

Slope stability analysis

Input data

Project

Task : Zemeljski plaz pri hiši Fošt 19
 Description : Povratna stabilnostna analiza
 Customer : Občina Oplotnica
 Author : GEOING d.o.o.
 Date : 11/03/2026

Settings

Slovenia - EN 1997 (129)

Stability analysis

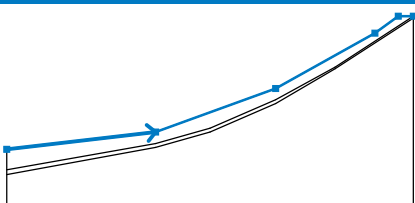
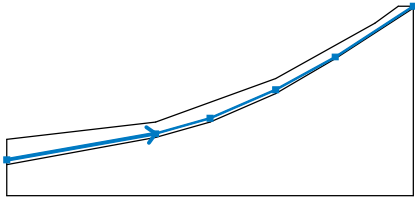
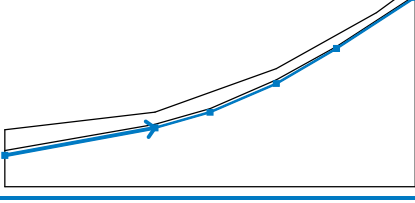
Earthquake analysis : Standard
 Verification methodology : Safety factors (ASD)

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	7,50	24,00	10,30	43,40	17,30
		59,40	26,25	63,20	29,00	65,60	29,00
2		0,00	4,20	24,00	8,40	32,80	10,90
		43,40	15,50	53,00	20,80	65,60	29,00
3		0,00	3,40	24,00	7,80	32,80	10,30
		43,40	14,90	53,00	20,50	65,60	28,70

Soil parameters - effective stress state

No.	Name	Pattern	ϕ_{ef} [°]	c_{ef} [kPa]	γ [kN/m ³]
1	Glina		23,00	0,00	19,00
2	Preperina		28,00	10,00	21,00

No.	Name	Pattern	φ_{ef} [°]	c_{ef} [kPa]	γ [kN/m ³]
3	Hribina		34,00	30,00	22,00

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		22,00		

Soil parameters

Glina

Unit weight : $\gamma = 19,00 \text{ kN/m}^3$
 Stress-state : effective
 Angle of internal friction : $\varphi_{ef} = 23,00^\circ$
 Cohesion of soil : $c_{ef} = 0,00 \text{ kPa}$
 Saturated unit weight : $\gamma_{sat} = 19,00 \text{ kN/m}^3$

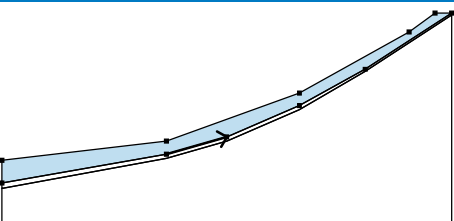
Preperina

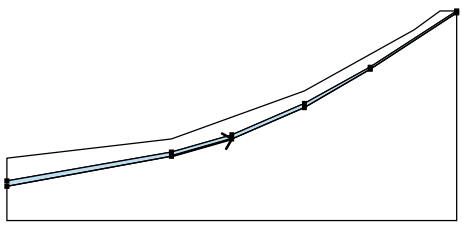
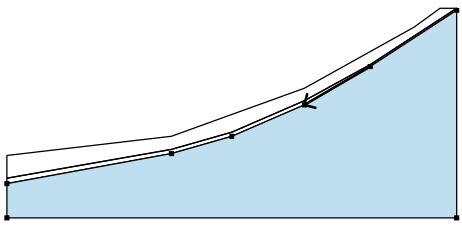
Unit weight : $\gamma = 21,00 \text{ kN/m}^3$
 Stress-state : effective
 Angle of internal friction : $\varphi_{ef} = 28,00^\circ$
 Cohesion of soil : $c_{ef} = 10,00 \text{ kPa}$
 Saturated unit weight : $\gamma_{sat} = 21,00 \text{ kN/m}^3$

Hribina

Unit weight : $\gamma = 22,00 \text{ kN/m}^3$
 Stress-state : effective
 Angle of internal friction : $\varphi_{ef} = 34,00^\circ$
 Cohesion of soil : $c_{ef} = 30,00 \text{ kPa}$
 Saturated unit weight : $\gamma_{sat} = 22,00 \text{ kN/m}^3$

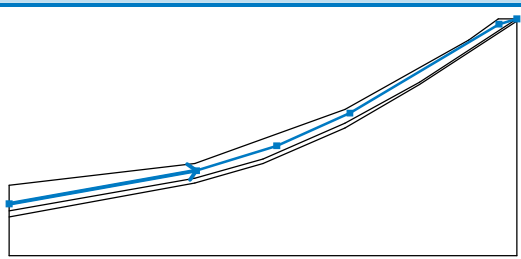
Assigning and surfaces

No.	Surface position	Coordinates of surface points [m]				Assigned soil
		x	z	x	z	
1		24,00	8,40	32,80	10,90	Glina 
		43,40	15,50	53,00	20,80	
		65,60	29,00	63,20	29,00	
		59,40	26,25	43,40	17,30	
		24,00	10,30	0,00	7,50	
		0,00	4,20			

No.	Surface position	Coordinates of surface points [m]				Assigned soil
		x	z	x	z	
2		24,00	7,80	32,80	10,30	Preperina 
		43,40	14,90	53,00	20,50	
		65,60	28,70	65,60	29,00	
		53,00	20,80	43,40	15,50	
		32,80	10,90	24,00	8,40	
		0,00	4,20	0,00	3,40	
3		53,00	20,50	43,40	14,90	Hribina 
		32,80	10,30	24,00	7,80	
		0,00	3,40	0,00	-1,60	
		65,60	-1,60	65,60	28,70	

Water

Water type : GWT

No.	GWT location	Coordinates of GWT points [m]					
		x	z	x	z	x	z
1		0,00	5,09	24,22	9,38	34,57	12,60
		44,03	16,82	63,28	28,31	65,60	29,00

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 =	23,17 [m]	Angles :	$\alpha_1 =$	1,56 [°]
	z =	49,59 [m]		$\alpha_2 =$	43,21 [°]
Radius :	R =	39,22 [m]			

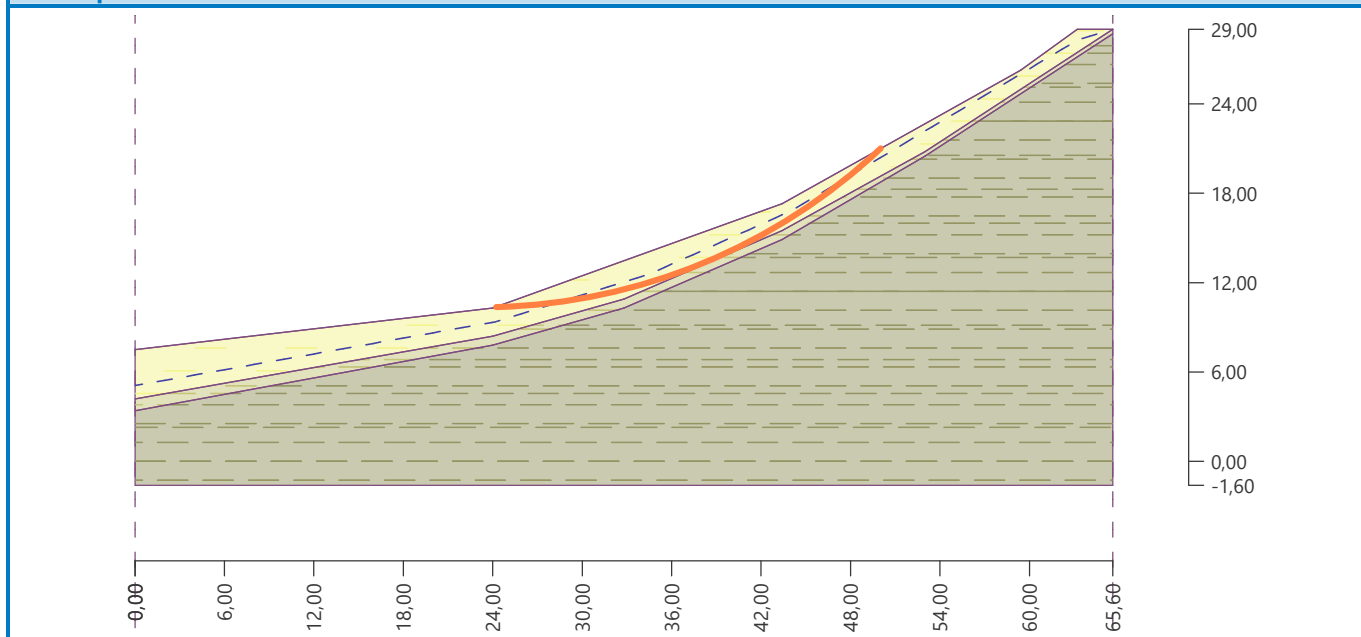
Analysis of the slip surface without optimization.

Slope stability verification (Bishop)Sum of active forces : $F_a = 234,35 \text{ kN/m}$ Sum of passive forces : $F_p = 231,42 \text{ kN/m}$ Sliding moment : $M_a = 9191,17 \text{ kNm/m}$ Resisting moment : $M_p = 9076,13 \text{ kNm/m}$ Factor of safety = $0,99 < 1,50$ **Slope stability NOT ACCEPTABLE**

Name : Analysis

Stage - analysis : 1 - 1

Description : Drsina 1



Analysis 2

Circular slip surface

Slip surface parameters						
Center :	x =	22,01 [m]	Angles :	$\alpha_1 =$	3,36 [°]	
	z =	54,40 [m]		$\alpha_2 =$	42,31 [°]	
Radius :	R =	43,96 [m]				
Analysis of the slip surface without optimization.						

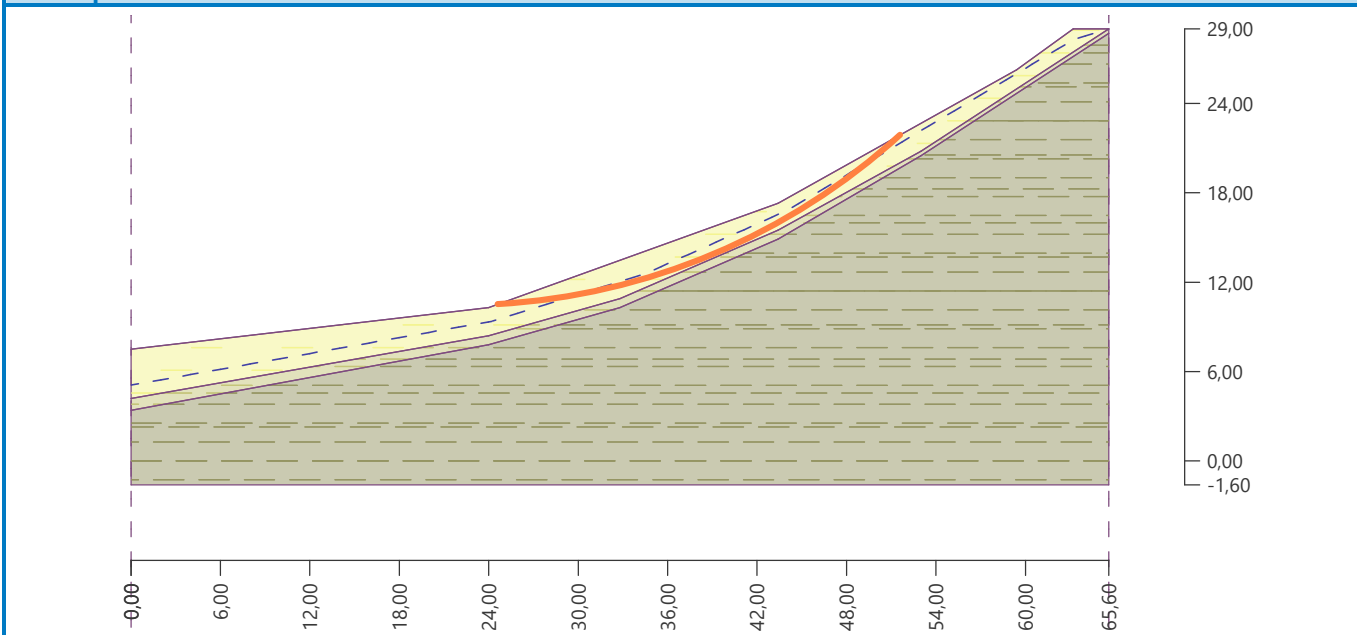
Slope stability verification (Bishop)

Sum of active forces : $F_a = 232,48$ kN/mSum of passive forces : $F_p = 226,47$ kN/mSliding moment : $M_a = 10219,52$ kNm/mResisting moment : $M_p = 9955,36$ kNm/mFactor of safety = $0,97 < 1,50$ **Slope stability NOT ACCEPTABLE**

Name : Analysis

Stage - analysis : 1 - 2

Description : Drsina 2



Analysis 3

Circular slip surface

Slip surface parameters					
Center :	x =	25,31 [m]	Angles :	α_1 =	-1,45 [°]
	z =	45,81 [m]		α_2 =	46,84 [°]
Radius :	R =	35,37 [m]			
Analysis of the slip surface without optimization.					

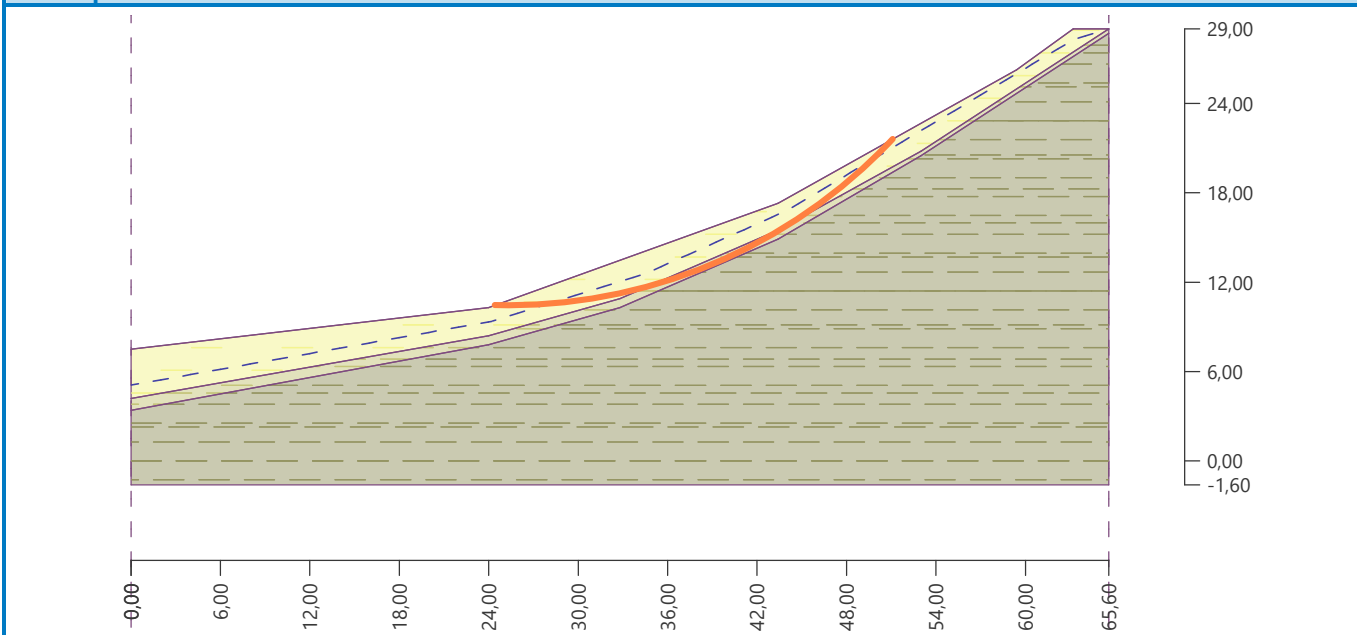
Slope stability verification (Bishop)

Sum of active forces : $F_a = 307,02$ kN/mSum of passive forces : $F_p = 416,95$ kN/mSliding moment : $M_a = 10860,14$ kNm/mResisting moment : $M_p = 14748,56$ kNm/mFactor of safety = $1,36 < 1,50$ **Slope stability NOT ACCEPTABLE**

Name : Analysis

Stage - analysis : 1 - 3

Description : Dršina 3



Analysis 4

Circular slip surface

Slip surface parameters					
Center :	x =	28,18 [m]	Angles :	α_1 =	-6,78 [°]
	z =	39,54 [m]		α_2 =	52,31 [°]
Radius :	R =	29,18 [m]			
Analysis of the slip surface without optimization.					

Slope stability verification (Bishop)

Sum of active forces : $F_a = 399,35$ kN/mSum of passive forces : $F_p = 882,33$ kN/mSliding moment : $M_a = 11651,21$ kNm/mResisting moment : $M_p = 25742,54$ kNm/m

Factor of safety = 2,21 > 1,50

Slope stability **ACCEPTABLE**

Name : Analysis

Stage - analysis : 1 - 4

Description : Drsina 4

