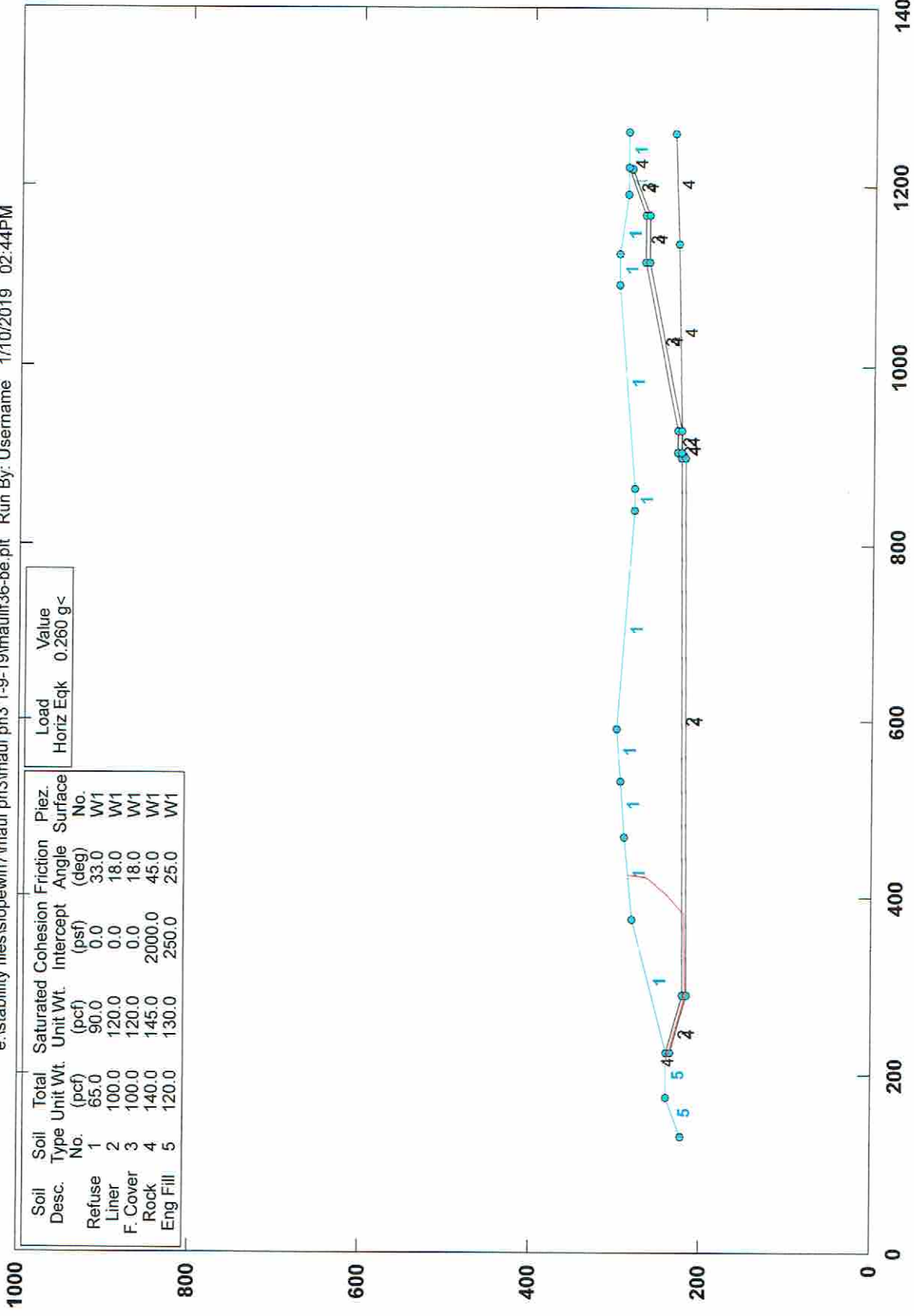
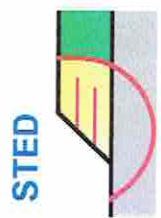


CML - ph III Slope Stab. Section III-S3 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\maui36-be.plt Run By: Username 1/10/2019 02:44PM

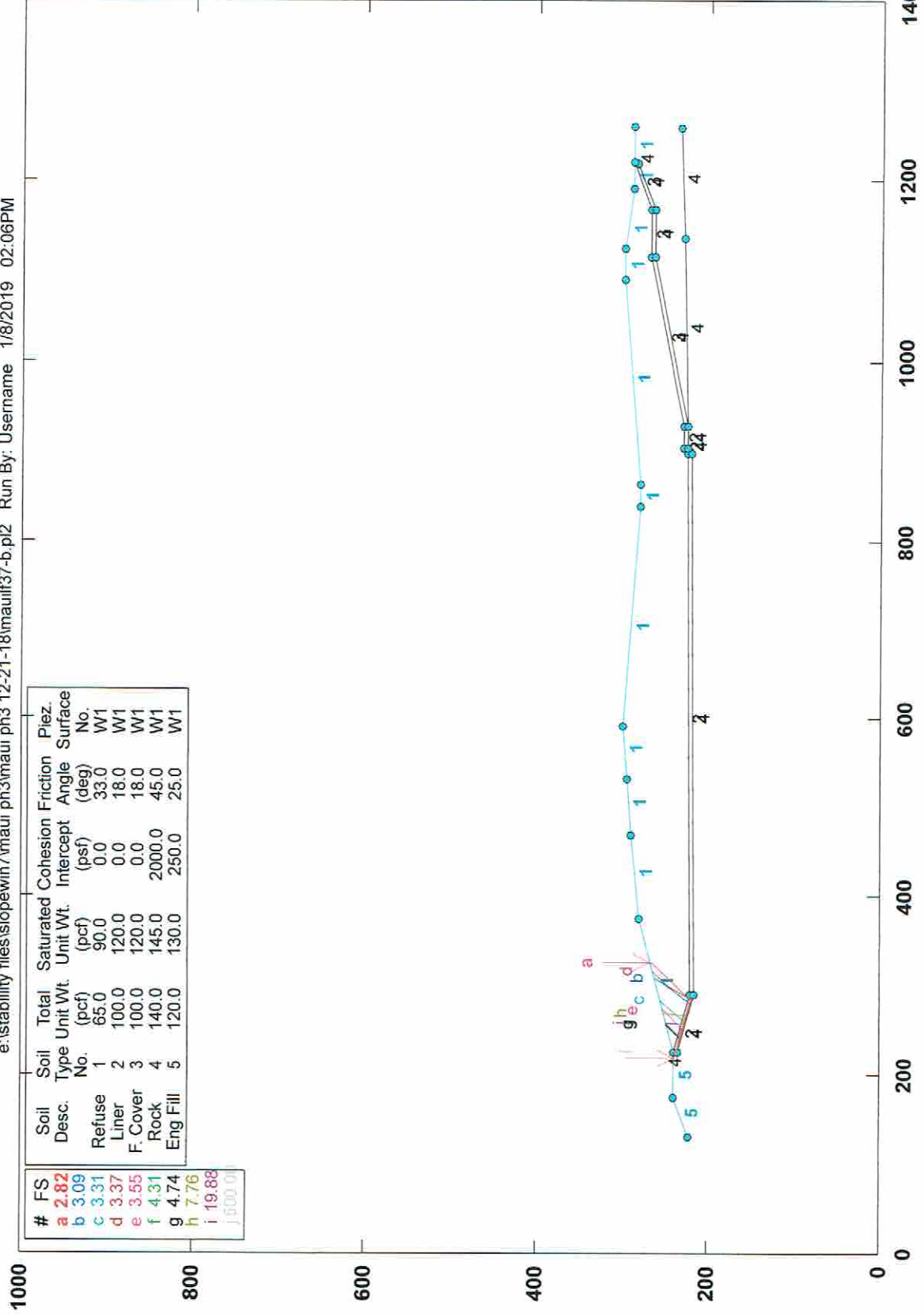


PCSTABL5M/si FSmin=1.00
Factors of Safety Calculated by Janbu Method



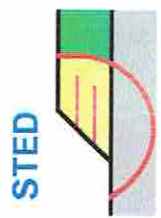
CML - ph III Slope Stab. Section III-S3 Static

e:\stability files\stability\7\maui\ph3\12-21-18\maui\37-b.pl2 Run By: Username 1/8/2019 02:06PM



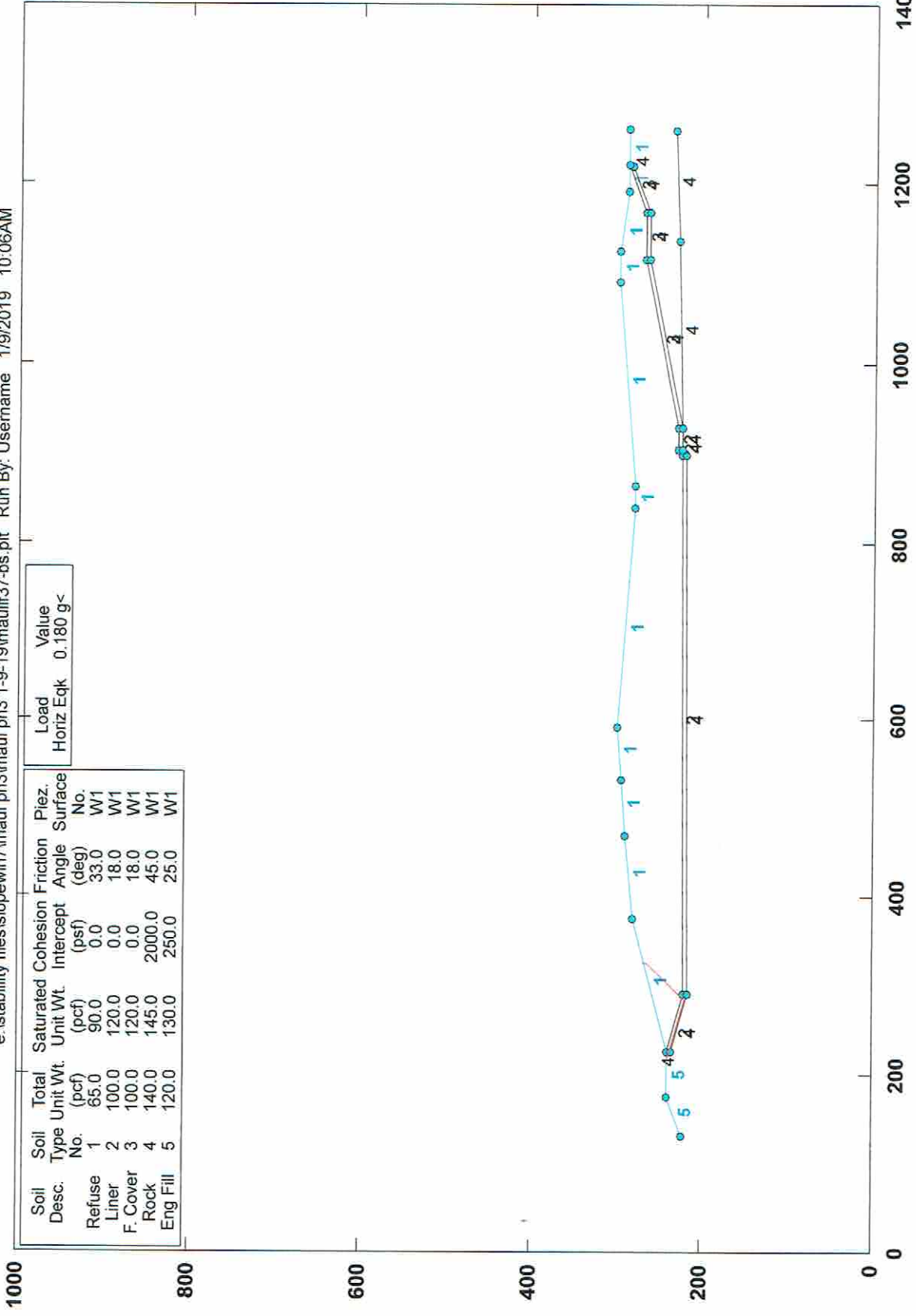
PCSTABL5M/si FSmin=2.82

Safety Factors Are Calculated By The Modified Janbu Method



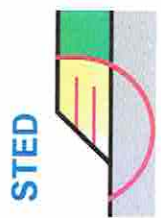
CML - ph III Slope Stab. Section III-S3 Pseudo-Static

e:\stability files\lopewin7\maui ph3 1-9-19\mauiif37-bs.plt Run By: Username 1/9/2019 10:06AM



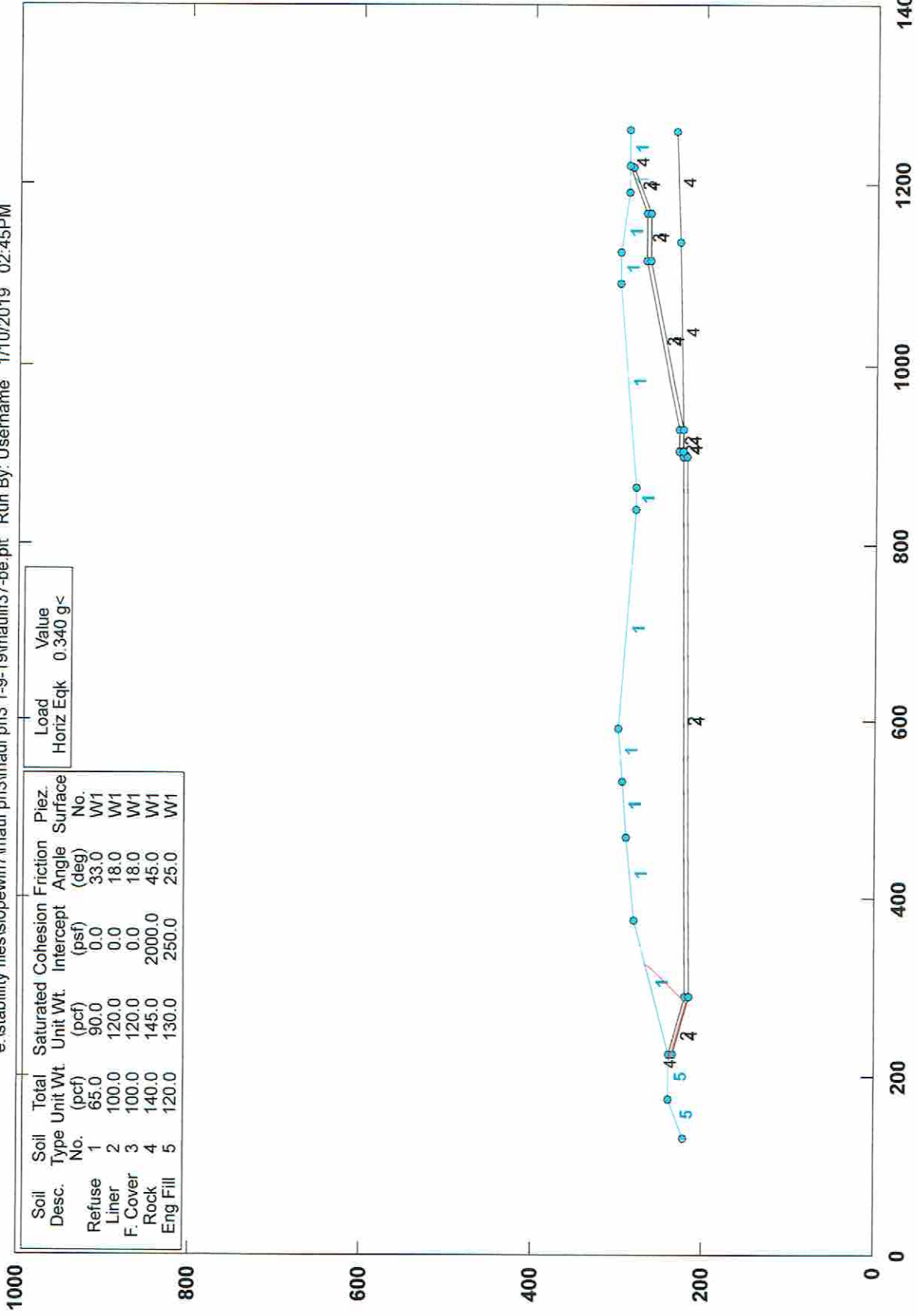
Load	Value
Hortz Eqk	0.180 g<

PCSTABL5M/si FSmin=1.47
Factors of Safety Calculated by Janbu Method

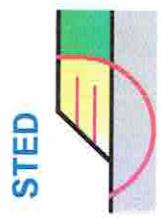


CML - ph III Slope Stab. Section III-S3 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\maui37-be.plt Run By: Username 1/10/2019 02:45PM



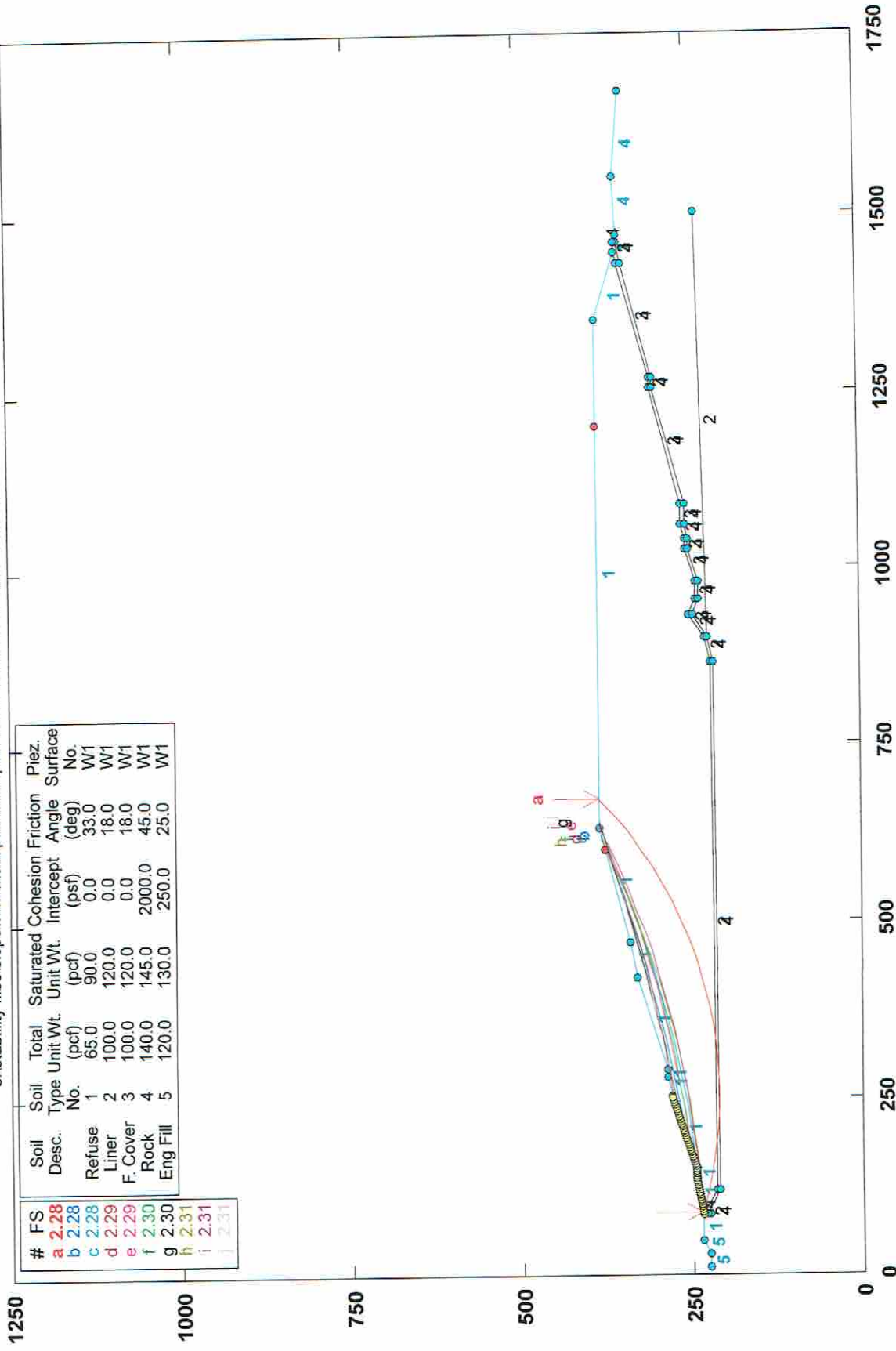
PCSTABL5M/si FSmin=1.00
Factors of Safety Calculated by Janbu Method



**CROSS SECTION
III-S4**

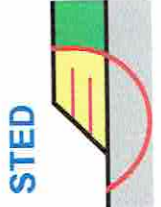
CML - ph III Slope Stab. Section III-S4 Static

e:\stability files\islopewin7\maui ph3 12-21-18\maui141-c.pl2 Run By: Username 1/8/2019 03:50PM



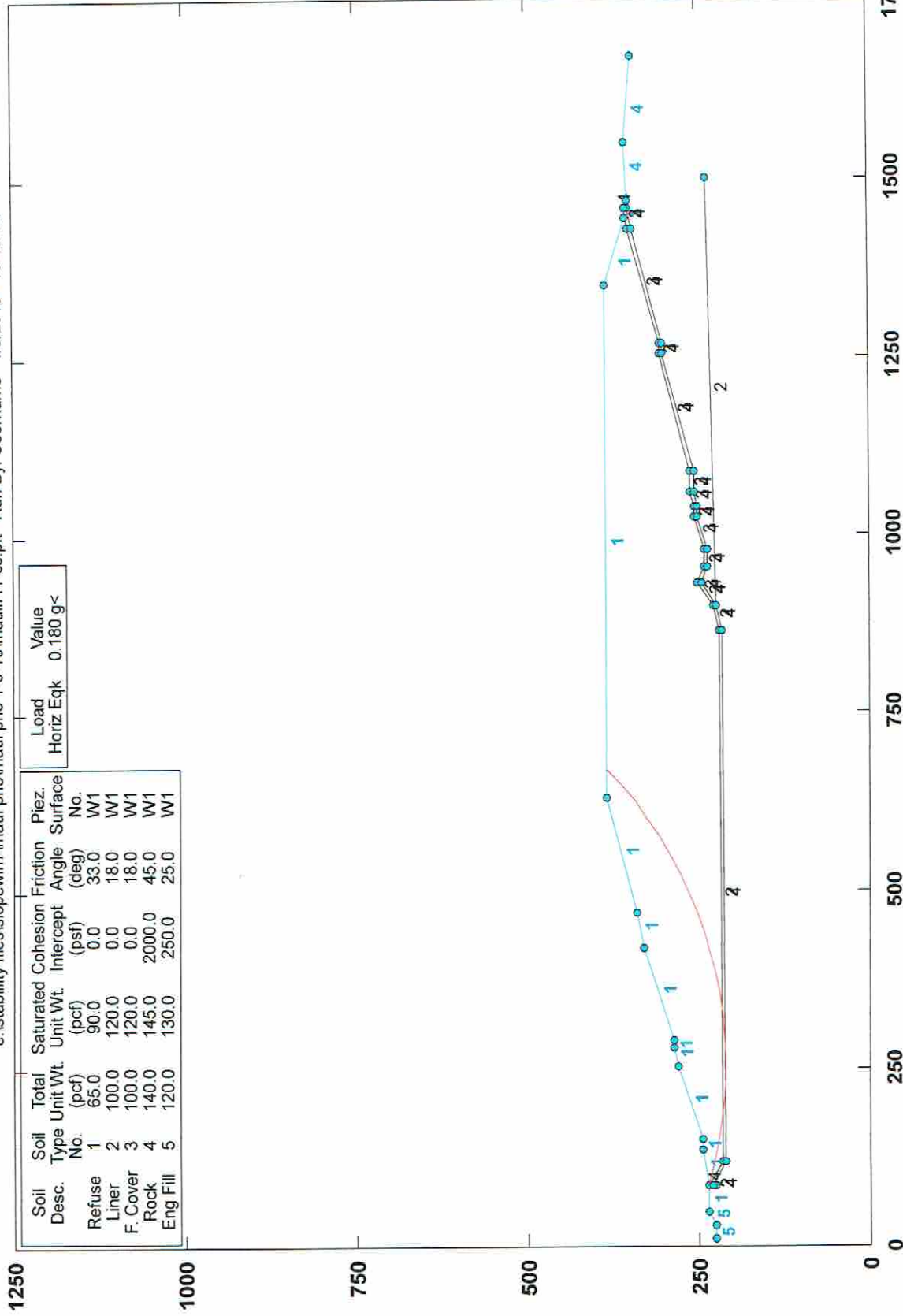
#	FS	Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
a	2.28	Refuse	1	65.0	90.0	0.0	33.0	W1
b	2.28	Liner	2	100.0	120.0	0.0	18.0	W1
c	2.29	F. Cover	3	100.0	120.0	0.0	18.0	W1
d	2.29	Rock	4	140.0	145.0	2000.0	45.0	W1
e	2.30	Eng Fill	5	120.0	130.0	250.0	25.0	W1
g	2.30							
h	2.31							
i	2.31							
j	2.31							

PCSTABL5M/si FSmin=2.28
Safety Factors Are Calculated By The Modified Bishop Method



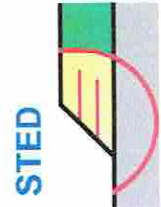
CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\stability\7\maui\ph3\1-9-19\mauif41-cs.plt Run By: Username 1/9/2019 10:46AM



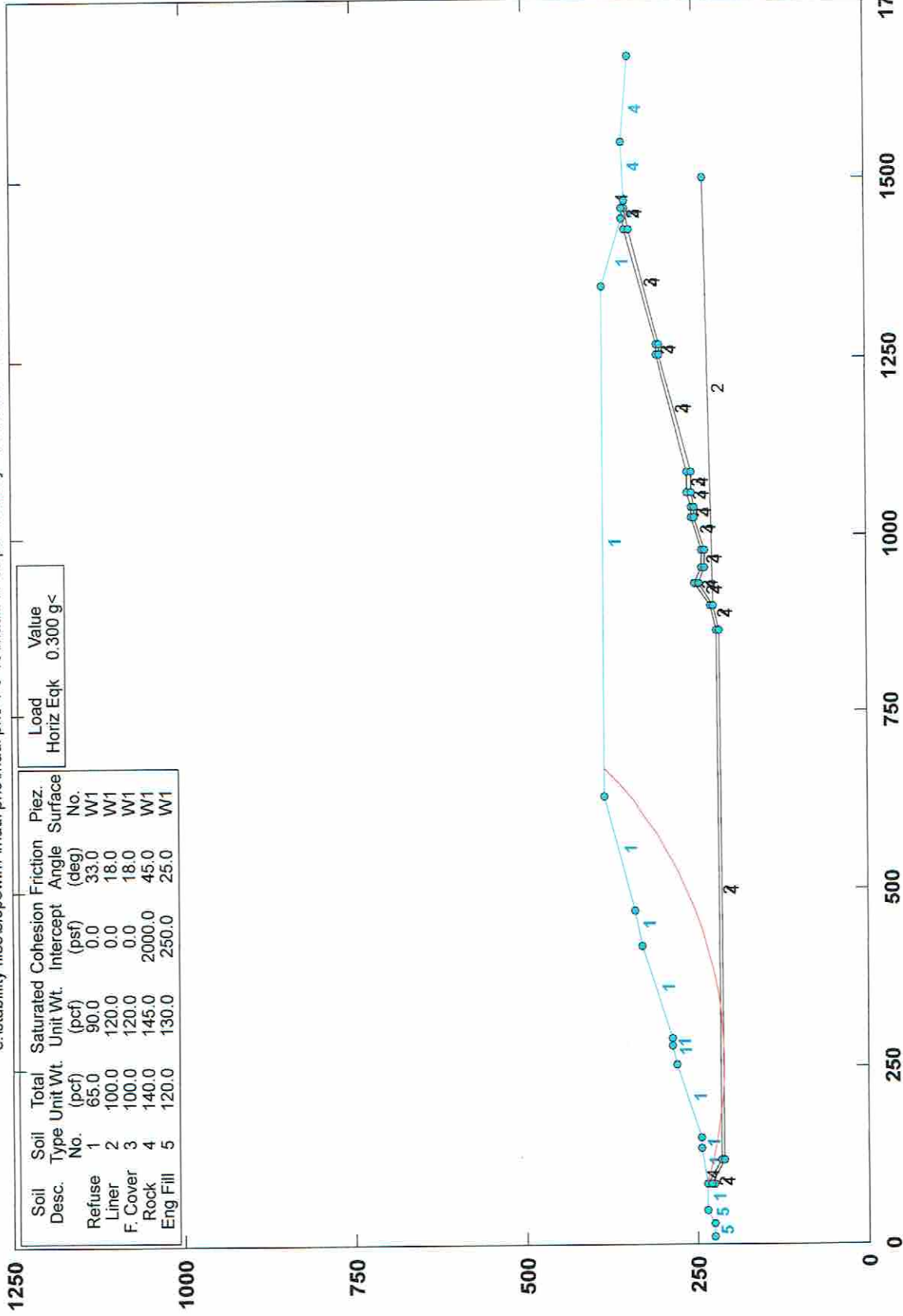
PCSTABL5M/si FSmin=1.31

Factor Of Safety Is Calculated By The Modified Bishop Method



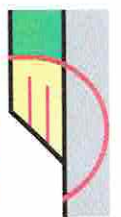
CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\slpewin7\maui ph3 1-9-19\mauil41-ce.plt Run By: Username 1/10/2019 03:58PM



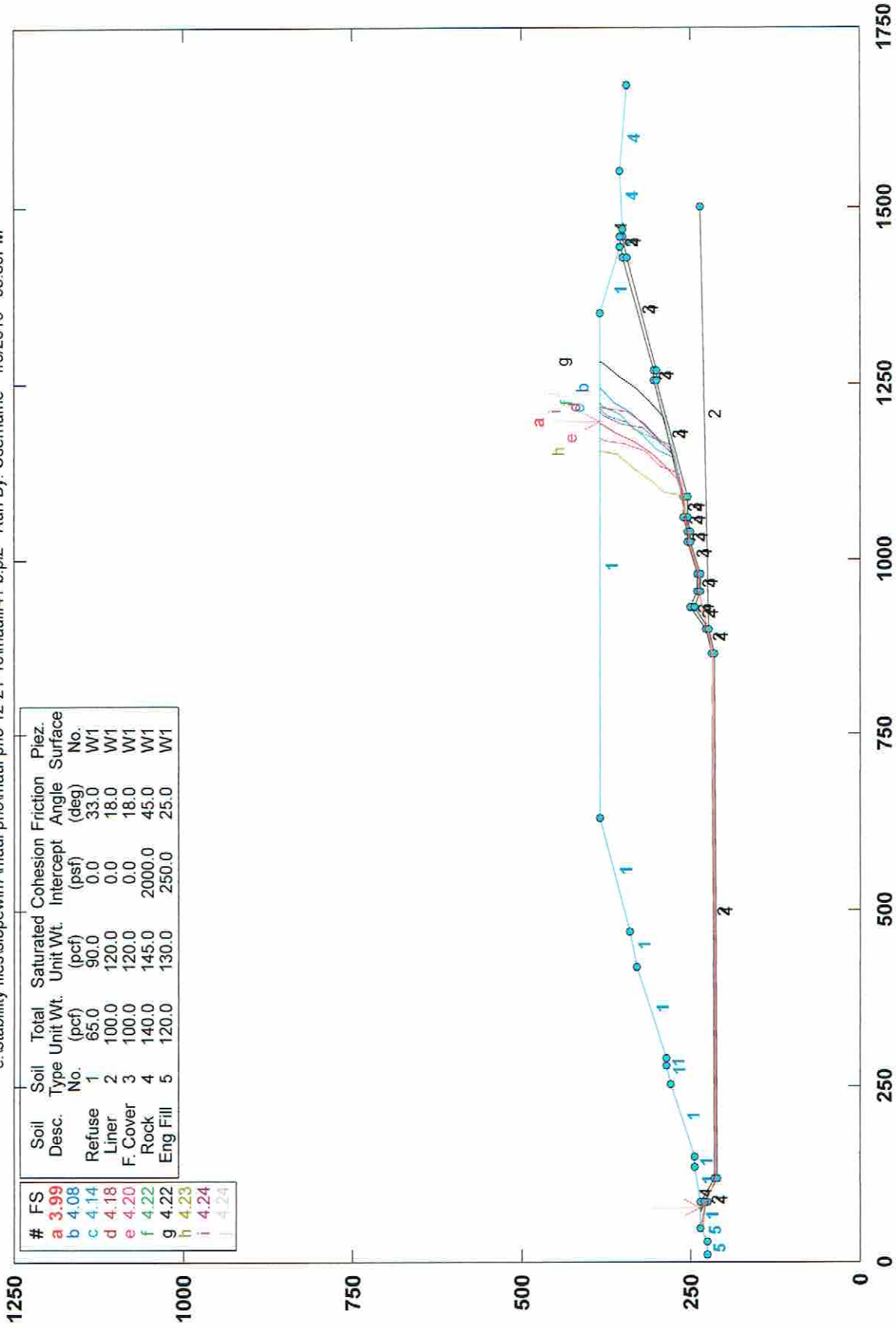
PCSTABL5M/si FSmin=1.00
Factor Of Safety Is Calculated By The Modified Bishop Method

STED



CML - ph III Slope Stab. Section III-S4 Static

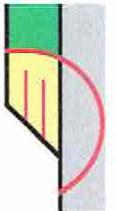
e:\stability files\slopewin7\maui ph3 12-21-18\maui41-b.pl2 Run By: Username 1/8/2019 03:39PM



PCSTABL5M/si FSmin=3.99

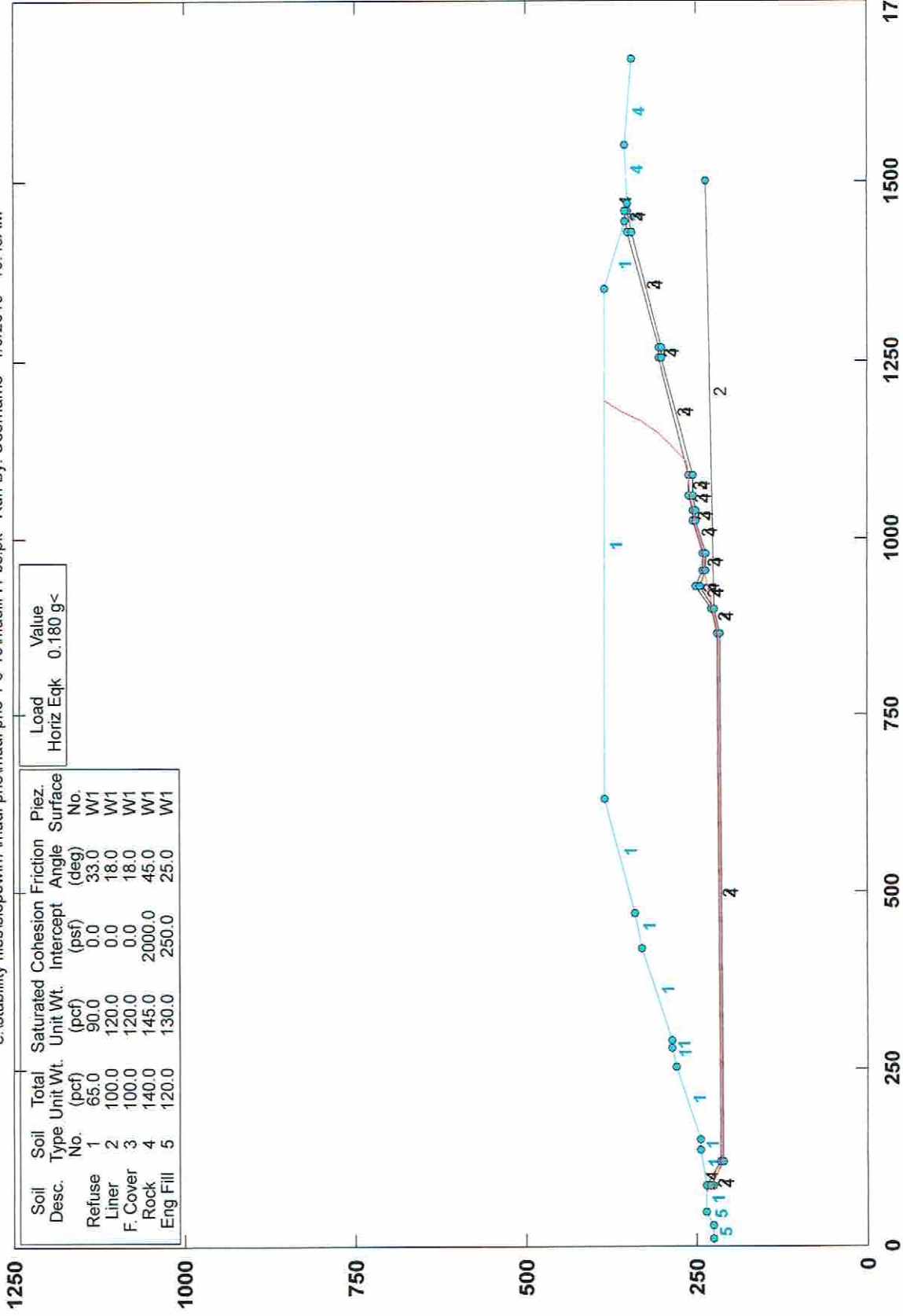
Safety Factors Are Calculated By The Modified Janbu Method

STED



CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\lopewin7\maui ph3 1-9-19\maui41-bs.plt Run By: Username 1/9/2019 10:45AM



PCSTABL5M/si F_{Smin}=1.43

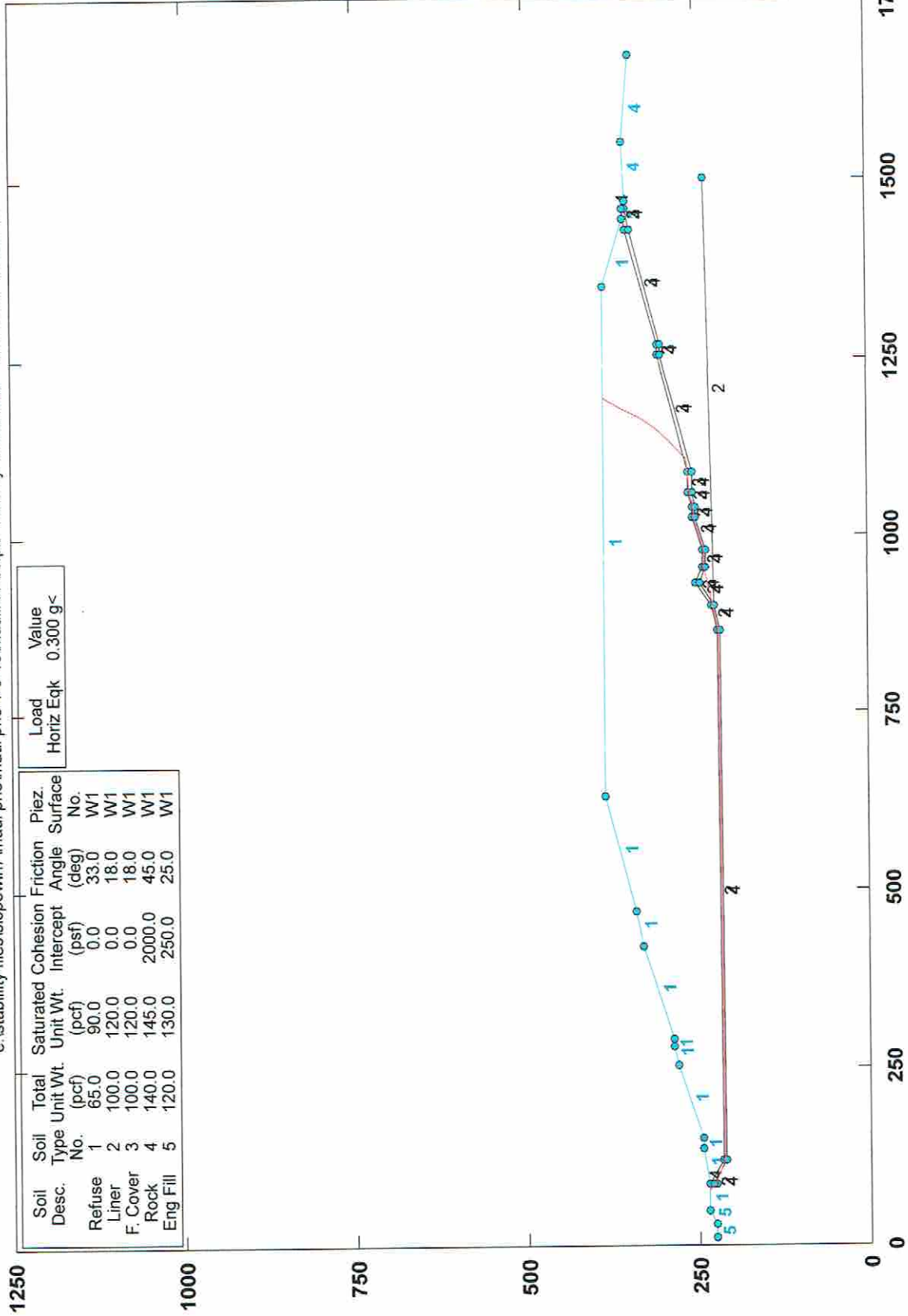
Factors of Safety Calculated by Janbu Method

STED



CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\slopewin7\maui ph3\maui ph3 1-9-19\mauiif41-be.plt Run By: Username 1/10/2019 03:57PM

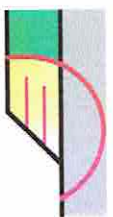


Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

Load Horiz Eqk	Value
0.300	g<

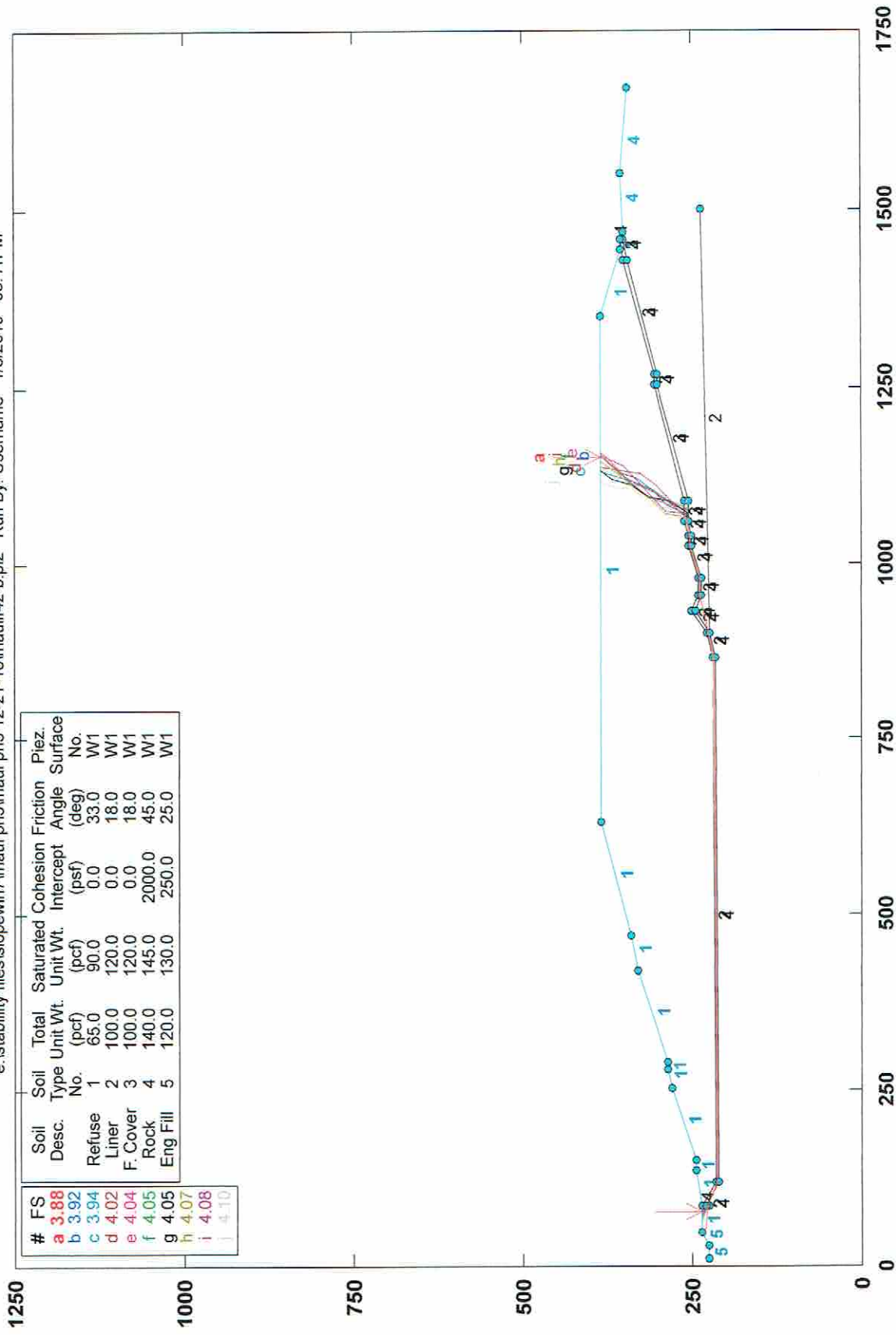
PCSTABL5M/si FSmin=0.99
Factors of Safety Calculated by Janbu Method

STED



CML - ph III Slope Stab. Section III-S4 Static

e:\stability files\lopewin7\maui ph3 12-21-18\maui42-b.pl2 Run By: Userame 1/8/2019 03:41PM



PCSTABL5M/si FSmin=3.88

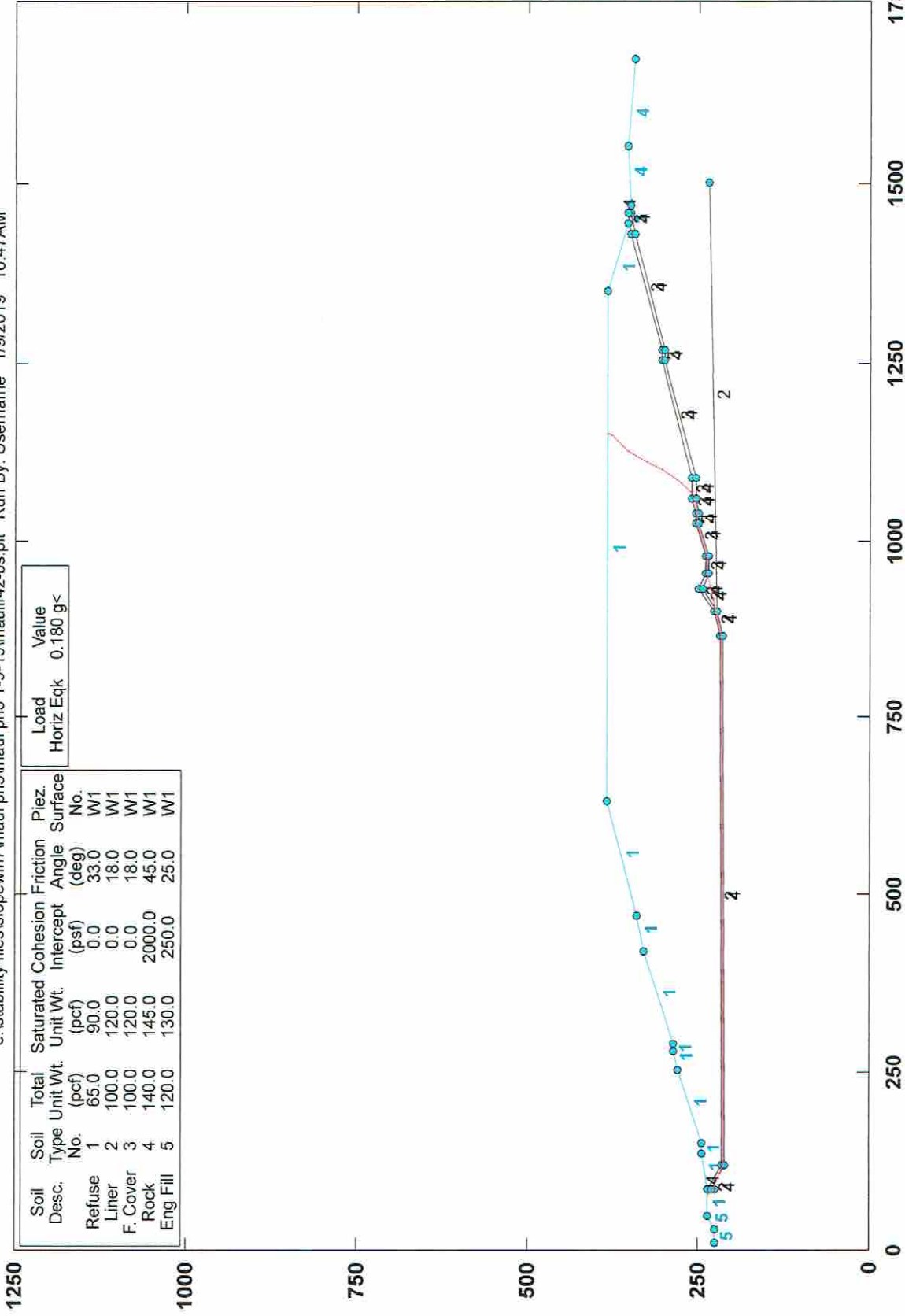
Safety Factors Are Calculated By The Modified Janbu Method

STED



CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\mauil42-bs.plt Run By: Username 1/9/2019 10:47AM

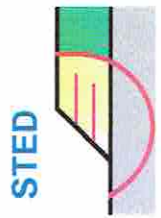


Load	Value
Horiz Eqk	0.180 g<

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

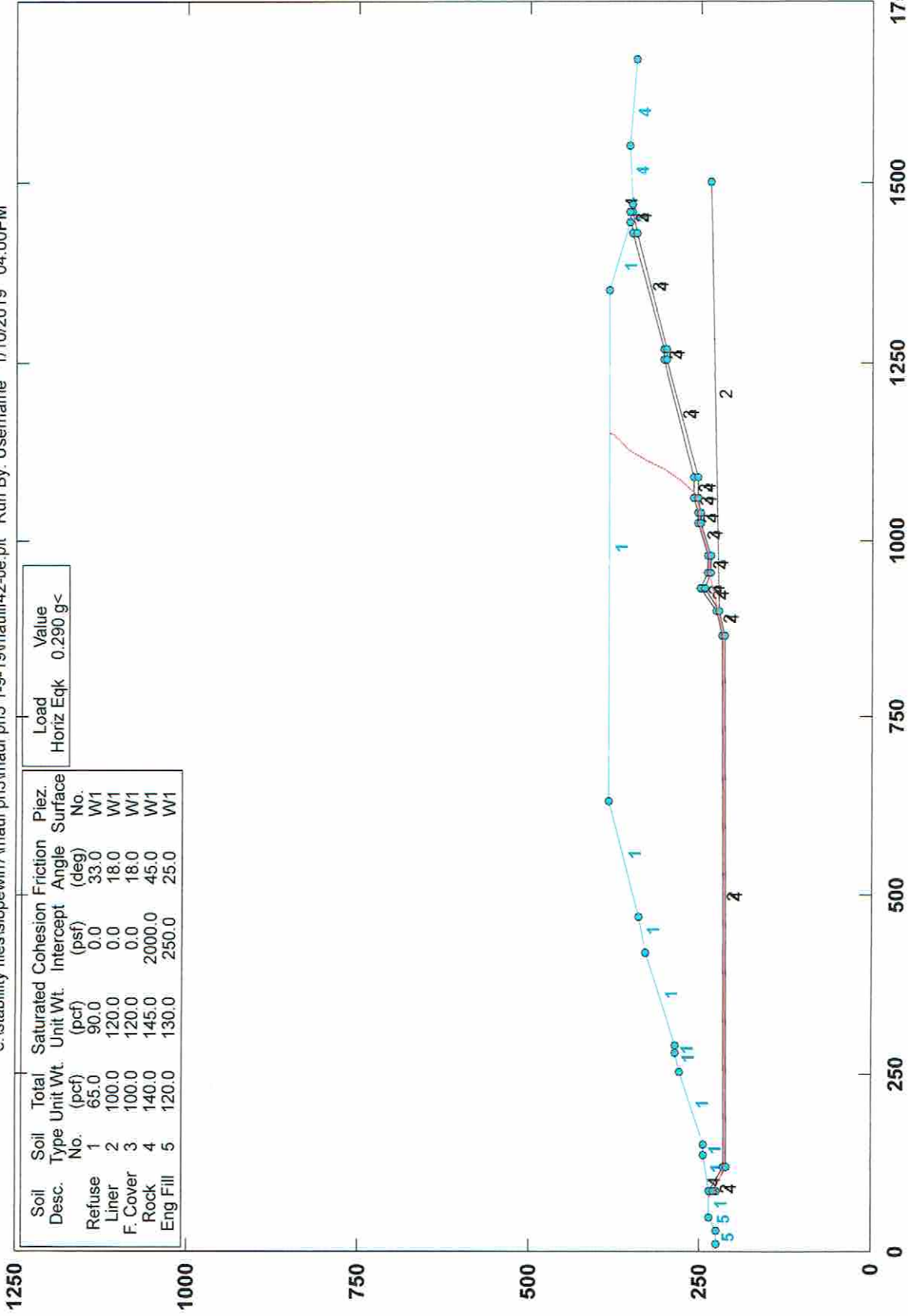
PCSTABL5M/si FSmin=1.42

Factors of Safety Calculated by Janbu Method

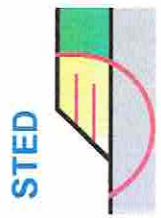


CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\slopewin7\maui ph3\maui ph3 1-9-19\maui42-be.plt Run By: Username 1/10/2019 04:00PM

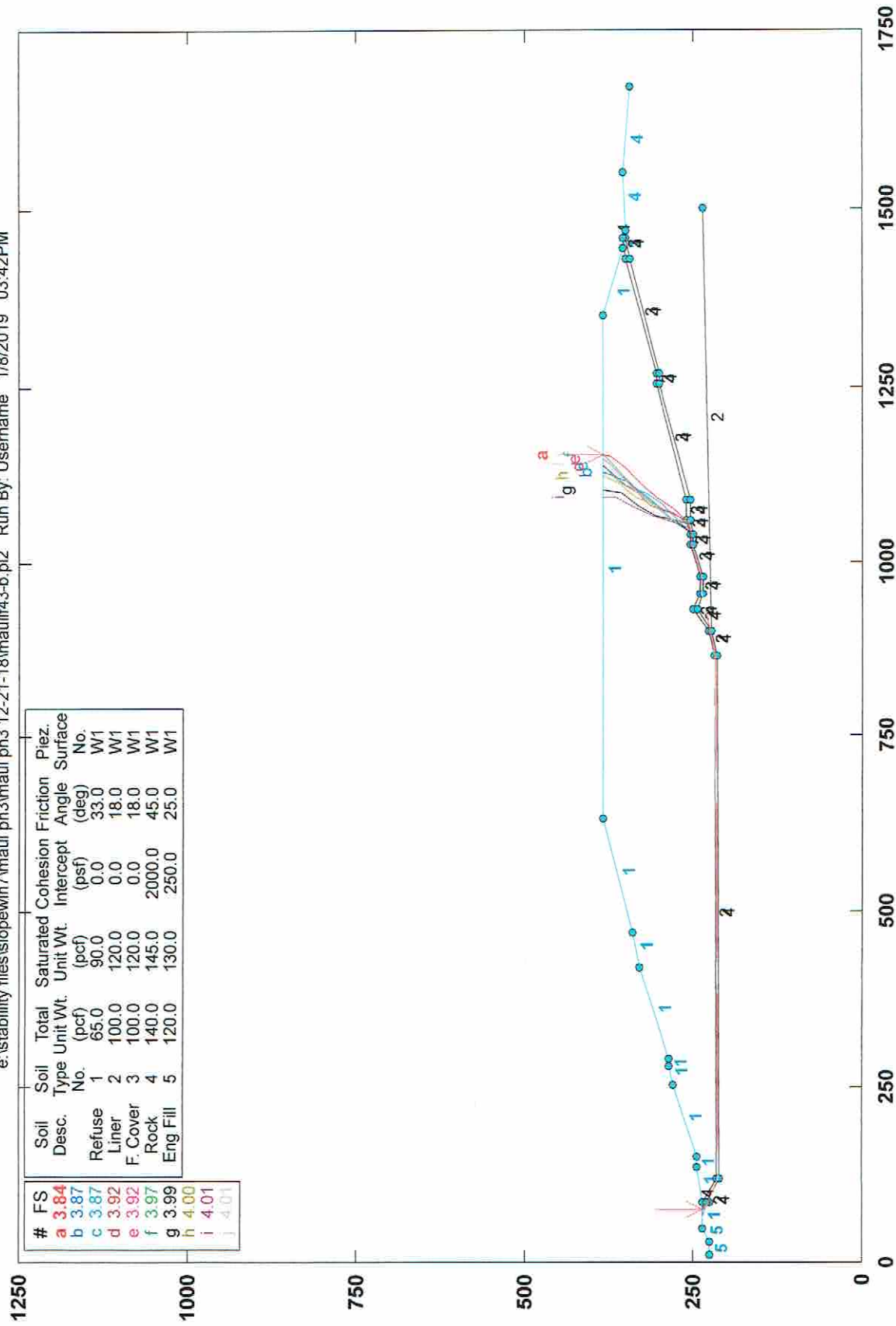


PCSTABL5M/si FSmin=1.01
Factors of Safety Calculated by Janbu Method



CML - ph III Slope Stab. Section III-S4 Static

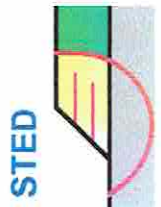
e:\stability files\slopewin7\maui ph3 12-21-18\maui43-b.pl2 Run By: Username 1/8/2019 03:42PM



#	FS	Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
a	3.84	Refuse	1	65.0	90.0	0.0	33.0	W1
b	3.87	Liner	2	100.0	120.0	0.0	18.0	W1
c	3.87	F. Cover	3	100.0	120.0	0.0	18.0	W1
d	3.92	Rock	4	140.0	145.0	2000.0	45.0	W1
e	3.97	Eng Fill	5	120.0	130.0	250.0	25.0	W1
g	3.99							
h	4.00							
i	4.01							
j	4.01							

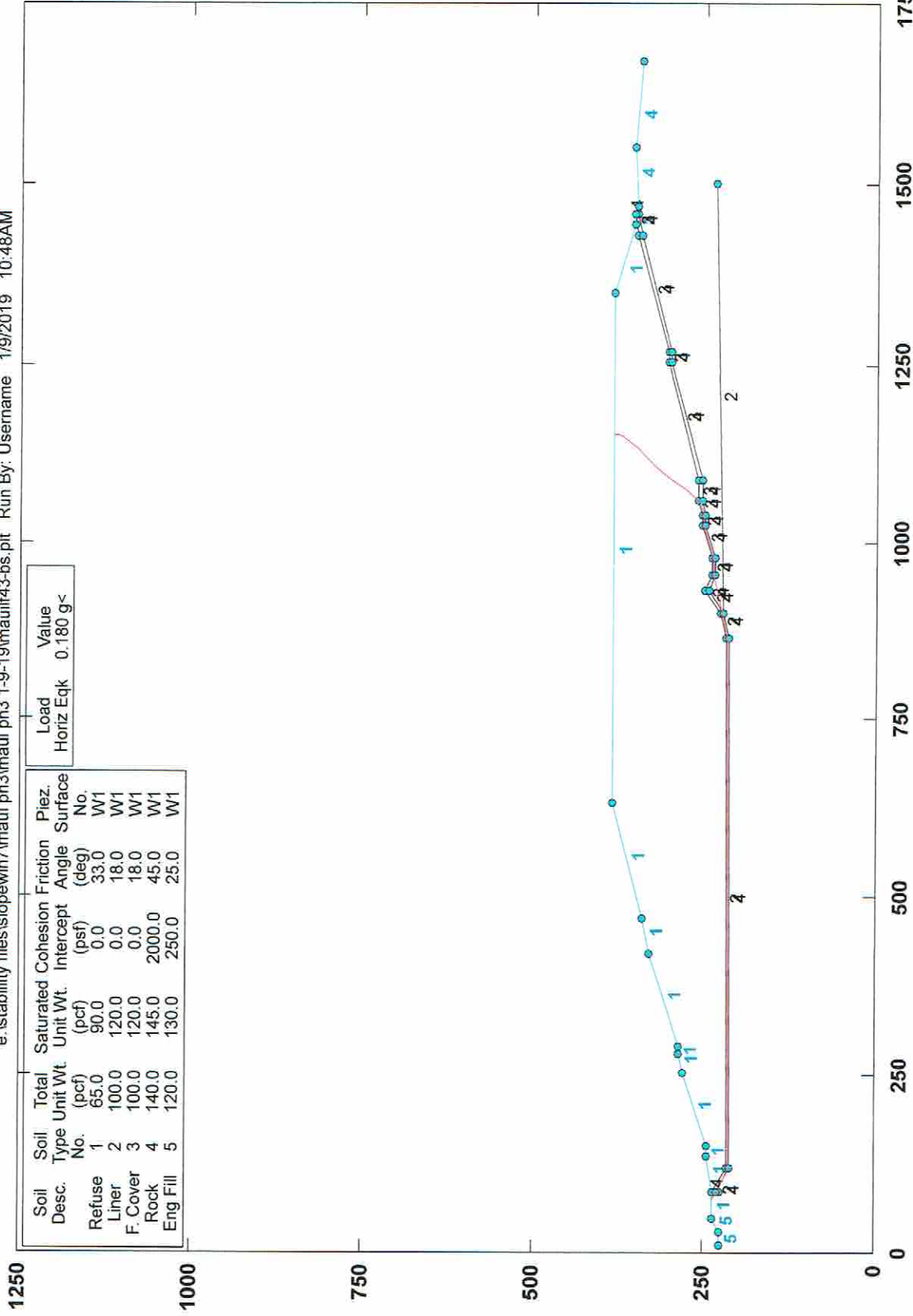
PCSTABL5M/si FSmin=3.84

Safety Factors Are Calculated By The Modified Janbu Method



CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\lopewin7\maui ph3 1-9-19\mauiif43-bs.plt Run By: Username 1/9/2019 10:48AM

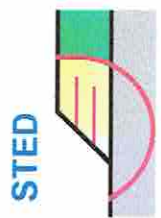


Load	Value
Horiz Eqk	0.180 g<

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

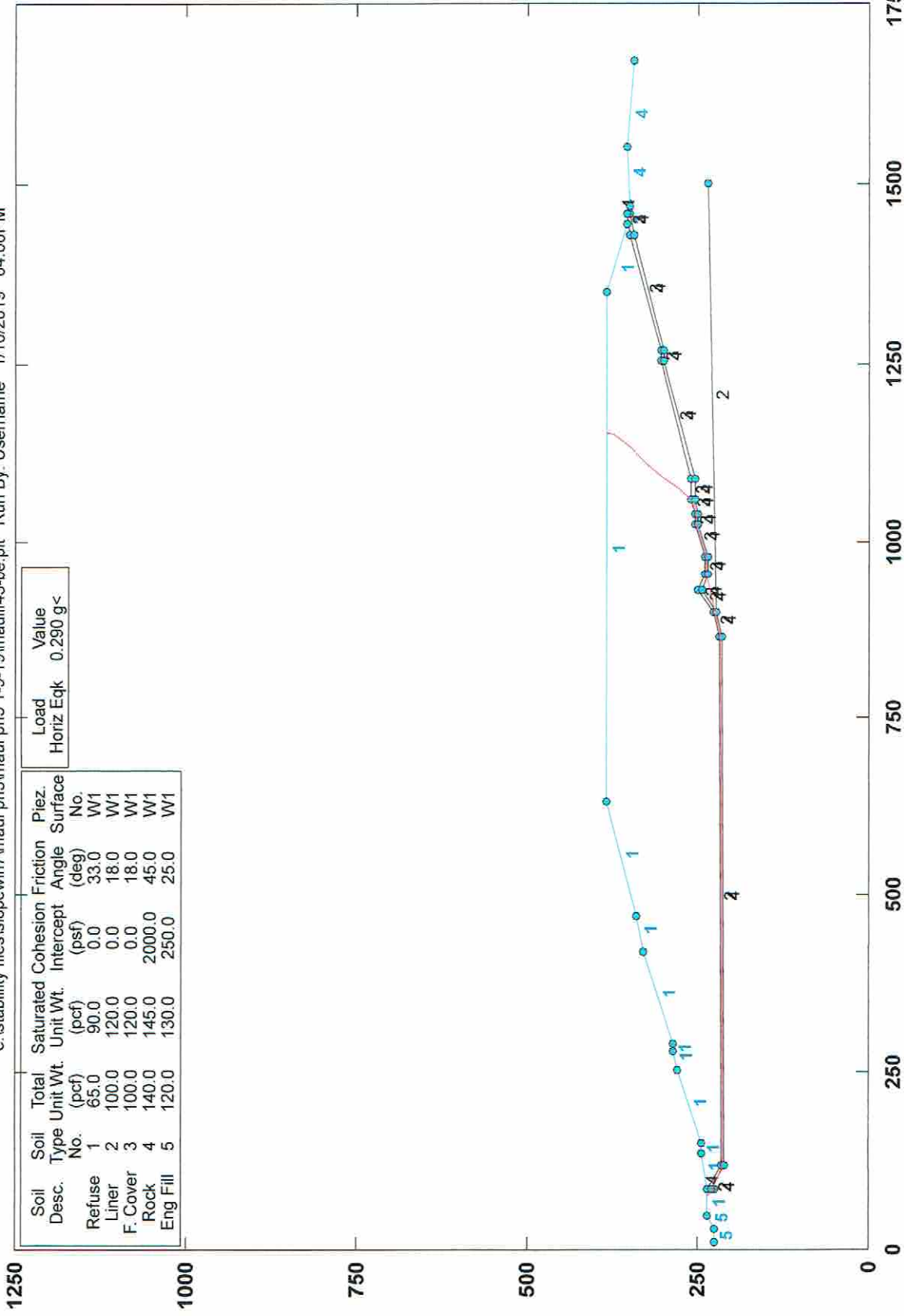
PCSTABL5M/si FSmin=1.41

Factors of Safety Calculated by Janbu Method

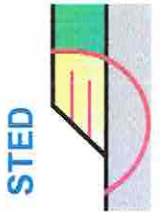


CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\mauil43-be.plt Run By: Username 1/10/2019 04:00PM

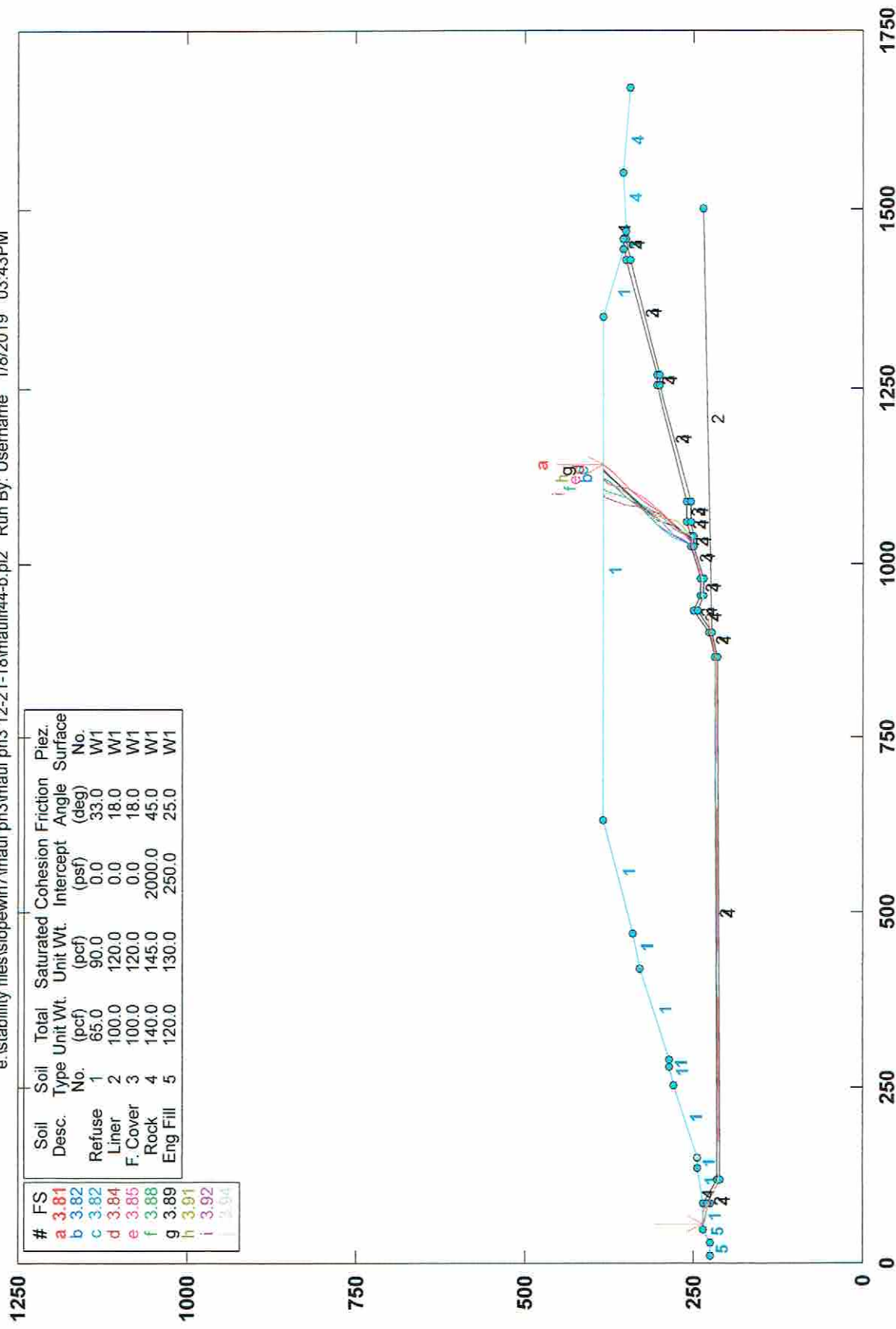


PCSTABL5M/si FSmin=1.00
Factors of Safety Calculated by Janbu Method



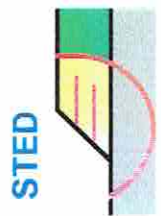
CML - ph III Slope Stab. Section III-S4 Static

e:\stability files\slopewin7\maui ph3 12-21-18\mauil44-b.pl2 Run By: Username 1/8/2019 03:43PM



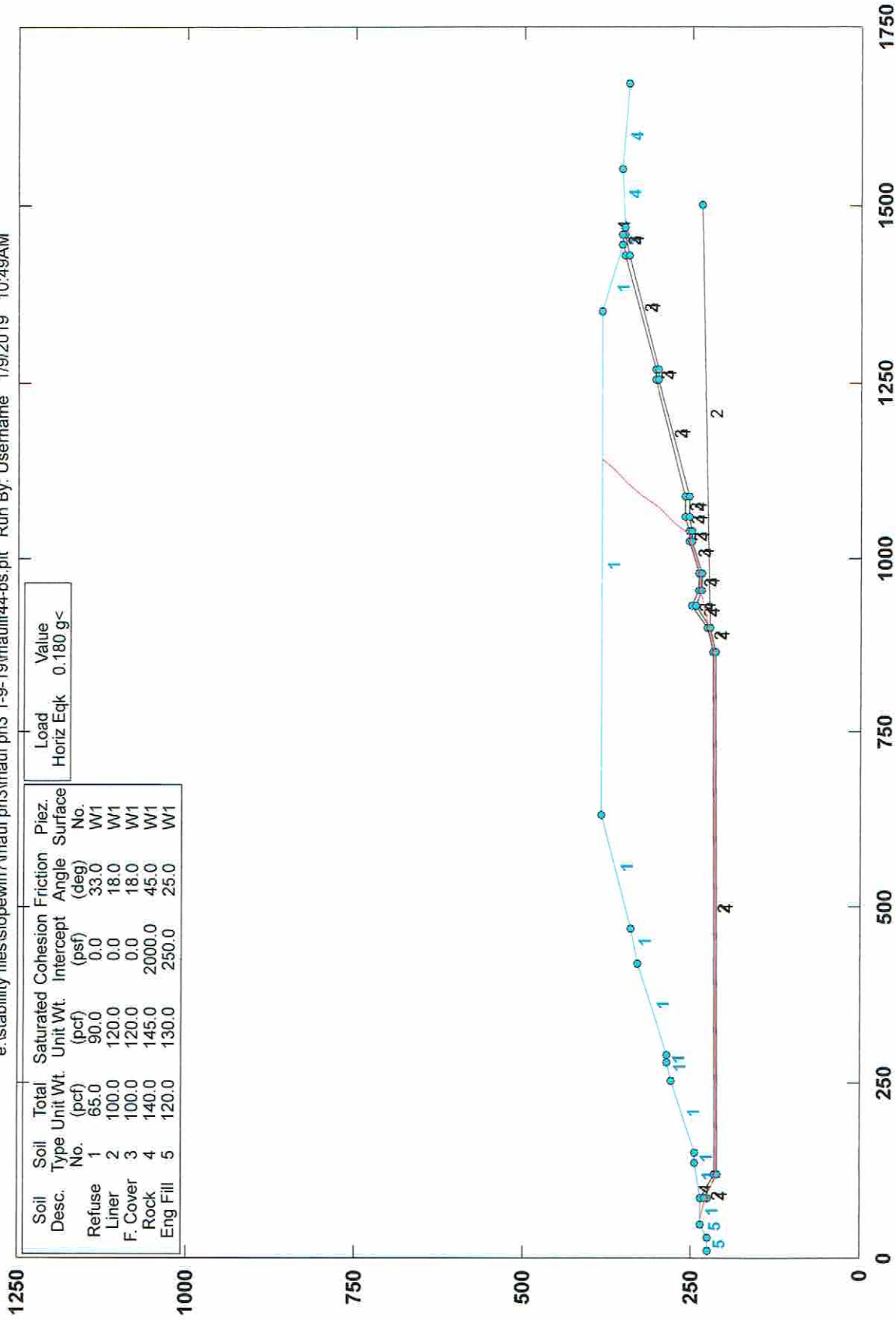
PCSTABL5M/si FSmin=3.81

Safety Factors Are Calculated By The Modified Janbu Method



CML - ph III Slope Stab. Section III-S4 Pseudo-Static

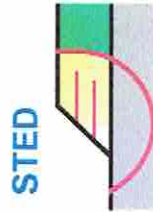
e:\stability files\lopewin7\maui ph3\maui ph3 1-9-19\mauiif44-bs.plt Run By: Useername 1/9/2019 10:49AM



Load Value
Horiz Eqk 0.180 g<

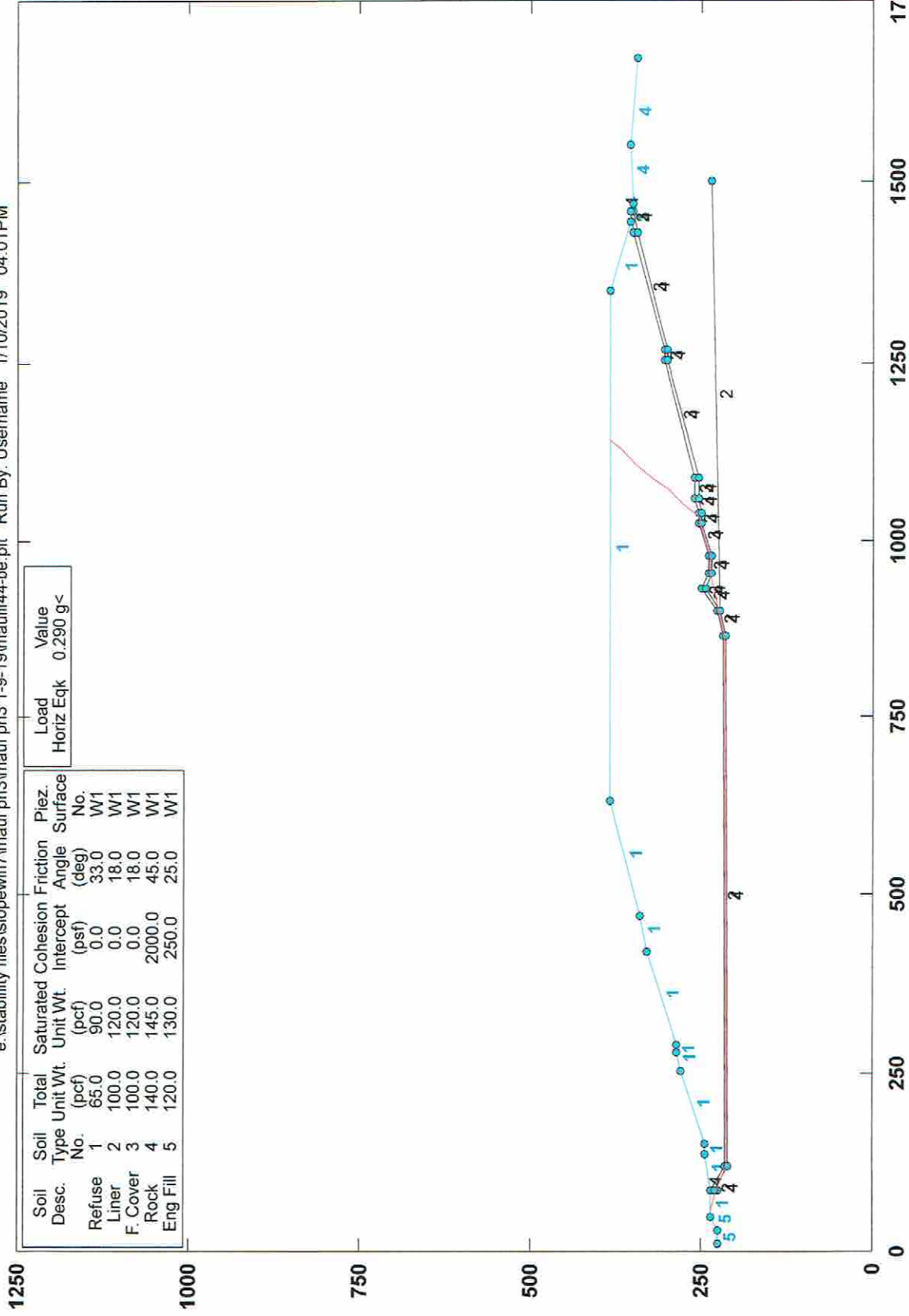
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	2500.0	25.0	W1

PCSTABL5M/si FSmin=1.41
Factors of Safety Calculated by Janbu Method

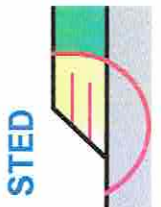


CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\stability7\maui ph3 1-9-19\maui44-be.plt Run By: Username 1/10/2019 04:01PM

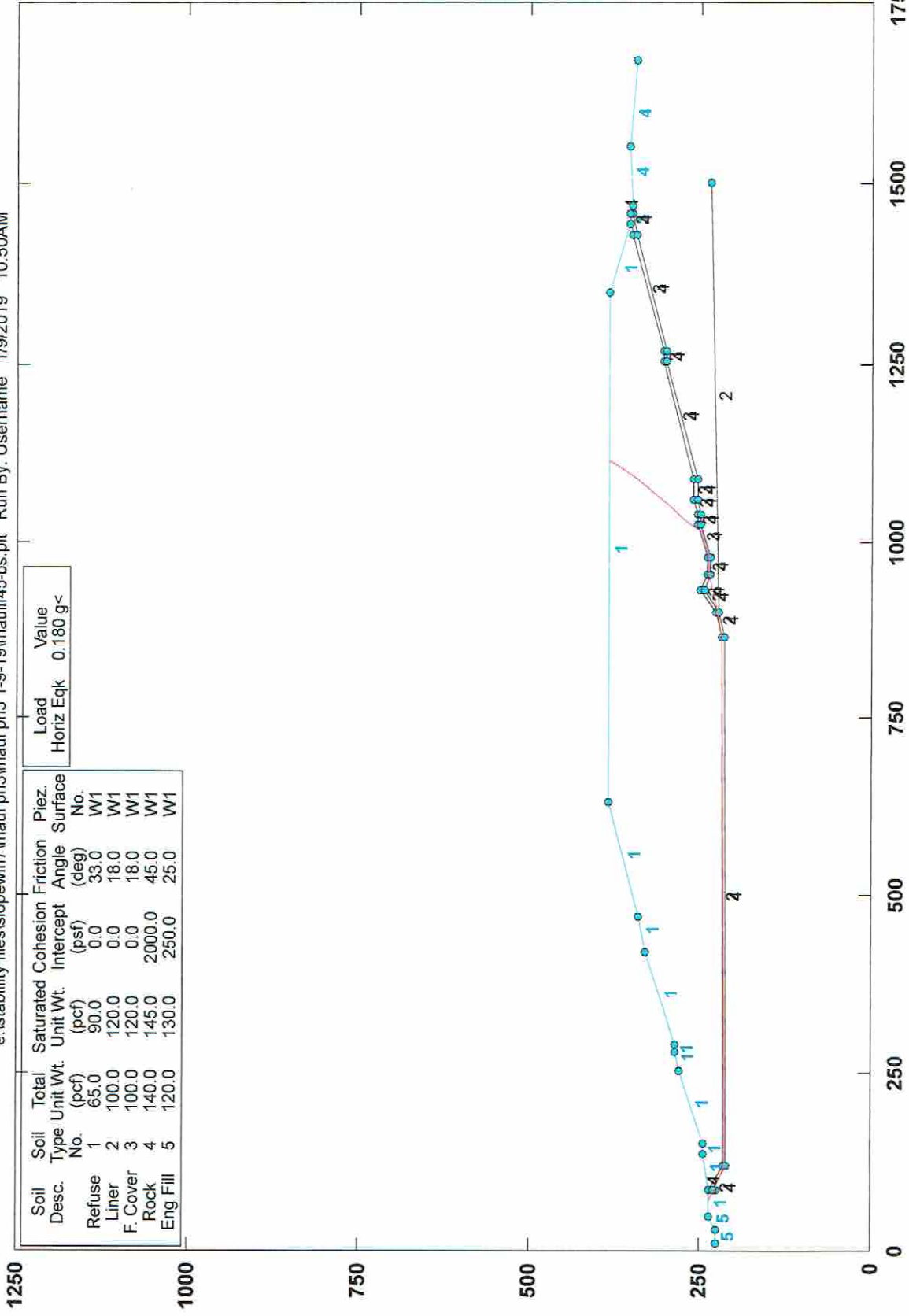


PCSTABL5M/si FSmin=1.00
Factors of Safety Calculated by Janbu Method

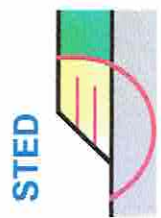


CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\mauiif45-bs.plt Run By: Username 1/9/2019 10:50AM

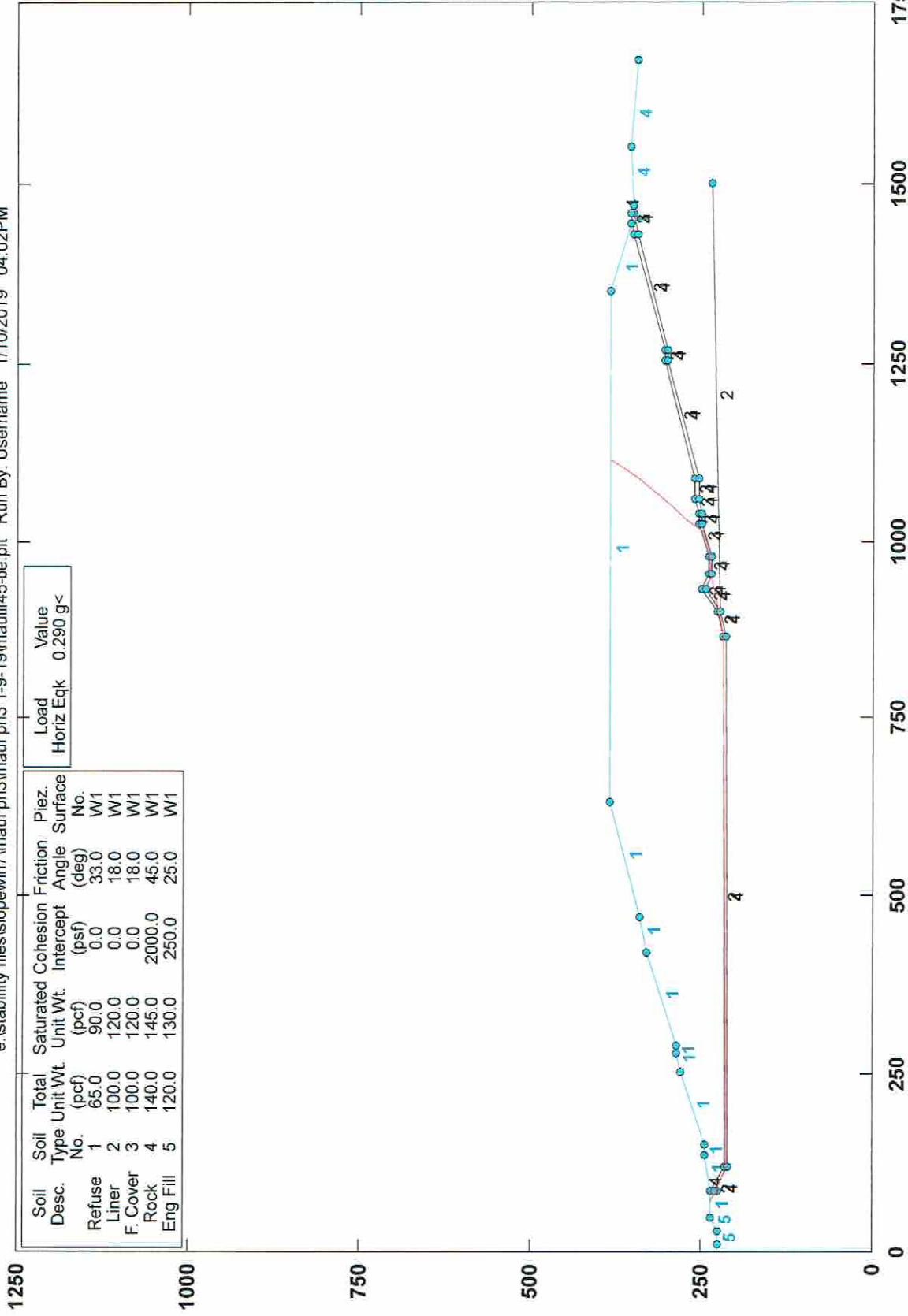


PCSTABL5M/si FSmin=1.42
Factors of Safety Calculated by Janbu Method



CML - ph III Slope Stab. Section III-S4 Pseudo-Static

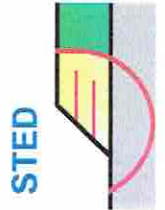
e:\stability files\stability\7\maui ph3 1-9-19\mauil45-be.plt Run By: Username 1/10/2019 04:02PM



Load Value
Horiz Eqk 0.290 g<

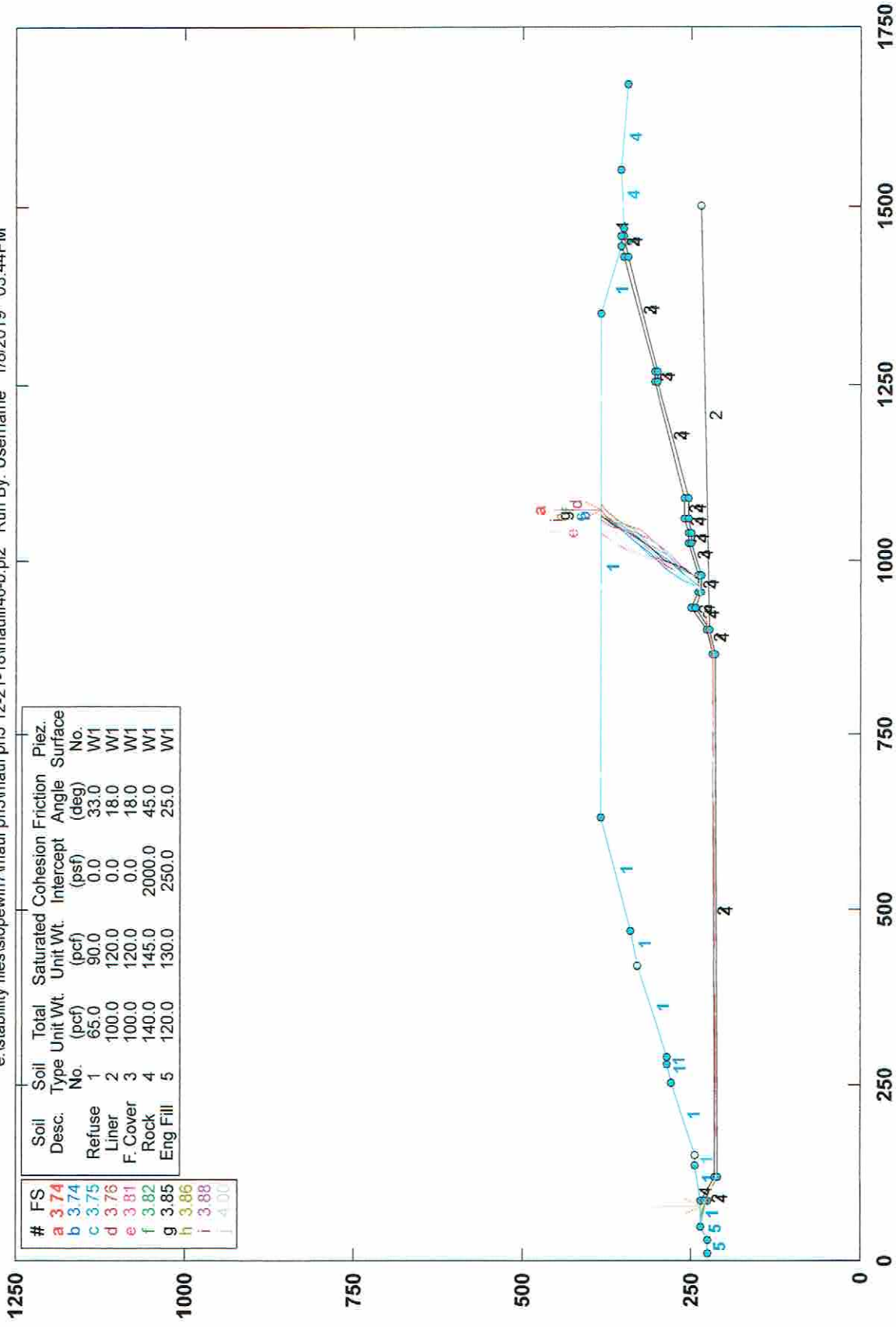
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	2500.0	25.0	W1

PCSTABL5M/si FSmin=1.01
Factors of Safety Calculated by Janbu Method



CML - ph III Slope Stab. Section III-S4 Static

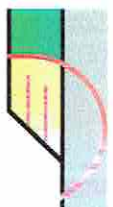
e:\stability files\stlopin7\maui ph3\maui ph3\12-21-18\mauif46-b.pl2 Run By: Username 1/8/2019 03:44PM



PCSTABL5M/si FSmin=3.74

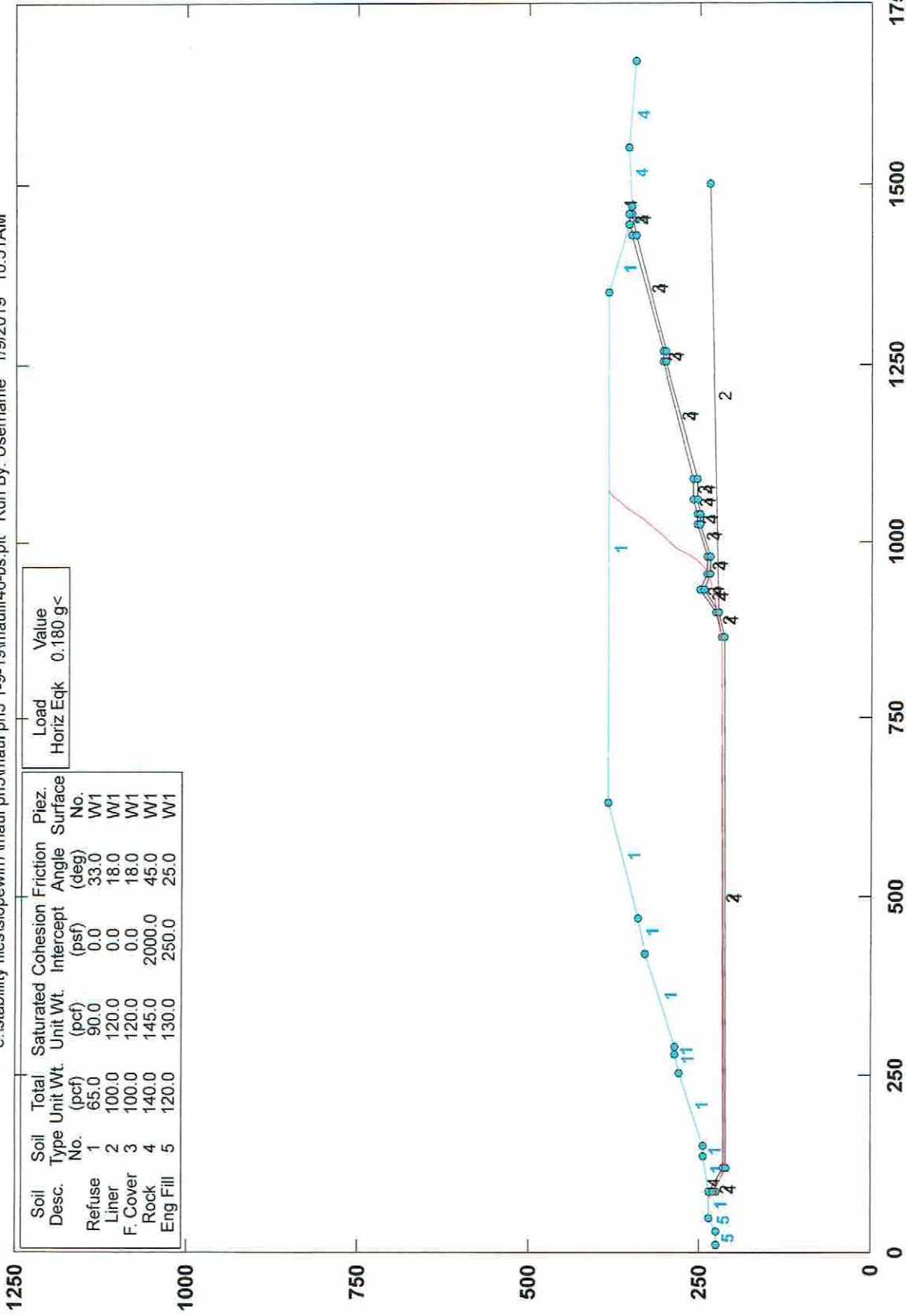
Safety Factors Are Calculated By The Modified Janbu Method

STED



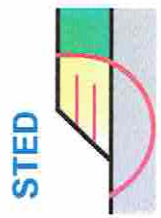
CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\stability\maui ph3\maui ph3 1-9-19\mauiif46-bs.plt Run By: Username 1/9/2019 10:51AM



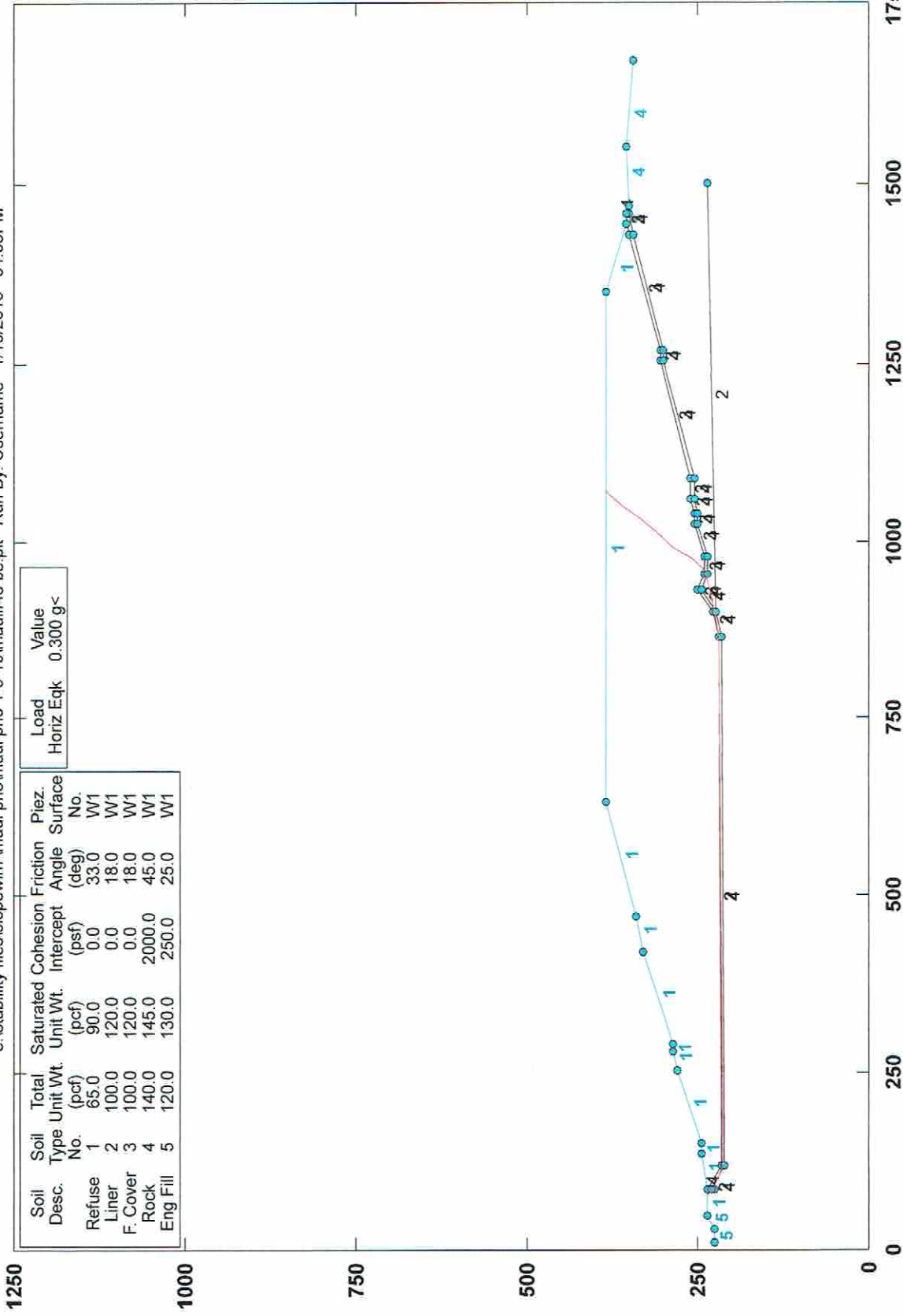
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	2500.0	25.0	W1

PCSTABL5M/si FSmin=1.44
Factors of Safety Calculated by Janbu Method



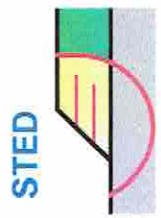
CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\mauil46-be.plt Run By: Username 1/10/2019 04:03PM



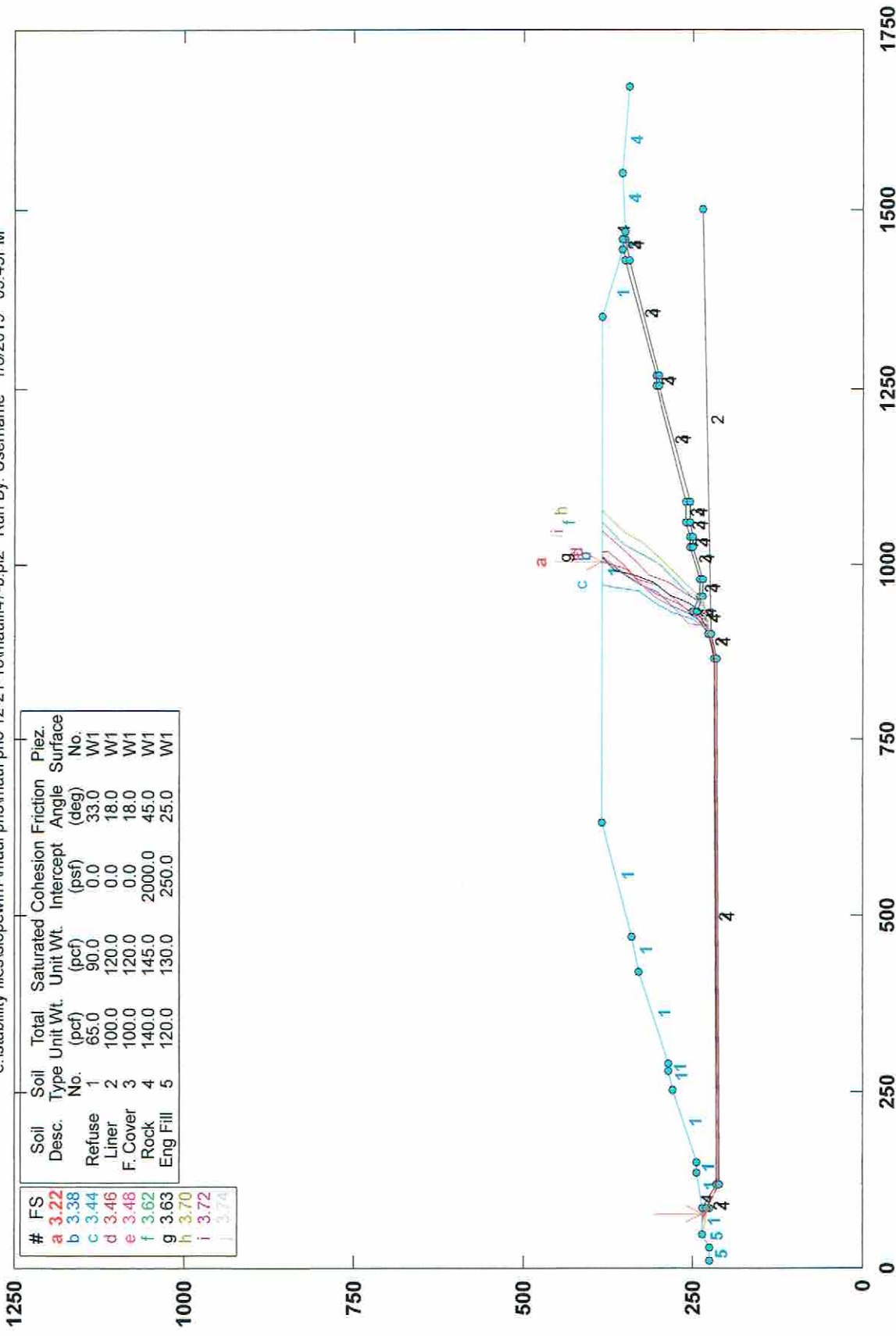
Load	Value
Horiz Eqk	0.300 g<

PCSTABL5M/si FSmin=1.00
Factors of Safety Calculated by Janbu Method



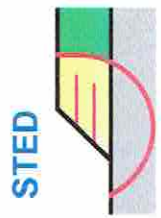
CML - ph III Slope Stab. Section III-S4 Static

e:\stability files\slopewin7\maui ph3 12-21-18\mauil47-b.pl2 Run By: Username 1/8/2019 03:45PM



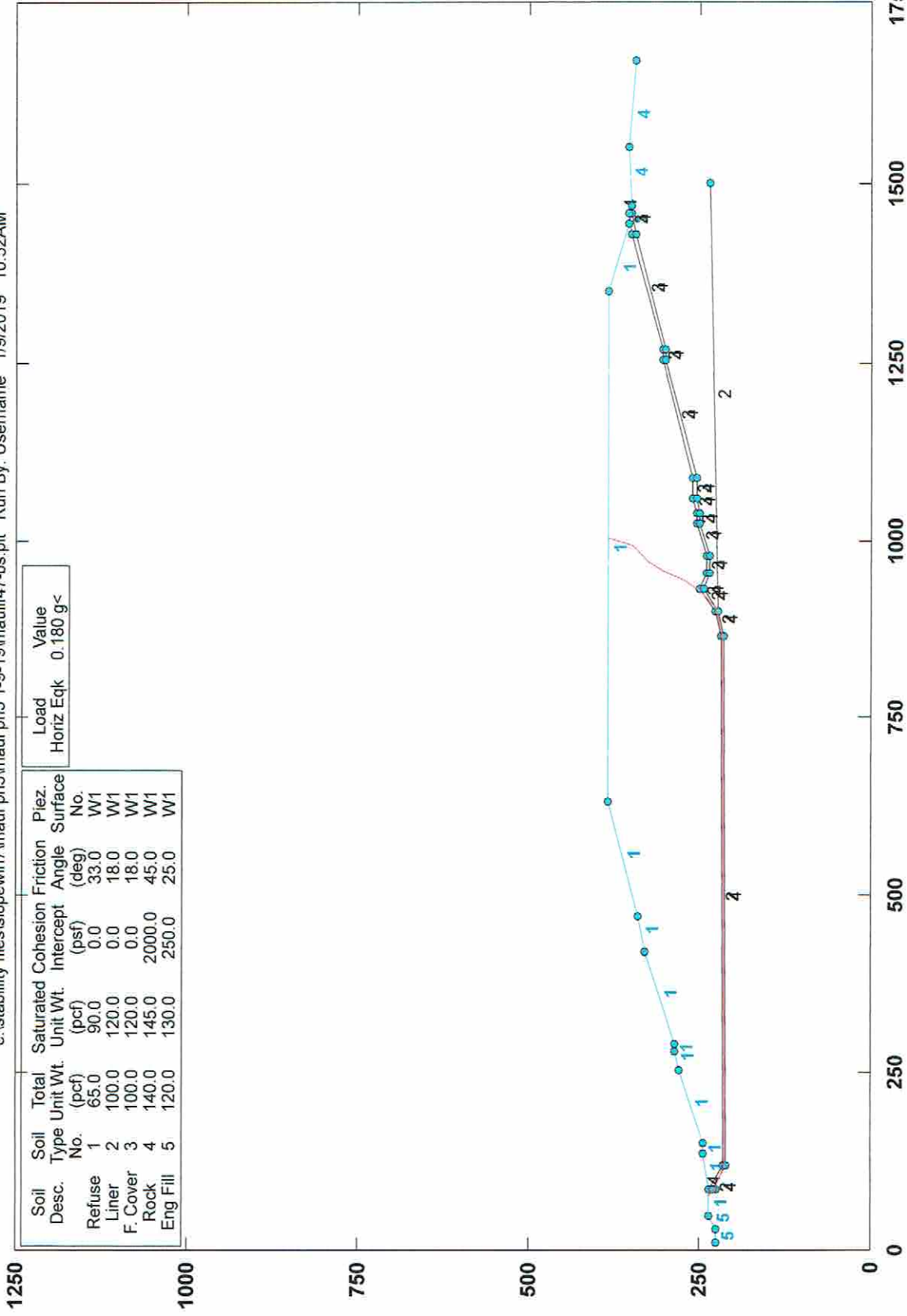
PCSTABL5M/si FSmin=3.22

Safety Factors Are Calculated By The Modified Janbu Method



CML - ph III Slope Stab. Section III-S4 Pseudo-Static

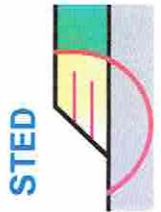
e:\stability files\slopewin7\maui ph3\1-9-19\mauil47-bs.plt Run By: Username 1/9/2019 10:52AM



Load	Value
Horiz Eqk	0.180 g<

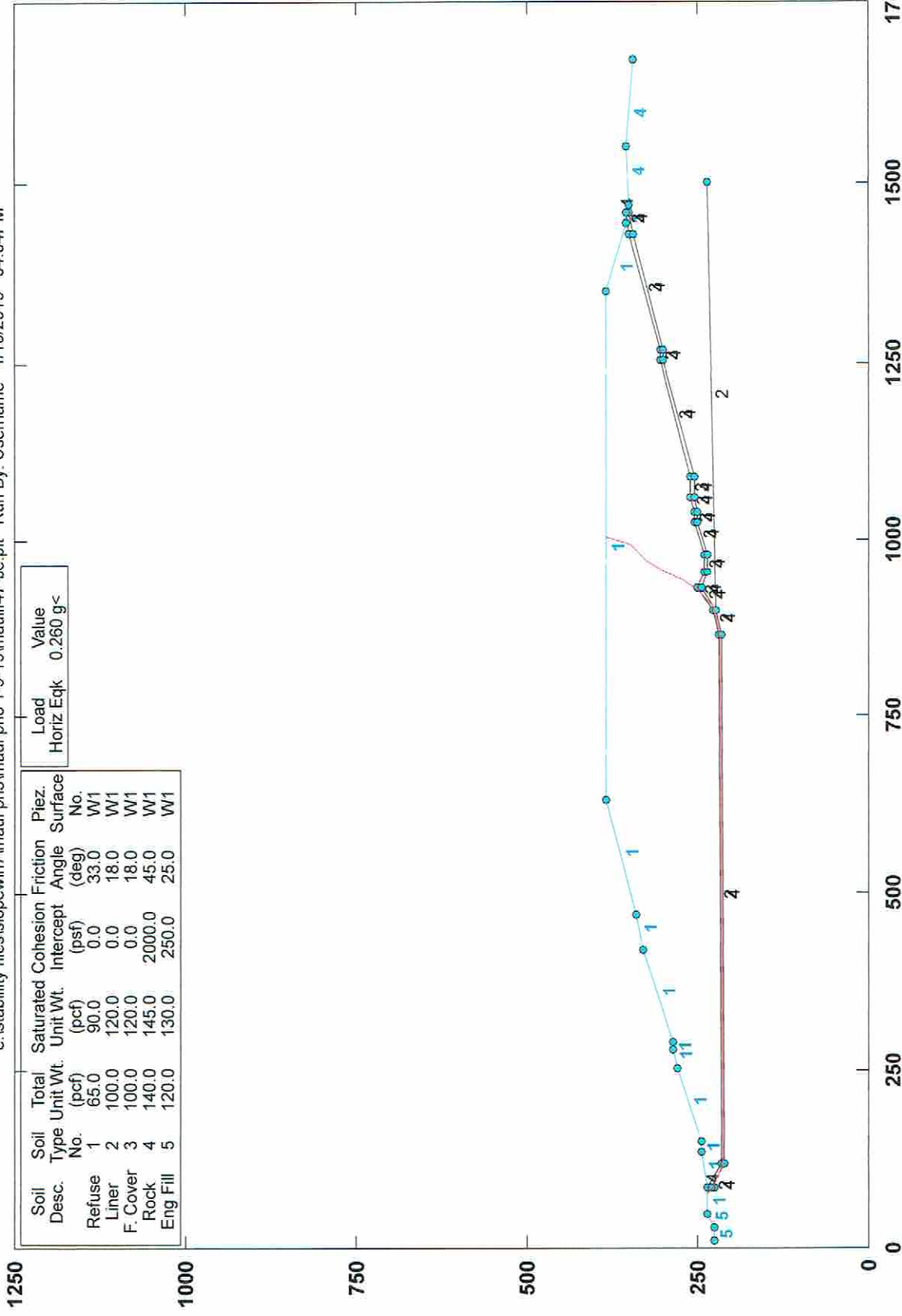
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	2500.0	25.0	W1

PCSTABL5M/si FSmin=1.28
Factors of Safety Calculated by Janbu Method



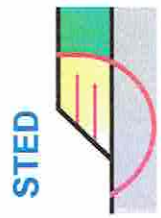
CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\islopewin7\maui ph3 1-9-19\mauilif47-be.plt Run By: Username 1/10/2019 04:04PM



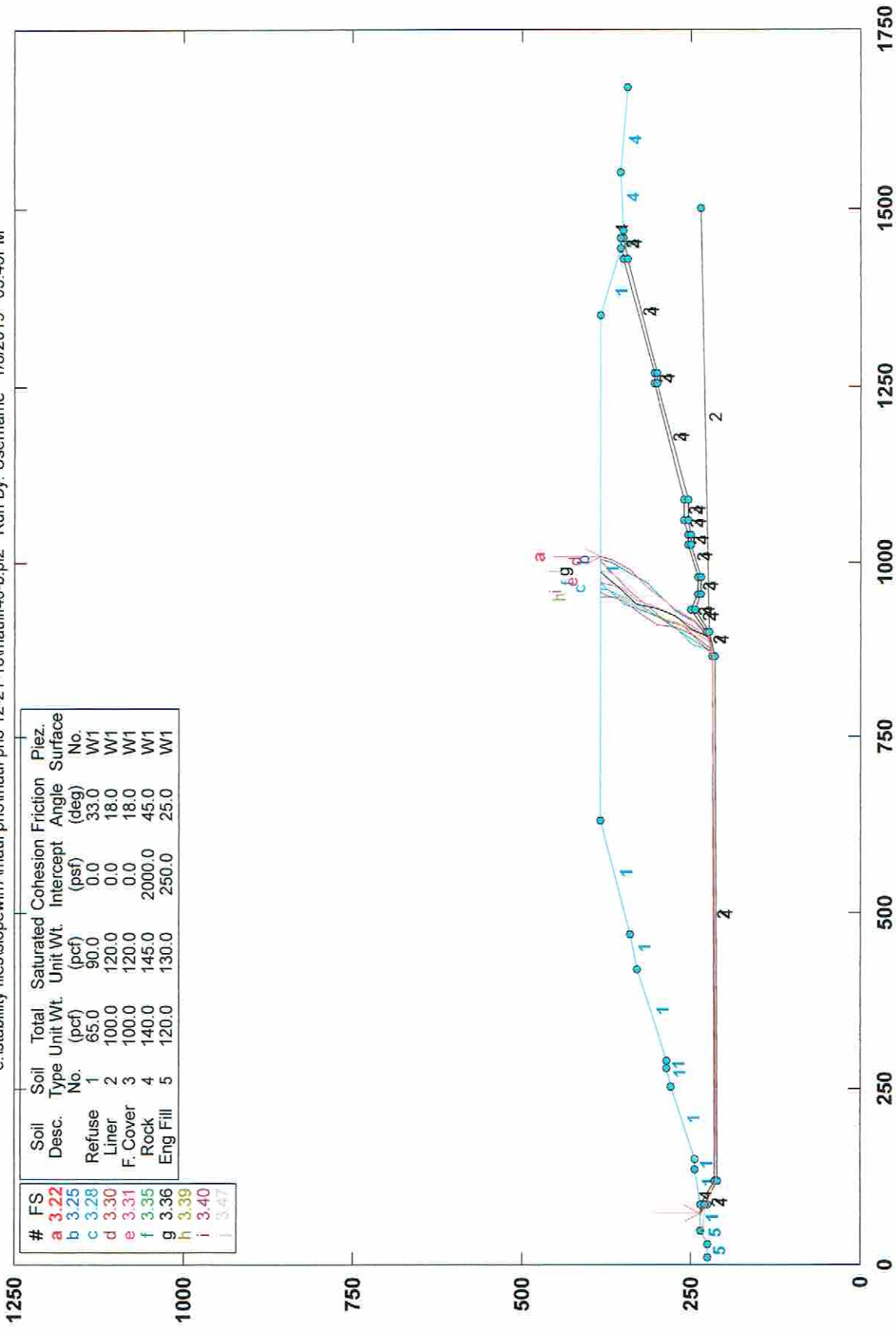
Load Value
Horiz Eqk 0.260 g<

PCSTABL5M/si FSmin=1.00
Factors of Safety Calculated by Janbu Method



CML - ph III Slope Stab. Section III-S4 Static

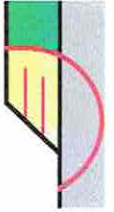
e:\stability files\slopewin7\maui ph3 12-21-18\mauil48-b.pl2 Run By: Username 1/8/2019 03:46PM



PCSTABL5M/si FSmin=3.22

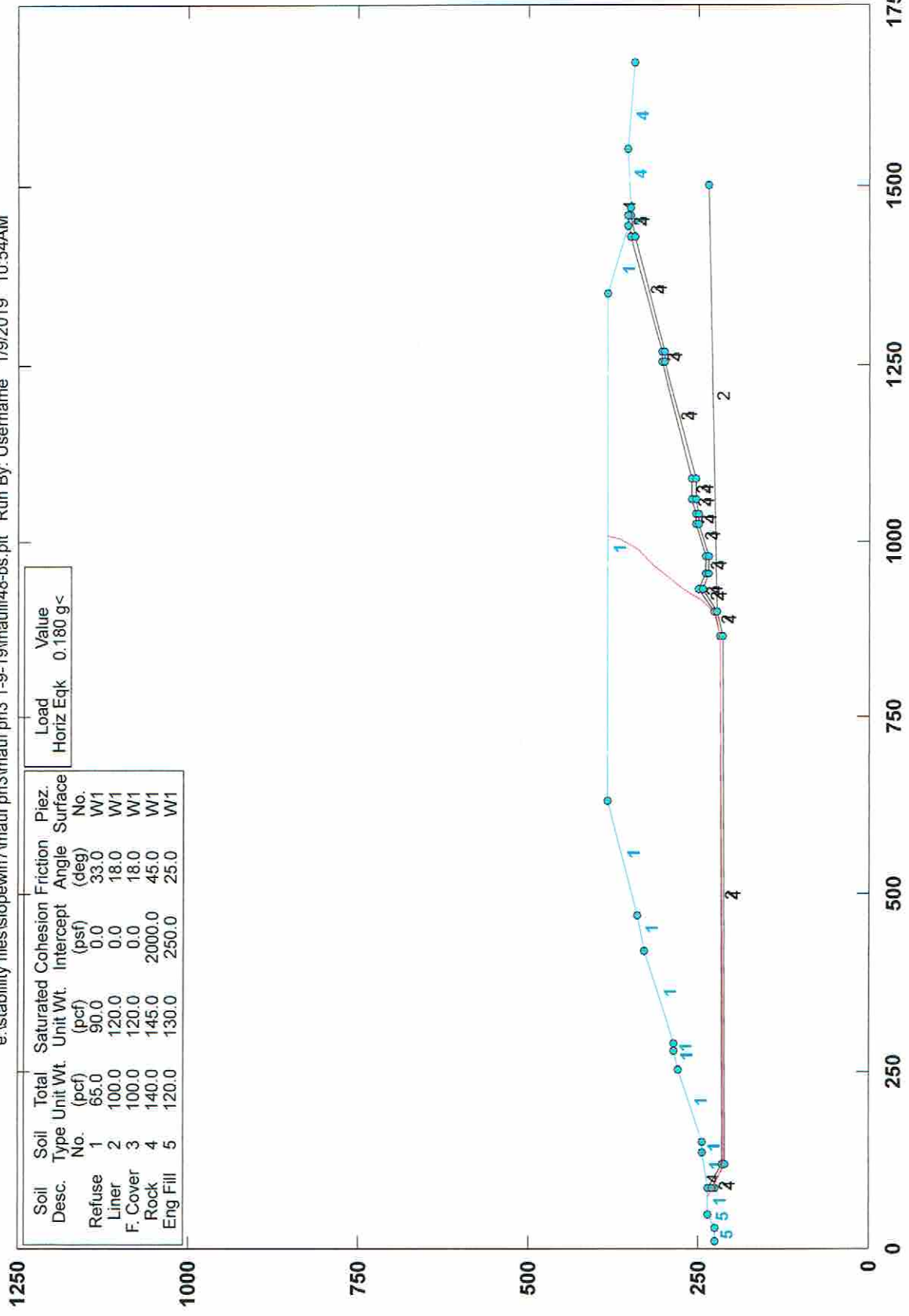
Safety Factors Are Calculated By The Modified Janbu Method

STED



CML - ph III Slope Stab. Section III-S4 Pseudo-Static

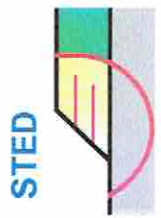
e:\stability files\slopewin7\maui ph3 1-9-19\mauil48-bs.plt Run By: Username 1/9/2019 10:54AM



Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

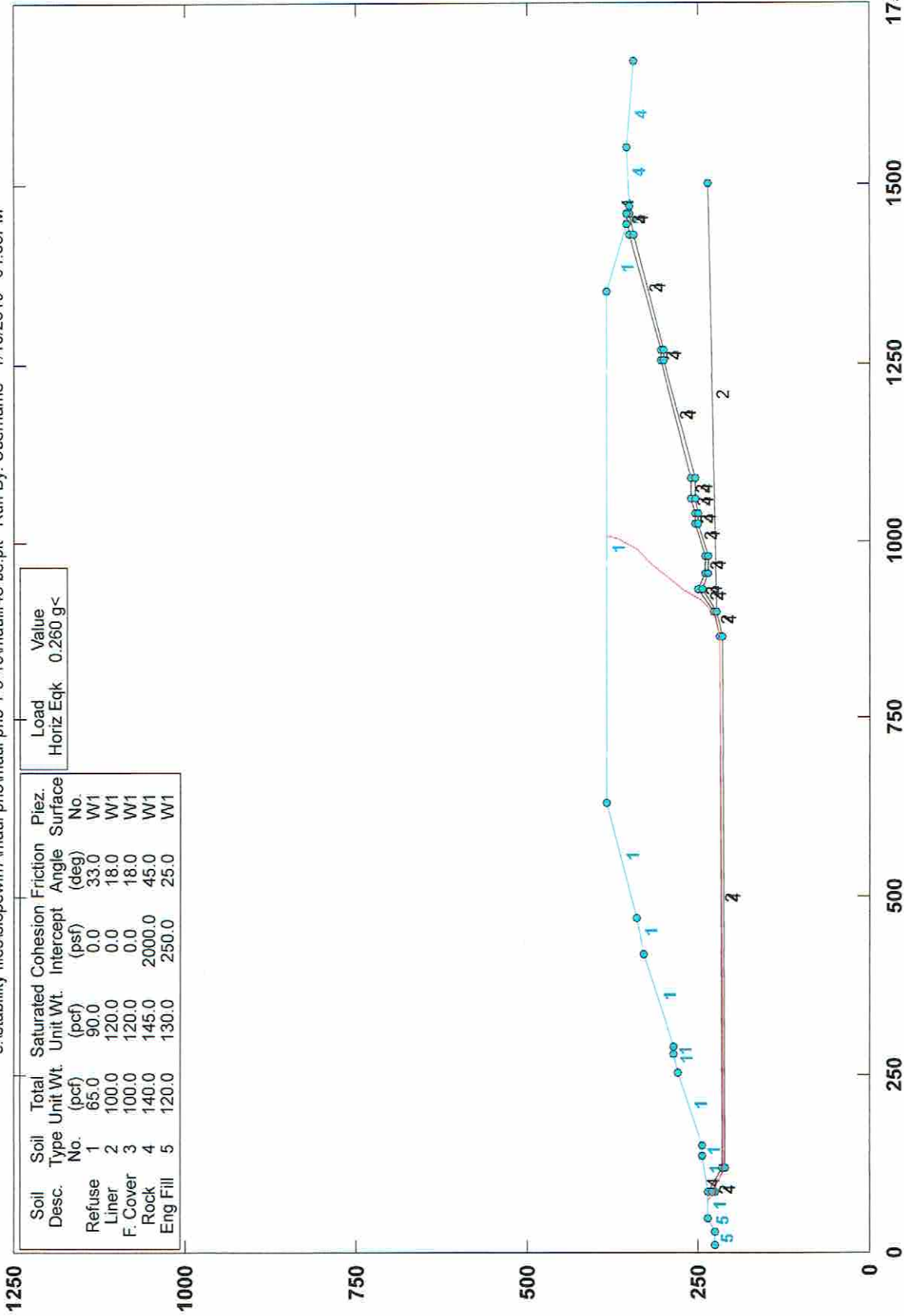
Load	Value
Horiz Eqk	0.180 g <

PCSTABL5M/si FSmin=1.28
Factors of Safety Calculated by Janbu Method

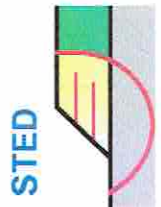


CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\maulif48-be.plt Run By: Username 1/10/2019 04:05PM

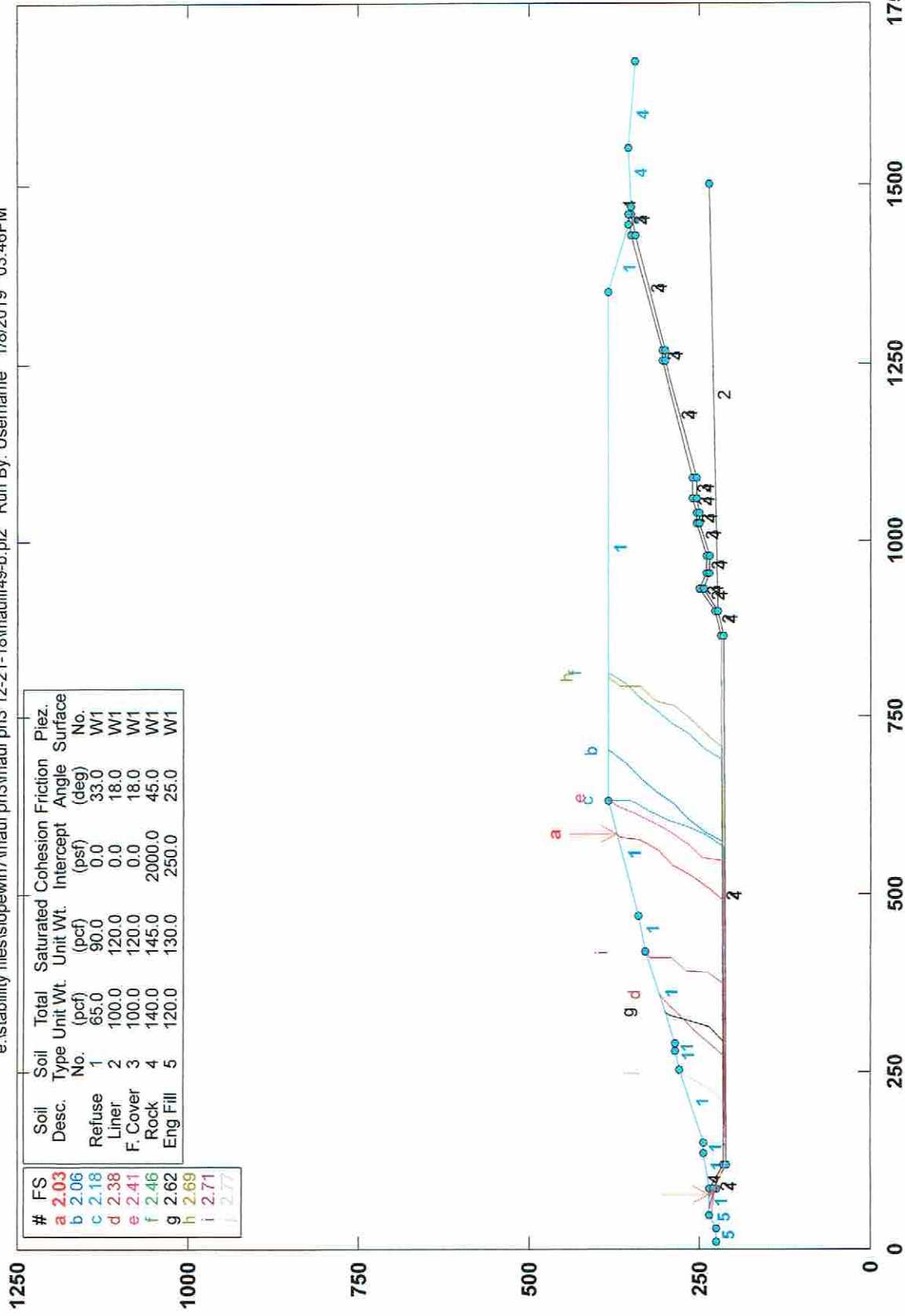


PCSTABL5M/si FSmin=1.00
Factors of Safety Calculated by Janbu Method



CML - ph III Slope Stab. Section III-S4 Static

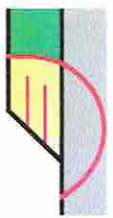
e:\stability files\slopewin7\maui ph3\maui ph3 12-21-18\maui49-b.pl2 Run By: Username 1/8/2019 03:46PM



PCSTABL5M/si FSmin=2.03

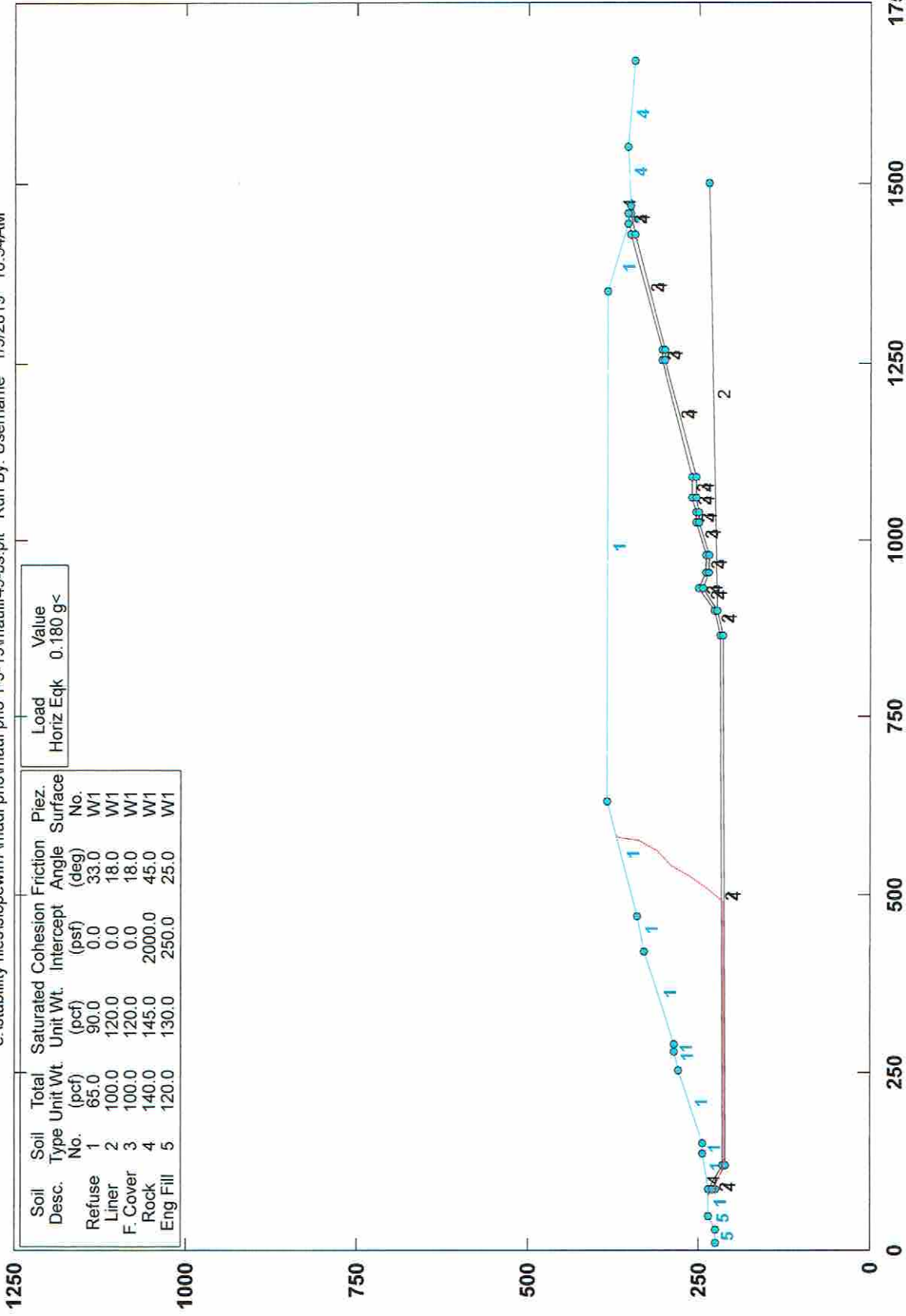
Safety Factors Are Calculated By The Modified Janbu Method

STED

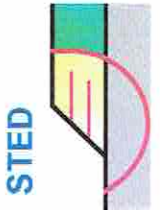


CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\stability\maui ph3 1-9-19\maui49-bs.plt Run By: Username 1/9/2019 10:54AM

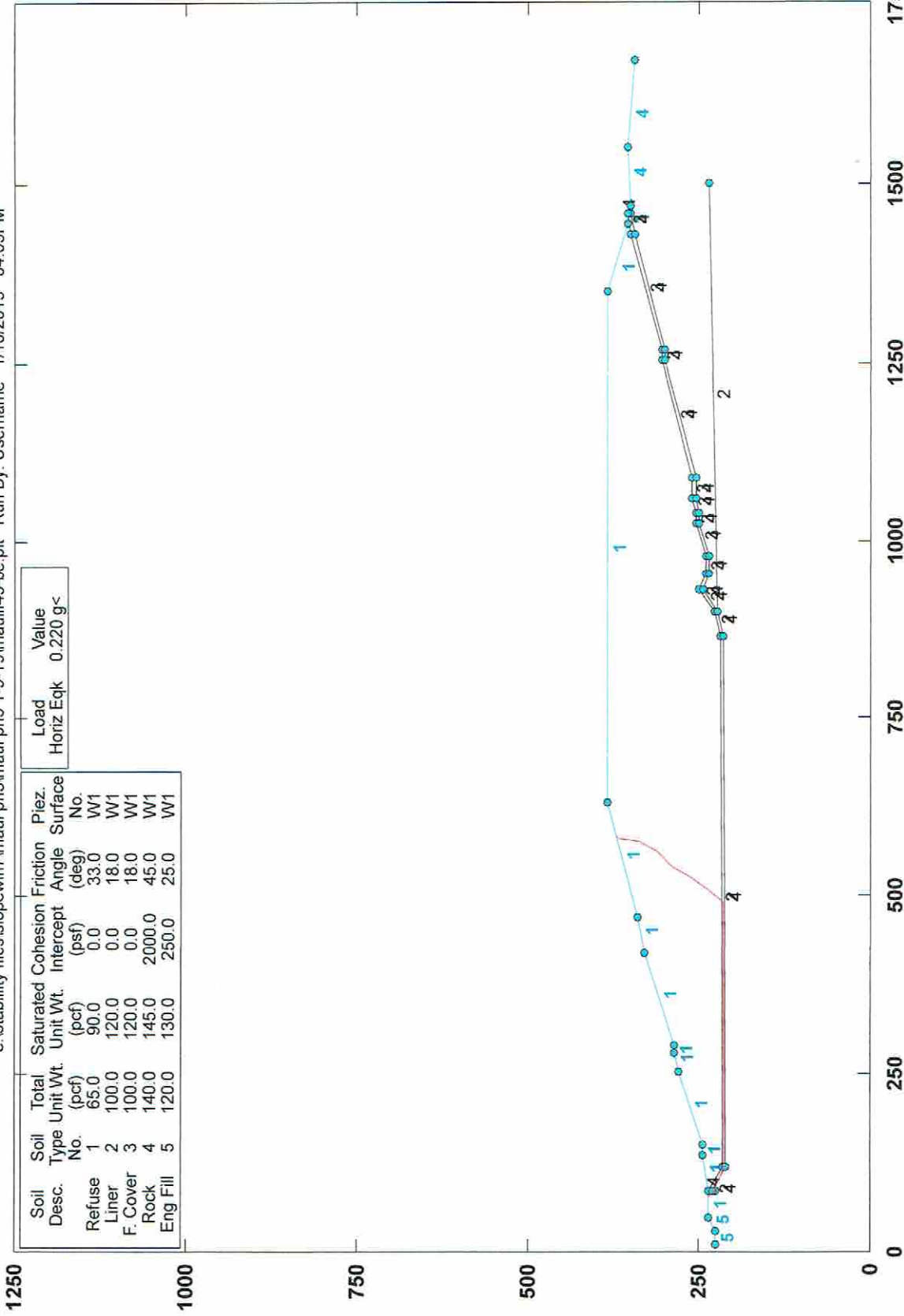


PCSTABLE5M/si FSmin=1.11
Factors of Safety Calculated by Janbu Method

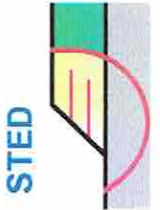


CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\slopewin7\maui ph3\maui ph3 1-9-19\mauil49-be.plt Run By: Username 1/10/2019 04:05PM

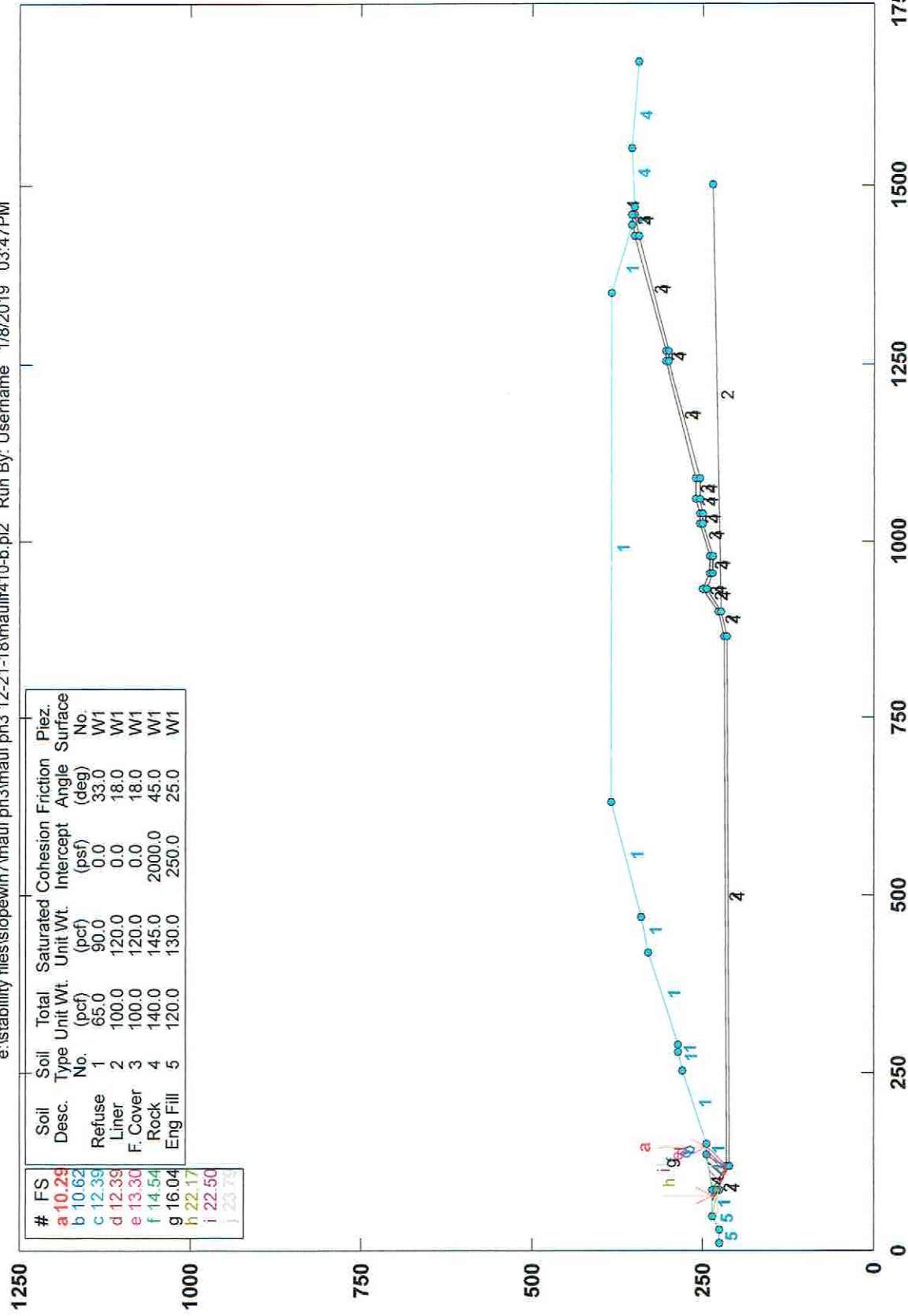


PCSTABL5M/si FSmin=1.01
Factors of Safety Calculated by Janbu Method



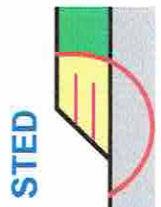
CML - ph III Slope Stab. Section III-S4 Static

e:\stability files\stopewin7\maui ph3\maui ph3 12-21-18\maui410-b.pl2 Run By: Username 1/8/2019 03:47PM



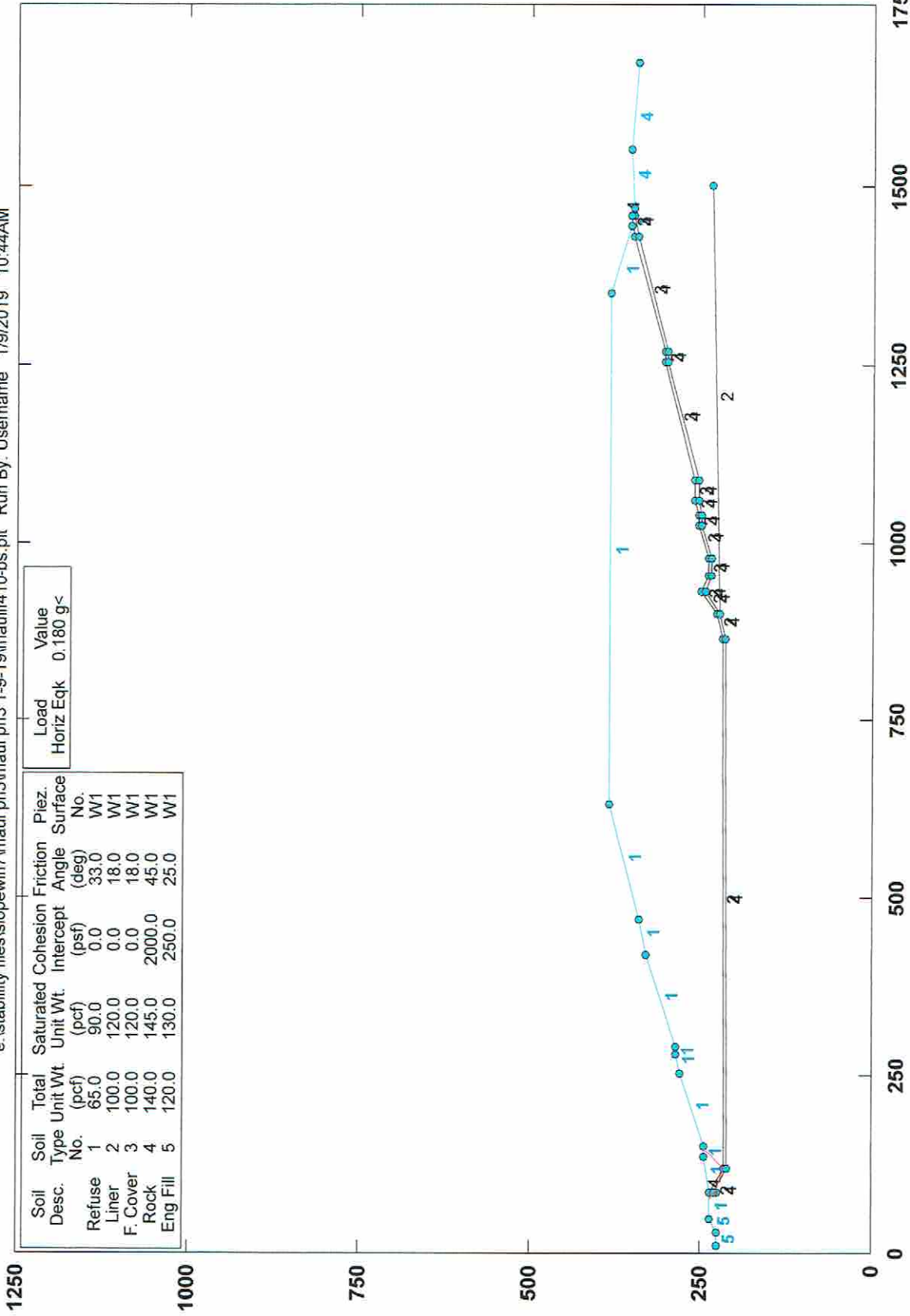
PCSTABL5M/si FSmin=10.29

Safety Factors Are Calculated By The Modified Janbu Method

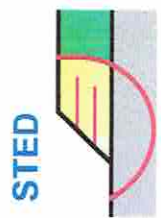


CML - ph III Slope Stab. Section III-S4 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\maui410-bs.plt Run By: Username 1/9/2019 10:44AM

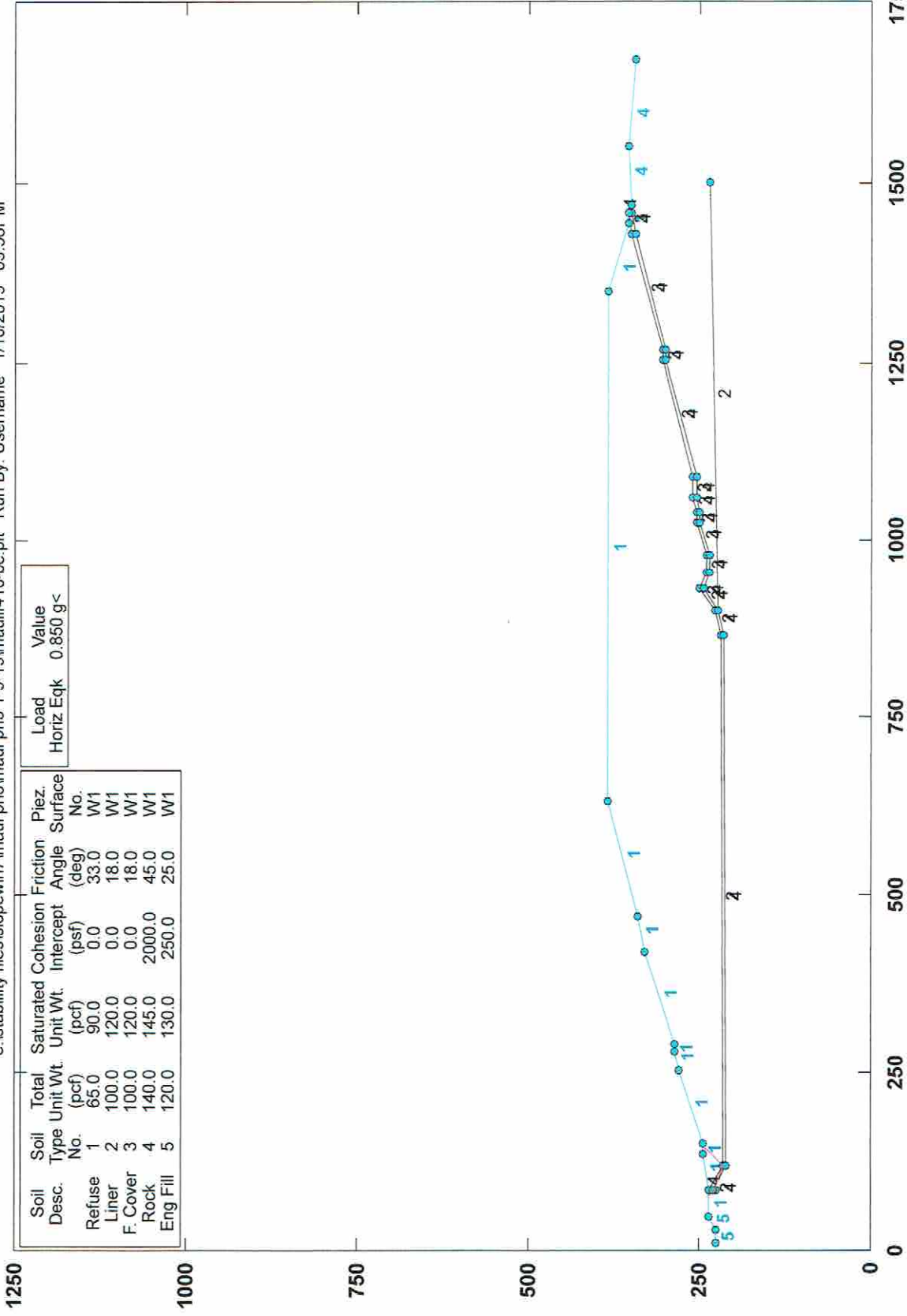


PCSTABL5M/si FSmin=4.37
Factors of Safety Calculated by Janbu Method



CML - ph III Slope Stab. Section III-S4 Pseudo-Static

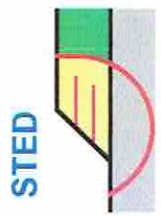
e:\stability files\slopewin7\maui ph3 1-9-19\maui410-be.plt Run By: Username 1/10/2019 03:56PM



Load	Value
Horiz Eqk	0.850 g<

PCSTABL5M/si FSmin=1.51

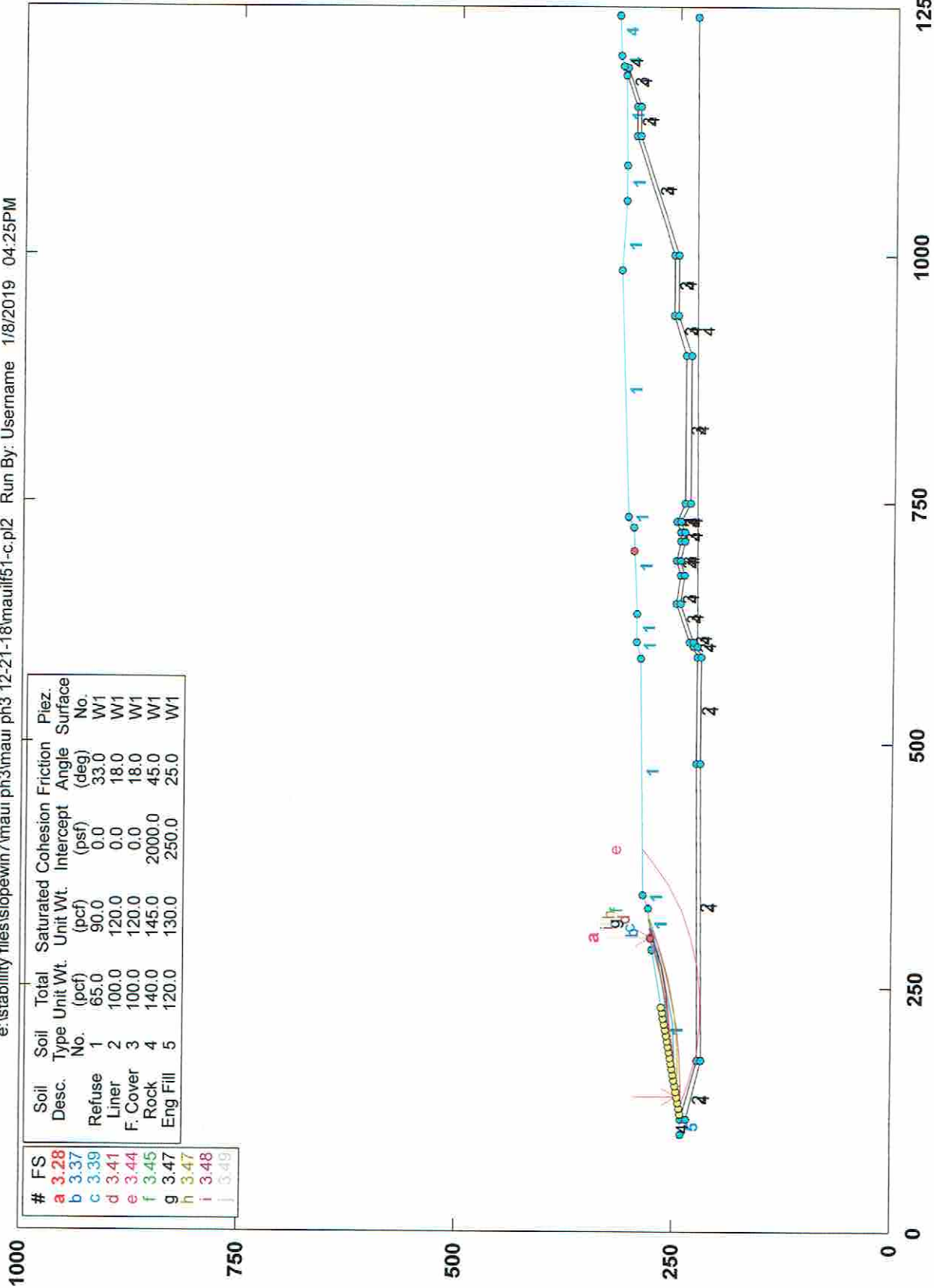
Factors of Safety Calculated by Janbu Method



**CROSS SECTION
III-S5**

CML - ph III Slope Stab. Section III-S5 Static

e:\stability files\slopewin7\maui ph3\maui ph3 12-21-18\mauil51-c.pl2 Run By: Username 1/8/2019 04:25PM

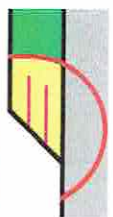


Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Intercept (psf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	0.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	0.0	25.0	W1

PCSTABL5M/si FSmin=3.28

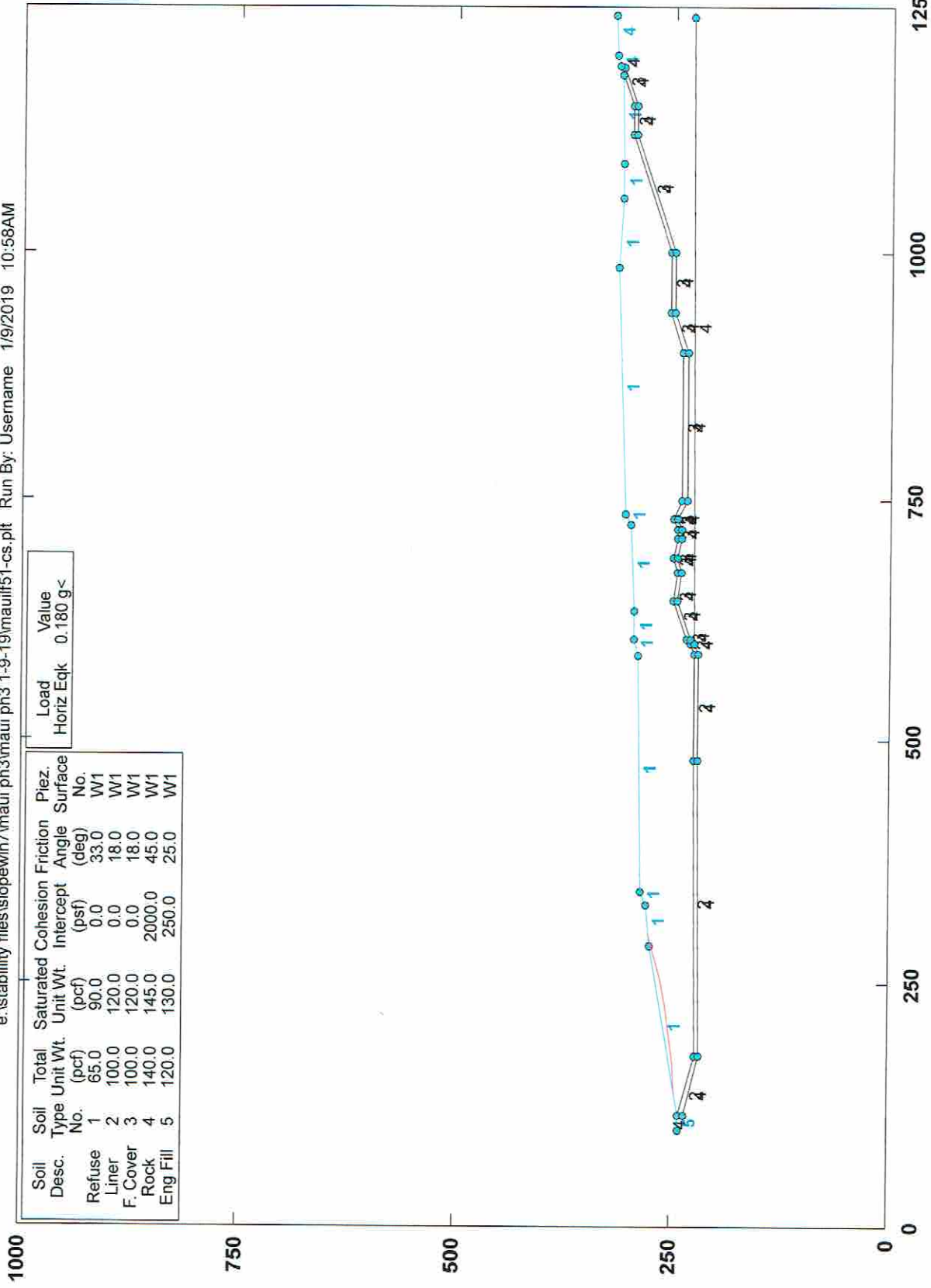
Safety Factors Are Calculated By The Modified Bishop Method

STED



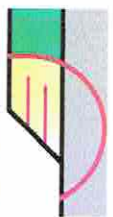
CML - ph III Slope Stab. Section III-S5 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\mauiff51-cs.plt Run By: Username 1/9/2019 10:58AM



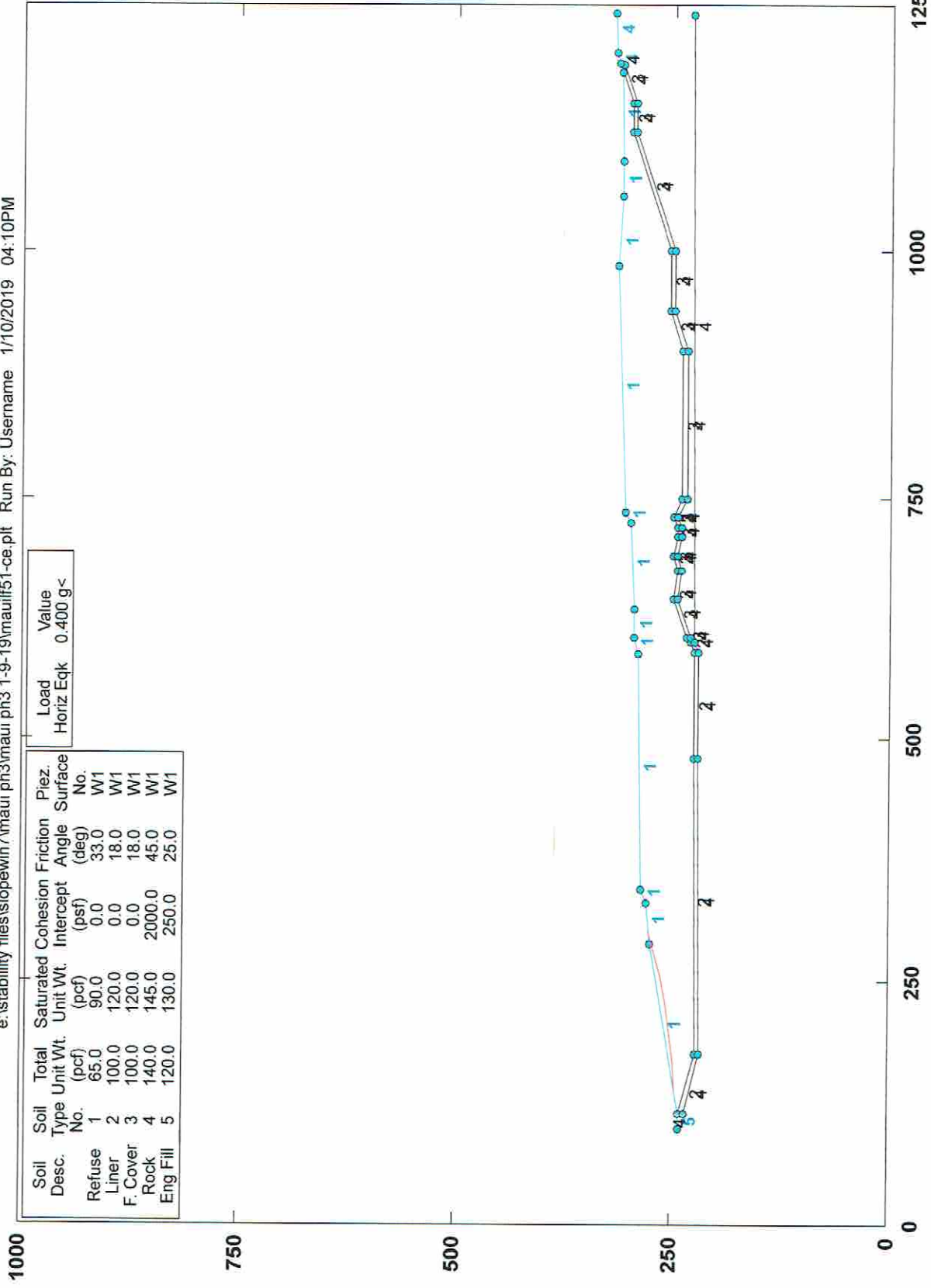
PCSTABL5M/si FSmin=1.66
Factor Of Safety Is Calculated By The Modified Bishop Method

STED



CML - ph III Slope Stab. Section III-S5 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\mauil51-ce.plt Run By: Username 1/10/2019 04:10PM



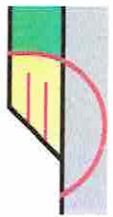
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Intercept (psf)	Cohesion (pcf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	0.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	250.0	25.0	W1

Load Horiz Eqk	Value
0.400 g <	0.400 g <

PCSTABL5M/si FSmin=1.01

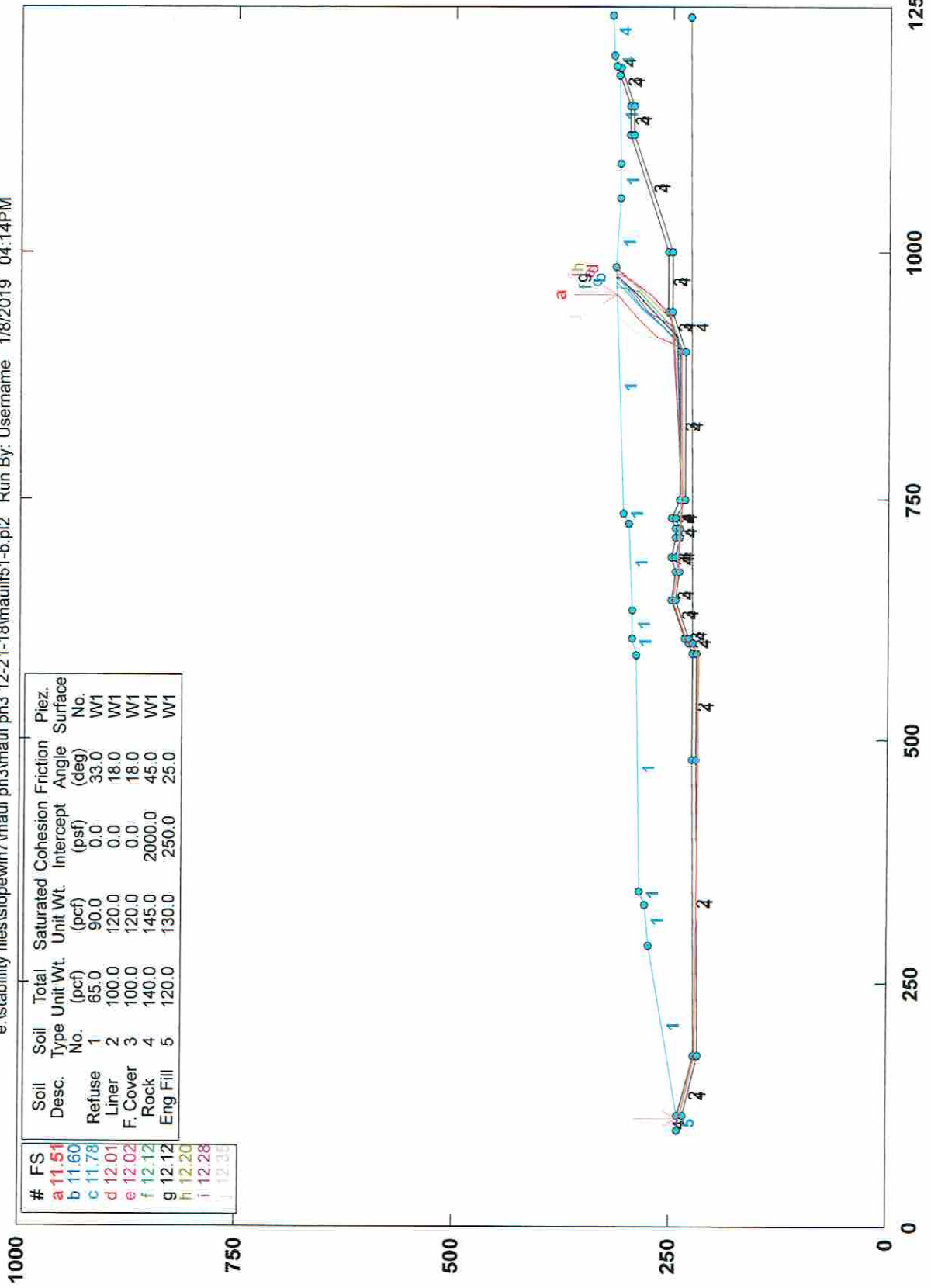
Factor Of Safety is Calculated By The Modified Bishop Method

STED



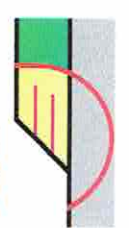
CML - ph III Slope Stab. Section III-S5 Static

e:\stability files\lopewin7\maui ph3\maui ph3 12-21-18\maui51-b.pl2 Run By: Userame 1/8/2019 04:14PM



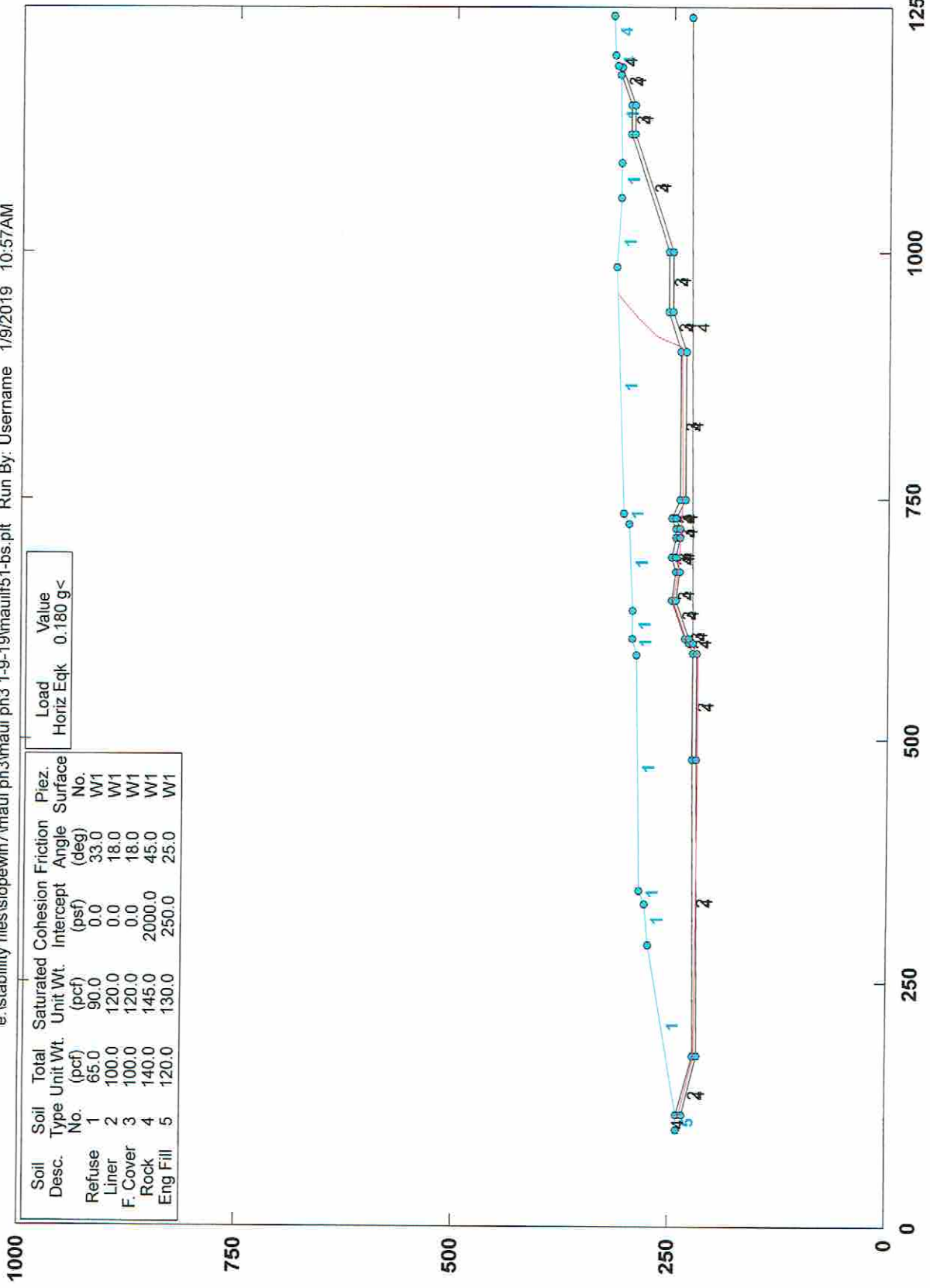
PCSTABL5M/si FSmin=11.51
Safety Factors Are Calculated By The Modified Janbu Method

STED



CML - ph III Slope Stab. Section III-S5 Pseudo-Static

e:\stability files\slopewin7\maui ph3\maui ph3 1-9-19\maulif51-bs.plt Run By: Username 1/9/2019 10:57AM



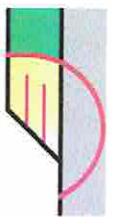
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

Load	Value
Horiz Eqk	0.180 g<

PCSTABL5M/si FSmin=3.23

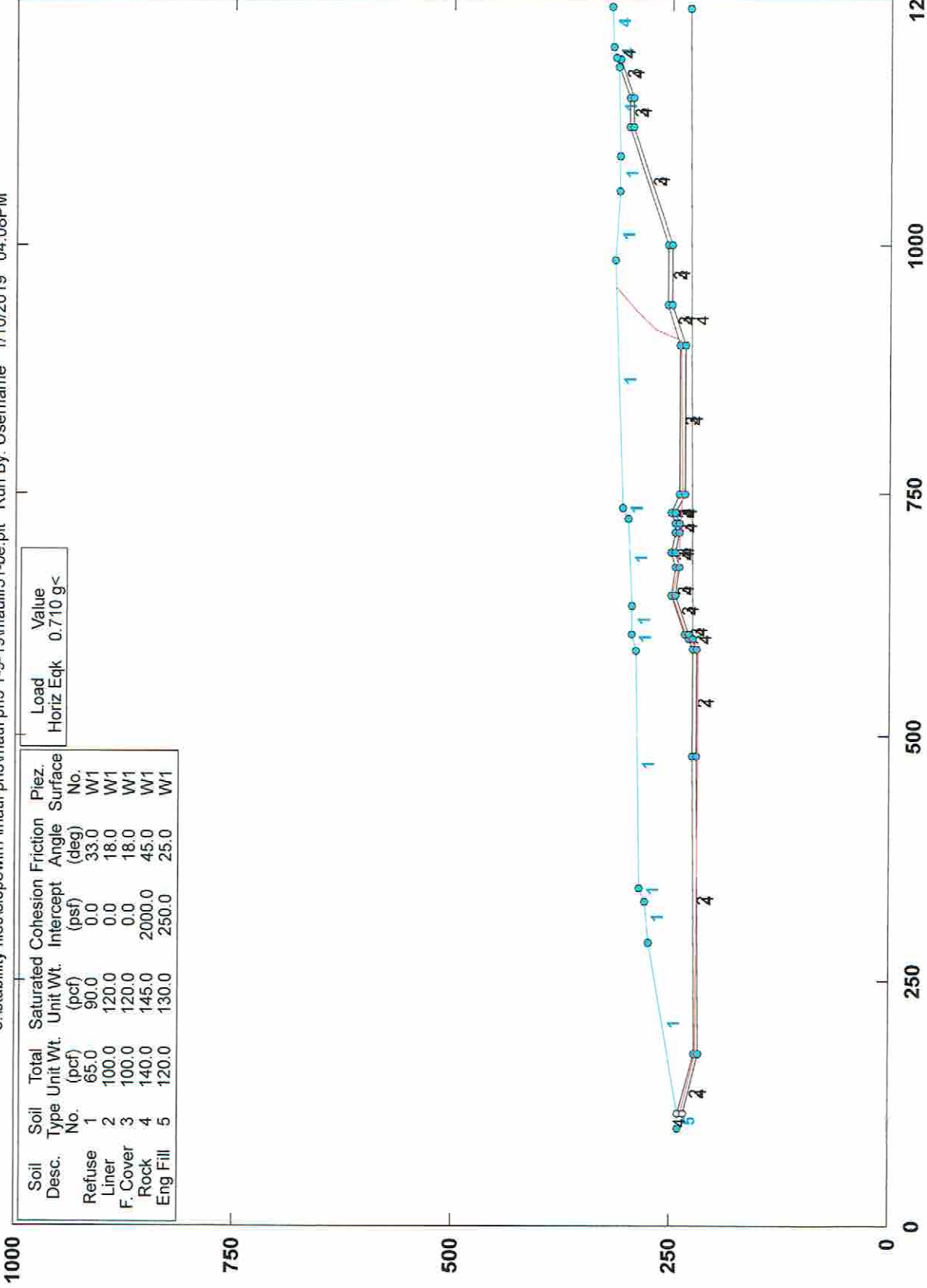
Factors of Safety Calculated by Janbu Method

STED



CML - ph III Slope Stab. Section III-S5 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\mauiif51-be.plt Run By: Username 1/10/2019 04:08PM

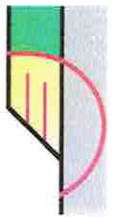


Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

Load	Value
Horiz Eqk	0.710 g<

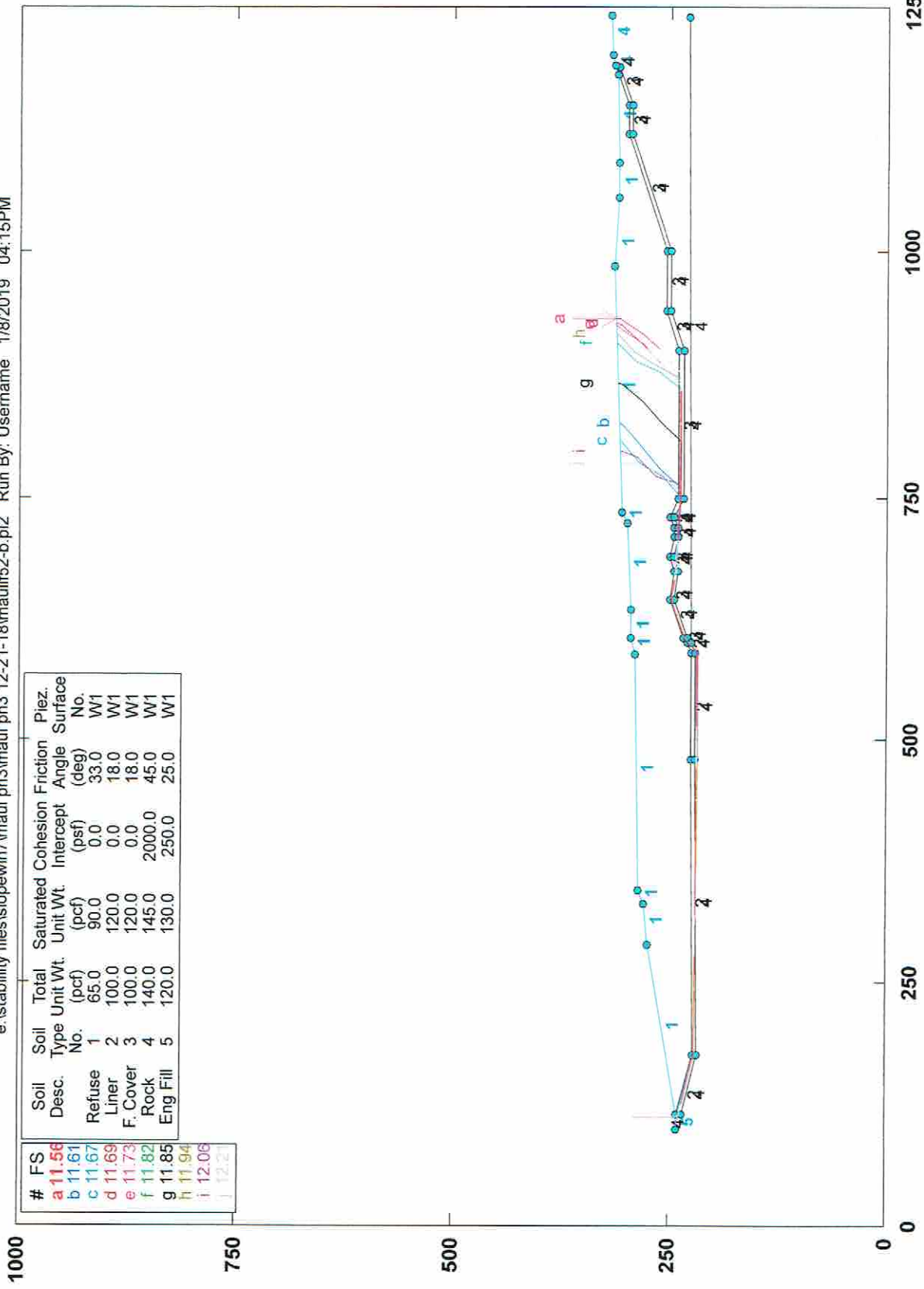
PCSTABL5M/si FSmin=1.01
Factors of Safety Calculated by Janbu Method

STED



CML - ph III Slope Stab. Section III-S5 Static

e:\stability files\islopewin7\maui ph3 12-21-18\maui52-b.pl2 Run By: Username 1/8/2019 04:15PM

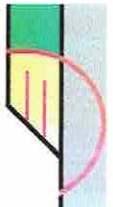


Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

#	FS
a	11.56
b	11.61
c	11.67
d	11.69
e	11.73
f	11.82
g	11.85
h	11.94
i	12.06

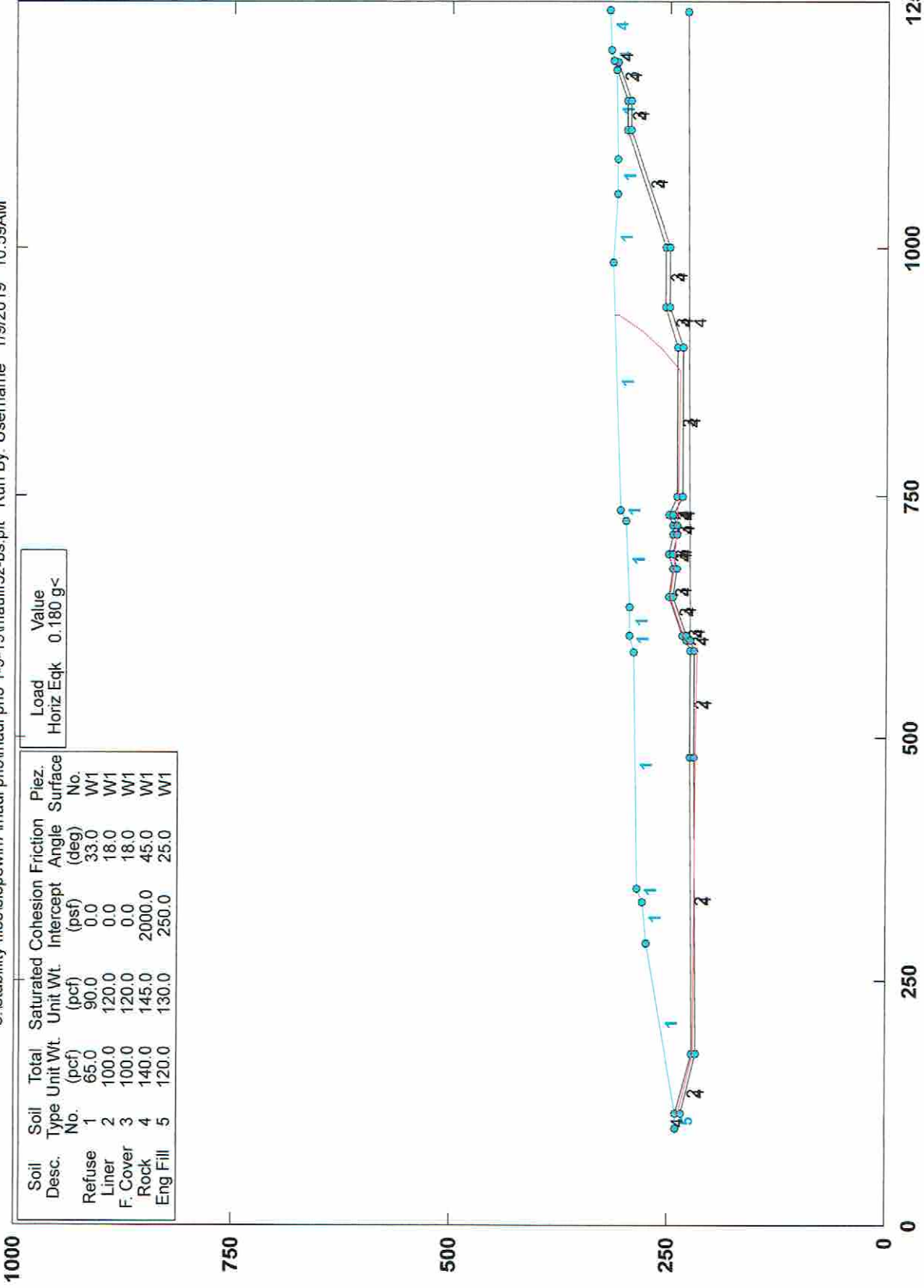
PCSTABL5M/si FSmin=11.56
Safety Factors Are Calculated By The Modified Janbu Method

STED



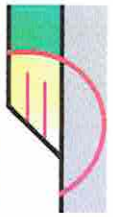
CML - ph III Slope Stab. Section III-S5 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\mauilf52-bs.plt Run By: Username 1/9/2019 10:59AM



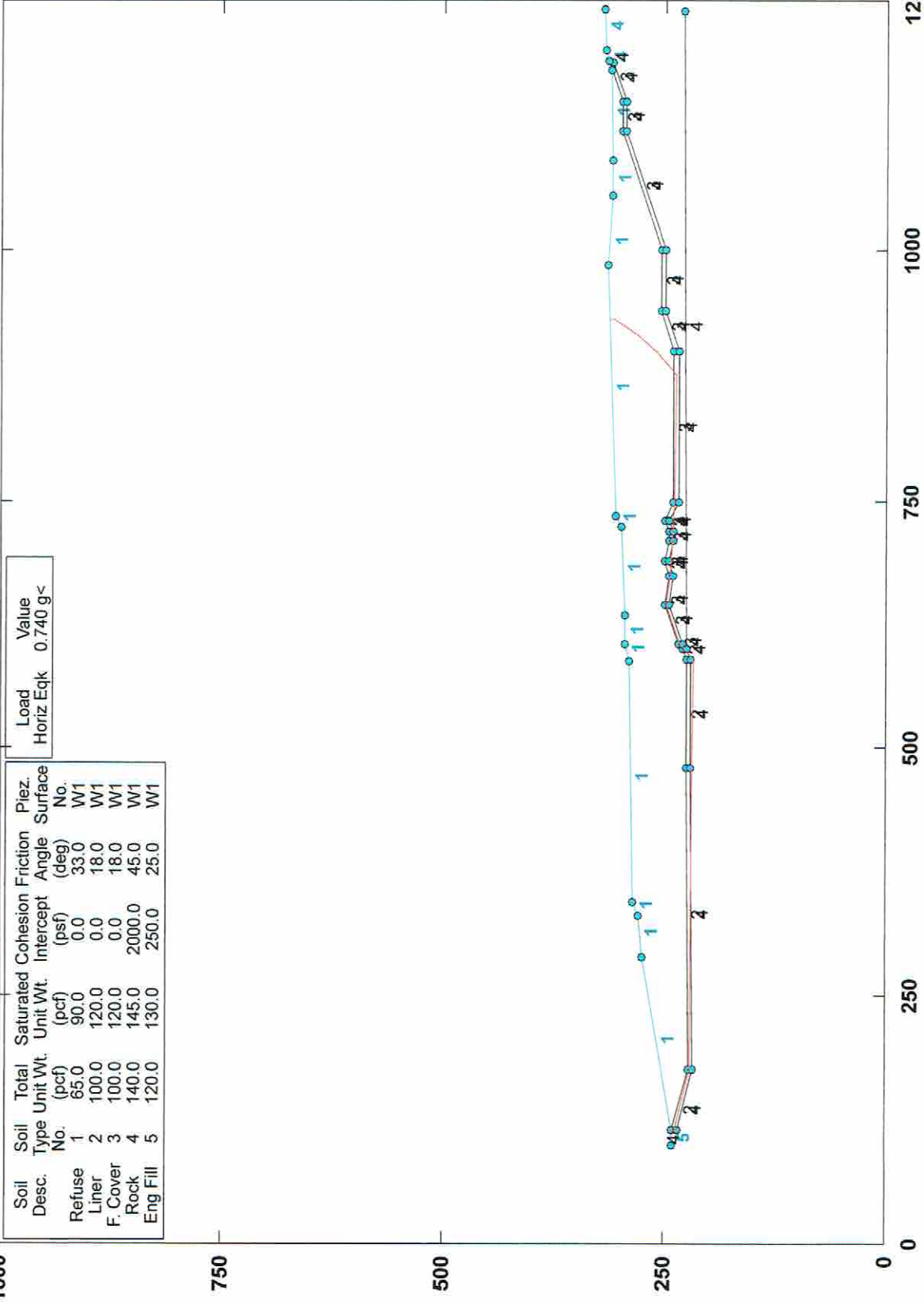
PCSTABL5M/si F_{Smin}=3.31
Factors of Safety Calculated by Janbu Method

STED



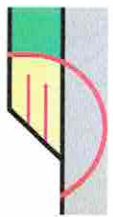
CML - ph III Slope Stab. Section III-S5 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\mauiif52-be.plt Run By: Username 1/10/2019 04:12PM



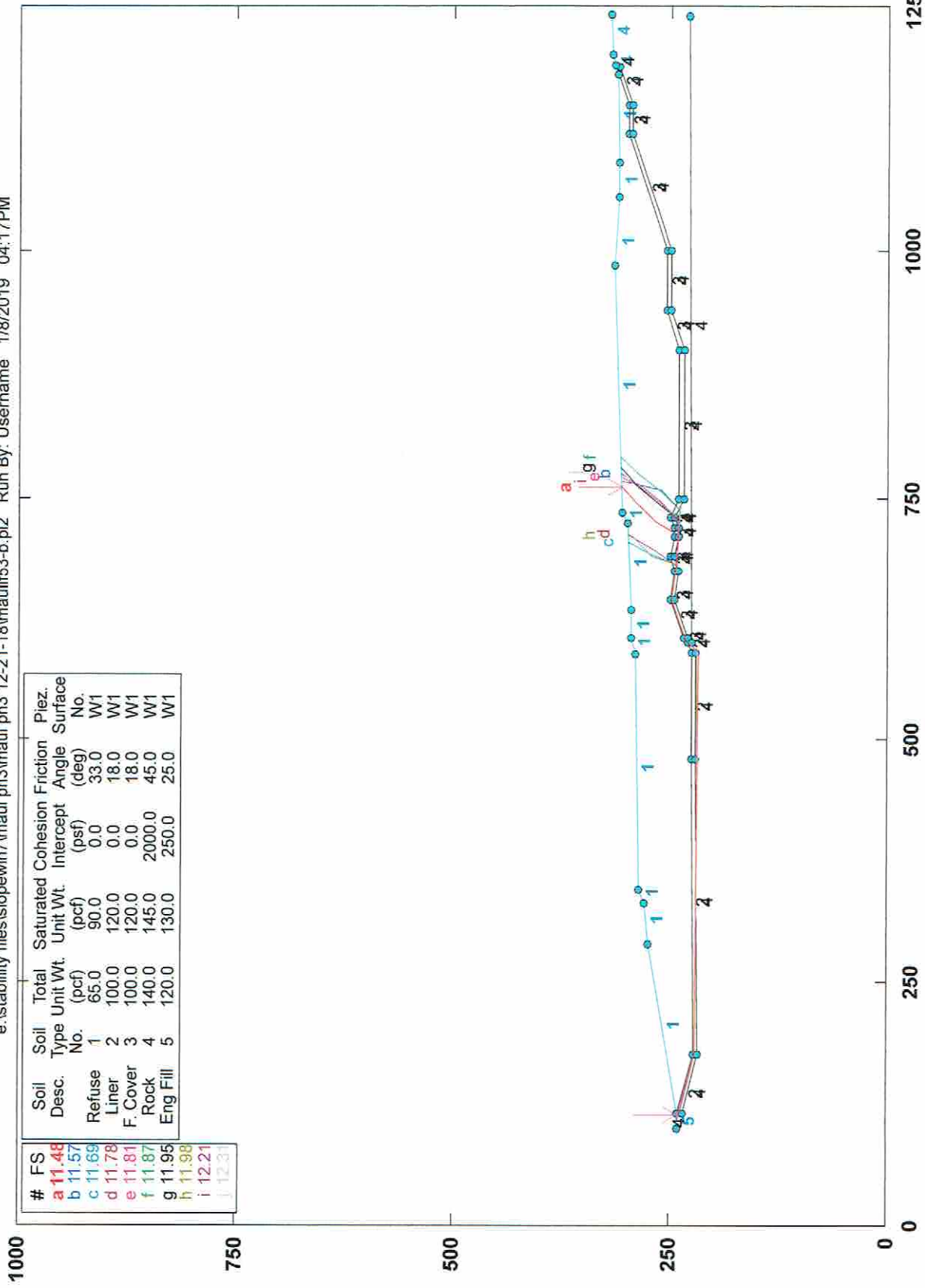
PCSTABL5M/si FSmin=1.01
Factors of Safety Calculated by Janbu Method

STED



CML - ph III Slope Stab. Section III-S5 Static

e:\stability files\lopewin7\maui ph3\maui ph3 12-21-18\maui53-b.pl2 Run By: Username 1/8/2019 04:17PM



PCSTABL5M/si FSmin=11.48

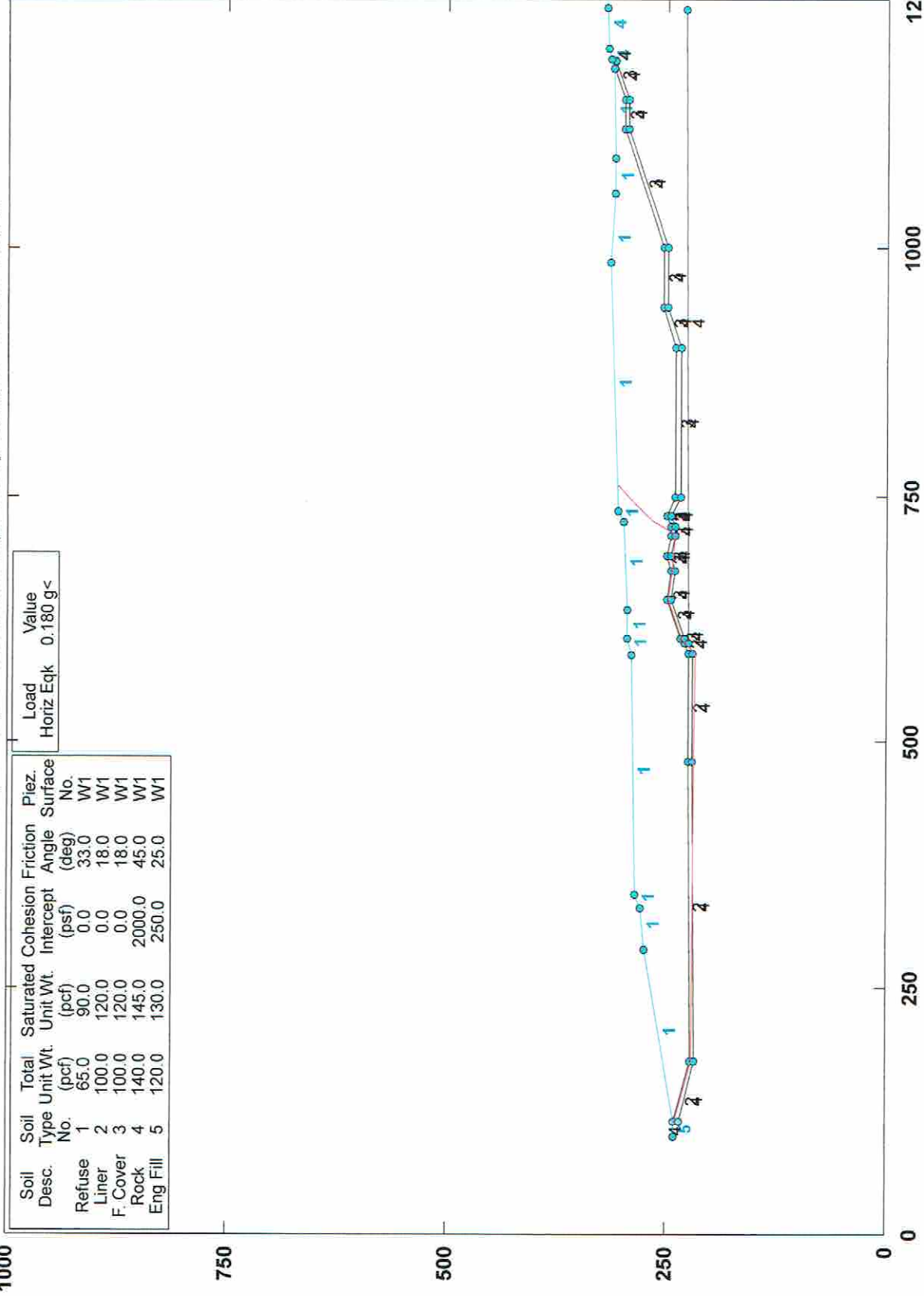
Safety Factors Are Calculated By The Modified Janbu Method

STED



CML - ph III Slope Stab. Section III-S5 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\mauilf53-bs.plt Run By: Username 1/9/2019 11:00AM

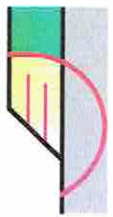


Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

Load	Value
Horiz Eqk	0.180 g<

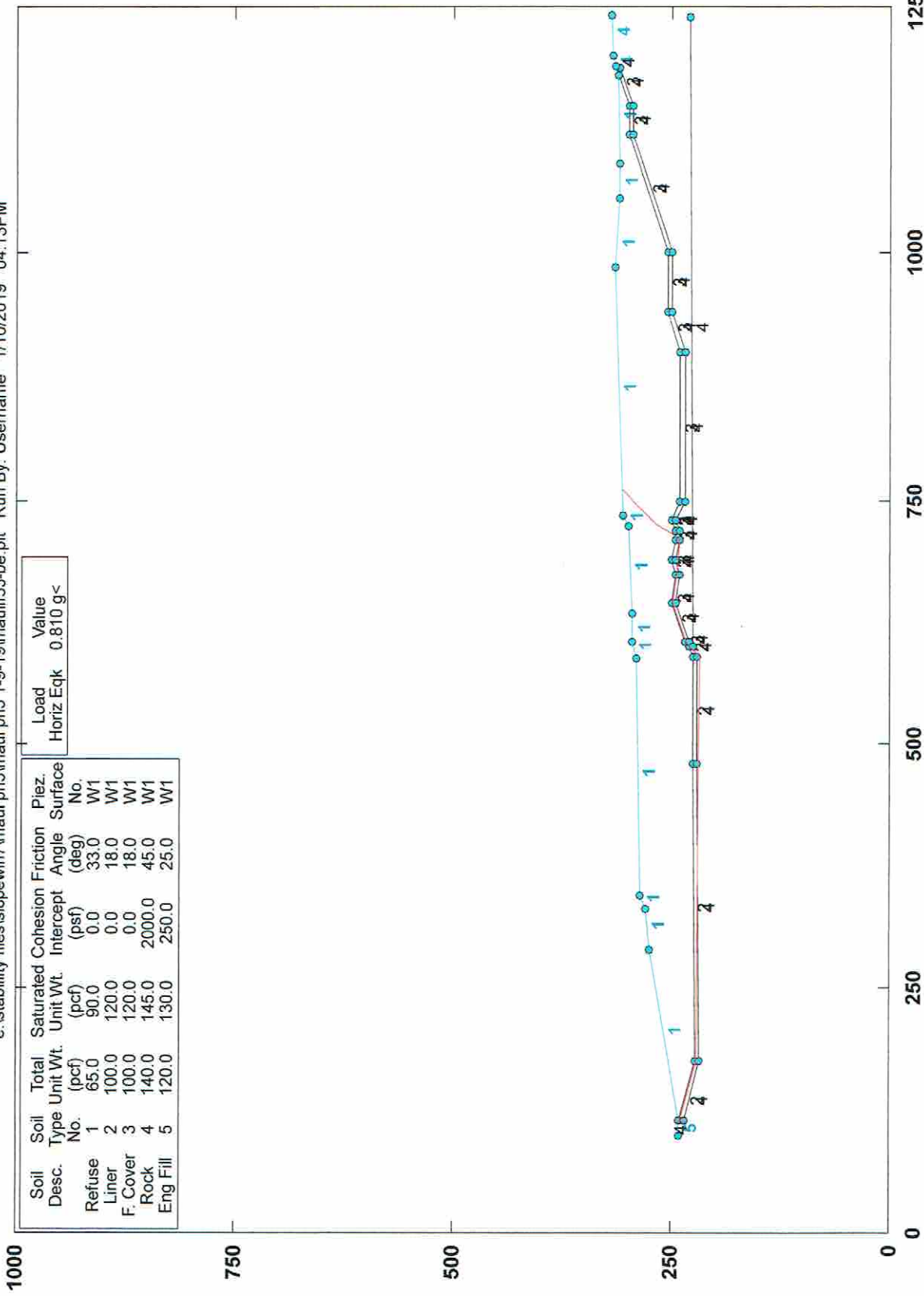
PCSTABL5M/si FSmin=3.54
Factors of Safety Calculated by Janbu Method

STED

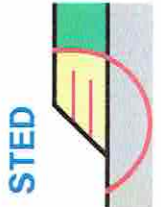


CML - ph III Slope Stab. Section III-S5 Pseudo-Static

e:\stability files\lopewin7\maui ph3 1-9-19\mauiif53-be.plt Run By: Username 1/10/2019 04:13PM

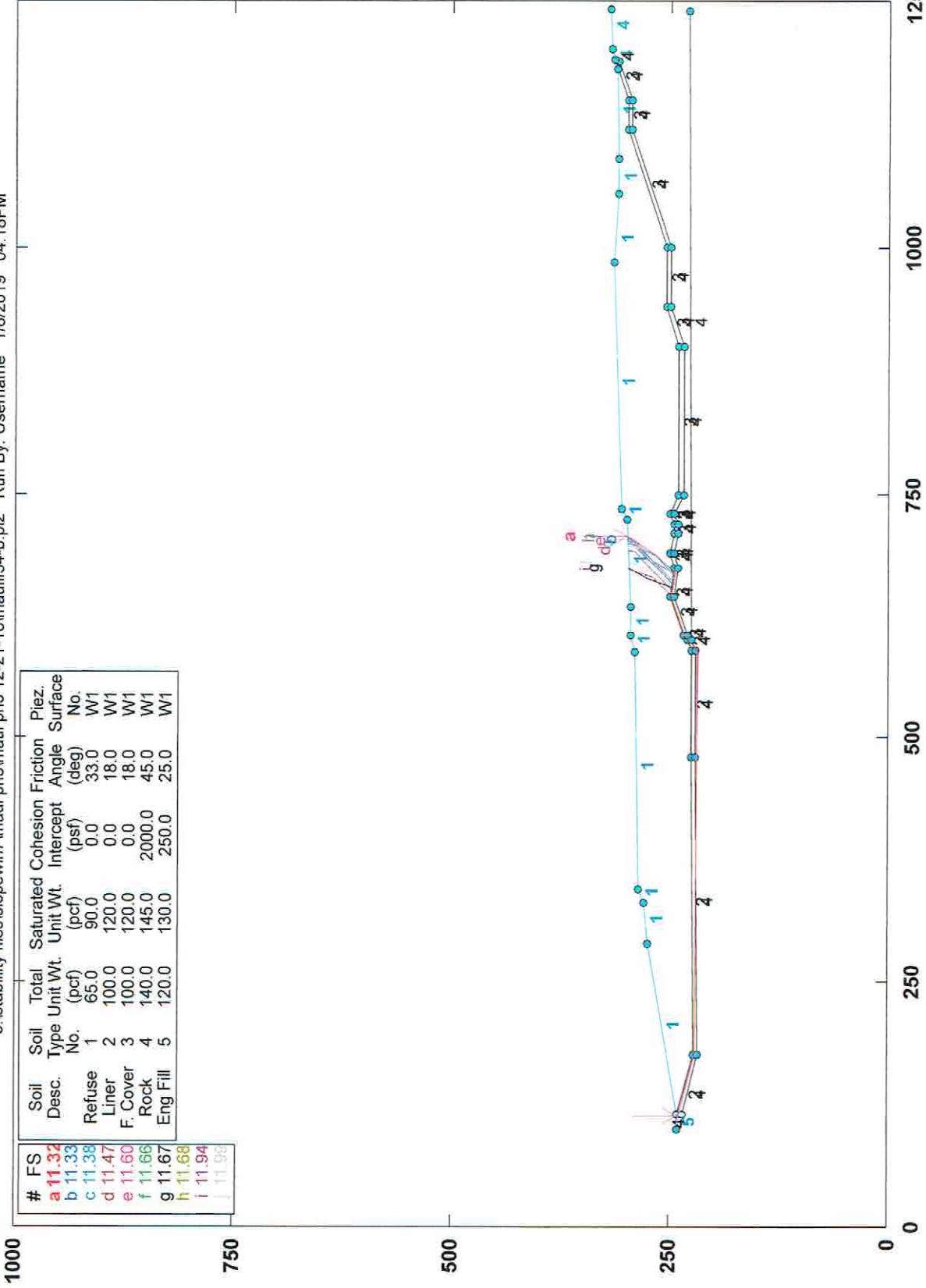


PCSTABL5M/si FSmin=1.01
Factors of Safety Calculated by Janbu Method



CML - ph III Slope Stab. Section III-S5 Static

e:\stability files\lopewin7\maui ph3 12-21-18\mauiif54-b.pl2 Run By: Username 1/8/2019 04:18PM



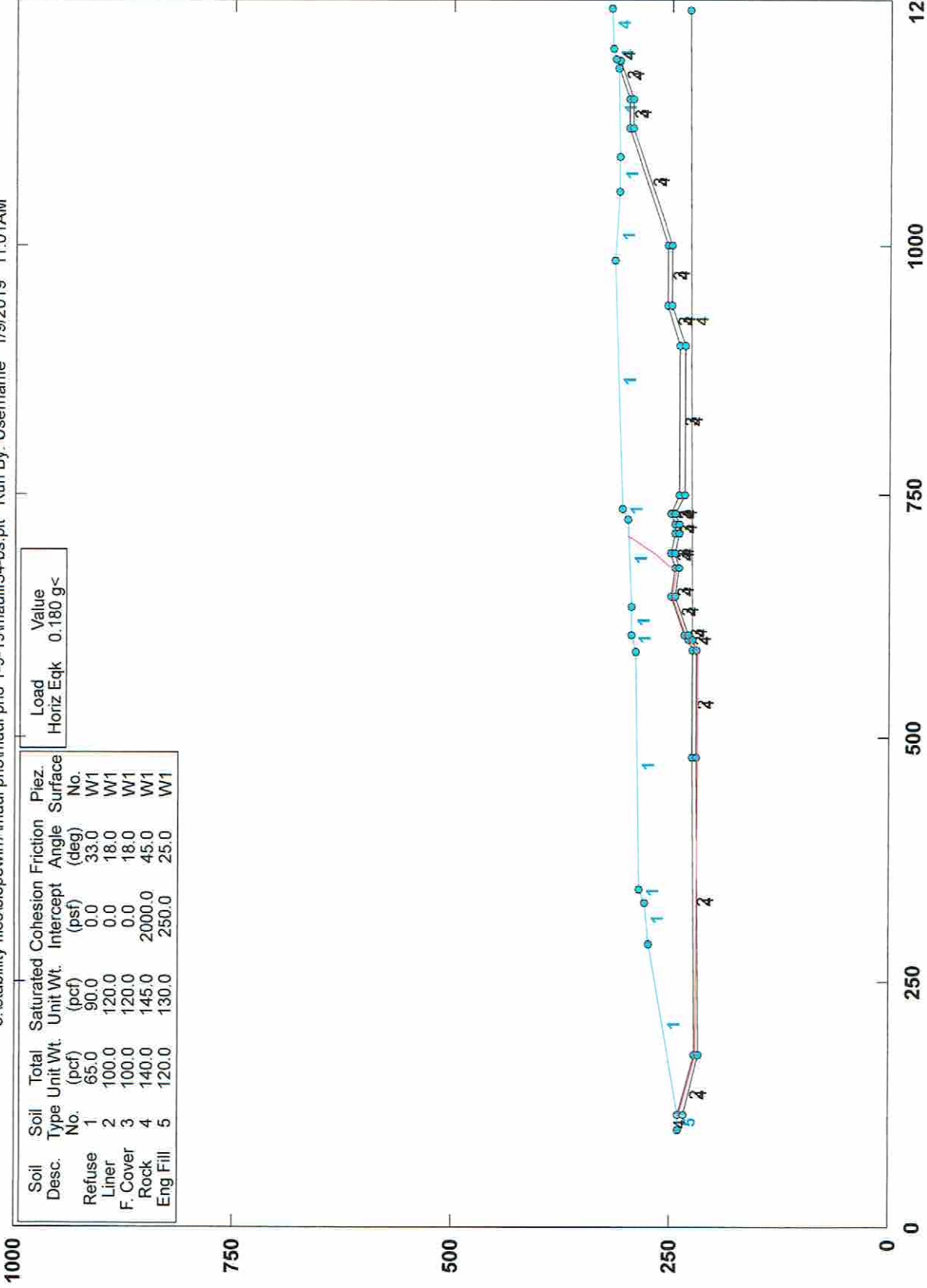
PCSTABL5M/si FSmin=11.32
Safety Factors Are Calculated By The Modified Janbu Method

STED



CML - ph III Slope Stab. Section III-S5 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\mauilf54-bs.plt Run By: Username 1/9/2019 11:01AM

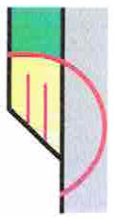


Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

Load	Value
Horiz Eqk	0.180 g<

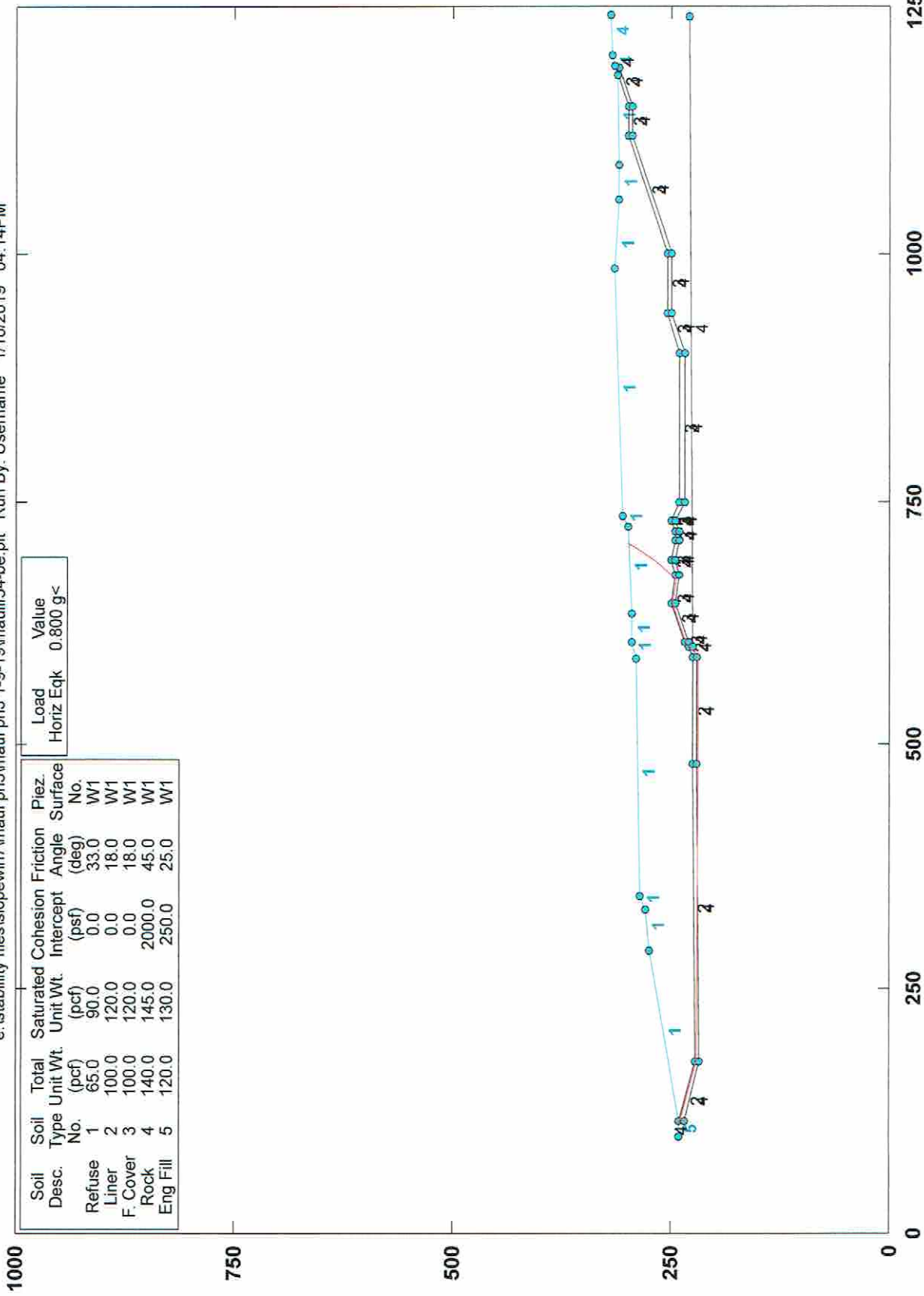
PCSTABL5M/si FSmin=3.45
Factors of Safety Calculated by Janbu Method

STED



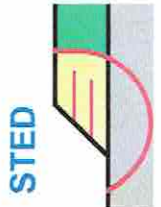
CML - ph III Slope Stab. Section III-S5 Pseudo-Static

e:\stability files\stability\maui ph3 1-9-19\mauiif54-be.plt Run By: Username 1/10/2019 04:14PM



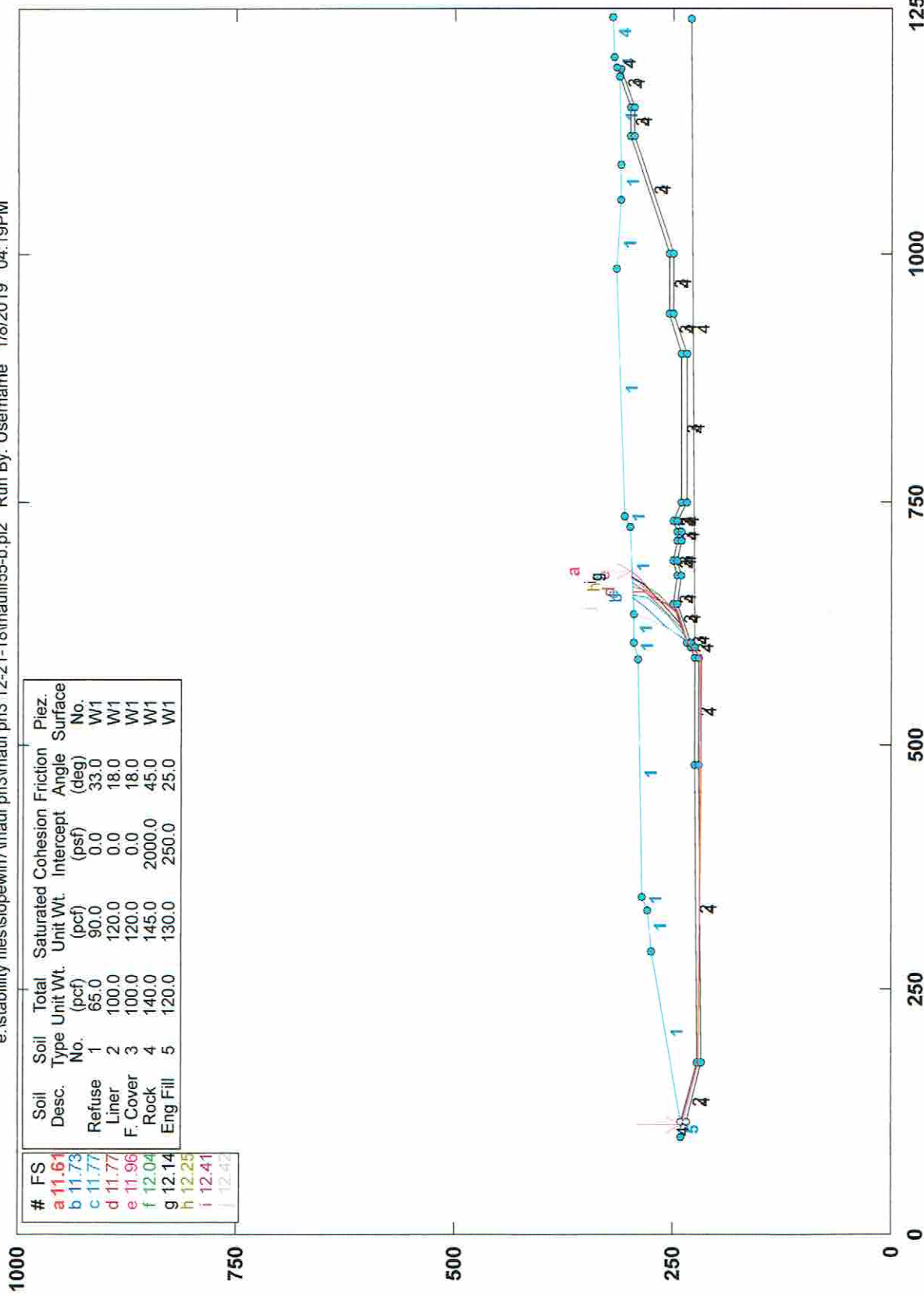
Load Value
Horiz Eqk 0.800 g<

PCSTABL5M/si FSmin=1.00
Factors of Safety Calculated by Janbu Method



CML - ph III Slope Stab. Section III-S5 Static

e:\stability files\lopewin7\maui ph3 12-21-18\mauiif55-b.pl2 Run By: Username 1/8/2019 04:19PM

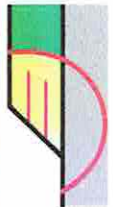


Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Intercept (psf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	25.0	W1

#	FS
a	11.61
b	11.73
c	11.77
d	11.77
e	11.96
f	12.04
g	12.14
h	12.25
i	12.41
j	12.47

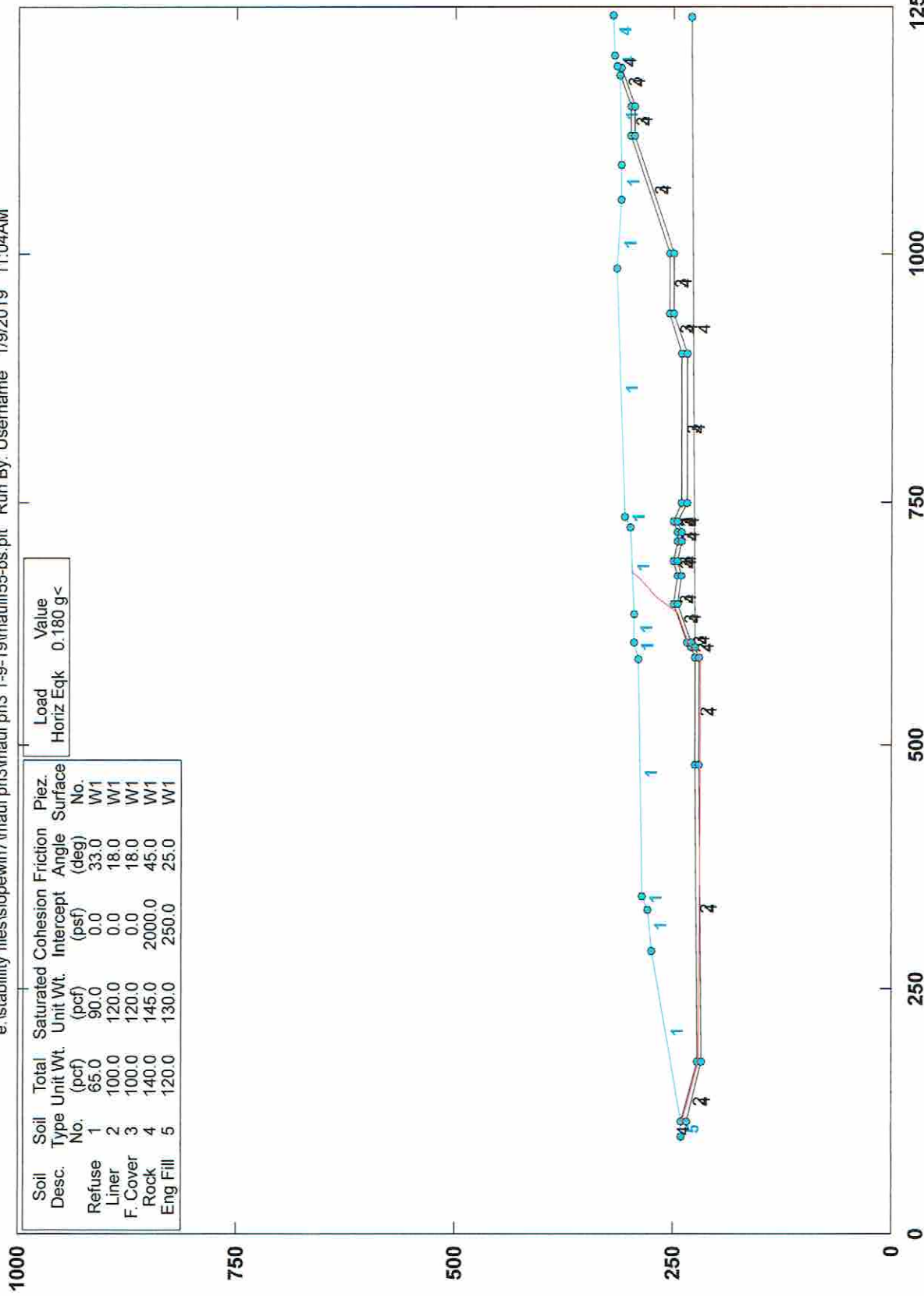
PCSTABL5M/si FSmin=11.61
Safety Factors Are Calculated By The Modified Janbu Method

STED



CML - ph III Slope Stab. Section III-S5 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\mauiif55-bs.plt Run By: Username 1/9/2019 11:04AM

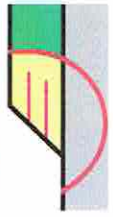


Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

Load	Value
Horiz Eqk	0.180 g<

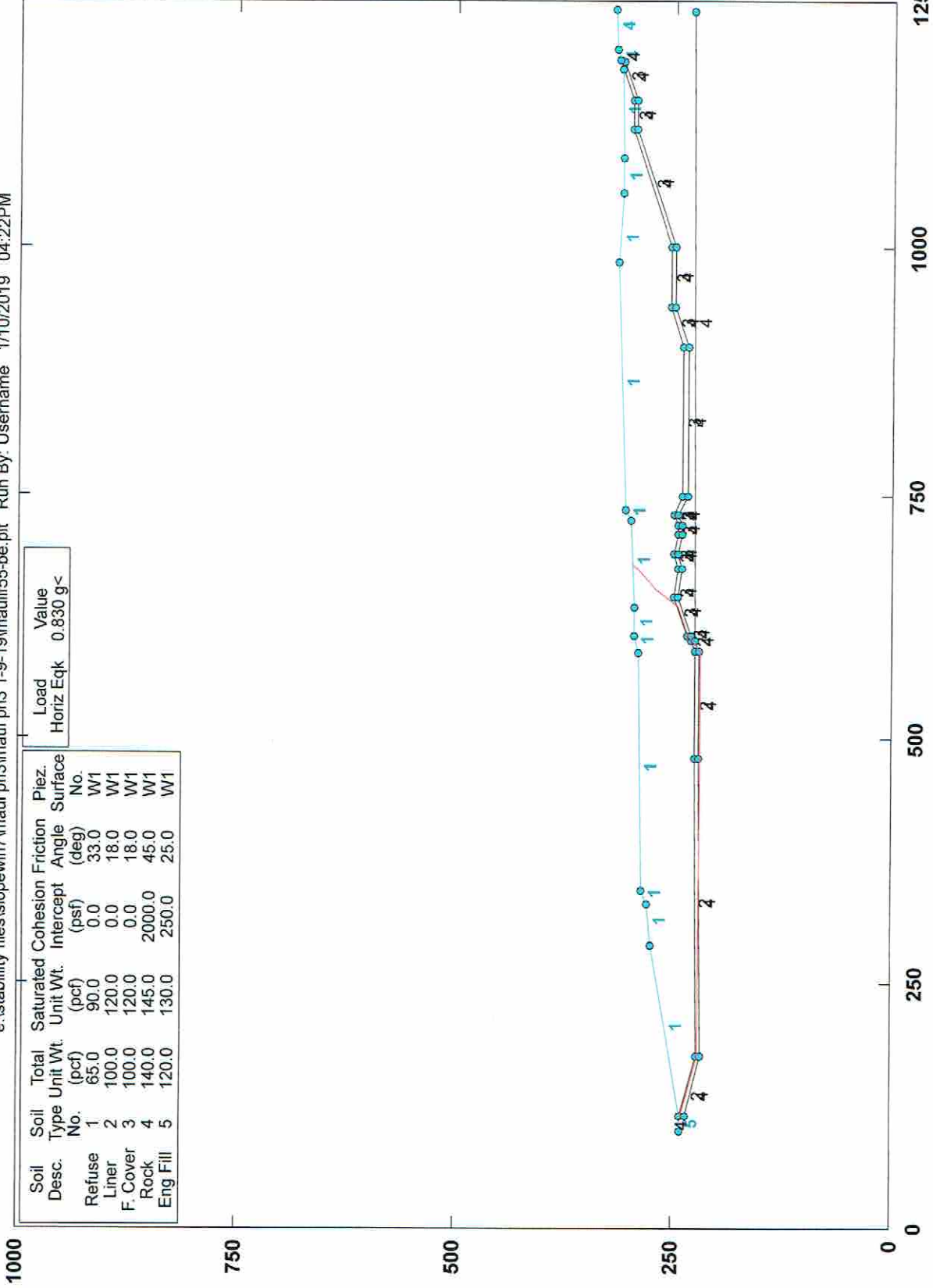
PCSTABL5M/si FSmin=3.60
Factors of Safety Calculated by Janbu Method

STED



CML - ph III Slope Stab. Section III-S5 Pseudo-Static

e:\stability files\slopewin7\maui ph3\maui ph3 1-9-19\mauilf55-be.plt Run By: Username 1/10/2019 04:22PM

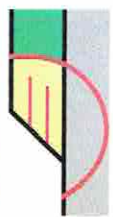


Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

Load Horiz Eqk	Value
Horiz Eqk	0.830 g<

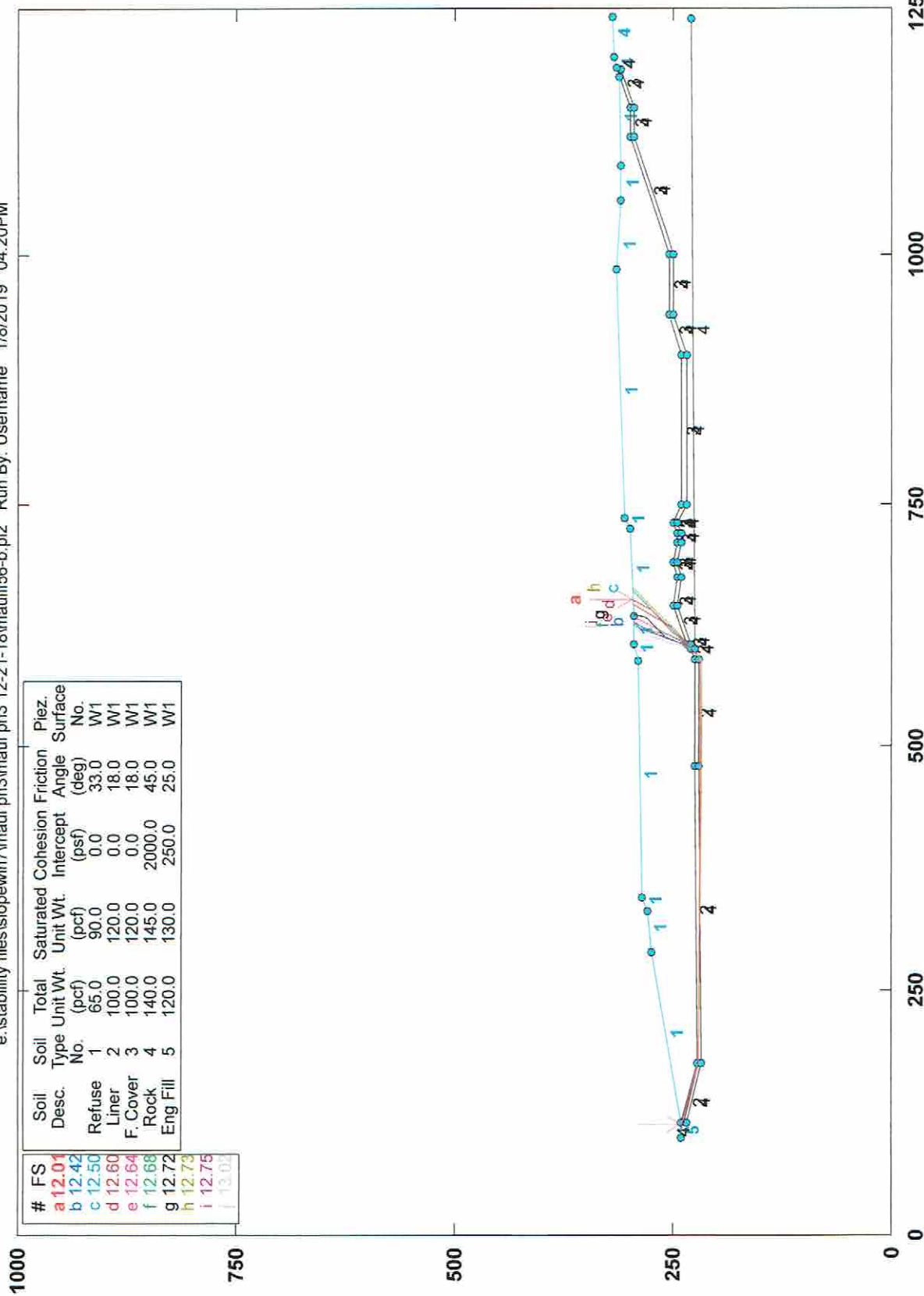
PCSTABL5M/si FSmin=1.01
Factors of Safety Calculated by Janbu Method

STED



CML - ph III Slope Stab. Section III-S5 Static

e:\stability files\slopewin7\maui ph3 12-21-18\mauiif56-b.pl2 Run By: Username 1/8/2019 04:20PM



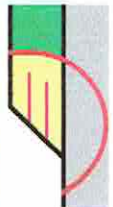
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

#	FS
a	12.01
b	12.42
c	12.50
d	12.60
e	12.64
f	12.68
g	12.72
h	12.73
i	12.75
j	13.01

PCSTABL5M/si FSmin=12.01

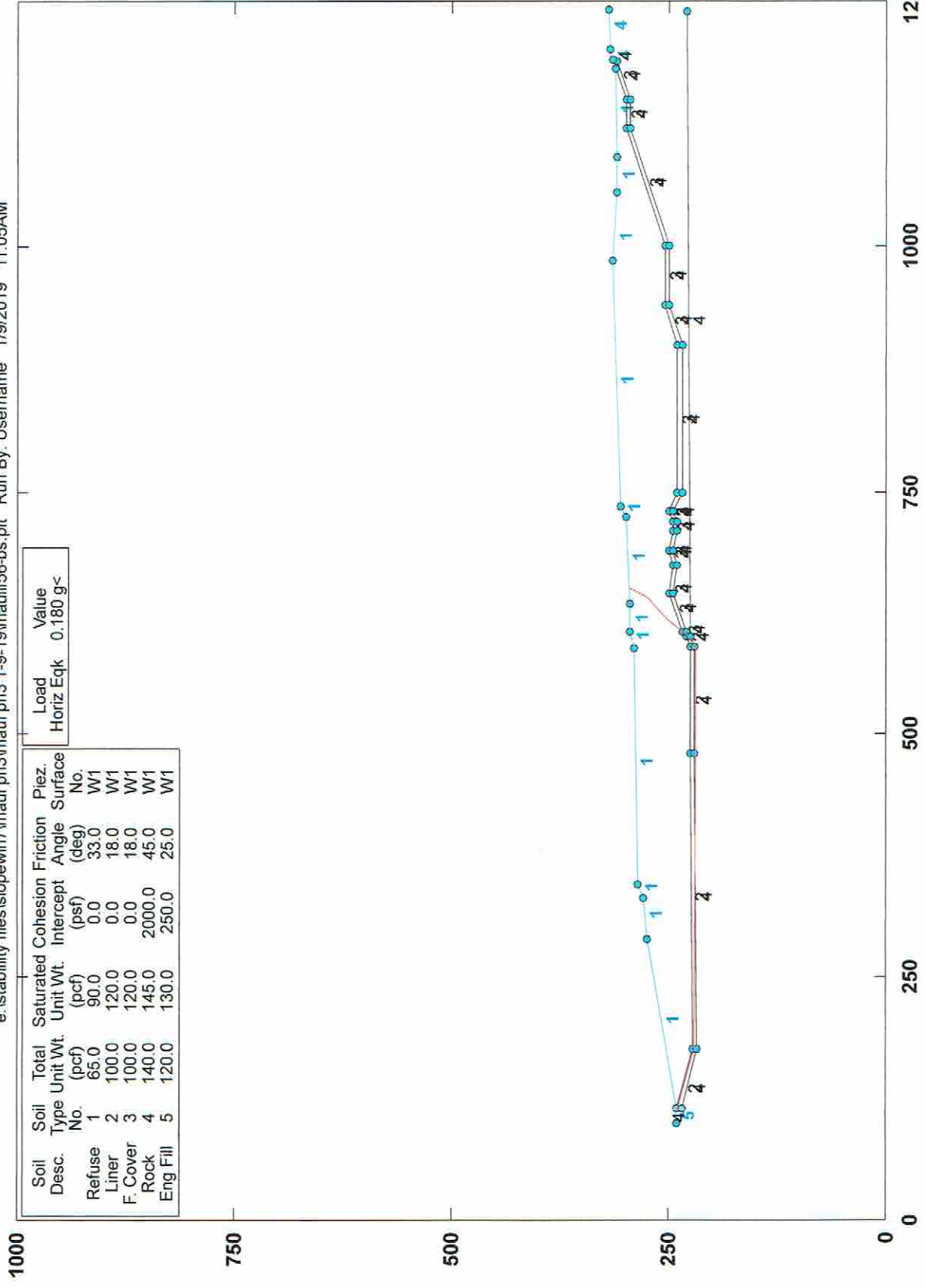
Safety Factors Are Calculated By The Modified Janbu Method

STED



CML - ph III Slope Stab. Section III-S5 Pseudo-Static

e:\stability files\islopewin7\maui ph3 1-9-19\mauiif56-bs.plt Run By: Username 1/9/2019 11:05AM

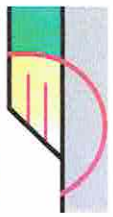


Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Intercept (psf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	0.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	250.0	25.0	W1

Load Horiz Eqk	Value
0.180 g<	0.180 g<

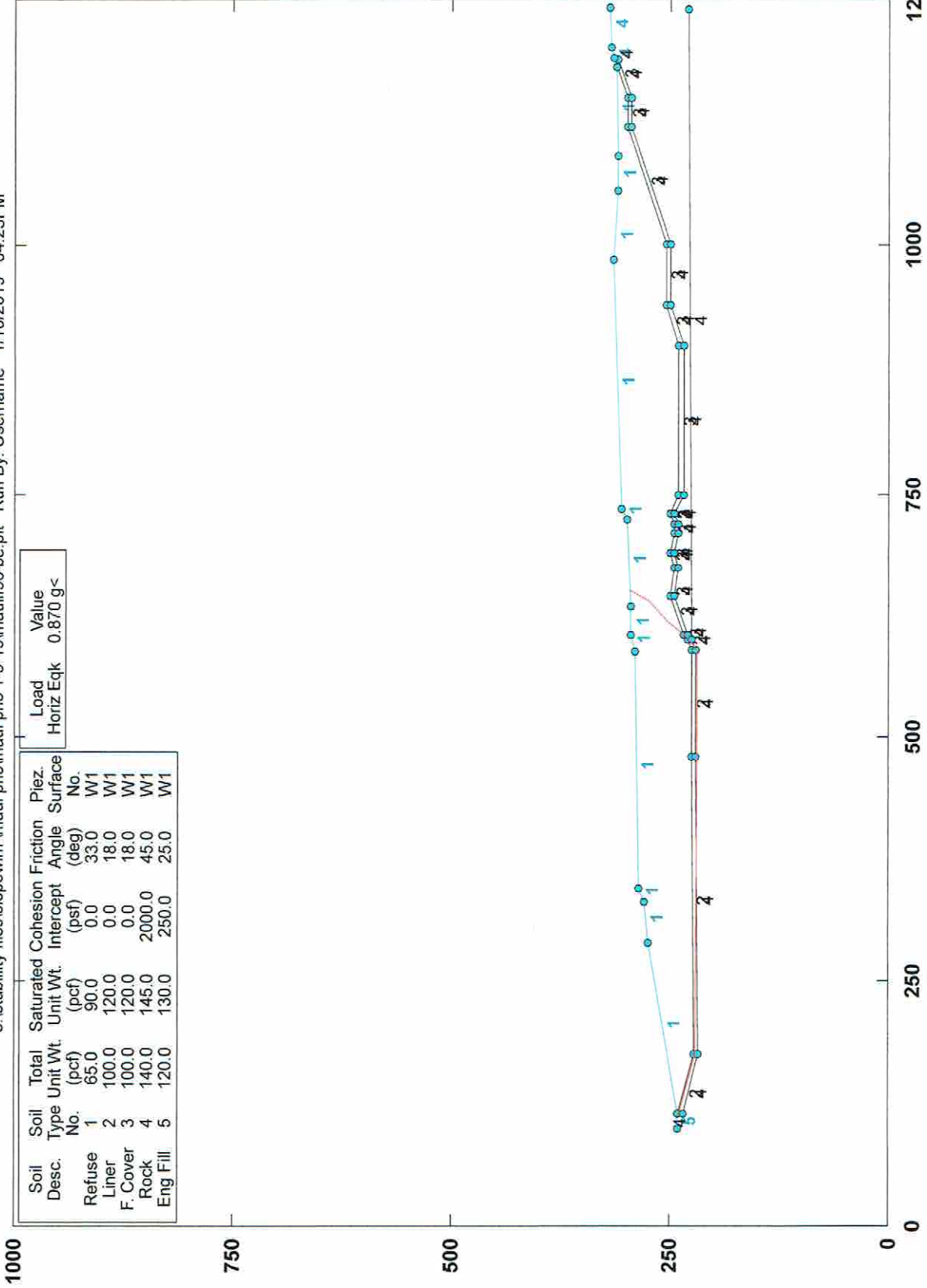
PCSTABL5M/si FSmin=3.75
Factors of Safety Calculated by Janbu Method

STED



CML - ph III Slope Stab. Section III-S5 Pseudo-Static

e:\stability files\lopewin7\maui ph3 1-9-19\mauiif56-be.plt Run By: Username 1/10/2019 04:23PM

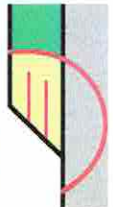


Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

Load Horiz Eqk	Value
Horiz Eqk	0.870 g<

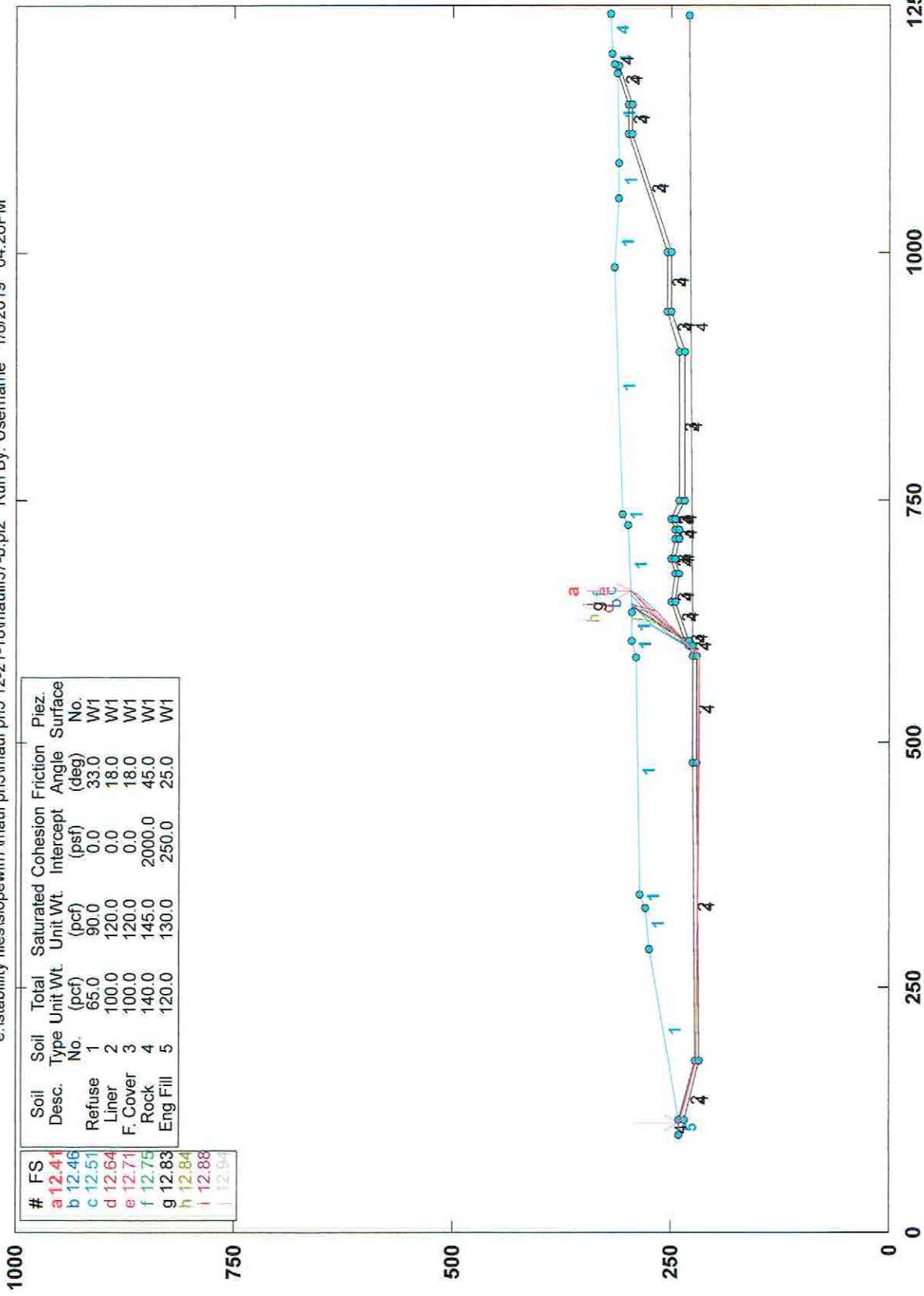
PCSTABL5M/si FSmin=1.01
Factors of Safety Calculated by Janbu Method

STED



CML - ph III Slope Stab. Section III-S5 Static

e:\stability files\stability\maui\ph3\12-21-18\maui\57-b.pl2 Run By: Username 1/8/2019 04:20PM

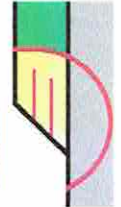


#	FS	Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
a	12.41	Refuse	1	65.0	90.0	0.0	33.0	W1
b	12.46	Liner	2	100.0	120.0	0.0	18.0	W1
c	12.51	F. Cover	3	100.0	120.0	0.0	18.0	W1
d	12.64	Rock	4	140.0	145.0	2000.0	45.0	W1
e	12.71	Eng Fill	5	120.0	130.0	250.0	25.0	W1

PCSTABL5M/si FSmin=12.41

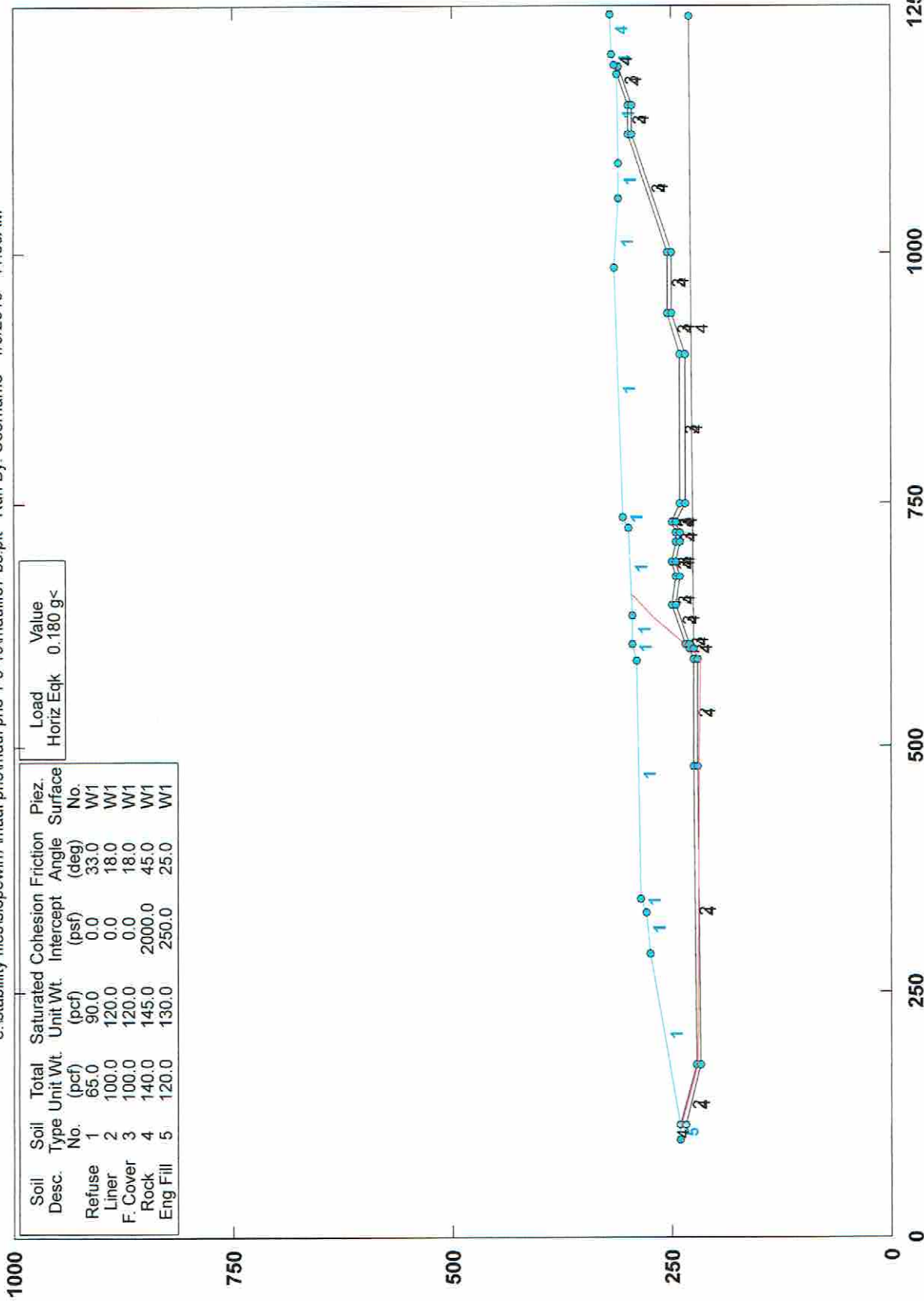
Safety Factors Are Calculated By The Modified Janbu Method

STED



CML - ph III Slope Stab. Section III-S5 Pseudo-Static

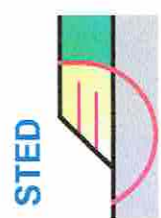
e:\stability files\islopewin7\maui ph3 1-9-19\mauiif57-bs.plt Run By: Username 1/9/2019 11:06AM



Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

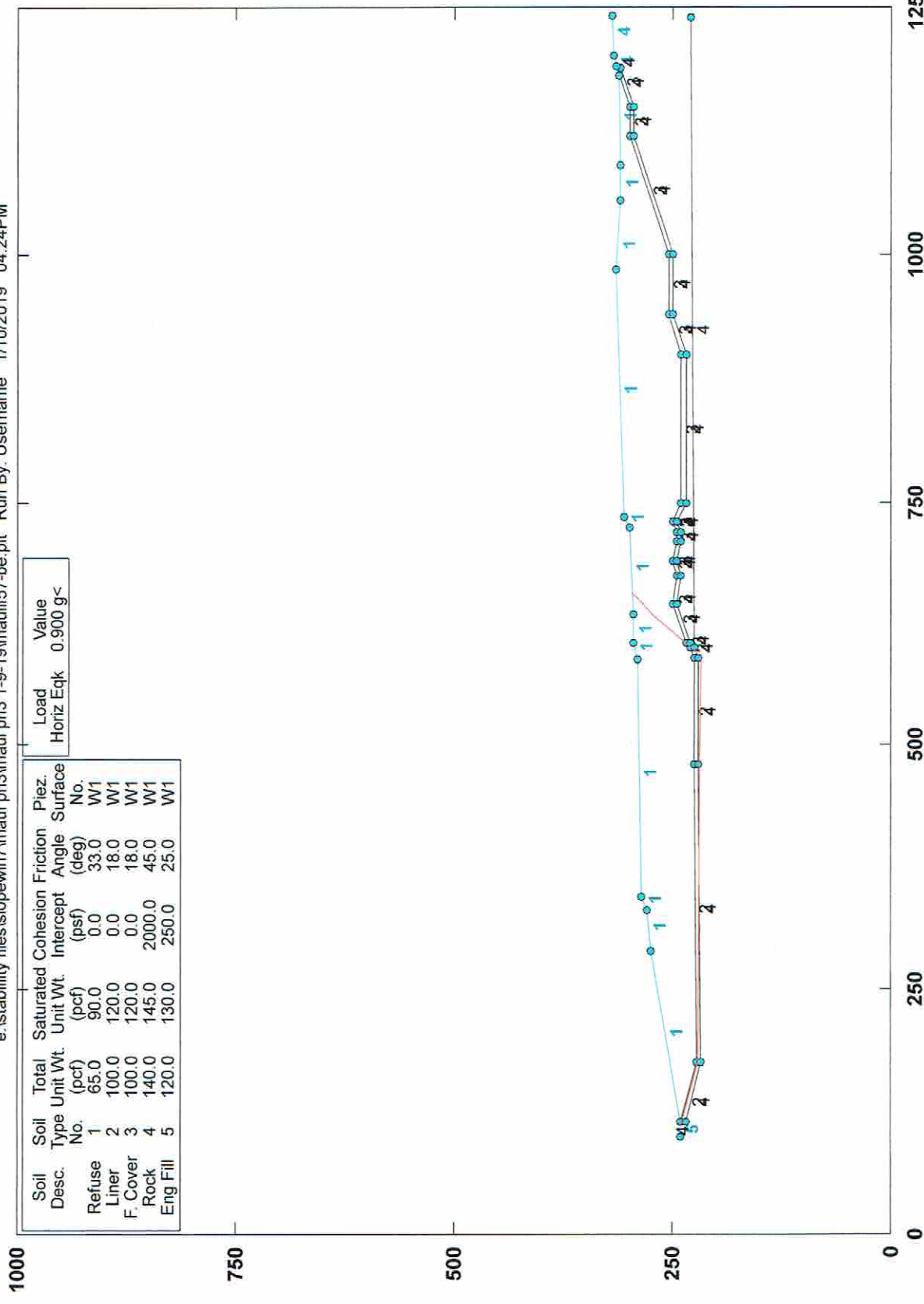
Load	Value
Horiz Eqk	0.180 g

PCSTABL5M/si FSmin=3.88
Factors of Safety Calculated by Janbu Method



CML - ph III Slope Stab. Section III-S5 Pseudo-Static

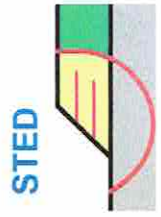
e:\stability files\lopewin7\maui ph3 1-9-19\mauiif57-be.plt Run By: Username 1/10/2019 04:24PM



Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

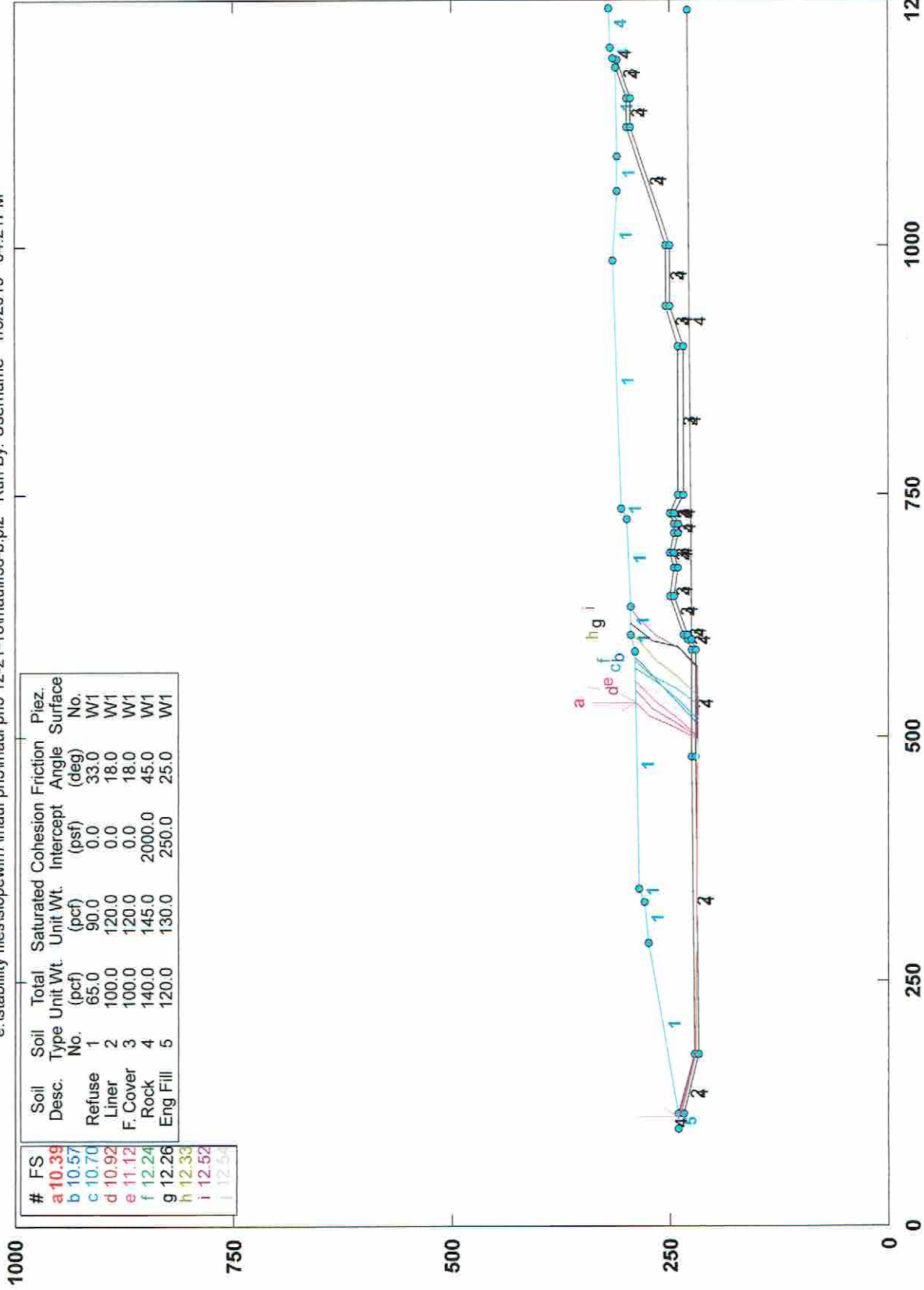
Load	Value
Horiz Eqk	0.900 g<

PCSTABL5M/si FSmin=1.01
Factors of Safety Calculated by Janbu Method



CML - ph III Slope Stab. Section III-S5 Static

e:\stability files\slopewin7\maui ph3\maui ph3 12-21-18\mauiif58-b.pl2 Run By: Username 1/8/2019 04:21PM



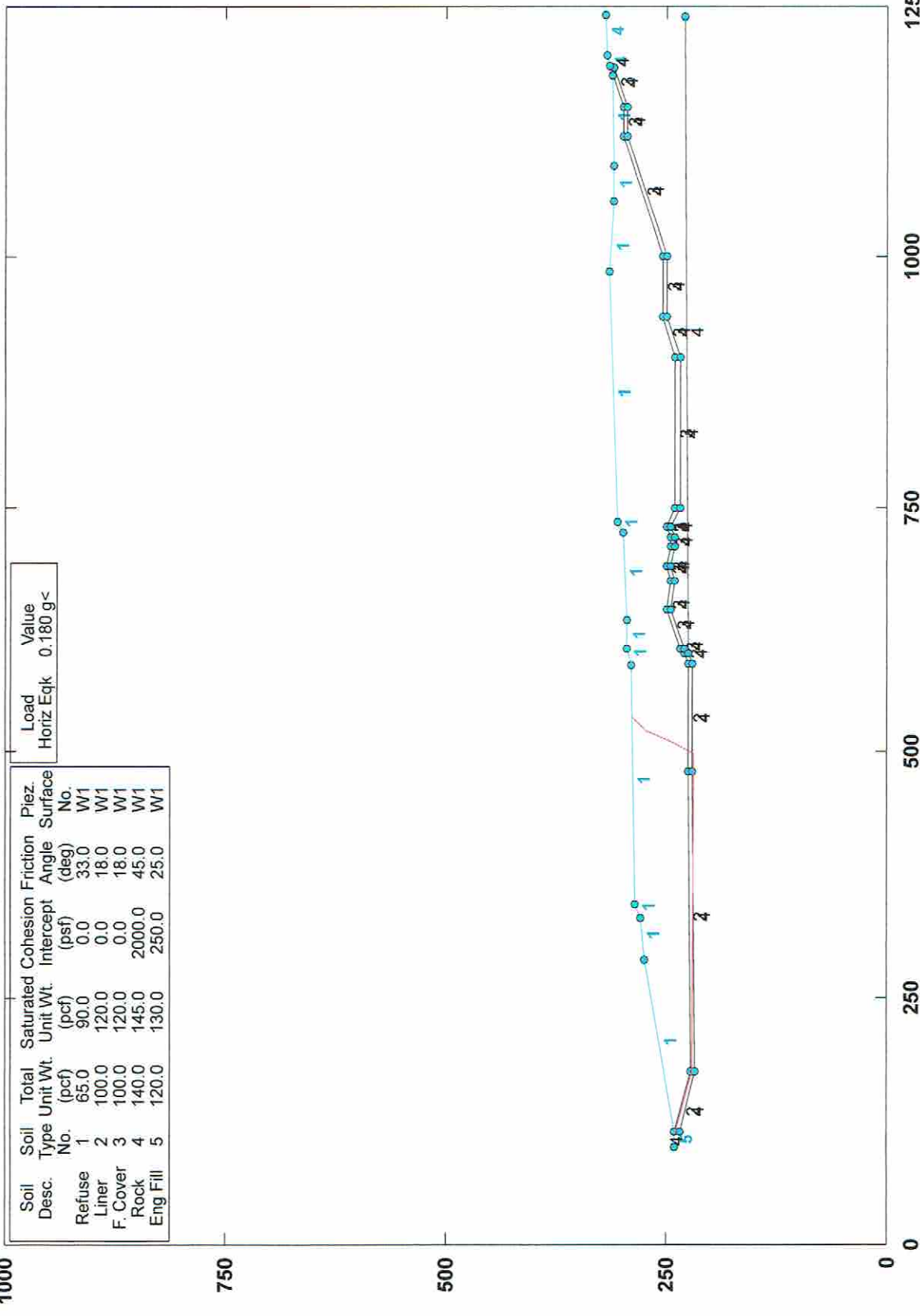
PCSTABL5M/si FSmin=10.39
Safety Factors Are Calculated By The Modified Janbu Method

STED



CML - ph III Slope Stab. Section III-S5 Pseudo-Static

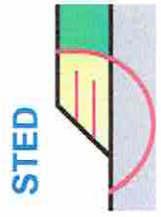
e:\stability files\slopewin7\maui ph3 1-9-19\mauiif58-bs.plt Run By: Username 1/9/2019 11:07AM



Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Intercept (psf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	250.0	25.0	W1

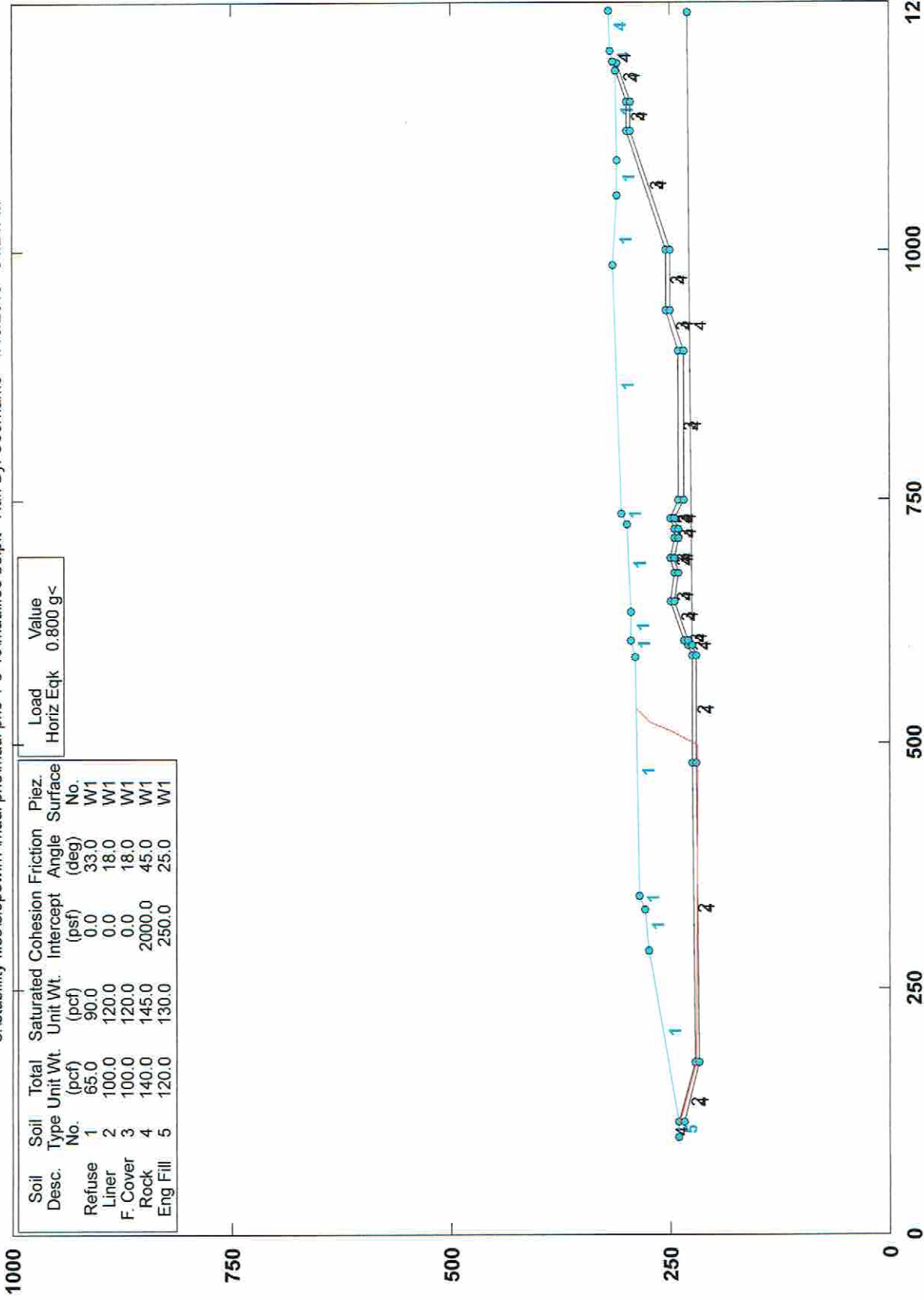
Load Horiz Eqk	Value
Horiz Eqk	0.180 g<

PCSTABL5M/si FSmin=3.42
Factors of Safety Calculated by Janbu Method



CML - ph III Slope Stab. Section III-S5 Pseudo-Static

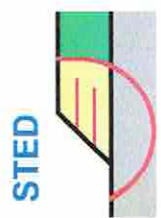
e:\stability files\slopewin7\maui ph3 1-9-19\mauif58-be.plt Run By: Username 1/10/2019 04:24PM



Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Intercept (psf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	0.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	250.0	25.0	W1

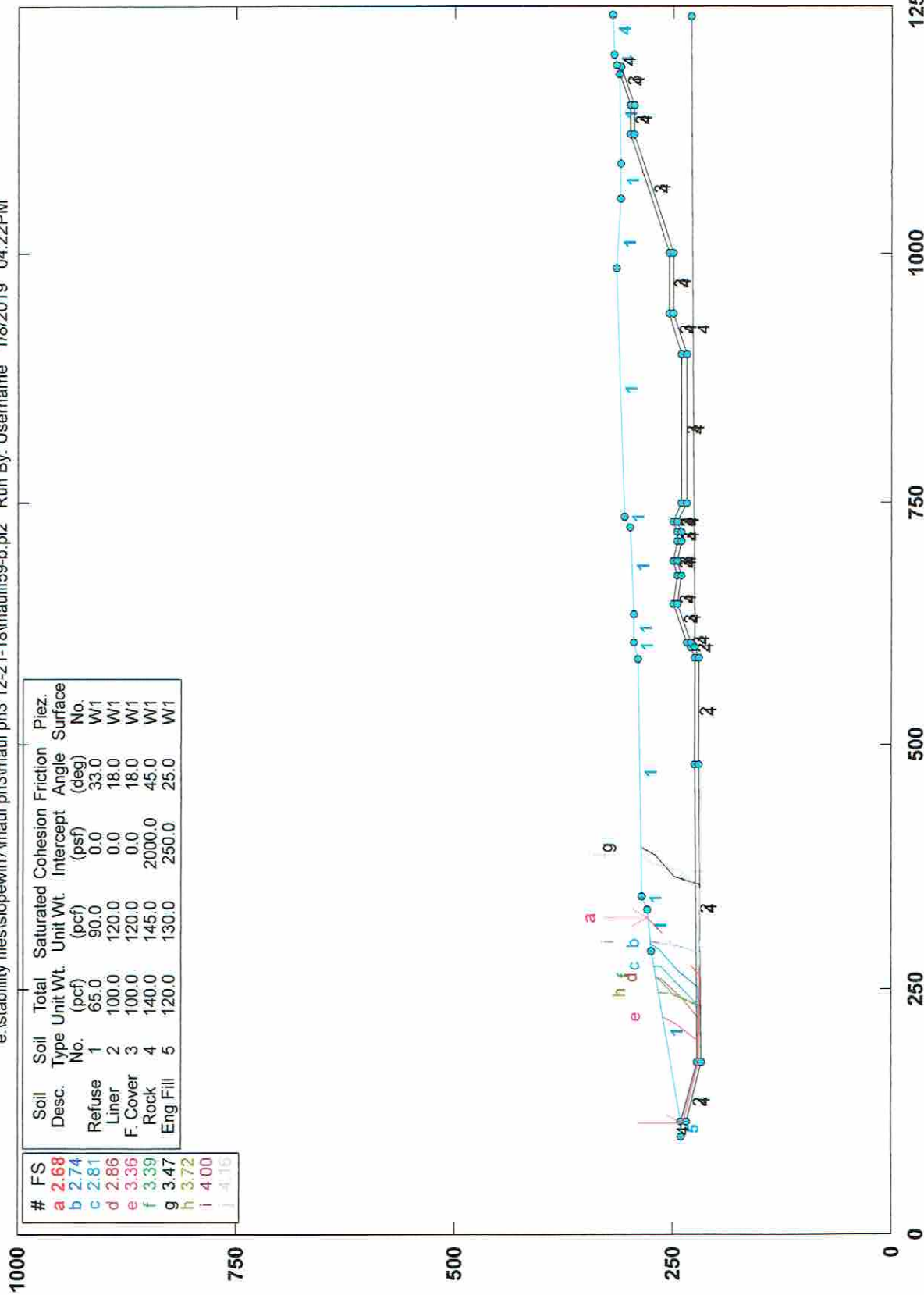
Load	Value
Horiz Eqk	0.800 g<

PCSTABL5M/si FSmin=0.99
Factors of Safety Calculated by Janbu Method



CML - ph III Slope Stab. Section III-S5 Static

e:\stability files\lopewin7\maui ph3 12-21-18\mauiif59-b.pl2 Run By: Username 1/8/2019 04:22PM



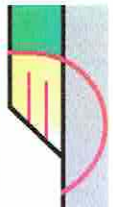
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Intercept (psf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	25.0	W1

#	FS
a	2.68
b	2.74
c	2.81
d	2.86
e	3.36
f	3.39
g	3.47
h	3.72
i	4.00
j	4.16

PCSTABL5M/si FSmin=2.68

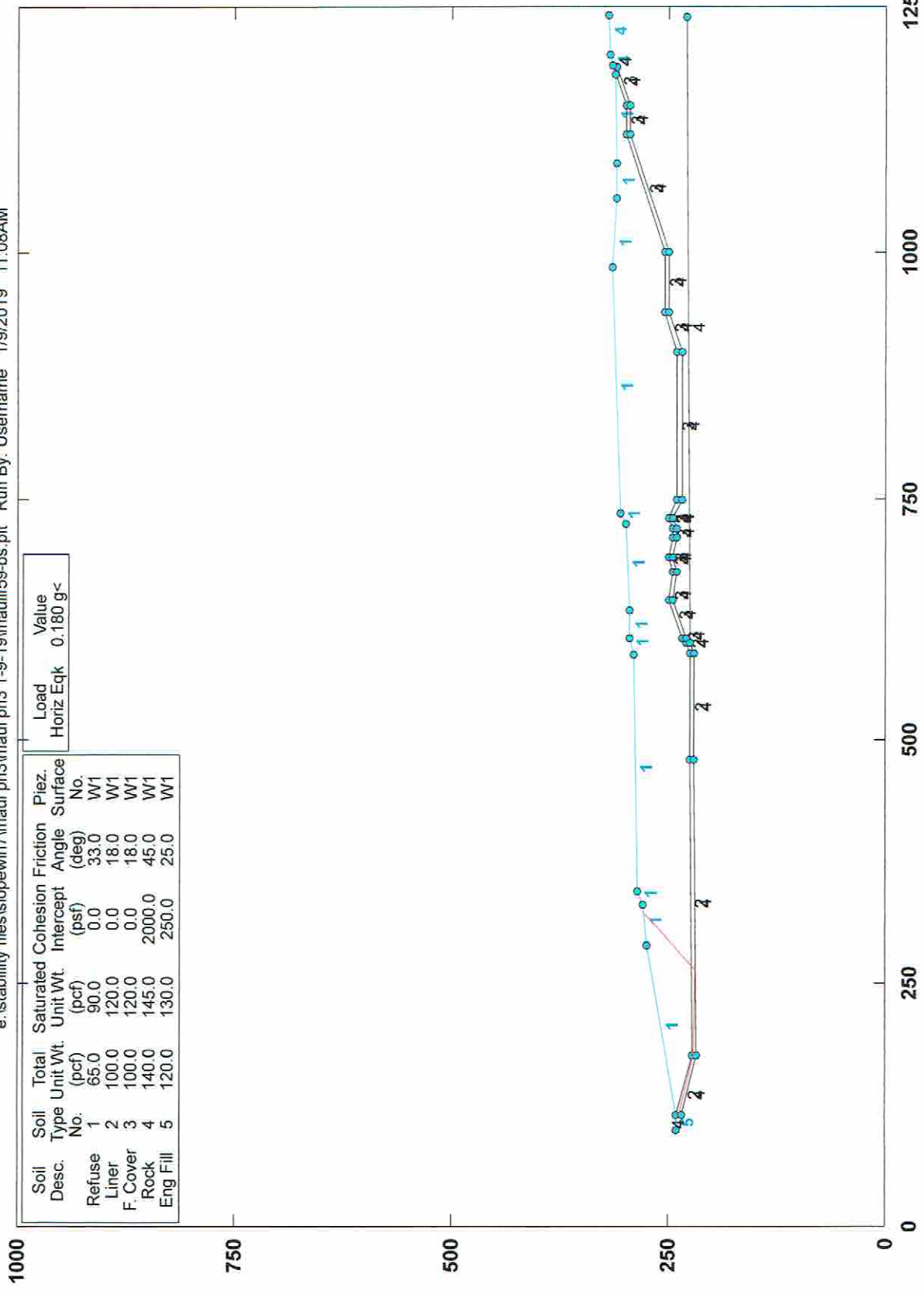
Safety Factors Are Calculated By The Modified Janbu Method

STED



CML - ph III Slope Stab. Section III-S5 Pseudo-Static

e:\stability files\lopewin7\maui ph3 1-9-19\mauiif59-bs.plt Run By: Username 1/9/2019 11:08AM

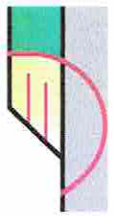


Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

Load Horiz Eqk	Value
0.180 g<	

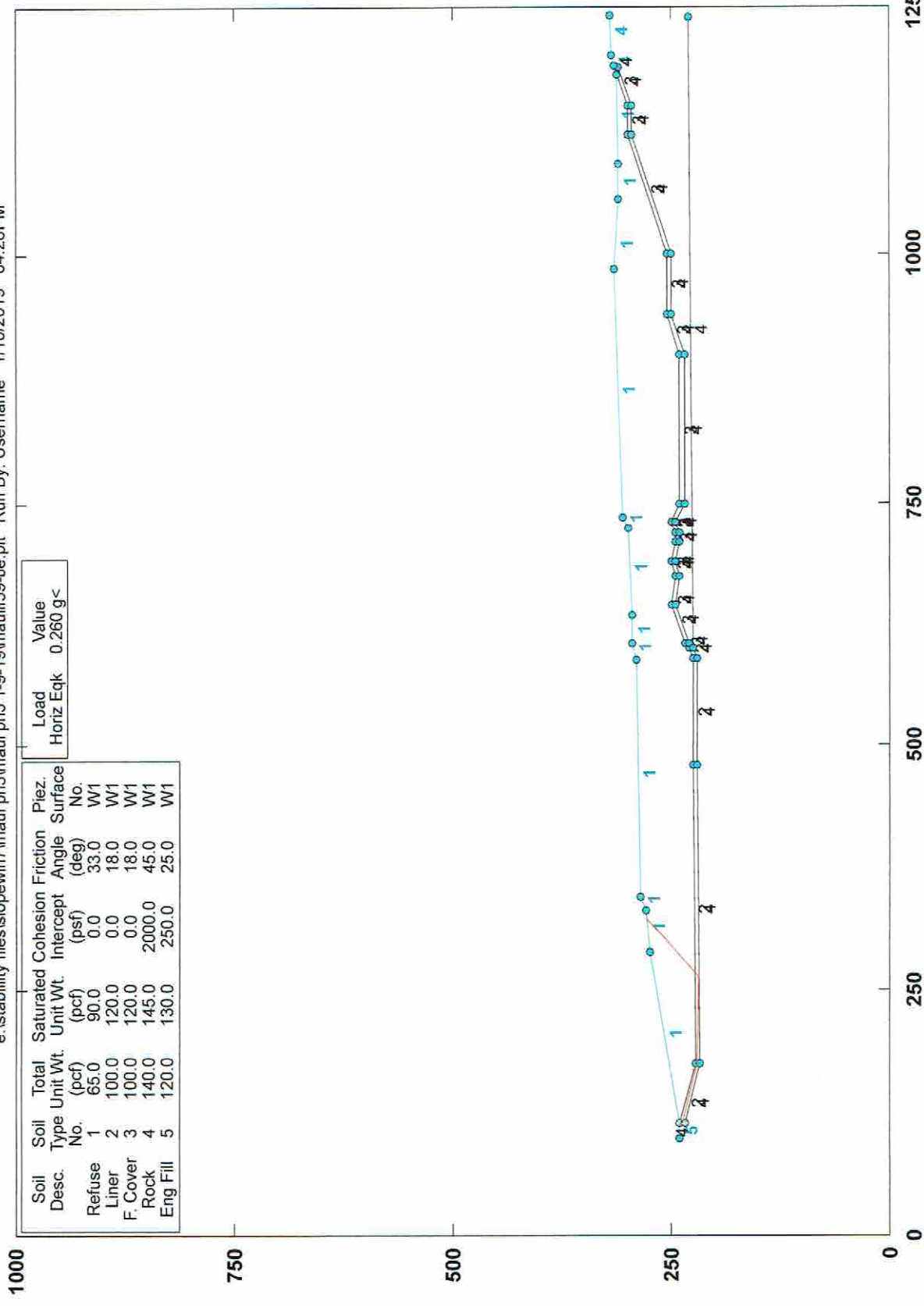
PCSTABL5M/si FSmin=1.26
Factors of Safety Calculated by Janbu Method

STED



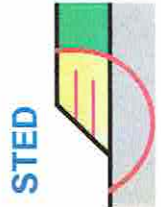
CML - ph III Slope Stab. Section III-S5 Pseudo-Static

e:\stability files\slopewin7\maui ph3 1-9-19\mauil59-be.plt Run By: Username 1/10/2019 04:26PM



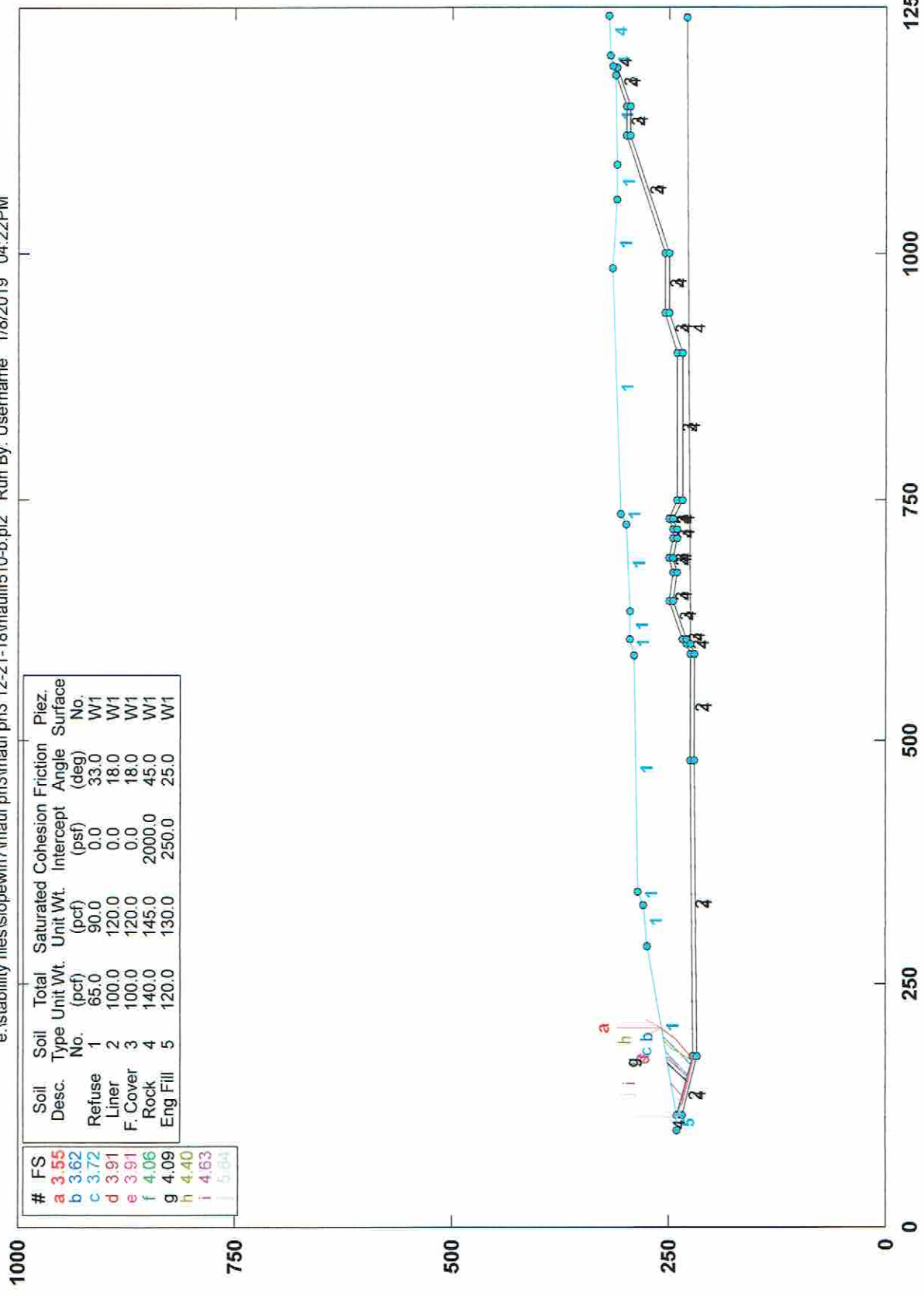
Load Horiz Eqk Value
0.260 g<

PCSTABL5M/si FSmin=1.00
Factors of Safety Calculated by Janbu Method



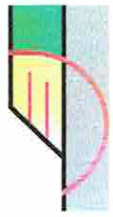
CML - ph III Slope Stab. Section III-S5 Static

e:\stability files\lopewin7\maui ph3\maui ph3 12-21-18\mauiif510-b.pl2 Run By: Username 1/8/2019 04:22PM



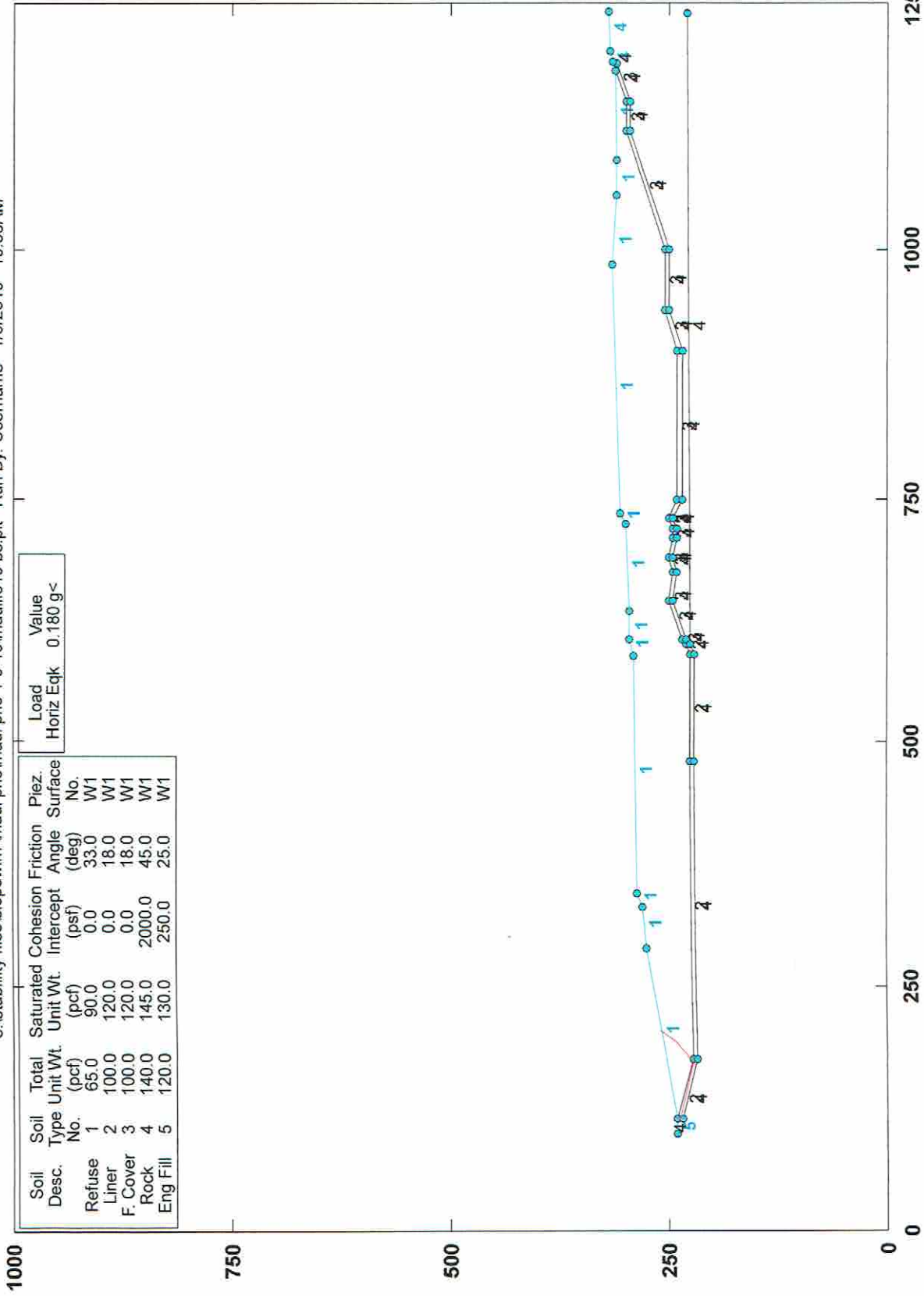
PCSTABL5M/si FSmin=3.55
Safety Factors Are Calculated By The Modified Janbu Method

STED



CML - ph III Slope Stab. Section III-S5 Pseudo-Static

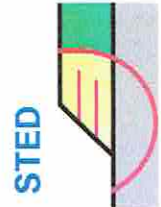
e:\stability files\stability\maui ph3 1-9-19\maui510-bs.plt Run By: Username 1/9/2019 10:56AM



Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Intercept (psf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	0.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	250.0	25.0	W1

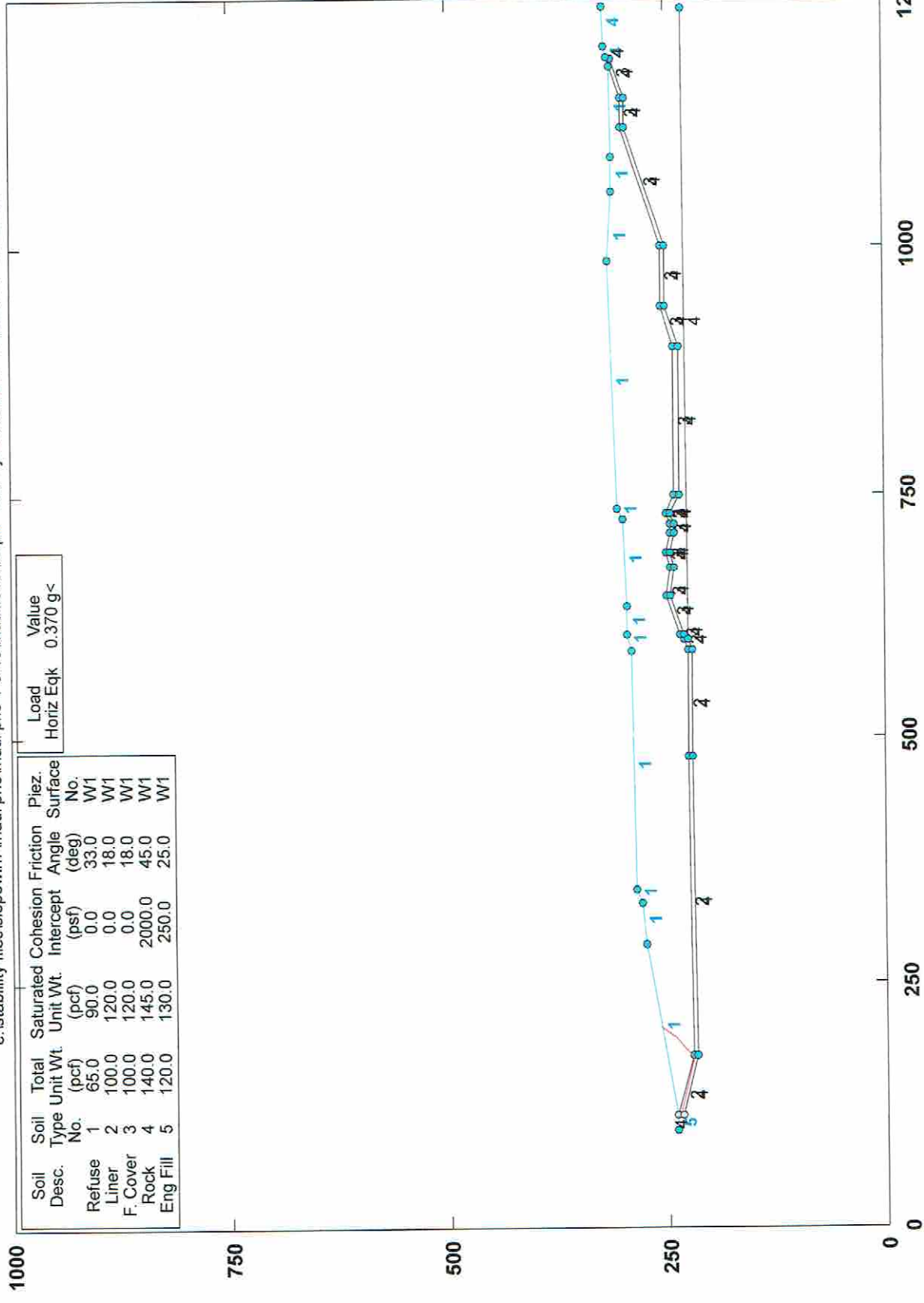
Load	Value
Horiz Eqk	0.180 g<

PCSTABL5M/si FSmin=1.64
Factors of Safety Calculated by Janbu Method



CML - ph III Slope Stab. Section III-S5 Pseudo-Static

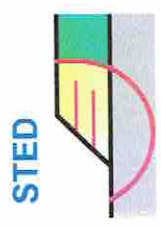
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Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	0.0	18.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

Load	Value
Horiz Eqk	0.370 g<

PCSTABL5M/si FSmin=1.01
Factors of Safety Calculated by Janbu Method



Appendix C-2

Stability Analysis

Phases IV - VI

Seismic Stability Analysis
Central Maui Landfill – Phases IV to VI
April 2016

Introduction

Central Maui Landfill (CML) 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 in lithified earth material, 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 Maui 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 Maui to be 0.36 g with a 2% probability of occurrence in 50 years. 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

A-Mehr, Inc. used the slope stability analysis computer program STABL5M as well as STED (which is a pre- and post-processor program for data input and output) to compute the static factor of safety and yield acceleration. 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 analysis is based on a gross slope stability evaluation of the landfill at the time when the landfill has reached its maximum permitted elevation, with design final slope gradients generally 3:1 (horizontal to vertical), and no steeper than 2.5:1 (horizontal to vertical).

Three critical cross-sections were developed for analysis, located as shown on Figures 1, and 2 on site plans displaying Phase IV to VI landfill liner grades, proposed final cover grades and the CML site aerial photograph, respectively. These sections, designated as A-A', B-B' and C-C', displayed on Figure 3, show maximum thickness of refuse over the liner system roughly on the order of 140 to 160 feet.

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 stability¹ of refuse slopes, as follows:

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.

- 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 generally recommended value for k_s is 50% of the peak horizontal acceleration during the design earthquake (USAPE, 1995).
- 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 .
- Based on Newmark-type slope material model for seismic analyses, if the resulting pseudo-static factor of safety is greater than 1.0, or the corresponding yield acceleration, K_y , is greater and the applied horizontal acceleration, K_s , there are no seismically-induced permanent slope displacements for the design earthquake event, and 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 forming the liner-waste system. Liner components are the essentially same on the floor and side slopes, except for the presence of leachate collection gravel media 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 $0.5 \times 0.36 = 0.18g$.

Table 1
System Components – From Bottom to Top

Prepared subgrade
Two (2) feet 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/protecting layer)
Solid waste

Analyses of gross stability of landfill slopes, including the liner system, were conducted for the most critical conditions, both assuming a slope ratio of 3 to 1 (horizontal: vertical). These analyses evaluated the cross-sections illustrated on Figure 3, 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 65 pounds per cubic foot (pcf) based on site-specific waste compaction and soil use data for CML.

Appendix C presents the data and calculations used to estimate the site-specific refuse mass unit weight of 65 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 bottom and side-slope soil liner, as well as structural fill against quarry walls	25	250	120
Solid Waste	33	0	65
Liner Interface System Low permeability soil liner vs. textured HDPE liner interface	18	0	100

Results

The computer output sheets for the STABL5M stability analyses are presented in Appendix C. The results are summarized in the following discussion.

Static Slope Stability:

Each of the three cross-sections was evaluated for gross (or deep-seated) slope stability 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.

Cross-sections analyzed were determined to have computed static factors of safety (FS) equal to or greater than 1.5 for all cases. As shown in Table 3, the lowest FS determined using wedge [W] type of potential sliding surfaces (including weakest bottom and side-slope liner interface elements), as well as circular [C] surfaces, for each cross section was:

- Cross-section A-A' 1.9 [W], 2.3 [C]
- Cross-section B-B' 2.2 [W], 2.5 [C]
- Cross-section C-C' 1.9 [W], 2.0 [C]

Pseudostatic Stability Analysis:

Both cross-sections were determined to have pseudo-static factors of safety (FS) in excess of 1.0 when analyzed using the seismic coefficient $k_s = 0.18g$.

As shown in Table 3, the lowest seismic FS values for each cross-section are:

- Cross-section A-A' 1.9 [W], 2.3 [C]
- Cross-section B-B' 2.2 [W], 2.5 [C]
- Cross-section C-C' 1.9 [W], 2.0 [C]

Table 3
Summary of Gross Slope Stability Analysis Results - Liner System
Static and Pseudo-Static Factors of Safety and Yield Acceleration

Cross Section	Analysis Type	Static Factor of Safety FS	Pseudo-Static PSFS (for 0.18g)	Yield Acceleration, Ky	Search Area
A-A'	Static, W	1.91	1.04	0.20	≈ 0-700' liner
		3.45	1.29	0.28	≈ 700-1100' liner
		4.76	1.41	0.27	≈ 1100-1600' liner
	Static, C	2.36			NW 3:1 (H:V) Slope
B-B'	Static, W	2.24	1.14	0.23	≈ 0-550' liner
		2.81	1.23	0.20	≈ 550-750' liner
		3.40	1.31		≈ 750-900' liner
		4.12	1.38		≈ 850-1000' liner
		4.57	1.41		≈ 1000-1800' liner
		6.48	1.50		≈ 1800-1850' liner
		6.78	1.54		≈ 1800-2300' liner
		8.61	1.60		≈ 2300-3000' liner
			Static, C	2.49	
C-C'	Static, W	1.91	1.07	0.20	≈ 100-350' liner
		2.05	1.09		≈ 350-750' liner
		6.70	1.49		≈ 750-900' liner
		Static, C	2.00		

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. With computed pseudo-static factors of safety greater than 1.0, or the corresponding computed yield acceleration greater than the applied horizontal acceleration, it can be concluded there will be no permanent seismically-induced displacement of the liner system during the design earthquake 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 Mehrzarin, P.E.
Principal Engineer

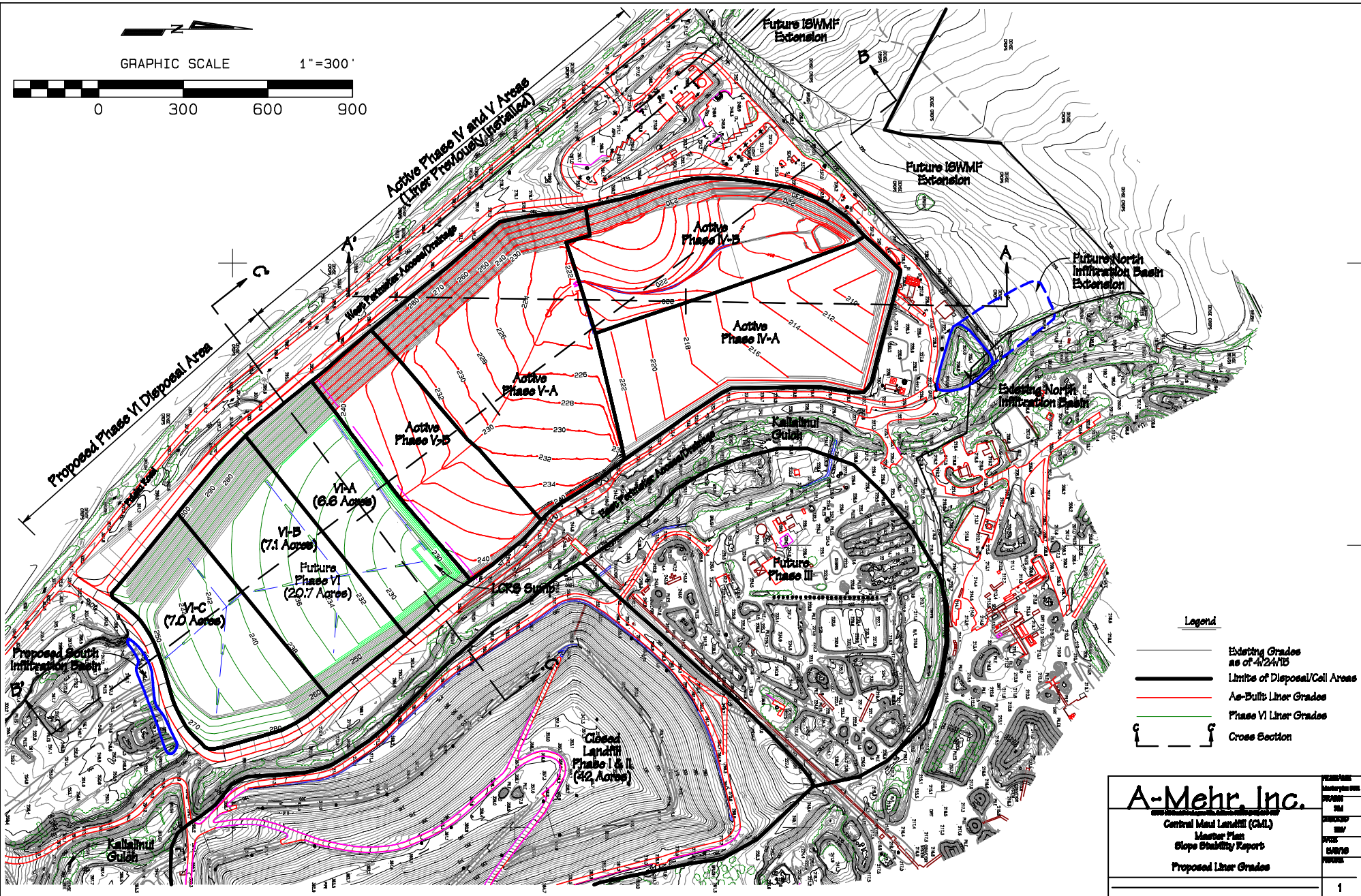
References

EPA, 1995. RCRA Subtitle D (258) Seismic Design Guidance for Municipal Solid Waste Landfill Facilities. EPA/600/R/95/051. U.S. Environmental Protection Agency, April 1995.

USGS, 2004a. Earthquake Hazards and Zoning in Hawaii.
<http://hvo.wr.usgs.gov/earthquakes/hazards/>. June 2004.

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<http://equhazmaps.usgs.gov/faq/>. United States Geological Survey website accessed September 2004.

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



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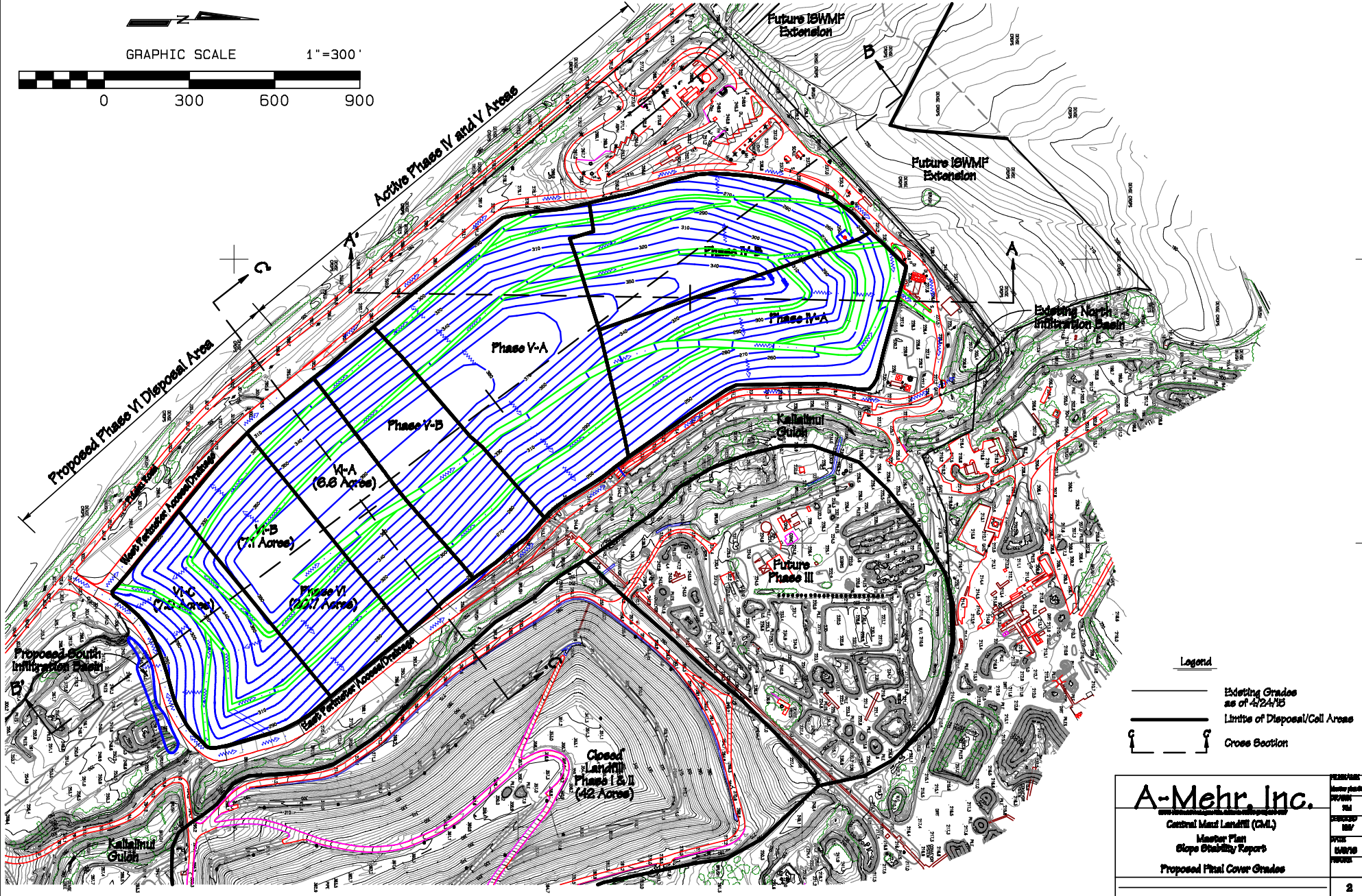
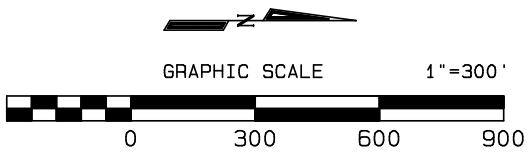
Legend

- Existing Grades as of 4/24/15
- Limits of Disposal/Cell Areas
- As-Built Liner Grades
- Phase VI Liner Grades
- Cross Section




A-Mehr, Inc.

Central Mass Landfill (CML)
Master Plan
Slope Stability Report
Proposed Liner Grades

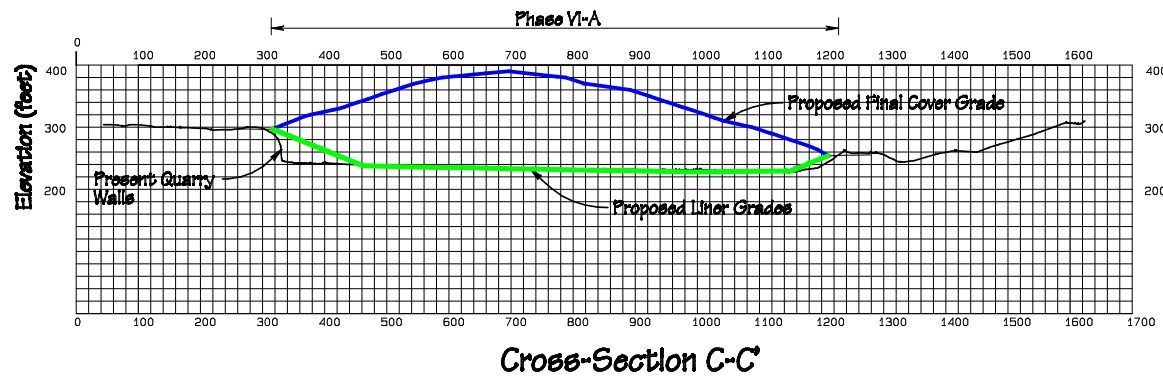
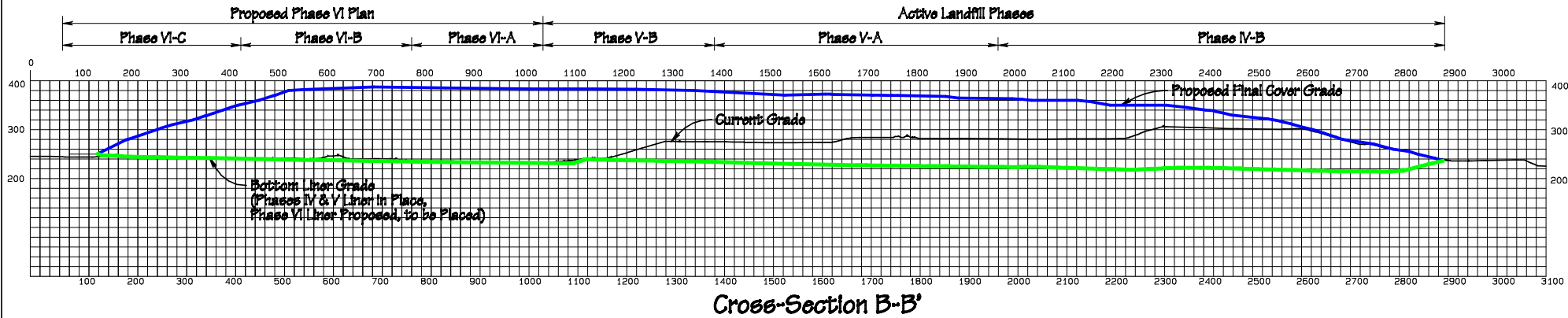
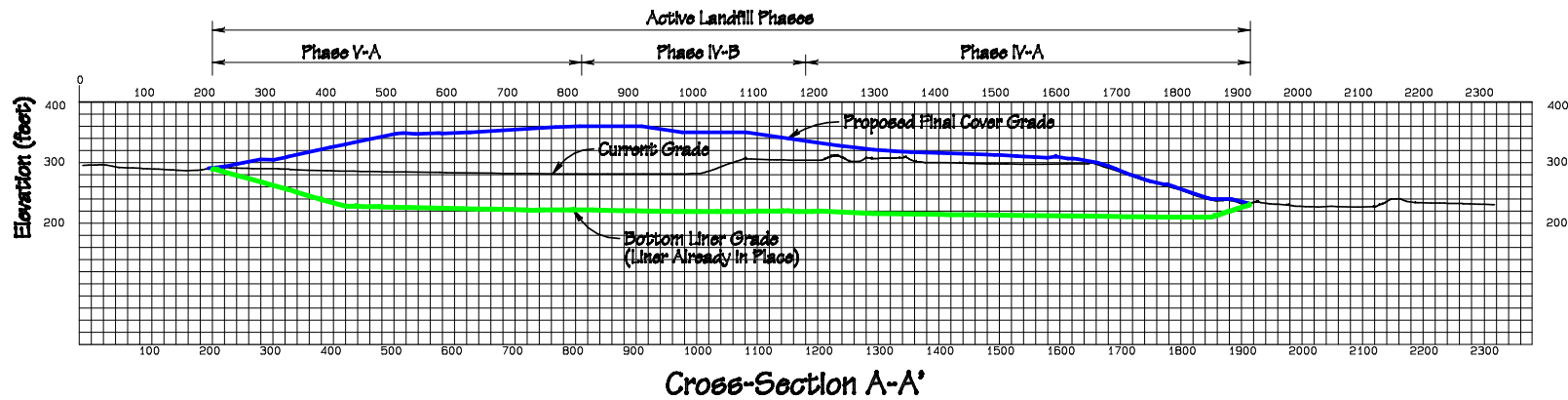
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SCALE	AS SHOWN
PROJECT	1



Legend

-  Edging Grades as of 4/24/13
-  Limits of Disposal/Cell Areas
-  Cross Section

A-Mehr, Inc.		DATE/ISSUE 10/24/13
Central Maui Landfill (CML)		PROJECT CML
Master Plan		DESIGNED BY A-Mehr, Inc.
Slope Stability Reports		DATE 10/24/13
Proposed Final Cover Grades		PROJECT CML
		2



<h1>A-Mehr, Inc.</h1> <p>Central Mass Landfill (CML)</p> <p>Master Plan Slope Stability Reports</p> <p>Cross Sections A-A', B-B', C-C'</p>	<small>PREPARED BY</small> <small>DATE</small> <small>SCALE</small> <small>PROJECT NO.</small> <small>PROJECT NAME</small>
	<small>DESIGNED BY</small> <small>DATE</small> <small>SCALE</small> <small>PROJECT NO.</small> <small>PROJECT NAME</small>
	<small>CHECKED BY</small> <small>DATE</small> <small>SCALE</small> <small>PROJECT NO.</small> <small>PROJECT NAME</small>
	<small>APPROVED BY</small> <small>DATE</small> <small>SCALE</small> <small>PROJECT NO.</small> <small>PROJECT NAME</small>

APPENDIX C

STABILITY ANALYSIS RESULTS

Summary of Gross Stability Analysis - Liner System

Cross Section	Analysis	FS	PSFS @ 0.18g	Ky	Search Area		
A-A'	Static, W	1.91	1.04	0.20	≈ 0-700' liner		
		3.45	1.29	0.28	≈ 700-1100' liner		
		4.76	1.41	0.27	≈ 1100-1600' liner		
	Static, C	2.36			NW 3:1 Slope		
B-B'	Static, W	2.24	1.14	0.23	≈ 0-550' liner		
		2.81	1.23	0.20	≈ 550-750' liner		
		3.40	1.31		≈ 750-900' liner		
		4.12	1.38		≈ 850-1000' liner		
		4.57	1.41		≈ 1000-1800' liner		
		6.48	1.50		≈ 1800-1850' liner		
		6.78	1.54		≈ 1800-2300' liner		
		8.61	1.60		≈ 2300-3000' liner		
			Static, C	2.49			North 3:1 Slope
		C-C'	Static, W	1.91	1.07	0.20	≈ 100-350' liner
2.05	1.09				≈ 350-750' liner		
6.70	1.49				≈ 750-900' liner		
Static, C	2.00				West 3:1 Slope		

Static Stability

Summary of Gross Stability Analysis - Liner System

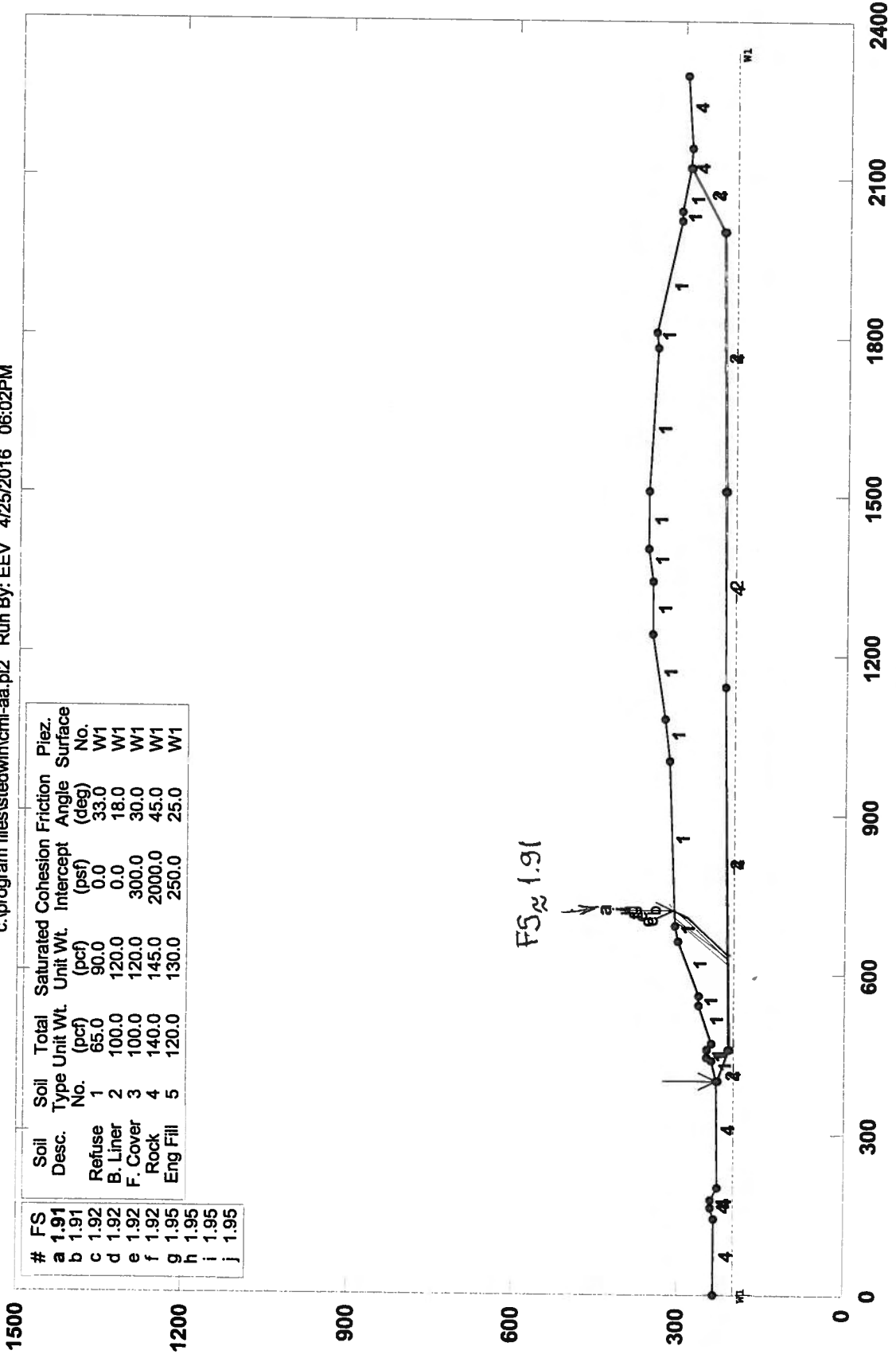
Cross Section	Analysis	FS	PSFS @ 0.18g	Ky	Search Area
A-A'	Static, W	1.91	1.04	0.20	≈ 0-700' liner
		3.45	1.29	0.28	≈ 700-1100' liner
		4.76	1.41	0.27	≈ 1100-1600' liner
	Static, C	2.36			NW 3:1 Slope
B-B'	Static, W	2.24	1.14	0.23	≈ 0-550' liner
		2.81	1.23	0.20	≈ 550-750' liner
		3.40	1.31		≈ 750-900' liner
		4.12	1.38		≈ 850-1000' liner
		4.57	1.41		≈ 1000-1800' liner
		6.48	1.50		≈ 1800-1850' liner
		6.78	1.54		≈ 1800-2300' liner
		8.61	1.60		≈ 2300-3000' liner
	Static, C	2.49			North 3:1 Slope
C-C'	Static, W	1.91	1.07	0.20	≈ 100-350' liner
		2.05	1.09		≈ 350-750' liner
		6.70	1.49		≈ 750-900' liner
	Static, C	2.00			West 3:1 Slope

CML - Phase VI - Section AA Static, Liner

c:\program files\stedwin\cml-aa.pl2 Run By: EEV 4/25/2016 06:02PM

#	FS	Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Intercept (psf)	Friction Angle (deg)	Cohesion (psf)	Piez. Surface No.
a	1.91	Refuse	1	65.0	90.0	0.0	33.0	0.0	W1
b	1.92	B. Liner	2	100.0	120.0	0.0	18.0	0.0	W1
c	1.92	F. Cover	3	100.0	120.0	300.0	30.0	300.0	W1
d	1.92	Rock	4	140.0	145.0	2000.0	45.0	2000.0	W1
e	1.92	Eng Fill	5	120.0	130.0	250.0	25.0	250.0	W1

g	1.95
h	1.95
i	1.95
j	1.95



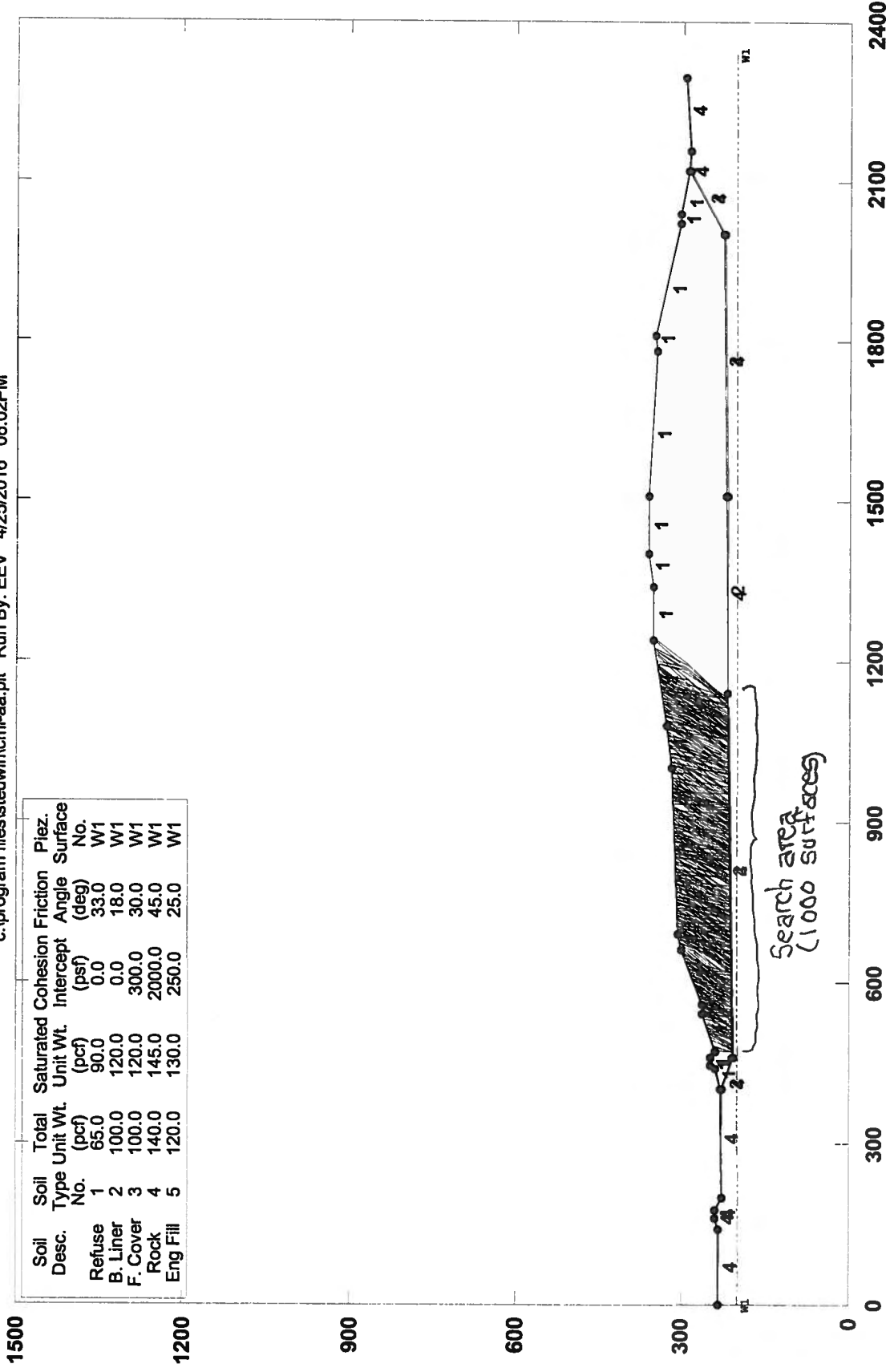
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Safety Factors Are Calculated By The Modified Janbu Method

CML - Phase VI - Section AA Static, Liner

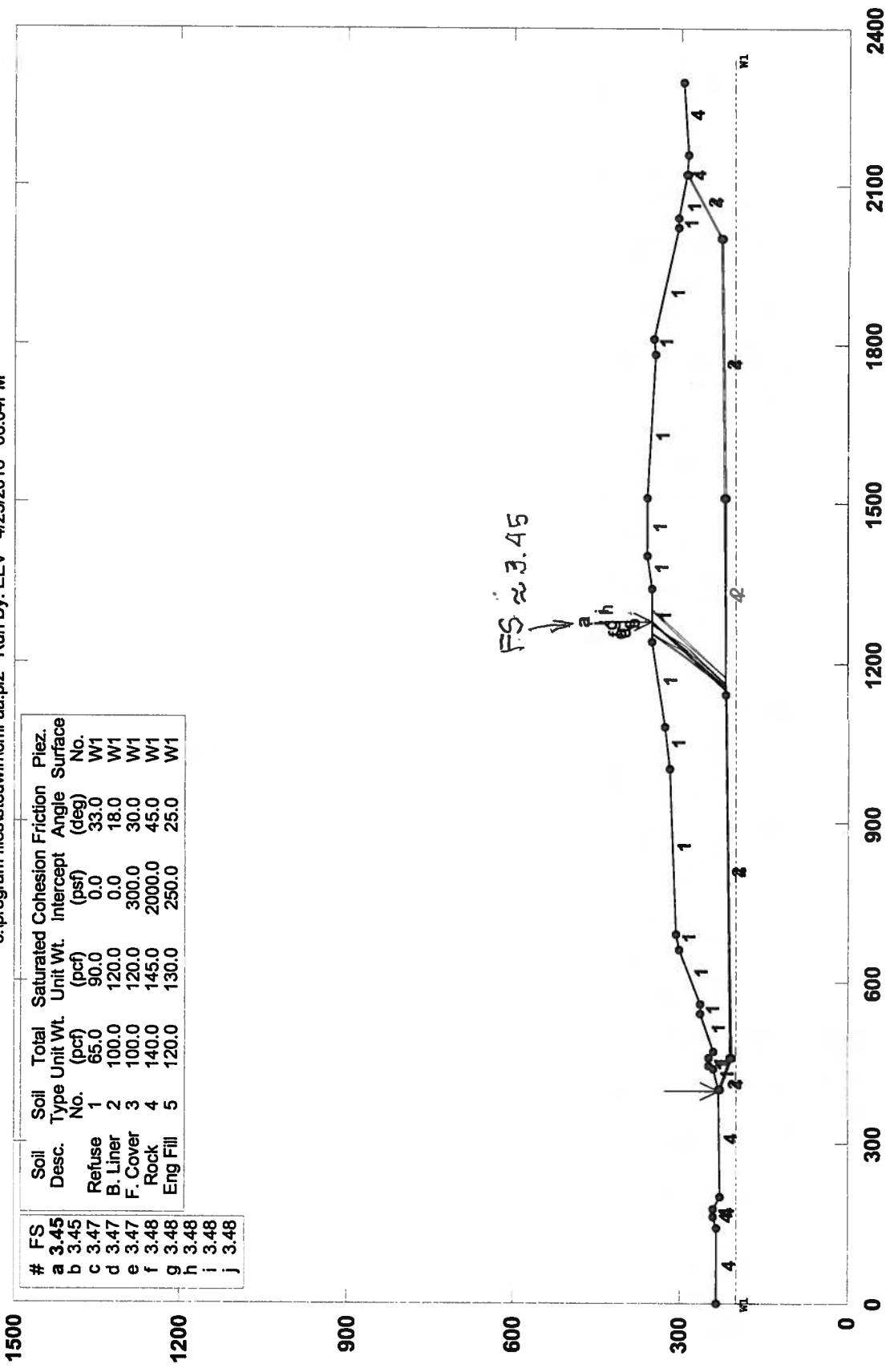
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Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



CML - Phase VI - Section AA Static, Liner

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#	Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
a	Refuse	1	65.0	90.0	0.0	33.0	W1
b	B. Liner	2	100.0	120.0	0.0	18.0	W1
c	F. Cover	3	100.0	120.0	300.0	30.0	W1
d	Rock	4	140.0	145.0	2000.0	45.0	W1
e	Eng Fill	5	120.0	130.0	250.0	25.0	W1
g							
h							
i							
j							

FS ≈ 3.45

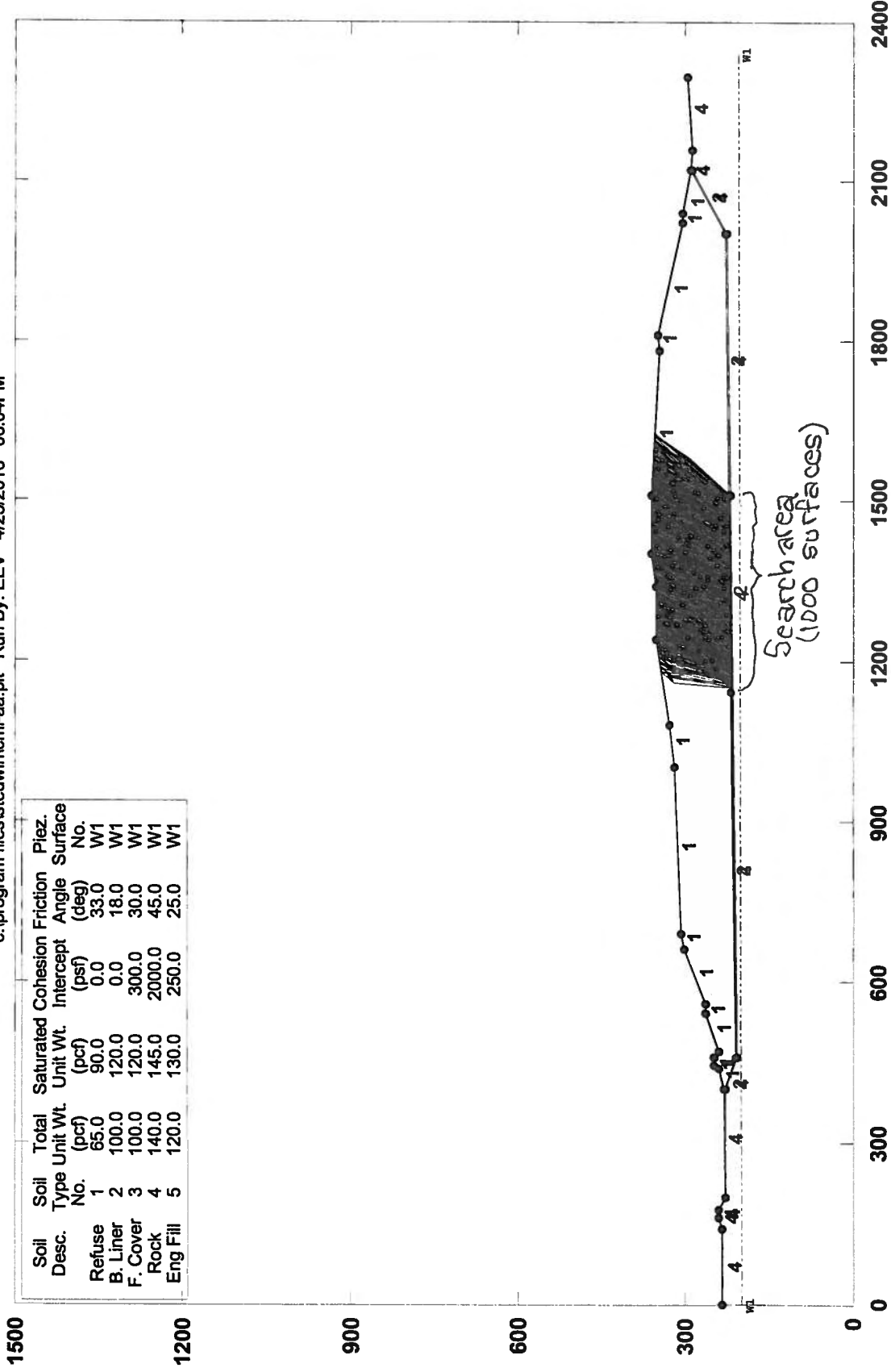
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Safety Factors Are Calculated By The Modified Janbu Method

CML - Phase VI - Section AA Static, Liner

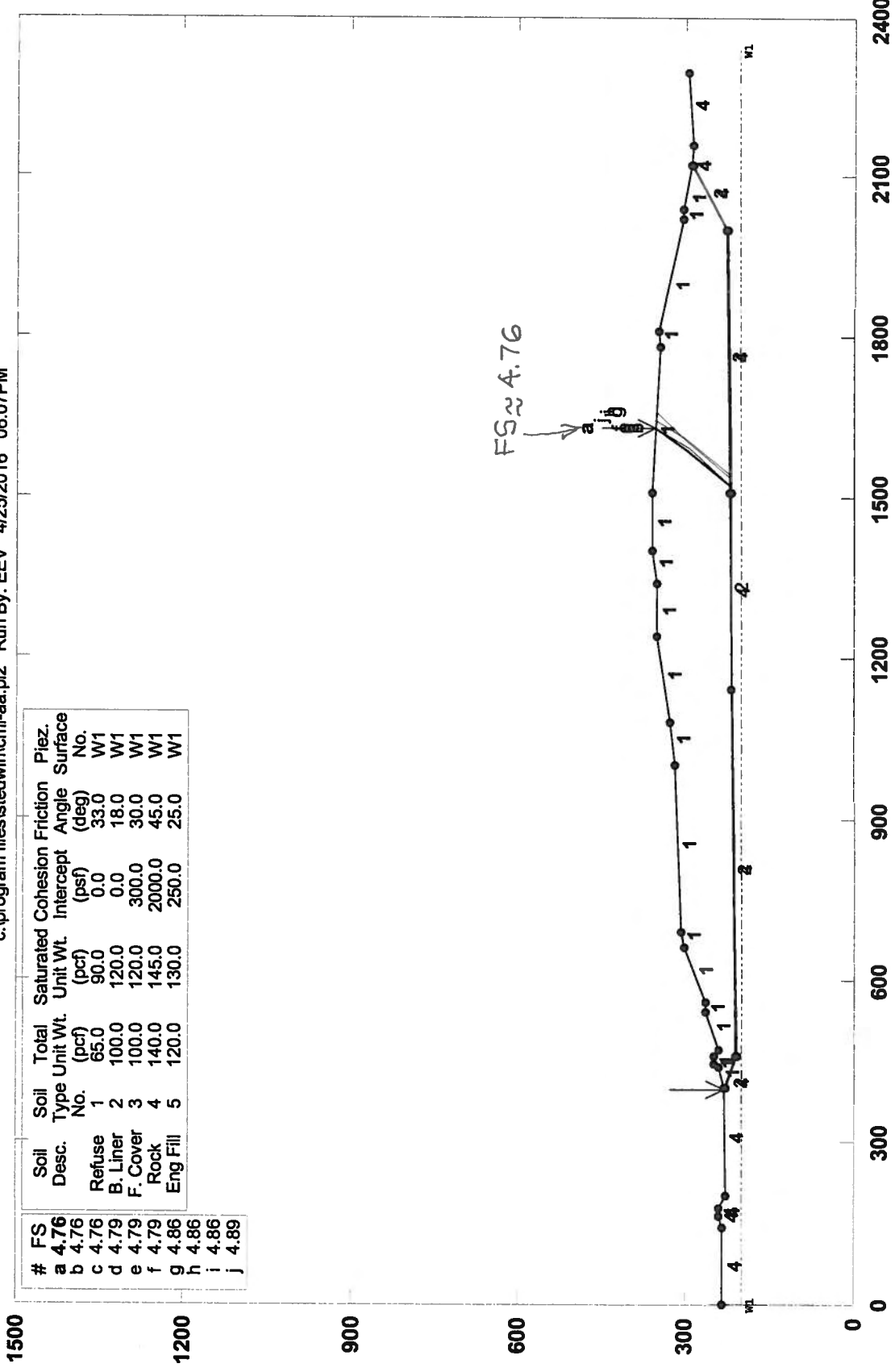
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Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1



CML - Phase VI - Section AA Static, Liner

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#	FS	Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
a	4.76	Refuse	1	65.0	90.0	0.0	33.0	W1
b	4.76	B. Liner	2	100.0	120.0	0.0	18.0	W1
c	4.79	F. Cover	3	100.0	120.0	300.0	30.0	W1
d	4.79	Rock	4	140.0	145.0	2000.0	45.0	W1
e	4.79	Eng Fill	5	120.0	130.0	250.0	25.0	W1

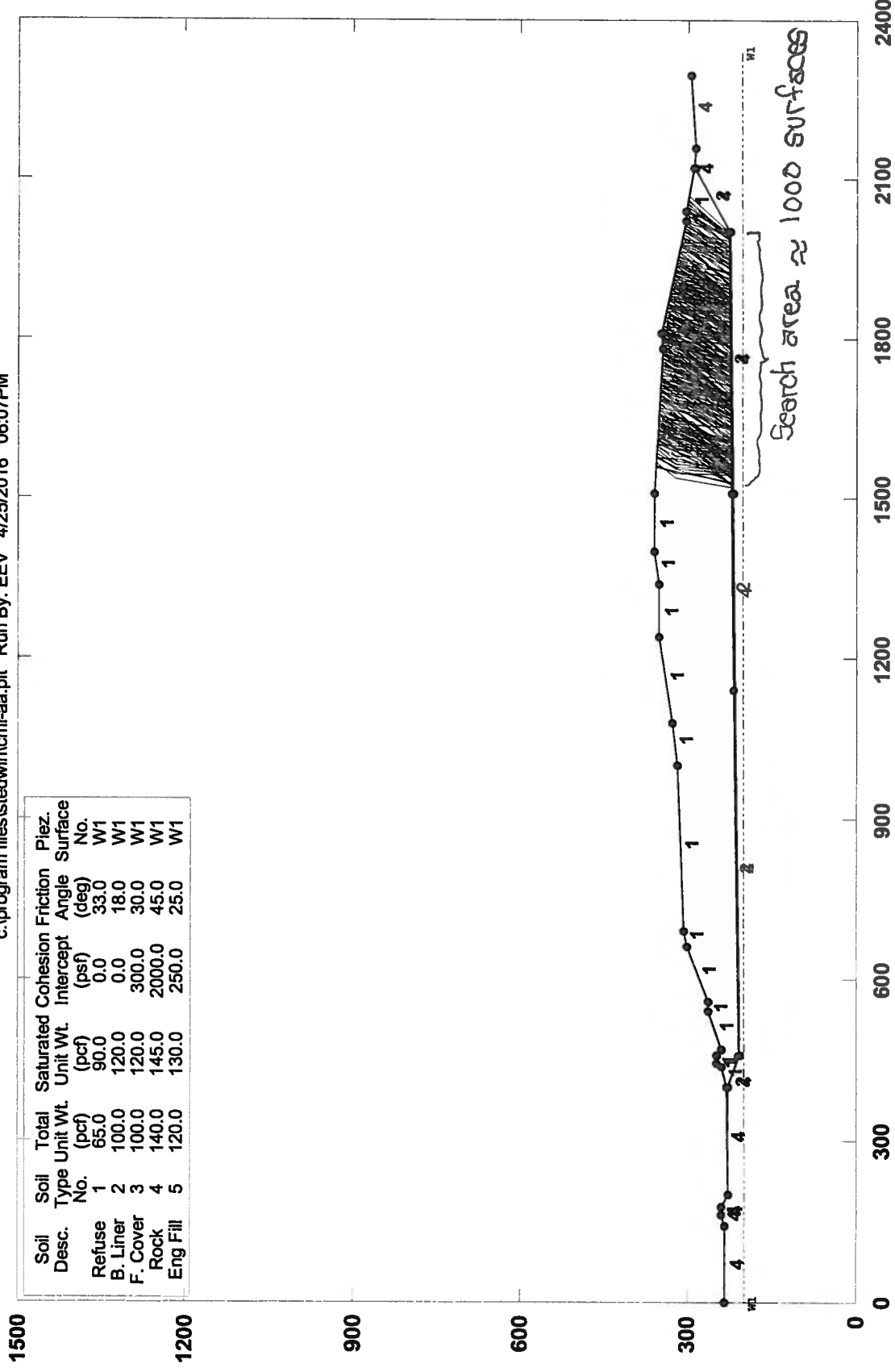
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- j 4.89

FS ≈ 4.76

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Safety Factors Are Calculated By The Modified Janbu Method

CML - Phase VI - Section AA Static, Liner

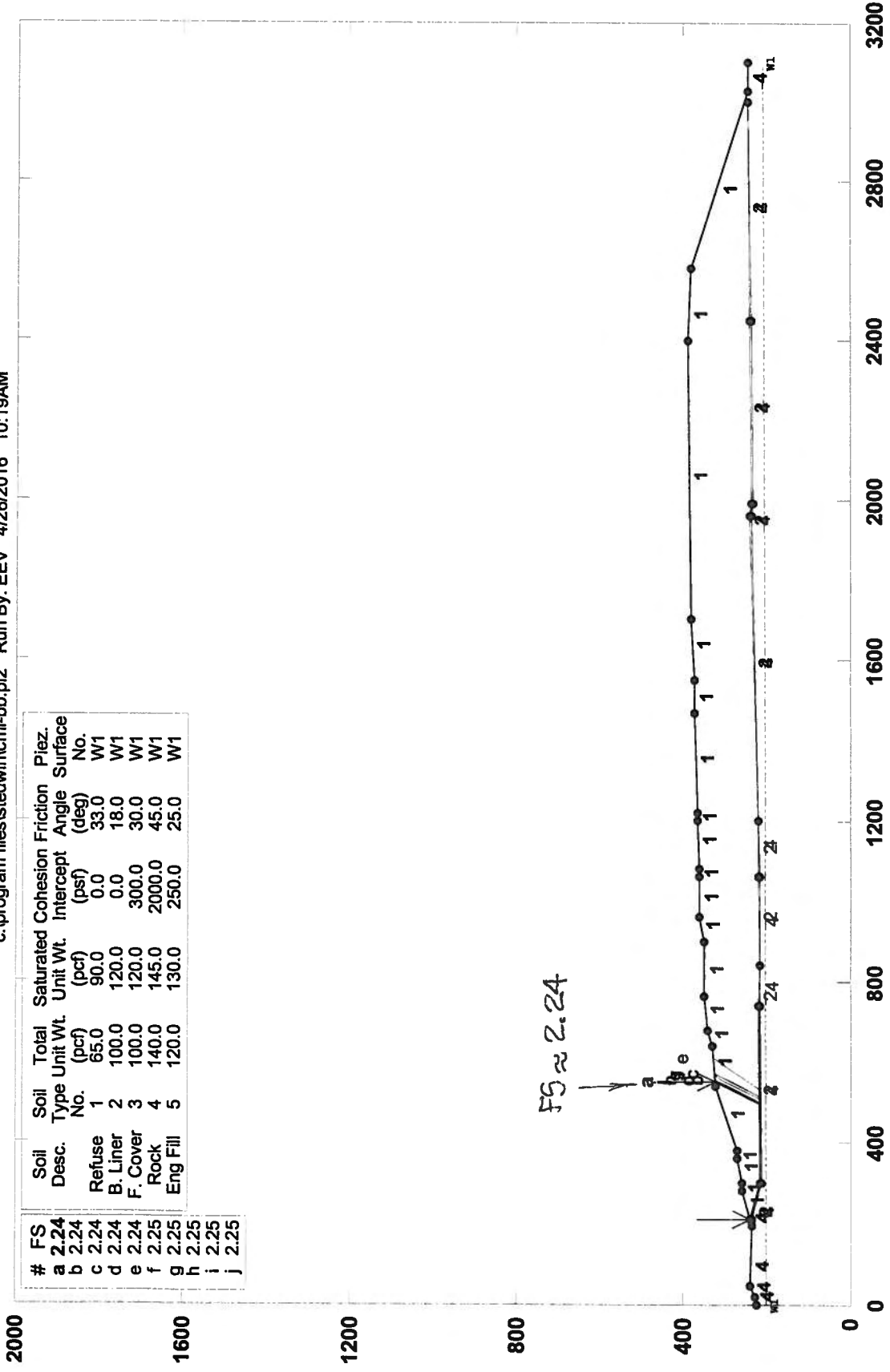
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Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
Refuse	1	65.0	90.0	0.0	33.0	W1
B. Liner	2	100.0	120.0	0.0	18.0	W1
F. Cover	3	100.0	120.0	300.0	30.0	W1
Rock	4	140.0	145.0	2000.0	45.0	W1
Eng Fill	5	120.0	130.0	250.0	25.0	W1

CML - Phase VI - Section BB Static, Liner

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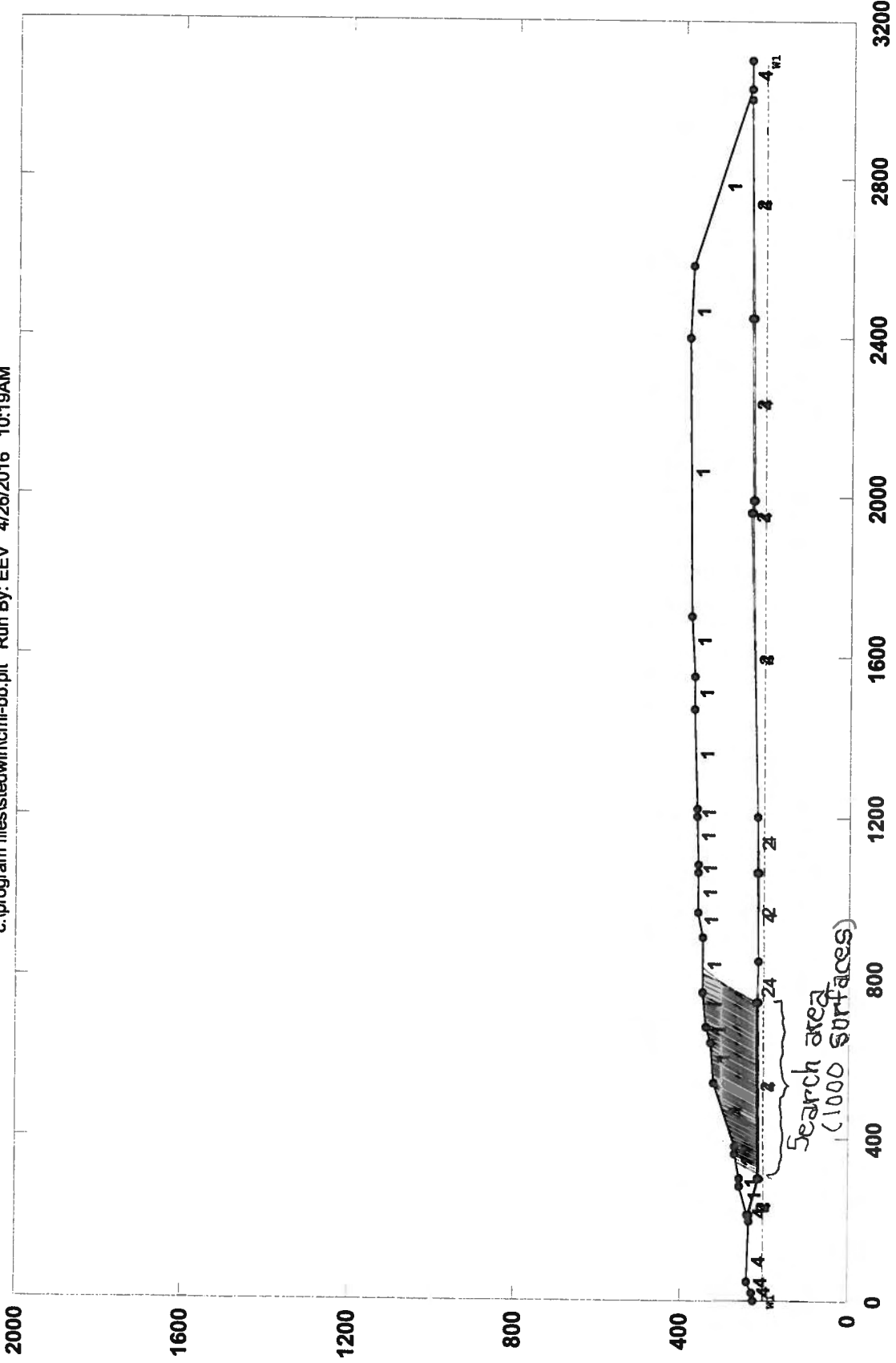
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a	2.24	Refuse	1	65.0	90.0	0.0	33.0	W1
b	2.24	B. Liner	2	100.0	120.0	0.0	18.0	W1
c	2.24	F. Cover	3	100.0	120.0	300.0	30.0	W1
d	2.24	Rock	4	140.0	145.0	2000.0	45.0	W1
e	2.25	Eng Fill	5	120.0	130.0	250.0	25.0	W1
f	2.25							
g	2.25							
h	2.25							
i	2.25							
j	2.25							

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Safety Factors Are Calculated By The Modified Janbu Method

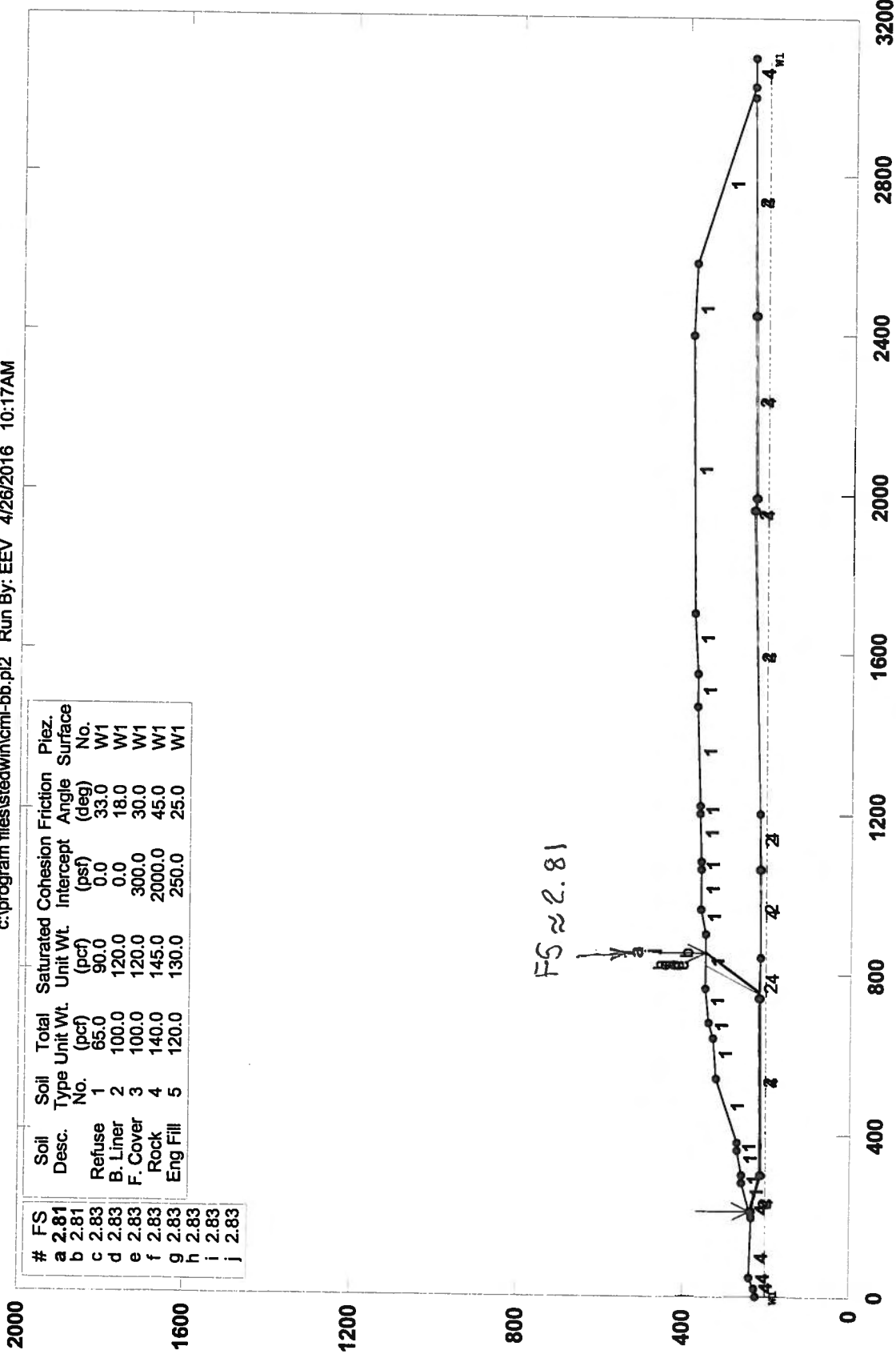
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CML - Phase VI - Section BB Static, Liner

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#	FS	Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
a	2.81	Refuse	1	65.0	90.0	0.0	33.0	W1
b	2.83	B. Liner	2	100.0	120.0	0.0	18.0	W1
c	2.83	F. Cover	3	100.0	120.0	300.0	30.0	W1
d	2.83	Rock	4	140.0	145.0	2000.0	45.0	W1
e	2.83	Eng. Fill	5	120.0	130.0	250.0	25.0	W1
f	2.83							
g	2.83							
h	2.83							
i	2.83							
j	2.83							

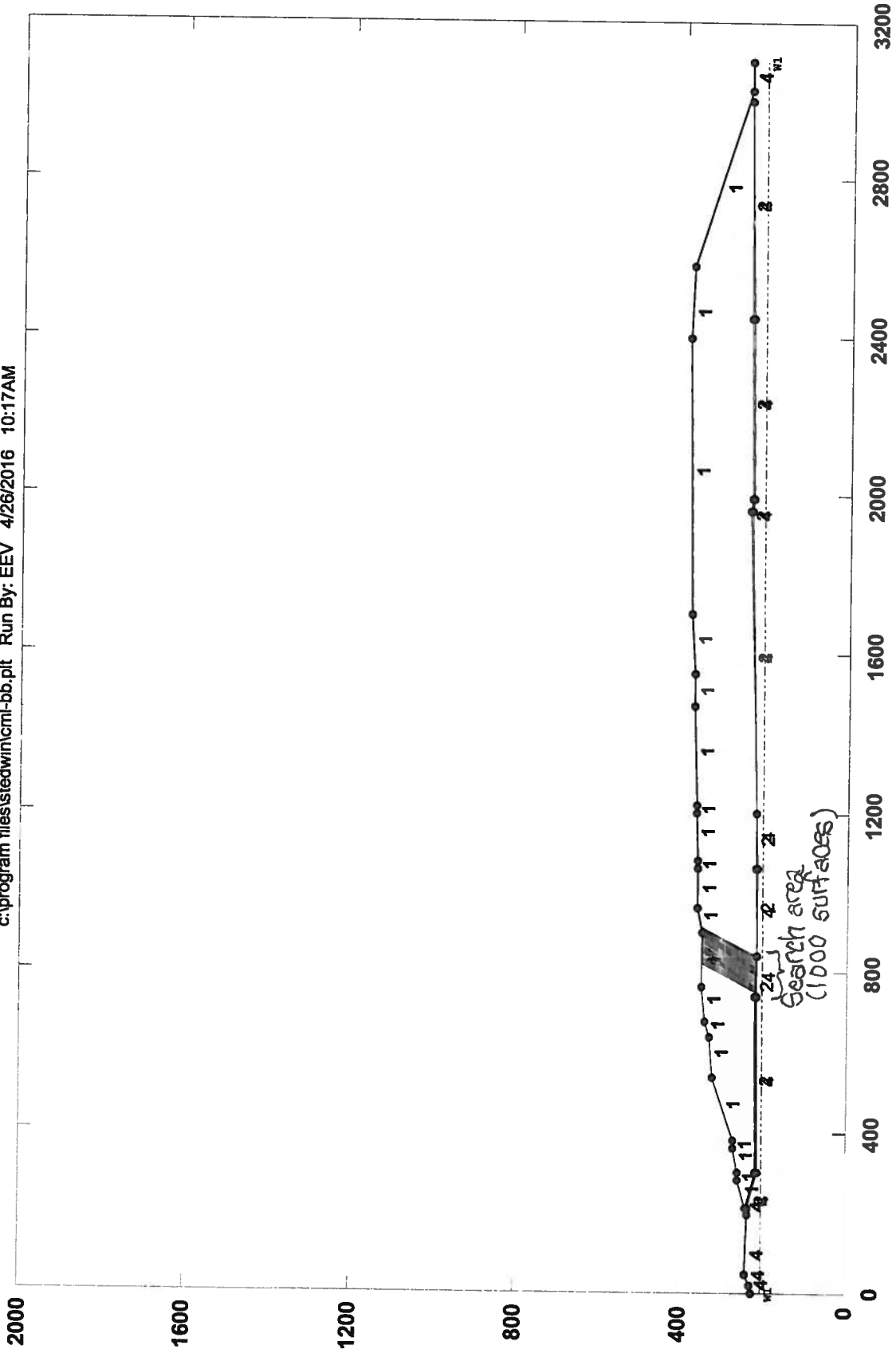
FS ≈ 2.81

PCSTABL5M/si FSmin=2.81

Safety Factors Are Calculated By The Modified Janbu Method

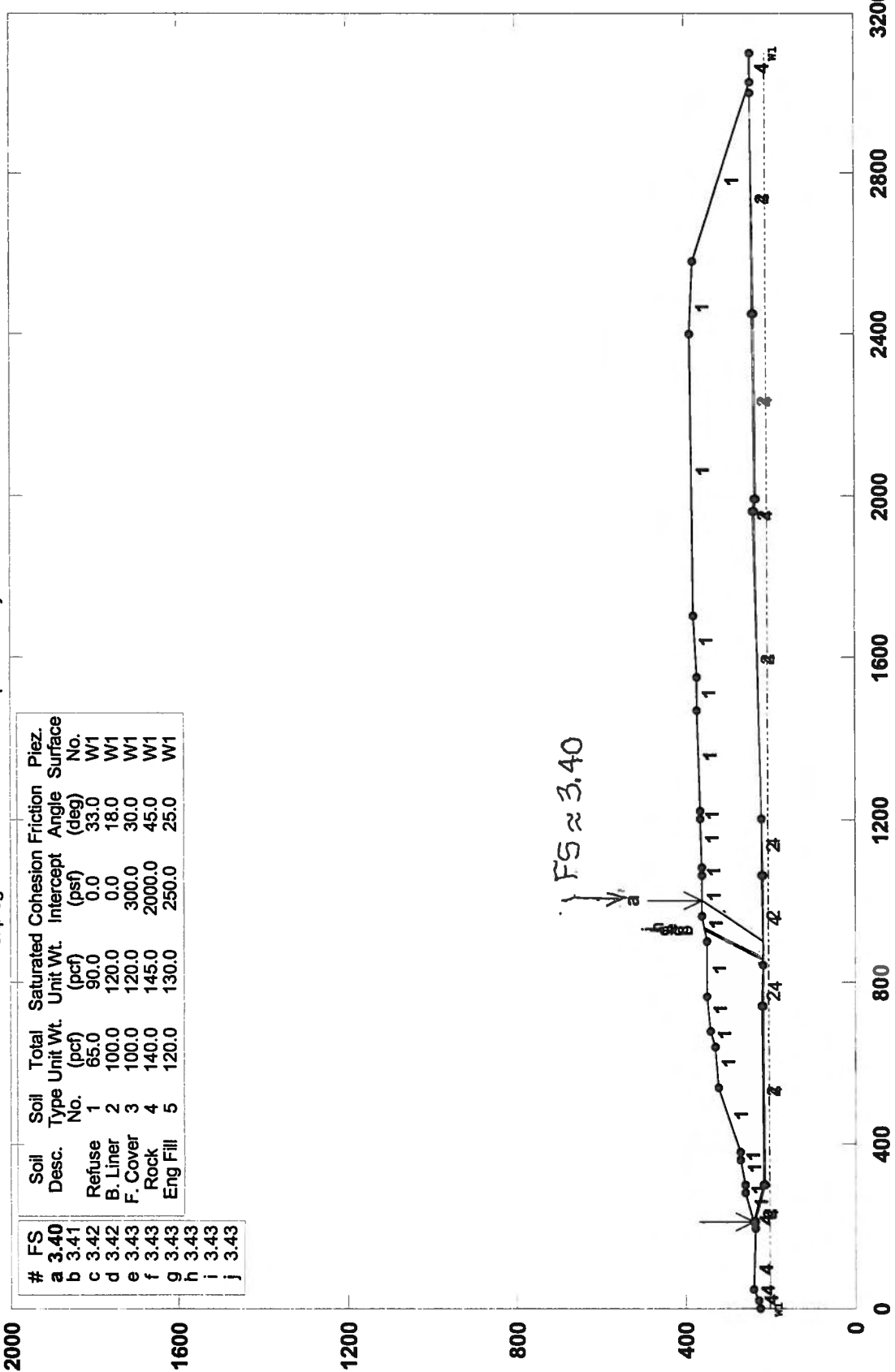
CML - Phase VI - Section BB Static, Liner

c:\program files\istedwin\cmi-bb.plt Run By: EEV 4/26/2016 10:17AM



CML - Phase VI - Section BB Static, Liner

c:\program files\stedwin\cml-bb.pl2 Run By: EEV 4/26/2016 10:12AM



#	FS	Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
a	3.40	Refuse	1	65.0	90.0	0.0	33.0	W1
b	3.41	B. Liner	2	100.0	120.0	0.0	18.0	W1
c	3.42	F. Cover	3	100.0	120.0	300.0	30.0	W1
d	3.43	Rock	4	140.0	145.0	2000.0	45.0	W1
e	3.43	Eng Fill	5	120.0	130.0	250.0	25.0	W1

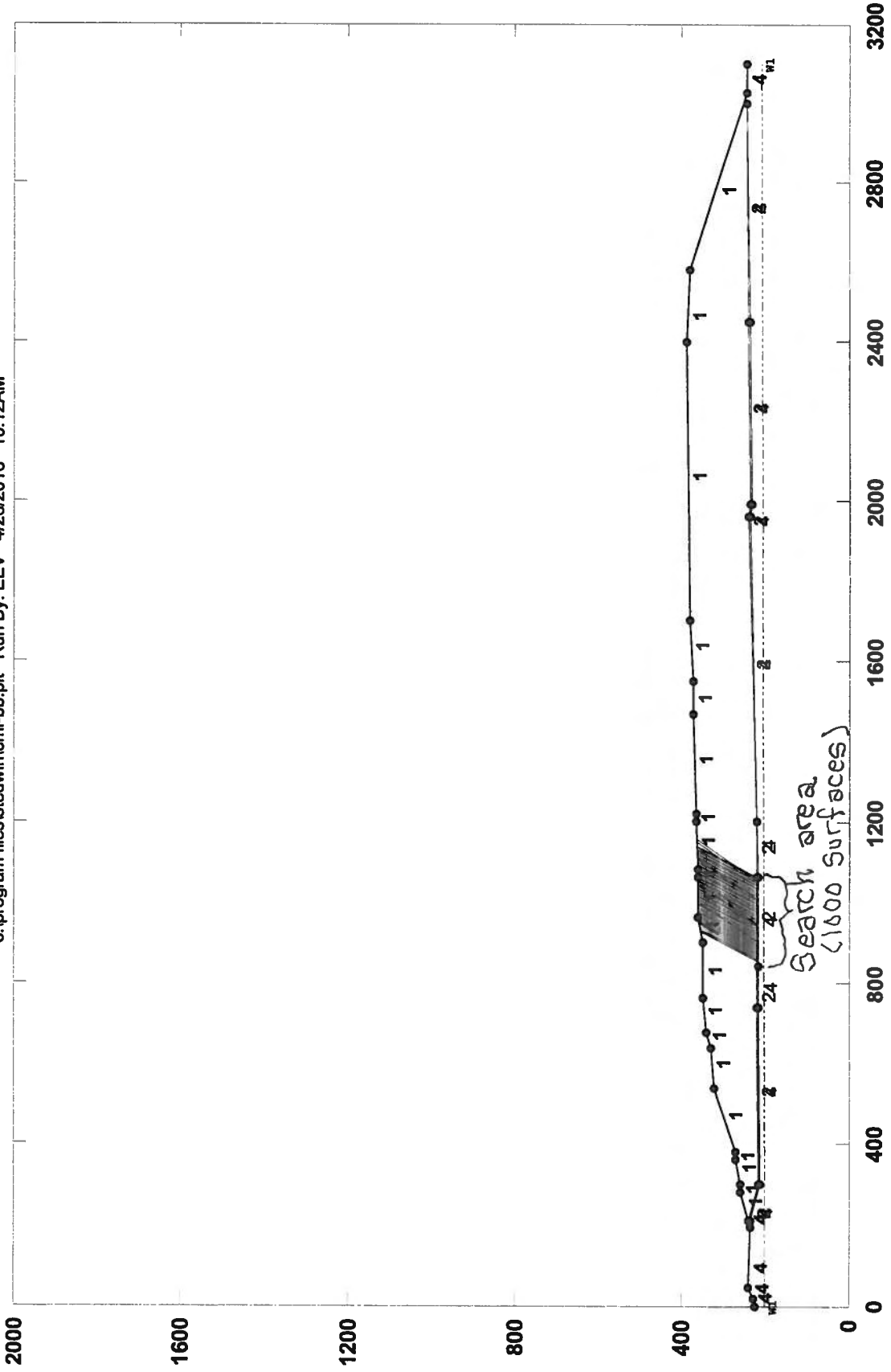
FS ≈ 3.40

PCSTABL5M/si FSmin=3.40

Safety Factors Are Calculated By The Modified Janbu Method

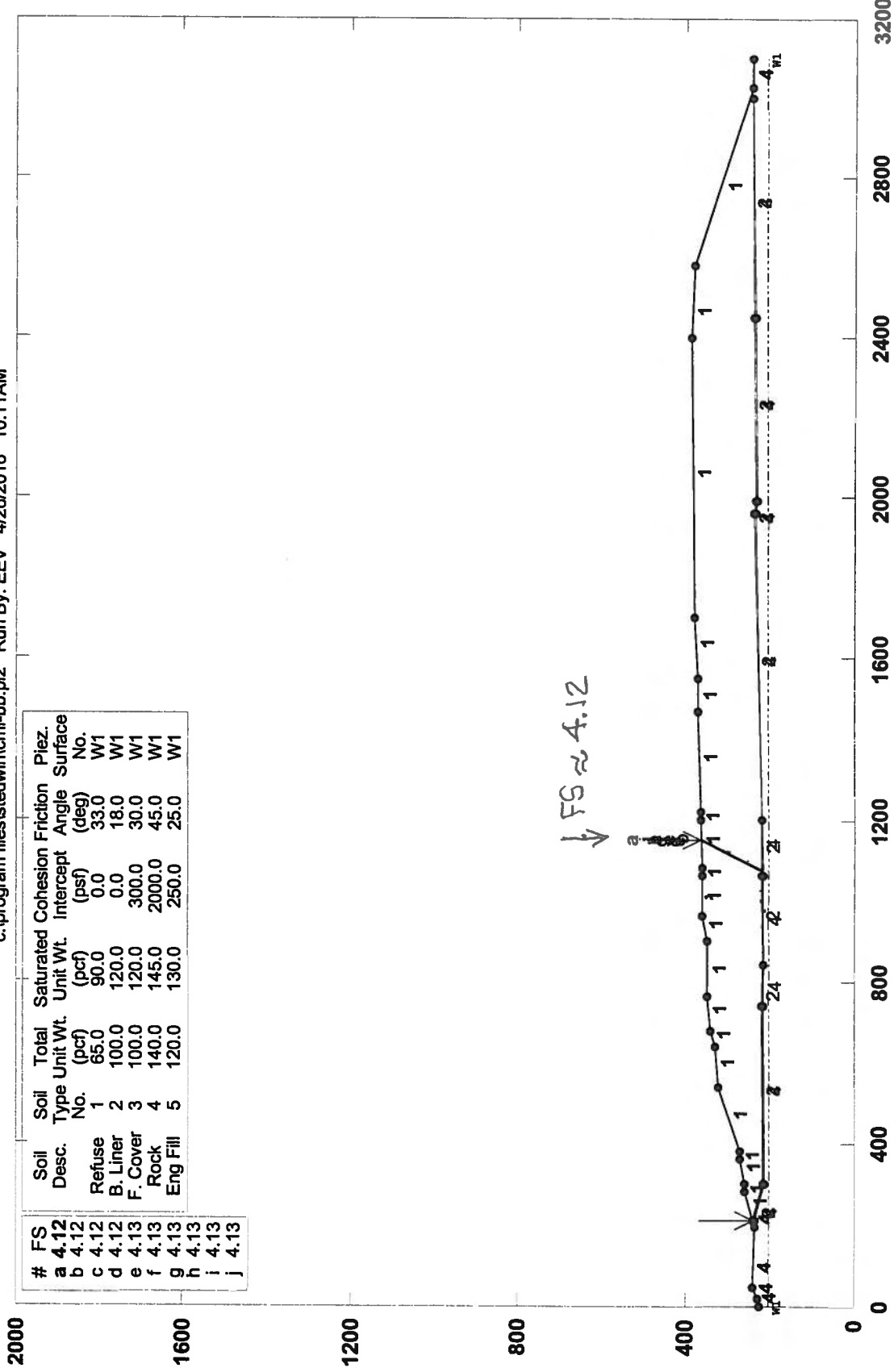
CML - Phase VI - Section BB Static, Liner

c:\program files\stedwin\cml-bb.plt Run By: EEV 4/26/2016 10:12AM



CML - Phase VI - Section BB Static, Liner

c:\program files\stedwin\cml-bb.pl2 Run By: EEV 4/26/2016 10:11AM

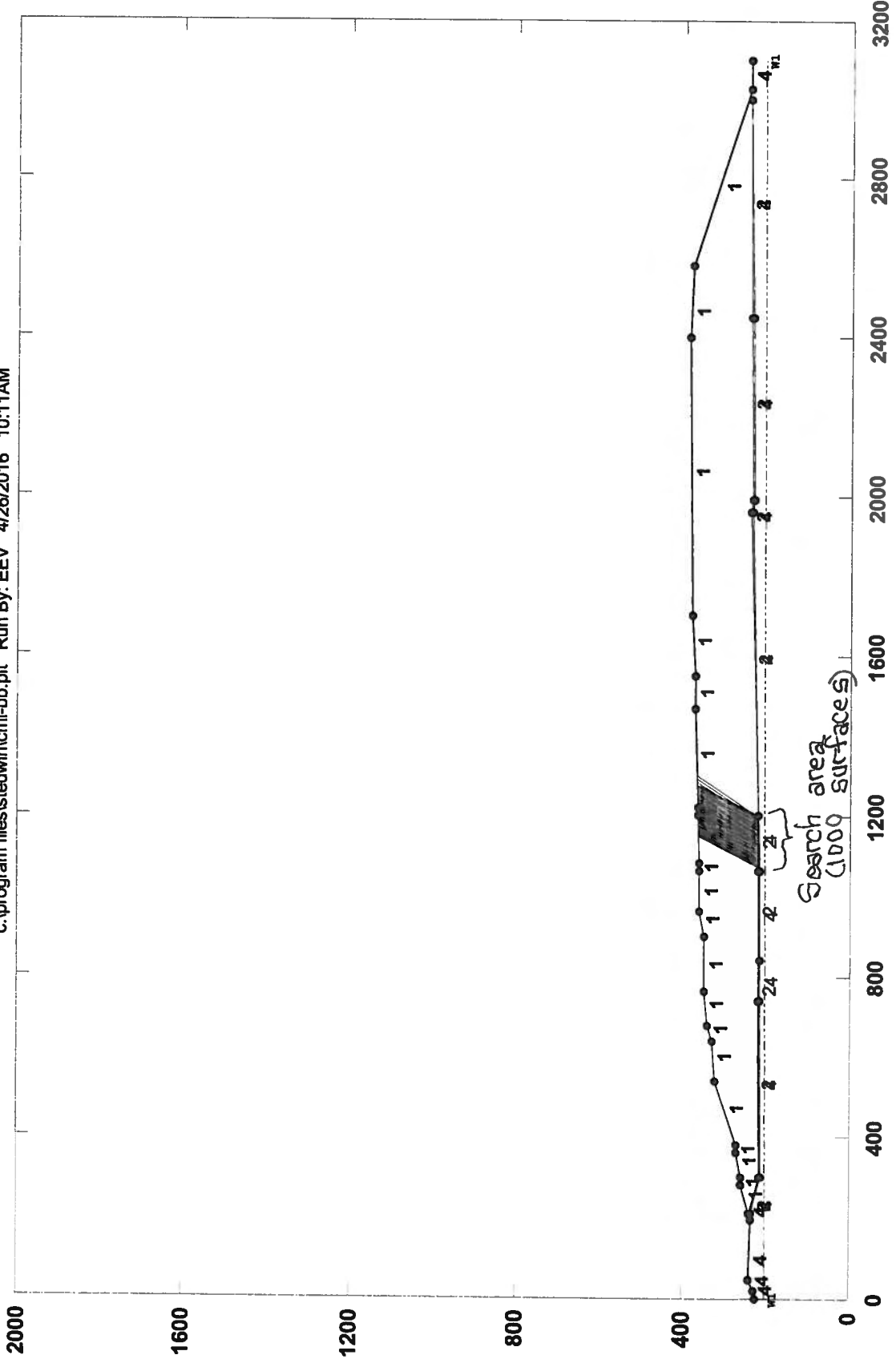


#	FS	Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion (psf)	Friction Angle (deg)	Piez. Surface No.
a	4.12	Refuse	1	65.0	90.0	0.0	33.0	W1
b	4.12	B. Liner	2	100.0	120.0	0.0	18.0	W1
c	4.12	F. Cover	3	100.0	120.0	300.0	30.0	W1
d	4.13	Rock	4	140.0	145.0	2000.0	45.0	W1
e	4.13	Eng Fill	5	120.0	130.0	250.0	25.0	W1
f	4.13							
g	4.13							
h	4.13							
i	4.13							
j	4.13							

PCSTABL5M/si FSmin=4.12
Safety Factors Are Calculated By The Modified Janbu Method

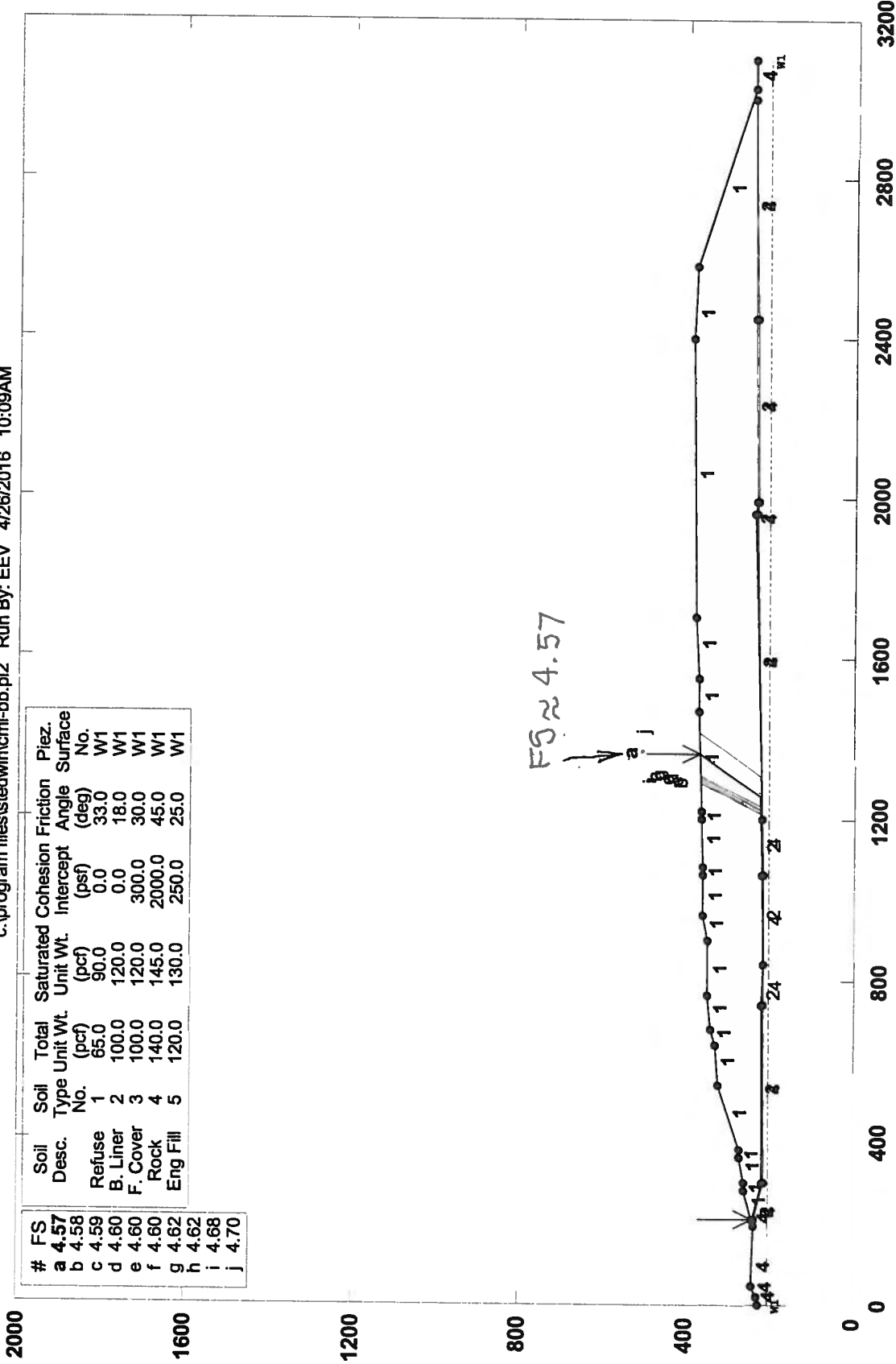
CML - Phase VI - Section BB Static, Liner

c:\program files\stedwin\cml-bb.plt Run By: EEV 4/26/2016 10:11AM



CML - Phase VI - Section BB Static, Liner

c:\program files\stedwin\cml-bb.pl2 Run By: EEV 4/26/2016 10:09AM



#	FS	Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
a	4.57	Refuse	1	65.0	90.0	0.0	33.0	W1
b	4.58	B. Liner	2	100.0	120.0	0.0	18.0	W1
c	4.59	F. Cover	3	100.0	120.0	300.0	30.0	W1
d	4.60	Rock	4	140.0	145.0	2000.0	45.0	W1
e	4.60	Eng Fill	5	120.0	130.0	250.0	25.0	W1
f	4.62							
g	4.62							
h	4.62							
i	4.68							
j	4.70							

FS ≈ 4.57

PCSTABL5M/si FSmin=4.57
Safety Factors Are Calculated By The Modified Janbu Method

CML - Phase VI - Section BB Static, Liner

c:\program files\stedwin\cml-bb.plt Run By: EEV 4/26/2016 10:09AM

