

8	306.00	860.00	332.00	854.00	1
9	332.00	854.00	439.00	858.00	3
10	439.00	858.00	470.00	874.00	1
11	470.00	874.00	494.00	885.00	1
12	494.00	885.00	496.00	897.00	1
13	496.00	897.00	501.00	897.00	1
14	501.00	897.00	548.00	920.00	1
15	548.00	920.00	565.00	919.00	1
16	565.00	919.00	640.00	918.00	1
17	640.00	918.00	774.00	918.00	1
18	774.00	918.00	890.00	918.00	2
19	890.00	918.00	936.00	940.00	2
20	936.00	940.00	962.00	950.00	2
21	962.00	950.00	1021.00	979.00	2
22	1021.00	979.00	1035.00	981.00	2
23	1035.00	981.00	1048.00	982.00	2
24	1048.00	982.00	1054.00	981.00	2
25	1054.00	981.00	1068.00	974.00	2
26	1068.00	974.00	1073.00	975.00	2
27	1073.00	975.00	1132.00	951.00	2
28	1132.00	951.00	1134.00	951.00	2
29	1134.00	951.00	1136.00	946.00	2
30	1136.00	946.00	1160.00	945.00	2
31	45.00	811.00	66.00	800.00	4
32	66.00	800.00	137.00	800.00	4
33	137.00	800.00	158.00	812.00	3
34	158.00	812.00	193.00	822.00	3
35	193.00	822.00	215.00	822.00	3
36	215.00	822.00	235.00	834.00	3
37	235.00	834.00	280.00	834.00	3
38	280.00	834.00	313.00	849.00	3
39	313.00	849.00	332.00	854.00	3
40	0.00	775.00	80.00	780.00	2
41	80.00	780.00	137.00	795.00	2
42	137.00	795.00	175.00	810.00	2
43	175.00	810.00	264.00	823.00	2
44	264.00	823.00	375.00	837.00	2
45	375.00	837.00	436.00	845.00	2
46	439.00	858.00	452.00	847.00	2
47	436.00	845.00	452.00	847.00	2
48	452.00	847.00	467.00	835.00	2
49	467.00	835.00	507.00	835.00	2
50	507.00	835.00	544.00	858.00	2
51	544.00	858.00	716.00	880.00	2
52	716.00	880.00	742.00	887.00	2
53	742.00	887.00	774.00	918.00	2

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

5 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	120.0	300.0	30.0	0.00	0.0	0

2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	26.0	0.00	0.0	0
4	120.0	120.0	100.0	27.0	0.00	0.0	0
5	120.0	120.0	150.0	18.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

2 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	2.0	300.00	30.00
2	9.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 3 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	2.0	300.00	26.00
2	9.0	100.00	12.00
3	90.0	300.00	26.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

1

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	565.00	888.00	250.0	0.0

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

Janbus Empirical Coef is being used for the case of c & phi both > 0

1

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 50.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	532.00	851.00	532.00	851.00	20.00
2	533.00	851.00	806.00	877.00	20.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 32.112 FS Min = 2.223 FS Ave = 5.718
Standard Deviation = 2.652 Coefficient of Variation = 46.37 %

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	441.755	859.422
2	482.072	847.521
3	532.000	844.842
4	550.846	861.219
5	586.192	896.583
6	600.286	918.530

Factor of Safety
*** 2.223 ***

Individual data on the 14 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	28.2	38835.8	0.0	0.0	0.	0.	0.0	0.0	0.0
2	12.1	39785.1	0.0	0.0	0.	0.	0.0	0.0	0.0
3	11.9	50192.8	0.0	0.0	0.	0.	0.0	0.0	0.0
4	2.0	10601.6	0.0	0.0	0.	0.	0.0	0.0	0.0
5	5.0	30216.6	0.0	0.0	0.	0.	0.0	0.0	0.0
6	22.6	153286.7	0.0	0.0	0.	0.	0.0	0.0	0.0
7	8.4	65865.4	0.0	0.0	0.	0.	0.0	0.0	0.0
8	12.0	93673.0	0.0	0.0	0.	0.	0.0	0.0	0.0
9	3.7	27440.2	0.0	0.0	0.	0.	0.0	0.0	0.0
10	0.3	2326.2	0.0	0.0	0.	0.	0.0	0.0	0.0
11	2.8	20466.1	0.0	0.0	0.	0.	0.0	0.0	0.0
12	14.2	86823.1	0.0	0.0	0.	0.	0.0	0.0	0.0
13	21.2	83610.2	0.0	0.0	0.	0.	0.0	0.0	5298.1
14	14.1	18717.8	0.0	0.0	0.	0.	0.0	0.0	3523.5

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	441.755	859.422
2	482.072	847.521
3	532.000	844.842
4	550.846	861.219
5	586.192	896.583
6	600.286	918.530

Factor of Safety
 *** 2.223 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	441.755	859.422
2	482.072	847.521
3	532.000	844.842
4	550.846	861.219
5	586.192	896.583
6	600.286	918.530

Factor of Safety
 *** 2.223 ***

Failure Surface Specified By 6 Coordinate Points

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

1	441.755	859.422
2	482.072	847.521
3	532.000	844.842
4	550.846	861.219
5	586.192	896.583
6	600.286	918.530

Factor of Safety
 *** 2.223 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	441.755	859.422
2	482.072	847.521
3	532.000	844.842
4	550.846	861.219
5	586.192	896.583
6	600.286	918.530

Factor of Safety
 *** 2.223 ***

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	441.755	859.422
2	482.072	847.521
3	532.000	844.842
4	550.846	861.219
5	586.192	896.583
6	600.286	918.530

Factor of Safety
 *** 2.223 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	441.755	859.422
2	482.072	847.521
3	532.000	844.842

4	550.846	861.219
5	586.192	896.583
6	600.286	918.530

Factor of Safety
*** 2.223 ***

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	441.755	859.422
2	482.072	847.521
3	532.000	844.842
4	550.846	861.219
5	586.192	896.583
6	600.286	918.530

Factor of Safety
*** 2.223 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	441.755	859.422
2	482.072	847.521
3	532.000	844.842
4	550.846	861.219
5	586.192	896.583
6	600.286	918.530

Factor of Safety
*** 2.223 ***

Failure Surface Specified By 6 Coordinate Points

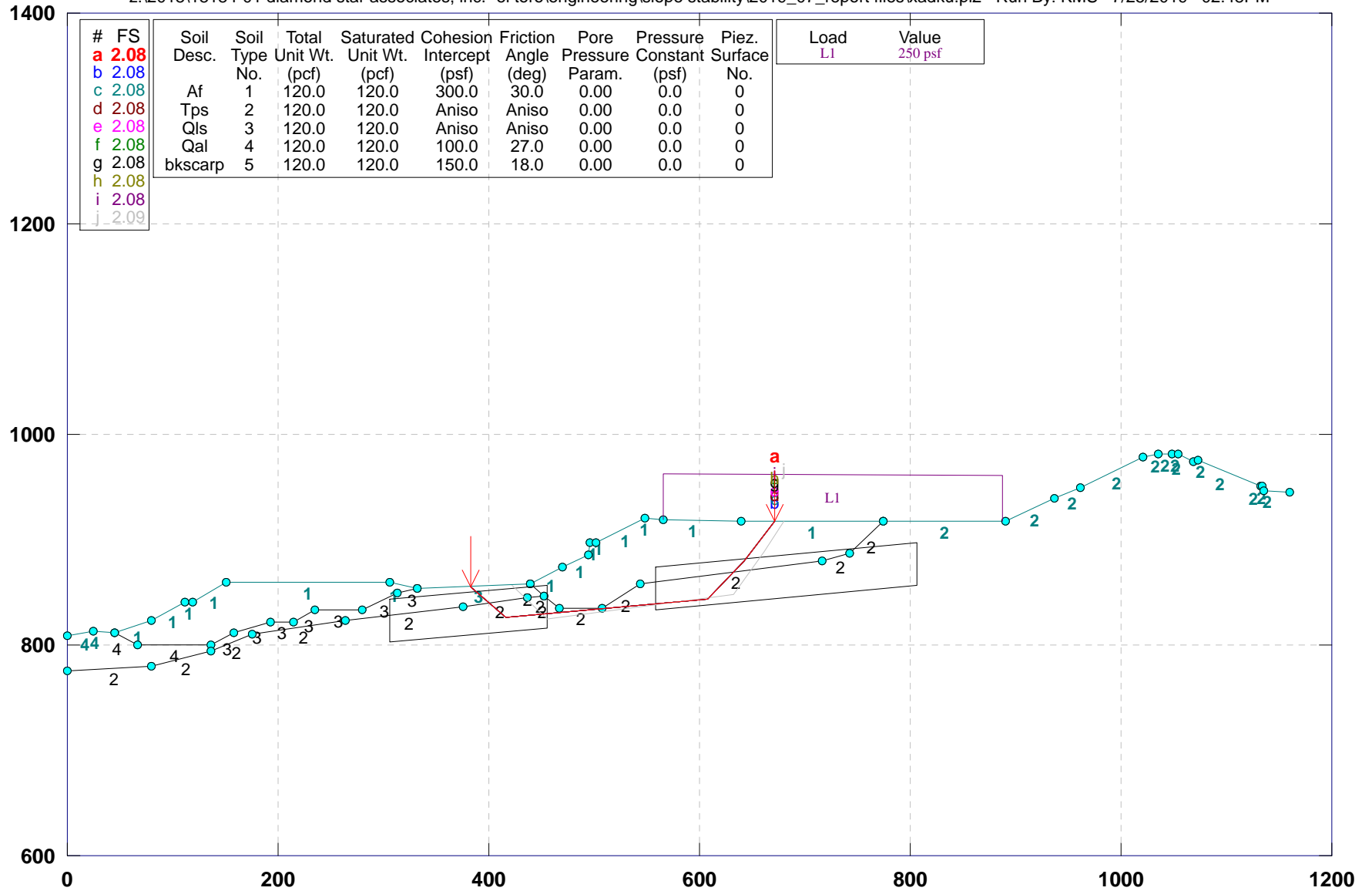
Point No.	X-Surf (ft)	Y-Surf (ft)
1	447.195	862.230
2	482.047	854.716
3	532.000	852.556
4	580.438	856.596
5	612.012	895.366
6	621.775	918.243

Factor of Safety
*** 2.473 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / A-A' / Design / Search Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xadku.pl2 Run By: KMS 7/25/2019 02:48PM

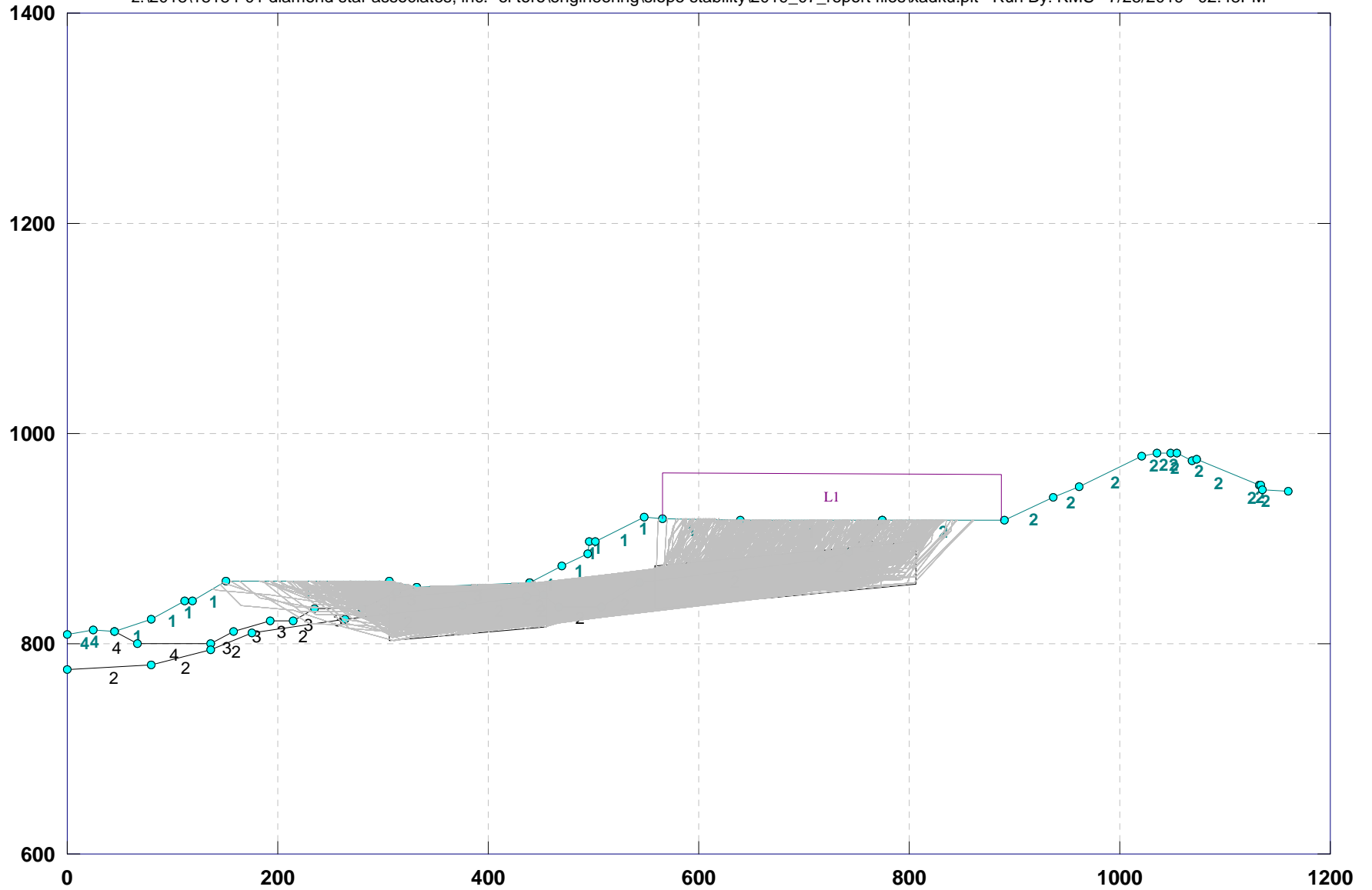


GSTABL7 v.2 FSmin=2.08

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / A-A' / Design / Search Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xadku.plt Run By: KMS 7/25/2019 02:48PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/25/2019
Time of Run: 02:48PM
Run By:
KMS

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
A\2019_07_xa\xadku.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
A\2019_07_xa\xadku.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
A\2019_07_xa\xadku.PLT

PROBLEM DESCRIPTION: 18184-01 / A-A' / Design / Search
Below Keyway

BOUNDARY COORDINATES

30 Top Boundaries
53 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	809.00	25.00	813.00	4
2	25.00	813.00	45.00	811.00	4
3	45.00	811.00	80.00	824.00	1
4	80.00	824.00	111.00	840.00	1
5	111.00	840.00	119.00	841.00	1
6	119.00	841.00	151.00	859.00	1
7	151.00	859.00	306.00	860.00	1

8	306.00	860.00	332.00	854.00	1
9	332.00	854.00	439.00	858.00	3
10	439.00	858.00	470.00	874.00	1
11	470.00	874.00	494.00	885.00	1
12	494.00	885.00	496.00	897.00	1
13	496.00	897.00	501.00	897.00	1
14	501.00	897.00	548.00	920.00	1
15	548.00	920.00	565.00	919.00	1
16	565.00	919.00	640.00	918.00	1
17	640.00	918.00	774.00	918.00	1
18	774.00	918.00	890.00	918.00	2
19	890.00	918.00	936.00	940.00	2
20	936.00	940.00	962.00	950.00	2
21	962.00	950.00	1021.00	979.00	2
22	1021.00	979.00	1035.00	981.00	2
23	1035.00	981.00	1048.00	982.00	2
24	1048.00	982.00	1054.00	981.00	2
25	1054.00	981.00	1068.00	974.00	2
26	1068.00	974.00	1073.00	975.00	2
27	1073.00	975.00	1132.00	951.00	2
28	1132.00	951.00	1134.00	951.00	2
29	1134.00	951.00	1136.00	946.00	2
30	1136.00	946.00	1160.00	945.00	2
31	45.00	811.00	66.00	800.00	4
32	66.00	800.00	137.00	800.00	4
33	137.00	800.00	158.00	812.00	3
34	158.00	812.00	193.00	822.00	3
35	193.00	822.00	215.00	822.00	3
36	215.00	822.00	235.00	834.00	3
37	235.00	834.00	280.00	834.00	3
38	280.00	834.00	313.00	849.00	3
39	313.00	849.00	332.00	854.00	3
40	0.00	775.00	80.00	780.00	2
41	80.00	780.00	137.00	795.00	2
42	137.00	795.00	175.00	810.00	2
43	175.00	810.00	264.00	823.00	2
44	264.00	823.00	375.00	837.00	2
45	375.00	837.00	436.00	845.00	2
46	439.00	858.00	452.00	847.00	2
47	436.00	845.00	452.00	847.00	2
48	452.00	847.00	467.00	835.00	2
49	467.00	835.00	507.00	835.00	2
50	507.00	835.00	544.00	858.00	2
51	544.00	858.00	716.00	880.00	2
52	716.00	880.00	742.00	887.00	2
53	742.00	887.00	774.00	918.00	2

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

5 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	120.0	300.0	30.0	0.00	0.0	0

2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	26.0	0.00	0.0	0
4	120.0	120.0	100.0	27.0	0.00	0.0	0
5	120.0	120.0	150.0	18.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

2 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	2.0	300.00	30.00
2	9.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 3 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	2.0	300.00	26.00
2	9.0	100.00	12.00
3	90.0	300.00	26.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

1

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	565.00	888.00	250.0	0.0

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

Janbus Empirical Coef is being used for the case of c & phi both > 0

1

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 50.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	306.00	823.00	456.00	836.00	40.00
2	558.00	854.00	806.00	877.00	40.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 11.691 FS Min = 2.076 FS Ave = 3.560
Standard Deviation = 1.072 Coefficient of Variation = 30.10 %

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	383.366	855.920
2	416.184	826.629
3	607.331	843.494
4	642.137	879.390
5	671.584	918.000

Factor of Safety
*** 2.076 ***

Individual data on the 19 slices

Water Water Tie Tie Earthquake

Slice No.	Width (ft)	Weight (lbs)	Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	Surcharge Load (lbs)
1	17.4	16913.3	0.0	0.0	0.	0.	0.0	0.0	0.0
2	15.4	43179.7	0.0	0.0	0.	0.	0.0	0.0	0.0
3	19.8	71372.9	0.0	0.0	0.	0.	0.0	0.0	0.0
4	3.0	10596.3	0.0	0.0	0.	0.	0.0	0.0	0.0
5	13.0	50137.4	0.0	0.0	0.	0.	0.0	0.0	0.0
6	15.0	68633.7	0.0	0.0	0.	0.	0.0	0.0	0.0
7	3.0	15113.1	0.0	0.0	0.	0.	0.0	0.0	0.0
8	24.0	135544.2	0.0	0.0	0.	0.	0.0	0.0	0.0
9	2.0	13780.0	0.0	0.0	0.	0.	0.0	0.0	0.0
10	5.0	37864.9	0.0	0.0	0.	0.	0.0	0.0	0.0
11	6.0	46145.4	0.0	0.0	0.	0.	0.0	0.0	0.0
12	37.0	322855.2	0.0	0.0	0.	0.	0.0	0.0	0.0
13	4.0	38850.4	0.0	0.0	0.	0.	0.0	0.0	0.0
14	17.0	164200.7	0.0	0.0	0.	0.	0.0	0.0	0.0
15	42.3	391595.8	0.0	0.0	0.	0.	0.0	0.0	10582.6
16	25.0	185785.9	0.0	0.0	0.	0.	0.0	0.0	6255.8
17	7.6	41112.5	0.0	0.0	0.	0.	0.0	0.0	1911.5
18	2.1	10183.1	0.0	0.0	0.	0.	0.0	0.0	534.2
19	29.4	68216.8	0.0	0.0	0.	0.	0.0	0.0	7361.8

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	383.366	855.920
2	416.184	826.629
3	607.331	843.494
4	642.137	879.390
5	671.584	918.000

Factor of Safety
 *** 2.076 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	383.366	855.920
2	416.184	826.629
3	607.331	843.494
4	642.137	879.390
5	671.584	918.000

Factor of Safety
 *** 2.076 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	383.366	855.920
2	416.184	826.629
3	607.331	843.494
4	642.137	879.390
5	671.584	918.000

Factor of Safety
 *** 2.076 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	383.366	855.920
2	416.184	826.629
3	607.331	843.494
4	642.137	879.390
5	671.584	918.000

Factor of Safety
 *** 2.076 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	383.366	855.920
2	416.184	826.629
3	607.331	843.494
4	642.137	879.390
5	671.584	918.000

Factor of Safety
 *** 2.076 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	383.366	855.920
2	416.184	826.629
3	607.331	843.494
4	642.137	879.390

5 671.584 918.000

Factor of Safety
*** 2.076 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	383.366	855.920
2	416.184	826.629
3	607.331	843.494
4	642.137	879.390
5	671.584	918.000

Factor of Safety
*** 2.076 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	383.366	855.920
2	416.184	826.629
3	607.331	843.494
4	642.137	879.390
5	671.584	918.000

Factor of Safety
*** 2.076 ***

Failure Surface Specified By 5 Coordinate Points

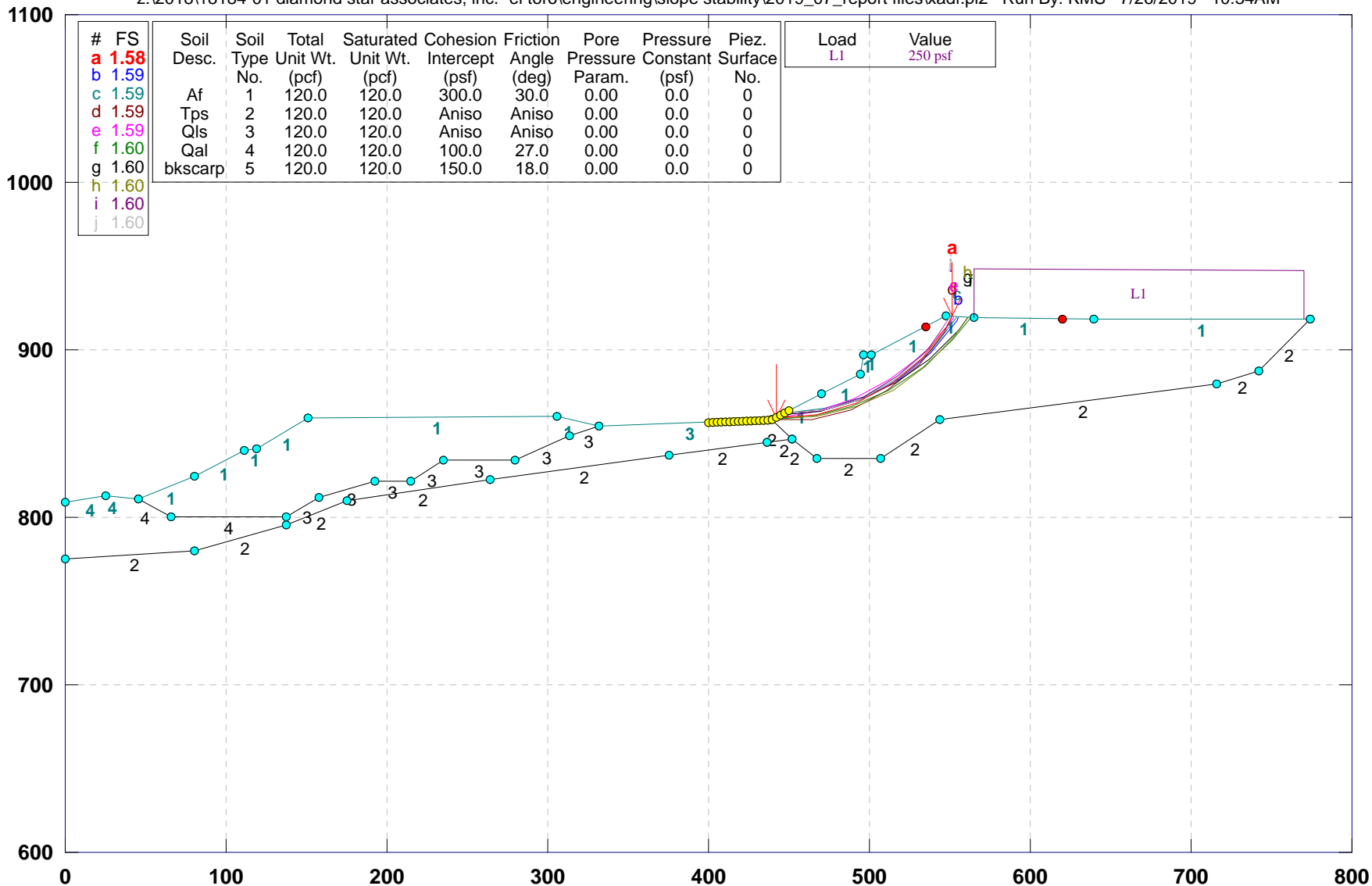
Point No.	X-Surf (ft)	Y-Surf (ft)
1	421.696	857.353
2	455.478	824.068
3	632.094	848.027
4	660.535	889.151
5	680.290	918.000

Factor of Safety
*** 2.089 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / A-A' / Design / Rotational / Static

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xadr.pl2 Run By: KMS 7/26/2019 10:34AM

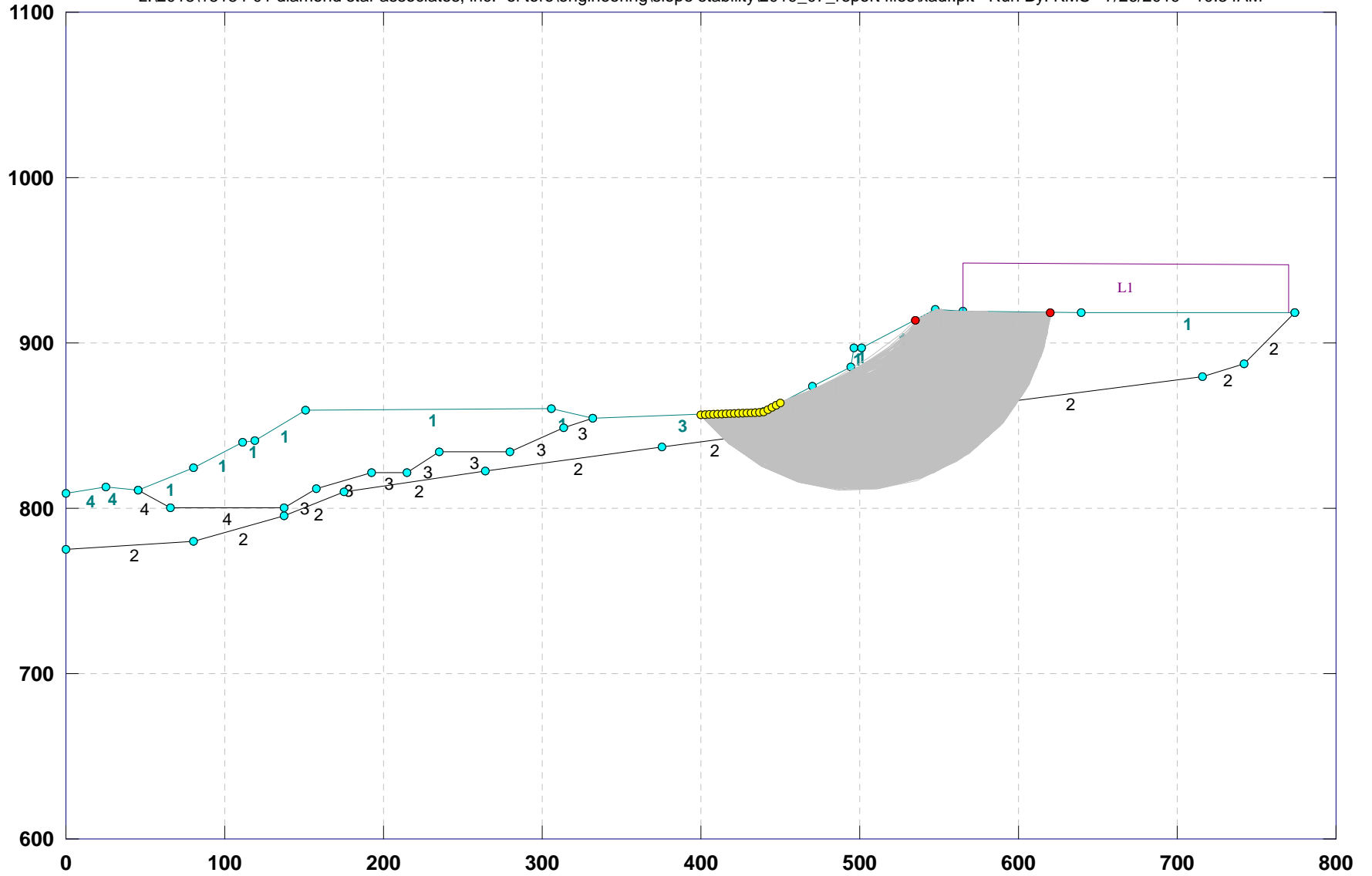


GSTABL7 v.2 FSmin=1.58

Safety Factors Are Calculated By The Modified Bishop Method

18184-01 / A-A' / Design / Rotational / Static

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xadr.plt Run By: KMS 7/26/2019 10:34AM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/26/2019
Time of Run: 10:34AM
Run By:
KMS

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
A\2019_07_xa\xadr.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
A\2019_07_xa\xadr.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
A\2019_07_xa\xadr.PLT

PROBLEM DESCRIPTION: 18184-01 / A-A' / Design / Rotational /
Static

BOUNDARY COORDINATES

17 Top Boundaries
40 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	809.00	25.00	813.00	4
2	25.00	813.00	45.00	811.00	4
3	45.00	811.00	80.00	824.00	1
4	80.00	824.00	111.00	840.00	1
5	111.00	840.00	119.00	841.00	1
6	119.00	841.00	151.00	859.00	1
7	151.00	859.00	306.00	860.00	1

8	306.00	860.00	332.00	854.00	1
9	332.00	854.00	439.00	858.00	3
10	439.00	858.00	470.00	874.00	1
11	470.00	874.00	494.00	885.00	1
12	494.00	885.00	496.00	897.00	1
13	496.00	897.00	501.00	897.00	1
14	501.00	897.00	548.00	920.00	1
15	548.00	920.00	565.00	919.00	1
16	565.00	919.00	640.00	918.00	1
17	640.00	918.00	774.00	918.00	1
18	45.00	811.00	66.00	800.00	4
19	66.00	800.00	137.00	800.00	4
20	137.00	800.00	158.00	812.00	3
21	158.00	812.00	193.00	822.00	3
22	193.00	822.00	215.00	822.00	3
23	215.00	822.00	235.00	834.00	3
24	235.00	834.00	280.00	834.00	3
25	280.00	834.00	313.00	849.00	3
26	313.00	849.00	332.00	854.00	3
27	0.00	775.00	80.00	780.00	2
28	80.00	780.00	137.00	795.00	2
29	137.00	795.00	175.00	810.00	2
30	175.00	810.00	264.00	823.00	2
31	264.00	823.00	375.00	837.00	2
32	375.00	837.00	436.00	845.00	2
33	439.00	858.00	452.00	847.00	2
34	436.00	845.00	452.00	847.00	2
35	452.00	847.00	467.00	835.00	2
36	467.00	835.00	507.00	835.00	2
37	507.00	835.00	544.00	858.00	2
38	544.00	858.00	716.00	880.00	2
39	716.00	880.00	742.00	887.00	2
40	742.00	887.00	774.00	918.00	2

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

5 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	26.0	0.00	0.0	0
4	120.0	120.0	100.0	27.0	0.00	0.0	0
5	120.0	120.0	150.0	18.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

2 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	2.0	300.00	30.00
2	9.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 3 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	2.0	300.00	26.00
2	9.0	100.00	12.00
3	90.0	300.00	26.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

1

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	565.00	770.00	250.0	0.0

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

1

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

4980 Trial Surfaces Have Been Generated.

249 Surface(s) Initiate(s) From Each Of 20 Points Equally Spaced Along The Ground Surface Between X = 400.00(ft) and X = 450.00(ft)

Each Surface Terminates Between X = 535.00(ft)

and X = 620.00(ft)

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

25.00(ft) Line Segments Define Each Trial Failure Surface.

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

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

Total Number of Trial Surfaces Attempted = 4980

Number of Trial Surfaces With Valid FS = 4980

Statistical Data On All Valid FS Values:

FS Max = 3.560 FS Min = 1.583 FS Ave = 2.365
Standard Deviation = 0.407 Coefficient of Variation = 17.20 %

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	442.105	859.603
2	467.035	861.485
3	491.094	868.276
4	513.328	879.706
5	532.852	895.321
6	548.889	914.500
7	551.751	919.779

Circle Center At X = 445.181 ; Y = 984.926 ; and Radius = 125.360

Factor of Safety
*** 1.583 ***

Individual data on the 11 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	Surcharge Load (lbs)
1	24.9	16430.4	0.0	0.0	0.	0.	0.0	0.0	0.0
2	3.0	4032.4	0.0	0.0	0.	0.	0.0	0.0	0.0
3	21.1	34262.7	0.0	0.0	0.	0.	0.0	0.0	0.0
4	2.9	5338.5	0.0	0.0	0.	0.	0.0	0.0	0.0

5	2.0	4971.9	0.0	0.0	0.	0.	0.0	0.0	0.0
6	5.0	14950.2	0.0	0.0	0.	0.	0.0	0.0	0.0
7	12.3	34735.7	0.0	0.0	0.	0.	0.0	0.0	0.0
8	19.5	47551.7	0.0	0.0	0.	0.	0.0	0.0	0.0
9	15.1	21658.3	0.0	0.0	0.	0.	0.0	0.0	0.0
10	0.9	640.7	0.0	0.0	0.	0.	0.0	0.0	0.0
11	2.9	935.4	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	447.369	862.319
2	472.296	864.227
3	496.352	871.031
4	518.585	882.463
5	538.115	898.070
6	554.169	917.234
7	555.435	919.563

Circle Center At X = 450.292 ; Y = 987.946 ; and Radius = 125.661

Factor of Safety
 *** 1.589 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	447.369	862.319
2	472.256	864.693
3	496.211	871.844
4	518.326	883.503
5	537.762	899.227
6	553.782	918.420
7	554.439	919.621

Circle Center At X = 447.683 ; Y = 990.698 ; and Radius = 128.379

Factor of Safety
 *** 1.589 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	439.474	858.245
2	464.471	858.651
3	488.781	864.480
4	511.245	875.453
5	530.786	891.046

6 546.471 910.513
7 551.072 919.819

Circle Center At X = 450.124 ; Y = 972.092 ; and Radius = 114.344

Factor of Safety
*** 1.591 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	442.105	859.603
2	466.871	863.018
3	490.695	870.597
4	512.881	882.119
5	532.784	897.248
6	549.822	915.543
7	552.559	919.732

Circle Center At X = 434.563 ; Y = 1005.803 ; and Radius = 146.395

Factor of Safety
*** 1.594 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	439.474	858.245
2	464.392	860.269
3	488.672	866.224
4	511.700	875.956
5	532.891	889.220
6	551.709	905.679
7	562.869	919.125

Circle Center At X = 439.256 ; Y = 1015.258 ; and Radius = 157.014

Factor of Safety
*** 1.596 ***

1

Failure Surface Specified By 7 Coordinate Points

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

1	444.737	860.961
2	469.617	863.405
3	493.751	869.930
4	516.473	880.357
5	537.158	894.397
6	555.236	911.664
7	560.903	919.241

Circle Center At X = 442.499 ; Y = 1011.598 ; and Radius = 150.654

Factor of Safety
 *** 1.596 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	442.105	859.603
2	467.091	860.464
3	491.477	865.968
4	514.410	875.923
5	535.084	889.979
6	552.775	907.644
7	560.694	919.253

Circle Center At X = 450.021 ; Y = 992.860 ; and Radius = 133.492

Factor of Safety
 *** 1.597 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	447.369	862.319
2	472.269	864.544
3	496.143	871.966
4	517.916	884.250
5	536.613	900.846
6	550.545	919.850

Circle Center At X = 449.466 ; Y = 979.840 ; and Radius = 117.540

Factor of Safety
 *** 1.597 ***

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	447.369	862.319
2	472.320	863.875
3	496.292	870.973
4	518.068	883.253
5	536.545	900.093
6	550.251	919.868

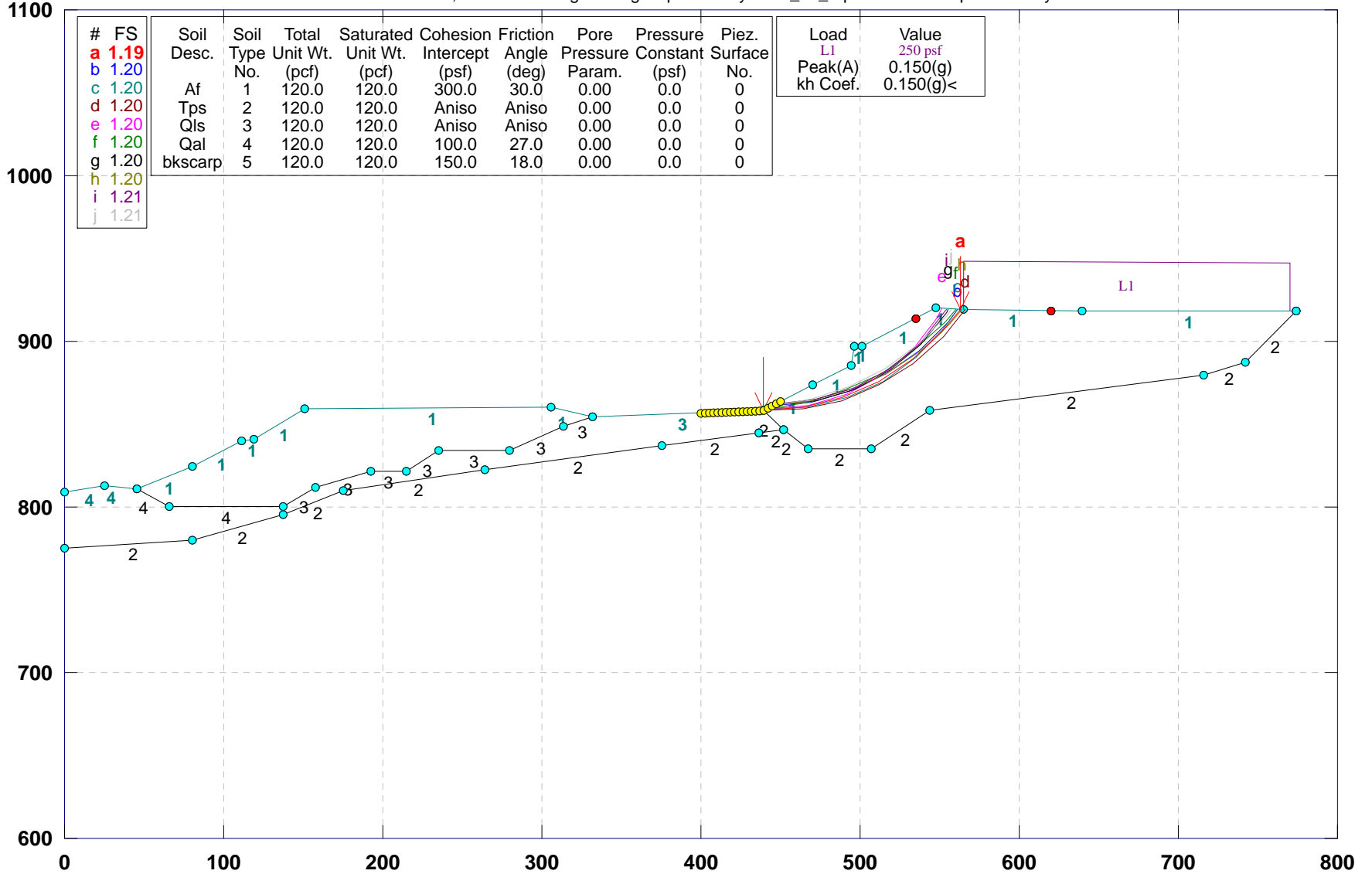
Circle Center At X = 453.030 ; Y = 972.936 ; and Radius = 110.761

Factor of Safety
*** 1.599 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / A-A' / Design / Rotational / Seismic

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xadre.pl2 Run By: KMS 7/26/2019 10:34AM

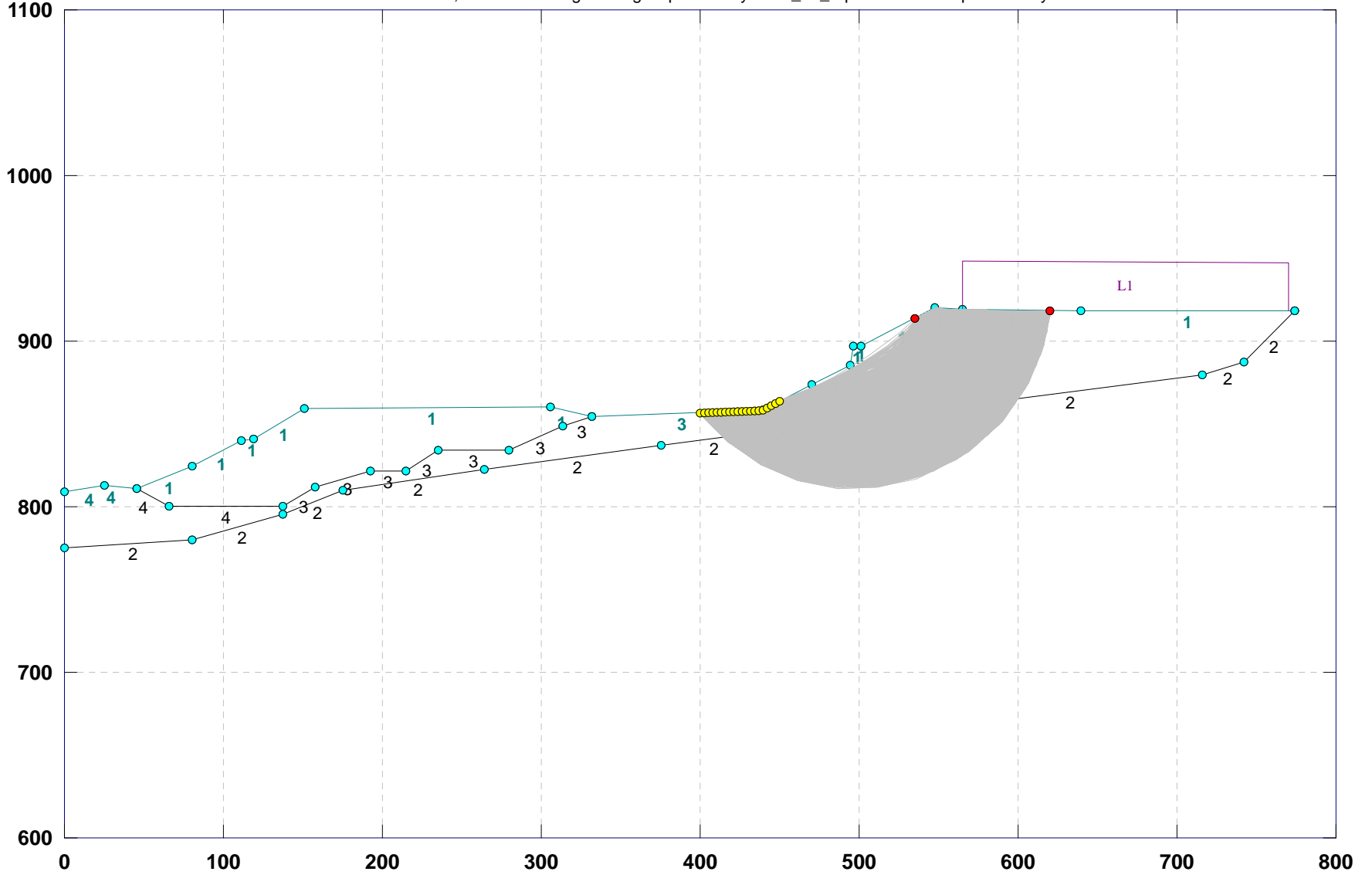


GSTABL7 v.2 FSmin=1.19

Safety Factors Are Calculated By The Modified Bishop Method

18184-01 / A-A' / Design / Rotational / Seismic

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xadre.plt Run By: KMS 7/26/2019 10:34AM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/26/2019
Time of Run: 10:34AM
Run By:
KMS

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
A\2019_07_xa\xadre.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
A\2019_07_xa\xadre.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
A\2019_07_xa\xadre.PLT

PROBLEM DESCRIPTION: 18184-01 / A-A' / Design / Rotational /
Seismic

BOUNDARY COORDINATES

17 Top Boundaries
40 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	809.00	25.00	813.00	4
2	25.00	813.00	45.00	811.00	4
3	45.00	811.00	80.00	824.00	1
4	80.00	824.00	111.00	840.00	1
5	111.00	840.00	119.00	841.00	1
6	119.00	841.00	151.00	859.00	1
7	151.00	859.00	306.00	860.00	1

8	306.00	860.00	332.00	854.00	1
9	332.00	854.00	439.00	858.00	3
10	439.00	858.00	470.00	874.00	1
11	470.00	874.00	494.00	885.00	1
12	494.00	885.00	496.00	897.00	1
13	496.00	897.00	501.00	897.00	1
14	501.00	897.00	548.00	920.00	1
15	548.00	920.00	565.00	919.00	1
16	565.00	919.00	640.00	918.00	1
17	640.00	918.00	774.00	918.00	1
18	45.00	811.00	66.00	800.00	4
19	66.00	800.00	137.00	800.00	4
20	137.00	800.00	158.00	812.00	3
21	158.00	812.00	193.00	822.00	3
22	193.00	822.00	215.00	822.00	3
23	215.00	822.00	235.00	834.00	3
24	235.00	834.00	280.00	834.00	3
25	280.00	834.00	313.00	849.00	3
26	313.00	849.00	332.00	854.00	3
27	0.00	775.00	80.00	780.00	2
28	80.00	780.00	137.00	795.00	2
29	137.00	795.00	175.00	810.00	2
30	175.00	810.00	264.00	823.00	2
31	264.00	823.00	375.00	837.00	2
32	375.00	837.00	436.00	845.00	2
33	439.00	858.00	452.00	847.00	2
34	436.00	845.00	452.00	847.00	2
35	452.00	847.00	467.00	835.00	2
36	467.00	835.00	507.00	835.00	2
37	507.00	835.00	544.00	858.00	2
38	544.00	858.00	716.00	880.00	2
39	716.00	880.00	742.00	887.00	2
40	742.00	887.00	774.00	918.00	2

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

5 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	26.0	0.00	0.0	0
4	120.0	120.0	100.0	27.0	0.00	0.0	0
5	120.0	120.0	150.0	18.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

2 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	2.0	300.00	30.00
2	9.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 3 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	2.0	300.00	26.00
2	9.0	100.00	12.00
3	90.0	300.00	26.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

1

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	565.00	770.00	250.0	0.0

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

Specified Peak Ground Acceleration Coefficient (A) = 0.150(g)
Specified Horizontal Earthquake Coefficient (kh) = 0.150(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)

Specified Seismic Pore-Pressure Factor = 0.000

1

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

4980 Trial Surfaces Have Been Generated.

249 Surface(s) Initiate(s) From Each Of 20 Points Equally Spaced
 Along The Ground Surface Between X = 400.00(ft)
 and X = 450.00(ft)

Each Surface Terminates Between X = 535.00(ft)
 and X = 620.00(ft)

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

25.00(ft) Line Segments Define Each Trial Failure Surface.

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

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

Total Number of Trial Surfaces Attempted = 4980

Number of Trial Surfaces With Valid FS = 4980

Statistical Data On All Valid FS Values:

FS Max = 2.503 FS Min = 1.192 FS Ave = 1.711
 Standard Deviation = 0.279 Coefficient of Variation = 16.32 %

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	439.474	858.245
2	464.392	860.269
3	488.672	866.224
4	511.700	875.956
5	532.891	889.220
6	551.709	905.679
7	562.869	919.125

Circle Center At X = 439.256 ; Y = 1015.258 ; and Radius = 157.014

Factor of Safety
 *** 1.192 ***

Individual data on the 11 slices

Slice	Width	Weight	Water Force Top	Water Force Bot	Tie Force Norm	Tie Force Tan	Earthquake Force Hor	Surcharge Ver	Load
-------	-------	--------	-----------------	-----------------	----------------	---------------	----------------------	---------------	------

No.	(ft)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)
1	24.9	16200.5	0.0	0.0	0.	0.	2430.1	0.0	0.0
2	5.6	7803.7	0.0	0.0	0.	0.	1170.6	0.0	0.0
3	18.7	32142.5	0.0	0.0	0.	0.	4821.4	0.0	0.0
4	5.3	10503.7	0.0	0.0	0.	0.	1575.6	0.0	0.0
5	2.0	5304.5	0.0	0.0	0.	0.	795.7	0.0	0.0
6	5.0	15973.8	0.0	0.0	0.	0.	2396.1	0.0	0.0
7	10.7	33286.3	0.0	0.0	0.	0.	4992.9	0.0	0.0
8	21.2	63150.4	0.0	0.0	0.	0.	9472.6	0.0	0.0
9	15.1	37123.1	0.0	0.0	0.	0.	5568.5	0.0	0.0
10	3.7	7047.2	0.0	0.0	0.	0.	1057.1	0.0	0.0
11	11.2	9443.4	0.0	0.0	0.	0.	1416.5	0.0	0.0

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	444.737	860.961
2	469.617	863.405
3	493.751	869.930
4	516.473	880.357
5	537.158	894.397
6	555.236	911.664
7	560.903	919.241

Circle Center At X = 442.499 ; Y = 1011.598 ; and Radius = 150.654

Factor of Safety
 *** 1.197 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	442.105	859.603
2	467.091	860.464
3	491.477	865.968
4	514.410	875.923
5	535.084	889.979
6	552.775	907.644
7	560.694	919.253

Circle Center At X = 450.021 ; Y = 992.860 ; and Radius = 133.492

Factor of Safety
 *** 1.199 ***

Failure Surface Specified By 7 Coordinate Points

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

1	439.474	858.245
2	464.449	859.362
3	488.892	864.609
4	512.126	873.840
5	533.505	886.798
6	552.437	903.125
7	565.598	918.992

Circle Center At X = 445.273 ; Y = 1008.252 ; and Radius = 150.120

Factor of Safety
 *** 1.200 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	442.105	859.603
2	467.035	861.485
3	491.094	868.276
4	513.328	879.706
5	532.852	895.321
6	548.889	914.500
7	551.751	919.779

Circle Center At X = 445.181 ; Y = 984.926 ; and Radius = 125.360

Factor of Safety
 *** 1.201 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	442.105	859.603
2	466.828	863.316
3	490.774	870.499
4	513.460	881.005
5	534.426	894.622
6	553.249	911.074
7	560.301	919.276

Circle Center At X = 428.414 ; Y = 1034.900 ; and Radius = 175.831

Factor of Safety
 *** 1.201 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	447.369	862.319
2	472.296	864.227
3	496.352	871.031
4	518.585	882.463
5	538.115	898.070
6	554.169	917.234
7	555.435	919.563

Circle Center At X = 450.292 ; Y = 987.946 ; and Radius = 125.661

Factor of Safety
*** 1.203 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	444.737	860.961
2	469.548	864.026
3	493.640	870.704
4	516.488	880.851
5	537.597	894.246
6	556.508	910.598
7	563.795	919.071

Circle Center At X = 436.403 ; Y = 1030.385 ; and Radius = 169.629

Factor of Safety
*** 1.203 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	447.369	862.319
2	472.256	864.693
3	496.211	871.844
4	518.326	883.503
5	537.762	899.227
6	553.782	918.420
7	554.439	919.621

Circle Center At X = 447.683 ; Y = 990.698 ; and Radius = 128.379

Factor of Safety
*** 1.205 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	444.737	860.961
2	469.438	864.816
3	493.270	872.370
4	515.681	883.447
5	536.156	897.793
6	554.221	915.075
7	557.574	919.437

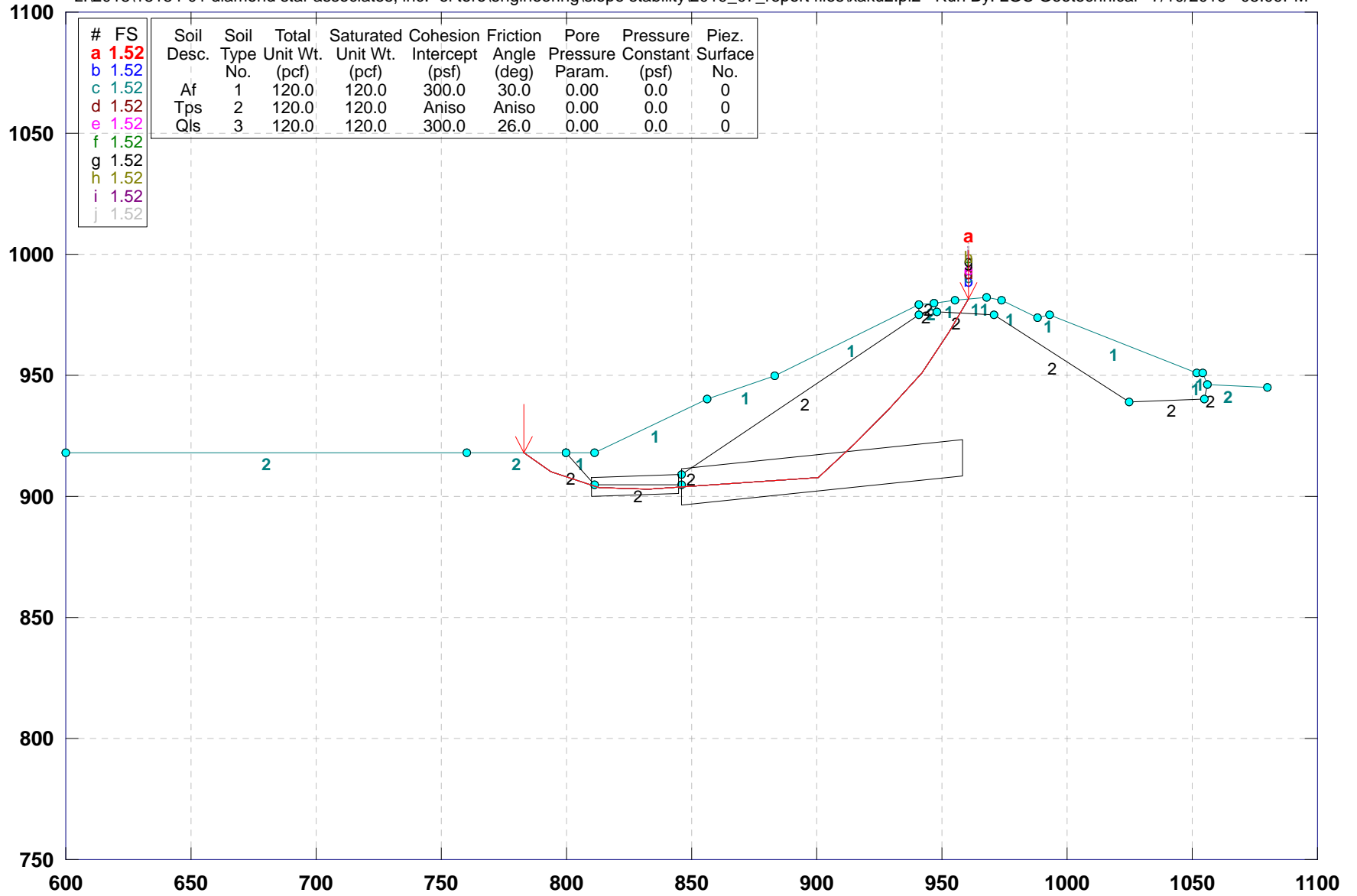
Circle Center At X = 431.790 ; Y = 1024.966 ; and Radius = 164.516

Factor of Safety
*** 1.206 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / A-A' / Design / Upper Slope / Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xaku2.pl2 Run By: LGC Geotechnical 7/10/2019 05:09PM

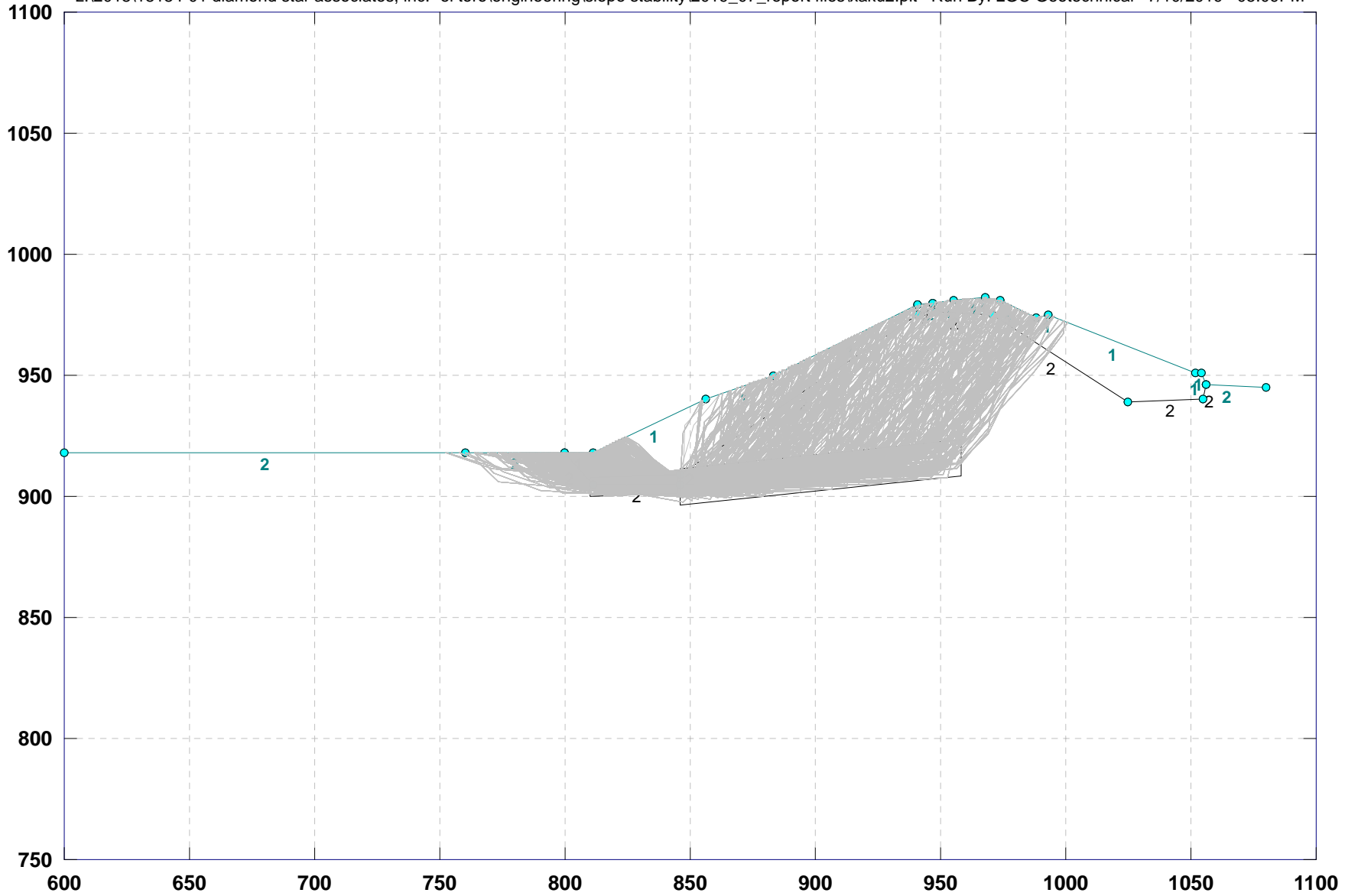


GSTABL7 v.2 FSmin=1.52

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / A-A' / Design / Upper Slope / Below Keyway

z:\2018\18184-01 diamond star associates, inc. - el toro\engineering\slope stability\2019_07_report files\xaku2.plt Run By: LGC Geotechnical 7/10/2019 05:09PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D., P.E., D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/10/2019
Time of Run: 05:09PM
Run By: LGC
Geotechnical

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec A\2019_07_xa\Upper
Slope\xaku2.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec A\2019_07_xa\Upper
Slope\xaku2.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec A\2019_07_xa\Upper
Slope\xaku2.PLT

PROBLEM DESCRIPTION: 18184-01 / A-A' / Design / Upper Slope
/ Below Keyway

BOUNDARY COORDINATES

16 Top Boundaries
26 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	600.00	918.00	760.00	917.80	2
2	760.00	917.80	800.00	918.00	2
3	800.00	918.00	811.00	918.00	1
4	811.00	918.00	856.00	940.00	1
5	856.00	940.00	883.00	950.00	1
6	883.00	950.00	941.00	979.00	1
7	941.00	979.00	947.00	980.00	2

8	947.00	980.00	955.00	981.00	1
9	955.00	981.00	968.00	982.00	1
10	968.00	982.00	974.00	981.00	1
11	974.00	981.00	988.00	974.00	1
12	988.00	974.00	993.00	975.00	1
13	993.00	975.00	1052.00	951.00	1
14	1052.00	951.00	1054.00	951.00	1
15	1054.00	951.00	1056.00	946.00	1
16	1056.00	946.00	1080.00	945.00	2
17	800.00	918.00	811.00	905.00	2
18	811.00	905.00	846.00	905.00	2
19	846.00	905.00	846.01	909.00	2
20	846.01	909.00	940.90	975.00	2
21	940.90	975.00	941.00	978.90	2
22	947.00	980.00	948.00	976.00	2
23	948.00	976.00	971.00	975.00	2
24	971.00	975.00	1025.00	939.00	2
25	1025.00	939.00	1055.00	940.00	2
26	1055.00	940.00	1056.00	946.00	2

User Specified Y-Origin = 750.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	26.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	-7.0	300.00	30.00
2	7.0	0.00	15.00
3	90.0	300.00	30.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.

(3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

Janbus Empirical Coef is being used for the case of c & phi both > 0

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 20.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	810.00	904.00	845.00	905.00	8.00
2	846.00	904.00	958.00	916.00	15.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 20.247 FS Min = 1.519 FS Ave = 2.534
Standard Deviation = 1.452 Coefficient of Variation = 57.32 %

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	782.782	917.914
2	793.860	910.070
3	812.807	903.666
4	832.796	902.997
5	900.735	907.633
6	914.877	921.776
7	929.002	935.935
8	942.224	950.941
9	952.652	968.007
10	960.418	981.417

Factor of Safety
 *** 1.519 ***

Individual data on the 21 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	11.1	5250.2	0.0	0.0	0.	0.	0.0	0.0	0.0
2	6.1	6595.6	0.0	0.0	0.	0.	0.0	0.0	0.0
3	11.0	15660.7	0.0	0.0	0.	0.	0.0	0.0	0.0
4	1.8	3137.7	0.0	0.0	0.	0.	0.0	0.0	0.0
5	20.0	49024.4	0.0	0.0	0.	0.	0.0	0.0	0.0
6	13.2	45057.7	0.0	0.0	0.	0.	0.0	0.0	0.0
7	0.0	37.5	0.0	0.0	0.	0.	0.0	0.0	0.0
8	10.0	39942.4	0.0	0.0	0.	0.	0.0	0.0	0.0
9	27.0	127974.9	0.0	0.0	0.	0.	0.0	0.0	0.0
10	17.7	100890.8	0.0	0.0	0.	0.	0.0	0.0	0.0
11	14.1	80946.7	0.0	0.0	0.	0.	0.0	0.0	0.0
12	14.1	68838.3	0.0	0.0	0.	0.	0.0	0.0	0.0
13	11.9	47529.4	0.0	0.0	0.	0.	0.0	0.0	0.0
14	0.1	353.7	0.0	0.0	0.	0.	0.0	0.0	0.0
15	1.2	4239.6	0.0	0.0	0.	0.	0.0	0.0	0.0
16	4.8	14185.4	0.0	0.0	0.	0.	0.0	0.0	0.0
17	1.0	2458.4	0.0	0.0	0.	0.	0.0	0.0	0.0
18	4.7	9051.5	0.0	0.0	0.	0.	0.0	0.0	0.0
19	2.3	3048.5	0.0	0.0	0.	0.	0.0	0.0	0.0
20	2.1	1784.5	0.0	0.0	0.	0.	0.0	0.0	0.0
21	3.4	1120.8	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	782.782	917.914
2	793.860	910.070
3	812.807	903.666
4	832.796	902.997
5	900.735	907.633
6	914.877	921.776
7	929.002	935.935
8	942.224	950.941
9	952.652	968.007
10	960.418	981.417

Factor of Safety
 *** 1.519 ***

Failure Surface Specified By 10 Coordinate Points

Point	X-Surf	Y-Surf
-------	--------	--------

No.	(ft)	(ft)
1	782.782	917.914
2	793.860	910.070
3	812.807	903.666
4	832.796	902.997
5	900.735	907.633
6	914.877	921.776
7	929.002	935.935
8	942.224	950.941
9	952.652	968.007
10	960.418	981.417

Factor of Safety
 *** 1.519 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	782.782	917.914
2	793.860	910.070
3	812.807	903.666
4	832.796	902.997
5	900.735	907.633
6	914.877	921.776
7	929.002	935.935
8	942.224	950.941
9	952.652	968.007
10	960.418	981.417

Factor of Safety
 *** 1.519 ***

1

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	782.782	917.914
2	793.860	910.070
3	812.807	903.666
4	832.796	902.997
5	900.735	907.633
6	914.877	921.776
7	929.002	935.935
8	942.224	950.941
9	952.652	968.007
10	960.418	981.417

Factor of Safety
 *** 1.519 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	782.782	917.914
2	793.860	910.070
3	812.807	903.666
4	832.796	902.997
5	900.735	907.633
6	914.877	921.776
7	929.002	935.935
8	942.224	950.941
9	952.652	968.007
10	960.418	981.417

Factor of Safety
*** 1.519 ***

1

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	782.782	917.914
2	793.860	910.070
3	812.807	903.666
4	832.796	902.997
5	900.735	907.633
6	914.877	921.776
7	929.002	935.935
8	942.224	950.941
9	952.652	968.007
10	960.418	981.417

Factor of Safety
*** 1.519 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	782.782	917.914
2	793.860	910.070
3	812.807	903.666
4	832.796	902.997
5	900.735	907.633
6	914.877	921.776
7	929.002	935.935
8	942.224	950.941

9	952.652	968.007
10	960.418	981.417

Factor of Safety
*** 1.519 ***

1

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	782.782	917.914
2	793.860	910.070
3	812.807	903.666
4	832.796	902.997
5	900.735	907.633
6	914.877	921.776
7	929.002	935.935
8	942.224	950.941
9	952.652	968.007
10	960.418	981.417

Factor of Safety
*** 1.519 ***

Failure Surface Specified By 10 Coordinate Points

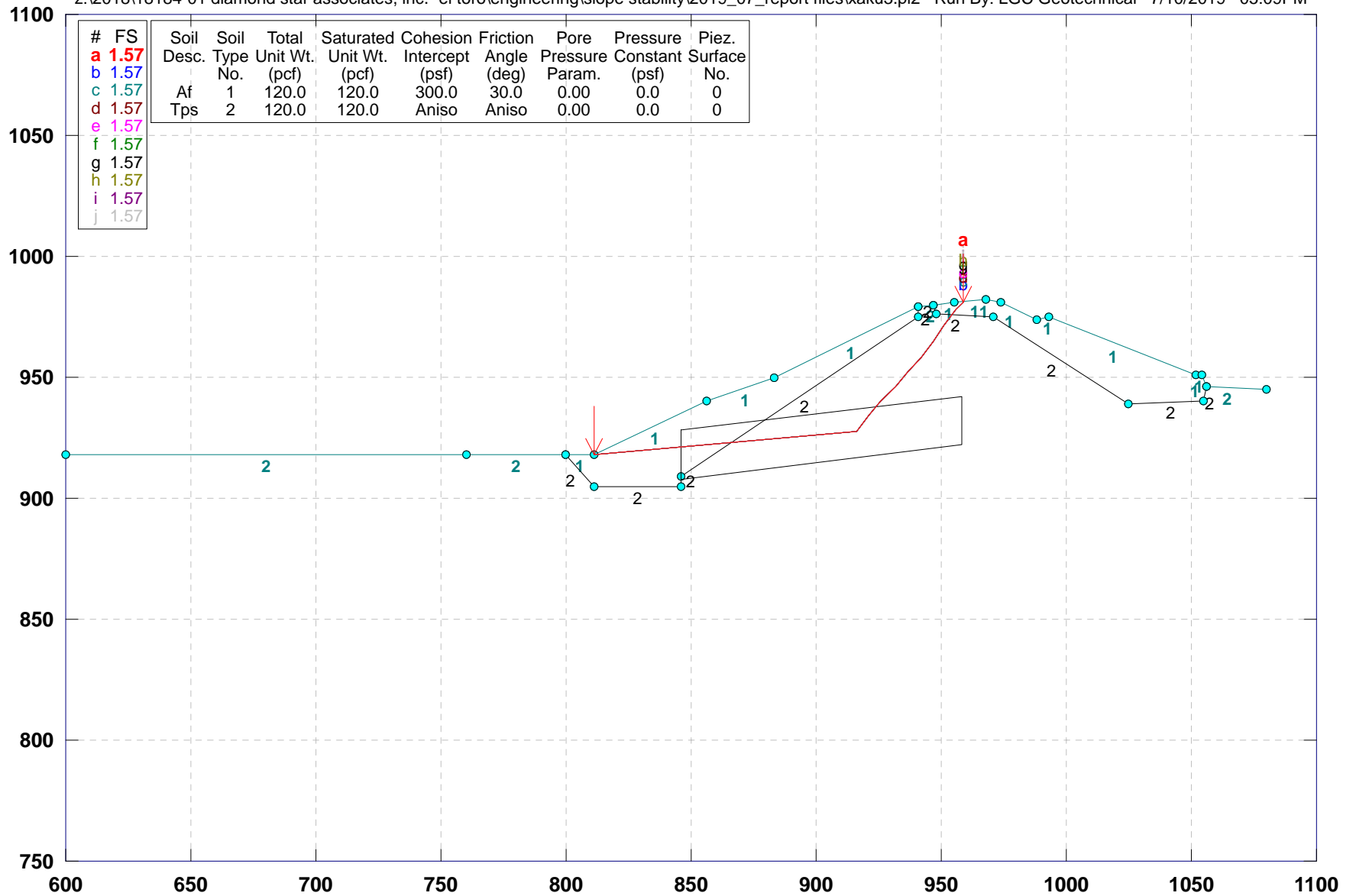
Point No.	X-Surf (ft)	Y-Surf (ft)
1	782.782	917.914
2	793.860	910.070
3	812.807	903.666
4	832.796	902.997
5	900.735	907.633
6	914.877	921.776
7	929.002	935.935
8	942.224	950.941
9	952.652	968.007
10	960.418	981.417

Factor of Safety
*** 1.519 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / A-A' / Design / Upper Slope / Behind Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xaku3.pl2 Run By: LGC Geotechnical 7/10/2019 05:09PM

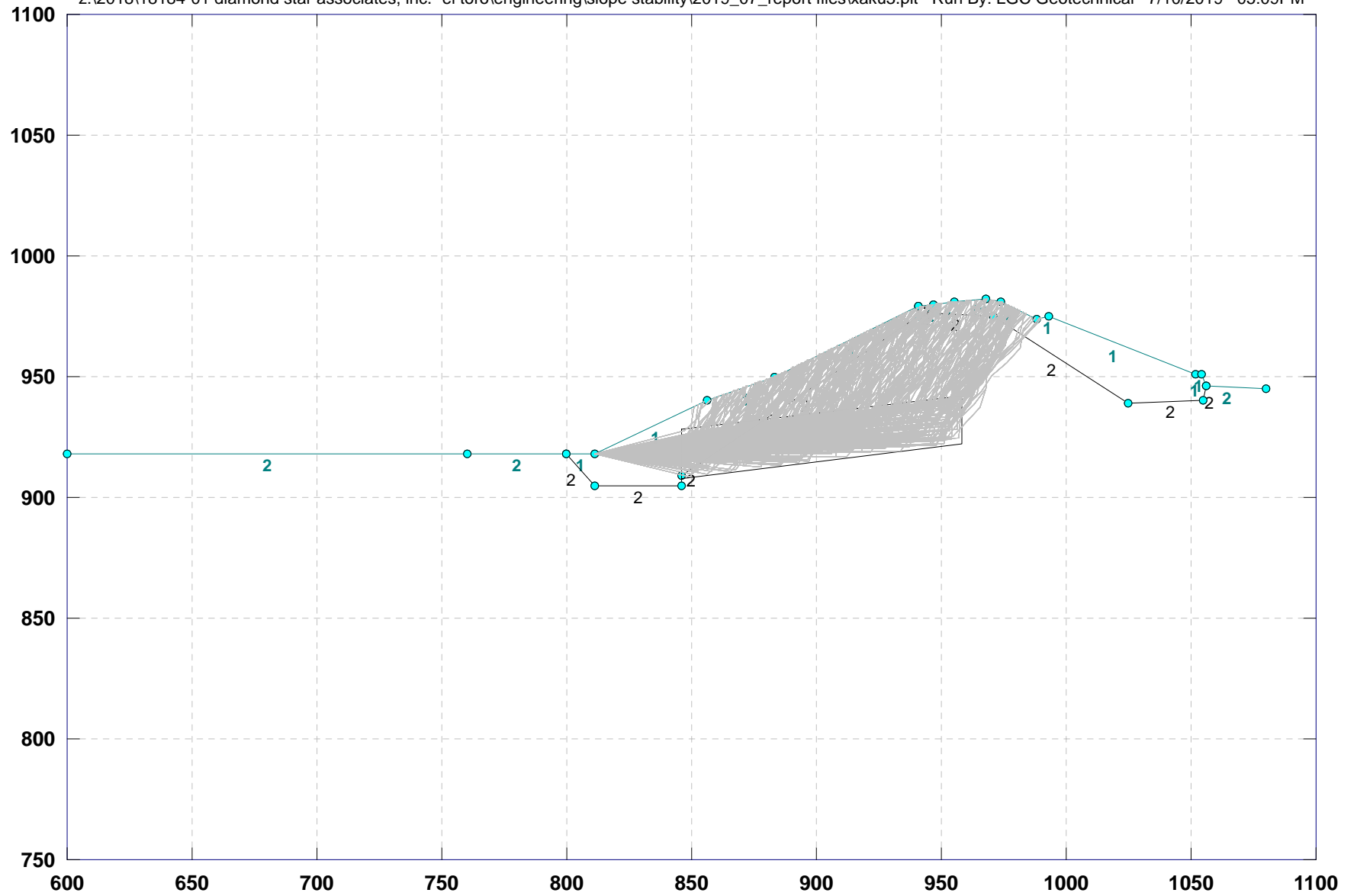


GSTABL7 v.2 FSmin=1.57

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / A-A' / Design / Upper Slope / Behind Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xaku3.plt Run By: LGC Geotechnical 7/10/2019 05:09PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/10/2019
Time of Run: 05:09PM
Run By: LGC
Geotechnical

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec A\2019_07_xa\Upper
Slope\xaku3.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec A\2019_07_xa\Upper
Slope\xaku3.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec A\2019_07_xa\Upper
Slope\xaku3.PLT

PROBLEM DESCRIPTION: 18184-01 / A-A' / Design / Upper Slope
/ Behind Keyway

BOUNDARY COORDINATES

16 Top Boundaries
26 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	600.00	918.00	760.00	917.80	2
2	760.00	917.80	800.00	918.00	2
3	800.00	918.00	811.00	918.00	1
4	811.00	918.00	856.00	940.00	1
5	856.00	940.00	883.00	950.00	1
6	883.00	950.00	941.00	979.00	1
7	941.00	979.00	947.00	980.00	2

8	947.00	980.00	955.00	981.00	1
9	955.00	981.00	968.00	982.00	1
10	968.00	982.00	974.00	981.00	1
11	974.00	981.00	988.00	974.00	1
12	988.00	974.00	993.00	975.00	1
13	993.00	975.00	1052.00	951.00	1
14	1052.00	951.00	1054.00	951.00	1
15	1054.00	951.00	1056.00	946.00	1
16	1056.00	946.00	1080.00	945.00	2
17	800.00	918.00	811.00	905.00	2
18	811.00	905.00	846.00	905.00	2
19	846.00	905.00	846.01	909.00	2
20	846.01	909.00	941.00	975.00	2
21	941.00	975.00	941.00	978.90	2
22	947.00	980.00	948.00	976.00	2
23	948.00	976.00	971.00	975.00	2
24	971.00	975.00	1025.00	939.00	2
25	1025.00	939.00	1055.00	940.00	2
26	1055.00	940.00	1056.00	946.00	2

User Specified Y-Origin = 750.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

2 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	-7.0	300.00	30.00
2	7.0	0.00	15.00
3	90.0	300.00	30.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and

C equal to zero, with water weight in the tension crack.

Janbus Empirical Coef is being used for the case of c & ϕ both > 0

1

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 8.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	811.00	918.00	811.00	918.00	0.00
2	846.00	918.00	958.00	932.00	20.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 6.254 FS Min = 1.570 FS Ave = 2.447
Standard Deviation = 0.665 Coefficient of Variation = 27.17 %

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	916.431	927.452
3	920.847	934.122
4	925.940	940.292
5	931.555	945.990
6	936.701	952.115
7	942.082	958.036
8	946.758	964.526
9	950.932	971.351
10	955.716	977.764
11	958.621	981.279

Factor of Safety
 *** 1.570 ***

Individual data on the 18 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	45.0	48507.4	0.0	0.0	0.	0.	0.0	0.0	0.0
2	10.1	23414.5	0.0	0.0	0.	0.	0.0	0.0	0.0
3	16.9	47072.8	0.0	0.0	0.	0.	0.0	0.0	0.0
4	33.4	129995.2	0.0	0.0	0.	0.	0.0	0.0	0.0
5	4.4	19626.9	0.0	0.0	0.	0.	0.0	0.0	0.0
6	5.1	20161.8	0.0	0.0	0.	0.	0.0	0.0	0.0
7	5.6	20035.0	0.0	0.0	0.	0.	0.0	0.0	0.0
8	5.1	16371.0	0.0	0.0	0.	0.	0.0	0.0	0.0
9	4.3	12093.8	0.0	0.0	0.	0.	0.0	0.0	0.0
10	1.1	2810.6	0.0	0.0	0.	0.	0.0	0.0	0.0
11	4.7	10263.6	0.0	0.0	0.	0.	0.0	0.0	0.0
12	0.2	442.3	0.0	0.0	0.	0.	0.0	0.0	0.0
13	1.0	1718.8	0.0	0.0	0.	0.	0.0	0.0	0.0
14	2.9	3995.3	0.0	0.0	0.	0.	0.0	0.0	0.0
15	3.3	2804.8	0.0	0.0	0.	0.	0.0	0.0	0.0
16	0.8	450.0	0.0	0.0	0.	0.	0.0	0.0	0.0
17	0.7	321.5	0.0	0.0	0.	0.	0.0	0.0	0.0
18	2.9	573.8	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	916.431	927.452
3	920.847	934.122
4	925.940	940.292
5	931.555	945.990
6	936.701	952.115
7	942.082	958.036
8	946.758	964.526
9	950.932	971.351
10	955.716	977.764
11	958.621	981.279

Factor of Safety
 *** 1.570 ***

Failure Surface Specified By 11 Coordinate Points

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

1	811.000	918.000
2	916.431	927.452
3	920.847	934.122
4	925.940	940.292
5	931.555	945.990
6	936.701	952.115
7	942.082	958.036
8	946.758	964.526
9	950.932	971.351
10	955.716	977.764
11	958.621	981.279

Factor of Safety
 *** 1.570 ***

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	916.431	927.452
3	920.847	934.122
4	925.940	940.292
5	931.555	945.990
6	936.701	952.115
7	942.082	958.036
8	946.758	964.526
9	950.932	971.351
10	955.716	977.764
11	958.621	981.279

Factor of Safety
 *** 1.570 ***

1

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	916.431	927.452
3	920.847	934.122
4	925.940	940.292
5	931.555	945.990
6	936.701	952.115
7	942.082	958.036
8	946.758	964.526
9	950.932	971.351
10	955.716	977.764
11	958.621	981.279

Factor of Safety
 *** 1.570 ***

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	916.431	927.452
3	920.847	934.122
4	925.940	940.292
5	931.555	945.990
6	936.701	952.115
7	942.082	958.036
8	946.758	964.526
9	950.932	971.351
10	955.716	977.764
11	958.621	981.279

Factor of Safety
*** 1.570 ***

1

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	916.431	927.452
3	920.847	934.122
4	925.940	940.292
5	931.555	945.990
6	936.701	952.115
7	942.082	958.036
8	946.758	964.526
9	950.932	971.351
10	955.716	977.764
11	958.621	981.279

Factor of Safety
*** 1.570 ***

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	916.431	927.452
3	920.847	934.122
4	925.940	940.292
5	931.555	945.990

6	936.701	952.115
7	942.082	958.036
8	946.758	964.526
9	950.932	971.351
10	955.716	977.764
11	958.621	981.279

Factor of Safety
 *** 1.570 ***

1

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	916.431	927.452
3	920.847	934.122
4	925.940	940.292
5	931.555	945.990
6	936.701	952.115
7	942.082	958.036
8	946.758	964.526
9	950.932	971.351
10	955.716	977.764
11	958.621	981.279

Factor of Safety
 *** 1.570 ***

Failure Surface Specified By 11 Coordinate Points

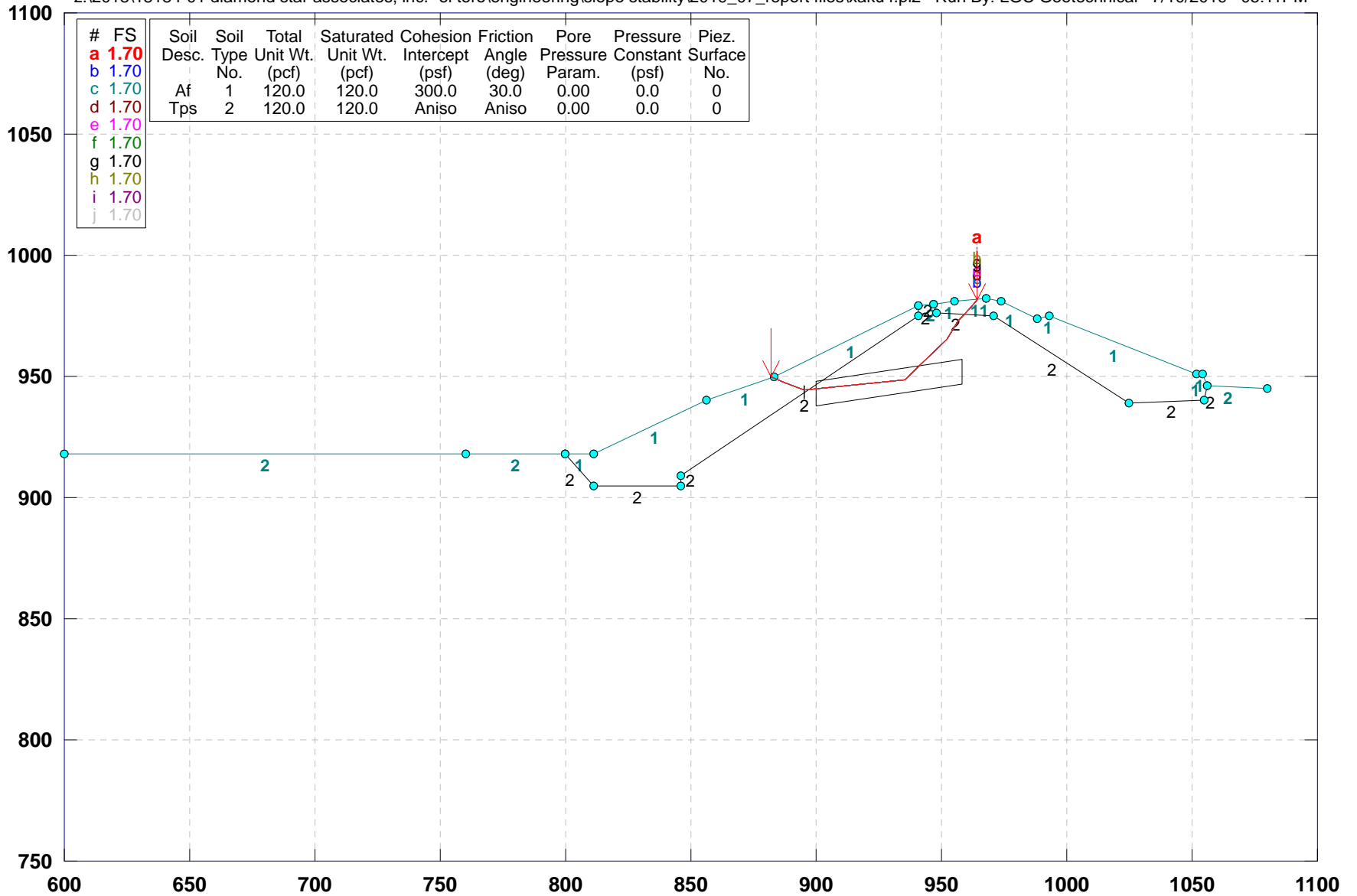
Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	916.431	927.452
3	920.847	934.122
4	925.940	940.292
5	931.555	945.990
6	936.701	952.115
7	942.082	958.036
8	946.758	964.526
9	950.932	971.351
10	955.716	977.764
11	958.621	981.279

Factor of Safety
 *** 1.570 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / A-A' / Design / Upper Slope / Upper Clay Bed Search

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xaku4.pl2 Run By: LGC Geotechnical 7/10/2019 05:11PM

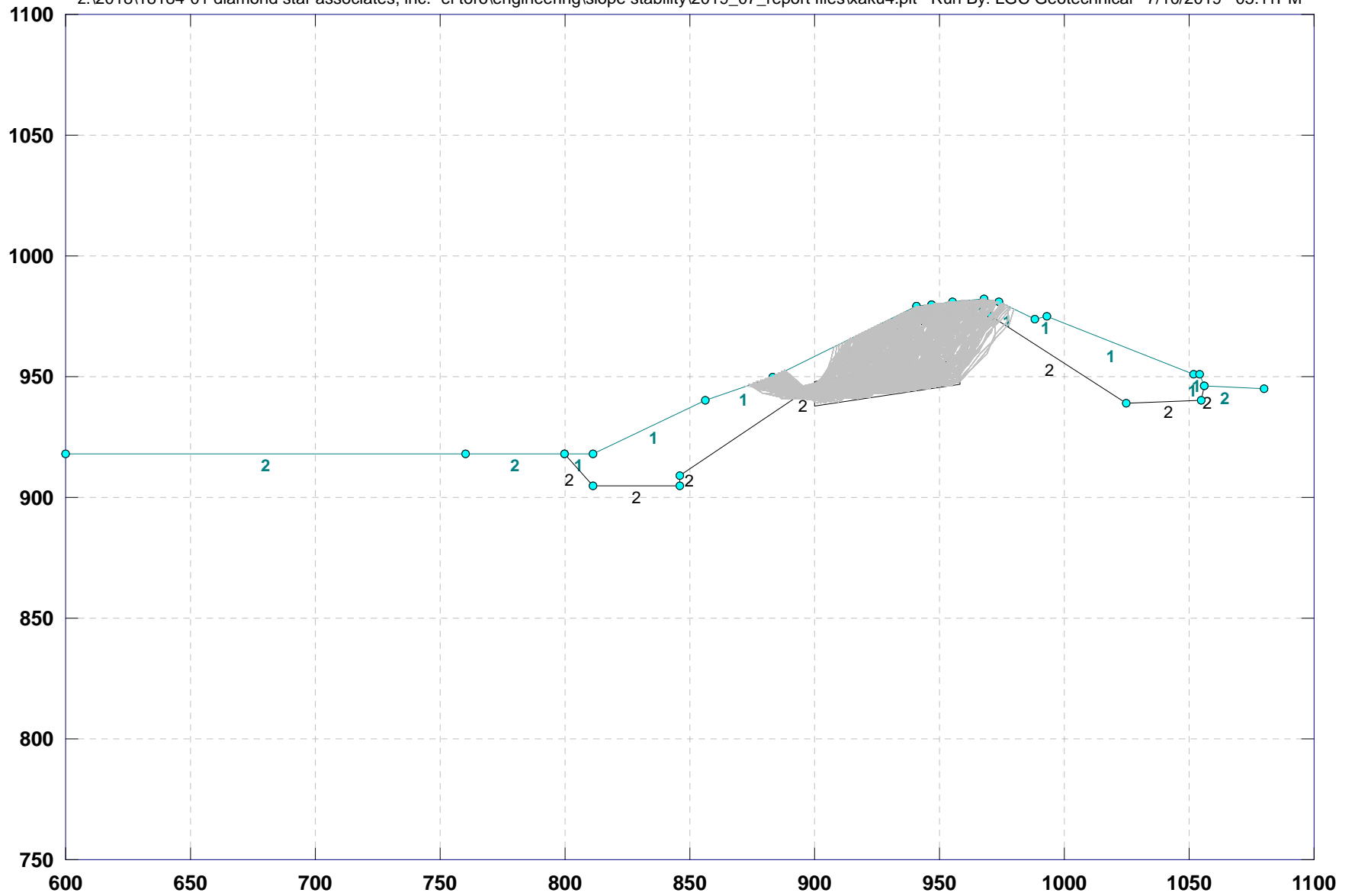


GSTABL7 v.2 FSmin=1.70

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / A-A' / Design / Upper Slope / Upper Clay Bed Search

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xaku4.plt Run By: LGC Geotechnical 7/10/2019 05:11PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D., P.E., D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/10/2019
Time of Run: 05:11PM
Run By: LGC
Geotechnical

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec A\2019_07_xa\Upper
Slope\xaku4.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec A\2019_07_xa\Upper
Slope\xaku4.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec A\2019_07_xa\Upper
Slope\xaku4.PLT

PROBLEM DESCRIPTION: 18184-01 / A-A' / Design / Upper Slope
/ Upper Clay Bed Search

BOUNDARY COORDINATES

16 Top Boundaries
26 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	600.00	918.00	760.00	917.80	2
2	760.00	917.80	800.00	918.00	2
3	800.00	918.00	811.00	918.00	1
4	811.00	918.00	856.00	940.00	1
5	856.00	940.00	883.00	950.00	1
6	883.00	950.00	941.00	979.00	1
7	941.00	979.00	947.00	980.00	2

8	947.00	980.00	955.00	981.00	1
9	955.00	981.00	968.00	982.00	1
10	968.00	982.00	974.00	981.00	1
11	974.00	981.00	988.00	974.00	1
12	988.00	974.00	993.00	975.00	1
13	993.00	975.00	1052.00	951.00	1
14	1052.00	951.00	1054.00	951.00	1
15	1054.00	951.00	1056.00	946.00	1
16	1056.00	946.00	1080.00	945.00	2
17	800.00	918.00	811.00	905.00	2
18	811.00	905.00	846.00	905.00	2
19	846.00	905.00	846.01	909.00	2
20	846.01	909.00	941.00	975.00	2
21	941.00	975.00	941.00	978.90	2
22	947.00	980.00	948.00	976.00	2
23	948.00	976.00	971.00	975.00	2
24	971.00	975.00	1025.00	939.00	2
25	1025.00	939.00	1055.00	940.00	2
26	1055.00	940.00	1056.00	946.00	2

User Specified Y-Origin = 750.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

2 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	-7.0	300.00	30.00
2	7.0	0.00	15.00
3	90.0	300.00	30.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and

C equal to zero, with water weight in the tension crack.

Janbus Empirical Coef is being used for the case of c & ϕ both > 0

1

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 8.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	895.00	943.00	895.00	944.00	5.00
2	900.00	943.00	958.00	951.70	10.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 17.157 FS Min = 1.700 FS Ave = 2.944
Standard Deviation = 1.454 Coefficient of Variation = 49.38 %

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	882.217	949.710
2	887.580	947.394
3	895.000	944.404
4	935.312	948.362
5	940.969	954.019
6	946.535	959.765
7	952.167	965.446
8	956.204	972.353
9	961.545	978.309
10	963.993	981.692

Factor of Safety
 *** 1.700 ***

Individual data on the 16 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	0.8	29.5	0.0	0.0	0.	0.	0.0	0.0	0.0
2	4.6	1517.9	0.0	0.0	0.	0.	0.0	0.0	0.0
3	7.4	7342.3	0.0	0.0	0.	0.	0.0	0.0	0.0
4	2.3	3310.8	0.0	0.0	0.	0.	0.0	0.0	0.0
5	38.0	91961.7	0.0	0.0	0.	0.	0.0	0.0	0.0
6	5.7	17906.4	0.0	0.0	0.	0.	0.0	0.0	0.0
7	0.0	94.1	0.0	0.0	0.	0.	0.0	0.0	0.0
8	5.5	14979.0	0.0	0.0	0.	0.	0.0	0.0	0.0
9	0.5	1114.3	0.0	0.0	0.	0.	0.0	0.0	0.0
10	1.0	2318.8	0.0	0.0	0.	0.	0.0	0.0	0.0
11	4.2	8521.3	0.0	0.0	0.	0.	0.0	0.0	0.0
12	2.8	4403.2	0.0	0.0	0.	0.	0.0	0.0	0.0
13	1.2	1404.6	0.0	0.0	0.	0.	0.0	0.0	0.0
14	2.8	2475.7	0.0	0.0	0.	0.	0.0	0.0	0.0
15	2.5	1348.6	0.0	0.0	0.	0.	0.0	0.0	0.0
16	2.4	469.1	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	882.217	949.710
2	887.580	947.394
3	895.000	944.404
4	935.312	948.362
5	940.969	954.019
6	946.535	959.765
7	952.167	965.446
8	956.204	972.353
9	961.545	978.309
10	963.993	981.692

Factor of Safety
 *** 1.700 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	882.217	949.710
2	887.580	947.394
3	895.000	944.404
4	935.312	948.362

5	940.969	954.019
6	946.535	959.765
7	952.167	965.446
8	956.204	972.353
9	961.545	978.309
10	963.993	981.692

Factor of Safety
 *** 1.700 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	882.217	949.710
2	887.580	947.394
3	895.000	944.404
4	935.312	948.362
5	940.969	954.019
6	946.535	959.765
7	952.167	965.446
8	956.204	972.353
9	961.545	978.309
10	963.993	981.692

Factor of Safety
 *** 1.700 ***

1

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	882.217	949.710
2	887.580	947.394
3	895.000	944.404
4	935.312	948.362
5	940.969	954.019
6	946.535	959.765
7	952.167	965.446
8	956.204	972.353
9	961.545	978.309
10	963.993	981.692

Factor of Safety
 *** 1.700 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	882.217	949.710
2	887.580	947.394
3	895.000	944.404
4	935.312	948.362
5	940.969	954.019
6	946.535	959.765
7	952.167	965.446
8	956.204	972.353
9	961.545	978.309
10	963.993	981.692

Factor of Safety
 *** 1.700 ***

1

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	882.217	949.710
2	887.580	947.394
3	895.000	944.404
4	935.312	948.362
5	940.969	954.019
6	946.535	959.765
7	952.167	965.446
8	956.204	972.353
9	961.545	978.309
10	963.993	981.692

Factor of Safety
 *** 1.700 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	882.217	949.710
2	887.580	947.394
3	895.000	944.404
4	935.312	948.362
5	940.969	954.019
6	946.535	959.765
7	952.167	965.446
8	956.204	972.353
9	961.545	978.309
10	963.993	981.692

Factor of Safety
 *** 1.700 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	882.217	949.710
2	887.580	947.394
3	895.000	944.404
4	935.312	948.362
5	940.969	954.019
6	946.535	959.765
7	952.167	965.446
8	956.204	972.353
9	961.545	978.309
10	963.993	981.692

Factor of Safety
*** 1.700 ***

Failure Surface Specified By 10 Coordinate Points

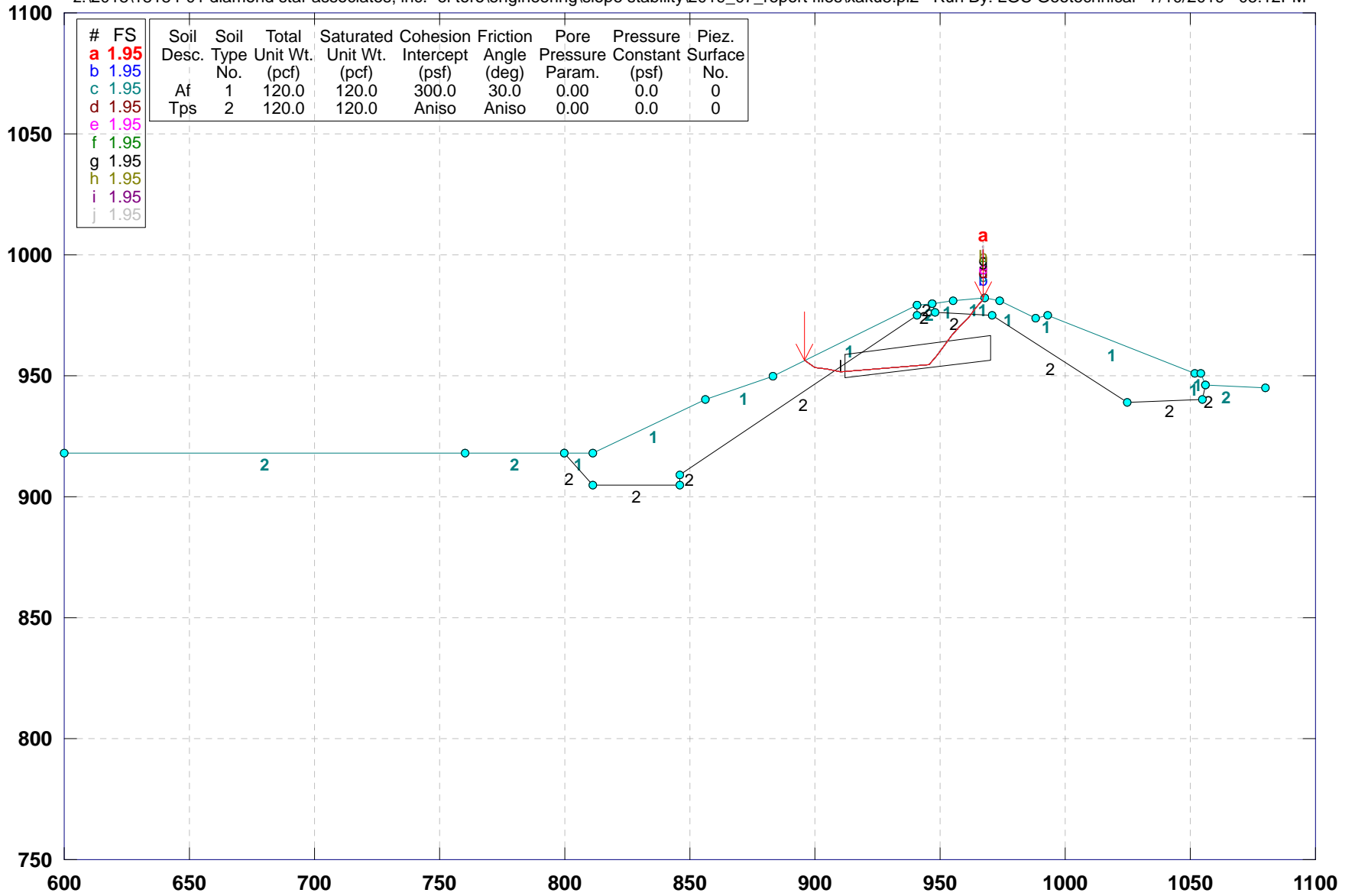
Point No.	X-Surf (ft)	Y-Surf (ft)
1	882.217	949.710
2	887.580	947.394
3	895.000	944.404
4	935.312	948.362
5	940.969	954.019
6	946.535	959.765
7	952.167	965.446
8	956.204	972.353
9	961.545	978.309
10	963.993	981.692

Factor of Safety
*** 1.700 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / A-A' / Design / Upper Slope / Upper Clay Bed Search 2

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xaku5.pl2 Run By: LGC Geotechnical 7/10/2019 05:12PM

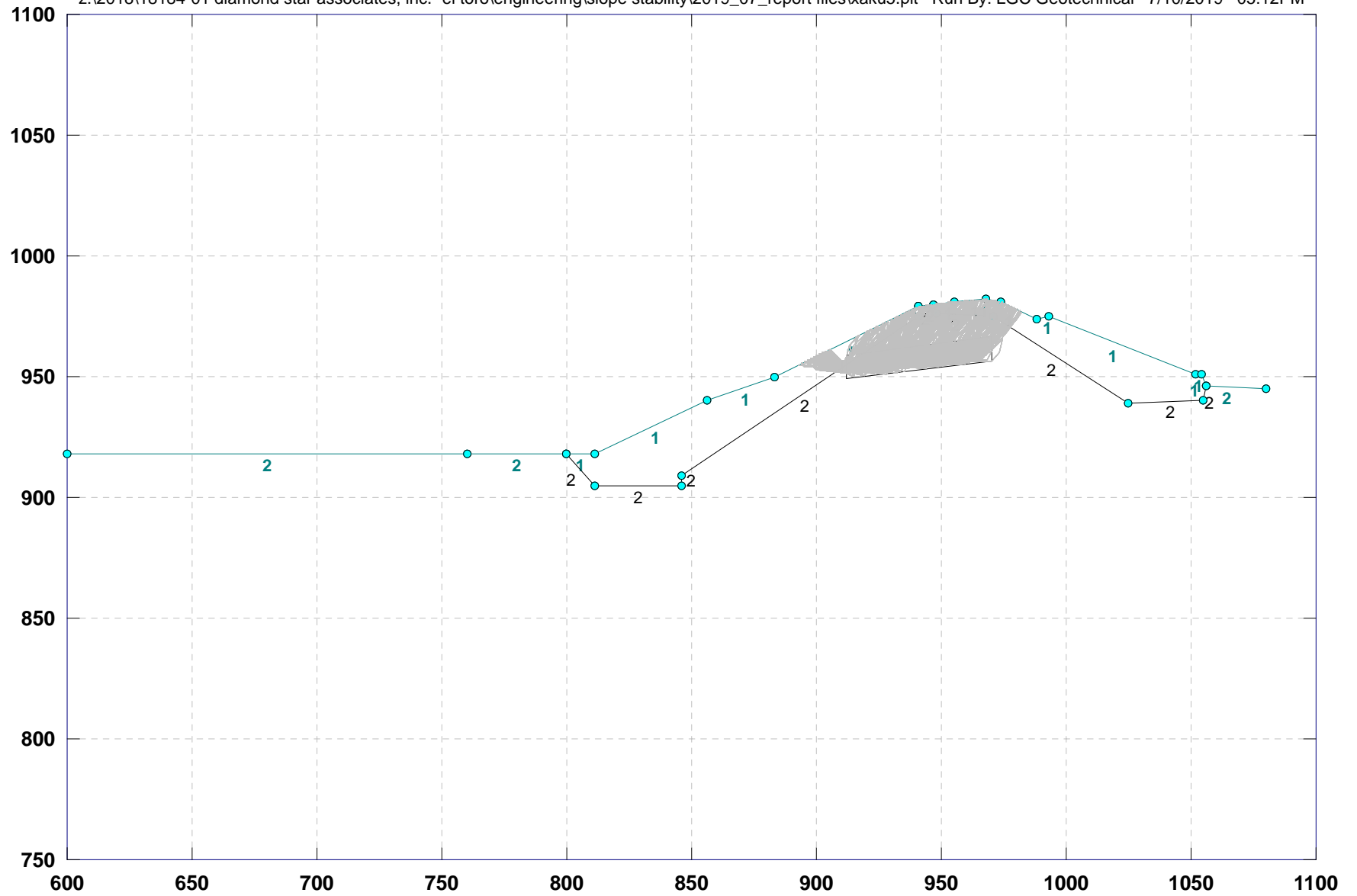


GSTABL7 v.2 FSmin=1.95

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / A-A' / Design / Upper Slope / Upper Clay Bed Search 2

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xaku5.plt Run By: LGC Geotechnical 7/10/2019 05:12PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/10/2019
Time of Run: 05:12PM
Run By: LGC
Geotechnical

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec A\2019_07_xa\Upper
Slope\xaku5.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec A\2019_07_xa\Upper
Slope\xaku5.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec A\2019_07_xa\Upper
Slope\xaku5.PLT

PROBLEM DESCRIPTION: 18184-01 / A-A' / Design / Upper Slope
/ Upper Clay Bed Search 2

BOUNDARY COORDINATES

16 Top Boundaries
26 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	600.00	918.00	760.00	917.80	2
2	760.00	917.80	800.00	918.00	2
3	800.00	918.00	811.00	918.00	1
4	811.00	918.00	856.00	940.00	1
5	856.00	940.00	883.00	950.00	1
6	883.00	950.00	941.00	979.00	1
7	941.00	979.00	947.00	980.00	2

8	947.00	980.00	955.00	981.00	1
9	955.00	981.00	968.00	982.00	1
10	968.00	982.00	974.00	981.00	1
11	974.00	981.00	988.00	974.00	1
12	988.00	974.00	993.00	975.00	1
13	993.00	975.00	1052.00	951.00	1
14	1052.00	951.00	1054.00	951.00	1
15	1054.00	951.00	1056.00	946.00	1
16	1056.00	946.00	1080.00	945.00	2
17	800.00	918.00	811.00	905.00	2
18	811.00	905.00	846.00	905.00	2
19	846.00	905.00	846.01	909.00	2
20	846.01	909.00	941.00	975.00	2
21	941.00	975.00	941.00	978.90	2
22	947.00	980.00	948.00	976.00	2
23	948.00	976.00	971.00	975.00	2
24	971.00	975.00	1025.00	939.00	2
25	1025.00	939.00	1055.00	940.00	2
26	1055.00	940.00	1056.00	946.00	2

User Specified Y-Origin = 750.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

2 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	-7.0	300.00	30.00
2	7.0	0.00	15.00
3	90.0	300.00	30.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and

C equal to zero, with water weight in the tension crack.

Janbus Empirical Coef is being used for the case of c & ϕ both > 0

1

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

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

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	910.00	954.00	910.00	954.00	5.00
2	912.00	954.00	970.00	961.40	10.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 13.650 FS Min = 1.953 FS Ave = 3.472
Standard Deviation = 1.438 Coefficient of Variation = 41.43 %

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	895.572	956.286
2	895.888	956.120
3	900.148	953.501
4	905.075	952.652
5	910.000	951.788
6	945.315	954.700
7	948.848	958.239
8	951.789	962.282
9	954.339	966.583
10	957.755	970.234
11	961.258	973.801
12	964.062	977.942

13	967.174	981.855
14	967.216	981.940

Factor of Safety
 *** 1.953 ***

Individual data on the 19 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	0.3	6.2	0.0	0.0	0.	0.	0.0	0.0	0.0
2	4.3	1379.4	0.0	0.0	0.	0.	0.0	0.0	0.0
3	4.9	3978.9	0.0	0.0	0.	0.	0.0	0.0	0.0
4	3.0	3386.4	0.0	0.0	0.	0.	0.0	0.0	0.0
5	1.9	2552.2	0.0	0.0	0.	0.	0.0	0.0	0.0
6	31.0	67644.3	0.0	0.0	0.	0.	0.0	0.0	0.0
7	4.3	12861.7	0.0	0.0	0.	0.	0.0	0.0	0.0
8	1.7	4915.7	0.0	0.0	0.	0.	0.0	0.0	0.0
9	1.0	2780.8	0.0	0.0	0.	0.	0.0	0.0	0.0
10	0.8	2274.8	0.0	0.0	0.	0.	0.0	0.0	0.0
11	2.9	7114.6	0.0	0.0	0.	0.	0.0	0.0	0.0
12	2.5	4994.0	0.0	0.0	0.	0.	0.0	0.0	0.0
13	0.7	1113.0	0.0	0.0	0.	0.	0.0	0.0	0.0
14	2.8	4080.7	0.0	0.0	0.	0.	0.0	0.0	0.0
15	3.5	3922.1	0.0	0.0	0.	0.	0.0	0.0	0.0
16	1.1	887.7	0.0	0.0	0.	0.	0.0	0.0	0.0
17	1.7	1035.7	0.0	0.0	0.	0.	0.0	0.0	0.0
18	3.1	716.6	0.0	0.0	0.	0.	0.0	0.0	0.0
19	0.0	0.2	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	895.572	956.286
2	895.888	956.120
3	900.148	953.501
4	905.075	952.652
5	910.000	951.788
6	945.315	954.700
7	948.848	958.239
8	951.789	962.282
9	954.339	966.583
10	957.755	970.234
11	961.258	973.801
12	964.062	977.942
13	967.174	981.855
14	967.216	981.940

Factor of Safety
 *** 1.953 ***

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	895.572	956.286
2	895.888	956.120
3	900.148	953.501
4	905.075	952.652
5	910.000	951.788
6	945.315	954.700
7	948.848	958.239
8	951.789	962.282
9	954.339	966.583
10	957.755	970.234
11	961.258	973.801
12	964.062	977.942
13	967.174	981.855
14	967.216	981.940

Factor of Safety
*** 1.953 ***

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	895.572	956.286
2	895.888	956.120
3	900.148	953.501
4	905.075	952.652
5	910.000	951.788
6	945.315	954.700
7	948.848	958.239
8	951.789	962.282
9	954.339	966.583
10	957.755	970.234
11	961.258	973.801
12	964.062	977.942
13	967.174	981.855
14	967.216	981.940

Factor of Safety
*** 1.953 ***

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	895.572	956.286
2	895.888	956.120

3	900.148	953.501
4	905.075	952.652
5	910.000	951.788
6	945.315	954.700
7	948.848	958.239
8	951.789	962.282
9	954.339	966.583
10	957.755	970.234
11	961.258	973.801
12	964.062	977.942
13	967.174	981.855
14	967.216	981.940

Factor of Safety
 *** 1.953 ***

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	895.572	956.286
2	895.888	956.120
3	900.148	953.501
4	905.075	952.652
5	910.000	951.788
6	945.315	954.700
7	948.848	958.239
8	951.789	962.282
9	954.339	966.583
10	957.755	970.234
11	961.258	973.801
12	964.062	977.942
13	967.174	981.855
14	967.216	981.940

Factor of Safety
 *** 1.953 ***

1

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	895.572	956.286
2	895.888	956.120
3	900.148	953.501
4	905.075	952.652
5	910.000	951.788
6	945.315	954.700
7	948.848	958.239
8	951.789	962.282
9	954.339	966.583
10	957.755	970.234
11	961.258	973.801

12	964.062	977.942
13	967.174	981.855
14	967.216	981.940

Factor of Safety
 *** 1.953 ***

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	895.572	956.286
2	895.888	956.120
3	900.148	953.501
4	905.075	952.652
5	910.000	951.788
6	945.315	954.700
7	948.848	958.239
8	951.789	962.282
9	954.339	966.583
10	957.755	970.234
11	961.258	973.801
12	964.062	977.942
13	967.174	981.855
14	967.216	981.940

Factor of Safety
 *** 1.953 ***

1

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	895.572	956.286
2	895.888	956.120
3	900.148	953.501
4	905.075	952.652
5	910.000	951.788
6	945.315	954.700
7	948.848	958.239
8	951.789	962.282
9	954.339	966.583
10	957.755	970.234
11	961.258	973.801
12	964.062	977.942
13	967.174	981.855
14	967.216	981.940

Factor of Safety
 *** 1.953 ***

Failure Surface Specified By 14 Coordinate Points

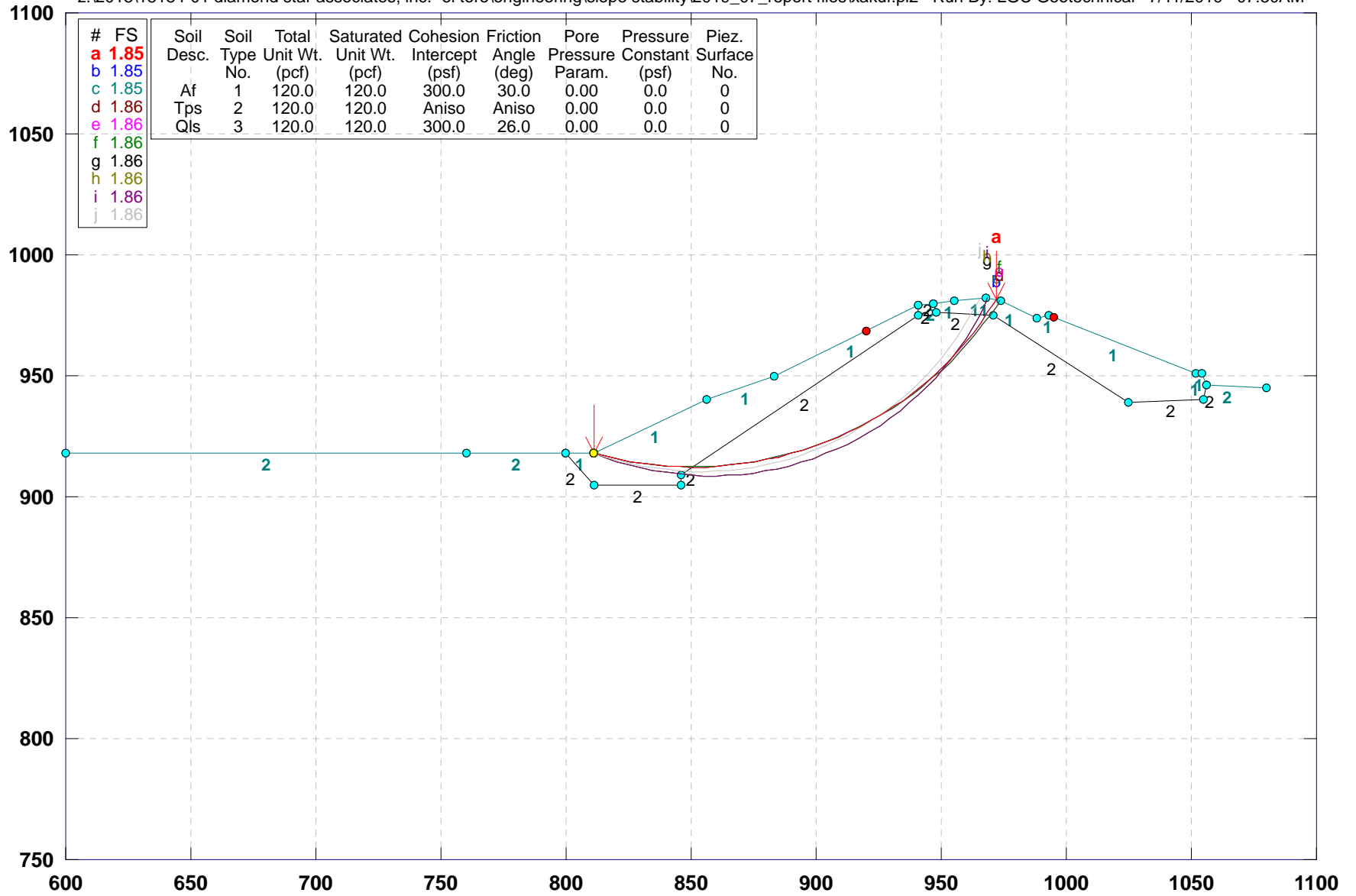
Point No.	X-Surf (ft)	Y-Surf (ft)
1	895.572	956.286
2	895.888	956.120
3	900.148	953.501
4	905.075	952.652
5	910.000	951.788
6	945.315	954.700
7	948.848	958.239
8	951.789	962.282
9	954.339	966.583
10	957.755	970.234
11	961.258	973.801
12	964.062	977.942
13	967.174	981.855
14	967.216	981.940

Factor of Safety
*** 1.953 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / A-A' / Upper Slope / Rotational / Static

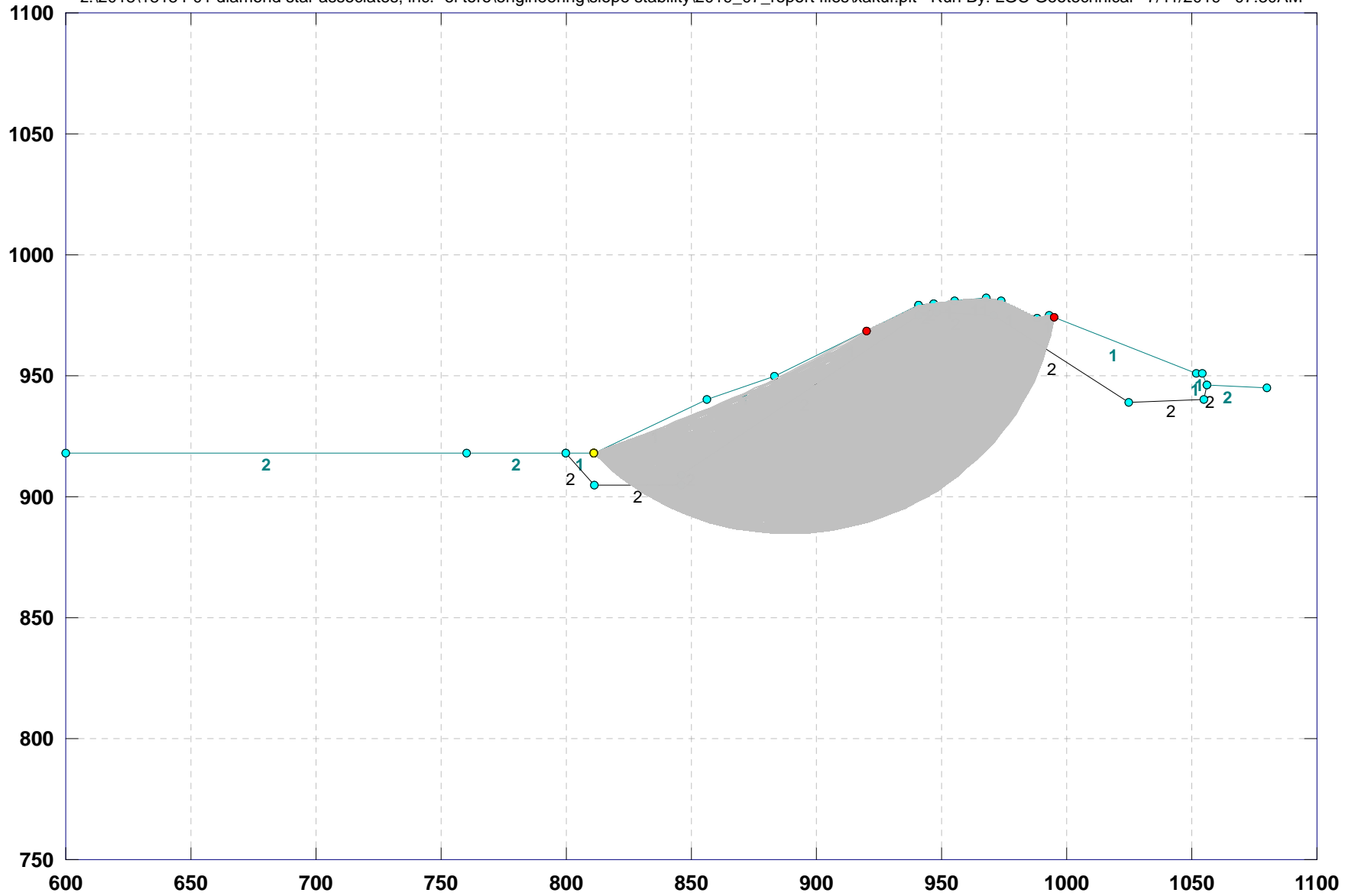
z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xakur.pl2 Run By: LGC Geotechnical 7/11/2019 07:30AM



GSTABL7 v.2 FSmin=1.85
Safety Factors Are Calculated By The Modified Bishop Method

18184-01 / A-A' / Upper Slope / Rotational / Static

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xakur.plt Run By: LGC Geotechnical 7/11/2019 07:30AM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/11/2019
Time of Run: 07:30AM
Run By: LGC
Geotechnical

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec A\2019_07_xa\Upper
Slope\xakur.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec A\2019_07_xa\Upper
Slope\xakur.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec A\2019_07_xa\Upper
Slope\xakur.PLT

PROBLEM DESCRIPTION: 18184-01 / A-A' / Upper Slope /
Rotational / Static

BOUNDARY COORDINATES

16 Top Boundaries
26 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	600.00	918.00	760.00	917.80	2
2	760.00	917.80	800.00	918.00	2
3	800.00	918.00	811.00	918.00	1
4	811.00	918.00	856.00	940.00	1
5	856.00	940.00	883.00	950.00	1
6	883.00	950.00	941.00	979.00	1
7	941.00	979.00	947.00	980.00	2

8	947.00	980.00	955.00	981.00	1
9	955.00	981.00	968.00	982.00	1
10	968.00	982.00	974.00	981.00	1
11	974.00	981.00	988.00	974.00	1
12	988.00	974.00	993.00	975.00	1
13	993.00	975.00	1052.00	951.00	1
14	1052.00	951.00	1054.00	951.00	1
15	1054.00	951.00	1056.00	946.00	1
16	1056.00	946.00	1080.00	945.00	2
17	800.00	918.00	811.00	905.00	2
18	811.00	905.00	846.00	905.00	2
19	846.00	905.00	846.01	909.00	2
20	846.01	909.00	940.90	975.00	2
21	940.90	975.00	941.00	978.90	2
22	947.00	980.00	948.00	976.00	2
23	948.00	976.00	971.00	975.00	2
24	971.00	975.00	1025.00	939.00	2
25	1025.00	939.00	1055.00	940.00	2
26	1055.00	940.00	1056.00	946.00	2

User Specified Y-Origin = 750.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	26.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	-7.0	300.00	30.00
2	7.0	0.00	15.00
3	90.0	300.00	30.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.

(3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

1

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

7500 Trial Surfaces Have Been Generated.

500 Surface(s) Initiate(s) From Each Of 15 Points Equally Spaced
Along The Ground Surface Between X = 811.00(ft)
and X = 811.00(ft)

Each Surface Terminates Between X = 920.00(ft)
and X = 995.00(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 Evaluated. They Are
Ordered - Most Critical First.

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

Total Number of Trial Surfaces Attempted = 0

Number of Trial Surfaces With Valid FS = 0

Statistical Data On All Valid FS Values:

FS Max = 0.000 FS Min = 500.000 FS Ave = NaN
Standard Deviation = 0.000 Coefficient of Variation = NaN %

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.819	916.666
3	820.682	915.505
4	825.584	914.518
5	830.517	913.705
6	835.477	913.068
7	840.455	912.609
8	845.447	912.326
9	850.446	912.222
10	855.446	912.295

11	860.439	912.547
12	865.421	912.975
13	870.384	913.581
14	875.323	914.363
15	880.230	915.320
16	885.101	916.451
17	889.928	917.754
18	894.705	919.229
19	899.427	920.872
20	904.088	922.683
21	908.682	924.658
22	913.202	926.795
23	917.643	929.092
24	922.000	931.545
25	926.267	934.152
26	930.438	936.909
27	934.508	939.812
28	938.473	942.859
29	942.327	946.044
30	946.065	949.365
31	949.683	952.816
32	953.175	956.394
33	956.538	960.094
34	959.767	963.912
35	962.859	967.842
36	965.808	971.879
37	968.613	976.018
38	971.268	980.255
39	971.901	981.350

Circle Center At X = 850.884 ; Y = 1052.746 ; and Radius = 140.525

Factor of Safety
 *** 1.852 ***

Individual data on the 0 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	Surcharge Load (lbs)

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.819	916.666
3	820.682	915.505
4	825.584	914.518
5	830.517	913.705
6	835.477	913.068
7	840.455	912.609
8	845.447	912.326
9	850.446	912.222
10	855.446	912.295
11	860.439	912.547
12	865.421	912.975

13	870.384	913.581
14	875.323	914.363
15	880.230	915.320
16	885.101	916.451
17	889.928	917.754
18	894.705	919.229
19	899.427	920.872
20	904.088	922.683
21	908.682	924.658
22	913.202	926.795
23	917.643	929.092
24	922.000	931.545
25	926.267	934.152
26	930.438	936.909
27	934.508	939.812
28	938.473	942.859
29	942.327	946.044
30	946.065	949.365
31	949.683	952.816
32	953.175	956.394
33	956.538	960.094
34	959.767	963.912
35	962.859	967.842
36	965.808	971.879
37	968.613	976.018
38	971.268	980.255
39	971.901	981.350

Circle Center At X = 850.884 ; Y = 1052.746 ; and Radius = 140.525

Factor of Safety
 *** 1.852 ***

1

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.819	916.666
3	820.682	915.505
4	825.584	914.518
5	830.517	913.705
6	835.477	913.068
7	840.455	912.609
8	845.447	912.326
9	850.446	912.222
10	855.446	912.295
11	860.439	912.547
12	865.421	912.975
13	870.384	913.581
14	875.323	914.363
15	880.230	915.320
16	885.101	916.451
17	889.928	917.754
18	894.705	919.229
19	899.427	920.872
20	904.088	922.683
21	908.682	924.658
22	913.202	926.795

23	917.643	929.092
24	922.000	931.545
25	926.267	934.152
26	930.438	936.909
27	934.508	939.812
28	938.473	942.859
29	942.327	946.044
30	946.065	949.365
31	949.683	952.816
32	953.175	956.394
33	956.538	960.094
34	959.767	963.912
35	962.859	967.842
36	965.808	971.879
37	968.613	976.018
38	971.268	980.255
39	971.901	981.350

Circle Center At X = 850.884 ; Y = 1052.746 ; and Radius = 140.525

Factor of Safety
 *** 1.852 ***

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.832	916.716
3	820.706	915.600
4	825.616	914.653
5	830.555	913.877
6	835.518	913.272
7	840.500	912.840
8	845.493	912.581
9	850.492	912.495
10	855.491	912.582
11	860.485	912.842
12	865.466	913.275
13	870.429	913.880
14	875.368	914.657
15	880.278	915.604
16	885.151	916.721
17	889.984	918.006
18	894.768	919.457
19	899.500	921.074
20	904.172	922.853
21	908.781	924.793
22	913.319	926.892
23	917.782	929.147
24	922.164	931.554
25	926.460	934.112
26	930.665	936.818
27	934.773	939.667
28	938.781	942.657
29	942.682	945.784
30	946.473	949.045
31	950.149	952.435
32	953.705	955.949
33	957.137	959.586

34	960.441	963.338
35	963.613	967.203
36	966.649	971.176
37	969.546	975.251
38	972.300	979.424
39	973.331	981.111

Circle Center At X = 850.482 ; Y = 1056.820 ; and Radius = 144.326

Factor of Safety
 *** 1.856 ***

1

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.832	916.716
3	820.706	915.600
4	825.616	914.653
5	830.555	913.877
6	835.518	913.272
7	840.500	912.840
8	845.493	912.581
9	850.492	912.495
10	855.491	912.582
11	860.485	912.842
12	865.466	913.275
13	870.429	913.880
14	875.368	914.657
15	880.278	915.604
16	885.151	916.721
17	889.984	918.006
18	894.768	919.457
19	899.500	921.074
20	904.172	922.853
21	908.781	924.793
22	913.319	926.892
23	917.782	929.147
24	922.164	931.554
25	926.460	934.112
26	930.665	936.818
27	934.773	939.667
28	938.781	942.657
29	942.682	945.784
30	946.473	949.045
31	950.149	952.435
32	953.705	955.949
33	957.137	959.586
34	960.441	963.338
35	963.613	967.203
36	966.649	971.176
37	969.546	975.251
38	972.300	979.424
39	973.331	981.111

Circle Center At X = 850.482 ; Y = 1056.820 ; and Radius = 144.326

Factor of Safety
*** 1.856 ***

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.832	916.716
3	820.706	915.600
4	825.616	914.653
5	830.555	913.877
6	835.518	913.272
7	840.500	912.840
8	845.493	912.581
9	850.492	912.495
10	855.491	912.582
11	860.485	912.842
12	865.466	913.275
13	870.429	913.880
14	875.368	914.657
15	880.278	915.604
16	885.151	916.721
17	889.984	918.006
18	894.768	919.457
19	899.500	921.074
20	904.172	922.853
21	908.781	924.793
22	913.319	926.892
23	917.782	929.147
24	922.164	931.554
25	926.460	934.112
26	930.665	936.818
27	934.773	939.667
28	938.781	942.657
29	942.682	945.784
30	946.473	949.045
31	950.149	952.435
32	953.705	955.949
33	957.137	959.586
34	960.441	963.338
35	963.613	967.203
36	966.649	971.176
37	969.546	975.251
38	972.300	979.424
39	973.331	981.111

Circle Center At X = 850.482 ; Y = 1056.820 ; and Radius = 144.326

Factor of Safety
*** 1.856 ***

Failure Surface Specified By 39 Coordinate Points

Point	X-Surf	Y-Surf
-------	--------	--------

No.	(ft)	(ft)
1	811.000	918.000
2	815.650	916.162
3	820.372	914.519
4	825.158	913.073
5	830.001	911.826
6	834.890	910.781
7	839.819	909.940
8	844.778	909.303
9	849.760	908.873
10	854.755	908.650
11	859.755	908.634
12	864.751	908.825
13	869.735	909.223
14	874.698	909.828
15	879.632	910.637
16	884.529	911.651
17	889.379	912.867
18	894.174	914.282
19	898.907	915.895
20	903.568	917.703
21	908.151	919.703
22	912.647	921.890
23	917.048	924.263
24	921.348	926.815
25	925.537	929.544
26	929.611	932.444
27	933.560	935.511
28	937.379	938.738
29	941.060	942.121
30	944.599	945.654
31	947.988	949.330
32	951.221	953.144
33	954.294	957.088
34	957.201	961.157
35	959.936	965.342
36	962.496	969.637
37	964.875	974.035
38	967.070	978.527
39	968.552	981.908

Circle Center At X = 857.641 ; Y = 1029.213 ; and Radius = 120.597

Factor of Safety
 *** 1.858 ***

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.650	916.162
3	820.372	914.519
4	825.158	913.073
5	830.001	911.826
6	834.890	910.781
7	839.819	909.940
8	844.778	909.303
9	849.760	908.873

10	854.755	908.650
11	859.755	908.634
12	864.751	908.825
13	869.735	909.223
14	874.698	909.828
15	879.632	910.637
16	884.529	911.651
17	889.379	912.867
18	894.174	914.282
19	898.907	915.895
20	903.568	917.703
21	908.151	919.703
22	912.647	921.890
23	917.048	924.263
24	921.348	926.815
25	925.537	929.544
26	929.611	932.444
27	933.560	935.511
28	937.379	938.738
29	941.060	942.121
30	944.599	945.654
31	947.988	949.330
32	951.221	953.144
33	954.294	957.088
34	957.201	961.157
35	959.936	965.342
36	962.496	969.637
37	964.875	974.035
38	967.070	978.527
39	968.552	981.908

Circle Center At X = 857.641 ; Y = 1029.213 ; and Radius = 120.597

Factor of Safety
 *** 1.858 ***

1

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.650	916.162
3	820.372	914.519
4	825.158	913.073
5	830.001	911.826
6	834.890	910.781
7	839.819	909.940
8	844.778	909.303
9	849.760	908.873
10	854.755	908.650
11	859.755	908.634
12	864.751	908.825
13	869.735	909.223
14	874.698	909.828
15	879.632	910.637
16	884.529	911.651
17	889.379	912.867
18	894.174	914.282
19	898.907	915.895

20	903.568	917.703
21	908.151	919.703
22	912.647	921.890
23	917.048	924.263
24	921.348	926.815
25	925.537	929.544
26	929.611	932.444
27	933.560	935.511
28	937.379	938.738
29	941.060	942.121
30	944.599	945.654
31	947.988	949.330
32	951.221	953.144
33	954.294	957.088
34	957.201	961.157
35	959.936	965.342
36	962.496	969.637
37	964.875	974.035
38	967.070	978.527
39	968.552	981.908

Circle Center At X = 857.641 ; Y = 1029.213 ; and Radius = 120.597

Factor of Safety
 *** 1.858 ***

Failure Surface Specified By 38 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.724	916.360
3	820.510	914.914
4	825.351	913.665
5	830.239	912.613
6	835.166	911.761
7	840.124	911.110
8	845.103	910.662
9	850.097	910.417
10	855.097	910.375
11	860.095	910.537
12	865.081	910.902
13	870.049	911.470
14	874.989	912.240
15	879.894	913.210
16	884.756	914.379
17	889.565	915.745
18	894.316	917.306
19	898.998	919.058
20	903.606	921.000
21	908.130	923.128
22	912.565	925.438
23	916.901	927.927
24	921.133	930.591
25	925.253	933.424
26	929.254	936.423
27	933.129	939.582
28	936.873	942.896
29	940.478	946.360
30	943.940	949.968

31	947.252	953.714
32	950.409	957.591
33	953.405	961.594
34	956.236	965.716
35	958.896	969.949
36	961.383	974.287
37	963.690	978.723
38	965.125	981.779

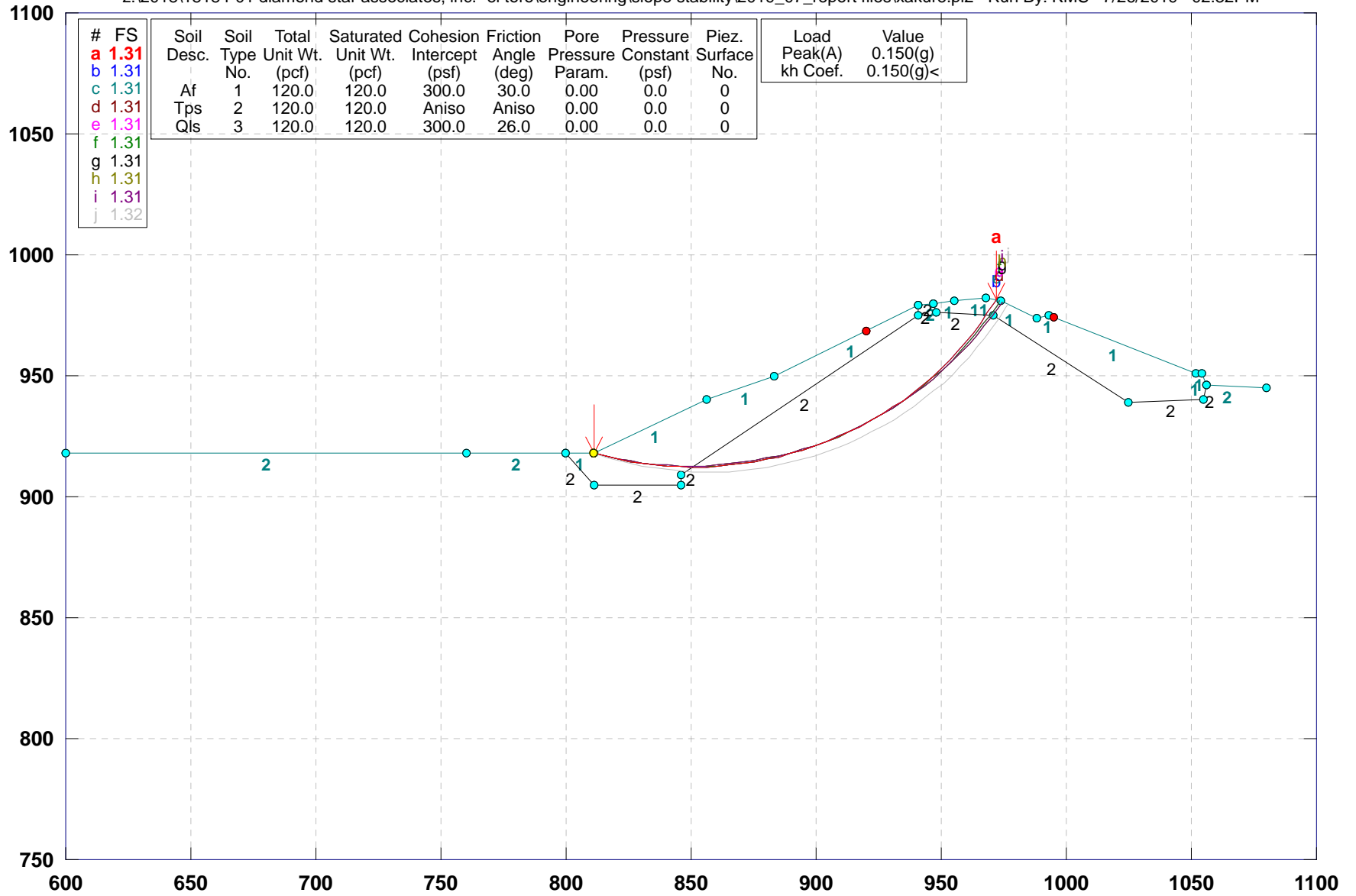
Circle Center At X = 853.621 ; Y = 1033.119 ; and Radius = 122.755

Factor of Safety
*** 1.859 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / A-A' / Upper Slope / Rotational / Seismic

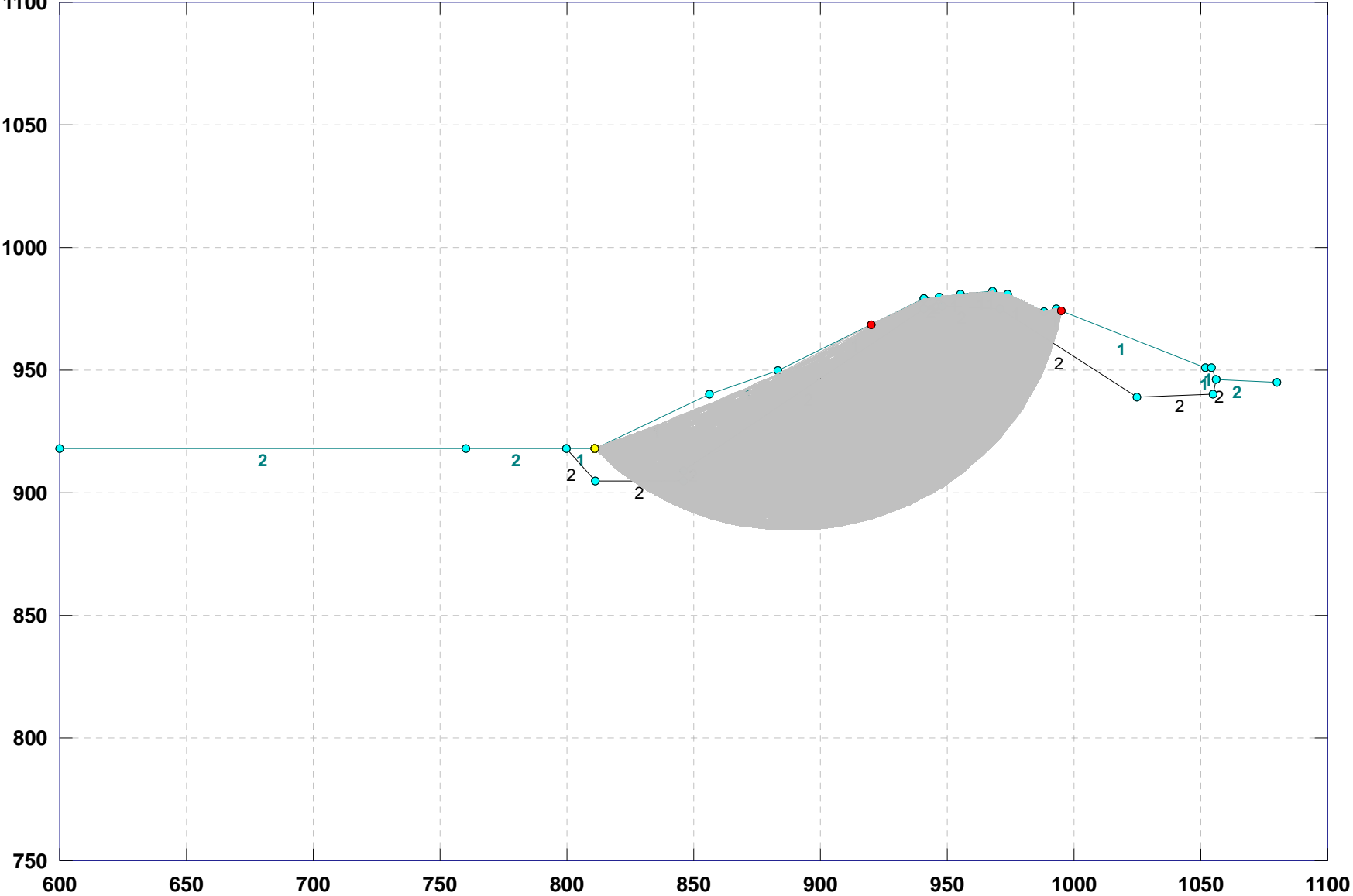
z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xakure.pl2 Run By: KMS 7/26/2019 02:32PM



GSTABL7 v.2 FSmin=1.31
 Safety Factors Are Calculated By The Modified Bishop Method

18184-01 / A-A' / Upper Slope / Rotational / Seismic

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xakure.plt Run By: KMS 7/26/2019 02:32PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/26/2019
Time of Run: 02:32PM
Run By:
KMS

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\2019_07_Report
files\xakure.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\2019_07_Report
files\xakure.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\2019_07_Report
files\xakure.PLT

PROBLEM DESCRIPTION: 18184-01 / A-A' / Upper Slope /
Rotational / Seismic

BOUNDARY COORDINATES

16 Top Boundaries
26 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	600.00	918.00	760.00	917.80	2
2	760.00	917.80	800.00	918.00	2
3	800.00	918.00	811.00	918.00	1
4	811.00	918.00	856.00	940.00	1
5	856.00	940.00	883.00	950.00	1
6	883.00	950.00	941.00	979.00	1
7	941.00	979.00	947.00	980.00	2

8	947.00	980.00	955.00	981.00	1
9	955.00	981.00	968.00	982.00	1
10	968.00	982.00	974.00	981.00	1
11	974.00	981.00	988.00	974.00	1
12	988.00	974.00	993.00	975.00	1
13	993.00	975.00	1052.00	951.00	1
14	1052.00	951.00	1054.00	951.00	1
15	1054.00	951.00	1056.00	946.00	1
16	1056.00	946.00	1080.00	945.00	2
17	800.00	918.00	811.00	905.00	2
18	811.00	905.00	846.00	905.00	2
19	846.00	905.00	846.01	909.00	2
20	846.01	909.00	940.90	975.00	2
21	940.90	975.00	941.00	978.90	2
22	947.00	980.00	948.00	976.00	2
23	948.00	976.00	971.00	975.00	2
24	971.00	975.00	1025.00	939.00	2
25	1025.00	939.00	1055.00	940.00	2
26	1055.00	940.00	1056.00	946.00	2

User Specified Y-Origin = 750.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	26.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	-7.0	300.00	30.00
2	7.0	0.00	15.00
3	90.0	300.00	30.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.

(3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

Specified Peak Ground Acceleration Coefficient (A) = 0.150(g)
Specified Horizontal Earthquake Coefficient (kh) = 0.150(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)

Specified Seismic Pore-Pressure Factor = 0.000

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

7500 Trial Surfaces Have Been Generated.

500 Surface(s) Initiate(s) From Each Of 15 Points Equally Spaced Along The Ground Surface Between X = 811.00(ft) and X = 811.00(ft)

Each Surface Terminates Between X = 920.00(ft) and X = 995.00(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 Evaluated. They Are Ordered - Most Critical First.

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

Total Number of Trial Surfaces Attempted = 0

Number of Trial Surfaces With Valid FS = 0

Statistical Data On All Valid FS Values:

FS Max = 0.000 FS Min = 500.000 FS Ave = NaN
Standard Deviation = 0.000 Coefficient of Variation = NaN %

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.819	916.666
3	820.682	915.505
4	825.584	914.518

5	830.517	913.705
6	835.477	913.068
7	840.455	912.609
8	845.447	912.326
9	850.446	912.222
10	855.446	912.295
11	860.439	912.547
12	865.421	912.975
13	870.384	913.581
14	875.323	914.363
15	880.230	915.320
16	885.101	916.451
17	889.928	917.754
18	894.705	919.229
19	899.427	920.872
20	904.088	922.683
21	908.682	924.658
22	913.202	926.795
23	917.643	929.092
24	922.000	931.545
25	926.267	934.152
26	930.438	936.909
27	934.508	939.812
28	938.473	942.859
29	942.327	946.044
30	946.065	949.365
31	949.683	952.816
32	953.175	956.394
33	956.538	960.094
34	959.767	963.912
35	962.859	967.842
36	965.808	971.879
37	968.613	976.018
38	971.268	980.255
39	971.901	981.350

Circle Center At X = 850.884 ; Y = 1052.746 ; and Radius = 140.525

Factor of Safety
 *** 1.313 ***

Individual data on the 0 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	Force Surcharge Load (lbs)

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.819	916.666
3	820.682	915.505
4	825.584	914.518
5	830.517	913.705
6	835.477	913.068

7	840.455	912.609
8	845.447	912.326
9	850.446	912.222
10	855.446	912.295
11	860.439	912.547
12	865.421	912.975
13	870.384	913.581
14	875.323	914.363
15	880.230	915.320
16	885.101	916.451
17	889.928	917.754
18	894.705	919.229
19	899.427	920.872
20	904.088	922.683
21	908.682	924.658
22	913.202	926.795
23	917.643	929.092
24	922.000	931.545
25	926.267	934.152
26	930.438	936.909
27	934.508	939.812
28	938.473	942.859
29	942.327	946.044
30	946.065	949.365
31	949.683	952.816
32	953.175	956.394
33	956.538	960.094
34	959.767	963.912
35	962.859	967.842
36	965.808	971.879
37	968.613	976.018
38	971.268	980.255
39	971.901	981.350

Circle Center At X = 850.884 ; Y = 1052.746 ; and Radius = 140.525

Factor of Safety
 *** 1.313 ***

1

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.819	916.666
3	820.682	915.505
4	825.584	914.518
5	830.517	913.705
6	835.477	913.068
7	840.455	912.609
8	845.447	912.326
9	850.446	912.222
10	855.446	912.295
11	860.439	912.547
12	865.421	912.975
13	870.384	913.581
14	875.323	914.363
15	880.230	915.320
16	885.101	916.451

17	889.928	917.754
18	894.705	919.229
19	899.427	920.872
20	904.088	922.683
21	908.682	924.658
22	913.202	926.795
23	917.643	929.092
24	922.000	931.545
25	926.267	934.152
26	930.438	936.909
27	934.508	939.812
28	938.473	942.859
29	942.327	946.044
30	946.065	949.365
31	949.683	952.816
32	953.175	956.394
33	956.538	960.094
34	959.767	963.912
35	962.859	967.842
36	965.808	971.879
37	968.613	976.018
38	971.268	980.255
39	971.901	981.350

Circle Center At X = 850.884 ; Y = 1052.746 ; and Radius = 140.525

Factor of Safety
 *** 1.313 ***

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.832	916.716
3	820.706	915.600
4	825.616	914.653
5	830.555	913.877
6	835.518	913.272
7	840.500	912.840
8	845.493	912.581
9	850.492	912.495
10	855.491	912.582
11	860.485	912.842
12	865.466	913.275
13	870.429	913.880
14	875.368	914.657
15	880.278	915.604
16	885.151	916.721
17	889.984	918.006
18	894.768	919.457
19	899.500	921.074
20	904.172	922.853
21	908.781	924.793
22	913.319	926.892
23	917.782	929.147
24	922.164	931.554
25	926.460	934.112
26	930.665	936.818
27	934.773	939.667

28	938.781	942.657
29	942.682	945.784
30	946.473	949.045
31	950.149	952.435
32	953.705	955.949
33	957.137	959.586
34	960.441	963.338
35	963.613	967.203
36	966.649	971.176
37	969.546	975.251
38	972.300	979.424
39	973.331	981.111

Circle Center At X = 850.482 ; Y = 1056.820 ; and Radius = 144.326

Factor of Safety
 *** 1.313 ***

1

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.832	916.716
3	820.706	915.600
4	825.616	914.653
5	830.555	913.877
6	835.518	913.272
7	840.500	912.840
8	845.493	912.581
9	850.492	912.495
10	855.491	912.582
11	860.485	912.842
12	865.466	913.275
13	870.429	913.880
14	875.368	914.657
15	880.278	915.604
16	885.151	916.721
17	889.984	918.006
18	894.768	919.457
19	899.500	921.074
20	904.172	922.853
21	908.781	924.793
22	913.319	926.892
23	917.782	929.147
24	922.164	931.554
25	926.460	934.112
26	930.665	936.818
27	934.773	939.667
28	938.781	942.657
29	942.682	945.784
30	946.473	949.045
31	950.149	952.435
32	953.705	955.949
33	957.137	959.586
34	960.441	963.338
35	963.613	967.203
36	966.649	971.176
37	969.546	975.251

38 972.300 979.424
39 973.331 981.111

Circle Center At X = 850.482 ; Y = 1056.820 ; and Radius = 144.326

Factor of Safety
*** 1.313 ***

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.832	916.716
3	820.706	915.600
4	825.616	914.653
5	830.555	913.877
6	835.518	913.272
7	840.500	912.840
8	845.493	912.581
9	850.492	912.495
10	855.491	912.582
11	860.485	912.842
12	865.466	913.275
13	870.429	913.880
14	875.368	914.657
15	880.278	915.604
16	885.151	916.721
17	889.984	918.006
18	894.768	919.457
19	899.500	921.074
20	904.172	922.853
21	908.781	924.793
22	913.319	926.892
23	917.782	929.147
24	922.164	931.554
25	926.460	934.112
26	930.665	936.818
27	934.773	939.667
28	938.781	942.657
29	942.682	945.784
30	946.473	949.045
31	950.149	952.435
32	953.705	955.949
33	957.137	959.586
34	960.441	963.338
35	963.613	967.203
36	966.649	971.176
37	969.546	975.251
38	972.300	979.424
39	973.331	981.111

Circle Center At X = 850.482 ; Y = 1056.820 ; and Radius = 144.326

Factor of Safety
*** 1.313 ***

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.845	916.766
3	820.729	915.695
4	825.647	914.790
5	830.592	914.051
6	835.559	913.480
7	840.543	913.076
8	845.537	912.840
9	850.537	912.773
10	855.536	912.875
11	860.528	913.145
12	865.509	913.583
13	870.472	914.189
14	875.412	914.961
15	880.323	915.900
16	885.200	917.004
17	890.037	918.272
18	894.828	919.702
19	899.568	921.293
20	904.252	923.042
21	908.874	924.949
22	913.429	927.010
23	917.913	929.224
24	922.319	931.587
25	926.642	934.098
26	930.879	936.753
27	935.024	939.550
28	939.072	942.484
29	943.019	945.554
30	946.860	948.755
31	950.592	952.083
32	954.208	955.535
33	957.707	959.108
34	961.083	962.796
35	964.333	966.596
36	967.452	970.503
37	970.439	974.513
38	973.288	978.622
39	974.621	980.690

Circle Center At X = 850.027 ; Y = 1061.061 ; and Radius = 148.289

Factor of Safety
 *** 1.314 ***

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.845	916.766
3	820.729	915.695

4	825.647	914.790
5	830.592	914.051
6	835.559	913.480
7	840.543	913.076
8	845.537	912.840
9	850.537	912.773
10	855.536	912.875
11	860.528	913.145
12	865.509	913.583
13	870.472	914.189
14	875.412	914.961
15	880.323	915.900
16	885.200	917.004
17	890.037	918.272
18	894.828	919.702
19	899.568	921.293
20	904.252	923.042
21	908.874	924.949
22	913.429	927.010
23	917.913	929.224
24	922.319	931.587
25	926.642	934.098
26	930.879	936.753
27	935.024	939.550
28	939.072	942.484
29	943.019	945.554
30	946.860	948.755
31	950.592	952.083
32	954.208	955.535
33	957.707	959.108
34	961.083	962.796
35	964.333	966.596
36	967.452	970.503
37	970.439	974.513
38	973.288	978.622
39	974.621	980.690

Circle Center At X = 850.027 ; Y = 1061.061 ; and Radius = 148.289

Factor of Safety
 *** 1.314 ***

1

Failure Surface Specified By 39 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.845	916.766
3	820.729	915.695
4	825.647	914.790
5	830.592	914.051
6	835.559	913.480
7	840.543	913.076
8	845.537	912.840
9	850.537	912.773
10	855.536	912.875
11	860.528	913.145
12	865.509	913.583
13	870.472	914.189

14	875.412	914.961
15	880.323	915.900
16	885.200	917.004
17	890.037	918.272
18	894.828	919.702
19	899.568	921.293
20	904.252	923.042
21	908.874	924.949
22	913.429	927.010
23	917.913	929.224
24	922.319	931.587
25	926.642	934.098
26	930.879	936.753
27	935.024	939.550
28	939.072	942.484
29	943.019	945.554
30	946.860	948.755
31	950.592	952.083
32	954.208	955.535
33	957.707	959.108
34	961.083	962.796
35	964.333	966.596
36	967.452	970.503
37	970.439	974.513
38	973.288	978.622
39	974.621	980.690

Circle Center At X = 850.027 ; Y = 1061.061 ; and Radius = 148.289

Factor of Safety
 *** 1.314 ***

Failure Surface Specified By 40 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	811.000	918.000
2	815.746	916.426
3	820.545	915.025
4	825.393	913.798
5	830.281	912.748
6	835.204	911.876
7	840.156	911.182
8	845.130	910.668
9	850.118	910.334
10	855.116	910.182
11	860.116	910.210
12	865.112	910.419
13	870.096	910.809
14	875.064	911.380
15	880.007	912.129
16	884.920	913.058
17	889.797	914.163
18	894.630	915.444
19	899.413	916.900
20	904.141	918.528
21	908.806	920.325
22	913.404	922.291
23	917.927	924.422
24	922.370	926.715

25	926.727	929.167
26	930.993	931.776
27	935.161	934.537
28	939.227	937.448
29	943.185	940.503
30	947.029	943.700
31	950.755	947.034
32	954.358	950.501
33	957.833	954.096
34	961.176	957.815
35	964.381	961.652
36	967.446	965.602
37	970.366	969.661
38	973.137	973.823
39	975.755	978.083
40	976.655	979.673

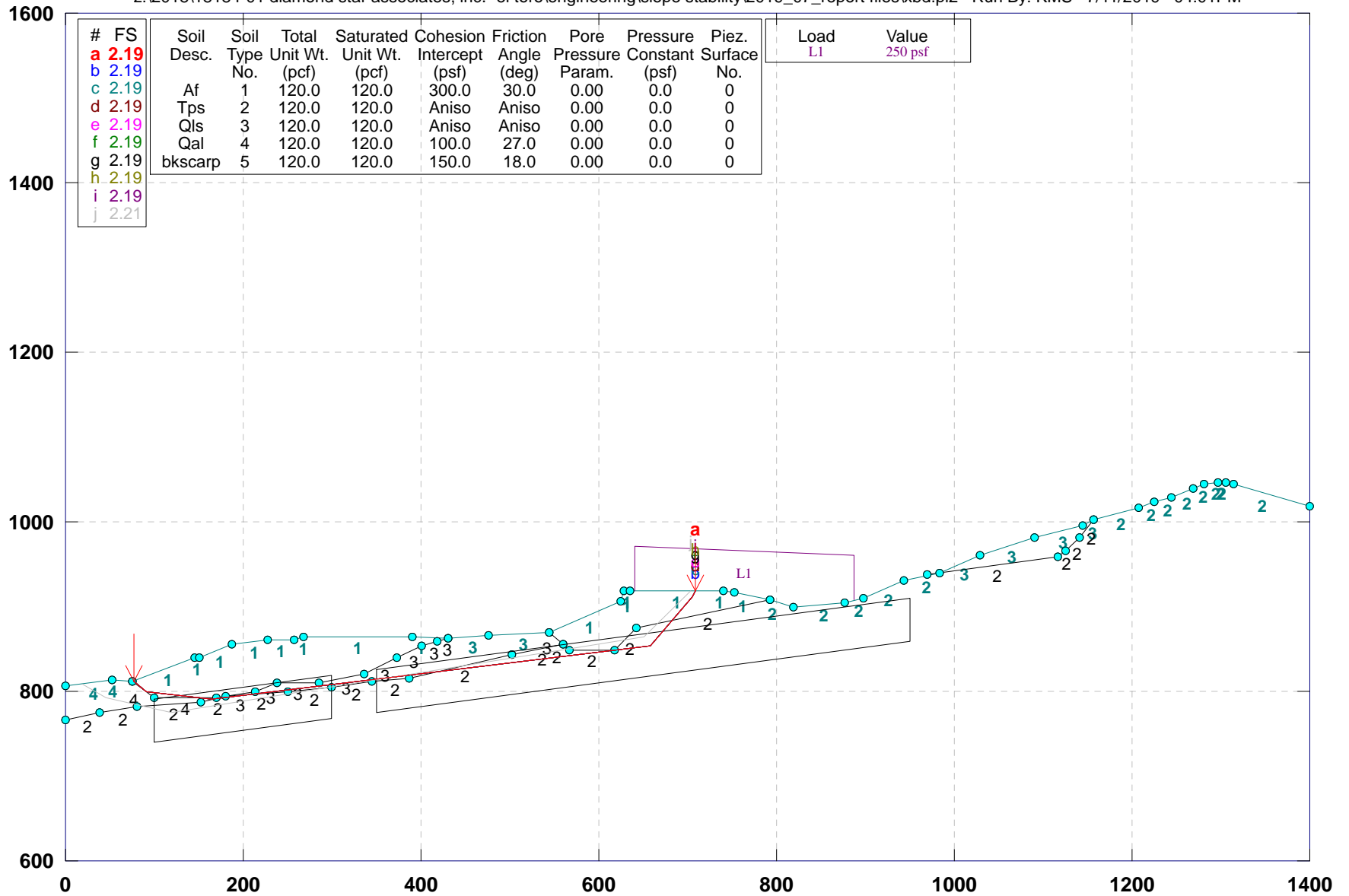
Circle Center At X = 856.834 ; Y = 1048.201 ; and Radius = 138.033

Factor of Safety
*** 1.317 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / B-B' / Design /

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xbd.pl2 Run By: KMS 7/11/2019 04:01PM

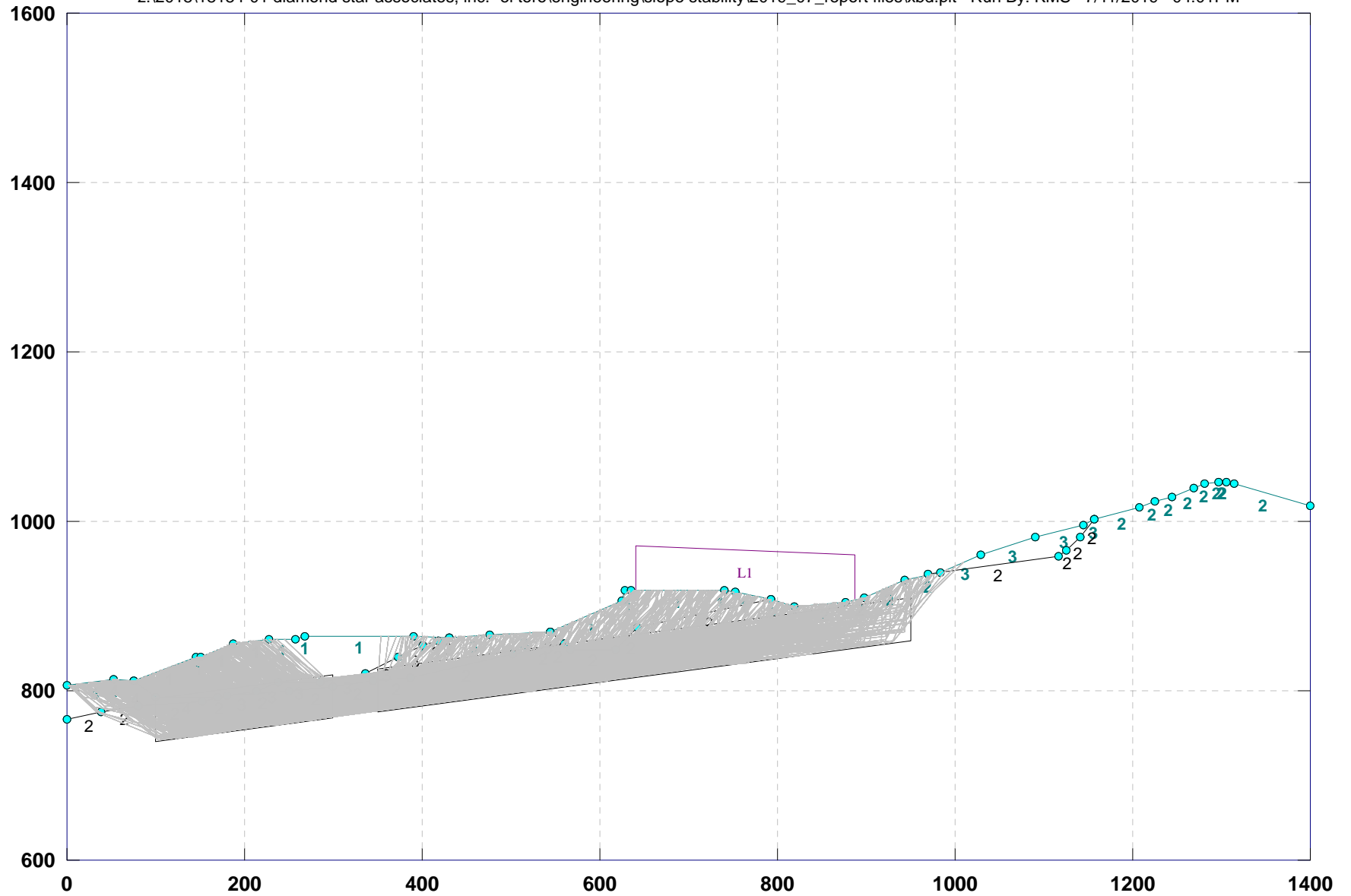


GSTABL7 v.2 FSmin=2.19

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / B-B' / Design /

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xbd.plt Run By: KMS 7/11/2019 04:01PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/11/2019
Time of Run: 04:01PM
Run By:
KMS

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\xbd.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\xbd.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\xbd.PLT

PROBLEM DESCRIPTION: 18184-01 / B-B' / Design /

BOUNDARY COORDINATES

36 Top Boundaries
65 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	806.00	53.00	813.00	4
2	53.00	813.00	75.00	811.00	4
3	75.00	811.00	145.00	839.00	1
4	145.00	839.00	150.00	839.00	1
5	150.00	839.00	187.00	856.00	1
6	187.00	856.00	227.00	861.00	1
7	227.00	861.00	258.00	861.00	1

8	258.00	861.00	267.00	865.00	1
9	267.00	865.00	390.00	864.00	1
10	390.00	864.00	430.00	863.00	1
11	430.00	863.00	476.00	866.00	3
12	476.00	866.00	545.00	870.00	3
13	545.00	870.00	625.00	906.00	1
14	625.00	906.00	628.00	918.00	1
15	628.00	918.00	635.00	919.00	1
16	635.00	919.00	741.00	918.00	1
17	741.00	918.00	752.00	916.00	1
18	752.00	916.00	793.00	908.00	1
19	793.00	908.00	819.00	900.00	2
20	819.00	900.00	877.00	905.00	2
21	877.00	905.00	898.00	910.00	2
22	898.00	910.00	943.00	930.00	2
23	943.00	930.00	984.00	940.00	2
24	984.00	940.00	1029.00	960.00	3
25	1029.00	960.00	1090.00	982.00	3
26	1090.00	982.00	1144.00	996.00	3
27	1144.00	996.00	1156.00	1002.00	3
28	1156.00	1002.00	1208.00	1017.00	2
29	1208.00	1017.00	1225.00	1024.00	2
30	1225.00	1024.00	1245.00	1028.00	2
31	1245.00	1028.00	1268.00	1040.00	2
32	1268.00	1040.00	1281.00	1044.00	2
33	1281.00	1044.00	1296.00	1047.00	2
34	1296.00	1047.00	1306.00	1047.00	2
35	1306.00	1047.00	1314.00	1045.00	2
36	1314.00	1045.00	1400.00	1018.00	2
37	75.00	811.00	100.00	792.00	4
38	100.00	792.00	170.00	792.00	4
39	170.00	792.00	213.00	800.00	3
40	213.00	800.00	238.00	810.00	3
41	238.00	810.00	286.00	810.00	3
42	286.00	810.00	336.00	821.00	3
43	336.00	821.00	372.00	839.00	3
44	372.00	839.00	401.00	853.00	3
45	401.00	853.00	418.00	859.00	3
46	418.00	859.00	430.00	863.00	3
47	0.00	766.00	38.00	775.00	2
48	38.00	775.00	80.00	782.00	2
49	80.00	782.00	152.00	788.00	2
50	152.00	788.00	181.00	794.00	2
51	181.00	794.00	250.00	799.00	2
52	250.00	799.00	299.00	804.00	2
53	299.00	804.00	345.00	811.00	2
54	345.00	811.00	386.00	815.00	2
55	386.00	815.00	503.00	843.00	2
56	545.00	870.00	560.00	855.00	3
57	503.00	843.00	560.00	855.00	2
58	560.00	855.00	567.00	848.00	2
59	567.00	848.00	617.00	848.00	2
60	617.00	848.00	643.00	874.00	2
61	643.00	874.00	793.00	908.00	2
62	969.00	938.00	1116.00	958.00	2
63	1116.00	958.00	1126.00	965.00	2
64	1126.00	965.00	1141.00	982.00	2
65	1141.00	982.00	1156.00	1002.00	2

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

5 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	26.0	0.00	0.0	0
4	120.0	120.0	100.0	27.0	0.00	0.0	0
5	120.0	120.0	150.0	18.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

2 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	30.00
2	10.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 3 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	26.00
2	10.0	100.00	12.00
3	90.0	300.00	26.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
----------	-------------	--------------	-----------------	------------------

1	640.00	888.00	250.0	0.0
---	--------	--------	-------	-----

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

Janbus Empirical Coef is being used for the case of c & ϕ both > 0

1

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 75.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	100.00	765.00	300.00	793.00	50.00
2	350.00	800.00	950.00	884.00	50.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 226.528 FS Min = 2.186 FS Ave = 8.374
 Standard Deviation = 13.818 Coefficient of Variation = 165.01 %

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	76.925	811.770
2	90.417	799.505
3	164.832	790.150
4	657.874	853.097
5	704.588	911.772

Factor of Safety
 *** 2.186 ***

Individual data on the 38 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	13.5	14297.8	0.0	0.0	0.	0.	0.0	0.0	0.0
2	54.6	209657.5	0.0	0.0	0.	0.	0.0	0.0	0.0
3	5.0	28002.6	0.0	0.0	0.	0.	0.0	0.0	0.0
4	0.1	657.8	0.0	0.0	0.	0.	0.0	0.0	0.0
5	13.2	80633.3	0.0	0.0	0.	0.	0.0	0.0	0.0
6	1.5	10056.3	0.0	0.0	0.	0.	0.0	0.0	0.0
7	5.2	35055.7	0.0	0.0	0.	0.	0.0	0.0	0.0
8	11.0	78149.4	0.0	0.0	0.	0.	0.0	0.0	0.0
9	6.0	44657.5	0.0	0.0	0.	0.	0.0	0.0	0.0
10	26.0	196513.2	0.0	0.0	0.	0.	0.0	0.0	0.0
11	0.3	2618.8	0.0	0.0	0.	0.	0.0	0.0	0.0
12	13.7	103106.3	0.0	0.0	0.	0.	0.0	0.0	0.0
13	11.0	82118.2	0.0	0.0	0.	0.	0.0	0.0	0.0
14	20.0	144556.3	0.0	0.0	0.	0.	0.0	0.0	0.0
15	9.0	65211.1	0.0	0.0	0.	0.	0.0	0.0	0.0
16	19.0	137976.6	0.0	0.0	0.	0.	0.0	0.0	0.0
17	50.0	334985.2	0.0	0.0	0.	0.	0.0	0.0	0.0
18	36.0	215963.1	0.0	0.0	0.	0.	0.0	0.0	0.0
19	18.0	100061.8	0.0	0.0	0.	0.	0.0	0.0	0.0
20	11.0	58427.2	0.0	0.0	0.	0.	0.0	0.0	0.0
21	15.3	77747.5	0.0	0.0	0.	0.	0.0	0.0	0.0
22	1.7	8188.7	0.0	0.0	0.	0.	0.0	0.0	0.0
23	12.0	57473.2	0.0	0.0	0.	0.	0.0	0.0	0.0
24	46.0	207328.2	0.0	0.0	0.	0.	0.0	0.0	0.0
25	27.0	113989.9	0.0	0.0	0.	0.	0.0	0.0	0.0
26	42.0	165198.4	0.0	0.0	0.	0.	0.0	0.0	0.0
27	15.0	60716.3	0.0	0.0	0.	0.	0.0	0.0	0.0
28	7.0	31312.6	0.0	0.0	0.	0.	0.0	0.0	0.0
29	50.0	278779.9	0.0	0.0	0.	0.	0.0	0.0	0.0
30	8.0	53578.4	0.0	0.0	0.	0.	0.0	0.0	0.0
31	3.0	22647.1	0.0	0.0	0.	0.	0.0	0.0	0.0
32	7.0	57767.1	0.0	0.0	0.	0.	0.0	0.0	0.0
33	5.0	41088.4	0.0	0.0	0.	0.	0.0	0.0	0.0
34	3.0	24455.6	0.0	0.0	0.	0.	0.0	0.0	750.0
35	14.9	119060.3	0.0	0.0	0.	0.	0.0	0.0	3718.4
36	23.6	143657.3	0.0	0.0	0.	0.	0.0	0.0	5895.4
37	23.1	58872.2	0.0	0.0	0.	0.	0.0	0.0	5783.1
38	4.9	1918.0	0.0	0.0	0.	0.	0.0	0.0	1216.1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	76.925	811.770
2	90.417	799.505
3	164.832	790.150
4	657.874	853.097

5	704.588	911.772
6	709.452	918.298

Factor of Safety
*** 2.186 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	76.925	811.770
2	90.417	799.505
3	164.832	790.150
4	657.874	853.097
5	704.588	911.772
6	709.452	918.298

Factor of Safety
*** 2.186 ***

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	76.925	811.770
2	90.417	799.505
3	164.832	790.150
4	657.874	853.097
5	704.588	911.772
6	709.452	918.298

Factor of Safety
*** 2.186 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	76.925	811.770
2	90.417	799.505
3	164.832	790.150
4	657.874	853.097
5	704.588	911.772
6	709.452	918.298

Factor of Safety
*** 2.186 ***

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	76.925	811.770
2	90.417	799.505
3	164.832	790.150
4	657.874	853.097
5	704.588	911.772
6	709.452	918.298

Factor of Safety
*** 2.186 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	76.925	811.770
2	90.417	799.505
3	164.832	790.150
4	657.874	853.097
5	704.588	911.772
6	709.452	918.298

Factor of Safety
*** 2.186 ***

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	76.925	811.770
2	90.417	799.505
3	164.832	790.150
4	657.874	853.097
5	704.588	911.772
6	709.452	918.298

Factor of Safety
*** 2.186 ***

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	76.925	811.770
2	90.417	799.505
3	164.832	790.150
4	657.874	853.097
5	704.588	911.772
6	709.452	918.298

Factor of Safety
 *** 2.186 ***

Failure Surface Specified By 6 Coordinate Points

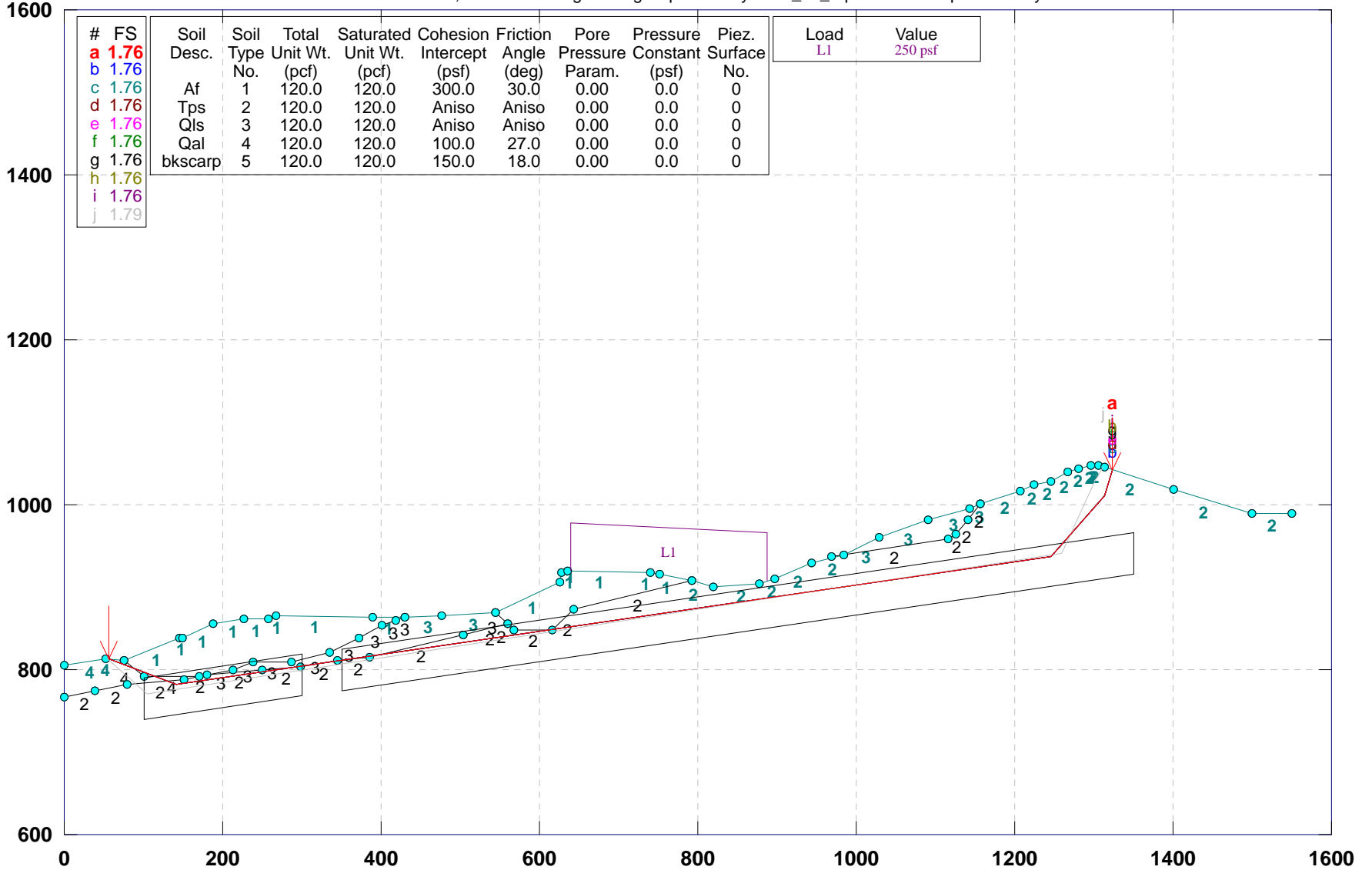
Point No.	X-Surf (ft)	Y-Surf (ft)
1	18.912	808.498
2	45.469	792.953
3	118.201	774.650
4	650.403	864.661
5	703.360	917.770
6	703.933	918.350

Factor of Safety
 *** 2.209 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / B-B' / Design / Search Entire Length

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xbdf.pl2 Run By: KMS 7/25/2019 03:12PM

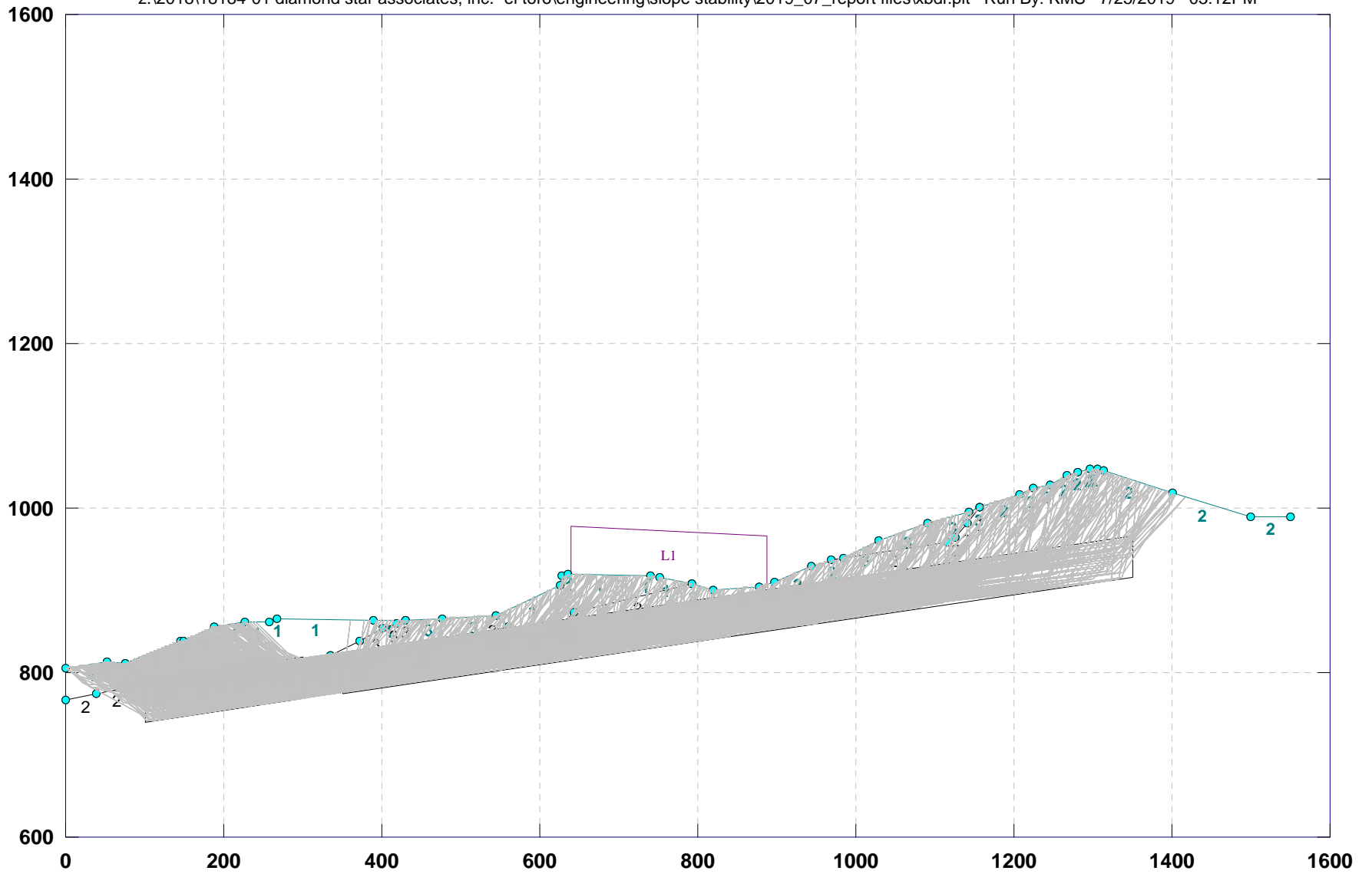


GSTABL7 v.2 FSmin=1.76

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / B-B' / Design / Search Entire Length

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xbdf.plt Run By: KMS 7/25/2019 03:12PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/25/2019
Time of Run: 03:12PM
Run By:
KMS

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\xbdf.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\xbdf.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\xbdf.PLT

PROBLEM DESCRIPTION: 18184-01 / B-B' / Design / Search
Entire Length

BOUNDARY COORDINATES

38 Top Boundaries
67 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	806.00	53.00	813.00	4
2	53.00	813.00	75.00	811.00	4
3	75.00	811.00	145.00	839.00	1
4	145.00	839.00	150.00	839.00	1
5	150.00	839.00	187.00	856.00	1
6	187.00	856.00	227.00	861.00	1
7	227.00	861.00	258.00	861.00	1

8	258.00	861.00	267.00	865.00	1
9	267.00	865.00	390.00	864.00	1
10	390.00	864.00	430.00	863.00	1
11	430.00	863.00	476.00	866.00	3
12	476.00	866.00	545.00	870.00	3
13	545.00	870.00	625.00	906.00	1
14	625.00	906.00	628.00	918.00	1
15	628.00	918.00	635.00	919.00	1
16	635.00	919.00	741.00	918.00	1
17	741.00	918.00	752.00	916.00	1
18	752.00	916.00	793.00	908.00	1
19	793.00	908.00	819.00	900.00	2
20	819.00	900.00	877.00	905.00	2
21	877.00	905.00	898.00	910.00	2
22	898.00	910.00	943.00	930.00	2
23	943.00	930.00	984.00	940.00	2
24	984.00	940.00	1029.00	960.00	3
25	1029.00	960.00	1090.00	982.00	3
26	1090.00	982.00	1144.00	996.00	3
27	1144.00	996.00	1156.00	1002.00	3
28	1156.00	1002.00	1208.00	1017.00	2
29	1208.00	1017.00	1225.00	1024.00	2
30	1225.00	1024.00	1245.00	1028.00	2
31	1245.00	1028.00	1268.00	1040.00	2
32	1268.00	1040.00	1281.00	1044.00	2
33	1281.00	1044.00	1296.00	1047.00	2
34	1296.00	1047.00	1306.00	1047.00	2
35	1306.00	1047.00	1314.00	1045.00	2
36	1314.00	1045.00	1400.00	1018.00	2
37	1400.00	1018.00	1500.00	990.00	2
38	1500.00	990.00	1550.00	990.00	2
39	75.00	811.00	100.00	792.00	4
40	100.00	792.00	170.00	792.00	4
41	170.00	792.00	213.00	800.00	3
42	213.00	800.00	238.00	810.00	3
43	238.00	810.00	286.00	810.00	3
44	286.00	810.00	336.00	821.00	3
45	336.00	821.00	372.00	839.00	3
46	372.00	839.00	401.00	853.00	3
47	401.00	853.00	418.00	859.00	3
48	418.00	859.00	430.00	863.00	3
49	0.00	766.00	38.00	775.00	2
50	38.00	775.00	80.00	782.00	2
51	80.00	782.00	152.00	788.00	2
52	152.00	788.00	181.00	794.00	2
53	181.00	794.00	250.00	799.00	2
54	250.00	799.00	299.00	804.00	2
55	299.00	804.00	345.00	811.00	2
56	345.00	811.00	386.00	815.00	2
57	386.00	815.00	503.00	843.00	2
58	545.00	870.00	560.00	855.00	3
59	503.00	843.00	560.00	855.00	2
60	560.00	855.00	567.00	848.00	2
61	567.00	848.00	617.00	848.00	2
62	617.00	848.00	643.00	874.00	2
63	643.00	874.00	793.00	908.00	2
64	969.00	938.00	1116.00	958.00	2
65	1116.00	958.00	1126.00	965.00	2
66	1126.00	965.00	1141.00	982.00	2
67	1141.00	982.00	1156.00	1002.00	2

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

5 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	26.0	0.00	0.0	0
4	120.0	120.0	100.0	27.0	0.00	0.0	0
5	120.0	120.0	150.0	18.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

2 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	30.00
2	10.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 3 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	26.00
2	10.0	100.00	12.00
3	90.0	300.00	26.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	640.00	888.00	250.0	0.0

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

Janbus Empirical Coef is being used for the case of c & ϕ both > 0

1

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 100.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	100.00	765.00	300.00	793.00	50.00
2	350.00	800.00	1350.00	941.00	50.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 83.487 FS Min = 1.764 FS Ave = 5.594
Standard Deviation = 7.620 Coefficient of Variation = 136.22 %

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	55.532	812.770
2	140.857	782.704
3	1245.203	936.523

4 1312.891 1010.132
 5 1324.231 1041.788

Factor of Safety
 *** 1.764 ***

Individual data on the 66 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	19.5	5945.5	0.0	0.0	0.	0.	0.0	0.0	0.0
2	12.5	14665.5	0.0	0.0	0.	0.	0.0	0.0	0.0
3	27.0	79793.5	0.0	0.0	0.	0.	0.0	0.0	0.0
4	16.4	80369.3	0.0	0.0	0.	0.	0.0	0.0	0.0
5	10.0	61184.3	0.0	0.0	0.	0.	0.0	0.0	0.0
6	4.1	27433.1	0.0	0.0	0.	0.	0.0	0.0	0.0
7	5.0	33222.3	0.0	0.0	0.	0.	0.0	0.0	0.0
8	2.0	13282.2	0.0	0.0	0.	0.	0.0	0.0	0.0
9	18.0	126455.6	0.0	0.0	0.	0.	0.0	0.0	0.0
10	11.0	83406.5	0.0	0.0	0.	0.	0.0	0.0	0.0
11	6.0	47453.9	0.0	0.0	0.	0.	0.0	0.0	0.0
12	26.0	208051.1	0.0	0.0	0.	0.	0.0	0.0	0.0
13	14.0	111547.5	0.0	0.0	0.	0.	0.0	0.0	0.0
14	11.0	86501.2	0.0	0.0	0.	0.	0.0	0.0	0.0
15	12.0	92058.4	0.0	0.0	0.	0.	0.0	0.0	0.0
16	8.0	60035.2	0.0	0.0	0.	0.	0.0	0.0	0.0
17	9.0	68420.9	0.0	0.0	0.	0.	0.0	0.0	0.0
18	12.4	94704.0	0.0	0.0	0.	0.	0.0	0.0	0.0
19	6.6	49678.1	0.0	0.0	0.	0.	0.0	0.0	0.0
20	50.0	349437.7	0.0	0.0	0.	0.	0.0	0.0	0.0
21	36.0	224211.3	0.0	0.0	0.	0.	0.0	0.0	0.0
22	18.0	103508.5	0.0	0.0	0.	0.	0.0	0.0	0.0
23	11.0	60311.1	0.0	0.0	0.	0.	0.0	0.0	0.0
24	3.5	18607.7	0.0	0.0	0.	0.	0.0	0.0	0.0
25	13.5	69908.4	0.0	0.0	0.	0.	0.0	0.0	0.0
26	12.0	59051.8	0.0	0.0	0.	0.	0.0	0.0	0.0
27	46.0	211520.0	0.0	0.0	0.	0.	0.0	0.0	0.0
28	27.0	115076.8	0.0	0.0	0.	0.	0.0	0.0	0.0
29	42.0	164869.6	0.0	0.0	0.	0.	0.0	0.0	0.0
30	15.0	60002.9	0.0	0.0	0.	0.	0.0	0.0	0.0
31	7.0	30872.4	0.0	0.0	0.	0.	0.0	0.0	0.0
32	42.6	227571.2	0.0	0.0	0.	0.	0.0	0.0	0.0
33	8.5	53724.0	0.0	0.0	0.	0.	0.0	0.0	0.0
34	6.8	44788.0	0.0	0.0	0.	0.	0.0	0.0	0.0
35	3.0	22195.0	0.0	0.0	0.	0.	0.0	0.0	0.0
36	7.0	56663.4	0.0	0.0	0.	0.	0.0	0.0	0.0
37	5.0	40258.3	0.0	0.0	0.	0.	0.0	0.0	0.0
38	3.0	23940.8	0.0	0.0	0.	0.	0.0	0.0	750.0
39	98.0	693746.0	0.0	0.0	0.	0.	0.0	0.0	24500.0
40	11.0	65919.0	0.0	0.0	0.	0.	0.0	0.0	2750.0
41	41.0	203280.9	0.0	0.0	0.	0.	0.0	0.0	10250.0
42	26.0	89391.7	0.0	0.0	0.	0.	0.0	0.0	6500.0
43	58.0	148256.4	0.0	0.0	0.	0.	0.0	0.0	14500.0
44	11.0	26803.1	0.0	0.0	0.	0.	0.0	0.0	2750.0
45	10.0	25611.5	0.0	0.0	0.	0.	0.0	0.0	0.0
46	45.0	154996.2	0.0	0.0	0.	0.	0.0	0.0	0.0
47	26.0	115218.9	0.0	0.0	0.	0.	0.0	0.0	0.0
48	15.0	70332.8	0.0	0.0	0.	0.	0.0	0.0	0.0

49	45.0	252312.2	0.0	0.0	0.	0.	0.0	0.0	0.0
50	61.0	441706.4	0.0	0.0	0.	0.	0.0	0.0	0.0
51	26.0	214199.9	0.0	0.0	0.	0.	0.0	0.0	0.0
52	10.0	84976.1	0.0	0.0	0.	0.	0.0	0.0	0.0
53	15.0	130163.5	0.0	0.0	0.	0.	0.0	0.0	0.0
54	3.0	26421.4	0.0	0.0	0.	0.	0.0	0.0	0.0
55	12.0	109061.4	0.0	0.0	0.	0.	0.0	0.0	0.0
56	52.0	510307.0	0.0	0.0	0.	0.	0.0	0.0	0.0
57	17.0	179468.2	0.0	0.0	0.	0.	0.0	0.0	0.0
58	20.0	218154.8	0.0	0.0	0.	0.	0.0	0.0	0.0
59	0.2	2226.0	0.0	0.0	0.	0.	0.0	0.0	0.0
60	22.8	232899.8	0.0	0.0	0.	0.	0.0	0.0	0.0
61	13.0	114842.6	0.0	0.0	0.	0.	0.0	0.0	0.0
62	15.0	111406.9	0.0	0.0	0.	0.	0.0	0.0	0.0
63	10.0	59759.3	0.0	0.0	0.	0.	0.0	0.0	0.0
64	6.9	32874.8	0.0	0.0	0.	0.	0.0	0.0	0.0
65	1.1	4451.3	0.0	0.0	0.	0.	0.0	0.0	0.0
66	10.2	19504.1	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	55.532	812.770
2	140.857	782.704
3	1245.203	936.523
4	1312.891	1010.132
5	1324.231	1041.788

Factor of Safety
 *** 1.764 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	55.532	812.770
2	140.857	782.704
3	1245.203	936.523
4	1312.891	1010.132
5	1324.231	1041.788

Factor of Safety
 *** 1.764 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	55.532	812.770
2	140.857	782.704

3	1245.203	936.523
4	1312.891	1010.132
5	1324.231	1041.788

Factor of Safety
*** 1.764 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	55.532	812.770
2	140.857	782.704
3	1245.203	936.523
4	1312.891	1010.132
5	1324.231	1041.788

Factor of Safety
*** 1.764 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	55.532	812.770
2	140.857	782.704
3	1245.203	936.523
4	1312.891	1010.132
5	1324.231	1041.788

Factor of Safety
*** 1.764 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	55.532	812.770
2	140.857	782.704
3	1245.203	936.523
4	1312.891	1010.132
5	1324.231	1041.788

Factor of Safety
*** 1.764 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	55.532	812.770
2	140.857	782.704
3	1245.203	936.523
4	1312.891	1010.132
5	1324.231	1041.788

Factor of Safety
*** 1.764 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	55.532	812.770
2	140.857	782.704
3	1245.203	936.523
4	1312.891	1010.132
5	1324.231	1041.788

Factor of Safety
*** 1.764 ***

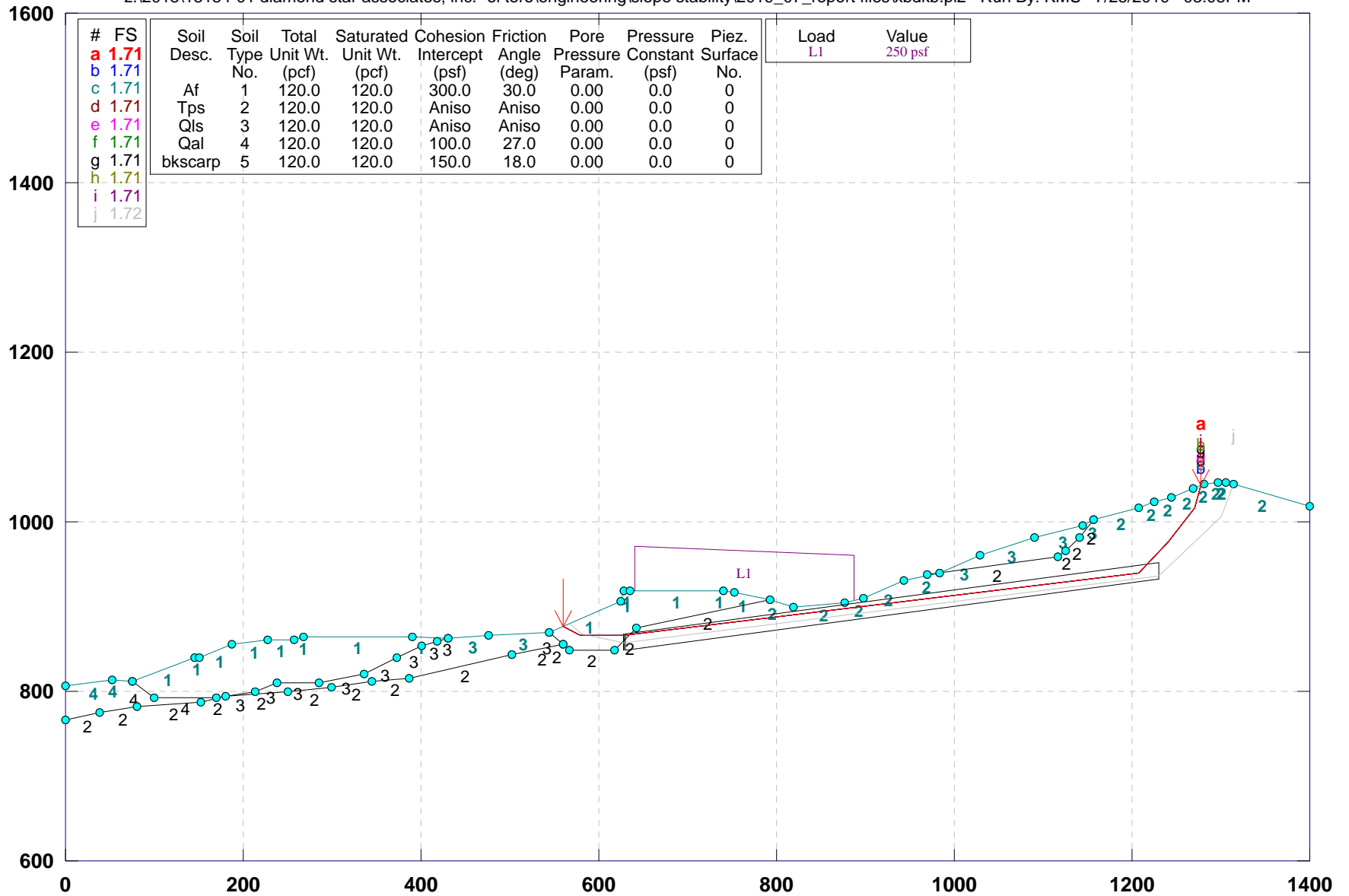
Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	54.075	812.902
2	104.871	769.695
3	1258.630	940.504
4	1302.842	1030.200
5	1311.294	1045.677

Factor of Safety
*** 1.789 ***

18184-01 / B-B' / Design / Search Behind Keyway

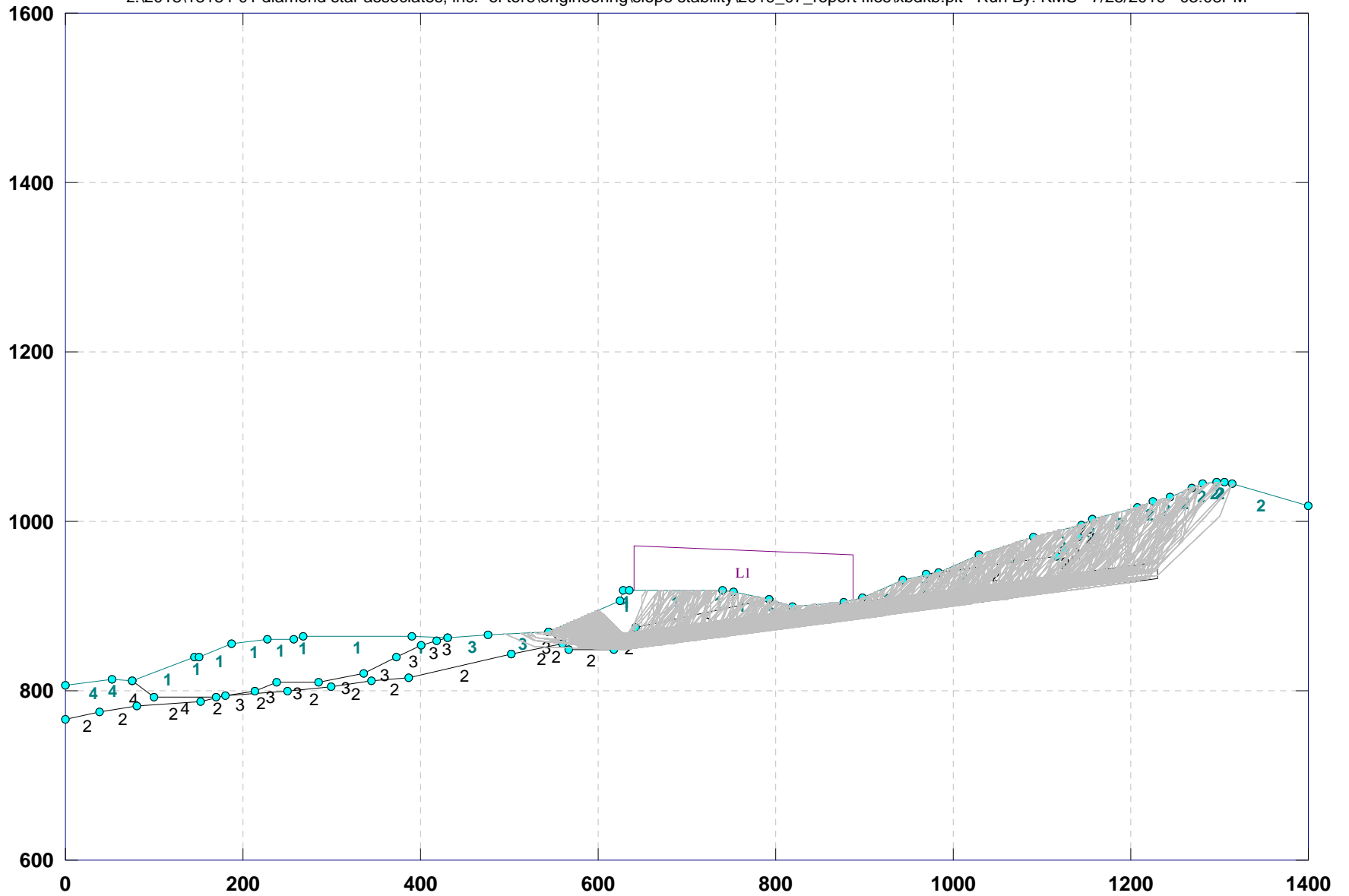
z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xbdkb.pl2 Run By: KMS 7/25/2019 03:08PM



GSTABL7 v.2 FSmin=1.71
 Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / B-B' / Design / Search Behind Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xbdkb.plt Run By: KMS 7/25/2019 03:08PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/25/2019
Time of Run: 03:08PM
Run By:
KMS

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\xbdkb.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\xbdkb.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\xbdkb.PLT

PROBLEM DESCRIPTION: 18184-01 / B-B' / Design / Search
Behind Keyway

BOUNDARY COORDINATES

36 Top Boundaries
65 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	806.00	53.00	813.00	4
2	53.00	813.00	75.00	811.00	4
3	75.00	811.00	145.00	839.00	1
4	145.00	839.00	150.00	839.00	1
5	150.00	839.00	187.00	856.00	1
6	187.00	856.00	227.00	861.00	1
7	227.00	861.00	258.00	861.00	1

8	258.00	861.00	267.00	865.00	1
9	267.00	865.00	390.00	864.00	1
10	390.00	864.00	430.00	863.00	1
11	430.00	863.00	476.00	866.00	3
12	476.00	866.00	545.00	870.00	3
13	545.00	870.00	625.00	906.00	1
14	625.00	906.00	628.00	918.00	1
15	628.00	918.00	635.00	919.00	1
16	635.00	919.00	741.00	918.00	1
17	741.00	918.00	752.00	916.00	1
18	752.00	916.00	793.00	908.00	1
19	793.00	908.00	819.00	900.00	2
20	819.00	900.00	877.00	905.00	2
21	877.00	905.00	898.00	910.00	2
22	898.00	910.00	943.00	930.00	2
23	943.00	930.00	984.00	940.00	2
24	984.00	940.00	1029.00	960.00	3
25	1029.00	960.00	1090.00	982.00	3
26	1090.00	982.00	1144.00	996.00	3
27	1144.00	996.00	1156.00	1002.00	3
28	1156.00	1002.00	1208.00	1017.00	2
29	1208.00	1017.00	1225.00	1024.00	2
30	1225.00	1024.00	1245.00	1028.00	2
31	1245.00	1028.00	1268.00	1040.00	2
32	1268.00	1040.00	1281.00	1044.00	2
33	1281.00	1044.00	1296.00	1047.00	2
34	1296.00	1047.00	1306.00	1047.00	2
35	1306.00	1047.00	1314.00	1045.00	2
36	1314.00	1045.00	1400.00	1018.00	2
37	75.00	811.00	100.00	792.00	4
38	100.00	792.00	170.00	792.00	4
39	170.00	792.00	213.00	800.00	3
40	213.00	800.00	238.00	810.00	3
41	238.00	810.00	286.00	810.00	3
42	286.00	810.00	336.00	821.00	3
43	336.00	821.00	372.00	839.00	3
44	372.00	839.00	401.00	853.00	3
45	401.00	853.00	418.00	859.00	3
46	418.00	859.00	430.00	863.00	3
47	0.00	766.00	38.00	775.00	2
48	38.00	775.00	80.00	782.00	2
49	80.00	782.00	152.00	788.00	2
50	152.00	788.00	181.00	794.00	2
51	181.00	794.00	250.00	799.00	2
52	250.00	799.00	299.00	804.00	2
53	299.00	804.00	345.00	811.00	2
54	345.00	811.00	386.00	815.00	2
55	386.00	815.00	503.00	843.00	2
56	545.00	870.00	560.00	855.00	3
57	503.00	843.00	560.00	855.00	2
58	560.00	855.00	567.00	848.00	2
59	567.00	848.00	617.00	848.00	2
60	617.00	848.00	643.00	874.00	2
61	643.00	874.00	793.00	908.00	2
62	969.00	938.00	1116.00	958.00	2
63	1116.00	958.00	1126.00	965.00	2
64	1126.00	965.00	1141.00	982.00	2
65	1141.00	982.00	1156.00	1002.00	2

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

5 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	26.0	0.00	0.0	0
4	120.0	120.0	100.0	27.0	0.00	0.0	0
5	120.0	120.0	150.0	18.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

2 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	30.00
2	10.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 3 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	26.00
2	10.0	100.00	12.00
3	90.0	300.00	26.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
----------	-------------	--------------	-----------------	------------------

1	640.00	888.00	250.0	0.0
---	--------	--------	-------	-----

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

Janbus Empirical Coef is being used for the case of c & ϕ both > 0

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 50.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	629.00	858.00	629.00	858.00	20.00
2	630.00	858.00	1230.00	942.00	20.00

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined By The Following 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	577.04	884.42
2	583.91	882.76
3	629.00	861.15
4	752.28	876.97
5	752.53	915.90

Factor of Safety for the Preceding Surface is Between 13.525 and 13.519

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined By The Following 6 Coordinate Points

Point	X-Surf	Y-Surf
-------	--------	--------

No.	(ft)	(ft)
1	576.36	884.11
2	588.15	877.49
3	629.00	848.66
4	721.37	862.53
5	721.76	912.53
6	723.68	918.16

Factor of Safety for the Preceding Surface is Between 26.999 and 26.981

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	577.04	884.42
2	583.91	882.76
3	629.00	861.15
4	752.28	876.97
5	752.53	915.90

Factor of Safety for the Preceding Surface is Between 13.525 and 13.519

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	576.36	884.11
2	588.15	877.49
3	629.00	848.66
4	721.37	862.53
5	721.76	912.53
6	723.68	918.16

Factor of Safety for the Preceding Surface is Between 26.999 and 26.981

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 5 Coordinate Points

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

1	577.04	884.42
2	583.91	882.76
3	629.00	861.15
4	752.28	876.97
5	752.53	915.90

Factor of Safety for the Preceding Surface is Between 13.525 and 13.519

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	576.36	884.11
2	588.15	877.49
3	629.00	848.66
4	721.37	862.53
5	721.76	912.53
6	723.68	918.16

Factor of Safety for the Preceding Surface is Between 26.999 and 26.981

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	577.04	884.42
2	583.91	882.76
3	629.00	861.15
4	752.28	876.97
5	752.53	915.90

Factor of Safety for the Preceding Surface is Between 13.525 and 13.519

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	576.36	884.11

2	588.15	877.49
3	629.00	848.66
4	721.37	862.53
5	721.76	912.53
6	723.68	918.16

Factor of Safety for the Preceding Surface is Between 26.999 and 26.981

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	577.04	884.42
2	583.91	882.76
3	629.00	861.15
4	752.28	876.97
5	752.53	915.90

Factor of Safety for the Preceding Surface is Between 13.525 and 13.519

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	576.36	884.11
2	588.15	877.49
3	629.00	848.66
4	721.37	862.53
5	721.76	912.53
6	723.68	918.16

Factor of Safety for the Preceding Surface is Between 26.999 and 26.981

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	577.04	884.42
2	583.91	882.76

3	629.00	861.15
4	752.28	876.97
5	752.53	915.90

Factor of Safety for the Preceding Surface is Between 13.525 and 13.519

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	576.36	884.11
2	588.15	877.49
3	629.00	848.66
4	721.37	862.53
5	721.76	912.53
6	723.68	918.16

Factor of Safety for the Preceding Surface is Between 26.999 and 26.981

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	577.04	884.42
2	583.91	882.76
3	629.00	861.15
4	752.28	876.97
5	752.53	915.90

Factor of Safety for the Preceding Surface is Between 13.525 and 13.519

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	576.36	884.11
2	588.15	877.49
3	629.00	848.66
4	721.37	862.53

5	721.76	912.53
6	723.68	918.16

Factor of Safety for the Preceding Surface is Between 26.999 and 26.981

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	577.04	884.42
2	583.91	882.76
3	629.00	861.15
4	752.28	876.97
5	752.53	915.90

Factor of Safety for the Preceding Surface is Between 13.525 and 13.519

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	576.36	884.11
2	588.15	877.49
3	629.00	848.66
4	721.37	862.53
5	721.76	912.53
6	723.68	918.16

Factor of Safety for the Preceding Surface is Between 26.999 and 26.981

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	577.04	884.42
2	583.91	882.76
3	629.00	861.15
4	752.28	876.97
5	752.53	915.90

Factor of Safety for the Preceding Surface is Between 13.525 and 13.519

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	576.36	884.11
2	588.15	877.49
3	629.00	848.66
4	721.37	862.53
5	721.76	912.53
6	723.68	918.16

Factor of Safety for the Preceding Surface is Between 26.999 and 26.981

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

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

Total Number of Trial Surfaces Attempted = 4999

WARNING! The Factor of Safety Calculation for one or More Trial Surfaces
Did Not Converge in 20 Iterations.

Number of Trial Surfaces with Non-Converged FS = 18

Number of Trial Surfaces With Valid FS = 4981

Percentage of Trial Surfaces With Non-Valid FS Solutions
of the Total Attempted = 0.4 %

Statistical Data On All Valid FS Values:

FS Max = 54.209 FS Min = 1.706 FS Ave = 5.165
Standard Deviation = 4.832 Coefficient of Variation = 93.55 %

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	559.206	876.393
2	579.009	866.262
3	629.000	865.323
4	1206.672	939.680
5	1241.624	975.435

6	1270.632	1016.160
7	1277.414	1042.897

Factor of Safety
 *** 1.706 ***

Individual data on the 33 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	19.8	22625.5	0.0	0.0	0.	0.	0.0	0.0	0.0
2	46.0	164586.8	0.0	0.0	0.	0.	0.0	0.0	0.0
3	3.0	16786.8	0.0	0.0	0.	0.	0.0	0.0	0.0
4	1.0	6328.7	0.0	0.0	0.	0.	0.0	0.0	0.0
5	6.0	38060.8	0.0	0.0	0.	0.	0.0	0.0	0.0
6	0.1	694.3	0.0	0.0	0.	0.	0.0	0.0	0.0
7	4.9	30841.3	0.0	0.0	0.	0.	0.0	0.0	0.0
8	3.0	18722.4	0.0	0.0	0.	0.	0.0	0.0	750.0
9	98.0	529553.1	0.0	0.0	0.	0.	0.0	0.0	24500.0
10	11.0	48249.4	0.0	0.0	0.	0.	0.0	0.0	2750.0
11	41.0	138772.9	0.0	0.0	0.	0.	0.0	0.0	10250.0
12	26.0	49588.7	0.0	0.0	0.	0.	0.0	0.0	6500.0
13	58.0	62553.8	0.0	0.0	0.	0.	0.0	0.0	14500.0
14	11.0	11030.3	0.0	0.0	0.	0.	0.0	0.0	2750.0
15	10.0	11405.8	0.0	0.0	0.	0.	0.0	0.0	0.0
16	45.0	92639.8	0.0	0.0	0.	0.	0.0	0.0	0.0
17	26.0	80360.9	0.0	0.0	0.	0.	0.0	0.0	0.0
18	15.0	50612.4	0.0	0.0	0.	0.	0.0	0.0	0.0
19	45.0	194863.1	0.0	0.0	0.	0.	0.0	0.0	0.0
20	61.0	367930.1	0.0	0.0	0.	0.	0.0	0.0	0.0
21	26.0	184188.4	0.0	0.0	0.	0.	0.0	0.0	0.0
22	10.0	73661.4	0.0	0.0	0.	0.	0.0	0.0	0.0
23	15.0	113429.2	0.0	0.0	0.	0.	0.0	0.0	0.0
24	3.0	23108.8	0.0	0.0	0.	0.	0.0	0.0	0.0
25	12.0	95925.1	0.0	0.0	0.	0.	0.0	0.0	0.0
26	50.7	443218.5	0.0	0.0	0.	0.	0.0	0.0	0.0
27	1.3	12179.6	0.0	0.0	0.	0.	0.0	0.0	0.0
28	17.0	144363.0	0.0	0.0	0.	0.	0.0	0.0	0.0
29	16.6	117156.4	0.0	0.0	0.	0.	0.0	0.0	0.0
30	3.4	20200.9	0.0	0.0	0.	0.	0.0	0.0	0.0
31	23.0	103995.6	0.0	0.0	0.	0.	0.0	0.0	0.0
32	2.6	8239.7	0.0	0.0	0.	0.	0.0	0.0	0.0
33	6.8	10031.5	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	559.206	876.393
2	579.009	866.262
3	629.000	865.323
4	1206.672	939.680
5	1241.624	975.435
6	1270.632	1016.160
7	1277.414	1042.897

Factor of Safety
*** 1.706 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	559.206	876.393
2	579.009	866.262
3	629.000	865.323
4	1206.672	939.680
5	1241.624	975.435
6	1270.632	1016.160
7	1277.414	1042.897

Factor of Safety
*** 1.706 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	559.206	876.393
2	579.009	866.262
3	629.000	865.323
4	1206.672	939.680
5	1241.624	975.435
6	1270.632	1016.160
7	1277.414	1042.897

Factor of Safety
*** 1.706 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	559.206	876.393
2	579.009	866.262
3	629.000	865.323
4	1206.672	939.680
5	1241.624	975.435
6	1270.632	1016.160
7	1277.414	1042.897

Factor of Safety
*** 1.706 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	559.206	876.393
2	579.009	866.262
3	629.000	865.323
4	1206.672	939.680
5	1241.624	975.435
6	1270.632	1016.160
7	1277.414	1042.897

Factor of Safety
*** 1.706 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	559.206	876.393
2	579.009	866.262
3	629.000	865.323
4	1206.672	939.680
5	1241.624	975.435
6	1270.632	1016.160
7	1277.414	1042.897

Factor of Safety
*** 1.706 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	559.206	876.393
2	579.009	866.262
3	629.000	865.323
4	1206.672	939.680
5	1241.624	975.435
6	1270.632	1016.160
7	1277.414	1042.897

Factor of Safety
*** 1.706 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	559.206	876.393
2	579.009	866.262
3	629.000	865.323
4	1206.672	939.680
5	1241.624	975.435
6	1270.632	1016.160
7	1277.414	1042.897

Factor of Safety
*** 1.706 ***

Failure Surface Specified By 7 Coordinate Points

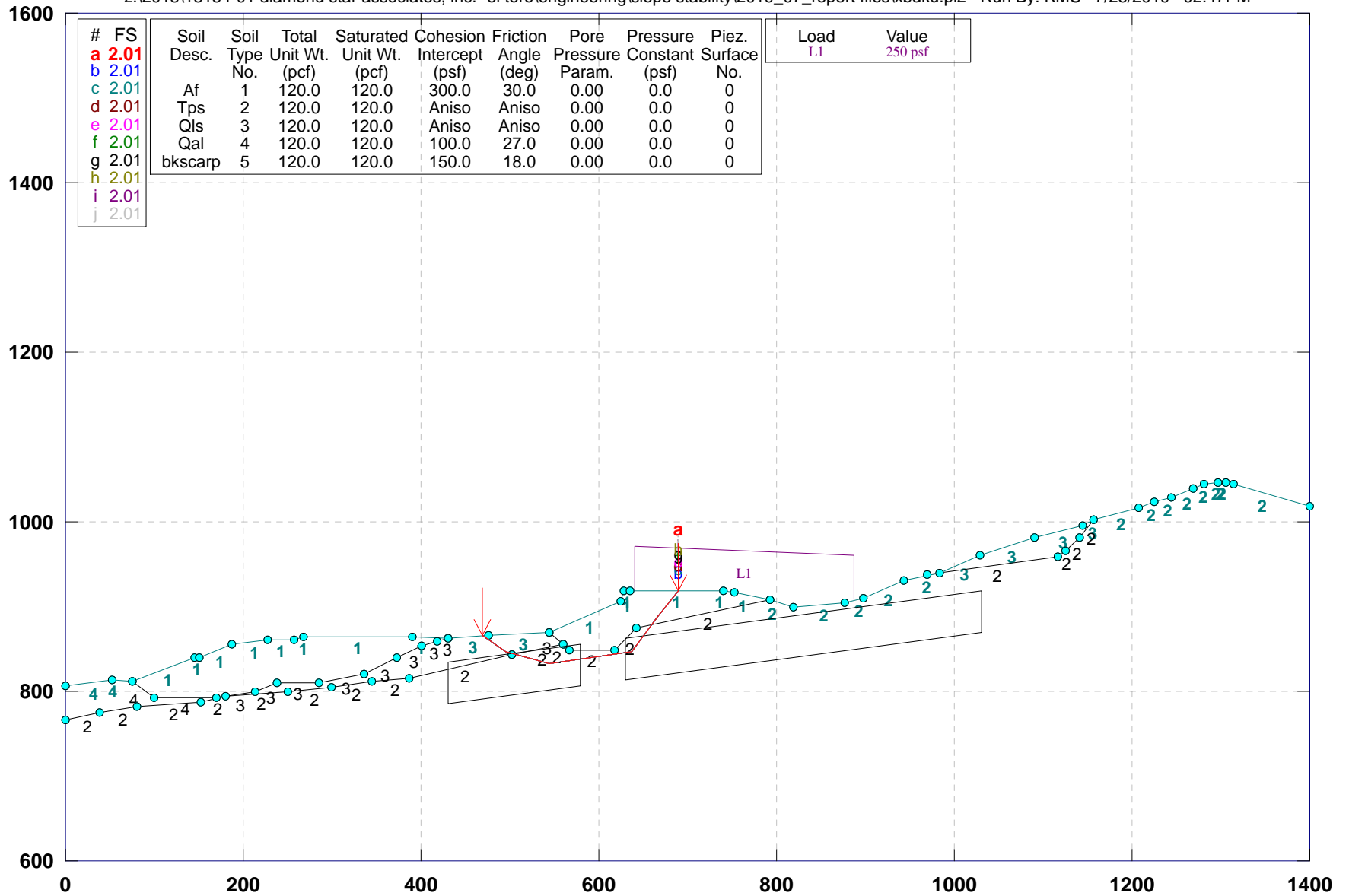
Point No.	X-Surf (ft)	Y-Surf (ft)
1	566.654	879.744
2	580.172	868.379
3	629.000	857.618
4	1229.817	935.137
5	1265.153	970.511
6	1300.259	1006.115
7	1314.417	1044.869

Factor of Safety
*** 1.716 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / B-B' / Design / Search Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xbdku.pl2 Run By: KMS 7/25/2019 02:47PM

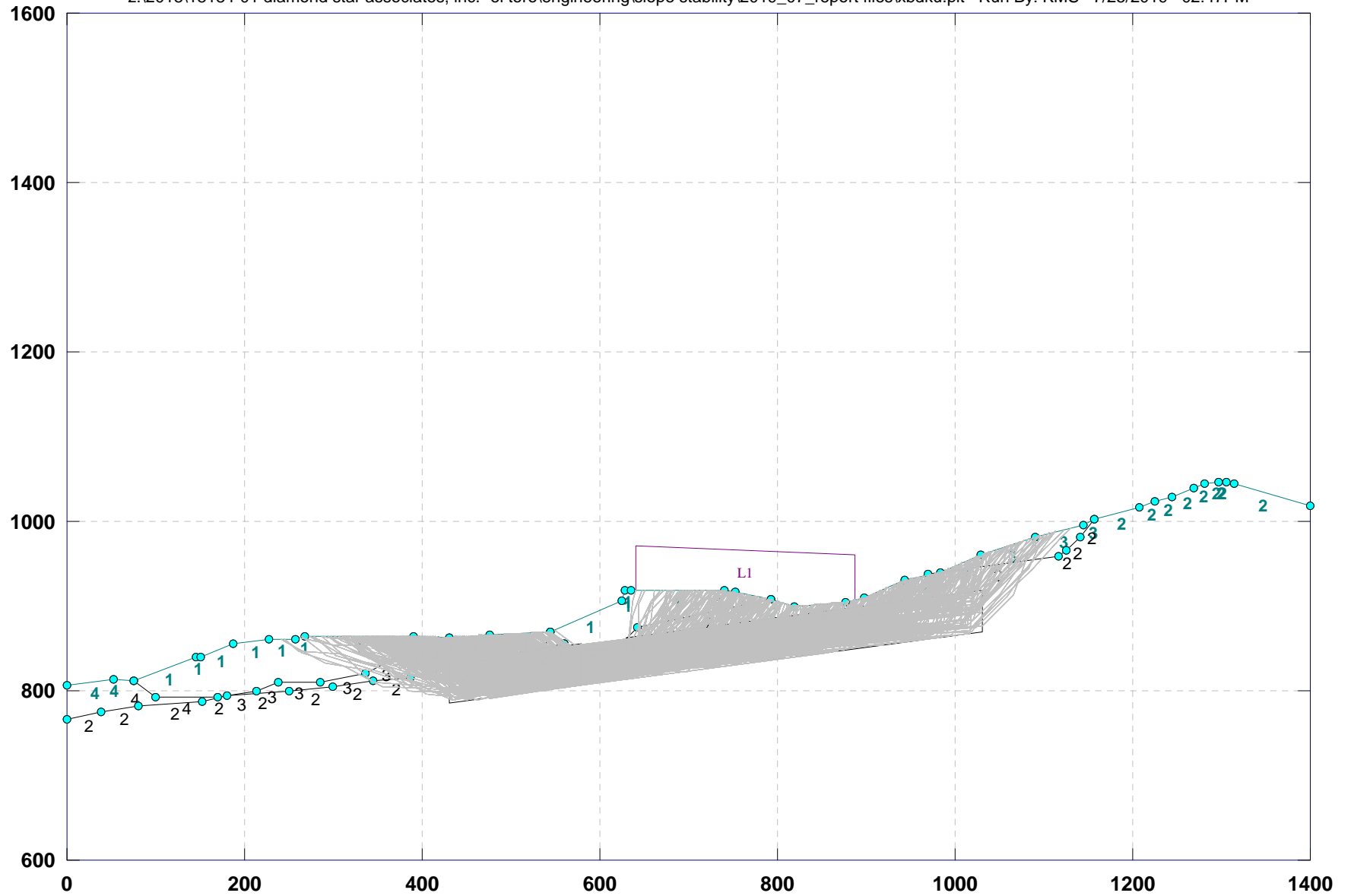


GSTABL7 v.2 FSmin=2.01

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / B-B' / Design / Search Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xbdku.plt Run By: KMS 7/25/2019 02:47PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/25/2019
Time of Run: 02:47PM
Run By:
KMS

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\xbdku.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\xbdku.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\xbdku.PLT

PROBLEM DESCRIPTION: 18184-01 / B-B' / Design / Search
Below Keyway

BOUNDARY COORDINATES

36 Top Boundaries
65 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	806.00	53.00	813.00	4
2	53.00	813.00	75.00	811.00	4
3	75.00	811.00	145.00	839.00	1
4	145.00	839.00	150.00	839.00	1
5	150.00	839.00	187.00	856.00	1
6	187.00	856.00	227.00	861.00	1
7	227.00	861.00	258.00	861.00	1

8	258.00	861.00	267.00	865.00	1
9	267.00	865.00	390.00	864.00	1
10	390.00	864.00	430.00	863.00	1
11	430.00	863.00	476.00	866.00	3
12	476.00	866.00	545.00	870.00	3
13	545.00	870.00	625.00	906.00	1
14	625.00	906.00	628.00	918.00	1
15	628.00	918.00	635.00	919.00	1
16	635.00	919.00	741.00	918.00	1
17	741.00	918.00	752.00	916.00	1
18	752.00	916.00	793.00	908.00	1
19	793.00	908.00	819.00	900.00	2
20	819.00	900.00	877.00	905.00	2
21	877.00	905.00	898.00	910.00	2
22	898.00	910.00	943.00	930.00	2
23	943.00	930.00	984.00	940.00	2
24	984.00	940.00	1029.00	960.00	3
25	1029.00	960.00	1090.00	982.00	3
26	1090.00	982.00	1144.00	996.00	3
27	1144.00	996.00	1156.00	1002.00	3
28	1156.00	1002.00	1208.00	1017.00	2
29	1208.00	1017.00	1225.00	1024.00	2
30	1225.00	1024.00	1245.00	1028.00	2
31	1245.00	1028.00	1268.00	1040.00	2
32	1268.00	1040.00	1281.00	1044.00	2
33	1281.00	1044.00	1296.00	1047.00	2
34	1296.00	1047.00	1306.00	1047.00	2
35	1306.00	1047.00	1314.00	1045.00	2
36	1314.00	1045.00	1400.00	1018.00	2
37	75.00	811.00	100.00	792.00	4
38	100.00	792.00	170.00	792.00	4
39	170.00	792.00	213.00	800.00	3
40	213.00	800.00	238.00	810.00	3
41	238.00	810.00	286.00	810.00	3
42	286.00	810.00	336.00	821.00	3
43	336.00	821.00	372.00	839.00	3
44	372.00	839.00	401.00	853.00	3
45	401.00	853.00	418.00	859.00	3
46	418.00	859.00	430.00	863.00	3
47	0.00	766.00	38.00	775.00	2
48	38.00	775.00	80.00	782.00	2
49	80.00	782.00	152.00	788.00	2
50	152.00	788.00	181.00	794.00	2
51	181.00	794.00	250.00	799.00	2
52	250.00	799.00	299.00	804.00	2
53	299.00	804.00	345.00	811.00	2
54	345.00	811.00	386.00	815.00	2
55	386.00	815.00	503.00	843.00	2
56	545.00	870.00	560.00	855.00	3
57	503.00	843.00	560.00	855.00	2
58	560.00	855.00	567.00	848.00	2
59	567.00	848.00	617.00	848.00	2
60	617.00	848.00	643.00	874.00	2
61	643.00	874.00	793.00	908.00	2
62	969.00	938.00	1116.00	958.00	2
63	1116.00	958.00	1126.00	965.00	2
64	1126.00	965.00	1141.00	982.00	2
65	1141.00	982.00	1156.00	1002.00	2

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

5 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	26.0	0.00	0.0	0
4	120.0	120.0	100.0	27.0	0.00	0.0	0
5	120.0	120.0	150.0	18.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

2 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	30.00
2	10.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 3 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	26.00
2	10.0	100.00	12.00
3	90.0	300.00	26.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	640.00	888.00	250.0	0.0

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

Janbus Empirical Coef is being used for the case of c & ϕ both > 0

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 50.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	430.00	810.00	580.00	831.00	50.00
2	630.00	838.00	1030.00	894.00	50.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 13.382 FS Min = 2.014 FS Ave = 4.612
Standard Deviation = 1.772 Coefficient of Variation = 38.42 %

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	468.947	865.540
2	495.714	845.959
3	543.809	832.290
4	637.202	847.489
5	666.153	888.255

Factor of Safety
 *** 2.014 ***

Individual data on the 17 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	Surcharge Load (lbs)
1	7.1	2378.0	0.0	0.0	0.	0.	0.0	0.0	0.0
2	19.7	31703.3	0.0	0.0	0.	0.	0.0	0.0	0.0
3	9.1	24780.7	0.0	0.0	0.	0.	0.0	0.0	0.0
4	39.0	144969.3	0.0	0.0	0.	0.	0.0	0.0	0.0
5	1.2	5369.8	0.0	0.0	0.	0.	0.0	0.0	0.0
6	15.0	71407.0	0.0	0.0	0.	0.	0.0	0.0	0.0
7	7.0	35977.5	0.0	0.0	0.	0.	0.0	0.0	0.0
8	50.0	306103.2	0.0	0.0	0.	0.	0.0	0.0	0.0
9	8.0	56973.8	0.0	0.0	0.	0.	0.0	0.0	0.0
10	3.0	23850.9	0.0	0.0	0.	0.	0.0	0.0	0.0
11	7.0	60428.6	0.0	0.0	0.	0.	0.0	0.0	0.0
12	2.2	18941.9	0.0	0.0	0.	0.	0.0	0.0	0.0
13	2.8	23336.4	0.0	0.0	0.	0.	0.0	0.0	0.0
14	3.0	23543.1	0.0	0.0	0.	0.	0.0	0.0	750.0
15	15.5	97392.9	0.0	0.0	0.	0.	0.0	0.0	3882.2
16	7.6	32801.7	0.0	0.0	0.	0.	0.0	0.0	1905.9
17	23.0	42019.7	0.0	0.0	0.	0.	0.0	0.0	5749.6

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	468.947	865.540
2	495.714	845.959
3	543.809	832.290
4	637.202	847.489
5	666.153	888.255
6	689.151	918.489

Factor of Safety
 *** 2.014 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	468.947	865.540
2	495.714	845.959
3	543.809	832.290
4	637.202	847.489

5	666.153	888.255
6	689.151	918.489

Factor of Safety
*** 2.014 ***

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	468.947	865.540
2	495.714	845.959
3	543.809	832.290
4	637.202	847.489
5	666.153	888.255
6	689.151	918.489

Factor of Safety
*** 2.014 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	468.947	865.540
2	495.714	845.959
3	543.809	832.290
4	637.202	847.489
5	666.153	888.255
6	689.151	918.489

Factor of Safety
*** 2.014 ***

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	468.947	865.540
2	495.714	845.959
3	543.809	832.290
4	637.202	847.489
5	666.153	888.255
6	689.151	918.489

Factor of Safety

*** 2.014 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	468.947	865.540
2	495.714	845.959
3	543.809	832.290
4	637.202	847.489
5	666.153	888.255
6	689.151	918.489

Factor of Safety
*** 2.014 ***

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	468.947	865.540
2	495.714	845.959
3	543.809	832.290
4	637.202	847.489
5	666.153	888.255
6	689.151	918.489

Factor of Safety
*** 2.014 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	468.947	865.540
2	495.714	845.959
3	543.809	832.290
4	637.202	847.489
5	666.153	888.255
6	689.151	918.489

Factor of Safety
*** 2.014 ***

Failure Surface Specified By 6 Coordinate Points

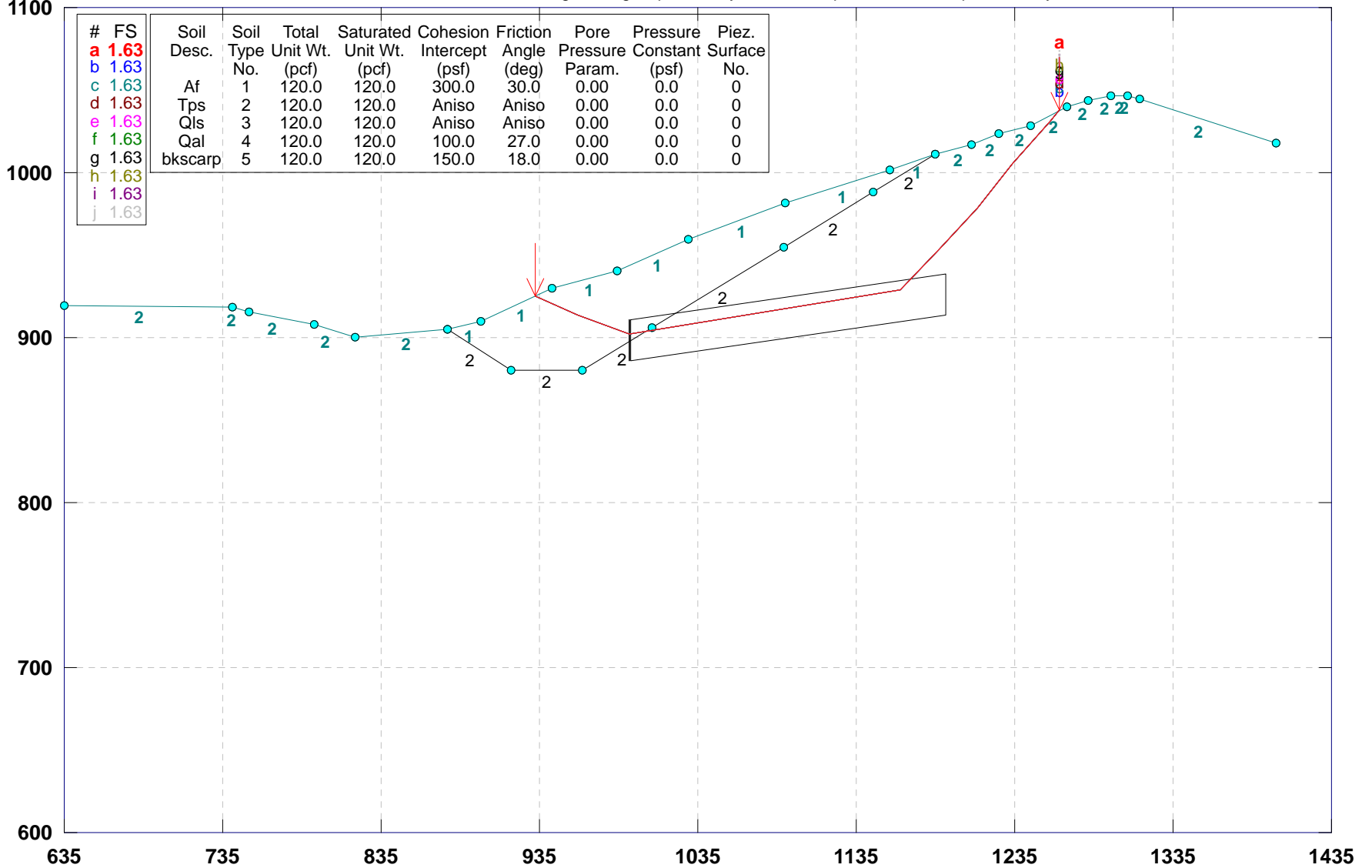
Point No.	X-Surf (ft)	Y-Surf (ft)
1	468.947	865.540
2	495.714	845.959
3	543.809	832.290
4	637.202	847.489
5	666.153	888.255
6	689.151	918.489

Factor of Safety
*** 2.014 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / B-B' / Design / Upper / Search Behind Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xbdukb.pl2 Run By: KMS 7/26/2019 10:08AM

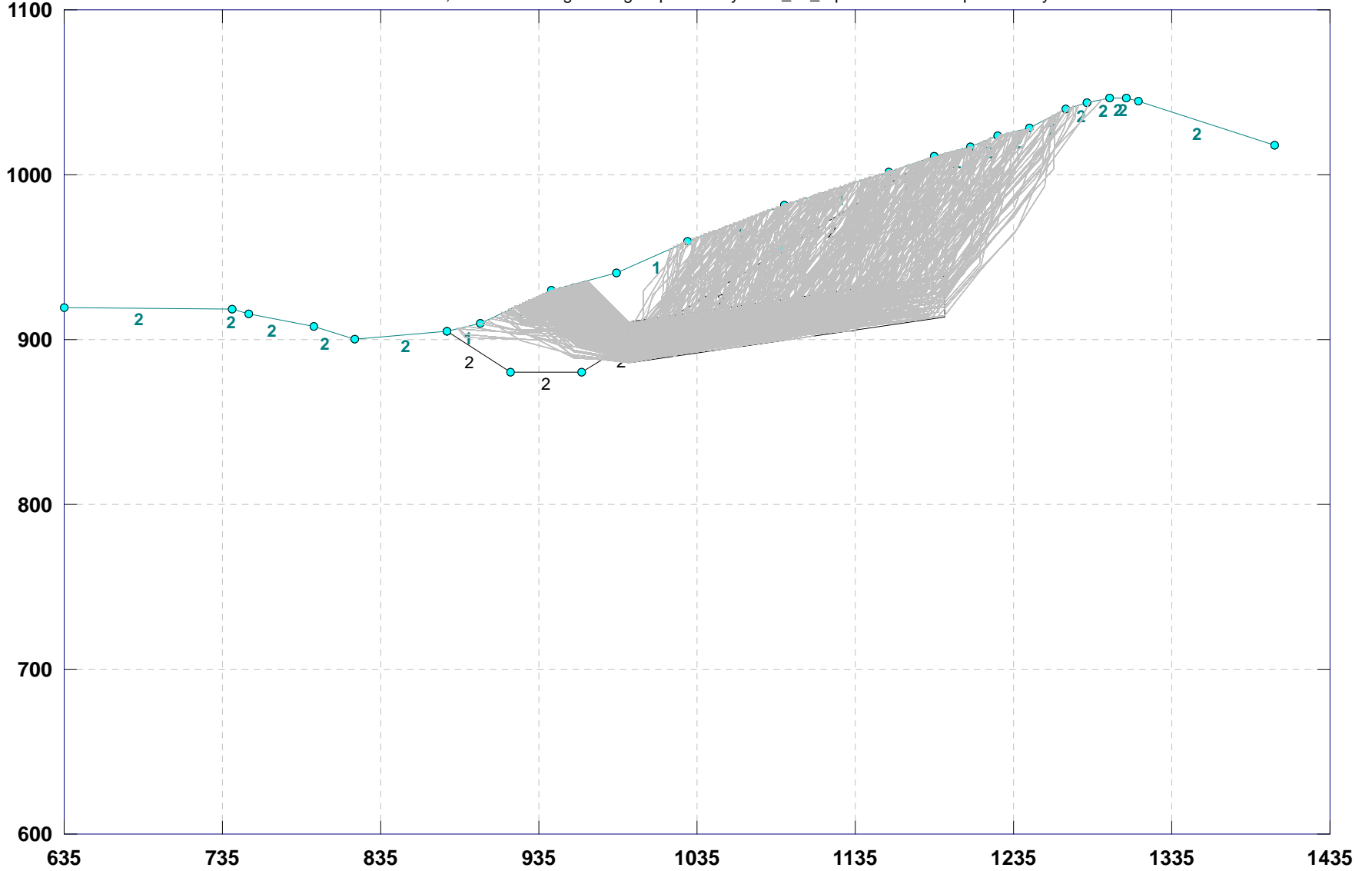


GSTABL7 v.2 FSmin=1.63

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / B-B' / Design / Upper / Search Behind Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xbduk.b.plt Run By: KMS 7/26/2019 10:08AM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/26/2019
Time of Run: 10:08AM
Run By:
KMS

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\upper\xbduk.b.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\upper\xbduk.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\upper\xbduk.PLT

PROBLEM DESCRIPTION: 18184-01 / B-B' / Design / Upper /
Search Behind Keyway

BOUNDARY COORDINATES

21 Top Boundaries
27 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	635.00	919.00	741.00	918.00	2
2	741.00	918.00	752.00	916.00	2
3	752.00	916.00	793.00	908.00	2
4	793.00	908.00	819.00	900.00	2
5	819.00	900.00	877.00	905.00	2
6	877.00	905.00	898.00	910.00	1
7	898.00	910.00	943.00	930.00	1

8	943.00	930.00	984.00	940.00	1
9	984.00	940.00	1029.00	960.00	1
10	1029.00	960.00	1090.00	982.00	1
11	1090.00	982.00	1156.00	1002.00	1
12	1156.00	1002.00	1185.00	1011.00	1
13	1185.00	1011.00	1208.00	1017.00	2
14	1208.00	1017.00	1225.00	1024.00	2
15	1225.00	1024.00	1245.00	1028.00	2
16	1245.00	1028.00	1268.00	1040.00	2
17	1268.00	1040.00	1281.00	1044.00	2
18	1281.00	1044.00	1296.00	1047.00	2
19	1296.00	1047.00	1306.00	1047.00	2
20	1306.00	1047.00	1314.00	1045.00	2
21	1314.00	1045.00	1400.00	1018.00	2
22	877.00	905.00	917.00	880.00	2
23	917.00	880.00	962.00	880.00	2
24	962.00	880.00	1006.00	906.00	2
25	1006.00	906.00	1089.00	955.00	2
26	1089.00	955.00	1146.00	988.00	2
27	1146.00	988.00	1185.00	1011.00	2

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

5 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	26.0	0.00	0.0	0
4	120.0	120.0	100.0	27.0	0.00	0.0	0
5	120.0	120.0	150.0	18.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

2 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	30.00
2	10.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 3 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	26.00
2	10.0	100.00	12.00
3	90.0	300.00	26.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

1

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	640.00	888.00	250.0	0.0

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

SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED

Janbus Empirical Coef is being used for the case of c & phi both > 0

1

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 35.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	992.00	898.00	992.00	898.00	25.00
2	993.00	898.00	1192.00	926.00	25.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 47.793 FS Min = 1.625 FS Ave = 3.414
 Standard Deviation = 2.828 Coefficient of Variation = 82.84 %

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	932.108	925.159
2	959.153	913.831
3	992.000	901.746
4	1162.594	928.673
5	1187.336	953.428
6	1212.058	978.204
7	1233.483	1005.880
8	1257.966	1030.892
9	1263.474	1037.639

Factor of Safety
 *** 1.625 ***

Individual data on the 21 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	Surcharge Load (lbs)
1	10.9	6145.4	0.0	0.0	0.	0.	0.0	0.0	0.0
2	16.2	28601.4	0.0	0.0	0.	0.	0.0	0.0	0.0
3	24.8	82620.5	0.0	0.0	0.	0.	0.0	0.0	0.0
4	8.0	37017.7	0.0	0.0	0.	0.	0.0	0.0	0.0
5	9.3	48038.5	0.0	0.0	0.	0.	0.0	0.0	0.0
6	4.7	25571.9	0.0	0.0	0.	0.	0.0	0.0	0.0
7	23.0	135565.6	0.0	0.0	0.	0.	0.0	0.0	0.0
8	60.0	421188.6	0.0	0.0	0.	0.	0.0	0.0	0.0
9	1.0	7762.1	0.0	0.0	0.	0.	0.0	0.0	0.0
10	56.0	462679.2	0.0	0.0	0.	0.	0.0	0.0	0.0
11	10.0	88370.9	0.0	0.0	0.	0.	0.0	0.0	0.0
12	6.6	59248.4	0.0	0.0	0.	0.	0.0	0.0	0.0
13	22.4	181865.1	0.0	0.0	0.	0.	0.0	0.0	0.0
14	2.3	16551.9	0.0	0.0	0.	0.	0.0	0.0	0.0

15	20.7	125278.1	0.0	0.0	0.	0.	0.0	0.0	0.0
16	4.1	20289.8	0.0	0.0	0.	0.	0.0	0.0	0.0
17	12.9	54002.8	0.0	0.0	0.	0.	0.0	0.0	0.0
18	8.5	24886.0	0.0	0.0	0.	0.	0.0	0.0	0.0
19	11.5	20848.4	0.0	0.0	0.	0.	0.0	0.0	0.0
20	13.0	11067.7	0.0	0.0	0.	0.	0.0	0.0	0.0
21	5.5	1280.0	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	932.108	925.159
2	959.153	913.831
3	992.000	901.746
4	1162.594	928.673
5	1187.336	953.428
6	1212.058	978.204
7	1233.483	1005.880
8	1257.966	1030.892
9	1263.474	1037.639

Factor of Safety
 *** 1.625 ***

1

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	932.108	925.159
2	959.153	913.831
3	992.000	901.746
4	1162.594	928.673
5	1187.336	953.428
6	1212.058	978.204
7	1233.483	1005.880
8	1257.966	1030.892
9	1263.474	1037.639

Factor of Safety
 *** 1.625 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	932.108	925.159
2	959.153	913.831
3	992.000	901.746
4	1162.594	928.673
5	1187.336	953.428

6	1212.058	978.204
7	1233.483	1005.880
8	1257.966	1030.892
9	1263.474	1037.639

Factor of Safety
 *** 1.625 ***

1

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	932.108	925.159
2	959.153	913.831
3	992.000	901.746
4	1162.594	928.673
5	1187.336	953.428
6	1212.058	978.204
7	1233.483	1005.880
8	1257.966	1030.892
9	1263.474	1037.639

Factor of Safety
 *** 1.625 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	932.108	925.159
2	959.153	913.831
3	992.000	901.746
4	1162.594	928.673
5	1187.336	953.428
6	1212.058	978.204
7	1233.483	1005.880
8	1257.966	1030.892
9	1263.474	1037.639

Factor of Safety
 *** 1.625 ***

1

Failure Surface Specified By 9 Coordinate Points

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

1	932.108	925.159
2	959.153	913.831
3	992.000	901.746
4	1162.594	928.673
5	1187.336	953.428
6	1212.058	978.204
7	1233.483	1005.880
8	1257.966	1030.892
9	1263.474	1037.639

Factor of Safety
 *** 1.625 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	932.108	925.159
2	959.153	913.831
3	992.000	901.746
4	1162.594	928.673
5	1187.336	953.428
6	1212.058	978.204
7	1233.483	1005.880
8	1257.966	1030.892
9	1263.474	1037.639

Factor of Safety
 *** 1.625 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	932.108	925.159
2	959.153	913.831
3	992.000	901.746
4	1162.594	928.673
5	1187.336	953.428
6	1212.058	978.204
7	1233.483	1005.880
8	1257.966	1030.892
9	1263.474	1037.639

Factor of Safety
 *** 1.625 ***

Failure Surface Specified By 9 Coordinate Points

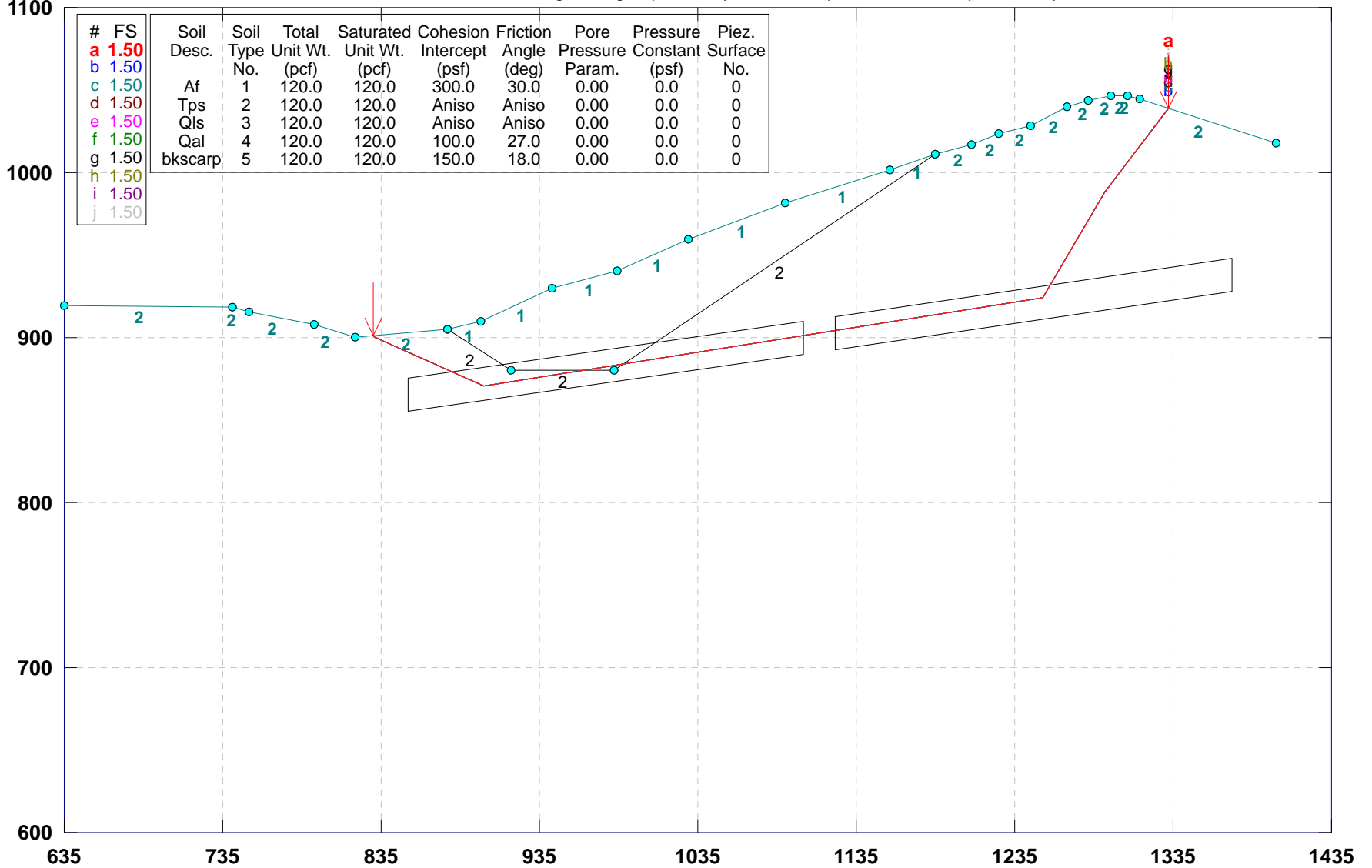
Point No.	X-Surf (ft)	Y-Surf (ft)
1	932.108	925.159
2	959.153	913.831
3	992.000	901.746
4	1162.594	928.673
5	1187.336	953.428
6	1212.058	978.204
7	1233.483	1005.880
8	1257.966	1030.892
9	1263.474	1037.639

Factor of Safety
*** 1.625 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / B-B' / Design / Upper / Lower Clay Bed

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xbdukcb.pl2 Run By: KMS 7/26/2019 10:28AM

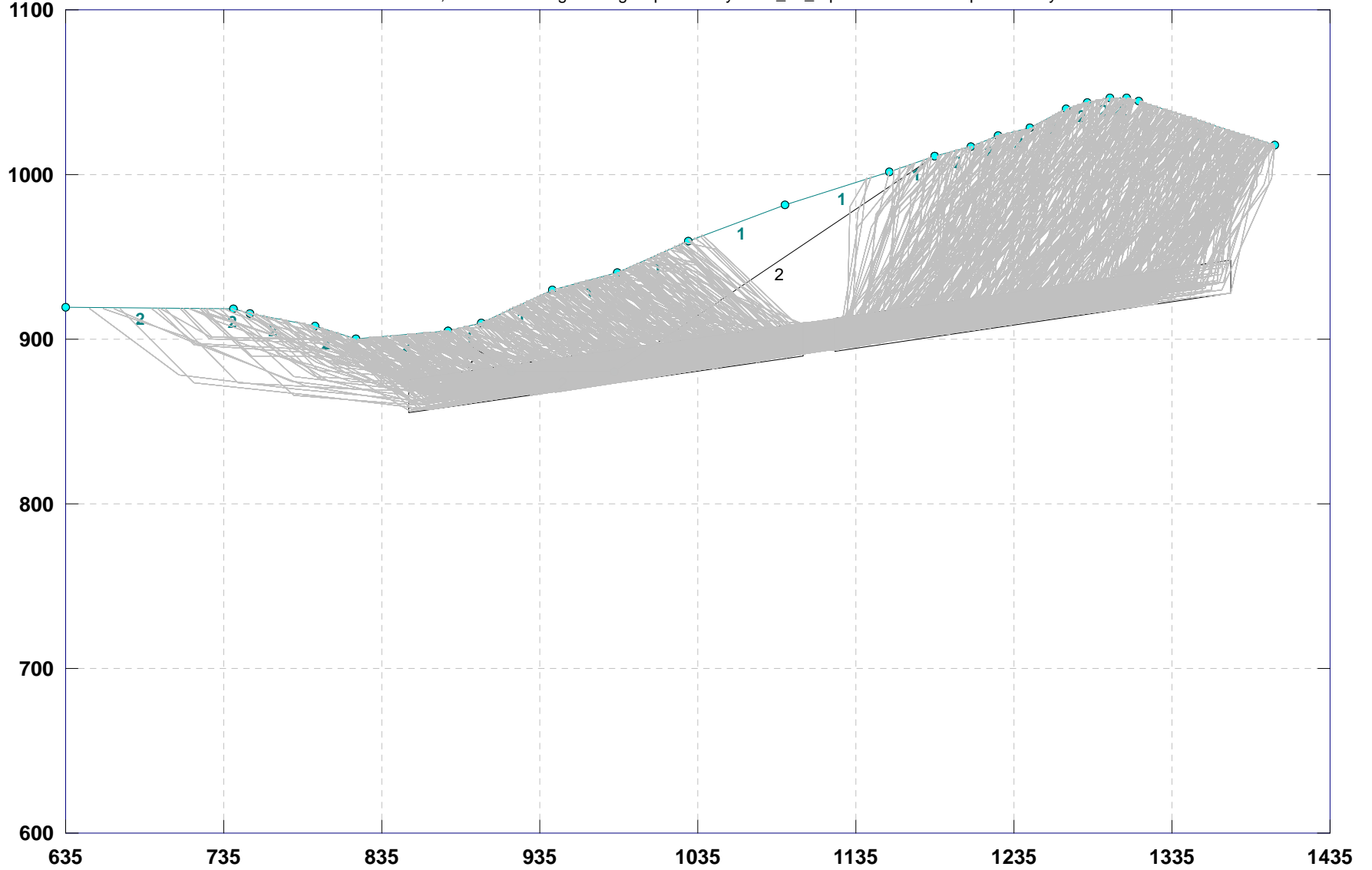


GSTABL7 v.2 FSmin=1.50

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / B-B' / Design / Upper / Lower Clay Bed

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xbduk1cb.plt Run By: KMS 7/26/2019 10:28AM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/26/2019
Time of Run: 10:28AM
Run By:
KMS

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\upper\xbduk1cb.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\upper\xbduk1cb.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\upper\xbduk1cb.PLT

PROBLEM DESCRIPTION: 18184-01 / B-B' / Design / Upper /
Lower Clay Bed

BOUNDARY COORDINATES

21 Top Boundaries
24 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	635.00	919.00	741.00	918.00	2
2	741.00	918.00	752.00	916.00	2
3	752.00	916.00	793.00	908.00	2
4	793.00	908.00	819.00	900.00	2
5	819.00	900.00	877.00	905.00	2
6	877.00	905.00	898.00	910.00	1
7	898.00	910.00	943.00	930.00	1

8	943.00	930.00	984.00	940.00	1
9	984.00	940.00	1029.00	960.00	1
10	1029.00	960.00	1090.00	982.00	1
11	1090.00	982.00	1156.00	1002.00	1
12	1156.00	1002.00	1185.00	1011.00	1
13	1185.00	1011.00	1208.00	1017.00	2
14	1208.00	1017.00	1225.00	1024.00	2
15	1225.00	1024.00	1245.00	1028.00	2
16	1245.00	1028.00	1268.00	1040.00	2
17	1268.00	1040.00	1281.00	1044.00	2
18	1281.00	1044.00	1296.00	1047.00	2
19	1296.00	1047.00	1306.00	1047.00	2
20	1306.00	1047.00	1314.00	1045.00	2
21	1314.00	1045.00	1400.00	1018.00	2
22	877.00	905.00	917.00	880.00	2
23	917.00	880.00	982.00	880.00	2
24	982.00	880.00	1185.00	1011.00	2

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

5 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	26.0	0.00	0.0	0
4	120.0	120.0	100.0	27.0	0.00	0.0	0
5	120.0	120.0	150.0	18.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

2 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	30.00
2	10.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 3 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	26.00
2	10.0	100.00	12.00
3	90.0	300.00	26.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

1

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	640.00	888.00	250.0	0.0

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

SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED

Janbus Empirical Coef is being used for the case of c & phi both > 0

1

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 75.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	852.00	865.00	1102.00	900.00	20.00
2	1122.00	903.00	1372.00	938.00	20.00

Following Are Displayed The Ten Most Critical Of The Trial

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 17.731 FS Min = 1.504 FS Ave = 2.490
Standard Deviation = 1.216 Coefficient of Variation = 48.85 %

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	830.091	900.956
2	831.509	900.245
3	900.325	870.421
4	1252.722	924.088
5	1292.040	987.956
6	1331.919	1039.374

Factor of Safety
*** 1.504 ***

Individual data on the 24 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	Surcharge Load (lbs)
1	1.4	70.9	0.0	0.0	0.	0.	0.0	0.0	0.0
2	45.5	69064.9	0.0	0.0	0.	0.	0.0	0.0	0.0
3	21.0	79431.8	0.0	0.0	0.	0.	0.0	0.0	0.0
4	2.3	11044.0	0.0	0.0	0.	0.	0.0	0.0	0.0
5	16.7	86140.3	0.0	0.0	0.	0.	0.0	0.0	0.0
6	26.0	153758.3	0.0	0.0	0.	0.	0.0	0.0	0.0
7	20.2	131049.4	0.0	0.0	0.	0.	0.0	0.0	0.0
8	20.8	139341.9	0.0	0.0	0.	0.	0.0	0.0	0.0
9	3.8	26173.1	0.0	0.0	0.	0.	0.0	0.0	0.0
10	41.2	316236.3	0.0	0.0	0.	0.	0.0	0.0	0.0
11	61.0	558792.5	0.0	0.0	0.	0.	0.0	0.0	0.0
12	66.0	694325.4	0.0	0.0	0.	0.	0.0	0.0	0.0
13	29.0	330368.9	0.0	0.0	0.	0.	0.0	0.0	0.0
14	23.0	271788.4	0.0	0.0	0.	0.	0.0	0.0	0.0
15	17.0	207933.7	0.0	0.0	0.	0.	0.0	0.0	0.0
16	20.0	251066.3	0.0	0.0	0.	0.	0.0	0.0	0.0
17	7.7	98701.3	0.0	0.0	0.	0.	0.0	0.0	0.0
18	15.3	182451.1	0.0	0.0	0.	0.	0.0	0.0	0.0
19	13.0	128755.6	0.0	0.0	0.	0.	0.0	0.0	0.0
20	11.0	87586.1	0.0	0.0	0.	0.	0.0	0.0	0.0

21	4.0	26658.5	0.0	0.0	0.	0.	0.0	0.0	0.0
22	10.0	56989.4	0.0	0.0	0.	0.	0.0	0.0	0.0
23	8.0	33491.7	0.0	0.0	0.	0.	0.0	0.0	0.0
24	17.9	30888.8	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	830.091	900.956
2	831.509	900.245
3	900.325	870.421
4	1252.722	924.088
5	1292.040	987.956
6	1331.919	1039.374

Factor of Safety
 *** 1.504 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	830.091	900.956
2	831.509	900.245
3	900.325	870.421
4	1252.722	924.088
5	1292.040	987.956
6	1331.919	1039.374

Factor of Safety
 *** 1.504 ***

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	830.091	900.956
2	831.509	900.245
3	900.325	870.421
4	1252.722	924.088
5	1292.040	987.956
6	1331.919	1039.374

Factor of Safety
 *** 1.504 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	830.091	900.956
2	831.509	900.245
3	900.325	870.421
4	1252.722	924.088
5	1292.040	987.956
6	1331.919	1039.374

Factor of Safety
*** 1.504 ***

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	830.091	900.956
2	831.509	900.245
3	900.325	870.421
4	1252.722	924.088
5	1292.040	987.956
6	1331.919	1039.374

Factor of Safety
*** 1.504 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	830.091	900.956
2	831.509	900.245
3	900.325	870.421
4	1252.722	924.088
5	1292.040	987.956
6	1331.919	1039.374

Factor of Safety
*** 1.504 ***

Failure Surface Specified By 6 Coordinate Points

Point	X-Surf	Y-Surf
-------	--------	--------

No.	(ft)	(ft)
1	830.091	900.956
2	831.509	900.245
3	900.325	870.421
4	1252.722	924.088
5	1292.040	987.956
6	1331.919	1039.374

Factor of Safety
 *** 1.504 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	830.091	900.956
2	831.509	900.245
3	900.325	870.421
4	1252.722	924.088
5	1292.040	987.956
6	1331.919	1039.374

Factor of Safety
 *** 1.504 ***

Failure Surface Specified By 6 Coordinate Points

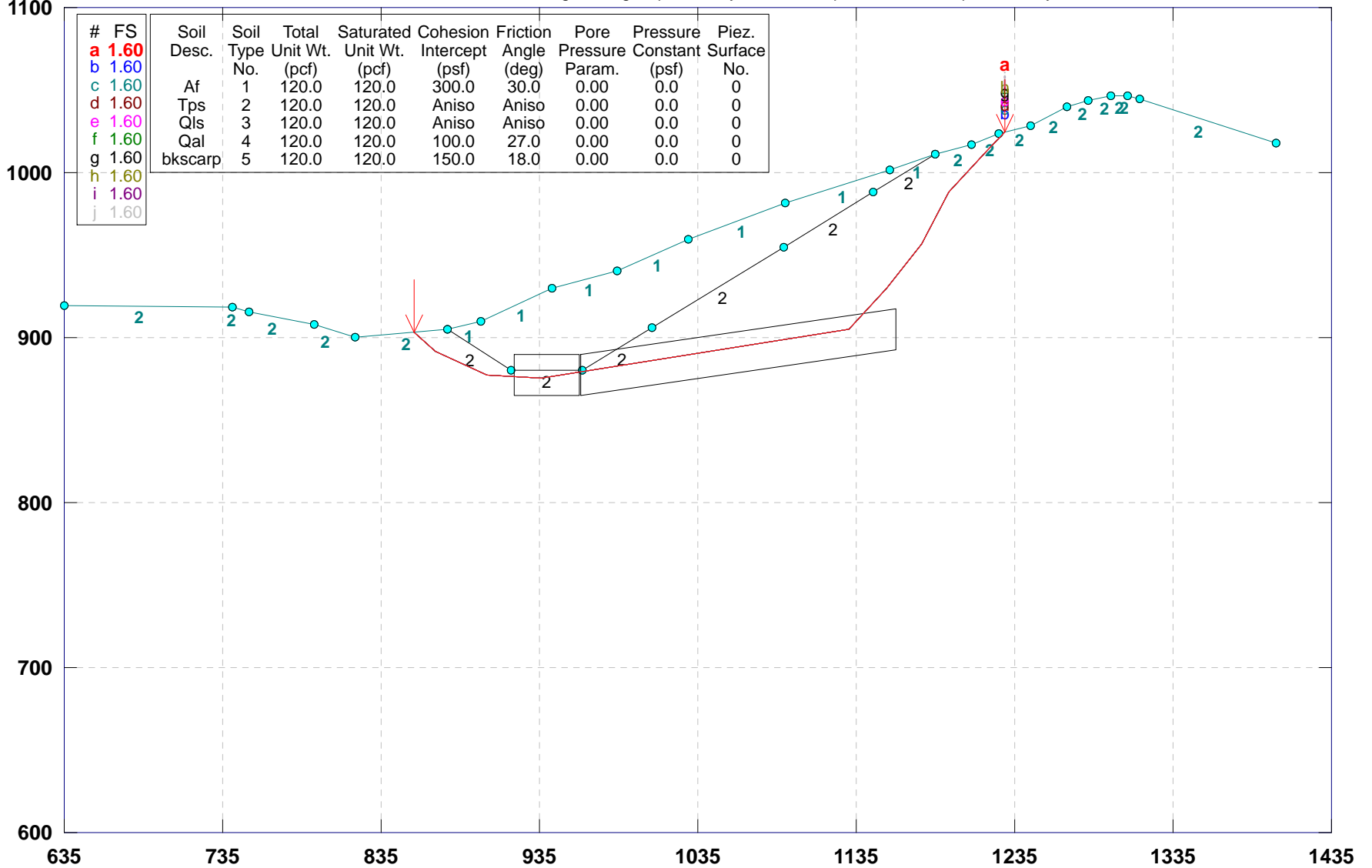
Point No.	X-Surf (ft)	Y-Surf (ft)
1	830.091	900.956
2	831.509	900.245
3	900.325	870.421
4	1252.722	924.088
5	1292.040	987.956
6	1331.919	1039.374

Factor of Safety
 *** 1.504 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / B-B' / Design / Upper / Search Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xbduku.pl2 Run By: KMS 7/26/2019 10:07AM

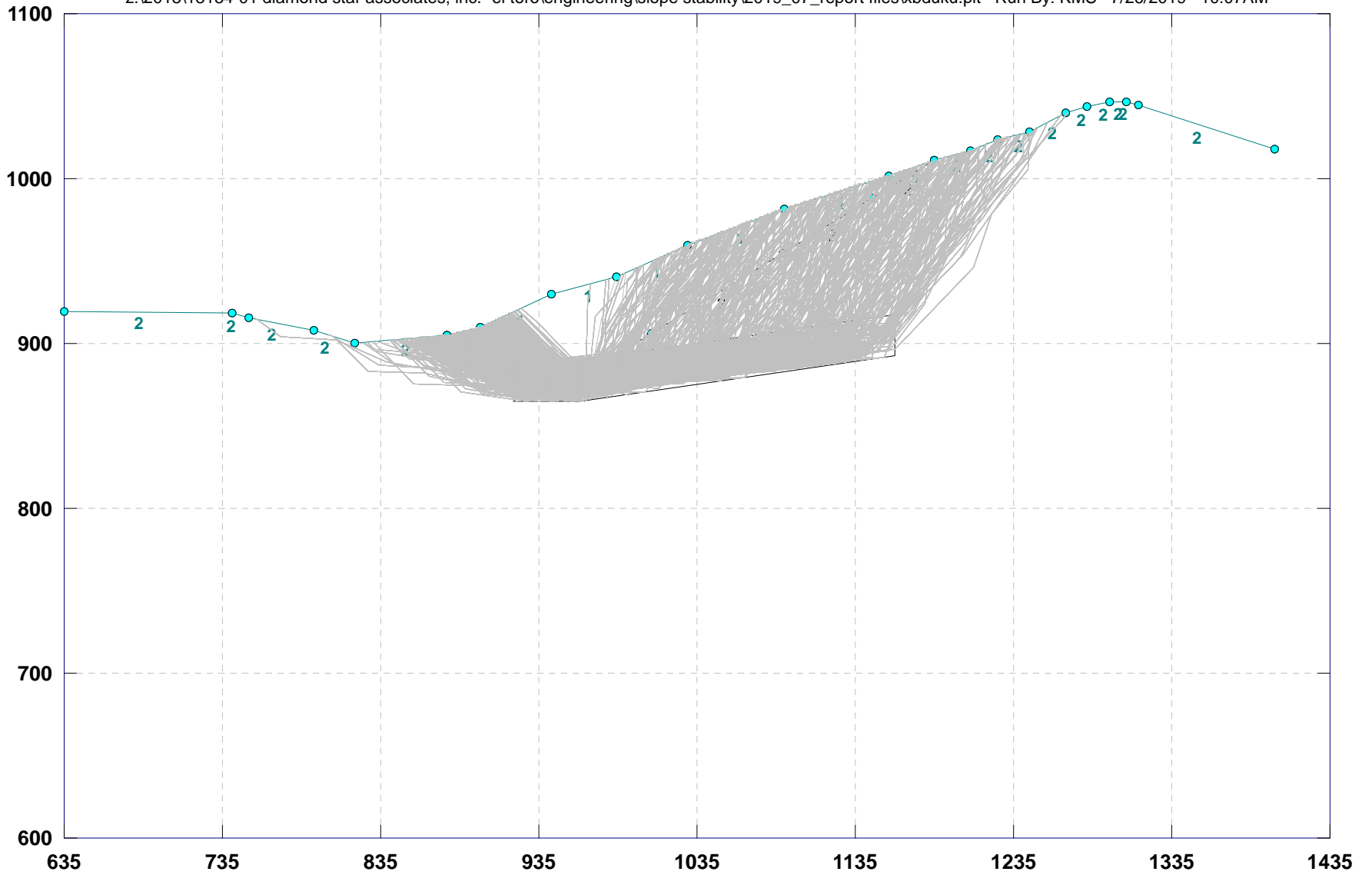


GSTABL7 v.2 FSmin=1.60

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / B-B' / Design / Upper / Search Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xbduku.plt Run By: KMS 7/26/2019 10:07AM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/26/2019
Time of Run: 10:07AM
Run By:
KMS

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\upper\xbduku.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\upper\xbduku.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\upper\xbduku.PLT

PROBLEM DESCRIPTION: 18184-01 / B-B' / Design / Upper /
Search Below Keyway

BOUNDARY COORDINATES

21 Top Boundaries
27 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	635.00	919.00	741.00	918.00	2
2	741.00	918.00	752.00	916.00	2
3	752.00	916.00	793.00	908.00	2
4	793.00	908.00	819.00	900.00	2
5	819.00	900.00	877.00	905.00	2
6	877.00	905.00	898.00	910.00	1
7	898.00	910.00	943.00	930.00	1

8	943.00	930.00	984.00	940.00	1
9	984.00	940.00	1029.00	960.00	1
10	1029.00	960.00	1090.00	982.00	1
11	1090.00	982.00	1156.00	1002.00	1
12	1156.00	1002.00	1185.00	1011.00	1
13	1185.00	1011.00	1208.00	1017.00	2
14	1208.00	1017.00	1225.00	1024.00	2
15	1225.00	1024.00	1245.00	1028.00	2
16	1245.00	1028.00	1268.00	1040.00	2
17	1268.00	1040.00	1281.00	1044.00	2
18	1281.00	1044.00	1296.00	1047.00	2
19	1296.00	1047.00	1306.00	1047.00	2
20	1306.00	1047.00	1314.00	1045.00	2
21	1314.00	1045.00	1400.00	1018.00	2
22	877.00	905.00	917.00	880.00	2
23	917.00	880.00	962.00	880.00	2
24	962.00	880.00	1006.00	906.00	2
25	1006.00	906.00	1089.00	955.00	2
26	1089.00	955.00	1146.00	988.00	2
27	1146.00	988.00	1185.00	1011.00	2

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

5 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	26.0	0.00	0.0	0
4	120.0	120.0	100.0	27.0	0.00	0.0	0
5	120.0	120.0	150.0	18.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

2 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	30.00
2	10.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 3 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	26.00
2	10.0	100.00	12.00
3	90.0	300.00	26.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

1

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	640.00	888.00	250.0	0.0

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

SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED

Janbus Empirical Coef is being used for the case of c & phi both > 0

1

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 35.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	919.00	877.00	960.00	877.00	25.00
2	961.00	877.00	1160.00	905.00	25.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 13.576 FS Min = 1.599 FS Ave = 3.099
 Standard Deviation = 1.361 Coefficient of Variation = 43.91 %

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	856.287	903.214
2	869.744	891.906
3	901.691	877.609
4	936.595	875.015
5	1129.866	905.013
6	1154.026	930.336
7	1176.522	957.149
8	1192.974	988.042
9	1217.674	1012.838
10	1228.678	1024.736

Factor of Safety
 *** 1.599 ***

Individual data on the 24 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	Surcharge Load (lbs)
1	13.5	10067.2	0.0	0.0	0.	0.	0.0	0.0	0.0
2	7.3	12541.9	0.0	0.0	0.	0.	0.0	0.0	0.0
3	21.0	59320.9	0.0	0.0	0.	0.	0.0	0.0	0.0
4	3.7	14343.8	0.0	0.0	0.	0.	0.0	0.0	0.0
5	15.3	69813.7	0.0	0.0	0.	0.	0.0	0.0	0.0
6	19.6	110645.2	0.0	0.0	0.	0.	0.0	0.0	0.0
7	6.4	40787.7	0.0	0.0	0.	0.	0.0	0.0	0.0
8	19.0	125020.5	0.0	0.0	0.	0.	0.0	0.0	0.0
9	22.0	149560.6	0.0	0.0	0.	0.	0.0	0.0	0.0
10	22.0	160535.7	0.0	0.0	0.	0.	0.0	0.0	0.0
11	23.0	185794.1	0.0	0.0	0.	0.	0.0	0.0	0.0
12	60.0	553004.8	0.0	0.0	0.	0.	0.0	0.0	0.0
13	1.0	9968.7	0.0	0.0	0.	0.	0.0	0.0	0.0

14	39.9	411995.3	0.0	0.0	0.	0.	0.0	0.0	0.0
15	16.1	160807.2	0.0	0.0	0.	0.	0.0	0.0	0.0
16	8.0	71321.0	0.0	0.0	0.	0.	0.0	0.0	0.0
17	2.0	16629.2	0.0	0.0	0.	0.	0.0	0.0	0.0
18	20.5	148408.9	0.0	0.0	0.	0.	0.0	0.0	0.0
19	8.5	45350.5	0.0	0.0	0.	0.	0.0	0.0	0.0
20	8.0	30125.7	0.0	0.0	0.	0.	0.0	0.0	0.0
21	15.0	35082.5	0.0	0.0	0.	0.	0.0	0.0	0.0
22	9.7	12780.8	0.0	0.0	0.	0.	0.0	0.0	0.0
23	7.3	5004.7	0.0	0.0	0.	0.	0.0	0.0	0.0
24	3.7	715.2	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	856.287	903.214
2	869.744	891.906
3	901.691	877.609
4	936.595	875.015
5	1129.866	905.013
6	1154.026	930.336
7	1176.522	957.149
8	1192.974	988.042
9	1217.674	1012.838
10	1228.678	1024.736

Factor of Safety
 *** 1.599 ***

1

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	856.287	903.214
2	869.744	891.906
3	901.691	877.609
4	936.595	875.015
5	1129.866	905.013
6	1154.026	930.336
7	1176.522	957.149
8	1192.974	988.042
9	1217.674	1012.838
10	1228.678	1024.736

Factor of Safety
 *** 1.599 ***

Failure Surface Specified By 10 Coordinate Points

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

1	856.287	903.214
2	869.744	891.906
3	901.691	877.609
4	936.595	875.015
5	1129.866	905.013
6	1154.026	930.336
7	1176.522	957.149
8	1192.974	988.042
9	1217.674	1012.838
10	1228.678	1024.736

Factor of Safety
 *** 1.599 ***

1

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	856.287	903.214
2	869.744	891.906
3	901.691	877.609
4	936.595	875.015
5	1129.866	905.013
6	1154.026	930.336
7	1176.522	957.149
8	1192.974	988.042
9	1217.674	1012.838
10	1228.678	1024.736

Factor of Safety
 *** 1.599 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	856.287	903.214
2	869.744	891.906
3	901.691	877.609
4	936.595	875.015
5	1129.866	905.013
6	1154.026	930.336
7	1176.522	957.149
8	1192.974	988.042
9	1217.674	1012.838
10	1228.678	1024.736

Factor of Safety
 *** 1.599 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	856.287	903.214
2	869.744	891.906
3	901.691	877.609
4	936.595	875.015
5	1129.866	905.013
6	1154.026	930.336
7	1176.522	957.149
8	1192.974	988.042
9	1217.674	1012.838
10	1228.678	1024.736

Factor of Safety
 *** 1.599 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	856.287	903.214
2	869.744	891.906
3	901.691	877.609
4	936.595	875.015
5	1129.866	905.013
6	1154.026	930.336
7	1176.522	957.149
8	1192.974	988.042
9	1217.674	1012.838
10	1228.678	1024.736

Factor of Safety
 *** 1.599 ***

Failure Surface Specified By 10 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	856.287	903.214
2	869.744	891.906
3	901.691	877.609
4	936.595	875.015
5	1129.866	905.013
6	1154.026	930.336
7	1176.522	957.149
8	1192.974	988.042

9	1217.674	1012.838
10	1228.678	1024.736

Factor of Safety
*** 1.599 ***

Failure Surface Specified By 10 Coordinate Points

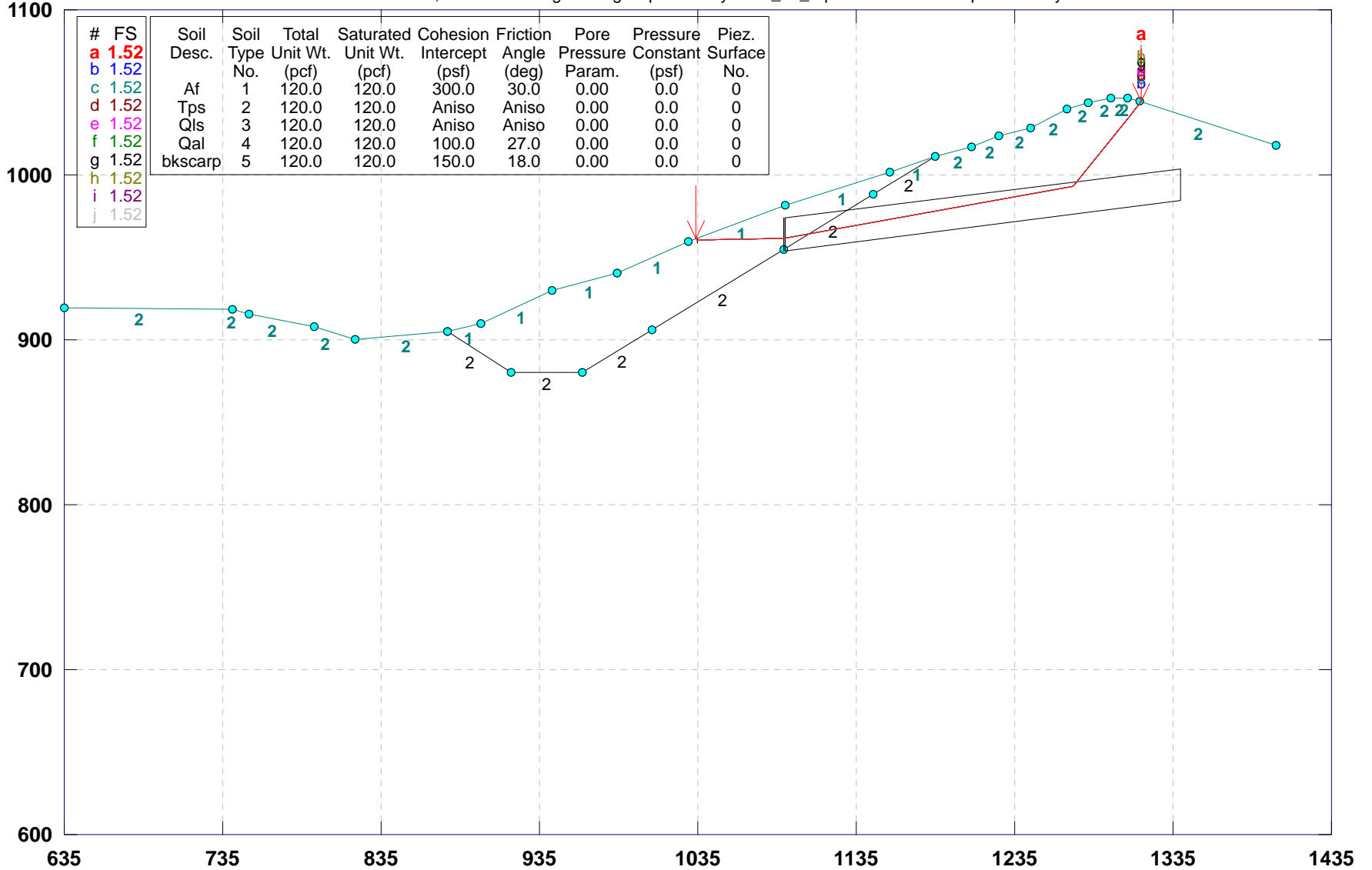
Point No.	X-Surf (ft)	Y-Surf (ft)
1	856.287	903.214
2	869.744	891.906
3	901.691	877.609
4	936.595	875.015
5	1129.866	905.013
6	1154.026	930.336
7	1176.522	957.149
8	1192.974	988.042
9	1217.674	1012.838
10	1228.678	1024.736

Factor of Safety
*** 1.599 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / B-B' / Design / Upper / Upper Clay Bed

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xbdukucb.pl2 Run By: KMS 7/26/2019 10:18AM

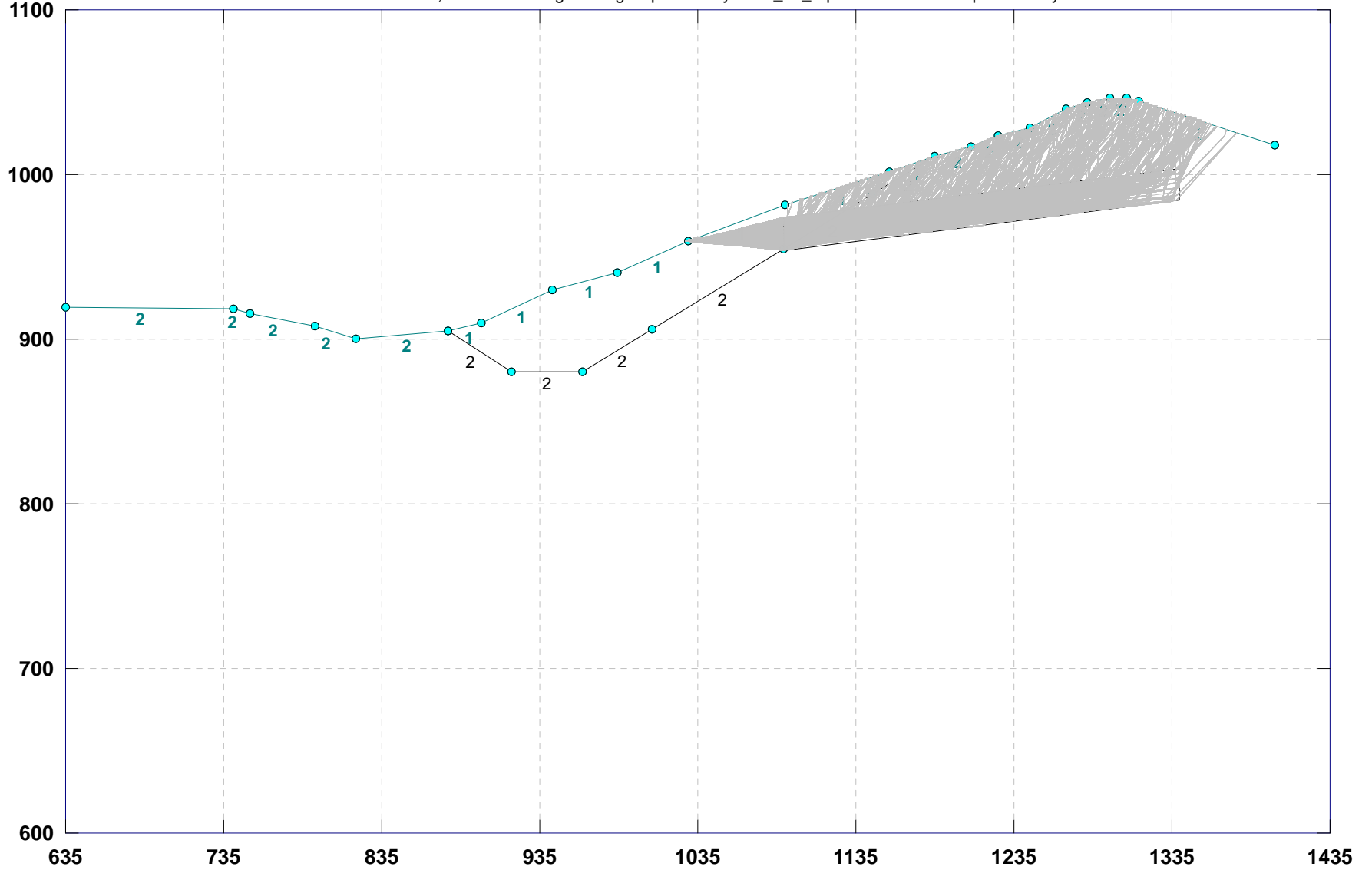


GSTABL7 v.2 FSmin=1.52

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / B-B' / Design / Upper / Upper Clay Bed

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xbdukucb.plt Run By: KMS 7/26/2019 10:18AM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/26/2019
Time of Run: 10:18AM
Run By:
KMS

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\upper\xbdukuch.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\upper\xbdukuch.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
B\2019_07_xb\upper\xbdukuch.PLT

PROBLEM DESCRIPTION: 18184-01 / B-B' / Design / Upper /
Upper Clay Bed

BOUNDARY COORDINATES

21 Top Boundaries
27 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	635.00	919.00	741.00	918.00	2
2	741.00	918.00	752.00	916.00	2
3	752.00	916.00	793.00	908.00	2
4	793.00	908.00	819.00	900.00	2
5	819.00	900.00	877.00	905.00	2
6	877.00	905.00	898.00	910.00	1
7	898.00	910.00	943.00	930.00	1

8	943.00	930.00	984.00	940.00	1
9	984.00	940.00	1029.00	960.00	1
10	1029.00	960.00	1090.00	982.00	1
11	1090.00	982.00	1156.00	1002.00	1
12	1156.00	1002.00	1185.00	1011.00	1
13	1185.00	1011.00	1208.00	1017.00	2
14	1208.00	1017.00	1225.00	1024.00	2
15	1225.00	1024.00	1245.00	1028.00	2
16	1245.00	1028.00	1268.00	1040.00	2
17	1268.00	1040.00	1281.00	1044.00	2
18	1281.00	1044.00	1296.00	1047.00	2
19	1296.00	1047.00	1306.00	1047.00	2
20	1306.00	1047.00	1314.00	1045.00	2
21	1314.00	1045.00	1400.00	1018.00	2
22	877.00	905.00	917.00	880.00	2
23	917.00	880.00	962.00	880.00	2
24	962.00	880.00	1006.00	906.00	2
25	1006.00	906.00	1089.00	955.00	2
26	1089.00	955.00	1146.00	988.00	2
27	1146.00	988.00	1185.00	1011.00	2

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

5 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	26.0	0.00	0.0	0
4	120.0	120.0	100.0	27.0	0.00	0.0	0
5	120.0	120.0	150.0	18.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

2 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	30.00
2	10.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 3 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	26.00
2	10.0	100.00	12.00
3	90.0	300.00	26.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

1

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	640.00	888.00	250.0	0.0

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

SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED

Janbus Empirical Coef is being used for the case of c & phi both > 0

1

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

4999 Trial Surfaces Have Been Generated.

3 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 55.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	1035.00	960.00	1035.00	960.00	2.00
2	1089.00	964.00	1089.00	964.00	20.00

3 1090.00 964.00 1340.00 994.00 20.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 19.902 FS Min = 1.520 FS Ave = 2.992
Standard Deviation = 1.429 Coefficient of Variation = 47.77 %

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	1033.413	961.592
2	1035.000	960.053
3	1089.000	961.274
4	1271.564	992.857
5	1306.785	1035.100
6	1314.546	1044.829

Factor of Safety
*** 1.520 ***

Individual data on the 18 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	1.6	201.1	0.0	0.0	0.	0.	0.0	0.0	0.0
2	54.0	72823.7	0.0	0.0	0.	0.	0.0	0.0	0.0
3	1.0	2455.1	0.0	0.0	0.	0.	0.0	0.0	0.0
4	14.5	37282.4	0.0	0.0	0.	0.	0.0	0.0	0.0
5	41.5	125300.3	0.0	0.0	0.	0.	0.0	0.0	0.0
6	10.0	34182.1	0.0	0.0	0.	0.	0.0	0.0	0.0
7	29.0	108321.2	0.0	0.0	0.	0.	0.0	0.0	0.0
8	23.0	94195.8	0.0	0.0	0.	0.	0.0	0.0	0.0
9	17.0	75824.8	0.0	0.0	0.	0.	0.0	0.0	0.0
10	20.0	94724.7	0.0	0.0	0.	0.	0.0	0.0	0.0
11	23.0	120747.8	0.0	0.0	0.	0.	0.0	0.0	0.0
12	3.6	20530.5	0.0	0.0	0.	0.	0.0	0.0	0.0
13	9.4	49857.6	0.0	0.0	0.	0.	0.0	0.0	0.0
14	15.0	58194.9	0.0	0.0	0.	0.	0.0	0.0	0.0
15	10.0	22605.6	0.0	0.0	0.	0.	0.0	0.0	0.0
16	0.8	1155.7	0.0	0.0	0.	0.	0.0	0.0	0.0

17	7.2	5437.1	0.0	0.0	0.	0.	0.0	0.0	0.0
18	0.5	28.0	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	1033.413	961.592
2	1035.000	960.053
3	1089.000	961.274
4	1271.564	992.857
5	1306.785	1035.100
6	1314.546	1044.829

Factor of Safety
*** 1.520 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	1033.413	961.592
2	1035.000	960.053
3	1089.000	961.274
4	1271.564	992.857
5	1306.785	1035.100
6	1314.546	1044.829

Factor of Safety
*** 1.520 ***

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	1033.413	961.592
2	1035.000	960.053
3	1089.000	961.274
4	1271.564	992.857
5	1306.785	1035.100
6	1314.546	1044.829

Factor of Safety
*** 1.520 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	1033.413	961.592
2	1035.000	960.053
3	1089.000	961.274
4	1271.564	992.857
5	1306.785	1035.100
6	1314.546	1044.829

Factor of Safety
 *** 1.520 ***

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	1033.413	961.592
2	1035.000	960.053
3	1089.000	961.274
4	1271.564	992.857
5	1306.785	1035.100
6	1314.546	1044.829

Factor of Safety
 *** 1.520 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	1033.413	961.592
2	1035.000	960.053
3	1089.000	961.274
4	1271.564	992.857
5	1306.785	1035.100
6	1314.546	1044.829

Factor of Safety
 *** 1.520 ***

Failure Surface Specified By 6 Coordinate Points

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

1	1033.413	961.592
2	1035.000	960.053
3	1089.000	961.274
4	1271.564	992.857
5	1306.785	1035.100
6	1314.546	1044.829

Factor of Safety
*** 1.520 ***

1

Failure Surface Specified By 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	1033.413	961.592
2	1035.000	960.053
3	1089.000	961.274
4	1271.564	992.857
5	1306.785	1035.100
6	1314.546	1044.829

Factor of Safety
*** 1.520 ***

Failure Surface Specified By 6 Coordinate Points

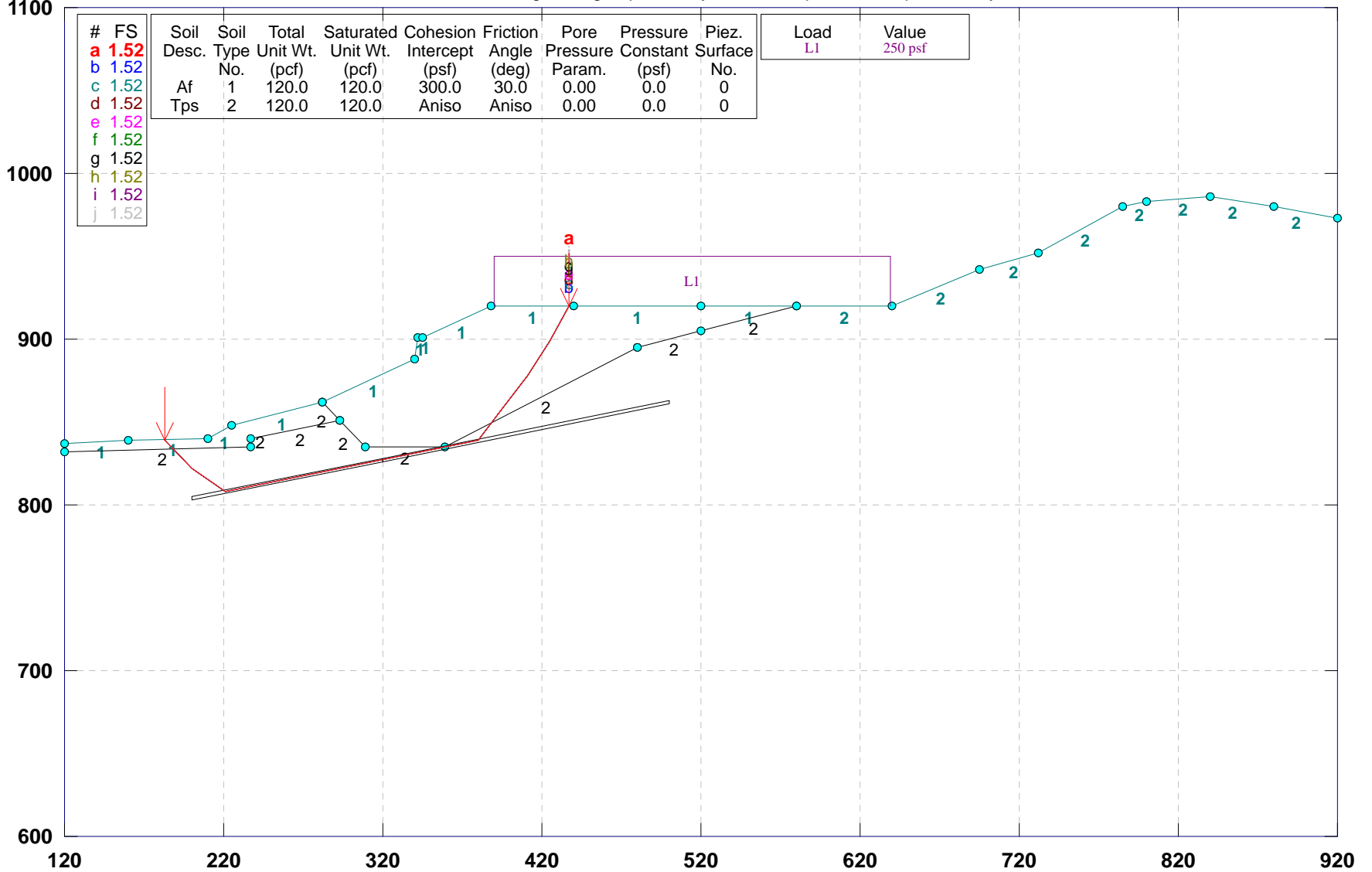
Point No.	X-Surf (ft)	Y-Surf (ft)
1	1033.413	961.592
2	1035.000	960.053
3	1089.000	961.274
4	1271.564	992.857
5	1306.785	1035.100
6	1314.546	1044.829

Factor of Safety
*** 1.520 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / C-C' / Design / Lower Slope /Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xck.pl2 Run By: LGC Geotechnical 7/8/2019 03:08PM

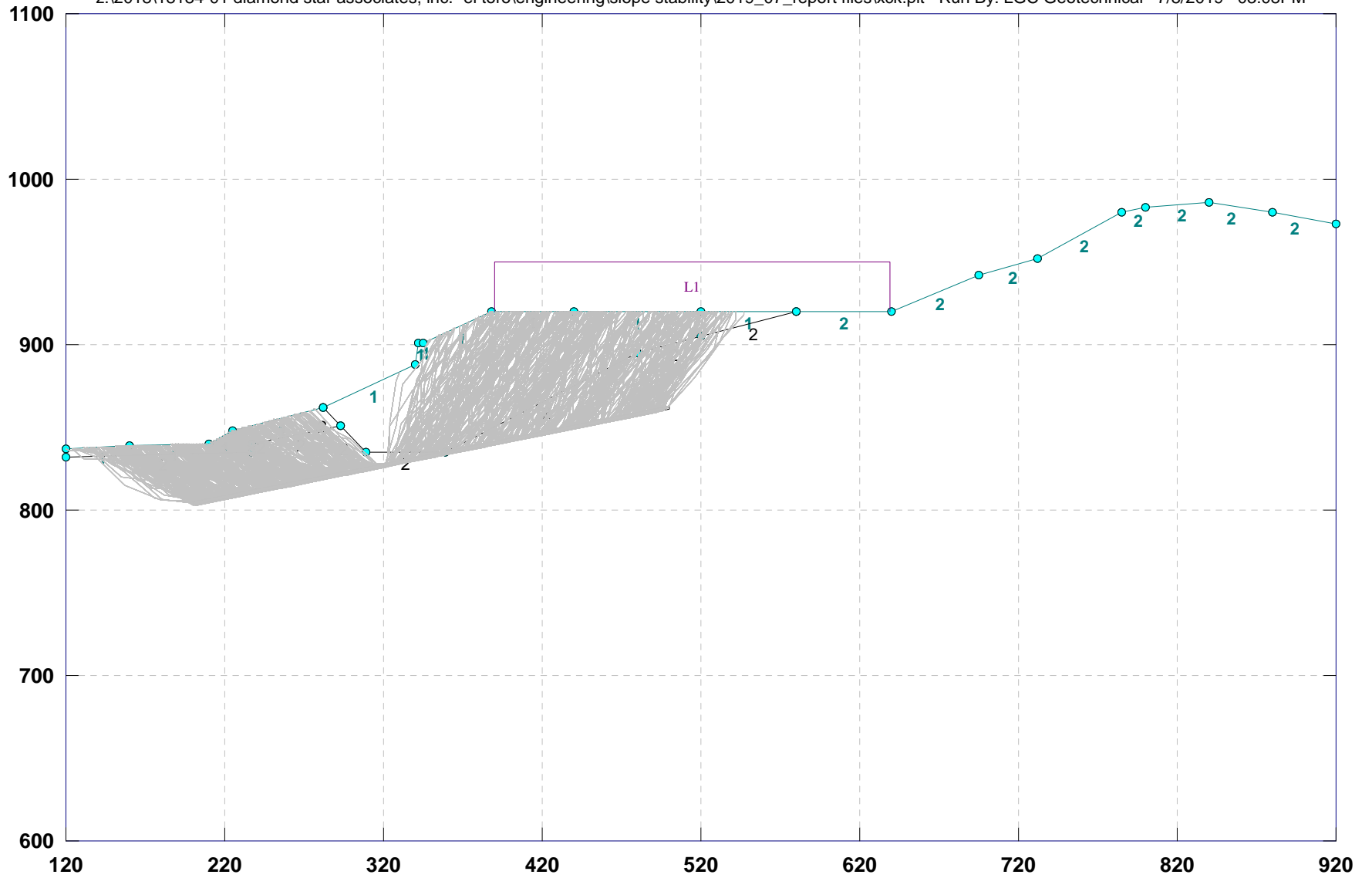


GSTABL7 v.2 FSmin=1.52

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / C-C' / Design / Lower Slope /Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xck.plt Run By: LGC Geotechnical 7/8/2019 03:08PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/8/2019
Time of Run: 03:08PM
Run By: LGC
Geotechnical

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
C\2019_07\xck.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
C\2019_07\xck.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
C\2019_07\xck.PLT

PROBLEM DESCRIPTION: 18184-01 / C-C' / Design / Lower Slope /
Below Keyway

BOUNDARY COORDINATES

19 Top Boundaries
28 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	120.00	837.00	160.00	839.00	1
2	160.00	839.00	210.00	840.00	1
3	210.00	840.00	225.00	848.00	1
4	225.00	848.00	282.00	862.00	1
5	282.00	862.00	340.00	888.00	1
6	340.00	888.00	342.00	901.00	1
7	342.00	901.00	345.00	901.00	1

8	345.00	901.00	388.00	920.00	1
9	388.00	920.00	440.00	920.00	1
10	440.00	920.00	520.00	920.00	1
11	520.00	920.00	580.00	920.00	1
12	580.00	920.00	640.00	920.00	2
13	640.00	920.00	695.00	942.00	2
14	695.00	942.00	732.00	952.00	2
15	732.00	952.00	785.00	980.00	2
16	785.00	980.00	800.00	983.00	2
17	800.00	983.00	840.00	986.00	2
18	840.00	986.00	880.00	980.00	2
19	880.00	980.00	920.00	973.00	2
20	282.00	862.00	293.00	851.00	2
21	293.00	851.00	309.00	835.00	2
22	309.00	835.00	359.00	835.00	2
23	359.00	835.00	480.00	895.00	2
24	120.00	832.00	237.00	835.00	2
25	237.00	835.00	237.10	840.00	2
26	237.10	840.00	293.00	851.00	2
27	480.00	895.00	520.00	905.00	2
28	520.00	905.00	580.00	920.00	2

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

2 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	30.00
2	11.0	0.00	15.00
3	90.0	300.00	30.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and

- C equal to zero, with no water weight in the tension crack.
 (3) An input value of 0.03 for Phi will set both Phi and
 C equal to zero, with water weight in the tension crack.

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	390.00	639.00	250.0	0.0

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

Janbus Empirical Coef is being used for the case of c & phi both > 0

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 25.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	200.00	803.60	320.00	826.90	2.00
2	320.10	826.90	500.00	861.90	2.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 6.878 FS Min = 1.520 FS Ave = 2.348
 Standard Deviation = 0.650 Coefficient of Variation = 27.67 %

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	182.729	839.455
2	200.178	822.141
3	220.940	808.215
4	379.514	838.776
5	394.890	858.489
6	410.756	877.809
7	424.761	898.518
8	436.557	920.000

Factor of Safety
 *** 1.520 ***

Individual data on the 22 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	5.7	2003.4	0.0	0.0	0.	0.	0.0	0.0	0.0
2	11.7	16488.5	0.0	0.0	0.	0.	0.0	0.0	0.0
3	9.8	24817.1	0.0	0.0	0.	0.	0.0	0.0	0.0
4	10.9	40741.0	0.0	0.0	0.	0.	0.0	0.0	0.0
5	4.1	18665.6	0.0	0.0	0.	0.	0.0	0.0	0.0
6	12.0	56621.2	0.0	0.0	0.	0.	0.0	0.0	0.0
7	0.1	475.7	0.0	0.0	0.	0.	0.0	0.0	0.0
8	44.9	219992.8	0.0	0.0	0.	0.	0.0	0.0	0.0
9	11.0	57318.2	0.0	0.0	0.	0.	0.0	0.0	0.0
10	16.0	89995.7	0.0	0.0	0.	0.	0.0	0.0	0.0
11	31.0	196706.6	0.0	0.0	0.	0.	0.0	0.0	0.0
12	2.0	15155.1	0.0	0.0	0.	0.	0.0	0.0	0.0
13	3.0	24899.2	0.0	0.0	0.	0.	0.0	0.0	0.0
14	14.0	118640.5	0.0	0.0	0.	0.	0.0	0.0	0.0
15	20.5	184425.6	0.0	0.0	0.	0.	0.0	0.0	0.0
16	8.1	72296.6	0.0	0.0	0.	0.	0.0	0.0	0.0
17	0.4	2966.4	0.0	0.0	0.	0.	0.0	0.0	0.0
18	2.0	16574.9	0.0	0.0	0.	0.	0.0	0.0	0.0
19	4.9	37932.7	0.0	0.0	0.	0.	0.0	0.0	1222.5
20	15.9	98720.9	0.0	0.0	0.	0.	0.0	0.0	3966.5
21	14.0	53503.5	0.0	0.0	0.	0.	0.0	0.0	3501.2
22	11.8	15204.0	0.0	0.0	0.	0.	0.0	0.0	2949.0

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	182.729	839.455
2	200.178	822.141
3	220.940	808.215
4	379.514	838.776
5	394.890	858.489
6	410.756	877.809

7	424.761	898.518
8	436.557	920.000

Factor of Safety
*** 1.520 ***

1

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	182.729	839.455
2	200.178	822.141
3	220.940	808.215
4	379.514	838.776
5	394.890	858.489
6	410.756	877.809
7	424.761	898.518
8	436.557	920.000

Factor of Safety
*** 1.520 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	182.729	839.455
2	200.178	822.141
3	220.940	808.215
4	379.514	838.776
5	394.890	858.489
6	410.756	877.809
7	424.761	898.518
8	436.557	920.000

Factor of Safety
*** 1.520 ***

1

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	182.729	839.455
2	200.178	822.141
3	220.940	808.215
4	379.514	838.776

5	394.890	858.489
6	410.756	877.809
7	424.761	898.518
8	436.557	920.000

Factor of Safety
 *** 1.520 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	182.729	839.455
2	200.178	822.141
3	220.940	808.215
4	379.514	838.776
5	394.890	858.489
6	410.756	877.809
7	424.761	898.518
8	436.557	920.000

Factor of Safety
 *** 1.520 ***

1

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	182.729	839.455
2	200.178	822.141
3	220.940	808.215
4	379.514	838.776
5	394.890	858.489
6	410.756	877.809
7	424.761	898.518
8	436.557	920.000

Factor of Safety
 *** 1.520 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	182.729	839.455
2	200.178	822.141
3	220.940	808.215

4	379.514	838.776
5	394.890	858.489
6	410.756	877.809
7	424.761	898.518
8	436.557	920.000

Factor of Safety
 *** 1.520 ***

1

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	182.729	839.455
2	200.178	822.141
3	220.940	808.215
4	379.514	838.776
5	394.890	858.489
6	410.756	877.809
7	424.761	898.518
8	436.557	920.000

Factor of Safety
 *** 1.520 ***

Failure Surface Specified By 8 Coordinate Points

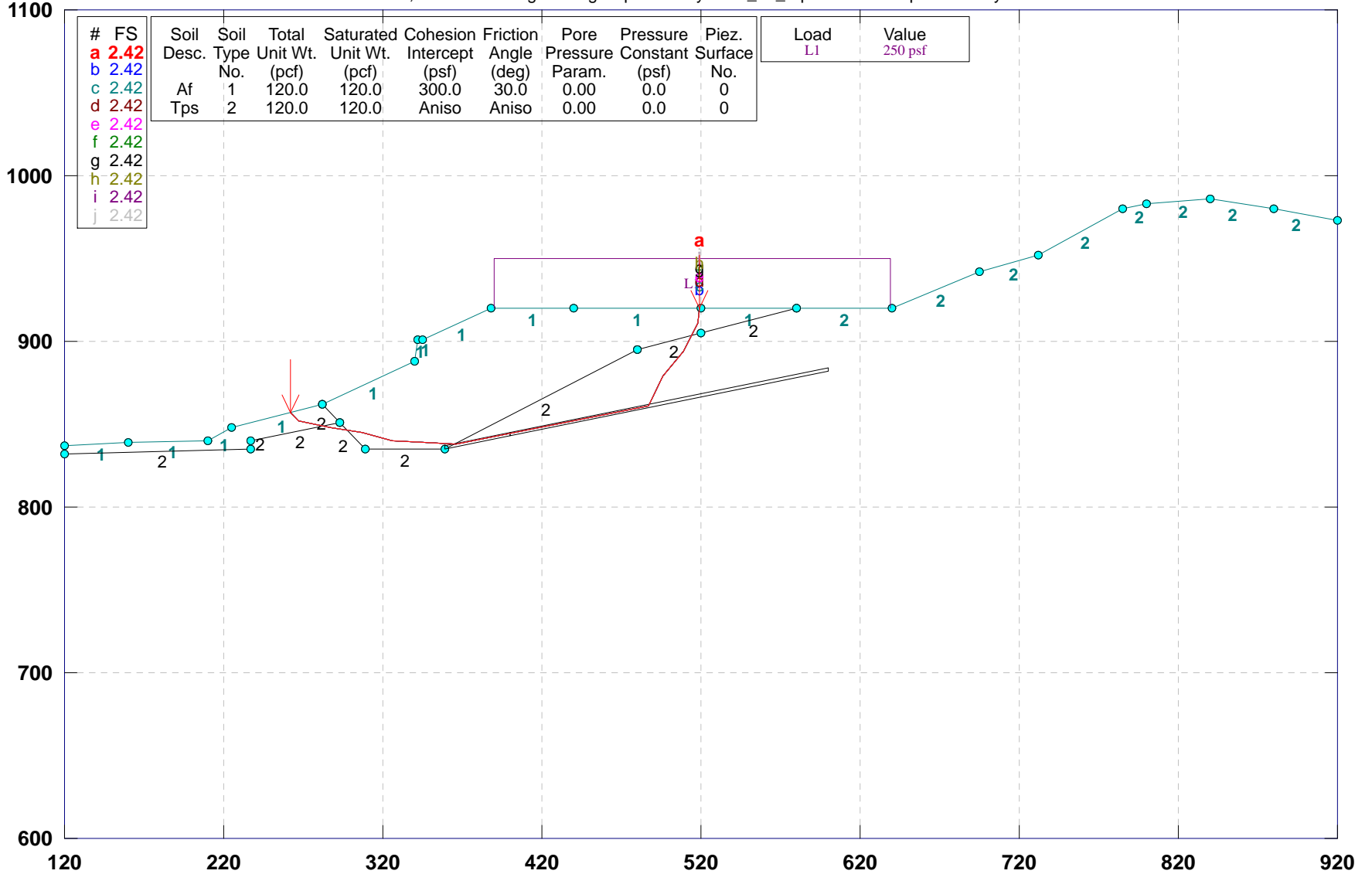
Point No.	X-Surf (ft)	Y-Surf (ft)
1	182.729	839.455
2	200.178	822.141
3	220.940	808.215
4	379.514	838.776
5	394.890	858.489
6	410.756	877.809
7	424.761	898.518
8	436.557	920.000

Factor of Safety
 *** 1.520 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / C-C' / Design / Lower Slope /Behind Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xck2.pl2 Run By: LGC Geotechnical 7/8/2019 03:13PM

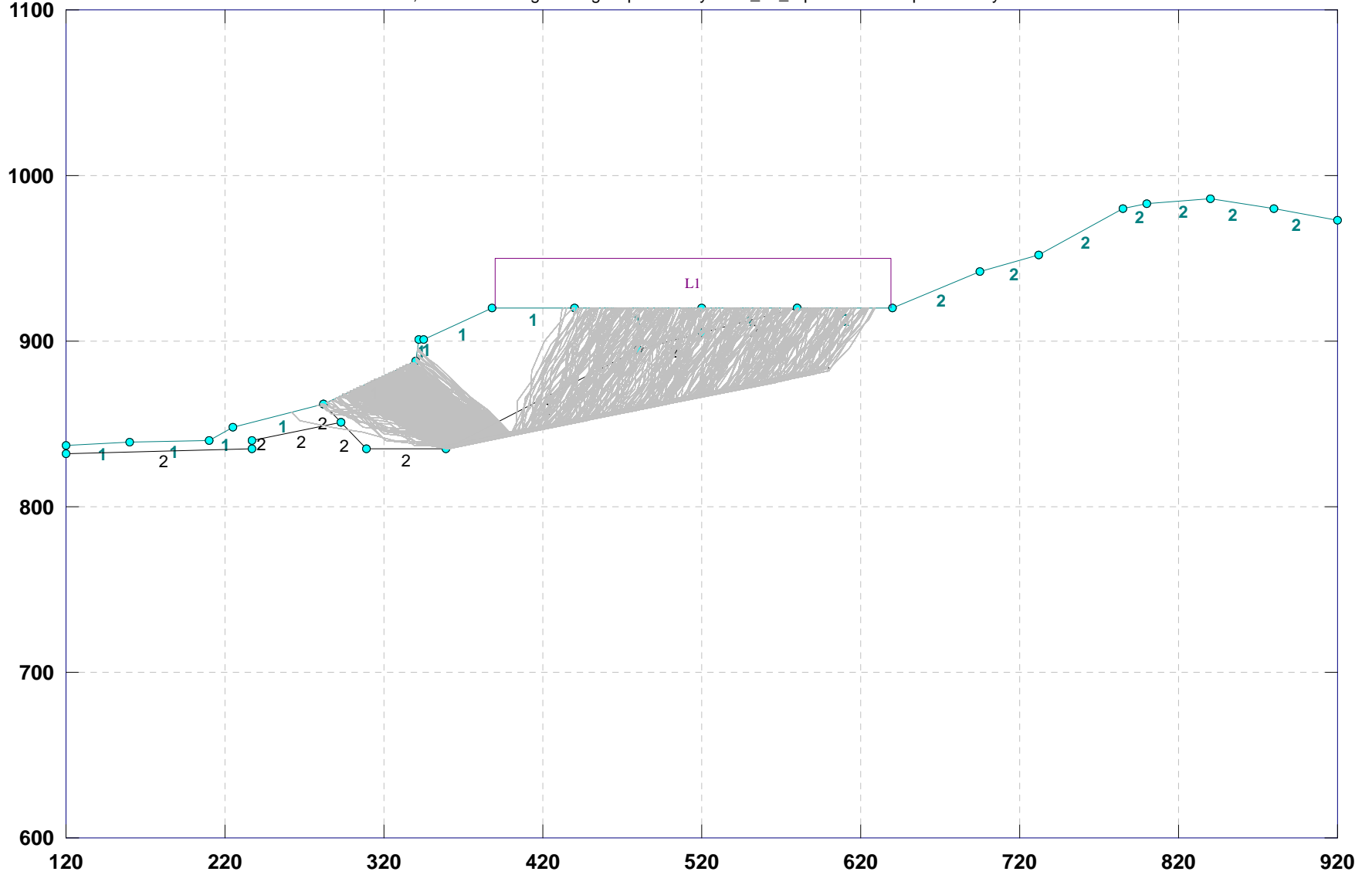


GSTABL7 v.2 FSmin=2.42

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / C-C' / Design / Lower Slope /Behind Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xck2.plt Run By: LGC Geotechnical 7/8/2019 03:13PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/8/2019
Time of Run: 03:13PM
Run By: LGC
Geotechnical

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
C\2019_07\xck2.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
C\2019_07\xck2.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
C\2019_07\xck2.PLT

PROBLEM DESCRIPTION: 18184-01 / C-C' / Design / Lower Slope /
Behind Keyway

BOUNDARY COORDINATES

19 Top Boundaries
28 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	120.00	837.00	160.00	839.00	1
2	160.00	839.00	210.00	840.00	1
3	210.00	840.00	225.00	848.00	1
4	225.00	848.00	282.00	862.00	1
5	282.00	862.00	340.00	888.00	1
6	340.00	888.00	342.00	901.00	1
7	342.00	901.00	345.00	901.00	1

8	345.00	901.00	388.00	920.00	1
9	388.00	920.00	440.00	920.00	1
10	440.00	920.00	520.00	920.00	1
11	520.00	920.00	580.00	920.00	1
12	580.00	920.00	640.00	920.00	2
13	640.00	920.00	695.00	942.00	2
14	695.00	942.00	732.00	952.00	2
15	732.00	952.00	785.00	980.00	2
16	785.00	980.00	800.00	983.00	2
17	800.00	983.00	840.00	986.00	2
18	840.00	986.00	880.00	980.00	2
19	880.00	980.00	920.00	973.00	2
20	282.00	862.00	293.00	851.00	2
21	293.00	851.00	309.00	835.00	2
22	309.00	835.00	359.00	835.00	2
23	359.00	835.00	480.00	895.00	2
24	120.00	832.00	237.00	835.00	2
25	237.00	835.00	237.10	840.00	2
26	237.10	840.00	293.00	851.00	2
27	480.00	895.00	520.00	905.00	2
28	520.00	905.00	580.00	920.00	2

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

2 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	30.00
2	11.0	0.00	15.00
3	90.0	300.00	30.00

ANISOTROPIC SOIL NOTES:

(1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.

(2) An input value of 0.02 for Phi will set both Phi and

- C equal to zero, with no water weight in the tension crack.
 (3) An input value of 0.03 for Phi will set both Phi and
 C equal to zero, with water weight in the tension crack.

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	390.00	639.00	250.0	0.0

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

Janbus Empirical Coef is being used for the case of c & phi both > 0

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 20.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	359.00	836.00	400.00	844.00	2.00
2	400.10	844.00	600.00	882.90	2.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 24.053 FS Min = 2.422 FS Ave = 5.564
 Standard Deviation = 2.226 Coefficient of Variation = 40.00 %

Failure Surface Specified By 12 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.291	857.159
2	267.186	852.358
3	286.713	848.034
4	306.540	845.407
5	325.812	840.059
6	345.797	839.292
7	365.744	837.839
8	487.154	860.603
9	495.582	878.740
10	508.759	893.786
11	518.279	911.375
12	519.342	920.000

Factor of Safety
 *** 2.422 ***

Individual data on the 24 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	Surcharge Load (lbs)
1	4.9	1763.4	0.0	0.0	0.	0.	0.0	0.0	0.0
2	14.8	16821.6	0.0	0.0	0.	0.	0.0	0.0	0.0
3	0.6	912.6	0.0	0.0	0.	0.	0.0	0.0	0.0
4	4.1	7288.9	0.0	0.0	0.	0.	0.0	0.0	0.0
5	6.3	13506.8	0.0	0.0	0.	0.	0.0	0.0	0.0
6	4.4	11035.3	0.0	0.0	0.	0.	0.0	0.0	0.0
7	9.2	27410.2	0.0	0.0	0.	0.	0.0	0.0	0.0
8	19.3	79985.8	0.0	0.0	0.	0.	0.0	0.0	0.0
9	14.2	76673.6	0.0	0.0	0.	0.	0.0	0.0	0.0
10	2.0	13205.8	0.0	0.0	0.	0.	0.0	0.0	0.0
11	3.0	22183.2	0.0	0.0	0.	0.	0.0	0.0	0.0
12	0.8	5916.7	0.0	0.0	0.	0.	0.0	0.0	0.0
13	19.1	153149.9	0.0	0.0	0.	0.	0.0	0.0	0.0
14	0.9	7688.9	0.0	0.0	0.	0.	0.0	0.0	0.0
15	22.3	200724.7	0.0	0.0	0.	0.	0.0	0.0	0.0
16	2.0	18672.2	0.0	0.0	0.	0.	0.0	0.0	0.0
17	50.0	437555.1	0.0	0.0	0.	0.	0.0	0.0	12500.0
18	40.0	309544.0	0.0	0.0	0.	0.	0.0	0.0	10000.0
19	7.2	51564.3	0.0	0.0	0.	0.	0.0	0.0	1788.4
20	8.4	50904.9	0.0	0.0	0.	0.	0.0	0.0	2107.2
21	13.2	53343.5	0.0	0.0	0.	0.	0.0	0.0	3294.1
22	5.3	13481.0	0.0	0.0	0.	0.	0.0	0.0	1315.2
23	4.3	6420.6	0.0	0.0	0.	0.	0.0	0.0	1065.0
24	1.1	550.1	0.0	0.0	0.	0.	0.0	0.0	265.7

Failure Surface Specified By 12 Coordinate Points

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

1	262.291	857.159
2	267.186	852.358
3	286.713	848.034
4	306.540	845.407
5	325.812	840.059
6	345.797	839.292
7	365.744	837.839
8	487.154	860.603
9	495.582	878.740
10	508.759	893.786
11	518.279	911.375
12	519.342	920.000

Factor of Safety
 *** 2.422 ***

1

Failure Surface Specified By 12 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.291	857.159
2	267.186	852.358
3	286.713	848.034
4	306.540	845.407
5	325.812	840.059
6	345.797	839.292
7	365.744	837.839
8	487.154	860.603
9	495.582	878.740
10	508.759	893.786
11	518.279	911.375
12	519.342	920.000

Factor of Safety
 *** 2.422 ***

Failure Surface Specified By 12 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.291	857.159
2	267.186	852.358
3	286.713	848.034
4	306.540	845.407
5	325.812	840.059
6	345.797	839.292
7	365.744	837.839
8	487.154	860.603
9	495.582	878.740
10	508.759	893.786
11	518.279	911.375
12	519.342	920.000

Factor of Safety
*** 2.422 ***

1

Failure Surface Specified By 12 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.291	857.159
2	267.186	852.358
3	286.713	848.034
4	306.540	845.407
5	325.812	840.059
6	345.797	839.292
7	365.744	837.839
8	487.154	860.603
9	495.582	878.740
10	508.759	893.786
11	518.279	911.375
12	519.342	920.000

Factor of Safety
*** 2.422 ***

Failure Surface Specified By 12 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.291	857.159
2	267.186	852.358
3	286.713	848.034
4	306.540	845.407
5	325.812	840.059
6	345.797	839.292
7	365.744	837.839
8	487.154	860.603
9	495.582	878.740
10	508.759	893.786
11	518.279	911.375
12	519.342	920.000

Factor of Safety
*** 2.422 ***

1

Failure Surface Specified By 12 Coordinate Points

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

1	262.291	857.159
2	267.186	852.358
3	286.713	848.034
4	306.540	845.407
5	325.812	840.059
6	345.797	839.292
7	365.744	837.839
8	487.154	860.603
9	495.582	878.740
10	508.759	893.786
11	518.279	911.375
12	519.342	920.000

Factor of Safety
 *** 2.422 ***

Failure Surface Specified By 12 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.291	857.159
2	267.186	852.358
3	286.713	848.034
4	306.540	845.407
5	325.812	840.059
6	345.797	839.292
7	365.744	837.839
8	487.154	860.603
9	495.582	878.740
10	508.759	893.786
11	518.279	911.375
12	519.342	920.000

Factor of Safety
 *** 2.422 ***

Failure Surface Specified By 12 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.291	857.159
2	267.186	852.358
3	286.713	848.034
4	306.540	845.407
5	325.812	840.059
6	345.797	839.292
7	365.744	837.839
8	487.154	860.603
9	495.582	878.740
10	508.759	893.786
11	518.279	911.375
12	519.342	920.000

Factor of Safety
*** 2.422 ***

Failure Surface Specified By 12 Coordinate Points

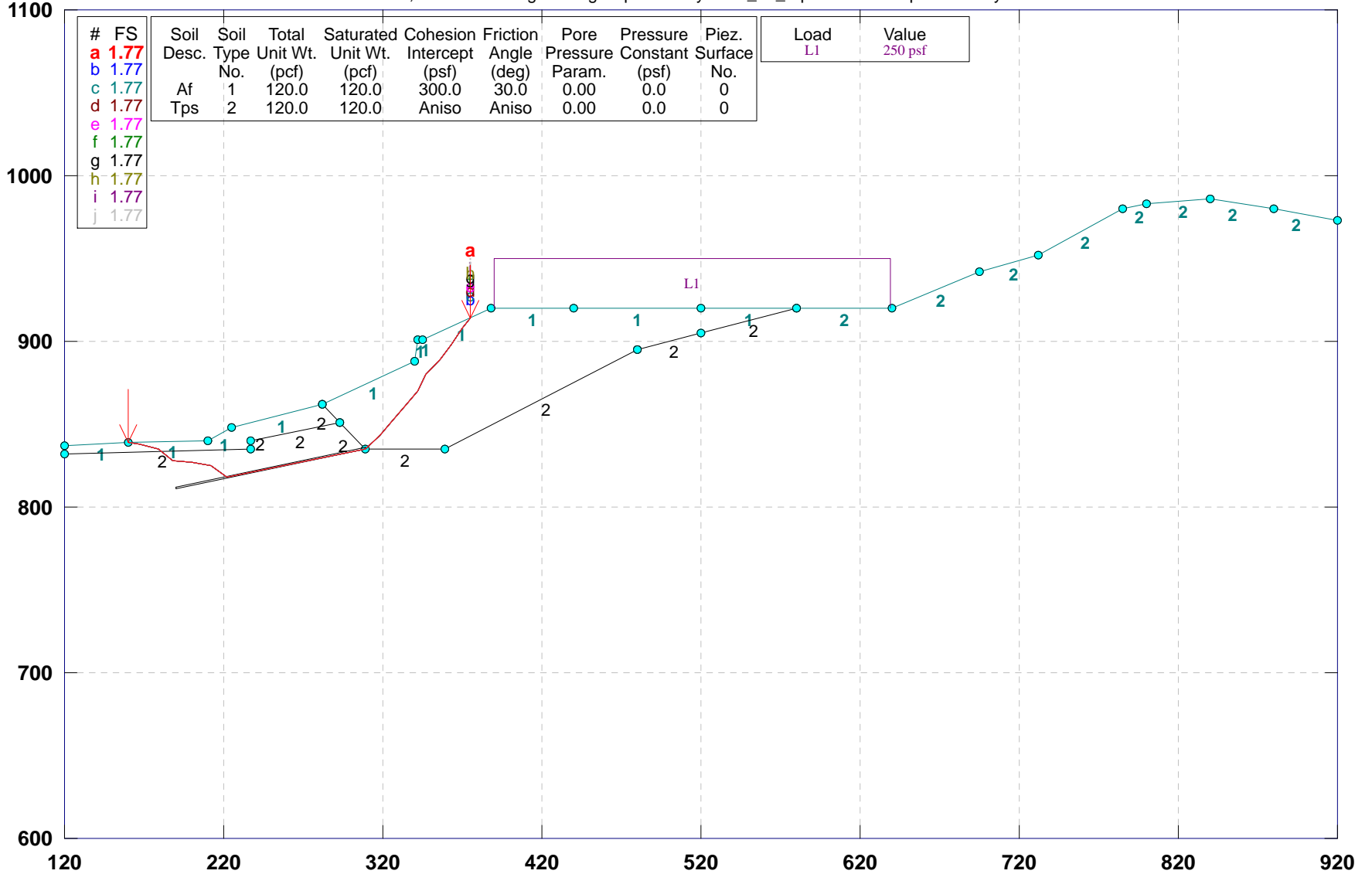
Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.291	857.159
2	267.186	852.358
3	286.713	848.034
4	306.540	845.407
5	325.812	840.059
6	345.797	839.292
7	365.744	837.839
8	487.154	860.603
9	495.582	878.740
10	508.759	893.786
11	518.279	911.375
12	519.342	920.000

Factor of Safety
*** 2.422 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / C-C' / Design / Lower Slope /Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xck3.pl2 Run By: LGC Geotechnical 7/8/2019 01:39PM

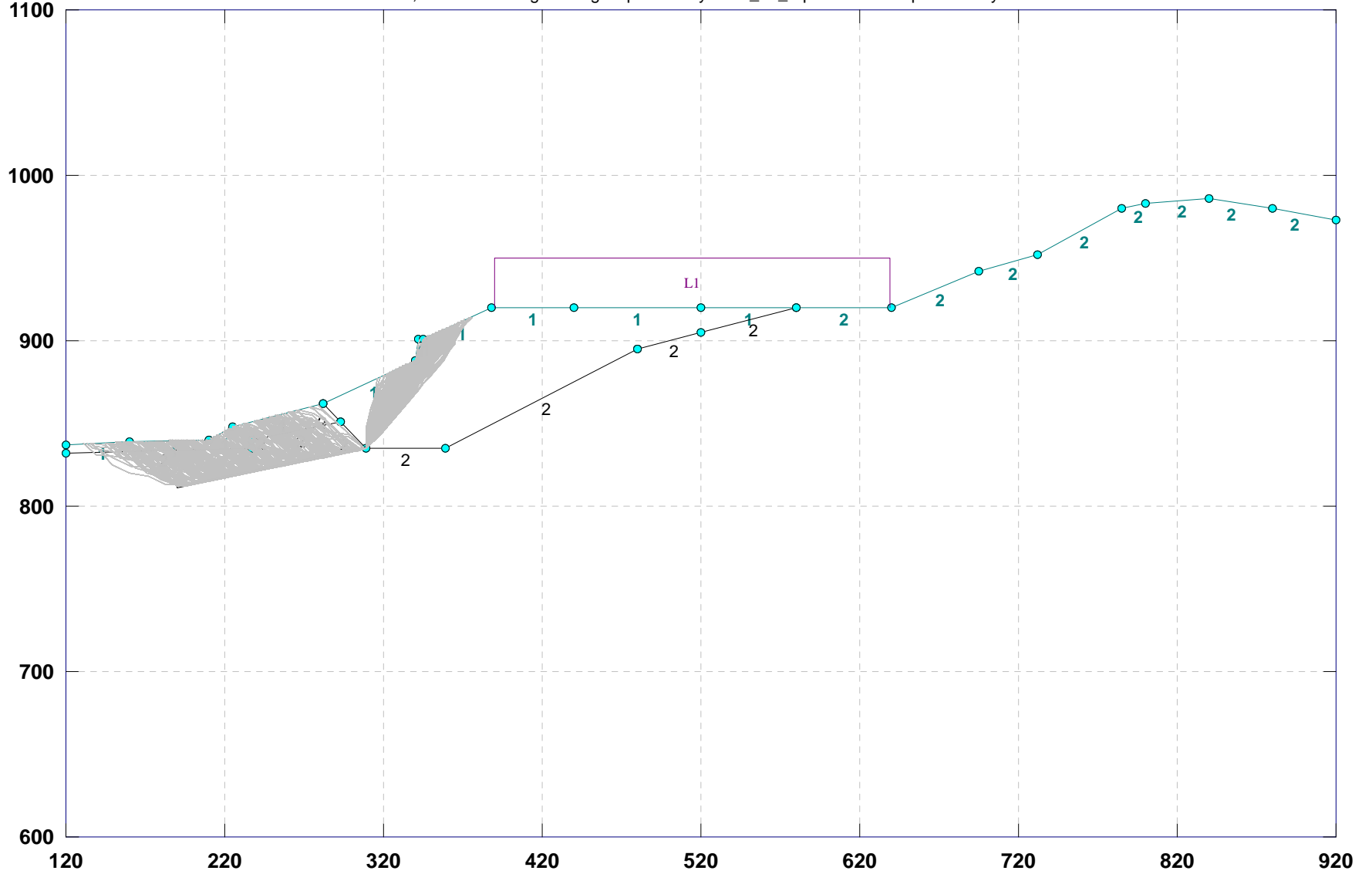


GSTABL7 v.2 FSmin=1.77

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / C-C' / Design / Lower Slope /Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xck3.plt Run By: LGC Geotechnical 7/8/2019 01:39PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/8/2019
Time of Run: 01:39PM
Run By: LGC
Geotechnical

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
C\2019_07\xck3.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
C\2019_07\xck3.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
C\2019_07\xck3.PLT

PROBLEM DESCRIPTION: 18184-01 / C-C' / Design / Lower Slope /
Below Keyway

BOUNDARY COORDINATES

19 Top Boundaries
28 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	120.00	837.00	160.00	839.00	1
2	160.00	839.00	210.00	840.00	1
3	210.00	840.00	225.00	848.00	1
4	225.00	848.00	282.00	862.00	1
5	282.00	862.00	340.00	888.00	1
6	340.00	888.00	342.00	901.00	1
7	342.00	901.00	345.00	901.00	1

8	345.00	901.00	388.00	920.00	1
9	388.00	920.00	440.00	920.00	1
10	440.00	920.00	520.00	920.00	1
11	520.00	920.00	580.00	920.00	1
12	580.00	920.00	640.00	920.00	2
13	640.00	920.00	695.00	942.00	2
14	695.00	942.00	732.00	952.00	2
15	732.00	952.00	785.00	980.00	2
16	785.00	980.00	800.00	983.00	2
17	800.00	983.00	840.00	986.00	2
18	840.00	986.00	880.00	980.00	2
19	880.00	980.00	920.00	973.00	2
20	282.00	862.00	293.00	851.00	2
21	293.00	851.00	309.00	835.00	2
22	309.00	835.00	359.00	835.00	2
23	359.00	835.00	480.00	895.00	2
24	120.00	832.00	237.00	835.00	2
25	237.00	835.00	237.10	840.00	2
26	237.10	840.00	293.00	851.00	2
27	480.00	895.00	520.00	905.00	2
28	520.00	905.00	580.00	920.00	2

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

2 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	30.00
2	11.0	0.00	15.00
3	90.0	300.00	30.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and

- C equal to zero, with no water weight in the tension crack.
 (3) An input value of 0.03 for Phi will set both Phi and
 C equal to zero, with water weight in the tension crack.

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	390.00	639.00	250.0	0.0

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

Janbus Empirical Coef is being used for the case of c & phi both > 0

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 12.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	190.00	811.90	309.00	835.00	1.00
2	309.10	835.00	309.10	835.00	1.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 8.191 FS Min = 1.774 FS Ave = 3.064
 Standard Deviation = 0.982 Coefficient of Variation = 32.04 %

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	159.731	838.987
2	166.831	837.985
3	178.521	835.277
4	188.262	828.269
5	200.147	826.614
6	212.058	825.155
7	221.718	818.036
8	309.100	834.584
9	317.535	843.119
10	325.609	851.997
11	333.727	860.834
12	341.966	869.558
13	347.499	880.207
14	355.686	888.980
15	363.284	898.268
16	369.776	908.360
17	375.040	914.274

Factor of Safety
 *** 1.774 ***

Individual data on the 29 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	Surcharge Load (lbs)
1	0.3	0.8	0.0	0.0	0.	0.	0.0	0.0	0.0
2	6.8	492.8	0.0	0.0	0.	0.	0.0	0.0	0.0
3	11.7	3678.5	0.0	0.0	0.	0.	0.0	0.0	0.0
4	2.4	1423.5	0.0	0.0	0.	0.	0.0	0.0	0.0
5	7.4	7570.8	0.0	0.0	0.	0.	0.0	0.0	0.0
6	11.9	17460.6	0.0	0.0	0.	0.	0.0	0.0	0.0
7	9.9	16423.5	0.0	0.0	0.	0.	0.0	0.0	0.0
8	2.1	3771.0	0.0	0.0	0.	0.	0.0	0.0	0.0
9	9.7	25593.4	0.0	0.0	0.	0.	0.0	0.0	0.0
10	3.3	11332.9	0.0	0.0	0.	0.	0.0	0.0	0.0
11	12.0	42739.5	0.0	0.0	0.	0.	0.0	0.0	0.0
12	0.1	360.3	0.0	0.0	0.	0.	0.0	0.0	0.0
13	44.9	168567.7	0.0	0.0	0.	0.	0.0	0.0	0.0
14	11.0	44843.5	0.0	0.0	0.	0.	0.0	0.0	0.0
15	16.0	71937.5	0.0	0.0	0.	0.	0.0	0.0	0.0
16	0.1	474.6	0.0	0.0	0.	0.	0.0	0.0	0.0
17	0.4	1947.8	0.0	0.0	0.	0.	0.0	0.0	0.0
18	8.0	35695.7	0.0	0.0	0.	0.	0.0	0.0	0.0
19	8.1	31177.3	0.0	0.0	0.	0.	0.0	0.0	0.0
20	8.1	26256.3	0.0	0.0	0.	0.	0.0	0.0	0.0
21	6.3	16892.0	0.0	0.0	0.	0.	0.0	0.0	0.0
22	2.0	6105.3	0.0	0.0	0.	0.	0.0	0.0	0.0
23	0.0	126.3	0.0	0.0	0.	0.	0.0	0.0	0.0
24	3.0	10256.4	0.0	0.0	0.	0.	0.0	0.0	0.0
25	2.5	7120.9	0.0	0.0	0.	0.	0.0	0.0	0.0
26	8.2	18981.2	0.0	0.0	0.	0.	0.0	0.0	0.0

27	7.6	12561.0	0.0	0.0	0.	0.	0.0	0.0	0.0
28	6.5	5608.9	0.0	0.0	0.	0.	0.0	0.0	0.0
29	5.3	1133.1	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	159.731	838.987
2	166.831	837.985
3	178.521	835.277
4	188.262	828.269
5	200.147	826.614
6	212.058	825.155
7	221.718	818.036
8	309.100	834.584
9	317.535	843.119
10	325.609	851.997
11	333.727	860.834
12	341.966	869.558
13	347.499	880.207
14	355.686	888.980
15	363.284	898.268
16	369.776	908.360
17	375.040	914.274

Factor of Safety
 *** 1.774 ***

1

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	159.731	838.987
2	166.831	837.985
3	178.521	835.277
4	188.262	828.269
5	200.147	826.614
6	212.058	825.155
7	221.718	818.036
8	309.100	834.584
9	317.535	843.119
10	325.609	851.997
11	333.727	860.834
12	341.966	869.558
13	347.499	880.207
14	355.686	888.980
15	363.284	898.268
16	369.776	908.360
17	375.040	914.274

Factor of Safety
 *** 1.774 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	159.731	838.987
2	166.831	837.985
3	178.521	835.277
4	188.262	828.269
5	200.147	826.614
6	212.058	825.155
7	221.718	818.036
8	309.100	834.584
9	317.535	843.119
10	325.609	851.997
11	333.727	860.834
12	341.966	869.558
13	347.499	880.207
14	355.686	888.980
15	363.284	898.268
16	369.776	908.360
17	375.040	914.274

Factor of Safety
*** 1.774 ***

1

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	159.731	838.987
2	166.831	837.985
3	178.521	835.277
4	188.262	828.269
5	200.147	826.614
6	212.058	825.155
7	221.718	818.036
8	309.100	834.584
9	317.535	843.119
10	325.609	851.997
11	333.727	860.834
12	341.966	869.558
13	347.499	880.207
14	355.686	888.980
15	363.284	898.268
16	369.776	908.360
17	375.040	914.274

Factor of Safety
*** 1.774 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	159.731	838.987
2	166.831	837.985
3	178.521	835.277
4	188.262	828.269
5	200.147	826.614
6	212.058	825.155
7	221.718	818.036
8	309.100	834.584
9	317.535	843.119
10	325.609	851.997
11	333.727	860.834
12	341.966	869.558
13	347.499	880.207
14	355.686	888.980
15	363.284	898.268
16	369.776	908.360
17	375.040	914.274

Factor of Safety
 *** 1.774 ***

1

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	159.731	838.987
2	166.831	837.985
3	178.521	835.277
4	188.262	828.269
5	200.147	826.614
6	212.058	825.155
7	221.718	818.036
8	309.100	834.584
9	317.535	843.119
10	325.609	851.997
11	333.727	860.834
12	341.966	869.558
13	347.499	880.207
14	355.686	888.980
15	363.284	898.268
16	369.776	908.360
17	375.040	914.274

Factor of Safety
 *** 1.774 ***

Failure Surface Specified By 17 Coordinate Points

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

1	159.731	838.987
2	166.831	837.985
3	178.521	835.277
4	188.262	828.269
5	200.147	826.614
6	212.058	825.155
7	221.718	818.036
8	309.100	834.584
9	317.535	843.119
10	325.609	851.997
11	333.727	860.834
12	341.966	869.558
13	347.499	880.207
14	355.686	888.980
15	363.284	898.268
16	369.776	908.360
17	375.040	914.274

Factor of Safety
 *** 1.774 ***

1

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	159.731	838.987
2	166.831	837.985
3	178.521	835.277
4	188.262	828.269
5	200.147	826.614
6	212.058	825.155
7	221.718	818.036
8	309.100	834.584
9	317.535	843.119
10	325.609	851.997
11	333.727	860.834
12	341.966	869.558
13	347.499	880.207
14	355.686	888.980
15	363.284	898.268
16	369.776	908.360
17	375.040	914.274

Factor of Safety
 *** 1.774 ***

Failure Surface Specified By 17 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	159.731	838.987
2	166.831	837.985

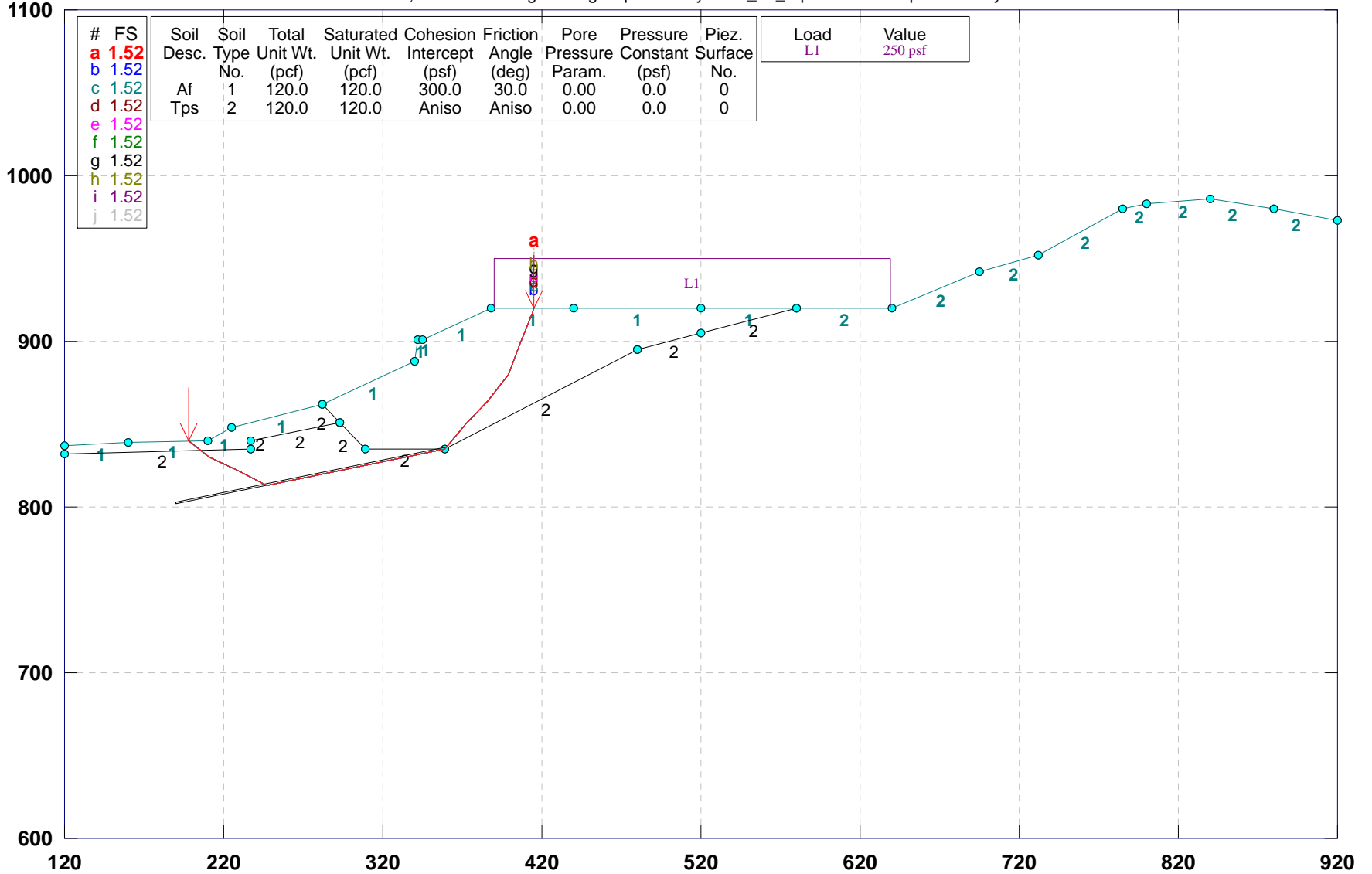
3	178.521	835.277
4	188.262	828.269
5	200.147	826.614
6	212.058	825.155
7	221.718	818.036
8	309.100	834.584
9	317.535	843.119
10	325.609	851.997
11	333.727	860.834
12	341.966	869.558
13	347.499	880.207
14	355.686	888.980
15	363.284	898.268
16	369.776	908.360
17	375.040	914.274

Factor of Safety
*** 1.774 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / C-C' / Design / Lower Slope /Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xck4.pl2 Run By: LGC Geotechnical 7/8/2019 01:26PM

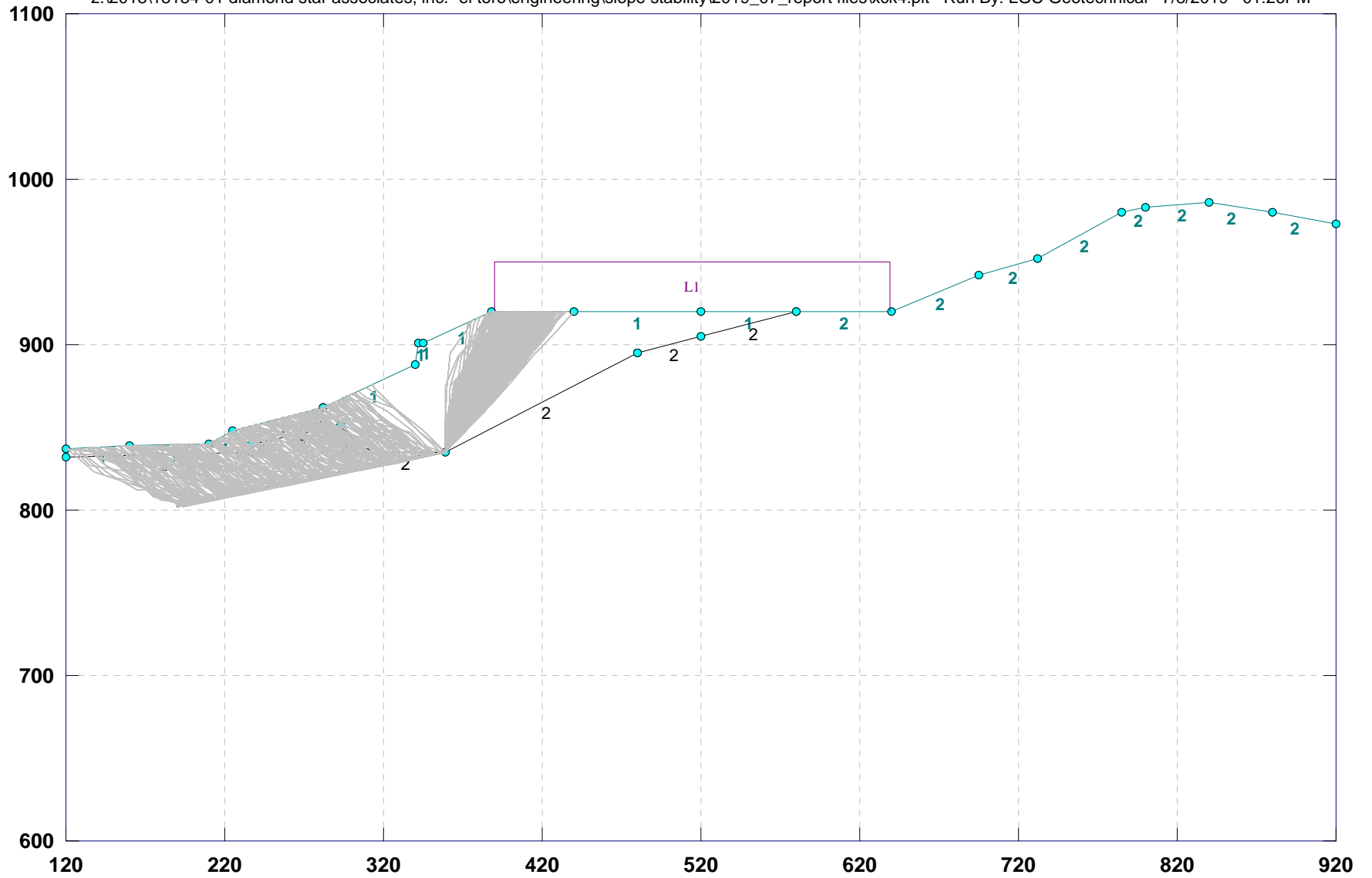


GSTABL7 v.2 FSmin=1.52

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / C-C' / Design / Lower Slope /Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xck4.plt Run By: LGC Geotechnical 7/8/2019 01:26PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/8/2019
Time of Run: 01:26PM
Run By: LGC
Geotechnical

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
C\2019_07\xck4.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
C\2019_07\xck4.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
C\2019_07\xck4.PLT

PROBLEM DESCRIPTION: 18184-01 / C-C' / Design / Lower Slope /
Below Keyway

BOUNDARY COORDINATES

19 Top Boundaries
28 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	120.00	837.00	160.00	839.00	1
2	160.00	839.00	210.00	840.00	1
3	210.00	840.00	225.00	848.00	1
4	225.00	848.00	282.00	862.00	1
5	282.00	862.00	340.00	888.00	1
6	340.00	888.00	342.00	901.00	1
7	342.00	901.00	345.00	901.00	1

8	345.00	901.00	388.00	920.00	1
9	388.00	920.00	440.00	920.00	1
10	440.00	920.00	520.00	920.00	1
11	520.00	920.00	580.00	920.00	1
12	580.00	920.00	640.00	920.00	2
13	640.00	920.00	695.00	942.00	2
14	695.00	942.00	732.00	952.00	2
15	732.00	952.00	785.00	980.00	2
16	785.00	980.00	800.00	983.00	2
17	800.00	983.00	840.00	986.00	2
18	840.00	986.00	880.00	980.00	2
19	880.00	980.00	920.00	973.00	2
20	282.00	862.00	293.00	851.00	2
21	293.00	851.00	309.00	835.00	2
22	309.00	835.00	359.00	835.00	2
23	359.00	835.00	480.00	895.00	2
24	120.00	832.00	237.00	835.00	2
25	237.00	835.00	237.10	840.00	2
26	237.10	840.00	293.00	851.00	2
27	480.00	895.00	520.00	905.00	2
28	520.00	905.00	580.00	920.00	2

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

2 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	6.0	300.00	30.00
2	11.0	0.00	15.00
3	90.0	300.00	30.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and

- C equal to zero, with no water weight in the tension crack.
 (3) An input value of 0.03 for Phi will set both Phi and
 C equal to zero, with water weight in the tension crack.

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	390.00	639.00	250.0	0.0

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

Janbus Empirical Coef is being used for the case of c & phi both > 0

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 20.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	190.00	802.10	359.00	835.00	1.00
2	359.10	835.00	359.10	835.00	1.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 13.861 FS Min = 1.520 FS Ave = 2.346
 Standard Deviation = 0.867 Coefficient of Variation = 36.94 %

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	197.821	839.756
2	210.619	830.031
3	229.105	822.400
4	246.928	813.325
5	359.100	834.810
6	372.169	849.949
7	386.013	864.383
8	398.970	879.619
9	406.373	898.199
10	413.709	916.805
11	415.154	920.000

Factor of Safety
 *** 1.520 ***

Individual data on the 25 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	7.3	2516.7	0.0	0.0	0.	0.	0.0	0.0	0.0
2	4.8	4424.4	0.0	0.0	0.	0.	0.0	0.0	0.0
3	0.6	734.8	0.0	0.0	0.	0.	0.0	0.0	0.0
4	14.4	29514.4	0.0	0.0	0.	0.	0.0	0.0	0.0
5	4.1	12442.7	0.0	0.0	0.	0.	0.0	0.0	0.0
6	7.9	28030.3	0.0	0.0	0.	0.	0.0	0.0	0.0
7	0.1	391.3	0.0	0.0	0.	0.	0.0	0.0	0.0
8	9.8	42872.4	0.0	0.0	0.	0.	0.0	0.0	0.0
9	35.1	172591.2	0.0	0.0	0.	0.	0.0	0.0	0.0
10	11.0	57247.5	0.0	0.0	0.	0.	0.0	0.0	0.0
11	16.0	89923.7	0.0	0.0	0.	0.	0.0	0.0	0.0
12	31.0	196671.4	0.0	0.0	0.	0.	0.0	0.0	0.0
13	2.0	15157.6	0.0	0.0	0.	0.	0.0	0.0	0.0
14	3.0	24904.0	0.0	0.0	0.	0.	0.0	0.0	0.0
15	14.0	118679.7	0.0	0.0	0.	0.	0.0	0.0	0.0
16	0.1	868.9	0.0	0.0	0.	0.	0.0	0.0	0.0
17	0.4	3134.2	0.0	0.0	0.	0.	0.0	0.0	0.0
18	12.7	103101.8	0.0	0.0	0.	0.	0.0	0.0	0.0
19	13.8	97844.1	0.0	0.0	0.	0.	0.0	0.0	0.0
20	2.0	12875.7	0.0	0.0	0.	0.	0.0	0.0	0.0
21	2.0	12505.1	0.0	0.0	0.	0.	0.0	0.0	0.0
22	9.0	49141.9	0.0	0.0	0.	0.	0.0	0.0	2242.5
23	7.4	27620.6	0.0	0.0	0.	0.	0.0	0.0	1850.8
24	7.3	11003.2	0.0	0.0	0.	0.	0.0	0.0	1834.1
25	1.4	277.1	0.0	0.0	0.	0.	0.0	0.0	361.3

Failure Surface Specified By 11 Coordinate Points

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

1	197.821	839.756
2	210.619	830.031
3	229.105	822.400
4	246.928	813.325
5	359.100	834.810
6	372.169	849.949
7	386.013	864.383
8	398.970	879.619
9	406.373	898.199
10	413.709	916.805
11	415.154	920.000

Factor of Safety
 *** 1.520 ***

1

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	197.821	839.756
2	210.619	830.031
3	229.105	822.400
4	246.928	813.325
5	359.100	834.810
6	372.169	849.949
7	386.013	864.383
8	398.970	879.619
9	406.373	898.199
10	413.709	916.805
11	415.154	920.000

Factor of Safety
 *** 1.520 ***

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	197.821	839.756
2	210.619	830.031
3	229.105	822.400
4	246.928	813.325
5	359.100	834.810
6	372.169	849.949
7	386.013	864.383
8	398.970	879.619
9	406.373	898.199
10	413.709	916.805
11	415.154	920.000

Factor of Safety
 *** 1.520 ***

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	197.821	839.756
2	210.619	830.031
3	229.105	822.400
4	246.928	813.325
5	359.100	834.810
6	372.169	849.949
7	386.013	864.383
8	398.970	879.619
9	406.373	898.199
10	413.709	916.805
11	415.154	920.000

Factor of Safety
*** 1.520 ***

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	197.821	839.756
2	210.619	830.031
3	229.105	822.400
4	246.928	813.325
5	359.100	834.810
6	372.169	849.949
7	386.013	864.383
8	398.970	879.619
9	406.373	898.199
10	413.709	916.805
11	415.154	920.000

Factor of Safety
*** 1.520 ***

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	197.821	839.756
2	210.619	830.031
3	229.105	822.400
4	246.928	813.325

5	359.100	834.810
6	372.169	849.949
7	386.013	864.383
8	398.970	879.619
9	406.373	898.199
10	413.709	916.805
11	415.154	920.000

Factor of Safety
 *** 1.520 ***

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	197.821	839.756
2	210.619	830.031
3	229.105	822.400
4	246.928	813.325
5	359.100	834.810
6	372.169	849.949
7	386.013	864.383
8	398.970	879.619
9	406.373	898.199
10	413.709	916.805
11	415.154	920.000

Factor of Safety
 *** 1.520 ***

1

Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	197.821	839.756
2	210.619	830.031
3	229.105	822.400
4	246.928	813.325
5	359.100	834.810
6	372.169	849.949
7	386.013	864.383
8	398.970	879.619
9	406.373	898.199
10	413.709	916.805
11	415.154	920.000

Factor of Safety
 *** 1.520 ***

Failure Surface Specified By 11 Coordinate Points

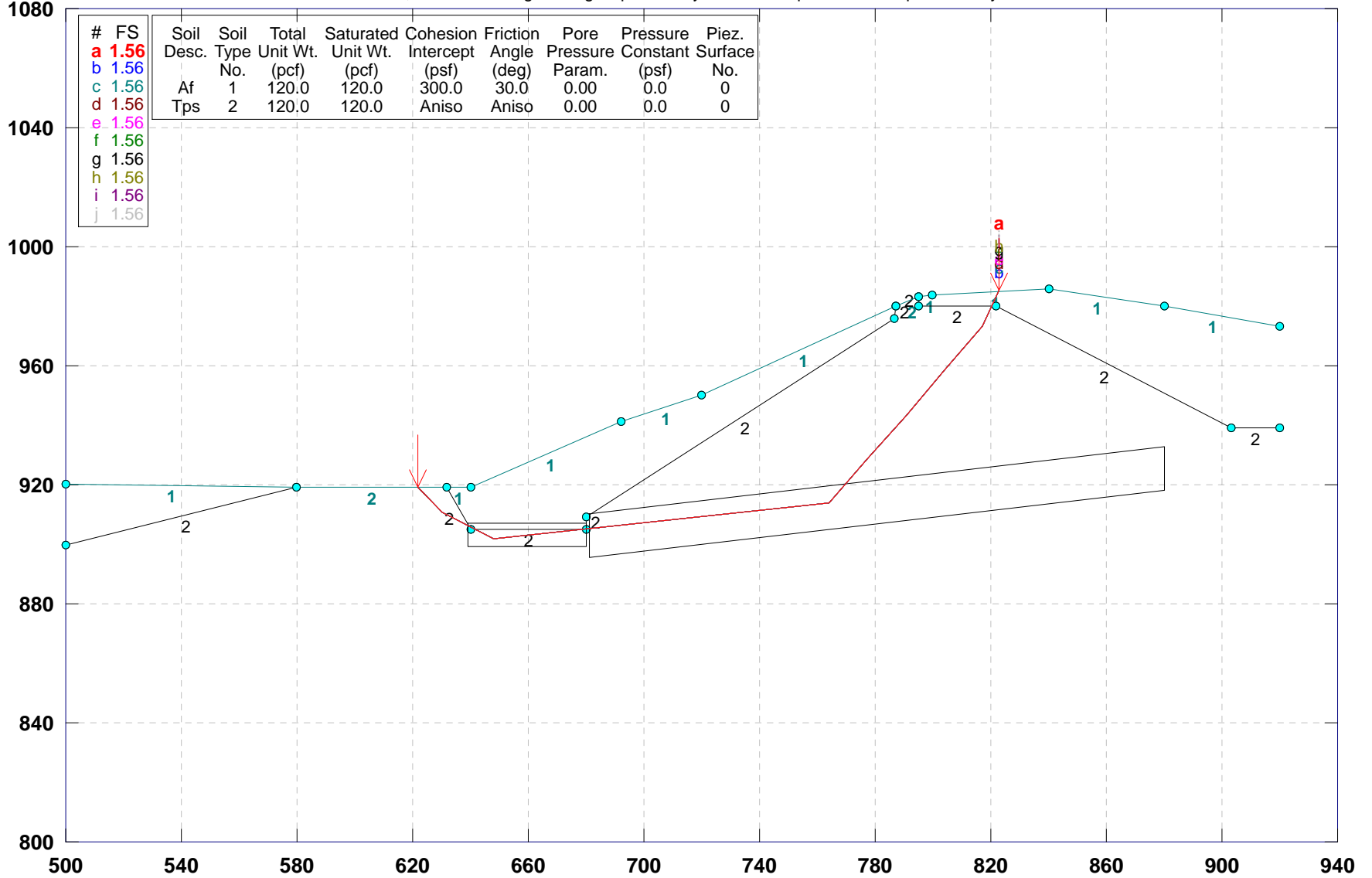
Point No.	X-Surf (ft)	Y-Surf (ft)
1	197.821	839.756
2	210.619	830.031
3	229.105	822.400
4	246.928	813.325
5	359.100	834.810
6	372.169	849.949
7	386.013	864.383
8	398.970	879.619
9	406.373	898.199
10	413.709	916.805
11	415.154	920.000

Factor of Safety
*** 1.520 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / C-C' / Upper Slope / Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xcuk.pl2 Run By: LGC Geotechnical 7/11/2019 01:18PM

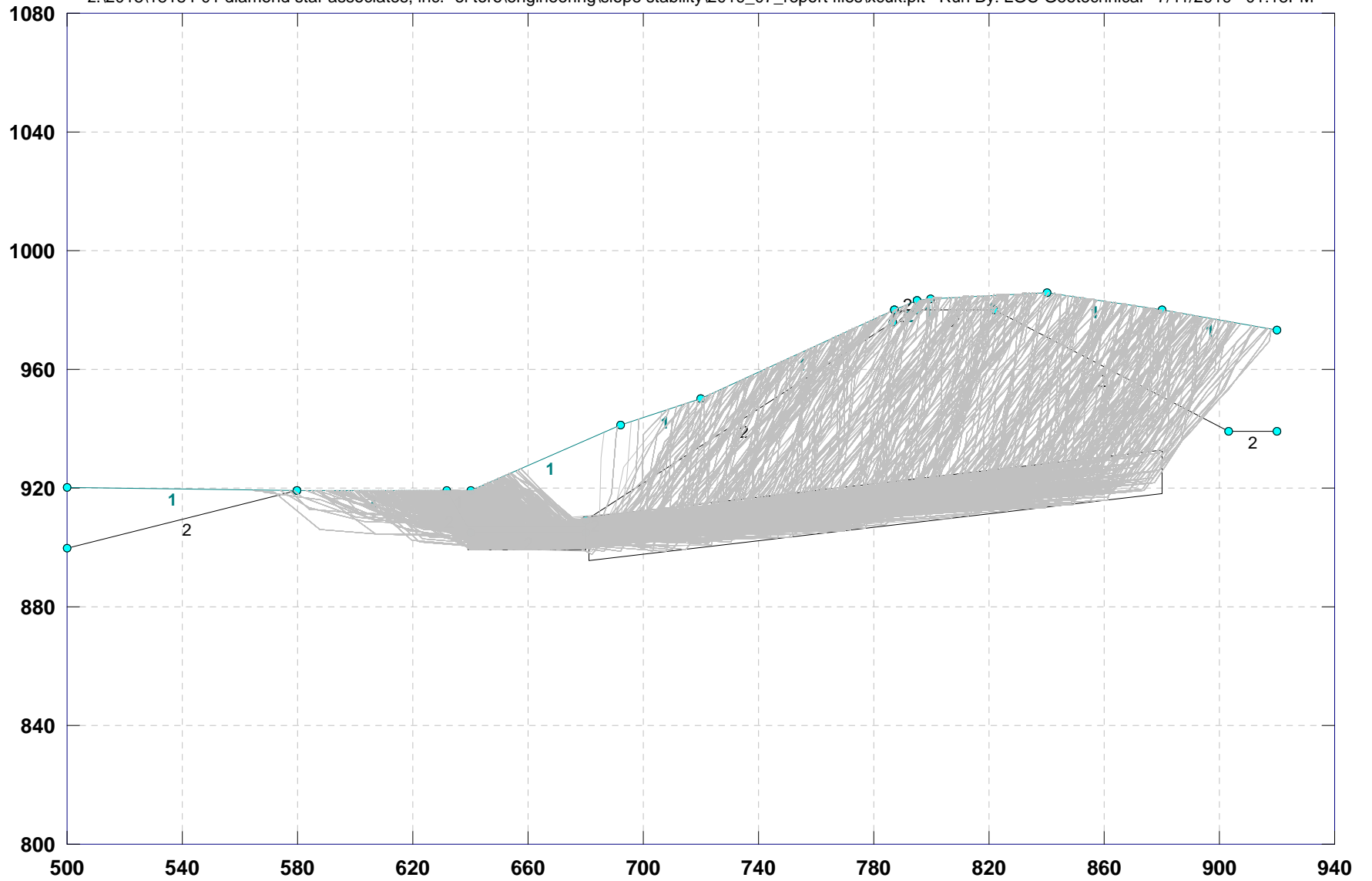


GSTABL7 v.2 FSmin=1.56

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / C-C' / Upper Slope / Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xcuk.plt Run By: LGC Geotechnical 7/11/2019 01:18PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/11/2019
Time of Run: 01:18PM
Run By: LGC
Geotechnical

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcuk.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcuk.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcuk.PLT

PROBLEM DESCRIPTION: 18184-01 / C-C' / Upper Slope / Below
Keyway

BOUNDARY COORDINATES

11 Top Boundaries
21 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	500.00	920.00	580.00	919.00	1
2	580.00	919.00	632.00	919.00	2
3	632.00	919.00	640.00	919.00	1
4	640.00	919.00	692.00	941.00	1
5	692.00	941.00	720.00	950.00	1
6	720.00	950.00	787.00	980.00	1
7	787.00	980.00	795.00	983.00	2

8	795.00	983.00	800.00	984.00	1
9	800.00	984.00	840.00	986.00	1
10	840.00	986.00	880.00	980.00	1
11	880.00	980.00	920.00	973.00	1
12	500.00	900.00	580.00	919.00	2
13	632.00	919.00	640.00	905.00	2
14	640.00	905.00	680.00	905.00	2
15	680.00	905.00	680.02	909.00	2
16	680.02	909.00	786.90	976.00	2
17	786.90	976.00	787.00	980.00	2
18	795.00	983.00	795.10	980.00	2
19	795.10	980.00	822.00	980.00	2
20	822.00	980.00	903.00	939.00	2
21	903.00	939.00	920.00	939.00	2

User Specified Y-Origin = 800.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

2 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	-4.0	300.00	30.00
2	7.0	0.00	15.00
3	90.0	300.00	30.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

Janbus Empirical Coef is being used for the case of c & phi both > 0

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 20.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	639.00	903.00	680.00	903.00	8.00
2	681.00	903.00	880.00	925.40	15.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 9.167 FS Min = 1.559 FS Ave = 2.567
Standard Deviation = 0.889 Coefficient of Variation = 34.63 %

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	621.957	919.000
2	630.113	910.890
3	648.006	901.955
4	763.872	913.818
5	777.384	928.564
6	790.981	943.230
7	804.118	958.311
8	817.247	973.398
9	822.754	985.138

Factor of Safety
*** 1.559 ***

Individual data on the 23 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	8.2	3968.9	0.0	0.0	0.	0.	0.0	0.0	0.0
2	1.9	1943.0	0.0	0.0	0.	0.	0.0	0.0	0.0
3	7.2	9432.8	0.0	0.0	0.	0.	0.0	0.0	0.0
4	0.8	1175.1	0.0	0.0	0.	0.	0.0	0.0	0.0
5	1.9	3188.2	0.0	0.0	0.	0.	0.0	0.0	0.0
6	6.1	12894.9	0.0	0.0	0.	0.	0.0	0.0	0.0
7	29.7	89952.0	0.0	0.0	0.	0.	0.0	0.0	0.0
8	2.3	8193.7	0.0	0.0	0.	0.	0.0	0.0	0.0
9	0.0	69.5	0.0	0.0	0.	0.	0.0	0.0	0.0
10	12.0	46894.5	0.0	0.0	0.	0.	0.0	0.0	0.0
11	28.0	126361.3	0.0	0.0	0.	0.	0.0	0.0	0.0
12	43.9	254020.6	0.0	0.0	0.	0.	0.0	0.0	0.0
13	13.5	83465.5	0.0	0.0	0.	0.	0.0	0.0	0.0
14	9.5	50393.7	0.0	0.0	0.	0.	0.0	0.0	0.0
15	0.1	493.0	0.0	0.0	0.	0.	0.0	0.0	0.0
16	4.0	18947.6	0.0	0.0	0.	0.	0.0	0.0	0.0
17	4.0	17704.3	0.0	0.0	0.	0.	0.0	0.0	0.0
18	0.1	421.2	0.0	0.0	0.	0.	0.0	0.0	0.0
19	4.9	19250.7	0.0	0.0	0.	0.	0.0	0.0	0.0
20	4.1	13914.8	0.0	0.0	0.	0.	0.0	0.0	0.0
21	13.1	29429.4	0.0	0.0	0.	0.	0.0	0.0	0.0
22	3.1	3062.4	0.0	0.0	0.	0.	0.0	0.0	0.0
23	2.4	725.5	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	621.957	919.000
2	630.113	910.890
3	648.006	901.955
4	763.872	913.818
5	777.384	928.564
6	790.981	943.230
7	804.118	958.311
8	817.247	973.398
9	822.754	985.138

Factor of Safety
 *** 1.559 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	621.957	919.000
2	630.113	910.890
3	648.006	901.955
4	763.872	913.818

5	777.384	928.564
6	790.981	943.230
7	804.118	958.311
8	817.247	973.398
9	822.754	985.138

Factor of Safety
 *** 1.559 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	621.957	919.000
2	630.113	910.890
3	648.006	901.955
4	763.872	913.818
5	777.384	928.564
6	790.981	943.230
7	804.118	958.311
8	817.247	973.398
9	822.754	985.138

Factor of Safety
 *** 1.559 ***

1

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	621.957	919.000
2	630.113	910.890
3	648.006	901.955
4	763.872	913.818
5	777.384	928.564
6	790.981	943.230
7	804.118	958.311
8	817.247	973.398
9	822.754	985.138

Factor of Safety
 *** 1.559 ***

Failure Surface Specified By 9 Coordinate Points

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

1	621.957	919.000
2	630.113	910.890
3	648.006	901.955
4	763.872	913.818
5	777.384	928.564
6	790.981	943.230
7	804.118	958.311
8	817.247	973.398
9	822.754	985.138

Factor of Safety
 *** 1.559 ***

1

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	621.957	919.000
2	630.113	910.890
3	648.006	901.955
4	763.872	913.818
5	777.384	928.564
6	790.981	943.230
7	804.118	958.311
8	817.247	973.398
9	822.754	985.138

Factor of Safety
 *** 1.559 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	621.957	919.000
2	630.113	910.890
3	648.006	901.955
4	763.872	913.818
5	777.384	928.564
6	790.981	943.230
7	804.118	958.311
8	817.247	973.398
9	822.754	985.138

Factor of Safety
 *** 1.559 ***

1

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	621.957	919.000
2	630.113	910.890
3	648.006	901.955
4	763.872	913.818
5	777.384	928.564
6	790.981	943.230
7	804.118	958.311
8	817.247	973.398
9	822.754	985.138

Factor of Safety
 *** 1.559 ***

Failure Surface Specified By 9 Coordinate Points

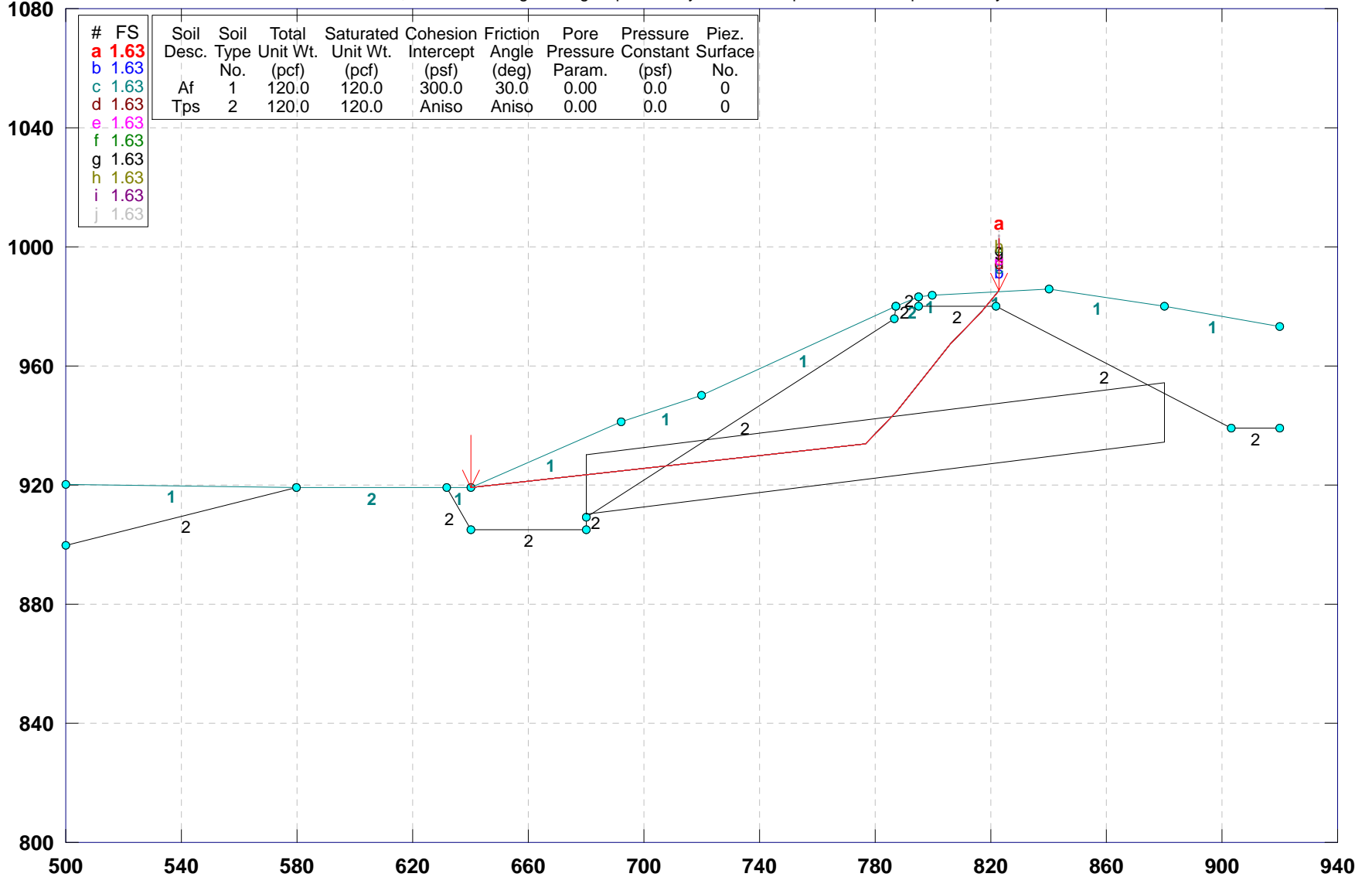
Point No.	X-Surf (ft)	Y-Surf (ft)
1	621.957	919.000
2	630.113	910.890
3	648.006	901.955
4	763.872	913.818
5	777.384	928.564
6	790.981	943.230
7	804.118	958.311
8	817.247	973.398
9	822.754	985.138

Factor of Safety
 *** 1.559 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / C-C' / Upper Slope / Behind Keyway

z:\2018\18184-01 diamond star associates, inc. - el toro\engineering\slope stability\2019_07_report files\xcuk3.pl2 Run By: LGC Geotechnical 7/11/2019 03:15PM

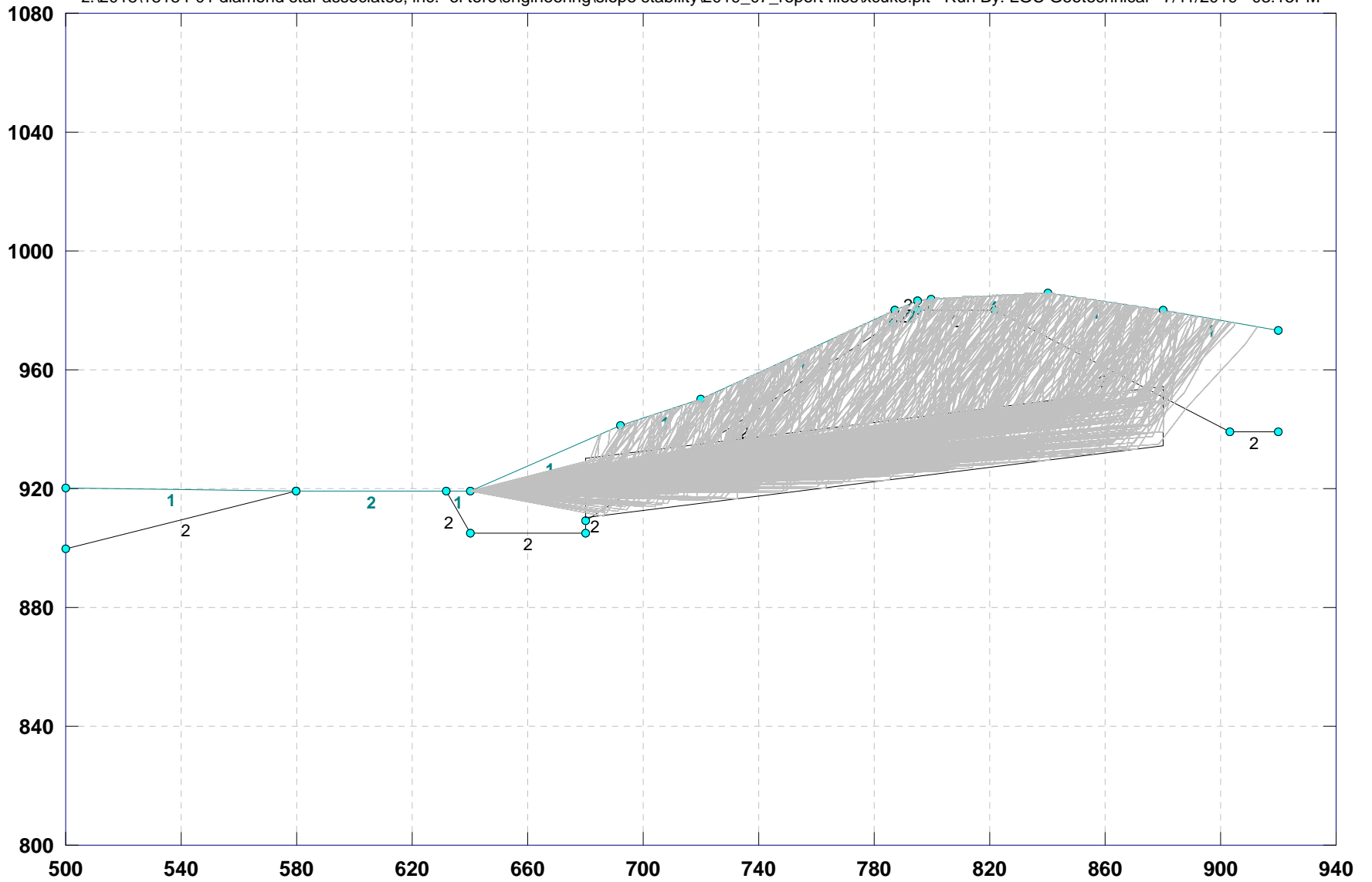


GSTABL7 v.2 FSmin=1.63

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / C-C' / Upper Slope / Behind Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xcuk3.plt Run By: LGC Geotechnical 7/11/2019 03:15PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/11/2019
Time of Run: 03:15PM
Run By: LGC
Geotechnical

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcuk3.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcuk3.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcuk3.PLT

PROBLEM DESCRIPTION: 18184-01 / C-C' / Upper Slope / Behind
Keyway

BOUNDARY COORDINATES

11 Top Boundaries
21 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	500.00	920.00	580.00	919.00	1
2	580.00	919.00	632.00	919.00	2
3	632.00	919.00	640.00	919.00	1
4	640.00	919.00	692.00	941.00	1
5	692.00	941.00	720.00	950.00	1
6	720.00	950.00	787.00	980.00	1
7	787.00	980.00	795.00	983.00	2

8	795.00	983.00	800.00	984.00	1
9	800.00	984.00	840.00	986.00	1
10	840.00	986.00	880.00	980.00	1
11	880.00	980.00	920.00	973.00	1
12	500.00	900.00	580.00	919.00	2
13	632.00	919.00	640.00	905.00	2
14	640.00	905.00	680.00	905.00	2
15	680.00	905.00	680.02	909.00	2
16	680.02	909.00	786.90	976.00	2
17	786.90	976.00	787.00	980.00	2
18	795.00	983.00	795.10	980.00	2
19	795.10	980.00	822.00	980.00	2
20	822.00	980.00	903.00	939.00	2
21	903.00	939.00	920.00	939.00	2

User Specified Y-Origin = 800.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

2 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	-4.0	300.00	30.00
2	7.0	0.00	15.00
3	90.0	300.00	30.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

Janbus Empirical Coef is being used for the case of c & phi both > 0

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 15.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	640.00	919.00	640.00	919.00	0.00
2	680.00	920.00	880.00	944.60	20.00

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined By The Following 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.00	919.00
2	687.36	917.47
3	687.43	932.47
4	694.43	941.78

Factor of Safety for the Preceding Surface is Between 38.985 and 38.851

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined By The Following 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.00	919.00
2	687.36	917.47
3	687.43	932.47
4	694.43	941.78

Factor of Safety for the Preceding Surface is Between 38.985 and 38.851

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.00	919.00
2	687.36	917.47
3	687.43	932.47
4	694.43	941.78

Factor of Safety for the Preceding Surface is Between 38.985 and 38.851

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.00	919.00
2	687.36	917.47
3	687.43	932.47
4	694.43	941.78

Factor of Safety for the Preceding Surface is Between 38.985 and 38.851

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.00	919.00
2	687.36	917.47
3	687.43	932.47
4	694.43	941.78

Factor of Safety for the Preceding Surface is Between 38.985 and 38.851

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.00	919.00
2	687.36	917.47
3	687.43	932.47
4	694.43	941.78

Factor of Safety for the Preceding Surface is Between 38.985 and 38.851

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined By The Following 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.00	919.00
2	687.36	917.47
3	687.43	932.47
4	694.43	941.78

Factor of Safety for the Preceding Surface is Between 38.985 and 38.851

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined By The Following 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.00	919.00
2	687.36	917.47
3	687.43	932.47
4	694.43	941.78

Factor of Safety for the Preceding Surface is Between 38.985 and 38.851

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined By The Following 4 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.00	919.00
2	687.36	917.47
3	687.43	932.47

Factor of Safety for the Preceding Surface is Between 38.985 and 38.851

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

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

Total Number of Trial Surfaces Attempted = 4999

WARNING! The Factor of Safety Calculation for one or More Trial Surfaces Did Not Converge in 20 Iterations.

Number of Trial Surfaces with Non-Converged FS = 9

Number of Trial Surfaces With Valid FS = 4990

Percentage of Trial Surfaces With Non-Valid FS Solutions of the Total Attempted = 0.2 %

Statistical Data On All Valid FS Values:

FS Max = 12.705 FS Min = 1.625 FS Ave = 2.689
 Standard Deviation = 0.961 Coefficient of Variation = 35.73 %

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.000	919.000
2	776.570	933.630
3	787.069	944.343
4	796.735	955.813
5	806.178	967.468
6	816.781	978.078
7	822.719	985.136

Factor of Safety
 *** 1.625 ***

Individual data on the 15 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	Surcharge Load (lbs)
1	52.0	51260.2	0.0	0.0	0.	0.	0.0	0.0	0.0
2	15.5	33668.2	0.0	0.0	0.	0.	0.0	0.0	0.0
3	12.5	31616.2	0.0	0.0	0.	0.	0.0	0.0	0.0

4	56.6	217669.8	0.0	0.0	0.	0.	0.0	0.0	0.0
5	10.3	48026.3	0.0	0.0	0.	0.	0.0	0.0	0.0
6	0.1	429.0	0.0	0.0	0.	0.	0.0	0.0	0.0
7	0.1	296.0	0.0	0.0	0.	0.	0.0	0.0	0.0
8	7.9	30896.9	0.0	0.0	0.	0.	0.0	0.0	0.0
9	0.1	350.3	0.0	0.0	0.	0.	0.0	0.0	0.0
10	1.6	5560.9	0.0	0.0	0.	0.	0.0	0.0	0.0
11	3.3	10126.1	0.0	0.0	0.	0.	0.0	0.0	0.0
12	6.2	15197.5	0.0	0.0	0.	0.	0.0	0.0	0.0
13	10.6	15016.0	0.0	0.0	0.	0.	0.0	0.0	0.0
14	1.6	1133.4	0.0	0.0	0.	0.	0.0	0.0	0.0
15	4.3	1275.3	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.000	919.000
2	776.570	933.630
3	787.069	944.343
4	796.735	955.813
5	806.178	967.468
6	816.781	978.078
7	822.719	985.136

Factor of Safety
 *** 1.625 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.000	919.000
2	776.570	933.630
3	787.069	944.343
4	796.735	955.813
5	806.178	967.468
6	816.781	978.078
7	822.719	985.136

Factor of Safety
 *** 1.625 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.000	919.000
2	776.570	933.630
3	787.069	944.343
4	796.735	955.813

5	806.178	967.468
6	816.781	978.078
7	822.719	985.136

Factor of Safety
*** 1.625 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.000	919.000
2	776.570	933.630
3	787.069	944.343
4	796.735	955.813
5	806.178	967.468
6	816.781	978.078
7	822.719	985.136

Factor of Safety
*** 1.625 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.000	919.000
2	776.570	933.630
3	787.069	944.343
4	796.735	955.813
5	806.178	967.468
6	816.781	978.078
7	822.719	985.136

Factor of Safety
*** 1.625 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.000	919.000
2	776.570	933.630
3	787.069	944.343
4	796.735	955.813
5	806.178	967.468

6	816.781	978.078
7	822.719	985.136

Factor of Safety
*** 1.625 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.000	919.000
2	776.570	933.630
3	787.069	944.343
4	796.735	955.813
5	806.178	967.468
6	816.781	978.078
7	822.719	985.136

Factor of Safety
*** 1.625 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.000	919.000
2	776.570	933.630
3	787.069	944.343
4	796.735	955.813
5	806.178	967.468
6	816.781	978.078
7	822.719	985.136

Factor of Safety
*** 1.625 ***

Failure Surface Specified By 7 Coordinate Points

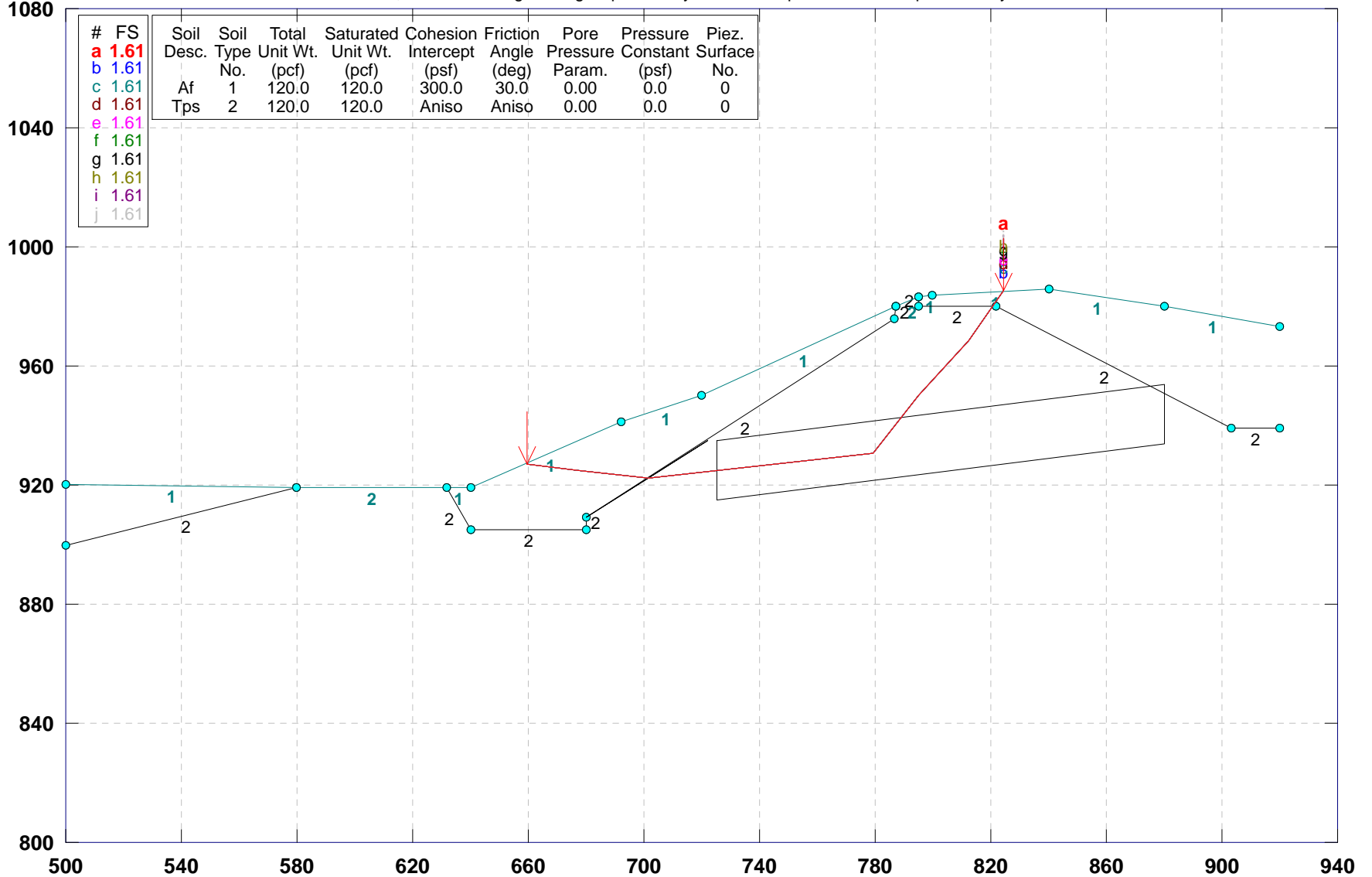
Point No.	X-Surf (ft)	Y-Surf (ft)
1	640.000	919.000
2	776.570	933.630
3	787.069	944.343
4	796.735	955.813
5	806.178	967.468
6	816.781	978.078
7	822.719	985.136

Factor of Safety
*** 1.625 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / C-C' / Upper Slope / Behind Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xcuk3b.pl2 Run By: LGC Geotechnical 7/11/2019 03:20PM

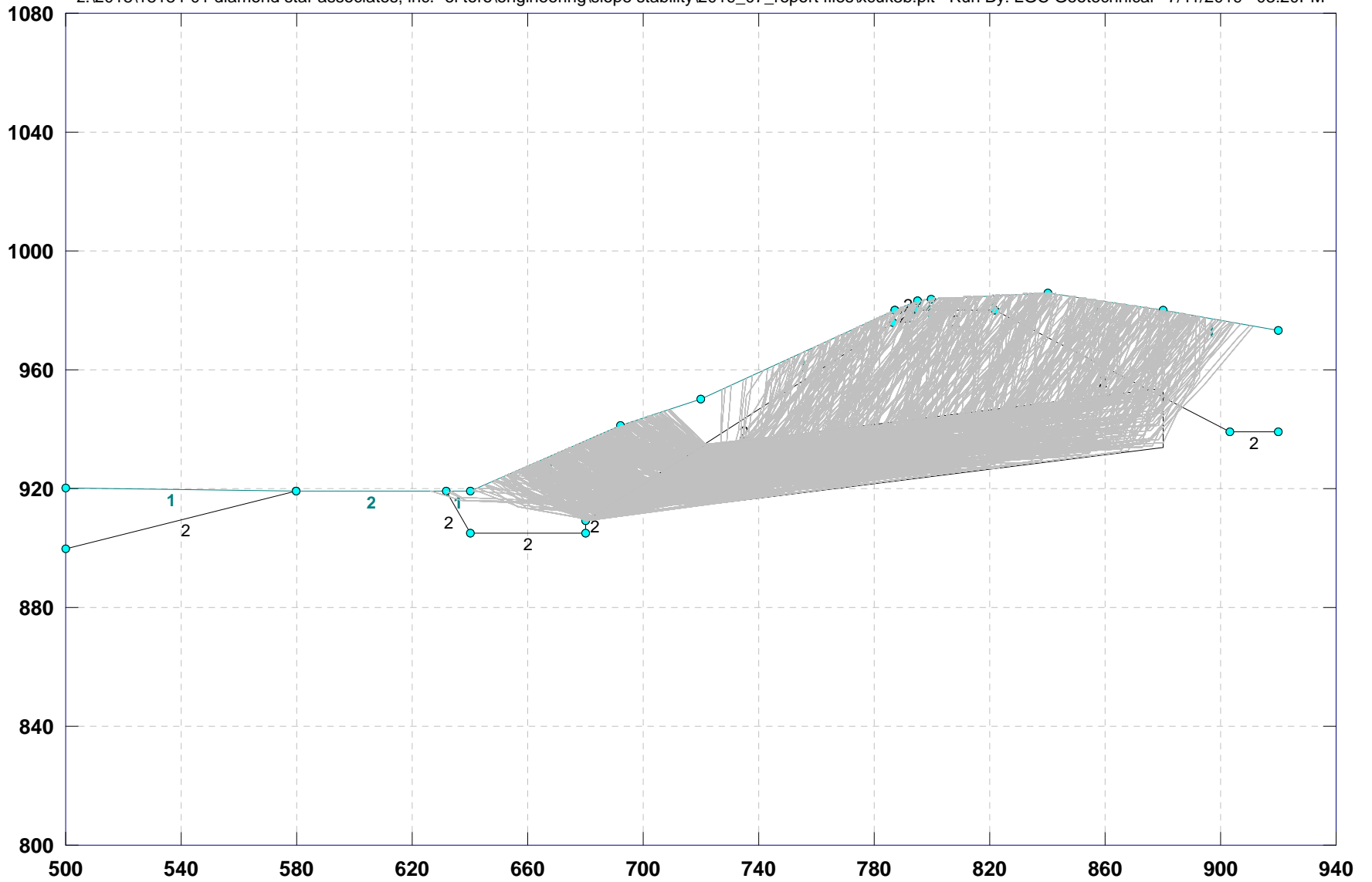


GSTABL7 v.2 FSmin=1.61

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / C-C' / Upper Slope / Behind Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xcuk3b.plt Run By: LGC Geotechnical 7/11/2019 03:20PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/11/2019
Time of Run: 03:20PM
Run By: LGC
Geotechnical

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcuk3b.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcuk3b.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcuk3b.PLT

PROBLEM DESCRIPTION: 18184-01 / C-C' / Upper Slope / Behind
Keyway

BOUNDARY COORDINATES

11 Top Boundaries
21 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	500.00	920.00	580.00	919.00	1
2	580.00	919.00	632.00	919.00	2
3	632.00	919.00	640.00	919.00	1
4	640.00	919.00	692.00	941.00	1
5	692.00	941.00	720.00	950.00	1
6	720.00	950.00	787.00	980.00	1
7	787.00	980.00	795.00	983.00	2

8	795.00	983.00	800.00	984.00	1
9	800.00	984.00	840.00	986.00	1
10	840.00	986.00	880.00	980.00	1
11	880.00	980.00	920.00	973.00	1
12	500.00	900.00	580.00	919.00	2
13	632.00	919.00	640.00	905.00	2
14	640.00	905.00	680.00	905.00	2
15	680.00	905.00	680.02	909.00	2
16	680.02	909.00	786.90	976.00	2
17	786.90	976.00	787.00	980.00	2
18	795.00	983.00	795.10	980.00	2
19	795.10	980.00	822.00	980.00	2
20	822.00	980.00	903.00	939.00	2
21	903.00	939.00	920.00	939.00	2

User Specified Y-Origin = 800.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

2 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	-4.0	300.00	30.00
2	7.0	0.00	15.00
3	90.0	300.00	30.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

Janbus Empirical Coef is being used for the case of c & phi both > 0

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 25.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	680.00	909.00	722.00	935.00	0.00
2	725.00	925.00	880.00	944.00	20.00

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	703.68	944.75
2	718.10	932.59
3	818.61	927.21
4	818.72	952.21
5	833.74	972.19
6	840.33	985.95

Factor of Safety for the Preceding Surface is Between 9.832 and 9.803

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	703.68	944.75
2	718.10	932.59
3	818.61	927.21
4	818.72	952.21
5	833.74	972.19
6	840.33	985.95

Factor of Safety for the Preceding Surface is Between 9.832 and 9.803

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	703.68	944.75
2	718.10	932.59
3	818.61	927.21
4	818.72	952.21
5	833.74	972.19
6	840.33	985.95

Factor of Safety for the Preceding Surface is Between 9.832 and 9.803

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	703.68	944.75
2	718.10	932.59
3	818.61	927.21
4	818.72	952.21
5	833.74	972.19
6	840.33	985.95

Factor of Safety for the Preceding Surface is Between 9.832 and 9.803

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	703.68	944.75
2	718.10	932.59
3	818.61	927.21
4	818.72	952.21
5	833.74	972.19
6	840.33	985.95

Factor of Safety for the Preceding Surface is Between 9.832 and 9.803

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	703.68	944.75
2	718.10	932.59
3	818.61	927.21
4	818.72	952.21
5	833.74	972.19
6	840.33	985.95

Factor of Safety for the Preceding Surface is Between 9.832 and 9.803

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	703.68	944.75
2	718.10	932.59
3	818.61	927.21
4	818.72	952.21
5	833.74	972.19
6	840.33	985.95

Factor of Safety for the Preceding Surface is Between 9.832 and 9.803

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	703.68	944.75
2	718.10	932.59
3	818.61	927.21
4	818.72	952.21
5	833.74	972.19
6	840.33	985.95

Factor of Safety for the Preceding Surface is Between 9.832 and 9.803

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	703.68	944.75
2	718.10	932.59
3	818.61	927.21
4	818.72	952.21
5	833.74	972.19
6	840.33	985.95

Factor of Safety for the Preceding Surface is Between 9.832 and 9.803

WARNING! The factor of safety calculation did not converge in 20 iterations.

The Trial Failure Surface In Question Is Defined
By The Following 6 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	703.68	944.75
2	718.10	932.59
3	818.61	927.21
4	818.72	952.21
5	833.74	972.19
6	840.33	985.95

Factor of Safety for the Preceding Surface is Between 9.832 and 9.803

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

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

Total Number of Trial Surfaces Attempted = 4999

WARNING! The Factor of Safety Calculation for one or More Trial Surfaces
Did Not Converge in 20 Iterations.

Number of Trial Surfaces with Non-Converged FS = 10

Number of Trial Surfaces With Valid FS = 4989

Percentage of Trial Surfaces With Non-Valid FS Solutions
of the Total Attempted = 0.2 %

Statistical Data On All Valid FS Values:

FS Max = 23.785 FS Min = 1.609 FS Ave = 2.992
Standard Deviation = 1.362 Coefficient of Variation = 45.54 %

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	659.372	927.196
2	676.818	925.096
3	701.674	922.417
4	779.180	930.922
5	795.093	950.204
6	812.364	968.279
7	824.600	985.230

Factor of Safety
*** 1.609 ***

Individual data on the 15 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	Surcharge Load (lbs)
1	17.4	9923.6	0.0	0.0	0.	0.	0.0	0.0	0.0
2	15.2	24613.2	0.0	0.0	0.	0.	0.0	0.0	0.0
3	9.5	22217.1	0.0	0.0	0.	0.	0.0	0.0	0.0
4	0.2	555.2	0.0	0.0	0.	0.	0.0	0.0	0.0
5	18.3	51969.0	0.0	0.0	0.	0.	0.0	0.0	0.0
6	59.2	252631.7	0.0	0.0	0.	0.	0.0	0.0	0.0
7	7.7	39490.0	0.0	0.0	0.	0.	0.0	0.0	0.0
8	0.1	475.6	0.0	0.0	0.	0.	0.0	0.0	0.0
9	8.0	34805.0	0.0	0.0	0.	0.	0.0	0.0	0.0
10	0.1	366.1	0.0	0.0	0.	0.	0.0	0.0	0.0
11	0.0	28.1	0.0	0.0	0.	0.	0.0	0.0	0.0
12	4.9	18072.0	0.0	0.0	0.	0.	0.0	0.0	0.0
13	12.4	33383.4	0.0	0.0	0.	0.	0.0	0.0	0.0
14	8.5	10853.5	0.0	0.0	0.	0.	0.0	0.0	0.0
15	3.8	1141.9	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	659.372	927.196
2	676.818	925.096
3	701.674	922.417
4	779.180	930.922
5	795.093	950.204
6	812.364	968.279
7	824.600	985.230

Factor of Safety
*** 1.609 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	659.372	927.196
2	676.818	925.096
3	701.674	922.417
4	779.180	930.922
5	795.093	950.204
6	812.364	968.279
7	824.600	985.230

Factor of Safety
*** 1.609 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	659.372	927.196
2	676.818	925.096
3	701.674	922.417
4	779.180	930.922
5	795.093	950.204
6	812.364	968.279
7	824.600	985.230

Factor of Safety
*** 1.609 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	659.372	927.196
2	676.818	925.096
3	701.674	922.417
4	779.180	930.922
5	795.093	950.204
6	812.364	968.279
7	824.600	985.230

Factor of Safety
*** 1.609 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	659.372	927.196
2	676.818	925.096
3	701.674	922.417
4	779.180	930.922
5	795.093	950.204
6	812.364	968.279
7	824.600	985.230

Factor of Safety
*** 1.609 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	659.372	927.196
2	676.818	925.096
3	701.674	922.417
4	779.180	930.922
5	795.093	950.204
6	812.364	968.279
7	824.600	985.230

Factor of Safety
*** 1.609 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	659.372	927.196
2	676.818	925.096
3	701.674	922.417
4	779.180	930.922
5	795.093	950.204
6	812.364	968.279
7	824.600	985.230

Factor of Safety

*** 1.609 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	659.372	927.196
2	676.818	925.096
3	701.674	922.417
4	779.180	930.922
5	795.093	950.204
6	812.364	968.279
7	824.600	985.230

Factor of Safety
*** 1.609 ***

Failure Surface Specified By 7 Coordinate Points

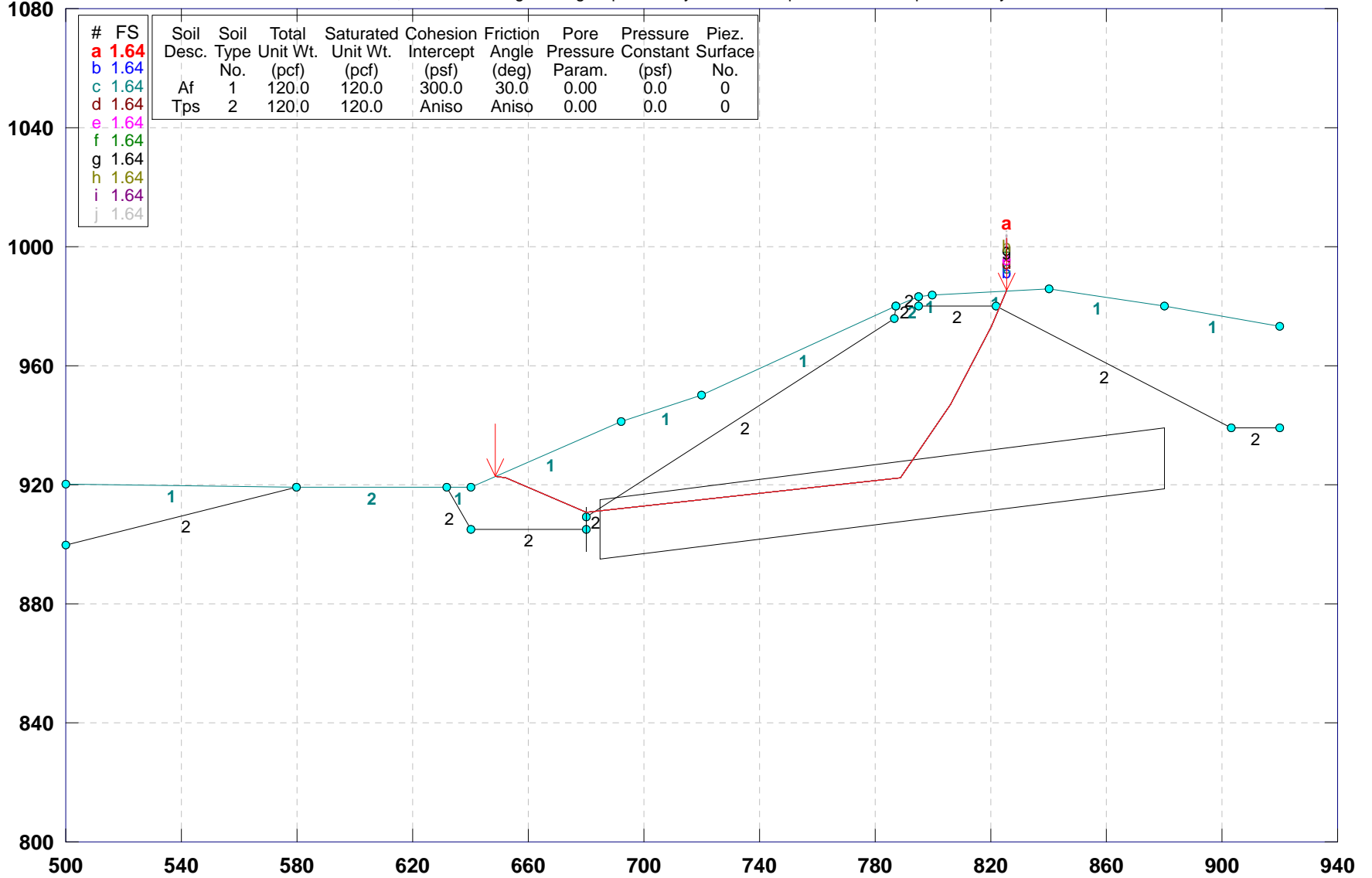
Point No.	X-Surf (ft)	Y-Surf (ft)
1	659.372	927.196
2	676.818	925.096
3	701.674	922.417
4	779.180	930.922
5	795.093	950.204
6	812.364	968.279
7	824.600	985.230

Factor of Safety
*** 1.609 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / C-C' / Upper Slope / Behind Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xcuk3c.pl2 Run By: LGC Geotechnical 7/11/2019 03:24PM

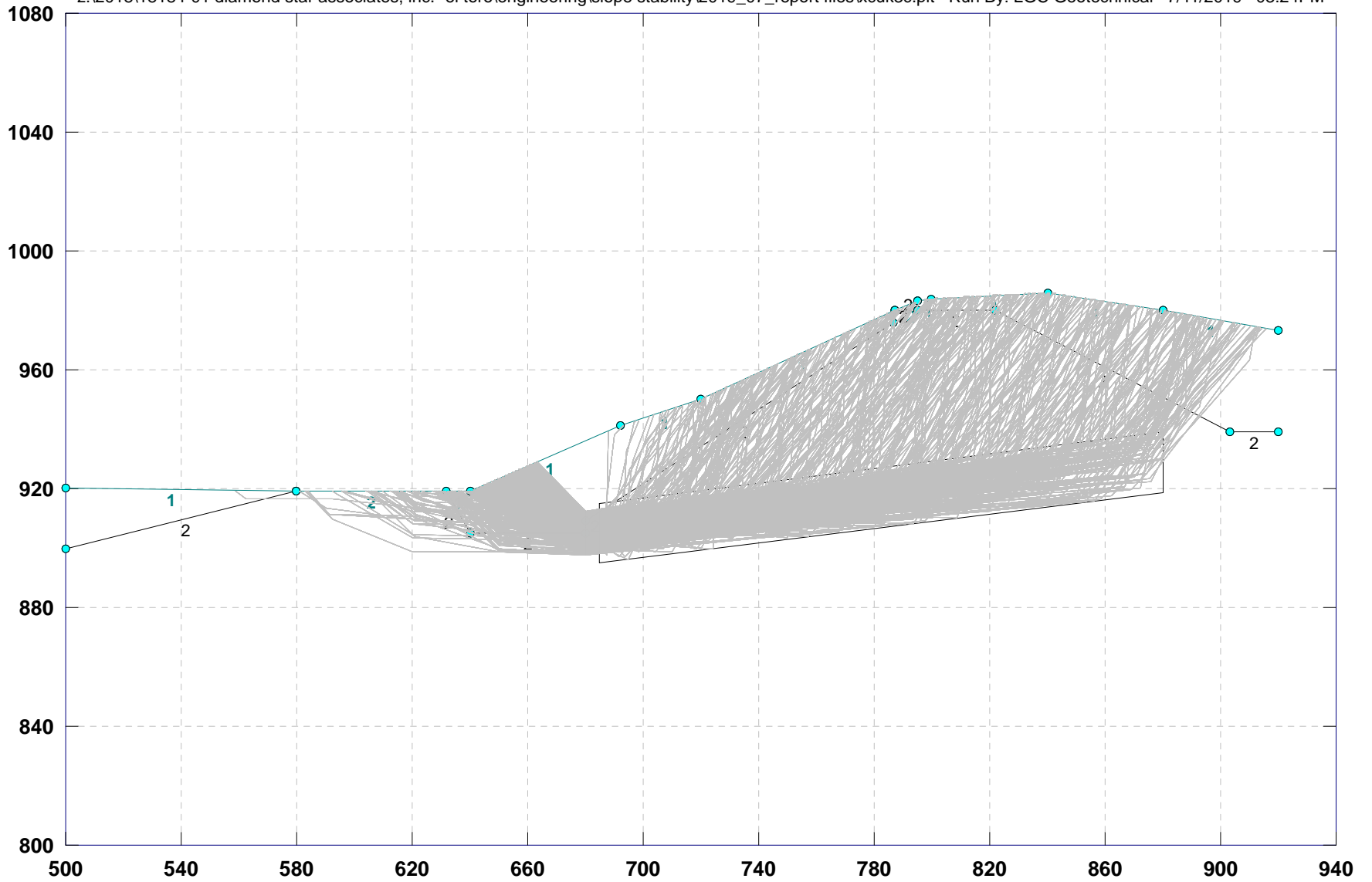


GSTABL7 v.2 FSmin=1.64

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / C-C' / Upper Slope / Behind Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xcuk3c.plt Run By: LGC Geotechnical 7/11/2019 03:24PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/11/2019
Time of Run: 03:24PM
Run By: LGC
Geotechnical

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcuk3c.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcuk3c.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcuk3c.PLT

PROBLEM DESCRIPTION: 18184-01 / C-C' / Upper Slope / Behind
Keyway

BOUNDARY COORDINATES

11 Top Boundaries
21 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	500.00	920.00	580.00	919.00	1
2	580.00	919.00	632.00	919.00	2
3	632.00	919.00	640.00	919.00	1
4	640.00	919.00	692.00	941.00	1
5	692.00	941.00	720.00	950.00	1
6	720.00	950.00	787.00	980.00	1
7	787.00	980.00	795.00	983.00	2

8	795.00	983.00	800.00	984.00	1
9	800.00	984.00	840.00	986.00	1
10	840.00	986.00	880.00	980.00	1
11	880.00	980.00	920.00	973.00	1
12	500.00	900.00	580.00	919.00	2
13	632.00	919.00	640.00	905.00	2
14	640.00	905.00	680.00	905.00	2
15	680.00	905.00	680.02	909.00	2
16	680.02	909.00	786.90	976.00	2
17	786.90	976.00	787.00	980.00	2
18	795.00	983.00	795.10	980.00	2
19	795.10	980.00	822.00	980.00	2
20	822.00	980.00	903.00	939.00	2
21	903.00	939.00	920.00	939.00	2

User Specified Y-Origin = 800.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

2 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	-4.0	300.00	30.00
2	7.0	0.00	15.00
3	90.0	300.00	30.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

Janbus Empirical Coef is being used for the case of c & phi both > 0

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 30.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	680.00	905.00	680.10	905.00	15.00
2	685.00	905.00	880.00	928.90	20.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 12.984 FS Min = 1.641 FS Ave = 3.072
Standard Deviation = 1.285 Coefficient of Variation = 41.83 %

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	648.677	922.671
2	652.377	922.120
3	680.086	910.620
4	788.963	922.258
5	806.202	946.810
6	820.165	973.362
7	825.729	985.286

Factor of Safety
*** 1.641 ***

Individual data on the 16 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	3.7	469.9	0.0	0.0	0.	0.	0.0	0.0	0.0
2	27.7	45644.2	0.0	0.0	0.	0.	0.0	0.0	0.0
3	3.0	9410.2	0.0	0.0	0.	0.	0.0	0.0	0.0
4	8.9	29510.7	0.0	0.0	0.	0.	0.0	0.0	0.0
5	28.0	107888.9	0.0	0.0	0.	0.	0.0	0.0	0.0
6	66.9	373429.1	0.0	0.0	0.	0.	0.0	0.0	0.0
7	0.1	695.1	0.0	0.0	0.	0.	0.0	0.0	0.0
8	2.0	13711.2	0.0	0.0	0.	0.	0.0	0.0	0.0
9	6.0	40071.6	0.0	0.0	0.	0.	0.0	0.0	0.0
10	0.1	624.8	0.0	0.0	0.	0.	0.0	0.0	0.0
11	4.9	28825.1	0.0	0.0	0.	0.	0.0	0.0	0.0
12	6.2	31078.5	0.0	0.0	0.	0.	0.0	0.0	0.0
13	14.0	41175.8	0.0	0.0	0.	0.	0.0	0.0	0.0
14	1.8	2141.3	0.0	0.0	0.	0.	0.0	0.0	0.0
15	1.0	825.7	0.0	0.0	0.	0.	0.0	0.0	0.0
16	2.7	920.9	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	648.677	922.671
2	652.377	922.120
3	680.086	910.620
4	788.963	922.258
5	806.202	946.810
6	820.165	973.362
7	825.729	985.286

Factor of Safety
 *** 1.641 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	648.677	922.671
2	652.377	922.120
3	680.086	910.620
4	788.963	922.258
5	806.202	946.810
6	820.165	973.362
7	825.729	985.286

Factor of Safety
 *** 1.641 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	648.677	922.671
2	652.377	922.120
3	680.086	910.620
4	788.963	922.258
5	806.202	946.810
6	820.165	973.362
7	825.729	985.286

Factor of Safety
*** 1.641 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	648.677	922.671
2	652.377	922.120
3	680.086	910.620
4	788.963	922.258
5	806.202	946.810
6	820.165	973.362
7	825.729	985.286

Factor of Safety
*** 1.641 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	648.677	922.671
2	652.377	922.120
3	680.086	910.620
4	788.963	922.258
5	806.202	946.810
6	820.165	973.362
7	825.729	985.286

Factor of Safety
*** 1.641 ***

1

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	648.677	922.671
2	652.377	922.120
3	680.086	910.620
4	788.963	922.258
5	806.202	946.810
6	820.165	973.362
7	825.729	985.286

Factor of Safety
 *** 1.641 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	648.677	922.671
2	652.377	922.120
3	680.086	910.620
4	788.963	922.258
5	806.202	946.810
6	820.165	973.362
7	825.729	985.286

Factor of Safety
 *** 1.641 ***

Failure Surface Specified By 7 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	648.677	922.671
2	652.377	922.120
3	680.086	910.620
4	788.963	922.258
5	806.202	946.810
6	820.165	973.362
7	825.729	985.286

Factor of Safety
 *** 1.641 ***

Failure Surface Specified By 7 Coordinate Points

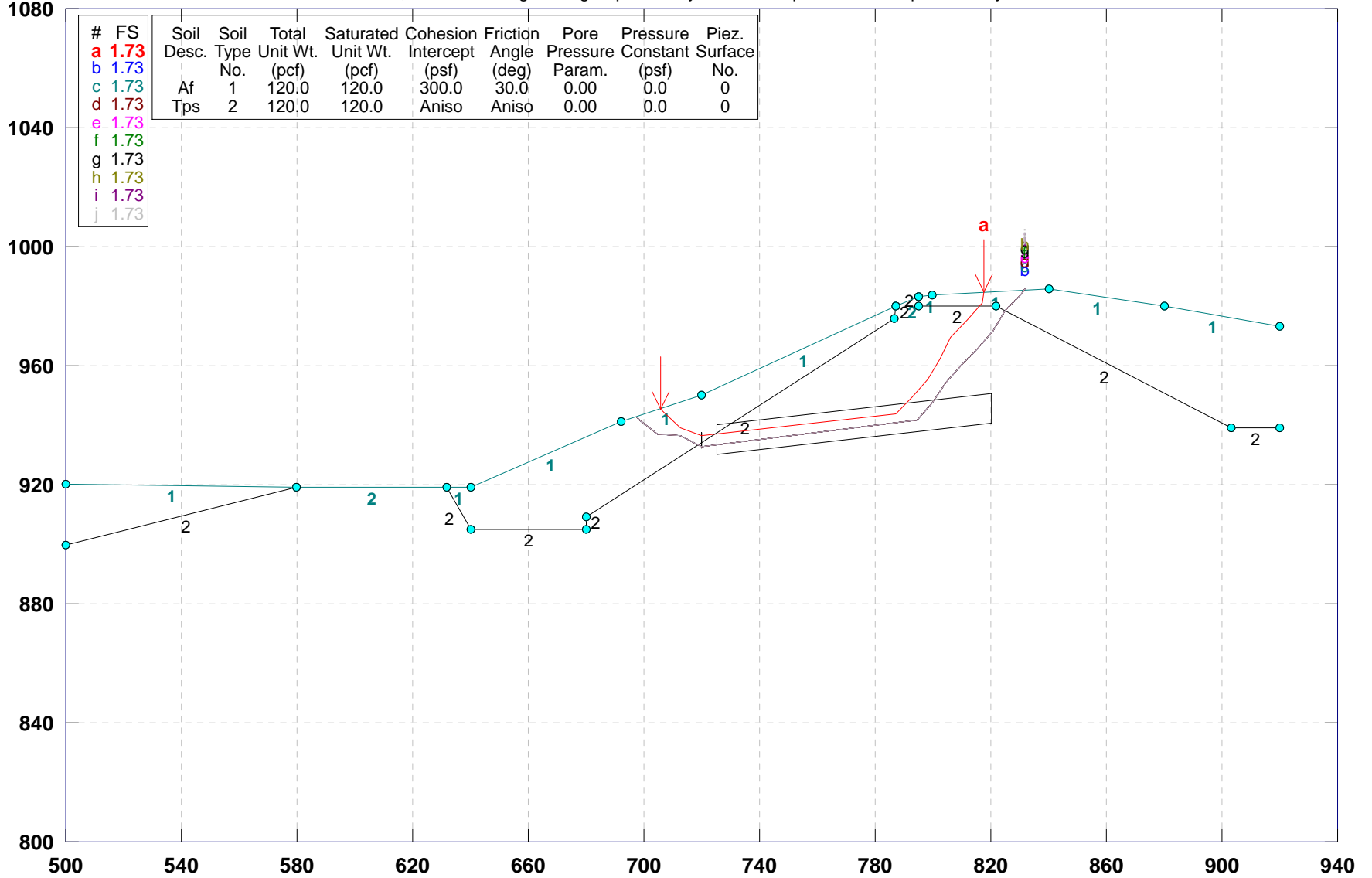
Point No.	X-Surf (ft)	Y-Surf (ft)
1	648.677	922.671
2	652.377	922.120
3	680.086	910.620
4	788.963	922.258
5	806.202	946.810
6	820.165	973.362
7	825.729	985.286

Factor of Safety
*** 1.641 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / C-C' / Upper Slope / Upper Clay Search

z:\2018\18184-01 diamond star associates, inc. - el toro\engineering\slope stability\2019_07_report files\xcuk4.pl2 Run By: LGC Geotechnical 7/11/2019 03:36PM

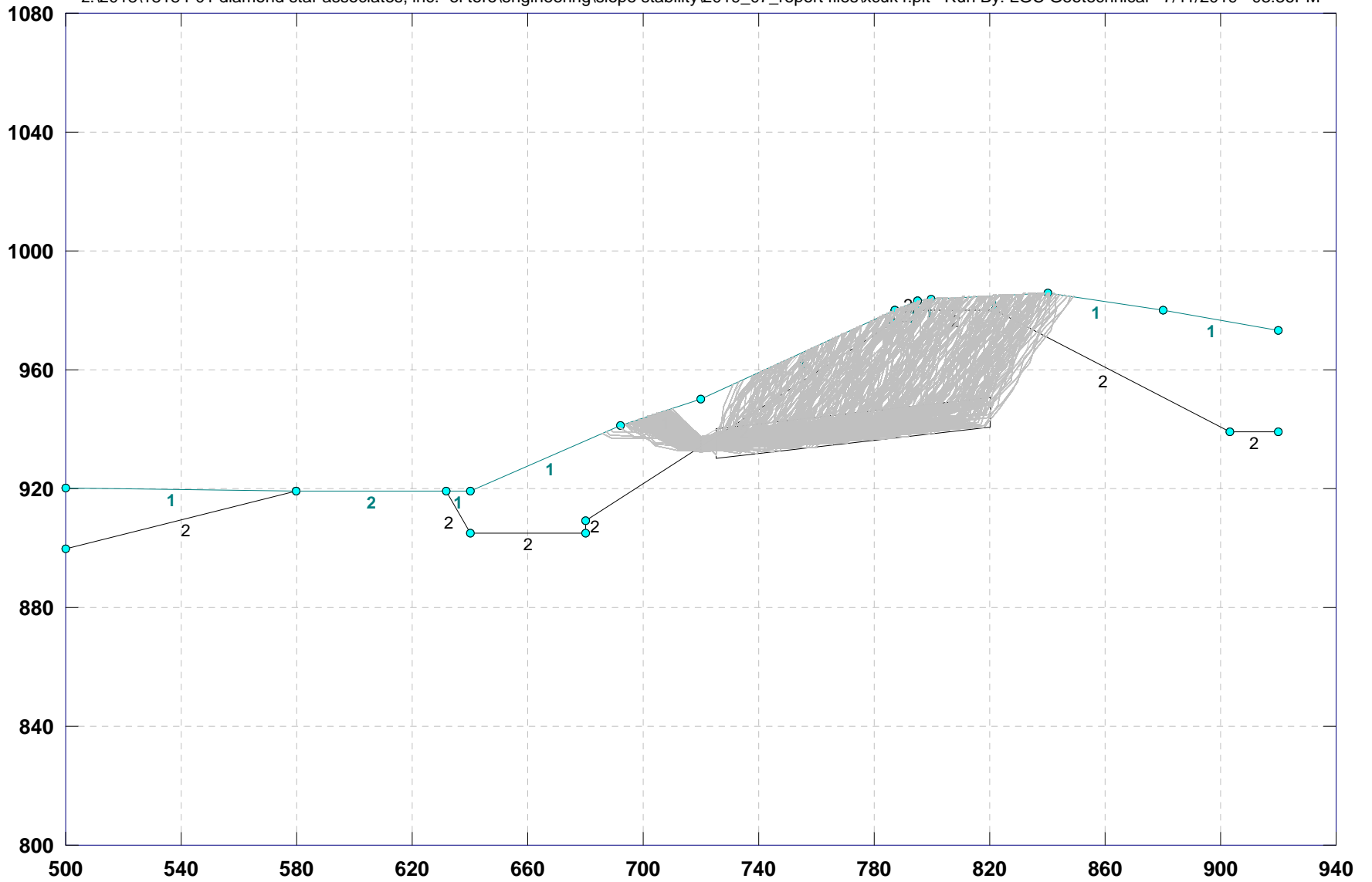


GSTABL7 v.2 FSmin=1.73

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / C-C' / Upper Slope / Upper Clay Search

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xcuk4.plt Run By: LGC Geotechnical 7/11/2019 03:36PM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/11/2019
Time of Run: 03:36PM
Run By: LGC
Geotechnical

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcuk4.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcuk4.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcuk4.PLT

PROBLEM DESCRIPTION: 18184-01 / C-C' / Upper Slope / Upper
Clay Search

BOUNDARY COORDINATES

11 Top Boundaries
21 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	500.00	920.00	580.00	919.00	1
2	580.00	919.00	632.00	919.00	2
3	632.00	919.00	640.00	919.00	1
4	640.00	919.00	692.00	941.00	1
5	692.00	941.00	720.00	950.00	1
6	720.00	950.00	787.00	980.00	1
7	787.00	980.00	795.00	983.00	2

8	795.00	983.00	800.00	984.00	1
9	800.00	984.00	840.00	986.00	1
10	840.00	986.00	880.00	980.00	1
11	880.00	980.00	920.00	973.00	1
12	500.00	900.00	580.00	919.00	2
13	632.00	919.00	640.00	905.00	2
14	640.00	905.00	680.00	905.00	2
15	680.00	905.00	680.02	909.00	2
16	680.02	909.00	786.90	976.00	2
17	786.90	976.00	787.00	980.00	2
18	795.00	983.00	795.10	980.00	2
19	795.10	980.00	822.00	980.00	2
20	822.00	980.00	903.00	939.00	2
21	903.00	939.00	920.00	939.00	2

User Specified Y-Origin = 800.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

2 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	-4.0	300.00	30.00
2	7.0	0.00	15.00
3	90.0	300.00	30.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

Janbus Empirical Coef is being used for the case of c & phi both > 0

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 8.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	720.00	935.00	720.00	935.00	5.00
2	725.00	935.00	820.00	945.70	10.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 14.537 FS Min = 1.727 FS Ave = 2.919
Standard Deviation = 1.297 Coefficient of Variation = 44.43 %

Failure Surface Specified By 12 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	705.794	945.434
2	706.732	944.543
3	712.445	938.943
4	720.000	936.311
5	787.315	943.913
6	792.901	949.639
7	798.456	955.396
8	802.485	962.307
9	806.130	969.429
10	811.778	975.095
11	816.895	981.244
12	817.482	984.874

Factor of Safety
*** 1.727 ***

Individual data on the 18 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	0.9	67.1	0.0	0.0	0.	0.	0.0	0.0	0.0
2	5.7	3366.4	0.0	0.0	0.	0.	0.0	0.0	0.0
3	7.6	10116.0	0.0	0.0	0.	0.	0.0	0.0	0.0
4	4.4	7571.2	0.0	0.0	0.	0.	0.0	0.0	0.0
5	62.5	192241.0	0.0	0.0	0.	0.	0.0	0.0	0.0
6	0.1	433.2	0.0	0.0	0.	0.	0.0	0.0	0.0
7	0.3	1366.0	0.0	0.0	0.	0.	0.0	0.0	0.0
8	5.6	23051.9	0.0	0.0	0.	0.	0.0	0.0	0.0
9	2.1	8030.7	0.0	0.0	0.	0.	0.0	0.0	0.0
10	0.1	373.6	0.0	0.0	0.	0.	0.0	0.0	0.0
11	3.4	11960.2	0.0	0.0	0.	0.	0.0	0.0	0.0
12	1.5	5025.8	0.0	0.0	0.	0.	0.0	0.0	0.0
13	2.5	7123.2	0.0	0.0	0.	0.	0.0	0.0	0.0
14	3.6	8026.0	0.0	0.0	0.	0.	0.0	0.0	0.0
15	5.6	8257.8	0.0	0.0	0.	0.	0.0	0.0	0.0
16	4.1	3499.0	0.0	0.0	0.	0.	0.0	0.0	0.0
17	1.0	521.5	0.0	0.0	0.	0.	0.0	0.0	0.0
18	0.6	126.9	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	697.425	942.744
2	698.682	941.939
3	704.828	936.818
4	712.820	936.451
5	720.000	932.923
6	794.482	941.792
7	800.032	947.553
8	804.325	954.304
9	809.832	960.107
10	815.310	965.938
11	820.634	971.909
12	825.039	978.587
13	830.695	984.244
14	831.989	985.599

Factor of Safety
 *** 1.731 ***

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	697.425	942.744

2	698.682	941.939
3	704.828	936.818
4	712.820	936.451
5	720.000	932.923
6	794.482	941.792
7	800.032	947.553
8	804.325	954.304
9	809.832	960.107
10	815.310	965.938
11	820.634	971.909
12	825.039	978.587
13	830.695	984.244
14	831.989	985.599

Factor of Safety
 *** 1.731 ***

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	697.425	942.744
2	698.682	941.939
3	704.828	936.818
4	712.820	936.451
5	720.000	932.923
6	794.482	941.792
7	800.032	947.553
8	804.325	954.304
9	809.832	960.107
10	815.310	965.938
11	820.634	971.909
12	825.039	978.587
13	830.695	984.244
14	831.989	985.599

Factor of Safety
 *** 1.731 ***

1

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	697.425	942.744
2	698.682	941.939
3	704.828	936.818
4	712.820	936.451
5	720.000	932.923
6	794.482	941.792
7	800.032	947.553
8	804.325	954.304
9	809.832	960.107
10	815.310	965.938

11	820.634	971.909
12	825.039	978.587
13	830.695	984.244
14	831.989	985.599

Factor of Safety
 *** 1.731 ***

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	697.425	942.744
2	698.682	941.939
3	704.828	936.818
4	712.820	936.451
5	720.000	932.923
6	794.482	941.792
7	800.032	947.553
8	804.325	954.304
9	809.832	960.107
10	815.310	965.938
11	820.634	971.909
12	825.039	978.587
13	830.695	984.244
14	831.989	985.599

Factor of Safety
 *** 1.731 ***

1

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	697.425	942.744
2	698.682	941.939
3	704.828	936.818
4	712.820	936.451
5	720.000	932.923
6	794.482	941.792
7	800.032	947.553
8	804.325	954.304
9	809.832	960.107
10	815.310	965.938
11	820.634	971.909
12	825.039	978.587
13	830.695	984.244
14	831.989	985.599

Factor of Safety
 *** 1.731 ***

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	697.425	942.744
2	698.682	941.939
3	704.828	936.818
4	712.820	936.451
5	720.000	932.923
6	794.482	941.792
7	800.032	947.553
8	804.325	954.304
9	809.832	960.107
10	815.310	965.938
11	820.634	971.909
12	825.039	978.587
13	830.695	984.244
14	831.989	985.599

Factor of Safety
*** 1.731 ***

1

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	697.425	942.744
2	698.682	941.939
3	704.828	936.818
4	712.820	936.451
5	720.000	932.923
6	794.482	941.792
7	800.032	947.553
8	804.325	954.304
9	809.832	960.107
10	815.310	965.938
11	820.634	971.909
12	825.039	978.587
13	830.695	984.244
14	831.989	985.599

Factor of Safety
*** 1.731 ***

Failure Surface Specified By 14 Coordinate Points

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

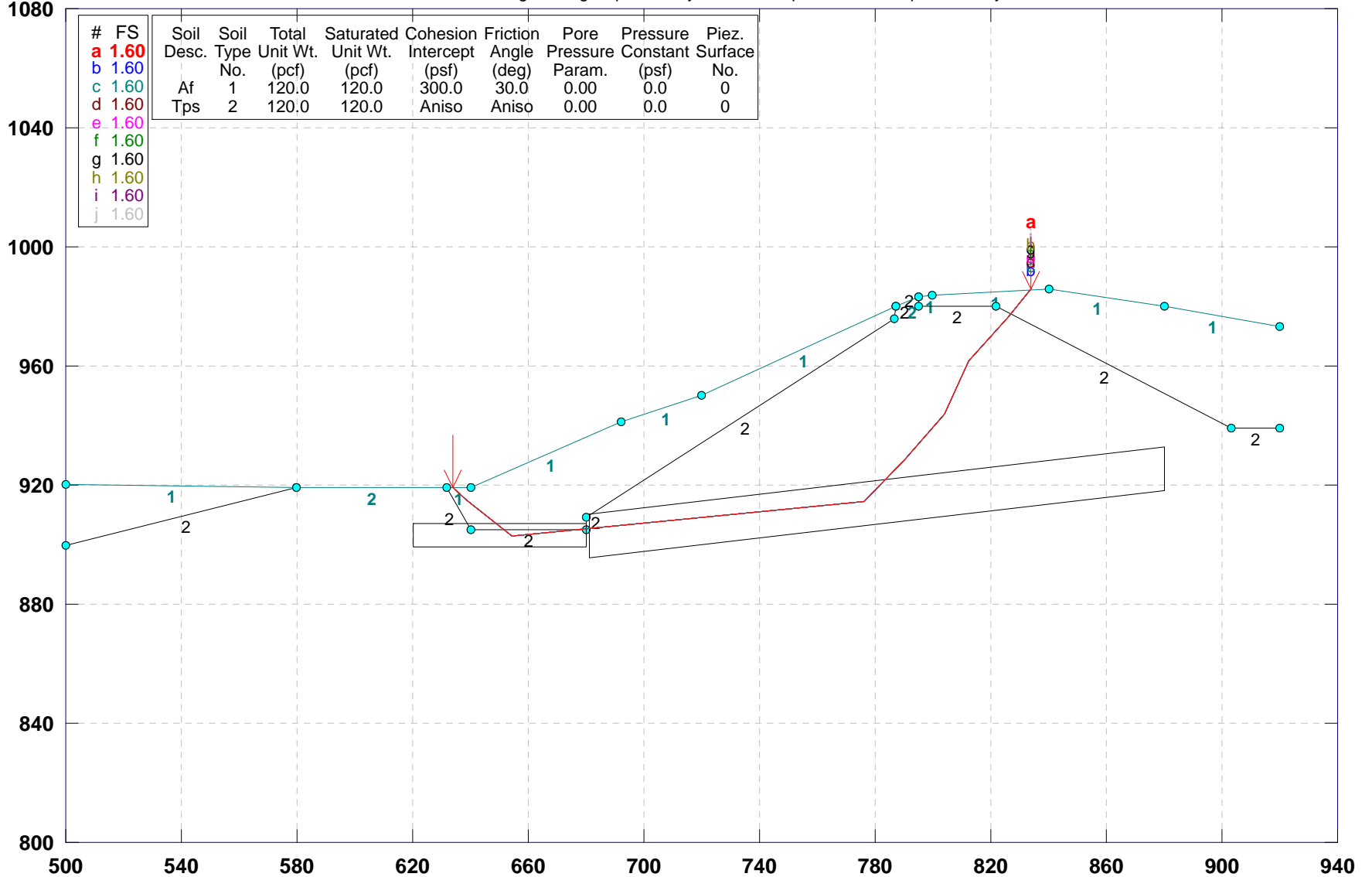
1	697.425	942.744
2	698.682	941.939
3	704.828	936.818
4	712.820	936.451
5	720.000	932.923
6	794.482	941.792
7	800.032	947.553
8	804.325	954.304
9	809.832	960.107
10	815.310	965.938
11	820.634	971.909
12	825.039	978.587
13	830.695	984.244
14	831.989	985.599

Factor of Safety
*** 1.731 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / C-C' / Upper Slope / Below Keyway

z:\2018\18184-01 diamond star associates, inc. - el toro\engineering\slope stability\2019_07_report files\xcukb.pl2 Run By: LGC Geotechnical 7/12/2019 08:37AM

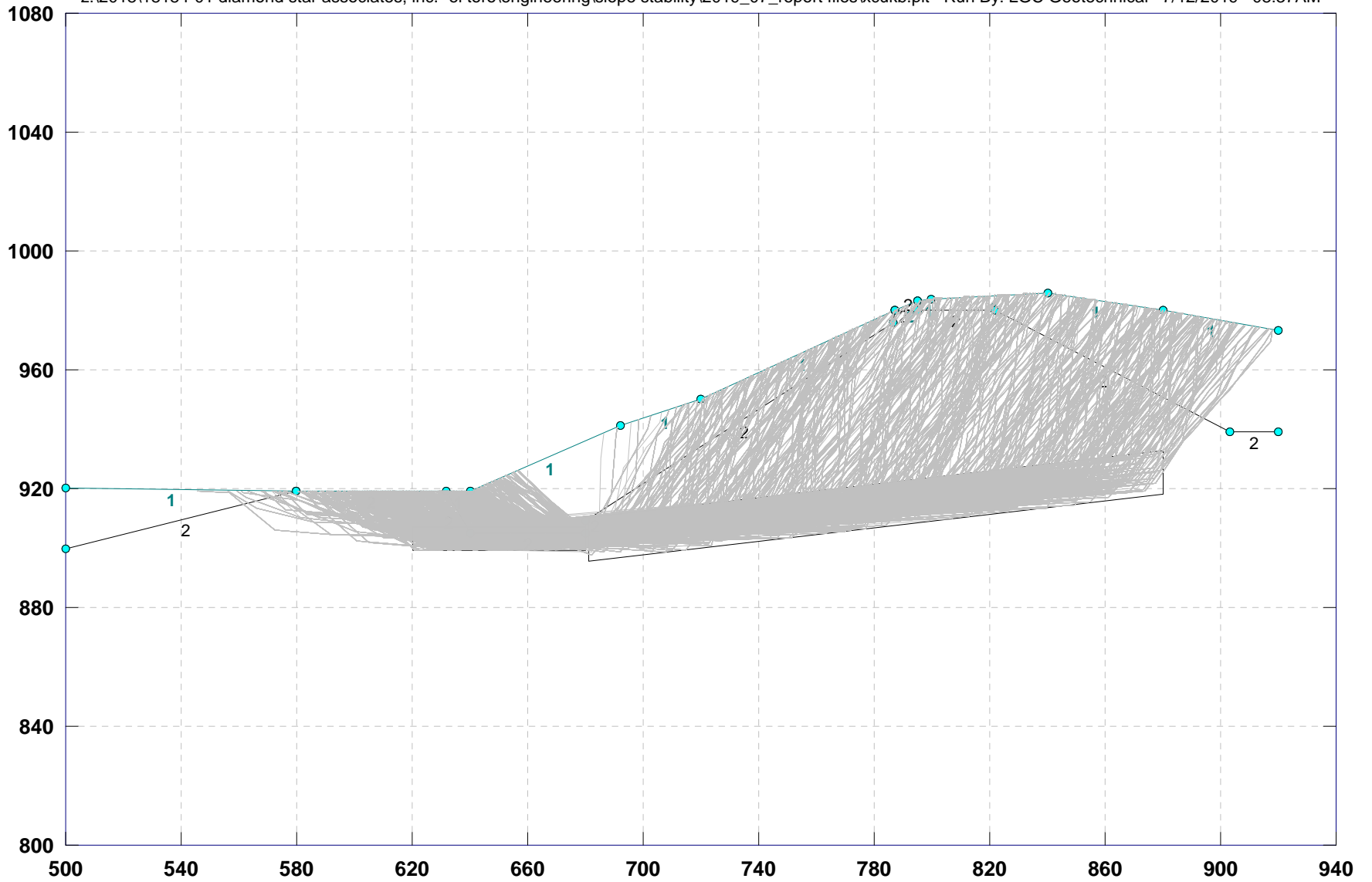


GSTABL7 v.2 FSmin=1.60

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / C-C' / Upper Slope / Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xcukb.plt Run By: LGC Geotechnical 7/12/2019 08:37AM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D., P.E., D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/12/2019
Time of Run: 08:37AM
Run By: LGC
Geotechnical

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcukb.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcukb.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec C\2019_07\Upper
Slope\xcukb.PLT

PROBLEM DESCRIPTION: 18184-01 / C-C' / Upper Slope / Below
Keyway

BOUNDARY COORDINATES

11 Top Boundaries
21 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	500.00	920.00	580.00	919.00	1
2	580.00	919.00	632.00	919.00	2
3	632.00	919.00	640.00	919.00	1
4	640.00	919.00	692.00	941.00	1
5	692.00	941.00	720.00	950.00	1
6	720.00	950.00	787.00	980.00	1
7	787.00	980.00	795.00	983.00	2

8	795.00	983.00	800.00	984.00	1
9	800.00	984.00	840.00	986.00	1
10	840.00	986.00	880.00	980.00	1
11	880.00	980.00	920.00	973.00	1
12	500.00	900.00	580.00	919.00	2
13	632.00	919.00	640.00	905.00	2
14	640.00	905.00	680.00	905.00	2
15	680.00	905.00	680.02	909.00	2
16	680.02	909.00	786.90	976.00	2
17	786.90	976.00	787.00	980.00	2
18	795.00	983.00	795.10	980.00	2
19	795.10	980.00	822.00	980.00	2
20	822.00	980.00	903.00	939.00	2
21	903.00	939.00	920.00	939.00	2

User Specified Y-Origin = 800.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

2 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	-4.0	300.00	30.00
2	7.0	0.00	15.00
3	90.0	300.00	30.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

Janbus Empirical Coef is being used for the case of c & phi both > 0

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

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 20.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	620.00	903.00	680.00	903.00	8.00
2	681.00	903.00	880.00	925.40	15.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 9.321 FS Min = 1.602 FS Ave = 2.491
Standard Deviation = 0.804 Coefficient of Variation = 32.28 %

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	633.923	919.000
2	638.401	914.916
3	654.537	903.099
4	776.407	914.621
5	790.513	928.799
6	803.755	943.787
7	812.193	961.920
8	826.106	976.288
9	833.689	985.684

Factor of Safety
*** 1.602 ***

Individual data on the 22 slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	4.5	1097.5	0.0	0.0	0.	0.	0.0	0.0	0.0
2	1.6	895.9	0.0	0.0	0.	0.	0.0	0.0	0.0
3	11.9	17416.2	0.0	0.0	0.	0.	0.0	0.0	0.0
4	2.6	6401.7	0.0	0.0	0.	0.	0.0	0.0	0.0
5	20.1	61172.7	0.0	0.0	0.	0.	0.0	0.0	0.0
6	5.4	18995.1	0.0	0.0	0.	0.	0.0	0.0	0.0
7	0.0	63.7	0.0	0.0	0.	0.	0.0	0.0	0.0
8	12.0	46565.5	0.0	0.0	0.	0.	0.0	0.0	0.0
9	28.0	126119.4	0.0	0.0	0.	0.	0.0	0.0	0.0
10	56.4	343001.8	0.0	0.0	0.	0.	0.0	0.0	0.0
11	10.5	72670.2	0.0	0.0	0.	0.	0.0	0.0	0.0
12	0.1	657.0	0.0	0.0	0.	0.	0.0	0.0	0.0
13	3.5	22608.4	0.0	0.0	0.	0.	0.0	0.0	0.0
14	4.5	27362.2	0.0	0.0	0.	0.	0.0	0.0	0.0
15	0.1	588.8	0.0	0.0	0.	0.	0.0	0.0	0.0
16	4.9	27487.3	0.0	0.0	0.	0.	0.0	0.0	0.0
17	3.8	19121.9	0.0	0.0	0.	0.	0.0	0.0	0.0
18	8.4	31942.0	0.0	0.0	0.	0.	0.0	0.0	0.0
19	9.8	21030.8	0.0	0.0	0.	0.	0.0	0.0	0.0
20	4.1	5436.9	0.0	0.0	0.	0.	0.0	0.0	0.0
21	0.9	950.5	0.0	0.0	0.	0.	0.0	0.0	0.0
22	6.6	3152.2	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	633.923	919.000
2	638.401	914.916
3	654.537	903.099
4	776.407	914.621
5	790.513	928.799
6	803.755	943.787
7	812.193	961.920
8	826.106	976.288
9	833.689	985.684

Factor of Safety
 *** 1.602 ***

1

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	633.923	919.000
2	638.401	914.916
3	654.537	903.099
4	776.407	914.621
5	790.513	928.799

6	803.755	943.787
7	812.193	961.920
8	826.106	976.288
9	833.689	985.684

Factor of Safety
 *** 1.602 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	633.923	919.000
2	638.401	914.916
3	654.537	903.099
4	776.407	914.621
5	790.513	928.799
6	803.755	943.787
7	812.193	961.920
8	826.106	976.288
9	833.689	985.684

Factor of Safety
 *** 1.602 ***

1

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	633.923	919.000
2	638.401	914.916
3	654.537	903.099
4	776.407	914.621
5	790.513	928.799
6	803.755	943.787
7	812.193	961.920
8	826.106	976.288
9	833.689	985.684

Factor of Safety
 *** 1.602 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	633.923	919.000

2	638.401	914.916
3	654.537	903.099
4	776.407	914.621
5	790.513	928.799
6	803.755	943.787
7	812.193	961.920
8	826.106	976.288
9	833.689	985.684

Factor of Safety
 *** 1.602 ***

1

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	633.923	919.000
2	638.401	914.916
3	654.537	903.099
4	776.407	914.621
5	790.513	928.799
6	803.755	943.787
7	812.193	961.920
8	826.106	976.288
9	833.689	985.684

Factor of Safety
 *** 1.602 ***

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	633.923	919.000
2	638.401	914.916
3	654.537	903.099
4	776.407	914.621
5	790.513	928.799
6	803.755	943.787
7	812.193	961.920
8	826.106	976.288
9	833.689	985.684

Factor of Safety
 *** 1.602 ***

1

Failure Surface Specified By 9 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	633.923	919.000
2	638.401	914.916
3	654.537	903.099
4	776.407	914.621
5	790.513	928.799
6	803.755	943.787
7	812.193	961.920
8	826.106	976.288
9	833.689	985.684

Factor of Safety
 *** 1.602 ***

Failure Surface Specified By 9 Coordinate Points

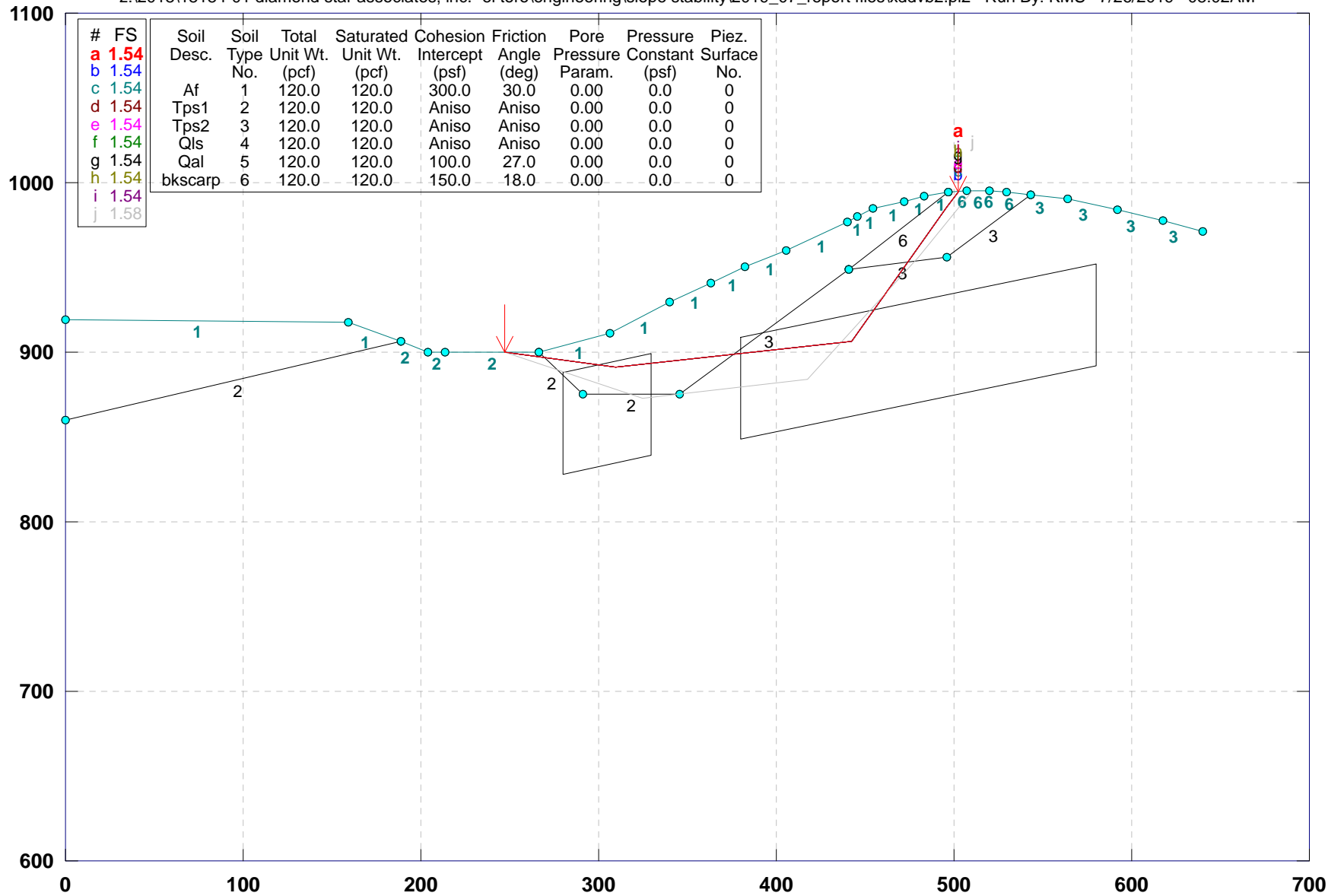
Point No.	X-Surf (ft)	Y-Surf (ft)
1	633.923	919.000
2	638.401	914.916
3	654.537	903.099
4	776.407	914.621
5	790.513	928.799
6	803.755	943.787
7	812.193	961.920
8	826.106	976.288
9	833.689	985.684

Factor of Safety
 *** 1.602 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / D-D' / Design /

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xddvb2.pl2 Run By: KMS 7/26/2019 08:02AM

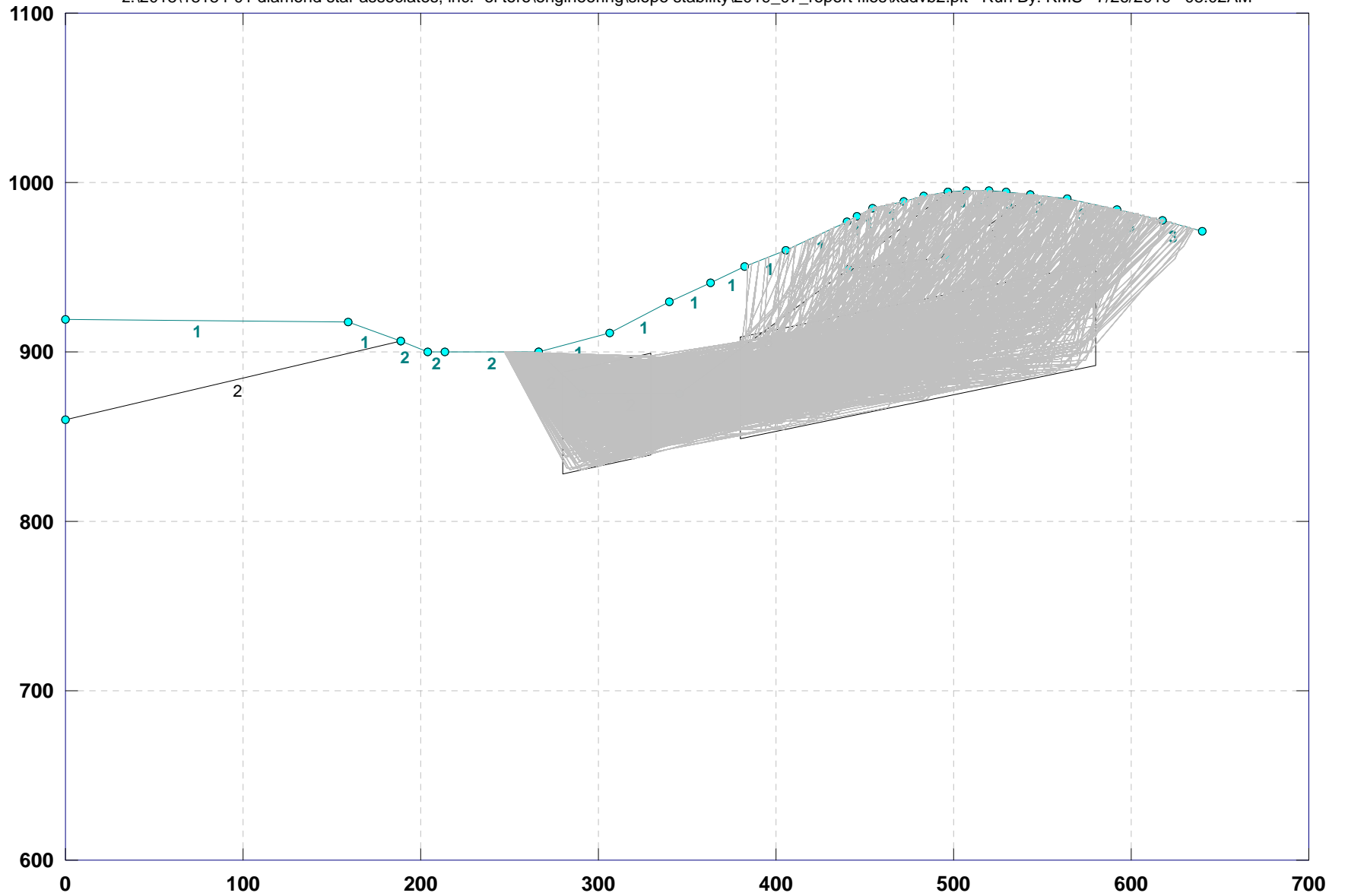


GSTABL7 v.2 FSmin=1.54

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / D-D' / Design /

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xddvb2.plt Run By: KMS 7/26/2019 08:02AM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/26/2019
Time of Run: 08:02AM
Run By:
KMS

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
D\2019_07_xd\xddvb2.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
D\2019_07_xd\xddvb2.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
D\2019_07_xd\xddvb2.PLT

PROBLEM DESCRIPTION: 18184-01 / D-D' / Design /

BOUNDARY COORDINATES

24 Top Boundaries
31 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	919.00	159.00	918.00	1
2	159.00	918.00	189.00	906.00	1
3	189.00	906.00	204.00	900.00	2
4	204.00	900.00	214.00	900.00	2
5	214.00	900.00	266.00	900.00	2
6	266.00	900.00	306.00	911.00	1
7	306.00	911.00	340.00	930.00	1

8	340.00	930.00	363.00	941.00	1
9	363.00	941.00	382.00	950.00	1
10	382.00	950.00	406.00	960.00	1
11	406.00	960.00	440.00	977.00	1
12	440.00	977.00	446.00	980.00	1
13	446.00	980.00	454.00	985.00	1
14	454.00	985.00	472.00	989.00	1
15	472.00	989.00	483.00	992.00	1
16	483.00	992.00	497.00	994.00	1
17	497.00	994.00	507.00	995.00	6
18	507.00	995.00	520.00	995.00	6
19	520.00	995.00	530.00	994.00	6
20	530.00	994.00	543.00	993.00	6
21	543.00	993.00	564.00	990.00	3
22	564.00	990.00	592.00	984.00	3
23	592.00	984.00	618.00	978.00	3
24	618.00	978.00	640.00	971.00	3
25	0.00	860.00	189.00	906.00	2
26	441.00	949.00	497.00	994.00	6
27	441.00	949.00	496.00	956.00	3
28	496.00	956.00	543.00	993.00	3
29	266.00	900.00	291.00	875.00	2
30	291.00	875.00	346.00	875.00	2
31	346.00	875.00	441.00	949.00	3

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

6 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	30.0	0.00	0.0	0
4	120.0	120.0	300.0	26.0	0.00	0.0	0
5	120.0	120.0	100.0	27.0	0.00	0.0	0
6	120.0	120.0	150.0	18.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

3 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	8.0	300.00	30.00

2	15.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 3 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	4.0	300.00	30.00
2	8.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 4 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	8.0	300.00	26.00
2	15.0	100.00	12.00
3	90.0	300.00	26.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

1

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	0.00	270.00	250.0	0.0

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

SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED

Janbus Empirical Coef is being used for the case of c & phi both > 0

1

A Critical Failure Surface Searching Method, Using A Random

Technique For Generating Sliding Block Surfaces, Has Been Specified.

4999 Trial Surfaces Have Been Generated.

3 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 95.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	247.00	900.00	247.00	900.00	0.00
2	280.00	858.00	330.00	869.00	60.00
3	380.00	879.00	580.00	922.00	60.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 50.141 FS Min = 1.539 FS Ave = 2.807
Standard Deviation = 2.177 Coefficient of Variation = 77.58 %

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	247.000	900.000
2	309.684	891.553
3	442.781	906.601
4	495.624	985.547
5	502.237	994.524

Factor of Safety
*** 1.539 ***

Individual data on the 20 slices

Slice	Width	Weight	Water Force Top	Water Force Bot	Tie Force Norm	Tie Force Tan	Earthquake Force Hor	Surcharge Ver	Load
-------	-------	--------	-----------------	-----------------	----------------	---------------	----------------------	---------------	------

No.	(ft)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)
1	19.0	2918.7	0.0	0.0	0.	0.	0.0	0.0	0.0
2	3.0	1124.3	0.0	0.0	0.	0.	0.0	0.0	0.0
3	37.0	50500.8	0.0	0.0	0.	0.	0.0	0.0	0.0
4	3.7	8943.5	0.0	0.0	0.	0.	0.0	0.0	0.0
5	30.3	102815.2	0.0	0.0	0.	0.	0.0	0.0	0.0
6	23.0	108245.1	0.0	0.0	0.	0.	0.0	0.0	0.0
7	14.0	77327.9	0.0	0.0	0.	0.	0.0	0.0	0.0
8	5.0	29478.8	0.0	0.0	0.	0.	0.0	0.0	0.0
9	24.0	155273.2	0.0	0.0	0.	0.	0.0	0.0	0.0
10	34.0	261673.6	0.0	0.0	0.	0.	0.0	0.0	0.0
11	1.0	8508.9	0.0	0.0	0.	0.	0.0	0.0	0.0
12	1.8	15267.2	0.0	0.0	0.	0.	0.0	0.0	0.0
13	3.2	27114.9	0.0	0.0	0.	0.	0.0	0.0	0.0
14	8.0	62509.5	0.0	0.0	0.	0.	0.0	0.0	0.0
15	18.0	108415.5	0.0	0.0	0.	0.	0.0	0.0	0.0
16	2.0	8874.4	0.0	0.0	0.	0.	0.0	0.0	0.0
17	9.0	33405.0	0.0	0.0	0.	0.	0.0	0.0	0.0
18	12.6	25427.1	0.0	0.0	0.	0.	0.0	0.0	0.0
19	1.4	1225.1	0.0	0.0	0.	0.	0.0	0.0	0.0
20	5.2	2069.3	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	247.000	900.000
2	309.684	891.553
3	442.781	906.601
4	495.624	985.547
5	502.237	994.524

Factor of Safety
 *** 1.539 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	247.000	900.000
2	309.684	891.553
3	442.781	906.601
4	495.624	985.547
5	502.237	994.524

Factor of Safety
 *** 1.539 ***

Failure Surface Specified By 5 Coordinate Points

Point	X-Surf	Y-Surf
-------	--------	--------

No.	(ft)	(ft)
1	247.000	900.000
2	309.684	891.553
3	442.781	906.601
4	495.624	985.547
5	502.237	994.524

Factor of Safety
 *** 1.539 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	247.000	900.000
2	309.684	891.553
3	442.781	906.601
4	495.624	985.547
5	502.237	994.524

Factor of Safety
 *** 1.539 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	247.000	900.000
2	309.684	891.553
3	442.781	906.601
4	495.624	985.547
5	502.237	994.524

Factor of Safety
 *** 1.539 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	247.000	900.000
2	309.684	891.553
3	442.781	906.601
4	495.624	985.547
5	502.237	994.524

Factor of Safety
*** 1.539 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	247.000	900.000
2	309.684	891.553
3	442.781	906.601
4	495.624	985.547
5	502.237	994.524

Factor of Safety
*** 1.539 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	247.000	900.000
2	309.684	891.553
3	442.781	906.601
4	495.624	985.547
5	502.237	994.524

Factor of Safety
*** 1.539 ***

Failure Surface Specified By 5 Coordinate Points

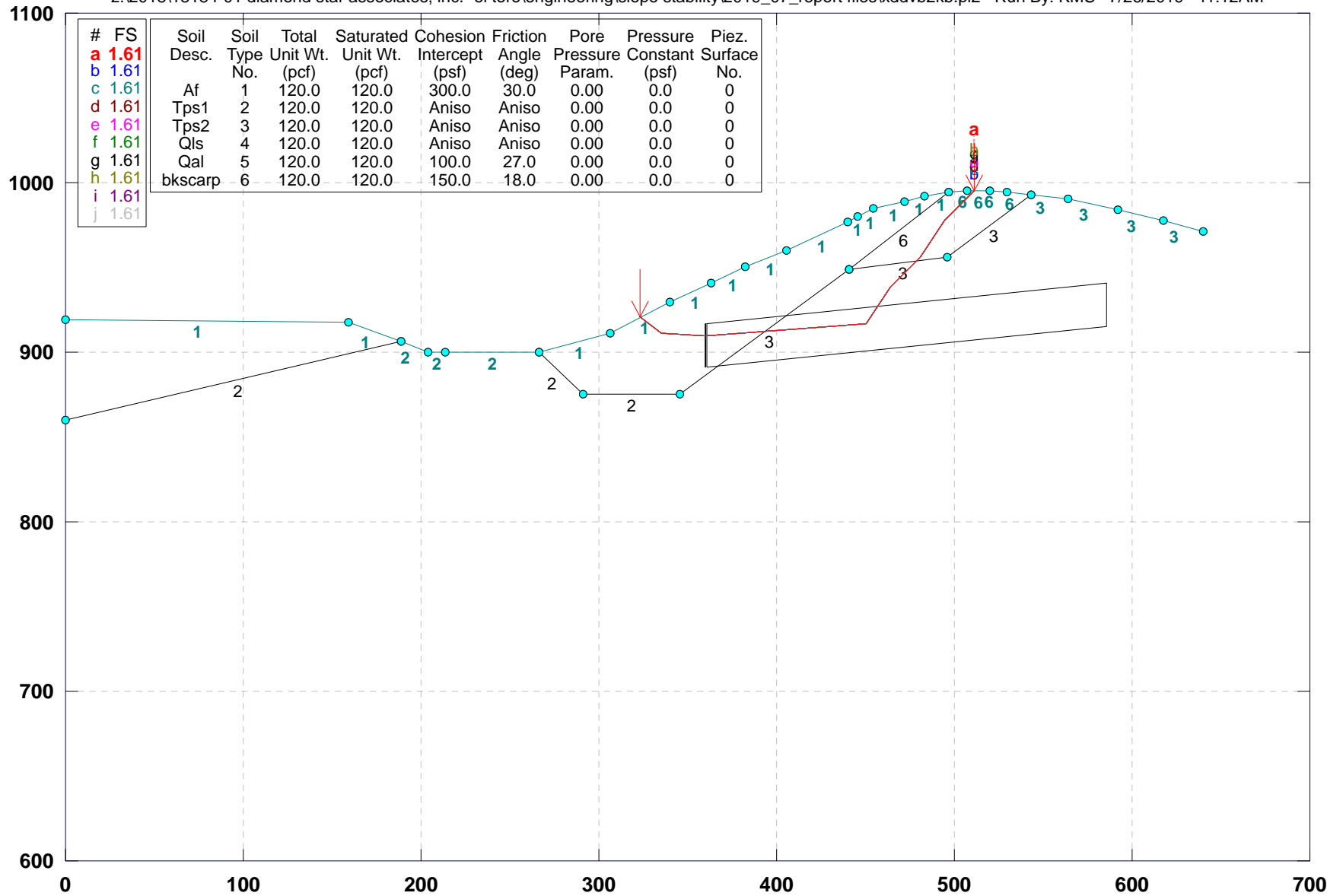
Point No.	X-Surf (ft)	Y-Surf (ft)
1	247.000	900.000
2	324.907	873.149
3	417.341	883.949
4	479.621	955.686
5	510.142	995.000

Factor of Safety
*** 1.575 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / D-D' / Design / Search Behind Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xddvb2kb.pl2 Run By: KMS 7/26/2019 11:12AM

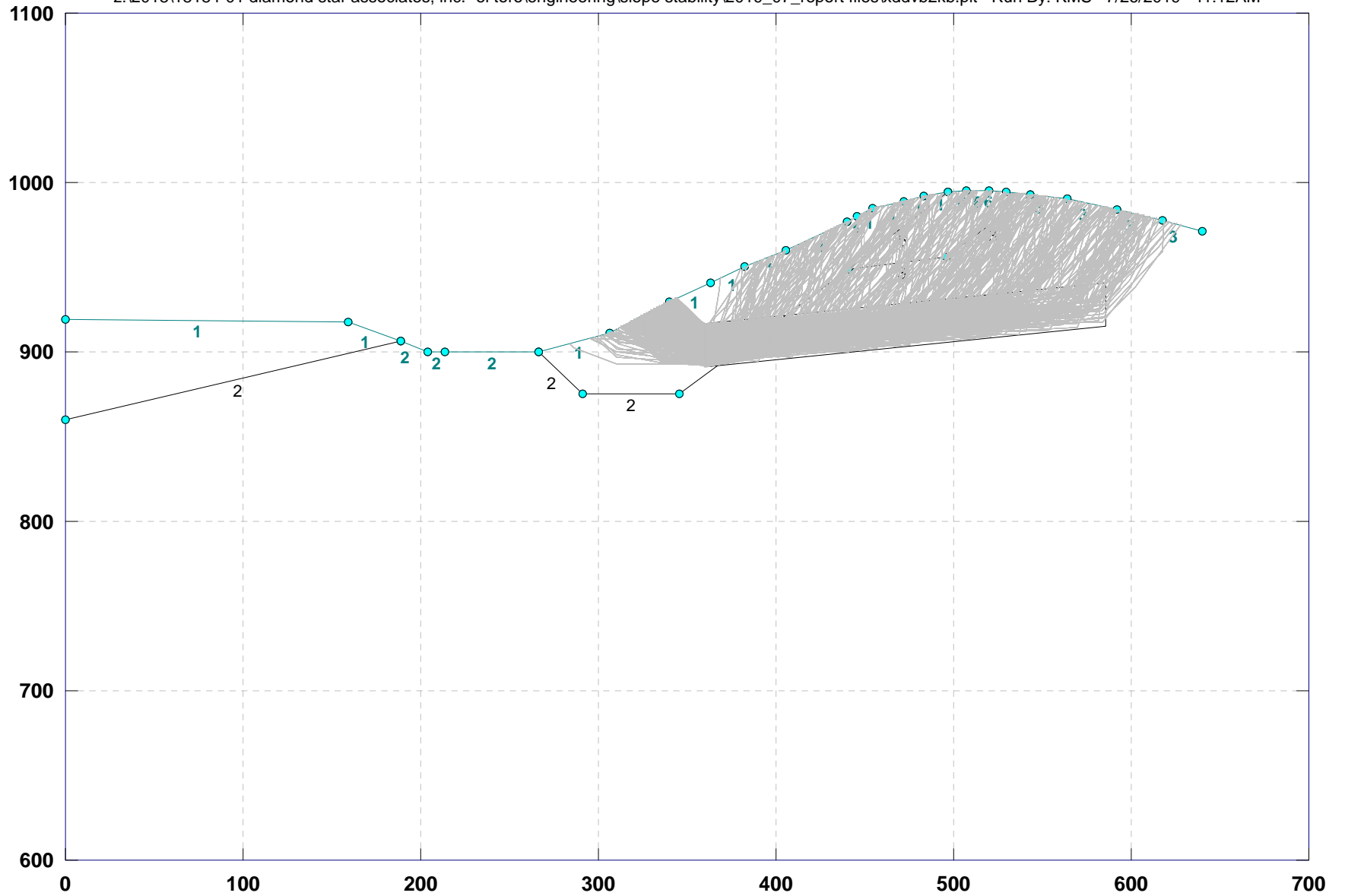


GSTABL7 v.2 FSmin=1.61

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / D-D' / Design / Search Behind Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xddvb2kb.plt Run By: KMS 7/26/2019 11:12AM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/26/2019
Time of Run: 11:12AM
Run By:
KMS

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
D\2019_07_xd\xddvb2kb.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
D\2019_07_xd\xddvb2kb.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
D\2019_07_xd\xddvb2kb.PLT

PROBLEM DESCRIPTION: 18184-01 / D-D' / Design / Search
Behind Keyway

BOUNDARY COORDINATES

24 Top Boundaries
31 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	919.00	159.00	918.00	1
2	159.00	918.00	189.00	906.00	1
3	189.00	906.00	204.00	900.00	2
4	204.00	900.00	214.00	900.00	2
5	214.00	900.00	266.00	900.00	2
6	266.00	900.00	306.00	911.00	1
7	306.00	911.00	340.00	930.00	1

8	340.00	930.00	363.00	941.00	1
9	363.00	941.00	382.00	950.00	1
10	382.00	950.00	406.00	960.00	1
11	406.00	960.00	440.00	977.00	1
12	440.00	977.00	446.00	980.00	1
13	446.00	980.00	454.00	985.00	1
14	454.00	985.00	472.00	989.00	1
15	472.00	989.00	483.00	992.00	1
16	483.00	992.00	497.00	994.00	1
17	497.00	994.00	507.00	995.00	6
18	507.00	995.00	520.00	995.00	6
19	520.00	995.00	530.00	994.00	6
20	530.00	994.00	543.00	993.00	6
21	543.00	993.00	564.00	990.00	3
22	564.00	990.00	592.00	984.00	3
23	592.00	984.00	618.00	978.00	3
24	618.00	978.00	640.00	971.00	3
25	0.00	860.00	189.00	906.00	2
26	441.00	949.00	497.00	994.00	6
27	441.00	949.00	496.00	956.00	3
28	496.00	956.00	543.00	993.00	3
29	266.00	900.00	291.00	875.00	2
30	291.00	875.00	346.00	875.00	2
31	346.00	875.00	441.00	949.00	3

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

6 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	30.0	0.00	0.0	0
4	120.0	120.0	300.0	26.0	0.00	0.0	0
5	120.0	120.0	100.0	27.0	0.00	0.0	0
6	120.0	120.0	150.0	18.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

3 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	8.0	300.00	30.00

2	15.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 3 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	4.0	300.00	30.00
2	8.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 4 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	8.0	300.00	26.00
2	15.0	100.00	12.00
3	90.0	300.00	26.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

1

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	0.00	270.00	250.0	0.0

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

SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED

Janbus Empirical Coef is being used for the case of c & phi both > 0

1

A Critical Failure Surface Searching Method, Using A Random

Technique For Generating Sliding Block Surfaces, Has Been Specified.

4999 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 25.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	360.00	904.00	360.00	904.00	25.00
2	361.00	904.00	586.00	928.00	25.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 64.689 FS Min = 1.614 FS Ave = 3.275
Standard Deviation = 3.481 Coefficient of Variation = 106.27 %

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	323.324	920.681
2	335.026	910.929
3	360.000	909.785
4	450.250	917.193
5	463.725	938.250
6	481.072	956.253
7	494.487	977.349
8	511.238	995.000

Factor of Safety
*** 1.614 ***

Individual data on the 21 slices

Water Water Tie Tie Earthquake

Slice No.	Width (ft)	Weight (lbs)	Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	Surcharge Load (lbs)
1	11.7	11438.5	0.0	0.0	0.	0.	0.0	0.0	0.0
2	5.0	10620.9	0.0	0.0	0.	0.	0.0	0.0	0.0
3	20.0	58894.9	0.0	0.0	0.	0.	0.0	0.0	0.0
4	3.0	10935.0	0.0	0.0	0.	0.	0.0	0.0	0.0
5	19.0	79091.7	0.0	0.0	0.	0.	0.0	0.0	0.0
6	12.3	59561.0	0.0	0.0	0.	0.	0.0	0.0	0.0
7	11.7	62621.5	0.0	0.0	0.	0.	0.0	0.0	0.0
8	34.0	218459.5	0.0	0.0	0.	0.	0.0	0.0	0.0
9	1.0	7302.9	0.0	0.0	0.	0.	0.0	0.0	0.0
10	5.0	37266.8	0.0	0.0	0.	0.	0.0	0.0	0.0
11	4.3	32799.4	0.0	0.0	0.	0.	0.0	0.0	0.0
12	3.7	28666.1	0.0	0.0	0.	0.	0.0	0.0	0.0
13	9.7	64687.7	0.0	0.0	0.	0.	0.0	0.0	0.0
14	8.3	45215.9	0.0	0.0	0.	0.	0.0	0.0	0.0
15	6.7	31869.0	0.0	0.0	0.	0.	0.0	0.0	0.0
16	2.4	10250.8	0.0	0.0	0.	0.	0.0	0.0	0.0
17	1.9	7859.8	0.0	0.0	0.	0.	0.0	0.0	0.0
18	11.5	33777.5	0.0	0.0	0.	0.	0.0	0.0	0.0
19	2.5	4567.4	0.0	0.0	0.	0.	0.0	0.0	0.0
20	10.0	11081.5	0.0	0.0	0.	0.	0.0	0.0	0.0
21	4.2	1135.5	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	323.324	920.681
2	335.026	910.929
3	360.000	909.785
4	450.250	917.193
5	463.725	938.250
6	481.072	956.253
7	494.487	977.349
8	511.238	995.000

Factor of Safety
 *** 1.614 ***

1

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	323.324	920.681
2	335.026	910.929
3	360.000	909.785
4	450.250	917.193
5	463.725	938.250
6	481.072	956.253
7	494.487	977.349
8	511.238	995.000

Factor of Safety

*** 1.614 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	323.324	920.681
2	335.026	910.929
3	360.000	909.785
4	450.250	917.193
5	463.725	938.250
6	481.072	956.253
7	494.487	977.349
8	511.238	995.000

Factor of Safety
*** 1.614 ***

1

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	323.324	920.681
2	335.026	910.929
3	360.000	909.785
4	450.250	917.193
5	463.725	938.250
6	481.072	956.253
7	494.487	977.349
8	511.238	995.000

Factor of Safety
*** 1.614 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	323.324	920.681
2	335.026	910.929
3	360.000	909.785
4	450.250	917.193
5	463.725	938.250
6	481.072	956.253
7	494.487	977.349
8	511.238	995.000

Factor of Safety
*** 1.614 ***

1

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	323.324	920.681
2	335.026	910.929
3	360.000	909.785
4	450.250	917.193
5	463.725	938.250
6	481.072	956.253
7	494.487	977.349
8	511.238	995.000

Factor of Safety
*** 1.614 ***

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	323.324	920.681
2	335.026	910.929
3	360.000	909.785
4	450.250	917.193
5	463.725	938.250
6	481.072	956.253
7	494.487	977.349
8	511.238	995.000

Factor of Safety
*** 1.614 ***

1

Failure Surface Specified By 8 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	323.324	920.681
2	335.026	910.929
3	360.000	909.785
4	450.250	917.193
5	463.725	938.250
6	481.072	956.253
7	494.487	977.349
8	511.238	995.000

Factor of Safety
*** 1.614 ***

Failure Surface Specified By 8 Coordinate Points

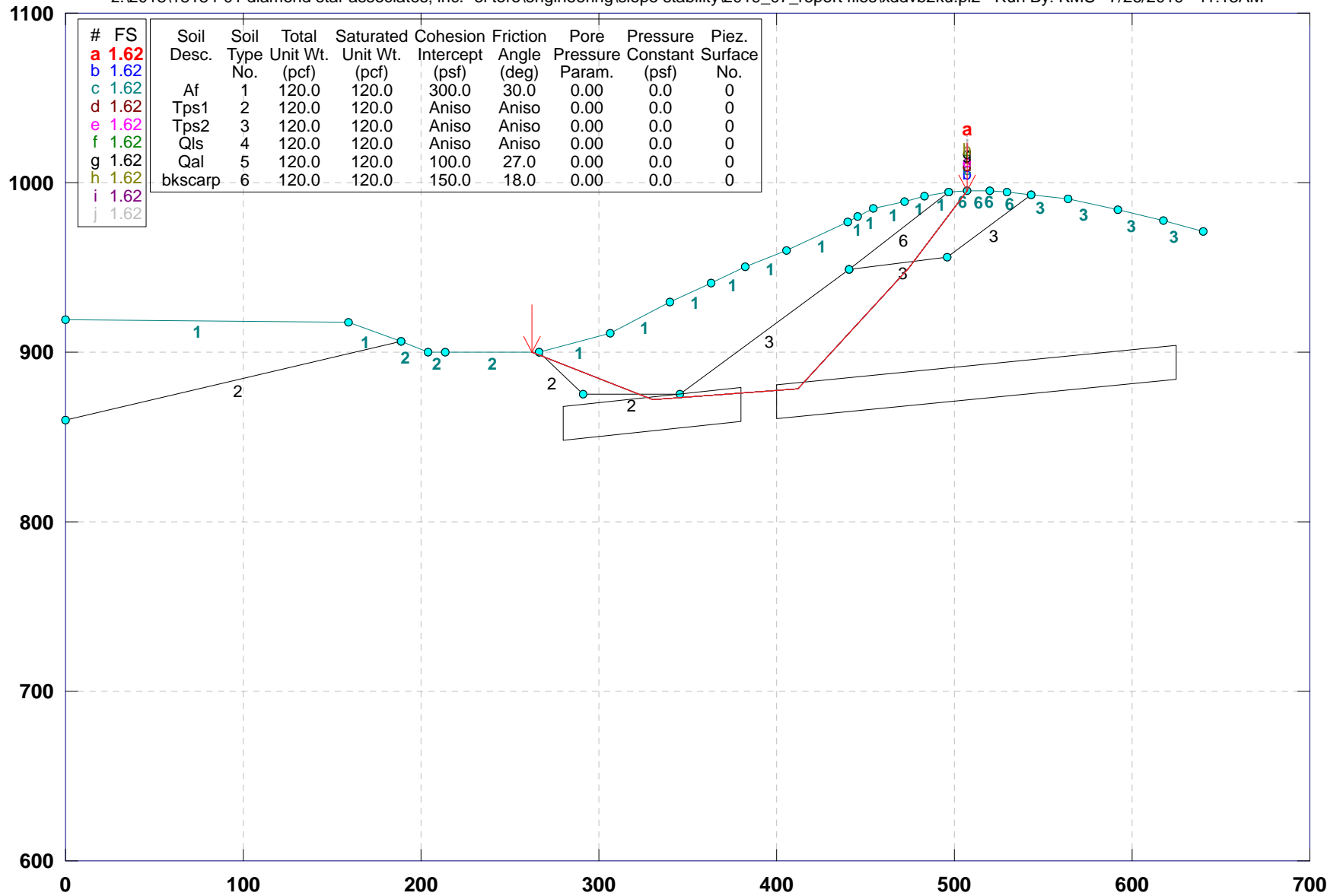
Point No.	X-Surf (ft)	Y-Surf (ft)
1	323.324	920.681
2	335.026	910.929
3	360.000	909.785
4	450.250	917.193
5	463.725	938.250
6	481.072	956.253
7	494.487	977.349
8	511.238	995.000

Factor of Safety
*** 1.614 ***

**** END OF GSTABL7 OUTPUT ****

18184-01 / D-D' / Design / Search Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\yddvb2ku.pl2 Run By: KMS 7/26/2019 11:13AM

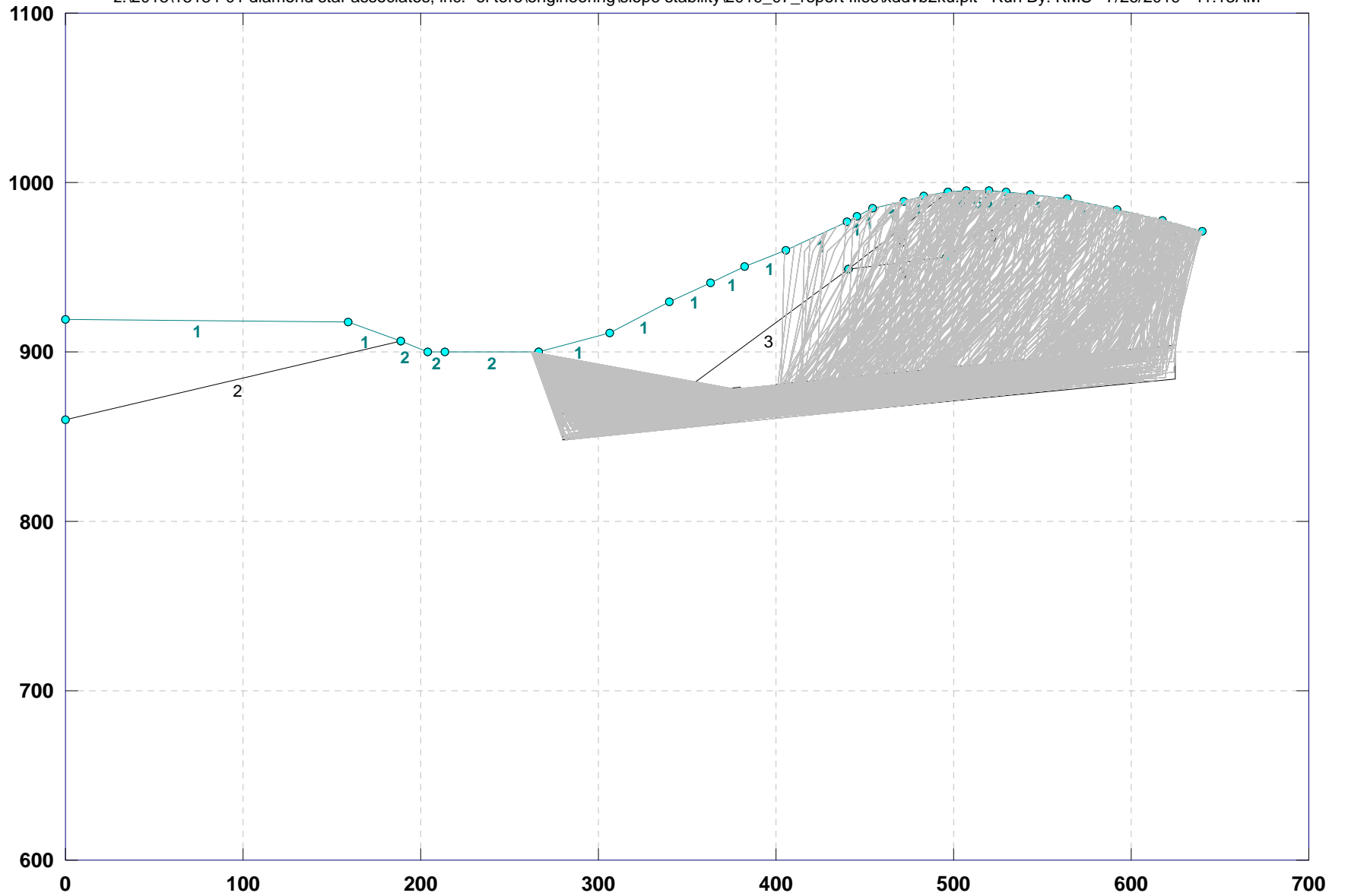


GSTABL7 v.2 FSmin=1.62

Safety Factors Are Calculated By The Simplified Janbu Method for the case of c & phi both > 0

18184-01 / D-D' / Design / Search Below Keyway

z:\2018\18184-01 diamond star associates, inc.- el toro\engineering\slope stability\2019_07_report files\xddvb2ku.plt Run By: KMS 7/26/2019 11:13AM



** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **
(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 7/26/2019
Time of Run: 11:13AM
Run By:
KMS

Input Data Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
D\2019_07_xd\xddvb2ku.in

Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
D\2019_07_xd\xddvb2ku.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18184-01 Diamond Star Associates, Inc.- El
Toro\Engineering\Slope Stability\Sec
D\2019_07_xd\xddvb2ku.PLT

PROBLEM DESCRIPTION: 18184-01 / D-D' / Design / Search
Below Keyway

BOUNDARY COORDINATES

24 Top Boundaries
31 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	919.00	159.00	918.00	1
2	159.00	918.00	189.00	906.00	1
3	189.00	906.00	204.00	900.00	2
4	204.00	900.00	214.00	900.00	2
5	214.00	900.00	266.00	900.00	2
6	266.00	900.00	306.00	911.00	1
7	306.00	911.00	340.00	930.00	1

8	340.00	930.00	363.00	941.00	1
9	363.00	941.00	382.00	950.00	1
10	382.00	950.00	406.00	960.00	1
11	406.00	960.00	440.00	977.00	1
12	440.00	977.00	446.00	980.00	1
13	446.00	980.00	454.00	985.00	1
14	454.00	985.00	472.00	989.00	1
15	472.00	989.00	483.00	992.00	1
16	483.00	992.00	497.00	994.00	1
17	497.00	994.00	507.00	995.00	6
18	507.00	995.00	520.00	995.00	6
19	520.00	995.00	530.00	994.00	6
20	530.00	994.00	543.00	993.00	6
21	543.00	993.00	564.00	990.00	3
22	564.00	990.00	592.00	984.00	3
23	592.00	984.00	618.00	978.00	3
24	618.00	978.00	640.00	971.00	3
25	0.00	860.00	189.00	906.00	2
26	441.00	949.00	497.00	994.00	6
27	441.00	949.00	496.00	956.00	3
28	496.00	956.00	543.00	993.00	3
29	266.00	900.00	291.00	875.00	2
30	291.00	875.00	346.00	875.00	2
31	346.00	875.00	441.00	949.00	3

User Specified Y-Origin = 600.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

6 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	120.0	300.0	30.0	0.00	0.0	0
2	120.0	120.0	300.0	30.0	0.00	0.0	0
3	120.0	120.0	300.0	30.0	0.00	0.0	0
4	120.0	120.0	300.0	26.0	0.00	0.0	0
5	120.0	120.0	100.0	27.0	0.00	0.0	0
6	120.0	120.0	150.0	18.0	0.00	0.0	0

ANISOTROPIC STRENGTH PARAMETERS

3 soil type(s)

Soil Type 2 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	8.0	300.00	30.00

2	15.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 3 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	4.0	300.00	30.00
2	8.0	0.00	15.00
3	90.0	300.00	30.00

Soil Type 4 Is Anisotropic

Number Of Direction Ranges Specified = 3

Direction Range No.	Counterclockwise Direction Limit (deg)	Cohesion Intercept (psf)	Friction Angle (deg)
1	8.0	300.00	26.00
2	15.0	100.00	12.00
3	90.0	300.00	26.00

ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

1

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	0.00	270.00	250.0	0.0

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

SURCHARGE BOUNDARY LOAD DATA HAS BEEN SUPPRESSED

Janbus Empirical Coef is being used for the case of c & phi both > 0

1

A Critical Failure Surface Searching Method, Using A Random

Technique For Generating Sliding Block Surfaces, Has Been Specified.

4999 Trial Surfaces Have Been Generated.

3 Boxes Specified For Generation Of Central Block Base

Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 95.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	262.00	900.00	262.00	900.00	0.00
2	280.00	858.00	380.00	869.00	20.00
3	400.00	871.00	625.00	894.00	20.00

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

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

Total Number of Trial Surfaces Attempted = 4999

Number of Trial Surfaces With Valid FS = 4999

Statistical Data On All Valid FS Values:

FS Max = 15.015 FS Min = 1.623 FS Ave = 2.959
 Standard Deviation = 1.241 Coefficient of Variation = 41.94 %

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.000	900.000
2	330.726	872.304
3	411.632	878.404
4	474.555	949.578
5	507.568	995.000

Factor of Safety
 *** 1.623 ***

Individual data on the 22 slices

Slice	Width	Weight	Water Force Top	Water Force Bot	Tie Force Norm	Tie Force Tan	Earthquake Force Hor	Surcharge Ver	Load
-------	-------	--------	-----------------	-----------------	----------------	---------------	----------------------	---------------	------

No.	(ft)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)
1	4.0	386.9	0.0	0.0	0.	0.	0.0	0.0	0.0
2	2.7	818.8	0.0	0.0	0.	0.	0.0	0.0	0.0
3	37.3	72005.3	0.0	0.0	0.	0.	0.0	0.0	0.0
4	18.0	80961.3	0.0	0.0	0.	0.	0.0	0.0	0.0
5	6.7	39571.7	0.0	0.0	0.	0.	0.0	0.0	0.0
6	9.3	60933.7	0.0	0.0	0.	0.	0.0	0.0	0.0
7	6.0	41907.7	0.0	0.0	0.	0.	0.0	0.0	0.0
8	17.0	128189.9	0.0	0.0	0.	0.	0.0	0.0	0.0
9	19.0	159705.9	0.0	0.0	0.	0.	0.0	0.0	0.0
10	24.0	224425.7	0.0	0.0	0.	0.	0.0	0.0	0.0
11	5.6	56238.9	0.0	0.0	0.	0.	0.0	0.0	0.0
12	28.4	256880.8	0.0	0.0	0.	0.	0.0	0.0	0.0
13	1.0	7943.1	0.0	0.0	0.	0.	0.0	0.0	0.0
14	5.0	38579.6	0.0	0.0	0.	0.	0.0	0.0	0.0
15	8.0	58269.0	0.0	0.0	0.	0.	0.0	0.0	0.0
16	18.0	109063.1	0.0	0.0	0.	0.	0.0	0.0	0.0
17	2.6	12634.4	0.0	0.0	0.	0.	0.0	0.0	0.0
18	3.0	13660.5	0.0	0.0	0.	0.	0.0	0.0	0.0
19	5.5	22277.6	0.0	0.0	0.	0.	0.0	0.0	0.0
20	14.0	37248.2	0.0	0.0	0.	0.	0.0	0.0	0.0
21	10.0	8593.4	0.0	0.0	0.	0.	0.0	0.0	0.0
22	0.6	26.7	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.000	900.000
2	330.726	872.304
3	411.632	878.404
4	474.555	949.578
5	507.568	995.000

Factor of Safety
 *** 1.623 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.000	900.000
2	330.726	872.304
3	411.632	878.404
4	474.555	949.578
5	507.568	995.000

Factor of Safety
 *** 1.623 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.000	900.000
2	330.726	872.304
3	411.632	878.404
4	474.555	949.578
5	507.568	995.000

Factor of Safety
 *** 1.623 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.000	900.000
2	330.726	872.304
3	411.632	878.404
4	474.555	949.578
5	507.568	995.000

Factor of Safety
 *** 1.623 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.000	900.000
2	330.726	872.304
3	411.632	878.404
4	474.555	949.578
5	507.568	995.000

Factor of Safety
 *** 1.623 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.000	900.000
2	330.726	872.304
3	411.632	878.404

4	474.555	949.578
5	507.568	995.000

Factor of Safety
*** 1.623 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.000	900.000
2	330.726	872.304
3	411.632	878.404
4	474.555	949.578
5	507.568	995.000

Factor of Safety
*** 1.623 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.000	900.000
2	330.726	872.304
3	411.632	878.404
4	474.555	949.578
5	507.568	995.000

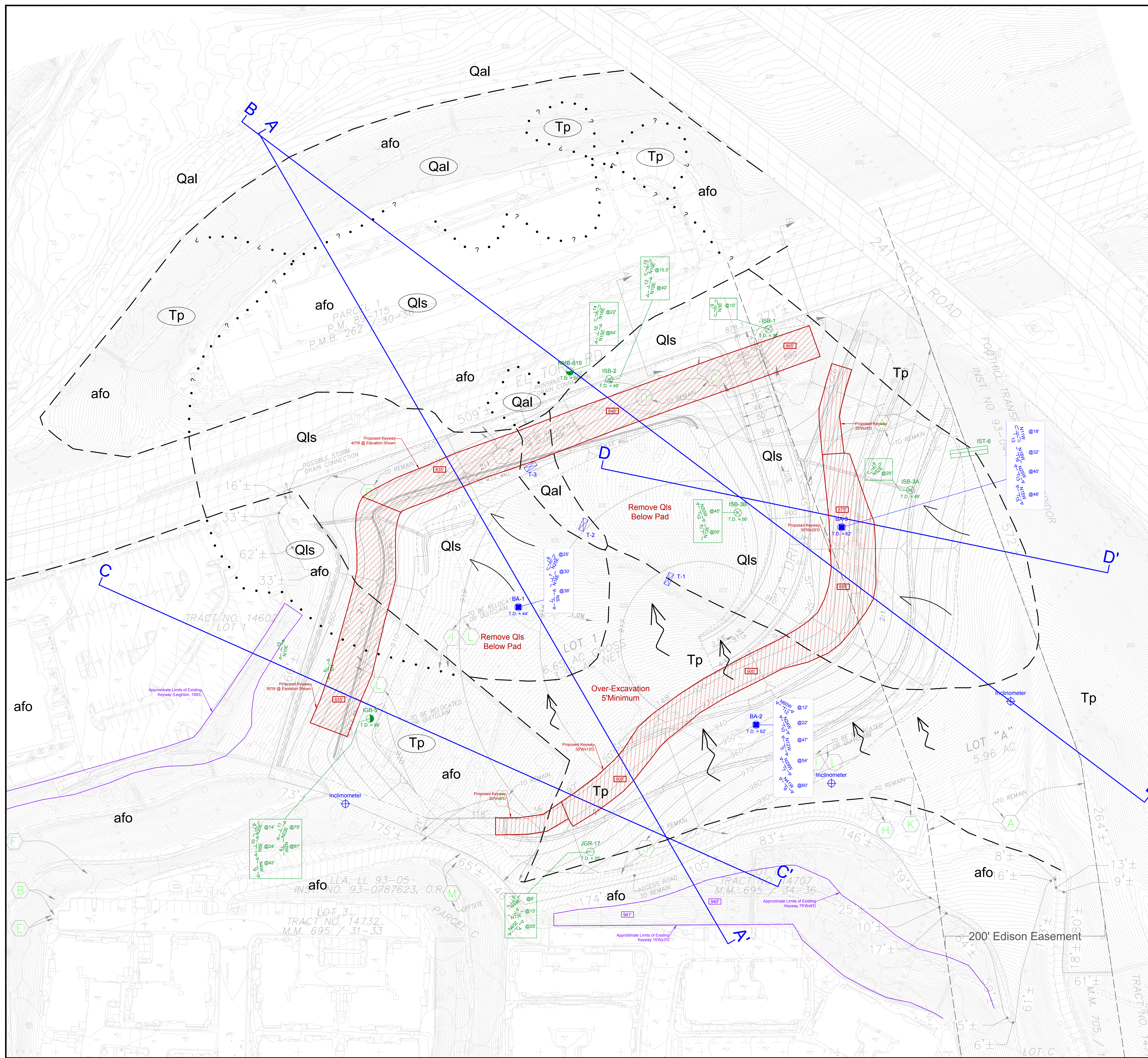
Factor of Safety
*** 1.623 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	262.000	900.000
2	330.726	872.304
3	411.632	878.404
4	474.555	949.578
5	507.568	995.000

Factor of Safety
*** 1.623 ***

**** END OF GSTABL7 OUTPUT ****



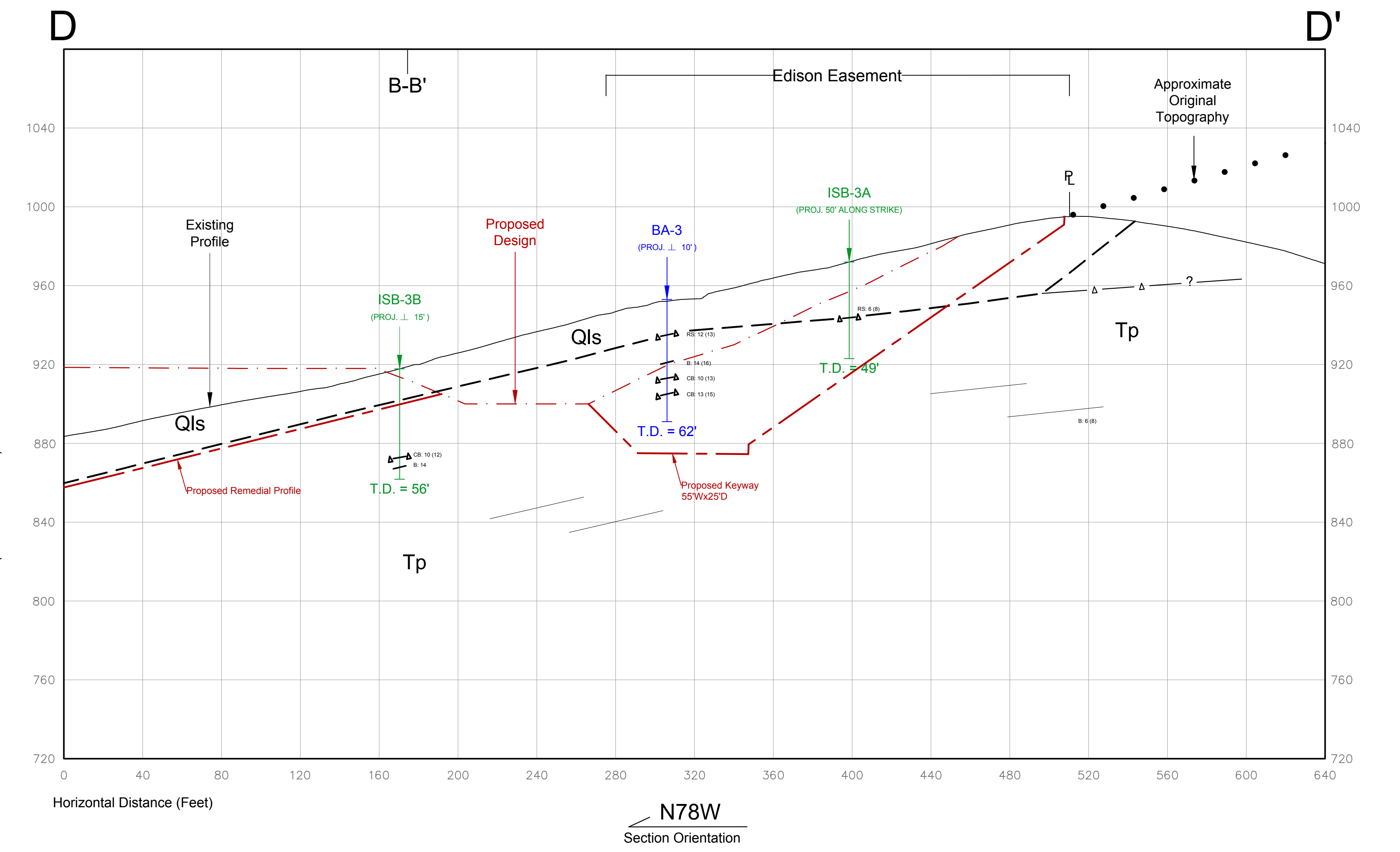
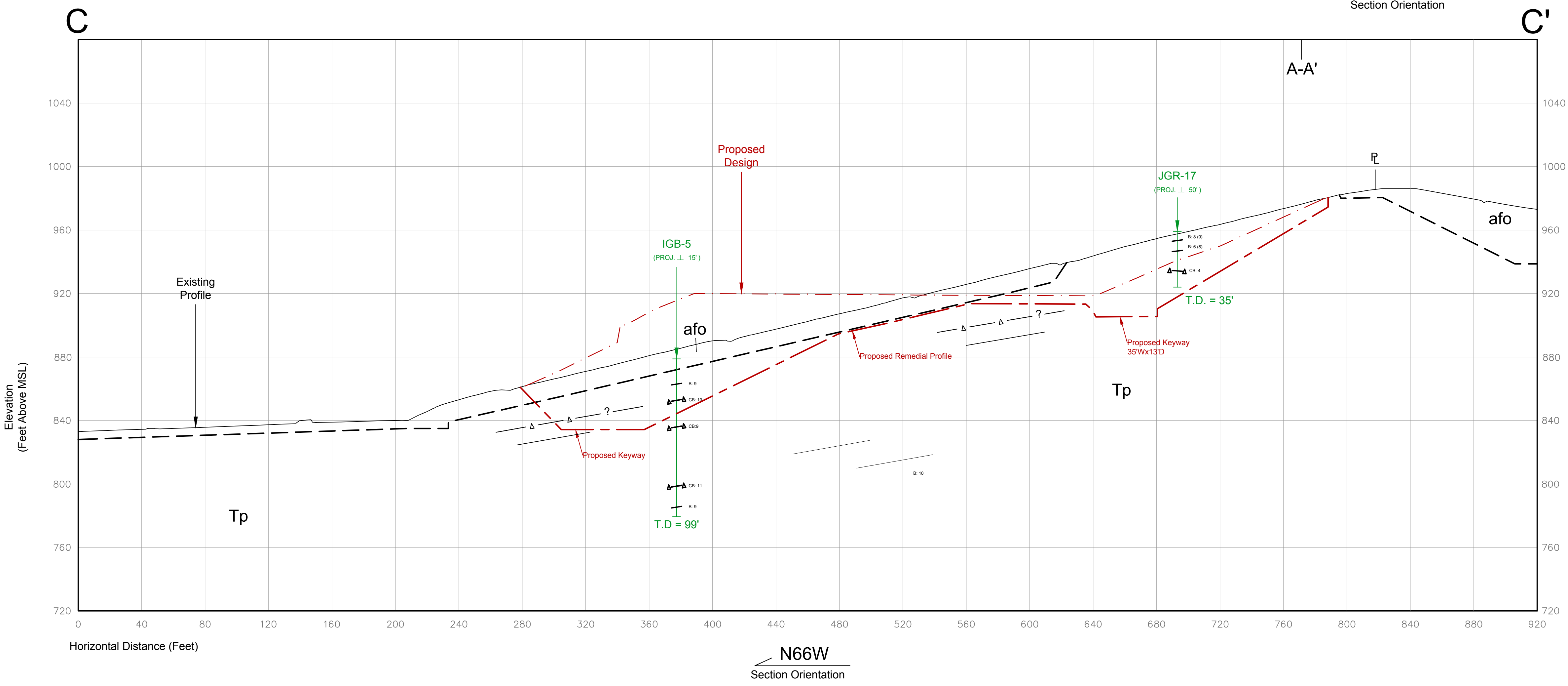
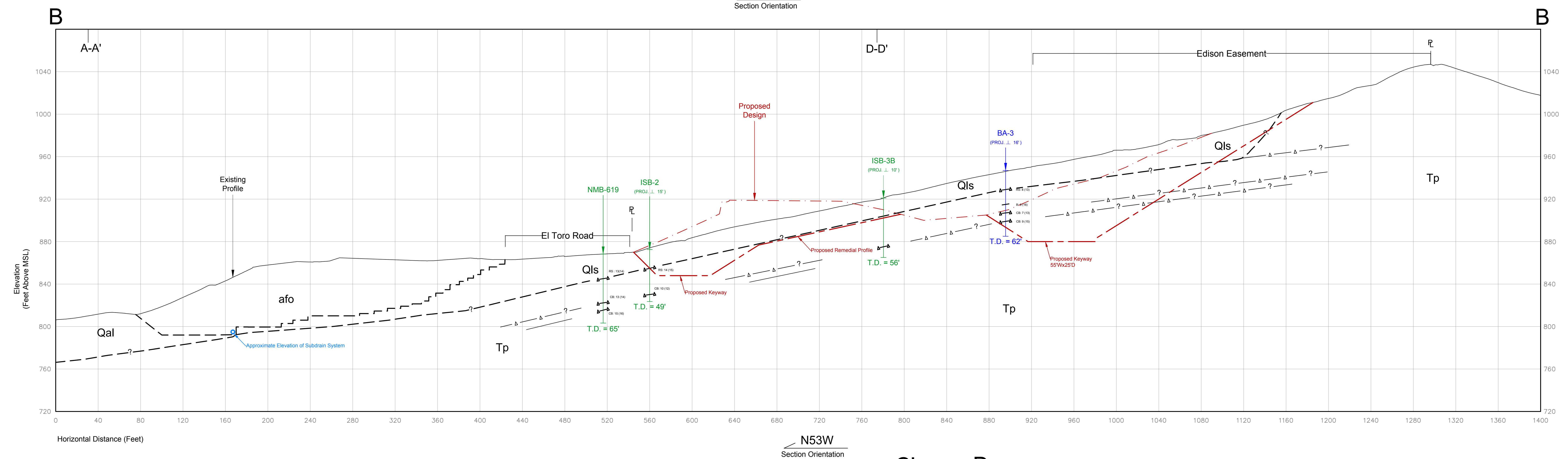
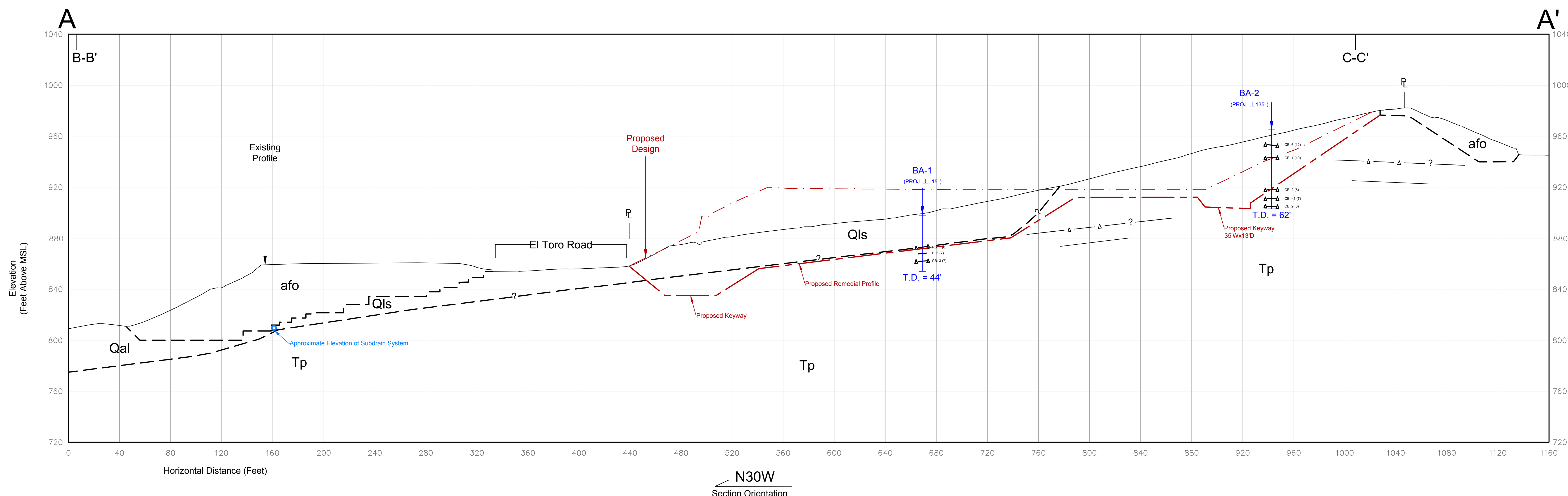
LEGEND	
afo	Older Artificial Fill, Undifferentiated
Qal	Quaternary Alluvium, Circled Where Buried
Qls	Quaternary Landslide, Circled Where Buried
Tp	Tertiary Puente Formation, Circled Where Buried
	Slopedash/Colluvium
	Approximate Location of Geologic Contact; Dotted Where Buried, Queried Where Uncertain
	Approximate Location of Bucket Auger Boring, With Total Depth in Feet
	Approximate Location of Exploratory Test Pit by LGC Geotechnical
	Approximate Location of Bucket Auger Boring by Irvine Soils, With Total Depth in Feet
	Approximate Location of Bucket Auger Boring by Ninyo & Moore, With Total Depth in Feet
	Approximate Location of Bucket Auger Boring by Leighton & Associates, With Total Depth in Feet
	Approximate Location of Bucket Auger Boring by Jack G. Raub, With Total Depth in Feet
	Approximate Location of Exploratory Test Pit by Irvine Soils
	Approximate Limits of Recommended Buttress Keyway, With Bottom Elevations Shown in Feet
	Approximate Limits of Existing Buttress Keyway by Others, With Bottom Elevations Shown in Feet
	Geotechnical Cross Section Alignment
	Approximate Location of Proposed Inclinator
Geologic Attitudes (Dashed Where Subsurface)	
	Bedding
	Clay Bed
	Joint
	Rupture Surface



LGC Geotechnical, Inc.
 131 Calle Iglesia, Ste. 200
 San Clemente, CA 92672
 TEL (949) 369-6141 FAX (949) 369-6142

Geotechnical Map

PROJECT NAME	El Toro 5
PROJECT NO.	18184-01
ENG. / GEOL.	DJB / KTM
SCALE	1" = 40'
DATE	July 2019



LGC Geotechnical, Inc.
131 Calle Iglesia, Ste. 200
San Clemente, CA 92672
TEL (949) 369-6141 FAX (949) 369-6142

Geotechnical Cross Sections A-A' through D-D'

PROJECT NAME	El Toro 5	SHEET 2 of 2
PROJECT NO.	18184-01	
ENG. / GEOL.	DJB / KTM	
SCALE	1" = 40'	
DATE	July 2019	