

Phase2 Analysis Information

Project Summary

File Name: PHASE P4 - sanacija
 Last saved with Phase2 version: 9.01
 Analysis: Converted from Slide v6.036 with PHASE2 9.010

General Settings

Single stage model
 Analysis Type: Plane Strain
 Solver Type: Gaussian Elimination
 Units: Metric, stress as kPa
 Permeability Units: meters/second
 Time Units: days

Analysis Options

Maximum Number of Iterations: 500
 Tolerance: 0.001
 Number of Load Steps: Automatic
 Convergence Type: Absolute Energy
 Tensile Failure: Reduces Shear Strength
 Joint tension reduces joint stiffness by a factor of 0.01

Strength Reduction Settings

Initial Estimate of SRF: 0.25
 Step Size: Custom
 Final SRF: 1.5
 Step Size: 0.25
 Limit SSR Search Area: No
 Accelerate SSR Analysis: Yes
 Apply SSR to Mohr-Coulomb Tensile Strength: Yes
 Convergence Parameters: Automatic

Groundwater Analysis

Method: Piezometric Lines
 Pore Fluid Unit Weight: 9.81 kN/m³
 Probability: None

Field Stress

Field stress:	Gravity
Using actual ground surface	
Total stress ratio (horizontal/vertical in-plane):	Total stress ratio1
Total stress ratio (horizontal/vertical out-of-plane):	Total stress ratio1
Locked-in horizontal stress (in-plane):	0
Locked-in horizontal stress (out-of-plane):	0

Mesh

Mesh type: Uniform

Element type: 6 Noded triangles

Number of elements: 4236

Number of nodes: 8635

Mesh Quality

All elements are of good quality

Poor quality elements defined as:

Side length ratio (maximum / minimum) > 30.00

Minimum interior angle < 2.0 degrees

Maximum interior angle > 175.0 degrees

Excavation Areas

Original Un-deformed Areas

External Boundary Area: 143.962 m²

External Boundary Perimeter: 53.159 m

1

Values not available until this stage is viewed in a window

Material Properties

Material: Peščeno glinena zemljina



Color	
Initial element loading	field stress & body force
Unit weight	19 kN/m ³
Elastic type	isotropic
Young's modulus	5000 kPa
Poisson's ratio	0.35
Failure criterion	Mohr-Coulomb
Is Jointed	No
Peak tensile strength	1 kPa
Residual tensile strength	0 kPa
Peak friction angle	22.4 degrees
Peak cohesion	3 kPa
Material type	Plastic
Dilation Angle	0 degrees
Residual Friction Angle	22.4 degrees
Residual Cohesion	0.5 kPa
Piezo to use	1
Hu Type	Custom
Hu value	1

Material: Zdrobljen lapor

Color	
Initial element loading	field stress & body force
Unit weight	21 kN/m ³
Elastic type	isotropic
Young's modulus	15000 kPa
Poisson's ratio	0.3
Failure criterion	Mohr-Coulomb
Is Jointed	No
Peak tensile strength	2 kPa
Residual tensile strength	0 kPa
Peak friction angle	26 degrees
Peak cohesion	5 kPa
Material type	Plastic
Dilation Angle	0 degrees
Residual Friction Angle	26 degrees
Residual Cohesion	1 kPa
Piezo to use	1
Hu Type	Custom
Hu value	1

Material: Laporna podlaga

Color	
Initial element loading	field stress & body force
Unit weight	23 kN/m ³
Elastic type	isotropic
Young's modulus	150000 kPa
Poisson's ratio	0.25
Failure criterion	Mohr-Coulomb
Is Jointed	No
Peak tensile strength	6 kPa
Residual tensile strength	0 kPa
Peak friction angle	34 degrees
Peak cohesion	13 kPa
Material type	Elastic
Piezo to use	None
Ru value	0

Material: Armiran beton

Color	
Initial element loading	field stress & body force
Unit weight	25 kN/m ³
Elastic type	isotropic
Young's modulus	3e+007 kPa
Poisson's ratio	0.2
Failure criterion	Mohr-Coulomb
Is Jointed	No
Peak tensile strength	10000 kPa
Residual tensile strength	0 kPa
Peak friction angle	0 degrees
Peak cohesion	12500 kPa
Material type	Elastic
Piezo to use	None
Ru value	0

Material: Tamponsko nasutje

Color	
Initial element loading	field stress & body force
Unit weight	21 kN/m ³
Elastic type	isotropic
Young's modulus	30000 kPa
Poisson's ratio	0.3
Failure criterion	Mohr-Coulomb
Is Jointed	No
Peak tensile strength	0 kPa
Residual tensile strength	0 kPa
Peak friction angle	35 degrees
Peak cohesion	0 kPa
Material type	Plastic
Dilation Angle	0 degrees
Residual Friction Angle	35 degrees
Residual Cohesion	0 kPa
Piezo to use	None
Ru value	0

Shear Strength Reduction - Material Properties

Strength Reduction Factor: 0.25
Maximum Total Displacement: 0.0176473 m
Converged: yes

Material	Peščeno glinena zemljina
Peak friction angle	58.7613 degrees
Peak cohesion	12 kPa
Residual Friction Angle	58.7613 degrees
Residual Cohesion	2 kPa

Material	Zdrobljen lapor
Peak friction angle	62.8614 degrees
Peak cohesion	20 kPa
Residual Friction Angle	62.8614 degrees
Residual Cohesion	4 kPa

Material	Laporna podlaga
Elastic material - no strength reduction	

Material	Armiran beton
Elastic material - no strength reduction	

Material	Tamponsko nasutje
Peak friction angle	70.3516 degrees
Peak cohesion	0 kPa
Residual Friction Angle	70.3516 degrees
Residual Cohesion	0 kPa

Strength Reduction Factor: 0.5
Maximum Total Displacement: 0.0200313 m
Converged: yes

Material	Peščeno glinena zemljina
Peak friction angle	39.5001 degrees
Peak cohesion	6 kPa
Residual Friction Angle	39.5001 degrees
Residual Cohesion	1 kPa

Material	Zdrobljen lapor
Peak friction angle	44.2884 degrees
Peak cohesion	10 kPa
Residual Friction Angle	44.2884 degrees
Residual Cohesion	2 kPa

Material	Laporna podlaga
Elastic material - no strength reduction	

Material	Armiran beton
Elastic material - no strength reduction	

Material	Tamponsko nasutje
Peak friction angle	54.4704 degrees
Peak cohesion	0 kPa
Residual Friction Angle	54.4704 degrees
Residual Cohesion	0 kPa

Strength Reduction Factor: 0.75
 Maximum Total Displacement: 0.023436 m
 Converged: yes

Material	Peščeno glinena zemljina
Peak friction angle	28.7915 degrees
Peak cohesion	4 kPa
Residual Friction Angle	28.7915 degrees
Residual Cohesion	0.666667 kPa

Material	Zdrobljen lapor
Peak friction angle	33.0364 degrees
Peak cohesion	6.66667 kPa
Residual Friction Angle	33.0364 degrees
Residual Cohesion	1.33333 kPa

Material	Laporna podlaga
Elastic material - no strength reduction	

Material	Armiran beton
Elastic material - no strength reduction	

Material	Tamponsko nasutje
Peak friction angle	43.0335 degrees
Peak cohesion	0 kPa
Residual Friction Angle	43.0335 degrees
Residual Cohesion	0 kPa

Critical Strength Reduction Factor: 1
 Maximum Total Displacement: 0.0326358 m
 Converged: yes



Material	Peščeno glinena zemljina
Peak friction angle	22.4 degrees
Peak cohesion	3 kPa
Residual Friction Angle	22.4 degrees
Residual Cohesion	0.5 kPa

Material	Zdrobljen lapor
Peak friction angle	26 degrees
Peak cohesion	5 kPa
Residual Friction Angle	26 degrees
Residual Cohesion	1 kPa

Material	Laporna podlaga
Elastic material - no strength reduction	

Material	Armiran beton
Elastic material - no strength reduction	

Material	Tamponsko nasutje
Peak friction angle	35 degrees
Peak cohesion	0 kPa
Residual Friction Angle	35 degrees
Residual Cohesion	0 kPa

Strength Reduction Factor: 1.25
Maximum Total Displacement: 1.26794 m
Converged: no

Material	Peščeno glinena zemljina
Peak friction angle	18.2493 degrees
Peak cohesion	2.4 kPa
Residual Friction Angle	18.2493 degrees
Residual Cohesion	0.4 kPa

Material	Zdrobljen lapor
Peak friction angle	21.315 degrees
Peak cohesion	4 kPa
Residual Friction Angle	21.315 degrees
Residual Cohesion	0.8 kPa

Material	Laporna podlaga
Elastic material - no strength reduction	

Material	Armiran beton
Elastic material - no strength reduction	

Material	Tamponsko nasutje
Peak friction angle	29.2561 degrees
Peak cohesion	0 kPa
Residual Friction Angle	29.2561 degrees
Residual Cohesion	0 kPa

Strength Reduction Factor: 1.5
 Maximum Total Displacement: 2.64855 m
 Converged: no

Material	Peščeno glinena zemljina
Peak friction angle	15.3645 degrees
Peak cohesion	2 kPa
Residual Friction Angle	15.3645 degrees
Residual Cohesion	0.333333 kPa

Material	Zdrobljen lapor
Peak friction angle	18.0122 degrees
Peak cohesion	3.33333 kPa
Residual Friction Angle	18.0122 degrees
Residual Cohesion	0.666667 kPa

Material	Laporna podlaga
Elastic material - no strength reduction	

Material	Armiran beton
Elastic material - no strength reduction	

Material	Tamponsko nasutje
Peak friction angle	25.0234 degrees
Peak cohesion	0 kPa
Residual Friction Angle	25.0234 degrees
Residual Cohesion	0 kPa

Liner Properties

Liner: Profil H140 na 50 cm

Color	
Liner Type	Standard Beam
Formulation	Timoshenko
Area	0.00628 m ²
Moment of Inertia	2.06e-005 m ⁴

Elastic Properties

Young's modulus	2e+008 kPa
Poisson's ratio	0.25

Displacements

Displacement data is not available until total displacement is viewed in a window

Yielded Elements

Yielded Mesh Elements

Number of yielded mesh elements is not available for 1 until the stage is viewed in a window -1

List of All Coordinates

External boundary

X	Y
0	0
17.456	0
17.456	8.2684
17.456	9.2684
17.456	11
14.993	10
12.7295	9.02645
12.687	9.02475
12.587	9.02475
12.547	8.90475
12.047	8.97975
8.8896	9.06808
8.687	9.07375
8.687	9.13375
8.637	9.18375
8.287	9.18375
8.287	8.68375
6.4772	7.81531
1.945	5.7
0	5.5
0	3.56934
0	2.56934

Material boundary

X	Y
0	3.56934
8.487	5.65296
9.39818	5.87666
17.456	9.2684

Material boundary

X	Y
0	2.56934
8.487	4.65296
9.39818	4.87666
17.456	8.2684

Material boundary

X	Y
8.487	4.08375
8.487	4.65296
8.487	5.65296
8.487	8.68375
8.487	9.08375

Material boundary

X	Y
8.547	8.68375
8.547	8.267
12.537	8.16725
12.537	8.77475
12.687	8.77475
12.687	9.02475

Material boundary

X	Y
12.537	8.77475
12.537	8.87475
12.547	8.90475

Material boundary

X	Y
8.287	8.68375
8.487	8.68375
8.547	8.68375
8.687	8.68375
8.687	9.07375

Piezometric line

X	Y
0	2.56934
8.487	4.65296
9.39818	4.87666
17.456	8.2684
17.456	9.902
12.537	8.16725
0	4.5969
0	2.56934