

Project Summary

File Name: estaca 11.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 17/06/2020, 15:36:21

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

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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Material de enchente | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|---|
| Color |  |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 5 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 10 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 20 | 12 |
| Water Surface | None | None | None | None | None |
| Ru Value | 0.46 | 0 | 0 | 0.46 | 0.46 |

Support Properties

Trinca

Support Type: End Anchored
Force Application: Active
Out-of-Plane Spacing: 1 m
Anchor Capacity: 0 kN

Global Minimums

Method: bishop simplified

FS: 1.603670
Center: 179.411, 349.054
Radius: 61.486
Left Slip Surface Endpoint: 151.141, 294.453
Right Slip Surface Endpoint: 228.788, 312.415
Resisting Moment=135355 kN-m
Driving Moment=84403.2 kN-m
Total Slice Area=1004.31 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.60367

| 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 | 3.27636 | 41.0876 | Resíduos | 13.5 | 22 | 11.5193 | 18.4732 | 18.0778 | 5.7687 | 12.3091 |
| 2 | 3.27636 | 89.2655 | Resíduos | 13.5 | 22 | 13.5243 | 21.6885 | 32.7999 | 12.5329 | 20.267 |
| 3 | 3.27636 | 153.793 | Resíduos | 13.5 | 22 | 16.2161 | 26.0052 | 52.5441 | 21.5925 | 30.9516 |
| 4 | 3.27636 | 190.192 | Resíduos | 13.5 | 22 | 17.5737 | 28.1824 | 63.0433 | 26.703 | 36.3403 |
| 5 | 3.27636 | 223.723 | Resíduos | 13.5 | 22 | 18.7749 | 30.1087 | 72.5187 | 31.4106 | 41.1081 |
| 6 | 3.27636 | 284.461 | Resíduos | 13.5 | 22 | 21.1302 | 33.8859 | 90.395 | 39.9382 | 50.4568 |
| 7 | 3.27636 | 319.422 | Resíduos | 13.5 | 22 | 22.3239 | 35.8002 | 100.042 | 44.8468 | 55.1949 |
| 8 | 3.55724 | 371.373 | Interface Solo x GMB Lisa | 3 | 12 | 9.41528 | 15.099 | 104.945 | 48.0236 | 56.9212 |
| 9 | 3.55724 | 420.402 | Interface Solo x GMB Lisa | 3 | 12 | 10.3294 | 16.565 | 118.182 | 54.3637 | 63.8183 |
| 10 | 3.55724 | 434.623 | Interface Solo x GMB Lisa | 3 | 12 | 10.5346 | 16.8941 | 121.569 | 56.2026 | 65.3665 |
| 11 | 2.92882 | 359.045 | Resíduos | 13.5 | 22 | 24.4118 | 39.1484 | 119.874 | 56.3915 | 63.4821 |

| | | | | | | | | | | |
|----|---------|---------|---------------------------|------|----|---------|---------|----------|---------|----------|
| 12 | 2.92882 | 366.395 | Resíduos | 13.5 | 22 | 24.4505 | 39.2105 | 121.181 | 57.5459 | 63.6355 |
| 13 | 2.92882 | 384.878 | Resíduos | 13.5 | 22 | 24.9725 | 40.0477 | 126.157 | 60.4487 | 65.7079 |
| 14 | 2.92882 | 390.075 | Resíduos | 13.5 | 22 | 24.894 | 39.9217 | 126.661 | 61.2651 | 65.3957 |
| 15 | 2.92882 | 388.498 | Resíduos | 13.5 | 22 | 24.5138 | 39.3121 | 124.905 | 61.0173 | 63.8873 |
| 16 | 2.92882 | 401.917 | Resíduos | 13.5 | 22 | 24.7656 | 39.7158 | 128.011 | 63.1249 | 64.8862 |
| 17 | 2.92882 | 380.72 | Resíduos | 13.5 | 22 | 23.5418 | 37.7533 | 119.825 | 59.7957 | 60.0291 |
| 18 | 3.18733 | 390.022 | Interface Solo x GMB Lisa | 3 | 12 | 9.97001 | 15.9886 | 117.395 | 56.2885 | 61.1066 |
| 19 | 3.18733 | 356.711 | Interface Solo x GMB Lisa | 3 | 12 | 9.18181 | 14.7246 | 106.641 | 51.4811 | 55.1601 |
| 20 | 3.18733 | 311.547 | Interface Solo x GMB Lisa | 3 | 12 | 8.15492 | 13.0778 | 92.3753 | 44.9629 | 47.4124 |
| 21 | 3.62246 | 291.645 | Resíduos | 13.5 | 22 | 16.2555 | 26.0684 | 68.1425 | 37.0347 | 31.1078 |
| 22 | 3.62246 | 216.558 | Resíduos | 13.5 | 22 | 13.5219 | 21.6847 | 47.7576 | 27.4998 | 20.2578 |
| 23 | 3.62246 | 131.881 | Resíduos | 13.5 | 22 | 10.5776 | 16.9629 | 25.3179 | 16.747 | 8.57094 |
| 24 | 1.6958 | 33.2082 | Material de enchente | 10 | 20 | 6.79577 | 10.8982 | 11.4757 | 9.00798 | 2.4677 |
| 25 | 1.4142 | 9.98314 | Resíduos | 13.5 | 22 | 7.07068 | 11.339 | -2.10132 | 3.24725 | -5.34857 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.60367

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 151.141 | 294.453 | 0 | 0 | 0 |
| 2 | 154.417 | 292.877 | 66.2092 | 0 | 0 |
| 3 | 157.693 | 291.531 | 154.657 | 0 | 0 |
| 4 | 160.97 | 290.399 | 267.279 | 0 | 0 |
| 5 | 164.246 | 289.468 | 383.545 | 0 | 0 |
| 6 | 167.522 | 288.728 | 498.645 | 0 | 0 |
| 7 | 170.799 | 288.174 | 617.95 | 0 | 0 |
| 8 | 174.075 | 287.8 | 728.503 | 0 | 0 |
| 9 | 177.632 | 287.594 | 783.629 | 0 | 0 |
| 10 | 181.19 | 287.594 | 820.362 | 0 | 0 |
| 11 | 184.747 | 287.8 | 832.754 | 0 | 0 |
| 12 | 187.676 | 288.126 | 865.151 | 0 | 0 |
| 13 | 190.605 | 288.596 | 879.848 | 0 | 0 |
| 14 | 193.533 | 289.212 | 875.212 | 0 | 0 |
| 15 | 196.462 | 289.98 | 850.853 | 0 | 0 |
| 16 | 199.391 | 290.905 | 807.065 | 0 | 0 |
| 17 | 202.32 | 291.995 | 740.005 | 0 | 0 |
| 18 | 205.249 | 293.26 | 657.345 | 0 | 0 |
| 19 | 208.436 | 294.85 | 502.489 | 0 | 0 |
| 20 | 211.623 | 296.681 | 336.445 | 0 | 0 |
| 21 | 214.811 | 298.781 | 168.491 | 0 | 0 |
| 22 | 218.433 | 301.538 | 39.5015 | 0 | 0 |
| 23 | 222.056 | 304.76 | -65.4157 | 0 | 0 |
| 24 | 225.678 | 308.558 | -123.282 | 0 | 0 |
| 25 | 227.374 | 310.582 | -134.982 | 0 | 0 |
| 26 | 228.788 | 312.415 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---------|---------|
| 120.844 | 275.135 |
| 279.987 | 275.135 |
| 279.987 | 332.019 |
| 278.251 | 332.317 |
| 276.876 | 332.063 |
| 276 | 331.424 |
| 268.298 | 325.87 |
| 262.884 | 322.791 |
| 252.914 | 317.407 |
| 243.141 | 312.12 |
| 242.696 | 312.134 |
| 242.126 | 312.152 |
| 241.45 | 312.144 |
| 239.439 | 312.205 |
| 236.782 | 311.935 |
| 231.972 | 312.404 |
| 231.727 | 312.377 |
| 231.155 | 312.405 |
| 229.858 | 312.275 |
| 226.461 | 312.718 |
| 225.548 | 312.697 |
| 224.888 | 312.498 |
| 222.94 | 312.332 |
| 220.146 | 312.247 |
| 214.487 | 312.223 |
| 211.654 | 312.196 |
| 208.858 | 312.236 |
| 203.125 | 311.724 |
| 202.019 | 311.576 |
| 201.77 | 311.619 |
| 200.631 | 311.009 |
| 196.842 | 308.724 |
| 194.376 | 308.604 |
| 193.792 | 308.539 |
| 188.397 | 305.839 |
| 188.281 | 305.78 |
| 188.135 | 305.756 |
| 185.322 | 305.342 |
| 179.99 | 304.809 |
| 178.465 | 304.359 |
| 178.368 | 303.905 |
| 178.358 | 303.336 |
| 175.58 | 302.509 |
| 175.042 | 302.287 |
| 173.859 | 301.917 |
| 173.423 | 301.918 |
| 170.715 | 301.904 |
| 167.01 | 299.404 |
| 164.865 | 298.29 |

| | |
|---------|---------|
| 163.556 | 298.217 |
| 161.581 | 298.226 |
| 159.607 | 298.238 |
| 158.984 | 297.876 |
| 157.79 | 296.042 |
| 156.118 | 296.052 |
| 154.071 | 296.268 |
| 151.242 | 294.52 |
| 149.707 | 293.494 |
| 149.328 | 293.476 |
| 147.251 | 293.448 |
| 137.72 | 286.861 |
| 135.848 | 285.531 |
| 133.255 | 283.812 |
| 132.954 | 283.699 |
| 128.185 | 283.63 |
| 126.253 | 283.573 |
| 125.928 | 283.55 |
| 125.63 | 283.5 |
| 122.573 | 283.307 |
| 121.289 | 283.206 |
| 121.175 | 283.198 |
| 120.844 | 283.24 |

Material Boundary

| X | Y |
|---------|---------|
| 133.255 | 283.812 |
| 155.745 | 287.5 |
| 155.443 | 287.8 |
| 149.707 | 293.494 |

Material Boundary

| X | Y |
|---------|--------|
| 155.745 | 287.5 |
| 180 | 287.5 |
| 195.872 | 287.5 |
| 221.852 | 302.5 |
| 231.852 | 302.5 |
| 243.141 | 312.12 |

Material Boundary

| X | Y |
|---------|---------|
| 229.828 | 310.262 |
| 226.354 | 310.715 |
| 225.866 | 310.703 |
| 225.265 | 310.523 |
| 223.056 | 310.334 |
| 220.18 | 310.247 |
| 214.5 | 310.223 |
| 211.649 | 310.195 |

| | |
|---------|---------|
| 208.933 | 310.235 |
| 203.347 | 309.736 |
| 202.205 | 309.583 |
| 202.205 | 307.287 |
| 202.611 | 307.531 |
| 202.83 | 307.649 |
| 203.569 | 307.748 |
| 209.008 | 308.233 |
| 211.644 | 308.195 |
| 214.515 | 308.223 |
| 220.215 | 308.247 |
| 223.171 | 308.337 |
| 225.642 | 308.548 |
| 226.183 | 308.71 |
| 226.248 | 308.712 |
| 229.798 | 308.249 |
| 229.828 | 310.262 |

Material Boundary

| X | Y |
|---------|---------|
| 155.443 | 287.8 |
| 180 | 287.8 |
| 180 | 287.8 |
| 180 | 287.8 |
| 195.791 | 287.8 |
| 221.772 | 302.8 |
| 231.742 | 302.8 |
| 242.696 | 312.134 |

Project Summary

File Name: Estaca 12.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:51:42

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

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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.4 | 0 | 0 | 0.4 |

Global Minimums

Method: bishop simplified

FS: 2.034710
 Center: 124.185, 323.503
 Radius: 35.942
 Left Slip Surface Endpoint: 105.075, 293.062
 Right Slip Surface Endpoint: 155.771, 306.352
 Resisting Moment=53320.8 kN-m
 Driving Moment=26205.6 kN-m
 Total Slice Area=489.576 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.03471

| 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 | 2.12362 | 17.8505 | Dique de solo compactado | 20 | 30 | 14.6245 | 29.7565 | 16.8988 | 0 | 16.8988 |
| 2 | 2.14119 | 39.2386 | Resíduos | 13.5 | 22 | 9.77703 | 19.8934 | 23.1545 | 7.33024 | 15.8243 |
| 3 | 2.14119 | 67.3008 | Resíduos | 13.5 | 22 | 11.3115 | 23.0157 | 36.1248 | 12.5726 | 23.5522 |
| 4 | 2.14119 | 95.4864 | Resíduos | 13.5 | 22 | 12.8186 | 26.0821 | 48.9799 | 17.838 | 31.1419 |
| 5 | 2.14119 | 119.874 | Resíduos | 13.5 | 22 | 14.0698 | 28.628 | 59.8369 | 22.394 | 37.4429 |
| 6 | 2.14119 | 143.737 | Resíduos | 13.5 | 22 | 15.266 | 31.0618 | 70.3187 | 26.8518 | 43.4669 |
| 7 | 2.14119 | 157.852 | Resíduos | 13.5 | 22 | 15.8799 | 32.311 | 76.0472 | 29.4886 | 46.5586 |
| 8 | 2.06953 | 164.058 | Interface Solo x GMB Lisa | 3 | 12 | 6.50206 | 13.2298 | 79.8365 | 31.7092 | 48.1273 |
| 9 | 2.06953 | 183.36 | Interface Solo x GMB Lisa | 3 | 12 | 7.04901 | 14.3427 | 88.8028 | 35.44 | 53.3628 |
| 10 | 2.06953 | 190.991 | Interface Solo x GMB Lisa | 3 | 12 | 7.23715 | 14.7255 | 92.079 | 36.9149 | 55.1641 |
| 11 | 2.06953 | 192.303 | Interface Solo x GMB Lisa | 3 | 12 | 7.23312 | 14.7173 | 92.2941 | 37.1684 | 55.1257 |
| 12 | 1.96051 | 179.279 | Resíduos | 13.5 | 22 | 17.0428 | 34.6771 | 88.9929 | 36.578 | 52.4149 |
| 13 | 1.96051 | 183.121 | Resíduos | 13.5 | 22 | 17.0818 | 34.7565 | 89.9737 | 37.362 | 52.6117 |
| 14 | 1.96051 | 191.74 | Resíduos | 13.5 | 22 | 17.3897 | 35.383 | 93.283 | 39.1205 | 54.1625 |
| 15 | 1.96051 | 183.814 | Resíduos | 13.5 | 22 | 16.7369 | 34.0548 | 88.3785 | 37.5033 | 50.8752 |
| 16 | 1.96051 | 176.678 | Resíduos | 13.5 | 22 | 16.1332 | 32.8263 | 83.8815 | 36.0473 | 47.8342 |
| 17 | 1.96051 | 178.859 | Resíduos | 13.5 | 22 | 16.0499 | 32.6568 | 83.9071 | 36.4924 | 47.4147 |
| 18 | 1.96051 | 180.744 | Resíduos | 13.5 | 22 | 15.9351 | 32.4234 | 83.7143 | 36.877 | 46.8373 |
| 19 | 1.96051 | 178.296 | Resíduos | 13.5 | 22 | 15.5667 | 31.6738 | 81.359 | 36.3774 | 44.9816 |
| 20 | 1.96051 | 165.305 | Resíduos | 13.5 | 22 | 14.6195 | 29.7465 | 73.9385 | 33.727 | 40.2115 |
| 21 | 1.96051 | 145.656 | Resíduos | 13.5 | 22 | 13.3207 | 27.1037 | 63.3884 | 29.7179 | 33.6705 |

| | | | | | | | | | | |
|----|---------|---------|----------|------|----|---------|---------|---------|---------|----------|
| 22 | 1.96051 | 123.365 | Resíduos | 13.5 | 22 | 11.8921 | 24.197 | 51.6462 | 25.1701 | 26.4761 |
| 23 | 1.96051 | 95.6093 | Resíduos | 13.5 | 22 | 10.198 | 20.7501 | 37.4516 | 19.507 | 17.9446 |
| 24 | 1.96051 | 61.2367 | Resíduos | 13.5 | 22 | 8.20238 | 16.6895 | 20.3882 | 12.494 | 7.89422 |
| 25 | 1.96051 | 21.6139 | Resíduos | 13.5 | 22 | 6.00371 | 12.2158 | 1.23134 | 4.40985 | -3.17851 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.03471

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 105.075 | 293.062 | 0 | 0 | 0 |
| 2 | 107.198 | 291.828 | 51.8916 | 0 | 0 |
| 3 | 109.34 | 290.77 | 97.3151 | 0 | 0 |
| 4 | 111.481 | 289.881 | 153.634 | 0 | 0 |
| 5 | 113.622 | 289.148 | 216.959 | 0 | 0 |
| 6 | 115.763 | 288.561 | 282.166 | 0 | 0 |
| 7 | 117.904 | 288.114 | 346.307 | 0 | 0 |
| 8 | 120.046 | 287.8 | 404.152 | 0 | 0 |
| 9 | 122.115 | 287.621 | 431.93 | 0 | 0 |
| 10 | 124.185 | 287.561 | 451.804 | 0 | 0 |
| 11 | 126.254 | 287.621 | 461.282 | 0 | 0 |
| 12 | 128.324 | 287.8 | 459.676 | 0 | 0 |
| 13 | 130.284 | 288.082 | 467.953 | 0 | 0 |
| 14 | 132.245 | 288.476 | 465.967 | 0 | 0 |
| 15 | 134.205 | 288.986 | 452.492 | 0 | 0 |
| 16 | 136.166 | 289.617 | 429.555 | 0 | 0 |
| 17 | 138.126 | 290.375 | 397.552 | 0 | 0 |
| 18 | 140.087 | 291.27 | 353.889 | 0 | 0 |
| 19 | 142.047 | 292.314 | 297.736 | 0 | 0 |
| 20 | 144.008 | 293.522 | 229.969 | 0 | 0 |
| 21 | 145.968 | 294.914 | 155.64 | 0 | 0 |
| 22 | 147.929 | 296.52 | 79.9272 | 0 | 0 |
| 23 | 149.889 | 298.381 | 7.13648 | 0 | 0 |
| 24 | 151.85 | 300.558 | -54.4056 | 0 | 0 |
| 25 | 153.81 | 303.152 | -91.2251 | 0 | 0 |
| 26 | 155.771 | 306.352 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---------|---------|
| 187.103 | 310.291 |
| 185.797 | 310.138 |
| 182.091 | 309.703 |
| 181.269 | 309.66 |
| 180.872 | 309.595 |
| 180.48 | 309.36 |
| 179.014 | 308.728 |
| 174.909 | 307.001 |

| | |
|---------|---------|
| 174.43 | 307.233 |
| 174.315 | 307.289 |
| 174.072 | 307.317 |
| 173.903 | 307.337 |
| 173.409 | 307.312 |
| 168.07 | 307 |
| 166.169 | 306.858 |
| 163.358 | 306.628 |
| 160.218 | 306.46 |
| 157.822 | 306.404 |
| 154.59 | 306.322 |
| 153.219 | 306.286 |
| 151.208 | 306.407 |
| 150.038 | 306.503 |
| 146.147 | 306.285 |
| 145.018 | 306.324 |
| 143.294 | 305.975 |
| 142.657 | 305.899 |
| 139.778 | 304.203 |
| 136.62 | 302.563 |
| 135.681 | 302.683 |
| 135 | 302.707 |
| 133.029 | 302.777 |
| 132.656 | 302.667 |
| 131.752 | 302.073 |
| 130.644 | 301.021 |
| 128.69 | 300.99 |
| 128.4 | 301.03 |
| 127.341 | 300.972 |
| 124.858 | 300.635 |
| 123.656 | 300.48 |
| 119.814 | 298.267 |
| 118.42 | 298.698 |
| 115.396 | 297.229 |
| 112.769 | 295.829 |
| 112.019 | 295.857 |
| 110.248 | 294.643 |
| 105.958 | 293.069 |
| 103.743 | 293.052 |
| 96.7099 | 287.5 |
| 94.8995 | 286.071 |
| 94.4235 | 285.661 |
| 91.6161 | 282.921 |
| 90.6881 | 282.981 |
| 85.785 | 282.919 |
| 83.8583 | 281.718 |
| 81.7346 | 280.891 |
| 78.9107 | 280.708 |
| 72.9457 | 280.246 |
| 72.8567 | 280.258 |
| 72.8567 | 280 |
| 194.289 | 280 |

| | |
|---------|--------|
| 194.289 | 311.27 |
|---------|--------|

Material Boundary

| X | Y |
|---------|---------|
| 96.7099 | 287.5 |
| 111.526 | 287.5 |
| 135 | 287.5 |
| 151.949 | 287.5 |
| 174.43 | 307.233 |

Material Boundary

| X | Y |
|---------|---------|
| 105.958 | 293.069 |
| 111.226 | 287.8 |
| 111.526 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 111.226 | 287.8 |
| 135 | 287.8 |
| 135 | 287.8 |
| 135 | 287.8 |
| 151.836 | 287.8 |
| 174.072 | 307.317 |

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File Name: Estaca 13.slim
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Maximum number of iterations: 50
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Initial trial value of FS: 1
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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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.45 | 0 | 0 | 0.45 |

Global Minimums

Method: bishop simplified

FS: 3.208120
 Center: 84.724, 312.254
 Radius: 20.534
 Left Slip Surface Endpoint: 77.995, 292.853
 Right Slip Surface Endpoint: 100.925, 299.637
 Resisting Moment=9832.11 kN-m
 Driving Moment=3064.76 kN-m
 Total Slice Area=90.7795 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 3.20812

| 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 | 0.042093 | 0.00295866 | Dique de solo compactado | 20 | 30 | 6.6611 | 21.3696 | 2.37222 | 0 | 2.37222 |
| 2 | 0.953654 | 3.48131 | Resíduos | 13.5 | 22 | 4.64663 | 14.907 | 5.12503 | 1.64272 | 3.48231 |
| 3 | 0.953654 | 10.0606 | Resíduos | 13.5 | 22 | 5.10921 | 16.391 | 11.9027 | 4.7473 | 7.15537 |
| 4 | 0.953654 | 16.312 | Resíduos | 13.5 | 22 | 5.54245 | 17.7809 | 18.2927 | 7.69713 | 10.5956 |
| 5 | 0.953654 | 22.1931 | Resíduos | 13.5 | 22 | 5.94377 | 19.0683 | 24.2544 | 10.4723 | 13.7821 |
| 6 | 0.953654 | 27.6355 | Resíduos | 13.5 | 22 | 6.30864 | 20.2389 | 29.7196 | 13.0403 | 16.6793 |
| 7 | 0.953654 | 31.3468 | Resíduos | 13.5 | 22 | 6.54287 | 20.9903 | 33.3307 | 14.7916 | 18.5391 |
| 8 | 0.953654 | 32.3996 | Resíduos | 13.5 | 22 | 6.58104 | 21.1128 | 34.1307 | 15.2884 | 18.8423 |
| 9 | 0.953654 | 34.1954 | Resíduos | 13.5 | 22 | 6.67271 | 21.4069 | 35.706 | 16.1358 | 19.5702 |
| 10 | 0.953654 | 35.1635 | Resíduos | 13.5 | 22 | 6.70359 | 21.5059 | 36.4079 | 16.5926 | 19.8153 |
| 11 | 0.953654 | 35.7489 | Resíduos | 13.5 | 22 | 6.70634 | 21.5147 | 36.706 | 16.8688 | 19.8372 |
| 12 | 0.953654 | 36.0323 | Resíduos | 13.5 | 22 | 6.68692 | 21.4524 | 36.6855 | 17.0025 | 19.683 |
| 13 | 0.953654 | 35.8913 | Resíduos | 13.5 | 22 | 6.63679 | 21.2916 | 36.2209 | 16.936 | 19.2849 |
| 14 | 0.953654 | 34.6059 | Resíduos | 13.5 | 22 | 6.50559 | 20.8707 | 34.5726 | 16.3294 | 18.2432 |
| 15 | 0.953654 | 32.8303 | Resíduos | 13.5 | 22 | 6.34025 | 20.3403 | 32.4219 | 15.4916 | 16.9303 |
| 16 | 0.953654 | 31.523 | Resíduos | 13.5 | 22 | 6.20764 | 19.9148 | 30.752 | 14.8747 | 15.8773 |
| 17 | 0.953654 | 32.1414 | Resíduos | 13.5 | 22 | 6.20719 | 19.9134 | 31.0403 | 15.1665 | 15.8738 |
| 18 | 0.953654 | 32.4153 | Resíduos | 13.5 | 22 | 6.18031 | 19.8272 | 30.9561 | 15.2958 | 15.6603 |
| 19 | 0.953654 | 31.8106 | Resíduos | 13.5 | 22 | 6.09062 | 19.5395 | 29.9586 | 15.0104 | 14.9482 |
| 20 | 0.953654 | 30.7007 | Resíduos | 13.5 | 22 | 5.96396 | 19.1331 | 28.4291 | 14.4867 | 13.9424 |
| 21 | 0.953654 | 29.0616 | Resíduos | 13.5 | 22 | 5.79873 | 18.603 | 26.3437 | 13.7133 | 12.6304 |

| | | | | | | | | | | |
|----|----------|---------|----------|------|----|---------|---------|---------|---------|----------|
| 22 | 0.953654 | 24.8445 | Resíduos | 13.5 | 22 | 5.45971 | 17.5154 | 21.6618 | 11.7233 | 9.93853 |
| 23 | 0.953654 | 18.8428 | Resíduos | 13.5 | 22 | 5.00315 | 16.0507 | 15.2045 | 8.89133 | 6.31319 |
| 24 | 0.953654 | 12.0954 | Resíduos | 13.5 | 22 | 4.4993 | 14.4343 | 8.01993 | 5.70744 | 2.31249 |
| 25 | 0.953654 | 4.12306 | Resíduos | 13.5 | 22 | 3.91906 | 12.5728 | -0.3493 | 1.94555 | -2.29485 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 3.20812

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 77.9955 | 292.853 | 0 | 0 | 0 |
| 2 | 78.0375 | 292.839 | 0.314855 | 0 | 0 |
| 3 | 78.9912 | 292.536 | 6.29668 | 0 | 0 |
| 4 | 79.9449 | 292.284 | 14.1751 | 0 | 0 |
| 5 | 80.8985 | 292.079 | 23.1994 | 0 | 0 |
| 6 | 81.8522 | 291.922 | 32.6916 | 0 | 0 |
| 7 | 82.8058 | 291.809 | 42.0368 | 0 | 0 |
| 8 | 83.7595 | 291.742 | 50.5135 | 0 | 0 |
| 9 | 84.7131 | 291.72 | 57.5627 | 0 | 0 |
| 10 | 85.6668 | 291.741 | 63.1529 | 0 | 0 |
| 11 | 86.6204 | 291.807 | 67.1388 | 0 | 0 |
| 12 | 87.5741 | 291.918 | 69.46 | 0 | 0 |
| 13 | 88.5277 | 292.075 | 70.0911 | 0 | 0 |
| 14 | 89.4814 | 292.278 | 69.0556 | 0 | 0 |
| 15 | 90.4351 | 292.53 | 66.5656 | 0 | 0 |
| 16 | 91.3887 | 292.831 | 62.8371 | 0 | 0 |
| 17 | 92.3424 | 293.185 | 57.8747 | 0 | 0 |
| 18 | 93.296 | 293.594 | 51.0911 | 0 | 0 |
| 19 | 94.2497 | 294.063 | 42.4869 | 0 | 0 |
| 20 | 95.2033 | 294.595 | 32.3527 | 0 | 0 |
| 21 | 96.157 | 295.197 | 20.9281 | 0 | 0 |
| 22 | 97.1106 | 295.876 | 8.56036 | 0 | 0 |
| 23 | 98.0643 | 296.643 | -2.84698 | 0 | 0 |
| 24 | 99.0179 | 297.511 | -11.2766 | 0 | 0 |
| 25 | 99.9716 | 298.5 | -14.9147 | 0 | 0 |
| 26 | 100.925 | 299.637 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---------|---------|
| 139.311 | 303.109 |
| 129.361 | 299.015 |
| 128.875 | 298.816 |
| 128.793 | 298.782 |
| 128.679 | 298.759 |
| 128.465 | 298.769 |
| 125.257 | 298.937 |
| 123.889 | 298.987 |

| | |
|---------|---------|
| 118.408 | 299.133 |
| 116.627 | 299.368 |
| 116.047 | 299.423 |
| 112.441 | 299.85 |
| 111.256 | 300.016 |
| 108.948 | 300.48 |
| 106.555 | 300.503 |
| 105 | 300.525 |
| 104.735 | 300.529 |
| 101.236 | 299.635 |
| 100.69 | 299.638 |
| 99.8345 | 299.789 |
| 96.9646 | 300.034 |
| 93.7106 | 298.667 |
| 91.6673 | 297.607 |
| 89.0446 | 297.578 |
| 85.1764 | 296.863 |
| 83.8224 | 296.461 |
| 83.0337 | 296.507 |
| 81.1364 | 295.156 |
| 78.0283 | 292.848 |
| 76.7523 | 293.053 |
| 74.9026 | 293.241 |
| 70.0595 | 289.57 |
| 67.3478 | 287.5 |
| 67.0786 | 287.294 |
| 66.1457 | 286.091 |
| 65.5719 | 285.261 |
| 63.8937 | 285.385 |
| 59.5492 | 285.894 |
| 59.5492 | 280 |
| 155.288 | 280 |
| 155.288 | 309.955 |

Material Boundary

| X | Y |
|---------|---------|
| 67.3478 | 287.5 |
| 83.3765 | 287.5 |
| 105 | 287.5 |
| 121.949 | 287.5 |
| 129.361 | 299.015 |

Material Boundary

| X | Y |
|---------|---------|
| 78.0283 | 292.848 |
| 83.0765 | 287.8 |
| 83.3765 | 287.5 |

Material Boundary

| X | Y |
|---|---|
|---|---|

| | |
|---------|---------|
| 83.0765 | 287.8 |
| 105 | 287.8 |
| 105 | 287.8 |
| 105.001 | 287.8 |
| 121.785 | 287.8 |
| 128.875 | 298.816 |

Project Summary

File Name: Estaca 14.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 17:01:38

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 malpha < 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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.36 | 0 | 0 | 0.36 |

Global Minimums

Method: bishop simplified

FS: 4.964680
 Center: 112.612, 301.839
 Radius: 9.765
 Left Slip Surface Endpoint: 108.811, 292.844
 Right Slip Surface Endpoint: 120.980, 296.805
 Resisting Moment=2351.1 kN-m
 Driving Moment=473.566 kN-m
 Total Slice Area=29.2546 m2

Method: janbu simplified

FS: 4.596840
 Center: 113.438, 299.476
 Radius: 7.862
 Left Slip Surface Endpoint: 109.078, 292.935
 Right Slip Surface Endpoint: 120.841, 296.829
 Resisting Horizontal Force=214.913 kN
 Driving Horizontal Force=46.7522 kN
 Total Slice Area=33.9844 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 4.96468

| 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 | 0.164569 | 0.0498982 | Dique de solo compactado | 20 | 30 | 4.26813 | 21.1899 | 2.06096 | 0 | 2.06096 |
| 2 | 0.500203 | 1.29313 | Resíduos | 13.5 | 22 | 2.94242 | 14.6082 | 3.67345 | 0.930672 | 2.74278 |
| 3 | 0.500203 | 3.29485 | Resíduos | 13.5 | 22 | 3.1414 | 15.5961 | 7.55923 | 2.37133 | 5.1879 |
| 4 | 0.500203 | 5.1934 | Resíduos | 13.5 | 22 | 3.32824 | 16.5236 | 11.2215 | 3.73773 | 7.48375 |
| 5 | 0.500203 | 6.99333 | Resíduos | 13.5 | 22 | 3.50352 | 17.3939 | 14.6708 | 5.03315 | 9.63763 |
| 6 | 0.500203 | 8.65477 | Resíduos | 13.5 | 22 | 3.66313 | 18.1863 | 17.8278 | 6.22891 | 11.5989 |
| 7 | 0.500203 | 10.1682 | Resíduos | 13.5 | 22 | 3.80618 | 18.8965 | 20.6747 | 7.31812 | 13.3566 |
| 8 | 0.500203 | 11.5621 | Resíduos | 13.5 | 22 | 3.93577 | 19.5398 | 23.2704 | 8.32137 | 14.949 |
| 9 | 0.500203 | 12.072 | Resíduos | 13.5 | 22 | 3.9724 | 19.7217 | 24.0876 | 8.68833 | 15.3992 |
| 10 | 0.500203 | 12.1305 | Resíduos | 13.5 | 22 | 3.96194 | 19.6698 | 24.0011 | 8.7304 | 15.2707 |
| 11 | 0.500203 | 12.0985 | Resíduos | 13.5 | 22 | 3.94208 | 19.5712 | 23.7341 | 8.70741 | 15.0267 |

| | | | | | | | | | | |
|----|----------|---------|----------|------|----|---------|---------|-----------|---------|----------|
| 12 | 0.500203 | 11.9749 | Resíduos | 13.5 | 22 | 3.91268 | 19.4252 | 23.2838 | 8.61845 | 14.6653 |
| 13 | 0.500203 | 11.7576 | Resíduos | 13.5 | 22 | 3.8735 | 19.2307 | 22.646 | 8.46205 | 14.1839 |
| 14 | 0.500203 | 11.4359 | Resíduos | 13.5 | 22 | 3.82345 | 18.9822 | 21.7995 | 8.23054 | 13.5689 |
| 15 | 0.500203 | 10.9771 | Resíduos | 13.5 | 22 | 3.75918 | 18.6631 | 20.6795 | 7.90034 | 12.7792 |
| 16 | 0.500203 | 10.408 | Resíduos | 13.5 | 22 | 3.68341 | 18.2869 | 19.3388 | 7.49069 | 11.8481 |
| 17 | 0.500203 | 9.72646 | Resíduos | 13.5 | 22 | 3.5959 | 17.8525 | 17.7731 | 7.00021 | 10.7729 |
| 18 | 0.500203 | 8.92416 | Resíduos | 13.5 | 22 | 3.49576 | 17.3553 | 15.9651 | 6.42279 | 9.54227 |
| 19 | 0.500203 | 8.40692 | Resíduos | 13.5 | 22 | 3.42313 | 16.9948 | 14.7003 | 6.05053 | 8.64981 |
| 20 | 0.500203 | 8.57771 | Resíduos | 13.5 | 22 | 3.41674 | 16.963 | 14.7447 | 6.17344 | 8.57128 |
| 21 | 0.500203 | 8.60646 | Resíduos | 13.5 | 22 | 3.39328 | 16.8466 | 14.4772 | 6.19414 | 8.28306 |
| 22 | 0.500203 | 8.33207 | Resíduos | 13.5 | 22 | 3.33637 | 16.564 | 13.5803 | 5.99666 | 7.58363 |
| 23 | 0.500203 | 6.51791 | Resíduos | 13.5 | 22 | 3.12666 | 15.5229 | 9.69781 | 4.69099 | 5.00682 |
| 24 | 0.500203 | 4.18313 | Resíduos | 13.5 | 22 | 2.86366 | 14.2172 | 4.78568 | 3.01063 | 1.77505 |
| 25 | 0.500203 | 1.46774 | Resíduos | 13.5 | 22 | 2.5595 | 12.7071 | -0.906128 | 1.05635 | -1.96248 |

Global Minimum Query (janbu simplified) - Safety Factor: 4.59684

| 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 | 0.470515 | 1.10033 | Resíduos | 13.5 | 22 | 3.24424 | 14.9133 | 4.33983 | 0.84188 | 3.49795 |
| 2 | 0.470515 | 3.2301 | Resíduos | 13.5 | 22 | 3.48384 | 16.0147 | 8.6954 | 2.47141 | 6.22399 |
| 3 | 0.470515 | 5.22532 | Resíduos | 13.5 | 22 | 3.70586 | 17.0353 | 12.7481 | 3.99799 | 8.75008 |
| 4 | 0.470515 | 7.09855 | Resíduos | 13.5 | 22 | 3.91196 | 17.9826 | 16.5262 | 5.43123 | 11.0949 |
| 5 | 0.470515 | 8.82383 | Resíduos | 13.5 | 22 | 4.099 | 18.8424 | 19.9743 | 6.75128 | 13.223 |
| 6 | 0.470515 | 10.3916 | Resíduos | 13.5 | 22 | 4.26594 | 19.6099 | 23.0733 | 7.95082 | 15.1225 |
| 7 | 0.470515 | 11.8583 | Resíduos | 13.5 | 22 | 4.41974 | 20.3168 | 25.9453 | 9.07302 | 16.8722 |
| 8 | 0.470515 | 12.695 | Resíduos | 13.5 | 22 | 4.49655 | 20.6699 | 27.4594 | 9.71316 | 17.7463 |
| 9 | 0.470515 | 12.9227 | Resíduos | 13.5 | 22 | 4.49992 | 20.6854 | 27.6719 | 9.88743 | 17.7845 |
| 10 | 0.470515 | 13.0573 | Resíduos | 13.5 | 22 | 4.49231 | 20.6504 | 27.6882 | 9.99035 | 17.6979 |
| 11 | 0.470515 | 13.0988 | Resíduos | 13.5 | 22 | 4.47367 | 20.5648 | 27.5081 | 10.0221 | 17.486 |
| 12 | 0.470515 | 13.0466 | Resíduos | 13.5 | 22 | 4.44384 | 20.4276 | 27.1286 | 9.98219 | 17.1464 |
| 13 | 0.470515 | 12.8989 | Resíduos | 13.5 | 22 | 4.40253 | 20.2377 | 26.5457 | 9.86916 | 16.6765 |
| 14 | 0.470515 | 12.6311 | Resíduos | 13.5 | 22 | 4.34677 | 19.9814 | 25.7064 | 9.66432 | 16.0421 |
| 15 | 0.470515 | 12.2388 | Resíduos | 13.5 | 22 | 4.27596 | 19.6559 | 24.6005 | 9.36412 | 15.2364 |
| 16 | 0.470515 | 11.7377 | Resíduos | 13.5 | 22 | 4.19184 | 19.2692 | 23.26 | 8.98075 | 14.2792 |
| 17 | 0.470515 | 11.12 | Resíduos | 13.5 | 22 | 4.09332 | 18.8164 | 21.6666 | 8.50811 | 13.1585 |
| 18 | 0.470515 | 10.3749 | Resíduos | 13.5 | 22 | 3.97895 | 18.2906 | 19.7952 | 7.938 | 11.8572 |
| 19 | 0.470515 | 9.9888 | Resíduos | 13.5 | 22 | 3.9033 | 17.9429 | 18.639 | 7.64261 | 10.9964 |
| 20 | 0.470515 | 10.0656 | Resíduos | 13.5 | 22 | 3.87593 | 17.817 | 18.3864 | 7.70137 | 10.685 |
| 21 | 0.470515 | 9.95371 | Resíduos | 13.5 | 22 | 3.82131 | 17.566 | 17.6793 | 7.61577 | 10.0635 |
| 22 | 0.470515 | 9.55909 | Resíduos | 13.5 | 22 | 3.72679 | 17.1315 | 16.302 | 7.31384 | 8.98817 |
| 23 | 0.470515 | 7.71891 | Resíduos | 13.5 | 22 | 3.46343 | 15.9209 | 11.8977 | 5.90588 | 5.99183 |
| 24 | 0.470515 | 5.171 | Resíduos | 13.5 | 22 | 3.10805 | 14.2872 | 5.9048 | 3.95642 | 1.94838 |
| 25 | 0.470515 | 1.88368 | Resíduos | 13.5 | 22 | 2.63883 | 12.1303 | -1.94898 | 1.44124 | -3.39022 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 4.96468

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 108.811 | 292.844 | 0 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 2 | 108.975 | 292.776 | 0.841981 | 0 | 0 |
| 3 | 109.476 | 292.591 | 2.99323 | 0 | 0 |
| 4 | 109.976 | 292.436 | 5.73468 | 0 | 0 |
| 5 | 110.476 | 292.31 | 8.81422 | 0 | 0 |
| 6 | 110.976 | 292.212 | 12.0115 | 0 | 0 |
| 7 | 111.476 | 292.14 | 15.1224 | 0 | 0 |
| 8 | 111.977 | 292.094 | 17.9681 | 0 | 0 |
| 9 | 112.477 | 292.075 | 20.3965 | 0 | 0 |
| 10 | 112.977 | 292.08 | 22.2417 | 0 | 0 |
| 11 | 113.477 | 292.112 | 23.4654 | 0 | 0 |
| 12 | 113.978 | 292.169 | 24.0719 | 0 | 0 |
| 13 | 114.478 | 292.253 | 24.0747 | 0 | 0 |
| 14 | 114.978 | 292.364 | 23.4974 | 0 | 0 |
| 15 | 115.478 | 292.504 | 22.377 | 0 | 0 |
| 16 | 115.978 | 292.672 | 20.7731 | 0 | 0 |
| 17 | 116.479 | 292.871 | 18.7575 | 0 | 0 |
| 18 | 116.979 | 293.104 | 16.4214 | 0 | 0 |
| 19 | 117.479 | 293.373 | 13.8833 | 0 | 0 |
| 20 | 117.979 | 293.68 | 11.0691 | 0 | 0 |
| 21 | 118.479 | 294.032 | 7.58819 | 0 | 0 |
| 22 | 118.98 | 294.435 | 3.46078 | 0 | 0 |
| 23 | 119.48 | 294.896 | -1.13683 | 0 | 0 |
| 24 | 119.98 | 295.429 | -4.74466 | 0 | 0 |
| 25 | 120.48 | 296.054 | -6.30333 | 0 | 0 |
| 26 | 120.98 | 296.805 | 0 | 0 | 0 |

Global Minimum Query (janbu simplified) - Safety Factor: 4.59684

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 109.078 | 292.935 | 0 | 0 | 0 |
| 2 | 109.549 | 292.644 | 2.78609 | 0 | 0 |
| 3 | 110.019 | 292.397 | 6.57484 | 0 | 0 |
| 4 | 110.49 | 292.189 | 10.977 | 0 | 0 |
| 5 | 110.96 | 292.015 | 15.6788 | 0 | 0 |
| 6 | 111.431 | 291.875 | 20.4064 | 0 | 0 |
| 7 | 111.901 | 291.766 | 24.927 | 0 | 0 |
| 8 | 112.372 | 291.687 | 29.0574 | 0 | 0 |
| 9 | 112.842 | 291.637 | 32.5476 | 0 | 0 |
| 10 | 113.313 | 291.616 | 35.2633 | 0 | 0 |
| 11 | 113.783 | 291.622 | 37.1951 | 0 | 0 |
| 12 | 114.254 | 291.657 | 38.3418 | 0 | 0 |
| 13 | 114.724 | 291.721 | 38.7104 | 0 | 0 |
| 14 | 115.195 | 291.813 | 38.3172 | 0 | 0 |
| 15 | 115.665 | 291.937 | 37.1931 | 0 | 0 |
| 16 | 116.136 | 292.092 | 35.3855 | 0 | 0 |
| 17 | 116.607 | 292.281 | 32.9548 | 0 | 0 |
| 18 | 117.077 | 292.507 | 29.9817 | 0 | 0 |
| 19 | 117.548 | 292.774 | 26.5756 | 0 | 0 |
| 20 | 118.018 | 293.086 | 22.5919 | 0 | 0 |
| 21 | 118.489 | 293.451 | 17.7055 | 0 | 0 |
| 22 | 118.959 | 293.879 | 11.9376 | 0 | 0 |
| 23 | 119.43 | 294.386 | 5.42919 | 0 | 0 |

| | | | | | |
|----|---------|---------|-----------|---|---|
| 24 | 119.9 | 294.998 | -0.226877 | 0 | 0 |
| 25 | 120.371 | 295.768 | -3.31026 | 0 | 0 |
| 26 | 120.841 | 296.829 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---------|---------|
| 154.284 | 295.42 |
| 153.871 | 295.151 |
| 153.191 | 294.677 |
| 152.767 | 294.431 |
| 151.261 | 294.617 |
| 150.809 | 294.673 |
| 150.446 | 294.718 |
| 144.584 | 295.451 |
| 144.372 | 295.429 |
| 144.264 | 295.459 |
| 143.934 | 295.527 |
| 139.319 | 295.848 |
| 137.351 | 295.959 |
| 136.376 | 296.16 |
| 135 | 296.201 |
| 130.336 | 296.338 |
| 130.1 | 296.354 |
| 129.358 | 296.358 |
| 125.854 | 296.761 |
| 124.635 | 296.402 |
| 122.832 | 296.448 |
| 122.138 | 296.602 |
| 119.221 | 297.114 |
| 119.01 | 296.908 |
| 117.575 | 295.802 |
| 115.197 | 295.7 |
| 112.368 | 295.5 |
| 111.008 | 294.485 |
| 108.933 | 292.818 |
| 105.775 | 293.481 |
| 105.625 | 293.511 |
| 105.587 | 293.518 |
| 105.464 | 293.425 |
| 105.411 | 293.372 |
| 104.883 | 292.972 |
| 99.2639 | 288.519 |
| 98.8636 | 288.002 |
| 98.395 | 287.5 |
| 97.9688 | 287.043 |
| 96.5501 | 287.22 |
| 94.8124 | 287.374 |
| 94.1691 | 287.402 |
| 92.406 | 287.608 |

| | |
|---------|---------|
| 92.406 | 280 |
| 154.579 | 280 |
| 154.579 | 295.573 |

Material Boundary

| X | Y |
|---------|---------|
| 98.395 | 287.5 |
| 114.252 | 287.5 |
| 135 | 287.5 |
| 140.762 | 287.5 |
| 151.261 | 294.617 |

Material Boundary

| X | Y |
|---------|---------|
| 108.933 | 292.818 |
| 113.952 | 287.8 |
| 114.252 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 113.952 | 287.8 |
| 135 | 287.8 |
| 135 | 287.8 |
| 135 | 287.8 |
| 140.67 | 287.8 |
| 150.809 | 294.673 |

Project Summary

File Name: Section.02.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 20/05/2020, 13:33:36

General Settings

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

Analysis Options

Analysis Methods Used

Bishop 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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Material de enchente | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|---|
| Color |  |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 5 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 10 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 20 | 12 |
| Water Surface | None | None | None | None | None |
| Ru Value | 0.42 | 0 | 0 | 0.42 | 0.42 |

Support Properties

Support 1

Support Type: End Anchored
Force Application: Active
Out-of-Plane Spacing: 1 m
Anchor Capacity: 100 kN

Global Minimums

Method: bishop simplified

FS: 1.654980
Center: 183.351, 348.735
Radius: 48.711
Left Slip Surface Endpoint: 141.302, 324.146
Right Slip Surface Endpoint: 205.684, 305.446
Resisting Moment=92883.9 kN-m
Driving Moment=56124 kN-m
Total Slice Area=690.485 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.65498

| 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 | 1.2576 | 8.80635 | Resíduos | 13.5 | 22 | 6.56012 | 10.8569 | -3.60094 | 2.94104 | -6.54198 |
| 2 | 1.40541 | 26.7123 | Material de enchente | 10 | 20 | 6.42054 | 10.6259 | 9.70238 | 7.98282 | 1.71956 |
| 3 | 2.63157 | 93.0168 | Resíduos | 13.5 | 22 | 10.0754 | 16.6745 | 22.7028 | 14.8455 | 7.85727 |
| 4 | 2.63157 | 155.747 | Resíduos | 13.5 | 22 | 13.1341 | 21.7367 | 45.2436 | 24.8572 | 20.3864 |
| 5 | 2.63157 | 196.294 | Resíduos | 13.5 | 22 | 15.3115 | 25.3403 | 60.6343 | 31.3286 | 29.3057 |
| 6 | 2.63157 | 228.344 | Resíduos | 13.5 | 22 | 17.1406 | 28.3674 | 73.2417 | 36.4438 | 36.7979 |
| 7 | 2.63157 | 239.067 | Resíduos | 13.5 | 22 | 18.0066 | 29.8005 | 78.5003 | 38.1552 | 40.3451 |
| 8 | 2.63157 | 252.541 | Resíduos | 13.5 | 22 | 18.9869 | 31.423 | 84.6667 | 40.3056 | 44.3611 |
| 9 | 2.63157 | 267.123 | Resíduos | 13.5 | 22 | 20.0169 | 33.1275 | 91.2128 | 42.633 | 48.5798 |
| 10 | 2.63157 | 268.639 | Resíduos | 13.5 | 22 | 20.415 | 33.7864 | 93.0854 | 42.8749 | 50.2105 |
| 11 | 2.63157 | 271.595 | Resíduos | 13.5 | 22 | 20.8713 | 34.5416 | 95.4263 | 43.3466 | 52.0797 |
| 12 | 2.63157 | 281.161 | Resíduos | 13.5 | 22 | 21.6519 | 35.8334 | 100.151 | 44.8734 | 55.2772 |
| 13 | 2.63157 | 287.653 | Resíduos | 13.5 | 22 | 22.2824 | 36.877 | 103.77 | 45.9095 | 57.8603 |
| 14 | 2.63157 | 286.596 | Resíduos | 13.5 | 22 | 22.5295 | 37.2859 | 104.613 | 45.7409 | 58.8719 |

| | | | | | | | | | | |
|----|---------|---------|---------------------------|------|----|---------|---------|---------|---------|---------|
| 15 | 2.63157 | 275.754 | Resíduos | 13.5 | 22 | 22.2638 | 36.8462 | 101.794 | 44.0105 | 57.7839 |
| 16 | 2.58761 | 254.829 | Interface Solo x GMB Lisa | 3 | 12 | 9.05576 | 14.9871 | 97.7566 | 41.3616 | 56.395 |
| 17 | 2.58761 | 246.415 | Interface Solo x GMB Lisa | 3 | 12 | 8.87624 | 14.69 | 94.993 | 39.9961 | 54.9969 |
| 18 | 2.58761 | 235.708 | Interface Solo x GMB Lisa | 3 | 12 | 8.62766 | 14.2786 | 91.3198 | 38.2581 | 53.0617 |
| 19 | 2.58761 | 210.863 | Interface Solo x GMB Lisa | 3 | 12 | 7.96475 | 13.1815 | 82.1257 | 34.2255 | 47.9002 |
| 20 | 2.9929 | 215.56 | Resíduos | 13.5 | 22 | 18.9964 | 31.4387 | 74.6498 | 30.25 | 44.3998 |
| 21 | 2.9929 | 193.823 | Resíduos | 13.5 | 22 | 18.2276 | 30.1663 | 68.4502 | 27.1997 | 41.2505 |
| 22 | 2.9929 | 155.711 | Resíduos | 13.5 | 22 | 16.6152 | 27.4978 | 56.4973 | 21.8513 | 34.646 |
| 23 | 2.9929 | 104.813 | Resíduos | 13.5 | 22 | 14.3002 | 23.6665 | 39.8718 | 14.7087 | 25.1631 |
| 24 | 2.9929 | 57.2256 | Resíduos | 13.5 | 22 | 12.0869 | 20.0035 | 24.1273 | 8.0306 | 16.0967 |
| 25 | 2.19314 | 21.4499 | Dique de solo compactado | 20 | 30 | 18.6468 | 30.8601 | 18.8103 | 0 | 18.8103 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.65498

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 141.302 | 324.146 | 0 | 0 | 0 |
| 2 | 142.56 | 322.111 | -15.5691 | 0 | 0 |
| 3 | 143.965 | 320.073 | -4.81085 | 0 | 0 |
| 4 | 146.597 | 316.768 | 43.7233 | 0 | 0 |
| 5 | 149.229 | 313.973 | 135.648 | 0 | 0 |
| 6 | 151.86 | 311.572 | 240.948 | 0 | 0 |
| 7 | 154.492 | 309.494 | 348.118 | 0 | 0 |
| 8 | 157.123 | 307.688 | 442.505 | 0 | 0 |
| 9 | 159.755 | 306.121 | 525.268 | 0 | 0 |
| 10 | 162.386 | 304.767 | 596.168 | 0 | 0 |
| 11 | 165.018 | 303.606 | 650.528 | 0 | 0 |
| 12 | 167.65 | 302.624 | 689.318 | 0 | 0 |
| 13 | 170.281 | 301.81 | 713.887 | 0 | 0 |
| 14 | 172.913 | 301.156 | 723.221 | 0 | 0 |
| 15 | 175.544 | 300.654 | 716.484 | 0 | 0 |
| 16 | 178.176 | 300.3 | 693.97 | 0 | 0 |
| 17 | 180.764 | 300.093 | 690.782 | 0 | 0 |
| 18 | 183.351 | 300.024 | 674.365 | 0 | 0 |
| 19 | 185.939 | 300.093 | 645.775 | 0 | 0 |
| 20 | 188.526 | 300.3 | 608.187 | 0 | 0 |
| 21 | 191.519 | 300.714 | 520.468 | 0 | 0 |
| 22 | 194.512 | 301.32 | 424.463 | 0 | 0 |
| 23 | 197.505 | 302.126 | 329.246 | 0 | 0 |
| 24 | 200.498 | 303.142 | 245.968 | 0 | 0 |
| 25 | 203.491 | 304.383 | 179.886 | 0 | 0 |
| 26 | 205.684 | 305.446 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---|---|
| | |

| | |
|---------|-----|
| 782.638 | 413 |
| 774.228 | 412 |
| 768.818 | 411 |
| 763.41 | 410 |
| 757.942 | 409 |
| 752.475 | 408 |
| 748.689 | 407 |
| 745.433 | 406 |
| 742.172 | 405 |
| 738.895 | 404 |
| 735.613 | 403 |
| 732.302 | 402 |
| 729.011 | 401 |
| 725.82 | 400 |
| 722.75 | 399 |
| 719.774 | 398 |
| 717.169 | 397 |
| 714.672 | 396 |
| 712.196 | 395 |
| 709.754 | 394 |
| 707.345 | 393 |
| 704.951 | 392 |
| 702.574 | 391 |
| 700.204 | 390 |
| 697.836 | 389 |
| 695.47 | 388 |
| 693.105 | 387 |
| 690.742 | 386 |
| 688.379 | 385 |
| 686.055 | 384 |
| 683.891 | 383 |
| 681.73 | 382 |
| 679.571 | 381 |
| 677.419 | 380 |
| 675.275 | 379 |
| 673.135 | 378 |
| 671.005 | 377 |
| 668.877 | 376 |
| 666.75 | 375 |
| 664.624 | 374 |
| 662.659 | 373 |
| 660.814 | 372 |
| 658.968 | 371 |
| 657.12 | 370 |
| 655.271 | 369 |
| 653.419 | 368 |
| 651.566 | 367 |
| 649.71 | 366 |
| 647.85 | 365 |
| 645.988 | 364 |
| 644.111 | 363 |
| 642.219 | 362 |

| | |
|---------|-----|
| 640.317 | 361 |
| 638.404 | 360 |
| 636.48 | 359 |
| 634.549 | 358 |
| 632.801 | 357 |
| 631.153 | 356 |
| 629.507 | 355 |
| 627.865 | 354 |
| 626.228 | 353 |
| 624.586 | 352 |
| 622.925 | 351 |
| 621.284 | 350 |
| 619.54 | 349 |
| 617.993 | 348 |
| 616.456 | 347 |
| 614.925 | 346 |
| 613.404 | 345 |
| 611.895 | 344 |
| 610.391 | 343 |
| 608.891 | 342 |
| 607.394 | 341 |
| 605.9 | 340 |
| 604.408 | 339 |
| 602.917 | 338 |
| 601.429 | 337 |
| 599.939 | 336 |
| 598.444 | 335 |
| 596.95 | 334 |
| 595.455 | 333 |
| 593.961 | 332 |
| 592.563 | 331 |
| 591.17 | 330 |
| 589.805 | 329 |
| 588.505 | 328 |
| 587.254 | 327 |
| 586.007 | 326 |
| 584.732 | 325 |
| 583.34 | 324 |
| 581.87 | 323 |
| 580.369 | 322 |
| 578.823 | 321 |
| 577.275 | 320 |
| 575.722 | 319 |
| 574.166 | 318 |
| 572.608 | 317 |
| 571.049 | 316 |
| 569.478 | 315 |
| 567.797 | 314 |
| 565.646 | 313 |
| 563.386 | 312 |
| 559.859 | 311 |
| 556.131 | 310 |

| | |
|---------|-----|
| 552.436 | 309 |
| 519.816 | 308 |
| 511.336 | 307 |
| 508.961 | 306 |
| 506.633 | 305 |
| 504.306 | 304 |
| 501.98 | 303 |
| 499.635 | 302 |
| 497.252 | 301 |
| 494.875 | 300 |
| 492.482 | 299 |
| 490.069 | 298 |
| 487.637 | 297 |
| 485.197 | 296 |
| 482.72 | 295 |
| 480.205 | 294 |
| 477.814 | 293 |
| 475.464 | 292 |
| 473.154 | 291 |
| 470.831 | 290 |
| 468.526 | 289 |
| 466.243 | 288 |
| 463.983 | 287 |
| 461.72 | 286 |
| 459.303 | 285 |
| 456.854 | 284 |
| 454.196 | 283 |
| 450.723 | 282 |
| 445.815 | 281 |
| 439.487 | 280 |
| 432.347 | 279 |
| 409.664 | 279 |
| 328.784 | 279 |
| 311.797 | 278 |
| 303.693 | 277 |
| 282.307 | 277 |
| 280.297 | 278 |
| 278.045 | 279 |
| 275.69 | 280 |
| 273.334 | 281 |
| 270.928 | 282 |
| 268.165 | 283 |
| 265.513 | 284 |
| 262.855 | 285 |
| 260.203 | 286 |
| 256.943 | 287 |
| 251.485 | 288 |
| 246.994 | 289 |
| 242.766 | 290 |
| 239.137 | 291 |
| 234.481 | 292 |
| 230.238 | 293 |

| | |
|---------|---------|
| 227.955 | 294 |
| 220.83 | 295 |
| 219.732 | 296 |
| 218.569 | 297 |
| 217.344 | 298 |
| 215.981 | 299 |
| 214.627 | 300 |
| 213.282 | 301 |
| 211.944 | 302 |
| 210.612 | 303 |
| 209.286 | 304 |
| 207.962 | 305 |
| 204.567 | 305.664 |
| 202.849 | 306 |
| 201.08 | 307 |
| 197.79 | 308 |
| 196.338 | 309 |
| 194.555 | 310 |
| 188.827 | 311 |
| 186.814 | 312 |
| 184.841 | 313 |
| 179.864 | 314 |
| 177.68 | 315 |
| 175.846 | 316 |
| 172.353 | 317 |
| 165.302 | 318 |
| 163.222 | 319 |
| 161.155 | 320 |
| 156.732 | 321 |
| 155.078 | 322 |
| 153.384 | 323 |
| 146.762 | 324 |
| 132.115 | 324.39 |
| 109.7 | 324.988 |
| 109.242 | 325 |
| 107.125 | 326 |
| 105.01 | 327 |
| 102.897 | 328 |
| 100.786 | 329 |
| 98.677 | 330 |
| 96.5696 | 331 |
| 94.4642 | 332 |
| 92.3606 | 333 |
| 90.2589 | 334 |
| 88.1573 | 335 |
| 86.0574 | 336 |
| 83.9621 | 337 |
| 82.1485 | 338 |
| 81.0059 | 339 |
| 79.8673 | 340 |
| 78.7243 | 341 |
| 77.5786 | 342 |

| | |
|--------------|---------|
| 76.4329 | 343 |
| 75.2871 | 344 |
| 74.1866 | 345 |
| 71.682 | 346 |
| 66.5595 | 347 |
| 64.7442 | 348 |
| 62.9245 | 349 |
| 61.1102 | 350 |
| 59.2778 | 351 |
| 57.1988 | 352 |
| 54.6474 | 353 |
| 44.9562 | 354 |
| 40.0373 | 355 |
| 3.6e-015 | 363.14 |
| 7.10543e-015 | 340.34 |
| 0 | 256.21 |
| 783.842 | 256.21 |
| 783.842 | 413.143 |

Material Boundary

| X | Y |
|--------------|---------|
| 7.10543e-015 | 340.34 |
| 42.3503 | 340 |
| 69.287 | 320 |
| 80.4093 | 320 |
| 109.181 | 315 |
| 120.191 | 315 |
| 148.453 | 300 |
| 199.81 | 300 |
| 200.069 | 300.308 |
| 204.567 | 305.664 |

Material Boundary

| X | Y |
|--------|-----|
| 199.81 | 300 |
| 220.83 | 295 |

Material Boundary

| X | Y |
|---------|-----|
| 109.242 | 325 |
| 120.191 | 315 |

Material Boundary

| X | Y |
|---------|---------|
| 146.585 | 319.981 |
| 146.409 | 320.008 |
| 117.665 | 320.774 |
| 117.665 | 322.775 |
| 146.585 | 322.004 |

| | |
|---------|---------|
| 146.585 | 319.981 |
|---------|---------|

Material Boundary

| X | Y |
|---------|---------|
| 109.7 | 324.988 |
| 120.365 | 315.247 |
| 148.528 | 300.3 |
| 199.671 | 300.3 |
| 200.069 | 300.308 |

RUPTURAS CIRCULARES – HIPÓTESE 02

Project Summary

File Name: Estaca 02.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 09:03:14

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

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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.36 | 0 | 0 | 0.36 |

Global Minimums

Method: bishop simplified

FS: 2.349340
 Center: 97.948, 323.279
 Radius: 35.770
 Left Slip Surface Endpoint: 82.062, 291.230
 Right Slip Surface Endpoint: 129.255, 305.978
 Resisting Moment=58743.4 kN-m
 Driving Moment=25004.2 kN-m
 Total Slice Area=386.786 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.34934

| 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 | 1.44853 | 10.785 | Dique de solo compactado | 20 | 30 | 11.6869 | 27.4565 | 12.9151 | 0 | 12.9151 |
| 2 | 1.44853 | 22.4234 | Dique de solo compactado | 20 | 30 | 13.7165 | 32.2247 | 21.1739 | 0 | 21.1739 |
| 3 | 2.10969 | 47.6437 | Resíduos | 18.2 | 28 | 11.9777 | 28.1396 | 26.8236 | 8.13 | 18.6936 |
| 4 | 2.10969 | 76.2547 | Resíduos | 18.2 | 28 | 13.8799 | 32.6085 | 40.1108 | 13.0122 | 27.0986 |
| 5 | 2.10969 | 101.364 | Resíduos | 18.2 | 28 | 15.4803 | 36.3686 | 51.4671 | 17.2969 | 34.1702 |
| 6 | 2.10969 | 110.984 | Resíduos | 18.2 | 28 | 15.9392 | 37.4467 | 55.1365 | 18.9385 | 36.198 |
| 7 | 1.82012 | 99.678 | Interface Solo x GMB Lisa | 3 | 12 | 4.4896 | 10.5476 | 55.2239 | 19.7152 | 35.5087 |
| 8 | 1.82012 | 111.328 | Interface Solo x GMB Lisa | 3 | 12 | 4.841 | 11.3732 | 61.4125 | 22.0196 | 39.3929 |
| 9 | 1.82012 | 125.8 | Interface Solo x GMB Lisa | 3 | 12 | 5.27908 | 12.4024 | 69.1164 | 24.882 | 44.2344 |
| 10 | 1.82012 | 132.66 | Interface Solo x GMB Lisa | 3 | 12 | 5.47208 | 12.8558 | 72.6066 | 26.2387 | 46.3679 |
| 11 | 1.82012 | 128.275 | Interface Solo x GMB Lisa | 3 | 12 | 5.30868 | 12.4719 | 69.933 | 25.3715 | 44.5615 |
| 12 | 1.91121 | 139.288 | Resíduos | 18.2 | 28 | 17.6798 | 41.5359 | 70.1253 | 26.2367 | 43.8886 |
| 13 | 1.91121 | 147.05 | Resíduos | 18.2 | 28 | 18.0266 | 42.3506 | 73.1195 | 27.6987 | 45.4208 |
| 14 | 1.91121 | 152.504 | Resíduos | 18.2 | 28 | 18.1924 | 42.7401 | 74.8793 | 28.726 | 46.1533 |
| 15 | 1.91121 | 156.188 | Resíduos | 18.2 | 28 | 18.219 | 42.8027 | 75.691 | 29.42 | 46.271 |
| 16 | 1.91121 | 158.271 | Resíduos | 18.2 | 28 | 18.1203 | 42.5707 | 75.6467 | 29.8123 | 45.8344 |
| 17 | 1.91121 | 158.518 | Resíduos | 18.2 | 28 | 17.8814 | 42.0094 | 74.6378 | 29.8589 | 44.7789 |
| 18 | 1.91121 | 155.998 | Resíduos | 18.2 | 28 | 17.4411 | 40.975 | 72.2175 | 29.3842 | 42.8333 |
| 19 | 1.91121 | 151.28 | Resíduos | 18.2 | 28 | 16.8416 | 39.5667 | 68.6802 | 28.4955 | 40.1847 |
| 20 | 1.91121 | 140.236 | Resíduos | 18.2 | 28 | 15.8159 | 37.157 | 62.0682 | 26.4151 | 35.6531 |
| 21 | 1.91121 | 123.607 | Resíduos | 18.2 | 28 | 14.4298 | 33.9004 | 52.8112 | 23.2829 | 29.5283 |

| | | | | | | | | | | |
|----|---------|---------|----------|------|----|---------|---------|-----------|---------|---------|
| 22 | 1.91121 | 108.133 | Resíduos | 18.2 | 28 | 13.1219 | 30.8277 | 44.1176 | 20.3682 | 23.7494 |
| 23 | 1.91121 | 89.1229 | Resíduos | 18.2 | 28 | 11.5953 | 27.2412 | 33.7915 | 16.7874 | 17.0041 |
| 24 | 1.91121 | 58.8992 | Resíduos | 18.2 | 28 | 9.41152 | 22.1109 | 18.4497 | 11.0944 | 7.35529 |
| 25 | 1.91121 | 20.4398 | Resíduos | 18.2 | 28 | 6.81269 | 16.0053 | -0.277514 | 3.85009 | -4.1276 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.34934

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 82.0619 | 291.23 | 0 | 0 | 0 |
| 2 | 83.5104 | 290.552 | 25.6821 | 0 | 0 |
| 3 | 84.9589 | 289.951 | 58.2805 | 0 | 0 |
| 4 | 87.0686 | 289.204 | 103.582 | 0 | 0 |
| 5 | 89.1783 | 288.601 | 157.04 | 0 | 0 |
| 6 | 91.288 | 288.135 | 213.685 | 0 | 0 |
| 7 | 93.3977 | 287.8 | 265.766 | 0 | 0 |
| 8 | 95.2178 | 287.613 | 284.222 | 0 | 0 |
| 9 | 97.0379 | 287.521 | 298.728 | 0 | 0 |
| 10 | 98.858 | 287.521 | 308.333 | 0 | 0 |
| 11 | 100.678 | 287.613 | 311.555 | 0 | 0 |
| 12 | 102.498 | 287.8 | 308.189 | 0 | 0 |
| 13 | 104.409 | 288.098 | 321.084 | 0 | 0 |
| 14 | 106.321 | 288.503 | 325.894 | 0 | 0 |
| 15 | 108.232 | 289.019 | 321.979 | 0 | 0 |
| 16 | 110.143 | 289.652 | 308.888 | 0 | 0 |
| 17 | 112.054 | 290.408 | 286.326 | 0 | 0 |
| 18 | 113.966 | 291.296 | 254.233 | 0 | 0 |
| 19 | 115.877 | 292.327 | 213.11 | 0 | 0 |
| 20 | 117.788 | 293.516 | 163.635 | 0 | 0 |
| 21 | 119.699 | 294.882 | 109.023 | 0 | 0 |
| 22 | 121.61 | 296.454 | 53.5864 | 0 | 0 |
| 23 | 123.522 | 298.27 | -1.43387 | 0 | 0 |
| 24 | 125.433 | 300.387 | -50.8145 | 0 | 0 |
| 25 | 127.344 | 302.899 | -79.1827 | 0 | 0 |
| 26 | 129.255 | 305.978 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---------|---------|
| 224.566 | 340.518 |
| 222.369 | 339.249 |
| 215.437 | 339.121 |
| 213.637 | 339.106 |
| 213.064 | 338.716 |
| 209.867 | 336.08 |
| 209.267 | 335.398 |
| 207.289 | 334.222 |

| | |
|---------|---------|
| 206.826 | 334.359 |
| 206.575 | 334.139 |
| 203.418 | 333.138 |
| 203.091 | 333.102 |
| 202.657 | 332.594 |
| 201.604 | 331.527 |
| 190.48 | 320.012 |
| 187.316 | 320.196 |
| 185.499 | 320.379 |
| 184.753 | 320.463 |
| 183.638 | 320.403 |
| 171.07 | 312.26 |
| 171.028 | 311.581 |
| 170.236 | 311.284 |
| 169.452 | 311.371 |
| 169.239 | 310.947 |
| 168.288 | 310.618 |
| 166.402 | 309.17 |
| 165.967 | 309.224 |
| 165.454 | 309.287 |
| 164.67 | 309.52 |
| 163.154 | 309.355 |
| 159.943 | 309.045 |
| 157.74 | 308.802 |
| 151.786 | 308.198 |
| 150.369 | 308.055 |
| 147.557 | 307.813 |
| 140.94 | 307.86 |
| 133.787 | 307.445 |
| 133.47 | 307.436 |
| 133.31 | 307.417 |
| 132.363 | 307.089 |
| 129.167 | 305.946 |
| 128.715 | 305.943 |
| 124.858 | 306.112 |
| 124.671 | 306.094 |
| 120.66 | 304.857 |
| 117.741 | 304.589 |
| 113.087 | 302.745 |
| 105.653 | 299.438 |
| 105 | 299.118 |
| 101.98 | 297.637 |
| 100.735 | 297.801 |
| 99.0912 | 297.952 |
| 95.8416 | 296.028 |
| 94.7299 | 295.452 |
| 93.2575 | 295.464 |
| 90.6229 | 295.516 |
| 88.9082 | 294.536 |
| 83.5694 | 291.34 |
| 81.1219 | 291.162 |
| 78.7719 | 291.01 |

| | |
|---------|---------|
| 74.7007 | 288.322 |
| 73.8627 | 287.8 |
| 73.3815 | 287.5 |
| 65.2019 | 282.406 |
| 62.0794 | 281.801 |
| 61.8346 | 281.763 |
| 55.7123 | 280.725 |
| 48.8919 | 279.633 |
| 46.7214 | 279.495 |
| 42.2692 | 278.611 |
| 41.5317 | 278.585 |
| 232.711 | 278.585 |
| 232.711 | 344.863 |

Material Boundary

| X | Y |
|---------|--------|
| 73.3815 | 287.5 |
| 87.4097 | 287.5 |
| 105 | 287.5 |
| 121.325 | 287.5 |
| 147.305 | 302.5 |
| 157.305 | 302.5 |
| 166.402 | 309.17 |

Material Boundary

| X | Y |
|---------|--------|
| 83.5694 | 291.34 |
| 87.11 | 287.8 |
| 87.4097 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 87.11 | 287.8 |
| 104.999 | 287.8 |
| 105 | 287.8 |
| 105 | 287.8 |
| 121.244 | 287.8 |
| 147.225 | 302.8 |
| 157.207 | 302.8 |
| 165.967 | 309.224 |

Project Summary

File Name: Estaca 03.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 09:14:30

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

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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.36 | 0 | 0 | 0.36 |

Global Minimums

Method: bishop simplified

FS: 2.188490
 Center: 99.915, 375.324
 Radius: 87.799
 Left Slip Surface Endpoint: 75.929, 290.866
 Right Slip Surface Endpoint: 162.019, 313.263
 Resisting Moment=277691 kN-m
 Driving Moment=126887 kN-m
 Total Slice Area=897.138 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.18849

| 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 | 3.78594 | 42.792 | Dique de solo compactado | 20 | 30 | 13.0132 | 28.4793 | 14.6866 | 0 | 14.6866 |
| 2 | 3.31663 | 77.3304 | Resíduos | 18.2 | 28 | 12.6033 | 27.5822 | 26.039 | 8.39374 | 17.6453 |
| 3 | 3.31663 | 135.435 | Resíduos | 18.2 | 28 | 15.3212 | 33.5303 | 43.5328 | 14.7006 | 28.8322 |
| 4 | 3.31663 | 157.362 | Resíduos | 18.2 | 28 | 16.2338 | 35.5274 | 49.6688 | 17.0807 | 32.5881 |
| 5 | 3.31663 | 189.518 | Resíduos | 18.2 | 28 | 17.6224 | 38.5664 | 58.8748 | 20.5711 | 38.3037 |
| 6 | 3.46682 | 237.844 | Interface Solo x GMB Lisa | 3 | 12 | 5.668 | 12.4044 | 68.9422 | 24.6981 | 44.2441 |
| 7 | 3.46682 | 254.313 | Interface Solo x GMB Lisa | 3 | 12 | 5.942 | 13.004 | 73.4737 | 26.4082 | 47.0655 |
| 8 | 3.46682 | 288.342 | Interface Solo x GMB Lisa | 3 | 12 | 6.52825 | 14.287 | 83.0431 | 29.9419 | 53.1012 |
| 9 | 3.46682 | 320.829 | Interface Solo x GMB Lisa | 3 | 12 | 7.08242 | 15.4998 | 92.1224 | 33.3153 | 58.8071 |
| 10 | 3.35487 | 339.585 | Resíduos | 18.2 | 28 | 23.493 | 51.4141 | 98.9064 | 36.4398 | 62.4666 |
| 11 | 3.35487 | 369.385 | Resíduos | 18.2 | 28 | 24.614 | 53.8674 | 106.718 | 39.6376 | 67.0804 |
| 12 | 3.35487 | 371.752 | Resíduos | 18.2 | 28 | 24.4918 | 53.6001 | 106.469 | 39.8915 | 66.5778 |
| 13 | 3.35487 | 377.902 | Resíduos | 18.2 | 28 | 24.5338 | 53.6919 | 107.302 | 40.5514 | 66.7505 |
| 14 | 3.35487 | 391.872 | Resíduos | 18.2 | 28 | 24.9101 | 54.5154 | 110.35 | 42.0505 | 68.2992 |
| 15 | 3.35487 | 382.477 | Resíduos | 18.2 | 28 | 24.2629 | 53.0992 | 106.678 | 41.0424 | 65.6356 |
| 16 | 3.35487 | 360.463 | Resíduos | 18.2 | 28 | 23.0804 | 50.5112 | 99.4487 | 38.6801 | 60.7686 |
| 17 | 3.35487 | 334.713 | Resíduos | 18.2 | 28 | 21.7538 | 47.608 | 91.2253 | 35.9169 | 55.3084 |
| 18 | 3.35487 | 307.771 | Resíduos | 18.2 | 28 | 20.394 | 44.632 | 82.7372 | 33.0259 | 49.7113 |
| 19 | 4.70492 | 391.458 | Interface Solo x GMB Lisa | 3 | 12 | 6.23754 | 13.6508 | 80.0605 | 29.9527 | 50.1078 |
| 20 | 4.10138 | 320.995 | Solo Natural | 18 | 32 | 26.2458 | 57.4386 | 63.1149 | 0 | 63.1149 |
| 21 | 3.55169 | 250.036 | Interface Solo x GMB Lisa | 3 | 12 | 5.4068 | 11.8327 | 66.8983 | 25.3436 | 41.5547 |

| | | | | | | | | | | |
|----|---------|---------|----------|------|----|---------|---------|---------|---------|----------|
| 22 | 3.15475 | 176.022 | Resíduos | 18.2 | 28 | 14.477 | 31.6828 | 45.4439 | 20.0866 | 25.3573 |
| 23 | 3.15475 | 128.769 | Resíduos | 18.2 | 28 | 12.3137 | 26.9484 | 31.1478 | 14.6943 | 16.4535 |
| 24 | 3.15475 | 79.5565 | Resíduos | 18.2 | 28 | 10.1153 | 22.1372 | 16.4833 | 9.07849 | 7.40481 |
| 25 | 3.15475 | 31.1155 | Resíduos | 18.2 | 28 | 7.99952 | 17.5069 | 2.24712 | 3.55071 | -1.30359 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.18849

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 75.9285 | 290.866 | 0 | 0 | 0 |
| 2 | 79.7145 | 289.881 | 63.7187 | 0 | 0 |
| 3 | 83.0311 | 289.164 | 124.174 | 0 | 0 |
| 4 | 86.3477 | 288.58 | 200.407 | 0 | 0 |
| 5 | 89.6644 | 288.126 | 276.795 | 0 | 0 |
| 6 | 92.981 | 287.8 | 354.435 | 0 | 0 |
| 7 | 96.4478 | 287.594 | 388.265 | 0 | 0 |
| 8 | 99.9146 | 287.526 | 413.892 | 0 | 0 |
| 9 | 103.381 | 287.594 | 430.834 | 0 | 0 |
| 10 | 106.848 | 287.8 | 436.43 | 0 | 0 |
| 11 | 110.203 | 288.131 | 482.524 | 0 | 0 |
| 12 | 113.558 | 288.592 | 515.821 | 0 | 0 |
| 13 | 116.913 | 289.187 | 534.66 | 0 | 0 |
| 14 | 120.268 | 289.917 | 538.571 | 0 | 0 |
| 15 | 123.623 | 290.787 | 526.142 | 0 | 0 |
| 16 | 126.977 | 291.801 | 499.408 | 0 | 0 |
| 17 | 130.332 | 292.963 | 461.217 | 0 | 0 |
| 18 | 133.687 | 294.281 | 413.959 | 0 | 0 |
| 19 | 137.042 | 295.762 | 359.83 | 0 | 0 |
| 20 | 141.747 | 298.132 | 199.433 | 0 | 0 |
| 21 | 145.848 | 300.5 | 157.606 | 0 | 0 |
| 22 | 149.4 | 302.8 | 22.9408 | 0 | 0 |
| 23 | 152.555 | 305.056 | -33.9308 | 0 | 0 |
| 24 | 155.71 | 307.534 | -72.2699 | 0 | 0 |
| 25 | 158.864 | 310.259 | -85.2763 | 0 | 0 |
| 26 | 162.019 | 313.263 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---------|---------|
| 229.19 | 338.986 |
| 228.926 | 338.851 |
| 228.615 | 338.853 |
| 222.124 | 338.933 |
| 215.524 | 334.785 |
| 214.604 | 334.256 |
| 213.959 | 333.815 |
| 213.055 | 333.797 |

| | |
|---------|---------|
| 208.463 | 333.71 |
| 206.215 | 331.158 |
| 204.24 | 329.055 |
| 200.127 | 324.337 |
| 198.862 | 324.346 |
| 196.999 | 324.51 |
| 196.113 | 324.623 |
| 195.879 | 324.47 |
| 192.406 | 322.677 |
| 178.267 | 314.628 |
| 175.803 | 313.352 |
| 175.249 | 313.345 |
| 174.868 | 313.341 |
| 173.403 | 313.351 |
| 163.089 | 313.288 |
| 160.066 | 313.218 |
| 156.708 | 312.312 |
| 149.893 | 311.821 |
| 146.577 | 311.555 |
| 140.506 | 308.918 |
| 137.534 | 308.379 |
| 136.496 | 308.222 |
| 132.797 | 307.902 |
| 125.022 | 307.581 |
| 122.621 | 307.381 |
| 120.02 | 306.263 |
| 117.208 | 305.057 |
| 116.89 | 304.773 |
| 113.56 | 304.665 |
| 113.091 | 304.627 |
| 112.851 | 304.615 |
| 106.014 | 301.154 |
| 105.677 | 300.965 |
| 105.532 | 300.988 |
| 105 | 300.962 |
| 104.415 | 300.934 |
| 104.23 | 300.402 |
| 97.0353 | 297.439 |
| 95.9837 | 297.542 |
| 93.997 | 297.529 |
| 92.4662 | 296.733 |
| 89.4247 | 295.12 |
| 85.4524 | 295.139 |
| 85.243 | 295.151 |
| 83.3052 | 293.993 |
| 78.4595 | 291.136 |
| 77.9787 | 291.111 |
| 73.5622 | 290.583 |
| 68.7656 | 287.5 |
| 67.9234 | 286.959 |
| 58.9928 | 281.288 |
| 56.5883 | 280.736 |

| | |
|---------|---------|
| 55.1834 | 280.521 |
| 48.5919 | 280.015 |
| 47.4813 | 279.885 |
| 41.4363 | 279.572 |
| 40.6969 | 279.534 |
| 40.6969 | 270 |
| 241.351 | 270 |
| 241.351 | 344.99 |

Material Boundary

| X | Y |
|---------|---------|
| 68.7656 | 287.5 |
| 82.0956 | 287.5 |
| 105 | 287.5 |
| 123.332 | 287.5 |
| 149.313 | 302.5 |
| 159.313 | 302.5 |
| 175.803 | 313.352 |

Material Boundary

| X | Y |
|---------|---------|
| 78.4595 | 291.136 |
| 81.7956 | 287.8 |
| 82.0956 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 81.7956 | 287.8 |
| 105 | 287.8 |
| 105 | 287.8 |
| 105.001 | 287.8 |
| 123.251 | 287.8 |
| 149.232 | 302.8 |
| 159.223 | 302.8 |
| 175.249 | 313.345 |

Project Summary

File Name: Estaca 04.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 15:09:49

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 malpha < 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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.23 | 0 | 0 | 0.23 |

Global Minimums

Method: bishop simplified

FS: 2.279830
 Center: 155.062, 366.726
 Radius: 79.179
 Left Slip Surface Endpoint: 131.703, 291.072
 Right Slip Surface Endpoint: 214.329, 314.221
 Resisting Moment=293518 kN-m
 Driving Moment=128746 kN-m
 Total Slice Area=894.277 m2

Method: janbu simplified

FS: 2.159900
 Center: 155.062, 366.726
 Radius: 79.179
 Left Slip Surface Endpoint: 131.703, 291.072
 Right Slip Surface Endpoint: 214.329, 314.221
 Resisting Horizontal Force=3388.41 kN
 Driving Horizontal Force=1568.78 kN
 Total Slice Area=894.277 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.27983

| 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 | 1.88545 | 11.7109 | Dique de solo compactado | 20 | 30 | 11.1812 | 25.4912 | 9.51104 | 0 | 9.51104 |
| 2 | 3.78852 | 70.5042 | Resíduos | 18.2 | 28 | 12.0418 | 27.4533 | 21.6832 | 4.28029 | 17.4029 |
| 3 | 3.78852 | 144.972 | Resíduos | 18.2 | 28 | 15.5952 | 35.5544 | 41.4402 | 8.80122 | 32.639 |
| 4 | 3.78852 | 169.135 | Resíduos | 18.2 | 28 | 16.5938 | 37.8311 | 47.189 | 10.2681 | 36.9209 |
| 5 | 3.78852 | 214.957 | Resíduos | 18.2 | 28 | 18.6254 | 42.4628 | 58.6818 | 13.05 | 45.6318 |
| 6 | 3.16014 | 215.035 | Interface Solo x GMB Lisa | 3 | 12 | 6.23577 | 14.2165 | 68.4199 | 15.6506 | 52.7693 |
| 7 | 3.16014 | 229.061 | Interface Solo x GMB Lisa | 3 | 12 | 6.53167 | 14.8911 | 72.6147 | 16.6714 | 55.9433 |
| 8 | 3.16014 | 263.885 | Interface Solo x GMB Lisa | 3 | 12 | 7.29704 | 16.636 | 83.3586 | 19.206 | 64.1526 |
| 9 | 3.16014 | 287.417 | Interface Solo x GMB Lisa | 3 | 12 | 7.80159 | 17.7863 | 90.4828 | 20.9186 | 69.5642 |
| 10 | 3.30915 | 312.652 | Resíduos | 18.2 | 28 | 24.3748 | 55.5703 | 92.0141 | 21.7307 | 70.2834 |
| 11 | 3.30915 | 345.532 | Resíduos | 18.2 | 28 | 25.8661 | 58.9702 | 100.693 | 24.016 | 76.6774 |

| | | | | | | | | | | |
|----|---------|---------|----------|------|----|---------|---------|---------|---------|---------|
| 12 | 3.30915 | 351.699 | Resíduos | 18.2 | 28 | 25.935 | 59.1275 | 101.418 | 24.4446 | 76.9736 |
| 13 | 3.30915 | 352.134 | Resíduos | 18.2 | 28 | 25.7016 | 58.5953 | 100.447 | 24.4748 | 75.9726 |
| 14 | 3.30915 | 351.9 | Resíduos | 18.2 | 28 | 25.4311 | 57.9785 | 99.2709 | 24.4586 | 74.8123 |
| 15 | 3.30915 | 356.052 | Resíduos | 18.2 | 28 | 25.3778 | 57.8571 | 99.3314 | 24.7471 | 74.5843 |
| 16 | 3.30915 | 366.12 | Resíduos | 18.2 | 28 | 25.6095 | 58.3854 | 101.025 | 25.447 | 75.5777 |
| 17 | 3.30915 | 342.071 | Resíduos | 18.2 | 28 | 24.1387 | 55.0322 | 93.0467 | 23.7754 | 69.2713 |
| 18 | 3.30915 | 312.804 | Resíduos | 18.2 | 28 | 22.4307 | 51.1381 | 83.6889 | 21.7412 | 61.9477 |
| 19 | 3.30915 | 325.717 | Resíduos | 18.2 | 28 | 22.7772 | 51.9281 | 86.0721 | 22.6388 | 63.4333 |
| 20 | 3.30915 | 336.925 | Resíduos | 18.2 | 28 | 23.0116 | 52.4625 | 87.856 | 23.4178 | 64.4382 |
| 21 | 3.30915 | 304.937 | Resíduos | 18.2 | 28 | 21.1872 | 48.3032 | 77.8105 | 21.1945 | 56.616 |
| 22 | 3.30915 | 251.649 | Resíduos | 18.2 | 28 | 18.4014 | 41.9521 | 62.1617 | 17.4907 | 44.671 |
| 23 | 3.30915 | 190.845 | Resíduos | 18.2 | 28 | 15.3292 | 34.948 | 44.7629 | 13.2646 | 31.4983 |
| 24 | 3.30915 | 121.749 | Resíduos | 18.2 | 28 | 11.9603 | 27.2675 | 25.5156 | 8.46206 | 17.0535 |
| 25 | 3.30915 | 42.1236 | Resíduos | 18.2 | 28 | 8.23142 | 18.7662 | 3.99269 | 2.92777 | 1.06492 |

Global Minimum Query (janbu simplified) - Safety Factor: 2.1599

| 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 | 1.88545 | 11.7109 | Dique de solo compactado | 20 | 30 | 11.8572 | 25.6103 | 9.71731 | 0 | 9.71731 |
| 2 | 3.78852 | 70.5042 | Resíduos | 18.2 | 28 | 12.7569 | 27.5537 | 21.872 | 4.28029 | 17.5917 |
| 3 | 3.78852 | 144.972 | Resíduos | 18.2 | 28 | 16.5085 | 35.6567 | 41.6327 | 8.80122 | 32.8315 |
| 4 | 3.78852 | 169.135 | Resíduos | 18.2 | 28 | 17.5527 | 37.9121 | 47.3411 | 10.2681 | 37.073 |
| 5 | 3.78852 | 214.957 | Resíduos | 18.2 | 28 | 19.6879 | 42.5239 | 58.7965 | 13.05 | 45.7465 |
| 6 | 3.16014 | 215.035 | Interface Solo x GMB Lisa | 3 | 12 | 6.58415 | 14.2211 | 68.4414 | 15.6506 | 52.7908 |
| 7 | 3.16014 | 229.061 | Interface Solo x GMB Lisa | 3 | 12 | 6.89509 | 14.8927 | 72.6223 | 16.6714 | 55.9509 |
| 8 | 3.16014 | 263.885 | Interface Solo x GMB Lisa | 3 | 12 | 7.70142 | 16.6343 | 83.35 | 19.206 | 64.144 |
| 9 | 3.16014 | 287.417 | Interface Solo x GMB Lisa | 3 | 12 | 8.23214 | 17.7806 | 90.4559 | 20.9186 | 69.5373 |
| 10 | 3.30915 | 312.652 | Resíduos | 18.2 | 28 | 25.6941 | 55.4966 | 91.8755 | 21.7307 | 70.1448 |
| 11 | 3.30915 | 345.532 | Resíduos | 18.2 | 28 | 27.2513 | 58.8601 | 100.486 | 24.016 | 76.4704 |
| 12 | 3.30915 | 351.699 | Resíduos | 18.2 | 28 | 27.3093 | 58.9853 | 101.151 | 24.4446 | 76.706 |
| 13 | 3.30915 | 352.134 | Resíduos | 18.2 | 28 | 27.0488 | 58.4226 | 100.122 | 24.4748 | 75.6477 |
| 14 | 3.30915 | 351.9 | Resíduos | 18.2 | 28 | 26.7494 | 57.776 | 98.8901 | 24.4586 | 74.4315 |
| 15 | 3.30915 | 356.052 | Resíduos | 18.2 | 28 | 26.6785 | 57.6229 | 98.8909 | 24.7471 | 74.1438 |
| 16 | 3.30915 | 366.12 | Resíduos | 18.2 | 28 | 26.9068 | 58.1161 | 100.518 | 25.447 | 75.0713 |
| 17 | 3.30915 | 342.071 | Resíduos | 18.2 | 28 | 25.3467 | 54.7463 | 92.5091 | 23.7754 | 68.7337 |
| 18 | 3.30915 | 312.804 | Resíduos | 18.2 | 28 | 23.5389 | 50.8417 | 83.1314 | 21.7412 | 61.3902 |
| 19 | 3.30915 | 325.717 | Resíduos | 18.2 | 28 | 23.8874 | 51.5945 | 85.4448 | 22.6388 | 62.806 |
| 20 | 3.30915 | 336.925 | Resíduos | 18.2 | 28 | 24.1172 | 52.0908 | 87.157 | 23.4178 | 63.7392 |
| 21 | 3.30915 | 304.937 | Resíduos | 18.2 | 28 | 22.1895 | 47.9271 | 77.1031 | 21.1945 | 55.9086 |
| 22 | 3.30915 | 251.649 | Resíduos | 18.2 | 28 | 19.2573 | 41.5938 | 61.4878 | 17.4907 | 43.9971 |
| 23 | 3.30915 | 190.845 | Resíduos | 18.2 | 28 | 16.0289 | 34.6208 | 44.1476 | 13.2646 | 30.883 |
| 24 | 3.30915 | 121.749 | Resíduos | 18.2 | 28 | 12.4948 | 26.9874 | 24.9888 | 8.46206 | 16.5268 |
| 25 | 3.30915 | 42.1236 | Resíduos | 18.2 | 28 | 8.59035 | 18.5543 | 3.59409 | 2.92777 | 0.666325 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.27983

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| | | | | | |

| | | | | | |
|----|---------|---------|----------|---|---|
| 1 | 131.703 | 291.072 | 0 | 0 | 0 |
| 2 | 133.588 | 290.515 | 26.3684 | 0 | 0 |
| 3 | 137.377 | 289.548 | 92.9456 | 0 | 0 |
| 4 | 141.165 | 288.777 | 183.972 | 0 | 0 |
| 5 | 144.954 | 288.195 | 274.243 | 0 | 0 |
| 6 | 148.742 | 287.8 | 367.979 | 0 | 0 |
| 7 | 151.902 | 287.61 | 400.648 | 0 | 0 |
| 8 | 155.062 | 287.547 | 425.863 | 0 | 0 |
| 9 | 158.223 | 287.61 | 443.656 | 0 | 0 |
| 10 | 161.383 | 287.8 | 451.149 | 0 | 0 |
| 11 | 164.692 | 288.135 | 500.95 | 0 | 0 |
| 12 | 168.001 | 288.612 | 538.527 | 0 | 0 |
| 13 | 171.31 | 289.232 | 561.374 | 0 | 0 |
| 14 | 174.619 | 290.001 | 569.224 | 0 | 0 |
| 15 | 177.928 | 290.921 | 561.985 | 0 | 0 |
| 16 | 181.238 | 291.999 | 538.849 | 0 | 0 |
| 17 | 184.547 | 293.242 | 498.02 | 0 | 0 |
| 18 | 187.856 | 294.658 | 446.127 | 0 | 0 |
| 19 | 191.165 | 296.257 | 386.469 | 0 | 0 |
| 20 | 194.474 | 298.053 | 307.237 | 0 | 0 |
| 21 | 197.783 | 300.061 | 206.925 | 0 | 0 |
| 22 | 201.093 | 302.302 | 102.687 | 0 | 0 |
| 23 | 204.402 | 304.799 | 8.29559 | 0 | 0 |
| 24 | 207.711 | 307.587 | -65.7797 | 0 | 0 |
| 25 | 211.02 | 310.708 | -105.846 | 0 | 0 |
| 26 | 214.329 | 314.221 | 0 | 0 | 0 |

Global Minimum Query (janbu simplified) - Safety Factor: 2.1599

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 131.703 | 291.072 | 0 | 0 | 0 |
| 2 | 133.588 | 290.515 | 27.8005 | 0 | 0 |
| 3 | 137.377 | 289.548 | 97.3621 | 0 | 0 |
| 4 | 141.165 | 288.777 | 192.117 | 0 | 0 |
| 5 | 144.954 | 288.195 | 286.236 | 0 | 0 |
| 6 | 148.742 | 287.8 | 384.185 | 0 | 0 |
| 7 | 151.902 | 287.61 | 417.999 | 0 | 0 |
| 8 | 155.062 | 287.547 | 444.405 | 0 | 0 |
| 9 | 158.223 | 287.61 | 463.523 | 0 | 0 |
| 10 | 161.383 | 287.8 | 472.432 | 0 | 0 |
| 11 | 164.692 | 288.135 | 526.807 | 0 | 0 |
| 12 | 168.001 | 288.612 | 569.241 | 0 | 0 |
| 13 | 171.31 | 289.232 | 596.974 | 0 | 0 |
| 14 | 174.619 | 290.001 | 609.703 | 0 | 0 |
| 15 | 177.928 | 290.921 | 607.347 | 0 | 0 |
| 16 | 181.238 | 291.999 | 589.159 | 0 | 0 |
| 17 | 184.547 | 293.242 | 553.423 | 0 | 0 |
| 18 | 187.856 | 294.658 | 506.45 | 0 | 0 |
| 19 | 191.165 | 296.257 | 451.5 | 0 | 0 |
| 20 | 194.474 | 298.053 | 377.221 | 0 | 0 |
| 21 | 197.783 | 300.061 | 282.124 | 0 | 0 |
| 22 | 201.093 | 302.302 | 182.929 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 23 | 204.402 | 304.799 | 93.175 | 0 | 0 |
| 24 | 207.711 | 307.587 | 23.2322 | 0 | 0 |
| 25 | 211.02 | 310.708 | -13.3424 | 0 | 0 |
| 26 | 214.329 | 314.221 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---------|---------|
| 303.56 | 342.72 |
| 303.098 | 342.676 |
| 302.853 | 342.658 |
| 302.154 | 342.51 |
| 301.774 | 342.304 |
| 300.94 | 341.684 |
| 295.595 | 338.923 |
| 292.921 | 338.919 |
| 288.439 | 338.763 |
| 287.523 | 337.893 |
| 282.113 | 333.613 |
| 280.398 | 333.725 |
| 278.361 | 333.755 |
| 277.473 | 333.742 |
| 276.409 | 332.555 |
| 273.824 | 329.952 |
| 270.978 | 330.315 |
| 268.96 | 330.506 |
| 264.474 | 327.105 |
| 259.007 | 322.849 |
| 256.659 | 322.712 |
| 245.88 | 317.602 |
| 237.711 | 313.612 |
| 237.368 | 313.683 |
| 237.28 | 313.685 |
| 234.926 | 313.749 |
| 232.971 | 313.856 |
| 227.754 | 314.02 |
| 220.2 | 314.121 |
| 217.774 | 314.102 |
| 214.915 | 314.2 |
| 208.487 | 314.439 |
| 208.231 | 314.441 |
| 203.541 | 314.422 |
| 200.279 | 314.394 |
| 199.963 | 314.381 |
| 199.364 | 314.355 |
| 196.829 | 314.186 |
| 194.805 | 312.757 |
| 189.45 | 308.602 |
| 186.655 | 308.708 |
| 185.211 | 308.754 |

| | |
|---------|---------|
| 183.823 | 308.715 |
| 183.166 | 308.723 |
| 177.401 | 305.679 |
| 173.952 | 305.536 |
| 173.817 | 305.528 |
| 172.779 | 304.475 |
| 172.351 | 304.308 |
| 171.281 | 304.187 |
| 169.322 | 304.09 |
| 167.701 | 303.999 |
| 166.094 | 303.186 |
| 165 | 302.569 |
| 161.481 | 300.587 |
| 159.976 | 300.831 |
| 159.631 | 300.877 |
| 159.014 | 300.601 |
| 152.178 | 297.178 |
| 149.671 | 297.586 |
| 149.452 | 297.468 |
| 144.29 | 294.763 |
| 141.436 | 294.918 |
| 139.704 | 295.048 |
| 136.44 | 293.23 |
| 132.879 | 291.225 |
| 130.439 | 290.907 |
| 127.26 | 290.238 |
| 127.116 | 290.046 |
| 126.324 | 288.69 |
| 124.114 | 288.182 |
| 122.774 | 287.848 |
| 122.253 | 287.5 |
| 115.15 | 282.754 |
| 113.161 | 281.437 |
| 113.002 | 281.411 |
| 112.752 | 281.315 |
| 112.341 | 281.182 |
| 111.846 | 281.073 |
| 110.628 | 280.809 |
| 110.132 | 281.059 |
| 109.841 | 280.979 |
| 103.043 | 280.743 |
| 102.176 | 280.634 |
| 101.6 | 280.539 |
| 101.164 | 280.478 |
| 100.275 | 280.338 |
| 100.275 | 270 |
| 305 | 270 |
| 305 | 343.065 |

Material Boundary

| X | Y |
|---------|-------|
| 122.253 | 287.5 |

| | |
|---------|---------|
| 136.603 | 287.5 |
| 165 | 287.5 |
| 185 | 287.5 |
| 210.982 | 302.5 |
| 220.982 | 302.5 |
| 237.711 | 313.612 |

Material Boundary

| X | Y |
|---------|---------|
| 132.879 | 291.225 |
| 136.303 | 287.8 |
| 136.603 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 136.303 | 287.8 |
| 165 | 287.8 |
| 165 | 287.8 |
| 165 | 287.8 |
| 184.92 | 287.8 |
| 210.901 | 302.8 |
| 220.891 | 302.8 |
| 237.28 | 313.685 |

Project Summary

File Name: Estaca 05.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 15:39:07

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

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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.23 | 0 | 0 | 0.23 |

Global Minimums

Method: bishop simplified

FS: 2.316970
 Center: 206.668, 356.144
 Radius: 68.591
 Left Slip Surface Endpoint: 184.138, 291.359
 Right Slip Surface Endpoint: 261.033, 314.321
 Resisting Moment=231601 kN-m
 Driving Moment=99958.3 kN-m
 Total Slice Area=793.901 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.31697

| 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 | 0.94033 | 3.57425 | Dique de solo compactado | 20 | 30 | 10.4645 | 24.246 | 7.35421 | 0 | 7.35421 |
| 2 | 3.15565 | 51.745 | Resíduos | 18.2 | 28 | 11.5619 | 26.7885 | 19.924 | 3.77144 | 16.1526 |
| 3 | 3.15565 | 106.571 | Resíduos | 18.2 | 28 | 14.6764 | 34.0048 | 37.492 | 7.76743 | 29.7246 |
| 4 | 3.15565 | 123.524 | Resíduos | 18.2 | 28 | 15.4967 | 35.9055 | 42.3022 | 9.00303 | 33.2992 |
| 5 | 3.15565 | 150.298 | Resíduos | 18.2 | 28 | 16.8735 | 39.0955 | 50.2533 | 10.9545 | 39.2988 |
| 6 | 3.15565 | 194.411 | Resíduos | 18.2 | 28 | 19.2192 | 44.5302 | 63.6895 | 14.1696 | 49.5199 |
| 7 | 2.9056 | 192.495 | Interface Solo x GMB Lisa | 3 | 12 | 6.0097 | 13.9243 | 66.6319 | 15.2374 | 51.3945 |
| 8 | 2.9056 | 218.091 | Interface Solo x GMB Lisa | 3 | 12 | 6.60971 | 15.3145 | 75.1985 | 17.2635 | 57.935 |
| 9 | 2.9056 | 244.59 | Interface Solo x GMB Lisa | 3 | 12 | 7.22707 | 16.7449 | 84.0256 | 19.3611 | 64.6645 |
| 10 | 2.9056 | 257.625 | Interface Solo x GMB Lisa | 3 | 12 | 7.51412 | 17.41 | 88.1865 | 20.3929 | 67.7936 |
| 11 | 3.23688 | 299.204 | Resíduos | 18.2 | 28 | 23.5988 | 54.6776 | 89.8646 | 21.2602 | 68.6044 |
| 12 | 3.23688 | 329.643 | Resíduos | 18.2 | 28 | 24.9492 | 57.8066 | 97.9125 | 23.4231 | 74.4894 |
| 13 | 3.23688 | 334.879 | Resíduos | 18.2 | 28 | 24.9512 | 57.8111 | 98.2927 | 23.7952 | 74.4975 |
| 14 | 3.23688 | 329.179 | Resíduos | 18.2 | 28 | 24.3812 | 56.4906 | 95.4044 | 23.3902 | 72.0142 |
| 15 | 3.23688 | 315.813 | Resíduos | 18.2 | 28 | 23.4231 | 54.2707 | 90.2796 | 22.4404 | 67.8392 |
| 16 | 3.23688 | 310.954 | Resíduos | 18.2 | 28 | 22.903 | 53.0655 | 87.6675 | 22.0951 | 65.5724 |
| 17 | 3.23688 | 312.413 | Resíduos | 18.2 | 28 | 22.6943 | 52.5819 | 86.8616 | 22.1988 | 64.6628 |
| 18 | 3.23688 | 322.765 | Resíduos | 18.2 | 28 | 22.9087 | 53.0788 | 88.5318 | 22.9344 | 65.5974 |
| 19 | 3.23688 | 315.16 | Resíduos | 18.2 | 28 | 22.2245 | 51.4936 | 85.0102 | 22.394 | 62.6162 |
| 20 | 3.23688 | 273.307 | Resíduos | 18.2 | 28 | 19.8978 | 46.1027 | 71.8973 | 19.4201 | 52.4772 |
| 21 | 3.23688 | 257.159 | Resíduos | 18.2 | 28 | 18.8164 | 43.5971 | 66.0376 | 18.2727 | 47.7649 |

| | | | | | | | | | | |
|----|---------|---------|----------|------|----|---------|---------|---------|---------|----------|
| 22 | 3.23688 | 251.019 | Resíduos | 18.2 | 28 | 18.193 | 42.1526 | 62.8846 | 17.8364 | 45.0482 |
| 23 | 3.23688 | 198.262 | Resíduos | 18.2 | 28 | 15.4386 | 35.7708 | 47.1336 | 14.0877 | 33.0459 |
| 24 | 3.23688 | 126.896 | Resíduos | 18.2 | 28 | 11.9257 | 27.6315 | 26.7548 | 9.01669 | 17.7382 |
| 25 | 3.23688 | 44.6659 | Resíduos | 18.2 | 28 | 8.06428 | 18.6847 | 4.08536 | 3.17378 | 0.911576 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.31697

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 184.138 | 291.359 | 0 | 0 | 0 |
| 2 | 185.079 | 291.04 | 12.1854 | 0 | 0 |
| 3 | 188.234 | 290.077 | 67.841 | 0 | 0 |
| 4 | 191.39 | 289.277 | 144.141 | 0 | 0 |
| 5 | 194.546 | 288.633 | 220.245 | 0 | 0 |
| 6 | 197.701 | 288.142 | 298.152 | 0 | 0 |
| 7 | 200.857 | 287.8 | 380.562 | 0 | 0 |
| 8 | 203.763 | 287.615 | 410.347 | 0 | 0 |
| 9 | 206.668 | 287.553 | 434.175 | 0 | 0 |
| 10 | 209.574 | 287.615 | 449.993 | 0 | 0 |
| 11 | 212.479 | 287.8 | 455.5 | 0 | 0 |
| 12 | 215.716 | 288.153 | 500.154 | 0 | 0 |
| 13 | 218.953 | 288.663 | 530.974 | 0 | 0 |
| 14 | 222.19 | 289.333 | 545.829 | 0 | 0 |
| 15 | 225.427 | 290.168 | 544.995 | 0 | 0 |
| 16 | 228.664 | 291.176 | 529.835 | 0 | 0 |
| 17 | 231.901 | 292.363 | 499.848 | 0 | 0 |
| 18 | 235.138 | 293.741 | 453.622 | 0 | 0 |
| 19 | 238.375 | 295.321 | 387.806 | 0 | 0 |
| 20 | 241.611 | 297.122 | 306.688 | 0 | 0 |
| 21 | 244.848 | 299.162 | 224.374 | 0 | 0 |
| 22 | 248.085 | 301.469 | 132.877 | 0 | 0 |
| 23 | 251.322 | 304.08 | 27.6079 | 0 | 0 |
| 24 | 254.559 | 307.04 | -61.999 | 0 | 0 |
| 25 | 257.796 | 310.42 | -113.841 | 0 | 0 |
| 26 | 261.033 | 314.321 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---------|---------|
| 151.741 | 280 |
| 360 | 280 |
| 360 | 342.248 |
| 356.673 | 341.544 |
| 355.839 | 341.092 |
| 355.312 | 340.289 |
| 354.27 | 339.176 |
| 353.701 | 339.169 |

| | |
|---------|---------|
| 348.717 | 339.095 |
| 344.882 | 336.399 |
| 342.233 | 334.679 |
| 341.164 | 333.819 |
| 340.785 | 333.853 |
| 336.037 | 333.94 |
| 333.453 | 332.117 |
| 331.665 | 330.846 |
| 327.717 | 331.045 |
| 327.485 | 331.062 |
| 320.373 | 324.754 |
| 319.539 | 323.986 |
| 318.416 | 323.056 |
| 318.025 | 323.074 |
| 314.238 | 322.919 |
| 312.818 | 322.785 |
| 309.706 | 321.261 |
| 308.301 | 320.305 |
| 295.32 | 313.604 |
| 294.82 | 313.646 |
| 294.666 | 313.658 |
| 289.94 | 313.688 |
| 288.931 | 313.694 |
| 284.143 | 313.796 |
| 273.422 | 314.01 |
| 273.23 | 314.07 |
| 270.976 | 314.172 |
| 268.356 | 314.264 |
| 264.937 | 314.241 |
| 259.495 | 314.352 |
| 251.51 | 314.301 |
| 250.467 | 314.312 |
| 250.046 | 314.285 |
| 248.839 | 313.388 |
| 244.416 | 310.176 |
| 240.909 | 310.197 |
| 239.977 | 310.197 |
| 239.28 | 310.236 |
| 238.229 | 309.565 |
| 236.802 | 308.855 |
| 233.017 | 306.473 |
| 230.645 | 305.613 |
| 227.658 | 304.589 |
| 224.255 | 304.447 |
| 223.845 | 304.41 |
| 223.092 | 303.992 |
| 221.959 | 304.075 |
| 220 | 303.658 |
| 219.027 | 303.451 |
| 218.096 | 303.333 |
| 217.717 | 303.148 |
| 217.375 | 303.153 |

| | |
|---------|---------|
| 215.897 | 302.217 |
| 212.482 | 300.251 |
| 210.206 | 300.433 |
| 209.945 | 300.335 |
| 202.913 | 297.182 |
| 202.397 | 296.924 |
| 202.206 | 296.956 |
| 201.055 | 297.096 |
| 200.024 | 297.236 |
| 199.627 | 297.032 |
| 198.327 | 296.342 |
| 194.797 | 294.491 |
| 193.311 | 294.495 |
| 189.959 | 294.794 |
| 186.106 | 292.634 |
| 184.661 | 291.458 |
| 183.782 | 291.292 |
| 180.309 | 290.6 |
| 177.833 | 290.245 |
| 176.811 | 289.425 |
| 174.438 | 287.5 |
| 172.012 | 285.532 |
| 171.621 | 285.561 |
| 170.965 | 285.244 |
| 169.92 | 284.743 |
| 169.595 | 284.381 |
| 168.531 | 284.401 |
| 167.522 | 284.428 |
| 167.118 | 284.492 |
| 165.207 | 284.255 |
| 164.781 | 284.22 |
| 164.39 | 284.33 |
| 162.164 | 284.273 |
| 158.426 | 284.136 |
| 157.863 | 284.168 |
| 156.239 | 284.104 |
| 155.825 | 284.118 |
| 153.588 | 284.035 |
| 151.741 | 283.981 |

Material Boundary

| X | Y |
|---------|---------|
| 174.438 | 287.5 |
| 188.618 | 287.5 |
| 220 | 287.5 |
| 241.511 | 287.5 |
| 267.491 | 302.5 |
| 277.491 | 302.5 |
| 295.32 | 313.604 |

Material Boundary

| X | Y |
|---------|---------|
| 184.661 | 291.458 |
| 188.318 | 287.8 |
| 188.618 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 188.318 | 287.8 |
| 220 | 287.8 |
| 220 | 287.8 |
| 220 | 287.8 |
| 241.43 | 287.8 |
| 267.411 | 302.8 |
| 277.406 | 302.8 |
| 294.82 | 313.646 |

Project Summary

File Name: Estaca 06.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 15:54:16

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

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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.36 | 0 | 0 | 0.36 |

Global Minimums

Method: bishop simplified

FS: 2.134090
 Center: 186.900, 375.739
 Radius: 88.193
 Left Slip Surface Endpoint: 161.451, 291.298
 Right Slip Surface Endpoint: 249.653, 313.771
 Resisting Moment=316967 kN-m
 Driving Moment=148526 kN-m
 Total Slice Area=1002.59 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.13409

| 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 | 3.7526 | 42.6464 | Resíduos | 18.2 | 28 | 11.1081 | 23.7056 | 14.4458 | 4.09122 | 10.3545 |
| 2 | 3.7526 | 119.338 | Resíduos | 18.2 | 28 | 14.4283 | 30.7912 | 35.1291 | 11.4485 | 23.6806 |
| 3 | 3.7526 | 147.749 | Resíduos | 18.2 | 28 | 15.5231 | 33.1276 | 42.2486 | 14.1741 | 28.0745 |
| 4 | 3.7526 | 201.539 | Resíduos | 18.2 | 28 | 17.7144 | 37.8042 | 56.2045 | 19.3343 | 36.8702 |
| 5 | 3.7526 | 231.572 | Resíduos | 18.2 | 28 | 18.8258 | 40.1759 | 63.5462 | 22.2155 | 41.3307 |
| 6 | 3.3432 | 242.533 | Interface Solo x GMB Lisa | 3 | 12 | 6.0645 | 12.9422 | 72.8905 | 26.1163 | 46.7742 |
| 7 | 3.3432 | 285.382 | Interface Solo x GMB Lisa | 3 | 12 | 6.86007 | 14.64 | 85.4918 | 30.7303 | 54.7615 |
| 8 | 3.3432 | 296.339 | Interface Solo x GMB Lisa | 3 | 12 | 7.04272 | 15.0298 | 88.5058 | 31.9101 | 56.5957 |
| 9 | 3.3432 | 302.578 | Interface Solo x GMB Lisa | 3 | 12 | 7.13452 | 15.2257 | 90.0991 | 32.582 | 57.5171 |
| 10 | 3.50416 | 338.987 | Resíduos | 18.2 | 28 | 23.3935 | 49.9239 | 94.4897 | 34.8258 | 59.6639 |
| 11 | 3.50416 | 366.513 | Resíduos | 18.2 | 28 | 24.3763 | 52.0212 | 101.262 | 37.6537 | 63.6084 |
| 12 | 3.50416 | 375.4 | Resíduos | 18.2 | 28 | 24.5238 | 52.336 | 102.767 | 38.5668 | 64.2003 |
| 13 | 3.50416 | 381.536 | Resíduos | 18.2 | 28 | 24.5445 | 52.3802 | 103.481 | 39.1971 | 64.2836 |
| 14 | 3.50416 | 388.963 | Resíduos | 18.2 | 28 | 24.6133 | 52.527 | 104.52 | 39.9601 | 64.5597 |
| 15 | 3.50416 | 413.673 | Resíduos | 18.2 | 28 | 25.403 | 54.2123 | 110.228 | 42.4986 | 67.7294 |
| 16 | 3.50416 | 410.089 | Resíduos | 18.2 | 28 | 24.983 | 53.316 | 108.174 | 42.1305 | 66.0435 |
| 17 | 3.50416 | 422.05 | Resíduos | 18.2 | 28 | 25.2027 | 53.7849 | 110.285 | 43.3593 | 66.9254 |
| 18 | 3.50416 | 398.108 | Resíduos | 18.2 | 28 | 23.9353 | 51.08 | 102.738 | 40.8996 | 61.8383 |
| 19 | 3.50416 | 377.254 | Resíduos | 18.2 | 28 | 22.8055 | 48.669 | 96.0611 | 38.7572 | 57.3039 |

| | | | | | | | | | | |
|----|---------|---------|----------|------|----|---------|---------|---------|---------|-----------|
| 20 | 3.50416 | 361.792 | Resíduos | 18.2 | 28 | 21.8993 | 46.7351 | 90.8356 | 37.1687 | 53.6669 |
| 21 | 3.50416 | 310.779 | Resíduos | 18.2 | 28 | 19.5962 | 41.82 | 76.3506 | 31.9279 | 44.4227 |
| 22 | 3.50416 | 254.661 | Resíduos | 18.2 | 28 | 17.1351 | 36.5679 | 60.7076 | 26.1626 | 34.545 |
| 23 | 3.50416 | 191.677 | Resíduos | 18.2 | 28 | 14.4602 | 30.8594 | 43.5008 | 19.6919 | 23.8089 |
| 24 | 3.50416 | 121.116 | Resíduos | 18.2 | 28 | 11.562 | 24.6743 | 24.6192 | 12.4428 | 12.1764 |
| 25 | 3.50416 | 42.225 | Resíduos | 18.2 | 28 | 8.43577 | 18.0027 | 3.96689 | 4.33798 | -0.371085 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.13409

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 161.451 | 291.298 | 0 | 0 | 0 |
| 2 | 165.203 | 290.257 | 56.7147 | 0 | 0 |
| 3 | 168.956 | 289.391 | 141.257 | 0 | 0 |
| 4 | 172.709 | 288.695 | 228.879 | 0 | 0 |
| 5 | 176.461 | 288.166 | 325.088 | 0 | 0 |
| 6 | 180.214 | 287.8 | 418.985 | 0 | 0 |
| 7 | 183.557 | 287.61 | 453.136 | 0 | 0 |
| 8 | 186.9 | 287.546 | 481.485 | 0 | 0 |
| 9 | 190.243 | 287.61 | 499.414 | 0 | 0 |
| 10 | 193.587 | 287.8 | 506.101 | 0 | 0 |
| 11 | 197.091 | 288.137 | 556.223 | 0 | 0 |
| 12 | 200.595 | 288.616 | 593.114 | 0 | 0 |
| 13 | 204.099 | 289.239 | 614.952 | 0 | 0 |
| 14 | 207.603 | 290.011 | 621.139 | 0 | 0 |
| 15 | 211.107 | 290.933 | 610.914 | 0 | 0 |
| 16 | 214.612 | 292.013 | 580.917 | 0 | 0 |
| 17 | 218.116 | 293.255 | 534.052 | 0 | 0 |
| 18 | 221.62 | 294.668 | 466.55 | 0 | 0 |
| 19 | 225.124 | 296.26 | 386.838 | 0 | 0 |
| 20 | 228.628 | 298.042 | 295.505 | 0 | 0 |
| 21 | 232.132 | 300.029 | 191.793 | 0 | 0 |
| 22 | 235.637 | 302.236 | 91.956 | 0 | 0 |
| 23 | 239.141 | 304.683 | 3.39143 | 0 | 0 |
| 24 | 242.645 | 307.398 | -64.0338 | 0 | 0 |
| 25 | 246.149 | 310.412 | -97.7455 | 0 | 0 |
| 26 | 249.653 | 313.771 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---------|---------|
| 339.612 | 342.538 |
| 338.395 | 341.755 |
| 335.652 | 341.846 |
| 333.745 | 340.275 |
| 332.366 | 339.089 |
| 332.187 | 339.132 |

| | |
|---------|---------|
| 328.941 | 339.719 |
| 327.502 | 338.779 |
| 321.333 | 334.626 |
| 319.671 | 334.655 |
| 315.557 | 334.551 |
| 311.993 | 331.997 |
| 311.744 | 331.819 |
| 311.112 | 331.849 |
| 308.517 | 332.015 |
| 303.847 | 327.686 |
| 299.325 | 323.421 |
| 294.078 | 323.001 |
| 293.148 | 322.96 |
| 283.186 | 317.838 |
| 276.14 | 313.503 |
| 275.498 | 313.464 |
| 275.151 | 313.443 |
| 269.839 | 313.369 |
| 268.012 | 313.337 |
| 266.476 | 313.369 |
| 253.428 | 313.635 |
| 251.875 | 313.709 |
| 247.562 | 313.829 |
| 240.623 | 313.859 |
| 236.839 | 313.84 |
| 232.42 | 313.783 |
| 229.725 | 313.815 |
| 228.414 | 313.664 |
| 226.644 | 312.372 |
| 225.684 | 311.529 |
| 223.002 | 311.738 |
| 220.916 | 311.785 |
| 216.624 | 309.423 |
| 215.723 | 308.889 |
| 215.24 | 308.87 |
| 213.45 | 308.793 |
| 212.337 | 308.112 |
| 211.566 | 307.718 |
| 209.575 | 306.289 |
| 207.955 | 305.698 |
| 203.248 | 304.537 |
| 201.217 | 303.831 |
| 200 | 303.812 |
| 199.841 | 303.809 |
| 195.355 | 301.764 |
| 192.832 | 300.795 |
| 192.707 | 300.799 |
| 189.728 | 300.021 |
| 189.548 | 299.991 |
| 188.045 | 300.271 |
| 185.768 | 300.036 |
| 181.89 | 298.028 |

| | |
|---------|---------|
| 180.008 | 297.063 |
| 178.927 | 296.583 |
| 176.648 | 296.914 |
| 176.248 | 296.968 |
| 174.096 | 295.858 |
| 171.608 | 294.547 |
| 167.269 | 294.713 |
| 167.141 | 294.643 |
| 166.956 | 294.534 |
| 160.942 | 290.999 |
| 156.065 | 290.364 |
| 155.416 | 290.281 |
| 154.848 | 289.793 |
| 152.322 | 287.5 |
| 148.939 | 284.429 |
| 145.019 | 284.446 |
| 138.723 | 284.436 |
| 138.111 | 284.444 |
| 137.557 | 284.445 |
| 133.039 | 284.287 |
| 127.319 | 284.464 |
| 126.291 | 284.462 |
| 126.017 | 284.461 |
| 124.166 | 284.471 |
| 113.003 | 284.32 |
| 108.96 | 284.336 |
| 105.281 | 284.306 |
| 105.281 | 280 |
| 340 | 280 |
| 340 | 342.598 |

Material Boundary

| X | Y |
|---------|---------|
| 152.322 | 287.5 |
| 164.441 | 287.5 |
| 200 | 287.5 |
| 222.033 | 287.5 |
| 248.013 | 302.5 |
| 258.014 | 302.5 |
| 276.14 | 313.503 |

Material Boundary

| X | Y |
|---------|---------|
| 160.942 | 290.999 |
| 164.141 | 287.8 |
| 164.441 | 287.5 |

Material Boundary

| X | Y |
|---------|-------|
| 164.141 | 287.8 |

| | |
|---------|---------|
| 200 | 287.8 |
| 200 | 287.8 |
| 200 | 287.8 |
| 221.952 | 287.8 |
| 247.933 | 302.8 |
| 257.93 | 302.8 |
| 275.498 | 313.464 |

Project Summary

File Name: Estaca 07.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:12:23

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

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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.16 | 0 | 0 | 0.16 |

Global Minimums

Method: bishop simplified

FS: 2.511990
 Center: 173.371, 347.716
 Radius: 60.168
 Left Slip Surface Endpoint: 153.428, 290.949
 Right Slip Surface Endpoint: 222.818, 313.435
 Resisting Moment=176869 kN-m
 Driving Moment=70409.8 kN-m
 Total Slice Area=615.883 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.51199

| 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 | 2.88752 | 25.7246 | Resíduos | 18.2 | 28 | 9.47734 | 23.807 | 11.9706 | 1.42542 | 10.5452 |
| 2 | 2.88752 | 72.2683 | Resíduos | 18.2 | 28 | 12.4003 | 31.1494 | 28.3588 | 4.00445 | 24.3543 |
| 3 | 2.88752 | 109.623 | Resíduos | 18.2 | 28 | 14.667 | 36.8433 | 41.1372 | 6.07429 | 35.0629 |
| 4 | 2.88752 | 122.787 | Resíduos | 18.2 | 28 | 15.3441 | 38.5442 | 45.0657 | 6.80374 | 38.262 |
| 5 | 2.88752 | 152.172 | Resíduos | 18.2 | 28 | 17.0345 | 42.7906 | 54.6804 | 8.43201 | 46.2483 |
| 6 | 2.75268 | 171.978 | Interface Solo x GMB Lisa | 3 | 12 | 5.66798 | 14.2379 | 62.8663 | 9.99627 | 52.8701 |
| 7 | 2.75268 | 187.039 | Interface Solo x GMB Lisa | 3 | 12 | 6.03557 | 15.1613 | 68.0864 | 10.8717 | 57.2147 |
| 8 | 2.75268 | 202.317 | Interface Solo x GMB Lisa | 3 | 12 | 6.406 | 16.0918 | 73.3519 | 11.7597 | 61.5922 |
| 9 | 2.75268 | 205.575 | Interface Solo x GMB Lisa | 3 | 12 | 6.46491 | 16.2398 | 74.2374 | 11.9491 | 62.2883 |
| 10 | 2.74639 | 212.023 | Resíduos | 18.2 | 28 | 20.4731 | 51.4281 | 74.8451 | 12.3521 | 62.493 |
| 11 | 2.74639 | 222.095 | Resíduos | 18.2 | 28 | 20.9068 | 52.5176 | 77.4808 | 12.9389 | 64.5419 |
| 12 | 2.74639 | 218.969 | Resíduos | 18.2 | 28 | 20.5094 | 51.5195 | 75.4216 | 12.7568 | 62.6648 |
| 13 | 2.74639 | 234.345 | Resíduos | 18.2 | 28 | 21.2494 | 53.3784 | 79.8135 | 13.6525 | 66.161 |
| 14 | 2.74639 | 246.562 | Resíduos | 18.2 | 28 | 21.7749 | 54.6984 | 83.0077 | 14.3643 | 68.6434 |
| 15 | 2.74639 | 232.528 | Resíduos | 18.2 | 28 | 20.7018 | 52.0026 | 77.1199 | 13.5467 | 63.5732 |
| 16 | 2.74639 | 221.528 | Resíduos | 18.2 | 28 | 19.8201 | 49.7879 | 72.314 | 12.9058 | 59.4082 |
| 17 | 2.74639 | 219.762 | Resíduos | 18.2 | 28 | 19.4868 | 48.9506 | 70.6364 | 12.8029 | 57.8335 |
| 18 | 2.74639 | 218.561 | Resíduos | 18.2 | 28 | 19.1772 | 48.1729 | 69.1037 | 12.733 | 56.3707 |
| 19 | 2.74639 | 216.201 | Resíduos | 18.2 | 28 | 18.7883 | 47.1959 | 67.1288 | 12.5955 | 54.5333 |

| | | | | | | | | | | |
|----|---------|---------|----------|------|----|---------|---------|---------|---------|----------|
| 20 | 2.74639 | 206.831 | Resíduos | 18.2 | 28 | 17.9886 | 45.1872 | 62.8052 | 12.0497 | 50.7555 |
| 21 | 2.74639 | 179.599 | Resíduos | 18.2 | 28 | 16.1895 | 40.6678 | 52.7188 | 10.4632 | 42.2556 |
| 22 | 2.74639 | 162.969 | Resíduos | 18.2 | 28 | 14.9917 | 37.659 | 46.0913 | 9.4943 | 36.597 |
| 23 | 2.74639 | 142.798 | Resíduos | 18.2 | 28 | 13.604 | 34.1732 | 38.3603 | 8.31919 | 30.0412 |
| 24 | 2.74639 | 97.2116 | Resíduos | 18.2 | 28 | 10.8946 | 27.3672 | 22.9043 | 5.66339 | 17.2409 |
| 25 | 2.74639 | 34.9277 | Resíduos | 18.2 | 28 | 7.41727 | 18.6321 | 2.84751 | 2.03483 | 0.812684 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.51199

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 153.428 | 290.949 | 0 | 0 | 0 |
| 2 | 156.315 | 290.016 | 38.5245 | 0 | 0 |
| 3 | 159.203 | 289.239 | 96.3202 | 0 | 0 |
| 4 | 162.09 | 288.614 | 164.36 | 0 | 0 |
| 5 | 164.978 | 288.136 | 230.214 | 0 | 0 |
| 6 | 167.865 | 287.8 | 297.741 | 0 | 0 |
| 7 | 170.618 | 287.611 | 325.242 | 0 | 0 |
| 8 | 173.371 | 287.548 | 346.137 | 0 | 0 |
| 9 | 176.124 | 287.611 | 359.141 | 0 | 0 |
| 10 | 178.876 | 287.8 | 362.867 | 0 | 0 |
| 11 | 181.623 | 288.116 | 395.405 | 0 | 0 |
| 12 | 184.369 | 288.561 | 418.301 | 0 | 0 |
| 13 | 187.115 | 289.138 | 431.067 | 0 | 0 |
| 14 | 189.862 | 289.852 | 432.48 | 0 | 0 |
| 15 | 192.608 | 290.706 | 421.348 | 0 | 0 |
| 16 | 195.355 | 291.707 | 400.925 | 0 | 0 |
| 17 | 198.101 | 292.865 | 371.644 | 0 | 0 |
| 18 | 200.847 | 294.188 | 331.688 | 0 | 0 |
| 19 | 203.594 | 295.689 | 280.587 | 0 | 0 |
| 20 | 206.34 | 297.384 | 218.343 | 0 | 0 |
| 21 | 209.086 | 299.295 | 147.753 | 0 | 0 |
| 22 | 211.833 | 301.446 | 78.7727 | 0 | 0 |
| 23 | 214.579 | 303.874 | 8.00743 | 0 | 0 |
| 24 | 217.326 | 306.628 | -60.2919 | 0 | 0 |
| 25 | 220.072 | 309.779 | -102.549 | 0 | 0 |
| 26 | 222.818 | 313.435 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---------|---------|
| 331.127 | 342.897 |
| 330.786 | 342.683 |
| 326.507 | 340.234 |
| 325.931 | 339.872 |
| 324.071 | 340.18 |
| 322.455 | 340.446 |

| | |
|---------|---------|
| 321.525 | 339.894 |
| 316.19 | 336.828 |
| 313.523 | 335.452 |
| 308.247 | 335.558 |
| 307.674 | 335.589 |
| 307.568 | 335.402 |
| 307.384 | 335.212 |
| 305.846 | 333.262 |
| 304.978 | 333.377 |
| 302.911 | 333.69 |
| 296.657 | 328.022 |
| 294.557 | 326.381 |
| 292.201 | 324 |
| 288.479 | 323.413 |
| 287.734 | 323.33 |
| 285.142 | 323.158 |
| 272.346 | 315.705 |
| 267.751 | 313.304 |
| 267.277 | 313.329 |
| 266.823 | 313.353 |
| 263.28 | 313.249 |
| 259.365 | 313.109 |
| 252.7 | 313.166 |
| 247.818 | 313.333 |
| 246.464 | 313.374 |
| 241.792 | 313.397 |
| 235.802 | 313.422 |
| 232.023 | 313.447 |
| 230.881 | 313.442 |
| 227.067 | 313.461 |
| 223.552 | 313.475 |
| 221.838 | 313.382 |
| 221.626 | 313.4 |
| 221.384 | 313.47 |
| 220.058 | 313.406 |
| 216.388 | 313.012 |
| 212.653 | 310.818 |
| 210.72 | 309.598 |
| 208.448 | 309.468 |
| 207.005 | 308.807 |
| 204.001 | 307.302 |
| 203.229 | 306.825 |
| 201.855 | 306.129 |
| 200.603 | 305.429 |
| 195.88 | 303.451 |
| 195.449 | 303.293 |
| 195 | 303.296 |
| 191.371 | 303.318 |
| 190.247 | 302.751 |
| 185.923 | 300.13 |
| 184.694 | 299.994 |
| 182.401 | 299.944 |

| | |
|---------|---------|
| 181.082 | 299.126 |
| 179.801 | 299.066 |
| 179.274 | 298.504 |
| 177.304 | 298.327 |
| 173.248 | 297.783 |
| 172.235 | 297.037 |
| 170.605 | 296.979 |
| 169.531 | 296.776 |
| 168.154 | 296.138 |
| 167.519 | 296.124 |
| 165.996 | 295.272 |
| 164.56 | 294.451 |
| 162.953 | 294.419 |
| 161.243 | 294.422 |
| 160.117 | 294.436 |
| 158.046 | 293.313 |
| 155.941 | 292.356 |
| 152.728 | 290.557 |
| 149.821 | 290.231 |
| 148.62 | 290.033 |
| 145.516 | 287.5 |
| 145.272 | 287.301 |
| 141.833 | 284.462 |
| 139.556 | 284.528 |
| 137.605 | 284.61 |
| 136.778 | 284.588 |
| 135.413 | 284.491 |
| 127.161 | 284.15 |
| 125.21 | 284.179 |
| 108.472 | 284.128 |
| 106.213 | 284.119 |
| 96.4438 | 284.409 |
| 94.4174 | 284.389 |
| 92.4473 | 284.337 |
| 92.2892 | 284.223 |
| 92.2892 | 280 |
| 335 | 280 |
| 335 | 343.388 |

Material Boundary

| X | Y |
|---------|---------|
| 145.516 | 287.5 |
| 155.785 | 287.5 |
| 195 | 287.5 |
| 216.962 | 287.5 |
| 242.943 | 302.5 |
| 252.943 | 302.5 |
| 267.751 | 313.304 |

Material Boundary

| X | Y |
|---|---|
|---|---|

| | |
|---------|---------|
| 152.728 | 290.557 |
| 155.485 | 287.8 |
| 155.785 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 155.485 | 287.8 |
| 195 | 287.8 |
| 195 | 287.8 |
| 195 | 287.8 |
| 216.881 | 287.8 |
| 242.862 | 302.8 |
| 252.845 | 302.8 |
| 267.277 | 313.329 |

Project Summary

File Name: Estaca 08.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:26:41

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

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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.16 | 0 | 0 | 0.16 |

Global Minimums

Method: bishop simplified

FS: 2.470940
 Center: 212.766, 356.491
 Radius: 68.983
 Left Slip Surface Endpoint: 192.276, 290.621
 Right Slip Surface Endpoint: 266.316, 313.004
 Resisting Moment=211225 kN-m
 Driving Moment=85483.5 kN-m
 Total Slice Area=646.727 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.47094

| 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 | 2.82859 | 23.844 | Resíduos | 18.2 | 28 | 9.47594 | 23.4145 | 11.1558 | 1.34874 | 9.80701 |
| 2 | 2.82859 | 70.26 | Resíduos | 18.2 | 28 | 12.5075 | 30.9054 | 27.8697 | 3.97428 | 23.8954 |
| 3 | 2.82859 | 98.6516 | Resíduos | 18.2 | 28 | 14.2789 | 35.2824 | 37.7075 | 5.58026 | 32.1272 |
| 4 | 2.82859 | 109.681 | Resíduos | 18.2 | 28 | 14.8716 | 36.7469 | 41.0859 | 6.20415 | 34.8818 |
| 5 | 2.82859 | 118.863 | Resíduos | 18.2 | 28 | 15.3349 | 37.8915 | 43.7577 | 6.7235 | 37.0342 |
| 6 | 3.17379 | 151.955 | Interface Solo x GMB Lisa | 3 | 12 | 4.7017 | 11.6176 | 48.2031 | 7.66049 | 40.5426 |
| 7 | 3.17379 | 185.288 | Interface Solo x GMB Lisa | 3 | 12 | 5.44343 | 13.4504 | 58.5061 | 9.34092 | 49.1652 |
| 8 | 3.17379 | 218.182 | Interface Solo x GMB Lisa | 3 | 12 | 6.16935 | 15.2441 | 68.6031 | 10.9992 | 57.6039 |
| 9 | 3.17379 | 224.948 | Interface Solo x GMB Lisa | 3 | 12 | 6.29813 | 15.5623 | 70.4413 | 11.3403 | 59.101 |
| 10 | 2.95017 | 220.991 | Resíduos | 18.2 | 28 | 20.4046 | 50.4186 | 72.5796 | 11.9853 | 60.5943 |
| 11 | 2.95017 | 236.753 | Resíduos | 18.2 | 28 | 21.1519 | 52.2651 | 76.9072 | 12.8401 | 64.0671 |
| 12 | 2.95017 | 238.011 | Resíduos | 18.2 | 28 | 21.0301 | 51.964 | 76.4093 | 12.9083 | 63.501 |
| 13 | 2.95017 | 258.026 | Resíduos | 18.2 | 28 | 21.996 | 54.3508 | 81.9838 | 13.9938 | 67.99 |
| 14 | 2.95017 | 261.143 | Resíduos | 18.2 | 28 | 21.9636 | 54.2708 | 82.0021 | 14.1629 | 67.8392 |
| 15 | 2.95017 | 248.646 | Resíduos | 18.2 | 28 | 21.033 | 51.9712 | 76.9994 | 13.4851 | 63.5143 |
| 16 | 2.95017 | 250.606 | Resíduos | 18.2 | 28 | 20.927 | 51.7093 | 76.6133 | 13.5914 | 63.0219 |
| 17 | 2.95017 | 233.749 | Resíduos | 18.2 | 28 | 19.7606 | 48.8273 | 70.2786 | 12.6772 | 57.6014 |
| 18 | 2.95017 | 222.63 | Resíduos | 18.2 | 28 | 18.9227 | 46.7568 | 65.7818 | 12.0742 | 53.7076 |
| 19 | 2.95017 | 237.045 | Resíduos | 18.2 | 28 | 19.4802 | 48.1345 | 69.1546 | 12.8559 | 56.2987 |

| | | | | | | | | | | |
|----|---------|---------|----------|------|----|---------|---------|---------|---------|----------|
| 20 | 2.95017 | 228.529 | Resíduos | 18.2 | 28 | 18.7691 | 46.3772 | 65.3875 | 12.3941 | 52.9934 |
| 21 | 2.95017 | 213.933 | Resíduos | 18.2 | 28 | 17.7295 | 43.8086 | 59.7651 | 11.6024 | 48.1627 |
| 22 | 2.95017 | 198.907 | Resíduos | 18.2 | 28 | 16.6684 | 41.1865 | 54.0188 | 10.7876 | 43.2312 |
| 23 | 2.95017 | 154.933 | Resíduos | 18.2 | 28 | 14.12 | 34.8897 | 39.7915 | 8.40268 | 31.3888 |
| 24 | 2.95017 | 95.3841 | Resíduos | 18.2 | 28 | 10.8421 | 26.7901 | 21.3288 | 5.17308 | 16.1557 |
| 25 | 2.95017 | 33.1022 | Resíduos | 18.2 | 28 | 7.52782 | 18.6008 | 2.54906 | 1.79527 | 0.753787 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.47094

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 192.276 | 290.621 | 0 | 0 | 0 |
| 2 | 195.104 | 289.807 | 35.8731 | 0 | 0 |
| 3 | 197.933 | 289.121 | 90.3441 | 0 | 0 |
| 4 | 200.761 | 288.56 | 151.871 | 0 | 0 |
| 5 | 203.59 | 288.12 | 211.976 | 0 | 0 |
| 6 | 206.419 | 287.8 | 269.35 | 0 | 0 |
| 7 | 209.592 | 287.58 | 294.851 | 0 | 0 |
| 8 | 212.766 | 287.507 | 316.393 | 0 | 0 |
| 9 | 215.94 | 287.58 | 330.952 | 0 | 0 |
| 10 | 219.114 | 287.8 | 335.462 | 0 | 0 |
| 11 | 222.064 | 288.137 | 371.186 | 0 | 0 |
| 12 | 225.014 | 288.603 | 397.676 | 0 | 0 |
| 13 | 227.964 | 289.202 | 413.919 | 0 | 0 |
| 14 | 230.914 | 289.937 | 418.52 | 0 | 0 |
| 15 | 233.865 | 290.813 | 411.482 | 0 | 0 |
| 16 | 236.815 | 291.835 | 394.815 | 0 | 0 |
| 17 | 239.765 | 293.01 | 366.48 | 0 | 0 |
| 18 | 242.715 | 294.348 | 330.76 | 0 | 0 |
| 19 | 245.665 | 295.858 | 287.217 | 0 | 0 |
| 20 | 248.615 | 297.554 | 227.356 | 0 | 0 |
| 21 | 251.566 | 299.453 | 158.534 | 0 | 0 |
| 22 | 254.516 | 301.576 | 83.9552 | 0 | 0 |
| 23 | 257.466 | 303.949 | 4.89604 | 0 | 0 |
| 24 | 260.416 | 306.609 | -59.3139 | 0 | 0 |
| 25 | 263.366 | 309.604 | -91.2309 | 0 | 0 |
| 26 | 266.316 | 313.004 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---------|---------|
| 370.883 | 343.803 |
| 367.652 | 343.664 |
| 366.751 | 343.593 |
| 365.196 | 343.396 |
| 365.069 | 343.317 |
| 364.058 | 342.606 |

| | |
|---------|---------|
| 363.454 | 342.119 |
| 361.305 | 340.472 |
| 358.125 | 341.125 |
| 349.166 | 336.395 |
| 348.32 | 335.96 |
| 345.625 | 335.468 |
| 344.52 | 335.437 |
| 344.506 | 335.685 |
| 344.325 | 335.13 |
| 343.256 | 334.868 |
| 341.57 | 334.375 |
| 340.392 | 334.275 |
| 336.947 | 333.547 |
| 335.981 | 333.077 |
| 334.81 | 332.343 |
| 334.562 | 332.877 |
| 328.745 | 327.307 |
| 325.958 | 324.475 |
| 325.194 | 323.774 |
| 322.108 | 323.551 |
| 321.733 | 323.452 |
| 315.579 | 320.333 |
| 301.789 | 313.019 |
| 300.983 | 312.86 |
| 300.547 | 312.824 |
| 300.506 | 312.821 |
| 299.158 | 312.836 |
| 291.544 | 313.106 |
| 289.059 | 313.236 |
| 285.769 | 313.175 |
| 282.589 | 313.245 |
| 281.549 | 313.224 |
| 280.478 | 313.254 |
| 274.171 | 313.317 |
| 270.213 | 313.272 |
| 268.623 | 313.241 |
| 266.369 | 313.007 |
| 264.066 | 312.883 |
| 263.784 | 312.77 |
| 260.21 | 312.686 |
| 257.119 | 312.917 |
| 256.913 | 312.903 |
| 256.6 | 312.741 |
| 250.791 | 309.694 |
| 249.752 | 309.454 |
| 248.414 | 309.193 |
| 244.572 | 306.162 |
| 242.943 | 304.919 |
| 241.971 | 304.953 |
| 239.485 | 305.097 |
| 236.326 | 303.688 |
| 235 | 303.184 |

| | |
|---------|---------|
| 234.769 | 303.096 |
| 231.922 | 303.006 |
| 231.136 | 303 |
| 228.095 | 301.323 |
| 225.541 | 299.857 |
| 222.799 | 299.852 |
| 222.489 | 299.867 |
| 221.789 | 299.365 |
| 219.247 | 297.885 |
| 215.231 | 297.612 |
| 214.982 | 297.625 |
| 214.216 | 297.261 |
| 208.676 | 294.549 |
| 206.224 | 294.15 |
| 205.508 | 293.926 |
| 202.518 | 293.89 |
| 198.82 | 293.801 |
| 197.985 | 293.839 |
| 191.758 | 290.329 |
| 187.726 | 289.729 |
| 185.695 | 288.21 |
| 184.729 | 287.5 |
| 183.334 | 286.473 |
| 182.458 | 285.055 |
| 182.07 | 284.707 |
| 181.546 | 284.385 |
| 181.366 | 284.417 |
| 181.135 | 284.442 |
| 180.793 | 284.421 |
| 180.64 | 284.423 |
| 180.508 | 284.579 |
| 180.295 | 284.633 |
| 177.033 | 284.63 |
| 176.108 | 284.662 |
| 175.086 | 284.673 |
| 141.408 | 284.523 |
| 133.767 | 284.468 |
| 132.464 | 284.454 |
| 128.904 | 284.406 |
| 128.691 | 284.336 |
| 128.455 | 284.165 |
| 128.455 | 280 |
| 375 | 280 |
| 375 | 343.94 |

Material Boundary

| X | Y |
|---------|-------|
| 184.729 | 287.5 |
| 194.649 | 287.5 |
| 235 | 287.5 |
| 255.65 | 287.5 |
| 281.632 | 302.5 |

| | |
|---------|--------|
| 291.632 | 302.5 |
| 300.983 | 312.86 |

Material Boundary

| X | Y |
|---------|---------|
| 191.758 | 290.329 |
| 194.342 | 287.8 |
| 194.649 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 194.342 | 287.8 |
| 235 | 287.8 |
| 235 | 287.8 |
| 235 | 287.8 |
| 255.57 | 287.8 |
| 281.551 | 302.8 |
| 291.498 | 302.8 |
| 300.547 | 312.824 |

Project Summary

File Name: Estaca 09.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:41:21

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

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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Material de enchente | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|---|
| Color |  |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 5 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 10 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 20 | 12 |
| Water Surface | None | None | None | None | None |
| Ru Value | 0.49 | 0 | 0 | 0.49 | 0.49 |

Support Properties

Support 1

Support Type: End Anchored
Force Application: Active
Out-of-Plane Spacing: 1 m
Anchor Capacity: 100 kN

Global Minimums

Method: bishop simplified

FS: 1.848990
Center: 235.971, 360.820
Radius: 73.187
Left Slip Surface Endpoint: 215.966, 290.420
Right Slip Surface Endpoint: 291.053, 312.631
Resisting Moment=183072 kN-m
Driving Moment=99012.2 kN-m
Total Slice Area=747.997 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.84899

| 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 | 0.648112 | 1.00652 | Dique de solo compactado | 20 | 30 | 12.3807 | 22.8918 | 5.00873 | 0 | 5.00873 |
| 2 | 2.88281 | 35.1102 | Resíduos | 18.2 | 28 | 12.5398 | 23.1859 | 15.3449 | 5.96777 | 9.37711 |
| 3 | 2.88281 | 87.7322 | Resíduos | 18.2 | 28 | 15.2253 | 28.1514 | 33.628 | 14.9121 | 18.7159 |
| 4 | 2.88281 | 104.353 | Resíduos | 18.2 | 28 | 15.9228 | 29.4411 | 38.8788 | 17.7372 | 21.1416 |
| 5 | 2.88281 | 139.816 | Resíduos | 18.2 | 28 | 17.6022 | 32.5463 | 50.7465 | 23.7649 | 26.9816 |
| 6 | 2.88281 | 179.139 | Resíduos | 18.2 | 28 | 19.4463 | 35.956 | 63.843 | 30.4488 | 33.3942 |
| 7 | 3.29468 | 216.723 | Interface Solo x GMB Lisa | 3 | 12 | 5.50761 | 10.1835 | 66.0279 | 32.232 | 33.7959 |
| 8 | 3.29468 | 230.816 | Interface Solo x GMB Lisa | 3 | 12 | 5.72986 | 10.5945 | 70.0571 | 34.328 | 35.7291 |
| 9 | 3.29468 | 267.122 | Interface Solo x GMB Lisa | 3 | 12 | 6.34307 | 11.7283 | 80.791 | 39.7276 | 41.0634 |
| 10 | 3.30829 | 266.8 | Resíduos | 18.2 | 28 | 21.121 | 39.0526 | 78.7344 | 39.5165 | 39.2179 |

| | | | | | | | | | | |
|----|---------|---------|----------------------|------|----|---------|---------|----------|---------|----------|
| 11 | 3.30829 | 293.625 | Resíduos | 18.2 | 28 | 21.9958 | 40.6701 | 85.7496 | 43.4895 | 42.2601 |
| 12 | 3.30829 | 317.511 | Resíduos | 18.2 | 28 | 22.7195 | 42.0082 | 91.8041 | 47.0275 | 44.7766 |
| 13 | 3.30829 | 314.04 | Resíduos | 18.2 | 28 | 22.2802 | 41.1958 | 89.7622 | 46.5133 | 43.2489 |
| 14 | 3.30829 | 322.402 | Resíduos | 18.2 | 28 | 22.3282 | 41.2846 | 91.1678 | 47.7518 | 43.416 |
| 15 | 3.30829 | 311.627 | Resíduos | 18.2 | 28 | 21.5889 | 39.9177 | 87.0009 | 46.1559 | 40.845 |
| 16 | 3.30829 | 312.294 | Resíduos | 18.2 | 28 | 21.3122 | 39.406 | 86.1374 | 46.2547 | 39.8827 |
| 17 | 3.30829 | 331.891 | Resíduos | 18.2 | 28 | 21.7701 | 40.2527 | 90.6324 | 49.1573 | 41.4751 |
| 18 | 3.30829 | 315.732 | Resíduos | 18.2 | 28 | 20.8093 | 38.4761 | 84.8977 | 46.764 | 38.1337 |
| 19 | 3.30829 | 285.823 | Resíduos | 18.2 | 28 | 19.33 | 35.7409 | 75.3238 | 42.334 | 32.9898 |
| 20 | 3.30829 | 281.059 | Resíduos | 18.2 | 28 | 18.8115 | 34.7822 | 72.815 | 41.6284 | 31.1866 |
| 21 | 3.30829 | 236.084 | Resíduos | 18.2 | 28 | 16.8013 | 31.0655 | 59.1636 | 34.9671 | 24.1965 |
| 22 | 3.30829 | 178.742 | Resíduos | 18.2 | 28 | 14.3865 | 26.6004 | 42.2728 | 26.4739 | 15.7989 |
| 23 | 3.30829 | 114.834 | Resíduos | 18.2 | 28 | 11.8032 | 21.8239 | 23.824 | 17.0084 | 6.81565 |
| 24 | 1.92545 | 36.4913 | Material de enchente | 10 | 20 | 6.08998 | 11.2603 | 12.7492 | 9.28653 | 3.46271 |
| 25 | 1.89926 | 13.295 | Resíduos | 18.2 | 28 | 8.25905 | 15.2709 | -2.07879 | 3.43003 | -5.50882 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.84899

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 215.966 | 290.42 | 0 | 0 | 0 |
| 2 | 216.614 | 290.239 | 8.9285 | 0 | 0 |
| 3 | 219.497 | 289.511 | 56.2402 | 0 | 0 |
| 4 | 222.38 | 288.906 | 120.471 | 0 | 0 |
| 5 | 225.263 | 288.42 | 185.233 | 0 | 0 |
| 6 | 228.146 | 288.052 | 254.642 | 0 | 0 |
| 7 | 231.028 | 287.8 | 326.806 | 0 | 0 |
| 8 | 234.323 | 287.651 | 354.753 | 0 | 0 |
| 9 | 237.618 | 287.651 | 373.627 | 0 | 0 |
| 10 | 240.913 | 287.8 | 382.522 | 0 | 0 |
| 11 | 244.221 | 288.099 | 428.802 | 0 | 0 |
| 12 | 247.529 | 288.551 | 462.795 | 0 | 0 |
| 13 | 250.837 | 289.159 | 482.178 | 0 | 0 |
| 14 | 254.146 | 289.926 | 487.04 | 0 | 0 |
| 15 | 257.454 | 290.857 | 475.972 | 0 | 0 |
| 16 | 260.762 | 291.96 | 451.434 | 0 | 0 |
| 17 | 264.071 | 293.242 | 411.452 | 0 | 0 |
| 18 | 267.379 | 294.715 | 349.985 | 0 | 0 |
| 19 | 270.687 | 296.391 | 276.532 | 0 | 0 |
| 20 | 273.995 | 298.286 | 197.694 | 0 | 0 |
| 21 | 277.304 | 300.422 | 104.405 | 0 | 0 |
| 22 | 280.612 | 302.825 | 17.8404 | 0 | 0 |
| 23 | 283.92 | 305.528 | -48.8787 | 0 | 0 |
| 24 | 287.229 | 308.581 | -82.5559 | 0 | 0 |
| 25 | 289.154 | 310.542 | -95.8415 | 0 | 0 |
| 26 | 291.053 | 312.631 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---------|---------|
| 145 | 280 |
| 393.414 | 280 |
| 393.414 | 343.702 |
| 393.295 | 343.65 |
| 389.78 | 343.533 |
| 386.076 | 343.608 |
| 379.879 | 342.816 |
| 378.623 | 341.966 |
| 377.679 | 341.285 |
| 375.448 | 341.439 |
| 372.005 | 341.557 |
| 363.452 | 337.35 |
| 362.031 | 336.687 |
| 360.766 | 335.896 |
| 360.058 | 335.275 |
| 359.083 | 335.139 |
| 353.6 | 334.792 |
| 347.503 | 329.347 |
| 342.682 | 324.938 |
| 342.147 | 324.893 |
| 341.125 | 324.53 |
| 327.654 | 317.643 |
| 318.572 | 313.469 |
| 317.956 | 313.186 |
| 317.182 | 312.831 |
| 314.553 | 312.773 |
| 311.696 | 312.694 |
| 309.102 | 312.835 |
| 304.438 | 313.043 |
| 301.915 | 313.038 |
| 300.521 | 312.953 |
| 298.364 | 312.884 |
| 297.013 | 312.901 |
| 293.149 | 312.866 |
| 292.22 | 312.685 |
| 288.865 | 312.529 |
| 285.094 | 312.648 |
| 284.853 | 312.527 |
| 277.533 | 312.356 |
| 276.842 | 312.352 |
| 276.663 | 312.277 |
| 276.178 | 311.898 |
| 271.912 | 309.284 |
| 270.276 | 309.249 |
| 267.099 | 309.092 |
| 266.846 | 308.972 |
| 266.457 | 308.913 |
| 266.337 | 308.775 |
| 262.662 | 306.247 |
| 261.229 | 305.315 |

| | |
|---------|---------|
| 260.737 | 304.813 |
| 259.941 | 304.806 |
| 257.5 | 304.959 |
| 255 | 304.01 |
| 253.562 | 303.464 |
| 252.04 | 302.831 |
| 251.751 | 302.831 |
| 249.003 | 302.727 |
| 244.674 | 300.348 |
| 243.137 | 299.33 |
| 239.423 | 299.444 |
| 238.949 | 299.482 |
| 238.385 | 299.118 |
| 235.214 | 297.009 |
| 230.625 | 297.158 |
| 230.114 | 297.184 |
| 229.646 | 296.959 |
| 226.829 | 295.241 |
| 224.32 | 293.711 |
| 224.031 | 293.73 |
| 220.986 | 293.842 |
| 219.345 | 292.674 |
| 218.807 | 292.14 |
| 216.437 | 290.416 |
| 216.159 | 290.425 |
| 214.842 | 290.39 |
| 214.265 | 290.423 |
| 210.866 | 290.208 |
| 209.625 | 289.287 |
| 208.606 | 288.636 |
| 207.662 | 288.634 |
| 206.311 | 288.323 |
| 205.233 | 288.182 |
| 204.367 | 287.5 |
| 204.208 | 287.374 |
| 200.801 | 284.634 |
| 200.467 | 284.651 |
| 200.177 | 284.602 |
| 197.641 | 284.667 |
| 196.903 | 284.681 |
| 192.509 | 284.613 |
| 190.264 | 284.558 |
| 189.645 | 284.501 |
| 188.986 | 284.494 |
| 188.359 | 284.495 |
| 172.815 | 284.473 |
| 151.253 | 284.318 |
| 149.289 | 284.296 |
| 148.426 | 284.29 |
| 148.289 | 284.203 |
| 148.185 | 284.301 |
| 145 | 284.282 |

Material Boundary

| X | Y |
|---------|---------|
| 204.367 | 287.5 |
| 219.353 | 287.5 |
| 255 | 287.5 |
| 273.695 | 287.5 |
| 299.676 | 302.5 |
| 309.676 | 302.5 |
| 318.572 | 313.469 |

Material Boundary

| X | Y |
|---------|---------|
| 216.437 | 290.416 |
| 219.053 | 287.8 |
| 219.353 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 276.842 | 308.352 |
| 276.842 | 310.352 |
| 276.92 | 310.354 |
| 277.534 | 310.356 |
| 284.853 | 310.527 |
| 285.094 | 310.648 |
| 288.865 | 310.529 |
| 292.22 | 310.685 |
| 293.149 | 310.866 |
| 297.013 | 310.901 |
| 298.364 | 310.884 |
| 300.521 | 310.953 |
| 301.915 | 311.038 |
| 304.438 | 311.043 |
| 305 | 311.018 |
| 305 | 309.018 |
| 304.438 | 309.043 |
| 301.915 | 309.038 |
| 300.521 | 308.953 |
| 298.364 | 308.884 |
| 297.013 | 308.901 |
| 293.149 | 308.866 |
| 292.22 | 308.685 |
| 288.865 | 308.529 |
| 285.094 | 308.648 |
| 284.853 | 308.527 |
| 277.534 | 308.356 |
| 276.842 | 308.352 |

Material Boundary

| X | Y |
|---|---|
|---|---|

| X | Y |
|---------|---------|
| 219.053 | 287.8 |
| 255 | 287.8 |
| 255 | 287.8 |
| 255 | 287.8 |
| 273.615 | 287.8 |
| 299.596 | 302.8 |
| 309.534 | 302.8 |
| 317.956 | 313.186 |

Project Summary

File Name: Estaca 10.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:47:50

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

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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Material de enchente | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|---|
| Color |  |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 5 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 10 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 20 | 12 |
| Water Surface | None | None | None | None | None |
| Ru Value | 0.45 | 0 | 0 | 0.45 | 0.45 |

Support Properties

Support 1

Support Type: End Anchored
Force Application: Active
Out-of-Plane Spacing: 1 m
Anchor Capacity: 100 kN

Global Minimums

Method: bishop simplified

FS: 2.228680
Center: 231.971, 352.757
Radius: 65.165
Left Slip Surface Endpoint: 205.568, 293.180
Right Slip Surface Endpoint: 283.154, 312.423
Resisting Moment=201874 kN-m
Driving Moment=90580.3 kN-m
Total Slice Area=920.562 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.22868

| 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 | 2.86325 | 59.3422 | Dique de solo compactado | 20 | 30 | 16.0671 | 35.8084 | 27.381 | 0 | 27.381 |
| 2 | 2.86325 | 88.3738 | Dique de solo compactado | 20 | 30 | 18.7154 | 41.7107 | 37.604 | 0 | 37.604 |
| 3 | 3.09333 | 120.317 | Resíduos | 18.2 | 28 | 14.3174 | 31.9088 | 43.2857 | 17.503 | 25.7827 |
| 4 | 3.09333 | 152.451 | Resíduos | 18.2 | 28 | 15.5751 | 34.712 | 53.2321 | 22.1777 | 31.0544 |
| 5 | 3.09333 | 184.259 | Resíduos | 18.2 | 28 | 16.7931 | 37.4264 | 62.9647 | 26.805 | 36.1597 |
| 6 | 3.09333 | 228.957 | Resíduos | 18.2 | 28 | 18.5543 | 41.3516 | 76.8491 | 33.3074 | 43.5417 |
| 7 | 3.09333 | 236.909 | Resíduos | 18.2 | 28 | 18.6796 | 41.6309 | 78.5313 | 34.4642 | 44.0671 |
| 8 | 3.47322 | 308.803 | Interface Solo x GMB Lisa | 3 | 12 | 6.04057 | 13.4625 | 89.2318 | 40.0094 | 49.2224 |
| 9 | 3.47322 | 356.8 | Interface Solo x GMB Lisa | 3 | 12 | 6.73475 | 15.0096 | 102.729 | 46.228 | 56.501 |
| 10 | 3.47322 | 362.817 | Interface Solo x GMB Lisa | 3 | 12 | 6.79115 | 15.1353 | 104.099 | 47.0077 | 57.0918 |
| 11 | 3.26728 | 355.496 | Resíduos | 18.2 | 28 | 21.8926 | 48.7916 | 106.497 | 48.9622 | 57.5344 |
| 12 | 3.26728 | 371.875 | Resíduos | 18.2 | 28 | 22.268 | 49.6282 | 110.326 | 51.2181 | 59.1081 |

| | | | | | | | | | | |
|----|---------|---------|----------------------|------|----|---------|---------|----------|---------|----------|
| 13 | 3.26728 | 394 | Resíduos | 18.2 | 28 | 22.848 | 50.9208 | 115.804 | 54.2653 | 61.539 |
| 14 | 3.26728 | 394.549 | Resíduos | 18.2 | 28 | 22.59 | 50.3458 | 114.798 | 54.341 | 60.4574 |
| 15 | 3.26728 | 406.684 | Resíduos | 18.2 | 28 | 22.7591 | 50.7227 | 117.178 | 56.0122 | 61.1662 |
| 16 | 3.26728 | 394.899 | Resíduos | 18.2 | 28 | 22.0284 | 49.0943 | 112.493 | 54.3892 | 58.1037 |
| 17 | 3.26728 | 397.515 | Resíduos | 18.2 | 28 | 21.8222 | 48.6346 | 111.989 | 54.7494 | 57.2393 |
| 18 | 3.26728 | 378.228 | Resíduos | 18.2 | 28 | 20.8154 | 46.3908 | 105.112 | 52.0931 | 53.0191 |
| 19 | 3.26728 | 345.107 | Resíduos | 18.2 | 28 | 19.3241 | 43.0672 | 94.2999 | 47.5314 | 46.7685 |
| 20 | 3.26728 | 301.506 | Resíduos | 18.2 | 28 | 17.4859 | 38.9705 | 80.5897 | 41.5262 | 39.0635 |
| 21 | 3.26728 | 248.845 | Resíduos | 18.2 | 28 | 15.3672 | 34.2485 | 64.4561 | 34.2732 | 30.1829 |
| 22 | 3.26728 | 186.946 | Resíduos | 18.2 | 28 | 12.981 | 28.9305 | 45.9291 | 25.748 | 20.1811 |
| 23 | 3.26728 | 116.199 | Resíduos | 18.2 | 28 | 10.3647 | 23.0995 | 25.2186 | 16.004 | 9.21458 |
| 24 | 1.82282 | 34.488 | Material de enchente | 10 | 20 | 5.23142 | 11.6592 | 13.0726 | 8.51408 | 4.55853 |
| 25 | 1.67563 | 12.125 | Resíduos | 18.2 | 28 | 7.067 | 15.7501 | -1.35139 | 3.25625 | -4.60764 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.22868

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 205.568 | 293.18 | 0 | 0 | 0 |
| 2 | 208.431 | 291.992 | 78.4546 | 0 | 0 |
| 3 | 211.294 | 290.959 | 170.785 | 0 | 0 |
| 4 | 214.387 | 290.008 | 256.123 | 0 | 0 |
| 5 | 217.481 | 289.223 | 346.034 | 0 | 0 |
| 6 | 220.574 | 288.596 | 437.367 | 0 | 0 |
| 7 | 223.667 | 288.123 | 531.015 | 0 | 0 |
| 8 | 226.761 | 287.8 | 614.02 | 0 | 0 |
| 9 | 230.234 | 287.615 | 651.509 | 0 | 0 |
| 10 | 233.707 | 287.615 | 674.857 | 0 | 0 |
| 11 | 237.18 | 287.8 | 679.096 | 0 | 0 |
| 12 | 240.448 | 288.145 | 713.736 | 0 | 0 |
| 13 | 243.715 | 288.658 | 729.724 | 0 | 0 |
| 14 | 246.982 | 289.344 | 724.843 | 0 | 0 |
| 15 | 250.25 | 290.208 | 699.384 | 0 | 0 |
| 16 | 253.517 | 291.256 | 650.693 | 0 | 0 |
| 17 | 256.784 | 292.501 | 582.587 | 0 | 0 |
| 18 | 260.051 | 293.952 | 491.199 | 0 | 0 |
| 19 | 263.319 | 295.627 | 383.037 | 0 | 0 |
| 20 | 266.586 | 297.545 | 265.148 | 0 | 0 |
| 21 | 269.853 | 299.734 | 145.802 | 0 | 0 |
| 22 | 273.12 | 302.227 | 35.1883 | 0 | 0 |
| 23 | 276.388 | 305.074 | -53.2201 | 0 | 0 |
| 24 | 279.655 | 308.341 | -101.818 | 0 | 0 |
| 25 | 281.478 | 310.383 | -118.985 | 0 | 0 |
| 26 | 283.154 | 312.423 | 0 | 0 | 0 |

List Of Coordinates

External Boundary



| X | Y |
|---------|---------|
| 130 | 280 |
| 362.357 | 280 |
| 362.357 | 340.866 |
| 354.459 | 339.75 |
| 346.691 | 338.519 |
| 344.177 | 336.498 |
| 340.467 | 333.224 |
| 339.281 | 333.145 |
| 336.288 | 333.127 |
| 335.792 | 332.795 |
| 335.038 | 332.289 |
| 327.461 | 325.782 |
| 309.587 | 316.591 |
| 306.394 | 314.775 |
| 302.602 | 312.727 |
| 302.172 | 312.708 |
| 301.684 | 312.686 |
| 300.742 | 312.638 |
| 297.693 | 312.497 |
| 296.292 | 312.451 |
| 293.677 | 312.679 |
| 291.454 | 312.786 |
| 290.484 | 312.729 |
| 286.815 | 312.47 |
| 283.995 | 312.37 |
| 282.417 | 312.469 |
| 280.758 | 312.329 |
| 270.032 | 312.449 |
| 269.885 | 312.45 |
| 263.808 | 312.246 |
| 262.757 | 311.739 |
| 260.373 | 311.726 |
| 258.479 | 310.649 |
| 255.888 | 309.132 |
| 254.028 | 309.002 |
| 253.763 | 308.995 |
| 253.571 | 308.97 |
| 250.547 | 308.161 |
| 248.109 | 306.602 |
| 246.188 | 306.367 |
| 245.498 | 306.227 |
| 243.94 | 306.096 |
| 243.84 | 305.815 |
| 243.222 | 304.814 |
| 242.062 | 304.758 |
| 240.271 | 303.972 |
| 240 | 303.887 |
| 235.436 | 302.457 |
| 232.397 | 302.433 |
| 231.776 | 302.41 |
| 230.671 | 301.727 |

| | |
|---------|---------|
| 225.921 | 298.759 |
| 222.52 | 299.056 |
| 221.724 | 299.121 |
| 221.271 | 298.828 |
| 217.785 | 296.623 |
| 215.128 | 296.673 |
| 213.833 | 296.673 |
| 211.569 | 295.296 |
| 208.634 | 293.619 |
| 207.377 | 293.79 |
| 206.474 | 293.82 |
| 198.834 | 288.422 |
| 197.537 | 287.5 |
| 196.352 | 286.658 |
| 195.092 | 286.39 |
| 192.836 | 285.93 |
| 190.208 | 285.938 |
| 189.806 | 285.74 |
| 188.585 | 285.449 |
| 186.408 | 284.847 |
| 177.479 | 284.532 |
| 174.495 | 284.436 |
| 170.821 | 284.362 |
| 163.207 | 284.175 |
| 160.053 | 283.884 |
| 156.693 | 283.846 |
| 153.498 | 283.854 |
| 148.677 | 283.847 |
| 140.764 | 284.238 |
| 140.184 | 284.23 |
| 139.094 | 284.209 |
| 137.904 | 284.162 |
| 137.478 | 284.139 |
| 135.875 | 284.106 |
| 135.611 | 284.101 |
| 135.459 | 284.102 |
| 135.281 | 284.101 |
| 135.124 | 284.101 |
| 134.914 | 284.098 |
| 134.68 | 284.102 |
| 134.384 | 284.095 |
| 133.877 | 284.098 |
| 132.922 | 284.094 |
| 131.063 | 284.085 |
| 130 | 284.079 |

Material Boundary

| X | Y |
|---------|-------|
| 197.537 | 287.5 |
| 214.753 | 287.5 |
| 240 | 287.5 |
| 256.976 | 287.5 |

| | |
|---------|---------|
| 282.957 | 302.5 |
| 292.957 | 302.5 |
| 302.602 | 312.727 |

Material Boundary

| X | Y |
|---------|---------|
| 208.634 | 293.619 |
| 214.453 | 287.8 |
| 214.753 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 260.906 | 307.744 |
| 260.906 | 309.729 |
| 263.22 | 309.742 |
| 264.296 | 310.261 |
| 269.905 | 310.447 |
| 269.936 | 310.449 |
| 270.014 | 310.449 |
| 280.831 | 310.329 |
| 282.439 | 310.463 |
| 283.969 | 310.368 |
| 286.921 | 310.473 |
| 290.612 | 310.733 |
| 291.464 | 310.783 |
| 293.543 | 310.683 |
| 293.543 | 308.675 |
| 293.408 | 308.687 |
| 291.474 | 308.78 |
| 290.74 | 308.738 |
| 287.027 | 308.475 |
| 283.942 | 308.366 |
| 282.46 | 308.458 |
| 280.904 | 308.328 |
| 269.997 | 308.449 |
| 269.989 | 308.449 |
| 264.785 | 308.276 |
| 263.682 | 307.744 |
| 260.906 | 307.744 |

Material Boundary

| X | Y |
|---------|-------|
| 214.453 | 287.8 |
| 240 | 287.8 |
| 240 | 287.8 |
| 240 | 287.8 |
| 256.895 | 287.8 |
| 282.876 | 302.8 |
| 292.827 | 302.8 |

Project Summary

File Name: estaca 11.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 17/06/2020, 15:36:21

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

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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Material de enchente | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|---|
| Color |  |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 5 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 10 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 20 | 12 |
| Water Surface | None | None | None | None | None |
| Ru Value | 0.46 | 0 | 0 | 0.46 | 0.46 |

Support Properties

Trinca

Support Type: End Anchored
Force Application: Active
Out-of-Plane Spacing: 1 m
Anchor Capacity: 0 kN

Global Minimums

Method: bishop simplified

FS: 2.046670
Center: 179.411, 349.054
Radius: 61.486
Left Slip Surface Endpoint: 151.141, 294.453
Right Slip Surface Endpoint: 228.788, 312.415
Resisting Moment=172746 kN-m
Driving Moment=84403.2 kN-m
Total Slice Area=1004.31 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.04667

| 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 | 3.27636 | 41.0876 | Resíduos | 18.2 | 28 | 12.1713 | 24.9107 | 18.3897 | 5.7687 | 12.621 |
| 2 | 3.27636 | 89.2655 | Resíduos | 18.2 | 28 | 14.233 | 29.1302 | 33.0896 | 12.5329 | 20.5567 |
| 3 | 3.27636 | 153.793 | Resíduos | 18.2 | 28 | 17.0038 | 34.8011 | 52.8147 | 21.5925 | 31.2222 |
| 4 | 3.27636 | 190.192 | Resíduos | 18.2 | 28 | 18.3936 | 37.6456 | 63.275 | 26.703 | 36.572 |
| 5 | 3.27636 | 223.723 | Resíduos | 18.2 | 28 | 19.6213 | 40.1584 | 72.7084 | 31.4106 | 41.2978 |
| 6 | 3.27636 | 284.461 | Resíduos | 18.2 | 28 | 22.0406 | 45.1098 | 90.5482 | 39.9382 | 50.61 |
| 7 | 3.27636 | 319.422 | Resíduos | 18.2 | 28 | 23.2593 | 47.6041 | 100.148 | 44.8468 | 55.3011 |
| 8 | 3.55724 | 371.373 | Interface Solo x GMB Lisa | 3 | 12 | 7.36499 | 15.0737 | 104.826 | 48.0236 | 56.8025 |
| 9 | 3.55724 | 420.402 | Interface Solo x GMB Lisa | 3 | 12 | 8.09364 | 16.565 | 118.182 | 54.3637 | 63.8183 |
| 10 | 3.55724 | 434.623 | Interface Solo x GMB Lisa | 3 | 12 | 8.26806 | 16.922 | 121.7 | 56.2026 | 65.4978 |
| 11 | 2.92882 | 359.045 | Resíduos | 18.2 | 28 | 25.3575 | 51.8984 | 119.769 | 56.3915 | 63.3775 |

| | | | | | | | | | | |
|----|---------|---------|---------------------------|------|----|---------|---------|----------|---------|----------|
| 12 | 2.92882 | 366.395 | Resíduos | 18.2 | 28 | 25.3859 | 51.9565 | 121.033 | 57.5459 | 63.4868 |
| 13 | 2.92882 | 384.878 | Resíduos | 18.2 | 28 | 25.9119 | 53.0332 | 125.96 | 60.4487 | 65.5117 |
| 14 | 2.92882 | 390.075 | Resíduos | 18.2 | 28 | 25.8193 | 52.8436 | 126.42 | 61.2651 | 65.155 |
| 15 | 2.92882 | 388.498 | Resíduos | 18.2 | 28 | 25.4164 | 52.019 | 124.622 | 61.0173 | 63.6044 |
| 16 | 2.92882 | 401.917 | Resíduos | 18.2 | 28 | 25.6633 | 52.5243 | 127.68 | 63.1249 | 64.5547 |
| 17 | 2.92882 | 380.72 | Resíduos | 18.2 | 28 | 24.3928 | 49.9241 | 119.46 | 59.7957 | 59.6643 |
| 18 | 3.18733 | 390.022 | Interface Solo x GMB Lisa | 3 | 12 | 7.91837 | 16.2063 | 118.419 | 56.2885 | 62.1308 |
| 19 | 3.18733 | 356.711 | Interface Solo x GMB Lisa | 3 | 12 | 7.30645 | 14.9539 | 107.72 | 51.4811 | 56.2384 |
| 20 | 3.18733 | 311.547 | Interface Solo x GMB Lisa | 3 | 12 | 6.5029 | 13.3093 | 93.4642 | 44.9629 | 48.5013 |
| 21 | 3.62246 | 291.645 | Resíduos | 18.2 | 28 | 16.8562 | 34.4991 | 67.6889 | 37.0347 | 30.6542 |
| 22 | 3.62246 | 216.558 | Resíduos | 18.2 | 28 | 14.0371 | 28.7294 | 47.3026 | 27.4998 | 19.8028 |
| 23 | 3.62246 | 131.881 | Resíduos | 18.2 | 28 | 11.0038 | 22.5212 | 24.874 | 16.747 | 8.12704 |
| 24 | 1.6958 | 33.2082 | Material de enchente | 10 | 20 | 5.58252 | 11.4256 | 12.9247 | 9.00798 | 3.91674 |
| 25 | 1.4142 | 9.98314 | Resíduos | 18.2 | 28 | 7.39459 | 15.1343 | -2.51853 | 3.24725 | -5.76578 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.04667

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 151.141 | 294.453 | 0 | 0 | 0 |
| 2 | 154.417 | 292.877 | 68.8261 | 0 | 0 |
| 3 | 157.693 | 291.531 | 159.973 | 0 | 0 |
| 4 | 160.97 | 290.399 | 275.468 | 0 | 0 |
| 5 | 164.246 | 289.468 | 394.62 | 0 | 0 |
| 6 | 167.522 | 288.728 | 512.617 | 0 | 0 |
| 7 | 170.799 | 288.174 | 634.969 | 0 | 0 |
| 8 | 174.075 | 287.8 | 748.606 | 0 | 0 |
| 9 | 177.632 | 287.594 | 796.41 | 0 | 0 |
| 10 | 181.19 | 287.594 | 825.185 | 0 | 0 |
| 11 | 184.747 | 287.8 | 829.482 | 0 | 0 |
| 12 | 187.676 | 288.126 | 864.662 | 0 | 0 |
| 13 | 190.605 | 288.596 | 882.15 | 0 | 0 |
| 14 | 193.533 | 289.212 | 880.366 | 0 | 0 |
| 15 | 196.462 | 289.98 | 858.883 | 0 | 0 |
| 16 | 199.391 | 290.905 | 817.98 | 0 | 0 |
| 17 | 202.32 | 291.995 | 753.891 | 0 | 0 |
| 18 | 205.249 | 293.26 | 674.166 | 0 | 0 |
| 19 | 208.436 | 294.85 | 511.138 | 0 | 0 |
| 20 | 211.623 | 296.681 | 337.138 | 0 | 0 |
| 21 | 214.811 | 298.781 | 161.628 | 0 | 0 |
| 22 | 218.433 | 301.538 | 36.0497 | 0 | 0 |
| 23 | 222.056 | 304.76 | -65.5486 | 0 | 0 |
| 24 | 225.678 | 308.558 | -120.195 | 0 | 0 |
| 25 | 227.374 | 310.582 | -136.887 | 0 | 0 |
| 26 | 228.788 | 312.415 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---------|---------|
| 120.844 | 275.135 |
| 279.987 | 275.135 |
| 279.987 | 332.019 |
| 278.251 | 332.317 |
| 276.876 | 332.063 |
| 276 | 331.424 |
| 268.298 | 325.87 |
| 262.884 | 322.791 |
| 252.914 | 317.407 |
| 243.141 | 312.12 |
| 242.696 | 312.134 |
| 242.126 | 312.152 |
| 241.45 | 312.144 |
| 239.439 | 312.205 |
| 236.782 | 311.935 |
| 231.972 | 312.404 |
| 231.727 | 312.377 |
| 231.155 | 312.405 |
| 229.858 | 312.275 |
| 226.461 | 312.718 |
| 225.548 | 312.697 |
| 224.888 | 312.498 |
| 222.94 | 312.332 |
| 220.146 | 312.247 |
| 214.487 | 312.223 |
| 211.654 | 312.196 |
| 208.858 | 312.236 |
| 203.125 | 311.724 |
| 202.019 | 311.576 |
| 201.77 | 311.619 |
| 200.631 | 311.009 |
| 196.842 | 308.724 |
| 194.376 | 308.604 |
| 193.792 | 308.539 |
| 188.397 | 305.839 |
| 188.281 | 305.78 |
| 188.135 | 305.756 |
| 185.322 | 305.342 |
| 179.99 | 304.809 |
| 178.465 | 304.359 |
| 178.368 | 303.905 |
| 178.358 | 303.336 |
| 175.58 | 302.509 |
| 175.042 | 302.287 |
| 173.859 | 301.917 |
| 173.423 | 301.918 |
| 170.715 | 301.904 |
| 167.01 | 299.404 |
| 164.865 | 298.29 |

| | |
|---------|---------|
| 163.556 | 298.217 |
| 161.581 | 298.226 |
| 159.607 | 298.238 |
| 158.984 | 297.876 |
| 157.79 | 296.042 |
| 156.118 | 296.052 |
| 154.071 | 296.268 |
| 151.242 | 294.52 |
| 149.707 | 293.494 |
| 149.328 | 293.476 |
| 147.251 | 293.448 |
| 137.72 | 286.861 |
| 135.848 | 285.531 |
| 133.255 | 283.812 |
| 132.954 | 283.699 |
| 128.185 | 283.63 |
| 126.253 | 283.573 |
| 125.928 | 283.55 |
| 125.63 | 283.5 |
| 122.573 | 283.307 |
| 121.289 | 283.206 |
| 121.175 | 283.198 |
| 120.844 | 283.24 |

Material Boundary

| X | Y |
|---------|---------|
| 133.255 | 283.812 |
| 155.745 | 287.5 |
| 155.443 | 287.8 |
| 149.707 | 293.494 |

Material Boundary

| X | Y |
|---------|--------|
| 155.745 | 287.5 |
| 180 | 287.5 |
| 195.872 | 287.5 |
| 221.852 | 302.5 |
| 231.852 | 302.5 |
| 243.141 | 312.12 |

Material Boundary

| X | Y |
|---------|---------|
| 229.828 | 310.262 |
| 226.354 | 310.715 |
| 225.866 | 310.703 |
| 225.265 | 310.523 |
| 223.056 | 310.334 |
| 220.18 | 310.247 |
| 214.5 | 310.223 |
| 211.649 | 310.195 |

| | |
|---------|---------|
| 208.933 | 310.235 |
| 203.347 | 309.736 |
| 202.205 | 309.583 |
| 202.205 | 307.287 |
| 202.611 | 307.531 |
| 202.83 | 307.649 |
| 203.569 | 307.748 |
| 209.008 | 308.233 |
| 211.644 | 308.195 |
| 214.515 | 308.223 |
| 220.215 | 308.247 |
| 223.171 | 308.337 |
| 225.642 | 308.548 |
| 226.183 | 308.71 |
| 226.248 | 308.712 |
| 229.798 | 308.249 |
| 229.828 | 310.262 |

Material Boundary

| X | Y |
|---------|---------|
| 155.443 | 287.8 |
| 180 | 287.8 |
| 180 | 287.8 |
| 180 | 287.8 |
| 195.791 | 287.8 |
| 221.772 | 302.8 |
| 231.742 | 302.8 |
| 242.696 | 312.134 |

Project Summary

File Name: Estaca 12.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:51:42

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

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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.4 | 0 | 0 | 0.4 |

Global Minimums

Method: bishop simplified

FS: 2.613590
 Center: 124.185, 323.503
 Radius: 35.942
 Left Slip Surface Endpoint: 105.075, 293.062
 Right Slip Surface Endpoint: 155.771, 306.352
 Resisting Moment=68490.8 kN-m
 Driving Moment=26205.6 kN-m
 Total Slice Area=489.576 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.61359

| 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 | 2.12362 | 17.8505 | Dique de solo compactado | 20 | 30 | 10.9094 | 28.5128 | 14.7446 | 0 | 14.7446 |
| 2 | 2.14119 | 39.2386 | Resíduos | 18.2 | 28 | 10.2288 | 26.734 | 23.3802 | 7.33024 | 16.05 |
| 3 | 2.14119 | 67.3008 | Resíduos | 18.2 | 28 | 11.7965 | 30.8313 | 36.3286 | 12.5726 | 23.756 |
| 4 | 2.14119 | 95.4864 | Resíduos | 18.2 | 28 | 13.3355 | 34.8536 | 49.1588 | 17.838 | 31.3208 |
| 5 | 2.14119 | 119.874 | Resíduos | 18.2 | 28 | 14.6116 | 38.1888 | 59.9874 | 22.394 | 37.5934 |
| 6 | 2.14119 | 143.737 | Resíduos | 18.2 | 28 | 15.8309 | 41.3754 | 70.4384 | 26.8518 | 43.5866 |
| 7 | 2.14119 | 157.852 | Resíduos | 18.2 | 28 | 16.4528 | 43.001 | 76.1327 | 29.4886 | 46.6441 |
| 8 | 2.06953 | 164.058 | Interface Solo x GMB Lisa | 3 | 12 | 5.05171 | 13.2031 | 79.7109 | 31.7092 | 48.0017 |
| 9 | 2.06953 | 183.36 | Interface Solo x GMB Lisa | 3 | 12 | 5.48407 | 14.3331 | 88.7579 | 35.44 | 53.3179 |
| 10 | 2.06953 | 190.991 | Interface Solo x GMB Lisa | 3 | 12 | 5.63792 | 14.7352 | 92.1249 | 36.9149 | 55.21 |
| 11 | 2.06953 | 192.303 | Interface Solo x GMB Lisa | 3 | 12 | 5.64228 | 14.7466 | 92.4318 | 37.1684 | 55.2634 |
| 12 | 1.96051 | 179.279 | Resíduos | 18.2 | 28 | 17.6101 | 46.0255 | 88.9101 | 36.578 | 52.3321 |
| 13 | 1.96051 | 183.121 | Resíduos | 18.2 | 28 | 17.6436 | 46.1132 | 89.8591 | 37.362 | 52.4971 |
| 14 | 1.96051 | 191.74 | Resíduos | 18.2 | 28 | 17.9522 | 46.9197 | 93.1344 | 39.1205 | 54.0139 |
| 15 | 1.96051 | 183.814 | Resíduos | 18.2 | 28 | 17.2777 | 45.1568 | 88.2018 | 37.5033 | 50.6985 |
| 16 | 1.96051 | 176.678 | Resíduos | 18.2 | 28 | 16.6534 | 43.5252 | 83.6769 | 36.0473 | 47.6296 |
| 17 | 1.96051 | 178.859 | Resíduos | 18.2 | 28 | 16.5614 | 43.2847 | 83.67 | 36.4924 | 47.1776 |
| 18 | 1.96051 | 180.744 | Resíduos | 18.2 | 28 | 16.4369 | 42.9594 | 83.4428 | 36.877 | 46.5658 |
| 19 | 1.96051 | 178.296 | Resíduos | 18.2 | 28 | 16.0528 | 41.9554 | 81.055 | 36.3774 | 44.6776 |
| 20 | 1.96051 | 165.305 | Resíduos | 18.2 | 28 | 15.077 | 39.4052 | 73.6083 | 33.727 | 39.8813 |
| 21 | 1.96051 | 145.656 | Resíduos | 18.2 | 28 | 13.7421 | 35.9163 | 63.0376 | 29.7179 | 33.3197 |

| | | | | | | | | | | |
|----|---------|---------|----------|------|----|---------|---------|----------|---------|----------|
| 22 | 1.96051 | 123.365 | Resíduos | 18.2 | 28 | 12.2748 | 32.0814 | 51.2773 | 25.1701 | 26.1072 |
| 23 | 1.96051 | 95.6093 | Resíduos | 18.2 | 28 | 10.5366 | 27.5383 | 37.0699 | 19.507 | 17.5629 |
| 24 | 1.96051 | 61.2367 | Resíduos | 18.2 | 28 | 8.49082 | 22.1915 | 20.001 | 12.494 | 7.507 |
| 25 | 1.96051 | 21.6139 | Resíduos | 18.2 | 28 | 6.23811 | 16.3039 | 0.843737 | 4.40985 | -3.56611 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.61359

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 105.075 | 293.062 | 0 | 0 | 0 |
| 2 | 107.198 | 291.828 | 41.3606 | 0 | 0 |
| 3 | 109.34 | 290.77 | 88.0011 | 0 | 0 |
| 4 | 111.481 | 289.881 | 145.552 | 0 | 0 |
| 5 | 113.622 | 289.148 | 210.129 | 0 | 0 |
| 6 | 115.763 | 288.561 | 276.6 | 0 | 0 |
| 7 | 117.904 | 288.114 | 342.021 | 0 | 0 |
| 8 | 120.046 | 287.8 | 401.137 | 0 | 0 |
| 9 | 122.115 | 287.621 | 425.898 | 0 | 0 |
| 10 | 124.185 | 287.561 | 442.539 | 0 | 0 |
| 11 | 126.254 | 287.621 | 448.712 | 0 | 0 |
| 12 | 128.324 | 287.8 | 443.798 | 0 | 0 |
| 13 | 130.284 | 288.082 | 453.226 | 0 | 0 |
| 14 | 132.245 | 288.476 | 452.405 | 0 | 0 |
| 15 | 134.205 | 288.986 | 440.125 | 0 | 0 |
| 16 | 136.166 | 289.617 | 418.377 | 0 | 0 |
| 17 | 138.126 | 290.375 | 387.565 | 0 | 0 |
| 18 | 140.087 | 291.27 | 345.133 | 0 | 0 |
| 19 | 142.047 | 292.314 | 290.263 | 0 | 0 |
| 20 | 144.008 | 293.522 | 223.833 | 0 | 0 |
| 21 | 145.968 | 294.914 | 150.875 | 0 | 0 |
| 22 | 147.929 | 296.52 | 76.5656 | 0 | 0 |
| 23 | 149.889 | 298.381 | 5.22354 | 0 | 0 |
| 24 | 151.85 | 300.558 | -54.8137 | 0 | 0 |
| 25 | 153.81 | 303.152 | -90.055 | 0 | 0 |
| 26 | 155.771 | 306.352 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---------|---------|
| 187.103 | 310.291 |
| 185.797 | 310.138 |
| 182.091 | 309.703 |
| 181.269 | 309.66 |
| 180.872 | 309.595 |
| 180.48 | 309.36 |
| 179.014 | 308.728 |
| 174.909 | 307.001 |

| | |
|---------|---------|
| 174.43 | 307.233 |
| 174.315 | 307.289 |
| 174.072 | 307.317 |
| 173.903 | 307.337 |
| 173.409 | 307.312 |
| 168.07 | 307 |
| 166.169 | 306.858 |
| 163.358 | 306.628 |
| 160.218 | 306.46 |
| 157.822 | 306.404 |
| 154.59 | 306.322 |
| 153.219 | 306.286 |
| 151.208 | 306.407 |
| 150.038 | 306.503 |
| 146.147 | 306.285 |
| 145.018 | 306.324 |
| 143.294 | 305.975 |
| 142.657 | 305.899 |
| 139.778 | 304.203 |
| 136.62 | 302.563 |
| 135.681 | 302.683 |
| 135 | 302.707 |
| 133.029 | 302.777 |
| 132.656 | 302.667 |
| 131.752 | 302.073 |
| 130.644 | 301.021 |
| 128.69 | 300.99 |
| 128.4 | 301.03 |
| 127.341 | 300.972 |
| 124.858 | 300.635 |
| 123.656 | 300.48 |
| 119.814 | 298.267 |
| 118.42 | 298.698 |
| 115.396 | 297.229 |
| 112.769 | 295.829 |
| 112.019 | 295.857 |
| 110.248 | 294.643 |
| 105.958 | 293.069 |
| 103.743 | 293.052 |
| 96.7099 | 287.5 |
| 94.8995 | 286.071 |
| 94.4235 | 285.661 |
| 91.6161 | 282.921 |
| 90.6881 | 282.981 |
| 85.785 | 282.919 |
| 83.8583 | 281.718 |
| 81.7346 | 280.891 |
| 78.9107 | 280.708 |
| 72.9457 | 280.246 |
| 72.8567 | 280.258 |
| 72.8567 | 280 |
| 194.289 | 280 |

| | |
|---------|--------|
| 194.289 | 311.27 |
|---------|--------|

Material Boundary

| X | Y |
|---------|---------|
| 96.7099 | 287.5 |
| 111.526 | 287.5 |
| 135 | 287.5 |
| 151.949 | 287.5 |
| 174.43 | 307.233 |

Material Boundary

| X | Y |
|---------|---------|
| 105.958 | 293.069 |
| 111.226 | 287.8 |
| 111.526 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 111.226 | 287.8 |
| 135 | 287.8 |
| 135 | 287.8 |
| 135 | 287.8 |
| 151.836 | 287.8 |
| 174.072 | 307.317 |

Project Summary

File Name: Estaca 13.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:55:31

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

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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.45 | 0 | 0 | 0.45 |

Global Minimums

Method: bishop simplified

FS: 4.166130
 Center: 90.576, 306.041
 Radius: 18.525
 Left Slip Surface Endpoint: 77.484, 292.935
 Right Slip Surface Endpoint: 108.249, 300.487
 Resisting Moment=19573.7 kN-m
 Driving Moment=4698.28 kN-m
 Total Slice Area=241.122 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 4.16613

| 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 | 1.32929 | 11.3712 | Dique de solo compactado | 20 | 30 | 6.84609 | 28.5217 | 14.76 | 0 | 14.76 |
| 2 | 1.32929 | 27.7052 | Dique de solo compactado | 20 | 30 | 8.57993 | 35.7451 | 27.2714 | 0 | 27.2714 |
| 3 | 1.20077 | 37.8667 | Resíduos | 18.2 | 28 | 7.15463 | 29.8071 | 36.0206 | 14.1909 | 21.8297 |
| 4 | 1.20077 | 50.9856 | Resíduos | 18.2 | 28 | 7.87909 | 32.8253 | 46.6135 | 19.1073 | 27.5062 |
| 5 | 1.20077 | 61.6838 | Resíduos | 18.2 | 28 | 8.44693 | 35.191 | 55.072 | 23.1166 | 31.9554 |
| 6 | 1.20077 | 67.323 | Resíduos | 18.2 | 28 | 8.70098 | 36.2494 | 59.1759 | 25.2299 | 33.946 |
| 7 | 1.20077 | 73.1733 | Resíduos | 18.2 | 28 | 8.96926 | 37.3671 | 63.4704 | 27.4223 | 36.0481 |
| 8 | 1.20077 | 77.5509 | Resíduos | 18.2 | 28 | 9.14885 | 38.1153 | 66.5182 | 29.0629 | 37.4553 |
| 9 | 1.29169 | 87.8282 | Interface Solo x GMB Lisa | 3 | 12 | 2.64713 | 11.0283 | 68.3679 | 30.5977 | 37.7702 |
| 10 | 1.29169 | 91.2682 | Interface Solo x GMB Lisa | 3 | 12 | 2.71251 | 11.3007 | 70.8478 | 31.7961 | 39.0517 |
| 11 | 1.29169 | 92.0801 | Interface Solo x GMB Lisa | 3 | 12 | 2.72047 | 11.3338 | 71.2866 | 32.079 | 39.2076 |
| 12 | 1.29169 | 92.8985 | Interface Solo x GMB Lisa | 3 | 12 | 2.72852 | 11.3674 | 71.7293 | 32.3641 | 39.3652 |
| 13 | 1.29169 | 96.844 | Interface Solo x GMB Lisa | 3 | 12 | 2.80381 | 11.681 | 74.5797 | 33.7386 | 40.8411 |
| 14 | 1.20363 | 92.952 | Resíduos | 18.2 | 28 | 9.5322 | 39.7124 | 75.2109 | 34.752 | 40.4589 |
| 15 | 1.20363 | 94.7082 | Resíduos | 18.2 | 28 | 9.54759 | 39.7765 | 75.9882 | 35.4086 | 40.5796 |
| 16 | 1.20363 | 95.3611 | Resíduos | 18.2 | 28 | 9.49627 | 39.5627 | 75.8302 | 35.6527 | 40.1775 |
| 17 | 1.20363 | 91.4546 | Resíduos | 18.2 | 28 | 9.18745 | 38.2761 | 71.9498 | 34.1922 | 37.7576 |
| 18 | 1.20363 | 85.6841 | Resíduos | 18.2 | 28 | 8.77426 | 36.5547 | 66.5549 | 32.0348 | 34.5201 |
| 19 | 1.20363 | 78.5693 | Resíduos | 18.2 | 28 | 8.2862 | 34.5214 | 60.0709 | 29.3747 | 30.6962 |
| 20 | 1.20363 | 72.004 | Resíduos | 18.2 | 28 | 7.8245 | 32.5979 | 53.9987 | 26.9202 | 27.0785 |
| 21 | 1.20363 | 66.3006 | Resíduos | 18.2 | 28 | 7.40051 | 30.8315 | 48.5442 | 24.7878 | 23.7564 |

| | | | | | | | | | | |
|----|---------|---------|----------|------|----|---------|---------|----------|---------|----------|
| 22 | 1.20363 | 59.037 | Resíduos | 18.2 | 28 | 6.8808 | 28.6663 | 41.7564 | 22.0722 | 19.6842 |
| 23 | 1.20363 | 48.5053 | Resíduos | 18.2 | 28 | 6.17307 | 25.7178 | 32.2736 | 18.1347 | 14.1389 |
| 24 | 1.20363 | 33.3023 | Resíduos | 18.2 | 28 | 5.20088 | 21.6675 | 18.9722 | 12.4507 | 6.52151 |
| 25 | 1.20363 | 12.3828 | Resíduos | 18.2 | 28 | 3.88489 | 16.185 | 0.839843 | 4.62957 | -3.78973 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 4.16613

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 77.4837 | 292.935 | 0 | 0 | 0 |
| 2 | 78.813 | 291.73 | 26.8867 | 0 | 0 |
| 3 | 80.1423 | 290.734 | 65.4587 | 0 | 0 |
| 4 | 81.3431 | 289.981 | 101.167 | 0 | 0 |
| 5 | 82.5439 | 289.348 | 140.132 | 0 | 0 |
| 6 | 83.7446 | 288.822 | 179.258 | 0 | 0 |
| 7 | 84.9454 | 288.393 | 215.101 | 0 | 0 |
| 8 | 86.1462 | 288.054 | 247.386 | 0 | 0 |
| 9 | 87.347 | 287.8 | 275.257 | 0 | 0 |
| 10 | 88.6386 | 287.618 | 291.12 | 0 | 0 |
| 11 | 89.9303 | 287.528 | 301.024 | 0 | 0 |
| 12 | 91.222 | 287.528 | 304.537 | 0 | 0 |
| 13 | 92.5137 | 287.618 | 301.581 | 0 | 0 |
| 14 | 93.8054 | 287.8 | 291.627 | 0 | 0 |
| 15 | 95.009 | 288.055 | 283.953 | 0 | 0 |
| 16 | 96.2127 | 288.395 | 269.599 | 0 | 0 |
| 17 | 97.4163 | 288.825 | 248.364 | 0 | 0 |
| 18 | 98.6199 | 289.354 | 221.403 | 0 | 0 |
| 19 | 99.8235 | 289.99 | 189.654 | 0 | 0 |
| 20 | 101.027 | 290.746 | 154.193 | 0 | 0 |
| 21 | 102.231 | 291.642 | 115.227 | 0 | 0 |
| 22 | 103.434 | 292.706 | 72.4931 | 0 | 0 |
| 23 | 104.638 | 293.981 | 27.4985 | 0 | 0 |
| 24 | 105.842 | 295.547 | -15.5815 | 0 | 0 |
| 25 | 107.045 | 297.559 | -47.509 | 0 | 0 |
| 26 | 108.249 | 300.487 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---------|---------|
| 139.311 | 303.109 |
| 129.361 | 299.015 |
| 128.875 | 298.816 |
| 128.793 | 298.782 |
| 128.679 | 298.759 |
| 128.465 | 298.769 |
| 125.257 | 298.937 |
| 123.889 | 298.987 |

| | |
|---------|---------|
| 118.408 | 299.133 |
| 116.627 | 299.368 |
| 116.047 | 299.423 |
| 112.441 | 299.85 |
| 111.256 | 300.016 |
| 108.948 | 300.48 |
| 106.555 | 300.503 |
| 105 | 300.525 |
| 104.735 | 300.529 |
| 101.236 | 299.635 |
| 100.69 | 299.638 |
| 99.8345 | 299.789 |
| 96.9646 | 300.034 |
| 93.7106 | 298.667 |
| 91.6673 | 297.607 |
| 89.0446 | 297.578 |
| 85.1764 | 296.863 |
| 83.8224 | 296.461 |
| 83.0337 | 296.507 |
| 81.1364 | 295.156 |
| 78.0283 | 292.848 |
| 76.7523 | 293.053 |
| 74.9026 | 293.241 |
| 70.0595 | 289.57 |
| 67.3478 | 287.5 |
| 67.0786 | 287.294 |
| 66.1457 | 286.091 |
| 65.5719 | 285.261 |
| 63.8937 | 285.385 |
| 59.5492 | 285.894 |
| 59.5492 | 280 |
| 155.288 | 280 |
| 155.288 | 309.955 |

Material Boundary

| X | Y |
|---------|---------|
| 67.3478 | 287.5 |
| 83.3765 | 287.5 |
| 105 | 287.5 |
| 121.949 | 287.5 |
| 129.361 | 299.015 |

Material Boundary

| X | Y |
|---------|---------|
| 78.0283 | 292.848 |
| 83.0765 | 287.8 |
| 83.3765 | 287.5 |

Material Boundary

| X | Y |
|---|---|
|---|---|

| | |
|---------|---------|
| 83.0765 | 287.8 |
| 105 | 287.8 |
| 105 | 287.8 |
| 105.001 | 287.8 |
| 121.785 | 287.8 |
| 128.875 | 298.816 |

Project Summary

File Name: Estaca 14.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 17:01:38

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 malpha < 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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.36 | 0 | 0 | 0.36 |

Global Minimums

Method: bishop simplified

FS: 6.630200
 Center: 112.612, 301.839
 Radius: 9.765
 Left Slip Surface Endpoint: 108.811, 292.844
 Right Slip Surface Endpoint: 120.980, 296.805
 Resisting Moment=3139.84 kN-m
 Driving Moment=473.566 kN-m
 Total Slice Area=29.2546 m2

Method: janbu simplified

FS: 6.076760
 Center: 113.438, 301.051
 Radius: 9.551
 Left Slip Surface Endpoint: 108.418, 292.926
 Right Slip Surface Endpoint: 121.911, 296.642
 Resisting Horizontal Force=334.855 kN
 Driving Horizontal Force=55.1043 kN
 Total Slice Area=39.3633 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 6.6302

| 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 | 0.164569 | 0.0498982 | Dique de solo compactado | 20 | 30 | 3.15607 | 20.9254 | 1.60279 | 0 | 1.60279 |
| 2 | 0.500203 | 1.29313 | Resíduos | 18.2 | 28 | 2.96565 | 19.6628 | 3.68189 | 0.930672 | 2.75122 |
| 3 | 0.500203 | 3.29485 | Resíduos | 18.2 | 28 | 3.16155 | 20.9617 | 7.56532 | 2.37133 | 5.19399 |
| 4 | 0.500203 | 5.1934 | Resíduos | 18.2 | 28 | 3.34551 | 22.1814 | 11.2257 | 3.73773 | 7.48798 |
| 5 | 0.500203 | 6.99333 | Resíduos | 18.2 | 28 | 3.51813 | 23.3259 | 14.6735 | 5.03315 | 9.64039 |
| 6 | 0.500203 | 8.65477 | Resíduos | 18.2 | 28 | 3.67532 | 24.3681 | 17.8295 | 6.22891 | 11.6006 |
| 7 | 0.500203 | 10.1682 | Resíduos | 18.2 | 28 | 3.81623 | 25.3023 | 20.6757 | 7.31812 | 13.3576 |
| 8 | 0.500203 | 11.5621 | Resíduos | 18.2 | 28 | 3.94388 | 26.1487 | 23.2708 | 8.32137 | 14.9494 |
| 9 | 0.500203 | 12.072 | Resíduos | 18.2 | 28 | 3.97996 | 26.3879 | 24.0876 | 8.68833 | 15.3992 |
| 10 | 0.500203 | 12.1305 | Resíduos | 18.2 | 28 | 3.96962 | 26.3194 | 24.0007 | 8.7304 | 15.2703 |
| 11 | 0.500203 | 12.0985 | Resíduos | 18.2 | 28 | 3.95001 | 26.1894 | 23.7331 | 8.70741 | 15.0257 |

| | | | | | | | | | | |
|----|----------|---------|----------|------|----|---------|---------|-----------|---------|----------|
| 12 | 0.500203 | 11.9749 | Resíduos | 18.2 | 28 | 3.921 | 25.997 | 23.2824 | 8.61845 | 14.664 |
| 13 | 0.500203 | 11.7576 | Resíduos | 18.2 | 28 | 3.88235 | 25.7408 | 22.6442 | 8.46205 | 14.1822 |
| 14 | 0.500203 | 11.4359 | Resíduos | 18.2 | 28 | 3.83297 | 25.4134 | 21.797 | 8.23054 | 13.5664 |
| 15 | 0.500203 | 10.9771 | Resíduos | 18.2 | 28 | 3.76958 | 24.993 | 20.6761 | 7.90034 | 12.7758 |
| 16 | 0.500203 | 10.408 | Resíduos | 18.2 | 28 | 3.69483 | 24.4974 | 19.3345 | 7.49069 | 11.8438 |
| 17 | 0.500203 | 9.72646 | Resíduos | 18.2 | 28 | 3.60849 | 23.925 | 17.7674 | 7.00021 | 10.7672 |
| 18 | 0.500203 | 8.92416 | Resíduos | 18.2 | 28 | 3.50968 | 23.2699 | 15.9579 | 6.42279 | 9.53506 |
| 19 | 0.500203 | 8.40692 | Resíduos | 18.2 | 28 | 3.43798 | 22.7945 | 14.6915 | 6.05053 | 8.64097 |
| 20 | 0.500203 | 8.57771 | Resíduos | 18.2 | 28 | 3.43158 | 22.7521 | 14.7346 | 6.17344 | 8.56119 |
| 21 | 0.500203 | 8.60646 | Resíduos | 18.2 | 28 | 3.40834 | 22.598 | 14.4655 | 6.19414 | 8.27134 |
| 22 | 0.500203 | 8.33207 | Resíduos | 18.2 | 28 | 3.35206 | 22.2248 | 13.5663 | 5.99666 | 7.56961 |
| 23 | 0.500203 | 6.51791 | Resíduos | 18.2 | 28 | 3.14501 | 20.852 | 9.67873 | 4.69099 | 4.98774 |
| 24 | 0.500203 | 4.18313 | Resíduos | 18.2 | 28 | 2.88524 | 19.1297 | 4.75923 | 3.01063 | 1.7486 |
| 25 | 0.500203 | 1.46774 | Resíduos | 18.2 | 28 | 2.58465 | 17.1368 | -0.943308 | 1.05635 | -1.99966 |

Global Minimum Query (janbu simplified) - Safety Factor: 6.07676

| 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 | 0.448776 | 0.710274 | Dique de solo compactado | 20 | 30 | 3.64253 | 22.1348 | 3.69759 | 0 | 3.69759 |
| 2 | 0.448776 | 1.82305 | Dique de solo compactado | 20 | 30 | 3.86486 | 23.4858 | 6.03766 | 0 | 6.03766 |
| 3 | 0.54762 | 3.94687 | Resíduos | 18.2 | 28 | 3.53482 | 21.4802 | 8.76385 | 2.59463 | 6.16922 |
| 4 | 0.54762 | 6.48225 | Resíduos | 18.2 | 28 | 3.77971 | 22.9684 | 13.2294 | 4.26136 | 8.96804 |
| 5 | 0.54762 | 8.87138 | Resíduos | 18.2 | 28 | 4.00778 | 24.3543 | 17.4066 | 5.83195 | 11.5746 |
| 6 | 0.54762 | 11.074 | Resíduos | 18.2 | 28 | 4.21499 | 25.6135 | 21.2226 | 7.27994 | 13.9427 |
| 7 | 0.54762 | 13.0765 | Resíduos | 18.2 | 28 | 4.40009 | 26.7383 | 24.6545 | 8.59636 | 16.0581 |
| 8 | 0.54762 | 14.8231 | Resíduos | 18.2 | 28 | 4.55751 | 27.6949 | 27.602 | 9.74455 | 17.8574 |
| 9 | 0.54762 | 15.39 | Resíduos | 18.2 | 28 | 4.59253 | 27.9077 | 28.3749 | 10.1172 | 18.2577 |
| 10 | 0.54762 | 15.6024 | Resíduos | 18.2 | 28 | 4.59118 | 27.8995 | 28.4989 | 10.2569 | 18.242 |
| 11 | 0.54762 | 15.6942 | Resíduos | 18.2 | 28 | 4.57757 | 27.8168 | 28.4038 | 10.3172 | 18.0866 |
| 12 | 0.54762 | 15.6649 | Resíduos | 18.2 | 28 | 4.5516 | 27.659 | 28.0878 | 10.2979 | 17.7899 |
| 13 | 0.54762 | 15.5105 | Resíduos | 18.2 | 28 | 4.51286 | 27.4236 | 27.5435 | 10.1965 | 17.347 |
| 14 | 0.54762 | 15.1894 | Resíduos | 18.2 | 28 | 4.4571 | 27.0847 | 26.6951 | 9.98537 | 16.7098 |
| 15 | 0.54762 | 14.7215 | Resíduos | 18.2 | 28 | 4.38631 | 26.6546 | 25.5786 | 9.67776 | 15.9008 |
| 16 | 0.54762 | 14.1165 | Resíduos | 18.2 | 28 | 4.30142 | 26.1387 | 24.2105 | 9.28002 | 14.9305 |
| 17 | 0.54762 | 13.3658 | Resíduos | 18.2 | 28 | 4.20149 | 25.5315 | 22.5749 | 8.78651 | 13.7884 |
| 18 | 0.54762 | 13.102 | Resíduos | 18.2 | 28 | 4.1483 | 25.2082 | 21.7937 | 8.61314 | 13.1806 |
| 19 | 0.54762 | 13.5445 | Resíduos | 18.2 | 28 | 4.16162 | 25.2891 | 22.2367 | 8.90398 | 13.3327 |
| 20 | 0.54762 | 13.8185 | Resíduos | 18.2 | 28 | 4.15469 | 25.2471 | 22.3378 | 9.08413 | 13.2537 |
| 21 | 0.54762 | 13.1733 | Resíduos | 18.2 | 28 | 4.05486 | 24.6404 | 20.7726 | 8.66001 | 12.1126 |
| 22 | 0.54762 | 10.9724 | Resíduos | 18.2 | 28 | 3.80273 | 23.1083 | 16.4443 | 7.21313 | 9.23113 |
| 23 | 0.54762 | 8.44215 | Resíduos | 18.2 | 28 | 3.51558 | 21.3634 | 11.4992 | 5.54978 | 5.94939 |
| 24 | 0.54762 | 5.49487 | Resíduos | 18.2 | 28 | 3.18321 | 19.3436 | 5.76309 | 3.61227 | 2.15082 |
| 25 | 0.54762 | 1.95086 | Resíduos | 18.2 | 28 | 2.78461 | 16.9214 | -1.12222 | 1.28248 | -2.4047 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 6.6302

| Slice | X coordinate | Y coordinate - Bottom | Interslice Normal Force | Interslice Shear Force | Interslice Force Angle |
|-------|--------------|-----------------------|-------------------------|------------------------|------------------------|
|-------|--------------|-----------------------|-------------------------|------------------------|------------------------|

| | [m] | [m] | [kN] | [kN] | [degrees] |
|----|---------|---------|----------|------|-----------|
| 1 | 108.811 | 292.844 | 0 | 0 | 0 |
| 2 | 108.975 | 292.776 | 0.627871 | 0 | 0 |
| 3 | 109.476 | 292.591 | 2.79208 | 0 | 0 |
| 4 | 109.976 | 292.436 | 5.54433 | 0 | 0 |
| 5 | 110.476 | 292.31 | 8.63281 | 0 | 0 |
| 6 | 110.976 | 292.212 | 11.8374 | 0 | 0 |
| 7 | 111.476 | 292.14 | 14.9543 | 0 | 0 |
| 8 | 111.977 | 292.094 | 17.8048 | 0 | 0 |
| 9 | 112.477 | 292.075 | 20.237 | 0 | 0 |
| 10 | 112.977 | 292.08 | 22.0856 | 0 | 0 |
| 11 | 113.477 | 292.112 | 23.3129 | 0 | 0 |
| 12 | 113.978 | 292.169 | 23.9232 | 0 | 0 |
| 13 | 114.478 | 292.253 | 23.9299 | 0 | 0 |
| 14 | 114.978 | 292.364 | 23.357 | 0 | 0 |
| 15 | 115.478 | 292.504 | 22.2414 | 0 | 0 |
| 16 | 115.978 | 292.672 | 20.643 | 0 | 0 |
| 17 | 116.479 | 292.871 | 18.6337 | 0 | 0 |
| 18 | 116.979 | 293.104 | 16.305 | 0 | 0 |
| 19 | 117.479 | 293.373 | 13.7755 | 0 | 0 |
| 20 | 117.979 | 293.68 | 10.9712 | 0 | 0 |
| 21 | 118.479 | 294.032 | 7.50101 | 0 | 0 |
| 22 | 118.98 | 294.435 | 3.3856 | 0 | 0 |
| 23 | 119.48 | 294.896 | -1.19793 | 0 | 0 |
| 24 | 119.98 | 295.429 | -4.78664 | 0 | 0 |
| 25 | 120.48 | 296.054 | -6.3182 | 0 | 0 |
| 26 | 120.98 | 296.805 | 0 | 0 | 0 |

Global Minimum Query (janbu simplified) - Safety Factor: 6.07676

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 108.418 | 292.926 | 0 | 0 | 0 |
| 2 | 108.867 | 292.666 | 2.59776 | 0 | 0 |
| 3 | 109.316 | 292.436 | 5.71689 | 0 | 0 |
| 4 | 109.863 | 292.195 | 9.76606 | 0 | 0 |
| 5 | 110.411 | 291.993 | 14.5049 | 0 | 0 |
| 6 | 110.958 | 291.828 | 19.5701 | 0 | 0 |
| 7 | 111.506 | 291.698 | 24.6374 | 0 | 0 |
| 8 | 112.054 | 291.601 | 29.4275 | 0 | 0 |
| 9 | 112.601 | 291.537 | 33.6929 | 0 | 0 |
| 10 | 113.149 | 291.505 | 37.1249 | 0 | 0 |
| 11 | 113.696 | 291.504 | 39.6635 | 0 | 0 |
| 12 | 114.244 | 291.534 | 41.301 | 0 | 0 |
| 13 | 114.792 | 291.597 | 42.0417 | 0 | 0 |
| 14 | 115.339 | 291.691 | 41.9029 | 0 | 0 |
| 15 | 115.887 | 291.82 | 40.9223 | 0 | 0 |
| 16 | 116.435 | 291.982 | 39.1557 | 0 | 0 |
| 17 | 116.982 | 292.182 | 36.6763 | 0 | 0 |
| 18 | 117.53 | 292.421 | 33.582 | 0 | 0 |
| 19 | 118.077 | 292.703 | 29.7159 | 0 | 0 |
| 20 | 118.625 | 293.031 | 24.6841 | 0 | 0 |
| 21 | 119.173 | 293.413 | 18.4264 | 0 | 0 |

| | | | | | |
|----|---------|---------|------------|---|---|
| 22 | 119.72 | 293.857 | 11.4303 | 0 | 0 |
| 23 | 120.268 | 294.374 | 4.99987 | 0 | 0 |
| 24 | 120.816 | 294.985 | -0.0961973 | 0 | 0 |
| 25 | 121.363 | 295.72 | -2.591 | 0 | 0 |
| 26 | 121.911 | 296.642 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---------|---------|
| 154.284 | 295.42 |
| 153.871 | 295.151 |
| 153.191 | 294.677 |
| 152.767 | 294.431 |
| 151.261 | 294.617 |
| 150.809 | 294.673 |
| 150.446 | 294.718 |
| 144.584 | 295.451 |
| 144.372 | 295.429 |
| 144.264 | 295.459 |
| 143.934 | 295.527 |
| 139.319 | 295.848 |
| 137.351 | 295.959 |
| 136.376 | 296.16 |
| 135 | 296.201 |
| 130.336 | 296.338 |
| 130.1 | 296.354 |
| 129.358 | 296.358 |
| 125.854 | 296.761 |
| 124.635 | 296.402 |
| 122.832 | 296.448 |
| 122.138 | 296.602 |
| 119.221 | 297.114 |
| 119.01 | 296.908 |
| 117.575 | 295.802 |
| 115.197 | 295.7 |
| 112.368 | 295.5 |
| 111.008 | 294.485 |
| 108.933 | 292.818 |
| 105.775 | 293.481 |
| 105.625 | 293.511 |
| 105.587 | 293.518 |
| 105.464 | 293.425 |
| 105.411 | 293.372 |
| 104.883 | 292.972 |
| 99.2639 | 288.519 |
| 98.8636 | 288.002 |
| 98.395 | 287.5 |
| 97.9688 | 287.043 |
| 96.5501 | 287.22 |
| 94.8124 | 287.374 |

| | |
|---------|---------|
| 94.1691 | 287.402 |
| 92.406 | 287.608 |
| 92.406 | 280 |
| 154.579 | 280 |
| 154.579 | 295.573 |

Material Boundary

| X | Y |
|---------|---------|
| 98.395 | 287.5 |
| 114.252 | 287.5 |
| 135 | 287.5 |
| 140.762 | 287.5 |
| 151.261 | 294.617 |

Material Boundary

| X | Y |
|---------|---------|
| 108.933 | 292.818 |
| 113.952 | 287.8 |
| 114.252 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 113.952 | 287.8 |
| 135 | 287.8 |
| 135 | 287.8 |
| 135 | 287.8 |
| 140.67 | 287.8 |
| 150.809 | 294.673 |

Project Summary

File Name: Section.02.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 20/05/2020, 13:33:36

General Settings

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

Analysis Options

Analysis Methods Used

Bishop 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: Create Tension Crack
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Material de enchente | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|---|
| Color |  |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 5 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 10 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 20 | 12 |
| Water Surface | None | None | None | None | None |
| Ru Value | 0.42 | 0 | 0 | 0.42 | 0.42 |

Support Properties

Support 1

Support Type: End Anchored
Force Application: Active
Out-of-Plane Spacing: 1 m
Anchor Capacity: 100 kN

Global Minimums

Method: bishop simplified

FS: 2.124790
Center: 183.351, 348.735
Radius: 48.711
Left Slip Surface Endpoint: 141.302, 324.146
Right Slip Surface Endpoint: 205.684, 305.446
Resisting Moment=119252 kN-m
Driving Moment=56124 kN-m
Total Slice Area=690.485 m2

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.12479

| 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 | 1.2576 | 8.80635 | Resíduos | 18.2 | 28 | 6.82124 | 14.4937 | -4.02948 | 2.94104 | -6.97052 |
| 2 | 1.40541 | 26.7123 | Material de enchente | 10 | 20 | 5.28261 | 11.2244 | 11.3469 | 7.98282 | 3.36412 |
| 3 | 2.63157 | 93.0168 | Resíduos | 18.2 | 28 | 10.4212 | 22.1429 | 22.2611 | 14.8455 | 7.41557 |
| 4 | 2.63157 | 155.747 | Resíduos | 18.2 | 28 | 13.5535 | 28.7984 | 44.7901 | 24.8572 | 19.9329 |
| 5 | 2.63157 | 196.294 | Resíduos | 18.2 | 28 | 15.7882 | 33.5466 | 60.1913 | 31.3286 | 28.8627 |
| 6 | 2.63157 | 228.344 | Resíduos | 18.2 | 28 | 17.6678 | 37.5403 | 72.8177 | 36.4438 | 36.3739 |
| 7 | 2.63157 | 239.067 | Resíduos | 18.2 | 28 | 18.564 | 39.4446 | 78.1105 | 38.1552 | 39.9553 |
| 8 | 2.63157 | 252.541 | Resíduos | 18.2 | 28 | 19.5769 | 41.5968 | 84.3085 | 40.3056 | 44.0029 |
| 9 | 2.63157 | 267.123 | Resíduos | 18.2 | 28 | 20.6404 | 43.8565 | 90.8858 | 42.633 | 48.2528 |
| 10 | 2.63157 | 268.639 | Resíduos | 18.2 | 28 | 21.058 | 44.7438 | 92.7964 | 42.8749 | 49.9215 |
| 11 | 2.63157 | 271.595 | Resíduos | 18.2 | 28 | 21.535 | 45.7573 | 95.1743 | 43.3466 | 51.8277 |
| 12 | 2.63157 | 281.161 | Resíduos | 18.2 | 28 | 22.3436 | 47.4755 | 99.9328 | 44.8734 | 55.0594 |
| 13 | 2.63157 | 287.653 | Resíduos | 18.2 | 28 | 22.9991 | 48.8683 | 103.588 | 45.9095 | 57.6785 |
| 14 | 2.63157 | 286.596 | Resíduos | 18.2 | 28 | 23.2622 | 49.4272 | 104.471 | 45.7409 | 58.7297 |

| | | | | | | | | | | |
|----|---------|---------|---------------------------|------|----|---------|---------|---------|---------|---------|
| 15 | 2.63157 | 275.754 | Resíduos | 18.2 | 28 | 23.0002 | 48.8707 | 101.693 | 44.0105 | 57.683 |
| 16 | 2.58761 | 254.829 | Interface Solo x GMB Lisa | 3 | 12 | 7.06931 | 15.0208 | 97.915 | 41.3616 | 56.5534 |
| 17 | 2.58761 | 246.415 | Interface Solo x GMB Lisa | 3 | 12 | 6.9188 | 14.701 | 95.0447 | 39.9961 | 55.0486 |
| 18 | 2.58761 | 235.708 | Interface Solo x GMB Lisa | 3 | 12 | 6.71497 | 14.2679 | 91.2692 | 38.2581 | 53.0111 |
| 19 | 2.58761 | 210.863 | Interface Solo x GMB Lisa | 3 | 12 | 6.18951 | 13.1514 | 81.9843 | 34.2255 | 47.7588 |
| 20 | 2.9929 | 215.56 | Resíduos | 18.2 | 28 | 19.701 | 41.8604 | 74.7488 | 30.25 | 44.4988 |
| 21 | 2.9929 | 193.823 | Resíduos | 18.2 | 28 | 18.9239 | 40.2094 | 68.5933 | 27.1997 | 41.3936 |
| 22 | 2.9929 | 155.711 | Resíduos | 18.2 | 28 | 17.2809 | 36.7182 | 56.6789 | 21.8513 | 34.8276 |
| 23 | 2.9929 | 104.813 | Resíduos | 18.2 | 28 | 14.9154 | 31.692 | 40.0834 | 14.7087 | 25.3747 |
| 24 | 2.9929 | 57.2256 | Resíduos | 18.2 | 28 | 12.6531 | 26.8851 | 24.365 | 8.0306 | 16.3344 |
| 25 | 2.19314 | 21.4499 | Dique de solo compactado | 20 | 30 | 13.9004 | 29.5354 | 16.5158 | 0 | 16.5158 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 2.12479

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 141.302 | 324.146 | 0 | 0 | 0 |
| 2 | 142.56 | 322.111 | -16.774 | 0 | 0 |
| 3 | 143.965 | 320.073 | -1.07024 | 0 | 0 |
| 4 | 146.597 | 316.768 | 45.0786 | 0 | 0 |
| 5 | 149.229 | 313.973 | 134.612 | 0 | 0 |
| 6 | 151.86 | 311.572 | 237.569 | 0 | 0 |
| 7 | 154.492 | 309.494 | 342.444 | 0 | 0 |
| 8 | 157.123 | 307.688 | 434.633 | 0 | 0 |
| 9 | 159.755 | 306.121 | 515.254 | 0 | 0 |
| 10 | 162.386 | 304.767 | 584.039 | 0 | 0 |
| 11 | 165.018 | 303.606 | 636.34 | 0 | 0 |
| 12 | 167.65 | 302.624 | 673.105 | 0 | 0 |
| 13 | 170.281 | 301.81 | 695.642 | 0 | 0 |
| 14 | 172.913 | 301.156 | 702.938 | 0 | 0 |
| 15 | 175.544 | 300.654 | 694.167 | 0 | 0 |
| 16 | 178.176 | 300.3 | 669.645 | 0 | 0 |
| 17 | 180.764 | 300.093 | 671.616 | 0 | 0 |
| 18 | 183.351 | 300.024 | 660.252 | 0 | 0 |
| 19 | 185.939 | 300.093 | 636.602 | 0 | 0 |
| 20 | 188.526 | 300.3 | 603.624 | 0 | 0 |
| 21 | 191.519 | 300.714 | 513.722 | 0 | 0 |
| 22 | 194.512 | 301.32 | 415.514 | 0 | 0 |
| 23 | 197.505 | 302.126 | 318.13 | 0 | 0 |
| 24 | 200.498 | 303.142 | 232.771 | 0 | 0 |
| 25 | 203.491 | 304.383 | 164.678 | 0 | 0 |
| 26 | 205.684 | 305.446 | 0 | 0 | 0 |

List Of Coordinates

External Boundary

| X | Y |
|---|---|
| | |

| | |
|---------|-----|
| 782.638 | 413 |
| 774.228 | 412 |
| 768.818 | 411 |
| 763.41 | 410 |
| 757.942 | 409 |
| 752.475 | 408 |
| 748.689 | 407 |
| 745.433 | 406 |
| 742.172 | 405 |
| 738.895 | 404 |
| 735.613 | 403 |
| 732.302 | 402 |
| 729.011 | 401 |
| 725.82 | 400 |
| 722.75 | 399 |
| 719.774 | 398 |
| 717.169 | 397 |
| 714.672 | 396 |
| 712.196 | 395 |
| 709.754 | 394 |
| 707.345 | 393 |
| 704.951 | 392 |
| 702.574 | 391 |
| 700.204 | 390 |
| 697.836 | 389 |
| 695.47 | 388 |
| 693.105 | 387 |
| 690.742 | 386 |
| 688.379 | 385 |
| 686.055 | 384 |
| 683.891 | 383 |
| 681.73 | 382 |
| 679.571 | 381 |
| 677.419 | 380 |
| 675.275 | 379 |
| 673.135 | 378 |
| 671.005 | 377 |
| 668.877 | 376 |
| 666.75 | 375 |
| 664.624 | 374 |
| 662.659 | 373 |
| 660.814 | 372 |
| 658.968 | 371 |
| 657.12 | 370 |
| 655.271 | 369 |
| 653.419 | 368 |
| 651.566 | 367 |
| 649.71 | 366 |
| 647.85 | 365 |
| 645.988 | 364 |
| 644.111 | 363 |
| 642.219 | 362 |

| | |
|---------|-----|
| 640.317 | 361 |
| 638.404 | 360 |
| 636.48 | 359 |
| 634.549 | 358 |
| 632.801 | 357 |
| 631.153 | 356 |
| 629.507 | 355 |
| 627.865 | 354 |
| 626.228 | 353 |
| 624.586 | 352 |
| 622.925 | 351 |
| 621.284 | 350 |
| 619.54 | 349 |
| 617.993 | 348 |
| 616.456 | 347 |
| 614.925 | 346 |
| 613.404 | 345 |
| 611.895 | 344 |
| 610.391 | 343 |
| 608.891 | 342 |
| 607.394 | 341 |
| 605.9 | 340 |
| 604.408 | 339 |
| 602.917 | 338 |
| 601.429 | 337 |
| 599.939 | 336 |
| 598.444 | 335 |
| 596.95 | 334 |
| 595.455 | 333 |
| 593.961 | 332 |
| 592.563 | 331 |
| 591.17 | 330 |
| 589.805 | 329 |
| 588.505 | 328 |
| 587.254 | 327 |
| 586.007 | 326 |
| 584.732 | 325 |
| 583.34 | 324 |
| 581.87 | 323 |
| 580.369 | 322 |
| 578.823 | 321 |
| 577.275 | 320 |
| 575.722 | 319 |
| 574.166 | 318 |
| 572.608 | 317 |
| 571.049 | 316 |
| 569.478 | 315 |
| 567.797 | 314 |
| 565.646 | 313 |
| 563.386 | 312 |
| 559.859 | 311 |
| 556.131 | 310 |

| | |
|---------|-----|
| 552.436 | 309 |
| 519.816 | 308 |
| 511.336 | 307 |
| 508.961 | 306 |
| 506.633 | 305 |
| 504.306 | 304 |
| 501.98 | 303 |
| 499.635 | 302 |
| 497.252 | 301 |
| 494.875 | 300 |
| 492.482 | 299 |
| 490.069 | 298 |
| 487.637 | 297 |
| 485.197 | 296 |
| 482.72 | 295 |
| 480.205 | 294 |
| 477.814 | 293 |
| 475.464 | 292 |
| 473.154 | 291 |
| 470.831 | 290 |
| 468.526 | 289 |
| 466.243 | 288 |
| 463.983 | 287 |
| 461.72 | 286 |
| 459.303 | 285 |
| 456.854 | 284 |
| 454.196 | 283 |
| 450.723 | 282 |
| 445.815 | 281 |
| 439.487 | 280 |
| 432.347 | 279 |
| 409.664 | 279 |
| 328.784 | 279 |
| 311.797 | 278 |
| 303.693 | 277 |
| 282.307 | 277 |
| 280.297 | 278 |
| 278.045 | 279 |
| 275.69 | 280 |
| 273.334 | 281 |
| 270.928 | 282 |
| 268.165 | 283 |
| 265.513 | 284 |
| 262.855 | 285 |
| 260.203 | 286 |
| 256.943 | 287 |
| 251.485 | 288 |
| 246.994 | 289 |
| 242.766 | 290 |
| 239.137 | 291 |
| 234.481 | 292 |
| 230.238 | 293 |

| | |
|---------|---------|
| 227.955 | 294 |
| 220.83 | 295 |
| 219.732 | 296 |
| 218.569 | 297 |
| 217.344 | 298 |
| 215.981 | 299 |
| 214.627 | 300 |
| 213.282 | 301 |
| 211.944 | 302 |
| 210.612 | 303 |
| 209.286 | 304 |
| 207.962 | 305 |
| 204.567 | 305.664 |
| 202.849 | 306 |
| 201.08 | 307 |
| 197.79 | 308 |
| 196.338 | 309 |
| 194.555 | 310 |
| 188.827 | 311 |
| 186.814 | 312 |
| 184.841 | 313 |
| 179.864 | 314 |
| 177.68 | 315 |
| 175.846 | 316 |
| 172.353 | 317 |
| 165.302 | 318 |
| 163.222 | 319 |
| 161.155 | 320 |
| 156.732 | 321 |
| 155.078 | 322 |
| 153.384 | 323 |
| 146.762 | 324 |
| 132.115 | 324.39 |
| 109.7 | 324.988 |
| 109.242 | 325 |
| 107.125 | 326 |
| 105.01 | 327 |
| 102.897 | 328 |
| 100.786 | 329 |
| 98.677 | 330 |
| 96.5696 | 331 |
| 94.4642 | 332 |
| 92.3606 | 333 |
| 90.2589 | 334 |
| 88.1573 | 335 |
| 86.0574 | 336 |
| 83.9621 | 337 |
| 82.1485 | 338 |
| 81.0059 | 339 |
| 79.8673 | 340 |
| 78.7243 | 341 |
| 77.5786 | 342 |

| | |
|--------------|---------|
| 76.4329 | 343 |
| 75.2871 | 344 |
| 74.1866 | 345 |
| 71.682 | 346 |
| 66.5595 | 347 |
| 64.7442 | 348 |
| 62.9245 | 349 |
| 61.1102 | 350 |
| 59.2778 | 351 |
| 57.1988 | 352 |
| 54.6474 | 353 |
| 44.9562 | 354 |
| 40.0373 | 355 |
| 3.6e-015 | 363.14 |
| 7.10543e-015 | 340.34 |
| 0 | 256.21 |
| 783.842 | 256.21 |
| 783.842 | 413.143 |

Material Boundary

| X | Y |
|--------------|---------|
| 7.10543e-015 | 340.34 |
| 42.3503 | 340 |
| 69.287 | 320 |
| 80.4093 | 320 |
| 109.181 | 315 |
| 120.191 | 315 |
| 148.453 | 300 |
| 199.81 | 300 |
| 200.069 | 300.308 |
| 204.567 | 305.664 |

Material Boundary

| X | Y |
|--------|-----|
| 199.81 | 300 |
| 220.83 | 295 |

Material Boundary

| X | Y |
|---------|-----|
| 109.242 | 325 |
| 120.191 | 315 |

Material Boundary

| X | Y |
|---------|---------|
| 146.585 | 319.981 |
| 146.409 | 320.008 |
| 117.665 | 320.774 |
| 117.665 | 322.775 |
| 146.585 | 322.004 |

| | |
|---------|---------|
| 146.585 | 319.981 |
|---------|---------|

Material Boundary

| X | Y |
|---------|---------|
| 109.7 | 324.988 |
| 120.365 | 315.247 |
| 148.528 | 300.3 |
| 199.671 | 300.3 |
| 200.069 | 300.308 |

RUPTURAS NÃO CIRCULARES – HIPÓTESE 01

Project Summary

File Name: Estaca 02.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 09:03:14

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.36 | 0 | 0 | 0.36 |

Global Minimums

Method: bishop simplified

FS: 1.088000
 Axis Location: 103.409, 374.295
 Left Slip Surface Endpoint: 83.714, 291.427
 Right Slip Surface Endpoint: 157.887, 308.818
 Resisting Moment=100668 kN-m
 Driving Moment=92525.8 kN-m
 Total Slice Area=744.022 m2

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 83.7139 | 291.427 |
| 87.52 | 287.648 |
| 121.348 | 287.648 |
| 157.887 | 308.818 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.088

| 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 | 3.65328 | 74.3393 | Resíduos | 13.5 | 22 | 27.3094 | 29.7126 | 47.4529 | 7.32552 | 40.1274 |
| 2 | 0.152797 | 6.38322 | Interface Solo x GMB Lisa | 3 | 12 | 9.9004 | 10.7716 | 51.6021 | 15.0393 | 36.5628 |
| 3 | 3.07527 | 151.336 | Interface Solo x GMB Lisa | 3 | 12 | 8.9103 | 9.69441 | 49.2106 | 17.7158 | 31.4948 |
| 4 | 3.07527 | 170.144 | Interface Solo x GMB Lisa | 3 | 12 | 9.675 | 10.5264 | 55.3265 | 19.9175 | 35.409 |
| 5 | 3.07527 | 177.011 | Interface Solo x GMB Lisa | 3 | 12 | 9.95421 | 10.8302 | 57.5594 | 20.7214 | 36.838 |
| 6 | 3.07527 | 211.638 | Interface Solo x GMB Lisa | 3 | 12 | 11.362 | 12.3619 | 68.8193 | 24.7749 | 44.0444 |

| | | | | | | | | | | |
|----|---------|---------|------------------------------|------|----|---------|---------|-----------|---------|----------|
| 7 | 3.07527 | 219.91 | Interface Solo x GMB Lisa | 3 | 12 | 11.6984 | 12.7278 | 71.5091 | 25.7432 | 45.7659 |
| 8 | 3.07527 | 242.324 | Interface Solo x GMB Lisa | 3 | 12 | 12.6097 | 13.7193 | 78.7976 | 28.3672 | 50.4304 |
| 9 | 3.07527 | 272.98 | Interface Solo x GMB Lisa | 3 | 12 | 13.8561 | 15.0754 | 88.7661 | 31.9558 | 56.8103 |
| 10 | 3.07527 | 302.426 | Interface Solo x GMB Lisa | 3 | 12 | 15.0533 | 16.378 | 98.3412 | 35.4029 | 62.9383 |
| 11 | 3.07527 | 331.116 | Interface Solo x GMB Lisa | 3 | 12 | 16.2198 | 17.6471 | 107.67 | 38.7614 | 68.9091 |
| 12 | 3.07527 | 357.208 | Interface Solo x GMB Lisa | 3 | 12 | 17.2806 | 18.8013 | 116.155 | 41.8158 | 74.3391 |
| 13 | 3.07527 | 370.545 | Interface Solo x GMB Lisa | 3 | 12 | 17.8228 | 19.3912 | 120.492 | 43.377 | 77.1148 |
| 14 | 2.90568 | 348.149 | Interface Solo x GMB Lisa | 3 | 12 | 15.9353 | 17.3376 | 110.587 | 43.1341 | 67.4532 |
| 15 | 2.90568 | 324.897 | Interface Solo x GMB Lisa | 3 | 12 | 15.0365 | 16.3597 | 103.106 | 40.2533 | 62.8525 |
| 16 | 2.90568 | 289.637 | Interface Solo x GMB Lisa | 3 | 12 | 13.6734 | 14.8767 | 91.7603 | 35.8848 | 55.8755 |
| 17 | 2.90568 | 271.076 | Interface Solo x GMB Lisa | 3 | 12 | 12.9559 | 14.096 | 85.7879 | 33.5851 | 52.2028 |
| 18 | 2.90568 | 250.837 | Interface Solo x GMB Lisa | 3 | 12 | 12.1735 | 13.2448 | 79.2757 | 31.0776 | 48.1981 |
| 19 | 2.90568 | 220.074 | Interface Solo x GMB Lisa | 3 | 12 | 10.9844 | 11.951 | 69.3774 | 27.2662 | 42.1112 |
| 20 | 2.90568 | 189.084 | Interface Solo x GMB Lisa | 3 | 12 | 9.78639 | 10.6476 | 59.4059 | 23.4266 | 35.9793 |
| 21 | 2.90568 | 155.431 | Interface Solo x GMB Lisa | 3 | 12 | 8.48547 | 9.23219 | 48.5773 | 19.2571 | 29.3202 |
| 22 | 2.90568 | 120.65 | Interface Solo x GMB Lisa | 3 | 12 | 7.14097 | 7.76937 | 37.386 | 14.948 | 22.438 |
| 23 | 3.46249 | 100.703 | Resíduos | 13.5 | 22 | 15.9004 | 17.2996 | 19.8746 | 10.4703 | 9.4043 |
| 24 | 3.46249 | 60.131 | Resíduos | 13.5 | 22 | 13.6085 | 14.806 | 9.48436 | 6.2519 | 3.23246 |
| 25 | 3.46249 | 20.023 | Resíduos | 13.5 | 22 | 11.3428 | 12.341 | -0.786907 | 2.08182 | -2.86873 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.088

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 83.7139 | 291.427 | 0 | 0 | 0 |
| 2 | 87.3672 | 287.8 | 271.85 | 0 | 0 |
| 3 | 87.52 | 287.648 | 281.191 | 0 | 0 |
| 4 | 90.5953 | 287.648 | 308.583 | 0 | 0 |
| 5 | 93.6705 | 287.648 | 338.327 | 0 | 0 |
| 6 | 96.7458 | 287.648 | 368.928 | 0 | 0 |
| 7 | 99.8211 | 287.648 | 403.858 | 0 | 0 |
| 8 | 102.896 | 287.648 | 439.822 | 0 | 0 |
| 9 | 105.972 | 287.648 | 478.587 | 0 | 0 |
| 10 | 109.047 | 287.648 | 521.184 | 0 | 0 |
| 11 | 112.122 | 287.648 | 567.462 | 0 | 0 |
| 12 | 115.197 | 287.648 | 617.325 | 0 | 0 |
| 13 | 118.273 | 287.648 | 670.45 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 14 | 121.348 | 287.648 | 725.242 | 0 | 0 |
| 15 | 124.254 | 289.332 | 585.354 | 0 | 0 |
| 16 | 127.159 | 291.015 | 455.45 | 0 | 0 |
| 17 | 130.065 | 292.699 | 340.687 | 0 | 0 |
| 18 | 132.971 | 294.382 | 233.894 | 0 | 0 |
| 19 | 135.876 | 296.066 | 135.792 | 0 | 0 |
| 20 | 138.782 | 297.749 | 50.9004 | 0 | 0 |
| 21 | 141.688 | 299.433 | -20.6838 | 0 | 0 |
| 22 | 144.593 | 301.116 | -77.8169 | 0 | 0 |
| 23 | 147.499 | 302.8 | -120.015 | 0 | 0 |
| 24 | 150.962 | 304.806 | -104.849 | 0 | 0 |
| 25 | 154.424 | 306.812 | -76.7727 | 0 | 0 |
| 26 | 157.887 | 308.818 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 83.7139 | 291.427 |
| 87.52 | 287.648 |
| 121.348 | 287.648 |
| 157.887 | 308.818 |

External Boundary

| X | Y |
|---------|---------|
| 224.566 | 340.518 |
| 222.369 | 339.249 |
| 215.437 | 339.121 |
| 213.637 | 339.106 |
| 213.064 | 338.716 |
| 209.867 | 336.08 |
| 209.267 | 335.398 |
| 207.289 | 334.222 |
| 206.826 | 334.359 |
| 206.575 | 334.139 |
| 203.418 | 333.138 |
| 203.091 | 333.102 |
| 202.657 | 332.594 |
| 201.604 | 331.527 |
| 190.48 | 320.012 |
| 187.316 | 320.196 |
| 185.499 | 320.379 |
| 184.753 | 320.463 |
| 183.638 | 320.403 |
| 171.07 | 312.26 |
| 171.028 | 311.581 |
| 170.236 | 311.284 |
| 169.452 | 311.371 |
| 169.239 | 310.947 |
| 168.288 | 310.618 |

| | |
|---------|---------|
| 166.402 | 309.17 |
| 165.967 | 309.224 |
| 165.454 | 309.287 |
| 164.67 | 309.52 |
| 163.154 | 309.355 |
| 159.943 | 309.045 |
| 157.74 | 308.802 |
| 151.786 | 308.198 |
| 150.369 | 308.055 |
| 147.557 | 307.813 |
| 140.94 | 307.86 |
| 133.787 | 307.445 |
| 133.47 | 307.436 |
| 133.31 | 307.417 |
| 132.363 | 307.089 |
| 129.167 | 305.946 |
| 128.715 | 305.943 |
| 124.858 | 306.112 |
| 124.671 | 306.094 |
| 120.66 | 304.857 |
| 117.741 | 304.589 |
| 113.087 | 302.745 |
| 105.653 | 299.438 |
| 105 | 299.118 |
| 101.98 | 297.637 |
| 100.735 | 297.801 |
| 99.0912 | 297.952 |
| 95.8416 | 296.028 |
| 94.7299 | 295.452 |
| 93.2575 | 295.464 |
| 90.6229 | 295.516 |
| 88.9082 | 294.536 |
| 83.5694 | 291.34 |
| 81.1219 | 291.162 |
| 78.7719 | 291.01 |
| 74.7007 | 288.322 |
| 73.8627 | 287.8 |
| 73.3815 | 287.5 |
| 65.2019 | 282.406 |
| 62.0794 | 281.801 |
| 61.8346 | 281.763 |
| 55.7123 | 280.725 |
| 48.8919 | 279.633 |
| 46.7214 | 279.495 |
| 42.2692 | 278.611 |
| 41.5317 | 278.585 |
| 232.711 | 278.585 |
| 232.711 | 344.863 |

Material Boundary

| X | Y |
|---------|-------|
| 73.3815 | 287.5 |

| | |
|---------|--------|
| 87.4097 | 287.5 |
| 105 | 287.5 |
| 121.325 | 287.5 |
| 147.305 | 302.5 |
| 157.305 | 302.5 |
| 166.402 | 309.17 |

Material Boundary

| X | Y |
|---------|--------|
| 83.5694 | 291.34 |
| 87.11 | 287.8 |
| 87.4097 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 87.11 | 287.8 |
| 104.999 | 287.8 |
| 105 | 287.8 |
| 105 | 287.8 |
| 121.244 | 287.8 |
| 147.225 | 302.8 |
| 157.207 | 302.8 |
| 165.967 | 309.224 |

Project Summary

File Name: Estaca 03.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 09:14:30

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.36 | 0 | 0 | 0.36 |

Global Minimums

Method: bishop simplified

FS: 1.052410
 Axis Location: 101.163, 391.277
 Left Slip Surface Endpoint: 78.708, 291.282
 Right Slip Surface Endpoint: 167.685, 313.316
 Resisting Moment=159059 kN-m
 Driving Moment=151138 kN-m
 Total Slice Area=972.142 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 78.7077 | 291.282 |
| 82.14 | 287.655 |
| 123.385 | 287.655 |
| 167.685 | 313.316 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.05241

| 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 | 3.29508 | 62.5658 | Resíduos | 13.5 | 22 | 29.4352 | 30.9779 | 50.0951 | 6.83555 | 43.2595 |
| 2 | 0.137196 | 5.34838 | Interface Solo x GMB Lisa | 3 | 12 | 10.0306 | 10.5563 | 49.5838 | 14.034 | 35.5498 |
| 3 | 3.74955 | 178.223 | Interface Solo x GMB Lisa | 3 | 12 | 8.99464 | 9.46605 | 47.5319 | 17.1115 | 30.4204 |
| 4 | 3.74955 | 197.855 | Interface Solo x GMB Lisa | 3 | 12 | 9.67144 | 10.1783 | 52.7677 | 18.9964 | 33.7713 |
| 5 | 3.74955 | 226.614 | Interface Solo x GMB Lisa | 3 | 12 | 10.6629 | 11.2217 | 60.4377 | 21.7576 | 38.6801 |
| 6 | 3.74955 | 259.875 | Interface Solo x GMB Lisa | 3 | 12 | 11.8095 | 12.4284 | 69.3084 | 24.951 | 44.3574 |

| | | | | | | | | | | |
|----|---------|---------|------------------------------|------|----|---------|---------|----------|---------|----------|
| 7 | 3.74955 | 279.815 | Interface Solo x GMB Lisa | 3 | 12 | 12.4969 | 13.1519 | 74.6264 | 26.8655 | 47.7609 |
| 8 | 3.74955 | 321.282 | Interface Solo x GMB Lisa | 3 | 12 | 13.9264 | 14.6563 | 85.6856 | 30.8468 | 54.8388 |
| 9 | 3.74955 | 364.339 | Interface Solo x GMB Lisa | 3 | 12 | 15.4108 | 16.2185 | 97.1688 | 34.9808 | 62.188 |
| 10 | 3.74955 | 412.371 | Interface Solo x GMB Lisa | 3 | 12 | 17.0666 | 17.9611 | 109.979 | 39.5924 | 70.3865 |
| 11 | 3.74955 | 447.417 | Interface Solo x GMB Lisa | 3 | 12 | 18.2748 | 19.2326 | 119.326 | 42.9572 | 76.3685 |
| 12 | 3.74955 | 464.802 | Interface Solo x GMB Lisa | 3 | 12 | 18.8741 | 19.8633 | 123.962 | 44.6264 | 79.3358 |
| 13 | 3.74955 | 506.161 | Interface Solo x GMB Lisa | 3 | 12 | 20.3 | 21.3639 | 134.993 | 48.5973 | 86.3953 |
| 14 | 3.73511 | 495.015 | Interface Solo x GMB Lisa | 3 | 12 | 17.8889 | 18.8265 | 122.168 | 47.7108 | 74.4576 |
| 15 | 3.73511 | 442.787 | Interface Solo x GMB Lisa | 3 | 12 | 16.2707 | 17.1235 | 109.123 | 42.677 | 66.446 |
| 16 | 3.73511 | 390.676 | Interface Solo x GMB Lisa | 3 | 12 | 14.6563 | 15.4244 | 96.1065 | 37.6544 | 58.4521 |
| 17 | 3.73511 | 342.706 | Interface Solo x GMB Lisa | 3 | 12 | 13.17 | 13.8602 | 84.1243 | 33.0309 | 51.0934 |
| 18 | 3.73511 | 304.177 | Interface Solo x GMB Lisa | 3 | 12 | 11.9763 | 12.6039 | 74.5005 | 29.3174 | 45.1831 |
| 19 | 3.73511 | 285.742 | Interface Solo x GMB Lisa | 3 | 12 | 11.4051 | 12.0029 | 69.8956 | 27.5406 | 42.355 |
| 20 | 3.73511 | 260.619 | Interface Solo x GMB Lisa | 3 | 12 | 10.6267 | 11.1837 | 63.6201 | 25.1191 | 38.501 |
| 21 | 3.63087 | 205.212 | Resíduos | 13.5 | 22 | 21.8547 | 23.0001 | 43.8603 | 20.3467 | 23.5136 |
| 22 | 3.63087 | 158.405 | Resíduos | 13.5 | 22 | 19.2634 | 20.273 | 32.4695 | 15.7058 | 16.7637 |
| 23 | 3.63087 | 121.028 | Resíduos | 13.5 | 22 | 17.1943 | 18.0954 | 23.374 | 11.9999 | 11.3741 |
| 24 | 3.63087 | 78.9063 | Resíduos | 13.5 | 22 | 14.8624 | 15.6413 | 13.1236 | 7.82354 | 5.30002 |
| 25 | 3.63087 | 26.4431 | Resíduos | 13.5 | 22 | 11.9581 | 12.5848 | 0.356595 | 2.62183 | -2.26524 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.05241

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 78.7077 | 291.282 | 0 | 0 | 0 |
| 2 | 82.0028 | 287.8 | 271.441 | 0 | 0 |
| 3 | 82.14 | 287.655 | 280.006 | 0 | 0 |
| 4 | 85.8895 | 287.655 | 313.73 | 0 | 0 |
| 5 | 89.6391 | 287.655 | 349.991 | 0 | 0 |
| 6 | 93.3886 | 287.655 | 389.969 | 0 | 0 |
| 7 | 97.1382 | 287.655 | 434.246 | 0 | 0 |
| 8 | 100.888 | 287.655 | 481.101 | 0 | 0 |
| 9 | 104.637 | 287.655 | 533.315 | 0 | 0 |
| 10 | 108.387 | 287.655 | 591.095 | 0 | 0 |
| 11 | 112.136 | 287.655 | 655.083 | 0 | 0 |
| 12 | 115.886 | 287.655 | 723.6 | 0 | 0 |
| 13 | 119.635 | 287.655 | 794.365 | 0 | 0 |
| 14 | 123.385 | 287.655 | 870.475 | 0 | 0 |
| 15 | 127.12 | 289.819 | 672.968 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 16 | 130.855 | 291.982 | 497.641 | 0 | 0 |
| 17 | 134.59 | 294.146 | 344.447 | 0 | 0 |
| 18 | 138.325 | 296.309 | 211.626 | 0 | 0 |
| 19 | 142.061 | 298.473 | 95.1691 | 0 | 0 |
| 20 | 145.796 | 300.636 | -13.4587 | 0 | 0 |
| 21 | 149.531 | 302.8 | -111.416 | 0 | 0 |
| 22 | 153.162 | 304.903 | -124.316 | 0 | 0 |
| 23 | 156.793 | 307.006 | -122.668 | 0 | 0 |
| 24 | 160.423 | 309.11 | -109.402 | 0 | 0 |
| 25 | 164.054 | 311.213 | -83.0434 | 0 | 0 |
| 26 | 167.685 | 313.316 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 78.7077 | 291.282 |
| 82.14 | 287.655 |
| 123.385 | 287.655 |
| 167.685 | 313.316 |

External Boundary

| X | Y |
|---------|---------|
| 229.19 | 338.986 |
| 228.926 | 338.851 |
| 228.615 | 338.853 |
| 222.124 | 338.933 |
| 215.524 | 334.785 |
| 214.604 | 334.256 |
| 213.959 | 333.815 |
| 213.055 | 333.797 |
| 208.463 | 333.71 |
| 206.215 | 331.158 |
| 204.24 | 329.055 |
| 200.127 | 324.337 |
| 198.862 | 324.346 |
| 196.999 | 324.51 |
| 196.113 | 324.623 |
| 195.879 | 324.47 |
| 192.406 | 322.677 |
| 178.267 | 314.628 |
| 175.803 | 313.352 |
| 175.249 | 313.345 |
| 174.868 | 313.341 |
| 173.403 | 313.351 |
| 163.089 | 313.288 |
| 160.066 | 313.218 |
| 156.708 | 312.312 |
| 149.893 | 311.821 |
| 146.577 | 311.555 |

| | |
|---------|---------|
| 140.506 | 308.918 |
| 137.534 | 308.379 |
| 136.496 | 308.222 |
| 132.797 | 307.902 |
| 125.022 | 307.581 |
| 122.621 | 307.381 |
| 120.02 | 306.263 |
| 117.208 | 305.057 |
| 116.89 | 304.773 |
| 113.56 | 304.665 |
| 113.091 | 304.627 |
| 112.851 | 304.615 |
| 106.014 | 301.154 |
| 105.677 | 300.965 |
| 105.532 | 300.988 |
| 105 | 300.962 |
| 104.415 | 300.934 |
| 104.23 | 300.402 |
| 97.0353 | 297.439 |
| 95.9837 | 297.542 |
| 93.997 | 297.529 |
| 92.4662 | 296.733 |
| 89.4247 | 295.12 |
| 85.4524 | 295.139 |
| 85.243 | 295.151 |
| 83.3052 | 293.993 |
| 78.4595 | 291.136 |
| 77.9787 | 291.111 |
| 73.5622 | 290.583 |
| 68.7656 | 287.5 |
| 67.9234 | 286.959 |
| 58.9928 | 281.288 |
| 56.5883 | 280.736 |
| 55.1834 | 280.521 |
| 48.5919 | 280.015 |
| 47.4813 | 279.885 |
| 41.4363 | 279.572 |
| 40.6969 | 279.534 |
| 40.6969 | 270 |
| 241.351 | 270 |
| 241.351 | 344.99 |

Material Boundary

| X | Y |
|---------|---------|
| 68.7656 | 287.5 |
| 82.0956 | 287.5 |
| 105 | 287.5 |
| 123.332 | 287.5 |
| 149.313 | 302.5 |
| 159.313 | 302.5 |
| 175.803 | 313.352 |

Material Boundary

| X | Y |
|---------|---------|
| 78.4595 | 291.136 |
| 81.7956 | 287.8 |
| 82.0956 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 81.7956 | 287.8 |
| 105 | 287.8 |
| 105 | 287.8 |
| 105.001 | 287.8 |
| 123.251 | 287.8 |
| 149.232 | 302.8 |
| 159.223 | 302.8 |
| 175.249 | 313.345 |

Project Summary

File Name: Estaca 04.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 15:09:49

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 malpha < 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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.23 | 0 | 0 | 0.23 |

Global Minimums

Method: bishop simplified

FS: 1.095330
 Axis Location: 159.049, 400.043
 Left Slip Surface Endpoint: 132.984, 291.284
 Right Slip Surface Endpoint: 230.418, 313.936
 Resisting Moment=235286 kN-m
 Driving Moment=214808 kN-m
 Total Slice Area=1216.14 m²

Method: janbu simplified

FS: 1.067270
 Axis Location: 159.049, 400.043
 Left Slip Surface Endpoint: 132.984, 291.284
 Right Slip Surface Endpoint: 230.418, 313.936
 Resisting Horizontal Force=1942.83 kN
 Driving Horizontal Force=1820.38 kN
 Total Slice Area=1216.14 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 132.984 | 291.284 |
| 136.567 | 287.666 |
| 185.02 | 287.666 |
| 230.418 | 313.936 |

Method: janbu simplified

| X | Y |
|---------|---------|
| 132.984 | 291.284 |
| 136.567 | 287.666 |
| 185.02 | 287.666 |
| 230.418 | 313.936 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.09533

| 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 | 3.44999 | 65.5273 | Resíduos | 13.5 | 22 | 28.2375 | 30.9294 | 47.5079 | 4.3685 | 43.1394 |
| 2 | 0.132689 | 5.1637 | Interface Solo x GMB Lisa | 3 | 12 | 10.6386 | 11.6528 | 49.6588 | 8.95065 | 40.7081 |
| 3 | 4.03775 | 190.874 | Interface Solo x GMB Lisa | 3 | 12 | 9.80253 | 10.737 | 47.2724 | 10.8727 | 36.3997 |
| 4 | 4.03775 | 205.075 | Interface Solo x GMB Lisa | 3 | 12 | 10.328 | 11.3126 | 50.7894 | 11.6815 | 39.1079 |
| 5 | 4.03775 | 237.331 | Interface Solo x GMB Lisa | 3 | 12 | 11.5218 | 12.6201 | 58.778 | 13.519 | 45.259 |
| 6 | 4.03775 | 275.573 | Interface Solo x GMB Lisa | 3 | 12 | 12.937 | 14.1703 | 68.2491 | 15.6973 | 52.5518 |
| 7 | 4.03775 | 306.684 | Interface Solo x GMB Lisa | 3 | 12 | 14.0883 | 15.4313 | 75.9542 | 17.4694 | 58.4848 |
| 8 | 4.03775 | 360.424 | Interface Solo x GMB Lisa | 3 | 12 | 16.077 | 17.6096 | 89.2636 | 20.5306 | 68.733 |
| 9 | 4.03775 | 389.227 | Interface Solo x GMB Lisa | 3 | 12 | 17.1429 | 18.7771 | 96.397 | 22.1713 | 74.2257 |
| 10 | 4.03775 | 448.619 | Interface Solo x GMB Lisa | 3 | 12 | 19.3408 | 21.1846 | 111.106 | 25.5544 | 85.5518 |
| 11 | 4.03775 | 468.952 | Interface Solo x GMB Lisa | 3 | 12 | 20.0933 | 22.0088 | 116.142 | 26.7127 | 89.4292 |
| 12 | 4.03775 | 505.002 | Interface Solo x GMB Lisa | 3 | 12 | 21.4274 | 23.4701 | 125.07 | 28.7661 | 96.3041 |
| 13 | 4.03775 | 534.41 | Interface Solo x GMB Lisa | 3 | 12 | 22.5157 | 24.6621 | 132.353 | 30.4413 | 101.912 |
| 14 | 4.03775 | 588.032 | Interface Solo x GMB Lisa | 3 | 12 | 24.5001 | 26.8357 | 145.634 | 33.4957 | 112.138 |
| 15 | 4.35882 | 605.318 | Interface Solo x GMB Lisa | 3 | 12 | 21.1184 | 23.1316 | 126.652 | 31.9406 | 94.7117 |
| 16 | 4.35882 | 575.667 | Interface Solo x GMB Lisa | 3 | 12 | 20.2045 | 22.1306 | 120.379 | 30.376 | 90.0025 |
| 17 | 4.35882 | 595.564 | Interface Solo x GMB Lisa | 3 | 12 | 20.8177 | 22.8023 | 124.589 | 31.4259 | 93.1627 |
| 18 | 4.35882 | 547.69 | Interface Solo x GMB Lisa | 3 | 12 | 19.3423 | 21.1862 | 114.459 | 28.8998 | 85.5594 |
| 19 | 4.35882 | 472.323 | Interface Solo x GMB Lisa | 3 | 12 | 17.0194 | 18.6419 | 98.5124 | 24.9229 | 73.5895 |
| 20 | 4.35882 | 394.693 | Interface Solo x GMB Lisa | 3 | 12 | 14.6269 | 16.0213 | 82.0871 | 20.8266 | 61.2605 |
| 21 | 3.84893 | 278.957 | Resíduos | 13.5 | 22 | 27.1215 | 29.707 | 56.7833 | 16.6696 | 40.1137 |
| 22 | 3.84893 | 215.431 | Resíduos | 13.5 | 22 | 23.2582 | 25.4754 | 42.5136 | 12.8735 | 29.6401 |
| 23 | 3.84893 | 154.643 | Resíduos | 13.5 | 22 | 19.5616 | 21.4264 | 28.8594 | 9.24102 | 19.6184 |
| 24 | 3.84893 | 93.382 | Resíduos | 13.5 | 22 | 15.836 | 17.3457 | 15.0986 | 5.58022 | 9.51841 |
| 25 | 3.84893 | 31.5425 | Resíduos | 13.5 | 22 | 12.0754 | 13.2265 | 1.20798 | 1.88488 | -0.676901 |

Global Minimum Query (janbu simplified) - Safety Factor: 1.06727

| 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 | 3.44999 | 65.5273 | Resíduos | 13.5 | 22 | 29.4353 | 31.4154 | 48.7105 | 4.3685 | 44.342 |
| 2 | 0.132689 | 5.1637 | Interface Solo x GMB Lisa | 3 | 12 | 10.9881 | 11.7273 | 50.0092 | 8.95065 | 41.0586 |
| 3 | 4.03775 | 190.874 | Interface Solo x GMB Lisa | 3 | 12 | 10.0602 | 10.737 | 47.2724 | 10.8727 | 36.3997 |
| 4 | 4.03775 | 205.075 | Interface Solo x GMB Lisa | 3 | 12 | 10.5996 | 11.3126 | 50.7894 | 11.6815 | 39.1079 |
| 5 | 4.03775 | 237.331 | Interface Solo x GMB Lisa | 3 | 12 | 11.8247 | 12.6201 | 58.778 | 13.519 | 45.259 |
| 6 | 4.03775 | 275.573 | Interface Solo x GMB Lisa | 3 | 12 | 13.2771 | 14.1703 | 68.2491 | 15.6973 | 52.5518 |
| 7 | 4.03775 | 306.684 | Interface Solo x GMB Lisa | 3 | 12 | 14.4587 | 15.4313 | 75.9542 | 17.4694 | 58.4848 |
| 8 | 4.03775 | 360.424 | Interface Solo x GMB Lisa | 3 | 12 | 16.4997 | 17.6096 | 89.2636 | 20.5306 | 68.733 |
| 9 | 4.03775 | 389.227 | Interface Solo x GMB Lisa | 3 | 12 | 17.5936 | 18.7771 | 96.397 | 22.1713 | 74.2257 |
| 10 | 4.03775 | 448.619 | Interface Solo x GMB Lisa | 3 | 12 | 19.8493 | 21.1846 | 111.106 | 25.5544 | 85.5518 |
| 11 | 4.03775 | 468.952 | Interface Solo x GMB Lisa | 3 | 12 | 20.6216 | 22.0088 | 116.142 | 26.7127 | 89.4292 |
| 12 | 4.03775 | 505.002 | Interface Solo x GMB Lisa | 3 | 12 | 21.9908 | 23.4701 | 125.07 | 28.7661 | 96.3041 |
| 13 | 4.03775 | 534.41 | Interface Solo x GMB Lisa | 3 | 12 | 23.1076 | 24.6621 | 132.353 | 30.4413 | 101.912 |
| 14 | 4.03775 | 588.032 | Interface Solo x GMB Lisa | 3 | 12 | 25.1442 | 26.8357 | 145.634 | 33.4957 | 112.138 |
| 15 | 4.35882 | 605.318 | Interface Solo x GMB Lisa | 3 | 12 | 21.6167 | 23.0709 | 126.367 | 31.9406 | 94.4262 |
| 16 | 4.35882 | 575.667 | Interface Solo x GMB Lisa | 3 | 12 | 20.6814 | 22.0726 | 120.105 | 30.376 | 89.7295 |
| 17 | 4.35882 | 595.564 | Interface Solo x GMB Lisa | 3 | 12 | 21.309 | 22.7425 | 124.307 | 31.4259 | 92.8811 |
| 18 | 4.35882 | 547.69 | Interface Solo x GMB Lisa | 3 | 12 | 19.7987 | 21.1306 | 114.198 | 28.8998 | 85.2978 |
| 19 | 4.35882 | 472.323 | Interface Solo x GMB Lisa | 3 | 12 | 17.4211 | 18.593 | 98.2823 | 24.9229 | 73.3594 |
| 20 | 4.35882 | 394.693 | Interface Solo x GMB Lisa | 3 | 12 | 14.9721 | 15.9793 | 81.8894 | 20.8266 | 61.0628 |
| 21 | 3.84893 | 278.957 | Resíduos | 13.5 | 22 | 27.7075 | 29.5714 | 56.4478 | 16.6696 | 39.7782 |
| 22 | 3.84893 | 215.431 | Resíduos | 13.5 | 22 | 23.7608 | 25.3592 | 42.226 | 12.8735 | 29.3525 |
| 23 | 3.84893 | 154.643 | Resíduos | 13.5 | 22 | 19.9843 | 21.3286 | 28.6174 | 9.24102 | 19.3764 |
| 24 | 3.84893 | 93.382 | Resíduos | 13.5 | 22 | 16.1782 | 17.2665 | 14.9028 | 5.58022 | 9.32254 |
| 25 | 3.84893 | 31.5425 | Resíduos | 13.5 | 22 | 12.3363 | 13.1662 | 1.05861 | 1.88488 | -0.826268 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.09533

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 132.984 | 291.284 | 0 | 0 | 0 |
| 2 | 136.434 | 287.8 | 262.933 | 0 | 0 |
| 3 | 136.567 | 287.666 | 270.999 | 0 | 0 |
| 4 | 140.605 | 287.666 | 310.576 | 0 | 0 |
| 5 | 144.643 | 287.666 | 352.275 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 6 | 148.68 | 287.666 | 398.793 | 0 | 0 |
| 7 | 152.718 | 287.666 | 451.025 | 0 | 0 |
| 8 | 156.756 | 287.666 | 507.906 | 0 | 0 |
| 9 | 160.793 | 287.666 | 572.816 | 0 | 0 |
| 10 | 164.831 | 287.666 | 642.029 | 0 | 0 |
| 11 | 168.869 | 287.666 | 720.116 | 0 | 0 |
| 12 | 172.907 | 287.666 | 801.242 | 0 | 0 |
| 13 | 176.945 | 287.666 | 887.754 | 0 | 0 |
| 14 | 180.982 | 287.666 | 978.659 | 0 | 0 |
| 15 | 185.02 | 287.666 | 1077.58 | 0 | 0 |
| 16 | 189.379 | 290.188 | 850.161 | 0 | 0 |
| 17 | 193.738 | 292.711 | 634.587 | 0 | 0 |
| 18 | 198.096 | 295.233 | 411.067 | 0 | 0 |
| 19 | 202.455 | 297.755 | 206.666 | 0 | 0 |
| 20 | 206.814 | 300.278 | 32.3642 | 0 | 0 |
| 21 | 211.173 | 302.8 | -110.936 | 0 | 0 |
| 22 | 215.022 | 305.027 | -133.027 | 0 | 0 |
| 23 | 218.871 | 307.255 | -138.204 | 0 | 0 |
| 24 | 222.72 | 309.482 | -127.197 | 0 | 0 |
| 25 | 226.569 | 311.709 | -99.8788 | 0 | 0 |
| 26 | 230.418 | 313.936 | 0 | 0 | 0 |

Global Minimum Query (janbu simplified) - Safety Factor: 1.06727

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 132.984 | 291.284 | 0 | 0 | 0 |
| 2 | 136.434 | 287.8 | 271.232 | 0 | 0 |
| 3 | 136.567 | 287.666 | 279.391 | 0 | 0 |
| 4 | 140.605 | 287.666 | 319.999 | 0 | 0 |
| 5 | 144.643 | 287.666 | 362.785 | 0 | 0 |
| 6 | 148.68 | 287.666 | 410.515 | 0 | 0 |
| 7 | 152.718 | 287.666 | 464.109 | 0 | 0 |
| 8 | 156.756 | 287.666 | 522.471 | 0 | 0 |
| 9 | 160.793 | 287.666 | 589.073 | 0 | 0 |
| 10 | 164.831 | 287.666 | 660.09 | 0 | 0 |
| 11 | 168.869 | 287.666 | 740.212 | 0 | 0 |
| 12 | 172.907 | 287.666 | 823.451 | 0 | 0 |
| 13 | 176.945 | 287.666 | 912.218 | 0 | 0 |
| 14 | 180.982 | 287.666 | 1005.49 | 0 | 0 |
| 15 | 185.02 | 287.666 | 1106.99 | 0 | 0 |
| 16 | 189.379 | 290.188 | 882.443 | 0 | 0 |
| 17 | 193.738 | 292.711 | 669.616 | 0 | 0 |
| 18 | 198.096 | 295.233 | 448.926 | 0 | 0 |
| 19 | 202.455 | 297.755 | 247.154 | 0 | 0 |
| 20 | 206.814 | 300.278 | 75.1659 | 0 | 0 |
| 21 | 211.173 | 302.8 | -66.1454 | 0 | 0 |
| 22 | 215.022 | 305.027 | -85.2583 | 0 | 0 |
| 23 | 218.871 | 307.255 | -87.8814 | 0 | 0 |
| 24 | 222.72 | 309.482 | -74.7257 | 0 | 0 |
| 25 | 226.569 | 311.709 | -45.6683 | 0 | 0 |
| 26 | 230.418 | 313.936 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 132.984 | 291.284 |
| 136.567 | 287.666 |
| 185.02 | 287.666 |
| 230.418 | 313.936 |

External Boundary

| X | Y |
|---------|---------|
| 303.56 | 342.72 |
| 303.098 | 342.676 |
| 302.853 | 342.658 |
| 302.154 | 342.51 |
| 301.774 | 342.304 |
| 300.94 | 341.684 |
| 295.595 | 338.923 |
| 292.921 | 338.919 |
| 288.439 | 338.763 |
| 287.523 | 337.893 |
| 282.113 | 333.613 |
| 280.398 | 333.725 |
| 278.361 | 333.755 |
| 277.473 | 333.742 |
| 276.409 | 332.555 |
| 273.824 | 329.952 |
| 270.978 | 330.315 |
| 268.96 | 330.506 |
| 264.474 | 327.105 |
| 259.007 | 322.849 |
| 256.659 | 322.712 |
| 245.88 | 317.602 |
| 237.711 | 313.612 |
| 237.368 | 313.683 |
| 237.28 | 313.685 |
| 234.926 | 313.749 |
| 232.971 | 313.856 |
| 227.754 | 314.02 |
| 220.2 | 314.121 |
| 217.774 | 314.102 |
| 214.915 | 314.2 |
| 208.487 | 314.439 |
| 208.231 | 314.441 |
| 203.541 | 314.422 |
| 200.279 | 314.394 |
| 199.963 | 314.381 |
| 199.364 | 314.355 |
| 196.829 | 314.186 |
| 194.805 | 312.757 |

| | |
|---------|---------|
| 189.45 | 308.602 |
| 186.655 | 308.708 |
| 185.211 | 308.754 |
| 183.823 | 308.715 |
| 183.166 | 308.723 |
| 177.401 | 305.679 |
| 173.952 | 305.536 |
| 173.817 | 305.528 |
| 172.779 | 304.475 |
| 172.351 | 304.308 |
| 171.281 | 304.187 |
| 169.322 | 304.09 |
| 167.701 | 303.999 |
| 166.094 | 303.186 |
| 165 | 302.569 |
| 161.481 | 300.587 |
| 159.976 | 300.831 |
| 159.631 | 300.877 |
| 159.014 | 300.601 |
| 152.178 | 297.178 |
| 149.671 | 297.586 |
| 149.452 | 297.468 |
| 144.29 | 294.763 |
| 141.436 | 294.918 |
| 139.704 | 295.048 |
| 136.44 | 293.23 |
| 132.879 | 291.225 |
| 130.439 | 290.907 |
| 127.26 | 290.238 |
| 127.116 | 290.046 |
| 126.324 | 288.69 |
| 124.114 | 288.182 |
| 122.774 | 287.848 |
| 122.253 | 287.5 |
| 115.15 | 282.754 |
| 113.161 | 281.437 |
| 113.002 | 281.411 |
| 112.752 | 281.315 |
| 112.341 | 281.182 |
| 111.846 | 281.073 |
| 110.628 | 280.809 |
| 110.132 | 281.059 |
| 109.841 | 280.979 |
| 103.043 | 280.743 |
| 102.176 | 280.634 |
| 101.6 | 280.539 |
| 101.164 | 280.478 |
| 100.275 | 280.338 |
| 100.275 | 270 |
| 305 | 270 |
| 305 | 343.065 |

Material Boundary

| X | Y |
|---------|---------|
| 122.253 | 287.5 |
| 136.603 | 287.5 |
| 165 | 287.5 |
| 185 | 287.5 |
| 210.982 | 302.5 |
| 220.982 | 302.5 |
| 237.711 | 313.612 |

Material Boundary

| X | Y |
|---------|---------|
| 132.879 | 291.225 |
| 136.303 | 287.8 |
| 136.603 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 136.303 | 287.8 |
| 165 | 287.8 |
| 165 | 287.8 |
| 165 | 287.8 |
| 184.92 | 287.8 |
| 210.901 | 302.8 |
| 220.891 | 302.8 |
| 237.28 | 313.685 |

Project Summary

File Name: Estaca 05.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 15:39:07

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.23 | 0 | 0 | 0.23 |

Global Minimums

Method: bishop simplified

FS: 1.154370
 Axis Location: 213.676, 404.386
 Left Slip Surface Endpoint: 184.915, 291.664
 Right Slip Surface Endpoint: 286.596, 313.744
 Resisting Moment=263922 kN-m
 Driving Moment=228628 kN-m
 Total Slice Area=1332.33 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 184.915 | 291.664 |
| 188.65 | 287.651 |
| 241.559 | 287.651 |
| 286.596 | 313.744 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.15437

| 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 | 3.59673 | 80.3804 | Resíduos | 13.5 | 22 | 28.3887 | 32.7711 | 52.8376 | 5.14009 | 47.6975 |
| 2 | 0.138684 | 6.14333 | Interface Solo x GMB Lisa | 3 | 12 | 11.0682 | 12.7768 | 56.1847 | 10.1884 | 45.9963 |
| 3 | 4.06992 | 199.587 | Interface Solo x GMB Lisa | 3 | 12 | 9.55172 | 11.0262 | 49.0395 | 11.2791 | 37.7604 |
| 4 | 4.06992 | 204.123 | Interface Solo x GMB Lisa | 3 | 12 | 9.70975 | 11.2086 | 50.154 | 11.5354 | 38.6186 |
| 5 | 4.06992 | 255.315 | Interface Solo x GMB Lisa | 3 | 12 | 11.4931 | 13.2673 | 62.7321 | 14.4284 | 48.3037 |
| 6 | 4.06992 | 277.586 | Interface Solo x GMB Lisa | 3 | 12 | 12.2689 | 14.1629 | 68.2042 | 15.687 | 52.5172 |

| | | | | | | | | | | |
|----|---------|---------|------------------------------|------|----|---------|---------|---------|---------|----------|
| 7 | 4.06992 | 325.108 | Interface Solo x GMB Lisa | 3 | 12 | 13.9245 | 16.074 | 79.8806 | 18.3726 | 61.508 |
| 8 | 4.06992 | 362.327 | Interface Solo x GMB Lisa | 3 | 12 | 15.221 | 17.5707 | 89.0255 | 20.4759 | 68.5496 |
| 9 | 4.06992 | 404.116 | Interface Solo x GMB Lisa | 3 | 12 | 16.6768 | 19.2512 | 99.2933 | 22.8374 | 76.4559 |
| 10 | 4.06992 | 453.218 | Interface Solo x GMB Lisa | 3 | 12 | 18.3873 | 21.2258 | 111.358 | 25.6123 | 85.7456 |
| 11 | 4.06992 | 473.478 | Interface Solo x GMB Lisa | 3 | 12 | 19.0931 | 22.0405 | 116.336 | 26.7573 | 89.5786 |
| 12 | 4.06992 | 486.972 | Interface Solo x GMB Lisa | 3 | 12 | 19.5632 | 22.5832 | 119.651 | 27.5198 | 92.1316 |
| 13 | 4.06992 | 521.439 | Interface Solo x GMB Lisa | 3 | 12 | 20.7639 | 23.9692 | 128.12 | 29.4676 | 98.6525 |
| 14 | 4.06992 | 581.519 | Interface Solo x GMB Lisa | 3 | 12 | 22.8569 | 26.3853 | 142.882 | 32.8629 | 110.019 |
| 15 | 4.06992 | 637.834 | Interface Solo x GMB Lisa | 3 | 12 | 24.8187 | 28.65 | 156.719 | 36.0454 | 120.674 |
| 16 | 4.3579 | 657.373 | Interface Solo x GMB Lisa | 3 | 12 | 21.6746 | 25.0205 | 138.293 | 34.6946 | 103.598 |
| 17 | 4.3579 | 655.869 | Interface Solo x GMB Lisa | 3 | 12 | 21.6304 | 24.9695 | 137.974 | 34.6153 | 103.358 |
| 18 | 4.3579 | 623.311 | Interface Solo x GMB Lisa | 3 | 12 | 20.6733 | 23.8646 | 131.057 | 32.8969 | 98.1602 |
| 19 | 4.3579 | 546.948 | Interface Solo x GMB Lisa | 3 | 12 | 18.4282 | 21.273 | 114.834 | 28.8666 | 85.9676 |
| 20 | 4.3579 | 469.27 | Interface Solo x GMB Lisa | 3 | 12 | 16.1446 | 18.6368 | 98.3324 | 24.767 | 73.5654 |
| 21 | 4.3579 | 390.096 | Interface Solo x GMB Lisa | 3 | 12 | 13.8169 | 15.9498 | 81.5123 | 20.5883 | 60.924 |
| 22 | 4.72239 | 331.619 | Resíduos | 13.5 | 22 | 25.4589 | 29.389 | 55.478 | 16.1512 | 39.3268 |
| 23 | 4.72239 | 234.418 | Resíduos | 13.5 | 22 | 20.8468 | 24.0649 | 37.5661 | 11.4171 | 26.149 |
| 24 | 4.72239 | 140.449 | Resíduos | 13.5 | 22 | 16.3879 | 18.9177 | 20.2499 | 6.84044 | 13.4094 |
| 25 | 4.72239 | 46.8589 | Resíduos | 13.5 | 22 | 11.9471 | 13.7914 | 3.00344 | 2.28222 | 0.721217 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.15437

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 184.915 | 291.664 | 0 | 0 | 0 |
| 2 | 188.511 | 287.8 | 306.249 | 0 | 0 |
| 3 | 188.65 | 287.651 | 316.155 | 0 | 0 |
| 4 | 192.72 | 287.651 | 355.016 | 0 | 0 |
| 5 | 196.79 | 287.651 | 394.519 | 0 | 0 |
| 6 | 200.86 | 287.651 | 441.278 | 0 | 0 |
| 7 | 204.93 | 287.651 | 491.194 | 0 | 0 |
| 8 | 209 | 287.651 | 547.845 | 0 | 0 |
| 9 | 213.07 | 287.651 | 609.771 | 0 | 0 |
| 10 | 217.139 | 287.651 | 677.619 | 0 | 0 |
| 11 | 221.209 | 287.651 | 752.427 | 0 | 0 |
| 12 | 225.279 | 287.651 | 830.106 | 0 | 0 |
| 13 | 229.349 | 287.651 | 909.698 | 0 | 0 |
| 14 | 233.419 | 287.651 | 994.175 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 15 | 237.489 | 287.651 | 1087.17 | 0 | 0 |
| 16 | 241.559 | 287.651 | 1188.14 | 0 | 0 |
| 17 | 245.917 | 290.176 | 933.396 | 0 | 0 |
| 18 | 250.275 | 292.701 | 679.264 | 0 | 0 |
| 19 | 254.633 | 295.226 | 438.427 | 0 | 0 |
| 20 | 258.991 | 297.75 | 228.769 | 0 | 0 |
| 21 | 263.349 | 300.275 | 50.8269 | 0 | 0 |
| 22 | 267.706 | 302.8 | -94.7873 | 0 | 0 |
| 23 | 272.429 | 305.536 | -126.392 | 0 | 0 |
| 24 | 277.151 | 308.272 | -130.762 | 0 | 0 |
| 25 | 281.874 | 311.008 | -108.803 | 0 | 0 |
| 26 | 286.596 | 313.744 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 184.915 | 291.664 |
| 188.65 | 287.651 |
| 241.559 | 287.651 |
| 286.596 | 313.744 |

External Boundary

| X | Y |
|---------|---------|
| 151.741 | 280 |
| 360 | 280 |
| 360 | 342.248 |
| 356.673 | 341.544 |
| 355.839 | 341.092 |
| 355.312 | 340.289 |
| 354.27 | 339.176 |
| 353.701 | 339.169 |
| 348.717 | 339.095 |
| 344.882 | 336.399 |
| 342.233 | 334.679 |
| 341.164 | 333.819 |
| 340.785 | 333.853 |
| 336.037 | 333.94 |
| 333.453 | 332.117 |
| 331.665 | 330.846 |
| 327.717 | 331.045 |
| 327.485 | 331.062 |
| 320.373 | 324.754 |
| 319.539 | 323.986 |
| 318.416 | 323.056 |
| 318.025 | 323.074 |
| 314.238 | 322.919 |
| 312.818 | 322.785 |
| 309.706 | 321.261 |
| 308.301 | 320.305 |

| | |
|---------|---------|
| 295.32 | 313.604 |
| 294.82 | 313.646 |
| 294.666 | 313.658 |
| 289.94 | 313.688 |
| 288.931 | 313.694 |
| 284.143 | 313.796 |
| 273.422 | 314.01 |
| 273.23 | 314.07 |
| 270.976 | 314.172 |
| 268.356 | 314.264 |
| 264.937 | 314.241 |
| 259.495 | 314.352 |
| 251.51 | 314.301 |
| 250.467 | 314.312 |
| 250.046 | 314.285 |
| 248.839 | 313.388 |
| 244.416 | 310.176 |
| 240.909 | 310.197 |
| 239.977 | 310.197 |
| 239.28 | 310.236 |
| 238.229 | 309.565 |
| 236.802 | 308.855 |
| 233.017 | 306.473 |
| 230.645 | 305.613 |
| 227.658 | 304.589 |
| 224.255 | 304.447 |
| 223.845 | 304.41 |
| 223.092 | 303.992 |
| 221.959 | 304.075 |
| 220 | 303.658 |
| 219.027 | 303.451 |
| 218.096 | 303.333 |
| 217.717 | 303.148 |
| 217.375 | 303.153 |
| 215.897 | 302.217 |
| 212.482 | 300.251 |
| 210.206 | 300.433 |
| 209.945 | 300.335 |
| 202.913 | 297.182 |
| 202.397 | 296.924 |
| 202.206 | 296.956 |
| 201.055 | 297.096 |
| 200.024 | 297.236 |
| 199.627 | 297.032 |
| 198.327 | 296.342 |
| 194.797 | 294.491 |
| 193.311 | 294.495 |
| 189.959 | 294.794 |
| 186.106 | 292.634 |
| 184.661 | 291.458 |
| 183.782 | 291.292 |
| 180.309 | 290.6 |

| | |
|---------|---------|
| 177.833 | 290.245 |
| 176.811 | 289.425 |
| 174.438 | 287.5 |
| 172.012 | 285.532 |
| 171.621 | 285.561 |
| 170.965 | 285.244 |
| 169.92 | 284.743 |
| 169.595 | 284.381 |
| 168.531 | 284.401 |
| 167.522 | 284.428 |
| 167.118 | 284.492 |
| 165.207 | 284.255 |
| 164.781 | 284.22 |
| 164.39 | 284.33 |
| 162.164 | 284.273 |
| 158.426 | 284.136 |
| 157.863 | 284.168 |
| 156.239 | 284.104 |
| 155.825 | 284.118 |
| 153.588 | 284.035 |
| 151.741 | 283.981 |

Material Boundary

| X | Y |
|---------|---------|
| 174.438 | 287.5 |
| 188.618 | 287.5 |
| 220 | 287.5 |
| 241.511 | 287.5 |
| 267.491 | 302.5 |
| 277.491 | 302.5 |
| 295.32 | 313.604 |

Material Boundary

| X | Y |
|---------|---------|
| 184.661 | 291.458 |
| 188.318 | 287.8 |
| 188.618 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 188.318 | 287.8 |
| 220 | 287.8 |
| 220 | 287.8 |
| 220 | 287.8 |
| 241.43 | 287.8 |
| 267.411 | 302.8 |
| 277.406 | 302.8 |
| 294.82 | 313.646 |

Project Summary

File Name: Estaca 06.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 15:54:16

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.36 | 0 | 0 | 0.36 |

Global Minimums

Method: bishop simplified

FS: 1.015570
 Axis Location: 191.523, 407.633
 Left Slip Surface Endpoint: 161.098, 291.091
 Right Slip Surface Endpoint: 266.502, 313.368
 Resisting Moment=242241 kN-m
 Driving Moment=238528 kN-m
 Total Slice Area=1398.07 m2

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 161.098 | 291.091 |
| 164.467 | 287.652 |
| 222.092 | 287.652 |
| 266.502 | 313.368 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.01557

| 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 | 3.2236 | 58.5068 | Resíduos | 13.5 | 22 | 30.1438 | 30.6131 | 48.8901 | 6.53384 | 42.3562 |
| 2 | 0.144981 | 5.41322 | Interface Solo x GMB Lisa | 3 | 12 | 10.1142 | 10.2716 | 47.6518 | 13.4414 | 34.2104 |
| 3 | 4.43269 | 204.646 | Interface Solo x GMB Lisa | 3 | 12 | 9.13816 | 9.28044 | 46.1674 | 16.6203 | 29.5471 |
| 4 | 4.43269 | 222.376 | Interface Solo x GMB Lisa | 3 | 12 | 9.67395 | 9.82457 | 50.1673 | 18.0602 | 32.1071 |
| 5 | 4.43269 | 274.521 | Interface Solo x GMB Lisa | 3 | 12 | 11.2497 | 11.4249 | 61.931 | 22.2952 | 39.6358 |
| 6 | 4.43269 | 297.55 | Interface Solo x GMB Lisa | 3 | 12 | 11.9456 | 12.1316 | 67.1262 | 24.1655 | 42.9607 |

| | | | | | | | | | | |
|----|---------|---------|------------------------------|------|----|---------|---------|---------|---------|----------|
| 7 | 4.43269 | 363.395 | Interface Solo x GMB Lisa | 3 | 12 | 13.9353 | 14.1523 | 81.9807 | 29.513 | 52.4677 |
| 8 | 4.43269 | 390.283 | Interface Solo x GMB Lisa | 3 | 12 | 14.7479 | 14.9775 | 88.0465 | 31.6967 | 56.3498 |
| 9 | 4.43269 | 416.89 | Interface Solo x GMB Lisa | 3 | 12 | 15.5519 | 15.794 | 94.0489 | 33.8576 | 60.1913 |
| 10 | 4.43269 | 473.174 | Interface Solo x GMB Lisa | 3 | 12 | 17.2528 | 17.5214 | 106.746 | 38.4287 | 68.3177 |
| 11 | 4.43269 | 515.489 | Interface Solo x GMB Lisa | 3 | 12 | 18.5315 | 18.82 | 116.293 | 41.8653 | 74.4272 |
| 12 | 4.43269 | 551.672 | Interface Solo x GMB Lisa | 3 | 12 | 19.6248 | 19.9304 | 124.455 | 44.8039 | 79.6514 |
| 13 | 4.43269 | 611.251 | Interface Solo x GMB Lisa | 3 | 12 | 21.4253 | 21.7589 | 137.896 | 49.6426 | 88.2535 |
| 14 | 4.43269 | 667.536 | Interface Solo x GMB Lisa | 3 | 12 | 23.1261 | 23.4862 | 150.594 | 54.2138 | 96.38 |
| 15 | 4.43269 | 730.265 | Interface Solo x GMB Lisa | 3 | 12 | 25.0217 | 25.4113 | 164.745 | 59.3083 | 105.437 |
| 16 | 4.35996 | 698.303 | Interface Solo x GMB Lisa | 3 | 12 | 21.7719 | 22.1109 | 147.568 | 57.6585 | 89.9096 |
| 17 | 4.35996 | 673.077 | Interface Solo x GMB Lisa | 3 | 12 | 21.0806 | 21.4088 | 142.182 | 55.5757 | 86.6065 |
| 18 | 4.35996 | 608.071 | Interface Solo x GMB Lisa | 3 | 12 | 19.299 | 19.5995 | 128.303 | 50.2081 | 78.0947 |
| 19 | 4.35996 | 532.229 | Interface Solo x GMB Lisa | 3 | 12 | 17.2207 | 17.4888 | 112.11 | 43.9459 | 68.1643 |
| 20 | 4.35996 | 455.465 | Interface Solo x GMB Lisa | 3 | 12 | 15.1169 | 15.3523 | 95.7205 | 37.6075 | 58.113 |
| 21 | 4.35996 | 377.659 | Interface Solo x GMB Lisa | 3 | 12 | 12.9847 | 13.1869 | 79.1086 | 31.1832 | 47.9254 |
| 22 | 4.56261 | 307.355 | Resíduos | 13.5 | 22 | 24.7491 | 25.1344 | 53.0469 | 24.251 | 28.7959 |
| 23 | 4.56261 | 218.415 | Resíduos | 13.5 | 22 | 20.7143 | 21.0369 | 35.8878 | 17.2334 | 18.6544 |
| 24 | 4.56261 | 131.027 | Resíduos | 13.5 | 22 | 16.7501 | 17.0109 | 19.0281 | 10.3383 | 8.68983 |
| 25 | 4.56261 | 43.6758 | Resíduos | 13.5 | 22 | 12.7874 | 12.9865 | 2.17527 | 3.44611 | -1.27084 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.01557

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 161.098 | 291.091 | 0 | 0 | 0 |
| 2 | 164.322 | 287.8 | 257.958 | 0 | 0 |
| 3 | 164.467 | 287.652 | 266.475 | 0 | 0 |
| 4 | 168.9 | 287.652 | 306.941 | 0 | 0 |
| 5 | 173.332 | 287.652 | 349.78 | 0 | 0 |
| 6 | 177.765 | 287.652 | 399.597 | 0 | 0 |
| 7 | 182.198 | 287.652 | 452.495 | 0 | 0 |
| 8 | 186.63 | 287.652 | 514.204 | 0 | 0 |
| 9 | 191.063 | 287.652 | 579.512 | 0 | 0 |
| 10 | 195.496 | 287.652 | 648.38 | 0 | 0 |
| 11 | 199.929 | 287.652 | 724.779 | 0 | 0 |
| 12 | 204.361 | 287.652 | 806.842 | 0 | 0 |
| 13 | 208.794 | 287.652 | 893.746 | 0 | 0 |
| 14 | 213.227 | 287.652 | 988.622 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 15 | 217.659 | 287.652 | 1091.03 | 0 | 0 |
| 16 | 222.092 | 287.652 | 1201.83 | 0 | 0 |
| 17 | 226.452 | 290.177 | 924.103 | 0 | 0 |
| 18 | 230.812 | 292.701 | 656.959 | 0 | 0 |
| 19 | 235.172 | 295.226 | 417.097 | 0 | 0 |
| 20 | 239.532 | 297.751 | 209.062 | 0 | 0 |
| 21 | 243.892 | 300.275 | 33.2434 | 0 | 0 |
| 22 | 248.252 | 302.8 | -109.923 | 0 | 0 |
| 23 | 252.814 | 305.442 | -137.267 | 0 | 0 |
| 24 | 257.377 | 308.084 | -137.666 | 0 | 0 |
| 25 | 261.94 | 310.726 | -111.59 | 0 | 0 |
| 26 | 266.502 | 313.368 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 161.098 | 291.091 |
| 164.467 | 287.652 |
| 222.092 | 287.652 |
| 266.502 | 313.368 |

External Boundary

| X | Y |
|---------|---------|
| 339.612 | 342.538 |
| 338.395 | 341.755 |
| 335.652 | 341.846 |
| 333.745 | 340.275 |
| 332.366 | 339.089 |
| 332.187 | 339.132 |
| 328.941 | 339.719 |
| 327.502 | 338.779 |
| 321.333 | 334.626 |
| 319.671 | 334.655 |
| 315.557 | 334.551 |
| 311.993 | 331.997 |
| 311.744 | 331.819 |
| 311.112 | 331.849 |
| 308.517 | 332.015 |
| 303.847 | 327.686 |
| 299.325 | 323.421 |
| 294.078 | 323.001 |
| 293.148 | 322.96 |
| 283.186 | 317.838 |
| 276.14 | 313.503 |
| 275.498 | 313.464 |
| 275.151 | 313.443 |
| 269.839 | 313.369 |
| 268.012 | 313.337 |
| 266.476 | 313.369 |

| | |
|---------|---------|
| 253.428 | 313.635 |
| 251.875 | 313.709 |
| 247.562 | 313.829 |
| 240.623 | 313.859 |
| 236.839 | 313.84 |
| 232.42 | 313.783 |
| 229.725 | 313.815 |
| 228.414 | 313.664 |
| 226.644 | 312.372 |
| 225.684 | 311.529 |
| 223.002 | 311.738 |
| 220.916 | 311.785 |
| 216.624 | 309.423 |
| 215.723 | 308.889 |
| 215.24 | 308.87 |
| 213.45 | 308.793 |
| 212.337 | 308.112 |
| 211.566 | 307.718 |
| 209.575 | 306.289 |
| 207.955 | 305.698 |
| 203.248 | 304.537 |
| 201.217 | 303.831 |
| 200 | 303.812 |
| 199.841 | 303.809 |
| 195.355 | 301.764 |
| 192.832 | 300.795 |
| 192.707 | 300.799 |
| 189.728 | 300.021 |
| 189.548 | 299.991 |
| 188.045 | 300.271 |
| 185.768 | 300.036 |
| 181.89 | 298.028 |
| 180.008 | 297.063 |
| 178.927 | 296.583 |
| 176.648 | 296.914 |
| 176.248 | 296.968 |
| 174.096 | 295.858 |
| 171.608 | 294.547 |
| 167.269 | 294.713 |
| 167.141 | 294.643 |
| 166.956 | 294.534 |
| 160.942 | 290.999 |
| 156.065 | 290.364 |
| 155.416 | 290.281 |
| 154.848 | 289.793 |
| 152.322 | 287.5 |
| 148.939 | 284.429 |
| 145.019 | 284.446 |
| 138.723 | 284.436 |
| 138.111 | 284.444 |
| 137.557 | 284.445 |
| 133.039 | 284.287 |

| | |
|---------|---------|
| 127.319 | 284.464 |
| 126.291 | 284.462 |
| 126.017 | 284.461 |
| 124.166 | 284.471 |
| 113.003 | 284.32 |
| 108.96 | 284.336 |
| 105.281 | 284.306 |
| 105.281 | 280 |
| 340 | 280 |
| 340 | 342.598 |

Material Boundary

| X | Y |
|---------|---------|
| 152.322 | 287.5 |
| 164.441 | 287.5 |
| 200 | 287.5 |
| 222.033 | 287.5 |
| 248.013 | 302.5 |
| 258.014 | 302.5 |
| 276.14 | 313.503 |

Material Boundary

| X | Y |
|---------|---------|
| 160.942 | 290.999 |
| 164.141 | 287.8 |
| 164.441 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 164.141 | 287.8 |
| 200 | 287.8 |
| 200 | 287.8 |
| 200 | 287.8 |
| 221.952 | 287.8 |
| 247.933 | 302.8 |
| 257.93 | 302.8 |
| 275.498 | 313.464 |

Project Summary

File Name: Estaca 07.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:12:23

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.16 | 0 | 0 | 0.16 |

Global Minimums

Method: bishop simplified

FS: 1.246310
 Axis Location: 184.371, 410.117
 Left Slip Surface Endpoint: 152.819, 290.608
 Right Slip Surface Endpoint: 261.047, 313.169
 Resisting Moment=308562 kN-m
 Driving Moment=247580 kN-m
 Total Slice Area=1432.95 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 152.819 | 290.608 |
| 155.805 | 287.626 |
| 216.964 | 287.626 |
| 261.047 | 313.169 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.24631

| 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 | 2.81208 | 43.1342 | Resíduos | 13.5 | 22 | 22.1903 | 27.656 | 37.4917 | 2.45423 | 35.0374 |
| 2 | 0.174278 | 5.55762 | Interface Solo x GMB Lisa | 3 | 12 | 8.40699 | 10.4777 | 40.2822 | 5.10232 | 35.1799 |
| 3 | 4.70454 | 192.959 | Interface Solo x GMB Lisa | 3 | 12 | 8.28303 | 10.3232 | 41.0155 | 6.56249 | 34.453 |
| 4 | 4.70454 | 227.398 | Interface Solo x GMB Lisa | 3 | 12 | 9.33174 | 11.6302 | 48.3359 | 7.73373 | 40.6021 |
| 5 | 4.70454 | 276.987 | Interface Solo x GMB Lisa | 3 | 12 | 10.8418 | 13.5123 | 58.8766 | 9.42025 | 49.4563 |
| 6 | 4.70454 | 322.177 | Interface Solo x GMB Lisa | 3 | 12 | 12.2179 | 15.2273 | 68.4822 | 10.9571 | 57.5251 |

| | | | | | | | | | | |
|----|---------|---------|------------------------------|------|----|---------|---------|---------|---------|----------|
| 7 | 4.70454 | 352.787 | Interface Solo x GMB Lisa | 3 | 12 | 13.15 | 16.389 | 74.9887 | 11.9982 | 62.9905 |
| 8 | 4.70454 | 393.19 | Interface Solo x GMB Lisa | 3 | 12 | 14.3804 | 17.9224 | 83.5767 | 13.3723 | 70.2044 |
| 9 | 4.70454 | 429.779 | Interface Solo x GMB Lisa | 3 | 12 | 15.4945 | 19.311 | 91.3541 | 14.6167 | 76.7374 |
| 10 | 4.70454 | 506.055 | Interface Solo x GMB Lisa | 3 | 12 | 17.8173 | 22.2059 | 107.567 | 17.2108 | 90.3566 |
| 11 | 4.70454 | 528.752 | Interface Solo x GMB Lisa | 3 | 12 | 18.5085 | 23.0673 | 112.392 | 17.9827 | 94.4092 |
| 12 | 4.70454 | 589.585 | Interface Solo x GMB Lisa | 3 | 12 | 20.3609 | 25.376 | 125.323 | 20.0516 | 105.271 |
| 13 | 4.70454 | 669.723 | Interface Solo x GMB Lisa | 3 | 12 | 22.8012 | 28.4174 | 142.357 | 22.7771 | 119.58 |
| 14 | 4.70454 | 728.139 | Interface Solo x GMB Lisa | 3 | 12 | 24.5802 | 30.6345 | 154.774 | 24.7638 | 130.01 |
| 15 | 4.70454 | 803.515 | Interface Solo x GMB Lisa | 3 | 12 | 26.8755 | 33.4952 | 170.796 | 27.3273 | 143.468 |
| 16 | 4.36458 | 748.519 | Interface Solo x GMB Lisa | 3 | 12 | 24.5502 | 30.5972 | 157.275 | 27.4398 | 129.835 |
| 17 | 4.36458 | 675.752 | Interface Solo x GMB Lisa | 3 | 12 | 22.3765 | 27.8881 | 141.862 | 24.7722 | 117.089 |
| 18 | 4.36458 | 598.628 | Interface Solo x GMB Lisa | 3 | 12 | 20.0728 | 25.0169 | 125.526 | 21.9449 | 103.581 |
| 19 | 4.36458 | 520.768 | Interface Solo x GMB Lisa | 3 | 12 | 17.7469 | 22.1182 | 109.035 | 19.0907 | 89.9438 |
| 20 | 4.36458 | 442.715 | Interface Solo x GMB Lisa | 3 | 12 | 15.4153 | 19.2123 | 92.5022 | 16.2294 | 76.2728 |
| 21 | 4.36458 | 364.67 | Interface Solo x GMB Lisa | 3 | 12 | 13.084 | 16.3067 | 75.9714 | 13.3683 | 62.6031 |
| 22 | 4.47383 | 290.597 | Resíduos | 13.5 | 22 | 24.0102 | 29.9241 | 51.0439 | 10.3928 | 40.6511 |
| 23 | 4.47383 | 205.893 | Resíduos | 13.5 | 22 | 19.6697 | 24.5146 | 34.6255 | 7.36347 | 27.262 |
| 24 | 4.47383 | 121.276 | Resíduos | 13.5 | 22 | 15.3337 | 19.1105 | 18.2238 | 4.33725 | 13.8866 |
| 25 | 4.47383 | 39.2984 | Resíduos | 13.5 | 22 | 11.133 | 13.8751 | 2.33388 | 1.40545 | 0.928432 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.24631

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 152.819 | 290.608 | 0 | 0 | 0 |
| 2 | 155.631 | 287.8 | 167.656 | 0 | 0 |
| 3 | 155.805 | 287.626 | 176.13 | 0 | 0 |
| 4 | 160.51 | 287.626 | 215.093 | 0 | 0 |
| 5 | 165.214 | 287.626 | 258.99 | 0 | 0 |
| 6 | 169.919 | 287.626 | 309.991 | 0 | 0 |
| 7 | 174.623 | 287.626 | 367.465 | 0 | 0 |
| 8 | 179.328 | 287.626 | 429.323 | 0 | 0 |
| 9 | 184.032 | 287.626 | 496.969 | 0 | 0 |
| 10 | 188.737 | 287.626 | 569.856 | 0 | 0 |
| 11 | 193.441 | 287.626 | 653.67 | 0 | 0 |
| 12 | 198.146 | 287.626 | 740.734 | 0 | 0 |
| 13 | 202.85 | 287.626 | 836.513 | 0 | 0 |
| 14 | 207.555 | 287.626 | 943.771 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 15 | 212.259 | 287.626 | 1059.4 | 0 | 0 |
| 16 | 216.964 | 287.626 | 1185.82 | 0 | 0 |
| 17 | 221.329 | 290.155 | 895.214 | 0 | 0 |
| 18 | 225.693 | 292.684 | 634.1 | 0 | 0 |
| 19 | 230.058 | 295.213 | 404.245 | 0 | 0 |
| 20 | 234.422 | 297.742 | 205.946 | 0 | 0 |
| 21 | 238.787 | 300.271 | 39.2825 | 0 | 0 |
| 22 | 243.152 | 302.8 | -95.7491 | 0 | 0 |
| 23 | 247.625 | 305.392 | -120.664 | 0 | 0 |
| 24 | 252.099 | 307.985 | -122.434 | 0 | 0 |
| 25 | 256.573 | 310.577 | -101.082 | 0 | 0 |
| 26 | 261.047 | 313.169 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 152.819 | 290.608 |
| 155.805 | 287.626 |
| 216.964 | 287.626 |
| 261.047 | 313.169 |

External Boundary

| X | Y |
|---------|---------|
| 331.127 | 342.897 |
| 330.786 | 342.683 |
| 326.507 | 340.234 |
| 325.931 | 339.872 |
| 324.071 | 340.18 |
| 322.455 | 340.446 |
| 321.525 | 339.894 |
| 316.19 | 336.828 |
| 313.523 | 335.452 |
| 308.247 | 335.558 |
| 307.674 | 335.589 |
| 307.568 | 335.402 |
| 307.384 | 335.212 |
| 305.846 | 333.262 |
| 304.978 | 333.377 |
| 302.911 | 333.69 |
| 296.657 | 328.022 |
| 294.557 | 326.381 |
| 292.201 | 324 |
| 288.479 | 323.413 |
| 287.734 | 323.33 |
| 285.142 | 323.158 |
| 272.346 | 315.705 |
| 267.751 | 313.304 |
| 267.277 | 313.329 |
| 266.823 | 313.353 |

| | |
|---------|---------|
| 263.28 | 313.249 |
| 259.365 | 313.109 |
| 252.7 | 313.166 |
| 247.818 | 313.333 |
| 246.464 | 313.374 |
| 241.792 | 313.397 |
| 235.802 | 313.422 |
| 232.023 | 313.447 |
| 230.881 | 313.442 |
| 227.067 | 313.461 |
| 223.552 | 313.475 |
| 221.838 | 313.382 |
| 221.626 | 313.4 |
| 221.384 | 313.47 |
| 220.058 | 313.406 |
| 216.388 | 313.012 |
| 212.653 | 310.818 |
| 210.72 | 309.598 |
| 208.448 | 309.468 |
| 207.005 | 308.807 |
| 204.001 | 307.302 |
| 203.229 | 306.825 |
| 201.855 | 306.129 |
| 200.603 | 305.429 |
| 195.88 | 303.451 |
| 195.449 | 303.293 |
| 195 | 303.296 |
| 191.371 | 303.318 |
| 190.247 | 302.751 |
| 185.923 | 300.13 |
| 184.694 | 299.994 |
| 182.401 | 299.944 |
| 181.082 | 299.126 |
| 179.801 | 299.066 |
| 179.274 | 298.504 |
| 177.304 | 298.327 |
| 173.248 | 297.783 |
| 172.235 | 297.037 |
| 170.605 | 296.979 |
| 169.531 | 296.776 |
| 168.154 | 296.138 |
| 167.519 | 296.124 |
| 165.996 | 295.272 |
| 164.56 | 294.451 |
| 162.953 | 294.419 |
| 161.243 | 294.422 |
| 160.117 | 294.436 |
| 158.046 | 293.313 |
| 155.941 | 292.356 |
| 152.728 | 290.557 |
| 149.821 | 290.231 |
| 148.62 | 290.033 |

| | |
|---------|---------|
| 145.516 | 287.5 |
| 145.272 | 287.301 |
| 141.833 | 284.462 |
| 139.556 | 284.528 |
| 137.605 | 284.61 |
| 136.778 | 284.588 |
| 135.413 | 284.491 |
| 127.161 | 284.15 |
| 125.21 | 284.179 |
| 108.472 | 284.128 |
| 106.213 | 284.119 |
| 96.4438 | 284.409 |
| 94.4174 | 284.389 |
| 92.4473 | 284.337 |
| 92.2892 | 284.223 |
| 92.2892 | 280 |
| 335 | 280 |
| 335 | 343.388 |

Material Boundary

| X | Y |
|---------|---------|
| 145.516 | 287.5 |
| 155.785 | 287.5 |
| 195 | 287.5 |
| 216.962 | 287.5 |
| 242.943 | 302.5 |
| 252.943 | 302.5 |
| 267.751 | 313.304 |

Material Boundary

| X | Y |
|---------|---------|
| 152.728 | 290.557 |
| 155.485 | 287.8 |
| 155.785 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 155.485 | 287.8 |
| 195 | 287.8 |
| 195 | 287.8 |
| 195 | 287.8 |
| 216.881 | 287.8 |
| 242.862 | 302.8 |
| 252.845 | 302.8 |
| 267.277 | 313.329 |

Project Summary

File Name: Estaca 08.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:26:41

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.16 | 0 | 0 | 0.16 |

Global Minimums

Method: bishop simplified

FS: 1.214360
 Axis Location: 223.099, 408.881
 Left Slip Surface Endpoint: 191.898, 290.408
 Right Slip Surface Endpoint: 299.157, 312.836
 Resisting Moment=292636 kN-m
 Driving Moment=240979 kN-m
 Total Slice Area=1363.83 m2

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 191.898 | 290.408 |
| 194.686 | 287.619 |
| 255.666 | 287.619 |
| 299.157 | 312.836 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.21436

| 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 | 2.6071 | 37.2058 | Resíduos | 13.5 | 22 | 22.6397 | 27.4927 | 36.9165 | 2.28336 | 34.6332 |
| 2 | 0.180942 | 5.39277 | Interface Solo x GMB Lisa | 3 | 12 | 8.30689 | 10.0876 | 38.1129 | 4.76862 | 33.3443 |
| 3 | 4.69077 | 185.074 | Interface Solo x GMB Lisa | 3 | 12 | 8.27149 | 10.0446 | 39.4549 | 6.31278 | 33.1422 |
| 4 | 4.69077 | 207.733 | Interface Solo x GMB Lisa | 3 | 12 | 8.98173 | 10.9071 | 44.2855 | 7.08566 | 37.1998 |
| 5 | 4.69077 | 217.755 | Interface Solo x GMB Lisa | 3 | 12 | 9.29588 | 11.2885 | 46.422 | 7.42752 | 38.9945 |
| 6 | 4.69077 | 269.111 | Interface Solo x GMB Lisa | 3 | 12 | 10.9056 | 13.2433 | 57.3703 | 9.17926 | 48.1911 |

| | | | | | | | | | | |
|----|---------|---------|------------------------------|------|----|---------|---------|---------|---------|---------|
| 7 | 4.69077 | 328.905 | Interface Solo x GMB Lisa | 3 | 12 | 12.7798 | 15.5193 | 70.1175 | 11.2188 | 58.8987 |
| 8 | 4.69077 | 365.715 | Interface Solo x GMB Lisa | 3 | 12 | 13.9336 | 16.9204 | 77.9648 | 12.4744 | 65.4904 |
| 9 | 4.69077 | 412.219 | Interface Solo x GMB Lisa | 3 | 12 | 15.3912 | 18.6905 | 87.8788 | 14.0606 | 73.8182 |
| 10 | 4.69077 | 482.386 | Interface Solo x GMB Lisa | 3 | 12 | 17.5906 | 21.3613 | 102.837 | 16.454 | 86.3833 |
| 11 | 4.69077 | 516.161 | Interface Solo x GMB Lisa | 3 | 12 | 18.6493 | 22.647 | 110.038 | 17.606 | 92.4316 |
| 12 | 4.69077 | 565.15 | Interface Solo x GMB Lisa | 3 | 12 | 20.1849 | 24.5117 | 120.481 | 19.277 | 101.204 |
| 13 | 4.69077 | 600.927 | Interface Solo x GMB Lisa | 3 | 12 | 21.3063 | 25.8735 | 128.108 | 20.4974 | 107.611 |
| 14 | 4.69077 | 703.118 | Interface Solo x GMB Lisa | 3 | 12 | 24.5094 | 29.7632 | 149.894 | 23.983 | 125.911 |
| 15 | 4.69077 | 770.951 | Interface Solo x GMB Lisa | 3 | 12 | 26.6355 | 32.3451 | 164.355 | 26.2968 | 138.058 |
| 16 | 4.36367 | 731.934 | Interface Solo x GMB Lisa | 3 | 12 | 24.6326 | 29.9128 | 153.452 | 26.8374 | 126.615 |
| 17 | 4.36367 | 654.452 | Interface Solo x GMB Lisa | 3 | 12 | 22.2623 | 27.0345 | 137.07 | 23.9964 | 113.074 |
| 18 | 4.36367 | 586.358 | Interface Solo x GMB Lisa | 3 | 12 | 20.1794 | 24.505 | 122.673 | 21.4996 | 101.173 |
| 19 | 4.36367 | 515.868 | Interface Solo x GMB Lisa | 3 | 12 | 18.0232 | 21.8866 | 107.769 | 18.915 | 88.8544 |
| 20 | 4.36367 | 439.198 | Interface Solo x GMB Lisa | 3 | 12 | 15.6778 | 19.0385 | 91.5591 | 16.1038 | 75.4553 |
| 21 | 4.36367 | 360.352 | Interface Solo x GMB Lisa | 3 | 12 | 13.2659 | 16.1096 | 74.8885 | 13.2128 | 61.6757 |
| 22 | 4.32728 | 277.39 | Resíduos | 13.5 | 22 | 24.3373 | 29.5543 | 49.992 | 10.2564 | 39.7356 |
| 23 | 4.32728 | 201.194 | Resíduos | 13.5 | 22 | 20.212 | 24.5447 | 34.7756 | 7.43908 | 27.3365 |
| 24 | 4.32728 | 121.022 | Resíduos | 13.5 | 22 | 15.8715 | 19.2737 | 18.7652 | 4.47477 | 14.2904 |
| 25 | 4.32728 | 40.3192 | Resíduos | 13.5 | 22 | 11.5022 | 13.9678 | 2.64862 | 1.49079 | 1.15783 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.21436

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 191.898 | 290.408 | 0 | 0 | 0 |
| 2 | 194.505 | 287.8 | 155.296 | 0 | 0 |
| 3 | 194.686 | 287.619 | 163.697 | 0 | 0 |
| 4 | 199.377 | 287.619 | 202.494 | 0 | 0 |
| 5 | 204.068 | 287.619 | 244.623 | 0 | 0 |
| 6 | 208.758 | 287.619 | 288.225 | 0 | 0 |
| 7 | 213.449 | 287.619 | 339.377 | 0 | 0 |
| 8 | 218.14 | 287.619 | 399.32 | 0 | 0 |
| 9 | 222.831 | 287.619 | 464.675 | 0 | 0 |
| 10 | 227.521 | 287.619 | 536.868 | 0 | 0 |
| 11 | 232.212 | 287.619 | 619.376 | 0 | 0 |
| 12 | 236.903 | 287.619 | 706.849 | 0 | 0 |
| 13 | 241.594 | 287.619 | 801.526 | 0 | 0 |
| 14 | 246.284 | 287.619 | 901.462 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 15 | 250.975 | 287.619 | 1016.42 | 0 | 0 |
| 16 | 255.666 | 287.619 | 1141.36 | 0 | 0 |
| 17 | 260.03 | 290.149 | 860.577 | 0 | 0 |
| 18 | 264.393 | 292.679 | 610.906 | 0 | 0 |
| 19 | 268.757 | 295.209 | 388.574 | 0 | 0 |
| 20 | 273.121 | 297.74 | 194.541 | 0 | 0 |
| 21 | 277.484 | 300.27 | 31.2896 | 0 | 0 |
| 22 | 281.848 | 302.8 | -100.307 | 0 | 0 |
| 23 | 286.175 | 305.309 | -120.433 | 0 | 0 |
| 24 | 290.503 | 307.818 | -120.23 | 0 | 0 |
| 25 | 294.83 | 310.327 | -98.6371 | 0 | 0 |
| 26 | 299.157 | 312.836 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 191.898 | 290.408 |
| 194.686 | 287.619 |
| 255.666 | 287.619 |
| 299.157 | 312.836 |

External Boundary

| X | Y |
|---------|---------|
| 370.883 | 343.803 |
| 367.652 | 343.664 |
| 366.751 | 343.593 |
| 365.196 | 343.396 |
| 365.069 | 343.317 |
| 364.058 | 342.606 |
| 363.454 | 342.119 |
| 361.305 | 340.472 |
| 358.125 | 341.125 |
| 349.166 | 336.395 |
| 348.32 | 335.96 |
| 345.625 | 335.468 |
| 344.52 | 335.437 |
| 344.506 | 335.685 |
| 344.325 | 335.13 |
| 343.256 | 334.868 |
| 341.57 | 334.375 |
| 340.392 | 334.275 |
| 336.947 | 333.547 |
| 335.981 | 333.077 |
| 334.81 | 332.343 |
| 334.562 | 332.877 |
| 328.745 | 327.307 |
| 325.958 | 324.475 |
| 325.194 | 323.774 |
| 322.108 | 323.551 |

| | |
|---------|---------|
| 321.733 | 323.452 |
| 315.579 | 320.333 |
| 301.789 | 313.019 |
| 300.983 | 312.86 |
| 300.547 | 312.824 |
| 300.506 | 312.821 |
| 299.158 | 312.836 |
| 291.544 | 313.106 |
| 289.059 | 313.236 |
| 285.769 | 313.175 |
| 282.589 | 313.245 |
| 281.549 | 313.224 |
| 280.478 | 313.254 |
| 274.171 | 313.317 |
| 270.213 | 313.272 |
| 268.623 | 313.241 |
| 266.369 | 313.007 |
| 264.066 | 312.883 |
| 263.784 | 312.77 |
| 260.21 | 312.686 |
| 257.119 | 312.917 |
| 256.913 | 312.903 |
| 256.6 | 312.741 |
| 250.791 | 309.694 |
| 249.752 | 309.454 |
| 248.414 | 309.193 |
| 244.572 | 306.162 |
| 242.943 | 304.919 |
| 241.971 | 304.953 |
| 239.485 | 305.097 |
| 236.326 | 303.688 |
| 235 | 303.184 |
| 234.769 | 303.096 |
| 231.922 | 303.006 |
| 231.136 | 303 |
| 228.095 | 301.323 |
| 225.541 | 299.857 |
| 222.799 | 299.852 |
| 222.489 | 299.867 |
| 221.789 | 299.365 |
| 219.247 | 297.885 |
| 215.231 | 297.612 |
| 214.982 | 297.625 |
| 214.216 | 297.261 |
| 208.676 | 294.549 |
| 206.224 | 294.15 |
| 205.508 | 293.926 |
| 202.518 | 293.89 |
| 198.82 | 293.801 |
| 197.985 | 293.839 |
| 191.758 | 290.329 |
| 187.726 | 289.729 |

| | |
|---------|---------|
| 185.695 | 288.21 |
| 184.729 | 287.5 |
| 183.334 | 286.473 |
| 182.458 | 285.055 |
| 182.07 | 284.707 |
| 181.546 | 284.385 |
| 181.366 | 284.417 |
| 181.135 | 284.442 |
| 180.793 | 284.421 |
| 180.64 | 284.423 |
| 180.508 | 284.579 |
| 180.295 | 284.633 |
| 177.033 | 284.63 |
| 176.108 | 284.662 |
| 175.086 | 284.673 |
| 141.408 | 284.523 |
| 133.767 | 284.468 |
| 132.464 | 284.454 |
| 128.904 | 284.406 |
| 128.691 | 284.336 |
| 128.455 | 284.165 |
| 128.455 | 280 |
| 375 | 280 |
| 375 | 343.94 |

Material Boundary

| X | Y |
|---------|--------|
| 184.729 | 287.5 |
| 194.649 | 287.5 |
| 235 | 287.5 |
| 255.65 | 287.5 |
| 281.632 | 302.5 |
| 291.632 | 302.5 |
| 300.983 | 312.86 |

Material Boundary

| X | Y |
|---------|---------|
| 191.758 | 290.329 |
| 194.342 | 287.8 |
| 194.649 | 287.5 |

Material Boundary

| X | Y |
|---------|-------|
| 194.342 | 287.8 |
| 235 | 287.8 |
| 235 | 287.8 |
| 235 | 287.8 |
| 255.57 | 287.8 |
| 281.551 | 302.8 |
| 291.498 | 302.8 |

Project Summary

File Name: Estaca 09.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:41:21

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Material de enchente | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|---|
| Color |  |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 5 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 10 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 20 | 12 |
| Water Surface | None | None | None | None | None |
| Ru Value | 0.49 | 0 | 0 | 0.49 | 0.49 |

Support Properties

Support 1

Support Type: End Anchored
 Force Application: Active
 Out-of-Plane Spacing: 1 m
 Anchor Capacity: 100 kN

Global Minimums

Method: bishop simplified

FS: 0.866741
 Axis Location: 244.488, 402.300
 Left Slip Surface Endpoint: 216.519, 290.476
 Right Slip Surface Endpoint: 317.166, 312.831
 Resisting Moment=180668 kN-m
 Driving Moment=208445 kN-m
 Total Slice Area=1295.65 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 216.519 | 290.476 |
| 219.37 | 287.631 |
| 273.698 | 287.631 |
| 317.166 | 312.831 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 0.866741

| 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 | 2.6814 | 43.5687 | Resíduos | 13.5 | 22 | 36.3421 | 31.4992 | 52.5115 | 7.96177 | 44.5497 |

| | | | | | | | | | | |
|----|----------|---------|------------------------------|------|----|---------|---------|---------|---------|----------|
| 2 | 0.169337 | 5.8503 | Interface Solo x GMB Lisa | 3 | 12 | 10.3035 | 8.93047 | 44.8294 | 16.9287 | 27.9007 |
| 3 | 4.17908 | 176.463 | Interface Solo x GMB Lisa | 3 | 12 | 8.74238 | 7.57738 | 42.2254 | 20.6904 | 21.535 |
| 4 | 4.17908 | 204.887 | Interface Solo x GMB Lisa | 3 | 12 | 9.59307 | 8.31471 | 49.0269 | 24.0232 | 25.0037 |
| 5 | 4.17908 | 269.863 | Interface Solo x GMB Lisa | 3 | 12 | 11.5376 | 10.0001 | 64.5748 | 31.6416 | 32.9332 |
| 6 | 4.17908 | 279.464 | Interface Solo x GMB Lisa | 3 | 12 | 11.825 | 10.2492 | 66.8722 | 32.7673 | 34.1049 |
| 7 | 4.17908 | 329.559 | Interface Solo x GMB Lisa | 3 | 12 | 13.3242 | 11.5487 | 78.8593 | 38.6411 | 40.2182 |
| 8 | 4.17908 | 349.205 | Interface Solo x GMB Lisa | 3 | 12 | 13.9122 | 12.0583 | 83.5603 | 40.9446 | 42.6157 |
| 9 | 4.17908 | 404.02 | Interface Solo x GMB Lisa | 3 | 12 | 15.5526 | 13.4801 | 96.6769 | 47.3716 | 49.3053 |
| 10 | 4.17908 | 446.064 | Interface Solo x GMB Lisa | 3 | 12 | 16.8109 | 14.5707 | 106.737 | 52.3013 | 54.4361 |
| 11 | 4.17908 | 479.982 | Interface Solo x GMB Lisa | 3 | 12 | 17.8261 | 15.4506 | 114.854 | 56.2782 | 58.5754 |
| 12 | 4.17908 | 506.724 | Interface Solo x GMB Lisa | 3 | 12 | 18.6263 | 16.1442 | 121.253 | 59.4138 | 61.8388 |
| 13 | 4.17908 | 558.835 | Interface Solo x GMB Lisa | 3 | 12 | 20.186 | 17.496 | 133.722 | 65.5239 | 68.1982 |
| 14 | 4.17908 | 625.616 | Interface Solo x GMB Lisa | 3 | 12 | 22.1846 | 19.2283 | 149.702 | 73.3539 | 76.3481 |
| 15 | 4.17908 | 641.904 | Interface Solo x GMB Lisa | 3 | 12 | 22.6721 | 19.6508 | 153.599 | 75.2637 | 78.3358 |
| 16 | 4.36097 | 691.991 | Interface Solo x GMB Lisa | 3 | 12 | 20.4066 | 17.6872 | 146.85 | 77.7524 | 69.098 |
| 17 | 4.36097 | 626.121 | Interface Solo x GMB Lisa | 3 | 12 | 18.7525 | 16.2536 | 132.705 | 70.3512 | 62.3534 |
| 18 | 4.36097 | 552.835 | Interface Solo x GMB Lisa | 3 | 12 | 16.9123 | 14.6586 | 116.966 | 62.1167 | 54.8495 |
| 19 | 4.36097 | 476.174 | Interface Solo x GMB Lisa | 3 | 12 | 14.9874 | 12.9902 | 100.503 | 53.5031 | 47 |
| 20 | 4.36097 | 405.859 | Interface Solo x GMB Lisa | 3 | 12 | 13.2217 | 11.4598 | 85.4027 | 45.6025 | 39.8002 |
| 21 | 4.36097 | 331.442 | Interface Solo x GMB Lisa | 3 | 12 | 11.3531 | 9.84019 | 69.4215 | 37.241 | 32.1805 |
| 22 | 4.32556 | 253.913 | Resíduos | 13.5 | 22 | 23.2491 | 20.151 | 45.2249 | 28.7632 | 16.4617 |
| 23 | 4.32556 | 190.408 | Resíduos | 13.5 | 22 | 20.5013 | 17.7693 | 32.1362 | 21.5694 | 10.5668 |
| 24 | 4.32556 | 111.788 | Resíduos | 13.5 | 22 | 17.0995 | 14.8208 | 15.9325 | 12.6634 | 3.26907 |
| 25 | 4.32556 | 36.4702 | Resíduos | 13.5 | 22 | 13.8405 | 11.9961 | 0.40913 | 4.13134 | -3.72221 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 0.866741

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 216.519 | 290.476 | 0 | 0 | 0 |
| 2 | 219.201 | 287.8 | 237.953 | 0 | 0 |
| 3 | 219.37 | 287.631 | 247.274 | 0 | 0 |
| 4 | 223.549 | 287.631 | 283.802 | 0 | 0 |
| 5 | 227.728 | 287.631 | 323.884 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 6 | 231.907 | 287.631 | 372.092 | 0 | 0 |
| 7 | 236.086 | 287.631 | 421.5 | 0 | 0 |
| 8 | 240.265 | 287.631 | 477.172 | 0 | 0 |
| 9 | 244.444 | 287.631 | 535.301 | 0 | 0 |
| 10 | 248.624 | 287.631 | 600.285 | 0 | 0 |
| 11 | 252.803 | 287.631 | 670.526 | 0 | 0 |
| 12 | 256.982 | 287.631 | 745.008 | 0 | 0 |
| 13 | 261.161 | 287.631 | 822.835 | 0 | 0 |
| 14 | 265.34 | 287.631 | 907.177 | 0 | 0 |
| 15 | 269.519 | 287.631 | 999.871 | 0 | 0 |
| 16 | 273.698 | 287.631 | 1094.6 | 0 | 0 |
| 17 | 278.059 | 290.159 | 812.314 | 0 | 0 |
| 18 | 282.42 | 292.687 | 558.578 | 0 | 0 |
| 19 | 286.781 | 295.216 | 336.608 | 0 | 0 |
| 20 | 291.142 | 297.744 | 147.867 | 0 | 0 |
| 21 | 295.503 | 300.272 | -10.3971 | 0 | 0 |
| 22 | 299.864 | 302.8 | -136.405 | 0 | 0 |
| 23 | 304.189 | 305.308 | -149.267 | 0 | 0 |
| 24 | 308.515 | 307.815 | -141.19 | 0 | 0 |
| 25 | 312.84 | 310.323 | -107.193 | 0 | 0 |
| 26 | 317.166 | 312.831 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 216.519 | 290.476 |
| 219.37 | 287.631 |
| 273.698 | 287.631 |
| 317.166 | 312.831 |

External Boundary

| X | Y |
|---------|---------|
| 145 | 280 |
| 393.414 | 280 |
| 393.414 | 343.702 |
| 393.295 | 343.65 |
| 389.78 | 343.533 |
| 386.076 | 343.608 |
| 379.879 | 342.816 |
| 378.623 | 341.966 |
| 377.679 | 341.285 |
| 375.448 | 341.439 |
| 372.005 | 341.557 |
| 363.452 | 337.35 |
| 362.031 | 336.687 |
| 360.766 | 335.896 |
| 360.058 | 335.275 |
| 359.083 | 335.139 |
| 353.6 | 334.792 |

| | |
|---------|---------|
| 347.503 | 329.347 |
| 342.682 | 324.938 |
| 342.147 | 324.893 |
| 341.125 | 324.53 |
| 327.654 | 317.643 |
| 318.572 | 313.469 |
| 317.956 | 313.186 |
| 317.182 | 312.831 |
| 314.553 | 312.773 |
| 311.696 | 312.694 |
| 309.102 | 312.835 |
| 304.438 | 313.043 |
| 301.915 | 313.038 |
| 300.521 | 312.953 |
| 298.364 | 312.884 |
| 297.013 | 312.901 |
| 293.149 | 312.866 |
| 292.22 | 312.685 |
| 288.865 | 312.529 |
| 285.094 | 312.648 |
| 284.853 | 312.527 |
| 277.533 | 312.356 |
| 276.842 | 312.352 |
| 276.663 | 312.277 |
| 276.178 | 311.898 |
| 271.912 | 309.284 |
| 270.276 | 309.249 |
| 267.099 | 309.092 |
| 266.846 | 308.972 |
| 266.457 | 308.913 |
| 266.337 | 308.775 |
| 262.662 | 306.247 |
| 261.229 | 305.315 |
| 260.737 | 304.813 |
| 259.941 | 304.806 |
| 257.5 | 304.959 |
| 255 | 304.01 |
| 253.562 | 303.464 |
| 252.04 | 302.831 |
| 251.751 | 302.831 |
| 249.003 | 302.727 |
| 244.674 | 300.348 |
| 243.137 | 299.33 |
| 239.423 | 299.444 |
| 238.949 | 299.482 |
| 238.385 | 299.118 |
| 235.214 | 297.009 |
| 230.625 | 297.158 |
| 230.114 | 297.184 |
| 229.646 | 296.959 |
| 226.829 | 295.241 |
| 224.32 | 293.711 |

| | |
|---------|---------|
| 224.031 | 293.73 |
| 220.986 | 293.842 |
| 219.345 | 292.674 |
| 218.807 | 292.14 |
| 216.437 | 290.416 |
| 216.159 | 290.425 |
| 214.842 | 290.39 |
| 214.265 | 290.423 |
| 210.866 | 290.208 |
| 209.625 | 289.287 |
| 208.606 | 288.636 |
| 207.662 | 288.634 |
| 206.311 | 288.323 |
| 205.233 | 288.182 |
| 204.367 | 287.5 |
| 204.208 | 287.374 |
| 200.801 | 284.634 |
| 200.467 | 284.651 |
| 200.177 | 284.602 |
| 197.641 | 284.667 |
| 196.903 | 284.681 |
| 192.509 | 284.613 |
| 190.264 | 284.558 |
| 189.645 | 284.501 |
| 188.986 | 284.494 |
| 188.359 | 284.495 |
| 172.815 | 284.473 |
| 151.253 | 284.318 |
| 149.289 | 284.296 |
| 148.426 | 284.29 |
| 148.289 | 284.203 |
| 148.185 | 284.301 |
| 145 | 284.282 |

Material Boundary

| X | Y |
|---------|---------|
| 204.367 | 287.5 |
| 219.353 | 287.5 |
| 255 | 287.5 |
| 273.695 | 287.5 |
| 299.676 | 302.5 |
| 309.676 | 302.5 |
| 318.572 | 313.469 |

Material Boundary

| X | Y |
|---------|---------|
| 216.437 | 290.416 |
| 219.053 | 287.8 |
| 219.353 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 276.842 | 308.352 |
| 276.842 | 310.352 |
| 276.92 | 310.354 |
| 277.534 | 310.356 |
| 284.853 | 310.527 |
| 285.094 | 310.648 |
| 288.865 | 310.529 |
| 292.22 | 310.685 |
| 293.149 | 310.866 |
| 297.013 | 310.901 |
| 298.364 | 310.884 |
| 300.521 | 310.953 |
| 301.915 | 311.038 |
| 304.438 | 311.043 |
| 305 | 311.018 |
| 305 | 309.018 |
| 304.438 | 309.043 |
| 301.915 | 309.038 |
| 300.521 | 308.953 |
| 298.364 | 308.884 |
| 297.013 | 308.901 |
| 293.149 | 308.866 |
| 292.22 | 308.685 |
| 288.865 | 308.529 |
| 285.094 | 308.648 |
| 284.853 | 308.527 |
| 277.534 | 308.356 |
| 276.842 | 308.352 |

Material Boundary

| X | Y |
|---------|---------|
| 219.053 | 287.8 |
| 255 | 287.8 |
| 255 | 287.8 |
| 255 | 287.8 |
| 273.615 | 287.8 |
| 299.596 | 302.8 |
| 309.534 | 302.8 |
| 317.956 | 313.186 |

Project Summary

File Name: Estaca 10.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:47:50

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Material de enchente | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|---|
| Color |  |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 5 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 10 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 20 | 12 |
| Water Surface | None | None | None | None | None |
| Ru Value | 0.45 | 0 | 0 | 0.45 | 0.45 |

Support Properties

Support 1

Support Type: End Anchored
 Force Application: Active
 Out-of-Plane Spacing: 1 m
 Anchor Capacity: 100 kN

Global Minimums

Method: bishop simplified

FS: 1.081570
 Axis Location: 235.606, 394.581
 Left Slip Surface Endpoint: 208.798, 293.713
 Right Slip Surface Endpoint: 300.216, 312.614
 Resisting Moment=175876 kN-m
 Driving Moment=162612 kN-m
 Total Slice Area=1199.12 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 208.798 | 293.713 |
| 214.784 | 287.641 |
| 256.979 | 287.641 |
| 300.216 | 312.614 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.08157

| 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 | 5.82953 | 188.464 | Resíduos | 13.5 | 22 | 30.7797 | 33.2904 | 63.531 | 14.5482 | 48.9828 |

| | | | | | | | | | | |
|----|----------|---------|------------------------------|------|----|---------|---------|-----------|---------|----------|
| 2 | 0.156763 | 9.86134 | Interface Solo x GMB Lisa | 3 | 12 | 11.9549 | 12.9301 | 75.0252 | 28.3078 | 46.7174 |
| 3 | 4.2195 | 271.182 | Interface Solo x GMB Lisa | 3 | 12 | 9.72051 | 10.5134 | 64.2688 | 28.921 | 35.3478 |
| 4 | 4.2195 | 323.944 | Interface Solo x GMB Lisa | 3 | 12 | 11.0721 | 11.9752 | 76.7731 | 34.5479 | 42.2252 |
| 5 | 4.2195 | 337.698 | Interface Solo x GMB Lisa | 3 | 12 | 11.4244 | 12.3563 | 80.0327 | 36.0147 | 44.018 |
| 6 | 4.2195 | 397.393 | Interface Solo x GMB Lisa | 3 | 12 | 12.9536 | 14.0102 | 94.1801 | 42.381 | 51.7991 |
| 7 | 4.2195 | 439.358 | Interface Solo x GMB Lisa | 3 | 12 | 14.0286 | 15.1729 | 104.126 | 46.8566 | 57.269 |
| 8 | 4.2195 | 463.273 | Interface Solo x GMB Lisa | 3 | 12 | 14.6412 | 15.8355 | 109.793 | 49.407 | 60.3863 |
| 9 | 4.2195 | 508.773 | Interface Solo x GMB Lisa | 3 | 12 | 15.8067 | 17.0961 | 120.577 | 54.2595 | 66.3171 |
| 10 | 4.2195 | 555.917 | Interface Solo x GMB Lisa | 3 | 12 | 17.0144 | 18.4023 | 131.749 | 59.2873 | 72.4622 |
| 11 | 4.2195 | 603.68 | Interface Solo x GMB Lisa | 3 | 12 | 18.2379 | 19.7256 | 143.069 | 64.3811 | 78.688 |
| 12 | 4.2195 | 636.405 | Interface Solo x GMB Lisa | 3 | 12 | 19.0763 | 20.6323 | 150.825 | 67.8712 | 82.9535 |
| 13 | 3.74938 | 582.986 | Interface Solo x GMB Lisa | 3 | 12 | 17.5854 | 19.0198 | 145.337 | 69.9698 | 75.3674 |
| 14 | 3.74938 | 539.066 | Interface Solo x GMB Lisa | 3 | 12 | 16.4482 | 17.7899 | 134.28 | 64.6985 | 69.581 |
| 15 | 3.74938 | 493.185 | Interface Solo x GMB Lisa | 3 | 12 | 15.2603 | 16.5051 | 122.728 | 59.1919 | 63.5364 |
| 16 | 3.74938 | 439.011 | Interface Solo x GMB Lisa | 3 | 12 | 13.8576 | 14.988 | 109.089 | 52.69 | 56.3993 |
| 17 | 3.74938 | 381.504 | Interface Solo x GMB Lisa | 3 | 12 | 12.3688 | 13.3777 | 94.6112 | 45.788 | 48.8232 |
| 18 | 3.74938 | 323.564 | Interface Solo x GMB Lisa | 3 | 12 | 10.8686 | 11.7552 | 80.0238 | 38.834 | 41.1898 |
| 19 | 3.74938 | 267.18 | Interface Solo x GMB Lisa | 3 | 12 | 9.40875 | 10.1762 | 65.8282 | 32.0668 | 33.7614 |
| 20 | 3.39705 | 191.631 | Resíduos | 13.5 | 22 | 19.8018 | 21.417 | 44.9803 | 25.385 | 19.5953 |
| 21 | 3.39705 | 148.883 | Resíduos | 13.5 | 22 | 17.675 | 19.1167 | 33.6241 | 19.7223 | 13.9018 |
| 22 | 3.39705 | 106.125 | Resíduos | 13.5 | 22 | 15.5477 | 16.8159 | 22.2653 | 14.0582 | 8.20715 |
| 23 | 0.126671 | 3.01872 | Material de enchente | 10 | 20 | 11.4352 | 12.368 | 17.2301 | 10.7241 | 6.506 |
| 24 | 3.33655 | 66.0612 | Resíduos | 13.5 | 22 | 13.614 | 14.7245 | 11.9404 | 8.90965 | 3.03072 |
| 25 | 3.33655 | 20.7294 | Resíduos | 13.5 | 22 | 11.3178 | 12.241 | -0.320487 | 2.79577 | -3.11626 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.08157

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 208.798 | 293.713 | 0 | 0 | 0 |
| 2 | 214.627 | 287.8 | 554.974 | 0 | 0 |
| 3 | 214.784 | 287.641 | 568.776 | 0 | 0 |
| 4 | 219.004 | 287.641 | 609.769 | 0 | 0 |
| 5 | 223.223 | 287.641 | 656.462 | 0 | 0 |
| 6 | 227.443 | 287.641 | 704.641 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 7 | 231.662 | 287.641 | 759.268 | 0 | 0 |
| 8 | 235.881 | 287.641 | 818.43 | 0 | 0 |
| 9 | 240.101 | 287.641 | 880.174 | 0 | 0 |
| 10 | 244.321 | 287.641 | 946.834 | 0 | 0 |
| 11 | 248.54 | 287.641 | 1018.59 | 0 | 0 |
| 12 | 252.76 | 287.641 | 1095.5 | 0 | 0 |
| 13 | 256.979 | 287.641 | 1175.95 | 0 | 0 |
| 14 | 260.728 | 289.807 | 927.108 | 0 | 0 |
| 15 | 264.478 | 291.972 | 697.953 | 0 | 0 |
| 16 | 268.227 | 294.138 | 489.361 | 0 | 0 |
| 17 | 271.977 | 296.303 | 305.05 | 0 | 0 |
| 18 | 275.726 | 298.469 | 146.512 | 0 | 0 |
| 19 | 279.475 | 300.634 | 13.9432 | 0 | 0 |
| 20 | 283.225 | 302.8 | -93.3551 | 0 | 0 |
| 21 | 286.622 | 304.762 | -114.379 | 0 | 0 |
| 22 | 290.019 | 306.724 | -120.342 | 0 | 0 |
| 23 | 293.416 | 308.686 | -111.241 | 0 | 0 |
| 24 | 293.543 | 308.759 | -111.054 | 0 | 0 |
| 25 | 296.879 | 310.686 | -88.6658 | 0 | 0 |
| 26 | 300.216 | 312.614 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 208.798 | 293.713 |
| 214.784 | 287.641 |
| 256.979 | 287.641 |
| 300.216 | 312.614 |

External Boundary

| X | Y |
|---------|---------|
| 130 | 280 |
| 362.357 | 280 |
| 362.357 | 340.866 |
| 354.459 | 339.75 |
| 346.691 | 338.519 |
| 344.177 | 336.498 |
| 340.467 | 333.224 |
| 339.281 | 333.145 |
| 336.288 | 333.127 |
| 335.792 | 332.795 |
| 335.038 | 332.289 |
| 327.461 | 325.782 |
| 309.587 | 316.591 |
| 306.394 | 314.775 |
| 302.602 | 312.727 |
| 302.172 | 312.708 |
| 301.684 | 312.686 |
| 300.742 | 312.638 |

| | |
|---------|---------|
| 297.693 | 312.497 |
| 296.292 | 312.451 |
| 293.677 | 312.679 |
| 291.454 | 312.786 |
| 290.484 | 312.729 |
| 286.815 | 312.47 |
| 283.995 | 312.37 |
| 282.417 | 312.469 |
| 280.758 | 312.329 |
| 270.032 | 312.449 |
| 269.885 | 312.45 |
| 263.808 | 312.246 |
| 262.757 | 311.739 |
| 260.373 | 311.726 |
| 258.479 | 310.649 |
| 255.888 | 309.132 |
| 254.028 | 309.002 |
| 253.763 | 308.995 |
| 253.571 | 308.97 |
| 250.547 | 308.161 |
| 248.109 | 306.602 |
| 246.188 | 306.367 |
| 245.498 | 306.227 |
| 243.94 | 306.096 |
| 243.84 | 305.815 |
| 243.222 | 304.814 |
| 242.062 | 304.758 |
| 240.271 | 303.972 |
| 240 | 303.887 |
| 235.436 | 302.457 |
| 232.397 | 302.433 |
| 231.776 | 302.41 |
| 230.671 | 301.727 |
| 225.921 | 298.759 |
| 222.52 | 299.056 |
| 221.724 | 299.121 |
| 221.271 | 298.828 |
| 217.785 | 296.623 |
| 215.128 | 296.673 |
| 213.833 | 296.673 |
| 211.569 | 295.296 |
| 208.634 | 293.619 |
| 207.377 | 293.79 |
| 206.474 | 293.82 |
| 198.834 | 288.422 |
| 197.537 | 287.5 |
| 196.352 | 286.658 |
| 195.092 | 286.39 |
| 192.836 | 285.93 |
| 190.208 | 285.938 |
| 189.806 | 285.74 |
| 188.585 | 285.449 |

| | |
|---------|---------|
| 186.408 | 284.847 |
| 177.479 | 284.532 |
| 174.495 | 284.436 |
| 170.821 | 284.362 |
| 163.207 | 284.175 |
| 160.053 | 283.884 |
| 156.693 | 283.846 |
| 153.498 | 283.854 |
| 148.677 | 283.847 |
| 140.764 | 284.238 |
| 140.184 | 284.23 |
| 139.094 | 284.209 |
| 137.904 | 284.162 |
| 137.478 | 284.139 |
| 135.875 | 284.106 |
| 135.611 | 284.101 |
| 135.459 | 284.102 |
| 135.281 | 284.101 |
| 135.124 | 284.101 |
| 134.914 | 284.098 |
| 134.68 | 284.102 |
| 134.384 | 284.095 |
| 133.877 | 284.098 |
| 132.922 | 284.094 |
| 131.063 | 284.085 |
| 130 | 284.079 |

Material Boundary

| X | Y |
|---------|---------|
| 197.537 | 287.5 |
| 214.753 | 287.5 |
| 240 | 287.5 |
| 256.976 | 287.5 |
| 282.957 | 302.5 |
| 292.957 | 302.5 |
| 302.602 | 312.727 |

Material Boundary

| X | Y |
|---------|---------|
| 208.634 | 293.619 |
| 214.453 | 287.8 |
| 214.753 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 260.906 | 307.744 |
| 260.906 | 309.729 |
| 263.22 | 309.742 |
| 264.296 | 310.261 |
| 269.905 | 310.447 |

| | |
|---------|---------|
| 269.936 | 310.449 |
| 270.014 | 310.449 |
| 280.831 | 310.329 |
| 282.439 | 310.463 |
| 283.969 | 310.368 |
| 286.921 | 310.473 |
| 290.612 | 310.733 |
| 291.464 | 310.783 |
| 293.543 | 310.683 |
| 293.543 | 308.675 |
| 293.408 | 308.687 |
| 291.474 | 308.78 |
| 290.74 | 308.738 |
| 287.027 | 308.475 |
| 283.942 | 308.366 |
| 282.46 | 308.458 |
| 280.904 | 308.328 |
| 269.997 | 308.449 |
| 269.989 | 308.449 |
| 264.785 | 308.276 |
| 263.682 | 307.744 |
| 260.906 | 307.744 |

Material Boundary

| X | Y |
|---------|---------|
| 214.453 | 287.8 |
| 240 | 287.8 |
| 240 | 287.8 |
| 240 | 287.8 |
| 256.895 | 287.8 |
| 282.876 | 302.8 |
| 292.827 | 302.8 |
| 302.172 | 312.708 |

Project Summary

File Name: estaca 11.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 17/06/2020, 15:36:21

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Material de enchente | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|---|
| Color |  |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 5 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 10 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 20 | 12 |
| Water Surface | None | None | None | None | None |
| Ru Value | 0.46 | 0 | 0 | 0.46 | 0.46 |

Support Properties

Trinca

Support Type: End Anchored

Force Application: Active

Out-of-Plane Spacing: 1 m

Anchor Capacity: 0 kN

Global Minimums

Method: bishop simplified

FS: 1.058050

Axis Location: 175.507, 390.919

Left Slip Surface Endpoint: 149.901, 293.624

Right Slip Surface Endpoint: 237.980, 312.057

Resisting Moment=160178 kN-m

Driving Moment=151390 kN-m

Total Slice Area=1135.46 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 149.901 | 293.624 |
| 155.76 | 287.639 |
| 195.926 | 287.639 |
| 237.98 | 312.057 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.05805

| 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 | 2.85064 | 47.6666 | Resíduos | 13.5 | 22 | 26.5659 | 28.108 | 43.8479 | 7.69183 | 36.1561 |

| | | | | | | | | | | |
|----|----------|---------|------------------------------|------|----|---------|---------|---------|---------|---------|
| 2 | 2.85064 | 135.295 | Resíduos | 13.5 | 22 | 36.9558 | 39.1011 | 85.1971 | 21.8322 | 63.3649 |
| 3 | 0.157619 | 9.28272 | Interface Solo x GMB Lisa | 3 | 12 | 11.6049 | 12.2786 | 70.7433 | 27.0909 | 43.6524 |
| 4 | 3.65145 | 230.195 | Interface Solo x GMB Lisa | 3 | 12 | 9.6744 | 10.236 | 63.042 | 28.9993 | 34.0427 |
| 5 | 3.65145 | 272.357 | Interface Solo x GMB Lisa | 3 | 12 | 10.927 | 11.5613 | 74.5886 | 34.3108 | 40.2778 |
| 6 | 3.65145 | 279.644 | Interface Solo x GMB Lisa | 3 | 12 | 11.1435 | 11.7904 | 76.5843 | 35.2288 | 41.3555 |
| 7 | 3.65145 | 328.917 | Interface Solo x GMB Lisa | 3 | 12 | 12.6073 | 13.3392 | 90.0783 | 41.436 | 48.6423 |
| 8 | 3.65145 | 366.307 | Interface Solo x GMB Lisa | 3 | 12 | 13.7183 | 14.5146 | 100.318 | 46.1464 | 54.1717 |
| 9 | 3.65145 | 383.225 | Interface Solo x GMB Lisa | 3 | 12 | 14.2209 | 15.0464 | 104.951 | 48.2776 | 56.6737 |
| 10 | 3.65145 | 430.706 | Interface Solo x GMB Lisa | 3 | 12 | 15.6315 | 16.5389 | 117.955 | 54.2591 | 63.6955 |
| 11 | 3.65145 | 448.701 | Interface Solo x GMB Lisa | 3 | 12 | 16.1662 | 17.1046 | 122.883 | 56.5261 | 66.3567 |
| 12 | 3.65145 | 459.986 | Interface Solo x GMB Lisa | 3 | 12 | 16.5014 | 17.4593 | 125.973 | 57.9478 | 68.0256 |
| 13 | 3.65145 | 493.201 | Interface Solo x GMB Lisa | 3 | 12 | 17.4882 | 18.5034 | 135.07 | 62.132 | 72.9377 |
| 14 | 3.65145 | 533.2 | Interface Solo x GMB Lisa | 3 | 12 | 18.6765 | 19.7607 | 146.024 | 67.171 | 78.853 |
| 15 | 3.7302 | 541.459 | Interface Solo x GMB Lisa | 3 | 12 | 16.6417 | 17.6078 | 135.496 | 66.7715 | 68.7245 |
| 16 | 3.7302 | 530.665 | Interface Solo x GMB Lisa | 3 | 12 | 16.3607 | 17.3104 | 132.766 | 65.4405 | 67.3252 |
| 17 | 3.7302 | 479.819 | Interface Solo x GMB Lisa | 3 | 12 | 15.0363 | 15.9092 | 119.903 | 59.1702 | 60.733 |
| 18 | 3.7302 | 430.421 | Interface Solo x GMB Lisa | 3 | 12 | 13.7497 | 14.5479 | 107.407 | 53.0786 | 54.3288 |
| 19 | 3.7302 | 374.173 | Interface Solo x GMB Lisa | 3 | 12 | 12.2848 | 12.9979 | 93.1785 | 46.1421 | 47.0364 |
| 20 | 3.7302 | 318.095 | Interface Solo x GMB Lisa | 3 | 12 | 10.8242 | 11.4525 | 78.9929 | 39.2267 | 39.7662 |
| 21 | 3.7302 | 262.081 | Interface Solo x GMB Lisa | 3 | 12 | 9.36529 | 9.90894 | 64.8233 | 32.3192 | 32.5041 |
| 22 | 3.9856 | 221.075 | Resíduos | 13.5 | 22 | 19.807 | 20.9568 | 43.9717 | 25.5155 | 18.4562 |
| 23 | 3.9856 | 158.834 | Resíduos | 13.5 | 22 | 17.1711 | 18.1679 | 29.8853 | 18.3319 | 11.5534 |
| 24 | 3.9856 | 104.613 | Resíduos | 13.5 | 22 | 14.8748 | 15.7383 | 17.6139 | 12.074 | 5.53994 |
| 25 | 3.9856 | 32.0511 | Resíduos | 13.5 | 22 | 11.8018 | 12.4869 | 1.19159 | 3.69919 | -2.5076 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.05805

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 149.901 | 293.624 | 0 | 0 | 0 |
| 2 | 152.752 | 290.712 | 203.38 | 0 | 0 |
| 3 | 155.602 | 287.8 | 556.768 | 0 | 0 |
| 4 | 155.76 | 287.639 | 569.986 | 0 | 0 |
| 5 | 159.411 | 287.639 | 605.3 | 0 | 0 |
| 6 | 163.063 | 287.639 | 645.186 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 7 | 166.714 | 287.639 | 685.862 | 0 | 0 |
| 8 | 170.366 | 287.639 | 731.882 | 0 | 0 |
| 9 | 174.017 | 287.639 | 781.957 | 0 | 0 |
| 10 | 177.669 | 287.639 | 833.866 | 0 | 0 |
| 11 | 181.32 | 287.639 | 890.925 | 0 | 0 |
| 12 | 184.972 | 287.639 | 949.935 | 0 | 0 |
| 13 | 188.623 | 287.639 | 1010.17 | 0 | 0 |
| 14 | 192.275 | 287.639 | 1074 | 0 | 0 |
| 15 | 195.926 | 287.639 | 1142.18 | 0 | 0 |
| 16 | 199.656 | 289.805 | 910.769 | 0 | 0 |
| 17 | 203.386 | 291.971 | 684.226 | 0 | 0 |
| 18 | 207.117 | 294.137 | 480.602 | 0 | 0 |
| 19 | 210.847 | 296.302 | 299.245 | 0 | 0 |
| 20 | 214.577 | 298.468 | 143.243 | 0 | 0 |
| 21 | 218.307 | 300.634 | 12.519 | 0 | 0 |
| 22 | 222.037 | 302.8 | -92.9562 | 0 | 0 |
| 23 | 226.023 | 305.114 | -115.797 | 0 | 0 |
| 24 | 230.009 | 307.428 | -116.542 | 0 | 0 |
| 25 | 233.994 | 309.742 | -98.038 | 0 | 0 |
| 26 | 237.98 | 312.057 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 149.901 | 293.624 |
| 155.76 | 287.639 |
| 195.926 | 287.639 |
| 237.98 | 312.057 |

External Boundary

| X | Y |
|---------|---------|
| 120.844 | 275.135 |
| 279.987 | 275.135 |
| 279.987 | 332.019 |
| 278.251 | 332.317 |
| 276.876 | 332.063 |
| 276 | 331.424 |
| 268.298 | 325.87 |
| 262.884 | 322.791 |
| 252.914 | 317.407 |
| 243.141 | 312.12 |
| 242.696 | 312.134 |
| 242.126 | 312.152 |
| 241.45 | 312.144 |
| 239.439 | 312.205 |
| 236.782 | 311.935 |
| 231.972 | 312.404 |
| 231.727 | 312.377 |
| 231.155 | 312.405 |

| | |
|---------|---------|
| 229.858 | 312.275 |
| 226.461 | 312.718 |
| 225.548 | 312.697 |
| 224.888 | 312.498 |
| 222.94 | 312.332 |
| 220.146 | 312.247 |
| 214.487 | 312.223 |
| 211.654 | 312.196 |
| 208.858 | 312.236 |
| 203.125 | 311.724 |
| 202.019 | 311.576 |
| 201.77 | 311.619 |
| 200.631 | 311.009 |
| 196.842 | 308.724 |
| 194.376 | 308.604 |
| 193.792 | 308.539 |
| 188.397 | 305.839 |
| 188.281 | 305.78 |
| 188.135 | 305.756 |
| 185.322 | 305.342 |
| 179.99 | 304.809 |
| 178.465 | 304.359 |
| 178.368 | 303.905 |
| 178.358 | 303.336 |
| 175.58 | 302.509 |
| 175.042 | 302.287 |
| 173.859 | 301.917 |
| 173.423 | 301.918 |
| 170.715 | 301.904 |
| 167.01 | 299.404 |
| 164.865 | 298.29 |
| 163.556 | 298.217 |
| 161.581 | 298.226 |
| 159.607 | 298.238 |
| 158.984 | 297.876 |
| 157.79 | 296.042 |
| 156.118 | 296.052 |
| 154.071 | 296.268 |
| 151.242 | 294.52 |
| 149.707 | 293.494 |
| 149.328 | 293.476 |
| 147.251 | 293.448 |
| 137.72 | 286.861 |
| 135.848 | 285.531 |
| 133.255 | 283.812 |
| 132.954 | 283.699 |
| 128.185 | 283.63 |
| 126.253 | 283.573 |
| 125.928 | 283.55 |
| 125.63 | 283.5 |
| 122.573 | 283.307 |
| 121.289 | 283.206 |

| | |
|---------|---------|
| 121.175 | 283.198 |
| 120.844 | 283.24 |

Material Boundary

| X | Y |
|---------|---------|
| 133.255 | 283.812 |
| 155.745 | 287.5 |
| 155.443 | 287.8 |
| 149.707 | 293.494 |

Material Boundary

| X | Y |
|---------|--------|
| 155.745 | 287.5 |
| 180 | 287.5 |
| 195.872 | 287.5 |
| 221.852 | 302.5 |
| 231.852 | 302.5 |
| 243.141 | 312.12 |

Material Boundary

| X | Y |
|---------|---------|
| 229.828 | 310.262 |
| 226.354 | 310.715 |
| 225.866 | 310.703 |
| 225.265 | 310.523 |
| 223.056 | 310.334 |
| 220.18 | 310.247 |
| 214.5 | 310.223 |
| 211.649 | 310.195 |
| 208.933 | 310.235 |
| 203.347 | 309.736 |
| 202.205 | 309.583 |
| 202.205 | 307.287 |
| 202.611 | 307.531 |
| 202.83 | 307.649 |
| 203.569 | 307.748 |
| 209.008 | 308.233 |
| 211.644 | 308.195 |
| 214.515 | 308.223 |
| 220.215 | 308.247 |
| 223.171 | 308.337 |
| 225.642 | 308.548 |
| 226.183 | 308.71 |
| 226.248 | 308.712 |
| 229.798 | 308.249 |
| 229.828 | 310.262 |

Material Boundary

| X | Y |
|---|---|
|---|---|

| | |
|---------|---------|
| 155.443 | 287.8 |
| 180 | 287.8 |
| 180 | 287.8 |
| 180 | 287.8 |
| 195.791 | 287.8 |
| 221.772 | 302.8 |
| 231.742 | 302.8 |
| 242.696 | 312.134 |

Project Summary

File Name: Estaca 12.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:51:42

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.4 | 0 | 0 | 0.4 |

Global Minimums

Method: bishop simplified

FS: 1.251150
 Axis Location: 125.977, 368.405
 Left Slip Surface Endpoint: 106.062, 293.107
 Right Slip Surface Endpoint: 174.267, 307.295
 Resisting Moment=89391.6 kN-m
 Driving Moment=71447.8 kN-m
 Total Slice Area=805.452 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 106.062 | 293.107 |
| 111.526 | 287.645 |
| 151.917 | 287.645 |
| 174.267 | 307.295 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.25115

| 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 | 2.65442 | 33.7014 | Resíduos | 13.5 | 22 | 19.5861 | 24.5051 | 32.3171 | 5.07853 | 27.2385 |
| 2 | 2.65442 | 102.51 | Resíduos | 13.5 | 22 | 27.0103 | 33.7939 | 65.6764 | 15.4474 | 50.229 |
| 3 | 0.155053 | 8.44048 | Interface Solo x GMB Lisa | 3 | 12 | 9.57645 | 11.9816 | 64.0296 | 21.7744 | 42.2552 |
| 4 | 2.88507 | 171.238 | Interface Solo x GMB Lisa | 3 | 12 | 8.44784 | 10.5695 | 59.3531 | 23.7412 | 35.6119 |
| 5 | 2.88507 | 199.224 | Interface Solo x GMB Lisa | 3 | 12 | 9.43664 | 11.8066 | 69.0534 | 27.6213 | 41.4321 |
| 6 | 2.88507 | 219.483 | Interface Solo x GMB Lisa | 3 | 12 | 10.1524 | 12.7022 | 76.0754 | 30.4302 | 45.6452 |
| | | | Interface Solo x GMB | | | | | | | |

| | | | | | | | | | | | |
|----|---------|---------|------------------------------|---|----|---------|---------|---------|---------|---------|--|
| | | | Lisa | | | | | | | | |
| 8 | 2.88507 | 262.256 | Interface Solo x GMB Lisa | 3 | 12 | 11.6637 | 14.593 | 90.901 | 36.3604 | 54.5406 | |
| 9 | 2.88507 | 269.884 | Interface Solo x GMB Lisa | 3 | 12 | 11.9332 | 14.9302 | 93.545 | 37.418 | 56.127 | |
| 10 | 2.88507 | 275.154 | Interface Solo x GMB Lisa | 3 | 12 | 12.1193 | 15.1631 | 95.3716 | 38.1487 | 57.2229 | |
| 11 | 2.88507 | 303.761 | Interface Solo x GMB Lisa | 3 | 12 | 13.1301 | 16.4277 | 105.287 | 42.1149 | 63.1723 | |
| 12 | 2.88507 | 305.439 | Interface Solo x GMB Lisa | 3 | 12 | 13.1894 | 16.5019 | 105.869 | 42.3475 | 63.5213 | |
| 13 | 2.88507 | 326.968 | Interface Solo x GMB Lisa | 3 | 12 | 13.95 | 17.4535 | 113.331 | 45.3323 | 67.9987 | |
| 14 | 2.88507 | 359.425 | Interface Solo x GMB Lisa | 3 | 12 | 15.0968 | 18.8883 | 124.581 | 49.8324 | 74.7486 | |
| 15 | 2.88507 | 376.234 | Interface Solo x GMB Lisa | 3 | 12 | 15.6906 | 19.6313 | 130.407 | 52.1629 | 78.2443 | |
| 16 | 2.88507 | 379.424 | Interface Solo x GMB Lisa | 3 | 12 | 15.8034 | 19.7724 | 131.513 | 52.6051 | 78.9078 | |
| 17 | 2.88507 | 381.024 | Interface Solo x GMB Lisa | 3 | 12 | 15.8599 | 19.8431 | 132.067 | 52.827 | 79.2404 | |
| 18 | 2.79369 | 342.966 | Interface Solo x GMB Lisa | 3 | 12 | 12.9701 | 16.2276 | 111.337 | 49.1058 | 62.2311 | |
| 19 | 2.79369 | 295.795 | Interface Solo x GMB Lisa | 3 | 12 | 11.4731 | 14.3546 | 95.7711 | 42.3518 | 53.4193 | |
| 20 | 2.79369 | 249.074 | Interface Solo x GMB Lisa | 3 | 12 | 9.99038 | 12.4995 | 80.3538 | 35.6624 | 44.6914 | |
| 21 | 2.79369 | 203.15 | Interface Solo x GMB Lisa | 3 | 12 | 8.53289 | 10.6759 | 65.1993 | 29.0869 | 36.1124 | |
| 22 | 2.79369 | 158.638 | Interface Solo x GMB Lisa | 3 | 12 | 7.12024 | 8.90849 | 50.511 | 22.7137 | 27.7973 | |
| 23 | 2.79369 | 114.857 | Interface Solo x GMB Lisa | 3 | 12 | 5.73078 | 7.17006 | 36.0636 | 16.4451 | 19.6185 | |
| 24 | 2.79369 | 70.2474 | Interface Solo x GMB Lisa | 3 | 12 | 4.31503 | 5.39875 | 21.3432 | 10.058 | 11.2852 | |
| 25 | 2.79369 | 25.2186 | Interface Solo x GMB Lisa | 3 | 12 | 2.88597 | 3.61078 | 6.48429 | 3.61079 | 2.8735 | |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.25115

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 106.062 | 293.107 | 0 | 0 | 0 |
| 2 | 108.717 | 290.454 | 137.853 | 0 | 0 |
| 3 | 111.371 | 287.8 | 383.975 | 0 | 0 |
| 4 | 111.526 | 287.645 | 395.387 | 0 | 0 |
| 5 | 114.411 | 287.645 | 419.812 | 0 | 0 |
| 6 | 117.296 | 287.645 | 447.094 | 0 | 0 |
| 7 | 120.181 | 287.645 | 476.447 | 0 | 0 |
| 8 | 123.066 | 287.645 | 507.579 | 0 | 0 |
| 9 | 125.951 | 287.645 | 541.301 | 0 | 0 |
| 10 | 128.836 | 287.645 | 575.802 | 0 | 0 |
| 11 | 131.721 | 287.645 | 610.841 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 12 | 134.607 | 287.645 | 648.802 | 0 | 0 |
| 13 | 137.492 | 287.645 | 686.935 | 0 | 0 |
| 14 | 140.377 | 287.645 | 727.267 | 0 | 0 |
| 15 | 143.262 | 287.645 | 770.914 | 0 | 0 |
| 16 | 146.147 | 287.645 | 816.278 | 0 | 0 |
| 17 | 149.032 | 287.645 | 861.968 | 0 | 0 |
| 18 | 151.917 | 287.645 | 907.822 | 0 | 0 |
| 19 | 154.711 | 290.101 | 670.667 | 0 | 0 |
| 20 | 157.504 | 292.557 | 467.554 | 0 | 0 |
| 21 | 160.298 | 295.014 | 298.158 | 0 | 0 |
| 22 | 163.092 | 297.47 | 161.904 | 0 | 0 |
| 23 | 165.885 | 299.926 | 57.7721 | 0 | 0 |
| 24 | 168.679 | 302.382 | -14.7639 | 0 | 0 |
| 25 | 171.473 | 304.838 | -55.1069 | 0 | 0 |
| 26 | 174.267 | 307.295 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 106.062 | 293.107 |
| 111.526 | 287.645 |
| 151.917 | 287.645 |
| 174.267 | 307.295 |

External Boundary

| X | Y |
|---------|---------|
| 187.103 | 310.291 |
| 185.797 | 310.138 |
| 182.091 | 309.703 |
| 181.269 | 309.66 |
| 180.872 | 309.595 |
| 180.48 | 309.36 |
| 179.014 | 308.728 |
| 174.909 | 307.001 |
| 174.43 | 307.233 |
| 174.315 | 307.289 |
| 174.072 | 307.317 |
| 173.903 | 307.337 |
| 173.409 | 307.312 |
| 168.07 | 307 |
| 166.169 | 306.858 |
| 163.358 | 306.628 |
| 160.218 | 306.46 |
| 157.822 | 306.404 |
| 154.59 | 306.322 |
| 153.219 | 306.286 |
| 151.208 | 306.407 |
| 150.038 | 306.503 |
| 146.147 | 306.285 |

| | |
|---------|---------|
| 145.018 | 306.324 |
| 143.294 | 305.975 |
| 142.657 | 305.899 |
| 139.778 | 304.203 |
| 136.62 | 302.563 |
| 135.681 | 302.683 |
| 135 | 302.707 |
| 133.029 | 302.777 |
| 132.656 | 302.667 |
| 131.752 | 302.073 |
| 130.644 | 301.021 |
| 128.69 | 300.99 |
| 128.4 | 301.03 |
| 127.341 | 300.972 |
| 124.858 | 300.635 |
| 123.656 | 300.48 |
| 119.814 | 298.267 |
| 118.42 | 298.698 |
| 115.396 | 297.229 |
| 112.769 | 295.829 |
| 112.019 | 295.857 |
| 110.248 | 294.643 |
| 105.958 | 293.069 |
| 103.743 | 293.052 |
| 96.7099 | 287.5 |
| 94.8995 | 286.071 |
| 94.4235 | 285.661 |
| 91.6161 | 282.921 |
| 90.6881 | 282.981 |
| 85.785 | 282.919 |
| 83.8583 | 281.718 |
| 81.7346 | 280.891 |
| 78.9107 | 280.708 |
| 72.9457 | 280.246 |
| 72.8567 | 280.258 |
| 72.8567 | 280 |
| 194.289 | 280 |
| 194.289 | 311.27 |

Material Boundary

| X | Y |
|---------|---------|
| 96.7099 | 287.5 |
| 111.526 | 287.5 |
| 135 | 287.5 |
| 151.949 | 287.5 |
| 174.43 | 307.233 |

Material Boundary

| X | Y |
|---------|---------|
| 105.958 | 293.069 |
| 111.226 | 287.8 |

| | |
|---------|-------|
| 111.526 | 287.5 |
|---------|-------|

Material Boundary

| X | Y |
|---------|---------|
| 111.226 | 287.8 |
| 135 | 287.8 |
| 135 | 287.8 |
| 135 | 287.8 |
| 151.836 | 287.8 |
| 174.072 | 307.317 |

Project Summary

File Name: Estaca 13.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:55:31

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.45 | 0 | 0 | 0.45 |

Global Minimums

Method: bishop simplified

FS: 3.350220

Axis Location: 97.658, 346.895

Left Slip Surface Endpoint: 78.151, 292.939

Right Slip Surface Endpoint: 129.118, 298.916

Resisting Moment=42218.4 kN-m

Driving Moment=12601.7 kN-m

Total Slice Area=508.396 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 78.1509 | 292.939 |
| 83.337 | 287.619 |
| 121.851 | 287.619 |
| 129.118 | 298.916 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 3.35022

| 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 | 2.50485 | 38.8297 | Resíduos | 13.5 | 22 | 5.77185 | 19.337 | 21.4228 | 6.97581 | 14.447 |
| 2 | 2.50485 | 116.018 | Resíduos | 13.5 | 22 | 8.10436 | 27.1514 | 54.6311 | 20.8428 | 33.7883 |
| 3 | 0.176437 | 10.8981 | Interface Solo x GMB Lisa | 3 | 12 | 3.26324 | 10.9326 | 65.1154 | 27.7955 | 37.3199 |
| 4 | 2.02705 | 129.066 | Interface Solo x GMB Lisa | 3 | 12 | 3.11729 | 10.4436 | 63.6718 | 28.6523 | 35.0195 |
| 5 | 2.02705 | 135.418 | Interface Solo x GMB Lisa | 3 | 12 | 3.22664 | 10.81 | 66.8054 | 30.0624 | 36.743 |
| 6 | 2.02705 | 140.648 | Interface Solo x GMB Lisa | 3 | 12 | 3.31668 | 11.1116 | 69.3855 | 31.2235 | 38.162 |
| | | | Interface Solo x GMB | | | | | | | |

| | | | | | | | | | | | |
|----|---------|---------|----------------------|------|---|----|---------|---------|---------|---------|---------|
| | | | | Lisa | | | | | | | |
| 8 | 2.02705 | 148.735 | Interface Solo x GMB | Lisa | 3 | 12 | 3.45588 | 11.578 | 73.375 | 33.0187 | 40.3563 |
| 9 | 2.02705 | 162.466 | Interface Solo x GMB | Lisa | 3 | 12 | 3.69227 | 12.3699 | 80.1489 | 36.0671 | 44.0818 |
| 10 | 2.02705 | 174.014 | Interface Solo x GMB | Lisa | 3 | 12 | 3.89106 | 13.0359 | 85.8458 | 38.6306 | 47.2152 |
| 11 | 2.02705 | 175.356 | Interface Solo x GMB | Lisa | 3 | 12 | 3.91416 | 13.1133 | 86.5079 | 38.9285 | 47.5794 |
| 12 | 2.02705 | 172.51 | Interface Solo x GMB | Lisa | 3 | 12 | 3.86516 | 12.9491 | 85.1039 | 38.2967 | 46.8072 |
| 13 | 2.02705 | 176.522 | Interface Solo x GMB | Lisa | 3 | 12 | 3.93425 | 13.1806 | 87.0831 | 39.1874 | 47.8957 |
| 14 | 2.02705 | 183.111 | Interface Solo x GMB | Lisa | 3 | 12 | 4.04767 | 13.5606 | 90.3336 | 40.6502 | 49.6834 |
| 15 | 2.02705 | 183.923 | Interface Solo x GMB | Lisa | 3 | 12 | 4.06164 | 13.6074 | 90.7342 | 40.8305 | 49.9037 |
| 16 | 2.02705 | 183.261 | Interface Solo x GMB | Lisa | 3 | 12 | 4.05024 | 13.5692 | 90.4076 | 40.6834 | 49.7242 |
| 17 | 2.02705 | 178.629 | Interface Solo x GMB | Lisa | 3 | 12 | 3.97052 | 13.3021 | 88.1225 | 39.6551 | 48.4674 |
| 18 | 2.02705 | 174.209 | Interface Solo x GMB | Lisa | 3 | 12 | 3.89443 | 13.0472 | 85.942 | 38.674 | 47.268 |
| 19 | 2.02705 | 170.763 | Interface Solo x GMB | Lisa | 3 | 12 | 3.8351 | 12.8484 | 84.242 | 37.909 | 46.333 |
| 20 | 2.02705 | 167.431 | Interface Solo x GMB | Lisa | 3 | 12 | 3.77774 | 12.6563 | 82.5982 | 37.1692 | 45.429 |
| 21 | 2.02705 | 164.461 | Interface Solo x GMB | Lisa | 3 | 12 | 3.72661 | 12.485 | 81.1331 | 36.5099 | 44.6232 |
| 22 | 2.02705 | 163.566 | Interface Solo x GMB | Lisa | 3 | 12 | 3.71121 | 12.4334 | 80.6915 | 36.3113 | 44.3802 |
| 23 | 2.42243 | 163.26 | Interface Solo x GMB | Lisa | 3 | 12 | 2.95573 | 9.90233 | 62.8007 | 30.3278 | 32.4729 |
| 24 | 2.42243 | 97.9242 | Interface Solo x GMB | Lisa | 3 | 12 | 2.09905 | 7.03228 | 37.1612 | 18.1908 | 18.9704 |
| 25 | 2.42243 | 32.1161 | Interface Solo x GMB | Lisa | 3 | 12 | 1.23618 | 4.14148 | 11.3363 | 5.96601 | 5.37026 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 3.35022

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 78.1509 | 292.939 | 0 | 0 | 0 |
| 2 | 80.6557 | 290.37 | 69.506 | 0 | 0 |
| 3 | 83.1606 | 287.8 | 230.188 | 0 | 0 |
| 4 | 83.337 | 287.619 | 242.549 | 0 | 0 |
| 5 | 85.3641 | 287.619 | 248.868 | 0 | 0 |
| 6 | 87.3911 | 287.619 | 255.409 | 0 | 0 |
| 7 | 89.4182 | 287.619 | 262.132 | 0 | 0 |
| 8 | 91.4452 | 287.619 | 268.924 | 0 | 0 |
| 9 | 93.4723 | 287.619 | 275.929 | 0 | 0 |
| 10 | 95.4993 | 287.619 | 283.413 | 0 | 0 |
| 11 | 97.5264 | 287.619 | 291.3 | 0 | 0 |

| | | | | | |
|----|---------|---------|---------|---|---|
| 12 | 99.5534 | 287.619 | 299.234 | 0 | 0 |
| 13 | 101.58 | 287.619 | 307.069 | 0 | 0 |
| 14 | 103.608 | 287.619 | 315.044 | 0 | 0 |
| 15 | 105.635 | 287.619 | 323.248 | 0 | 0 |
| 16 | 107.662 | 287.619 | 331.481 | 0 | 0 |
| 17 | 109.689 | 287.619 | 339.691 | 0 | 0 |
| 18 | 111.716 | 287.619 | 347.74 | 0 | 0 |
| 19 | 113.743 | 287.619 | 355.634 | 0 | 0 |
| 20 | 115.77 | 287.619 | 363.408 | 0 | 0 |
| 21 | 117.797 | 287.619 | 371.065 | 0 | 0 |
| 22 | 119.824 | 287.619 | 378.619 | 0 | 0 |
| 23 | 121.851 | 287.619 | 386.142 | 0 | 0 |
| 24 | 124.273 | 291.385 | 156.823 | 0 | 0 |
| 25 | 126.696 | 295.15 | 21.9759 | 0 | 0 |
| 26 | 129.118 | 298.916 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 78.1509 | 292.939 |
| 83.337 | 287.619 |
| 121.851 | 287.619 |
| 129.118 | 298.916 |

External Boundary

| X | Y |
|---------|---------|
| 139.311 | 303.109 |
| 129.361 | 299.015 |
| 128.875 | 298.816 |
| 128.793 | 298.782 |
| 128.679 | 298.759 |
| 128.465 | 298.769 |
| 125.257 | 298.937 |
| 123.889 | 298.987 |
| 118.408 | 299.133 |
| 116.627 | 299.368 |
| 116.047 | 299.423 |
| 112.441 | 299.85 |
| 111.256 | 300.016 |
| 108.948 | 300.48 |
| 106.555 | 300.503 |
| 105 | 300.525 |
| 104.735 | 300.529 |
| 101.236 | 299.635 |
| 100.69 | 299.638 |
| 99.8345 | 299.789 |
| 96.9646 | 300.034 |
| 93.7106 | 298.667 |
| 91.6673 | 297.607 |

| | |
|---------|---------|
| 89.0446 | 297.578 |
| 85.1764 | 296.863 |
| 83.8224 | 296.461 |
| 83.0337 | 296.507 |
| 81.1364 | 295.156 |
| 78.0283 | 292.848 |
| 76.7523 | 293.053 |
| 74.9026 | 293.241 |
| 70.0595 | 289.57 |
| 67.3478 | 287.5 |
| 67.0786 | 287.294 |
| 66.1457 | 286.091 |
| 65.5719 | 285.261 |
| 63.8937 | 285.385 |
| 59.5492 | 285.894 |
| 59.5492 | 280 |
| 155.288 | 280 |
| 155.288 | 309.955 |

Material Boundary

| X | Y |
|---------|---------|
| 67.3478 | 287.5 |
| 83.3765 | 287.5 |
| 105 | 287.5 |
| 121.949 | 287.5 |
| 129.361 | 299.015 |

Material Boundary

| X | Y |
|---------|---------|
| 78.0283 | 292.848 |
| 83.0765 | 287.8 |
| 83.3765 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 83.0765 | 287.8 |
| 105 | 287.8 |
| 105 | 287.8 |
| 105.001 | 287.8 |
| 121.785 | 287.8 |
| 128.875 | 298.816 |

Project Summary

File Name: Estaca 14.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 17:01:38

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 malpha < 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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.36 | 0 | 0 | 0.36 |

Global Minimums

Method: bishop simplified

FS: 17.220600
 Axis Location: 128.449, 335.704
 Left Slip Surface Endpoint: 109.155, 292.997
 Right Slip Surface Endpoint: 151.039, 294.645
 Resisting Moment=25351.9 kN-m
 Driving Moment=1472.19 kN-m
 Total Slice Area=294.085 m²

Method: janbu simplified

FS: 16.129500
 Axis Location: 128.449, 335.704
 Left Slip Surface Endpoint: 109.155, 292.997
 Right Slip Surface Endpoint: 151.039, 294.645
 Resisting Horizontal Force=481.045 kN
 Driving Horizontal Force=29.8239 kN
 Total Slice Area=294.085 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 109.155 | 292.997 |
| 114.279 | 287.629 |
| 140.691 | 287.629 |
| 151.039 | 294.645 |

Method: janbu simplified

| X | Y |
|---------|---------|
| 109.155 | 292.997 |
| 114.279 | 287.629 |
| 140.691 | 287.629 |
| 151.039 | 294.645 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 17.2206

| 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 | 1.65344 | 17.7095 | Resíduos | 13.5 | 22 | 0.968579 | 16.6795 | 11.7254 | 3.85585 | 7.86957 |
| 2 | 1.65344 | 52.6893 | Resíduos | 13.5 | 22 | 1.29425 | 22.2878 | 33.2224 | 11.472 | 21.7504 |
| 3 | 1.65344 | 79.8484 | Resíduos | 13.5 | 22 | 1.54711 | 26.6421 | 49.9131 | 17.3853 | 32.5278 |
| 4 | 0.163226 | 9.08519 | Interface Solo x GMB Lisa | 3 | 12 | 0.621947 | 10.7103 | 56.3115 | 20.0377 | 36.2738 |
| 5 | 1.7608 | 100.282 | Interface Solo x GMB Lisa | 3 | 12 | 0.624113 | 10.7476 | 56.9525 | 20.5029 | 36.4496 |
| 6 | 1.7608 | 101.424 | Interface Solo x GMB Lisa | 3 | 12 | 0.629236 | 10.8358 | 57.6011 | 20.7364 | 36.8647 |
| 7 | 1.7608 | 111.897 | Interface Solo x GMB Lisa | 3 | 12 | 0.676222 | 11.6449 | 63.549 | 22.8776 | 40.6714 |
| 8 | 1.7608 | 115.168 | Interface Solo x GMB Lisa | 3 | 12 | 0.690897 | 11.8977 | 65.4066 | 23.5464 | 41.8602 |
| 9 | 1.7608 | 111.26 | Interface Solo x GMB Lisa | 3 | 12 | 0.673365 | 11.5958 | 63.1872 | 22.7474 | 40.4398 |
| 10 | 1.7608 | 109.295 | Interface Solo x GMB Lisa | 3 | 12 | 0.664548 | 11.4439 | 62.0712 | 22.3456 | 39.7256 |
| 11 | 1.7608 | 112.179 | Interface Solo x GMB Lisa | 3 | 12 | 0.677489 | 11.6668 | 63.7091 | 22.9353 | 40.7738 |
| 12 | 1.7608 | 111.146 | Interface Solo x GMB Lisa | 3 | 12 | 0.672851 | 11.5869 | 63.1224 | 22.724 | 40.3984 |
| 13 | 1.7608 | 108.877 | Interface Solo x GMB Lisa | 3 | 12 | 0.662676 | 11.4117 | 61.8338 | 22.2603 | 39.5735 |
| 14 | 1.7608 | 108.014 | Interface Solo x GMB Lisa | 3 | 12 | 0.658803 | 11.345 | 61.3437 | 22.0838 | 39.2599 |
| 15 | 1.7608 | 107.368 | Interface Solo x GMB Lisa | 3 | 12 | 0.655905 | 11.2951 | 60.9768 | 21.9517 | 39.0251 |
| 16 | 1.7608 | 106.728 | Interface Solo x GMB Lisa | 3 | 12 | 0.653031 | 11.2456 | 60.6134 | 21.8208 | 38.7926 |
| 17 | 1.7608 | 105.698 | Interface Solo x GMB Lisa | 3 | 12 | 0.648414 | 11.1661 | 60.0284 | 21.6103 | 38.4181 |
| 18 | 1.7608 | 103.107 | Interface Solo x GMB Lisa | 3 | 12 | 0.636789 | 10.9659 | 58.5569 | 21.0806 | 37.4763 |
| 19 | 1.7608 | 101.776 | Interface Solo x GMB Lisa | 3 | 12 | 0.630816 | 10.863 | 57.801 | 20.8084 | 36.9926 |
| 20 | 1.72471 | 91.2498 | Interface Solo x GMB Lisa | 3 | 12 | 0.587244 | 10.1127 | 52.5091 | 19.0467 | 33.4624 |
| 21 | 1.72471 | 75.6676 | Interface Solo x GMB Lisa | 3 | 12 | 0.516466 | 8.89385 | 43.5226 | 15.7942 | 27.7284 |
| 22 | 1.72471 | 59.3765 | Interface Solo x GMB Lisa | 3 | 12 | 0.442468 | 7.61956 | 34.127 | 12.3937 | 21.7333 |
| 23 | 1.72471 | 42.7461 | Interface Solo x GMB Lisa | 3 | 12 | 0.366928 | 6.31872 | 24.5358 | 8.92244 | 15.6134 |
| 24 | 1.72471 | 26.0259 | Interface Solo x GMB Lisa | 3 | 12 | 0.290981 | 5.01086 | 14.8928 | 5.43241 | 9.46037 |
| 25 | 1.72471 | 9.24361 | Interface Solo x GMB Lisa | 3 | 12 | 0.214751 | 3.69814 | 5.21391 | 1.92943 | 3.28448 |

Global Minimum Query (janbu simplified) - Safety Factor: 16.1295

| | | | | | Base | | | Base | | Effective |
|--|--|--|--|--|------|--|--|------|--|-----------|
|--|--|--|--|--|------|--|--|------|--|-----------|

| Slice Number | Width [m] | Weight [kN] | Base Material | Cohesion [kPa] | Friction Angle [degrees] | Stress [kPa] | Strength [kPa] | Normal Stress [kPa] | Pressure [kPa] | Normal Stress [kPa] |
|--------------|-----------|-------------|---------------------------|----------------|--------------------------|--------------|----------------|---------------------|----------------|---------------------|
| 1 | 1.65344 | 17.7095 | Resíduos | 13.5 | 22 | 1.03587 | 16.708 | 11.796 | 3.85585 | 7.94019 |
| 2 | 1.65344 | 52.6893 | Resíduos | 13.5 | 22 | 1.38417 | 22.3259 | 33.3169 | 11.472 | 21.8449 |
| 3 | 1.65344 | 79.8484 | Resíduos | 13.5 | 22 | 1.65459 | 26.6877 | 50.0258 | 17.3853 | 32.6405 |
| 4 | 0.163226 | 9.08519 | Interface Solo x GMB Lisa | 3 | 12 | 0.664609 | 10.7198 | 56.3564 | 20.0377 | 36.3187 |
| 5 | 1.7608 | 100.282 | Interface Solo x GMB Lisa | 3 | 12 | 0.666332 | 10.7476 | 56.9525 | 20.5029 | 36.4496 |
| 6 | 1.7608 | 101.424 | Interface Solo x GMB Lisa | 3 | 12 | 0.671801 | 10.8358 | 57.6011 | 20.7364 | 36.8647 |
| 7 | 1.7608 | 111.897 | Interface Solo x GMB Lisa | 3 | 12 | 0.721965 | 11.6449 | 63.549 | 22.8776 | 40.6714 |
| 8 | 1.7608 | 115.168 | Interface Solo x GMB Lisa | 3 | 12 | 0.737634 | 11.8977 | 65.4066 | 23.5464 | 41.8602 |
| 9 | 1.7608 | 111.26 | Interface Solo x GMB Lisa | 3 | 12 | 0.718916 | 11.5958 | 63.1872 | 22.7474 | 40.4398 |
| 10 | 1.7608 | 109.295 | Interface Solo x GMB Lisa | 3 | 12 | 0.709502 | 11.4439 | 62.0712 | 22.3456 | 39.7256 |
| 11 | 1.7608 | 112.179 | Interface Solo x GMB Lisa | 3 | 12 | 0.723318 | 11.6668 | 63.7091 | 22.9353 | 40.7738 |
| 12 | 1.7608 | 111.146 | Interface Solo x GMB Lisa | 3 | 12 | 0.718367 | 11.5869 | 63.1224 | 22.724 | 40.3984 |
| 13 | 1.7608 | 108.877 | Interface Solo x GMB Lisa | 3 | 12 | 0.707503 | 11.4117 | 61.8338 | 22.2603 | 39.5735 |
| 14 | 1.7608 | 108.014 | Interface Solo x GMB Lisa | 3 | 12 | 0.703368 | 11.345 | 61.3437 | 22.0838 | 39.2599 |
| 15 | 1.7608 | 107.368 | Interface Solo x GMB Lisa | 3 | 12 | 0.700274 | 11.2951 | 60.9768 | 21.9517 | 39.0251 |
| 16 | 1.7608 | 106.728 | Interface Solo x GMB Lisa | 3 | 12 | 0.697206 | 11.2456 | 60.6134 | 21.8208 | 38.7926 |
| 17 | 1.7608 | 105.698 | Interface Solo x GMB Lisa | 3 | 12 | 0.692276 | 11.1661 | 60.0284 | 21.6103 | 38.4181 |
| 18 | 1.7608 | 103.107 | Interface Solo x GMB Lisa | 3 | 12 | 0.679865 | 10.9659 | 58.5569 | 21.0806 | 37.4763 |
| 19 | 1.7608 | 101.776 | Interface Solo x GMB Lisa | 3 | 12 | 0.673488 | 10.863 | 57.801 | 20.8084 | 36.9926 |
| 20 | 1.72471 | 91.2498 | Interface Solo x GMB Lisa | 3 | 12 | 0.626616 | 10.107 | 52.4828 | 19.0467 | 33.4361 |
| 21 | 1.72471 | 75.6676 | Interface Solo x GMB Lisa | 3 | 12 | 0.551093 | 8.88885 | 43.499 | 15.7942 | 27.7048 |
| 22 | 1.72471 | 59.3765 | Interface Solo x GMB Lisa | 3 | 12 | 0.472133 | 7.61527 | 34.1069 | 12.3937 | 21.7132 |
| 23 | 1.72471 | 42.7461 | Interface Solo x GMB Lisa | 3 | 12 | 0.391529 | 6.31517 | 24.5191 | 8.92244 | 15.5967 |
| 24 | 1.72471 | 26.0259 | Interface Solo x GMB Lisa | 3 | 12 | 0.310489 | 5.00804 | 14.8795 | 5.43241 | 9.44713 |
| 25 | 1.72471 | 9.24361 | Interface Solo x GMB Lisa | 3 | 12 | 0.229149 | 3.69606 | 5.20417 | 1.92943 | 3.27474 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 17.2206

| Slice | X coordinate | Y coordinate - Bottom | Interslice Normal Force | Interslice Shear Force | Interslice Force Angle |
|-------|--------------|-----------------------|-------------------------|------------------------|------------------------|
| | | | | | |

| | [m] | [m] | [kN] | [kN] | [degrees] |
|----|---------|---------|---------|------|-----------|
| 1 | 109.155 | 292.997 | 0 | 0 | 0 |
| 2 | 110.809 | 291.264 | 21.912 | 0 | 0 |
| 3 | 112.462 | 289.532 | 81.5995 | 0 | 0 |
| 4 | 114.116 | 287.8 | 170.616 | 0 | 0 |
| 5 | 114.279 | 287.629 | 180.347 | 0 | 0 |
| 6 | 116.04 | 287.629 | 181.446 | 0 | 0 |
| 7 | 117.801 | 287.629 | 182.554 | 0 | 0 |
| 8 | 119.561 | 287.629 | 183.745 | 0 | 0 |
| 9 | 121.322 | 287.629 | 184.961 | 0 | 0 |
| 10 | 123.083 | 287.629 | 186.147 | 0 | 0 |
| 11 | 124.844 | 287.629 | 187.317 | 0 | 0 |
| 12 | 126.605 | 287.629 | 188.51 | 0 | 0 |
| 13 | 128.365 | 287.629 | 189.695 | 0 | 0 |
| 14 | 130.126 | 287.629 | 190.862 | 0 | 0 |
| 15 | 131.887 | 287.629 | 192.022 | 0 | 0 |
| 16 | 133.648 | 287.629 | 193.176 | 0 | 0 |
| 17 | 135.409 | 287.629 | 194.326 | 0 | 0 |
| 18 | 137.169 | 287.629 | 195.468 | 0 | 0 |
| 19 | 138.93 | 287.629 | 196.589 | 0 | 0 |
| 20 | 140.691 | 287.629 | 197.7 | 0 | 0 |
| 21 | 142.416 | 288.798 | 137.316 | 0 | 0 |
| 22 | 144.14 | 289.968 | 87.3176 | 0 | 0 |
| 23 | 145.865 | 291.137 | 48.1774 | 0 | 0 |
| 24 | 147.59 | 292.306 | 20.1216 | 0 | 0 |
| 25 | 149.315 | 293.475 | 3.20998 | 0 | 0 |
| 26 | 151.039 | 294.645 | 0 | 0 | 0 |

Global Minimum Query (janbu simplified) - Safety Factor: 16.1295

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 109.155 | 292.997 | 0 | 0 | 0 |
| 2 | 110.809 | 291.264 | 22.1459 | 0 | 0 |
| 3 | 112.462 | 289.532 | 82.1457 | 0 | 0 |
| 4 | 114.116 | 287.8 | 171.536 | 0 | 0 |
| 5 | 114.279 | 287.629 | 181.282 | 0 | 0 |
| 6 | 116.04 | 287.629 | 182.455 | 0 | 0 |
| 7 | 117.801 | 287.629 | 183.638 | 0 | 0 |
| 8 | 119.561 | 287.629 | 184.909 | 0 | 0 |
| 9 | 121.322 | 287.629 | 186.208 | 0 | 0 |
| 10 | 123.083 | 287.629 | 187.474 | 0 | 0 |
| 11 | 124.844 | 287.629 | 188.724 | 0 | 0 |
| 12 | 126.605 | 287.629 | 189.998 | 0 | 0 |
| 13 | 128.365 | 287.629 | 191.263 | 0 | 0 |
| 14 | 130.126 | 287.629 | 192.509 | 0 | 0 |
| 15 | 131.887 | 287.629 | 193.747 | 0 | 0 |
| 16 | 133.648 | 287.629 | 194.98 | 0 | 0 |
| 17 | 135.409 | 287.629 | 196.208 | 0 | 0 |
| 18 | 137.169 | 287.629 | 197.427 | 0 | 0 |
| 19 | 138.93 | 287.629 | 198.625 | 0 | 0 |
| 20 | 140.691 | 287.629 | 199.811 | 0 | 0 |
| 21 | 142.416 | 288.798 | 139.526 | 0 | 0 |

| | | | | | |
|----|---------|---------|---------|---|---|
| 22 | 144.14 | 289.968 | 89.6149 | 0 | 0 |
| 23 | 145.865 | 291.137 | 50.5496 | 0 | 0 |
| 24 | 147.59 | 292.306 | 22.5558 | 0 | 0 |
| 25 | 149.315 | 293.475 | 5.69342 | 0 | 0 |
| 26 | 151.039 | 294.645 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 109.155 | 292.997 |
| 114.279 | 287.629 |
| 140.691 | 287.629 |
| 151.039 | 294.645 |

External Boundary

| X | Y |
|---------|---------|
| 154.284 | 295.42 |
| 153.871 | 295.151 |
| 153.191 | 294.677 |
| 152.767 | 294.431 |
| 151.261 | 294.617 |
| 150.809 | 294.673 |
| 150.446 | 294.718 |
| 144.584 | 295.451 |
| 144.372 | 295.429 |
| 144.264 | 295.459 |
| 143.934 | 295.527 |
| 139.319 | 295.848 |
| 137.351 | 295.959 |
| 136.376 | 296.16 |
| 135 | 296.201 |
| 130.336 | 296.338 |
| 130.1 | 296.354 |
| 129.358 | 296.358 |
| 125.854 | 296.761 |
| 124.635 | 296.402 |
| 122.832 | 296.448 |
| 122.138 | 296.602 |
| 119.221 | 297.114 |
| 119.01 | 296.908 |
| 117.575 | 295.802 |
| 115.197 | 295.7 |
| 112.368 | 295.5 |
| 111.008 | 294.485 |
| 108.933 | 292.818 |
| 105.775 | 293.481 |
| 105.625 | 293.511 |
| 105.587 | 293.518 |
| 105.464 | 293.425 |

| | |
|---------|---------|
| 105.411 | 293.372 |
| 104.883 | 292.972 |
| 99.2639 | 288.519 |
| 98.8636 | 288.002 |
| 98.395 | 287.5 |
| 97.9688 | 287.043 |
| 96.5501 | 287.22 |
| 94.8124 | 287.374 |
| 94.1691 | 287.402 |
| 92.406 | 287.608 |
| 92.406 | 280 |
| 154.579 | 280 |
| 154.579 | 295.573 |

Material Boundary

| X | Y |
|---------|---------|
| 98.395 | 287.5 |
| 114.252 | 287.5 |
| 135 | 287.5 |
| 140.762 | 287.5 |
| 151.261 | 294.617 |

Material Boundary

| X | Y |
|---------|---------|
| 108.933 | 292.818 |
| 113.952 | 287.8 |
| 114.252 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 113.952 | 287.8 |
| 135 | 287.8 |
| 135 | 287.8 |
| 135 | 287.8 |
| 140.67 | 287.8 |
| 150.809 | 294.673 |

Project Summary

File Name: Section.02.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 20/05/2020, 13:33:36

General Settings

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

Analysis Options

Analysis Methods Used

Bishop 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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Material de enchente | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|---|
| Color |  |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 5 | 10 |
| Cohesion [kPa] | 13.5 | 20 | 18 | 10 | 3 |
| Friction Angle [deg] | 22 | 30 | 32 | 20 | 12 |
| Water Surface | None | None | None | None | None |
| Ru Value | 0.42 | 0 | 0 | 0.42 | 0.42 |

Support Properties

Support 1

Support Type: End Anchored
 Force Application: Active
 Out-of-Plane Spacing: 1 m
 Anchor Capacity: 100 kN

Global Minimums

Method: bishop simplified

FS: 1.072360
 Axis Location: 176.169, 410.194
 Left Slip Surface Endpoint: 109.470, 324.994
 Right Slip Surface Endpoint: 204.309, 305.714
 Resisting Moment=180087 kN-m
 Driving Moment=167935 kN-m
 Total Slice Area=1350.5 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 109.47 | 324.994 |
| 120.173 | 315.158 |
| 148.431 | 300.149 |
| 199.782 | 300.149 |
| 204.309 | 305.714 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.07236

| 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 | 3.5677 | 41.9769 | Interface Solo x GMB Lisa | 3 | 12 | 3.51134 | 3.76542 | 8.54268 | 4.94164 | 3.60104 |
| 2 | 3.5677 | 121.769 | Interface Solo x GMB Lisa | 3 | 12 | 5.68674 | 6.09823 | 28.9111 | 14.335 | 14.5761 |
| 3 | 3.5677 | 191.455 | Interface Solo x GMB Lisa | 3 | 12 | 7.58658 | 8.13555 | 46.6994 | 22.5386 | 24.1608 |
| 4 | 4.03686 | 284.851 | Interface Solo x GMB Lisa | 3 | 12 | 9.87165 | 10.586 | 65.3254 | 29.6363 | 35.6891 |
| 5 | 4.03686 | 342.398 | Interface Solo x GMB Lisa | 3 | 12 | 11.3546 | 12.1762 | 78.7942 | 35.6236 | 43.1706 |
| 6 | 4.03686 | 399.967 | Interface Solo x GMB Lisa | 3 | 12 | 12.838 | 13.767 | 92.2677 | 41.6131 | 50.6546 |
| 7 | 4.03686 | 457.535 | Interface Solo x GMB Lisa | 3 | 12 | 14.3215 | 15.3578 | 105.742 | 47.6025 | 58.139 |
| 8 | 4.03686 | 515.103 | Interface Solo x GMB Lisa | 3 | 12 | 15.805 | 16.9486 | 119.215 | 53.592 | 65.6231 |
| 9 | 4.03686 | 572.672 | Interface Solo x GMB Lisa | 3 | 12 | 17.2884 | 18.5394 | 132.689 | 59.5815 | 73.1072 |
| 10 | 4.03686 | 636.409 | Interface Solo x GMB Lisa | 3 | 12 | 18.9309 | 20.3007 | 147.606 | 66.2129 | 81.3935 |
| 11 | 3.95008 | 646.074 | Interface Solo x GMB Lisa | 3 | 12 | 21.601 | 23.1641 | 163.56 | 68.6951 | 94.8648 |
| 12 | 3.95008 | 616.14 | Interface Solo x GMB Lisa | 3 | 12 | 20.7299 | 22.2299 | 155.982 | 65.5123 | 90.4695 |
| 13 | 3.95008 | 568.703 | Interface Solo x GMB Lisa | 3 | 12 | 19.3492 | 20.7493 | 143.973 | 60.4685 | 83.5041 |
| 14 | 3.95008 | 535.273 | Interface Solo x GMB Lisa | 3 | 12 | 18.3763 | 19.706 | 135.51 | 56.914 | 78.5955 |
| 15 | 3.95008 | 493.194 | Interface Solo x GMB Lisa | 3 | 12 | 17.1516 | 18.3927 | 124.857 | 52.4398 | 72.417 |
| 16 | 3.95008 | 476.344 | Interface Solo x GMB Lisa | 3 | 12 | 16.6612 | 17.8668 | 120.591 | 50.6482 | 69.9429 |
| 17 | 3.95008 | 453.773 | Interface Solo x GMB Lisa | 3 | 12 | 16.0042 | 17.1623 | 114.877 | 48.2483 | 66.6287 |
| 18 | 3.95008 | 408.467 | Interface Solo x GMB Lisa | 3 | 12 | 14.6856 | 15.7483 | 103.407 | 43.431 | 59.9764 |
| 19 | 3.95008 | 372.875 | Interface Solo x GMB Lisa | 3 | 12 | 13.6498 | 14.6375 | 94.3969 | 39.6467 | 54.7502 |
| 20 | 3.95008 | 340.744 | Interface Solo x GMB Lisa | 3 | 12 | 12.7147 | 13.6347 | 86.2626 | 36.2303 | 50.0323 |
| 21 | 3.95008 | 297.518 | Interface Solo x GMB Lisa | 3 | 12 | 11.4566 | 12.2856 | 75.3195 | 31.6342 | 43.6853 |
| 22 | 3.95008 | 275.339 | Interface Solo x GMB Lisa | 3 | 12 | 10.8111 | 11.5934 | 69.7047 | 29.276 | 40.4287 |
| 23 | 3.95008 | 223.781 | Interface Solo x GMB Lisa | 3 | 12 | 9.31054 | 9.98425 | 56.6523 | 23.7939 | 32.8584 |
| 24 | 0.126642 | 6.36618 | Interface Solo x GMB Lisa | 3 | 12 | 11.3357 | 12.1559 | 64.1881 | 21.1131 | 43.075 |
| 25 | 4.40063 | 106.513 | Resíduos | 13.5 | 22 | 33.2696 | 35.677 | 65.0557 | 10.1657 | 54.89 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.07236

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| | | | | | |

| | | | | |
|----|---------|---------|---------|---|
| 1 | 109.47 | 324.994 | 0 | 0 |
| 2 | 113.038 | 321.715 | 15.4954 | 0 |
| 3 | 116.605 | 318.437 | 90.0191 | 0 |
| 4 | 120.173 | 315.158 | 216.094 | 0 |
| 5 | 124.21 | 313.014 | 316.357 | 0 |
| 6 | 128.247 | 310.87 | 439.519 | 0 |
| 7 | 132.284 | 308.726 | 585.589 | 0 |
| 8 | 136.32 | 306.581 | 754.566 | 0 |
| 9 | 140.357 | 304.437 | 946.451 | 0 |
| 10 | 144.394 | 302.293 | 1161.24 | 0 |
| 11 | 148.431 | 300.149 | 1401.4 | 0 |
| 12 | 152.381 | 300.149 | 1316.17 | 0 |
| 13 | 156.331 | 300.149 | 1234.38 | 0 |
| 14 | 160.281 | 300.149 | 1158.04 | 0 |
| 15 | 164.231 | 300.149 | 1085.54 | 0 |
| 16 | 168.181 | 300.149 | 1017.86 | 0 |
| 17 | 172.131 | 300.149 | 952.126 | 0 |
| 18 | 176.082 | 300.149 | 888.981 | 0 |
| 19 | 180.032 | 300.149 | 831.038 | 0 |
| 20 | 183.982 | 300.149 | 777.183 | 0 |
| 21 | 187.932 | 300.149 | 727.017 | 0 |
| 22 | 191.882 | 300.149 | 681.814 | 0 |
| 23 | 195.832 | 300.149 | 639.159 | 0 |
| 24 | 199.782 | 300.149 | 602.424 | 0 |
| 25 | 199.909 | 300.305 | 590.997 | 0 |
| 26 | 204.309 | 305.714 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 109.47 | 324.994 |
| 120.173 | 315.158 |
| 148.431 | 300.149 |
| 199.782 | 300.149 |
| 204.309 | 305.714 |

External Boundary

| X | Y |
|---------|-----|
| 782.638 | 413 |
| 774.228 | 412 |
| 768.818 | 411 |
| 763.41 | 410 |
| 757.942 | 409 |
| 752.475 | 408 |
| 748.689 | 407 |
| 745.433 | 406 |
| 742.172 | 405 |
| 738.895 | 404 |
| 735.613 | 403 |

| | |
|---------|-----|
| 732.302 | 402 |
| 729.011 | 401 |
| 725.82 | 400 |
| 722.75 | 399 |
| 719.774 | 398 |
| 717.169 | 397 |
| 714.672 | 396 |
| 712.196 | 395 |
| 709.754 | 394 |
| 707.345 | 393 |
| 704.951 | 392 |
| 702.574 | 391 |
| 700.204 | 390 |
| 697.836 | 389 |
| 695.47 | 388 |
| 693.105 | 387 |
| 690.742 | 386 |
| 688.379 | 385 |
| 686.055 | 384 |
| 683.891 | 383 |
| 681.73 | 382 |
| 679.571 | 381 |
| 677.419 | 380 |
| 675.275 | 379 |
| 673.135 | 378 |
| 671.005 | 377 |
| 668.877 | 376 |
| 666.75 | 375 |
| 664.624 | 374 |
| 662.659 | 373 |
| 660.814 | 372 |
| 658.968 | 371 |
| 657.12 | 370 |
| 655.271 | 369 |
| 653.419 | 368 |
| 651.566 | 367 |
| 649.71 | 366 |
| 647.85 | 365 |
| 645.988 | 364 |
| 644.111 | 363 |
| 642.219 | 362 |
| 640.317 | 361 |
| 638.404 | 360 |
| 636.48 | 359 |
| 634.549 | 358 |
| 632.801 | 357 |
| 631.153 | 356 |
| 629.507 | 355 |
| 627.865 | 354 |
| 626.228 | 353 |
| 624.586 | 352 |
| 622.925 | 351 |

| | |
|---------|-----|
| 621.284 | 350 |
| 619.54 | 349 |
| 617.993 | 348 |
| 616.456 | 347 |
| 614.925 | 346 |
| 613.404 | 345 |
| 611.895 | 344 |
| 610.391 | 343 |
| 608.891 | 342 |
| 607.394 | 341 |
| 605.9 | 340 |
| 604.408 | 339 |
| 602.917 | 338 |
| 601.429 | 337 |
| 599.939 | 336 |
| 598.444 | 335 |
| 596.95 | 334 |
| 595.455 | 333 |
| 593.961 | 332 |
| 592.563 | 331 |
| 591.17 | 330 |
| 589.805 | 329 |
| 588.505 | 328 |
| 587.254 | 327 |
| 586.007 | 326 |
| 584.732 | 325 |
| 583.34 | 324 |
| 581.87 | 323 |
| 580.369 | 322 |
| 578.823 | 321 |
| 577.275 | 320 |
| 575.722 | 319 |
| 574.166 | 318 |
| 572.608 | 317 |
| 571.049 | 316 |
| 569.478 | 315 |
| 567.797 | 314 |
| 565.646 | 313 |
| 563.386 | 312 |
| 559.859 | 311 |
| 556.131 | 310 |
| 552.436 | 309 |
| 519.816 | 308 |
| 511.336 | 307 |
| 508.961 | 306 |
| 506.633 | 305 |
| 504.306 | 304 |
| 501.98 | 303 |
| 499.635 | 302 |
| 497.252 | 301 |
| 494.875 | 300 |
| 492.482 | 299 |

| | |
|---------|-----|
| 490.069 | 298 |
| 487.637 | 297 |
| 485.197 | 296 |
| 482.72 | 295 |
| 480.205 | 294 |
| 477.814 | 293 |
| 475.464 | 292 |
| 473.154 | 291 |
| 470.831 | 290 |
| 468.526 | 289 |
| 466.243 | 288 |
| 463.983 | 287 |
| 461.72 | 286 |
| 459.303 | 285 |
| 456.854 | 284 |
| 454.196 | 283 |
| 450.723 | 282 |
| 445.815 | 281 |
| 439.487 | 280 |
| 432.347 | 279 |
| 409.664 | 279 |
| 328.784 | 279 |
| 311.797 | 278 |
| 303.693 | 277 |
| 282.307 | 277 |
| 280.297 | 278 |
| 278.045 | 279 |
| 275.69 | 280 |
| 273.334 | 281 |
| 270.928 | 282 |
| 268.165 | 283 |
| 265.513 | 284 |
| 262.855 | 285 |
| 260.203 | 286 |
| 256.943 | 287 |
| 251.485 | 288 |
| 246.994 | 289 |
| 242.766 | 290 |
| 239.137 | 291 |
| 234.481 | 292 |
| 230.238 | 293 |
| 227.955 | 294 |
| 220.83 | 295 |
| 219.732 | 296 |
| 218.569 | 297 |
| 217.344 | 298 |
| 215.981 | 299 |
| 214.627 | 300 |
| 213.282 | 301 |
| 211.944 | 302 |
| 210.612 | 303 |
| 209.286 | 304 |

| | |
|---------|---------|
| 207.962 | 305 |
| 204.567 | 305.664 |
| 202.849 | 306 |
| 201.08 | 307 |
| 197.79 | 308 |
| 196.338 | 309 |
| 194.555 | 310 |
| 188.827 | 311 |
| 186.814 | 312 |
| 184.841 | 313 |
| 179.864 | 314 |
| 177.68 | 315 |
| 175.846 | 316 |
| 172.353 | 317 |
| 165.302 | 318 |
| 163.222 | 319 |
| 161.155 | 320 |
| 156.732 | 321 |
| 155.078 | 322 |
| 153.384 | 323 |
| 146.762 | 324 |
| 132.115 | 324.39 |
| 109.7 | 324.988 |
| 109.242 | 325 |
| 107.125 | 326 |
| 105.01 | 327 |
| 102.897 | 328 |
| 100.786 | 329 |
| 98.677 | 330 |
| 96.5696 | 331 |
| 94.4642 | 332 |
| 92.3606 | 333 |
| 90.2589 | 334 |
| 88.1573 | 335 |
| 86.0574 | 336 |
| 83.9621 | 337 |
| 82.1485 | 338 |
| 81.0059 | 339 |
| 79.8673 | 340 |
| 78.7243 | 341 |
| 77.5786 | 342 |
| 76.4329 | 343 |
| 75.2871 | 344 |
| 74.1866 | 345 |
| 71.682 | 346 |
| 66.5595 | 347 |
| 64.7442 | 348 |
| 62.9245 | 349 |
| 61.1102 | 350 |
| 59.2778 | 351 |
| 57.1988 | 352 |
| 54.6474 | 353 |

| | |
|--------------|---------|
| 44.9562 | 354 |
| 40.0373 | 355 |
| 3.6e-015 | 363.14 |
| 7.10543e-015 | 340.34 |
| 0 | 256.21 |
| 783.842 | 256.21 |
| 783.842 | 413.143 |

Material Boundary

| X | Y |
|--------------|---------|
| 7.10543e-015 | 340.34 |
| 42.3503 | 340 |
| 69.287 | 320 |
| 80.4093 | 320 |
| 109.181 | 315 |
| 120.191 | 315 |
| 148.453 | 300 |
| 199.81 | 300 |
| 200.069 | 300.308 |
| 204.567 | 305.664 |

Material Boundary

| X | Y |
|--------|-----|
| 199.81 | 300 |
| 220.83 | 295 |

Material Boundary

| X | Y |
|---------|-----|
| 109.242 | 325 |
| 120.191 | 315 |

Material Boundary

| X | Y |
|---------|---------|
| 146.585 | 319.981 |
| 146.409 | 320.008 |
| 117.665 | 320.774 |
| 117.665 | 322.775 |
| 146.585 | 322.004 |
| 146.585 | 319.981 |

Material Boundary

| X | Y |
|---------|---------|
| 109.7 | 324.988 |
| 120.365 | 315.247 |
| 148.528 | 300.3 |
| 199.671 | 300.3 |
| 200.069 | 300.308 |

RUPTURAS NÃO CIRCULARES – HIPÓTESE 02

Project Summary

File Name: Estaca 02.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 09:03:14

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.36 | 0 | 0 | 0.36 |

Global Minimums

Method: bishop simplified

FS: 1.222110
 Axis Location: 103.409, 374.295
 Left Slip Surface Endpoint: 83.714, 291.427
 Right Slip Surface Endpoint: 157.887, 308.818
 Resisting Moment=110961 kN-m
 Driving Moment=90794.2 kN-m
 Total Slice Area=744.022 m2

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 83.7139 | 291.427 |
| 87.52 | 287.648 |
| 121.348 | 287.648 |
| 157.887 | 308.818 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.22211

| 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 | 3.65328 | 74.3393 | Resíduos | 18.2 | 28 | 36.2454 | 44.2959 | 56.4047 | 7.32552 | 49.0792 |
| 2 | 0.152797 | 6.38322 | Interface Solo x GMB Lisa | 3 | 12 | 8.59142 | 10.4997 | 50.3225 | 15.0393 | 35.2832 |
| 3 | 3.07527 | 151.336 | Interface Solo x GMB Lisa | 3 | 12 | 7.93252 | 9.69441 | 49.2106 | 17.7158 | 31.4948 |
| 4 | 3.07527 | 170.144 | Interface Solo x GMB Lisa | 3 | 12 | 8.6133 | 10.5264 | 55.3265 | 19.9175 | 35.409 |
| 5 | 3.07527 | 177.011 | Interface Solo x GMB Lisa | 3 | 12 | 8.86187 | 10.8302 | 57.5594 | 20.7214 | 36.838 |
| 6 | 3.07527 | 211.638 | Interface Solo x GMB Lisa | 3 | 12 | 10.1152 | 12.3619 | 68.8193 | 24.7749 | 44.0444 |

| | | | | | | | | | | |
|----|---------|---------|------------------------------|------|----|---------|---------|----------|---------|----------|
| 7 | 3.07527 | 219.91 | Interface Solo x GMB Lisa | 3 | 12 | 10.4146 | 12.7278 | 71.5091 | 25.7432 | 45.7659 |
| 8 | 3.07527 | 242.324 | Interface Solo x GMB Lisa | 3 | 12 | 11.2259 | 13.7193 | 78.7976 | 28.3672 | 50.4304 |
| 9 | 3.07527 | 272.98 | Interface Solo x GMB Lisa | 3 | 12 | 12.3356 | 15.0754 | 88.7661 | 31.9558 | 56.8103 |
| 10 | 3.07527 | 302.426 | Interface Solo x GMB Lisa | 3 | 12 | 13.4014 | 16.378 | 98.3412 | 35.4029 | 62.9383 |
| 11 | 3.07527 | 331.116 | Interface Solo x GMB Lisa | 3 | 12 | 14.4399 | 17.6471 | 107.67 | 38.7614 | 68.9091 |
| 12 | 3.07527 | 357.208 | Interface Solo x GMB Lisa | 3 | 12 | 15.3843 | 18.8013 | 116.155 | 41.8158 | 74.3391 |
| 13 | 3.07527 | 370.545 | Interface Solo x GMB Lisa | 3 | 12 | 15.867 | 19.3912 | 120.492 | 43.377 | 77.1148 |
| 14 | 2.90568 | 348.149 | Interface Solo x GMB Lisa | 3 | 12 | 14.3436 | 17.5295 | 111.49 | 43.1341 | 68.356 |
| 15 | 2.90568 | 324.897 | Interface Solo x GMB Lisa | 3 | 12 | 13.5345 | 16.5407 | 103.957 | 40.2533 | 63.7041 |
| 16 | 2.90568 | 289.637 | Interface Solo x GMB Lisa | 3 | 12 | 12.3077 | 15.0414 | 92.5348 | 35.8848 | 56.65 |
| 17 | 2.90568 | 271.076 | Interface Solo x GMB Lisa | 3 | 12 | 11.6619 | 14.2521 | 86.522 | 33.5851 | 52.9369 |
| 18 | 2.90568 | 250.837 | Interface Solo x GMB Lisa | 3 | 12 | 10.9576 | 13.3914 | 79.9654 | 31.0776 | 48.8878 |
| 19 | 2.90568 | 220.074 | Interface Solo x GMB Lisa | 3 | 12 | 9.88722 | 12.0833 | 69.9998 | 27.2662 | 42.7336 |
| 20 | 2.90568 | 189.084 | Interface Solo x GMB Lisa | 3 | 12 | 8.8089 | 10.7654 | 59.96 | 23.4266 | 36.5334 |
| 21 | 2.90568 | 155.431 | Interface Solo x GMB Lisa | 3 | 12 | 7.63791 | 9.33437 | 49.0579 | 19.2571 | 29.8008 |
| 22 | 2.90568 | 120.65 | Interface Solo x GMB Lisa | 3 | 12 | 6.4277 | 7.85536 | 37.7907 | 14.948 | 22.8427 |
| 23 | 3.46249 | 100.703 | Resíduos | 18.2 | 28 | 18.3547 | 22.4315 | 18.4286 | 10.4703 | 7.95828 |
| 24 | 3.46249 | 60.131 | Resíduos | 18.2 | 28 | 15.7499 | 19.2481 | 8.22307 | 6.2519 | 1.97117 |
| 25 | 3.46249 | 20.023 | Resíduos | 18.2 | 28 | 13.1749 | 16.1011 | -1.86559 | 2.08182 | -3.94741 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.22211

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 83.7139 | 291.427 | 0 | 0 | 0 |
| 2 | 87.3672 | 287.8 | 337.259 | 0 | 0 |
| 3 | 87.52 | 287.648 | 346.208 | 0 | 0 |
| 4 | 90.5953 | 287.648 | 370.651 | 0 | 0 |
| 5 | 93.6705 | 287.648 | 397.191 | 0 | 0 |
| 6 | 96.7458 | 287.648 | 424.497 | 0 | 0 |
| 7 | 99.8211 | 287.648 | 455.665 | 0 | 0 |
| 8 | 102.896 | 287.648 | 487.756 | 0 | 0 |
| 9 | 105.972 | 287.648 | 522.347 | 0 | 0 |
| 10 | 109.047 | 287.648 | 560.357 | 0 | 0 |
| 11 | 112.122 | 287.648 | 601.651 | 0 | 0 |
| 12 | 115.197 | 287.648 | 646.145 | 0 | 0 |
| 13 | 118.273 | 287.648 | 693.549 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 14 | 121.348 | 287.648 | 742.44 | 0 | 0 |
| 15 | 124.254 | 289.332 | 596.504 | 0 | 0 |
| 16 | 127.159 | 291.015 | 460.894 | 0 | 0 |
| 17 | 130.065 | 292.699 | 340.942 | 0 | 0 |
| 18 | 132.971 | 294.382 | 229.233 | 0 | 0 |
| 19 | 135.876 | 296.066 | 126.511 | 0 | 0 |
| 20 | 138.782 | 297.749 | 37.4509 | 0 | 0 |
| 21 | 141.688 | 299.433 | -37.8471 | 0 | 0 |
| 22 | 144.593 | 301.116 | -98.2004 | 0 | 0 |
| 23 | 147.499 | 302.8 | -143.108 | 0 | 0 |
| 24 | 150.962 | 304.806 | -116.4 | 0 | 0 |
| 25 | 154.424 | 306.812 | -78.2557 | 0 | 0 |
| 26 | 157.887 | 308.818 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 83.7139 | 291.427 |
| 87.52 | 287.648 |
| 121.348 | 287.648 |
| 157.887 | 308.818 |

External Boundary

| X | Y |
|---------|---------|
| 224.566 | 340.518 |
| 222.369 | 339.249 |
| 215.437 | 339.121 |
| 213.637 | 339.106 |
| 213.064 | 338.716 |
| 209.867 | 336.08 |
| 209.267 | 335.398 |
| 207.289 | 334.222 |
| 206.826 | 334.359 |
| 206.575 | 334.139 |
| 203.418 | 333.138 |
| 203.091 | 333.102 |
| 202.657 | 332.594 |
| 201.604 | 331.527 |
| 190.48 | 320.012 |
| 187.316 | 320.196 |
| 185.499 | 320.379 |
| 184.753 | 320.463 |
| 183.638 | 320.403 |
| 171.07 | 312.26 |
| 171.028 | 311.581 |
| 170.236 | 311.284 |
| 169.452 | 311.371 |
| 169.239 | 310.947 |
| 168.288 | 310.618 |

| | |
|---------|---------|
| 166.402 | 309.17 |
| 165.967 | 309.224 |
| 165.454 | 309.287 |
| 164.67 | 309.52 |
| 163.154 | 309.355 |
| 159.943 | 309.045 |
| 157.74 | 308.802 |
| 151.786 | 308.198 |
| 150.369 | 308.055 |
| 147.557 | 307.813 |
| 140.94 | 307.86 |
| 133.787 | 307.445 |
| 133.47 | 307.436 |
| 133.31 | 307.417 |
| 132.363 | 307.089 |
| 129.167 | 305.946 |
| 128.715 | 305.943 |
| 124.858 | 306.112 |
| 124.671 | 306.094 |
| 120.66 | 304.857 |
| 117.741 | 304.589 |
| 113.087 | 302.745 |
| 105.653 | 299.438 |
| 105 | 299.118 |
| 101.98 | 297.637 |
| 100.735 | 297.801 |
| 99.0912 | 297.952 |
| 95.8416 | 296.028 |
| 94.7299 | 295.452 |
| 93.2575 | 295.464 |
| 90.6229 | 295.516 |
| 88.9082 | 294.536 |
| 83.5694 | 291.34 |
| 81.1219 | 291.162 |
| 78.7719 | 291.01 |
| 74.7007 | 288.322 |
| 73.8627 | 287.8 |
| 73.3815 | 287.5 |
| 65.2019 | 282.406 |
| 62.0794 | 281.801 |
| 61.8346 | 281.763 |
| 55.7123 | 280.725 |
| 48.8919 | 279.633 |
| 46.7214 | 279.495 |
| 42.2692 | 278.611 |
| 41.5317 | 278.585 |
| 232.711 | 278.585 |
| 232.711 | 344.863 |

Material Boundary

| X | Y |
|---------|-------|
| 73.3815 | 287.5 |

| | |
|---------|--------|
| 87.4097 | 287.5 |
| 105 | 287.5 |
| 121.325 | 287.5 |
| 147.305 | 302.5 |
| 157.305 | 302.5 |
| 166.402 | 309.17 |

Material Boundary

| X | Y |
|---------|--------|
| 83.5694 | 291.34 |
| 87.11 | 287.8 |
| 87.4097 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 87.11 | 287.8 |
| 104.999 | 287.8 |
| 105 | 287.8 |
| 105 | 287.8 |
| 121.244 | 287.8 |
| 147.225 | 302.8 |
| 157.207 | 302.8 |
| 165.967 | 309.224 |

Project Summary

File Name: Estaca 03.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 09:14:30

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.36 | 0 | 0 | 0.36 |

Global Minimums

Method: bishop simplified

FS: 1.190750
 Axis Location: 101.163, 391.277
 Left Slip Surface Endpoint: 78.708, 291.282
 Right Slip Surface Endpoint: 167.685, 313.316
 Resisting Moment=177274 kN-m
 Driving Moment=148876 kN-m
 Total Slice Area=972.142 m2

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 78.7077 | 291.282 |
| 82.14 | 287.655 |
| 123.385 | 287.655 |
| 167.685 | 313.316 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.19075

| 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 | 3.29508 | 62.5658 | Resíduos | 18.2 | 28 | 39.2478 | 46.7343 | 60.5008 | 6.83555 | 53.6652 |
| 2 | 0.137196 | 5.34838 | Interface Solo x GMB Lisa | 3 | 12 | 8.59606 | 10.2358 | 48.0756 | 14.034 | 34.0416 |
| 3 | 3.74955 | 178.223 | Interface Solo x GMB Lisa | 3 | 12 | 7.94965 | 9.46605 | 47.5319 | 17.1115 | 30.4204 |
| 4 | 3.74955 | 197.855 | Interface Solo x GMB Lisa | 3 | 12 | 8.54782 | 10.1783 | 52.7677 | 18.9964 | 33.7713 |
| 5 | 3.74955 | 226.614 | Interface Solo x GMB Lisa | 3 | 12 | 9.42409 | 11.2217 | 60.4377 | 21.7576 | 38.6801 |
| 6 | 3.74955 | 259.875 | Interface Solo x GMB Lisa | 3 | 12 | 10.4375 | 12.4284 | 69.3084 | 24.951 | 44.3574 |

| | | | | | | | | | | |
|----|---------|---------|------------------------------|------|----|---------|---------|-----------|---------|----------|
| 7 | 3.74955 | 279.815 | Interface Solo x GMB Lisa | 3 | 12 | 11.0451 | 13.1519 | 74.6264 | 26.8655 | 47.7609 |
| 8 | 3.74955 | 321.282 | Interface Solo x GMB Lisa | 3 | 12 | 12.3085 | 14.6563 | 85.6856 | 30.8468 | 54.8388 |
| 9 | 3.74955 | 364.339 | Interface Solo x GMB Lisa | 3 | 12 | 13.6204 | 16.2185 | 97.1688 | 34.9808 | 62.188 |
| 10 | 3.74955 | 412.371 | Interface Solo x GMB Lisa | 3 | 12 | 15.0839 | 17.9611 | 109.979 | 39.5924 | 70.3865 |
| 11 | 3.74955 | 447.417 | Interface Solo x GMB Lisa | 3 | 12 | 16.1517 | 19.2326 | 119.326 | 42.9572 | 76.3685 |
| 12 | 3.74955 | 464.802 | Interface Solo x GMB Lisa | 3 | 12 | 16.6813 | 19.8633 | 123.962 | 44.6264 | 79.3358 |
| 13 | 3.74955 | 506.161 | Interface Solo x GMB Lisa | 3 | 12 | 17.9415 | 21.3639 | 134.993 | 48.5973 | 86.3953 |
| 14 | 3.73511 | 495.015 | Interface Solo x GMB Lisa | 3 | 12 | 16.004 | 19.0568 | 123.252 | 47.7108 | 75.5413 |
| 15 | 3.73511 | 442.787 | Interface Solo x GMB Lisa | 3 | 12 | 14.5564 | 17.333 | 110.109 | 42.677 | 67.4316 |
| 16 | 3.73511 | 390.676 | Interface Solo x GMB Lisa | 3 | 12 | 13.112 | 15.6131 | 96.9945 | 37.6544 | 59.3401 |
| 17 | 3.73511 | 342.706 | Interface Solo x GMB Lisa | 3 | 12 | 11.7823 | 14.0298 | 84.9222 | 33.0309 | 51.8913 |
| 18 | 3.73511 | 304.177 | Interface Solo x GMB Lisa | 3 | 12 | 10.7144 | 12.7582 | 75.2259 | 29.3174 | 45.9085 |
| 19 | 3.73511 | 285.742 | Interface Solo x GMB Lisa | 3 | 12 | 10.2034 | 12.1497 | 70.5867 | 27.5406 | 43.0461 |
| 20 | 3.73511 | 260.619 | Interface Solo x GMB Lisa | 3 | 12 | 9.50702 | 11.3205 | 64.264 | 25.1191 | 39.1449 |
| 21 | 3.63087 | 205.212 | Resíduos | 18.2 | 28 | 24.9722 | 29.7356 | 42.0419 | 20.3467 | 21.6952 |
| 22 | 3.63087 | 158.405 | Resíduos | 18.2 | 28 | 22.0456 | 26.2508 | 30.847 | 15.7058 | 15.1412 |
| 23 | 3.63087 | 121.028 | Resíduos | 18.2 | 28 | 19.7087 | 23.4681 | 21.9077 | 11.9999 | 9.90783 |
| 24 | 3.63087 | 78.9063 | Resíduos | 18.2 | 28 | 17.075 | 20.3321 | 11.8334 | 7.82354 | 4.0099 |
| 25 | 3.63087 | 26.4431 | Resíduos | 18.2 | 28 | 13.7948 | 16.4262 | -0.714192 | 2.62183 | -3.33602 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.19075

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 78.7077 | 291.282 | 0 | 0 | 0 |
| 2 | 82.0028 | 287.8 | 340.121 | 0 | 0 |
| 3 | 82.14 | 287.655 | 348.273 | 0 | 0 |
| 4 | 85.8895 | 287.655 | 378.104 | 0 | 0 |
| 5 | 89.6391 | 287.655 | 410.18 | 0 | 0 |
| 6 | 93.3886 | 287.655 | 445.544 | 0 | 0 |
| 7 | 97.1382 | 287.655 | 484.711 | 0 | 0 |
| 8 | 100.888 | 287.655 | 526.158 | 0 | 0 |
| 9 | 104.637 | 287.655 | 572.346 | 0 | 0 |
| 10 | 108.387 | 287.655 | 623.457 | 0 | 0 |
| 11 | 112.136 | 287.655 | 680.059 | 0 | 0 |
| 12 | 115.886 | 287.655 | 740.669 | 0 | 0 |
| 13 | 119.635 | 287.655 | 803.266 | 0 | 0 |
| 14 | 123.385 | 287.655 | 870.592 | 0 | 0 |
| 15 | 127.12 | 289.819 | 663.752 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 16 | 130.855 | 291.982 | 479.937 | 0 | 0 |
| 17 | 134.59 | 294.146 | 319.097 | 0 | 0 |
| 18 | 138.325 | 296.309 | 179.405 | 0 | 0 |
| 19 | 142.061 | 298.473 | 56.6997 | 0 | 0 |
| 20 | 145.796 | 300.636 | -57.8782 | 0 | 0 |
| 21 | 149.531 | 302.8 | -161.38 | 0 | 0 |
| 22 | 153.162 | 304.903 | -159.059 | 0 | 0 |
| 23 | 156.793 | 307.006 | -143.828 | 0 | 0 |
| 24 | 160.423 | 309.11 | -118.288 | 0 | 0 |
| 25 | 164.054 | 311.213 | -81.129 | 0 | 0 |
| 26 | 167.685 | 313.316 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 78.7077 | 291.282 |
| 82.14 | 287.655 |
| 123.385 | 287.655 |
| 167.685 | 313.316 |

External Boundary

| X | Y |
|---------|---------|
| 229.19 | 338.986 |
| 228.926 | 338.851 |
| 228.615 | 338.853 |
| 222.124 | 338.933 |
| 215.524 | 334.785 |
| 214.604 | 334.256 |
| 213.959 | 333.815 |
| 213.055 | 333.797 |
| 208.463 | 333.71 |
| 206.215 | 331.158 |
| 204.24 | 329.055 |
| 200.127 | 324.337 |
| 198.862 | 324.346 |
| 196.999 | 324.51 |
| 196.113 | 324.623 |
| 195.879 | 324.47 |
| 192.406 | 322.677 |
| 178.267 | 314.628 |
| 175.803 | 313.352 |
| 175.249 | 313.345 |
| 174.868 | 313.341 |
| 173.403 | 313.351 |
| 163.089 | 313.288 |
| 160.066 | 313.218 |
| 156.708 | 312.312 |
| 149.893 | 311.821 |
| 146.577 | 311.555 |

| | |
|---------|---------|
| 140.506 | 308.918 |
| 137.534 | 308.379 |
| 136.496 | 308.222 |
| 132.797 | 307.902 |
| 125.022 | 307.581 |
| 122.621 | 307.381 |
| 120.02 | 306.263 |
| 117.208 | 305.057 |
| 116.89 | 304.773 |
| 113.56 | 304.665 |
| 113.091 | 304.627 |
| 112.851 | 304.615 |
| 106.014 | 301.154 |
| 105.677 | 300.965 |
| 105.532 | 300.988 |
| 105 | 300.962 |
| 104.415 | 300.934 |
| 104.23 | 300.402 |
| 97.0353 | 297.439 |
| 95.9837 | 297.542 |
| 93.997 | 297.529 |
| 92.4662 | 296.733 |
| 89.4247 | 295.12 |
| 85.4524 | 295.139 |
| 85.243 | 295.151 |
| 83.3052 | 293.993 |
| 78.4595 | 291.136 |
| 77.9787 | 291.111 |
| 73.5622 | 290.583 |
| 68.7656 | 287.5 |
| 67.9234 | 286.959 |
| 58.9928 | 281.288 |
| 56.5883 | 280.736 |
| 55.1834 | 280.521 |
| 48.5919 | 280.015 |
| 47.4813 | 279.885 |
| 41.4363 | 279.572 |
| 40.6969 | 279.534 |
| 40.6969 | 270 |
| 241.351 | 270 |
| 241.351 | 344.99 |

Material Boundary

| X | Y |
|---------|---------|
| 68.7656 | 287.5 |
| 82.0956 | 287.5 |
| 105 | 287.5 |
| 123.332 | 287.5 |
| 149.313 | 302.5 |
| 159.313 | 302.5 |
| 175.803 | 313.352 |

Material Boundary

| X | Y |
|---------|---------|
| 78.4595 | 291.136 |
| 81.7956 | 287.8 |
| 82.0956 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 81.7956 | 287.8 |
| 105 | 287.8 |
| 105 | 287.8 |
| 105.001 | 287.8 |
| 123.251 | 287.8 |
| 149.232 | 302.8 |
| 159.223 | 302.8 |
| 175.249 | 313.345 |

Project Summary

File Name: Estaca 04.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 15:09:49

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 malpha < 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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.23 | 0 | 0 | 0.23 |

Global Minimums

Method: bishop simplified

FS: 1.215700
 Axis Location: 159.049, 400.043
 Left Slip Surface Endpoint: 132.984, 291.284
 Right Slip Surface Endpoint: 230.418, 313.936
 Resisting Moment=258520 kN-m
 Driving Moment=212651 kN-m
 Total Slice Area=1216.14 m²

Method: janbu simplified

FS: 1.192770
 Axis Location: 159.049, 400.043
 Left Slip Surface Endpoint: 132.984, 291.284
 Right Slip Surface Endpoint: 230.418, 313.936
 Resisting Horizontal Force=2122.93 kN
 Driving Horizontal Force=1779.83 kN
 Total Slice Area=1216.14 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 132.984 | 291.284 |
| 136.567 | 287.666 |
| 185.02 | 287.666 |
| 230.418 | 313.936 |

Method: janbu simplified

| X | Y |
|---------|---------|
| 132.984 | 291.284 |
| 136.567 | 287.666 |
| 185.02 | 287.666 |
| 230.418 | 313.936 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.2157

| 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 | 3.44999 | 65.5273 | Resíduos | 18.2 | 28 | 38.2098 | 46.4516 | 57.502 | 4.3685 | 53.1335 |
| 2 | 0.132689 | 5.1637 | Interface Solo x GMB Lisa | 3 | 12 | 9.35545 | 11.3734 | 48.3445 | 8.95065 | 39.3939 |
| 3 | 4.03775 | 190.874 | Interface Solo x GMB Lisa | 3 | 12 | 8.83195 | 10.737 | 47.2724 | 10.8727 | 36.3997 |
| 4 | 4.03775 | 205.075 | Interface Solo x GMB Lisa | 3 | 12 | 9.30543 | 11.3126 | 50.7894 | 11.6815 | 39.1079 |
| 5 | 4.03775 | 237.331 | Interface Solo x GMB Lisa | 3 | 12 | 10.3809 | 12.6201 | 58.778 | 13.519 | 45.259 |
| 6 | 4.03775 | 275.573 | Interface Solo x GMB Lisa | 3 | 12 | 11.6561 | 14.1703 | 68.2491 | 15.6973 | 52.5518 |
| 7 | 4.03775 | 306.684 | Interface Solo x GMB Lisa | 3 | 12 | 12.6933 | 15.4313 | 75.9542 | 17.4694 | 58.4848 |
| 8 | 4.03775 | 360.424 | Interface Solo x GMB Lisa | 3 | 12 | 14.4852 | 17.6096 | 89.2636 | 20.5306 | 68.733 |
| 9 | 4.03775 | 389.227 | Interface Solo x GMB Lisa | 3 | 12 | 15.4455 | 18.7771 | 96.397 | 22.1713 | 74.2257 |
| 10 | 4.03775 | 448.619 | Interface Solo x GMB Lisa | 3 | 12 | 17.4258 | 21.1846 | 111.106 | 25.5544 | 85.5518 |
| 11 | 4.03775 | 468.952 | Interface Solo x GMB Lisa | 3 | 12 | 18.1038 | 22.0088 | 116.142 | 26.7127 | 89.4292 |
| 12 | 4.03775 | 505.002 | Interface Solo x GMB Lisa | 3 | 12 | 19.3058 | 23.4701 | 125.07 | 28.7661 | 96.3041 |
| 13 | 4.03775 | 534.41 | Interface Solo x GMB Lisa | 3 | 12 | 20.2863 | 24.6621 | 132.353 | 30.4413 | 101.912 |
| 14 | 4.03775 | 588.032 | Interface Solo x GMB Lisa | 3 | 12 | 22.0743 | 26.8357 | 145.634 | 33.4957 | 112.138 |
| 15 | 4.35882 | 605.318 | Interface Solo x GMB Lisa | 3 | 12 | 19.223 | 23.3694 | 127.771 | 31.9406 | 95.8305 |
| 16 | 4.35882 | 575.667 | Interface Solo x GMB Lisa | 3 | 12 | 18.3911 | 22.3581 | 121.449 | 30.376 | 91.0728 |
| 17 | 4.35882 | 595.564 | Interface Solo x GMB Lisa | 3 | 12 | 18.9493 | 23.0367 | 125.691 | 31.4259 | 94.2654 |
| 18 | 4.35882 | 547.69 | Interface Solo x GMB Lisa | 3 | 12 | 17.6063 | 21.404 | 115.484 | 28.8998 | 86.5838 |
| 19 | 4.35882 | 472.323 | Interface Solo x GMB Lisa | 3 | 12 | 15.4919 | 18.8335 | 99.4139 | 24.9229 | 74.491 |
| 20 | 4.35882 | 394.693 | Interface Solo x GMB Lisa | 3 | 12 | 13.3141 | 16.186 | 82.8618 | 20.8266 | 62.0352 |
| 21 | 3.84893 | 278.957 | Resíduos | 18.2 | 28 | 31.4384 | 38.2197 | 54.3211 | 16.6696 | 37.6515 |
| 22 | 3.84893 | 215.431 | Resíduos | 18.2 | 28 | 27.0008 | 32.8249 | 40.3789 | 12.8735 | 27.5054 |
| 23 | 3.84893 | 154.643 | Resíduos | 18.2 | 28 | 22.7545 | 27.6627 | 27.0377 | 9.24102 | 17.7966 |
| 24 | 3.84893 | 93.382 | Resíduos | 18.2 | 28 | 18.4752 | 22.4602 | 13.5926 | 5.58022 | 8.01235 |
| 25 | 3.84893 | 31.5425 | Resíduos | 18.2 | 28 | 14.1554 | 17.2087 | 0.0205166 | 1.88488 | -1.86436 |

Global Minimum Query (janbu simplified) - Safety Factor: 1.19277

| 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 | 3.44999 | 65.5273 | Resíduos | 18.2 | 28 | 39.6671 | 47.3137 | 59.1234 | 4.3685 | 54.7549 |
| 2 | 0.132689 | 5.1637 | Interface Solo x GMB Lisa | 3 | 12 | 9.58268 | 11.4299 | 48.6104 | 8.95065 | 39.6597 |
| 3 | 4.03775 | 190.874 | Interface Solo x GMB Lisa | 3 | 12 | 9.00174 | 10.737 | 47.2724 | 10.8727 | 36.3997 |
| 4 | 4.03775 | 205.075 | Interface Solo x GMB Lisa | 3 | 12 | 9.48432 | 11.3126 | 50.7894 | 11.6815 | 39.1079 |
| 5 | 4.03775 | 237.331 | Interface Solo x GMB Lisa | 3 | 12 | 10.5805 | 12.6201 | 58.778 | 13.519 | 45.259 |
| 6 | 4.03775 | 275.573 | Interface Solo x GMB Lisa | 3 | 12 | 11.8802 | 14.1703 | 68.2491 | 15.6973 | 52.5518 |
| 7 | 4.03775 | 306.684 | Interface Solo x GMB Lisa | 3 | 12 | 12.9374 | 15.4313 | 75.9542 | 17.4694 | 58.4848 |
| 8 | 4.03775 | 360.424 | Interface Solo x GMB Lisa | 3 | 12 | 14.7636 | 17.6096 | 89.2636 | 20.5306 | 68.733 |
| 9 | 4.03775 | 389.227 | Interface Solo x GMB Lisa | 3 | 12 | 15.7424 | 18.7771 | 96.397 | 22.1713 | 74.2257 |
| 10 | 4.03775 | 448.619 | Interface Solo x GMB Lisa | 3 | 12 | 17.7608 | 21.1846 | 111.106 | 25.5544 | 85.5518 |
| 11 | 4.03775 | 468.952 | Interface Solo x GMB Lisa | 3 | 12 | 18.4518 | 22.0088 | 116.142 | 26.7127 | 89.4292 |
| 12 | 4.03775 | 505.002 | Interface Solo x GMB Lisa | 3 | 12 | 19.677 | 23.4701 | 125.07 | 28.7661 | 96.3041 |
| 13 | 4.03775 | 534.41 | Interface Solo x GMB Lisa | 3 | 12 | 20.6763 | 24.6621 | 132.353 | 30.4413 | 101.912 |
| 14 | 4.03775 | 588.032 | Interface Solo x GMB Lisa | 3 | 12 | 22.4986 | 26.8357 | 145.634 | 33.4957 | 112.138 |
| 15 | 4.35882 | 605.318 | Interface Solo x GMB Lisa | 3 | 12 | 19.551 | 23.3199 | 127.538 | 31.9406 | 95.5977 |
| 16 | 4.35882 | 575.667 | Interface Solo x GMB Lisa | 3 | 12 | 18.705 | 22.3108 | 121.226 | 30.376 | 90.8502 |
| 17 | 4.35882 | 595.564 | Interface Solo x GMB Lisa | 3 | 12 | 19.2728 | 22.988 | 125.462 | 31.4259 | 94.036 |
| 18 | 4.35882 | 547.69 | Interface Solo x GMB Lisa | 3 | 12 | 17.9068 | 21.3587 | 115.271 | 28.8998 | 86.3709 |
| 19 | 4.35882 | 472.323 | Interface Solo x GMB Lisa | 3 | 12 | 15.7563 | 18.7937 | 99.2265 | 24.9229 | 74.3036 |
| 20 | 4.35882 | 394.693 | Interface Solo x GMB Lisa | 3 | 12 | 13.5413 | 16.1517 | 82.7007 | 20.8266 | 61.8741 |
| 21 | 3.84893 | 278.957 | Resíduos | 18.2 | 28 | 31.8942 | 38.0424 | 53.9876 | 16.6696 | 37.318 |
| 22 | 3.84893 | 215.431 | Resíduos | 18.2 | 28 | 27.3922 | 32.6726 | 40.0924 | 12.8735 | 27.2189 |
| 23 | 3.84893 | 154.643 | Resíduos | 18.2 | 28 | 23.0844 | 27.5344 | 26.7964 | 9.24102 | 17.5554 |
| 24 | 3.84893 | 93.382 | Resíduos | 18.2 | 28 | 18.743 | 22.356 | 13.3966 | 5.58022 | 7.81637 |
| 25 | 3.84893 | 31.5425 | Resíduos | 18.2 | 28 | 14.3606 | 17.1289 | -0.129637 | 1.88488 | -2.01452 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.2157

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 132.984 | 291.284 | 0 | 0 | 0 |
| 2 | 136.434 | 287.8 | 331.896 | 0 | 0 |
| 3 | 136.567 | 287.666 | 339.613 | 0 | 0 |
| 4 | 140.605 | 287.666 | 375.201 | 0 | 0 |
| 5 | 144.643 | 287.666 | 412.698 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 6 | 148.68 | 287.666 | 454.528 | 0 | 0 |
| 7 | 152.718 | 287.666 | 501.496 | 0 | 0 |
| 8 | 156.756 | 287.666 | 552.644 | 0 | 0 |
| 9 | 160.793 | 287.666 | 611.012 | 0 | 0 |
| 10 | 164.831 | 287.666 | 673.25 | 0 | 0 |
| 11 | 168.869 | 287.666 | 743.467 | 0 | 0 |
| 12 | 172.907 | 287.666 | 816.416 | 0 | 0 |
| 13 | 176.945 | 287.666 | 894.209 | 0 | 0 |
| 14 | 180.982 | 287.666 | 975.953 | 0 | 0 |
| 15 | 185.02 | 287.666 | 1064.9 | 0 | 0 |
| 16 | 189.379 | 290.188 | 826.239 | 0 | 0 |
| 17 | 193.738 | 292.711 | 599.904 | 0 | 0 |
| 18 | 198.096 | 295.233 | 365.297 | 0 | 0 |
| 19 | 202.455 | 297.755 | 150.595 | 0 | 0 |
| 20 | 206.814 | 300.278 | -32.7717 | 0 | 0 |
| 21 | 211.173 | 302.8 | -183.861 | 0 | 0 |
| 22 | 215.022 | 305.027 | -184.092 | 0 | 0 |
| 23 | 218.871 | 307.255 | -170.315 | 0 | 0 |
| 24 | 222.72 | 309.482 | -143.134 | 0 | 0 |
| 25 | 226.569 | 311.709 | -102.444 | 0 | 0 |
| 26 | 230.418 | 313.936 | 0 | 0 | 0 |

Global Minimum Query (janbu simplified) - Safety Factor: 1.19277

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 132.984 | 291.284 | 0 | 0 | 0 |
| 2 | 136.434 | 287.8 | 343.083 | 0 | 0 |
| 3 | 136.567 | 287.666 | 350.871 | 0 | 0 |
| 4 | 140.605 | 287.666 | 387.282 | 0 | 0 |
| 5 | 144.643 | 287.666 | 425.645 | 0 | 0 |
| 6 | 148.68 | 287.666 | 468.442 | 0 | 0 |
| 7 | 152.718 | 287.666 | 516.496 | 0 | 0 |
| 8 | 156.756 | 287.666 | 568.826 | 0 | 0 |
| 9 | 160.793 | 287.666 | 628.543 | 0 | 0 |
| 10 | 164.831 | 287.666 | 692.219 | 0 | 0 |
| 11 | 168.869 | 287.666 | 764.06 | 0 | 0 |
| 12 | 172.907 | 287.666 | 838.696 | 0 | 0 |
| 13 | 176.945 | 287.666 | 918.286 | 0 | 0 |
| 14 | 180.982 | 287.666 | 1001.92 | 0 | 0 |
| 15 | 185.02 | 287.666 | 1092.92 | 0 | 0 |
| 16 | 189.379 | 290.188 | 856.6 | 0 | 0 |
| 17 | 193.738 | 292.711 | 632.503 | 0 | 0 |
| 18 | 198.096 | 295.233 | 400.201 | 0 | 0 |
| 19 | 202.455 | 297.755 | 187.64 | 0 | 0 |
| 20 | 206.814 | 300.278 | 6.15866 | 0 | 0 |
| 21 | 211.173 | 302.8 | -143.311 | 0 | 0 |
| 22 | 215.022 | 305.027 | -140.582 | 0 | 0 |
| 23 | 218.871 | 307.255 | -124.262 | 0 | 0 |
| 24 | 222.72 | 309.482 | -94.9373 | 0 | 0 |
| 25 | 226.569 | 311.709 | -52.5075 | 0 | 0 |
| 26 | 230.418 | 313.936 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 132.984 | 291.284 |
| 136.567 | 287.666 |
| 185.02 | 287.666 |
| 230.418 | 313.936 |

External Boundary

| X | Y |
|---------|---------|
| 303.56 | 342.72 |
| 303.098 | 342.676 |
| 302.853 | 342.658 |
| 302.154 | 342.51 |
| 301.774 | 342.304 |
| 300.94 | 341.684 |
| 295.595 | 338.923 |
| 292.921 | 338.919 |
| 288.439 | 338.763 |
| 287.523 | 337.893 |
| 282.113 | 333.613 |
| 280.398 | 333.725 |
| 278.361 | 333.755 |
| 277.473 | 333.742 |
| 276.409 | 332.555 |
| 273.824 | 329.952 |
| 270.978 | 330.315 |
| 268.96 | 330.506 |
| 264.474 | 327.105 |
| 259.007 | 322.849 |
| 256.659 | 322.712 |
| 245.88 | 317.602 |
| 237.711 | 313.612 |
| 237.368 | 313.683 |
| 237.28 | 313.685 |
| 234.926 | 313.749 |
| 232.971 | 313.856 |
| 227.754 | 314.02 |
| 220.2 | 314.121 |
| 217.774 | 314.102 |
| 214.915 | 314.2 |
| 208.487 | 314.439 |
| 208.231 | 314.441 |
| 203.541 | 314.422 |
| 200.279 | 314.394 |
| 199.963 | 314.381 |
| 199.364 | 314.355 |
| 196.829 | 314.186 |
| 194.805 | 312.757 |

| | |
|---------|---------|
| 189.45 | 308.602 |
| 186.655 | 308.708 |
| 185.211 | 308.754 |
| 183.823 | 308.715 |
| 183.166 | 308.723 |
| 177.401 | 305.679 |
| 173.952 | 305.536 |
| 173.817 | 305.528 |
| 172.779 | 304.475 |
| 172.351 | 304.308 |
| 171.281 | 304.187 |
| 169.322 | 304.09 |
| 167.701 | 303.999 |
| 166.094 | 303.186 |
| 165 | 302.569 |
| 161.481 | 300.587 |
| 159.976 | 300.831 |
| 159.631 | 300.877 |
| 159.014 | 300.601 |
| 152.178 | 297.178 |
| 149.671 | 297.586 |
| 149.452 | 297.468 |
| 144.29 | 294.763 |
| 141.436 | 294.918 |
| 139.704 | 295.048 |
| 136.44 | 293.23 |
| 132.879 | 291.225 |
| 130.439 | 290.907 |
| 127.26 | 290.238 |
| 127.116 | 290.046 |
| 126.324 | 288.69 |
| 124.114 | 288.182 |
| 122.774 | 287.848 |
| 122.253 | 287.5 |
| 115.15 | 282.754 |
| 113.161 | 281.437 |
| 113.002 | 281.411 |
| 112.752 | 281.315 |
| 112.341 | 281.182 |
| 111.846 | 281.073 |
| 110.628 | 280.809 |
| 110.132 | 281.059 |
| 109.841 | 280.979 |
| 103.043 | 280.743 |
| 102.176 | 280.634 |
| 101.6 | 280.539 |
| 101.164 | 280.478 |
| 100.275 | 280.338 |
| 100.275 | 270 |
| 305 | 270 |
| 305 | 343.065 |

Material Boundary

| X | Y |
|---------|---------|
| 122.253 | 287.5 |
| 136.603 | 287.5 |
| 165 | 287.5 |
| 185 | 287.5 |
| 210.982 | 302.5 |
| 220.982 | 302.5 |
| 237.711 | 313.612 |

Material Boundary

| X | Y |
|---------|---------|
| 132.879 | 291.225 |
| 136.303 | 287.8 |
| 136.603 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 136.303 | 287.8 |
| 165 | 287.8 |
| 165 | 287.8 |
| 165 | 287.8 |
| 184.92 | 287.8 |
| 210.901 | 302.8 |
| 220.891 | 302.8 |
| 237.28 | 313.685 |

Project Summary

File Name: Estaca 05.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 15:39:07

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.23 | 0 | 0 | 0.23 |

Global Minimums

Method: bishop simplified

FS: 1.280760

Axis Location: 213.676, 404.386

Left Slip Surface Endpoint: 184.915, 291.664

Right Slip Surface Endpoint: 286.596, 313.744

Resisting Moment=289006 kN-m

Driving Moment=225652 kN-m

Total Slice Area=1332.33 m2

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 184.915 | 291.664 |
| 188.65 | 287.651 |
| 241.559 | 287.651 |
| 286.596 | 313.744 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.28076

| 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 | 3.59673 | 80.3804 | Resíduos | 18.2 | 28 | 38.5724 | 49.402 | 63.8226 | 5.14009 | 58.6825 |
| 2 | 0.138684 | 6.14333 | Interface Solo x GMB Lisa | 3 | 12 | 9.74148 | 12.4765 | 54.7718 | 10.1884 | 44.5834 |
| 3 | 4.06992 | 199.587 | Interface Solo x GMB Lisa | 3 | 12 | 8.60912 | 11.0262 | 49.0395 | 11.2791 | 37.7604 |
| 4 | 4.06992 | 204.123 | Interface Solo x GMB Lisa | 3 | 12 | 8.75155 | 11.2086 | 50.154 | 11.5354 | 38.6186 |
| 5 | 4.06992 | 255.315 | Interface Solo x GMB Lisa | 3 | 12 | 10.3589 | 13.2673 | 62.7321 | 14.4284 | 48.3037 |
| 6 | 4.06992 | 277.586 | Interface Solo x GMB Lisa | 3 | 12 | 11.0582 | 14.1629 | 68.2042 | 15.687 | 52.5172 |

| | | | | | | | | | | |
|----|---------|---------|------------------------------|------|----|---------|---------|---------|---------|-----------|
| 7 | 4.06992 | 325.108 | Interface Solo x GMB Lisa | 3 | 12 | 12.5504 | 16.074 | 79.8806 | 18.3726 | 61.508 |
| 8 | 4.06992 | 362.327 | Interface Solo x GMB Lisa | 3 | 12 | 13.719 | 17.5707 | 89.0255 | 20.4759 | 68.5496 |
| 9 | 4.06992 | 404.116 | Interface Solo x GMB Lisa | 3 | 12 | 15.0311 | 19.2512 | 99.2933 | 22.8374 | 76.4559 |
| 10 | 4.06992 | 453.218 | Interface Solo x GMB Lisa | 3 | 12 | 16.5728 | 21.2258 | 111.358 | 25.6123 | 85.7456 |
| 11 | 4.06992 | 473.478 | Interface Solo x GMB Lisa | 3 | 12 | 17.2089 | 22.0405 | 116.336 | 26.7573 | 89.5786 |
| 12 | 4.06992 | 486.972 | Interface Solo x GMB Lisa | 3 | 12 | 17.6327 | 22.5832 | 119.651 | 27.5198 | 92.1316 |
| 13 | 4.06992 | 521.439 | Interface Solo x GMB Lisa | 3 | 12 | 18.7148 | 23.9692 | 128.12 | 29.4676 | 98.6525 |
| 14 | 4.06992 | 581.519 | Interface Solo x GMB Lisa | 3 | 12 | 20.6013 | 26.3853 | 142.882 | 32.8629 | 110.019 |
| 15 | 4.06992 | 637.834 | Interface Solo x GMB Lisa | 3 | 12 | 22.3695 | 28.65 | 156.719 | 36.0454 | 120.674 |
| 16 | 4.3579 | 657.373 | Interface Solo x GMB Lisa | 3 | 12 | 19.7213 | 25.2582 | 139.411 | 34.6946 | 104.717 |
| 17 | 4.3579 | 655.869 | Interface Solo x GMB Lisa | 3 | 12 | 19.681 | 25.2067 | 139.09 | 34.6153 | 104.474 |
| 18 | 4.3579 | 623.311 | Interface Solo x GMB Lisa | 3 | 12 | 18.8102 | 24.0913 | 132.123 | 32.8969 | 99.2266 |
| 19 | 4.3579 | 546.948 | Interface Solo x GMB Lisa | 3 | 12 | 16.7675 | 21.4751 | 115.785 | 28.8666 | 86.9183 |
| 20 | 4.3579 | 469.27 | Interface Solo x GMB Lisa | 3 | 12 | 14.6896 | 18.8138 | 99.1651 | 24.767 | 74.3981 |
| 21 | 4.3579 | 390.096 | Interface Solo x GMB Lisa | 3 | 12 | 12.5717 | 16.1013 | 82.2251 | 20.5883 | 61.6368 |
| 22 | 4.72239 | 331.619 | Resíduos | 18.2 | 28 | 29.546 | 37.8413 | 53.0911 | 16.1512 | 36.9399 |
| 23 | 4.72239 | 234.418 | Resíduos | 18.2 | 28 | 24.2429 | 31.0493 | 35.583 | 11.4171 | 24.1659 |
| 24 | 4.72239 | 140.449 | Resíduos | 18.2 | 28 | 19.116 | 24.483 | 18.6571 | 6.84044 | 11.8166 |
| 25 | 4.72239 | 46.8589 | Resíduos | 18.2 | 28 | 14.0099 | 17.9433 | 1.79944 | 2.28222 | -0.482783 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.28076

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 184.915 | 291.664 | 0 | 0 | 0 |
| 2 | 188.511 | 287.8 | 385.472 | 0 | 0 |
| 3 | 188.65 | 287.651 | 394.985 | 0 | 0 |
| 4 | 192.72 | 287.651 | 430.051 | 0 | 0 |
| 5 | 196.79 | 287.651 | 465.697 | 0 | 0 |
| 6 | 200.86 | 287.651 | 507.89 | 0 | 0 |
| 7 | 204.93 | 287.651 | 552.932 | 0 | 0 |
| 8 | 209 | 287.651 | 604.051 | 0 | 0 |
| 9 | 213.07 | 287.651 | 659.93 | 0 | 0 |
| 10 | 217.139 | 287.651 | 721.153 | 0 | 0 |
| 11 | 221.209 | 287.651 | 788.656 | 0 | 0 |
| 12 | 225.279 | 287.651 | 858.751 | 0 | 0 |
| 13 | 229.349 | 287.651 | 930.57 | 0 | 0 |
| 14 | 233.419 | 287.651 | 1006.8 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 15 | 237.489 | 287.651 | 1090.71 | 0 | 0 |
| 16 | 241.559 | 287.651 | 1181.82 | 0 | 0 |
| 17 | 245.917 | 290.176 | 915.845 | 0 | 0 |
| 18 | 250.275 | 292.701 | 650.502 | 0 | 0 |
| 19 | 254.633 | 295.226 | 398.95 | 0 | 0 |
| 20 | 258.991 | 297.75 | 179.741 | 0 | 0 |
| 21 | 263.349 | 300.275 | -6.56899 | 0 | 0 |
| 22 | 267.706 | 302.8 | -159.344 | 0 | 0 |
| 23 | 272.429 | 305.536 | -164.965 | 0 | 0 |
| 24 | 277.151 | 308.272 | -147.746 | 0 | 0 |
| 25 | 281.874 | 311.008 | -108.448 | 0 | 0 |
| 26 | 286.596 | 313.744 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 184.915 | 291.664 |
| 188.65 | 287.651 |
| 241.559 | 287.651 |
| 286.596 | 313.744 |

External Boundary

| X | Y |
|---------|---------|
| 151.741 | 280 |
| 360 | 280 |
| 360 | 342.248 |
| 356.673 | 341.544 |
| 355.839 | 341.092 |
| 355.312 | 340.289 |
| 354.27 | 339.176 |
| 353.701 | 339.169 |
| 348.717 | 339.095 |
| 344.882 | 336.399 |
| 342.233 | 334.679 |
| 341.164 | 333.819 |
| 340.785 | 333.853 |
| 336.037 | 333.94 |
| 333.453 | 332.117 |
| 331.665 | 330.846 |
| 327.717 | 331.045 |
| 327.485 | 331.062 |
| 320.373 | 324.754 |
| 319.539 | 323.986 |
| 318.416 | 323.056 |
| 318.025 | 323.074 |
| 314.238 | 322.919 |
| 312.818 | 322.785 |
| 309.706 | 321.261 |
| 308.301 | 320.305 |

| | |
|---------|---------|
| 295.32 | 313.604 |
| 294.82 | 313.646 |
| 294.666 | 313.658 |
| 289.94 | 313.688 |
| 288.931 | 313.694 |
| 284.143 | 313.796 |
| 273.422 | 314.01 |
| 273.23 | 314.07 |
| 270.976 | 314.172 |
| 268.356 | 314.264 |
| 264.937 | 314.241 |
| 259.495 | 314.352 |
| 251.51 | 314.301 |
| 250.467 | 314.312 |
| 250.046 | 314.285 |
| 248.839 | 313.388 |
| 244.416 | 310.176 |
| 240.909 | 310.197 |
| 239.977 | 310.197 |
| 239.28 | 310.236 |
| 238.229 | 309.565 |
| 236.802 | 308.855 |
| 233.017 | 306.473 |
| 230.645 | 305.613 |
| 227.658 | 304.589 |
| 224.255 | 304.447 |
| 223.845 | 304.41 |
| 223.092 | 303.992 |
| 221.959 | 304.075 |
| 220 | 303.658 |
| 219.027 | 303.451 |
| 218.096 | 303.333 |
| 217.717 | 303.148 |
| 217.375 | 303.153 |
| 215.897 | 302.217 |
| 212.482 | 300.251 |
| 210.206 | 300.433 |
| 209.945 | 300.335 |
| 202.913 | 297.182 |
| 202.397 | 296.924 |
| 202.206 | 296.956 |
| 201.055 | 297.096 |
| 200.024 | 297.236 |
| 199.627 | 297.032 |
| 198.327 | 296.342 |
| 194.797 | 294.491 |
| 193.311 | 294.495 |
| 189.959 | 294.794 |
| 186.106 | 292.634 |
| 184.661 | 291.458 |
| 183.782 | 291.292 |
| 180.309 | 290.6 |

| | |
|---------|---------|
| 177.833 | 290.245 |
| 176.811 | 289.425 |
| 174.438 | 287.5 |
| 172.012 | 285.532 |
| 171.621 | 285.561 |
| 170.965 | 285.244 |
| 169.92 | 284.743 |
| 169.595 | 284.381 |
| 168.531 | 284.401 |
| 167.522 | 284.428 |
| 167.118 | 284.492 |
| 165.207 | 284.255 |
| 164.781 | 284.22 |
| 164.39 | 284.33 |
| 162.164 | 284.273 |
| 158.426 | 284.136 |
| 157.863 | 284.168 |
| 156.239 | 284.104 |
| 155.825 | 284.118 |
| 153.588 | 284.035 |
| 151.741 | 283.981 |

Material Boundary

| X | Y |
|---------|---------|
| 174.438 | 287.5 |
| 188.618 | 287.5 |
| 220 | 287.5 |
| 241.511 | 287.5 |
| 267.491 | 302.5 |
| 277.491 | 302.5 |
| 295.32 | 313.604 |

Material Boundary

| X | Y |
|---------|---------|
| 184.661 | 291.458 |
| 188.318 | 287.8 |
| 188.618 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 188.318 | 287.8 |
| 220 | 287.8 |
| 220 | 287.8 |
| 220 | 287.8 |
| 241.43 | 287.8 |
| 267.411 | 302.8 |
| 277.406 | 302.8 |
| 294.82 | 313.646 |

Project Summary

File Name: Estaca 06.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 15:54:16

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.36 | 0 | 0 | 0.36 |

Global Minimums

Method: bishop simplified

FS: 1.119940
 Axis Location: 191.523, 407.633
 Left Slip Surface Endpoint: 161.098, 291.091
 Right Slip Surface Endpoint: 266.502, 313.368
 Resisting Moment=264020 kN-m
 Driving Moment=235744 kN-m
 Total Slice Area=1398.07 m2

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 161.098 | 291.091 |
| 164.467 | 287.652 |
| 222.092 | 287.652 |
| 266.502 | 313.368 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.11994

| 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 | 3.2236 | 58.5068 | Resíduos | 18 | 28 | 41.8572 | 46.8776 | 60.8447 | 6.53384 | 54.3109 |
| 2 | 0.144981 | 5.41322 | Interface Solo x GMB Lisa | 3 | 12 | 8.94583 | 10.0188 | 46.4623 | 13.4414 | 33.0209 |
| 3 | 4.43269 | 204.646 | Interface Solo x GMB Lisa | 3 | 12 | 8.28655 | 9.28044 | 46.1674 | 16.6203 | 29.5471 |
| 4 | 4.43269 | 222.376 | Interface Solo x GMB Lisa | 3 | 12 | 8.77241 | 9.82457 | 50.1673 | 18.0602 | 32.1071 |
| 5 | 4.43269 | 274.521 | Interface Solo x GMB Lisa | 3 | 12 | 10.2013 | 11.4249 | 61.931 | 22.2952 | 39.6358 |
| 6 | 4.43269 | 297.55 | Interface Solo x GMB Lisa | 3 | 12 | 10.8324 | 12.1316 | 67.1262 | 24.1655 | 42.9607 |

| | | | | | | | | | | |
|----|---------|---------|------------------------------|----|----|---------|---------|----------|---------|----------|
| 7 | 4.43269 | 363.395 | Interface Solo x GMB Lisa | 3 | 12 | 12.6367 | 14.1523 | 81.9807 | 29.513 | 52.4677 |
| 8 | 4.43269 | 390.283 | Interface Solo x GMB Lisa | 3 | 12 | 13.3735 | 14.9775 | 88.0465 | 31.6967 | 56.3498 |
| 9 | 4.43269 | 416.89 | Interface Solo x GMB Lisa | 3 | 12 | 14.1025 | 15.794 | 94.0489 | 33.8576 | 60.1913 |
| 10 | 4.43269 | 473.174 | Interface Solo x GMB Lisa | 3 | 12 | 15.6449 | 17.5214 | 106.746 | 38.4287 | 68.3177 |
| 11 | 4.43269 | 515.489 | Interface Solo x GMB Lisa | 3 | 12 | 16.8045 | 18.82 | 116.293 | 41.8653 | 74.4272 |
| 12 | 4.43269 | 551.672 | Interface Solo x GMB Lisa | 3 | 12 | 17.796 | 19.9304 | 124.455 | 44.8039 | 79.6514 |
| 13 | 4.43269 | 611.251 | Interface Solo x GMB Lisa | 3 | 12 | 19.4286 | 21.7589 | 137.896 | 49.6426 | 88.2535 |
| 14 | 4.43269 | 667.536 | Interface Solo x GMB Lisa | 3 | 12 | 20.9709 | 23.4862 | 150.594 | 54.2138 | 96.38 |
| 15 | 4.43269 | 730.265 | Interface Solo x GMB Lisa | 3 | 12 | 22.6899 | 25.4113 | 164.745 | 59.3083 | 105.437 |
| 16 | 4.35996 | 698.303 | Interface Solo x GMB Lisa | 3 | 12 | 19.9432 | 22.3352 | 148.623 | 57.6585 | 90.9649 |
| 17 | 4.35996 | 673.077 | Interface Solo x GMB Lisa | 3 | 12 | 19.31 | 21.626 | 143.204 | 55.5757 | 87.6283 |
| 18 | 4.35996 | 608.071 | Interface Solo x GMB Lisa | 3 | 12 | 17.6781 | 19.7984 | 129.238 | 50.2081 | 79.0303 |
| 19 | 4.35996 | 532.229 | Interface Solo x GMB Lisa | 3 | 12 | 15.7742 | 17.6662 | 112.945 | 43.9459 | 68.9989 |
| 20 | 4.35996 | 455.465 | Interface Solo x GMB Lisa | 3 | 12 | 13.8473 | 15.5081 | 96.4533 | 37.6075 | 58.8458 |
| 21 | 4.35996 | 377.659 | Interface Solo x GMB Lisa | 3 | 12 | 11.894 | 13.3206 | 79.738 | 31.1832 | 48.5548 |
| 22 | 4.56261 | 307.355 | Resíduos | 18 | 28 | 28.6662 | 32.1044 | 50.7775 | 24.251 | 26.5265 |
| 23 | 4.56261 | 218.415 | Resíduos | 18 | 28 | 24.0196 | 26.9005 | 33.9729 | 17.2334 | 16.7395 |
| 24 | 4.56261 | 131.027 | Resíduos | 18 | 28 | 19.4541 | 21.7874 | 17.4615 | 10.3383 | 7.12315 |
| 25 | 4.56261 | 43.6758 | Resíduos | 18 | 28 | 14.8905 | 16.6764 | 0.956881 | 3.44611 | -2.48923 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.11994

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 161.098 | 291.091 | 0 | 0 | 0 |
| 2 | 164.322 | 287.8 | 335.047 | 0 | 0 |
| 3 | 164.467 | 287.652 | 343.22 | 0 | 0 |
| 4 | 168.9 | 287.652 | 379.922 | 0 | 0 |
| 5 | 173.332 | 287.652 | 418.777 | 0 | 0 |
| 6 | 177.765 | 287.652 | 463.961 | 0 | 0 |
| 7 | 182.198 | 287.652 | 511.94 | 0 | 0 |
| 8 | 186.63 | 287.652 | 567.91 | 0 | 0 |
| 9 | 191.063 | 287.652 | 627.144 | 0 | 0 |
| 10 | 195.496 | 287.652 | 689.607 | 0 | 0 |
| 11 | 199.929 | 287.652 | 758.902 | 0 | 0 |
| 12 | 204.361 | 287.652 | 833.332 | 0 | 0 |
| 13 | 208.794 | 287.652 | 912.154 | 0 | 0 |
| 14 | 213.227 | 287.652 | 998.207 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 15 | 217.659 | 287.652 | 1091.09 | 0 | 0 |
| 16 | 222.092 | 287.652 | 1191.59 | 0 | 0 |
| 17 | 226.452 | 290.177 | 903.249 | 0 | 0 |
| 18 | 230.812 | 292.701 | 625.831 | 0 | 0 |
| 19 | 235.172 | 295.226 | 376.562 | 0 | 0 |
| 20 | 239.532 | 297.751 | 160.135 | 0 | 0 |
| 21 | 243.892 | 300.275 | -23.0516 | 0 | 0 |
| 22 | 248.252 | 302.8 | -172.547 | 0 | 0 |
| 23 | 252.814 | 305.442 | -176.012 | 0 | 0 |
| 24 | 257.377 | 308.084 | -156.262 | 0 | 0 |
| 25 | 261.94 | 310.726 | -113.704 | 0 | 0 |
| 26 | 266.502 | 313.368 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 161.098 | 291.091 |
| 164.467 | 287.652 |
| 222.092 | 287.652 |
| 266.502 | 313.368 |

External Boundary

| X | Y |
|---------|---------|
| 339.612 | 342.538 |
| 338.395 | 341.755 |
| 335.652 | 341.846 |
| 333.745 | 340.275 |
| 332.366 | 339.089 |
| 332.187 | 339.132 |
| 328.941 | 339.719 |
| 327.502 | 338.779 |
| 321.333 | 334.626 |
| 319.671 | 334.655 |
| 315.557 | 334.551 |
| 311.993 | 331.997 |
| 311.744 | 331.819 |
| 311.112 | 331.849 |
| 308.517 | 332.015 |
| 303.847 | 327.686 |
| 299.325 | 323.421 |
| 294.078 | 323.001 |
| 293.148 | 322.96 |
| 283.186 | 317.838 |
| 276.14 | 313.503 |
| 275.498 | 313.464 |
| 275.151 | 313.443 |
| 269.839 | 313.369 |
| 268.012 | 313.337 |
| 266.476 | 313.369 |

| | |
|---------|---------|
| 253.428 | 313.635 |
| 251.875 | 313.709 |
| 247.562 | 313.829 |
| 240.623 | 313.859 |
| 236.839 | 313.84 |
| 232.42 | 313.783 |
| 229.725 | 313.815 |
| 228.414 | 313.664 |
| 226.644 | 312.372 |
| 225.684 | 311.529 |
| 223.002 | 311.738 |
| 220.916 | 311.785 |
| 216.624 | 309.423 |
| 215.723 | 308.889 |
| 215.24 | 308.87 |
| 213.45 | 308.793 |
| 212.337 | 308.112 |
| 211.566 | 307.718 |
| 209.575 | 306.289 |
| 207.955 | 305.698 |
| 203.248 | 304.537 |
| 201.217 | 303.831 |
| 200 | 303.812 |
| 199.841 | 303.809 |
| 195.355 | 301.764 |
| 192.832 | 300.795 |
| 192.707 | 300.799 |
| 189.728 | 300.021 |
| 189.548 | 299.991 |
| 188.045 | 300.271 |
| 185.768 | 300.036 |
| 181.89 | 298.028 |
| 180.008 | 297.063 |
| 178.927 | 296.583 |
| 176.648 | 296.914 |
| 176.248 | 296.968 |
| 174.096 | 295.858 |
| 171.608 | 294.547 |
| 167.269 | 294.713 |
| 167.141 | 294.643 |
| 166.956 | 294.534 |
| 160.942 | 290.999 |
| 156.065 | 290.364 |
| 155.416 | 290.281 |
| 154.848 | 289.793 |
| 152.322 | 287.5 |
| 148.939 | 284.429 |
| 145.019 | 284.446 |
| 138.723 | 284.436 |
| 138.111 | 284.444 |
| 137.557 | 284.445 |
| 133.039 | 284.287 |

| | |
|---------|---------|
| 127.319 | 284.464 |
| 126.291 | 284.462 |
| 126.017 | 284.461 |
| 124.166 | 284.471 |
| 113.003 | 284.32 |
| 108.96 | 284.336 |
| 105.281 | 284.306 |
| 105.281 | 280 |
| 340 | 280 |
| 340 | 342.598 |

Material Boundary

| X | Y |
|---------|---------|
| 152.322 | 287.5 |
| 164.441 | 287.5 |
| 200 | 287.5 |
| 222.033 | 287.5 |
| 248.013 | 302.5 |
| 258.014 | 302.5 |
| 276.14 | 313.503 |

Material Boundary

| X | Y |
|---------|---------|
| 160.942 | 290.999 |
| 164.141 | 287.8 |
| 164.441 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 164.141 | 287.8 |
| 200 | 287.8 |
| 200 | 287.8 |
| 200 | 287.8 |
| 221.952 | 287.8 |
| 247.933 | 302.8 |
| 257.93 | 302.8 |
| 275.498 | 313.464 |

Project Summary

File Name: Estaca 07.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:12:23

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.16 | 0 | 0 | 0.16 |

Global Minimums

Method: bishop simplified

FS: 1.344530
 Axis Location: 184.371, 410.117
 Left Slip Surface Endpoint: 152.819, 290.608
 Right Slip Surface Endpoint: 261.047, 313.169
 Resisting Moment=330900 kN-m
 Driving Moment=246109 kN-m
 Total Slice Area=1432.95 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 152.819 | 290.608 |
| 155.805 | 287.626 |
| 216.964 | 287.626 |
| 261.047 | 313.169 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.34453

| 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 | 2.81208 | 43.1342 | Resíduos | 18.2 | 28 | 30.7618 | 41.3602 | 46.0124 | 2.45423 | 43.5582 |
| 2 | 0.174278 | 5.55762 | Interface Solo x GMB Lisa | 3 | 12 | 7.67606 | 10.3207 | 39.5435 | 5.10232 | 34.4411 |
| 3 | 4.70454 | 192.959 | Interface Solo x GMB Lisa | 3 | 12 | 7.67794 | 10.3232 | 41.0155 | 6.56249 | 34.453 |
| 4 | 4.70454 | 227.398 | Interface Solo x GMB Lisa | 3 | 12 | 8.65004 | 11.6302 | 48.3359 | 7.73373 | 40.6021 |
| 5 | 4.70454 | 276.987 | Interface Solo x GMB Lisa | 3 | 12 | 10.0498 | 13.5123 | 58.8766 | 9.42025 | 49.4563 |
| 6 | 4.70454 | 322.177 | Interface Solo x GMB Lisa | 3 | 12 | 11.3254 | 15.2273 | 68.4822 | 10.9571 | 57.5251 |

| | | | | | | | | | | |
|----|---------|---------|------------------------------|------|----|---------|---------|---------|---------|-----------|
| 7 | 4.70454 | 352.787 | Interface Solo x GMB Lisa | 3 | 12 | 12.1894 | 16.389 | 74.9887 | 11.9982 | 62.9905 |
| 8 | 4.70454 | 393.19 | Interface Solo x GMB Lisa | 3 | 12 | 13.3299 | 17.9224 | 83.5767 | 13.3723 | 70.2044 |
| 9 | 4.70454 | 429.779 | Interface Solo x GMB Lisa | 3 | 12 | 14.3626 | 19.311 | 91.3541 | 14.6167 | 76.7374 |
| 10 | 4.70454 | 506.055 | Interface Solo x GMB Lisa | 3 | 12 | 16.5157 | 22.2059 | 107.567 | 17.2108 | 90.3566 |
| 11 | 4.70454 | 528.752 | Interface Solo x GMB Lisa | 3 | 12 | 17.1564 | 23.0673 | 112.392 | 17.9827 | 94.4092 |
| 12 | 4.70454 | 589.585 | Interface Solo x GMB Lisa | 3 | 12 | 18.8735 | 25.376 | 125.323 | 20.0516 | 105.271 |
| 13 | 4.70454 | 669.723 | Interface Solo x GMB Lisa | 3 | 12 | 21.1356 | 28.4174 | 142.357 | 22.7771 | 119.58 |
| 14 | 4.70454 | 728.139 | Interface Solo x GMB Lisa | 3 | 12 | 22.7845 | 30.6345 | 154.774 | 24.7638 | 130.01 |
| 15 | 4.70454 | 803.515 | Interface Solo x GMB Lisa | 3 | 12 | 24.9122 | 33.4952 | 170.796 | 27.3273 | 143.468 |
| 16 | 4.36458 | 748.519 | Interface Solo x GMB Lisa | 3 | 12 | 22.9096 | 30.8026 | 158.241 | 27.4398 | 130.801 |
| 17 | 4.36458 | 675.752 | Interface Solo x GMB Lisa | 3 | 12 | 20.8811 | 28.0753 | 142.742 | 24.7722 | 117.97 |
| 18 | 4.36458 | 598.628 | Interface Solo x GMB Lisa | 3 | 12 | 18.7313 | 25.1848 | 126.316 | 21.9449 | 104.371 |
| 19 | 4.36458 | 520.768 | Interface Solo x GMB Lisa | 3 | 12 | 16.5609 | 22.2666 | 109.733 | 19.0907 | 90.6424 |
| 20 | 4.36458 | 442.715 | Interface Solo x GMB Lisa | 3 | 12 | 14.3852 | 19.3413 | 93.109 | 16.2294 | 76.8796 |
| 21 | 4.36458 | 364.67 | Interface Solo x GMB Lisa | 3 | 12 | 12.2096 | 16.4162 | 76.4864 | 13.3683 | 63.1181 |
| 22 | 4.47383 | 290.597 | Resíduos | 18.2 | 28 | 28.5742 | 38.4189 | 48.419 | 10.3928 | 38.0262 |
| 23 | 4.47383 | 205.893 | Resíduos | 18.2 | 28 | 23.4562 | 31.5376 | 32.4478 | 7.36347 | 25.0843 |
| 24 | 4.47383 | 121.276 | Resíduos | 18.2 | 28 | 18.3433 | 24.6631 | 16.4927 | 4.33725 | 12.1554 |
| 25 | 4.47383 | 39.2984 | Resíduos | 18.2 | 28 | 13.39 | 18.0032 | 1.03537 | 1.40545 | -0.370077 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.34453

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 152.819 | 290.608 | 0 | 0 | 0 |
| 2 | 155.631 | 287.8 | 215.578 | 0 | 0 |
| 3 | 155.805 | 287.626 | 223.794 | 0 | 0 |
| 4 | 160.51 | 287.626 | 259.869 | 0 | 0 |
| 5 | 165.214 | 287.626 | 300.511 | 0 | 0 |
| 6 | 169.919 | 287.626 | 347.73 | 0 | 0 |
| 7 | 174.623 | 287.626 | 400.942 | 0 | 0 |
| 8 | 179.328 | 287.626 | 458.214 | 0 | 0 |
| 9 | 184.032 | 287.626 | 520.844 | 0 | 0 |
| 10 | 188.737 | 287.626 | 588.327 | 0 | 0 |
| 11 | 193.441 | 287.626 | 665.926 | 0 | 0 |
| 12 | 198.146 | 287.626 | 746.536 | 0 | 0 |
| 13 | 202.85 | 287.626 | 835.213 | 0 | 0 |
| 14 | 207.555 | 287.626 | 934.518 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 15 | 212.259 | 287.626 | 1041.57 | 0 | 0 |
| 16 | 216.964 | 287.626 | 1158.62 | 0 | 0 |
| 17 | 221.329 | 290.155 | 858.292 | 0 | 0 |
| 18 | 225.693 | 292.684 | 588.317 | 0 | 0 |
| 19 | 230.058 | 295.213 | 350.513 | 0 | 0 |
| 20 | 234.422 | 297.742 | 145.186 | 0 | 0 |
| 21 | 238.787 | 300.271 | -27.582 | 0 | 0 |
| 22 | 243.152 | 302.8 | -167.795 | 0 | 0 |
| 23 | 247.625 | 305.392 | -165.639 | 0 | 0 |
| 24 | 252.099 | 307.985 | -144.95 | 0 | 0 |
| 25 | 256.573 | 310.577 | -105.744 | 0 | 0 |
| 26 | 261.047 | 313.169 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 152.819 | 290.608 |
| 155.805 | 287.626 |
| 216.964 | 287.626 |
| 261.047 | 313.169 |

External Boundary

| X | Y |
|---------|---------|
| 331.127 | 342.897 |
| 330.786 | 342.683 |
| 326.507 | 340.234 |
| 325.931 | 339.872 |
| 324.071 | 340.18 |
| 322.455 | 340.446 |
| 321.525 | 339.894 |
| 316.19 | 336.828 |
| 313.523 | 335.452 |
| 308.247 | 335.558 |
| 307.674 | 335.589 |
| 307.568 | 335.402 |
| 307.384 | 335.212 |
| 305.846 | 333.262 |
| 304.978 | 333.377 |
| 302.911 | 333.69 |
| 296.657 | 328.022 |
| 294.557 | 326.381 |
| 292.201 | 324 |
| 288.479 | 323.413 |
| 287.734 | 323.33 |
| 285.142 | 323.158 |
| 272.346 | 315.705 |
| 267.751 | 313.304 |
| 267.277 | 313.329 |
| 266.823 | 313.353 |

| | |
|---------|---------|
| 263.28 | 313.249 |
| 259.365 | 313.109 |
| 252.7 | 313.166 |
| 247.818 | 313.333 |
| 246.464 | 313.374 |
| 241.792 | 313.397 |
| 235.802 | 313.422 |
| 232.023 | 313.447 |
| 230.881 | 313.442 |
| 227.067 | 313.461 |
| 223.552 | 313.475 |
| 221.838 | 313.382 |
| 221.626 | 313.4 |
| 221.384 | 313.47 |
| 220.058 | 313.406 |
| 216.388 | 313.012 |
| 212.653 | 310.818 |
| 210.72 | 309.598 |
| 208.448 | 309.468 |
| 207.005 | 308.807 |
| 204.001 | 307.302 |
| 203.229 | 306.825 |
| 201.855 | 306.129 |
| 200.603 | 305.429 |
| 195.88 | 303.451 |
| 195.449 | 303.293 |
| 195 | 303.296 |
| 191.371 | 303.318 |
| 190.247 | 302.751 |
| 185.923 | 300.13 |
| 184.694 | 299.994 |
| 182.401 | 299.944 |
| 181.082 | 299.126 |
| 179.801 | 299.066 |
| 179.274 | 298.504 |
| 177.304 | 298.327 |
| 173.248 | 297.783 |
| 172.235 | 297.037 |
| 170.605 | 296.979 |
| 169.531 | 296.776 |
| 168.154 | 296.138 |
| 167.519 | 296.124 |
| 165.996 | 295.272 |
| 164.56 | 294.451 |
| 162.953 | 294.419 |
| 161.243 | 294.422 |
| 160.117 | 294.436 |
| 158.046 | 293.313 |
| 155.941 | 292.356 |
| 152.728 | 290.557 |
| 149.821 | 290.231 |
| 148.62 | 290.033 |

| | |
|---------|---------|
| 145.516 | 287.5 |
| 145.272 | 287.301 |
| 141.833 | 284.462 |
| 139.556 | 284.528 |
| 137.605 | 284.61 |
| 136.778 | 284.588 |
| 135.413 | 284.491 |
| 127.161 | 284.15 |
| 125.21 | 284.179 |
| 108.472 | 284.128 |
| 106.213 | 284.119 |
| 96.4438 | 284.409 |
| 94.4174 | 284.389 |
| 92.4473 | 284.337 |
| 92.2892 | 284.223 |
| 92.2892 | 280 |
| 335 | 280 |
| 335 | 343.388 |

Material Boundary

| X | Y |
|---------|---------|
| 145.516 | 287.5 |
| 155.785 | 287.5 |
| 195 | 287.5 |
| 216.962 | 287.5 |
| 242.943 | 302.5 |
| 252.943 | 302.5 |
| 267.751 | 313.304 |

Material Boundary

| X | Y |
|---------|---------|
| 152.728 | 290.557 |
| 155.485 | 287.8 |
| 155.785 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 155.485 | 287.8 |
| 195 | 287.8 |
| 195 | 287.8 |
| 195 | 287.8 |
| 216.881 | 287.8 |
| 242.862 | 302.8 |
| 252.845 | 302.8 |
| 267.277 | 313.329 |

Project Summary

File Name: Estaca 08.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:26:41

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m3] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.16 | 0 | 0 | 0.16 |

Global Minimums

Method: bishop simplified

FS: 1.309850
 Axis Location: 223.099, 408.881
 Left Slip Surface Endpoint: 191.898, 290.408
 Right Slip Surface Endpoint: 299.157, 312.836
 Resisting Moment=313825 kN-m
 Driving Moment=239588 kN-m
 Total Slice Area=1363.83 m2

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 191.898 | 290.408 |
| 194.686 | 287.619 |
| 255.666 | 287.619 |
| 299.157 | 312.836 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.30985

| 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 | 2.6071 | 37.2058 | Resíduos | 18.2 | 28 | 31.5664 | 41.3473 | 45.8169 | 2.28336 | 43.5336 |
| 2 | 0.180942 | 5.39277 | Interface Solo x GMB Lisa | 3 | 12 | 7.58263 | 9.93211 | 37.3817 | 4.76862 | 32.613 |
| 3 | 4.69077 | 185.074 | Interface Solo x GMB Lisa | 3 | 12 | 7.66849 | 10.0446 | 39.4549 | 6.31278 | 33.1422 |
| 4 | 4.69077 | 207.733 | Interface Solo x GMB Lisa | 3 | 12 | 8.32695 | 10.9071 | 44.2855 | 7.08566 | 37.1998 |
| 5 | 4.69077 | 217.755 | Interface Solo x GMB Lisa | 3 | 12 | 8.61819 | 11.2885 | 46.422 | 7.42752 | 38.9945 |
| 6 | 4.69077 | 269.111 | Interface Solo x GMB Lisa | 3 | 12 | 10.1105 | 13.2433 | 57.3703 | 9.17926 | 48.1911 |

| | | | | | | | | | | |
|----|---------|---------|------------------------------|------|----|---------|---------|---------|---------|-----------|
| 7 | 4.69077 | 328.905 | Interface Solo x GMB Lisa | 3 | 12 | 11.8482 | 15.5193 | 70.1175 | 11.2188 | 58.8987 |
| 8 | 4.69077 | 365.715 | Interface Solo x GMB Lisa | 3 | 12 | 12.9178 | 16.9204 | 77.9648 | 12.4744 | 65.4904 |
| 9 | 4.69077 | 412.219 | Interface Solo x GMB Lisa | 3 | 12 | 14.2692 | 18.6905 | 87.8788 | 14.0606 | 73.8182 |
| 10 | 4.69077 | 482.386 | Interface Solo x GMB Lisa | 3 | 12 | 16.3082 | 21.3613 | 102.837 | 16.454 | 86.3833 |
| 11 | 4.69077 | 516.161 | Interface Solo x GMB Lisa | 3 | 12 | 17.2898 | 22.647 | 110.038 | 17.606 | 92.4316 |
| 12 | 4.69077 | 565.15 | Interface Solo x GMB Lisa | 3 | 12 | 18.7134 | 24.5117 | 120.481 | 19.277 | 101.204 |
| 13 | 4.69077 | 600.927 | Interface Solo x GMB Lisa | 3 | 12 | 19.753 | 25.8735 | 128.108 | 20.4974 | 107.611 |
| 14 | 4.69077 | 703.118 | Interface Solo x GMB Lisa | 3 | 12 | 22.7226 | 29.7632 | 149.894 | 23.983 | 125.911 |
| 15 | 4.69077 | 770.951 | Interface Solo x GMB Lisa | 3 | 12 | 24.6937 | 32.3451 | 164.355 | 26.2968 | 138.058 |
| 16 | 4.36367 | 731.934 | Interface Solo x GMB Lisa | 3 | 12 | 22.993 | 30.1174 | 154.415 | 26.8374 | 127.577 |
| 17 | 4.36367 | 654.452 | Interface Solo x GMB Lisa | 3 | 12 | 20.7806 | 27.2195 | 137.94 | 23.9964 | 113.944 |
| 18 | 4.36367 | 586.358 | Interface Solo x GMB Lisa | 3 | 12 | 18.8363 | 24.6727 | 123.462 | 21.4996 | 101.962 |
| 19 | 4.36367 | 515.868 | Interface Solo x GMB Lisa | 3 | 12 | 16.8235 | 22.0363 | 108.474 | 18.915 | 89.5586 |
| 20 | 4.36367 | 439.198 | Interface Solo x GMB Lisa | 3 | 12 | 14.6343 | 19.1687 | 92.1717 | 16.1038 | 76.0679 |
| 21 | 4.36367 | 360.352 | Interface Solo x GMB Lisa | 3 | 12 | 12.3829 | 16.2198 | 75.4069 | 13.2128 | 62.1941 |
| 22 | 4.32728 | 277.39 | Resíduos | 18.2 | 28 | 28.9461 | 37.9151 | 47.3351 | 10.2564 | 37.0787 |
| 23 | 4.32728 | 201.194 | Resíduos | 18.2 | 28 | 24.085 | 31.5478 | 32.5427 | 7.43908 | 25.1036 |
| 24 | 4.32728 | 121.022 | Resíduos | 18.2 | 28 | 18.9704 | 24.8483 | 16.9784 | 4.47477 | 12.5037 |
| 25 | 4.32728 | 40.3192 | Resíduos | 18.2 | 28 | 13.8217 | 18.1044 | 1.31099 | 1.49079 | -0.179797 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.30985

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 191.898 | 290.408 | 0 | 0 | 0 |
| 2 | 194.505 | 287.8 | 201.705 | 0 | 0 |
| 3 | 194.686 | 287.619 | 209.842 | 0 | 0 |
| 4 | 199.377 | 287.619 | 245.778 | 0 | 0 |
| 5 | 204.068 | 287.619 | 284.8 | 0 | 0 |
| 6 | 208.758 | 287.619 | 325.187 | 0 | 0 |
| 7 | 213.449 | 287.619 | 372.568 | 0 | 0 |
| 8 | 218.14 | 287.619 | 428.091 | 0 | 0 |
| 9 | 222.831 | 287.619 | 488.627 | 0 | 0 |
| 10 | 227.521 | 287.619 | 555.496 | 0 | 0 |
| 11 | 232.212 | 287.619 | 631.92 | 0 | 0 |
| 12 | 236.903 | 287.619 | 712.944 | 0 | 0 |
| 13 | 241.594 | 287.619 | 800.639 | 0 | 0 |
| 14 | 246.284 | 287.619 | 893.206 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 15 | 250.975 | 287.619 | 999.689 | 0 | 0 |
| 16 | 255.666 | 287.619 | 1115.41 | 0 | 0 |
| 17 | 260.03 | 290.149 | 824.952 | 0 | 0 |
| 18 | 264.393 | 292.679 | 566.533 | 0 | 0 |
| 19 | 268.757 | 295.209 | 336.27 | 0 | 0 |
| 20 | 273.121 | 297.74 | 135.155 | 0 | 0 |
| 21 | 277.484 | 300.27 | -34.2576 | 0 | 0 |
| 22 | 281.848 | 302.8 | -171.067 | 0 | 0 |
| 23 | 286.175 | 305.309 | -164.697 | 0 | 0 |
| 24 | 290.503 | 307.818 | -142.227 | 0 | 0 |
| 25 | 294.83 | 310.327 | -102.816 | 0 | 0 |
| 26 | 299.157 | 312.836 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 191.898 | 290.408 |
| 194.686 | 287.619 |
| 255.666 | 287.619 |
| 299.157 | 312.836 |

External Boundary

| X | Y |
|---------|---------|
| 370.883 | 343.803 |
| 367.652 | 343.664 |
| 366.751 | 343.593 |
| 365.196 | 343.396 |
| 365.069 | 343.317 |
| 364.058 | 342.606 |
| 363.454 | 342.119 |
| 361.305 | 340.472 |
| 358.125 | 341.125 |
| 349.166 | 336.395 |
| 348.32 | 335.96 |
| 345.625 | 335.468 |
| 344.52 | 335.437 |
| 344.506 | 335.685 |
| 344.325 | 335.13 |
| 343.256 | 334.868 |
| 341.57 | 334.375 |
| 340.392 | 334.275 |
| 336.947 | 333.547 |
| 335.981 | 333.077 |
| 334.81 | 332.343 |
| 334.562 | 332.877 |
| 328.745 | 327.307 |
| 325.958 | 324.475 |
| 325.194 | 323.774 |
| 322.108 | 323.551 |

| | |
|---------|---------|
| 321.733 | 323.452 |
| 315.579 | 320.333 |
| 301.789 | 313.019 |
| 300.983 | 312.86 |
| 300.547 | 312.824 |
| 300.506 | 312.821 |
| 299.158 | 312.836 |
| 291.544 | 313.106 |
| 289.059 | 313.236 |
| 285.769 | 313.175 |
| 282.589 | 313.245 |
| 281.549 | 313.224 |
| 280.478 | 313.254 |
| 274.171 | 313.317 |
| 270.213 | 313.272 |
| 268.623 | 313.241 |
| 266.369 | 313.007 |
| 264.066 | 312.883 |
| 263.784 | 312.77 |
| 260.21 | 312.686 |
| 257.119 | 312.917 |
| 256.913 | 312.903 |
| 256.6 | 312.741 |
| 250.791 | 309.694 |
| 249.752 | 309.454 |
| 248.414 | 309.193 |
| 244.572 | 306.162 |
| 242.943 | 304.919 |
| 241.971 | 304.953 |
| 239.485 | 305.097 |
| 236.326 | 303.688 |
| 235 | 303.184 |
| 234.769 | 303.096 |
| 231.922 | 303.006 |
| 231.136 | 303 |
| 228.095 | 301.323 |
| 225.541 | 299.857 |
| 222.799 | 299.852 |
| 222.489 | 299.867 |
| 221.789 | 299.365 |
| 219.247 | 297.885 |
| 215.231 | 297.612 |
| 214.982 | 297.625 |
| 214.216 | 297.261 |
| 208.676 | 294.549 |
| 206.224 | 294.15 |
| 205.508 | 293.926 |
| 202.518 | 293.89 |
| 198.82 | 293.801 |
| 197.985 | 293.839 |
| 191.758 | 290.329 |
| 187.726 | 289.729 |

| | |
|---------|---------|
| 185.695 | 288.21 |
| 184.729 | 287.5 |
| 183.334 | 286.473 |
| 182.458 | 285.055 |
| 182.07 | 284.707 |
| 181.546 | 284.385 |
| 181.366 | 284.417 |
| 181.135 | 284.442 |
| 180.793 | 284.421 |
| 180.64 | 284.423 |
| 180.508 | 284.579 |
| 180.295 | 284.633 |
| 177.033 | 284.63 |
| 176.108 | 284.662 |
| 175.086 | 284.673 |
| 141.408 | 284.523 |
| 133.767 | 284.468 |
| 132.464 | 284.454 |
| 128.904 | 284.406 |
| 128.691 | 284.336 |
| 128.455 | 284.165 |
| 128.455 | 280 |
| 375 | 280 |
| 375 | 343.94 |

Material Boundary

| X | Y |
|---------|--------|
| 184.729 | 287.5 |
| 194.649 | 287.5 |
| 235 | 287.5 |
| 255.65 | 287.5 |
| 281.632 | 302.5 |
| 291.632 | 302.5 |
| 300.983 | 312.86 |

Material Boundary

| X | Y |
|---------|---------|
| 191.758 | 290.329 |
| 194.342 | 287.8 |
| 194.649 | 287.5 |

Material Boundary

| X | Y |
|---------|-------|
| 194.342 | 287.8 |
| 235 | 287.8 |
| 235 | 287.8 |
| 235 | 287.8 |
| 255.57 | 287.8 |
| 281.551 | 302.8 |
| 291.498 | 302.8 |

Project Summary

File Name: Estaca 09.rulocal.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:41:21

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Material de enchente | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|---|
| Color |  |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 5 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 10 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 20 | 12 |
| Water Surface | None | None | None | None | None |
| Ru Value | 0.49 | 0 | 0 | 0.49 | 0.49 |

Support Properties

Support 1

Support Type: End Anchored
 Force Application: Active
 Out-of-Plane Spacing: 1 m
 Anchor Capacity: 100 kN

Global Minimums

Method: bishop simplified

FS: 0.967125
 Axis Location: 244.488, 402.300
 Left Slip Surface Endpoint: 216.519, 290.476
 Right Slip Surface Endpoint: 317.166, 312.831
 Resisting Moment=198858 kN-m
 Driving Moment=205617 kN-m
 Total Slice Area=1295.65 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 216.519 | 290.476 |
| 219.37 | 287.631 |
| 273.698 | 287.631 |
| 317.166 | 312.831 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 0.967125

| 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 | 2.6814 | 43.5687 | Resíduos | 18.2 | 28 | 51.7871 | 50.0846 | 67.9279 | 7.96177 | 59.9662 |

| | | | | | | | | | | |
|----|----------|---------|------------------------------|------|----|---------|---------|-----------|---------|----------|
| 2 | 0.169337 | 5.8503 | Interface Solo x GMB Lisa | 3 | 12 | 8.93387 | 8.64017 | 43.4638 | 16.9287 | 26.5351 |
| 3 | 4.17908 | 176.463 | Interface Solo x GMB Lisa | 3 | 12 | 7.83495 | 7.57738 | 42.2254 | 20.6904 | 21.535 |
| 4 | 4.17908 | 204.887 | Interface Solo x GMB Lisa | 3 | 12 | 8.59735 | 8.31471 | 49.0269 | 24.0232 | 25.0037 |
| 5 | 4.17908 | 269.863 | Interface Solo x GMB Lisa | 3 | 12 | 10.3401 | 10.0001 | 64.5748 | 31.6416 | 32.9332 |
| 6 | 4.17908 | 279.464 | Interface Solo x GMB Lisa | 3 | 12 | 10.5976 | 10.2492 | 66.8722 | 32.7673 | 34.1049 |
| 7 | 4.17908 | 329.559 | Interface Solo x GMB Lisa | 3 | 12 | 11.9412 | 11.5487 | 78.8593 | 38.6411 | 40.2182 |
| 8 | 4.17908 | 349.205 | Interface Solo x GMB Lisa | 3 | 12 | 12.4682 | 12.0583 | 83.5603 | 40.9446 | 42.6157 |
| 9 | 4.17908 | 404.02 | Interface Solo x GMB Lisa | 3 | 12 | 13.9383 | 13.4801 | 96.6769 | 47.3716 | 49.3053 |
| 10 | 4.17908 | 446.064 | Interface Solo x GMB Lisa | 3 | 12 | 15.066 | 14.5707 | 106.737 | 52.3013 | 54.4361 |
| 11 | 4.17908 | 479.982 | Interface Solo x GMB Lisa | 3 | 12 | 15.9758 | 15.4506 | 114.854 | 56.2782 | 58.5754 |
| 12 | 4.17908 | 506.724 | Interface Solo x GMB Lisa | 3 | 12 | 16.693 | 16.1442 | 121.253 | 59.4138 | 61.8388 |
| 13 | 4.17908 | 558.835 | Interface Solo x GMB Lisa | 3 | 12 | 18.0907 | 17.496 | 133.722 | 65.5239 | 68.1982 |
| 14 | 4.17908 | 625.616 | Interface Solo x GMB Lisa | 3 | 12 | 19.8819 | 19.2283 | 149.702 | 73.3539 | 76.3481 |
| 15 | 4.17908 | 641.904 | Interface Solo x GMB Lisa | 3 | 12 | 20.3188 | 19.6508 | 153.599 | 75.2637 | 78.3358 |
| 16 | 4.36097 | 691.991 | Interface Solo x GMB Lisa | 3 | 12 | 18.5276 | 17.9185 | 147.938 | 77.7524 | 70.1861 |
| 17 | 4.36097 | 626.121 | Interface Solo x GMB Lisa | 3 | 12 | 17.0258 | 16.4661 | 133.704 | 70.3512 | 63.3532 |
| 18 | 4.36097 | 552.835 | Interface Solo x GMB Lisa | 3 | 12 | 15.3551 | 14.8503 | 117.868 | 62.1167 | 55.7511 |
| 19 | 4.36097 | 476.174 | Interface Solo x GMB Lisa | 3 | 12 | 13.6073 | 13.16 | 101.302 | 53.5031 | 47.7991 |
| 20 | 4.36097 | 405.859 | Interface Solo x GMB Lisa | 3 | 12 | 12.0043 | 11.6097 | 86.1076 | 45.6025 | 40.5051 |
| 21 | 4.36097 | 331.442 | Interface Solo x GMB Lisa | 3 | 12 | 10.3077 | 9.96886 | 70.0268 | 37.241 | 32.7858 |
| 22 | 4.32556 | 253.913 | Resíduos | 18.2 | 28 | 26.7519 | 25.8725 | 43.1931 | 28.7632 | 14.4299 |
| 23 | 4.32556 | 190.408 | Resíduos | 18.2 | 28 | 23.6303 | 22.8534 | 30.3212 | 21.5694 | 8.75175 |
| 24 | 4.32556 | 111.788 | Resíduos | 18.2 | 28 | 19.7657 | 19.1159 | 14.3859 | 12.6634 | 1.72254 |
| 25 | 4.32556 | 36.4702 | Resíduos | 18.2 | 28 | 16.0634 | 15.5353 | -0.880234 | 4.13134 | -5.01157 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 0.967125

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 216.519 | 290.476 | 0 | 0 | 0 |
| 2 | 219.201 | 287.8 | 320.629 | 0 | 0 |
| 3 | 219.37 | 287.631 | 329.487 | 0 | 0 |
| 4 | 223.549 | 287.631 | 362.227 | 0 | 0 |
| 5 | 227.728 | 287.631 | 398.152 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 6 | 231.907 | 287.631 | 441.361 | 0 | 0 |
| 7 | 236.086 | 287.631 | 485.645 | 0 | 0 |
| 8 | 240.265 | 287.631 | 535.544 | 0 | 0 |
| 9 | 244.444 | 287.631 | 587.644 | 0 | 0 |
| 10 | 248.624 | 287.631 | 645.889 | 0 | 0 |
| 11 | 252.803 | 287.631 | 708.845 | 0 | 0 |
| 12 | 256.982 | 287.631 | 775.603 | 0 | 0 |
| 13 | 261.161 | 287.631 | 845.359 | 0 | 0 |
| 14 | 265.34 | 287.631 | 920.955 | 0 | 0 |
| 15 | 269.519 | 287.631 | 1004.04 | 0 | 0 |
| 16 | 273.698 | 287.631 | 1088.94 | 0 | 0 |
| 17 | 278.059 | 290.159 | 795.719 | 0 | 0 |
| 18 | 282.42 | 292.687 | 531.935 | 0 | 0 |
| 19 | 286.781 | 295.216 | 300.902 | 0 | 0 |
| 20 | 291.142 | 297.744 | 104.129 | 0 | 0 |
| 21 | 295.503 | 300.272 | -61.2197 | 0 | 0 |
| 22 | 299.864 | 302.8 | -193.312 | 0 | 0 |
| 23 | 304.189 | 305.308 | -185.917 | 0 | 0 |
| 24 | 308.515 | 307.815 | -159.747 | 0 | 0 |
| 25 | 312.84 | 310.323 | -110.332 | 0 | 0 |
| 26 | 317.166 | 312.831 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 216.519 | 290.476 |
| 219.37 | 287.631 |
| 273.698 | 287.631 |
| 317.166 | 312.831 |

External Boundary

| X | Y |
|---------|---------|
| 145 | 280 |
| 393.414 | 280 |
| 393.414 | 343.702 |
| 393.295 | 343.65 |
| 389.78 | 343.533 |
| 386.076 | 343.608 |
| 379.879 | 342.816 |
| 378.623 | 341.966 |
| 377.679 | 341.285 |
| 375.448 | 341.439 |
| 372.005 | 341.557 |
| 363.452 | 337.35 |
| 362.031 | 336.687 |
| 360.766 | 335.896 |
| 360.058 | 335.275 |
| 359.083 | 335.139 |
| 353.6 | 334.792 |

| | |
|---------|---------|
| 347.503 | 329.347 |
| 342.682 | 324.938 |
| 342.147 | 324.893 |
| 341.125 | 324.53 |
| 327.654 | 317.643 |
| 318.572 | 313.469 |
| 317.956 | 313.186 |
| 317.182 | 312.831 |
| 314.553 | 312.773 |
| 311.696 | 312.694 |
| 309.102 | 312.835 |
| 304.438 | 313.043 |
| 301.915 | 313.038 |
| 300.521 | 312.953 |
| 298.364 | 312.884 |
| 297.013 | 312.901 |
| 293.149 | 312.866 |
| 292.22 | 312.685 |
| 288.865 | 312.529 |
| 285.094 | 312.648 |
| 284.853 | 312.527 |
| 277.533 | 312.356 |
| 276.842 | 312.352 |
| 276.663 | 312.277 |
| 276.178 | 311.898 |
| 271.912 | 309.284 |
| 270.276 | 309.249 |
| 267.099 | 309.092 |
| 266.846 | 308.972 |
| 266.457 | 308.913 |
| 266.337 | 308.775 |
| 262.662 | 306.247 |
| 261.229 | 305.315 |
| 260.737 | 304.813 |
| 259.941 | 304.806 |
| 257.5 | 304.959 |
| 255 | 304.01 |
| 253.562 | 303.464 |
| 252.04 | 302.831 |
| 251.751 | 302.831 |
| 249.003 | 302.727 |
| 244.674 | 300.348 |
| 243.137 | 299.33 |
| 239.423 | 299.444 |
| 238.949 | 299.482 |
| 238.385 | 299.118 |
| 235.214 | 297.009 |
| 230.625 | 297.158 |
| 230.114 | 297.184 |
| 229.646 | 296.959 |
| 226.829 | 295.241 |
| 224.32 | 293.711 |

| | |
|---------|---------|
| 224.031 | 293.73 |
| 220.986 | 293.842 |
| 219.345 | 292.674 |
| 218.807 | 292.14 |
| 216.437 | 290.416 |
| 216.159 | 290.425 |
| 214.842 | 290.39 |
| 214.265 | 290.423 |
| 210.866 | 290.208 |
| 209.625 | 289.287 |
| 208.606 | 288.636 |
| 207.662 | 288.634 |
| 206.311 | 288.323 |
| 205.233 | 288.182 |
| 204.367 | 287.5 |
| 204.208 | 287.374 |
| 200.801 | 284.634 |
| 200.467 | 284.651 |
| 200.177 | 284.602 |
| 197.641 | 284.667 |
| 196.903 | 284.681 |
| 192.509 | 284.613 |
| 190.264 | 284.558 |
| 189.645 | 284.501 |
| 188.986 | 284.494 |
| 188.359 | 284.495 |
| 172.815 | 284.473 |
| 151.253 | 284.318 |
| 149.289 | 284.296 |
| 148.426 | 284.29 |
| 148.289 | 284.203 |
| 148.185 | 284.301 |
| 145 | 284.282 |

Material Boundary

| X | Y |
|---------|---------|
| 204.367 | 287.5 |
| 219.353 | 287.5 |
| 255 | 287.5 |
| 273.695 | 287.5 |
| 299.676 | 302.5 |
| 309.676 | 302.5 |
| 318.572 | 313.469 |

Material Boundary

| X | Y |
|---------|---------|
| 216.437 | 290.416 |
| 219.053 | 287.8 |
| 219.353 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 276.842 | 308.352 |
| 276.842 | 310.352 |
| 276.92 | 310.354 |
| 277.534 | 310.356 |
| 284.853 | 310.527 |
| 285.094 | 310.648 |
| 288.865 | 310.529 |
| 292.22 | 310.685 |
| 293.149 | 310.866 |
| 297.013 | 310.901 |
| 298.364 | 310.884 |
| 300.521 | 310.953 |
| 301.915 | 311.038 |
| 304.438 | 311.043 |
| 305 | 311.018 |
| 305 | 309.018 |
| 304.438 | 309.043 |
| 301.915 | 309.038 |
| 300.521 | 308.953 |
| 298.364 | 308.884 |
| 297.013 | 308.901 |
| 293.149 | 308.866 |
| 292.22 | 308.685 |
| 288.865 | 308.529 |
| 285.094 | 308.648 |
| 284.853 | 308.527 |
| 277.534 | 308.356 |
| 276.842 | 308.352 |

Material Boundary

| X | Y |
|---------|---------|
| 219.053 | 287.8 |
| 255 | 287.8 |
| 255 | 287.8 |
| 255 | 287.8 |
| 273.615 | 287.8 |
| 299.596 | 302.8 |
| 309.534 | 302.8 |
| 317.956 | 313.186 |

Project Summary

File Name: Estaca 10.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:47:50

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Material de enchente | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|---|
| Color |  |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 5 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 10 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 20 | 12 |
| Water Surface | None | None | None | None | None |
| Ru Value | 0.45 | 0 | 0 | 0.45 | 0.45 |

Support Properties

Support 1

Support Type: End Anchored
 Force Application: Active
 Out-of-Plane Spacing: 1 m
 Anchor Capacity: 100 kN

Global Minimums

Method: bishop simplified

FS: 1.245310
 Axis Location: 235.606, 394.581
 Left Slip Surface Endpoint: 208.798, 293.713
 Right Slip Surface Endpoint: 300.216, 312.614
 Resisting Moment=198385 kN-m
 Driving Moment=159306 kN-m
 Total Slice Area=1199.12 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 208.798 | 293.713 |
| 214.784 | 287.641 |
| 256.979 | 287.641 |
| 300.216 | 312.614 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.24531

| 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 | 5.82953 | 188.464 | Resíduos | 18.2 | 28 | 39.1689 | 48.7774 | 72.056 | 14.5482 | 57.5078 |

| | | | | | | | | | | |
|----|----------|---------|------------------------------|------|----|---------|---------|----------|---------|----------|
| 2 | 0.156763 | 9.86134 | Interface Solo x GMB Lisa | 3 | 12 | 10.0552 | 12.5219 | 73.1044 | 28.3078 | 44.7966 |
| 3 | 4.2195 | 271.182 | Interface Solo x GMB Lisa | 3 | 12 | 8.4424 | 10.5134 | 64.2688 | 28.921 | 35.3478 |
| 4 | 4.2195 | 323.944 | Interface Solo x GMB Lisa | 3 | 12 | 9.61627 | 11.9752 | 76.7731 | 34.5479 | 42.2252 |
| 5 | 4.2195 | 337.698 | Interface Solo x GMB Lisa | 3 | 12 | 9.92228 | 12.3563 | 80.0327 | 36.0147 | 44.018 |
| 6 | 4.2195 | 397.393 | Interface Solo x GMB Lisa | 3 | 12 | 11.2504 | 14.0102 | 94.1801 | 42.381 | 51.7991 |
| 7 | 4.2195 | 439.358 | Interface Solo x GMB Lisa | 3 | 12 | 12.184 | 15.1729 | 104.126 | 46.8566 | 57.269 |
| 8 | 4.2195 | 463.273 | Interface Solo x GMB Lisa | 3 | 12 | 12.7161 | 15.8355 | 109.793 | 49.407 | 60.3863 |
| 9 | 4.2195 | 508.773 | Interface Solo x GMB Lisa | 3 | 12 | 13.7284 | 17.0961 | 120.577 | 54.2595 | 66.3171 |
| 10 | 4.2195 | 555.917 | Interface Solo x GMB Lisa | 3 | 12 | 14.7773 | 18.4023 | 131.749 | 59.2873 | 72.4622 |
| 11 | 4.2195 | 603.68 | Interface Solo x GMB Lisa | 3 | 12 | 15.8399 | 19.7256 | 143.069 | 64.3811 | 78.688 |
| 12 | 4.2195 | 636.405 | Interface Solo x GMB Lisa | 3 | 12 | 16.568 | 20.6323 | 150.825 | 67.8712 | 82.9535 |
| 13 | 3.74938 | 582.986 | Interface Solo x GMB Lisa | 3 | 12 | 15.4798 | 19.2772 | 146.548 | 69.9698 | 76.5781 |
| 14 | 3.74938 | 539.066 | Interface Solo x GMB Lisa | 3 | 12 | 14.4788 | 18.0306 | 135.412 | 64.6985 | 70.7134 |
| 15 | 3.74938 | 493.185 | Interface Solo x GMB Lisa | 3 | 12 | 13.4331 | 16.7284 | 123.779 | 59.1919 | 64.587 |
| 16 | 3.74938 | 439.011 | Interface Solo x GMB Lisa | 3 | 12 | 12.1985 | 15.1909 | 110.043 | 52.69 | 57.3534 |
| 17 | 3.74938 | 381.504 | Interface Solo x GMB Lisa | 3 | 12 | 10.8878 | 13.5587 | 95.4627 | 45.788 | 49.6747 |
| 18 | 3.74938 | 323.564 | Interface Solo x GMB Lisa | 3 | 12 | 9.56727 | 11.9142 | 80.7721 | 38.834 | 41.9381 |
| 19 | 3.74938 | 267.18 | Interface Solo x GMB Lisa | 3 | 12 | 8.28221 | 10.3139 | 66.476 | 32.0668 | 34.4092 |
| 20 | 3.39705 | 191.631 | Resíduos | 18.2 | 28 | 22.3504 | 27.8332 | 43.5023 | 25.385 | 18.1173 |
| 21 | 3.39705 | 148.883 | Resíduos | 18.2 | 28 | 19.9799 | 24.8811 | 32.2876 | 19.7223 | 12.5653 |
| 22 | 3.39705 | 106.125 | Resíduos | 18.2 | 28 | 17.6088 | 21.9284 | 21.0703 | 14.0582 | 7.01208 |
| 23 | 0.126671 | 3.01872 | Material de enchente | 10 | 20 | 10.148 | 12.6374 | 17.9702 | 10.7241 | 7.24608 |
| 24 | 3.33655 | 66.0612 | Resíduos | 18.2 | 28 | 15.4535 | 19.2444 | 10.8739 | 8.90965 | 1.9642 |
| 25 | 3.33655 | 20.7294 | Resíduos | 18.2 | 28 | 12.8941 | 16.0572 | -1.23432 | 2.79577 | -4.03009 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.24531

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 208.798 | 293.713 | 0 | 0 | 0 |
| 2 | 214.627 | 287.8 | 654.376 | 0 | 0 |
| 3 | 214.784 | 287.641 | 667.576 | 0 | 0 |
| 4 | 219.004 | 287.641 | 703.198 | 0 | 0 |
| 5 | 223.223 | 287.641 | 743.773 | 0 | 0 |
| 6 | 227.443 | 287.641 | 785.638 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 7 | 231.662 | 287.641 | 833.108 | 0 | 0 |
| 8 | 235.881 | 287.641 | 884.517 | 0 | 0 |
| 9 | 240.101 | 287.641 | 938.171 | 0 | 0 |
| 10 | 244.321 | 287.641 | 996.096 | 0 | 0 |
| 11 | 248.54 | 287.641 | 1058.45 | 0 | 0 |
| 12 | 252.76 | 287.641 | 1125.28 | 0 | 0 |
| 13 | 256.979 | 287.641 | 1195.19 | 0 | 0 |
| 14 | 260.728 | 289.807 | 935.866 | 0 | 0 |
| 15 | 264.478 | 291.972 | 696.907 | 0 | 0 |
| 16 | 268.227 | 294.138 | 479.219 | 0 | 0 |
| 17 | 271.977 | 296.303 | 286.647 | 0 | 0 |
| 18 | 275.726 | 298.469 | 120.737 | 0 | 0 |
| 19 | 279.475 | 300.634 | -18.3106 | 0 | 0 |
| 20 | 283.225 | 302.8 | -131.217 | 0 | 0 |
| 21 | 286.622 | 304.762 | -140.649 | 0 | 0 |
| 22 | 290.019 | 306.724 | -136.129 | 0 | 0 |
| 23 | 293.416 | 308.686 | -117.654 | 0 | 0 |
| 24 | 293.543 | 308.759 | -117.684 | 0 | 0 |
| 25 | 296.879 | 310.686 | -87.0791 | 0 | 0 |
| 26 | 300.216 | 312.614 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 208.798 | 293.713 |
| 214.784 | 287.641 |
| 256.979 | 287.641 |
| 300.216 | 312.614 |

External Boundary

| X | Y |
|---------|---------|
| 130 | 280 |
| 362.357 | 280 |
| 362.357 | 340.866 |
| 354.459 | 339.75 |
| 346.691 | 338.519 |
| 344.177 | 336.498 |
| 340.467 | 333.224 |
| 339.281 | 333.145 |
| 336.288 | 333.127 |
| 335.792 | 332.795 |
| 335.038 | 332.289 |
| 327.461 | 325.782 |
| 309.587 | 316.591 |
| 306.394 | 314.775 |
| 302.602 | 312.727 |
| 302.172 | 312.708 |
| 301.684 | 312.686 |
| 300.742 | 312.638 |

| | |
|---------|---------|
| 297.693 | 312.497 |
| 296.292 | 312.451 |
| 293.677 | 312.679 |
| 291.454 | 312.786 |
| 290.484 | 312.729 |
| 286.815 | 312.47 |
| 283.995 | 312.37 |
| 282.417 | 312.469 |
| 280.758 | 312.329 |
| 270.032 | 312.449 |
| 269.885 | 312.45 |
| 263.808 | 312.246 |
| 262.757 | 311.739 |
| 260.373 | 311.726 |
| 258.479 | 310.649 |
| 255.888 | 309.132 |
| 254.028 | 309.002 |
| 253.763 | 308.995 |
| 253.571 | 308.97 |
| 250.547 | 308.161 |
| 248.109 | 306.602 |
| 246.188 | 306.367 |
| 245.498 | 306.227 |
| 243.94 | 306.096 |
| 243.84 | 305.815 |
| 243.222 | 304.814 |
| 242.062 | 304.758 |
| 240.271 | 303.972 |
| 240 | 303.887 |
| 235.436 | 302.457 |
| 232.397 | 302.433 |
| 231.776 | 302.41 |
| 230.671 | 301.727 |
| 225.921 | 298.759 |
| 222.52 | 299.056 |
| 221.724 | 299.121 |
| 221.271 | 298.828 |
| 217.785 | 296.623 |
| 215.128 | 296.673 |
| 213.833 | 296.673 |
| 211.569 | 295.296 |
| 208.634 | 293.619 |
| 207.377 | 293.79 |
| 206.474 | 293.82 |
| 198.834 | 288.422 |
| 197.537 | 287.5 |
| 196.352 | 286.658 |
| 195.092 | 286.39 |
| 192.836 | 285.93 |
| 190.208 | 285.938 |
| 189.806 | 285.74 |
| 188.585 | 285.449 |

| | |
|---------|---------|
| 186.408 | 284.847 |
| 177.479 | 284.532 |
| 174.495 | 284.436 |
| 170.821 | 284.362 |
| 163.207 | 284.175 |
| 160.053 | 283.884 |
| 156.693 | 283.846 |
| 153.498 | 283.854 |
| 148.677 | 283.847 |
| 140.764 | 284.238 |
| 140.184 | 284.23 |
| 139.094 | 284.209 |
| 137.904 | 284.162 |
| 137.478 | 284.139 |
| 135.875 | 284.106 |
| 135.611 | 284.101 |
| 135.459 | 284.102 |
| 135.281 | 284.101 |
| 135.124 | 284.101 |
| 134.914 | 284.098 |
| 134.68 | 284.102 |
| 134.384 | 284.095 |
| 133.877 | 284.098 |
| 132.922 | 284.094 |
| 131.063 | 284.085 |
| 130 | 284.079 |

Material Boundary

| X | Y |
|---------|---------|
| 197.537 | 287.5 |
| 214.753 | 287.5 |
| 240 | 287.5 |
| 256.976 | 287.5 |
| 282.957 | 302.5 |
| 292.957 | 302.5 |
| 302.602 | 312.727 |

Material Boundary

| X | Y |
|---------|---------|
| 208.634 | 293.619 |
| 214.453 | 287.8 |
| 214.753 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 260.906 | 307.744 |
| 260.906 | 309.729 |
| 263.22 | 309.742 |
| 264.296 | 310.261 |
| 269.905 | 310.447 |

| | |
|---------|---------|
| 269.936 | 310.449 |
| 270.014 | 310.449 |
| 280.831 | 310.329 |
| 282.439 | 310.463 |
| 283.969 | 310.368 |
| 286.921 | 310.473 |
| 290.612 | 310.733 |
| 291.464 | 310.783 |
| 293.543 | 310.683 |
| 293.543 | 308.675 |
| 293.408 | 308.687 |
| 291.474 | 308.78 |
| 290.74 | 308.738 |
| 287.027 | 308.475 |
| 283.942 | 308.366 |
| 282.46 | 308.458 |
| 280.904 | 308.328 |
| 269.997 | 308.449 |
| 269.989 | 308.449 |
| 264.785 | 308.276 |
| 263.682 | 307.744 |
| 260.906 | 307.744 |

Material Boundary

| X | Y |
|---------|---------|
| 214.453 | 287.8 |
| 240 | 287.8 |
| 240 | 287.8 |
| 240 | 287.8 |
| 256.895 | 287.8 |
| 282.876 | 302.8 |
| 292.827 | 302.8 |
| 302.172 | 312.708 |

Project Summary

File Name: estaca 11.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 17/06/2020, 15:36:21

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Material de enchente | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|---|
| Color |  |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 5 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 10 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 20 | 12 |
| Water Surface | None | None | None | None | None |
| Ru Value | 0.46 | 0 | 0 | 0.46 | 0.46 |

Support Properties

Trinca

Support Type: End Anchored

Force Application: Active

Out-of-Plane Spacing: 1 m

Anchor Capacity: 0 kN

Global Minimums

Method: bishop simplified

FS: 1.223460

Axis Location: 175.507, 390.919

Left Slip Surface Endpoint: 149.901, 293.624

Right Slip Surface Endpoint: 237.980, 312.057

Resisting Moment=181233 kN-m

Driving Moment=148131 kN-m

Total Slice Area=1135.46 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 149.901 | 293.624 |
| 155.76 | 287.639 |
| 195.926 | 287.639 |
| 237.98 | 312.057 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.22346

| 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 | 2.85064 | 47.6666 | Resíduos | 18.2 | 28 | 33.8068 | 41.3613 | 51.2518 | 7.69183 | 43.56 |

| | | | | | | | | | | |
|----|----------|---------|------------------------------|------|----|---------|---------|----------|---------|----------|
| 2 | 2.85064 | 135.295 | Resíduos | 18.2 | 28 | 46.7795 | 57.2328 | 95.2421 | 21.8322 | 73.4099 |
| 3 | 0.157619 | 9.28272 | Interface Solo x GMB Lisa | 3 | 12 | 9.69819 | 11.8653 | 68.7993 | 27.0909 | 41.7084 |
| 4 | 3.65145 | 230.195 | Interface Solo x GMB Lisa | 3 | 12 | 8.36644 | 10.236 | 63.042 | 28.9993 | 34.0427 |
| 5 | 3.65145 | 272.357 | Interface Solo x GMB Lisa | 3 | 12 | 9.4497 | 11.5613 | 74.5886 | 34.3108 | 40.2778 |
| 6 | 3.65145 | 279.644 | Interface Solo x GMB Lisa | 3 | 12 | 9.63692 | 11.7904 | 76.5843 | 35.2288 | 41.3555 |
| 7 | 3.65145 | 328.917 | Interface Solo x GMB Lisa | 3 | 12 | 10.9028 | 13.3392 | 90.0783 | 41.436 | 48.6423 |
| 8 | 3.65145 | 366.307 | Interface Solo x GMB Lisa | 3 | 12 | 11.8636 | 14.5146 | 100.318 | 46.1464 | 54.1717 |
| 9 | 3.65145 | 383.225 | Interface Solo x GMB Lisa | 3 | 12 | 12.2982 | 15.0464 | 104.951 | 48.2776 | 56.6737 |
| 10 | 3.65145 | 430.706 | Interface Solo x GMB Lisa | 3 | 12 | 13.5181 | 16.5389 | 117.955 | 54.2591 | 63.6955 |
| 11 | 3.65145 | 448.701 | Interface Solo x GMB Lisa | 3 | 12 | 13.9805 | 17.1046 | 122.883 | 56.5261 | 66.3567 |
| 12 | 3.65145 | 459.986 | Interface Solo x GMB Lisa | 3 | 12 | 14.2704 | 17.4593 | 125.973 | 57.9478 | 68.0256 |
| 13 | 3.65145 | 493.201 | Interface Solo x GMB Lisa | 3 | 12 | 15.1238 | 18.5034 | 135.07 | 62.132 | 72.9377 |
| 14 | 3.65145 | 533.2 | Interface Solo x GMB Lisa | 3 | 12 | 16.1515 | 19.7607 | 146.024 | 67.171 | 78.853 |
| 15 | 3.7302 | 541.459 | Interface Solo x GMB Lisa | 3 | 12 | 14.5975 | 17.8595 | 136.68 | 66.7715 | 69.9085 |
| 16 | 3.7302 | 530.665 | Interface Solo x GMB Lisa | 3 | 12 | 14.3509 | 17.5578 | 133.93 | 65.4405 | 68.4892 |
| 17 | 3.7302 | 479.819 | Interface Solo x GMB Lisa | 3 | 12 | 13.1893 | 16.1366 | 120.973 | 59.1702 | 61.8029 |
| 18 | 3.7302 | 430.421 | Interface Solo x GMB Lisa | 3 | 12 | 12.0608 | 14.7559 | 108.386 | 53.0786 | 55.3072 |
| 19 | 3.7302 | 374.173 | Interface Solo x GMB Lisa | 3 | 12 | 10.7758 | 13.1837 | 94.0525 | 46.1421 | 47.9104 |
| 20 | 3.7302 | 318.095 | Interface Solo x GMB Lisa | 3 | 12 | 9.49458 | 11.6162 | 79.763 | 39.2267 | 40.5363 |
| 21 | 3.7302 | 262.081 | Interface Solo x GMB Lisa | 3 | 12 | 8.21487 | 10.0506 | 65.4896 | 32.3192 | 33.1704 |
| 22 | 3.9856 | 221.075 | Resíduos | 18.2 | 28 | 22.2731 | 27.2503 | 42.5365 | 25.5155 | 17.021 |
| 23 | 3.9856 | 158.834 | Resíduos | 18.2 | 28 | 19.3467 | 23.6699 | 28.6192 | 18.3319 | 10.2873 |
| 24 | 3.9856 | 104.613 | Resíduos | 18.2 | 28 | 16.7973 | 20.5508 | 16.4952 | 12.074 | 4.42119 |
| 25 | 3.9856 | 32.0511 | Resíduos | 18.2 | 28 | 13.3855 | 16.3767 | 0.270023 | 3.69919 | -3.42917 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.22346

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 149.901 | 293.624 | 0 | 0 | 0 |
| 2 | 152.752 | 290.712 | 245.602 | 0 | 0 |
| 3 | 155.602 | 287.8 | 656.272 | 0 | 0 |
| 4 | 155.76 | 287.639 | 668.877 | 0 | 0 |
| 5 | 159.411 | 287.639 | 699.426 | 0 | 0 |
| 6 | 163.063 | 287.639 | 733.93 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 7 | 166.714 | 287.639 | 769.117 | 0 | 0 |
| 8 | 170.366 | 287.639 | 808.927 | 0 | 0 |
| 9 | 174.017 | 287.639 | 852.244 | 0 | 0 |
| 10 | 177.669 | 287.639 | 897.149 | 0 | 0 |
| 11 | 181.32 | 287.639 | 946.507 | 0 | 0 |
| 12 | 184.972 | 287.639 | 997.555 | 0 | 0 |
| 13 | 188.623 | 287.639 | 1049.66 | 0 | 0 |
| 14 | 192.275 | 287.639 | 1104.88 | 0 | 0 |
| 15 | 195.926 | 287.639 | 1163.86 | 0 | 0 |
| 16 | 199.656 | 289.805 | 922.276 | 0 | 0 |
| 17 | 203.386 | 291.971 | 685.733 | 0 | 0 |
| 18 | 207.117 | 294.137 | 472.919 | 0 | 0 |
| 19 | 210.847 | 296.302 | 283.159 | 0 | 0 |
| 20 | 214.577 | 298.468 | 119.648 | 0 | 0 |
| 21 | 218.307 | 300.634 | -17.6915 | 0 | 0 |
| 22 | 222.037 | 302.8 | -128.891 | 0 | 0 |
| 23 | 226.023 | 305.114 | -138.558 | 0 | 0 |
| 24 | 230.009 | 307.428 | -127.683 | 0 | 0 |
| 25 | 233.994 | 309.742 | -98.9104 | 0 | 0 |
| 26 | 237.98 | 312.057 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 149.901 | 293.624 |
| 155.76 | 287.639 |
| 195.926 | 287.639 |
| 237.98 | 312.057 |

External Boundary

| X | Y |
|---------|---------|
| 120.844 | 275.135 |
| 279.987 | 275.135 |
| 279.987 | 332.019 |
| 278.251 | 332.317 |
| 276.876 | 332.063 |
| 276 | 331.424 |
| 268.298 | 325.87 |
| 262.884 | 322.791 |
| 252.914 | 317.407 |
| 243.141 | 312.12 |
| 242.696 | 312.134 |
| 242.126 | 312.152 |
| 241.45 | 312.144 |
| 239.439 | 312.205 |
| 236.782 | 311.935 |
| 231.972 | 312.404 |
| 231.727 | 312.377 |
| 231.155 | 312.405 |

| | |
|---------|---------|
| 229.858 | 312.275 |
| 226.461 | 312.718 |
| 225.548 | 312.697 |
| 224.888 | 312.498 |
| 222.94 | 312.332 |
| 220.146 | 312.247 |
| 214.487 | 312.223 |
| 211.654 | 312.196 |
| 208.858 | 312.236 |
| 203.125 | 311.724 |
| 202.019 | 311.576 |
| 201.77 | 311.619 |
| 200.631 | 311.009 |
| 196.842 | 308.724 |
| 194.376 | 308.604 |
| 193.792 | 308.539 |
| 188.397 | 305.839 |
| 188.281 | 305.78 |
| 188.135 | 305.756 |
| 185.322 | 305.342 |
| 179.99 | 304.809 |
| 178.465 | 304.359 |
| 178.368 | 303.905 |
| 178.358 | 303.336 |
| 175.58 | 302.509 |
| 175.042 | 302.287 |
| 173.859 | 301.917 |
| 173.423 | 301.918 |
| 170.715 | 301.904 |
| 167.01 | 299.404 |
| 164.865 | 298.29 |
| 163.556 | 298.217 |
| 161.581 | 298.226 |
| 159.607 | 298.238 |
| 158.984 | 297.876 |
| 157.79 | 296.042 |
| 156.118 | 296.052 |
| 154.071 | 296.268 |
| 151.242 | 294.52 |
| 149.707 | 293.494 |
| 149.328 | 293.476 |
| 147.251 | 293.448 |
| 137.72 | 286.861 |
| 135.848 | 285.531 |
| 133.255 | 283.812 |
| 132.954 | 283.699 |
| 128.185 | 283.63 |
| 126.253 | 283.573 |
| 125.928 | 283.55 |
| 125.63 | 283.5 |
| 122.573 | 283.307 |
| 121.289 | 283.206 |

| | |
|---------|---------|
| 121.175 | 283.198 |
| 120.844 | 283.24 |

Material Boundary

| X | Y |
|---------|---------|
| 133.255 | 283.812 |
| 155.745 | 287.5 |
| 155.443 | 287.8 |
| 149.707 | 293.494 |

Material Boundary

| X | Y |
|---------|--------|
| 155.745 | 287.5 |
| 180 | 287.5 |
| 195.872 | 287.5 |
| 221.852 | 302.5 |
| 231.852 | 302.5 |
| 243.141 | 312.12 |

Material Boundary

| X | Y |
|---------|---------|
| 229.828 | 310.262 |
| 226.354 | 310.715 |
| 225.866 | 310.703 |
| 225.265 | 310.523 |
| 223.056 | 310.334 |
| 220.18 | 310.247 |
| 214.5 | 310.223 |
| 211.649 | 310.195 |
| 208.933 | 310.235 |
| 203.347 | 309.736 |
| 202.205 | 309.583 |
| 202.205 | 307.287 |
| 202.611 | 307.531 |
| 202.83 | 307.649 |
| 203.569 | 307.748 |
| 209.008 | 308.233 |
| 211.644 | 308.195 |
| 214.515 | 308.223 |
| 220.215 | 308.247 |
| 223.171 | 308.337 |
| 225.642 | 308.548 |
| 226.183 | 308.71 |
| 226.248 | 308.712 |
| 229.798 | 308.249 |
| 229.828 | 310.262 |

Material Boundary

| X | Y |
|---|---|
|---|---|

| | |
|---------|---------|
| 155.443 | 287.8 |
| 180 | 287.8 |
| 180 | 287.8 |
| 180 | 287.8 |
| 195.791 | 287.8 |
| 221.772 | 302.8 |
| 231.742 | 302.8 |
| 242.696 | 312.134 |

Project Summary

File Name: Estaca 12.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:51:42

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.4 | 0 | 0 | 0.4 |

Global Minimums

Method: bishop simplified

FS: 1.389510
 Axis Location: 125.977, 368.405
 Left Slip Surface Endpoint: 106.062, 293.107
 Right Slip Surface Endpoint: 174.267, 307.295
 Resisting Moment=96552.5 kN-m
 Driving Moment=69486.5 kN-m
 Total Slice Area=805.452 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 106.062 | 293.107 |
| 111.526 | 287.645 |
| 151.917 | 287.645 |
| 174.267 | 307.295 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.38951

| 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 | 2.65442 | 33.7014 | Resíduos | 18.2 | 28 | 25.925 | 36.023 | 38.5988 | 5.07853 | 33.5203 |
| 2 | 2.65442 | 102.51 | Resíduos | 18.2 | 28 | 35.5605 | 49.4117 | 74.148 | 15.4474 | 58.7006 |
| 3 | 0.155053 | 8.44048 | Interface Solo x GMB Lisa | 3 | 12 | 8.44628 | 11.7362 | 62.8752 | 21.7744 | 41.1008 |
| 4 | 2.88507 | 171.238 | Interface Solo x GMB Lisa | 3 | 12 | 7.60665 | 10.5695 | 59.3531 | 23.7412 | 35.6119 |
| 5 | 2.88507 | 199.224 | Interface Solo x GMB Lisa | 3 | 12 | 8.49699 | 11.8066 | 69.0534 | 27.6213 | 41.4321 |
| 6 | 2.88507 | 219.483 | Interface Solo x GMB Lisa | 3 | 12 | 9.1415 | 12.7022 | 76.0754 | 30.4302 | 45.6452 |
| | | | Interface Solo x GMB | | | | | | | |

| | | | | | | | | | | | |
|----|---------|---------|------------------------------|---|----|---------|---------|---------|---------|---------|--|
| | | | Lisa | | | | | | | | |
| 8 | 2.88507 | 262.256 | Interface Solo x GMB Lisa | 3 | 12 | 10.5023 | 14.593 | 90.901 | 36.3604 | 54.5406 | |
| 9 | 2.88507 | 269.884 | Interface Solo x GMB Lisa | 3 | 12 | 10.7449 | 14.9302 | 93.545 | 37.418 | 56.127 | |
| 10 | 2.88507 | 275.154 | Interface Solo x GMB Lisa | 3 | 12 | 10.9126 | 15.1631 | 95.3716 | 38.1487 | 57.2229 | |
| 11 | 2.88507 | 303.761 | Interface Solo x GMB Lisa | 3 | 12 | 11.8227 | 16.4277 | 105.287 | 42.1149 | 63.1723 | |
| 12 | 2.88507 | 305.439 | Interface Solo x GMB Lisa | 3 | 12 | 11.8761 | 16.5019 | 105.869 | 42.3475 | 63.5213 | |
| 13 | 2.88507 | 326.968 | Interface Solo x GMB Lisa | 3 | 12 | 12.5609 | 17.4535 | 113.331 | 45.3323 | 67.9987 | |
| 14 | 2.88507 | 359.425 | Interface Solo x GMB Lisa | 3 | 12 | 13.5935 | 18.8883 | 124.581 | 49.8324 | 74.7486 | |
| 15 | 2.88507 | 376.234 | Interface Solo x GMB Lisa | 3 | 12 | 14.1282 | 19.6313 | 130.407 | 52.1629 | 78.2443 | |
| 16 | 2.88507 | 379.424 | Interface Solo x GMB Lisa | 3 | 12 | 14.2298 | 19.7724 | 131.513 | 52.6051 | 78.9078 | |
| 17 | 2.88507 | 381.024 | Interface Solo x GMB Lisa | 3 | 12 | 14.2806 | 19.8431 | 132.067 | 52.827 | 79.2404 | |
| 18 | 2.79369 | 342.966 | Interface Solo x GMB Lisa | 3 | 12 | 11.8358 | 16.4459 | 112.364 | 49.1058 | 63.258 | |
| 19 | 2.79369 | 295.795 | Interface Solo x GMB Lisa | 3 | 12 | 10.4697 | 14.5477 | 96.6795 | 42.3518 | 54.3277 | |
| 20 | 2.79369 | 249.074 | Interface Solo x GMB Lisa | 3 | 12 | 9.1166 | 12.6676 | 81.1449 | 35.6624 | 45.4825 | |
| 21 | 2.79369 | 203.15 | Interface Solo x GMB Lisa | 3 | 12 | 7.78658 | 10.8195 | 65.8749 | 29.0869 | 36.788 | |
| 22 | 2.79369 | 158.638 | Interface Solo x GMB Lisa | 3 | 12 | 6.49748 | 9.02832 | 51.0748 | 22.7137 | 28.3611 | |
| 23 | 2.79369 | 114.857 | Interface Solo x GMB Lisa | 3 | 12 | 5.22955 | 7.26651 | 36.5174 | 16.4451 | 20.0723 | |
| 24 | 2.79369 | 70.2474 | Interface Solo x GMB Lisa | 3 | 12 | 3.93763 | 5.47137 | 21.6849 | 10.058 | 11.6269 | |
| 25 | 2.79369 | 25.2186 | Interface Solo x GMB Lisa | 3 | 12 | 2.63355 | 3.65935 | 6.71279 | 3.61079 | 3.102 | |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.38951

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 106.062 | 293.107 | 0 | 0 | 0 |
| 2 | 108.717 | 290.454 | 171.202 | 0 | 0 |
| 3 | 111.371 | 287.8 | 462.298 | 0 | 0 |
| 4 | 111.526 | 287.645 | 473.352 | 0 | 0 |
| 5 | 114.411 | 287.645 | 495.287 | 0 | 0 |
| 6 | 117.296 | 287.645 | 519.788 | 0 | 0 |
| 7 | 120.181 | 287.645 | 546.148 | 0 | 0 |
| 8 | 123.066 | 287.645 | 574.107 | 0 | 0 |
| 9 | 125.951 | 287.645 | 604.391 | 0 | 0 |
| 10 | 128.836 | 287.645 | 635.374 | 0 | 0 |
| 11 | 131.721 | 287.645 | 666.841 | 0 | 0 |

| | | | | | |
|----|---------|---------|----------|---|---|
| 12 | 134.607 | 287.645 | 700.932 | 0 | 0 |
| 13 | 137.492 | 287.645 | 735.177 | 0 | 0 |
| 14 | 140.377 | 287.645 | 771.397 | 0 | 0 |
| 15 | 143.262 | 287.645 | 810.595 | 0 | 0 |
| 16 | 146.147 | 287.645 | 851.335 | 0 | 0 |
| 17 | 149.032 | 287.645 | 892.367 | 0 | 0 |
| 18 | 151.917 | 287.645 | 933.546 | 0 | 0 |
| 19 | 154.711 | 290.101 | 690.605 | 0 | 0 |
| 20 | 157.504 | 292.557 | 482.374 | 0 | 0 |
| 21 | 160.298 | 295.014 | 308.522 | 0 | 0 |
| 22 | 163.092 | 297.47 | 168.461 | 0 | 0 |
| 23 | 165.885 | 299.926 | 61.1538 | 0 | 0 |
| 24 | 168.679 | 302.382 | -13.9385 | 0 | 0 |
| 25 | 171.473 | 304.838 | -56.2063 | 0 | 0 |
| 26 | 174.267 | 307.295 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 106.062 | 293.107 |
| 111.526 | 287.645 |
| 151.917 | 287.645 |
| 174.267 | 307.295 |

External Boundary

| X | Y |
|---------|---------|
| 187.103 | 310.291 |
| 185.797 | 310.138 |
| 182.091 | 309.703 |
| 181.269 | 309.66 |
| 180.872 | 309.595 |
| 180.48 | 309.36 |
| 179.014 | 308.728 |
| 174.909 | 307.001 |
| 174.43 | 307.233 |
| 174.315 | 307.289 |
| 174.072 | 307.317 |
| 173.903 | 307.337 |
| 173.409 | 307.312 |
| 168.07 | 307 |
| 166.169 | 306.858 |
| 163.358 | 306.628 |
| 160.218 | 306.46 |
| 157.822 | 306.404 |
| 154.59 | 306.322 |
| 153.219 | 306.286 |
| 151.208 | 306.407 |
| 150.038 | 306.503 |
| 146.147 | 306.285 |

| | |
|---------|---------|
| 145.018 | 306.324 |
| 143.294 | 305.975 |
| 142.657 | 305.899 |
| 139.778 | 304.203 |
| 136.62 | 302.563 |
| 135.681 | 302.683 |
| 135 | 302.707 |
| 133.029 | 302.777 |
| 132.656 | 302.667 |
| 131.752 | 302.073 |
| 130.644 | 301.021 |
| 128.69 | 300.99 |
| 128.4 | 301.03 |
| 127.341 | 300.972 |
| 124.858 | 300.635 |
| 123.656 | 300.48 |
| 119.814 | 298.267 |
| 118.42 | 298.698 |
| 115.396 | 297.229 |
| 112.769 | 295.829 |
| 112.019 | 295.857 |
| 110.248 | 294.643 |
| 105.958 | 293.069 |
| 103.743 | 293.052 |
| 96.7099 | 287.5 |
| 94.8995 | 286.071 |
| 94.4235 | 285.661 |
| 91.6161 | 282.921 |
| 90.6881 | 282.981 |
| 85.785 | 282.919 |
| 83.8583 | 281.718 |
| 81.7346 | 280.891 |
| 78.9107 | 280.708 |
| 72.9457 | 280.246 |
| 72.8567 | 280.258 |
| 72.8567 | 280 |
| 194.289 | 280 |
| 194.289 | 311.27 |

Material Boundary

| X | Y |
|---------|---------|
| 96.7099 | 287.5 |
| 111.526 | 287.5 |
| 135 | 287.5 |
| 151.949 | 287.5 |
| 174.43 | 307.233 |

Material Boundary

| X | Y |
|---------|---------|
| 105.958 | 293.069 |
| 111.226 | 287.8 |

| | |
|---------|-------|
| 111.526 | 287.5 |
|---------|-------|

Material Boundary

| X | Y |
|---------|---------|
| 111.226 | 287.8 |
| 135 | 287.8 |
| 135 | 287.8 |
| 135 | 287.8 |
| 151.836 | 287.8 |
| 174.072 | 307.317 |

Project Summary

File Name: Estaca 13.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 16:55:31

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

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.45 | 0 | 0 | 0.45 |

Global Minimums

Method: bishop simplified

FS: 3.683500
 Axis Location: 97.658, 346.895
 Left Slip Surface Endpoint: 78.151, 292.939
 Right Slip Surface Endpoint: 129.118, 298.916
 Resisting Moment=45491.5 kN-m
 Driving Moment=12350.1 kN-m
 Total Slice Area=508.396 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 78.1509 | 292.939 |
| 83.337 | 287.619 |
| 121.851 | 287.619 |
| 129.118 | 298.916 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 3.6835

| 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 | 2.50485 | 38.8297 | Resíduos | 18.2 | 28 | 7.24344 | 26.6812 | 22.9267 | 6.97581 | 15.9509 |
| 2 | 2.50485 | 116.018 | Resíduos | 18.2 | 28 | 10.1148 | 37.2579 | 56.6854 | 20.8428 | 35.8426 |
| 3 | 0.176437 | 10.8981 | Interface Solo x GMB Lisa | 3 | 12 | 2.94926 | 10.8636 | 64.791 | 27.7955 | 36.9955 |
| 4 | 2.02705 | 129.066 | Interface Solo x GMB Lisa | 3 | 12 | 2.83524 | 10.4436 | 63.6718 | 28.6523 | 35.0195 |
| 5 | 2.02705 | 135.418 | Interface Solo x GMB Lisa | 3 | 12 | 2.9347 | 10.81 | 66.8054 | 30.0624 | 36.743 |
| 6 | 2.02705 | 140.648 | Interface Solo x GMB Lisa | 3 | 12 | 3.01659 | 11.1116 | 69.3855 | 31.2235 | 38.162 |
| | | | Interface Solo x GMB | | | | | | | |

| | | | | | | | | | | | |
|----|---------|---------|----------------------|------|---|----|---------|---------|---------|---------|---------|
| | | | | Lisa | | | | | | | |
| 8 | 2.02705 | 148.735 | Interface Solo x GMB | Lisa | 3 | 12 | 3.1432 | 11.578 | 73.375 | 33.0187 | 40.3563 |
| 9 | 2.02705 | 162.466 | Interface Solo x GMB | Lisa | 3 | 12 | 3.35819 | 12.3699 | 80.1489 | 36.0671 | 44.0818 |
| 10 | 2.02705 | 174.014 | Interface Solo x GMB | Lisa | 3 | 12 | 3.539 | 13.0359 | 85.8458 | 38.6306 | 47.2152 |
| 11 | 2.02705 | 175.356 | Interface Solo x GMB | Lisa | 3 | 12 | 3.56001 | 13.1133 | 86.5079 | 38.9285 | 47.5794 |
| 12 | 2.02705 | 172.51 | Interface Solo x GMB | Lisa | 3 | 12 | 3.51544 | 12.9491 | 85.1039 | 38.2967 | 46.8072 |
| 13 | 2.02705 | 176.522 | Interface Solo x GMB | Lisa | 3 | 12 | 3.57828 | 13.1806 | 87.0831 | 39.1874 | 47.8957 |
| 14 | 2.02705 | 183.111 | Interface Solo x GMB | Lisa | 3 | 12 | 3.68144 | 13.5606 | 90.3336 | 40.6502 | 49.6834 |
| 15 | 2.02705 | 183.923 | Interface Solo x GMB | Lisa | 3 | 12 | 3.69415 | 13.6074 | 90.7342 | 40.8305 | 49.9037 |
| 16 | 2.02705 | 183.261 | Interface Solo x GMB | Lisa | 3 | 12 | 3.68378 | 13.5692 | 90.4076 | 40.6834 | 49.7242 |
| 17 | 2.02705 | 178.629 | Interface Solo x GMB | Lisa | 3 | 12 | 3.61127 | 13.3021 | 88.1225 | 39.6551 | 48.4674 |
| 18 | 2.02705 | 174.209 | Interface Solo x GMB | Lisa | 3 | 12 | 3.54207 | 13.0472 | 85.942 | 38.674 | 47.268 |
| 19 | 2.02705 | 170.763 | Interface Solo x GMB | Lisa | 3 | 12 | 3.4881 | 12.8484 | 84.242 | 37.909 | 46.333 |
| 20 | 2.02705 | 167.431 | Interface Solo x GMB | Lisa | 3 | 12 | 3.43593 | 12.6563 | 82.5982 | 37.1692 | 45.429 |
| 21 | 2.02705 | 164.461 | Interface Solo x GMB | Lisa | 3 | 12 | 3.38943 | 12.485 | 81.1331 | 36.5099 | 44.6232 |
| 22 | 2.02705 | 163.566 | Interface Solo x GMB | Lisa | 3 | 12 | 3.37542 | 12.4334 | 80.6915 | 36.3113 | 44.3802 |
| 23 | 2.42243 | 163.26 | Interface Solo x GMB | Lisa | 3 | 12 | 2.71048 | 9.98406 | 63.1853 | 30.3278 | 32.8575 |
| 24 | 2.42243 | 97.9242 | Interface Solo x GMB | Lisa | 3 | 12 | 1.92489 | 7.09032 | 37.4342 | 18.1908 | 19.2434 |
| 25 | 2.42243 | 32.1161 | Interface Solo x GMB | Lisa | 3 | 12 | 1.13361 | 4.17566 | 11.4971 | 5.96601 | 5.53106 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 3.6835

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 78.1509 | 292.939 | 0 | 0 | 0 |
| 2 | 80.6557 | 290.37 | 77.0423 | 0 | 0 |
| 3 | 83.1606 | 287.8 | 248.019 | 0 | 0 |
| 4 | 83.337 | 287.619 | 260.266 | 0 | 0 |
| 5 | 85.3641 | 287.619 | 266.009 | 0 | 0 |
| 6 | 87.3911 | 287.619 | 271.953 | 0 | 0 |
| 7 | 89.4182 | 287.619 | 278.063 | 0 | 0 |
| 8 | 91.4452 | 287.619 | 284.235 | 0 | 0 |
| 9 | 93.4723 | 287.619 | 290.602 | 0 | 0 |
| 10 | 95.4993 | 287.619 | 297.403 | 0 | 0 |
| 11 | 97.5264 | 287.619 | 304.572 | 0 | 0 |

| | | | | | |
|----|---------|---------|---------|---|---|
| 12 | 99.5534 | 287.619 | 311.782 | 0 | 0 |
| 13 | 101.58 | 287.619 | 318.902 | 0 | 0 |
| 14 | 103.608 | 287.619 | 326.15 | 0 | 0 |
| 15 | 105.635 | 287.619 | 333.607 | 0 | 0 |
| 16 | 107.662 | 287.619 | 341.089 | 0 | 0 |
| 17 | 109.689 | 287.619 | 348.55 | 0 | 0 |
| 18 | 111.716 | 287.619 | 355.864 | 0 | 0 |
| 19 | 113.743 | 287.619 | 363.039 | 0 | 0 |
| 20 | 115.77 | 287.619 | 370.104 | 0 | 0 |
| 21 | 117.797 | 287.619 | 377.063 | 0 | 0 |
| 22 | 119.824 | 287.619 | 383.928 | 0 | 0 |
| 23 | 121.851 | 287.619 | 390.765 | 0 | 0 |
| 24 | 124.273 | 291.385 | 159.399 | 0 | 0 |
| 25 | 126.696 | 295.15 | 23.0983 | 0 | 0 |
| 26 | 129.118 | 298.916 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 78.1509 | 292.939 |
| 83.337 | 287.619 |
| 121.851 | 287.619 |
| 129.118 | 298.916 |

External Boundary

| X | Y |
|---------|---------|
| 139.311 | 303.109 |
| 129.361 | 299.015 |
| 128.875 | 298.816 |
| 128.793 | 298.782 |
| 128.679 | 298.759 |
| 128.465 | 298.769 |
| 125.257 | 298.937 |
| 123.889 | 298.987 |
| 118.408 | 299.133 |
| 116.627 | 299.368 |
| 116.047 | 299.423 |
| 112.441 | 299.85 |
| 111.256 | 300.016 |
| 108.948 | 300.48 |
| 106.555 | 300.503 |
| 105 | 300.525 |
| 104.735 | 300.529 |
| 101.236 | 299.635 |
| 100.69 | 299.638 |
| 99.8345 | 299.789 |
| 96.9646 | 300.034 |
| 93.7106 | 298.667 |
| 91.6673 | 297.607 |

| | |
|---------|---------|
| 89.0446 | 297.578 |
| 85.1764 | 296.863 |
| 83.8224 | 296.461 |
| 83.0337 | 296.507 |
| 81.1364 | 295.156 |
| 78.0283 | 292.848 |
| 76.7523 | 293.053 |
| 74.9026 | 293.241 |
| 70.0595 | 289.57 |
| 67.3478 | 287.5 |
| 67.0786 | 287.294 |
| 66.1457 | 286.091 |
| 65.5719 | 285.261 |
| 63.8937 | 285.385 |
| 59.5492 | 285.894 |
| 59.5492 | 280 |
| 155.288 | 280 |
| 155.288 | 309.955 |

Material Boundary

| X | Y |
|---------|---------|
| 67.3478 | 287.5 |
| 83.3765 | 287.5 |
| 105 | 287.5 |
| 121.949 | 287.5 |
| 129.361 | 299.015 |

Material Boundary

| X | Y |
|---------|---------|
| 78.0283 | 292.848 |
| 83.0765 | 287.8 |
| 83.3765 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 83.0765 | 287.8 |
| 105 | 287.8 |
| 105 | 287.8 |
| 105.001 | 287.8 |
| 121.785 | 287.8 |
| 128.875 | 298.816 |

Project Summary

File Name: Estaca 14.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 24/06/2020, 17:01:38

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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|
| Color |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 12 |
| Water Surface | None | None | None | None |
| Ru Value | 0.36 | 0 | 0 | 0.36 |

Global Minimums

Method: bishop simplified

FS: 19.283400
 Axis Location: 128.449, 335.704
 Left Slip Surface Endpoint: 109.155, 292.997
 Right Slip Surface Endpoint: 151.039, 294.645
 Resisting Moment=27691.7 kN-m
 Driving Moment=1436.04 kN-m
 Total Slice Area=294.085 m²

Method: janbu simplified

FS: 18.114000
 Axis Location: 128.449, 335.704
 Left Slip Surface Endpoint: 109.155, 292.997
 Right Slip Surface Endpoint: 151.039, 294.645
 Resisting Horizontal Force=518.338 kN
 Driving Horizontal Force=28.6152 kN
 Total Slice Area=294.085 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 109.155 | 292.997 |
| 114.279 | 287.629 |
| 140.691 | 287.629 |
| 151.039 | 294.645 |

Method: janbu simplified

| X | Y |
|---------|---------|
| 109.155 | 292.997 |
| 114.279 | 287.629 |
| 140.691 | 287.629 |
| 151.039 | 294.645 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 19.2834

| 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 | 1.65344 | 17.7095 | Resíduos | 18.2 | 28 | 1.16653 | 22.4946 | 11.9328 | 3.85585 | 8.07691 |
| 2 | 1.65344 | 52.6893 | Resíduos | 18.2 | 28 | 1.55097 | 29.9079 | 33.4914 | 11.472 | 22.0194 |
| 3 | 1.65344 | 79.8484 | Resíduos | 18.2 | 28 | 1.84946 | 35.6638 | 50.23 | 17.3853 | 32.8447 |
| 4 | 0.163226 | 9.08519 | Interface Solo x GMB Lisa | 3 | 12 | 0.554638 | 10.6953 | 56.2413 | 20.0377 | 36.2036 |
| 5 | 1.7608 | 100.282 | Interface Solo x GMB Lisa | 3 | 12 | 0.55735 | 10.7476 | 56.9525 | 20.5029 | 36.4496 |
| 6 | 1.7608 | 101.424 | Interface Solo x GMB Lisa | 3 | 12 | 0.561925 | 10.8358 | 57.6011 | 20.7364 | 36.8647 |
| 7 | 1.7608 | 111.897 | Interface Solo x GMB Lisa | 3 | 12 | 0.603884 | 11.6449 | 63.549 | 22.8776 | 40.6714 |
| 8 | 1.7608 | 115.168 | Interface Solo x GMB Lisa | 3 | 12 | 0.61699 | 11.8977 | 65.4066 | 23.5464 | 41.8602 |
| 9 | 1.7608 | 111.26 | Interface Solo x GMB Lisa | 3 | 12 | 0.601333 | 11.5958 | 63.1872 | 22.7474 | 40.4398 |
| 10 | 1.7608 | 109.295 | Interface Solo x GMB Lisa | 3 | 12 | 0.593459 | 11.4439 | 62.0712 | 22.3456 | 39.7256 |
| 11 | 1.7608 | 112.179 | Interface Solo x GMB Lisa | 3 | 12 | 0.605016 | 11.6668 | 63.7091 | 22.9353 | 40.7738 |
| 12 | 1.7608 | 111.146 | Interface Solo x GMB Lisa | 3 | 12 | 0.600874 | 11.5869 | 63.1224 | 22.724 | 40.3984 |
| 13 | 1.7608 | 108.877 | Interface Solo x GMB Lisa | 3 | 12 | 0.591787 | 11.4117 | 61.8338 | 22.2603 | 39.5735 |
| 14 | 1.7608 | 108.014 | Interface Solo x GMB Lisa | 3 | 12 | 0.588329 | 11.345 | 61.3437 | 22.0838 | 39.2599 |
| 15 | 1.7608 | 107.368 | Interface Solo x GMB Lisa | 3 | 12 | 0.585741 | 11.2951 | 60.9768 | 21.9517 | 39.0251 |
| 16 | 1.7608 | 106.728 | Interface Solo x GMB Lisa | 3 | 12 | 0.583175 | 11.2456 | 60.6134 | 21.8208 | 38.7926 |
| 17 | 1.7608 | 105.698 | Interface Solo x GMB Lisa | 3 | 12 | 0.579051 | 11.1661 | 60.0284 | 21.6103 | 38.4181 |
| 18 | 1.7608 | 103.107 | Interface Solo x GMB Lisa | 3 | 12 | 0.56867 | 10.9659 | 58.5569 | 21.0806 | 37.4763 |
| 19 | 1.7608 | 101.776 | Interface Solo x GMB Lisa | 3 | 12 | 0.563336 | 10.863 | 57.801 | 20.8084 | 36.9926 |
| 20 | 1.72471 | 91.2498 | Interface Solo x GMB Lisa | 3 | 12 | 0.524891 | 10.1217 | 52.5514 | 19.0467 | 33.5047 |
| 21 | 1.72471 | 75.6676 | Interface Solo x GMB Lisa | 3 | 12 | 0.461628 | 8.90175 | 43.5598 | 15.7942 | 27.7656 |
| 22 | 1.72471 | 59.3765 | Interface Solo x GMB Lisa | 3 | 12 | 0.395487 | 7.62633 | 34.1589 | 12.3937 | 21.7652 |
| 23 | 1.72471 | 42.7461 | Interface Solo x GMB Lisa | 3 | 12 | 0.327968 | 6.32434 | 24.5622 | 8.92244 | 15.6398 |
| 24 | 1.72471 | 26.0259 | Interface Solo x GMB Lisa | 3 | 12 | 0.260084 | 5.01531 | 14.9137 | 5.43241 | 9.4813 |
| 25 | 1.72471 | 9.24361 | Interface Solo x GMB Lisa | 3 | 12 | 0.191949 | 3.70143 | 5.22941 | 1.92943 | 3.29998 |

Global Minimum Query (janbu simplified) - Safety Factor: 18.114

| | | | | | Base | | | Base | | Effective |
|--|--|--|--|--|------|--|--|------|--|-----------|
|--|--|--|--|--|------|--|--|------|--|-----------|

| Slice Number | Width [m] | Weight [kN] | Base Material | Cohesion [kPa] | Friction Angle [degrees] | Stress [kPa] | Strength [kPa] | Normal Stress [kPa] | Pressure [kPa] | Normal Stress [kPa] |
|--------------|-----------|-------------|---------------------------|----------------|--------------------------|--------------|----------------|---------------------|----------------|---------------------|
| 1 | 1.65344 | 17.7095 | Resíduos | 18.2 | 28 | 1.24422 | 22.5379 | 12.0142 | 3.85585 | 8.15834 |
| 2 | 1.65344 | 52.6893 | Resíduos | 18.2 | 28 | 1.65427 | 29.9655 | 33.5996 | 11.472 | 22.1276 |
| 3 | 1.65344 | 79.8484 | Resíduos | 18.2 | 28 | 1.97264 | 35.7324 | 50.3591 | 17.3853 | 32.9738 |
| 4 | 0.163226 | 9.08519 | Interface Solo x GMB Lisa | 3 | 12 | 0.59089 | 10.7034 | 56.2794 | 20.0377 | 36.2417 |
| 5 | 1.7608 | 100.282 | Interface Solo x GMB Lisa | 3 | 12 | 0.593331 | 10.7476 | 56.9525 | 20.5029 | 36.4496 |
| 6 | 1.7608 | 101.424 | Interface Solo x GMB Lisa | 3 | 12 | 0.598201 | 10.8358 | 57.6011 | 20.7364 | 36.8647 |
| 7 | 1.7608 | 111.897 | Interface Solo x GMB Lisa | 3 | 12 | 0.64287 | 11.6449 | 63.549 | 22.8776 | 40.6714 |
| 8 | 1.7608 | 115.168 | Interface Solo x GMB Lisa | 3 | 12 | 0.656821 | 11.8977 | 65.4066 | 23.5464 | 41.8602 |
| 9 | 1.7608 | 111.26 | Interface Solo x GMB Lisa | 3 | 12 | 0.640154 | 11.5958 | 63.1872 | 22.7474 | 40.4398 |
| 10 | 1.7608 | 109.295 | Interface Solo x GMB Lisa | 3 | 12 | 0.631772 | 11.4439 | 62.0712 | 22.3456 | 39.7256 |
| 11 | 1.7608 | 112.179 | Interface Solo x GMB Lisa | 3 | 12 | 0.644074 | 11.6668 | 63.7091 | 22.9353 | 40.7738 |
| 12 | 1.7608 | 111.146 | Interface Solo x GMB Lisa | 3 | 12 | 0.639665 | 11.5869 | 63.1224 | 22.724 | 40.3984 |
| 13 | 1.7608 | 108.877 | Interface Solo x GMB Lisa | 3 | 12 | 0.629992 | 11.4117 | 61.8338 | 22.2603 | 39.5735 |
| 14 | 1.7608 | 108.014 | Interface Solo x GMB Lisa | 3 | 12 | 0.62631 | 11.345 | 61.3437 | 22.0838 | 39.2599 |
| 15 | 1.7608 | 107.368 | Interface Solo x GMB Lisa | 3 | 12 | 0.623555 | 11.2951 | 60.9768 | 21.9517 | 39.0251 |
| 16 | 1.7608 | 106.728 | Interface Solo x GMB Lisa | 3 | 12 | 0.620823 | 11.2456 | 60.6134 | 21.8208 | 38.7926 |
| 17 | 1.7608 | 105.698 | Interface Solo x GMB Lisa | 3 | 12 | 0.616433 | 11.1661 | 60.0284 | 21.6103 | 38.4181 |
| 18 | 1.7608 | 103.107 | Interface Solo x GMB Lisa | 3 | 12 | 0.605382 | 10.9659 | 58.5569 | 21.0806 | 37.4763 |
| 19 | 1.7608 | 101.776 | Interface Solo x GMB Lisa | 3 | 12 | 0.599704 | 10.863 | 57.801 | 20.8084 | 36.9926 |
| 20 | 1.72471 | 91.2498 | Interface Solo x GMB Lisa | 3 | 12 | 0.558509 | 10.1168 | 52.5288 | 19.0467 | 33.4821 |
| 21 | 1.72471 | 75.6676 | Interface Solo x GMB Lisa | 3 | 12 | 0.491194 | 8.89749 | 43.5397 | 15.7942 | 27.7455 |
| 22 | 1.72471 | 59.3765 | Interface Solo x GMB Lisa | 3 | 12 | 0.420817 | 7.62268 | 34.1417 | 12.3937 | 21.748 |
| 23 | 1.72471 | 42.7461 | Interface Solo x GMB Lisa | 3 | 12 | 0.348974 | 6.32131 | 24.548 | 8.92244 | 15.6255 |
| 24 | 1.72471 | 26.0259 | Interface Solo x GMB Lisa | 3 | 12 | 0.276742 | 5.01291 | 14.9024 | 5.43241 | 9.47002 |
| 25 | 1.72471 | 9.24361 | Interface Solo x GMB Lisa | 3 | 12 | 0.204243 | 3.69966 | 5.22106 | 1.92943 | 3.29163 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 19.2834

| Slice | X coordinate | Y coordinate - Bottom | Interslice Normal Force | Interslice Shear Force | Interslice Force Angle |
|-------|--------------|-----------------------|-------------------------|------------------------|------------------------|
| | | | | | |

| | [m] | [m] | [kN] | [kN] | [degrees] |
|----|---------|---------|---------|------|-----------|
| 1 | 109.155 | 292.997 | 0 | 0 | 0 |
| 2 | 110.809 | 291.264 | 22.5985 | 0 | 0 |
| 3 | 112.462 | 289.532 | 83.1762 | 0 | 0 |
| 4 | 114.116 | 287.8 | 173.242 | 0 | 0 |
| 5 | 114.279 | 287.629 | 182.949 | 0 | 0 |
| 6 | 116.04 | 287.629 | 183.931 | 0 | 0 |
| 7 | 117.801 | 287.629 | 184.92 | 0 | 0 |
| 8 | 119.561 | 287.629 | 185.983 | 0 | 0 |
| 9 | 121.322 | 287.629 | 187.07 | 0 | 0 |
| 10 | 123.083 | 287.629 | 188.129 | 0 | 0 |
| 11 | 124.844 | 287.629 | 189.174 | 0 | 0 |
| 12 | 126.605 | 287.629 | 190.239 | 0 | 0 |
| 13 | 128.365 | 287.629 | 191.297 | 0 | 0 |
| 14 | 130.126 | 287.629 | 192.339 | 0 | 0 |
| 15 | 131.887 | 287.629 | 193.375 | 0 | 0 |
| 16 | 133.648 | 287.629 | 194.406 | 0 | 0 |
| 17 | 135.409 | 287.629 | 195.433 | 0 | 0 |
| 18 | 137.169 | 287.629 | 196.453 | 0 | 0 |
| 19 | 138.93 | 287.629 | 197.454 | 0 | 0 |
| 20 | 140.691 | 287.629 | 198.446 | 0 | 0 |
| 21 | 142.416 | 288.798 | 137.905 | 0 | 0 |
| 22 | 144.14 | 289.968 | 87.7683 | 0 | 0 |
| 23 | 145.865 | 291.137 | 48.5099 | 0 | 0 |
| 24 | 147.59 | 292.306 | 20.356 | 0 | 0 |
| 25 | 149.315 | 293.475 | 3.36658 | 0 | 0 |
| 26 | 151.039 | 294.645 | 0 | 0 | 0 |

Global Minimum Query (janbu simplified) - Safety Factor: 18.114

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| 1 | 109.155 | 292.997 | 0 | 0 | 0 |
| 2 | 110.809 | 291.264 | 22.868 | 0 | 0 |
| 3 | 112.462 | 289.532 | 83.804 | 0 | 0 |
| 4 | 114.116 | 287.8 | 174.297 | 0 | 0 |
| 5 | 114.279 | 287.629 | 184.017 | 0 | 0 |
| 6 | 116.04 | 287.629 | 185.062 | 0 | 0 |
| 7 | 117.801 | 287.629 | 186.115 | 0 | 0 |
| 8 | 119.561 | 287.629 | 187.247 | 0 | 0 |
| 9 | 121.322 | 287.629 | 188.403 | 0 | 0 |
| 10 | 123.083 | 287.629 | 189.531 | 0 | 0 |
| 11 | 124.844 | 287.629 | 190.643 | 0 | 0 |
| 12 | 126.605 | 287.629 | 191.777 | 0 | 0 |
| 13 | 128.365 | 287.629 | 192.903 | 0 | 0 |
| 14 | 130.126 | 287.629 | 194.013 | 0 | 0 |
| 15 | 131.887 | 287.629 | 195.116 | 0 | 0 |
| 16 | 133.648 | 287.629 | 196.214 | 0 | 0 |
| 17 | 135.409 | 287.629 | 197.307 | 0 | 0 |
| 18 | 137.169 | 287.629 | 198.392 | 0 | 0 |
| 19 | 138.93 | 287.629 | 199.458 | 0 | 0 |
| 20 | 140.691 | 287.629 | 200.514 | 0 | 0 |
| 21 | 142.416 | 288.798 | 140.058 | 0 | 0 |

| | | | | | |
|----|---------|---------|---------|---|---|
| 22 | 144.14 | 289.968 | 89.9956 | 0 | 0 |
| 23 | 145.865 | 291.137 | 50.801 | 0 | 0 |
| 24 | 147.59 | 292.306 | 22.7 | 0 | 0 |
| 25 | 149.315 | 293.475 | 5.7525 | 0 | 0 |
| 26 | 151.039 | 294.645 | 0 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 109.155 | 292.997 |
| 114.279 | 287.629 |
| 140.691 | 287.629 |
| 151.039 | 294.645 |

External Boundary

| X | Y |
|---------|---------|
| 154.284 | 295.42 |
| 153.871 | 295.151 |
| 153.191 | 294.677 |
| 152.767 | 294.431 |
| 151.261 | 294.617 |
| 150.809 | 294.673 |
| 150.446 | 294.718 |
| 144.584 | 295.451 |
| 144.372 | 295.429 |
| 144.264 | 295.459 |
| 143.934 | 295.527 |
| 139.319 | 295.848 |
| 137.351 | 295.959 |
| 136.376 | 296.16 |
| 135 | 296.201 |
| 130.336 | 296.338 |
| 130.1 | 296.354 |
| 129.358 | 296.358 |
| 125.854 | 296.761 |
| 124.635 | 296.402 |
| 122.832 | 296.448 |
| 122.138 | 296.602 |
| 119.221 | 297.114 |
| 119.01 | 296.908 |
| 117.575 | 295.802 |
| 115.197 | 295.7 |
| 112.368 | 295.5 |
| 111.008 | 294.485 |
| 108.933 | 292.818 |
| 105.775 | 293.481 |
| 105.625 | 293.511 |
| 105.587 | 293.518 |
| 105.464 | 293.425 |

| | |
|---------|---------|
| 105.411 | 293.372 |
| 104.883 | 292.972 |
| 99.2639 | 288.519 |
| 98.8636 | 288.002 |
| 98.395 | 287.5 |
| 97.9688 | 287.043 |
| 96.5501 | 287.22 |
| 94.8124 | 287.374 |
| 94.1691 | 287.402 |
| 92.406 | 287.608 |
| 92.406 | 280 |
| 154.579 | 280 |
| 154.579 | 295.573 |

Material Boundary

| X | Y |
|---------|---------|
| 98.395 | 287.5 |
| 114.252 | 287.5 |
| 135 | 287.5 |
| 140.762 | 287.5 |
| 151.261 | 294.617 |

Material Boundary

| X | Y |
|---------|---------|
| 108.933 | 292.818 |
| 113.952 | 287.8 |
| 114.252 | 287.5 |

Material Boundary

| X | Y |
|---------|---------|
| 113.952 | 287.8 |
| 135 | 287.8 |
| 135 | 287.8 |
| 135 | 287.8 |
| 140.67 | 287.8 |
| 150.809 | 294.673 |

Project Summary

File Name: Section.02.slim
Slide Modeler Version: 6.032
Project Title: SLIDE - An Interactive Slope Stability Program
Date Created: 20/05/2020, 13:33:36

General Settings

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

Analysis Options

Analysis Methods Used

Bishop 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: Non-Circular Block Search
Number of Surfaces: 5000
Pseudo-Random Surfaces: Enabled
Convex Surfaces Only: Disabled
Left Projection Angle (Start Angle): 135
Left Projection Angle (End Angle): 135
Right Projection Angle (Start Angle): 45
Right Projection Angle (End Angle): 45
Minimum Elevation: Not Defined
Minimum Depth: Not Defined

Material Properties

| Property | Resíduos | Dique de solo compactado | Solo Natural | Material de enchente | Interface Solo x GMB Lisa |
|----------------------------------|---|---|---|---|---|
| Color |  |  |  |  |  |
| Strength Type | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb | Mohr-Coulomb |
| Unit Weight [kN/m ³] | 7 | 19 | 18 | 5 | 10 |
| Cohesion [kPa] | 18.2 | 20 | 18 | 10 | 3 |
| Friction Angle [deg] | 28 | 30 | 32 | 20 | 12 |
| Water Surface | None | None | None | None | None |
| Ru Value | 0.42 | 0 | 0 | 0.42 | 0.42 |

Support Properties

Support 1

Support Type: End Anchored
 Force Application: Active
 Out-of-Plane Spacing: 1 m
 Anchor Capacity: 100 kN

Global Minimums

Method: bishop simplified

FS: 1.202970
 Axis Location: 176.169, 410.194
 Left Slip Surface Endpoint: 109.470, 324.994
 Right Slip Surface Endpoint: 204.309, 305.714
 Resisting Moment=193335 kN-m
 Driving Moment=160714 kN-m
 Total Slice Area=1350.5 m²

Global Minimum Coordinates

Method: bishop simplified

| X | Y |
|---------|---------|
| 109.47 | 324.994 |
| 120.173 | 315.158 |
| 148.431 | 300.149 |
| 199.782 | 300.149 |
| 204.309 | 305.714 |

Slice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.20297

| 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 | 3.5677 | 41.9769 | Interface Solo x GMB Lisa | 3 | 12 | 3.18312 | 3.82919 | 8.84267 | 4.94164 | 3.90103 |
| 2 | 3.5677 | 121.769 | Interface Solo x GMB Lisa | 3 | 12 | 5.15517 | 6.20151 | 29.3969 | 14.335 | 15.0619 |
| 3 | 3.5677 | 191.455 | Interface Solo x GMB Lisa | 3 | 12 | 6.87742 | 8.27333 | 47.3477 | 22.5386 | 24.8091 |
| 4 | 4.03686 | 284.851 | Interface Solo x GMB Lisa | 3 | 12 | 8.89138 | 10.6961 | 65.8435 | 29.6363 | 36.2072 |
| 5 | 4.03686 | 342.398 | Interface Solo x GMB Lisa | 3 | 12 | 10.227 | 12.3028 | 79.3899 | 35.6236 | 43.7663 |
| 6 | 4.03686 | 399.967 | Interface Solo x GMB Lisa | 3 | 12 | 11.5632 | 13.9102 | 92.9413 | 41.6131 | 51.3282 |
| 7 | 4.03686 | 457.535 | Interface Solo x GMB Lisa | 3 | 12 | 12.8993 | 15.5175 | 106.493 | 47.6025 | 58.8905 |
| 8 | 4.03686 | 515.103 | Interface Solo x GMB Lisa | 3 | 12 | 14.2355 | 17.1249 | 120.044 | 53.592 | 66.4525 |
| 9 | 4.03686 | 572.672 | Interface Solo x GMB Lisa | 3 | 12 | 15.5716 | 18.7322 | 133.596 | 59.5815 | 74.0144 |
| 10 | 4.03686 | 636.409 | Interface Solo x GMB Lisa | 3 | 12 | 17.051 | 20.5119 | 148.6 | 66.2129 | 82.3867 |
| 11 | 3.95008 | 646.074 | Interface Solo x GMB Lisa | 3 | 12 | 19.2558 | 23.1641 | 163.56 | 68.6951 | 94.8648 |
| 12 | 3.95008 | 616.14 | Interface Solo x GMB Lisa | 3 | 12 | 18.4792 | 22.2299 | 155.982 | 65.5123 | 90.4695 |
| 13 | 3.95008 | 568.703 | Interface Solo x GMB Lisa | 3 | 12 | 17.2484 | 20.7493 | 143.973 | 60.4685 | 83.5041 |
| 14 | 3.95008 | 535.273 | Interface Solo x GMB Lisa | 3 | 12 | 16.3811 | 19.706 | 135.51 | 56.914 | 78.5955 |
| 15 | 3.95008 | 493.194 | Interface Solo x GMB Lisa | 3 | 12 | 15.2894 | 18.3927 | 124.857 | 52.4398 | 72.417 |
| 16 | 3.95008 | 476.344 | Interface Solo x GMB Lisa | 3 | 12 | 14.8522 | 17.8668 | 120.591 | 50.6482 | 69.9429 |
| 17 | 3.95008 | 453.773 | Interface Solo x GMB Lisa | 3 | 12 | 14.2666 | 17.1623 | 114.877 | 48.2483 | 66.6287 |
| 18 | 3.95008 | 408.467 | Interface Solo x GMB Lisa | 3 | 12 | 13.0912 | 15.7483 | 103.407 | 43.431 | 59.9764 |
| 19 | 3.95008 | 372.875 | Interface Solo x GMB Lisa | 3 | 12 | 12.1678 | 14.6375 | 94.3969 | 39.6467 | 54.7502 |
| 20 | 3.95008 | 340.744 | Interface Solo x GMB Lisa | 3 | 12 | 11.3342 | 13.6347 | 86.2626 | 36.2303 | 50.0323 |
| 21 | 3.95008 | 297.518 | Interface Solo x GMB Lisa | 3 | 12 | 10.2127 | 12.2856 | 75.3195 | 31.6342 | 43.6853 |
| 22 | 3.95008 | 275.339 | Interface Solo x GMB Lisa | 3 | 12 | 9.63731 | 11.5934 | 69.7047 | 29.276 | 40.4287 |
| 23 | 3.95008 | 223.781 | Interface Solo x GMB Lisa | 3 | 12 | 8.29967 | 9.98425 | 56.6523 | 23.7939 | 32.8584 |
| 24 | 0.126642 | 6.36618 | Interface Solo x GMB Lisa | 3 | 12 | 9.76508 | 11.7471 | 62.2647 | 21.1131 | 41.1516 |
| 25 | 4.40063 | 106.513 | Resíduos | 18.2 | 28 | 46.6792 | 56.1537 | 81.5464 | 10.1657 | 71.3807 |

Interslice Data

Global Minimum Query (bishop simplified) - Safety Factor: 1.20297

| Slice Number | X coordinate [m] | Y coordinate - Bottom [m] | Interslice Normal Force [kN] | Interslice Shear Force [kN] | Interslice Force Angle [degrees] |
|--------------|------------------|---------------------------|------------------------------|-----------------------------|----------------------------------|
| | | | | | |

| | | | | |
|----|---------|---------|---------|---|
| 1 | 109.47 | 324.994 | 0 | 0 |
| 2 | 113.038 | 321.715 | 17.6437 | 0 |
| 3 | 116.605 | 318.437 | 95.6469 | 0 |
| 4 | 120.173 | 315.158 | 226.364 | 0 |
| 5 | 124.21 | 313.014 | 331.674 | 0 |
| 6 | 128.247 | 310.87 | 460.642 | 0 |
| 7 | 132.284 | 308.726 | 613.276 | 0 |
| 8 | 136.32 | 306.581 | 789.577 | 0 |
| 9 | 140.357 | 304.437 | 989.544 | 0 |
| 10 | 144.394 | 302.293 | 1213.18 | 0 |
| 11 | 148.431 | 300.149 | 1463.01 | 0 |
| 12 | 152.381 | 300.149 | 1387.01 | 0 |
| 13 | 156.331 | 300.149 | 1314.06 | 0 |
| 14 | 160.281 | 300.149 | 1245.98 | 0 |
| 15 | 164.231 | 300.149 | 1181.32 | 0 |
| 16 | 168.181 | 300.149 | 1120.97 | 0 |
| 17 | 172.131 | 300.149 | 1062.34 | 0 |
| 18 | 176.082 | 300.149 | 1006.03 | 0 |
| 19 | 180.032 | 300.149 | 954.356 | 0 |
| 20 | 183.982 | 300.149 | 906.326 | 0 |
| 21 | 187.932 | 300.149 | 861.587 | 0 |
| 22 | 191.882 | 300.149 | 821.275 | 0 |
| 23 | 195.832 | 300.149 | 783.234 | 0 |
| 24 | 199.782 | 300.149 | 750.474 | 0 |
| 25 | 199.909 | 300.305 | 739.544 | 0 |
| 26 | 204.309 | 305.714 | 0 | 0 |

List Of Coordinates

Non-Circular Failure Surface

| X | Y |
|---------|---------|
| 109.47 | 324.994 |
| 120.173 | 315.158 |
| 148.431 | 300.149 |
| 199.782 | 300.149 |
| 204.309 | 305.714 |

External Boundary

| X | Y |
|---------|-----|
| 782.638 | 413 |
| 774.228 | 412 |
| 768.818 | 411 |
| 763.41 | 410 |
| 757.942 | 409 |
| 752.475 | 408 |
| 748.689 | 407 |
| 745.433 | 406 |
| 742.172 | 405 |
| 738.895 | 404 |
| 735.613 | 403 |

| | |
|---------|-----|
| 732.302 | 402 |
| 729.011 | 401 |
| 725.82 | 400 |
| 722.75 | 399 |
| 719.774 | 398 |
| 717.169 | 397 |
| 714.672 | 396 |
| 712.196 | 395 |
| 709.754 | 394 |
| 707.345 | 393 |
| 704.951 | 392 |
| 702.574 | 391 |
| 700.204 | 390 |
| 697.836 | 389 |
| 695.47 | 388 |
| 693.105 | 387 |
| 690.742 | 386 |
| 688.379 | 385 |
| 686.055 | 384 |
| 683.891 | 383 |
| 681.73 | 382 |
| 679.571 | 381 |
| 677.419 | 380 |
| 675.275 | 379 |
| 673.135 | 378 |
| 671.005 | 377 |
| 668.877 | 376 |
| 666.75 | 375 |
| 664.624 | 374 |
| 662.659 | 373 |
| 660.814 | 372 |
| 658.968 | 371 |
| 657.12 | 370 |
| 655.271 | 369 |
| 653.419 | 368 |
| 651.566 | 367 |
| 649.71 | 366 |
| 647.85 | 365 |
| 645.988 | 364 |
| 644.111 | 363 |
| 642.219 | 362 |
| 640.317 | 361 |
| 638.404 | 360 |
| 636.48 | 359 |
| 634.549 | 358 |
| 632.801 | 357 |
| 631.153 | 356 |
| 629.507 | 355 |
| 627.865 | 354 |
| 626.228 | 353 |
| 624.586 | 352 |
| 622.925 | 351 |

| | |
|---------|-----|
| 621.284 | 350 |
| 619.54 | 349 |
| 617.993 | 348 |
| 616.456 | 347 |
| 614.925 | 346 |
| 613.404 | 345 |
| 611.895 | 344 |
| 610.391 | 343 |
| 608.891 | 342 |
| 607.394 | 341 |
| 605.9 | 340 |
| 604.408 | 339 |
| 602.917 | 338 |
| 601.429 | 337 |
| 599.939 | 336 |
| 598.444 | 335 |
| 596.95 | 334 |
| 595.455 | 333 |
| 593.961 | 332 |
| 592.563 | 331 |
| 591.17 | 330 |
| 589.805 | 329 |
| 588.505 | 328 |
| 587.254 | 327 |
| 586.007 | 326 |
| 584.732 | 325 |
| 583.34 | 324 |
| 581.87 | 323 |
| 580.369 | 322 |
| 578.823 | 321 |
| 577.275 | 320 |
| 575.722 | 319 |
| 574.166 | 318 |
| 572.608 | 317 |
| 571.049 | 316 |
| 569.478 | 315 |
| 567.797 | 314 |
| 565.646 | 313 |
| 563.386 | 312 |
| 559.859 | 311 |
| 556.131 | 310 |
| 552.436 | 309 |
| 519.816 | 308 |
| 511.336 | 307 |
| 508.961 | 306 |
| 506.633 | 305 |
| 504.306 | 304 |
| 501.98 | 303 |
| 499.635 | 302 |
| 497.252 | 301 |
| 494.875 | 300 |
| 492.482 | 299 |

| | |
|---------|-----|
| 490.069 | 298 |
| 487.637 | 297 |
| 485.197 | 296 |
| 482.72 | 295 |
| 480.205 | 294 |
| 477.814 | 293 |
| 475.464 | 292 |
| 473.154 | 291 |
| 470.831 | 290 |
| 468.526 | 289 |
| 466.243 | 288 |
| 463.983 | 287 |
| 461.72 | 286 |
| 459.303 | 285 |
| 456.854 | 284 |
| 454.196 | 283 |
| 450.723 | 282 |
| 445.815 | 281 |
| 439.487 | 280 |
| 432.347 | 279 |
| 409.664 | 279 |
| 328.784 | 279 |
| 311.797 | 278 |
| 303.693 | 277 |
| 282.307 | 277 |
| 280.297 | 278 |
| 278.045 | 279 |
| 275.69 | 280 |
| 273.334 | 281 |
| 270.928 | 282 |
| 268.165 | 283 |
| 265.513 | 284 |
| 262.855 | 285 |
| 260.203 | 286 |
| 256.943 | 287 |
| 251.485 | 288 |
| 246.994 | 289 |
| 242.766 | 290 |
| 239.137 | 291 |
| 234.481 | 292 |
| 230.238 | 293 |
| 227.955 | 294 |
| 220.83 | 295 |
| 219.732 | 296 |
| 218.569 | 297 |
| 217.344 | 298 |
| 215.981 | 299 |
| 214.627 | 300 |
| 213.282 | 301 |
| 211.944 | 302 |
| 210.612 | 303 |
| 209.286 | 304 |

| | |
|---------|---------|
| 207.962 | 305 |
| 204.567 | 305.664 |
| 202.849 | 306 |
| 201.08 | 307 |
| 197.79 | 308 |
| 196.338 | 309 |
| 194.555 | 310 |
| 188.827 | 311 |
| 186.814 | 312 |
| 184.841 | 313 |
| 179.864 | 314 |
| 177.68 | 315 |
| 175.846 | 316 |
| 172.353 | 317 |
| 165.302 | 318 |
| 163.222 | 319 |
| 161.155 | 320 |
| 156.732 | 321 |
| 155.078 | 322 |
| 153.384 | 323 |
| 146.762 | 324 |
| 132.115 | 324.39 |
| 109.7 | 324.988 |
| 109.242 | 325 |
| 107.125 | 326 |
| 105.01 | 327 |
| 102.897 | 328 |
| 100.786 | 329 |
| 98.677 | 330 |
| 96.5696 | 331 |
| 94.4642 | 332 |
| 92.3606 | 333 |
| 90.2589 | 334 |
| 88.1573 | 335 |
| 86.0574 | 336 |
| 83.9621 | 337 |
| 82.1485 | 338 |
| 81.0059 | 339 |
| 79.8673 | 340 |
| 78.7243 | 341 |
| 77.5786 | 342 |
| 76.4329 | 343 |
| 75.2871 | 344 |
| 74.1866 | 345 |
| 71.682 | 346 |
| 66.5595 | 347 |
| 64.7442 | 348 |
| 62.9245 | 349 |
| 61.1102 | 350 |
| 59.2778 | 351 |
| 57.1988 | 352 |
| 54.6474 | 353 |

| | |
|--------------|---------|
| 44.9562 | 354 |
| 40.0373 | 355 |
| 3.6e-015 | 363.14 |
| 7.10543e-015 | 340.34 |
| 0 | 256.21 |
| 783.842 | 256.21 |
| 783.842 | 413.143 |

Material Boundary

| X | Y |
|--------------|---------|
| 7.10543e-015 | 340.34 |
| 42.3503 | 340 |
| 69.287 | 320 |
| 80.4093 | 320 |
| 109.181 | 315 |
| 120.191 | 315 |
| 148.453 | 300 |
| 199.81 | 300 |
| 200.069 | 300.308 |
| 204.567 | 305.664 |

Material Boundary

| X | Y |
|--------|-----|
| 199.81 | 300 |
| 220.83 | 295 |

Material Boundary

| X | Y |
|---------|-----|
| 109.242 | 325 |
| 120.191 | 315 |

Material Boundary

| X | Y |
|---------|---------|
| 146.585 | 319.981 |
| 146.409 | 320.008 |
| 117.665 | 320.774 |
| 117.665 | 322.775 |
| 146.585 | 322.004 |
| 146.585 | 319.981 |

Material Boundary

| X | Y |
|---------|---------|
| 109.7 | 324.988 |
| 120.365 | 315.247 |
| 148.528 | 300.3 |
| 199.671 | 300.3 |
| 200.069 | 300.308 |

Anexo VI - Relatório Fotográfico



Foto 1. Vista frontal do Aterro Sanitário de Muriaé/MG.



Foto 2. Outra vista frontal do Aterro Sanitário de Muriaé/MG.



Foto 3. Outra vista frontal do Aterro Sanitário de Muriaé/MG.



Foto 4. Área de surgimento das trincas.



Foto 5. Dreno de biogás comprometido.



Foto 6. Outro dreno de biogás comprometido.



Foto 7. Instalação do piezômetro tipo Geotech.



Foto 8. Piezômetro tipo Geotech instalado.



Foto 9. Marco superficial instalado.



Foto 10. Pé do talude com presença de afloramento de chorume – trecho em manutenção, com instalação de drenos de lixiviados executados com bambu.



Foto 11. Afloramento de chorume no pé do talude.



Foto 12. Resíduos domiciliares dispostos sem cobertura.



Foto 13. Drenagem pluvial assoreada.



Foto 14. Treinamento para realização de leitura de piezômetro tipo Geotech

Anexo VII - Anotação de Responsabilidade Técnica - ART



Anotação de Responsabilidade Técnica - ART
Lei nº 6.496, de 7 de dezembro de 1977

Conselho Regional de Engenharia e Agronomia do Estado de São Paulo

CREA-SP

ART de Obra ou Serviço
28027230200558774

1. Responsável Técnico

MARCELO BENVENUTO

Título Profissional: Engenheiro Civil

RNP: 2613129417

Registro: 5069305675-SP

Empresa Contratada: **GEOTECH - GEOTECNIA AMBIENTAL CONSULTORIA E PROJS
LTDA**

Registro: 0489910-SP

2. Dados do Contrato

Contratante: **DEMSUR - DEPARTAMENTO**

CPF/CNPJ: 02.318.396/0001-45

Endereço: **Avenida MAESTRO SANSÃO**

Nº: 236

Complemento: **2º ANDAR**

Bairro: **CENTRO**

Cidade: **Muriae**

UF: **MG**

CEP: 36880-002

Contrato: **25/2020**

Celebrado em: **27/04/2020**

Vinculada à Art nº:

Valor:

Tipo de Contratante: **Pessoa Jurídica de Direito Público**

Ação Institucional:

3. Dados da Obra Serviço

Endereço: **Área RURAL**

Nº:

Complemento: **REGIÃO RETIRO FORMOSO - FAZENDA CACHOEIRA DA ENCOBERTA**

Bairro: **ÁREA RURAL DE MURIAÉ**

Cidade: **Muriae**

UF: **MG**

CEP: 36891-899

Data de Início: **20/05/2020**

Previsão de Término: **26/07/2020**

Coordenadas Geográficas:

Finalidade: **Ambiental**

Código:

Proprietário: **DEMSUR**

CPF/CNPJ: 02.318.396/0001-45

Endereço: **Rua JOÃO DA CRUZ MELÃO**

Nº: 131

Complemento:

Bairro: **JARDIM LEONOR**

Cidade: **São Paulo**

UF: **SP**

CEP: 05621-020

Data de Início: **20/05/2020**

Previsão de Término: **26/07/2020**

Coordenadas Geográficas:

Finalidade: **Ambiental**

Código:

Proprietário: **GEOTECH - GEOTECNIA AMBIENTAL CONSULTORIA E PROJETOS LTDA**

CPF/CNPJ: 01.847.195/0001-72

4. Atividade Técnica

| | | | Quantidade | Unidade |
|-------------------|----------|---------------|-----------------------------------|----------------------------|
| Elaboração | 1 | Monitoramento | Estudo Ambiental Aterro Sanitário | 52673,74000 metro quadrado |
| | | Laudo | Estabilidade | 52673,74000 metro quadrado |
| Execução | 2 | Instalação | Qualidade Ambiental | 52673,74000 metro quadrado |

Após a conclusão das atividades técnicas o profissional deverá proceder a baixa desta ART

5. Observações

ELABORAÇÃO DE PROJETO DE MONITORAMENTO GEOTÉCNICO, AQUISIÇÃO E INSTALAÇÃO DE PIEZOMETROS E MARCOS SUPERFICIAIS NO ATUAL MACIÇO DE RESÍDUOS; ELABORAÇÃO DE LAUDO DE ESTABILIDADE E DEFINIÇÃO DE PROCEDIMENTO PARA MONITORAMENTO GEOTÉCNICO PARA DESINTERDIÇÃO DA OPERAÇÃO DA DISPOSIÇÃO DE RESÍDUOS NO LOCAL E TREINAMENTO PARA A EQUIPE TÉCNICA DO DEMSUR DE LEITURAS DA INSTRUMENTAÇÃO INSTALADA E ASPECTOS DEFINIDOS NO PLANO DE MONITORAMENTO DA ESTABILIDADE GEOTÉCNICA DO ATERRO SANITÁRIO.

6. Declarações

Acessibilidade: Declaro que as regras de acessibilidade previstas nas normas técnicas da ABNT, na legislação específica e no Decreto nº 5.296, de 2 de dezembro de 2004, não se aplicam às atividades profissionais acima relacionadas.

7. Entidade de Classe

0-NÃO DESTINADA

8. Assinaturas

Declaro serem verdadeiras as informações acima

São Paulo 09 de Junho de 2020
 Local data

MARCELO BENVENUTO - CPF: 277.822.618-48

DEMSUR - DEPARTAMENTO - CPF/CNPJ: 02.318.396/0001-45

9. Informações

- A presente ART encontra-se devidamente quitada conforme dados constantes no rodapé-versão do sistema, certificada pelo *Nosso Número*.

- A autenticidade deste documento pode ser verificada no site www.creasp.org.br ou www.confex.org.br

- A guarda da via assinada da ART será de responsabilidade do profissional e do contratante com o objetivo de documentar o vínculo contratual.

www.creasp.org.br

Tel: 0800 17 18 11

E-mail: acessar link Fale Conosco do site acima



Valor ART R\$ 233,94

Registrada em: 21/05/2020

Valor Pago R\$ 233,94

Nosso Número: 28027230200558774

Versão do sistema

Impresso em: 09/06/2020 17:37:49

