

Appendix G

Geotechnical Calculations

G-1

TDRSA Liner Stability Analysis

TDRSA Liner Stability Calculations

1. Purpose

Evaluate the stability of the TDRSA based upon the proposed design.

2. Methodology

Stability analysis was conducted using the PC Stable program employing limit equilibrium methodology. PC Stable employs different analytical methods for calculating critical factors of safety including Janbu and the Modified Bishops method of analysis. Both methods evaluate resistive forces to sliding forces per elemental unit to calculate the sum factor of safety for an individual surface. Block, circular and random failure surfaces can be evaluated using these analytical methods. Block and random failures were evaluated for this analysis.

3. Analysis Basis

Conditions

Two conditions were evaluated to demonstrate the TDRSA stability. Illustrations of both conditions are shown in Attachment 3.

Case 1: Interim development; this condition would exist during filling of the TDRSA with development rock. It is assumed that the interim outslope would be equivalent to the rock angle of repose, 45° or 1:1 (horizontal:vertical, H:V). From this analysis stability the maximum height of the interim slope will be evaluated.

Case 2: Final build-out; this condition represents the TDRSA filled to capacity. It is assumed under this configuration the maximum outslope will be 4:1 (H:V).

The composition of the TDRSA used for the analysis is summarized below with selected geotechnical parameters. The parameters used are shown in Table G-1.

Table G-1

Component	Parameters
Development Rock	Unit Weight γ Internal Friction Angle ϕ
Liner System	Interfacial Friction Angles Between Components ϕ
Foundation	Cohesion C Friction Angle ϕ Unit Weight γ

Development Rock

Development rock is expected to range from 3 to 6-inch diameter having a unit weight of 2.0 tonnes/m³.

Converting to English units:

$$1 \text{ tonne} = 2,205 \text{ lbs.}$$

then

$$\gamma = \text{development rock unit weight lb/ft}^3$$

$$\gamma = 2 \text{ tonnes/m}^3 \times 2205 \text{ lb/tonne} \times \text{m}^3/35.31 \text{ ft}^3$$

$$\gamma = 124.8 \text{ lbs/ft}^3$$

$$\text{Use } \gamma = 125 \text{ pcf (lb/ft}^3 = \text{pcf)}$$

Shear strength of broken rock is a function of its internal friction angle (ϕ). Based upon published information (Reference 1), $\phi = 40\text{-}55^\circ$. For this analysis use $\phi = 45^\circ$.

Liner System

The base liner system for the TDRSA is comprised of the following components from top to bottom.

- ♦ Drainage stone.
- ♦ Geocomposite drainage fabric.
- ♦ Textured 60 mil HDPE geomembrane.
- ♦ Geosynthetic clay liner

Typical range of interfacial friction angles between liner components are listed below:

Interface	Friction Angle (ϕ)
1. Drainage Stone/Geocomposite	21-37°
2. Geocomposite/Textured HDPE	16-29°
3. Textured HDPE/GCL	16-30°

References and range development for geosynthetic friction angles are presented in Attachment 1. For this analysis, the critical interface extends between textured HDPE and either the geocomposite use $\phi = 18^\circ$ for liner system in the analysis. Note: Geocomposite and GCL have upper and lower sides comprised of non-woven geotextile fabrics. As such, frictional test results between textured HDPE and geotextile is appropriate.

Foundation

Foundation soils are comprised primarily of sands and silty sands based on boring standard penetration test (SPT) average $N=12$ blows/ft. A copy of the geotechnical logs presenting blow counts and development of the average are shown in Attachment 2.

According to Bowles Foundation Analysis and Design, 3rd edition, Table 3-2, for $N=10$, the approximate angle of internal friction, ϕ , ranges from 30-35°. For this analysis, foundation soils friction angle:

$$\phi=35^{\circ}$$

Summary of Geotechnical Parameters Used in Analysis

Material	Cohesion $C^{(1)}$ (psf)	Friction Angle ϕ (Degrees)	Unit Weight γ (psf)
Development Rock	0	45	125
Liner System	0	18	125
Foundation	0	35	115

⁽¹⁾ Cohesion of granular materials such as development rock, liner system materials and foundation materials are assumed to be 0.

Based upon the proposed Contingency Plan, the analysis also considered water present in the TDRSA. For the Final Build-out, water level was assumed at the top of the perimeter berm, ~ 15 feet deep. For the interim conditions water elevations were assumed to be 1-foot below the rock working level, i.e., 4-feet deep and 9-feet deep.

4. Analysis Results

As presented in Section 3, two cases were evaluated using PC Stable: Case 1 - interim development during operations, and Case 2 - final build-out. The minimum design Factor of Safety used in the analysis is 1.1 based upon the consequence of failure and conservativeness of the analysis method.

Results of analysis are presented below:

Condition	Factor of Safety			
	w/o Water		w/ Water ⁽⁴⁾	
	Block	Random	Block	Random
Interim ⁽¹⁾				
♦ 5' (on floor) ⁽²⁾	1.23	2.02	1.13	1.96
♦ 10' (on floor) ⁽³⁾	1.56	1.91	1.36	1.78
Final Build-Out	3.64	5.18	3.05	3.97

⁽¹⁾ Interim slope is 1:1 (H:V)

⁽²⁾ 5' of rock on the base having a maximum outslope differential height of 35 feet.

⁽³⁾ 10' of rock on the base with a maximum outslope differential height of 45 feet.

⁽⁴⁾ Water present on the base, i.e. contingency plan.



Client: Kennecott Minerals Company
Project: TDRSA Stability Analysis
Prepared by: JOS1
Checked by: JBH1

Scope ID.: 04W018
Page: 4 of 4
Date: 10/27/05
Date: 11/13/05

Block failure is a representation whereby the failure surface follows a plane of weakest resistance, i.e., the basic liner system. A random failure is randomly generated failure surface that propagates through the development rock to the underlying base liner system. The results of the stability analysis as well as plots of the critical failure surfaces are provided in Attachment 3.

5. Conclusions

Based upon this analysis, the calculated factor of safety for both interim and final build-out cases exceed 1.1 indicating stable conditions even with water present on the floor during a contingency event. Recognize the contingency event would be very remote occurrence. During interim operations, at least 5 feet of development rock will initially be required across the base. The maximum height of the interim 1:1 (H:V) slope cannot exceed 35 feet. If 10 feet of rock is initially graded across the base, the maximum height of the interim slope should not exceed 45 feet.

Attachment 1

Geotechnical Parameter References

To develop the range of geosynthetic friction angles for development rock and the TDRSA liner system, multiple references were consulted and are described and summarized here.

Development Rock

Development rock lies above the liner system. The development rock internal friction angle was obtained from Bowles *Foundation Analysis and Design*, 3rd Edition, Table 2-5 - Representative Values for Angle of Internal Friction ϕ . For medium size gravel, unconsolidated-undrained and Consolidated-drained : $\phi = 40-55^\circ$

TDRSA Liner System

Table 1 presents the reference, description, and appropriate liner component. The liner system has three interfaces that were evaluated for friction angles. The list below corresponds to the interfaces listed on the table:

1. Drainage Stone to Geocomposite
2. Geocomposite to Textured HDPE
3. Textured HDPE to geosynthetic clay liner (GCL)

Table 1 – TDRSA Liner Component Internal Friction Angle Data

Reference and Description	Interface 1	Interface 2	Interface 3
Koerner, Designing with Geosynthetics, 2 nd edition Table 5.5 Friction Values and Efficiencies for (c) Soil to Geotextile Combinations: nonwoven, needle-punched - concrete sand and - Ottawa sand	30° 26°		
Koerner, Designing with Geosynthetics, 2 nd edition Table 5.5 (b) Geomembrane-to-Geotextile Combinations: nonwoven, needle-punched - rough PVC		23°	23°
GSE, Side Slopes and Friction Angles, Friction Surfaces, Ref. T-036 Gundline HD/Geotextile (Mirafi 140N)		29°	29°
Proceedings of the 4 th Geosynthetic Research Institute Seminar, (Dec. 13-14, 1990), page 57, SLT Frictionflex™. Nonwoven polypropylene geotextile - FrictionFlex®			33°
Geosynthetics '91 Conference, Atlanta, Georgia. Page 130, Table I - Range of Values of Interface Friction Angles, Nonwoven Fabric/Sand	21 to 29°		
Geosynthetics '91 Conference, Atlanta, Georgia. Page 117, Table 1 – Factors of Safety for Selected Landfill Side Slope Interfaces Based on a 3 Horizontal to 1 Vertical Slope Angle Geotextile/Sand	>25°		
Proceedings of the 4 th Geosynthetic Research Institute Seminar, December 13-14, 1991, Page 150-161, Table 1 – Geosynthetic vs. Sand Interface Friction (Efficiency), nonwoven needlepunched	30°, 40°, 32.5° 30.5°		
Geosynthetics '91 Conference, Atlanta, Georgia. Page 151, Table 2 – Summary of Interface Shear Strength Parameters from Laboratory Testing Program, Trevira 1155 Geotextile, SLT - Textured		18°	30° 18°



Proceedings of the 4 th Geosynthetic Research Institute Seminar, December 13-14, 1991, Page 92, Table 1 Typical Interface Friction Angles, nonwoven Fabric/Sand	21 to 29°		
Friction Testing for CWS-Asbestos Landfill Closure, GZA GeoEnvironmental, Inc. , hand drawn figure.	37.2° 35.2°		
Geosynthetics '91 Conference, Atlanta, Georgia. Plum, Byrne, Dunbar, Presentation. Section on Modern Landfills and Seismic Stability Considerations, un-named Table, page 2, Textured HDPE to Geotextile		16 to 20°	16 to 20°
Range based on referenced data and good engineering practice	21-37°	16-29°	16-30°

Attachment 2

Boring Logs and Average Blow Count Development



Client: Kenecott Minerals Company Scope ID.: 04W018
Project: TDRSA Stability Analysis- Boring Well Data Averages
Prepared by: AKM Date: 01/12/06
Checked by: JOS1 Date: 01/12/05

North Jackson Company Boring/Well Construction Report

Bore Hole: QAL032		Bore Hole: QAL033		Bore Hole: QAL034		Bore Hole: QAL035	
Blow Count	Data	Blow Count	Data	Blow Count	Data	Blow Count	Data
Depth = 0'	1	Depth = 0'	1	Depth = 0'	2	Depth = 0'	1
	2		2		2		2
	2		2		3		3
	1		3		4		3
	1		3		3		3
	2		4		4		3
	1		6		5		4
	1		8		5		7
	2		7		4		4
	2		7		5		5
	4		8		5		8
	4		9		5		8
	2		1		4		2
	4		6		4		4
	4		4		5		4
	5		6		6		6
	1		1		3		1
	4		5		4		3
	5		5		5		4
Depth = 10'	6	Depth = 10'	9	Depth = 10'	7	Depth = 10'	7
	1		4		1		1
	6		5		3		3
	6		10		6		5
	6		12		7		7
	3		4		4		3
	4		5		5		6
	5		7		6		7
	6		9		7		6
	1		4		3		2
Depth = 15'	4	Depth = 15'	8	Depth = 15'	5	Depth = 15'	3
start average here	4	start average here	8	start average here	6	start average here	3
	5		10		7		5
	2		3		3		3
	3		5		4		5
	5		8		3		5
	5		9		3		7
	2		4		3		2
	3		5		4		5
	5		6		3		4
	5		7		2		6
	2		4		3		2
	3		6		3		5
	5		5		3		5
	5		2		2		1
	6		4		2		4
	7		4		3		3
	9		8		4		6
	3		1		3		3
	6		9		3		5
	11		10		4		5
	11		12		6		6
	4		6		3		3
	7		8		5		5
	6		8		5		6
	8		9		5		6
	4		4		3		3
	7		8		3		6
	9		8		5		7
	9		10		8		7
	4						
	7		3		4		4
	9		3		5		7
	10		6		7		8
			8		8		9
	3						5
	4		3		3	end of data - 50'	
	5		7		1	Average of shaded	
	6		7		2	data deeper than 15'	10
			7		6	blow/ft	
	4						
	4		4		3		
	7		6		4		
	7		9		5		
			10		7		
	1						
	1		1		2		
	3		1		2		
	5		3		4		
	1						
	4						
	7						
end of data - 50'	10	end of data - 50'	5	end of data - 50'	5		
Average*	11	Average*	13	Average*	7		
blow/ft		blow/ft		blow/ft			

Overall average of four borehole data sets: 10 blow/ft
From Bowles *Foundation Analysis and Design*, 3rd ed.
Table 3-2, internal friction angle ϕ : 30-35°

Average* - The blow count data listed is in 6" increments. To calculate the blow count per foot, two adjacent datum are summed and averaged.

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Owner: Kennecott Minerals Co.

Contractor: Prosonic

Geologist: AJM, North Jackson Co.

Sampling method: Split-spoon with 4.25" ID HSA

Surface Elevation (ft MSL): 1456

Started: 8/1/2005

Total Depth (ft): 50

Completed: 8/1/2005

Easting (UTM): 432403.27

Northing (UTM): 5177485.68

Depth (ft)	Core Intervals	Sample Location	Sample Number	Sample Type	Color	Blow Counts	Moisture Content	Lithologic Description	Well Construction (Auger Rig Installation)
0					7.5YR 5/8	1 2 2 1	sl. moist	SP Topsoil: sand, poorly sorted, mostly fine grained, with organics, strong brown	
					7.5YR 5/4	1 2 1 1 2 2 4 4 2 4 4 5 1 4 5 6 1 6 6 3 4 5 6	moist	SP Unsaturated Outwash: sand, poorly sorted, mostly fine grained, trace coarse sand, brown	
10					7.5YR 5/4	1 4 4 5	moist	SP sand, poorly sorted, mostly medium grained, trace coarse sand, brown	
					7.5YR 5/4	2 3 5 5	moist	SP sand, poorly sorted, mostly fine-medium grained, little silt, brown	
20					7.5YR 5/4	2 3 5 5 6 7 9 3 6 11 11	moist	SP sand, poorly sorted, mostly fine grained, trace coarse sand, brown	
					7.5YR 5/4	4 7 6 8 4	moist	SP sand, mostly fine-medium grained, brown	

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Owner: Kennecott Minerals Co.

Contractor: Prosonic

Geologist: AJM, North Jackson Co.

Sampling method: Split-spoon with 4.25" ID HSA

Surface Elevation (ft MSL): 1456

Started: 8/1/2005

Total Depth (ft): 50

Completed: 8/1/2005

Easting (UTM): 432403.27

Northing (UTM): 5177485.68

Depth (ft)	Core Intervals	Sample Location	Sample Number	Sample Type	Color	Blow Counts	Moisture Content	Lithologic Description		Well Construction (Auger Rig Installation)		
30						7 9 9	↓	SP	sand, mostly fine-medium grained, 10% coarse sand, brown			
						4 7 9 10	↑					
						3 4 5 6	moist					
						4 4 7 7	↓					
40							↑	SP	Saturated Outwash: sand, mostly medium grained, 20% coarse sand, reddish brown			
						1 1 3 5	saturated					
							↓					
							↑	SP	sand, mostly fine-medium grained, reddish brown			
						1 4 7 10	saturated					
							↓					
50												TD=50

Owner: Kennecott Minerals Co.
Contractor: Prosonic
Geologist: AJM, North Jackson Co.
Sampling method: Split-spoon with 4.25" ID HSA

Surface Elevation (ft MSL): 1456

Started: 7/29/2005

Total Depth (ft): 50

Completed: 7/29/2005

Easting (UTM): 432477.43

Northing (UTM): 5177743.81

Depth (ft)	Core Intervals	Sample Location	Sample Number	Sample Type	Color	Blow Counts	Moisture Content	Lithologic Description	Well Construction (Auger Rig Installation)
0					7.5YR 5/8	1 2 2 3	sl. moist	SP Topsoil: sand, poorly graded, mostly fine grained, with organics, strong brown	
						3 4 6 8 7 7 8 9 1 6 4 6 1 5 5 9 4 5 10 12 4 5 7 9 4 8 8 10 3 5 8 9 4	moist	SP Unsaturated Outwash: sand, poorly graded, mostly fine-medium grained, trace coarse sand, brown	
10					7.5YR 5/4	10 12 4 5 7 9 4 8 8 10 3 5 8 9 4	moist	SP sand, poorly graded, mostly medium graded, trace coarse sand, reddish brown	
20					5YR 5/4	7 4 6 5	moist	SP sand, poorly graded, medium grained, 10% coarse sand, reddish brown	
					5YR 5/4	4 6 5	moist	SP sand, poorly graded, medium grained, 10% coarse sand, reddish brown	
					5YR 5/3	2 4 4 8 1 9 10 12	moist	SM sand, mostly fine grained, some silt, reddish brown	

Boring/Well Construction Report

Bore Hole: **QAL033**
Project: **Eagle**

1004 Harbor Hills Drive, Suite 102 PO Box 218 Marquette, MI 49855 phone: 906.225.6787 fax: 906.225.6769

Owner: Kennecott Minerals Co.
Contractor: Prosonic
Geologist: AJM, North Jackson Co.
Sampling method: Split-spoon with 4.25" ID HSA

Surface Elevation (ft MSL): 1456
Started: 7/29/2005 **Total Depth (ft):** 50
Completed: 7/29/2005 **Easting (UTM):** 432477.43
Northing (UTM): 5177743.81

Depth (ft)	Core Intervals	Sample Location	Sample Number	Sample Type	Color	Blow Counts	Moisture Content	Lithologic Description		Well Construction (Auger Rig Installation)									
30					5YR 5/3	6	moist	SM	sand, poorly sorted, mostly fine-medium grained, some silt, reddish brown										
						8													
						8													
					5YR 5/3	4	moist	SP	sand, mostly fine-medium grained, reddish brown										
						8													
						8													
					5YR 5/3	10	moist	SP	sand, poorly sorted, fine-medium grained, little silt, reddish brown										
						3													
						3													
						6													
40					5YR 5/3	8	moist	SP	sand, poorly sorted, mostly fine grained, little silt, reddish brown										
						3													
						7													
					5YR 5/3	7	moist	SM	sand, poorly sorted, mostly fine grained, reddish brown										
						7													
						4													
					5YR 5/3	6	moist	SM	sand, poorly sorted, mostly fine grained, reddish brown										
						9													
						10													
50	5YR 4/4		saturated	SM	Transitional Deposit: sandy silt, reddish brown														
		1																	
		1																	
		3																	
		5																	

TD=50

TD=50

Boring/Well Construction Report

Bore Hole: **QAL034**
Project: **Eagle**

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Owner: Kennecott Minerals Co.
Contractor: Prosonic
Geologist: AJM, North Jackson Co.
Sampling method: Split-spoon with 4.25" ID HSA

Surface Elevation (ft MSL): 1457
Total Depth (ft): 50
Easting (UTM): 432520.79
Northing (UTM): 5177649.26

Depth (ft)	Core Intervals	Sample Location	Sample Number	Sample Type	Color	Blow Counts	Moisture Content	Lithologic Description	Well Construction (Auger Rig Installation)
0					7.5YR 4/6	2 2 3 4	↑	SP Topsoil: sand, poorly sorted, mostly fine-medium grained, with organics, strong brown	
						3 4 5 5 5 5 4 4 5 6 3 4 5 6 7 3 5 6 7 3 5 6 7 3 4 3 3	↑ slightly moist ↓	SP Unsaturated Outwash: sand, poorly sorted, mostly fine-medium grained, trace coarse sand, brown	
10					7.5YR 5/4	7 1 3 6 7 4 5 6 7 3 5 6 7 3 4 3 3	↑ slightly moist ↓	SP sand, poorly sorted, mostly medium grained, trace coarse sand, brown	
20					7.5YR 5/3	2 2 3 3 5 2 2 3 4 4 3 3 6 3	↑ slightly moist ↓	SP sand, poorly sorted, mostly medium grained, trace fine gravel, brown	

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Owner: Kennecott Minerals Co.
Contractor: Prosonic
Geologist: AJM, North Jackson Co.
Sampling method: Split-spoon with 4.25" ID HSA

Surface Elevation (ft MSL): 1457
Started: 8/1/2005
Completed: 8/1/2005
Total Depth (ft): 50
Easting (UTM): 432520.79
Northing (UTM): 5177649.26

Depth (ft)	Core Intervals	Sample Location	Sample Number	Sample Type	Color	Blow Counts	Moisture Content	Lithologic Description		Well Construction (Auger Rig Installation)		
30					7.5YR 5/3	5 5 5 3 3 5 8	slightly moist					
						4 5 7 8						
					5YR 4/3	3 1 2 6	wet	SM	silty sand, reddish brown			
40					5YR 4/3	3 4 5 7	saturated	SP	Saturated Outwash: sand, poorly sorted, mostly fine-medium grained, reddish brown			
					5YR 4/3	2 2 4 12	saturated	SC	Lacustrine Deposit: sandy clay with silt, reddish brown			
50												TD=50

Boring/Well Construction Report

Bore Hole: **QAL035**

Project: **Eagle**

1004 Harbor Hills Drive, Suite 102 PO Box 218 Marquette, MI 49855 phone: 906.225.6787 fax: 906.225.6769

Owner: Kennecott Minerals Co.

Contractor: Prosonic

Geologist: AJM, North Jackson Co.

Sampling method: Split-spoon with 4.25" ID HSA

Surface Elevation (ft MSL): 1457

Started: 8/1/2005

Total Depth (ft): 35

Completed: 8/1/2005

Easting (UTM): 432463.87

Northing (UTM): 5177537.50

Depth (ft)	Core Intervals	Sample Location	Sample Number	Sample Type	Color	Blow Counts	Moisture Content	Lithologic Description	Well Construction (Auger Rig Installation)
0					7.5YR 5/8	1 2 3 3	sl. moist	SP Topsoil: sand, poorly sorted, mostly fine grained, with organics, strong brown	
						3 3 4 7 4 5 8 8 2 4 4 6 1 3 4 7 1 3 5 7 3 6 7 6 2 3 3 5 3 5 5 7 2 5 4 6 2 5 5 5 1 4 3 6 3 5 5 6 3	moist	SP Unsaturated Outwash: sand, poorly sorted, mostly fine grained, trace coarse sand, trace fine gravel, brown	
10					7.5YR 5/4				
20									
					7.5YR 5/4	3 5 5 6 3	moist	SP sand, poorly sorted, mostly fine-medium grained, trace coarse sand, brown	

**North
Jackson
Company**

Boring/Well Construction Report

Bore Hole: **QAL035**

Project: **Eagle**

1004 Harbor Hills Drive, Suite 102 PO Box 218 Marquette, MI 49855 phone: 906.225.6787 fax: 906.225.6769

Owner: Kennecott Minerals Co.

Contractor: Prosonic

Geologist: AJM, North Jackson Co.

Sampling method: Split-spoon with 4.25" ID HSA

Surface Elevation (ft MSL): 1457

Started: 8/1/2005

Completed: 8/1/2005

Total Depth (ft): 35

Easting (UTM): 432463.87

Northing (UTM): 5177537.50

Depth (ft)	Core Intervals	Sample Location	Sample Number	Sample Type	Color	Blow Counts	Moisture Content	Lithologic Description		Well Construction (Auger Rig Installation)		
30						5 6 6 3 6 7 7	↓ ↑ moist ↓	SP	sand, poorly sorted, mostly fine grained, brown			TD=35
					7.5YR 5/4	4 7 8 9						

Attachment 3

Stability Analysis Output Files

Case 1: Interim Development, Output Files

TDRSA Height = 10 ft Rock on Floor Random FS

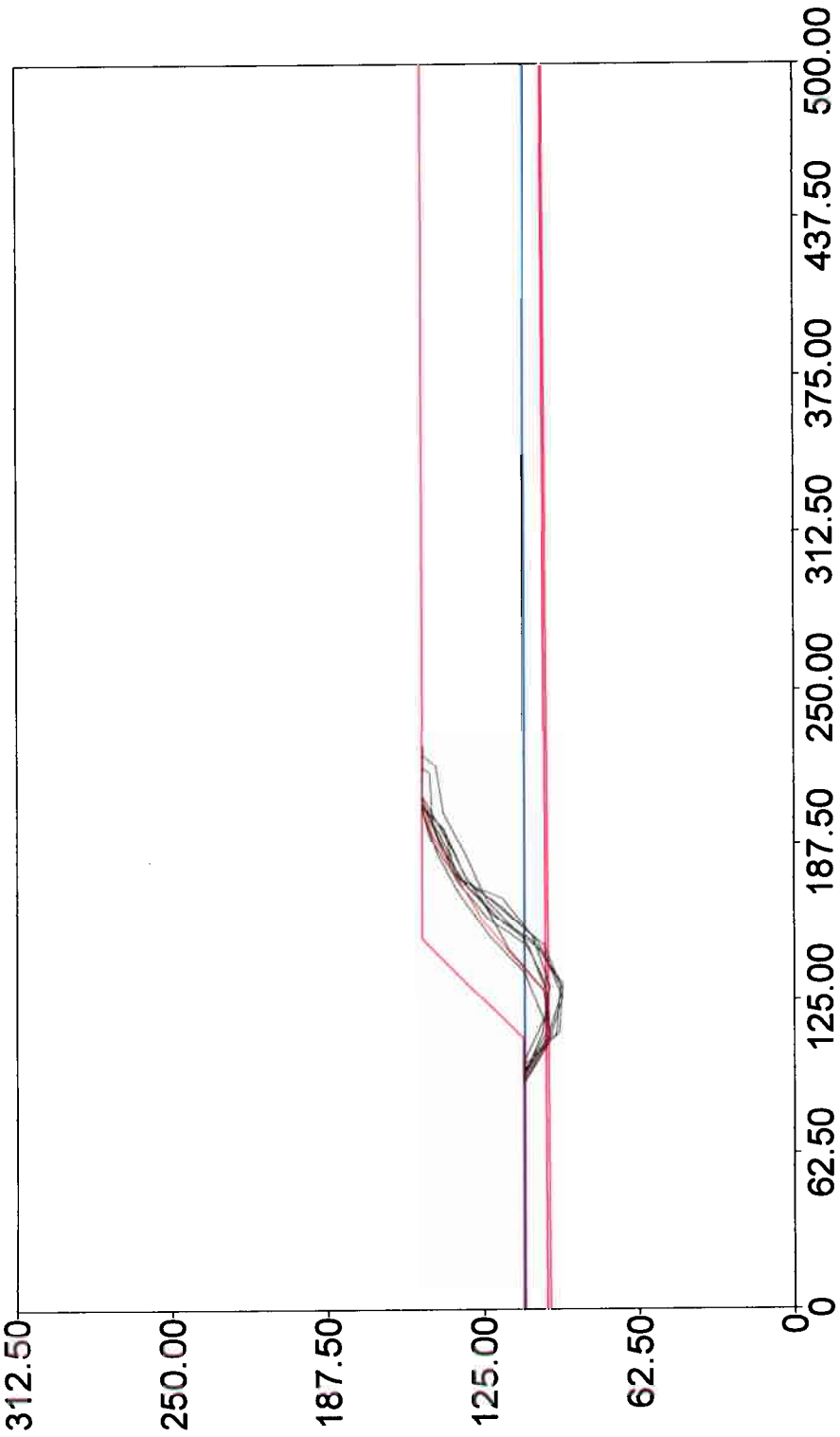
TDRSA Height = 10 ft Rock on Floor Block FS

TDRSA Height = 5 ft Rock on Floor Random FS

TDRSA Height = 5 ft Rock on Floor Block FS

10 ft Random Analysis

Development stability, 10ft of floor rock



Safety Factors

interim10ftandomwater.txt
** PCSTABL6 **

by
Purdue University

modified by
Peter J. Bosscher
University of Wisconsin-Madison

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer's Method of Slices

PROBLEM DESCRIPTION Developement strability

BOUNDARY COORDINATES

3 Top Boundaries
5 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	110.00	110.00	110.00	1
2	110.00	110.00	150.00	150.00	1
3	150.00	150.00	500.00	150.00	1
4	0.00	100.00	500.00	102.50	2
5	0.00	99.00	500.00	101.50	3

ISOTROPIC SOIL PARAMETERS

3 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	125.0	125.0	0.0	45.0	0.00	0.0	1
2	125.0	125.0	0.0	18.0	0.00	0.0	1
3	115.0	115.0	0.0	35.0	0.00	0.0	0

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

interim10ftrandomwater.txt

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	109.00
2	500.00	109.00

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

10000 Trial Surfaces Have Been Generated.

100 Surfaces Initiate From Each Of 100 Points Equally Spaced
Along The Ground Surface Between X = 90.00 ft.
and X = 100.00 ft.

Each Surface Terminates Between X = 200.00 ft.
and X = 450.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 10.00 ft.

20.00 ft. Line Segments Define Each Trial Failure Surface.

Factor of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	90.30	110.00
2	109.38	104.01
3	128.06	96.84
4	142.21	82.71
5	158.15	70.63
6	177.38	65.13
7	193.92	53.88
8	213.37	49.24

interim10ft randomwater.txt

9	228.01	35.62
10	246.99	29.29
11	266.99	29.11
12	286.86	31.39
13	303.75	42.09
14	322.10	50.06
15	339.78	59.40
16	347.36	77.91
17	347.39	97.91
18	353.35	117.00
19	364.25	133.77
20	370.19	150.00

Factor of Safety for the Preceding Surface is Between 59.096 and 59.089

Factor of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	91.01	110.00
2	105.16	95.86
3	121.12	83.81
4	138.89	74.64
5	156.66	65.45
6	174.42	56.26
7	192.19	47.08
8	212.08	45.01
9	231.64	49.17
10	249.87	57.41
11	259.05	75.18
12	259.18	95.18
13	259.24	115.18
14	259.28	135.18
15	259.33	150.00

Factor of Safety for the Preceding Surface is Between 84.877 and 84.826

Factor of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 23 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
--------------	----------------	----------------

		interim10ft random water.txt
1	95.25	110.00
2	109.59	96.06
3	124.95	83.24
4	141.85	72.56
5	159.48	63.10
6	173.95	49.29
7	193.44	44.80
8	208.43	31.57
9	223.27	18.16
10	241.85	10.75
11	261.84	10.17
12	281.84	10.60
13	300.50	17.78
14	318.49	26.53
15	334.39	38.65
16	341.66	57.29
17	341.70	77.29
18	351.60	94.66
19	367.68	106.55
20	385.00	116.56
21	396.99	132.56
22	415.61	139.86
23	421.25	150.00

Factor of Safety for the Preceding Surface is Between 55.482 and 55.476

Factor Of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	98.89	110.00
2	113.55	96.40
3	128.52	83.14
4	143.69	70.10
5	158.97	57.20
6	177.71	50.22
7	196.60	43.63
8	216.11	39.22
9	234.04	48.07
10	250.42	59.55
11	257.72	78.17
12	257.81	98.17
13	257.88	118.17
14	257.98	138.17
15	258.06	150.00

Factor of Safety for the Preceding Surface is Between 85.929 and 85.896

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 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	92.32	110.00
2	108.71	98.53
3	128.62	100.43
4	143.71	113.55
5	158.53	126.99
6	176.25	136.26
7	193.13	146.98
8	208.20	150.00

*** 1.780 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	99.09	110.00
2	117.49	102.15
3	136.40	108.66
4	150.66	122.68
5	166.67	134.66
6	184.27	144.17
7	202.35	150.00

*** 1.843 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	90.81	110.00
2	107.72	99.33
3	126.90	93.64
4	145.10	101.91
5	157.04	117.96
6	170.95	132.33
7	187.76	143.17
8	206.62	149.83
9	226.61	149.31
10	228.14	150.00

interim10ftrandomwater.txt
 *** 1.892 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	91.92	110.00
2	108.65	99.04
3	128.62	100.07
4	147.30	107.23
5	158.75	123.62
6	174.35	136.15
7	193.63	141.46
8	205.12	150.00

*** 1.897 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	96.97	110.00
2	111.79	96.57
3	131.74	95.16
4	149.21	104.89
5	163.40	118.99
6	175.45	134.95
7	193.33	143.92
8	204.63	150.00

*** 1.948 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	94.14	110.00
2	111.15	99.48
3	130.23	93.48
4	148.31	102.04
5	161.56	117.02
6	174.11	132.59
7	192.06	141.40
8	208.28	150.00

*** 1.978 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	94.14	110.00
2	110.49	98.48
3	130.20	101.88
4	145.54	114.72
5	163.00	124.48
6	178.20	137.47
7	196.30	145.98
8	216.23	147.65
9	218.75	150.00

*** 1.980 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	95.35	110.00
2	112.64	99.94
3	132.64	100.38
4	150.23	109.89
5	164.72	123.68
6	182.57	132.70
7	200.39	141.79
8	220.18	144.70
9	224.76	150.00

*** 1.984 ***

Failure Surface Specified By 8 Coordinate Points

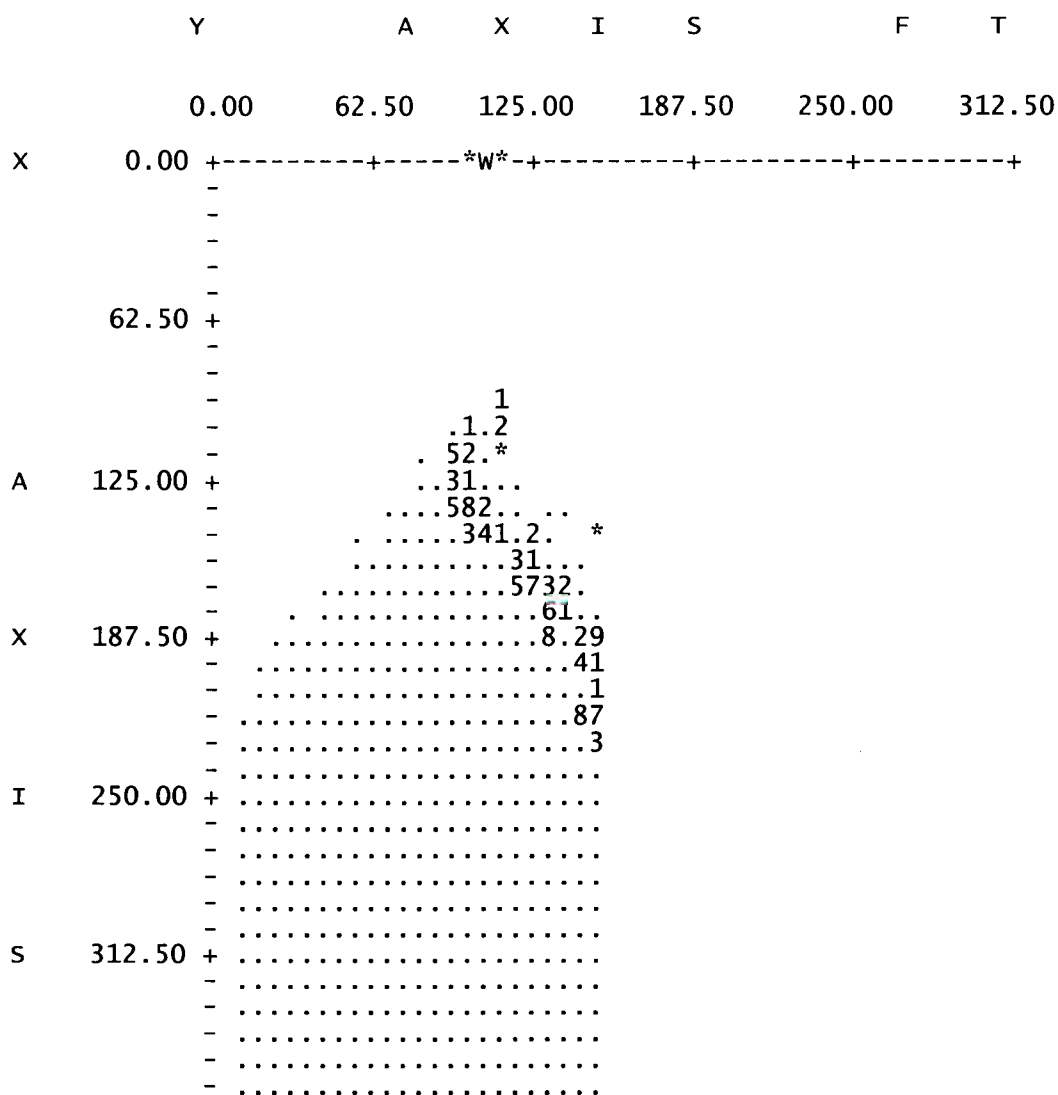
Point No.	X-Surf (ft)	Y-Surf (ft)
1	93.33	110.00
2	111.83	102.39
3	131.53	98.92
4	150.40	105.54
5	165.92	118.16
6	174.84	136.06
7	191.25	147.50
8	202.46	150.00

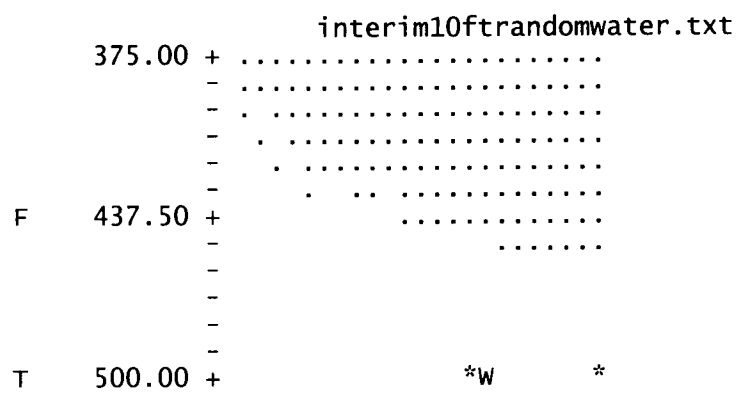
*** 1.991 ***

interim10ftrandomwater.txt
Failure Surface Specified By 8 Coordinate Points

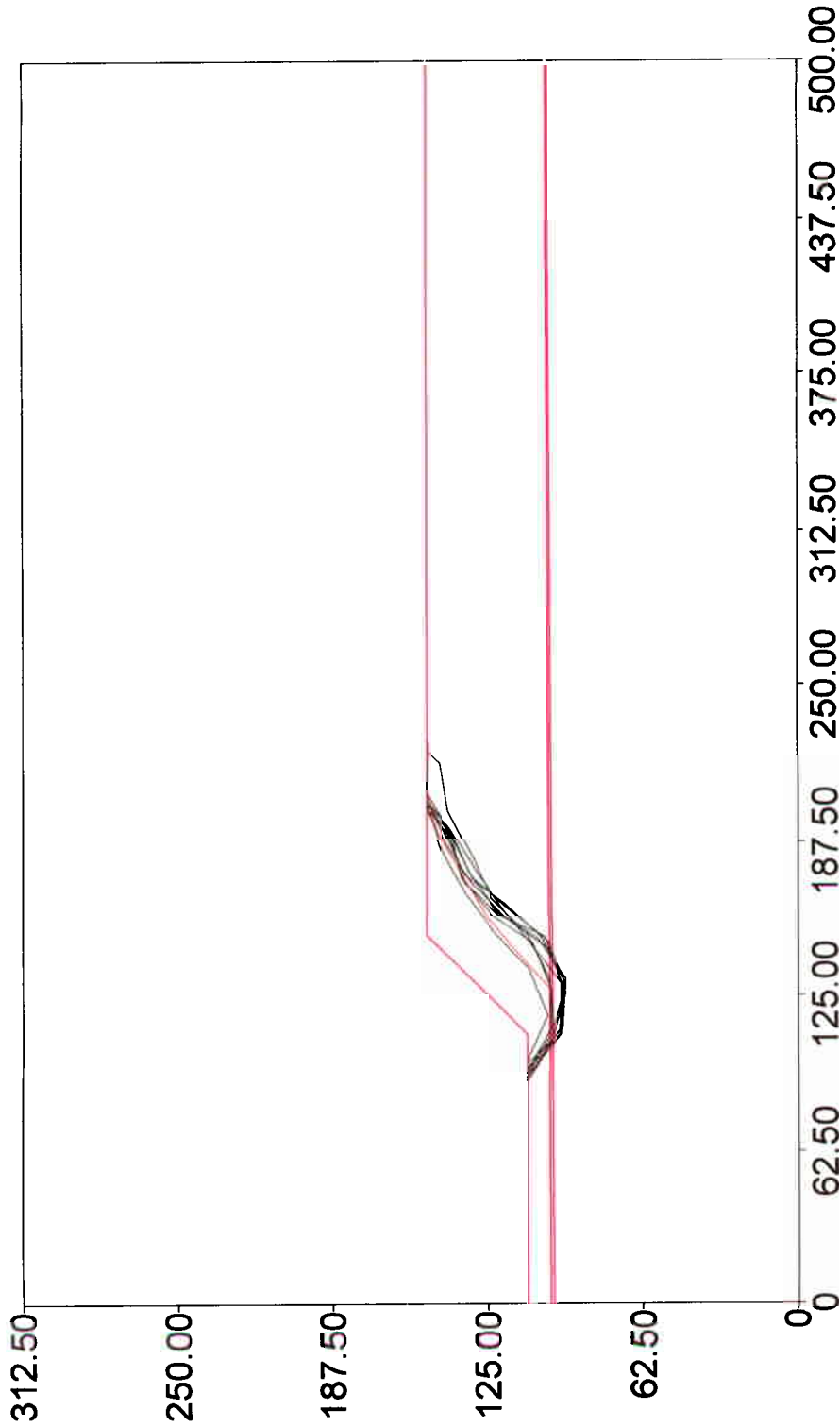
Point No.	X-Surf (ft)	Y-Surf (ft)
1	98.28	110.00
2	112.50	95.93
3	132.40	94.01
4	148.50	105.89
5	160.18	122.12
6	176.97	132.99
7	195.03	141.58
8	202.26	150.00

*** 1.999 ***





Development stability, 10ft of floor rock



Safety Factors

1.91
1.95
1.98
2.03
2.04
2.06
2.09
2.10
2.11
2.12

interim10ftrandomnowater.txt

** PCSTABL6 **

by
Purdue University

modified by
Peter J. Bosscher
University of Wisconsin-Madison

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer's Method of Slices

PROBLEM DESCRIPTION Devlopement strability

BOUNDARY COORDINATES

3 Top Boundaries
5 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	110.00	110.00	110.00	1
2	110.00	110.00	150.00	150.00	1
3	150.00	150.00	500.00	150.00	1
4	0.00	100.00	500.00	102.50	2
5	0.00	99.00	500.00	101.50	3

ISOTROPIC SOIL PARAMETERS

3 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	125.0	125.0	0.0	45.0	0.00	0.0	0
2	125.0	125.0	0.0	18.0	0.00	0.0	0
3	115.0	115.0	0.0	35.0	0.00	0.0	0

A Critical Failure Surface Searching Method, Using A Random

interim10ftrandomnowater.txt
Technique For Generating Irregular Surfaces, Has Been Specified.

10000 Trial Surfaces Have Been Generated.

100 Surfaces Initiate From Each Of 100 Points Equally Spaced
Along The Ground Surface Between X = 90.00 ft.
and X = 100.00 ft.

Each Surface Terminates Between X = 200.00 ft.
and X = 450.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 10.00 ft.

20.00 ft. Line Segments Define Each Trial Failure Surface.

Factor Of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	90.30	110.00
2	109.38	104.01
3	128.06	96.84
4	142.21	82.71
5	158.15	70.63
6	177.38	65.13
7	193.92	53.88
8	213.37	49.24
9	228.01	35.62
10	246.99	29.29
11	266.99	29.11
12	286.86	31.39
13	303.75	42.09
14	322.10	50.06
15	339.78	59.40
16	347.36	77.91
17	347.39	97.91
18	353.35	117.00
19	364.25	133.77
20	370.19	150.00

Factor of Safety for the Preceding Surface is Between 59.297 and 59.291

Factor Of Safety Calculation Has Gone Through 20 Iterations
Page 2

The Trial Failure Surface In Question Is Defined
By The Following 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	91.01	110.00
2	105.16	95.86
3	121.12	83.81
4	138.89	74.64
5	156.66	65.45
6	174.42	56.26
7	192.19	47.08
8	212.08	45.01
9	231.64	49.17
10	249.87	57.41
11	259.05	75.18
12	259.18	95.18
13	259.24	115.18
14	259.28	135.18
15	259.33	150.00

Factor of Safety for the Preceding Surface is Between 86.614 and 86.564

Factor of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 23 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	95.25	110.00
2	109.59	96.06
3	124.95	83.24
4	141.85	72.56
5	159.48	63.10
6	173.95	49.29
7	193.44	44.80
8	208.43	31.57
9	223.27	18.16
10	241.85	10.75
11	261.84	10.17
12	281.84	10.60
13	300.50	17.78
14	318.49	26.53
15	334.39	38.65
16	341.66	57.29
17	341.70	77.29
18	351.60	94.66

interim10ftrandomnowater.txt

19	367.68	106.55
20	385.00	116.56
21	396.99	132.56
22	415.61	139.86
23	421.25	150.00

Factor of Safety for the Preceding Surface is Between 55.581 and 55.575

Factor of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	98.89	110.00
2	113.55	96.40
3	128.52	83.14
4	143.69	70.10
5	158.97	57.20
6	177.71	50.22
7	196.60	43.63
8	216.11	39.22
9	234.04	48.07
10	250.42	59.55
11	257.72	78.17
12	257.81	98.17
13	257.88	118.17
14	257.98	138.17
15	258.06	150.00

Factor of Safety for the Preceding Surface is Between 87.607 and 87.576

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 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	92.32	110.00
2	108.71	98.53
3	128.62	100.43
4	143.71	113.55
5	158.53	126.99
6	176.25	136.26

interim10ft random water.txt

7	193.13	146.98
8	208.20	150.00

*** 1.907 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	99.09	110.00
2	117.49	102.15
3	136.40	108.66
4	150.66	122.68
5	166.67	134.66
6	184.27	144.17
7	202.35	150.00

*** 1.953 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	90.81	110.00
2	107.72	99.33
3	126.90	93.64
4	145.10	101.91
5	157.04	117.96
6	170.95	132.33
7	187.76	143.17
8	206.62	149.83
9	226.61	149.31
10	228.14	150.00

*** 1.982 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	91.92	110.00
2	108.65	99.04
3	128.62	100.07
4	147.30	107.23
5	158.75	123.62
6	174.35	136.15
7	193.63	141.46
8	205.12	150.00

*** 2.034 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	96.97	110.00
2	111.79	96.57
3	131.74	95.16
4	149.21	104.89
5	163.40	118.99
6	175.45	134.95
7	193.33	143.92
8	204.63	150.00

*** 2.043 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	94.14	110.00
2	111.15	99.48
3	130.23	93.48
4	148.31	102.04
5	161.56	117.02
6	174.11	132.59
7	192.06	141.40
8	208.28	150.00

*** 2.064 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	98.28	110.00
2	112.50	95.93
3	132.40	94.01
4	148.50	105.89
5	160.18	122.12
6	176.97	132.99
7	195.03	141.58
8	202.26	150.00

*** 2.091 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	96.06	110.00
2	110.69	96.36
3	130.69	96.04
4	149.32	103.32
5	158.53	121.07
6	172.61	135.28
7	191.59	141.59
8	201.43	150.00

*** 2.104 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	94.65	110.00
2	109.20	96.28
3	129.14	94.80
4	144.97	107.02
5	160.50	119.63
6	177.04	130.87
7	194.29	141.00
8	200.14	150.00

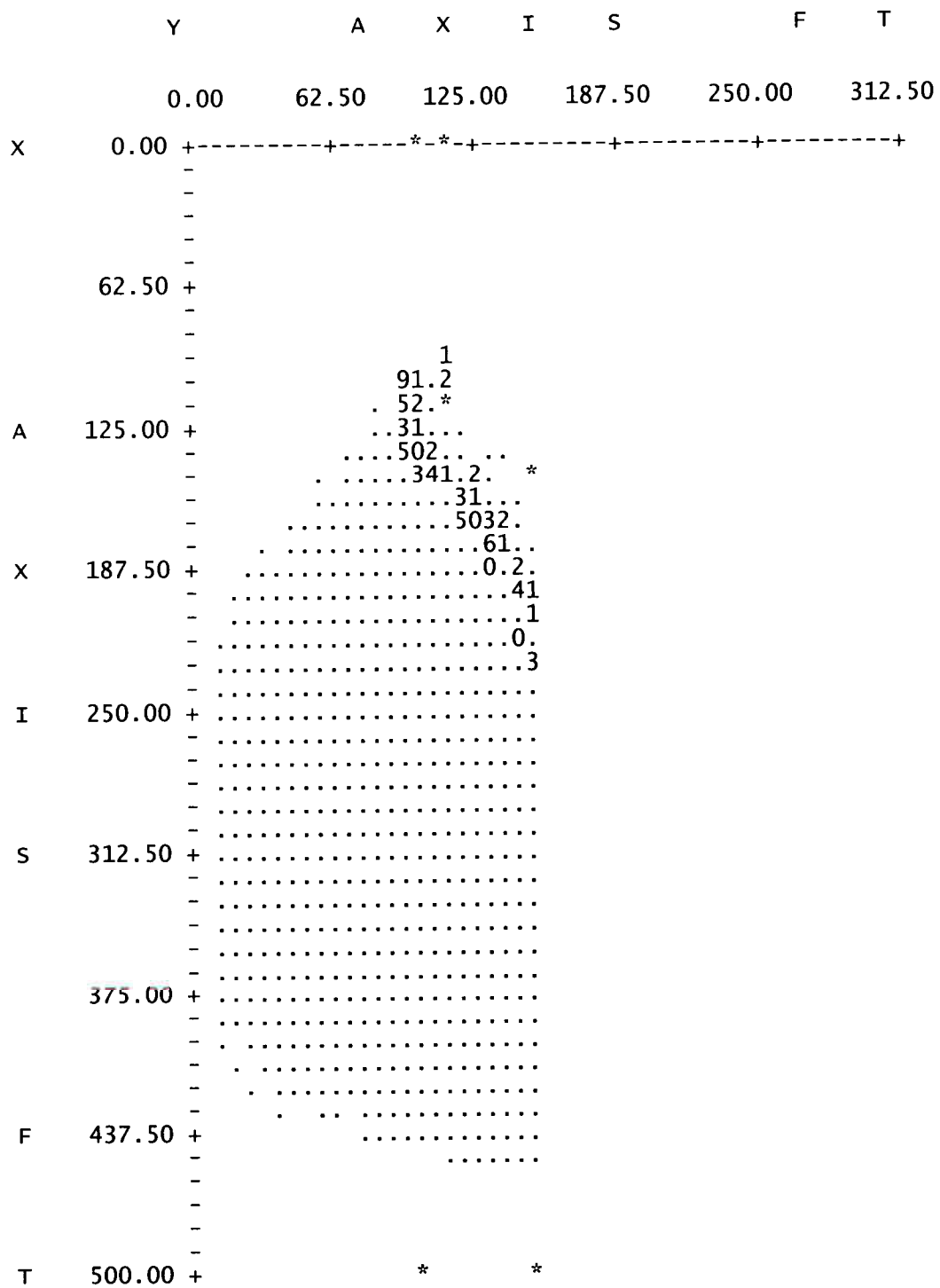
*** 2.108 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	95.35	110.00
2	112.64	99.94
3	132.64	100.38
4	150.23	109.89
5	164.72	123.68
6	182.57	132.70
7	200.39	141.79
8	220.18	144.70
9	224.76	150.00

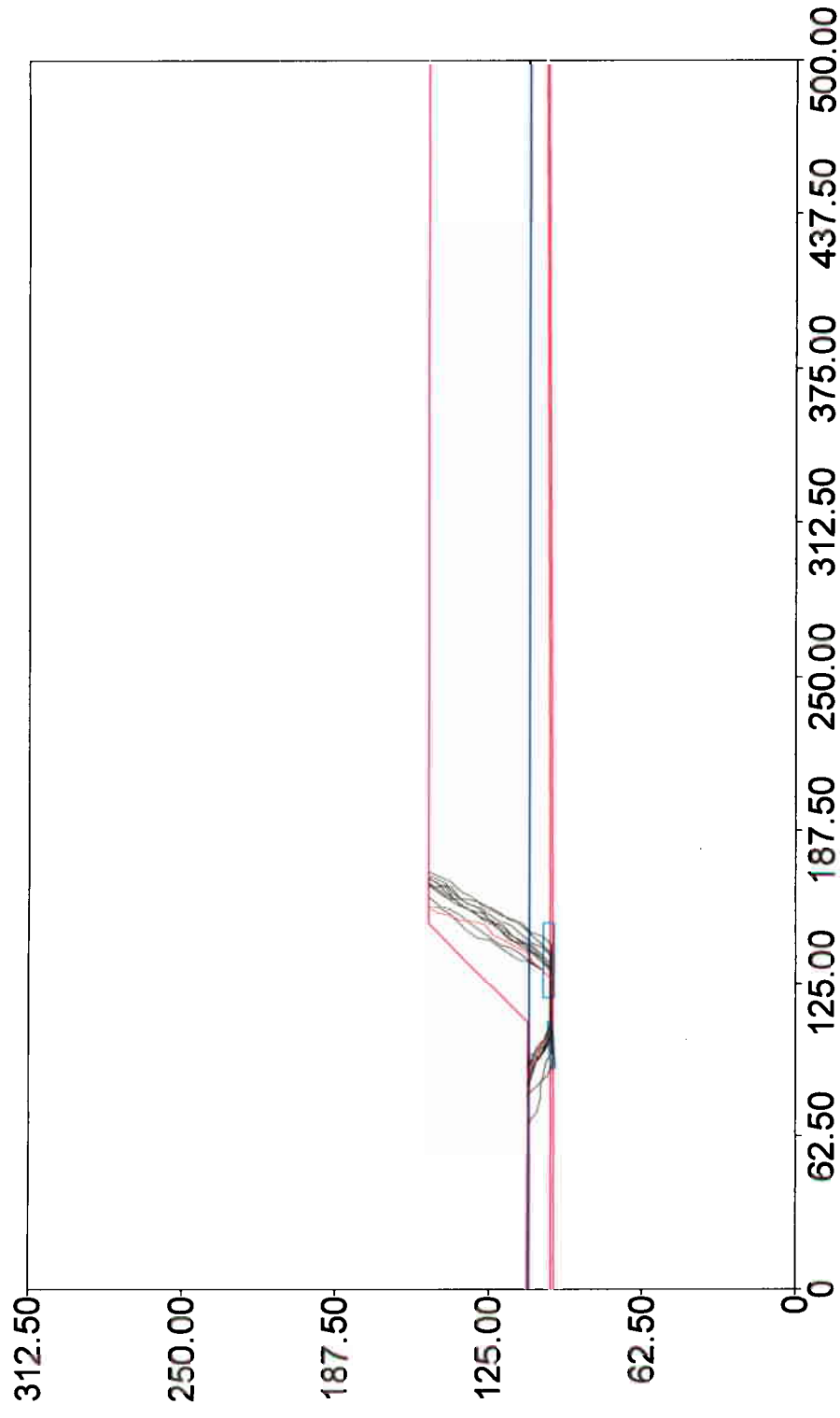
*** 2.119 ***

interim10ftrandomnowater.txt



10 ft Block Analysis

Development stability, 10ft of floor rock



Safety Factors

1.36
1.38
1.38
1.38
1.40
1.40
1.40
1.41
1.41
1.41

Interim10ftBlockknowater.txt
** PCSTABL6 **

by
Purdue University

modified by
Peter J. Bosscher
University of Wisconsin-Madison

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer's Method of Slices

PROBLEM DESCRIPTION Development strability

BOUNDARY COORDINATES

3 Top Boundaries
5 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	110.00	110.00	110.00	1
2	110.00	110.00	150.00	150.00	1
3	150.00	150.00	500.00	150.00	1
4	0.00	100.00	500.00	102.50	2
5	0.00	99.00	500.00	101.50	3

ISOTROPIC SOIL PARAMETERS

3 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	125.0	125.0	0.0	45.0	0.00	0.0	0
2	125.0	125.0	0.0	18.0	0.00	0.0	0
3	115.0	115.0	0.0	35.0	0.00	0.0	0

A Critical Failure Surface Searching Method, Using A Random
Page 1

Interim10ftBlocknowater.txt
 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 5.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	90.00	99.00	110.00	100.50	2.00
2	120.00	101.00	150.00	101.50	5.00

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	90.93	110.00
2	95.14	107.72
3	99.54	105.34
4	103.51	102.30
5	108.11	100.35
6	138.05	100.43
7	141.55	104.00
8	145.08	107.54
9	148.16	111.48
10	151.53	115.17
11	152.78	120.01
12	154.91	124.53
13	157.95	128.51
14	161.32	132.20
15	163.60	136.65
16	166.96	140.36
17	168.56	145.09
18	171.10	149.40
19	171.13	150.00

*** 1.560 ***

Failure Surface Specified By 19 Coordinate Points

Interim10ftBlocknowater.txt		
Point No.	X-Surf (ft)	Y-Surf (ft)
1	94.33	110.00
2	95.78	108.78
3	99.35	105.28
4	103.91	103.21
5	108.09	100.47
6	132.60	100.50
7	135.54	104.54
8	138.74	108.38
9	142.00	112.17
10	143.61	116.91
11	147.02	120.57
12	150.55	124.10
13	153.75	127.95
14	154.74	132.85
15	157.45	137.05
16	159.69	141.52
17	163.18	145.11
18	166.19	149.10
19	166.47	150.00

*** 1.562 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	86.50	110.00
2	90.35	108.09
3	95.04	106.36
4	99.83	104.92
5	103.91	102.03
6	108.18	99.43
7	127.63	100.20
8	131.16	103.74
9	134.68	107.28
10	138.21	110.82
11	140.84	115.08
12	143.75	119.15
13	145.86	123.68
14	149.23	127.37
15	150.40	132.23
16	151.20	137.17
17	152.85	141.89
18	154.12	146.72
19	156.09	150.00

*** 1.562 ***

Failure Surface Specified By 19 Coordinate Points

Point X-Surf Y-Surf
Page 3

No.	Interim10ftBlocknowater.txt	
	(ft)	(ft)
1	91.05	110.00
2	92.86	108.51
3	96.79	105.43
4	100.94	102.64
5	104.71	99.34
6	133.54	100.61
7	137.03	104.19
8	140.53	107.75
9	142.78	112.22
10	145.41	116.47
11	148.85	120.10
12	150.62	124.78
13	154.13	128.33
14	157.45	132.07
15	159.79	136.49
16	163.03	140.30
17	166.56	143.84
18	168.98	148.21
19	169.49	150.00

*** 1.589 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	96.21	110.00
2	97.21	109.07
3	101.29	106.17
4	105.43	103.37
5	109.22	100.11
6	140.08	100.09
7	142.68	104.36
8	146.21	107.90
9	149.35	111.79
10	152.78	115.43
11	156.20	119.07
12	157.10	123.99
13	159.03	128.60
14	162.50	132.21
15	165.18	136.43
16	168.08	140.50
17	170.72	144.75
18	172.31	149.49
19	172.48	150.00

*** 1.599 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
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Interim10ftBlocknowater.txt

1	83.07	110.00
2	84.13	109.38
3	89.00	108.28
4	93.83	106.99
5	97.41	103.49
6	101.48	100.59
7	137.18	100.08
8	140.22	104.06
9	142.81	108.33
10	145.82	112.33
11	148.56	116.51
12	150.32	121.19
13	153.35	125.16
14	156.09	129.35
15	158.76	133.57
16	161.45	137.78
17	164.88	141.42
18	165.35	146.40
19	168.80	150.00

*** 1.608 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	84.34	110.00
2	86.28	108.06
3	91.20	107.16
4	95.66	104.91
5	100.25	102.93
6	104.69	100.63
7	132.81	100.04
8	135.70	104.12
9	139.16	107.73
10	142.68	111.28
11	144.69	115.86
12	147.88	119.71
13	150.81	123.76
14	151.64	128.69
15	154.48	132.80
16	157.99	136.37
17	161.45	139.98
18	164.89	143.60
19	165.03	148.60
20	166.34	150.00

*** 1.610 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
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Interim10ftBlocknowater.txt

1	90.13	110.00
2	93.31	107.42
3	97.12	104.18
4	101.58	101.93
5	106.18	99.97
6	141.83	100.12
7	144.70	104.21
8	146.94	108.68
9	149.82	112.76
10	151.03	117.62
11	154.18	121.49
12	157.16	125.51
13	159.67	129.83
14	160.43	134.78
15	160.89	139.75
16	161.99	144.63
17	165.10	148.55
18	165.26	150.00

*** 1.613 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	79.04	110.00
2	79.71	109.37
3	83.24	105.84
4	87.21	102.80
5	91.08	99.63
6	130.69	99.88
7	134.04	103.59
8	137.48	107.22
9	139.77	111.66
10	143.30	115.20
11	146.45	119.08
12	148.93	123.42
13	150.95	128.00
14	154.14	131.85
15	157.14	135.85
16	160.43	139.61
17	163.32	143.70
18	166.73	147.35
19	168.11	150.00

*** 1.616 ***

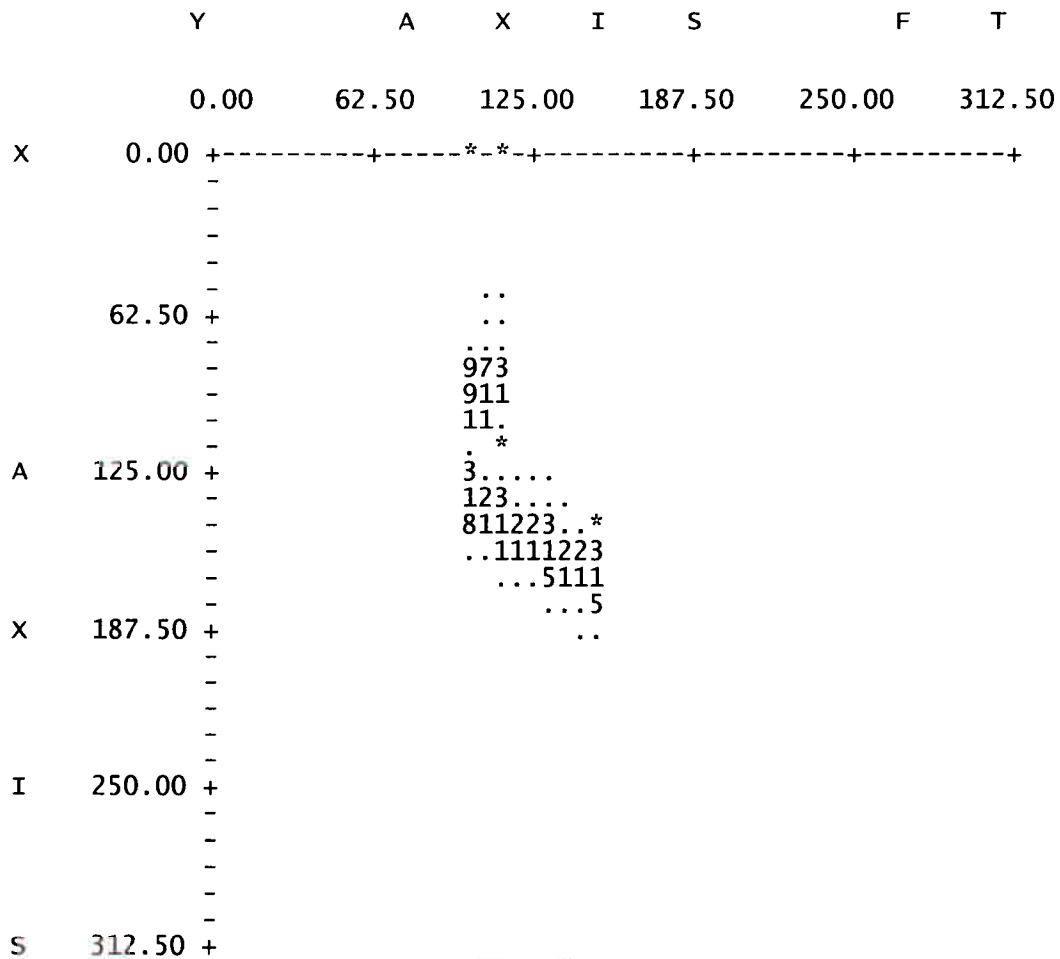
Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	88.69	110.00

Interim10ftBlocknowater.txt

2	91.55	109.57
3	95.12	106.07
4	100.12	105.91
5	104.49	103.48
6	108.60	100.64
7	134.43	100.09
8	137.51	104.04
9	139.95	108.40
10	143.49	111.94
11	146.53	115.90
12	149.99	119.52
13	153.45	123.12
14	156.23	127.28
15	157.01	132.21
16	160.52	135.78
17	163.28	139.95
18	166.32	143.92
19	167.32	148.82
20	168.35	150.00

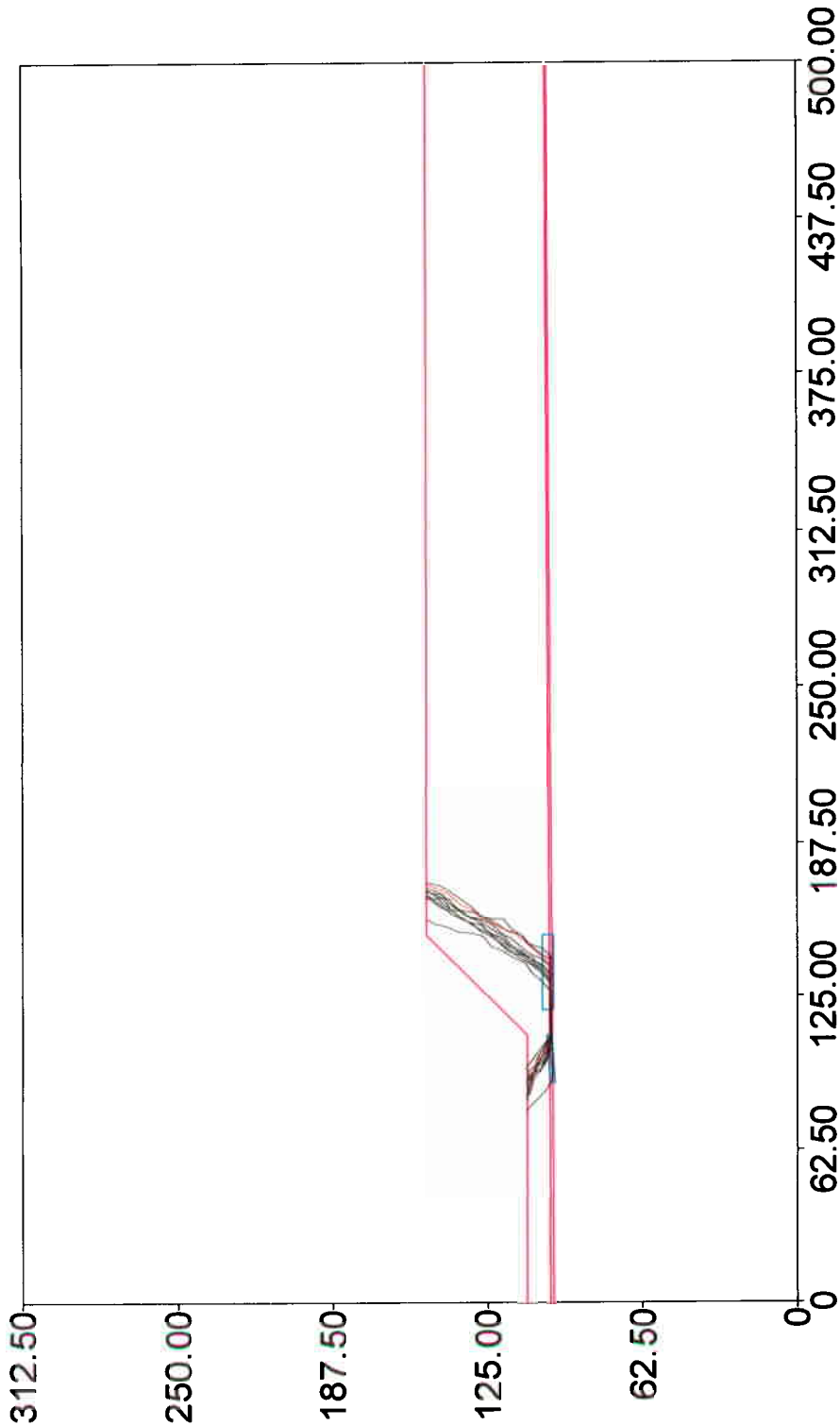
*** 1.619 ***



Interim10ftBlocknowater.txt

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Development stability, 10ft of floor rock



Safety Factors

1.56
1.56
1.56
1.59
1.60
1.61
1.61
1.61
1.62
1.62

interim10ftblockwater.txt
** PCSTABL6 **

by
Purdue University

modified by
Peter J. Bosscher
University of Wisconsin-Madison

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer's Method of Slices

PROBLEM DESCRIPTION Developement strability

BOUNDARY COORDINATES

3 Top Boundaries
5 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	110.00	110.00	110.00	1
2	110.00	110.00	150.00	150.00	1
3	150.00	150.00	500.00	150.00	1
4	0.00	100.00	500.00	102.50	2
5	0.00	99.00	500.00	101.50	3

ISOTROPIC SOIL PARAMETERS

3 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	125.0	125.0	0.0	45.0	0.00	0.0	1
2	125.0	125.0	0.0	18.0	0.00	0.0	1
3	115.0	115.0	0.0	35.0	0.00	0.0	0

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

interim10ftblockwater.txt

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	109.00
2	500.00	109.00

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 5.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	90.00	99.00	110.00	100.50	2.00
2	120.00	101.00	150.00	101.50	5.00

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	86.50	110.00
2	90.35	108.09
3	95.04	106.36
4	99.83	104.92
5	103.91	102.03
6	108.18	99.43
7	127.63	100.20
8	131.16	103.74
9	134.68	107.28
10	138.21	110.82

interim10ftblockwater.txt

11	140.84	115.08
12	143.75	119.15
13	145.86	123.68
14	149.23	127.37
15	150.40	132.23
16	151.20	137.17
17	152.85	141.89
18	154.12	146.72
19	156.09	150.00

*** 1.357 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	94.33	110.00
2	95.78	108.78
3	99.35	105.28
4	103.91	103.21
5	108.09	100.47
6	132.60	100.50
7	135.54	104.54
8	138.74	108.38
9	142.00	112.17
10	143.61	116.91
11	147.02	120.57
12	150.55	124.10
13	153.75	127.95
14	154.74	132.85
15	157.45	137.05
16	159.69	141.52
17	163.18	145.11
18	166.19	149.10
19	166.47	150.00

*** 1.377 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	90.93	110.00
2	95.14	107.72
3	99.54	105.34
4	103.51	102.30
5	108.11	100.35
6	138.05	100.43
7	141.55	104.00
8	145.08	107.54
9	148.16	111.48
10	151.53	115.17
11	152.78	120.01

interim10ftblockwater.txt

12	154.91	124.53
13	157.95	128.51
14	161.32	132.20
15	163.60	136.65
16	166.96	140.36
17	168.56	145.09
18	171.10	149.40
19	171.13	150.00

*** 1.379 ***

Failure Surface Specified By 21 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	78.16	110.00
2	79.05	109.15
3	84.03	108.69
4	88.87	107.44
5	93.50	105.55
6	98.15	103.70
7	102.52	101.28
8	107.34	99.93
9	127.99	100.34
10	131.49	103.91
11	134.21	108.11
12	135.24	113.00
13	137.72	117.35
14	140.39	121.57
15	143.80	125.23
16	144.65	130.16
17	147.24	134.43
18	150.65	138.08
19	154.02	141.78
20	156.17	146.30
21	157.60	150.00

*** 1.385 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	84.34	110.00
2	86.28	108.06
3	91.20	107.16
4	95.66	104.91
5	100.25	102.93
6	104.69	100.63
7	132.81	100.04
8	135.70	104.12
9	139.16	107.73
10	142.68	111.28

interim10ftblockwater.txt

11	144.69	115.86
12	147.88	119.71
13	150.81	123.76
14	151.64	128.69
15	154.48	132.80
16	157.99	136.37
17	161.45	139.98
18	164.89	143.60
19	165.03	148.60
20	166.34	150.00

*** 1.396 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	83.07	110.00
2	84.13	109.38
3	89.00	108.28
4	93.83	106.99
5	97.41	103.49
6	101.48	100.59
7	137.18	100.08
8	140.22	104.06
9	142.81	108.33
10	145.82	112.33
11	148.56	116.51
12	150.32	121.19
13	153.35	125.16
14	156.09	129.35
15	158.76	133.57
16	161.45	137.78
17	164.88	141.42
18	165.35	146.40
19	168.80	150.00

*** 1.401 ***

Failure Surface Specified By 19 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	79.04	110.00
2	79.71	109.37
3	83.24	105.84
4	87.21	102.80
5	91.08	99.63
6	130.69	99.88
7	134.04	103.59
8	137.48	107.22
9	139.77	111.66
10	143.30	115.20

interim10ftblockwater.txt

11	146.45	119.08
12	148.93	123.42
13	150.95	128.00
14	154.14	131.85
15	157.14	135.85
16	160.43	139.61
17	163.32	143.70
18	166.73	147.35
19	168.11	150.00

*** 1.401 ***

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	67.68	110.00
2	69.38	108.38
3	73.40	105.41
4	78.40	105.26
5	83.40	105.05
6	88.29	104.03
7	92.95	102.22
8	97.50	100.13
9	127.60	100.27
10	131.13	103.81
11	133.70	108.10
12	137.04	111.82
13	139.69	116.06
14	141.06	120.87
15	144.33	124.65
16	146.92	128.93
17	149.82	133.00
18	152.89	136.95
19	155.27	141.34
20	157.41	145.86
21	160.95	149.40
22	161.28	150.00

*** 1.405 ***

Failure Surface Specified By 19 Coordinate Points

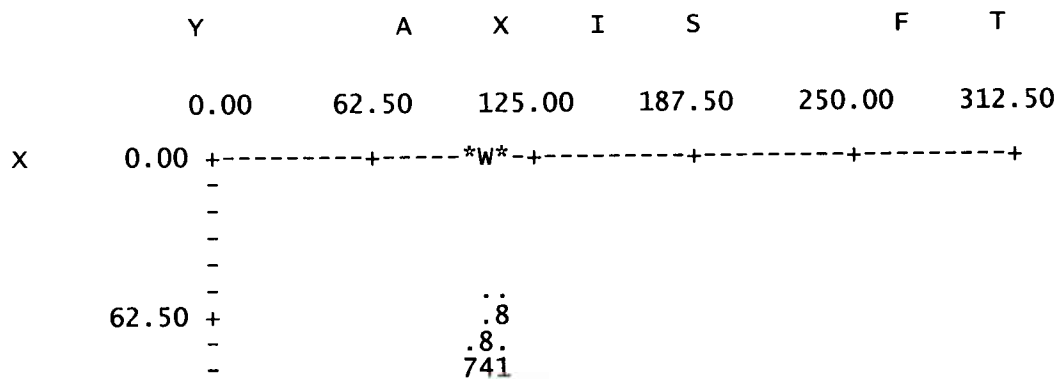
Point No.	X-Surf (ft)	Y-Surf (ft)
1	91.05	110.00
2	92.86	108.51
3	96.79	105.43
4	100.94	102.64
5	104.71	99.34
6	133.54	100.61
7	137.03	104.19
8	140.53	107.75

9	142.78	112.22
10	145.41	116.47
11	148.85	120.10
12	150.62	124.78
13	154.13	128.33
14	157.45	132.07
15	159.79	136.49
16	163.03	140.30
17	166.56	143.84
18	168.98	148.21
19	169.49	150.00

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	90.13	110.00
2	93.31	107.42
3	97.12	104.18
4	101.58	101.93
5	106.18	99.97
6	141.83	100.12
7	144.70	104.21
8	146.94	108.68
9	149.82	112.76
10	151.03	117.62
11	154.18	121.49
12	157.16	125.51
13	159.67	129.83
14	160.43	134.78
15	160.89	139.75
16	161.99	144.63
17	165.10	148.55
18	165.26	150.00

*** 1.409 ***



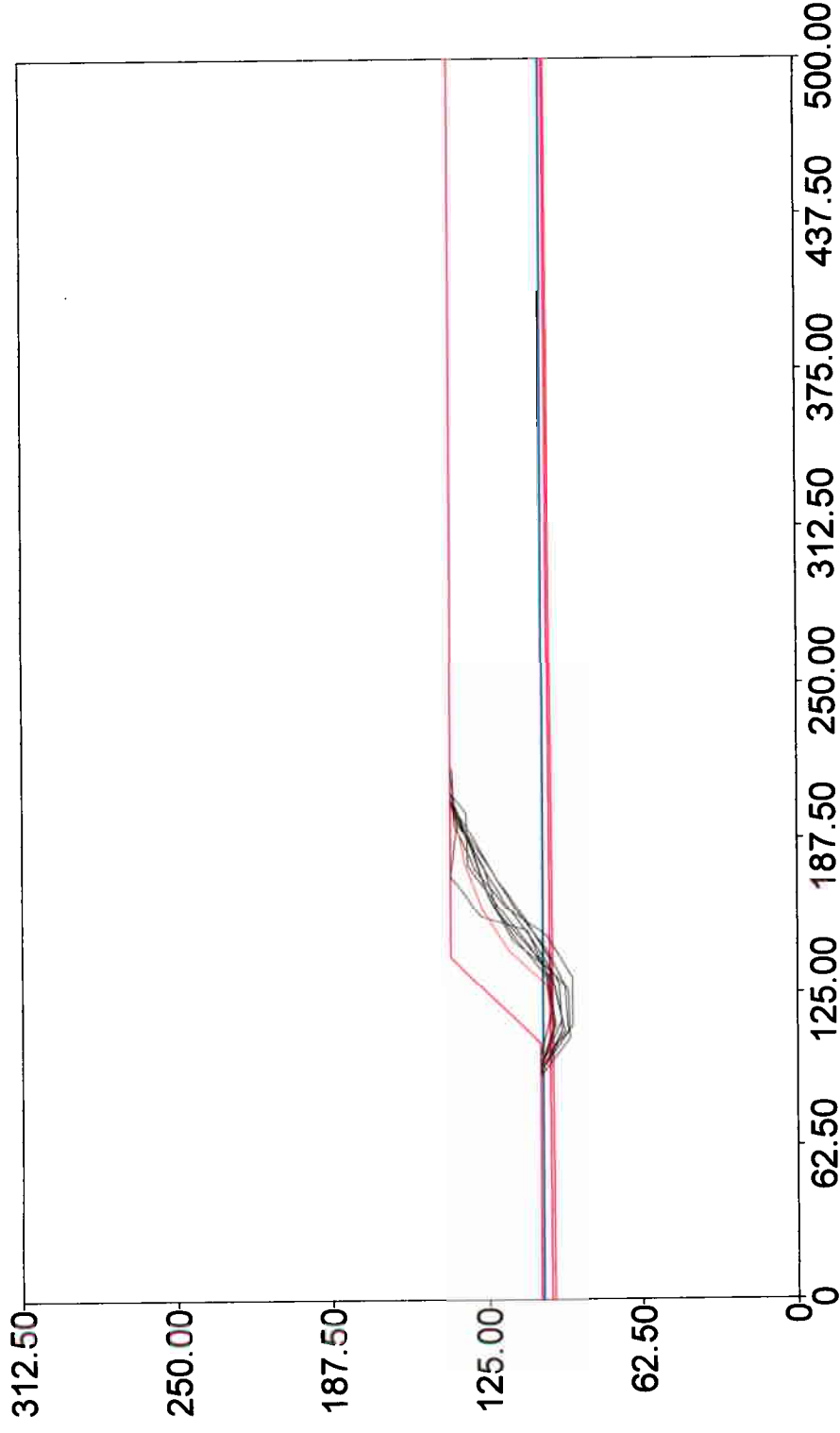
interim10ftblockwater.txt

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T	500.00	+	*W *

5 ft Random Analysis

Development stability, 5ft of floor rock

Safety Factors



Profile.out
 ** PCSTABL6 **

by
 Purdue University

modified by
 Peter J. Bosscher
 University of Wisconsin-Madison

--Slope Stability Analysis--
 Simplified Janbu, Simplified Bishop
 or Spencer's Method of Slices

PROBLEM DESCRIPTION Devlopement strability

BOUNDARY COORDINATES

3 Top Boundaries
 5 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	105.00	105.00	105.00	1
2	105.00	105.00	140.00	140.00	1
3	140.00	140.00	500.00	140.00	1
4	0.00	100.00	500.00	102.50	2
5	0.00	99.00	500.00	101.50	3

ISOTROPIC SOIL PARAMETERS

3 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	125.0	125.0	0.0	45.0	0.00	0.0	1
2	125.0	125.0	0.0	18.0	0.00	0.0	1
3	115.0	115.0	0.0	35.0	0.00	0.0	0

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Profile.out

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	104.00
2	500.00	104.00

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

10000 Trial Surfaces Have Been Generated.

100 Surfaces Initiate From Each Of 100 Points Equally Spaced
Along The Ground Surface Between X = 90.00 ft.
and X = 100.00 ft.

Each Surface Terminates Between X = 200.00 ft.
and X = 450.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 10.00 ft.

20.00 ft. Line Segments Define Each Trial Failure Surface.

Factor Of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	91.01	105.00
2	105.16	90.86
3	121.12	78.81
4	138.89	69.64
5	156.66	60.45
6	174.42	51.26
7	192.19	42.08
8	212.08	40.01

		Profile.out
9	231.64	44.17
10	249.87	52.41
11	259.05	70.18
12	259.18	90.18
13	259.24	110.18
14	259.28	130.18
15	259.31	140.00

Factor of Safety for the Preceding Surface is Between***** and*****

Factor Of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 13 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	92.73	105.00
2	110.31	95.46
3	126.48	83.70
4	142.60	71.85
5	160.17	62.30
6	179.29	56.45
7	198.14	49.75
8	216.32	58.08
9	224.19	76.46
10	224.25	96.46
11	225.10	116.44
12	228.04	136.23
13	228.92	140.00

Factor of Safety for the Preceding Surface is Between51.530 and51.524

Factor Of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	92.93	105.00
2	109.60	93.94
3	129.21	90.02
4	147.20	81.28
5	166.65	76.61
6	184.53	67.66
7	200.98	56.29

		Profile.out
8	215.60	42.64
9	234.31	35.58
10	254.14	32.97
11	270.25	44.83
12	288.55	52.89
13	305.48	63.54
14	310.03	83.02
15	310.05	103.02
16	311.66	122.95
17	317.95	140.00

Factor of Safety for the Preceding Surface is Between 82.470 and 82.449

Factor Of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	95.46	105.00
2	110.18	91.46
3	126.79	80.33
4	143.73	69.70
5	161.61	60.72
6	179.70	52.20
7	196.68	41.64
8	210.83	27.50
9	230.17	22.40
10	250.11	20.90
11	269.69	24.96
12	283.84	39.10
13	283.87	59.10
14	290.64	77.92
15	302.29	94.18
16	314.62	109.92
17	320.44	129.06
18	329.00	140.00

Factor of Safety for the Preceding Surface is Between ***** and *****

Factor Of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
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Profile.out

1	96.36	105.00
2	114.61	96.81
3	132.84	88.58
4	149.72	77.86
5	168.47	70.89
6	187.28	64.10
7	206.79	68.51
8	217.91	85.13
9	217.96	105.13
10	220.81	124.93
11	225.60	140.00

Factor of Safety for the Preceding Surface is Between 38.526 and 38.507

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 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	90.51	105.00
2	109.64	99.17
3	129.37	102.41
4	143.14	116.92
5	159.75	128.06
6	178.70	134.46
7	198.27	138.58
8	201.99	140.00

*** 1.955 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	95.76	105.00
2	113.87	96.52
3	133.55	100.09
4	147.16	114.74
5	164.35	124.97
6	183.02	132.15
7	201.80	139.01
8	203.09	140.00

*** 2.031 ***

Profile.out

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	92.42	105.00
2	108.62	93.26
3	128.54	95.01
4	143.73	108.01
5	158.80	121.17
6	177.71	127.68
7	195.27	137.25
8	201.59	140.00

*** 2.068 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	93.74	105.00
2	112.60	98.36
3	132.40	101.20
4	150.46	109.80
5	157.15	128.65
6	173.80	139.73
7	193.67	137.50
8	213.52	139.93
9	214.56	140.00

*** 2.089 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	93.74	105.00
2	112.66	98.53
3	132.27	102.48
4	148.18	114.59
5	164.66	125.94
6	183.61	132.32
7	202.08	139.99
8	202.10	140.00

*** 2.101 ***

Profile.out
Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	97.58	105.00
2	112.00	91.14
3	132.00	91.36
4	148.61	102.49
5	160.63	118.48
6	176.39	130.80
7	194.63	138.99
8	214.63	139.11
9	216.51	140.00

*** 2.116 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	92.12	105.00
2	109.54	95.17
3	129.22	98.74
4	146.02	109.59
5	161.82	121.85
6	178.29	133.19
7	198.28	133.80
8	207.03	140.00

*** 2.117 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	99.60	105.00
2	118.82	99.48
3	138.79	100.60
4	155.69	111.29
5	172.50	122.13
6	189.71	132.31
7	202.30	140.00

*** 2.129 ***

Failure Surface Specified By 8 Coordinate Points

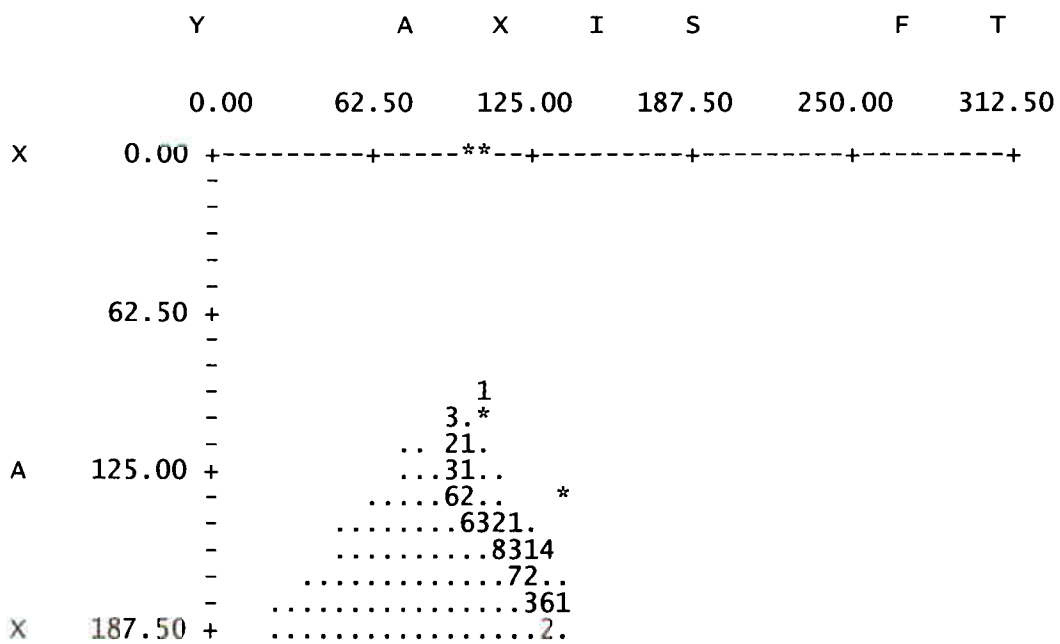
Point No.	X-Surf (ft)	Y-Surf (ft)	Profile.out
1	92.12	105.00	
2	110.08	96.19	
3	130.03	97.59	
4	147.57	107.20	
5	163.42	119.40	
6	180.49	129.81	
7	198.57	138.37	
8	203.18	140.00	

*** 2.141 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	90.51	105.00
2	105.98	92.33
3	125.97	93.00
4	143.47	102.67
5	159.88	114.10
6	177.10	124.28
7	193.44	135.82
8	206.72	140.00

*** 2.166 ***

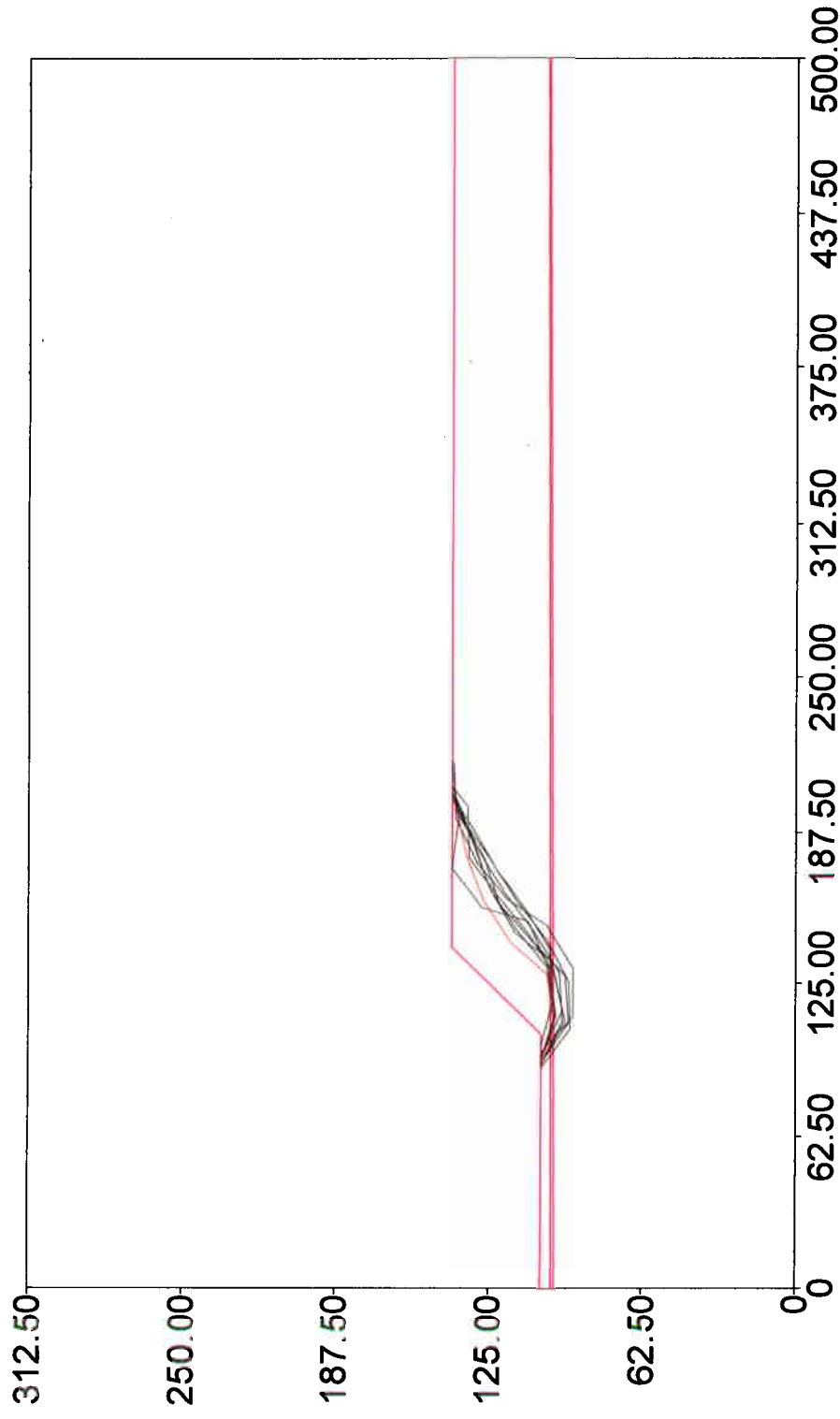


```

                                Profile.out
- .....71
- .....4
- .....4
- .....
I  250.00 + .....
- .....
- .....
- .....
- .....
S  312.50 + .....
- .....
- .....
- .....
- .....
375.00 + .....
- .....
- .....
- .....
- .....
F  437.50 + .....
- .....
- .....
- .....
T  500.00 + .....
                                *W  *

```

Development stability, 5ft of floor rock



Safety Factors

2.02
2.06
2.09
2.14
2.14
2.15
2.17
2.18
2.19

Profile.out
** PCSTABL6 **

by
Purdue University

modified by
Peter J. Bosscher
University of Wisconsin-Madison

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer's Method of Slices

PROBLEM DESCRIPTION Developement strability

BOUNDARY COORDINATES

3 Top Boundaries
5 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	105.00	105.00	105.00	1
2	105.00	105.00	140.00	140.00	1
3	140.00	140.00	500.00	140.00	1
4	0.00	100.00	500.00	102.50	2
5	0.00	99.00	500.00	101.50	3

ISOTROPIC SOIL PARAMETERS

3 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	125.0	125.0	0.0	45.0	0.00	0.0	1
2	125.0	125.0	0.0	18.0	0.00	0.0	1
3	115.0	115.0	0.0	35.0	0.00	0.0	0

Profile.out
Technique For Generating Irregular Surfaces, Has Been Specified.

10000 Trial Surfaces Have Been Generated.

100 Surfaces Initiate From Each Of 100 Points Equally Spaced
Along The Ground Surface Between $X = 90.00$ ft.
and $X = 100.00$ ft.

Each Surface Terminates Between $X = 200.00$ ft.
and $X = 450.00$ ft.

Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is $Y = 10.00$ ft.

20.00 ft. Line Segments Define Each Trial Failure Surface.

Factor Of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	91.01	105.00
2	105.16	90.86
3	121.12	78.81
4	138.89	69.64
5	156.66	60.45
6	174.42	51.26
7	192.19	42.08
8	212.08	40.01
9	231.64	44.17
10	249.87	52.41
11	259.05	70.18
12	259.18	90.18
13	259.24	110.18
14	259.28	130.18
15	259.31	140.00

Factor of Safety for the Preceding Surface is Between***** and*****

Factor Of Safety Calculation Has Gone Through 20 Iterations

Profile.out
The Trial Failure Surface In Question Is Defined
By The Following 13 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	92.73	105.00
2	110.31	95.46
3	126.48	83.70
4	142.60	71.85
5	160.17	62.30
6	179.29	56.45
7	198.14	49.75
8	216.32	58.08
9	224.19	76.46
10	224.25	96.46
11	225.10	116.44
12	228.04	136.23
13	228.92	140.00

Factor of Safety for the Preceding Surface is Between 51.641 and 51.635

Factor Of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	92.93	105.00
2	109.60	93.94
3	129.21	90.02
4	147.20	81.28
5	166.65	76.61
6	184.53	67.66
7	200.98	56.29
8	215.60	42.64
9	234.31	35.58
10	254.14	32.97
11	270.25	44.83
12	288.55	52.89
13	305.48	63.54
14	310.03	83.02
15	310.05	103.02
16	311.66	122.95
17	317.95	140.00

Factor of Safety for the Preceding Surface is Between 83.021 and 83.000

Factor Of Safety Calculation Has Gone Through 20 Iterations

Profile.out

The Trial Failure Surface In Question Is Defined
By The Following 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	95.46	105.00
2	110.18	91.46
3	126.79	80.33
4	143.73	69.70
5	161.61	60.72
6	179.70	52.20
7	196.68	41.64
8	210.83	27.50
9	230.17	22.40
10	250.11	20.90
11	269.69	24.96
12	283.84	39.10
13	283.87	59.10
14	290.64	77.92
15	302.29	94.18
16	314.62	109.92
17	320.44	129.06
18	329.00	140.00

Factor of Safety for the Preceding Surface is Between***** and*****

Factor Of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	96.36	105.00
2	114.61	96.81
3	132.84	88.58
4	149.72	77.86
5	168.47	70.89
6	187.28	64.10
7	206.79	68.51
8	217.91	85.13
9	217.96	105.13
10	220.81	124.93
11	225.60	140.00

Factor of Safety for the Preceding Surface is Between38.959 and38.939

Following Are Displayed The Ten Most Critical Of The Trial

Profile.out

Failure Surfaces Examined. They Are Ordered - Most Critical First.

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

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	90.51	105.00
2	109.64	99.17
3	129.37	102.41
4	143.14	116.92
5	159.75	128.06
6	178.70	134.46
7	198.27	138.58
8	201.99	140.00

*** 2.017 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	95.76	105.00
2	113.87	96.52
3	133.55	100.09
4	147.16	114.74
5	164.35	124.97
6	183.02	132.15
7	201.80	139.01
8	203.09	140.00

*** 2.058 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	92.42	105.00
2	108.62	93.26
3	128.54	95.01
4	143.73	108.01
5	158.80	121.17
6	177.71	127.68
7	195.27	137.25
8	201.59	140.00

*** 2.090 *** Profile.out

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	97.58	105.00
2	112.00	91.14
3	132.00	91.36
4	148.61	102.49
5	160.63	118.48
6	176.39	130.80
7	194.63	138.99
8	214.63	139.11
9	216.51	140.00

*** 2.136 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	93.74	105.00
2	112.60	98.36
3	132.40	101.20
4	150.46	109.80
5	157.15	128.65
6	173.80	139.73
7	193.67	137.50
8	213.52	139.93
9	214.56	140.00

*** 2.139 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	92.12	105.00
2	109.54	95.17
3	129.22	98.74
4	146.02	109.59
5	161.82	121.85
6	178.29	133.19
7	198.28	133.80
8	207.03	140.00

*** 2.142 ***

Profile.out

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	93.74	105.00
2	112.66	98.53
3	132.27	102.48
4	148.18	114.59
5	164.66	125.94
6	183.61	132.32
7	202.08	139.99
8	202.10	140.00

*** 2.149 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	92.12	105.00
2	110.08	96.19
3	130.03	97.59
4	147.57	107.20
5	163.42	119.40
6	180.49	129.81
7	198.57	138.37
8	203.18	140.00

*** 2.167 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	99.60	105.00
2	118.82	99.48
3	138.79	100.60
4	155.69	111.29
5	172.50	122.13
6	189.71	132.31
7	202.30	140.00

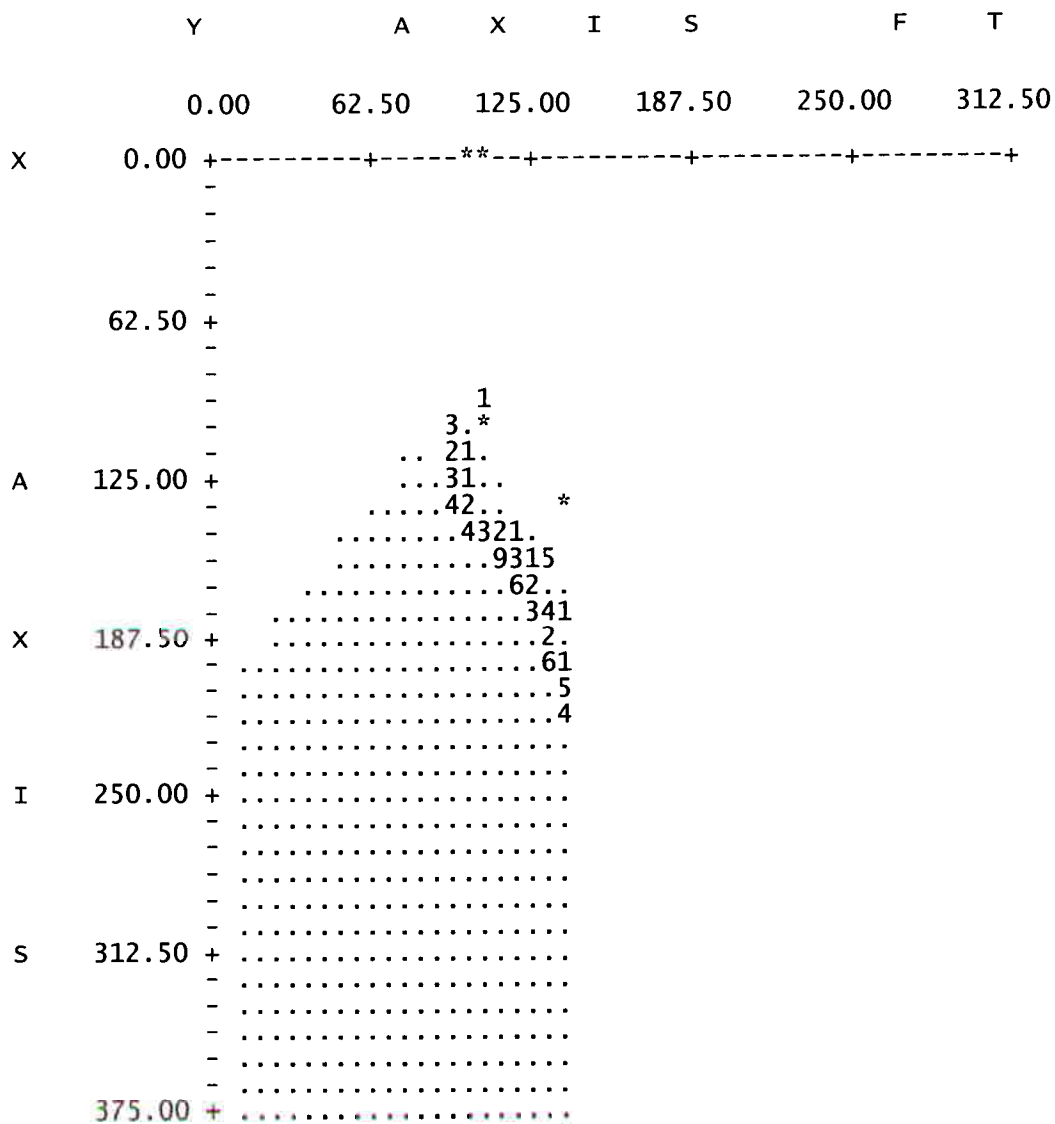
*** 2.178 ***

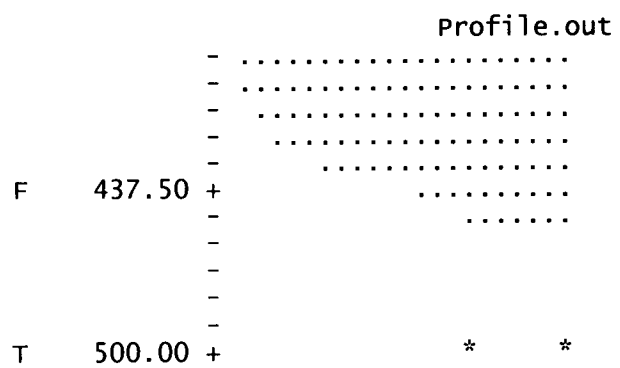
Failure Surface Specified By 8 Coordinate Points
Page 7

Profile.out

Point No.	X-Surf (ft)	Y-Surf (ft)
1	90.51	105.00
2	105.98	92.33
3	125.97	93.00
4	143.47	102.67
5	159.88	114.10
6	177.10	124.28
7	193.44	135.82
8	206.72	140.00

*** 2.187 ***

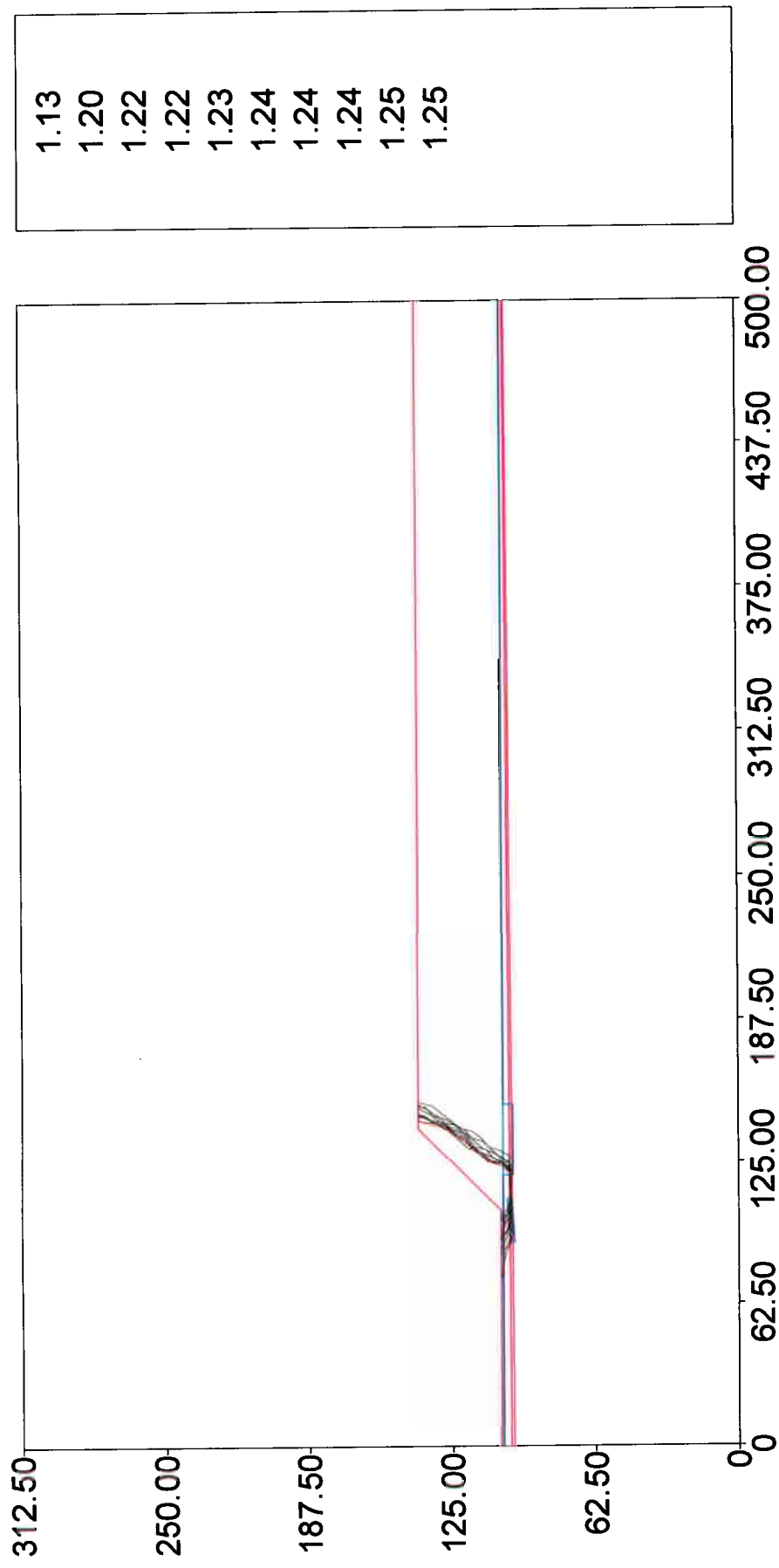




5 ft Block Analysis

Development stability, 5ft of floor rock

Safety Factors



Profile.out
** PCSTABL6 **

by
Purdue University

modified by
Peter J. Bosscher
University of Wisconsin-Madison

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer's Method of Slices

PROBLEM DESCRIPTION Developement strability

BOUNDARY COORDINATES

3 Top Boundaries
5 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	105.00	105.00	105.00	1
2	105.00	105.00	140.00	140.00	1
3	140.00	140.00	500.00	140.00	1
4	0.00	100.00	500.00	102.50	2
5	0.00	99.00	500.00	101.50	3

ISOTROPIC SOIL PARAMETERS

3 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	125.0	125.0	0.0	45.0	0.00	0.0	1
2	125.0	125.0	0.0	18.0	0.00	0.0	1
3	115.0	115.0	0.0	35.0	0.00	0.0	0

1 PIEZOMETRIC SURFACE(S) HAVE BEEN SPECIFIED

Profile.out

Unit Weight of Water = 62.40

Piezometric Surface No. 1 Specified by 2 Coordinate Points

Point No.	X-Water (ft)	Y-Water (ft)
1	0.00	104.00
2	500.00	104.00

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 5.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	90.00	99.00	110.00	100.50	2.00
2	120.00	101.00	150.00	101.50	5.00

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 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	95.60	105.00
2	98.94	102.50
3	103.26	99.98
4	108.24	99.55
5	120.85	99.83
6	123.17	104.25
7	125.32	108.77
8	128.81	112.35
9	131.90	116.28
10	134.24	120.70

		Profile.out
11	137.08	124.81
12	140.01	128.87
13	141.99	133.46
14	142.90	138.38
15	144.27	140.00

*** 1.134 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	90.48	105.00
2	90.60	104.89
3	94.97	102.47
4	99.55	100.45
5	120.77	99.73
6	124.16	103.41
7	126.15	108.00
8	129.35	111.84
9	132.06	116.05
10	135.59	119.59
11	138.70	123.50
12	139.37	128.45
13	142.67	132.21
14	142.90	137.20
15	143.55	140.00

*** 1.200 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	94.03	105.00
2	95.45	103.61
3	100.42	103.08
4	104.34	99.98
5	121.60	99.61
6	124.14	103.91
7	127.60	107.52
8	131.13	111.07
9	132.79	115.78
10	134.36	120.53
11	137.88	124.08
12	140.64	128.25
13	142.68	132.81
14	145.92	136.62
15	146.33	140.00

*** 1.220 ***

Profile.out

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	74.52	105.00
2	75.62	104.54
3	80.56	103.83
4	85.43	102.68
5	89.80	100.24
6	94.76	99.64
7	120.52	100.00
8	123.44	104.06
9	125.77	108.49
10	129.08	112.23
11	132.57	115.81
12	134.64	120.36
13	137.88	124.17
14	141.32	127.79
15	144.83	131.36
16	147.85	135.34
17	150.06	139.83
18	150.13	140.00

*** 1.221 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	99.13	105.00
2	99.31	104.86
3	103.28	101.83
4	107.78	99.65
5	121.70	100.51
6	125.04	104.24
7	125.42	109.22
8	128.50	113.17
9	131.97	116.77
10	135.40	120.40
11	137.67	124.85
12	140.40	129.05
13	143.24	133.16
14	144.77	137.92
15	144.86	140.00

*** 1.225 ***

Failure Surface Specified By 15 Coordinate Points

Point X-Surf Y-Surf

No.	(ft)	Profile.out (ft)
1	87.73	105.00
2	89.26	104.03
3	93.21	100.96
4	98.18	100.39
5	124.00	99.85
6	127.24	103.65
7	130.26	107.64
8	132.18	112.25
9	135.22	116.23
10	138.51	119.99
11	141.75	123.80
12	142.42	128.75
13	143.75	133.57
14	145.58	138.22
15	146.44	140.00

*** 1.235 ***

Failure surface specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	84.34	105.00
2	86.50	103.52
3	90.70	100.81
4	95.66	100.20
5	125.14	100.56
6	127.79	104.80
7	131.28	108.38
8	134.36	112.31
9	135.62	117.15
10	138.71	121.09
11	142.18	124.68
12	144.62	129.05
13	145.70	133.93
14	148.13	138.30
15	148.85	140.00

*** 1.243 ***

Failure surface specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	92.15	105.00
2	93.98	103.31
3	97.93	100.25
4	102.90	99.69
5	123.26	100.52
6	124.68	105.32
7	126.84	109.83

		Profile.out
8	130.28	113.46
9	133.81	117.00
10	137.33	120.55
11	139.78	124.91
12	141.83	129.47
13	145.17	133.19
14	148.71	136.73
15	149.61	140.00

*** 1.245 ***

Failure Surface Specified By 14 Coordinate Points

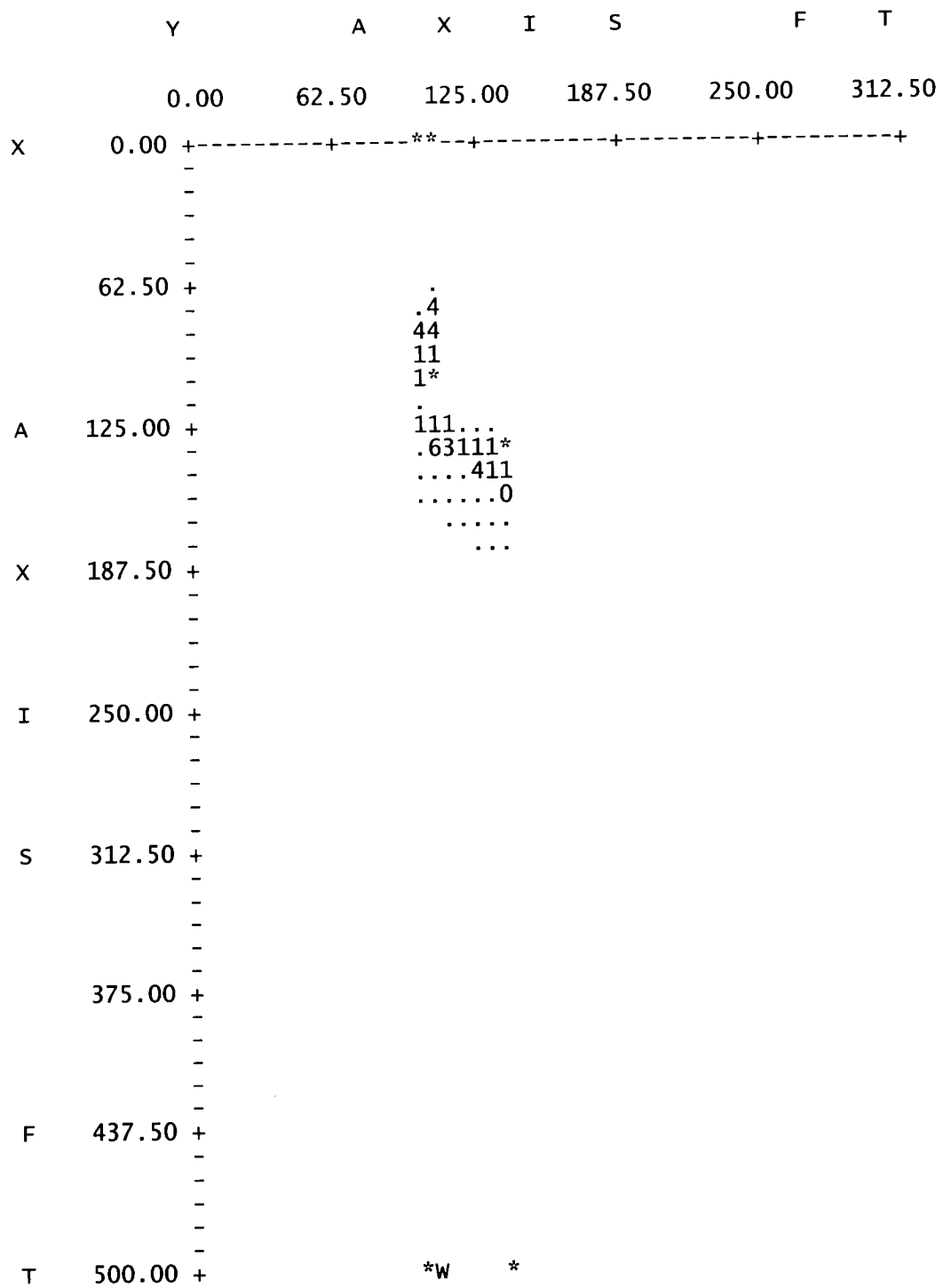
Point No.	X-Surf (ft)	Y-Surf (ft)
1	101.52	105.00
2	104.56	102.78
3	108.54	99.75
4	124.39	100.40
5	126.37	105.00
6	128.49	109.52
7	130.47	114.11
8	131.70	118.96
9	135.07	122.65
10	138.60	126.20
11	140.57	130.79
12	144.03	134.40
13	145.49	139.18
14	145.90	140.00

*** 1.245 ***

Failure Surface Specified By 15 Coordinate Points

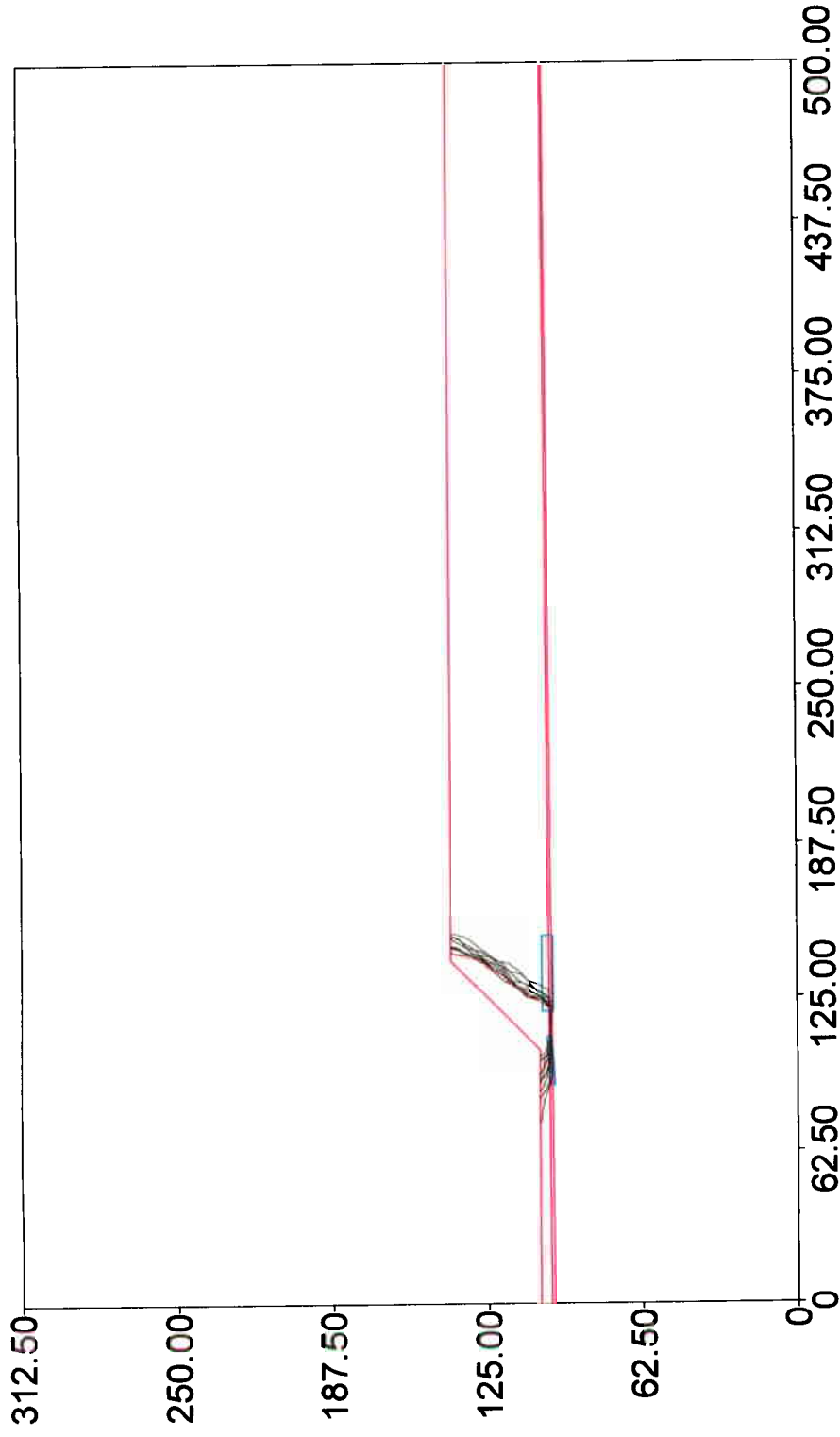
Point No.	X-Surf (ft)	Y-Surf (ft)
1	94.24	105.00
2	95.04	104.68
3	99.55	102.52
4	103.44	99.38
5	128.45	100.46
6	130.90	104.82
7	132.49	109.56
8	135.88	113.23
9	138.72	117.35
10	139.87	122.21
11	143.37	125.79
12	146.31	129.83
13	149.08	133.99
14	150.34	138.83
15	151.50	140.00

*** 1.249 *** Profile.out



Development stability, 5ft of floor rock

Safety Factors



- 1.23
- 1.31
- 1.31
- 1.32
- 1.33
- 1.33
- 1.34
- 1.34
- 1.34
- 1.35

Profile.out
 ** PCSTABL6 **

by
 Purdue University

modified by
 Peter J. Bosscher
 University of Wisconsin-Madison

--Slope Stability Analysis--
 Simplified Janbu, Simplified Bishop
 or Spencer's Method of Slices

PROBLEM DESCRIPTION Developement strability

BOUNDARY COORDINATES

3 Top Boundaries
 5 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	105.00	105.00	105.00	1
2	105.00	105.00	140.00	140.00	1
3	140.00	140.00	500.00	140.00	1
4	0.00	100.00	500.00	102.50	2
5	0.00	99.00	500.00	101.50	3

ISOTROPIC SOIL PARAMETERS

3 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	125.0	125.0	0.0	45.0	0.00	0.0	0
2	125.0	125.0	0.0	18.0	0.00	0.0	0
3	115.0	115.0	0.0	35.0	0.00	0.0	0

A Critical Failure Surface Searching Method, Using A Random

Profile.out
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 5.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	90.00	99.00	110.00	100.50	2.00
2	120.00	101.00	150.00	101.50	5.00

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 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	95.60	105.00
2	98.94	102.50
3	103.26	99.98
4	108.24	99.55
5	120.85	99.83
6	123.17	104.25
7	125.32	108.77
8	128.81	112.35
9	131.90	116.28
10	134.24	120.70
11	137.08	124.81
12	140.01	128.87
13	141.99	133.46
14	142.90	138.38
15	144.27	140.00

*** 1.234 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	90.48	105.00

		Profile.out
2	90.60	104.89
3	94.97	102.47
4	99.55	100.45
5	120.77	99.73
6	124.16	103.41
7	126.15	108.00
8	129.35	111.84
9	132.06	116.05
10	135.59	119.59
11	138.70	123.50
12	139.37	128.45
13	142.67	132.21
14	142.90	137.20
15	143.55	140.00

*** 1.305 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	94.03	105.00
2	95.45	103.61
3	100.42	103.08
4	104.34	99.98
5	121.60	99.61
6	124.14	103.91
7	127.60	107.52
8	131.13	111.07
9	132.79	115.78
10	134.36	120.53
11	137.88	124.08
12	140.64	128.25
13	142.68	132.81
14	145.92	136.62
15	146.33	140.00

*** 1.313 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	99.13	105.00
2	99.31	104.86
3	103.28	101.83
4	107.78	99.65
5	121.70	100.51
6	125.04	104.24
7	125.42	109.22
8	128.50	113.17
9	131.97	116.77
10	135.40	120.40

		Profile.out
11	137.67	124.85
12	140.40	129.05
13	143.24	133.16
14	144.77	137.92
15	144.86	140.00

*** 1.319 ***

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	101.52	105.00
2	104.56	102.78
3	108.54	99.75
4	124.39	100.40
5	126.37	105.00
6	128.49	109.52
7	130.47	114.11
8	131.70	118.96
9	135.07	122.65
10	138.60	126.20
11	140.57	130.79
12	144.03	134.40
13	145.49	139.18
14	145.90	140.00

*** 1.333 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	94.24	105.00
2	95.04	104.68
3	99.55	102.52
4	103.44	99.38
5	128.45	100.46
6	130.90	104.82
7	132.49	109.56
8	135.88	113.23
9	138.72	117.35
10	139.87	122.21
11	143.37	125.79
12	146.31	129.83
13	149.08	133.99
14	150.34	138.83
15	151.50	140.00

*** 1.333 ***

Profile.out

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	74.52	105.00
2	75.62	104.54
3	80.56	103.83
4	85.43	102.68
5	89.80	100.24
6	94.76	99.64
7	120.52	100.00
8	123.44	104.06
9	125.77	108.49
10	129.08	112.23
11	132.57	115.81
12	134.64	120.36
13	137.88	124.17
14	141.32	127.79
15	144.83	131.36
16	147.85	135.34
17	150.06	139.83
18	150.13	140.00

*** 1.340 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	87.73	105.00
2	89.26	104.03
3	93.21	100.96
4	98.18	100.39
5	124.00	99.85
6	127.24	103.65
7	130.26	107.64
8	132.18	112.25
9	135.22	116.23
10	138.51	119.99
11	141.75	123.80
12	142.42	128.75
13	143.75	133.57
14	145.58	138.22
15	146.44	140.00

*** 1.343 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
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Profile.out

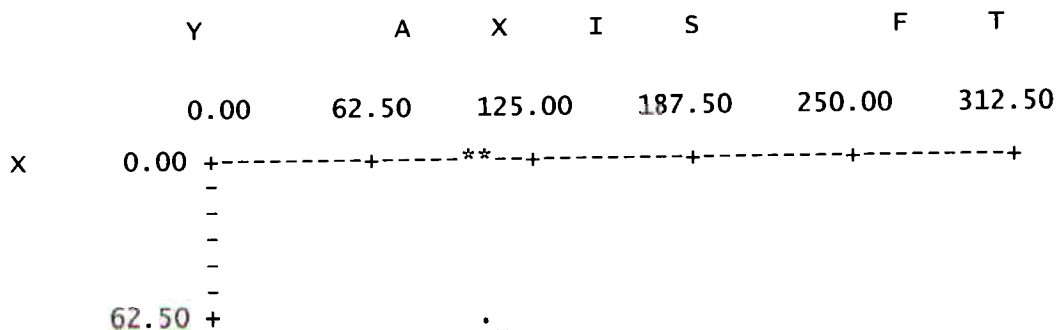
1	92.15	105.00
2	93.98	103.31
3	97.93	100.25
4	102.90	99.69
5	123.26	100.52
6	124.68	105.32
7	126.84	109.83
8	130.28	113.46
9	133.81	117.00
10	137.33	120.55
11	139.78	124.91
12	141.83	129.47
13	145.17	133.19
14	148.71	136.73
15	149.61	140.00

*** 1.344 ***

Failure Surface Specified By 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	84.34	105.00
2	86.50	103.52
3	90.70	100.81
4	95.66	100.20
5	125.14	100.56
6	127.79	104.80
7	131.28	108.38
8	134.36	112.31
9	135.62	117.15
10	138.71	121.09
11	142.18	124.68
12	144.62	129.05
13	145.70	133.93
14	148.13	138.30
15	148.85	140.00

*** 1.346 ***



Profile.out

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S	312.50 +	
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F	437.50 +	
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T	500.00 +	* *

Case 2: Final Build-Out

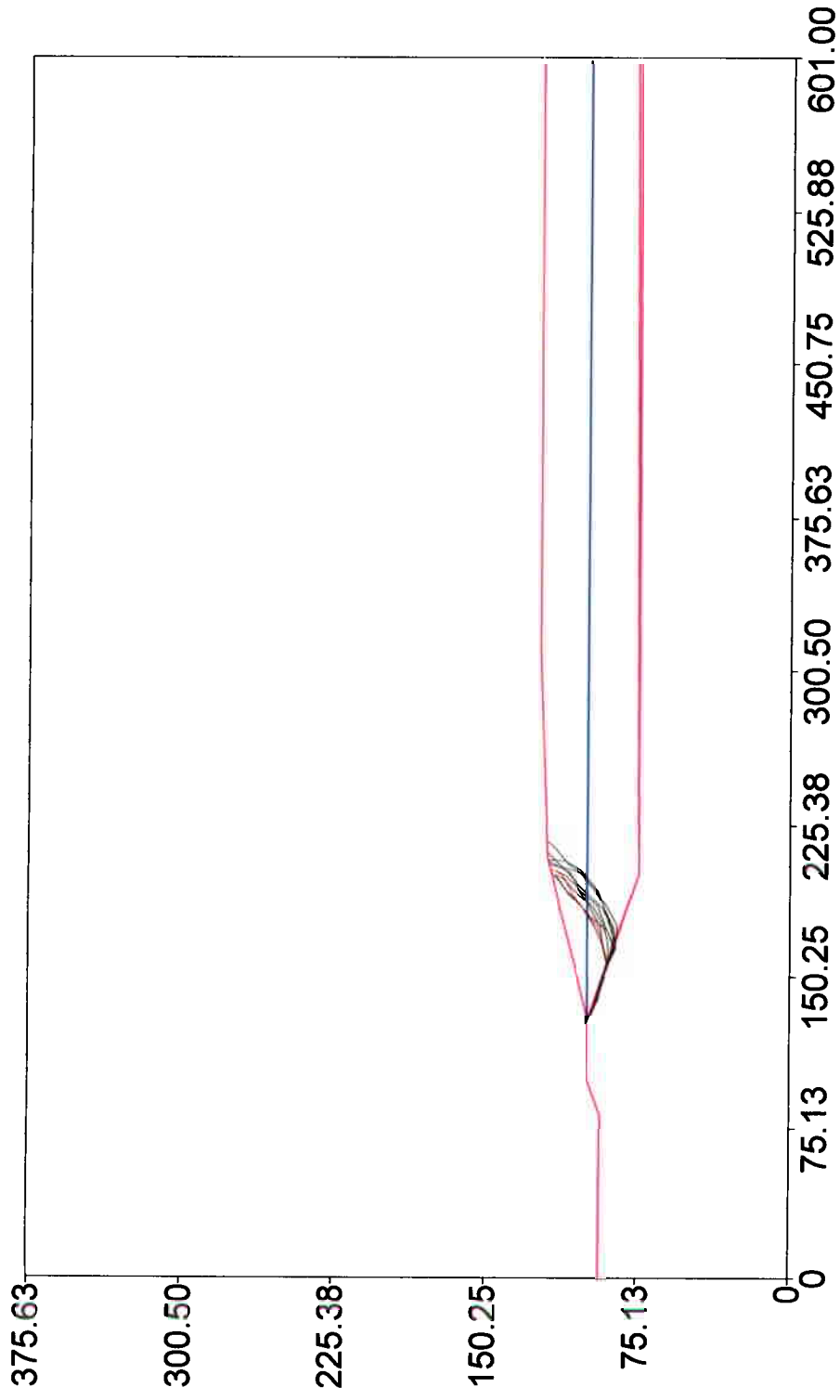
Random FS

Block FS

Random Analysis

Final Build-out

Safety Factors



Profile.out
 ** PCSTABL6 **

by
 Purdue University
 modified by
 Peter J. Bosscher
 University of Wisconsin-Madison

--Slope Stability Analysis--
 Simplified Janbu, Simplified Bishop
 or Spencer's Method of Slices

PROBLEM DESCRIPTION Final Buil-out

BOUNDARY COORDINATES

8 Top Boundaries
 12 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	95.00	82.00	94.00	1
2	82.00	94.00	100.00	100.00	1
3	100.00	100.00	127.00	100.00	1
4	127.00	100.00	130.00	100.00	2
5	130.00	100.00	211.00	120.00	3
6	211.00	120.00	271.00	123.00	3
7	271.00	123.00	311.00	125.00	3
8	311.00	125.00	601.00	125.00	3
9	130.00	100.00	201.00	76.00	2
10	201.00	76.00	601.00	78.00	2
11	127.00	100.00	201.00	75.00	1
12	201.00	75.00	601.00	77.00	1

ISOTROPIC SOIL PARAMETERS

3 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.
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			Profile.out				
1	115.0	115.0	0.0	35.0	0.00	0.0	0
2	125.0	125.0	0.0	18.0	0.00	0.0	1
3	125.0	125.0	0.0	45.0	0.00	0.0	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	127.00	100.00
2	600.00	100.00

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

10000 Trial Surfaces Have Been Generated.

100 Surfaces Initiate From Each of 100 Points Equally Spaced Along The Ground Surface Between X = 127.00 ft. and X = 130.00 ft.

Each Surface Terminates Between X = 200.00 ft. and X = 250.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 10.00 ft.

10.00 ft. Line Segments Define Each Trial Failure Surface.

Factor of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined By The Following 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	127.61	100.00

		Profile.out
2	134.74	92.99
3	141.85	85.96
4	149.37	79.37
5	156.90	72.79
6	164.97	66.88
7	174.92	65.90
8	184.78	67.55
9	194.62	69.34
10	201.81	76.29
11	202.64	86.26
12	202.69	96.26
13	202.70	106.26
14	202.73	116.26
15	202.73	117.96

Factor of Safety for the Preceding Surface is Between 20.731 and 20.723

Factor Of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 12 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	129.97	100.00
2	137.04	92.93
3	146.24	89.01
4	155.67	85.67
5	165.14	82.47
6	175.06	81.19
7	185.00	80.05
8	194.97	80.80
9	201.77	88.12
10	201.81	98.12
11	201.96	108.12
12	202.12	117.81

Factor of Safety for the Preceding Surface is Between 18.551 and 18.537

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 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
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		Profile.out
1	129.06	100.00
2	138.63	97.11
3	147.87	93.27
4	157.26	89.83
5	166.90	92.48
6	176.15	96.27
7	184.14	102.28
8	192.33	108.03
9	200.59	113.66
10	204.25	118.33

*** 3.054 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	129.46	100.00
2	138.62	96.00
3	148.29	93.44
4	157.88	90.63
5	167.54	93.22
6	176.32	98.00
7	184.86	103.21
8	192.68	109.45
9	199.73	116.53
10	200.19	117.33

*** 3.113 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	129.24	100.00
2	138.61	96.49
3	148.06	93.21
4	157.57	90.14
5	167.57	90.23
6	177.25	92.75
7	185.31	98.67
8	192.39	105.73
9	199.07	113.17
10	201.57	117.67

*** 3.194 ***

Failure Surface Specified By 12 Coordinate Points

Point No.	X-Surf (ft)	Profile.out Y-Surf
		(ft)
1	128.94	100.00
2	138.40	96.75
3	147.83	93.44
4	157.33	90.32
5	166.88	87.34
6	176.81	86.18
7	185.74	90.68
8	193.64	96.81
9	201.48	103.02
10	208.42	110.22
11	215.28	117.49
12	217.58	120.33

*** 3.208 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	129.18	100.00
2	138.73	97.04
3	148.15	93.67
4	157.39	89.84
5	167.32	88.65
6	176.96	91.31
7	185.52	96.47
8	193.30	102.75
9	199.73	110.42
10	203.94	118.26

*** 3.228 ***

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	128.03	100.00
2	137.73	97.56
3	147.10	94.08
4	156.60	90.94
5	166.04	87.66
6	176.02	88.28
7	184.90	92.88
8	192.03	99.89
9	198.21	107.75
10	205.98	114.05
11	213.27	120.11

*** 3.251 ***

Profile.out

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	128.18	100.00
2	137.69	96.92
3	147.15	93.65
4	156.43	89.92
5	166.15	92.24
6	175.80	94.87
7	184.72	99.39
8	193.40	104.36
9	202.22	109.08
10	207.71	117.43
11	208.81	119.46

*** 3.287 ***

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	129.03	100.00
2	138.52	96.83
3	147.95	93.53
4	157.42	90.30
5	166.83	86.93
6	176.46	89.64
7	186.01	92.61
8	194.97	97.05
9	203.14	102.82
10	208.56	111.22
11	209.30	119.58

*** 3.303 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	127.00	100.00
2	136.52	96.94
3	146.28	94.77
4	155.63	91.21
5	164.88	87.41
6	174.15	91.15
7	180.55	98.84
8	187.52	106.01

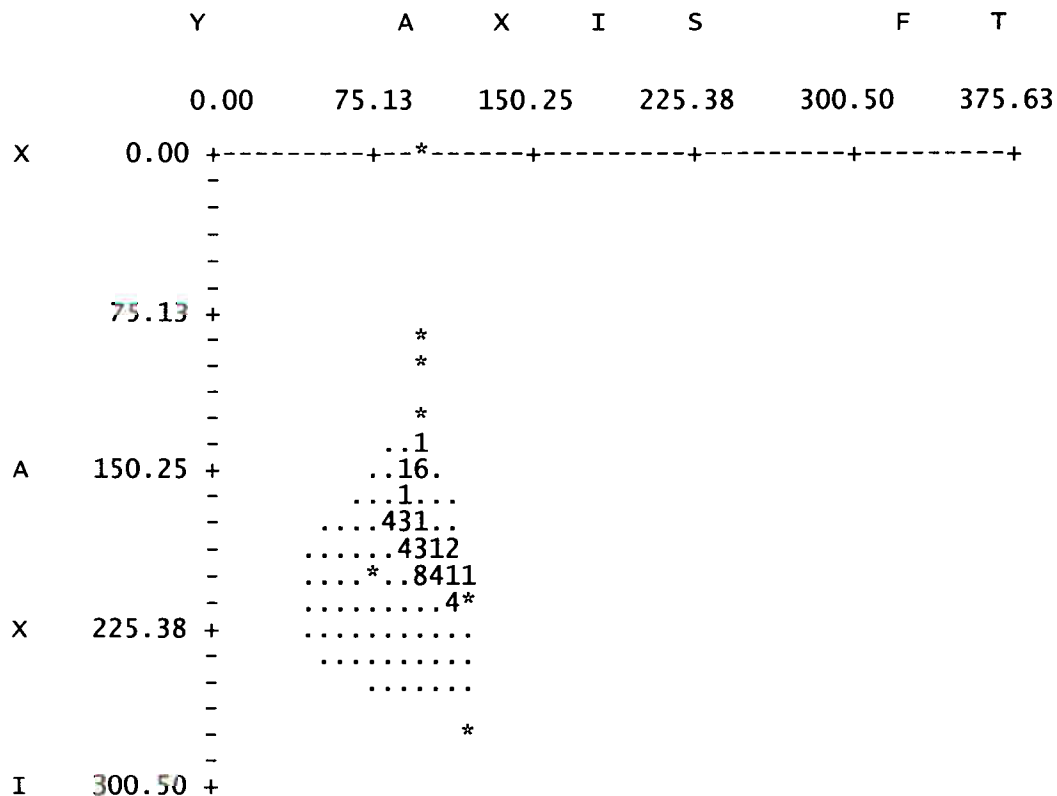
Profile.out
 9 195.37 112.21
 10 200.23 117.34

*** 3.305 ***

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	127.39	100.00
2	136.86	96.78
3	146.31	93.51
4	155.88	90.59
5	165.26	87.13
6	175.23	87.83
7	184.38	91.86
8	193.75	95.37
9	201.25	101.98
10	204.69	111.37
11	207.63	119.17

*** 3.311 ***



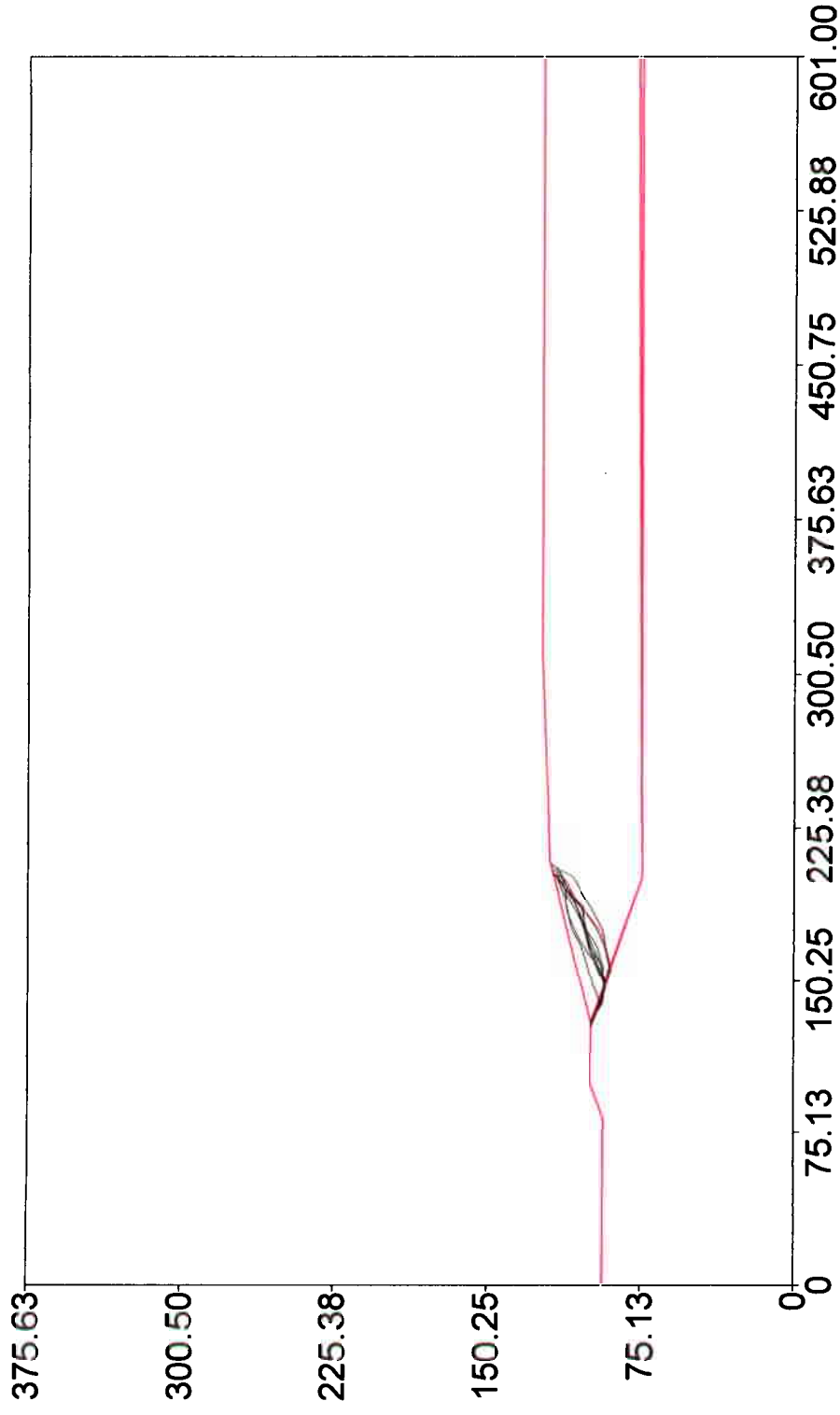
Profile.out

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450.75 +
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F    525.88 +
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T    601.00 +      *  W  *
```

Final Build-out

Safety Factors



3.64
3.69
3.72
3.76
3.77
3.80
3.80
3.82
3.82
3.83

TDRSAFianl_buildoutRandom.out.txt
 ** PCSTABL6 **

by
 Purdue University

modified by
 Peter J. Bosscher
 University of Wisconsin-Madison

--Slope Stability Analysis--
 Simplified Janbu, Simplified Bishop
 or Spencer's Method of Slices

PROBLEM DESCRIPTION Final Buil-out

BOUNDARY COORDINATES

8 Top Boundaries
 12 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	95.00	82.00	94.00	1
2	82.00	94.00	100.00	100.00	1
3	100.00	100.00	127.00	100.00	1
4	127.00	100.00	130.00	100.00	2
5	130.00	100.00	211.00	120.00	3
6	211.00	120.00	271.00	123.00	3
7	271.00	123.00	311.00	125.00	3
8	311.00	125.00	601.00	125.00	3
9	130.00	100.00	201.00	76.00	2
10	201.00	76.00	601.00	78.00	2
11	127.00	100.00	201.00	75.00	1
12	201.00	75.00	601.00	77.00	1

ISOTROPIC SOIL PARAMETERS

3 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.
---------------	----------------------	--------------------------	--------------------------	----------------------	----------------------	-------------------------	-------------------

				TDRSAFianl_buildoutRandom.out.txt			
1	115.0	115.0	0.0	35.0	0.00	0.0	0
2	125.0	125.0	0.0	18.0	0.00	0.0	1
3	125.0	125.0	0.0	45.0	0.00	0.0	1

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

10000 Trial Surfaces Have Been Generated.

100 Surfaces Initiate From Each Of 100 Points Equally Spaced
Along The Ground Surface Between X = 127.00 ft.
and X = 130.00 ft.

Each Surface Terminates Between X = 200.00 ft.
and X = 250.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 10.00 ft.

10.00 ft. Line Segments Define Each Trial Failure Surface.

Factor Of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	127.61	100.00
2	134.74	92.99
3	141.85	85.96
4	149.37	79.37
5	156.90	72.79
6	164.97	66.88
7	174.92	65.90
8	184.78	67.55
9	194.62	69.34
10	201.81	76.29
11	202.64	86.26
12	202.69	96.26
13	202.70	106.26
14	202.73	116.26
15	202.73	117.96

Factor of Safety for the Preceding Surface is Between 30.425 and 30.402

Factor Of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	128.24	100.00
2	135.33	92.94
3	144.20	88.32
4	152.77	83.18
5	161.81	78.90
6	171.78	78.19
7	181.78	78.36
8	191.76	79.03
9	201.44	81.52
10	207.79	89.25
11	207.83	99.25
12	207.88	109.25
13	208.23	119.25
14	208.23	119.32

Factor of Safety for the Preceding Surface is Between 16.748 and 16.740

Factor Of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 15 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	129.85	100.00
2	137.73	93.85
3	147.47	91.59
4	156.31	86.92
5	164.82	81.66
6	172.25	74.97
7	181.24	70.59
8	190.90	67.98
9	200.24	71.55
10	205.27	80.19
11	205.30	90.19
12	205.71	100.18
13	206.59	110.14
14	213.08	117.75
15	214.78	120.19

TDRSAFianl_buildoutRandom.out.txt
Factor of Safety for the Preceding Surface is Between 27.651 and 27.646

Factor of Safety Calculation Has Gone Through 20 Iterations

The Trial Failure Surface In Question Is Defined
By The Following 12 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	129.97	100.00
2	137.04	92.93
3	146.24	89.01
4	155.67	85.67
5	165.14	82.47
6	175.06	81.19
7	185.00	80.05
8	194.97	80.80
9	201.77	88.12
10	201.81	98.12
11	201.96	108.12
12	202.12	117.81

Factor of Safety for the Preceding Surface is Between 26.020 and 25.993

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 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	129.06	100.00
2	138.63	97.11
3	147.87	93.27
4	157.26	89.83
5	166.90	92.48
6	176.15	96.27
7	184.14	102.28
8	192.33	108.03
9	200.59	113.66
10	204.25	118.33

*** 3.637 ***

TDRSAFianl_buildoutRandom.out.txt
 Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	129.46	100.00
2	138.62	96.00
3	148.29	93.44
4	157.88	90.63
5	167.54	93.22
6	176.32	98.00
7	184.86	103.21
8	192.68	109.45
9	199.73	116.53
10	200.19	117.33

*** 3.695 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	128.46	100.00
2	137.97	96.91
3	147.24	93.17
4	156.54	96.83
5	165.92	100.31
6	175.27	103.86
7	184.92	106.46
8	194.50	109.35
9	202.21	115.72
10	202.98	118.02

*** 3.719 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	130.00	100.00
2	139.17	96.02
3	148.76	93.17
4	158.49	95.45
5	167.17	100.42
6	177.03	102.09
7	186.62	104.91
8	194.93	110.49
9	203.45	115.72
10	205.67	118.68

*** 3.757 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	130.00	100.00
2	138.95	95.54
3	148.74	93.48
4	158.10	96.99
5	167.66	99.92
6	176.95	103.61
7	185.96	107.95
8	194.93	112.37
9	204.24	116.03
10	209.97	119.75

*** 3.768 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	129.55	100.00
2	139.01	96.77
3	148.43	93.40
4	158.16	95.71
5	167.53	99.19
6	176.95	102.57
7	186.72	104.66
8	194.21	111.29
9	202.37	117.07
10	203.08	118.04

*** 3.801 ***

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	128.18	100.00
2	137.69	96.92
3	147.15	93.65
4	156.43	89.92
5	166.15	92.24
6	175.80	94.87
7	184.72	99.39
8	193.40	104.36
9	202.22	109.08
10	207.71	117.43

11 TDRSAFianl_buildoutRandom.out.txt
 208.81 119.46
 *** 3.801 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	127.21	100.00
2	136.62	96.60
3	146.25	93.90
4	156.08	95.70
5	164.40	101.25
6	172.82	106.65
7	182.03	110.53
8	191.78	112.78
9	200.71	117.26
10	200.97	117.52

*** 3.815 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	128.94	100.00
2	138.30	96.48
3	147.93	93.77
4	157.92	94.18
5	167.40	97.36
6	176.27	101.97
7	185.19	106.50
8	194.28	110.66
9	202.77	115.95
10	203.36	118.11

*** 3.821 ***

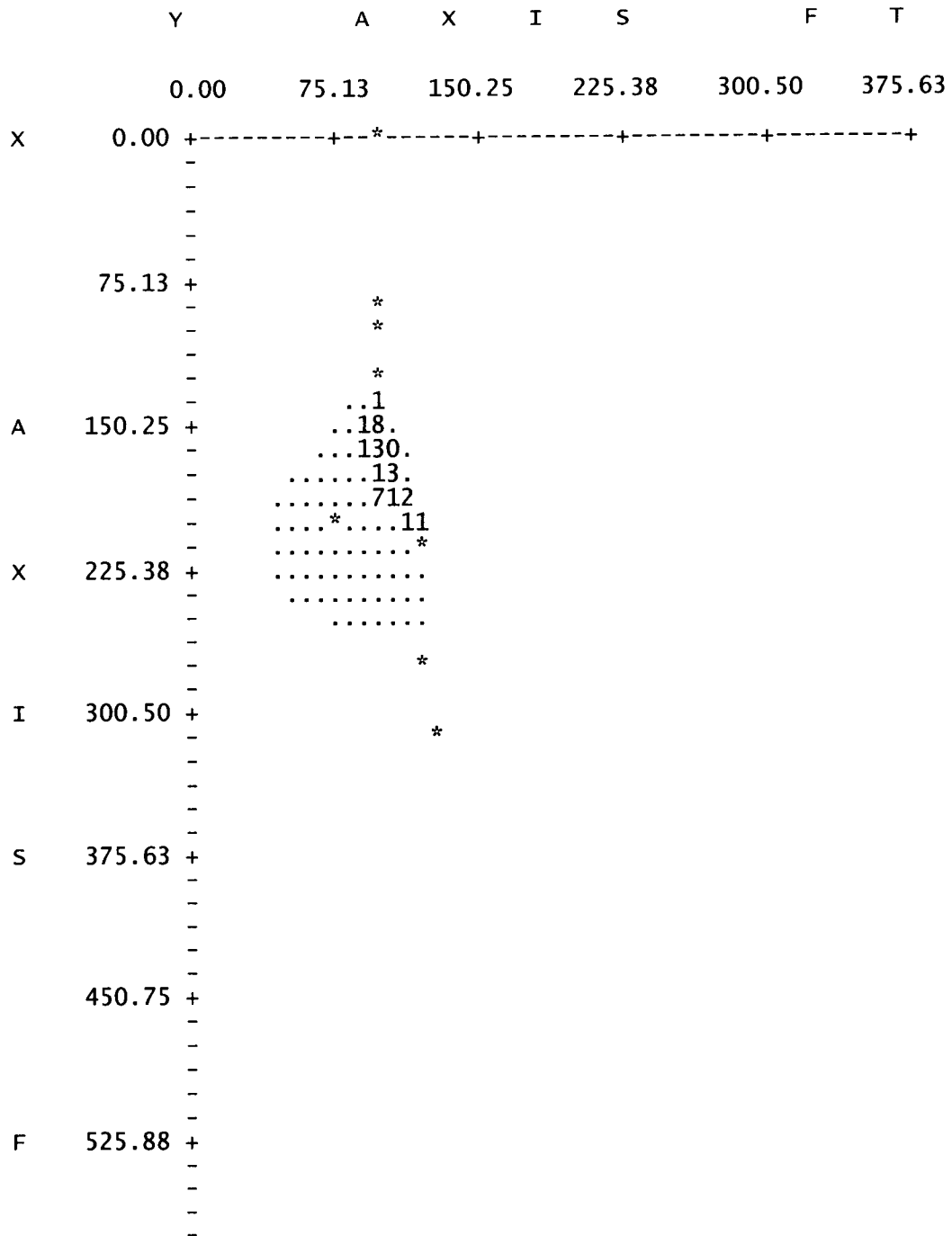
Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	129.15	100.00
2	138.52	96.51
3	148.20	99.05
4	157.85	101.65
5	167.32	104.88
6	176.49	108.86

TDRSAFianl_buildoutRandom.out.txt

7	186.02	111.89
8	195.87	113.59
9	204.51	118.40

*** 3.833 ***



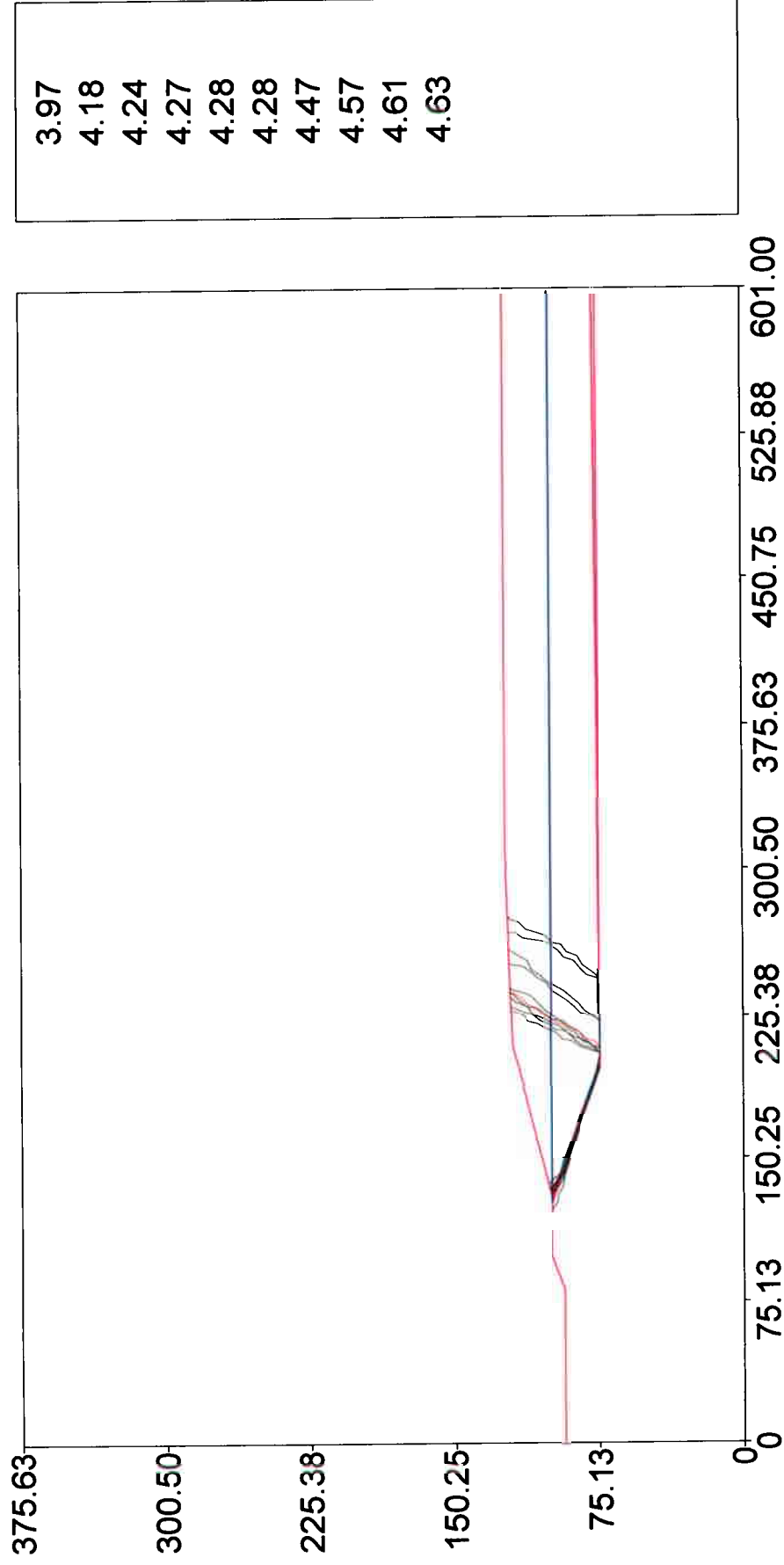
TDRSAFianl_buildoutRandom.out.txt

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Block Analysis

Safety Factors

Final Build-out



TDSAFinal_Buildoutwater.out.txt
** PCSTABL6 **

by
Purdue University

modified by
Peter J. Bosscher
University of Wisconsin-Madison

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer's Method of Slices

PROBLEM DESCRIPTION Final Buil-out

BOUNDARY COORDINATES

8 Top Boundaries
12 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	95.00	82.00	94.00	1
2	82.00	94.00	100.00	100.00	1
3	100.00	100.00	127.00	100.00	1
4	127.00	100.00	130.00	100.00	2
5	130.00	100.00	211.00	120.00	3
6	211.00	120.00	271.00	123.00	3
7	271.00	123.00	311.00	125.00	3
8	311.00	125.00	601.00	125.00	3
9	130.00	100.00	201.00	76.00	2
10	201.00	76.00	601.00	78.00	2
11	127.00	100.00	201.00	75.00	1
12	201.00	75.00	601.00	77.00	1

ISOTROPIC SOIL PARAMETERS

3 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.
---------------------	----------------------------	--------------------------------	--------------------------------	----------------------------	----------------------------	-------------------------------	-------------------------

			TDSAFinal_Buildoutwater.out.txt				
1	115.0	115.0	0.0	35.0	0.00	0.0	0
2	125.0	125.0	0.0	18.0	0.00	0.0	1
3	125.0	125.0	0.0	45.0	0.00	0.0	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	127.00	100.00
2	600.00	100.00

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

100 Trial Surfaces Have Been Generated.

3 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 5.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	140.00	96.00	150.00	93.00	2.00
2	180.00	82.00	201.00	75.50	1.00
3	205.00	75.60	250.00	75.75	1.00

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 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	132.27	100.56
2	135.00	99.08

Page 2

TDSAFinal_Buildoutwater.out.txt

3	139.79	97.65
4	144.14	95.18
5	199.17	75.72
6	209.75	75.14
7	213.22	78.74
8	214.84	83.47
9	217.91	87.42
10	220.56	91.66
11	221.65	96.54
12	224.85	100.38
13	227.16	104.82
14	230.50	108.54
15	232.64	113.05
16	235.57	117.11
17	238.29	121.30
18	238.30	121.36

*** 3.974 ***

Failure Surface Specified By 21 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	124.08	100.00
2	126.70	98.31
3	131.64	97.51
4	136.13	95.31
5	141.00	94.17
6	145.92	93.32
7	200.47	76.13
8	222.21	75.60
9	225.68	79.19
10	229.17	82.77
11	232.70	86.32
12	236.23	89.86
13	239.24	93.85
14	241.46	98.33
15	243.58	102.86
16	246.87	106.62
17	250.40	110.16
18	253.85	113.78
19	257.03	117.63
20	258.94	122.26
21	259.03	122.40

*** 4.177 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	134.94	101.22
2	135.25	101.02

TDSAFinal_Buildoutwater.out.txt

3	139.29	98.08
4	142.94	94.66
5	199.95	76.01
6	246.27	76.09
7	249.77	79.66
8	252.77	83.66
9	256.09	87.40
10	258.77	91.62
11	261.97	95.46
12	264.01	100.03
13	267.54	103.57
14	269.30	108.25
15	270.75	113.03
16	273.36	117.30
17	275.15	121.97
18	276.42	123.27

*** 4.243 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	132.74	100.68
2	135.89	97.54
3	140.18	94.97
4	200.06	76.13
5	207.17	75.31
6	210.30	79.20
7	213.81	82.76
8	216.95	86.65
9	219.94	90.66
10	223.00	94.61
11	223.78	99.55
12	226.95	103.42
13	229.68	107.61
14	231.26	112.35
15	233.90	116.60
16	237.25	120.31
17	237.63	121.33

*** 4.272 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	137.10	101.75
2	140.08	98.83
3	143.67	95.34
4	190.77	78.61
5	207.58	75.71
6	211.07	79.29

TDSAFinal_Buildoutwater.out.txt

7	213.00	83.90
8	216.26	87.69
9	219.73	91.29
10	222.47	95.48
11	225.87	99.14
12	229.32	102.76
13	232.35	106.74
14	235.89	110.27
15	237.20	115.10
16	239.16	119.70
17	240.32	121.47

*** 4.280 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	130.86	100.21
2	131.31	99.87
3	136.30	99.53
4	140.41	96.68
5	200.42	75.44
6	223.31	75.23
7	226.22	79.30
8	227.56	84.11
9	230.97	87.77
10	234.29	91.51
11	235.74	96.29
12	239.26	99.84
13	242.71	103.46
14	245.85	107.35
15	249.15	111.11
16	251.55	115.49
17	252.48	120.41
18	253.32	122.12

*** 4.281 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	134.75	101.17
2	137.76	98.36
3	142.44	96.58
4	146.84	94.21
5	198.96	75.68
6	206.65	76.06
7	208.79	80.57
8	210.39	85.31
9	213.35	89.34
10	213.81	94.32

TDSAFinal_Buildoutwater.out.txt

11	216.86	98.28
12	219.29	102.65
13	221.57	107.10
14	223.48	111.72
15	226.87	115.39
16	228.80	120.01
17	229.40	120.92

*** 4.467 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	132.40	100.59
2	134.21	100.20
3	137.96	96.89
4	142.72	95.39
5	200.29	75.56
6	245.74	76.12
7	247.00	80.95
8	250.18	84.81
9	253.70	88.36
10	255.42	93.06
11	258.81	96.73
12	261.99	100.59
13	264.54	104.90
14	265.49	109.81
15	266.07	114.77
16	268.70	119.03
17	268.79	122.89

*** 4.574 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	135.02	101.24
2	135.22	101.11
3	138.96	97.80
4	143.07	94.95
5	188.05	79.87
6	206.67	75.96
7	209.84	79.83
8	211.03	84.68
9	214.34	88.43
10	217.62	92.21
11	220.24	96.46
12	222.32	101.01
13	224.95	105.26
14	227.61	109.50
15	231.07	113.11

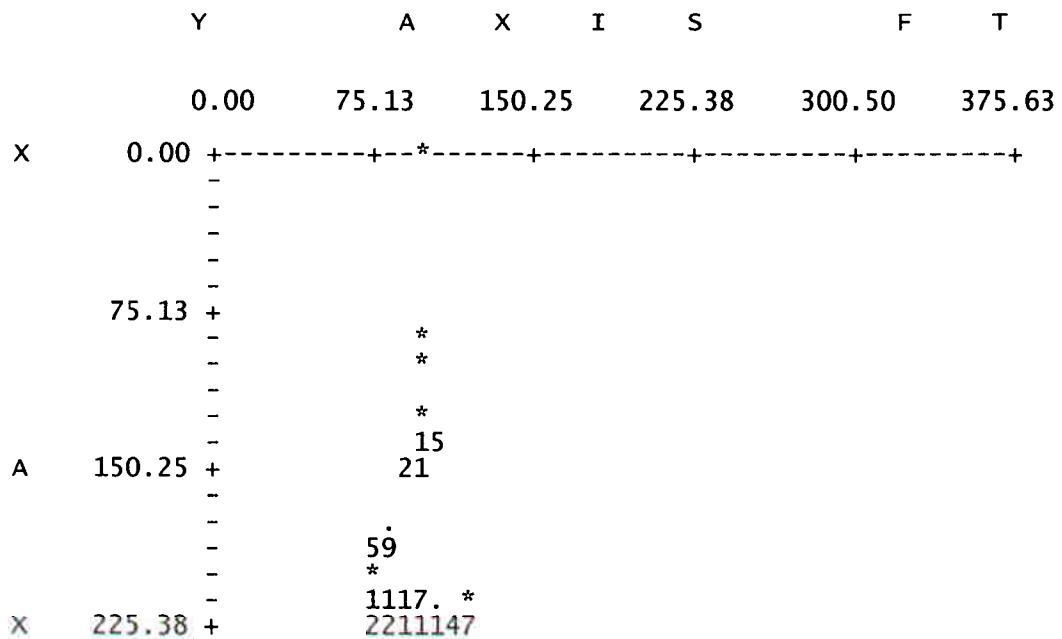
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 16 233.31 117.58
 17 235.40 121.22

*** 4.609 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	132.49	100.62
2	134.80	98.46
3	139.80	98.32
4	143.42	94.87
5	198.64	76.21
6	209.69	75.28
7	211.46	79.95
8	214.39	84.00
9	215.49	88.88
10	218.08	93.16
11	218.41	98.15
12	221.42	102.14
13	224.10	106.37
14	227.53	110.01
15	228.60	114.89
16	230.87	119.34
17	231.72	121.04

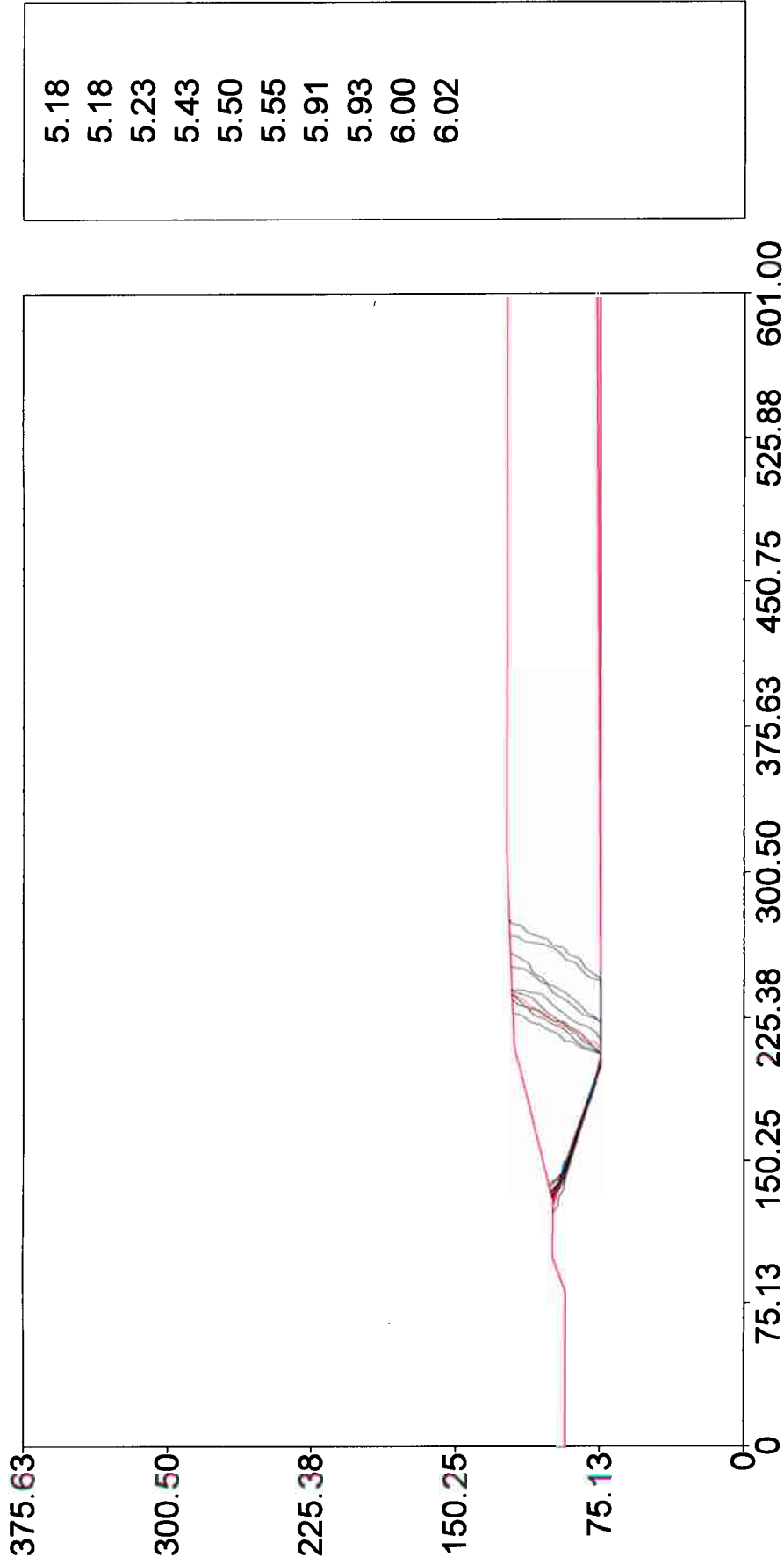
*** 4.629 ***



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T	601.00	+	* W *

Final Build-out

Safety Factors



TDRSAFinal_Buildout1.out.txt
** PCSTABL6 **

by
Purdue University

modified by
Peter J. Bosscher
University of Wisconsin-Madison

--Slope Stability Analysis--
Simplified Janbu, Simplified Bishop
or Spencer's Method of Slices

PROBLEM DESCRIPTION Final Buil-out

BOUNDARY COORDINATES

8 Top Boundaries
12 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	95.00	82.00	94.00	1
2	82.00	94.00	100.00	100.00	1
3	100.00	100.00	127.00	100.00	1
4	127.00	100.00	130.00	100.00	2
5	130.00	100.00	211.00	120.00	3
6	211.00	120.00	271.00	123.00	3
7	271.00	123.00	311.00	125.00	3
8	311.00	125.00	601.00	125.00	3
9	130.00	100.00	201.00	76.00	2
10	201.00	76.00	601.00	78.00	2
11	127.00	100.00	201.00	75.00	1
12	201.00	75.00	601.00	77.00	1

ISOTROPIC SOIL PARAMETERS

3 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.
---------------------	----------------------------	--------------------------------	--------------------------------	----------------------------	----------------------------	-------------------------------	-------------------------

TDRSAFinal_Buildout1.out.txt							
1	115.0	115.0	0.0	35.0	0.00	0.0	0
2	125.0	125.0	0.0	18.0	0.00	0.0	0
3	125.0	125.0	0.0	45.0	0.00	0.0	0

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

100 Trial Surfaces Have Been Generated.

3 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 5.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	140.00	96.00	150.00	93.00	2.00
2	180.00	82.00	201.00	75.50	1.00
3	205.00	75.60	250.00	75.75	1.00

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 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	132.27	100.56
2	135.00	99.08
3	139.79	97.65
4	144.14	95.18
5	199.17	75.72
6	209.75	75.14
7	213.22	78.74
8	214.84	83.47
9	217.91	87.42
10	220.56	91.66
11	221.65	96.54
12	224.85	100.38
13	227.16	104.82
14	230.50	108.54
15	232.64	113.05
16	235.57	117.11
17	238.29	121.30
18	238.30	121.36

TDRSAFinal_Buildout1.out.txt
 *** 5.179 ***

Failure Surface Specified By 21 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	124.08	100.00
2	126.70	98.31
3	131.64	97.51
4	136.13	95.31
5	141.00	94.17
6	145.92	93.32
7	200.47	76.13
8	222.21	75.60
9	225.68	79.19
10	229.17	82.77
11	232.70	86.32
12	236.23	89.86
13	239.24	93.85
14	241.46	98.33
15	243.58	102.86
16	246.87	106.62
17	250.40	110.16
18	253.85	113.78
19	257.03	117.63
20	258.94	122.26
21	259.03	122.40

*** 5.183 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	132.74	100.68
2	135.89	97.54
3	140.18	94.97
4	200.06	76.13
5	207.17	75.31
6	210.30	79.20
7	213.81	82.76
8	216.95	86.65
9	219.94	90.66
10	223.00	94.61
11	223.78	99.55
12	226.95	103.42
13	229.68	107.61
14	231.26	112.35
15	233.90	116.60
16	237.25	120.31
17	237.63	121.33

*** 5.234 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	134.94	101.22
2	135.25	101.02
3	139.29	98.08
4	142.94	94.66
5	199.95	76.01
6	246.27	76.09
7	249.77	79.66
8	252.77	83.66
9	256.09	87.40
10	258.77	91.62
11	261.97	95.46
12	264.01	100.03
13	267.54	103.57
14	269.30	108.25
15	270.75	113.03
16	273.36	117.30
17	275.15	121.97
18	276.42	123.27

*** 5.426 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	137.10	101.75
2	140.08	98.83
3	143.67	95.34
4	190.77	78.61
5	207.58	75.71
6	211.07	79.29
7	213.00	83.90
8	216.26	87.69
9	219.73	91.29
10	222.47	95.48
11	225.87	99.14
12	229.32	102.76
13	232.35	106.74
14	235.89	110.27
15	237.20	115.10
16	239.16	119.70
17	240.32	121.47

*** 5.503 ***

Failure Surface Specified By 18 Coordinate Points

TDRSAFinal_Buildout1.out.txt

Point No.	X-Surf (ft)	Y-Surf (ft)
1	130.86	100.21
2	131.31	99.87
3	136.30	99.53
4	140.41	96.68
5	200.42	75.44
6	223.31	75.23
7	226.22	79.30
8	227.56	84.11
9	230.97	87.77
10	234.29	91.51
11	235.74	96.29
12	239.26	99.84
13	242.71	103.46
14	245.85	107.35
15	249.15	111.11
16	251.55	115.49
17	252.48	120.41
18	253.32	122.12

*** 5.554 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	134.75	101.17
2	137.76	98.36
3	142.44	96.58
4	146.84	94.21
5	198.96	75.68
6	206.65	76.06
7	208.79	80.57
8	210.39	85.31
9	213.35	89.34
10	213.81	94.32
11	216.86	98.28
12	219.29	102.65
13	221.57	107.10
14	223.48	111.72
15	226.87	115.39
16	228.80	120.01
17	229.40	120.92

*** 5.906 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
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TDRSAFinal_Buildout1.out.txt

1	132.40	100.59
2	134.21	100.20
3	137.96	96.89
4	142.72	95.39
5	200.29	75.56
6	245.74	76.12
7	247.00	80.95
8	250.18	84.81
9	253.70	88.36
10	255.42	93.06
11	258.81	96.73
12	261.99	100.59
13	264.54	104.90
14	265.49	109.81
15	266.07	114.77
16	268.70	119.03
17	268.79	122.89

*** 5.932 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	138.14	102.01
2	141.42	98.88
3	145.00	95.39
4	199.60	75.62
5	214.12	75.66
6	217.61	79.23
7	221.05	82.87
8	222.54	87.64
9	225.96	91.29
10	228.85	95.37
11	232.37	98.91
12	235.37	102.92
13	238.46	106.84
14	238.79	111.83
15	240.15	116.64
16	240.46	121.47

*** 6.000 ***

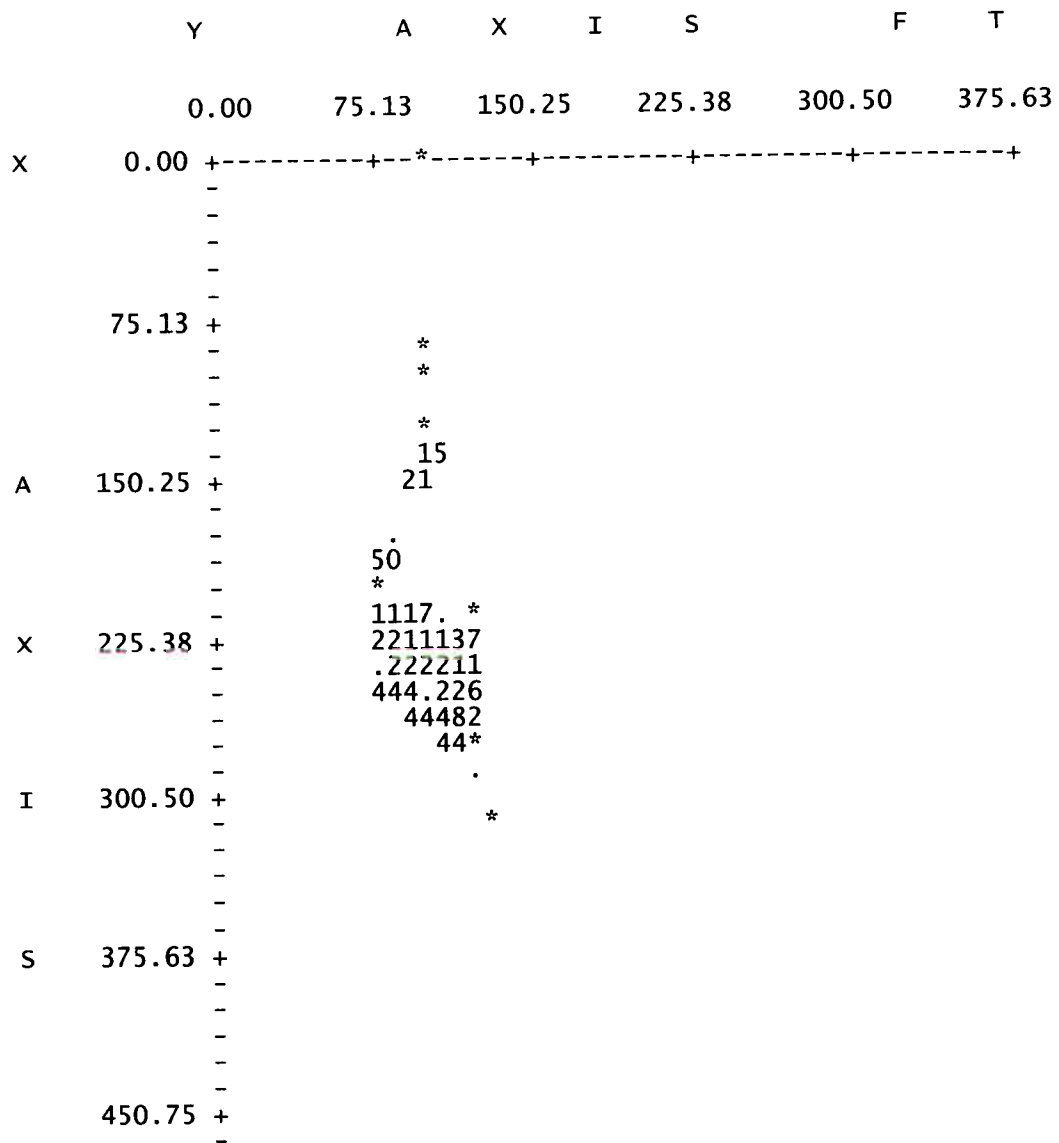
Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	135.02	101.24
2	135.22	101.11
3	138.96	97.80
4	143.07	94.95
5	188.05	79.87

TDRSAFinal_Buildout1.out.txt

6	206.67	75.96
7	209.84	79.83
8	211.03	84.68
9	214.34	88.43
10	217.62	92.21
11	220.24	96.46
12	222.32	101.01
13	224.95	105.26
14	227.61	109.50
15	231.07	113.11
16	233.31	117.58
17	235.40	121.22

*** 6.015 ***



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