CRITICAL AREAS REPORT

Talus Parcel 7
Issaquah, Washington

Project No. T-6165

Terra Associates, Inc.

Prepared for:

J.R. Hayes and Sons
Maple Valley, Washington

January 9, 2014

TERRA ASSOCIATES, Inc.

Consultants in Geotechnical Engineering, Geology
and
Environmental Earth Sciences

January 9, 2014
Project No. T-6165

Mr. Darren Peugh
J.R. Hayes and Sons
22430 SE 231st Street
Maple Valley, Washington 98038

Subject: Critical Areas Report
Talus Parcel 7
Issaquah, Washington

Dear Mr. Peugh:

As requested, we have prepared a critical area report for the subject project. This report has been prepared in response to requirements regarding critical areas and steep slopes contained in the development agreement between the City of Issaquah and the Talus Project. In particular, the report addresses the requirements in the agreement that are in Section 8.0, Critical Areas Studies, Section 13.0, Critical Area Protection Mechanisms, Buffer Areas, and Building Setback Areas, and Section 24.0, Steep Slope Hazard Areas-Protection Mechanisms and Permitted Alterations.

The purpose of this report is to request approval of the proposed site grading to allow for the reduction of the existing steep slope areas within the parcel development area and to request a reduction to 10 feet in the standard minimum 50-foot buffer from steep slopes, to apply to the steep slope areas that remain following final site grading.

We trust the information presented in this report is sufficient for your current needs. If you have any questions or require additional information, please call.

Sincerely yours,
TERRA ASSOCIATES, INC.

Carolyn S. Decker, P.E.
Project Engineer

1-9-14

Theodore J. Schepper, P.E.
Principal

cc: Mr. Al Fure, Triad Associates

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Critical Areas Report
Talus Parcel 7
Issaquah, Washington

1.0 PROJECT DESCRIPTION

The project consists of developing the parcel as a residential community with 56 single-family lots, retaining walls, and associated access parking and utilities. Based on plans prepared by Triad Associates, grading to establish lot and roadway elevations will be significant with cuts and fills ranging from 5 to 60 feet. With the current eastward descending topography, multiple terraced walls will be constructed to support cut vertical grade transitions required to establish roadway and lot elevations in the western development area of the parcel. Individual terraced wall heights of up to ten feet will be constructed to accommodate vertical grade changes of as much as 60 feet. In the lower eastern development area of the parcel, lot and roadway grades will be established with a combination of cut and fill with a single height wall planned along the eastern site margin supporting fill heights of 2 to 45 feet. The wall is currently planned as a Mechanically Stabilized Earth Wall (MSE).

2.0 SITE CONDITIONS

2.1 Surface

The Talus Master Planned Development is located southwest of the City of Issaquah, Washington. Parcel 7 is located in the western limits of the development northwest of the intersection of Talus Drive and Shangri- La Way. The approximate location of the project site is shown on Figure 1.

Parcel 7 is located on an east-facing, rolling to steep hillside overlooking the City of Issaquah. Site elevations from the western property boundary descend eastward with elevations ranging from 830 to 870 feet along the western margin to elevations 610 to 700 feet along the eastern margin. Slope gradients range from 10 to 70 percent. The majority of the slope gradients are in the 10 to 30 percent range.

The western border of the project is the Cougar Mountain Regional Wildland Park. The southern portion of the parcel is bordered by a steep slope that extends into a drainage ravine. At the top of this drainage ravine are two existing City of Issaquah water reservoir tanks. A trail from the water tanks provides access to the site from the south. A catch basin structure is set within this trail for control of surface water on the trail. This structure drains into a HDPE pipe that is laid on the ground across the upper southern drainage ravine; then, it is tied into the storm drainage system within the paved water tanks access road. The northern site boundary is bordered by undeveloped forested land. The rolling to steep eastward facing hillside extends down to a public access trail that borders the parcels east perimeter. This trail extends through the southern portion of the project to the Cougar Mountain Regional Wildland Park. Below the trail is undeveloped forest that borders the back of an existing residential development.

The site was originally forested with portions recently logged and the timber removed. Unlogged sections still remain on the western perimeter and on the northern half of the southern drainage ravine.

2.2 Subsurface

In general, the site surface soils consist of 12 to 30 inches of dark brown to black organic silt with abundant roots and sticks (forest duff) overlying silty sand with gravel to weathered elastic silt. The underlying predominant feature is stiff to hard weathered sandstone to siltstone. Generally, silty sand with gravel was observed on the lower slope sections with the elastic silt to weathered bedrock being observed at shallow depths on the upper western steeper sections of the site. Cobbles to small boulders were occasionally observed within the silty sand with gravel unit. We also observed fractured weathered sandstone and siltstone pieces near the bottom of most of the silty sand deposits. Generally, the elastic silt to weathered siltstone had a fractured structure when first observed, becoming very hard and massive with depth. Heavy iron staining was observed on the fractured face sides of the bedrock.

The *Geologic Map of the Issaquah 7.5' Quadrangle, King County, Washington*, by Derek B. Booth and James P. Minard (1992), indicates the site is underlain by ice-contact deposits (Qvi) overlying Blakely to Renton Formation Bedrock, (Tb, Tr). In general, the granular mixture of silt, sandy silt, and silty sand with gravel we observed correlates to the ice-contact deposits. The weathered siltstone and sandstone observed would correlate to the Blakely formation.

The preceding discussion is intended to be a general review of the soil conditions encountered. For more detailed descriptions, please refer to the Test Pit Logs and Boring Logs in Appendix A.

2.3 Groundwater

We observed slight groundwater seepage in Test Pit TP-31 at a depth of 4.5 feet and moderate groundwater seepage at a depth of 7.5 feet. No groundwater was observed in the test borings during drilling.

The seepage observed is isolated and represents infiltrated rainfall traveling through the more pervious shallow soil profile on top of the less pervious Blakely Formation within low areas of the site. Fluctuations in groundwater seepage levels should be expected on a seasonal and annual basis. The amount of seepage will be highest during and shortly following the normally wet winter season.

3.0 DISCUSSION AND RECOMMENDATIONS

3.1 Existing Steep Slopes

The existing slopes on the majority of the parcel are gentle to moderate. The steep slope areas are concentrated along the western and eastern site margin and along the northern flank of the ravine south of the parcel. The steep slope area along the eastern margin of the site generally has a descending gradient of about 40 to 53 percent, but locally is as much as 60 to 70 percent. The steep slope is about 60 to 100 feet high along much of its length. Slopes that exceed a gradient of 40 percent and; therefore, are defined as steep slopes in the development agreement are shown on Figure 2.

Our reconnaissance of the property noted that overall, there was no evidence of unstable slope conditions on the parcel. We did observe and are aware of two isolated slope failures located on the slope east of the pedestrian trail. We observed the condition of one of these slides when it originally occurred in December 2010. The slide formed an arch shaped scarp that was about 10 feet tall and 30 feet in width. The slide mass had mobilized downslope and was deposited mainly on a bench area below the slide and above an existing retaining wall. Some of the slide debris did flow over the wall. We observed an older similar feature just to the north of this slide area. It was determined that the probable cause of the slides was excess seepage or pore water pressure that had developed behind the slope in response to the heavy precipitation. The proposed development is located west of the pedestrian trail and west of the slope failures.

3.2 Post-Development Slopes

Proposed grading to establish lot and roadway elevations will alter and remove portions of the existing steep slopes. Post graded steep slope areas are shown on attached Figure 3. Relatively tall retaining walls will be constructed adjacent the steep slopes in the eastern portion of the site. Design of the walls will incorporate mechanically stabilized earth (MSE) in conjunction with segmental block facing units. The wall foundations will be carried to firm competent soils below the near-surface materials. Terracing of the western slope areas will be accomplished using permanent soil nail retaining walls.

Slope stability analyses were completed in order to assess relative slope stability of the slopes for the post-construction cases. The analyses were performed at locations chosen as Cross-Sections A-A', B-B', C-C', and D-D' using the computer program WINSTABL. The cross-section locations are shown on Figure 4. The cross sections are shown on Figures 5 through 8.

Our analysis considered both static and the pseudostatic (seismic) conditions. A horizontal acceleration of 0.31g was used in the pseudostatic analysis to simulate slope performance under earthquake loading. This value represents acceleration that could be expected for an earthquake having a 10 percent probability of being exceeded in 50 years (return period of once per 500 years).

Based on our field exploration, laboratory testing, and previous experience with similar soil types, we chose the following parameters for our analysis:

Table 1 – Slope Stability Analysis Soil Parameters

Soil Type	Unit Weight (pcf)	Friction Angle (degrees)	Cohesion (psf)
Structural Fill	125	32	0
Medium Dense ML/SM	120	34	0
Hard Bedrock	145	42	500

The results of our slope stability analysis, as shown by the lowest safety factors for each condition, are presented in the following table:

Table 2 – Slope Stability Analysis Results

Section	MINIMUM SAFETY FACTORS
	Post Construction
A-A'	1.61 (Seismic FS = 1.19)
B-B'	1.76 (Seismic FS = 1.15)
C-C'	1.51 (Seismic FS = 1.13)
D-D'	1.73 (Seismic FS = 1.17)

Results of the computer simulated stability analysis are attached in Appendix B.

3.3 Erosion and Drainage Plan

A detailed erosion and drainage plan needs to be developed and implemented. This should include methods to minimize slope erosion and sloughing, which reflect the soil types and slope inclination. The project Landscape Architect should be involved with developing these criteria. The client should consider the capital cost and aesthetics of the erosion protection, the cost of long-term maintenance problems, and the visual impact of potential slope erosion of the overall Talus Development. The drainage plan should include provisions to direct runoff away from the slope crests and reduce development of surface rills and sloughs.

4.0 CONCLUSIONS AND REQUESTED ALTERATIONS TO STEEP SLOPE BUFFERS

4.1 Conclusions

The natural geologic conditions that exist at Parcel 7 demonstrate that the slopes have been stable with respect to deep-seated failure during the post-glacial period. This is evident in the widespread intact nature of the glacial deposits throughout the parcel, such as dense ice-contact deposits and the hard bedrock. Results of our stability analysis indicates that alterations to the existing steep slopes would not impact stability and that acceptable safety factors against slope failures would be provided post construction.

Excessive rainfall resulted in two small slope failures near the base of the slope well east of the proposed development. These failures appear to have been caused by excess groundwater seepage or pore water pressures that built up locally behind the slope face. With proper drainage installed, it is our opinion, that the proposed development will capture and control runoff and reduce the groundwater seepage currently causing the issues and help mitigate the potential for future slope failures.

The natural steep slope located along the eastern margin of the site will be partially removed during the development of the parcel, however, the majority of the slope will remain in its current conditions along with the existing pedestrian trail.

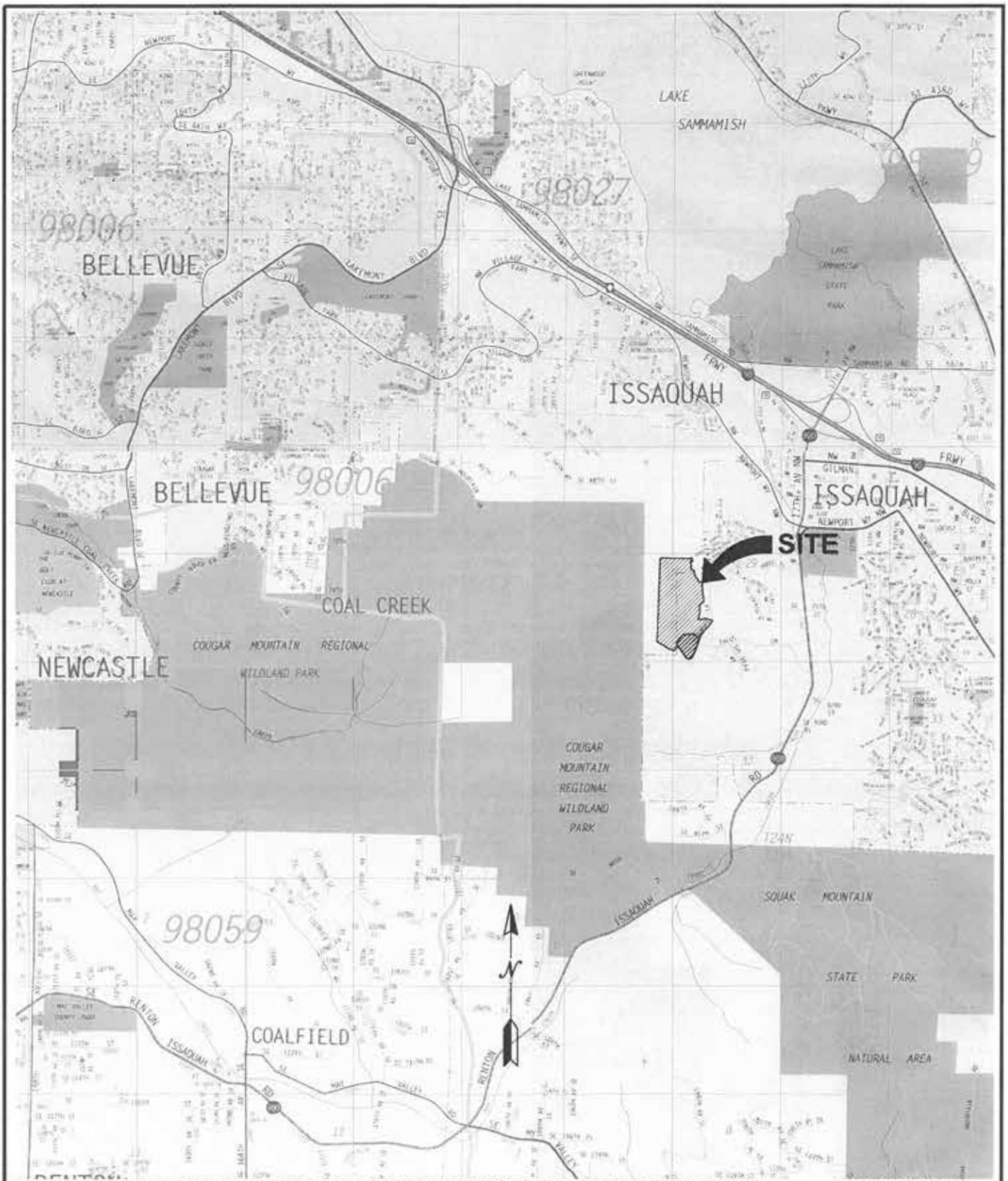
4.2 Requested Alterations to Steep Slopes

Stability analysis demonstrates the proposed grading and wall construction will not adversely impact the stability of the slope. Based on our study and analysis, per Section 24 of Appendix E of the Talus Development Agreement, it is our opinion that the steep slope buffer can be reduced from 50 to 10 feet. This reduction in the buffer will not reduce the level of protection otherwise provided by the 50-foot buffer distance.

5.0 LIMITATIONS

We prepared this report in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made. This report is the copyrighted property of Terra Associates, Inc. and is intended for specific application to the Talus Parcel 7 project. This report is for the exclusive use of J.R. Hayes and Sons and their authorized representatives.

The analyses and recommendations presented in this report are based on data obtained from the test pits and test borings excavated on the site. Variations in soil conditions can occur, the nature and extent of which may not become evident until construction. If variations appear evident, Terra Associates, Inc. should be requested to reevaluate the recommendations in this report prior to proceeding with construction.



REFERENCE: THOMAS GUIDE CD-ROM, KING/PIERCE/SNOHOMISH COUNTIES, 2004 NOT TO SCALE

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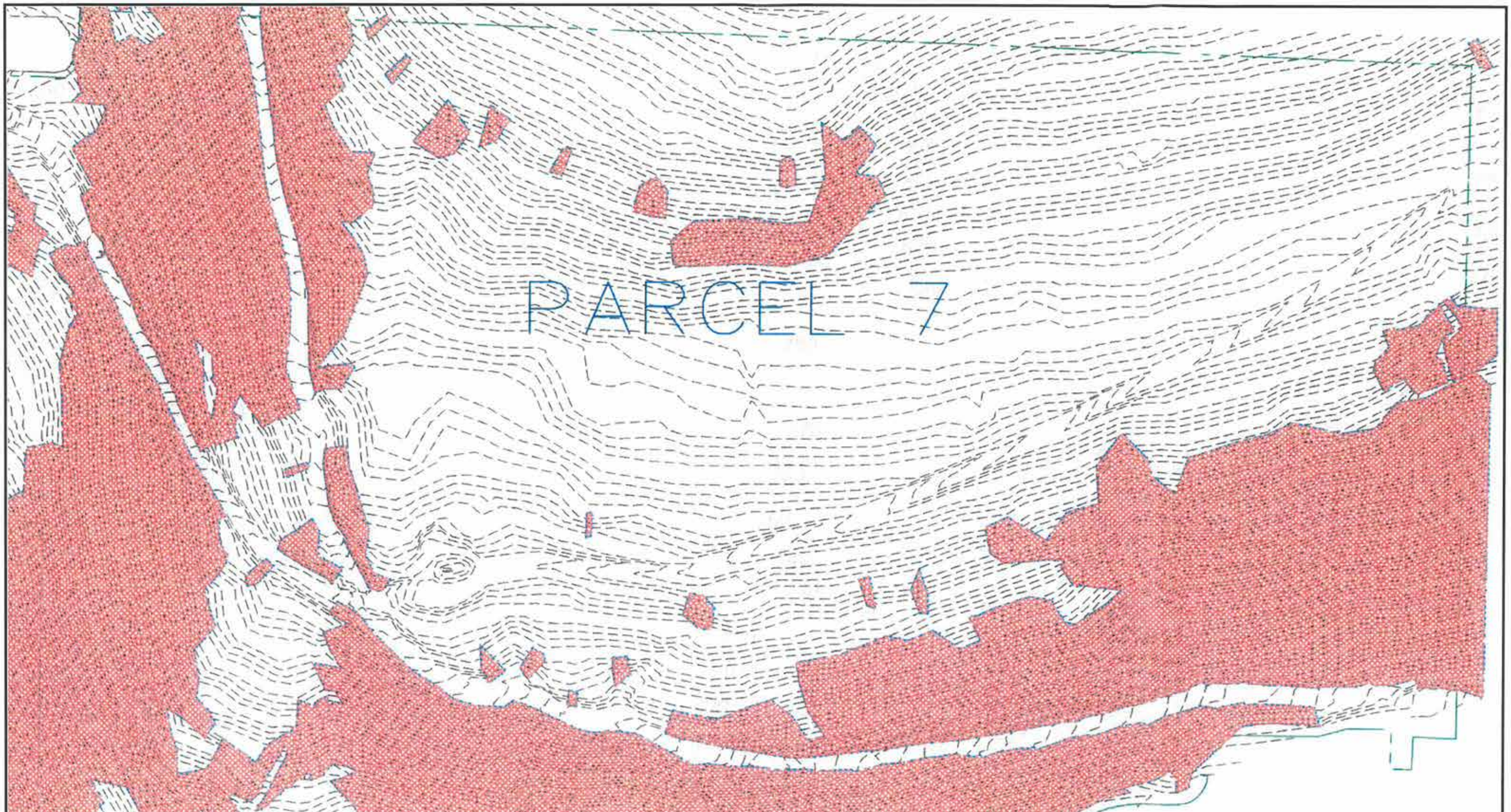
VICINITY MAP
TALUS PARCEL 7
ISSAQUAH, WASHINGTON

Proj. No.T-6165	Date JAN 2014	Figure 1



NOTE:

THIS SITE PLAN IS SCHEMATIC. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. IT IS INTENDED FOR REFERENCE ONLY AND SHOULD NOT BE USED FOR DESIGN OR CONSTRUCTION PURPOSES.

REFERENCE: TRIAD ASSOCIATES STEEP SLOPE EXHIBIT DATED JAN 2. 2014

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EXISTING STEEP SLOPE EXHIBIT
TALUS PARCEL 7
ISSAQUAH, WASHINGTON

Proj. No.T-6165	Date JAN 2014	Figure 2

NOTE:

THIS SITE PLAN IS SCHEMATIC. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. IT IS INTENDED FOR REFERENCE ONLY AND SHOULD NOT BE USED FOR DESIGN OR CONSTRUCTION PURPOSES.

REFERENCE: TRIAD ASSOCIATES PROPOSED REMAINING STEEP SLOPE EXHIBIT DATED JAN 2. 2014

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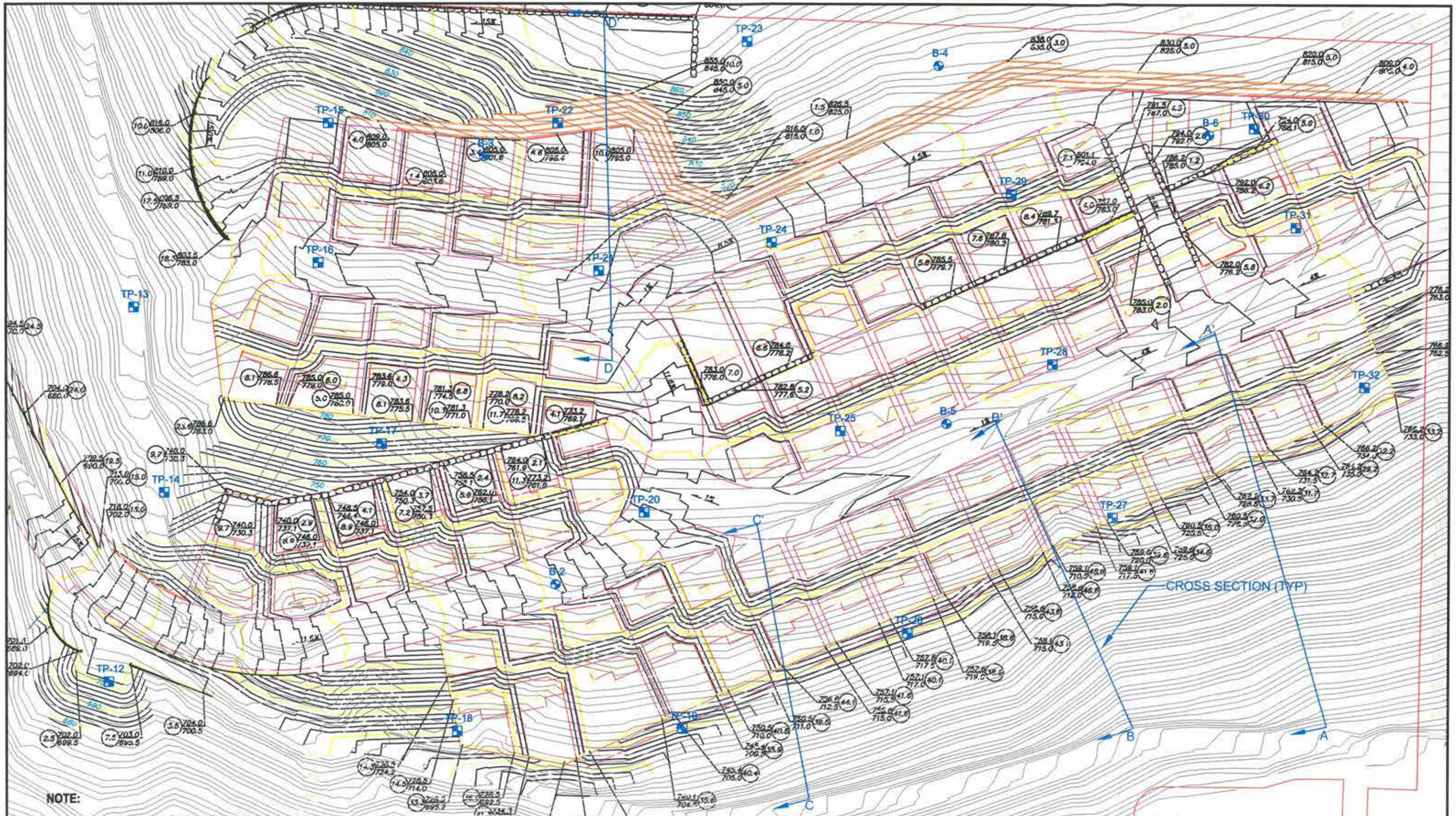
POST GRADING STEEP SLOPE EXHIBIT
TALUS PARCEL 7
ISSAQUAH, WASHINGTON

Proj. No.T-6165	Date JAN 2014	Figure 3



NOTE:

THIS SITE PLAN IS SCHEMATIC. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. IT IS INTENDED FOR REFERENCE ONLY AND SHOULD NOT BE USED FOR DESIGN OR CONSTRUCTION PURPOSES.

REFERENCE:

SITE PLAN PROVIDED BY TRIAD ASSOCIATES

LEGEND:

- APPROXIMATE TEST PIT LOCATION
- APPROXIMATE BORING LOCATION

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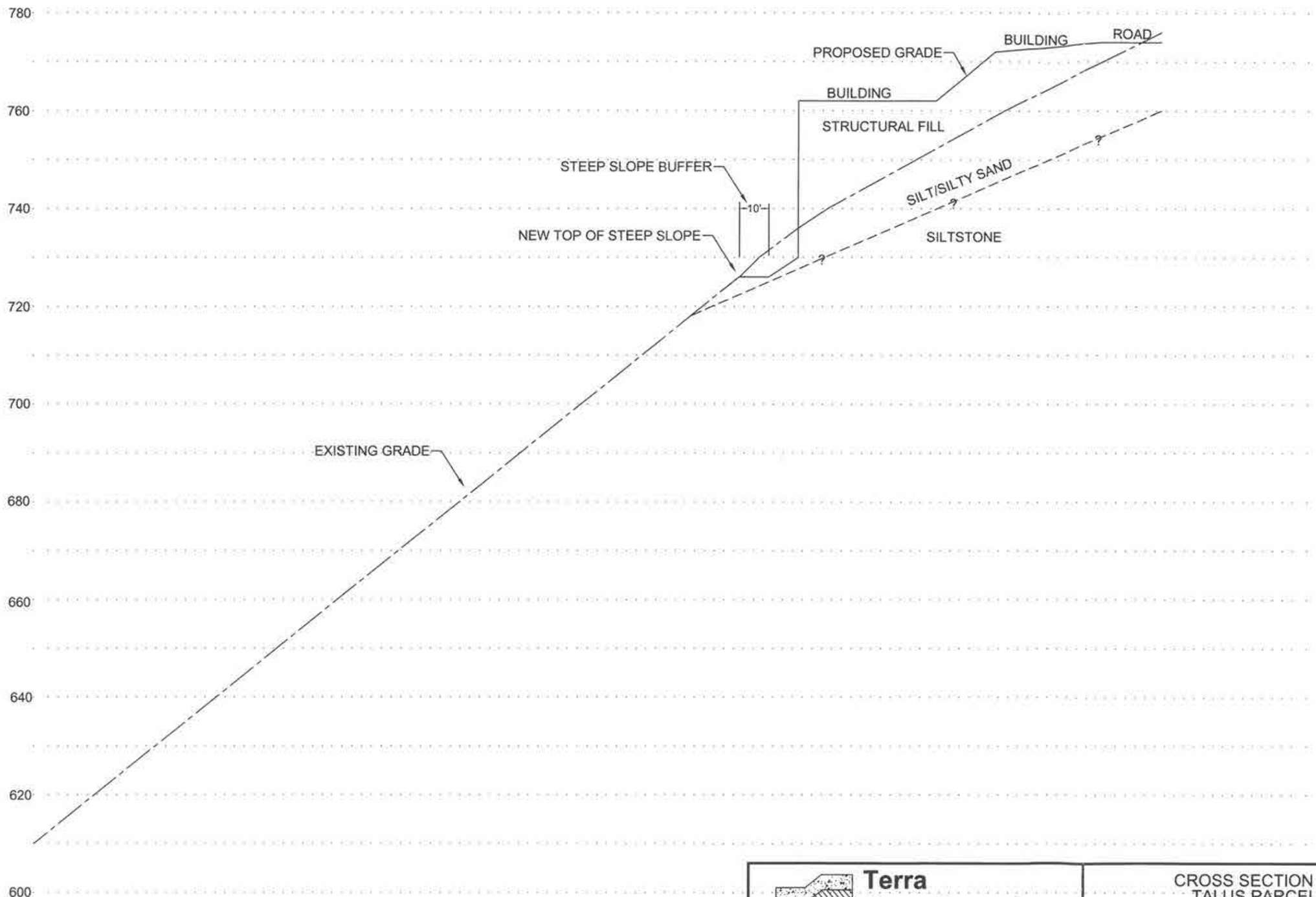
EXPLORATION LOCATION PLAN
TALUS PARCEL 7
ISSAQUAH, WASHINGTON

Proj. No.T-6165	Date JAN 2014	Figure 4



CROSS SECTION A-A'

SCALE
HORIZONTAL 1:30
VERTICAL 1:20

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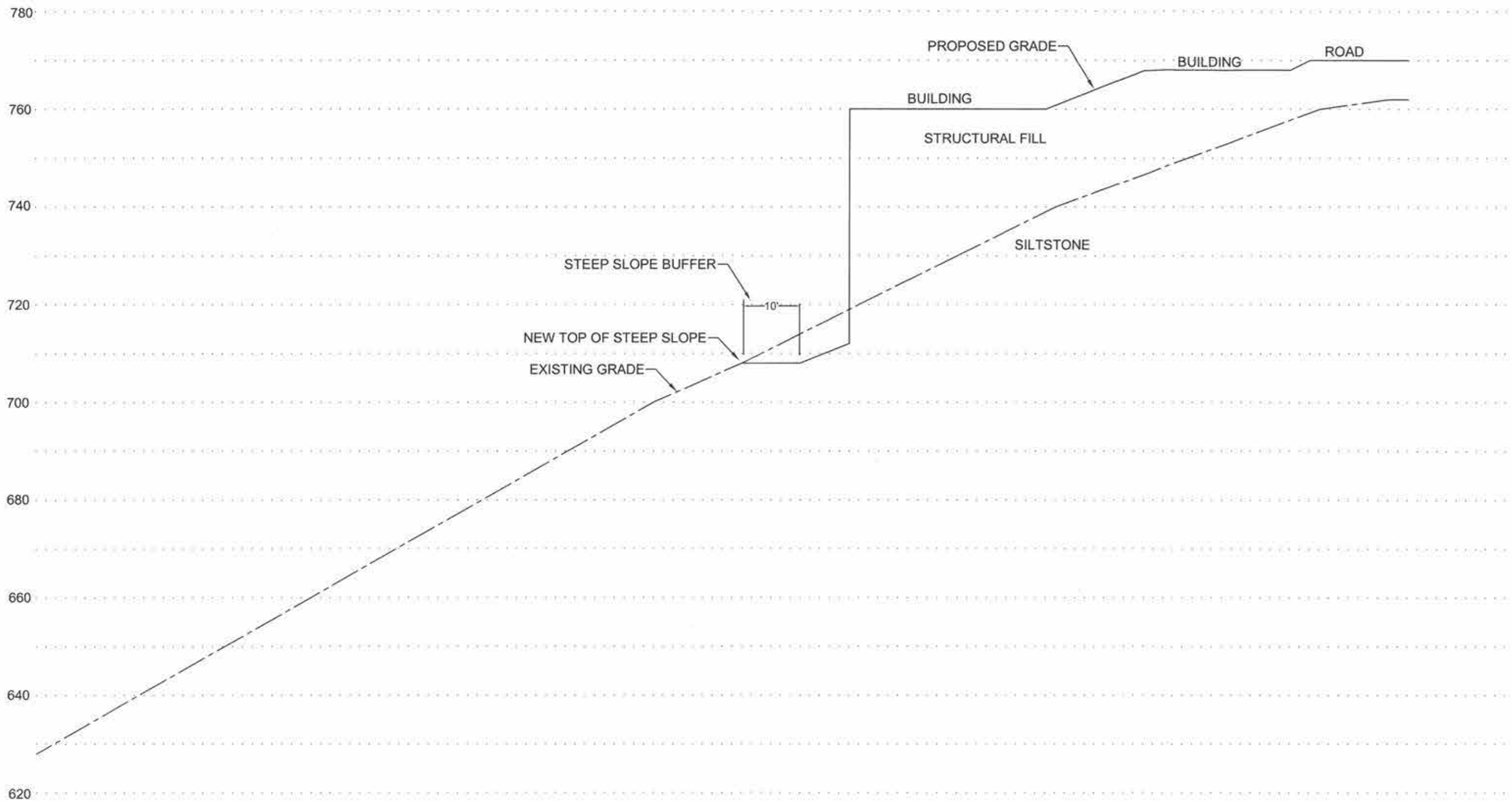
CROSS SECTION A-A'
TALUS PARCEL 7
ISSAQUAH, WASHINGTON

Proj. No.T-6165	Date JAN 2014	Figure 5



CROSS SECTION B-B'

0 20 40
APPROXIMATE SCALE IN FEET

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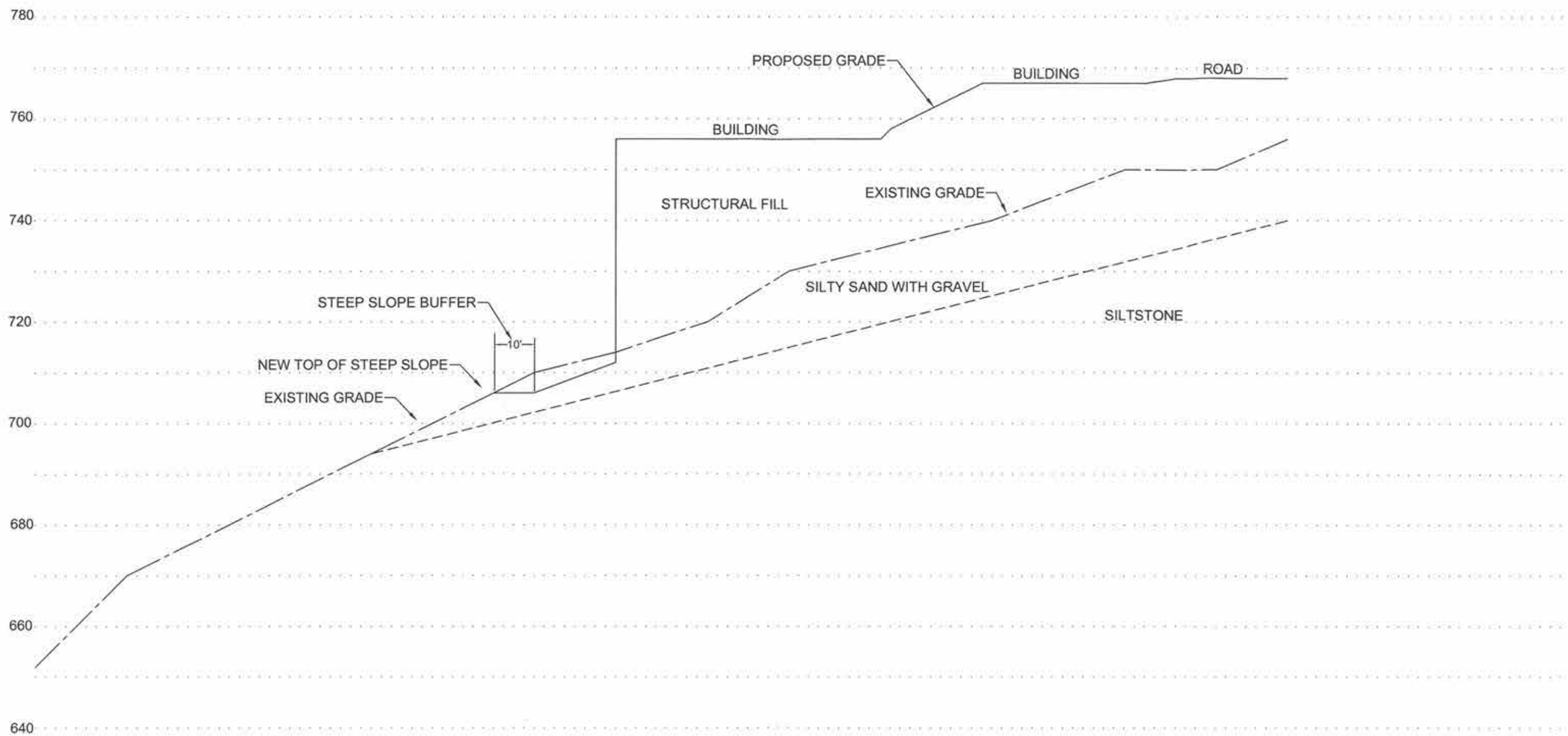
CROSS SECTION B-B'
TALUS PARCEL 7
ISSAQUAH, WASHINGTON

Proj. No.T-6165	Date JAN 2014	Figure 6



CROSS SECTION C-C'

0 20 40
APPROXIMATE SCALE IN FEET

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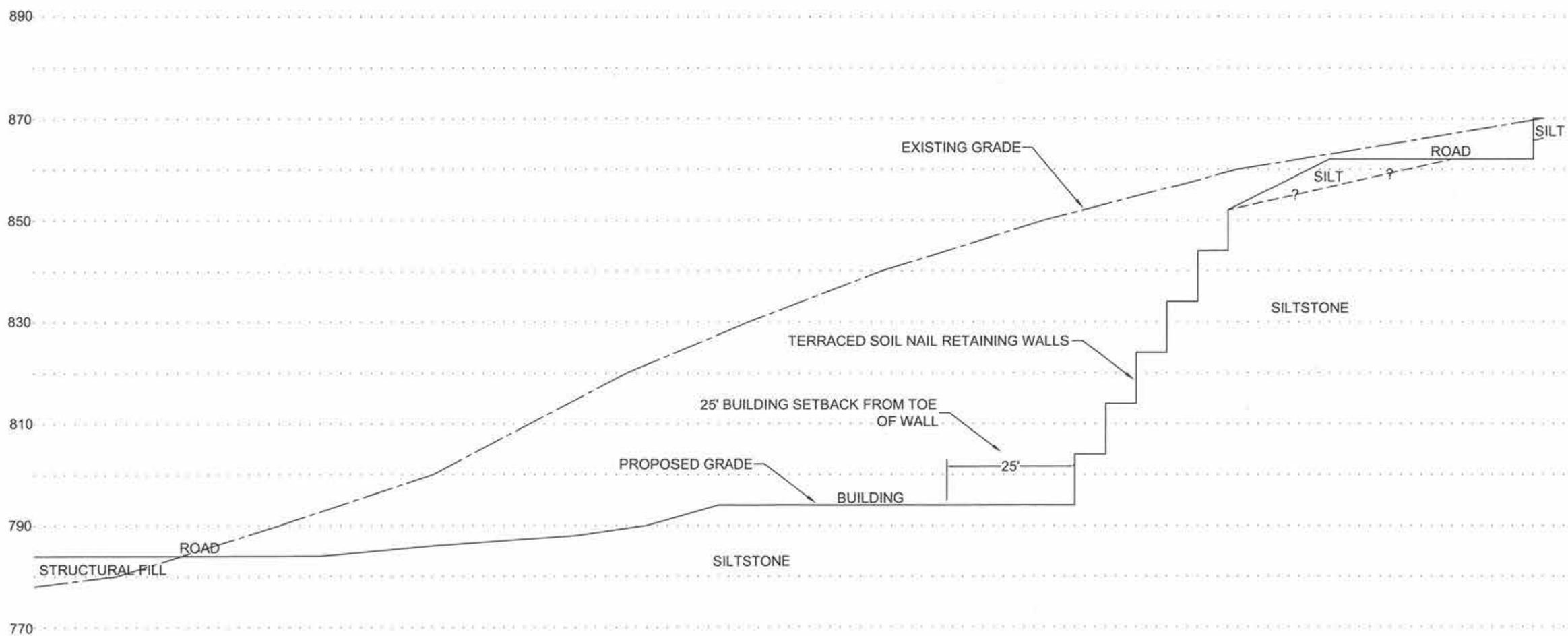
CROSS SECTION C-C'
TALUS PARCEL 7
ISSAQUAH, WASHINGTON

Proj. No.T-6165	Date JAN 2014	Figure 7



CROSS SECTION D-D'

0 20 40
APPROXIMATE SCALE IN FEET

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CROSS SECTION D-D'
TALUS PARCEL 7
ISSAQUAH, WASHINGTON

Proj. No.T-6165	Date JAN 2014	Figure 8

APPENDIX A
FIELD EXPLORATION AND LABORATORY TESTING

Talus Parcel 7
Issaquah, Washington

Our original site exploration was completed on December 10 and 11, 2007 by excavating 21 soil test pits. On December 20, 2007, we advanced 5 soil test borings using a track-mounted drill rig to a maximum depth of 14 feet below current surface grades. The approximate test pit and boring locations are shown on the Exploration Location Plan, Figure 4. The Test Pit and Test Boring Logs are presented on Figures A-2 through A-27.

An engineering geologist from our office conducted the field exploration. Our representative classified the soil conditions encountered, maintained a log of each test boring and test pit, obtained representative soil samples, and recorded water levels observed. During drilling, soil samples were obtained in general accordance with ASTM Test Designation D-1586. Using this procedure, a 2-inch (outside diameter) split barrel sampler is driven into the ground 18 inches using a 140-pound hammer free falling a height of 30 inches. The number of blows required to drive the sampler 12 inches after an initial 6-inch set is referred to as the Standard Penetration Resistance value or N value. This is an index related to the consistency of cohesive soils and relative density of cohesionless materials. N values obtained for each sampling interval are recorded on the Boring Logs, Figures A-2 through A-6. All soil samples were visually classified in accordance with the Unified Soil Classification System (USCS) described on Figure A-1.

Representative soil samples obtained from the test pits and borings were placed in closed containers and taken to our laboratory for further examination and testing. The moisture content of each sample was measured and is reported on the Test Pit and Boring Logs. Atterberg Limits tests were conducted on nine of the fine-grained soil samples to determine its plasticity characteristics. The results of the tests were used in the soil descriptions on the Test Pit Logs. Grain size analyses were performed on selected samples. The results are shown on Figures A-28 and A-29.

MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTION
COARSE GRAINED SOILS More than 50% material larger than No. 200 sieve size	**GRAVELS** More than 50% of coarse fraction is larger than No. 4 sieve	Clean Gravels (less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines.
		Gravels with fines	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS More than 50% of coarse fraction is smaller than No. 4 sieve	Clean Sands (less than 5% fines)	SW	Well-graded sands, sands with gravel, little or no fines.
			SP	Poorly-graded sands, sands with gravel, little or no fines.
		Sands with fines	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS More than 50% material smaller than No. 200 sieve size	**SILTS AND CLAYS** Liquid Limit is less than 50%		ML	Inorganic silts, rock flour, clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity. (Lean clay)
			OL	Organic silts and organic clays of low plasticity.
	SILTS AND CLAYS Liquid Limit is greater than 50%		MH	Inorganic silts, elastic.
			CH	Inorganic clays of high plasticity. (Fat clay)
			OH	Organic clays of high plasticity.
HIGHLY ORGANIC SOILS			PT	Peat.

DEFINITION OF TERMS AND SYMBOLS

COHESIONLESS

Density	Standard Penetration Resistance in Blows/Foot
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	>50

COHESIVE

Consistancy	Standard Penetration Resistance in Blows/Foot
Very Soft	0-2
Soft	2-4
Medium Stiff	4-8
Stiff	8-16
Very Stiff	16-32
Hard	>32

I	2" OUTSIDE DIAMETER SPILT SPOON SAMPLER
II	2.4" INSIDE DIAMETER RING SAMPLER OR SHELBY TUBE SAMPLER
▼	WATER LEVEL (Date)
Tr	TORVANE READINGS, tsf
Pp	PENETROMETER READING, tsf
DD	DRY DENSITY, pounds per cubic foot
LL	LIQUID LIMIT, percent
PI	PLASTIC INDEX
N	STANDARD PENETRATION, blows per foot

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UNIFIED SOIL CLASSIFICATION SYSTEM
TALUS PARCEL 7
ISSAQUAH, WASHINGTON

Proj. No.T-6165	Date JAN 2014	Figure A-1

LOG OF BORING NO. 2

Figure No. A-2

Project: Talus Parcels 7 and 8 **Project No:** T-6165 **Date Drilled:** Dec. 20, 2007

Client: J.R. Hayes and Sons **Driller:** Gregory Drilling **Logged By:** DPL

Location: Issaquah, Washington **Approx. Elev:** 744'

Depth (ft)	Sample Interval	Soil Description	Consistency/ Relative Density	Moisture Content % Wp |-----x-----| Wl 10 20 30 40	Pocket Penetrometer TSF 1 2 3 4 / SPT (N) Blows/ft 10 20 30 40
		(ORGANICS, FOREST DEBRIS)			
1					
2		Reddish-brown to brown silty SAND to sandy SILT, fine grained, moist. (Weathered sandstone to siltstone)			
3				25.8	40
4					
5			Dense to Very Dense		
6				23.1	50/5"
7					
8					
9					
10				21.9	50/5"
11					
12					
13		Gray SILTSTONE, moist. (Bedrock)	Very Hard		
14					
15				20.4	50/3"
16		Boring terminated at 15 feet 3 inches. No groundwater observed.			
17					
18					
19					
20					

Note: This borehole log has been prepared for geotechnical purposes. This information pertains only to this boring location and should not be interpeted as being indicative of other areas of the site.

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LOG OF BORING NO. 3

Figure No. A-3

Project: Talus Parcels 7 and 8 **Project No:** T-6165 **Date Drilled:** Dec. 20, 2007

Client: J.R. Hayes and Sons **Driller:** Gregory Drilling **Logged By:** DPL

Location: Issaquah, Washington **Approx. Elev:** 834'

Depth (ft)	Sample Interval	Soil Description	Consistency/ Relative Density	Moisture Content % Wp |-----x-----| Wl 10 20 30 40	Pocket Penetrometer TSF 1 2 3 4 / SPT (N) Blows/ft 10 20 30 40
		(Black ORGANICS, FOREST DEBRIS)			
1					
2		Reddish-brown silty SAND to sandy SILT, fine grained, moist. (Weathered sandstone to siltstone)			
3				32.8	28
4					
5			Medium Dense to Very Dense		51
6				25.8	
7					
8					
9					
10					56
11		Brown SANDSTONE, moist.	Hard	25.6	
12					
13		Gray SILTSTONE, moist. (Bedrock)	Very Hard		
14					
15				21.0	50/4"
16		Boring terminated at 15 feet 4 inches. No groundwater observed.			
17					
18					
19					
20					

Note: This borehole log has been prepared for geotechnical purposes. This information pertains only to this boring location and should not be interpeted as being indicative of other areas of the site.

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LOG OF BORING NO. 4

Figure No. A-4

Project: Talus Parcels 7 and 8 **Project No:** T-6165 **Date Drilled:** Dec. 20, 2007

Client: J.R. Hayes and Sons **Driller:** Gregory Drilling **Logged By:** DPL

Location: Issaquah, Washington **Approx. Elev:** 840'

Depth (ft)	Sample Interval	Soil Description	Consistency/ Relative Density	Moisture Content % Wp |-----x-----| Wl 10 20 30 40	Pocket Penetrometer TSF 1 2 3 4 / SPT (N) Blows/ft 10 20 30 40
		(Dark brown ORGANICS, FOREST DEBRIS)			
1		Dark brown to brown organic SILT, roots, old sticks, wet.	Soft		
2					
3					
4					
5		Reddish-brown to brown elastic SILT, moist. Iron stained. (MH)	Hard	40.0	39
6			LL=57 PI=7		
7					
8					
9					
10		Reddish-brown to brown SANDSTONE to SILTSTONE, iron stained, moist.	Very Hard	31.7	73/11"
11					
12					
13					
14		Gray SILTSTONE, moist. (Bedrock)	Very Hard		
15				21.6	50/4"
16		Boring terminated at 15 feet 4 inches. No groundwater observed.			
17					
18					
19					
20					

Note: This borehole log has been prepared for geotechnical purposes. This information pertains only to this boring location and should not be interpeted as being indicative of other areas of the site.

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LOG OF BORING NO. 5

Figure No. A-5

Project: Talus Parcels 7 and 8 **Project No:** T-6165 **Date Drilled:** Dec. 20, 2007

Client: J.R. Hayes and Sons **Driller:** Gregory Drilling **Logged By:** DPL

Location: Issaquah, Washington **Approx. Elev:** 766'

Depth (ft)	Sample Interval	Soil Description	Consistency/ Relative Density	Moisture Content % Wp |-----x-----| Wl 10 20 30 40	Pocket Penetrometer TSF △ 1 2 3 4 △ / SPT (N) Blows/ft • 10 20 30 40 •
1		(Black ORGANICS, FOREST DEBRIS) Dark brown to brown sandy organic SILT, roots, old sticks, wet.	Soft		
2					
3					
4					4 •
5		Light brown to reddish-brown silty SAND to sandy SILT, fine grained, iron stained, moist. (SM/ML)	Dense	40.3 ×	28 •
6					
7					
8					
9					
10				33.8 ×	50/5" •
11		Gray SILTSTONE, moist. (Bedrock)	Very Hard		
12					
13					
14				25.5 ×	50/3" •
15		Boring terminated at 14 feet 3 inches. No groundwater observed.			
16					
17					
18					
19					
20					

Note: This borehole log has been prepared for geotechnical purposes. This information pertains only to this boring location and should not be interpeted as being indicative of other areas of the site.

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LOG OF BORING NO. 6

Figure No. A-6

Project: Talus Parcels 7 and 8 **Project No:** T-6165 **Date Drilled:** Dec. 20. 2007

Client: J.R. Hayes and Sons **Driller:** Gregory Drilling **Logged By:** DPL

Location: Issaquah, Washington **Approx. Elev:** 812'

Depth (ft)	Sample Interval	Soil Description	Consistency/ Relative Density	Moisture Content % Wp |-----x-----| Wl 10 20 30 40	Pocket Penetrometer TSF △ 1 2 3 4 △ / SPT (N) Blows/ft • 10 20 30 40 •
1		(Black ORGANICS, FOREST DEBRIS) Dark brown to brown organic SILT, roots, trace sticks, wet.	Soft		
2					
3					
4		Brown to reddish-brown SANDSTONE to SILTSTONE, iron stained, moist.	Dense		28 •
5				38.9 ×	
6					
7					
8					
9					
10				24.8 ×	50/4" •
11		Gray SILTSTONE, moist. (Bedrock)	Very Hard		
12					
13					
14				18.8 ×	50/3" •
15		Boring terminated at 14 feet 3 inches. No groundwater observed.			
16					
17					
18					
19					
20					

Note: This borehole log has been prepared for geotechnical purposes. This information pertains only to this boring location and should not be interpeted as being indicative of other areas of the site.

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LOG OF TEST PIT NO. 12

FIGURE A-7

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Brush **APPROX. ELEV:** 692'

DATE LOGGED: December 10, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		12 inches dark brown to black organic SILT with sticks, roots, wet.	Soft			
1						
2		Brown silty SAND with gravel, fine grained, roots, wet. (SM)	Medium Dense	22.3		
3						
4						
5		Grayish-brown silty SAND with gravel, fine grained, cemented, moist. (SM) (Till-like)	Dense to Very Dense	11.6		
6						
7				13.5		
8						
9		Orange brown to brown SILTSTONE, fractured, moist to wet. (ML) (Weathered bedrock)	Hard	32.3		
10						
		Test pit terminated at 10 feet. No groundwater seepage observed.				
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 13

FIGURE A-8

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Brush **APPROX. ELEV:** 752'

DATE LOGGED: December 10, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		12 inches black organic SILT (forest duff), roots, wet.	Very Soft			
1						
2		Brown silty SAND with gravel, fine grained, roots, wet to moist. (SM)	Medium Dense	13.7		
3						
4						
5		Tan to orange brown SANDSTONE to SILTSTONE, fractured, moist to wet. (Weathered bedrock)	Hard	29.6		
6						
7				54.9		
8						
9						
10						
11				38.9		
12		Test pit terminated at 12 feet. No groundwater seepage observed.				
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 14

FIGURE A-9

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Brush **APPROX. ELEV:** 736'

DATE LOGGED: December 10, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		8 to 12 inches black organic SILT, sticks, roots, wet.	Soft			
1						
2		Reddish-brown to brown silty SAND with gravel, fine grained, roots, wet. (SM) (Mottled 3 to 4 feet)	Loose			
3				11.4		
4						
5		Grayish-brown silty SAND with gravel, fine grained, cemented, moist. (SM) (Till-like)				
6			Dense to Very Dense	8.2		
7						
8						
9						
		Test pit terminated at 9 feet. No groundwater seepage observed.				
10						
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 15

FIGURE A-10

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Brush **APPROX. ELEV:** 820'

DATE LOGGED: December 11, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		12 to 18 inches dark brown to black organic SILT, roots, wet.	Soft			
2, 3, 4, 5		Brown sandy elastic SILT, roots, some weathered siltstone pieces, wet. (ML)	Medium Stiff	57.8		
6, 7, 8, 9, 10		Orange brown SILTSTONE fractured to slight fracturing below 8 feet, wet to moist. (Weathered bedrock)	Hard	33.3 30.5		
11, 12, 13, 14, 15		Test pit terminated at 10 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 16

FIGURE A-11

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Brush **APPROX. ELEV:** 790'

DATE LOGGED: December 11, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		12 inches dark brown to black organic SILT, roots, wet.	Soft			
1						
2		Brown to orange brown sandy elastic SILT, trace gravel, roots, some weathered siltstone pieces, wet. (ML)	Medium Stiff	46.7		
3						
4						
5		Orange brown SILTSTONE fractured to slight fracturing, wet to moist. (Weathered bedrock)	Stiff to Hard			
6				39.6		
7						
8				32.5		
		Test pit terminated at 8 feet. No groundwater seepage observed.				
9						
10						
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 17

FIGURE A-12

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Brush **APPROX. ELEV:** 758'

DATE LOGGED: December 11, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		12 inches dark brown organic SILT, sticks, roots, wet.	Soft			
1						
2		Brown silty SAND with gravel, fine grained wet. (SM)	Medium Dense	9.5		
3						
4						
5		Orange brown SILTSTONE, semi-fractured, wet to moist. (Weathered bedrock)	Stiff to Hard	44.4		
6						
7				30.5		
		Test pit terminated at 7 feet due to refusal. No groundwater seepage observed.				
8						
9						
10						
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 18

FIGURE A-13

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Grass **APPROX. ELEV:** 702'

DATE LOGGED: December 10, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		12 inches black organic SILT, sticks, roots, wet.	Soft			
1						
2				22.5		
3		Dark brown to brown silty SAND with gravel, fine grained, cobbles to small boulders, some weathered siltstone pieces, wet. (SM)	Medium Dense			
4						
5				34.1		
6						
7						
8		Orange brown SANDSTONE to SILTSTONE, fractured, moist. (Weathered bedrock)	Stiff to Hard	32.9		
9						
10		Test pit terminated at 10 feet. No groundwater seepage observed.				
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 19

FIGURE A-14

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Grass **APPROX. ELEV:** 702'

DATE LOGGED: December 10, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		8 to 12 inches dark brown to black organic SILT, roots, wet.	Soft			
1						
2						
3		Brown to reddish-brown silty SAND with gravel, fine grained, wet. Pieces of weathered siltstone	Medium Dense	41.6		
4				40.2		
5						
6		Orange brown SILTSTONE, fractured, wet to moist. (Weathered bedrock)	Stiff to Hard	25.3		
7		Test pit terminated at 7 feet due to refusal. No groundwater seepage observed.				
8						
9						
10						
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 20

FIGURE A-15

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Grass **APPROX. ELEV:** 758'

DATE LOGGED: December 11, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		12 to 18 inches dark brown to black organic SILT, sticks, roots, wet.	Soft			
2, 3, 4		Brown to reddish-brown silty SAND with gravel, fine grained, wet. (SM) Pieces of weathered siltstone	Medium Dense	39.4		
5, 6, 7, 8		Orange brown SILTSTONE, fractured, wet to moist. (Weathered bedrock)	Stiff to Hard	25.4 25.4		
9, 10, 11, 12, 13, 14, 15		Test pit terminated at 8 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 21

FIGURE A-16

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Grass **APPROX. ELEV:** 800'

DATE LOGGED: December 11, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		12 to 18 inches black organic SILT, sticks, roots, wet.	Soft			
2 3 4		Brown to reddish-brown elastic SILT, trace gravel, roots, pieces of weathered siltstone, wet. (MH) LL=75 PL=63 PI=12	Medium Stiff	67.6		
5 6		Brown SILTSTONE, fractured at first, moist. (Weathered bedrock)	Stiff to Hard	26.6		
7 8 9 10 11 12 13 14 15		Test pit terminated at 7 feet due to refusal. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 22

FIGURE A-17

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Brush **APPROX. ELEV:** 848'

DATE LOGGED: December 11, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		12 to 18 inches dark brown to black organic SILT, sticks, roots, wet.	Soft			
2 3		Tan brown sandy elastic SILT, trace gravel, wet. (MH) LL=37 PL=34 PI=3	Medium Stiff	41.2		
4 5 6		Tan brown to orange brown SILTSTONE, fractured at first, moist to wet. (Weathered bedrock)	Stiff to Hard	21.3 24.8		
7 8 9 10 11 12 13 14 15		Test pit terminated at 7 feet due to refusal. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 23

FIGURE A-18

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Forest Duff **APPROX. ELEV:** 866'

DATE LOGGED: December 11, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		12 inches dark brown organic SILT, sticks, roots, wet.	Soft			
1						
2		Brown to reddish-brown sandy SILT, pieces of weathered siltstone, wet. (ML)	Medium Stiff	37.4		
3						
4				38.5		
5						
6		Orange brown SILTSTONE, fractured at first, moist. (Weathered bedrock)	Hard	22.9		
				28.9		
7		Test pit terminated at 6.5 feet due to refusal. No groundwater seepage observed.				
8						
9						
10						
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 24

FIGURE A-19

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Forest Duff **APPROX. ELEV:** 802'

DATE LOGGED: December 11, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		18 inches black organic SILT, sticks, roots, wet.	Soft			
2				54.1		
3		Brown to orange brown sandy elastic SILT, roots, pieces of weathered siltstone, wet. (MH) LL=61 PL=51 PI=10	Medium Stiff			
4				53.4		
5						
6						
7		Orange brown SILTSTONE, fractured, wet to moist. (Weathered bedrock)	Stiff to Hard	37.8		
8						
9				48.5		
10		Test pit terminated at 10 feet. No groundwater seepage observed.				
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 25

FIGURE A-20

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Grass **APPROX. ELEV:** 770'

DATE LOGGED: December 11, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		12 inches black to dark brown organic SILT, sticks, roots, wet.	Soft			
1						
2		Brown silty SAND with gravel to sandy SILT with gravel, roots, pieces of weathered siltstone, cobbles, wet. (SM/ML)	Medium Dense			
3				48.9		
4						
5				40.8		
6		Orange brown SILTSTONE, fractured, wet to moist. (Weathered bedrock)	Stiff to Hard			
7						
8						
9						
				33.0		
10		Test pit terminated at 10 feet. No groundwater seepage observed.				
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 26

FIGURE A-21

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Forest Duff **APPROX. ELEV:** 714'

DATE LOGGED: December 11, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1, 2		24 to 30 inches black organic SILT, lots of sticks, old roots, wet.	Very Soft			
3, 4, 5, 6, 7		Orange brown SILTSTONE, fractured, wet to moist. (Weathered bedrock)	Medium Stiff to Hard	43.6 37.2		
8, 9, 10, 11, 12, 13, 14, 15		Test pit terminated at 8 feet. No groundwater seepage observed.				

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 27

FIGURE A-22

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Grass **APPROX. ELEV:** 730'

DATE LOGGED: December 11, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		18 to 24 inches black organic SILT, lots of sticks, roots, wet.	Very Soft			
2						
3				16.8		
4		Dark brown to brown silty SAND with gravel, fine grained, lots of cobbles to small boulders, wet.				
5			Medium Dense			
6						
7						
8						
9		Orange brown SILTSTONE, fractured, moist. (Weathered bedrock)	Hard	32.9		
10						
11		Test pit terminated at 10 feet. No groundwater seepage observed.				
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 28

FIGURE A-23

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Grass **APPROX. ELEV:** 776'

DATE LOGGED: December 11, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		12 inches dark brown organic SILT, sticks, roots, wet.	Soft			
1						
2		Brown silty SAND with gravel, fine grained, roots, wet. (SM)	Loose	19.5		
3						
4		Grayish-brown silty SAND with gravel, fine grained, cemented, wet to moist. (SM)	Dense			
5				13.0		
6						
7		Reddish-brown to orange brown SILTSTONE, fractured, wet to moist. (Weathered bedrock)	Stiff to Hard			
8				36.7		
9				34.8		
10		Test pit terminated at 10 feet. No groundwater seepage observed.				
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 29

FIGURE A-24

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Grass **APPROX. ELEV:** 806'

DATE LOGGED: December 11, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		12 inches black organic SILT, roots, sticks, wet.	Soft			
1						
2		Brown silty SAND with gravel, fine grained, roots, wet. (SM)	Medium Dense	26.9		
3						
4				62.6		
5						
6		Orange brown SILTSTONE, fractured, wet to moist. (Weathered bedrock)	Medium Stiff to Hard	41.9		
7		LL=49 PL=47 PI=2				
8						
9				35.6		
10		Test pit terminated at 10 feet. No groundwater seepage observed.				
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 30

FIGURE A-25

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Forest Duff **APPROX. ELEV:** 812'

DATE LOGGED: December 11, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		6 to 10 inches black organic SILT, roots, wet.	Soft			
1						
2		Reddish-brown sandy SILT, pieces of weathered siltstone, wet. (ML)	Medium Stiff	32.4		
3						
4						
5						
6						
7		Orange brown SILTSTONE, fractured at first, moist. (Weathered bedrock)	Stiff to Hard	47.5		
8						
9				23.9		
10		Test pit terminated at 10 feet. No groundwater seepage observed.				
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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Geology and
Environmental Earth Sciences

LOG OF TEST PIT NO. 31

FIGURE A-26

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Grass **APPROX. ELEV:** 786'

DATE LOGGED: December 11, 2007 **DEPTH TO GROUNDWATER:** 4.5 & 7.5 Ft **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
1		12 to 18 inches dark brown to black organic SILT, some gravel, sticks, roots, wet.	Soft			
2						
3				17.0		
4		Brown silty SAND with gravel, fine grained, wet to moist. (SM)	Medium Dense to Dense			
5						
6				10.2		
7						
8		Orange brown SILTSTONE, fractured, moist. (Weathered bedrock)	Hard	29.0		
9		Test pit terminated at 8.5 feet. Slight groundwater seepage observed at 4.5 feet. Moderate groundwater seepage observed at 7.5 feet.				
10						
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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LOG OF TEST PIT NO. 32

FIGURE A-27

PROJECT NAME: Talus Parcels 7 and 8 **PROJ. NO:** T-6165 **LOGGED BY:** DPL

LOCATION: Issaquah, Washington **SURFACE CONDS:** Grass **APPROX. ELEV:** 744'

DATE LOGGED: December 11, 2007 **DEPTH TO GROUNDWATER:** N/A **DEPTH TO CAVING:** N/A

DEPTH (FT.)	SAMPLE NO.	DESCRIPTION	CONSISTENCY/ RELATIVE DENSITY	W (%)	POCKET PEN. (TSF)	REMARKS
		12 inches dark brown organic SILT, sticks, roots, wet.	Soft			
1						
2						
3		Reddish-brown sandy elastic SILT with gravel, iron stained, wet. (MH) LL=40 PL=38 PI=2	Medium Stiff	37.8		
4						
5						
6						
7		Orange brown SILTSTONE, fractured, moist. (Weathered bedrock)	Stiff to Hard	27.0		
8						
9				27.0		
10		Test pit terminated at 9.5 feet. No groundwater seepage observed.				
11						
12						
13						
14						
15						

NOTE: This subsurface information pertains only to this test pit location and should not be interpreted as being indicative of other locations at the site.

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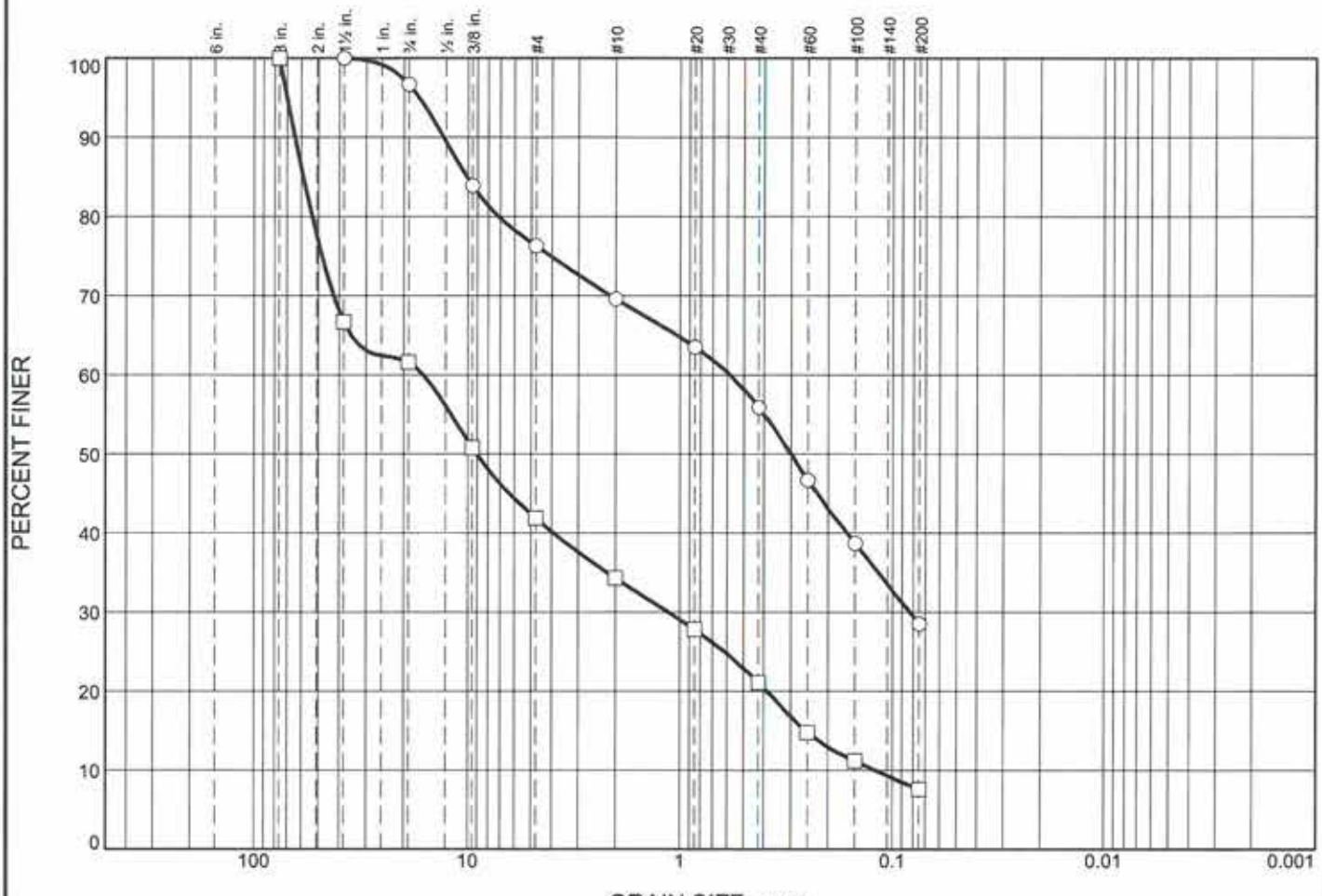
Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	3.3	20.4	6.7	13.7	27.4	28.5	
□	0.0	38.4	19.7	7.6	13.2	13.5	7.6	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			10.1425	0.5834	0.3010	0.0830				
□			58.8253	16.2424	9.0797	1.1273	0.2551	0.1199	0.65	135.43

Material Description	USCS	AASHTO
○ Silty SAND with gravel	SM	
□ Poorly graded GRAVEL with silt and sand	GP-GM	

Project No. T-6165 **Client:** JR Hayes

Project: Talus Parcel 7

Issaquah, Washington

○ **Location:** Test Pit TP-14 **Depth:** -5.5'

□ **Location:** Test Pit TP-17 **Depth:** -2'

Remarks:

○ Tested on 12/13/2007

□ Tested on 12/13/2007

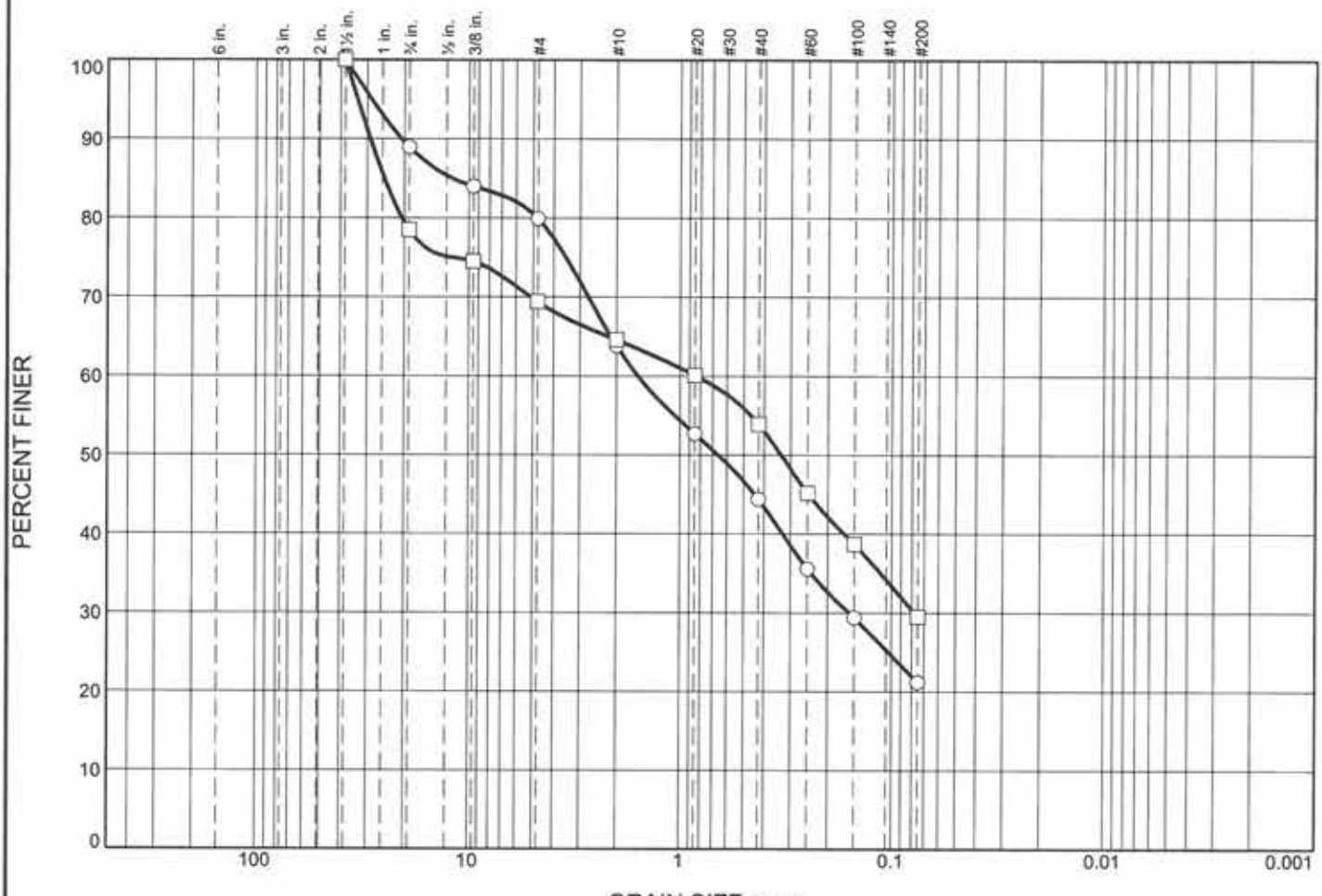
Terra Associates, Inc.

Kirkland, WA

Figure A-28

Tested By: FQ

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	11.0	9.1	16.1	19.4	23.2	21.2	
□	0.0	21.5	9.1	4.8	10.7	24.4	29.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			11.8429	1.5806	0.6576	0.1583				
□			24.9189	0.8360	0.3332	0.0778				

Material Description	USCS	AASHTO
○ Silty SAND with gravel	SM	
□ Silty SAND with gravel	SM	

Project No. T-6165 **Client:** JR Hayes
Project: Talus Parcel 7
Issaquah, Washington
○ **Location:** Test Pit TP-28 **Depth:** -5'
□ **Location:** Test Pit TP-31 **Depth:** -6'

Remarks:
○ Tested on 12/13/2007
□ Tested on 12/13/2007

Terra Associates, Inc.

Kirkland, WA

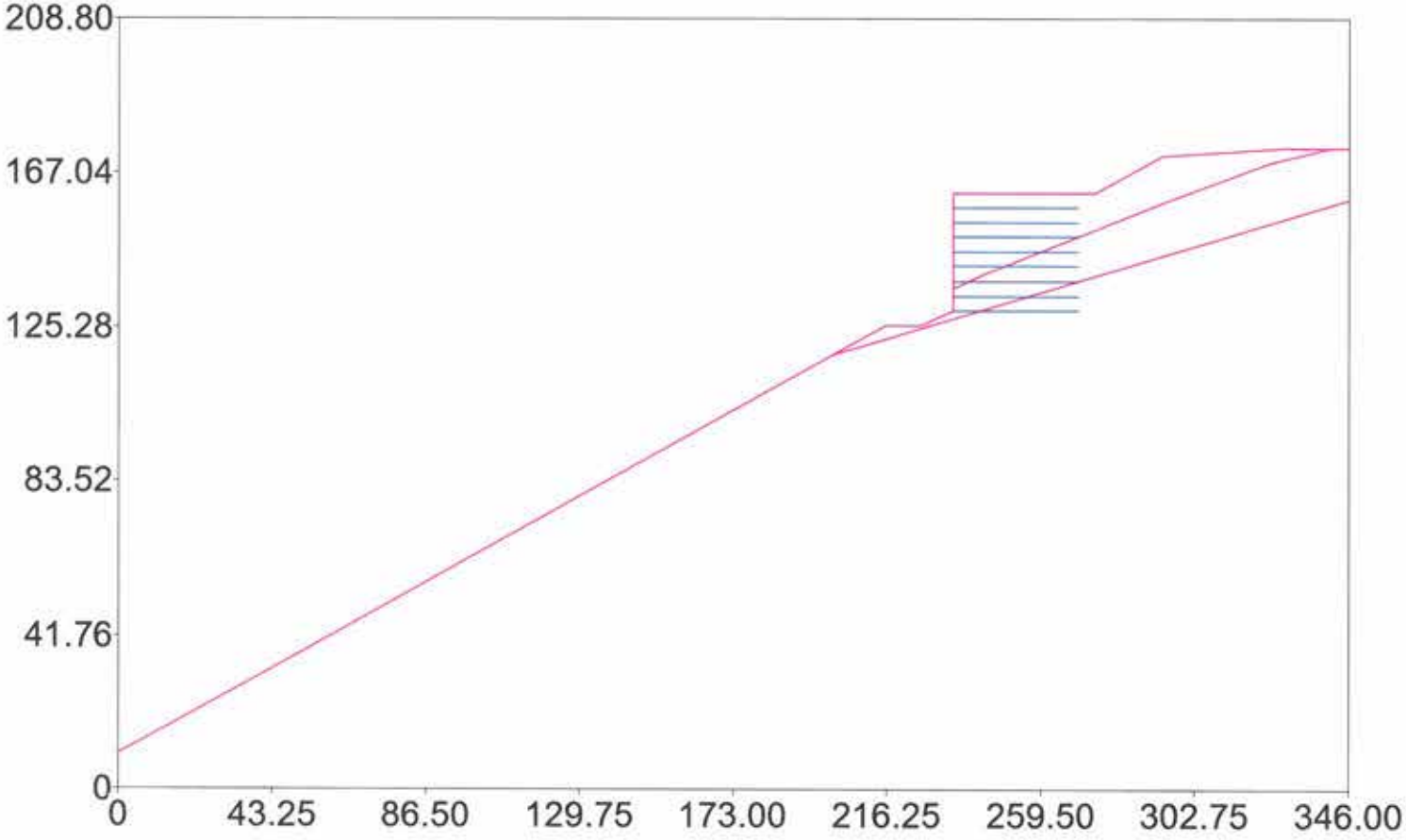
Figure A-29

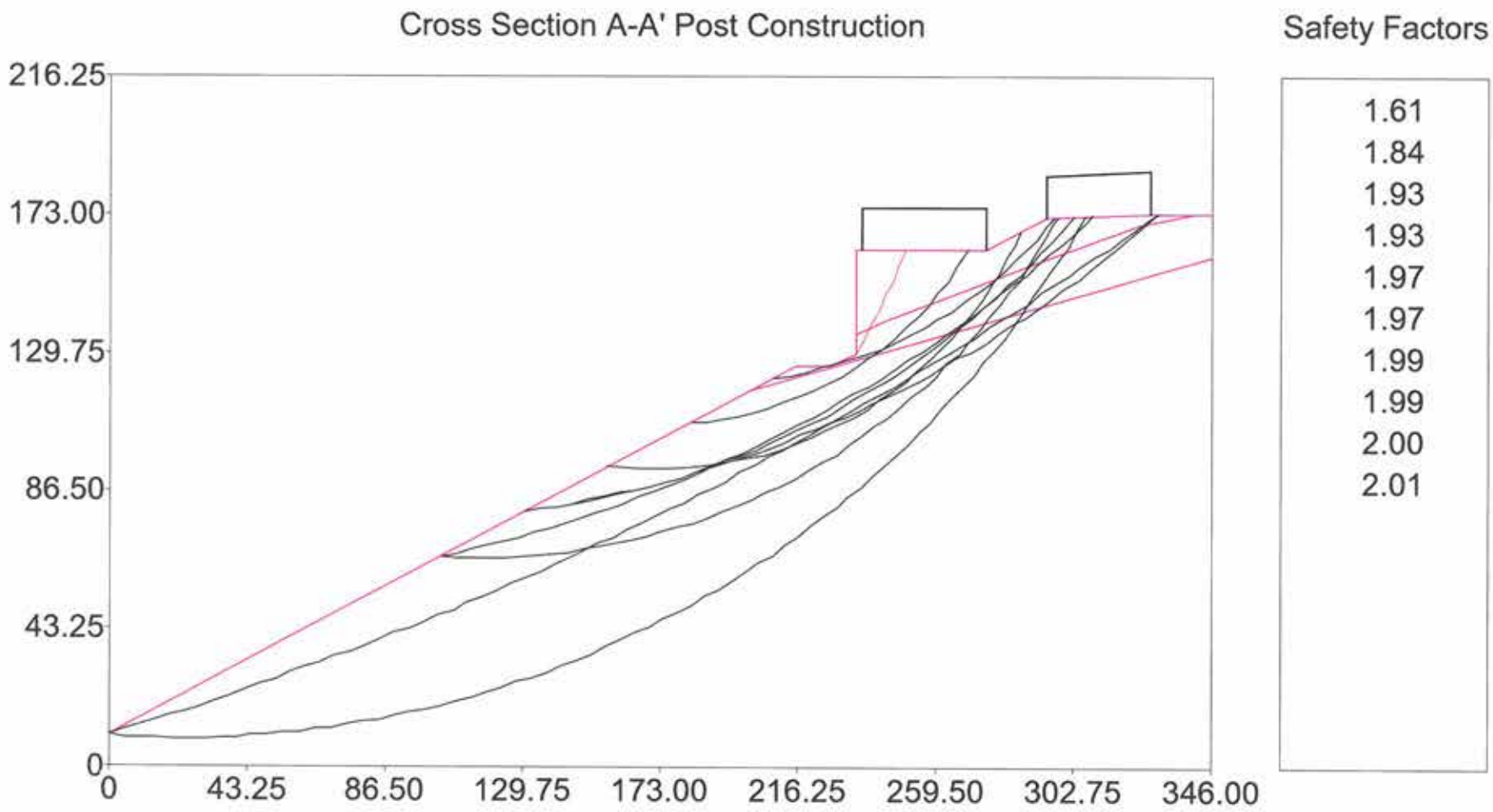
Tested By: FQ

APPENDIX B

WINSTABL GRAPHICAL OUTPUT

Cross Section A-A' Post Construction




Cross Section A-A' Post Construction
Safety Factors
216.25
173.00
129.75
86.50
43.25
0
0
43.25
86.50
129.75
173.00
216.25
259.50
302.75
346.00
1.61
1.84
1.93
1.93
1.97
1.97
1.99
1.99
2.00
2.01

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 Cross Section A-A' Post Construction

BOUNDARY COORDINATES

11 Top Boundaries
16 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	10.00	201.00	118.00	2
2	201.00	118.00	216.00	126.00	1
3	216.00	126.00	226.00	126.00	1
4	226.00	126.00	235.00	130.00	1
5	235.00	130.00	235.01	136.00	1
6	235.01	136.00	235.02	162.00	3
7	235.02	162.00	275.00	162.00	3
8	275.00	162.00	294.00	172.00	3
9	294.00	172.00	327.00	174.00	3
10	327.00	174.00	341.00	174.00	3
11	341.00	174.00	346.00	174.00	1
12	235.01	136.00	244.00	140.00	1
13	244.00	140.00	296.00	160.00	1
14	296.00	160.00	324.00	170.00	1
15	324.00	170.00	341.00	174.00	1
16	201.00	118.00	346.00	160.00	2

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	120.0	135.0	0.0	34.0	0.00	0.0	0
2	145.0	160.0	500.0	42.0	0.00	0.0	0
3	125.0	140.0	0.0	32.0	0.00	0.0	0

BOUNDARY LOAD(S)

2 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	236.00	275.00	2500.0	0.0
2	294.00	327.00	2500.0	0.0

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

REINFORCING LAYER(S)

8 REINFORCING LAYER(S) SPECIFIED

REINFORCING LAYER NO. 1

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	235.00	130.00	14000.00	0.000
2	270.00	130.00	14000.00	0.000

REINFORCING LAYER NO. 2

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	235.01	134.00	14000.00	0.000
2	270.01	134.00	14000.00	0.000

REINFORCING LAYER NO. 3

2 POINTS DEFINE THIS LAYER

POINT	X-COORD	Y-COORD	FORCE	INCLINATION

NO.				FACTOR
1	235.01	138.00	14000.00	0.000
2	270.01	138.00	14000.00	0.000

REINFORCING LAYER NO. 4

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	235.02	142.00	14000.00	0.000
2	270.02	142.00	14000.00	0.000

REINFORCING LAYER NO. 5

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	235.02	146.00	14000.00	0.000
2	270.02	146.00	14000.00	0.000

REINFORCING LAYER NO. 6

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	235.02	150.00	14000.00	0.000
2	270.02	150.00	14000.00	0.000

REINFORCING LAYER NO. 7

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	235.02	154.00	14000.00	0.000
2	270.02	154.00	14000.00	0.000

REINFORCING LAYER NO. 8

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	235.02	158.00	14000.00	0.000

2 270.02 158.00 14000.00 0.000

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

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced Along The Ground Surface Between X = 0.00 ft.
and X = 235.00 ft.

Each Surface Terminates Between X = 250.00 ft.
and X = 346.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00 ft.

5.00 ft. Line Segments Define Each Trial Failure Surface.

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 Bishop Method * *

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	235.00	130.31
2	237.21	134.80
3	239.42	139.28
4	241.62	143.77
5	243.81	148.27
6	246.00	152.76
7	248.18	157.26
8	250.36	161.76
9	250.48	162.00

Circle Center At X = ****** ; Y = 1996.3 and Radius, 4215.7

*** 1.609 ***

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	208.89	122.21
2	213.82	123.04
3	218.72	124.04
4	223.58	125.21
5	228.39	126.56
6	233.16	128.08
7	237.87	129.76
8	242.51	131.61
9	247.09	133.63
10	251.59	135.80
11	256.01	138.14
12	260.35	140.63
13	264.59	143.27
14	268.74	146.06
15	272.79	148.99
16	276.73	152.07
17	280.56	155.29
18	284.27	158.63
19	287.86	162.11
20	291.33	165.72
21	294.67	169.44
22	296.95	172.18

Circle Center At X = 188.0 ; Y = 261.6 and Radius, 141.0

*** 1.835 ***

Failure Surface Specified By 41 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	130.56	80.15
2	135.51	80.83
3	140.45	81.59
4	145.38	82.45
5	150.29	83.40
6	155.18	84.43
7	160.05	85.56
8	164.90	86.77
9	169.73	88.08
10	174.53	89.47
11	179.31	90.95
12	184.05	92.51
13	188.77	94.17
14	193.46	95.90
15	198.12	97.73
16	202.74	99.64
17	207.32	101.63
18	211.87	103.71
19	216.38	105.86
20	220.85	108.11
21	225.28	110.43
22	229.66	112.83
23	234.00	115.31
24	238.30	117.88

25	242.54	120.52
26	246.74	123.23
27	250.89	126.03
28	254.98	128.90
29	259.03	131.84
30	263.01	134.86
31	266.94	137.94
32	270.82	141.10
33	274.64	144.34
34	278.39	147.63
35	282.09	151.00
36	285.72	154.44
37	289.29	157.94
38	292.80	161.50
39	296.24	165.13
40	299.61	168.82
41	302.88	172.54

Circle Center At X = 96.0 ; Y = 351.4 and Radius, 273.5

*** 1.926 ***

Failure Surface Specified By 48 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	104.44	66.12
2	109.32	67.23
3	114.18	68.39
4	119.03	69.61
5	123.87	70.89
6	128.69	72.22
7	133.49	73.60
8	138.28	75.04
9	143.05	76.53
10	147.81	78.07
11	152.55	79.67
12	157.27	81.32
13	161.97	83.02
14	166.65	84.78
15	171.31	86.59
16	175.95	88.45
17	180.57	90.37
18	185.17	92.34
19	189.74	94.35
20	194.29	96.42
21	198.82	98.54
22	203.32	100.71
23	207.80	102.94
24	212.26	105.21
25	216.68	107.53
26	221.08	109.90
27	225.46	112.33
28	229.81	114.80
29	234.12	117.32
30	238.41	119.89
31	242.68	122.50
32	246.91	125.17

33	251.11	127.88
34	255.28	130.64
35	259.42	133.44
36	263.52	136.30
37	267.60	139.19
38	271.64	142.14
39	275.64	145.13
40	279.62	148.16
41	283.56	151.24
42	287.46	154.37
43	291.33	157.53
44	295.16	160.74
45	298.96	164.00
46	302.72	167.29
47	306.44	170.63
48	308.92	172.90

Circle Center At X = 8.4 ; Y = 499.2 and Radius, 443.6

*** 1.928 ***

Failure Surface Specified By 48 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	104.44	66.12
2	109.44	65.88
3	114.44	65.77
4	119.44	65.78
5	124.44	65.90
6	129.43	66.15
7	134.42	66.52
8	139.39	67.01
9	144.36	67.62
10	149.30	68.34
11	154.23	69.19
12	159.14	70.16
13	164.02	71.24
14	168.87	72.45
15	173.69	73.77
16	178.48	75.20
17	183.24	76.75
18	187.95	78.42
19	192.62	80.20
20	197.25	82.09
21	201.83	84.09
22	206.36	86.20
23	210.84	88.42
24	215.27	90.75
25	219.63	93.19
26	223.94	95.73
27	228.18	98.37
28	232.36	101.12
29	236.47	103.96
30	240.52	106.91
31	244.48	109.95
32	248.38	113.09
33	252.20	116.32

34	255.93	119.64
35	259.59	123.05
36	263.16	126.54
37	266.65	130.13
38	270.05	133.79
39	273.36	137.54
40	276.58	141.37
41	279.71	145.27
42	282.74	149.24
43	285.67	153.29
44	288.51	157.41
45	291.24	161.60
46	293.87	165.85
47	296.40	170.16
48	297.54	172.21

Circle Center At X = 116.7 ; Y = 272.6 and Radius, 206.9

*** 1.969 ***

Failure Surface Specified By 46 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	130.56	80.15
2	135.49	80.95
3	140.42	81.81
4	145.33	82.73
5	150.23	83.72
6	155.12	84.77
7	160.00	85.88
8	164.86	87.06
9	169.70	88.30
10	174.53	89.60
11	179.34	90.96
12	184.13	92.39
13	188.90	93.87
14	193.66	95.42
15	198.39	97.03
16	203.11	98.70
17	207.80	100.43
18	212.47	102.22
19	217.11	104.07
20	221.73	105.98
21	226.33	107.95
22	230.90	109.98
23	235.44	112.06
24	239.96	114.21
25	244.45	116.41
26	248.91	118.67
27	253.34	120.99
28	257.74	123.37
29	262.11	125.80
30	266.44	128.29
31	270.75	130.83
32	275.02	133.43
33	279.26	136.08
34	283.46	138.79

35	287.63	141.55
36	291.76	144.36
37	295.86	147.23
38	299.92	150.15
39	303.94	153.12
40	307.92	156.15
41	311.86	159.22
42	315.77	162.35
43	319.63	165.52
44	323.45	168.74
45	327.23	172.02
46	329.46	174.00

Circle Center At X = 71.1 ; Y = 464.0 and Radius, 388.4

*** 1.970 ***

Failure Surface Specified By 75 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	0.00	10.00
2	4.77	11.49
3	9.54	12.99
4	14.30	14.52
5	19.06	16.07
6	23.81	17.64
7	28.55	19.23
8	33.28	20.84
9	38.01	22.47
10	42.72	24.12
11	47.44	25.80
12	52.14	27.49
13	56.84	29.20
14	61.53	30.94
15	66.21	32.70
16	70.88	34.47
17	75.55	36.27
18	80.21	38.09
19	84.86	39.92
20	89.50	41.78
21	94.13	43.66
22	98.76	45.56
23	103.37	47.48
24	107.98	49.42
25	112.58	51.38
26	117.17	53.36
27	121.75	55.36
28	126.33	57.38
29	130.89	59.42
30	135.45	61.48
31	139.99	63.56
32	144.53	65.66
33	149.06	67.78
34	153.58	69.93
35	158.09	72.09
36	162.59	74.27
37	167.08	76.47

38	171.56	78.69
39	176.03	80.92
40	180.49	83.18
41	184.94	85.46
42	189.38	87.76
43	193.81	90.08
44	198.23	92.42
45	202.64	94.77
46	207.04	97.15
47	211.43	99.54
48	215.81	101.96
49	220.17	104.39
50	224.53	106.85
51	228.88	109.32
52	233.21	111.81
53	237.54	114.32
54	241.85	116.85
55	246.15	119.40
56	250.44	121.96
57	254.72	124.55
58	258.99	127.15
59	263.25	129.78
60	267.49	132.42
61	271.72	135.08
62	275.95	137.76
63	280.15	140.46
64	284.35	143.18
65	288.54	145.91
66	292.71	148.66
67	296.87	151.44
68	301.02	154.23
69	305.16	157.03
70	309.28	159.86
71	313.40	162.70
72	317.50	165.57
73	321.58	168.45
74	325.66	171.35
75	329.35	174.00

Circle Center At X = -335.3 ; Y = 1096.1 and Radius, 1136.6

*** 1.989 ***

Failure Surface Specified By 23 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	182.78	108.21
2	187.75	108.70
3	192.70	109.41
4	197.62	110.34
5	202.48	111.49
6	207.29	112.87
7	212.03	114.46
8	216.69	116.26
9	221.27	118.27
10	225.75	120.48
11	230.13	122.90

12	234.40	125.51
13	238.54	128.31
14	242.55	131.29
15	246.42	134.45
16	250.15	137.79
17	253.72	141.29
18	257.13	144.94
19	260.37	148.75
20	263.44	152.70
21	266.32	156.78
22	269.02	160.99
23	269.60	162.00

Circle Center At X = 174.5 ; Y = 218.6 and Radius, 110.7

*** 1.991 ***

Failure Surface Specified By 75 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	0.00	10.00
2	4.99	9.69
3	9.99	9.46
4	14.98	9.31
5	19.98	9.23
6	24.98	9.22
7	29.98	9.30
8	34.98	9.45
9	39.97	9.67
10	44.97	9.97
11	49.95	10.35
12	54.93	10.81
13	59.90	11.34
14	64.87	11.94
15	69.82	12.62
16	74.76	13.38
17	79.69	14.21
18	84.61	15.12
19	89.51	16.10
20	94.40	17.15
21	99.27	18.29
22	104.12	19.49
23	108.96	20.77
24	113.77	22.12
25	118.56	23.55
26	123.33	25.04
27	128.08	26.61
28	132.80	28.26
29	137.50	29.97
30	142.17	31.76
31	146.81	33.62
32	151.42	35.54
33	156.01	37.54
34	160.56	39.61
35	165.08	41.74
36	169.57	43.95
37	174.02	46.22

38	178.44	48.56
39	182.82	50.97
40	187.17	53.45
41	191.47	55.99
42	195.74	58.59
43	199.97	61.26
44	204.15	64.00
45	208.30	66.80
46	212.40	69.66
47	216.45	72.58
48	220.47	75.56
49	224.43	78.61
50	228.35	81.72
51	232.22	84.88
52	236.04	88.10
53	239.82	91.39
54	243.54	94.72
55	247.21	98.12
56	250.83	101.57
57	254.39	105.08
58	257.90	108.63
59	261.36	112.25
60	264.76	115.91
61	268.11	119.63
62	271.40	123.39
63	274.63	127.21
64	277.80	131.08
65	280.91	134.99
66	283.96	138.95
67	286.96	142.95
68	289.89	147.01
69	292.75	151.10
70	295.56	155.24
71	298.30	159.42
72	300.98	163.64
73	303.59	167.91
74	306.14	172.21
75	306.46	172.75

Circle Center At X = 22.7 ; Y = 337.2 and Radius, 328.0

*** 1.999 ***

Failure Surface Specified By 33 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	156.67	94.18
2	161.64	93.70
3	166.64	93.41
4	171.64	93.33
5	176.63	93.44
6	181.62	93.76
7	186.60	94.27
8	191.55	94.98
9	196.46	95.88
10	201.34	96.98
11	206.17	98.27

12	210.95	99.76
13	215.66	101.43
14	220.30	103.29
15	224.86	105.33
16	229.34	107.55
17	233.73	109.95
18	238.02	112.52
19	242.20	115.26
20	246.27	118.16
21	250.23	121.23
22	254.05	124.45
23	257.75	127.81
24	261.31	131.32
25	264.72	134.98
26	267.99	138.76
27	271.11	142.67
28	274.07	146.70
29	276.86	150.85
30	279.49	155.10
31	281.95	159.45
32	284.23	163.90
33	286.04	167.81

Circle Center At X = 171.3 ; Y = 219.0 and Radius, 125.7

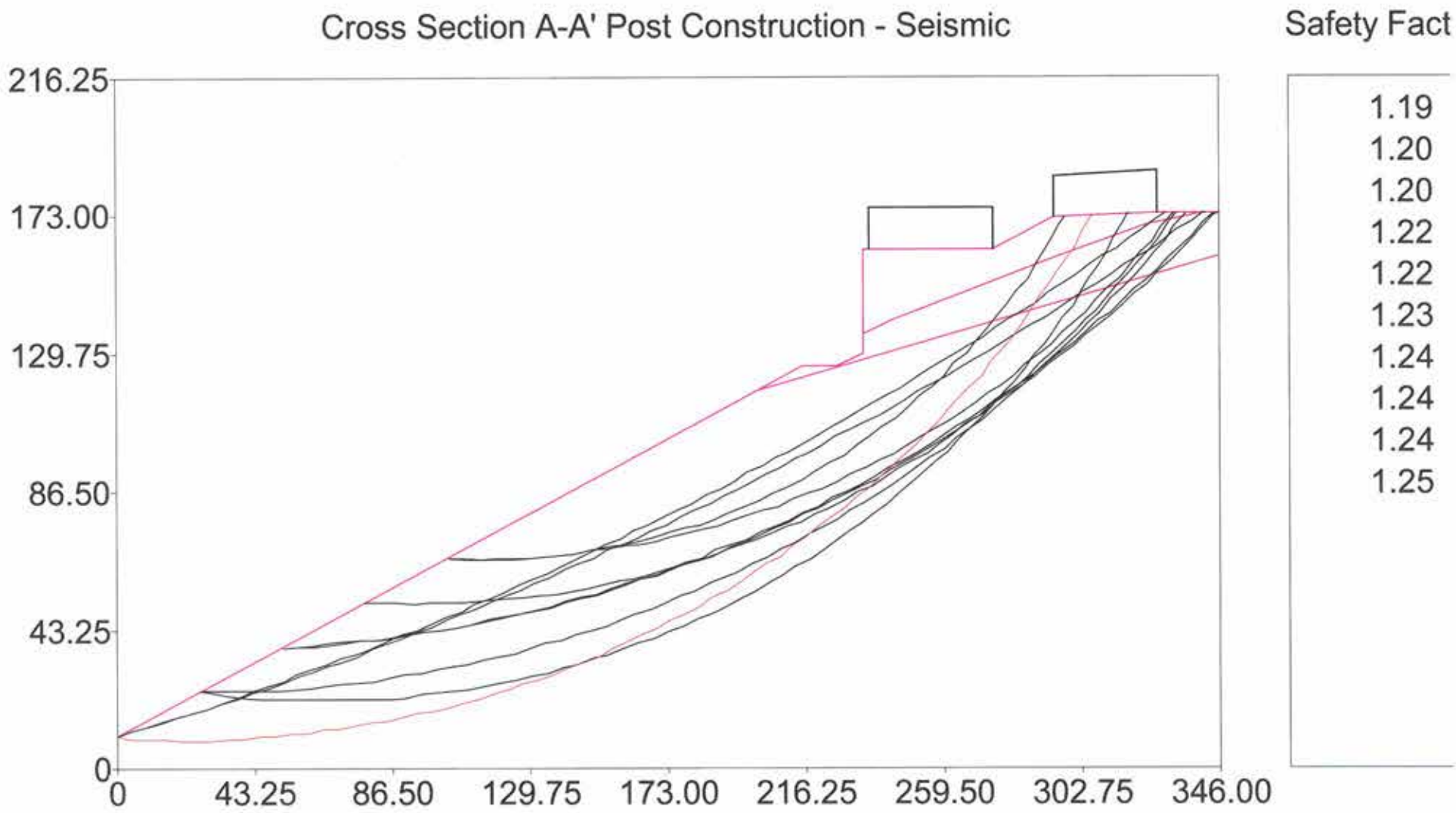
*** 2.005 ***

```
          Y            A     X     I     S            F     T

          0.00     43.25     86.50    129.75    173.00    216.25

X      0.00 +-*-------+---------+---------+---------+---------+
            - 97
            - 97
            -.9 7
            -.9 7..
            -.9 .7.
      43.25 +.9 ..7
            ..9...7  .
            ..99...7..
            ...9 ..77..
            ...9 ...7. .
            -..9.....7 ..
A     86.50 +..99... 77...
            -...9... .7....
            -...99.....7...4
            -....9.....7. .54
            -....9......7..54
            -.....9......7.54.
X    129.75 +.....99.....775.4 3
            .......9......75.4.3
            .......99......75.43.
            ........9..... .5.43..
            .........9......57 43.0
            ..........9.....557 3.0.
I    173.00 ..........99.....577330.
            ... .......99....557.30..8
```

```
             -.. ........9.....5.733..8
             -..  ........99....5.733.88
             -... .........99...5.763..8*
             - .. ..........99...5.733.8 2
S    216.25 + ... ...........9...55034.82*
             -  .. ...........99...5.73388*
             -   .. ............99..5.6338212345678
             -   ................99..556348**RRRRR*/1
             -    .......... ......99.5563422*1111
             -     ..................99..5633288...1
     259.50 +      ..... .............99.5612345678
             -       ..... .............995RRRRRRRR
             -        .....................9665322.*1/
             -          ...................966733220
             -           ....... .............6753220
             -             ...... .............679*32*/2
F    302.75 +               ....................67.933
             -                ....................66744
             -                  ....................6..
             -                     ..................**2/
             -                        ................6
             -                           ............*
T    346.00 +                                 . ..*..*
```


Cross Section A-A' Post Construction - Seismic
Safety Fact
216.25
173.00
129.75
86.50
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86.50
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1.19
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1.22
1.22
1.23
1.24
1.24
1.24
1.25

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 Cross Section A-A' Post Construction - S
eismic

BOUNDARY COORDINATES

11 Top Boundaries
16 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	10.00	201.00	118.00	2
2	201.00	118.00	216.00	126.00	1
3	216.00	126.00	226.00	126.00	1
4	226.00	126.00	235.00	130.00	1
5	235.00	130.00	235.01	136.00	1
6	235.01	136.00	235.02	162.00	3
7	235.02	162.00	275.00	162.00	3
8	275.00	162.00	294.00	172.00	3
9	294.00	172.00	327.00	174.00	3
10	327.00	174.00	341.00	174.00	3
11	341.00	174.00	346.00	174.00	1
12	235.01	136.00	244.00	140.00	1
13	244.00	140.00	296.00	160.00	1
14	296.00	160.00	324.00	170.00	1
15	324.00	170.00	341.00	174.00	1
16	201.00	118.00	346.00	160.00	2

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	120.0	135.0	0.0	34.0	0.00	0.0	0
2	145.0	160.0	500.0	42.0	0.00	0.0	0
3	125.0	140.0	0.0	32.0	0.00	0.0	0

A Horizontal Earthquake Loading Coefficient
Of0.310 Has Been Assigned

A Vertical Earthquake Loading Coefficient
Of0.000 Has Been Assigned

Cavitation Pressure = 0.0 psf

BOUNDARY LOAD(S)

2 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	236.00	275.00	2500.0	0.0
2	294.00	327.00	2500.0	0.0

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

REINFORCING LAYER(S)

8 REINFORCING LAYER(S) SPECIFIED

REINFORCING LAYER NO. 1

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	235.00	130.00	14000.00	0.000
2	270.00	130.00	14000.00	0.000

REINFORCING LAYER NO. 2

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR

1	235.01	134.00	14000.00	0.000
2	270.01	134.00	14000.00	0.000

REINFORCING LAYER NO. 3

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	235.01	138.00	14000.00	0.000
2	270.01	138.00	14000.00	0.000

REINFORCING LAYER NO. 4

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	235.02	142.00	14000.00	0.000
2	270.02	142.00	14000.00	0.000

REINFORCING LAYER NO. 5

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	235.02	146.00	14000.00	0.000
2	270.02	146.00	14000.00	0.000

REINFORCING LAYER NO. 6

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	235.02	150.00	14000.00	0.000
2	270.02	150.00	14000.00	0.000

REINFORCING LAYER NO. 7

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	235.02	154.00	14000.00	0.000
2	270.02	154.00	14000.00	0.000

REINFORCING LAYER NO. 8

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	235.02	158.00	14000.00	0.000
2	270.02	158.00	14000.00	0.000

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

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced Along The Ground Surface Between X = 0.00 ft.
and X = 235.00 ft.

Each Surface Terminates Between X = 250.00 ft.
and X = 346.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00 ft.

5.00 ft. Line Segments Define Each Trial Failure Surface.

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 Bishop Method * *

Failure Surface Specified By 75 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	0.00	10.00
2	4.99	9.69
3	9.99	9.46
4	14.98	9.31
5	19.98	9.23
6	24.98	9.22
7	29.98	9.30
8	34.98	9.45
9	39.97	9.67
10	44.97	9.97

11	49.95	10.35
12	54.93	10.81
13	59.90	11.34
14	64.87	11.94
15	69.82	12.62
16	74.76	13.38
17	79.69	14.21
18	84.61	15.12
19	89.51	16.10
20	94.40	17.15
21	99.27	18.29
22	104.12	19.49
23	108.96	20.77
24	113.77	22.12
25	118.56	23.55
26	123.33	25.04
27	128.08	26.61
28	132.80	28.26
29	137.50	29.97
30	142.17	31.76
31	146.81	33.62
32	151.42	35.54
33	156.01	37.54
34	160.56	39.61
35	165.08	41.74
36	169.57	43.95
37	174.02	46.22
38	178.44	48.56
39	182.82	50.97
40	187.17	53.45
41	191.47	55.99
42	195.74	58.59
43	199.97	61.26
44	204.15	64.00
45	208.30	66.80
46	212.40	69.66
47	216.45	72.58
48	220.47	75.56
49	224.43	78.61
50	228.35	81.72
51	232.22	84.88
52	236.04	88.10
53	239.82	91.39
54	243.54	94.72
55	247.21	98.12
56	250.83	101.57
57	254.39	105.08
58	257.90	108.63
59	261.36	112.25
60	264.76	115.91
61	268.11	119.63
62	271.40	123.39
63	274.63	127.21
64	277.80	131.08
65	280.91	134.99
66	283.96	138.95
67	286.96	142.95
68	289.89	147.01
69	292.75	151.10
70	295.56	155.24
71	298.30	159.42
72	300.98	163.64
73	303.59	167.91

74	306.14	172.21
75	306.46	172.75

Circle Center At X = 22.7 ; Y = 337.2 and Radius, 328.0

*** 1.191 ***

Failure Surface Specified By 73 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	26.11	24.03
2	31.11	24.06
3	36.11	24.15
4	41.11	24.30
5	46.10	24.52
6	51.10	24.80
7	56.08	25.14
8	61.07	25.55
9	66.05	26.02
10	71.02	26.55
11	75.98	27.14
12	80.94	27.80
13	85.89	28.52
14	90.82	29.31
15	95.75	30.15
16	100.67	31.06
17	105.57	32.03
18	110.47	33.06
19	115.34	34.16
20	120.21	35.31
21	125.06	36.53
22	129.89	37.81
23	134.71	39.15
24	139.51	40.55
25	144.29	42.01
26	149.05	43.54
27	153.80	45.12
28	158.52	46.76
29	163.22	48.46
30	167.90	50.22
31	172.56	52.04
32	177.19	53.92
33	181.80	55.86
34	186.38	57.86
35	190.94	59.91
36	195.47	62.02
37	199.98	64.19
38	204.46	66.42
39	208.90	68.70
40	213.32	71.04
41	217.71	73.43
42	222.07	75.88
43	226.40	78.39
44	230.69	80.95
45	234.96	83.56
46	239.19	86.23
47	243.38	88.95

48	247.54	91.72
49	251.67	94.55
50	255.75	97.43
51	259.81	100.36
52	263.82	103.34
53	267.80	106.37
54	271.73	109.45
55	275.63	112.58
56	279.49	115.76
57	283.31	118.99
58	287.08	122.27
59	290.82	125.60
60	294.51	128.97
61	298.16	132.39
62	301.76	135.85
63	305.33	139.36
64	308.84	142.91
65	312.31	146.51
66	315.74	150.15
67	319.12	153.84
68	322.45	157.57
69	325.74	161.34
70	328.97	165.15
71	332.16	169.00
72	335.30	172.89
73	336.17	174.00

Circle Center At X = 26.5 ; Y = 418.7 and Radius, 394.7

*** 1.198 ***

Failure Surface Specified By 78 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	0.00	10.00
2	4.78	11.46
3	9.56	12.94
4	14.33	14.44
5	19.09	15.96
6	23.85	17.50
7	28.60	19.06
8	33.34	20.64
9	38.08	22.23
10	42.82	23.85
11	47.54	25.48
12	52.26	27.13
13	56.97	28.80
14	61.68	30.49
15	66.38	32.20
16	71.07	33.93
17	75.75	35.68
18	80.43	37.44
19	85.10	39.23
20	89.77	41.03
21	94.42	42.85
22	99.07	44.69
23	103.71	46.55

24	108.35	48.43
25	112.97	50.32
26	117.59	52.24
27	122.20	54.17
28	126.81	56.12
29	131.40	58.09
30	135.99	60.08
31	140.57	62.09
32	145.14	64.11
33	149.70	66.16
34	154.26	68.22
35	158.81	70.30
36	163.35	72.40
37	167.88	74.51
38	172.40	76.65
39	176.91	78.80
40	181.41	80.97
41	185.91	83.16
42	190.40	85.37
43	194.87	87.59
44	199.34	89.83
45	203.80	92.09
46	208.25	94.37
47	212.70	96.67
48	217.13	98.98
49	221.55	101.31
50	225.96	103.66
51	230.37	106.03
52	234.76	108.41
53	239.15	110.82
54	243.52	113.24
55	247.89	115.67
56	252.24	118.13
57	256.59	120.60
58	260.93	123.09
59	265.25	125.60
60	269.57	128.12
61	273.87	130.67
62	278.17	133.22
63	282.46	135.80
64	286.73	138.39
65	290.99	141.00
66	295.25	143.63
67	299.49	146.28
68	303.72	148.94
69	307.95	151.62
70	312.16	154.31
71	316.36	157.02
72	320.55	159.75
73	324.73	162.50
74	328.89	165.26
75	333.05	168.04
76	337.20	170.84
77	341.33	173.65
78	341.84	174.00

Circle Center At X = -362.3 ; Y = 1203.4 and Radius, 1247.2

*** 1.200 ***

Failure Surface Specified By 75 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	0.00	10.00
2	4.77	11.49
3	9.54	12.99
4	14.30	14.52
5	19.06	16.07
6	23.81	17.64
7	28.55	19.23
8	33.28	20.84
9	38.01	22.47
10	42.72	24.12
11	47.44	25.80
12	52.14	27.49
13	56.84	29.20
14	61.53	30.94
15	66.21	32.70
16	70.88	34.47
17	75.55	36.27
18	80.21	38.09
19	84.86	39.92
20	89.50	41.78
21	94.13	43.66
22	98.76	45.56
23	103.37	47.48
24	107.98	49.42
25	112.58	51.38
26	117.17	53.36
27	121.75	55.36
28	126.33	57.38
29	130.89	59.42
30	135.45	61.48
31	139.99	63.56
32	144.53	65.66
33	149.06	67.78
34	153.58	69.93
35	158.09	72.09
36	162.59	74.27
37	167.08	76.47
38	171.56	78.69
39	176.03	80.92
40	180.49	83.18
41	184.94	85.46
42	189.38	87.76
43	193.81	90.08
44	198.23	92.42
45	202.64	94.77
46	207.04	97.15
47	211.43	99.54
48	215.81	101.96
49	220.17	104.39
50	224.53	106.85
51	228.88	109.32
52	233.21	111.81
53	237.54	114.32
54	241.85	116.85
55	246.15	119.40
56	250.44	121.96
57	254.72	124.55

58	258.99	127.15
59	263.25	129.78
60	267.49	132.42
61	271.72	135.08
62	275.95	137.76
63	280.15	140.46
64	284.35	143.18
65	288.54	145.91
66	292.71	148.66
67	296.87	151.44
68	301.02	154.23
69	305.16	157.03
70	309.28	159.86
71	313.40	162.70
72	317.50	165.57
73	321.58	168.45
74	325.66	171.35
75	329.35	174.00

Circle Center At X = -335.3 ; Y = 1096.1 and Radius, 1136.6

*** 1.218 ***

Failure Surface Specified By 68 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	52.22	38.06
2	57.21	38.37
3	62.20	38.75
4	67.18	39.17
5	72.16	39.66
6	77.13	40.20
7	82.09	40.80
8	87.05	41.46
9	92.00	42.17
10	96.94	42.94
11	101.87	43.76
12	106.79	44.65
13	111.70	45.59
14	116.60	46.58
15	121.49	47.63
16	126.37	48.74
17	131.23	49.90
18	136.08	51.12
19	140.91	52.39
20	145.73	53.72
21	150.54	55.11
22	155.33	56.55
23	160.10	58.04
24	164.85	59.59
25	169.59	61.19
26	174.31	62.85
27	179.00	64.56
28	183.68	66.33
29	188.34	68.14
30	192.98	70.02
31	197.59	71.94

32	202.18	73.92
33	206.75	75.95
34	211.30	78.03
35	215.82	80.16
36	220.32	82.35
37	224.79	84.58
38	229.23	86.87
39	233.65	89.21
40	238.05	91.60
41	242.41	94.04
42	246.75	96.53
43	251.05	99.07
44	255.33	101.66
45	259.58	104.29
46	263.80	106.98
47	267.99	109.71
48	272.14	112.49
49	276.26	115.32
50	280.35	118.20
51	284.41	121.12
52	288.43	124.09
53	292.42	127.10
54	296.38	130.16
55	300.30	133.27
56	304.18	136.42
57	308.03	139.61
58	311.84	142.85
59	315.61	146.13
60	319.34	149.46
61	323.04	152.82
62	326.70	156.23
63	330.32	159.68
64	333.89	163.17
65	337.43	166.71
66	340.93	170.28
67	344.39	173.89
68	344.49	174.00

Circle Center At X = 27.3 ; Y = 473.8 and Radius, 436.4

*** 1.221 ***

Failure Surface Specified By 68 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	52.22	38.06
2	57.21	38.35
3	62.20	38.70
4	67.19	39.10
5	72.16	39.56
6	77.14	40.08
7	82.10	40.66
8	87.06	41.29
9	92.02	41.98
10	96.96	42.73
11	101.90	43.53
12	106.82	44.39

13	111.74	45.31
14	116.64	46.28
15	121.53	47.31
16	126.41	48.40
17	131.28	49.54
18	136.14	50.74
19	140.98	51.99
20	145.80	53.30
21	150.61	54.66
22	155.41	56.08
23	160.18	57.56
24	164.94	59.09
25	169.69	60.67
26	174.41	62.31
27	179.11	64.00
28	183.80	65.75
29	188.46	67.55
30	193.11	69.41
31	197.73	71.31
32	202.33	73.27
33	206.91	75.29
34	211.46	77.35
35	215.99	79.47
36	220.49	81.64
37	224.97	83.86
38	229.43	86.14
39	233.85	88.46
40	238.25	90.83
41	242.63	93.26
42	246.97	95.73
43	251.29	98.26
44	255.57	100.83
45	259.83	103.46
46	264.05	106.13
47	268.25	108.85
48	272.41	111.62
49	276.54	114.44
50	280.64	117.30
51	284.71	120.21
52	288.74	123.17
53	292.74	126.17
54	296.70	129.22
55	300.63	132.32
56	304.52	135.46
57	308.37	138.64
58	312.19	141.87
59	315.97	145.14
60	319.71	148.46
61	323.42	151.81
62	327.08	155.21
63	330.71	158.66
64	334.30	162.14
65	337.84	165.66
66	341.35	169.23
67	344.81	172.84
68	345.91	174.00

Circle Center At X = 29.5 ; Y = 472.3 and Radius, 434.8

*** 1.226 ***

Failure Surface Specified By 48 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	104.44	66.12
2	109.44	65.88
3	114.44	65.77
4	119.44	65.78
5	124.44	65.90
6	129.43	66.15
7	134.42	66.52
8	139.39	67.01
9	144.36	67.62
10	149.30	68.34
11	154.23	69.19
12	159.14	70.16
13	164.02	71.24
14	168.87	72.45
15	173.69	73.77
16	178.48	75.20
17	183.24	76.75
18	187.95	78.42
19	192.62	80.20
20	197.25	82.09
21	201.83	84.09
22	206.36	86.20
23	210.84	88.42
24	215.27	90.75
25	219.63	93.19
26	223.94	95.73
27	228.18	98.37
28	232.36	101.12
29	236.47	103.96
30	240.52	106.91
31	244.48	109.95
32	248.38	113.09
33	252.20	116.32
34	255.93	119.64
35	259.59	123.05
36	263.16	126.54
37	266.65	130.13
38	270.05	133.79
39	273.36	137.54
40	276.58	141.37
41	279.71	145.27
42	282.74	149.24
43	285.67	153.29
44	288.51	157.41
45	291.24	161.60
46	293.87	165.85
47	296.40	170.16
48	297.54	172.21

Circle Center At X = 116.7 ; Y = 272.6 and Radius, 206.9

*** 1.237 ***

Failure Surface Specified By 71 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	26.11	24.03
2	31.07	23.40
3	36.04	22.86
4	41.02	22.41
5	46.01	22.05
6	51.00	21.77
7	56.00	21.58
8	61.00	21.47
9	66.00	21.45
10	71.00	21.53
11	75.99	21.68
12	80.99	21.93
13	85.98	22.26
14	90.96	22.68
15	95.93	23.19
16	100.90	23.78
17	105.85	24.46
18	110.79	25.23
19	115.72	26.08
20	120.63	27.02
21	125.52	28.04
22	130.40	29.15
23	135.26	30.34
24	140.09	31.62
25	144.90	32.98
26	149.69	34.43
27	154.45	35.96
28	159.18	37.57
29	163.88	39.27
30	168.56	41.05
31	173.20	42.90
32	177.81	44.84
33	182.38	46.86
34	186.92	48.96
35	191.42	51.14
36	195.88	53.40
37	200.30	55.73
38	204.68	58.14
39	209.02	60.63
40	213.31	63.19
41	217.56	65.83
42	221.76	68.54
43	225.92	71.32
44	230.02	74.18
45	234.08	77.10
46	238.08	80.10
47	242.03	83.17
48	245.92	86.30
49	249.76	89.50
50	253.55	92.77
51	257.27	96.11
52	260.94	99.51
53	264.54	102.97
54	268.09	106.50
55	271.57	110.08
56	274.99	113.73
57	278.35	117.44

58	281.64	121.20
59	284.87	125.02
60	288.02	128.90
61	291.11	132.83
62	294.13	136.81
63	297.08	140.85
64	299.96	144.94
65	302.77	149.08
66	305.51	153.26
67	308.17	157.49
68	310.75	161.77
69	313.27	166.10
70	315.70	170.46
71	317.28	173.41

Circle Center At X = 64.5 ; Y = 307.8 and Radius, 286.3

*** 1.240 ***

Failure Surface Specified By 60 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	78.33	52.09
2	83.33	51.87
3	88.33	51.73
4	93.33	51.68
5	98.33	51.71
6	103.33	51.83
7	108.32	52.03
8	113.31	52.31
9	118.30	52.69
10	123.28	53.14
11	128.25	53.68
12	133.21	54.31
13	138.16	55.01
14	143.10	55.81
15	148.02	56.68
16	152.93	57.64
17	157.82	58.69
18	162.69	59.81
19	167.54	61.02
20	172.37	62.31
21	177.18	63.69
22	181.96	65.14
23	186.72	66.67
24	191.45	68.29
25	196.16	69.99
26	200.83	71.76
27	205.47	73.62
28	210.08	75.55
29	214.66	77.56
30	219.20	79.65
31	223.71	81.81
32	228.18	84.05
33	232.61	86.37
34	237.00	88.76
35	241.35	91.23

36	245.66	93.77
37	249.92	96.38
38	254.14	99.07
39	258.31	101.82
40	262.44	104.65
41	266.51	107.54
42	270.54	110.51
43	274.51	113.54
44	278.44	116.64
45	282.31	119.81
46	286.12	123.04
47	289.88	126.33
48	293.59	129.69
49	297.23	133.11
50	300.82	136.60
51	304.35	140.14
52	307.82	143.74
53	311.22	147.40
54	314.57	151.12
55	317.85	154.89
56	321.06	158.72
57	324.21	162.61
58	327.29	166.54
59	330.31	170.53
60	332.84	174.00

Circle Center At X = 93.9 ; Y = 346.1 and Radius, 294.5

*** 1.244 ***

Failure Surface Specified By 54 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	104.44	66.12
2	109.44	65.99
3	114.44	65.95
4	119.44	66.00
5	124.44	66.14
6	129.44	66.37
7	134.42	66.70
8	139.41	67.11
9	144.38	67.62
10	149.35	68.22
11	154.30	68.91
12	159.24	69.69
13	164.16	70.56
14	169.07	71.51
15	173.96	72.56
16	178.83	73.70
17	183.67	74.93
18	188.50	76.24
19	193.30	77.65
20	198.07	79.14
21	202.81	80.71
22	207.53	82.38
23	212.21	84.13
24	216.86	85.96

25	221.48	87.88
26	226.06	89.89
27	230.60	91.98
28	235.11	94.15
29	239.57	96.40
30	243.99	98.73
31	248.37	101.15
32	252.71	103.64
33	256.99	106.21
34	261.23	108.86
35	265.42	111.59
36	269.56	114.40
37	273.65	117.27
38	277.69	120.23
39	281.67	123.25
40	285.59	126.35
41	289.46	129.52
42	293.26	132.76
43	297.01	136.07
44	300.70	139.45
45	304.32	142.90
46	307.88	146.41
47	311.38	149.98
48	314.81	153.62
49	318.17	157.32
50	321.47	161.08
51	324.69	164.90
52	327.85	168.78
53	330.93	172.71
54	331.90	174.00

Circle Center At X = 114.2 ; Y = 339.4 and Radius, 273.4

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      ***     1.255   ***



           Y            A     X     I     S            F     T

           0.00     43.25     86.50    129.75    173.00    216.25

X       0.00 +-*-------+---------+---------+---------+---------+
             - 13
             - 13
             -.1 3
             -.1 382
             -.1 .32
      43.25 +.1 .82
             ..1..82  5
             ..11.823.5
             ...1 82345.
             ...1 82.35 .
             -..1.82.33 .9
A     86.50 +..118.2 34.9.
             -...18.2 .3.9..
             -...11.2..339..7
             -....1822.539 .7.
             -....18.2.653..7.
             -.....1.2..593.7..
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X    129.75 +.....11.2.55347.. .
            .......1.2..59340...
            .......11.2.59337....
            ........1.2..5 33.....
            .........1.2.59.34 ....
            .........8122.5.734 ....
I    173.00 ..........112.55.734....
            ... ......8112.5.733......
            -.. .......812295.733.....
            -..  .......811.550734.....
            -... ........811.5.7.34....*
            - .. .........8116507.34... .
S    216.25 + ... .........8216507334....*
            -  .. ..........8115507334...*
            -   .. ..........88115.7.34...12345678
            -   ...............2110.733...**RRRRR*/1
            -    .......... ...88211.7334...*....
            -     ...............8211..344.......
     259.50 +      ..... .........82511.3412345678
            -       ..... ..........220113RRRRRRRR
            -        ................225.13447...*1/
            -          ................22.111477...
            -           ....... ........2288311777..
            -             ...... ........52283411*77*/2
F    302.75 +               ...............220384.111
            -                ...............5223344.1
            -                  ...............5223488
            -                     .............5223**2/
            -                        ............5224
            -                           ..........63*
T    346.00 +                                 . ..*..*
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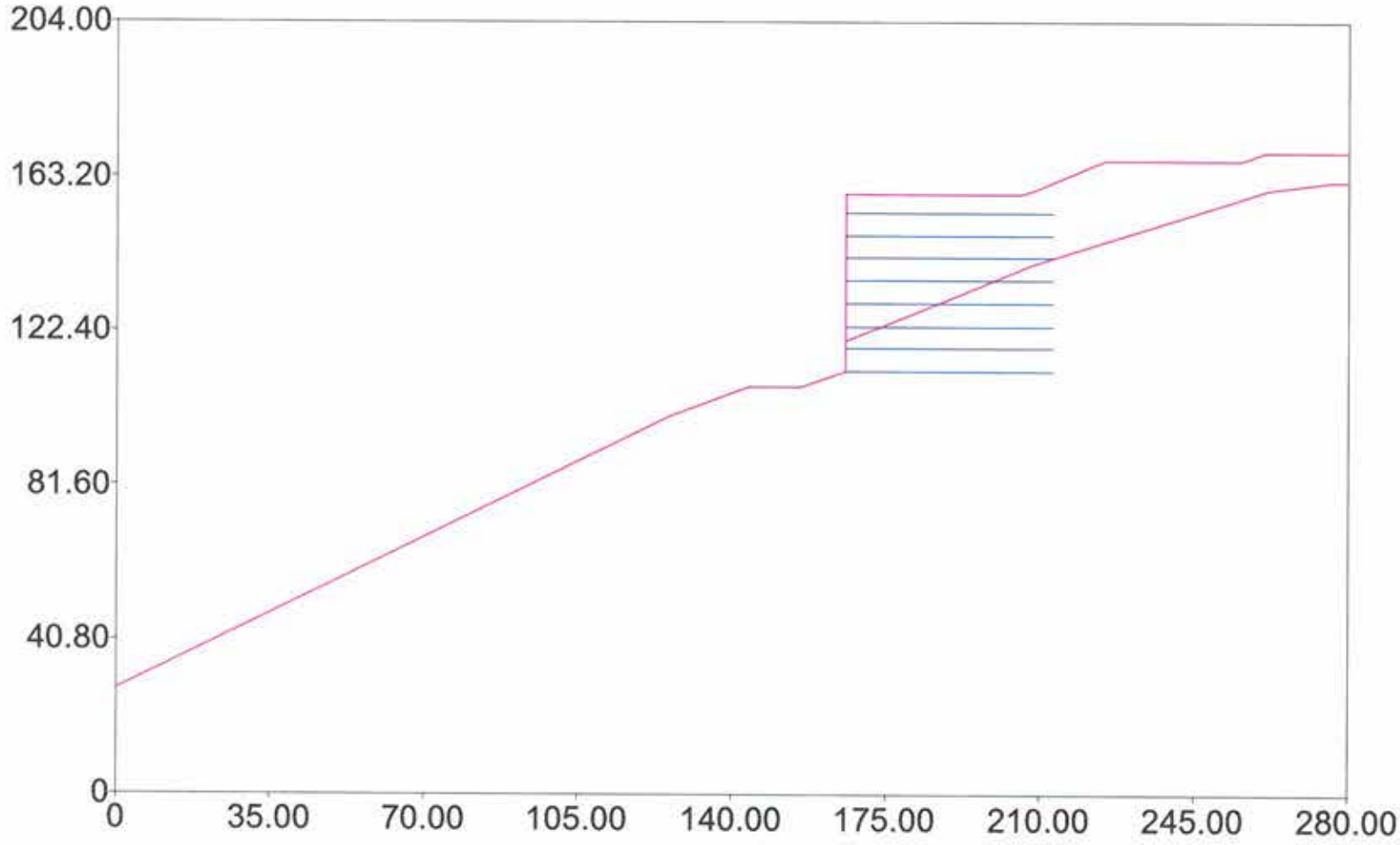
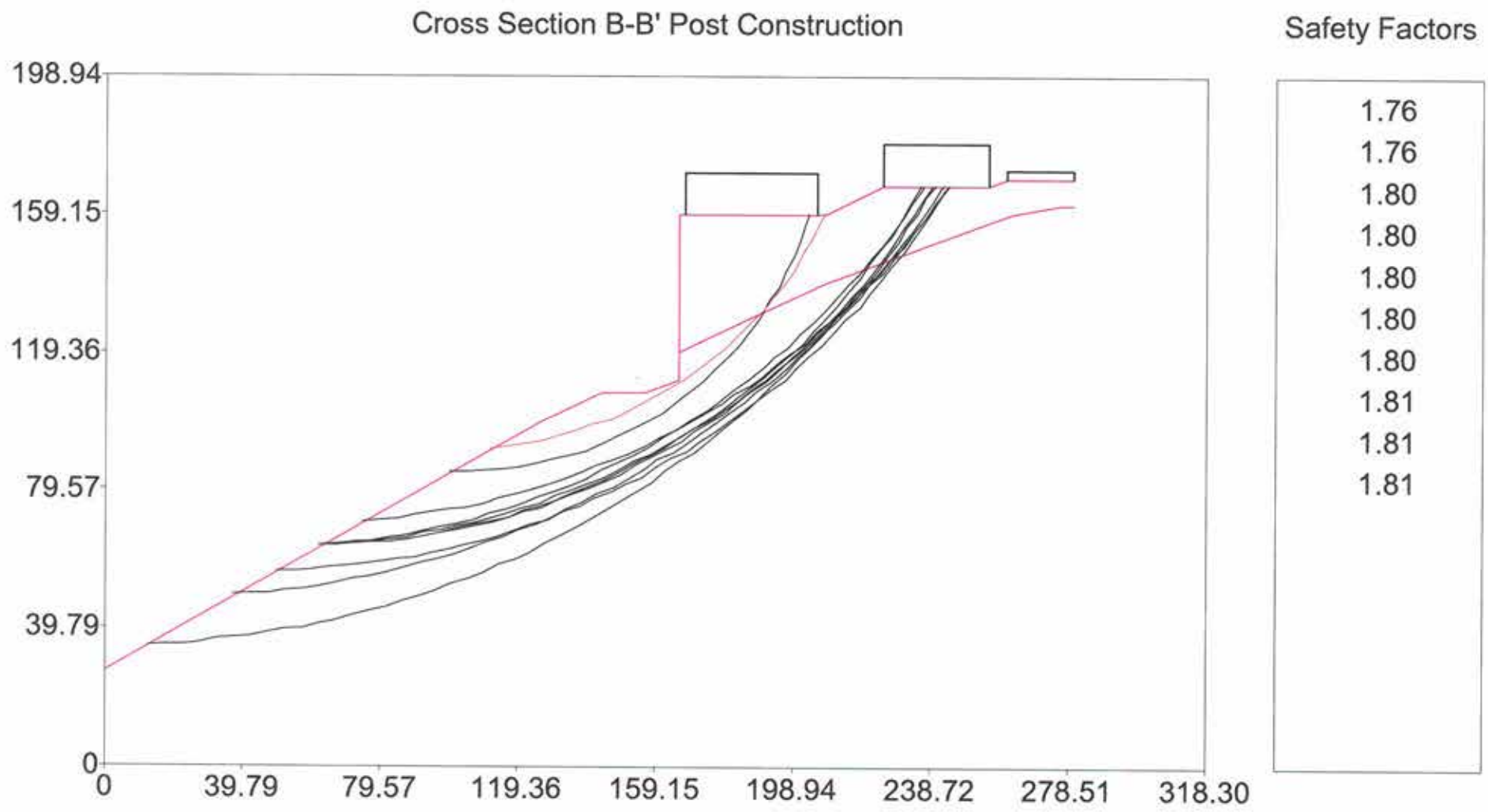
Cross Section B-B' Post Construction




Cross Section B-B' Post Construction
Safety Factors
198.94
159.15
119.36
79.57
39.79
0
0
39.79
79.57
119.36
159.15
198.94
238.72
278.51
318.30
1.76
1.76
1.80
1.80
1.80
1.80
1.80
1.81
1.81
1.81

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 Cross Section B-B' Post Construction

BOUNDARY COORDINATES

12 Top Boundaries
17 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	28.00	126.00	100.00	2
2	126.00	100.00	144.00	108.00	2
3	144.00	108.00	156.00	108.00	2
4	156.00	108.00	166.00	112.00	2
5	166.00	112.00	166.01	120.00	2
6	166.01	120.00	166.02	159.00	3
7	166.02	159.00	206.00	159.00	3
8	206.00	159.00	209.00	160.00	3
9	209.00	160.00	225.00	168.00	3
10	225.00	168.00	256.00	168.00	3
11	256.00	168.00	261.00	170.00	3
12	261.00	170.00	280.00	170.00	3
13	166.01	120.00	187.00	130.00	2
14	187.00	130.00	208.00	140.00	2
15	208.00	140.00	262.00	160.00	2
16	262.00	160.00	276.00	162.00	2
17	276.00	162.00	280.00	162.00	2

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	120.0	135.0	0.0	34.0	0.00	0.0	0
2	145.0	160.0	500.0	42.0	0.00	0.0	0
3	125.0	140.0	0.0	32.0	0.00	0.0	0

BOUNDARY LOAD(S)

3 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	168.00	206.00	2500.0	0.0
2	225.00	256.00	2500.0	0.0
3	261.00	280.00	500.0	0.0

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

REINFORCING LAYER(S)

8 REINFORCING LAYER(S) SPECIFIED

REINFORCING LAYER NO. 1

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	166.00	112.00	12000.00	0.000
2	213.00	112.00	12000.00	0.000

REINFORCING LAYER NO. 2

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	166.01	118.00	12000.00	0.000
2	213.01	118.00	12000.00	0.000

REINFORCING LAYER NO. 3

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	166.02	124.00	12000.00	0.000
2	213.02	124.00	12000.00	0.000

REINFORCING LAYER NO. 4

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	166.02	130.00	12000.00	0.000
2	213.02	130.00	12000.00	0.000

REINFORCING LAYER NO. 5

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	166.02	136.00	12000.00	0.000
2	213.02	136.00	12000.00	0.000

REINFORCING LAYER NO. 6

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	166.02	142.00	12000.00	0.000
2	213.02	142.00	12000.00	0.000

REINFORCING LAYER NO. 7

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	166.02	148.00	12000.00	0.000
2	213.02	148.00	12000.00	0.000

REINFORCING LAYER NO. 8

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR

1	166.02	154.00	12000.00	0.000
2	213.02	154.00	12000.00	0.000

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

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced Along The Ground Surface Between X = 0.00 ft.
and X = 112.00 ft.

Each Surface Terminates Between X = 157.00 ft.
and X = 244.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00 ft.

5.00 ft. Line Segments Define Each Trial Failure Surface.

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 Bishop Method * *

Failure Surface Specified By 26 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	112.00	92.00
2	116.97	92.58
3	121.90	93.37
4	126.80	94.37
5	131.66	95.58
6	136.45	96.98
7	141.19	98.59
8	145.85	100.39
9	150.43	102.39
10	154.93	104.58
11	159.33	106.96
12	163.62	109.52
13	167.80	112.26
14	171.87	115.18
15	175.81	118.26
16	179.61	121.50
17	183.28	124.90
18	186.79	128.45

19	190.16	132.15
20	193.37	135.99
21	196.41	139.96
22	199.28	144.05
23	201.98	148.26
24	204.50	152.58
25	206.84	157.00
26	208.13	159.71

Circle Center At X = 100.6 ; Y = 210.3 and Radius, 118.8

*** 1.758 ***

Failure Surface Specified By 29 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	99.56	84.89
2	104.56	84.84
3	109.55	85.03
4	114.53	85.46
5	119.49	86.12
6	124.41	87.02
7	129.28	88.16
8	134.09	89.52
9	138.83	91.11
10	143.49	92.92
11	148.06	94.95
12	152.52	97.20
13	156.88	99.66
14	161.11	102.32
15	165.21	105.18
16	169.17	108.23
17	172.98	111.47
18	176.64	114.88
19	180.12	118.47
20	183.44	122.21
21	186.57	126.11
22	189.51	130.15
23	192.25	134.33
24	194.80	138.64
25	197.13	143.06
26	199.26	147.58
27	201.16	152.21
28	202.85	156.91
29	203.48	159.00

Circle Center At X = 103.1 ; Y = 190.0 and Radius, 105.1

*** 1.765 ***

Failure Surface Specified By 44 Coordinate Points

Point	X-Surf	Y-Surf

No.	(ft)	(ft)
1	62.22	63.56
2	67.22	63.73
3	72.21	64.02
4	77.19	64.43
5	82.17	64.97
6	87.12	65.62
7	92.06	66.40
8	96.98	67.30
9	101.87	68.32
10	106.74	69.46
11	111.58	70.72
12	116.39	72.09
13	121.16	73.58
14	125.90	75.19
15	130.59	76.92
16	135.24	78.75
17	139.84	80.71
18	144.40	82.77
19	148.90	84.94
20	153.35	87.23
21	157.74	89.62
22	162.07	92.12
23	166.34	94.72
24	170.54	97.43
25	174.68	100.24
26	178.74	103.15
27	182.74	106.15
28	186.66	109.26
29	190.50	112.46
30	194.26	115.75
31	197.94	119.14
32	201.54	122.61
33	205.05	126.17
34	208.47	129.81
35	211.81	133.54
36	215.05	137.35
37	218.19	141.24
38	221.24	145.20
39	224.20	149.23
40	227.05	153.34
41	229.80	157.51
42	232.45	161.75
43	234.99	166.06
44	236.08	168.00

Circle Center At X = 57.8 ; Y = 267.9 and Radius, 204.4

*** 1.799 ***

Failure Surface Specified By 48 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	49.78	56.44
2	54.78	56.57
3	59.77	56.81

4	64.76	57.15
5	69.74	57.60
6	74.71	58.16
7	79.66	58.83
8	84.60	59.61
9	89.52	60.49
10	94.43	61.48
11	99.30	62.57
12	104.16	63.77
13	108.98	65.08
14	113.78	66.48
15	118.55	68.00
16	123.28	69.61
17	127.97	71.33
18	132.63	73.15
19	137.25	75.07
20	141.82	77.09
21	146.35	79.21
22	150.83	81.42
23	155.27	83.74
24	159.65	86.15
25	163.98	88.65
26	168.25	91.24
27	172.47	93.93
28	176.62	96.71
29	180.72	99.58
30	184.75	102.54
31	188.72	105.58
32	192.62	108.71
33	196.45	111.92
34	200.21	115.21
35	203.90	118.59
36	207.52	122.04
37	211.05	125.58
38	214.52	129.18
39	217.90	132.87
40	221.20	136.62
41	224.42	140.45
42	227.56	144.34
43	230.61	148.30
44	233.57	152.33
45	236.45	156.42
46	239.23	160.57
47	241.93	164.78
48	243.90	168.00

Circle Center At X = 46.4 ; Y = 287.0 and Radius, 230.6

*** 1.800 ***

Failure Surface Specified By 51 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	37.33	49.33
2	42.32	49.72
3	47.30	50.20
4	52.26	50.77

5	57.22	51.43
6	62.16	52.18
7	67.09	53.02
8	72.00	53.95
9	76.90	54.97
10	81.77	56.08
11	86.63	57.29
12	91.46	58.58
13	96.26	59.95
14	101.04	61.42
15	105.80	62.98
16	110.52	64.62
17	115.21	66.35
18	119.87	68.16
19	124.49	70.06
20	129.08	72.04
21	133.64	74.11
22	138.15	76.26
23	142.62	78.50
24	147.05	80.81
25	151.44	83.21
26	155.79	85.69
27	160.08	88.24
28	164.33	90.88
29	168.53	93.59
30	172.68	96.38
31	176.78	99.25
32	180.82	102.19
33	184.81	105.20
34	188.75	108.29
35	192.62	111.45
36	196.44	114.68
37	200.20	117.97
38	203.89	121.34
39	207.53	124.78
40	211.10	128.28
41	214.60	131.84
42	218.04	135.47
43	221.41	139.16
44	224.72	142.92
45	227.95	146.73
46	231.11	150.60
47	234.20	154.53
48	237.22	158.52
49	240.17	162.56
50	243.04	166.65
51	243.94	168.00

Circle Center At X = 18.8 ; Y = 320.8 and Radius, 272.1

*** 1.801 ***

Failure Surface Specified By 44 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	62.22	63.56
2	67.22	63.72

3	72.21	64.01
4	77.20	64.42
5	82.17	64.94
6	87.13	65.58
7	92.07	66.34
8	96.99	67.22
9	101.89	68.22
10	106.76	69.33
11	111.61	70.56
12	116.43	71.90
13	121.21	73.36
14	125.96	74.93
15	130.67	76.61
16	135.33	78.41
17	139.95	80.31
18	144.53	82.33
19	149.06	84.45
20	153.53	86.69
21	157.95	89.02
22	162.31	91.47
23	166.62	94.01
24	170.86	96.66
25	175.04	99.41
26	179.15	102.25
27	183.19	105.20
28	187.16	108.24
29	191.05	111.37
30	194.87	114.60
31	198.62	117.91
32	202.28	121.31
33	205.86	124.81
34	209.36	128.38
35	212.77	132.04
36	216.09	135.77
37	219.32	139.59
38	222.46	143.48
39	225.51	147.44
40	228.46	151.48
41	231.31	155.59
42	234.07	159.76
43	236.72	164.00
44	239.10	168.00

Circle Center At X = 57.7 ; Y = 273.2 and Radius, 209.7

*** 1.803 ***

Failure Surface Specified By 45 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	62.22	63.56
2	67.21	63.88
3	72.19	64.31
4	77.16	64.84
5	82.12	65.49
6	87.07	66.24
7	91.99	67.11

8	96.90	68.07
9	101.78	69.15
10	106.64	70.33
11	111.47	71.62
12	116.27	73.01
13	121.04	74.50
14	125.78	76.10
15	130.48	77.81
16	135.14	79.61
17	139.77	81.52
18	144.35	83.52
19	148.88	85.63
20	153.37	87.83
21	157.81	90.13
22	162.20	92.53
23	166.53	95.02
24	170.81	97.60
25	175.04	100.28
26	179.20	103.05
27	183.30	105.91
28	187.34	108.86
29	191.31	111.89
30	195.22	115.01
31	199.06	118.22
32	202.82	121.51
33	206.52	124.88
34	210.14	128.32
35	213.68	131.85
36	217.15	135.45
37	220.54	139.13
38	223.84	142.88
39	227.07	146.71
40	230.21	150.60
41	233.26	154.56
42	236.23	158.58
43	239.11	162.67
44	241.90	166.82
45	242.65	168.00

Circle Center At X = 50.0 ; Y = 292.8 and Radius, 229.6

*** 1.803 ***

Failure Surface Specified By 56 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	12.44	35.11
2	17.44	35.31
3	22.43	35.61
4	27.42	35.99
5	32.39	36.47
6	37.36	37.03
7	42.32	37.68
8	47.26	38.43
9	52.19	39.26
10	57.11	40.18
11	62.01	41.19

12	66.88	42.29
13	71.74	43.48
14	76.57	44.76
15	81.38	46.12
16	86.17	47.57
17	90.93	49.11
18	95.66	50.73
19	100.36	52.44
20	105.02	54.23
21	109.66	56.11
22	114.26	58.07
23	118.82	60.11
24	123.35	62.24
25	127.83	64.44
26	132.28	66.73
27	136.68	69.10
28	141.04	71.55
29	145.36	74.07
30	149.63	76.68
31	153.85	79.36
32	158.02	82.12
33	162.14	84.95
34	166.21	87.86
35	170.22	90.83
36	174.18	93.89
37	178.09	97.01
38	181.94	100.20
39	185.72	103.46
40	189.45	106.80
41	193.12	110.19
42	196.73	113.66
43	200.27	117.18
44	203.75	120.78
45	207.16	124.43
46	210.51	128.14
47	213.79	131.92
48	217.00	135.75
49	220.14	139.65
50	223.20	143.59
51	226.20	147.60
52	229.12	151.65
53	231.97	155.76
54	234.75	159.92
55	237.45	164.13
56	239.83	168.00

Circle Center At X = 3.7 ; Y = 311.0 and Radius, 276.0

*** 1.808 ***

Failure Surface Specified By 42 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	74.67	70.67
2	79.65	71.10
3	84.62	71.63
4	89.58	72.28

5	94.52	73.04
6	99.44	73.91
7	104.35	74.89
8	109.23	75.97
9	114.08	77.16
10	118.91	78.46
11	123.71	79.87
12	128.48	81.38
13	133.21	83.00
14	137.90	84.72
15	142.56	86.54
16	147.17	88.47
17	151.74	90.50
18	156.26	92.63
19	160.74	94.86
20	165.17	97.19
21	169.54	99.61
22	173.86	102.13
23	178.12	104.75
24	182.32	107.46
25	186.46	110.26
26	190.54	113.15
27	194.55	116.14
28	198.50	119.21
29	202.37	122.36
30	206.18	125.61
31	209.91	128.93
32	213.57	132.34
33	217.15	135.83
34	220.66	139.39
35	224.08	143.04
36	227.43	146.75
37	230.69	150.55
38	233.86	154.41
39	236.95	158.34
40	239.96	162.34
41	242.87	166.40
42	243.96	168.00

Circle Center At X = 57.8 ; Y = 296.0 and Radius, 225.9

*** 1.808 ***

Failure Surface Specified By 44 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	62.22	63.56
2	67.20	63.98
3	72.18	64.52
4	77.13	65.16
5	82.08	65.91
6	87.00	66.78
7	91.91	67.75
8	96.79	68.82
9	101.65	70.01
10	106.48	71.30
11	111.28	72.70

12	116.05	74.20
13	120.78	75.81
14	125.48	77.52
15	130.14	79.34
16	134.76	81.25
17	139.33	83.27
18	143.86	85.39
19	148.34	87.61
20	152.77	89.92
21	157.15	92.33
22	161.48	94.84
23	165.75	97.44
24	169.96	100.14
25	174.11	102.93
26	178.20	105.81
27	182.22	108.78
28	186.18	111.83
29	190.07	114.97
30	193.89	118.20
31	197.63	121.51
32	201.31	124.90
33	204.90	128.38
34	208.43	131.93
35	211.87	135.55
36	215.23	139.26
37	218.51	143.03
38	221.70	146.88
39	224.81	150.79
40	227.83	154.78
41	230.77	158.82
42	233.61	162.94
43	236.36	167.11
44	236.92	168.00

Circle Center At X = 45.4 ; Y = 290.1 and Radius, 227.1

*** 1.811 ***

```
          Y            A     X     I     S            F     T

          0.00     39.79     79.58    119.36    159.15    198.94
X      0.00 +------*--+---------+---------+---------+---------+
            -     ...
            -    ....8
            -   .....8.
            -   .....8..
            -   .....8..
      39.79 +  ......8..5.
            -  .......8..5
            - . ......8..54.
            - . ......8..54.3
            - . .......8.54.3
            - . .. ....8..443 9
A     79.58 + . .......88.54309
            - . ........8.54379..
            - . ........88.4.39..
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              - .  ........8.54309.2
              - .  .........8.4379.2.
              -  . .........885439.2.1
X     119.36 +  . .... .....8.4379.21.
              -  .. ..........84439.2.1*
              -   . ...........843392.1
              -    . ..........884399211
              -    ..............8437221.*
              -     . ...........844392.1.
I     159.15 +      ..............843922*1 23 45 67 8
              -       . ............443.2.*.*R RR RR R*/1
              -        ..............8339221..
              -         . ............4439.211. .
              -          .. ............439..11*.....
              -            ..............4330..112.....
S     198.94 +              .............4433...1112..
              -               ............1.23345*6718*1/
              -                 ..........R.RR4RR3RR.R*.
              -                  .............44330.....
              -                      ...........44533..*/2
              -                         ..........445333
      238.72 +                              ........4443
              -                                     ...4
              -
              -                                        **/3
              -                                      *
              -
F     278.51 +                                        * *3/
              -
              -
              -
              -
              -
T     318.30 +
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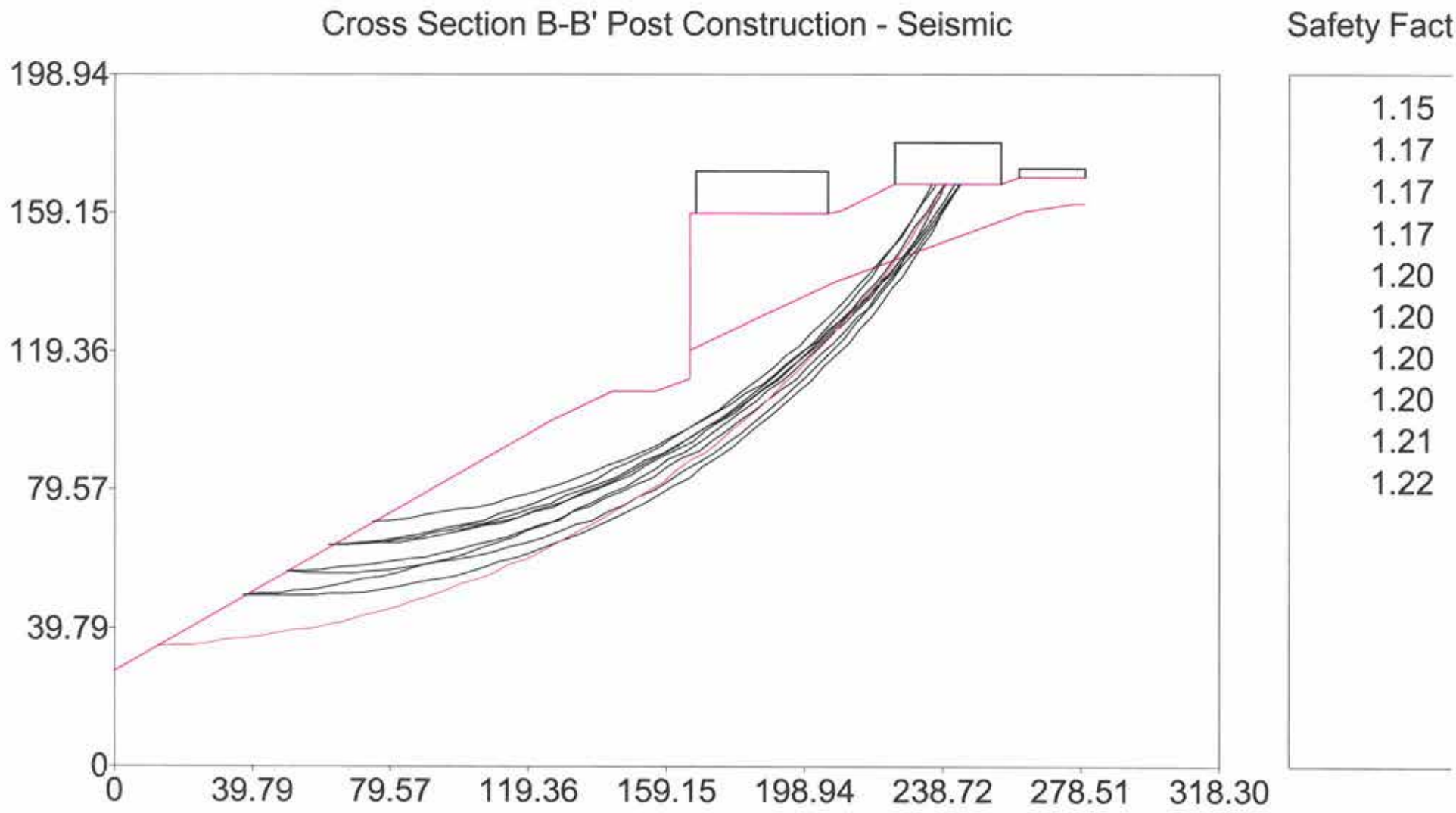
Cross Section B-B' Post Construction - Seismic
Safety Fact
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Profile.out
** PCSTABL6 **

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 Cross Section B-B' Post Construction - S
eismic

BOUNDARY COORDINATES

12 Top Boundaries
17 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	28.00	126.00	100.00	2
2	126.00	100.00	144.00	108.00	2
3	144.00	108.00	156.00	108.00	2
4	156.00	108.00	166.00	112.00	2
5	166.00	112.00	166.01	120.00	2
6	166.01	120.00	166.02	159.00	3
7	166.02	159.00	206.00	159.00	3
8	206.00	159.00	209.00	160.00	3
9	209.00	160.00	225.00	168.00	3
10	225.00	168.00	256.00	168.00	3
11	256.00	168.00	261.00	170.00	3
12	261.00	170.00	280.00	170.00	3
13	166.01	120.00	187.00	130.00	2
14	187.00	130.00	208.00	140.00	2
15	208.00	140.00	262.00	160.00	2
16	262.00	160.00	276.00	162.00	2
17	276.00	162.00	280.00	162.00	2

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	120.0	135.0	0.0	34.0	0.00	0.0	0
2	145.0	160.0	500.0	42.0	0.00	0.0	0
3	125.0	140.0	0.0	32.0	0.00	0.0	0

A Horizontal Earthquake Loading Coefficient
Of0.310 Has Been Assigned

A Vertical Earthquake Loading Coefficient
Of0.000 Has Been Assigned

Cavitation Pressure = 0.0 psf

BOUNDARY LOAD(S)

3 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	168.00	206.00	2500.0	0.0
2	225.00	256.00	2500.0	0.0
3	261.00	280.00	500.0	0.0

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

REINFORCING LAYER(S)

8 REINFORCING LAYER(S) SPECIFIED

REINFORCING LAYER NO. 1

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	166.00	112.00	12000.00	0.000
2	213.00	112.00	12000.00	0.000

REINFORCING LAYER NO. 2

2 POINTS DEFINE THIS LAYER

POINT	X-COORD	Y-COORD	FORCE	INCLINATION

NO.				FACTOR
1	166.01	118.00	12000.00	0.000
2	213.01	118.00	12000.00	0.000

REINFORCING LAYER NO. 3

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	166.02	124.00	12000.00	0.000
2	213.02	124.00	12000.00	0.000

REINFORCING LAYER NO. 4

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	166.02	130.00	12000.00	0.000
2	213.02	130.00	12000.00	0.000

REINFORCING LAYER NO. 5

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	166.02	136.00	12000.00	0.000
2	213.02	136.00	12000.00	0.000

REINFORCING LAYER NO. 6

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	166.02	142.00	12000.00	0.000
2	213.02	142.00	12000.00	0.000

REINFORCING LAYER NO. 7

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	166.02	148.00	12000.00	0.000

2	213.02	148.00	12000.00	0.000

REINFORCING LAYER NO. 8

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	166.02	154.00	12000.00	0.000
2	213.02	154.00	12000.00	0.000

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

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced Along The Ground Surface Between X = 0.00 ft.
and X = 112.00 ft.

Each Surface Terminates Between X = 157.00 ft.
and X = 244.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00 ft.

5.00 ft. Line Segments Define Each Trial Failure Surface.

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 Bishop Method * *

Failure Surface Specified By 56 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	12.44	35.11
2	17.44	35.31
3	22.43	35.61
4	27.42	35.99
5	32.39	36.47
6	37.36	37.03
7	42.32	37.68
8	47.26	38.43

9	52.19	39.26
10	57.11	40.18
11	62.01	41.19
12	66.88	42.29
13	71.74	43.48
14	76.57	44.76
15	81.38	46.12
16	86.17	47.57
17	90.93	49.11
18	95.66	50.73
19	100.36	52.44
20	105.02	54.23
21	109.66	56.11
22	114.26	58.07
23	118.82	60.11
24	123.35	62.24
25	127.83	64.44
26	132.28	66.73
27	136.68	69.10
28	141.04	71.55
29	145.36	74.07
30	149.63	76.68
31	153.85	79.36
32	158.02	82.12
33	162.14	84.95
34	166.21	87.86
35	170.22	90.83
36	174.18	93.89
37	178.09	97.01
38	181.94	100.20
39	185.72	103.46
40	189.45	106.80
41	193.12	110.19
42	196.73	113.66
43	200.27	117.18
44	203.75	120.78
45	207.16	124.43
46	210.51	128.14
47	213.79	131.92
48	217.00	135.75
49	220.14	139.65
50	223.20	143.59
51	226.20	147.60
52	229.12	151.65
53	231.97	155.76
54	234.75	159.92
55	237.45	164.13
56	239.83	168.00

Circle Center At X = 3.7 ; Y = 311.0 and Radius, 276.0

*** 1.152 ***

Failure Surface Specified By 51 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	37.33	49.33

2	42.32	49.72
3	47.30	50.20
4	52.26	50.77
5	57.22	51.43
6	62.16	52.18
7	67.09	53.02
8	72.00	53.95
9	76.90	54.97
10	81.77	56.08
11	86.63	57.29
12	91.46	58.58
13	96.26	59.95
14	101.04	61.42
15	105.80	62.98
16	110.52	64.62
17	115.21	66.35
18	119.87	68.16
19	124.49	70.06
20	129.08	72.04
21	133.64	74.11
22	138.15	76.26
23	142.62	78.50
24	147.05	80.81
25	151.44	83.21
26	155.79	85.69
27	160.08	88.24
28	164.33	90.88
29	168.53	93.59
30	172.68	96.38
31	176.78	99.25
32	180.82	102.19
33	184.81	105.20
34	188.75	108.29
35	192.62	111.45
36	196.44	114.68
37	200.20	117.97
38	203.89	121.34
39	207.53	124.78
40	211.10	128.28
41	214.60	131.84
42	218.04	135.47
43	221.41	139.16
44	224.72	142.92
45	227.95	146.73
46	231.11	150.60
47	234.20	154.53
48	237.22	158.52
49	240.17	162.56
50	243.04	166.65
51	243.94	168.00

Circle Center At X = 18.8 ; Y = 320.8 and Radius, 272.1

*** 1.170 ***

Failure Surface Specified By 52 Coordinate Points

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

1	37.33	49.33
2	42.33	49.18
3	47.33	49.15
4	52.33	49.22
5	57.33	49.41
6	62.32	49.70
7	67.30	50.11
8	72.27	50.64
9	77.23	51.27
10	82.18	52.01
11	87.10	52.87
12	92.01	53.84
13	96.89	54.91
14	101.75	56.10
15	106.58	57.39
16	111.38	58.79
17	116.15	60.30
18	120.88	61.92
19	125.57	63.64
20	130.23	65.46
21	134.84	67.39
22	139.41	69.43
23	143.93	71.56
24	148.40	73.80
25	152.82	76.14
26	157.19	78.57
27	161.50	81.10
28	165.75	83.73
29	169.95	86.45
30	174.08	89.27
31	178.14	92.18
32	182.15	95.18
33	186.08	98.27
34	189.94	101.44
35	193.73	104.70
36	197.44	108.05
37	201.08	111.48
38	204.65	114.99
39	208.13	118.58
40	211.53	122.24
41	214.85	125.98
42	218.08	129.80
43	221.23	133.68
44	224.28	137.64
45	227.25	141.66
46	230.13	145.75
47	232.92	149.90
48	235.61	154.12
49	238.20	158.39
50	240.70	162.72
51	243.10	167.11
52	243.57	168.00

Circle Center At X = 46.5 ; Y = 271.9 and Radius, 222.8

*** 1.171 ***

Failure Surface Specified By 48 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	49.78	56.44
2	54.78	56.57
3	59.77	56.81
4	64.76	57.15
5	69.74	57.60
6	74.71	58.16
7	79.66	58.83
8	84.60	59.61
9	89.52	60.49
10	94.43	61.48
11	99.30	62.57
12	104.16	63.77
13	108.98	65.08
14	113.78	66.48
15	118.55	68.00
16	123.28	69.61
17	127.97	71.33
18	132.63	73.15
19	137.25	75.07
20	141.82	77.09
21	146.35	79.21
22	150.83	81.42
23	155.27	83.74
24	159.65	86.15
25	163.98	88.65
26	168.25	91.24
27	172.47	93.93
28	176.62	96.71
29	180.72	99.58
30	184.75	102.54
31	188.72	105.58
32	192.62	108.71
33	196.45	111.92
34	200.21	115.21
35	203.90	118.59
36	207.52	122.04
37	211.05	125.58
38	214.52	129.18
39	217.90	132.87
40	221.20	136.62
41	224.42	140.45
42	227.56	144.34
43	230.61	148.30
44	233.57	152.33
45	236.45	156.42
46	239.23	160.57
47	241.93	164.78
48	243.90	168.00

Circle Center At X = 46.4 ; Y = 287.0 and Radius, 230.6

*** 1.175 ***

Failure Surface Specified By 45 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	62.22	63.56
2	67.21	63.88
3	72.19	64.31
4	77.16	64.84
5	82.12	65.49
6	87.07	66.24
7	91.99	67.11
8	96.90	68.07
9	101.78	69.15
10	106.64	70.33
11	111.47	71.62
12	116.27	73.01
13	121.04	74.50
14	125.78	76.10
15	130.48	77.81
16	135.14	79.61
17	139.77	81.52
18	144.35	83.52
19	148.88	85.63
20	153.37	87.83
21	157.81	90.13
22	162.20	92.53
23	166.53	95.02
24	170.81	97.60
25	175.04	100.28
26	179.20	103.05
27	183.30	105.91
28	187.34	108.86
29	191.31	111.89
30	195.22	115.01
31	199.06	118.22
32	202.82	121.51
33	206.52	124.88
34	210.14	128.32
35	213.68	131.85
36	217.15	135.45
37	220.54	139.13
38	223.84	142.88
39	227.07	146.71
40	230.21	150.60
41	233.26	154.56
42	236.23	158.58
43	239.11	162.67
44	241.90	166.82
45	242.65	168.00

Circle Center At X = 50.0 ; Y = 292.8 and Radius, 229.6

*** 1.197 ***

Failure Surface Specified By 48 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	49.78	56.44

2	54.77	56.21
3	59.77	56.11
4	64.77	56.13
5	69.77	56.27
6	74.76	56.55
7	79.75	56.95
8	84.72	57.47
9	89.68	58.12
10	94.62	58.90
11	99.53	59.80
12	104.43	60.82
13	109.29	61.97
14	114.13	63.24
15	118.93	64.63
16	123.70	66.14
17	128.42	67.78
18	133.11	69.53
19	137.74	71.40
20	142.33	73.39
21	146.87	75.49
22	151.35	77.70
23	155.78	80.03
24	160.14	82.47
25	164.44	85.02
26	168.68	87.68
27	172.85	90.44
28	176.94	93.31
29	180.96	96.28
30	184.91	99.35
31	188.78	102.52
32	192.56	105.78
33	196.26	109.14
34	199.88	112.60
35	203.41	116.14
36	206.84	119.77
37	210.19	123.49
38	213.44	127.29
39	216.59	131.17
40	219.64	135.13
41	222.59	139.17
42	225.44	143.28
43	228.18	147.46
44	230.82	151.71
45	233.35	156.02
46	235.77	160.40
47	238.08	164.83
48	239.62	168.00

Circle Center At X = 61.5 ; Y = 253.9 and Radius, 197.8

*** 1.198 ***

Failure Surface Specified By 44 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	62.22	63.56
2	67.22	63.72

3	72.21	64.01
4	77.20	64.42
5	82.17	64.94
6	87.13	65.58
7	92.07	66.34
8	96.99	67.22
9	101.89	68.22
10	106.76	69.33
11	111.61	70.56
12	116.43	71.90
13	121.21	73.36
14	125.96	74.93
15	130.67	76.61
16	135.33	78.41
17	139.95	80.31
18	144.53	82.33
19	149.06	84.45
20	153.53	86.69
21	157.95	89.02
22	162.31	91.47
23	166.62	94.01
24	170.86	96.66
25	175.04	99.41
26	179.15	102.25
27	183.19	105.20
28	187.16	108.24
29	191.05	111.37
30	194.87	114.60
31	198.62	117.91
32	202.28	121.31
33	205.86	124.81
34	209.36	128.38
35	212.77	132.04
36	216.09	135.77
37	219.32	139.59
38	222.46	143.48
39	225.51	147.44
40	228.46	151.48
41	231.31	155.59
42	234.07	159.76
43	236.72	164.00
44	239.10	168.00

Circle Center At X = 57.7 ; Y = 273.2 and Radius, 209.7

*** 1.199 ***

Failure Surface Specified By 44 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	62.22	63.56
2	67.22	63.73
3	72.21	64.02
4	77.19	64.43
5	82.17	64.97
6	87.12	65.62
7	92.06	66.40

8	96.98	67.30
9	101.87	68.32
10	106.74	69.46
11	111.58	70.72
12	116.39	72.09
13	121.16	73.58
14	125.90	75.19
15	130.59	76.92
16	135.24	78.75
17	139.84	80.71
18	144.40	82.77
19	148.90	84.94
20	153.35	87.23
21	157.74	89.62
22	162.07	92.12
23	166.34	94.72
24	170.54	97.43
25	174.68	100.24
26	178.74	103.15
27	182.74	106.15
28	186.66	109.26
29	190.50	112.46
30	194.26	115.75
31	197.94	119.14
32	201.54	122.61
33	205.05	126.17
34	208.47	129.81
35	211.81	133.54
36	215.05	137.35
37	218.19	141.24
38	221.24	145.20
39	224.20	149.23
40	227.05	153.34
41	229.80	157.51
42	232.45	161.75
43	234.99	166.06
44	236.08	168.00

Circle Center At X = 57.8 ; Y = 267.9 and Radius, 204.4

*** 1.199 ***

Failure Surface Specified By 44 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	62.22	63.56
2	67.20	63.98
3	72.18	64.52
4	77.13	65.16
5	82.08	65.91
6	87.00	66.78
7	91.91	67.75
8	96.79	68.82
9	101.65	70.01
10	106.48	71.30
11	111.28	72.70
12	116.05	74.20

13	120.78	75.81
14	125.48	77.52
15	130.14	79.34
16	134.76	81.25
17	139.33	83.27
18	143.86	85.39
19	148.34	87.61
20	152.77	89.92
21	157.15	92.33
22	161.48	94.84
23	165.75	97.44
24	169.96	100.14
25	174.11	102.93
26	178.20	105.81
27	182.22	108.78
28	186.18	111.83
29	190.07	114.97
30	193.89	118.20
31	197.63	121.51
32	201.31	124.90
33	204.90	128.38
34	208.43	131.93
35	211.87	135.55
36	215.23	139.26
37	218.51	143.03
38	221.70	146.88
39	224.81	150.79
40	227.83	154.78
41	230.77	158.82
42	233.61	162.94
43	236.36	167.11
44	236.92	168.00

Circle Center At X = 45.4 ; Y = 290.1 and Radius, 227.1

*** 1.214 ***

Failure Surface Specified By 42 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	74.67	70.67
2	79.65	71.10
3	84.62	71.63
4	89.58	72.28
5	94.52	73.04
6	99.44	73.91
7	104.35	74.89
8	109.23	75.97
9	114.08	77.16
10	118.91	78.46
11	123.71	79.87
12	128.48	81.38
13	133.21	83.00
14	137.90	84.72
15	142.56	86.54
16	147.17	88.47
17	151.74	90.50

18	156.26	92.63
19	160.74	94.86
20	165.17	97.19
21	169.54	99.61
22	173.86	102.13
23	178.12	104.75
24	182.32	107.46
25	186.46	110.26
26	190.54	113.15
27	194.55	116.14
28	198.50	119.21
29	202.37	122.36
30	206.18	125.61
31	209.91	128.93
32	213.57	132.34
33	217.15	135.83
34	220.66	139.39
35	224.08	143.04
36	227.43	146.75
37	230.69	150.55
38	233.86	154.41
39	236.95	158.34
40	239.96	162.34
41	242.87	166.40
42	243.96	168.00

Circle Center At X = 57.8 ; Y = 296.0 and Radius, 225.9

*** 1.215 ***

```
          Y            A     X     I     S            F     T

          0.00     39.79     79.58    119.36    159.15    198.94

X      0.00 +------*--+---------+---------+---------+---------+
            -     ...
            -    ....1
            -   .....1.
            -   .....1..
      39.79 +  ......1..2.
            -  .......1.32
            - . ......1.324.
            - . ......1.324.5
            - . .......1.24.5
            - . .. ....1.3245 0
A     79.58 + . .......11324590
            - . ........1324750..
            - . ........1132.50..
            - .  ........1324590..
            - .  .........162750...
            -  . .........112250....
X    119.36 +  . .... .....132550....
            -  .. ..........14250....*
            -   . ..........314250...
            -    . ..........112590...
            -    .............31255....*
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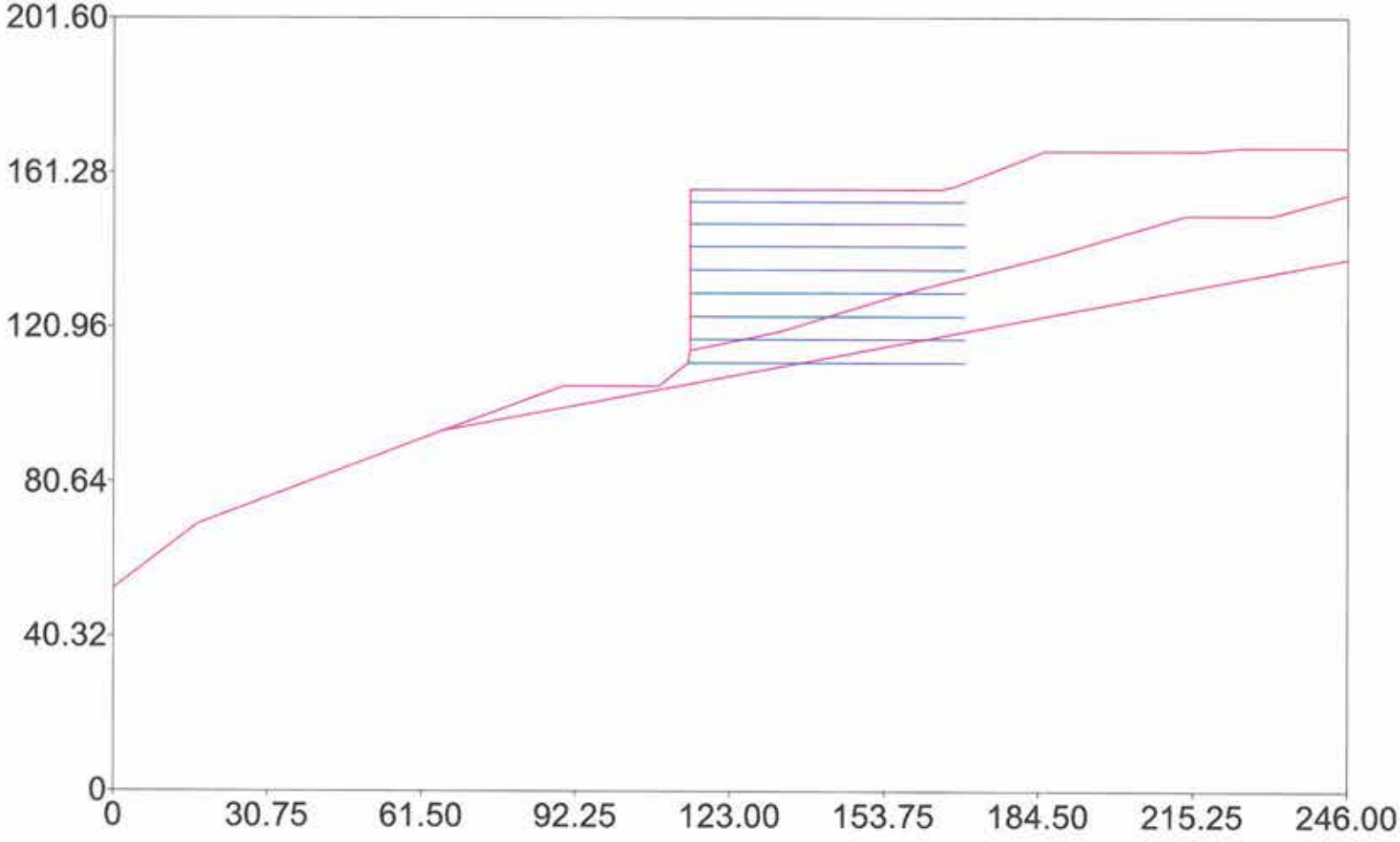
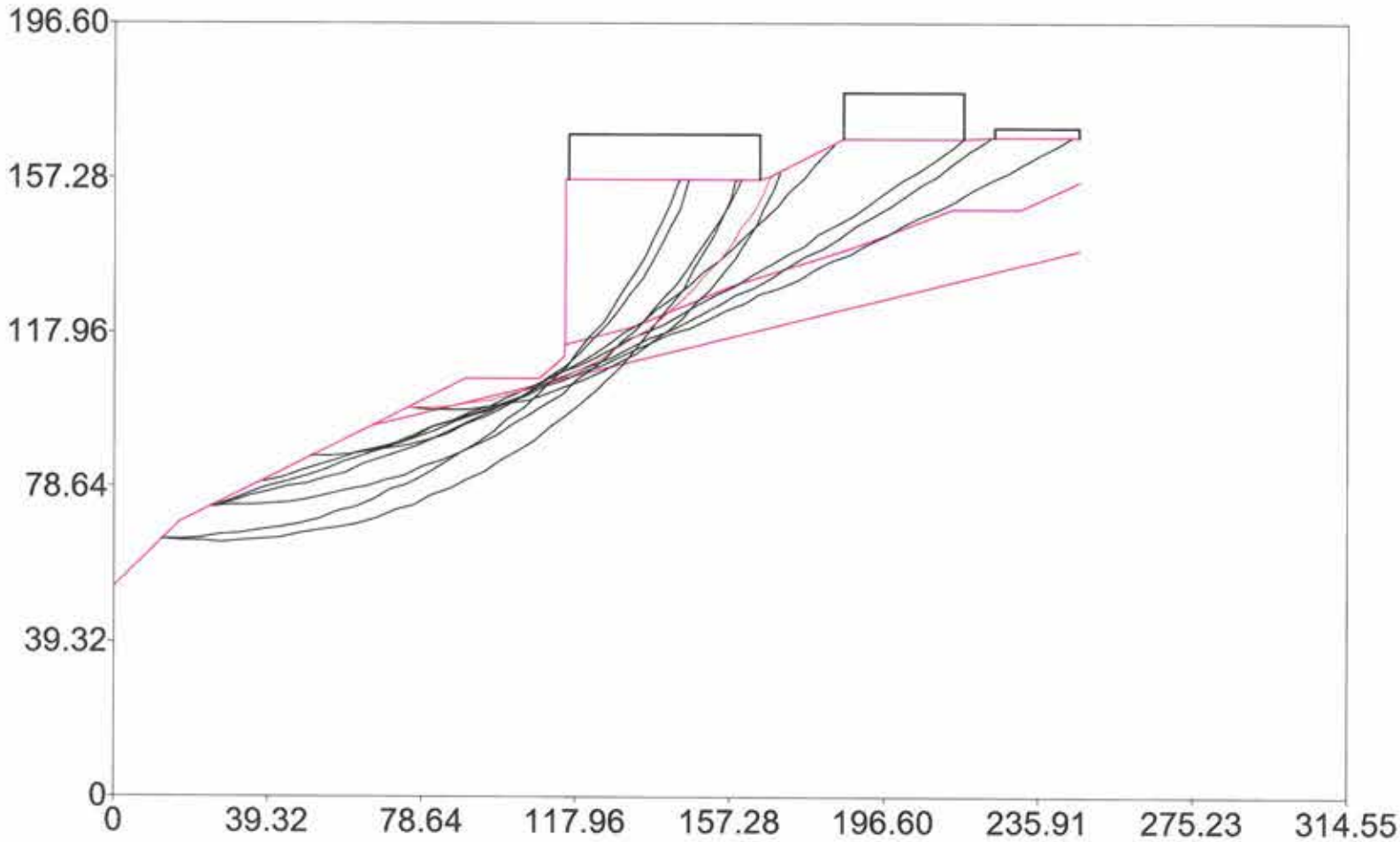
                -     . ...........11229....
I     159.15 +       .............31259..*1 23 45 67 8
                -      . ...........3122...*.*R RR RR R*/1
                -       .............31159.....
                -        . ...........31129..... .
                -         .. ...........3129....*.....
                -           ............331159..........
S     198.94 +              ............33128.........
                -             ............1323845*67.8*1/
                -               ..........R.RR1RR8RR.R*.
                -                 .............31189.....
                -                     ...........31178..*/2
                -                        ..........311188
      238.72 +                              ........3211
                -                                     ...2
                -
                -                                        **/3
                -                                      *
                -
F     278.51 +                                          * *3/
                -
                -
                -
                -
                -
T     318.30 +
```

Cross Section C-C' Post Construction



Cross Section C-C' Post Construction



Safety Factors

1.51
1.60
1.70
1.70
1.70
1.71
1.71
1.83
1.85
1.86

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 Cross Section C-C' Post Construction

BOUNDARY COORDINATES

13 Top Boundaries
20 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	53.00	17.00	70.00	2
2	17.00	70.00	66.00	94.00	2
3	66.00	94.00	90.00	106.00	1
4	90.00	106.00	109.00	106.00	1
5	109.00	106.00	115.00	112.00	1
6	115.00	112.00	115.01	115.00	1
7	115.01	115.00	115.02	157.00	3
8	115.02	157.00	165.00	157.00	3
9	165.00	157.00	168.00	158.00	3
10	168.00	158.00	186.00	167.00	3
11	186.00	167.00	217.00	167.00	3
12	217.00	167.00	225.00	168.00	3
13	225.00	168.00	246.00	168.00	3
14	115.01	115.00	133.00	120.00	1
15	133.00	120.00	158.00	130.00	1
16	158.00	130.00	188.00	140.00	1
17	188.00	140.00	214.00	150.00	1
18	214.00	150.00	231.00	150.00	1
19	231.00	150.00	246.00	156.00	1
20	66.00	94.00	246.00	139.00	2

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	120.0	135.0	0.0	34.0	0.00	0.0	0
2	145.0	160.0	500.0	42.0	0.00	0.0	0
3	125.0	140.0	0.0	32.0	0.00	0.0	0

BOUNDARY LOAD(S)

3 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	116.00	165.00	2500.0	0.0
2	186.00	217.00	2500.0	0.0
3	225.00	246.00	500.0	0.0

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

REINFORCING LAYER(S)

8 REINFORCING LAYER(S) SPECIFIED

REINFORCING LAYER NO. 1

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	115.00	112.00	14000.00	0.000
2	170.00	112.00	14000.00	0.000

REINFORCING LAYER NO. 2

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	115.02	118.00	14000.00	0.000
2	170.02	118.00	14000.00	0.000

REINFORCING LAYER NO. 3

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	115.02	124.00	14000.00	0.000
2	170.02	124.00	14000.00	0.000

REINFORCING LAYER NO. 4

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	115.02	130.00	14000.00	0.000
2	170.02	130.00	14000.00	0.000

REINFORCING LAYER NO. 5

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	115.02	136.00	14000.00	0.000
2	170.02	136.00	14000.00	0.000

REINFORCING LAYER NO. 6

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	115.02	142.00	14000.00	0.000
2	170.02	142.00	14000.00	0.000

REINFORCING LAYER NO. 7

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	115.02	148.00	14000.00	0.000
2	170.02	148.00	14000.00	0.000

REINFORCING LAYER NO. 8

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	115.02	154.00	14000.00	0.000
2	170.02	154.00	14000.00	0.000

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

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced Along The Ground Surface Between X = 0.00 ft.
and X = 114.00 ft.

Each Surface Terminates Between X = 130.00 ft.
and X = 246.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00 ft.

5.00 ft. Line Segments Define Each Trial Failure Surface.

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 Bishop Method * *

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	76.00	99.00
2	81.00	99.12
3	85.99	99.50
4	90.95	100.12
5	95.87	100.98
6	100.75	102.09
7	105.56	103.44
8	110.30	105.02
9	114.96	106.84
10	119.52	108.89
11	123.98	111.16
12	128.31	113.65
13	132.52	116.35
14	136.59	119.26
15	140.50	122.37

16	144.26	125.67
17	147.85	129.15
18	151.27	132.80
19	154.49	136.62
20	157.53	140.59
21	160.36	144.71
22	162.99	148.97
23	165.40	153.35
24	167.59	157.84
25	167.60	157.87

Circle Center At X = 76.0 ; Y = 199.7 and Radius, 100.7

*** 1.511 ***

Failure Surface Specified By 27 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	50.67	86.49
2	55.67	86.60
3	60.65	86.95
4	65.62	87.56
5	70.54	88.41
6	75.42	89.51
7	80.24	90.84
8	84.98	92.42
9	89.64	94.23
10	94.21	96.27
11	98.67	98.54
12	103.00	101.03
13	107.21	103.73
14	111.28	106.63
15	115.20	109.74
16	118.96	113.04
17	122.55	116.52
18	125.96	120.17
19	129.18	123.99
20	132.21	127.97
21	135.04	132.09
22	137.66	136.35
23	140.06	140.74
24	142.25	145.24
25	144.20	149.84
26	145.92	154.53
27	146.69	157.00

Circle Center At X = 51.0 ; Y = 186.7 and Radius, 100.2

*** 1.602 ***

Failure Surface Specified By 43 Coordinate Points

Point	X-Surf	Y-Surf

No.	(ft)	(ft)
1	38.00	80.29
2	42.83	81.58
3	47.65	82.91
4	52.46	84.29
5	57.25	85.71
6	62.03	87.17
7	66.80	88.68
8	71.55	90.22
9	76.30	91.81
10	81.02	93.44
11	85.74	95.11
12	90.43	96.83
13	95.11	98.58
14	99.78	100.38
15	104.43	102.21
16	109.06	104.09
17	113.68	106.01
18	118.28	107.97
19	122.86	109.97
20	127.43	112.01
21	131.98	114.09
22	136.50	116.21
23	141.01	118.37
24	145.50	120.57
25	149.97	122.81
26	154.42	125.09
27	158.85	127.41
28	163.26	129.77
29	167.65	132.17
30	172.02	134.60
31	176.36	137.08
32	180.68	139.59
33	184.99	142.14
34	189.26	144.73
35	193.52	147.35
36	197.75	150.02
37	201.96	152.72
38	206.14	155.45
39	210.30	158.23
40	214.44	161.04
41	218.55	163.89
42	222.63	166.77
43	224.20	167.90

Circle Center At X = -105.9 ; Y = 627.8 and Radius, 566.1

*** 1.695 ***

Failure Surface Specified By 35 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	25.33	74.08
2	30.33	74.12
3	35.33	74.32
4	40.32	74.70

5	45.29	75.24
6	50.24	75.94
7	55.16	76.82
8	60.05	77.86
9	64.90	79.06
10	69.71	80.42
11	74.47	81.95
12	79.18	83.64
13	83.83	85.48
14	88.41	87.48
15	92.92	89.63
16	97.36	91.94
17	101.72	94.39
18	105.99	96.99
19	110.18	99.73
20	114.26	102.60
21	118.25	105.62
22	122.14	108.77
23	125.92	112.04
24	129.58	115.44
25	133.13	118.97
26	136.56	122.61
27	139.86	126.36
28	143.03	130.22
29	146.08	134.19
30	148.98	138.26
31	151.75	142.42
32	154.38	146.68
33	156.86	151.02
34	159.19	155.44
35	159.95	157.00

Circle Center At X = 26.8 ; Y = 222.5 and Radius, 148.5

*** 1.702 ***

Failure Surface Specified By 44 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	25.33	74.08
2	30.12	75.53
3	34.90	77.01
4	39.66	78.53
5	44.41	80.08
6	49.15	81.67
7	53.88	83.30
8	58.60	84.96
9	63.30	86.66
10	67.99	88.39
11	72.67	90.16
12	77.33	91.96
13	81.98	93.80
14	86.62	95.67
15	91.24	97.58
16	95.84	99.53
17	100.44	101.50
18	105.01	103.52

19	109.57	105.57
20	114.12	107.65
21	118.65	109.76
22	123.16	111.91
23	127.66	114.10
24	132.14	116.32
25	136.61	118.57
26	141.05	120.86
27	145.48	123.18
28	149.89	125.53
29	154.29	127.92
30	158.66	130.34
31	163.02	132.79
32	167.36	135.27
33	171.68	137.79
34	175.98	140.34
35	180.26	142.93
36	184.52	145.54
37	188.76	148.19
38	192.98	150.87
39	197.18	153.58
40	201.36	156.33
41	205.52	159.10
42	209.66	161.91
43	213.78	164.74
44	217.00	167.00

Circle Center At X = -163.4 ; Y = 707.6 and Radius, 661.0

*** 1.703 ***

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	76.00	99.00
2	80.99	98.68
3	85.99	98.64
4	90.98	98.87
5	95.96	99.38
6	100.90	100.16
7	105.79	101.21
8	110.61	102.52
9	115.35	104.10
10	120.01	105.94
11	124.55	108.03
12	128.97	110.36
13	133.25	112.94
14	137.39	115.75
15	141.37	118.78
16	145.17	122.02
17	148.79	125.47
18	152.22	129.11
19	155.44	132.93
20	158.45	136.93
21	161.23	141.08
22	163.78	145.39
23	166.09	149.82

24	168.15	154.38
25	169.93	158.96

Circle Center At X = 84.3 ; Y = 189.6 and Radius, 91.0

*** 1.710 ***

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	25.33	74.08
2	30.24	75.06
3	35.12	76.12
4	39.99	77.27
5	44.83	78.51
6	49.65	79.84
7	54.45	81.26
8	59.22	82.76
9	63.96	84.35
10	68.67	86.02
11	73.35	87.78
12	78.00	89.62
13	82.61	91.55
14	87.19	93.56
15	91.73	95.65
16	96.23	97.83
17	100.69	100.09
18	105.11	102.42
19	109.49	104.84
20	113.82	107.34
21	118.11	109.91
22	122.35	112.56
23	126.54	115.29
24	130.68	118.10
25	134.77	120.97
26	138.80	123.93
27	142.78	126.95
28	146.71	130.05
29	150.58	133.21
30	154.39	136.45
31	158.14	139.76
32	161.83	143.13
33	165.46	146.57
34	169.03	150.07
35	172.53	153.64
36	175.97	157.27
37	179.34	160.97
38	182.64	164.72
39	183.53	165.76

Circle Center At X = -26.0 ; Y = 344.9 and Radius, 275.7

*** 1.711 ***

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	12.67	65.67
2	17.65	65.29
3	22.65	65.10
4	27.65	65.07
5	32.65	65.23
6	37.64	65.55
7	42.61	66.05
8	47.57	66.73
9	52.49	67.58
10	57.39	68.60
11	62.24	69.79
12	67.05	71.15
13	71.81	72.68
14	76.52	74.38
15	81.16	76.23
16	85.73	78.25
17	90.23	80.43
18	94.66	82.77
19	98.99	85.26
20	103.24	87.90
21	107.39	90.68
22	111.44	93.61
23	115.39	96.68
24	119.23	99.89
25	122.95	103.23
26	126.55	106.69
27	130.03	110.28
28	133.38	114.00
29	136.60	117.82
30	139.68	121.76
31	142.63	125.80
32	145.43	129.94
33	148.08	134.18
34	150.58	138.51
35	152.93	142.92
36	155.13	147.41
37	157.16	151.98
38	159.04	156.62
39	159.17	157.00

Circle Center At X = 25.8 ; Y = 207.8 and Radius, 142.7

*** 1.831 ***

Failure Surface Specified By 36 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	12.67	65.67
2	17.67	65.70
3	22.66	65.91
4	27.65	66.30

5	32.61	66.87
6	37.56	67.62
7	42.47	68.55
8	47.35	69.65
9	52.18	70.93
10	56.96	72.39
11	61.69	74.01
12	66.36	75.81
13	70.96	77.78
14	75.48	79.90
15	79.92	82.20
16	84.28	84.65
17	88.55	87.25
18	92.72	90.01
19	96.79	92.92
20	100.75	95.97
21	104.59	99.17
22	108.32	102.50
23	111.93	105.96
24	115.41	109.55
25	118.75	113.27
26	121.96	117.10
27	125.03	121.05
28	127.95	125.11
29	130.73	129.27
30	133.35	133.52
31	135.82	137.87
32	138.13	142.31
33	140.28	146.82
34	142.26	151.41
35	144.07	156.07
36	144.40	157.00

Circle Center At X = 14.3 ; Y = 203.9 and Radius, 138.3

*** 1.849 ***

Failure Surface Specified By 49 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	25.33	74.08
2	30.11	75.57
3	34.88	77.07
4	39.64	78.60
5	44.39	80.15
6	49.14	81.72
7	53.88	83.31
8	58.61	84.92
9	63.34	86.55
10	68.06	88.20
11	72.77	89.87
12	77.47	91.57
13	82.17	93.28
14	86.86	95.02
15	91.54	96.77
16	96.22	98.55
17	100.88	100.35

18	105.54	102.17
19	110.19	104.01
20	114.83	105.87
21	119.46	107.75
22	124.09	109.65
23	128.70	111.57
24	133.31	113.51
25	137.91	115.47
26	142.50	117.45
27	147.08	119.45
28	151.66	121.48
29	156.22	123.52
30	160.77	125.58
31	165.32	127.66
32	169.86	129.77
33	174.38	131.89
34	178.90	134.03
35	183.41	136.20
36	187.91	138.38
37	192.39	140.58
38	196.87	142.80
39	201.34	145.05
40	205.80	147.31
41	210.25	149.59
42	214.69	151.89
43	219.12	154.21
44	223.54	156.55
45	227.94	158.91
46	232.34	161.29
47	236.73	163.69
48	241.11	166.11
49	244.49	168.00

Circle Center At X = -308.1 ; Y = 1154.7 and Radius, 1130.9

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      ***     1.857   ***



           Y            A     X     I     S            F     T

           0.00     39.32     78.64    117.96    157.28    196.60
X       0.00 +---------+--*------+---------+---------+---------+
             -           ..
             -          ....  8
             -         .......8*
             -         .......8.4
             -        ........8.45
       39.32 +       .........8.43
             -       . .......89453
             -      .. .......894432
             -      .. .......889472
             -      . ..... ...894723*
             -      . ..... ...8.4423
A      78.64 +      . ..........894.231
             -     ..............8.4721
             -     ...... .......889421.*
             -      ..... .........84921.
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             -      ...............88441.
             -      ......... .......843*1 2 34 56 78
X    117.96 +       ..................861**R RR RR RR*/1
             -      ...................861522
             -       ....................611*229
             -       .......... ..........6114 2229
             -        ......................33144. 2222
             -        .. ....................351144....
I    157.28 +         ......................03*6111484
             -          ..................1.2.34556678*1/
             -           ................R.R.RR3RR RR*
             -            ......................035...77.
             -             ......................035....*/2
             -              ....................0*35.. .
S    196.60 +                ...................0335...
             -                 ...................0.33..
             -                   ..................0.35.
             -                     ................*0.3*2/
             -                      ................0.3*/3
             -                         ...........*.00..
     235.92 +                             ............0.
             -                                 ........00
             -                                  *    * .*3/
             -
             -
             -
F    275.24 +
             -
             -
             -
             -
             -
T    314.55 +
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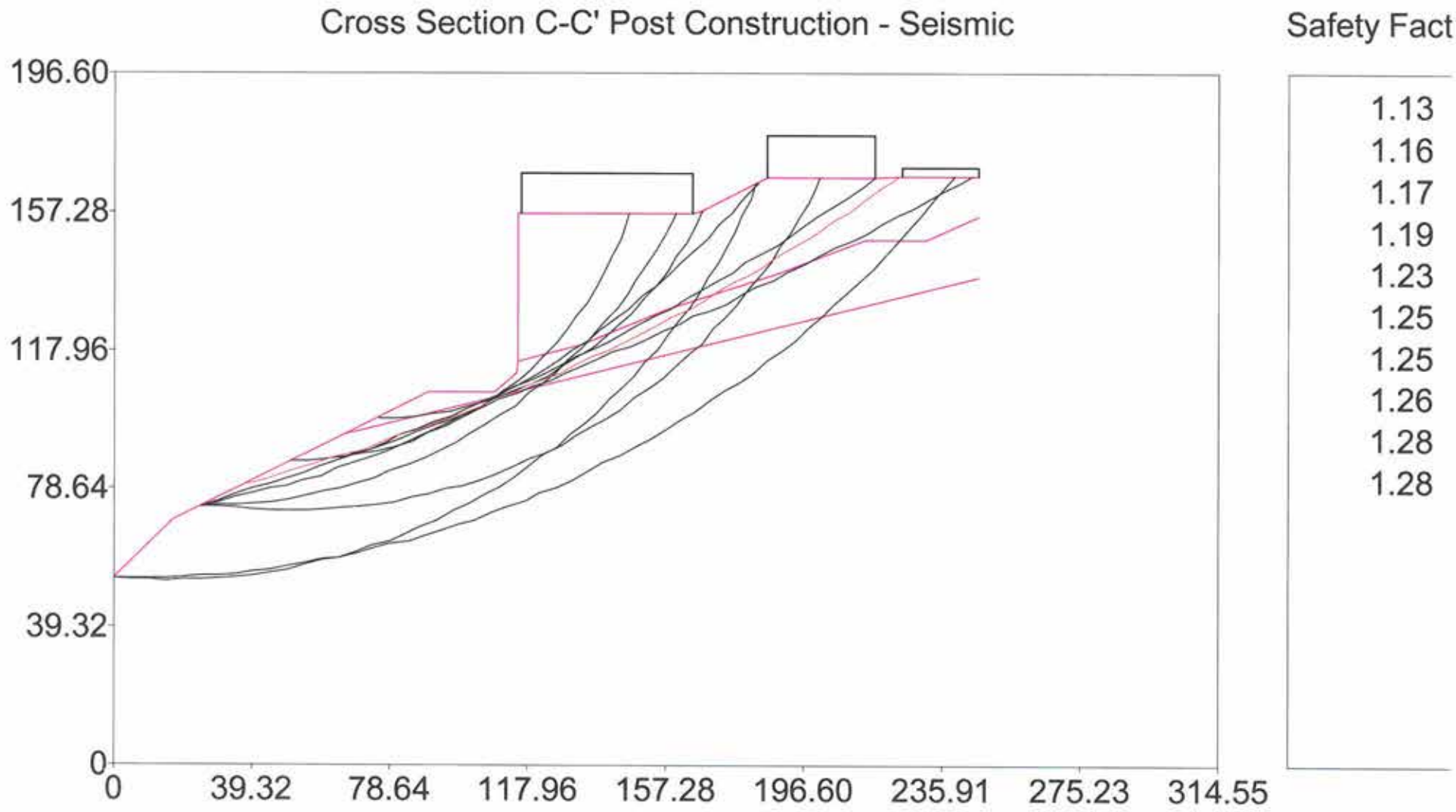
Cross Section C-C' Post Construction - Seismic
Safety Fact
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Profile.out
** PCSTABL6 **

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 Cross Section C-C' Post Construction - S
eismic

BOUNDARY COORDINATES

13 Top Boundaries
20 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	53.00	17.00	70.00	2
2	17.00	70.00	66.00	94.00	2
3	66.00	94.00	90.00	106.00	1
4	90.00	106.00	109.00	106.00	1
5	109.00	106.00	115.00	112.00	1
6	115.00	112.00	115.01	115.00	1
7	115.01	115.00	115.02	157.00	3
8	115.02	157.00	165.00	157.00	3
9	165.00	157.00	168.00	158.00	3
10	168.00	158.00	186.00	167.00	3
11	186.00	167.00	217.00	167.00	3
12	217.00	167.00	225.00	168.00	3
13	225.00	168.00	246.00	168.00	3
14	115.01	115.00	133.00	120.00	1
15	133.00	120.00	158.00	130.00	1
16	158.00	130.00	188.00	140.00	1
17	188.00	140.00	214.00	150.00	1
18	214.00	150.00	231.00	150.00	1
19	231.00	150.00	246.00	156.00	1
20	66.00	94.00	246.00	139.00	2

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	120.0	135.0	0.0	34.0	0.00	0.0	0
2	145.0	160.0	500.0	42.0	0.00	0.0	0
3	125.0	140.0	0.0	32.0	0.00	0.0	0

A Horizontal Earthquake Loading Coefficient
Of0.310 Has Been Assigned

A Vertical Earthquake Loading Coefficient
Of0.000 Has Been Assigned

Cavitation Pressure = 0.0 psf

BOUNDARY LOAD(S)

3 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	116.00	165.00	2500.0	0.0
2	186.00	217.00	2500.0	0.0
3	225.00	246.00	500.0	0.0

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

REINFORCING LAYER(S)

8 REINFORCING LAYER(S) SPECIFIED

REINFORCING LAYER NO. 1

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	115.00	112.00	14000.00	0.000
2	170.00	112.00	14000.00	0.000

REINFORCING LAYER NO. 2

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	115.02	118.00	14000.00	0.000
2	170.02	118.00	14000.00	0.000

REINFORCING LAYER NO. 3

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	115.02	124.00	14000.00	0.000
2	170.02	124.00	14000.00	0.000

REINFORCING LAYER NO. 4

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	115.02	130.00	14000.00	0.000
2	170.02	130.00	14000.00	0.000

REINFORCING LAYER NO. 5

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	115.02	136.00	14000.00	0.000
2	170.02	136.00	14000.00	0.000

REINFORCING LAYER NO. 6

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	115.02	142.00	14000.00	0.000
2	170.02	142.00	14000.00	0.000

REINFORCING LAYER NO. 7

2 POINTS DEFINE THIS LAYER

POINT X-COORD Y-COORD FORCE INCLINATION

NO.				FACTOR
1	115.02	148.00	14000.00	0.000
2	170.02	148.00	14000.00	0.000

REINFORCING LAYER NO. 8

2 POINTS DEFINE THIS LAYER

POINT NO.	X-COORD	Y-COORD	FORCE	INCLINATION FACTOR
1	115.02	154.00	14000.00	0.000
2	170.02	154.00	14000.00	0.000

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

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced Along The Ground Surface Between X = 0.00 ft.
and X = 114.00 ft.

Each Surface Terminates Between X = 130.00 ft.
and X = 246.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00 ft.

5.00 ft. Line Segments Define Each Trial Failure Surface.

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 Bishop Method * *

Failure Surface Specified By 43 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	38.00	80.29
2	42.83	81.58
3	47.65	82.91
4	52.46	84.29
5	57.25	85.71

6	62.03	87.17
7	66.80	88.68
8	71.55	90.22
9	76.30	91.81
10	81.02	93.44
11	85.74	95.11
12	90.43	96.83
13	95.11	98.58
14	99.78	100.38
15	104.43	102.21
16	109.06	104.09
17	113.68	106.01
18	118.28	107.97
19	122.86	109.97
20	127.43	112.01
21	131.98	114.09
22	136.50	116.21
23	141.01	118.37
24	145.50	120.57
25	149.97	122.81
26	154.42	125.09
27	158.85	127.41
28	163.26	129.77
29	167.65	132.17
30	172.02	134.60
31	176.36	137.08
32	180.68	139.59
33	184.99	142.14
34	189.26	144.73
35	193.52	147.35
36	197.75	150.02
37	201.96	152.72
38	206.14	155.45
39	210.30	158.23
40	214.44	161.04
41	218.55	163.89
42	222.63	166.77
43	224.20	167.90

Circle Center At X = -105.9 ; Y = 627.8 and Radius, 566.1

*** 1.134 ***

Failure Surface Specified By 44 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	25.33	74.08
2	30.12	75.53
3	34.90	77.01
4	39.66	78.53
5	44.41	80.08
6	49.15	81.67
7	53.88	83.30
8	58.60	84.96
9	63.30	86.66
10	67.99	88.39
11	72.67	90.16

12	77.33	91.96
13	81.98	93.80
14	86.62	95.67
15	91.24	97.58
16	95.84	99.53
17	100.44	101.50
18	105.01	103.52
19	109.57	105.57
20	114.12	107.65
21	118.65	109.76
22	123.16	111.91
23	127.66	114.10
24	132.14	116.32
25	136.61	118.57
26	141.05	120.86
27	145.48	123.18
28	149.89	125.53
29	154.29	127.92
30	158.66	130.34
31	163.02	132.79
32	167.36	135.27
33	171.68	137.79
34	175.98	140.34
35	180.26	142.93
36	184.52	145.54
37	188.76	148.19
38	192.98	150.87
39	197.18	153.58
40	201.36	156.33
41	205.52	159.10
42	209.66	161.91
43	213.78	164.74
44	217.00	167.00

Circle Center At X = -163.4 ; Y = 707.6 and Radius, 661.0

*** 1.165 ***

Failure Surface Specified By 49 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	25.33	74.08
2	30.11	75.57
3	34.88	77.07
4	39.64	78.60
5	44.39	80.15
6	49.14	81.72
7	53.88	83.31
8	58.61	84.92
9	63.34	86.55
10	68.06	88.20
11	72.77	89.87
12	77.47	91.57
13	82.17	93.28
14	86.86	95.02
15	91.54	96.77
16	96.22	98.55

17	100.88	100.35
18	105.54	102.17
19	110.19	104.01
20	114.83	105.87
21	119.46	107.75
22	124.09	109.65
23	128.70	111.57
24	133.31	113.51
25	137.91	115.47
26	142.50	117.45
27	147.08	119.45
28	151.66	121.48
29	156.22	123.52
30	160.77	125.58
31	165.32	127.66
32	169.86	129.77
33	174.38	131.89
34	178.90	134.03
35	183.41	136.20
36	187.91	138.38
37	192.39	140.58
38	196.87	142.80
39	201.34	145.05
40	205.80	147.31
41	210.25	149.59
42	214.69	151.89
43	219.12	154.21
44	223.54	156.55
45	227.94	158.91
46	232.34	161.29
47	236.73	163.69
48	241.11	166.11
49	244.49	168.00

Circle Center At X = -308.1 ; Y = 1154.7 and Radius, 1130.9

*** 1.172 ***

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	76.00	99.00
2	81.00	99.12
3	85.99	99.50
4	90.95	100.12
5	95.87	100.98
6	100.75	102.09
7	105.56	103.44
8	110.30	105.02
9	114.96	106.84
10	119.52	108.89
11	123.98	111.16
12	128.31	113.65
13	132.52	116.35
14	136.59	119.26
15	140.50	122.37
16	144.26	125.67

17	147.85	129.15
18	151.27	132.80
19	154.49	136.62
20	157.53	140.59
21	160.36	144.71
22	162.99	148.97
23	165.40	153.35
24	167.59	157.84
25	167.60	157.87

Circle Center At X = 76.0 ; Y = 199.7 and Radius, 100.7

*** 1.188 ***

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	25.33	74.08
2	30.24	75.06
3	35.12	76.12
4	39.99	77.27
5	44.83	78.51
6	49.65	79.84
7	54.45	81.26
8	59.22	82.76
9	63.96	84.35
10	68.67	86.02
11	73.35	87.78
12	78.00	89.62
13	82.61	91.55
14	87.19	93.56
15	91.73	95.65
16	96.23	97.83
17	100.69	100.09
18	105.11	102.42
19	109.49	104.84
20	113.82	107.34
21	118.11	109.91
22	122.35	112.56
23	126.54	115.29
24	130.68	118.10
25	134.77	120.97
26	138.80	123.93
27	142.78	126.95
28	146.71	130.05
29	150.58	133.21
30	154.39	136.45
31	158.14	139.76
32	161.83	143.13
33	165.46	146.57
34	169.03	150.07
35	172.53	153.64
36	175.97	157.27
37	179.34	160.97
38	182.64	164.72
39	183.53	165.76

Circle Center At X = -26.0 ; Y = 344.9 and Radius, 275.7

*** 1.231 ***

Failure Surface Specified By 35 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	25.33	74.08
2	30.33	74.12
3	35.33	74.32
4	40.32	74.70
5	45.29	75.24
6	50.24	75.94
7	55.16	76.82
8	60.05	77.86
9	64.90	79.06
10	69.71	80.42
11	74.47	81.95
12	79.18	83.64
13	83.83	85.48
14	88.41	87.48
15	92.92	89.63
16	97.36	91.94
17	101.72	94.39
18	105.99	96.99
19	110.18	99.73
20	114.26	102.60
21	118.25	105.62
22	122.14	108.77
23	125.92	112.04
24	129.58	115.44
25	133.13	118.97
26	136.56	122.61
27	139.86	126.36
28	143.03	130.22
29	146.08	134.19
30	148.98	138.26
31	151.75	142.42
32	154.38	146.68
33	156.86	151.02
34	159.19	155.44
35	159.95	157.00

Circle Center At X = 26.8 ; Y = 222.5 and Radius, 148.5

*** 1.248 ***

Failure Surface Specified By 57 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	0.00	53.00

2	5.00	53.00
3	10.00	53.07
4	15.00	53.24
5	19.99	53.48
6	24.98	53.81
7	29.96	54.22
8	34.94	54.71
9	39.91	55.29
10	44.86	55.94
11	49.81	56.68
12	54.74	57.50
13	59.66	58.41
14	64.56	59.39
15	69.44	60.46
16	74.31	61.60
17	79.16	62.83
18	83.98	64.14
19	88.79	65.53
20	93.57	66.99
21	98.32	68.54
22	103.05	70.16
23	107.75	71.87
24	112.42	73.65
25	117.07	75.51
26	121.68	77.44
27	126.25	79.45
28	130.80	81.54
29	135.31	83.70
30	139.78	85.94
31	144.21	88.25
32	148.61	90.63
33	152.96	93.09
34	157.28	95.62
35	161.55	98.22
36	165.78	100.89
37	169.96	103.63
38	174.10	106.43
39	178.18	109.31
40	182.23	112.26
41	186.22	115.27
42	190.16	118.34
43	194.05	121.48
44	197.89	124.69
45	201.67	127.96
46	205.40	131.29
47	209.07	134.68
48	212.69	138.14
49	216.24	141.65
50	219.74	145.22
51	223.18	148.85
52	226.56	152.54
53	229.88	156.28
54	233.13	160.07
55	236.32	163.92
56	239.45	167.82
57	239.59	168.00

Circle Center At X = 2.8 ; Y = 354.3 and Radius, 301.3

*** 1.251 ***

Failure Surface Specified By 47 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	0.00	53.00
2	4.99	52.68
3	9.99	52.50
4	14.99	52.46
5	19.99	52.55
6	24.98	52.78
7	29.97	53.15
8	34.94	53.65
9	39.90	54.29
10	44.84	55.06
11	49.76	55.97
12	54.65	57.01
13	59.51	58.18
14	64.34	59.49
15	69.12	60.93
16	73.87	62.50
17	78.57	64.19
18	83.23	66.02
19	87.83	67.97
20	92.38	70.05
21	96.87	72.25
22	101.30	74.57
23	105.66	77.01
24	109.96	79.57
25	114.18	82.25
26	118.33	85.04
27	122.40	87.95
28	126.39	90.96
29	130.29	94.08
30	134.11	97.31
31	137.84	100.64
32	141.48	104.07
33	145.02	107.60
34	148.47	111.22
35	151.81	114.94
36	155.05	118.75
37	158.19	122.64
38	161.22	126.62
39	164.13	130.68
40	166.94	134.82
41	169.63	139.03
42	172.21	143.31
43	174.67	147.67
44	177.01	152.09
45	179.23	156.57
46	181.32	161.11
47	183.26	165.63

Circle Center At X = 14.1 ; Y = 235.5 and Radius, 183.0

*** 1.261 ***

Failure Surface Specified By 27 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	50.67	86.49
2	55.67	86.60
3	60.65	86.95
4	65.62	87.56
5	70.54	88.41
6	75.42	89.51
7	80.24	90.84
8	84.98	92.42
9	89.64	94.23
10	94.21	96.27
11	98.67	98.54
12	103.00	101.03
13	107.21	103.73
14	111.28	106.63
15	115.20	109.74
16	118.96	113.04
17	122.55	116.52
18	125.96	120.17
19	129.18	123.99
20	132.21	127.97
21	135.04	132.09
22	137.66	136.35
23	140.06	140.74
24	142.25	145.24
25	144.20	149.84
26	145.92	154.53
27	146.69	157.00

Circle Center At X = 51.0 ; Y = 186.7 and Radius, 100.2

*** 1.277 ***

Failure Surface Specified By 44 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	25.33	74.08
2	30.29	73.44
3	35.27	72.94
4	40.26	72.59
5	45.25	72.39
6	50.25	72.34
7	55.25	72.44
8	60.24	72.68
9	65.23	73.07
10	70.20	73.61
11	75.15	74.30
12	80.08	75.13
13	84.99	76.11
14	89.86	77.24
15	94.69	78.50
16	99.49	79.91
17	104.24	81.46

18	108.95	83.16
19	113.60	84.99
20	118.20	86.95
21	122.74	89.06
22	127.21	91.29
23	131.61	93.66
24	135.94	96.16
25	140.20	98.78
26	144.37	101.53
27	148.47	104.41
28	152.47	107.40
29	156.39	110.51
30	160.21	113.73
31	163.94	117.07
32	167.56	120.51
33	171.08	124.06
34	174.49	127.72
35	177.80	131.47
36	180.99	135.32
37	184.06	139.26
38	187.02	143.29
39	189.86	147.41
40	192.57	151.61
41	195.16	155.89
42	197.62	160.24
43	199.95	164.66
44	201.09	167.00

Circle Center At X = 49.5 ; Y = 241.1 and Radius, 168.7

*** 1.280 ***

```
          Y           A     X     I     S           F     T

          0.00     39.32     78.64    117.96    157.28    196.60

X      0.00 +---------+--*------+---------+---------+---------+
            -           .7
            -          ..77  .
            -         ...87...*
            -         ...87....2
            -        .....7....22
      39.32 +       ......7...061
            -       . ....7...0621
            -      .. ....77..06519
            -      .. .....7..0.651
            -      . ..... 7...06521*
            -      . ..... 77..06651
A     78.64 +      . .......7..0.6.114
            -     ...........78.0..6514
            -     ...... ....78.0..651.*
            -      ..... ....7880..6.11.
            -      ...........7.80..661.
            -      ......... ..7880..61*1 2 34 56 78
X    117.96 +      ............7..8....1**R RR RR RR*/1
            -      .............7.88....1299
            -       .............7..88..312*99.
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             -        .......... ..77.008..3145 999.
             -         .............7...88..11456. 9999
             -         .. ...........77..088.124466....
I    157.28 +           ..............7...00831*.4446.6
             -           ..............77.1.2.34256578*1/
             -            ..............7.R.R0RR1RR RR*
             -             ..............77...00312.8855.
             -              ...............7....0312...8*/2
             -               ...............7....3*120. .
S    196.60 +                 ..............77...311200.
             -                  ...............7...3.11.0
             -                    ..............77..3.12.
             -                      ..............7.*3.1*2/
             -                        .............77.3.1*/3
             -                           ...........*733..
     235.92 +                               ...........73.
             -                                   ........33
             -                                    *    * .*3/
             -
             -
             -
F    275.24 +
             -
             -
             -
             -
             -
T    314.55 +
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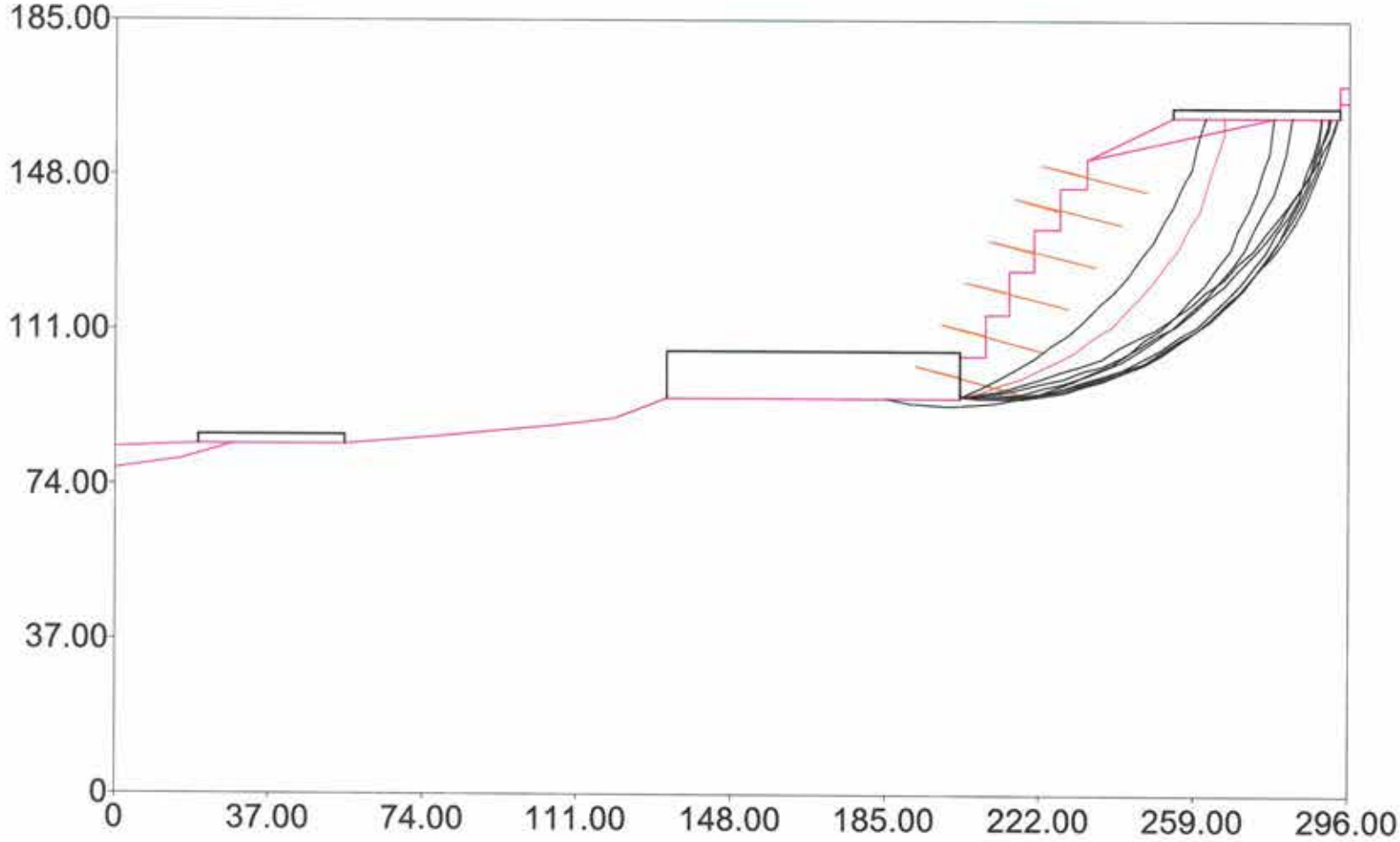
Cross Section D-D' Post Construction



Safety Factors

1.73
1.88
1.98
2.04
2.06
2.08
2.09
2.11
2.11
2.14

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 Cross Section D-D' Post Construction

BOUNDARY COORDINATES

25 Top Boundaries
29 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	83.00	20.00	84.00	3
2	20.00	84.00	29.00	84.00	3
3	29.00	84.00	55.00	84.00	2
4	55.00	84.00	77.00	86.00	2
5	77.00	86.00	106.00	88.00	2
6	106.00	88.00	120.00	90.00	2
7	120.00	90.00	133.00	95.00	2
8	133.00	95.00	203.00	95.00	2
9	203.00	95.00	203.01	105.00	2
10	203.01	105.00	209.00	105.00	2
11	209.00	105.00	209.01	115.00	2
12	209.01	115.00	215.00	115.00	2
13	215.00	115.00	215.01	125.00	2
14	215.01	125.00	221.00	125.00	2
15	221.00	125.00	221.01	135.00	2
16	221.01	135.00	227.00	135.00	2
17	227.00	135.00	227.01	145.00	2
18	227.01	145.00	233.00	145.00	2
19	233.00	145.00	233.01	152.00	2
20	233.01	152.00	254.00	162.00	1
21	254.00	162.00	278.00	162.00	1
22	278.00	162.00	294.00	162.00	2
23	294.00	162.00	294.01	166.00	2
24	294.01	166.00	294.02	170.00	1
25	294.02	170.00	296.00	170.00	1

26	294.01	166.00	296.00	166.00	2
27	233.01	152.00	278.00	162.00	2
28	0.00	78.00	16.00	80.00	2
29	16.00	80.00	29.00	84.00	2

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	120.0	135.0	0.0	34.0	0.00	0.0	0
2	145.0	160.0	500.0	42.0	0.00	0.0	0
3	125.0	140.0	0.0	32.0	0.00	0.0	0

BOUNDARY LOAD(S)

3 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	20.00	55.00	500.0	0.0
2	133.00	203.00	2500.0	0.0
3	254.00	294.00	500.0	0.0

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

TIEBACK LOAD(S)

6 Tieback Load(s) Specified

Tieback No.	X-Pos (ft)	Y-Pos (ft)	Load (lbs)	Spacing (ft)	Inclination (deg)	Length (ft)
1	233.00	148.00	90000.0	6.0	15.00	15.0
2	227.01	140.00	90000.0	6.0	15.00	15.0
3	221.01	130.00	90000.0	6.0	15.00	15.0
4	215.01	120.00	90000.0	6.0	15.00	15.0
5	209.01	110.00	90000.0	6.0	15.00	15.0
6	203.01	100.00	90000.0	6.0	15.00	15.0

NOTE - An Equivalent Line Load Is Calculated For Each Row Of Tiebacks Assuming A Uniform Distribution Of Load Horizontally Between Individual Tiebacks.

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

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced Along The Ground Surface Between X = 125.00 ft.
and X = 203.00 ft.

Each Surface Terminates Between X = 233.00 ft.
and X = 294.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00 ft.

5.00 ft. Line Segments Define Each Trial Failure Surface.

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 Bishop Method * *

Failure Surface Specified By 21 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55
2	207.89	96.60
3	212.70	97.95
4	217.42	99.62
5	222.02	101.58
6	226.48	103.83
7	230.79	106.37
8	234.93	109.17
9	238.88	112.23
10	242.63	115.54
11	246.16	119.09
12	249.45	122.85
13	252.50	126.81
14	255.28	130.97
15	257.80	135.29
16	260.03	139.76
17	261.97	144.37
18	263.61	149.09
19	264.95	153.91
20	265.98	158.80
21	266.43	162.00

Circle Center At X = 189.1 ; Y = 172.4 and Radius, 78.1

*** 1.725 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55
2	207.63	97.44
3	212.15	99.57
4	216.56	101.94
5	220.83	104.53
6	224.97	107.34
7	228.95	110.37
8	232.76	113.60
9	236.40	117.03
10	239.86	120.64
11	243.12	124.43
12	246.18	128.39
13	249.03	132.50
14	251.65	136.75
15	254.06	141.14
16	256.22	145.64
17	258.15	150.25
18	259.84	154.96
19	261.27	159.75
20	261.82	162.00

Circle Center At X = 169.3 ; Y = 184.7 and Radius, 95.3

*** 1.881 ***

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55
2	207.96	96.19
3	212.88	97.05
4	217.77	98.14
5	222.59	99.44
6	227.36	100.95
7	232.05	102.68
8	236.66	104.62
9	241.18	106.76
10	245.60	109.10
11	249.90	111.64
12	254.09	114.37
13	258.16	117.28
14	262.08	120.38
15	265.87	123.64
16	269.50	127.07

17	272.98	130.67
18	276.29	134.41
19	279.44	138.30
20	282.40	142.33
21	285.18	146.49
22	287.77	150.76
23	290.17	155.15
24	292.36	159.64
25	293.39	162.00

Circle Center At X = 191.2 ; Y = 206.3 and Radius, 111.4

*** 1.984 ***

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55
2	208.00	95.32
3	212.99	95.39
4	217.98	95.76
5	222.93	96.44
6	227.84	97.43
7	232.67	98.71
8	237.42	100.28
9	242.06	102.14
10	246.58	104.28
11	250.96	106.69
12	255.18	109.36
13	259.23	112.29
14	263.10	115.46
15	266.77	118.86
16	270.22	122.48
17	273.44	126.30
18	276.43	130.31
19	279.16	134.50
20	281.64	138.84
21	283.84	143.33
22	285.76	147.95
23	287.40	152.67
24	288.75	157.48
25	289.72	162.00

Circle Center At X = 209.3 ; Y = 177.1 and Radius, 81.8

*** 2.040 ***

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55

2	207.99	95.86
3	212.96	96.42
4	217.89	97.24
5	222.78	98.31
6	227.60	99.63
7	232.35	101.20
8	237.01	103.00
9	241.57	105.04
10	246.03	107.32
11	250.36	109.81
12	254.56	112.53
13	258.61	115.46
14	262.51	118.59
15	266.24	121.92
16	269.80	125.43
17	273.17	129.13
18	276.35	132.98
19	279.32	137.00
20	282.09	141.17
21	284.64	145.47
22	286.97	149.89
23	289.06	154.43
24	290.92	159.07
25	291.93	162.00

Circle Center At X = 199.5 ; Y = 193.1 and Radius, 97.6

*** 2.063 ***

Failure Surface Specified By 26 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55
2	207.99	95.31
3	212.99	95.36
4	217.98	95.70
5	222.94	96.34
6	227.86	97.26
7	232.71	98.47
8	237.48	99.96
9	242.16	101.73
10	246.72	103.77
11	251.16	106.07
12	255.46	108.63
13	259.60	111.43
14	263.57	114.47
15	267.35	117.74
16	270.93	121.23
17	274.31	124.92
18	277.46	128.80
19	280.39	132.85
20	283.06	137.07
21	285.49	141.45
22	287.66	145.95
23	289.56	150.58
24	291.19	155.30
25	292.54	160.12

26	292.94	162.00

Circle Center At X = 209.6 ; Y = 180.7 and Radius, 85.4

*** 2.076 ***

Failure Surface Specified By 26 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55
2	207.99	95.23
3	212.99	95.21
4	217.98	95.49
5	222.95	96.08
6	227.87	96.98
7	232.72	98.17
8	237.50	99.65
9	242.17	101.43
10	246.73	103.49
11	251.15	105.82
12	255.42	108.41
13	259.53	111.27
14	263.46	114.36
15	267.18	117.70
16	270.70	121.25
17	274.00	125.01
18	277.05	128.97
19	279.87	133.10
20	282.42	137.40
21	284.70	141.85
22	286.72	146.42
23	288.44	151.12
24	289.88	155.91
25	291.02	160.77
26	291.23	162.00

Circle Center At X = 210.8 ; Y = 177.0 and Radius, 81.9

*** 2.089 ***

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55
2	208.00	95.50
3	212.99	95.78
4	217.96	96.37
5	222.87	97.29
6	227.72	98.53
7	232.47	100.08
8	237.11	101.93

9	241.63	104.08
10	245.99	106.52
11	250.19	109.24
12	254.20	112.22
13	258.02	115.46
14	261.61	118.93
15	264.97	122.64
16	268.08	126.55
17	270.93	130.66
18	273.51	134.94
19	275.81	139.38
20	277.81	143.96
21	279.52	148.66
22	280.91	153.46
23	281.99	158.35
24	282.55	162.00

Circle Center At X = 206.3 ; Y = 172.5 and Radius, 77.1

*** 2.107 ***

Failure Surface Specified By 26 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55
2	207.98	95.13
3	212.98	95.03
4	217.98	95.24
5	222.95	95.78
6	227.88	96.62
7	232.74	97.78
8	237.52	99.25
9	242.20	101.02
10	246.75	103.08
11	251.17	105.43
12	255.42	108.06
13	259.50	110.94
14	263.39	114.09
15	267.07	117.47
16	270.53	121.08
17	273.75	124.91
18	276.72	128.93
19	279.43	133.13
20	281.87	137.50
21	284.02	142.01
22	285.88	146.65
23	287.44	151.40
24	288.70	156.24
25	289.65	161.15
26	289.76	162.00

Circle Center At X = 212.1 ; Y = 173.6 and Radius, 78.5

*** 2.111 ***

Failure Surface Specified By 27 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	185.67	95.00
2	190.60	94.15
3	195.57	93.63
4	200.56	93.42
5	205.56	93.54
6	210.54	93.99
7	215.48	94.75
8	220.37	95.83
9	225.17	97.22
10	229.87	98.93
11	234.45	100.93
12	238.89	103.22
13	243.18	105.80
14	247.29	108.64
15	251.21	111.75
16	254.92	115.10
17	258.40	118.69
18	261.65	122.49
19	264.64	126.50
20	267.37	130.69
21	269.82	135.04
22	271.99	139.55
23	273.86	144.19
24	275.42	148.94
25	276.68	153.78
26	277.62	158.69
27	278.04	162.00

Circle Center At X = 201.2 ; Y = 170.8 and Radius, 77.4

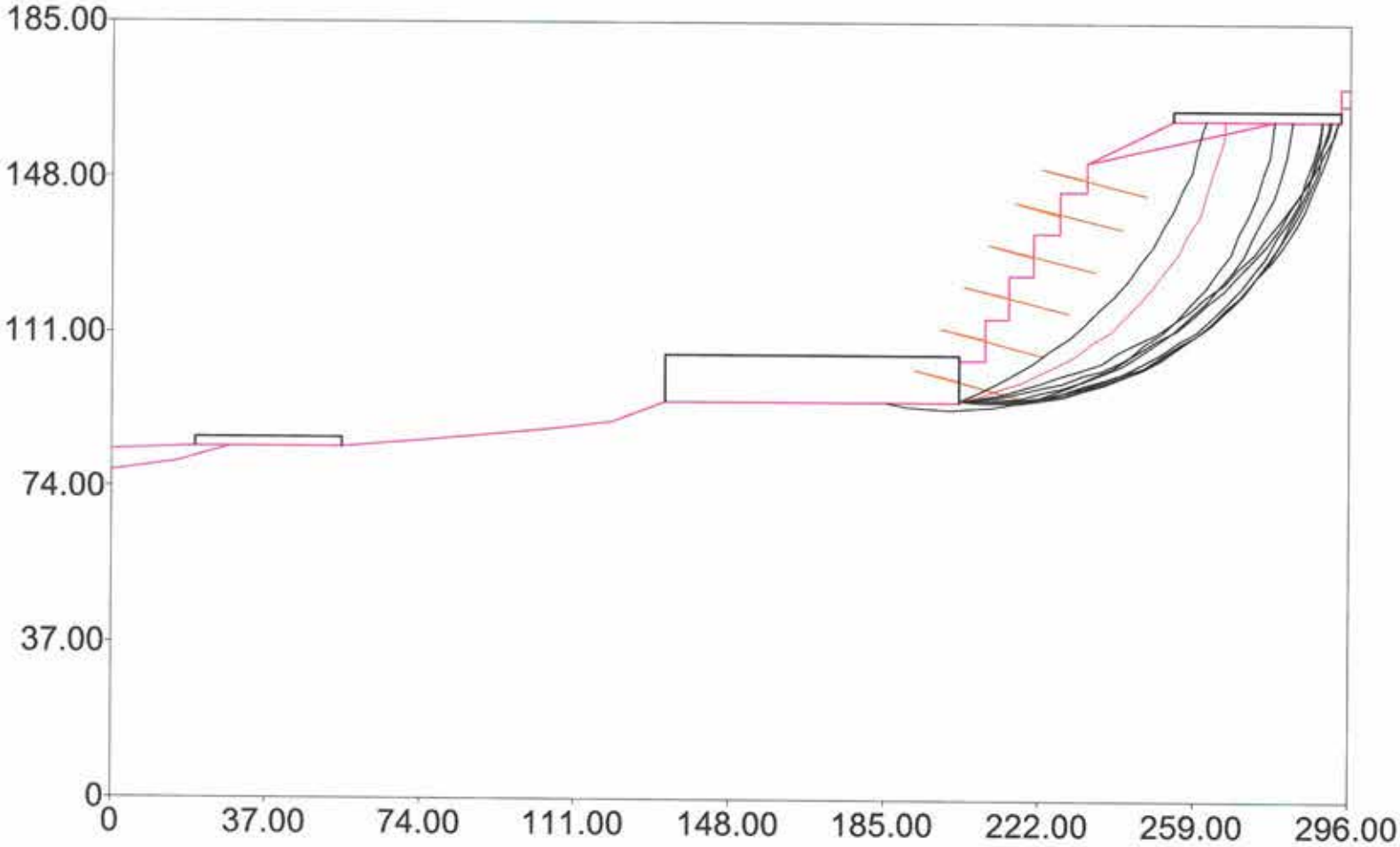
*** 2.143 ***

```
            Y            A     X     I     S            F     T

            0.00     37.00     74.00    111.00    148.00    185.00
X       0.00 +---------+---------+**-------+---------+---------+
             -
             -
             -                     **/1
             -
             -                      *
       37.00 +
             -
             -
             -                      *1/
             -
             -
A      74.00 +                      *
             -
```

```
             -
             -
             -
             -                        *
X    111.00 +
             -                        *
             -                         .
             -                        ..
             -                     ....*/2
             -                     .....
I    148.00 +                   .......
             -                   . ....
             -                  ........
             -                .........
             -                ........
             -                .........
S    185.00 +                 ........0
             -                .......0
             -                .......0.6
             -                .......0*T* 5
             -                .......012* T*4
             -                ........T12. *T *3
     222.00 +                  .......612T..  *T* 2
             -                 .......43152T.   * T*1
             -                  ......943.142.T    *T*
             -                   ......64311.23..T
             -                   ......43..11.222.T....
             -                    .....9433..11.221....*/3
F    259.00 +                     ......4530...111.2222
             -                      .....44380....1.111
             -                       ......4338.00.....
             -                         ......433888.00*
             -                            .....63438.88
             -                                ....6.3334
T    296.00 +                                       ...***
```

Cross Section D-D' Post Construction - Seismic



Safety Factors

1.17
1.23
1.25
1.32
1.36
1.36
1.38
1.40
1.41
1.50

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 Cross Section D-D' Post Construction - S
eismic

BOUNDARY COORDINATES

25 Top Boundaries
29 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	83.00	20.00	84.00	3
2	20.00	84.00	29.00	84.00	3
3	29.00	84.00	55.00	84.00	2
4	55.00	84.00	77.00	86.00	2
5	77.00	86.00	106.00	88.00	2
6	106.00	88.00	120.00	90.00	2
7	120.00	90.00	133.00	95.00	2
8	133.00	95.00	203.00	95.00	2
9	203.00	95.00	203.01	105.00	2
10	203.01	105.00	209.00	105.00	2
11	209.00	105.00	209.01	115.00	2
12	209.01	115.00	215.00	115.00	2
13	215.00	115.00	215.01	125.00	2
14	215.01	125.00	221.00	125.00	2
15	221.00	125.00	221.01	135.00	2
16	221.01	135.00	227.00	135.00	2
17	227.00	135.00	227.01	145.00	2
18	227.01	145.00	233.00	145.00	2
19	233.00	145.00	233.01	152.00	2
20	233.01	152.00	254.00	162.00	1
21	254.00	162.00	278.00	162.00	1
22	278.00	162.00	294.00	162.00	2
23	294.00	162.00	294.01	166.00	2
24	294.01	166.00	294.02	170.00	1
25	294.02	170.00	296.00	170.00	1

26	294.01	166.00	296.00	166.00	2
27	233.01	152.00	278.00	162.00	2
28	0.00	78.00	16.00	80.00	2
29	16.00	80.00	29.00	84.00	2

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	120.0	135.0	0.0	34.0	0.00	0.0	0
2	145.0	160.0	500.0	42.0	0.00	0.0	0
3	125.0	140.0	0.0	32.0	0.00	0.0	0

A Horizontal Earthquake Loading Coefficient
Of0.310 Has Been Assigned

A Vertical Earthquake Loading Coefficient
Of0.000 Has Been Assigned

Cavitation Pressure = 0.0 psf

BOUNDARY LOAD(S)

3 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (lb/sqft)	Deflection (deg)
1	20.00	55.00	500.0	0.0
2	133.00	203.00	2500.0	0.0
3	254.00	294.00	500.0	0.0

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

TIEBACK LOAD(S)

6 Tieback Load(s) Specified

Tieback No.	X-Pos (ft)	Y-Pos (ft)	Load (lbs)	Spacing (ft)	Inclination (deg)	Length (ft)
1	233.00	148.00	90000.0	6.0	15.00	15.0
2	227.01	140.00	90000.0	6.0	15.00	15.0

3	221.01	130.00	90000.0	6.0	15.00	15.0
4	215.01	120.00	90000.0	6.0	15.00	15.0
5	209.01	110.00	90000.0	6.0	15.00	15.0
6	203.01	100.00	90000.0	6.0	15.00	15.0

NOTE - An Equivalent Line Load Is Calculated For Each Row Of Tiebacks Assuming A Uniform Distribution Of Load Horizontally Between Individual Tiebacks.

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

100 Trial Surfaces Have Been Generated.

10 Surfaces Initiate From Each Of 10 Points Equally Spaced Along The Ground Surface Between X = 125.00 ft.
and X = 203.00 ft.

Each Surface Terminates Between X = 233.00 ft.
and X = 294.00 ft.

Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00 ft.

5.00 ft. Line Segments Define Each Trial Failure Surface.

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 Bishop Method * *

Failure Surface Specified By 21 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55
2	207.89	96.60
3	212.70	97.95
4	217.42	99.62
5	222.02	101.58
6	226.48	103.83
7	230.79	106.37
8	234.93	109.17
9	238.88	112.23
10	242.63	115.54
11	246.16	119.09
12	249.45	122.85

13	252.50	126.81
14	255.28	130.97
15	257.80	135.29
16	260.03	139.76
17	261.97	144.37
18	263.61	149.09
19	264.95	153.91
20	265.98	158.80
21	266.43	162.00

Circle Center At X = 189.1 ; Y = 172.4 and Radius, 78.1

*** 1.167 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55
2	207.63	97.44
3	212.15	99.57
4	216.56	101.94
5	220.83	104.53
6	224.97	107.34
7	228.95	110.37
8	232.76	113.60
9	236.40	117.03
10	239.86	120.64
11	243.12	124.43
12	246.18	128.39
13	249.03	132.50
14	251.65	136.75
15	254.06	141.14
16	256.22	145.64
17	258.15	150.25
18	259.84	154.96
19	261.27	159.75
20	261.82	162.00

Circle Center At X = 169.3 ; Y = 184.7 and Radius, 95.3

*** 1.234 ***

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55
2	207.96	96.19
3	212.88	97.05
4	217.77	98.14
5	222.59	99.44
6	227.36	100.95

7	232.05	102.68
8	236.66	104.62
9	241.18	106.76
10	245.60	109.10
11	249.90	111.64
12	254.09	114.37
13	258.16	117.28
14	262.08	120.38
15	265.87	123.64
16	269.50	127.07
17	272.98	130.67
18	276.29	134.41
19	279.44	138.30
20	282.40	142.33
21	285.18	146.49
22	287.77	150.76
23	290.17	155.15
24	292.36	159.64
25	293.39	162.00

Circle Center At X = 191.2 ; Y = 206.3 and Radius, 111.4

*** 1.248 ***

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55
2	207.99	95.86
3	212.96	96.42
4	217.89	97.24
5	222.78	98.31
6	227.60	99.63
7	232.35	101.20
8	237.01	103.00
9	241.57	105.04
10	246.03	107.32
11	250.36	109.81
12	254.56	112.53
13	258.61	115.46
14	262.51	118.59
15	266.24	121.92
16	269.80	125.43
17	273.17	129.13
18	276.35	132.98
19	279.32	137.00
20	282.09	141.17
21	284.64	145.47
22	286.97	149.89
23	289.06	154.43
24	290.92	159.07
25	291.93	162.00

Circle Center At X = 199.5 ; Y = 193.1 and Radius, 97.6

*** 1.317 ***

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55
2	208.00	95.32
3	212.99	95.39
4	217.98	95.76
5	222.93	96.44
6	227.84	97.43
7	232.67	98.71
8	237.42	100.28
9	242.06	102.14
10	246.58	104.28
11	250.96	106.69
12	255.18	109.36
13	259.23	112.29
14	263.10	115.46
15	266.77	118.86
16	270.22	122.48
17	273.44	126.30
18	276.43	130.31
19	279.16	134.50
20	281.64	138.84
21	283.84	143.33
22	285.76	147.95
23	287.40	152.67
24	288.75	157.48
25	289.72	162.00

Circle Center At X = 209.3 ; Y = 177.1 and Radius, 81.8

*** 1.355 ***

Failure Surface Specified By 26 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55
2	207.99	95.31
3	212.99	95.36
4	217.98	95.70
5	222.94	96.34
6	227.86	97.26
7	232.71	98.47
8	237.48	99.96
9	242.16	101.73
10	246.72	103.77
11	251.16	106.07
12	255.46	108.63
13	259.60	111.43
14	263.57	114.47
15	267.35	117.74

16	270.93	121.23
17	274.31	124.92
18	277.46	128.80
19	280.39	132.85
20	283.06	137.07
21	285.49	141.45
22	287.66	145.95
23	289.56	150.58
24	291.19	155.30
25	292.54	160.12
26	292.94	162.00

Circle Center At X = 209.6 ; Y = 180.7 and Radius, 85.4

*** 1.363 ***

Failure Surface Specified By 26 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55
2	207.99	95.23
3	212.99	95.21
4	217.98	95.49
5	222.95	96.08
6	227.87	96.98
7	232.72	98.17
8	237.50	99.65
9	242.17	101.43
10	246.73	103.49
11	251.15	105.82
12	255.42	108.41
13	259.53	111.27
14	263.46	114.36
15	267.18	117.70
16	270.70	121.25
17	274.00	125.01
18	277.05	128.97
19	279.87	133.10
20	282.42	137.40
21	284.70	141.85
22	286.72	146.42
23	288.44	151.12
24	289.88	155.91
25	291.02	160.77
26	291.23	162.00

Circle Center At X = 210.8 ; Y = 177.0 and Radius, 81.9

*** 1.383 ***

Failure Surface Specified By 24 Coordinate Points

Point X-Surf Y-Surf

No.	(ft)	(ft)
1	203.00	95.55
2	208.00	95.50
3	212.99	95.78
4	217.96	96.37
5	222.87	97.29
6	227.72	98.53
7	232.47	100.08
8	237.11	101.93
9	241.63	104.08
10	245.99	106.52
11	250.19	109.24
12	254.20	112.22
13	258.02	115.46
14	261.61	118.93
15	264.97	122.64
16	268.08	126.55
17	270.93	130.66
18	273.51	134.94
19	275.81	139.38
20	277.81	143.96
21	279.52	148.66
22	280.91	153.46
23	281.99	158.35
24	282.55	162.00

Circle Center At X = 206.3 ; Y = 172.5 and Radius, 77.1

*** 1.405 ***

Failure Surface Specified By 26 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	203.00	95.55
2	207.98	95.13
3	212.98	95.03
4	217.98	95.24
5	222.95	95.78
6	227.88	96.62
7	232.74	97.78
8	237.52	99.25
9	242.20	101.02
10	246.75	103.08
11	251.17	105.43
12	255.42	108.06
13	259.50	110.94
14	263.39	114.09
15	267.07	117.47
16	270.53	121.08
17	273.75	124.91
18	276.72	128.93
19	279.43	133.13
20	281.87	137.50
21	284.02	142.01
22	285.88	146.65
23	287.44	151.40

24	288.70	156.24
25	289.65	161.15
26	289.76	162.00

Circle Center At X = 212.1 ; Y = 173.6 and Radius, 78.5

*** 1.411 ***

Failure Surface Specified By 27 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	185.67	95.00
2	190.60	94.15
3	195.57	93.63
4	200.56	93.42
5	205.56	93.54
6	210.54	93.99
7	215.48	94.75
8	220.37	95.83
9	225.17	97.22
10	229.87	98.93
11	234.45	100.93
12	238.89	103.22
13	243.18	105.80
14	247.29	108.64
15	251.21	111.75
16	254.92	115.10
17	258.40	118.69
18	261.65	122.49
19	264.64	126.50
20	267.37	130.69
21	269.82	135.04
22	271.99	139.55
23	273.86	144.19
24	275.42	148.94
25	276.68	153.78
26	277.62	158.69
27	278.04	162.00

Circle Center At X = 201.2 ; Y = 170.8 and Radius, 77.4

*** 1.502 ***

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          Y            A     X     I     S            F     T

          0.00      37.00     74.00    111.00    148.00    185.00
X       0.00 +---------+---------+**-------+---------+---------+
             -
             -
             -                     **/1
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                 -
                 -                    *
        37.00 +
                 -
                 -
                 -                    *1/
                 -
                 -
A       74.00 +                       *
                 -
                 -
                 -
                 -
                 -                     *
X      111.00 +
                 -                     *
                 -                      .
                 -                     ..
                 -                  ....*/2
                 -                  .....
I      148.00 +                  .......
                 -                  . ....
                 -                .........
                 -               .........
                 -               ........
                 -               .........
S      185.00 +                  ........0
                 -               .......0
                 -               .......0.6
                 -               .......0*T* 5
                 -               .......012* T*4
                 -               ........T12. *T *3
       222.00 +                   .......612T..  *T* 2
                 -                .......53152T.   * T*1
                 -                 ......943.142.T    *T*
                 -                  ......64311.23..T
                 -                   ......53..11.222.T....
                 -                    .....9533..11.221....*/3
F      259.00 +                      ......5430...111.2222
                 -                      .....54380....1.111
                 -                       ......5338.00.....
                 -                         ......533888.00*
                 -                            .....63438.88
                 -                               ....6.3334
T      296.00 +                                        ...***
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