Project

Job name : Sanacija Plazu 2 na JP 948 321
Part : Pilotna stena
Description : Konzola nad pilotom
Client : Občina Oplotnica
Author : GEOING d.o.o.
Date : 23/02/2023

Standard

Standard **EN 1992-1-1/Default EC**.

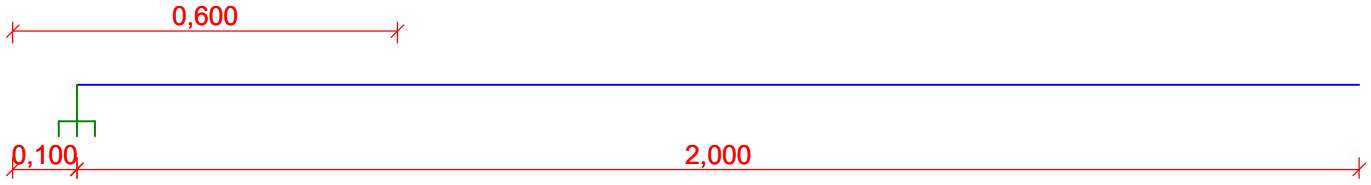
1 Konzola

1.1 Input data

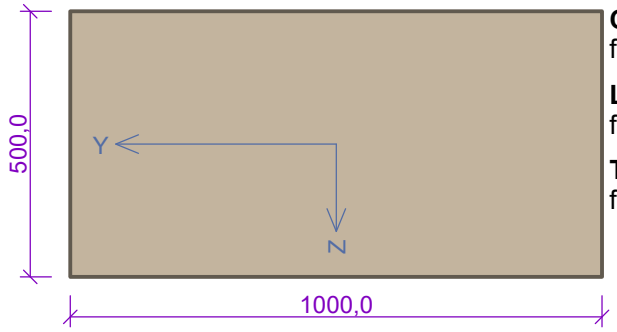
Geometry

Length = 2,00m

x [m]	Point kind	Width [m]	A/L [m]	I/L [m³]	Offset [m]
0,000	fixed support	0,600	-	-	0,100
2,000	free	-	-	-	-



Cross-section



Materials

Concrete: C 30/37
f_{ck} = 30,0 MPa; f_{ctm} = 2,9 MPa; E_{cm} = 33000 MPa

Longitudinal steel: B500B
f_{yk} = 500,0 MPa; E_s = 200000 MPa

Transverse steel: B500
f_{yk} = 500,0 MPa; E_s = 200000 MPa

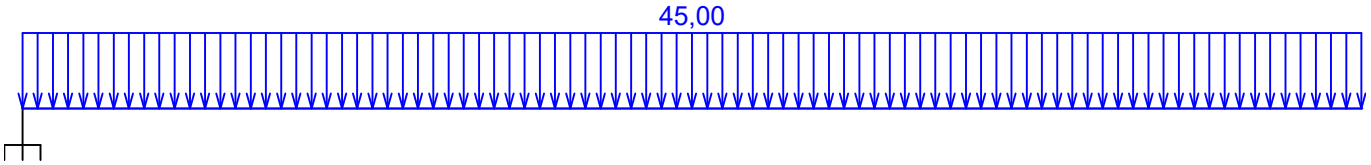
Load cases

no.	Name	Code	Type	γ_f ($\gamma_{f,inf}$)*	Factors for combinations				
					ξ	Categ.**	ψ_0	ψ_1	ψ_2
1	G1 force -promet	Force	Permanent	1,35(0,90)	0,85	-	-	-	-
2	G2 self weight-permanent	Self weight	Permanent	1,35(0,90)	0,85	-	-	-	-

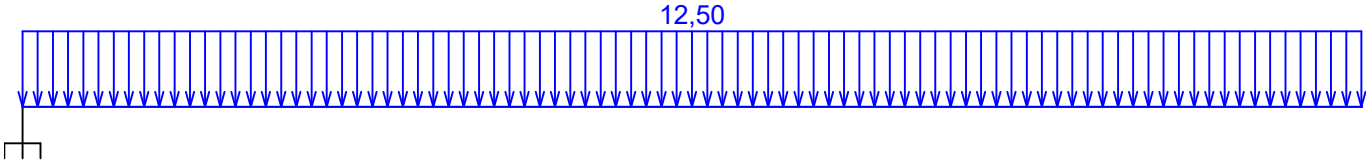
* $\gamma_{f,inf}$ for favourable dead loads
** Category of live loads according to table A1.1 in EN 1990

G1 force -promet - load				
Type	Coor.x [m]	Length [m]	Size1	Size2
uniform	0,000	2,000	45,00kN/m	-

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G2 self weight-permanent - load				
Type	Coor.x [m]	Length [m]	Size1	Size2
uniform	0,000	2,000	12,50kN/m	-



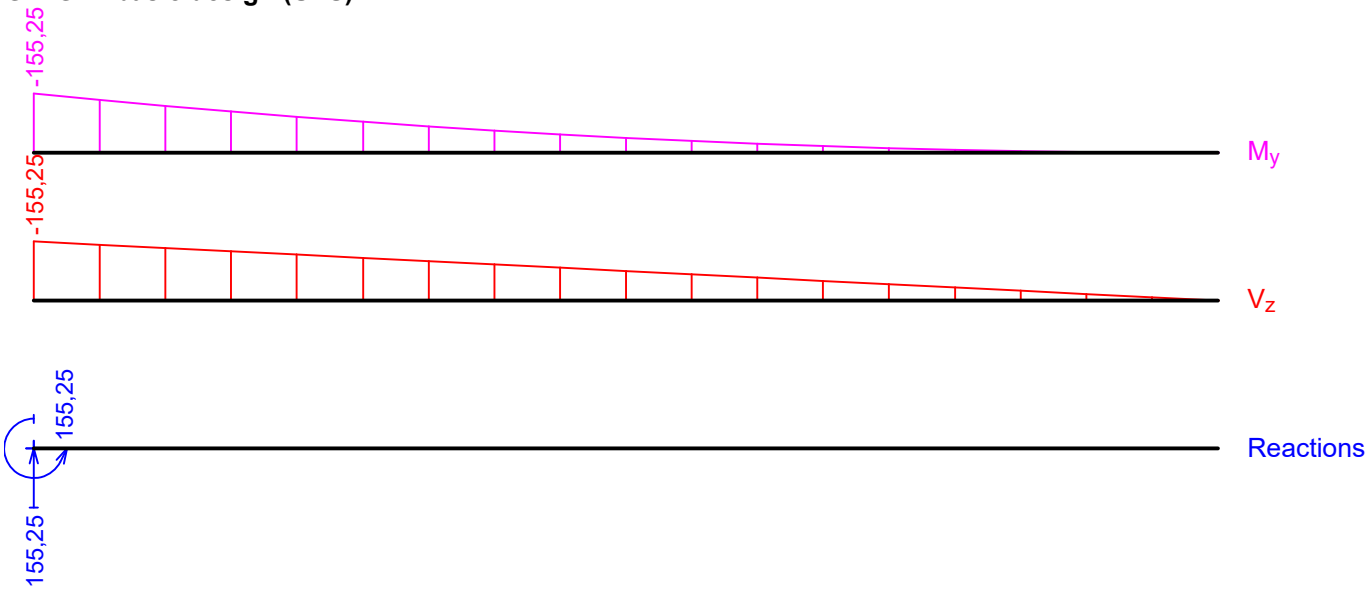
Combinations

Combination for check of ultimate limit state (ULS), 1st order

Number	Comb. name and type
	Composition
1	G1+G2; basic combination
	$\gamma_{f,sup,1}$(1,35)*G1 + $\gamma_{f,sup,2}$(1,35)*G2

Internal forces

G1+G2 - basic design (ULS)

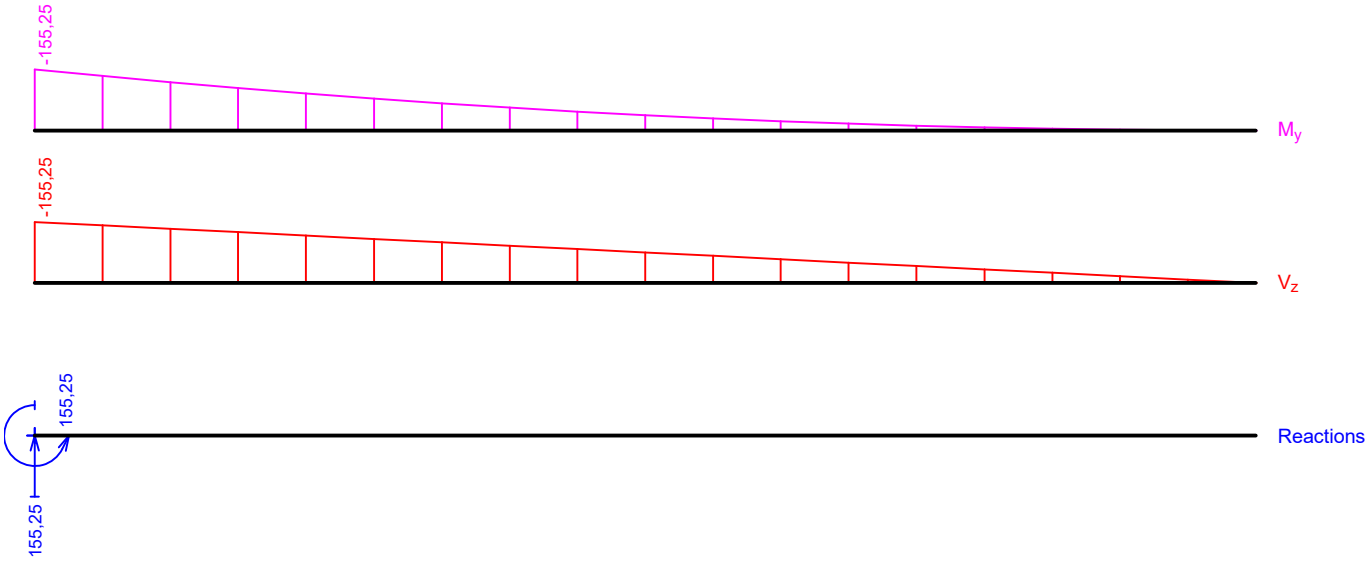


Envelopes

Envelope basic design (ULS)								
x [m]	Max M_{Edy} [kNm]	Min M_{Edy} [kNm]	Max V_{Edz} [kN]	Min V_{Edz} [kN]	Max R_z [kN]	Min R_z [kN]	Max RO_x [kNm]	Min RO_x [kNm]
0,000	-155,25	-155,25	-155,25	-155,25	155,25	155,25	155,25	155,25
0,111	-138,53	-138,53	-146,63	-146,63	-	-	-	-
0,222	-122,74	-122,74	-138,02	-138,02	-	-	-	-
0,333	-107,86	-107,86	-129,40	-129,40	-	-	-	-

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Envelope basic design (ULS)								
x [m]	Max M_{Edy} [kNm]	Min M_{Edy} [kNm]	Max V_{Edz} [kN]	Min V_{Edz} [kN]	Max R_z [kN]	Min R_z [kN]	Max RO_x [kNm]	Min RO_x [kNm]
0,444	-94,01	-94,01	-120,78	-120,78	-	-	-	-
0,556	-80,97	-80,97	-112,09	-112,09	-	-	-	-
0,667	-68,97	-68,97	-103,47	-103,47	-	-	-	-
0,778	-58,00	-58,00	-94,86	-94,86	-	-	-	-
0,889	-47,95	-47,95	-86,24	-86,24	-	-	-	-
1,000	-38,81	-38,81	-77,62	-77,62	-	-	-	-
1,111	-30,71	-30,71	-69,01	-69,01	-	-	-	-
1,222	-23,53	-23,53	-60,39	-60,39	-	-	-	-
1,333	-17,27	-17,27	-51,78	-51,78	-	-	-	-
1,444	-12,04	-12,04	-43,16	-43,16	-	-	-	-
1,556	-7,69	-7,69	-34,47	-34,47	-	-	-	-
1,667	-4,30	-4,30	-25,85	-25,85	-	-	-	-
1,778	-1,95	-1,95	-17,23	-17,23	-	-	-	-
1,889	-0,52	-0,52	-8,62	-8,62	-	-	-	-
2,000	0,00	0,00	0,00	0,00	-	-	-	-



Reactions extremes

Reactions extremes basic design (ULS)	
x [m]	Reaction
0,000	Max R_z = 155,25kN - G1+G2
0,000	Min R_z = 155,25kN - G1+G2
0,000	Max RO_x = 155,25kNm - G1+G2
0,000	Min RO_x = 155,25kNm - G1+G2

Longitudinal reinf.

Bar type	Beginning [m]	End [m]	Cover [mm]	Profile [mm]	Count
Upper	0,000	2,000	26,0	16	5
Bottom	0,000	2,000	26,0	16	4

Reinforcement in compression not considered.

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Shear reinf.

Sector no.: 1, (0,00m - 2,00m)
not set in the sector

Minimum cover

Structural class: S4
c_{min} = max($c_{min,b}$; $c_{min,dur}$; 10) = max(0; 10; 10) = 10 mm
c_{nom} = c_{min} + Δc_{dev} + $\varnothing_s$ = 10 + 10 + 0 = 20 mm

1.2 Check of ultimate limit state

Ultimate limit state is checked for envelope of extreme loads

Bent-up bar

Reinforcement in compression not considered; moment reduction - no; shear effect considered

Check of bar spacings

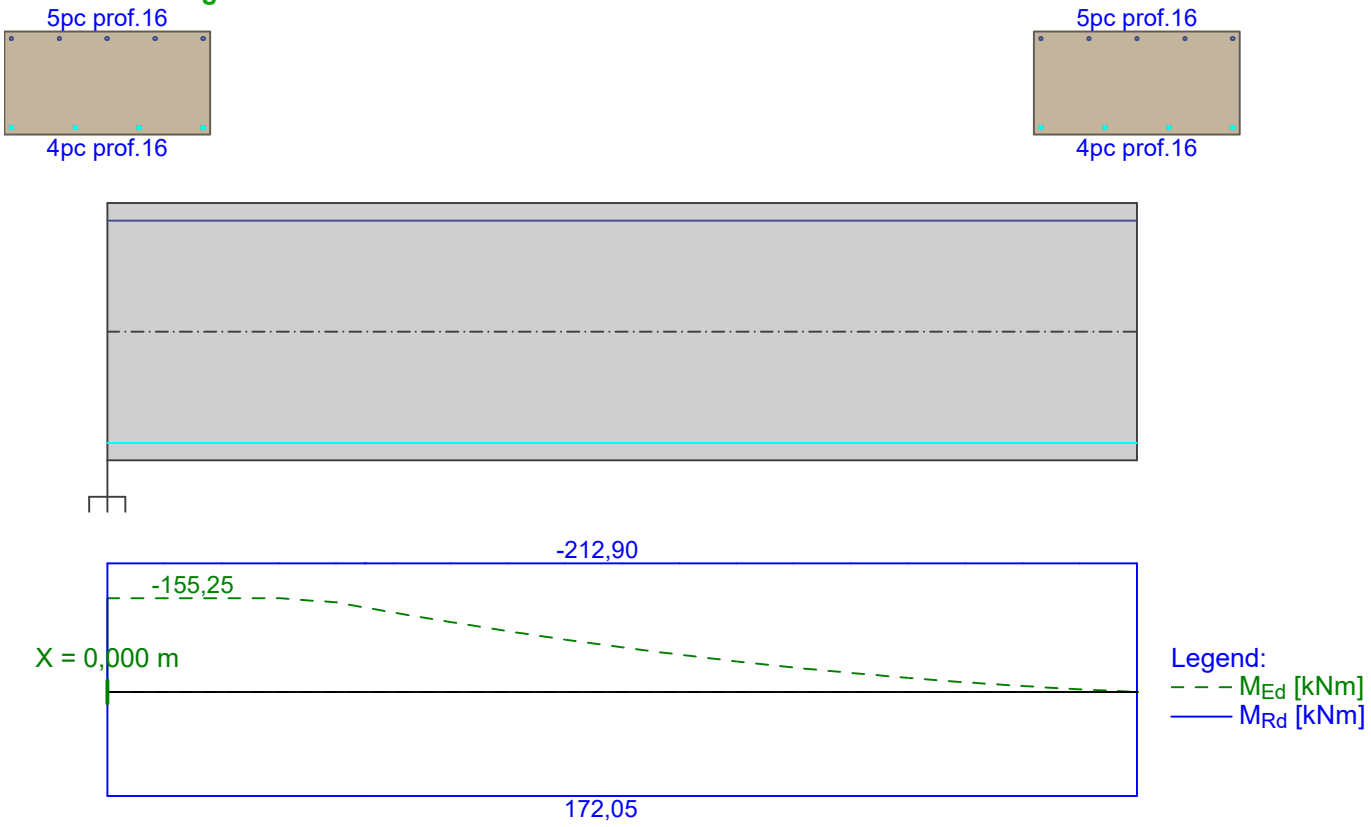
Bar spacing pass.

Check of min and max reinforcement level

Beam (reinforcement in tension - min, total reinforcement - max):
$\rho_{s,t}$ = 0,00216 ≥ $\rho_{s,min}$ = 0,00151 □ **Pass**
ρ_s = 0,00362 ≤ $\rho_{s,max}$ = 0,04 □ **Pass**

Critical cut at point x = 0,000m
M_{Ed} = -155,25kNm ≤ M_{Rd} = -212,90kNm □ Pass

Member bending PASS

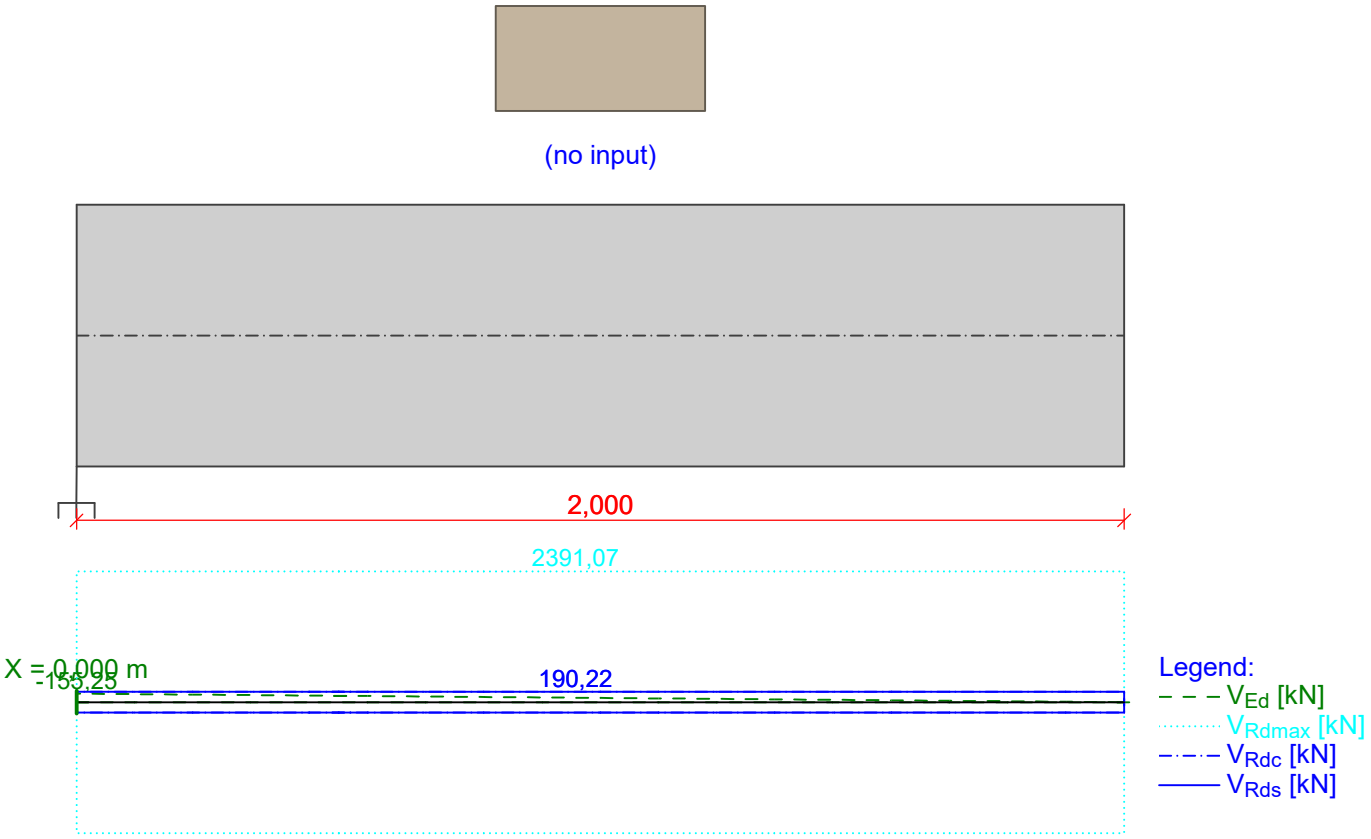


Shear

Member type: beam
Critical cut at point x = 0,000m
V_{Ed} = 155,25kN ≤ V_{Rd} = 190,22kN □ Pass

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Member shear PASS



Anchorage

End adjustment of bars - Straight bar

Type	profile	Beginning		End		Eff. length	Total length
		σ_{sd}	l_{bd}	σ_{sd}	l_{bd}		
	[mm]	[MPa]	[m]	[MPa]	[m]	[m]	[m]
Upper	16	434,78	0,751	434,78	0,751	2,000	3,501
Bottom	16	41,16	0,160	434,78	0,525	1,500	2,185

Ultimate limit state PASS

1.3 Check of serviceability limit state

No service loads are set.

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