

Slide Analysis Information

SLIDE - An Interactive Slope Stability Program

Project Summary

File Name: Slide P4
Slide Modeler Version: 6.036
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 16.11.2015, 12:20:40

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: Water Surfaces
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: Grid Search
Radius Increment: 10
Composite Surfaces: Disabled
Reverse Curvature: Invalid Surfaces
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Loading

1 Distributed Load present

Distributed Load 1

Distribution: Constant
Magnitude [kPa]: 20
Orientation: Vertical

Material Properties

Property	Peščeno glinena zemljina	Zdrobljen lapor	Laporna podlaga	Tamponsko nasutje
Color				
Strength Type	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [kN/m3]	19	21	23	21
Cohesion [kPa]	2.4	4	10.4	0
Friction Angle [deg]	18.2	21.3	28.3	29.3
Water Surface	Water Table	Water Table	None	None
Hu Value	1	1		
Ru Value			0	0

Global Minimums

Method: bishop simplified

FS: 0.991468
Center: 3.998, 13.727
Radius: 8.721
Left Slip Surface Endpoint: 0.863, 5.589
Right Slip Surface Endpoint: 11.281, 8.929
Resisting Moment=1152.57 kN-m
Driving Moment=1162.49 kN-m
Total Slice Area=18.3048 m2

Method: janbu simplified

FS: 0.880740
Center: 4.411, 11.665
Radius: 6.778
Left Slip Surface Endpoint: 1.314, 5.635
Right Slip Surface Endpoint: 10.563, 8.820
Resisting Horizontal Force=104.846 kN
Driving Horizontal Force=119.043 kN
Total Slice Area=17.8451 m2

Valid / Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 7171
Number of Invalid Surfaces: 3400

Error Codes:

- Error Code -103 reported for 536 surfaces
- Error Code -107 reported for 155 surfaces
- Error Code -108 reported for 53 surfaces
- Error Code -114 reported for 2656 surfaces

Method: janbu simplified

Number of Valid Surfaces: 6984
Number of Invalid Surfaces: 3587

Error Codes:

- Error Code -103 reported for 536 surfaces
- Error Code -107 reported for 155 surfaces
- Error Code -108 reported for 239 surfaces
- Error Code -112 reported for 1 surface
- Error Code -114 reported for 2656 surfaces

Error Codes

- The following errors were encountered during the computation:
- 103 = Two surface / slope intersections, but one or more surface / nonslope external polygon intersections lie between them. This usually occurs when the slip surface extends past the bottom of the soil region, but may also occur on a benched slope model with two sets of Slope Limits.
 - 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.
 - 114 = Surface with Reverse Curvature.

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 0.991468

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	0.41432	0.749146	Peščeno glinena zemljina	2.4	18.2	3.42483	3.3956	3.02815	0	3.02815
2	0.41432	2.15702	Peščeno glinena zemljina	2.4	18.2	4.60663	4.56733	6.59197	0	6.59197
3	0.41432	3.49437	Peščeno glinena zemljina	2.4	18.2	5.68473	5.63623	9.84307	0	9.84307

4	0.41432	5.7032	Peščeno glinena zemljina	2.4	18.2	7.47308	7.40932	15.2359	0	15.2359
5	0.41432	8.01196	Peščeno glinena zemljina	2.4	18.2	8.83205	8.75669	20.6376	1.30359	19.334
6	0.41432	10.1605	Peščeno glinena zemljina	2.4	18.2	9.78466	9.70118	25.4882	3.28144	22.2068
7	0.41432	12.1515	Peščeno glinena zemljina	2.4	18.2	10.6465	10.5557	29.8688	5.06309	24.8057
8	0.41432	13.9868	Peščeno glinena zemljina	2.4	18.2	11.422	11.3245	33.7947	6.65061	27.1441
9	0.41432	15.6669	Peščeno glinena zemljina	2.4	18.2	12.1142	12.0109	37.2765	8.04478	29.2317
10	0.41432	17.1914	Peščeno glinena zemljina	2.4	18.2	12.7256	12.617	40.3202	9.24501	31.0752
11	0.41432	18.5587	Peščeno glinena zemljina	2.4	18.2	13.2576	13.1445	42.9289	10.2494	32.6795
12	0.41432	19.7662	Peščeno glinena zemljina	2.4	18.2	13.711	13.594	45.1014	11.0546	34.0468
13	0.41432	20.81	Peščeno glinena zemljina	2.4	18.2	14.086	13.9658	46.8332	11.6558	35.1774
14	0.41432	21.6848	Peščeno glinena zemljina	2.4	18.2	14.3817	14.259	48.1159	12.0464	36.0695
15	0.41432	22.3838	Peščeno glinena zemljina	2.4	18.2	14.5969	14.4724	48.9365	12.218	36.7185
16	0.41432	22.8983	Peščeno glinena zemljina	2.4	18.2	14.7294	14.6037	49.2774	12.1595	37.1179
17	0.41432	22.9694	Peščeno glinena zemljina	2.4	18.2	14.6041	14.4795	48.5975	11.8574	36.7401
18	0.41432	22.1976	Peščeno glinena zemljina	2.4	18.2	13.9644	13.8453	46.1053	11.2942	34.8111
19	0.41432	21.2088	Peščeno glinena zemljina	2.4	18.2	13.2678	13.1546	43.1283	10.4181	32.7102
20	0.41432	19.031	Peščeno glinena zemljina	2.4	18.2	11.8863	11.7849	37.756	9.21185	28.5442
21	0.41432	16.4617	Peščeno glinena zemljina	2.4	18.2	12.4844	12.3779	38.0057	7.65777	30.3479
22	0.41432	13.574	Peščeno glinena zemljina	2.4	18.2	13.9483	13.8293	40.4693	5.7069	34.7624
23	0.41432	10.3139	Peščeno glinena zemljina	2.4	18.2	12.1633	12.0595	32.6715	3.29182	29.3796
24	0.41432	6.72877	Peščeno glinena zemljina	2.4	18.2	10.3888	10.3002	24.344	0.315412	24.0286
25	0.474169	2.88911	Tamponsko nasutje	0	29.3	8.38103	8.30952	14.8073	0	14.8073

Global Minimum Query (janbu simplified) - Safety Factor: 0.88074

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	0.373621	0.766976	Peščeno glinena zemljina	2.4	18.2	4.24437	3.73819	4.07012	0	4.07012
2	0.373621	2.26138	Peščeno glinena zemljina	2.4	18.2	5.8682	5.16836	8.41999	0	8.41999
3	0.373621	4.39217	Peščeno glinena zemljina	2.4	18.2	8.13562	7.16537	14.494	0	14.494

4	0.373621	6.62255	Peščeno glinena zemljina	2.4	18.2	10.1346	8.92591	20.4978	0.64908	19.8487
5	0.373621	8.68957	Peščeno glinena zemljina	2.4	18.2	11.2287	9.88959	25.6544	2.8747	22.7797
6	0.373621	10.5999	Peščeno glinena zemljina	2.4	18.2	12.2008	10.7458	30.2676	4.8838	25.3838
7	0.373621	12.3584	Peščeno glinena zemljina	2.4	18.2	13.0607	11.503	34.3701	6.68304	27.687
8	0.373621	13.9682	Peščeno glinena zemljina	2.4	18.2	13.8155	12.1679	37.9858	8.27685	29.709
9	0.373621	15.4311	Peščeno glinena zemljina	2.4	18.2	14.4707	12.7449	41.1319	9.66767	31.4642
10	0.373621	16.7475	Peščeno glinena zemljina	2.4	18.2	15.0297	13.2373	43.8181	10.856	32.9621
11	0.373621	17.9164	Peščeno glinena zemljina	2.4	18.2	15.4953	13.6473	46.0495	11.8406	34.2089
12	0.373621	18.9356	Peščeno glinena zemljina	2.4	18.2	15.8682	13.9758	47.8263	12.6181	35.2082
13	0.373621	19.801	Peščeno glinena zemljina	2.4	18.2	16.1487	14.2228	49.1425	13.1832	35.9593
14	0.373621	20.5071	Peščeno glinena zemljina	2.4	18.2	16.3354	14.3872	49.9874	13.5282	36.4592
15	0.373621	21.0463	Peščeno glinena zemljina	2.4	18.2	16.4256	14.4667	50.3436	13.6426	36.701
16	0.373621	21.4087	Peščeno glinena zemljina	2.4	18.2	16.4159	14.4581	50.1873	13.5125	36.6748
17	0.373621	21.5698	Peščeno glinena zemljina	2.4	18.2	16.291	14.3481	49.4598	13.1197	36.3401
18	0.373621	21.046	Peščeno glinena zemljina	2.4	18.2	15.6619	13.7941	47.0955	12.4403	34.6552
19	0.373621	20.0383	Peščeno glinena zemljina	2.4	18.2	14.7285	12.972	43.5977	11.4427	32.155
20	0.373621	18.7591	Peščeno glinena zemljina	2.4	18.2	13.6964	12.0629	39.4354	10.0454	29.39
21	0.373621	16.3545	Peščeno glinena zemljina	2.4	18.2	11.9368	10.5132	32.8976	8.22124	24.6764
22	0.373621	13.591	Peščeno glinena zemljina	2.4	18.2	12.0392	10.6034	30.8389	5.8882	24.9507
23	0.373621	10.3603	Peščeno glinena zemljina	2.4	18.2	13.2278	11.6502	31.0441	2.90954	28.1346
24	0.373621	6.49166	Peščeno glinena zemljina	2.4	18.2	10.5824	9.32032	21.0482	0	21.0482
25	0.281733	1.64722	Tamponsko nasutje	0	29.3	7.39698	6.51482	11.6093	0	11.6093

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 0.991468

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [degrees]
1	0.862858	5.58873	0	0	0
2	1.27718	5.441	1.86503	0	0
3	1.6915	5.31625	4.5943	0	0

4	2.10582	5.21346	7.95924	0	0
5	2.52014	5.13184	12.2962	0	0
6	2.93446	5.0708	17.2119	0	0
7	3.34878	5.02991	22.3046	0	0
8	3.7631	5.00887	27.34	0	0
9	4.17742	5.00755	32.1128	0	0
10	4.59174	5.02593	36.4421	0	0
11	5.00606	5.06415	40.1689	0	0
12	5.42038	5.12246	43.1535	0	0
13	5.8347	5.20128	45.2742	0	0
14	6.24902	5.30119	46.4261	0	0
15	6.66334	5.42294	46.5213	0	0
16	7.07766	5.56751	45.4887	0	0
17	7.49199	5.73615	43.276	0	0
18	7.90631	5.9304	39.8809	0	0
19	8.32063	6.15226	35.4329	0	0
20	8.73495	6.40421	30.0587	0	0
21	9.14927	6.68949	24.2077	0	0
22	9.56359	7.01236	17.1049	0	0
23	9.97791	7.37854	8.0597	0	0
24	10.3922	7.79605	-0.5459	0	0
25	10.8065	8.27666	-7.94562	0	0
26	11.2807	8.9286	0	0	0

Global Minimum Query (janbu simplified) - Safety Factor: 0.88074

Slice Number	X coordinate [m]	Y coordinate - Bottom [m]	Interslice Normal Force [kN]	Interslice Shear Force [kN]	Interslice Force Angle [degrees]
1	1.31425	5.63514	0	0	0
2	1.68787	5.45747	2.30812	0	0
3	2.06149	5.30667	5.76928	0	0
4	2.43511	5.18085	10.631	0	0
5	2.80873	5.07859	16.5117	0	0
6	3.18235	4.99881	22.7518	0	0
7	3.55597	4.94069	29.067	0	0
8	3.92959	4.90369	35.216	0	0
9	4.30321	4.88745	40.9919	0	0
10	4.67684	4.89184	46.2155	0	0
11	5.05046	4.91688	50.7308	0	0
12	5.42408	4.96281	54.4022	0	0
13	5.7977	5.03006	57.1114	0	0
14	6.17132	5.1193	58.7567	0	0
15	6.54494	5.23143	59.2517	0	0
16	6.91856	5.36768	58.5263	0	0
17	7.29218	5.52965	56.5275	0	0
18	7.6658	5.71946	53.2235	0	0
19	8.03942	5.93985	48.6925	0	0
20	8.41305	6.19454	43.0888	0	0
21	8.78667	6.48858	36.608	0	0
22	9.16029	6.82914	29.8619	0	0
23	9.53391	7.22692	22.0906	0	0

24	9.90753	7.69911	12.3716	0	0
25	10.2812	8.27666	4.1669	0	0
26	10.5629	8.82013	0	0	0

List Of Coordinates

Water Table

X	Y
0	2.56934
9.39818	4.87666
17.456	8.2684
17.456	10.479
8.274	7.251
0	4.24255
0	2.56934

Distributed Load

X	Y
9.39818	8.87666
10.562	8.82
11.4939	8.96081

External Boundary

X	Y
0	0
17.456	0
17.456	8.2684
17.456	9.2684
17.456	11
14.993	10
12.668	9
12.476	8.9
12.018	9.04
10.562	8.82
9.39818	8.87666
8.714	8.91
8.539	8.97
7.601	8.73
1.945	5.7
0	5.5
0	3.56934
0	2.56934

Material Boundary

X	Y

0	3.56934
9.39818	5.87666
17.456	9.2684

Material Boundary

X	Y
0	2.56934
9.39818	4.87666
17.456	8.2684

Material Boundary

X	Y
8.539	8.97
8.539	8.27666
12.018	8.27666
12.018	9.04