REPORT

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User: Montaldo Engineering S.r.l. – Via Renata Bianchi 38, Genova Italy

Title: Imbocco S. Siro

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Length 70

[m] 70

Nodes 70

1 70

Pali 70

14,000 70

2716, 2476, 2182, 2178, 2184, 2196, 2201, 2203, 2213, 2326, 2541, 2620, 2897, 3585, 4802, 5080. 70

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Geotextiles 70

no 70

Data set 70

Length 70

[m] 70

Nodes 70

1 70

Bulbo Tiranti 3 70

13,195 70

6020, 6547. 70

2 70

Bulbo tiranti 2 70

14,995 70

5838, 6235, 6544. 70

3 70
Bulbo Tiranti 1 70
11,996 70
5664, 6201. 70
4 70
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11,993 70
5249, 5579, 5858, 6198. 70
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1 71
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Gruppo4 71
Gruppo4 71
Gruppo4 71
Gruppo4 71
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Gruppo 3 71
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Gruppo4 71
Gruppo4 71
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[m] 72
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1 72
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10,095 72
2620 72
6020 72
2 72
Tiranti 2 72
10,185 72
2213 72
5838 72
3 72
Tiranti 1 72
10,287 72
2196 72

5664 72
4 72
Tiranti 1 72
10,003 72
2182 72
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Linear Elastic 74

8 74

Terre-Armate 74

Type 74

Non-porous 74

γ_{unsat} 74

[kN/m³] 74

10,00 74

γ_{sat} 74

[kN/m³] 74

10,00 74

k_x 74

[m/day] 74

0,000 74

k_y 74

[m/day] 74

0,000 74

e_{init} 74

[-] 74

0,500 74

c_k 74

[-] 74

1E15 74

E_{ref} 74

[kN/m²] 74

60000,00 74

ν 75

[-] 75

0,300 75

G_{ref} 75
[kN/m²] 75
23076,923 75
E_{oed} 75
[kN/m²] 75
80769,231 75
E_{incr} 75
[kN/m²/m] 75
0,00 75
y_{ref} 75
[m] 75
0,000 75
R_{inter} 75
[-] 75
0,750 75
Interface 75
permeability 75
Impermeable 75
Mohr-Coulomb 75
1 75
Gruppo4 75
2 75
Gruppo 3 75
3 75
Gruppo 3 minimo 75
4 75
Gruppo 3 min migliorato 75
Type 75
Drained 75
Drained 75
Drained 75

Drained 75
γ_{unsat} 75
[kN/m³] 75
24,00 75
25,00 75
25,00 75
25,00 75
γ_{sat} 75
[kN/m³] 75
24,00 75
25,00 75
25,00 75
25,00 75
k_x 76
[m/day] 76
0,009 76
0,009 76
0,009 76
0,009 76
k_y 76
[m/day] 76
0,009 76
0,009 76
0,009 76
0,009 76
e_{init} 76
[-] 76
0,500 76
0,500 76
0,500 76
0,500 76

c_k 76
[-] 76
1E15 76
1E15 76
1E15 76
1E15 76
E_{ref} 76
[kN/m²] 76
500000,000 76
1400000,000 76
533000,000 76
533000,000 76
ν 76
[-] 76
0,380 76
0,300 76
0,350 76
0,350 76
G_{ref} 76
[kN/m²] 76
181159,420 76
538461,538 76
197407,407 76
197407,407 76
E_{oed} 76
[kN/m²] 76
935990,338 76
1884615,385 76
855432,099 76
855432,099 76
c_{ref} 76

[kN/m²] 76
56,00 76
200,00 76
104,00 76
156,00 76
φ 76
[°] 76
18,00 76
25,00 76
19,00 76
19,00 76
ψ 76
[°] 76
0,00 76
0,00 76
0,00 76
0,00 76
E_{inc} 76
[kN/m²/m] 76
0,00 76
0,00 76
0,00 76
0,00 76
y_{ref} 77
[m] 77
0,000 77
0,000 77
0,000 77
0,000 77
$c_{increment}$ 77
[kN/m²/m] 77

0,00 77
0,00 77
0,00 77
0,00 77
$T_{str.}$ 77
[kN/m²] 77
0,00 77
0,00 77
0,00 77
0,00 77
$R_{inter.}$ 77
[-] 77
0,85 77
0,85 77
0,85 77
1,00 77
Interface 77
permeability 77
Neutral 77
Neutral 77
Neutral 77
Neutral 77
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Type 77
Drained 77

Drained 77
Drained 77
γ_{unsat} 77
[kN/m³] 77
24,00 77
20,00 77
25,00 77
γ_{sat} 77
[kN/m³] 77
24,00 77
20,00 77
25,00 77
k_x 77
[m/day] 77
0,009 77
0,009 77
0,009 77
k_y 78
[m/day] 78
0,009 78
0,009 78
0,009 78
e_{init} 78
[-] 78
0,500 78
0,500 78
0,500 78
c_k 78
[-] 78
1E15 78
1E15 78

1E15 78

E_{ref} 78

[kN/m²] 78

500000,000 78

20000,000 78

1400000,000 78

ν 78

[-] 78

0,380 78

0,380 78

0,300 78

G_{ref} 78

[kN/m²] 78

181159,420 78

7246,377 78

538461,538 78

E_{oed} 78

[kN/m²] 78

935990,338 78

37439,614 78

1884615,385 78

c_{ref} 78

[kN/m²] 78

84,00 78

5,00 78

300,00 78

φ 78

[°] 78

18,00 78

18,00 78

25,00 78

ψ 78
[°] 78
0,00 78
0,00 78
0,00 78
E_{inc} 78
[kN/m²/m] 78
0,00 78
0,00 78
0,00 78
y_{ref} 78
[m] 78
0,000 78
0,000 78
0,000 78
$c_{increment}$ 79
[kN/m²/m] 79
0,00 79
0,00 79
0,00 79
$T_{str.}$ 79
[kN/m²] 79
0,00 79
0,00 79
0,00 79
$R_{inter.}$ 79
[-] 79
1,00 79
1,00 79
1,00 79
Interface 79

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Neutral 79
Neutral 79
Neutral 79
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Identification 79
EA 79
EI 79
w 79
ν 79
Mp 79
Np 79
[kN/m] 79
[kNm²/m] 79
[kN/m/m] 79
[-] 79
[kNm/m] 79
[kN/m] 79
1 79
Pali 79
2,1E6 79
4284,00 79
0,77 79
0,20 79
1E15 79
1E15 79
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No. 79
Identification 79
EA 79

ν 79
[kN/m] 79
[-] 79
1 80
Bulbo Tiranti 3 80
8792000,00 80
0,00 80
2 80
Bulbo tiranti 2 80
670333,00 80
0,00 80
3 80
Bulbo Tiranti 1 80
4509667,00 80
0,00 80
4 80
Bulbo 2 80
2011000,00 80
0,00 80
5 80
Bulbo 3 80
26376000,00 80
0,00 80
6 80
Bulbo tiranti -1 80
2511667,00 80
0,00 80
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No. 80
Identification 80
EA 80

|Fmax,comp| 80
|Fmax,tens| 80
L spacing 80
[kN] 80
[kN] 80
[kN] 80
[m] 80
1 80
Tiranti 1 80
88200,00 80
1E15 80
1E15 80
3,00 80
2 80
Tiranti 2 80
117600,00 80
1E15 80
1E15 80
3,00 80
3 81
Tirante singolo 81
117600,00 81
1E15 81
1E15 81
1,00 81
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Start phase 82
Calculation type 82

Load input 82
First step 82
Last step 82
Initial phase 82
0 82
0 82
- 82
0 82
0 82
K0 82
1 82
0 82
Plastic 82
Total multipliers 82
1 82
13 82
Installazione-Paratia 82
2 82
1 82
Plastic 82
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Staged construction 82
21 82
51 82
1-Scavo 82

4 82
3 82
Plastic 82
Staged construction 82
52 82
62 82
2-Scavo 82
5 82
4 82
Plastic 82
Staged construction 82
63 82
89 82
3-Scavo 82
6 82
5 82
Plastic 82
Staged construction 82
90 82
107 82
4-Scavo 82
7 82
6 82
Plastic 82
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Active clusters 83
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Active geotextiles 83
Active anchors 83
0 83
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 31. 83
26, 29, 30, 32. 83
2 83
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 31. 83
26, 29, 30, 32. 83
1. 83
3 83
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32. 83
1. 83
4 84
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32. 84
19, 24. 84
1. 84
4. 84
5 84
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 20, 21, 23, 25, 26, 27, 28, 29, 30, 31, 32. 84
16, 19, 22, 24. 84
1. 84
3, 4. 84
6 84

1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 20, 21, 23, 25, 26, 27, 28, 29, 30, 31, 32. 84

6, 15, 16, 19, 22, 24. 84

1. 84

2, 3, 4. 84

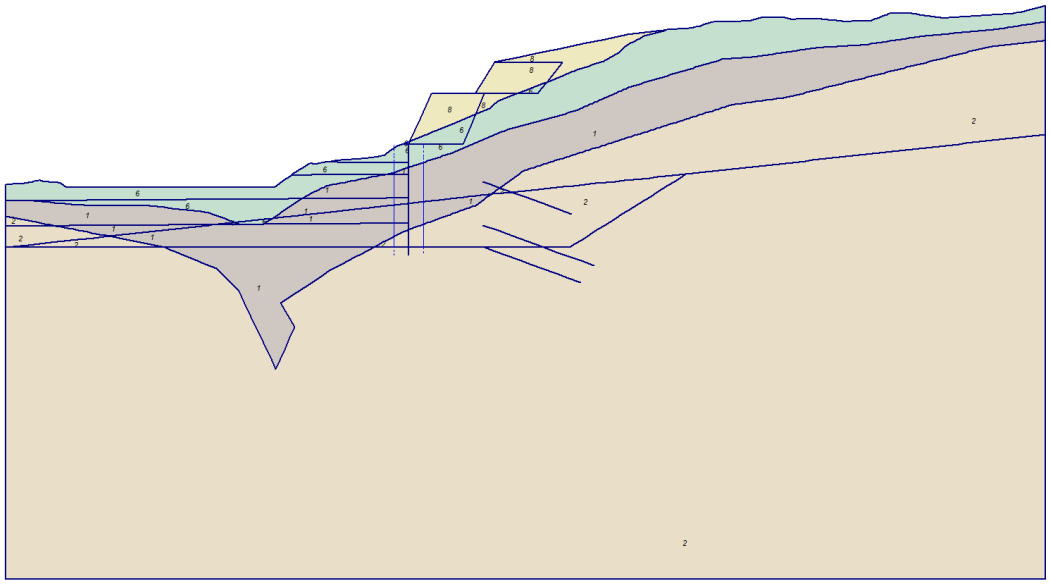
7 85

1, 2, 3, 4, 5, 7, 9, 10, 11, 17, 18, 20, 21, 23, 25, 26, 27, 28, 29, 30, 31, 32. 85

6, 8, 12, 13, 14, 15, 16, 19, 22, 24. 85

1. 85

1, 2, 3, 4. 85



..... 85

Table [17] Control parameters 1 85

Ph-No. 85

Additional steps 85

Reset displacements to zero 85

Ignore undrained behaviour 85

Delete intermediate steps 85

1 86

2 86
3 86
4 86
5 86
6 86
7 86
9 86
250 86
250 86
250 86
250 86
250 86
250 86
250 86
100 86
No 86
Yes 86
No 86
Yes 86
No 86
No 86
No 86
Yes 86
No 86
No 86
No 86
No 86
No 86
No 86
No 86
No 86
No 86

Yes 86

Yes 86

Yes 86

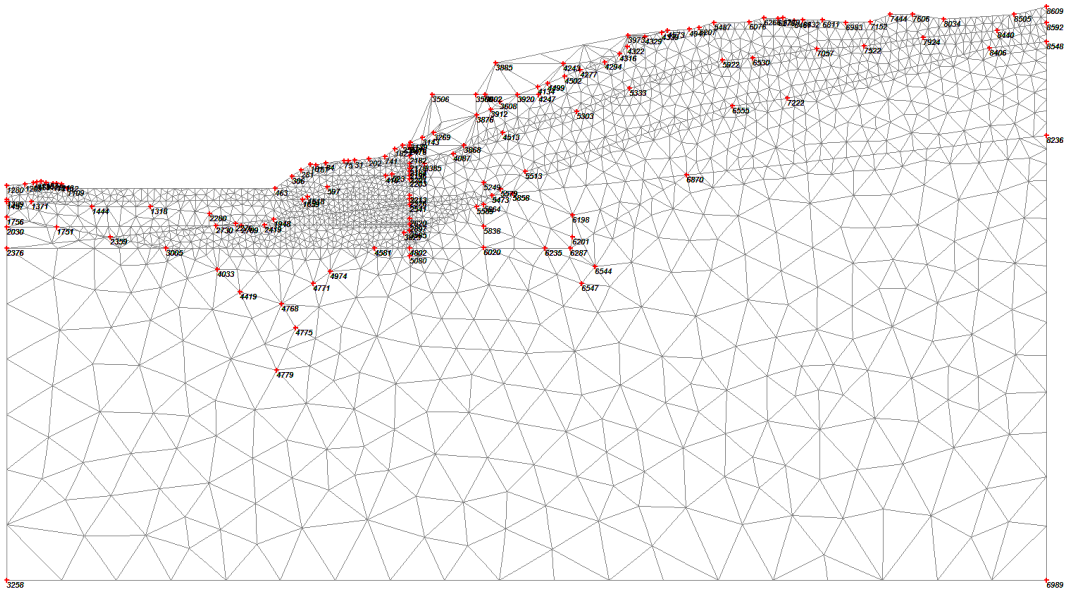
Yes 86

Yes 86

Yes 86

Yes 86

Yes 86



..... 86

Table [18] Control parameters 2 87

Ph-No. 87

Iterative procedure 87

Tolerated error 87

Over relaxation 87

Max. iterations 87

Desired min. 87

Desired max. 87

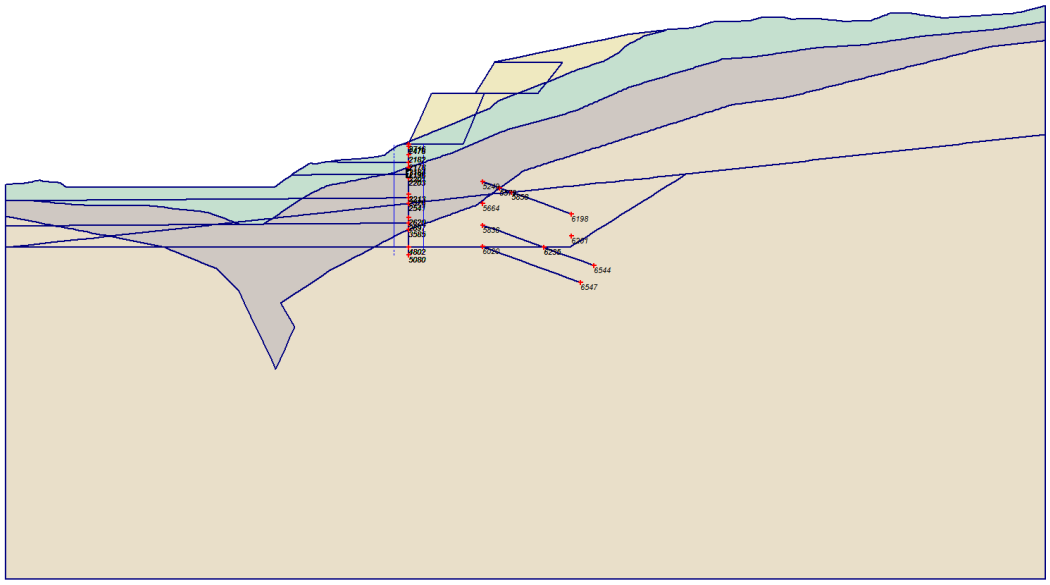
Arc-Length control 87
1 87
2 87
3 87
4 87
5 87
6 87
7 87
9 87
Standard 87
Standard 87
Standard 87
Standard 87
Standard 87
Standard 87
Standard 87
Standard 87
Manual 87
0,010 87
0,010 87
0,010 87
0,010 87
0,010 87
0,010 87
0,010 87
0,050 87
1,200 87
1,200 87
1,200 87
1,200 87
1,200 87
1,200 87

1,200 87
1,200 87
60 87
60 87
60 87
60 87
60 87
60 87
60 87
60 87
60 87
6 87
6 87
6 87
6 87
6 87
6 87
6 87
6 87
15 87
15 87
15 87
15 87
15 87
15 87
15 87
15 87
Yes 87
Yes 87
Yes 87
Yes 87
Yes 87

Yes 87

Yes 87

Yes 87



..... 88

Table [19] Incremental multipliers (input values) 88

Ph-No. 88

Displ. 88

Load A 88

Load B 88

Weight 88

Accel 88

Time 88

s-f 88

0 88

1 88

2 88

3 88

4 88
5 88
6 88
7 88
9 88
0,0000 88
0,0000 88
0,0000 88
0,0000 88
0,0000 88
0,0000 88
0,0000 88
0,0000 88
0,0000 88
0,0000 88
0,0000 88
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0,0000 88
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0,0000 88
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0,0000 88
0,0000 88
0,0000 88
0,0000 88

0,0000 88
0,0000 88
0,0000 88

0,0000 88

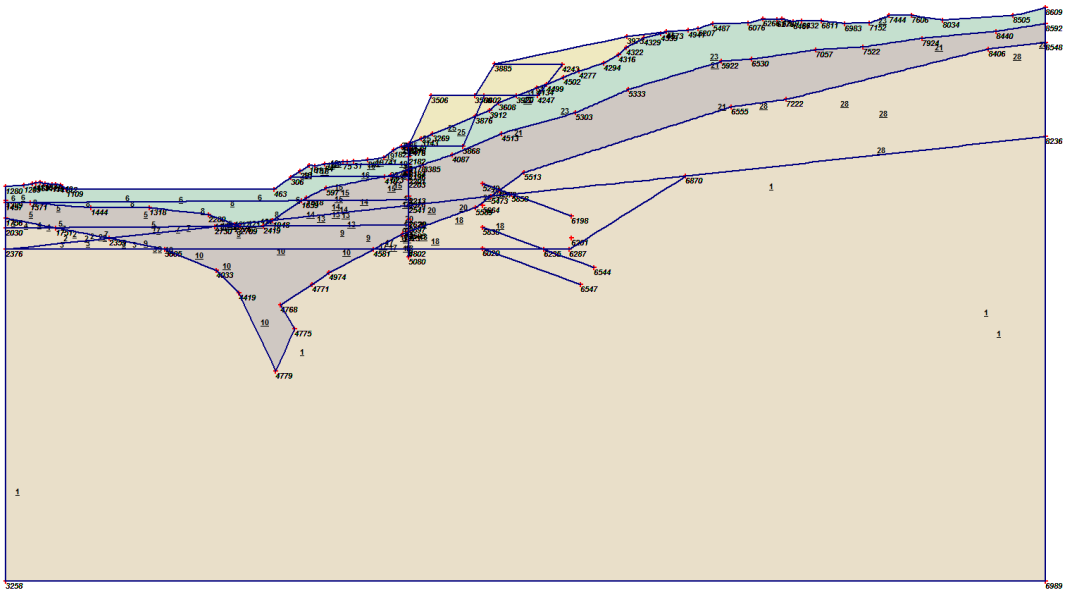
0,0000 88

0,0000 88

0,0000 88

0,0000 88

0,1000 88



..... 89

Table [20] Total multipliers - input values 89

Ph-No. 89

Displ. 89

Load A 89

Load B 89

Weight 89

Accel 89

Time 89

s-f 89

0 89

1 89
2 89
3 89
4 89
5 89
6 89
7 89
9 89
1,0000 89
1,0000 89
1,0000 89
1,0000 89
1,0000 89
1,0000 89
1,0000 89
1,0000 89
1,0000 89
1,0000 89
1,0000 89
1,0000 89
1,0000 89
1,0000 89
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1,0000 89
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1,0000 89
1,0000 89

1,0000 89
1,0000 89
1,0000 89
1,0000 89
0,0000 89
1,0000 89
1,0000 89
1,0000 89
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1,0000 89
1,0000 89
0,0000 89
0,0000 89
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0,0000 89
0,0000 89
0,0000 89

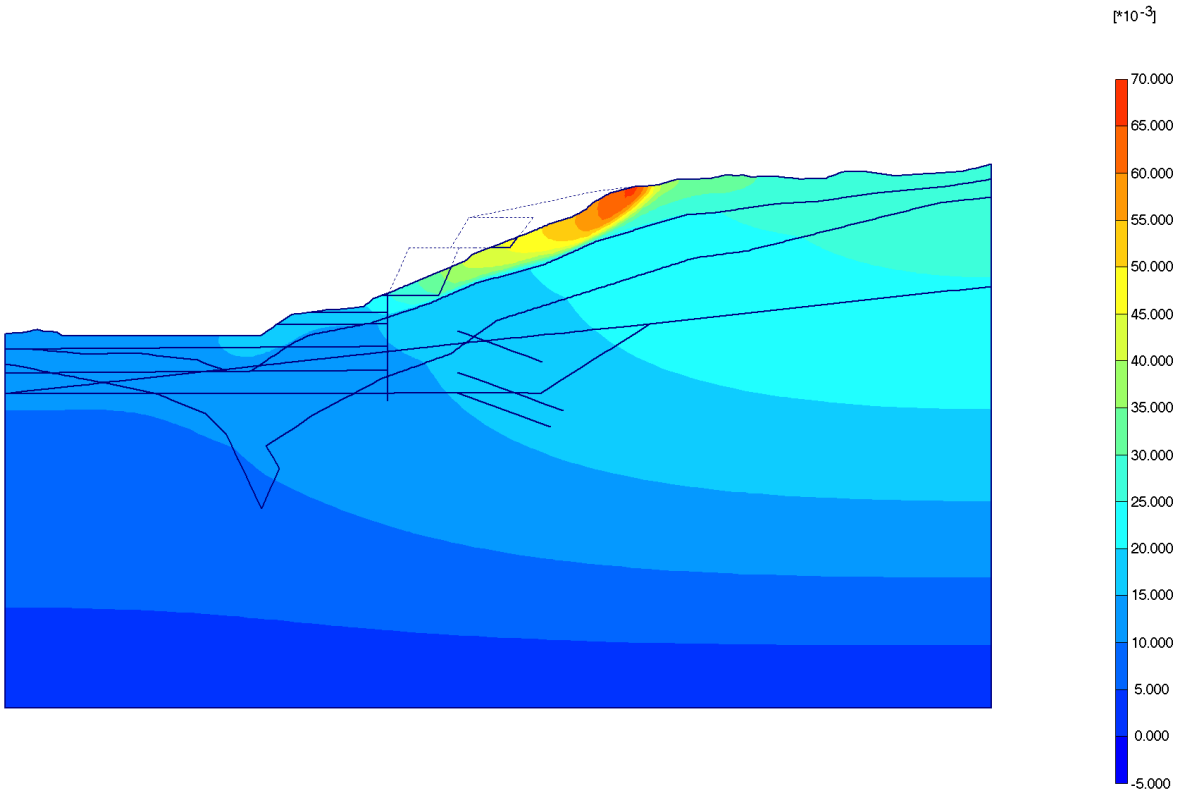
1,0000 89
1,0000 89
1,0000 89
1,0000 89
1,0000 89
1,0000 89
1,0000 89
1,0000 89
2,6582 89
Table [21] Total multipliers - reached values 90
Ph-No. 90
Displ. 90
Load A 90
Load B 90
Weight 90
Accel 90
Time 90
s-f 90
0 90
1 90
2 90
3 90
4 90
5 90
6 90
7 90
9 90
1,0000 90
1,0000 90
1,0000 90
1,0000 90

1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
0,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90
1,0000..... 90

1,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
0,0000 90
1,0000 90
1,0000 90
1,0000 90
1,0000 90
1,0000 90
1,0000 90
1,0000 90
1,0000 90
2,5728 90
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Step no: 91

13 91
Calculation type 91
PLASTIC 91
Extrapolation factor 91
0,433 91
Relative stiffness 91
0,367 91
Table [23] Reached multipliers phase no: 1 91
Multipliers 91
Incremental value 91
Total value 91
Prescribed displacements 91
0,0000 91
1,0000 91
Load system A 91
0,0000 91
1,0000 91
Load system B 91
0,0000 91
1,0000 91
Soil weight 91
0,1022 91
1,0000 91
Acceleration 91
0,0000 91
0,0000 91
Strength reduction factor 91
0,0000 91
1,0000 91
Time 91
0,0000 91

0,0000 91
Table [24] Staged construction info phase no: 1 92
Staged construction 92
Incremental value 92
Total value 92
Active proportion of total area 92
0,000 92
0,988 92
Active proportion of stage 92
0,000 92
0,000 92
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- step no: 13 - (phase: 1) 92
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Calculation type 93
PLASTIC 93
Extrapolation factor 93
0,080 93
Relative stiffness 93
0,017 93



..... 93

Table [26] Reached multipliers phase no: 2 93

Multipliers 93

Incremental value 93

Total value 93

Prescribed displacements 94

0,0000 94

1,0000 94

Load system A 94

0,0000 94

1,0000 94

Load system B 94

0,0000 94

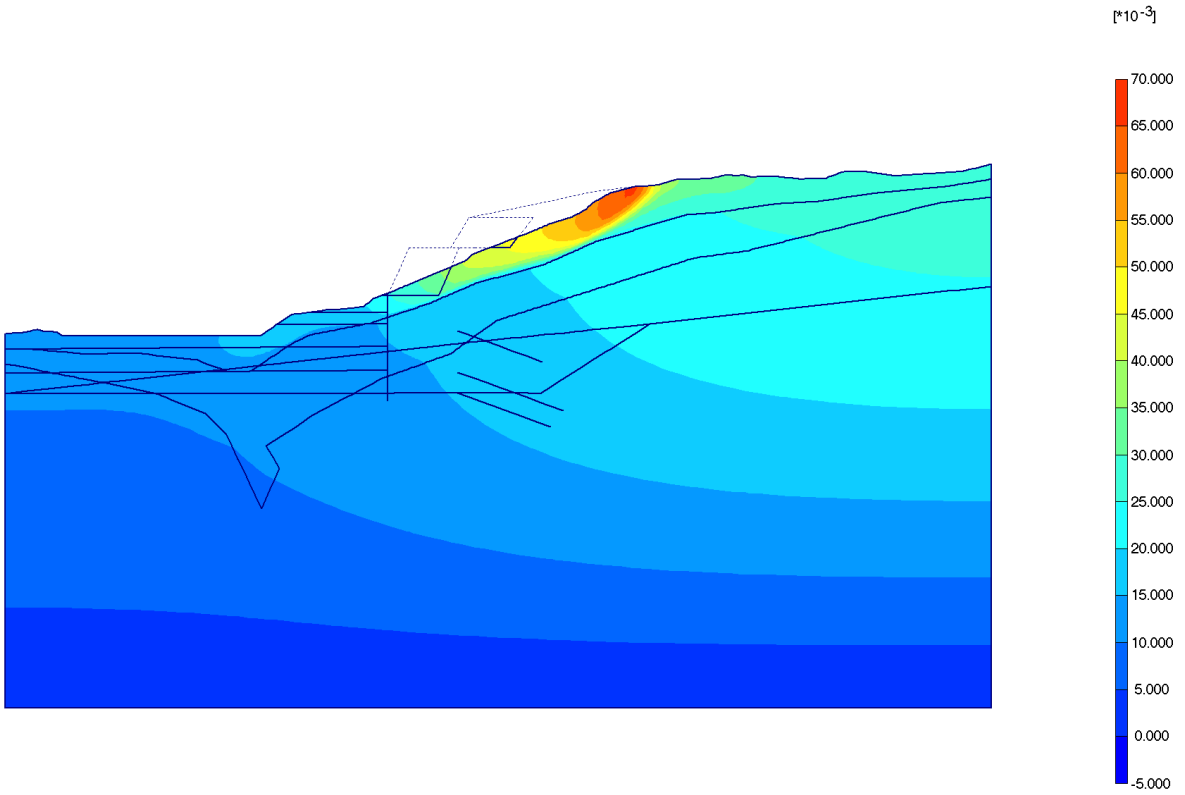
1,0000 94

Soil weight 94

0,0000 94

1,0000 94

Acceleration 94
0,0000 94
0,0000 94
Strength reduction factor 94
0,0000 94
1,0000 94
Time 94
0,0000 94
0,0000 94
Table [27] Staged construction info phase no: 2 94
Staged construction 94
Incremental value 94
Total value 94
Active proportion of total area 94
0,000 94
0,988 94
Active proportion of stage 94
0,037 94
1,000 94



..... 95

Fig. 9 Plot of deformed mesh 95

- step no: 20 - (phase: 2) 95

Fig. 10 Plot of total displacements (shadings) 95

- step no: 20 - (phase: 2) 95

Fig. 11 Plot of total incremental strains (shear shadings) 95

- step no: 20 - (phase: 2) 95

9. Results for phase 3 97

Table [28] Step info phase no: 3 97

Step no: 97

51 97

Calculation type 97

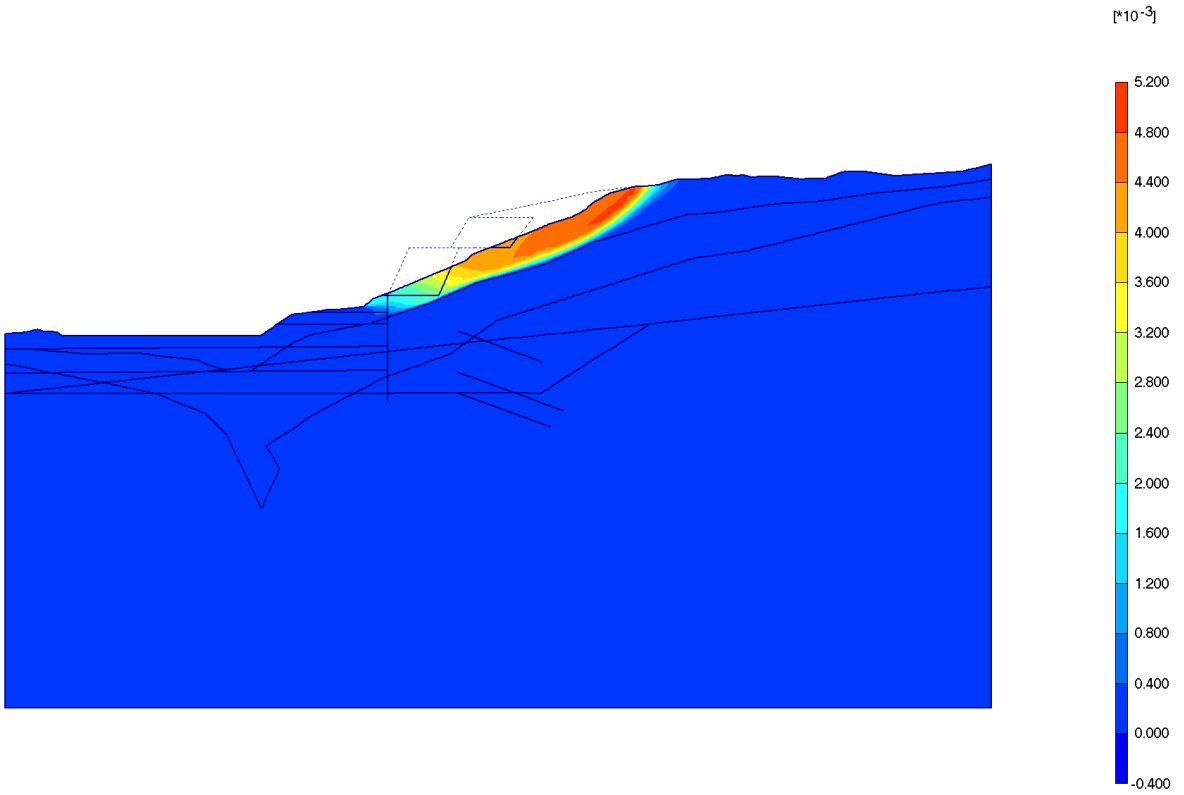
PLASTIC 97

Extrapolation factor 97

0,474 97

Relative stiffness 97

0,003 97



..... 97

Table [29] Reached multipliers phase no: 3 97

Multipliers 97

Incremental value..... 97

Total value 97

Prescribed displacements 98

0,0000..... 98

1,0000..... 98

Load system A 98

0,0000..... 98

1,0000..... 98

Load system B..... 98

0,0000..... 98

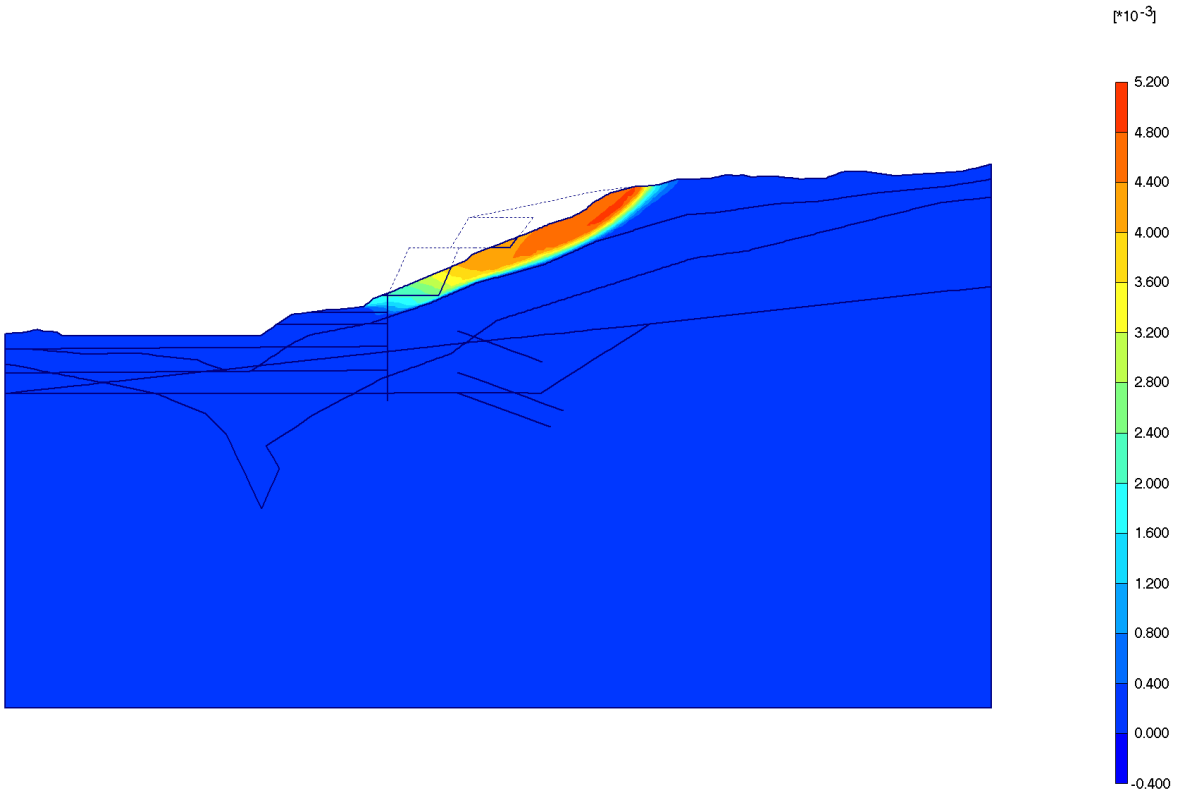
1,0000..... 98

Soil weight 98

0,0000..... 98

1,0000..... 98

Acceleration 98
0,0000 98
0,0000 98
Strength reduction factor 98
0,0000 98
1,0000 98
Time 98
0,0000 98
0,0000 98
Table [30] Staged construction info phase no: 3 98
Staged construction 98
Incremental value 98
Total value 98
Active proportion of total area 98
0,000 98
1,000 98
Active proportion of stage 98
0,006 98
1,000 98



..... 99

Fig. 12 Plot of deformed mesh 99

- step no: 51 - (phase: 3) 99

Fig. 13 Plot of total displacements (shadings) 99

- step no: 51 - (phase: 3) 99

Fig. 14 Plot of total incremental strains (shear shadings) 99

- step no: 51 - (phase: 3) 99

10. Results for phase 4 101

Table [31] Step info phase no: 4 101

Step no: 101

62 101

Calculation type 101

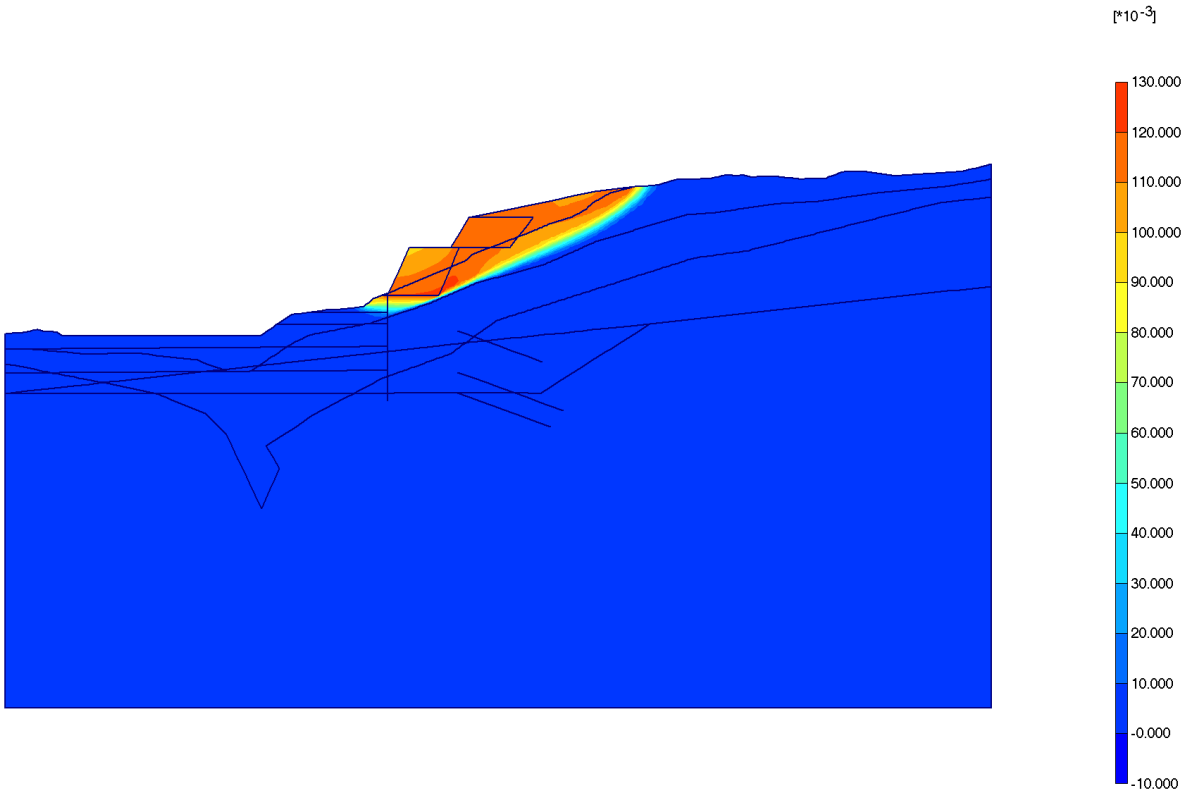
PLASTIC 101

Extrapolation factor 101

0,488 101

Relative stiffness 101

0,086 101



..... 101

Table [32] Reached multipliers phase no: 4 101

Multipliers 101

Incremental value 101

Total value 101

Prescribed displacements 102

0,0000 102

1,0000 102

Load system A 102

0,0000 102

1,0000 102

Load system B 102

0,0000 102

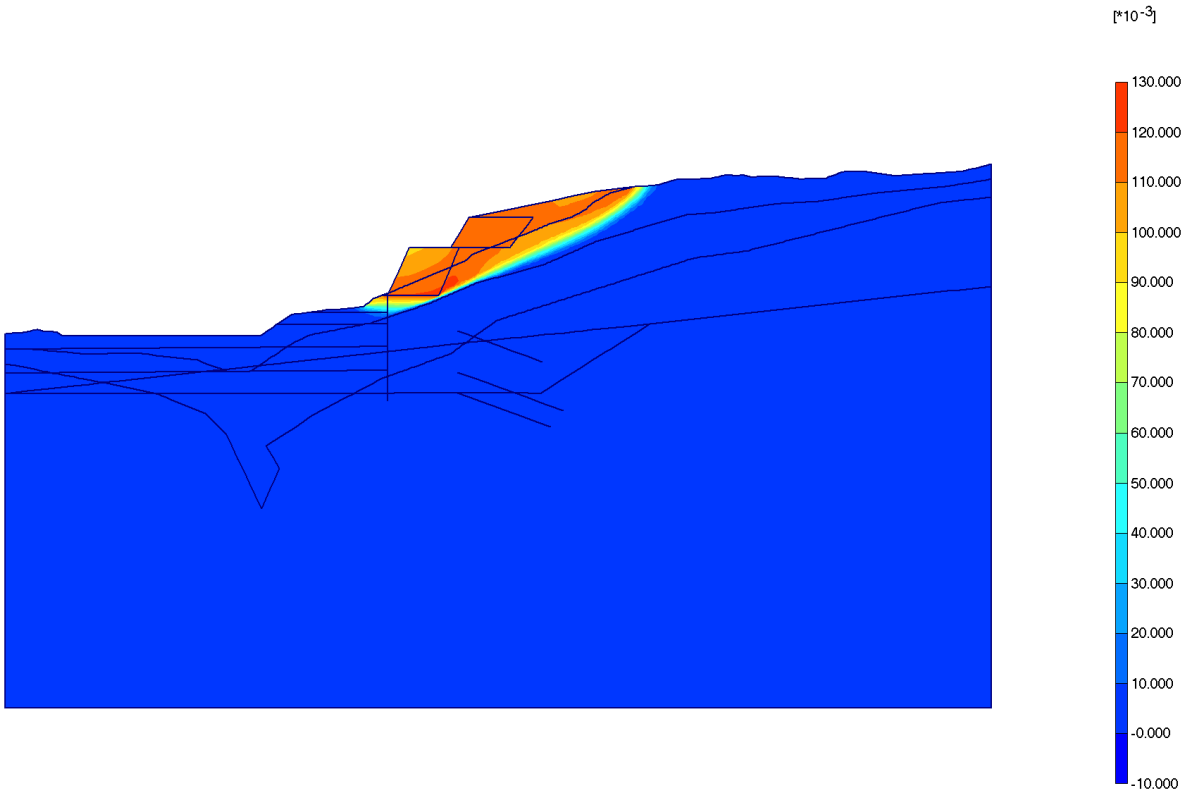
1,0000 102

Soil weight 102

0,0000 102

1,0000 102

Acceleration 102
0,0000 102
0,0000 102
Strength reduction factor 102
0,0000 102
1,0000 102
Time 102
0,0000 102
0,0000 102
Table [33] Staged construction info phase no: 4 102
Staged construction 102
Incremental value 102
Total value 102
Active proportion of total area 102
0,000 102
0,999 102
Active proportion of stage 102
0,012 102
1,000 102



..... 103

Fig. 15 Plot of deformed mesh 103

- step no: 62 - (phase: 4) 103

Fig. 16 Plot of total displacements (shadings) 103

- step no: 62 - (phase: 4) 103

Fig. 17 Plot of total incremental strains (shear shadings) 103

- step no: 62 - (phase: 4) 103

11. Results for phase 5 105

Table [34] Step info phase no: 5 105

Step no: 105

89 105

Calculation type 105

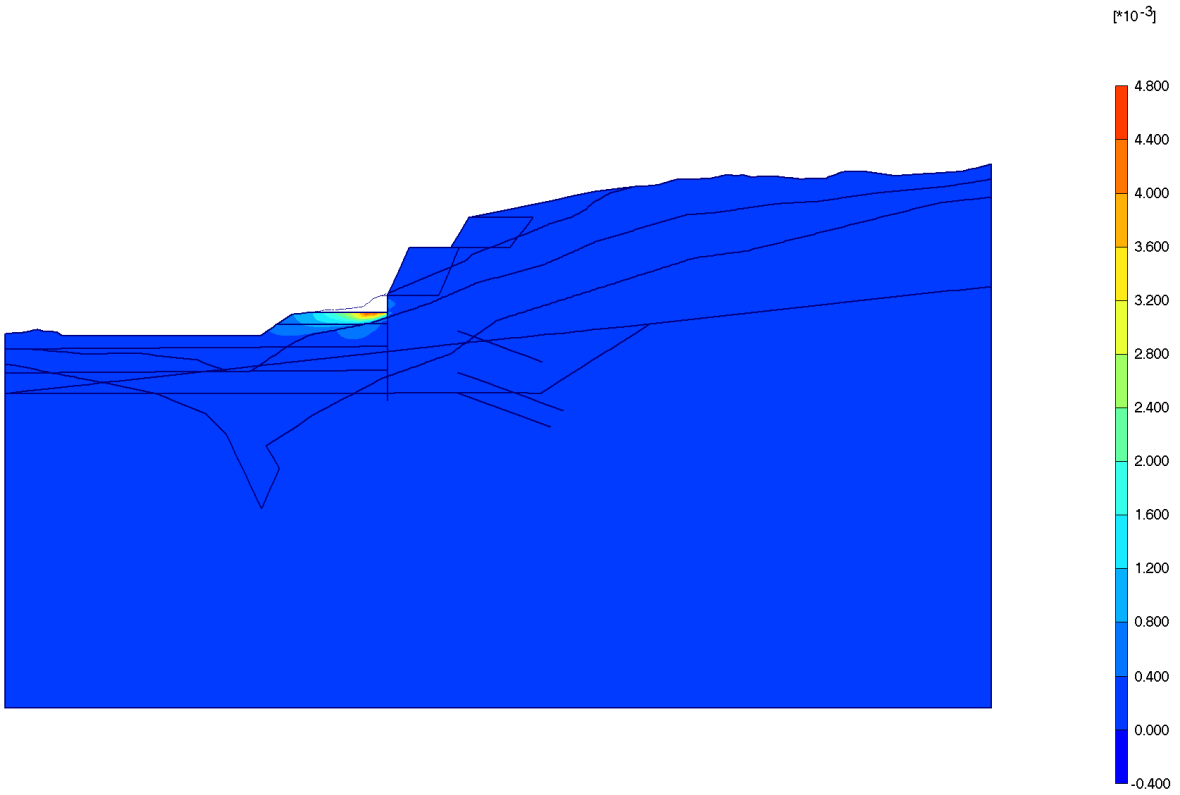
PLASTIC 105

Extrapolation factor 105

1,688 105

Relative stiffness 105

0,021 105



..... 105

Table [35] Reached multipliers phase no: 5 105

Multipliers 105

Incremental value..... 105

Total value 105

Prescribed displacements 106

0,0000..... 106

1,0000..... 106

Load system A 106

0,0000..... 106

1,0000..... 106

Load system B..... 106

0,0000..... 106

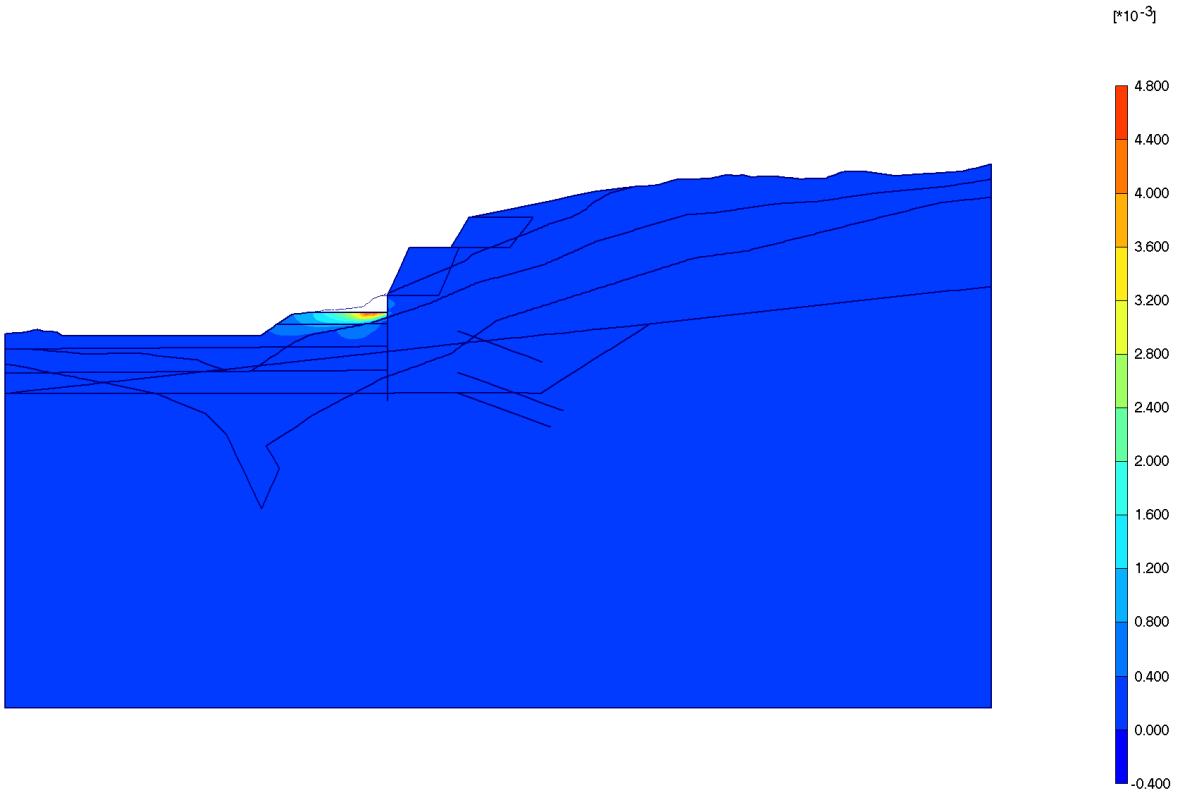
1,0000..... 106

Soil weight 106

0,0000..... 106

1,0000..... 106

Acceleration 106
0,0000 106
0,0000 106
Strength reduction factor 106
0,0000 106
1,0000 106
Time 106
0,0000 106
0,0000 106
Table [36] Staged construction info phase no: 5 106
Staged construction 106
Incremental value 106
Total value 106
Active proportion of total area 106
0,000 106
0,996 106
Active proportion of stage 106
0,105 106
1,000 106



..... 107

Fig. 18 Plot of deformed mesh 107

- step no: 89 - (phase: 5) 107

Fig. 19 Plot of total displacements (shadings) 107

- step no: 89 - (phase: 5) 107

Fig. 20 Plot of total incremental strains (shear shadings) 107

- step no: 89 - (phase: 5) 107

12. Results for phase 6 109

Table [37] Step info phase no: 6 109

Step no: 109

107 109

Calculation type 109

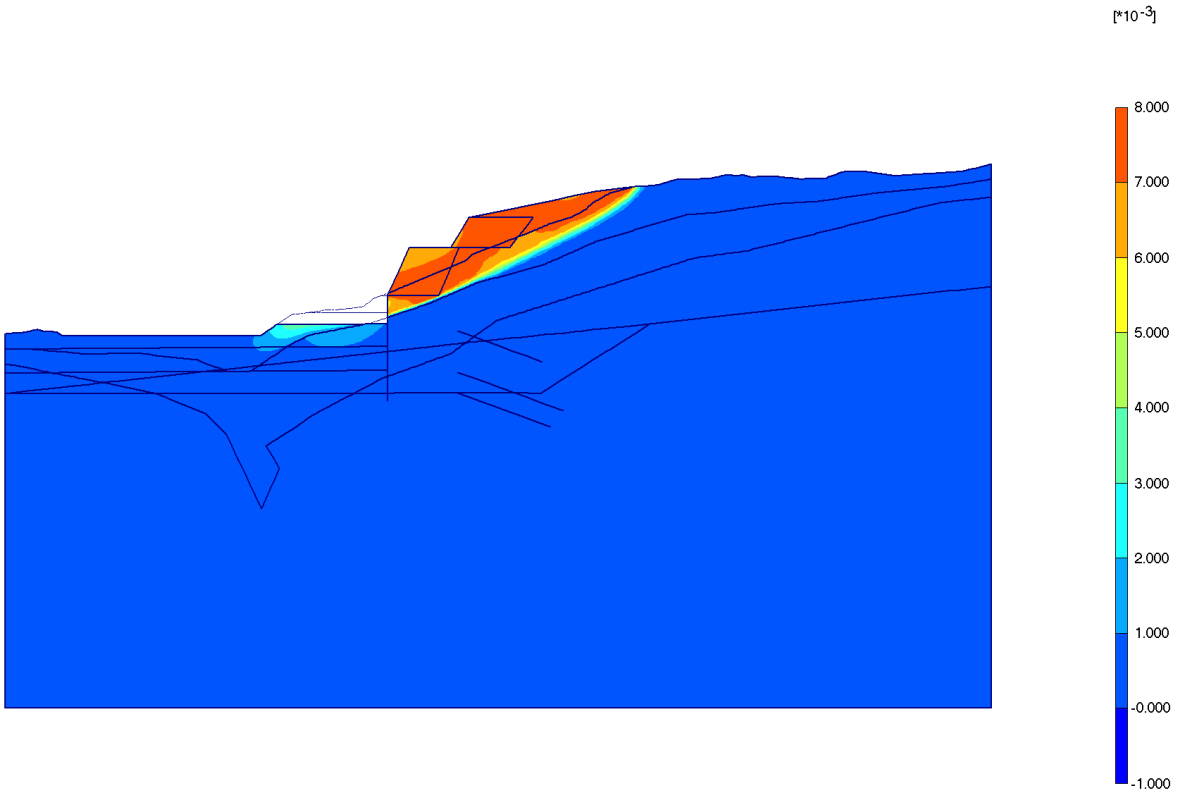
PLASTIC 109

Extrapolation factor 109

0,602 109

Relative stiffness 109

0,205 109



..... 109

Table [38] Reached multipliers phase no: 6 109

Multipliers 109

Incremental value 109

Total value 109

Prescribed displacements 110

0,0000 110

1,0000 110

Load system A 110

0,0000 110

1,0000 110

Load system B 110

0,0000 110

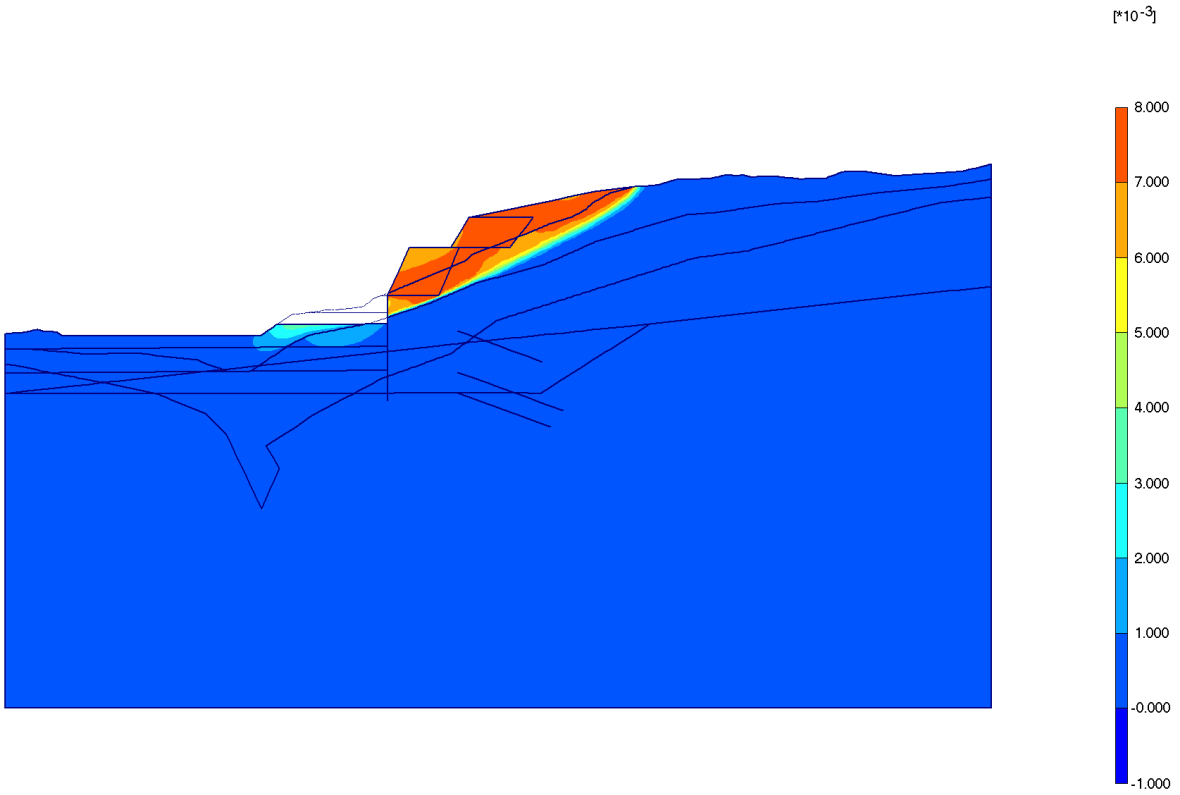
1,0000 110

Soil weight 110

0,0000 110

1,0000 110

Acceleration 110
0,0000 110
0,0000 110
Strength reduction factor 110
0,0000 110
1,0000 110
Time 110
0,0000 110
0,0000 110
Table [39] Staged construction info phase no: 6. 110
Staged construction 110
Incremental value 110
Total value 110
Active proportion of total area 110
0,000 110
0,983 110
Active proportion of stage 110
0,036 110
1,000 110



..... 111

Fig. 21 Plot of deformed mesh 111

- step no: 107 - (phase: 6) 111

Fig. 22 Plot of total displacements (shadings) 111

- step no: 107 - (phase: 6) 111

Fig. 23 Plot of total incremental strains (shear shadings) 111

- step no: 107 - (phase: 6) 111

13. Results for phase 7 113

Table [40] Step info phase no: 7 113

Step no: 113

109 113

Calculation type 113

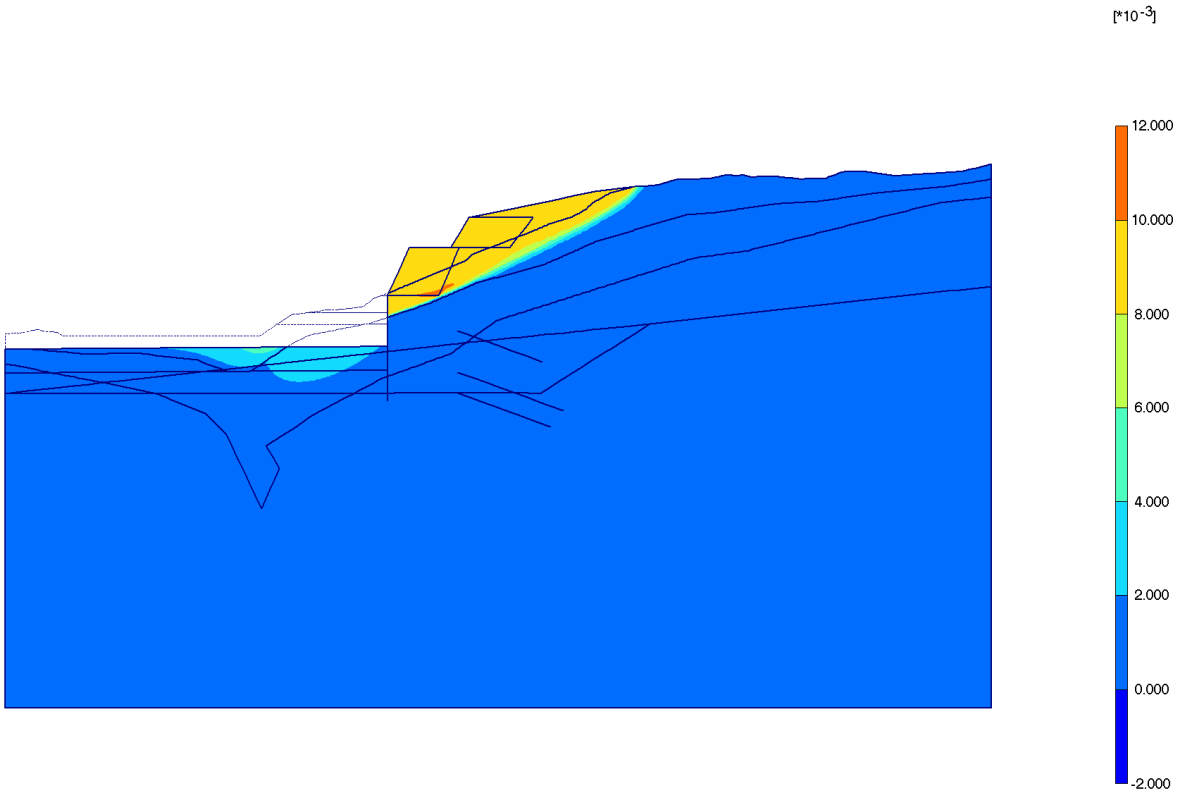
PLASTIC 113

Extrapolation factor 113

1,000 113

Relative stiffness 113

0,938 113



..... 113

Table [41] Reached multipliers phase no: 7 113

Multipliers 113

Incremental value 113

Total value 113

Prescribed displacements 114

0,0000 114

1,0000 114

Load system A 114

0,0000 114

1,0000 114

Load system B 114

0,0000 114

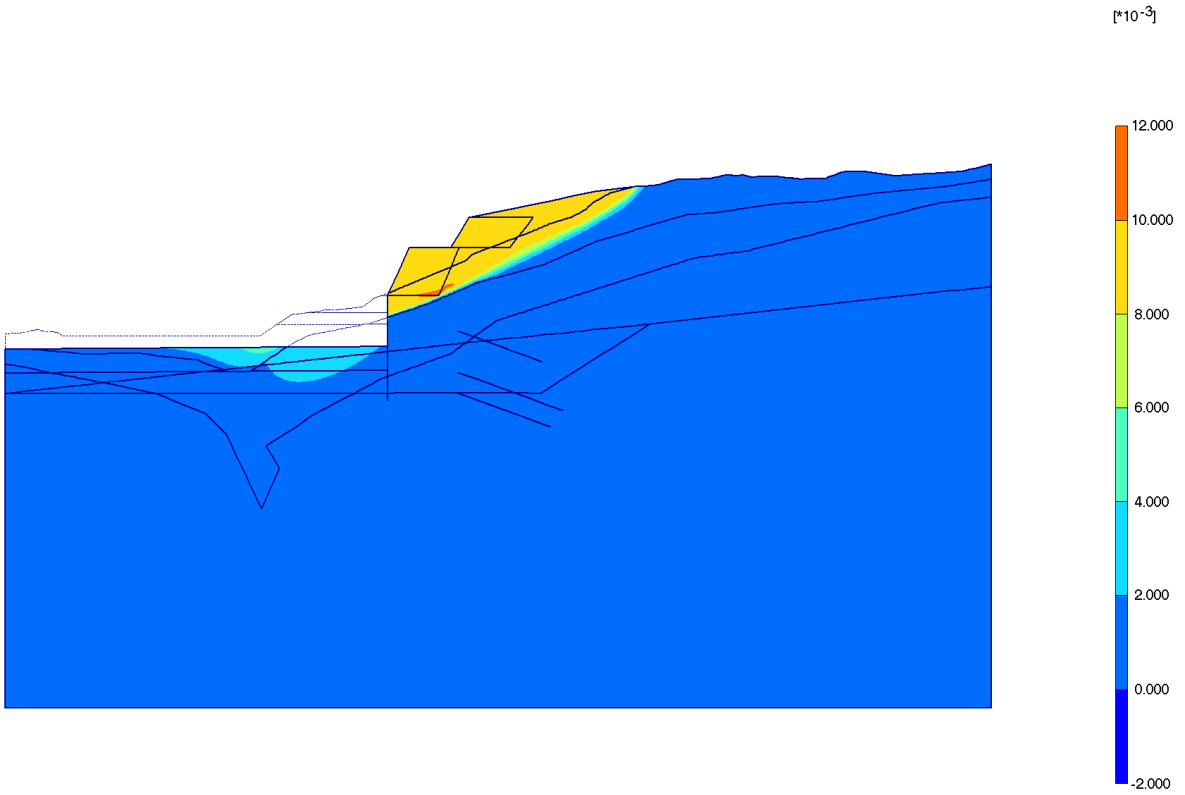
1,0000 114

Soil weight 114

0,0000 114

1,0000 114

Acceleration 114
0,0000 114
0,0000 114
Strength reduction factor 114
0,0000 114
1,0000 114
Time 114
0,0000 114
0,0000 114
Table [42] Staged construction info phase no: 7 114
Staged construction 114
Incremental value 114
Total value 114
Active proportion of total area 114
0,000 114
0,971 114
Active proportion of stage 114
0,500 114
1,000 114



..... 115

Fig. 24 Plot of deformed mesh 115

- step no: 109 - (phase: 7) 115

Fig. 25 Plot of total displacements (shadings) 115

- step no: 109 - (phase: 7) 115

Fig. 26 Plot of total incremental strains (shear shadings) 115

- step no: 109 - (phase: 7) 115

14. Results for phase 9 117

Table [43] Step info phase no: 9 117

Step no: 117

209 117

Calculation type 117

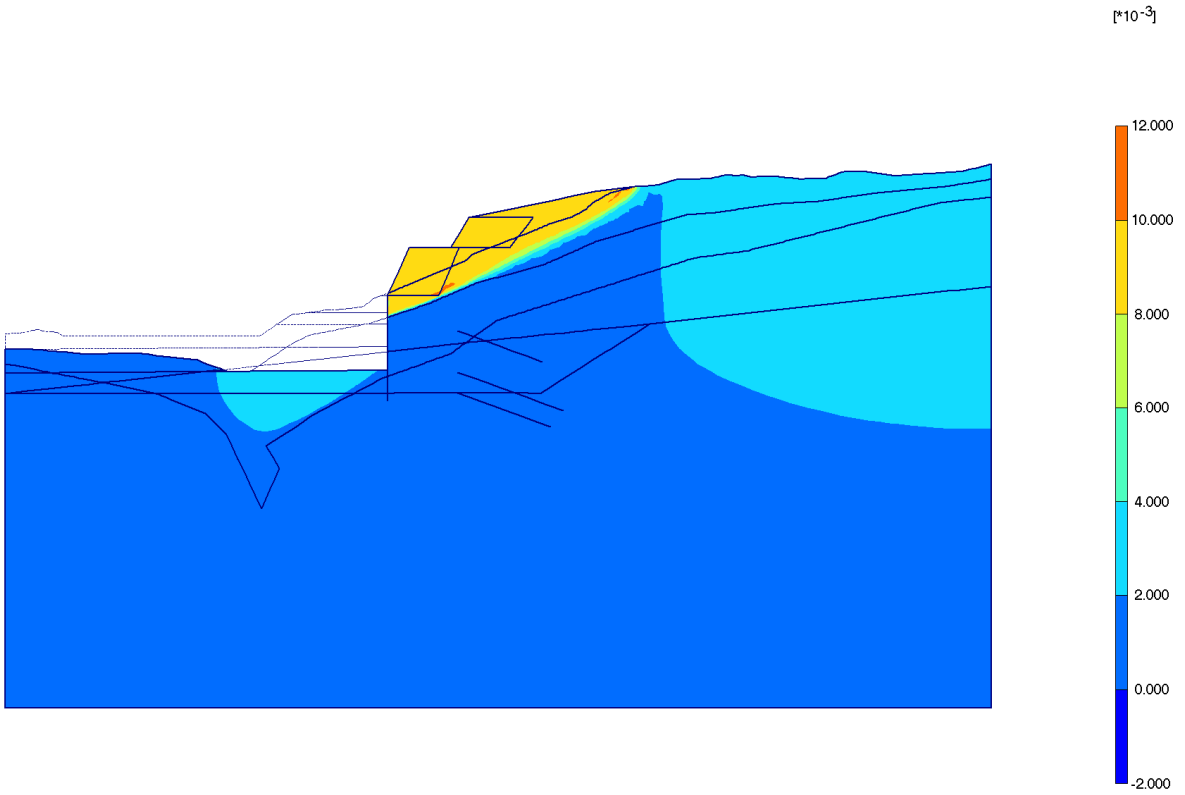
PLASTIC 117

Extrapolation factor 117

0,500 117

Relative stiffness 117

0,000 117



..... 117

Table [44] Reached multipliers phase no: 9 117

Multipliers 117

Incremental value 117

Total value 117

Prescribed displacements 118

0,0000 118

1,0000 118

Load system A 118

0,0000 118

1,0000 118

Load system B 118

0,0000 118

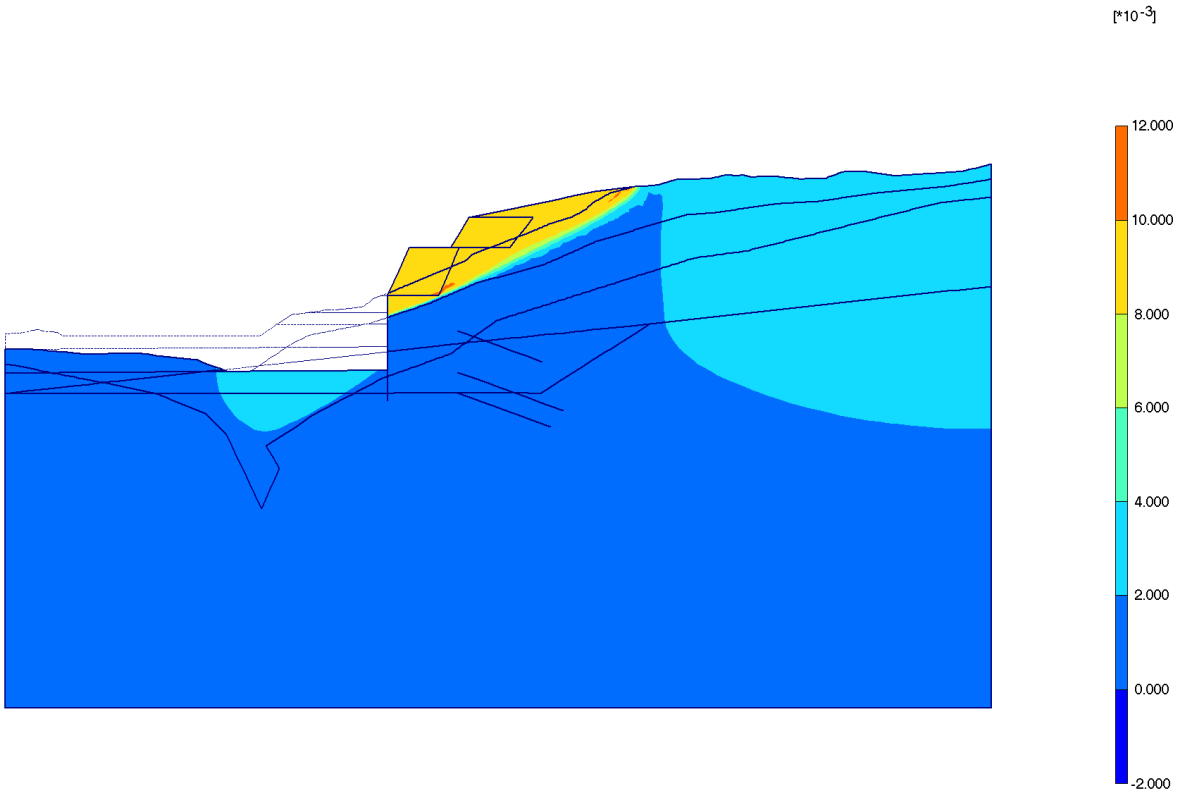
1,0000 118

Soil weight 118

0,0000 118

1,0000 118

Acceleration 118
0,0000 118
0,0000 118
Strength reduction factor 118
-0,0473 118
2,5728 118
Time 118
0,0000 118
0,0000 118
Table [45] Staged construction info phase no: 9 118
Staged construction 118
Incremental value 118
Total value 118
Active proportion of total area 118
0,000 118
0,971 118
Active proportion of stage 118
0,000 118
0,000 118



..... 119

Fig. 27 Plot of deformed mesh 119

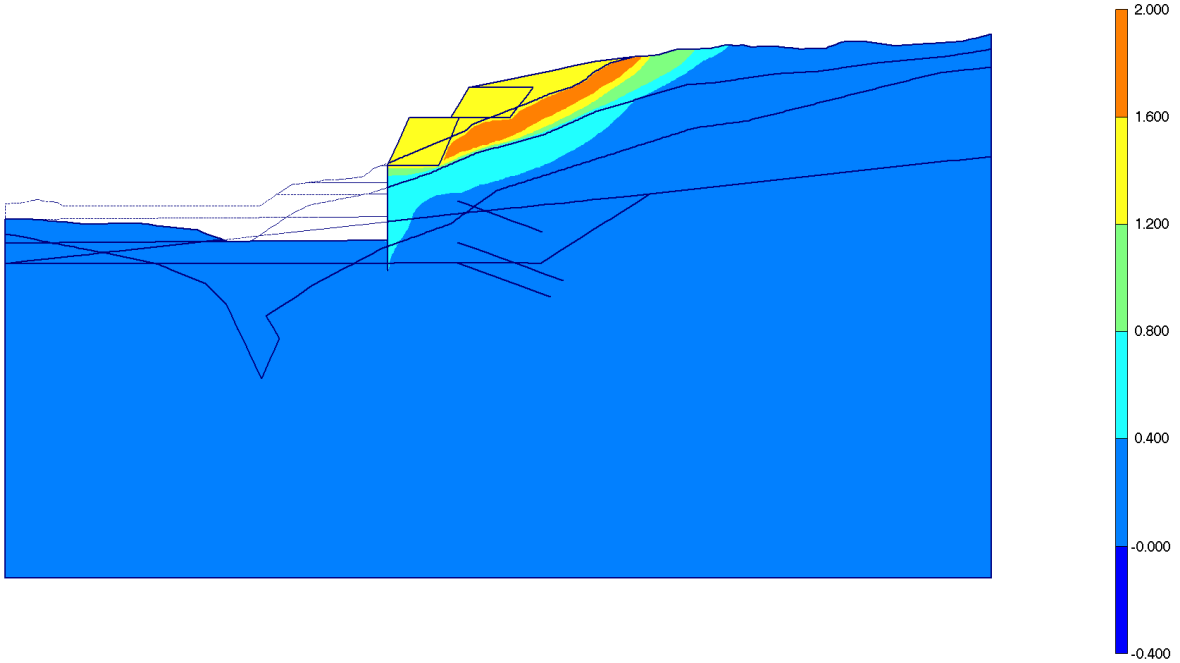
- step no: 209 - (phase: 9) 119

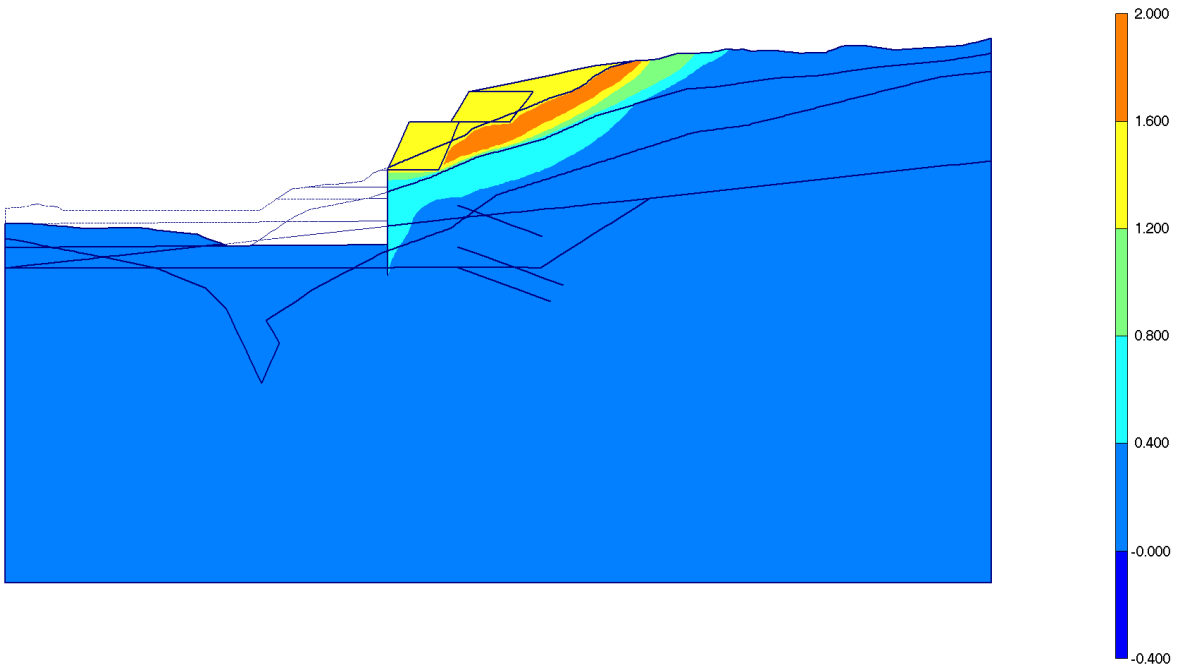
Fig. 28 Plot of total displacements (shadings) 119

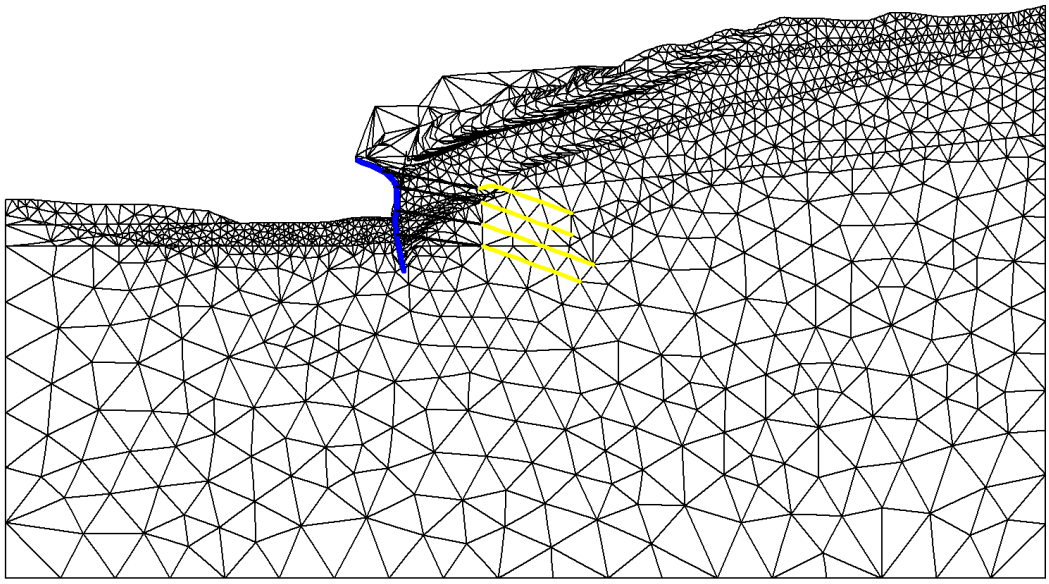
- step no: 209 - (phase: 9) 119

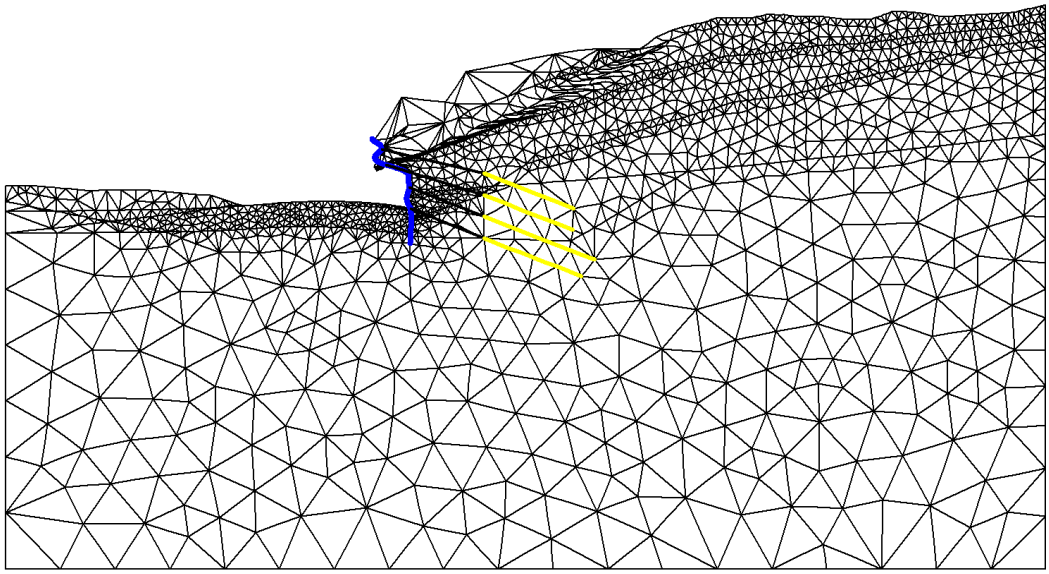
Fig. 29 Plot of total incremental strains (shear shadings) 119

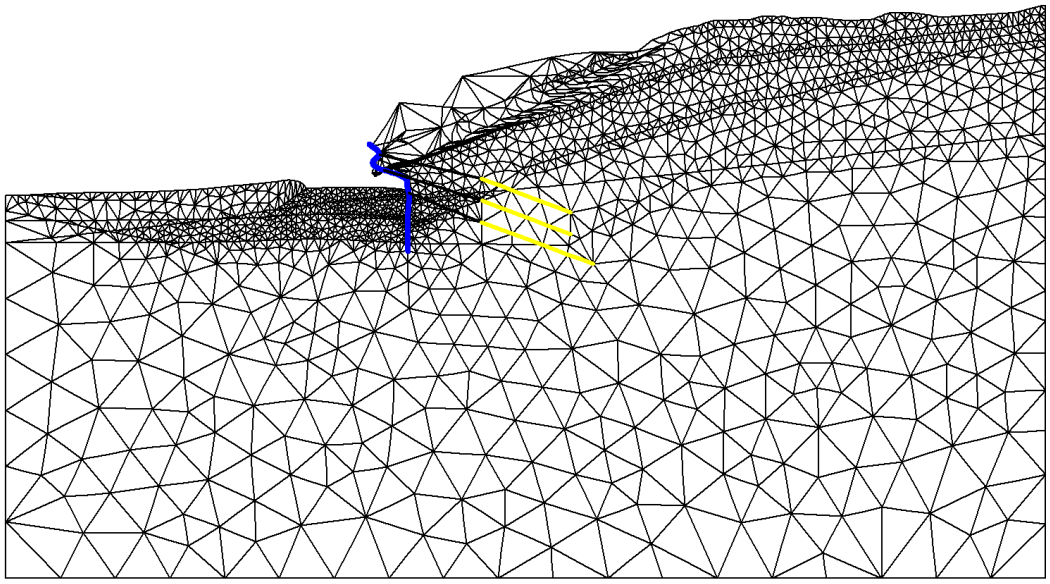
- step no: 209 - (phase: 9) 119

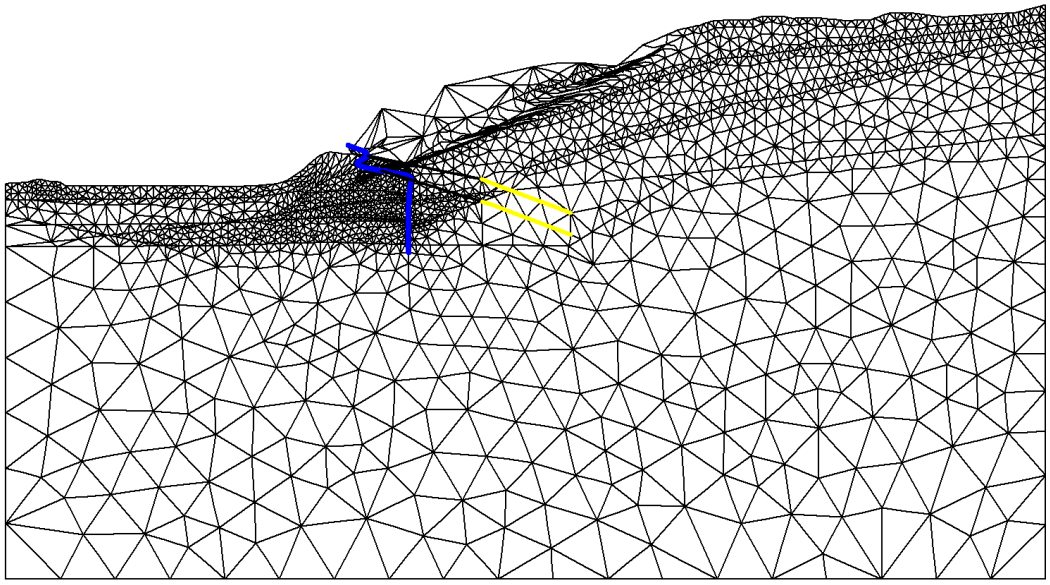

2.000
1.600
1.200
0.800
0.400
-0.000
-0.400

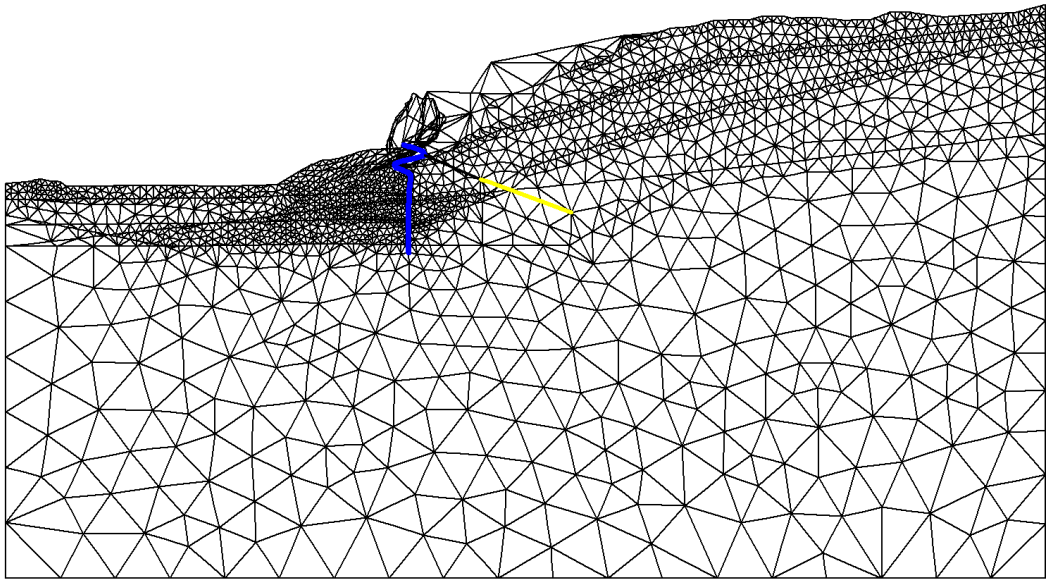

2.000
1.600
1.200
0.800
0.400
-0.000
-0.400

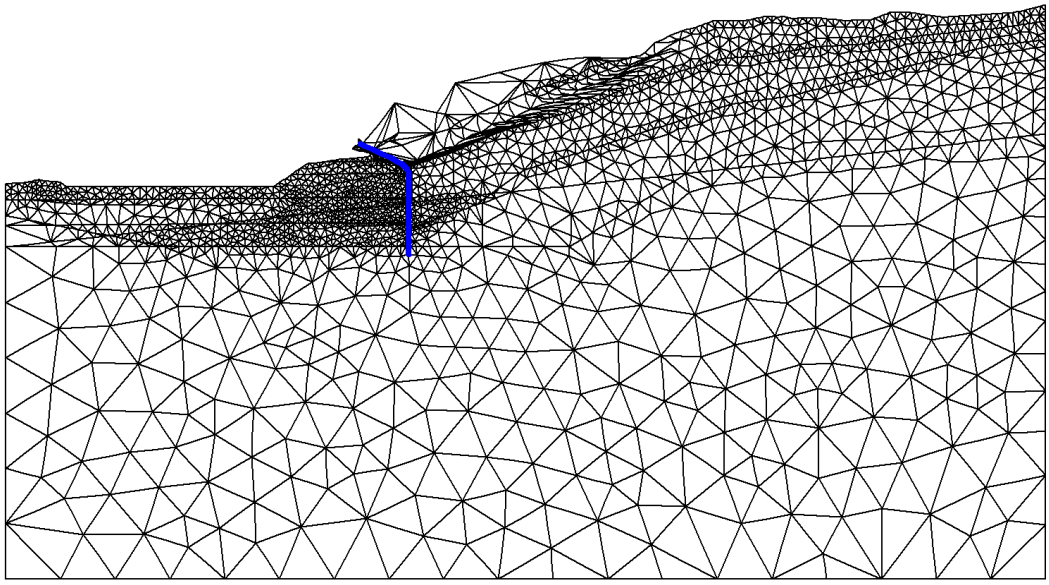


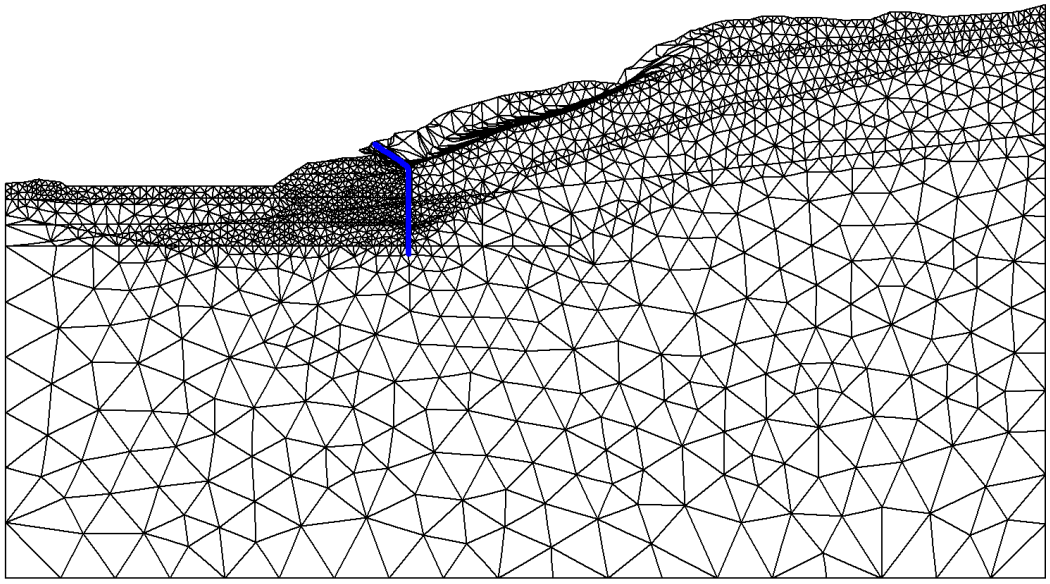


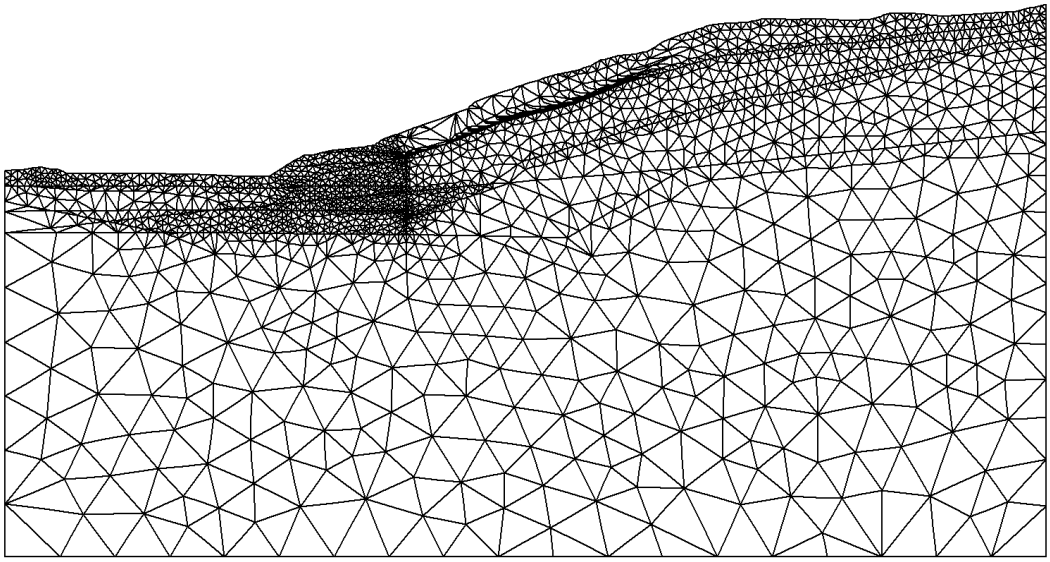


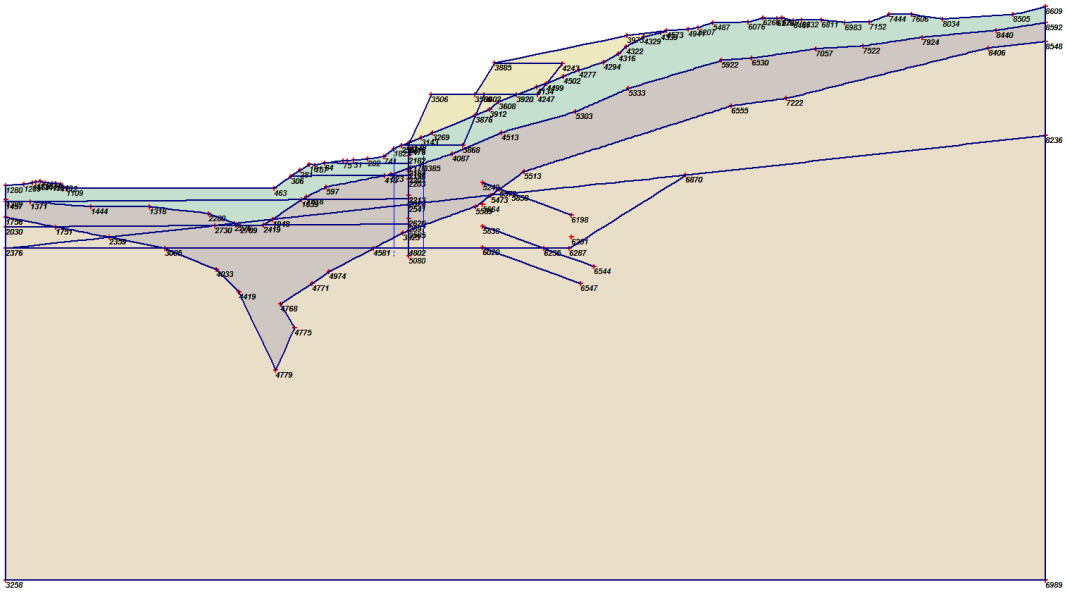












..... 120

1. General Information

Table [1] Units

Type	Unit
Length	m
Force	kN
Time	day

Table [2] Model dimensions

	min.	max.
X	0,000	131,870
Y	-50,000	22,670

Table [3] Model

Model	Plane strain
Element	6-Noded

2. Geometry

Fig. 1 Plot of geometry model with significant nodes

Table [4] Table of significant nodes

Node no.	x-coord.	y-coord.	Node no.	x-coord.	y-coord.
1280	0,000	0,000	4768	34,890	-14,970
1209	2,360	0,160	4771	38,900	-12,400
1169	3,370	0,390	4974	40,980	-10,920
1136	3,850	0,470	3823	50,430	-5,960
1133	4,350	0,580	5589	59,590	-2,640
1129	5,000	0,400	6555	92,030	10,110
1121	5,950	0,250	7222	99,020	11,050
1116	6,350	0,310	8406	124,620	17,460
1112	6,950	0,140	8548	131,870	18,250
1109	7,710	-0,330	2376	0,000	-7,970
463	34,010	-0,330	8236	131,870	6,350
281	37,390	2,010	1948	33,829	-4,296
161	38,550	2,670	2359	13,114	-6,546
157	39,200	2,630	2716	51,100	5,090
7	42,790	3,170	5080	51,100	-8,910
5	43,340	3,160	2184	51,100	2,172
31	44,140	3,200	3585	51,100	-5,717
202	45,960	3,370	2541	51,100	-2,421
741	47,940	3,670	2030	0,000	-5,280
1821	49,200	4,670	2897	51,100	-4,910
3269	54,170	6,670	2419	32,706	-5,043
3912	61,400	9,670	1751	6,331	-5,234
3608	62,520	10,670	2709	29,752	-5,065

Node no.	x-coord.	y-coord.	Node no.	x-coord.	y-coord.
4134	67,390	12,490	2730	26,541	-5,088
4502	70,760	13,850	3143	52,720	6,090
4277	72,750	14,670	2558	50,209	5,077
4294	75,830	15,620	2196	51,100	1,790
4316	77,690	16,670	2213	51,100	-1,220
4322	78,710	17,640	2620	51,100	-4,220
4329	80,950	18,810	5513	65,735	1,790
4339	83,080	19,400	5473	61,560	-1,220
4573	83,770	19,620	306	36,200	1,190
4941	86,590	19,800	2201	51,100	1,290
5207	87,800	20,030	410	48,067	1,270
5487	89,660	20,650	1457	0,000	-2,080
6076	94,180	20,690	2326	51,100	-1,720
6266	96,040	21,220	1371	3,179	-2,058
6276	97,820	21,130	1659	37,560	-1,815
6279	98,470	21,230	6287	71,490	-7,970
6467	99,920	20,940	3005	20,180	-7,970
6632	100,950	20,980	4581	46,600	-7,970
6811	103,470	20,970	4802	51,100	-7,970
6983	106,440	20,670	6870	86,220	1,310
7152	109,510	20,730	2178	51,100	2,790
7444	112,060	21,670	3385	52,939	2,790
7606	114,840	21,670	2276	29,087	-4,811
8034	118,840	21,100	84	40,469	2,821
8505	127,770	21,670	2203	51,100	0,840
8609	131,870	22,670	2476	51,100	4,790
6989	131,870	-50,000	2182	51,100	3,790
3258	0,000	-50,000	6020	60,500	-7,900
1389	0,000	-1,790	6547	72,900	-12,410
1444	10,810	-2,700	5838	60,500	-5,140

Node no.	x-coord.	y-coord.	Node no.	x-coord.	y-coord.
1318	18,270	-2,670	6544	74,590	-10,270
2280	25,720	-3,530	6235	68,216	-7,949
1518	38,200	-1,390	5664	60,500	-2,390
597	40,680	-0,170	6201	71,770	-6,500
523	48,890	1,430	5249	60,500	0,370
4087	56,660	4,040	6198	71,770	-3,730
4513	62,920	6,740	5858	64,142	-0,955
5303	72,260	9,350	5579	62,670	-0,419
5333	78,980	12,320	3506	54,000	11,500
5922	90,770	15,860	3139	51,228	5,488
6530	94,630	16,130	3560	59,500	11,500
7057	102,730	17,320	3885	62,000	15,500
7522	108,710	17,680	3973	78,800	19,000
7924	116,250	18,790	3602	60,667	11,500
8440	125,620	19,660	3868	57,968	5,099
8592	131,870	20,640	3876	59,576	8,913
1756	0,000	-4,010	4247	67,459	11,500
4033	26,760	-10,650	3920	64,741	11,500
4419	29,550	-13,450	4243	70,551	15,497
4779	34,260	-23,360	4499	68,604	12,980
4775	36,620	-18,020			

Fig. 2 Plot of geometry model with cluster numbers

Table [5] Table of clusters

Cluster no.	Nodes
1	6989, 3258, 4033, 4419, 4779, 4775, 4768, 4771, 4974, 2376, 8236, 5080, 6287, 3005, 4581, 4802, 6870, 6020, 6547, 6544, 6235.
2	2376, 2359, 2030, 1751.

Cluster no.	Nodes
3	2376, 2359, 3005.
4	1756, 2030, 1751.
5	1444, 1318, 2280, 1756, 1751, 2730, 1457, 1371, 2276.
6	1280, 1209, 1169, 1136, 1133, 1129, 1121, 1116, 1112, 1109, 463, 1389, 1518, 597, 306, 410, 1457, 1371, 1659.
7	2359, 1751, 2730.
8	1444, 1318, 2280, 1948, 1371, 1659, 2276.
9	3823, 2359, 3585, 2897, 2419, 2709, 2730, 3005, 4581.
10	4033, 4419, 4779, 4775, 4768, 4771, 4974, 3005, 4581.
11	2709, 2730, 2276.
12	1948, 2419, 2709, 2276.
13	1948, 2541, 2897, 2419, 2620.
14	1948, 2541, 2326, 1659.
15	1518, 597, 2213, 2201, 410, 2326, 1659, 2203.
16	281, 161, 157, 523, 2184, 306, 410, 2178, 84.
17	3823, 3585, 4581, 4802.
18	5589, 3585, 5473, 6287, 4802, 6870, 6020, 5838, 6235, 5664, 6201, 6198, 5858.
19	7, 5, 31, 202, 741, 1821, 2716, 2558, 2178, 84, 2476, 2182.
20	5589, 3585, 2541, 2897, 2620, 5473.
21	4087, 4513, 5303, 5333, 5922, 6530, 7057, 7522, 7924, 8440, 8592, 6555, 7222, 8406, 8548, 2184, 2541, 2196, 2213, 5513, 5473, 2201, 2326, 3385, 2203, 5249, 5579.
22	523, 2184, 2196, 2201, 410.
23	3912, 3608, 4502, 4277, 4294, 4316, 4322, 4329, 4339, 4573, 4941, 5207, 5487, 6076, 6266, 6276, 6279, 6467, 6632, 6811, 6983, 7152, 7444, 7606, 8034, 8505, 8609, 4087, 4513, 5303, 5333, 5922, 6530, 7057, 7522, 7924, 8440, 8592, 2716, 2184, 2178, 3385, 2476, 2182, 3868, 3876, 4247, 3920, 4499.
24	2716, 2558, 3139.
25	3269, 2716, 3143, 3139, 3868, 3876.
26	3269, 3143, 3506, 3139, 3560, 3602, 3876.
27	5473, 5858, 5579.
28	6555, 7222, 8406, 8548, 8236, 5513, 6870, 5858, 5579.
29	3912, 3608, 3602, 3876, 3920.

Cluster no.	Nodes
30	4134, 3560, 3885, 3602, 3920, 4243, 4499.
31	4134, 4247, 3920, 4499.
32	4502, 4277, 4294, 4316, 4322, 4329, 4339, 4573, 3885, 3973, 4243, 4499.

3. Structures

Fig. 3 Plot of geometry model with structures

Table [6] Beams

Plate no.	Data set	Length [m]	Nodes
1	Pali	14,000	2716, 2476, 2182, 2178, 2184, 2196, 2201, 2203, 2213, 2326, 2541, 2620, 2897, 3585, 4802, 5080.

Table [7] Geotextiles

Geotextiles no.	Data set	Length [m]	Nodes
1	Bulbo Tiranti 3	13,195	6020, 6547.
2	Bulbo tiranti 2	14,995	5838, 6235, 6544.
3	Bulbo Tiranti 1	11,996	5664, 6201.
4	Bulbo tiranti -1	11,993	5249, 5579, 5858, 6198.

Table [8] Interfaces

Interface no.	Data set	Nodes
1	Gruppo 3	4802, 5080, 5080, 4802.
	Gruppo4	3585, 2897.
	Gruppo4	2620, 2541, 2897, 2620.
	Gruppo4	2541, 2326.
	Gruppo4	2326, 2213, 2203, 2201, 2213, 2203.
	Depositi detritico colluviali	2184, 2178.
	Gruppo 3	4802, 3585.
	Gruppo 3	3585, 4802.
	Depositi detritico colluviali	2476, 2716, 2182, 2476, 2178, 2182.
	Gruppo4	2541, 2620, 2897, 3585, 2620, 2897.
	Gruppo4	2184, 2196, 2196, 2201, 2213, 2326, 2201, 2203, 2326, 2541, 2203, 2213.
	Depositi detritico colluviali	2196, 2184, 2201, 2196.
		2716, 2476, 2178, 2184, 2476, 2182, 2182, 2178.

Interface no.	Data set	Nodes

Table [9] Node-to-node anchors

Anchor no.	Data set	Length [m]	First node	Last node
1	Tiranti 2	10,095	2620	6020
2	Tiranti 2	10,185	2213	5838
3	Tiranti 1	10,287	2196	5664
4	Tiranti 1	10,003	2182	5249

4. Mesh data

Fig. 4 Plot of the mesh with significant nodes

Table [10] Numbers, type of elements, integrations

Type	Type of element	Type of integration	Total no.
Soil	6-node triangle	3-point Gauss	4120
Plate	3-node line	3-point Gauss	40
Geogrid	3-node line	3-point Newton-Cotes	16
Interface	3-node line	3-point Newton-Cotes	80

5. Material data

Fig. 5 Plot of geometry with material data sets

Table [11] Soil data sets parameters

Linear Elastic		8 Terre-Armate
Type		Non-porous
γ_{unsat}	[kN/m³]	10,00
γ_{sat}	[kN/m³]	10,00
k_x	[m/day]	0,000
k_y	[m/day]	0,000
e_{init}	[-]	0,500
c_k	[-]	1E15
E_{ref}	[kN/m²]	60000,00

Linear Elastic		8 Terre-Armate
ν	[-]	0,300
G_{ref}	[kN/m²]	23076,923
E_{oed}	[kN/m²]	80769,231
E_{incr}	[kN/m²/m]	0,00
y_{ref}	[m]	0,000
R_{inter}	[-]	0,750
Interface permeability		Impermeable

Mohr-Coulomb		1 Gruppo4	2 Gruppo 3	3 Gruppo 3 minimo	4 Gruppo 3 min migliorato
Type		Drained	Drained	Drained	Drained
γ_{unsat}	[kN/m³]	24,00	25,00	25,00	25,00
γ_{sat}	[kN/m³]	24,00	25,00	25,00	25,00

Mohr-Coulomb		1 Gruppo4	2 Gruppo 3	3 Gruppo 3 minimo	4 Gruppo 3 min migliorato
k_x	[m/day]	0,009	0,009	0,009	0,009
k_y	[m/day]	0,009	0,009	0,009	0,009
e_{init}	[-]	0,500	0,500	0,500	0,500
c_k	[-]	1E15	1E15	1E15	1E15
E_{ref}	[kN/m²]	500000,000	1400000,000	533000,000	533000,000
ν	[-]	0,380	0,300	0,350	0,350
G_{ref}	[kN/m²]	181159,420	538461,538	197407,407	197407,407
E_{oed}	[kN/m²]	935990,338	1884615,385	855432,099	855432,099
c_{ref}	[kN/m²]	56,00	200,00	104,00	156,00
φ	[°]	18,00	25,00	19,00	19,00
ψ	[°]	0,00	0,00	0,00	0,00
E_{inc}	[kN/m²/m]	0,00	0,00	0,00	0,00

Mohr-Coulomb		1 Gruppo4	2 Gruppo 3	3 Gruppo 3 minimo	4 Gruppo 3 min migliorato
y_{ref}	[m]	0,000	0,000	0,000	0,000
$c_{increment}$	[kN/m²/m]	0,00	0,00	0,00	0,00
$T_{str.}$	[kN/m²]	0,00	0,00	0,00	0,00
$R_{inter.}$	[-]	0,85	0,85	0,85	1,00
Interface permeability		Neutral	Neutral	Neutral	Neutral

Mohr-Coulomb		5 Gruppo 4 migliorato	6 Depositi detritico colluviali	7 Gruppo 3 migliorato
Type		Drained	Drained	Drained
γ_{unsat}	[kN/m³]	24,00	20,00	25,00
γ_{sat}	[kN/m³]	24,00	20,00	25,00
k_x	[m/day	0,009	0,009	0,009

Mohr-Coulomb		5 Gruppo 4 migliorato	6 Depositi detritico colluviali	7 Gruppo 3 migliorato
	]			
k_y	[m/day]	0,009	0,009	0,009
e_{init}	[-]	0,500	0,500	0,500
c_k	[-]	1E15	1E15	1E15
E_{ref}	[kN/m²]	500000,000	20000,000	1400000,000
ν	[-]	0,380	0,380	0,300
G_{ref}	[kN/m²]	181159,420	7246,377	538461,538
E_{oed}	[kN/m²]	935990,338	37439,614	1884615,385
c_{ref}	[kN/m²]	84,00	5,00	300,00
φ	[°]	18,00	18,00	25,00
ψ	[°]	0,00	0,00	0,00
E_{inc}	[kN/m²/m]	0,00	0,00	0,00
y_{ref}	[m]	0,000	0,000	0,000

Mohr-Coulomb		5	6	7
		Gruppo 4 migliorato	Depositi detritico colluviali	Gruppo 3 migliorato
$c_{increment}$	[kN/m²/m]	0,00	0,00	0,00
$T_{str.}$	[kN/m²]	0,00	0,00	0,00
$R_{inter.}$	[-]	1,00	1,00	1,00
Interface permeability		Neutral	Neutral	Neutral

Table [12] Beam data sets parameters

No.	Identification	EA [kN/m]	EI [kNm²/m]	w [kN/m/m]	ν [-]	Mp [kNm/m]	Np [kN/m]
1	Pali	2,1E6	4284,00	0,77	0,20	1E15	1E15

Table [13] Geotextile data sets parameters

No.	Identification	EA [kN/m]	ν [-]

No.	Identification	EA [kN/m]	ν [-]
1	Bulbo Tiranti 3	8792000,00	0,00
2	Bulbo tiranti 2	670333,00	0,00
3	Bulbo Tiranti 1	4509667,00	0,00
4	Bulbo 2	2011000,00	0,00
5	Bulbo 3	26376000,00	0,00
6	Bulbo tiranti -1	2511667,00	0,00

Table [14] Anchor data sets parameters

No.	Identification	EA [kN]	|Fmax, comp| [kN]	|Fmax, tens| [kN]	L spacing [m]
1	Tiranti 1	88200,00	1E15	1E15	3,00
2	Tiranti 2	117600	1E15	1E15	3,00

No.	Identification	EA [kN]	|Fmax, comp| [kN]	|Fmax, tens| [kN]	L spacing [m]
3	Tirante singolo	,00 117600 ,00	1E15	1E15	1,00

6. Calculation phases

Table [15] List of phases

Phase	Ph-No.	Start phase	Calculation type	Load input	First step	Last step
Initial phase	0	0		-	0	0
K0	1	0	Plastic	Total multipliers	1	13
Installazione-Paratia	2	1	Plastic	Staged construction	14	20
Terre-Rinforzate	3	2	Plastic	Staged construction	21	51
1-Scavo	4	3	Plastic	Staged construction	52	62
2-Scavo	5	4	Plastic	Staged construction	63	89
3-Scavo	6	5	Plastic	Staged construction	90	107
4-Scavo	7	6	Plastic	Staged construction	108	109
GdS	9	7	Phi/c reduction	Incremental multipliers	110	209

Table [16] Staged construction info

Ph-No.	Active clusters	Inactive clusters	Active beams	Active geotextiles	Active anchors
0	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 31.	26, 29, 30, 32.			
2	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 31.	26, 29, 30, 32.	1.		
3	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27,		1.		

Ph-No.	Active clusters	Inactive clusters	Active beams	Active geotextiles	Active anchors
	28, 29, 30, 31, 32.				
4	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32.	19, 24.	1.	4.	
5	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 20, 21, 23, 25, 26, 27, 28, 29, 30, 31, 32.	16, 19, 22, 24.	1.	3, 4.	
6	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 20, 21, 23, 25, 26, 27, 28, 29, 30, 31, 32.	6, 15, 16, 19, 22, 24.	1.	2, 3, 4.	

Ph-No.	Active clusters	Inactive clusters	Active beams	Active geotextiles	Active anchors
7	1, 2, 3, 4, 5, 7, 9, 10, 11, 17, 18, 20, 21, 23, 25, 26, 27, 28, 29, 30, 31, 32.	6, 8, 12, 13, 14, 15, 16, 19, 22, 24.	1.	1, 2, 3, 4.	

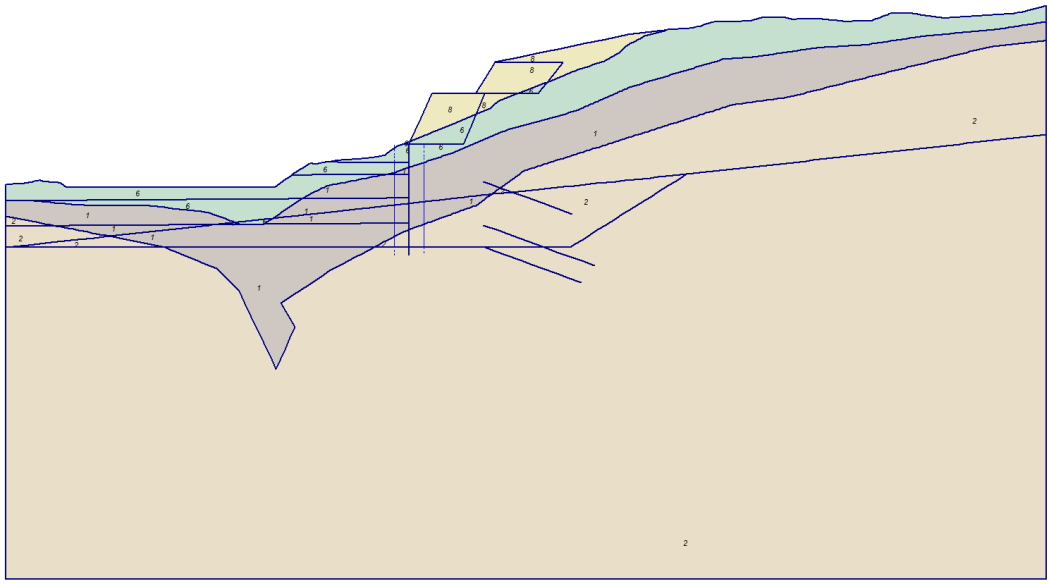


Table [17] Control parameters 1

Ph-No.	Additional steps	Reset displacements to zero	Ignore undrained behaviour	Delete intermediate steps

Ph-No.	Additional steps	Reset displacements to zero	Ignore undrained behaviour	Delete intermediate steps
1	250	No	No	Yes
2	250	Yes	No	Yes
3	250	No	No	Yes
4	250	Yes	No	Yes
5	250	No	No	Yes
6	250	No	No	Yes
7	250	No	No	Yes
9	100	Yes	No	Yes

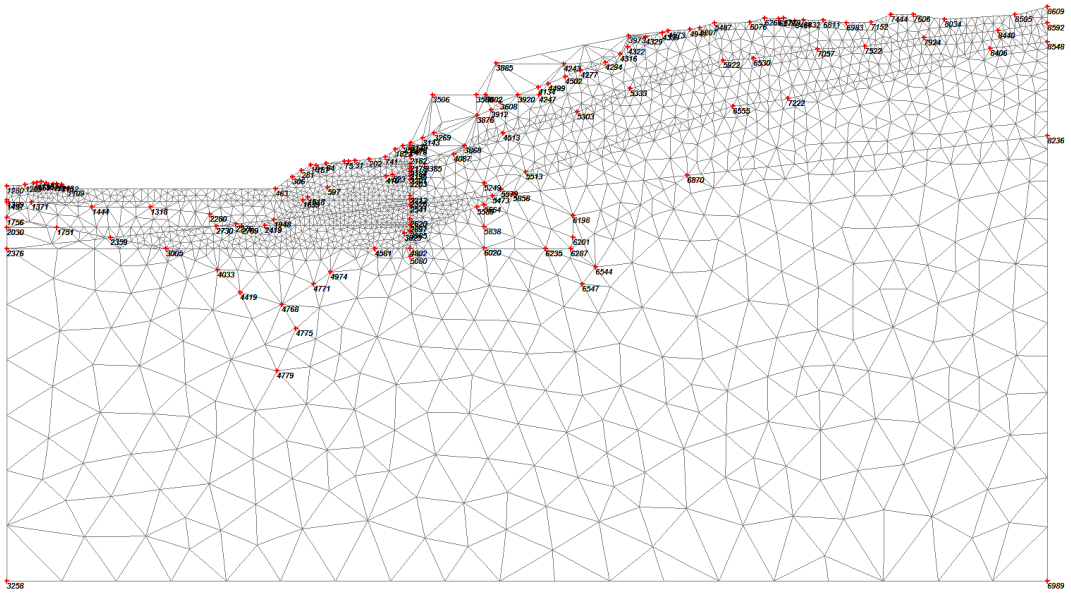


Table [18] Control parameters 2

Ph-No.	Iterative procedure	Tolerated error	Over relaxation	Max. iterations	Desired min.	Desired max.	Arc-Length control
1	Standard	0,010	1,200	60	6	15	Yes
2	Standard	0,010	1,200	60	6	15	Yes
3	Standard	0,010	1,200	60	6	15	Yes
4	Standard	0,010	1,200	60	6	15	Yes
5	Standard	0,010	1,200	60	6	15	Yes
6	Standard	0,010	1,200	60	6	15	Yes
7	Standard	0,010	1,200	60	6	15	Yes
9	Manual	0,050	1,200	60	6	15	Yes

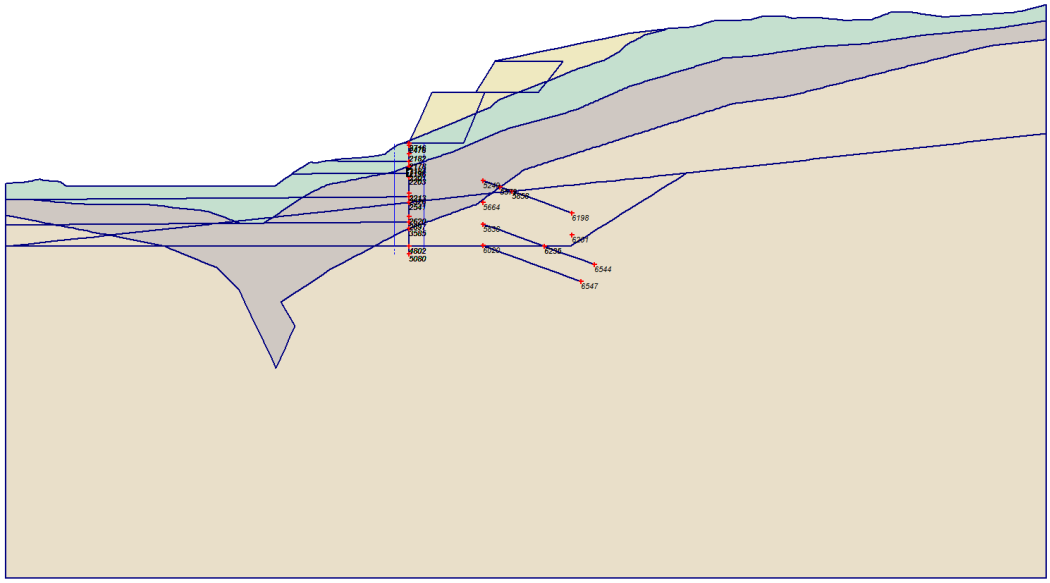


Table [19] Incremental multipliers (input values)

Ph-No.	Displ.	Load A	Load B	Weight	Accel	Time	s-f
0	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
1	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
2	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
3	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
4	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
5	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
6	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
7	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
9	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,1000

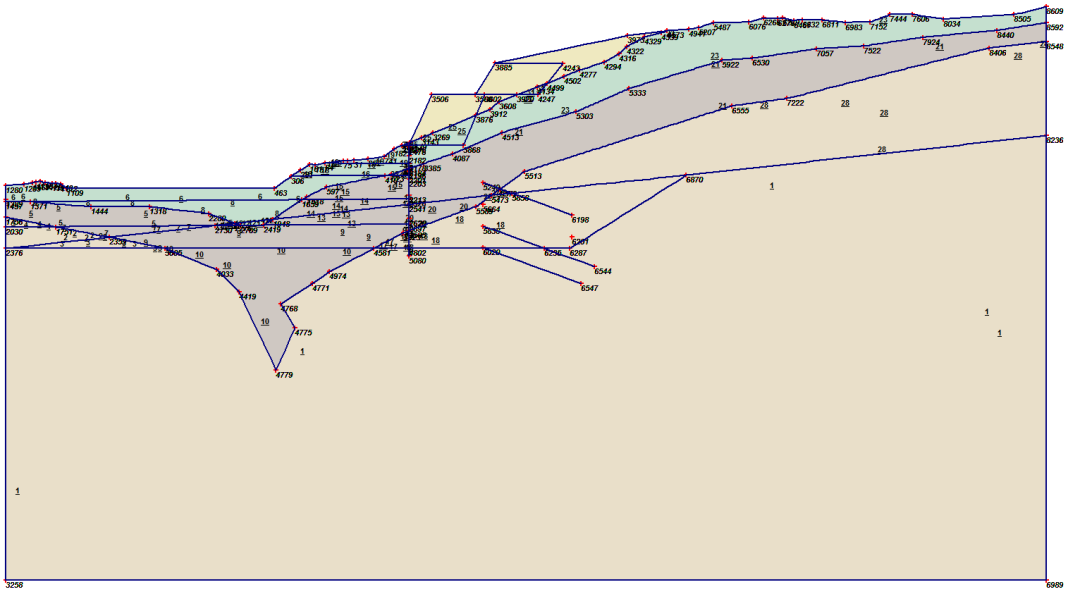


Table [20] Total multipliers - input values

Ph-No.	Displ.	Load A	Load B	Weight	Accel	Time	s-f
0	1,0000	1,0000	1,0000	0,0000	0,0000	0,0000	1,0000
1	1,0000	1,0000	1,0000	1,0000	0,0000	0,0000	1,0000
2	1,0000	1,0000	1,0000	1,0000	0,0000	0,0000	1,0000
3	1,0000	1,0000	1,0000	1,0000	0,0000	0,0000	1,0000
4	1,0000	1,0000	1,0000	1,0000	0,0000	0,0000	1,0000
5	1,0000	1,0000	1,0000	1,0000	0,0000	0,0000	1,0000
6	1,0000	1,0000	1,0000	1,0000	0,0000	0,0000	1,0000
7	1,0000	1,0000	1,0000	1,0000	0,0000	0,0000	1,0000
9	1,0000	1,0000	1,0000	1,0000	0,0000	0,0000	2,6582

Table [21] Total multipliers - reached values

Ph-No.	Displ.	Load A	Load B	Weigh t	Accel	Time	s-f
0	1,0000	1,0000	1,0000	0,0000	0,0000	0,0000	1,0000
1	1,0000	1,0000	1,0000	1,0000	0,0000	0,0000	1,0000
2	1,0000	1,0000	1,0000	1,0000	0,0000	0,0000	1,0000
3	1,0000	1,0000	1,0000	1,0000	0,0000	0,0000	1,0000
4	1,0000	1,0000	1,0000	1,0000	0,0000	0,0000	1,0000
5	1,0000	1,0000	1,0000	1,0000	0,0000	0,0000	1,0000
6	1,0000	1,0000	1,0000	1,0000	0,0000	0,0000	1,0000
7	1,0000	1,0000	1,0000	1,0000	0,0000	0,0000	1,0000
9	1,0000	1,0000	1,0000	1,0000	0,0000	0,0000	2,5728

7. Results for phase 1

Table [22] Step info phase no: 1

Step no:	13
Calculation type	PLASTIC
Extrapolation factor	0,433
Relative stiffness	0,367

Table [23] Reached multipliers phase no: 1

Multipliers	Incremental value	Total value
Prescribed displacements	0,0000	1,0000
Load system A	0,0000	1,0000
Load system B	0,0000	1,0000
Soil weight	0,1022	1,0000
Acceleration	0,0000	0,0000
Strength reduction factor	0,0000	1,0000
Time	0,0000	0,0000

Table [24] Staged construction info phase no: 1

Staged construction	Incremental value	Total value
Active proportion of total area	0,000	0,988
Active proportion of stage	0,000	0,000

Fig. 6 Plot of deformed mesh

- step no: 13 - (phase: 1)

Fig. 7 Plot of total displacements (shadings)

- step no: 13 - (phase: 1)

Fig. 8 Plot of total incremental strains (shear shadings)

- step no: 13 - (phase: 1)

8. Results for phase 2

Table [25] Step info phase no: 2

Step no:	20
Calculation type	PLASTIC
Extrapolation factor	0,080
Relative stiffness	0,017

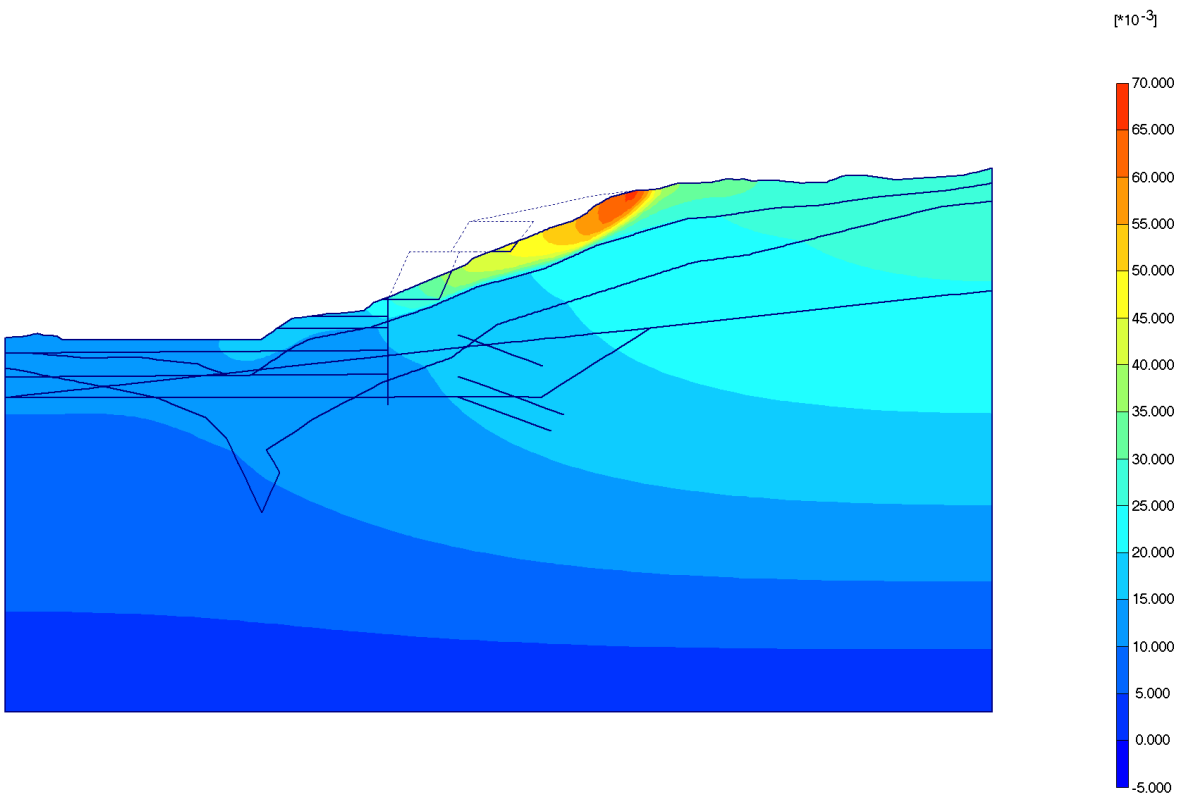


Table [26] Reached multipliers phase no: 2

Multipliers	Incremental value	Total value

Multipliers	Incremental value	Total value
Prescribed displacements	0,0000	1,0000
Load system A	0,0000	1,0000
Load system B	0,0000	1,0000
Soil weight	0,0000	1,0000
Acceleration	0,0000	0,0000
Strength reduction factor	0,0000	1,0000
Time	0,0000	0,0000

Table [27] Staged construction info phase no: 2

Staged construction	Incremental value	Total value
Active proportion of total area	0,000	0,988
Active proportion of stage	0,037	1,000

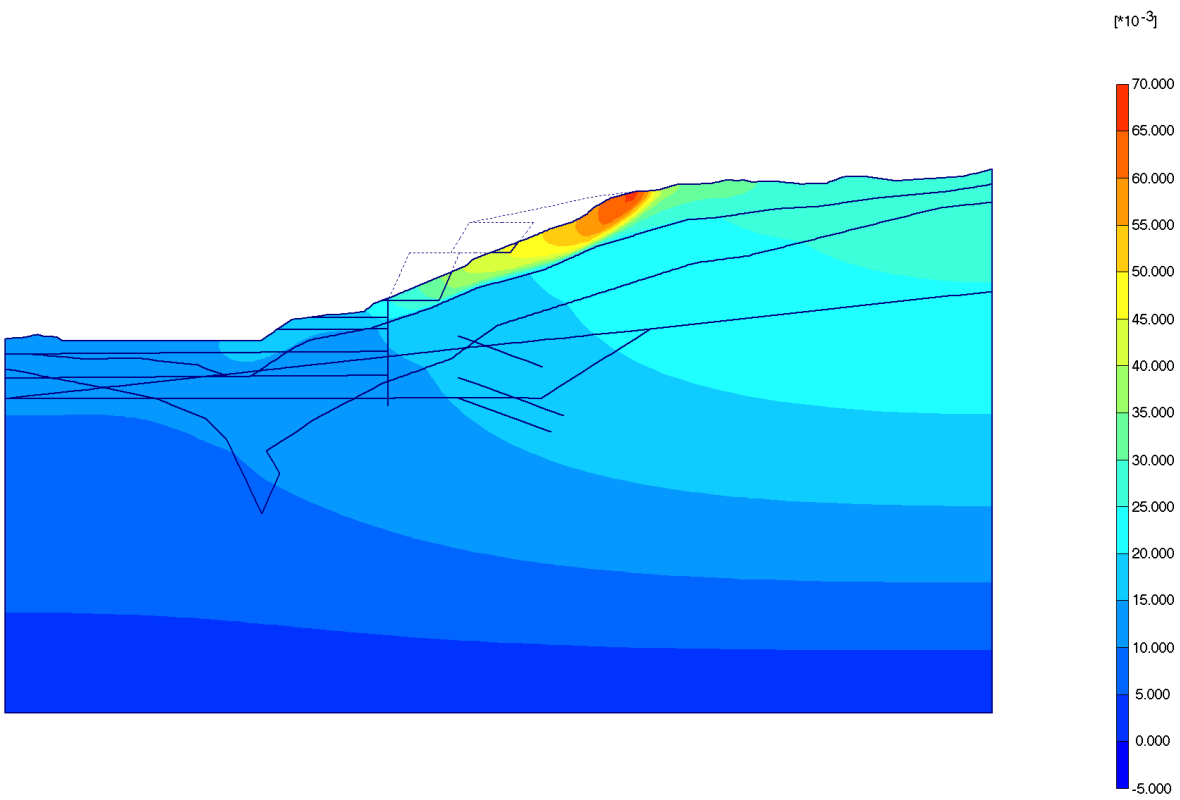


Fig. 9 Plot of deformed mesh

- step no: 20 - (phase: 2)

Fig. 10 Plot of total displacements (shadings)

- step no: 20 - (phase: 2)

Fig. 11 Plot of total incremental strains (shear shadings)

- step no: 20 - (phase: 2)

9. Results for phase 3

Table [28] Step info phase no: 3

Step no:	51
Calculation type	PLASTIC
Extrapolation factor	0,474
Relative stiffness	0,003

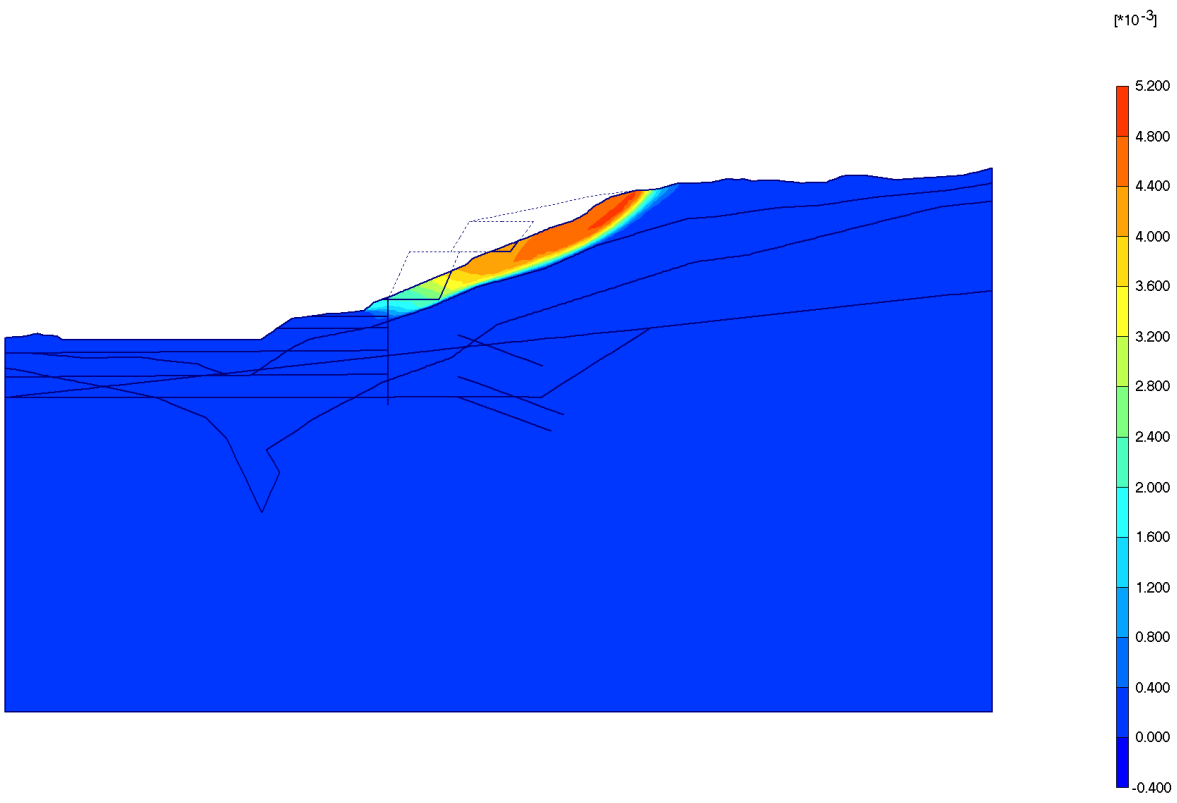


Table [29] Reached multipliers phase no: 3

Multipliers	Incremental value	Total value

Multipliers	Incremental value	Total value
Prescribed displacements	0,0000	1,0000
Load system A	0,0000	1,0000
Load system B	0,0000	1,0000
Soil weight	0,0000	1,0000
Acceleration	0,0000	0,0000
Strength reduction factor	0,0000	1,0000
Time	0,0000	0,0000

Table [30] Staged construction info phase no: 3

Staged construction	Incremental value	Total value
Active proportion of total area	0,000	1,000
Active proportion of stage	0,006	1,000

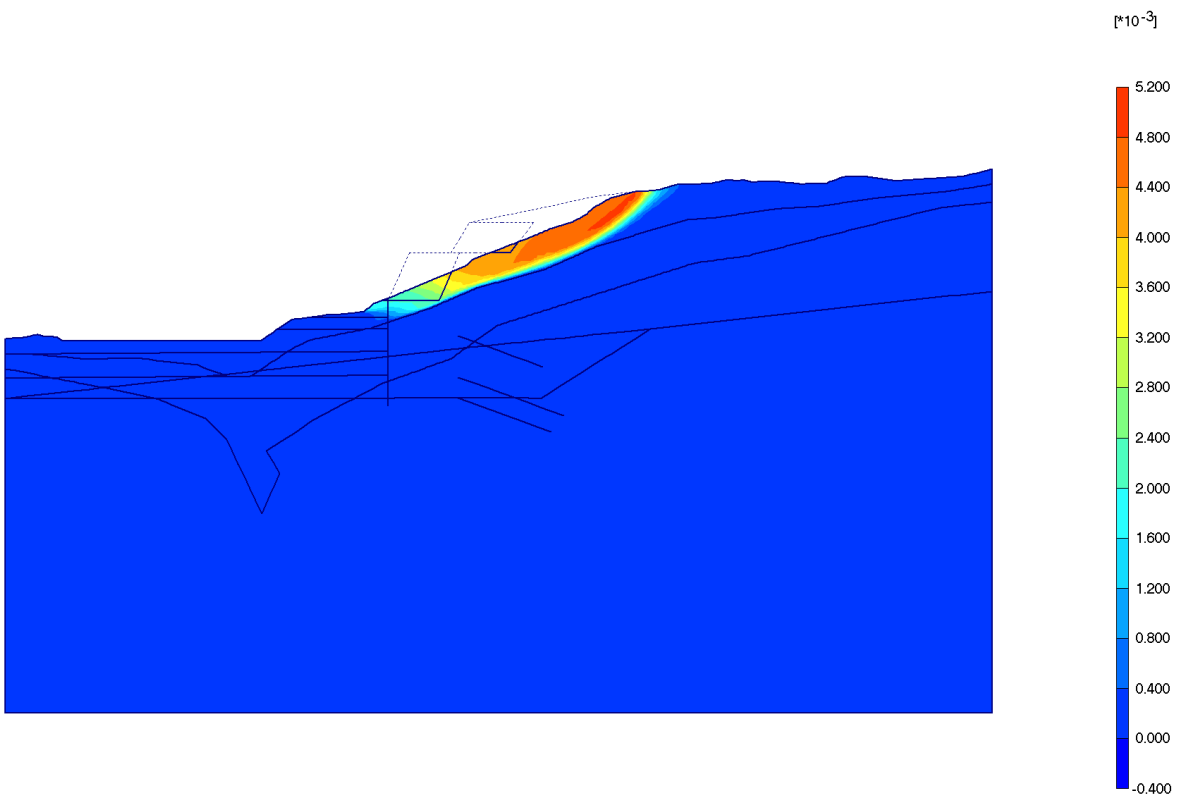


Fig. 12 Plot of deformed mesh

- step no: 51 - (phase: 3)

Fig. 13 Plot of total displacements (shadings)

- step no: 51 - (phase: 3)

Fig. 14 Plot of total incremental strains (shear shadings)

- step no: 51 - (phase: 3)

10. Results for phase 4

Table [31] Step info phase no: 4

Step no:	62
Calculation type	PLASTIC
Extrapolation factor	0,488
Relative stiffness	0,086

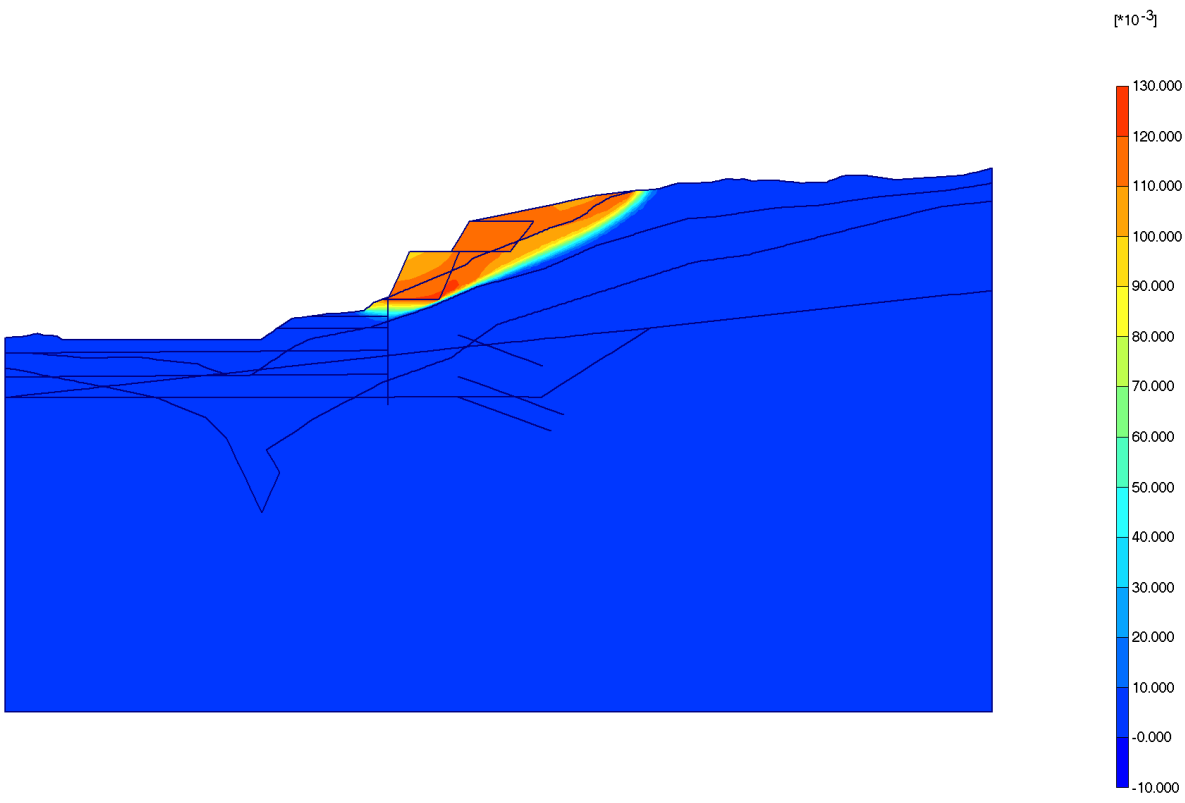


Table [32] Reached multipliers phase no: 4

Multipliers	Incremental value	Total value

Multipliers	Incremental value	Total value
Prescribed displacements	0,0000	1,0000
Load system A	0,0000	1,0000
Load system B	0,0000	1,0000
Soil weight	0,0000	1,0000
Acceleration	0,0000	0,0000
Strength reduction factor	0,0000	1,0000
Time	0,0000	0,0000

Table [33] Staged construction info phase no: 4

Staged construction	Incremental value	Total value
Active proportion of total area	0,000	0,999
Active proportion of stage	0,012	1,000

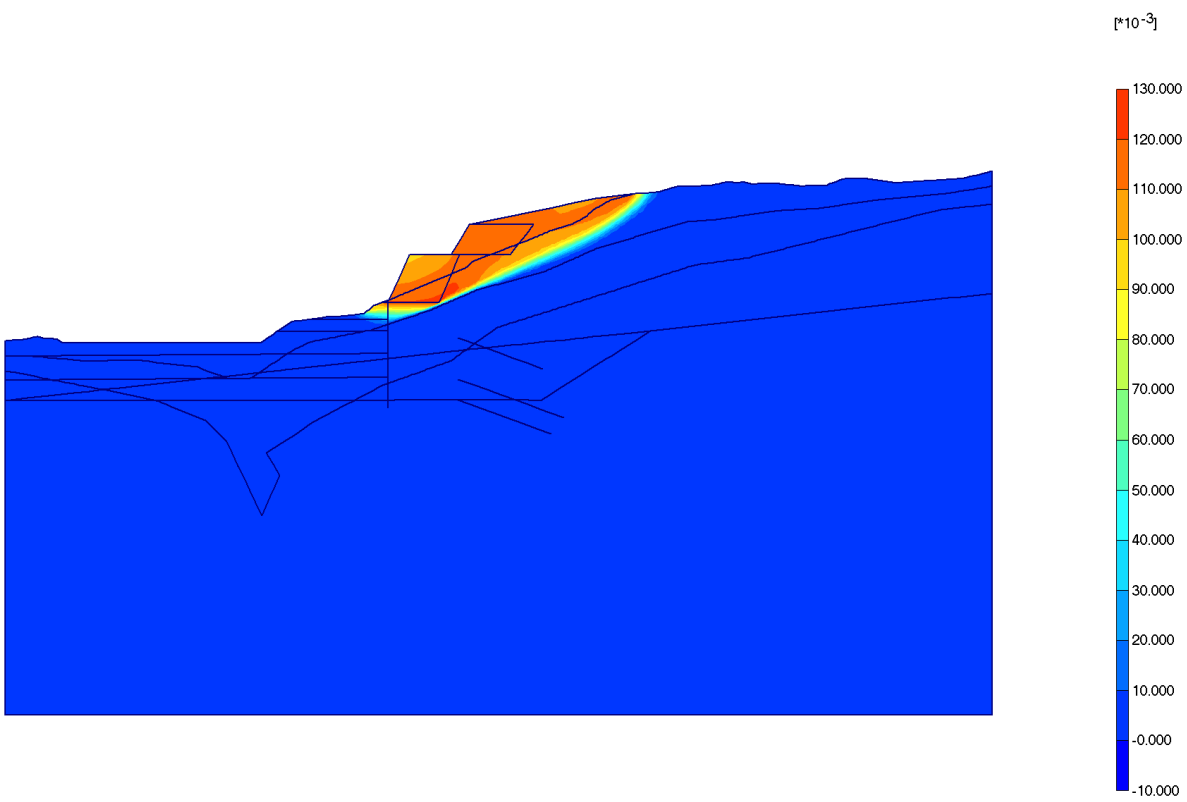


Fig. 15 Plot of deformed mesh

- step no: 62 - (phase: 4)

Fig. 16 Plot of total displacements (shadings)

- step no: 62 - (phase: 4)

Fig. 17 Plot of total incremental strains (shear shadings)

- step no: 62 - (phase: 4)

11. Results for phase 5

Table [34] Step info phase no: 5

Step no:	89
Calculation type	PLASTIC
Extrapolation factor	1,688
Relative stiffness	0,021

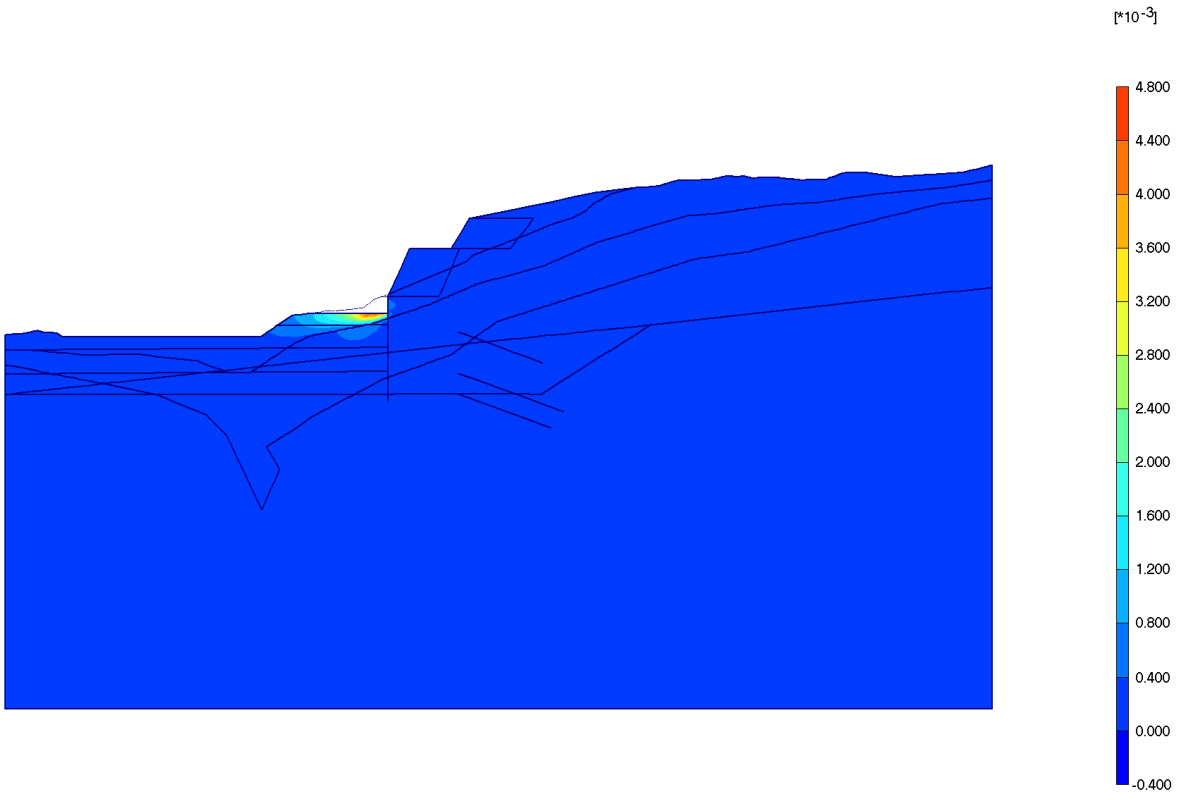


Table [35] Reached multipliers phase no: 5

Multipliers	Incremental value	Total value

Multipliers	Incremental value	Total value
Prescribed displacements	0,0000	1,0000
Load system A	0,0000	1,0000
Load system B	0,0000	1,0000
Soil weight	0,0000	1,0000
Acceleration	0,0000	0,0000
Strength reduction factor	0,0000	1,0000
Time	0,0000	0,0000

Table [36] Staged construction info phase no: 5

Staged construction	Incremental value	Total value
Active proportion of total area	0,000	0,996
Active proportion of stage	0,105	1,000

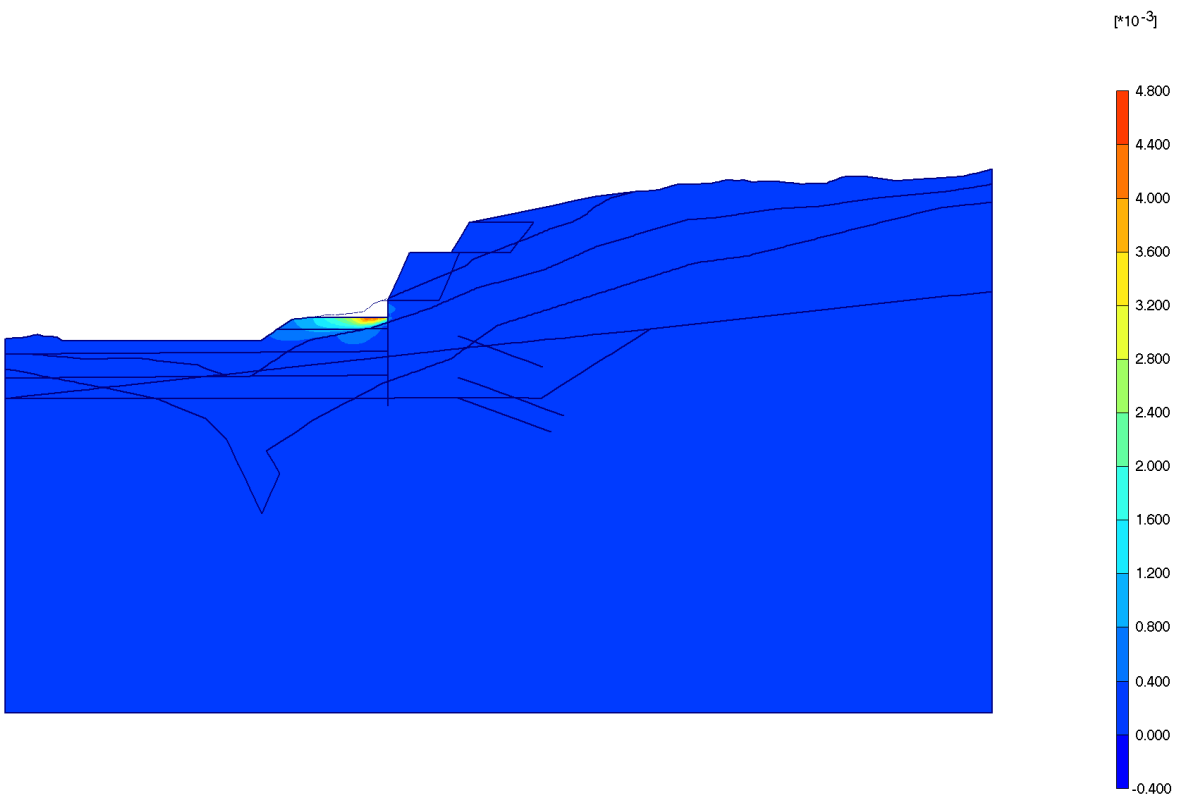


Fig. 18 Plot of deformed mesh

- step no: 89 - (phase: 5)

Fig. 19 Plot of total displacements (shadings)

- step no: 89 - (phase: 5)

Fig. 20 Plot of total incremental strains (shear shadings)

- step no: 89 - (phase: 5)

12. Results for phase 6

Table [37] Step info phase no: 6

Step no:	107
Calculation type	PLASTIC
Extrapolation factor	0,602
Relative stiffness	0,205

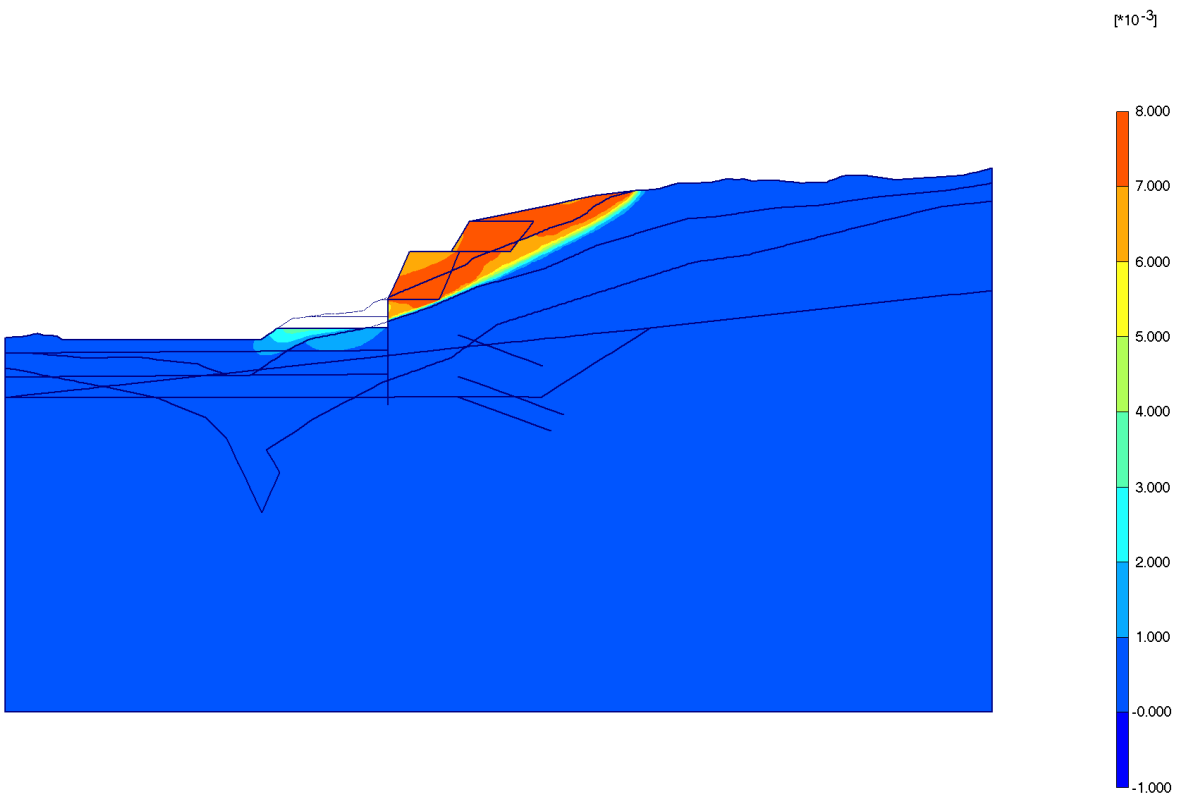


Table [38] Reached multipliers phase no: 6

Multipliers	Incremental value	Total value

Multipliers	Incremental value	Total value
Prescribed displacements	0,0000	1,0000
Load system A	0,0000	1,0000
Load system B	0,0000	1,0000
Soil weight	0,0000	1,0000
Acceleration	0,0000	0,0000
Strength reduction factor	0,0000	1,0000
Time	0,0000	0,0000

Table [39] Staged construction info phase no: 6

Staged construction	Incremental value	Total value
Active proportion of total area	0,000	0,983
Active proportion of stage	0,036	1,000

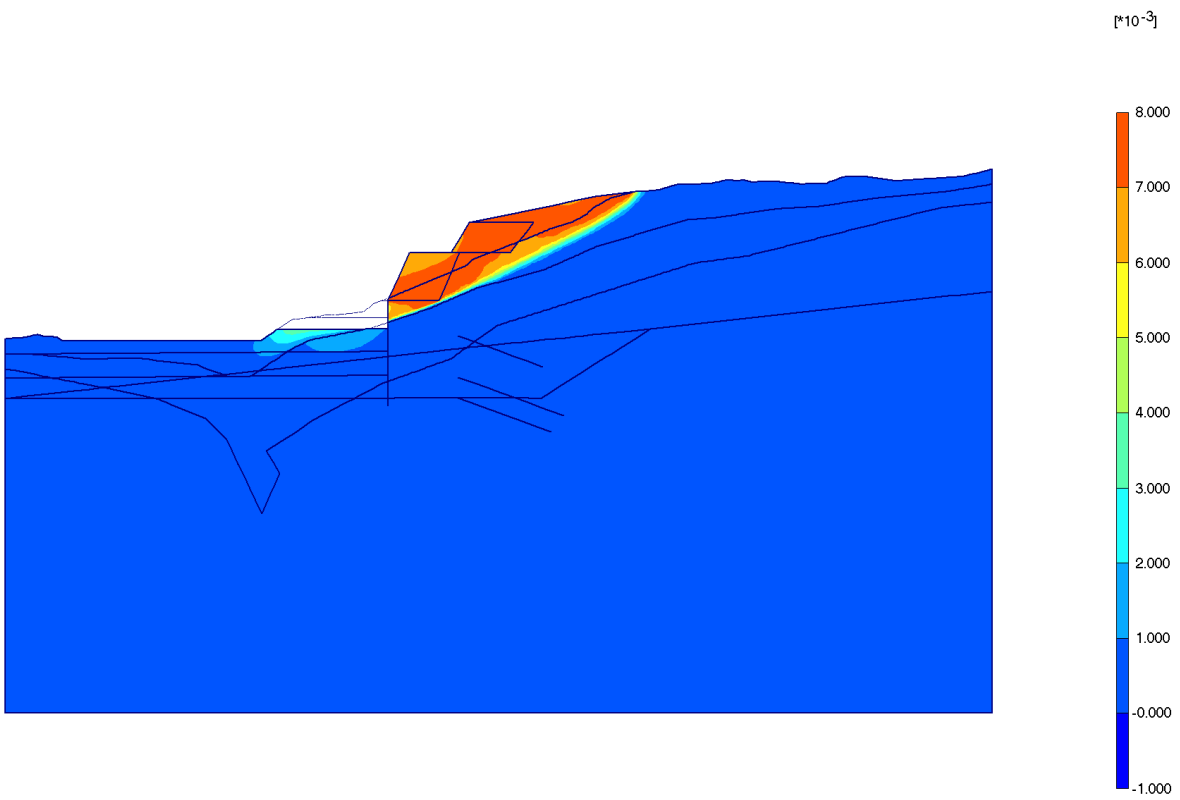


Fig. 21 Plot of deformed mesh

- step no: 107 - (phase: 6)

Fig. 22 Plot of total displacements (shadings)

- step no: 107 - (phase: 6)

Fig. 23 Plot of total incremental strains (shear shadings)

- step no: 107 - (phase: 6)

13. Results for phase 7

Table [40] Step info phase no: 7

Step no:	109
Calculation type	PLASTIC
Extrapolation factor	1,000
Relative stiffness	0,938

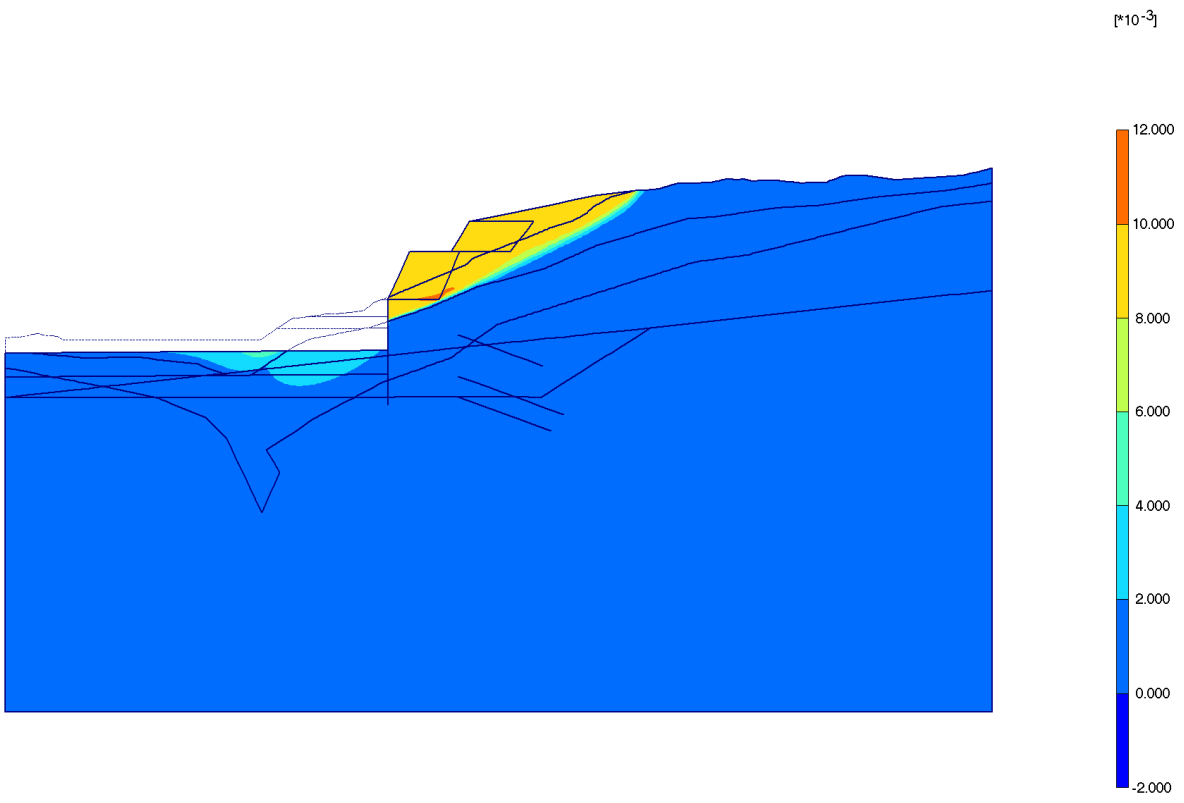


Table [41] Reached multipliers phase no: 7

Multipliers	Incremental value	Total value

Multipliers	Incremental value	Total value
Prescribed displacements	0,0000	1,0000
Load system A	0,0000	1,0000
Load system B	0,0000	1,0000
Soil weight	0,0000	1,0000
Acceleration	0,0000	0,0000
Strength reduction factor	0,0000	1,0000
Time	0,0000	0,0000

Table [42] Staged construction info phase no: 7

Staged construction	Incremental value	Total value
Active proportion of total area	0,000	0,971
Active proportion of stage	0,500	1,000

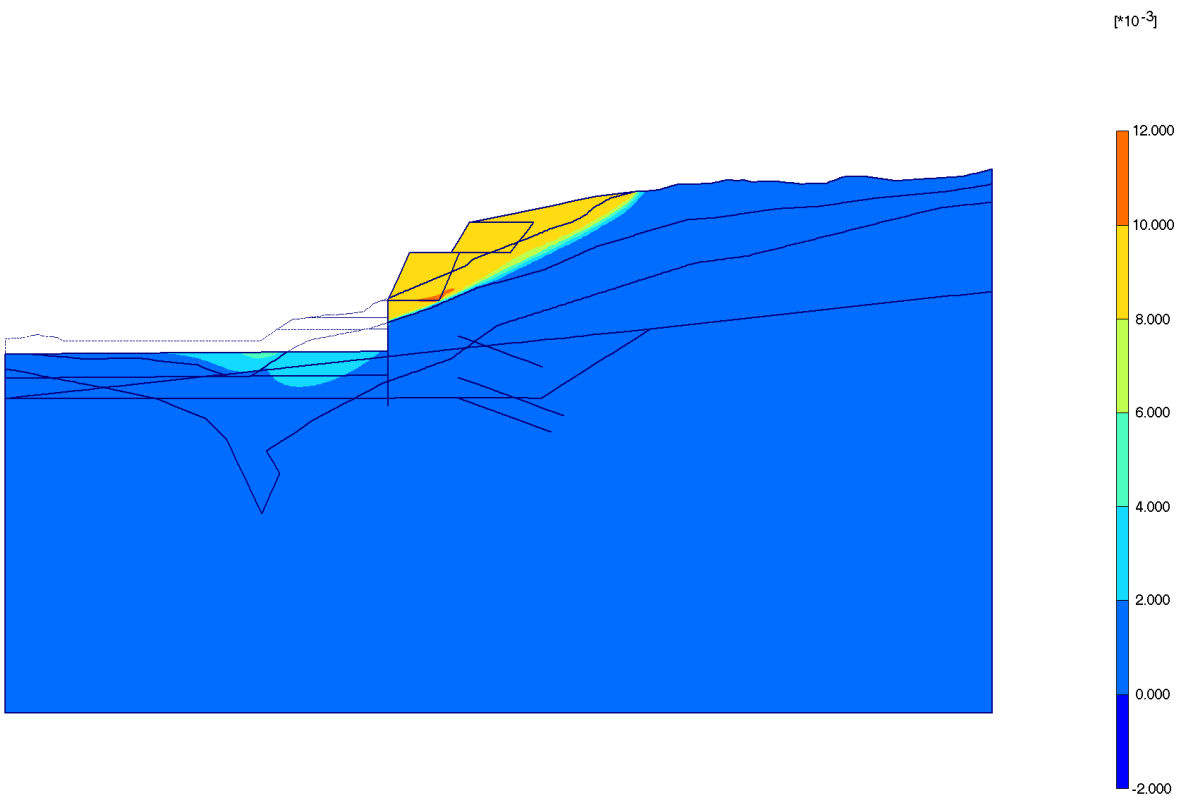


Fig. 24 Plot of deformed mesh

- step no: 109 - (phase: 7)

Fig. 25 Plot of total displacements (shadings)

- step no: 109 - (phase: 7)

Fig. 26 Plot of total incremental strains (shear shadings)

- step no: 109 - (phase: 7)

14. Results for phase 9

Table [43] Step info phase no: 9

Step no:	209
Calculation type	PLASTIC
Extrapolation factor	0,500
Relative stiffness	0,000

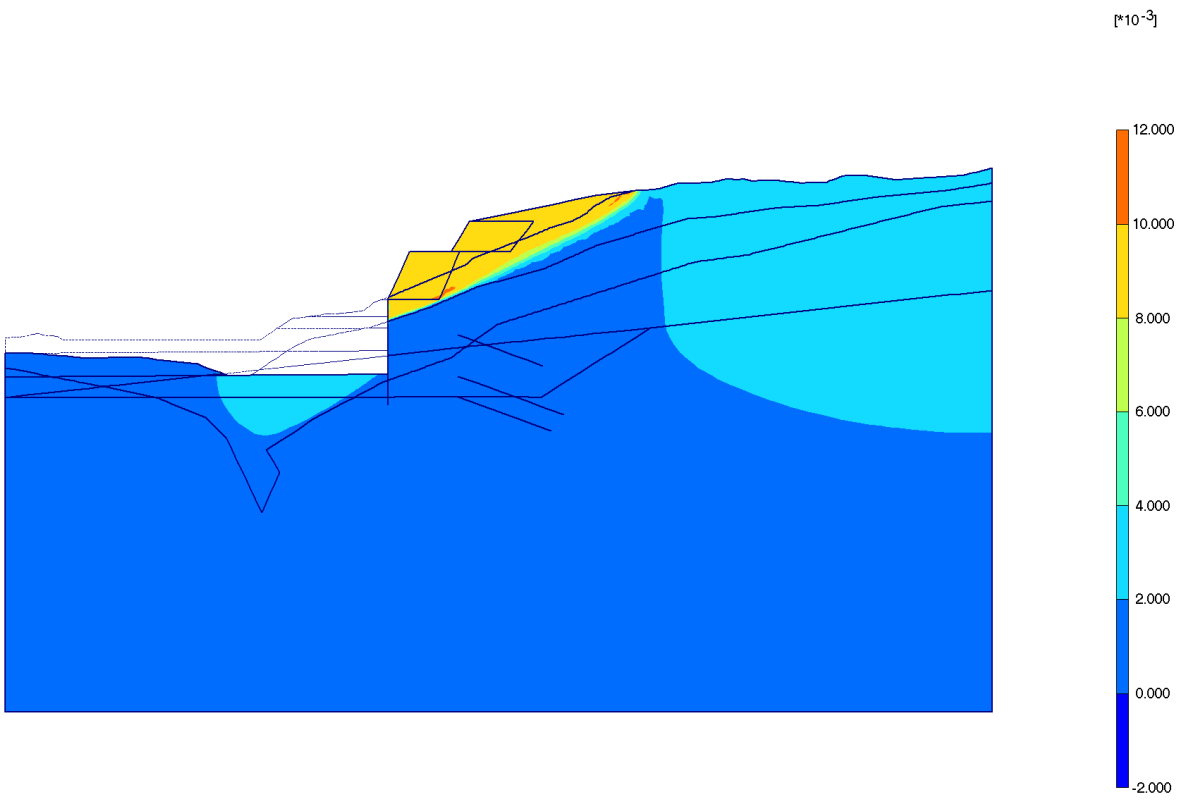


Table [44] Reached multipliers phase no: 9

Multipliers	Incremental value	Total value

Multipliers	Incremental value	Total value
Prescribed displacements	0,0000	1,0000
Load system A	0,0000	1,0000
Load system B	0,0000	1,0000
Soil weight	0,0000	1,0000
Acceleration	0,0000	0,0000
Strength reduction factor	-0,0473	2,5728
Time	0,0000	0,0000

Table [45] Staged construction info phase no: 9

Staged construction	Incremental value	Total value
Active proportion of total area	0,000	0,971
Active proportion of stage	0,000	0,000

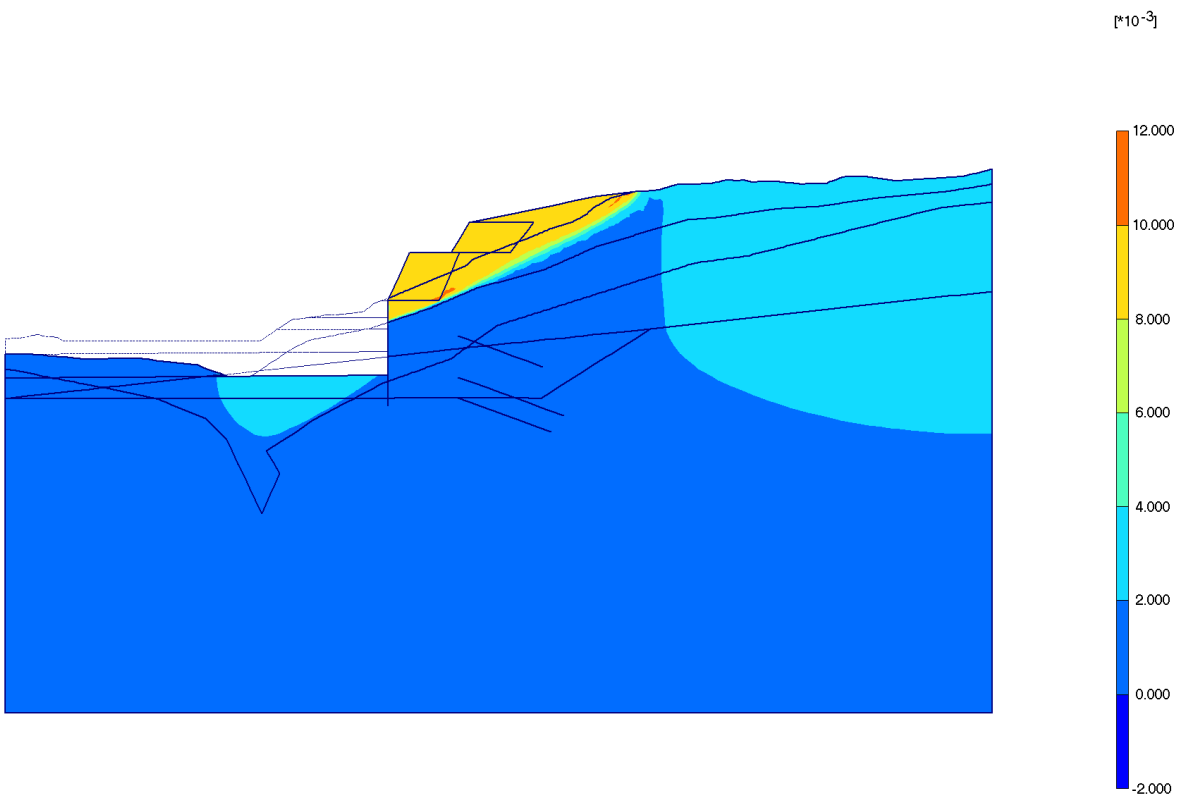


Fig. 27 Plot of deformed mesh

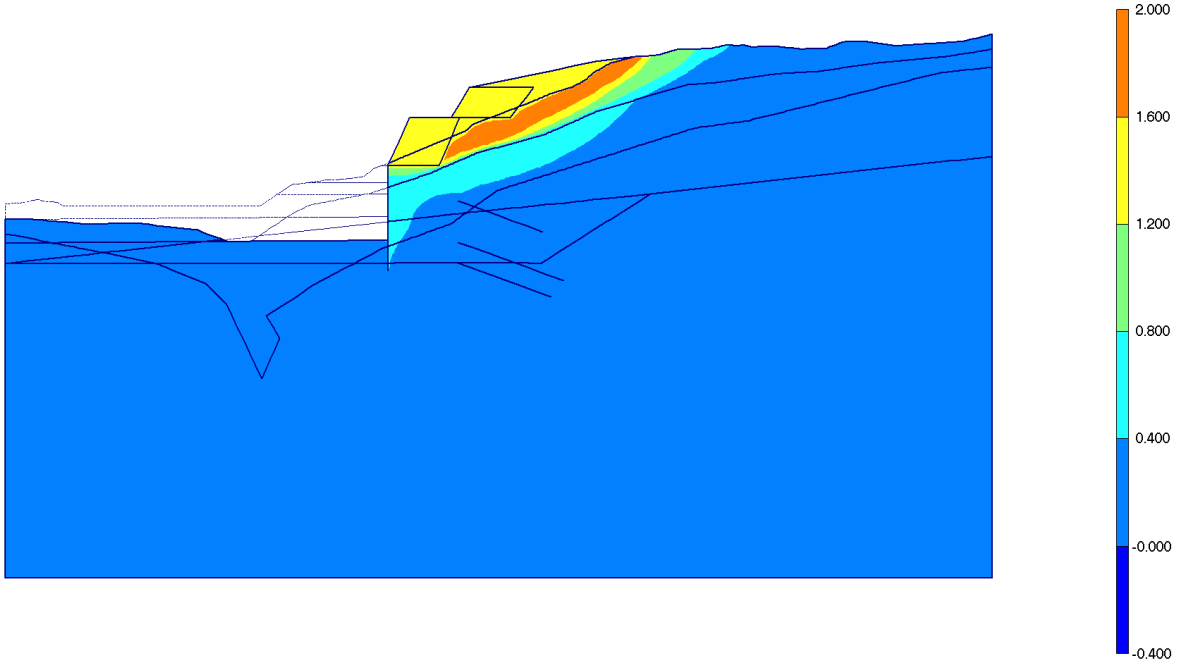
- step no: 209 - (phase: 9)

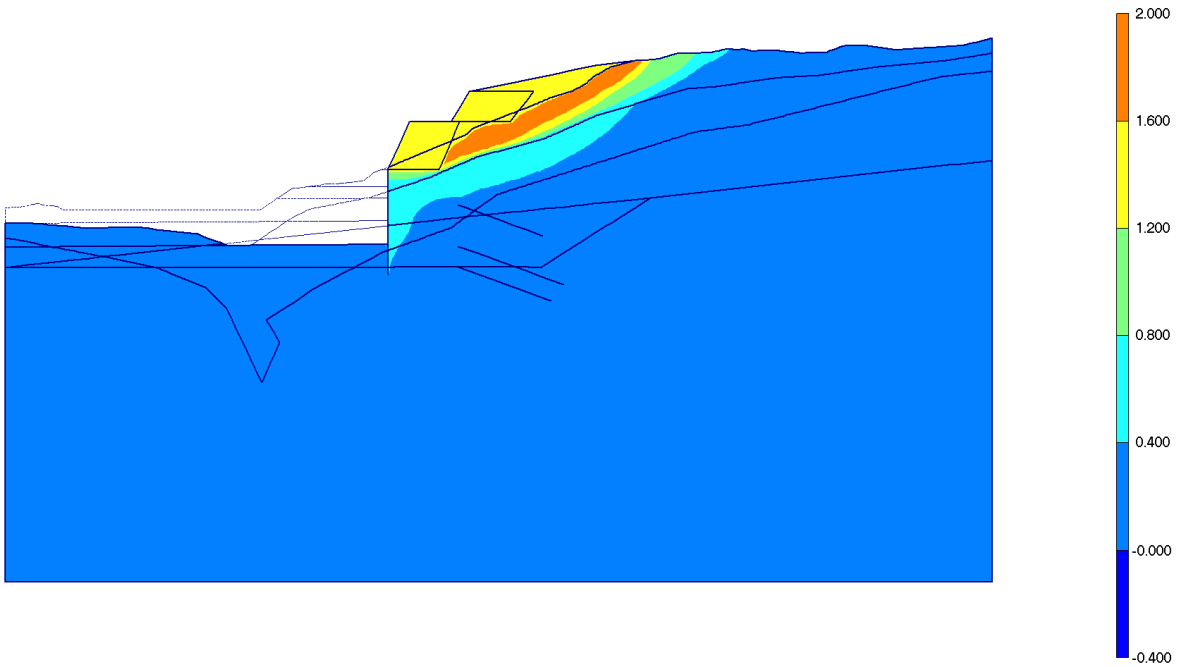
Fig. 28 Plot of total displacements (shadings)

- step no: 209 - (phase: 9)

Fig. 29 Plot of total incremental strains (shear shadings)

- step no: 209 - (phase: 9)


2.000
1.600
1.200
0.800
0.400
-0.000
-0.400


2.000
1.600
1.200
0.800
0.400
-0.000
-0.400

