

PRILOGA 1B

NASLOVNA STRAN NAČRTA

OSNOVNI PODATKI O GRADNJI

naziv gradnje	Ureditev nogometnega igrišča z umetno travo in dveh odbojgarskih igrišč na mivki v ŠC Žalec
kratak opis gradnje	Na območju ŠC Žalec se na novem nog. in odbojgarskem igrišču namestijo luči na kandelabrih. Zanje se izvedejo točkovni temelji.

Seznam objektov, ureditev površin in komunalnih naprav z navedbo vrste gradnje.

vrste gradnje	<input checked="" type="checkbox"/> novogradnja - novozgrajen objekt
Označiti vse ustrezne vrste gradnje	<input type="checkbox"/> novogradnja - prizidava
	<input type="checkbox"/> rekonstrukcija
	<input type="checkbox"/> sprememba namembnosti
	<input type="checkbox"/> odstranitev

DOKUMENTACIJA

vrsta dokumentacije	PZI
(IZP, DGD, PZI, PID)	
številka projekta	UP-002/2023
	<input type="checkbox"/> sprememba dokumentacije

PODATKI O NAČRTU

strokovno področje načrta	2 NAČRT S PODROČJA GRADBENIŠTVA
številka načrta	370/23
datum izdelave	MAJ 2023

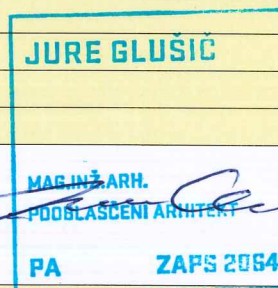
PODATKI O IZDELOVALCU NAČRTA

ime in priimek pooblaščenega arhitekta, pooblaščenega inženirja	Kristian Krejči u.d.l.g
identifikacijska številka	IZS G-1889
podpis pooblaščenega arhitekta, pooblaščenega inženirja	



PODATKI O PROJEKTANTU

projektant (naziv družbe)	UNI PROJEKT d.o.o.
naslov	Savinjska cesta 117, 3313 Polzela
vodja projekta	Jure Glušič, mag.inž.arh.
identifikacijska številka	ZAPS 2064 PA
podpis vodje projekta	
odgovorna oseba projektanta	mag. Jože Grobelnik, inž. grad.
podpis odgovorne osebe projektanta	



SPLOŠNO O OBJEKTU

TEMELJ KANDELABRA ZA LUČI

V projektu je obdelan temeljenje kandelabrov za luči obšportnem igrišču.

Pridobljeni so podatki o kandelabrih, višine 12 m in 9.8 m. Dodano imajo še sidrno ploščo 300 x 300 mm z po štirimi sidri M18 dolžine 1000 mm KV 8.8

Določiti je potrebno točkovni temelj. Točkovni temelj je 150 x 150 x 60 cm.

Nastavek 80 x 80 x 50 cm. Spodnja kota temelja je -120 cm.

Armatura v peti temelja: spodaj v obeh smereh fi 14 / 20 cm in zgoraj fi 12/20 cm v obeh smereh

V nastavku temelja: po stranici oboda 3 fi 14. Z vogalno armaturo 1 fi 14. stremena fi 10 /15 cm

MATERIAL KONSTRUKCIJE

Beton c25/30 armatura B500

Debelina zaščitnega sloja betona vseh armiranobetonskih elementov, ki so v stiku z vodo ali zemljo je 3,00 cm.

3.6 STATIČNI RAČUN

ANALIZA VPLIVOV

Obremenitve – vplivi na objekt so določene z upoštevanjem veljavnih predpisov (Evrokod-ov)

Stalna in koristna obtežba

Streha kritina nad vsemi objekti in nadstrešnico

Teža kandelabra z lučmi

strop + instalacije	3,00 KN
skupaj	3,00 KN

OBTEŽBA VETRA

OSNOVNE VREDNOSTI OBTEŽBE VETRA

Temeljna osnovna hitrost vetra $V_{b,0} = 20,0000 \text{ m/s}$

$C_{dir} = 1,0$ $C_{sesaon} = 1,0$

Osnovna hitrost vetra je tako $V_b = 20,0 \text{ m/s}$

Višina nad tlemi $Z_e = 12,0 \text{ m}$

Kategorija terena $k_t = 2$

$z_0 = 0,0500$

$z_{min} = 2,0000$

faktor terena $k_r = 0,1900$

$C_r(z) = 0,7779$

Srednja hitrost vetra je $v_m(z) = 15,55 \text{ m/s}$

Vetrna turbolenca $I_v(z) = 0,24$

Tlak pri največjih sunkih vetra $q_p(z) = 0,41 \text{ KN/m}^2$

Osnovni tlak $q_b = 0,25 \text{ KN/m}^2$

PRITISK VETRA NA CILINDRE KANDELABRE

$Re = b \times V(z) / \eta_i = 0,17 \times 15,55 / 1,5 \cdot 10^{-6} = 1,76 \cdot 10^6$

$b =$ širina prereza v smeri vetra: $= 0,17 \text{ m}$

$v(z) =$ srednja hitrost vetra $= 15,55 \text{ m/s}$

$\eta_i =$ kinematična viskoznost zraka $= 1,5 \cdot 10^{-6} \text{ m}^2/\text{s}$

$C_{pe} = C_{p0} \cdot \Psi_{SI} \lambda_{\alpha} = 1 \cdot 1 = 1,00$

$C_{p0} = 1$

$\Psi_{SI} \lambda_{\alpha} = 1$

Pri kotu $\alpha = 0$ $C_{p0} = 1$

$C_{pe} = 1,0$

$w_e = C_{pe} \cdot q_p(Z)$ $w_e = 0,41 \text{ kN/m}^2$

Ker je kandelaber fi 0.17m je sila na plašč $0,41 \text{ KN/m}^2 \times 0,17 \text{ m} = 0,070 \text{ KN/m}$

OSNOVNE VREDNOSTI OBTEŽBE VETRA

Osnovna hitrost vetra:

Temeljna osnovna hitrost vetra	$V_{b,0}=$	20,0000	m/s
	$C_{dir}=$	1,0000	
	$C_{sesaon}=$	1,0000	

Osnovna hitrost vetra je tako $V_b=$ 20,0000 m/s

Srednji veter

Višina nad tlemi	$Z_e =$	12,0000	m
Kategorija terena	$kat =$	3	
	$z_0=$	0,3000	
	$z_{min}=$	5,0000	
faktor terena	$k_r=$	0,2154	
	$Cr(z)=$	0,7945	

Srednja hitrost vetra je $vm(z)=$ 15,8909 m/s

Vetrna turbolenca

$I_v(z)=$ 0,2711

Tlak pri največjih sunkih vetra

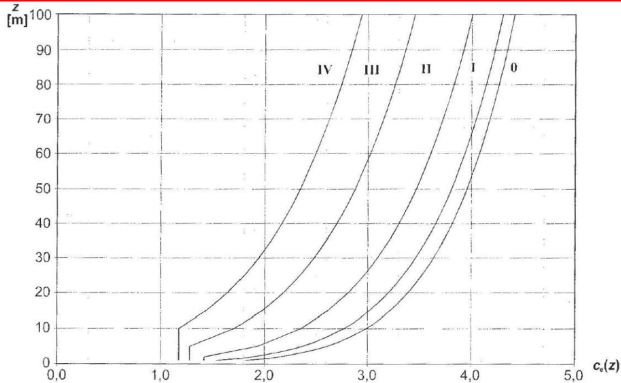
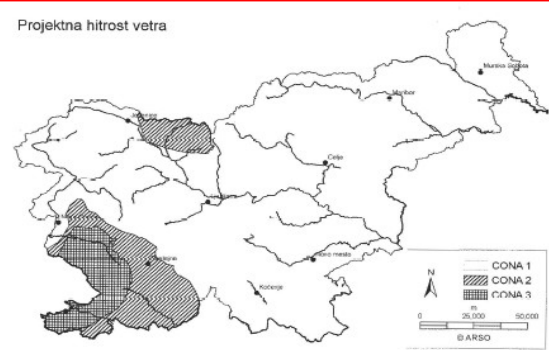
$qp(z)=$ 0,4573 kN/m2

Osnovni tlak

$qb=$ 0,2500 kN/m2

Faktor izpostavljenosti

$C_e(z)=$ 1,8293



Preglednica 4.1: Kategorije terena in terenski parametri

Kategorija terena	z_0 m	z_{min} m
0 Morsko ali obalno področje, izpostavljeno proti odprtemu morju	0,003	1
I Jezersko ali ravninsko področje z zanemarljivim rastlinjem in brez ovir	0,01	1
II Področje z nizkim rastlinjem (trava) in posameznimi ovirami (drevesi, stavbami) na razdalji najmanj 20 višin ovir	0,05	2
III Področja z običajnim rastlinjem ali stavbami ali s posameznimi ovirami na razdalji največ 20 višin ovir (vasi, podeželsko okolje, stalni gozd)	0,3	5
IV Področje, kjer je najmanj 15 % površine pokrite s stavbami s povprečno višino več kot 15 m	1,0	10

OPOMBA: Kategorije terena so ilustrirane v A.1.

Osnovni podatki o modelu

Datoteka: KANDELAVER.twp
Datum preračuna: 18.5.2023

Način preračuna: 2D model (Xp, Zp, Yr)

- | | | |
|---|---|---------------------------------------|
| <input checked="" type="checkbox"/> Teorija I-ga reda | <input type="checkbox"/> Modalna analiza | <input type="checkbox"/> Stabilnost |
| <input type="checkbox"/> Teorija II-ga reda | <input type="checkbox"/> Seizmični preračun | <input type="checkbox"/> Faze gradnje |
| <input type="checkbox"/> Nelinearen preračun | | |

Velikost modela

Število vozlišč:	5
Število ploskovnih elementov:	0
Število grednih elementov	4
Število robnih elementov	6
Število osnovnih obtežnih primerov:	2
Število kombinacij obtežb:	4

Enote mer

Dolžina:	m [cm,mm]
Sila:	kN
Temperatura:	Celsius

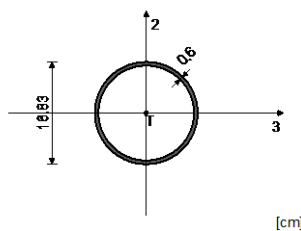
Vhodni podatki - Konstrukcija

Tabele materialov

No	Naziv materiala	E[kN/m ²]	μ	γ [kN/m ³]	α_t [1/C]	Em[kN/m ²]	μ_m
1	Jeklo	2.100e+8	0.30	78.50	1.000e-5	2.100e+8	0.30

Seti gred

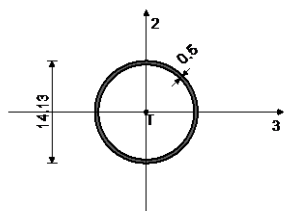
Set: 1 Prerez: D= 168.3x6, Fiktivna ekscentričnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
1 - Jeklo	3.059e-3	1.529e-3	1.529e-3	2.016e-5	1.009e-5	1.009e-5

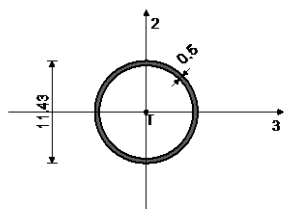
Set: 2 Prerez: D= 141.3x5, Fiktivna ekscentričnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
1 - Jeklo	2.141e-3	1.070e-3	1.070e-3	9.952e-6	4.979e-6	4.979e-6

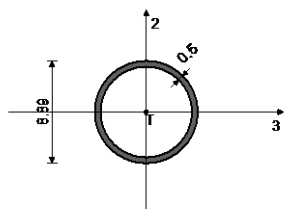
Set: 3 Prerez: D= 114.3x5, Fiktivna ekscentričnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
1 - Jeklo	1.717e-3	8.580e-4	8.580e-4	5.136e-6	2.569e-6	2.569e-6

Set: 4 Prerez: D= 88.9x5, Fiktivna ekscentričnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
1 - Jeklo	1.318e-3	6.586e-4	6.586e-4	2.326e-6	1.164e-6	1.164e-6

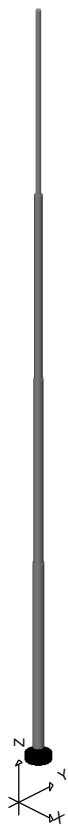
Seti točkovnih podpor

Set	K,R1	K,R2	K,R3	K,M1	K,M2	K,M3
1	1.000e+10	1.000e+10	1.000e+10	1.000e+10	1.000e+10	1.000e+10

Konture točkovnih podpor

Vozlišča	Set
1	1

Izometrija



Vhodni podatki - Obtežba

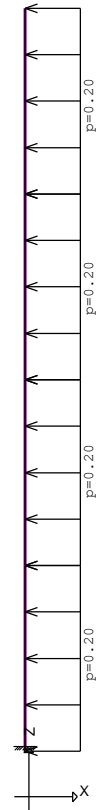
Lista obtežnih primerov

LC	Naziv	pX [kN]	pY [kN]	pZ [kN]
1	LASTNA TEŽA (g)	0.00	0.00	-2.94
2	VETER	-2.40	0.00	0.00
3	Komb.: 1.35xI+1.5xII	-3.60	0.00	-3.97
4	Komb.: I+1.5xII	-3.60	0.00	-2.94
5	Komb.: 1.35xI	0.00	0.00	-3.97
6	Komb.: I	0.00	0.00	-2.94

Obt. 1: LASTNA TEŽA (g)



Obt. 2: VETER



REAKCIJE NA TEMELJ

Obt. 1: LASTNA TEŽA (g)

2.94 (R3)

Reakcije podpor

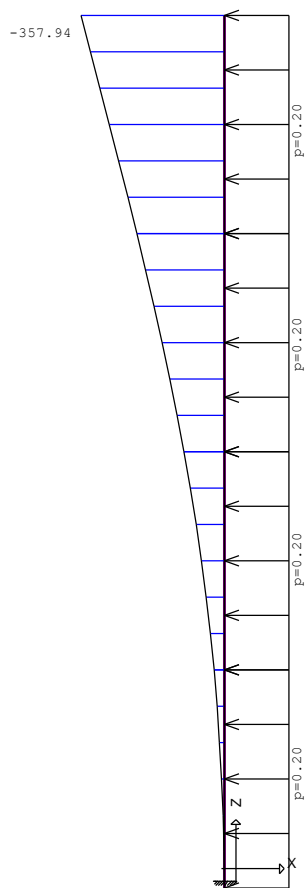
Obt. 2: VETER

2.40 (R1)
4.40 (M2)

Reakcije podpor

POMIKI KONSTRUKCIJE

Obt. 2: VETER



Vplivi v gredi: max $X_p = -0.00$ / min $X_p = -357.94$ m / 1000

Merodajna obtežba - EC 2 (EN 1992-1-1:2004)

Obtežni primeri

- I LASTNA TEŽA (g) - <Stalna>(dolgotrajno)
- II VETER - <Veter>(kratkotrajno)

Materialni koeficienti varnosti

[SP] Stalne in prehodne kombinacije: $\gamma_C = 1.50$, $\gamma_S = 1.15$

[SE] Seizmične kombinacije: $\gamma_C = 1.50$, $\gamma_S = 1.15$

[IN] Nezgodne kombinacije: $\gamma_C = 1.20$, $\gamma_S = 1.00$

Kombinacije obtežb iz sheme kombinacij

- 1. [SP] $1.35 \times I + 1.50 \times II$
- 2. [SP] $I + 1.50 \times II$
- 3. [SP] $1.35 \times I$
- 4. [SP] I

Uporabniško določene kombinacije obtežb

- 1. [SP] $1.35 \times I + 1.50 \times II$
- 2. [SP] $I + 1.50 \times II$
- 3. [SP] $1.35 \times I$
- 4. [SP] I

Kombinacije za preračun razpok in upogiba

(karakteristične kombinacije - dolgotrajno)

- 1. I
- 2. I

(karakteristične kombinacije - kratkotrajno)

- 1. II
- 2. ---

Kombinacije za preračun razpok in upogiba

(pogoste kombinacije - dolgotrajno)

- 1. I
- 2. I

(pogoste kombinacije - kratkotrajno)

- 1. $0.20 \times II$
- 2. ---

Kombinacije za preračun razpok in upogiba

(kvazi-stalne kombinacije - dolgotrajno)

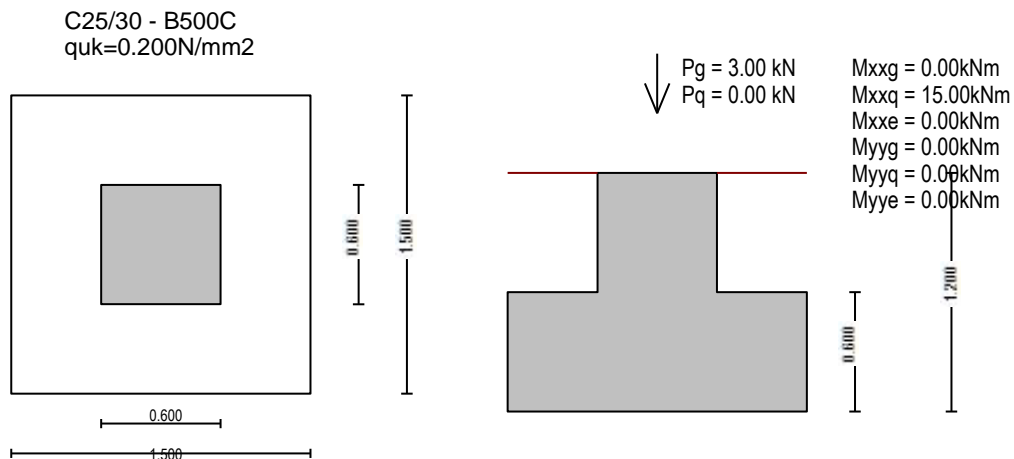
- 1. I

(kvazi-stalne kombinacije - kratkotrajno)

- 1. ---

PRIMERI RAZNI**1. KANDELABER TEMELJ****Symmetric footing with eccentric load**

(EC2 EN1992-1-1:2004, EC0 EN1990:2002, EC7 EN1997-1-1:2004, +SIST EN)

**Reinforced concrete design**

Concrete-Steel class: C25/30-B500C

(EC2 §3)

Environmental class : XC1

(EC2 §4.4.1)

Concrete cover : Cnom=50 mm

(EC2 §4.4.1)

Concrete weight : 25.0 kN/m³ $\gamma_c = 1.50$, $\gamma_s = 1.15$

(EC2 Table 2.1N)

 $f_{cd} = \alpha_{cc} \cdot f_{ck} / \gamma_c = 1.00 \times 25 / 1.50 = 16.67 \text{ MPa}$

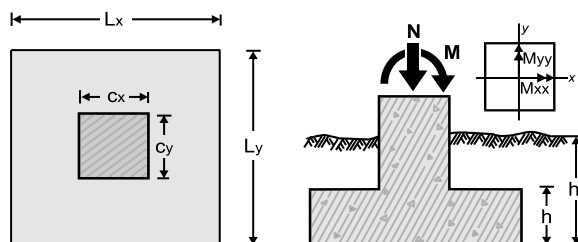
(EC2 §3.1.6)

 $f_{ctd} = \alpha_{ct} \cdot f_{ctk0.05} / \gamma_c = 1.00 \times 1.8 / 1.50 = 1.20 \text{ MPa}$

(EC2 §3.1.6)

 $f_{yd} = f_{yk} / \gamma_s = 500 / 1.15 = 435 \text{ MPa}$

(EC2 §3.2.7)

Modulus of elasticity of concrete $E_{cm} = 31.0 \text{ GPa}$ **2. Dimensions, materials, loads****Dimensions**Footing $L_x = 1.500 \text{ m}$ $L_y = 1.500 \text{ m}$ Column $c_x = 0.600 \text{ m}$ $c_y = 0.600 \text{ m}$ Height of footing $h = 0.600 \text{ m}$ Depth of footing $h_f = 1.200 \text{ m}$ Base area of footing $A_f = 2.25 \text{ m}^2$ Volume of footing $V_f = 1.57 \text{ m}^3$ **Materials of footing**

Concrete-Steel class: C25/30-B500C

(EC2 §3)

Concrete cover: Cnom=50 mm

(EC2 §4.4.1)

Effective depth of cross section $d = h - d_1$, $d_1 = C_{nom} +$ $A (3/2) = 50 + 3 \times 14 / 2 = 71 \text{ mm}$, $d = 600 - 71 = 529 \text{ mm}$ **Soil**Soil bearing pressure $q_{uk} = 0.200 \text{ N/mm}^2$ Unit weight of soil $\gamma = 20.000 \text{ kN/m}^3$

Loads

		permanent variable	
Self weight	kN	1.57x25.00	39.25
Soil weight	kN	(2.25x1.20-1.57)x20.00	22.60
Vertical load	kN	3.00	0.00
Moment Mxx	kNm	0.00	15.00
Moment Myy	kNm	0.00	0.00

3. Eurocode parametersCheck of soil bearing capacity

(EC7 EN1997-1-1:2004, §6)

Partial factors for actions and soil properties

(EC7 Tab. A.1-A.4, EC8-5 §3.1)

Equilibrium limit state (EQU), Structural limit state (STR), Geotechnical limit state (GEO)

		(EQU) (STR/GEO)	
		(A1+M1)	
Actions	Permanent Unfavorable	γ_{Gdst}	1.10 1.35
	Permanent Favorable	γ_{Gstb}	0.90 1.00
	Variable Unfavorable	γ_{Qdst}	1.50 1.50
	Variable Favorable	γ_{Qstb}	0.00 0.00
Soil parameters	Angle of shearing resistance	γ_{ϕ}	1.25 1.00
	Effective cohesion	γ_c	1.25 1.00
	Undrained shear strength	γ_{cu}	1.40 1.00
	Unconfined strength	γ_{qu}	1.40 1.00
	Weight density	γ_w	1.00 1.00

 $\gamma_{R,v}(R2)=1.40$, $\gamma_{R,h}(R2)=1.10$, $\gamma_{R,e}(R2)=1.40$ Partial safety factors for actions : $\gamma_G=1.35$, $\gamma_Q=1.50$

(EC0 Annex A1)

Combination of accidental actions : (EC7) $\psi_2 = 0.30$ Combination of accidental actions : (EC2) $\psi_2 = 0.30$ Design of reinforced concrete

(EC2 EN1992-1-1:2004)

4. Check of soil bearing capacity

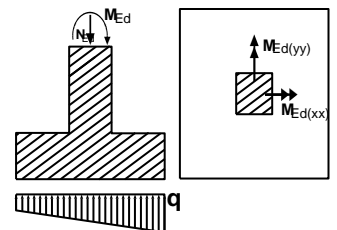
(EC7 EN1997-1-1:2004, §6)

4.1. (EQU), 1.10xPermanent + 1.50xVariable

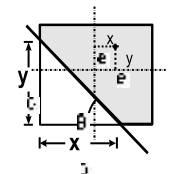
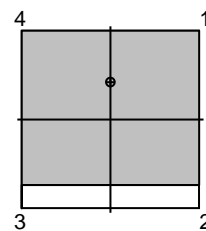
(EC7 §2.4.7.2)

Design Loads

Ned = 1.10x 64.85+1.50x 0.00= 71.33 kN
 Medxx= 1.10x 0.00+1.50x 15.00= 22.50 kNm

Eccentricities, soil pressures, footing area

relative eccentricity $e_x/L_x = M_{yy}/(N \cdot L_x) = 0.000$
 relative eccentricity $e_y/L_y = M_{xx}/(N \cdot L_y) = 0.210$
 soil pressure $q_1 = 0.073 \text{ N/mm}^2$
 soil pressure $q_2 = 0.000 \text{ N/mm}^2$
 soil pressure $q_3 = 0.000 \text{ N/mm}^2$
 soil pressure $q_4 = 0.073 \text{ N/mm}^2$
 zero pressure line $y_0 = 0.20 \text{ m}$, $\theta = 0^\circ$
 effective footing area 86.91%

Check bearing resistance failure $R_d \geq V_d$

(EC7 EN1997-1-1:2004, §6.5.2)

relative load eccentricities $e_x/L_x = M_{yy}/(N \cdot L_x) = 0.000$, $e_y/L_y = M_{xx}/(N \cdot L_y) = 0.210$ relative load eccentricities ≤ 0.333

(EC7 §6.5.4)

effective design length of footing $L' = 1.500 \times (1 - 2 \times 0.000) = 1.500 \text{ m}$

(EC7 Annex D)

effective design width of footing $B' = 1.500 \times (1 - 2 \times 0.210) = 0.870 \text{ m}$ effective design area of footing $L' \cdot B' = 1.500 \times 0.870 = 1.31 \text{ m}^2$ Design bearing resistance of footing $R_d = 1000 \times 1.31 \times 0.200 / 1.40 = 187.14 \text{ kN} > V_d = 71.33 \text{ kN}$

Effective footing area 86.91% > 50.00%

(EC7 §6.5.4)

4.2. (STR/GEO A1+M1), 1.35xPermanent + 1.50xVariable

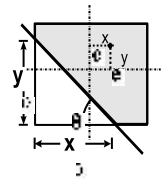
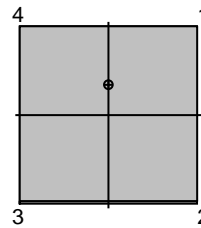
(EC7 §2.4.7.3)

Design Loads

Ned = 1.35x 64.85+1.50x 0.00= 87.55 kN
 Medxx = 1.35x 0.00+1.50x 15.00= 22.50 kNm

Eccentricities, soil pressures, footing area

relative eccentricity $e_x/L_x = M_{yy}/(N \cdot L_x) = 0.000$
 relative eccentricity $e_y/L_y = M_{xx}/(N \cdot L_y) = 0.171$
 soil pressure $q_1 = 0.079$ N/mm²
 soil pressure $q_2 = 0.000$ N/mm²
 soil pressure $q_3 = 0.000$ N/mm²
 soil pressure $q_4 = 0.079$ N/mm²
 zero pressure line $y_0 = 0.02$ m, $\theta = 0^\circ$
 effective footing area 98.60%

Check bearing resistance failure $R_d \geq V_d$

(EC7 EN1997-1-1:2004, §6.5.2)

relative load eccentricities $e_x/L_x = M_{yy}/(N \cdot L_x) = 0.000$, $e_y/L_y = M_{xx}/(N \cdot L_y) = 0.171$

relative load eccentricities ≤ 0.333

(EC7 §6.5.4)

effective design length of footing $L' = 1.500 \times (1 - 2 \times 0.000) = 1.500$ m

(EC7 Annex D)

effective design width of footing $B' = 1.500 \times (1 - 2 \times 0.171) = 0.987$ m

effective design area of footing $L' \cdot B' = 1.500 \times 0.987 = 1.48$ m²

Design bearing resistance of footing $R_d = 1000 \times 1.48 \times 0.200 / 1.40 = 211.43$ kN > $V_d = 87.55$ kN

Effective footing area 98.60% > 50.00%

(EC7 §6.5.4)

5. Internal actions for reinforced concrete design

Moments M and shearing forces V, are computed at column faces.

Shearing forces V^* are computed at distance $d = 0.529$ m from the column face.

They are computed, by numerical integration of the soil pressure under the footing.

5.1. Loading 1.35xPermanent + 1.50xVariableDesign Loads

Ned = 1.35x 64.85+1.50x 0.00= 87.55 kN
 Medxx = 1.35x 0.00+1.50x 15.00= 22.50 kNm

Eccentricities, soil pressures, footing area

relative load eccentricities $e_x/L_x = M_{yy}/(N \cdot L_x) = 0.000$, $e_y/L_y = M_{xx}/(N \cdot L_y) = 0.171$

soil pressures $q_1 = 0.079$, $q_2 = 0.000$, $q_3 = 0.000$, $q_4 = 0.079$ N/mm²

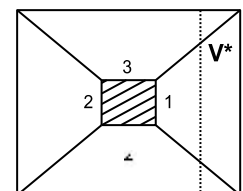
zero pressure line $y_0 = 0.02$ m, $\theta = 0^\circ$

pressure due to self weight+soil weight $q_g = 0.001 \times 1.35 \times (39.25 + 22.60) / 2.25 = 0.037$ N/mm²

Shear at critical section + (self weight+soil weight) $q \cdot A_{\text{cont}} + q_g \cdot A = 87.45$ kN

Internal actions (bending moments, shearing forces)

$M_{yy}(1) = 1.66$ kNm, $V(1) = 7.39$ kN, $V^*(1) = 0.00$ kN
 $M_{yy}(2) = 1.66$ kNm, $V(2) = 7.39$ kN, $V^*(2) = 0.00$ kN
 $M_{xx}(3) = 5.14$ kNm, $V(3) = 20.16$ kN, $V^*(3) = 0.00$ kN
 $M_{xx}(4) = 0.00$ kNm, $V(4) = 0.00$ kN, $V^*(4) = 0.00$ kN

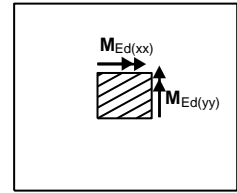


6. Design for bending

(EC2 EN1992-1-1:2004, §6.1)

Maximum design moments

Med(yy)= 1.66 kNm, b= 1500 mm, d= 529 mm
 Med(xx)= 5.14 kNm, b= 1500 mm, d= 529 mm



Med=1.66kNm, b=1500mm, d=529mm, Kd=50.24, x/d=0.00

$\epsilon_c/\epsilon_s=0.1/20.0$, $K_s=2.30$, **As= 0.07cm²**

Minimum reinforcement $As \geq 0.26bd \cdot f_{ctm}/f_{yk}$ (As= 7.15cm²/m) (EC2 §9.3.1)

Minimum reinforcement A14/215 (7.16cm²/m)

Med=5.14kNm, b=1500mm, d=529mm, Kd=28.56, x/d=0.01

$\epsilon_c/\epsilon_s=0.2/20.0$, $K_s=2.31$, **As= 0.22cm²**

Minimum reinforcement $As \geq 0.26bd \cdot f_{ctm}/f_{yk}$ (As= 7.15cm²/m) (EC2 §9.3.1)

Minimum reinforcement A14/215 (7.16cm²/m)

Reinforcement of footing

Reinforcement in x-x direction: A14/215 (7.16cm²/m) , 8A14 (12.32cm²)

Reinforcement in y-y direction: A14/215 (7.16cm²/m) , 8A14 (12.32cm²)

7. Design for shear

(EC2 EN1992-1-1:2004, §6.2)

The design for shear is covered by the design in punching shear, because the critical rupture surface is considered at angle

$$\theta=45^\circ, \tan(\theta)=1$$

8. Design for punching shear

(EC2 EN1992-1-1:2004, §6.4)

Footing cantilevers in x-x, $L_1=0.450 < d=0.529m$, $L_2=0.450 < d=0.529m$

Footing cantilevers in y-y, $L_1=0.450 < d=0.529m$, $L_2=0.450 < d=0.529m$

the width of footing cantilevers is < footing height d.

he critical rupture surface at angle 45°,

is outside the area of the footing.

The check for punching shear is satisfied

9. Anchorage of footing reinforcement

(EC2 §9.8.2.2, §8.4)

$x=h/2=0.300m$, $R=1000 \times 0.079 \times 0.300 \times 1.500=35.55$ kN

$e=0.15b=0.090m$ $z_e=0.390$ m, $z_i=0.900d=0.476m$

$F_s=R \cdot z_e/z_i=35.55 \times 0.390/0.476=29.12$ kN

$\sigma_{sd}=F_s/As=1000 \times 29.12/1232=24$ MPa

Basic required anchorage length (EC2 Eq.8.3)

$l_{b,rqd}=(A/4) (\sigma_{sd}/f_{bd})=(14/4) \times (24/2.70)=31mm$

$f_{bd}=2.25 \times 1.00 \times f_{ctd}=2.70$ MPa (EC2 §8.4.2)

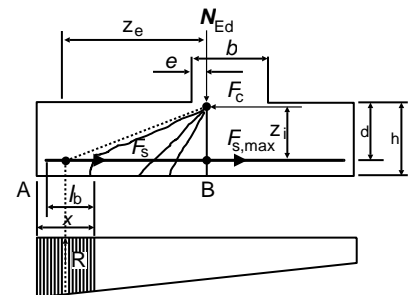
Design anchorage length (EC2 §8.4.4, T.8.2)

$l_{bd}=0.70 \times 31=22mm$, $C_{nom}=50mm > 3 \times 14=42mm$ **=(3A)**

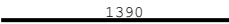
Minimum anchorage length $l_{b,min}=\max(0.30l_{b,rqd}, 10A, 100mm)=140mm$

Necessary anchorage length of longitudinal reinforcement $l_{bd}=140mm=0.140m$

$l_{bd}=140mm < (x-C_{nom})=250.00$. Sufficient length is available



10. Reinforcing bar schedule

Num	type	reinforcing bar [mm]	items	Ø	g/m [kg/m]	length [m]	weight [kg]
1	①		8	14	1.210	1.390	13.46
2	②		8	14	1.210	1.390	13.46
Total weight [kg]							26.92

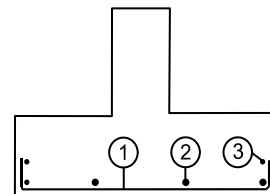
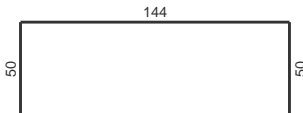
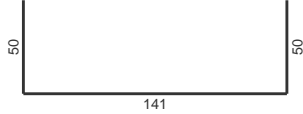
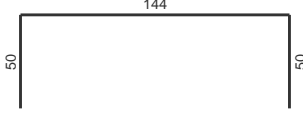
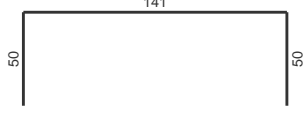
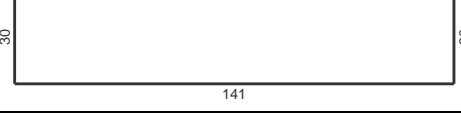
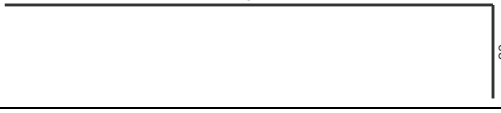


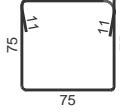


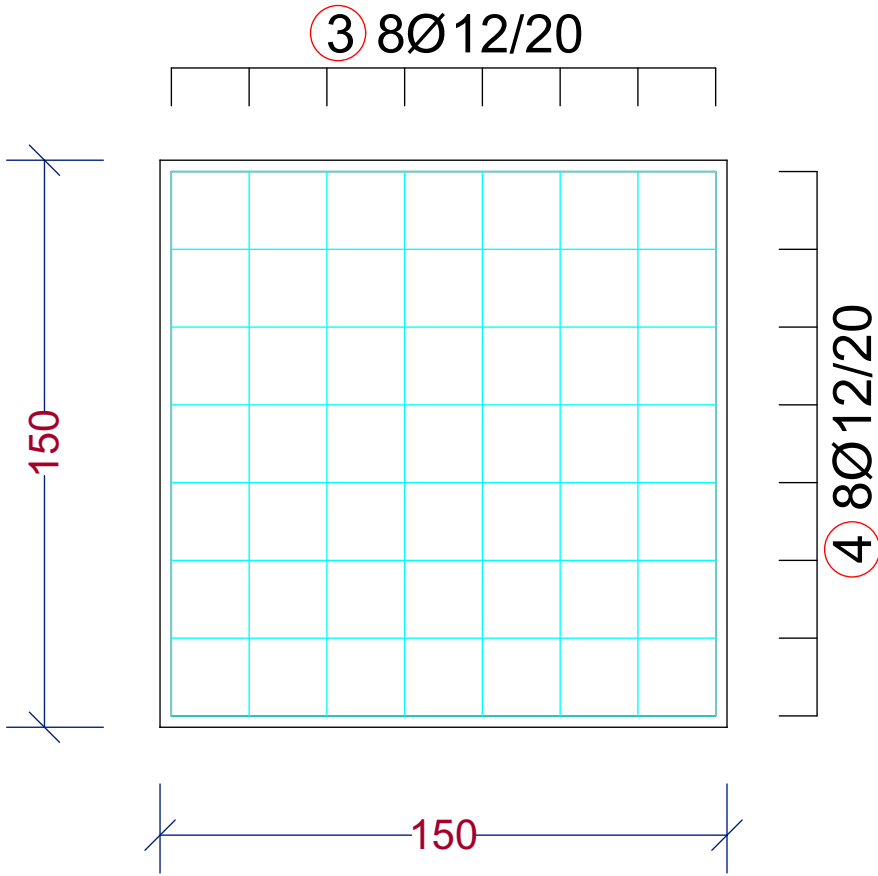
Table of contents

1. KANDELABER TEMELJ
2. Dimensions, materials, loads
3. Eurocode parameters
4. Check of soil bearing capacity
 - 4.1. (EQU), $1.10 \times \text{Permanent} + 1.50 \times \text{Variable}$
 - 4.2. (STR/GEO A1+M1), $1.35 \times \text{Permanent} + 1.50 \times \text{Variable}$
5. Internal actions for reinforced concrete design
 - 5.1. Loading $1.35 \times \text{Permanent} + 1.50 \times \text{Variable}$
6. Design for bending
7. Design for shear
8. Design for punching shear
9. Anchorage of footing reinforcement
10. Reinforcing bar schedule

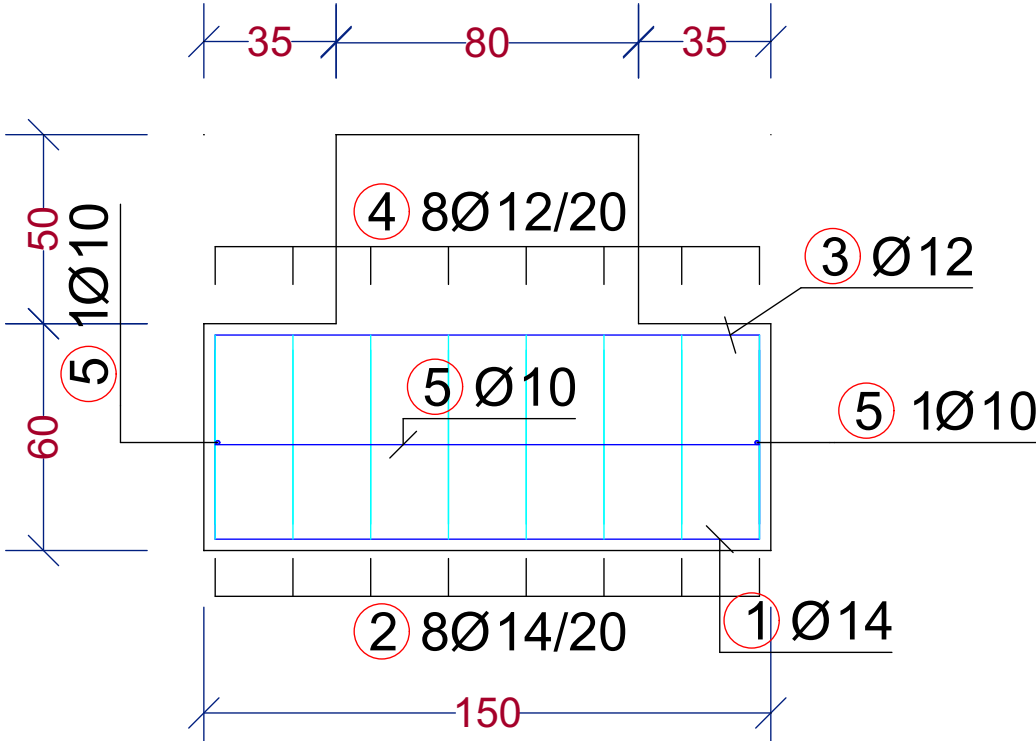
Specifikacija armature AB temelje za reflektorje						
ozn	oblika in mere (cm)	St 37-2 Ø (mm)	BSt500Ø (mm)	l (cm)	k (kom)	d (m)
temelj za razsvetljavo (10 kom.)						
1			14	244	80	195.20
2			14	241	80	192.80
3			12	244	80	195.20
4			12	241	80	192.80
5			10	201	40	80.40
6			14	125	160	200.00
7			10	133	50	66.50
8			10	131	50	65.50
9			10	397	40	158.80

Rekapitulacija armature AB temelje za reflektorje			
Ø (mm)	d (m)	kg/m'	Teža (kg)
BSt500S			
10	371.2	0.649	240.91
12	388	0.920	356.96
14	588	1.252	736.18
Skupaj			1334.05

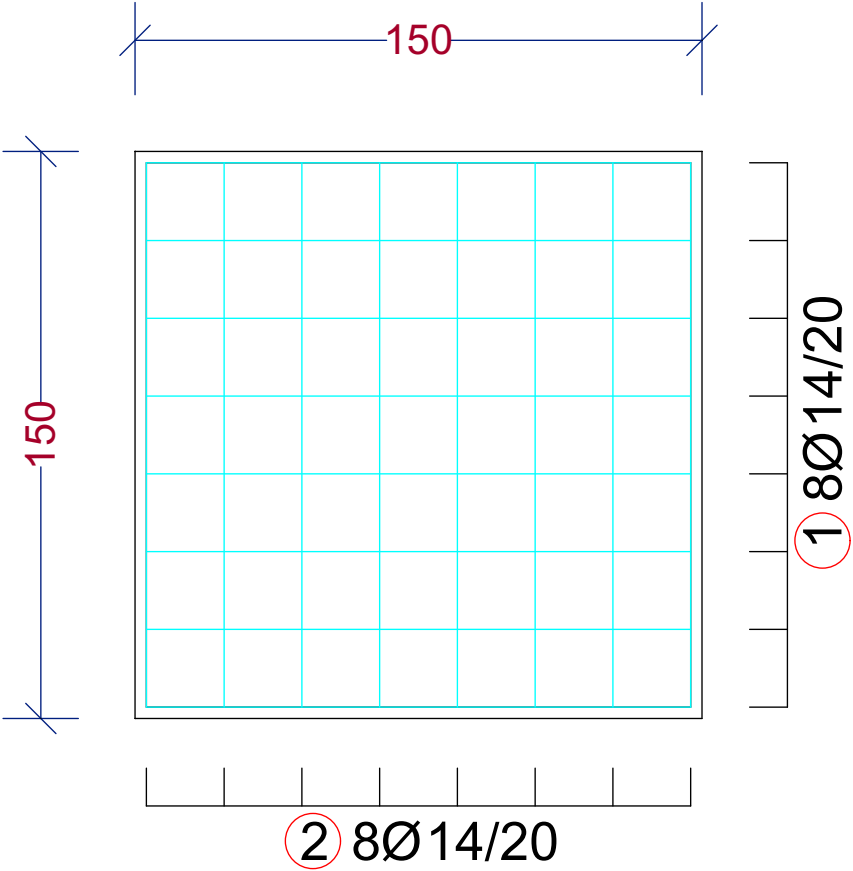
AB PETA TEMELJA
ARMATURA ZGORAJ



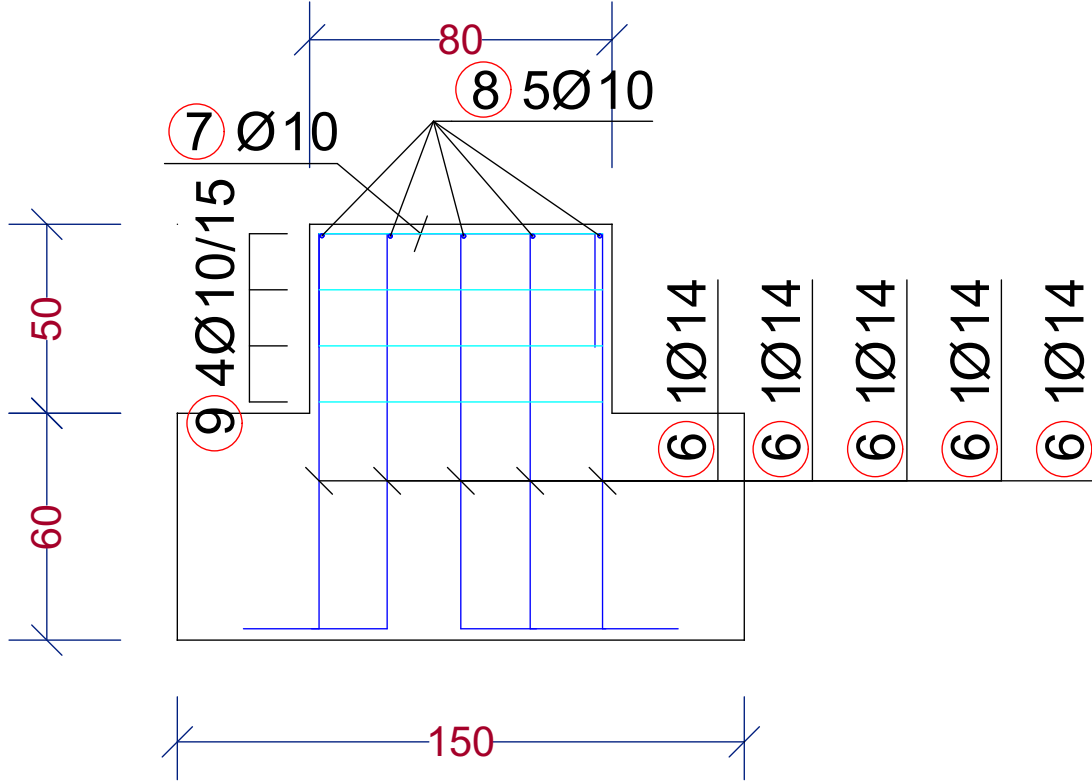
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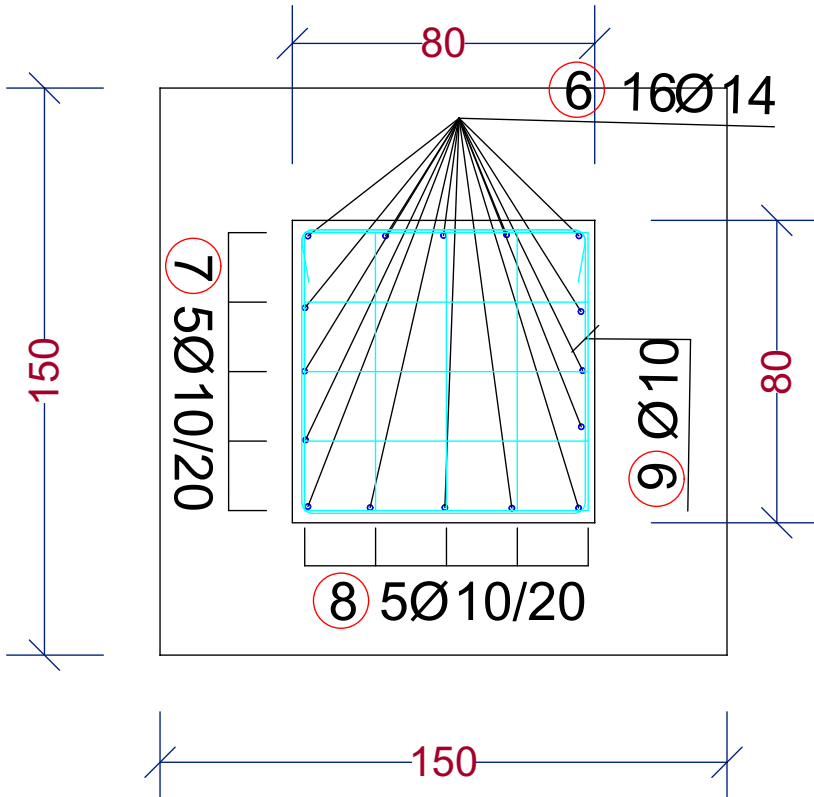
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ARMATURA SPODAJ



ARMATURA AB NASTAVKA
POGLED



ARMATURA AB NASTAVKA



OPOMBA:
VSE DIMENZJE IN VIŠINSKE NOTE JE POTREBNO PRED SAMO IZVEDBO DEL PREVERITI IN SPROTI KONTROLIRATI NA GRADBIŠČU TER UJH PRILAGODITI GLEDE NA OBSTOJEČE STANJE. V KOLIKOR SO ODSTOPANJA VEČJA, JE POTREBNO O TEM OBVESTITI PROJEKTANTA!

Projektant	G - PROFIL Kristian Krejčí s.p., Stritarjeva 5, Celje			Naročnik:	Občina Žalec Ulica Sevnjske čete 5 3310 Žalec		
	Ime in priimek	Ident. štev.	Podpis	Naziv obj.:	UREDITEV NOGOMETNEGA IGRIŠČA Z UMETNO TRAVO IN DVEH ODBOJKARSKIH IGRIŠČ NA MIVKI		
Odg.v.proj.:	J. Glušič m.i.a.	PA - ZAPS 2064					
Odg. proj.:	K. Krejčí, u.d.i.g.	IZS G-1889		Vsečina nač.:	2 - NAČRT S PODROČJA GRADBENIŠTVA		
Projektant:				Vsečina proj.:	TEME LJ ZA REFLEKTORJE	Faza:	PZ
Obdelal:				Vseb. risbe	ARMATURNI NAČRTI	Št.nač.:	1P-030301-04
Datum izd.:	Celje, maj 2023			Merilo:	M	Št.proj.:	37023
						Št.str.:	1