

1. NASLOVNA STRAN S PODATKI

ŠTEVILČNA OZNAKA NAČRTA IN
VRSTA NAČRTA

STATIČNI ELABORAT

NAROČNIK:

Mestna občina Maribor

Ulica heroja Staneta 1
2000 Maribor

NAZIV GRADNJE:

**Prenova notranjih prostorov
v objektu KPD**

VRSTA PROJEKTNE DOKUMENTACIJE:

STATIČNI ELABORAT

ZA GRADNJO:

**SPREMEMBA NAMEMBNOSTI,
manjša rekonstrukcija**

PROJEKTANT:

DIREKTOR:

**Branko Jug, dipl. inž. grad.
PI IZS G -3211**



NORMAPRO

PROJEKTIRANJE, KONSTRUIRANJE,
INŽENIRING, NADZOR, d.o.o.

Ob Dravi 3b, 2250 Ptuj

www.normapro.eu

info@normapro.eu

POOBlašČENI INŽENIR:

Branko Jug, dipl. inž. grad.

PI IZS G -3211

KRAJ IN DATUM IZDELAVE ELABORATA:

Ptuj, september 2026

ŠTEVILKA ELABORATA:

03 – 82 – K – 2026

Št. izvoda:

1 2 3 4 5

2. KAZALO VSEBINE

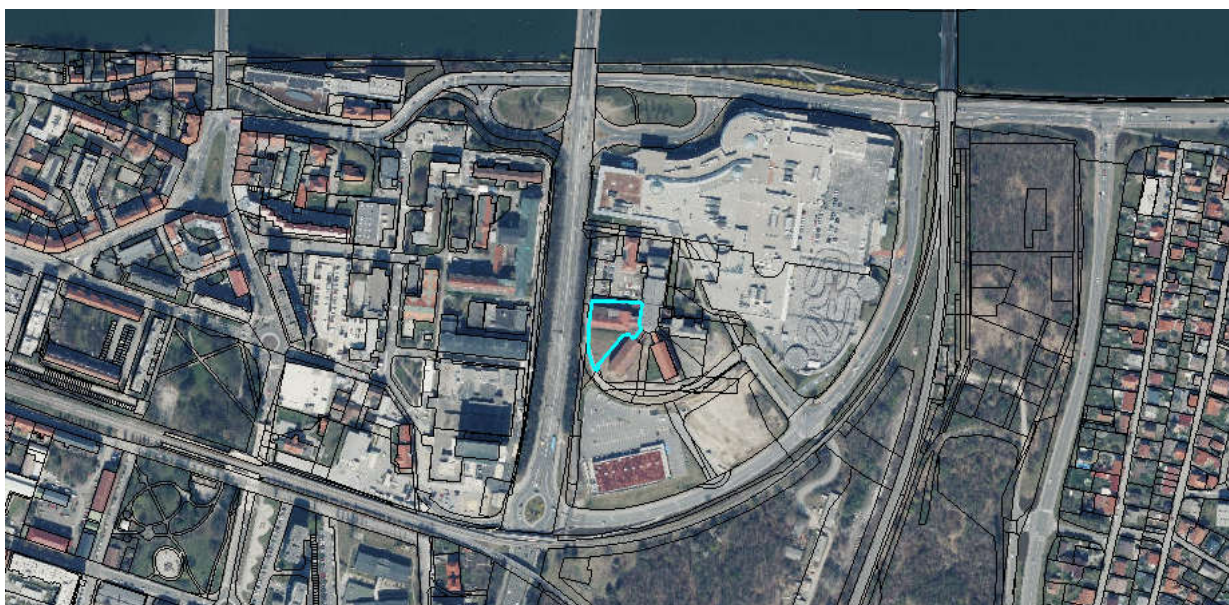
- 1 Naslovna stran
- 2 Kazalo vsebine
- 3 Tehnično poročilo
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 - 3.2 Predvideni posegi v konstrukcijo
 - 4 Kvaliteta materialov glede na konstrukcije
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 - 5.1 Priloge statičnega izračuna
 - 5.2 Priloga 20A – mnenje pooblaščenega strokovnjaka s področja gradbeništva
 - 6 Tehnični prikazi

3. TEHNIČNO POROČILO

3.1 Splošno

V skladu z naročilom Mestne občine Maribor je izdelan statični elaborat za ureditev manjših posegov pri urejanju prostorov zahodnega kraka poslovnega objekta KPD Maribor, na parc. št. 157/1, k.o. 659-Tabor. Gre za objekt etažnosti K+ME+P+1+2+M. Tlak pritličja ± 0.00 je na nadmorski višini 272,95 m. Objekt je namenjen za storitvene dejavnosti. Tlorisna zasnova objekta je razvejana. Streha je sestavljena dvokapnica.

- Lokacija: Pobreška cesta 20
- zemljišče parc. št. 157/1, k.o. 659-Tabor



3.2 Predvideni posegi v konstrukcijo:

Predmet obdelave:

- manjši preboj obstoječe kletne AB stene s pomočjo premostitvenega AB okvirja
- izvedba AB stopnišča in AB podesta pri zunanjem servisnem vhodu v objekt
- izvedba lesenih menjalnikov v paviljonu za novo, manjšo strešno okno
- izvedba jeklene nadstrešnice nad rampo pri vhodu v medetažo.

Drugi gradbeni načrti so predmet posebnega sklopa projekta (načrta)!

Statična analiza je izdelana s programsko opremo RFEM.

Elaborat je izdelan na osnovi:

- Arhitekturnih načrtov

Statični preračun zajema izključno lokalne, manjše rekonstrukcijske posege. Zaradi pomanjkanja podatkov o obstoječi konstrukciji in globalni stabilnosti celotnega objekta, globalna mehanska odpornost in stabilnost obstoječe stavbe nista bili predmet tega preračuna. Predvideni posegi so zasnovani tako, da ne vplivajo na nosilnost in stabilnost preostalega dela objekta

Uporabljeni standardi in predpisi:

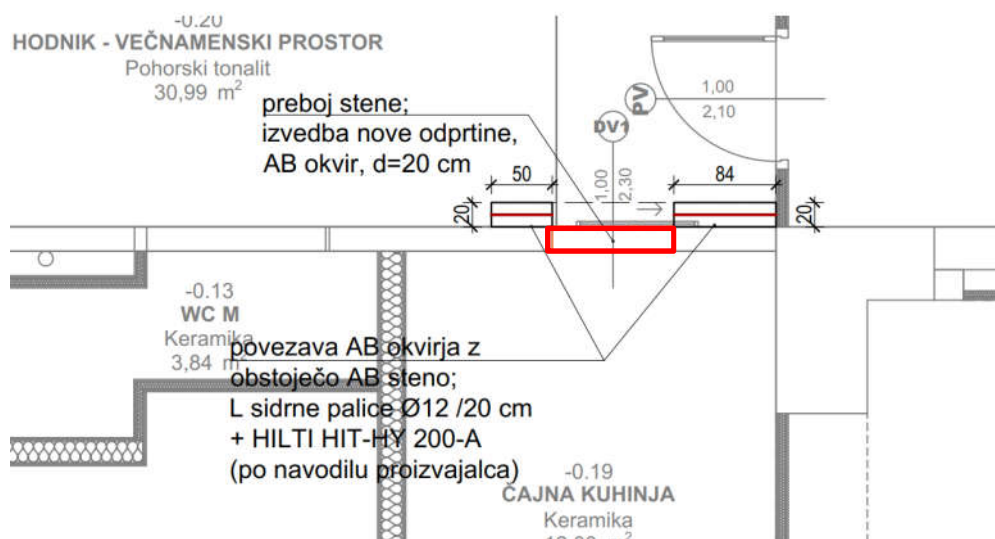
Pri izdelavi statičnega elaborata so bili uporabljeni naslednji standardi:

- Pravilnik o mehanski odpornosti in stabilnosti, Ur.l. RS št.101/11.11.2005,
- standardi SIST EN 1990 do SIST EN 1998 (EVROKODI)

-Preboj stene v kleti

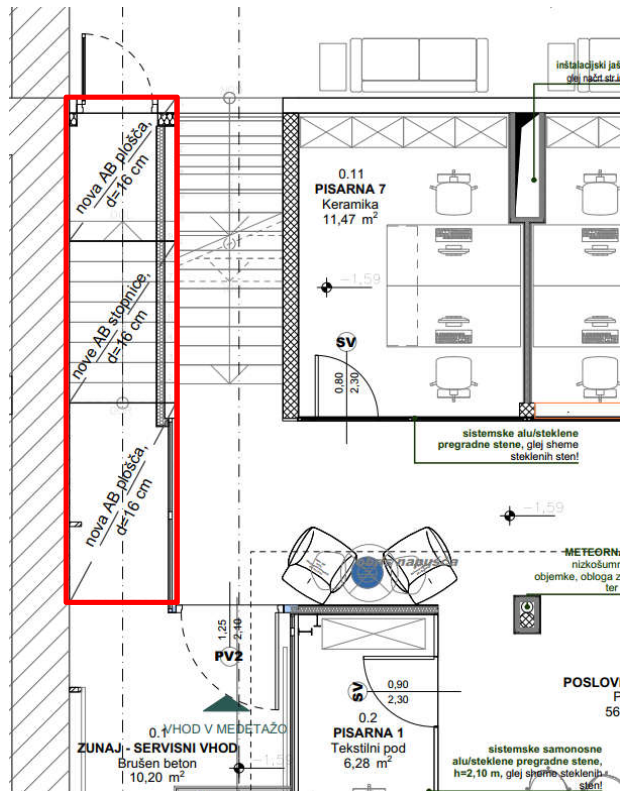
Predvidena izvedba nove odprtine v nosilno AB steno v kletnem prostoru. Debelina AB okvirja bo, $d = 20$ cm. Natančne dimenzije stebrov in preklade (AB okvirja) so podane v pozicijskem in pa armaturnem načrtu.

Pri sami izvedbi AB okvirjev in odkritju, da temeljenje ni ustrezno, se izvajalec mora posvetovati z odgovornim projektantom o jačanju temeljev ali izvedbi novih.



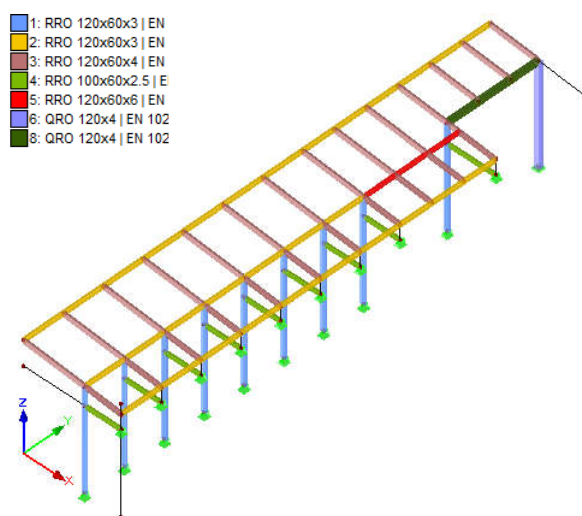
-Izvedba zunanjega dostopa, rampa/stopnišče (pritličje)

Na zunanjem servisnem vhodu se bo izvedlo AB stopnišče in podesta za dostop v medetažo. AB nosilna konstrukcija bo debeline $d=16$ cm. Nova konstrukcija se na obeh straneh vpne v obstoječo konstrukcijo s povezovalnimi palicami $\phi 16$, na rastru 25 cm. Nova konstrukcija nalega na nosilni zid, v katerega se poveže z L palicami $\phi 12$ na rastru 25 cm. Potrebna armatura je prikazana v armaturnem načrtu A.1.



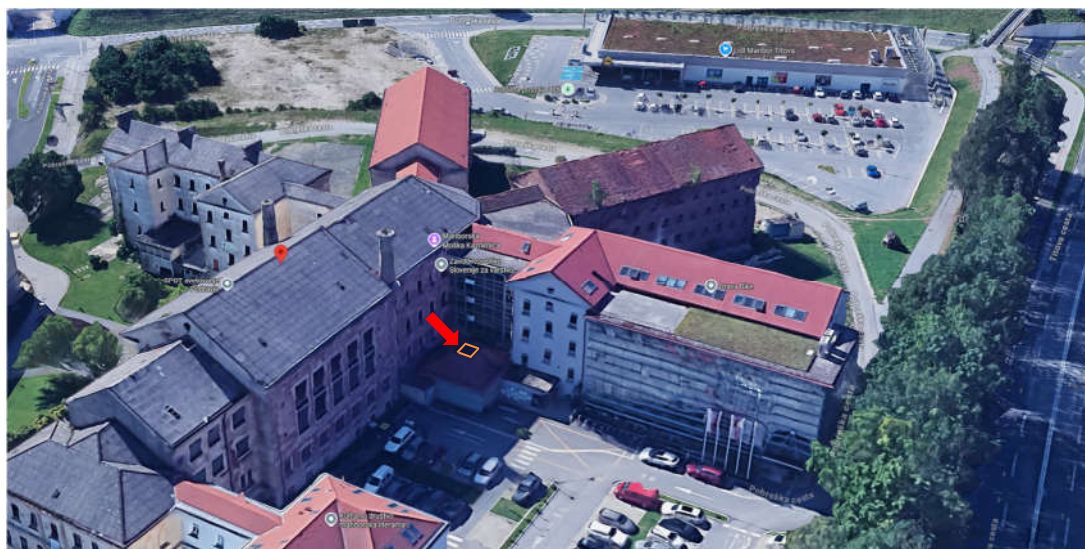
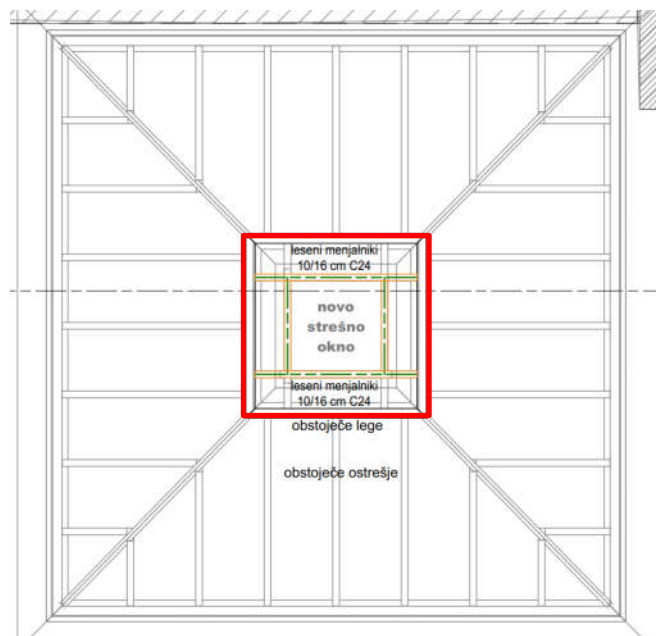
-Izvedba jeklenega nadstreška nad rampo (vhod)

Nad zunanjo obstoječo rampo se predvidi izvedba jeklene nadstrešnice. Nadstrešnica se bo vpela z jeklenimi stebri RHS 120x60x3 v obstoječi AB parapetni zid. Na koncu dela kjer se nadstrešnica prilagodi/zamakne, se uporabi močnejši steber, RHS 120x120x4 mm. Kot primarni nosilci se uporabijo jekleni nosilci RHS 120x60x3 mm, ter v določenem delu tudi RHS 120x60x6 in RHS 120x120x4 mm (glej skico). Sekundarni nosilci se bodo nosili konzolno, dimenzije RHS 120x60x4 mm in se bodo nalegali na jeklene stebre. Za stabilnost se izvedejo podporniki iz jeklenih profilov RHS100x60x2,5 mm, ki se bodo vpeli v obstoječi AB del paviljona. Za dimenzije in detajle glej pozicijske načrte.



-Izvedba menjalnika za novo strešno okno paviljona

Na strehi paviljona se bodo izvedli leseni menjalniki za novo manjše strešno okno. V primeru slabega materiala obstoječega ostrešja, ga je potrebno zamenjati z ustreznimi legami ustreznih dimenzij po statičnem izračunu. Obstoječe ostrešje ni predmet tega načrta !



4. KVALITETA MATERIALOV GLEDE NA VRSTO KONSTRUKCIJE:

- armiranobetonske konstrukcije

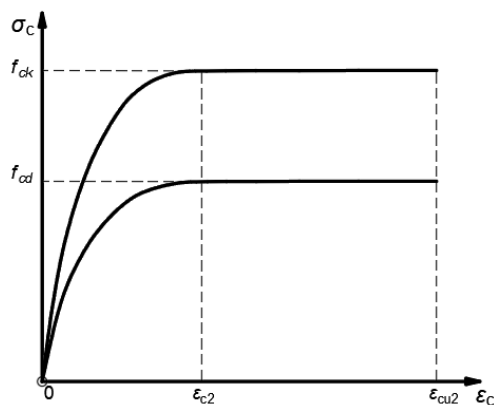
Materiali, skladni s standardom SIST EN 1992

Beton mora biti v skladu s SIST EN 206:2016, SIST EN 1026:2016, izdelava betonskih konstrukcij pa v skladu s SIST EN 13670:2010/A101:2010.

Armaturno jeklo mora biti v skladu s SIST EN 10080:2005, krivljeno v skladu s SIST EN 1992-1-1. AB konstrukcijski elementi pri izvajanju rekonstrukcijskih del so iz betona C25/30 XC1 CI0,2 D_{max}16 S4.

Beton trdnostnega razreda C25/30:

- karakteristična tlačna trdnost: $f_{ck} = 2,5 \text{ kN/cm}^2$,
- povprečna natezna trdnost: $f_{ctm} = 0,26 \text{ kN/cm}^2$,
- modul elastičnosti: $E_{cm} = 3100 \text{ kN/cm}^2$,
- Poissonov količnik: $\nu = 0,2$,
- Prostorninska teža (z upoštevanjem armature): $\gamma = 25 \text{ kN/m}^3$.

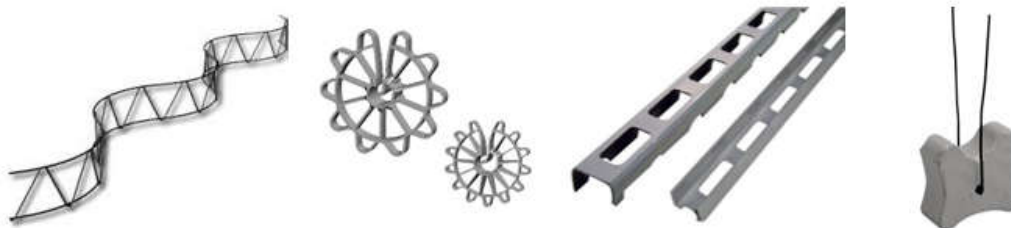


V nadaljevanju podajamo trdnostne in mehanske lastnosti jekla za armiranje, ki jih upoštevamo v analizi in so skladne standardom SIST EN 1992- 1-1:2005.

- karakteristična meja elastičnosti: $f_{yk} = 50 \text{ kN/cm}^2$,
- natezna trdnost: $f_t = f_{yk} = 50 \text{ kN/cm}^2$,
- modul elastičnosti: $E_s = 20000 \text{ kN/cm}^2$,
- Prostorninska teža: $\rho_s = 78,50 \text{ kN/m}^3$.



Za zagotavljanja ustreznega zaščitnega betonskega sloja armaturi so za vgradnjo predvideni tipski distančniki v obliki distančnih kač, trakov in objemk (niso zajeti v masi armature).



- lesene konstrukcije

Materiali, skladni s standardom SIST EN 1995

Nosilna lesena konstrukcija je izdelana iz lesa C24 (II. razred uporabnosti).

V nadaljevanju podajamo trdnostne in mehanske lastnosti uporabljenega lesa, ki jih upoštevamo v analizi in so skladne s standardom SIST EN 1995-1-1:2005.

Les kvalitete C24:

- | | |
|--|--|
| • upogibna trdnost: | $f_{m,k} = 24 \text{ N/mm}^2$, |
| • natezna trdnost, vzporedno: | $f_{t,0,k} = 14 \text{ N/mm}^2$, |
| • natezna trdnost, pravokotno: | $f_{t,90,k} = 0,4 \text{ N/mm}^2$, |
| • tlačna trdnost, vzporedno: | $f_{c,0,k} = 21 \text{ N/mm}^2$, |
| • tlačna trdnost, pravokotno: | $f_{c,90,k} = 2,5 \text{ N/mm}^2$, |
| • strižna trdnost: | $f_{v,k} = 4,0 \text{ N/mm}^2$, |
| | |
| • povprečni modul elastičnosti, vzporedno | $E_{0,mean} = 11 \text{ kN/mm}^2$, |
| • povprečni modul elastičnosti, pravokotno | $E_{90,mean} = 0,37 \text{ kN/mm}^2$, |
| • povprečni strižni modul | $G_{mean} = 0,69 \text{ kN/mm}^2$ |
| | |
| • karakteristična gostota | $\rho_k = 350 \text{ kg/m}^3$. |

- jeklene konstrukcije

Materiali, skladni s standardom SIST EN 1993

Nosilna jeklena konstrukcija je izdelana iz jekla S235. V nadaljevanju podajamo trdnostne in mehanske lastnosti uporabljenih jekel, ki jih upoštevamo v analizi in so skladne s standardom SIST EN 1993-1-1:2005.

Jeklo kvalitete S 235:

- napetost tečenja $f_{yk} = 23,5 \text{ kN/cm}^2$,
- natezna napetost $f_u = 36 \text{ kN/cm}^2$,
- modul elastičnosti $E = 21000 \text{ kN/cm}^2$,
- strižni modul $G = 8100 \text{ kN/cm}^2$
- Poissonov količnik $\nu = 0,3$,
- prostorninska teža $\gamma = 78,5 \text{ kN/m}^3$.

Preglednica 3.1: Nazivne vrednosti napetosti tečenja f_y in natezne trdnosti f_u za vroče valjana konstrukcijska jekla

Standard in kakovost jekla	Nazivna debelina elementa t [mm]			
	$t \leq 40 \text{ mm}$		$40 \text{ mm} < t \leq 80 \text{ mm}$	
	f_y [N/mm ²]	f_u [N/mm ²]	f_y [N/mm ²]	f_u [N/mm ²]
EN 10025-2				
S 235	235	360	215	360
S 275	275	430	255	410
S 355	355	510	335	470
S 450	440	550	410	550
EN 10025-3				
S 275 N/NL	275	390	255	370
S 355 N/NL	355	490	335	470
S 420 N/NL	420	520	390	520
S 460 N/NL	460	540	430	540
EN 10025-4				
S 275 M/ML	275	370	255	360
S 355 M/ML	355	470	335	450
S 420 M/ML	420	520	390	500
S 460 M/ML	460	540	430	530
EN 10025-5				
S 235 W	235	360	215	340
S 355 W	355	510	335	490
EN 10025-6				
S 460 Q/QL/QL1	460	570	440	550

Nosilni stiki

•vijak	8.8	EN 4014 ali EN 4017
•podložka	200 HV	EN 7089
•matica	8	EN 4032

Spoji

•vijak	8.8	EN 4014 ali EN 4017
•podložka	200 HV	EN 7089
•matica	8	EN 4032

Lastnosti spojnega materiala morajo biti v skladu z SIST EN 15048-1:2007 - vijačni kompletiza konstrukcijske vijake, znotraj katerega so vijaki 4014, matice 4032 in podložke 7089.

Navojne palice za izdelavo sider morajo biti skladne s SIST EN ISO 898-1.

Ves spojni material mora biti protikorozijsko zaščiten z vročim pocinkanjem.

Vijačni spojni material je projektiran po principu SB. Ves spojni material je kvalitete 8.8. K vijačnemu sklopu je potrebno dodati dve podložki, da se prepreči poškodovanje PKZ pri montaži.

Vsi zvari so polno nosilni in so izvedeni obojestransko v debelini $a=2 \times 0.50 \text{ t}$ ($a^{\text{max}}=0,58 \text{ t}$), razen na nedostopnih mestih kjer se lahko izvede le enostranski zvar. V teh primerih se zaradi nedostopnosti izvajajo obdelani zvari v debelini $a=1 \times t$ (t =debeline pločevine, ki se vari).

Ves vgrajen material (pločevine, profili, dodajni material, spojna sredstva...) mora biti opremljen s potrdili o kvaliteti v skladu z zakonom o standardizaciji. Potrdila o kvaliteti morajo biti stopnje v skladu z določili podanimi v Tabeli 1 točke 5.2 standarda SIST EN 1090-2.

Izdelki za izdelavo elementov nosilne jeklene konstrukcije, ki so izdelani v skladu z harmoniziranimi standardi (profili, pločevine, dodajni material, vijačne zveze, ležišča,...), morajo biti ustrezno opremljeni s CE znakom in dobavljeni z ustrezno izjavo oziroma certifikatom o skladnosti (Zakon o gradbenih proizvodih).

PROTIKOROZIJSKA ZAŠČITA

Konstrukcijo je potrebno antikorozijsko zaščititi, v skladu z zahtevami naročnika in predpisi (EN ISO 12944, deli 1-8). Če v nadaljnjih fazah ne bo drugače določeno, je potrebno upoštevati kategorijo korozijske zaščite C2, z visoko trajnostjo (razred H), v skladu z EN ISO 12944-5, tabele A.4.

5. STATIČNI IZRAČUN

SPLOŠNO

Pri računski analizi in dimenzioniranju upoštevamo:

- stalno obtežbo,
- koristne obtežbe,
- spremenljivo obtežbo snega in vetra,
- potresno obtežbo.

Obtežbe so določene v skladu s:

- SIST EN 1991-1-1: *Splošni vplivi – Prostorninske teže, lastna teža, koristne obtežbe stavb*
- SIST EN 1991-1-3: *Splošni vplivi – Obtežba snega*
- SIST EN 1991-1-4: *Splošni vplivi – Obtežba vetra*
- SIST EN 1998-1: *Splošna pravila, potresni vplivi in vplivi na stavbe*

- Stalna obtežba

Stalno obtežbo predstavljajo lastne teže konstrukcijskih in ne konstrukcijskih elementov s pritrjeno opremo ter težo zemljin in balasta.

Lastna teža konstrukcijskih elementov je odvisna od materiala in dimenzij konstrukcijskih elementov. Prostorninske teže so določene v skladu s SIST EN 1991-1-1. Upoštevane teže materialov so navedene v poglavju KVALITETA MATERIALOV GLEDE NA VRSTO KONSTRUKCIJE. Lastna teža konstrukcijskih elementov se v računskih modelih upošteva samodejno.

Lastne teže ne konstrukcijskih elementov (kritine, obloge, oprema in naprave, ..), teže zemljine in balastov so odvisne predvidenega stanja objekta. Prostorninske teže materialov so določene v skladu s SIST EN 1991-1-1 s preglednicami A.1 – A.12 oz. pridobljene iz tehničnih katalogov proizvajalcev materialov. Obtežbe pritrjenih naprav in opreme so pridobljene s strani proizvajalcev naprav oz. opreme.

jeklena nadstrešnica nad rampo

obtežba	opis sloja	teža kN/m ³	debelina m	teža kN/m ²
<u>Lastna</u>	jekleni profili	upoštevano v računalniškem programu		
<u>Stalna</u>	steklena strešna zasteklitev - enojno	25,00	0,020	0,500
	lepljeno varnostno steklo			
	jeklena podkonstrukcija	-	-	0,100
	rezerva	-	-	0,100
skupaj				0,700

- Koristna obtežba

Vrste in velikosti koristnih obtežb tlakov so določene v skladu s SIST EN 1991-1-1 s preglednicami 6.1 – 6.12.

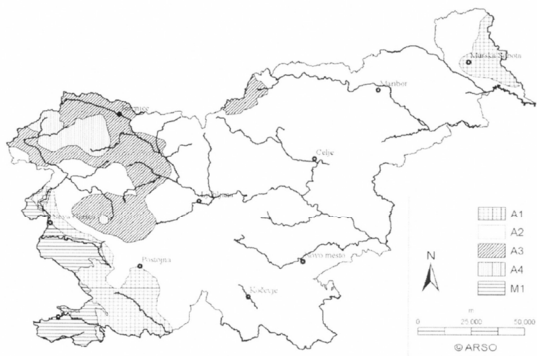
Kategorija	Opis	q_k [kN/m ²]	Q_k [kN]
H	Streha, dostopna za popravila in vzdrževanje	0,4	1,0

- Obtežba snega

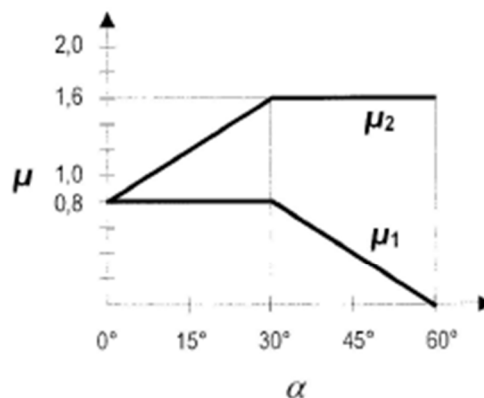
Obtežbo snega za celoten objekt določimo skladno s standardom SIST EN 1991-1-3. Karakteristično vrednost obtežbe snega s_k na tleh na nadmorski višini A določimo s pomočjo karte snežnih con, ki je podana v Nacionalnem dodatku k SIST EN 1991-1-3: 2004 (slika 6). Karakteristična obtežba snega je odvisna od cone (Slovenija je razdeljena na 5 con) ter od nadmorske višine.

Podatki:

Kraj:	Maribor	Obtežba snega na tleh odvisna od snežne cone in NMV:
Snežna Cona:	A2	$S_k = 1,293(1+(A/728)^2)$
N.M.V.:	275 m	$S_k = 1,4775 \text{ kN/m}^2$
Naklon α_1 :	7 °	
Naklon α_2 :	0 °	



Snežna karta Slovenije razdeljena na 5 snežnih con



Oblikovni koeficient obtežbe snega

Izračun obtežbe snega na strehi:

$$S = \mu \cdot C_e \cdot C_t \cdot S_k$$

$$\mu = 0,8$$

μ - oblikovni koeficient obtežbe snega

$$C_e = 1,0$$

C_e - koeficient izpostavljenosti

$$C_t = 1,0$$

C_t - toplotni koeficient

$S = 1,182 \text{ kN/m}^2$	α_1
$S = 1,182 \text{ kN/m}^2$	α_2

V kolikor na streho zapade količina snega z težo večjo od računsko upošteevane, je potrebno sneg s strehe očistiti. Pri čiščenju snega s strehe je potrebno upoštevati sledeče:

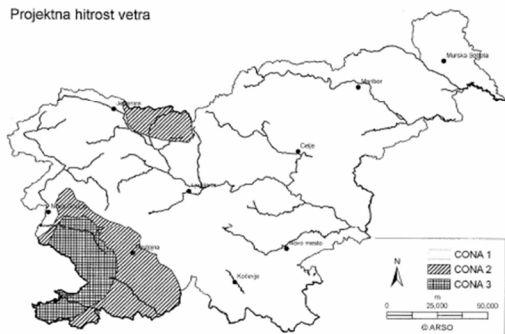
- Sneg s strehe je potrebno čistiti ročno z uporabo lopat.
- Teža posameznega čistilca skupaj z orodjem ne sme presegati 100kg (1kN) - točkovna obremenitev.
- Ob čiščenju strehe morajo biti čistilci enakomerno razporejeni, tako da na 10m² strehe pride en čistilec (poleg snega dodatnih cca. 10kg/m² (0,1kN/m²)).
- Pri čiščenju strehe se sneg ne sme kopičiti ampak se mora sproti odstranjevati s strehe.

- Obtežbo vetra

Obtežba vetra je določena v skladu s SIST EN 1991-1-4. Pri določitvi obtežbe vetra na zunanje površine upoštevamo razdelitev objekta na območja A-E za vertikalne površine (fasada) in območja F-J za strešno površino.

Kraj: Maribor
Vetrna cona: 1
N.M.V.: 275 m
Višina objekta: 4,5 m
Vb,0= 20 m/s --: Projektna hitrost
Kategorija terena: 3

Projektna hitrost vetra



Hitrosti vetra:

Cona 1 (večina Slovenije):

20 m/s pod 800m
 25 m/s od 800 m do 1600 m
 30 m/s od 1600 m do 2000 m
 40 m/s nad 2000 m

Cona 2 (Trnovski gozd, Notranjska, Karavanke):

25m/s pod 1600 m
 30 m/s od 1600 do 2000 m
 40 m/s nad 2000 m

Cona 3 (Primorje, Kras in del Vipavske doline):

30 m/s

Vetrna karta Slovenije razdeljena na 3 vetrne cone in hitrosti vetra glede na nadmorsko višini

Osnovna hitrost vetra

$$V_b = C_{dir} \cdot C_{season} \cdot V_{b,0}$$

$C_{dir} = 1,0$ C_{dir} - smerni faktor
 $C_{season} = 1,0$ C_{season} - faktor letnega časa

Vb= 20 m/s

Srednji veter

$$V_m(z) = C_r(z) \cdot C_o(z) \cdot V_b$$

$C_r(z) = 0,6059787$ $C_r(z)$ - faktor hrapavosti terena
 $C_o(z) = 1,0$ $C_o(z)$ - faktor hribovitosti

Vm(z)= 12,12 m/s

Vetrna turbolenca

$$I_v(z) = 0,35544046$$

Tlak pri največji hitrosti ob sunku vetra

$$q_p(z) = (1 + 7 \cdot I_v(z)) \cdot 0,5 \cdot \rho \cdot V_m(z)^2$$

$\rho = 1,25 \text{ kg/m}^3 \rightarrow$ gostota zraka

qp(z)= 0,320 kN/m2 (največji tlak pri sunkih vetra)

- potresna obtežba

Pri izvedbi nove odprtine v AB steno, se z novim AB okvirjem nadomesti potrebna nosilnost, ter s tem ne prihaja do poslabšanja potresne odpornosti. **Globalna potresna analiza objekta ni predmet obdelave.**

KOMBINACIJE OBTEŽB

Kombinacije obtežb posameznih vplivov določim v skladu s SIST EN 1990. Za dimenzioniranje pri mejnem stanju nosilnosti (MSN) upoštevam varnostne faktorje za kombinacije običajnih obtežb 1,35 za stalne vplive in 1,5 za spremenljive vplive, za nezgodne kombinacije in za potresno projektno stanje pa varnostne faktorje 1,0 za stalne in spremenljive vplive. Za dimenzioniranje pri mejnem stanju uporabnosti (MSU) upoštevamo varnostne faktorje 1,0 za stalne in spremenljive vplive. Pri kombinacijah obtežb upoštevamo tudi parcialne faktorje ψ (za spremenljive vplive, ki niso prevladujoči) v vrednostih 0,6 za obtežbo vetra in 0,5 za obtežbo snega pri običajnih kombinacijah (faktor ψ_0). V primeru kombinacij s potresno obtežbo sta parcialna faktorja (ψ_2) za sneg in veter enaka 0 (snega in vetra v kombinaciji s potresno obtežbo ne upoštevamo).

- (1) Splošna oblika kombinacije učinkov vplivov je:

$$E_d = \gamma_{sd} E \{ \gamma_{G,j} G_{k,j} ; \gamma_P P ; \gamma_{Q,1} Q_{k,1} ; \gamma_{Q,i} \psi_{0,i} Q_{k,i} \} j \geq 1 ; i > 1 \quad (6.9.a)$$

- (2) Obravnavane kombinacije učinkov vplivov temeljijo na:

- projektni vrednosti prevladujočega spremenljivega vpliva in
- projektnih kombinacijskih vrednostih spremljajočih spremenljivih vplivov:

OPOMBA: Glej tudi točko 6.4.3.2(4).

$$E_d = E \{ \gamma_{G,j} G_{k,j} ; \gamma_P P ; \gamma_{Q,1} Q_{k,1} ; \gamma_{Q,i} \psi_{0,i} Q_{k,i} \} j \geq 1 ; i > 1 \quad (6.9.b)$$

- (3) Kombinacija vplivov v oklepajih { } v (6.9.b) se lahko izrazi kot:

$$\sum_{j \geq 1} \gamma_{G,j} G_{k,j} "+" \gamma_P P "+" \gamma_{Q,1} Q_{k,1} "+" \sum_{i > 1} \gamma_{Q,i} \psi_{0,i} Q_{k,i} \quad (6.10)$$

ali alternativno za mejna stanja STR in GEO z neugodnejšim od naslednjih dveh izrazov:

$$\sum_{j \geq 1} \gamma_{G,j} G_{k,j} "+" \gamma_P P "+" \gamma_{Q,1} \psi_{0,1} Q_{k,1} "+" \sum_{i > 1} \gamma_{Q,i} \psi_{0,i} Q_{k,i} \quad (6.10.a)$$

$$\sum_{j \geq 1} \xi_j \gamma_{G,j} G_{k,j} "+" \gamma_P P "+" \gamma_{Q,1} Q_{k,1} "+" \sum_{i > 1} \gamma_{Q,i} \psi_{0,i} Q_{k,i} \quad (6.10.b)$$

SPLOŠNA OPOMBA!

Izvajalec del mora upoštevati predpise o varstvu pri delu za svojo tehnologijo izvajanja del. V času gradnje mora voditi vso s predpisi zahtevano dokumentacijo o izvajanju del. Pred pričetkom izvajanja posameznih gradbenih faz mora izvajalec obvezno detajlno pregledati tehnično dokumentacijo in obvestiti projektanta o morebitnih nejasnostih, napaki ali nastali spremembi.

Izvajalec mora pred začetkom del, ki vplivajo na obstoječo konstrukcijo, obvestiti projektanta, da po potrebi opravi projektantski nadzor ali ogled na licu mesta. Pri gradnji je potrebno natančno upoštevati navodila izračuna, vse računsko dobljene dimenzije in količine dimenzioniranega materiala.

Dokumentacija ne obsega preveritve celotne nosilnosti ali statične stabilnosti preostalega objekta.

Pri izvedbi je potrebno upoštevati vse predpise za varno izvedbo. Prav tako je potrebno paziti, upoštevati, zatečeno stanje, obstoječo konstrukcijo in nosilnost le te.

V kolikor se med posegom odkrije, da je kakšna predpostavka napačna, da je material v slabšem stanju od predvidenega ali da dejansko stanje odstopa od tega mnenja, je potrebno dela takoj ustaviti in nemudoma obvestiti pooblaščenega inženirja!

PRESOJA

Mnenje je podano na podlagi vizualnega ogleda na licu mesta ter podatkov in podlog naročnika.

Smatramo, da predvideni posegi ob strokovni in dosledni izvedbi ne poslabšujejo obstoječe nosilnosti, statične varnosti in stabilnosti objekta.

Izvajalec del je v celoti odgovoren za pravilno in strokovno tehnologijo izvajanja del ter dosledno upoštevanje projektne dokumentacije. V kolikor izvajalec pred ali med izvajanjem del ugotovi kakršnakoli odstopanja dejanskega stanja od predvidenega ali druge nepredvidene okoliščine, mora dela na tistem delu takoj ustaviti in o tem pismeno obvestiti naročnika in projektanta.

5.1 Statični izračun – priloge

- statični izračun jeklenega nadstreška



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Date: 23. 09. 2026

STRUCTURAL ANALYSIS

PROJECT

Prenova notranjih prostorov
v objektu KPD

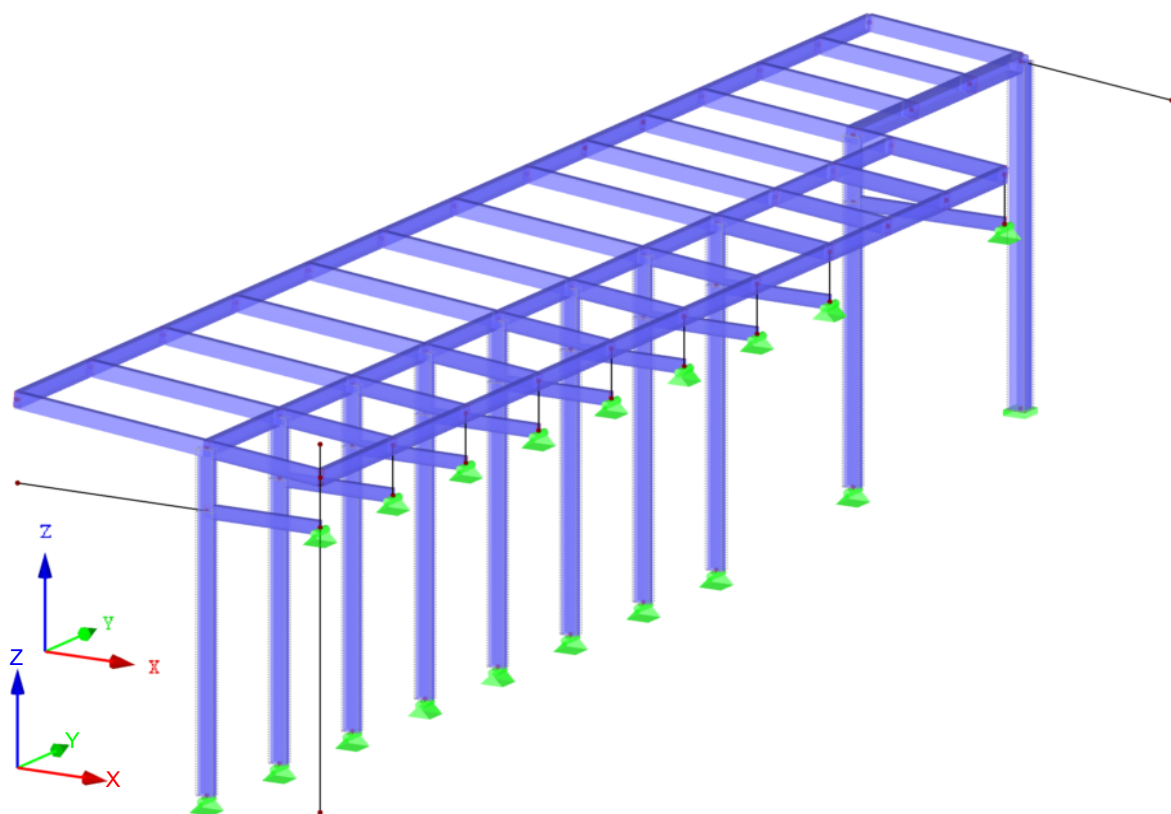
NADSTRESEK

CLIENT

Mestna občina Maribor
Ulica heroja Staneta 1
2000 Maribor

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MODEL

Project: Model: RRA - Inkubator_PZI_3D model_nadstresek Date: 23. 09. 2026

■ MODEL - GENERAL DATA

	General	Model name	: RRA - Inkubator_PZI_3D model_nadstresek
		Type of model	: 3D
		Positive direction of global axis Z	: Upward
		Classification of load cases and combinations	: According to Standard: EN 1990 National Annex: SIST - Slovenia
		☒ Automatically create combinations	: ☒ Load Combinations
	Options	☐ RF-FORM-FINDING - Find initial equilibrium shapes of membrane and cable structures	
		☐ RF-CUTTING-PATTERN	
		☐ Piping analysis	
		☐ Use CQC Rule	
		☐ Enable CAD/BIM model	
		Standard Gravity g	: 10.00 m/s ²

■ FE MESH SETTINGS

	General	Target length of finite elements	l_{FE}	: 0.500 m
		Maximum distance between a node and a line to integrate it into the line	ϵ	: 0.001 m
		Maximum number of mesh nodes (in thousands)		: 500
	Members	Number of divisions of members with cable, elastic foundation, taper, or plastic characteristic		: 10
		☒ Activate member divisions for large deformation or post-critical analysis		
		☒ Use division also for straight members, which are not integrated in surfaces, with		: Target length LFE of finite elements
		Minimum number of member divisions		: 2
		☒ Use division for members with node lying on them		
	Surfaces	Maximum ratio of FE rectangle diagonals	Δ_D	: 1.800
		Maximum out-of-plane inclination of two finite elements	α	: 0.50 °
		Shape direction of finite elements		: Triangles and quadrangles
				☒ Same squares where possible

■ 1.3 MATERIALS

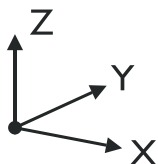
Matl. No.	Modulus E [kN/cm ²]	Modulus G [kN/cm ²]	Poisson's Ratio ν [-]	Spec. Weight γ [kN/m ³]	Coeff. of Th. Ex α [1/°C]	Partial Factor γ_M [-]	Material Model
1	Steel S 235 EN 10025-2:2004-11 21000.00	8076.92	0.300	78.50	1.20E-05	1.00	Isotropic Linear Elastic
2	Concrete C30/37 3300.00	1375.00	0.200	25.00	1.00E-05	1.00	Isotropic Linear Elastic

■ 1.7 NODAL SUPPORTS

Support No.	Nodes No.	Axis System	Column in Z	Support Conditions					
				u_X	u_Y	u_Z	φ_X	φ_Y	φ_Z
1	1,4,9,12,15,18,21,24,27,30,33,36,39,42,45,48,54,59	Global X,Y,Z	☐	☒	☒	☒	☒	☐	☒
2	66	Global X,Y,Z	☐	☒	☒	☒	☒	☒	☒

■ 1.13 CROSS-SECTIONS

Section No.	Matl. No.	J [cm ⁴]		I _y [cm ⁴]		I _z [cm ⁴]		Principal Axe α [°]	Rotation α' [°]	Overall Dimensions [mm]	
		A [cm ²]		A _y [cm ²]		A _z [cm ²]				Width b	Height h
1	RRO 120x60x3 EN 10219-2:2006										
	1	156.00		189.00		64.40	0.00	0.00	60.0	120.0	
	steber	10.20		2.30		6.46					
2	RRO 120x60x3 EN 10219-2:2006										
	1	156.00		189.00		64.40	0.00	0.00	60.0	120.0	
	SN	10.20		2.30		6.46					
3	RRO 120x60x4 EN 10219-2:2006										
	1	201.00		241.00		81.20	0.00	0.00	60.0	120.0	
	PN	13.30		3.01		8.54					
4	RRO 100x60x2.5 EN 10219-2:2006										
	1	103.00		103.00		46.90	0.00	0.00	60.0	100.0	
		7.59		2.08		4.43					
5	RRO 120x60x6 EN 10219-2:2006										
	1	280.00		328.00		109.00	0.00	0.00	60.0	120.0	
		19.20		4.36		12.60					
6	QRO 120x4 EN 10219-2:2006										
	1	637.00		402.00		402.00	0.00	0.00	120.0	120.0	
		18.10		7.80		7.80					



RRO 120x60x3 RRO 120x60x3



RRO 120x60x4 RRO 100x60x2.5



RRO 120x60x6 QRO 120x4



QRO 120x4 QRO 120x4





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MODEL

Project: Model: RRA - Inkubator_PZI_3D model_nadstresek

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1.13 CROSS-SECTIONS

Section No.	Matl. No.	J [cm ⁴] A [cm ²]	I _y [cm ⁴] A _y [cm ²]	I _z [cm ⁴] A _z [cm ²]	Principal Axe α [°]	Rotation α' [°]	Overall Dimensions [mm]	
							Width b	Height h
7	QRO 120x4 EN 10219-2:2006 1	637.00 18.10	402.00 7.80	402.00 7.80	0.00	0.00	120.0	120.0
8	QRO 120x4 EN 10219-2:2006 1	637.00 18.10	402.00 7.80	402.00 7.80	0.00	0.00	120.0	120.0

2.1 LOAD CASES

Load Case	Load Case Description	EN 1990 SIST Action Category	Self-Weight - Factor in Direction			
			Active	X	Y	Z
LC1	Self-weight	Permanent	☒	0.000	0.000	-1.000
LC2	stalna teza	Permanent	☐			
LC3	Snow	Snow (H ≤ 1000 m a.s.l.)	☐			
LC4	Snow 2 - kopicenje	Accidental	☐			
LC5	Wind in - X	Wind	☐			
LC6	Wind in + X	Wind	☐			

2.5 LOAD COMBINATIONS

Load Combin.	Load Combination		No.	Factor	Load Case	
	DS	Description				
CO1	STR	1.35G1 + 1.35G2	1	1.35	LC1	Self-weight
			2	1.35	LC2	stalna teza
CO2	STR	1.35G1 + 1.35G2 + 1.5Qs	1	1.35	LC1	Self-weight
			2	1.35	LC2	stalna teza
CO3	STR	1.35G1 + 1.35G2 + 1.5Qs + 0.9Qw1	3	1.50	LC3	Snow
			1	1.35	LC1	Self-weight
			2	1.35	LC2	stalna teza
			3	1.50	LC3	Snow
CO4	STR	1.35G1 + 1.35G2 + 1.5Qs + 0.9Qw2	4	0.90	LC5	Wind in - X
			1	1.35	LC1	Self-weight
			2	1.35	LC2	stalna teza
			3	1.50	LC3	Snow
CO5	STR	1.35G1 + 1.35G2 + 1.5Qw1	4	0.90	LC6	Wind in + X
			1	1.35	LC1	Self-weight
			2	1.35	LC2	stalna teza
			3	1.50	LC3	Snow
CO6	STR	1.35G1 + 1.35G2 + 1.5Qw2	4	0.90	LC6	Wind in + X
			1	1.35	LC1	Self-weight
			2	1.35	LC2	stalna teza
CO7	STR	1.35G1 + 1.35G2 + 0.75Qs + 1.5Qw1	3	1.50	LC6	Wind in + X
			1	1.35	LC1	Self-weight
			2	1.35	LC2	stalna teza
			3	0.75	LC3	Snow
CO8	STR	1.35G1 + 1.35G2 + 0.75Qs + 1.5Qw2	4	1.50	LC5	Wind in - X
			1	1.35	LC1	Self-weight
			2	1.35	LC2	stalna teza
			3	0.75	LC3	Snow
CO9	S Ch	G1 + G2	4	1.50	LC6	Wind in + X
			1	1.00	LC1	Self-weight
CO10	S Ch	G1 + G2 + Qs	2	1.00	LC2	stalna teza
			1	1.00	LC1	Self-weight
CO11	S Ch	G1 + G2 + Qs + 0.6Qw1	2	1.00	LC2	stalna teza
			3	1.00	LC3	Snow
			1	1.00	LC1	Self-weight
			4	0.60	LC5	Wind in - X
CO12	S Ch	G1 + G2 + Qs + 0.6Qw2	1	1.00	LC1	Self-weight
			2	1.00	LC2	stalna teza
			3	1.00	LC3	Snow
			4	0.60	LC6	Wind in + X
CO13	S Ch	G1 + G2 + Qw1	1	1.00	LC1	Self-weight
			2	1.00	LC2	stalna teza
			3	1.00	LC5	Wind in - X
CO14	S Ch	G1 + G2 + Qw2	1	1.00	LC1	Self-weight
			2	1.00	LC2	stalna teza
			3	1.00	LC6	Wind in + X
CO15	S Ch	G1 + G2 + 0.5Qs + Qw1	1	1.00	LC1	Self-weight
			2	1.00	LC2	stalna teza
			3	0.50	LC3	Snow
			4	1.00	LC5	Wind in - X
CO16	S Ch	G1 + G2 + 0.5Qs + Qw2	1	1.00	LC1	Self-weight
			2	1.00	LC2	stalna teza
			3	0.50	LC3	Snow
			4	1.00	LC6	Wind in + X
CO17	ACC	G1 + G2 + A	1	1.00	LC1	Self-weight
			2	1.00	LC2	stalna teza
			3	1.00	LC4	Snow 2 - kopicenje
CO18	ACC	G1 + G2 + 0.2Qs + A	1	1.00	LC1	Self-weight
			2	1.00	LC2	stalna teza
			3	0.20	LC3	Snow
			4	1.00	LC4	Snow 2 - kopicenje
CO19	ACC	G1 + G2 + A + 0.2Qw1	1	1.00	LC1	Self-weight
			2	1.00	LC2	stalna teza
			3	1.00	LC4	Snow 2 - kopicenje
			4	0.20	LC5	Wind in - X
CO20	ACC	G1 + G2 + A + 0.2Qw2	1	1.00	LC1	Self-weight
			2	1.00	LC2	stalna teza
			3	1.00	LC4	Snow 2 - kopicenje



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- **LC1: SELF-WEIGHT**

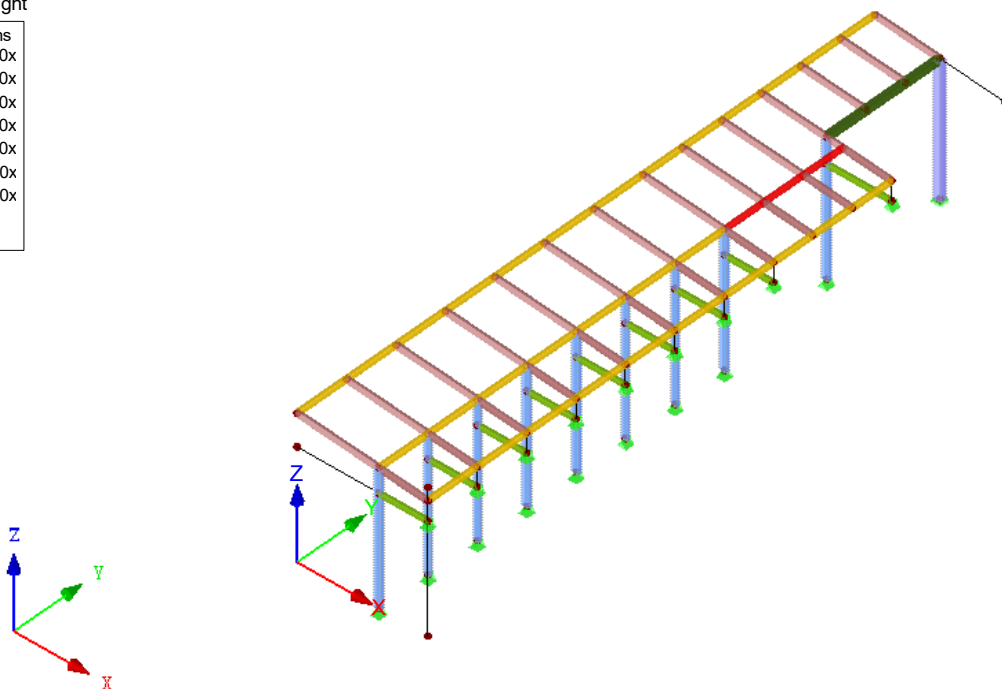
Load Combin.	DS	Load Combination Description	No.	Factor	Load Case
			4	0.20	LC6
					Wind in + X

LC1 : Self-weight

Isometric

Cross-Sections

- 1: RRO 120x
- 2: RRO 120x
- 3: RRO 120x
- 4: RRO 100x
- 5: RRO 120x
- 6: QRO 120x
- 8: QRO 120x



LC2
stalna teza

■ 3.15 GENERATED LOADS

LC2: stalna teza

No.	Load Description			
1	From Area Loads via Plane			
	Area load direction	Global relative to the true area:	:	☒ ZL
	Area of load application	☒ Fully closed plane		
	Load distribution type:	☒ Combined		
	Area load magnitude	☒ Constant	:	-0.70 kN/m ²
	Boundary of the area load plane	Corner nodes	:	5,61,62,6
		Note	:	Each row in the drop down list box denotes one plane
	Generating total loads in direction	ΣP_{Areas}	X	: 0.000 kN
			Y	: 0.000 kN
			Z	: -19.754 kN
		$\Sigma P_{Members}$	X	: 0.000 kN
			Y	: 0.000 kN
			Z	: -19.754 kN
	Total moment to the origin	ΣM_{Areas}	X	: -115.561 kNm
			Y	: 23.705 kNm
		Z	: 0.000 kNm	
	$\Sigma M_{Members}$	X	: -115.561 kNm	
		Y	: 23.705 kNm	
		Z	: 0.000 kNm	
Cells selected for generating	Σ number of cells	:	24	
	Σ cell area	:	28.220 m ²	
Convert loads to members No.		:	4,5,9,10,14,15,19,20,24,25,29,30,34,35,39-45,47,51-60,62,64-86,89,94,99,101-103	



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LOADS

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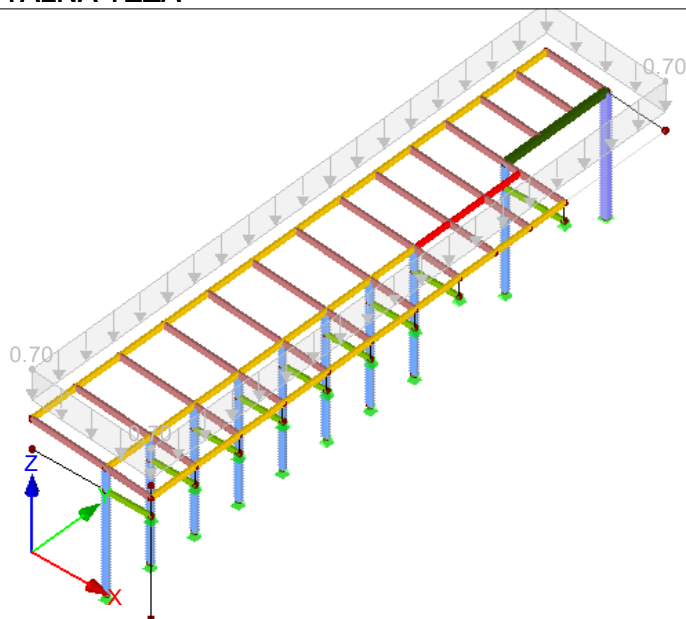
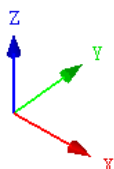
Date: 23. 09. 2026

■ LC2: STALNA TEZA

LC2 : stalna teza
Loads [kN/m²]

Cross-Section
s

- 1: RRO 120:
- 2: RRO 120:
- 3: RRO 120:
- 4: RRO 100:
- 5: RRO 120:
- 6: QRO 120:
- ...

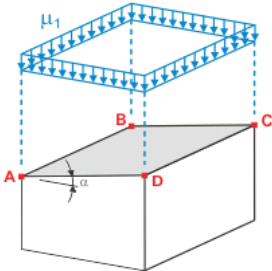


Isometric

LC3
Snow

■ 3.15 GENERATED LOADS

LC3: Snow

No.	Load Description																		
1	From Snow Loads (Flat/Monopitch Roof) 																		
Snow load parameters	<table><tr><td>According to Standard</td><td>:</td><td>EN 1991-1-3</td></tr><tr><td>National Annex</td><td>:</td><td>Slovenia</td></tr><tr><td>Snow load zone</td><td>Z</td><td>A2</td></tr><tr><td>Altitude</td><td>A</td><td>300.000 m</td></tr><tr><td>Ground snow load</td><td>s_k</td><td>1.51 kN/m²</td></tr><tr><td>Topography type</td><td>:</td><td>Normal</td></tr></table>	According to Standard	:	EN 1991-1-3	National Annex	:	Slovenia	Snow load zone	Z	A2	Altitude	A	300.000 m	Ground snow load	s _k	1.51 kN/m²	Topography type	:	Normal
According to Standard	:	EN 1991-1-3																	
National Annex	:	Slovenia																	
Snow load zone	Z	A2																	
Altitude	A	300.000 m																	
Ground snow load	s _k	1.51 kN/m²																	
Topography type	:	Normal																	
Coefficients	<table><tr><td>Exposure</td><td>C_e</td><td>: 1.00</td></tr><tr><td>Thermal coefficient</td><td>C_t</td><td>: 1.00</td></tr></table>	Exposure	C _e	: 1.00	Thermal coefficient	C _t	: 1.00												
Exposure	C _e	: 1.00																	
Thermal coefficient	C _t	: 1.00																	
Roof geometry	<table><tr><td>Node</td><td>A</td><td>: 5</td></tr><tr><td></td><td>B</td><td>: 61</td></tr><tr><td></td><td>C</td><td>: 62</td></tr><tr><td></td><td>D</td><td>: 6</td></tr></table>	Node	A	: 5		B	: 61		C	: 62		D	: 6						
Node	A	: 5																	
	B	: 61																	
	C	: 62																	
	D	: 6																	
Generate LC	<table><tr><td>☒ LC s1</td><td>:</td><td>LC3</td></tr></table>	☒ LC s1	:	LC3															
☒ LC s1	:	LC3																	
Create load type	<table><tr><td>☒ Member loads</td></tr></table>	☒ Member loads																	
☒ Member loads																			
Load distribution type	<table><tr><td>☒ Combined</td></tr></table>	☒ Combined																	
☒ Combined																			
Generate snow loads on members No.	<table><tr><td></td><td>:</td><td>4,5,9,10,14,15,19,20, 24,25,29,30,34,35, 39-45,47,51-60,62, 64-86,89,94,99, 101-103</td></tr></table>		:	4,5,9,10,14,15,19,20, 24,25,29,30,34,35, 39-45,47,51-60,62, 64-86,89,94,99, 101-103															
	:	4,5,9,10,14,15,19,20, 24,25,29,30,34,35, 39-45,47,51-60,62, 64-86,89,94,99, 101-103																	



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LOADS

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3.15 GENERATED LOADS

LC3: Snow

No.	Load Description			
	Parameters	A_R	: 28.220	m ²
		α	: 5.7	°
		S_k	: 1.51	kN/m ²
		μ_1	: 0.800	
		s_1	: 1.21	kN/m ²
	Generated total loads	ΣP_{Areas}	: 33.978	kN
		ΣP	: 33.978	kN
	Total moment to the origin	ΣM_{Areas}	: 202.913	kNm
		ΣM	: 202.913	kNm
	Cells selected for generating	Σ number of cells	: 24	
		Σ cell area	: 28.080	m ²

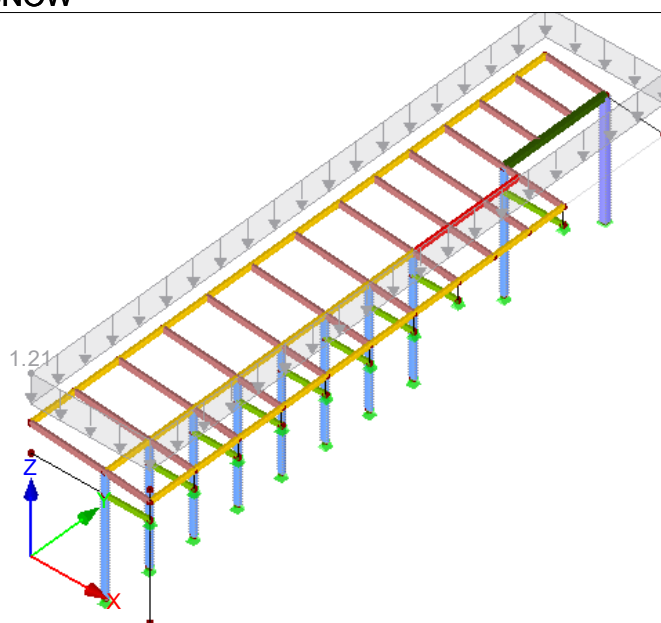
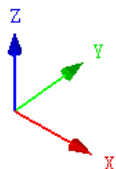
LC3: SNOW

LC3 : Snow
Loads [kN/m²]

Cross-Section

s

- 1: RRO 120:
- 2: RRO 120:
- 3: RRO 120:
- 4: RRO 100:
- 5: RRO 120:
- 6: QRO 120:
- ...



Isometric

LC4
Snow 2 - kopicenje

3.15 GENERATED LOADS

LC4: Snow 2 - kopicenje

No.	Load Description			
1	From Area Loads via Plane			
	Area load direction	Global relative to the projected area: ☒ ZP		
	Area of load application	☒ Fully closed plane		
	Load distribution type:	☒ Combined		
	Area load magnitude	☒ Constant	: -2.80	kN/m ²
	Boundary of the area load plane	Corner nodes	: 5,61,62,6	
		Note	Each row in the drop down list box denotes one plane	
	Generating total loads in direction	ΣP_{Areas}	X	: 0.000 kN
			Y	: 0.000 kN
			Z	: -78.624 kN
		$\Sigma P_{Members}$	X	: 0.000 kN
			Y	: 0.000 kN
			Z	: -78.624 kN
	Total moment to the origin	ΣM_{Areas}	X	: -459.950 kNm
			Y	: 94.349 kNm



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LOADS

Project: Model: RRA - Inkubator_PZI_3D model_nadstresek

Date: 23. 09. 2026

3.15 GENERATED LOADS

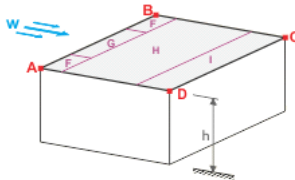
LC4: Snow 2 - kopicenje

No.	Load Description			
	ΣM Members	Z	:	0.000 kNm
		X	:	-459.950 kNm
		Y	:	94.349 kNm
		Z	:	0.000 kNm
Cells selected for generating	Σ number of cells	:	24	
	Σ cell area	:	28.080	m ²
Convert loads to members No.		:	4,5,9,10,14,15,19,20, 24,25,29,30,34,35, 39-45,47,51-60,62, 64-86,89,94,99, 101-103	

LC5
Wind in - X

3.15 GENERATED LOADS

LC5: Wind in - X

No.	Load Description			
1	From Wind Loads (Flat Roof)			
				
Velocity pressure	According to Standard	:	EN 1991-1-4	
	National Annex	:	Slovenia	
	Wind zone	:	1	
	Terrain category	:	Category II	
	Altitude	H_s	:	300.000 m
	Structure height	h	:	3.000 m
	Fundamental wind velocity	$v_{b,0}$	:	20.0 m/s
Roof geometry	Node	A	:	5
		B	:	61
		C	:	62
		D	:	6
Eaves type	• Sharp-edges eaves area			
Generate LC	☒ LC w+	:	LC5	
Set wind on side	• A - B			
Create load type	• Member loads			
Load distribution type	• Combined			
Generate wind loads on members No.		:	4,5,9,10,14,15,19,20, 24,25,29,30,34,35, 39-45,47,51-60,62, 64-86,89,94,99, 101-103	
Flat Roof Dimensions	h	:	3.000	m
	b	:	11.700	m
	d	:	2.400	m
	e	:	6.000	m
	A	:	28.220	m ²
	α	:	5.7	°
	b_F	:	1.500	m
	d_F	:	0.600	m
	d_H	:	2.400	m
Zone	External pressure coefficient $c_{pe, 10}$		External pressure w_e [kN/m ²]	
F	-1.800		-0.74	
G	-1.200		-0.49	
H	-0.700		-0.29	
I	0.200		0.08	
Generated total loads	ΣP_{Areas}	:	9.989	kN
	ΣP	:	9.989	kN
Total moment to the origin	ΣM_{Areas}	:	58.943	kNm
	ΣM	:	58.943	kNm
Cells selected for generating	Σ number of cells	:	70	
	Σ cell area	:	72.540	m ²



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LOADS

Project: Model: RRA - Inkubator_PZI_3D model_nadstresek

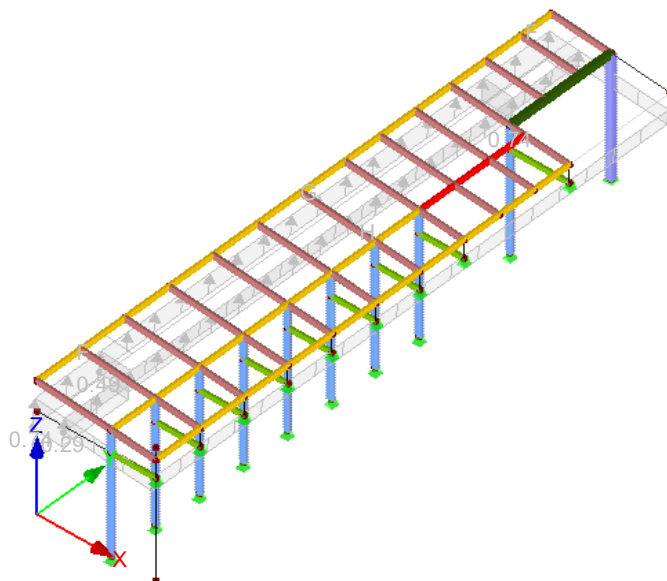
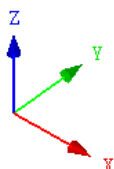
Date: 23. 09. 2026

■ LC5: WIND IN - X

LC5 : Wind in - X
Loads [kN/m²]

Cross-Section
s

- 1: RRO 120:
- 2: RRO 120:
- 3: RRO 120:
- 4: RRO 100:
- 5: RRO 120:
- 6: QRO 120:
- ...

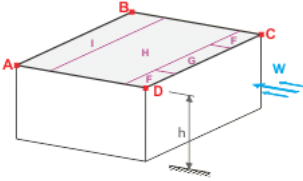


Isometric

LC6
Wind in + X

■ 3.15 GENERATED LOADS

LC6: Wind in + X

No.	Load Description	
1	From Wind Loads (Flat Roof)	
		
Velocity pressure	According to Standard National Annex Wind zone Terrain category Altitude Structure height Fundamental wind velocity	: EN 1991-1-4 : Slovenia : 1 : Category II : H_s : 300.000 m : h : 3.000 m : $v_{b,0}$: 20.0 m/s
Roof geometry	Node	A : 5 B : 61 C : 62 D : 6
Eaves type	☒ Sharp-edges eaves area	
Generate LC	☒ LC w-	: LC6
Set wind on side	☒ C - D	
Create load type	☒ Member loads	
Load distribution type	☒ Combined	
Generate wind loads on members No.		: 4,5,9,10,14,15,19,20, 24,25,29,30,34,35, 39-45,47,51-60,62, 64-86,89,94,99, 101-103
Flat Roof Dimensions	h b d	: 3.000 m : 11.700 m : 2.400 m

Project: Model: RRA - Inkubator_PZI_3D model_nadstresek

Date: 23. 09. 2026

3.15 GENERATED LOADS

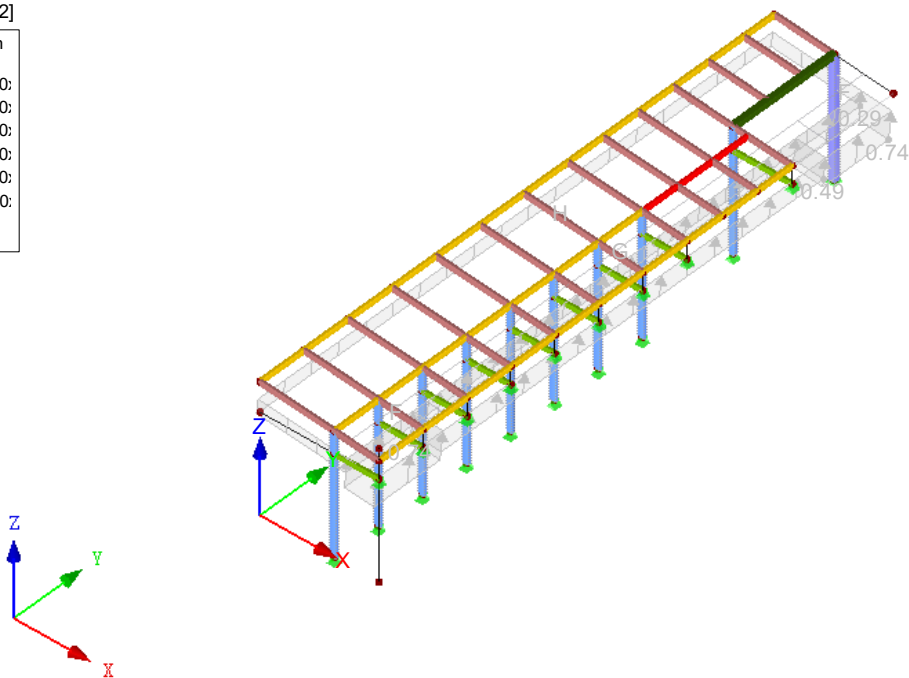
LC6: Wind in + X

No.	Load Description	
	e	: 6.000 m
	A	: 28.220 m ²
	α	: 5.7 °
	b _F	: 1.500 m
	d _F	: 0.600 m
	d _H	: 2.400 m
Zone	External pressure coefficient c _{pe, 10}	External pressure w _e [kN/m ²]
F	-1.800	-0.74
G	-1.200	-0.49
H	-0.700	-0.29
I	-0.200	-0.08
Generated total loads		ΣP_{Areas} : 9.989 kN
		ΣP : 9.989 kN
Total moment to the origin		ΣM_{Areas} : 59.486 kNm
		ΣM : 58.827 kNm
Cells selected for generating		Σ number of cells : 78
		Σ cell area : 78.691 m ²

LC6: WIND IN + X

 LC6 : Wind in + X
Loads [kN/m²]

Cross-Section s
1: RRO 120:
2: RRO 120:
3: RRO 120:
4: RRO 100:
5: RRO 120:
6: QRO 120:
...



Isometric



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RESULTS

Project:

Model: RRA - Inkubator_PZI_3D model_nadstresek

Date: 23. 09. 2026

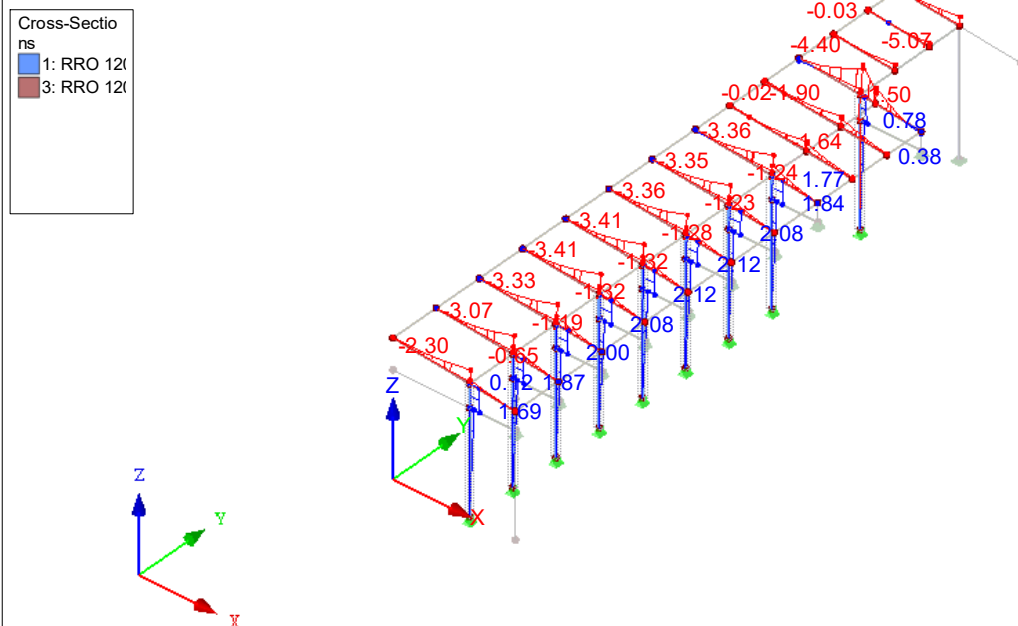
INTERNAL FORCES M_y

RC1 : ULS (STR/GEO) - Permanent / transient - Eq. 6.10

Internal Forces M-y

Result Combinations: Max and Min Values

Isometric



Max M-y: 2.12, Min M-y: -5.07 [kNm]

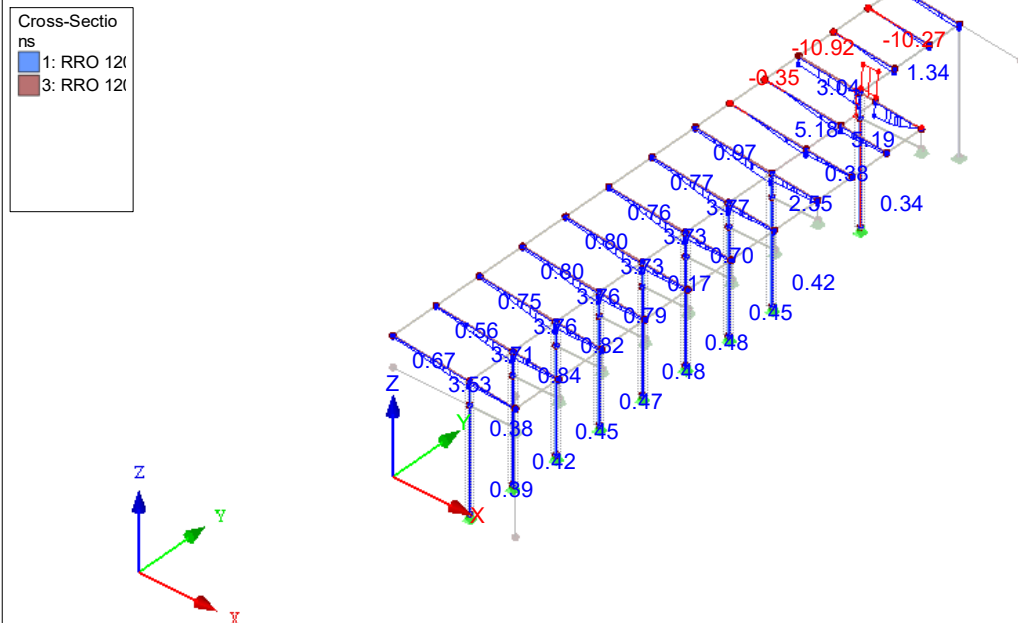
INTERNAL FORCES V_z

RC1 : ULS (STR/GEO) - Permanent / transient - Eq. 6.10

Internal Forces V-z

Result Combinations: Max and Min Values

Isometric



Max V-z: 5.19, Min V-z: -10.92 [kN]



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RESULTS

Project:

Model: RRA - Inkubator_PZI_3D model_nadstresek

Date: 23. 09. 2026

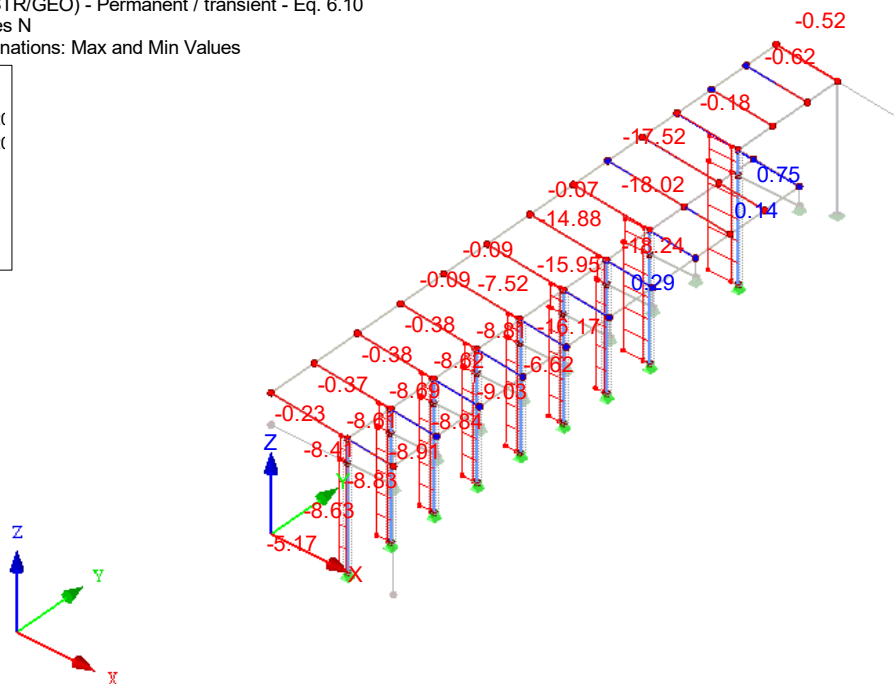
INTERNAL FORCES N

RC1 : ULS (STR/GEO) - Permanent / transient - Eq. 6.10

Internal Forces N

Result Combinations: Max and Min Values

Cross-Sections
1: RRO 12I
3: RRO 12I



Max N: 0.83, Min N: -18.24 [kN]

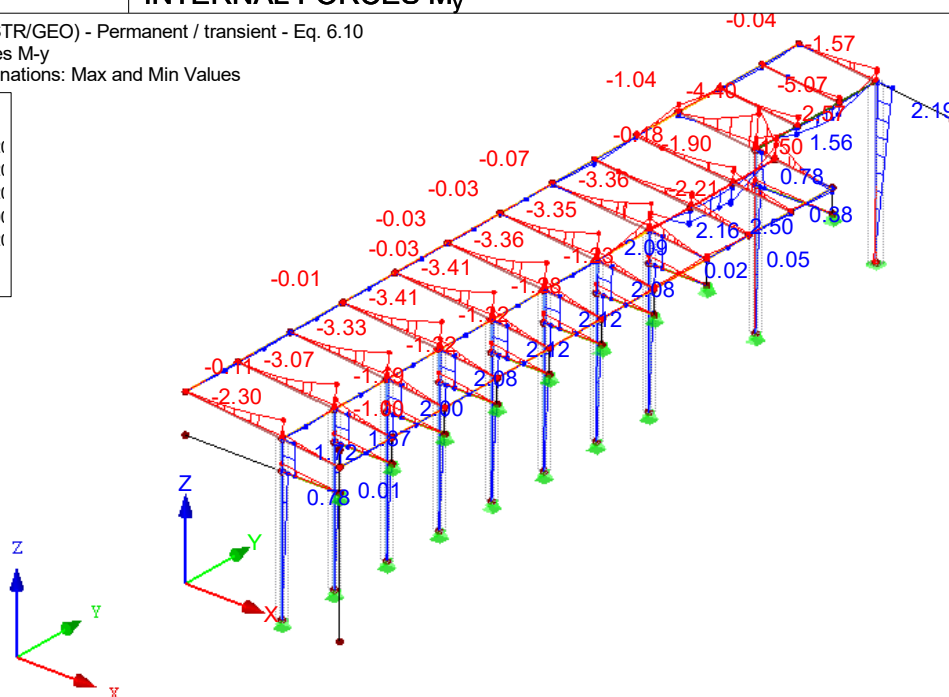
INTERNAL FORCES M_y

RC1 : ULS (STR/GEO) - Permanent / transient - Eq. 6.10

Internal Forces M-y

Result Combinations: Max and Min Values

Cross-Sections
1: RRO 12I
2: RRO 12I
3: RRO 12I
4: RRO 10I
5: RRO 12I
...



Max M-y: 2.50, Min M-y: -5.07 [kNm]



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RESULTS

Project: Model: RRA - Inkubator_PZI_3D model_nadstresek

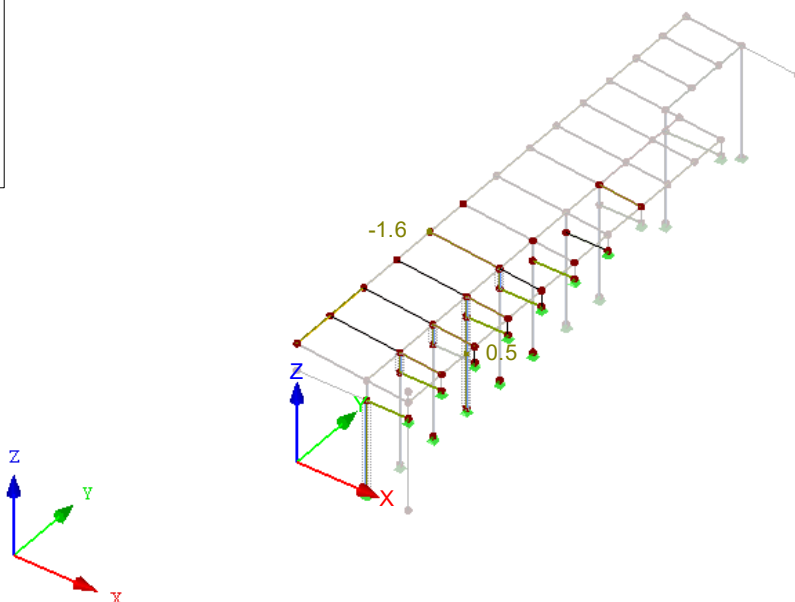
Date: 23. 09. 2026

GLOBAL DEFORMATIONS u_x

RC2 : SLS - Characteristic
Global Deformations u-X [mm]
Result Combinations: Max and Min Values

Isometric

Cross-Sections
1: RRO 12
2: RRO 12
3: RRO 12
4: RRO 10



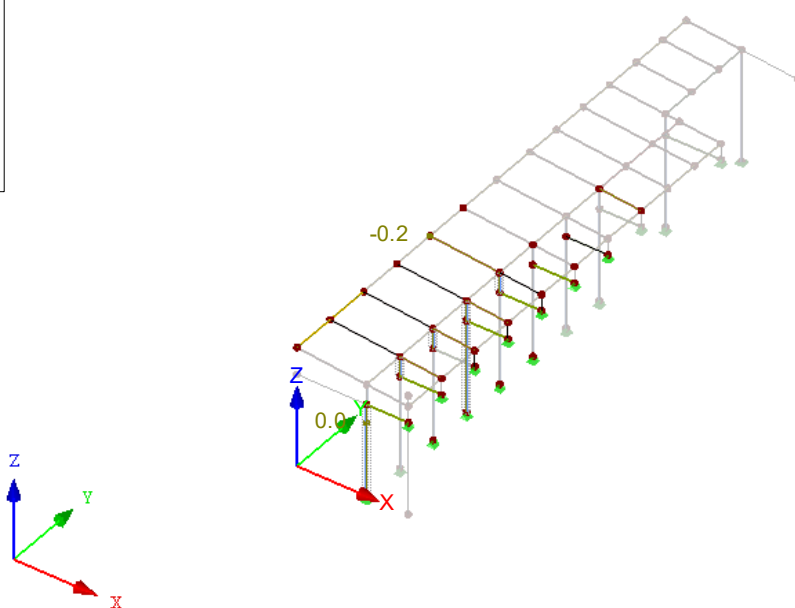
Factor of deformations: 11.00
Max u-X: 0.5, Min u-X: -1.6 mm

GLOBAL DEFORMATIONS u_y

RC2 : SLS - Characteristic
Global Deformations u-Y [mm]
Result Combinations: Max and Min Values

Isometric

Cross-Sections
1: RRO 12
2: RRO 12
3: RRO 12
4: RRO 10



Factor of deformations: 11.00
Max u-Y: 0.0, Min u-Y: -0.2 mm



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RESULTS

Project:

Model: RRA - Inkubator_PZI_3D model_nadstresek

Date: 23. 09. 2026

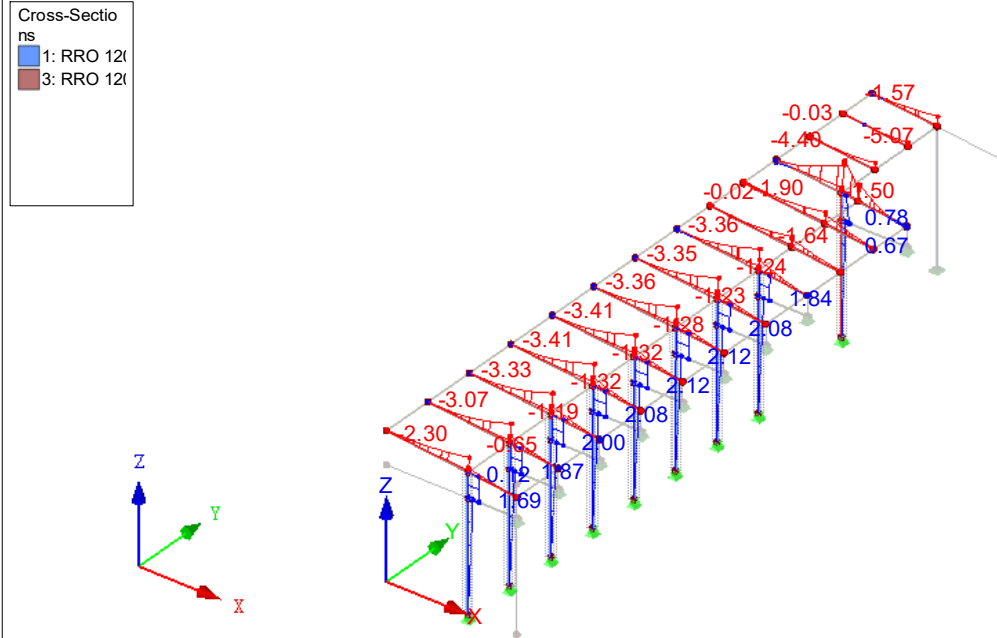
INTERNAL FORCES M_y

RC1 : ULS (STR/GEO) - Permanent / transient - Eq. 6.10

Internal Forces M-y

Result Combinations: Max and Min Values

Isometric



Max M-y: 2.12, Min M-y: -5.07 [kNm]

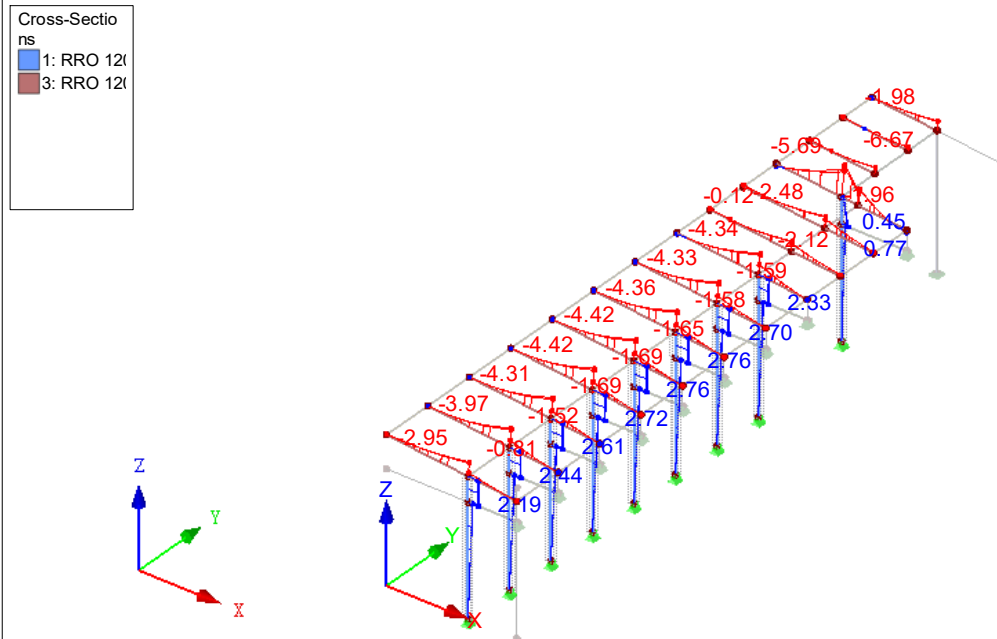
INTERNAL FORCES M_y

RC3 : ULS (STR/GEO) - Accidental - psi-1,1

Internal Forces M-y

Result Combinations: Max and Min Values

Isometric



Max M-y: 2.76, Min M-y: -6.67 [kNm]



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RESULTS

Project:

Model: RRA - Inkubator_PZI_3D model_nadstresek

Date: 23. 09. 2026

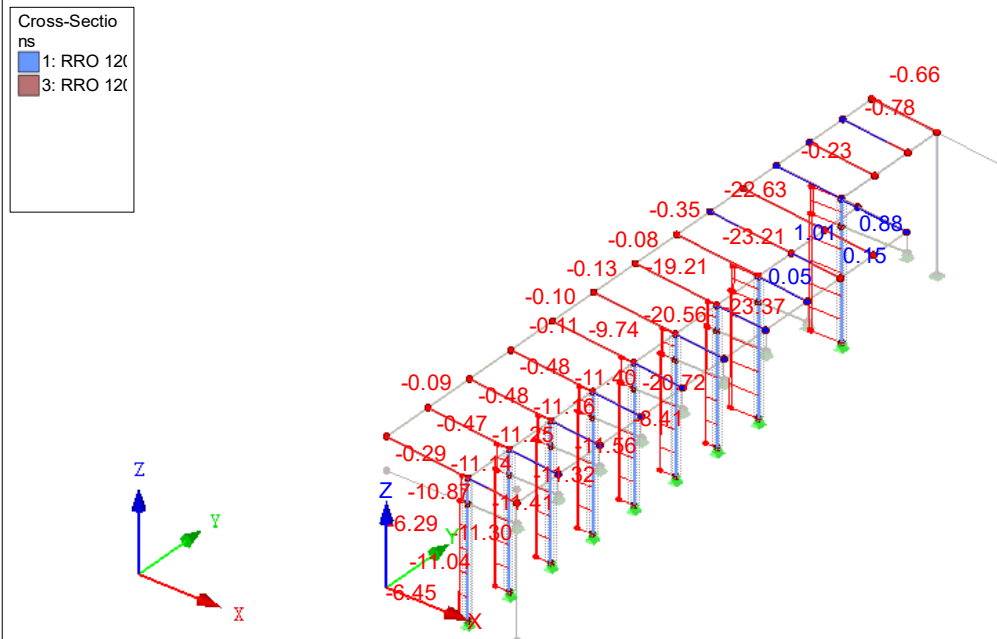
INTERNAL FORCES N

RC3 : ULS (STR/GEO) - Accidental - psi-1,1

Internal Forces N

Result Combinations: Max and Min Values

Isometric



Max N: 1.01, Min N: -23.37 [kN]

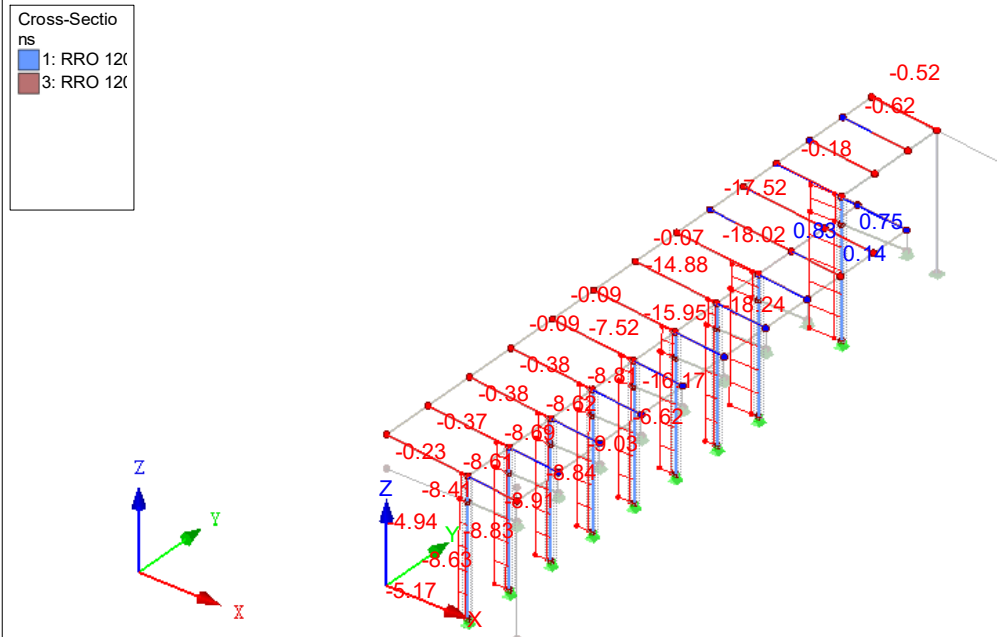
INTERNAL FORCES N

RC1 : ULS (STR/GEO) - Permanent / transient - Eq. 6.10

Internal Forces N

Result Combinations: Max and Min Values

Isometric



Max N: 0.83, Min N: -18.24 [kN]



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Sheet: 1

RESULTS

Project:

Model: RRA - Inkubator_PZI_3D model_nadstresek

Date: 23. 09. 2026

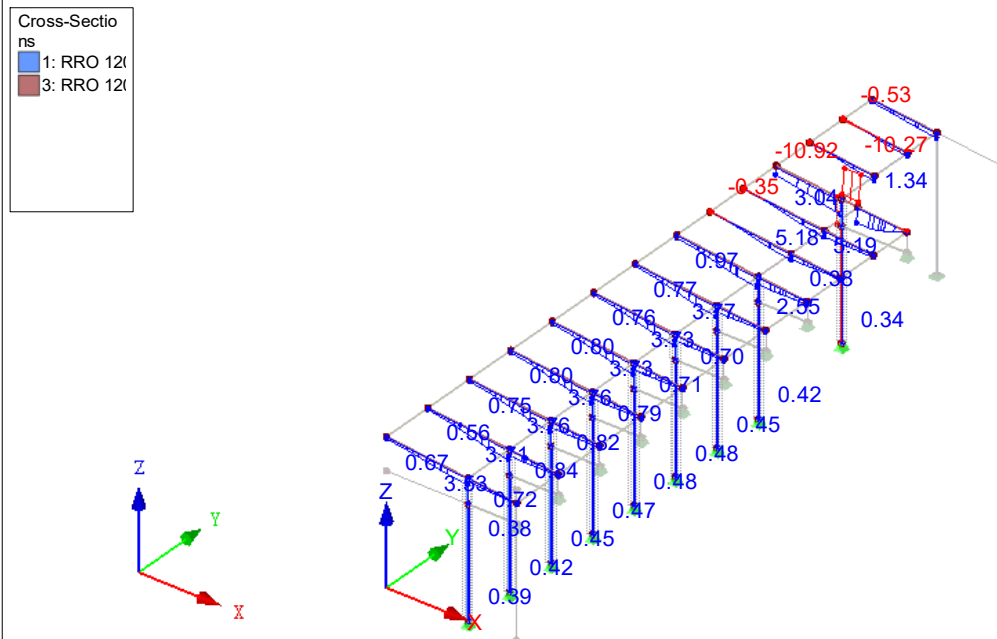
INTERNAL FORCES V_z

RC1 : ULS (STR/GEO) - Permanent / transient - Eq. 6.10

Internal Forces V-z

Result Combinations: Max and Min Values

Isometric



Max V-z: 5.19, Min V-z: -10.92 [kN]

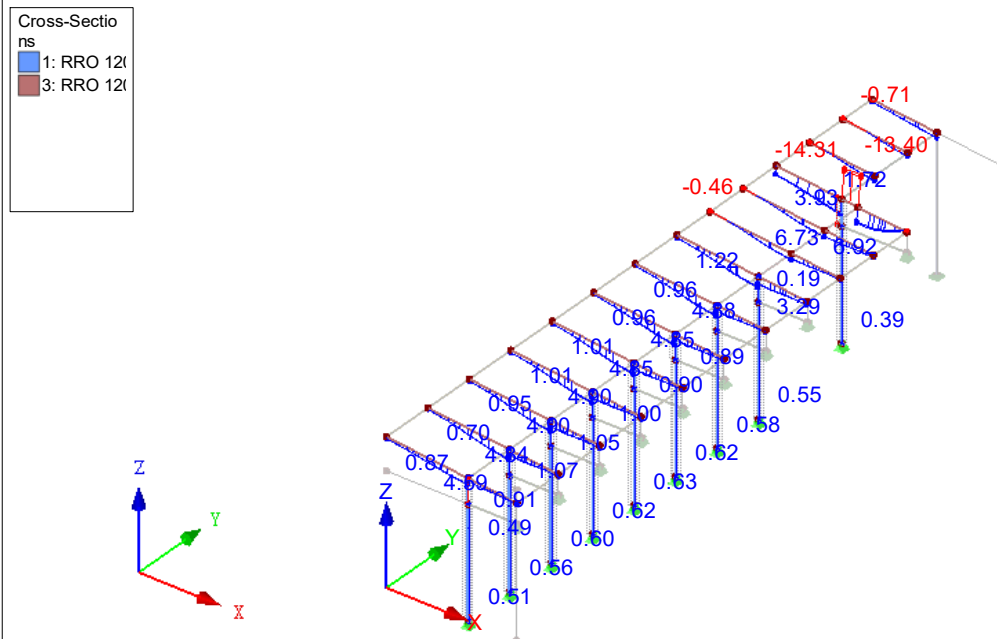
INTERNAL FORCES V_z

RC3 : ULS (STR/GEO) - Accidental - psi-1,1

Internal Forces V-z

Result Combinations: Max and Min Values

Isometric



Max V-z: 6.92, Min V-z: -14.31 [kN]



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RESULTS

Project:

Model: RRA - Inkubator_PZI_3D model_nadstresek

Date: 23. 09. 2026

INTERNAL FORCES V_z

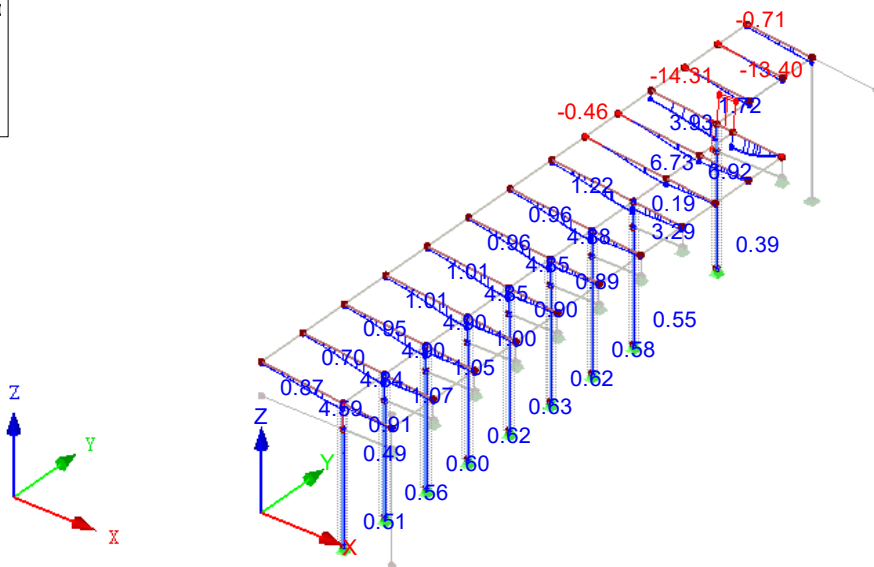
RC3 : ULS (STR/GEO) - Accidental - psi-1,1

Internal Forces V-z

Result Combinations: Max and Min Values

Isometric

Cross-Sections
1: RRO 12I
3: RRO 12I



Max V-z: 6.92, Min V-z: -14.31 [kN]



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RF-STEEL Members

RF-STEEL Members
CA1
General stress analysis
of steel members

Project: Model: RRA - Inkubator_PZI_3D model_nadstresek

Date: 23. 09. 2026

1.1.1 GENERAL DATA

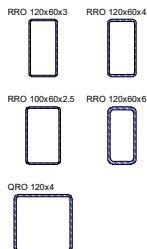
Members to design:	All		
Result combinations to design:	RC1 RC3	ULS (STR/GEO) - Permanent / transient - Eq. 6.10 ULS (STR/GEO) - Accidental - psi-1,1	

1.2 MATERIALS

Matl. No.	Material Description	Safety Factor γ_M [-]	Yield Strength f_{yk} [kN/cm ²]	Manually	Limit Stresses [kN/cm ²]		
					Limit σ_x	Limit τ	Limit σ_{eqv}
1	Steel S 235	1.00	23.50	☐	23.50	13.57	23.50

1.3.1 CROSS-SECTIONS

Sect. No.	Matl. No.	Cross-section Description	I_t [cm ⁴] A [cm ²]	I_y [cm ⁴] $\alpha_{pl,y}$	I_z [cm ⁴] $\alpha_{pl,z}$	Comment
1	1	RRO 120x60x3 EN 10219-2:2006	156.00 10.20	189.00 1.24	64.40 1.13	steber
2	1	RRO 120x60x3 EN 10219-2:2006	156.00 10.20	189.00 1.24	64.40 1.13	SN
3	1	RRO 120x60x4 EN 10219-2:2006	201.00 13.30	241.00 1.26	81.20 1.15	PN
4	1	RRO 100x60x2.5 EN 10219-2:2006	103.00 7.59	103.00 1.22	46.90 1.13	
5	1	RRO 120x60x6 EN 10219-2:2006	280.00 19.20	328.00 1.29	109.00 1.19	
6	1	QRO 120x4 EN 10219-2:2006	637.00 18.10	402.00 1.17	402.00 1.17	
8	1	QRO 120x4 EN 10219-2:2006	637.00 18.10	402.00 1.17	402.00 1.17	



2.1 STRESSES BY CROSS-SECTION

Sect. No.	Member No.	Location x [m]	S-Point No.	Load Case	Stress Type	Stress [kN/cm ²]		Stress Ratio
						Existing	Limit	
1	RRO 120x60x3 EN 10219-2:2006 - steber							
	38	0.450	6	RC3	Sigma Total	-11.16	23.50	0.47
	98	0.480	8	RC3	Tau Total	0.45	13.57	0.03
	38	0.450	6	RC3	Sigma-eqv	11.16	23.50	0.48
2	RRO 120x60x3 EN 10219-2:2006 - SN							
	70	1.000	3	RC3	Sigma Total	7.06	23.50	0.30
	86	0.000	16	RC3	Tau Total	1.62	13.57	0.12
	70	1.000	3	RC3	Sigma-eqv	7.06	23.50	0.30
3	RRO 120x60x4 EN 10219-2:2006 - PN							
	44	0.301	3	RC3	Sigma Total	17.51	23.50	0.75
	44	0.000	8	RC3	Tau Total	5.09	13.57	0.38
	44	0.301	11	RC3	Sigma-eqv	18.57	23.50	0.79
4	RRO 100x60x2.5 EN 10219-2:2006							
	22	0.000	3	RC3	Sigma Total	7.32	23.50	0.31
	37	0.000	16	RC3	Tau Total	0.48	13.57	0.04
	22	0.000	3	RC3	Sigma-eqv	7.32	23.50	0.31
5	RRO 120x60x6 EN 10219-2:2006							
	85	0.000	13	RC3	Sigma Total	5.97	23.50	0.25
	85	0.800	8	RC3	Tau Total	2.18	13.57	0.16
	85	0.000	11	RC3	Sigma-eqv	6.63	23.50	0.28
6	QRO 120x4 EN 10219-2:2006							
	100	2.500	2	RC3	Sigma Total	-6.85	23.50	0.29
	100	0.250	15	RC3	Tau Total	0.29	13.57	0.02
	100	2.500	2	RC3	Sigma-eqv	6.85	23.50	0.29
8	QRO 120x4 EN 10219-2:2006							
	101	0.000	3	RC3	Sigma Total	3.35	23.50	0.14
	101	0.800	8	RC3	Tau Total	-1.92	13.57	0.14
	101	0.000	11	RC3	Sigma-eqv	4.22	23.50	0.18

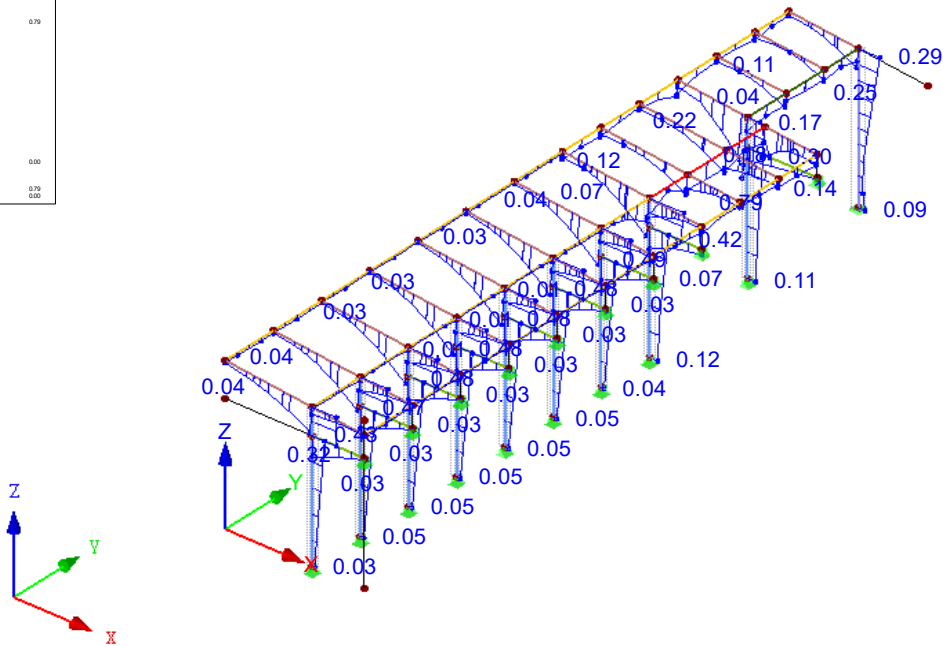
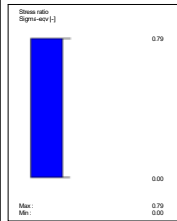
Project: Model: RRA - Inkubator_PZI_3D model_nadstresek

Date: 23. 09. 2026

■ STRESS RATIO Sigma-eqv

RF-STEEL Members CA1

Isometric



Max Sigma-eqv: 0.79, Min Sigma-eqv: 0.00



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RF-STEEL EC3

RF-STEEL EC3

CA1

stebri

Project:

Model: RRA - Inkubator_PZI_3D model_nadstresek

Date:

23. 09. 2026

1.1 GENERAL DATA

	Members to design:		
	Sets of members to design:	1-10	
	National Annex:	SIST	
	Ultimate Limit State Design		
	Result combinations to design:	RC1	ULS (STR/GEO) - Permanent / transient - Eq. 6.10
	RC3	ULS (STR/GEO) - Accidental - psi-1,1	

1.2 MATERIALS

Matl. No.	Material Description	E- Modulus E [kN/cm ²]	Shear Modulus G [kN/cm ²]	Poisson's Ratio ν [-]	Yield Stress f _{yk} [kN/cm ²]	Max. Thickness t [mm]
1	Steel S 235 EN 10025-2:2004-11	21000.00	8076.92	0.300	23.50	16.0
					22.50	40.0
					21.50	100.0
					19.50	150.0
					18.50	200.0
					17.50	250.0
					16.50	400.0

RRO 120x60x3

QRO 120x4



1.3 CROSS-SECTIONS

Sect. No.	Matl. No.	Cross-Section Description	Cross-Section Type	Max Design Ratio	Comment
1	1	RRO 120x60x3 EN 10219-2:2006	Box rolled	0.40	steber
6	1	QRO 120x4 EN 10219-2:2006	Box rolled	0.18	

2.3 DESIGN BY SET OF MEMBERS

Set No.	Member No.	Location x [m]	LC/CO/ RC	Design	Equation No.	Description
1	Continuous Members 1 (Member No. 1,3)					
	1	0.000	RC3	0.03	≤ 1	CS102) Cross-section check - Compression acc. to 6.2.4
	1	0.000	RC3	0.01	≤ 1	CS121) Cross-section check - Shear force in z-axis acc. to 6.2.6
	3	0.000	RC3	0.00	≤ 1	CS123) Cross-section check - Shear force in y-axis acc. to 6.2.6
	1	0.000	RC1	0.00	≤ 1	CS126) Cross-section check - Shear buckling acc. to 6.2.6(6)
	3	0.000	RC1	0.07	≤ 1	CS181) Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	1	0.000	RC3	0.01	≤ 1	CS201) Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	3	0.000	RC3	0.10	≤ 1	CS221) Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	3	0.000	RC3	0.28	≤ 1	ST371) Stability analysis - Bending and compression acc. to 6.3.4, General Method
2	Continuous Members 2 (Member No. 6,8)					
	6	0.000	RC3	0.05	≤ 1	CS102) Cross-section check - Compression acc. to 6.2.4
	6	0.000	RC3	0.01	≤ 1	CS121) Cross-section check - Shear force in z-axis acc. to 6.2.6
	6	0.000	RC1	0.00	≤ 1	CS126) Cross-section check - Shear buckling acc. to 6.2.6(6)
	8	0.000	RC3	0.26	≤ 1	CS181) Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	8	0.450	RC3	0.11	≤ 1	CS221) Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
3	Continuous Members 3 (Member No. 11,13)					
	11	0.000	RC3	0.05	≤ 1	CS102) Cross-section check - Compression acc. to 6.2.4
	11	0.000	RC3	0.01	≤ 1	CS121) Cross-section check - Shear force in z-axis acc. to 6.2.6
	11	0.000	RC1	0.00	≤ 1	CS126) Cross-section check - Shear buckling acc. to 6.2.6(6)
	13	0.000	RC3	0.28	≤ 1	CS181) Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	13	0.450	RC3	0.12	≤ 1	CS221) Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
4	Continuous Members 4 (Member No. 16,18)					
	16	0.000	RC3	0.05	≤ 1	CS102) Cross-section check - Compression acc. to 6.2.4
	16	0.000	RC3	0.01	≤ 1	CS121) Cross-section check - Shear force in z-axis acc. to 6.2.6
	16	0.000	RC1	0.00	≤ 1	CS126) Cross-section check - Shear buckling acc. to 6.2.6(6)
	18	0.225	RC3	0.29	≤ 1	CS181) Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	18	0.450	RC3	0.13	≤ 1	CS221) Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
5	Continuous Members 5 (Member No. 21,23)					
	21	0.000	RC3	0.05	≤ 1	CS102) Cross-section check - Compression acc. to 6.2.4
	21	0.000	RC3	0.01	≤ 1	CS121) Cross-section check - Shear force in z-axis acc. to 6.2.6



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2.3 DESIGN BY SET OF MEMBERS

Set No.	Member No.	Location x [m]	LC/CO/ RC	Design		Equation No.	Description
6	21	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	23	0.225	RC3	0.30	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	23	0.450	RC3	0.13	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	23	0.450	RC3	0.38	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
	Continuous Members 6 (Member No. 26,28)						
	26	0.000	RC3	0.05	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	26	0.000	RC3	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	26	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	28	0.000	RC3	0.29	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	28	0.450	RC3	0.13	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	28	0.450	RC3	0.38	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
	Continuous Members 7 (Member No. 31,33)						
	31	0.000	RC3	0.04	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	31	0.000	RC3	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	31	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	33	0.450	RC1	0.08	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	31	0.000	RC3	0.00	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	33	0.450	RC3	0.13	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	33	0.450	RC3	0.35	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
	Continuous Members 8 (Member No. 36,38)						
	36	0.000	RC3	0.09	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	36	0.000	RC3	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	38	0.000	RC3	0.01	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	36	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	36	0.820	RC3	0.05	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	36	0.000	RC3	0.02	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	38	0.450	RC3	0.12	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	38	0.450	RC3	0.40	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
	Continuous Members 9 (Member No. 46,98)						
	46	0.000	RC3	0.10	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	98	0.480	RC3	0.02	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	46	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	46	1.230	RC1	0.03	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	46	0.000	RC3	0.01	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	98	0.000	RC3	0.04	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	98	0.000	RC3	0.33	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
	Continuous Members 10 (Member No. 100)						
	100	0.000	RC3	0.03	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	100	0.250	RC3	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	100	0.750	RC3	0.01	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	100	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	100	0.750	RC1	0.03	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	100	0.250	RC3	0.03	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	100	2.500	RC3	0.06	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	100	2.500	RC3	0.18	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method

2.4 DESIGN BY MEMBER

Member No.	Location x [m]	LC/CO/ RC	Design	Equation No.	Description	
1	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006					
	0.000	RC3	0.03	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.000	RC3	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	1.230	RC3	0.07	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0.000	RC3	0.01	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1



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2.4 DESIGN BY MEMBER

Member No.	Location x [m]	LC/CO/ RC	Design		Equation No.	Description
3	2.050	RC3	0.03	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	2.050	RC3	0.16	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006					
	0.000	RC3	0.02	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.000	RC3	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.07	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0.000	RC3	0.10	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0.000	RC3	0.28	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006					
	0.000	RC3	0.05	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
6	0.000	RC3	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	2.050	RC3	0.12	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	2.050	RC3	0.20	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006					
	0.000	RC3	0.04	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.000	RC3	0.26	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0.450	RC3	0.11	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0.450	RC3	0.34	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006					
11	0.000	RC3	0.05	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.000	RC3	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	2.050	RC3	0.13	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	2.050	RC3	0.22	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006					
	0.000	RC3	0.04	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.000	RC3	0.28	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0.450	RC3	0.12	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0.450	RC3	0.36	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
16	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006					
	0.000	RC3	0.05	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.000	RC3	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	2.050	RC3	0.14	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	2.050	RC3	0.22	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006					
	0.000	RC3	0.04	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.225	RC3	0.29	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0.450	RC3	0.13	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
18	0.450	RC3	0.37	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006					
	0.000	RC3	0.05	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.000	RC3	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	2.050	RC3	0.14	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	2.050	RC3	0.22	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006					
	0.000	RC3	0.04	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.225	RC3	0.30	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
21	0.450	RC3	0.13	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0.450	RC3	0.38	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006					
	0.000	RC3	0.05	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.000	RC3	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	2.050	RC3	0.14	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	2.050	RC3	0.22	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006					
	0.000	RC3	0.05	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
23	0.000	RC3	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	2.050	RC3	0.14	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	2.050	RC3	0.22	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006					
	0.000	RC3	0.05	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.000	RC3	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	2.050	RC3	0.14	≤ 1	CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	2.050	RC3	0.22	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method



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2.4 DESIGN BY MEMBER

Member No.	Location x [m]	LC/CO/ RC	Design	Equation No.	Description
General Method					
28	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006				
	0.000	RC3	0.04	≤ 1 CS102)	Cross-section check - Compression acc. to 6.2.4
	0.000	RC1	0.00	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	RC3	0.29	≤ 1 CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0.450	RC3	0.13	≤ 1 CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0.450	RC3	0.38	≤ 1 ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
31	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006				
	0.000	RC3	0.04	≤ 1 CS102)	Cross-section check - Compression acc. to 6.2.4
	0.000	RC3	0.01	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	1.230	RC3	0.07	≤ 1 CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0.000	RC3	0.00	≤ 1 CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	2.050	RC3	0.03	≤ 1 CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
33	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006				
	0.000	RC3	0.03	≤ 1 CS102)	Cross-section check - Compression acc. to 6.2.4
	0.000	RC1	0.00	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.450	RC1	0.08	≤ 1 CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0.450	RC3	0.13	≤ 1 CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0.450	RC3	0.35	≤ 1 ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
36	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006				
	0.000	RC3	0.09	≤ 1 CS102)	Cross-section check - Compression acc. to 6.2.4
	0.000	RC3	0.01	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.820	RC3	0.00	≤ 1 CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.820	RC3	0.05	≤ 1 CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0.000	RC3	0.02	≤ 1 CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
38	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006				
	0.000	RC3	0.08	≤ 1 CS102)	Cross-section check - Compression acc. to 6.2.4
	0.000	RC1	0.00	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC3	0.01	≤ 1 CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.450	RC3	0.12	≤ 1 CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0.450	RC3	0.40	≤ 1 ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method
46	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006				
	0.000	RC3	0.10	≤ 1 CS102)	Cross-section check - Compression acc. to 6.2.4
	0.000	RC3	0.00	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	1.230	RC1	0.03	≤ 1 CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0.000	RC3	0.01	≤ 1 CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	2.050	RC3	0.02	≤ 1 CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
98	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006				
	0.000	RC3	0.09	≤ 1 CS102)	Cross-section check - Compression acc. to 6.2.4
	0.480	RC3	0.02	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	RC1	0.02	≤ 1 CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0.480	RC1	0.01	≤ 1 CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	0.000	RC3	0.04	≤ 1 CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
100	Cross-section No. 6 - QRO 120x4 EN 10219-2:2006				
	0.000	RC3	0.03	≤ 1 CS102)	Cross-section check - Compression acc. to 6.2.4
	0.250	RC3	0.01	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.750	RC3	0.01	≤ 1 CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.750	RC1	0.03	≤ 1 CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1



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RF-STEEL EC3

Project: Model: RRA - Inkubator_PZI_3D model_nadstresek

Date: 23. 09. 2026

2.4 DESIGN BY MEMBER

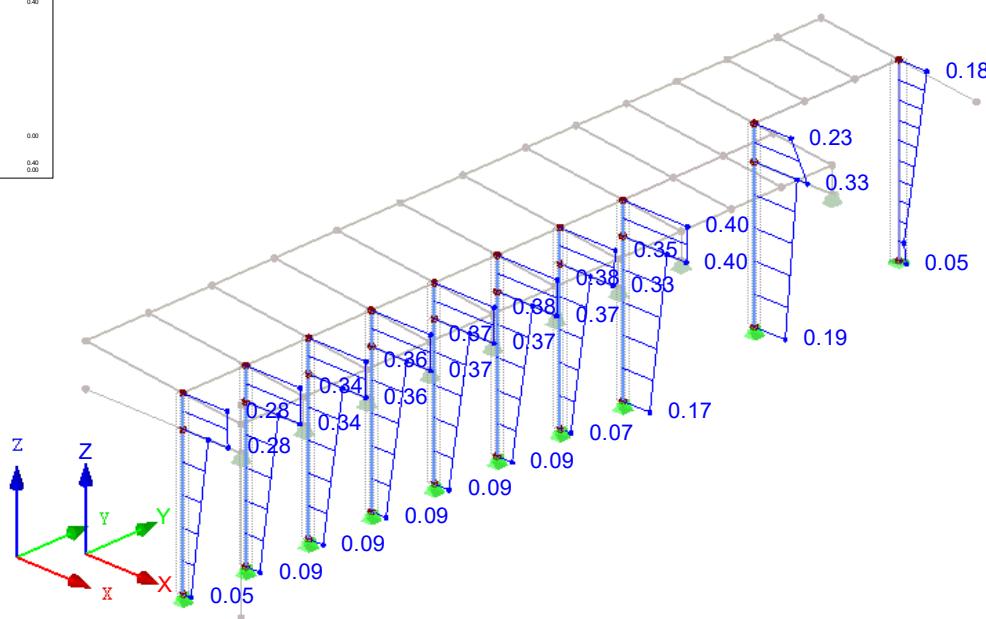
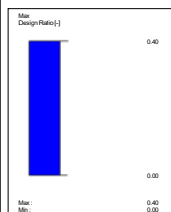
Member No.	Location x [m]	LC/CO/RC	Design		Equation No.	Description
	0.250	RC3	0.03	≤ 1	CS201)	Cross-section check - Bending about z-axis, shear and axial force acc. to 6.2.9.1
	2.500	RC3	0.06	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	2.500	RC3	0.18	≤ 1	ST371)	Stability analysis - Bending and compression acc. to 6.3.4, General Method

DESIGN RATIO

RF-STEEL EC3 CA1

Isometric

Ultimate Limit State: Cross-Section Design, Stability Design, Weld Design, Pressure Design, Plastic Design



Max Design Ratio: 0.40

RF-STEEL EC3
CA2
PN

1.1 GENERAL DATA

	Members to design:	4,9,14,19,24,29,34,39,41-43,47,82,99		
	Sets of members to design:			
	National Annex:	SIST		
	Ultimate Limit State Design			
	Result combinations to design:	RC1	ULS (STR/GEO) - Permanent / transient - Eq. 6.10	
		RC3	ULS (STR/GEO) - Accidental - psi-1,1	
	Serviceability Limit State Design			
	Result combinations to design:	RC2	SLS - Characteristic	

1.2 MATERIALS

Matl. No.	Material Description	E- Modulus E [kN/cm ²]	Shear Modulus G [kN/cm ²]	Poisson's Ratio ν [-]	Yield Stress f_{yk} [kN/cm ²]	Max. Thickness t [mm]
1	Steel S 235 EN 10025-2:2004-11	21000.00	8076.92	0.300	23.50	16.0
					22.50	40.0
					21.50	100.0
					19.50	150.0
					18.50	200.0
					17.50	250.0
					16.50	400.0



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RF-STEEL EC3

Project: Model: RRA - Inkubator_PZI_3D model_nadstresek

Date: 23. 09. 2026

RRO 120x60x4



1.3 CROSS-SECTIONS

Sect. No.	Matl. No.	Cross-Section Description	Cross-Section Type	Max Design Ratio	Comment
3	1	RRO 120x60x4 EN 10219-2:2006	Box rolled	0.95	PN

2.4 DESIGN BY MEMBER

Member No.	Location x [m]	LC/CO/RC	Design	Equation No.	Description
4	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006				
	0.754	RC3	0.09	≤ 1 CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.507	RC1	0.00	≤ 1 CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.02	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.754	RC3	0.09	≤ 1 CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.507	RC1	0.00	≤ 1 CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.10	≤ 1 CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	RC2	0.00	≤ 1 SE400)	Serviceability - Negligible deformations
	1.507	RC2	0.74	≤ 1 SE411)	Serviceability - Combination of actions 'Characteristic' - z-direction, Cantilever
9	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006				
	0.377	RC1	0.13	≤ 1 CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.507	RC3	0.01	≤ 1 CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.04	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.377	RC1	0.13	≤ 1 CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.507	RC3	0.01	≤ 1 CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.16	≤ 1 CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	RC2	0.00	≤ 1 SE400)	Serviceability - Negligible deformations
	1.507	RC2	0.84	≤ 1 SE411)	Serviceability - Combination of actions 'Characteristic' - z-direction, Cantilever
14	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006				
	0.000	RC1	0.13	≤ 1 CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.507	RC1	0.01	≤ 1 CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.04	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	RC1	0.13	≤ 1 CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.507	RC1	0.01	≤ 1 CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.19	≤ 1 CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	RC2	0.00	≤ 1 SE400)	Serviceability - Negligible deformations
	1.507	RC2	0.90	≤ 1 SE411)	Serviceability - Combination of actions 'Characteristic' - z-direction, Cantilever
19	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006				
	0.000	RC1	0.14	≤ 1 CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.507	RC1	0.01	≤ 1 CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.04	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	RC1	0.14	≤ 1 CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.507	RC1	0.01	≤ 1 CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.19	≤ 1 CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	RC2	0.00	≤ 1 SE400)	Serviceability - Negligible deformations
	1.507	RC2	0.94	≤ 1 SE411)	Serviceability - Combination of actions 'Characteristic' - z-direction, Cantilever
24	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006				
	1.507	RC1	0.00	≤ 1 CS100)	Negligible internal forces
	0.000	RC1	0.14	≤ 1 CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.507	RC1	0.01	≤ 1 CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.04	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.500	RC3	0.00	≤ 1 CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	RC1	0.14	≤ 1 CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 a



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RF-STEEL EC3

Project: Model: RRA - Inkubator_PZI_3D model_nadstresek

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2.4 DESIGN BY MEMBER

Member No.	Location x [m]	LC/CO/ RC	Design		Equation No.	Description
29	1.507	RC1	0.01	≤ 1	CS151)	and 6.2.8 Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.20	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	RC2	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1.507	RC2	0.95	≤ 1	SE411)	Serviceability - Combination of actions 'Characteristic' - z-direction, Cantilever
	1.507	RC2	0.02	≤ 1	SE416)	Serviceability - Combination of actions 'Characteristic' - y-direction, Cantilever
	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	1.507	RC1	0.00	≤ 1	CS100)	Negligible internal forces
	0.754	RC3	0.10	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.507	RC3	0.02	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.04	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.754	RC3	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.754	RC3	0.10	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.507	RC3	0.02	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.19	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	RC2	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1.507	RC2	0.94	≤ 1	SE411)	Serviceability - Combination of actions 'Characteristic' - z-direction, Cantilever
	1.507	RC2	0.02	≤ 1	SE416)	Serviceability - Combination of actions 'Characteristic' - y-direction, Cantilever
34	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	1.507	RC1	0.00	≤ 1	CS100)	Negligible internal forces
	0.754	RC3	0.10	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.507	RC1	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.04	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.377	RC3	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.754	RC3	0.10	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.507	RC1	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.19	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	RC2	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1.507	RC2	0.91	≤ 1	SE411)	Serviceability - Combination of actions 'Characteristic' - z-direction, Cantilever
	1.507	RC2	0.02	≤ 1	SE416)	Serviceability - Combination of actions 'Characteristic' - y-direction, Cantilever
39	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.000	RC3	0.00	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.754	RC3	0.10	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.04	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	1.507	RC3	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.754	RC3	0.10	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC1	0.12	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	RC3	0.19	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0.000	RC2	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1.507	RC2	0.86	≤ 1	SE411)	Serviceability - Combination of actions 'Characteristic' - z-direction, Cantilever
	1.507	RC2	0.03	≤ 1	SE416)	Serviceability - Combination of actions 'Characteristic' - y-direction, Cantilever
41	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.000	RC3	0.00	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.603	RC1	0.04	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.206	RC1	0.02	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.02	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	1.206	RC3	0.01	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.603	RC1	0.04	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.206	RC1	0.02	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC1	0.04	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	RC3	0.06	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0.000	RC2	0.00	≤ 1	SE400)	Serviceability - Negligible deformations
	1.206	RC2	0.56	≤ 1	SE411)	Serviceability - Combination of actions 'Characteristic' - z-direction, Cantilever
	1.206	RC2	0.03	≤ 1	SE416)	Serviceability - Combination of actions 'Characteristic' - y-direction, Cantilever



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RF-STEEL EC3

Project: Model: RRA - Inkubator_PZI_3D model_nadstresek

Date: 23. 09. 2026

2.4 DESIGN BY MEMBER

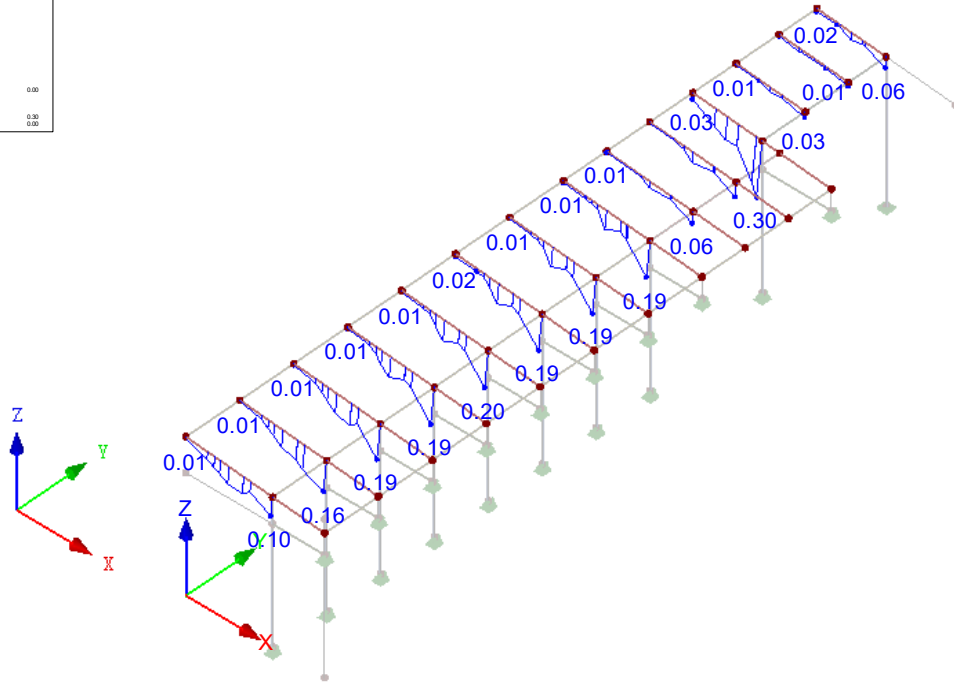
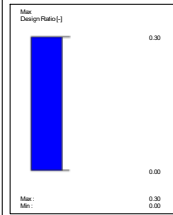
Member No.	Location x [m]	LC/CO/ RC	Design	Equation No.	Description
42	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006				
	0.603	RC3	0.02	≤ 1 CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.02	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC3	0.01	≤ 1 CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.603	RC3	0.02	≤ 1 CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.03	≤ 1 CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	RC2	0.00	≤ 1 SE400)	Serviceability - Negligible deformations
	1.206	RC2	0.61	≤ 1 SE411)	Serviceability - Combination of actions 'Characteristic' - z-direction, Cantilever
	1.206	RC2	0.03	≤ 1 SE416)	Serviceability - Combination of actions 'Characteristic' - y-direction, Cantilever
43	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006				
	0.856	RC1	0.00	≤ 1 CS100)	Negligible internal forces
	0.000	RC1	0.01	≤ 1 CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.856	RC3	0.02	≤ 1 CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.01	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	1.206	RC3	0.01	≤ 1 CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	RC1	0.01	≤ 1 CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.856	RC3	0.02	≤ 1 CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.02	≤ 1 CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
47	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006				
	0.754	RC3	0.03	≤ 1 CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.02	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	1.131	RC3	0.01	≤ 1 CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.754	RC3	0.03	≤ 1 CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.06	≤ 1 CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	RC2	0.00	≤ 1 SE400)	Serviceability - Negligible deformations
	1.507	RC2	0.68	≤ 1 SE411)	Serviceability - Combination of actions 'Characteristic' - z-direction, Cantilever
	1.507	RC2	0.03	≤ 1 SE416)	Serviceability - Combination of actions 'Characteristic' - y-direction, Cantilever
82	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006				
	0.754	RC3	0.06	≤ 1 CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.03	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC3	0.00	≤ 1 CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.754	RC3	0.06	≤ 1 CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.08	≤ 1 CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	RC2	0.00	≤ 1 SE400)	Serviceability - Negligible deformations
	1.507	RC2	0.58	≤ 1 SE411)	Serviceability - Combination of actions 'Characteristic' - z-direction, Cantilever
	1.507	RC2	0.03	≤ 1 SE416)	Serviceability - Combination of actions 'Characteristic' - y-direction, Cantilever
99	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006				
	0.000	RC1	0.18	≤ 1 CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.06	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	RC1	0.18	≤ 1 CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.30	≤ 1 CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	RC2	0.00	≤ 1 SE400)	Serviceability - Negligible deformations
	1.206	RC2	0.72	≤ 1 SE411)	Serviceability - Combination of actions 'Characteristic' - z-direction, Cantilever
	1.206	RC2	0.03	≤ 1 SE416)	Serviceability - Combination of actions 'Characteristic' - y-direction, Cantilever

DESIGN RATIO

RF-STEEL EC3 CA2

Ultimate Limit State: Cross-Section Design, Stability Design, Weld Design, Pressure Design, Plastic Design

Isometric



Max Design Ratio: 0.30

RF-STEEL EC3

CA3

streha_SN

1.1 GENERAL DATA

Members to design:	23,24,51,52
Sets of members to design:	
National Annex:	SIST
Ultimate Limit State Design	
Result combinations to design:	RC1 ULS (STR/GEO) - Permanent / transient - Eq. 6.10
Serviceability Limit State Design	
Result combinations to design:	RC2 SLS - Characteristic

1.2 MATERIALS

Matl. No.	Material Description	E- Modulus E [kN/cm ²]	Shear Modulus G [kN/cm ²]	Poisson's Ratio ν [-]	Yield Stress f _{yk} [kN/cm ²]	Max. Thickness t [mm]
1	Steel S 235 EN 10025-2:2004-11	21000.00	8076.92	0.300	23.50	16.0
					22.50	40.0
					21.50	100.0
					19.50	150.0
					18.50	200.0
					17.50	250.0
					16.50	400.0

1.3 CROSS-SECTIONS

RRO 120x60x3 RRO 120x60x4



Sect. No.	Matl. No.	Cross-Section Description	Cross-Section Type	Max Design Ratio	Comment
1	1	RRO 120x60x3 EN 10219-2:2006	Box rolled	0.26	steber
2	1	RRO 120x60x3 EN 10219-2:2006	Box rolled	0.02	SN
3	1	RRO 120x60x4 EN 10219-2:2006	Box rolled	0.14	PN



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RF-STEEL EC3

Project: Model: RRA - Inkubator_PZI_3D model_nadstresek

Date: 23. 09. 2026

2.4 DESIGN BY MEMBER

Member No.	Location x [m]	LC/CO/ RC	Design	Equation No.	Description
23	Cross-section No. 1 - RRO 120x60x3 EN 10219-2:2006				
	0.000	RC1	0.03	≤ 1 CS102)	Cross-section check - Compression acc. to 6.2.4
	0.225	RC1	0.23	≤ 1 CS181)	Cross-section check - Bending, shear and axial force acc. to 6.2.9.1
	0.450	RC1	0.09	≤ 1 CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
	0.000	RC1	0.26	≤ 1 ST364)	Stability analysis - Bending and compression acc. to 6.3.3, Method 2
	0.000	RC2	0.00	≤ 1 SE400)	Serviceability - Negligible deformations
	0.225	RC2	0.04	≤ 1 SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	0.225	RC2	0.00	≤ 1 SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
24	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006				
	1.507	RC1	0.00	≤ 1 CS100)	Negligible internal forces
	0.000	RC1	0.14	≤ 1 CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.507	RC1	0.01	≤ 1 CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC1	0.03	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	RC1	0.14	≤ 1 CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.507	RC1	0.01	≤ 1 CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC1	0.13	≤ 1 CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	RC2	0.00	≤ 1 SE400)	Serviceability - Negligible deformations
	0.502	RC2	0.06	≤ 1 SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
	0.377	RC2	0.00	≤ 1 SE406)	Serviceability - Combination of actions 'Characteristic' - y-direction
51	Cross-section No. 2 - RRO 120x60x3 EN 10219-2:2006				
	0.750	RC1	0.02	≤ 1 CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC1	0.01	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.750	RC1	0.02	≤ 1 CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC1	0.00	≤ 1 CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	RC2	0.00	≤ 1 SE400)	Serviceability - Negligible deformations
	0.500	RC2	0.01	≤ 1 SE401)	Serviceability - Combination of actions 'Characteristic' - z-direction
52	Cross-section No. 2 - RRO 120x60x3 EN 10219-2:2006				
	0.500	RC1	0.02	≤ 1 CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC1	0.00	≤ 1 CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC1	0.00	≤ 1 CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1 CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.500	RC1	0.02	≤ 1 CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC1	0.00	≤ 1 CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.250	RC1	0.00	≤ 1 CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9



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RF-STAHLEC3

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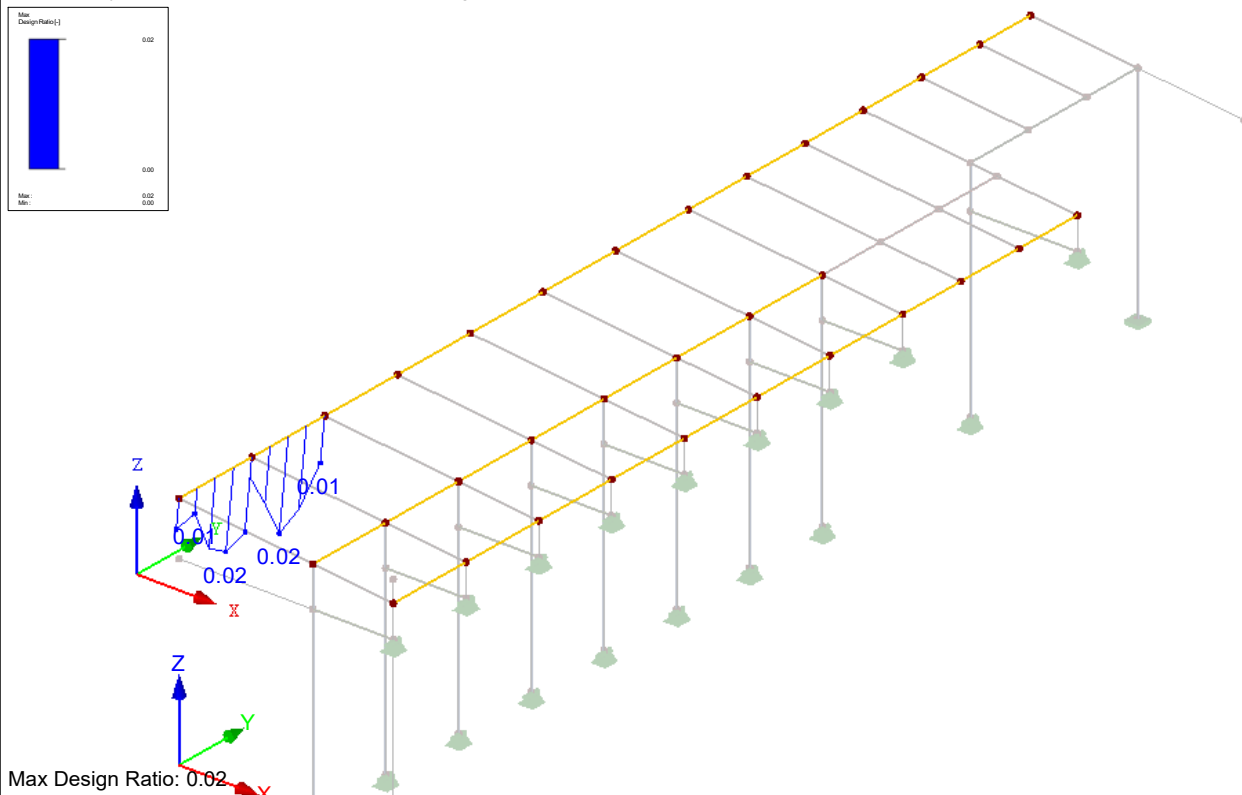
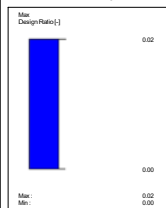
DESIGN RATIO

RF-STEEL EC3 CA3

Ultimate Limit State: Cross-Section Design, Stability Design, Weld Design, Pressure Design, Plastic Design

Serviceability Limit State: Deformations, Web Breathing

Isometric



RF-STEEL EC3

CA4

PN - neznodna

1.1 GENERAL DATA

Members to design:	4, 9, 14, 19, 24, 29, 34, 39, 41-43, 47, 82, 99
Sets of members to design:	
National Annex:	SIST
Ultimate Limit State Design	
Result combinations to design:	RC1 ULS (STR/GEO) - Permanent / transient - Eq. 6.10 RC3 ULS (STR/GEO) - Accidental - psi-1,1

1.2 MATERIALS

Matl. No.	Material Description	E- Modulus E [kN/cm ²]	Shear Modulus G [kN/cm ²]	Poisson's Ratio ν [-]	Yield Stress f_{yk} [kN/cm ²]	Max. Thickness t [mm]
1	Steel S 235 EN 10025-2:2004-11	21000.00	8076.92	0.300	23.50	16.0
					22.50	40.0
					21.50	100.0
					19.50	150.0
					18.50	200.0
					17.50	250.0
					16.50	400.0

1.3 CROSS-SECTIONS

Sect. No.	Matl. No.	Cross-Section Description	Cross-Section Type	Max Design Ratio	Comment
3	1	RRO 120x60x4 EN 10219-2:2006	Box rolled	0.30	PN

2.4 DESIGN BY MEMBER

Member No.	Location x [m]	LC/CO/ RC	Design	Equation No.	Description
4	0.754	RC3	0.09	≤ 1	CS111) Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.507	RC1	0.00	≤ 1	CS116) Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.02	≤ 1	CS121) Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126) Cross-section check - Shear buckling acc. to 6.2.6(6)



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RF-STEEL EC3

Project: Model: RRA - Inkubator_PZI_3D model_nadstresek

Date: 23. 09. 2026

2.4 DESIGN BY MEMBER

Member No.	Location x [m]	LC/CO/ RC	Design		Equation No.	Description
9	0.754	RC3	0.09	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.507	RC1	0.00	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.10	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.377	RC1	0.13	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.507	RC3	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.04	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.377	RC1	0.13	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.507	RC3	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.16	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
14	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.000	RC1	0.13	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.507	RC1	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.04	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	RC1	0.13	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.507	RC1	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.19	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
19	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.000	RC1	0.14	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.507	RC1	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.04	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	RC1	0.14	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.507	RC1	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.19	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
24	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	1.507	RC1	0.00	≤ 1	CS100)	Negligible internal forces
	0.000	RC1	0.14	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.507	RC1	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.04	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.500	RC3	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	RC1	0.14	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.507	RC1	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.20	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
29	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	1.507	RC1	0.00	≤ 1	CS100)	Negligible internal forces
	0.754	RC3	0.10	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.507	RC3	0.02	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.04	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.754	RC3	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.754	RC3	0.10	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.507	RC3	0.02	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.19	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
34	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	1.507	RC1	0.00	≤ 1	CS100)	Negligible internal forces
	0.754	RC3	0.10	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.507	RC1	0.01	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.04	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.377	RC3	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.754	RC3	0.10	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.507	RC1	0.01	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8



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RF-STEEL EC3

Project:

Model: RRA - Inkubator_PZI_3D model_nadstresek

Date: 23. 09. 2026

2.4 DESIGN BY MEMBER

Member No.	Location x [m]	LC/CO/ RC	Design		Equation No.	Description
39	0.000	RC3	0.19	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.000	RC3	0.00	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.754	RC3	0.10	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.04	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	1.507	RC3	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.754	RC3	0.10	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC1	0.12	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	0.000	RC3	0.19	≤ 1	CS221)	Cross-section check - Biaxial bending, shear and axial force acc. to 6.2.10 and 6.2.9
41	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.000	RC3	0.00	≤ 1	CS102)	Cross-section check - Compression acc. to 6.2.4
	0.603	RC1	0.04	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	1.206	RC1	0.02	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.02	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	1.206	RC3	0.01	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.603	RC1	0.04	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	1.206	RC1	0.02	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC1	0.04	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
42	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.603	RC3	0.02	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.02	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC3	0.01	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.603	RC3	0.02	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.03	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.856	RC1	0.00	≤ 1	CS100)	Negligible internal forces
	0.000	RC1	0.01	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
43	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.856	RC3	0.02	≤ 1	CS116)	Cross-section check - Bending about z-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.01	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	1.206	RC3	0.01	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	RC1	0.01	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.856	RC3	0.02	≤ 1	CS151)	Cross-section check - Bending about z-axis and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.02	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.754	RC3	0.03	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
47	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.000	RC3	0.02	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	1.131	RC3	0.01	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.754	RC3	0.03	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.06	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.754	RC3	0.06	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.03	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC3	0.00	≤ 1	CS123)	Cross-section check - Shear force in y-axis acc. to 6.2.6
82	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.754	RC3	0.06	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.08	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.000	RC1	0.18	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.06	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	RC1	0.18	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.30	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
99	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.000	RC1	0.18	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.06	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)
	0.000	RC1	0.18	≤ 1	CS141)	Cross-section check - Bending and shear force acc. to 6.2.5 and 6.2.8
	0.000	RC3	0.30	≤ 1	CS161)	Cross-section check - Biaxial bending and shear force acc. to 6.2.6, 6.2.7 and 6.2.9
	Cross-section No. 3 - RRO 120x60x4 EN 10219-2:2006					
	0.000	RC1	0.18	≤ 1	CS111)	Cross-section check - Bending about y-axis acc. to 6.2.5 - Class 1 or 2
	0.000	RC3	0.06	≤ 1	CS121)	Cross-section check - Shear force in z-axis acc. to 6.2.6
	0.000	RC1	0.00	≤ 1	CS126)	Cross-section check - Shear buckling acc. to 6.2.6(6)



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Ob Dravi 3b, 2250 Ptuj

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Sheet: 1

RF-STAHLEC3

Project: Model: RRA - Inkubator_PZI_3D model_nadstresek

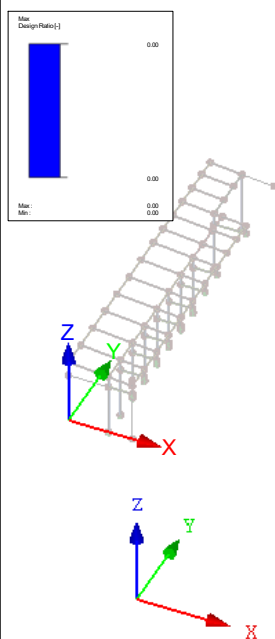
Date: 23. 09. 2026

■ DESIGN RATIO

RF-STEEL EC3 CA4

Ultimate Limit State: Cross-Section Design, Stability Design, Weld Design, Pressure Design, Plastic Design

Isometric



Max Design Ratio: 0.00

RF-STABILITY

CA1

Stability analysis

■ 1.1 GENERAL DATA

Number of lowest eigenvalues (eigenvectors for buckling):	10
Normalization of eigenvectors:	Such that $ u =1$
Import axial forces from RFEM from:	CO2 - 1.35G1 + 1.35G2 + 1.5Qs
Consider favorable effect due to tension:	☒
Consider axial forces as prestress:	☐
Eigenvalue calculation method:	☒ Method by Lanczos ☐ Roots of the characteristic polynomial ☐ Subspace Iteration Method ☐ ICG Iteration Method
Stability analysis of LC/CO results	☒
Stability analysis for load increased to structural failure:	☐
Type of matrix:	Standard
Activate Stiffness Modification from RFEM	☒

■ 2.1 CRITICAL LOAD FACTORS

E-Value No.	Critical Load Factor f	Magnification Factor α	
1	46.030	1.022	
2	54.925	1.019	
3	62.567	1.016	
4	85.409	1.012	
5	88.018	1.011	
6	98.797	1.010	
7	101.160	1.010	
8	101.713	1.010	
9	102.792	1.010	
10	103.379	1.010	

5.2 Priloga 20A – mnenje pooblaščenega strokovnjaka s področja gradbeništva

PRILOGA 20A

**MNENJE POOBLAŠČENEGA STROKOVNJAKA
S PODROČJA GRADBENIŠTVA**

OSNOVNI PODATKI O INVESTITORJU, OBJEKTU IN ZEMLJIŠČIH	
ime in priimek ali naziv družbe	Mestna občina Maribor
naslov ali sedež družbe	Ulica heroja Staneta 1, 2000 Maribor
naziv objekta	Prenova notranjih prostorov v objektu KPD
naslov objekta	Pobreška cesta 20, 2000 Maribor
katastrska občina	k.o. 659 Tabor.
parc. št.	parc. št.: 157/1
št. stavbe	/
št. stanovanja v večstanovanjski stavbi	/

PROJEKTANT/ NADZORNIK/ IZVAJALEC

naziv družbe	NORMAPRO d.o.o.
poslovni naslov družbe	OB DRAVI 3B, 2250 PTUJ
odgovorna oseba	BRANKO JUG

POOBLAŠČENI STROKOVNJAK S PODROČJA GRADBENIŠTVA

ime in priimek	BRANKO JUG, dipl.inž.grad.
identifikacijska številka	IZS PI G - 3211

UGOTAVLJAVA, DA PREDVIDENA MANJŠA REKONSTRUKCIJA PREDSTAVLJA:

označiti vsa ustrezna dela

☐	statično ojačitev posameznega ali več posameznih konstrukcijskih elementov
☐	zamenjavo istovrstnih posameznih konstrukcijskih elementov (zamenjava ostrešja, delov medetažne konstrukcije, ipd.)
☐	zamenjavo elementov javnega vodovoda in javne kanalizacije
☐	dolbenje utorov in niš v nosilno konstrukcijo
☒	izvedbo odprtín in večjih konstrukcijskih prebojev ter povečanje obstoječih odprtín v objektu, ki ne presega eno tretjino površine posameznega konstrukcijskega elementa in niso širši od 2 m
☐	povečanje obstoječih prebojev fasade stavbe do 2 m; velikost povečanja odprtine ne presega eno tretjino površine fasade
☐	nov preboj fasade stavbe, pri čemer je ravnina fasade, na kateri se izvajajo preboji, oddaljena od meje zemljišča drugega lastnika več kot 2 m, velikost novih prebojev ne presega eno tretjino površine fasade in noben preboj ni širši od 2 m
☐	vgradnjo dvigala v notranjosti objekta, s katerim se posega v nosilno konstrukcijo
☐	manjše povečanje prostornine, ki ne poveča bruto tlorisne površine objekta, ter pomeni izvedbo posameznih konstrukcijskih elementov na objektu (izvedba frčade, vsaj z dveh strani odprti nadstrešek na obstoječi pohodni strehi, dvig obodnega zidu pod poševno streho za višino horizontalne vezi za največ 0,3 m, ipd.)
☐	prizidavo nakladalnih ramp in klančin
☐	izvedbo nepohodnega konzolnega nadstreška površine do 6 m ²

S KATERO SE NE BODO OGROŽALE ALI POSLABŠALE GRADBENOTEHNIČNE LASTNOSTI OBJEKTA.

datum	23.09.2026
podpis pooblaščenega strokovnjaka s področja gradbeništva	BRANKO JUG dipl.inž.grad. IZS G-3211
podpis odgovorne osebe	 NORMAPRO d.o.o., Ob Dravi 3b, 2250 Ptuj www.normapro.eu

PRILOGA

☒	Grafični prikaz	grafični dea statičnega elaborata; št. 03-82-K-2026, september 2026.
☒	Statična presoja	statični elaborat; št. 03-82-K-2026, september 2026.

OPOMBA K MNENJU POOBLAŠČENEGA STROKOVNJAKA – PRILOGA 20B

Mnenje je podano na podlagi razpoložljive projektne dokumentacije, opravljenega ogleda objekta in izdelanega statičnega elaborata št. 03-82-K-2026, september 2026.

Projektna dokumentacija obstoječega objekta s statičnim izračunom ni bila posredovana, zato podatki o prvotni zasnovi, materialnih karakteristikah, armaturi in temeljenju obstoječe nosilne konstrukcije niso v celoti poznani.

Mnenje se nanaša izključno na predvidene lokalne konstrukcijske posege, opredeljene v statičnem elaboratu, in njihov vpliv na obstoječo nosilno konstrukcijo. Celovita statična in potresna presoja obstoječega objekta ni predmet obravnave.

Predvideni posegi ob upoštevanju projektiranih konstrukcijskih rešitev, ustreznem začasnem podpiranju in pravilni izvedbi del ne bodo poslabšali mehanske odpornosti in stabilnosti obstoječega objekta.

Pred začetkom izvajanja del je treba preveriti dejansko stanje obstoječe konstrukcije na območju posegov. Morebitna odstopanja od predpostavljenega stanja je treba pred nadaljevanjem del uskladiti s projektantom gradbenih konstrukcij.

Pooblaščen strokovnjak poda končno mnenje o ustreznosti izvedenih posegov po zaključku del in preveritvi njihove skladnosti s statičnim elaboratom ter morebitnimi usklajenimi spremembami.

SPLOŠNA OPOMBA – MANJŠA REKONSTRUKCIJA

Predmet statičnega elaborata so lokalni konstrukcijski posegi v okviru predvidene manjše rekonstrukcije objekta KPD Maribor, ki obsegajo izvedbo novih odprtih v obstoječih nosilnih stenah z ustreznimi ojačitvami, izvedbo zunanega dostopa z AB stopniščem in podestoma, izvedbo jeklenega nadstreška ter lokalne prilagoditve obstoječega ostrešja.

Obravnavani objekt je obsežna in konstrukcijsko kompleksna obstoječa stavba. Projektna dokumentacija obstoječega objekta s statičnim izračunom ni bila posredovana, zato podatki o prvotni zasnovi nosilne konstrukcije, dejanskih materialnih karakteristikah, armaturi, temeljenju in prenosu obtežb niso v celoti poznani.

Statični elaborat je izdelan na podlagi razpoložljive dokumentacije, ugotovitev na terenu in predpostavk o obstoječi konstrukciji. Obravnavani so izključno predvideni lokalni posegi in njihova konstrukcijska navezava na obstoječe nosilne elemente. Celovita statična in potresna presoja obstoječega objekta ter preveritev njegove nosilnosti in stabilnosti zunaj območja predvidenih posegov niso predmet tega elaborata.

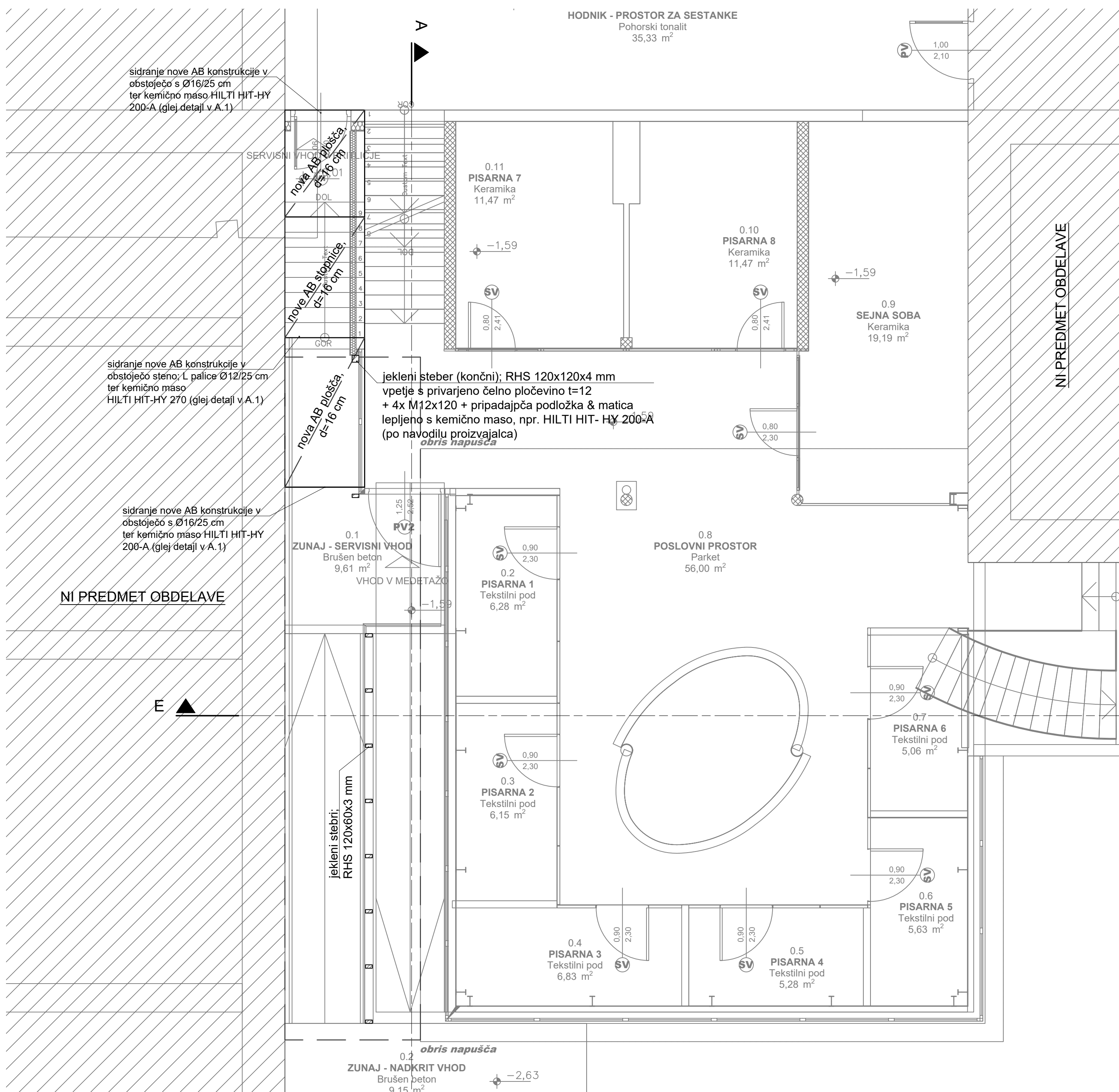
Pred začetkom izvajanja del je treba na območju posameznih posegov preveriti dejansko stanje obstoječe konstrukcije, zlasti dimenzije, sestavo, armaturo, stanje materialov in možnosti izvedbe predvidenih konstrukcijskih povezav. Pred posegi v nosilno konstrukcijo je treba zagotoviti ustrezno začasno podpiranje in varen vrstni red izvajanja del.

V primeru ugotovljenih odstopanj od predpostavljenega stanja, poškodb obstoječe konstrukcije ali drugih nepredvidenih okoliščin je treba dela na prizadetem območju prekiniti in o ugotovitvah obvestiti projektanta gradbenih konstrukcij, ki določijo morebitne dodatne ukrepe oziroma potrebne prilagoditve predvidenih konstrukcijskih rešitev.

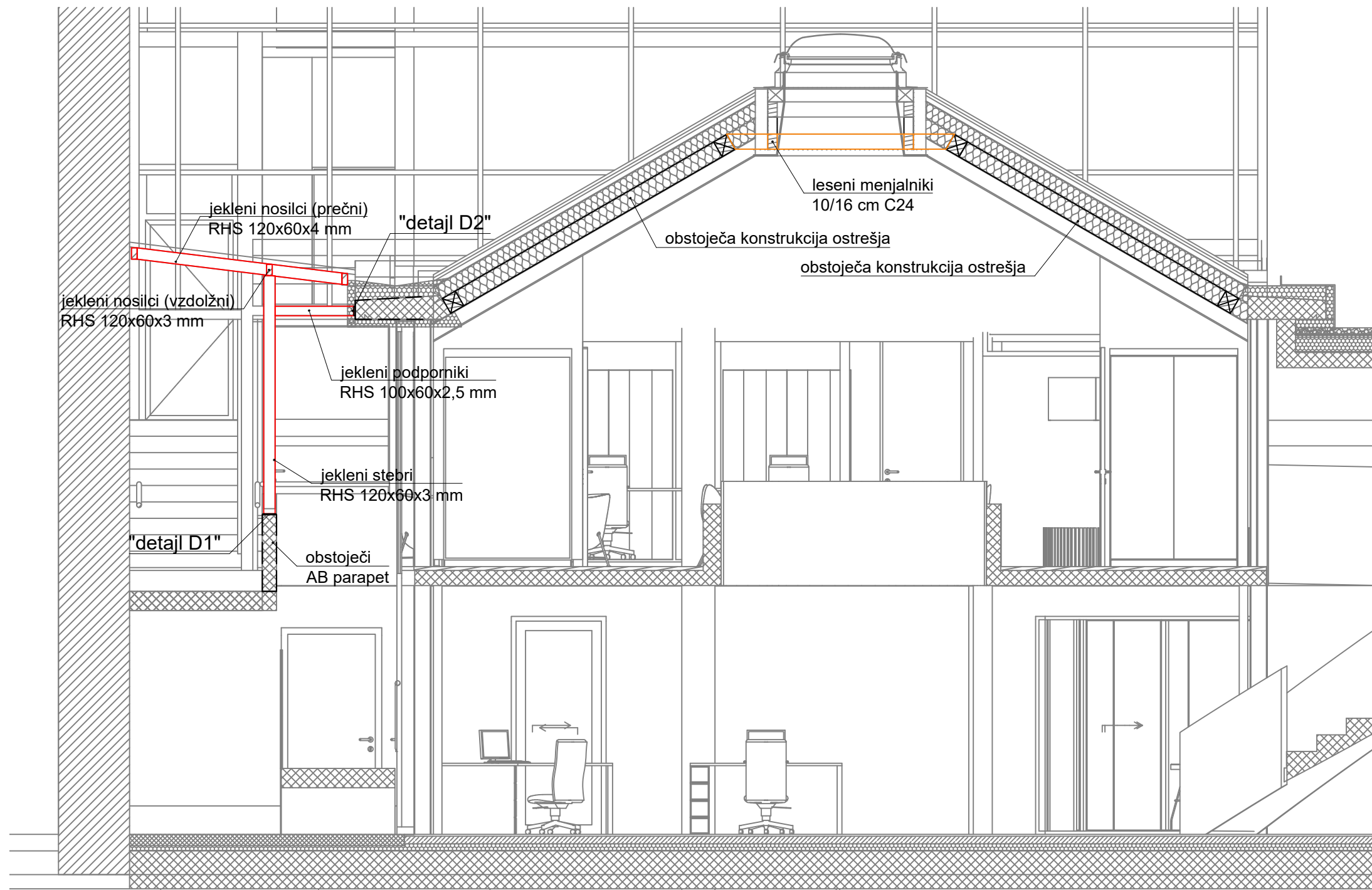
6. TEHNIČNI PRIKAZI

TEHNIČNI PRIKAZI – ARMATURNE RISBE		MERILO
OP.1	TLORISI, PREREZI	1:50
A.1	AB OKVIR IN STOPNICE	1:25,50

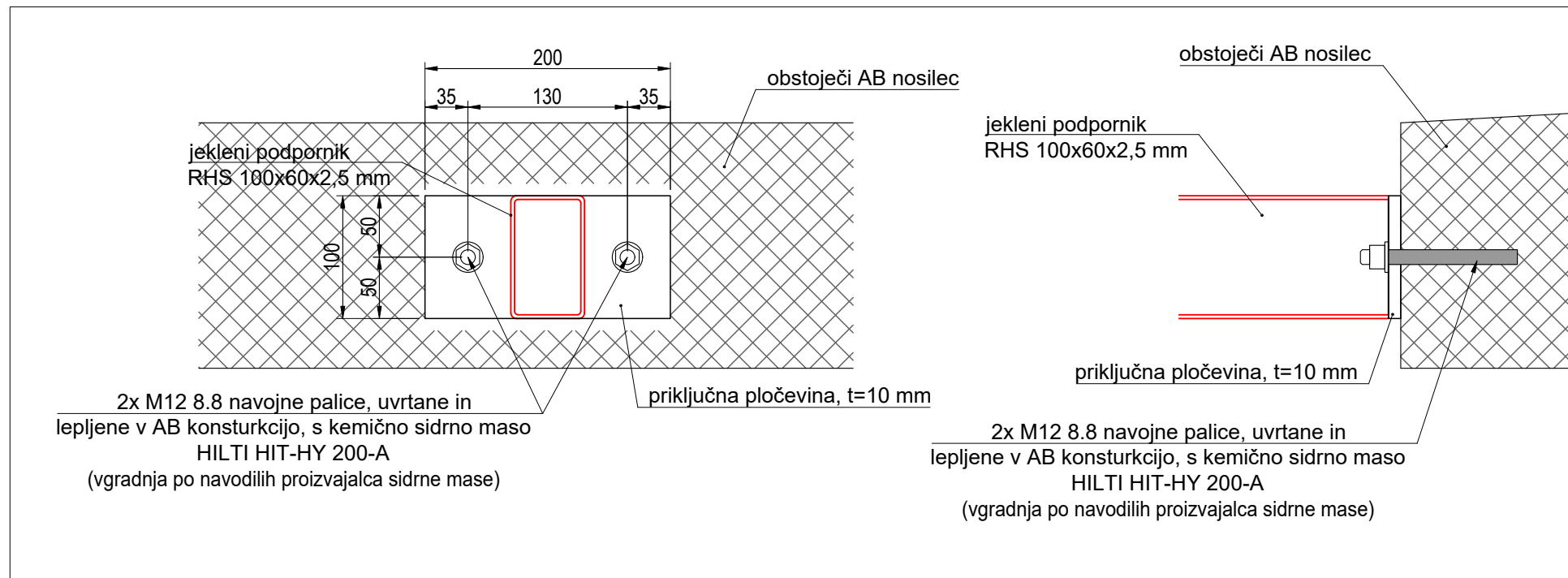
TLORIS PRITLIČJA



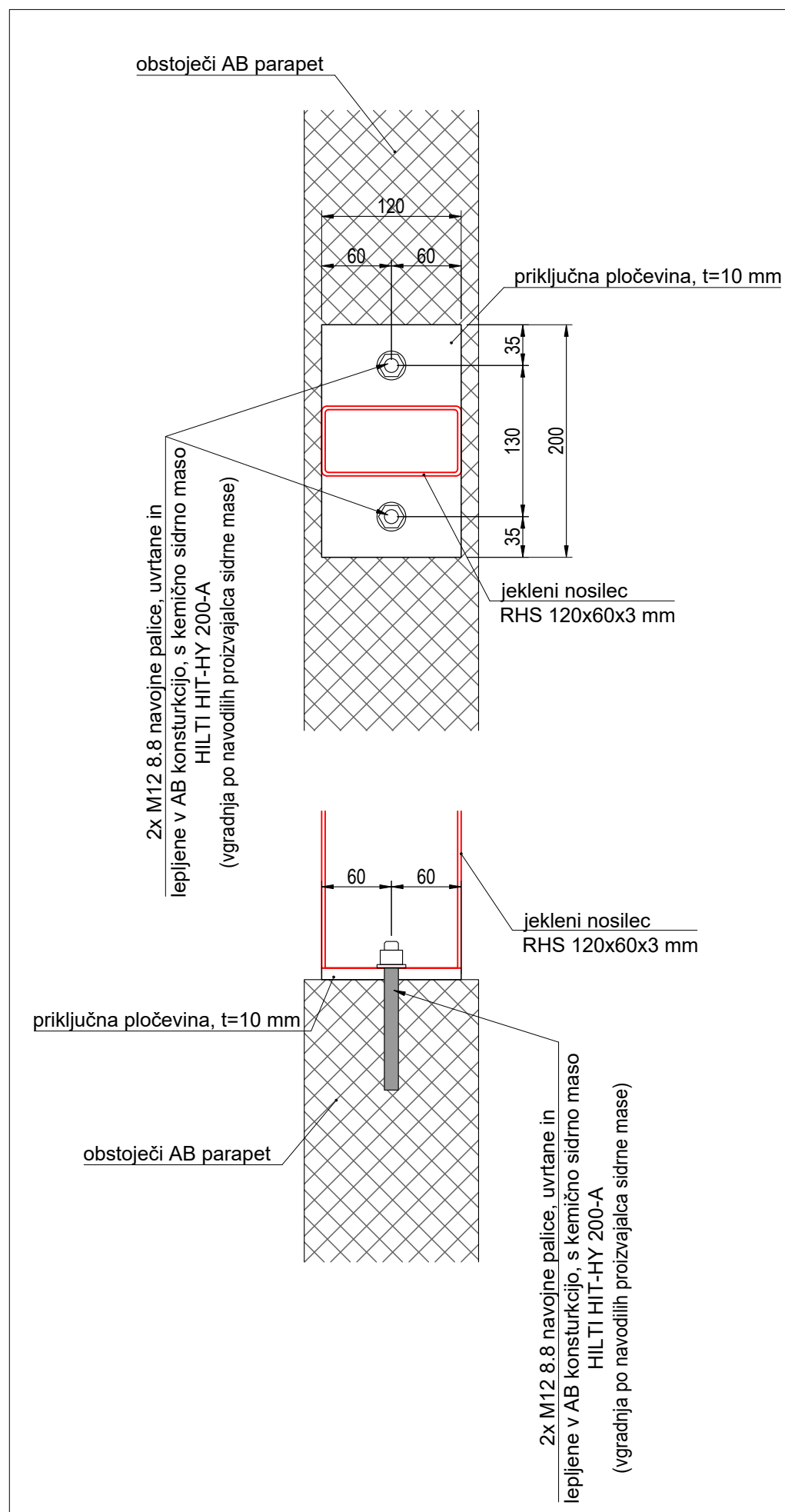
DELNI PREREZ E-E



Detalji "D2": priključevanje podpornikov nadstrešnice v obstoječo AB konstrukcijo, M 1:5



Detalji "D1": priključevanje stebrov nadstrešnice v obstoječi AB parapet, M 1:5



SPOŠNE OPOMBE:
Izvajalec del mora pred začetkom naliženih del nosilne konstrukcije pregledati armaturne načrte, preveriti dejansko stanje na objektu in se posvetovati s projektantom gradbenih konstrukcij, kateri na licu mesta pregleda aktualno stanje obstoječe konstrukcije, poda priporočila za varno izvajanje in morebitne dodatne napotke za obdelavo specifičnih detajlov. Zaradi velikosti in kompleksnosti objekta so določene stvari, ki se nanašajo na obstoječe stanje nosilne konstrukcije, predpostavljene.

Pred izvedbo jeklene konstrukcije je potrebno preveriti mere na objektu, na licu mesta.

JEKLENA KONSTRUKCIJA:
RAZREZ IZVEDBE JEKLENIH ELEMENTOV V SKLADU S SIST EN 1090 JE EXC2.

Lastnosti konstrukcijskega jekla v skladu s:
SIST EN 10210-1:2008 in SIST EN 10210-2:2019 za vroče izdelane volle profile
SIST EN 10219-1:2008 in SIST EN 10219-2:2019 za hladno oblikovane volle profile
SIST EN 10029:2011 za pločevine

Vsi jekleni elementi (stebri, nosilci) so kvalitete: S 235 JR
Vse priključne pločevine so kvalitete: S 235 JR

Lastnosti spojnega materiala v skladu s:
SIST EN 15048-1:2007 za vijake zveze: vijaki ISO 4014, matice ISO 4032 in podložke ISO 7089
SIST EN ISO 899-1 za izdelavo sidler iz navojnih palic

Vijačni spojni material je projektiran po principu SB. Vse spojni material je kvalitete 8.8. K vijačnemu sklopu je potrebno dodati dve podložki, da se prepreči poškodovanje PKZ pri montaži.

Vsi zvarji so polno nosilni in so izvedeni obojestransko v debelini a=2x0.50 l (amax=0.58 t), razen na nedostopnih mestih kjer se lahko izvede le enostranski zvar. V teh primerih se zaradi nedostopnosti izvajajo obdelani zvarji v debelini a=1x1 (t=debeline pločevine, ki se varj).

Sistemi protikorozijske zaščite (PKZ):
Pričakovana življenska doba PKZ: VH - zelo visoka: >25 let
Razred korozijske okolja: C1 - notranji prostori
C3 - zunanji prostori

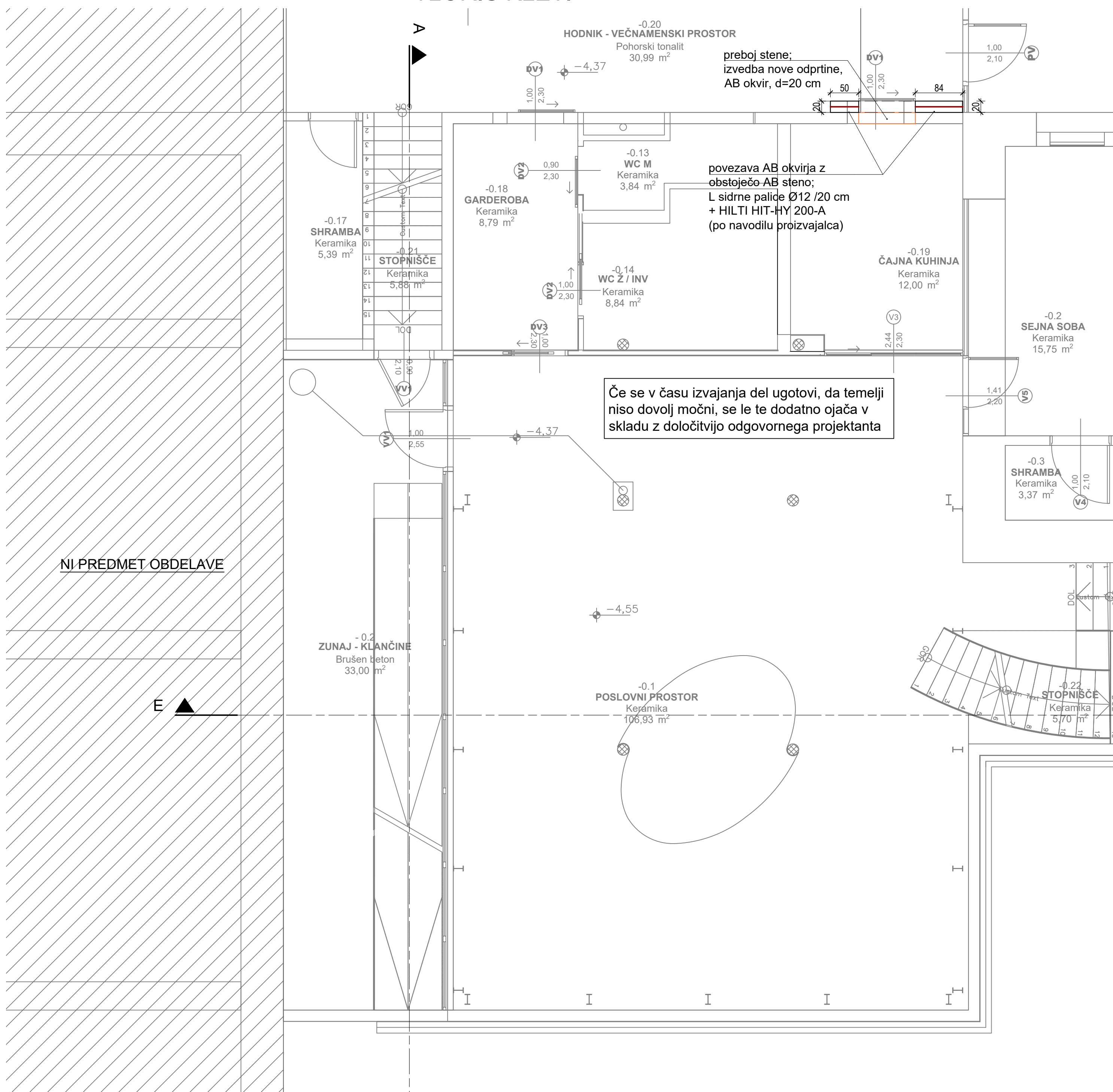
Minimalna debelina cinkove prevleke za elemente z debelino jekla t=3-6 mm znaša 55 µm in 70 µm za elemente z debelino jekla t=9 mm. Vsi materiali, postopki izvedbe in zagotavljanje kvalitete morajo ustrezati paketu standardov EN ISO 12944, EN ISO 14713-1 in EN ISO 1461.

Vse spojni material mora biti protikorozijsko zaščiten z vročim pocinkanjem.

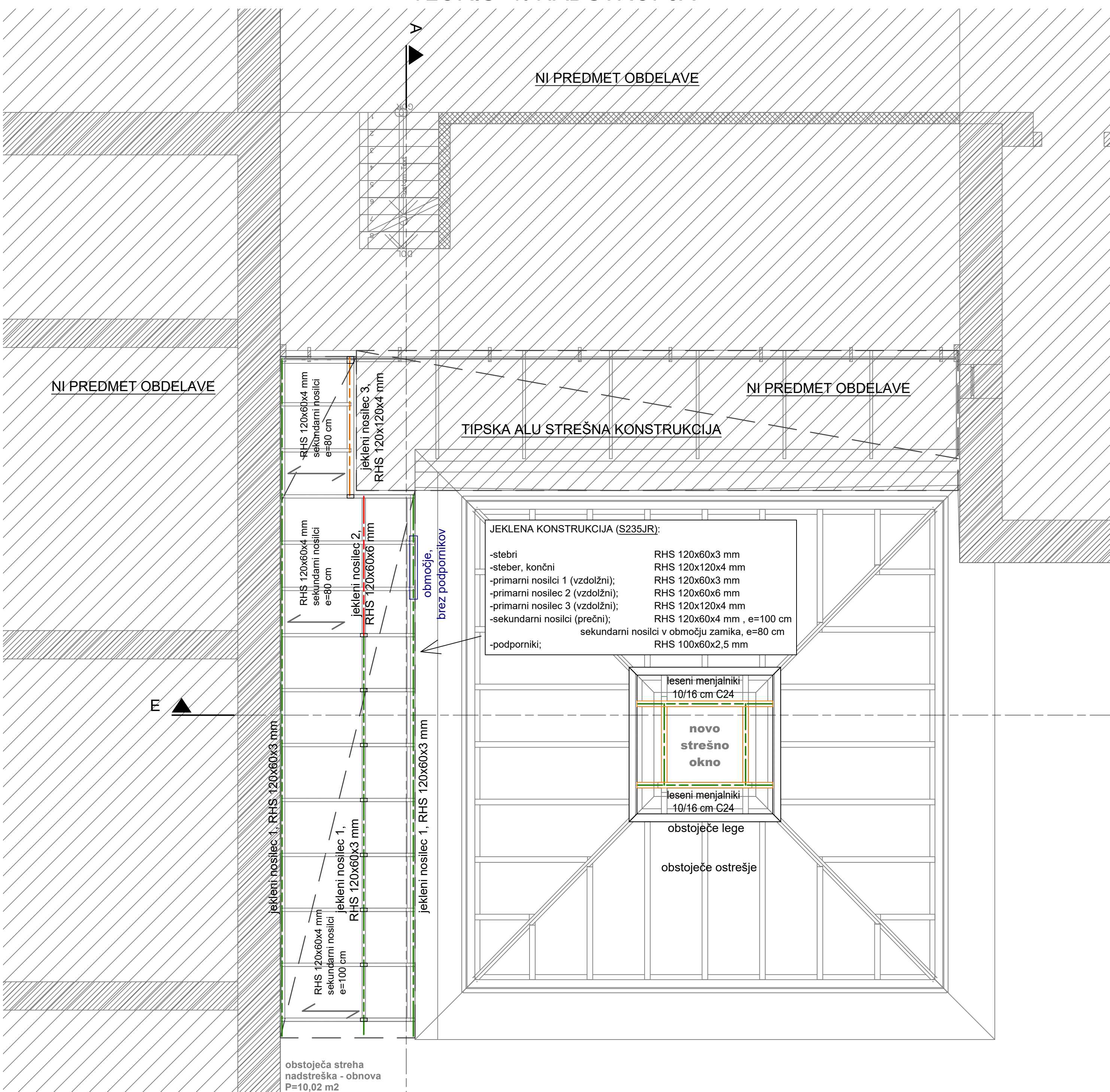
Sistemi protipožarne zaščite (PPZ):
Pričakovani razred požarne zaščite: R60

Pasivna požarna zaščita se izvede z ognjevarnimi oblogami ali s protipožarnim premazom.

TLORIS KLETI



TLORIS 1. NADSTROPJA



LEGENDA:

ARMIRAN BETON BETON OPEKA

POZICIJE KONSTRUKCIJSKIH ELEMENTOV:

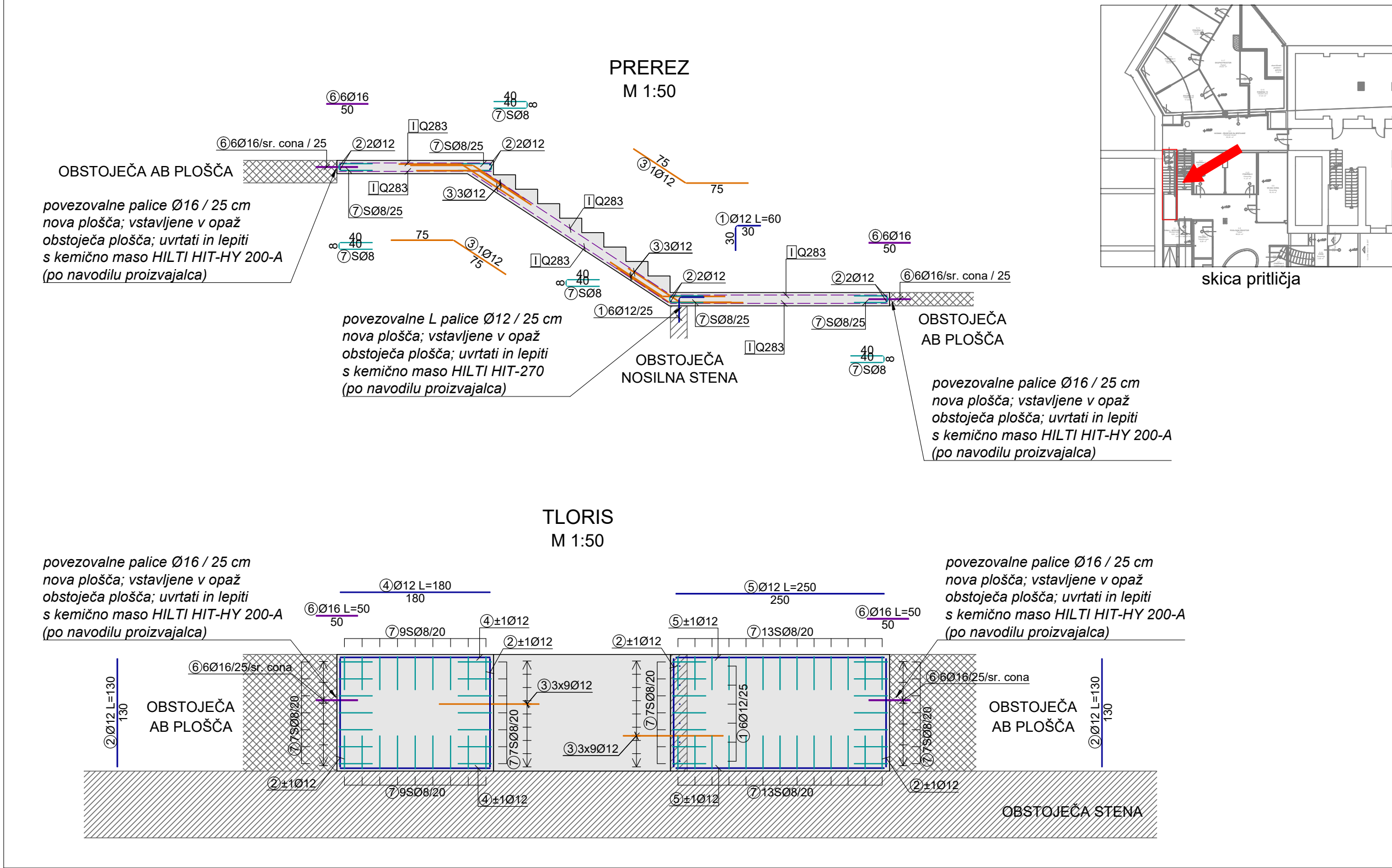
AB PLOŠČA, TEMELJ AB STENA AB STEBER
JEKLO OPEČNA STENA NOSILEC

OPOMBE:

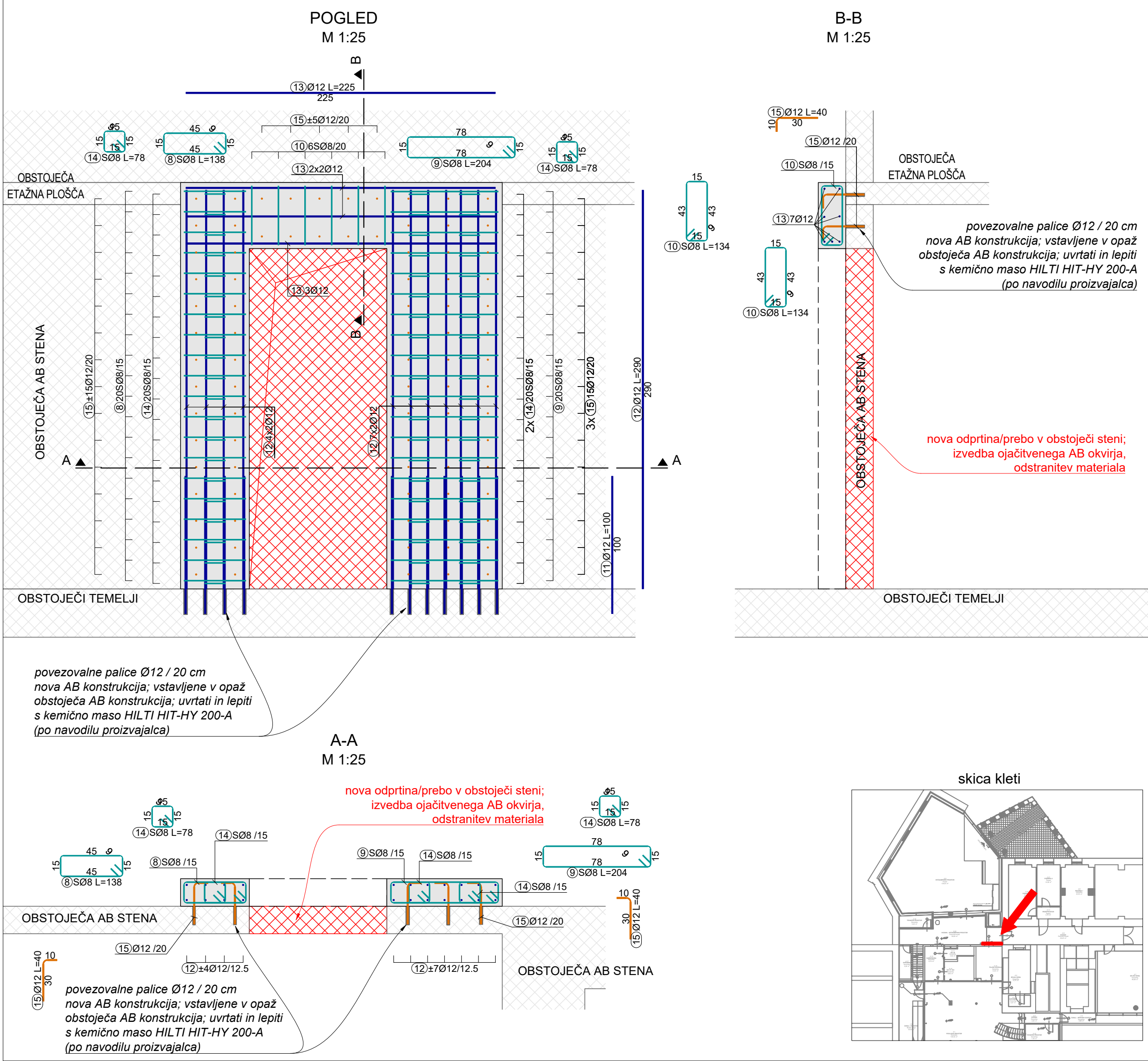
V skladu s predpisi, mora izvajalec del pred začetkom izvajanja del, opraviti pregled projekta za izvedbo (PZ) in opozoriti na morebitne ugotovljene pomanjkljivosti in zahtevati njihovo odpravo.
IZVAJALEC DEL JAMO ZA PRAVLNOST IZVEDBE.
Mere, višinske kote in preboje preveriti v načrtu arhitekture in načrtih strojnih ter elektro instalacij.
Pred vgradnjo betona vgrajeno armaturo obvezno preveriti odgovorni nadzornik za gradbena dela.
Položeno armaturo potrdi z vpisom v gradbeni dnevnik. Polaganje armature se prilagodi v skladu z morebitnimi spremembami v arhitekturnih načrtih PZI!

Razpisal	Datum	Opis	Podpis
Projektant:			
NORMAPRO Mestna občina Maribor, Ulica heroja Staneta 1, 2000 Maribor			
Mestna občina Maribor, Ulica heroja Staneta 1, 2000 Maribor			
Prenova notranjih prostorov v objektu KPD			
parc. št. 157/1 k.o. 659 - Tabor			
2 NAČRT GRADBENIŠTVA, 2.1 NAČRT GRADBENIH KONSTRUKCIJ			
OPAŽNO/POZIČNA RISBA			
TLORISI, PREREZI			
1:50			
OP.1			

AB STOPNICE IN PODEST (1 kom), M 1:50



AB OKVIR (1 kom), M 1: 25



Palice - specifikacija						
ozn	oblika in mere [cm]	Ø	lg [m]	n [kos]	lgm [m]	Opomba
KPD inkubator MB - AB okvir in stopnice (1 kos)						
1		12	0.60	6	3.60	
2		12	1.30	8	10.40	
3		12	1.50	6	9.00	
4		12	1.80	4	7.20	
5		12	2.50	4	10.00	
6		16	0.50	24	12.00	
7		8	0.88	72	63.36	
8		8	1.38	20	27.60	
9		8	2.04	20	40.80	
10		8	1.34	6	8.04	
11		12	1.00	22	22.00	
12		12	2.90	22	63.80	
13		12	2.25	7	15.75	
14		8	0.78	60	46.80	
15		12	0.40	85	34.00	
Palice - izveček						
Ø [mm]	lgm [m]	Teža enote [kg/m²]		Teža [kg]		
B500 B						
8	186.60	0.40		73.71		
12	175.75	0.89		156.07		
16	12.00	1.58		18.96		
Skupaj (B500 B)		248.73				

Mreže - izveček						
Oznaka mreže	B [cm]	L [cm]	n	Teža enote [kg/m²]	Neto vgrajena teža [kg]	Skupna teža [kg]
Q283	215	600	3	4.49	86.67	173.80
Skupaj					86.67	173.80

MREŽNA ARMATURA SE POLAGA S 40 cm PREKLOPOM

- DISANČNE KAČE/JAHAČI (niso zajeti v masi armature!):
- PODEST, STOPNICE; d=16 cm: OSNOVNA VIŠINA: h=8 cm
 - AB OKVIR; d=20 cm: OSNOVNA VIŠINA: h=15 cm

OPOMBE:

V skladu s predpisi, mora izvajalec del pred začetkom izvajanja del, opraviti pregled projekta za izvedbo (PZI) in opozoriti na morebitne ugotovljene pomanjkljivosti in zahtevati njihovo odpravo.

IZVAJALEC DEL JAMČI ZA PRAVILNOST IZVEDBE.

Mere, višinske kote in preboje preveriti v načrtu arhitekture in načrtih strojnih ter elektro inštalacij.

Pred vgradnjo betonov vgrajeno armaturo obvezno preveri odgovorni nadzornik za gradbena dela. Položeno armaturo potrdi z vpisom v gradbeni dnevnik. Polaganje armature se prilagodi v skladu z morebitnimi spremembami v arhitekturnih načrtih PZI!

PODATKI O MATERIALIH

BETON	Specifikacije projektnega betona				Zaščitni sloj [cm]		
	Trdnostni razred [N/mm²]	Razred izpostavljenosti, stopnja vsebnosti kloridov, maksimalno zmožnost argagata [mm]	razred konsistence, dodatno		30mm	50mm	70mm
STOPNICE IN PODESTA	C25/30	XC1	Cl 0,2	D _{max} 16	S4	2,5	2,5
AB OKVIR	C25/30	XC1	Cl 0,2	D _{max} 16	S4	2,5	2,5
PROJEKT BETONA IZDELA DOBAVITELJ SVEŽE BETONSKE MEŠANICE!							

ARMATURNO JEKLO	Vrsta jekla	Trdnostni razred [N/mm²]	Stopnja duktilnosti [%]
Lasnost v skladu s SIST EN 10080:2005 Krivljenje v skladu s SIST EN 1992-1-1			
REBRASTE ARMATURNE PALICE	B500 B	500	visoka ≥ 5,0
REBRASTE ARMATURNE MREŽE	B500 A	500	srednja ≥ 2,5

Različica	Datum	Opis	Podpis		
Projektant:					
		NORMAPRO d.o.o. Ob Dravi 3b, 2250 Ptuj, Slovenija T: +386 (0)31 623 821 E: info@normapro.eu T: +386 (0)31 754 757 W: www.normapro.eu			
Investitor:	Mestna občina Maribor, Ulica heroja Staneta 1, 2000 Maribor	Naročnik:	ANURA d.o.o., Grajska ulica 7 2000 Maribor		
Naziv gradnje:	Prenova notranjih prostorov v objektu KPD	Lokacija:	parc. št. 157/1 k.o. 659 - Tabor		
Vrsta načrta:	2 NAČRT GRADBENIŠTVA, 2.1 NAČRT GRADBENIH KONSTRUKCIJ		Vrsta projekta: statični elaborat		
Vsebina / naslov risbe:	ARMATURNA RISBA		Št. projekta: 14_2026		
AB OKVIR IN STOPNICE			Št. načrta: 03-82-K-2026		
			Datum: september 2026		
Vrsta projekta:	Ivana Vuković Šmelc, m.i.a.	Id številka:	ZAPS 2378 PA		
Pooblaščen inženir:	Branko Jug, dipl. inž. grad.	IZS PI G-3211	Št. risbe:		
Sodelavci:	Rok Murko, mag.inž.grad. Patrik Škvorc	IZS PI G-4706			
Vse pravice pridržane. Vsebinska projektna dokumentacija je last podjetja NORMAPRO d.o.o., ki je skladno z določbami Zakona o avtorskih in sorodnih pravicah - ZASP (U.p. 1. RS, št. 21/95) lastnik avtorskih pravic. Preprodano je v celotni celoti, kopiranje, spreminjanje ali druga oblika pomenjata vsebinsko projektno dokumentacijo brez predhodnega pismenega soglasja podjetja NORMAPRO d.o.o.					