

Client: **POVODÍ LABE, S.O. /**

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● Project Information

Title: VD VRCHLICE_1
Number:
Client: POVODÍ LABE, S.O.
Designer: A. Kačora

Description: Stabilita svahu_kotvená ocelová síť 80 kN

● Input

Rock Slope

Slope inclination [°]	65
Thickness of the surficial instability [m]	1.10
Density of the rock mass [kN/m³]	27.00
Assumed plasticization between rock and anchor [m]	0.10

Most Dangerous Joint

Inclination [°]	64
Compressive Strength JCS [MPa]	120.00
Roughness coefficient JRC	16.00

Seismic Acceleration

Horizontal seismic coefficient	0.05
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Mesh

Mesh type	Steelgrid HR 100
Mesh ultimate tensile strength [kN/m]	80.00
Maximum design displacement [m]	0.20

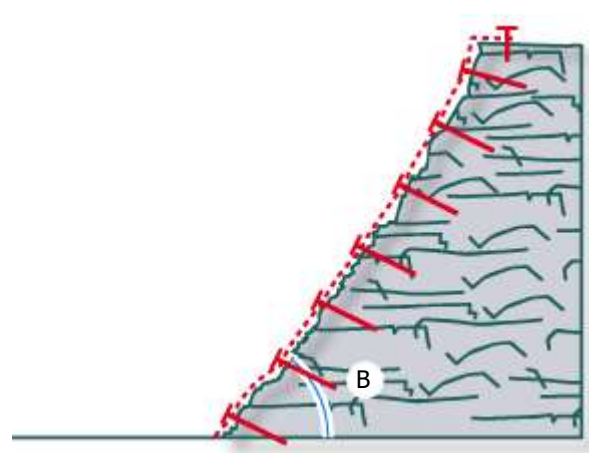
Anchor Bars

Geometry

Horizontal spacing between the anchors [m]	1.75
Vertical spacing between the anchors [m]	1.75
Inclination of bar to the horizontal [°]	10

Anchor Type

Bar type	Fully threaded steel bars 500/550
Bar internal diameter [mm]	0
Bar external diameter [mm]	25
Thickness of corrosion crown [mm]	1
Bar yield stress [MPa]	500.00
Rock-grout adhesion (Bond stress) [MPa]	2.00



Safety Coefficients

Uncertainty of the thickness of surficial instability	1.20
Uncertainty of the rock mass unit weight	1.01
Uncertainty of rock behavior and weathering	1.02
Safety coefficient to reduce stabilizing forces	1.24

Slope surface morphology	1.10
External loads	1.02
Safety coefficient to increase the driving forces	1.12

Global Safety Coefficient	1.39
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Coefficient for the mesh tensile resistance	2.50
Coefficient for the maximum mesh displacement	1.20

Coefficient for the steel bar yield stress	1.16
Coefficient for rock-grout adhesion (bond stress)	2.00

Results

Bar design check (Slope SF)

2.07 Satisfied

Mesh design check

48.93 Satisfied

Serviceability design check

8.50 Satisfied

Bar design

Stabilizing forces [kN]	195.92
Driving forces [kN]	94.48
Ratio Stabilizing/Driving forces	2.07

Angle between perpendicular to slope and bar axis [°]	15.00
Minimum acceptable steel yield stress [MPa]	431.03
Effective cross section of bar [mm ²]	415.48
Sliding plane stabilizing forces - per anchorage [kN]	132.77
Minimum drilling diameter (NOMINAL) [mm]	40.00
Anchor pull-out force due to global instability [kN]	0.12
Anchor pull-out force due to global instability [kN]	8.11
Maximum pull-out force (total) [kN]	8.11
Minimum bar length in the stable rock mass [m]	0.10
Minimum length (bar) in the unstable rock mass [m]	1.30
Minimum total bar length [m]	1.50

Serviceability

Maximum acceptable displacement [m]	0.17
Calculated mesh displacement [m]	0.02
Displacement Ratio	8.50

Geometry

Mesh design

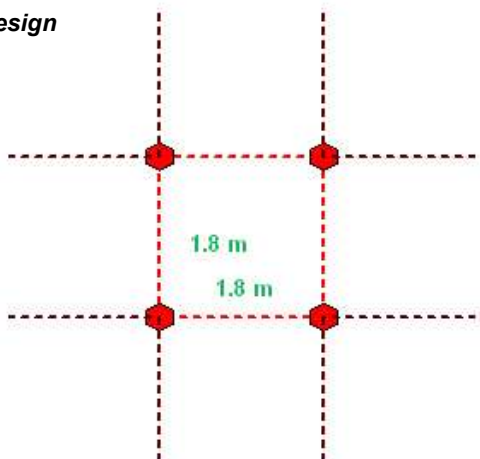
Admissible tensile stress of the mesh [kN/m]	32.00
Max. tensile stress within the mesh [kN/m]	0.65
Force-strength ratio	48.93

Potential unstable volume on joint - case A [m ³ /m]	0.03
Potential unstable volume on joint - case B [m ³ /m]	0.00
Potential unstable volume on joint - case C [m ³ /m]	0.00
Maximum rock volume that can slide between anchors [m ³ /m]	0.03
Maximum rock weight that can slide between anchors [kN/m]	0.72
Sum of driving forces acting on the sliding plane [kN/m]	0.74
Sum of stabilizing forces acting on the sliding plane [kN/m]	0.50
Punching forces acting on the mesh [kN]	0.10
Average angle between deformed mesh plane and rock surface [°]	0.58

Features of the instability

Pressure on the average slip surface [MPa]	0.01
Initial dilance of the most dangerous joint [°]	7.19
Total unstable volume controlled by each anchorage [m ³]	3.37
Total unstable weight controlled by each anchorage [kN]	90.96

Nails Design



Instability Model

