11012 N. Ridgedale Road
Temple Terrace, Florida 33617
(813) 629-1965 office
(813) 914-7347 fax

February 21, 2020 Project No. 20-01-012.01

Mr. John Locklear, P.G.
President
Locklear and Associates, Inc.
4140 NW 37th Place, Suite A
Gainesville, Florida 32606

RE: Slope Stability Evaluation – Waste Placement in Cells 5, 6, and 7 to Elevation 190
Enterprise Recycling and Disposal Facility
Dade City, Florida

Dear Mr. Locklear,

Based upon our conversation, it is our understanding that additional waste was placed within Cells 5, 6, and 7 at the Enterprise Recycling and Disposal Facility (Facility) located in Dade City, Florida. The additional waste was placed approximately 20 feet above the height shown for a particular fill sequence plan for these areas (i.e. these cells were shown to be filled to EL 170; however, waste was actually placed to EL 190.0). The cell immediately to the north (Cell 17) remains open and has yet to be filled. You also indicated that the waste material (Class III waste), sideslopes (3h:1v), and geometry (base footprint) of the cells has remained as permitted in January of 2019. Based upon the information conveyed in our conversation, you requested our professional opinion on i) whether the additional 20 feet of waste material would pose a slope stability concern (i.e. Factor of Safety < 1.5) and ii) whether it would be safe for the additional waste to remain in-place until fill material was placed within Cell 17.

<u>Reference Documents</u>

The following reference documents were used as part of this analysis (Note: Please refer to the copies of the boring logs and drawings contained in the CDS January 23, 2019 Report of the Cell 17 expansion and Cell 1-16 Modification permit application);

Reference No 1. Universal Engineering Sciences – Geotechnical Exploration dated August 30, 2017 (Revised December 12, 2018).

- Karst Activity Evaluation
- Boring Logs B-101 through B-111, & B131-133 in Universal 2017 Report

Reference No 2. Universal Engineering Sciences – Geotechnical Exploration dated May, 2000.

- Boring Logs B-1 through B-10.

Reference No 3. Hartman and Associates, Inc. – Geotechnical Exploration dated February, 2001.

- Boring Logs B-11 through B-17.

Reference No 4. Universal Engineering Science. – Geotechnical Exploration dated January, 2001.

- Boring Logs DCL01-1 through DCL01-15.

Reference No 5. Locklear and Associates, Inc. – Angelo's Class III Cell 17 Expansion Permit Application, dated February of 2018; Revised January of 2019.

Slope Stability Model Analysis

In the January 23, 2019 Slope Stability Report, Figure 1 was developed to show the location of slope stability sections used for modeling. Based upon Figure 1 (provided for reference at the end of this Report), Figures 2 and 3 were cut north/south and through Cells 5, 6, and 7. Figure 2 and 3 were subsequently modified for this Report to reflect the current condition of Cell 17 being open and the cells to the south being filled to EL 190 with no terraces.

Soil Strengths, Boring Logs, and Groundwater Elevations

- Soil Strength estimates were modeled using the same parameters as reported in the January, 23, 2019 Report.

- Borings B15 and B9 were added to Slope Stability Model sections in Figure 2 and 3 to better reflect subsurface conditions in Cell 5, 6, and 7 and failure planes passing through these cells. In previous models, the Cell 17 area was filled and failure planes did not extend into cells further to the south (Cells 5, 6, and 7), so the additional boring information was added to the models to reflex the subsurface under the cells south of Cell 17.

- The SHGWT was modeled at EL 72, the same elevation used in the January 23, 2019 Report.

Slope Stability Analysis

PCSTABL was used to model and estimate slope stability of the waste placed to EL 190 in Cell 5, 6, and 7 and Cell 17 open (not filled). Both BLOCK and CIRCULAR failure modes were evaluated. BLOCK failure modes are used to evaluate horizontal sliding failure planes in the foundation and the CIRCULAR failure modes are used to evaluate shallow and deep rotational stability of the waste and foundation soils. Equipment loads are more accurately modeled using CIRCULAR failure modes to evaluate stability during operations use since equipment failure planes are generally shallower through the waste mound whereas BLOCK failure planes model horizontal sliding of deeper foundation soils.

A typical input file of the slope stability models for the BLOCK and CIRCULAR searches has been placed prior to the graphical output of the models. In each scenario, the profile and failure search routines were adjusted to determine the lowest Factor of Safety.

The output files of the slope stability analyses are contained in the following attachments;

- Attachment A – North/South Cross Section Slope Stability Model of Figure 2
    - Model Input/Output Parameters
    - BLOCK Analysis (No Equipment)
    - CIRCULAR Analysis (No Equipment)
    - CIRCULAR Analysis (CAT D8)
    - CIRCULAR Analysis (CAT 826H)
    - CIRCULAR Analysis (CAT 740B)

- Attachment B – North/South Cross Section Slope Stability Model of Figure 3
    - Model Input/Output Parameters
    - BLOCK Analysis (No Equipment)
    - CIRCULAR Analysis (No Equipment)
    - CIRCULAR Analysis (CAT D8)
    - CIRCULAR Analysis (CAT 826H)
    - CIRCULAR Analysis (CAT 740B)

Summary of Slope Stability Model Results

Table 1 summarizes the slope stability mode results. As shown in Table 1, the slopes are stable and have a factor of safety above 1.5.

Table 1. Summary of Slope Stability Models

Section ID	**BLOCK**	**CIRCULAR**			
	No Equipment	No Equipment	CAT D8	CAT 826H	CAT 740B
Figure 2	2.5	2.2	2.1	2.2	2.1
Figure 3	2.3	2.1	2.1	2.1	2.1

Conclusions

- **Based upon the PCSTABL Model results, and the assumptions stated in this Report, a minimum Factor of Safety (FS) of 1.5 or greater was achieved for the additional waste placed in Cell 5, 6 and 7 up to EL 190 with Cell 17 in an open cell condition (i.e. no waste placed). Once waste in Cell 17, the FS will increase as the waste provides a buttress effect to the adjoining cells.**

- **Based upon the PCSTABL Model result, the additional waste would be considered stable until fill was placed within Cell 17. Both Block and Circular failure planes were evaluated for static loading, as well as operational stability using typical landfill equipment. All models were well above the minimum Factor of Safety of 1.5.**

If you have any questions, please call.

Sincerely,

Civil Design Services, Inc.
Certificate of Authorization 28923

This item has been electronically signed and sealed by **Joseph H. O'Neill, P.E. (#52049)** on the date adjacent to the seal using a *SHA* authentication code.

Printed copies of this document are not considered signed and sealed and the *SHA* authentication code must be verified on any electronic copies.

Civil Design Services, Inc.
11012 Ridgedale Road
Temple Terrace, Florida 33617
Certificate of Authorization 28923

JOSEPH H. O'NEILL
LICENSE
No. 52049
STATE OF FLORIDA
PROFESSIONAL ENGINEER

Digitally signed by Joseph H. O'Neill, P.E.
DN: cn=Joseph H. O'Neill, P.E., o, ou=Civil Design Services, Inc., email=joneill@civildesignservicesinc.com, c=US
Date: 2020.02.21 07:18:37 -05'00'

Joseph H. O'Neill, P.E.
Vice President
P.E. No. 52049

ELECTRONIC SIGNATURE REPORT

In accordance with Rule 61G15-23.005(3) F.A.C., listed below are the engineering documents that have been professionally overseen, reviewed, and/or prepared under my direct supervision as the engineer for the "**Slope Stability Evaluation – Waste Placement in Cells 5, 6, and 7 to Elevation 190** " at the Angelo's Enterprise Class III Landfill located in Dade City, Florida.

Engineers Name: Joseph H. O'Neill, P.E.

License Number: 52049

SHA-1 CODE: 44 BE 79 50 81 40 37 FF 8F B3 28 12 D5 22 61 A3 03 57 0B FE

Documents included as part of this Electronic Signature Report;

1. Slope Stability Report, Engineering Calculations (slope stability models), and supporting documents.
2. Supporting Documents;
   - Figure 1 – Slope Stability Section Locations
   - Figure 2 – Slope Stability Section
   - Figure 3 – Slope Stability Section

Attachment(s)

Attachment A – North/South Cross Section Slope Stability Model of Figure 2

- Model Input/Output Parameters
- BLOCK Analysis (No Equipment)
- CIRCULAR Analysis (No Equipment)
- CIRCULAR Analysis (CAT D8)
- CIRCULAR Analysis (CAT 826H)
- CIRCULAR Analysis (CAT 740B)

Attachment B – North/South Cross Section Slope Stability Model of Figure 3

- Model Input/Output Parameters
- BLOCK Analysis (No Equipment)
- CIRCULAR Analysis (No Equipment)
- CIRCULAR Analysis (CAT D8)
- CIRCULAR Analysis (CAT 826H)
- CIRCULAR Analysis (CAT 740B)

2/21/20

Joseph H. O'Neill, P.E.
P.E. # 052049

Civil Design Services, Inc.
11012 Ridgedale Road
Temple Terrace, Florida 33619
Certificate of Authorization 28923

FIGURES

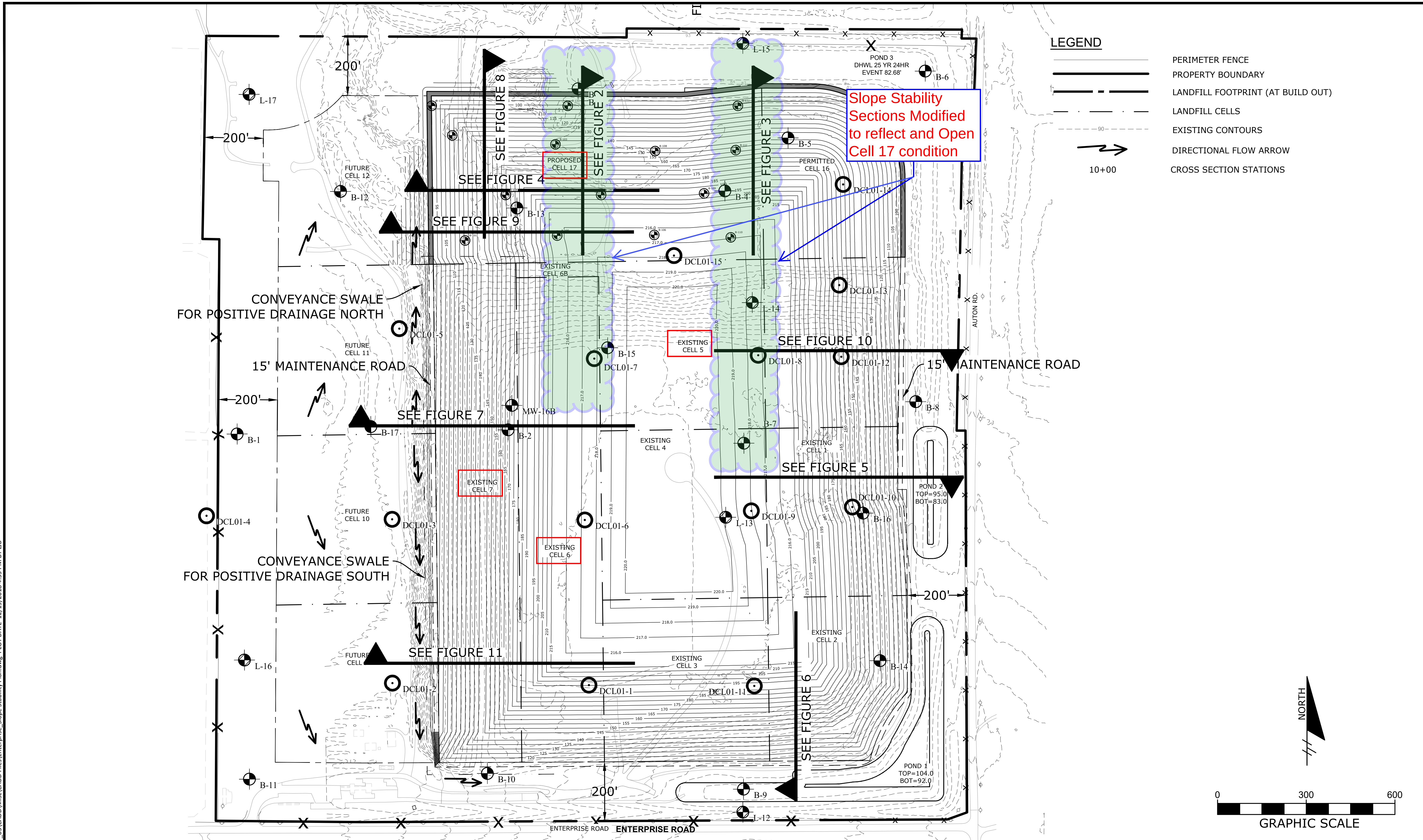


FIGURE NO. 1
SLOPE STABILITY CROSS SECTION LOCATIONS

C:\Civil 3D Projects\02000-217-17_03\CADD\Misc\CADD Files\Enterprise_Slope Stability Plan.dwg PLOT DATE 12/19/2018 4:59 PM BY LJB

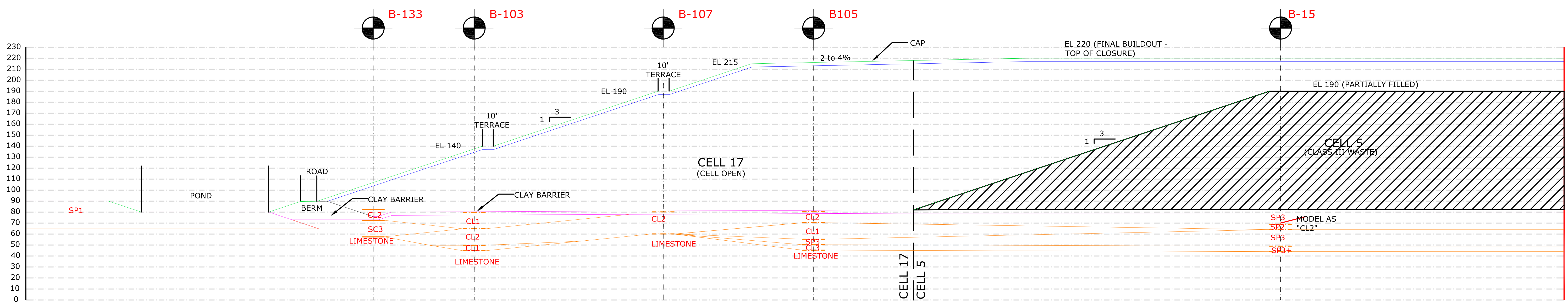


FIGURE 2 (REVISED FEB 2020). CELL 17 OPEN, NORTH/SOUTH SLOPE STABILITY SECTION

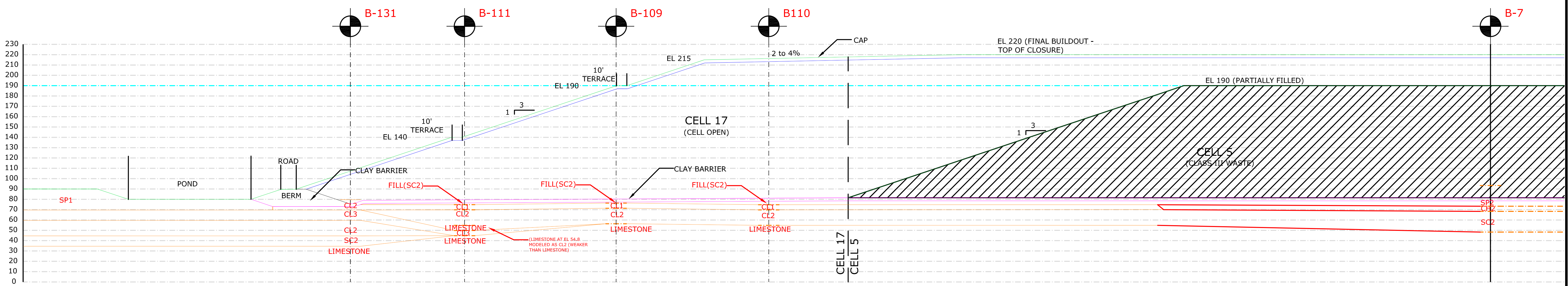


FIGURE 3 (REVISED FEB 2020). CELL 17 OPEN, NORTH/SOUTH SLOPE STABILITY SECTION

ATTACHMENT A

MODEL INPUT

**** STABL6H ****
by
Purdue University
--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer`s Method of Slices

Run Date: 2/16/2020
Time of Run: 7:57PM
Run By: JHO
Input Data Filename: C:ns_cel~1.
Output Filename: C:ns_cel~1.OUT
Plotted Output Filename: C:ns_cel~1.PLT
PROBLEM DESCRIPTION Angelos Class III Cell 17 Expansion
Cell 17 _ N/S Section_Figure 2

BOUNDARY COORDINATES
12 Top Boundaries
54 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	.00	90.00	75.00	90.00	1
2	75.00	90.00	105.00	80.00	1
3	105.00	80.00	221.00	80.00	1
4	221.00	80.00	249.80	89.60	15
5	249.80	89.60	264.80	89.80	15
6	264.80	89.80	274.30	89.80	15
7	274.30	89.80	315.70	76.00	15
8	315.70	76.00	320.70	76.00	15
9	320.70	76.00	332.70	80.00	15
10	332.70	80.00	808.00	82.00	15
11	808.00	82.00	1132.00	190.00	16
12	1132.00	190.00	1500.00	190.00	16
13	808.00	82.00	1500.00	82.00	15
14	221.00	80.00	242.00	73.00	1
15	242.00	73.00	321.20	73.00	6
16	321.20	73.00	333.20	77.00	7
17	333.20	77.00	549.10	77.90	7
18	549.10	77.90	808.00	79.00	8
19	808.00	79.00	1500.00	79.20	8
20	242.00	73.00	266.70	64.80	1
21	321.20	73.00	398.00	64.80	6
22	.00	64.80	266.70	64.80	6
23	398.00	64.80	418.00	64.80	8
24	418.00	64.80	549.10	77.90	8
25	570.00	60.10	590.00	60.10	17
26	590.00	60.10	707.00	70.30	7
27	707.00	70.30	727.00	70.30	7
28	727.00	70.30	1131.90	64.00	7
29	1131.90	64.00	1151.90	64.00	3
30	1151.90	64.00	1500.00	64.00	3
31	.00	57.40	306.00	57.40	17
32	306.00	57.40	326.00	57.40	17
33	326.00	57.40	398.00	64.80	8
34	590.00	60.10	707.00	55.30	3
35	707.00	55.30	727.00	55.30	3
36	727.00	55.30	1131.90	64.00	3
37	590.00	60.10	707.00	50.30	9
38	707.00	50.30	727.00	50.30	9
39	727.00	50.30	1131.90	49.00	9
40	1131.90	49.00	1151.90	49.00	9
41	1151.90	49.00	1500.00	49.00	9
42	590.00	60.10	707.00	45.30	17
43	707.00	45.30	727.00	45.30	17
44	727.00	45.30	1131.90	44.00	17
45	1131.90	44.00	1151.90	44.00	17
46	1151.90	44.00	1500.00	44.00	17
47	326.00	57.40	367.60	49.80	17
48	367.60	49.80	398.00	49.80	7
49	398.00	49.80	418.00	49.80	7
50	418.00	49.80	505.10	53.60	7
51	505.10	53.60	570.00	60.10	17

52	367.60	49.80	398.00	44.80	17
53	398.00	44.80	418.00	44.80	17
54	418.00	44.80	505.10	53.60	17

ISOTROPIC SOIL PARAMETERS

17 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	105.0	110.0	.0	26.0	.00	.0	1
2	107.0	112.0	.0	30.0	.00	.0	1
3	110.0	115.0	.0	34.0	.00	.0	1
4	85.0	100.0	.0	26.0	.00	.0	1
5	95.0	105.0	.0	30.0	.00	.0	1
6	100.0	115.0	.0	34.0	.00	.0	1
7	85.0	100.0	.0	28.0	.00	.0	1
8	95.0	105.0	.0	30.0	.00	.0	1
9	100.0	115.0	.0	34.0	.00	.0	1
10	80.0	100.0	100.0	.0	.00	.0	1
11	95.0	105.0	750.0	.0	.00	.0	1
12	100.0	115.0	1500.0	.0	.00	.0	1
13	110.0	115.0	.0	30.0	.00	.0	1
14	110.0	115.0	.0	30.0	.00	.0	1
15	95.0	105.0	.0	30.0	.00	.0	1
16	50.0	50.0	.0	35.0	.00	.0	1
17	120.0	130.0	.0	40.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	.00	72.00
2	1500.00	72.00

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	1132.00	1142.50	2400.0	.0

NOTE - Intensity Is Specified As A Uniformly Distributed Force Acting On A Horizontally Projected Surface.

SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Sliding Block Surfaces, Has Been Specified.

1000 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 10.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	700.00	75.00	950.00	75.00	10.00
2	1000.00	75.00	1200.00	75.00	10.00

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Janbu Method * *

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	814.75	84.25
2	815.76	83.33
3	823.28	76.74
4	1025.48	75.91
5	1031.95	83.54
6	1038.98	90.65
7	1045.46	98.26
8	1051.81	105.99
9	1058.80	113.14
10	1065.87	120.22
11	1072.29	127.88
12	1075.54	137.34

13	1082.13	144.85
14	1089.16	151.97
15	1096.19	159.08
16	1102.99	166.41
17	1108.12	175.00
18	1115.13	182.13
19	1117.82	185.27

*** 2.481 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	812.31	83.44
2	818.19	79.95
3	827.37	75.98
4	1025.23	72.24
5	1031.23	80.24
6	1037.00	88.41
7	1043.57	95.95
8	1049.00	104.34
9	1056.07	111.42
10	1063.12	118.51
11	1070.16	125.61
12	1077.00	132.91
13	1081.23	141.97
14	1084.30	151.49
15	1087.43	160.99
16	1093.68	168.79
17	1100.69	175.93
18	1104.85	180.95

*** 2.633 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	812.31	83.44
2	818.19	79.95
3	827.37	75.98
4	1025.23	72.24
5	1031.23	80.24
6	1037.00	88.41
7	1043.57	95.95
8	1049.00	104.34
9	1056.07	111.42
10	1063.12	118.51
11	1070.16	125.61
12	1077.00	132.91
13	1081.23	141.97
14	1084.30	151.49
15	1087.43	160.99
16	1093.68	168.79
17	1100.69	175.93
18	1104.85	180.95

*** 2.633 ***

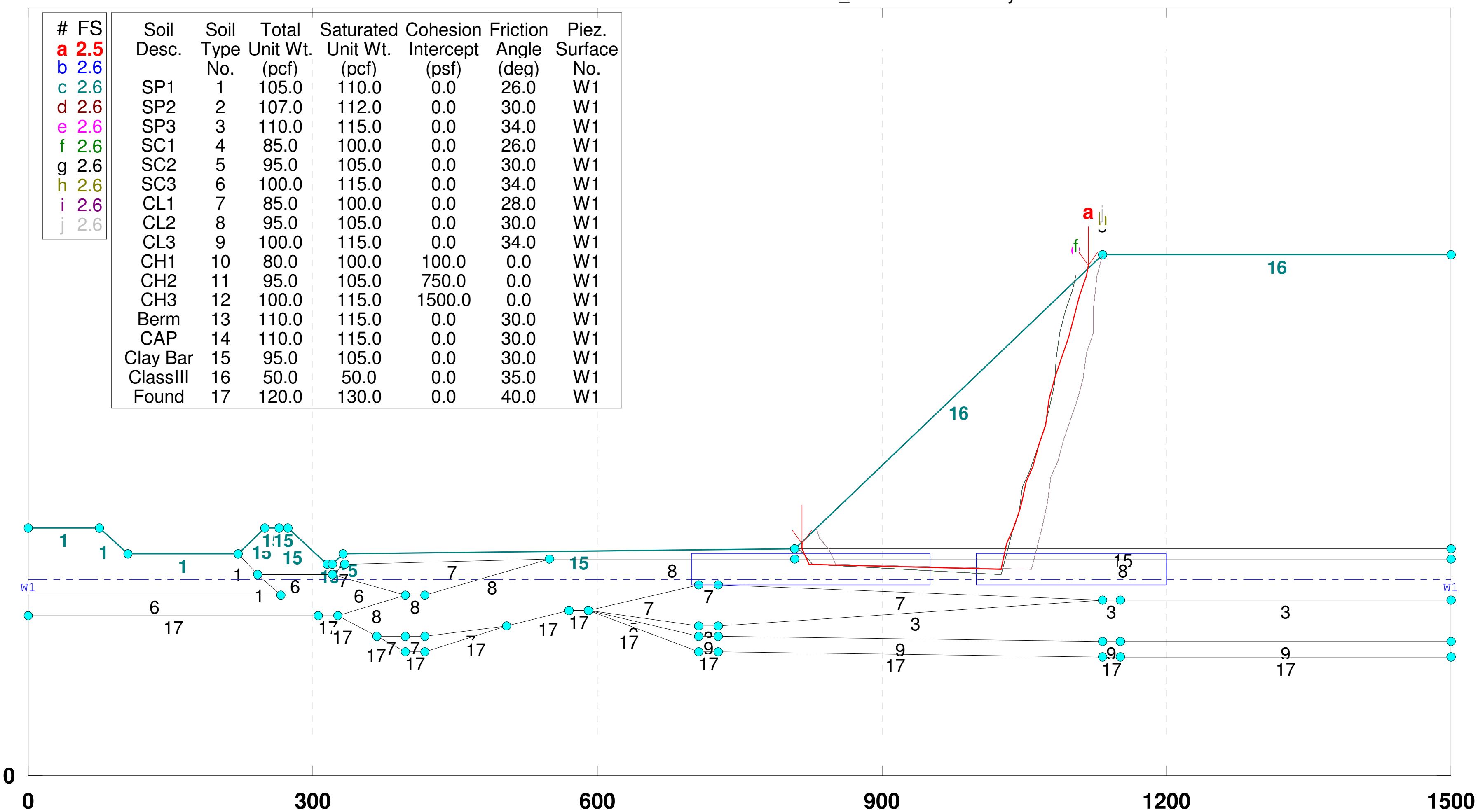
Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	812.31	83.44
2	818.19	79.95
3	827.37	75.98
4	1025.23	72.24
5	1031.23	80.24
6	1037.00	88.41
7	1043.57	95.95
8	1049.00	104.34
9	1056.07	111.42
10	1063.12	118.51
11	1070.16	125.61
12	1077.00	132.91
13	1081.23	141.97
14	1084.30	151.49
15	1087.43	160.99

BLOCK FAILURE

Angelos Class III Cell 17 Expansion Cell 17 _ N/S Section_Figure 2

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~4\FIGURE~1\NS_CEL~1.PL2 Run By: JHO 2/16/2020 7:57PM



Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

STABL6H FSmin=2.5

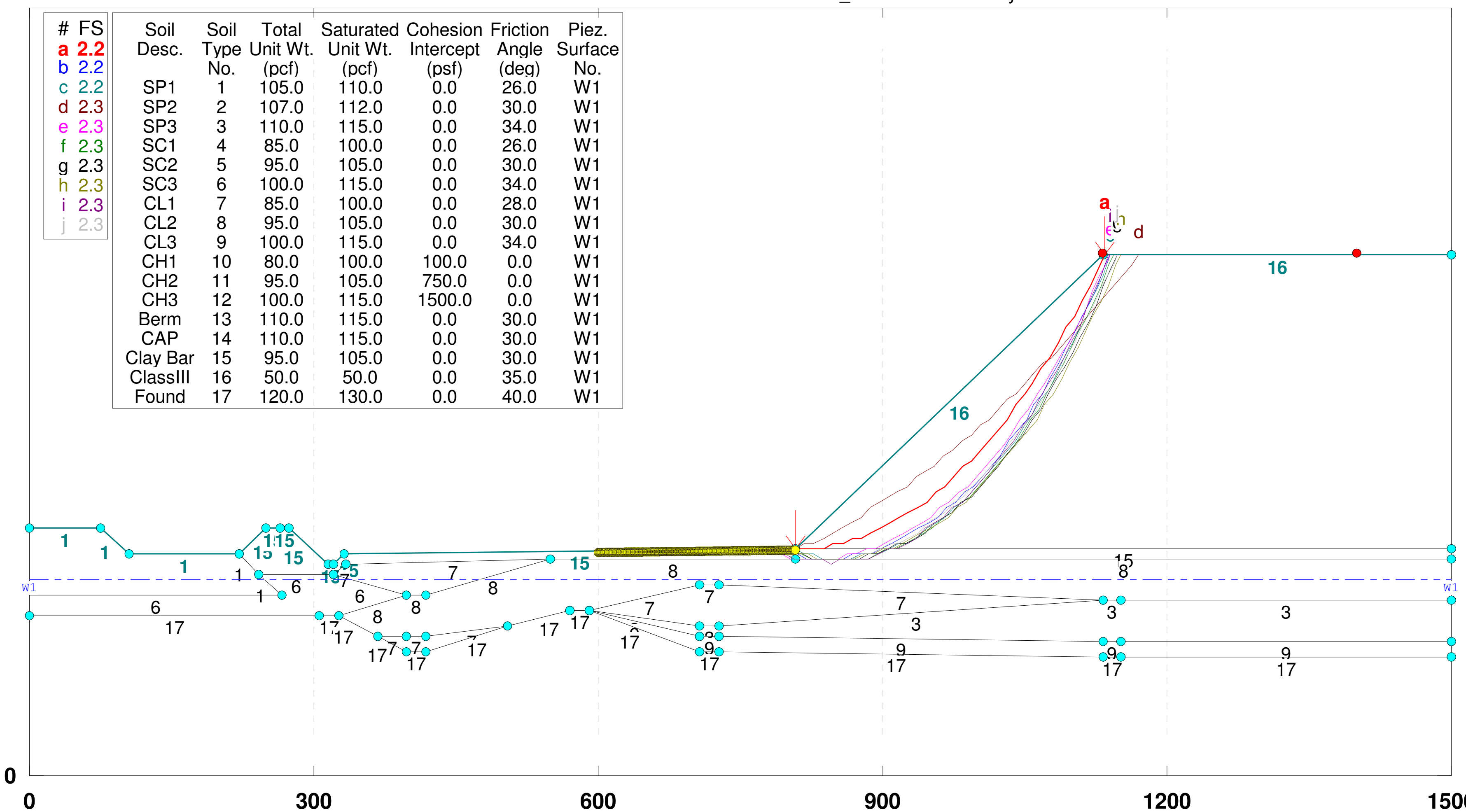
Safety Factors Are Calculated By The Modified Janbu Method

STED

CIRCULAR FAILURE
(NO EQUIPMENT)

Angelos Class III Cell 17 Expansion Cell 17 _ N/S Section_Figure 2

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~4\FIGURE~1\NS_CEL~1.PL2   Run By: JHO   2/16/2020   7:24PM



Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

STABL6H FSmin=2.2

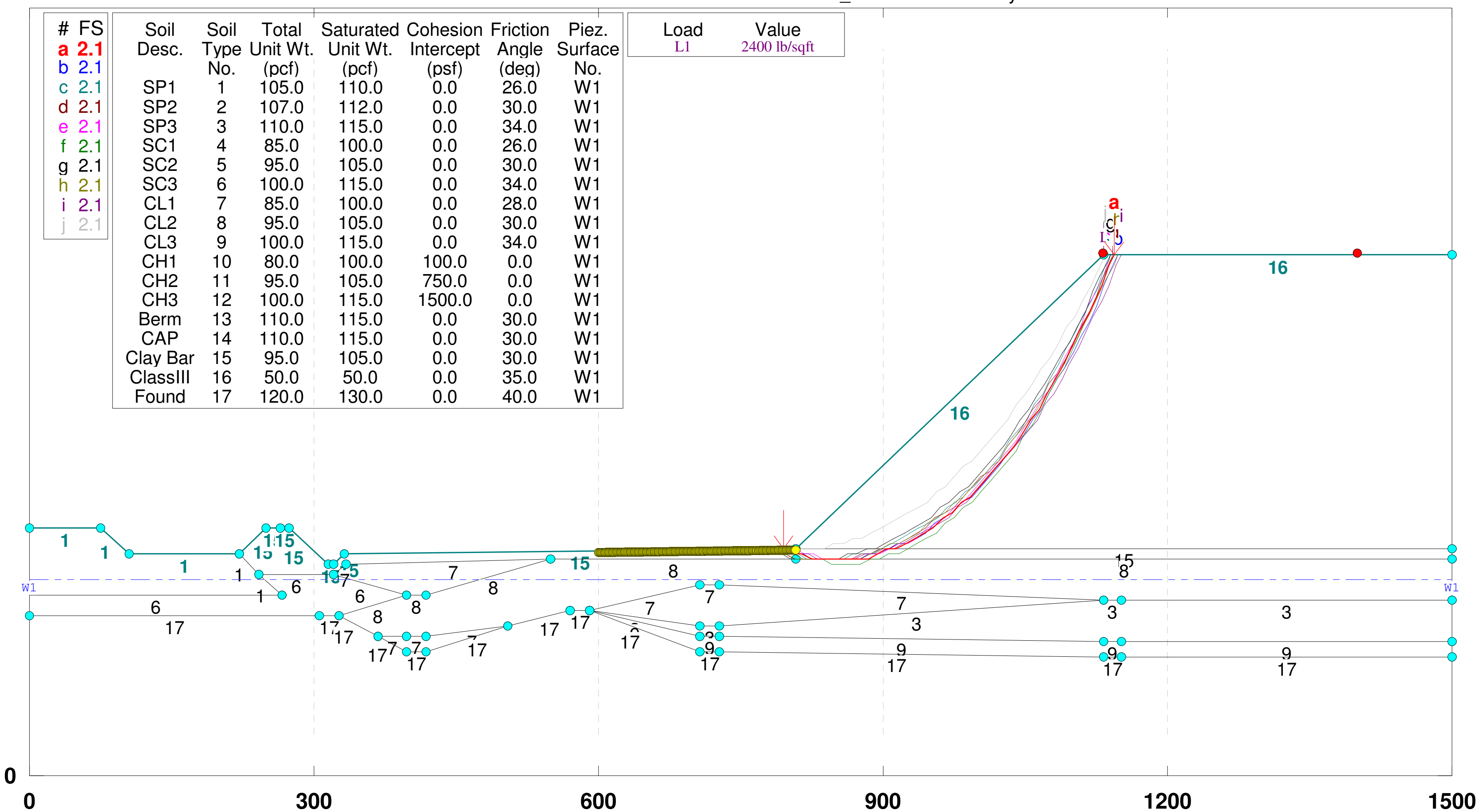
Safety Factors Are Calculated By The Modified Bishop Method

STED

CIRCULAR FAILURE
(CAT D8)

Angelos Class III Cell 17 Expansion Cell 17 _ N/S Section_Figure 2 CATD8

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~4\FIGURE~1\NS_CEL~1.PL2 Run By: JHO 2/16/2020 7:49PM



Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

STABL6H FSmin=2.1

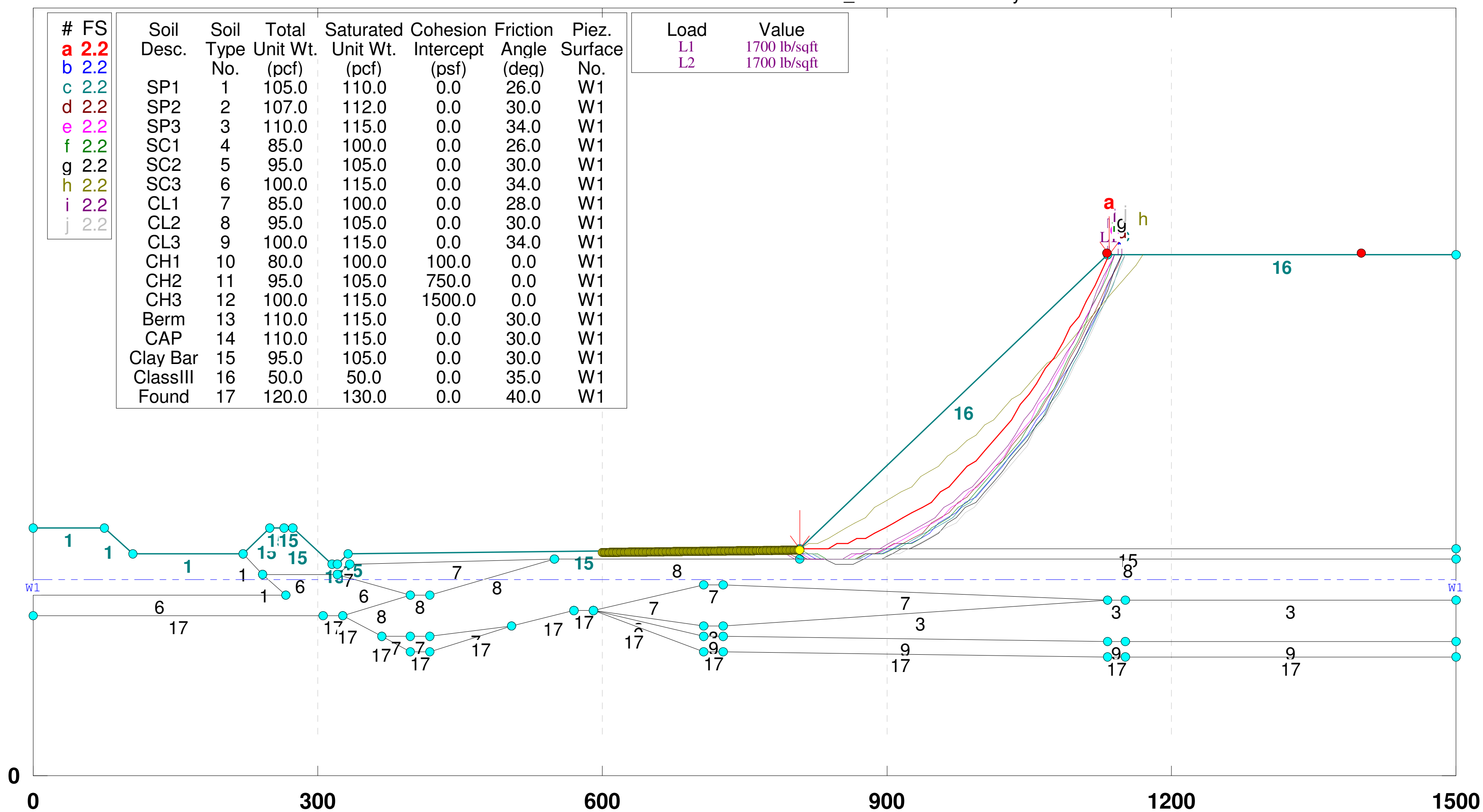
Safety Factors Are Calculated By The Modified Bishop Method

STED

CIRCULAR FAILURE
(CAT 826H)

Angelos Class III Cell 17 Expansion Cell 17 _ N/S Section_Figure 2 CAT826H

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~4\FIGURE~1\NS_CEL~1.PL2 Run By: JHO 2/16/2020 7:45PM



#	FS
a	2.2
b	2.2
c	2.2
d	2.2
e	2.2
f	2.2
g	2.2
h	2.2
i	2.2
j	2.2

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

Load	Value
L1	1700 lb/sqft
L2	1700 lb/sqft

STABL6H FSmin=2.2

Safety Factors Are Calculated By The Modified Bishop Method

STED

CIRCULAR FAILURE
(CAT 740B)

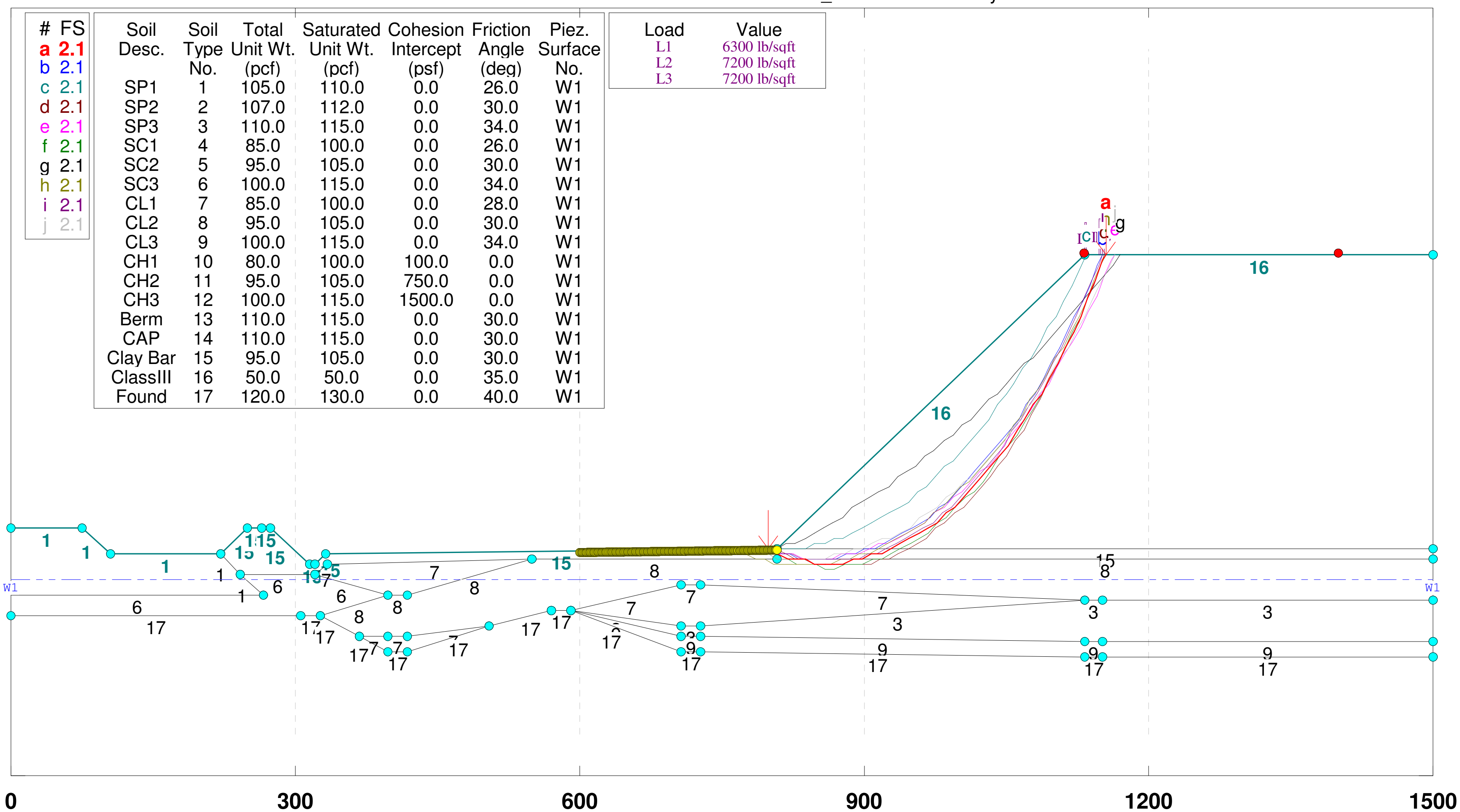
Angelos Class III Cell 17 Expansion Cell 17 _ N/S Section_Figure 2 CAT740B

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~4\FIGURE~1\NS_CEL~1.PL2 Run By: JHO 2/16/2020 7:40PM

#	FS
a	2.1
b	2.1
c	2.1
d	2.1
e	2.1
f	2.1
g	2.1
h	2.1
i	2.1
j	2.1

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

Load	Value
L1	6300 lb/sqft
L2	7200 lb/sqft
L3	7200 lb/sqft



STABL6H FSmin=2.1

Safety Factors Are Calculated By The Modified Bishop Method

STED

ATTACHMENT B

MODEL INPUT

**** STABL6H ****

by

Purdue University

--Slope Stability Analysis--

Simplified Janbu, Simplified Bishop

or Spencer`s Method of Slices

Run Date: 2/16/2020

Time of Run: 8:13PM

Run By: JHO

Input Data Filename: C:ns_cel~1.

Output Filename: C:ns_cel~1.OUT

Plotted Output Filename: C:ns_cel~1.PLT

PROBLEM DESCRIPTION Angelos Class III Cell 17 Expansion

Cell 17_ N/S Section_Figure 3

BOUNDARY COORDINATES

12 Top Boundaries

62 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	.00	90.00	72.00	90.00	1
2	72.00	90.00	102.00	80.00	1
3	102.00	80.00	221.00	80.00	1
4	221.00	80.00	249.80	89.60	15
5	249.80	89.60	264.80	89.80	15
6	264.80	89.80	274.30	89.80	15
7	274.30	89.80	315.70	76.00	15
8	315.70	76.00	320.70	76.00	15
9	320.70	76.00	329.70	79.00	15
10	329.70	79.00	800.00	81.50	15
11	800.00	81.50	1125.50	190.00	16
12	1125.50	190.00	1500.00	190.00	16
13	800.00	81.50	1500.00	81.50	15
14	221.00	80.00	242.00	73.00	1
15	242.00	73.00	321.20	73.00	7
16	321.20	73.00	326.90	74.80	7
17	326.90	74.80	330.20	76.00	5
18	330.20	76.00	800.00	78.50	5
19	800.00	78.50	1500.00	78.50	5
20	326.90	74.80	418.00	74.80	7
21	418.00	74.80	438.00	74.80	7
22	438.00	74.80	565.00	76.40	7
23	565.00	76.40	585.00	76.40	7
24	585.00	76.40	713.00	74.80	7
25	713.00	74.80	733.00	74.80	7
26	733.00	74.80	1100.00	74.80	7
27	1100.00	74.80	1412.80	73.30	11
28	1412.80	73.30	1432.80	73.30	11
29	1432.80	73.30	1500.00	73.30	11
30	1100.00	74.80	1105.90	70.00	7
31	.00	69.60	307.28	69.60	9
32	307.28	69.60	327.28	69.60	9
33	327.28	69.60	418.00	69.80	8
34	418.00	69.80	438.00	69.80	8
35	438.00	69.80	565.00	71.40	8
36	565.00	71.40	585.00	71.40	8
37	585.00	71.40	713.00	69.80	8
38	713.00	69.80	1105.90	70.00	8
39	1105.90	70.00	1412.80	68.30	8
40	1412.80	68.30	1432.80	68.30	8
41	1432.80	68.30	1500.00	68.30	8
42	.00	59.90	307.28	59.60	8
43	307.28	59.60	327.28	59.60	8
44	327.28	69.60	418.00	49.80	9
45	418.00	49.80	438.00	49.80	9
46	438.00	49.80	565.00	56.43	9
47	327.28	59.60	418.00	44.80	8
48	565.00	56.40	585.00	56.40	17
49	585.00	56.40	713.00	54.80	17
50	713.00	54.80	733.00	54.80	17
51	733.00	54.80	1100.00	54.80	17

52	1100.00	54.80	1412.80	54.80	17
53	1412.80	54.80	1432.80	54.80	17
54	1432.80	54.80	1500.00	54.80	17
55	.00	44.60	307.28	44.60	5
56	307.28	44.60	327.28	44.60	5
57	327.28	44.60	418.00	44.80	5
58	.00	34.60	307.28	34.60	17
59	307.28	34.60	327.28	34.60	17
60	327.28	34.60	418.00	44.80	17
61	418.00	44.80	438.00	44.80	17
62	438.00	44.80	565.00	56.40	17

ISOTROPIC SOIL PARAMETERS

17 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	105.0	110.0	.0	26.0	.00	.0	1
2	107.0	112.0	.0	30.0	.00	.0	1
3	110.0	115.0	.0	34.0	.00	.0	1
4	85.0	100.0	.0	26.0	.00	.0	1
5	95.0	105.0	.0	30.0	.00	.0	1
6	100.0	115.0	.0	34.0	.00	.0	1
7	85.0	100.0	.0	28.0	.00	.0	1
8	95.0	105.0	.0	30.0	.00	.0	1
9	100.0	115.0	.0	34.0	.00	.0	1
10	80.0	100.0	100.0	.0	.00	.0	1
11	95.0	105.0	750.0	.0	.00	.0	1
12	100.0	115.0	1500.0	.0	.00	.0	1
13	110.0	115.0	.0	30.0	.00	.0	1
14	110.0	115.0	.0	30.0	.00	.0	1
15	95.0	105.0	.0	30.0	.00	.0	1
16	50.0	50.0	.0	35.0	.00	.0	1
17	120.0	130.0	.0	40.0	.00	.0	1

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	.00	72.00
2	1500.00	72.00

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	1125.50	1136.00	2400.0	.0

NOTE - Intensity Is Specified As A Uniformly Distributed Force Acting On A Horizontally Projected Surface.

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Sliding Block Surfaces, Has Been Specified.

1000 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 10.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	650.00	75.00	950.00	75.00	10.00
2	1000.00	75.00	1250.00	75.00	10.00

Following Are Displayed The Ten Most Critical Of The Trial Failure Surfaces Examined. They Are Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Janbu Method * *

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	809.43	84.64
2	812.67	82.35
3	820.67	76.35
4	829.28	71.26
5	1056.02	76.92

6	1062.58	84.46
7	1068.02	92.85
8	1075.09	99.93
9	1082.14	107.02
10	1089.18	114.12
11	1096.01	121.42
12	1100.24	130.48
13	1103.32	140.00
14	1106.45	149.50
15	1112.70	157.30
16	1119.71	164.44
17	1126.09	172.14
18	1133.04	179.32
19	1136.07	188.85
20	1137.20	190.00

*** 2.310 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	809.43	84.64
2	812.67	82.35
3	820.67	76.35
4	829.28	71.26
5	1056.02	76.92
6	1062.58	84.46
7	1068.02	92.85
8	1075.09	99.93
9	1082.14	107.02
10	1089.18	114.12
11	1096.01	121.42
12	1100.24	130.48
13	1103.32	140.00
14	1106.45	149.50
15	1112.70	157.30
16	1119.71	164.44
17	1126.09	172.14
18	1133.04	179.32
19	1136.07	188.85
20	1137.20	190.00

*** 2.310 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	809.43	84.64
2	812.67	82.35
3	820.67	76.35
4	829.28	71.26
5	1056.02	76.92
6	1062.58	84.46
7	1068.02	92.85
8	1075.09	99.93
9	1082.14	107.02
10	1089.18	114.12
11	1096.01	121.42
12	1100.24	130.48
13	1103.32	140.00
14	1106.45	149.50
15	1112.70	157.30
16	1119.71	164.44
17	1126.09	172.14
18	1133.04	179.32
19	1136.07	188.85
20	1137.20	190.00

*** 2.310 ***

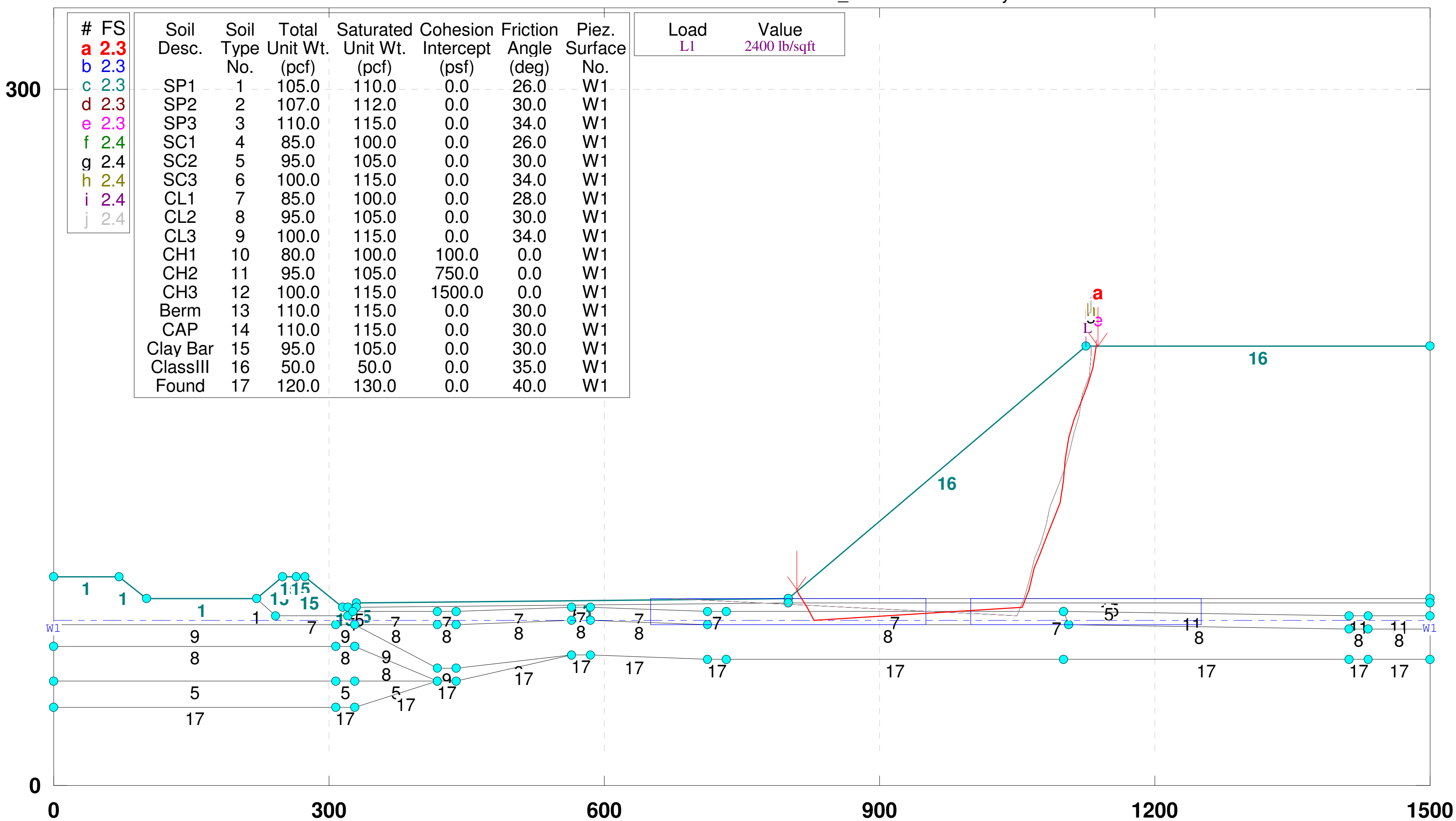
Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	809.43	84.64
2	812.67	82.35
3	820.67	76.35

BLOCK FAILURE

Angelos Class III Cell 17 Expansion Cell 17_ N/S Section_Figure 3

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~4\FIGURE~2\NS_CEL~1.PL2 Run By: JHO 2/16/2020 8:13PM



#	FS
a	2.3
b	2.3
c	2.3
d	2.3
e	2.3
f	2.4
g	2.4
h	2.4
i	2.4
j	2.4

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

Load	Value
L1	2400 lb/sqft

STABL6H FSmin=2.3

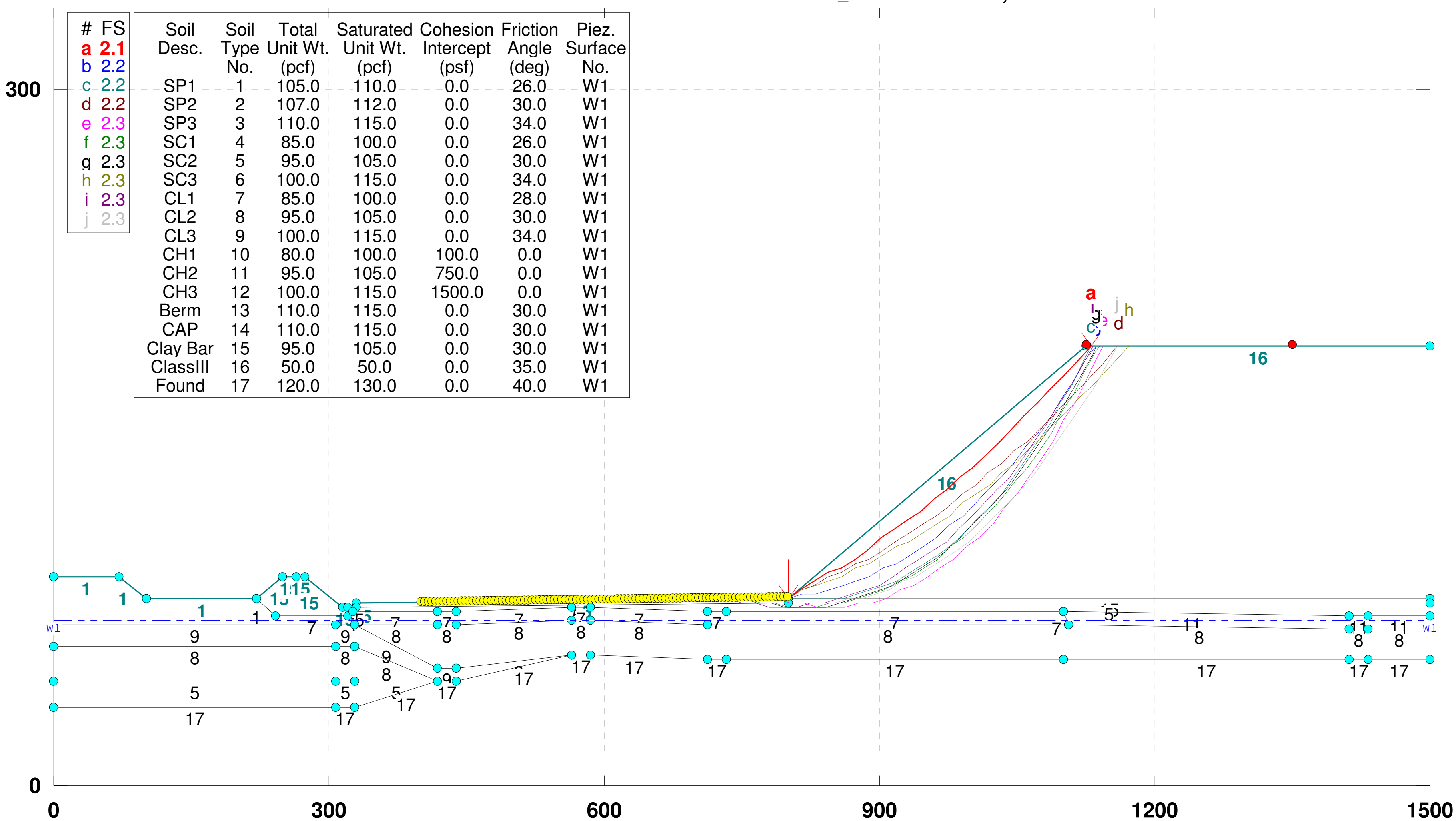
Safety Factors Are Calculated By The Modified Janbu Method

STED

CIRCULAR FAILURE
(NO EQUIPMENT)

Angelos Class III Cell 17 Expansion Cell 17_ N/S Section_Figure 3

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~4\FIGURE~2\NS_CEL~1.PL2 Run By: JHO 2/16/2020 6:04PM



#	FS
a	2.1
b	2.2
c	2.2
d	2.2
e	2.3
f	2.3
g	2.3
h	2.3
i	2.3
j	2.3

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

STABL6H FSmin=2.1

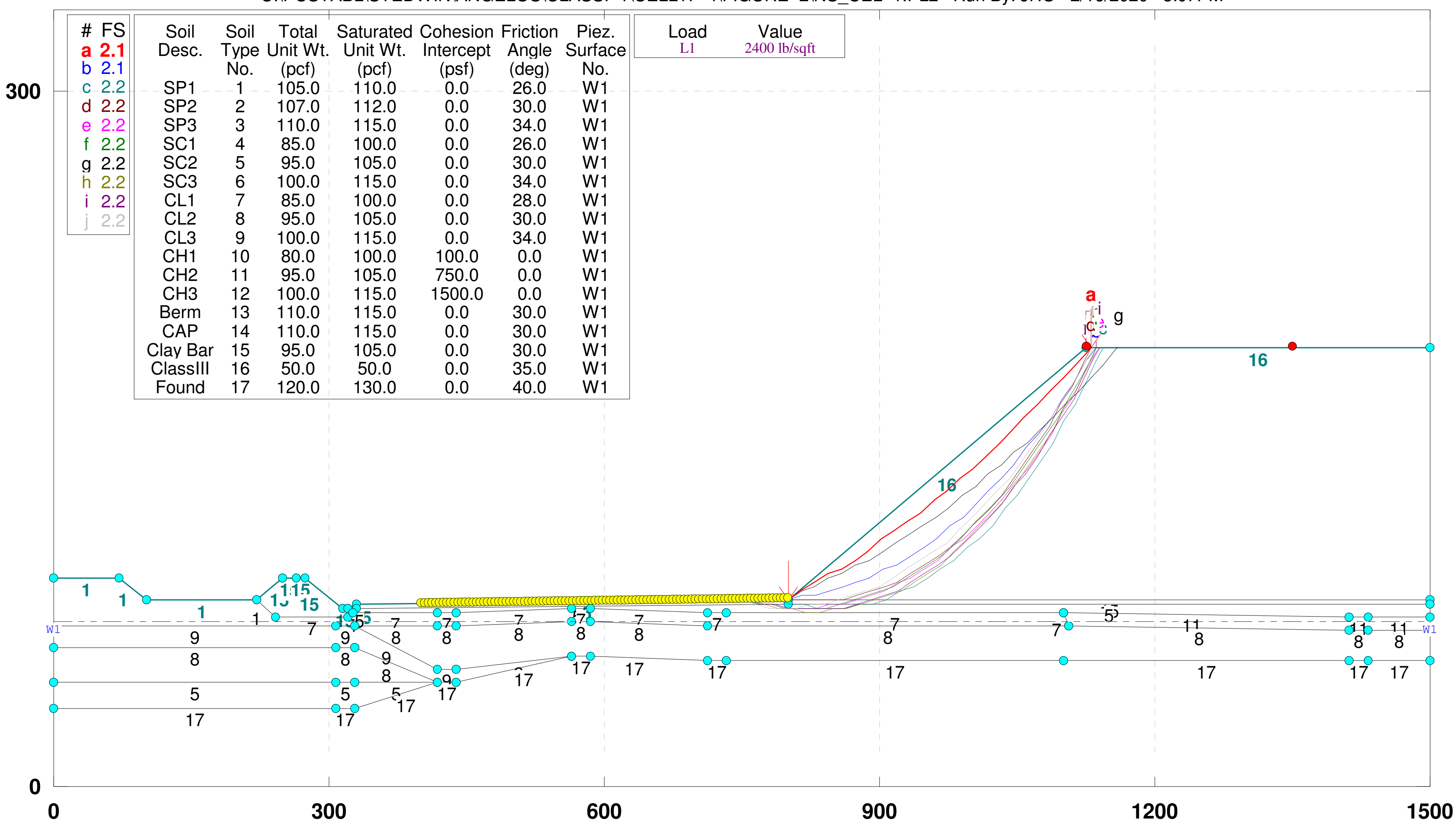
Safety Factors Are Calculated By The Modified Bishop Method

STED

CIRCULAR FAILURE
(CAT D8)

Angelos Class III Cell 17 Expansion Cell 17_ N/S Section_Figure 3 CAT D8

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~4\FIGURE~2\NS_CEL~1.PL2 Run By: JHO 2/16/2020 8:07PM



#	FS
a	2.1
b	2.1
c	2.2
d	2.2
e	2.2
f	2.2
g	2.2
h	2.2
i	2.2
j	2.2

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

Load	Value
L1	2400 lb/sqft

STABL6H FSmin=2.1

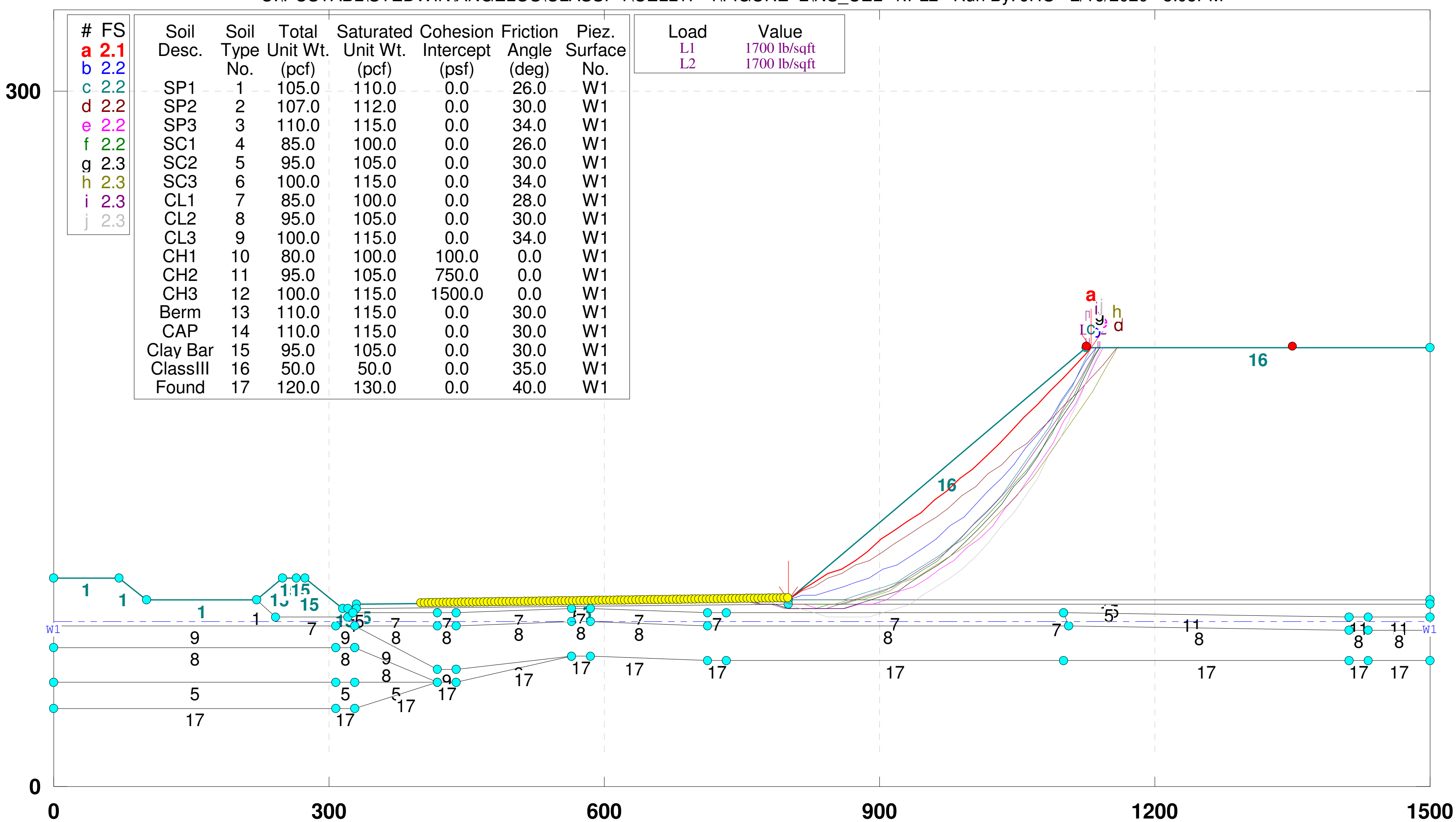
Safety Factors Are Calculated By The Modified Bishop Method

STED

CIRCULAR FAILURE
(CAT 826H)

Angelos Class III Cell 17 Expansion Cell 17_ N/S Section_Figure 3 CAT 826H

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~4\FIGURE~2\NS_CEL~1.PL2 Run By: JHO 2/16/2020 8:05PM



#	FS
a	2.1
b	2.2
c	2.2
d	2.2
e	2.2
f	2.2
g	2.3
h	2.3
i	2.3
j	2.3

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

Load	Value
L1	1700 lb/sqft
L2	1700 lb/sqft

STABL6H FSmin=2.1

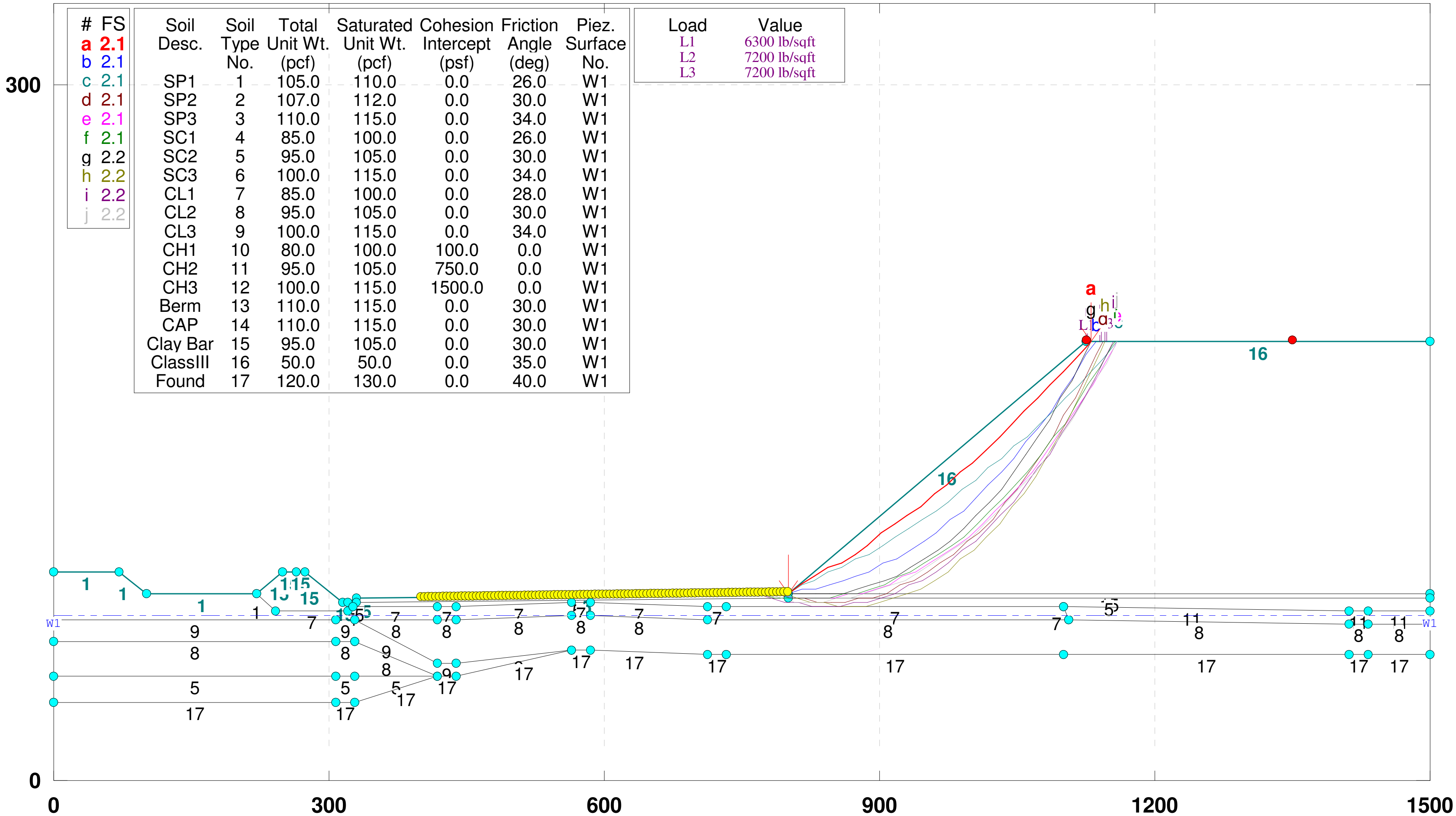
Safety Factors Are Calculated By The Modified Bishop Method

STED

CIRCULAR FAILURE
(CAT 740B)

Angelos Class III Cell 17 Expansion Cell 17_ N/S Section_Figure 3 CAT740B

C:\PCSTABL\STEDWIN\ANGELOS\CLASSI~1\CELL17~4\FIGURE~2\NS_CEL~1.PL2 Run By: JHO 2/16/2020 8:01PM



#	FS
a	2.1
b	2.1
c	2.1
d	2.1
e	2.1
f	2.1
g	2.2
h	2.2
i	2.2
j	2.2

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Piez. Surface No.
SP1	1	105.0	110.0	0.0	26.0	W1
SP2	2	107.0	112.0	0.0	30.0	W1
SP3	3	110.0	115.0	0.0	34.0	W1
SC1	4	85.0	100.0	0.0	26.0	W1
SC2	5	95.0	105.0	0.0	30.0	W1
SC3	6	100.0	115.0	0.0	34.0	W1
CL1	7	85.0	100.0	0.0	28.0	W1
CL2	8	95.0	105.0	0.0	30.0	W1
CL3	9	100.0	115.0	0.0	34.0	W1
CH1	10	80.0	100.0	100.0	0.0	W1
CH2	11	95.0	105.0	750.0	0.0	W1
CH3	12	100.0	115.0	1500.0	0.0	W1
Berm	13	110.0	115.0	0.0	30.0	W1
CAP	14	110.0	115.0	0.0	30.0	W1
Clay Bar	15	95.0	105.0	0.0	30.0	W1
ClassIII	16	50.0	50.0	0.0	35.0	W1
Found	17	120.0	130.0	0.0	40.0	W1

Load	Value
L1	6300 lb/sqft
L2	7200 lb/sqft
L3	7200 lb/sqft

STABL6H FSmin=2.1

Safety Factors Are Calculated By The Modified Bishop Method

STED