

Slide Analysis Information

Estabilidad UD FJC Sede Vivero

Project Summary

File Name: PerfilS1S2TerrAncladoSIN
Slide Modeler Version: 6.005
Project Title: Estabilidad UD FJC Sede Vivero
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Date Created: 5/03/2019, 3:05:39 p. m.

General Settings

Units of Measurement: Metric Units
Time Units: days
Permeability Units: meters/second
Failure Direction: Right to Left
Data Output: Standard
Maximum Material Properties: 20
Maximum Support Properties: 20

Analysis Options

Analysis Methods Used

Bishop simplified
Janbu simplified

Number of slices: 25
Tolerance: 0.005
Maximum number of iterations: 50
Check $m\alpha < 0.2$: Yes
Initial trial value of FS: 1
Steffensen Iteration: Yes

Groundwater Analysis

Groundwater Method: Ru Coefficient
Pore Fluid Unit Weight: 9.81 kN/m³
Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116

Random Number Generation Method: Park and Miller v.3

Surface Options

Surface Type: Circular
 Search Method: Slope Search
 Number of Surfaces: 5000
 Upper Angle: Not Defined
 Lower Angle: Not Defined
 Composite Surfaces: Disabled
 Reverse Curvature: Create Tension Crack
 Minimum Elevation: Not Defined
 Minimum Depth: Not Defined

Loading

Seismic Load Coefficient (Horizontal): 0.144
 2 Distributed Loads present



Distributed Load 1

Distribution: Constant
 Magnitude [kN/m²]: 20
 Orientation: Normal to boundary

Distributed Load 2

Distribution: Constant
 Magnitude [kN/m²]: 10
 Orientation: Normal to boundary

Material Properties

Property	Arcilla Dura	Arenisca
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [kN/m ³]	21	22
Cohesion [kPa]	100	250
Friction Angle [deg]	0	30
Ru Value	0.1	0.1

Support Properties

Support 1

Support Type: Grouted Tieback
Force Application: Active
Out-of-Plane Spacing: 2 m
Tensile Capacity: 148 kN
Plate Capacity: 500 kN
Bond length: 10.000 m
Bond Strength: 31 kN/m

Global Minimums

Method: bishop simplified

FS: 2.129230
Center: 101586.900, 100210.287
Radius: 0.801
Left Slip Surface Endpoint: 101587.108, 100209.514
Right Slip Surface Endpoint: 101587.673, 100210.079
Resisting Moment=67.0547 kN-m
Driving Moment=31.4925 kN-m

Method: janbu simplified

FS: 1.150280
Center: 101586.900, 100210.287
Radius: 0.801
Left Slip Surface Endpoint: 101587.108, 100209.514
Right Slip Surface Endpoint: 101587.673, 100210.079
Resisting Horizontal Force=56.5324 kN
Driving Horizontal Force=49.1466 kN

Valid / Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 2658
Number of Invalid Surfaces: 2342

Error Codes:

Error Code -105 reported for 50 surfaces
Error Code -106 reported for 8 surfaces
Error Code -107 reported for 458 surfaces
Error Code -108 reported for 61 surfaces
Error Code -112 reported for 1765 surfaces

Method: janbu simplified

Number of Valid Surfaces: 2286
Number of Invalid Surfaces: 2714

Error Codes:

- Error Code -105 reported for 50 surfaces
- Error Code -106 reported for 8 surfaces
- Error Code -107 reported for 458 surfaces
- Error Code -108 reported for 433 surfaces
- Error Code -112 reported for 1765 surfaces

Error Codes

The following errors were encountered during the computation:

- 105 = More than two surface / slope intersections with no valid slip surface.
- 106 = Average slice width is less than 0.0001 * (maximum horizontal extent of soil region). This limitation is imposed to avoid numerical errors which may result from too many slices, or too small a slip region.
- 107 = Total driving moment or total driving force is negative. This will occur if the wrong failure direction is specified, or if high external or anchor loads are applied against the failure direction.
- 108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
- 112 = The coefficient $M\text{-}\alpha = \cos(\alpha)(1 + \tan(\alpha)\tan(\phi)/F) < 0.2$ for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.12923

Slice Number	Width [m]	Weight [kN]	Base Material	Base Cohesion [kPa]	Base Friction Angle [degrees]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]
1	0.022613	0.00386524	Arcilla Dura	100	0	46.9653	100	-13.2232	0.017093	-13.2403
2	0.022613	0.0113354	Arcilla Dura	100	0	46.9653	100	-14.3972	0.0501277	-14.4473
3	0.022613	0.0185051	Arcilla Dura	100	0	46.9653	100	-15.6336	0.081834	-15.7154
4	0.022613	0.0252943	Arcilla Dura	100	0	46.9653	100	-16.9364	0.111858	-17.0483
5	0.022613	0.031723	Arcilla Dura	100	0	46.9653	100	-18.3122	0.140287	-18.4524
6	0.022613	0.0377111	Arcilla Dura	100	0	46.9653	100	-19.7727	0.166768	-19.9395
7	0.022613	0.0433788	Arcilla Dura	100	0	46.9653	100	-21.3225	0.191832	-21.5143
8	0.022613	0.0485659	Arcilla Dura	100	0	46.9653	100	-22.9798	0.21477	-23.1946
9	0.022613	0.0533524	Arcilla Dura	100	0	46.9653	100	-24.7545	0.235937	-24.9904
10	0.022613	0.0576382	Arcilla Dura	100	0	46.9653	100	-26.6668	0.25489	-26.9217
			Arcilla							

			Dura								
12	0.022613	0.0647478	Arcilla Dura	100	0	46.9653	100	-30.9841	0.28633	-31.2705	
13	0.022613	0.0674114	Arcilla Dura	100	0	46.9653	100	-33.449	0.29811	-33.7471	
14	0.022613	0.0695143	Arcilla Dura	100	0	46.9653	100	-36.1632	0.307409	-36.4706	
15	0.022613	0.0709162	Arcilla Dura	100	0	46.9653	100	-39.1801	0.313608	-39.4937	
16	0.022613	0.0715971	Arcilla Dura	100	0	46.9653	100	-42.5634	0.31662	-42.88	
17	0.022613	0.0714769	Arcilla Dura	100	0	46.9653	100	-46.4003	0.316088	-46.7164	
18	0.022613	0.0703754	Arcilla Dura	100	0	46.9653	100	-50.8151	0.311217	-51.1263	
19	0.022613	0.0681925	Arcilla Dura	100	0	46.9653	100	-55.979	0.301564	-56.2806	
20	0.022613	0.0647478	Arcilla Dura	100	0	46.9653	100	-62.1509	0.28633	-62.4372	
21	0.022613	0.0597811	Arcilla Dura	100	0	46.9653	100	-69.7397	0.264366	-70.004	
22	0.022613	0.0528917	Arcilla Dura	100	0	46.9653	100	-79.4431	0.2339	-79.677	
23	0.022613	0.043479	Arcilla Dura	100	0	46.9653	100	-92.5778	0.192274	-92.7701	
24	0.022613	0.0304213	Arcilla Dura	100	0	46.9653	100	-112.062	0.13453	-112.197	
25	0.022613	0.0114355	Arcilla Dura	100	0	46.9653	100	2266.9	0.0505706	2266.85	

Global Minimum Query (janbu simplified) - Safety Factor: 1.15028

Slice Number	Width [m]	Weight [kN]	Base Material	Base Cohesion [kPa]	Base Friction Angle [degrees]	Shear Stress [kPa]	Shear Strength [kPa]	Base Normal Stress [kPa]	Pore Pressure [kPa]	Effective Normal Stress [kPa]
1	0.022613	0.00386524	Arcilla Dura	100	0	86.9354	100	-24.6182	0.017093	-24.6352
2	0.022613	0.0113354	Arcilla Dura	100	0	86.9354	100	-27.072	0.0501277	-27.1221
3	0.022613	0.0185051	Arcilla Dura	100	0	86.9354	100	-29.6299	0.081834	-29.7118
4	0.022613	0.0252943	Arcilla Dura	100	0	86.9354	100	-32.2966	0.111858	-32.4085
5	0.022613	0.031723	Arcilla Dura	100	0	86.9354	100	-35.0847	0.140287	-35.2249
6	0.022613	0.0377111	Arcilla Dura	100	0	86.9354	100	-38.0131	0.166768	-38.1799
7	0.022613	0.0433788	Arcilla Dura	100	0	86.9354	100	-41.0944	0.191832	-41.2862
			Arcilla							

			Dura							
9	0.022613	0.0533524	Arcilla Dura	100	0	86.9354	100	-47.8215	0.235937	-48.0575
10	0.022613	0.0576382	Arcilla Dura	100	0	86.9354	100	-51.5218	0.25489	-51.7767
11	0.022613	0.0614634	Arcilla Dura	100	0	86.9354	100	-55.4924	0.271806	-55.7642
12	0.022613	0.0647478	Arcilla Dura	100	0	86.9354	100	-59.7795	0.28633	-60.0659
13	0.022613	0.0674114	Arcilla Dura	100	0	86.9354	100	-64.4418	0.29811	-64.7399
14	0.022613	0.0695143	Arcilla Dura	100	0	86.9354	100	-69.5439	0.307409	-69.8513
15	0.022613	0.0709162	Arcilla Dura	100	0	86.9354	100	-75.1806	0.313608	-75.4942
16	0.022613	0.0715971	Arcilla Dura	100	0	86.9354	100	-81.4675	0.31662	-81.7841
17	0.022613	0.0714769	Arcilla Dura	100	0	86.9354	100	-88.5643	0.316088	-88.8804
18	0.022613	0.0703754	Arcilla Dura	100	0	86.9354	100	-96.6935	0.311217	-97.0047
19	0.022613	0.0681925	Arcilla Dura	100	0	86.9354	100	-106.169	0.301564	-106.47
20	0.022613	0.0647478	Arcilla Dura	100	0	86.9354	100	-117.461	0.28633	-117.748
21	0.022613	0.0597811	Arcilla Dura	100	0	86.9354	100	-131.319	0.264366	-131.584
22	0.022613	0.0528917	Arcilla Dura	100	0	86.9354	100	-149.019	0.2339	-149.253
23	0.022613	0.043479	Arcilla Dura	100	0	86.9354	100	-172.974	0.192274	-173.166
24	0.022613	0.0304213	Arcilla Dura	100	0	86.9354	100	-208.543	0.13453	-208.678
25	0.022613	0.0114355	Arcilla Dura	100	0	86.9354	100	2141.93	0.0505706	2141.87

List Of Coordinates

Line Load

X	Y
101606	100214
101598	100214

Line Load

X	Y
101578	100207

101577	100207
101570	100207

External Boundary

X	Y
101569	100188
101611	100188
101611	100211
101611	100214
101598	100214
101597	100214
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101596	100214
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101593	100214
101592	100213
101591	100213
101591	100212
101591	100211
101589	100211
101588	100210
101587	100210
101587	100209
101585	100209
101584	100208
101583	100208
101583	100207
101577	100207
101569	100207
101569	100202

Material Boundary

X	Y
101569	100202
101570	100202
101571	100202
101571	100202
101572	100202
101573	100202

101574	100202
101575	100202
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101576	100203
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