Slope stability analysis

Input data

Project

Task : Sanacija plazu pri hiši Straža 6
Description : Konzolna pilotna stena - dvojna: stabilnostna analiza nad steno
Customer : Občina Oplotnica
Author : GEOING d.o.o.
Date : 29/05/2025

Settings

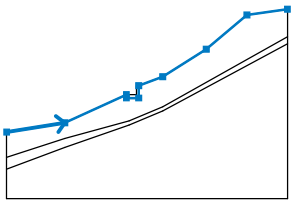
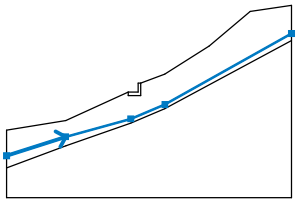
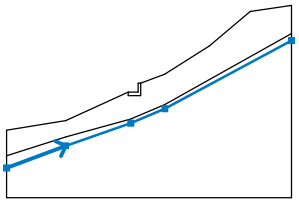
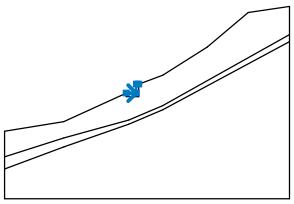
Slovenia - EN 1997 (57)

Stability analysis

Earthquake analysis : Standard
Verification methodology : Safety factors (ASD)

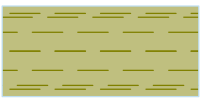
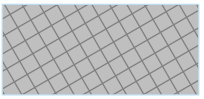
Safety factors			
Permanent design situation			
Safety factor :	SF_s =	1,50	[–]

Interface

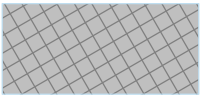
No.	Interface location	Coordinates of interface points [m]					
		x	z	x	z	x	z
1		0,00	9,60	9,90	11,20	20,35	16,00
		20,35	15,40	22,45	15,40	22,45	17,50
		26,50	19,00	33,90	23,70	40,80	29,50
		47,70	30,50				
2		0,00	5,30	9,90	8,50	20,80	11,50
		26,50	13,90	47,70	25,80		
3		0,00	3,30	9,90	7,00	20,80	10,80
		26,50	13,20	47,70	24,60		
4		20,35	16,00	22,05	16,00	22,05	17,50
		22,45	17,50				

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Soil parameters - effective stress state

No.	Name	Pattern	φ_{ef} [°]	c_{ef} [kPa]	γ [kN/m^3]
1	Glina		22,00	5,00	19,00
2	Preperina		30,00	10,00	21,00
3	Hribina		34,00	30,00	23,00
4	Vezna greda		45,00	100,00	24,00

Soil parameters - uplift

No.	Name	Pattern	γ_{sat} [kN/m^3]	γ_s [kN/m^3]	n [–]
1	Glina		19,00		
2	Preperina		21,00		
3	Hribina		23,00		
4	Vezna greda		24,00		

Soil parameters

Glina

Unit weight : γ = 19,00 kN/m^3
Stress-state : effective
Angle of internal friction : φ_{ef} = 22,00 °
Cohesion of soil : c_{ef} = 5,00 kPa
Saturated unit weight : γ_{sat} = 19,00 kN/m^3

Preperina

Unit weight : γ = 21,00 kN/m^3
Stress-state : effective
Angle of internal friction : φ_{ef} = 30,00 °
Cohesion of soil : c_{ef} = 10,00 kPa
Saturated unit weight : γ_{sat} = 21,00 kN/m^3

Hribina

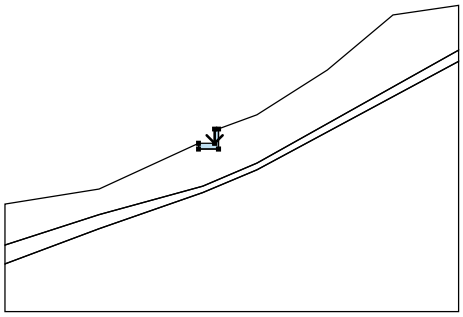
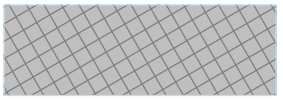
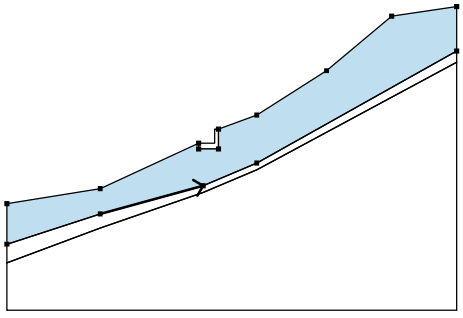
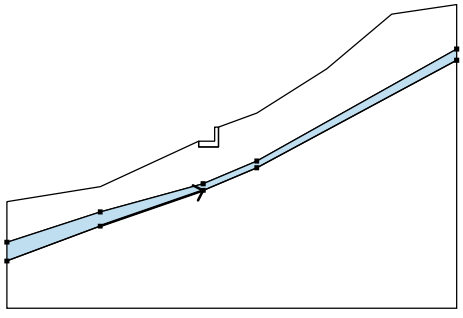
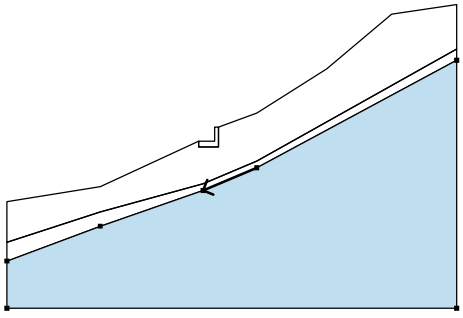
Unit weight : γ = 23,00 kN/m^3
Stress-state : effective
Angle of internal friction : φ_{ef} = 34,00 °

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Cohesion of soil : c_{ef} = 30,00 kPa
Saturated unit weight : γ_{sat} = 23,00 kN/m^3

Vezna greda
Unit weight : γ = 24,00 kN/m^3
Stress-state : effective
Angle of internal friction : φ_{ef} = 45,00 °
Cohesion of soil : c_{ef} = 100,00 kPa
Saturated unit weight : γ_{sat} = 24,00 kN/m^3

Assigning and surfaces

No.	Surface position	Coordinates of surface points [m]				Assigned soil
		x	z	x	z	
1		22,05	17,50	22,05	16,00	Vezna greda
		20,35	16,00	20,35	15,40	
		22,45	15,40	22,45	17,50	
2		9,90	8,50	20,80	11,50	Glina
		26,50	13,90	47,70	25,80	
		47,70	30,50	40,80	29,50	
		33,90	23,70	26,50	19,00	
		22,45	17,50	22,45	15,40	
		20,35	15,40	20,35	16,00	
		9,90	11,20	0,00	9,60	
		0,00	5,30			
3		9,90	7,00	20,80	10,80	Preperina
		26,50	13,20	47,70	24,60	
		47,70	25,80	26,50	13,90	
		20,80	11,50	9,90	8,50	
		0,00	5,30	0,00	3,30	
4		26,50	13,20	20,80	10,80	Hribina
		9,90	7,00	0,00	3,30	
		0,00	-1,70	47,70	-1,70	
		47,70	24,60			

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Anti-Slide piles

No.	Point		Length	Pile spacing	Cross-section	Pile bearing capacity			
	x [m]	z [m]	l [m]	b [m]	[m]	Distribution along the pile	Max. bearing capacity V_u [kN]	Gradient K [–]	Passive force direction
1	20,80	16,00	8,60	1,00	d = 0,60	linear	130,00	0,50	perpendicular to pile
2	22,05	16,00	8,60	1,00	d = 0,60	linear	130,00	0,50	perpendicular to pile

Water

Water type : No water

Tensile crack

Tensile crack not input.

Earthquake

Earthquake not included.

Settings of the stage of construction

Design situation : permanent

Results (Stage of construction 1)

Analysis 1

Circular slip surface

Slip surface parameters							
Center :	x =	20,32	[m]	Angles :	α_1 =	4,62	[°]
	z =	44,01	[m]		α_2 =	57,67	[°]
Radius :	R =	26,59	[m]				
Analysis of the slip surface without optimization.							

The forces acting on the pile

Anti-Slide Pile No. 1 (20,80; 16,00 [m])
The pile do not intersect slip surface, forces acting on pile cannot be computed.Anti-Slide Pile No. 2 (22,05; 16,00 [m])
The forces acting on the pile cannot be computed - the pile is below the terrain.

Slope stability verification (Morgenstern-Price)

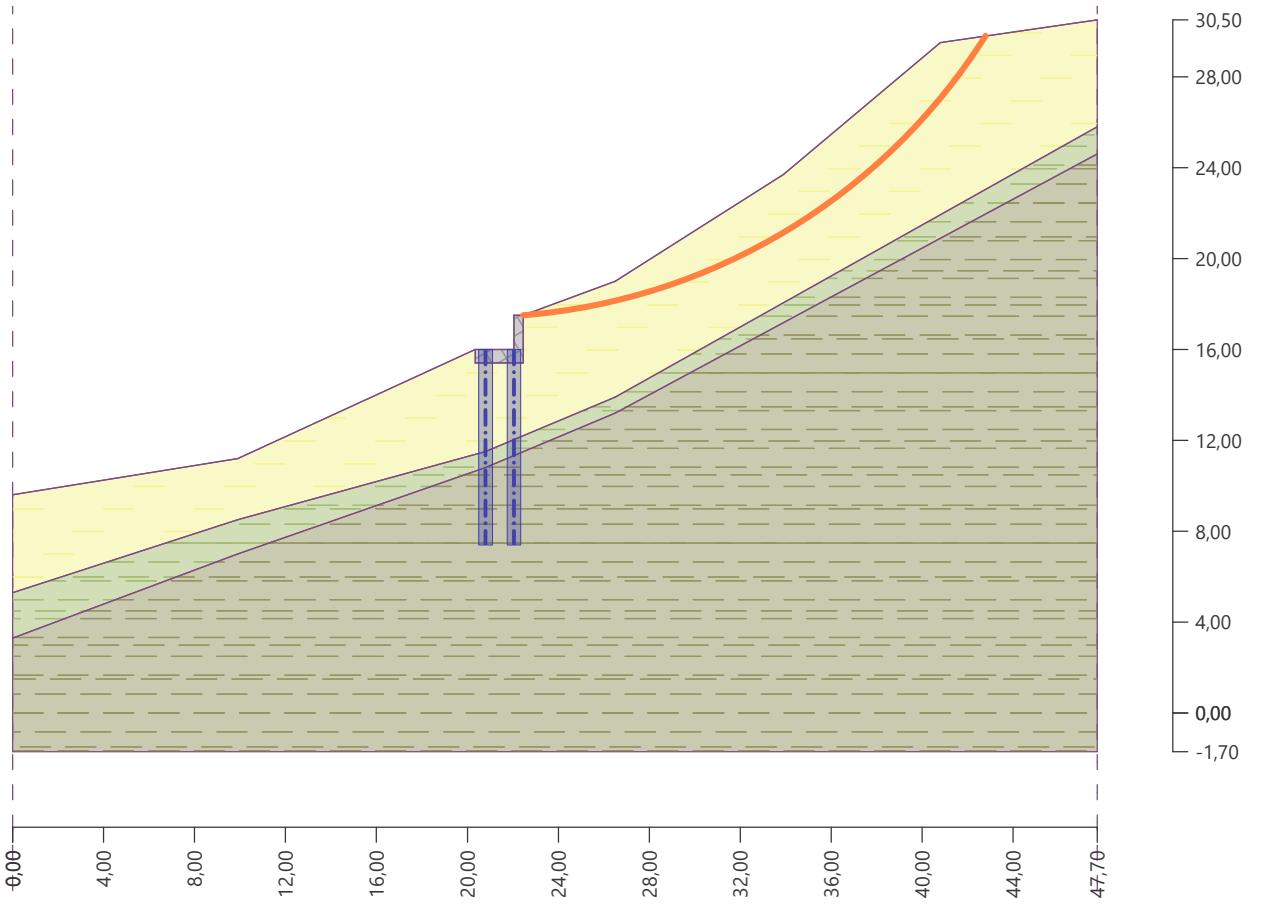
Factor of safety = 0,98 < 1,50

Slope stability NOT ACCEPTABLE

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Name : Analysis | **Stage - analysis : 1 - 1**

Description : Drsina



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