Allegato 10

Analisi di stabilità del pendio

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 1 - Condizioni drenate

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

Material Properties

Material: Depositi Fluvioglaciali (Besnate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 8 kPa Friction Angle: 29 degrees

Material: Depositi Glaciali (Besnate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 16 kPa Friction Angle: 27 degrees

Global Minimums

Method: janbu corrected FS: 1.166580
Center: 80.181, 102.684 Radius: 73.090

Method: spencer FS: 1.202400
Center: 62.470, 170.012 Radius: 141.973

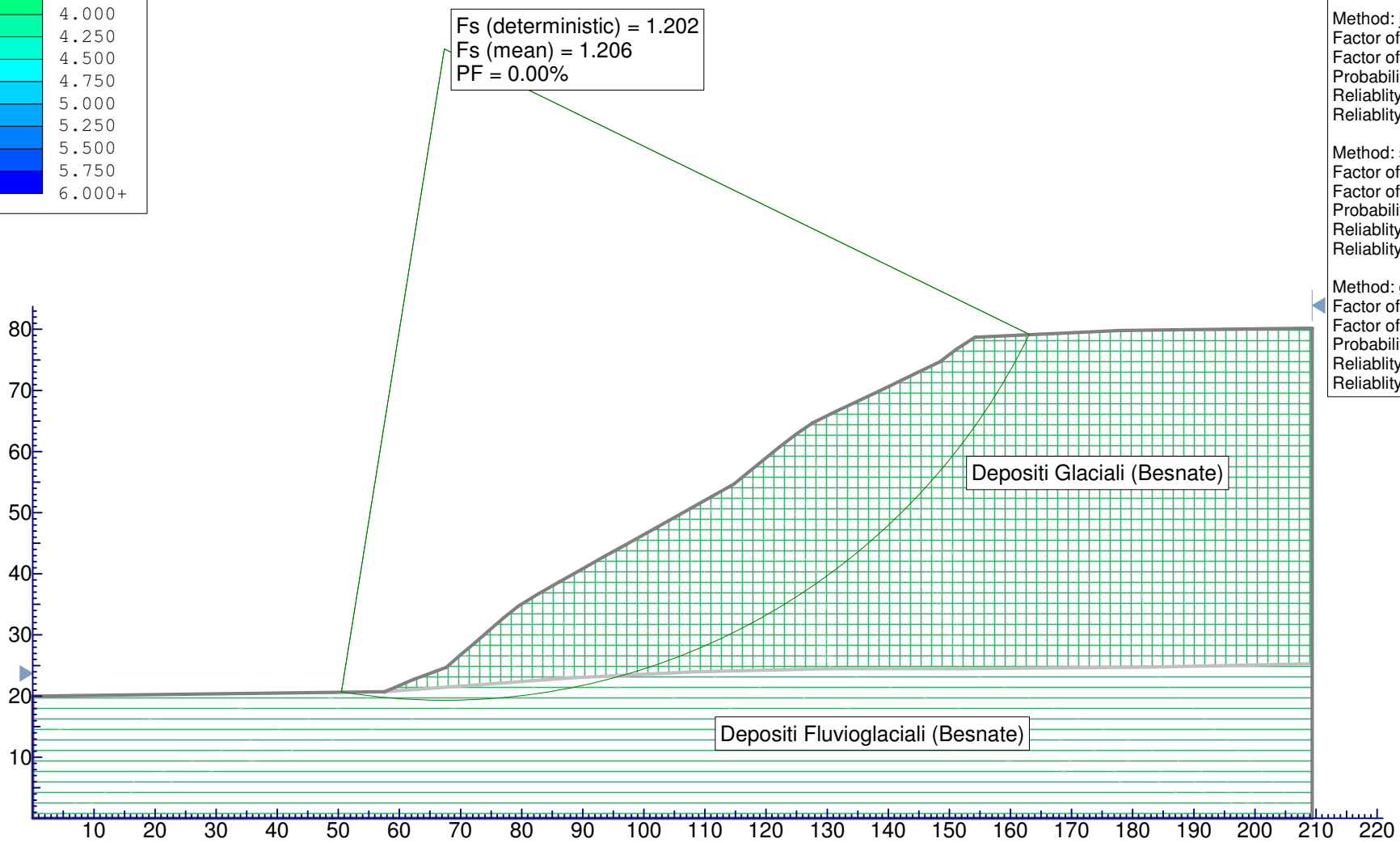
Method: gle/morgenstern-price FS: 1.202410
Center: 81.153, 135.685 Radius: 106.618

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 1.167974
Factor of Safety, standard deviation: 0.023226
Probability of Failure: 0.000%
Reliablity index: 7.23225 (normal distribution)
Reliablity index: 7.79909 (lognormal distribution)

Method: spencer
Factor of Safety, mean: 1.206553
Factor of Safety, standard deviation: 0.022471
Probability of Failure: 0.000%
Reliablity index: 9.19201 (normal distribution)
Reliablity index: 10.07355 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 1.206013
Factor of Safety, standard deviation: 0.022860
Probability of Failure: 0.000%
Reliablity index: 9.01202 (normal distribution)
Reliablity index: 9.87384 (lognormal distribution)



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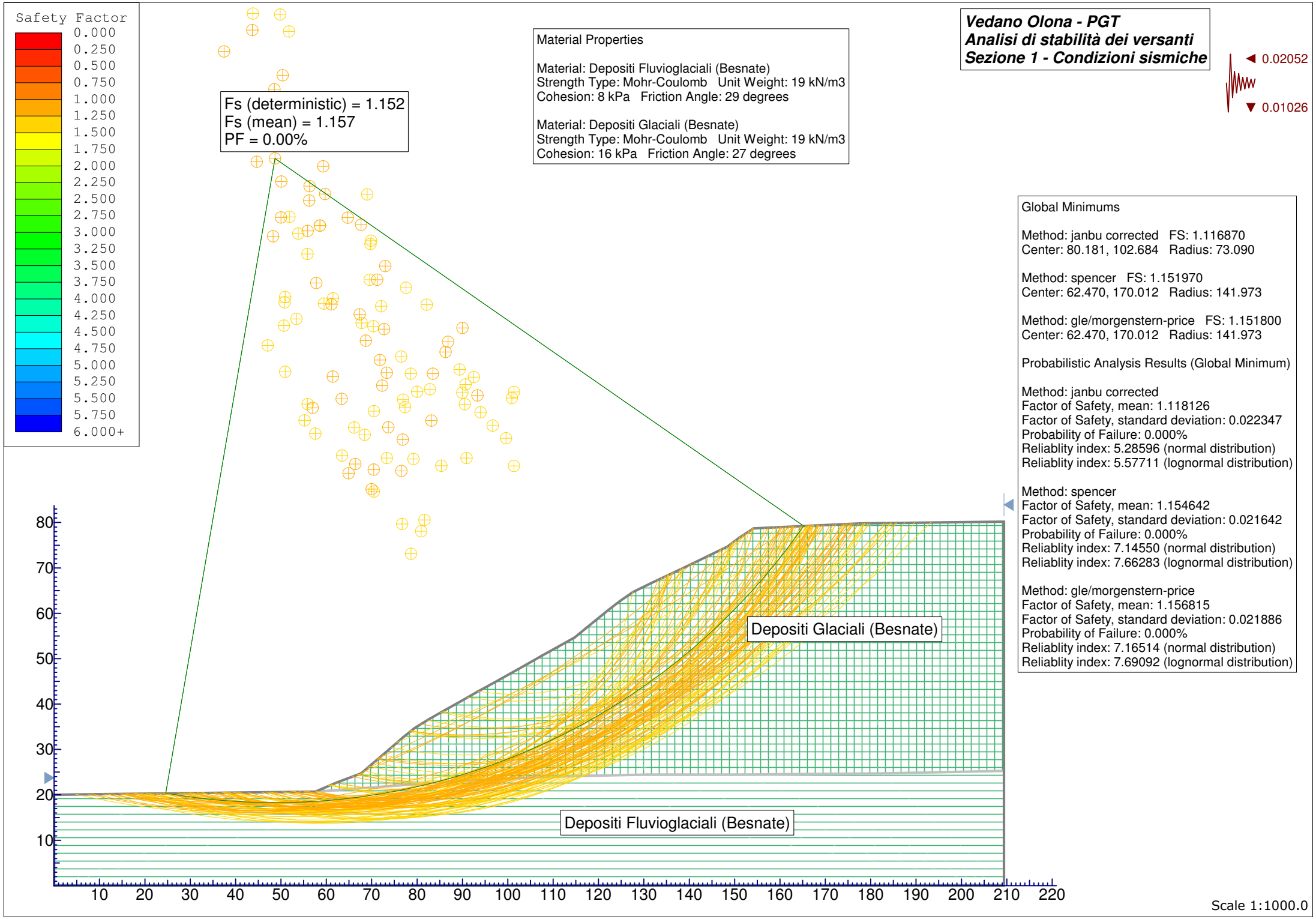

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 1 - Condizioni sismiche
Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+
Fs (deterministic) = 1.152
Fs (mean) = 1.157
PF = 0.00%
Material Properties
Material: Depositi Fluvioglaciali (Besnate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 8 kPa Friction Angle: 29 degrees
Material: Depositi Glaciali (Besnate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 16 kPa Friction Angle: 27 degrees
0.02052
0.01026
Global Minimums
Method: janbu corrected FS: 1.116870
Center: 80.181, 102.684 Radius: 73.090
Method: spencer FS: 1.151970
Center: 62.470, 170.012 Radius: 141.973
Method: gle/morgenstern-price FS: 1.151800
Center: 62.470, 170.012 Radius: 141.973
Probabilistic Analysis Results (Global Minimum)
Method: janbu corrected
Factor of Safety, mean: 1.118126
Factor of Safety, standard deviation: 0.022347
Probability of Failure: 0.000%
Reliablity index: 5.28596 (normal distribution)
Reliablity index: 5.57711 (lognormal distribution)
Method: spencer
Factor of Safety, mean: 1.154642
Factor of Safety, standard deviation: 0.021642
Probability of Failure: 0.000%
Reliablity index: 7.14550 (normal distribution)
Reliablity index: 7.66283 (lognormal distribution)
Method: gle/morgenstern-price
Factor of Safety, mean: 1.156815
Factor of Safety, standard deviation: 0.021886
Probability of Failure: 0.000%
Reliablity index: 7.16514 (normal distribution)
Reliablity index: 7.69092 (lognormal distribution)
Depositi Glaciali (Besnate)
Depositi Fluvioglaciali (Besnate)
80
70
60
50
40
30
20
10
10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220
Scale 1:1000.0

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 2 - Condizioni drenate

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

Global Minimums

Method: janbu corrected FS: 1.486110
Center: 129.941, 192.999 Radius: 139.896

Method: spencer FS: 1.514850
Center: 129.941, 192.999 Radius: 139.896

Method: gle/morgenstern-price FS: 1.513200
Center: 129.941, 192.999 Radius: 139.896

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 1.486140
Factor of Safety, standard deviation: 0.017920
Probability of Failure: 0.000%
Reliablity index: 27.12868 (normal distribution)
Reliablity index: 32.85171 (lognormal distribution)

Method: spencer
Factor of Safety, mean: 1.514378
Factor of Safety, standard deviation: 0.018383
Probability of Failure: 0.000%
Reliablity index: 27.98069 (normal distribution)
Reliablity index: 34.18239 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 1.517049
Factor of Safety, standard deviation: 0.018461
Probability of Failure: 0.000%
Reliablity index: 28.00802 (normal distribution)
Reliablity index: 34.24385 (lognormal distribution)

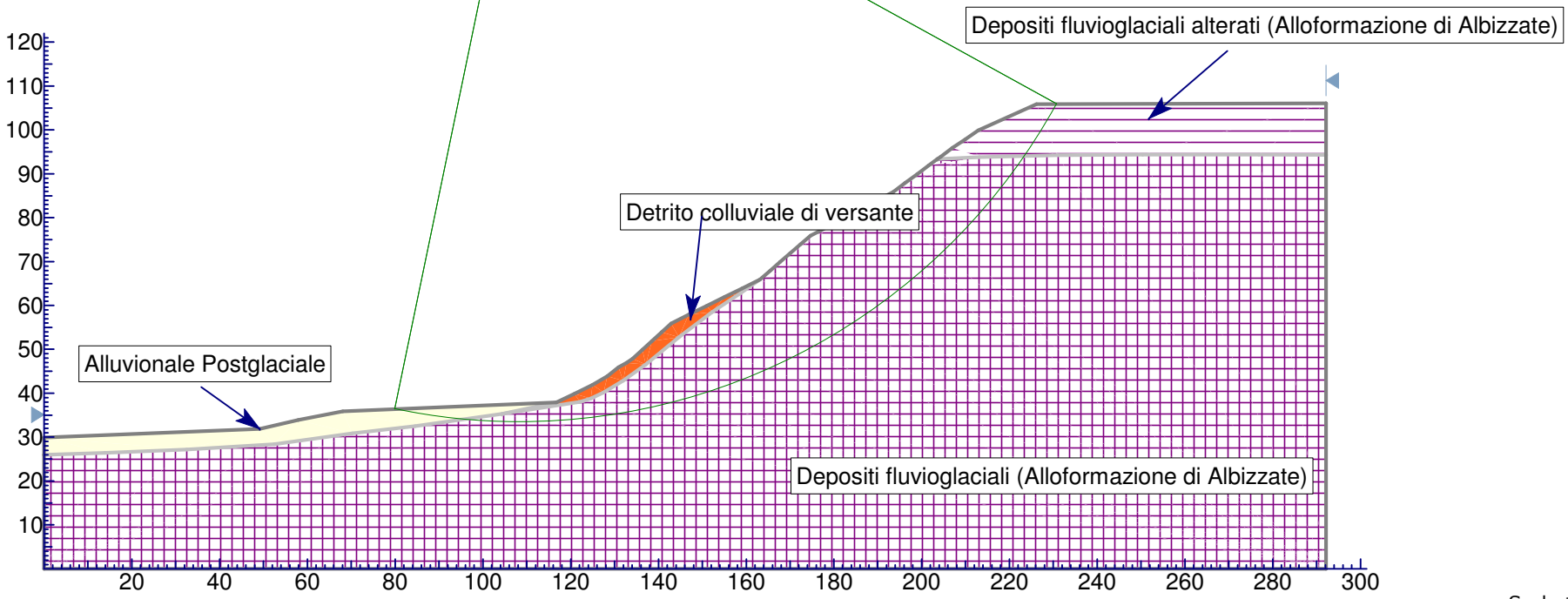
Material Properties

Material: Detrito colluviale di versante
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 5 kPa Friction Angle: 30 degrees

Material: Depositi fluvioglaciali alterati (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 10 kPa Friction Angle: 31 degrees

Material: Depositi fluvioglaciali (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 15 kPa Friction Angle: 35 degrees

Material: Alluvionale Postglaciale
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 3 kPa Friction Angle: 27 degrees



Scale 1:1500.0

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 2 - Condizioni di parziale saturazione

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

Fs (deterministic) = 1.507
Fs (mean) = 1.507
PF = 0.00%

Material Properties

Material: Detrito colluviale di versante
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 5 kPa Friction Angle: 30 degrees
Ru coefficient = 0.36

Material: Depositi fluvioglaciali alterati (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 10 kPa Friction Angle: 31 degrees
Ru coefficient = 0.5 - 0.36

Material: Depositi fluvioglaciali (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 15 kPa Friction Angle: 35 degrees
Ru coefficient = 0.36

Material: Alluvionale Postglaciale
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 3 kPa Friction Angle: 27 degrees
Ru coefficient = 0.485

Global Minimums

Method: janbu corrected FS: 1.485330
Center: 129.941, 192.999 Radius: 139.896

Method: spencer FS: 1.506410
Center: 36.133, 326.570 Radius: 286.415

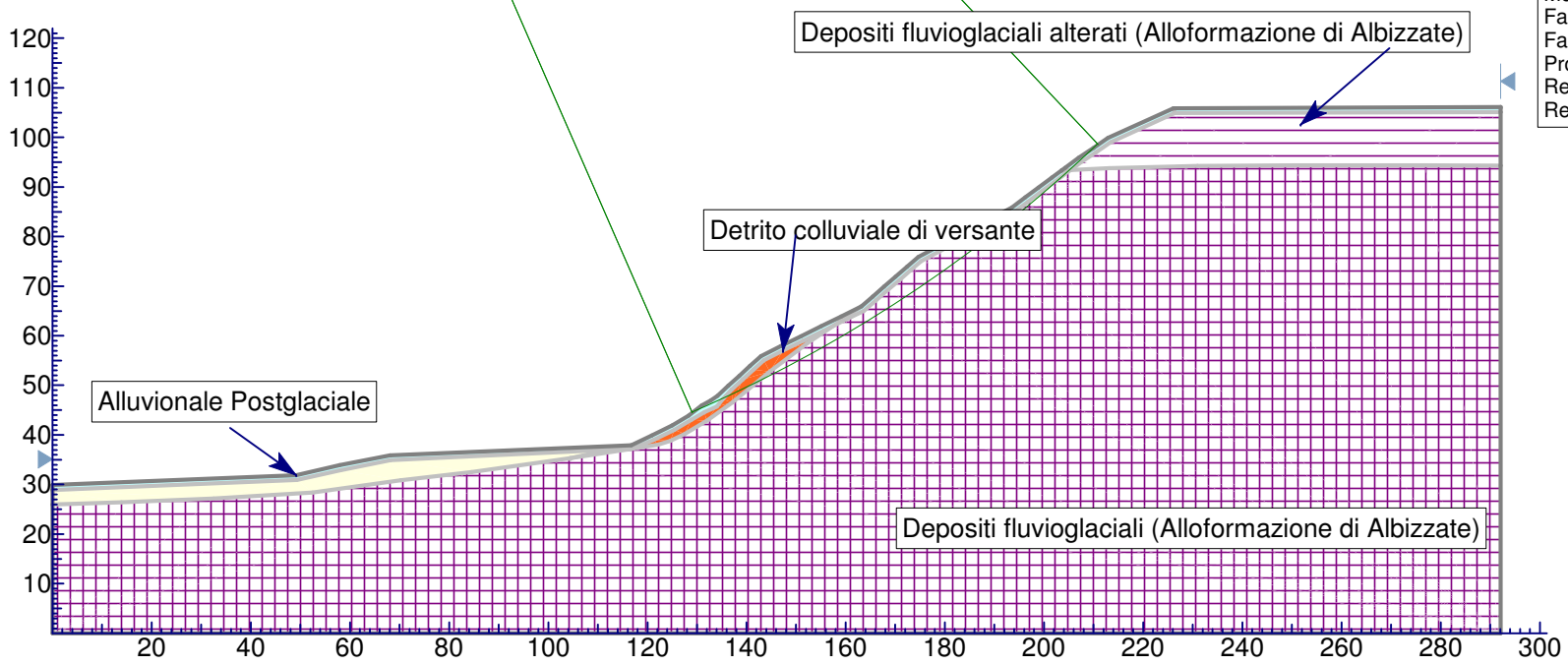
Method: gle/morgenstern-price FS: 1.506600
Center: 36.133, 326.570 Radius: 286.415

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 1.485375
Factor of Safety, standard deviation: 0.017906
Probability of Failure: 0.000%
Reliablity index: 27.10711 (normal distribution)
Reliablity index: 32.81770 (lognormal distribution)

Method: spencer
Factor of Safety, mean: 1.506125
Factor of Safety, standard deviation: 0.028302
Probability of Failure: 0.000%
Reliablity index: 17.88299 (normal distribution)
Reliablity index: 21.78667 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 1.506782
Factor of Safety, standard deviation: 0.028283
Probability of Failure: 0.000%
Reliablity index: 17.91843 (normal distribution)
Reliablity index: 21.83431 (lognormal distribution)



Scale 1:1500.0

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 2 - Condizioni sismiche

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

Global Minimums

Method: janbu corrected FS: 1.409550
Center: 129.941, 192.999 Radius: 139.896

Method: spencer FS: 1.438120
Center: 129.941, 192.999 Radius: 139.896

Method: gle/morgenstern-price FS: 1.439350
Center: 129.941, 192.999 Radius: 139.896

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 1.409466
Factor of Safety, standard deviation: 0.017147
Probability of Failure: 0.000%
Reliablity index: 23.87967 (normal distribution)
Reliablity index: 28.20647 (lognormal distribution)

Method: spencer
Factor of Safety, mean: 1.439839
Factor of Safety, standard deviation: 0.017495
Probability of Failure: 0.000%
Reliablity index: 25.14062 (normal distribution)
Reliablity index: 29.99571 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 1.444469
Factor of Safety, standard deviation: 0.017565
Probability of Failure: 0.000%
Reliablity index: 25.30365 (normal distribution)
Reliablity index: 30.23582 (lognormal distribution)

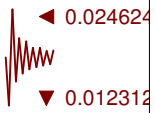
Material Properties

Material: Detrito colluviale di versante
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 5 kPa Friction Angle: 30 degrees

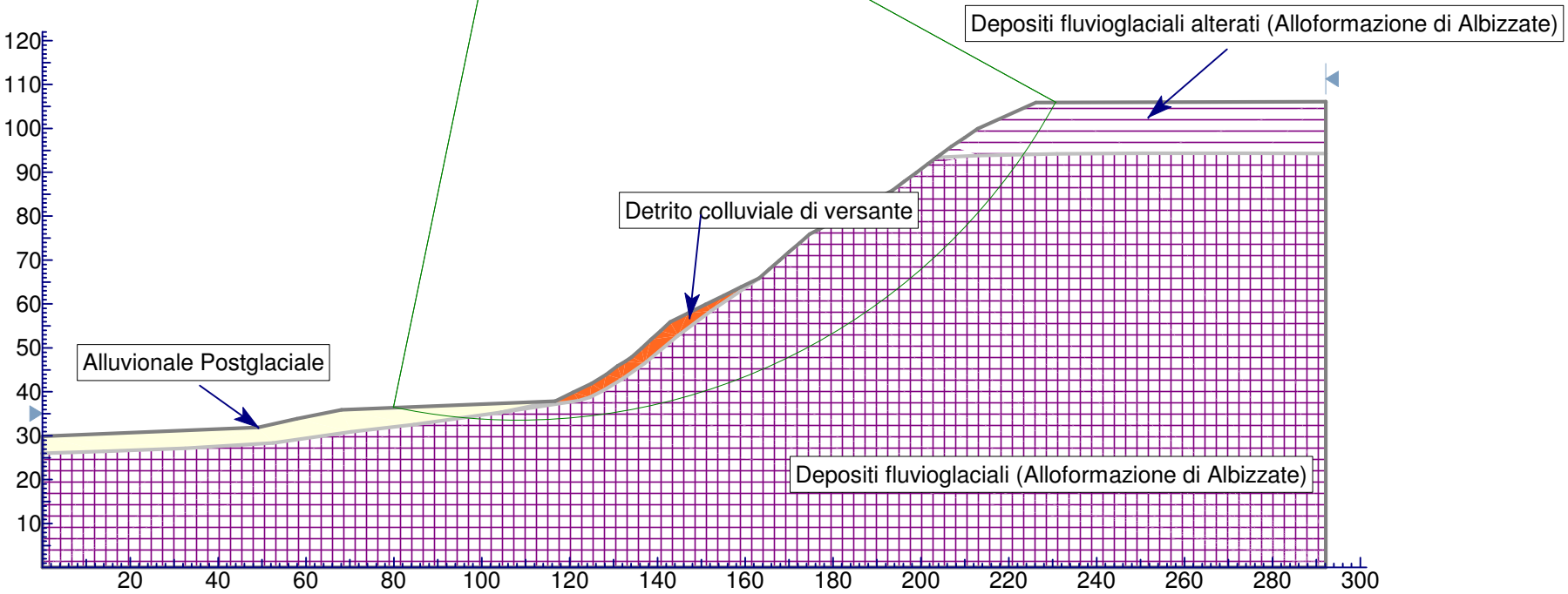
Material: Depositi fluvioglaciali alterati (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 10 kPa Friction Angle: 31 degrees

Material: Depositi fluvioglaciali (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 15 kPa Friction Angle: 35 degrees

Material: Alluvionale Postglaciale
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 3 kPa Friction Angle: 27 degrees



Fs (deterministic) = 1.439
Fs (mean) = 1.444
PF = 0.00%



Scale 1:1500.0

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 3 - Condizioni drenate

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

Material Properties

Material: Detrito colluviale di versante
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 5 kPa Friction Angle: 30 degrees

Material: Depositi fluvioglaciali alterati (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 15 kPa Friction Angle: 31 degrees

Material: Depositi fluvioglaciali (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 10 kPa Friction Angle: 35 degrees

Material: Alluvionale Postglaciale
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 3 kPa Friction Angle: 27 degrees

Material: Gonfolite
Strength Type: Infinite strength Unit Weight: 22 kN/m3

Material: Depositi fluvioglaciali cementati (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 21 kN/m3
Cohesion: 50 kPa Friction Angle: 40 degrees

Global Minimums

Method: janbu corrected FS: 1.183350
Center: 183.100, 82.122 Radius: 45.765

Method: spencer FS: 1.222270
Center: 186.839, 103.044 Radius: 66.534

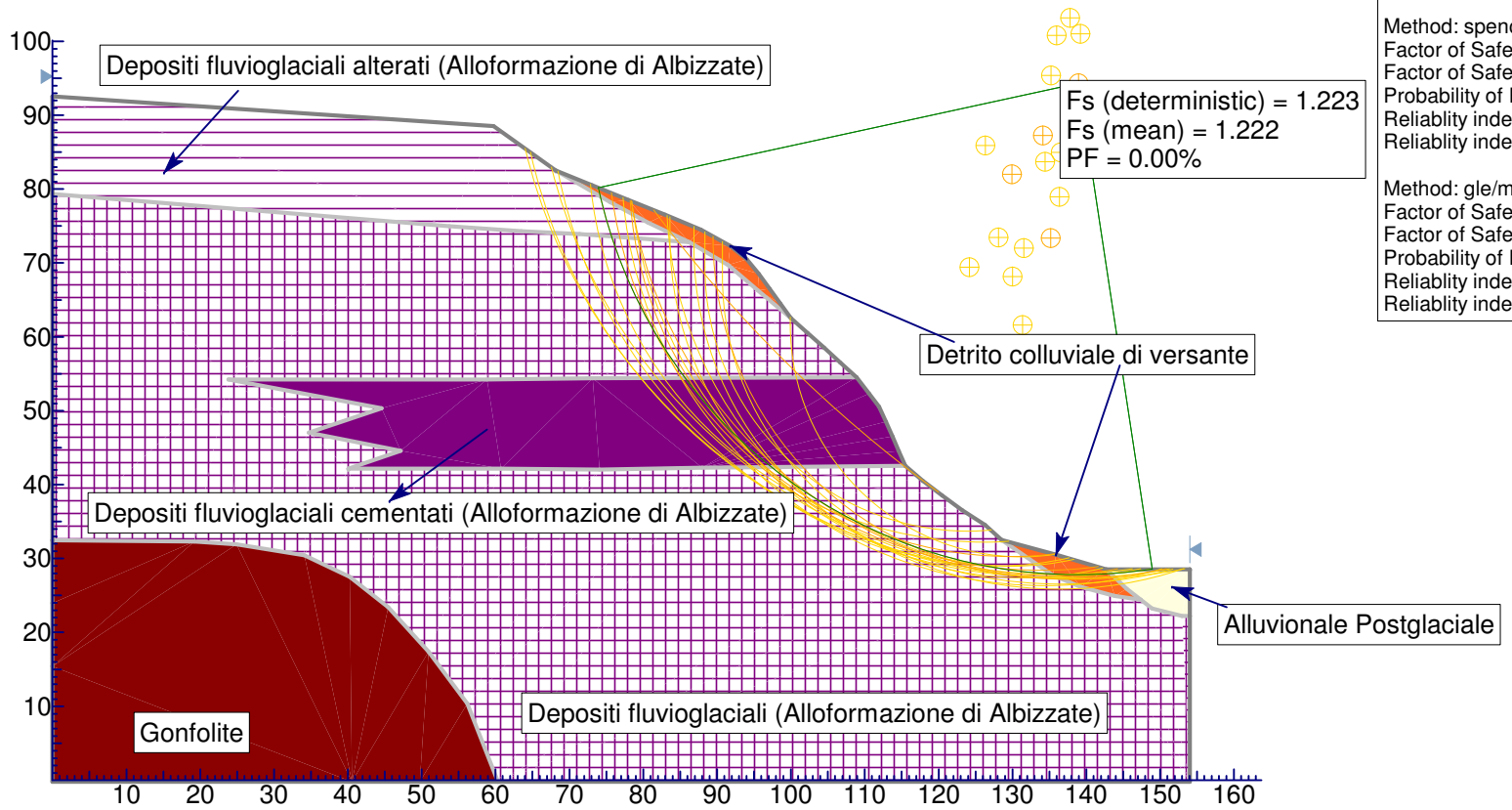
Method: gle/morgenstern-price FS: 1.223030
Center: 186.839, 103.044 Radius: 66.534

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 1.183383
Factor of Safety, standard deviation: 0.012617
Probability of Failure: 0.000%
Reliablity index: 14.53452 (normal distribution)
Reliablity index: 15.78760 (lognormal distribution)

Method: spencer
Factor of Safety, mean: 1.221698
Factor of Safety, standard deviation: 0.011356
Probability of Failure: 0.000%
Reliablity index: 19.52206 (normal distribution)
Reliablity index: 21.53764 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 1.222154
Factor of Safety, standard deviation: 0.011786
Probability of Failure: 0.000%
Reliablity index: 18.84843 (normal distribution)
Reliablity index: 20.79790 (lognormal distribution)



Scale 1:1000.0

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 3 - Condizioni di parziale saturazione

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

Material: Detrito colluviale di versante
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 5 kPa Friction Angle: 30 degrees
Ru coefficient = 0.47 - 0.35

Material: Depositi fluvioglaciali alterati (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 15 kPa Friction Angle: 31 degrees
Ru coefficient = 0.485 - 0.35

Material: Depositi fluvioglaciali (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 10 kPa Friction Angle: 35 degrees
Ru coefficient = 0.38

Material: Alluvionale Postglaciale
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 3 kPa Friction Angle: 27 degrees
Ru coefficient = 0.5

Material: Gonfolite
Strength Type: Infinite strength Unit Weight: 22 kN/m3

Material: Depositi fluvioglaciali cementati (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 21 kN/m3
Cohesion: 50 kPa Friction Angle: 40 degrees

Global Minimums

Method: janbu corrected FS: 1.182110
Center: 183.100, 82.122 Radius: 45.765

Method: spencer FS: 1.217020
Center: 186.839, 103.044 Radius: 66.534

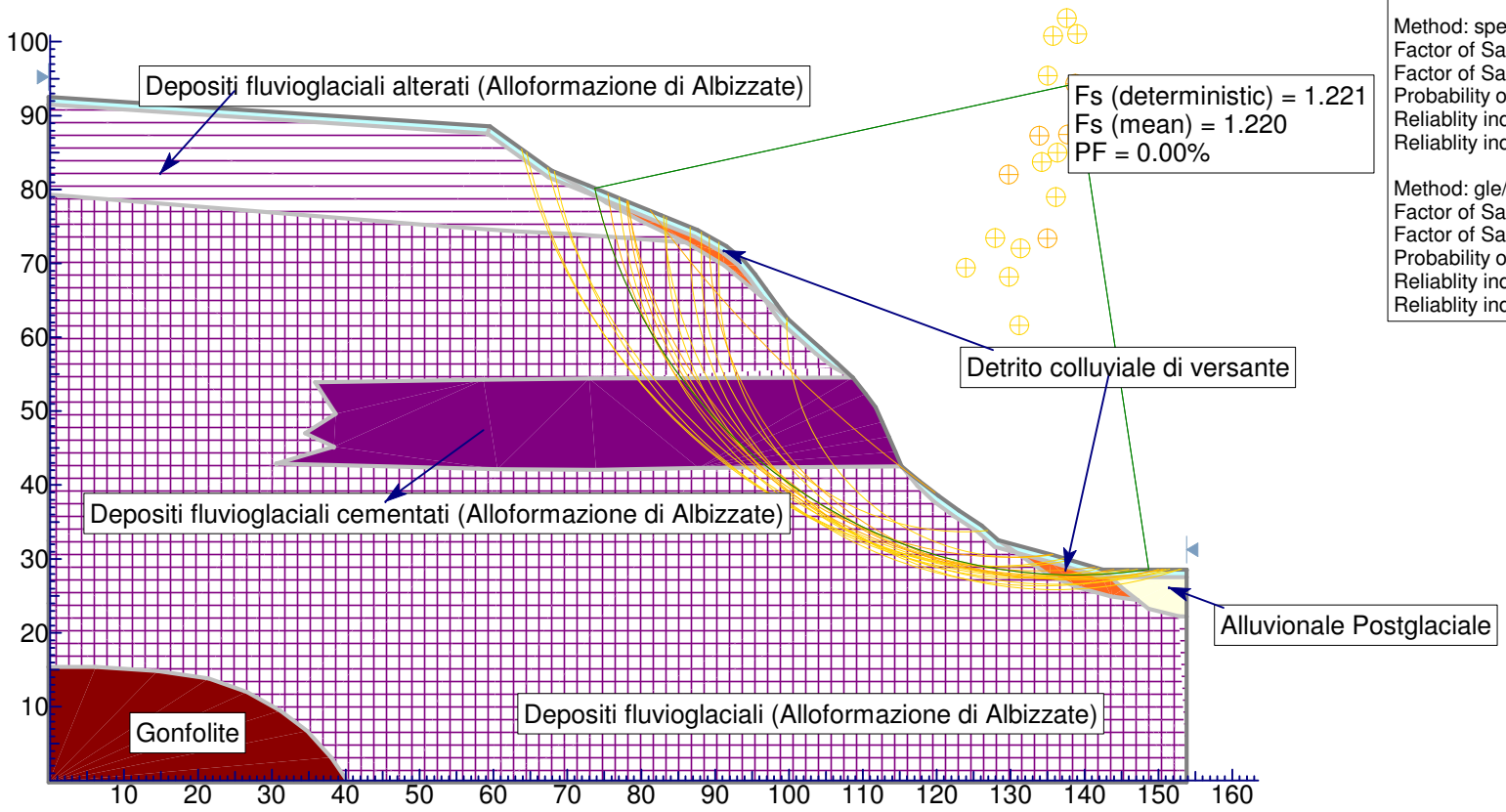
Method: gle/morgenstern-price FS: 1.220660
Center: 186.839, 103.044 Radius: 66.534

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 1.182149
Factor of Safety, standard deviation: 0.012598
Probability of Failure: 0.000%
Reliablity index: 14.45902 (normal distribution)
Reliablity index: 15.69760 (lognormal distribution)

Method: spencer
Factor of Safety, mean: 1.219536
Factor of Safety, standard deviation: 0.011380
Probability of Failure: 0.000%
Reliablity index: 19.29135 (normal distribution)
Reliablity index: 21.26481 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 1.219761
Factor of Safety, standard deviation: 0.011804
Probability of Failure: 0.000%
Reliablity index: 18.61704 (normal distribution)
Reliablity index: 20.52305 (lognormal distribution)



Scale 1:1000.0

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 3 - Condizioni sismiche

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

Material Properties

Material: Detrito colluviale di versante
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 5 kPa Friction Angle: 30 degrees

Material: Depositi fluvioglaciali alterati (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 15 kPa Friction Angle: 31 degrees

Material: Depositi fluvioglaciali (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 10 kPa Friction Angle: 35 degrees

Material: Alluvionale Postglaciale
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 3 kPa Friction Angle: 27 degrees

Material: Gonfolite
Strength Type: Infinite strength Unit Weight: 22 kN/m3

Material: Depositi fluvioglaciali cementati (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 21 kN/m3
Cohesion: 50 kPa Friction Angle: 40 degrees

▶ 0.02462
▼ 0.01231

Global Minimums

Method: janbu corrected FS: 1.132750
Center: 183.100, 82.122 Radius: 45.765

Method: spencer FS: 1.173530
Center: 186.839, 103.044 Radius: 66.534

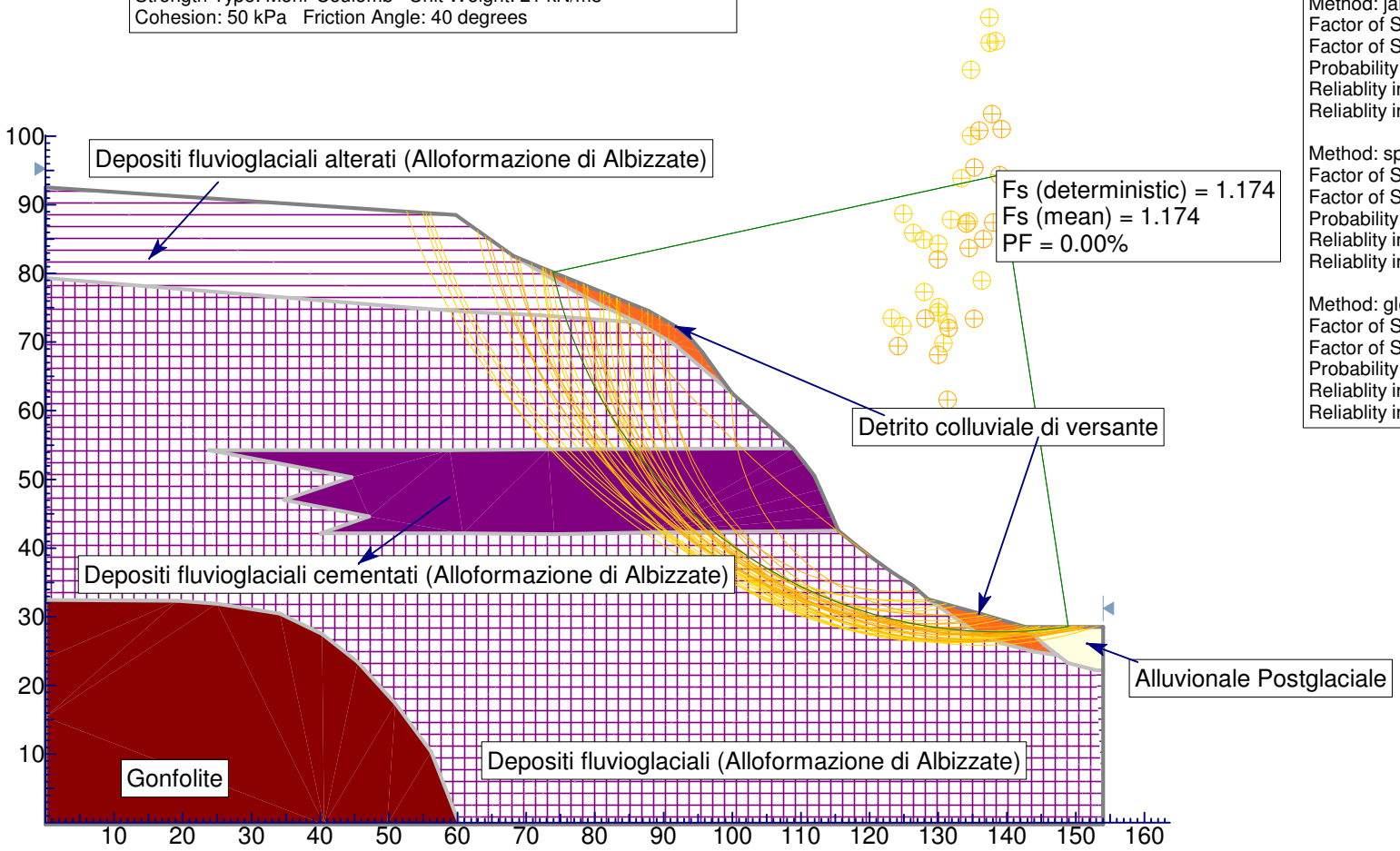
Method: gle/morgenstern-price FS: 1.173860
Center: 186.839, 103.044 Radius: 66.534

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 1.132732
Factor of Safety, standard deviation: 0.012405
Probability of Failure: 0.000%
Reliablity index: 10.70031 (normal distribution)
Reliablity index: 11.37583 (lognormal distribution)

Method: spencer
Factor of Safety, mean: 1.172170
Factor of Safety, standard deviation: 0.010958
Probability of Failure: 0.000%
Reliablity index: 15.71246 (normal distribution)
Reliablity index: 16.98921 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 1.174457
Factor of Safety, standard deviation: 0.012996
Probability of Failure: 0.000%
Reliablity index: 13.42389 (normal distribution)
Reliablity index: 14.52704 (lognormal distribution)



Scale 1:1000.0

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 4 - Condizioni drenate

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

Material Properties

Material: Detrito colluviale di versante
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 5 kPa Friction Angle: 30 degrees

Material: Depositi fluvioglaciali alterati (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 10 kPa Friction Angle: 31 degrees

Material: Depositi fluvioglaciali (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 15 kPa Friction Angle: 35 degrees

Material: Alluvionale Postglaciale
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 3 kPa Friction Angle: 27 degrees

Material: Gonfolite
Strength Type: Infinite strength Unit Weight: 22 kN/m3

Global Minimums

Method: janbu corrected FS: 0.744504
Center: 196.708, 83.265 Radius: 42.503

Method: spencer FS: 0.733970
Center: 196.708, 83.265 Radius: 42.503

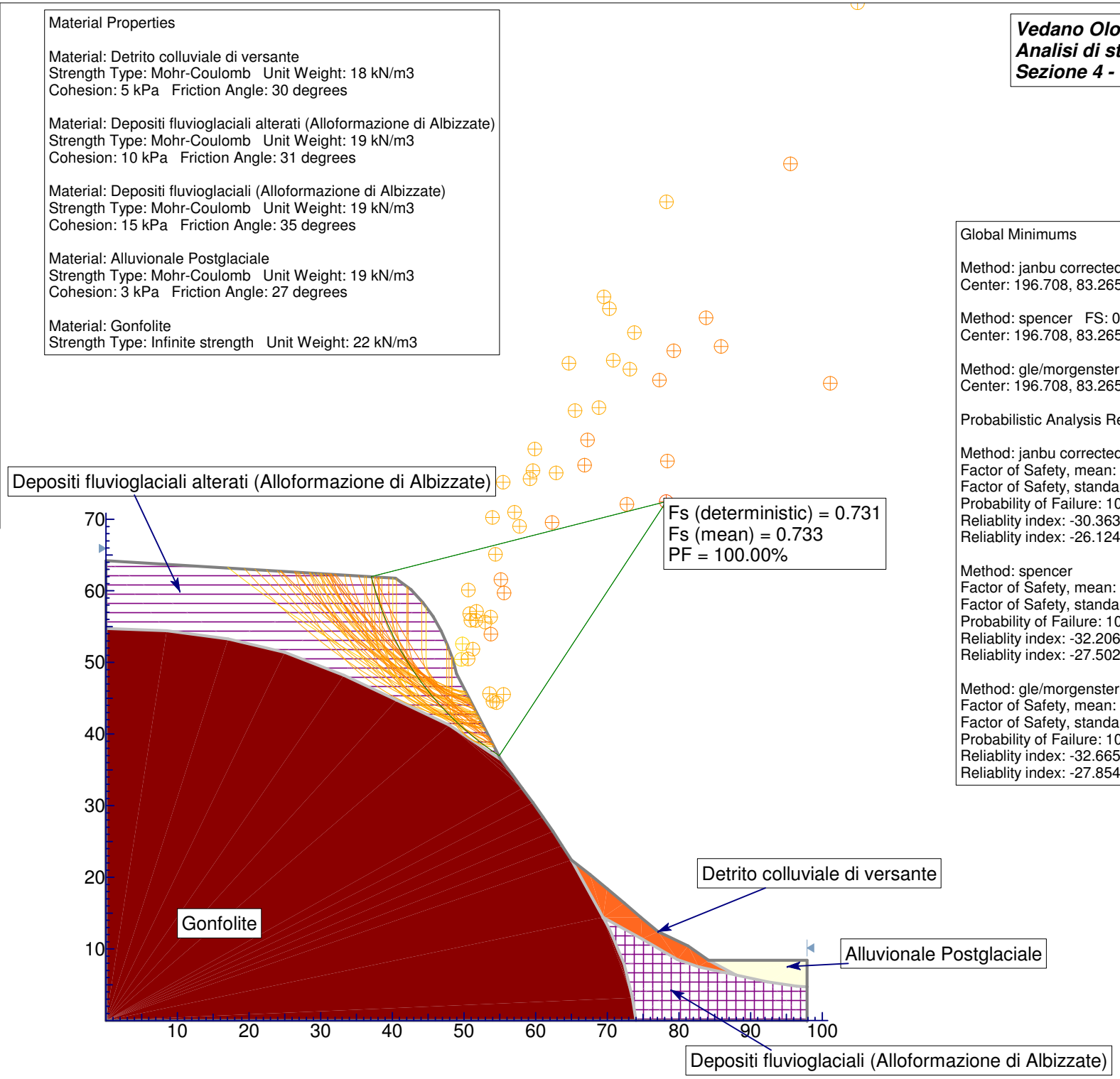
Method: gle/morgenstern-price FS: 0.730797
Center: 196.708, 83.265 Radius: 42.503

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 0.745238
Factor of Safety, standard deviation: 0.008390
Probability of Failure: 100.000%
Reliablity index: -30.36394 (normal distribution)
Reliablity index: -26.12459 (lognormal distribution)

Method: spencer
Factor of Safety, mean: 0.734679
Factor of Safety, standard deviation: 0.008238
Probability of Failure: 100.000%
Reliablity index: -32.20607 (normal distribution)
Reliablity index: -27.50236 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 0.732681
Factor of Safety, standard deviation: 0.008184
Probability of Failure: 100.000%
Reliablity index: -32.66551 (normal distribution)
Reliablity index: -27.85467 (lognormal distribution)



Scale 1:750.0

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 4 - Condizioni di parziale saturazione

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

Material Properties

Material: Detrito colluviale di versante
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 5 kPa Friction Angle: 30 degrees
Ru coefficient = 0.38

Material: Depositi fluvioglaciali alterati (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 10 kPa Friction Angle: 31 degrees
Ru coefficient = 0.485 - 0.06

Material: Depositi fluvioglaciali (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 15 kPa Friction Angle: 35 degrees

Material: Alluvionale Postglaciale
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 3 kPa Friction Angle: 27 degrees
Ru coefficient = 0.5

Material: Gonfolite
Strength Type: Infinite strength Unit Weight: 22 kN/m3

Global Minimums

Method: janbu corrected FS: 0.742613
Center: 196.708, 83.265 Radius: 42.503

Method: spencer FS: 0.732348
Center: 196.708, 83.265 Radius: 42.503

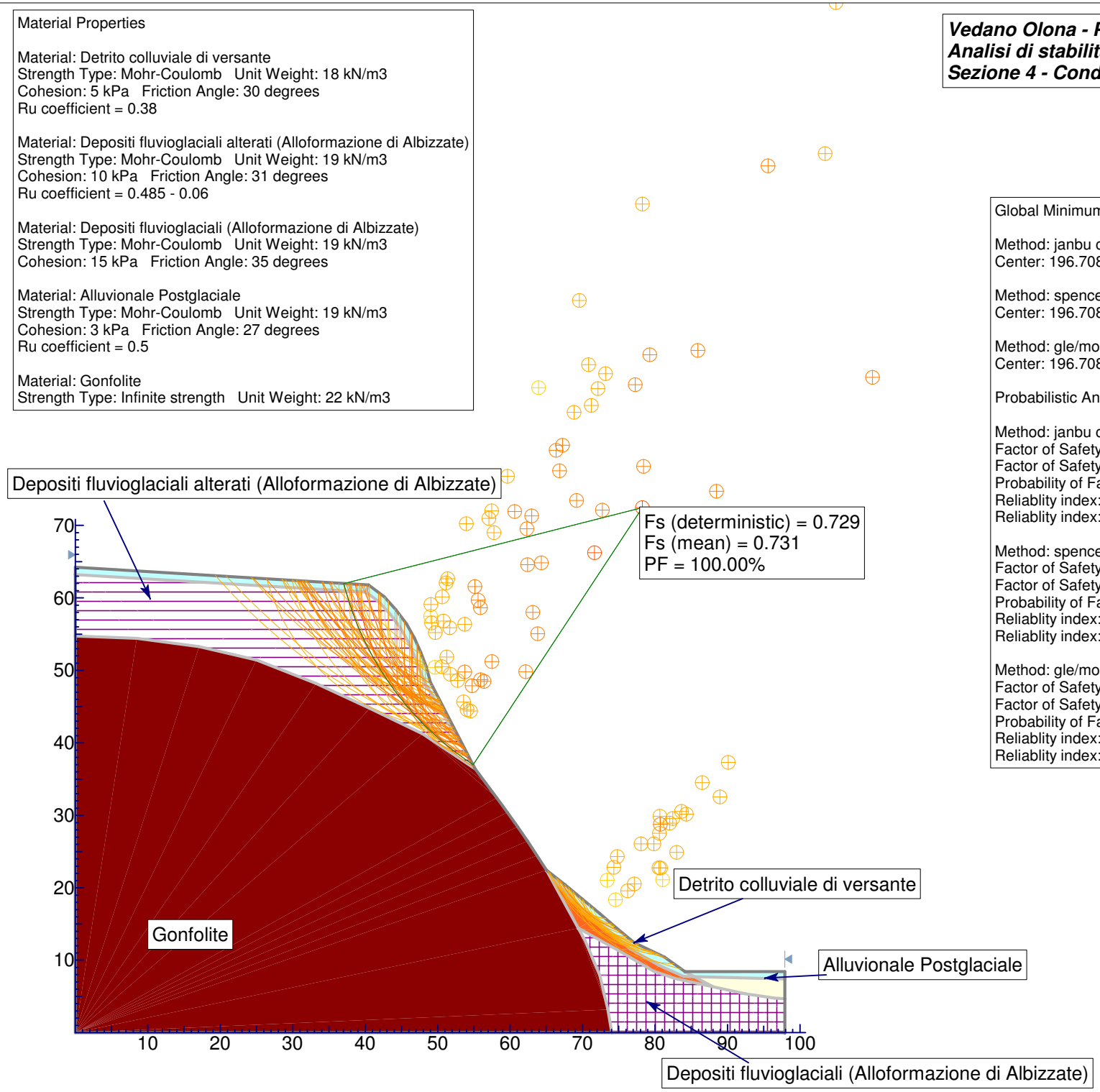
Method: gle/morgenstern-price FS: 0.729431
Center: 196.708, 83.265 Radius: 42.503

Probabilistic Analysis Results (Global Minimum)

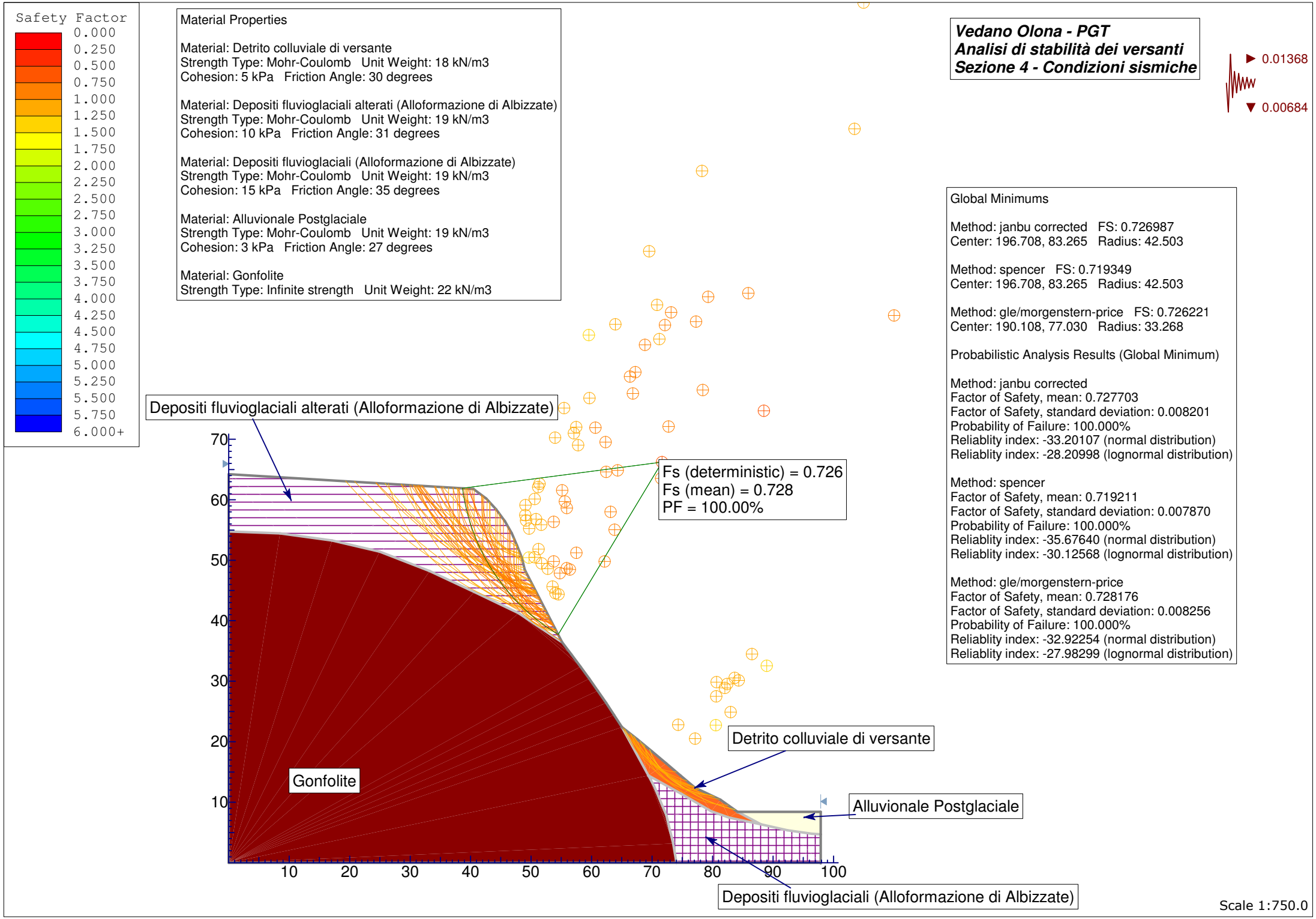
Method: janbu corrected
Factor of Safety, mean: 0.743345
Factor of Safety, standard deviation: 0.008274
Probability of Failure: 100.000%
Reliablity index: -31.01846 (normal distribution)
Reliablity index: -26.65195 (lognormal distribution)

Method: spencer
Factor of Safety, mean: 0.735300
Factor of Safety, standard deviation: 0.008213
Probability of Failure: 100.000%
Reliablity index: -32.22927 (normal distribution)
Reliablity index: -27.53436 (lognormal distribution)

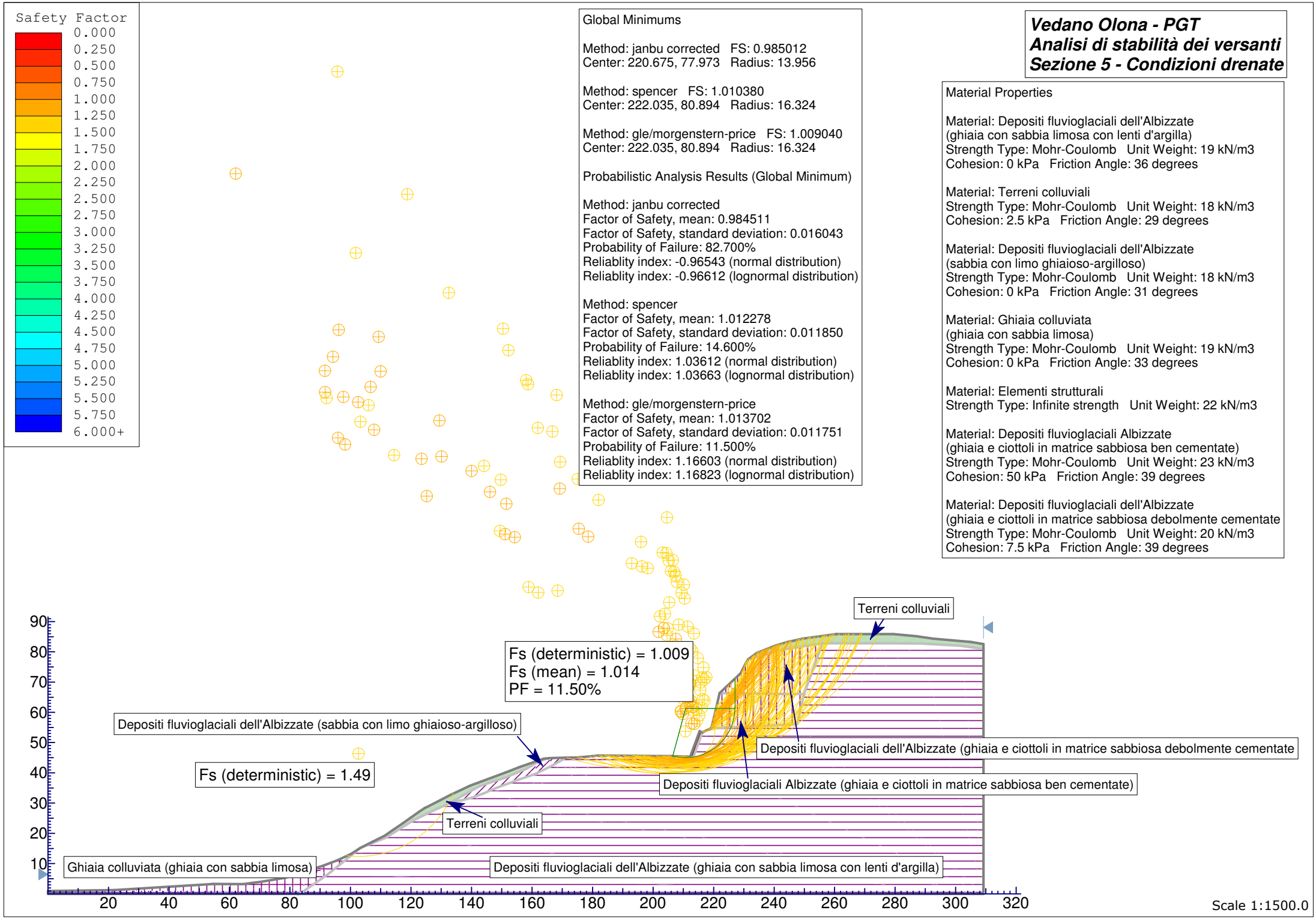
Method: gle/morgenstern-price
Factor of Safety, mean: 0.731035
Factor of Safety, standard deviation: 0.008081
Probability of Failure: 100.000%
Reliablity index: -33.28395 (normal distribution)
Reliablity index: -28.34831 (lognormal distribution)



Scale 1:750.0


Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+
Material Properties
Material: Detrito colluviale di versante
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 5 kPa Friction Angle: 30 degrees
Material: Depositi fluvioglaciali alterati (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 10 kPa Friction Angle: 31 degrees
Material: Depositi fluvioglaciali (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 15 kPa Friction Angle: 35 degrees
Material: Alluvionale Postglaciale
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 3 kPa Friction Angle: 27 degrees
Material: Gonfolite
Strength Type: Infinite strength Unit Weight: 22 kN/m3
Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 4 - Condizioni sismiche
0.01368
0.00684
Global Minimums
Method: janbu corrected FS: 0.726987
Center: 196.708, 83.265 Radius: 42.503
Method: spencer FS: 0.719349
Center: 196.708, 83.265 Radius: 42.503
Method: gle/morgenstern-price FS: 0.726221
Center: 190.108, 77.030 Radius: 33.268
Probabilistic Analysis Results (Global Minimum)
Method: janbu corrected
Factor of Safety, mean: 0.727703
Factor of Safety, standard deviation: 0.008201
Probability of Failure: 100.000%
Reliablity index: -33.20107 (normal distribution)
Reliablity index: -28.20998 (lognormal distribution)
Method: spencer
Factor of Safety, mean: 0.719211
Factor of Safety, standard deviation: 0.007870
Probability of Failure: 100.000%
Reliablity index: -35.67640 (normal distribution)
Reliablity index: -30.12568 (lognormal distribution)
Method: gle/morgenstern-price
Factor of Safety, mean: 0.728176
Factor of Safety, standard deviation: 0.008256
Probability of Failure: 100.000%
Reliablity index: -32.92254 (normal distribution)
Reliablity index: -27.98299 (lognormal distribution)
Depositi fluvioglaciali alterati (Alloformazione di Albizzate)
Fs (deterministic) = 0.726
Fs (mean) = 0.728
PF = 100.00%
Detrito colluviale di versante
Gonfolite
Alluvionale Postglaciale
Depositi fluvioglaciali (Alloformazione di Albizzate)
70
60
50
40
30
20
10
10
20
30
40
50
60
70
80
90
100
Scale 1:750.0

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 5 - Condizioni drenate



Global Minimums

Method: janbu corrected FS: 0.985012
Center: 220.675, 77.973 Radius: 13.956

Method: spencer FS: 1.010380
Center: 222.035, 80.894 Radius: 16.324

Method: gle/morgenstern-price FS: 1.009040
Center: 222.035, 80.894 Radius: 16.324

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 0.984511
Factor of Safety, standard deviation: 0.016043
Probability of Failure: 82.700%
Reliablity index: -0.96543 (normal distribution)
Reliablity index: -0.96612 (lognormal distribution)

Method: spencer
Factor of Safety, mean: 1.012278
Factor of Safety, standard deviation: 0.011850
Probability of Failure: 14.600%
Reliablity index: 1.03612 (normal distribution)
Reliablity index: 1.03663 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 1.013702
Factor of Safety, standard deviation: 0.011751
Probability of Failure: 11.500%
Reliablity index: 1.16603 (normal distribution)
Reliablity index: 1.16823 (lognormal distribution)

Material Properties

Material: Depositi fluvioglaciali dell'Albizzate
(ghiaia con sabbia limosa con lenti d'argilla)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 0 kPa Friction Angle: 36 degrees

Material: Terreni colluviali
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 2.5 kPa Friction Angle: 29 degrees

Material: Depositi fluvioglaciali dell'Albizzate
(sabbia con limo ghiaioso-argilloso)
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 0 kPa Friction Angle: 31 degrees

Material: Ghiaia colluviata
(ghiaia con sabbia limosa)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 0 kPa Friction Angle: 33 degrees

Material: Elementi strutturali
Strength Type: Infinite strength Unit Weight: 22 kN/m3

Material: Depositi fluvioglaciali Albizzate
(ghiaia e ciottoli in matrice sabbiosa ben cementate)
Strength Type: Mohr-Coulomb Unit Weight: 23 kN/m3
Cohesion: 50 kPa Friction Angle: 39 degrees

Material: Depositi fluvioglaciali dell'Albizzate
(ghiaia e ciottoli in matrice sabbiosa debolmente cementate
Strength Type: Mohr-Coulomb Unit Weight: 20 kN/m3
Cohesion: 7.5 kPa Friction Angle: 39 degrees

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 5 - Condizioni di parziale saturazione

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

Material: Depositi fluvioglaciali dell'Albizzate
(ghiaia con sabbia limosa con lenti d'argilla)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 0 kPa Friction Angle: 36 degrees
Ru coefficient = 0.5

Material: Terreni colluviali
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 2.5 kPa Friction Angle: 29 degrees
Ru coefficient = 0.5 - 0.38

Material: Depositi fluvioglaciali dell'Albizzate
(sabbia con limo ghiaioso-argilloso)
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 0 kPa Friction Angle: 31 degrees
Ru coefficient = 0.5

Material: Ghiaia colluviata
(ghiaia con sabbia limosa)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 0 kPa Friction Angle: 33 degrees
Ru coefficient = 0.485

Material: Elementi strutturali
Strength Type: Infinite strength Unit Weight: 22 kN/m3

Material: Depositi fluvioglaciali Albizzate
(ghiaia e ciottoli in matrice sabbiosa ben cementate)
Strength Type: Mohr-Coulomb Unit Weight: 23 kN/m3
Cohesion: 50 kPa Friction Angle: 39 degrees
Ru coefficient = 0.06

Material: Depositi fluvioglaciali dell'Albizzate
(ghiaia e ciottoli in matrice sabbiosa debolmente cementate
Strength Type: Mohr-Coulomb Unit Weight: 20 kN/m3
Cohesion: 7.5 kPa Friction Angle: 39 degrees
Ru coefficient = 0.06

Global Minimums

Method: janbu corrected FS: 0.959915
Center: 223.973, 75.955 Radius: 11.722

Method: spencer FS: 0.999482
Center: 222.035, 80.894 Radius: 16.324

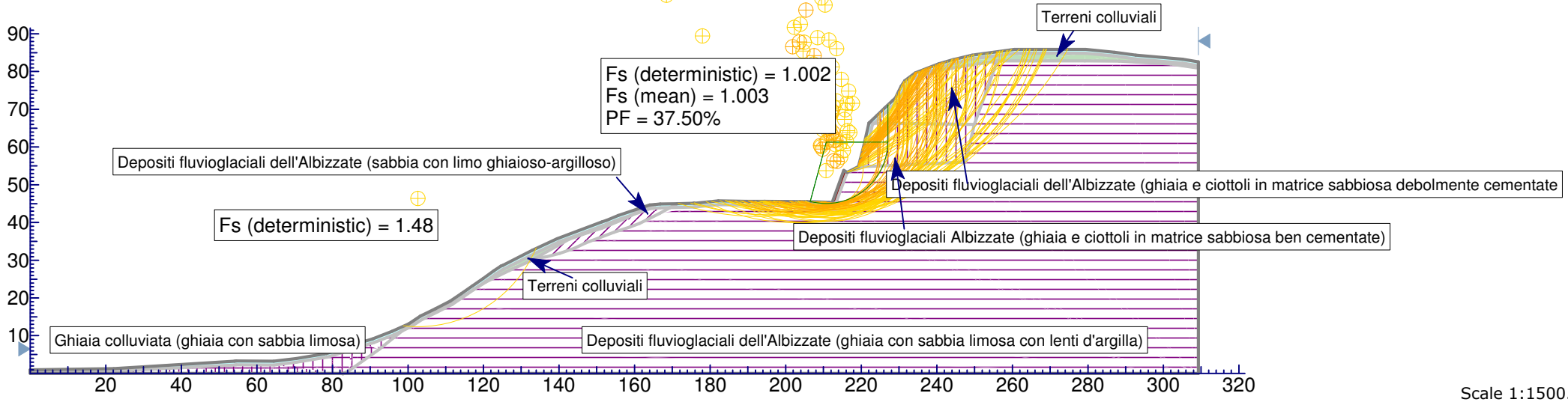
Method: gle/morgenstern-price FS: 1.002350
Center: 222.035, 80.894 Radius: 16.324

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 0.960287
Factor of Safety, standard deviation: 0.011932
Probability of Failure: 100.000%
Reliablity index: -3.32823 (normal distribution)
Reliablity index: -3.26759 (lognormal distribution)

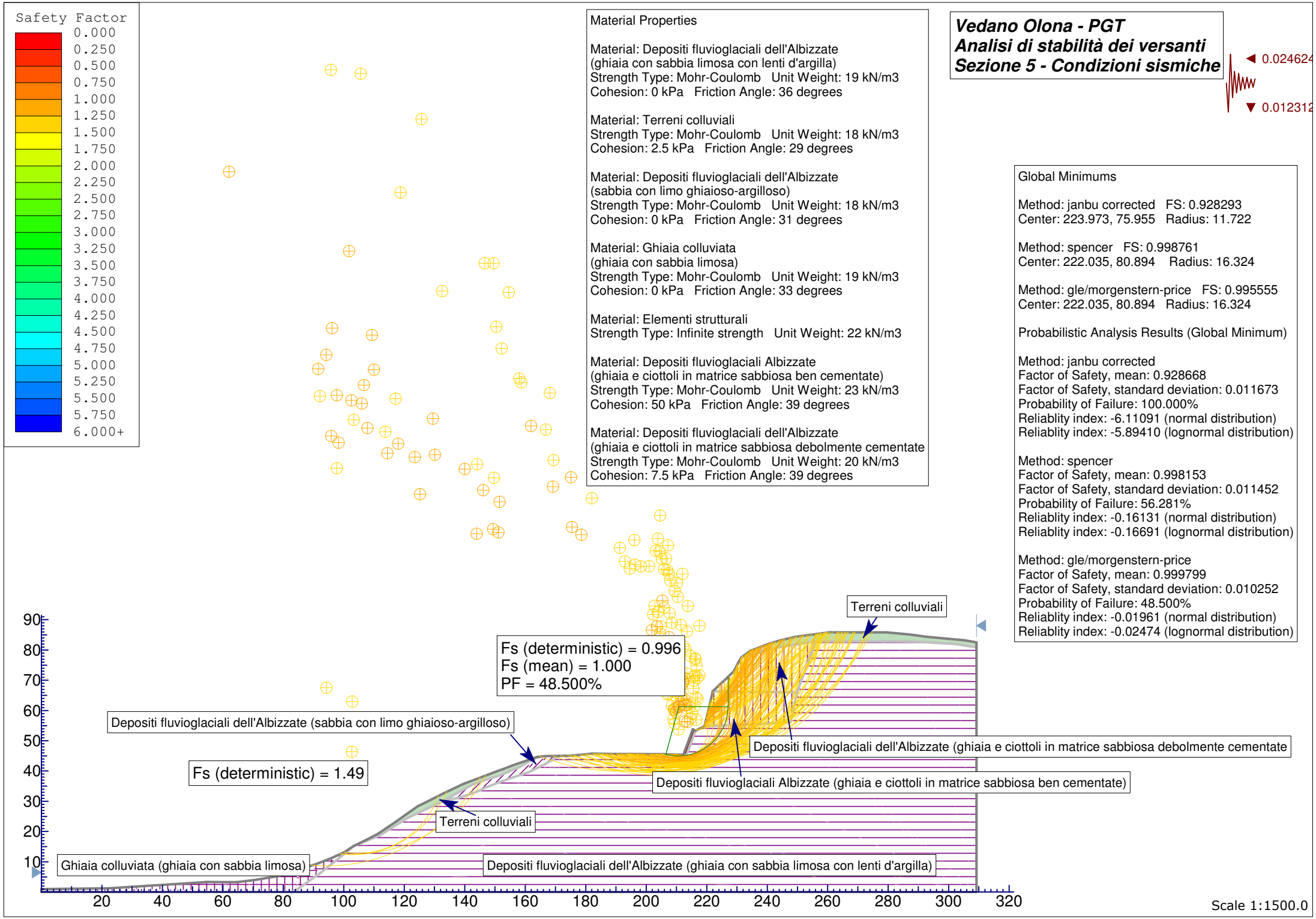
Method: spencer
Factor of Safety, mean: 1.001552
Factor of Safety, standard deviation: 0.010403
Probability of Failure: 44.300%
Reliablity index: 0.14921 (normal distribution)
Reliablity index: 0.14414 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 1.003243
Factor of Safety, standard deviation: 0.010273
Probability of Failure: 37.700%
Reliablity index: 0.31568 (normal distribution)
Reliablity index: 0.31108 (lognormal distribution)



Scale 1:1500.0

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 5 - Condizioni sismiche



Material Properties

Material: Depositi fluvioglaciali dell'Albizzate
(ghiaia con sabbia limosa con lenti d'argilla)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 0 kPa Friction Angle: 36 degrees

Material: Terreni colluviali
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 2.5 kPa Friction Angle: 29 degrees

Material: Depositi fluvioglaciali dell'Albizzate
(sabbia con limo ghiaioso-argilloso)
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 0 kPa Friction Angle: 31 degrees

Material: Ghiaia colluviata
(ghiaia con sabbia limosa)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 0 kPa Friction Angle: 33 degrees

Material: Elementi strutturali
Strength Type: Infinite strength Unit Weight: 22 kN/m3

Material: Depositi fluvioglaciali Albizzate
(ghiaia e ciottoli in matrice sabbiosa ben cementate)
Strength Type: Mohr-Coulomb Unit Weight: 23 kN/m3
Cohesion: 50 kPa Friction Angle: 39 degrees

Material: Depositi fluvioglaciali dell'Albizzate
(ghiaia e ciottoli in matrice sabbiosa debolmente cementate
Strength Type: Mohr-Coulomb Unit Weight: 20 kN/m3
Cohesion: 7.5 kPa Friction Angle: 39 degrees

Global Minimums

Method: janbu corrected FS: 0.928293
Center: 223.973, 75.955 Radius: 11.722

Method: spencer FS: 0.998761
Center: 222.035, 80.894 Radius: 16.324

Method: gle/morgenstern-price FS: 0.995555
Center: 222.035, 80.894 Radius: 16.324

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 0.928668
Factor of Safety, standard deviation: 0.011673
Probability of Failure: 100.000%
Reliablity index: -6.11091 (normal distribution)
Reliablity index: -5.89410 (lognormal distribution)

Method: spencer
Factor of Safety, mean: 0.998153
Factor of Safety, standard deviation: 0.011452
Probability of Failure: 56.281%
Reliablity index: -0.16131 (normal distribution)
Reliablity index: -0.16691 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 0.999799
Factor of Safety, standard deviation: 0.010252
Probability of Failure: 48.500%
Reliablity index: -0.01961 (normal distribution)
Reliablity index: -0.02474 (lognormal distribution)

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 6 - Condizioni drenate

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

Material Properties

Material: Detrito colluviale di versante
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 2.5 kPa Friction Angle: 28 degrees

Material: Depositi fluvioglaciali alterati (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 10 kPa Friction Angle: 31 degrees

Material: Depositi fluvioglaciali (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 15 kPa Friction Angle: 35 degrees

Material: Elementi strutturali
Strength Type: Infinite strength Unit Weight: 22 kN/m3

Material: Gonfolite
Strength Type: Infinite strength Unit Weight: 22 kN/m3

Global Minimums

Method: janbu corrected FS: 1.255470
Center: 71.157, 63.449 Radius: 5.842

Method: spencer FS: 1.249690
Center: 71.157, 63.449 Radius: 5.842

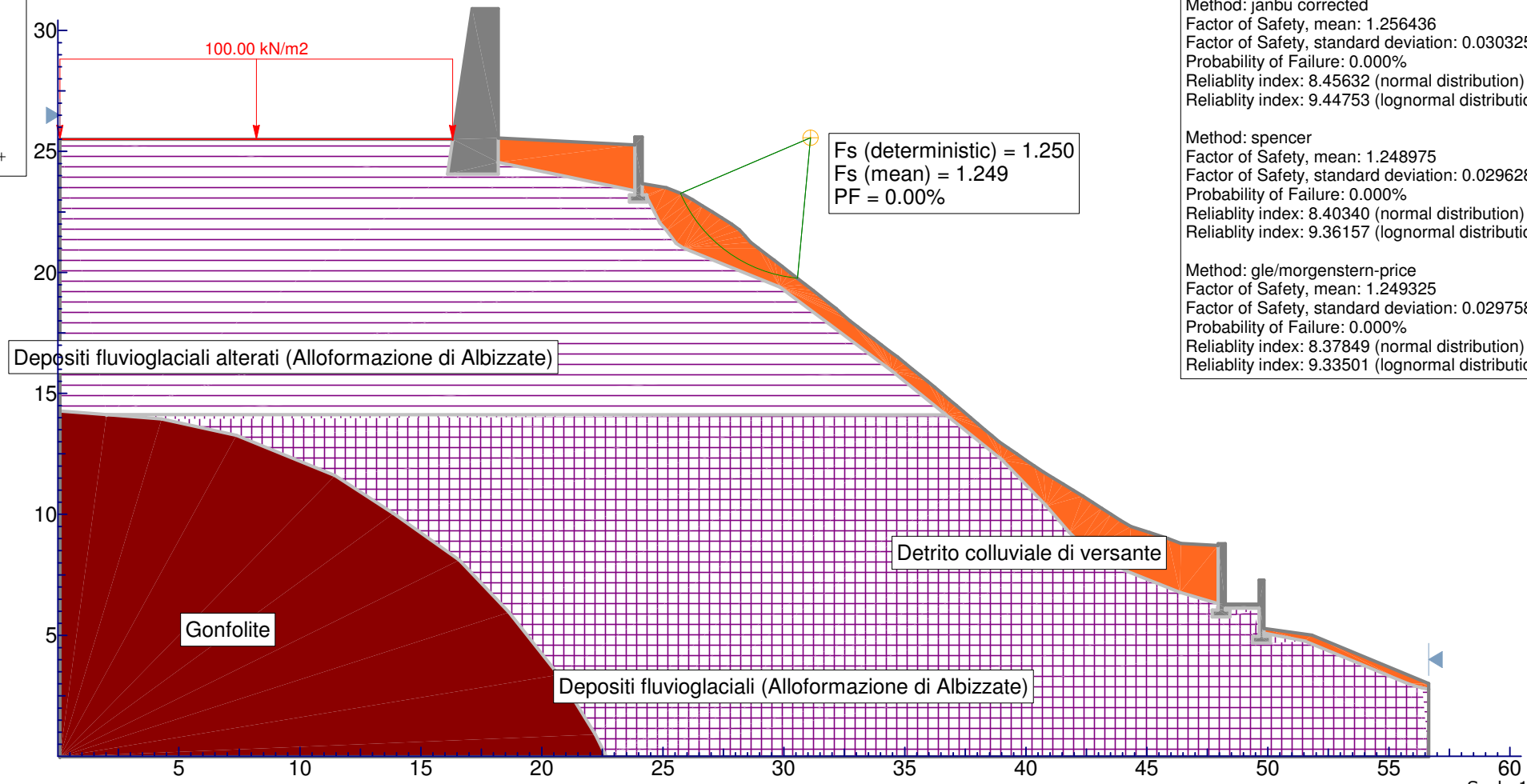
Method: gle/morgenstern-price FS: 1.249530
Center: 71.157, 63.449 Radius: 5.842

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 1.256436
Factor of Safety, standard deviation: 0.030325
Probability of Failure: 0.000%
Reliablity index: 8.45632 (normal distribution)
Reliablity index: 9.44753 (lognormal distribution)

Method: spencer
Factor of Safety, mean: 1.248975
Factor of Safety, standard deviation: 0.029628
Probability of Failure: 0.000%
Reliablity index: 8.40340 (normal distribution)
Reliablity index: 9.36157 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 1.249325
Factor of Safety, standard deviation: 0.029758
Probability of Failure: 0.000%
Reliablity index: 8.37849 (normal distribution)
Reliablity index: 9.33501 (lognormal distribution)



Scale 1:250.0

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 6 - Condizioni di parziale saturazione

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

Material Properties

Material: Detrito colluviale di versante
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 2.5 kPa Friction Angle: 28 degrees
Ru coefficient = 0.5 - 0.38

Material: Depositi fluvioglaciali alterati (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 10 kPa Friction Angle: 31 degrees
Ru coefficient = 0.5

Material: Depositi fluvioglaciali (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 15 kPa Friction Angle: 35 degrees

Material: Elementi strutturali
Strength Type: Infinite strength Unit Weight: 22 kN/m3

Material: Gonfolite
Strength Type: Infinite strength Unit Weight: 22 kN/m3

Fs (deterministic) = 0.944
Fs (mean) = 0.945
PF = 100.00%

Global Minimums

Method: janbu corrected FS: 0.958935
Center: 89.037, 75.758 Radius: 26.140

Method: spencer FS: 0.943256
Center: 89.037, 75.758 Radius: 26.140

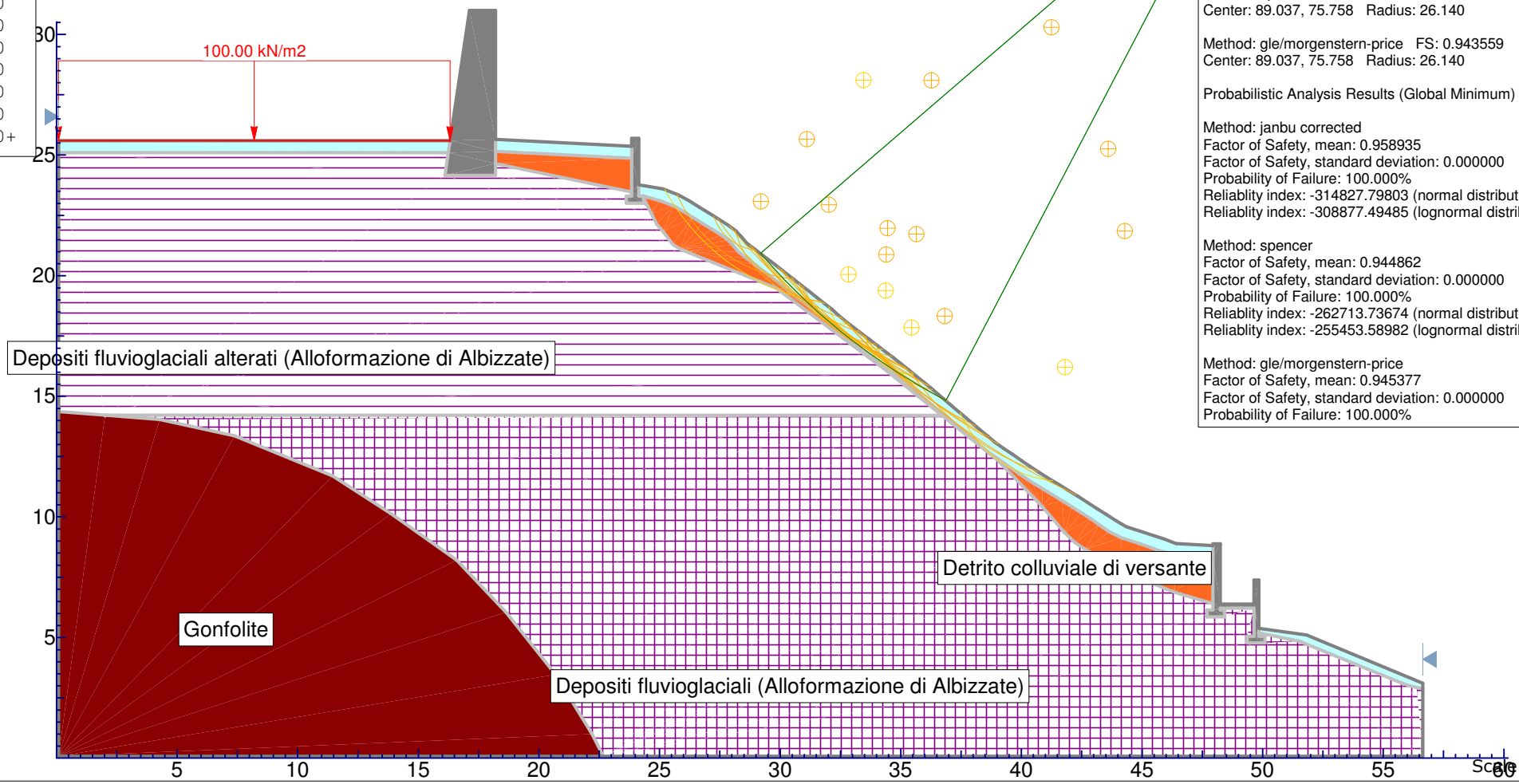
Method: gle/morgenstern-price FS: 0.943559
Center: 89.037, 75.758 Radius: 26.140

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 0.958935
Factor of Safety, standard deviation: 0.000000
Probability of Failure: 100.000%
Reliablity index: -314827.79803 (normal distribution)
Reliablity index: -308877.49485 (lognormal distribution)

Method: spencer
Factor of Safety, mean: 0.944862
Factor of Safety, standard deviation: 0.000000
Probability of Failure: 100.000%
Reliablity index: -262713.73674 (normal distribution)
Reliablity index: -255453.58982 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 0.945377
Factor of Safety, standard deviation: 0.000000
Probability of Failure: 100.000%



Scale 1:250.0

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 6 - Condizioni sismiche

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

Material Properties

Material: Detrito colluviale di versante
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 2.5 kPa Friction Angle: 28 degrees

Material: Depositi fluvioglaciali alterati (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 10 kPa Friction Angle: 31 degrees

Material: Depositi fluvioglaciali (Alloformazione di Albizzate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 15 kPa Friction Angle: 35 degrees

Material: Elementi strutturali
Strength Type: Infinite strength Unit Weight: 22 kN/m3

Material: Gonfolite
Strength Type: Infinite strength Unit Weight: 22 kN/m3

▶ 0.02462
▼ 0.01231

Global Minimums

Method: janbu corrected FS: 1.196440
Center: 71.157, 63.449 Radius: 5.842

Method: spencer FS: 1.194690
Center: 71.157, 63.449 Radius: 5.842

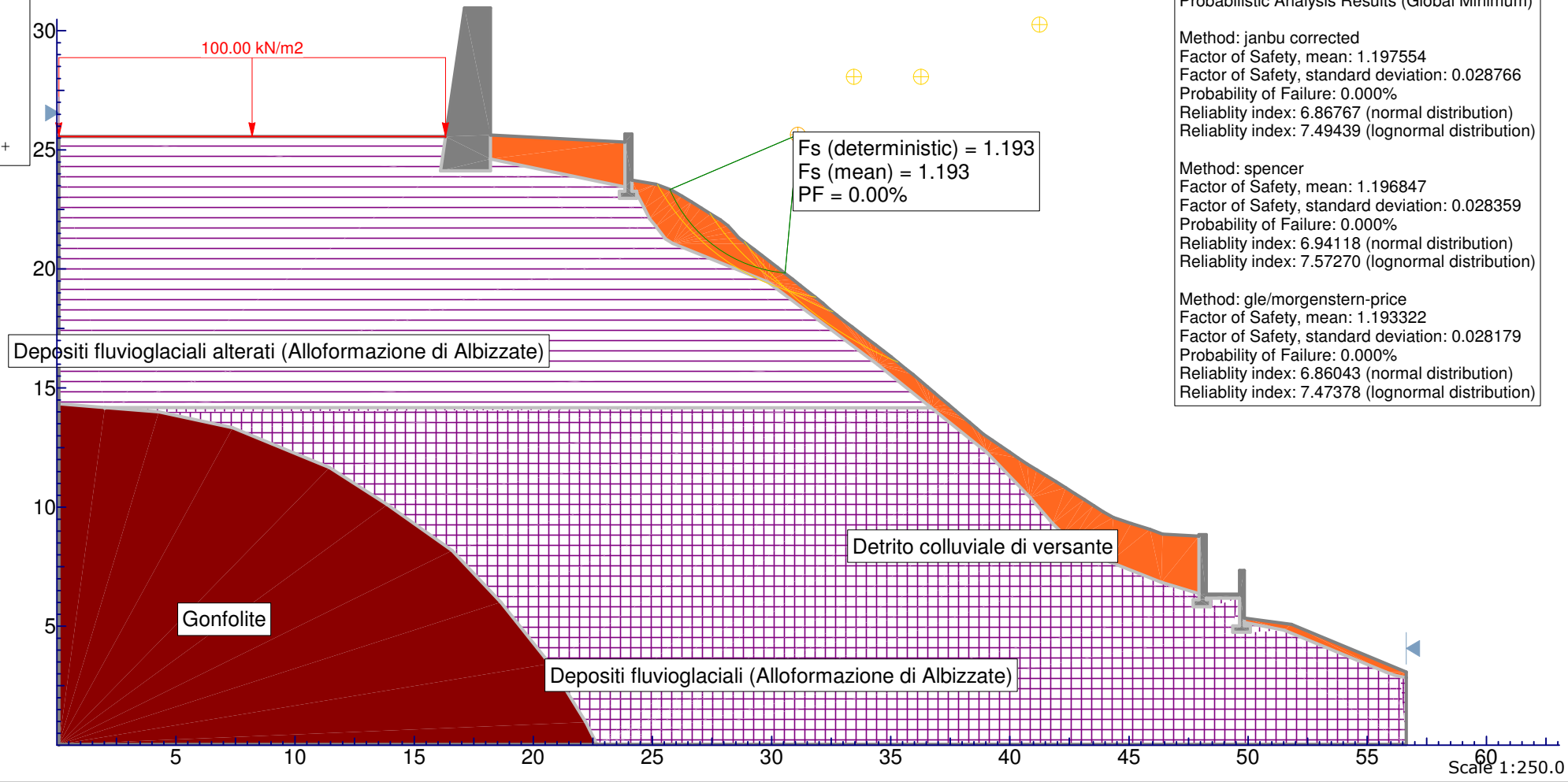
Method: gle/morgenstern-price FS: 1.192640
Center: 71.157, 63.449 Radius: 5.842

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 1.197554
Factor of Safety, standard deviation: 0.028766
Probability of Failure: 0.000%
Reliablity index: 6.86767 (normal distribution)
Reliablity index: 7.49439 (lognormal distribution)

Method: spencer
Factor of Safety, mean: 1.196847
Factor of Safety, standard deviation: 0.028359
Probability of Failure: 0.000%
Reliablity index: 6.94118 (normal distribution)
Reliablity index: 7.57270 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 1.193322
Factor of Safety, standard deviation: 0.028179
Probability of Failure: 0.000%
Reliablity index: 6.86043 (normal distribution)
Reliablity index: 7.47378 (lognormal distribution)



Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 7 - Condizioni drenate

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

Material Properties

Material: Detrito colluviale di versante
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 5 kPa Friction Angle: 28 degrees

Material: Depositi fluvioglaciali (Besnate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 8 kPa Friction Angle: 29 degrees

Material: Alluvionale Postglaciale
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 3 kPa Friction Angle: 27 degrees

Material: Gonfolite
Strength Type: Infinite strength Unit Weight: 22 kN/m3

Global Minimums

Method: janbu corrected FS: 1.608140
Center: 92.795, 73.019 Radius: 17.292

Method: spencer FS: 1.629320
Center: 92.795, 73.019 Radius: 17.292

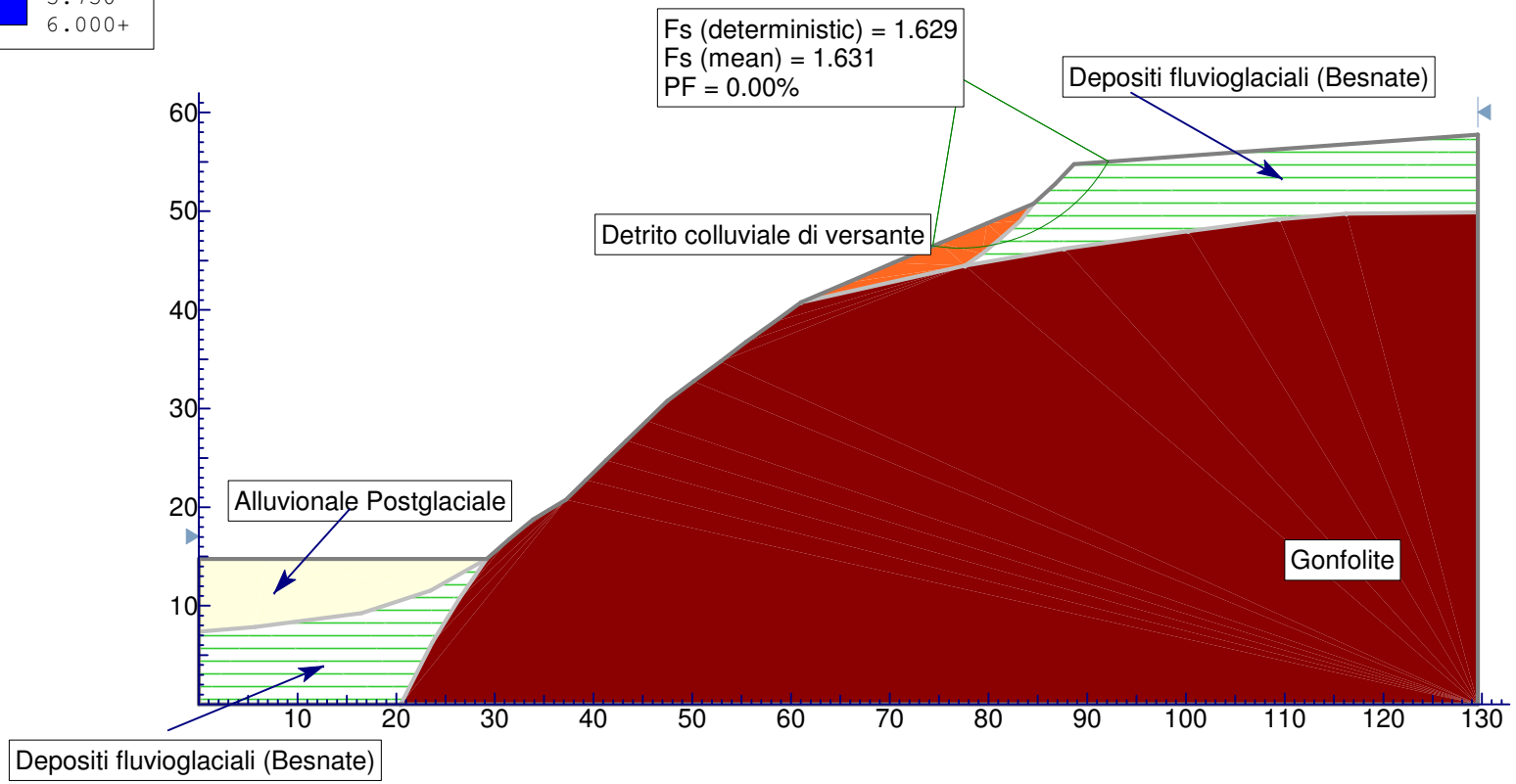
Method: gle/morgenstern-price FS: 1.629300
Center: 92.795, 73.019 Radius: 17.292

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 1.610872
Factor of Safety, standard deviation: 0.046729
Probability of Failure: 0.000%
Reliablity index: 13.07270 (normal distribution)
Reliablity index: 16.42473 (lognormal distribution)

Method: spencer
Factor of Safety, mean: 1.629795
Factor of Safety, standard deviation: 0.043882
Probability of Failure: 0.000%
Reliablity index: 14.35186 (normal distribution)
Reliablity index: 18.13101 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 1.630612
Factor of Safety, standard deviation: 0.044012
Probability of Failure: 0.000%
Reliablity index: 14.32811 (normal distribution)
Reliablity index: 18.10515 (lognormal distribution)



Scale 1:750.0

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 7 - Condizioni di parziale saturazione

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

Material Properties

Material: Detrito colluviale di versante
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 5 kPa Friction Angle: 28 degrees
Ru coefficient = 0.44

Material: Depositi fluvioglaciali (Besnate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 8 kPa Friction Angle: 29 degrees
Ru coefficient = 0.49 - 0.38

Material: Alluvionale Postglaciale
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 3 kPa Friction Angle: 27 degrees
Ru coefficient = 0.5

Material: Gonfolite
Strength Type: Infinite strength Unit Weight: 22 kN/m3

Global Minimums

Method: janbu corrected FS: 1.575030
Center: 92.795, 73.019 Radius: 17.292

Method: spencer FS: 1.593430
Center: 91.385, 78.105 Radius: 22.084

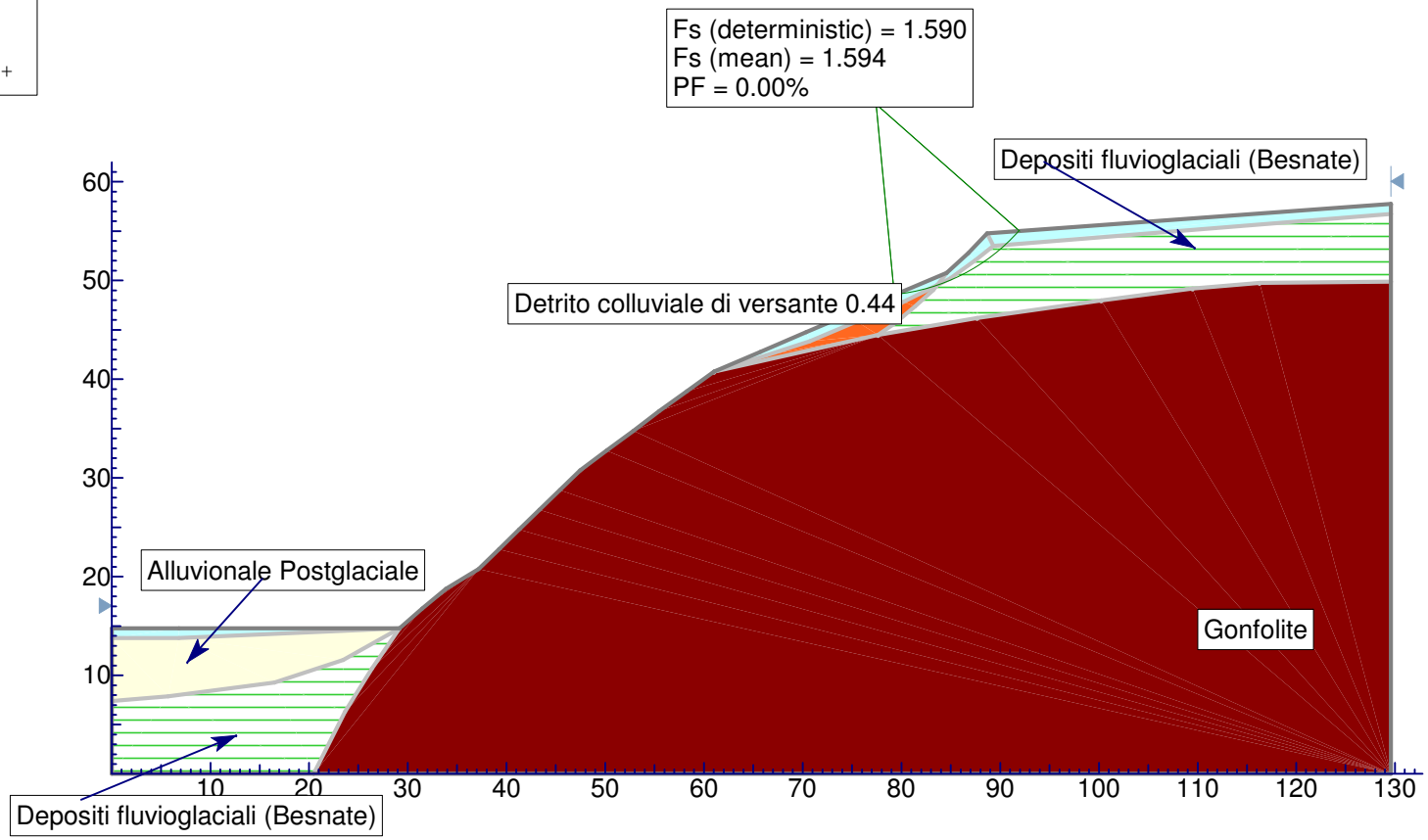
Method: gle/morgenstern-price FS: 1.590310
Center: 93.085, 77.354 Radius: 19.403

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 1.577418
Factor of Safety, standard deviation: 0.041032
Probability of Failure: 0.000%
Reliablity index: 14.07236 (normal distribution)
Reliablity index: 17.51212 (lognormal distribution)

Method: spencer
Factor of Safety, mean: 1.595207
Factor of Safety, standard deviation: 0.040719
Probability of Failure: 0.000%
Reliablity index: 14.61734 (normal distribution)
Reliablity index: 18.28544 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 1.594395
Factor of Safety, standard deviation: 0.056992
Probability of Failure: 0.000%
Reliablity index: 10.42945 (normal distribution)
Reliablity index: 13.03685 (lognormal distribution)



Scale 1:750.0

Vedano Olona - PGT
Analisi di stabilità dei versanti
Sezione 7 - Condizioni sismiche

Safety Factor
0.000
0.250
0.500
0.750
1.000
1.250
1.500
1.750
2.000
2.250
2.500
2.750
3.000
3.250
3.500
3.750
4.000
4.250
4.500
4.750
5.000
5.250
5.500
5.750
6.000+

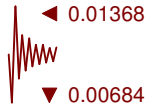
Material Properties

Material: Detrito colluviale di versante
Strength Type: Mohr-Coulomb Unit Weight: 18 kN/m3
Cohesion: 5 kPa Friction Angle: 28 degrees

Material: Depositi fluvioglaciali (Besnate)
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 8 kPa Friction Angle: 29 degrees

Material: Alluvionale Postglaciale
Strength Type: Mohr-Coulomb Unit Weight: 19 kN/m3
Cohesion: 3 kPa Friction Angle: 27 degrees

Material: Gonfolite
Strength Type: Infinite strength Unit Weight: 22 kN/m3



Global Minimums

Method: janbu corrected FS: 1.558540
Center: 92.795, 73.019 Radius: 17.292

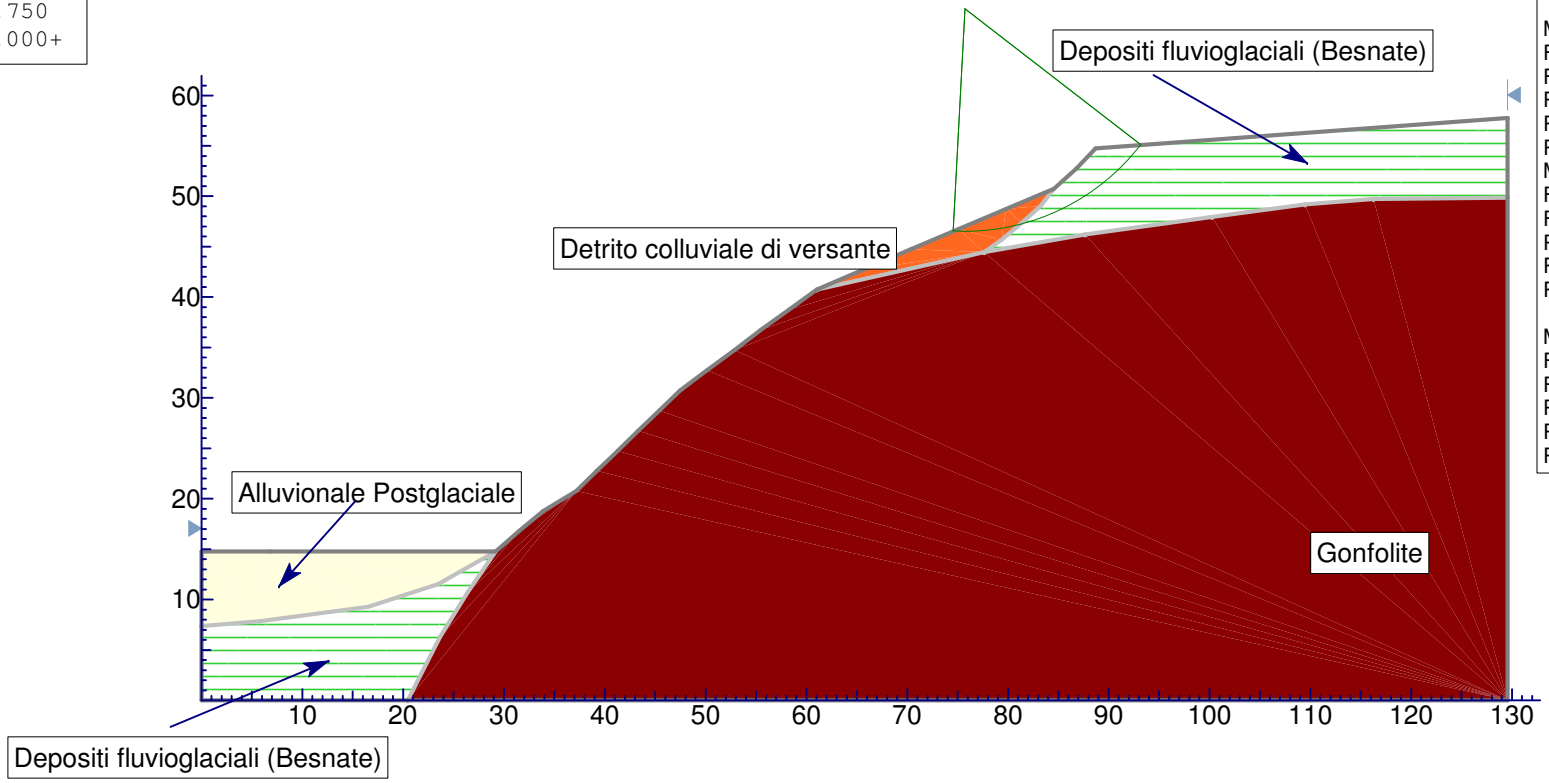
Method: spencer FS: 1.580880
Center: 92.795, 73.019 Radius: 17.292

Method: gle/morgenstern-price FS: 1.578770
Center: 91.385, 78.105 Radius: 22.084

Probabilistic Analysis Results (Global Minimum)

Method: janbu corrected
Factor of Safety, mean: 1.561112
Factor of Safety, standard deviation: 0.045084
Probability of Failure: 0.000%
Reliablity index: 12.44583 (normal distribution)
Reliablity index: 15.41135 (lognormal distribution)
Method: spencer
Factor of Safety, mean: 1.582572
Factor of Safety, standard deviation: 0.042314
Probability of Failure: 0.000%
Reliablity index: 13.76799 (normal distribution)
Reliablity index: 17.15873 (lognormal distribution)

Method: gle/morgenstern-price
Factor of Safety, mean: 1.583019
Factor of Safety, standard deviation: 0.044777
Probability of Failure: 0.000%
Reliablity index: 13.02052 (normal distribution)
Reliablity index: 16.22815 (lognormal distribution)



Scale 1:750.0

Slide Analysis Information

Project Settings

Project Title: SLIDE - An Interactive Slope Stability Program
Failure Direction: Right to Left
Units of Measurement: SI Units
Pore Fluid Unit Weight: 9.81 kN/m3
Groundwater Method: Ru coefficient
Data Output: Standard
Calculate Excess Pore Pressure: Off
Allow Ru with Water Surfaces or Grids: Off
Random Numbers: Pseudo-random Seed
Random Number Seed: 10116
Random Number Generation Method: Park and Miller v.3

Analysis Methods

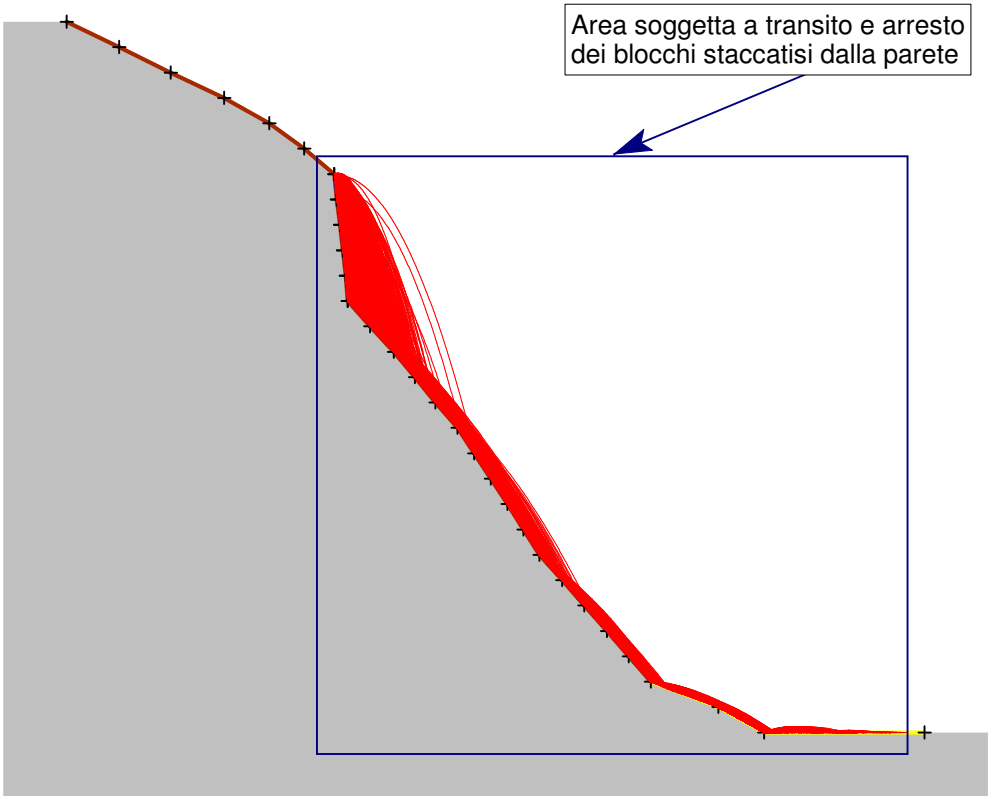
Analysis Methods used:
GLE/Morgenstern-Price with interslice force function: Half Sine
Janbu corrected
Spencer

Number of slices: 25
Tolerance: 0.005
Maximum number of iterations: 50

Surface Options

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

Vedano Olona - PGT
Analisi di stabilità dei versanti - Rischio crollo
Sezione 8

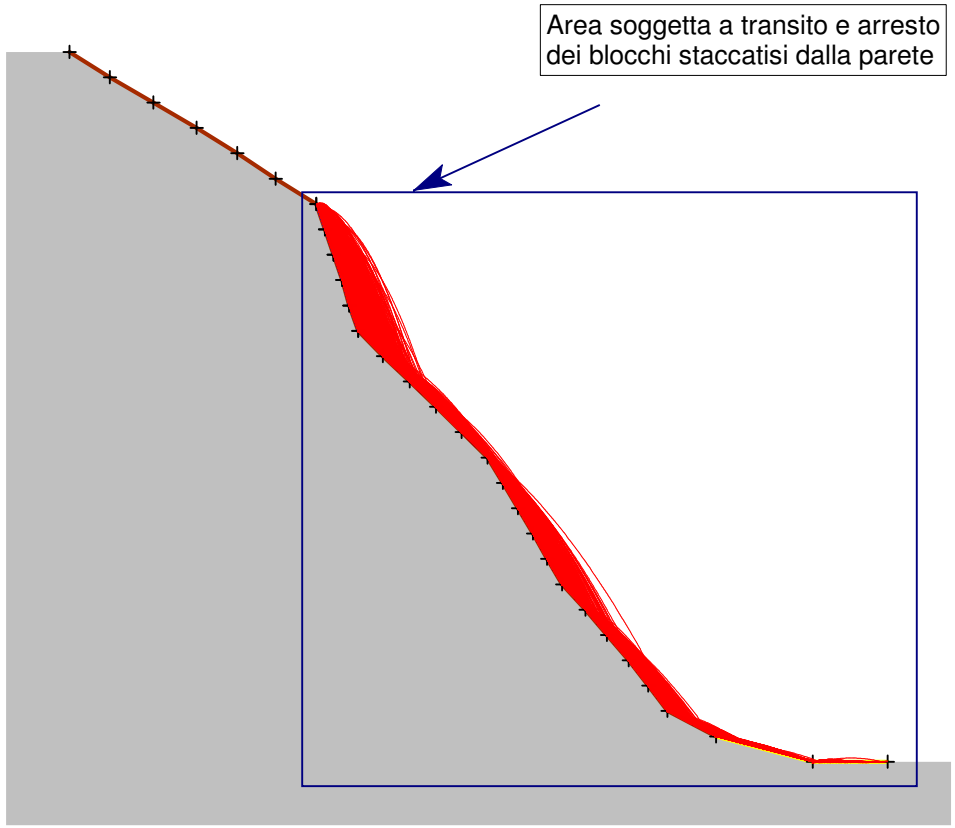


Materials

Material name: Roccia
Coefficient of Normal Restitution (RN): mean=0.6 std dev=0.09
Coefficient of Tangential Restitution (RT): mean=0.75 std dev=0.09
Friction Angle: mean=44 std dev=2
Roughness: std dev=0

Material name: Detrito
Coefficient of Normal Restitution (RN): mean=0.62 std dev=0.03
Coefficient of Tangential Restitution (RT): mean=0.66 std dev=0.03
Friction Angle: mean=21 std dev=2
Roughness: std dev=0

Vedano Olona - PGT
Analisi di stabilità dei versanti - Rischio crollo
Sezione 9



Materials

Material name: Roccia
Coefficient of Normal Restitution (RN): mean=0.6 std dev=0.09
Coefficient of Tangential Restitution (RT): mean=0.75 std dev=0.09
Friction Angle: mean=44 std dev=2
Roughness: std dev=0

Material name: Detrito
Coefficient of Normal Restitution (RN): mean=0.62 std dev=0.03
Coefficient of Tangential Restitution (RT): mean=0.66 std dev=0.03
Friction Angle: mean=21 std dev=2
Roughness: std dev=0

RocFall Analysis Information

Project Settings

Units: Metric
Friction angle: Use friction fngle specified in material editor
Coefficient of Normal Restitution (RN) scaled based on rock velocity, According to:
Rn(scaled) = Rn/(1+(Vrock/K)^2) , where K=9.144
Minimum Velocity=0.1
Angular Velocity of the rocks CONSIDERED
Standard Deviations NOT USED when generating slope vertices
Random-number generation: Pseudo-random with seed=190274

Materials

Material name: Roccia
Coefficient of Normal Restitution (RN): mean=0.6 std dev=0.09
Coefficient of Tangential Restitution (RT): mean=0.75 std dev=0.09
Friction Angle: mean=44 std dev=2
Roughness: std dev=0

Material name: Detrito
Coefficient of Normal Restitution (RN): mean=0.62 std dev=0.03
Coefficient of Tangential Restitution (RT): mean=0.66 std dev=0.03
Friction Angle: mean=21 std dev=2
Roughness: std dev=0

Seeders

Line Seeder
Horizontal Velocity: mean=2, std dev=1
Vertical Velocity: mean=1, std dev=0.3
Mass: mean=100, std dev=0
Angular Velocity: mean=0, std dev=0