

April 19, 2021

Project No. 18045-01

Mr. Jon Conk
Project Dimensions, Inc.
4 Park Plaza, Suite 700
Irvine, California 92614

Subject: Geotechnical Addendum to Feasibility Study, Proposed Development of 29001 Paseo De Colinas, Laguna Niguel, California

Introduction

In accordance with your request, LGC Geotechnical, Inc. has prepared this letter regarding our geotechnical review of the revised conceptual design plan for the proposed residential development to be located at a property located at 29001 Paseo de Colinas, between Niguel Hills Middle School and Paseo De La Colinas in the City of Laguna Niguel, California.

LGC Geotechnical has performed a geotechnical evaluation for the proposed development of the site (LGC Geotechnical, 2018). We have also responded to associated review comments from the City's geotechnical reviewer (LGC Geotechnical, 2020). Subsequently, the project conceptual plans (KTGY, 2021) were revised to include the proposed construction of an additional residential structure within a previously established setback zone related to slope stability (LGC Geotechnical, 2018). This addendum report has been prepared to present our geotechnical findings, conclusions and recommendations with regard to the feasibility of building construction within the setback zone. This report is not a stand-alone document and must be used in conjunction with the referenced geotechnical reports (Appendix A) for completeness.

Evaluation

The results of our previous analyses indicated that the location of the northern portion of the site has a static slope stability factor of safety less than 1.5 based on current site conditions (LGC Geotechnical, 2018). A setback zone was established in this area to preclude construction of proposed residential structures within this zone. An additional geotechnical cross-section (Geotechnical Cross-Section D-D') has been prepared, through the slope and the location of the proposed structure within the setback zone. The cross-section was utilized to model the slope for use in the additional slope stability analysis performed.

Slope Stability Analysis

Gross slope stability analysis was performed using the computer program GSTABL7 with STEDwin version 2.005.3 (Gregory Geotechnical Software, 2013). Potential rotational and block surfaces were analyzed using Bishop's Modified Method and Janbu's Simplified Method, respectively. Slope stability analysis was performed for static and seismic loading conditions. A minimum factor of safety of 1.5 is typically required for static loading conditions. Seismic slope stability analysis was performed using a horizontal seismic coefficient (K_h) of 0.15 with a minimum required factor of safety of 1.1. Since the clay bed is less than 12 degrees from the horizontal, pseudostatic (seismic) slope stability was not performed for block surfaces.

A method to increase the existing factor of safety to allow for construction of proposed buildings in this area, includes the addition of appropriately designed shear pins between the northern slope and the proposed building. Slope stability analysis was performed on Geotechnical Cross-Section D-D' (Figure 1) to model the use of proposed shear pins to mitigate potential slope stability issues.

Our analysis included modeling of shear pins with a sufficient depth so that the generated potential failure surfaces extending below the proposed piles have a factor of safety of at least 1.5. Based on analysis of Cross Section D-D', shear pins are required to provide a minimum shear resistance of 37.5 kips per linear foot (A center-to-center shear pin spacing of 7.5 feet would require a shear pin resistance of 281.25 kips.). Reinforcement of shear pins to be designed by a structural engineer. From a geotechnical perspective, shear pins are anticipated to be a minimum of 60 feet in length, 30-inches in diameter, spaced at approximately 3 pile diameters on-center and connected with rigid grade beam system at the top. Plan and cross-sectional views for the current conceptual shear pin locations are presented on our Geotechnical Map (Sheet 1) and Geotechnical Cross-Section D-D' (Figure 1). It should be noted that the shear pins will not increase the slope stability factor of safety north of the shear pins. Slope stability analysis is included in Appendix B.

Conclusions and Recommendations

Slope stability analysis indicates adequate static and seismic factor of safety can be achieved with the use of shear pins for proposed building structures within the previously delineated set back zone. The analysis performed herein was for a proposed structure to be located at the top of the northern site slope along Geotechnical Cross-Section D-D'. It may be assumed that construction of proposed structures elsewhere within the setback zone, may also be achievable with appropriate shear pin design and construction.

Finalized project plans depicting proposed building locations should be reviewed and slope stability analysis and geotechnical shear pin recommendations should be confirmed and/or updated as required. The preliminary shear pin design provided herein is based on Geotechnical Cross-Section D-D', depending on the location of the proposed structure(s) with respect to the top of the slope, alternate shear pin recommendations may be required for other locations within the setback zone.

Limitations

Our services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable soils engineers and geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and modification.

Should you have any questions regarding this report, please do not hesitate to contact this office.

Sincerely,

LGC Geotechnical, Inc.



Brad Zellmer, GE 2618
Project Engineer



Kevin B. Colson, CEG 2210
Vice President



KBC/BTZ/amm

Attachments: Appendix A – References
Appendix B – Slope Stability Analysis, Section D-D'
Sheet 1 – Geotechnical Map
Figure 1 – Geotechnical Cross-Section D-D'

Distribution: (4) Addressee (3 wet-signed copies and 1 electronic copy)

Appendix A

References

APPENDIX A

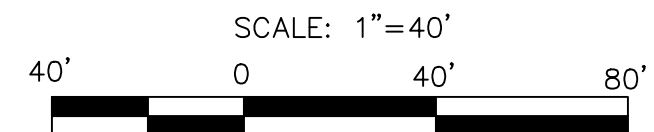
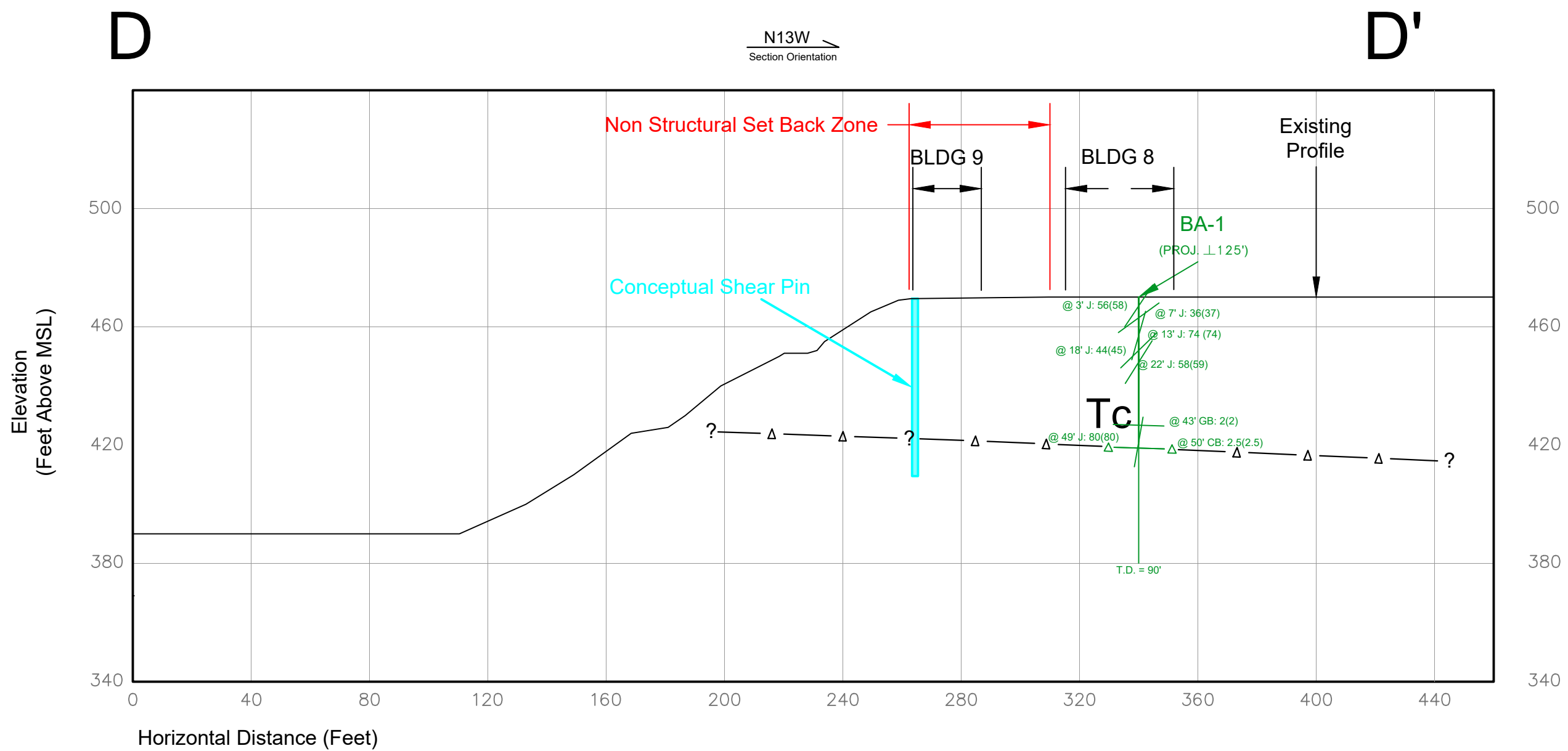
References

KTGY, 2021, Architectural Site Plan, Paseo de Colinas Townhomes, Laguna Niguel, California, Project No. 2018-1173, plot date March 18, 2021.

Gregory Geotechnical Software, 2013, GSTABL7, Version 2.005.3.

LGC Geotechnical, 2018, Summary of Geotechnical Evaluation and Feasibility Study, Residential Development, Paseo De La Colinas, Laguna Niguel, California, Project No. 18045-01, dated May 15, 2018.

_____, 2020, Response to Geotechnical Review Comments dated June 2, 2020 regarding the Proposed Residential Development, 29001 Paseo De Colinas, Laguna Niguel, California, Project No. 18045-01, dated August 7, 2020.



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Figure 1
Geotechnical Cross-Section D-D'

PROJECT NAME	Paseo De La Colinas
PROJECT NO.	18045-01
ENG. / GEOL.	BTZ/KBC
SCALE	1" = 40'
DATE	April 2021

Appendix B
Slope Stability Analysis, Section D-D'

Summary of Slope Stability Analysis

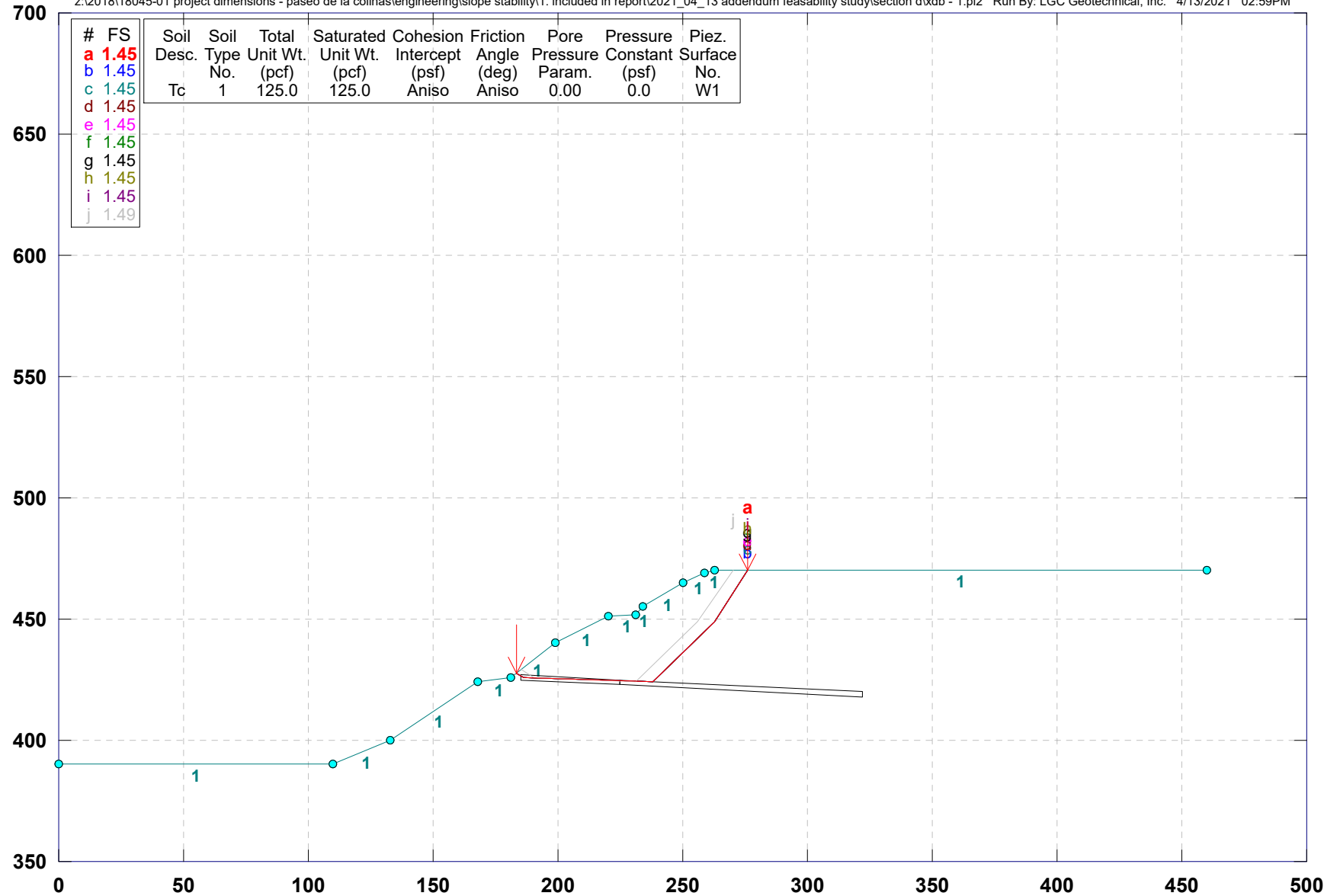
Cross-Section	File Name	Factor of Safety	Description
A-A' *	xa	1.34	Along Clay Bed - Static
	xa15	1.53	Along Clay Bed – 30 ft Set-Back
	xar	1.32	Rotational – Static
	xarx15	1.51	Rotational – 60 ft Set-Back - Static
	xarx15e	1.28	Rotational - 60 ft Set-Back - Seismic
B-B' *	sec b	1.47	Along Clay Bed - Static
	sec br	1.68	Rotational – Static
	sec bre	1.49	Rotational - Seismic
B1-B1' **	sec b1	1.51	Along Clay Bed - Static
C-C' *	sec c	1.83	Along Clay Bed - Static
	sec cr	1.72	Rotational – Static
	sec cre	1.53	Rotational - Seismic
D-D'	xdb-1	1.45	Along Clay Bed - Static
	xdbp	1.50	Along Clay Bed - Static; with Caisson
	xdr	1.38	Rotational - Static
	xdrp-3	1.52	Rotational – Static; with Caisson
	xdrp-3e	1.30	Seismic

* LGC Geotechnical, 2018

** LGC Geotechnical, 2020

Paseo de la Colinas 18045-01/Sec D-D' /Block/Static

z:\2018\18045-01 project dimensions - paseo de la colinas\engineering\slope stability\1. included in report\2021_04_13 addendum feasibility study\section d\xdb - 1.pl2 Run By: LGC Geotechnical, Inc. 4/13/2021 02:59PM



GSTABL7 v.2 FSmin=1.45

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

*** GSTABL7 ***

** 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: 4/13/2021
Time of Run: 02:59PM
Run By: LGC Geotechnical,
Inc.

Input Data Filename: Z:\2018\18045-01 Project Dimensions - Paseo de la
Colinas\Engineering\Slope Stability\Sec D\2021_04_13\xd\xdb -
1.in

Output Filename: Z:\2018\18045-01 Project Dimensions - Paseo de la
Colinas\Engineering\Slope Stability\Sec D\2021_04_13\xd\xdb -
1.0UT

Unit System: English

Plotted Output Filename: Z:\2018\18045-01 Project Dimensions - Paseo de la
Colinas\Engineering\Slope Stability\Sec D\2021_04_13\xd\xdb -
1.PLT

PROBLEM DESCRIPTION: Paseo de la Colinas 18045-01/Sec D-D'
/Block/Static

BOUNDARY COORDINATES

12 Top Boundaries
12 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	390.00	110.00	390.00	1
2	110.00	390.00	133.00	400.00	1
3	133.00	400.00	168.00	424.00	1
4	168.00	424.00	181.00	426.00	1
5	181.00	426.00	199.00	440.00	1
6	199.00	440.00	220.00	451.00	1
7	220.00	451.00	231.00	452.00	1

8	231.00	452.00	234.00	455.00	1
9	234.00	455.00	250.00	465.00	1
10	250.00	465.00	259.00	469.00	1
11	259.00	469.00	263.00	470.00	1
12	263.00	470.00	460.00	470.00	1

User Specified Y-Origin = 350.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

1 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	125.0	125.0	300.0	26.0	0.00	0.0	1

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 1 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	26.00
2	-1.0	0.00	18.00
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.

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	185.00	426.00	225.00	424.00	2.00
2	225.10	424.00	322.00	419.00	2.00

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	183.94	428.29
2	191.35	426.68
3	280.36	421.94
4	280.75	456.94
5	293.60	470.00

Factor of Safety for the Preceding Surface is Between15.026 and15.013

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	199.99	440.52
2	216.26	424.36
3	236.80	423.61
4	236.83	456.77

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

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)
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1	181.82	426.63
2	193.00	425.43
3	297.41	421.03
4	297.74	456.03
5	307.58	470.00

Factor of Safety for the Preceding Surface is Between17.585 and17.568

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)
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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 = 25

Number of Trial Surfaces With Valid FS = 4974

Percentage of Trial Surfaces With Non-Valid FS Solutions of the Total Attempted = 0.5 %

Statistical Data On All Valid FS Values:
FS Max = 489.762 FS Min = 1.445 FS Ave = 4.009
Standard Deviation = 19.616 Coefficient of Variation = 489.26 %

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	183.333	427.814
2	186.238	426.067
3	237.893	424.315
4	262.641	449.064
5	276.015	470.000

Factor of Safety
*** 1.445 ***

Individual data on the 11 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force	Water Force	Tie Force	Tie Force	Earthquake Force		Surcharge Load (lbs)
			Top (lbs)	Bot (lbs)	Norm (lbs)	Tan (lbs)	Hor (lbs)	Ver (lbs)	
1	2.9	727.6	0.0	0.0	0.	0.	0.0	0.0	0.0
2	12.8	14654.8	0.0	0.0	0.	0.	0.0	0.0	0.0
3	21.0	53082.5	0.0	0.0	0.	0.	0.0	0.0	0.0
4	11.0	36801.1	0.0	0.0	0.	0.	0.0	0.0	0.0
5	3.0	10875.7	0.0	0.0	0.	0.	0.0	0.0	0.0
6	3.9	15490.4	0.0	0.0	0.	0.	0.0	0.0	0.0
7	12.1	46685.0	0.0	0.0	0.	0.	0.0	0.0	0.0
8	9.0	29336.9	0.0	0.0	0.	0.	0.0	0.0	0.0

9	3.6	10110.2	0.0	0.0	0.	0.	0.0	0.0	0.0
10	0.4	923.9	0.0	0.0	0.	0.	0.0	0.0	0.0
11	13.0	16573.2	0.0	0.0	0.	0.	0.0	0.0	0.0

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1

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2	186.238	426.067
3	237.893	424.315
4	262.641	449.064
5	276.015	470.000

Factor of Safety
*** 1.445 ***

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	183.333	427.814
2	186.238	426.067
3	237.893	424.315
4	262.641	449.064
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Factor of Safety
*** 1.445 ***

1

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Factor of Safety
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Failure Surface Specified By 5 Coordinate Points

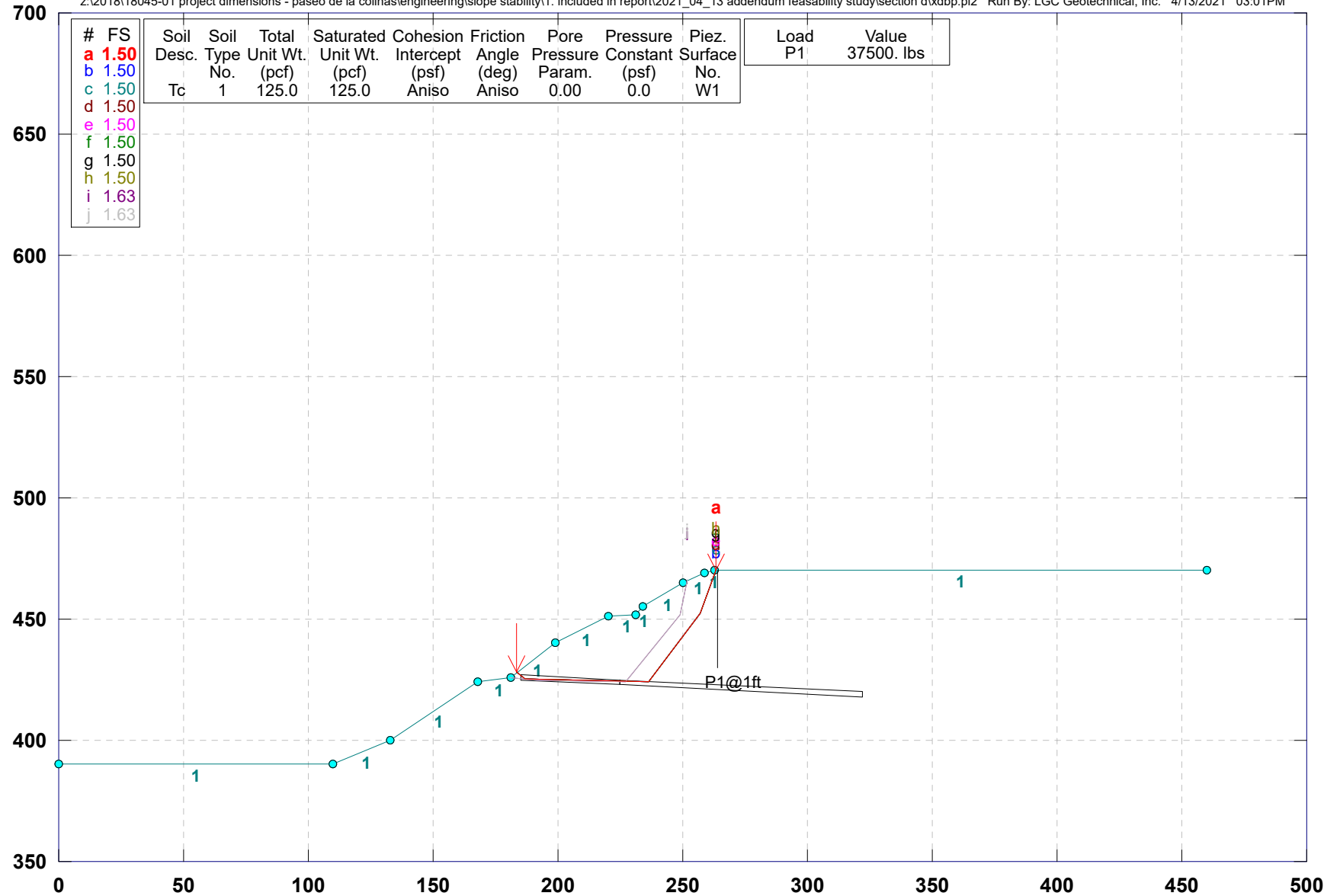
Point No.	X-Surf (ft)	Y-Surf (ft)
1	185.286	429.334
2	190.486	425.788
3	231.340	423.942
4	256.024	448.755
5	270.198	470.000

Factor of Safety
*** 1.493 ***

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

Paseo de la Colinas 18045-01/Sec D-D' /Claybed Search/Pier/Static

z:\2018\18045-01 project dimensions - paseo de la colinas\engineering\slope stability\1. included in report\2021_04_13 addendum feasibility study\section d\xdbp.pl2 Run By: LGC Geotechnical, Inc. 4/13/2021 03:01PM



GSTABL7 v.2 FSmin=1.50

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

*** GSTABL7 ***

** 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 **
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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: 4/13/2021
Time of Run: 03:01PM
Run By: LGC Geotechnical,
Inc.

Input Data Filename: Z:\2018\18045-01 Project Dimensions - Paseo de la
Colinas\Engineering\Slope Stability\Sec
D\2021_04_13\xd\xdbp.in

Output Filename: Z:\2018\18045-01 Project Dimensions - Paseo de la
Colinas\Engineering\Slope Stability\Sec
D\2021_04_13\xd\xdbp.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18045-01 Project Dimensions - Paseo de la
Colinas\Engineering\Slope Stability\Sec
D\2021_04_13\xd\xdbp.PLT

PROBLEM DESCRIPTION: Paseo de la Colinas 18045-01/Sec D-D'
/Claybed Search/Pier/Static

BOUNDARY COORDINATES

12 Top Boundaries
12 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	390.00	110.00	390.00	1
2	110.00	390.00	133.00	400.00	1
3	133.00	400.00	168.00	424.00	1
4	168.00	424.00	181.00	426.00	1
5	181.00	426.00	199.00	440.00	1
6	199.00	440.00	220.00	451.00	1
7	220.00	451.00	231.00	452.00	1

8	231.00	452.00	234.00	455.00	1
9	234.00	455.00	250.00	465.00	1
10	250.00	465.00	259.00	469.00	1
11	259.00	469.00	263.00	470.00	1
12	263.00	470.00	460.00	470.00	1

User Specified Y-Origin = 350.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

1 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	125.0	125.0	300.0	26.0	0.00	0.0	1

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 1 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	26.00
2	0.0	0.00	18.00
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.

PIER/PILE LOAD(S)

1 Pier/Pile Load(s) Specified

Pier/Pile No.	X-Pos (ft)	Y-Pos (ft)	Load (lbs)	Spacing (ft)	Inclination (deg)	Length (ft)
1	264.00	470.00	37500.0	1.0	90.00	40.0

1

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

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 35.0

Box No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Height (ft)
1	185.00	426.00	225.00	424.00	2.00
2	225.10	424.00	322.00	419.00	2.00

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	183.94	428.29
2	191.35	426.68
3	280.36	421.94
4	280.75	456.94
5	293.60	470.00

Factor of Safety for the Preceding Surface is Between15.026 and15.013

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	199.99	440.52
2	216.26	424.36

3	236.80	423.61
4	236.83	456.77

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

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	181.82	426.63
2	193.00	425.43
3	297.41	421.03
4	297.74	456.03
5	307.58	470.00

Factor of Safety for the Preceding Surface is Between17.585 and17.568

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

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Factor of Safety for the Preceding Surface is Between15.026 and15.013

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 = 25

Number of Trial Surfaces With Valid FS = 4974

Percentage of Trial Surfaces With Non-Valid FS Solutions
of the Total Attempted = 0.5 %

Statistical Data On All Valid FS Values:
FS Max = 489.762 FS Min = 1.504 FS Ave = 4.058
Standard Deviation = 19.611 Coefficient of Variation = 483.23 %

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	183.680	428.084
2	187.136	425.543
3	236.284	424.404
4	257.124	452.524
5	263.531	470.000

Factor of Safety
*** 1.504 ***

Individual data on the 11 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Surcharge Force Ver (lbs)	Load (lbs)
1	3.5	1129.6	0.0	0.0	0.	0.	0.0	0.0	0.0
2	11.9	14800.6	0.0	0.0	0.	0.	0.0	0.0	0.0
3	21.0	53746.7	0.0	0.0	0.	0.	0.0	0.0	0.0
4	11.0	36913.0	0.0	0.0	0.	0.	0.0	0.0	0.0
5	3.0	10878.0	0.0	0.0	0.	0.	0.0	0.0	0.0
6	2.3	8931.2	0.0	0.0	0.	0.	0.0	0.0	0.0
7	13.7	46387.2	0.0	0.0	0.	0.	0.0	0.0	0.0
8	7.1	16798.3	0.0	0.0	0.	0.	0.0	0.0	0.0
9	1.9	3166.6	0.0	0.0	0.	0.	0.0	0.0	0.0
10	4.0	3201.4	0.0	0.0	0.	0.	0.0	0.0	0.0
11	0.5	48.0	0.0	0.0	0.	0.	0.0	0.0	0.0

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Factor of Safety
*** 1.504 ***

1

Failure Surface Specified By 5 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	180.823	425.973
2	191.218	424.774
3	226.868	424.395
4	248.700	451.751
5	251.999	465.888

Factor of Safety
*** 1.626 ***

Failure Surface Specified By 5 Coordinate Points

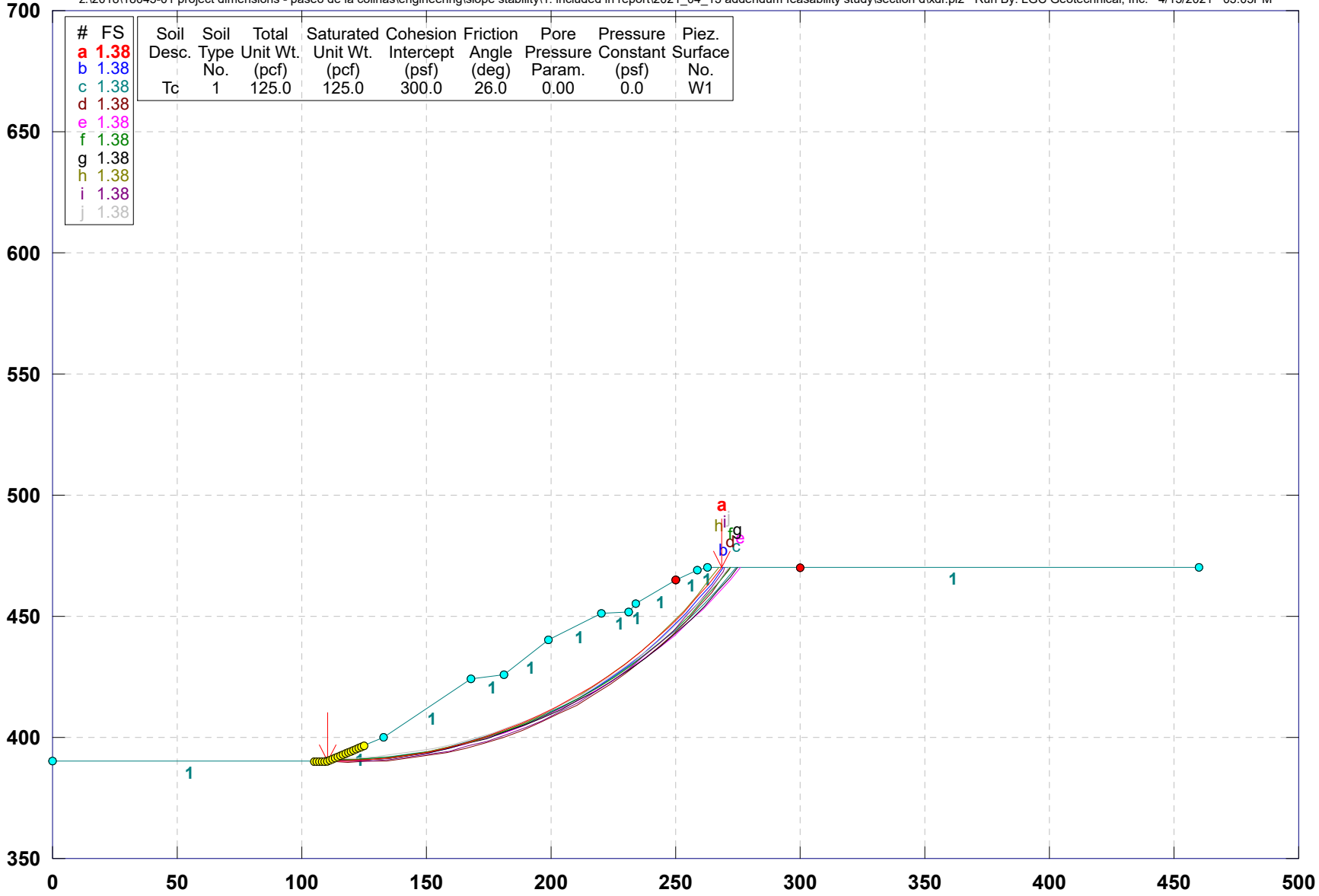
Point No.	X-Surf (ft)	Y-Surf (ft)
1	180.823	425.973
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4	248.700	451.751
5	251.999	465.888

Factor of Safety
*** 1.626 ***

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

Paseo de la Colinas 18045-01/Sec D-D' /Rotational/Static

z:\2018\18045-01 project dimensions - paseo de la colinas\engineering\slope stability\1. included in report\2021_04_13 addendum feasibility study\section d\ldr.pl2 Run By: LGC Geotechnical, Inc. 4/13/2021 03:05PM



GSTABL7 v.2 FSmin=1.38
Safety Factors Are Calculated By The Modified Bishop Method

*** GSTABL7 ***

** 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: 4/13/2021
Time of Run: 03:05PM
Run By: LGC Geotechnical,
Inc.

Input Data Filename: Z:\2018\18045-01 Project Dimensions - Paseo de la
Colinas\Engineering\Slope Stability\Sec
D\2021_04_13\xd\xdr.in

Output Filename: Z:\2018\18045-01 Project Dimensions - Paseo de la
Colinas\Engineering\Slope Stability\Sec
D\2021_04_13\xd\xdr.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18045-01 Project Dimensions - Paseo de la
Colinas\Engineering\Slope Stability\Sec
D\2021_04_13\xd\xdr.PLT

PROBLEM DESCRIPTION: Paseo de la Colinas 18045-01/Sec D-D'
/Rotational/Static

BOUNDARY COORDINATES

12 Top Boundaries
12 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	390.00	110.00	390.00	1
2	110.00	390.00	133.00	400.00	1
3	133.00	400.00	168.00	424.00	1
4	168.00	424.00	181.00	426.00	1
5	181.00	426.00	199.00	440.00	1
6	199.00	440.00	220.00	451.00	1
7	220.00	451.00	231.00	452.00	1

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9	234.00	455.00	250.00	465.00	1
10	250.00	465.00	259.00	469.00	1
11	259.00	469.00	263.00	470.00	1
12	263.00	470.00	460.00	470.00	1

User Specified Y-Origin = 350.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

1 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	125.0	125.0	300.0	26.0	0.00	0.0	1

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 1 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	26.00
2	0.0	0.00	18.00
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

ANISOTROPIC STRENGTH DATA HAS BEEN SUPPRESSED

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 = 105.00(ft)
and X = 125.00(ft)

Each Surface Terminates Between X = 250.00(ft)
and X = 300.00(ft)

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

8.00(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 = 2.316 FS Min = 1.381 FS Ave = 1.791
Standard Deviation = 0.275 Coefficient of Variation = 15.37 %

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	110.263	390.114
2	118.263	390.194
3	126.252	390.607
4	134.217	391.351
5	142.145	392.426
6	150.021	393.830
7	157.831	395.561
8	165.563	397.615
9	173.203	399.989
10	180.737	402.678
11	188.153	405.679
12	195.438	408.986
13	202.579	412.592
14	209.563	416.493
15	216.379	420.681
16	223.015	425.149
17	229.460	429.889
18	235.702	434.893
19	241.730	440.152
20	247.534	445.658
21	253.104	451.400
22	258.430	457.369

23	263.504	463.555
24	268.316	469.946
25	268.353	470.000

Circle Center At X = 112.346 ; Y = 582.364 ; and Radius = 192.260

Factor of Safety
*** 1.381 ***

Individual data on the 34 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	8.0	1699.1	0.0	0.0	0.	0.	0.0	0.0	0.0
2	8.0	4922.4	0.0	0.0	0.	0.	0.0	0.0	0.0
3	6.7	6419.8	0.0	0.0	0.	0.	0.0	0.0	0.0
4	1.2	1388.3	0.0	0.0	0.	0.	0.0	0.0	0.0
5	7.9	11558.2	0.0	0.0	0.	0.	0.0	0.0	0.0
6	7.9	15596.7	0.0	0.0	0.	0.	0.0	0.0	0.0
7	7.8	19188.2	0.0	0.0	0.	0.	0.0	0.0	0.0
8	7.7	22316.1	0.0	0.0	0.	0.	0.0	0.0	0.0
9	2.4	7667.4	0.0	0.0	0.	0.	0.0	0.0	0.0
10	5.2	16401.7	0.0	0.0	0.	0.	0.0	0.0	0.0
11	7.5	22646.8	0.0	0.0	0.	0.	0.0	0.0	0.0
12	0.3	763.9	0.0	0.0	0.	0.	0.0	0.0	0.0
13	7.2	21950.8	0.0	0.0	0.	0.	0.0	0.0	0.0
14	7.3	24644.1	0.0	0.0	0.	0.	0.0	0.0	0.0
15	3.6	12792.8	0.0	0.0	0.	0.	0.0	0.0	0.0
16	3.6	13083.3	0.0	0.0	0.	0.	0.0	0.0	0.0
17	7.0	25459.7	0.0	0.0	0.	0.	0.0	0.0	0.0
18	6.8	24479.9	0.0	0.0	0.	0.	0.0	0.0	0.0
19	3.6	12741.0	0.0	0.0	0.	0.	0.0	0.0	0.0
20	3.0	10178.4	0.0	0.0	0.	0.	0.0	0.0	0.0
21	6.4	19372.3	0.0	0.0	0.	0.	0.0	0.0	0.0
22	1.5	4124.1	0.0	0.0	0.	0.	0.0	0.0	0.0
23	3.0	7940.2	0.0	0.0	0.	0.	0.0	0.0	0.0
24	1.7	4535.3	0.0	0.0	0.	0.	0.0	0.0	0.0
25	6.0	15390.4	0.0	0.0	0.	0.	0.0	0.0	0.0
26	5.8	13596.0	0.0	0.0	0.	0.	0.0	0.0	0.0
27	2.5	5332.7	0.0	0.0	0.	0.	0.0	0.0	0.0
28	3.1	6165.4	0.0	0.0	0.	0.	0.0	0.0	0.0
29	5.3	8774.0	0.0	0.0	0.	0.	0.0	0.0	0.0
30	0.6	794.3	0.0	0.0	0.	0.	0.0	0.0	0.0
31	4.0	4498.9	0.0	0.0	0.	0.	0.0	0.0	0.0
32	0.5	425.3	0.0	0.0	0.	0.	0.0	0.0	0.0
33	4.8	1954.4	0.0	0.0	0.	0.	0.0	0.0	0.0
34	0.0	0.1	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	111.316	390.572
2	119.316	390.531
3	127.310	390.833
4	135.284	391.476

5	143.223	392.461
6	151.113	393.785
7	158.939	395.446
8	166.686	397.440
9	174.341	399.765
10	181.889	402.415
11	189.317	405.386
12	196.611	408.673
13	203.757	412.269
14	210.742	416.168
15	217.554	420.363
16	224.181	424.845
17	230.609	429.608
18	236.827	434.641
19	242.824	439.936
20	248.588	445.483
21	254.110	451.272
22	259.378	457.292
23	264.384	463.533
24	269.118	469.982
25	269.130	470.000

Circle Center At X = 116.275 ; Y = 577.213 ; and Radius = 186.707

Factor of Safety
*** 1.382 ***

1

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	111.316	390.572
2	119.314	390.756
3	127.299	391.246
4	135.259	392.044
5	143.183	393.146
6	151.058	394.551
7	158.874	396.258
8	166.618	398.264
9	174.280	400.566
10	181.848	403.161
11	189.310	406.044
12	196.656	409.212
13	203.875	412.659
14	210.956	416.382
15	217.890	420.373
16	224.664	424.628
17	231.271	429.140
18	237.699	433.902
19	243.939	438.907
20	249.983	444.149
21	255.821	449.619
22	261.444	455.309
23	266.845	461.210
24	272.016	467.315
25	274.118	470.000

Circle Center At X = 110.534 ; Y = 598.834 ; and Radius = 208.263

Factor of Safety
*** 1.383 ***

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	110.263	390.114
2	118.259	389.865
3	126.259	389.963
4	134.246	390.409
5	142.207	391.202
6	150.125	392.341
7	157.987	393.823
8	165.777	395.645
9	173.480	397.805
10	181.081	400.298
11	188.567	403.119
12	195.924	406.263
13	203.136	409.723
14	210.192	413.495
15	217.076	417.569
16	223.777	421.940
17	230.281	426.597
18	236.577	431.533
19	242.652	436.739
20	248.495	442.203
21	254.095	447.917
22	259.440	453.868
23	264.522	460.047
24	269.330	466.441
25	271.772	470.000

Circle Center At X = 120.000 ; Y = 573.736 ; and Radius = 183.880

Factor of Safety
*** 1.383 ***

1

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	110.263	390.114
2	118.262	390.227
3	126.251	390.644
4	134.219	391.367
5	142.153	392.392
6	150.042	393.719
7	157.875	395.347
8	165.640	397.272
9	173.325	399.492
10	180.921	402.003
11	188.415	404.803

12	195.797	407.886
13	203.056	411.249
14	210.182	414.886
15	217.163	418.792
16	223.990	422.962
17	230.654	427.389
18	237.143	432.067
19	243.450	436.990
20	249.563	442.149
21	255.476	447.538
22	261.179	453.149
23	266.664	458.973
24	271.922	465.002
25	275.956	470.000

Circle Center At X = 111.315 ; Y = 599.773 ; and Radius = 209.661

Factor of Safety
*** 1.383 ***

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	112.368	391.030
2	120.368	391.044
3	128.361	391.388
4	136.333	392.063
5	144.269	393.066
6	152.158	394.396
7	159.985	396.052
8	167.737	398.029
9	175.400	400.325
10	182.962	402.936
11	190.410	405.857
12	197.730	409.083
13	204.911	412.609
14	211.940	416.429
15	218.806	420.536
16	225.496	424.923
17	231.998	429.583
18	238.303	434.508
19	244.398	439.689
20	250.275	445.117
21	255.922	450.784
22	261.330	456.679
23	266.490	462.793
24	271.392	469.114
25	272.022	470.000

Circle Center At X = 116.033 ; Y = 584.540 ; and Radius = 193.545

Factor of Safety
*** 1.383 ***

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	111.316	390.572
2	119.316	390.618
3	127.308	390.979
4	135.279	391.657
5	143.217	392.648
6	151.110	393.953
7	158.945	395.568
8	166.710	397.492
9	174.394	399.721
10	181.983	402.252
11	189.466	405.081
12	196.831	408.204
13	204.068	411.615
14	211.164	415.309
15	218.108	419.281
16	224.890	423.524
17	231.499	428.032
18	237.925	432.797
19	244.157	437.813
20	250.187	443.071
21	256.004	448.563
22	261.599	454.281
23	266.964	460.215
24	272.090	466.357
25	274.895	470.000

Circle Center At X = 114.162 ; Y = 592.965 ; and Radius = 202.412

Factor of Safety
*** 1.383 ***

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	111.316	390.572
2	119.316	390.578
3	127.308	390.929
4	135.278	391.624
5	143.210	392.664
6	151.090	394.045
7	158.903	395.765
8	166.634	397.821
9	174.269	400.208
10	181.795	402.924
11	189.195	405.961
12	196.458	409.316
13	203.569	412.981
14	210.515	416.950
15	217.283	421.215
16	223.861	425.768
17	230.236	430.602
18	236.396	435.706
19	242.331	441.071

20	248.027	446.688
21	253.476	452.545
22	258.667	458.632
23	263.590	464.938
24	267.202	470.000

Circle Center At X = 115.216 ; Y = 575.604 ; and Radius = 185.073

Factor of Safety
*** 1.384 ***

1

Failure Surface Specified By 25 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	111.316	390.572
2	119.312	390.322
3	127.311	390.430
4	135.298	390.894
5	143.255	391.715
6	151.169	392.890
7	159.022	394.417
8	166.798	396.294
9	174.484	398.515
10	182.062	401.078
11	189.519	403.976
12	196.839	407.204
13	204.007	410.756
14	211.009	414.624
15	217.832	418.802
16	224.462	423.279
17	230.885	428.048
18	237.089	433.099
19	243.061	438.422
20	248.789	444.007
21	254.263	449.841
22	259.470	455.914
23	264.401	462.214
24	269.046	468.727
25	269.871	470.000

Circle Center At X = 120.905 ; Y = 569.462 ; and Radius = 179.147

Factor of Safety
*** 1.384 ***

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	113.421	391.487
2	121.420	391.632
3	129.406	392.102

4	137.367	392.895
5	145.288	394.012
6	153.158	395.448
7	160.963	397.204
8	168.691	399.274
9	176.328	401.657
10	183.861	404.348
11	191.280	407.343
12	198.570	410.636
13	205.721	414.223
14	212.721	418.097
15	219.557	422.252
16	226.219	426.681
17	232.696	431.377
18	238.976	436.332
19	245.050	441.539
20	250.908	446.987
21	256.540	452.669
22	261.936	458.575
23	267.088	464.695
24	271.198	470.000

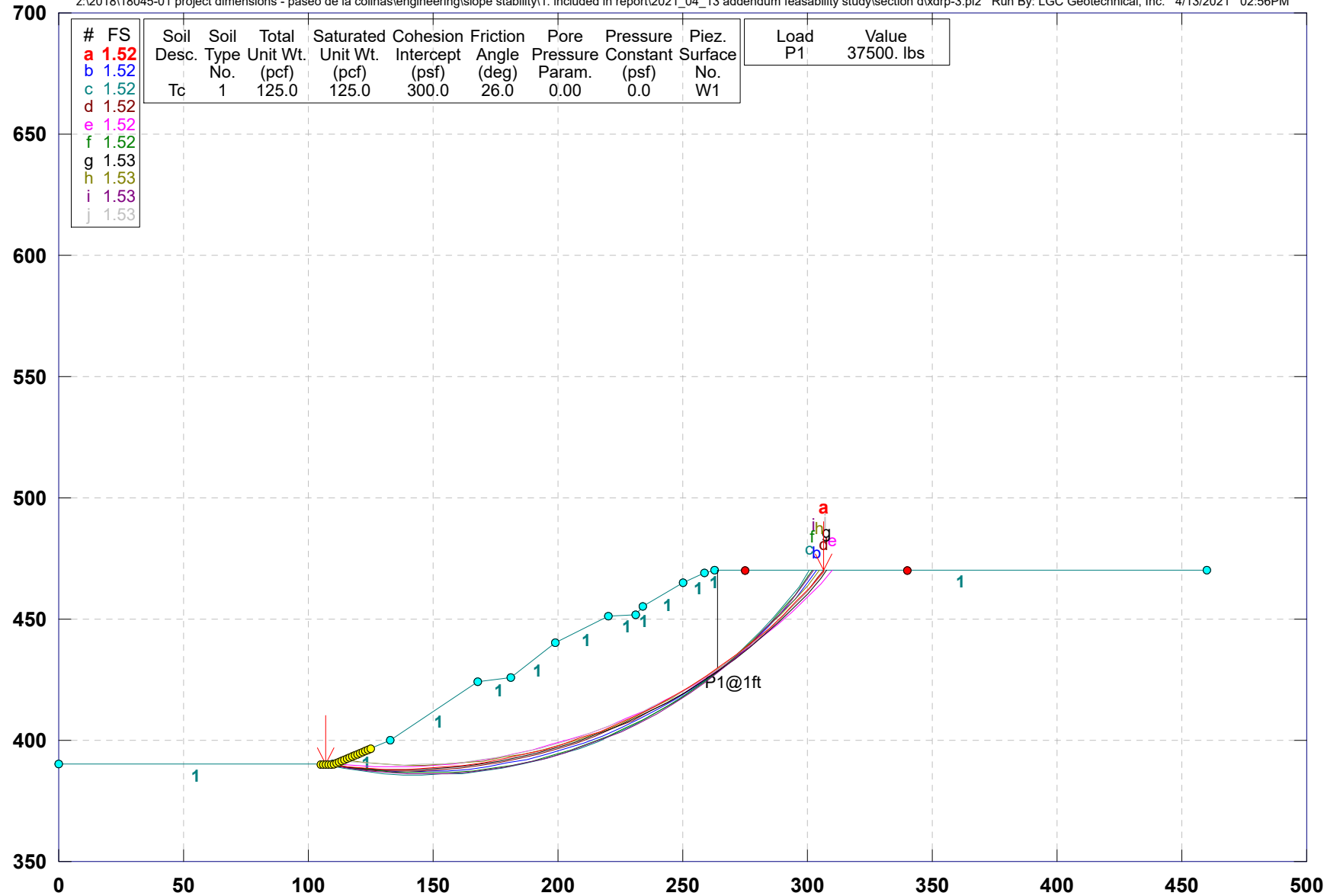
Circle Center At X = 113.876 ; Y = 588.362 ; and Radius = 196.875

Factor of Safety
*** 1.384 ***

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

Paseo de la Colinas 18045-01/Sec D-D' /Rotational/Pier/Static

z:\2018\18045-01 project dimensions - paseo de la colinas\engineering\slope stability\1. included in report\2021_04_13 addendum feasibility study\section d\ldrdp-3.plt Run By: LGC Geotechnical, Inc. 4/13/2021 02:56PM



GSTABL7 v.2 FSmin=1.52

Safety Factors Are Calculated By The Modified Bishop Method

*** GSTABL7 ***
** 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 **
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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: 4/13/2021
Time of Run: 02:56PM
Run By: LGC Geotechnical,
Inc.

Input Data Filename: Z:\2018\18045-01 Project Dimensions - Paseo de la
Colinas\Engineering\Slope Stability\Sec
D\2021_04_13\xd\xdrp-3.in

Output Filename: Z:\2018\18045-01 Project Dimensions - Paseo de la
Colinas\Engineering\Slope Stability\Sec
D\2021_04_13\xd\xdrp-3.0UT

Unit System: English

Plotted Output Filename: Z:\2018\18045-01 Project Dimensions - Paseo de la
Colinas\Engineering\Slope Stability\Sec
D\2021_04_13\xd\xdrp-3.PLT

PROBLEM DESCRIPTION: Paseo de la Colinas 18045-01/Sec D-D'
/Rotational/Pier/Static

BOUNDARY COORDINATES

12 Top Boundaries
12 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	390.00	110.00	390.00	1
2	110.00	390.00	133.00	400.00	1
3	133.00	400.00	168.00	424.00	1
4	168.00	424.00	181.00	426.00	1
5	181.00	426.00	199.00	440.00	1
6	199.00	440.00	220.00	451.00	1
7	220.00	451.00	231.00	452.00	1

8	231.00	452.00	234.00	455.00	1
9	234.00	455.00	250.00	465.00	1
10	250.00	465.00	259.00	469.00	1
11	259.00	469.00	263.00	470.00	1
12	263.00	470.00	460.00	470.00	1

User Specified Y-Origin = 350.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

1 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	125.0	125.0	300.0	26.0	0.00	0.0	1

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 1 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	26.00
2	0.0	0.00	18.00
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.

ANISOTROPIC STRENGTH DATA HAS BEEN SUPPRESSED

PIER/PILE LOAD(S)

1 Pier/Pile Load(s) Specified

Pier/Pile	X-Pos	Y-Pos	Load	Spacing	Inclination	Length
-----------	-------	-------	------	---------	-------------	--------

1

No.	(ft)	(ft)	(lbs)	(ft)	(deg)	(ft)
1	264.00	470.00	37500.0	1.0	90.00	40.0
NOTE - An Equivalent Line Load Is Calculated For Each Row Of Piers/Piles Assuming A Uniform Distribution Of Load Horizontally Between Individual Piers/Piles.						
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 = 105.00(ft) and X = 125.00(ft)						
Each Surface Terminates Between X = 275.00(ft) and X = 340.00(ft)						
Unless Further Limitations Were Imposed, The Minimum Elevation At Which A Surface Extends Is Y = 0.00(ft)						
8.00(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 = 2.839 FS Min = 1.516 FS Ave = 2.096 Standard Deviation = 0.365 Coefficient of Variation = 17.40 %						
Failure Surface Specified By 30 Coordinate Points						
Point No.	X-Surf (ft)	Y-Surf (ft)				
1	107.105	390.000				
2	115.054	389.098				
3	123.031	388.486				
4	131.024	388.166				

5	139.024	388.137							
6	147.020	388.400							
7	155.001	388.955							
8	162.956	389.800							
9	170.875	390.935							
10	178.747	392.358							
11	186.563	394.068							
12	194.310	396.061							
13	201.980	398.335							
14	209.562	400.888							
15	217.046	403.715							
16	224.421	406.814							
17	231.679	410.179							
18	238.809	413.807							
19	245.802	417.693							
20	252.649	421.831							
21	259.340	426.216							
22	265.867	430.842							
23	272.220	435.703							
24	278.392	440.793							
25	284.375	446.105							
26	290.160	451.631							
27	295.739	457.364							
28	301.105	463.297							
29	306.252	469.422							
30	306.703	470.000							
Circle Center At X = 135.814 ; Y = 607.368 ; and Radius = 219.255									
Factor of Safety *** 1.516 ***									
Individual data on the 40 slices									
Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	2.9	59.4	0.0	0.0	0.	0.	0.0	0.0	0.0
2	5.1	1083.0	0.0	0.0	0.	0.	0.0	0.0	0.0
3	8.0	5124.5	0.0	0.0	0.	0.	0.0	0.0	0.0
4	8.0	9070.1	0.0	0.0	0.	0.	0.0	0.0	0.0
5	2.0	2817.3	0.0	0.0	0.	0.	0.0	0.0	0.0
6	6.0	10480.5	0.0	0.0	0.	0.	0.0	0.0	0.0
7	8.0	18593.5	0.0	0.0	0.	0.	0.0	0.0	0.0
8	8.0	23615.3	0.0	0.0	0.	0.	0.0	0.0	0.0
9	8.0	28276.8	0.0	0.0	0.	0.	0.0	0.0	0.0
10	5.0	20244.8	0.0	0.0	0.	0.	0.0	0.0	0.0
11	2.9	12036.2	0.0	0.0	0.	0.	0.0	0.0	0.0
12	7.9	32868.3	0.0	0.0	0.	0.	0.0	0.0	0.0
13	2.3	9354.3	0.0	0.0	0.	0.	0.0	0.0	0.0
14	5.6	24131.1	0.0	0.0	0.	0.	0.0	0.0	0.0
15	7.7	37068.3	0.0	0.0	0.	0.	0.0	0.0	0.0
16	4.7	24280.2	0.0	0.0	0.	0.	0.0	0.0	0.0
17	3.0	15977.3	0.0	0.0	0.	0.	0.0	0.0	0.0
18	7.6	41638.7	0.0	0.0	0.	0.	0.0	0.0	0.0
19	7.5	42274.3	0.0	0.0	0.	0.	0.0	0.0	0.0
20	3.0	16946.0	0.0	0.0	0.	0.	0.0	0.0	0.0
21	4.4	25044.8	0.0	0.0	0.	0.	0.0	0.0	0.0
22	6.6	35657.5	0.0	0.0	0.	0.	0.0	0.0	0.0

23	0.7	3591.9	0.0	0.0	0.	0.	0.0	0.0	0.0
24	2.3	12495.4	0.0	0.0	0.	0.	0.0	0.0	0.0
25	4.8	26401.3	0.0	0.0	0.	0.	0.0	0.0	0.0
26	7.0	38846.8	0.0	0.0	0.	0.	0.0	0.0	0.0
27	4.2	23469.7	0.0	0.0	0.	0.	0.0	0.0	0.0
28	2.6	14752.6	0.0	0.0	0.	0.	0.0	0.0	0.0
29	6.4	34675.1	0.0	0.0	0.	0.	0.0	0.0	0.0
30	0.3	1824.0	0.0	0.0	0.	0.	0.0	0.0	0.0
31	3.7	19229.2	0.0	0.0	0.	0.	0.0	0.0	0.0
32	2.9	14395.2	0.0	0.0	0.	0.	0.0	0.0	0.0
33	6.4	29169.0	0.0	0.0	0.	0.	0.0	0.0	0.0
34	6.2	24497.0	0.0	0.0	0.	0.	0.0	0.0	0.0
35	6.0	19854.9	0.0	0.0	0.	0.	0.0	0.0	0.0
36	5.8	15280.6	0.0	0.0	0.	0.	0.0	0.0	0.0
37	5.6	10811.8	0.0	0.0	0.	0.	0.0	0.0	0.0
38	5.4	6486.4	0.0	0.0	0.	0.	0.0	0.0	0.0
39	5.1	2342.0	0.0	0.0	0.	0.	0.0	0.0	0.0
40	0.5	16.3	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 29 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	108.158	390.000
2	116.064	388.779
3	124.013	387.878
4	131.992	387.297
5	139.988	387.039
6	147.988	387.103
7	155.978	387.489
8	163.947	388.197
9	171.881	389.226
10	179.766	390.573
11	187.591	392.237
12	195.343	394.215
13	203.009	396.504
14	210.576	399.099
15	218.032	401.998
16	225.366	405.194
17	232.565	408.684
18	239.617	412.460
19	246.512	416.518
20	253.237	420.850
21	259.783	425.450
22	266.137	430.310
23	272.291	435.422
24	278.234	440.777
25	283.956	446.368
26	289.449	452.185
27	294.702	458.218
28	299.708	464.458
29	303.798	470.000

Circle Center At X = 142.399 ; Y = 585.529 ; and Radius = 198.505

Factor of Safety
*** 1.519 ***

Failure Surface Specified By 29 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	106.053	390.000
2	113.905	388.472
3	121.817	387.284
4	129.772	386.438
5	137.756	385.935
6	145.754	385.777
7	153.752	385.963
8	161.735	386.494
9	169.687	387.369
10	177.594	388.585
11	185.441	390.141
12	193.214	392.033
13	200.898	394.259
14	208.479	396.813
15	215.943	399.692
16	223.277	402.890
17	230.465	406.400
18	237.496	410.217
19	244.355	414.334
20	251.031	418.742
21	257.511	423.434
22	263.783	428.400
23	269.835	433.632
24	275.655	439.120
25	281.234	444.854
26	286.561	450.823
27	291.626	457.016
28	296.419	463.421
29	300.913	470.000

Circle Center At X = 145.425 ; Y = 571.416 ; and Radius = 185.639

Factor of Safety
*** 1.521 ***

Failure Surface Specified By 30 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	105.000	390.000
2	112.927	388.919
3	120.888	388.135
4	128.873	387.649
5	136.871	387.463
6	144.870	387.576
7	152.860	387.989
8	160.828	388.700
9	168.764	389.709
10	176.657	391.014
11	184.495	392.614
12	192.269	394.506
13	199.965	396.687
14	207.575	399.155
15	215.087	401.906
16	222.491	404.936

17	229.777	408.241
18	236.933	411.817
19	243.951	415.658
20	250.820	419.758
21	257.531	424.113
22	264.074	428.716
23	270.440	433.561
24	276.621	438.641
25	282.607	443.948
26	288.390	449.475
27	293.962	455.215
28	299.316	461.160
29	304.443	467.301
30	306.531	470.000

Circle Center At X = 137.861 ; Y = 601.061 ; and Radius = 213.604

Factor of Safety
*** 1.521 ***

1

Failure Surface Specified By 29 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	110.263	390.114
2	118.238	389.485
3	126.230	389.128
4	134.230	389.044
5	142.228	389.232
6	150.214	389.693
7	158.181	390.426
8	166.118	391.429
9	174.016	392.703
10	181.866	394.245
11	189.658	396.054
12	197.385	398.127
13	205.037	400.463
14	212.604	403.058
15	220.079	405.909
16	227.452	409.014
17	234.715	412.368
18	241.859	415.967
19	248.877	419.808
20	255.759	423.886
21	262.499	428.196
22	269.088	432.733
23	275.518	437.493
24	281.783	442.468
25	287.874	447.654
26	293.785	453.045
27	299.509	458.634
28	305.039	464.415
29	310.027	470.000

Circle Center At X = 132.706 ; Y = 623.728 ; and Radius = 234.689

Factor of Safety
*** 1.524 ***

Failure Surface Specified By 29 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	110.263	390.114
2	118.142	388.725
3	126.072	387.674
4	134.041	386.965
5	142.032	386.599
6	150.032	386.577
7	158.026	386.897
8	165.998	387.561
9	173.935	388.567
10	181.821	389.912
11	189.642	391.595
12	197.384	393.611
13	205.032	395.959
14	212.572	398.632
15	219.990	401.627
16	227.273	404.938
17	234.407	408.558
18	241.379	412.481
19	248.176	416.700
20	254.786	421.207
21	261.196	425.993
22	267.394	431.051
23	273.370	436.369
24	279.112	441.940
25	284.610	447.751
26	289.853	453.794
27	294.832	460.056
28	299.537	466.526
29	301.842	470.000

Circle Center At X = 146.559 ; Y = 572.831 ; and Radius = 186.287

Factor of Safety
*** 1.524 ***

1

Failure Surface Specified By 30 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	105.000	390.000
2	112.936	388.989
3	120.903	388.269
4	128.892	387.840
5	136.891	387.702
6	144.889	387.856
7	152.877	388.302
8	160.843	389.038
9	168.777	390.065
10	176.668	391.381

11	184.506	392.983
12	192.280	394.870
13	199.980	397.040
14	207.596	399.489
15	215.118	402.214
16	222.535	405.211
17	229.838	408.477
18	237.017	412.008
19	244.062	415.798
20	250.964	419.842
21	257.715	424.135
22	264.304	428.672
23	270.723	433.446
24	276.965	438.451
25	283.019	443.680
26	288.878	449.127
27	294.536	454.783
28	299.982	460.642
29	305.212	466.696
30	307.862	470.000

Circle Center At X = 136.682 ; Y = 606.867 ; and Radius = 219.169

Factor of Safety
*** 1.525 ***

Failure Surface Specified By 28 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	114.474	391.945
2	122.412	390.951
3	130.383	390.271
4	138.375	389.908
5	146.374	389.862
6	154.370	390.133
7	162.348	390.720
8	170.297	391.622
9	178.204	392.839
10	186.057	394.368
11	193.843	396.206
12	201.549	398.352
13	209.165	400.801
14	216.678	403.550
15	224.076	406.594
16	231.348	409.929
17	238.482	413.549
18	245.467	417.449
19	252.292	421.623
20	258.947	426.063
21	265.420	430.764
22	271.702	435.717
23	277.783	440.915
24	283.654	446.350
25	289.304	452.013
26	294.726	457.896
27	299.911	463.988
28	304.629	470.000

Circle Center At X = 143.545 ; Y = 591.775 ; and Radius = 201.934

Factor of Safety
*** 1.525 ***

1

Failure Surface Specified By 29 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	108.158	390.000
2	116.023	388.539
3	123.944	387.416
4	131.906	386.632
5	139.893	386.190
6	147.893	386.090
7	155.889	386.332
8	163.868	386.916
9	171.814	387.840
10	179.714	389.104
11	187.552	390.704
12	195.315	392.638
13	202.988	394.902
14	210.557	397.493
15	218.008	400.405
16	225.328	403.632
17	232.503	407.170
18	239.521	411.012
19	246.367	415.150
20	253.030	419.577
21	259.498	424.285
22	265.759	429.265
23	271.801	434.509
24	277.613	440.006
25	283.185	445.747
26	288.506	451.721
27	293.566	457.917
28	298.358	464.323
29	302.235	470.000

Circle Center At X = 146.234 ; Y = 573.089 ; and Radius = 187.007

Factor of Safety
*** 1.527 ***

Failure Surface Specified By 29 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	113.421	391.487
2	121.380	390.674
3	129.363	390.155
4	137.360	389.933
5	145.359	390.006
6	153.351	390.375

7	161.323	391.040
8	169.265	391.999
9	177.167	393.252
10	185.016	394.796
11	192.803	396.629
12	200.517	398.749
13	208.148	401.154
14	215.683	403.839
15	223.115	406.801
16	230.432	410.036
17	237.624	413.539
18	244.681	417.306
19	251.594	421.332
20	258.354	425.611
21	264.951	430.137
22	271.375	434.904
23	277.619	439.905
24	283.674	445.135
25	289.530	450.584
26	295.181	456.247
27	300.619	462.114
28	305.836	468.179
29	307.289	470.000

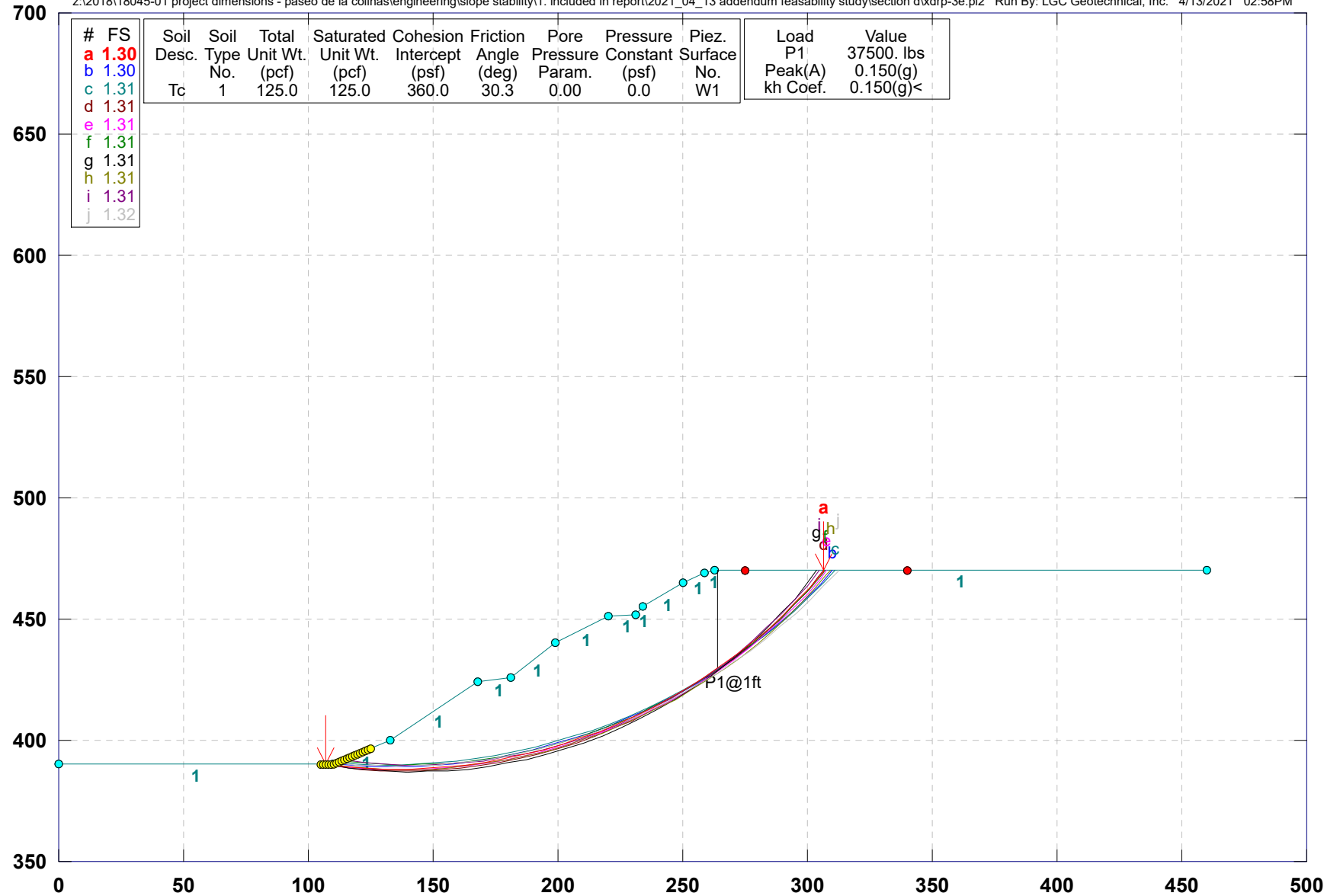
Circle Center At X = 139.379 ; Y = 606.085 ; and Radius = 216.161

Factor of Safety
*** 1.527 ***

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

Paseo de la Colinas 18045-01/Sec D-D' /Rotational/Pier/Seismic

z:\2018\18045-01 project dimensions - paseo de la colinas\engineering\slope stability\1. included in report\2021_04_13 addendum feasibility study\section d\xdrp-3e.pl2 Run By: LGC Geotechnical, Inc. 4/13/2021 02:58PM



GSTABL7 v.2 FSmin=1.30

Safety Factors Are Calculated By The Modified Bishop Method

*** GSTABL7 ***

** 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 **
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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: 4/13/2021
Time of Run: 02:58PM
Run By: LGC Geotechnical,
Inc.

Input Data Filename: Z:\2018\18045-01 Project Dimensions - Paseo de la
Colinas\Engineering\Slope Stability\Sec
D\2021_04_13\xd\xdrp-3e.in

Output Filename: Z:\2018\18045-01 Project Dimensions - Paseo de la
Colinas\Engineering\Slope Stability\Sec
D\2021_04_13\xd\xdrp-3e.OUT

Unit System: English

Plotted Output Filename: Z:\2018\18045-01 Project Dimensions - Paseo de la
Colinas\Engineering\Slope Stability\Sec
D\2021_04_13\xd\xdrp-3e.PLT

PROBLEM DESCRIPTION: Paseo de la Colinas 18045-01/Sec D-D'
/Rotational/Pier/Seismic

BOUNDARY COORDINATES

12 Top Boundaries
12 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	390.00	110.00	390.00	1
2	110.00	390.00	133.00	400.00	1
3	133.00	400.00	168.00	424.00	1
4	168.00	424.00	181.00	426.00	1
5	181.00	426.00	199.00	440.00	1
6	199.00	440.00	220.00	451.00	1
7	220.00	451.00	231.00	452.00	1

8	231.00	452.00	234.00	455.00	1
9	234.00	455.00	250.00	465.00	1
10	250.00	465.00	259.00	469.00	1
11	259.00	469.00	263.00	470.00	1
12	263.00	470.00	460.00	470.00	1

User Specified Y-Origin = 350.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

1

ISOTROPIC SOIL PARAMETERS

1 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	125.0	125.0	360.0	30.3	0.00	0.0	1

ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 1 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	26.00
2	0.0	0.00	18.00
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.

ANISOTROPIC STRENGTH DATA HAS BEEN SUPPRESSED

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

1

PIER/PILE LOAD(S)

1 Pier/Pile Load(s) Specified

Pier/Pile No.	X-Pos (ft)	Y-Pos (ft)	Load (lbs)	Spacing (ft)	Inclination (deg)	Length (ft)
1	264.00	470.00	37500.0	1.0	90.00	40.0

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

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 = 105.00(ft) and X = 125.00(ft)

Each Surface Terminates Between X = 275.00(ft) and X = 340.00(ft)

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

8.00(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 = 2.380 FS Min = 1.303 FS Ave = 1.794
Standard Deviation = 0.314 Coefficient of Variation = 17.51 %

Failure Surface Specified By 30 Coordinate Points

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

No.	(ft)	(ft)
1	107.105	390.000
2	115.054	389.098
3	123.031	388.486
4	131.024	388.166
5	139.024	388.137
6	147.020	388.400
7	155.001	388.955
8	162.956	389.800
9	170.875	390.935
10	178.747	392.358
11	186.563	394.068
12	194.310	396.061
13	201.980	398.335
14	209.562	400.888
15	217.046	403.715
16	224.421	406.814
17	231.679	410.179
18	238.809	413.807
19	245.802	417.693
20	252.649	421.831
21	259.340	426.216
22	265.867	430.842
23	272.220	435.703
24	278.392	440.793
25	284.375	446.105
26	290.160	451.631
27	295.739	457.364
28	301.105	463.297
29	306.252	469.422
30	306.703	470.000

Circle Center At X = 135.814 ; Y = 607.368 ; and Radius = 219.255

Factor of Safety
*** 1.303 ***

Individual data on the 40 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	2.9	59.4	0.0	0.0	0.	0.	8.9	0.0	0.0
2	5.1	1083.0	0.0	0.0	0.	0.	162.4	0.0	0.0
3	8.0	5124.5	0.0	0.0	0.	0.	768.7	0.0	0.0
4	8.0	9070.1	0.0	0.0	0.	0.	1360.5	0.0	0.0
5	2.0	2817.3	0.0	0.0	0.	0.	422.6	0.0	0.0
6	6.0	10480.5	0.0	0.0	0.	0.	1572.1	0.0	0.0
7	8.0	18593.5	0.0	0.0	0.	0.	2789.0	0.0	0.0
8	8.0	23615.3	0.0	0.0	0.	0.	3542.3	0.0	0.0
9	8.0	28276.8	0.0	0.0	0.	0.	4241.5	0.0	0.0
10	5.0	20244.8	0.0	0.0	0.	0.	3036.7	0.0	0.0
11	2.9	12036.2	0.0	0.0	0.	0.	1805.4	0.0	0.0
12	7.9	32868.3	0.0	0.0	0.	0.	4930.2	0.0	0.0
13	2.3	9354.3	0.0	0.0	0.	0.	1403.1	0.0	0.0
14	5.6	24131.1	0.0	0.0	0.	0.	3619.7	0.0	0.0
15	7.7	37068.3	0.0	0.0	0.	0.	5560.2	0.0	0.0
16	4.7	24280.2	0.0	0.0	0.	0.	3642.0	0.0	0.0

17	3.0	15977.3	0.0	0.0	0.	0.	2396.6	0.0	0.0
18	7.6	41638.7	0.0	0.0	0.	0.	6245.8	0.0	0.0
19	7.5	42274.3	0.0	0.0	0.	0.	6341.1	0.0	0.0
20	3.0	16946.0	0.0	0.0	0.	0.	2541.9	0.0	0.0
21	4.4	25044.8	0.0	0.0	0.	0.	3756.7	0.0	0.0
22	6.6	35657.5	0.0	0.0	0.	0.	5348.6	0.0	0.0
23	0.7	3591.9	0.0	0.0	0.	0.	538.8	0.0	0.0
24	2.3	12495.4	0.0	0.0	0.	0.	1874.3	0.0	0.0
25	4.8	26401.3	0.0	0.0	0.	0.	3960.2	0.0	0.0
26	7.0	38846.8	0.0	0.0	0.	0.	5827.0	0.0	0.0
27	4.2	23469.7	0.0	0.0	0.	0.	3520.5	0.0	0.0
28	2.6	14752.6	0.0	0.0	0.	0.	2212.9	0.0	0.0
29	6.4	34675.1	0.0	0.0	0.	0.	5201.3	0.0	0.0
30	0.3	1824.0	0.0	0.0	0.	0.	273.6	0.0	0.0
31	3.7	19229.2	0.0	0.0	0.	0.	2884.4	0.0	0.0
32	2.9	14395.2	0.0	0.0	0.	0.	2159.3	0.0	0.0
33	6.4	29169.0	0.0	0.0	0.	0.	4375.3	0.0	0.0
34	6.2	24497.0	0.0	0.0	0.	0.	3674.6	0.0	0.0
35	6.0	19854.9	0.0	0.0	0.	0.	2978.2	0.0	0.0
36	5.8	15280.6	0.0	0.0	0.	0.	2292.1	0.0	0.0
37	5.6	10811.8	0.0	0.0	0.	0.	1621.8	0.0	0.0
38	5.4	6486.4	0.0	0.0	0.	0.	973.0	0.0	0.0
39	5.1	2342.0	0.0	0.0	0.	0.	351.3	0.0	0.0
40	0.5	16.3	0.0	0.0	0.	0.	2.4	0.0	0.0

Failure Surface Specified By 29 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	110.263	390.114
2	118.238	389.485
3	126.230	389.128
4	134.230	389.044
5	142.228	389.232
6	150.214	389.693
7	158.181	390.426
8	166.118	391.429
9	174.016	392.703
10	181.866	394.245
11	189.658	396.054
12	197.385	398.127
13	205.037	400.463
14	212.604	403.058
15	220.079	405.909
16	227.452	409.014
17	234.715	412.368
18	241.859	415.967
19	248.877	419.808
20	255.759	423.886
21	262.499	428.196
22	269.088	432.733
23	275.518	437.493
24	281.783	442.468
25	287.874	447.654
26	293.785	453.045
27	299.509	458.634
28	305.039	464.415
29	310.027	470.000

Circle Center At X = 132.706 ; Y = 623.728 ; and Radius = 234.689

Factor of Safety
*** 1.304 ***

1

Failure Surface Specified By 29 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	111.316	390.572
2	119.298	390.036
3	127.293	389.765
4	135.293	389.759
5	143.289	390.018
6	151.272	390.542
7	159.233	391.329
8	167.164	392.380
9	175.055	393.693
10	182.899	395.267
11	190.686	397.099
12	198.409	399.189
13	206.057	401.533
14	213.625	404.129
15	221.101	406.974
16	228.480	410.065
17	235.752	413.399
18	242.910	416.972
19	249.945	420.781
20	256.851	424.820
21	263.619	429.085
22	270.242	433.573
23	276.713	438.277
24	283.024	443.193
25	289.169	448.315
26	295.141	453.638
27	300.933	459.156
28	306.540	464.863
29	311.263	470.000

Circle Center At X = 131.478 ; Y = 631.245 ; and Radius = 241.516

Factor of Safety
*** 1.306 ***

Failure Surface Specified By 30 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	105.000	390.000
2	112.927	388.919
3	120.888	388.135
4	128.873	387.649
5	136.871	387.463
6	144.870	387.576
7	152.860	387.989
8	160.828	388.700
9	168.764	389.709
10	176.657	391.014

11	184.495	392.614
12	192.269	394.506
13	199.965	396.687
14	207.575	399.155
15	215.087	401.906
16	222.491	404.936
17	229.777	408.241
18	236.933	411.817
19	243.951	415.658
20	250.820	419.758
21	257.531	424.113
22	264.074	428.716
23	270.440	433.561
24	276.621	438.641
25	282.607	443.948
26	288.390	449.475
27	293.962	455.215
28	299.316	461.160
29	304.443	467.301
30	306.531	470.000

Circle Center At X = 137.861 ; Y = 601.061 ; and Radius = 213.604

Factor of Safety
*** 1.309 ***

1

Failure Surface Specified By 30 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	105.000	390.000
2	112.936	388.989
3	120.903	388.269
4	128.892	387.840
5	136.891	387.702
6	144.889	387.856
7	152.877	388.302
8	160.843	389.038
9	168.777	390.065
10	176.668	391.381
11	184.506	392.983
12	192.280	394.870
13	199.980	397.040
14	207.596	399.489
15	215.118	402.214
16	222.535	405.211
17	229.838	408.477
18	237.017	412.008
19	244.062	415.798
20	250.964	419.842
21	257.715	424.135
22	264.304	428.672
23	270.723	433.446
24	276.965	438.451
25	283.019	443.680
26	288.878	449.127
27	294.536	454.783
28	299.982	460.642
29	305.212	466.696

30 307.862 470.000

Circle Center At X = 136.682 ; Y = 606.867 ; and Radius = 219.169

Factor of Safety
*** 1.310 ***

Failure Surface Specified By 29 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	113.421	391.487
2	121.380	390.674
3	129.363	390.155
4	137.360	389.933
5	145.359	390.006
6	153.351	390.375
7	161.323	391.040
8	169.265	391.999
9	177.167	393.252
10	185.016	394.796
11	192.803	396.629
12	200.517	398.749
13	208.148	401.154
14	215.683	403.839
15	223.115	406.801
16	230.432	410.036
17	237.624	413.539
18	244.681	417.306
19	251.594	421.332
20	258.354	425.611
21	264.951	430.137
22	271.375	434.904
23	277.619	439.905
24	283.674	445.135
25	289.530	450.584
26	295.181	456.247
27	300.619	462.114
28	305.836	468.179
29	307.289	470.000

Circle Center At X = 139.379 ; Y = 606.085 ; and Radius = 216.161

Factor of Safety
*** 1.310 ***

1

Failure Surface Specified By 29 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	108.158	390.000
2	116.064	388.779
3	124.013	387.878

4	131.992	387.297
5	139.988	387.039
6	147.988	387.103
7	155.978	387.489
8	163.947	388.197
9	171.881	389.226
10	179.766	390.573
11	187.591	392.237
12	195.343	394.215
13	203.009	396.504
14	210.576	399.099
15	218.032	401.998
16	225.366	405.194
17	232.565	408.684
18	239.617	412.460
19	246.512	416.518
20	253.237	420.850
21	259.783	425.450
22	266.137	430.310
23	272.291	435.422
24	278.234	440.777
25	283.956	446.368
26	289.449	452.185
27	294.702	458.218
28	299.708	464.458
29	303.798	470.000

Circle Center At X = 142.399 ; Y = 585.529 ; and Radius = 198.505

Factor of Safety
*** 1.313 ***

Failure Surface Specified By 30 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	108.158	390.000
2	116.103	389.061
3	124.076	388.411
4	132.068	388.052
5	140.068	387.984
6	148.065	388.208
7	156.048	388.722
8	164.008	389.527
9	171.932	390.621
10	179.812	392.002
11	187.637	393.670
12	195.395	395.621
13	203.077	397.853
14	210.673	400.363
15	218.173	403.149
16	225.566	406.205
17	232.843	409.528
18	239.994	413.114
19	247.010	416.958
20	253.881	421.055
21	260.599	425.400
22	267.154	429.985
23	273.538	434.807
24	279.742	439.857

25	285.758	445.130
26	291.579	450.619
27	297.195	456.316
28	302.601	462.213
29	307.788	468.304
30	309.130	470.000

Circle Center At X = 137.943 ; Y = 607.612 ; and Radius = 219.640

Factor of Safety
*** 1.313 ***

1

Failure Surface Specified By 28 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	114.474	391.945
2	122.412	390.951
3	130.383	390.271
4	138.375	389.908
5	146.374	389.862
6	154.370	390.133
7	162.348	390.720
8	170.297	391.622
9	178.204	392.839
10	186.057	394.368
11	193.843	396.206
12	201.549	398.352
13	209.165	400.801
14	216.678	403.550
15	224.076	406.594
16	231.348	409.929
17	238.482	413.549
18	245.467	417.449
19	252.292	421.623
20	258.947	426.063
21	265.420	430.764
22	271.702	435.717
23	277.783	440.915
24	283.654	446.350
25	289.304	452.013
26	294.726	457.896
27	299.911	463.988
28	304.629	470.000

Circle Center At X = 143.545 ; Y = 591.775 ; and Radius = 201.934

Factor of Safety
*** 1.314 ***

Failure Surface Specified By 30 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
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1	111.316	390.572
2	119.287	389.895
3	127.277	389.489
4	135.276	389.356
5	143.274	389.494
6	151.264	389.905
7	159.235	390.588
8	167.178	391.542
9	175.084	392.765
10	182.943	394.256
11	190.748	396.015
12	198.488	398.037
13	206.155	400.322
14	213.739	402.867
15	221.233	405.668
16	228.626	408.723
17	235.912	412.028
18	243.081	415.578
19	250.125	419.371
20	257.036	423.401
21	263.805	427.664
22	270.426	432.154
23	276.890	436.868
24	283.190	441.799
25	289.318	446.941
26	295.268	452.289
27	301.032	457.836
28	306.604	463.577
29	311.978	469.503
30	312.398	470.000

Circle Center At X = 135.204 ; Y = 624.344 ; and Radius = 234.989

Factor of Safety
*** 1.315 ***

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

