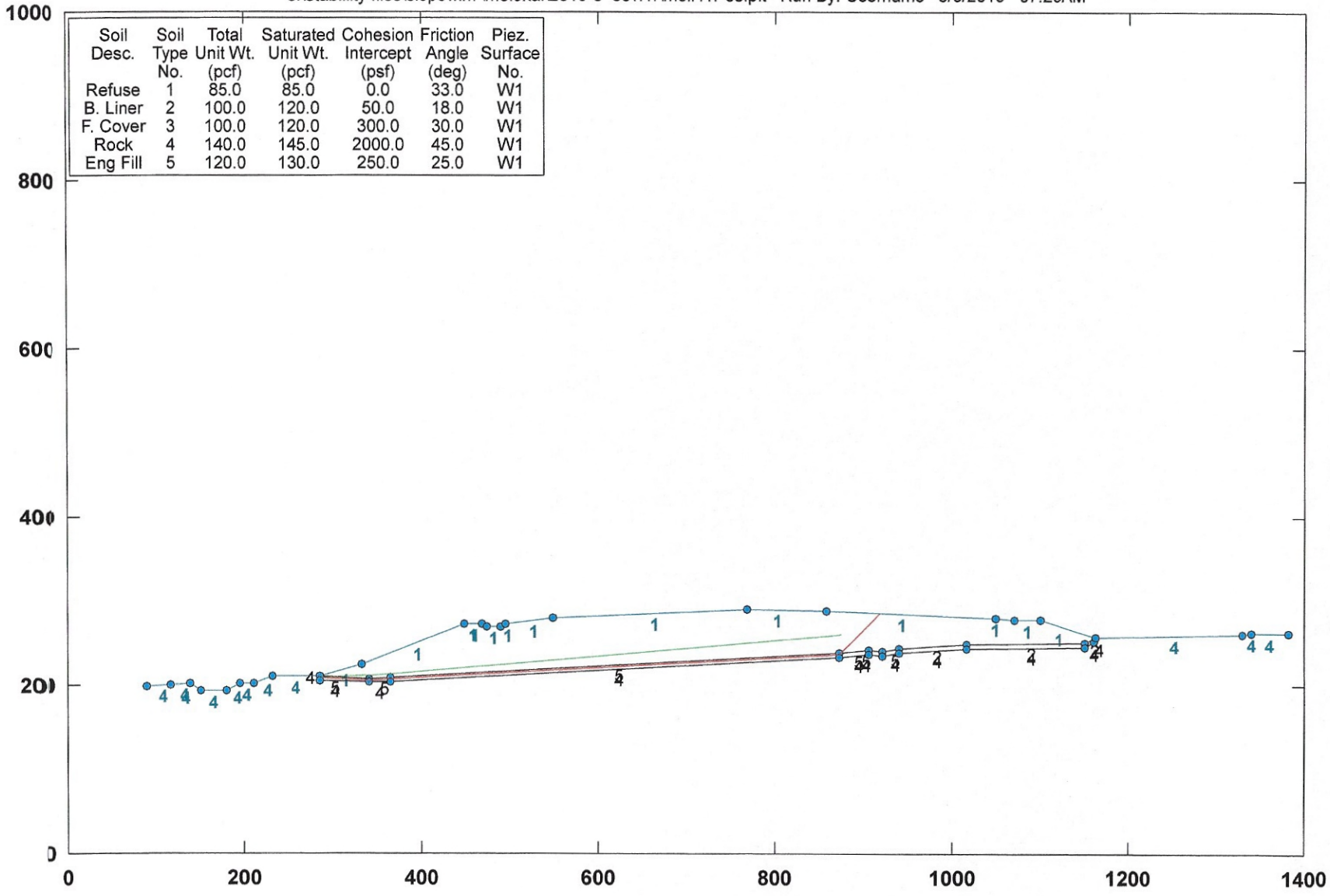
STED



MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-3 85\11r\molf11r-6s.plt Run By: Username 5/6/2019 07:29AM

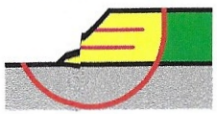
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=6.10

Factor Of Safety Is Calculated By Spencer`s Method of Slices

STED

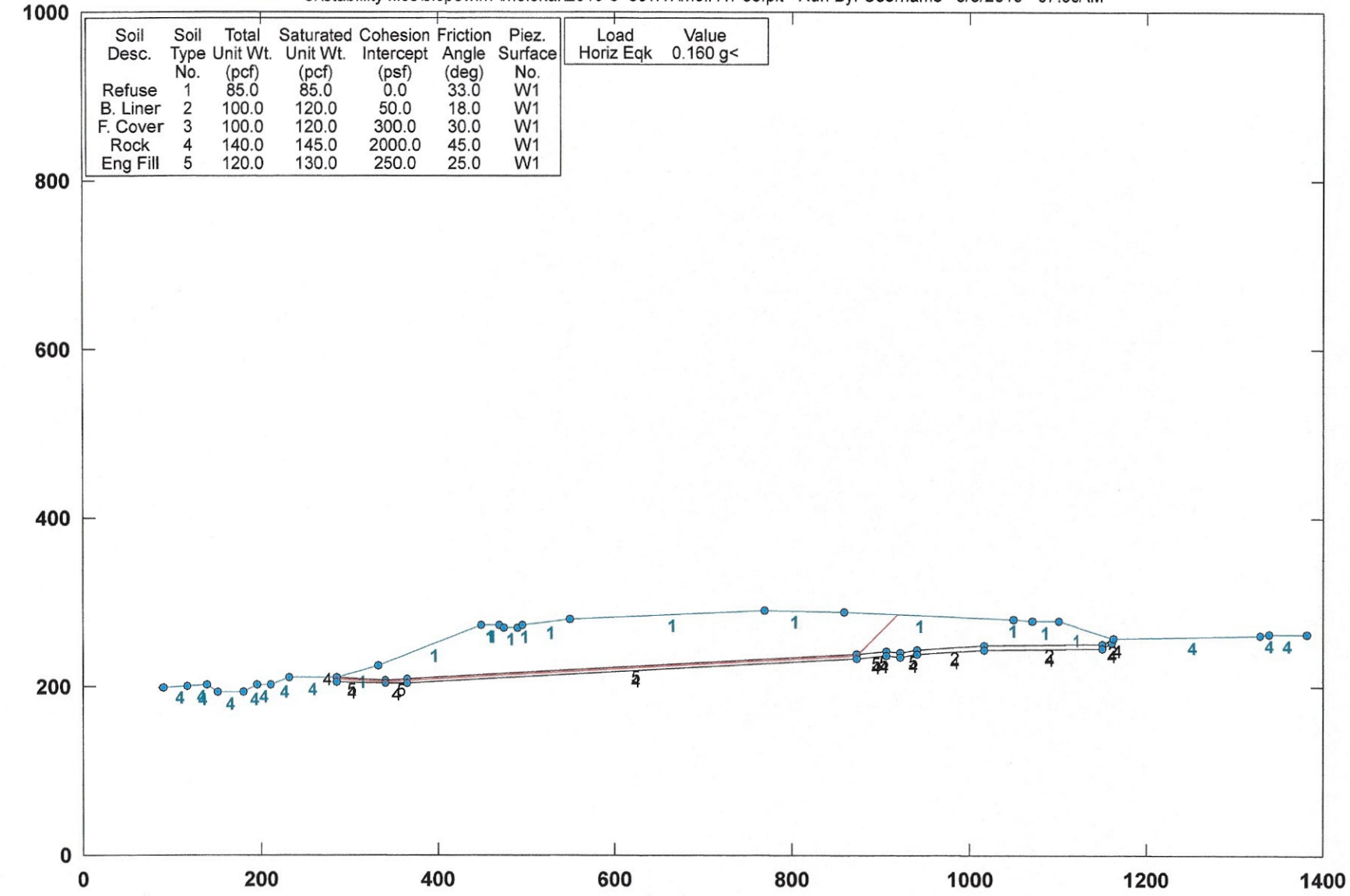


MOLF - Slope Stability Section 1-1 Pseudo-Static

e:\stabillity files\slopewin7\molokai\2019-3 85\11r\molf11r-6e.plt Run By: Username 5/6/2019 07:30AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

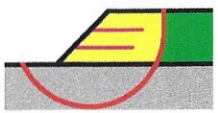
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=2.15

Factors of Safety Calculated by Janbu Method

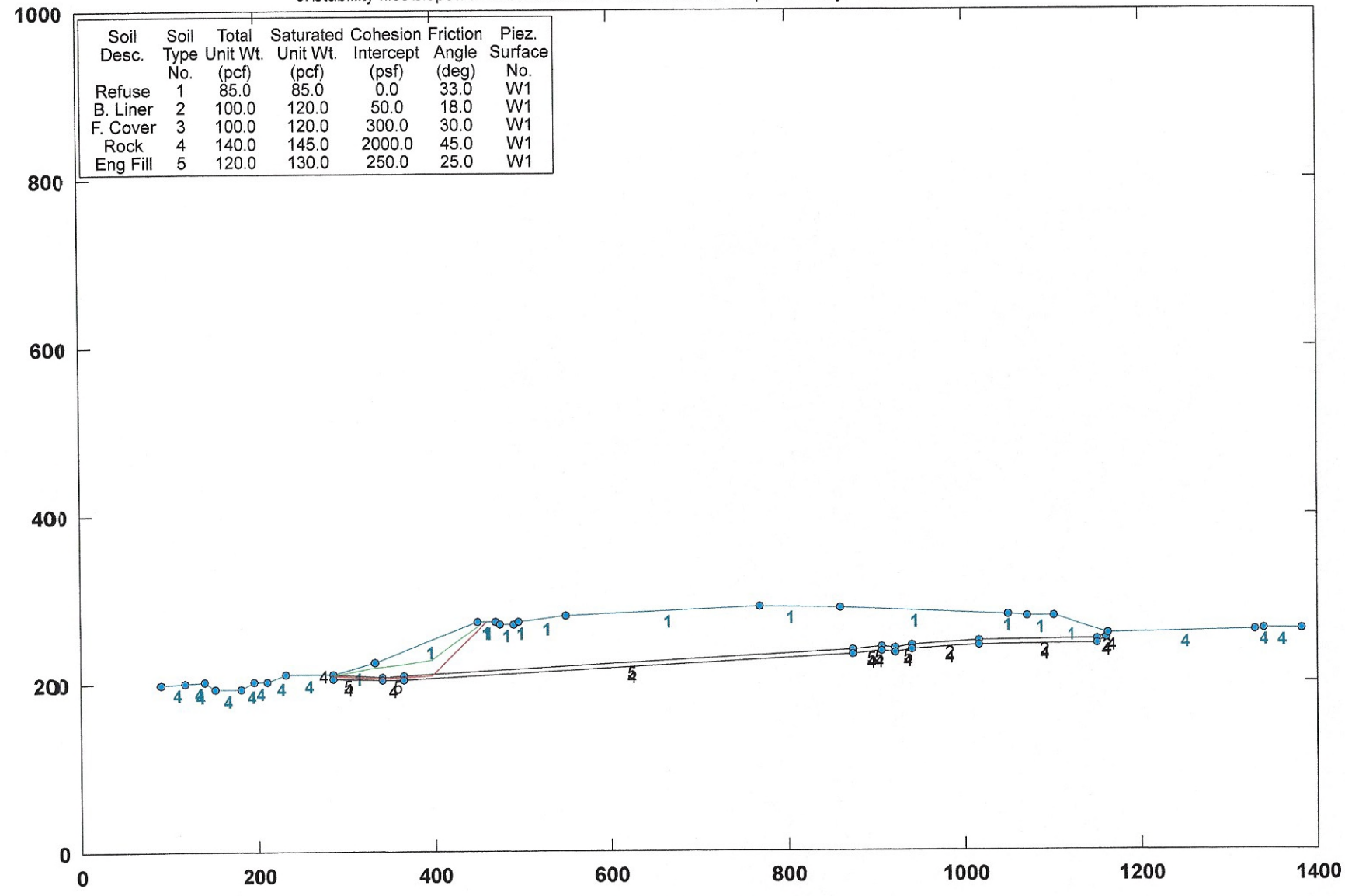
STED



MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-3 85\11r\molf11r-7s.plt Run By: Username 5/6/2019 07:31AM

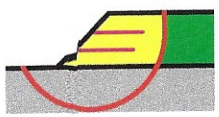
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=2.43

Factor Of Safety Is Calculated By Spencer`s Method of Slices

STED

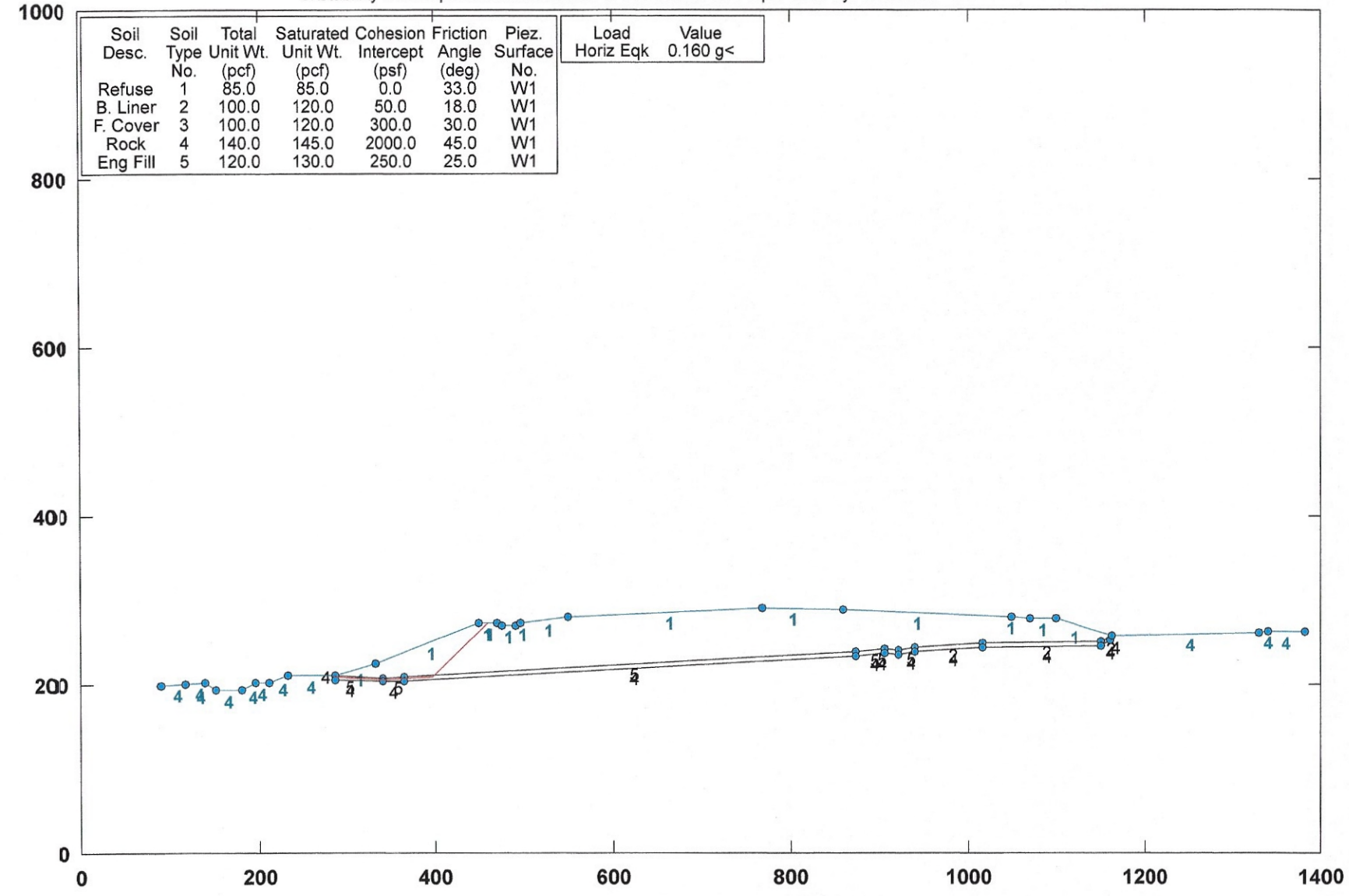


MOLF - Slope Stability Section 1-1 Pseudo-Static

e:\stabillity files\slopewin7\molokai\2019-3 85\11r\molf11r-7e.plt Run By: Username 5/6/2019 07:33AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

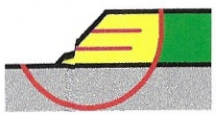
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=1.40

Factor Of Safety Is Calculated By Spencer`s Method of Slices

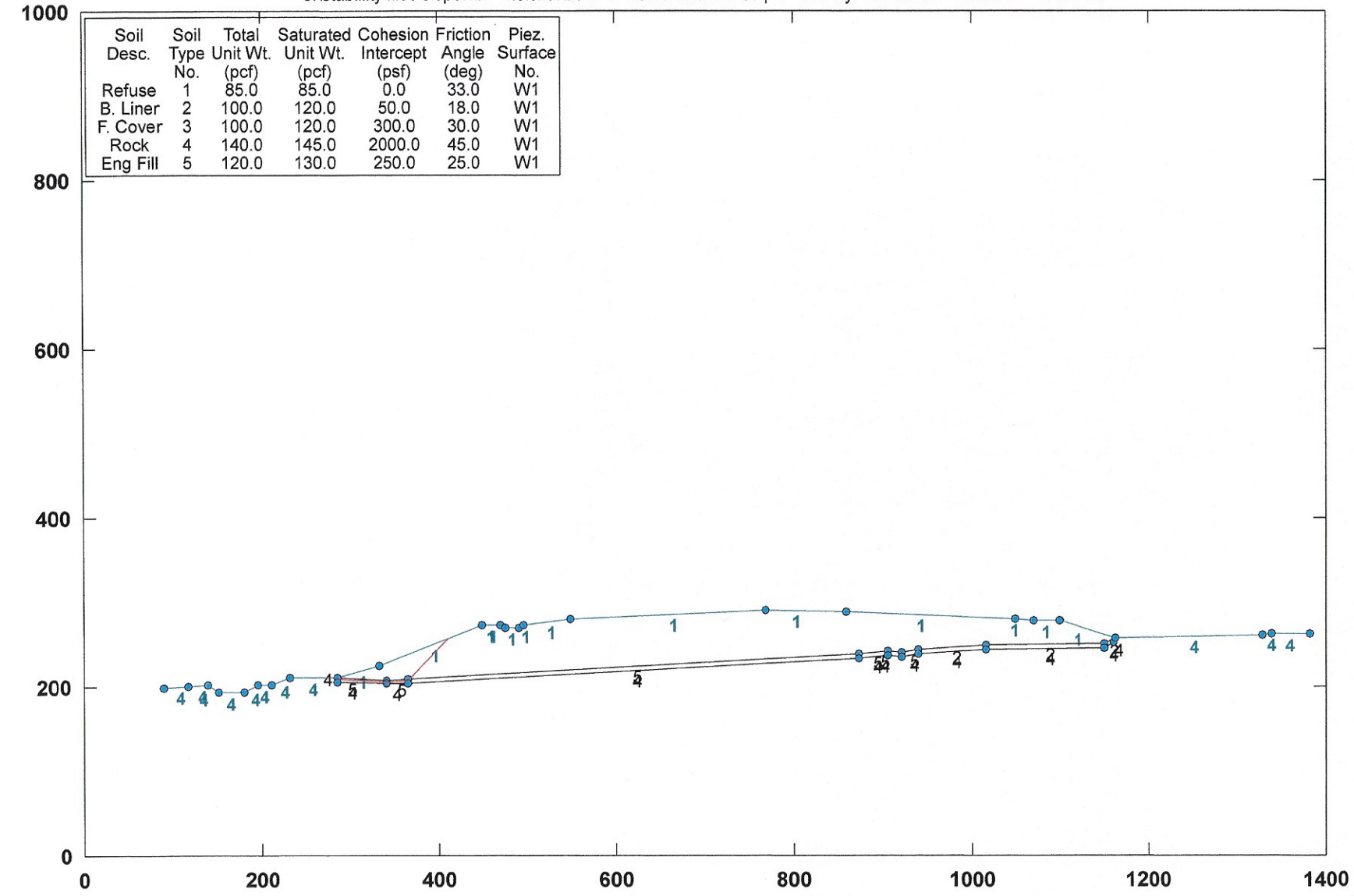
STED



MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-3 85\11r\molf11r-8s.plt Run By: Username 5/6/2019 07:38AM

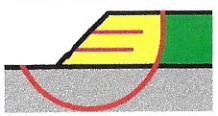
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=2.62

Factor Of Safety Is Calculated By Spencer`s Method of Slices

STED

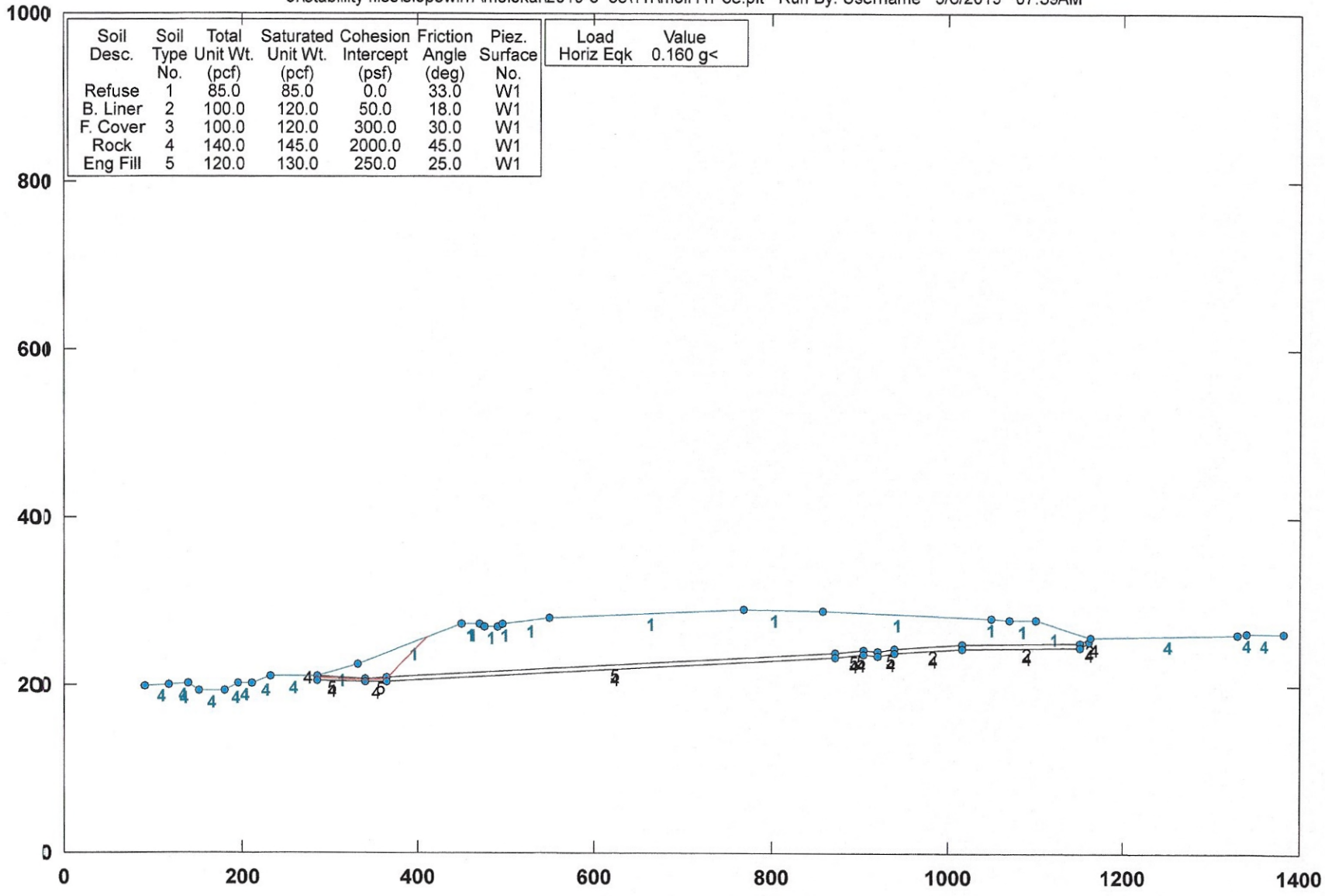


MOLF - Slope Stability Section 1-1 Pseudo-Static

e:\stabillity files\slopewin7\molokai\2019-3 85\11r\molf11r-8e.plt Run By: Username 5/6/2019 07:39AM

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

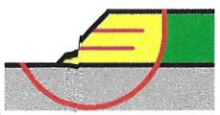
Load	Value
Horiz Eqk	0.160 g<



PCSTABL5M/si FSmin=1.91

Factor Of Safety Is Calculated By The Modified Bishop Method

STED

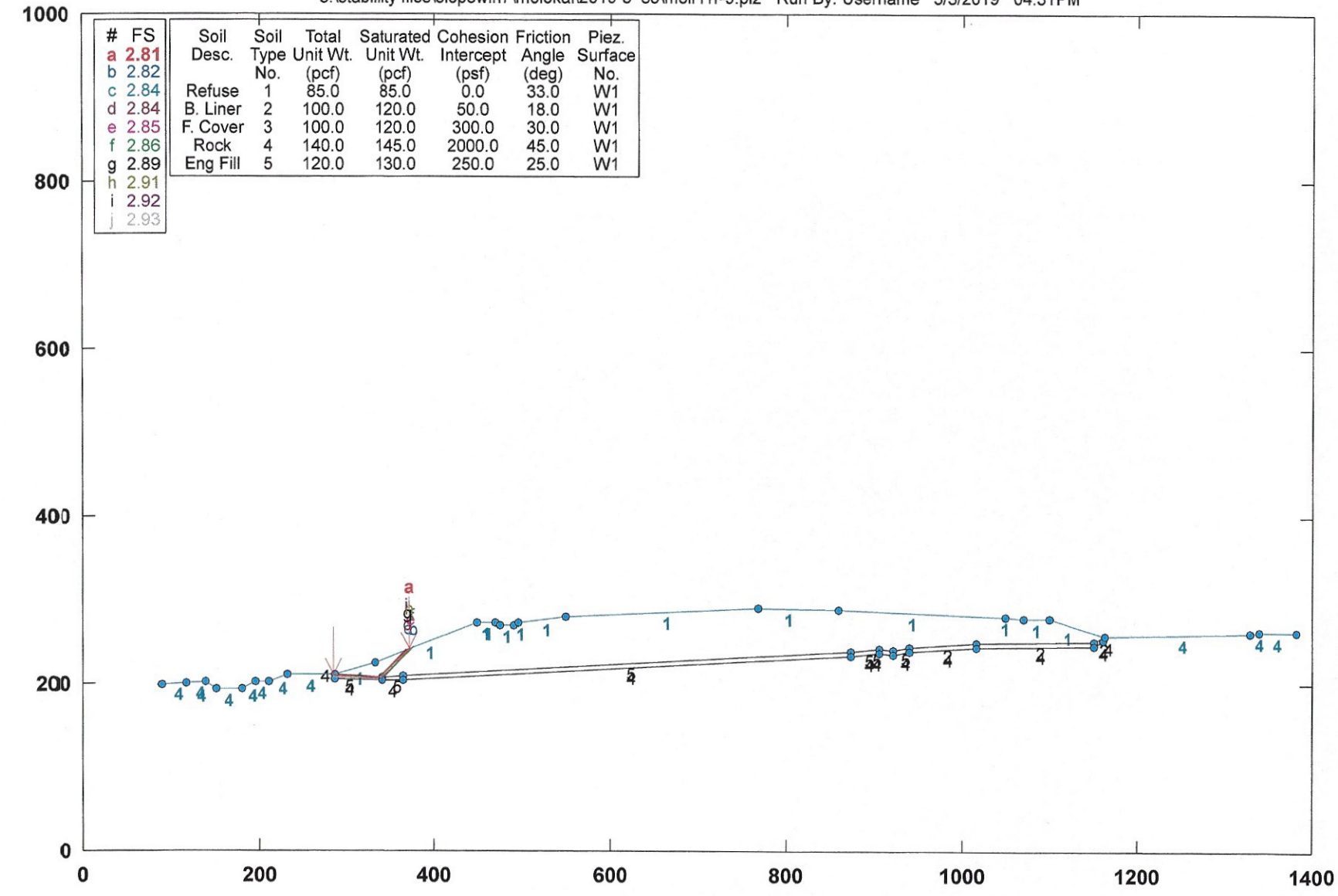


MOLF - Slope Stability Section 1-1 Static

e:\stabillity files\slopewin7\molokai\2019-3 85\molf11r-9.pl2 Run By: Username 5/3/2019 04:31PM

#	FS
a	2.81
b	2.82
c	2.84
d	2.84
e	2.85
f	2.86
g	2.89
h	2.91
i	2.92
j	2.93

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	85.0	85.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	50.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



PCSTABL5M/si FSmin=2.81

Safety Factors Are Calculated By The Modified Janbu Method

STED