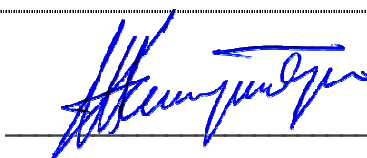


Datum :	2018.					
Broj tehničke dokumentacije:	26/17-10/11-01-IDP-2.1					
Odgovorni projektant:	Ljiljana Mijatović, dipl.inž.građ, 310 3025 03					
Investitor:	JAVNO PREDUZEĆE „ELEKTROPRIVREDA SRBIJE” BEOGRAD, Ul. Carice Milice br.2, 11000 Beograd					
Objekat:	Magacin za smeštaj opreme, Lokacija: TE Kostolac, K.P. 303, K.O. Kostolac selo					
Vrsta tehničke dokumentacije:	IDP - IDEjni Projekat					
Naziv i oznaka dela projekta:	Projekat konstrukcije,					
Za građenje/izvođenje radova:	Nova gradnja					
Broj ugovora	Br. objekta	Vrsta dok.	Br dela projekta	Br dela sveske	Revizija	
26/17-10/11	01	IDP	2	1	0	
✉ Zaplanjska 86, 11010 Beograd, Voždovac Telefon: +381-11-78.56.903 Faks: +381-11-31.21.788 🌐 www.deltaipreving.rs						
📁 Šifra delatnosti: 7112; 📁 Matični/Registracioni broj: 20660937; 📁 PIB: SR106691377,						

Datum :	2018.					
Broj tehničke dokumentacije:	26/17-10/11-01-IDP-2.1					
Odgovorni projektant:	Ljiljana Mijatović, dipl.inž.građ., 310 3025 03					
Investitor:	JAVNO PREDUZEĆE „ELEKTROPRIVREDA SRBIJE” BEOGRAD, Ul. Carice Milice br.2, 11000 Beograd					
Objekat:	Magacin za smeštaj opreme, Lokacija: TE Kostolac, K.P. 303, K.O. Kostolac selo					
Vrsta tehničke dokumentacije:	IDP - IDEjni Projekat					
Naziv i oznaka dela projekta:	Projekat konstrukcije,					
Za građenje/izvođenje radova:	Nova gradnja					
Broj ugovora	Br. objekta	Vrsta dok.	Br dela projekta	Br dela sveske	Revizija	
26/17-10/11	01	IDP	2	1	0	
✉ Zaplanjska 86, 11010 Beograd, Voždovac Telefon: +381-11-78.56.903 Faks: +381-11-31.21.788 🌐 www.deltaipreving.rs						
📁 Šifra delatnosti: 7112; 📁 Matični/Registracioni broj: 20660937; 📁 PIB: SR106691377,						

Naziv i oznaka dela projekta:	Projekat konstrukcije,				
Investitor:	JAVNO PREDUZEĆE „ELEKTROPRIVREDA SRBIJE” BEOGRAD, Ul. Carice Milice br.2, 11000 Beograd				
Objekat	Magacin za smeštaj opreme, Lokacija: TE Kostolac, K.P. 303, K.O. Kostolac selo				
Vrsta tehničke dokumentacije:	IDP - IDEjni Projekat				
Za građenje/izvođenje radova:	Nova gradnja				
Projektant:	delta preving, Zaplanjska br. 86, 11010 Beograd – Voždovac				
Odgovorno lice projektanta:	Dušan Dženopoljac, direktor				
Potpis i pečat:	 				
Odgovorni projektant:	Ljiljana Mijatović, dipl.inž.grad.				
Broj licence:	310 3025 03				
Potpis i lični pečat:					
Broj tehničke dokumentacije:	26/17-10/11-01-IDP-2.1				
Broj ugovora	Br. objekta	Vrsta dok.	Br dela projekta	Br dela sveske	Revizija
26/17-10/11	01	IDP	2	1	0
Mesto i datum:	Beograd, 15. januar 2018.				

2018.	0	IDP - IDEjni Projekat			
Datum:	Rev.	Vrsta tehničke dokumentacije:	Uradio:	Odobrio:	
✉ Zaplanjska 86, 11010 Beograd, Voždovac Telefon: +381-11-78.56.903 Faks: +381-11-31.21.788 🌐 www.deltapreviing.rs					
📁 Šifradelatnosti: 7112;		📁 Matični/Registracioni broj: 20660937;		📁 PIB: SR106691377,	

	Investitor:	JAVNO PREDUZEĆE „ELEKTROPRIVREDA SRBIJE” BEOGRAD, Ul. Carice Milice br.2, 11000 Beograd						
	Objekat:	Magacin za smeštaj opreme, Lokacija: TE Kostolac, K.P. 303, K.O. Kostolac selo						
	Vrsta teh. dokum.:	IDP - IDEjni Projekat						
Deo projekta:	26/17-10/11-01-IDP-2.1 -00	Projekat konstrukcije			List:	1.2.1	Rev.:	0
1.2 SADRŽAJ DELA PROJEKTA								
Broj	Naziv dokumenta		Broj dokumenta		Format	List	Rev.	Datum
1.1	NASLOVNA STRANA TEHNIČKE DOKUMENTACIJE		26/17-10/11-01-IDP-2.1 -00		A4	1	0	15.01.2018.
1.2	SADRŽAJ		26/17-10/11-01-IDP-2.1 -00		A4	1	0	15.01.2018.
1.3	REŠENJE O ODREĐIVANJU ODGOVORNOG PROJEKTANTA		26/17-10/11-01-IDP-2.1 -00		A4	1	0	15.01.2018.
1.4	IZJAVA ODGOVORNOG PROJEKTANTA		26/17-10/11-01-IDP-2.1 -00		A4	1	0	15.01.2018.
1.5	TEKSTUALNA DOKUMENTACIJA		26/17-10/11-01-IDP-2.1 -00		A4	1	0	15.01.2018.
1.5.1	Osnovni izveštaj		26/17-10/11-01-IDP-2.1 -00		A4	2	0	15.01.2018.
1.5.2	Tehnički opis		26/17-10/11-01-IDP-2.1 -00		A4	3	0	15.01.2018.
1.6.	NUMERIČKA DOKUMENTACIJA		26/17-10/11-01-IDP-2.1 -00		A4	1	0	15.01.2018.
1.6.1	Statički proračun		26/17-10/11-01-IDP-2.1 -00		A4	338	0	15.01.2018.
1.6.2	Procenjena investiciona vrednost		26/17-10/11-01-IDP-2.1 -00		A4	1	0	15.01.2018.
1.7.	GRAFIČKA DOKUMENTACIJA		26/17-10/11-01-IDP-2.1 -00		A4	1	0	15.01.2018.
1.7.1	Izvod iz situacionog plana		26/17-10/11-01-IDP-2.1 -01		A2	1	0	15.01.2018.
1.7.2	Osnova temelja		26/17-10/11-01-IDP-2.1 -02		A1	1	0	15.01.2018.
1.7.3	Osnova prizemlja		26/17-10/11-01-IDP-2.1 -03		A1	1	0	15.01.2018.
1.7.4	Presek 1-1, Presek 2-2		26/17-10/11-01-IDP-2.1 -04		A3	1	0	15.01.2018.
1.7.5	Presek 3-3, Presek 5-5		26/17-10/11-01-IDP-2.1 -05		A3	1	0	15.01.2018.
1.7.6	Presek 4-4		26/17-10/11-01-IDP-2.1 -06		A3	1	0	15.01.2018.
1.7.7	Tankvana za otpadna ulja - osnova i presek		26/17-10/11-01-IDP-2.1 -07		A3	1	0	15.01.2018.

	Investitor:	JAVNO PREDUZEĆE „ELEKTROPRIVREDA SRBIJE” BEOGRAD, Ul. Carice Milice br.2, 11000 Beograd					
	Objekat:	Magacin za smeštaj opreme, Lokacija: TE Kostolac, K.P. 303, K.O. Kostolac selo					
	Vrsta teh. dokum.:	IDP - IDEjni Projekat					
Deo projekta:	26/17-10/11-01-IDP-2.1 -00	Projekat konstrukcije		List:	1.3.1	Rev.:	0

1.3

REŠENJE O ODREĐIVANJU ODGOVORNOG PROJEKTANTA

Na osnovu člana 128. Zakona o planiranju i izgradnji ("Službeni glasnik RS", br. 72/09, 81/09-ispravka, 64/10 odluka US, 24/11 i 121/12, 42/13–odluka US, 50/2013–odluka US, 98/2013–odluka US, 132/14 i 145/14) i odredbi Pravilnika o sadržini, načinu i postupku izrade i način vršenja kontrole tehničke dokumentacije prema klasi i nameni objekata ("Službeni glasnik RS", br. 23/2015, 77/2015, 58/2016, 96/2016 i 67/2017) kao:

ODGOVORNI PROJEKTANT

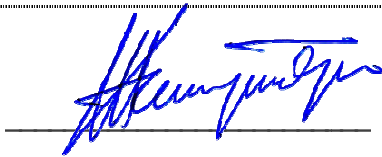
 Zaplanska br. 86, 11010 Beograd – Voždovac	Br.04/18 08.01.2018 god.
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za izradu tehničke dokumentacije :

Naziv i oznaka dela projekta:	Projekat konstrukcije,
Objekat	Magacin za smeštaj opreme, Lokacija: TE Kostolac, K.P. 303, K.O. Kostolac selo
Vrsta tehničke dokumentacije:	IDP - IDEjni Projekat
Za građenje/izvođenje radova:	Nova gradnja

određuje se:

Odgovorni projektant:	Ljiljana Mijatović, dipl.inž.grad.
Broj licence:	310 3025 03

Projektant:	delta preving , Zaplanska br. 86, 11010 Beograd – Voždovac
Odgovorno lice projektanta:	Dušan Dženopoljac, direktor
Potpis i pečat:	 
Broj tehničke dokumentacije:	26/17-10/11-01-IDP-2.1
Mesto i datum:	Beograd, 15 januar 2018.

	Investitor:	JAVNO PREDUZEĆE „ELEKTROPRIVREDA SRBIJE” BEOGRAD, Ul. Carice Milice br.2, 11000 Beograd			
	Objekat:	Magacin za smeštaj opreme, Lokacija: TE Kostolac, K.P. 303, K.O. Kostolac selo			
	Vrsta teh. dokum.:	IDP - IDEjni Projekat			
Deo projekta:	26/17-10/11-01-IDP-2.1 -00	Projekat konstrukcije	List:	1.4.1	Rev.: 0

1.4

IZJAVA ODGOVORNOG PROJEKTANTA

Odgovorni projektant za izradu tehničke dokumentacije:

Naziv i oznaka dela projekta:	Projekat konstrukcije,
Objekat	Magacin za smeštaj opreme, Lokacija: TE Kostolac, K.P. 303, K.O. Kostolac selo
Vrsta tehničke dokumentacije:	IDP - IDEjni Projekat
Za građenje/izvođenje radova:	Nova gradnja

Odgovorni projektant:	Ljiljana Mijatović, dipl.inž.grad.
Broj licence:	310 3025 03

IZJAVLJUJEM

- da je projekat u svemu u skladu sa: izdatim Lokacijskim uslovima
- da je projekat izrađen u skladu sa Zakonom o planiranju i izgradnji, propisima, standardima i normativima iz oblasti izgradnje objekata i pravilima struke;
- da su pri izradi projekta poštovane sve propisane i utvrđene mere i preporuke za ispunjenje osnovnih zahteva za objekat i da je projekat izrađen u skladu sa merama i preporukama kojima se dokazuje ispunjenost osnovnih zahteva.

Odgovorni projektant:	Ljiljana Mijatović, dipl.inž.grad.
Broj licence:	310 3025 03
Potpis i lični pečat:	
Broj tehničke dokumentacije:	26/17-10/11-01-IDP-2.1
Mesto i datum:	Beograd, 15.januar 2018.

	Investitor:	JAVNO PREDUZEĆE „ELEKTROPRIVREDA SRBIJE” BEOGRAD, Ul. Carice Milice br.2, 11000 Beograd					
	Objekat:	Magacin za smeštaj opreme, Lokacija: TE Kostolac, K.P. 303, K.O. Kostolac selo					
	Vrsta teh. dokum.:	IDP - IDEjni Projekat					
Deo projekta:	26/17-10/11-01-IDP-2.1 -00	Projekat konstrukcije		List:	1.5.1	Rev.:	0

1.5

TEKSTUALNA DOKUMENTACIJA

	Investitor:	JAVNO PREDUZEĆE „ELEKTROPRIVREDA SRBIJE” BEOGRAD, Ul. Carice Milice br.2, 11000 Beograd					
	Objekat:	Magacin za smeštaj opreme, Lokacija: TE Kostolac, K.P. 303, K.O. Kostolac selo					
	Vrsta teh. dokum.:	IDP - IDEjni Projekat					
Deo projekta:	26/17-10/11-01-IDP-2.1 -00	Projekat konstrukcije		List:	1.5.1.1	Rev.:	0

1.5.1

Osnovni izveštaj

PODLOGE ZA IZRADU PROJEKTA

Izdati uslovi	Lokacijski uslovi br. 350-02-00343/2017-14, od 04.01.2018.god.
Prethodna tehnička dokumentacija	Idejno rešenje, Delta inženjering, Septembar 2017.
Izvod iz katastra	Kopija katastarskog plana priložena u glavnoj svesci projekta
Geodetski snimak	Overen KTP priložen u glavnoj svesci projekta
Elaborati o ispitivanjima	Ne
Projekti i/ili podaci o postojećem stanju objekata i/ili instalacija	Ne
Podloge za izbor opreme	Oprema je izabrana u skladu sa projektnim zadatkom
Podloge iz drugih projekata	Ne

VARIJANTNA REŠENJA

Da li su razmatrana varijantna rešenja	Ne
Razlozi za izbor rešenja po kome je urađen projekt	Projektni zadatak i raspoloživ prostor na parceli

OGRANIČENJA

Ograničenja koja su postojala kod izrade projekata	Raspoloživ prostor na parceli
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REVIZIJE

Razlozi za sprovedene revizije ako su rađene revizije dokumentacije	Projekat urađen u Reviziji 0
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ISPUNJENJE OSNOVNIH ZAHTEVA

NOSIVOST I STABILNOST

Sprečavanje rušenja celog ili dela objekta;	Primenjene mere u delu projekta 2/1-konstrukcija
Sprečavanje deformacije iznad dozvoljenog nivoa;	Primenjene mere u delu projekta 2/1-konstrukcija

ZAŠTITA OD POŽARA

Sprečavanje širenja vatre i dima u objektu;	Predviđene mere u Elaboratu zaštite od požara i delu projekta 3-Projekat hidrotehničkih instalacija
Sprečavanje širenja vatre na susedne objekte;	Obezbeđeno
Omogućavanje sigurne i bezbedne evakuacija ljudi, odnosno njihovog spasavanja.	U objektu su predviđeni putevi za evakuaciju

HIGIJENA, ZDRAVLJE I ŽIVOTNA SREDINA

Sprečavanje ispuštanja otrovnih gasova;	U magacinu ne dolazi do ispuštanja otrovnih gasova
Sprečavanje emisije opasnih materija, isparljivih organskih jedinjenja, gasova sa efektom staklene bašte ili opasnih čestica u vazduh unutar objekta ili okolinu;	U magacinu ne dolazi do emisije otrovnih materija i opasnih čestica
Sprečavanje emitovanja opasnih zračenja;	Nema zračenja
Sprečavanje ispuštanja opasnih supstanci u podzemne vode, površinske vode ili zemljište;	Obezbeđeno. Pored magacina je predviđena tankvana za prihvatanje eventualno prosutog ulja.

Deo projekta:	26/17-10/11-01-IDP-2.1 -00	Projekat konstrukcije	List:	1.5.1.2	Rev.:	0
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1.5.1	Osnovni izveštaj
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Sprečavanje ispuštanja opasnih supstanci u vodu za piće ili supstanci koje imaju neki drugi negativan uticaj na vodu za piće;	Obezbeđeno
Sprečavanje zagađenja ispuštanjem otpadnih voda, emisije dimnih gasova ili pogrešnog odlaganja čvrstog ili tečnog otpada	Obezbeđeno
Sprečavanje prisustva vlage u delovima objekta ili na površinama unutar objekta.	Obezbeđeno
BEZBEDNOST I PRISTUPAČNOST PRILIKOM UPOTREBE	
Sprečavanje opasnosti od nezgoda ili oštećenja pri radu ili upotrebi, kao što su klizanje, pad, sudar, opekotine, strujni udari, povrede od eksplozija i provale	Obezbeđeno
Obezbeđivanje pristupačnosti i korišćenja osobama sa invaliditetom, deci i starim osobama	U opsluživanju magacina ne mogu da učestvuju osobe sa invaliditetom
ZAŠTITA OD BUKE	
Obezbeđivanje da buka kojoj su izloženi korisnici ili susedi bude na nivou koji ne ugrožava njihovo zdravlje i koja im omogućava spavanje, odmor i rad u odgovarajućim uslovima	Obezbeđeno
EKONOMIČNO KORIŠĆENJE ENERGIJE I OČUVANJE TOPLOTE	
Obezbeđivanje što je moguće nižeg nivoa potrošnje energije tokom građenja, upotrebe, održavanja i uklanjanja.	Obezbeđeno
ODRŽIVO KORIŠĆENJE PRIRODNIH RESURSA	
Obezbeđivanje ponovnog korišćenja ili mogućnost reciklaže objekta, ugrađenih materijala i delova objekta nakon uklanjanja;	Da
Obezbeđivanje trajnosti objekta;	Da - Adekvatan izbor materijala
Obezbeđivanje korišćenja ekoloških materijala i sekundarnih sirovina pri izgradnji objekta	Da

Odgovorni projektant:	Ljiljana Mijatović, dipl.inž.građ.	
Broj licence:	310 3025 03	

	Investitor:	JAVNO PREDUZEĆE „ELEKTROPRIVREDA SRBIJE” BEOGRAD, Ul. Carice Milice br.2, 11000 Beograd			
	Objekat:	Magacin za smeštaj opreme, Lokacija: TE Kostolac, K.P. 303, K.O. Kostolac selo			
	Vrsta teh. dokum.:	IDP - IDEjni Projekat			
Deo projekta:	26/17-10/11-01-IDP-2.1 -00	Projekat konstrukcije	List:	1.5.2.1	Rev.: 0
1.5.2 Tehnički opis					

UVOD:

Na osnovu ugovorenog projektnog zadatka definisanog od strane Investitora „JAVNO PREDUZEĆE „ELEKTROPRIVREDA SRBIJE” BEOGRAD“ pristupilo se izradi KONSTRUKTIVNE FAZE IDEJNOG PROJEKTA Magacina za smeštaj opreme u krugu Termoelektrane Kostolac B.

OPIS KONSTRUKCIJE OBJEKTA:

Magacin za smeštaj opreme je u osnovi nepravilnog oblika sa najvećim dimenzijama u x i y pravcu 90,00 m * 96,80m. Organizaciono je podeljen na: Magacin 1, Magacin 2, Magacin 3 koji se sastoji iz dva fizički odvojena dela 3.1 i 3.2 i Magacin 4. U sastavu Magacina 1 nalazi se i administrativni deo. Pošto se magacini međusobno razlikuju u visini i površini usvojene su dilatacione razdelnice na njihovim kontaktnim površinama tako da je svaki od pomenutih magacina statički zaseban objekat.

Magacin 1 je najveći. Projektovan je kao jednobrodna hala sa rasponima 2*21.6m između osa 4-11, odnosno 1*21.6m između osa 1-4. Glavni noseći sistem čini skeletna konstrukcija konstruisana od prefabrikovanih stubova i prefabrikovanih glavnih krovnih „I-150“ nosača. Stubovi su kvadratnog poprečnog preseka i to obodni 80/80cm i centralni 80/110cm. Glavni nosači su na rasteru od 9,0m i projektovani su kao prethodno napregnuti. Predviđeno je adheziono prethodno naprezanje.

Fasadna konstrukcija sastoji se od sendvič panela sa termičkim karakteristikama u svemu prema arhitektonskim crtežima i preporukama tehnologa. Horizontalne je orijentacije. Krovna konstrukcija se sastoji od AB montažnih rožnjača „T“ preseka, visine 55cm i na međusobnom rastojanju od 2,7m sa krovim pokrivačem od sendvič panela. Nagib krovne ravni je 11%. Prefabrikovani stubovi su uklješteni u čašice koje prenose opterećenje na temelje samce. Po obodu hale temelji su povezani armiranobetonskom gredom. U kalkanima su projektovani fasadni stubovi 30*50cm tako da primaju samo opterećenje od vetra i težinu fasade dok je veza sa krovim nosačem takva da ne primaju vertikalno opterećenje sa krova.

U hali su predviđena dva krana nosivosti 25T koji se na svojim krajevima oslanjaju na kranski nosač koji je preko kratkih elemenata oslonjen na ab stubove.

Magacin 2 je funkcionalno povezan sa Magacinom 1. Zajedno sa Magacinom 3.1 čine jednu dilatacionu celinu. U osnovi su dimenzija 27m*37m magacin 2 i 13.5m*18m magacin 3.2. Statički sistem je takođe skeletni. Glavni nosači su „T“ preseka visine 100cm i raspona 2*13,5m, odnosno 3*13,5m na delu sa magacinom 3.1, klasično armirani. Stubovi su kvadratni 60*60cm i 50*50cm u osi 2'. Krovni pokrivač i fasada su kao u Magacinu 1. Rožnjače su takođe „T“ grede visine 55cm i na međusobnom rastojanju 2,7m.

U magacinu 3.1 predviđeno je visokoregalno skladište.

Magacin 3.2 je takođe predviđen za visokoregalno skladište. U osnovi je dimenzija 13,5*20,6m. Nalazi se uz Magacin 1. Skeletni sistem je od ab stubova 50*50cm i krovnog nosača „T“ preseka visine 100cm i raspona 13,5m, na međusobnom rastojanju od 10,3m.

Rožnjače su „T“ grede visine 65cm i na međusobnom rastojanju 3,17m.

Magacin 4 je predviđen za skladištenje buradi na podnoj ploči. Dimenzija je 13,6m*15,6m. Skeletni sistem je od ab stubova 40*40cm i krovnog nosača „T“ preseka visine 100cm i raspona 13,6m, na međusobnom rastojanju od 5,2m.

Rožnjače su „T“ grede visine 45cm i na međusobnom rastojanju 2,7m.

Deo projekta:	26/17-10/11-01-IDP-2.1 -00	Projekat konstrukcije	List:	1.5.2.2	Rev.:	0
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1.5.2	Tehnički opis
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Svi skeletni sistemi su funkcionalno međusobno povezani ali međusobno nezavisni tako da formiraju zasebne prostorne noseće konstrukcije koje su sposobne da prime projektovana opterećenja, tj. kako gravitacione tako i lateralne uticaje (vetar, seizmika) .

TEMELJNA KONSTRUKCIJA:

Temeljna konstrukcija predviđena je od temeljnih čašica koje se rade u fabrici i temelja samaca koje se rade na licu mjesta. Stubovi se fundiraju u temeljne čašice čime se ostvaruje potrebnii stepen uklještenja stuba u temelj. Iz temeljnih čašica ostavlja se armatura neophodna za uvezivanje u jednu celinu sa temeljem samcem. Na osnovu preporuke iz geomehantičkog elaborata koji je uradilo preduzeće „BG Invest“ usvojena je računska nosivost tla od 150 kN/m². Uzimajući veličinu sleganja od 2cm usvojena je računska krutost tla $150/0,02 = 7000 \text{ kN/m}^3$. Na osnovu takvog modela usvojene su dimenzije temelja samaca. Usvojena je relativna kota fundiranja -2,2m. Stope su u sloju glinovite prašine, osim u delu Magacina 3,2 gde je dubina nasutog tla veća od dubine fundiranja pa će na tom delu biti neophodno sprovesti kontrolisanu zamenu tla.

Podna ploča hale debljine je 25cm i izvodi se na tlu pripremljenom u svemu prema geomehantičkom elaboratu. Debljinu tampona, kao i njegov granulometrijski sastav, treba usvojiti tako da se postigne minimalna zbijenost ispod podne ploče od najmanje 80MPa. Pre početka izrade tampona treba u potpunosti ukloniti humus, nivelisati teren i izvršiti mehaničku stabilizaciju podtla (glinovite prašine).

Podna ploča je projektovana kao klasično armirana armaturnom mrežom Q295 u donjoj zoni. Predvideti betoniranje podne ploče hale u poljima od ~20*20m i šahovskom rasporedu kako bi se izbegli sekundarni uticaji od skupljanja i tečenja betona. U beton dodati aditive za beton koji sprečavaju prsline usled tečenja i skupljanja betona.

Opterećenja:

Analiza opterećenja podne ploče

1. Regalno skladište (leđa u leđa):

- Po projektu tehnologije, opterećenje od regala u skladištima 3.1 i 3.2 na podnu ploču je 50kN/m².

2. Palete sa ozidom:

- U skladišnom prostoru 2 predviđene su palete sa ozidom (3 palete po visini na podu skladišta) težine 50kN/m².

3. Palete sa buradima:

- U skladišnom prostoru 4 predviđene su palete sa buradima (3 palete po visini na podu skladišta) težine 25kN/m².

4. Palete sa čeličnim tablama:

- U skladišnom prostoru 1 predviđene su palete sa čeličnim tablama težine 80kN/m².

5. „Jelke“ za cevi u osama A,C,D,4 i 11:

- U skladišnom prostoru 1 predviđene su „Jelke“ za cevi težine 50kN na 0,4m² lokalno.

6. Pokretno opterećenje od viljuškara

- Po projektu se predviđa korišćenje viljuškara i to u Skladišnim prostorima 3.1, 3.2 i 4 predviđen je viljuškar nosivosti 2t i težine 50kN po osovini, a u Skladištima 1 i 2 predviđen je viljuškar nosivosti 7t i težine 170kN po osovini.

7. Pokretno opterećenje od kamiona

- Po projektu se u Skladištima 1 i 2 predviđa korišćenje kamiona šlepera težine 100kN po osovini.

Deo projekta:	26/17-10/11-01-IDP-2.1 -00	Projekat konstrukcije	List:	1.5.2.3	Rev.:	0
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1.5.2	Tehnički opis
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Usvojeni materijali:

Armiranobetonski prefabrikovani elementi su projektovani od betona MB35 (rožnjače, čašice i obodne temeljne grede), MB50 (glavni nosači i stubovi). Svi prefabrikovani elementi su armirani klasičnom armaturom osim glavnih nosača u Magacinu 1 gde su projektovani prethodno napregnuti glavni nosači. Predviđeno je adheziono prethodno naprezanje. Armiranobetonski elementi liveni na licu mesta (temelji samci) su projektovani od betona MB30.

Sva armatura projektovana je kvaliteta B500B.

Proračun:

Proračun je sproveden prema SRPS propisima.

Seizmički proračun je sproveden u skladu sa važećim standardima i propisima. Ulazni parametri su usvojeni prema preporukama datim u geomehaničkom elaboratu: tlo II kategorija i koeficijent seizmičkog intenziteta $K_s=0,04$. Usvojena je kategorija objekta I.

Proračun je sproveden u softverskom paketu Tower 6, u Mathcad-u i u Excel-u.

Odgovorni projektant:	Ljiljana Mijatović, dipl.inž.građ.	
Broj licence:	310 3025 03	

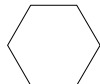
	Investitor:	JAVNO PREDUZEĆE „ELEKTROPRIVREDA SRBIJE” BEOGRAD, Ul. Carice Milice br.2, 11000 Beograd					
	Objekat:	Magacin za smeštaj opreme, Lokacija: TE Kostolac, K.P. 303, K.O. Kostolac selo					
	Vrsta teh. dokum.:	IDP - IDEjni Projekat					
Deo projekta:	26/17-10/11-01-IDP-2.1 -00	Projekat konstrukcije		List:	1.6.1	Rev.:	0

1.6

NUMERIČKA DOKUMENTACIJA

	Investitor:	JAVNO PREDUZEĆE „ELEKTROPRIVREDA SRBIJE” BEOGRAD, Ul. Carice Milice br.2, 11000 Beograd						
	Objekat:	Magacin za smeštaj opreme, Lokacija: TE Kostolac, K.P. 303, K.O. Kostolac selo						
	Vrsta teh. dokum.:	IDP - IDEjni Projekat						
Deo projekta:	26/17-10/11-01-IDP-2.1 -00	Projekat konstrukcije			List:	1.6.1.1	Rev.:	0

1.6	STATIČKI PRORAČUN
-----	-------------------

Odgovorni projektant:	Ljiljana Mijatović, dipl.inž.građ.	
Broj licence:	310 3025 03	

Određivanje debljine podne ploče prema:

"Concrete industrial ground floors - A guide to design and construction"
izdato od: "Concrete Society Technical Report No.34, Third Edition"

Slučaj: Jednako podeljeno opterećenje na ploču

Preporuke za usvajanje vrednosti krutosti tla:

Table 6.2: Typical values of modulus of subgrade reaction k related to soil type.

Soil type	k value (N/mm ³)	
	Lower value	Upper value
Fine or slightly compacted sand	0.015	0.03
Well compacted sand	0.05	0.10
Very well compacted sand	0.10	0.15
Loam or clay (moist)	0.03	0.06
Loam or clay (dry)	0.08	0.10
Clay with sand	0.08	0.10
Crushed stone with sand	0.10	0.15
Coarse crushed stone	0.20	0.25
Well compacted crushed stone	0.20	0.30

U našem slučaju radi se o glinovitoj prašini -lokalno peskovitom tlu.

$k_{usv} =$	0,06 N/mm ³	modulus of subgrade reaction
$d =$	250 mm	debljina ploče C25/30 (MB30)
$f_{cm} =$	33 MPa	srednja vrednost čvrstoće betona pri pritisku na cilindar
$E_{cm} =$	31,48 kN/mm ²	sekantni modul elastičnosti betona
$\gamma_c =$	1,5	parcijalni koeficijent sigurnosti za beton
$f_{ctk} =$	1,8 MPa	karakteristična čvrstoća betona na zatezanje
$C_{fctk,fl} =$	1,894427	
$f_{ctk,fl} =$	3,409969 MPa	Karakteristična čvrstoća pri savijanju $< 2f_{ctk(5\%)}$
$A_s =$	2,95 cm ² /m	površina armature u donjoj zoni ploče
$f_y =$	500 N/mm ²	karakteristična čvrstoća čelika
$a =$	50 mm	zaštitni sloj
$\gamma_s =$	1,15	parcijalni koeficijent sigurnosti za armaturu
$M_n =$	23680,34 kNmm = 23,68034 kNm	Računski negativni moment (gornja zona ploče)
$M_p =$	24369,57 kNmm = 24,36957 kNm	Računski pozitivni moment (donja zona ploče)
$\lambda =$	0,000778 mm ⁻¹ = 0,777802 m ⁻¹	
w_1	85,27397 kN/m ²	Nosivost ploče na površinsko opterećenje

Najveće površinsko opterećenje je od čeličnih tabli na paleti na podu u magacinu 1 ukupne težine
80kN/m² < w1....OK

Proračun podne ploče

Slučaj: Koncentrisano opterećenje usled paleta na visokim regalima

klasa čvrstoće betona

EC2 C25/30 (JUS MB30)

$f_{cu,cube} =$	30	N/mm ²	Čvrstoća kocke
$f_{ck} =$	25	N/mm ²	Čvrstoća cilindra
$f_{cm} =$	33	N/mm ²	Srednja vrednost čvrstoće betona na pritisak cilindra
$f_{ctm} =$	2,6	N/mm ²	Srednja vrednost čvrstoće betona pri aksijalnom zatezanju
$f_{ctk(5\%)} =$	1,8	N/mm ²	Karakteristična čvrstoća pri aksijalnom zatezanju
$E_{cm} =$	31,48	kN/mm ²	Sekantni modul elastičnosti betona
$K =$	0,06	N/mm ³	Koeficijent posteljice
$h =$	250	mm	Debljina ploče
$d =$	200	mm	Statička visina
$\nu =$	0,2		Poissonov koeficijent
$\gamma_c =$	1,5		parcijalni koeficijent sigurnosti za beton
$l =$	918,43	mm	Poluprečnik relativne krutosti

U magacinu je opterećenje od paleta 50kN/m². Na središnji par stubova pada 1,3*2,8*50 = 182kN, na ivične 0,6*2,8*50 = 84kN, a na ugaone 0,6*1,275*50 = 38,25kN.

Napomena: Maksimalno opterećenje od vozila je 170kN po osovini, odnosno 170/2 = 85kN po jednom paru točkova, što je manje od opterećenja od regala.

Koncentrisano opterećenje

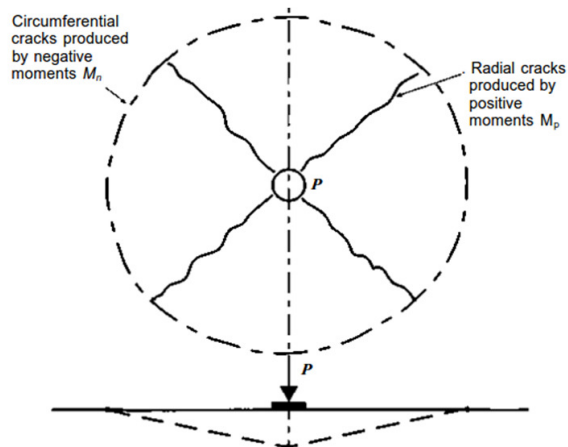
$f_{ctk,fl} =$	3,40	N/mm ²	Karakteristična čvrstoća pri savijanju $< 2f_{ctk(5\%)}$
$k_1 =$	2,0		Koeficijent za smicanje
$v_{Rd,ct} =$	0,28	N/mm ²	Minimalna nosivost betona na smicanje
$A_s =$	2,95	cm ² /m	površina armature u donjoj zoni ploče
$f_y =$	500	N/mm ²	karakteristična čvrstoća čelika
$a =$	50	mm	zaštitni sloj
$\gamma_s =$	1,15		parcijalni koeficijent sigurnosti za armaturu
$M_n =$	23,62	kNm	
$M_p =$	24,37	kNm	
$a =$	140	mm	a,b dimenzije oslonačkog lima
$b =$	140	mm	

a) obodni stubovi regala

$$a = 78,99 \text{ mm}^2$$

$$a/l = 0,09$$

površina



$$P_{u,a/l=0} = 301,53 \text{ kN}$$

$$P_{u,a/l=0,2} = 620,86 \text{ kN}$$

$a/l=0$ opterećenje unutra

$a/l=0,2$ opterećenje unutra

$a/l = 0$:

$$P_u = 2\pi (M_p + M_n)$$

$a/l > 0.2$:

$$P_u = 4\pi (M_p + M_n) / \left[1 - \frac{a}{3l} \right]$$

$$P_u = 438,85 \text{ kN}$$

linearna interpolacija za opterećenje unutra

> 84 kN...OK

$$P_{u,a/l=0} = 122,62 \text{ kN}$$

$$P_{u,a/l=0,2} = 260,17 \text{ kN}$$

$a/l=0$ opterećenje na ivici

$a/l=0,2$ opterećenje na ivici

$a/l = 0$:

$$P_u = \left[\pi (M_p + M_n) / 2 \right] + 2 M_n$$

$a/l > 0.2$:

$$P_u = \left[\pi (M_p + M_n) + 4 M_n \right] / \left[1 - \frac{2a}{3l} \right]$$

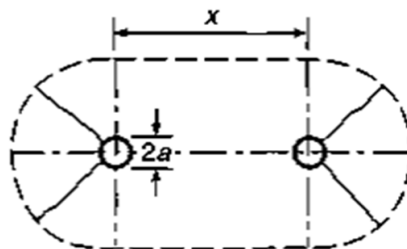
$$P_u = 181,77 \text{ kN}$$

linearna interpolacija za opterećenje na ivici

> 38,25 kN...OK

b) unutrašnji stubovi regala (back to back)

$$x = 320 \text{ mm}$$



$$a = 50551,39 \text{ mm}^2$$

kombinovana površina

$$a_{eqv} = 126,85 \text{ mm}$$

$$a/l = 0,14$$

$$P_{u,a/l=0} = 301,53 \text{ kN}$$

$a/l=0$ opterećenje unutra

$$P_{u,a/l=0,2} = 632,17 \text{ kN}$$

$a/l=0,2$ opterećenje unutra

$$P_u = 443,71 \text{ kN}$$

linearna interpolacija za opterećenje unutra

> 182 kN...OK

Home > Unnamed Project > Basic Data > Crane Configuration > End Results

End Results

ZKKE 25t x 22000mm



Basic Data

Number of Crabs:	1 Qty
SWL:	25 t
Hook Path:	12 m
Crab span:	1400 mm
Span:	22000 mm
Girder Profile:	Box Girder
Deflection	1/800
Platform:	with
Operating Voltage:	400 V
Frequency:	50 Hz

General Information

Classification DIN EN 13001:	S3
Control Voltage:	48 V
Control Type:	DSE
Crab	
FEM / ISO Group:	1Am / M4
Hoist Speed: (V1)	3/0,5 m/min
Cross-travel Speed:	5 - 25 m/min
Crane	
Girder Style:	Standard 1
Long-travel Speed:	10/40 m/min

[Show Details](#)

1. Crane Module:

Qty	Module	Specification
1	Crab(s)	EZ DR-Pro 20-25 4/1-12 Z-3/0,5 1400
2	End Carriages & Drives	DFW-L-Z 315/3150
1	Crab Power Supply	KBK 25
1	Crane Electrics	
1	Crane Control	DSE
1	Crane Options	
2	Crane Girder	
1	Platform	
1	Final Wiring	
1	Final Assembly	
1	Further Options	

Region: World · Version: 05.01.2015

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Dimensions
ZKKE 25t x 22000mm



Crane

Girder Style:	Standard 1
Bridge X1:	1703 mm
Bridge X2:	1703 mm
Bridge H1:	1203 mm
Bridge HB:	1080 mm
Bridge U:	645 mm
Crab platform UKaB:	237 mm

End Carriage

d:	315 mm
eKT:	3150 mm
LeKT:	3941 mm
Buffer Type:	DPZ 160
b	225 mm

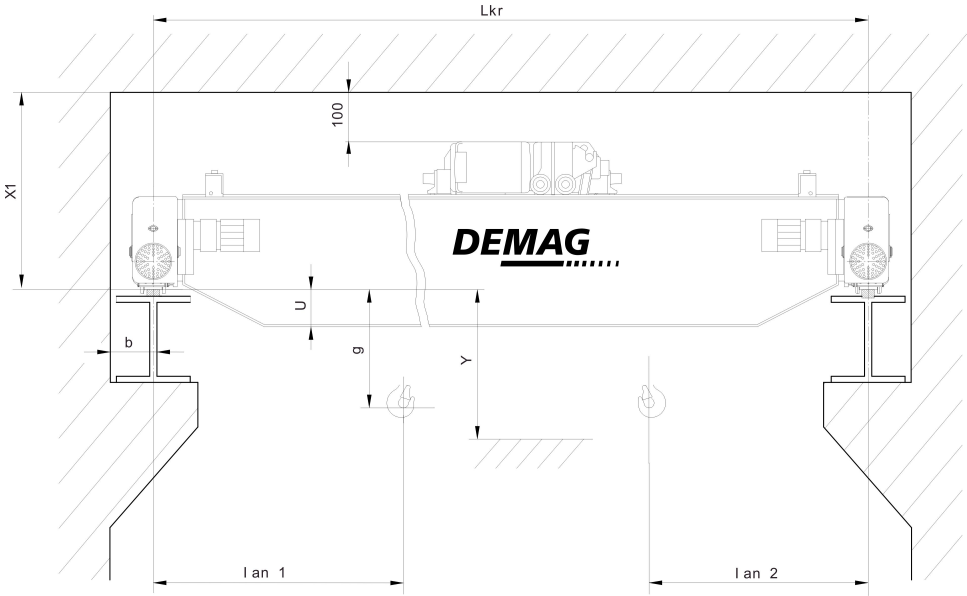
Crab

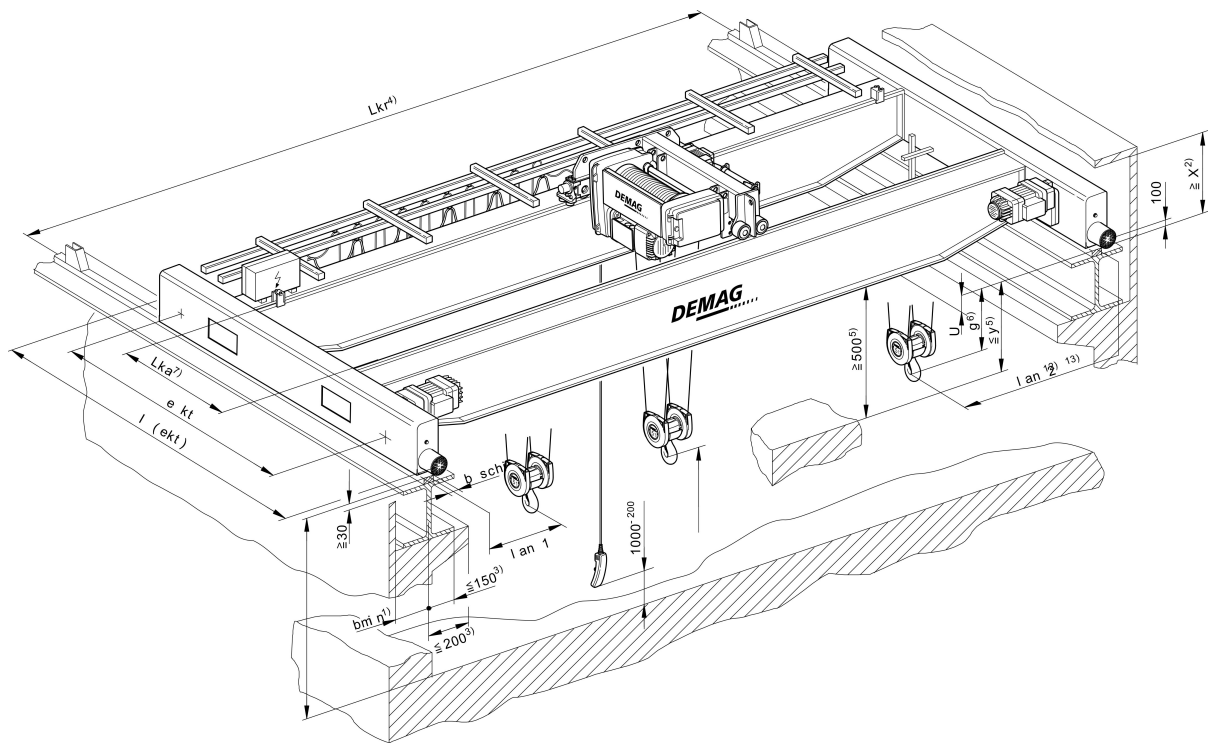
Long Travel Rail Height y:	1145 mm
Crab platform yKaB:	737 mm
Hook to LT Rail Height g:	417 mm
Hook Approach lan1:	1650 mm
Hook Approach lan2:	2230 mm
crab span lka:	1400 mm

Important Information

The crane designer has calculated these results using the information provided. Other dimensional characteristics can be obtained using other options. It is possible to select options which don't correspond with the dimensions given. Our project engineers would be more than happy to check your selections and give advice on more appropriate selections.

The cross travel approach dimension for the (DCL) downshop conductor is located, based upon standard components on crane side 1.





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Loads and Forces

ZKKE 25t x 22000mm



Vertical Wheel Loads

Proportion of crane weight	
max. Qc.1	5024 kg
max. Qc.2	4198 kg
Proportion of lifting capacity	
max. Qh.1	12376 kg
max. Qh.2	11024 kg
Proportion of crane weight	
min. Qc.1	3999 kg
min. Qc.2	3332 kg
Proportion of lifting capacity	
min. Qh.1	925 kg
min. Qh.2	824 kg

Force

HL	3,84 kN
HTmax	11,85 kN
HTmin	3,3 kN

Horizontal Load

S	53,19 kN
HS11	0 kN
HS12	41,46 kN
HS21	0 kN
HS22	11,73 kN

Buffer Load

HB	31,1 kN
Buffer type:	DPZ 160

Crane

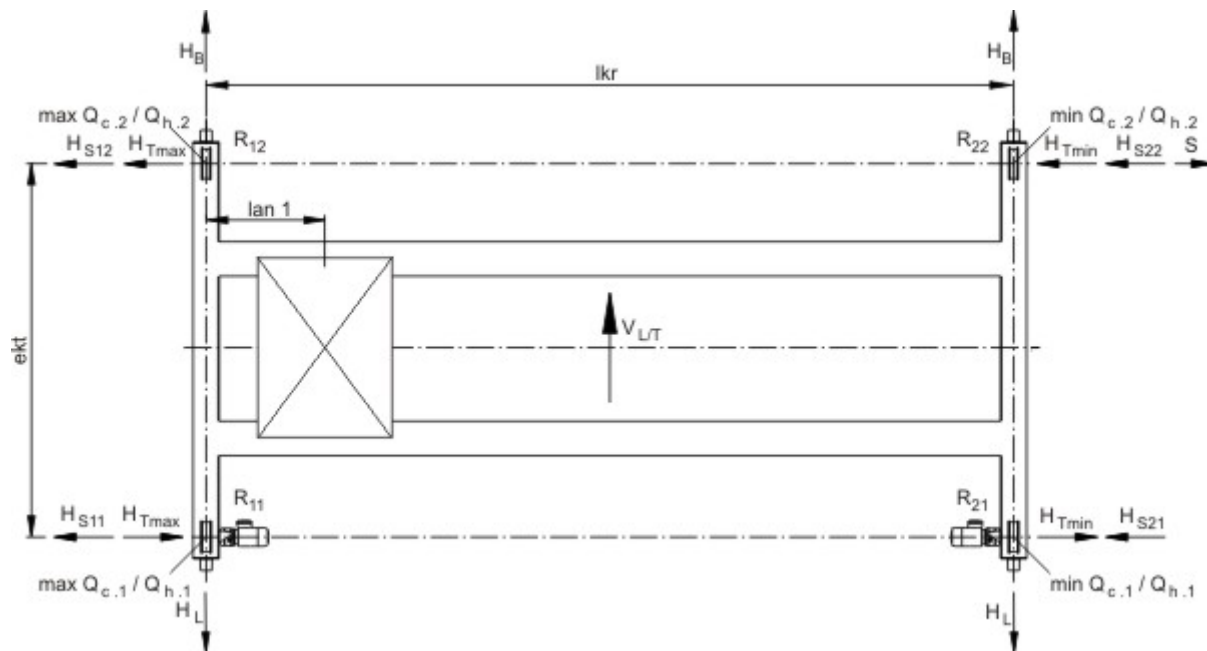
Crane Weight:	16703 kg
Crab Weight:	2224 kg
eKT:	3150 mm
Distance of guide rollers	3150 mm

Dynamic coefficients

Φ1 (Dead weight)	1,1
Φ2A (Lifted load)	1,05
Φ2C/L (Overload)	1,13
Φ3 (Load reduction)	1
Φ4kr (Crane runway unevenness)	1
Φ5kr (Long-travel drive)	1,8
Φ5hw (Hoist unit drive)	1,35
Φ6dyn (Test load: dynamic)	1,03
Φ6stat (Test load: static)	1
Φ7 (Buffer impact)	1,25

Important Information

The crane designer has calculated these results using the information provided. Other load characteristics can be obtained using other options. It is however possible to select options which don't correspond with the loadings given. Our project engineers would be more than happy to check your selections and give advice on more appropriate selections.



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Datoteka: Hala 1-rev01.twp
Datum proračuna: 10.12.2017

Nacin proračuna: 3D model

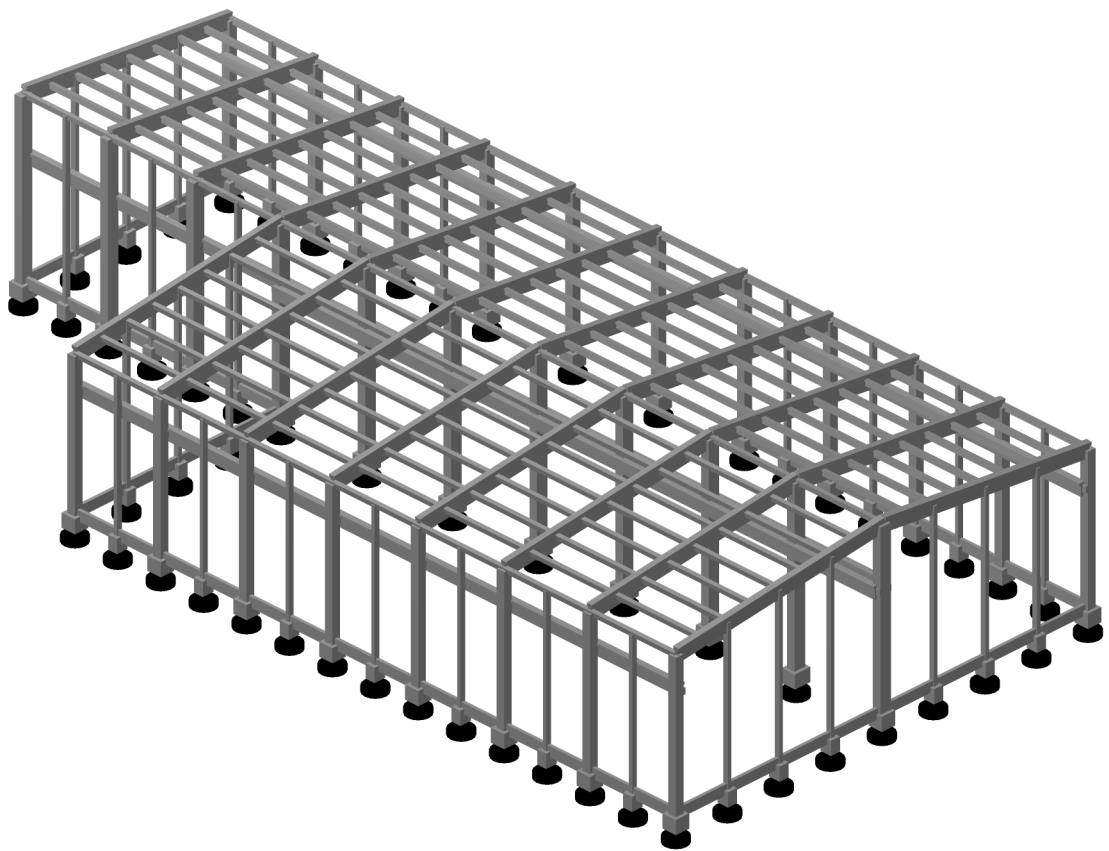
- ☒ Teorija I-og reda ☒ Modalna analiza ☐ Stabilnost
☐ Teorija II-og reda ☒ Seizmicki proračun ☐ Faze gradjenja
☐ Nelinearan proračun

Velicina modela

Broj cvorova: 366
Broj pločastih elemenata: 0
Broj grednih elemenata: 585
Broj granicnih elemenata: 354
Broj osnovnih slučajeve opterećenja: 16
Broj kombinacija opterećenja: 1088

Jedinice mera

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



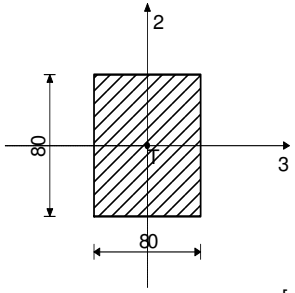
Izometrija

Tabela materijala							
No	Naziv materijala	E[kN/m ²]	μ	γ [kN/m ³]	α [1/C]	Em[kN/m ²]	μ_m
1	Beton MB 30	3.150e+7	0.20	25.00	1.000e-5	3.150e+7	0.20

Setovi greda

@1@Set: 1 Presek: b/d=80/80, Fiktivna ekscentricnost

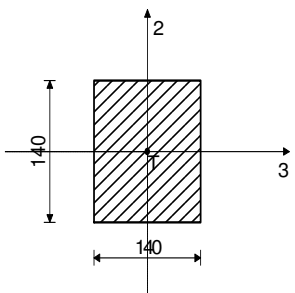
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	6.400e-1	5.333e-1	5.333e-1	5.769e-2	3.413e-2	3.413e-2



[m]

@1@Set: 2 Presek: b/d=140/140, Fiktivna ekscentricnost

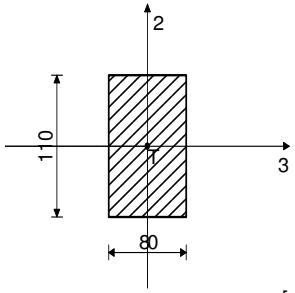
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	1.960e+0	1.633e+0	1.633e+0	5.410e-1	3.201e-1	3.201e-1



[m]

@1@Set: 3 Presek: b/d=80/110, Fiktivna ekscentricnost

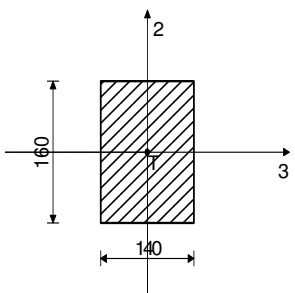
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	8.800e-1	7.333e-1	7.333e-1	1.037e-1	4.693e-2	8.873e-2



[m]

@1@Set: 4 Presek: b/d=140/160, Fiktivna ekscentricnost

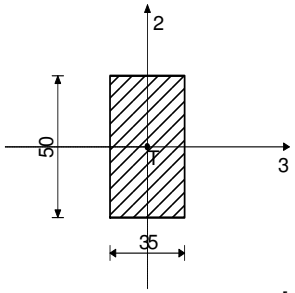
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	2.240e+0	1.867e+0	1.867e+0	6.961e-1	3.659e-1	4.779e-1



[m]

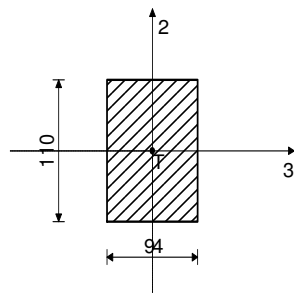
@1@Set: 5 Presek: b/d=35/50, Fiktivna ekscentricnost

Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	1.750e-1	1.458e-1	1.458e-1	4.058e-3	1.786e-3	3.646e-3



[m]

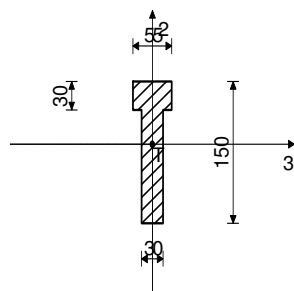
@1@Set: 6 Presek: b/d=94/110, Fiktivna ekscentricnost



[m]

Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	1.034e+0	8.617e-1	8.617e-1	1.479e-1	7.614e-2	1.043e-1

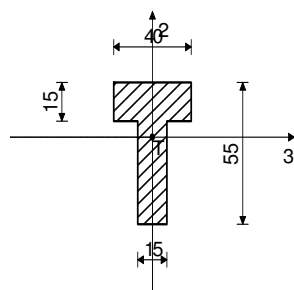
@1@Set: 7 Presek: T 55/150, Fiktivna ekscentricnost



[m]

Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	5.250e-1	3.953e-1	4.737e-1	1.575e-2	6.859e-3	1.081e-1

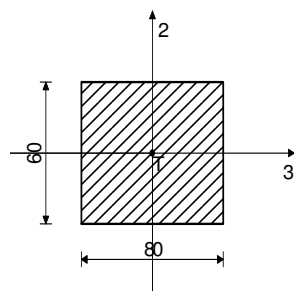
@1@Set: 8 Presek: T 40/55, Fiktivna ekscentricnost



[m]

Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	1.200e-1	7.883e-2	1.013e-1	9.000e-4	9.125e-4	3.181e-3

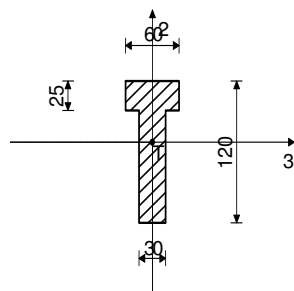
@1@Set: 9 Presek: b/d=80/60, Fiktivna ekscentricnost



[m]

Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	4.800e-1	4.000e-1	4.000e-1	3.110e-2	2.560e-2	1.440e-2

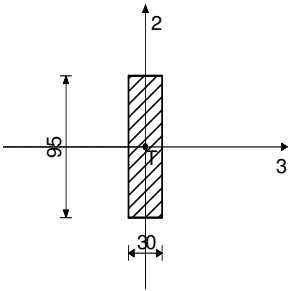
@1@Set: 10 Presek: T 60/120, Fiktivna ekscentricnost



[m]

Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	4.350e-1	3.195e-1	3.878e-1	1.167e-2	6.637e-3	5.759e-2

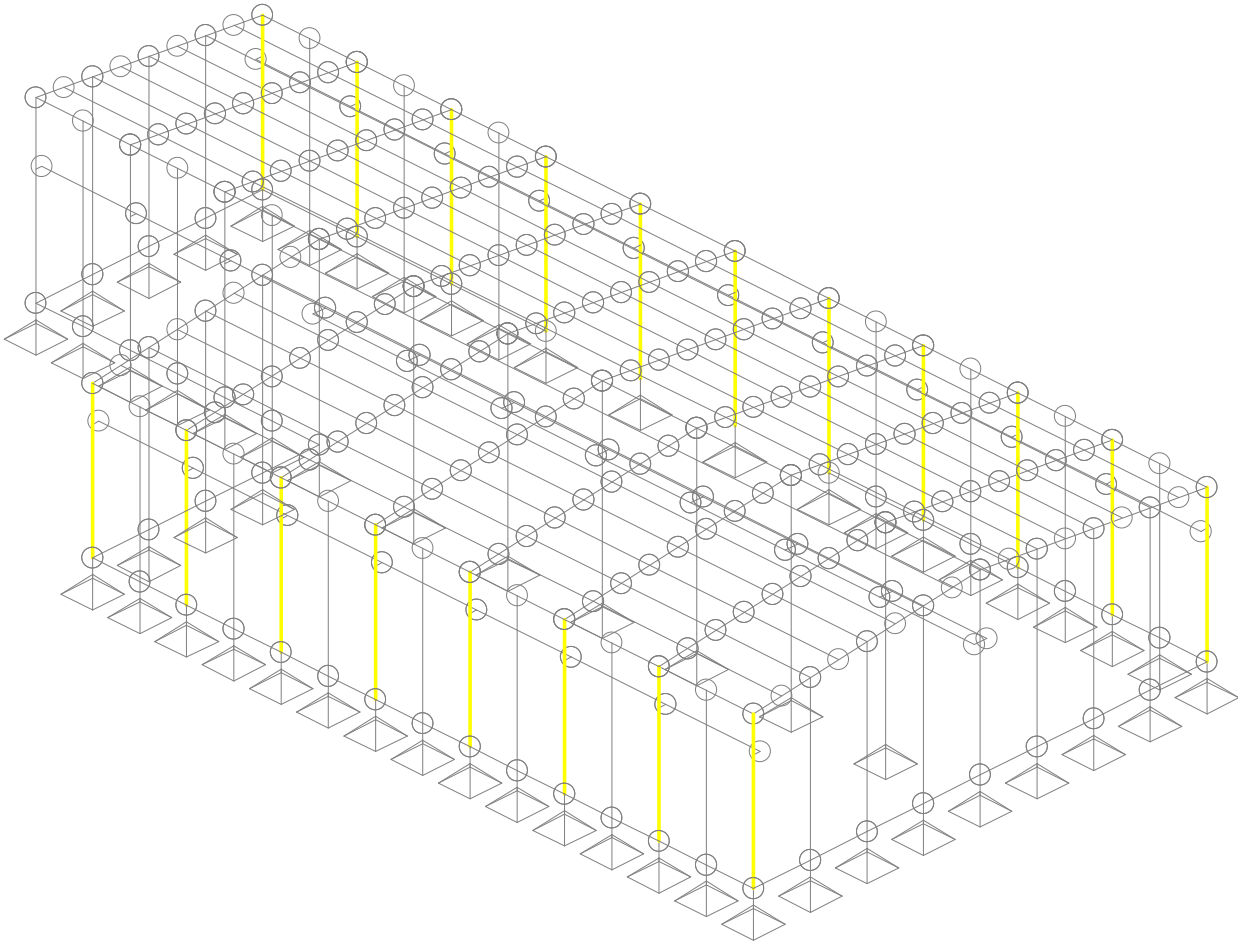
@1@Set: 11	Presek: b/d=30/95, Fiktivna ekscentricnost						
	Mat.	A1	A2	A3	I1	I2	I3
	1 - Beton MB 30	2.850e-1	2.375e-1	2.375e-1	6.850e-3	2.138e-3	2.143e-2



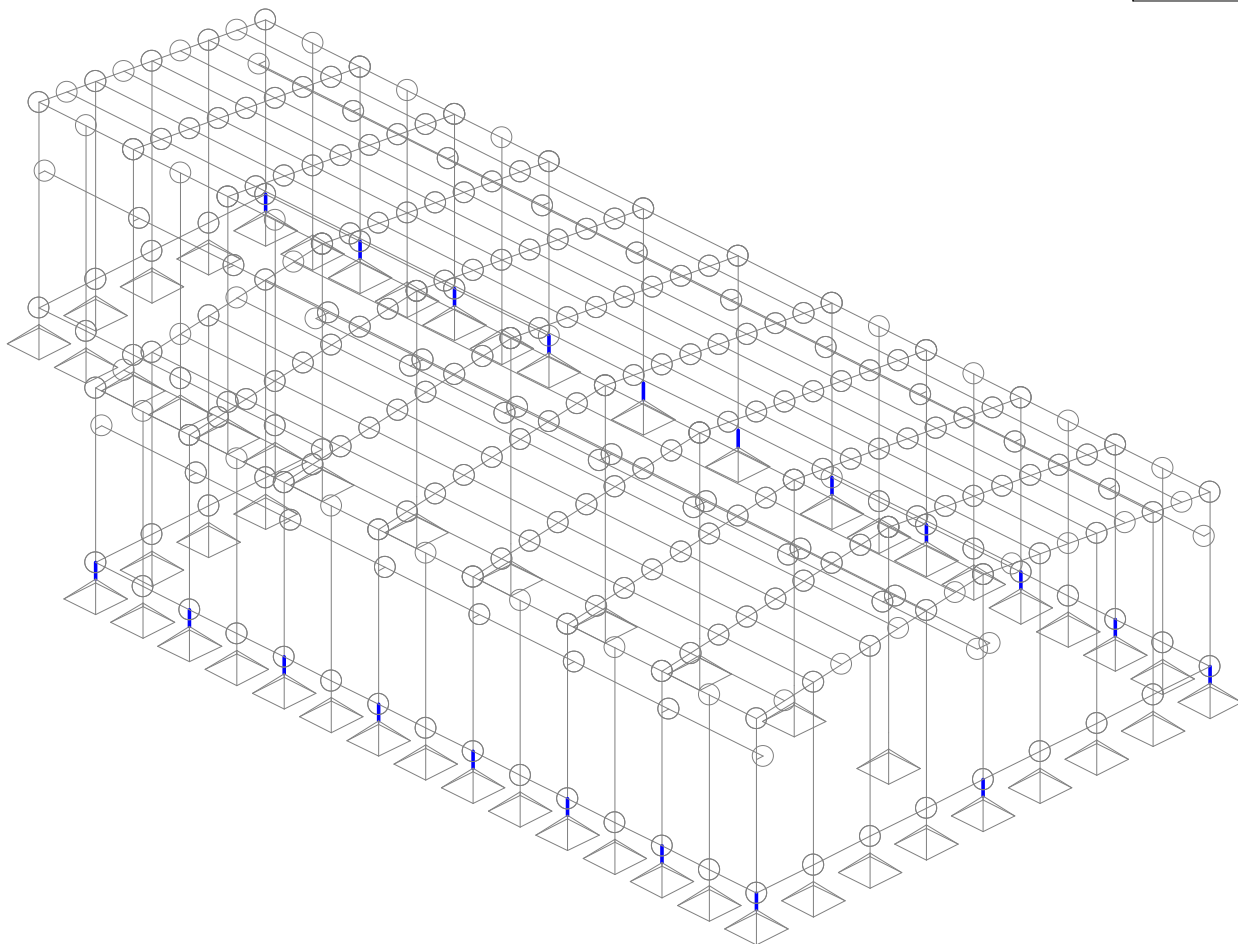
[m]

Setovi tackastih oslonaca						
	K,R1	K,R2	K,R3	K,M1	K,M2	K,M3
1	1.000e+10	1.000e+10	1.000e+10	1.000e+10	1.000e+10	1.000e+10

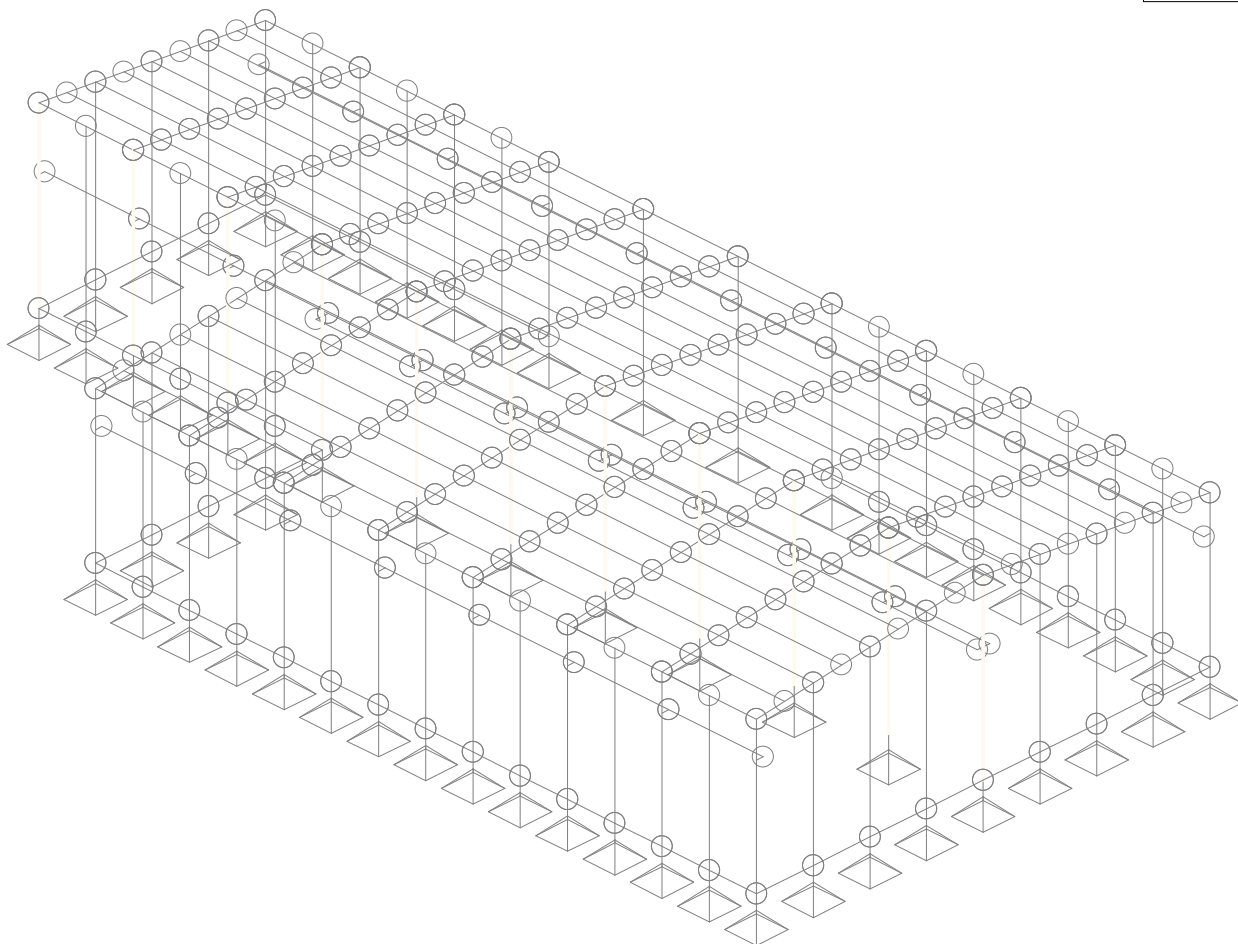
Greda
1. b/d=80/80



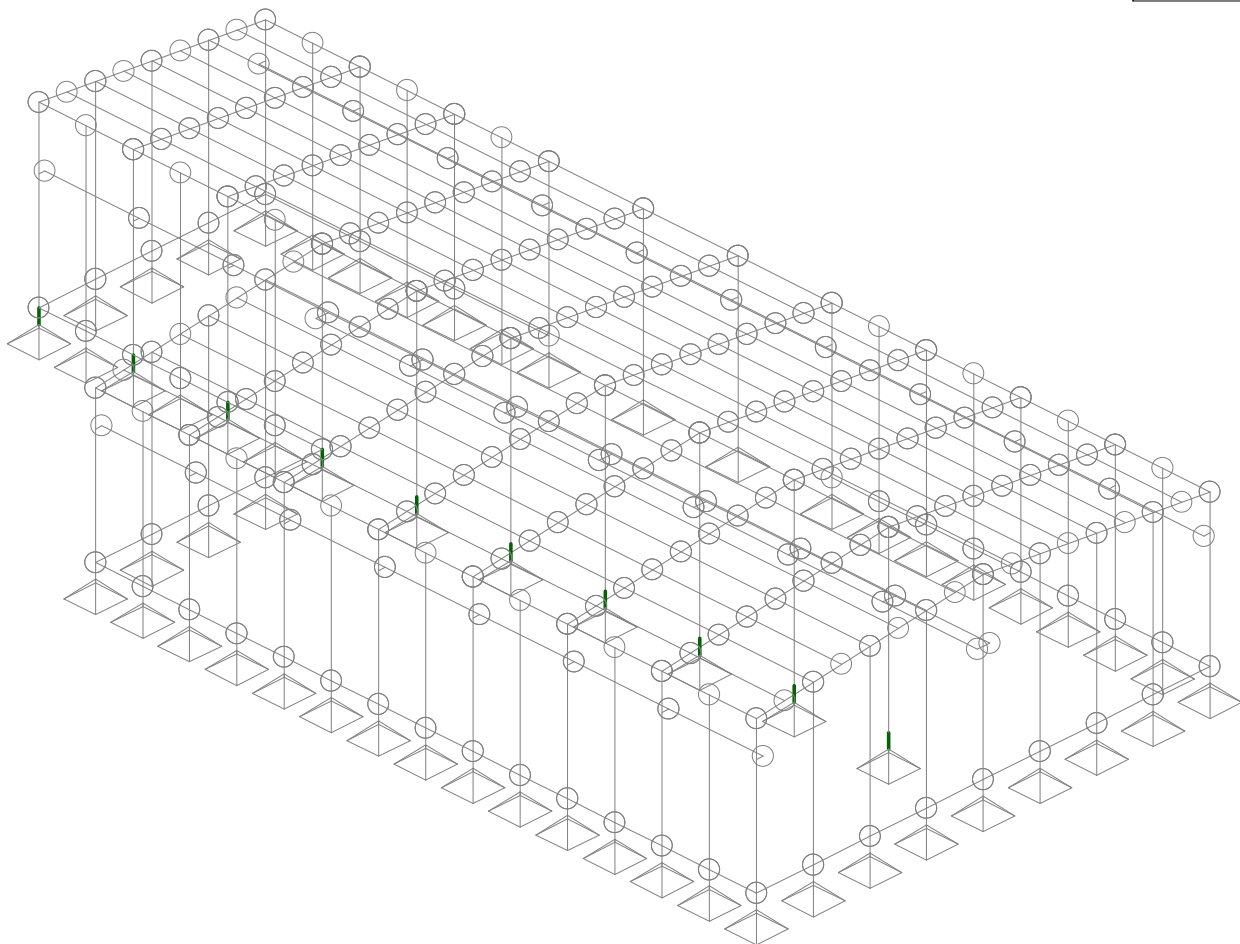
Setovi numerickih podataka
Greda (1)



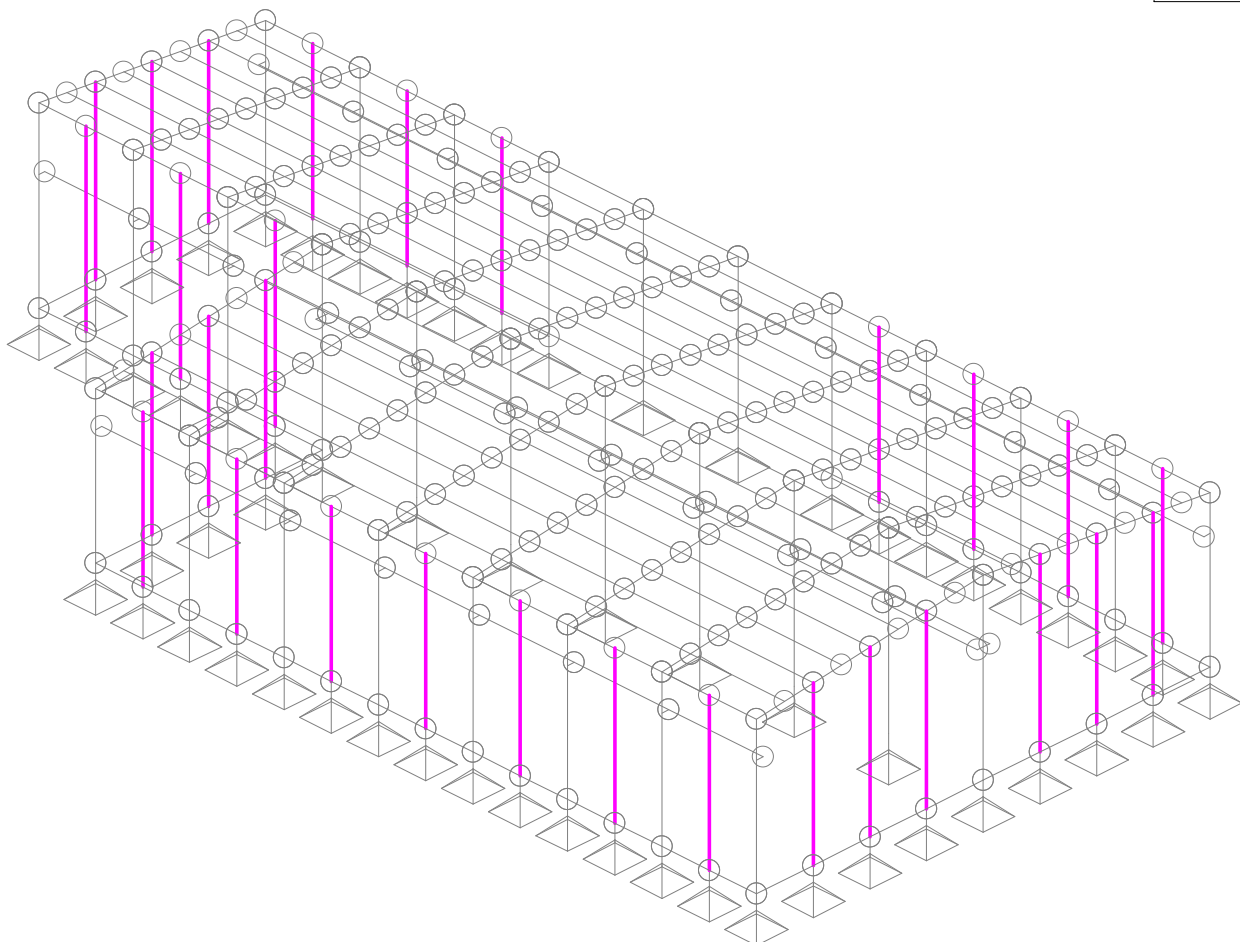
Setovi numerickih podataka
Greda (2)



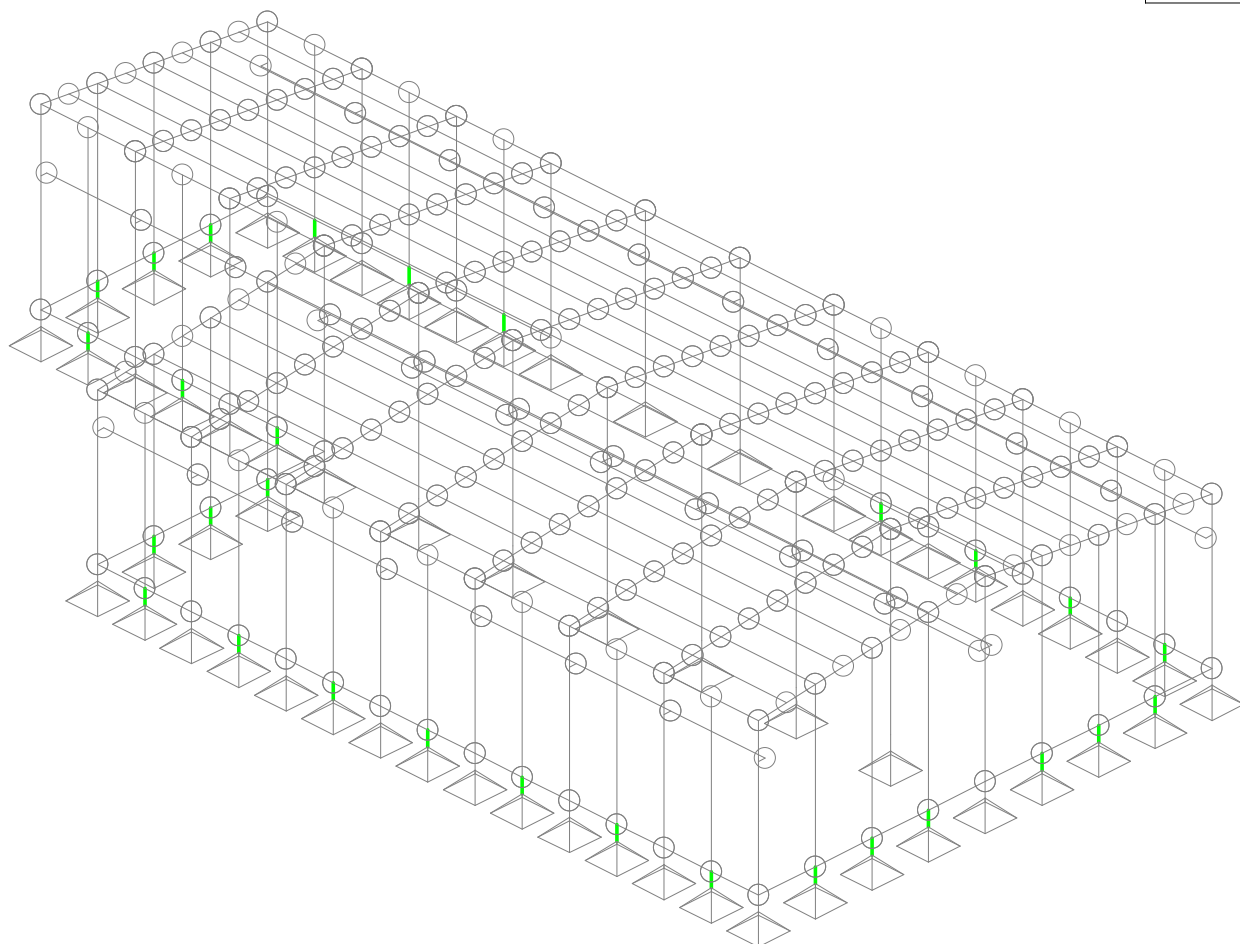
Setovi numerickih podataka
Greda (3)



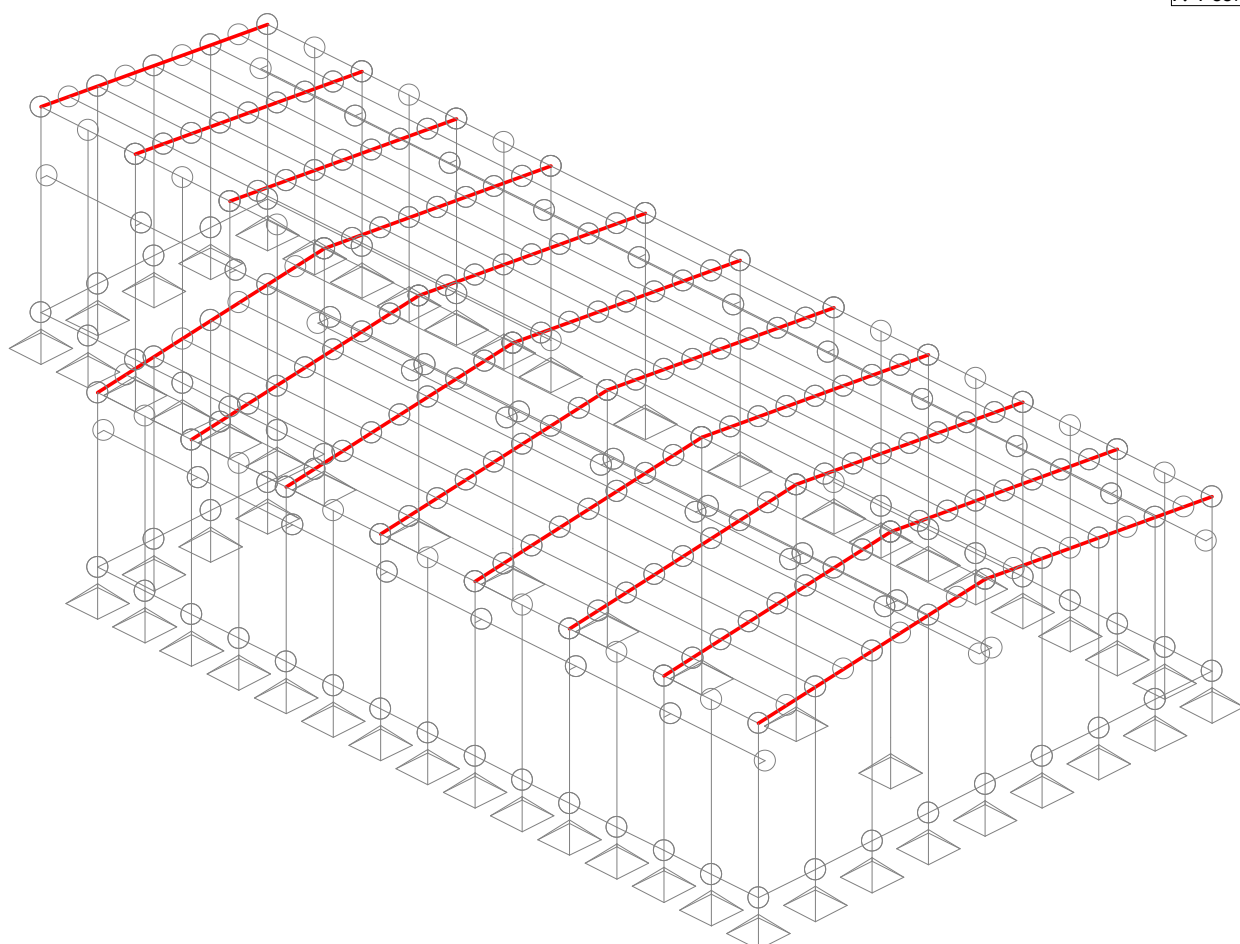
Setovi numerickih podataka
Greda (4)



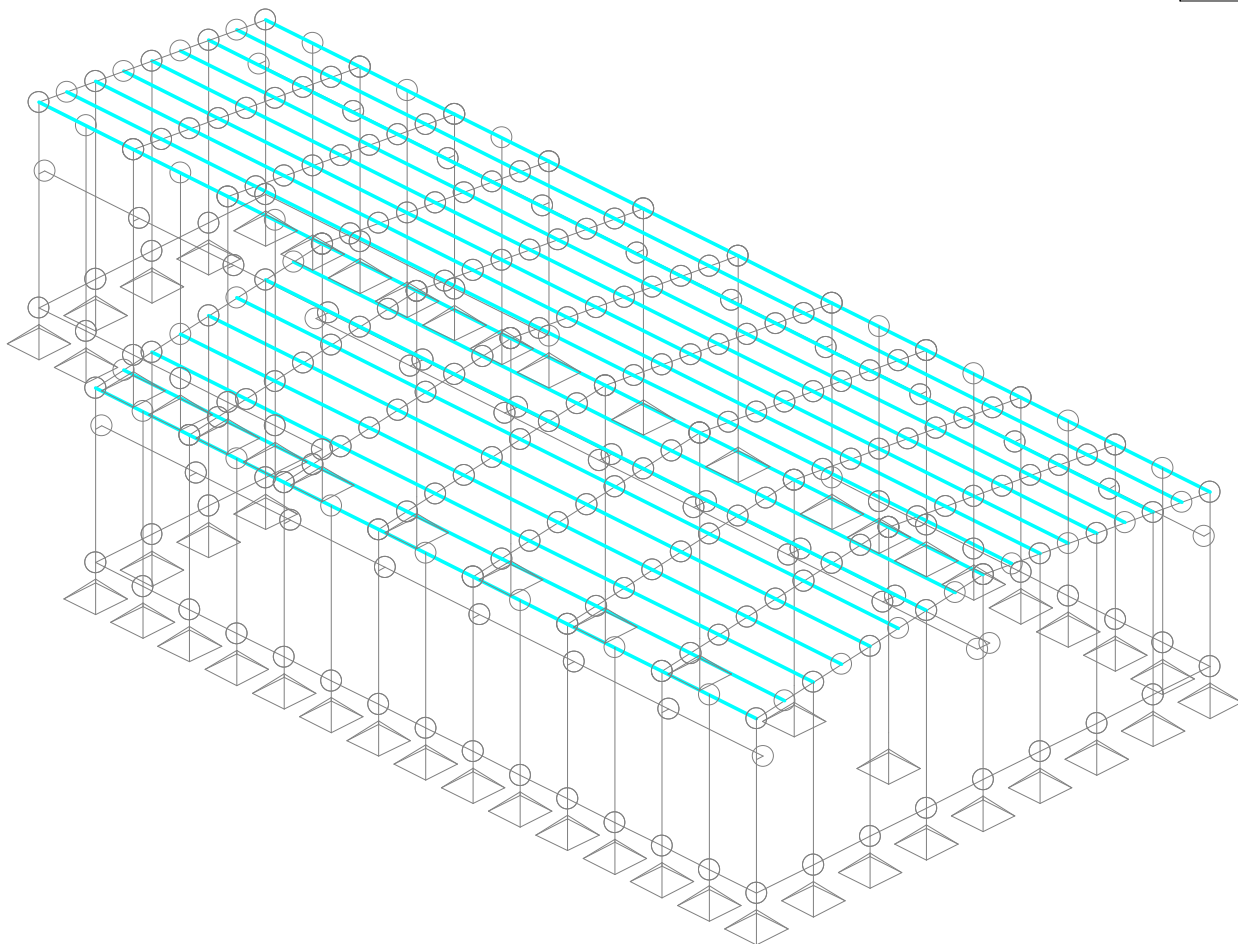
Setovi numerickih podataka
Greda (5)



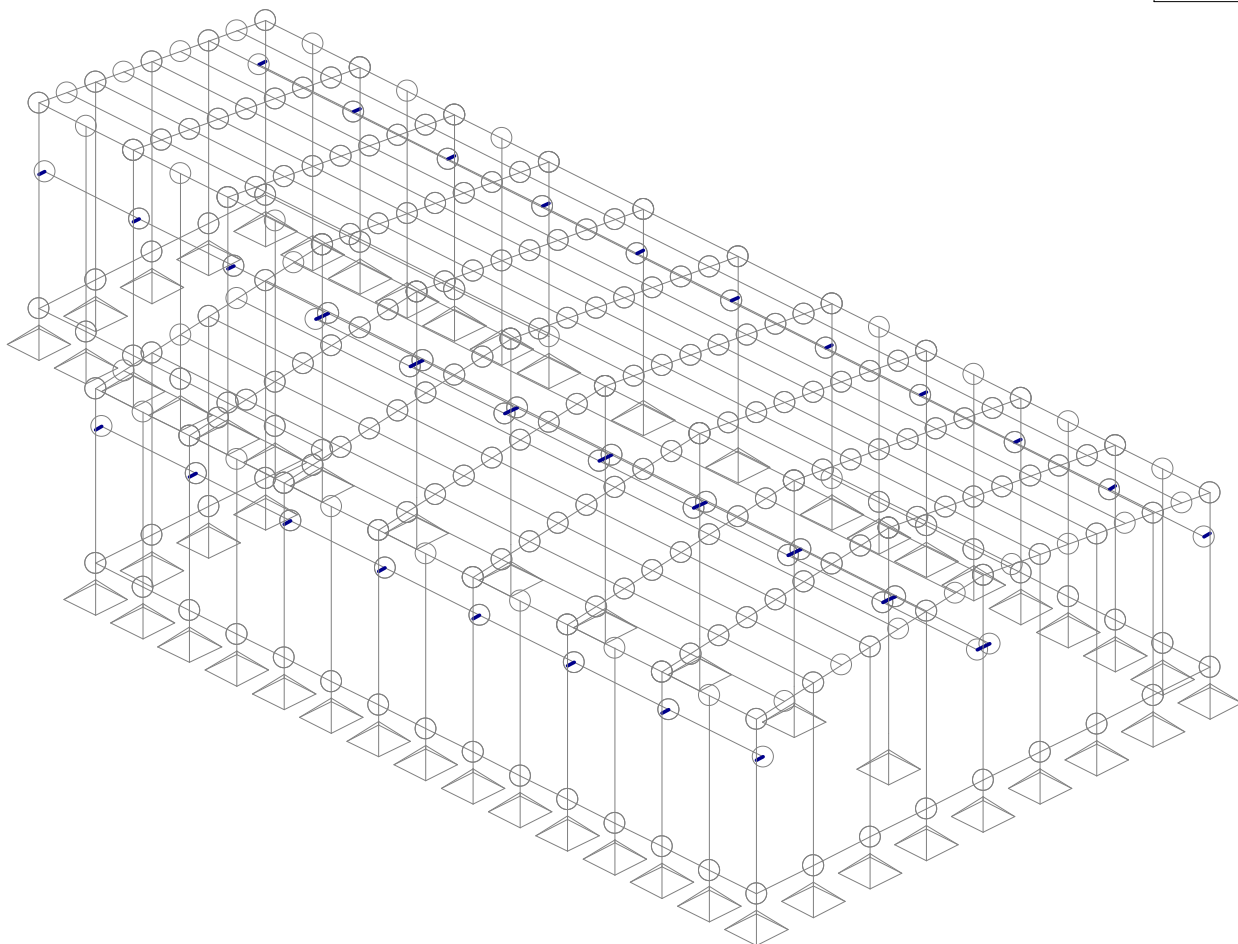
Setovi numerickih podataka
Greda (6)



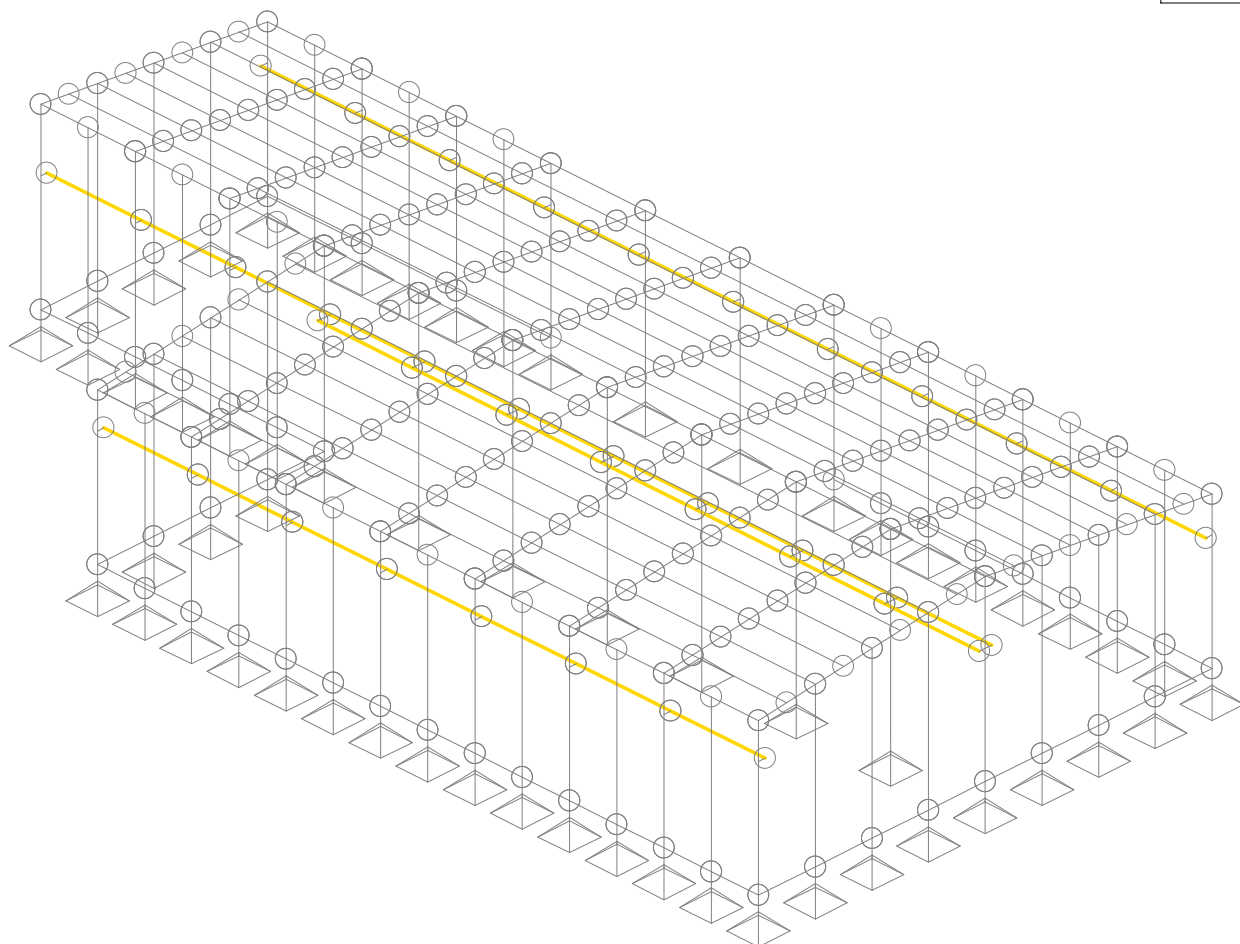
Setovi numerickih podataka
Greda (7)



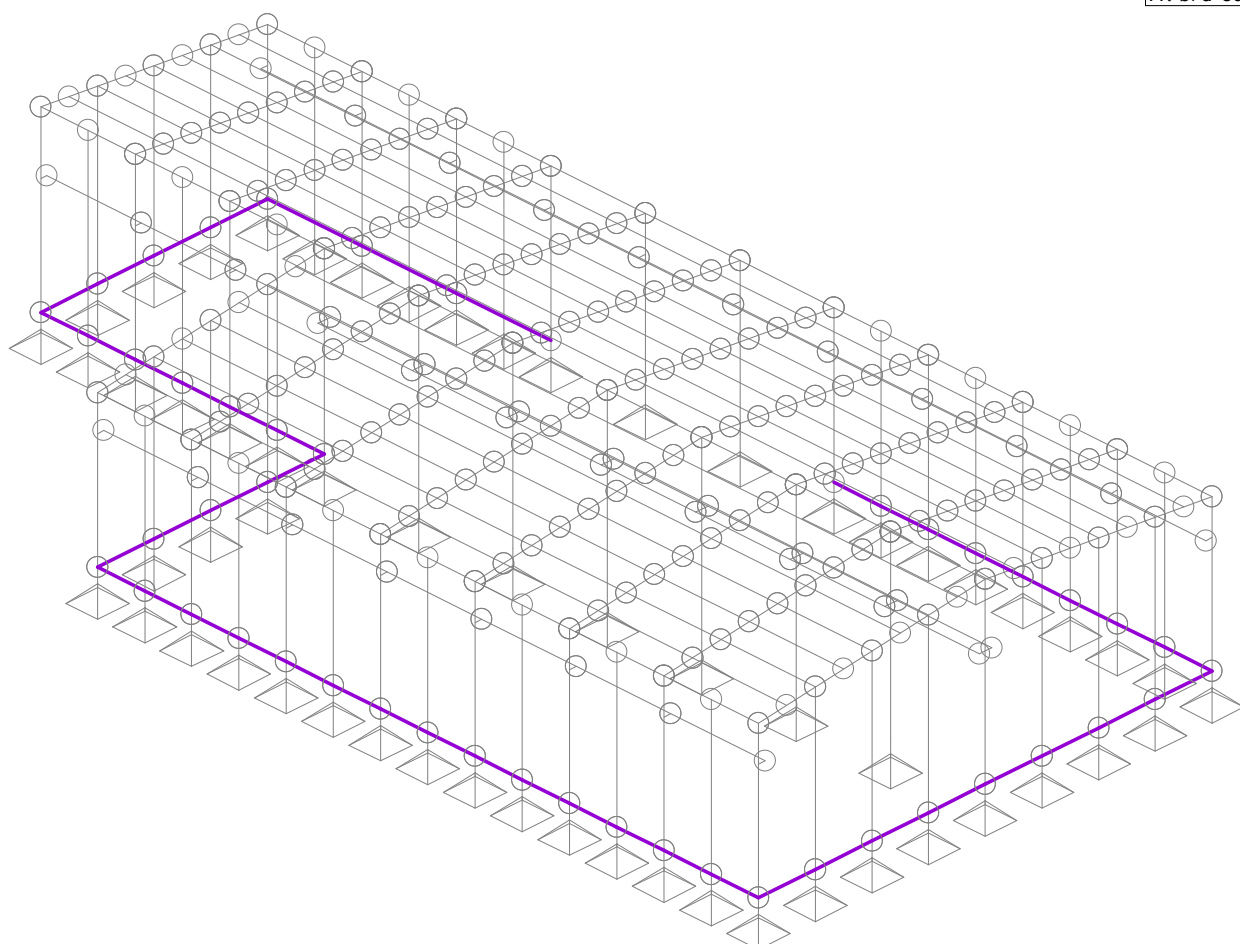
Setovi numerickih podataka
Greda (8)



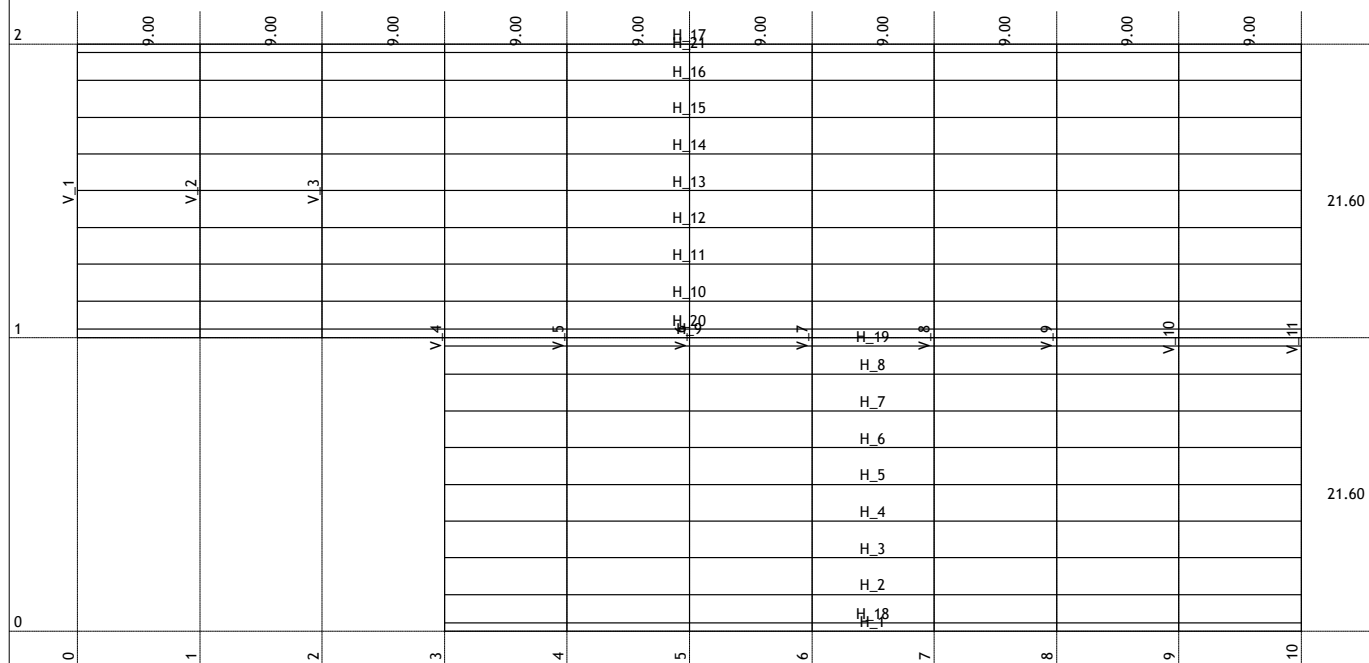
Setovi numerickih podataka
Greda (9)



Setovi numerickih podataka
Greda (10)



Setovi numerickih podataka
Greda (11)



Lista slučajeva opterećenja

No	Naziv
1	SW (g)
2	G
3	S
4	W-x
5	Wy
6	Wu
7	Gkran-max.staza
8	Pkran-max.staza
9	Gkran-max.M stub
10	Pkran-max.M stub
11	Gkran-max.N stub
12	Pkran-max.N stub
13	Gkran-max.N stub-sl.2
14	Pkran-max.N stub-sl.2
15	Sx
16	Sy
17	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xIV+1.8xV+1.6xVII+1.8xVIII
18	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xIV-1.8xV+1.6xVII+1.8xVIII
19	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV-1.8xVI+ +1.6xVII+1.8xVIII
20	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xIV-1.8xV+1.6xIX+1.8xX
21	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xIV+1.8xV+1.6xIX+1.8xX
22	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV+1.8xVI+ +1.6xVII+1.8xVIII
23	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV-1.8xVI+ +1.6xIX+1.8xX
24	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV+1.8xVI+ +1.6xIX+1.8xX
25	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xV-1.8xVI+1.6xXI+1.8xXII
26	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xV+1.8xVI+1.6xXI+1.8xXII
27	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV-1. 8xVI+1.6xXI+1.8xXII
28	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV+ +1.8xVI+1.6xXI+1.8xXII
29	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV-1. 8xVI+1.6xXIII+1.8xXIV
30	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV-1.8xVI+ +1.6xXIII+1.8xXIV
31	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV+1.8xVI+ +1.6xXIII+1.8xXIV
32	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV+ +1.8xVI+1.6xXIII+1.8xXIV
33	Komb.: I+1.6xII+1.8xIII+1.8xIV- -1.8xVI+1.6xVII+1.8xVIII
34	Komb.: I+1.6xII+1.8xIII+ +1.8xIV+1.8xVI+1.6xVII+1.8xVIII
35	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV-1. 8xVI+XI+1.8xXII
36	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xV+1.8xVI+XI+1.8xXII
37	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xV-1.8xVI+XI+1.8xXII
38	Komb.: 1.6xI+II+1.8xIII+1.8xV+ +1.8xVI+1.6xXI+1.8xXII
39	Komb.: 1.6xI+II+1.8xIII+ +1.8xV-1.8xVI+1.6xXI+1.8xXII
40	Komb.: 1.6xI+II+1.8xIII+1.8xIV- -1.8xVI+1.6xVII+1.8xVIII
41	Komb.: I+1.6xII+1.8xIII+1.8xV+ +1.8xVI+1.6xXI+1.8xXII
42	Komb.: I+1.6xII+1.8xIII+ +1.8xV-1.8xVI+1.6xXI+1.8xXII
43	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV+1.8xVI+1.6xVII+1.8xVIII
44	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV+ +1.8xVI+XI+1.8xXII
45	Komb.: 1.6xI+II+1.8xIII+1.8xIV+ +1.8xVI+1.6xXI+1.8xXII
46	Komb.: 1.6xI+ +II+1.8xIII+1.8xIV-1.8xVI +1.6xXI+1.8xXII
47	Komb.: I+1.6xII+1.8xIII+1.8xIV+ +1.8xVI+1.6xXI+1.8xXII
48	Komb.: I+1.6xII+1.8xIII+1. 8xIV-1.8xVI+1.6xXI+1.8xXII
49	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV+1.8xVI+ +IX+1.8xX
50	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV-1.8xVI+ +IX+1.8xX
51	Komb.: 1.6xI+

No	Naziv
	+II+1.8xIII+1.8xV+1.8xVI+ +1.6xIX+1.8xX
52	Komb.: 1.6xI+ +II+1.8xIII+1.8xV-1.8xVI+ +1.6xIX+1.8xX
53	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV+1.8xVI+ +VII+1.8xVIII
54	Komb.: I+1.6xII+1.8xIII+1. 8xV+1.8xVI+1.6xIX+1.8xX
55	Komb.: I+1.6xII+1.8xIII+1. 8xV-1.8xVI+1.6xIX+1.8xX
56	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xIV+1.8xV+IX+1.8xX
57	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xIV-1.8xVI+IX+1.8xX
58	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV+1.8xVI+1.6xIX+1.8xX
59	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xIV-1.8xVI+VII+1.8xVIII
60	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV-1.8xVI+1.6xIX+1.8xX
61	Komb.: I+1.6xII+1.8xIII+ +1.8xIV+1.8xVI+1.6xIX+1.8xX
62	Komb.: I+1.6xII+1.8xIII+ +1.8xIV-1.8xVI+1.6xIX+1.8xX
63	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV-1.8xVI+ +VII+1.8xVIII
64	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xIV+1.8xVI+VII+1.8xVIII
65	Komb.: 1.6xI+ +II+1.8xIII+1.8xV+1.8xVI+ +1.6xVII+1.8xVIII
66	Komb.: I+1.6xII+1.8xIII+1.8xIV+ +1.8xVI+1.6xXIII+1.8xXIV
67	Komb.: 1.6xI+ +II+1.8xIII+1.8xIV-1.8xVI +1.6xXIII+1.8xXIV
68	Komb.: I+1.6xII+1.8xIII+1. 8xIV-1.8xVI+1.6xXIII+1.8xXIV
69	Komb.: 1.6xI+II+1.8xIII+1.8xIV+ +1.8xVI+1.6xXIII+1.8xXIV
70	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV-1. 8xVI+XIII+1.8xXIV
71	Komb.: 1.6xI+II+1.8xIII+1.8xV- -1.8xVI+1.6xVII+1.8xVIII
72	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV+ +1.8xVI+XIII+1.8xXIV
73	Komb.: I+1.6xII+1.8xIII+1. 8xV+1.8xVI+1.6xVII+1.8xVIII
74	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV+1.8xVI+ +XIII+1.8xXIV
75	Komb.: I+1.6xII+1.8xIII+1.8xV- -1.8xVI+1.6xVII+1.8xVIII
76	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV-1.8xVI+ +XIII+1.8xXIV
77	Komb.: I+1.6xII+1.8xIII+1.8xV- -1.8xVI+1.6xXIII+1.8xXIV
78	Komb.: 1.6xI+ +II+1.8xIII+1.8xV+1.8xVI+ +1.6xXIII+1.8xXIV
79	Komb.: I+1.6xII+1.8xIII+1. 8xV+1.8xVI+1.6xXIII+1.8xXIV
80	Komb.: 1.6xI+II+1.8xIII+1.8xV- -1.8xVI+1.6xXIII+1.8xXIV
81	Komb.: I+II+1.8xIII+1.8xIV- -1.8xVI+1.6xIX+1.8xX
82	Komb.: I+II+1.8xIII+ +1.8xIV+1.8xVI+1.6xIX+1.8xX
83	Komb.: I+1.6xII+1.8xIII+ +1.8xIV-1.8xVI+IX+1.8xX
84	Komb.: I+1.6xII+1.8xIII+ +1.8xIV+1.8xVI+IX+1.8xX
85	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV-1.8xVI+IX+1.8xX
86	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV+1.8xVI+IX+1.8xX
87	Komb.: I+II+1.8xIII+1.8xV- -1.8xVI+1.6xIX+1.8xX
88	Komb.: I+II+1.8xIII+1.8xV +1.8xVI+1.6xIX+1.8xX
89	Komb.: I+1.6xII+1.8xIII+1. 8xV-1.8xVI+IX+1.8xX
90	Komb.: I+1.6xII+1.8xIII+1. 8xV+1.8xVI+IX+1.8xX
91	Komb.: 1.6xI+ +II+1.8xIII+1.8xV-1.8xVI+ +IX+1.8xX
92	Komb.: 1.6xI+ +II+1.8xIII+1.8xV+1.8xVI+ +IX+1.8xX
93	Komb.: I+II+1.8xIII+1.8xV- -1.8xVI+1.6xVII+1.8xVIII
94	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV+1.8xVI+VII+1.8xVIII

Lista slucajeva opterecenja	
No	Naziv
95	Komb.: 1.6xI+II+1.8xIII+1.8xIV-1.8xVI+VII+1.8xVIII
96	Komb.: I+1.6xII+1.8xIII+1.8xIV+1.8xVI+VII+1.8xVIII
97	Komb.: I+1.6xII+1.8xIII+1.8xIV-1.8xVI+VII+1.8xVIII
98	Komb.: I+II+1.8xIII+1.8xIV-1.8xVI+1.6xXI+1.8xXII
99	Komb.: I+II+1.8xIII+1.8xIV+1.8xVI+1.6xXI+1.8xXII
100	Komb.: I+1.6xII+1.8xIII+1.8xIV-1.8xVI+XI+1.8xXII
101	Komb.: I+1.6xII+1.8xIII+1.8xIV+1.8xVI+XI+1.8xXII
102	Komb.: 1.6xI+II+1.8xIII+1.8xIV-1.8xVI+XI+1.8xXII
103	Komb.: 1.6xI+II+1.8xIII+1.8xIV+1.8xVI+XI+1.8xXII
104	Komb.: I+II+1.8xIII+1.8xV-1.8xVI+1.6xXI+1.8xXII
105	Komb.: I+II+1.8xIII+1.8xV+1.8xVI+1.6xXI+1.8xXII
106	Komb.: I+1.6xII+1.8xIII+1.8xV-1.8xVI+XI+1.8xXII
107	Komb.: I+1.6xII+1.8xIII+1.8xV+1.8xVI+XI+1.8xXII
108	Komb.: 1.6xI+II+1.8xIII+1.8xV-1.8xVI+XI+1.8xXII
109	Komb.: 1.6xI+II+1.8xIII+1.8xV+1.8xVI+XI+1.8xXII
110	Komb.: I+II+1.8xIII+1.8xIV+1.8xVI+1.6xVII+1.8xVIII
111	Komb.: I+II+1.8xIII+1.8xIV-1.8xVI+1.6xVII+1.8xVIII
112	Komb.: 1.6xI+II+1.8xIII+1.8xV+1.8xVI+XIII+1.8xXIV
113	Komb.: 1.6xI+II+1.8xIII+1.8xV-1.8xVI+XIII+1.8xXIV
114	Komb.: I+1.6xII+1.8xIII+1.8xV+1.8xVI+XIII+1.8xXIV
115	Komb.: I+1.6xII+1.8xIII+1.8xV-1.8xVI+XIII+1.8xXIV
116	Komb.: I+II+1.8xIII+1.8xV+1.8xVI+1.6xXIII+1.8xXIV
117	Komb.: I+II+1.8xIII+1.8xV-1.8xVI+1.6xXIII+1.8xXIV
118	Komb.: 1.6xI+II+1.8xIII+1.8xIV+1.8xVI+XIII+1.8xXIV
119	Komb.: 1.6xI+II+1.8xIII+1.8xIV-1.8xVI+XIII+1.8xXIV
120	Komb.: I+1.6xII+1.8xIII+1.8xIV+1.8xVI+XIII+1.8xXIV
121	Komb.: 1.6xI+II+1.8xIII+1.8xV+1.8xVI+VII+1.8xVIII
122	Komb.: I+1.6xII+1.8xIII+1.8xIV-1.8xVI+XIII+1.8xXIV
123	Komb.: 1.6xI+II+1.8xIII+1.8xV-1.8xVI+VII+1.8xVIII
124	Komb.: I+II+1.8xIII+1.8xIV+1.8xVI+1.6xXIII+1.8xXIV
125	Komb.: I+1.6xII+1.8xIII+1.8xV+1.8xVI+VII+1.8xVIII
126	Komb.: I+II+1.8xIII+1.8xIV-1.8xVI+1.6xXIII+1.8xXIV
127	Komb.: I+1.6xII+1.8xIII+1.8xV-1.8xVI+VII+1.8xVIII
128	Komb.: I+II+1.8xIII+1.8xV+1.8xVI+1.6xVII+1.8xVIII
129	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xIV-1.8xVI+1.8xXII
130	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xIV+1.8xVI+1.8xXII
131	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xIV-1.8xVI+1.8xVIII
132	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xIV+1.8xVI+1.8xVIII
133	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xV-1.8xVI+1.8xXII
134	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xV+1.8xVI+1.8xXII
135	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xIV-1.8xVI+1.8xX
136	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xIV+1.8xVI+1.8xX
137	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xV-1.8xVI+1.8xX
138	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xV+1.8xVI+1.8xVIII
139	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xV-1.8xVI+1.8xVIII
140	Komb.: 1.6xI+

No	Naziv
	+1.6xII+1.8xIII+1.8xV+1.8xVI+1.8xX
141	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xIV-1.8xVI+1.8xXIV
142	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xV-1.8xVI+1.8xXIV
143	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xV+1.8xVI+1.8xXIV
144	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xIV+1.8xVI+1.8xXIV
145	Komb.: 1.6xI+1.6xII+1.8xIV-1.8xVI+1.6xIX+1.8xX
146	Komb.: 1.6xI+1.6xII+1.8xIV+1.8xVI+1.6xIX+1.8xX
147	Komb.: 1.6xI+1.6xII+1.8xIV+1.8xVI+1.6xVII+1.8xVIII
148	Komb.: 1.6xI+1.6xII+1.8xV-1.8xVI+1.6xIX+1.8xX
149	Komb.: 1.6xI+1.6xII+1.8xV+1.8xVI+1.6xIX+1.8xX
150	Komb.: 1.6xI+1.6xII+1.8xIII-1.8xVI+1.6xIX+1.8xX
151	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xVI+1.6xIX+1.8xX
152	Komb.: 1.6xI+1.6xII+1.8xIV-1.8xVI+1.6xVII+1.8xVIII
153	Komb.: 1.6xI+1.6xII+1.8xIV-1.8xVI+1.6xXI+1.8xXII
154	Komb.: 1.6xI+1.6xII+1.8xIV+1.8xVI+1.6xXI+1.8xXII
155	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xVI+1.6xVII+1.8xVIII
156	Komb.: 1.6xI+1.6xII+1.8xIII-1.8xVI+1.6xVII+1.8xVIII
157	Komb.: 1.6xI+1.6xII+1.8xV+1.8xVI+1.6xVII+1.8xVIII
158	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xVI+1.6xXI+1.8xXII
159	Komb.: 1.6xI+1.6xII+1.8xIII-1.8xVI+1.6xXI+1.8xXII
160	Komb.: 1.6xI+1.6xII+1.8xV+1.8xVI+1.6xXI+1.8xXII
161	Komb.: 1.6xI+1.6xII+1.8xV-1.8xVI+1.6xXI+1.8xXII
162	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xVI+1.6xXIII+1.8xXIV
163	Komb.: 1.6xI+1.6xII+1.8xIV+1.8xVI+1.6xXIII+1.8xXIV
164	Komb.: 1.6xI+1.6xII+1.8xIII-1.8xVI+1.6xXIII+1.8xXIV
165	Komb.: 1.6xI+1.6xII+1.8xIV-1.8xVI+1.6xXIII+1.8xXIV
166	Komb.: 1.6xI+1.6xII+1.8xV-1.8xVI+1.6xXIII+1.8xXIV
167	Komb.: 1.6xI+1.6xII+1.8xV-1.8xVI+1.6xXI+1.8xXII
168	Komb.: 1.6xI+1.6xII+1.8xV+1.8xVI+1.6xXIII+1.8xXIV
169	Komb.: I+II+1.8xIII+1.8xIV+1.8xVI+VII+1.8xVIII
170	Komb.: I+II+1.8xIII+1.8xIV-1.8xVI+VII+1.8xVIII
171	Komb.: I+II+1.8xIII+1.8xV-1.8xVI+VII+1.8xVIII
172	Komb.: I+II+1.8xIII+1.8xV+1.8xVI+VII+1.8xVIII
173	Komb.: I+II+1.8xIII+1.8xV+1.8xVI+IX+1.8xX
174	Komb.: I+II+1.8xIII+1.8xV-1.8xVI+IX+1.8xX
175	Komb.: I+II+1.8xIII+1.8xIV+1.8xVI+IX+1.8xX
176	Komb.: I+II+1.8xIII+1.8xIV-1.8xVI+IX+1.8xX
177	Komb.: I+II+1.8xIII+1.8xV-1.8xVI+XI+1.8xXII
178	Komb.: I+II+1.8xIII+1.8xIV+1.8xVI+XI+1.8xXII
179	Komb.: I+II+1.8xIII+1.8xIV-1.8xVI+XI+1.8xXII
180	Komb.: I+II+1.8xIII+1.8xV-1.8xVI+XIII+1.8xXIV
181	Komb.: I+II+1.8xIII+1.8xV+1.8xVI+XIII+1.8xXIV
182	Komb.: I+II+1.8xIII+1.8xV-1.8xVI+XIII+1.8xXIV
183	Komb.: I+II+1.8xIII+1.8xIV+1.8xVI+XIII+1.8xXIV
184	Komb.: I+II+1.8xIII+1.8xV+1.8xVI+XI+1.8xXII

Lista slucajeva opterecenja	
No	Naziv
185	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xV+1.8xVI+1.6xVII
186	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xV-1.8xVI+1.6xVII
187	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xV+1.8xVI+1.6xIX
188	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xV-1.8xVI+1.6xIX
189	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xIV+1.8xVI+1.6xIX
190	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xIV-1.8xVI+1.6xIX
191	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xIV-1.8xVI+1.6xVII
192	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xIV+1.8xVI+1.6xVII
193	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xV-1.8xVI+1.6xXI
194	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xV+1.8xVI+1.6xXI
195	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xIV+1.8xVI+1.6xXI
196	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xIV-1.8xVI+1.6xXI
197	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xIV-1.8xVI+1.6xXIII
198	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xV-1.8xVI+1.6xXIII
199	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xV+1.8xVI+1.6xXIII
200	Komb.: 1.6xI+1.6xII+1.8xIII+1.8xIV+1.8xVI+1.6xXIII
201	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xX
202	Komb.: 1.6xI+1.8xIII+1.8xV-1.8xVI+1.8xX
203	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xX
204	Komb.: 1.6xI+1.8xIII+1.8xIV+1.8xV-1.8xVI+1.8xX
205	Komb.: 1.6xI+1.8xIII+1.8xIV+1.8xVI+1.8xX
206	Komb.: 1.6xI+1.8xIII+1.8xIV-1.8xVI+1.8xX
207	Komb.: 1.6xI+1.8xIII+1.8xIV+1.8xV+1.8xVI+1.8xX
208	Komb.: 1.6xI+1.8xIII+1.8xIV+1.8xV+1.8xVI+1.8xX
209	Komb.: 1.6xI+1.8xIII+1.8xIV+1.8xV+1.8xVI+1.8xVIII
210	Komb.: 1.6xI+1.8xIII+1.8xIV+1.8xV+1.8xVI+1.8xXIV
211	Komb.: 1.6xI+1.8xIII+1.8xIV+1.8xV-1.8xVI+1.8xXIV
212	Komb.: 1.6xI+1.8xIII+1.8xIV-1.8xVI+1.8xVIII
213	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xVIII
214	Komb.: 1.6xI+1.8xIII+1.8xV-1.8xVI+1.8xXIV
215	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xVIII
216	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xXII
217	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xXII
218	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xXII
219	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xVIII
220	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xXII
221	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xXIV
222	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xXIV
223	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xVIII
224	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xXIV
225	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xVIII
226	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xXII
227	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xXII
228	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xXII

No	Naziv
229	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.8xXII
230	Komb.: 1.6xI+1.8xIII+1.8xIV+1.8xV+1.8xVI+1.8xXIV
231	Komb.: 1.6xI+1.8xIII+1.8xIV+1.8xV+1.8xVI+1.8xXIV
232	Komb.: 1.6xI+1.8xIII+1.8xIV+1.8xV+1.8xVI+1.8xVIII
233	Komb.: 1.6xI+1.8xIII+1.8xIV+1.8xV+1.8xVI+1.8xVIII
234	Komb.: 1.6xI+1.8xIII+1.8xV+1.8xVI+1.6xVII+1.8xVIII
235	Komb.: 1.6xI+1.8xIII+1.8xIV-1.8xVI+1.6xIX+1.8xX
236	Komb.: 1.6xI+1.8xIII+1.8xIV+1.8xV+1.6xIX+1.8xX
237	Komb.: 1.6xI+1.8xIV-1.8xVI+1.6xVII+1.8xVIII
238	Komb.: 1.6xI+1.8xIV-1.8xVI+1.6xIX+1.8xX
239	Komb.: 1.6xI+1.8xIV+1.8xVI+1.6xIX+1.8xX
240	Komb.: 1.6xI+1.8xIV+1.8xVI+1.6xIX+1.8xVIII
241	Komb.: 1.6xI+1.8xIV+1.8xVI+1.6xVII+1.8xVIII
242	Komb.: 1.6xI+1.8xIV+1.8xVI+1.6xVII+1.8xVIII
243	Komb.: 1.6xI+1.8xIV+1.8xVI+1.6xVII+1.8xVIII
244	Komb.: 1.6xI+1.8xV+1.8xVI+1.6xVII+1.8xVIII
245	Komb.: 1.6xI+1.8xV+1.8xVI+1.6xIX+1.8xX
246	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xX
247	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xX
248	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xX
249	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xVIII
250	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xX
251	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xX
252	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xX
253	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xX
254	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xVIII
255	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xVIII
256	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
257	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
258	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
259	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
260	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xVIII
261	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
262	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
263	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
264	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
265	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
266	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
267	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
268	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
269	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
270	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
271	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
272	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
273	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
274	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
275	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
276	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII
277	Komb.: 1.6xI+1.8xV+1.8xVI+1.8xXII

Lista slučajeva opterećenja	
No	Naziv
	+1.6xXIII+1.8xXIV
278	Komb.: 1.6xI+II+1.8xIV-1.8xVI+ +1.6xXIII+1.8xXIV
279	Komb.: 1.6xI+II+1.8xIV+1.8xVI+ +1.6xXIII+1.8xXIV
280	Komb.: 1.6xI+II+1.8xIII+1.8xVI+ +1.6xXIII+1.8xXIV
281	Komb.: 1.6xI+1.6xII+ +1.8xV-1.8xVI+VII+1.8xVIII
282	Komb.: I+1.6xII+1.8xIII+ +1.8xIV+1.8xVI+1.6xVII
283	Komb.: 1.6xI+1.6xII+1.8xV+ +1.8xVI+VII+1.8xVIII
284	Komb.: I+1.6xII+1.8xIII+ +1.8xIV-1.8xVI+1.6xVII
285	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xV-1.8xVI+VII
286	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV+1.8xVI+1.6xVII
287	Komb.: 1.6xI+1.6xII+1.8xIV- -1.8xVI+VII+1.8xVIII
288	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xV+1.8xVI+VII
289	Komb.: 1.6xI+II+1.8xIII+1.8xV+ +1.8xVI+1.6xVII
290	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV+1.8xVI+ +IX
291	Komb.: 1.6xI+1.6xII+ +1.8xIV+1.8xVI+VII+1.8xVIII
292	Komb.: 1.6xI+II+1.8xIII+ +1.8xV-1.8xVI+1.6xVII
293	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV-1.8xVI+ +IX
294	Komb.: 1.6xI+1.6xII+1.8xV+ +1.8xVI+IX+1.8xX
295	Komb.: 1.6xI+1.6xII+ +1.8xV-1.8xVI+IX+1.8xX
296	Komb.: 1.6xI+ +II+1.8xIII+1.8xV+1.8xVI+ +1.6xIX
297	Komb.: 1.6xI+ +II+1.8xIII+1.8xV-1.8xVI+ +1.6xIX
298	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV-1.8xVI+1.6xVII
299	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV+1.8xVI+ +XI
300	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV-1.8xVI+ +XI
301	Komb.: I+1.6xII+1.8xIII+1 +1.8xV+1.8xVI+1.6xIX
302	Komb.: 1.6xI+1.6xII+1.8xIII- -1.8xVI+VII+1.8xVIII
303	Komb.: I+1.6xII+1.8xIII+1 +1.8xV-1.8xVI+1.6xIX
304	Komb.: I+1.6xII+1.8xIII+ +1.8xIV-1.8xVI+1.6xXI
305	Komb.: I+1.6xII+1.8xIII+ +1.8xIV+1.8xVI+1.6xXI
306	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xIV+1.8xVI+VII
307	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV-1.8xVI+1.6xXI
308	Komb.: I+1.6xII+1.8xIII+ +1.8xIV-1.8xVI+1.6xXI
309	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV+1.8xVI+1.6xXI
310	Komb.: 1.6xI+ +1.6xII+1.8xIV-1.8xVI+XI+ +1.8xXII
311	Komb.: 1.6xI+1.6xII+1.8xIV+ +1.8xVI+XI+1.8xXII
312	Komb.: 1.6xI+ +1.6xII+1.8xV+1.8xVI+ +XI+1.8xXII
313	Komb.: 1.6xI+1.6xII+ +1.8xIII+1.8xVI+XI+1.8xXII
314	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xVI+XI+1.8xXII
315	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xIV-1.8xVI+XI
316	Komb.: I+1.6xII+1.8xIII+ +1.8xV-1.8xVI+1.6xVII
317	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xIV+1.8xVI+XI
318	Komb.: 1.6xI+1.6xII+1.8xV- -1.8xVI+XI+1.8xXII
319	Komb.: I+1.6xII+1.8xIII+ +1.8xIV+1.8xVI+1.6xXI
320	Komb.: 1.6xI+ +II+1.8xIII+1.8xV+1.8xVI+ +1.6xXI
321	Komb.: 1.6xI+ +II+1.8xIII+1.8xIV-1.8xVI +1.6xXIII
322	Komb.: 1.6xI+1.6xII+1.8xIII+

No	Naziv
	+1.8xIV+1.8xVI+IX
323	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xVI+VII+ +1.8xVIII
324	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV+ +1.8xVI+XIII
325	Komb.: I+1.6xII+1.8xIII+1.8xV+ +1.8xVI+1.6xXIII
326	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xIV-1.8xVI+IX
327	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV-1. 8xVI+XIII
328	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xVI+ +IX+1.8xX
329	Komb.: 1.6xI+ +II+1.8xIII+1.8xV-1.8xVI+ +1.6xXI
330	Komb.: I+1.6xII+1.8xIII+ +1.8xV-1.8xVI+1.6xXIII
331	Komb.: 1.6xI+1.6xII+1.8xIII- -1.8xVI+IX+1.8xX
332	Komb.: I+1.6xII+1.8xIII+1 +1.8xV+1.8xVI+1.6xXI
333	Komb.: I+1.6xII+1.8xIII+1.8xIV+ +1.8xVI+1.6xXIII
334	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xV+1.8xVI+XIII
335	Komb.: I+1.6xII+1.8xIII+1.8xV+ +1.8xVI+1.6xVII
336	Komb.: 1.6xI+1.6xII+ +1.8xIV+1.8xVI+XIII+1.8xXIV
337	Komb.: 1.6xI+II+1.8xIII+ +1.8xV-1.8xVI+1.6xXIII
338	Komb.: 1.6xI+1.6xII+ +1.8xIV+1.8xVI+IX+1.8xX
339	Komb.: 1.6xI+II+1.8xIII+1.8xV+ +1.8xVI+1.6xXIII
340	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV-1.8xVI+1.6xXI
341	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xIV-1.8xVI+VII
342	Komb.: 1.6xI+1.6xII+1.8xIV- -1.8xVI+XIII+1.8xXIV
343	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xV-1.8xVI+XIII
344	Komb.: I+1.6xII+1.8xIII+1 +1.8xV-1.8xVI+1.6xXI
345	Komb.: 1.6xI+1.6xII+1.8xIV- -1.8xVI+IX+1.8xX
346	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xVI+ +XIII+1.8xXIV
347	Komb.: 1.6xI+1.6xII+1.8xIII- -1.8xVI+XIII+1.8xXIV
348	Komb.: 1.6xI+II+1.8xIII+1.8xIV+ +1.8xVI+1.6xXIII
349	Komb.: 1.6xI+ +1.6xII+1.8xV+1.8xVI+ +XIII+1.8xXIV
350	Komb.: I+1.6xII+1.8xIII+1 +1.8xIV-1.8xVI+1.6xXIII
351	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV+1.8xVI+1.6xXI
352	Komb.: 1.6xI+1.6xII+1.8xV- -1.8xVI+XIII+1.8xXIV
353	Komb.: I+II+1.8xIII+1.8xI V-1.8xVI+1.8xVIII
354	Komb.: I+II+1.8xIII+1.8xIV+ +1.8xVI+1.8xVIII
355	Komb.: I+II+1.8xIII+1.8xV +1.8xVI+1.8xX
356	Komb.: I+II+1.8xIII+1.8xV- -1.8xVI+1.8xX
357	Komb.: I+II+1.8xIII+1.8xIV+ +1.8xVI+1.8xX
358	Komb.: I+II+1.8xIII+1.8xI V-1.8xVI+1.8xX
359	Komb.: I+II+1.8xIII+ +1.8xV-1.8xVI+1.8xVIII
360	Komb.: I+II+1.8xIII+1.8xV+ +1.8xVI+1.8xVIII
361	Komb.: I+II+1.8xIII+ +1.8xIV+1.8xVI+1.8xXII
362	Komb.: I+II+1.8xIII+1.8xIV- -1.8xVI+1.8xXII
363	Komb.: I+II+1.8xIII+ +1.8xIV+1.8xVI+1.8xXIV
364	Komb.: I+II+1.8xIII+1.8xIV- -1.8xVI+1.8xXIV
365	Komb.: I+II+1.8xIII+1.8xV +1.8xVI+1.8xXIV
366	Komb.: I+II+1.8xIII+1.8xV+ +1.8xVI+1.8xXII
367	Komb.: I+II+1.8xIII+ +1.8xV-1.8xVI+1.8xXII
368	Komb.: I+II+1.8xIII+1.8xV- -1.8xVI+1.8xXIV

Lista slucajeva opterecenja	
No	Naziv
369	Komb.: I+1.6xII+1.8xIII+ +1.8xIV+1.8xVI+VII
370	Komb.: I+1.6xII+1.8xIII+ +1.8xIV-1.8xVI+VII
371	Komb.: I+II+1.8xIV-1.8xVI+ +1.6xIX+1.8xX
372	Komb.: I+1.6xII+1.8xIII+ +1.8xV-1.8xVI+VII
373	Komb.: I+1.6xII+1.8xIII+1.8xVI+ +VII+1.8xVIII
374	Komb.: 1.6xI+II+1.8xIV-1.8xVI+ +VII+1.8xVIII
375	Komb.: I+II+1.8xIV+1.8xVI+ +1.6xIX+1.8xX
376	Komb.: I+II+1.8xIII+1.8xIV- -1.8xVI+1.6xIX
377	Komb.: I+II+1.8xIII+ +1.8xIV+1.8xVI+1.6xIX
378	Komb.: I+1.6xII+1.8xIV- -1.8xVI+IX+1.8xX
379	Komb.: I+1.6xII+ +1.8xIV+1.8xVI+IX+1.8xX
380	Komb.: I+1.6xII+1.8xIII+ +1.8xIV-1.8xVI+IX
381	Komb.: I+1.6xII+1.8xIII+ +1.8xIV+1.8xVI+IX
382	Komb.: 1.6xI+II+1.8xIV- -1.8xVI+IX+1.8xX
383	Komb.: 1.6xI+II+ +1.8xIV+1.8xVI+IX+1.8xX
384	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV-1.8xVI+IX
385	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV+1.8xVI+IX
386	Komb.: I+1.6xII+1.8xIII+1.8xV+ +1.8xVI+VII
387	Komb.: 1.6xI+II+1.8xIV+1.8xVI+ +VII+1.8xVIII
388	Komb.: I+1.6xII+1.8xV+ +1.8xVI+VII+1.8xVIII
389	Komb.: I+1.6xII+ +1.8xV-1.8xVI+VII+1.8xVIII
390	Komb.: 1.6xI+II+ +1.8xV-1.8xVI+VII+1.8xVIII
391	Komb.: I+II+1.8xIV-1.8xVI+ +1.6xVII+1.8xVIII
392	Komb.: I+II+ +1.8xV-1.8xVI+1.6xIX+1.8xX
393	Komb.: I+II+1.8xV+ +1.8xVI+1.6xIX+1.8xX
394	Komb.: 1.6xI+II+1.8xV+ +1.8xVI+VII+1.8xVIII
395	Komb.: I+II+1.8xIII+1.8xV+ +1.8xVI+1.6xVII
396	Komb.: I+II+1.8xIII-1.8xVI+ +1.6xIX+1.8xX
397	Komb.: I+II+1.8xIII+ +1.8xV-1.8xVI+1.6xVII
398	Komb.: I+II+1.8xIII+1.8xVI+ +1.6xIX+1.8xX
399	Komb.: I+II+1.8xIII+1.8xV- -1.8xVI+1.6xIX
400	Komb.: I+II+1.8xIII+1.8xV+ +1.8xVI+1.6xIX
401	Komb.: I+1.6xII+ +1.8xV-1.8xVI+IX+1.8xX
402	Komb.: I+1.6xII+1.8xV+ +1.8xVI+IX+1.8xX
403	Komb.: I+1.6xII+1.8xIII- -1.8xVI+IX+1.8xX
404	Komb.: I+1.6xII+1.8xIII+1 .8xVI+IX+1.8xX
405	Komb.: I+1.6xII+1.8xIII+1 .8xV-1.8xVI+IX
406	Komb.: I+1.6xII+1.8xIII+1 .8xV+1.8xVI+IX
407	Komb.: 1.6xI+II+1.8xIII-1.8xVI+ +VII+1.8xVIII
408	Komb.: 1.6xI+II+ +1.8xV-1.8xVI+IX+1.8xX
409	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV-1.8xVI+VII
410	Komb.: 1.6xI+II+1.8xV+ +1.8xVI+IX+1.8xX
411	Komb.: 1.6xI+II+1.8xIII- -1.8xVI+IX+1.8xX
412	Komb.: I+II+1.8xV+ +1.8xVI+1.6xVII+1.8xVIII
413	Komb.: 1.6xI+ +II+1.8xIII+1.8xVI+IX+1.8xX
414	Komb.: 1.6xI+ +II+1.8xIII+1.8xV-1.8xVI+IX
415	Komb.: 1.6xI+ +II+1.8xIII+1.8xV+1.8xVI+IX
416	Komb.: 1.6xI+II+1.8xIII+1.8xVI+ +VII+1.8xVIII
417	Komb.: 1.6xI+II+1.8xIII+ +1.8xV-1.8xVI+VII
418	Komb.: 1.6xI+II+1.8xIII+1.8xV+ +1.8xVI+VII

No	Naziv
419	Komb.: I+II+ +1.8xV-1.8xVI+1.6xVII+1.8xVIII
420	Komb.: I+II+1.8xIV+1.8xVI+ +1.6xVII+1.8xVIII
421	Komb.: I+1.6xII+1.8xIV-1.8xVI+ +VII+1.8xVIII
422	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV+1.8xVI+VII
423	Komb.: I+II+1.8xIII-1.8xVI+ +1.6xVII+1.8xVIII
424	Komb.: I+1.6xII+1.8xIII-1.8xVI+ +VII+1.8xVIII
425	Komb.: I+II+1.8xIII+1.8xVI+ +1.6xVII+1.8xVIII
426	Komb.: I+1.6xII+1.8xV+1.8xVI+ +XI+1.8xXII
427	Komb.: I+1.6xII+1.8xIII+1 .8xV-1.8xVI+XI
428	Komb.: I+1.6xII+1.8xV-1.8xVI+ +XI+1.8xXII
429	Komb.: I+II+1.8xIII+1.8xV +1.8xVI+1.6xXI
430	Komb.: I+1.6xII+1.8xIII+1 .8xV+1.8xVI+XI
431	Komb.: I+II+1.8xIII+1.8xIV- -1.8xVI+1.6xVII
432	Komb.: 1.6xI+II+1.8xV-1.8xVI+ +XI+1.8xXII
433	Komb.: 1.6xI+II+1.8xV+1.8xVI+ +XI+1.8xXII
434	Komb.: 1.6xI+ +II+1.8xIII+1.8xV-1.8xVI+XI
435	Komb.: 1.6xI+ +II+1.8xIII+1.8xV+1.8xVI+XI
436	Komb.: I+II+1.8xIV-1.8xVI +1.6xXI+1.8xXII
437	Komb.: I+II+1.8xIV+ +1.8xVI+1.6xXI+1.8xXII
438	Komb.: I+II+1.8xIII+1.8xIV- -1.8xVI+1.6xXI
439	Komb.: I+II+1.8xIII+ +1.8xIV+1.8xVI+1.6xXI
440	Komb.: I+II+1.8xIII+1.8xV- -1.8xVI+1.6xXI
441	Komb.: I+1.6xII+1.8xIV-1. 8xVI+XI+1.8xXII
442	Komb.: I+1.6xII+1.8xIV+ +1.8xVI+XI+1.8xXII
443	Komb.: I+II+1.8xIII+ +1.8xIV+1.8xVI+1.6xVII
444	Komb.: 1.6xI+II+1.8xV+1.8xVI+ +XIII+1.8xXIV
445	Komb.: I+1.6xII+ +1.8xIII-1.8xVI+XI+1.8xXII
446	Komb.: 1.6xI+II+1.8xV-1.8xVI+ +XIII+1.8xXIV
447	Komb.: I+1.6xII+1.8xIII+ +1.8xVI+XI+1.8xXII
448	Komb.: I+1.6xII+1.8xIII+ +1.8xIV-1.8xVI+XI
449	Komb.: I+II+1.8xIV-1.8xVI+ +1.6xXIII+1.8xXIV
450	Komb.: I+II+1.8xIV+1.8xVI+ +1.6xXIII+1.8xXIV
451	Komb.: I+1.6xII+1.8xIII+1.8xV+ +1.8xVI+XIII
452	Komb.: I+1.6xII+1.8xIII+ +1.8xV-1.8xVI+XIII
453	Komb.: I+1.6xII+1.8xIII+ +1.8xIV+1.8xVI+XI
454	Komb.: I+II+1.8xIII+1.8xIV+ +1.8xVI+1.6xXIII
455	Komb.: 1.6xI+ +II+1.8xIV-1.8xVI+XI+1.8xXII
456	Komb.: 1.6xI+II+1.8xIV+ +1.8xVI+XI+1.8xXII
457	Komb.: I+1.6xII+1.8xIV-1.8xVI+ +XIII+1.8xXIV
458	Komb.: 1.6xI+II+ +1.8xIII-1.8xVI+XI+1.8xXII
459	Komb.: 1.6xI+II+1.8xIII+ +1.8xVI+XI+1.8xXII
460	Komb.: I+1.6xII+1.8xV+1.8xVI+ +XIII+1.8xXIV
461	Komb.: I+1.6xII+1.8xIV+1.8xVI+ +XIII+1.8xXIV
462	Komb.: I+1.6xII+1.8xV-1.8xVI+ +XIII+1.8xXIV
463	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV-1.8xVI+XI
464	Komb.: I+1.6xII+1.8xIII-1.8xVI+ +XIII+1.8xXIV
465	Komb.: I+1.6xII+1.8xIV+1.8xVI+ +VII+1.8xVIII
466	Komb.: I+II+1.8xIII+1.8xV+ +1.8xVI+1.6xXIII
467	Komb.: I+1.6xII+1.8xIII+1.8xVI+ +XIII+1.8xXIV
468	Komb.: 1.6xI+II+1.8xIII+ +1.8xIV+1.8xVI+XI

Lista slucajeva opterecenja	
No	Naziv
469	Komb.: I+II+1.8xIII+ +1.8xV-1.8xVI+1.6xXIII
470	Komb.: I+II+1.8xIII+1.8xVI+ +1.6xXIII+1.8xXIV
471	Komb.: I+II+1.8xV-1.8xVI+ +1.6xXI+1.8xXII
472	Komb.: I+II+1.8xIII-1.8xVI+ +1.6xXIII+1.8xXIV
473	Komb.: I+II+1.8xV+1.8xVI+ +1.6xXI+1.8xXII
474	Komb.: I+II+ +1.8xIII-1.8xVI+1.6xXI+1.8xXII
475	Komb.: I+II+1.8xV+1.8xVI+ +1.6xXIII+1.8xXIV
476	Komb.: I+II+1.8xIII+ +1.8xVI+1.6xXI+1.8xXII
477	Komb.: I+II+1.8xV-1.8xVI+ +1.6xXIII+1.8xXIV
478	Komb.: I+1.6xII+1.8xIII+1 .8xIV-1.8xVI+XIII
479	Komb.: I+1.6xII+1.8xIII+1.8xIV+ +1.8xVI+XIII
480	Komb.: 1.6xI+II+1.8xIII+1.8xVI+ +XIII+1.8xXIV
481	Komb.: 1.6xI+II+1.8xIV-1.8xVI+ +XIII+1.8xXIV
482	Komb.: 1.6xI+II+1.8xIV+1.8xVI+ +XIII+1.8xXIV
483	Komb.: 1.6xI+II+1.8xIII+ +1.8xV-1.8xVI+XIII
484	Komb.: 1.6xI+II+1.8xIII+1.8xV+ +1.8xVI+XIII
485	Komb.: 1.6xI+II+1.8xIII+1.8xIV+ +1.8xVI+XIII
486	Komb.: 1.6xI+ +II+1.8xIII+1.8xIV-1.8xVI+XIII
487	Komb.: 1.6xI+II+1.8xIII-1.8xVI+ +XIII+1.8xXIV
488	Komb.: I+II+1.8xIII+1.8xI V-1.8xVI+1.6xXIII
489	Komb.: 1.6xI+1.6xII+1.8xIV- -1.8xVI+1.8xX
490	Komb.: 1.6xI+1.6xII+ +1.8xIV+1.8xVI+1.8xX
491	Komb.: 1.6xI+1.6xII+1.8xV- -1.8xVI+1.8xX
492	Komb.: 1.6xI+ +1.6xII+1.8xV+1.8xVI+1.8xX
493	Komb.: 1.6xI+1.6xII+1.8xIII- -1.8xVI+1.8xX
494	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xVI+1.8xX
495	Komb.: 1.6xI+ +1.6xII+1.8xIV-1.8xVI+1.8 xVIII
496	Komb.: 1.6xI+1.6xII+1.8xIV+ +1.8xVI+1.8xVIII
497	Komb.: 1.6xI+1.6xII+ +1.8xIII-1.8xVI+1.8xVIII
498	Komb.: 1.6xI+ +1.6xII+1.8xV+1.8xVI+1.8xVIII
499	Komb.: 1.6xI+1.6xII+1.8xIV- -1.8xVI+1.8xXIV
500	Komb.: 1.6xI+1.6xII+ +1.8xIV+1.8xVI+1.8xXIV
501	Komb.: 1.6xI+1.6xII+ +1.8xV-1.8xVI+1.8xXII
502	Komb.: 1.6xI+1.6xII+1.8xV- -1.8xVI+1.8xVIII
503	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xVI+1.8xVIII
504	Komb.: 1.6xI+ +1.6xII+1.8xIV-1.8xVI+1.8xXII
505	Komb.: 1.6xI+1.6xII+1.8xIV+ +1.8xVI+1.8xXII
506	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV-1.8xVI
507	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV+1.8xVI
508	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xVI+ +1.8xXIV
509	Komb.: 1.6xI+1.6xII+1.8xIII- -1.8xVI+1.8xXIV
510	Komb.: 1.6xI+1.6xII+1.8xV+ +1.8xVI+1.8xXIV
511	Komb.: 1.6xI+1.6xII+1.8xV+ +1.8xVI+1.8xXII
512	Komb.: 1.6xI+1.6xII+ +1.8xIII-1.8xVI+1.8xXII
513	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV+1.8xVI
514	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xVI+1.8xXII
515	Komb.: 1.6xI+1.6xII+ +1.8xV-1.8xVI+1.8xXIV
516	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV-1.8xVI
517	Komb.: I+II+1.8xV+1.8xVI+IX+ +1.8xX

No	Naziv
518	Komb.: I+II+1.8xV-1.8xVI+IX+ +1.8xX
519	Komb.: I+II+ +1.8xV-1.8xVI+VII+1.8xVIII
520	Komb.: I+II+1.8xV+ +1.8xVI+VII+1.8xVIII
521	Komb.: I+II+1.8xIV-1.8xVI+VII+ +1.8xVIII
522	Komb.: I+II+1.8xIII+1.8xVI+VII+ +1.8xVIII
523	Komb.: I+II+1.8xIII+1.8xVI+ +IX+1.8xX
524	Komb.: I+II+1.8xIII-1.8xVI+ +IX+1.8xX
525	Komb.: I+II+1.8xV-1.8xVI+ +XI+1.8xXII
526	Komb.: I+II+1.8xIV+1.8xVI+ +IX+1.8xX
527	Komb.: I+II+1.8xIV-1.8xVI+XI+ +1.8xXII
528	Komb.: I+II+1.8xIII-1.8xVI+VII+ +1.8xVIII
529	Komb.: I+II+1.8xIV+1.8xVI+XI+ +1.8xXII
530	Komb.: I+II+1.8xIV-1.8xVI+ +IX+1.8xX
531	Komb.: I+II+1.8xIV+1.8xVI+VII+ +1.8xVIII
532	Komb.: I+II+1.8xIV+1.8xVI+ +XIII+1.8xXIV
533	Komb.: I+II+1.8xIV-1.8xVI+ +XIII+1.8xXIV
534	Komb.: I+II+1.8xIII+1.8xVI+ +XIII+1.8xXIV
535	Komb.: I+II+1.8xIII+1.8xVI+XI+ +1.8xXII
536	Komb.: I+II+1.8xIII-1.8xVI+ +XIII+1.8xXIV
537	Komb.: I+II+1.8xIII-1.8xVI+XI+ +1.8xXII
538	Komb.: I+II+1.8xV+1.8xVI+ +XIII+1.8xXIV
539	Komb.: I+II+1.8xV-1.8xVI+ +XIII+1.8xXIV
540	Komb.: I+II+1.8xV+1.8xVI+ +XI+1.8xXII
541	Komb.: 1.6xI+1.6xII+1.8xIV+ +1.8xVI+1.6xVII
542	Komb.: 1.6xI+1.6xII+1.8xV+ +1.8xVI+1.6xIX
543	Komb.: 1.6xI+1.6xII+ +1.8xV-1.8xVI+1.6xIX
544	Komb.: 1.6xI+1.6xII+ +1.8xV-1.8xVI+1.6xVII
545	Komb.: 1.6xI+1.6xII+1.8xV+ +1.8xVI+1.6xXI
546	Komb.: 1.6xI+1.6xII+1.8xV+ +1.8xVI+1.6xVII
547	Komb.: 1.6xI+1.6xII+ +1.8xIII-1.8xVI+1.6xVII
548	Komb.: 1.6xI+ +1.6xII+1.8xIV-1.8xVI+1.6xVII
549	Komb.: 1.6xI+1.6xII-1.8xV I+1.6xIX+1.8xX
550	Komb.: 1.6xI+1.6xII+ +1.8xVI+1.6xIX+1.8xX
551	Komb.: 1.6xI+1.6xII+1.8xIV- -1.8xVI+1.6xIX
552	Komb.: 1.6xI+1.6xII-1.8xV I+1.6xVII+1.8xVIII
553	Komb.: 1.6xI+1.6xII+ +1.8xIV+1.8xVI+1.6xIX
554	Komb.: 1.6xI+1.6xII+1.8xIII- -1.8xVI+1.6xIX
555	Komb.: 1.6xI+1.6xII+1.8xIV- -1.8xVI+1.6xXI
556	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xVI+1.6xIX
557	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xVI+1.6xVII
558	Komb.: 1.6xI+1.6xII+ +1.8xIV+1.8xVI+1.6xXI
559	Komb.: 1.6xI+1.6xII+1.8xIV+ +1.8xVI+1.6xXIII
560	Komb.: 1.6xI+ +1.6xII+1.8xIV-1.8xVI+1.6 xXIII
561	Komb.: 1.6xI+1.6xII+1.8xIII- -1.8xVI+1.6xXI
562	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xVI+1.6xXI
563	Komb.: 1.6xI+1.6xII+ +1.8xVI+1.6xVII+1.8xVIII
564	Komb.: 1.6xI+1.6xII+ +1.8xV-1.8xVI+1.6xXI
565	Komb.: 1.6xI+1.6xII-1.8xVI+ +1.6xXIII+1.8xXIV
566	Komb.: 1.6xI+1.6xII+1.8xVI+ +1.6xXIII+1.8xXIV
567	Komb.: 1.6xI+1.6xII+1.8xVI+ +1.8xX

Lista slučajeva opterećenja	
No	Naziv
	+1.6xXI+1.8xXII
568	Komb.: 1.6xI+1.6xII-1.8xVI+ +1.6xXI+1.8xXII
569	Komb.: 1.6xI+1.6xII+1.8xV- -1.8xVI+1.6xXIII
570	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xVI+1.6xXIII
571	Komb.: 1.6xI+1.6xII+ +1.8xIII-1.8xVI+1.6xXIII
572	Komb.: 1.6xI+ +1.6xII+1.8xV+1.8xVI+1.6xXIII
573	Komb.: I+II+1.8xIII+ +1.8xV-1.8xVI+VII
574	Komb.: I+II+1.8xIII+1.8xV+ +1.8xVI+VII
575	Komb.: I+II+1.8xIII+1.8xV- -1.8xVI+IX
576	Komb.: I+II+1.8xIII+1.8xV +1.8xVI+IX
577	Komb.: I+II+1.8xIII+ +1.8xIV+1.8xVI+VII
578	Komb.: I+II+1.8xIII+ +1.8xIV+1.8xVI+IX
579	Komb.: I+II+1.8xIII+1.8xIV- -1.8xVI+VII
580	Komb.: I+II+1.8xIII+1.8xIV- -1.8xVI+IX
581	Komb.: I+II+1.8xIII+1.8xIV- -1.8xVI+XI
582	Komb.: I+II+1.8xIII+ +1.8xIV+1.8xVI+XI
583	Komb.: I+II+1.8xIII+1.8xV +1.8xVI+XI
584	Komb.: I+II+1.8xIII+1.8xI V-1.8xVI+XIII
585	Komb.: I+II+1.8xIII+ +1.8xV-1.8xVI+XIII
586	Komb.: I+II+1.8xIII+1.8xV- -1.8xVI+XI
587	Komb.: I+II+1.8xIII+1.8xIV+ +1.8xVI+XIII
588	Komb.: I+II+1.8xIII+1.8xV+ +1.8xVI+XIII
589	Komb.: I+1.6xII+1.8xIV- -1.8xVI+1.8xX
590	Komb.: I+1.6xII+ +1.8xIV+1.8xVI+1.8xX
591	Komb.: 1.6xI+II+1.8xIV- -1.8xVI+1.8xX
592	Komb.: 1.6xI+II+ +1.8xIV+1.8xVI+1.8xX
593	Komb.: I+1.6xII+1.8xV- -1.8xVI+1.8xX
594	Komb.: I+1.6xII+1.8xV+1.8 xVI+1.8xX
595	Komb.: I+1.6xII+1.8xIII- -1.8xVI+1.8xX
596	Komb.: I+1.6xII+1.8xIII+1 .8xVI+1.8xX
597	Komb.: 1.6xI+II+1.8xV- -1.8xVI+1.8xX
598	Komb.: 1.6xI+ +II+1.8xV+1.8xVI+1.8xX
599	Komb.: 1.6xI+II+1.8xIII- -1.8xVI+1.8xX
600	Komb.: 1.6xI+ +II+1.8xIII+1.8xVI+1.8xX
601	Komb.: I+1.6xII+1.8xV+1.8xVI+ +1.8xVIII
602	Komb.: I+1.6xII+1.8xV-1.8xVI+ +1.8xVIII
603	Komb.: 1.6xI+II+1.8xV+ +1.8xVI+1.8xXII
604	Komb.: 1.6xI+II+ +1.8xV-1.8xVI+1.8xXII
605	Komb.: I+1.6xII+1.8xV+ +1.8xVI+1.8xXII
606	Komb.: I+1.6xII+ +1.8xV-1.8xVI+1.8xXII
607	Komb.: 1.6xI+II+1.8xIV+ +1.8xVI+1.8xVIII
608	Komb.: 1.6xI+ +II+1.8xIV-1.8xVI+1.8xVIII
609	Komb.: 1.6xI+II+1.8xIII+ +1.8xVI+1.8xXII
610	Komb.: 1.6xI+II+ +1.8xIII-1.8xVI+1.8xXII
611	Komb.: 1.6xI+II+1.8xIV+ +1.8xVI+1.8xXII
612	Komb.: 1.6xI+ +II+1.8xIV-1.8xVI+1.8xXII
613	Komb.: I+1.6xII+1.8xIII+ +1.8xVI+1.8xXII
614	Komb.: I+1.6xII+ +1.8xIII-1.8xVI+1.8xXII
615	Komb.: I+1.6xII+1.8xIV+ +1.8xVI+1.8xXII
616	Komb.: I+1.6xII+1.8xIV-1. 8xVI+1.8xXII
617	Komb.: 1.6xI+II+1.8xV-1.8xVI+

No	Naziv
	+1.8xVIII
618	Komb.: I+1.6xII+1.8xIII+ +1.8xVI+1.8xVIII
619	Komb.: I+1.6xII+ +1.8xIII-1.8xVI+1.8xVIII
620	Komb.: 1.6xI+II+ +1.8xV-1.8xVI+1.8xXIV
621	Komb.: 1.6xI+II+1.8xV+ +1.8xVI+1.8xXIV
622	Komb.: 1.6xI+II+ +1.8xIII-1.8xVI+1.8xVIII
623	Komb.: 1.6xI+II+1.8xIII+ +1.8xVI+1.8xVIII
624	Komb.: 1.6xI+ +II+1.8xIII+1.8xV-1.8xVI
625	Komb.: I+1.6xII+1.8xIV+ +1.8xVI+1.8xVIII
626	Komb.: I+1.6xII+1.8xIV-1. 8xVI+1.8xVIII
627	Komb.: 1.6xI+ +II+1.8xIII+1.8xV+1.8xVI
628	Komb.: I+1.6xII+1.8xIV- -1.8xVI+1.8xXIV
629	Komb.: I+1.6xII+1.8xIII+1 .8xIV+1.8xVI
630	Komb.: 1.6xI+II+1.8xIV- -1.8xVI+1.8xXIV
631	Komb.: 1.6xI+II+ +1.8xIV+1.8xVI+1.8xXIV
632	Komb.: 1.6xI+II+1.8xIII- -1.8xVI+1.8xXIV
633	Komb.: 1.6xI+ +II+1.8xIII+1.8xVI+1.8xXIV
634	Komb.: 1.6xI+ +II+1.8xIII+1.8xIV-1.8xVI
635	Komb.: I+1.6xII+ +1.8xIV+1.8xVI+1.8xXIV
636	Komb.: I+1.6xII+ +1.8xV-1.8xVI+1.8xXIV
637	Komb.: I+1.6xII+1.8xV+ +1.8xVI+1.8xXIV
638	Komb.: I+1.6xII+1.8xIII+1 .8xV-1.8xVI
639	Komb.: 1.6xI+II+1.8xV+1.8xVI+ +1.8xVIII
640	Komb.: 1.6xI+ +II+1.8xIII+1.8xIV+1.8xVI
641	Komb.: I+1.6xII+1.8xIII- -1.8xVI+1.8xXIV
642	Komb.: I+1.6xII+1.8xIII+1 .8xIV-1.8xVI
643	Komb.: I+1.6xII+1.8xIII+1 .8xVI+1.8xXIV
644	Komb.: I+1.6xII+1.8xIII+1 .8xV+1.8xVI
645	Komb.: 1.6xI+II+1.8xV+ +1.8xVI+1.6xIX
646	Komb.: 1.6xI+II+ +1.8xV-1.8xVI+1.6xIX
647	Komb.: I+1.6xII+1.8xV+ +1.8xVI+1.6xIX
648	Komb.: I+1.6xII+ +1.8xV-1.8xVI+1.6xIX
649	Komb.: I+1.6xII+1.8xIV-1. 8xVI+1.6xVII
650	Komb.: I+1.6xII+1.8xIV+ +1.8xVI+1.6xVII
651	Komb.: 1.6xI+II+1.8xV+ +1.8xVI+1.6xVII
652	Komb.: 1.6xI+II+ +1.8xV-1.8xVI+1.6xVII
653	Komb.: 1.6xI+ +II+1.8xIII+1.8xVI+1.6xIX
654	Komb.: 1.6xI+II+1.8xIII- -1.8xVI+1.6xIX
655	Komb.: 1.6xI+II+ +1.8xIV+1.8xVI+1.6xIX
656	Komb.: 1.6xI+II+1.8xIV- -1.8xVI+1.6xIX
657	Komb.: I+1.6xII+1.8xIII+1 .8xVI+1.6xIX
658	Komb.: I+1.6xII+1.8xIII- -1.8xVI+1.6xIX
659	Komb.: I+1.6xII+ +1.8xIV+1.8xVI+1.6xIX
660	Komb.: I+1.6xII+1.8xIV- -1.8xVI+1.6xIX
661	Komb.: I+1.6xII+ +1.8xV-1.8xVI+1.6xVII
662	Komb.: I+1.6xII+1.8xV+ +1.8xVI+1.6xVII
663	Komb.: 1.6xI+II+1.8xIII+ +1.8xVI+1.6xVII
664	Komb.: 1.6xI+II+ +1.8xIII-1.8xVI+1.6xVII
665	Komb.: 1.6xI+II+1.8xIV+ +1.8xVI+1.6xVII
666	Komb.: 1.6xI+ +II+1.8xIV-1.8xVI+1.6xVII
667	Komb.: I+1.6xII+

Lista slucajeva opterecenja	
No	Naziv
	+1.8xIII-1.8xVI+1.6xVII
668	Komb.: I+1.6xII+ +1.8xV-1.8xVI+1.6xXI
669	Komb.: I+1.6xII+1.8xV+ +1.8xVI+1.6xXI
670	Komb.: I+1.6xII+1.8xV-1.8xVI+ +1.6xXIII
671	Komb.: I+1.6xII+1.8xV+1.8xVI+ +1.6xXIII
672	Komb.: 1.6xI+II+ +1.8xIV+1.8xVI+1.6xXI
673	Komb.: 1.6xI+II+1.8xIV- -1.8xVI+1.6xXI
674	Komb.: 1.6xI+II+1.8xV+1.8xVI+ +1.6xXIII
675	Komb.: 1.6xI+II+ +1.8xV-1.8xVI+1.6xXI
676	Komb.: 1.6xI+II+1.8xV+ +1.8xVI+1.6xXI
677	Komb.: 1.6xI+II+1.8xV-1.8xVI+ +1.6xXIII
678	Komb.: 1.6xI+II+1.8xIII- -1.8xVI+1.6xXI
679	Komb.: 1.6xI+ +II+1.8xIII+1.8xVI+1.6xXI
680	Komb.: I+1.6xII+1.8xIV- -1.8xVI+1.6xXI
681	Komb.: I+1.6xII+ +1.8xIV+1.8xVI+1.6xXI
682	Komb.: I+1.6xII+1.8xIII- -1.8xVI+1.6xXI
683	Komb.: 1.6xI+ +II+1.8xIV-1.8xVI+1.6xXIII
684	Komb.: 1.6xI+II+1.8xIV+ +1.8xVI+1.6xXIII
685	Komb.: 1.6xI+II+ +1.8xIII-1.8xVI+1.6xXIII
686	Komb.: I+1.6xII+1.8xIII+ +1.8xVI+1.6xXIII
687	Komb.: 1.6xI+II+1.8xIII+ +1.8xVI+1.6xXIII
688	Komb.: I+1.6xII+1.8xIV+ +1.8xVI+1.6xXIII
689	Komb.: I+1.6xII+ +1.8xIII-1.8xVI+1.6xXIII
690	Komb.: I+1.6xII+1.8xIII+1 .8xVI+1.6xXI
691	Komb.: I+1.6xII+1.8xIV-1. 8xVI+1.6xXIII
692	Komb.: I+1.6xII+1.8xIII+ +1.8xVI+1.6xVII
693	Komb.: 1.6xI+1.6xII+ +1.8xV-1.8xVI+VII
694	Komb.: 1.6xI+1.6xII+ +1.8xIV+1.8xVI+IX
695	Komb.: 1.6xI+1.6xII+1.8xIV- -1.8xVI+IX
696	Komb.: 1.6xI+1.6xII+1.8xV+ +1.8xVI+VII
697	Komb.: 1.6xI+II+ +1.8xVI+1.6xVII+1.8xVIII
698	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xVI+VII
699	Komb.: 1.6xI+1.6xII+ +1.8xVI+VII+1.8xVIII
700	Komb.: 1.6xI+1.6xII+1.8xIV+ +1.8xVI+VII
701	Komb.: 1.6xI+ +1.6xII+1.8xIV-1.8xVI+VII
702	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xVI+IX
703	Komb.: I+1.6xII-1.8xVI+1. 6xVII+1.8xVIII
704	Komb.: 1.6xI+1.6xII-1.8xV I+VII+1.8xVIII
705	Komb.: I+1.6xII+ +1.8xVI+1.6xVII+1.8xVIII
706	Komb.: 1.6xI+1.6xII+1.8xIII- -1.8xVI+IX
707	Komb.: 1.6xI+II+1.8xVI+ +1.6xXI+1.8xXII
708	Komb.: 1.6xI+1.6xII+1.8xV+ +1.8xVI+IX
709	Komb.: I+1.6xII-1.8xVI+1. 6xIX+1.8xX
710	Komb.: I+1.6xII+ +1.8xVI+1.6xIX+1.8xX
711	Komb.: 1.6xI+1.6xII+ +1.8xV-1.8xVI+IX
712	Komb.: 1.6xI+1.6xII+1.8xIV- -1.8xVI+XI
713	Komb.: I+1.6xII+1.8xVI+ +1.6xXI+1.8xXII
714	Komb.: 1.6xI+1.6xII+ +1.8xVI+IX+1.8xX
715	Komb.: I+1.6xII-1.8xVI+ +1.6xXI+1.8xXII
716	Komb.: 1.6xI+1.6xII-1.8xV I+IX+1.8xX
717	Komb.: 1.6xI+II-1.8xVI+

No	Naziv
	+1.6xXI+1.8xXII
718	Komb.: 1.6xI+II-1.8xVI+1. 6xVII+1.8xVIII
719	Komb.: 1.6xI+II+ +1.8xVI+1.6xIX+1.8xX
720	Komb.: 1.6xI+1.6xII+ +1.8xIV+1.8xVI+XI
721	Komb.: 1.6xI+1.6xII+ +1.8xIII-1.8xVI+VII
722	Komb.: 1.6xI+1.6xII+1.8xIII- -1.8xVI+XI
723	Komb.: 1.6xI+1.6xII-1.8xVI+ +XI+1.8xXII
724	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xVI+XI
725	Komb.: 1.6xI+II-1.8xVI+1. 6xIX+1.8xX
726	Komb.: 1.6xI+1.6xII+1.8xV- -1.8xVI+XIII
727	Komb.: 1.6xI+II-1.8xVI+ +1.6xXIII+1.8xXIV
728	Komb.: I+1.6xII-1.8xVI+ +1.6xXIII+1.8xXIV
729	Komb.: 1.6xI+ +1.6xII+1.8xV+1.8xVI+XIII
730	Komb.: 1.6xI+II+1.8xVI+ +1.6xXIII+1.8xXIV
731	Komb.: I+1.6xII+1.8xVI+ +1.6xXIII+1.8xXIV
732	Komb.: 1.6xI+1.6xII+1.8xVI+ +XI+1.8xXII
733	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xVI+XIII
734	Komb.: 1.6xI+1.6xII+ +1.8xV-1.8xVI+XI
735	Komb.: 1.6xI+1.6xII+1.8xIV+ +1.8xVI+XIII
736	Komb.: 1.6xI+1.6xII+ +1.8xIII-1.8xVI+XIII
737	Komb.: 1.6xI+ +1.6xII+1.8xIV-1.8xVI+XIII
738	Komb.: 1.6xI+1.6xII+1.8xV+ +1.8xVI+XI
739	Komb.: 1.6xI+1.6xII+1.8xVI+ +XIII+1.8xXIV
740	Komb.: 1.6xI+1.6xII-1.8xVI+ +XIII+1.8xXIV
741	Komb.: I+II+1.8xIII+ +1.8xVI+1.8xVIII
742	Komb.: I+II+ +1.8xIII-1.8xVI+1.8xVIII
743	Komb.: I+II+1.8xV+1.8xVI+ +1.8xVIII
744	Komb.: I+II+1.8xV-1.8xVI+ +1.8xVIII
745	Komb.: I+II+1.8xIV+ +1.8xVI+1.8xVIII
746	Komb.: I+II+1.8xIV-1.8xVI +1.8xVIII
747	Komb.: I+II+1.8xV-1.8xVI+ +1.8xX
748	Komb.: I+II+1.8xV+1.8xVI+ +1.8xX
749	Komb.: I+II+1.8xV+ +1.8xVI+1.8xXII
750	Komb.: I+II+ +1.8xV-1.8xVI+1.8xXII
751	Komb.: I+II+1.8xIV-1.8xVI+ +1.8xX
752	Komb.: I+II+1.8xIV+1.8xVI+ +1.8xX
753	Komb.: I+II+1.8xIII-1.8xVI+ +1.8xX
754	Komb.: I+II+1.8xIII+1.8xVI+ +1.8xX
755	Komb.: I+II+ +1.8xV-1.8xVI+1.8xXIV
756	Komb.: I+II+1.8xIII+1.8xV- -1.8xVI
757	Komb.: I+II+1.8xIII-1.8xVI+ +1.8xXIV
758	Komb.: I+II+1.8xIV+1.8xVI+ +1.8xXIV
759	Komb.: I+II+1.8xV+ +1.8xVI+1.8xXIV
760	Komb.: I+II+1.8xIV-1.8xVI+ +1.8xXIV
761	Komb.: I+II+1.8xIII+1.8xVI+ +1.8xXIV
762	Komb.: I+II+1.8xIV-1.8xVI +1.8xXII
763	Komb.: I+II+1.8xIV+ +1.8xVI+1.8xXII
764	Komb.: I+II+1.8xIII+1.8xIV+ +1.8xVI
765	Komb.: I+II+1.8xIII+1.8xV +1.8xVI
766	Komb.: I+II+1.8xIII+1.8xI V-1.8xVI
767	Komb.: I+II+1.8xIII+

Lista slučajeva opterećenja	
No	Naziv
	+1.8xVI+1.8xXII
768	Komb.: I+II+ +1.8xIII-1.8xVI+1.8xXII
769	Komb.: 1.6xI+II+ +1.8xV-1.8xVI+VII
770	Komb.: 1.6xI+II+1.8xV+ +1.8xVI+VII
771	Komb.: 1.6xI+II+ +1.8xIV+1.8xVI+IX
772	Komb.: 1.6xI+II+1.8xIV- -1.8xVI+IX
773	Komb.: 1.6xI+II+1.8xVI+IX+ +1.8xX
774	Komb.: I+1.6xII+1.8xIV-1. 8xVI+VII
775	Komb.: 1.6xI+ +II+1.8xIV-1.8xVI+VII
776	Komb.: I+1.6xII-1.8xVI+VI I+1.8xVIII
777	Komb.: I+1.6xII+ +1.8xIV+1.8xVI+IX
778	Komb.: I+1.6xII+1.8xIV- -1.8xVI+IX
779	Komb.: I+1.6xII+ +1.8xVI+VII+1.8xVIII
780	Komb.: I+1.6xII+ +1.8xV-1.8xVI+VII
781	Komb.: I+1.6xII+1.8xV+ +1.8xVI+VII
782	Komb.: I+1.6xII-1.8xVI+IX+ +1.8xX
783	Komb.: I+1.6xII+1.8xVI+IX+ +1.8xX
784	Komb.: I+1.6xII+ +1.8xV-1.8xVI+IX
785	Komb.: I+1.6xII+1.8xV+ +1.8xVI+IX
786	Komb.: I+1.6xII+1.8xIII- -1.8xVI+IX
787	Komb.: I+1.6xII+1.8xIII+1 .8xVI+IX
788	Komb.: I+II+1.8xVI+1.6xIX+ +1.8xX
789	Komb.: I+II-1.8xVI+1.6xIX+ +1.8xX
790	Komb.: 1.6xI+II+ +1.8xVI+VII+1.8xVIII
791	Komb.: I+1.6xII+1.8xIV+ +1.8xVI+VII
792	Komb.: 1.6xI+II-1.8xVI+IX+ +1.8xX
793	Komb.: I+1.6xII+ +1.8xV-1.8xVI+XI
794	Komb.: I+1.6xII+1.8xV+ +1.8xVI+XI
795	Komb.: I+1.6xII+1.8xIII+ +1.8xVI+VII
796	Komb.: 1.6xI+II+ +1.8xV-1.8xVI+IX
797	Komb.: 1.6xI+II+1.8xV+ +1.8xVI+IX
798	Komb.: 1.6xI+II+1.8xIII- -1.8xVI+IX
799	Komb.: 1.6xI+ +II+1.8xIII+1.8xVI+IX
800	Komb.: I+II-1.8xVI+1.6xVI I+1.8xVIII
801	Komb.: 1.6xI+II-1.8xVI+VI I+1.8xVIII
802	Komb.: 1.6xI+II+1.8xIV+ +1.8xVI+VII
803	Komb.: I+1.6xII+1.8xIII- -1.8xVI+XI
804	Komb.: I+1.6xII+1.8xIII+1 .8xVI+XI
805	Komb.: I+1.6xII+ +1.8xIV+1.8xVI+XI
806	Komb.: I+1.6xII+1.8xIV- -1.8xVI+XI
807	Komb.: I+1.6xII+1.8xVI+ +XI+1.8xXII
808	Komb.: I+1.6xII+1.8xV+1.8xVI+ +XIII
809	Komb.: 1.6xI+II+1.8xIII+ +1.8xVI+VII
810	Komb.: 1.6xI+II-1.8xVI+ +XI+1.8xXII
811	Komb.: I+1.6xII+1.8xV-1.8xVI+ +XIII
812	Komb.: 1.6xI+II+1.8xV+1.8xVI+ +XIII
813	Komb.: I+1.6xII+ +1.8xIII-1.8xVI+VII
814	Komb.: 1.6xI+II+1.8xIV- -1.8xVI+XI
815	Komb.: 1.6xI+II+1.8xV-1.8xVI+ +XIII
816	Komb.: 1.6xI+II+ +1.8xV-1.8xVI+XI
817	Komb.: 1.6xI+II+1.8xV+

No	Naziv
	+1.8xVI+XI
818	Komb.: 1.6xI+II+ +1.8xIV+1.8xVI+XI
819	Komb.: I+II+ +1.8xVI+1.6xVII+1.8xVIII
820	Komb.: 1.6xI+II+1.8xIII- -1.8xVI+XI
821	Komb.: I+1.6xII-1.8xVI+ +XI+1.8xXII
822	Komb.: I+II-1.8xVI+ +1.6xXIII+1.8xXIV
823	Komb.: 1.6xI+II+1.8xVI+ +XI+1.8xXII
824	Komb.: 1.6xI+ +II+1.8xIII+1.8xVI+XI
825	Komb.: 1.6xI+II+ +1.8xIII-1.8xVI+VII
826	Komb.: I+II+1.8xVI+ +1.6xXIII+1.8xXIV
827	Komb.: I+II+1.8xVI+ +1.6xXI+1.8xXII
828	Komb.: 1.6xI+II+ +1.8xIII-1.8xVI+XIII
829	Komb.: 1.6xI+ +II+1.8xIV-1.8xVI+XIII
830	Komb.: 1.6xI+II+1.8xVI+ +XIII+1.8xXIV
831	Komb.: I+1.6xII+1.8xIII+ +1.8xVI+XIII
832	Komb.: 1.6xI+II+1.8xIII+ +1.8xVI+XIII
833	Komb.: I+1.6xII+ +1.8xIII-1.8xVI+XIII
834	Komb.: 1.6xI+II+1.8xIV+ +1.8xVI+XIII
835	Komb.: I+1.6xII+1.8xIV+ +1.8xVI+XIII
836	Komb.: I+1.6xII+1.8xIV-1. 8xVI+XIII
837	Komb.: I+1.6xII+1.8xVI+ +XIII+1.8xXIV
838	Komb.: I+1.6xII-1.8xVI+ +XIII+1.8xXIV
839	Komb.: 1.6xI+II-1.8xVI+ +XIII+1.8xXIV
840	Komb.: I+II-1.8xVI+ +1.6xXI+1.8xXII
841	Komb.: I+II+1.8xIV-1.8xVI +1.6xVII
842	Komb.: I+II+1.8xIV+ +1.8xVI+1.6xVII
843	Komb.: I+II+1.8xIV-1.8xVI+ +1.6xIX
844	Komb.: I+II+1.8xV+ +1.8xVI+1.6xIX
845	Komb.: I+II+ +1.8xV-1.8xVI+1.6xIX
846	Komb.: I+II+1.8xIV+1.8xVI+ +1.6xIX
847	Komb.: I+II+1.8xIII-1.8xVI+ +1.6xIX
848	Komb.: I+II+1.8xIII+1.8xVI+ +1.6xIX
849	Komb.: I+II+1.8xIII+ +1.8xVI+1.6xVII
850	Komb.: I+II+ +1.8xIII-1.8xVI+1.6xVII
851	Komb.: I+II+1.8xV+ +1.8xVI+1.6xVII
852	Komb.: I+II+1.8xIV+1.8xVI+ +1.6xXI
853	Komb.: I+II+1.8xV+ +1.8xVI+1.6xXI
854	Komb.: I+II+1.8xIV-1.8xVI+ +1.6xXI
855	Komb.: I+II+ +1.8xV-1.8xVI+1.6xVII
856	Komb.: I+II+1.8xIV-1.8xVI +1.6xXIII
857	Komb.: I+II+1.8xIV+ +1.8xVI+1.6xXIII
858	Komb.: I+II+1.8xIII+1.8xVI+ +1.6xXI
859	Komb.: I+II+1.8xIII-1.8xVI+ +1.6xXI
860	Komb.: I+II+ +1.8xV-1.8xVI+1.6xXI
861	Komb.: I+II+1.8xV+1.8xVI+ +1.6xXIII
862	Komb.: I+II+1.8xV-1.8xVI+ +1.6xXIII
863	Komb.: I+II+1.8xIII+ +1.8xVI+1.6xXIII
864	Komb.: I+II+ +1.8xIII-1.8xVI+1.6xXIII
865	Komb.: 1.6xI+1.6xII-1.8xVI+ +1.8xVIII
866	Komb.: 1.6xI+1.6xII-1.8xV I+1.8xXIV
867	Komb.: 1.6xI+1.6xII+1.8xVI+

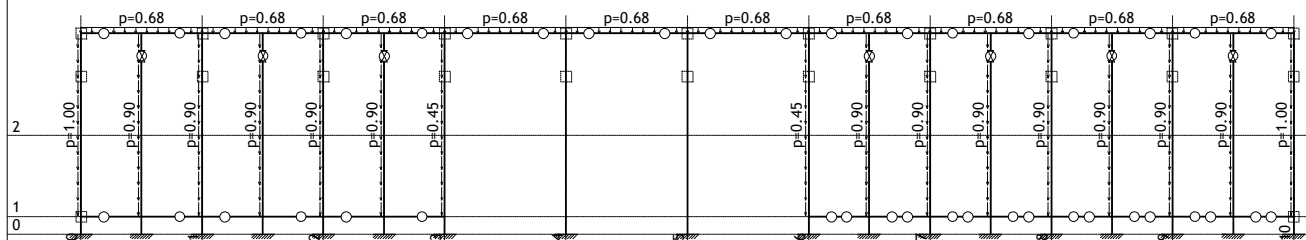
Lista slucajeva opterecenja	
No	Naziv
	+1.8xVIII
868	Komb.: 1.6xI+1.6xII+1.8xV- -1.8xVI
869	Komb.: 1.6xI+1.6xII+1.8xVI+ +1.8xX
870	Komb.: 1.6xI+1.6xII-1.8xVI+ +1.8xX
871	Komb.: 1.6xI+1.6xII-1.8xV I+1.8xXII
872	Komb.: 1.6xI+1.6xII+ +1.8xVI+1.8xXII
873	Komb.: 1.6xI+ +1.6xII+1.8xV+1.8xVI
874	Komb.: 1.6xI+1.6xII+ +1.8xIV+1.8xVI
875	Komb.: 1.6xI+1.6xII+ +1.8xVI+1.8xXIV
876	Komb.: 1.6xI+1.6xII+1.8xIV- -1.8xVI
877	Komb.: 1.6xI+1.6xII+1.8xIII- -1.8xVI
878	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xVI
879	Komb.: I+II+1.8xIV-1.8xVI+VII
880	Komb.: I+II+1.8xIV+1.8xVI+IX
881	Komb.: I+II+1.8xV+1.8xVI+IX
882	Komb.: I+II+1.8xIV+1.8xVI+VII
883	Komb.: I+II+1.8xIV-1.8xVI+IX
884	Komb.: I+II+1.8xV-1.8xVI+VII
885	Komb.: I+II+1.8xV+1.8xVI+VII
886	Komb.: I+II+1.8xIII-1.8xVI+VII
887	Komb.: I+II-1.8xVI+IX+1.8xX
888	Komb.: I+II+1.8xVI+IX+1.8xX
889	Komb.: I+II+1.8xIII+1.8xVI+VII
890	Komb.: I+II+1.8xV-1.8xVI+IX
891	Komb.: I+II+1.8xIV-1.8xVI+XI
892	Komb.: I+II+ +1.8xVI+VII+1.8xVIII
893	Komb.: I+II+1.8xV-1.8xVI+XI
894	Komb.: I+II+1.8xVI+XI+1.8xXII
895	Komb.: I+II-1.8xVI+XI+1.8xXII
896	Komb.: I+II+1.8xIII+1.8xVI+IX
897	Komb.: I+II+1.8xV+1.8xVI+XI
898	Komb.: I+II+1.8xIV+1.8xVI+XI
899	Komb.: I+II-1.8xVI+VII+1. 8xVIII
900	Komb.: I+II+1.8xIII+1.8xVI+XI
901	Komb.: I+II+1.8xIV-1.8xVI +XIII
902	Komb.: I+II+1.8xIII-1.8xVI+XI
903	Komb.: I+II+1.8xIV+ +1.8xVI+XIII
904	Komb.: I+II+1.8xVI+ +XIII+1.8xXIV
905	Komb.: I+II+1.8xV-1.8xVI+XIII
906	Komb.: I+II-1.8xVI+ +XIII+1.8xXIV
907	Komb.: I+II+1.8xIII-1.8xVI+IX
908	Komb.: I+II+1.8xIII+ +1.8xVI+XIII
909	Komb.: I+II+ +1.8xIII-1.8xVI+XIII
910	Komb.: I+II+1.8xV+1.8xVI+XIII
911	Komb.: 1.6xI+1.6xII-1.8xV I+1.6xVII
912	Komb.: 1.6xI+1.6xII+ +1.8xVI+1.6xIX
913	Komb.: 1.6xI+1.6xII-1.8xV I+1.6xIX
914	Komb.: 1.6xI+1.6xII+ +1.8xVI+1.6xVII
915	Komb.: 1.6xI+1.6xII+ +1.8xVI+1.6xXI
916	Komb.: 1.6xI+1.6xII-1.8xV I+1.6xXI
917	Komb.: 1.6xI+1.6xII-1.8xVI+ +1.6xXIII
918	Komb.: 1.6xI+1.6xII+1.8xVI+ +1.6xXIII
919	Komb.: I+1.6xII-1.8xVI+ +1.8xVIII
920	Komb.: I+1.6xII+1.8xVI+ +1.8xVIII
921	Komb.: 1.6xI+II-1.8xVI+ +1.8xX
922	Komb.: I+1.6xII+1.8xV- -1.8xVI
923	Komb.: I+1.6xII+1.8xV+1.8 xVI
924	Komb.: I+1.6xII+1.8xVI+ +1.8xX
925	Komb.: 1.6xI+II+1.8xVI+ +1.8xX
926	Komb.: I+1.6xII-1.8xVI+ +1.8xX
927	Komb.: I+1.6xII+ +1.8xVI+1.8xXIV
928	Komb.: 1.6xI+II+ +1.8xVI+1.8xXII
929	Komb.: 1.6xI+

No	Naziv
	+II+1.8xV+1.8xVI
930	Komb.: I+1.6xII+ +1.8xIV+1.8xVI
931	Komb.: I+1.6xII+1.8xIV- -1.8xVI
932	Komb.: I+1.6xII+ +1.8xVI+1.8xXII
933	Komb.: 1.6xI+II+1.8xV- -1.8xVI
934	Komb.: I+1.6xII-1.8xVI+1. 8xXII
935	Komb.: 1.6xI+II+ +1.8xVI+1.8xXIV
936	Komb.: 1.6xI+II-1.8xVI+ +1.8xVIII
937	Komb.: 1.6xI+II+1.8xIV- -1.8xVI
938	Komb.: 1.6xI+II-1.8xVI+1. 8xXII
939	Komb.: 1.6xI+II+1.8xVI+ +1.8xVIII
940	Komb.: 1.6xI+II+ +1.8xIV+1.8xVI
941	Komb.: I+1.6xII-1.8xVI+1. 8xXIV
942	Komb.: 1.6xI+II+1.8xIII- -1.8xVI
943	Komb.: 1.6xI+ +II+1.8xIII+1.8xVI
944	Komb.: 1.6xI+II-1.8xVI+1. 8xXIV
945	Komb.: I+1.6xII+1.8xIII+1 8xVI
946	Komb.: I+1.6xII+1.8xIII- -1.8xVI
947	Komb.: I+1.6xII+ +1.8xVI+1.6xIX
948	Komb.: I+1.6xII+ +1.8xVI+1.6xVII
949	Komb.: 1.6xI+II+ +1.8xVI+1.6xVII
950	Komb.: 1.6xI+II+ +1.8xVI+1.6xIX
951	Komb.: 1.6xI+II-1.8xVI+1. 6xIX
952	Komb.: I+1.6xII-1.8xVI+1. 6xIX
953	Komb.: 1.6xI+1.6xII+ +1.8xVI+IX
954	Komb.: 1.6xI+1.6xII-1.8xV I+IX
955	Komb.: I+1.6xII-1.8xVI+1. 6xVII
956	Komb.: 1.6xI+1.6xII+ +1.8xVI+VII
957	Komb.: 1.6xI+II-1.8xVI+1. 6xXI
958	Komb.: 1.6xI+II+ +1.8xVI+1.6xXI
959	Komb.: 1.6xI+1.6xII+ +1.8xVI+XI
960	Komb.: 1.6xI+1.6xII-1.8xV I+VII
961	Komb.: I+1.6xII+ +1.8xVI+1.6xXI
962	Komb.: 1.6xI+1.6xII+1.8xVI+ +XIII
963	Komb.: I+1.6xII+1.8xVI+ +1.6xXIII
964	Komb.: 1.6xI+1.6xII-1.8xV I+XI
965	Komb.: I+1.6xII-1.8xVI+ +1.6xXIII
966	Komb.: 1.6xI+II+1.8xVI+ +1.6xXIII
967	Komb.: 1.6xI+II-1.8xVI+1. 6xVII
968	Komb.: I+1.6xII-1.8xVI+1. 6xXI
969	Komb.: 1.6xI+1.6xII-1.8xVI+ +XIII
970	Komb.: 1.6xI+II-1.8xVI+ +1.6xXIII
971	Komb.: I+II+1.8xVI+1.8xVIII
972	Komb.: I+II-1.8xVI+1.8xVIII
973	Komb.: I+II+1.8xV-1.8xVI
974	Komb.: I+II-1.8xVI+1.8xXII
975	Komb.: I+II+1.8xV+1.8xVI
976	Komb.: I+II+1.8xVI+1.8xXII
977	Komb.: I+II-1.8xVI+1.8xXIV
978	Komb.: I+II+1.8xIV+1.8xVI
979	Komb.: I+II+1.8xIII-1.8xVI
980	Komb.: I+II+1.8xIV-1.8xVI
981	Komb.: I+II+1.8xVI+1.8xX
982	Komb.: I+II+1.8xIII+1.8xVI
983	Komb.: I+II-1.8xVI+1.8xX
984	Komb.: I+II+1.8xVI+1.8xXIV
985	Komb.: I+1.6xII+1.8xVI+VII
986	Komb.: I+1.6xII-1.8xVI+VII
987	Komb.: 1.6xI+II-1.8xVI+VII

Lista slucajeva opterecenja	
No	Naziv
988	Komb.: I+II-1.8xVI+1.6xIX
989	Komb.: I+II+1.8xVI+1.6xIX
990	Komb.: I+II+1.8xVI+1.6xVII
991	Komb.: I+1.6xII-1.8xVI+IX
992	Komb.: I+1.6xII+1.8xVI+IX
993	Komb.: I+II-1.8xVI+1.6xVII
994	Komb.: 1.6xI+II-1.8xVI+IX
995	Komb.: 1.6xI+II+1.8xVI+IX
996	Komb.: 1.6xI+II+1.8xVI+XI
997	Komb.: I+II-1.8xVI+1.6xXI
998	Komb.: I+II+1.8xVI+1.6xXI
999	Komb.: 1.6xI+II-1.8xVI+XI
1000	Komb.: I+1.6xII-1.8xVI+XI
1001	Komb.: I+1.6xII-1.8xVI+XIII
1002	Komb.: I+II+1.8xVI+1.6xXIII
1003	Komb.: 1.6xI+II+1.8xVI+VII
1004	Komb.: I+1.6xII+1.8xVI+XIII
1005	Komb.: I+1.6xII+1.8xVI+XI
1006	Komb.: I+II-1.8xVI+1.6xXIII
1007	Komb.: 1.6xI+II-1.8xVI+XIII
1008	Komb.: 1.6xI+II+1.8xVI+XIII
1009	Komb.: 1.6xI+1.6xII-1.8xVI
1010	Komb.: 1.6xI+1.6xII+1.8xVI
1011	Komb.: I+II+1.8xVI+VII
1012	Komb.: I+II-1.8xVI+VII
1013	Komb.: I+II+1.8xVI+IX
1014	Komb.: I+II-1.8xVI+IX
1015	Komb.: I+II-1.8xVI+XI
1016	Komb.: I+II+1.8xVI+XI
1017	Komb.: I+II-1.8xVI+XIII
1018	Komb.: I+II+1.8xVI+XIII
1019	Komb.: 1.6xI+II+1.8xVI
1020	Komb.: I+1.6xII-1.8xVI
1021	Komb.: 1.6xI+II-1.8xVI
1022	Komb.: I+1.6xII+1.8xVI
1023	Komb.: I+II+1.8xVI
1024	Komb.: I+II-1.8xVI
1025	Komb.: I+II+III+VII+0.5xVIII+XV
1026	Komb.: I+II+III+VII+0.5xV III-1xXV
1027	Komb.: I+II+III+VII+0.5xVIII+ +XVI
1028	Komb.: I+II+III+VII+0.5xV III-1xXVI
1029	Komb.: 1.3xI+ +1.3xII+1.3xIII+1.3xVII+0 .65xVIII+1.3xXV
1030	Komb.: 1.3xI+ +1.3xII+1.3xIII+1.3xVII+0 .65xVIII-1.3xXV
1031	Komb.: 1.3xI+ +1.3xII+1.3xIII+1.3xVII+0 .65xVIII+1.3xXVI
1032	Komb.: 1.3xI+ +1.3xII+1.3xIII+1.3xVII+0 .65xVIII-1.3xXVI
1033	Komb.: I+II+III+VII
1034	Komb.: I+II+III+IV+VII
1035	Komb.: I+II+III+V+VII
1036	Komb.: I+II+III+VI+VII
1037	Komb.: I+II+III-1xVI+VII
1038	Komb.: I+II+III+IV+VI+VII
1039	Komb.: I+II+III+IV-1xVI+VII
1040	Komb.: I+II+III+V+VI+VII
1041	Komb.: I+II+III+V-1xVI+VII

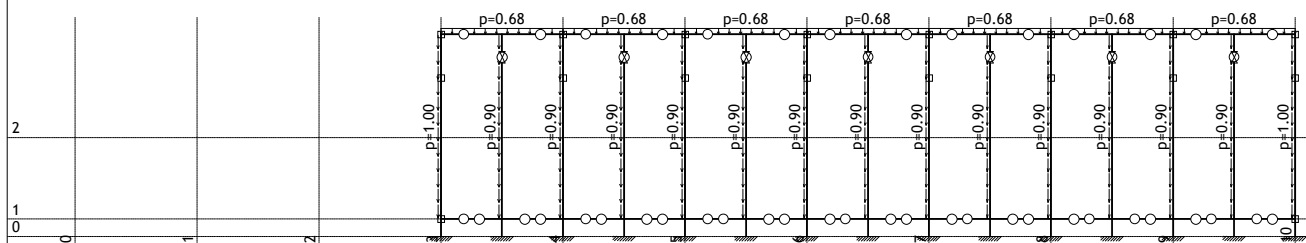
No	Naziv
1042	Komb.: I+II+III+VII+VIII
1043	Komb.: I+II+III+IV+VII+VIII
1044	Komb.: I+II+III+V+VII+VIII
1045	Komb.: I+II+III+VI+VII+VIII
1046	Komb.: I+II+III-1xVI+VII+VIII
1047	Komb.: I+II+III+IV+VI+VII+VIII
1048	Komb.: I+II+III+IV-1xVI+VII+VIII
1049	Komb.: I+II+III+V+VI+VII+VIII
1050	Komb.: I+II+III+V-1xVI+VII+VIII
1051	Komb.: I+II+III+IX
1052	Komb.: I+II+III+IV+IX
1053	Komb.: I+II+III+V+IX
1054	Komb.: I+II+III+VI+IX
1055	Komb.: I+II+III-1xVI+IX
1056	Komb.: I+II+III+IV+VI+IX
1057	Komb.: I+II+III+IV-1xVI+IX
1058	Komb.: I+II+III+V+VI+IX
1059	Komb.: I+II+III+V-1xVI+IX
1060	Komb.: I+II+III+IX+X
1061	Komb.: I+II+III+IV+IX+X
1062	Komb.: I+II+III+V+IX+X
1063	Komb.: I+II+III+VI+IX+X
1064	Komb.: I+II+III-1xVI+IX+X
1065	Komb.: I+II+III+IV+VI+IX+X
1066	Komb.: I+II+III+IV-1xVI+IX+X
1067	Komb.: I+II+III+V+VI+IX+X
1068	Komb.: I+II+III+V-1xVI+IX+X
1069	Komb.: I+II+III+XI
1070	Komb.: I+II+III+IV+XI
1071	Komb.: I+II+III+V+XI
1072	Komb.: I+II+III+VI+XI
1073	Komb.: I+II+III-1xVI+XI
1074	Komb.: I+II+III+IV+VI+XI
1075	Komb.: I+II+III+IV-1xVI+XI
1076	Komb.: I+II+III+V+VI+XI
1077	Komb.: I+II+III+V-1xVI+XI
1078	Komb.: I+II+III+XI+XII
1079	Komb.: I+II+III+IV+XI+XII
1080	Komb.: I+II+III+V+XI+XII
1081	Komb.: I+II+III+VI+XI+XII
1082	Komb.: I+II+III-1xVI+XI+XII
1083	Komb.: I+II+III+IV+VI+XI+XII
1084	Komb.: I+II+III+IV-1xVI+XI+XII
1085	Komb.: I+II+III+V+VI+XI+XII
1086	Komb.: I+II+III+V-1xVI+XI+XII
1087	Komb.: I+II+III+XIII
1088	Komb.: I+II+III+IV+XIII
1089	Komb.: I+II+III+V+XIII
1090	Komb.: I+II+III+VI+XIII
1091	Komb.: I+II+III-1xVI+XIII
1092	Komb.: I+II+III+IV+VI+XIII
1093	Komb.: I+II+III+IV-1xVI+XIII
1094	Komb.: I+II+III+V+VI+XIII
1095	Komb.: I+II+III+V-1xVI+XIII
1096	Komb.: I+II+III+XIII+XIV
1097	Komb.: I+II+III+IV+XIII+XIV
1098	Komb.: I+II+III+V+XIII+XIV
1099	Komb.: I+II+III+VI+XIII+XIV
1100	Komb.: I+II+III-1xVI+XIII+XIV
1101	Komb.: I+II+III+IV+VI+XIII+XIV
1102	Komb.: I+II+III+IV-1xVI+XIII+ +XIV
1103	Komb.: I+II+III+V+VI+XIII+XIV
1104	Komb.: I+II+III+V-1xVI+XIII+XIV

Opt. 2: G



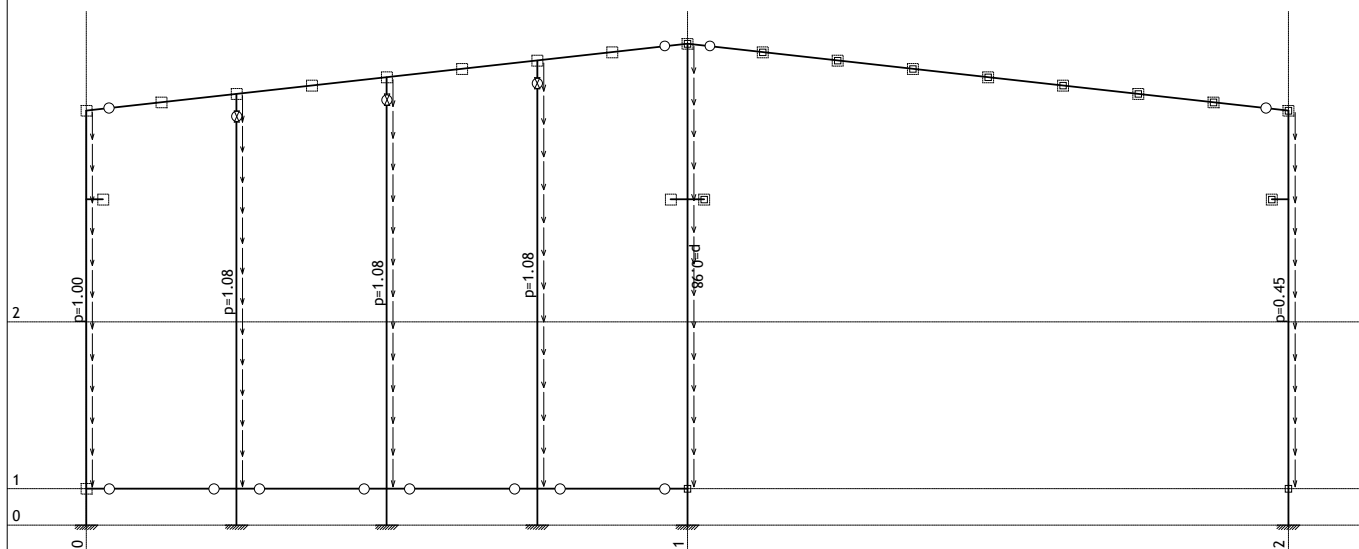
Ram: H 17

Opt. 2: G

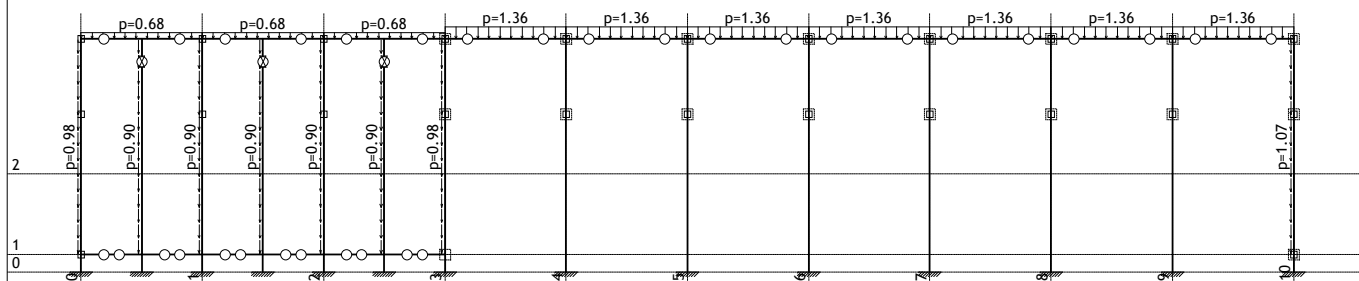


Ram: H 1

Opt. 2: G

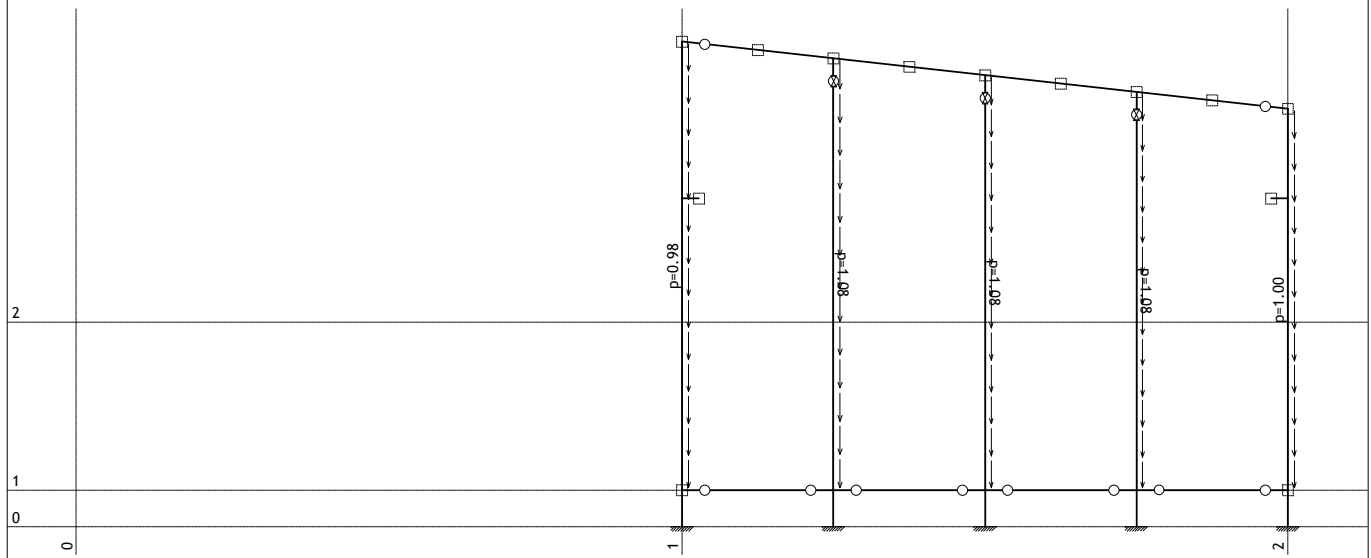


Ram: V 4
Opt. 2: G

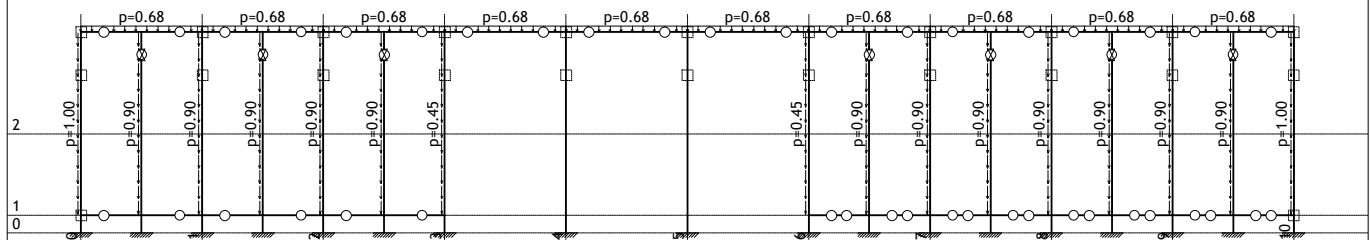


Ram: H 9

Opt. 2: G

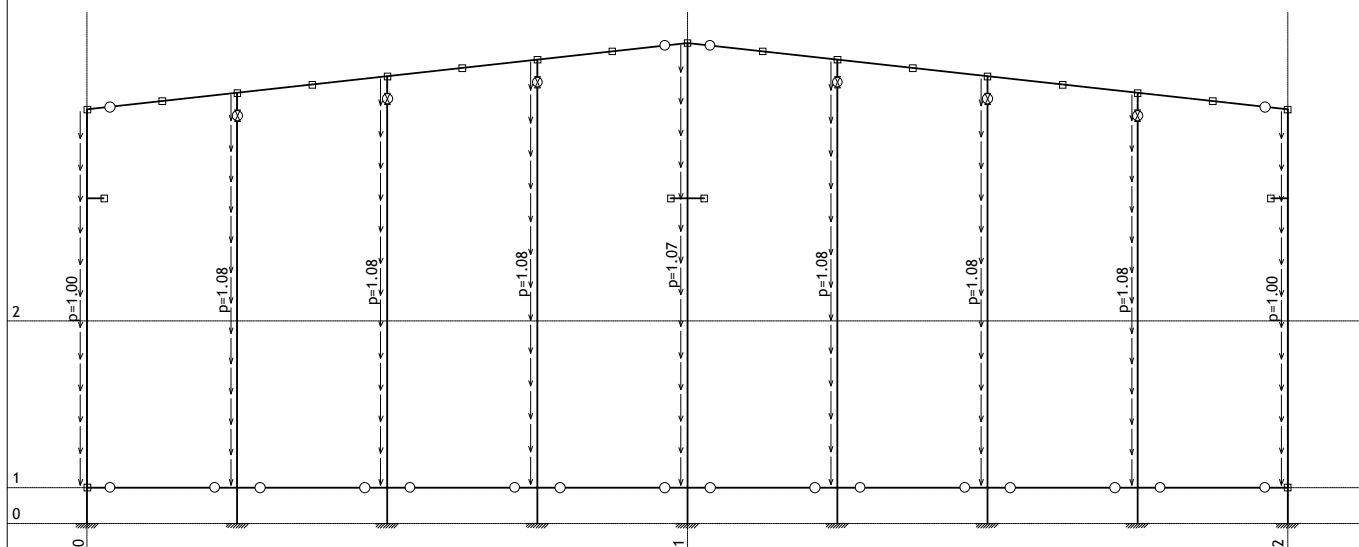


Ram: V 1
Opt. 2: G

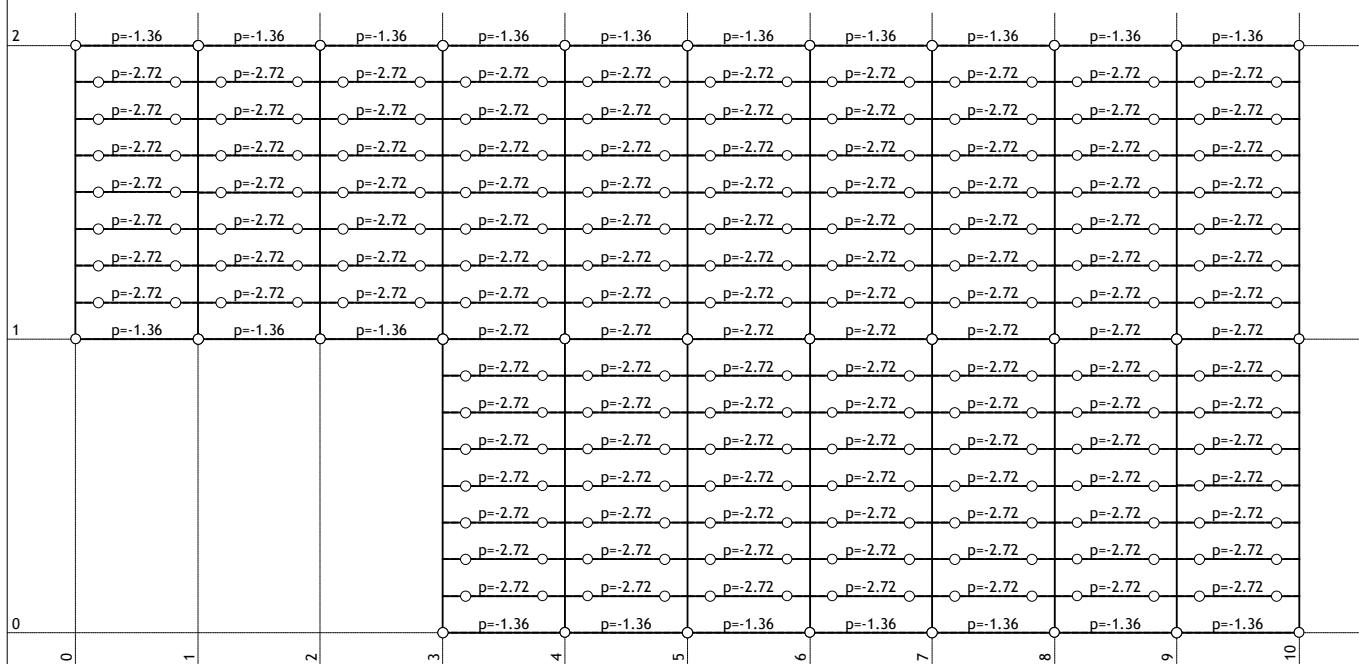


Ram: H 17

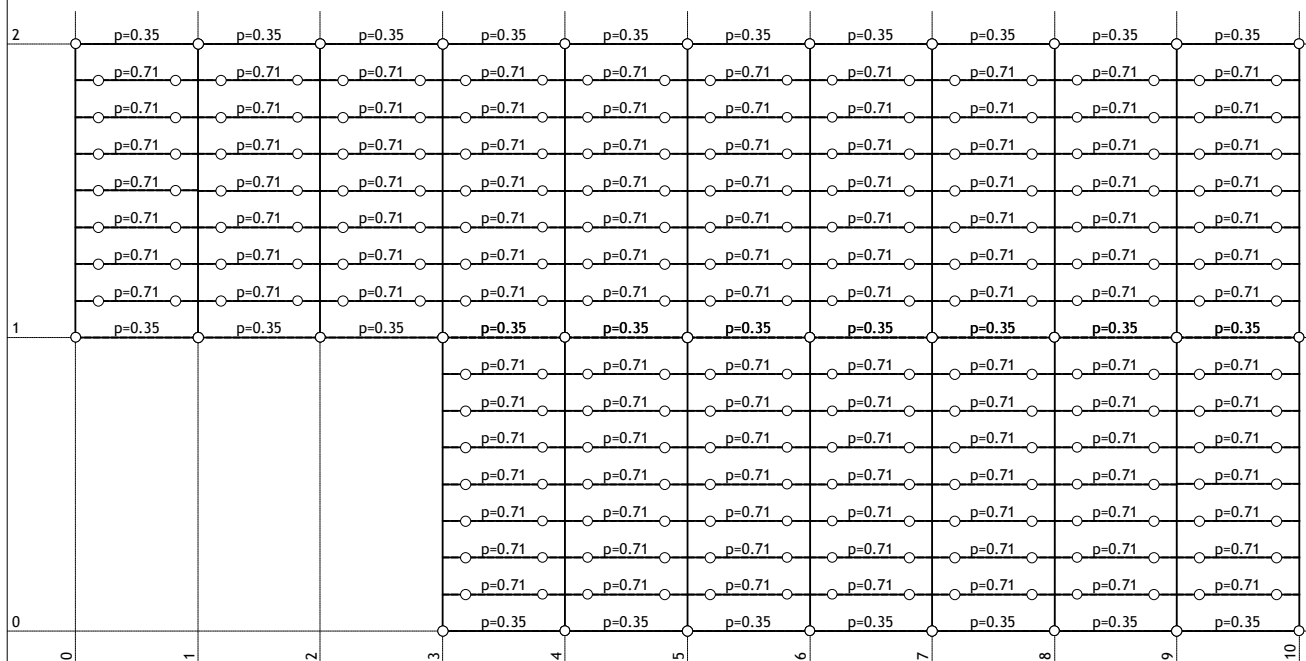
Opt. 2: G



Ram: V 11
Opt. 3: S

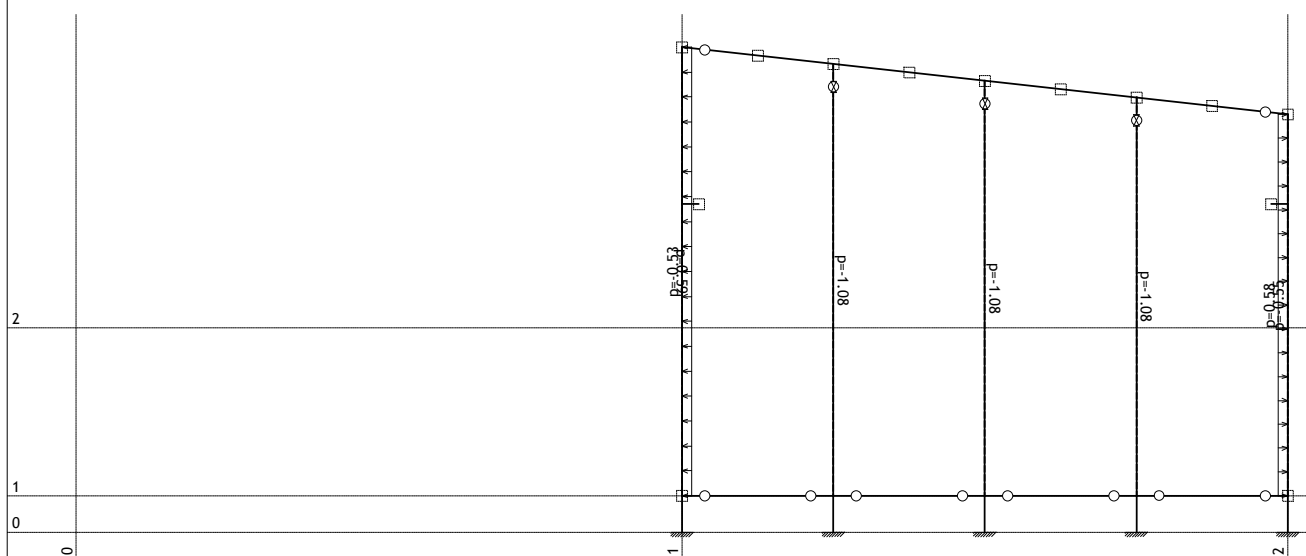


Opt. 4: W-x



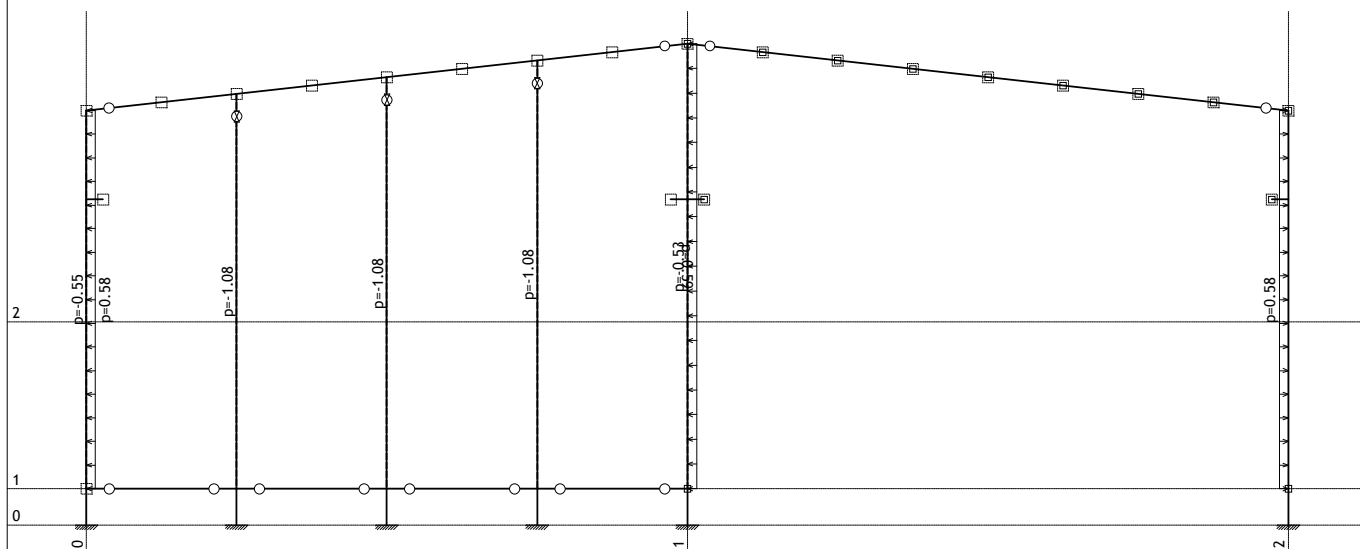
Pogled: Kispred+Kiza

Opt. 4: W-x

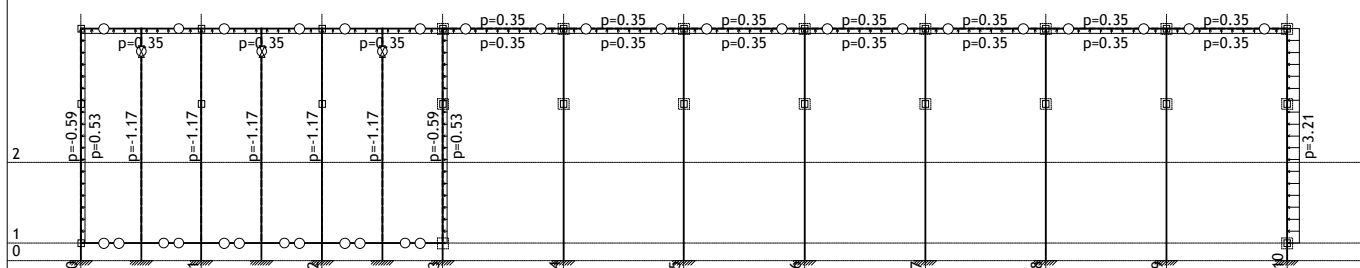


Ram: V 1

Opt. 4: W-x

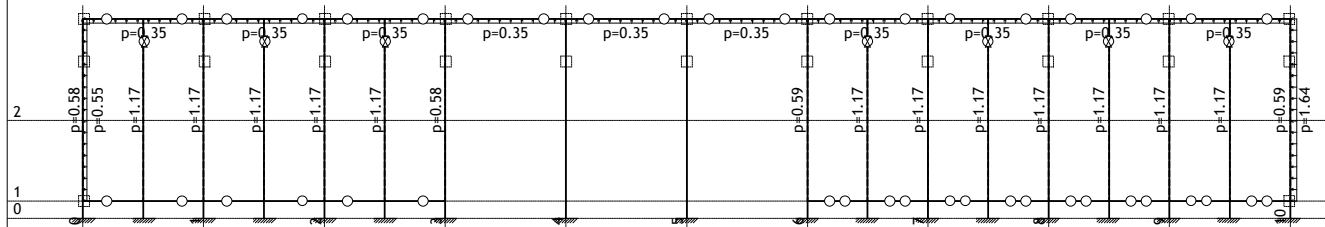


Ram: V_4
Opt. 4: W-x



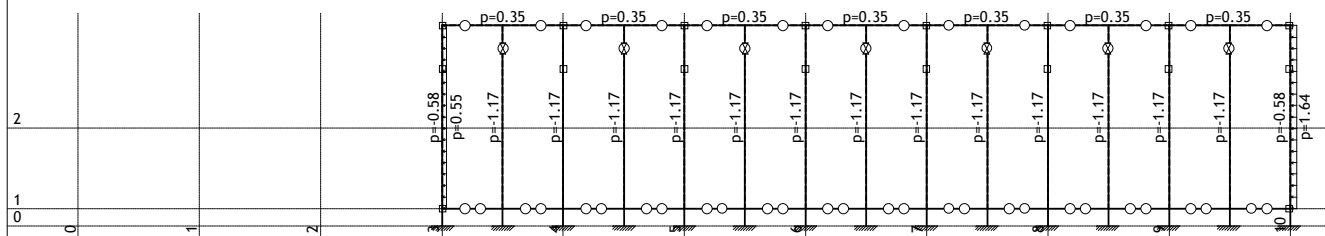
Ram: H_9

Opt. 4: W-x



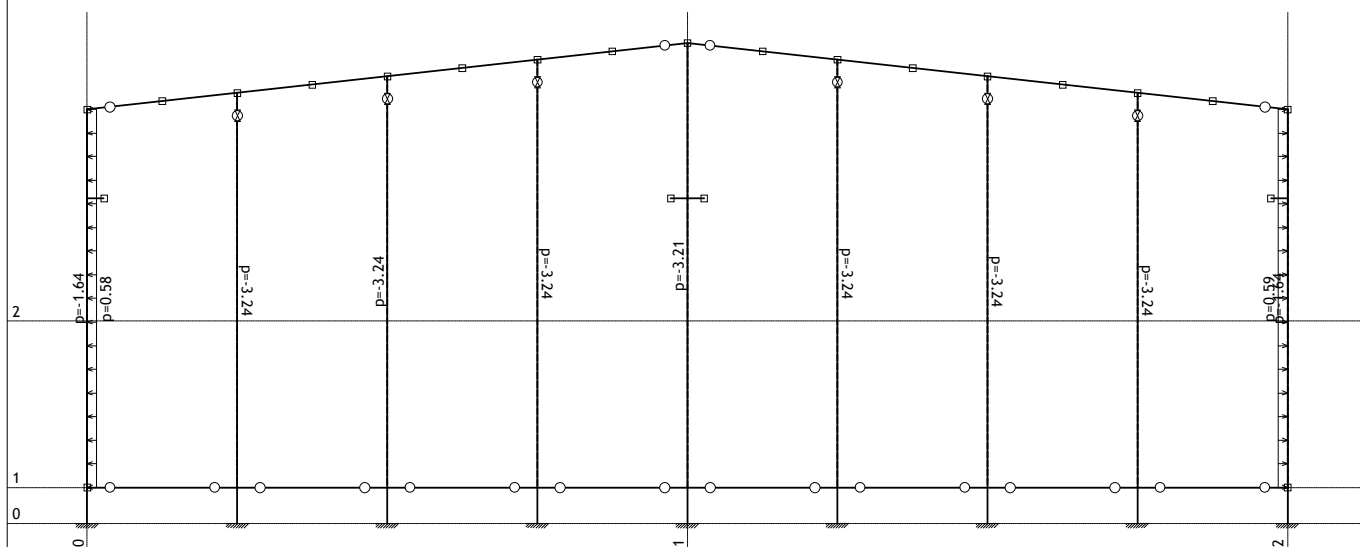
Ram: H 17

Opt. 4: W-x

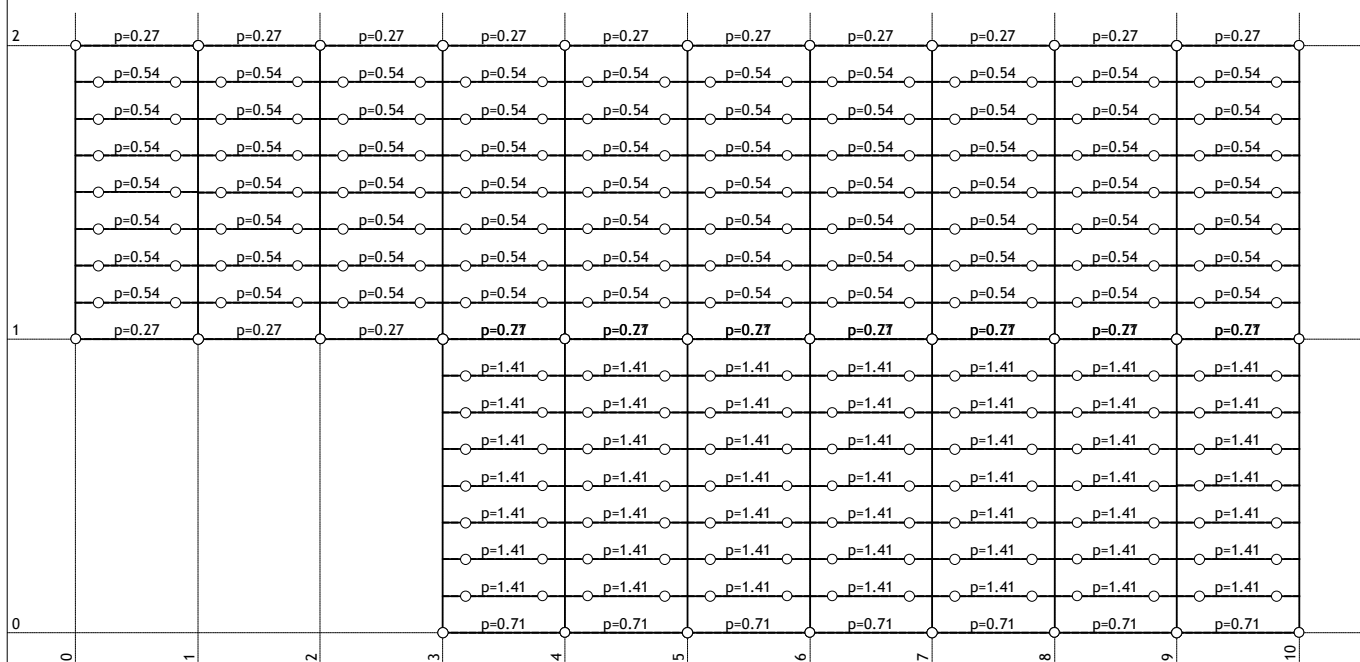


Ram: H 1

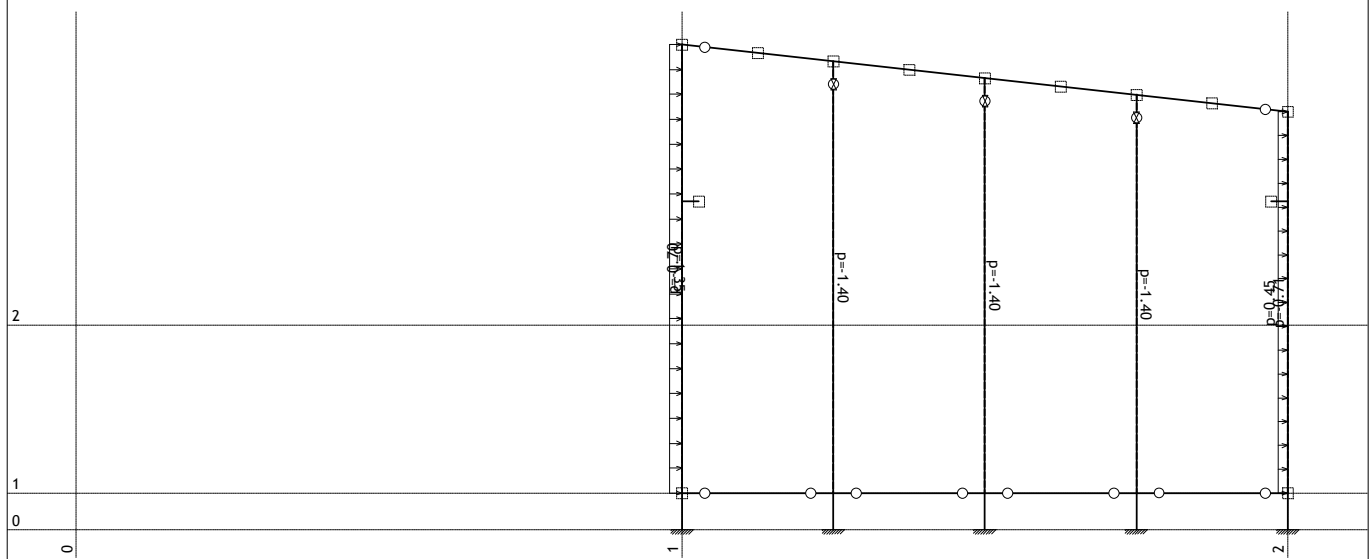
Opt. 4: W-x



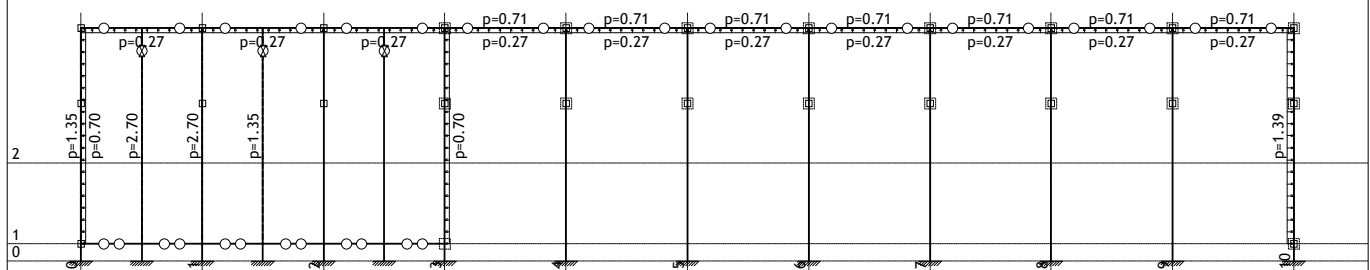
Ram: V 11
Opt. 5: Wy



Opt. 5: Wy

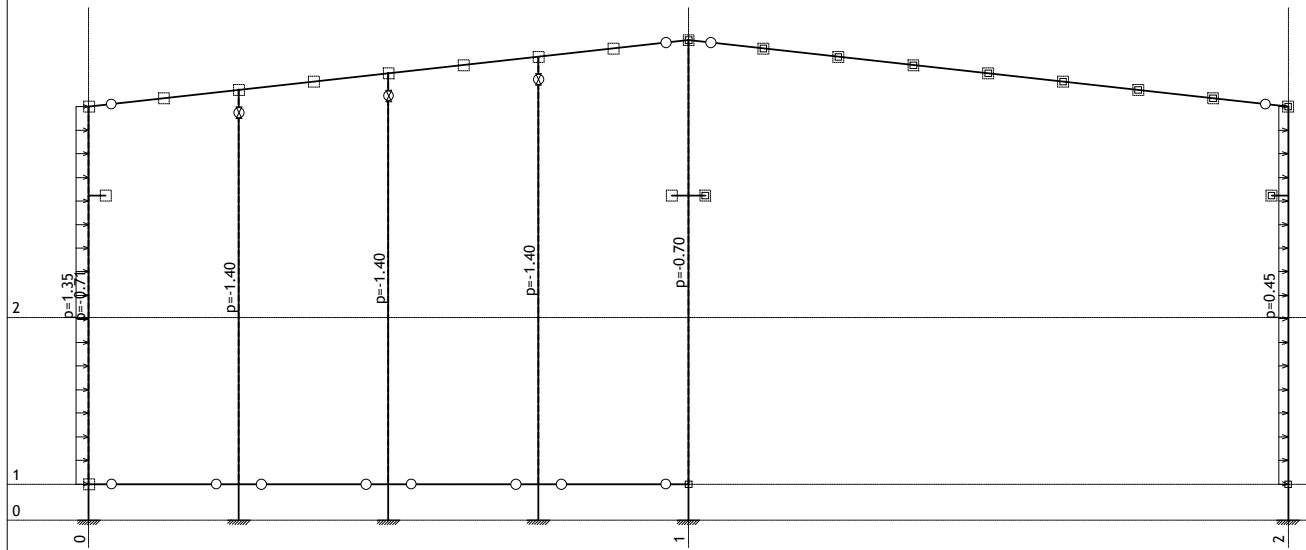


Ram: V_1
Opt. 5: Wy

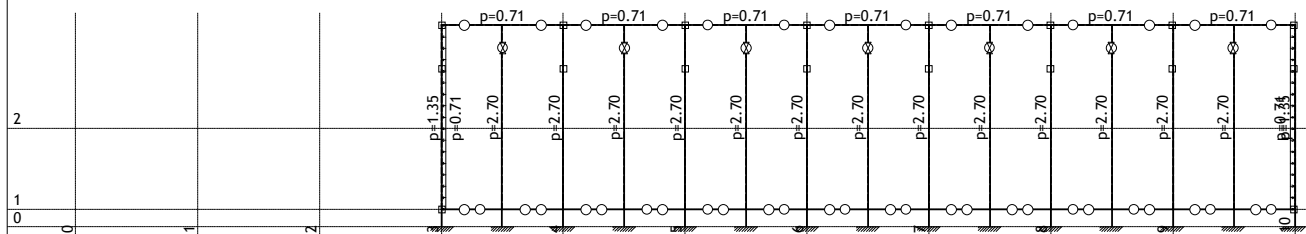


Ram: H_9

Opt. 5: Wy

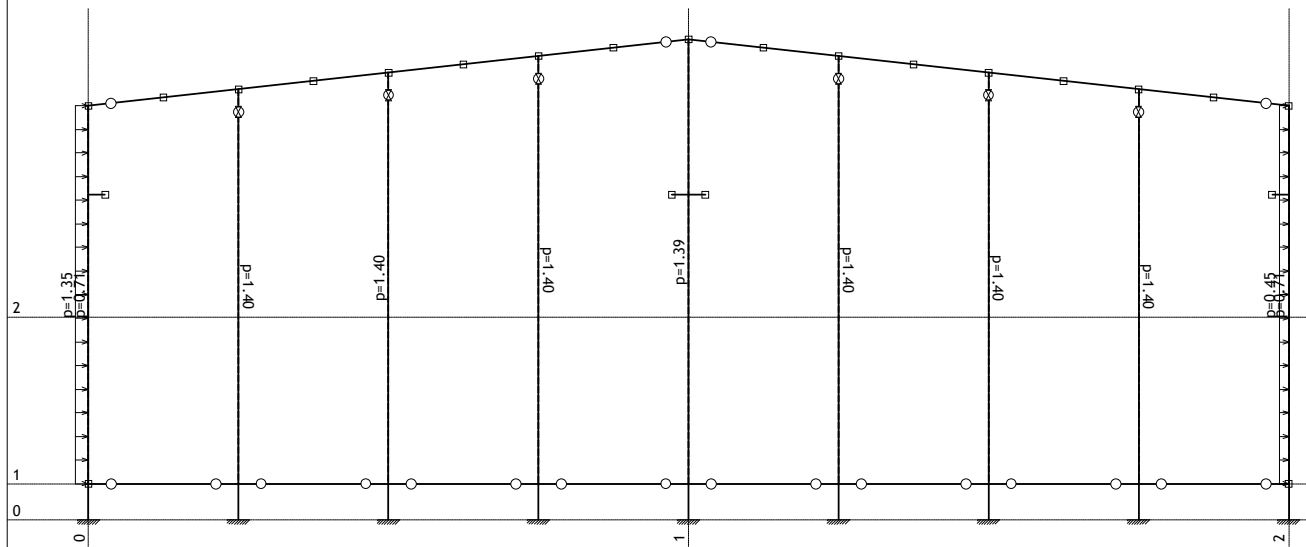


Ram: V 4
Opt. 5: Wy

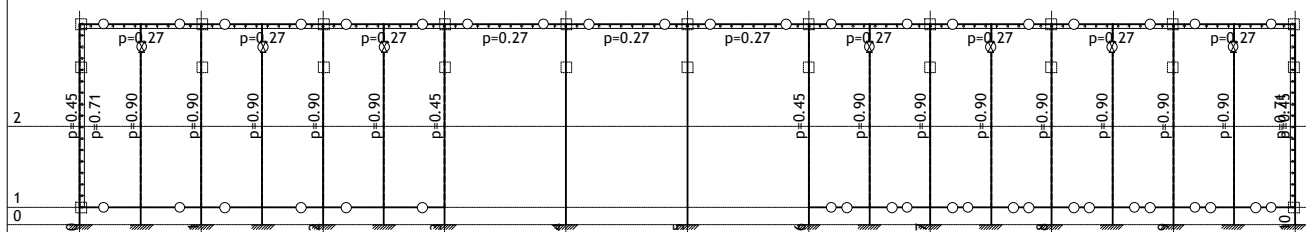


Ram: H 1

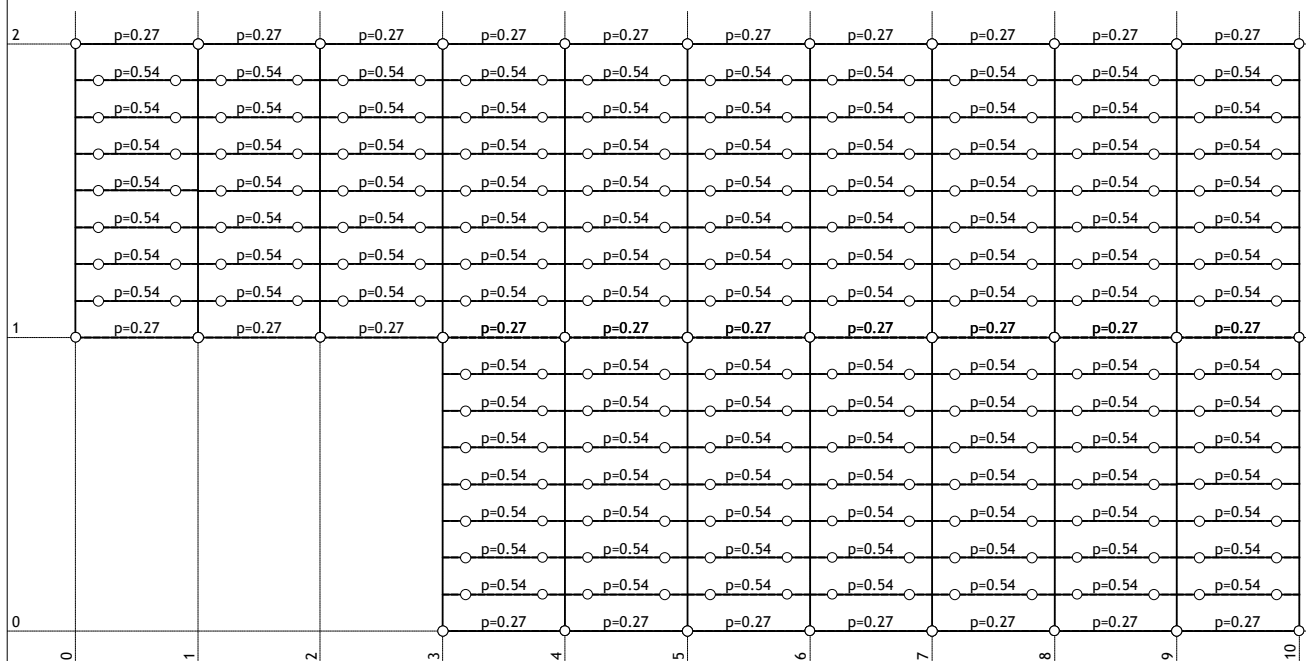
Opt. 5: Wy



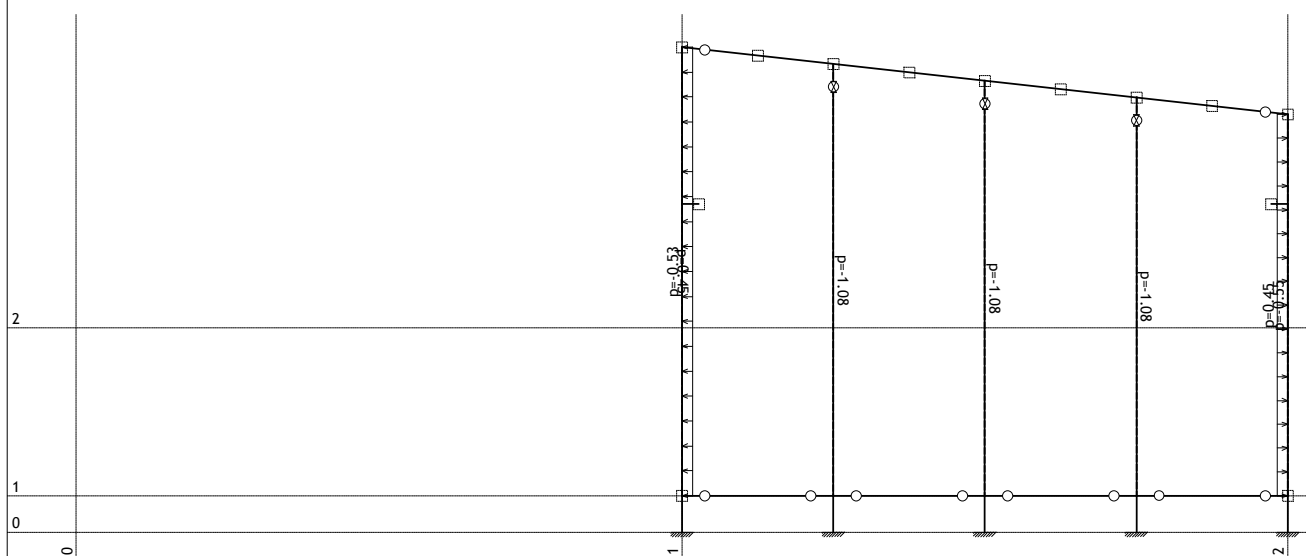
Ram: V 11
Opt. 5: Wy



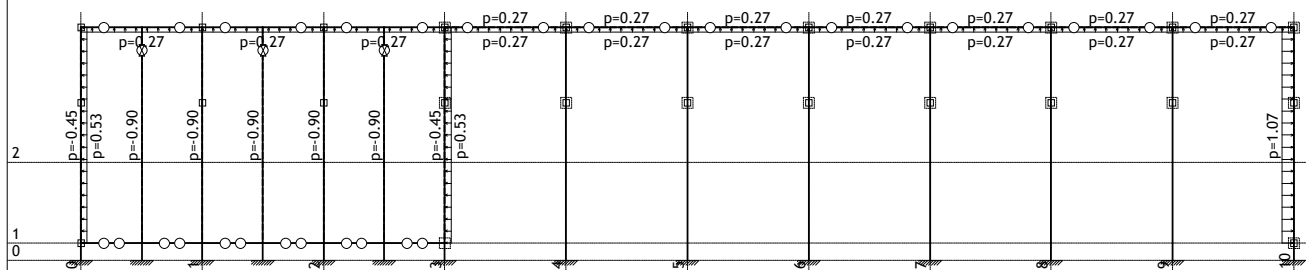
Ram: H 17



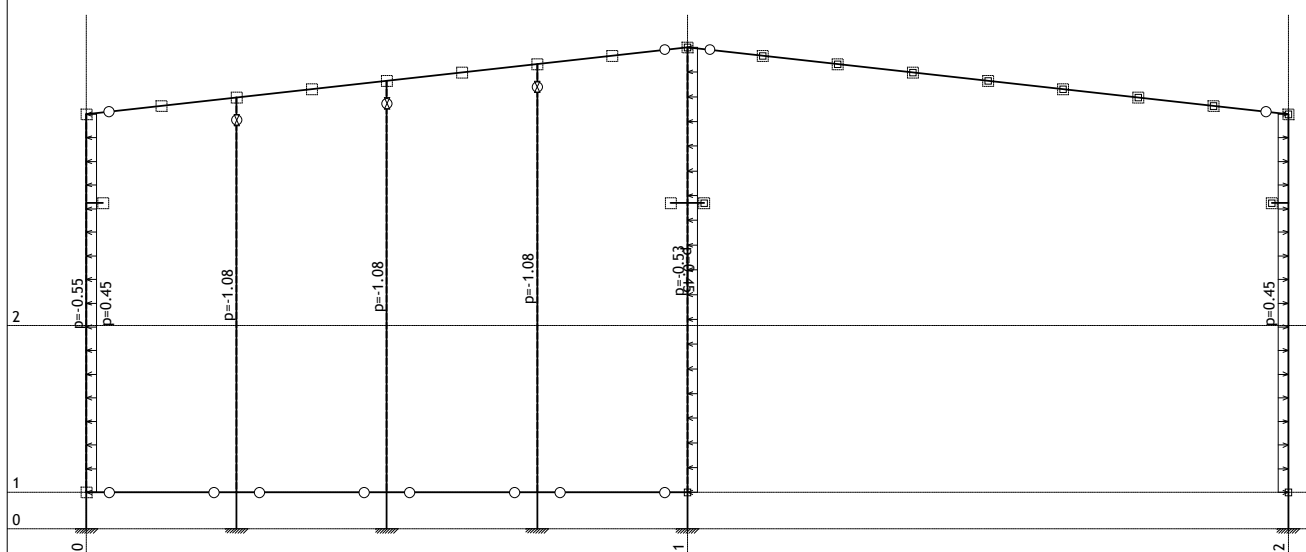
Pogled: Kispred+Kiza
Opt. 6: Wu



Opt. 6: Wu

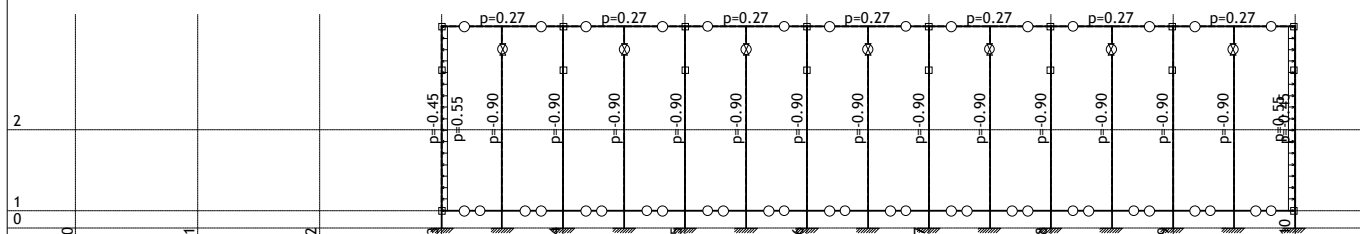


Ram: H 9
Opt. 6: Wu

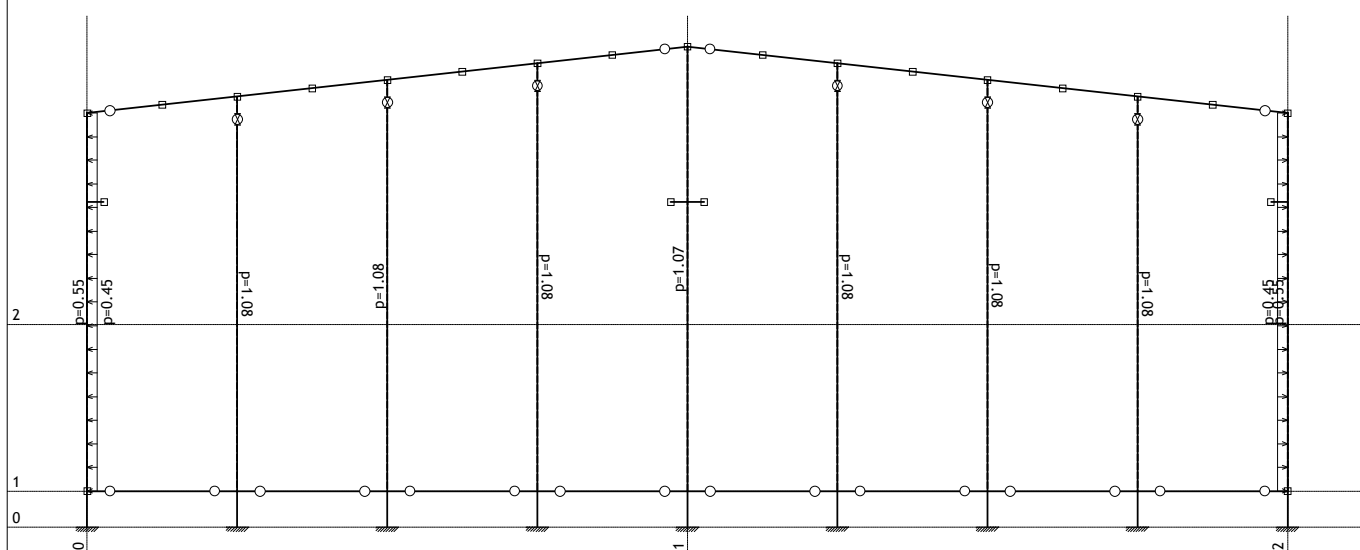


Ram: V 4

Opt. 6: Wu

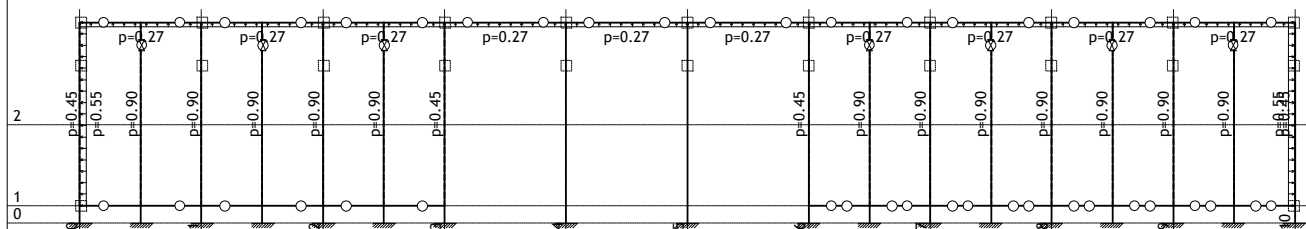


Ram: H 1
Opt. 6: Wu



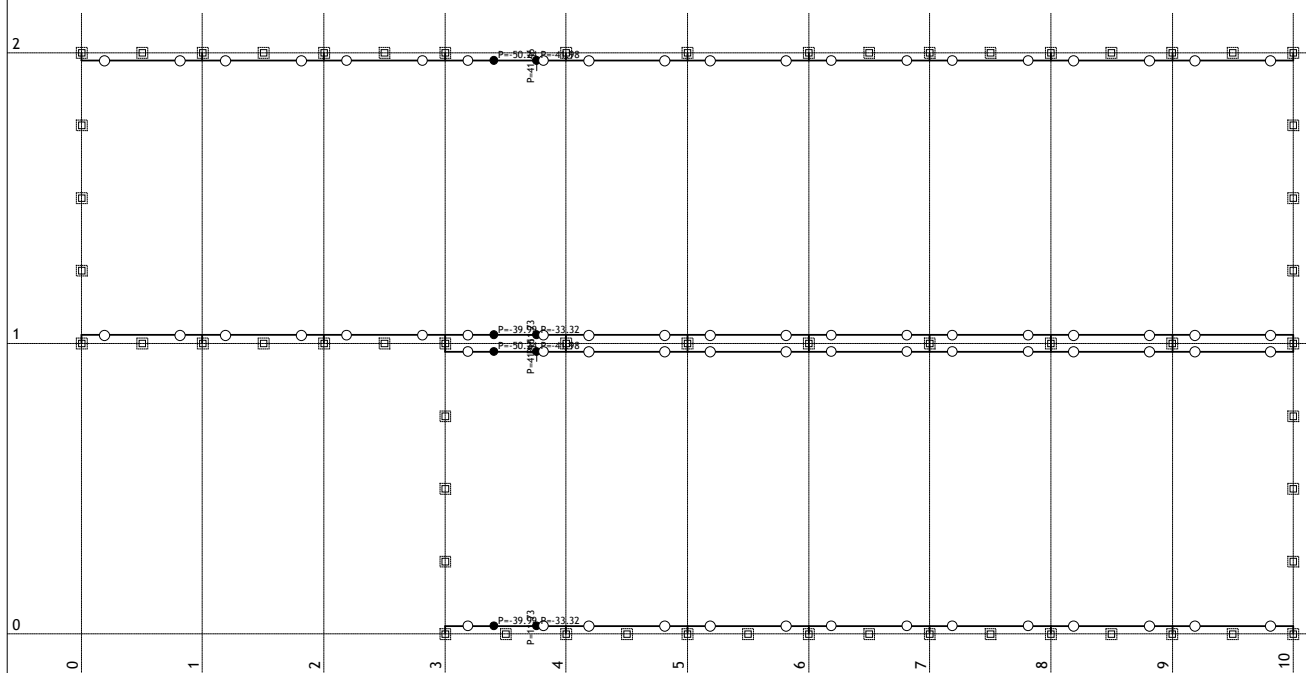
Ram: V 11

Opt. 6: Wu



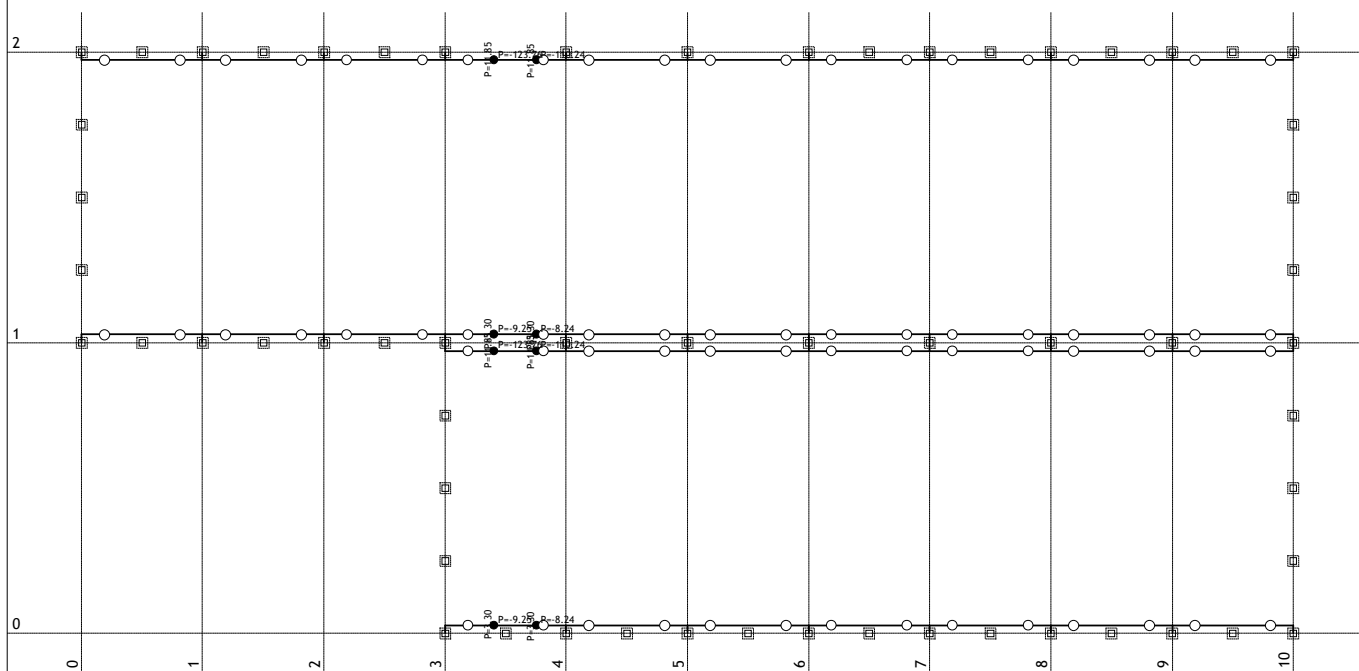
Ram: H_17

Opt. 7: Gkran-max.staza



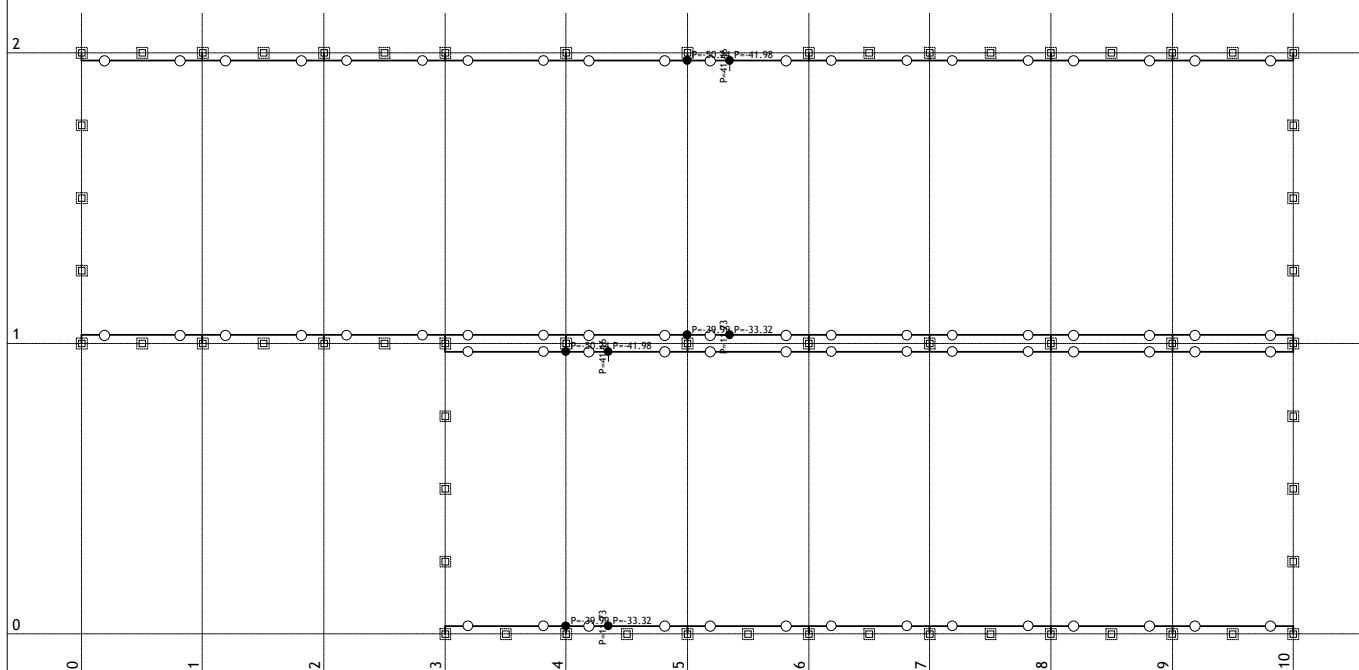
Pogled: GIŠ

Opt. 8: Pkran-max.staza



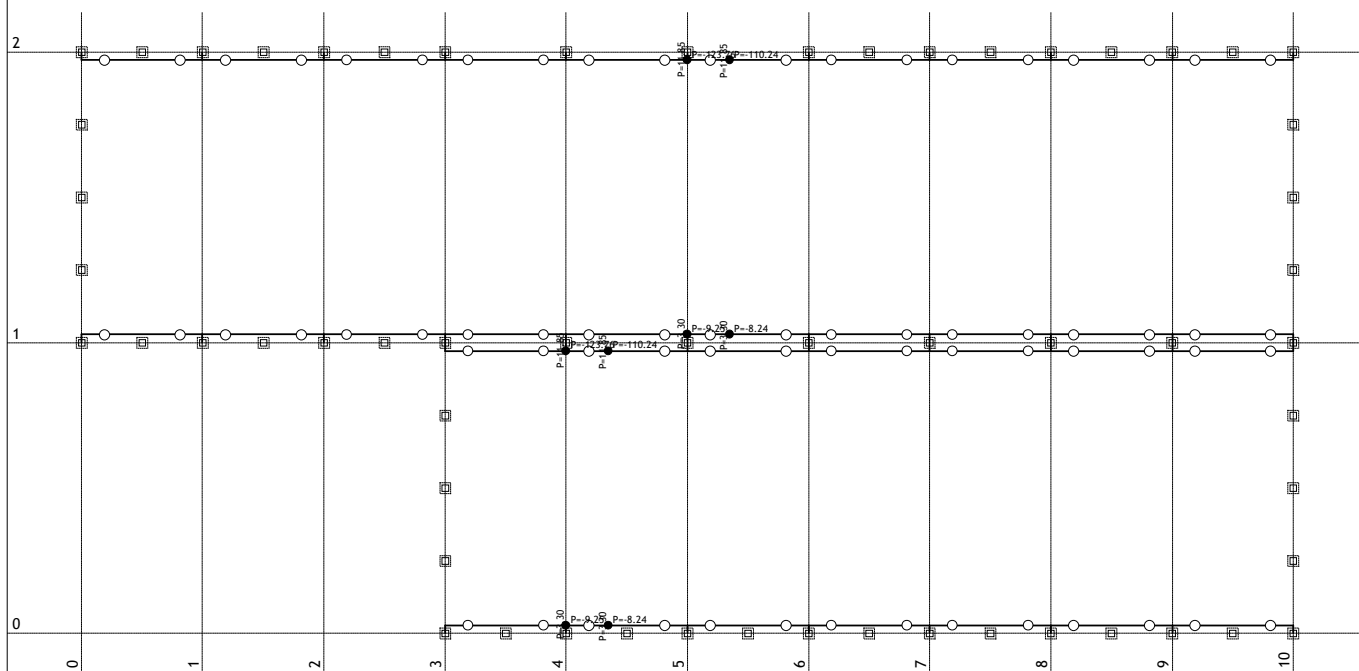
Pogled: GiŠ

Opt. 9: Gkran-max.M stub



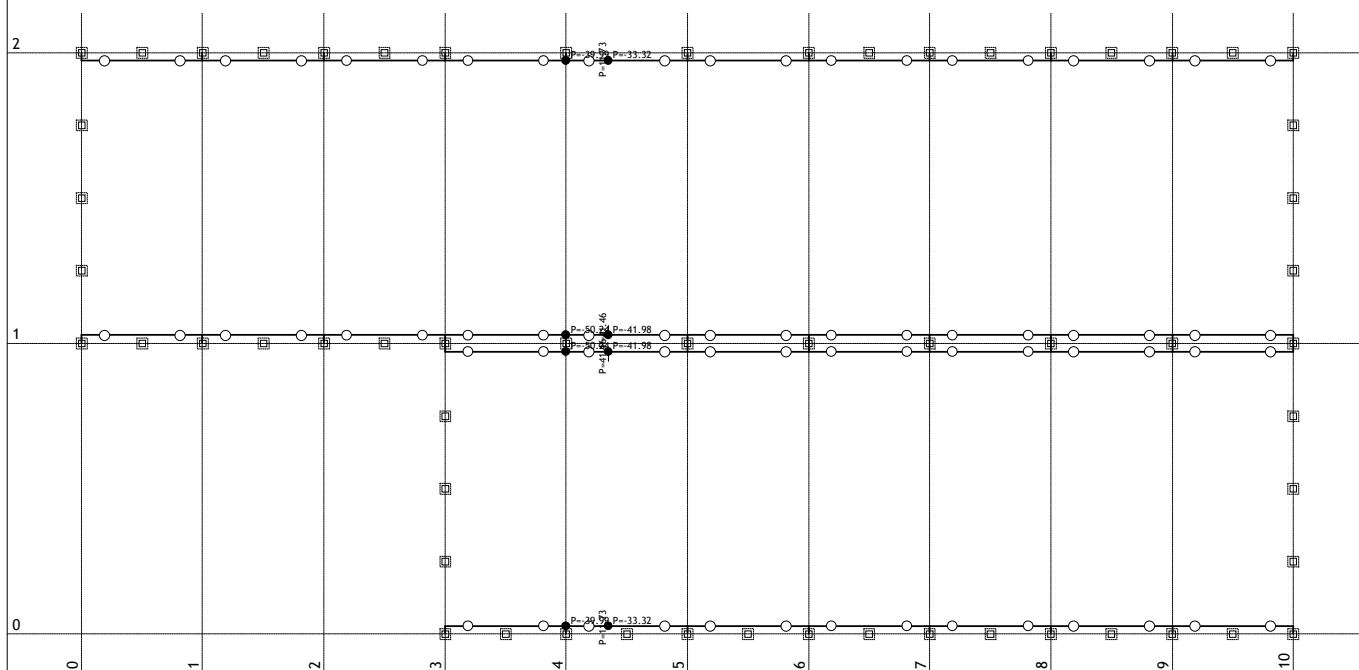
Pogled: GiŠ

Opt. 10: Pkran-max.M stub



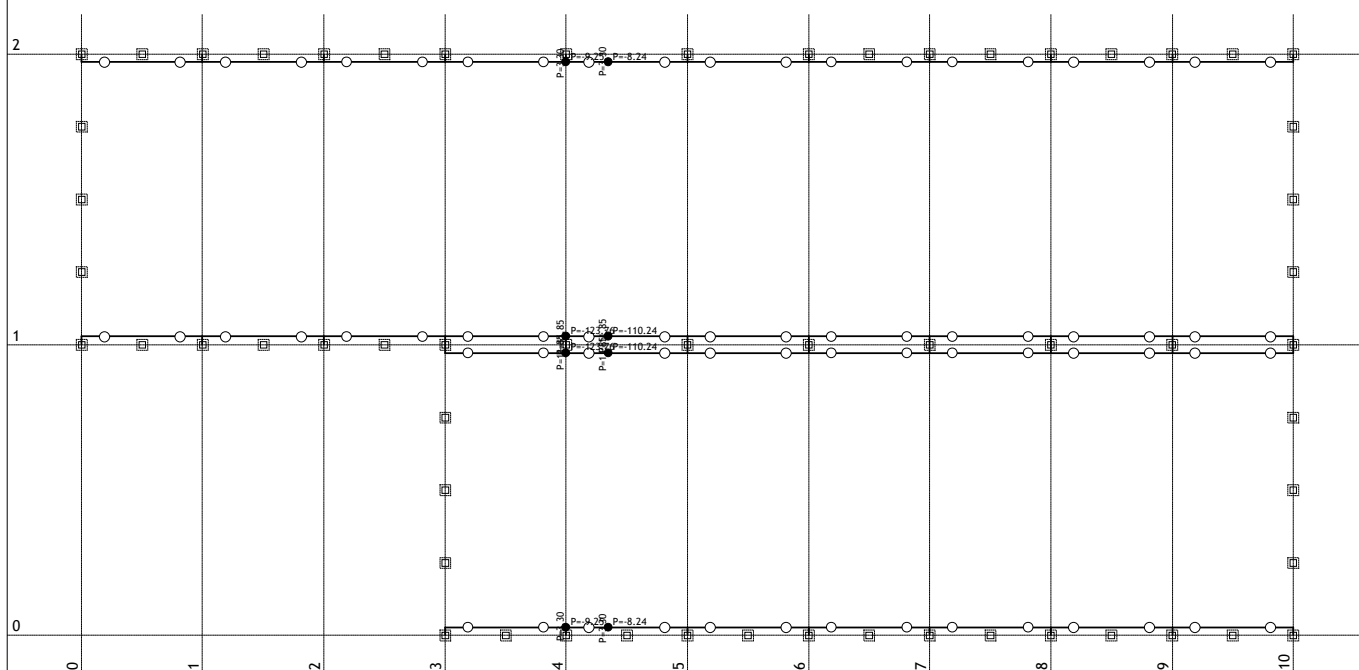
Pogled: GlŠ

Opt. 11: Gkran-max.N stub



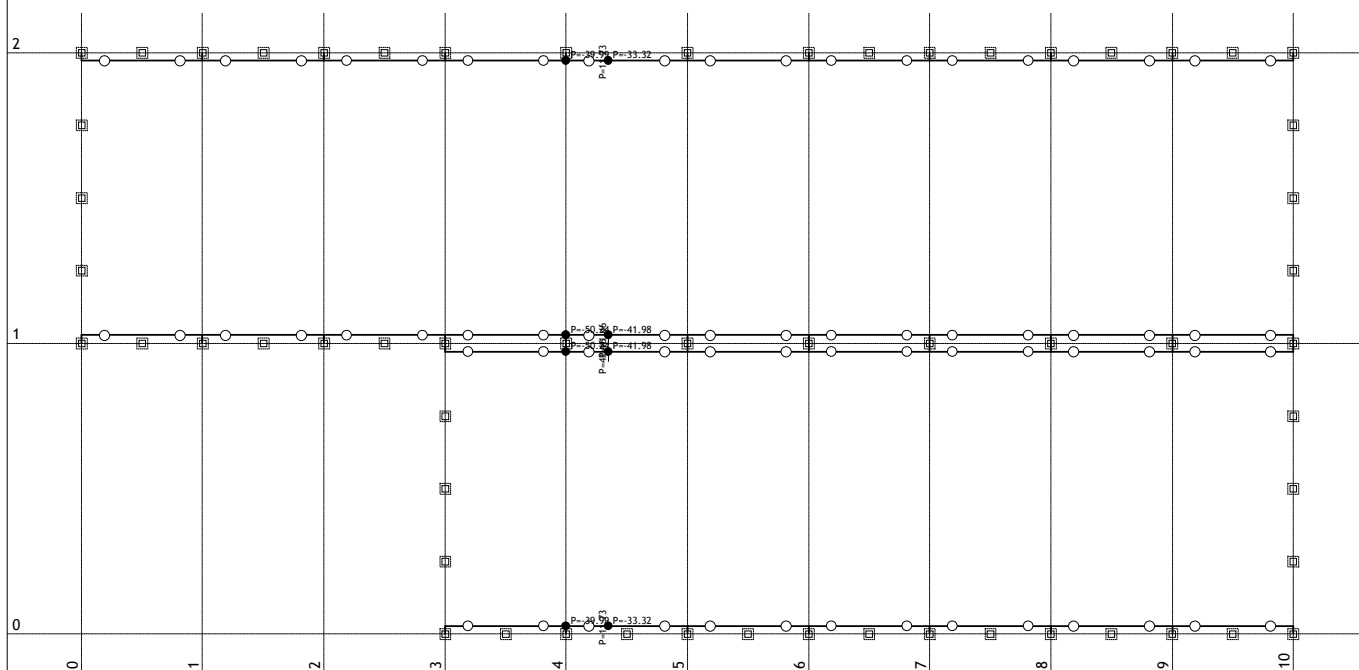
Pogled: GlŠ

Opt. 12: Pkran-max.N stub

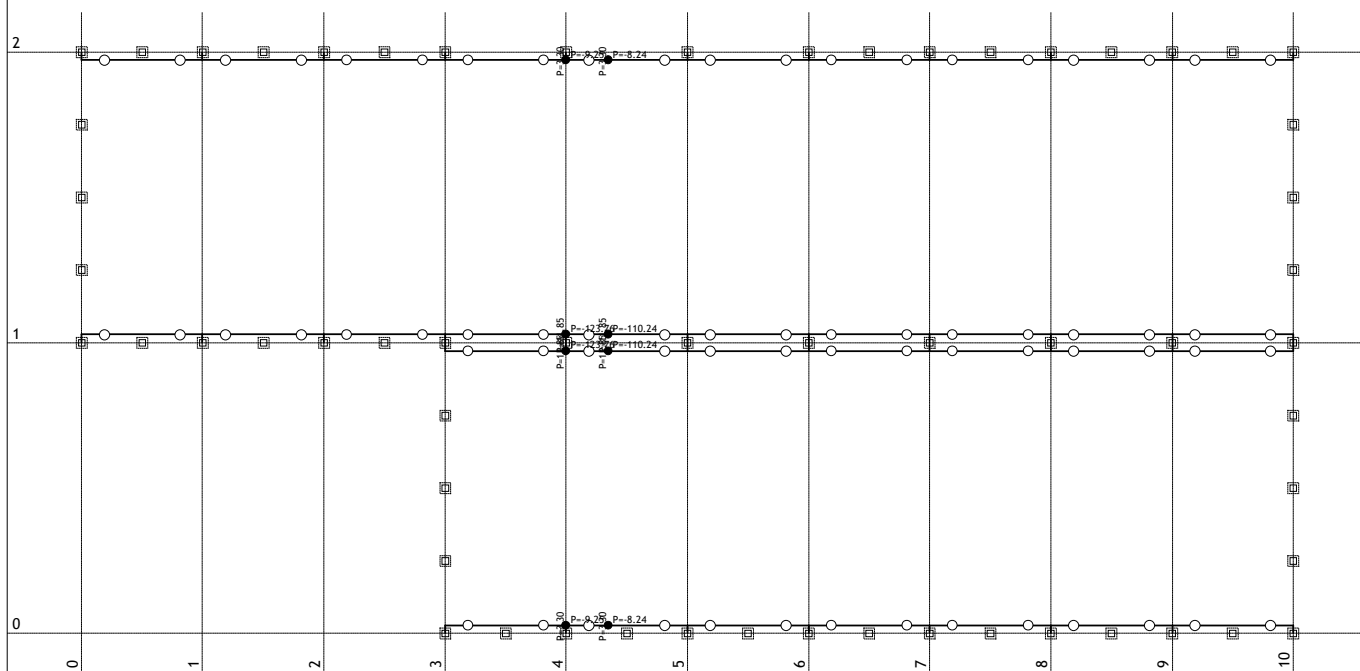


Pogled: GlŠ

Opt. 13: Gkran-max.N stub-sl.2



Pogled: GlŠ



Pogled: GiŠ

Napredne opcije seizmickog proracuna:

Multiplikator krutosti oslonaca:
Spreceno oscilovanje u Z pravcu

10000.000

Faktori opterecenja za proracun masa

No	Naziv	Koeficijent
1	SW (g)	1.00
2	G	1.00
3	S	1.00
4	W-x	0.00
5	Wy	0.00
6	Wu	0.00
7	Gkran-max.staza	1.00

No	Naziv	Koeficijent
8	Pkran-max.staza	0.50
9	Gkran-max.M stub	0.00
10	Pkran-max.M stub	0.00
11	Gkran-max.N stub	0.00
12	Pkran-max.N stub	0.00
13	Gkran-max.N stub-sl.2	0.00
14	Pkran-max.N stub-sl.2	0.00

Raspored masa po visini objekta

Nivo	Z [m]	X [m]	Y [m]	Masa [T]	T/m2
	16.00	-66.61	-29.35	1585.72	
	10.40	-68.93	-29.19	849.05	
	6.00	0.00	0.00	0.00	
	0.00	-68.83	-30.28	852.65	
	-1.30	-68.62	-29.78	151.76	
Ukupno:	9.89	-67.82	-29.56	3439.18	

Položaj centara krutosti po visini objekta

Nivo	Z [m]	X [m]	Y [m]
	16.00	-68.14	-31.17
	10.40	-69.59	-29.38
	6.00	-69.59	-29.38
	0.00	-69.37	-29.51
	-1.30	-69.34	-29.52

Ekscentricitet po visini objekta

Nivo	Z [m]	eox [m]	eoy [m]
	16.00	1.53	1.82
	10.40	0.67	0.19
	6.00	69.59	29.38
	0.00	0.53	0.77
	-1.30	0.71	0.26

Periodi oscilovanja konstrukcije

No	T [s]	f [Hz]
1	1.7817	0.5612
2	1.3972	0.7157
3	1.3227	0.7560
4	1.2852	0.7781
5	1.2349	0.8098

Seizmicki proracun

Seizmicki proracun: JUS (Ekvivalentno staticko opterecenje)

Kategorija tla: II
 Seizmicka zona: (Ks = 0.040)
 Kategorija objekta: I
 Vrsta konstrukcije: 2
 Kota ukljestenja: Zd = 0.00 m
 Multiplikator krutosti oslonaca: 10000.000

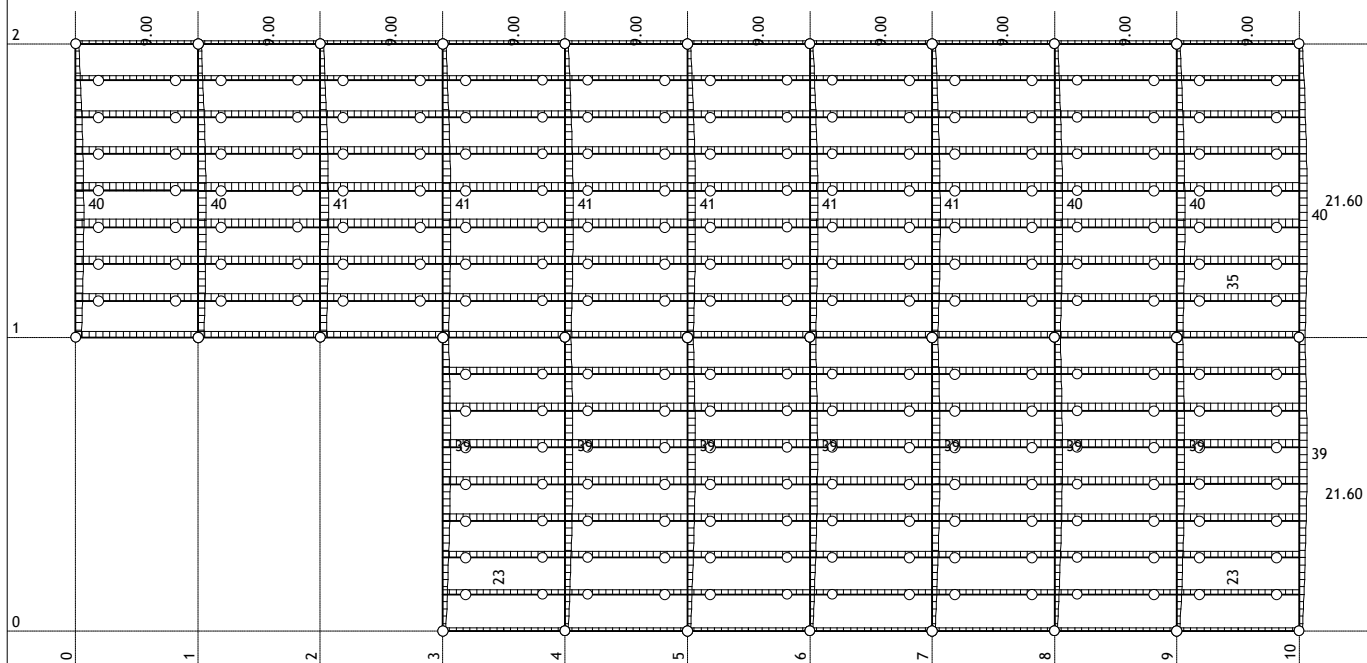
Ugao dejstva zemljotresa:		
Naziv	T [sec]	α [°]
Sx	1.782	0.00
Sy	1.397	90.00

Raspored seizmickih sila po visini objekta (Sx)		
Nivo	Z [m]	S [kN]
	16.00	636.01
	10.40	239.31
	6.00	0.00
	0.00	0.00
	-1.30	0.00
	$\Sigma=$	875.33

Raspored seizmickih sila po visini objekta (Sy)		
Nivo	Z [m]	S [kN]
	16.00	677.95
	10.40	255.09
	6.00	0.00
	0.00	0.00
	-1.30	0.00
	$\Sigma=$	933.04

Raspored masa po visini objekta					
Nivo	Z [m]	X [m]	Y [m]	Masa [T]	T/m2
	16.00	-66.61	-29.35	1585.72	
	10.40	-68.93	-29.19	849.05	
	6.00	0.00	0.00	0.00	
	0.00	-68.83	-30.28	852.65	
	-1.30	-68.62	-29.78	151.76	
Ukupno:	9.89	-67.82	-29.56	3439.18	

Opt. 15: Sx

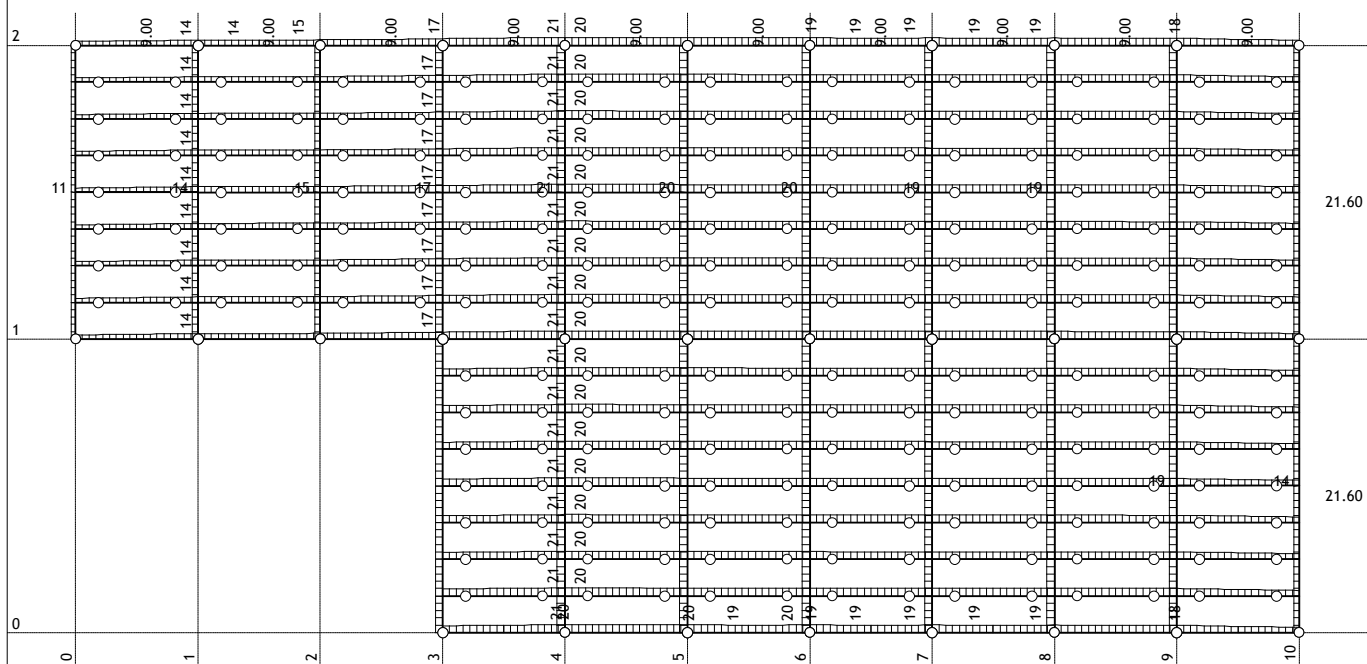


Pogled: Kispred+Kiza

Uticaji u gredi: max $X_p = 41$ / min $X_p = 15$ m / 1000

Max $x_p = H/420$ što je u granicama prihvatljivog za ovu vrstu objekata.

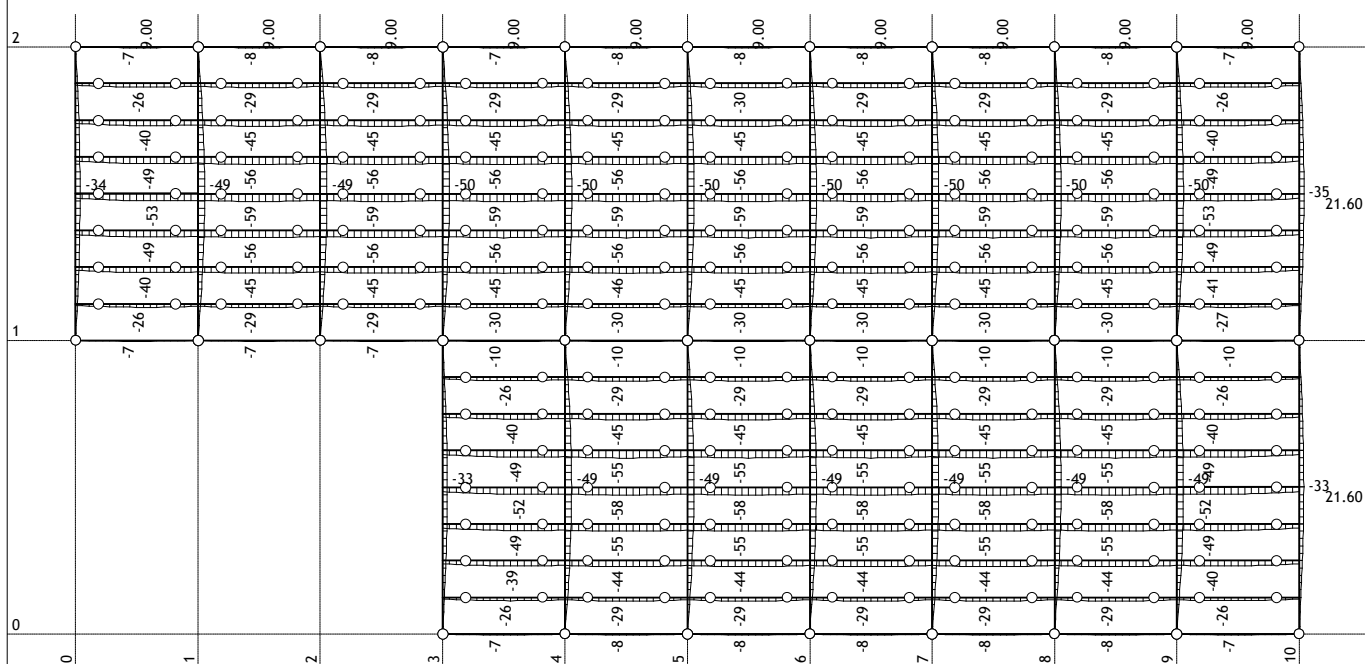
Opt. 16: Sy



Pogled: Kispred+Kiza

Uticaji u gredi: max $Y_p = 21$ / min $Y_p = 11$ m / 1000

Opt. 1107: [Neponderisano] 89-106,1025-1028,1033-1104



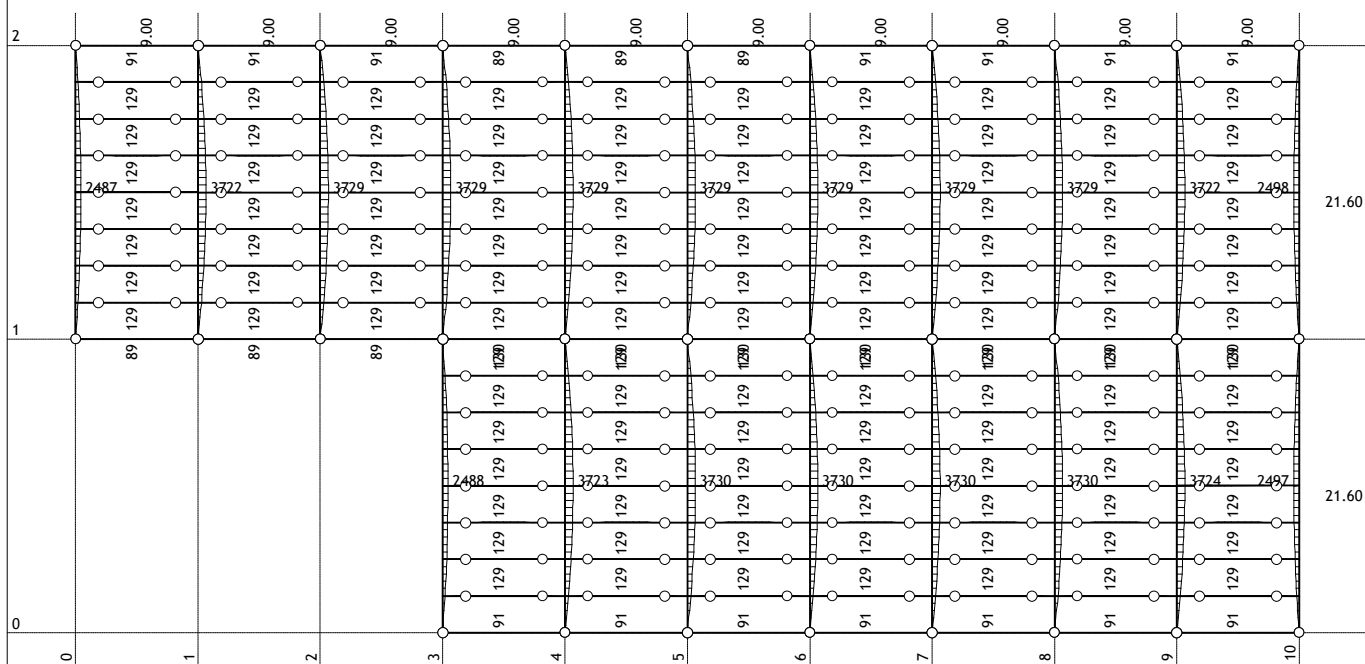
Pogled: Kispred+Kiza

Uticaji u gredi: max Zp= -0 / min Zp= -59 m / 1000

Ugib glavnih nosača dat uz dimenzionisanje nosača kao prethodno napregnutog i značajno je manji od ovde prikazanog.

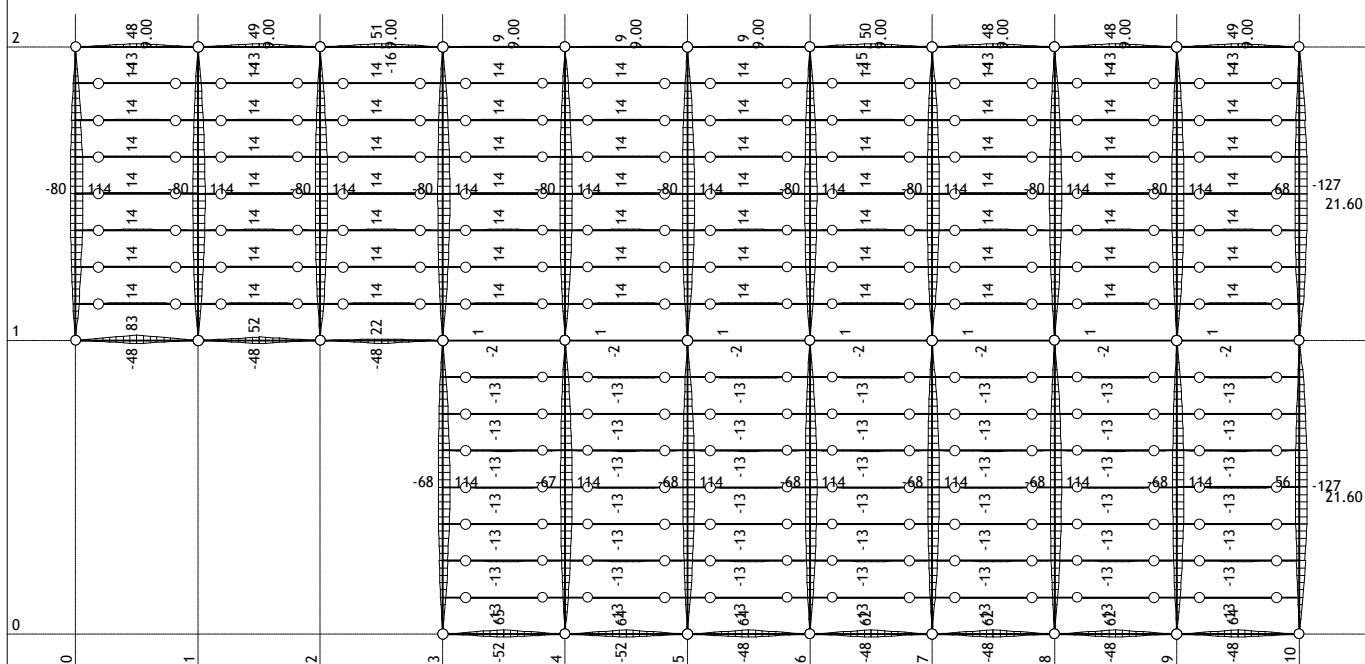
Maksimalni relativni ugib rožnjače je 10mm što je manje od dozvoljenog 9000/300= 30mm.

Opt. 1106: [Ponderisano] 17-1024,1029-1032



Pogled: Kispred+Kiza

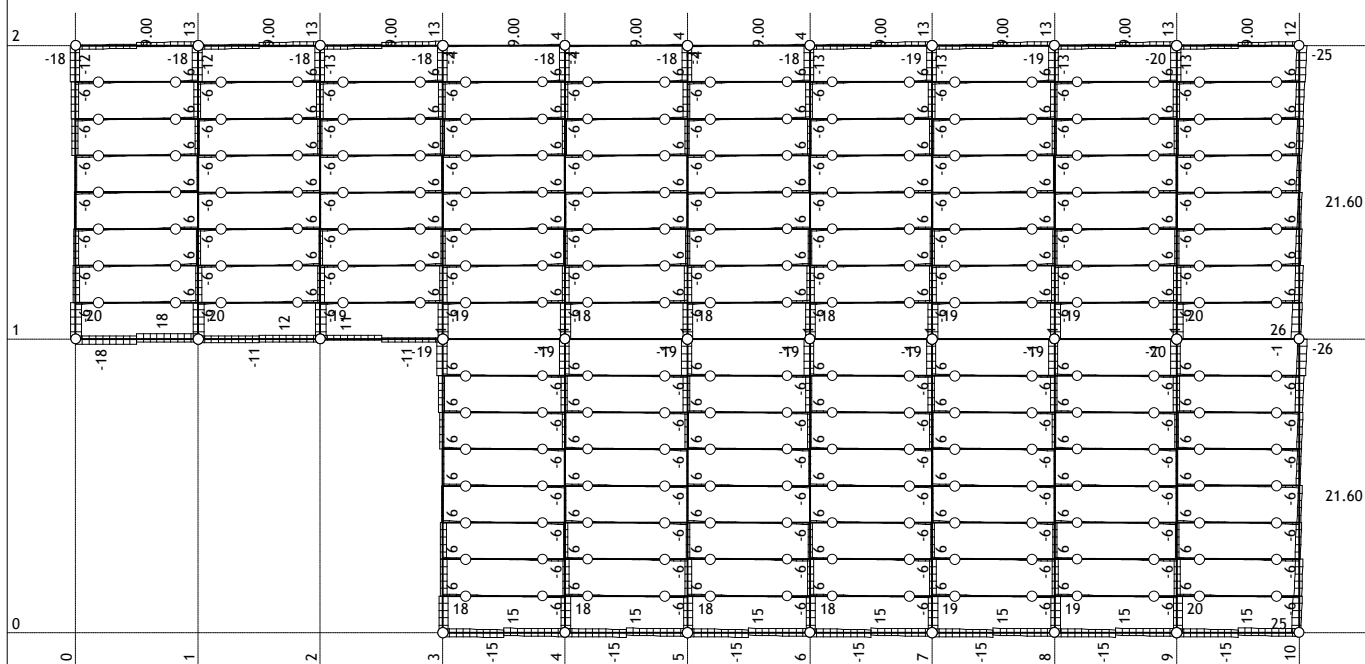
Uticaji u gredi: max M3= 3730 / min M3= 0 kNm



Pogled: Kispred+Kiza

Uticaji u gredi: max M2= 114 / min M2= -127 kNm

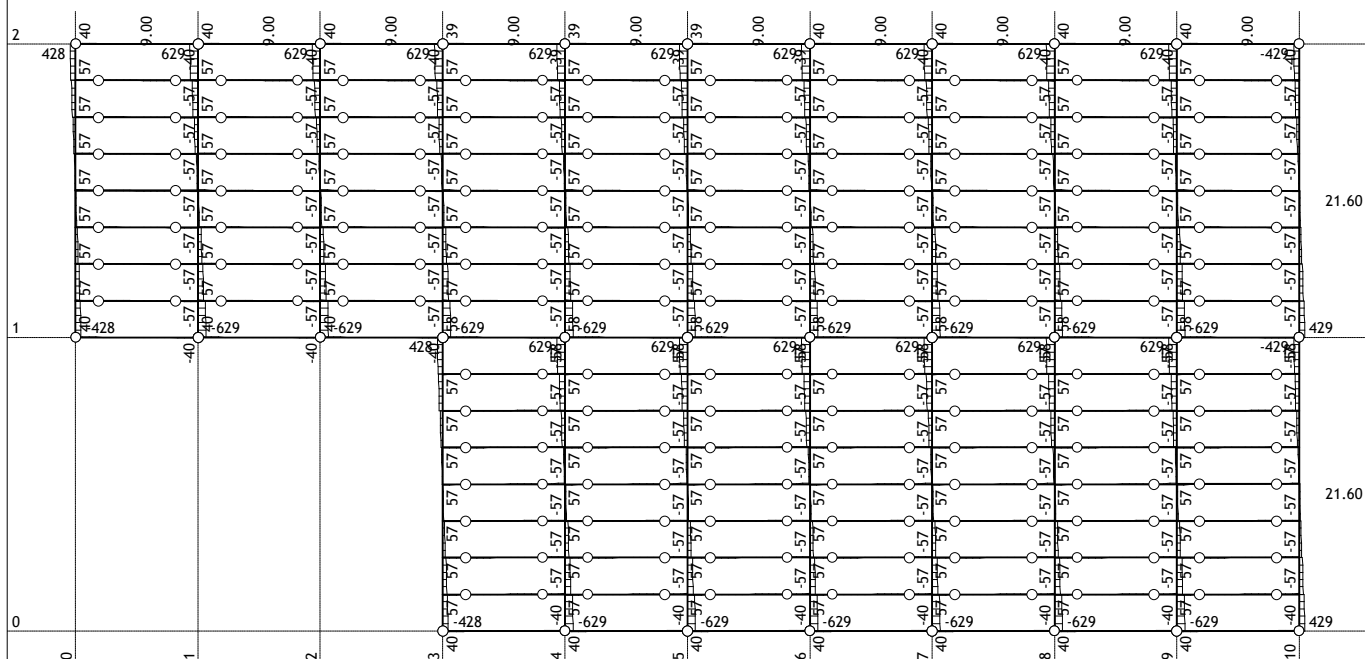
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Pogled: Kispred+Kiza

Uticaji u gredi: max T3= 26 / min T3= -26 kN

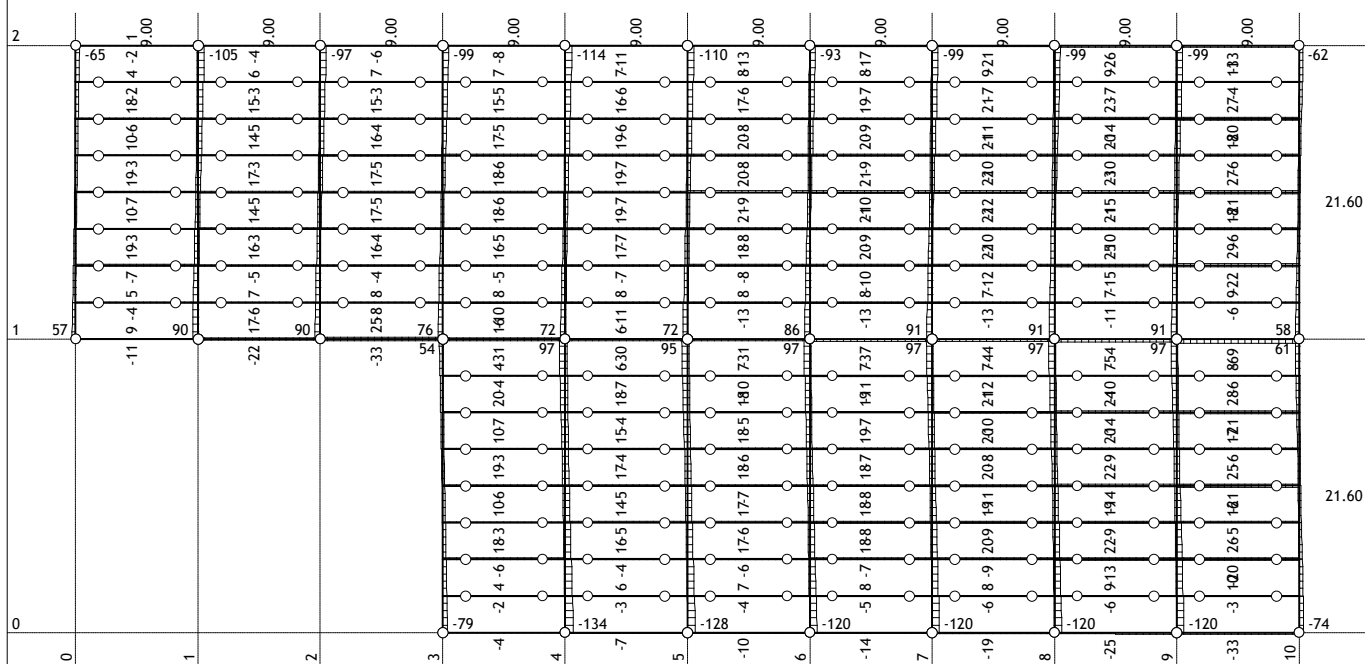
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Pogled: Kispred+Kiza

Uticaji u gredi: max T2= 629 / min T2= -629 kN

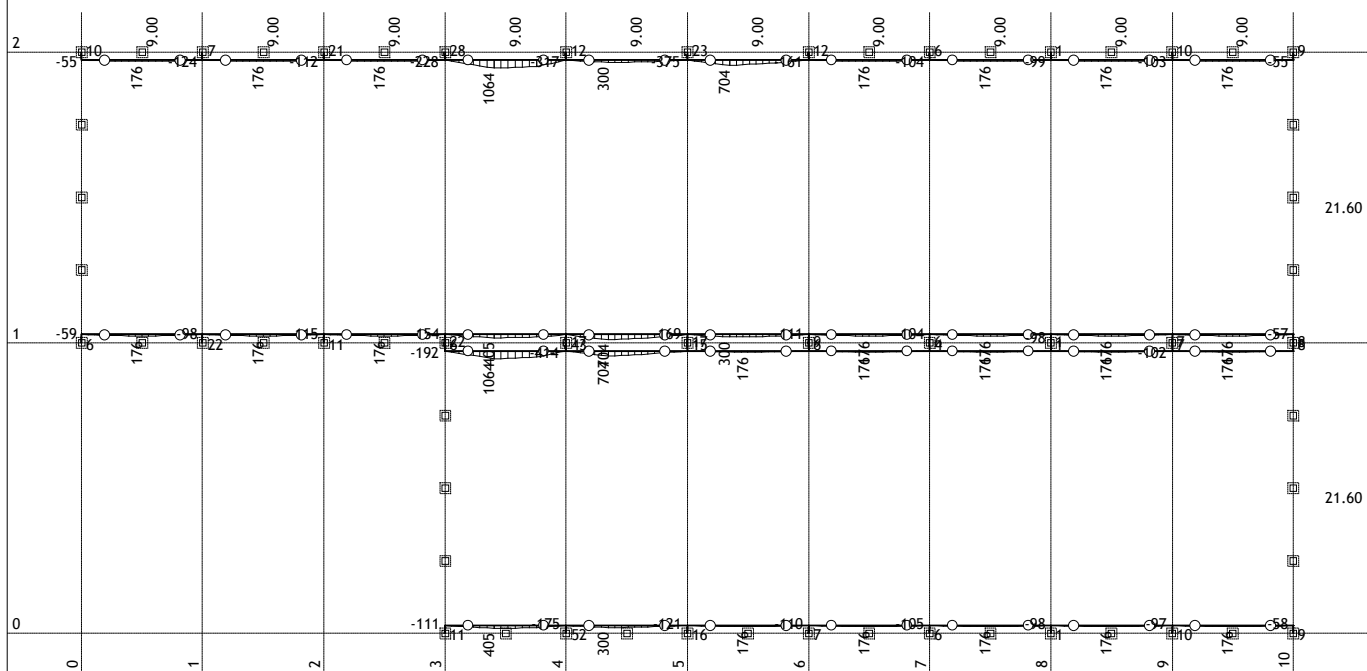
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Pogled: Kispred+Kiza

Uticaji u gredi: max N1= 97 / min N1= -134 kN

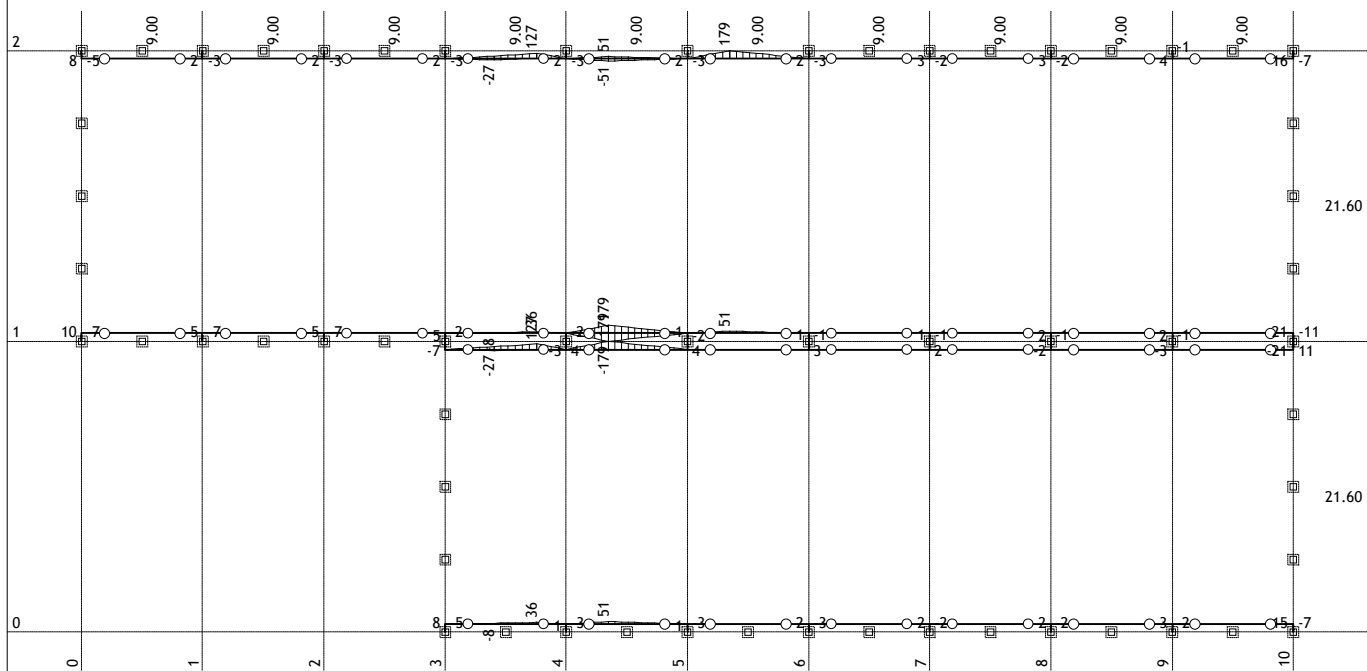
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Pogled: GlŠ

Uticaji u gredi: max M3= 1064 / min M3= -414 kNm

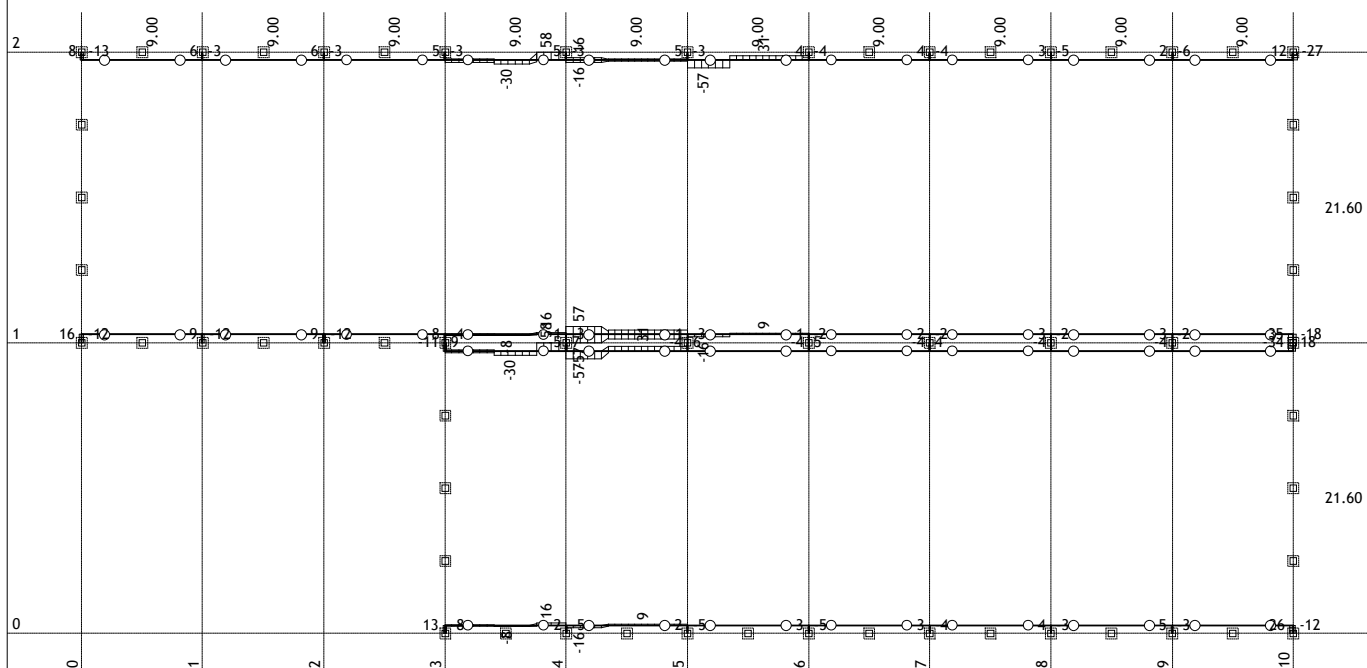
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Pogled: GlŠ

Uticaji u gredi: max M2= 179 / min M2= -179 kNm

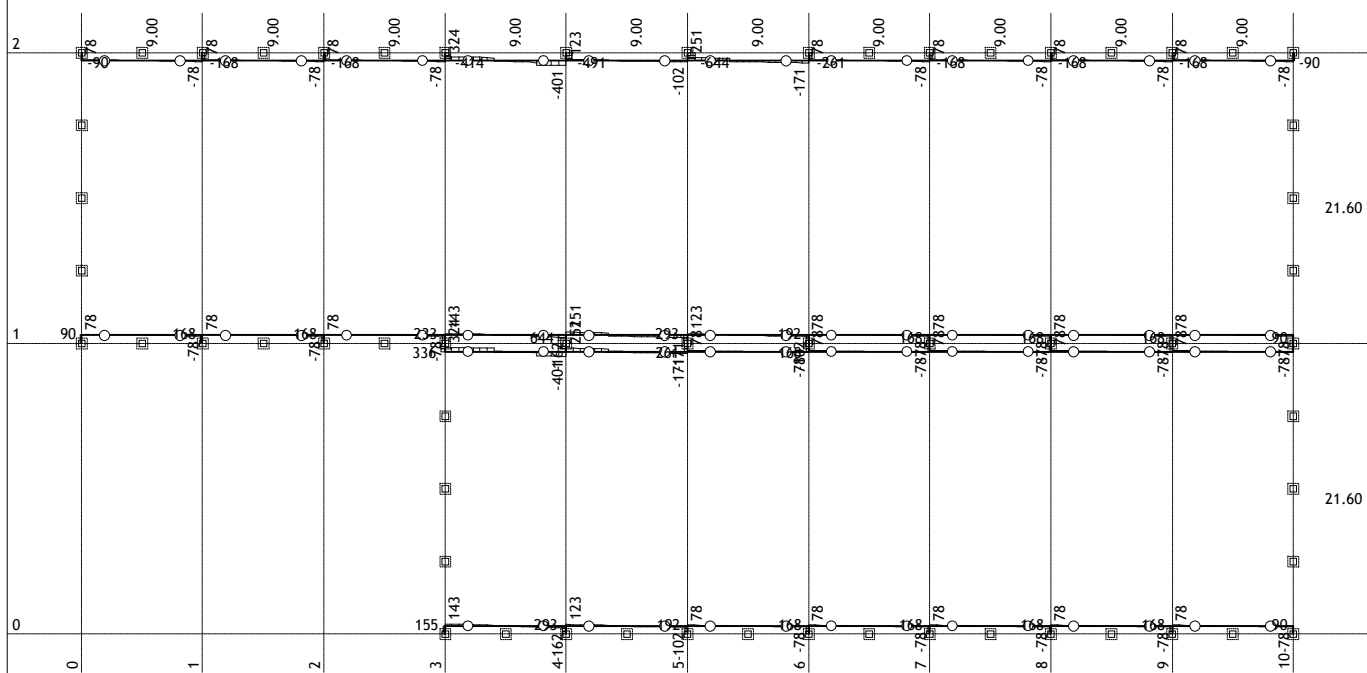
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Pogled: GlŠ

Uticaji u gredi: max T3= 58 / min T3= -57 kN

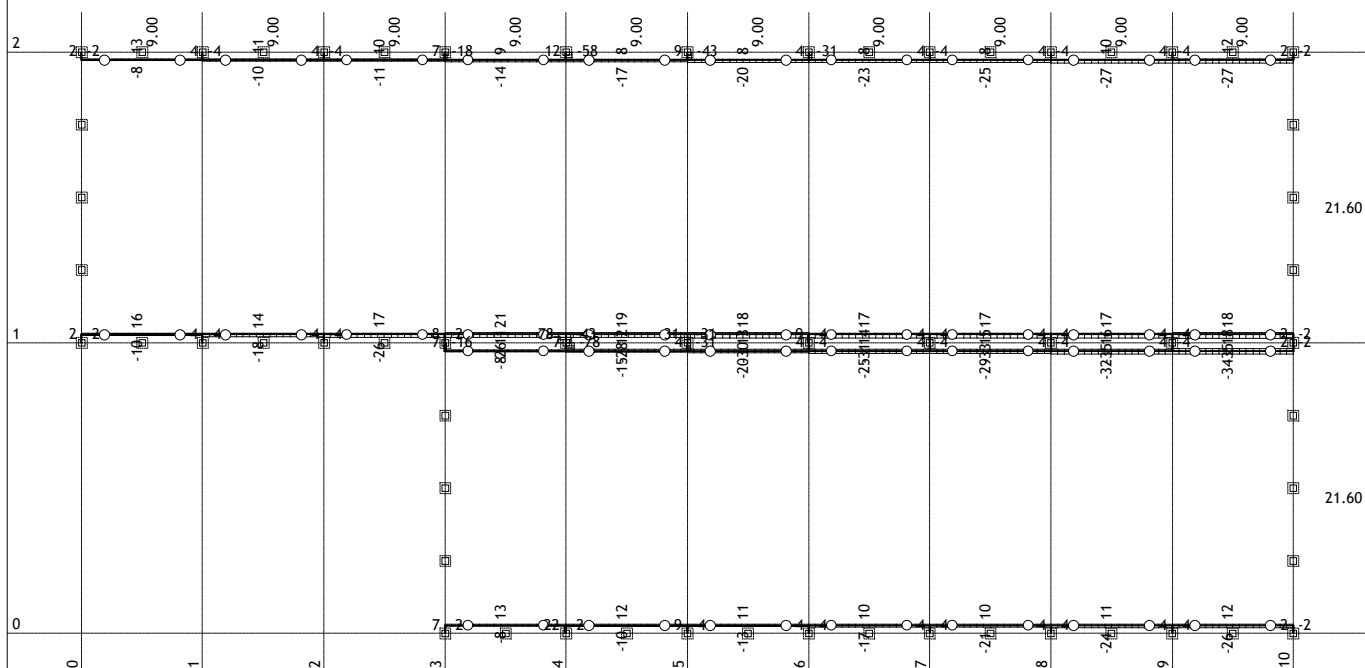
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Pogled: GlŠ

Uticaji u gredi: max T2= 644 / min T2= -644 kN

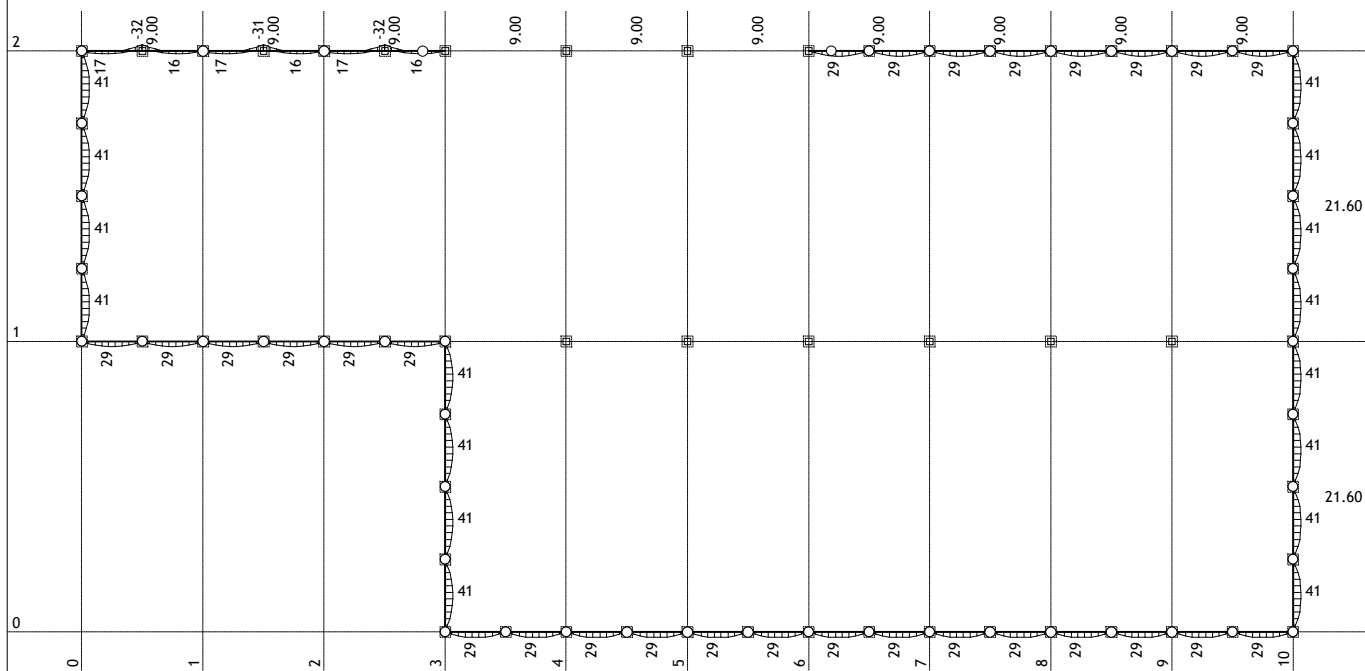
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Pogled: GlŠ

Uticaji u gredi: max N1= 78 / min N1= -78 kN

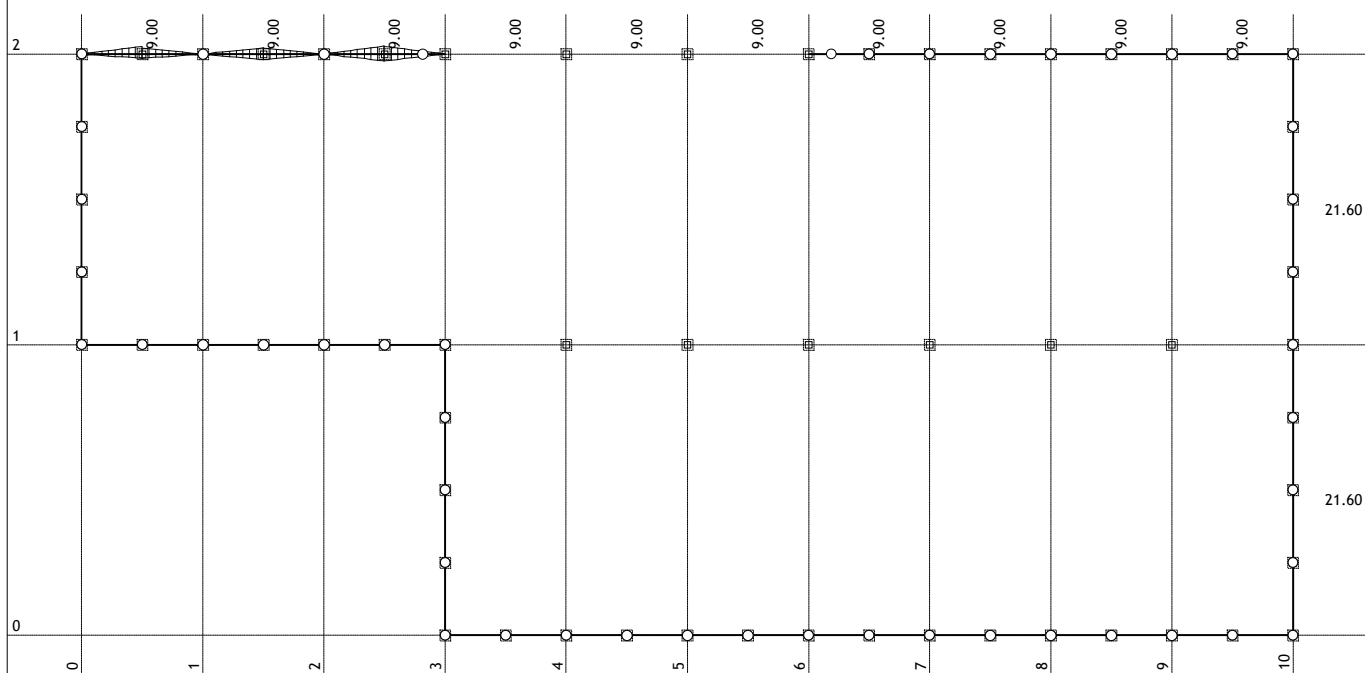
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Nivo: [0.00 m]

Uticaji u gredi: max M3= 41 / min M3= -32 kNm

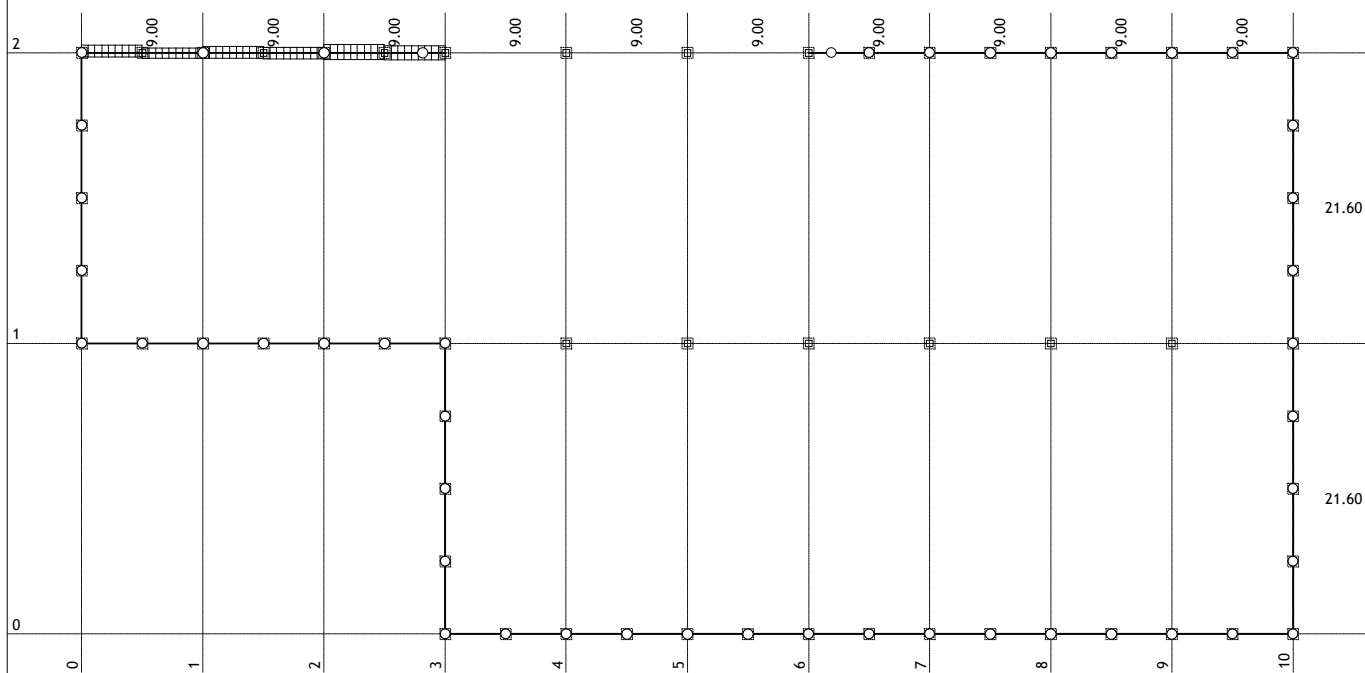
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Nivo: [0.00 m]

Uticaji u gredi: max M2= 0 / min M2= -0 kNm

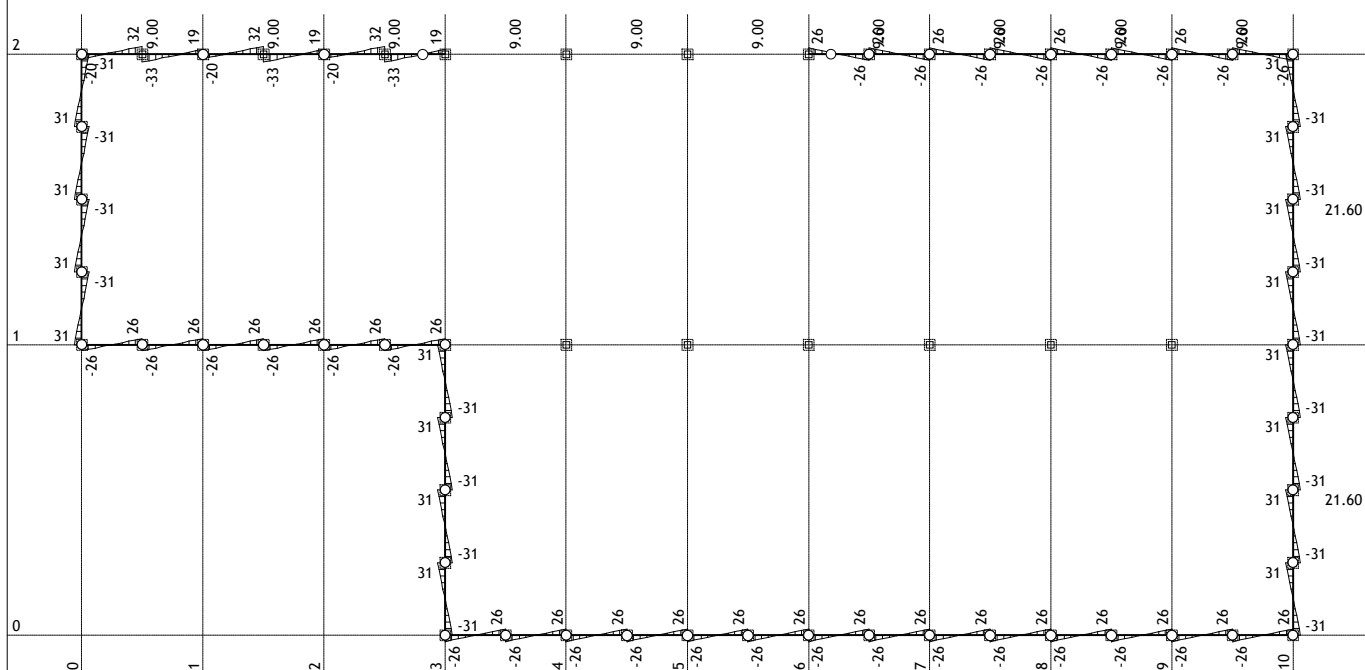
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Nivo: [0.00 m]

Uticaji u gredi: max T3= 0 / min T3= -0 kN

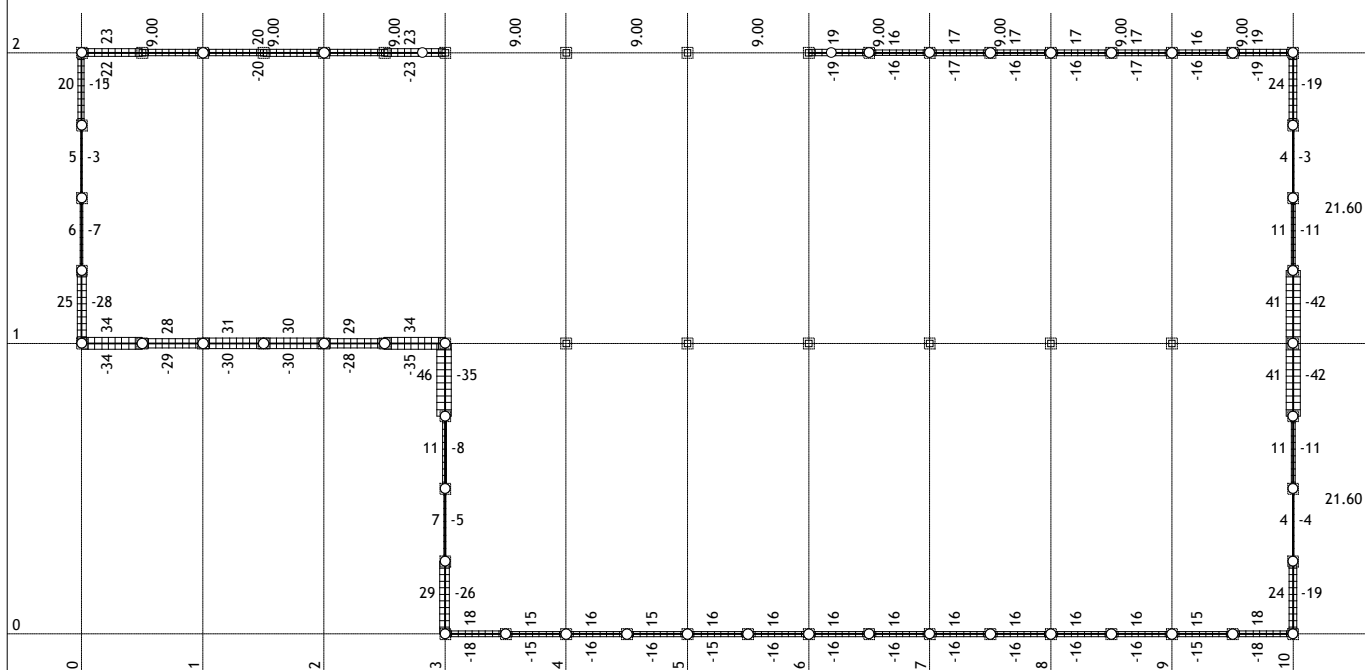
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Nivo: [0.00 m]

Uticaji u gredi: max T2= 32 / min T2= -33 kN

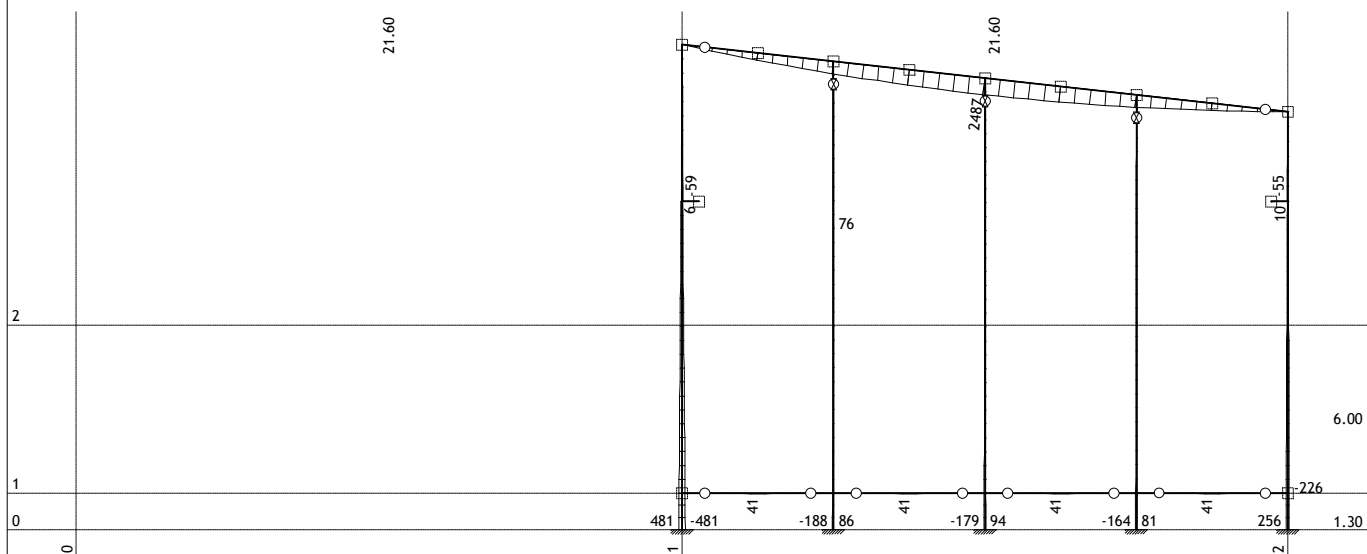
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Nivo: [0.00 m]

Uticaji u gredi: max N1= 46 / min N1= -42 kN

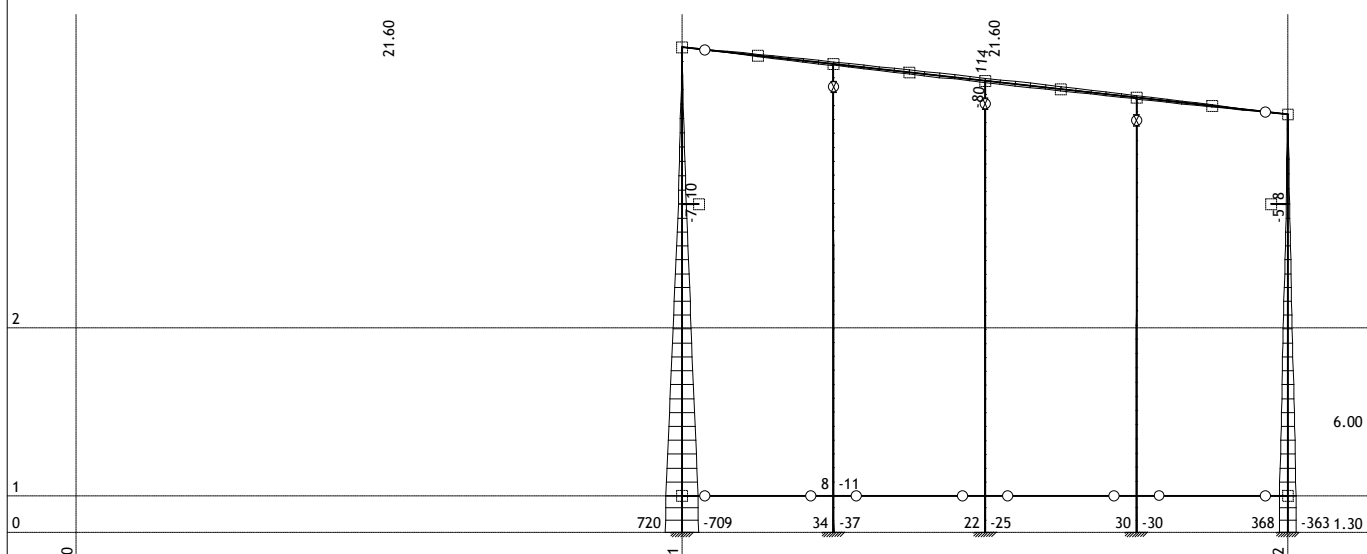
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: V_1

Uticaji u gredi: max $M_3 = 2487$ / min $M_3 = -481$ kNm

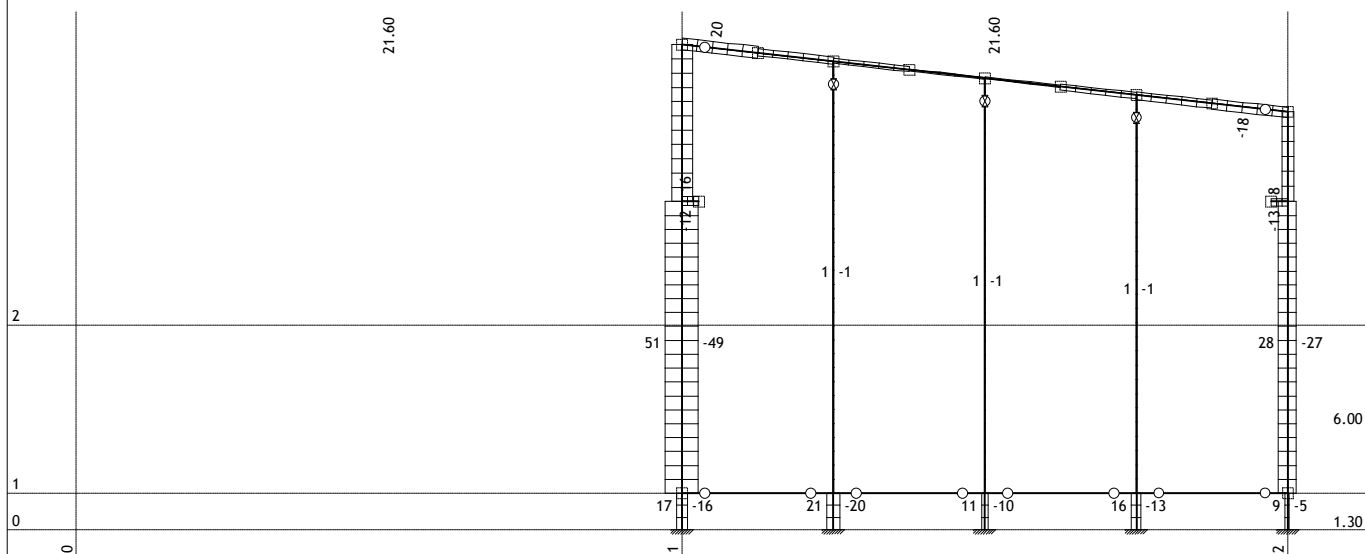
Opt. 1106: [Ponderisano] 17-1024, 1029-1032



Ram: V_1

Uticaji u gredi: max $M_2 = 720$ / min $M_2 = -709$ kNm

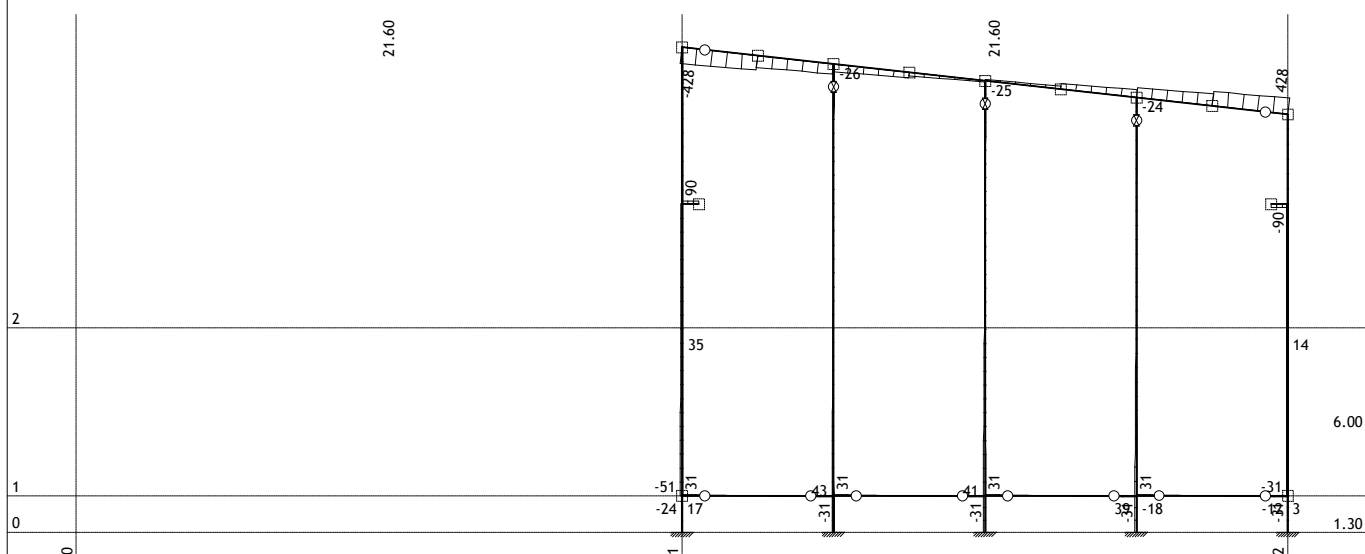
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: V_1

Uticaji u gredi: max T3= 51 / min T3= -49 kN

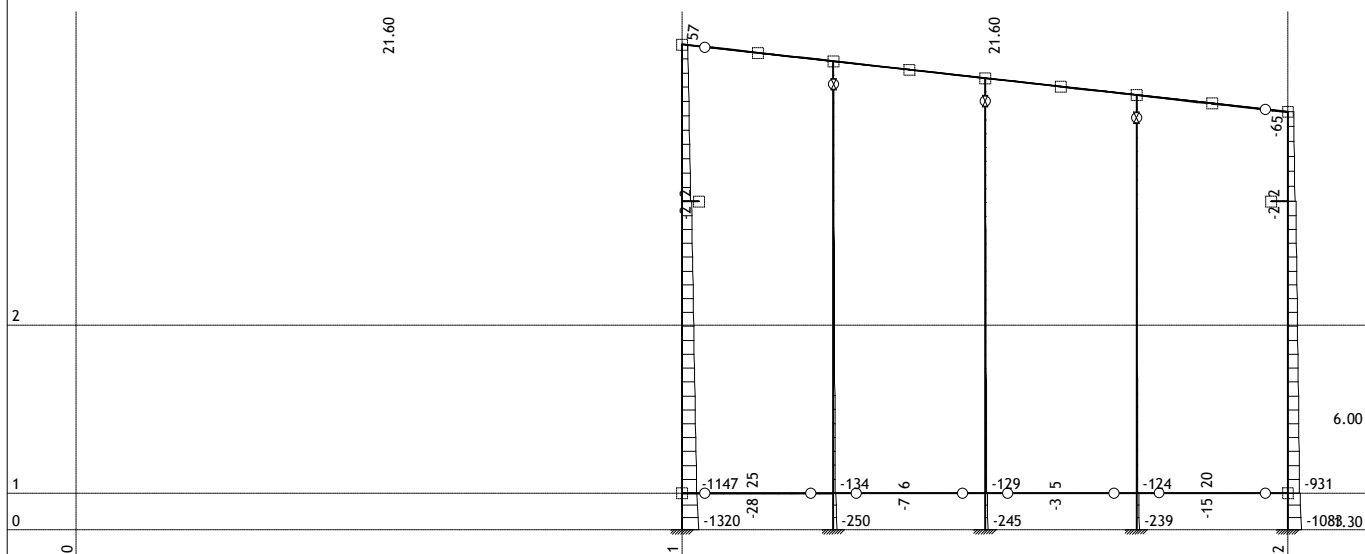
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: V_1

Uticaji u gredi: max T2= 428 / min T2= -428 kN

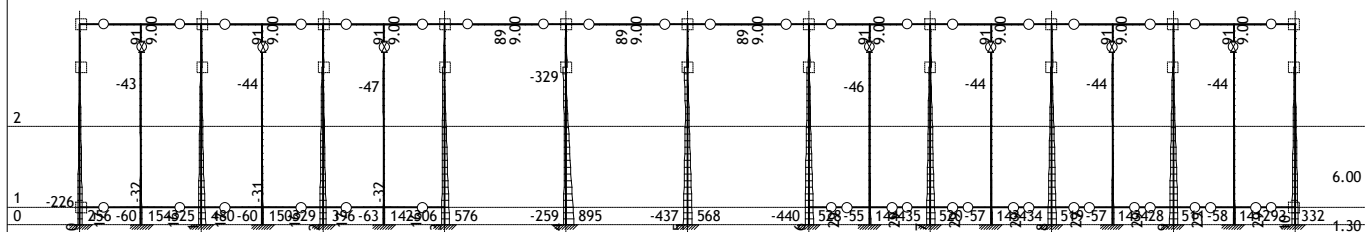
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: V_1

Uticaji u gredi: max $N_1 = 57$ / min $N_1 = -1320$ kN

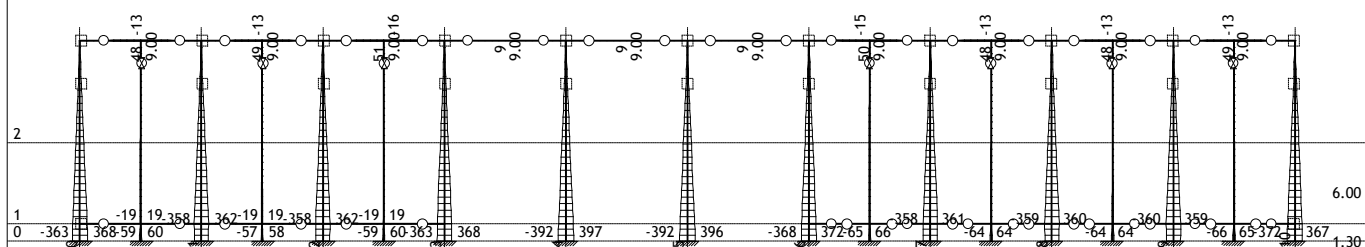
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: H_17

Uticaji u gredi: max M3= 895 / min M3= -440 kNm

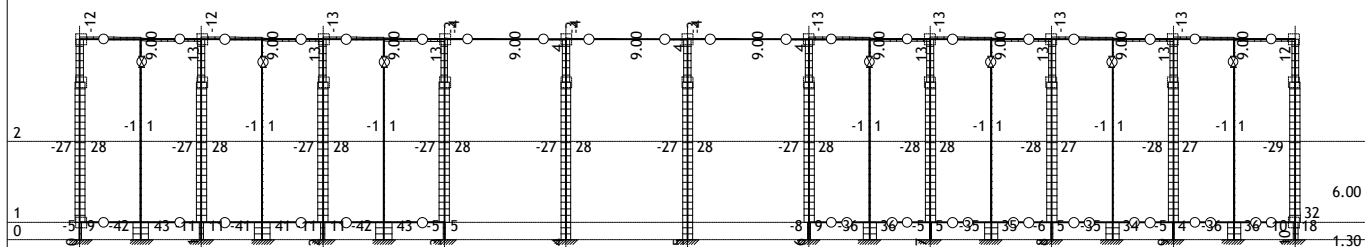
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: H_17

Uticaji u gredi: max $M_2 = 397$ / min $M_2 = -392$ kNm

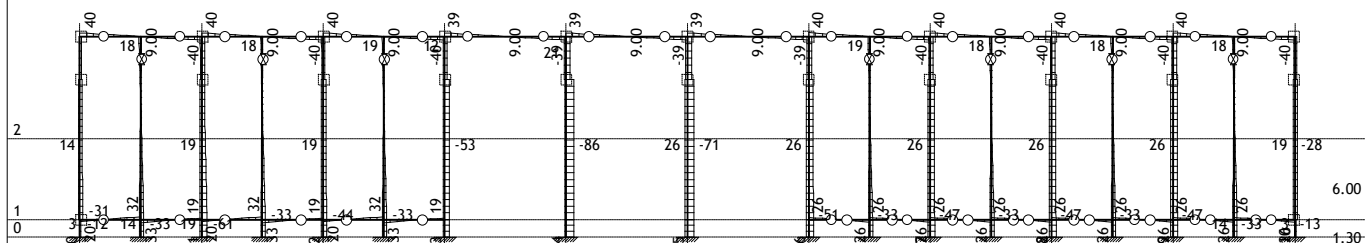
Opt. 1106: [Ponderisano] 17-1024, 1029-1032



Ram: H_17

Uticaji u gredi: max T3= 43 / min T3= -42 kN

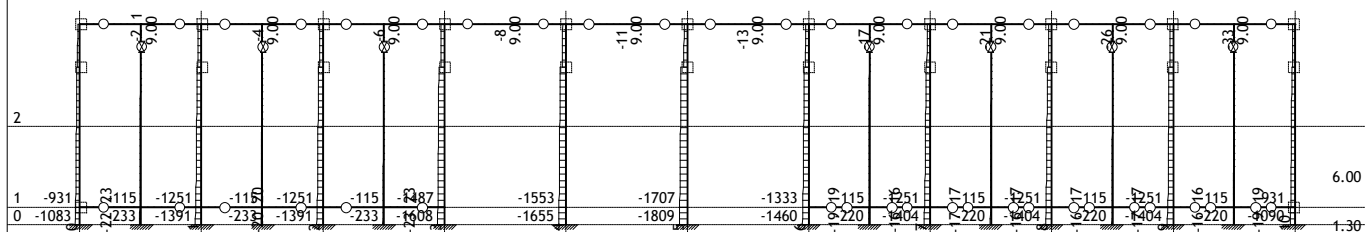
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: H_17

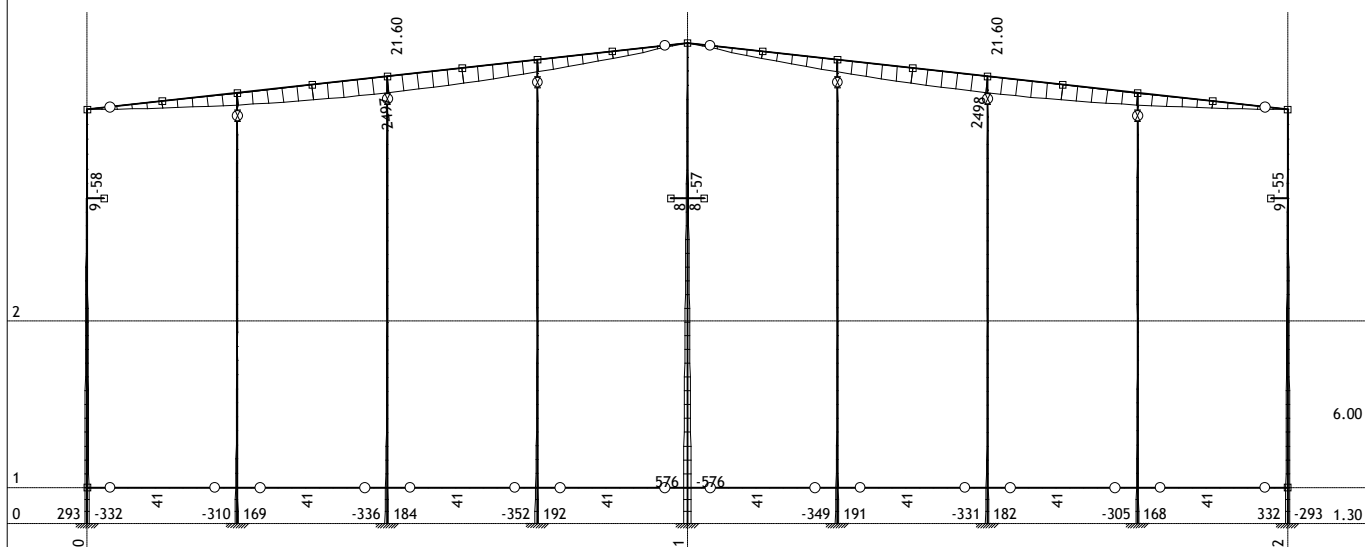
Uticaji u gredi: max T2= 40 / min T2= -86 kN

Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: H_17

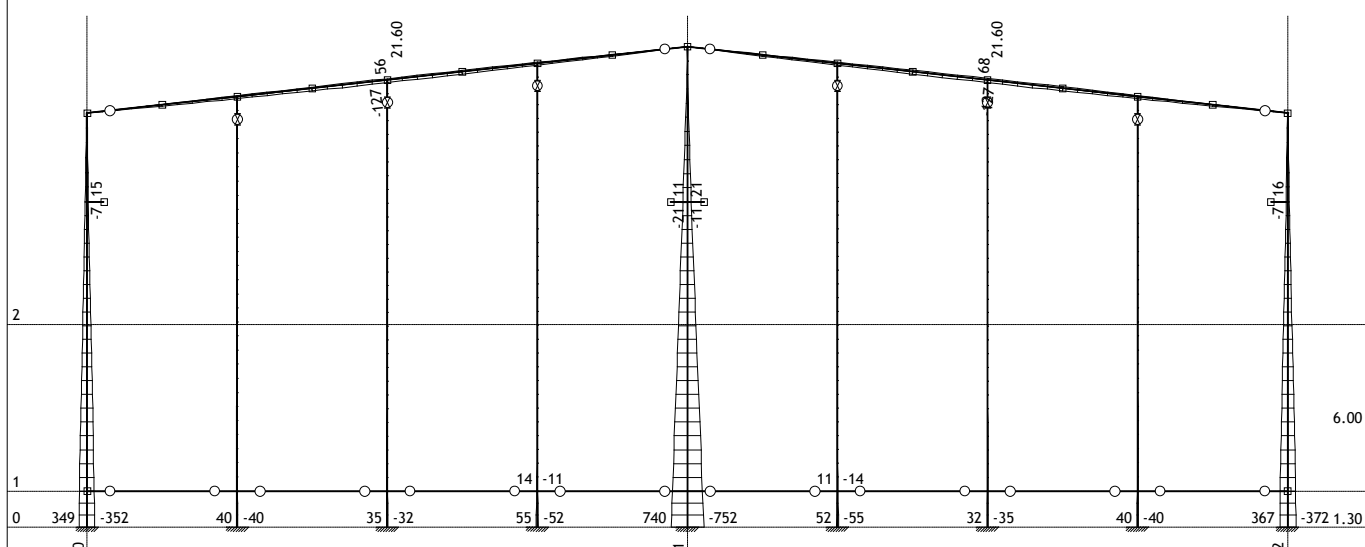
Uticaji u gredi: max N1= 23 / min N1= -1809 kN



Ram: V_11

Uticaji u gredi: max M3= 2498 / min M3= -576 kNm

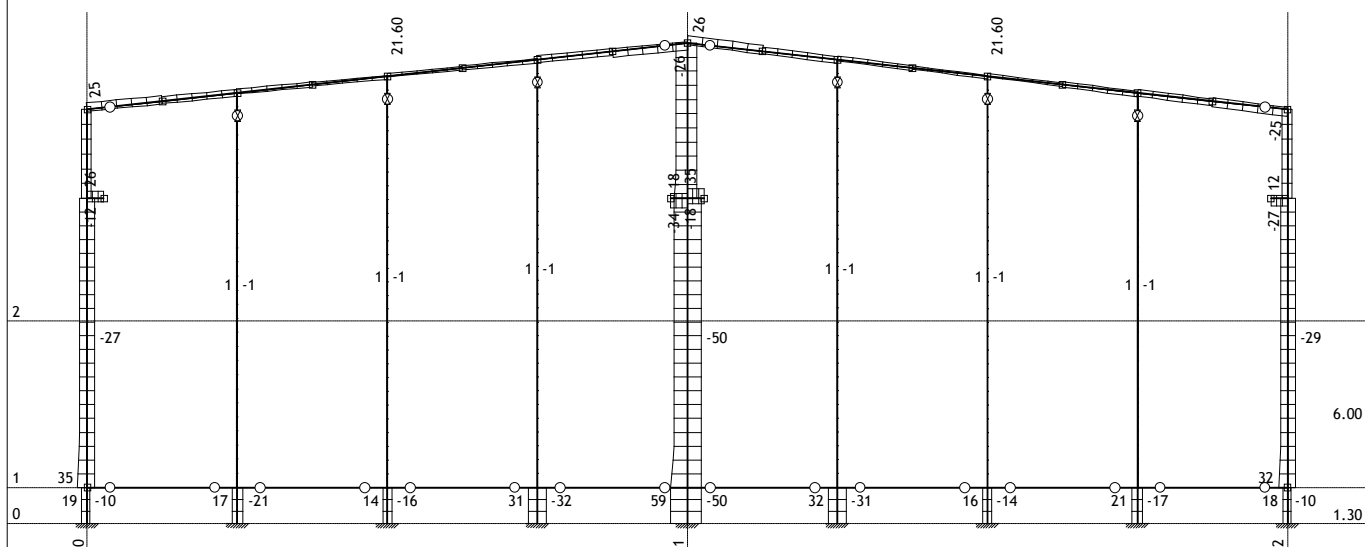
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: V_11

Uticaji u gredi: max M2= 740 / min M2= -752 kNm

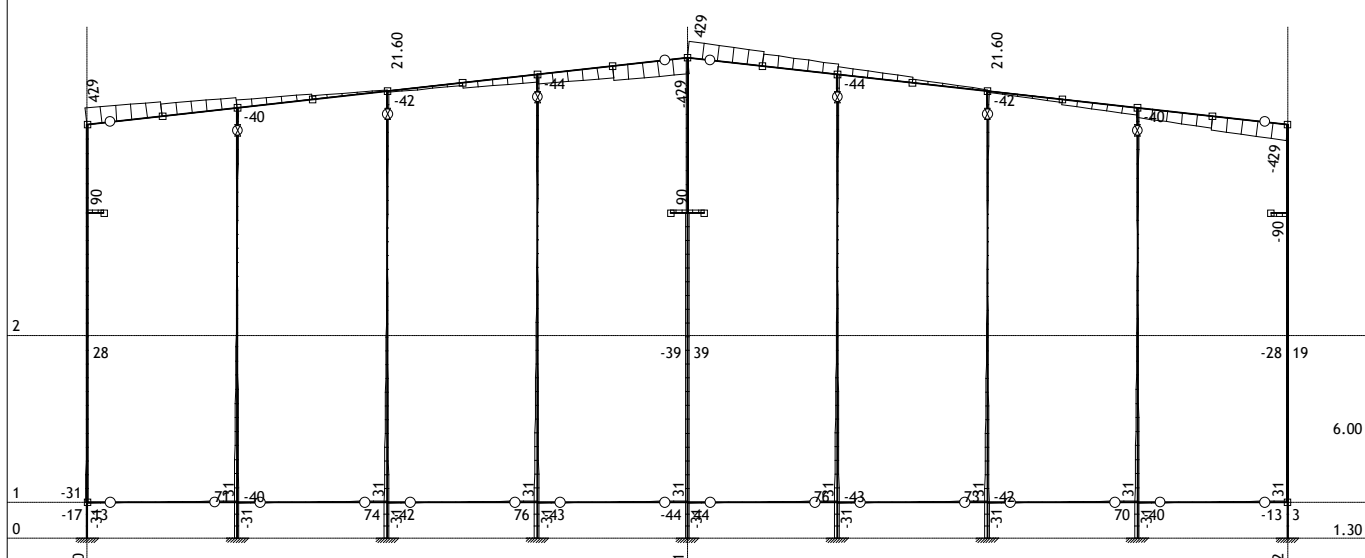
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: V_11

Uticaji u gredi: max T3= 59 / min T3= -50 kN

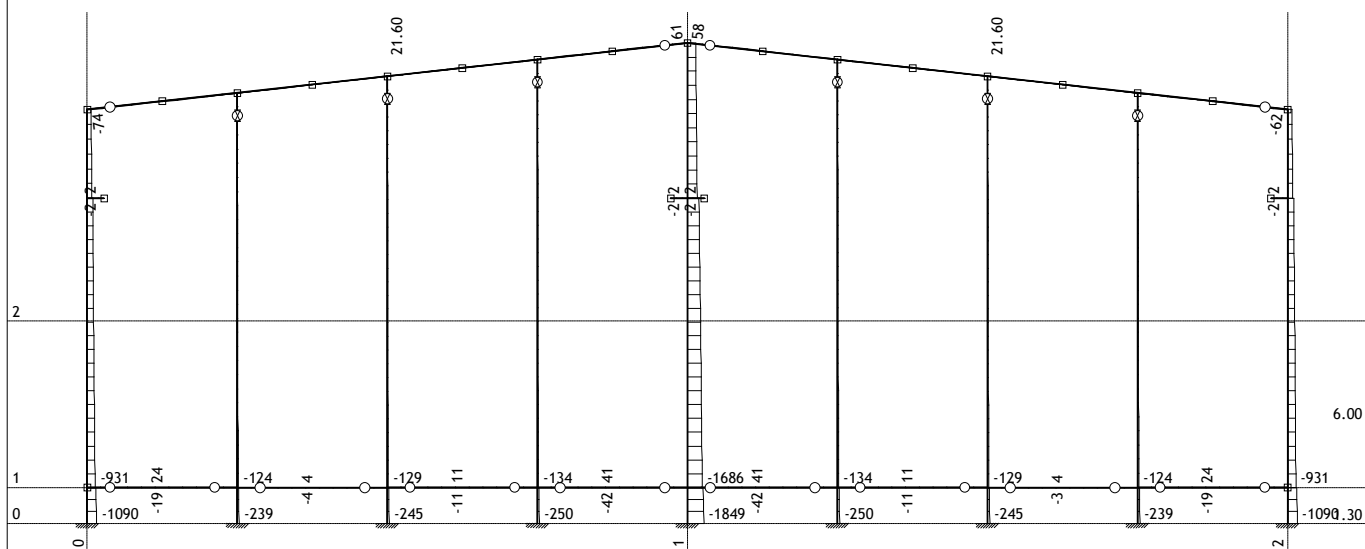
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: V_11

Uticaji u gredi: max T2= 429 / min T2= -429 kN

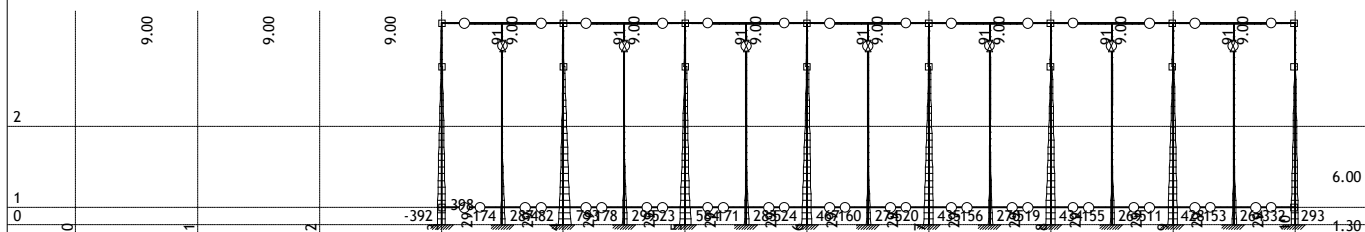
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: V_11

Uticaji u gredi: max $N_1 = 61$ / min $N_1 = -1849$ kN

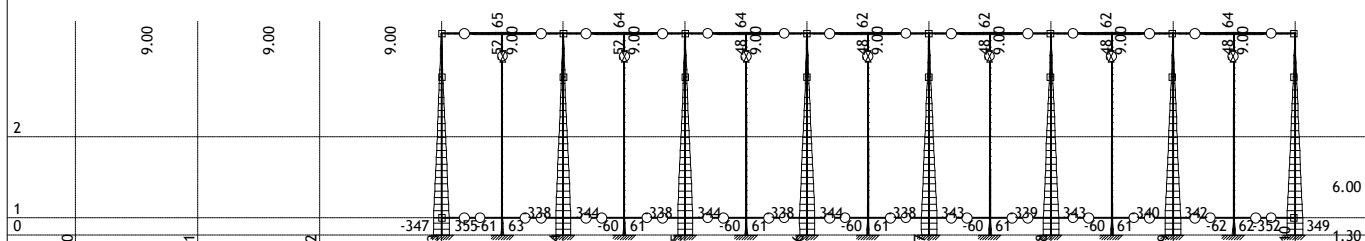
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: H_1

Uticaji u gredi: max $M_3 = 793$ / min $M_3 = -524$ kNm

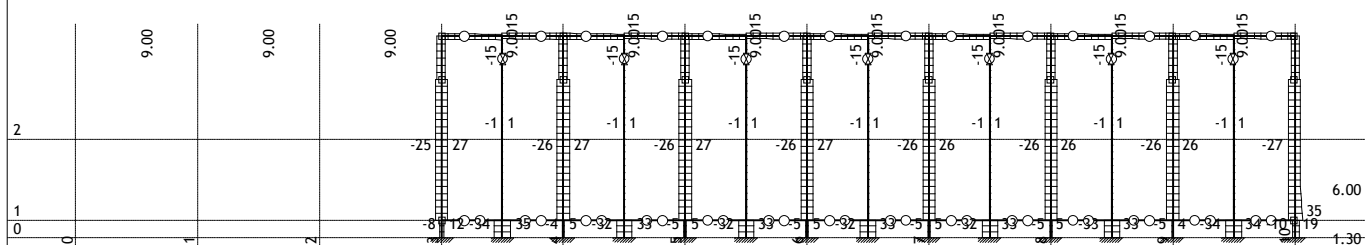
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: H_1

Uticaji u gredi: max M2= 355 / min M2= -352 kNm

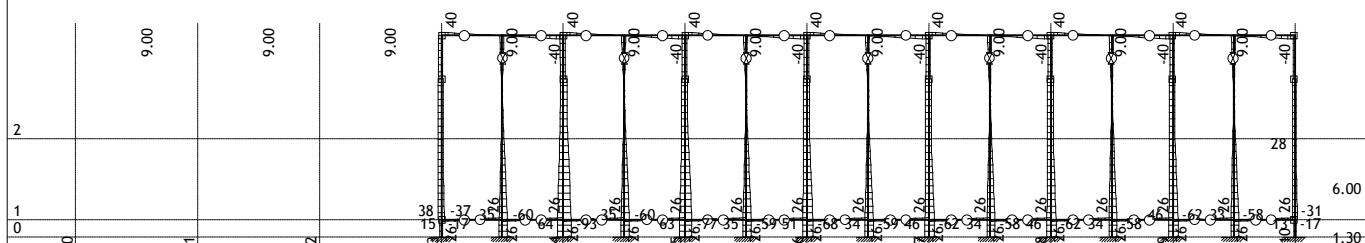
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: H_1

Uticaji u gredi: max T3= 35 / min T3= -34 kN

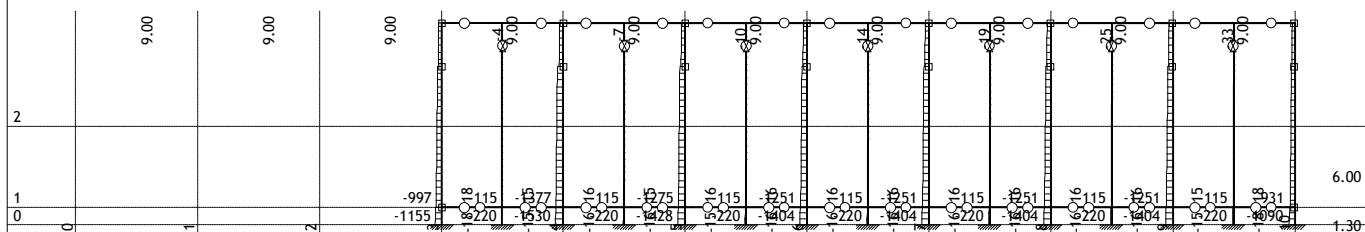
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: H_1

Uticaji u gredi: max T2= 64 / min T2= -93 kN

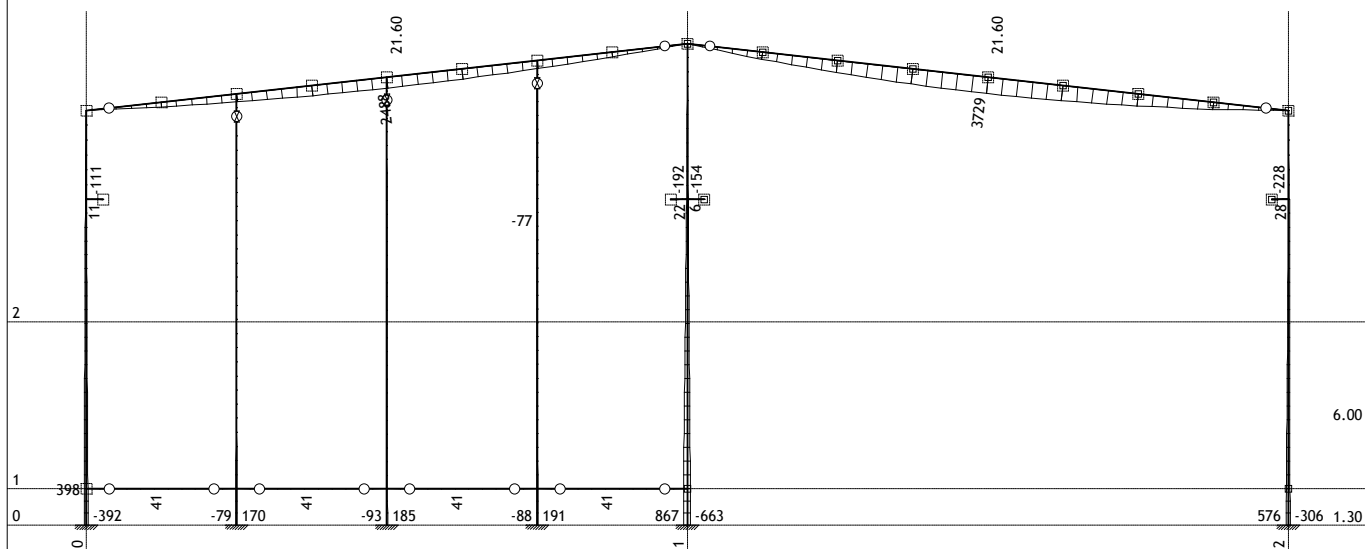
Opt. 1106: [Ponderisano] 17-1024,1029-1032



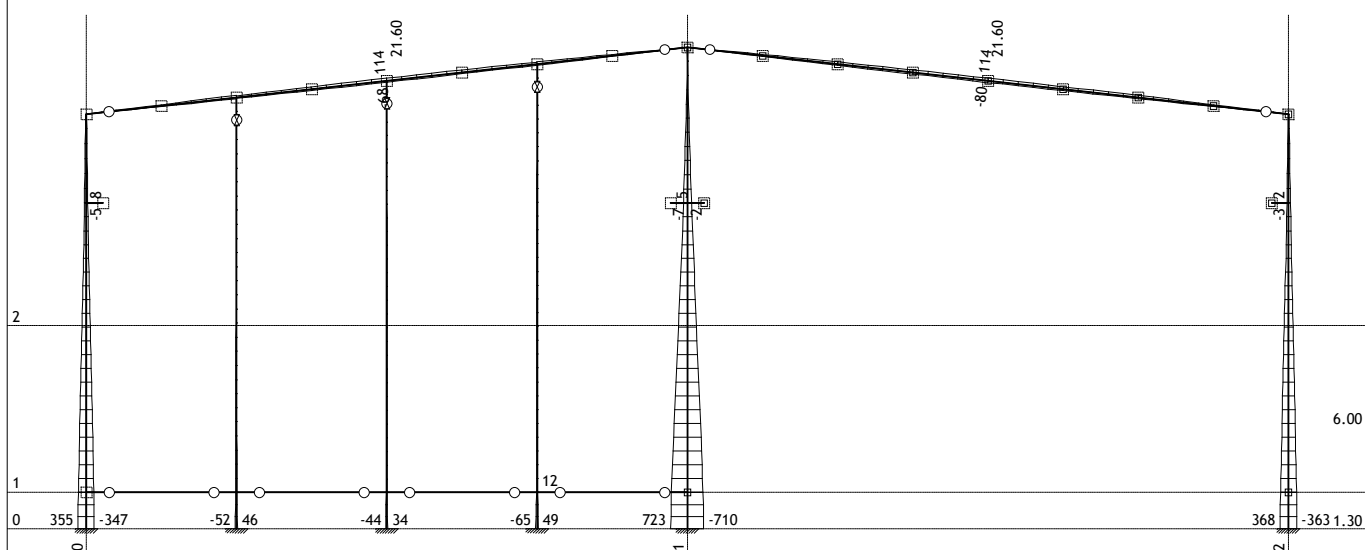
Ram: H_1

Uticaji u gredi: max N1= 18 / min N1= -1530 kN

Opt. 1106: [Ponderisano] 17-1024,1029-1032

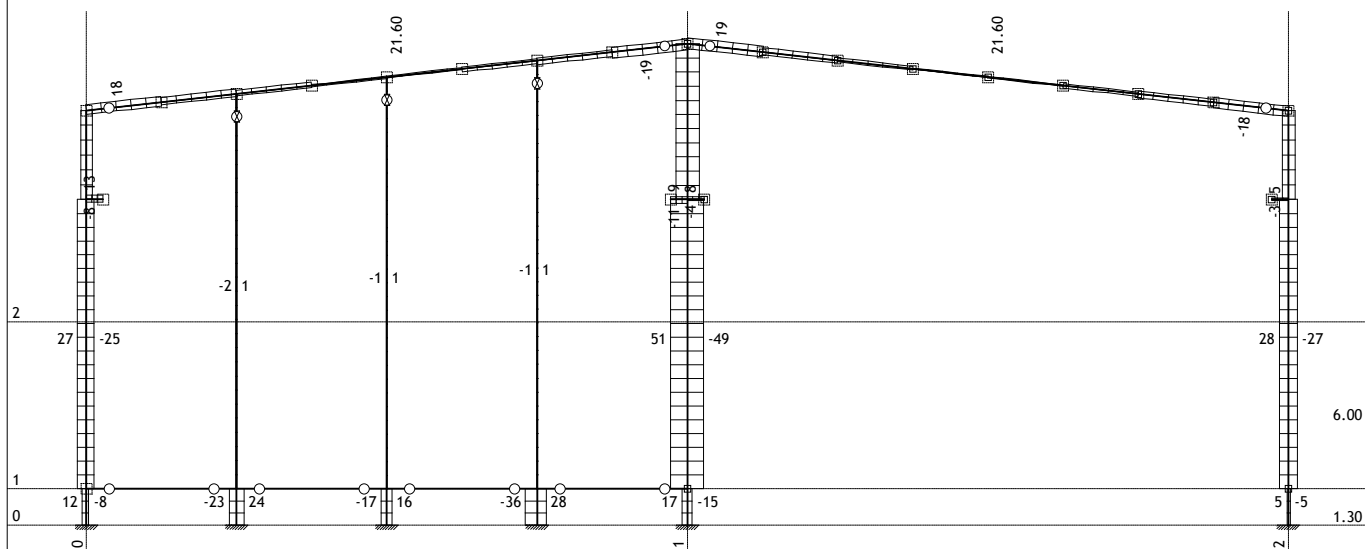


Ram: V_4
 Uticaji u gredi: max M3= 3729 / min M3= -663 kNm
 Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: V_4
 Uticaji u gredi: max M2= 723 / min M2= -710 kNm

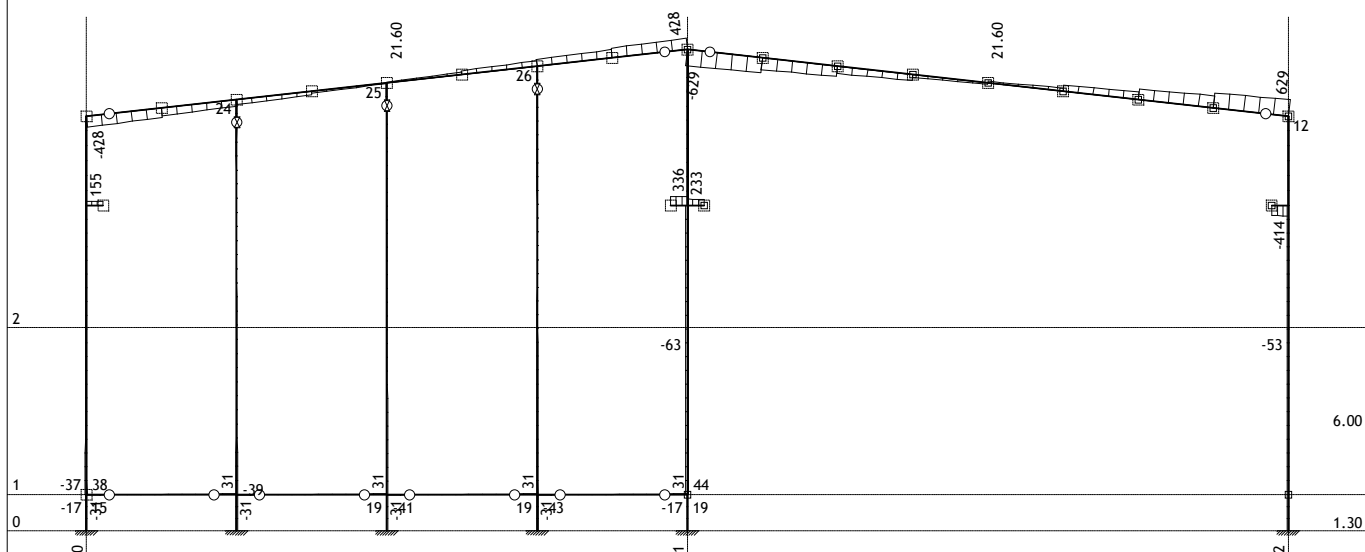
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: V_4

Uticaji u gredi: max T3= 51 / min T3= -49 kN

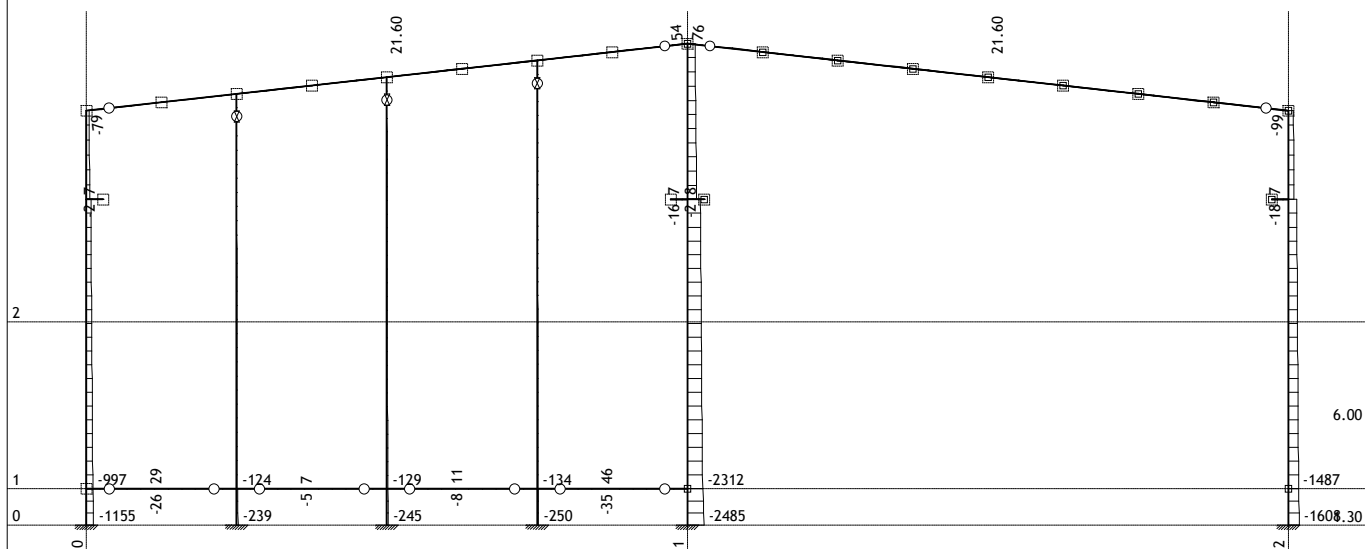
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: V_4

Uticaji u gredi: max T2= 629 / min T2= -629 kN

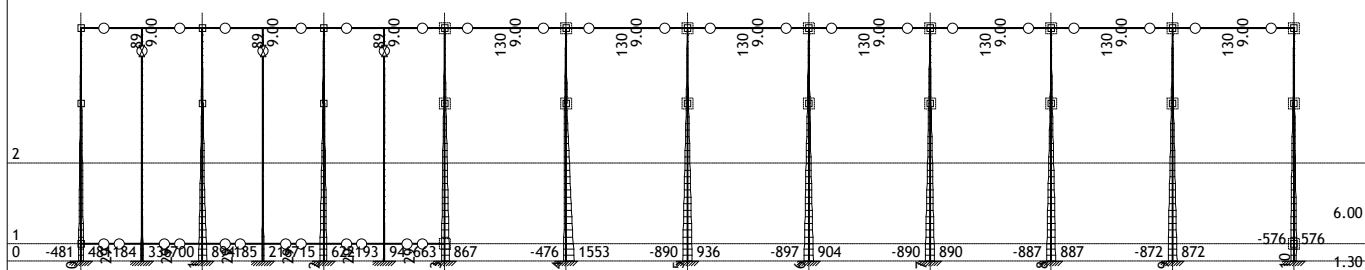
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: V_4

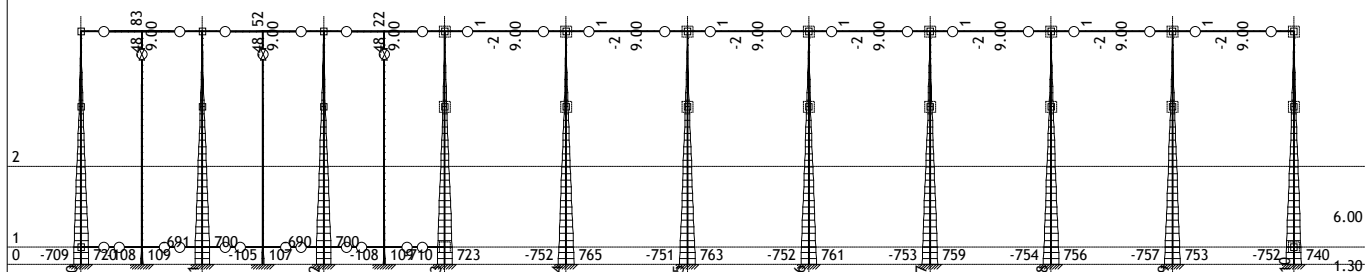
Uticaji u gredi: max N1= 76 / min N1= -2485 kN

Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: H_9

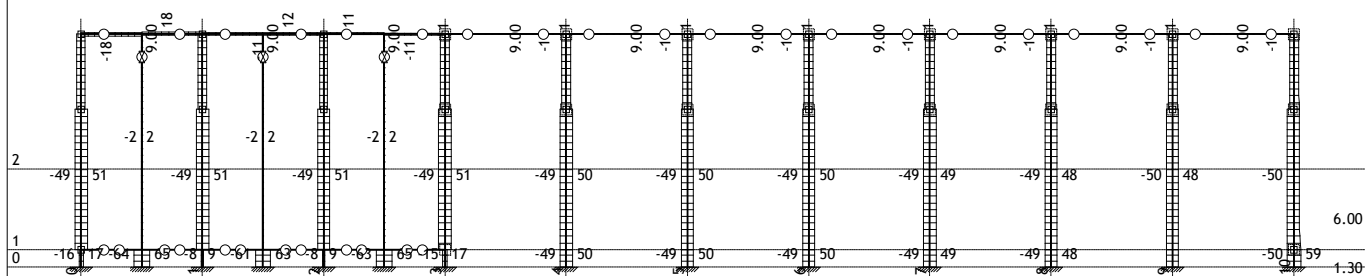
Uticaji u gredi: max M3= 1553 / min M3= -897 kNm



Ram: H_9

Uticaji u gredi: max M2= 765 / min M2= -757 kNm

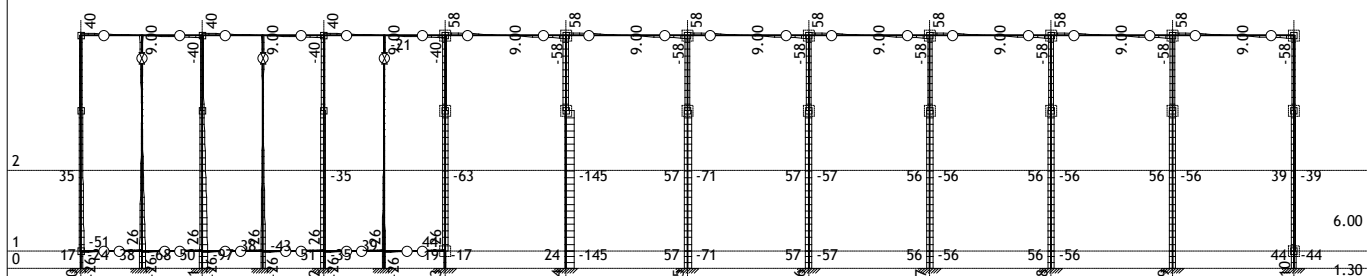
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: H_9

Uticaji u gredi: max T3= 65 / min T3= -64 kN

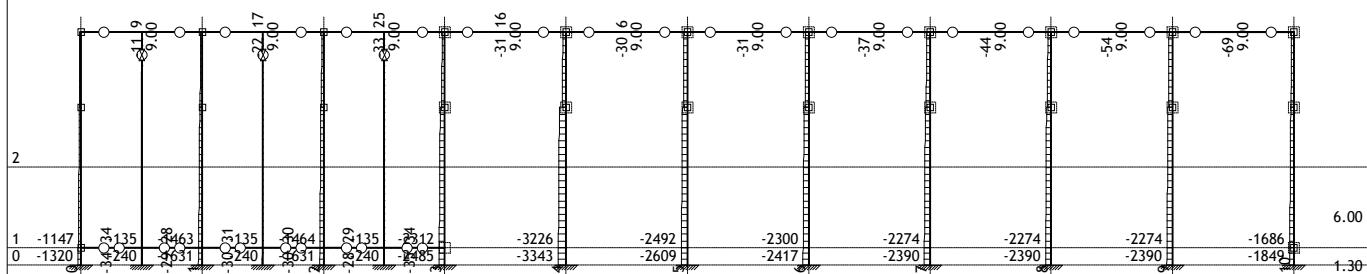
Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: H_9

Uticaji u gredi: max T2= 58 / min T2= -145 kN

Opt. 1106: [Ponderisano] 17-1024,1029-1032



Ram: H_9

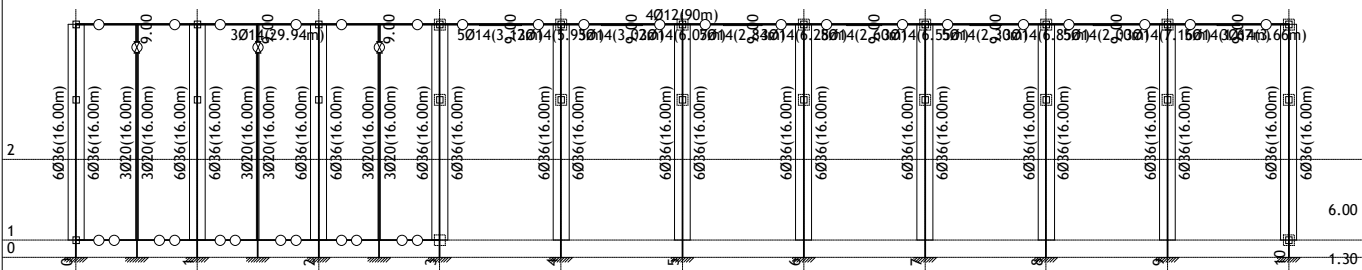
Uticaji u gredi: max N1= 34 / min N1= -3343 kN

Uticaji u tackastim osloncima - Ekstremne vrednosti - Opterecenje: 1107. [Neponderisano]

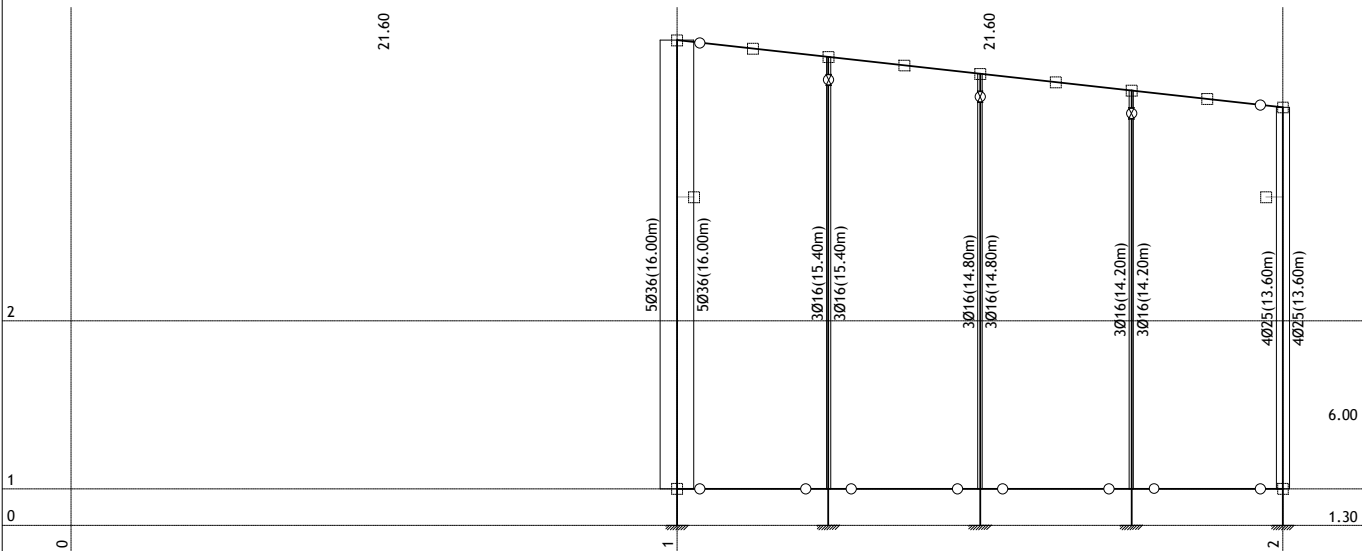
89-106,1025-1028,1033-1104

Oznaka	LC	R1 [kN]	R2 [kN]	R3 [kN]	M1 [kNm]	M2 [kNm]	M3 [kNm]
274	A(R1+)	76.282	0.795	156.09	0.082	350.54	1.831
310	A(R1+)	76.123	0.060	156.09	-1.577	347.89	-0.941
253	A(R1+)	73.617	1.058	152.81	0.397	333.54	-0.578
323	A(R1+)	73.341	-0.647	152.81	-1.353	329.11	0.884
232	A(R1+)	70.533	2.065	149.54	-1.377	308.11	-3.148
340	A(R1+)	70.227	-1.545	149.54	0.248	303.35	2.857
292	A(R1+)	58.329	-0.654	1191.1	-7.145	395.37	0.850
42	A(R1+)	49.801	-0.054	150.07	0.997	84.135	-0.670
3	A(R1+)	49.750	0.022	150.07	-0.462	84.015	0.073
3	A(R1-)	-48.860	0.022	150.07	-0.462	-82.804	0.073
9	A(R2-)	0.489	-97.295	1061.5	892.39	5.030	-0.880
89	A(R2-)	0.733	-95.302	1929.9	1037.9	5.355	0.258
20	A(R2-)	0.376	-80.077	952.90	614.18	3.351	-0.764
174	A(R2-)	0.352	-75.922	1200.5	664.87	2.270	0.559
3	A(R2-)	0.846	-67.513	150.07	336.14	1.130	-2.376
75	A(R2-)	0.067	-65.883	905.48	439.45	2.600	-0.445
46	A(R2-)	0.134	-65.446	923.09	427.87	2.981	-0.660
182	A(R2-)	-0.484	-62.222	869.25	384.24	-0.067	0.866
148	A(R2-)	-0.129	-62.194	869.25	389.28	1.231	0.286
112	A(R2-)	-0.012	-62.182	869.25	390.08	1.968	-0.129
89	A(R3+)	19.175	3.081	3101.7	-51.141	278.35	3.338
126	A(R3+)	18.920	2.960	2412.2	-49.946	277.55	2.468
57	A(R3+)	6.713	-1.076	2322.2	-90.189	262.89	4.565
262	A(R3+)	17.196	0.963	2245.7	-16.189	271.66	0.981
195	A(R3+)	18.275	0.974	2245.6	-17.825	275.50	1.434
228	A(R3+)	17.816	0.969	2245.6	-16.824	273.93	1.153
161	A(R3+)	18.630	1.951	2245.4	-33.768	276.64	1.856
292	A(R3+)	57.662	-0.655	1766.5	-7.147	393.25	0.895
208	A(R3+)	0.371	-57.700	1699.2	455.16	2.723	0.528
30	A(R3+)	0.584	-22.587	1558.9	294.60	6.708	-1.158
89	A(M1+)	0.673	-91.489	1594.3	1164.9	4.916	0.456
9	A(M1+)	0.489	-97.295	1061.5	892.39	5.030	-0.880
126	A(M1+)	0.537	-44.585	1428.4	720.05	4.346	0.330
161	A(M1+)	0.338	-43.924	1428.3	695.63	3.491	0.241
161	A(M1-)	0.337	43.815	1428.0	-690.08	3.485	0.242
174	A(M1+)	0.299	-65.973	916.25	688.56	1.931	0.473
195	A(M1+)	0.060	-43.385	1428.2	684.96	2.279	0.180
126	A(M1-)	0.537	44.171	1427.9	-684.58	4.341	0.331
195	A(M1-)	0.059	43.377	1428.2	-684.28	2.272	0.181
228	A(M1+)	-0.319	-43.359	1428.2	682.49	0.602	0.140
89	A(M2+)	38.820	-42.223	1593.9	417.19	588.20	2.736
126	A(M2+)	38.466	-0.207	1428.1	17.731	586.71	1.957
161	A(M2+)	38.107	-0.054	1428.2	2.773	585.20	1.410
195	A(M2+)	37.715	0.000	1428.2	0.343	583.51	1.032
262	A(M2-)	-38.364	0.000	1428.2	0.000	-582.43	-0.399
228	A(M2+)	37.258	0.000	1428.2	0.046	581.52	0.781
228	A(M2-)	-37.897	0.000	1428.2	0.046	-580.32	-0.502
262	A(M2+)	36.701	0.000	1428.2	0.000	579.03	0.628
195	A(M2-)	-37.596	0.000	1428.2	0.343	-578.96	-0.671
292	A(M2-)	-38.456	0.000	1122.8	0.000	-578.70	-0.349
349	A(M3-)	17.480	-3.448	1042.7	26.877	177.00	-16.781
215	A(M3+)	18.535	3.449	1042.8	-35.563	211.04	15.789
1	A(M3+)	9.768	-12.246	812.51	384.96	46.071	9.402
232	A(M3+)	-3.925	1.306	149.54	-0.164	-61.095	9.126
12	A(M3+)	-3.917	0.249	149.54	2.432	-60.966	9.087
340	A(M3-)	-4.001	-1.306	149.54	0.164	-62.292	-8.975
24	A(M3-)	-3.990	-1.048	149.54	-0.172	-62.116	-8.912
4	A(M3+)	9.519	-7.506	640.19	64.295	45.706	17.707
39	A(M3-)	9.311	-10.389	663.00	238.45	45.173	-7.565
215	A(M3-)	-9.662	-7.539	639.91	101.46	-43.896	-6.962

Usvojena armatura
@1@PBAB 87, B500

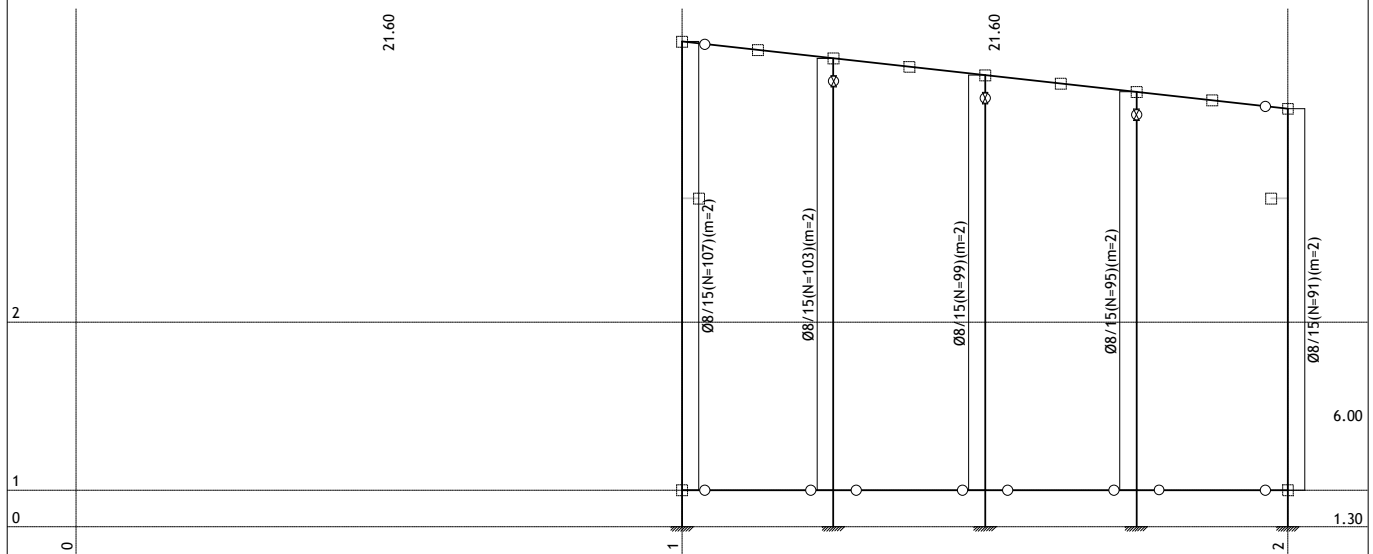


Ram: H_9
Armatura u gredama: Aa2/Aa1
Usvojena armatura
@1@PBAB 87, B500

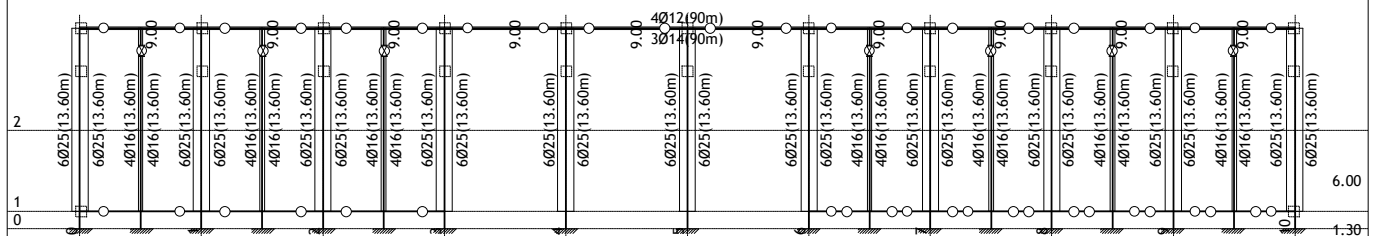


Ram: V_1
Armatura u gredama: Aa3/Aa4

Usvojena armatura
@1@PBAB 87, B500

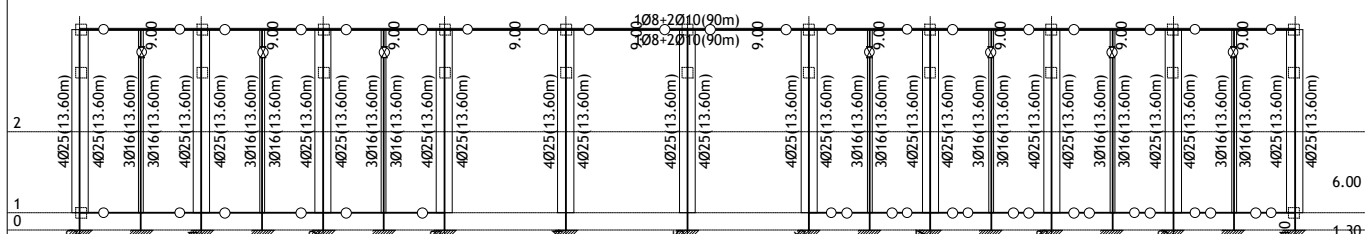


Ram: V_1
Armatura u gredama: Aa,uz
Usvojena armatura
@1@PBAB 87, MB 30, B500

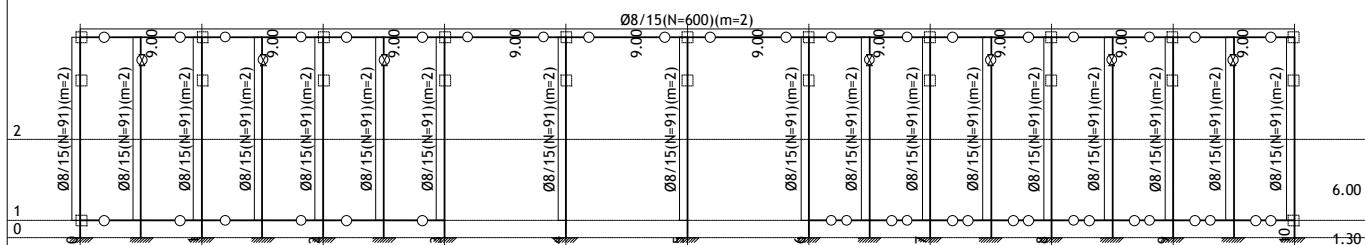


Ram: H_17
Armatura u gredama: Aa2/Aa1

Usvojena armatura
@1@PBAB 87, MB 30, B500

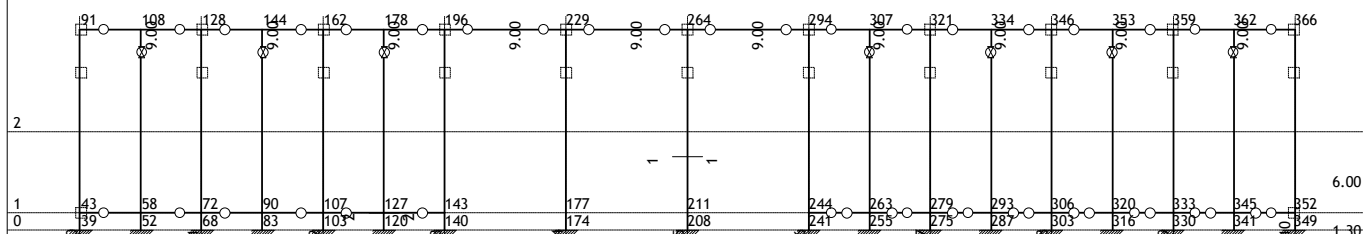


Ram: H_17
Armatura u gredama: Aa3/Aa4
Usvojena armatura
@1@PBAB 87, MB 30, B500



Ram: H_17
Armatura u gredama: Aa_{uz}

Merodavno opterećenje: 17-1024,1029-1032
@1@PBAB 87, MB 30, B500



Ram: H_17
Dispozicija greda

Greda 178-127

@1@PBAB 87
MB 30
B500
Dimenzionisanje grupe slucajeva
opterećenja: 17-1024,1029-1032

Merodavna kombinacija za savijanje:

1.00xI+1.00xII+1.80xIII+1.80xV
+1.80xVI+1.60xVII
N1u = -71.74 kN
M2u = 0.02 kNm
M3u = 102.71 kNm

Merodavna kombinacija za torziju:

1.00xI+1.00xII+1.80xV+1.80xVI
+1.80xVIII
M1u = -3.65 kNm

Merodavna kombinacija za smicanje:

1.00xI+1.60xII+1.80xIV+1.80xVI
+1.80xVIII
T2u = -31.94 kN
T3u = 0.40 kN
M1u = -3.59 kNm

$\epsilon_b/\epsilon_a = -1.788/10.000 \text{ ‰}$

Aa1 = 2.45 + 0.09' = 2.55 cm²

Aa2 = 2.43 + 0.09' = 2.53 cm²

Aa3 = 1.64 + 0.13' = 1.77 cm²

Aa4 = 1.62 + 0.13' = 1.75 cm²

Aa,uz = 0.00 cm²/m (m=2)

[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

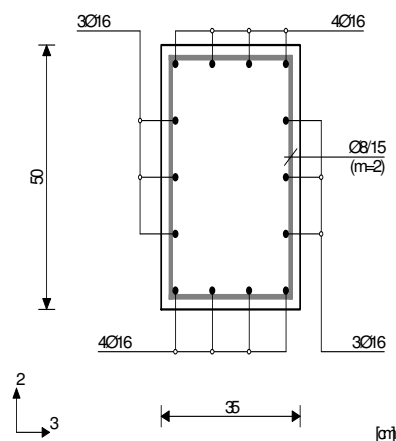
$\tau_y = 0.68 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$

$\tau_z = 0.46 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$

Procent armiranja: 1.61%

*) - dodatna poduzna armatura za prijem torzije.

Presek 2-2 x = 13.60m



Greda 264-211

@1@PBAB 87

MB 30

B500

Dimenzionisanje grupe slucajeva
opterecenja: 17-1024,1029-1032li,2 = 27.20 m ($\lambda_2 = 117.78$)li,3 = 27.20 m ($\lambda_3 = 117.78$)

Pomerljiva konstrukcija

Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII+1.80xV

-1.80xVI+1.60xIX+1.80xX

N1u = -1566.35 kN

M2u = 0.72 kNm

M3u = 181.41 kNm

 $\tau_y = 0.14 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$

Procenat armiranja: 1.53%

*) - dodatna poduzna armatura za prijem torzije.

Merodavna kombinacija za torziju:

1.30xI+1.30xII+1.30xIII+1.30xVII

+0.65xVIII-1.30xXV

M1u = -1.63 kNm

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIII+1.80xV

-1.80xVI+1.60xIX+1.80xX

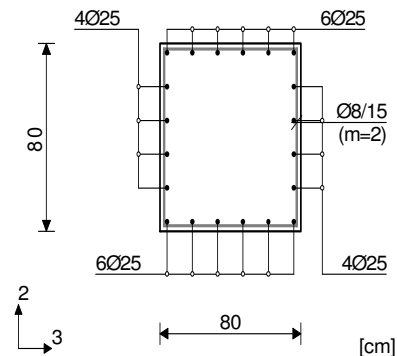
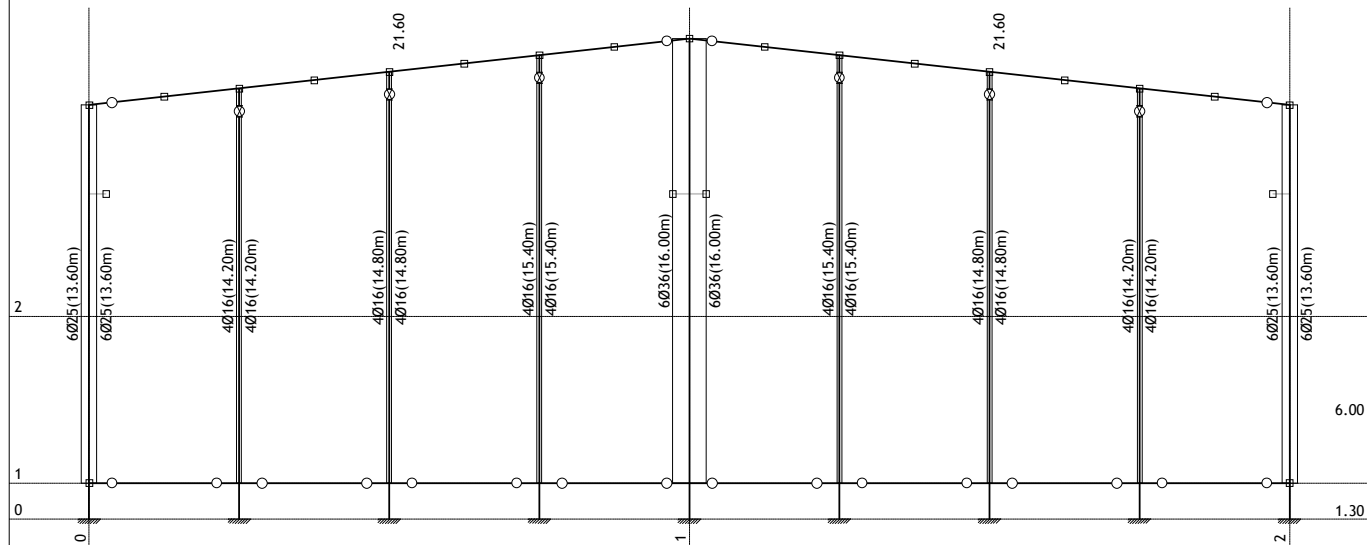
T2u = -70.83 kN

T3u = 0.38 kN

M1u = -0.55 kNm

 $\Delta e_2 = 13.6 < e_0 > + 57.1 < e_{II} > = 70.7 \text{ cm}$ $|\Delta M_2| = 1107.19 \text{ kNm}$ $\Delta e_3 = 13.6 < e_0 > + 57.1 < e_{II} > = 70.7 \text{ cm}$ $|\Delta M_3| = 1107.19 \text{ kNm}$ $\epsilon_b/\epsilon_a = -3.500/4.446 \text{ ‰}$ Aa1 = 28.24 + 0.03' = 28.26 cm²Aa2 = 28.01 + 0.03' = 28.04 cm²Aa3 = 18.83 + 0.03' = 18.86 cm²Aa4 = 18.63 + 0.03' = 18.66 cm²Aa,uz = 0.00 cm²/m (m=2)[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

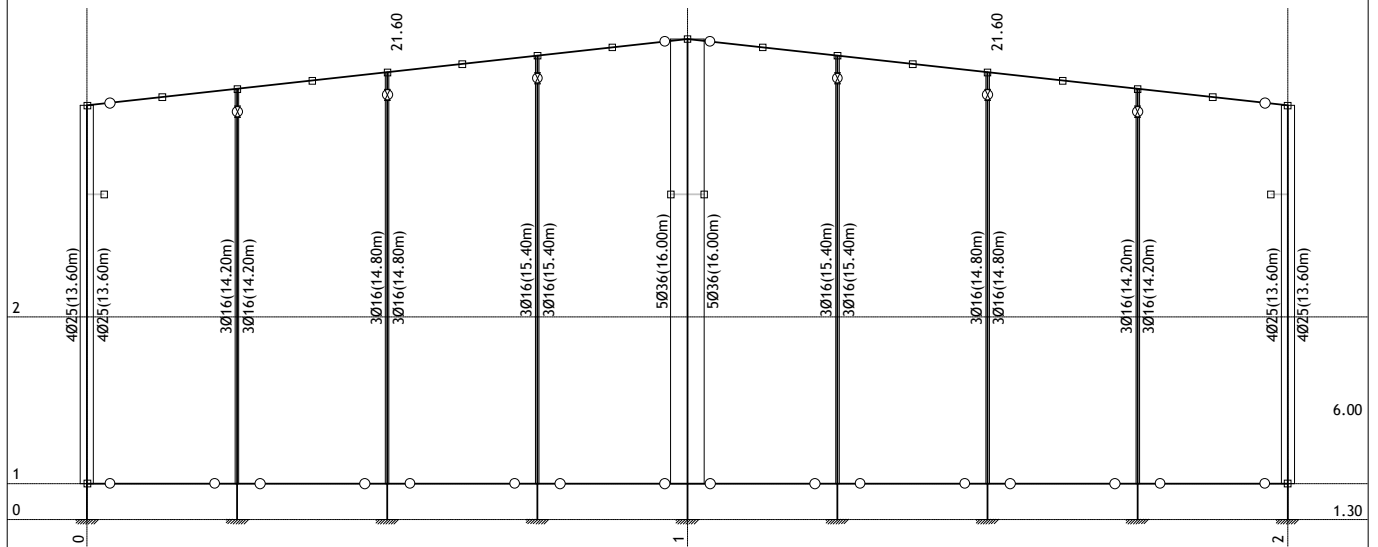
Presek 1-1 x = 9.44m

Usvojena armatura
@1@PBAB 87, B500

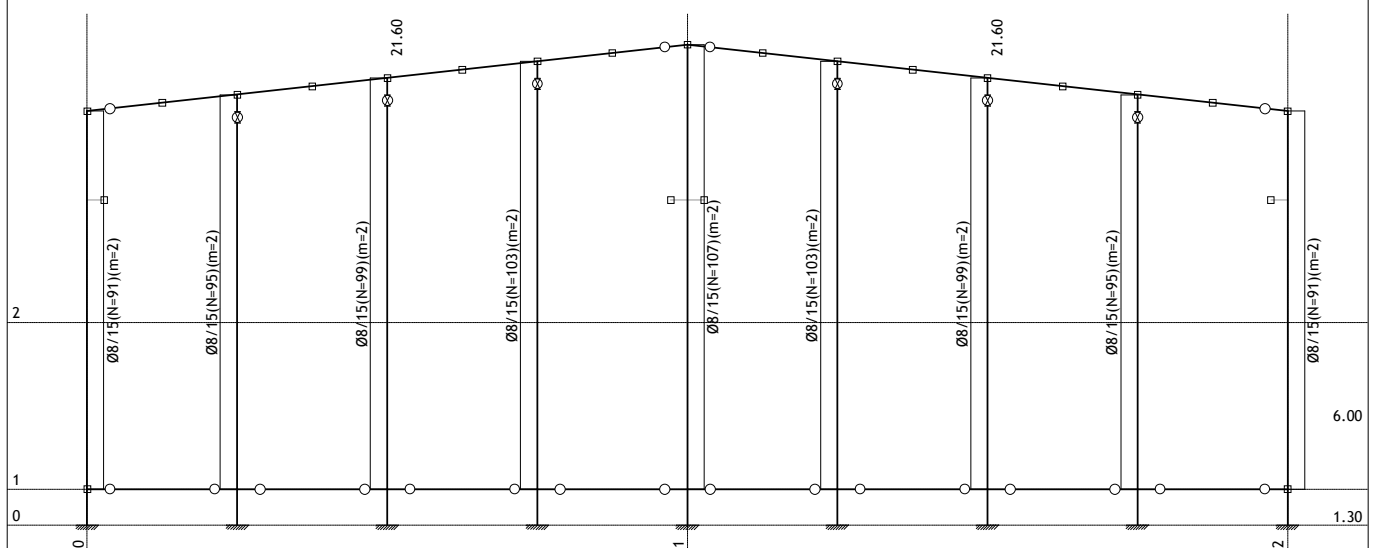
Ram: V_11

Armatura u gredama: Aa2/Aa1

Usvojena armatura
@1@PBAB 87, B500

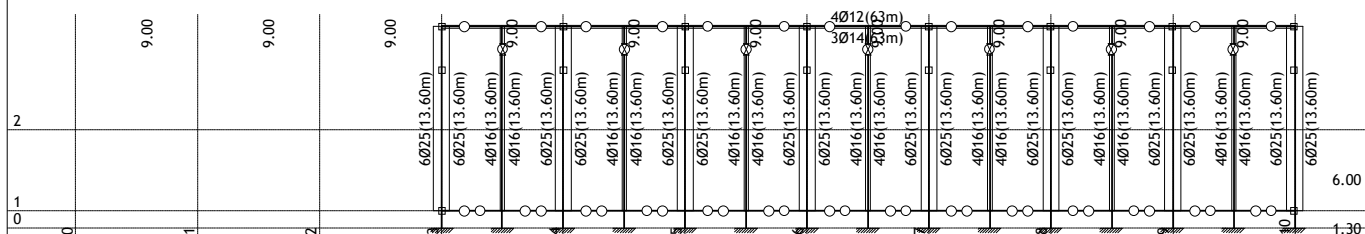


Ram: V_11
Armatura u gredama: Aa3/Aa4
Usvojena armatura
@1@PBAB 87, B500

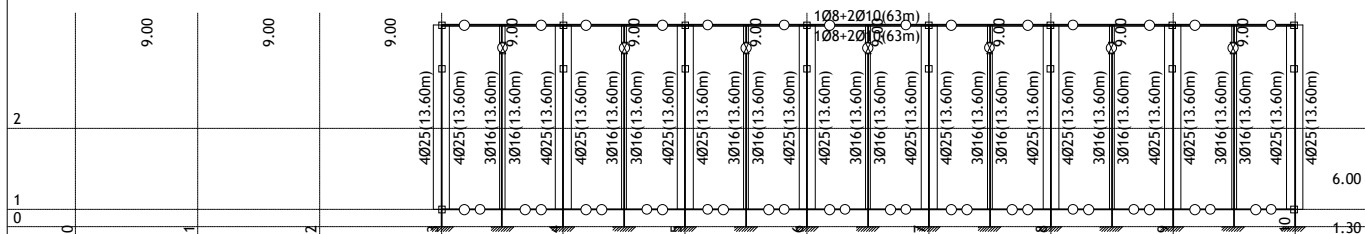


Ram: V_11
Armatura u gredama: Aa,uz

Usvojena armatura
@1@PBAB 87, MB 30, B500

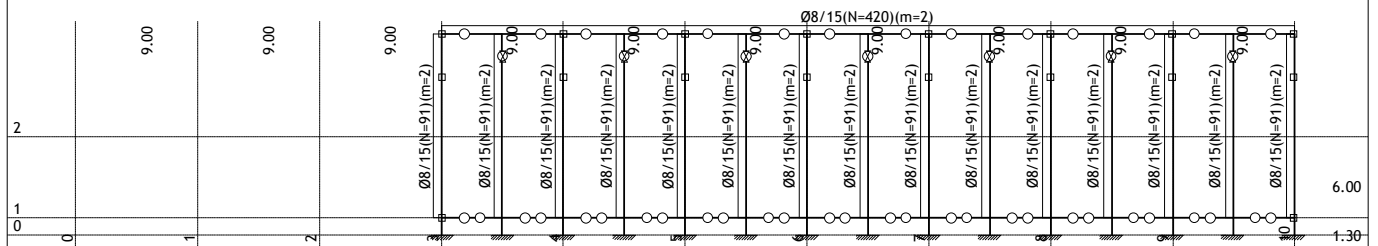


Ram: H_1
Armatura u gredama: Aa2/Aa1
Usvojena armatura
@1@PBAB 87, MB 30, B500

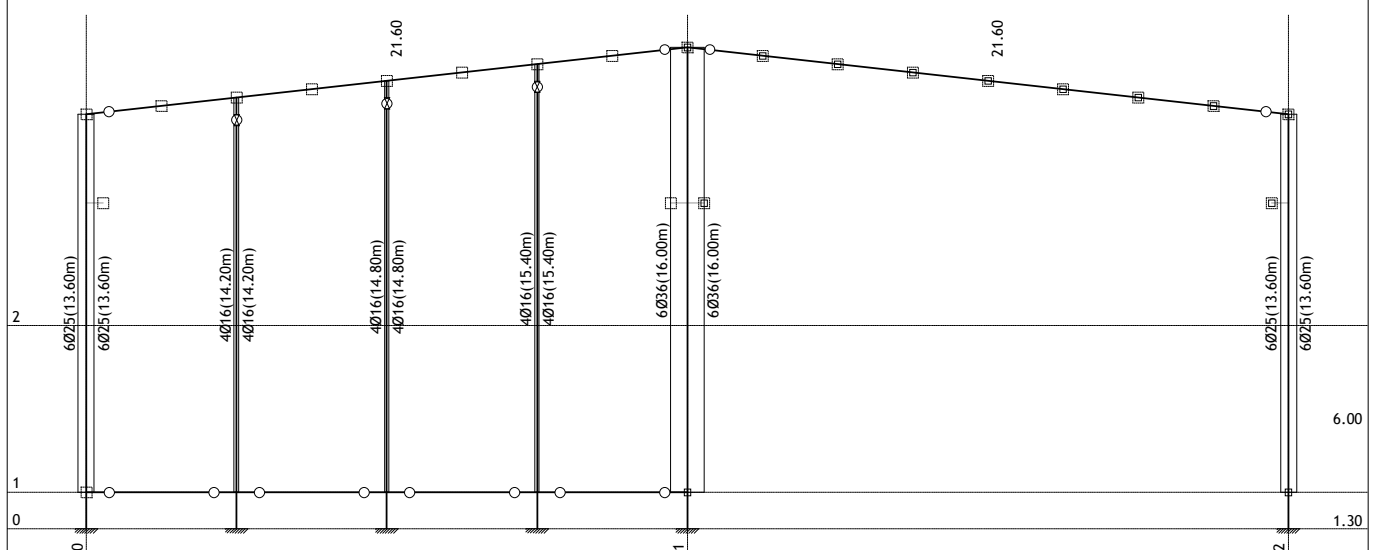


Ram: H_1
Armatura u gredama: Aa3/Aa4

Usvojena armatura
@1@PBAB 87, MB 30, B500

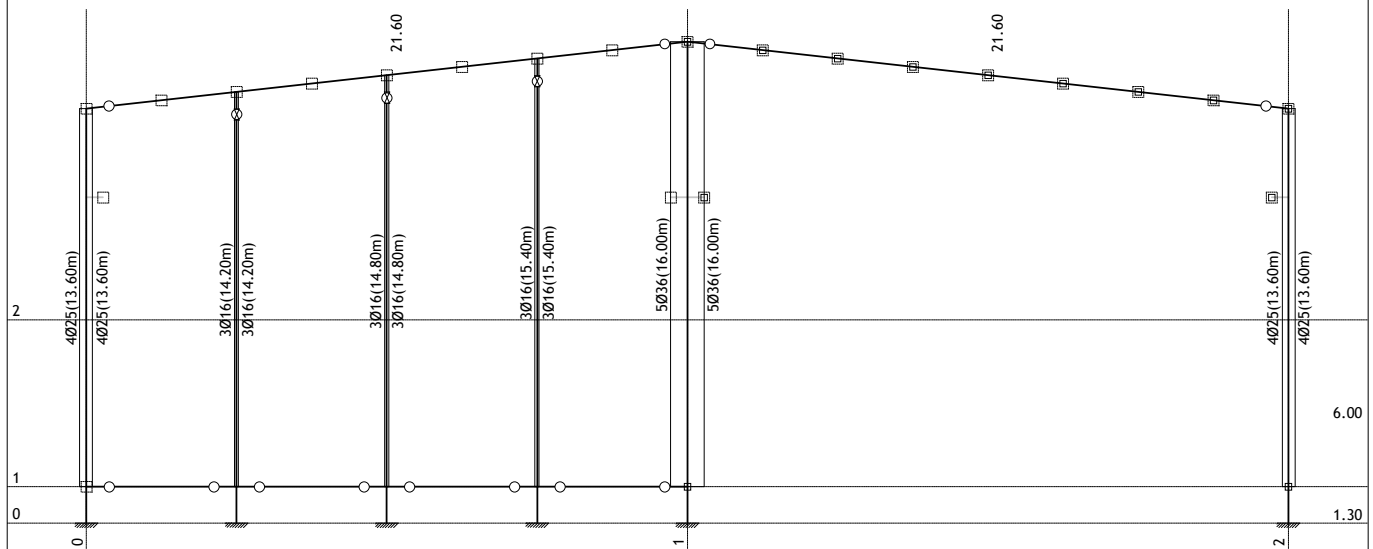


Ram: H_1
Armatura u gredama: Aa,uz
Usvojena armatura
@1@PBAB 87, B500

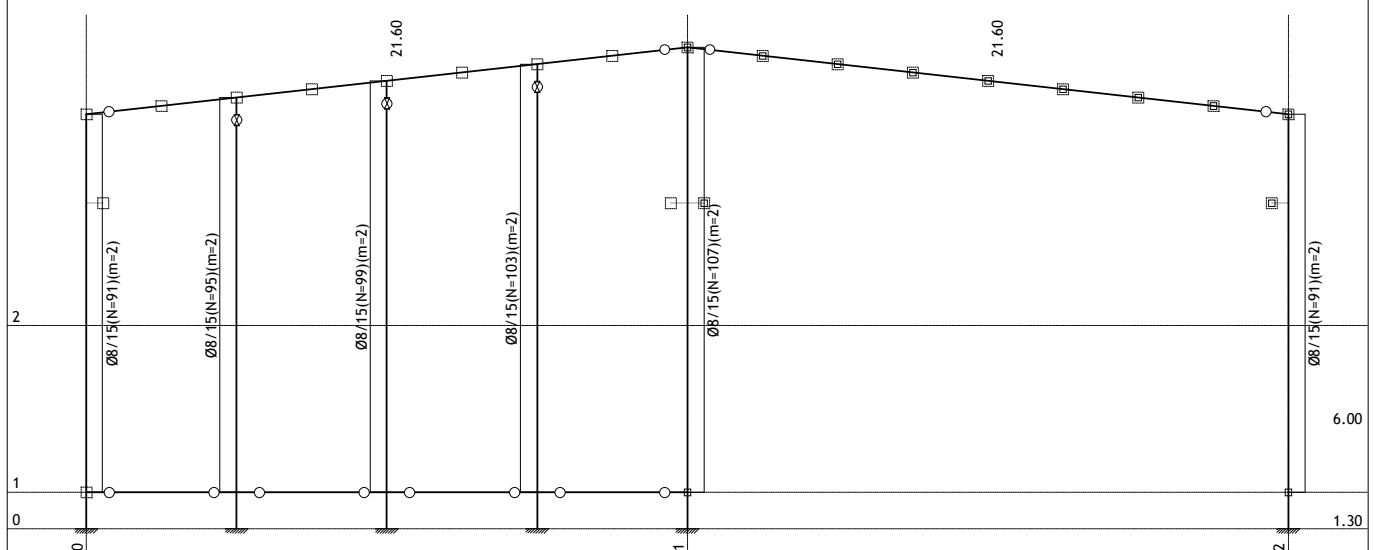


Ram: V_4
Armatura u gredama: Aa2/Aa1

Usvojena armatura
@1@PBAB 87, B500

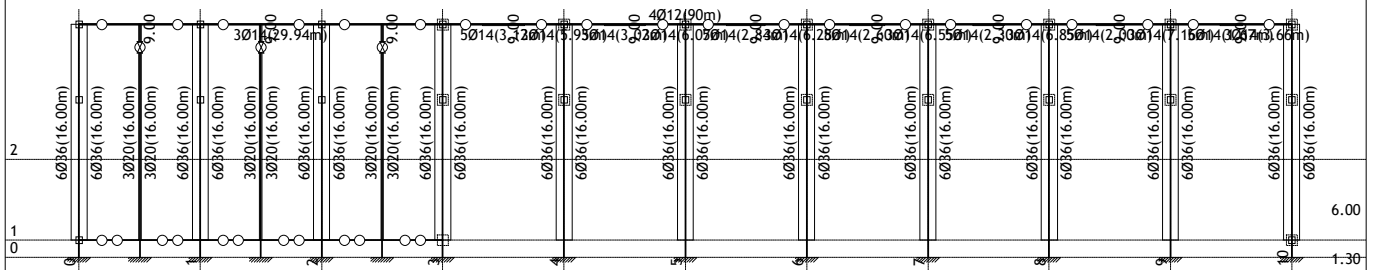


Ram: V_4
Armatura u gredama: Aa3/Aa4
Usvojena armatura
@1@PBAB 87, B500

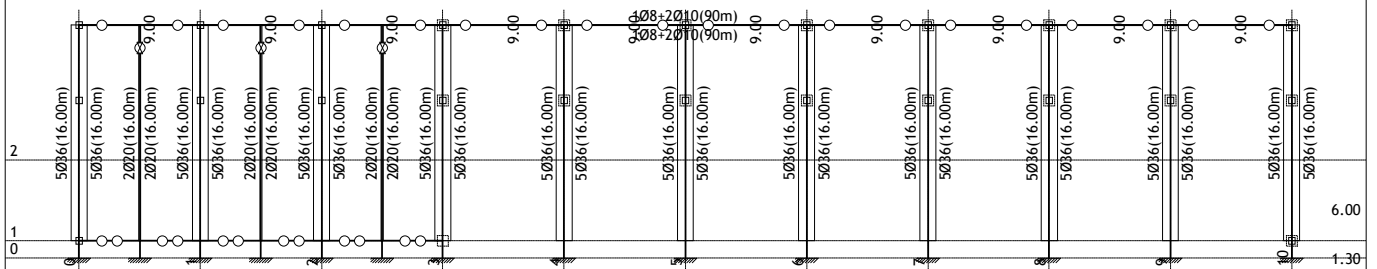


Ram: V_4
Armatura u gredama: Aa,uz

Usvojena armatura
@1@PBAB 87, B500

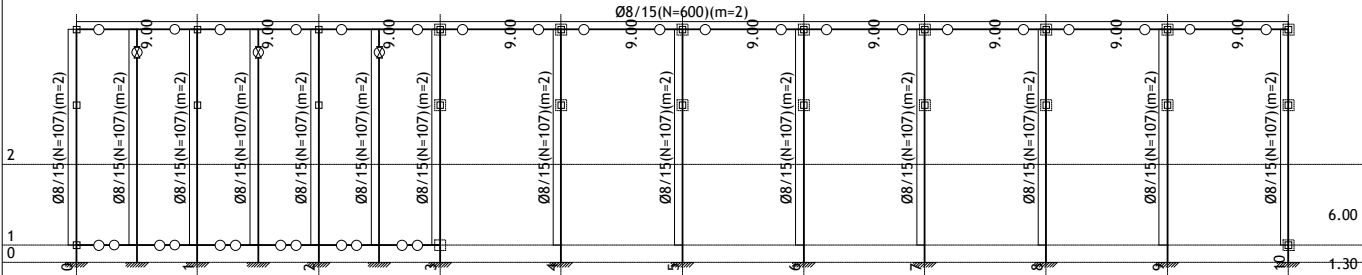


Ram: H_9
Armatura u gredama: Aa2/Aa1
Usvojena armatura
@1@PBAB 87, B500

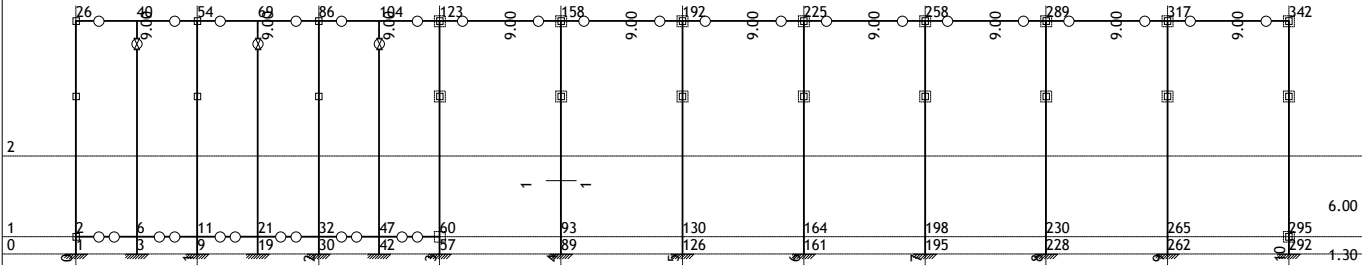


Ram: H_9
Armatura u gredama: Aa3/Aa4

Usvojena armatura
@1@PBAB 87, B500



Ram: H_9
Armatura u gredama: Aa,uz
Usvojena armatura
@1@PBAB 87, B500



Ram: H_9
Dispozicija greda

Greda 158-93

@1@PBAB 87

MB 50

B500

Dimenzionisanje grupe slucajeva
opterecenja: 17-1024,1029-1032li,2 = 32.00 m ($\lambda_2 = 138.56$)li,3 = 32.00 m ($\lambda_3 = 100.77$)

Pomerljiva konstrukcija

Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII-1.80xVI

+1.60xXIII+1.80xXIV

N1u = -3079.61 kN

M2u = 2.06 kNm

M3u = 620.88 kNm

Merodavna kombinacija za torziju:

1.30xI+1.30xII+1.30xIII+1.30xVII

+0.65xVIII-1.30xXV

M1u = -3.56 kNm

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIII+1.80xV

-1.80xVI+1.60xXIII+1.80xXIV

T2u = -144.91 kN

T3u = 1.06 kN

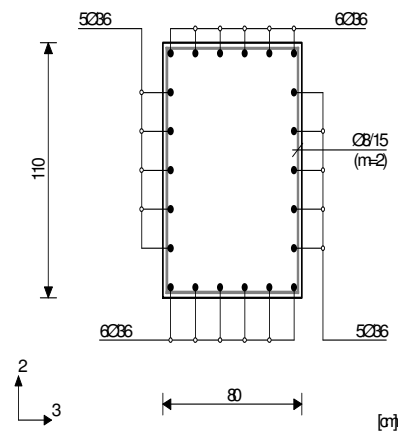
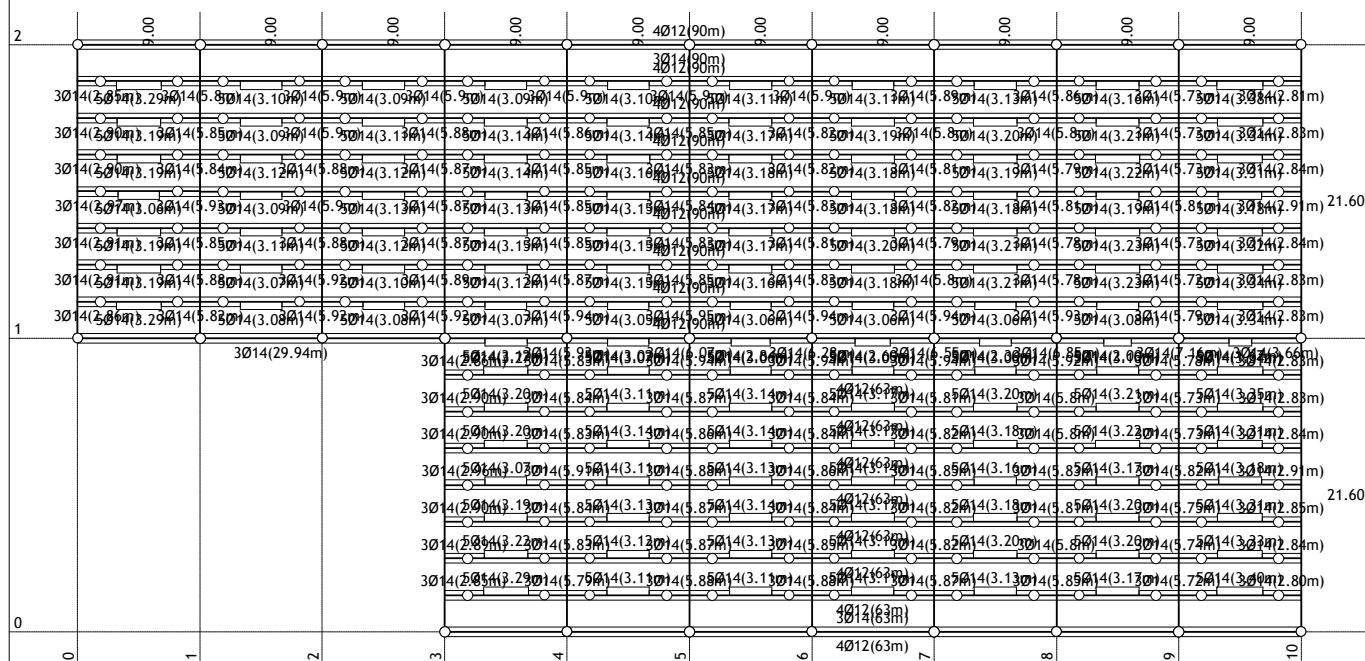
M1u = -0.48 kNm

 $\Delta e_2 = 15.3 < e_0 > + 79.0 < e_{ll} > = 94.3$ cm $|\Delta M_2| = 2905.48$ kNm $\Delta e_3 = 15.3 < e_0 > + 57.5 < e_{ll} > = 72.8$ cm $|\Delta M_3| = 2241.86$ kNm $\epsilon_b/\epsilon_a = -3.500/4.474$ ‰Aa1 = 56.36 + 0.04' = 56.40 cm²Aa2 = 55.87 + 0.04' = 55.91 cm²Aa3 = 46.83 + 0.06' = 46.89 cm²Aa4 = 46.40 + 0.06' = 46.45 cm²Aa,uz = 0.00 cm²/m (m=2)[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m] $\tau_y = 0.21$ MPa < τ_r , $\tau_r = 1.50$ MPa

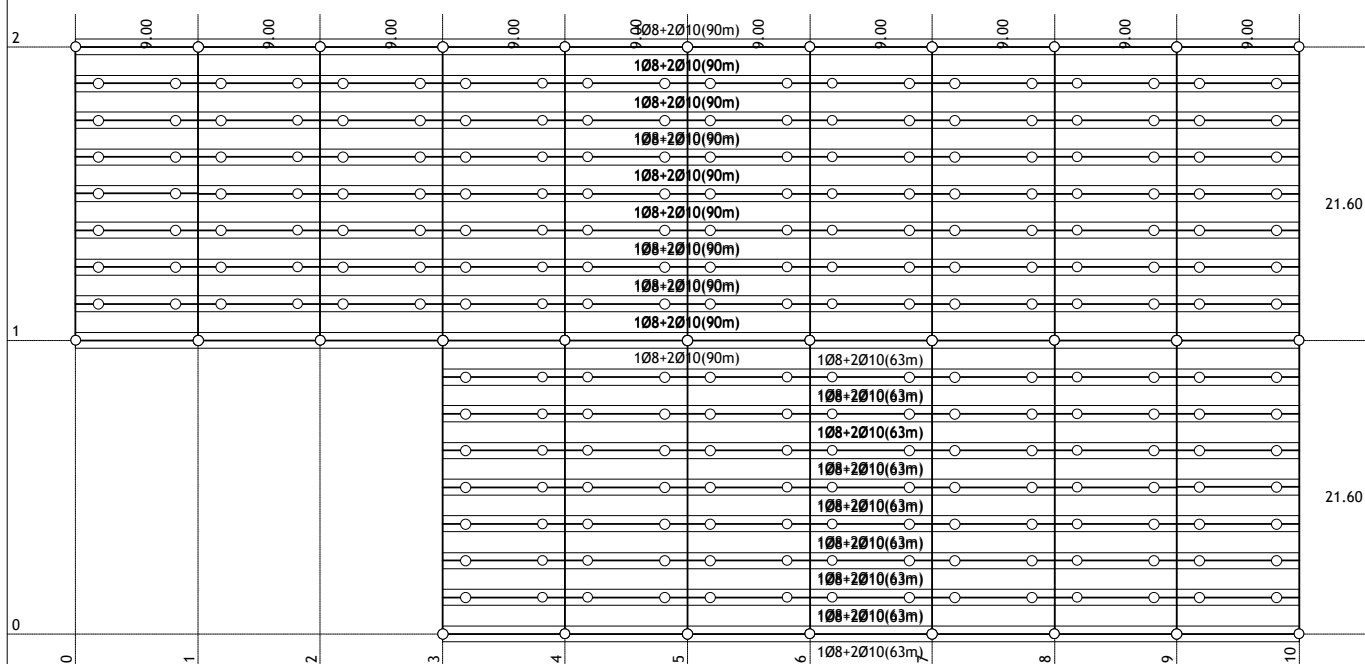
Procenat armiranja: 2.54%

*) - dodatna poduzna armatura za prijem torzije.

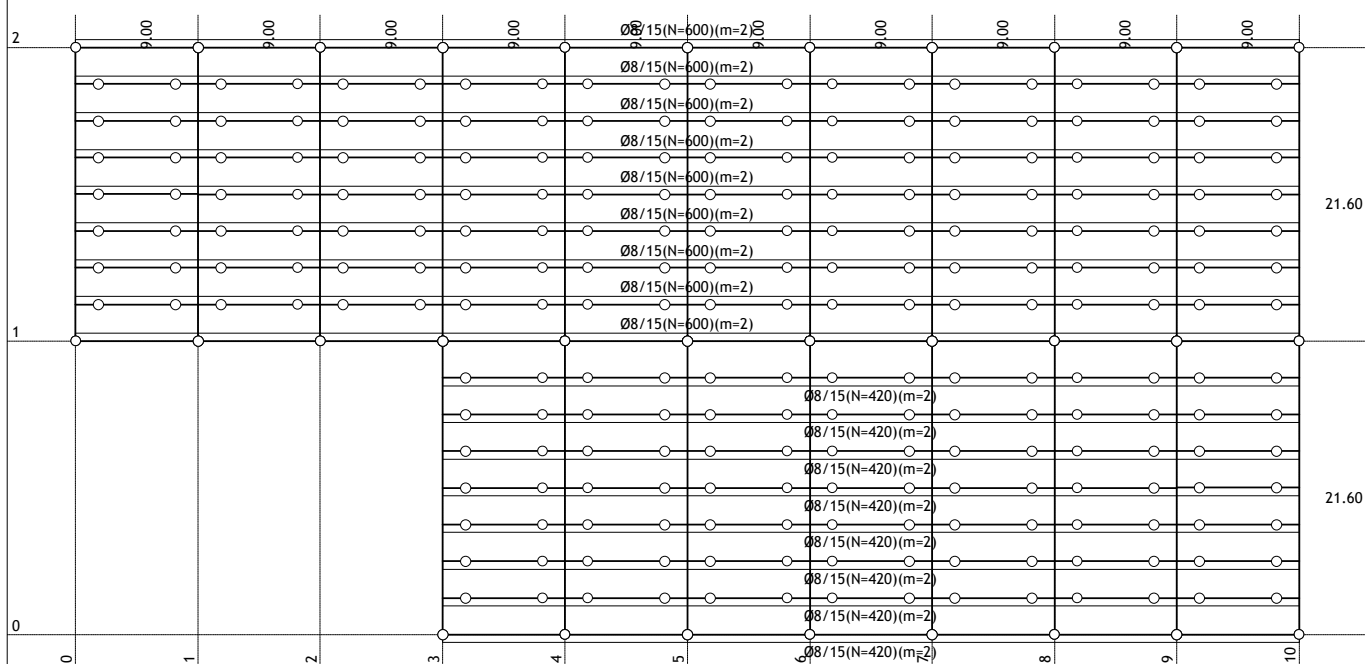
Presek 1-1 x = 11.84m

Usvojena armatura
@1@PBAB 87, MB 30, B500Pogled: Kispred+Kiza
Armatura u gredama: Aa2/Aa1

Usvojena armatura
@1@PBAB 87, MB 30, B500

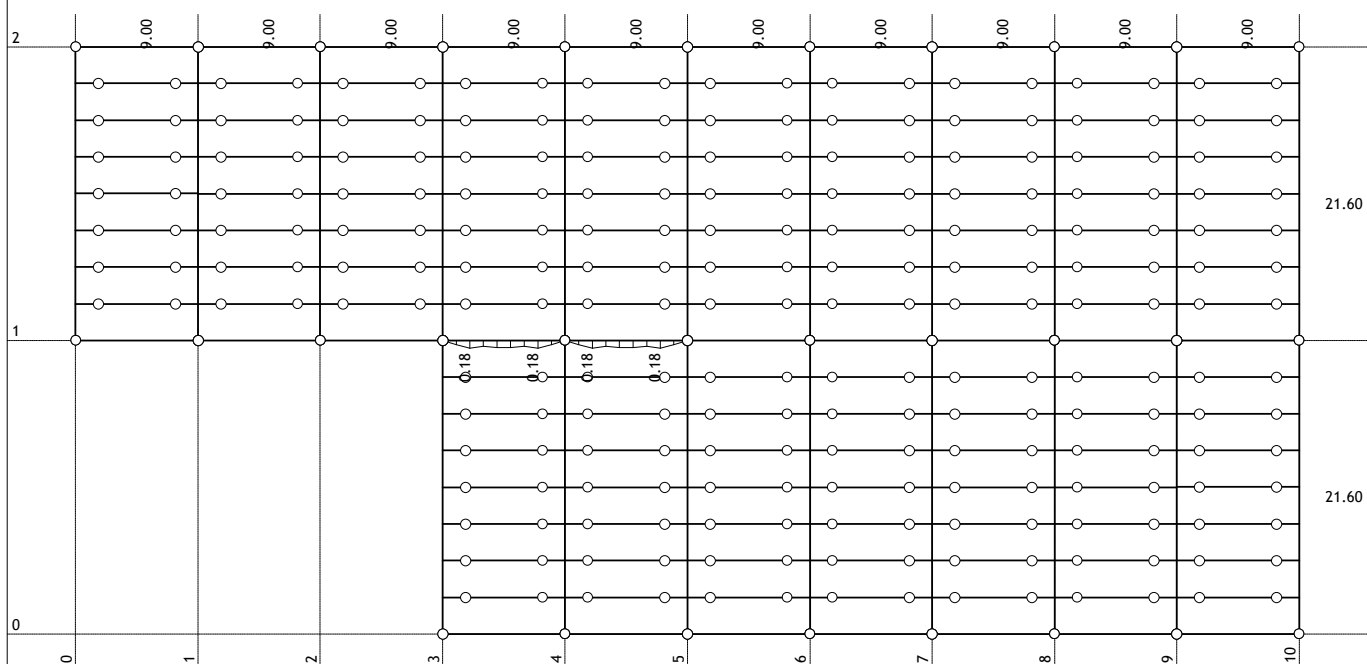


Pogled: Kispred+Kiza
Armatura u gredama: Aa3/Aa4
Usvojena armatura
@1@PBAB 87, MB 30, B500

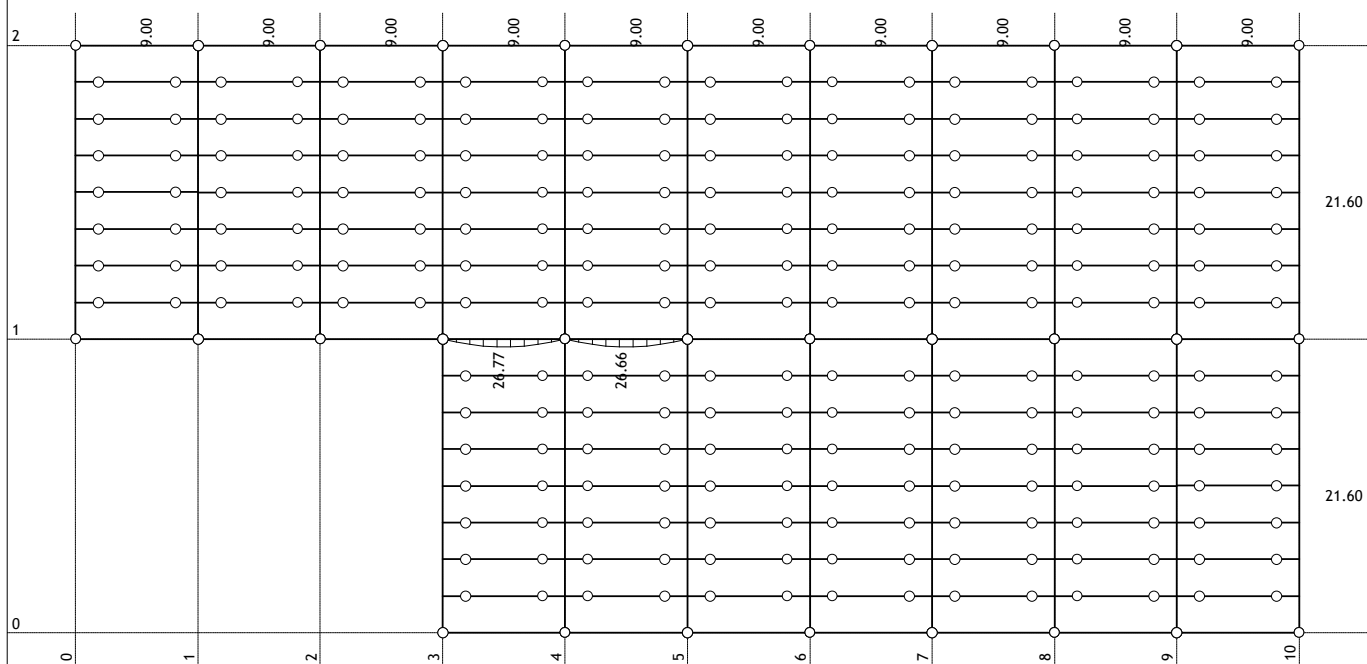


Pogled: Kispred+Kiza
Armatura u gredama: Aa,uz

@1@PBAB 87, MB 30, B500



Pogled: Kispred+Kiza
Dijagram prsline: max $ak(t^\infty) = 0.18$ mm
@1@PBAB 87, MB 30, B500



Pogled: Kispred+Kiza
Dijagram ugiba: max $ug(t^\infty) = 26.77$ mm

Greda 158-123

@1@PBAB 87

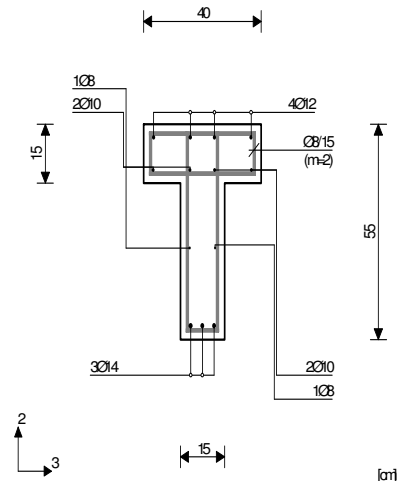
MB 30

B500

 $E_b(t_0) = 3.15e+007 \text{ kN/m}^2$ $E_a = 2e+008 \text{ kN/m}^2$ $f_{bzs} = 1788.33 \text{ kN/m}^2$ $\phi = 2.50$ $X = 1.00$ $\varepsilon_s = 0.340\%$ $k_1 = 0.40$ $\beta_1 = 1.00$

Savijanje oko ose 3

Ugib: Savijanje oko ose 3

Presek 1-1 $x = 2.00 \text{ m}$ 

T = 0 Presek sa prslinom

Merodavna kombinacija: 1.00xI

+1.00xII+1.00xXIII

 $N_1 = -4.79 \text{ kN}$ $M_3 = 30.51 \text{ kNm}$ $M_2 = 0.00 \text{ kNm}$

Ivni naponi u betonu

[-3823.90 , 20846.00] kN/m²

Ivne dilatacije

[-0.12‰ , 0.66‰]

 $k_2 = 0.125$ $\sigma_{a,II} = 122387.90 \text{ kN/m}^2$ $\beta_2 = 1.00$ $\zeta = 0.62$ $\varepsilon_{sr} = 0.38\%$ $M_r = 18.91 \text{ kNm}$ $N_r = -2.97 \text{ kN}$ $\sigma_{a,r} = 75835.54 \text{ kN/m}^2$ $\mu_{z,ef} = 1.50\%$

Rastojanje prslina Lps = 12.74 cm

Sirina prslina $ak(t_0) = 0.082 \text{ mm}$

Ugib

Merodavna kombinacija: 1.00xI

+1.00xII+1.00xXIII

 $N_1 = -4.79 \text{ kN}$ $M_3 = 30.51 \text{ kNm}$ $M_2 = 0.00 \text{ kNm}$ **$ug(t_0) = 5.320 \text{ mm}$**

T = ∞ Presek sa prslinom

Dugotrajni uticaji

Merodavna kombinacija: 1.00xI

+1.00xII+1.00xXI

 $N_1 = -4.79 \text{ kN}$ $M_3 = 30.51 \text{ kNm}$ $M_2 = 0.00 \text{ kNm}$

Kratkotrajni uticaji

Merodavna kombinacija: 1.00xIII

+1.00xXII

 $N_1 = -1.05 \text{ kN}$ $M_3 = 19.02 \text{ kNm}$ $M_2 = 0.00 \text{ kNm}$

Ivni naponi u betonu

[-3760.07 , 22934.57] kN/m²

Ivne dilatacije

[-0.57‰ , 1.16‰]

 $k_2 = 0.125$ $\sigma_{a,II} = 209871.54 \text{ kN/m}^2$ $\beta_2 = 0.50$ $\zeta = 0.93$ $\varepsilon_{sr} = 0.98\%$ $M_r = 18.85 \text{ kNm}$ $N_r = -2.22 \text{ kN}$ $\sigma_{a,r} = 76100.15 \text{ kN/m}^2$ $\mu_{z,ef} = 1.50\%$

Rastojanje prslina Lps = 11.06 cm

Sirina prslina $ak(t_\infty) = 0.184 \text{ mm}$

Ugib

Dugotrajni uticaji

Merodavna kombinacija: 1.00xI

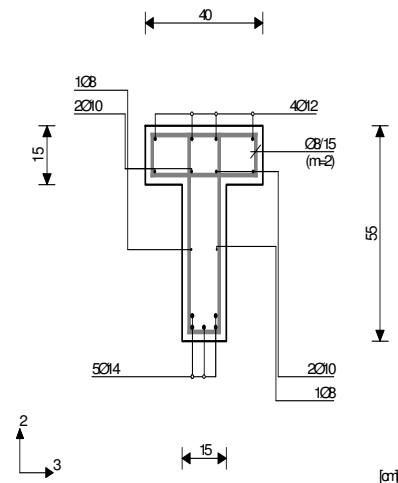
+1.00xII+1.00xXIII

 $N_1 = -4.79 \text{ kN}$ $M_3 = 30.51 \text{ kNm}$ $M_2 = 0.00 \text{ kNm}$

Kratkotrajni uticaji

Merodavna kombinacija:

1.00xIII

 $N_1 = -1.05 \text{ kN}$ $M_3 = 19.02 \text{ kNm}$ $M_2 = 0.00 \text{ kNm}$ **$ug(t_\infty) = 18.030 \text{ mm}$** Presek 2-2 $x = 4.00 \text{ m}$ 

T = 0 Presek sa prslinom

Merodavna kombinacija: 1.00xI

+1.00xII+1.00xXIII

 $N_1 = -4.79 \text{ kN}$ $M_3 = 43.58 \text{ kNm}$ $M_2 = 0.00 \text{ kNm}$

Ivni naponi u betonu

[-4520.77 , 19908.21] kN/m²

Ivne dilatacije

[-0.14‰ , 0.63‰]

 $k_2 = 0.125$ $\sigma_{a,II} = 116531.04 \text{ kN/m}^2$ $\beta_2 = 1.00$ $\zeta = 0.80$ $\varepsilon_{sr} = 0.46\%$ $M_r = 19.68 \text{ kNm}$ $N_r = -2.16 \text{ kN}$ $\sigma_{a,r} = 52602.07 \text{ kN/m}^2$ $\mu_{z,ef} = 2.08\%$

Rastojanje prslina Lps = 11.44 cm

Sirina prslina $ak(t_0) = 0.090 \text{ mm}$

Ugib

Merodavna kombinacija: 1.00xI

+1.00xII+1.00xXIII

 $N_1 = -4.79 \text{ kN}$ $M_3 = 43.58 \text{ kNm}$ $M_2 = 0.00 \text{ kNm}$ **$ug(t_0) = 8.202 \text{ mm}$**

T = ∞ Presek sa prslinom

Dugotrajni uticaji

Merodavna kombinacija: 1.00xI

+1.00xII+1.00xXI

 $N_1 = -4.79 \text{ kN}$ $M_3 = 43.58 \text{ kNm}$ $M_2 = 0.00 \text{ kNm}$

Kratkotrajni uticaji

Merodavna kombinacija: 1.00xIII

+1.00xXII

 $N_1 = -1.05 \text{ kN}$ $M_3 = 27.17 \text{ kNm}$ $M_2 = 0.00 \text{ kNm}$

Ivni naponi u betonu

[-4805.06 , 21963.47] kN/m²

Ivne dilatacije

[-0.65‰ , 1.10‰]

 $k_2 = 0.125$ $\sigma_{a,II} = 198537.24 \text{ kN/m}^2$ $\beta_2 = 0.50$ $\zeta = 0.96$ $\varepsilon_{sr} = 0.96\%$ $M_r = 19.64 \text{ kNm}$ $N_r = -1.62 \text{ kN}$ $\sigma_{a,r} = 52719.25 \text{ kN/m}^2$ $\mu_{z,ef} = 2.08\%$

Rastojanje prslina Lps = 9.76 cm

Sirina prslina $ak(t_\infty) = 0.159 \text{ mm}$

Ugib

Dugotrajni uticaji

Merodavna kombinacija: 1.00xI

+1.00xII+1.00xXIII

 $N_1 = -4.79 \text{ kN}$ $M_3 = 43.58 \text{ kNm}$ $M_2 = 0.00 \text{ kNm}$

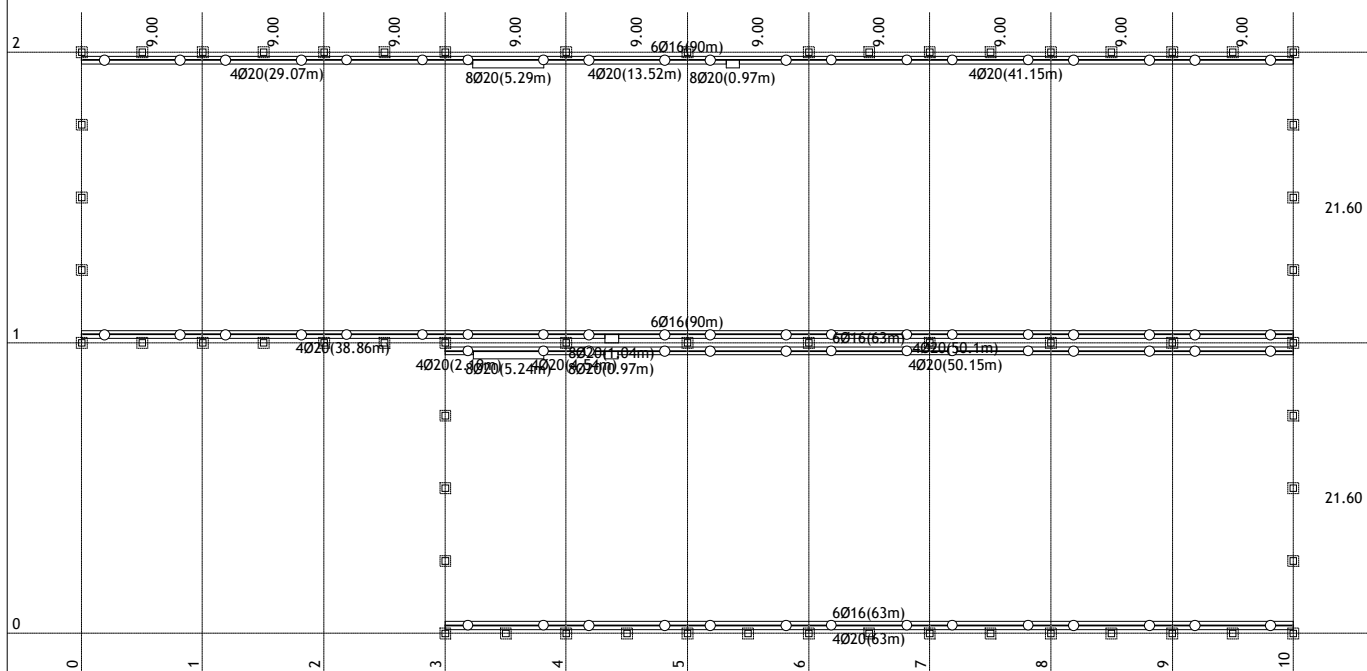
Kratkotrajni uticaji

Merodavna kombinacija:

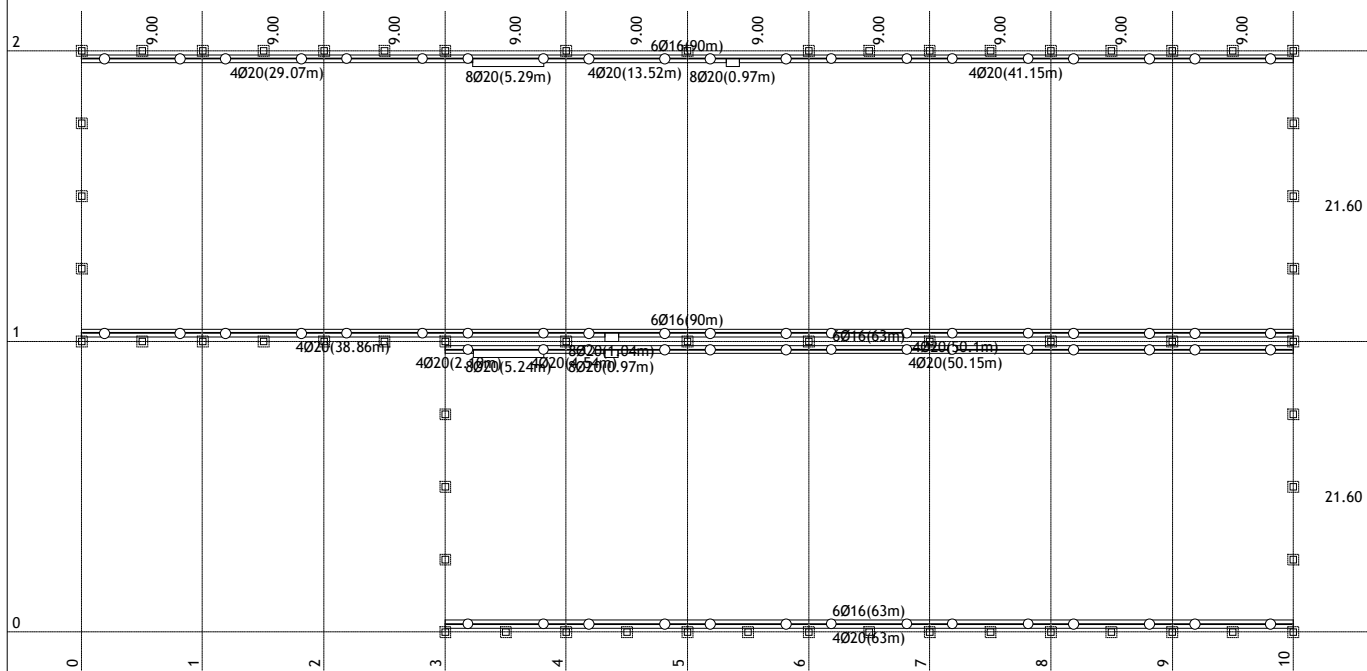
1.00xIII

 $N_1 = -1.05 \text{ kN}$ $M_3 = 27.17 \text{ kNm}$ $M_2 = 0.00 \text{ kNm}$ **$ug(t_\infty) = 26.773 \text{ mm}$**

Usvojena armatura
@1@PBAB 87, MB 30, B500

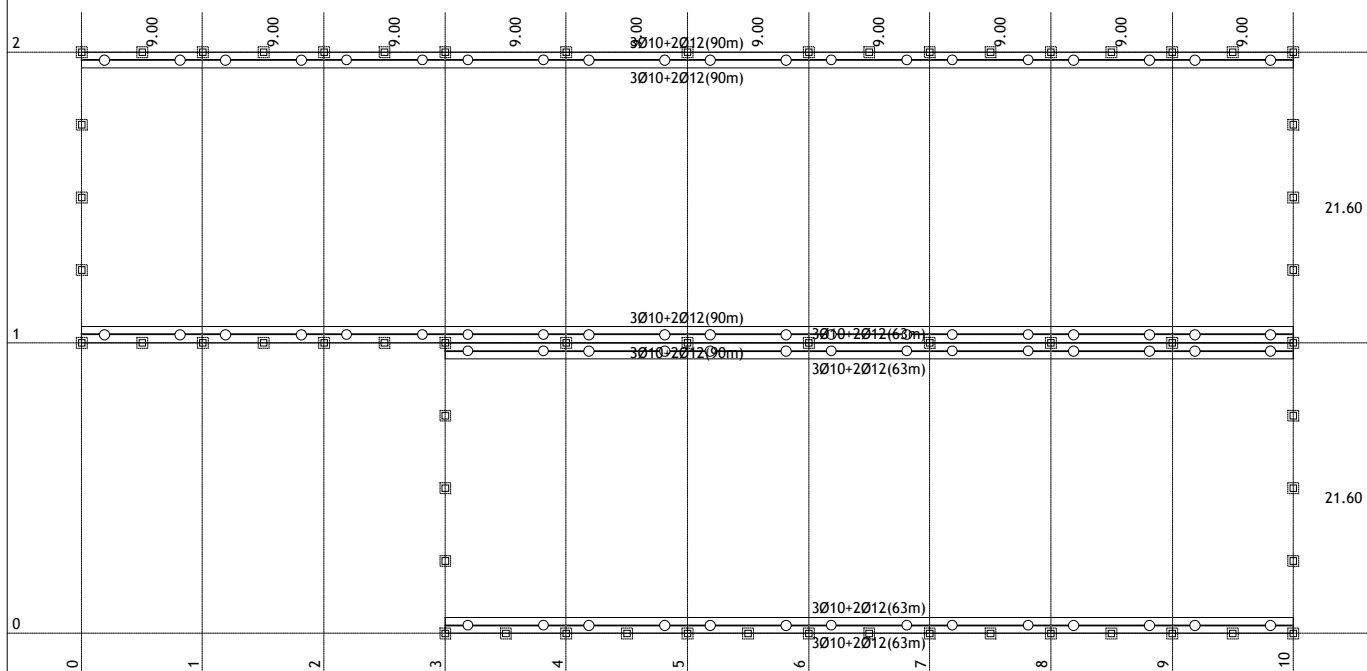


Pogled: GlŠ
Armatura u gredama: Aa2/Aa1
Usvojena armatura
@1@PBAB 87, MB 30, B500

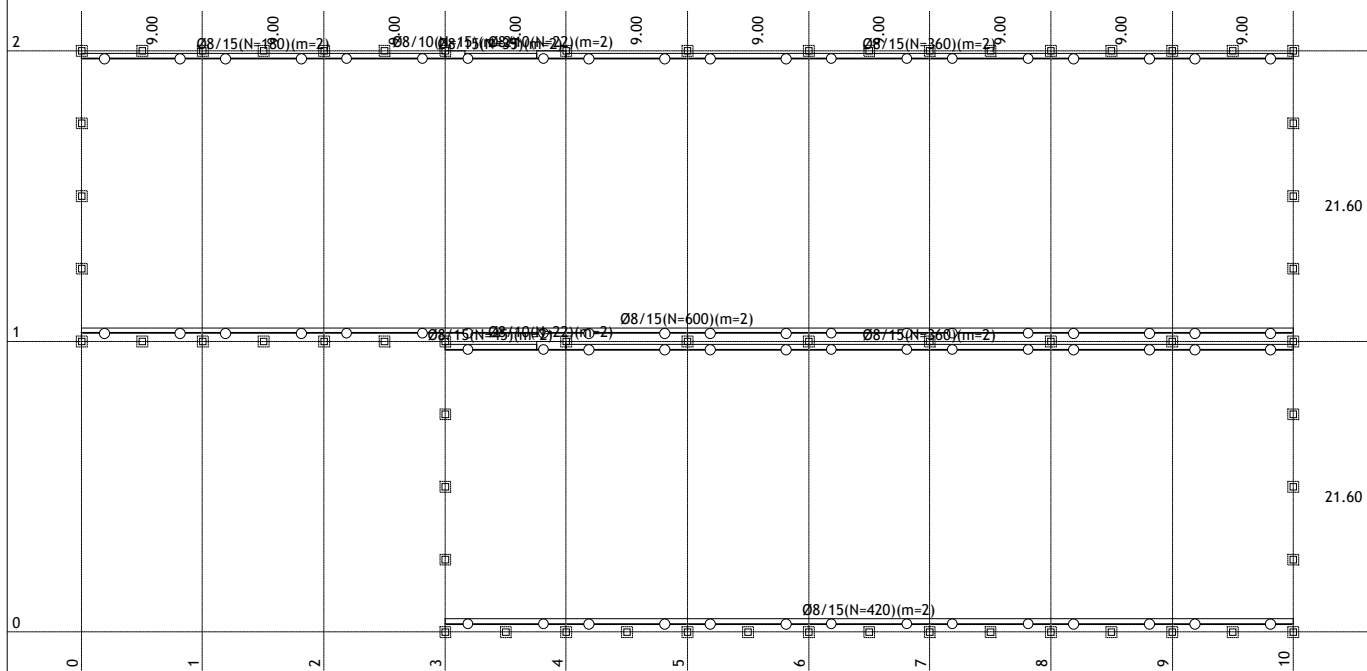


Pogled: GlŠ
Armatura u gredama: Aa2/Aa1

Usvojena armatura
@1@PBAB 87, MB 30, B500

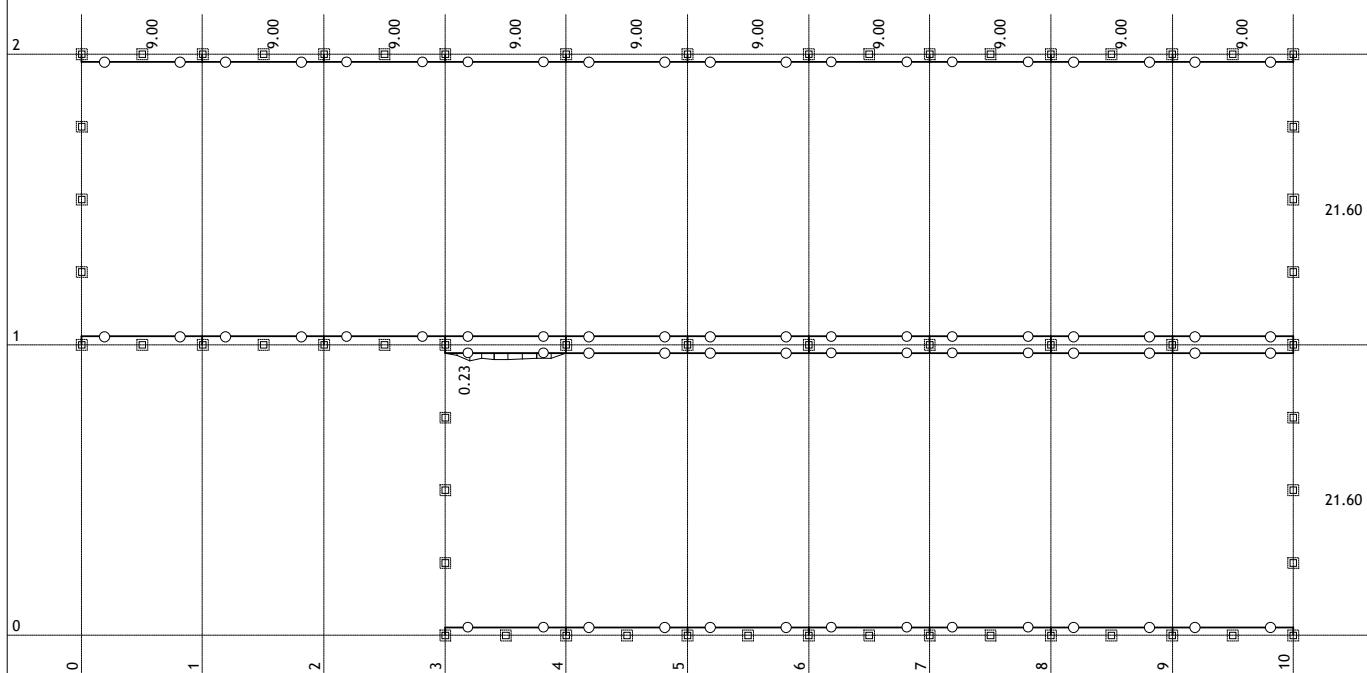


Pogled: GlŠ
Armatura u gredama: Aa3/Aa4
Usvojena armatura
@1@PBAB 87, MB 30, B500

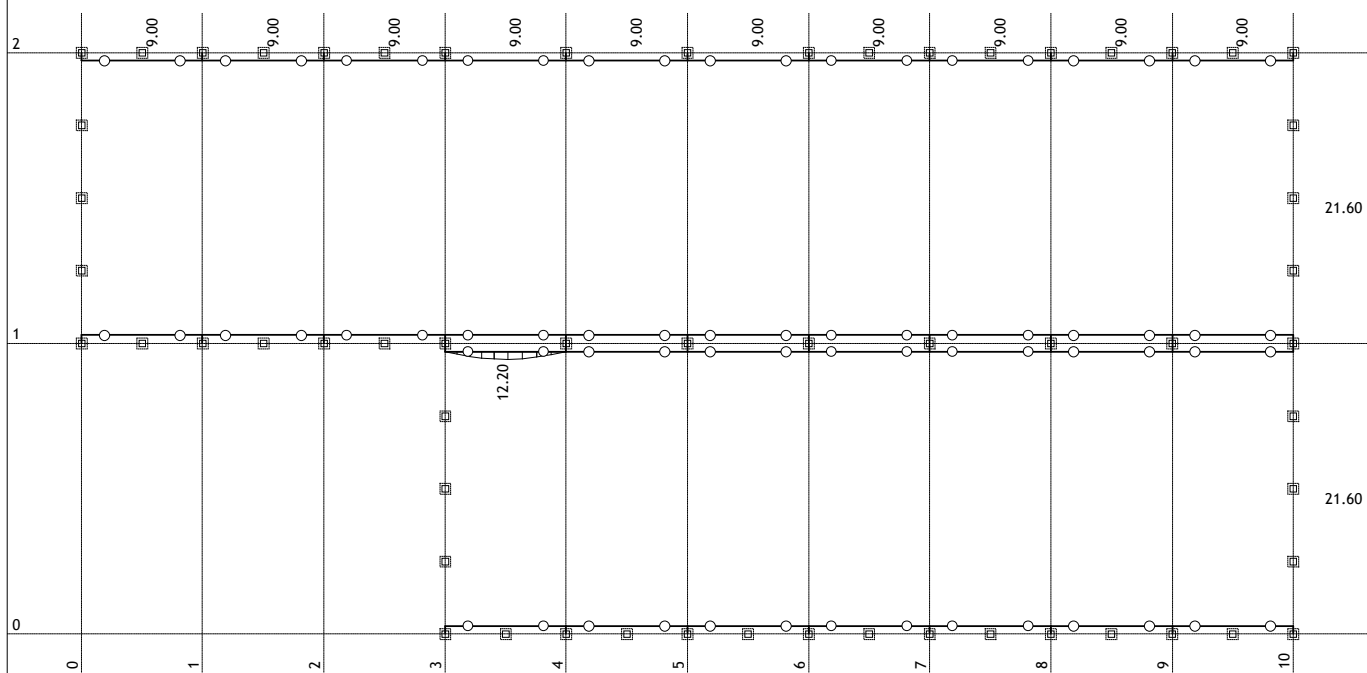


Pogled: GlŠ
Armatura u gredama: Aa,uz

@1@PBAB 87, MB 30, B500



Pogled: GlŠ
Dijagram prsline: max $ak(t^\infty) = 0.23$ mm
@1@PBAB 87, MB 30, B500



Pogled: GlŠ
Dijagram ugiba: max $ug(t^\infty) = 12.20$ mm

Greda 132-95

@1@PBAB 87

MB 30

B500

Eb(t0) = 3.15e+007 kN/m²Ea = 2e+008 kN/m²fbzs = 1680 kN/m²

φ = 2.50

X = 1.00

εs = 0.340‰

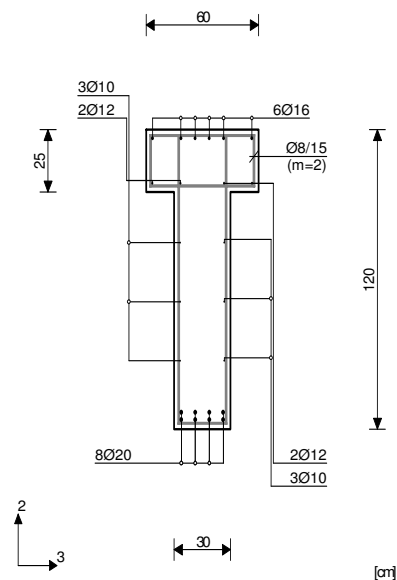
k1 = 0.40

β1 = 1.00

Savijanje oko ose 3

Ugib: Savijanje oko ose 3

Presek 1-1 x = 4.31m



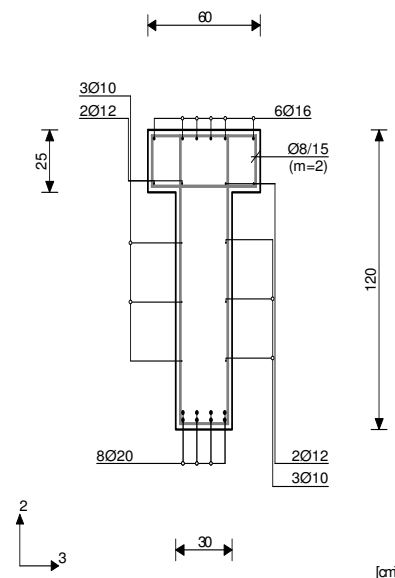
T = 0 Presek sa prslinom
 Merodavna kombinacija: 1.00xI
 +1.00xII+1.00xVII
 N1 = -1.01 kN
 M3 = 245.84 kNm
 M2 = 47.75 kNm
 Ivicni naponi u betonu
 [-3258.74 , 14245.22] kN/m²
 Ivicne dilatacije
 [-0.10‰ , 0.45‰]
 k2 = 0.125
 σa1,II = 86926.50 kN/m²
 β2 = 1.00
 ζ = 0.56
 εsr = 0.25‰
 Mr = 162.27 kNm
 Nr = -0.67 kN
 σa,r = 57375.47 kN/m²
 μz,ef = 2.41%
 Rastojanje prslina Lps = 11.24 cm
Sirina prslina ak(t0) = 0.047 mm
 Ugib
 Merodavna kombinacija: 1.00xI
 +1.00xII+1.00xVII
 N1 = -1.01 kN
 M3 = 245.84 kNm
 M2 = 47.75 kNm
ug(t0) = 1.433 mm

T = ∞ Presek sa prslinom
 Dugotrajni uticaji
 Merodavna kombinacija: 1.00xI
 +1.00xII+1.00xVII
 N1 = -1.01 kN
 M3 = 245.84 kNm
 M2 = 47.75 kNm
 Kratkotrajni uticaji
 Merodavna kombinacija: 1.00xV
 +1.00xVI+1.00xVIII
 N1 = 6.86 kN
 M3 = 342.69 kNm
 M2 = -7.01 kNm
 Ivicni naponi u betonu
 [-5994.38 , 27469.71] kN/m²
 Ivicne dilatacije
 [-0.65‰ , 1.12‰]
 k2 = 0.125
 σa1,II = 212981.34 kN/m²
 β2 = 0.50
 ζ = 0.96
 εsr = 1.03‰
 Mr = 161.79 kNm
 Nr = 1.61 kN
 σa,r = 57542.54 kN/m²
 μz,ef = 2.41%

Rastojanje prslina Lps = 11.24 cm
Sirina prslina ak(t∞) = 0.196 mm

Ugib
 Dugotrajni uticaji
 Merodavna kombinacija: 1.00xI
 +1.00xII+1.00xVII
 N1 = -1.01 kN
 M3 = 245.84 kNm
 M2 = 47.75 kNm
 Kratkotrajni uticaji
 Merodavna kombinacija:
 1.00xV+1.00xVI+1.00xVIII
 N1 = 6.86 kN
 M3 = 342.69 kNm
 M2 = -7.01 kNm
ug(t∞) = 12.205 mm

Presek 2-2 x = 5.36m

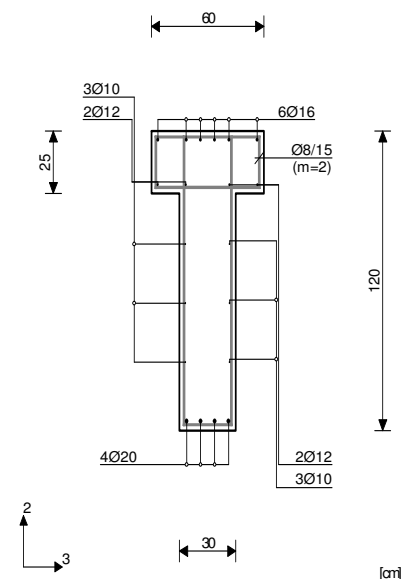


T = 0 Presek sa prslinom
 Merodavna kombinacija: 1.00xI
 +1.00xII+1.00xVII
 N1 = -1.01 kN
 M3 = 252.52 kNm
 M2 = 37.06 kNm
 Ivicni naponi u betonu
 [-3347.30 , 14633.29] kN/m²
 Ivicne dilatacije
 [-0.11‰ , 0.46‰]
 k2 = 0.125
 σa1,II = 89294.64 kN/m²
 β2 = 1.00
 ζ = 0.59
 εsr = 0.26‰
 Mr = 162.27 kNm
 Nr = -0.65 kN
 σa,r = 57376.77 kN/m²
 μz,ef = 2.41%
 Rastojanje prslina Lps = 11.24 cm
Sirina prslina ak(t0) = 0.050 mm
 Ugib
 Merodavna kombinacija: 1.00xI
 +1.00xII+1.00xVII
 N1 = -1.01 kN
 M3 = 252.52 kNm
 M2 = 37.06 kNm
ug(t0) = 1.366 mm

T = ∞ Presek sa prslinom
 Dugotrajni uticaji
 Merodavna kombinacija: 1.00xI
 +1.00xII+1.00xVII
 N1 = -1.01 kN
 M3 = 252.52 kNm
 M2 = 37.06 kNm
 Kratkotrajni uticaji
 Merodavna kombinacija: 1.00xV
 +1.00xVI+1.00xVIII
 N1 = 6.86 kN
 M3 = 366.82 kNm
 M2 = -15.10 kNm
 Ivicni naponi u betonu
 [-6367.09 , 28985.42] kN/m²
 Ivicne dilatacije
 [-0.66‰ , 1.18‰]
 k2 = 0.125
 σa1,II = 223965.67 kN/m²
 β2 = 0.50
 ζ = 0.97
 εsr = 1.08‰
 Mr = 161.81 kNm

Nr = 1.53 kN
 σa,r = 57536.66 kN/m²
 μz,ef = 2.41%
 Rastojanje prslina Lps = 11.24 cm
Sirina prslina ak(t∞) = 0.207 mm
 Ugib
 Dugotrajni uticaji
 Merodavna kombinacija: 1.00xI
 +1.00xII+1.00xVII
 N1 = -1.01 kN
 M3 = 252.52 kNm
 M2 = 37.06 kNm
 Kratkotrajni uticaji
 Merodavna kombinacija:
 1.00xV+1.00xVI+1.00xVIII
 N1 = 6.86 kN
 M3 = 366.82 kNm
 M2 = -15.10 kNm
ug(t∞) = 11.712 mm

Presek 3-3 x = 7.18m

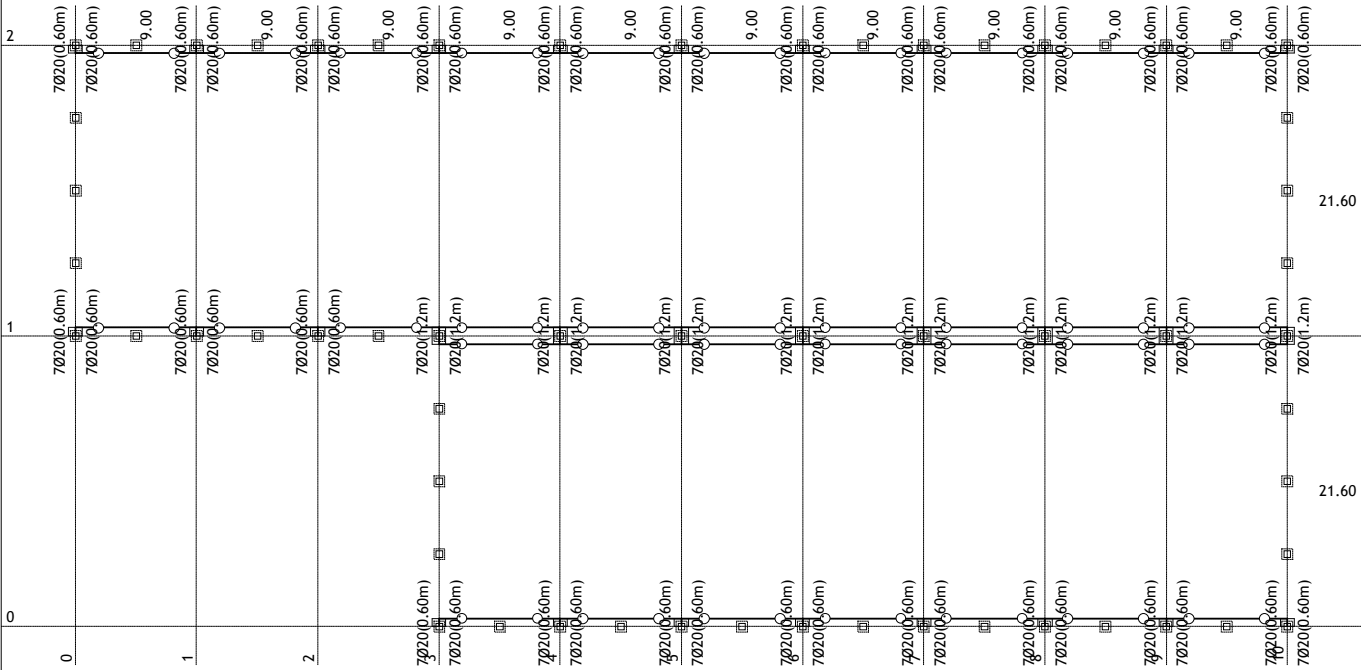


T = 0 Presek bez prslina
 Ugib
 Merodavna kombinacija: 1.00xI
 +1.00xII+1.00xVII
 N1 = -1.01 kN
 M3 = 143.90 kNm
 M2 = 18.53 kNm
ug(t0) = 0.807 mm

T = ∞ Presek sa prslinom
 Dugotrajni uticaji
 Merodavna kombinacija: 1.00xI
 +1.00xII+1.00xVII
 N1 = -1.01 kN
 M3 = 143.90 kNm
 M2 = 18.53 kNm
 Kratkotrajni uticaji
 Merodavna kombinacija: 1.00xV
 +1.00xVI+1.00xVIII
 N1 = 6.86 kN
 M3 = 183.41 kNm
 M2 = -7.55 kNm
 Ivicni naponi u betonu
 [-4660.77 , 41671.86] kN/m²
 Ivicne dilatacije
 [-0.54‰ , 1.13‰]
 k2 = 0.125
 σa1,II = 214883.88 kN/m²
 β2 = 0.50
 ζ = 0.89
 εsr = 0.96‰
 Mr = 153.31 kNm
 Nr = 2.74 kN
 σa,r = 98498.89 kN/m²
 μz,ef = 1.42%
 Rastojanje prslina Lps = 14.12 cm
Sirina prslina ak(t∞) = 0.231 mm
 Ugib
 Dugotrajni uticaji
 Merodavna kombinacija: 1.00xI
 +1.00xII+1.00xVII
 N1 = -1.01 kN
 M3 = 143.90 kNm
 M2 = 18.53 kNm
 Kratkotrajni uticaji
 Merodavna kombinacija:
 1.00xV+1.00xVI+1.00xVIII
 N1 = 6.86 kN
 M3 = 183.41 kNm

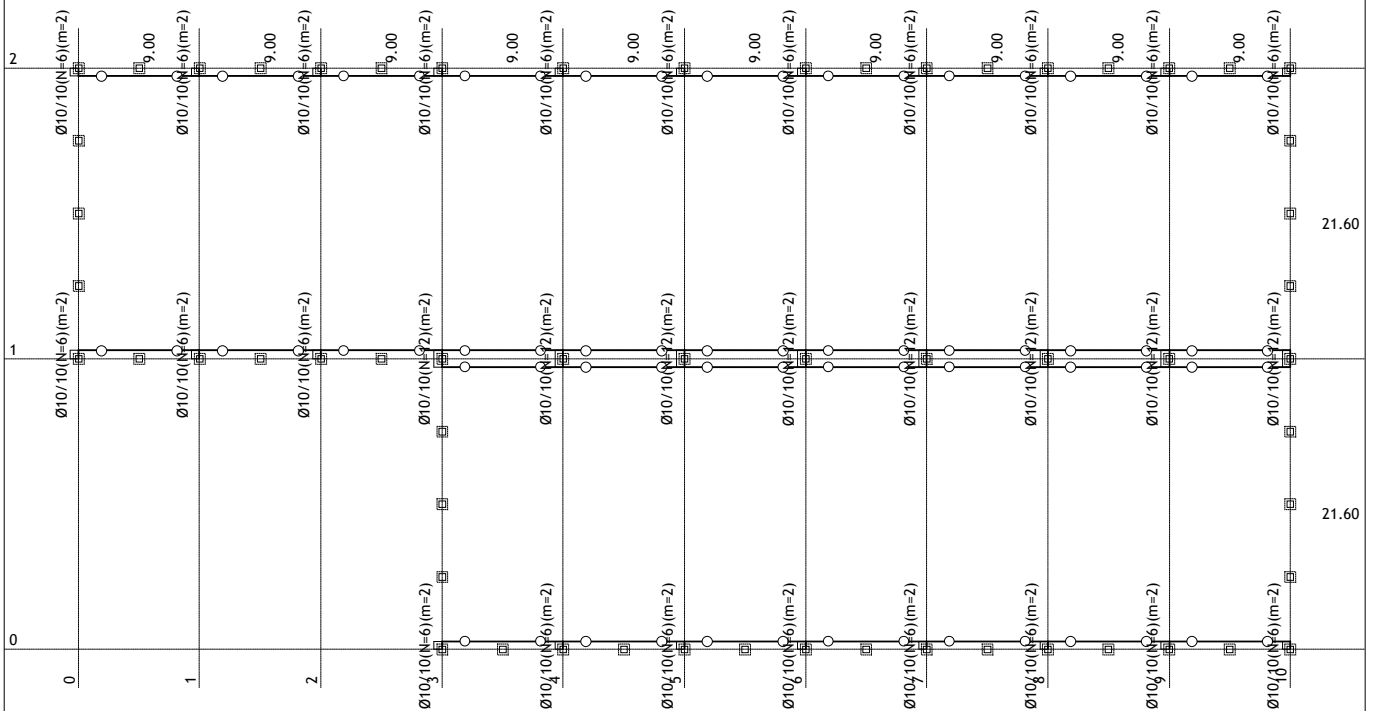
M2 = -7.55 kNm ug(t∞) = 7.398 mm

Usvojena armatura
@1@PBAB 87, MB 30, B500



Pogled: GlŠ
Armatura u gredama: Aa2/Aa1

Usvojena armatura
@1@PBAB 87, MB 30, B500

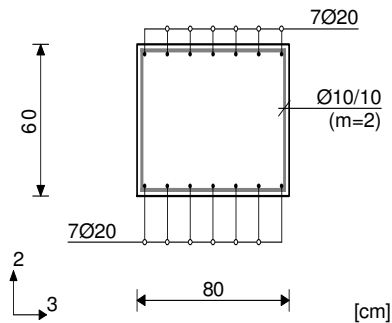


Pogled: GlŠ
Armatura u gredama: Aa,uz

Greda 139-138

@1@PBAB 87
MB 30
B500
Dimenzionisanje grupe slucajeva
opterećenja: 17-1024,1029-1032

Presek 1-1 x = 0.00m



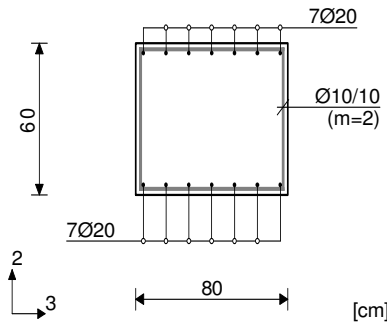
Merodavna kombinacija za savijanje:
1.00xI+1.00xII+1.80xV-1.80xVI
+1.60xXIII+1.80xXIV
N1u = 78.31 kN
M2u = 0.00 kNm
M3u = 42.91 kNm

Merodavna kombinacija za smicanje:
1.60xI+1.00xII-1.80xVI+1.60xXI
+1.80xXII
T2u = 632.39 kN
T3u = 0.39 kN
M1u = 0.00 kNm

$\epsilon_b/\epsilon_a = -0.365/10.000 \%$
Aa1 = 2.45 cm²
Aa2 = 0.56 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 6.32 cm²/m (m=2)
[Usvojeno Aa,uz = Ø10/10(m=2) = 7.85 cm²/m]

$\tau_y = 1.63 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procentat armiranja: 0.92%

Presek 2-2 x = 0.60m



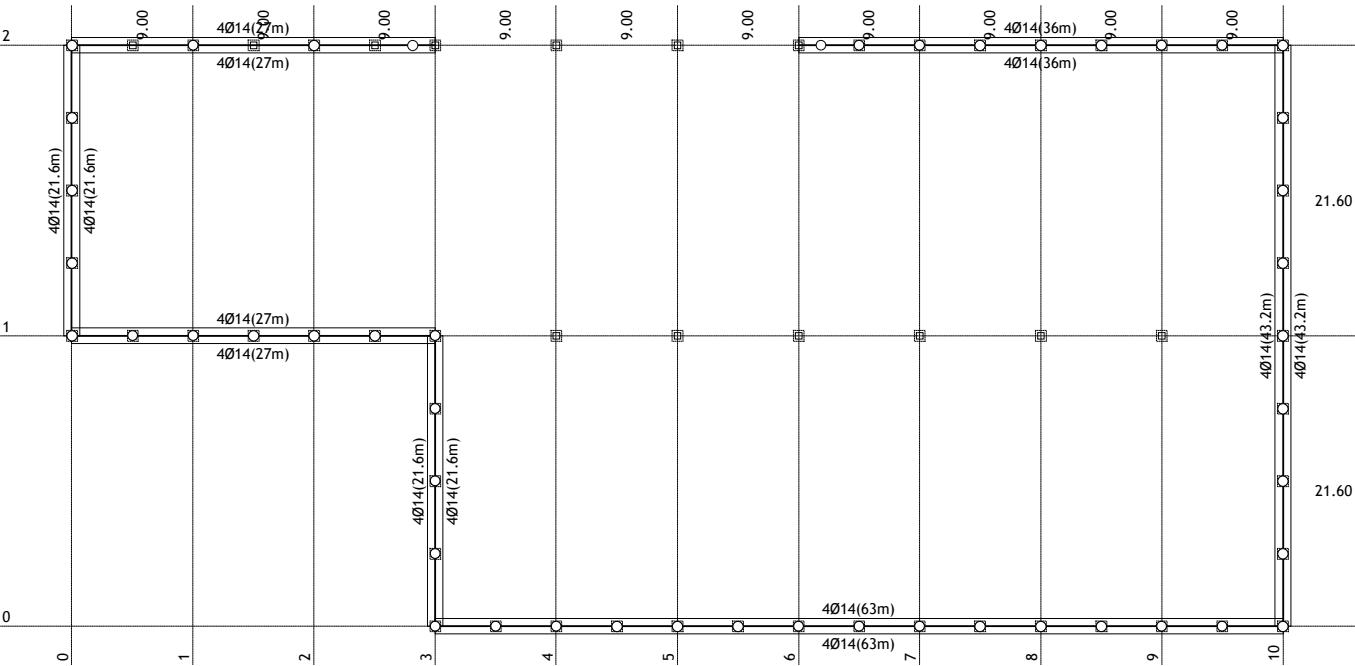
Merodavna kombinacija za savijanje:
1.60xI+1.00xII+1.80xIV+1.80xVI
+1.60xXI+1.80xXII
N1u = -35.65 kN
M2u = 0.00 kNm
M3u = -383.77 kNm

Merodavna kombinacija za smicanje:
1.60xI+1.00xII-1.80xVI+1.60xXI
+1.80xXII
T2u = 643.91 kN
T3u = 0.39 kN
M1u = 0.00 kNm

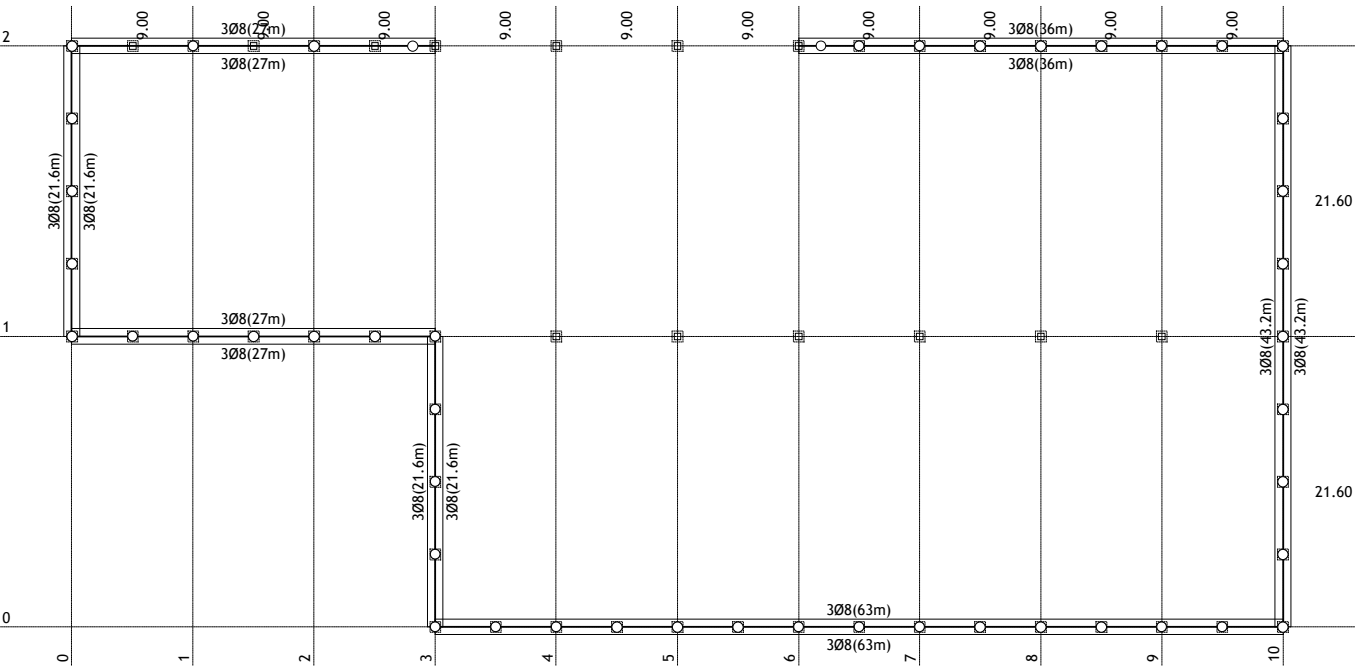
$\epsilon_b/\epsilon_a = -1.673/10.000 \%$
Aa1 = 0.00 cm²
Aa2 = 14.61 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 6.67 cm²/m (m=2)
[Usvojeno Aa,uz = Ø10/10(m=2) = 7.85 cm²/m]

$\tau_y = 1.66 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procentat armiranja: 0.92%

Usvojena armatura
@1@PBAB 87, MB 30, B500

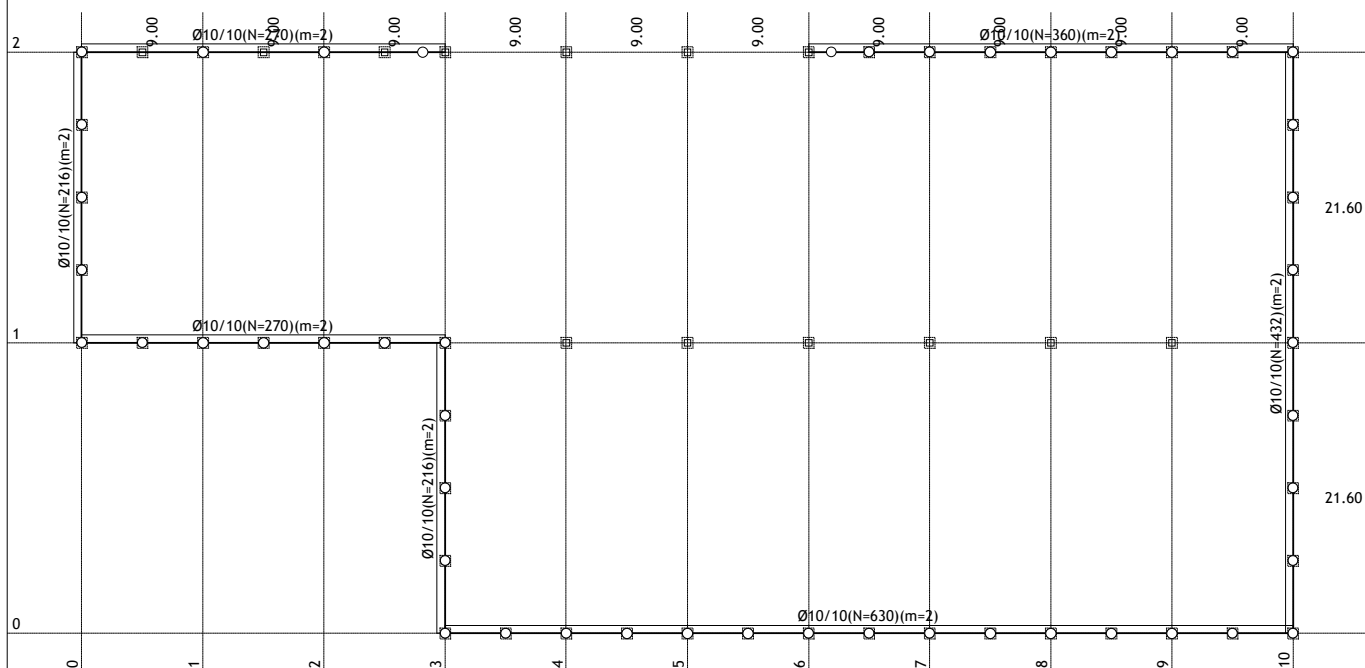


Nivo: [0.00 m]
Armatura u gredama: Aa2/Aa1
Usvojena armatura
@1@PBAB 87, MB 30, B500

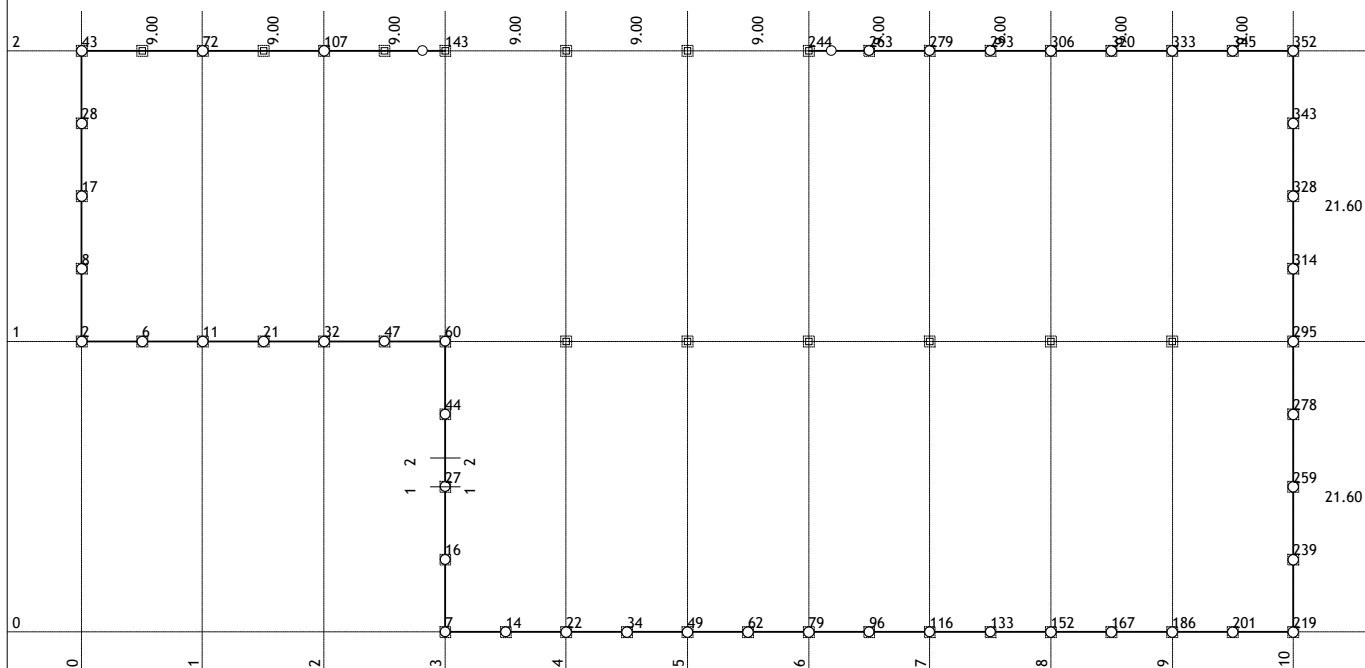


Nivo: [0.00 m]
Armatura u gredama: Aa3/Aa4

Usvojena armatura
@1@PBAB 87, MB 30, B500



Nivo: [0.00 m]
Armatura u gredama: Aa,uz
Usvojena armatura
@1@PBAB 87, MB 30, B500



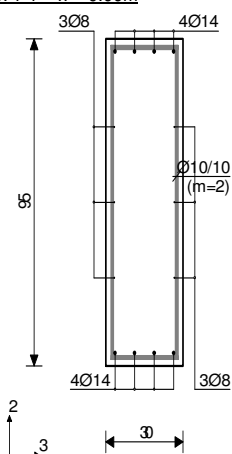
Nivo: [0.00 m]
Dispozicija greda

Greda 27-44

@1@PBAB 87

MB 30

B500

Dimenzionisanje grupe slucajeva
opterećenja: 17-1024,1029-1032**Presek 1-1 x = 0.00m**

Merodavna kombinacija za savijanje:

1.30xI+1.30xII+1.30xIII+1.30xVII
+0.65xVIII+1.30xXVI

N1u = 11.41 kN
M2u = 0.00 kNm
M3u = 0.00 kNm

Merodavna kombinacija za torziju:

1.60xI+1.60xII+1.80xIII+1.80xV
+1.80xVI

M1u = -0.09 kNm

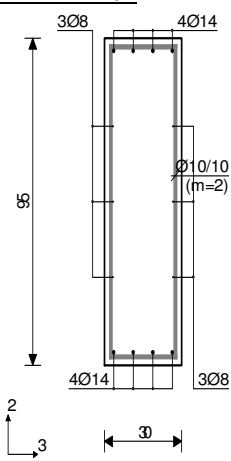
Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIII+1.80xV
+1.80xVI

T2u = -30.78 kN
T3u = 0.00 kN
M1u = -0.09 kNm

 $\epsilon_b/\epsilon_a = 10.000/10.000 \%$ Aa1 = 0.11 cm²Aa2 = 0.11 cm²Aa3 = 0.00 cm²Aa4 = 0.00 cm²Aa,uz = 0.00 cm²/m (m=2)[Usvojeno Aa,uz = Ø10/10(m=2) = 7.85 cm²/m] $\tau_y = 0.14 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$

Procent armiranja: 0.54%

Presek 2-2 x = 2.16m

Merodavna kombinacija za savijanje:

1.60xI+1.00xII+1.80xV-1.80xVI
+1.60xVII

N1u = 5.67 kN
M2u = 0.00 kNm
M3u = 39.56 kNm

Merodavna kombinacija za torziju:

1.60xI+1.60xII+1.80xIII+1.80xV
+1.80xVI

M1u = -0.09 kNm

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIII+1.80xV
+1.80xVI

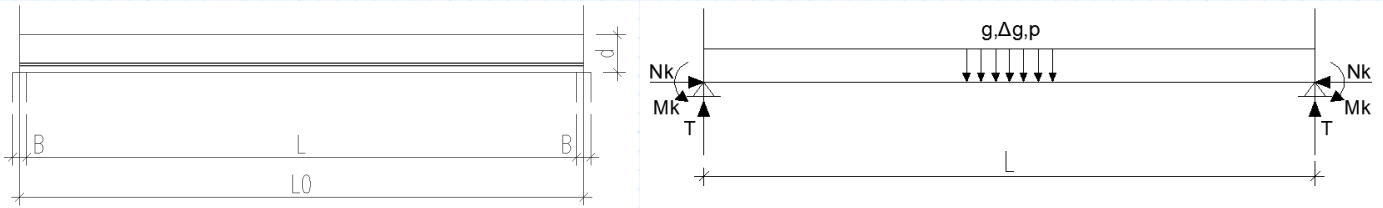
T2u = -6.16 kN
T3u = 0.00 kN
M1u = -0.09 kNm

 $\epsilon_b/\epsilon_a = -0.436/10.000 \%$ Aa1 = 1.00 cm²Aa2 = 0.00 cm²Aa3 = 0.00 cm²Aa4 = 0.00 cm²Aa,uz = 0.00 cm²/m (m=2)[Usvojeno Aa,uz = Ø10/10(m=2) = 7.85 cm²/m] $\tau_y = 0.03 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$

Procent armiranja: 0.54%

1. Glavni nosač POS GN1

1.1 Statički sistem nosača



Dužina grede $L_0 := 2170 \text{ cm}$

Širina oslonca $B := 35 \text{ cm}$

Računski raspon grede: $L := L_0 - 2 \cdot B = 21 \text{ m}$

Usvaja se adheziono ograničeno prednaprezanje pravolinijskom trasom kablova. Ograničeno prednaprezanje podrazumeva dozvoljenu pojavu napona zatezanja što je u skladu sa EC2 - Vrednosti dozvoljenih napona se usvajaju prema propisima PNB71.

1.2 Karakteristike materijala

	Čelik	Beton
Koeficijenti sigurnosti:	$\gamma_s := 1.15$	$\gamma_b := 1.5$
	Moduo elastičnosti betona	
	Dopušteni naponi (PNB71, tabela 5)	
U fazi prethodnog naprezanja:	"30/37"	$E_{cm0} := 32 \text{ GPa}$ $E_{cd0} := \frac{E_{cm0}}{\gamma_b} = 21.3 \text{ GPa}$ $\sigma_{bc0} := 19.5 \text{ MPa}$ $\sigma_{bz0} := 3 \text{ MPa}$
U fazi eksploatacije:	"40/50"	$E_{cmt} := 35 \text{ GPa}$ $E_{cdt} := \frac{E_{cmt}}{\gamma_b} = 23.3 \text{ GPa}$ $\sigma_{bct} := 18.5 \text{ MPa}$ $\sigma_{bzt} := 2.1 \text{ MPa}$

U fazi prethodnog naprezanja sila prethodnog naprezanja se unosi pre nego što beton dostigne punu čvrstoću. Prema PNB71 potrebno je minimalno postignuta čvrstoća 70% računске ($0.7 \cdot 50 = 35$).

Zapreminska težina betona $\gamma_c := 25 \frac{\text{kN}}{\text{m}^3}$

Koeficijent tečenja betona $\varphi_\infty := 2.5$

Usvajaju se sledeće karakteristike užeta za prethodno naprezanje, prema katalogu IMS, Tabela 1.7.2, 70% sile kidanja:

			Moduo elastičnosti čelika	Zatezna čvrstoća čelika	Prečnik užeta	Površina užeta
Usvojen kvalitet čelika:	"B2"	Kablovi	$E_k := 195 \text{ GPa}$	$\sigma_{kz} := 1860 \text{ MPa}$	$\phi_{k1} := 16 \text{ mm}$	$F_{k1} := 150 \text{ mm}^2$
		Armatura	$E_a := 205 \text{ GPa}$	$\sigma_{a0.2} := 500 \text{ MPa}$		

Dopuštena početna sila prethodnog naprezanja: $N_{k1.0} := 195 \text{ kN}$

1.3 Gubici prednaprezanja

Gubitak sile usled elastičnih deformacija: $\varphi_e := 5\%$

Gubitak sile usled tečenja i skupljanja: $\omega_\infty := 20\%$ $\omega := 1 - \omega_\infty = 0.8$

1.4 Opterećenje

Dodatno stalno $\Delta g := 0.5 \frac{\text{kN}}{\text{m}^2} \cdot 9 \text{ m} + (15 \text{ cm} \cdot (40 + 40) \text{ cm}) \cdot 25 \cdot \frac{\text{kN}}{\text{m}^3} \cdot 9 \text{ m} \cdot \frac{1}{2.7 \text{ m}} = 14.5 \frac{\text{kN}}{\text{m}}$

Povremeno $p := \left(1 \frac{\text{kN}}{\text{m}^2}\right) \cdot 9 \text{ m} = 9 \frac{\text{kN}}{\text{m}}$

1.5 Armatura i kablovi

-Kablovi

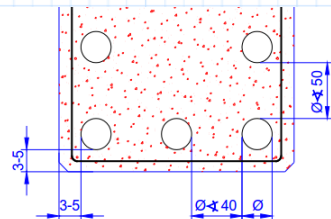
Početna sila prednaprezanja:

$$n := 10 \quad (\text{usvojen ukupan broj užadi})$$

$$N_{k0} := (1 - \varphi_e) \cdot n \cdot N_{k1.0} = 1852.5 \text{ kN}$$

Površina usvojenih kablova:

$$F_k := n \cdot F_{k1} = 15 \text{ cm}^2$$



Minimalna potrebno rastojanje između kablova:

$$a_{min} := \phi_{k1} + 40 \text{ mm} = 5.6 \text{ cm}$$

$$b_{min} := \phi_{k1} + 50 \text{ mm} = 6.6 \text{ cm}$$

Položaj rezultante prethodnog naprezanja u odnosu na donju ivicu preseka:

$$a_k := \frac{(4 \cdot 5 \text{ cm} + 4 \cdot 12 \text{ cm} + 2 \cdot 19 \text{ cm})}{n} = 10.6 \text{ cm}$$

-Armatura

Usvaja se armatura radi regulisanja prslina, za prijem glavnih napona zatezanja na donjoj i gornjoj ivici betonskog preseka.

Površina usvojene armature:

$$n_a := 4 \quad \phi := 14 \text{ mm}$$

$$F_{a1} := n_a \cdot \phi^2 \cdot \frac{\pi}{4} = 6.2 \text{ cm}^2 \quad F_{a2} := F_{a1}$$

Dozvoljeni napon u armaturi:

$$\sigma_{azdop} := 0.6 \cdot \sigma_{a0.2} = 300 \text{ MPa}$$

Rastojanje armature od donje ivice preseka:

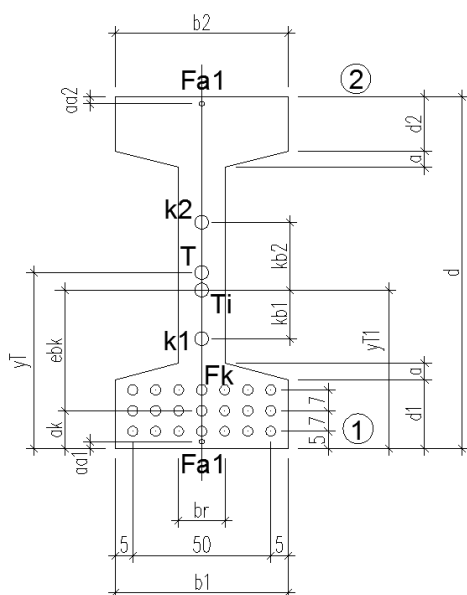
$$a_a := 3.5 \text{ cm}$$

1.6 Proračun napona

-I Faza - Faza prethodnog naprezanja - t=0

Idealizovan presek: $n_k := \frac{E_k}{E_{cm0}} = 6.1 \quad n_a := \frac{E_a}{E_{cm0}} = 6.4$

$$b_1 := 25 \text{ cm} \quad b_2 := 40 \text{ cm} \quad b_r := 15 \text{ cm} \quad d_1 := 26 \text{ cm} \quad d_2 := 21 \text{ cm} \quad d := 150 \text{ cm} \quad a := 9 \text{ cm}$$



Površina betonskog preseka: $F_b = 2922.5 \text{ cm}^2$

Površina betonskog neto preseka: $F_{bn} := F_b - F_k - F_{a1} - F_{a2} = 2895.2 \text{ cm}^2$

Površina betonskog preseka: $F_{bi} := F_{bn} + n_k \cdot F_k + n_a \cdot (F_{a1} + F_{a2}) = 3065.5 \text{ cm}^2$

Položaj težišta betonskog preseka u odnosu na donju ivicu: $y_T = 82.1 \text{ cm}$

Položaj težišta idealizovanog preseka u odnosu na donju ivicu: $y_{Ti} = 80.2 \text{ cm}$

Moment inercije betonskog preseka: $I_b = 6938391.4 \text{ cm}^4$

Moment inercije idealizovanog preseka: $I_{bi} = 7541759.3 \text{ cm}^4$

Otporni momenti: $W_{b1} = 94085.1 \text{ cm}^3 \quad W_{b2} = 107984.5 \text{ cm}^3$

Odstojanja jezgra preseka od težišta: $k_{b1} = 35.2 \text{ cm} \quad k_{b2} = 30.7 \text{ cm}$

Ekscentricitet rezultante prethodnog naprezanja: $e_{bk} := y_{Ti} - a_k = 69.6 \text{ cm}$

$$I_0 := I_b$$

$$e_0 := e_{bk}$$

Sopstvena težina grede:

$$g := F_b \cdot \gamma_c = 7.3 \frac{\text{kN}}{\text{m}}$$

-Statički uticaji u fazi prethodnog naprezanja:

$$n := 0 \dots 11$$

$$\Delta x_n := n \cdot \frac{L}{11} = \begin{bmatrix} 0 \\ 1.9 \\ 3.8 \\ 5.7 \\ 7.6 \\ 9.5 \\ 11.5 \\ 13.4 \\ 15.3 \\ 17.2 \\ 19.1 \\ 21 \end{bmatrix} m$$

$$M_{g_n} := g \cdot \frac{\Delta x(n)}{2} \cdot (L - \Delta x(n)) = \begin{bmatrix} 0 \\ 133.1 \\ 239.7 \\ 319.5 \\ 372.8 \\ 399.4 \\ 399.4 \\ 372.8 \\ 319.5 \\ 239.7 \\ 133.1 \\ 0 \end{bmatrix} kN \cdot m$$

Sila prednaprezanja unosi se na 8m od početka štapa, sa obe strane.

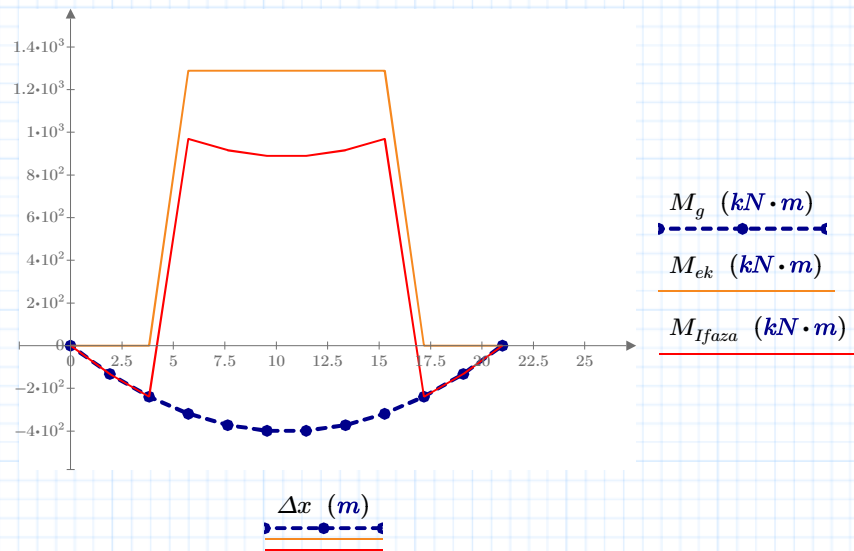
$$n := 0 \dots 11 \quad ns := 5.7 m$$

$$M_{ek_n} := \begin{cases} \text{if } n \cdot \frac{L}{11} < ns \\ 0 \\ \text{else if } n \cdot \frac{L}{11} < (L - ns) \\ -N_{k0} \cdot e_{bk} \\ \text{else} \\ 0 \end{cases}$$

$$M_{ek_n} = \begin{bmatrix} 0 \\ 0 \\ 0 \\ -1288.6 \\ -1288.6 \\ -1288.6 \\ -1288.6 \\ -1288.6 \\ -1288.6 \\ 0 \\ 0 \\ 0 \end{bmatrix} kN \cdot m$$

$$M_{Ifaza_n} := M_{g_n} + M_{ek_n} = \begin{bmatrix} 0 \\ 133.1 \\ 239.7 \\ -969 \\ -915.8 \\ -889.1 \\ -889.1 \\ -915.8 \\ -969 \\ 239.7 \\ 133.1 \\ 0 \end{bmatrix} kN \cdot m$$

Dijagrami momenata:



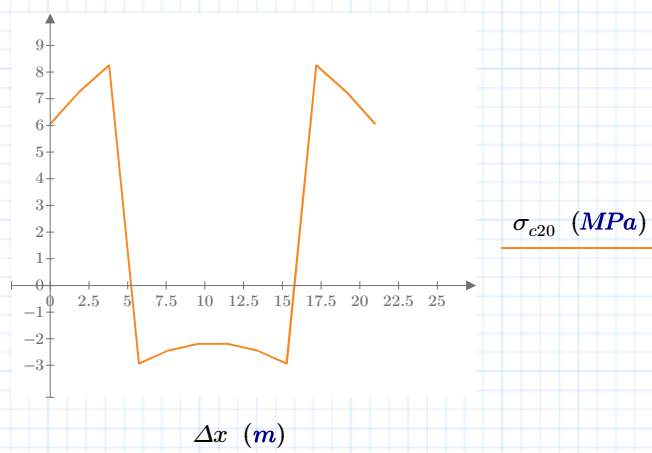
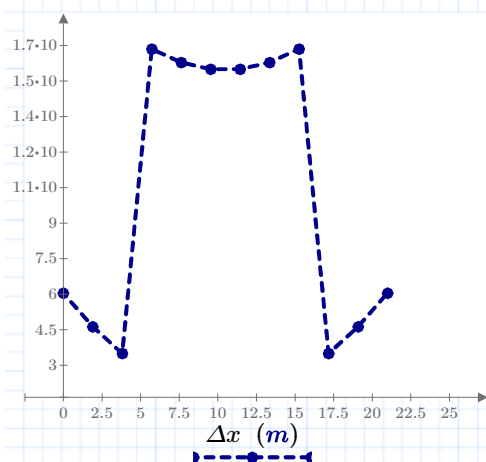
Odgovarajući naponi:

$$\sigma_{c10} := \frac{N_{k0}}{F_{bi}} - \frac{M_{Ifaza}}{W_{b1}} = \begin{bmatrix} 6 \\ 4.6 \\ 3.5 \\ 16.3 \\ 15.8 \\ 15.5 \\ 15.5 \\ 15.8 \\ 16.3 \\ 3.5 \\ 4.6 \\ 6 \end{bmatrix} MPa$$

$$\sigma_{c20} := \frac{N_{k0}}{F_{bi}} + \frac{M_{Ifaza}}{W_{b2}} = \begin{bmatrix} 6 \\ 7.3 \\ 8.3 \\ -2.9 \\ -2.4 \\ -2.2 \\ -2.2 \\ -2.4 \\ -2.9 \\ 8.3 \\ 7.3 \\ 6 \end{bmatrix} MPa$$

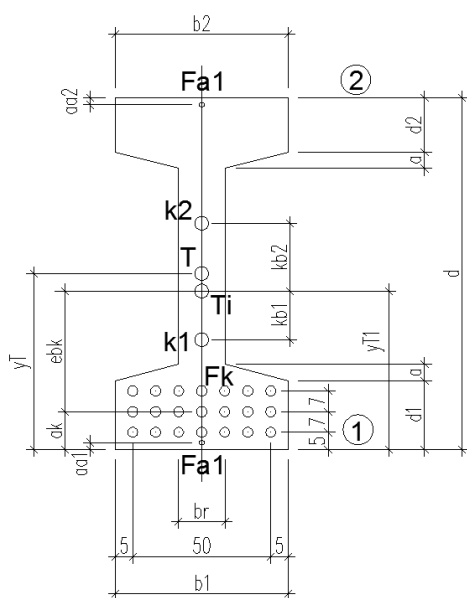
Dijagrami dilatacija donje i gornje ivice betona:

Dijagrami dilatacija donje i gornje ivice betona:



-II Faza Faza eksploatacije - $t = \infty$

Idealizovan presek: $n_k := \frac{E_k}{E_{cmt}} = 5.6$ $n_a := \frac{E_a}{E_{cmt}} = 5.9$



Površina betonskog preseka: $F_b = 2922.5 \text{ cm}^2$

Površina betonskog neto preseka: $F_{bn} := F_b - F_k - F_{a1} - F_{a2} = 2895.2 \text{ cm}^2$

Površina betonskog preseka: $F_{bi} := F_{bn} + n_k \cdot F_k + n_a \cdot (F_{a1} + F_{a2}) = 3050.9 \text{ cm}^2$

Položaj težišta betonskog preseka u odnosu na donju ivicu: $y_T = 82.1 \text{ cm}$

Položaj težišta idealizovanog preseka u odnosu na donju ivicu: $y_{Ti} = 80.3 \text{ cm}$

Moment inercije betonskog preseka: $I_b = 6938391.4 \text{ cm}^4$

Moment inercije idealizovanog preseka: $I_{bi} = 7484469.3 \text{ cm}^4$

Otporni momenti: $W_{b1} = 93149.6 \text{ cm}^3$ $W_{b2} = 107456.6 \text{ cm}^3$

Odstojanja jezgra preseka od težišta: $k_{b1} = 35.2 \text{ cm}$ $k_{b2} = 30.5 \text{ cm}$

Ekscentricitet rezultante prethodnog naprezanja: $e_{bk} := y_{Ti} - a_k = 69.7 \text{ cm}$

$N_{kt} := \omega \cdot N_{k0} = 1482 \text{ kN}$

-Statički uticaji u fazi eksploatacije:

I faza: $M_g^T = [0 \ 133.1 \ 239.7 \ 319.5 \ 372.8 \ 399.4 \ 399.4 \ 372.8 \ 319.5 \ 239.7 \ 133.1 \ 0] \text{ kN} \cdot \text{m}$

Kablovi: $M_{ek}^T = [0 \ 0 \ -1033.7 \ -1033.7 \ -1033.7 \ -1033.7 \ -1033.7 \ -1033.7 \ -1033.7 \ -1033.7 \ 0 \ 0] \text{ kN} \cdot \text{m}$

Dodatno stalno opterećenje:

Korisno opterećenje:

Dodatno stalno opterećenje:

Korisno opterećenje:

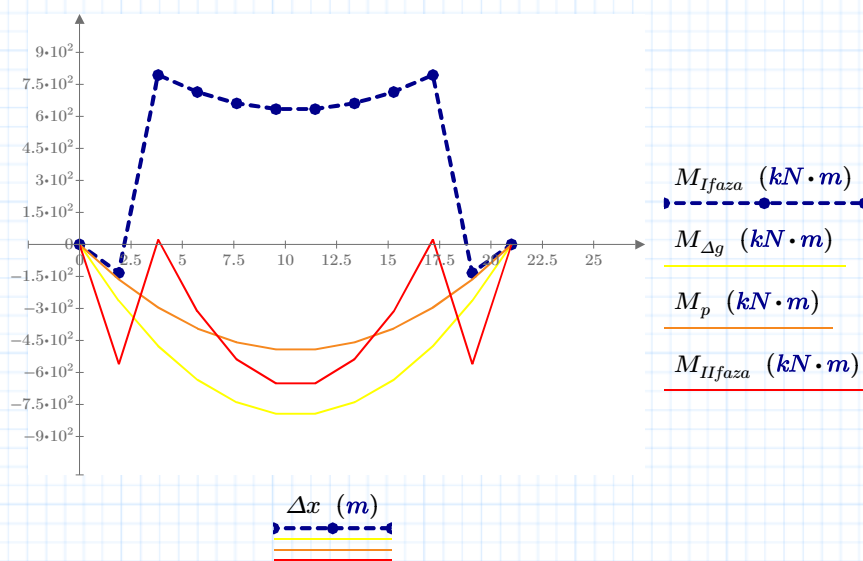
$$M_{\Delta g_n} := \Delta g \cdot \frac{\Delta x(n)}{2} \cdot (L - \Delta x(n)) = \begin{bmatrix} 0 \\ 264.2 \\ 475.6 \\ 634.2 \\ 739.9 \\ 792.7 \\ 792.7 \\ 739.9 \\ 634.2 \\ 475.6 \\ 264.2 \\ 0 \end{bmatrix} \text{ kN} \cdot \text{m}$$

$$M_{p_n} := p \cdot \frac{\Delta x(n)}{2} \cdot (L - \Delta x(n)) = \begin{bmatrix} 0 \\ 164 \\ 295.2 \\ 393.6 \\ 459.2 \\ 492 \\ 492 \\ 459.2 \\ 393.6 \\ 295.2 \\ 164 \\ 0 \end{bmatrix} \text{ kN} \cdot \text{m}$$

$$M_{II faza} := M_g + M_{ek} + M_{\Delta g} + M_p$$

$$M_{II faza}^T = [0 \ 561.4 \ -23.2 \ 313.6 \ 538.2 \ 650.5 \ 650.5 \ 538.2 \ 313.6 \ -23.2 \ 561.4 \ 0] \text{ kN} \cdot \text{m}$$

Dijagrami momenata:

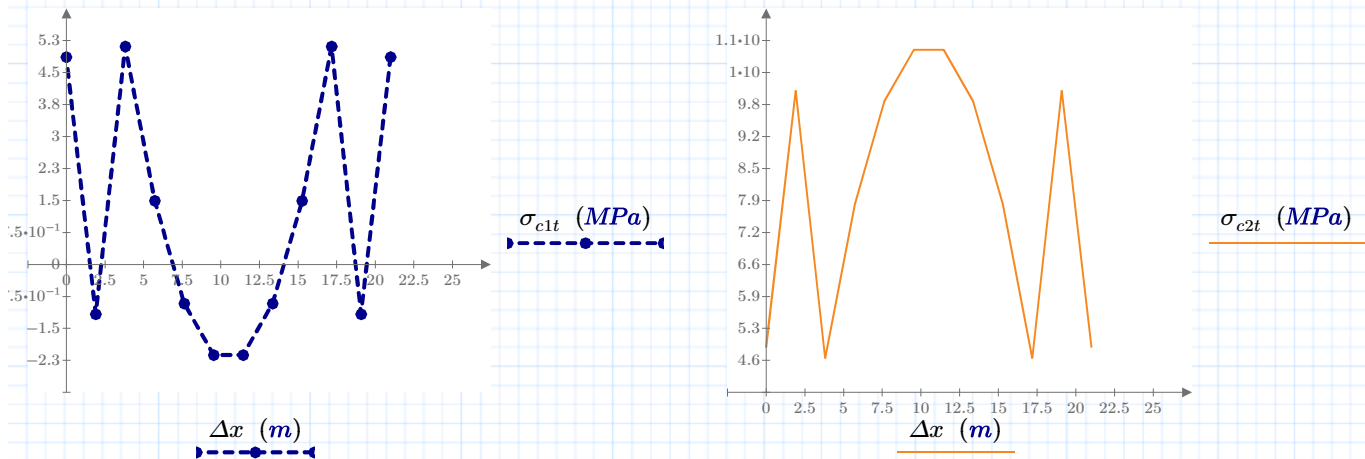


Odgovarajući naponi:

$$\sigma_{c1t} := \frac{N_{kt}}{F_{bi}} - \frac{M_{II faza}}{W_{b1}} = \begin{bmatrix} 4.9 \\ -1.2 \\ 5.1 \\ 1.5 \\ -0.9 \\ -2.1 \\ -2.1 \\ -0.9 \\ 1.5 \\ 5.1 \\ -1.2 \\ 4.9 \end{bmatrix} \text{ MPa}$$

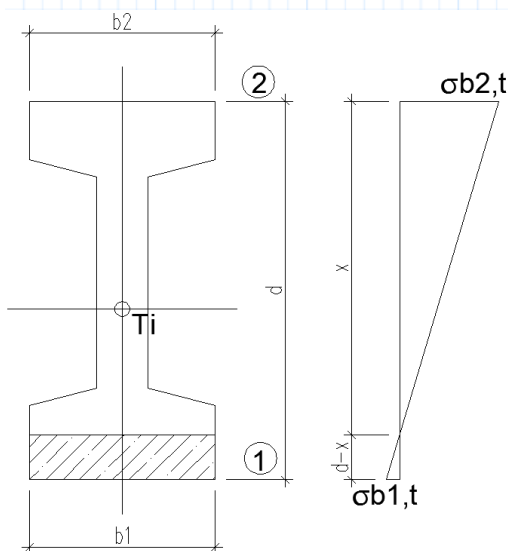
$$\sigma_{c2t} := \frac{N_{kt}}{F_{bi}} + \frac{M_{II faza}}{W_{b2}} = \begin{bmatrix} 4.9 \\ 10.1 \\ 4.6 \\ 7.8 \\ 9.9 \\ 10.9 \\ 10.9 \\ 9.9 \\ 7.8 \\ 4.6 \\ 10.1 \\ 4.9 \end{bmatrix} \text{ MPa}$$

Dijagrami dilatacija donje i gornje ivice betona:



1.7 Provera usvojene armature za prihvatanje normalnih napona zatezanja

-Donja ivica preseka:



$$\sigma_{c1tmin} := 2.1 \text{ MPa}$$

$$\sigma_{c2todg} := 10.9 \text{ MPa}$$

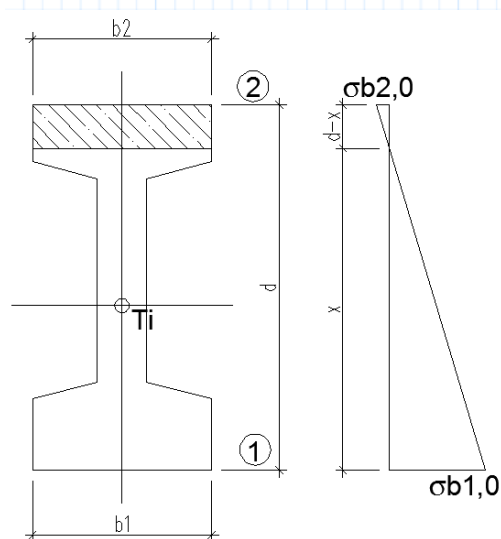
$$x := \frac{\sigma_{c2todg}}{\sigma_{c1tmin} + \sigma_{c2todg}} \cdot d = 1.3 \text{ m}$$

$$d - x = 24.2 \text{ cm}$$

$$Z_{ar} := b_1 \cdot (d - x) \cdot \frac{\sigma_{c1tmin}}{2} = 63.6 \text{ kN}$$

$$F_{a1potr} := \frac{Z_{ar}}{\sigma_{azdop}} = 2.1 \text{ cm}^2 \quad \square < \square \quad F_{a1} = 6.2 \text{ cm}^2 \quad OK$$

-Gornja ivica preseka:



$$\sigma_{c10odg} := 16.3 \text{ MPa}$$

$$\sigma_{c20min} := 2.9 \text{ MPa}$$

$$x := \frac{\sigma_{c10odg}}{\sigma_{c10odg} + \sigma_{c20min}} \cdot d = 1.3 \text{ m}$$

$$d - x = 22.7 \text{ cm}$$

$$Z_{ar} := b_2 \cdot (d - x) \cdot \frac{\sigma_{c20min}}{2} = 131.4 \text{ kN}$$

$$F_{a2potr} := \frac{Z_{ar}}{\sigma_{azdop}} = 4.4 \text{ cm}^2 \quad \square < \square \quad F_{a2} = 6.2 \text{ cm}^2 \quad OK$$

1.8 Kontrola glavnih napona zatezanja na osloncu

-Kontrola će biti sprovedena na mestu početka horizontalne vute. Početak vute je na $x := 80 \text{ cm}$ od početka nosača.

-Statički uticaji na mestu x u fazi eksploatacije: $q := g + \Delta g + p = 30.8 \frac{\text{kN}}{\text{m}}$

$$\delta := d_1 = 26 \text{ cm}$$

$$M_q := q \cdot \frac{L}{2} \cdot x - q \cdot \frac{x^2}{2} = 248.9 \text{ kN} \cdot \text{m}$$

$$h := d - 2 \cdot \delta = 98 \text{ cm}$$

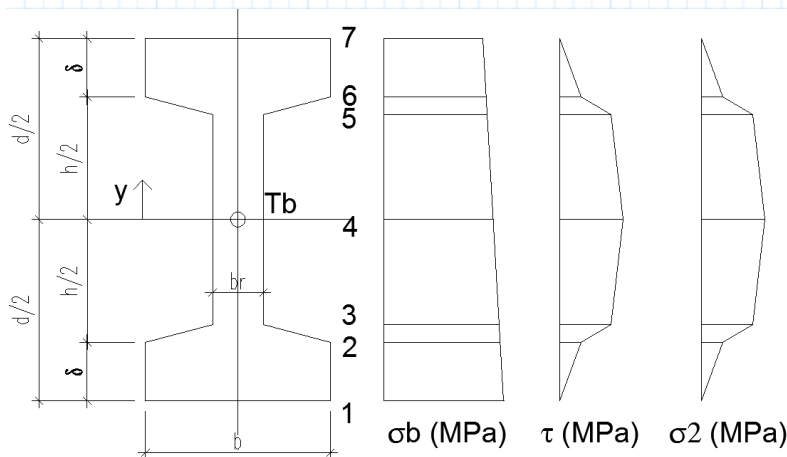
$$b := b_1 = 25 \text{ cm}$$

$$T_q := q \cdot \frac{L}{2} - q \cdot x = 298.8 \text{ kN}$$

$$i_b := \sqrt{\frac{I_b}{F_b}} = 48.7 \text{ cm}$$

-Sila prednaprezanja je horizontalna - nema redukcije T sile usled sile prednaprezanja.

-Glavni naponi zatezanja na rastojanju y od Tb:



$$\sigma_b := \frac{N_{kt}}{F_b} \cdot \left(1 - \frac{e_{bk}}{i_b^2} \cdot y \right) + \frac{M_q}{I_b} \cdot y$$

-za tačke 1,2,6 i 7:

$$S_b := \frac{b}{2} \cdot \left(\left(\frac{h}{2} + \delta \right)^2 - y^2 \right) \quad \tau := \frac{T_q \cdot S_b}{I_b \cdot b}$$

-za tačke 3,4,5 i 6:

$$S_b := \frac{b_r}{2} \cdot \left(\frac{h^2}{4} - y^2 \right) + \frac{b}{2} \cdot \delta \cdot (h + \delta) \quad \tau := \frac{T_q \cdot S_b}{I_b \cdot b_r}$$

$$\sigma_2 := \frac{\sigma_b}{2} - \sqrt{\frac{\sigma_b^2}{4} + \tau^2} = ? \text{ MPa}$$

-Tačka 1: $y := \frac{-d}{2} = -75 \text{ cm}$

$$\sigma_b := \frac{N_{kt}}{F_b} \cdot \left(1 - \frac{e_{bk}}{i_b^2} \cdot y \right) + \frac{M_q}{I_b} \cdot y = 13.5539 \text{ MPa}$$

$$S_b := \frac{b}{2} \cdot \left(\left(\frac{h}{2} + \delta \right)^2 - y^2 \right) = 0 \text{ cm}^3$$

$$\tau := \frac{T_q \cdot S_b}{I_b \cdot b} = 0 \text{ MPa}$$

$$\sigma_{2.1} := \frac{\sigma_b}{2} - \sqrt{\frac{\sigma_b^2}{4} + \tau^2} = 0 \text{ MPa}$$

-Tačka 2: $y := -\left(\frac{d}{2} - \delta \right) = -49 \text{ cm}$

$$\sigma_b := \frac{N_{kt}}{F_b} \cdot \left(1 - \frac{e_{bk}}{i_b^2} \cdot y \right) + \frac{M_q}{I_b} \cdot y = 10.6131 \text{ MPa}$$

$$S_b := \frac{b}{2} \cdot \left(\left(\frac{h}{2} + \delta \right)^2 - y^2 \right) = 40300 \text{ cm}^3$$

$$\tau := \frac{T_q \cdot S_b}{I_b \cdot b} = 0.6943 \text{ MPa}$$

$$\sigma_{2.2} := \frac{\sigma_b}{2} - \sqrt{\frac{\sigma_b^2}{4} + \tau^2} = -0.0452 \text{ MPa}$$

-Tačka 3: $y := -\left(\frac{d}{2} - \delta - a \right) = -40 \text{ cm}$

$$\sigma_b := \frac{N_{kt}}{F_b} \cdot \left(1 - \frac{e_{bk}}{i_b^2} \cdot y \right) + \frac{M_q}{I_b} \cdot y = 9.5952 \text{ MPa}$$

$$S_b := \frac{b_r}{2} \cdot \left(\frac{h^2}{4} - y^2 \right) + \frac{b}{2} \cdot \delta \cdot (h + \delta) = 46307.5 \text{ cm}^3$$

$$\tau := \frac{T_q \cdot S_b}{I_b \cdot b_r} = 1.3296 \text{ MPa}$$

$$\sigma_{2.3} := \frac{\sigma_b}{2} - \sqrt{\frac{\sigma_b^2}{4} + \tau^2} = -0.1808 \text{ MPa}$$

-Tačka 4: $y := 0 \text{ cm}$

$$\sigma_b := \frac{N_{kt}}{F_b} \cdot \left(1 - \frac{e_{bk}}{i_b^2} \cdot y\right) + \frac{M_q}{I_b} \cdot y = 5.071 \text{ MPa}$$

$$S_b := \frac{b_r}{2} \cdot \left(\frac{h^2}{4} - y^2\right) + \frac{b}{2} \cdot \delta \cdot (h + \delta) = 58307.5 \text{ cm}^3$$

$$\tau := \frac{T_q \cdot S_b}{I_b \cdot b_r} = 1.6741 \text{ MPa}$$

$$\sigma_{2.4} := \frac{\sigma_b}{2} - \sqrt{\frac{\sigma_b^2}{4} + \tau^2} = -0.5028 \text{ MPa}$$

-Tačka 5: $y := \left(\frac{d}{2} - \delta - a\right) = 40 \text{ cm}$

$$\sigma_b := \frac{N_{kt}}{F_b} \cdot \left(1 - \frac{e_{bk}}{i_b^2} \cdot y\right) + \frac{M_q}{I_b} \cdot y = 0.5468 \text{ MPa}$$

$$S_b := \frac{b_r}{2} \cdot \left(\frac{h^2}{4} - y^2\right) + \frac{b}{2} \cdot \delta \cdot (h + \delta) = 46307.5 \text{ cm}^3$$

$$\tau := \frac{T_q \cdot S_b}{I_b \cdot b_r} = 1.3296 \text{ MPa}$$

$$\sigma_{2.5} := \frac{\sigma_b}{2} - \sqrt{\frac{\sigma_b^2}{4} + \tau^2} = -1.084 \text{ MPa}$$

-Tačka 6: $y := \left(\frac{d}{2} - \delta\right) = 49 \text{ cm}$

$$\sigma_b := \frac{N_{kt}}{F_b} \cdot \left(1 - \frac{e_{bk}}{i_b^2} \cdot y\right) + \frac{M_q}{I_b} \cdot y = -0.4711 \text{ MPa}$$

$$S_b := \frac{b}{2} \cdot \left(\left(\frac{h}{2} + \delta\right)^2 - y^2\right) = 40300 \text{ cm}^3$$

$$\tau := \frac{T_q \cdot S_b}{I_b \cdot b} = 0.6943 \text{ MPa}$$

$$\sigma_{2.6} := \frac{\sigma_b}{2} - \sqrt{\frac{\sigma_b^2}{4} + \tau^2} = -0.9687 \text{ MPa}$$

-Tačka 7: $y := \frac{d}{2} = 75 \text{ cm}$

$$\sigma_b := \frac{N_{kt}}{F_b} \cdot \left(1 - \frac{e_{bk}}{i_b^2} \cdot y\right) + \frac{M_q}{I_b} \cdot y = -3.4119 \text{ MPa}$$

$$S_b := \frac{b}{2} \cdot \left(\left(\frac{h}{2} + \delta\right)^2 - y^2\right) = 0 \text{ cm}^3$$

$$\tau := \frac{T_q \cdot S_b}{I_b \cdot b} = 0 \text{ MPa}$$

$$\sigma_{2.7} := \frac{\sigma_b}{2} - \sqrt{\frac{\sigma_b^2}{4} + \tau^2} = -3.4119 \text{ MPa}$$

-Najveći napon zatezanja: $\sigma_{2.max} := \min(\sigma_{2.1}, \sigma_{2.2}, \sigma_{2.3}, \sigma_{2.4}, \sigma_{2.5}, \sigma_{2.6}, \sigma_{2.7}) = -3.4 \text{ MPa}$ $\blacksquare > \blacksquare$ $\tau_a := 1.1 \text{ MPa}$ (PNB71, tabela 5)

$$\sigma_{b.odg} := 3.41 \text{ MPa}$$

-Proračun armature za prijem glavnih napona zatezanja:

$$u := 2 \cdot \left| \frac{\sigma_{2.max}}{\sigma_{b.odg}} \right| = 2.001 \quad \varphi := \frac{1}{2} \arctan(u) = 31.72^\circ$$

-Vertikalne dvosečne uzengije $m := 2$:

$$x := \frac{|\sigma_{2.max}| \cdot b_r}{\sigma_{a0.2} \cdot m} \cdot (\cos(\varphi))^2 = 0.037 \text{ cm}$$

$$-\phi 10 : f_{vu.10} := \frac{1 \text{ cm}^2 \pi}{4} = 0.79 \text{ cm}^2$$

$$e_{vu.10} := \frac{f_{vu.10}}{x} = 21.2 \text{ cm}$$

$$-\phi 8 : f_{vu.8} := \frac{0.64 \text{ cm}^2 \pi}{4} = 0.5 \text{ cm}^2$$

$$e_{vu.8} := \frac{f_{vu.8}}{x} = 13.6 \text{ cm}$$

-Horizontalna armatura:

$$x := \frac{|\sigma_{2.max}| \cdot b_r}{\sigma_{a0.2} \cdot m} = 0.0512 \text{ cm}$$

$$-\phi 10 : f_{vu.10} := \frac{1 \text{ cm}^2 \pi}{4} = 0.79 \text{ cm}^2$$

$$e_{vu.10} := \frac{f_{vu.10}}{x} = 15.3 \text{ cm}$$

$$-\phi 8 : f_{vu.8} := \frac{0.64 \text{ cm}^2 \pi}{4} = 0.5 \text{ cm}^2$$

$$e_{vu.8} := \frac{f_{vu.8}}{x} = 9.8 \text{ cm}$$

-Usvaja se, duž celog nosača:

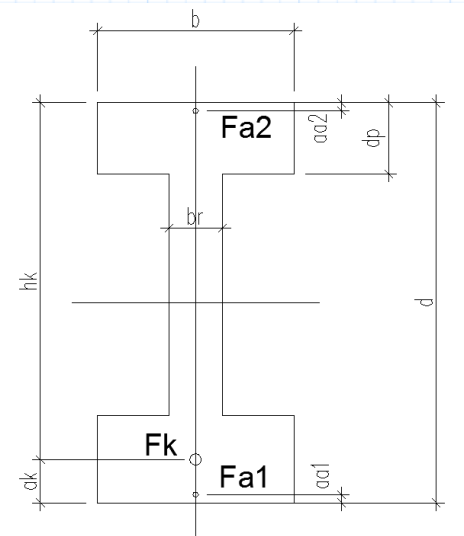
-Vertikalne uzengije U10/20

-Horizontalna armatura $\pm 10/15$

1.9 Kontrola koeficijenta sigurnosti od loma

-Za računski radni dijagram se uzima parabola drugog stepena u čijem je temenu pri lomu preko betona $\varepsilon_b := 0.35\%$ i za C40/50, $\beta_k := 50 \text{ MPa}$, $\beta_b := 0.7 \cdot \beta_k = 35 \text{ MPa}$.

Zamenjujući presek:



$$b := 30 \text{ cm}$$

$$b_r := 15 \text{ cm}$$

$$d_p := 21 \text{ cm}$$

$$d := 150 \text{ cm}$$

Površina betonskog preseka:

$$F_b = 2880 \text{ cm}^2$$

Položaj težišta betonskog preseka:

$$y_T := \frac{d}{2} = 75 \text{ cm}$$

Moment inercije betonskog preseka:

$$I_b = 6862860 \text{ cm}^4$$

Ekscentricitet rezultante prethodnog naprezanja:

$$e_{bk} := y_T - a_k = 64.4 \text{ cm}$$

$$i_b := \sqrt{\frac{I_b}{F_b}} = 48.8 \text{ cm}$$

Napon u kablovima:

$$\sigma_k := \frac{N_{kt}}{F_k} = 988 \text{ MPa}$$

Armatura u donjoj flanši:

$$F_{a1} = 6.2 \text{ cm}^2 \quad a_{a1} := a_a = 3.5 \text{ cm}$$

Armatura u gornjoj flanši:

$$F_{a2} = 6.2 \text{ cm}^2 \quad a_{a2} := a_a = 3.5 \text{ cm}$$

Žice za prethodno naprezanje

$$F_k = 15 \text{ cm}^2 \quad a_k = 10.6 \text{ cm}$$

$$h_k := d - a_k = 139.4 \text{ cm}$$

$$\delta_p := \frac{d_p}{h_k} = 0.151$$

$$\frac{b}{b_r} = 2$$

$$\alpha_{a1} := \frac{a_{a1}}{h_k} = 0.0251$$

$$\mu_{a1} := \frac{F_{a2}}{b_r \cdot h_k} = 0.294\%$$

$$\alpha_{a2} := \frac{a_{a2}}{h_k} = 0.0251$$

$$\mu_{a2} := \frac{F_{a1}}{b_r \cdot h_k} = 0.294\%$$

$$\alpha_k := \frac{a_k}{h_k} = 0.076$$

$$\mu_k := \frac{F_k}{b_r \cdot h_k} = 0.717\%$$

-Dilatacija u kablovskom čeliku u fazi dekompresije (bruto presek):

$$\varepsilon_{kd} := \frac{\sigma_k}{E_k} \cdot \left(1 + n_k \cdot \frac{F_k}{F_b} \cdot \left(1 + \frac{e_{bk}^2}{i_b^2} \right) \right) = 0.547\%$$

-Zatezna čvrstoća čelika kablova:

$$\sigma_m := \sigma_{kz} = 1860 \text{ MPa}$$

-Granica razvlačenja čelika kablova:

$0.8 \cdot \sigma_m \leq \sigma_{0.2} \leq 0.92 \cdot \sigma_m$ usvaja se:

$$\sigma_{0.2} := 0.8 \cdot \sigma_m = 1488 \text{ MPa}$$

-Dozvoljen napon pri zatezanju σ_{k0} :

$$\sigma_{k0} := \min(0.85 \cdot \sigma_{0.2}, 0.7 \cdot \sigma_m) = 1264.8 \text{ MPa} \quad \sigma_k = 988 \text{ MPa} \quad \dots \text{OK}$$

$$\sigma_{0.1} := 0.7 \cdot \sigma_m = 1302 \text{ MPa}$$

-Ukupna dilatacija kablovskog čelika u fazi loma

($\Delta \varepsilon_k := \frac{10}{1000}$):

$$\varepsilon_k := \varepsilon_{kd} + \Delta \varepsilon_k = 1.54696\%$$

-Dilatacija pri zateznoj čvrstoći:

$$\varepsilon_m := 5\%$$

-Dilatacija na granici razvlačenja:

$$\varepsilon_{0.2} := 0.2\% + \frac{\sigma_{0.2}}{E_k} = 0.9631\%$$

-Napon u kablovima pri dilataciji ε_k :

$$\sigma_k := \sigma_{0.2} + \frac{\sigma_m - \sigma_{0.2}}{\varepsilon_m - \varepsilon_{0.2}} \cdot (\varepsilon_k - \varepsilon_{0.2}) = 1542 \text{ MPa}$$

-Koeficijent s :

$$s_{zv} := \frac{1}{1 + \frac{\Delta\varepsilon_k}{\varepsilon_b}} = 0.259 \quad \blacksquare > \blacksquare \quad \delta_p = 0.151 \quad \dots T - \text{presek}$$

-Za T presek:

$$I_{Ib,zv} := \frac{2}{3} \cdot s_{zv} \cdot \frac{b}{b_r} - \left(\frac{b}{b_r} - 1 \right) \cdot \left(\frac{s_{zv} - \delta_p}{s_{zv}} \right)^2 \cdot \left(s_{zv} - \frac{s_{zv} - \delta_p}{3} \right) = 0.307$$

-Napon u armaturi donje flanše u fazi loma :

$$\sigma_{a1} := \sigma_{a0.2} = 500 \text{ MPa}$$

-Dilatacija u armaturi gornje flanše u fazi loma :

$$\varepsilon_{a2} := \varepsilon_b \cdot \left(1 - \frac{\alpha_{a2}}{s_{zv}} \right) = 0.316\%$$

-Dilatacija u armaturi gornje flanše pri naponu tečenja :

$$\varepsilon_{a0.2} := \frac{\sigma_{a0.2}}{E_a} = 0.244\% \quad \blacksquare < \blacksquare \quad \varepsilon_{a2} \quad \dots \blacksquare \text{usvaja se } \varepsilon_{a2} = \varepsilon_{a0.2}$$

-Napon u armaturi gornje flanše u fazi loma :

$$\sigma_{a2} := \sigma_{a0.2} = 500 \text{ MPa}$$

-Granični procenat armiranja kablovskim čelikom: $\mu_{k,zv} := \frac{1}{\sigma_k} \cdot (I_{Ib,zv} \cdot \beta_b - \mu_{a1} \cdot \sigma_{a1} + \mu_{a2} \cdot \sigma_{a2}) = 0.696\% \quad \blacksquare < \blacksquare \quad \mu_k = 0.717\%$

Lom je po betonu - $\varphi := 1$, $\Delta\varepsilon_k = ?$

-1. Aproximacija

$$s := 0.2564$$

$$\Delta\varepsilon_k := \varphi \cdot \varepsilon_b \cdot \left(\frac{1}{s} - 1 \right) = 1.0151\%$$

$$\varepsilon_k := \varepsilon_{kd} + \Delta\varepsilon_k = 1.56201\%$$

$$\varepsilon_{a1} := \varepsilon_k \cdot (1 + \alpha_{a1}) = 1.601\% \quad \blacksquare < \blacksquare \quad \varepsilon_{a0.2} = 0.244\% \quad \dots \blacksquare \text{usvaja se } \varepsilon_{a1} = \varepsilon_{a1}$$

$$\sigma_k := \sigma_{0.2} + \frac{\sigma_m - \sigma_{0.2}}{\varepsilon_m - \varepsilon_{0.2}} \cdot (\varepsilon_k - \varepsilon_{a1}) = 1484 \text{ MPa}$$

$$\varepsilon_{a2} := \varphi \cdot \varepsilon_b \cdot \left(1 - \frac{\alpha_{a2}}{s} \right) = 0.316\% \quad \blacksquare > \blacksquare \quad \varepsilon_{a0.2} = 0.244\% \quad \dots \blacksquare \text{usvaja se } \varepsilon_{a2} = \varepsilon_{a0.2}$$

$$\sigma_{a2} := \sigma_{a0.2} = 500 \text{ MPa}$$

-koeficijent k(s):

$$k := \frac{1}{\beta_b} \cdot (\mu_k \cdot \sigma_k + \mu_{a1} \cdot \sigma_{a1} - \mu_{a2} \cdot \sigma_{a2}) = 0.304$$

-koeficijent s:

$$f(s) := 2 \cdot s^3 + 3 \cdot s^2 \cdot \left(\left(\frac{b}{b_r} - 1 \right) \cdot \delta_p - k \right) - \left(\frac{b}{b_r} - 1 \right) \cdot \delta_p^3$$

$$r0 := \text{root}(f(s), s)$$

$$r0 = 0.2564 \quad \dots \blacksquare \text{pretpostavka je dobra, usvaja se } s = 0.2564 \quad \blacksquare > \blacksquare \quad \delta_p = 0.151 \quad \dots T - \text{presek}$$

-Moment loma preseka:

$$I_{Ib} := \frac{s}{3} \cdot \left(2 - 3 \frac{s}{4} \right) \cdot \frac{b}{b_r} - \left(\frac{b}{b_r} - 1 \right) \cdot \left(\frac{s - \delta_p}{s} \right)^2 \cdot \left((1-s) \cdot \left(s - \frac{s - \delta_p}{3} \right) + (s - \delta_p) \cdot \left(\frac{2s}{3} - \frac{s - \delta_p}{4} \right) \right) = 0.278$$

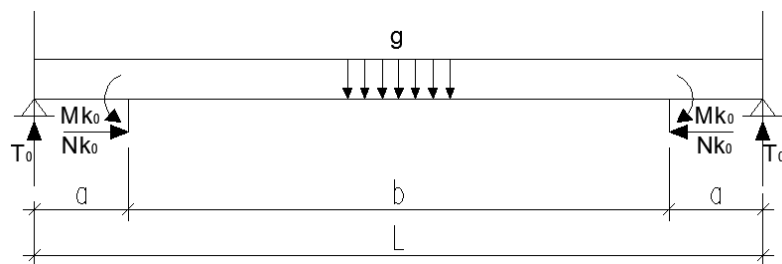
$$M_{ku} := b_r \cdot h_k^2 \cdot (I_{Ib} \cdot \beta_b + \mu_{a1} \cdot \sigma_{a1} \cdot (\alpha_k - \alpha_{a1}) + \mu_{a2} \cdot \sigma_{a2} \cdot (1 - \alpha_{a2})) = 3280.7 \text{ kN} \cdot \text{m}$$

-Koeficijent sigurnosti: $M_{max} := (g + \Delta g + p) \cdot \frac{L^2}{8} = 1698.2 \text{ kN} \cdot \text{m}$

$$\gamma_u := \frac{M_{ku}}{M_{max}} = 1.93 \quad \blacksquare > \blacksquare \quad 1.8 \quad \dots OK$$

1.10 Provera ugiba

-I Faza - Faza prethodnog naprezanja - $t=0$



$$E_{cm0} = 32000 \text{ MPa}$$

$$g = 7.3 \frac{\text{kN}}{\text{m}}$$

$$I_0 = 6938391.4 \text{ cm}^4$$

$$a := 5.7 \text{ m}$$

$$N_{k0} = 1852.5 \text{ kN}$$

$$b := L - \frac{2a}{3} = 17.2 \text{ m}$$

$$M_{k0} := N_{k0} \cdot e_0 = 1288.6 \text{ kN} \cdot \text{m}$$

-Ugib od sopstvene težine nosača u_g :

$$u_g := 5 \cdot g \cdot \frac{L^4}{384 \cdot E_{cm0} \cdot I_0} = 8.3 \text{ mm}$$

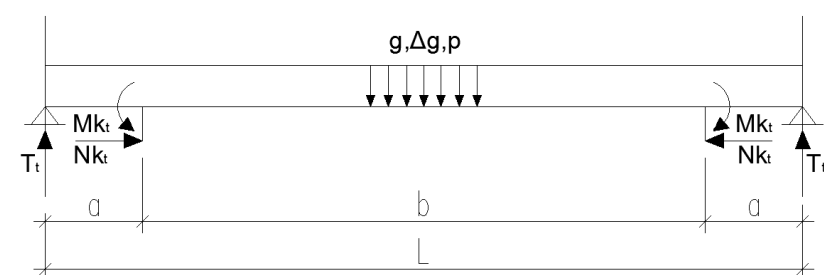
-Ugib od sile prethodnog naprezanja u_{Nk0} :

$$u_{Nk0} := -M_{k0} \cdot \frac{b^2}{8 \cdot E_{cm0} \cdot I_0} = -21.5 \text{ mm}$$

-Ukupni ugib nakon prve faze:

$$u_g + u_{Nk0} = -13.1 \text{ mm}$$

-II Faza Faza eksploatacije - $t = \infty$



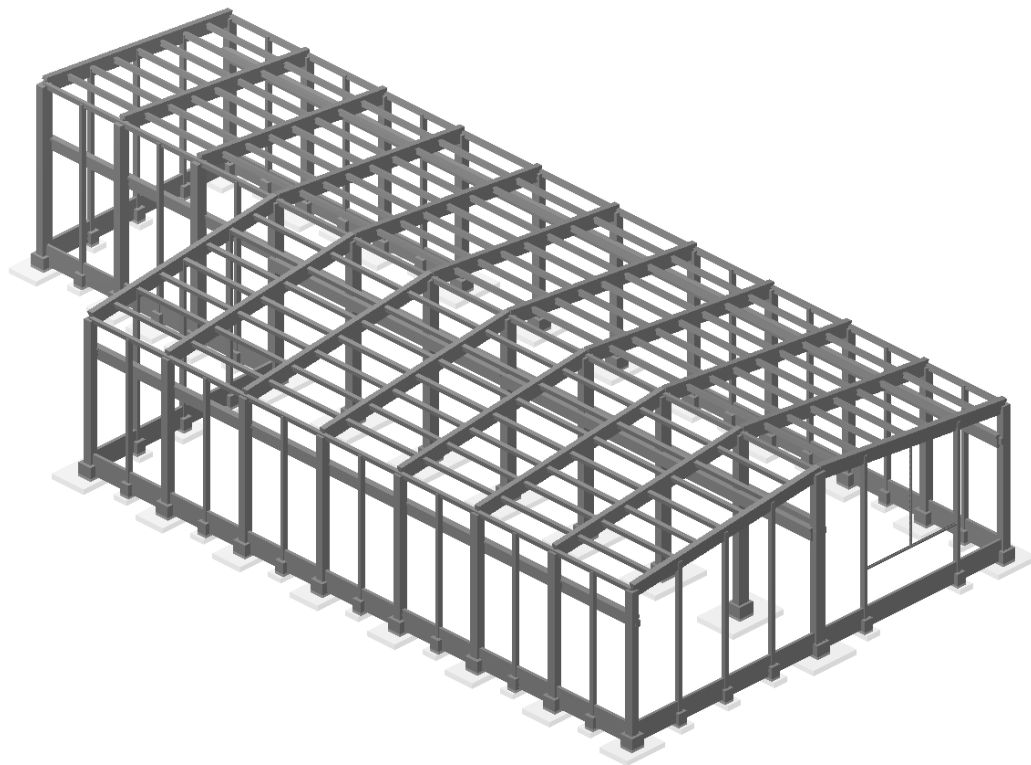
-Ugib u fazi eksploatacije u_∞ : $u_\infty := \boxed{u_{Nk\infty}} + \frac{1}{2} (u_{Nk0} + u_{Nk\infty}) \cdot \varphi_\infty + u_{g\uparrow\Delta g} (1 + \varphi_\infty) + u_p$

S obzirom na to da su opterećenja Δg , s i p , kao i g , jednako podeljena, a uz pretpostavku da je koeficijent efikasnosti prethodnog naprezanja nepromenljiv duž nosača:

$$u_\infty := \omega \cdot u_{Nk0} + \frac{1}{2} (1 + \omega) \cdot u_{Nk0} \cdot \varphi_\infty + \frac{g + \Delta g}{g} \cdot u_g \cdot (1 + \varphi_\infty) + \frac{p}{g} \cdot u_g = 31.9 \text{ mm} \quad \square = \square \quad L / 660$$

$$\square < \square \quad u_{d02} := \frac{L}{300} = 70 \text{ mm}$$

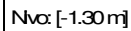
Proračun temelja



Izometrija

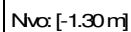
Setovi površinskih oslonaca

@1@ Set	K,R1	K,R2	K,R3
1	7.000e+3	7.000e+3	7.000e+3



Uticaji u pov. osloncu: $\max \sigma_{tla} = 151.97 / \min \sigma_{tla} = 60.12 \text{ kN/m}^2$

Opt. 1389: [Anv] 1025-1270



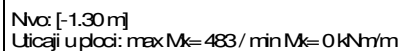
Uticaji u pov. osloncu: max s,tla= -8.59 / min s,tla= -21.71 m/ 1000

Mx [kNm/m]

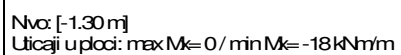
0
69
138
207
276
345
414
483



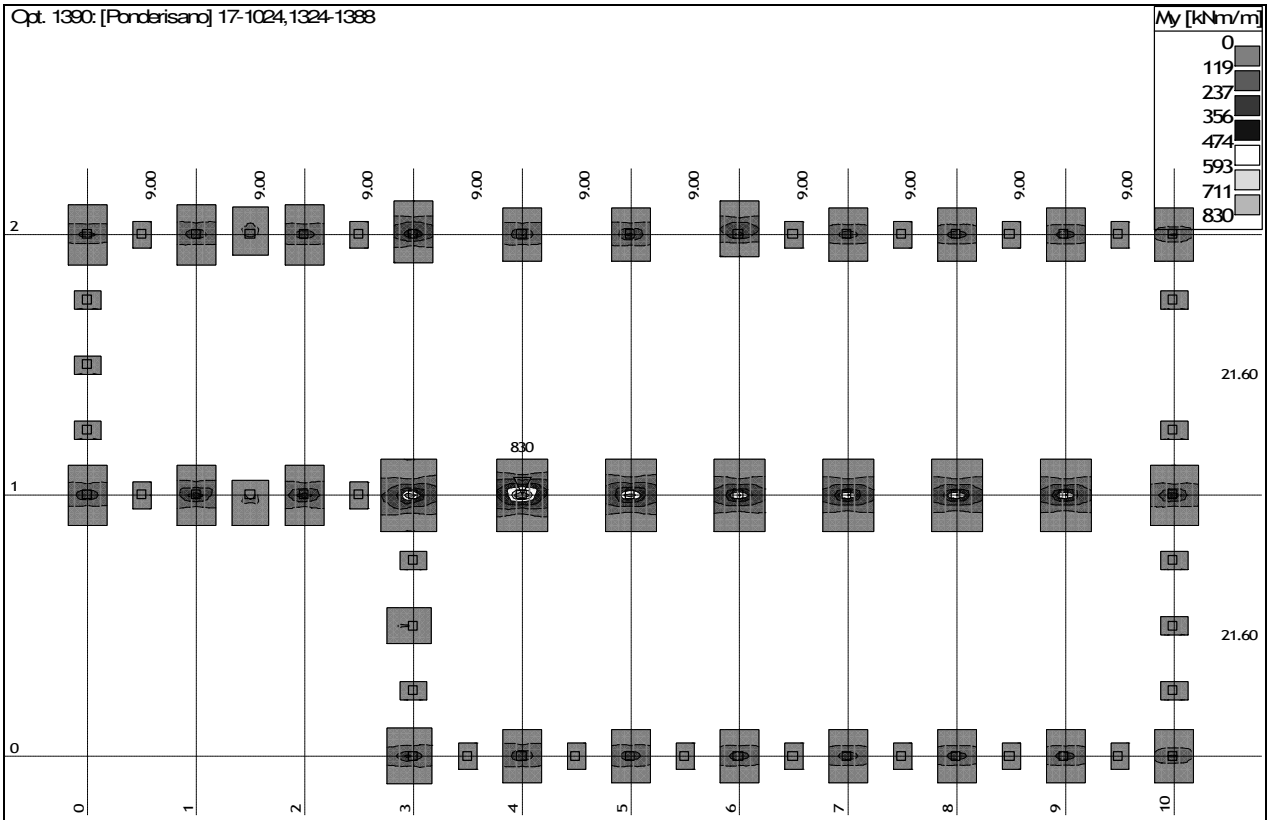
10.00



Mx [kNm/m]



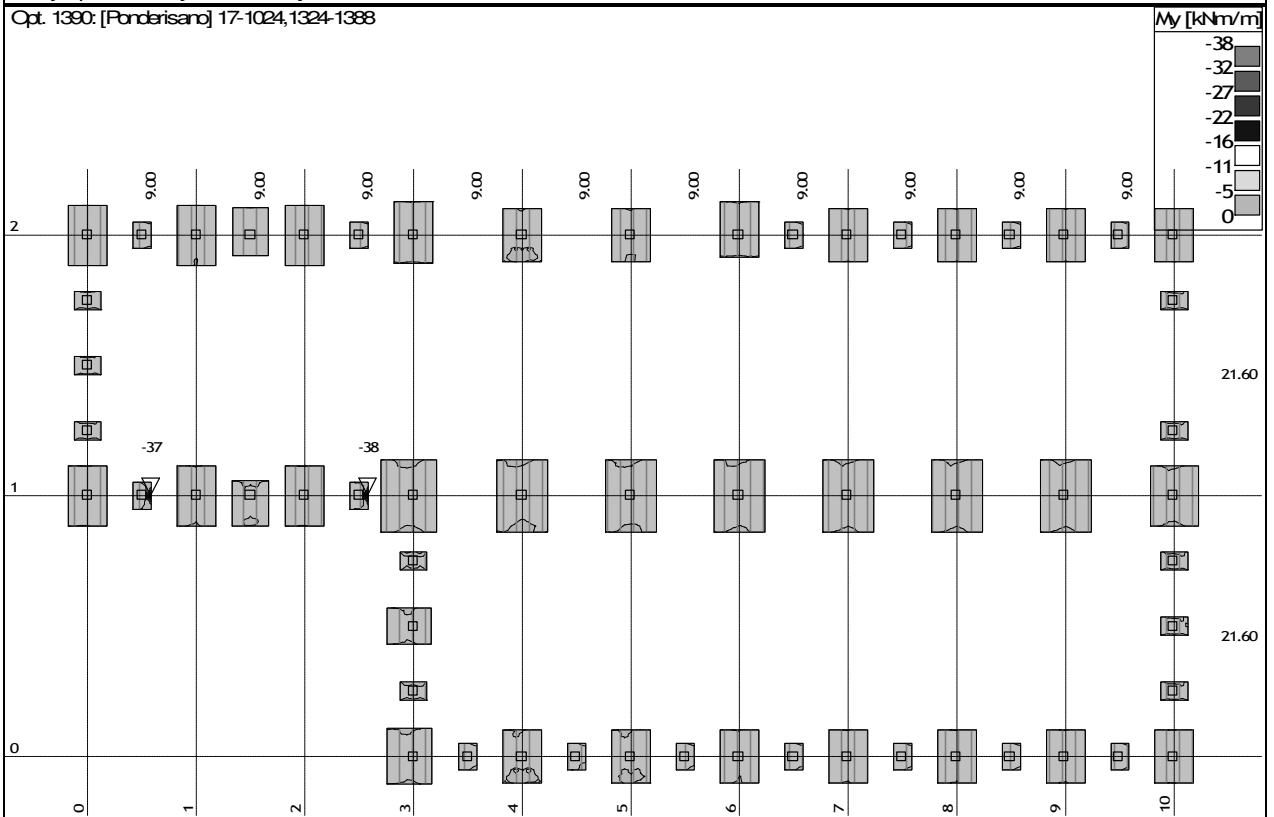
Opt. 1390: [Ponderisano] 17-1024,1324-1388



Nv: [-1.30 m]

Uticaji uplovi: max $M_y = 830$ / min $M_y = 0$ kNm/m

Opt. 1390: [Ponderisano] 17-1024,1324-1388



Nv: [-1.30 m]

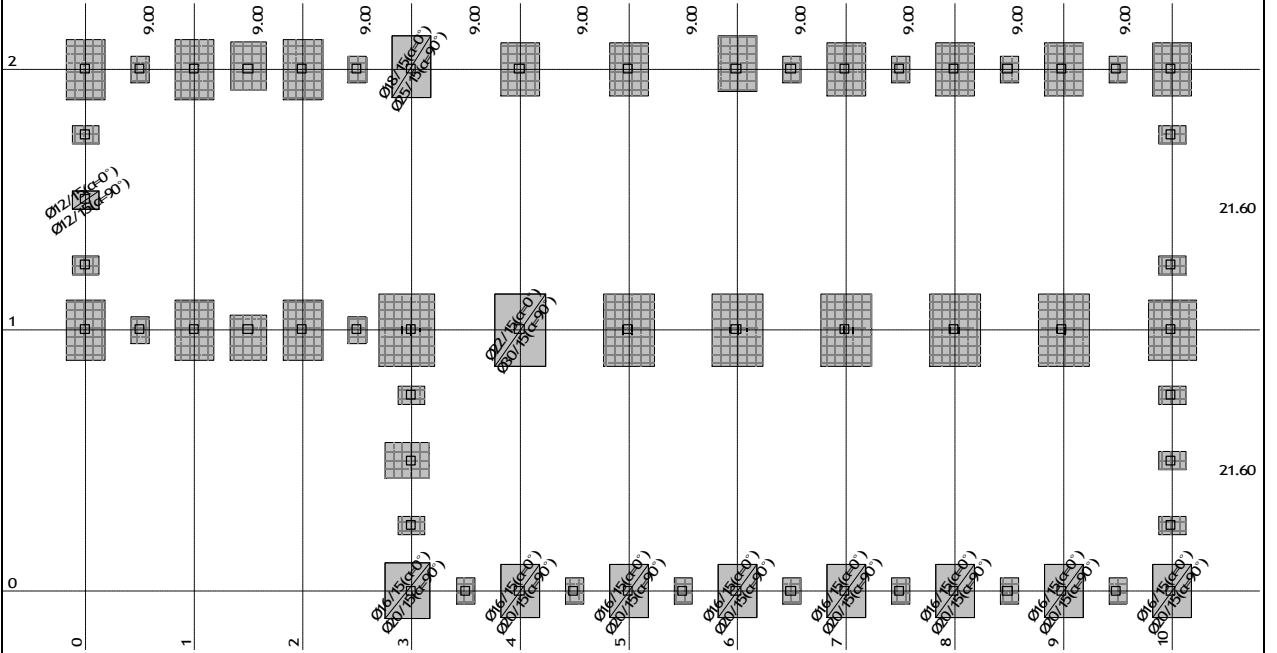
Uticaji uplovi: max $M_y = 0$ / min $M_y = -38$ kNm/m

Dimenzionisanje (beton)

Usvojena armatura
@1@PBAB 87, MB 30, B500, a=5.00 cm

Aa - d.zona [cm²/m]

0
21
42



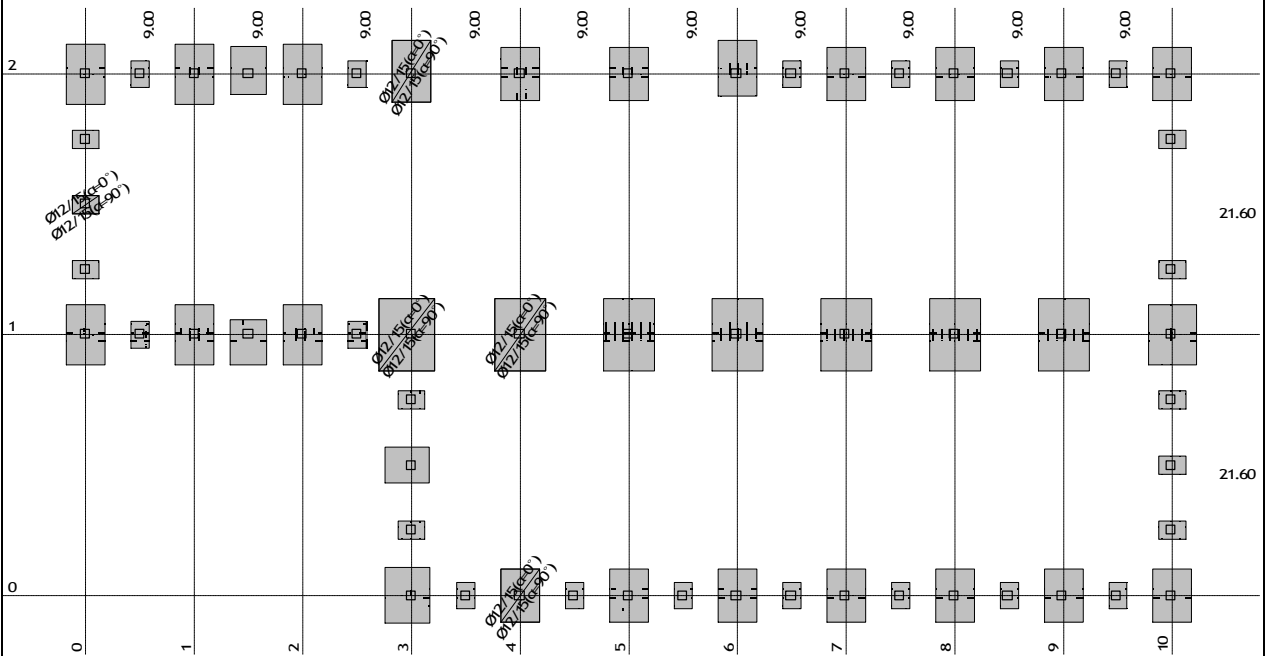
Nivo: [-1.30 m]

Aa - d.zona

Usvojena armatura
@1@PBAB 87, MB 30, B500, a=5.00 cm

Aa - g.zona [cm²/m]

-2
-1
0



Nivo: [-1.30 m]

Aa - g.zona

Nivo: [-1.30 m]

@1@PBAB 87

d.pl=50.0 cm

MB 30

Gornja zona: B500 (a=5.0 cm)

Donja zona: B500 (a=5.0 cm)

Dimenzionisanje grupe slucajeva

opterecenja: 17-1024,1324-1388

Tacka 1X=-118 m; Y=20 m; Z=-1 mPravac 1: ($\alpha=0^\circ$)

Merodavna kombinacija:

1.60xI+1.00xII+1.80xIV+1.80xVI

Mu = -2.98 kNm

Nu = 0.00 kN

eb/ea = -0.122/10.000 %

Ag1 = 0.13 cm2/m

Ad1 = 0.00 cm2/m

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:

1.30xI+1.30xII+1.30xIII+1.30xXVI

Mu = 9.25 kNm

Nu = 0.00 kN

eb/ea = -0.218/10.000 %

Ag2 = 0.00 cm2/m

Ad2 = 0.41 cm2/m

Tacka 2X=-117 m; Y=21 m; Z=-1 mPravac 1: ($\alpha=0^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIV+1.80xVI

Mu = 26.63 kNm

Nu = 0.00 kN

eb/ea = -0.380/10.000 %

Ag1 = 0.00 cm2/m

Ad1 = 1.20 cm2/m

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:

1.30xI+1.30xII+1.30xIII+1.30xXVI

Mu = -1.83 kNm

Nu = 0.00 kN

eb/ea = -0.095/10.000 %

Ag2 = 0.08 cm2/m

Ad2 = 0.00 cm2/m

Tacka 3X=-117 m; Y=20 m; Z=-1 mPravac 1: ($\alpha=0^\circ$)

Merodavna kombinacija:

1.30xI+1.30xII+1.30xIII+1.30xXVI

Mu = 68.63 kNm

Nu = 0.00 kN

eb/ea = -0.634/10.000 %

Ag1 = 0.00 cm2/m

Ad1 = 3.11 cm2/m

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:

1.30xI+1.30xII+1.30xIII+1.30xXVI

Mu = -1.44 kNm

Nu = 0.00 kN

eb/ea = -0.116/10.000 %

Ag2 = 0.06 cm2/m

Ad2 = 0.15 cm2/m

Tacka 4X=-117 m; Y=20 m; Z=-1 mPravac 1: ($\alpha=0^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xVI

Mu = 60.15 kNm

Nu = 0.00 kN

eb/ea = -0.590/10.000 %

Ag1 = 0.00 cm2/m

Ad1 = 2.73 cm2/m

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:

1.30xI+1.30xII+1.30xIII+1.30xXVI

Mu = 29.98 kNm

Nu = 0.00 kN

eb/ea = -0.404/10.000 %

Ag2 = 0.00 cm2/m

Ad2 = 1.35 cm2/m

@1@PBAB 87

d.pl=50.0 cm

MB 30

Gornja zona: B500 (a=5.0 cm)

Donja zona: B500 (a=5.0 cm)

Dimenzionisanje grupe slucajeva

opterecenja: 17-1024,1324-1388

Tacka 5X=-82 m; Y=-31 m; Z=-1 mPravac 1: ($\alpha=0^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xIV

+1.80xVI+1.80xX

Mu = 13.44 kNm

Nu = 0.00 kN

eb/ea = -0.298/10.000 %

Ag1 = 0.49 cm2/m

Ad1 = 0.58 cm2/m

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xVI

+1.60xXIII+1.80xXIV

Mu = 391.53 kNm

Nu = 0.00 kN

eb/ea = -1.851/10.000 %

Ag2 = 0.09 cm2/m

Ad2 = 18.46 cm2/m

Tacka 6X=-81 m; Y=-31 m; Z=-1 mPravac 1: ($\alpha=0^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xVI

+1.60xXIII+1.80xXIV

Mu = 483.24 kNm

Nu = 0.00 kN

eb/ea = -2.188/10.000 %

Ag1 = 0.12 cm2/m

Ad1 = 23.07 cm2/m

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xVI

+1.60xXIII+1.80xXIV

Mu = 830.07 kNm

Nu = 0.00 kN

eb/ea = -3.500/9.085 %

Ag2 = 0.21 cm2/m

Ad2 = 41.72 cm2/m

@1@PBAB 87

d.pl=50.0 cm

MB 30

Gornja zona: B500 (a=5.0 cm)

Donja zona: B500 (a=5.0 cm)

Dimenzionisanje grupe slucajeva

opterecenja: 17-1024,1324-1388

Tacka 7X=-91 m; Y=-9 m; Z=-1 mPravac 1: ($\alpha=0^\circ$)

Merodavna kombinacija:

1.60xI+1.00xII+1.80xIII+1.80xV

-1.80xVI+1.60xVII+1.80xVIII

Mu = -3.56 kNm

Nu = 0.00 kN

eb/ea = -0.134/10.000 %

Ag1 = 0.16 cm2/m

Ad1 = 0.00 cm2/m

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xV

-1.80xVI+1.60xVII+1.80xVIII

Mu = 265.85 kNm

Nu = 0.00 kN

eb/ea = -1.416/10.000 %

Ag2 = 0.06 cm2/m

Ad2 = 12.38 cm2/m

Tacka 8X=-90 m; Y=-10 m; Z=-1 mPravac 1: ($\alpha=0^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xVI

+1.60xVII+1.80xVIII

Mu = 230.93 kNm

Nu = 0.00 kN

eb/ea = -1.292/10.000 %

Ag1 = 0.05 cm2/m

Ad1 = 10.70 cm2/m

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xVI

+1.60xVII+1.80xVIII

Mu = 447.04 kNm

Nu = 0.00 kN

eb/ea = -2.051/10.000 %

Ag2 = 0.11 cm2/m

Ad2 = 21.23 cm2/m

Tacka 9X=-90 m; Y=-9 m; Z=-1 mPravac 1: ($\alpha=0^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xV

-1.80xVI+1.60xVII+1.80xVIII

Mu = 263.64 kNm

Nu = 0.00 kN

eb/ea = -1.408/10.000 %

Ag1 = 0.06 cm2/m

Ad1 = 12.27 cm2/m

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xV

-1.80xVI+1.60xVII+1.80xVIII

Mu = 292.58 kNm

Nu = 0.00 kN

eb/ea = -1.507/10.000 %

Ag2 = 0.07 cm2/m

Ad2 = 13.64 cm2/m

@1@PBAB 87

d.pl=50.0 cm

MB 30

Gornja zona: B500 (a=5.0 cm)

Donja zona: B500 (a=5.0 cm)

Dimenzionisanje grupe slucajeva

opterecenja: 17-1024,1324-1388

Tacka 10X=-81 m; Y=54 m; Z=-1 mPravac 1: ($\alpha=0^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xIV

+1.80xVI+1.60xXI+1.80xXII

Mu = 121.39 kNm

Nu = 0.00 kN

eb/ea = -0.882/10.000 %

Ag1 = 0.58 cm2/m

Ad1 = 5.54 cm2/m

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xIV

+1.80xVI+1.60xXI+1.80xXII

Mu = 63.54 kNm

Nu = 0.00 kN

eb/ea = -0.607/10.000 %

Ag2 = 0.00 cm2/m

Ad2 = 2.88 cm2/m

Tacka 11X=-80 m; Y=54 m; Z=-1 mPravac 1: ($\alpha=0^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xVI

+1.60xXI+1.80xXII

Mu = 73.83 kNm

Nu = 0.00 kN

eb/ea = -0.660/10.000 %

Ag1 = 0.00 cm2/m

Ad1 = 3.35 cm2/m

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xIV

+1.80xVI+1.60xXI+1.80xXII

Mu = 80.21 kNm

Nu = 0.00 kN

eb/ea = -0.698/10.000 %

Ag2 = 0.38 cm2/m

Ad2 = 3.64 cm2/m

Tacka 12X=-81 m; Y=53 m; Z=-1 mPravac 1: ($\alpha=0^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xVI

+1.60xIX+1.80xX

Mu = 191.71 kNm

Nu = 0.00 kN

eb/ea = -1.151/10.000 %

Ag1 = 0.00 cm2/m

Ad1 = 8.85 cm2/m

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xVI

+1.60xIX+1.80xX

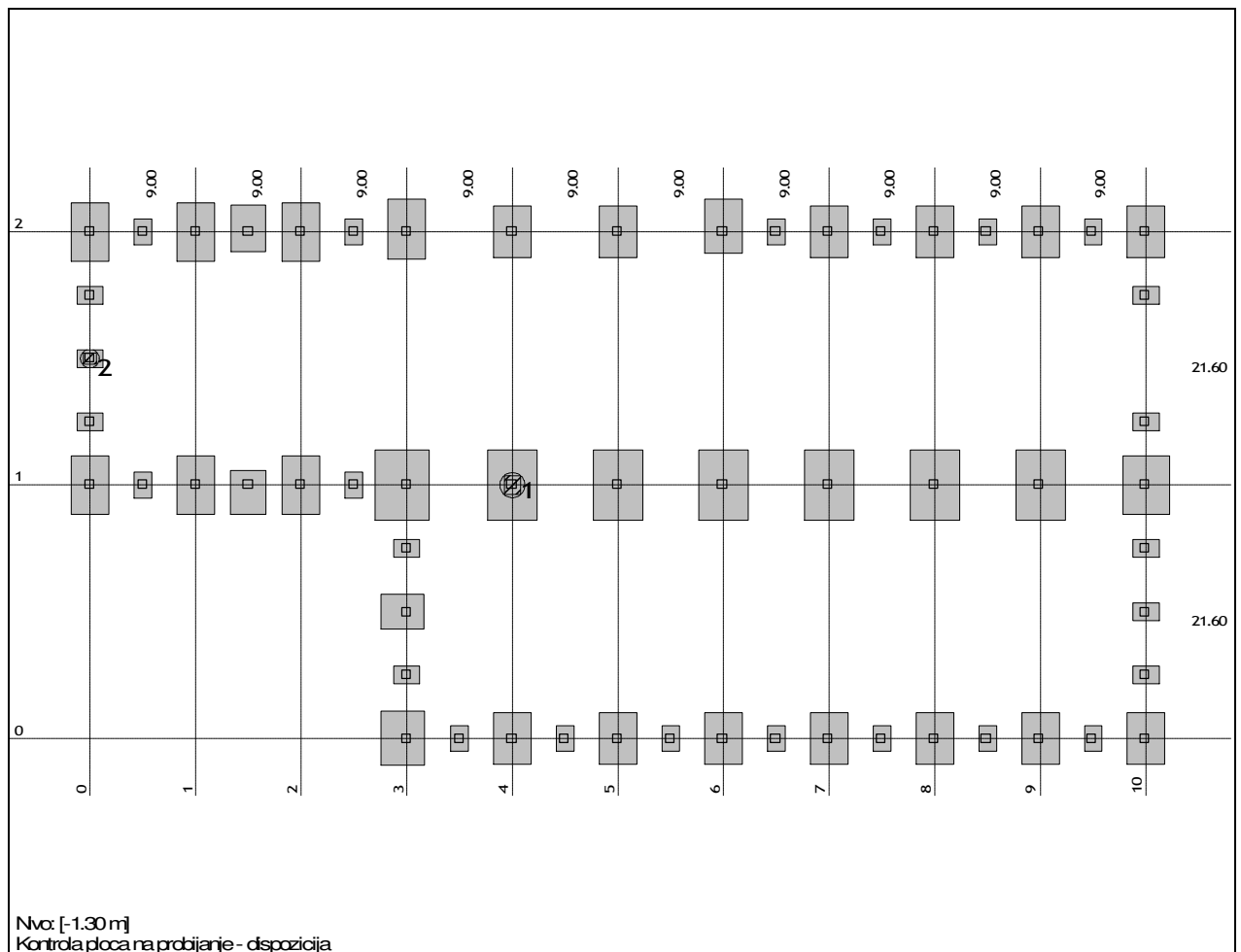
Mu = 345.95 kNm

Nu = 0.00 kN

eb/ea = -1.693/10.000 %

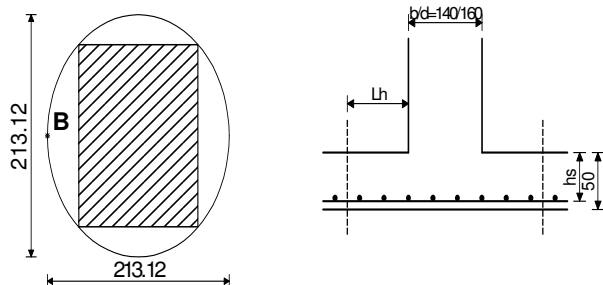
Ag2 = 0.08 cm2/m

Ad2 = 16.24 cm2/m



Kontrola ploca na probijanje

Nivo: [-1.30 m]
Presek 1 (-80.87,-31.17,-1.30)
MB 30



KONTROLA KRITICNOG PRESEKA 1. (Lh = 0.22m od ivice stuba)
(stub zamenjujuceg kruznog preseka, ds = 1.69m)

Merodavna kombinacija:

I+II+III-1.00xVI+XIII+XIV

Sila u stubu

Merodavni smicuci napon (tacka B)

Debljina ploce

Staticka visina ploce

N = 2011.4 kN
 $\tau = 0.683$ MPa
d,pl = 0.500 m
hs = 0.440 m

Obim kritičnog preseka

Okp = 6.695 m

Postojeca armatura u ploci

Povrsina armature - pravac 1

Procenat armiranja - pravac 1

Povrsina armature - pravac 2

Procenat armiranja - pravac 2

Srednja vrednost procenta armiranja

Koeficijent

Koeficijent

Koeficijent

Dopusteni glavni napon zatezanja

Dopusteni glavni napon zatezanja

Maksimalna otpornost($\gamma_2 \times \tau_b$)

Aa,1 = 25.342 cm²
 $\mu_1 = 0.576$ %
Aa,2 = 47.124 cm²
 $\mu_2 = 1.071$ %
 $\mu = 0.823$ %
 $\alpha_a = 1.400$
 $\gamma_1 = 1.652$
 $\gamma_2 = 0.572$
 $\tau_a = 0.800$
 $\tau_b = 2.200$
 $\tau_{max} = 1.258$ MPa

Uslov: $\tau \leq \tau_{max}$ (0.68 ≤ 1.26)

Uslov je ispunjen

Otpornost na probijanje ploce bez dodatne armature za obezbedjenje ($2/3 \times \gamma_1 \times \tau_a$)

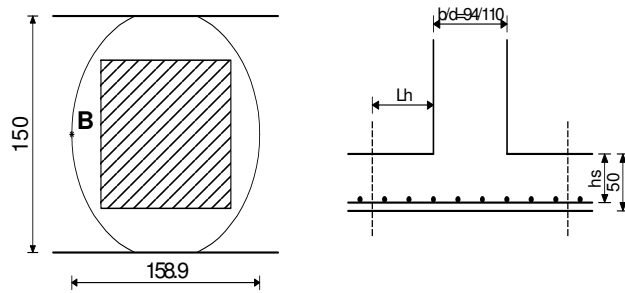
$\tau_{gr} = 0.881$ MPa

Uslov: $\tau \leq \tau_{gr}$ (0.68 ≤ 0.88)

Uslov je ispunjen, nije potrebna dodatna armatura za obezbedjenje od probijanja ploce.

Kontrola ploče na probijanje

Nivo: [-1.30 m]
Presek 2 (-116.87,-20.37,-1.30)
MB 30



KONTROLA KRITICNOG PRESEKA 1. ($L_h = 0.22\text{m}$ od ivice stuba)
(stub zamenjujućeg kruznog preseka, $d_s = 1.15\text{m}$)

Merodavna kombinacija: I+II+III+V-1.00xVI

Sila u stubu

$N = 193.31 \text{ kN}$

Merodavni smicuci napon (tačka B)

$\tau = 0.112 \text{ MPa}$

Debljina ploče

$d, pl = 0.500 \text{ m}$

Statika visina ploče

$h_s = 0.440 \text{ m}$

Obim kritičnog preseka

$Okp = 3.923 \text{ m}$

Postojeća armatura u ploči

$A_{a,1} = 7.540 \text{ cm}^2$

Površina armature - pravac 1

$\mu, 1 = 0.171 \%$

Procenat armiranja - pravac 1

$A_{a,2} = 7.540 \text{ cm}^2$

Površina armature - pravac 2

$\mu, 2 = 0.171 \%$

Procenat armiranja - pravac 2

Srednja vrednost procenta armiranja (usvojena)

$\mu = 0.500 \%$

Koeficijent

$\alpha_a = 1.400$

Koeficijent

$\gamma_1 = 1.287$

Koeficijent

$\gamma_2 = 0.445$

Dopusteni glavni napon zatezanja

$\tau_a = 0.800$

Dopusteni glavni napon zatezanja

$\tau_b = 2.200$

Maksimalna otpornost ($\gamma_2 \times \tau_b$)

$\tau_{max} = 0.980 \text{ MPa}$

Uslov: $\tau \leq \tau_{max}$ ($0.11 \leq 0.98$)

Uslov je ispunjen

Otpornost na probijanje ploče bez dodatne armature za
obebeđenje ($2/3 \times \gamma_1 \times \tau_a$)

$\tau_{gr} = 0.686 \text{ MPa}$

Uslov: $\tau \leq \tau_{gr}$ ($0.11 \leq 0.69$)

**Uslov je ispunjen, nije potrebna dodatna armatura za
obebeđenje od probijanja ploče.**

Osnovni podaci o modelu

Datoteka: Hale 2 i 3.1-horizontalna
fasada-rev2-stubovi60x60-bezcelika.twp
Datum proračuna: 10.12.2017

Nacin proračuna: 3D model

- | | | |
|---|--|---|
| ☒ Teorija I-og reda | ☒ Modalna analiza | ☐ Stabilnost |
| ☐ Teorija II-og reda | ☒ Seizmicki proračun | ☐ Faze gradjenja |
| ☐ Nelinearan proračun | | |

Velicina modela

Broj cvorova:	161
Broj pločastih elemenata:	0
Broj grednih elemenata:	244
Broj granicnih elemenata:	198
Broj osnovnih slučajeva opterećenja:	8
Broj kombinacija opterećenja:	69

Jedinice mera

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

Ulazni podaci - Konstrukcija



Izometrija

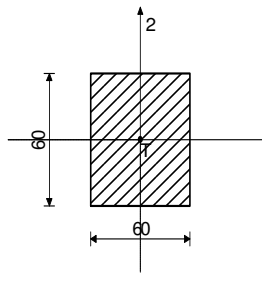
Tabela materijala

No	Naziv materijala	E[kN/m ²]	μ	γ [kN/m ³]	α [1/C]	E _m [kN/m ²]	μ_m
1	Beton MB 30	3.150e+7	0.20	25.00	1.000e-5	3.150e+7	0.20
2	Celik	2.100e+8	0.30	78.50	1.000e-5	2.100e+8	0.30

Setovi greda

@1@Set: 1 Presek: b/d=60/60, Fiktivna ekscentricnost

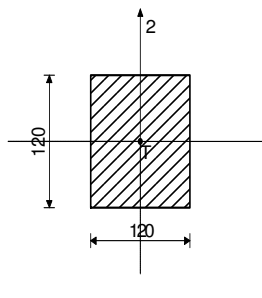
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	3.600e-1	3.000e-1	3.000e-1	1.825e-2	1.080e-2	1.080e-2



[mm]

@1@Set: 2 Presek: b/d=120/120, Fiktivna ekscentricnost

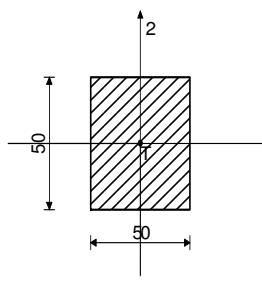
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	1.440e+0	1.200e+0	1.200e+0	2.920e-1	1.728e-1	1.728e-1



[mm]

@1@Set: 3 Presek: b/d=50/50, Fiktivna ekscentricnost

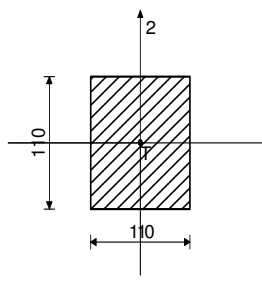
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	2.500e-1	2.083e-1	2.083e-1	8.802e-3	5.208e-3	5.208e-3



[mm]

@1@Set: 4 Presek: b/d=110/110, Fiktivna ekscentricnost

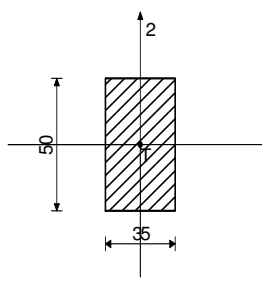
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	1.210e+0	1.008e+0	1.008e+0	2.062e-1	1.220e-1	1.220e-1



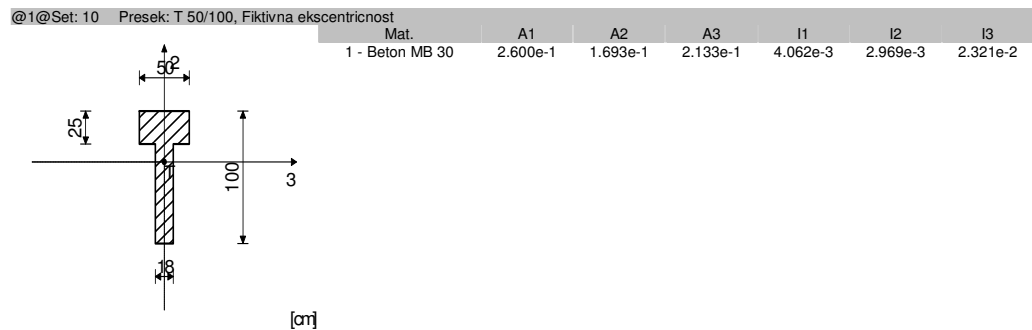
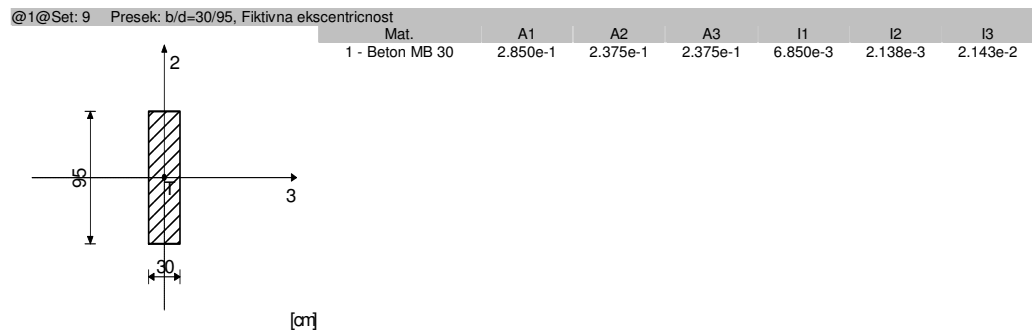
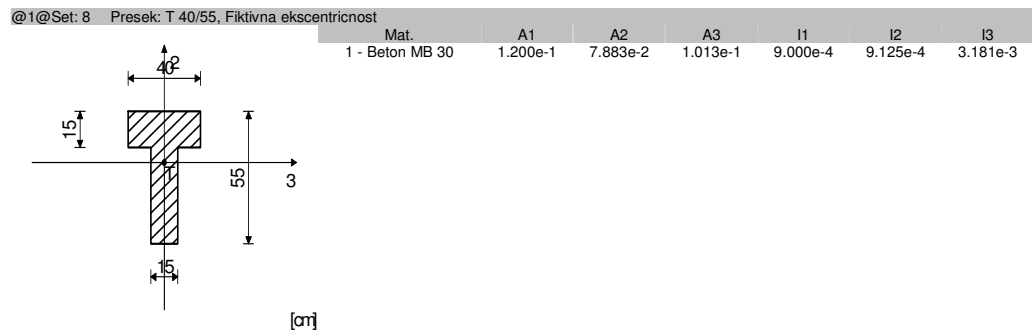
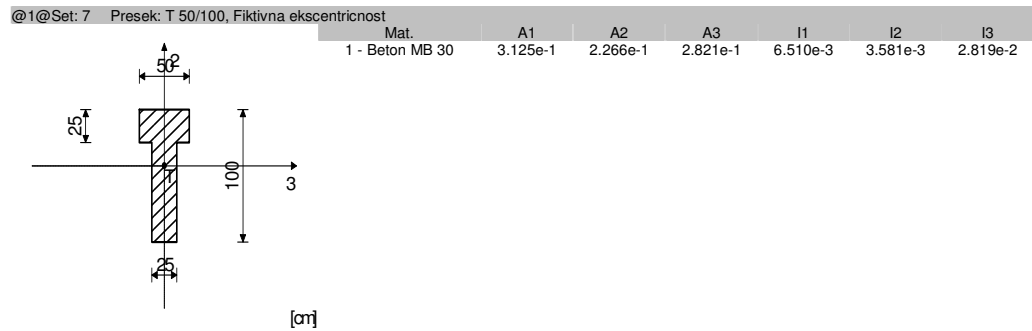
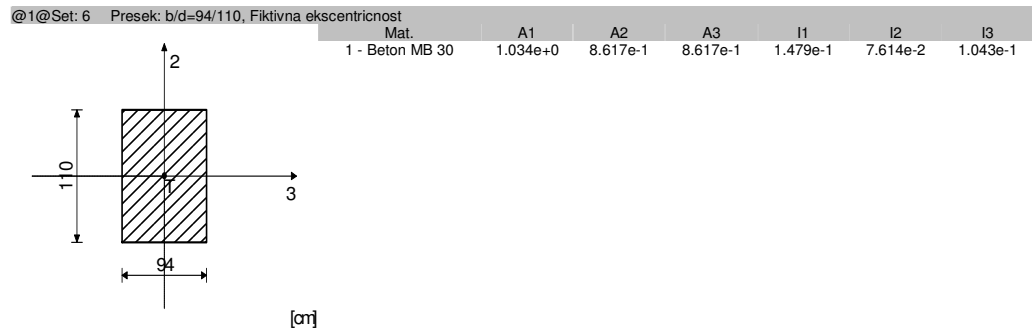
[mm]

@1@Set: 5 Presek: b/d=35/50, Fiktivna ekscentricnost

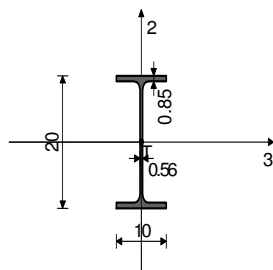
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	1.750e-1	1.458e-1	1.458e-1	4.058e-3	1.786e-3	3.646e-3



[mm]



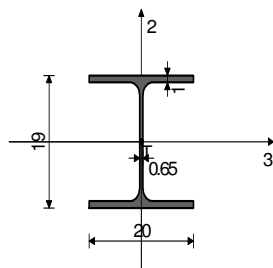
@1@Set: 11 Presek: IPE 200, Fiktivna ekscentricnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
2 - Celik	2.850e-3	1.402e-3	1.448e-3	7.020e-8	1.420e-6	1.940e-5

@1@Set: 12 Presek: IPBI 200, Fiktivna ekscentricnost



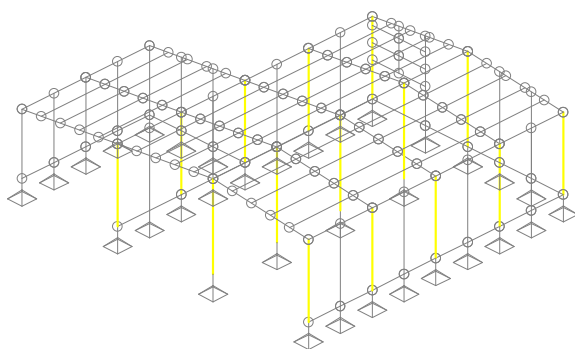
[cm]

Mat.	A1	A2	A3	I1	I2	I3
2 - Celik	5.380e-3	1.805e-3	3.575e-3	2.110e-7	1.340e-5	3.690e-5

Setovi tackastih oslonaca

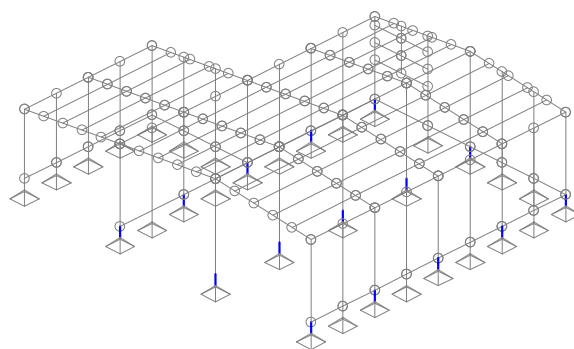
	K,R1	K,R2	K,R3	K,M1	K,M2	K,M3
1	1.000e+10	1.000e+10	1.000e+10	1.000e+10	1.000e+10	1.000e+10

Greda
1. b/d=60/60



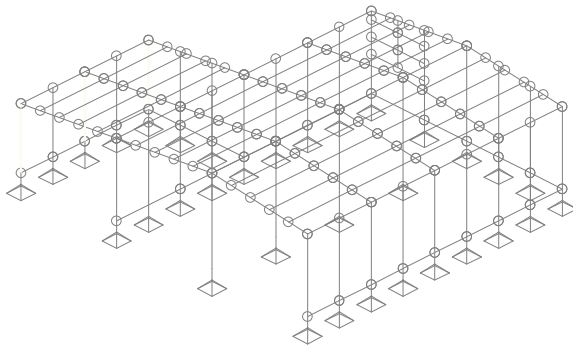
Setovi numerickih podataka
Greda (1)

Greda
2. b/d=120/120



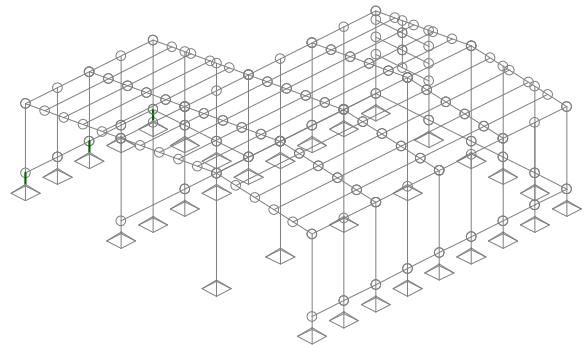
Setovi numerickih podataka
Greda (2)

Greda
3. b/d=50/50



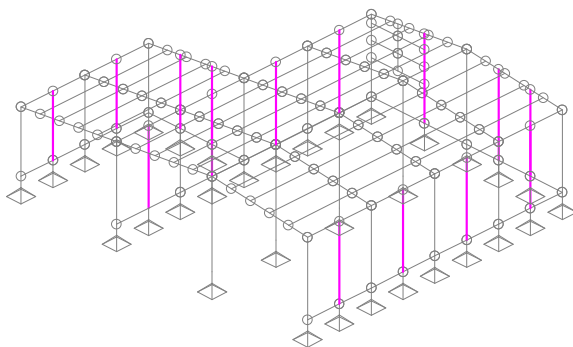
Setovi numerickih podataka
Greda (3)

Greda
4. b/d=110/110



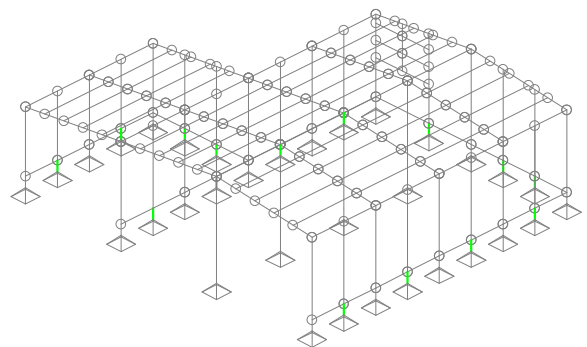
Setovi numerickih podataka
Greda (4)

Greda
5. b/d=35/50



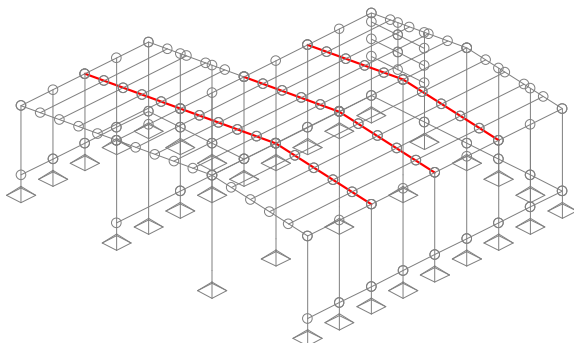
Setovi numerickih podataka
Greda (5)

Greda
6. b/d=94/110



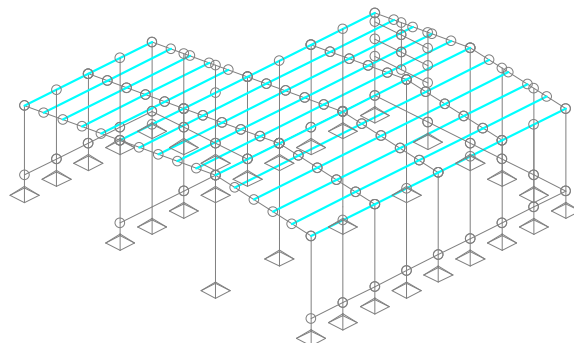
Setovi numerickih podataka
Greda (6)

Greda
7. T 50/100



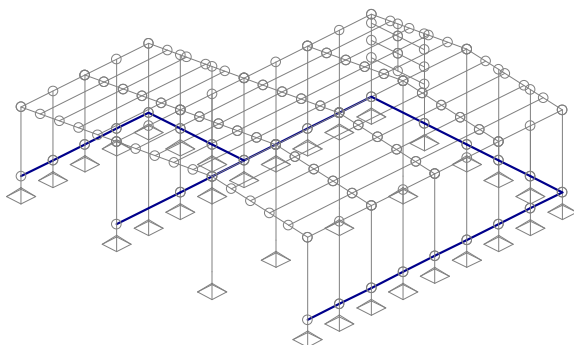
Setovi numerickih podataka
Greda (7)

Greda
8. T 40/55



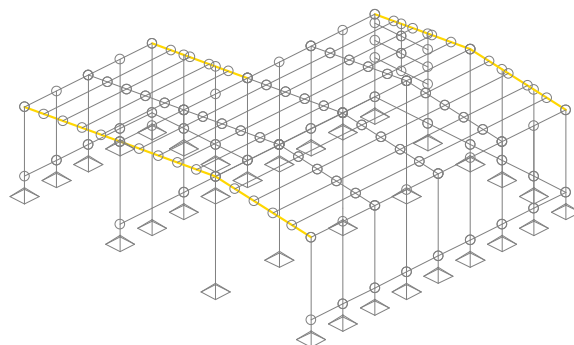
Setovi numerickih podataka
Greda (8)

Greda
9. b/d=30/95



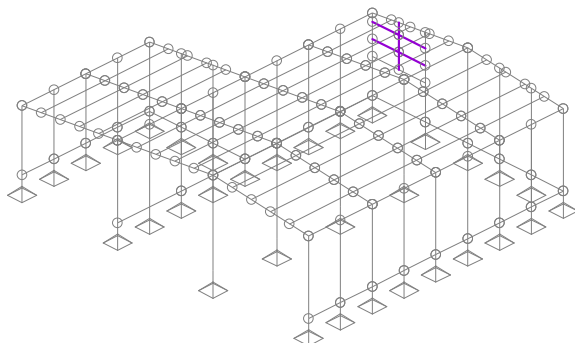
Setovi numerickih podataka
Greda (9)

Greda
10. T 50/100



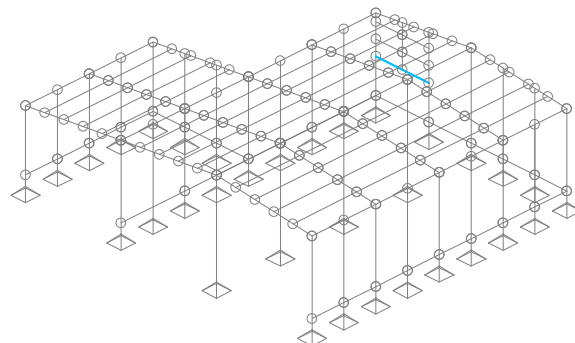
Setovi numerickih podataka
Greda (10)

Greda
11. IPE 200

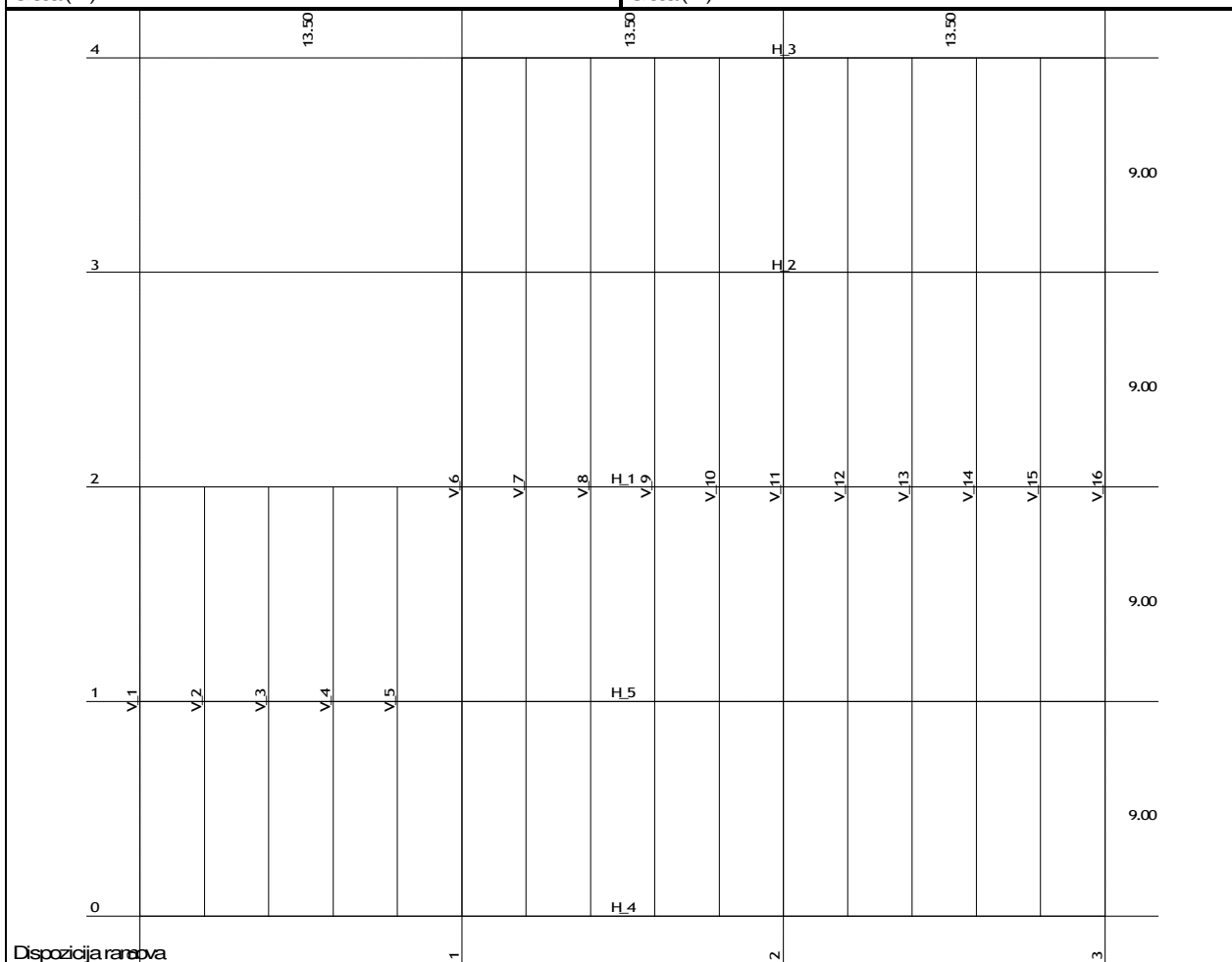


Setovi numerickih podataka
Greda (11)

Greda
12. IPBL 200



Setovi numerickih podataka
Greda (12)

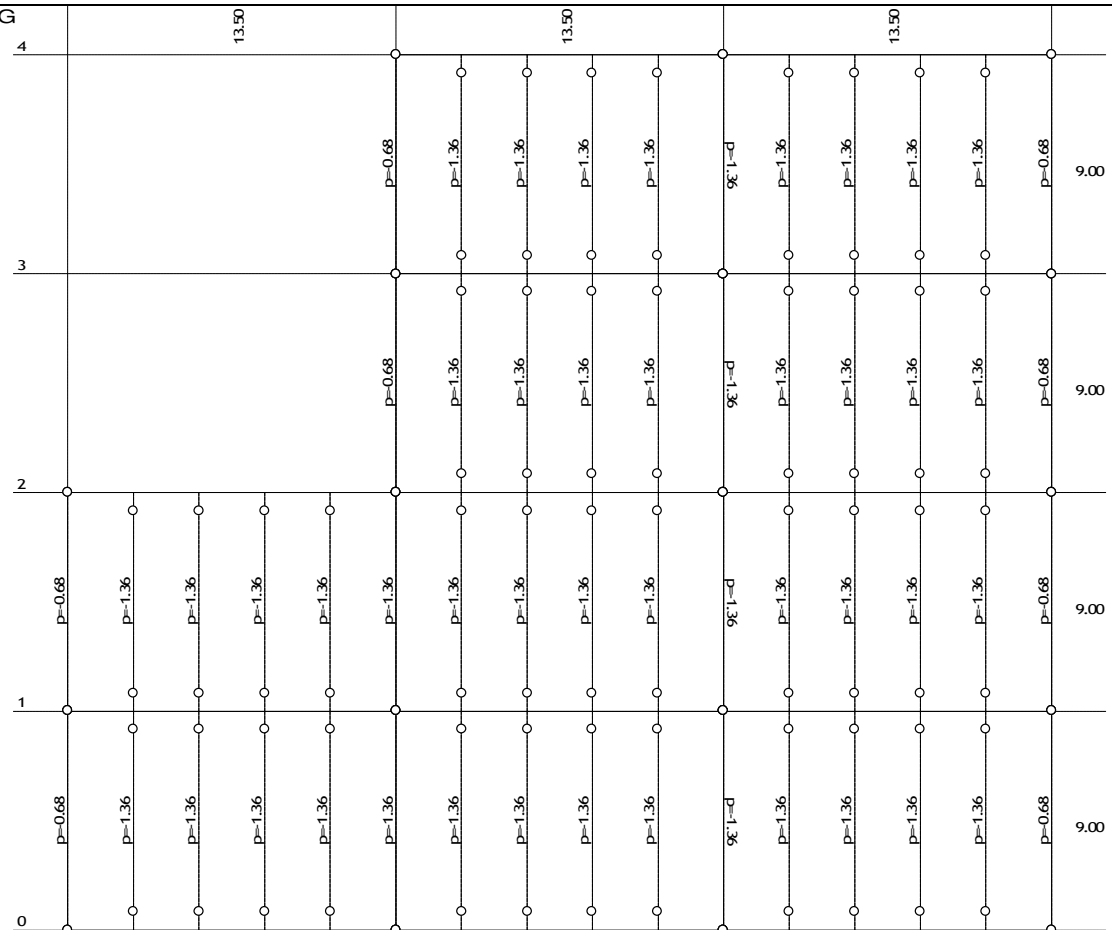


Lista slucajeva opterećenja

No	Naziv
1	SW (g)
2	G
3	S
4	Wx
5	Wy
6	Wu
7	Sx
8	Sy
9	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV+1.8xVI
10	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV+1.8xVI
11	Komb.: 1.6xI+ +II+1.8xIII+1.8xV+1.8xVI
12	Komb.: I+1.6xII+1.8xIII+1 .8xIV+1.8xVI
13	Komb.: 1.6xI+ +II+1.8xIII+1.8xIV+1.8xVI
14	Komb.: I+1.6xII+1.8xIII+1 .8xV+1.8xVI
15	Komb.: I+II+1.8xIII+1.8xV +1.8xVI
16	Komb.: I+II+1.8xIII+1.8xIV+ +1.8xVI
17	Komb.: 1.6xI+1.6xII+ +1.8xIV+1.8xVI
18	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xVI
19	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xV
20	Komb.: 1.6xI+ +1.6xII+1.8xV+1.8xVI
21	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV
22	Komb.: I+1.6xII+ +1.8xIV+1.8xVI
23	Komb.: 1.6xI+II+ +1.8xIV+1.8xVI
24	Komb.: 1.6xI+ +II+1.8xV+1.8xVI
25	Komb.: I+1.6xII+1.8xIII+ +1.8xV
26	Komb.: I+1.6xII+1.8xV+1.8 xVI
27	Komb.: 1.6xI+ +II+1.8xIII+1.8xIV
28	Komb.: I+1.6xII+1.8xIII+1 .8xIV
29	Komb.: 1.6xI+II+1.8xIII+ +1.8xV
30	Komb.: I+1.6xII+1.8xIII+1 .8xVI
31	Komb.: 1.6xI+ +II+1.8xIII+1.8xVI
32	Komb.: I+II+1.8xIV+1.8xVI
33	Komb.: I+II+1.8xIII+1.8xV

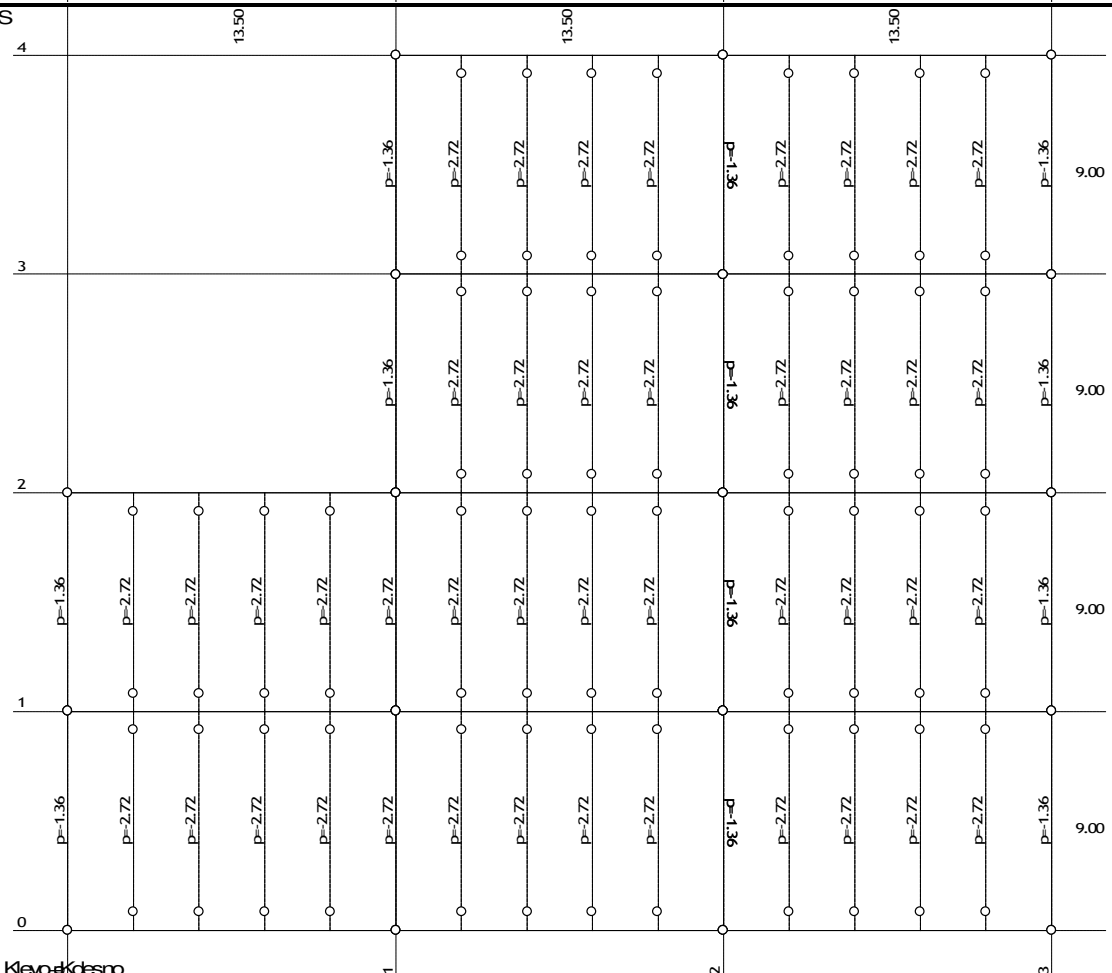
34	Komb.: I+II+1.8xV+1.8xVI
35	Komb.: I+II+1.8xIII+1.8xIV
36	Komb.: I+II+1.8xIII+1.8xVI
37	Komb.: 1.6xI+1.6xII+1.8xIII
38	Komb.: 1.6xI+1.6xII+1.8xV
39	Komb.: 1.6xI+1.6xII+1.8xIV
40	Komb.: 1.6xI+1.6xII+1.8xVI
41	Komb.: I+1.6xII+1.8xIV
42	Komb.: 1.6xI+II+1.8xIII
43	Komb.: 1.6xI+II+1.8xV
44	Komb.: 1.6xI+II+1.8xVI
45	Komb.: I+1.6xII+1.8xV
46	Komb.: I+1.6xII+1.8xVI
47	Komb.: 1.6xI+II+1.8xIV
48	Komb.: I+1.6xII+1.8xIII
49	Komb.: I+II+1.8xV
50	Komb.: I+II+1.8xIV
51	Komb.: I+II+1.8xIII
52	Komb.: I+II+1.8xVI
53	Komb.: 1.6xI+1.6xII
54	Komb.: 1.6xI+II
55	Komb.: I+1.6xII
56	Komb.: I+II
57	Komb.: I+II+III
58	Komb.: I+II+IV
59	Komb.: I+II+III+IV
60	Komb.: I+II+V
61	Komb.: I+II+III+V
62	Komb.: I+II+IV+VI
63	Komb.: I+II+IV-1xVI
64	Komb.: I+II+III+IV+VI
65	Komb.: I+II+III+IV-1xVI
66	Komb.: I+II+V+VI
67	Komb.: I+II+V-1xVI
68	Komb.: I+II+III+V+VI
69	Komb.: I+II+III+V-1xVI
70	Komb.: I+II+III+VII
71	Komb.: I+II+III-1xVII
72	Komb.: I+II+III+VIII
73	Komb.: I+II+III-1xVIII
74	Komb.: 1.3xI+ +1.3xII+1.3xIII+1.3xVII
75	Komb.: 1.3xI+1.3xII+1.3xIII- -1.3xVII
76	Komb.: 1.3xI+1.3xII+1.3xIII+ +1.3xVIII
77	Komb.: 1.3xI+1.3xII+ +1.3xIII-1.3xVIII

Opt. 2 G



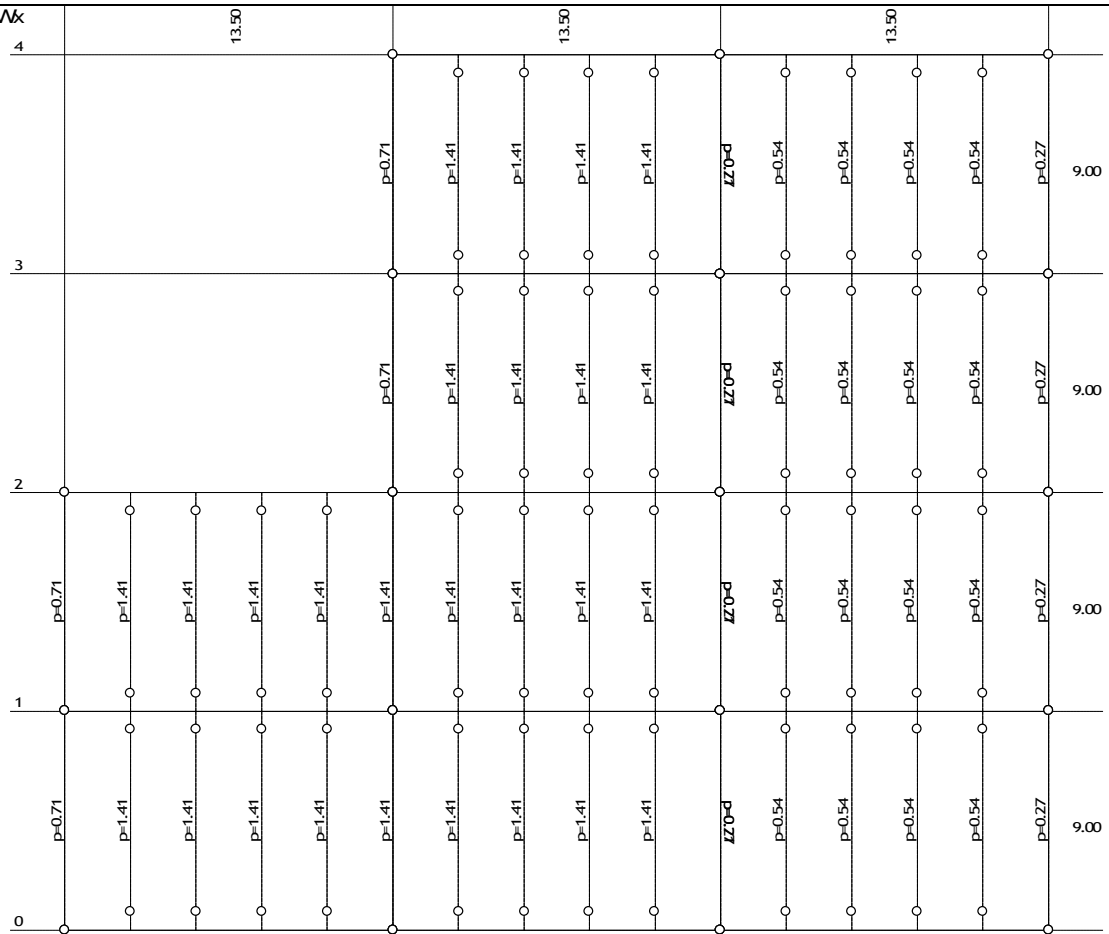
Project: Kevorkidesno

Opt. 3: S



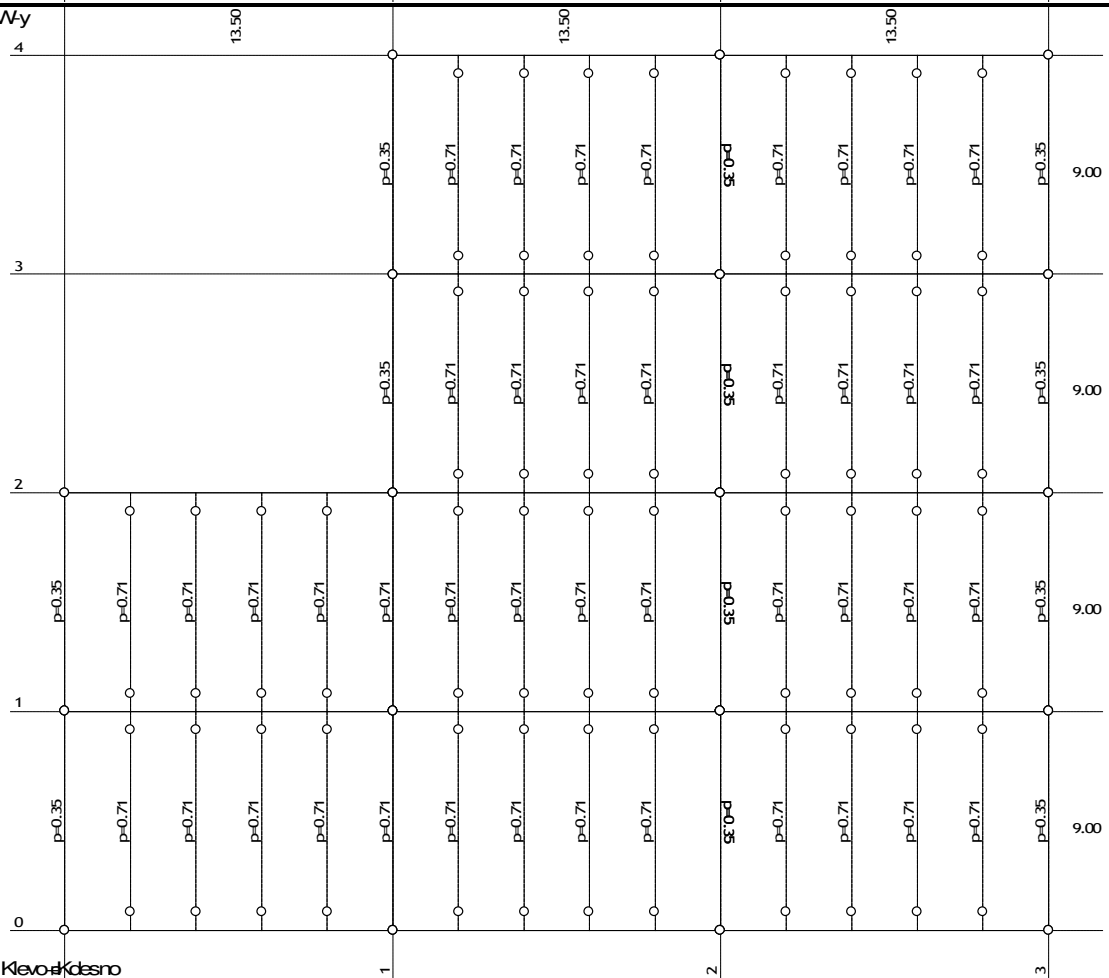
Project: Kevorkidesno

Opt. 4: Wk



Project: Kevon Klesno

Opt. 5: Wy



Project: Kevon Klesno

Opt. 2 G

2

1

0

0

1

2

3

4

9.00

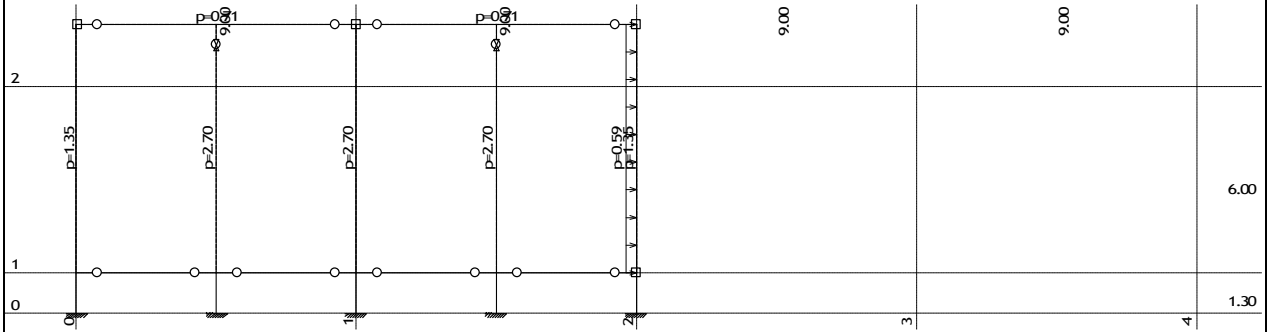
9.00

6.00

1.30

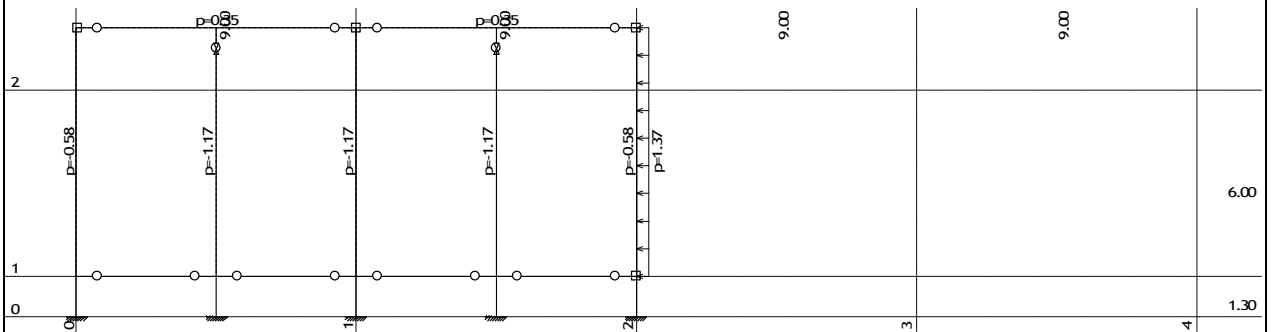
Ram V.1

Opt. 4: Wx



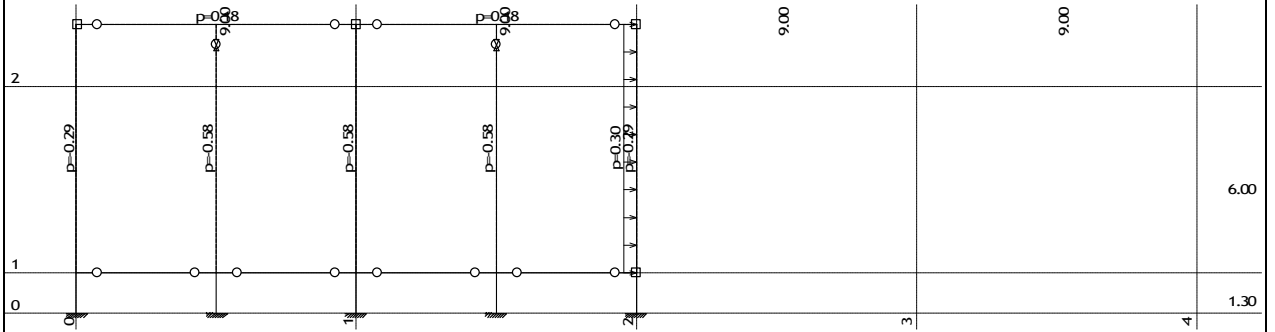
Ram V.1

Opt. 5: Wy



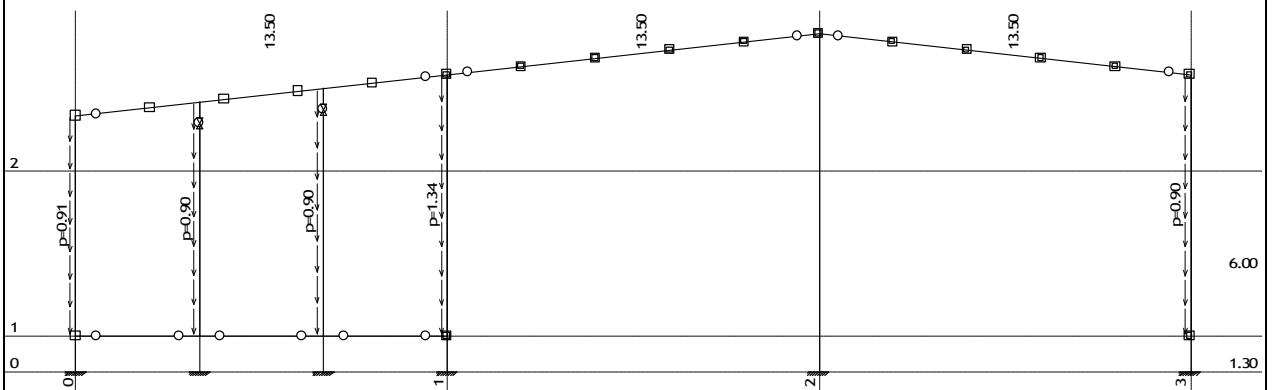
Ram V.1

Opt. 6: Wu



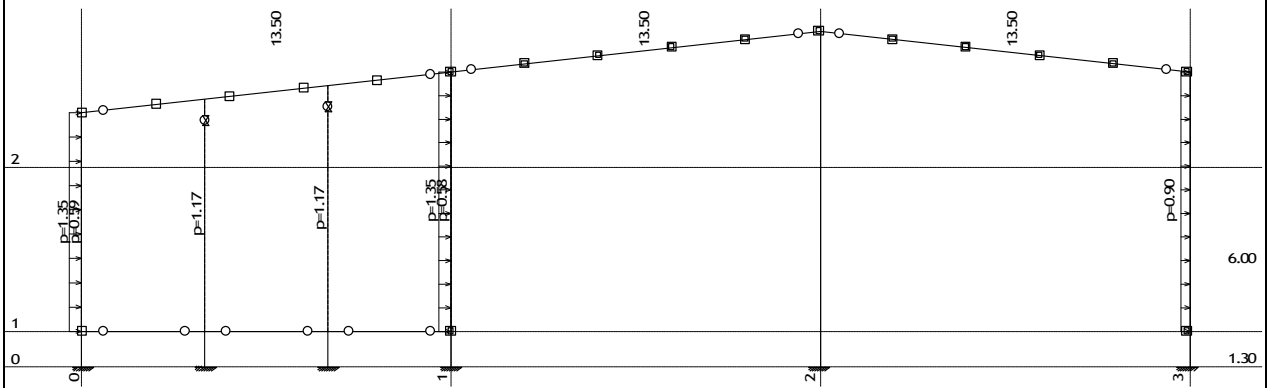
Ram: V.1

Opt. 2: G



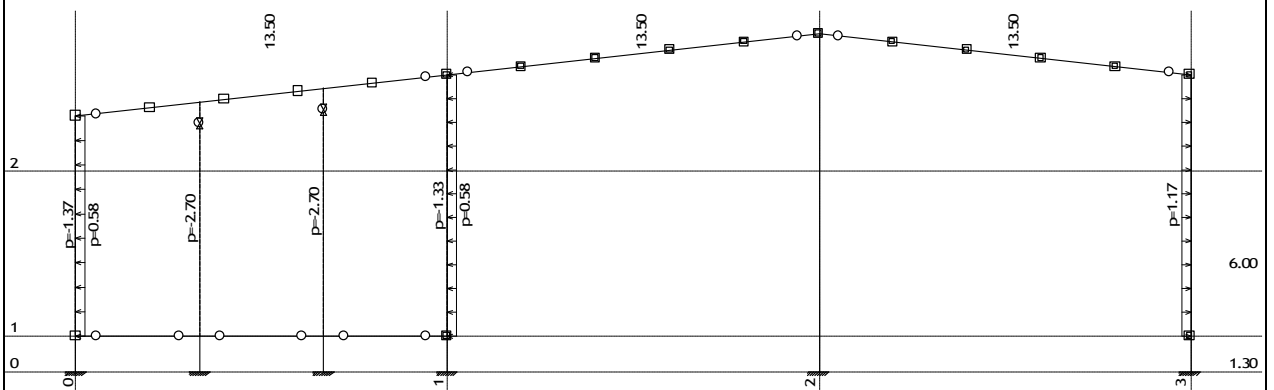
Ram: H.1

Opt. 4: Wk



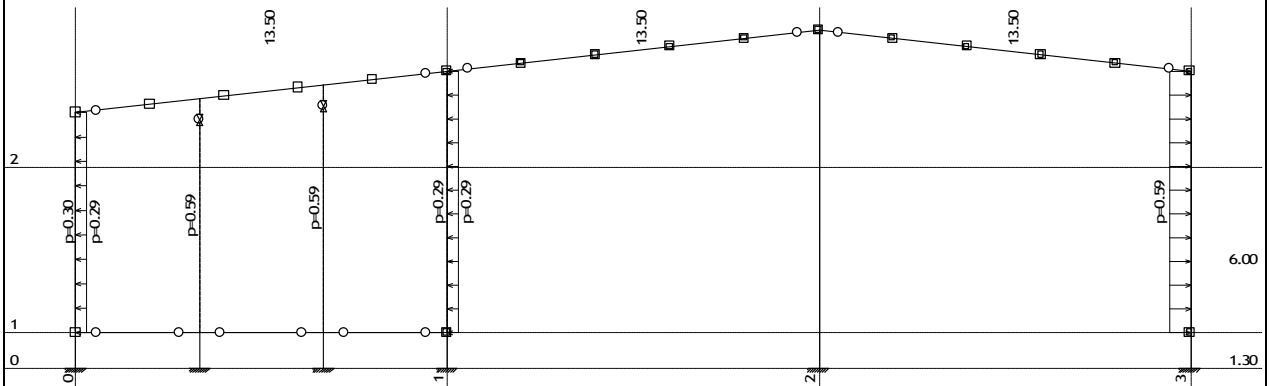
Ram H 1

Opt. 5: Wy



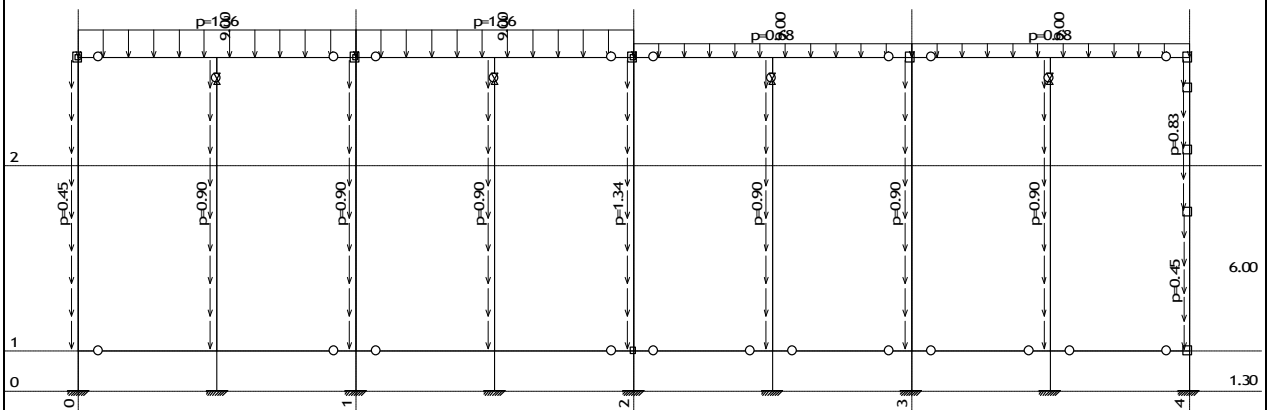
Ram H 1

Opt. 6: Wu



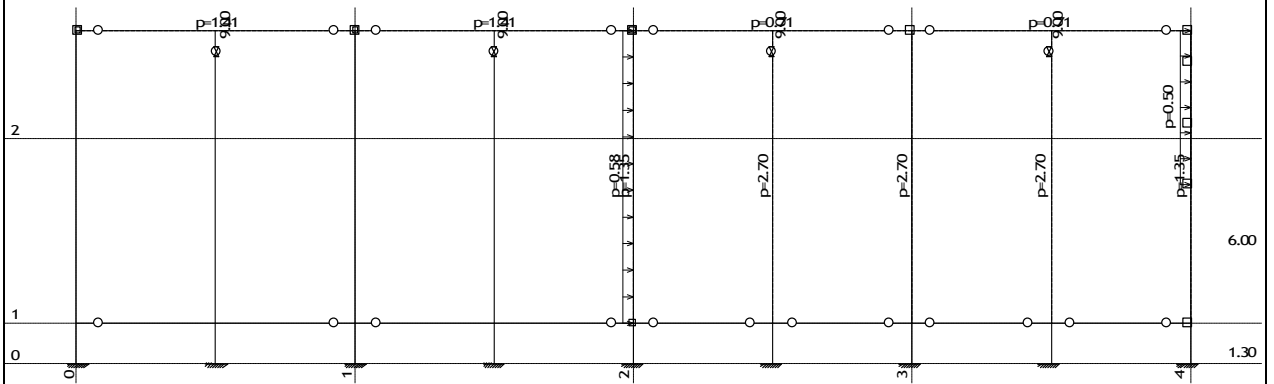
Ram: H_1

Opt. 2 G



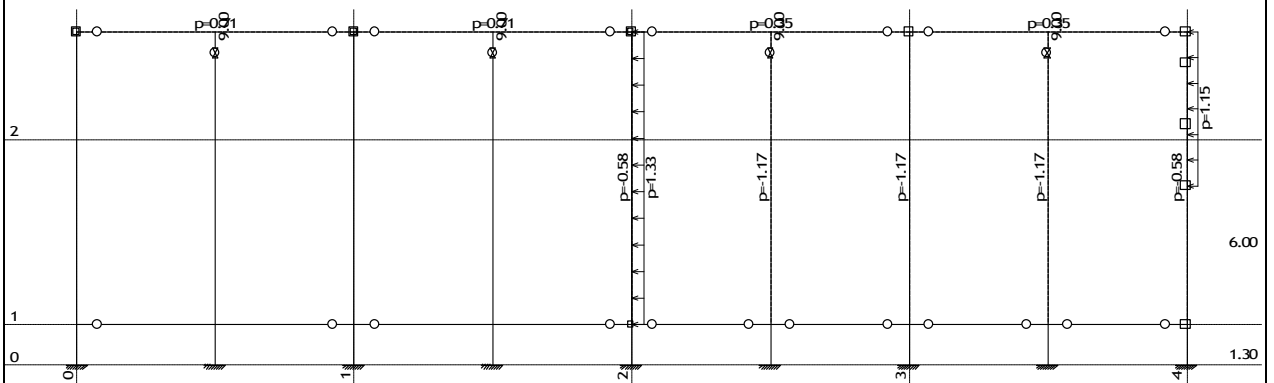
Param V_6

Opt. 4: Wx



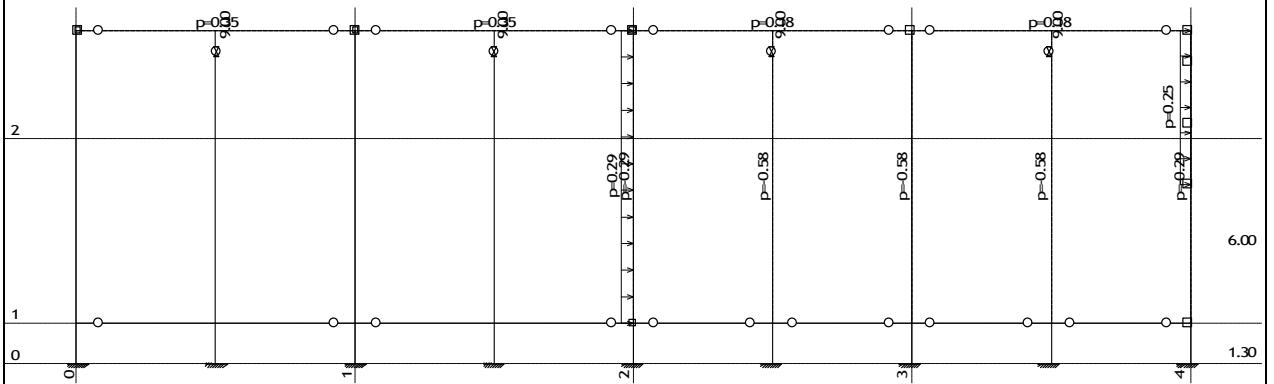
Ram V.6

Opt. 5: Wy



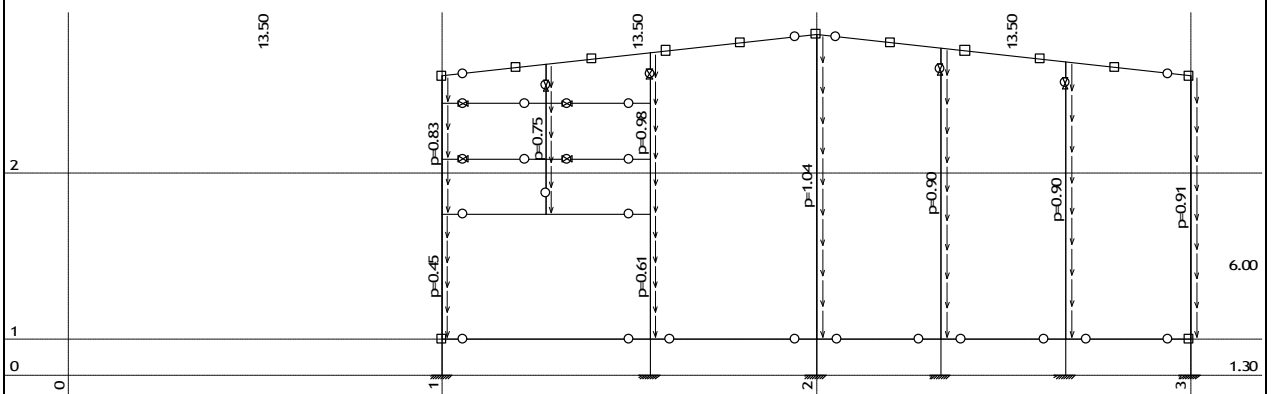
Ram V.6

Opt. 6: Wu



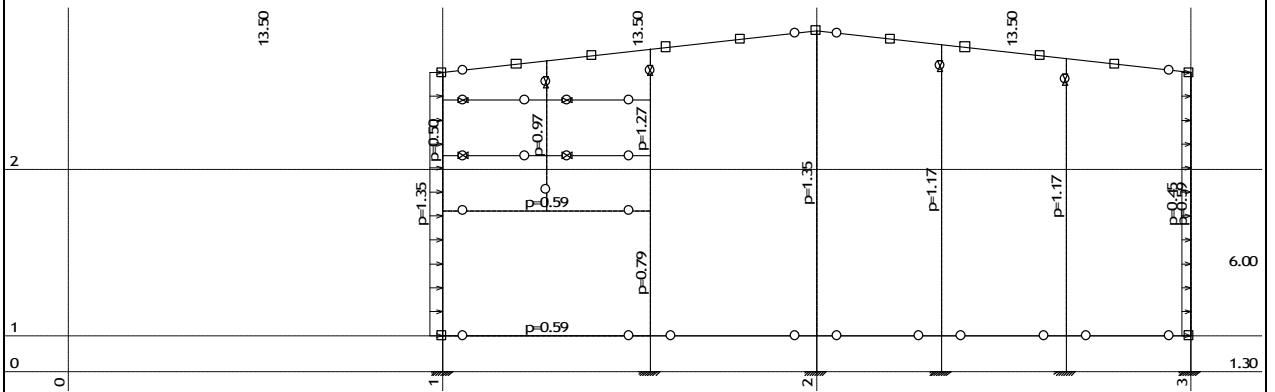
Ram V.6

Opt. 2: G



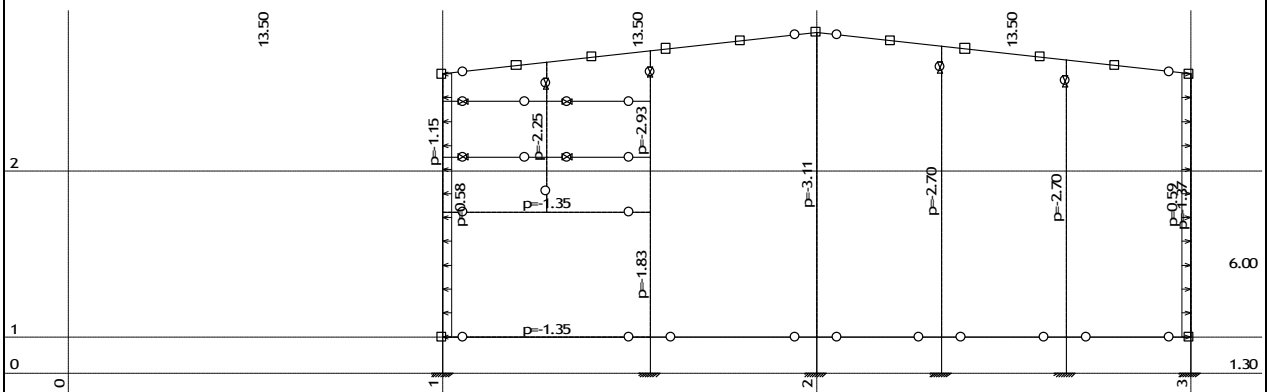
Ram H.3

Opt. 4: Wk

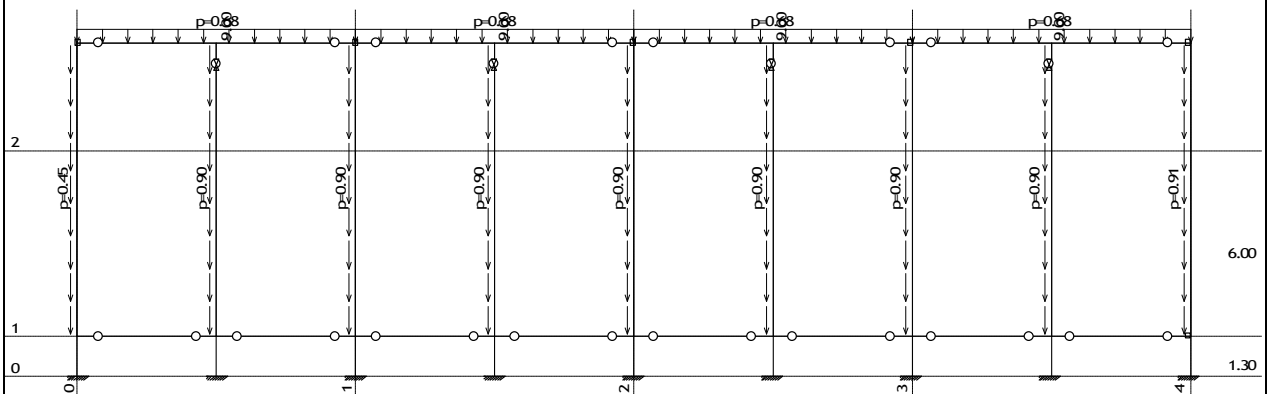
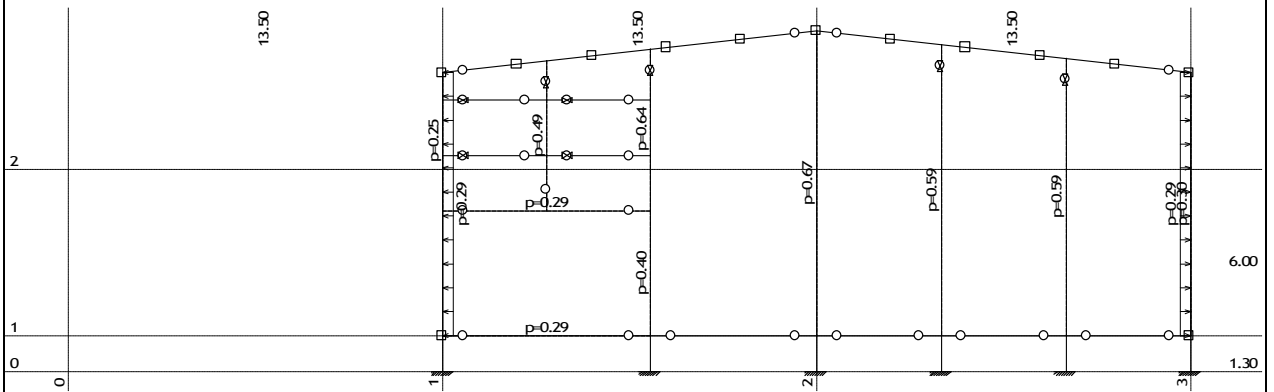


Ram H.3

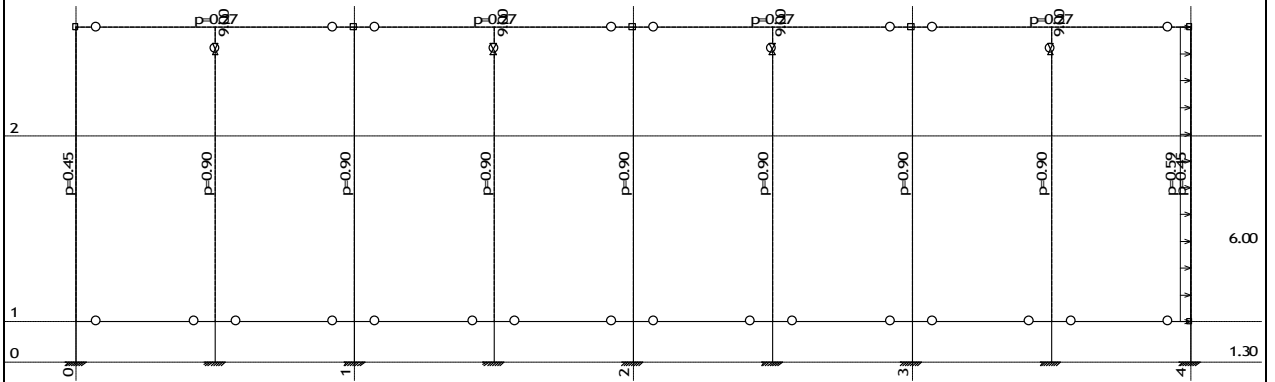
Opt. 5: Wy



Ram H.3

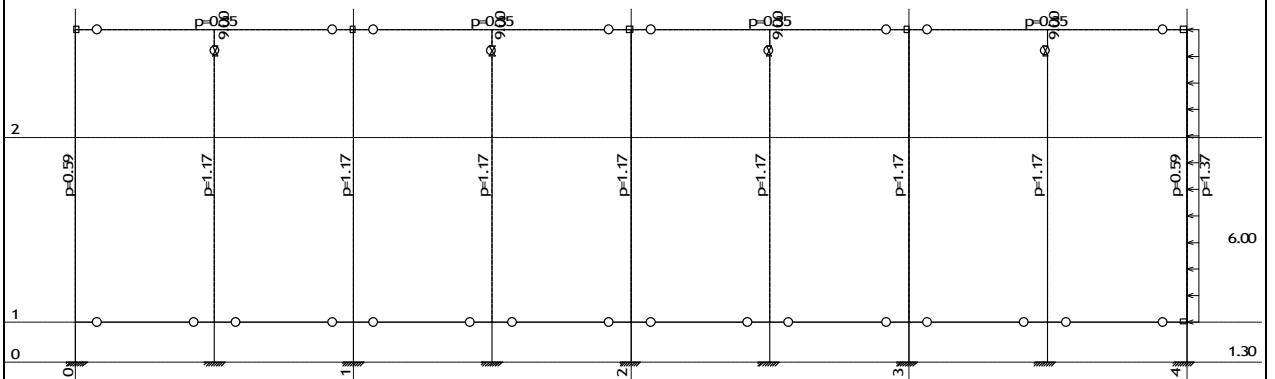


Opt. 4: Wx

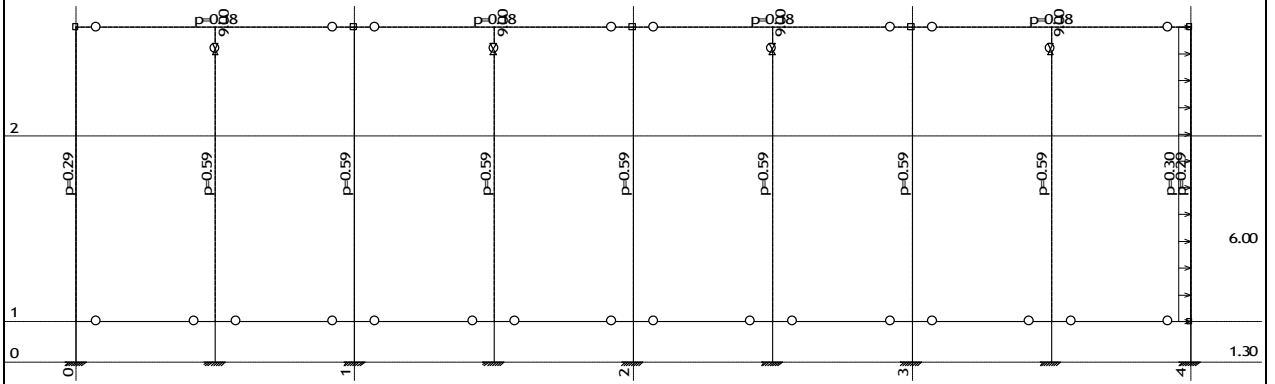


Ram V 16

Opt. 5: Wy



Ram V 16



Napredne opcije seizmickog proracuna:

Multiplikator krutosti oslonaca: 10000.000
Sprecono oscilovanje u Z pravcu

Faktori opterecenja za proracun masa

No	Naziv	Koeficijent
1	SW (g)	1.00
2	G	1.00
3	S	1.00
4	Wx	0.00
5	W-y	0.00
6	Wu	0.00

Raspored masa po visini objekta

Nivo	Z [m]	X [m]	Y [m]	Masa [T]	T/m2
	11.00	-42.61	-23.28	504.67	
	6.00	-63.32	-26.25	50.03	
	0.00	-44.90	-21.27	312.89	
	-1.30	-44.98	-22.06	67.51	
Ukupno:	6.16	-44.65	-22.68	935.10	

Položaj centara krutosti po visini objekta

Nivo	Z [m]	X [m]	Y [m]
	11.00	-40.37	-22.17
	6.00	-43.36	-22.66
	0.00	-44.42	-22.42
	-1.30	-44.48	-22.41

Ekscentricitet po visini objekta

Nivo	Z [m]	eoX [m]	eoY [m]
	11.00	2.25	1.11
	6.00	19.97	3.59
	0.00	0.47	1.15
	-1.30	0.50	0.35

Periodi oscilovanja konstrukcije

No	T [s]	f [Hz]
1	1.2451	0.8032
2	1.0461	0.9559
3	1.0233	0.9772

Seizmicki proracun

Seizmicki proracun: JUS (Ekvivalentno staticko opterecenje)

Kategorija tla: II
Seizmicka zona: (Ks = 0.040)
Kategorija objekta: I
Vrsta konstrukcije: 2
Kota ukljescenja: Zd = 0.00 m
Multiplikator krutosti oslonaca: 10000.000

Ugao dejstva zemljotresa:

Naziv	T [sec]	α [°]
Sx	1.046	0.00
Sy	1.245	90.00

Raspored seizmickih sila po visini objekta (Sx)

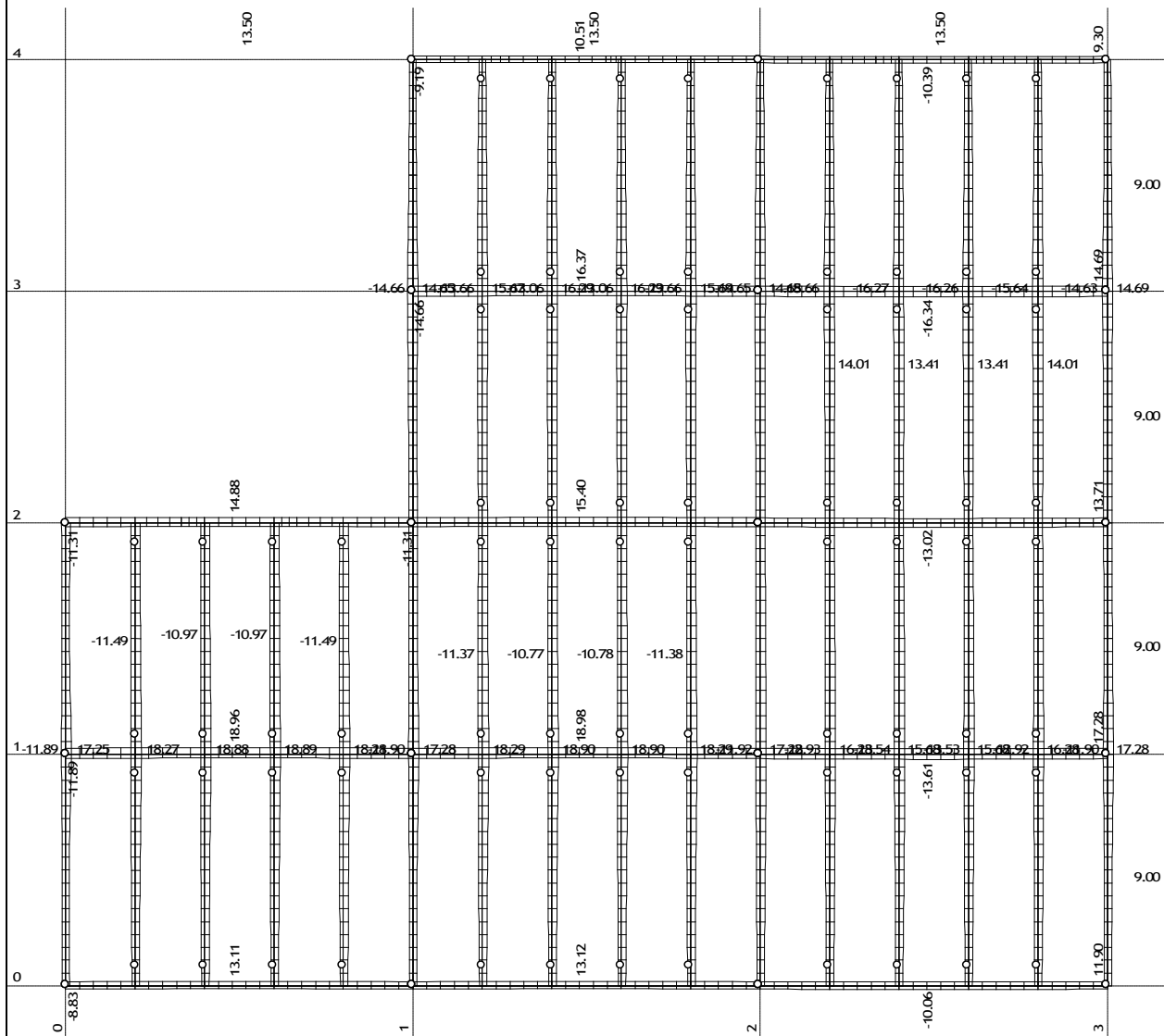
Nivo	Z [m]	S [kN]
	11.00	262.98
	6.00	20.93
	0.00	0.00
	-1.30	0.00
	Σ=	283.92

Raspored seizmickih sila po visini objekta (Sy)

Nivo	Z [m]	S [kN]
	11.00	220.96
	6.00	17.59
	0.00	0.00
	-1.30	0.00
	Σ=	238.55

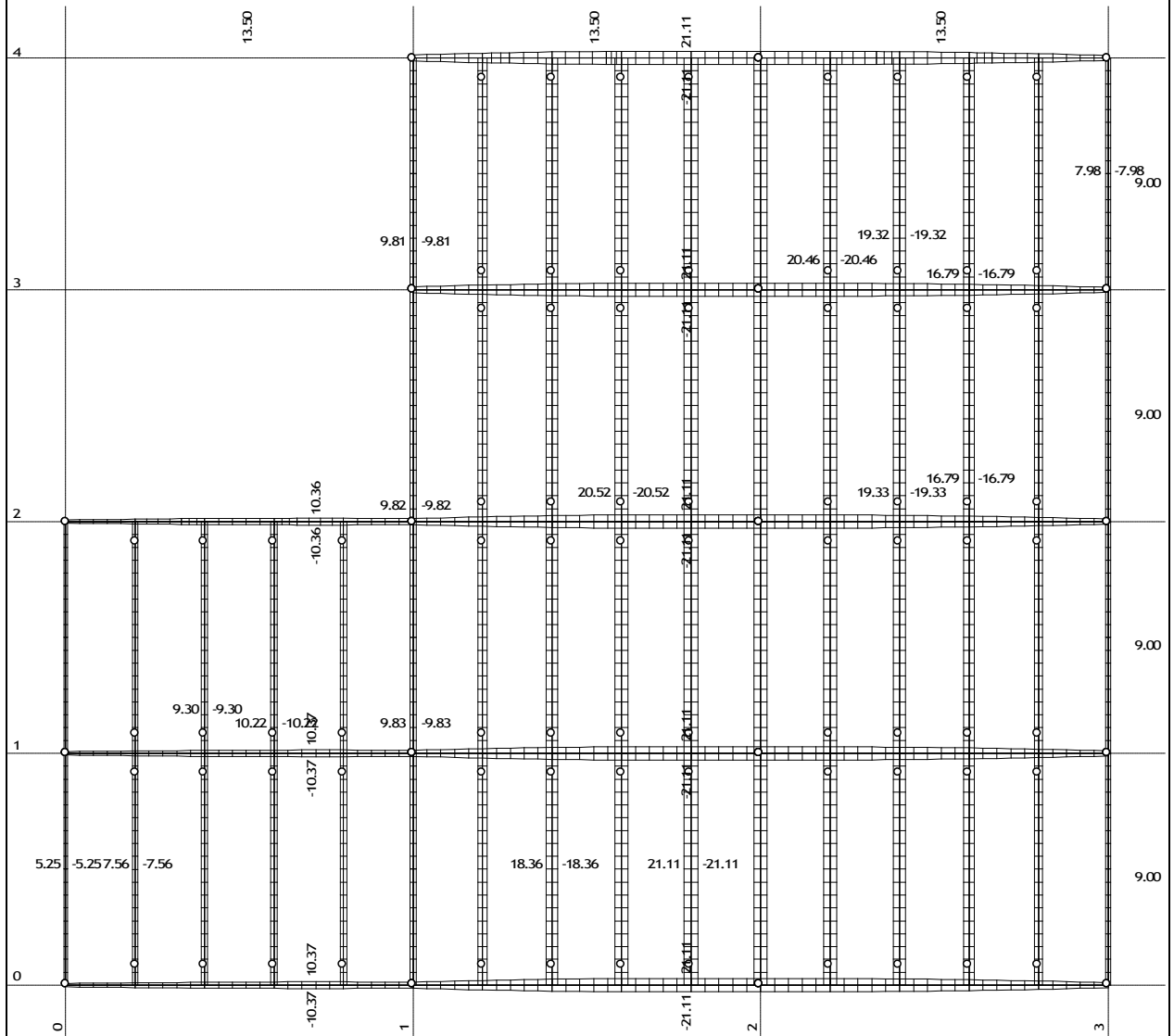
Raspored masa po visini objekta

Nivo	Z [m]	X [m]	Y [m]	Masa [T]	T/m2
	11.00	-42.61	-23.28	504.67	
	6.00	-63.32	-26.25	50.03	
	0.00	-44.90	-21.27	312.89	
	-1.30	-44.98	-22.06	67.51	
Ukupno:	6.16	-44.65	-22.68	935.10	



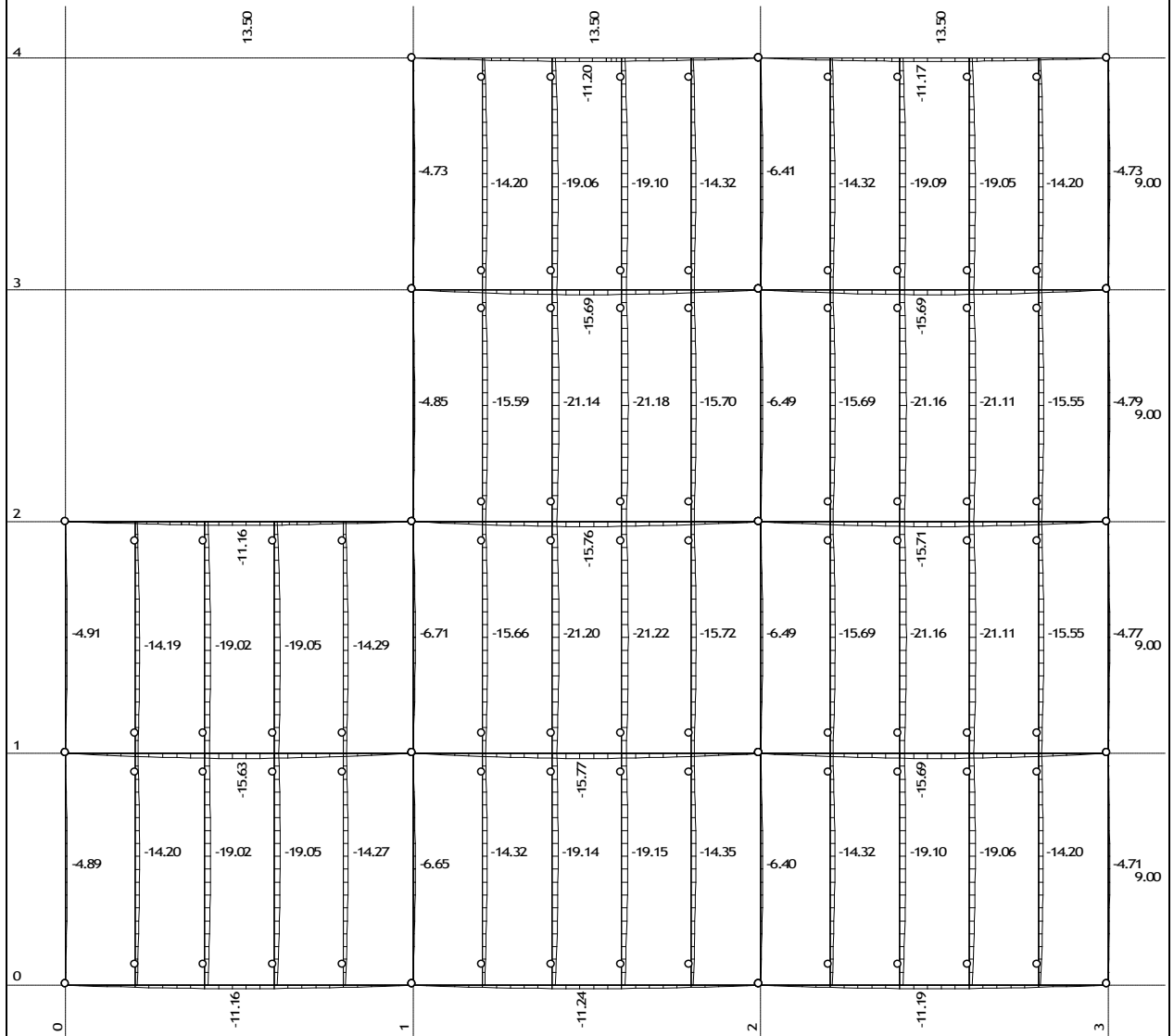
Pogled: Kleva+Klesno

Uticaji u gredi: max $X_p = 18.98$ / min $X_p = -16.34$ m / 1000

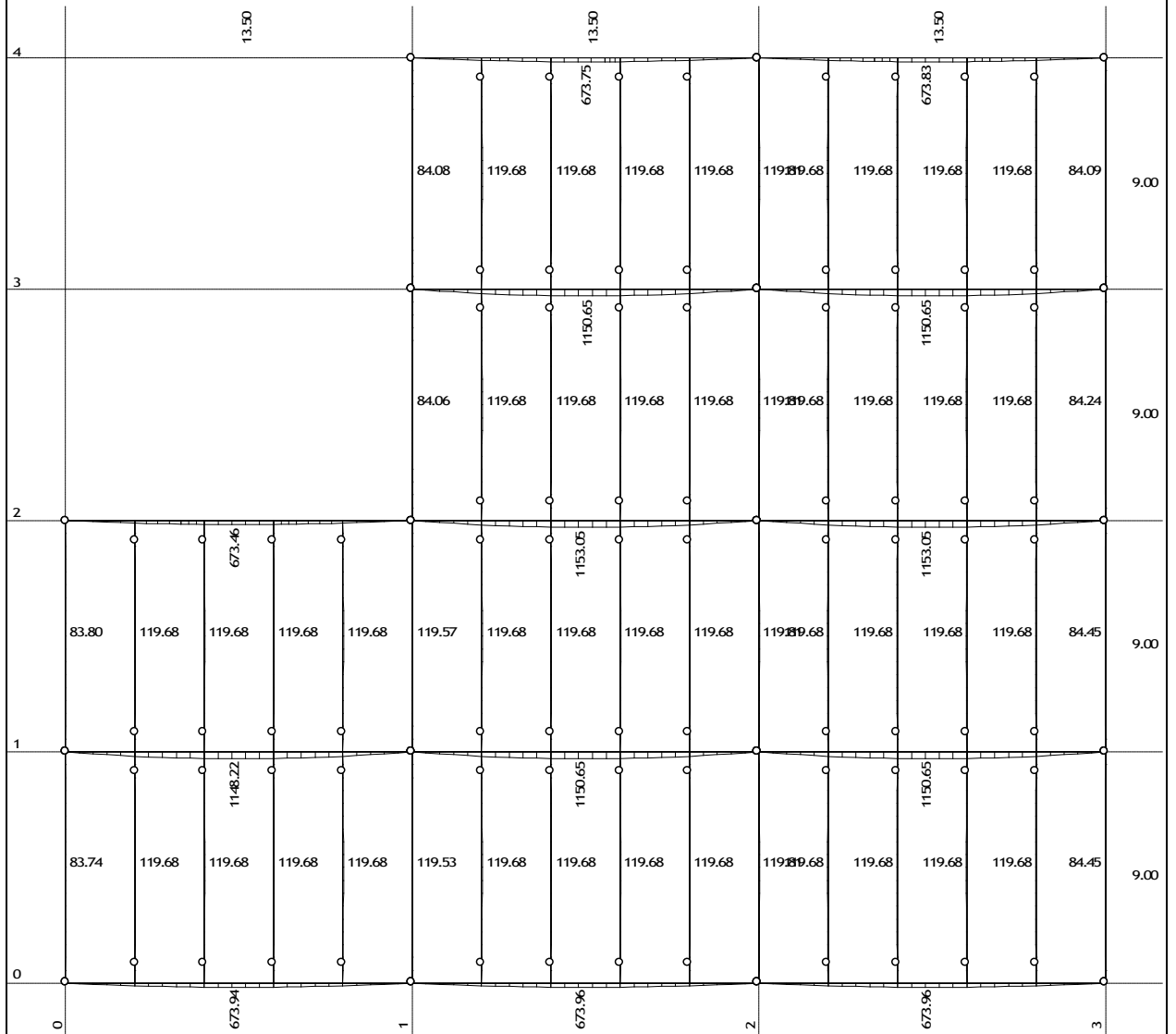


Pogled: Klevo+Kdesno

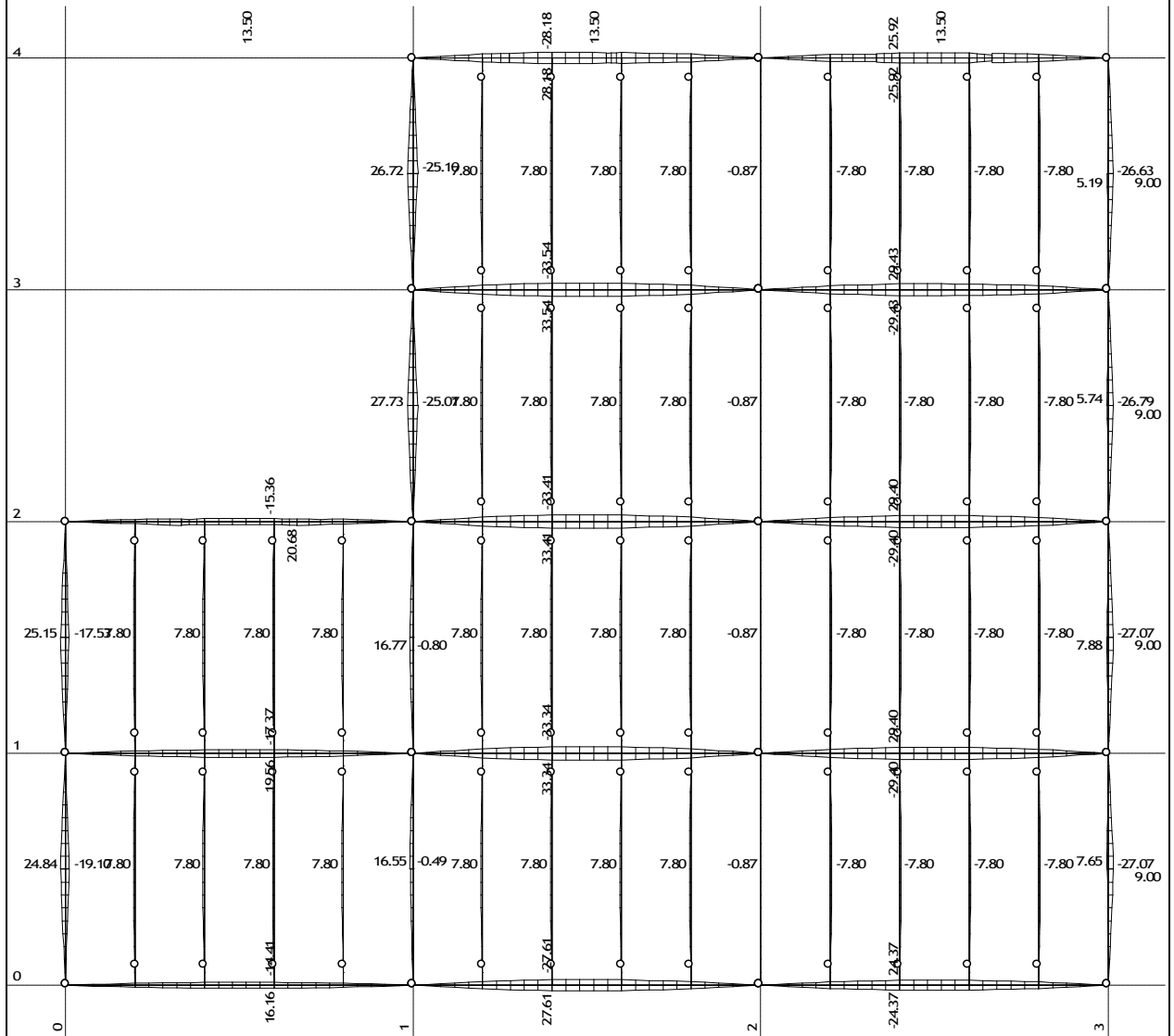
Ulicaji u gredi: max $Y_p = 21.11$ / min $Y_p = -21.11$ m / 1000



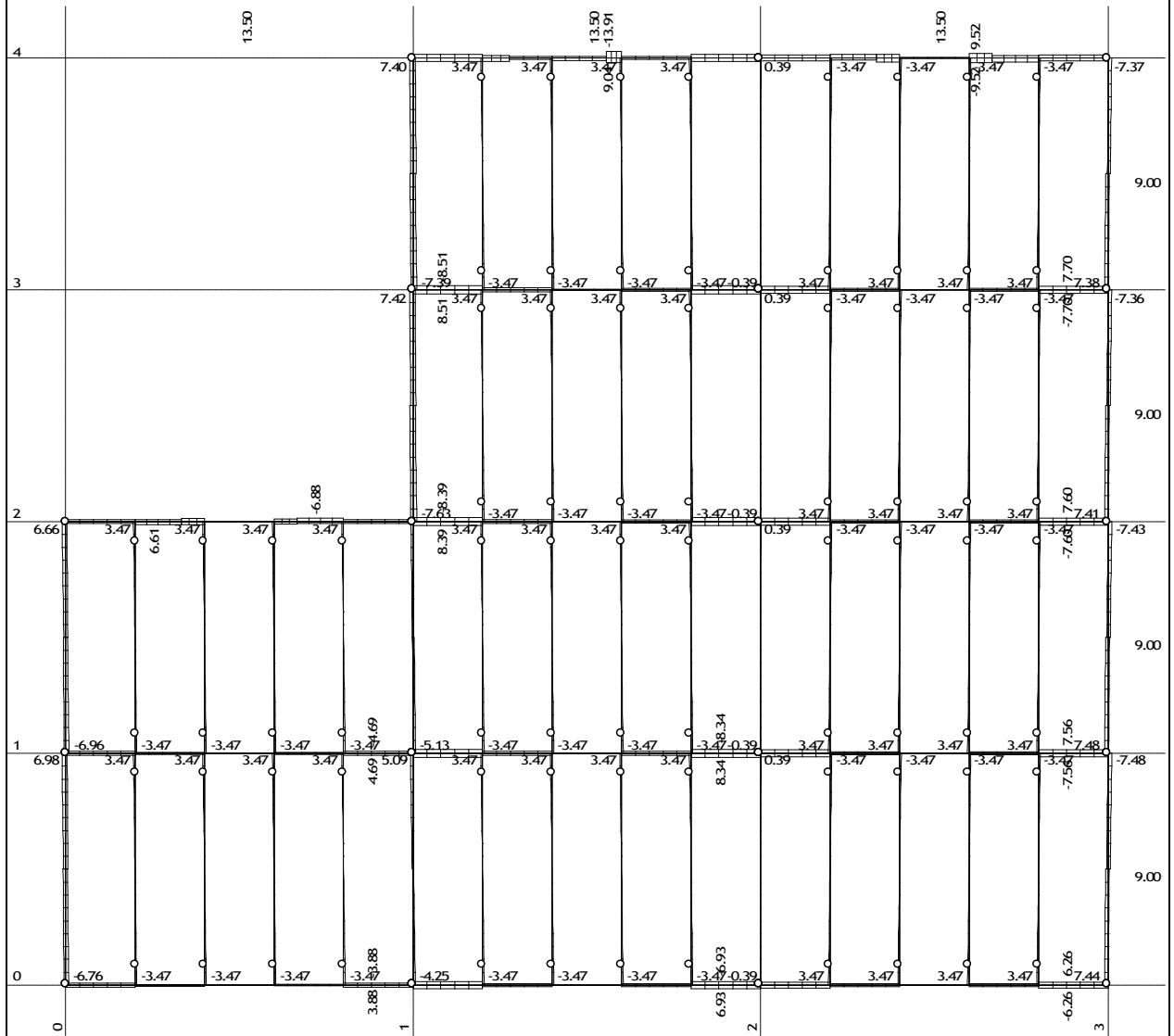
Pogled: Klevo+Kdesno
 Ulicaji ugredi: max Zp=-0.11 / min Zp=-21.22 m / 1000



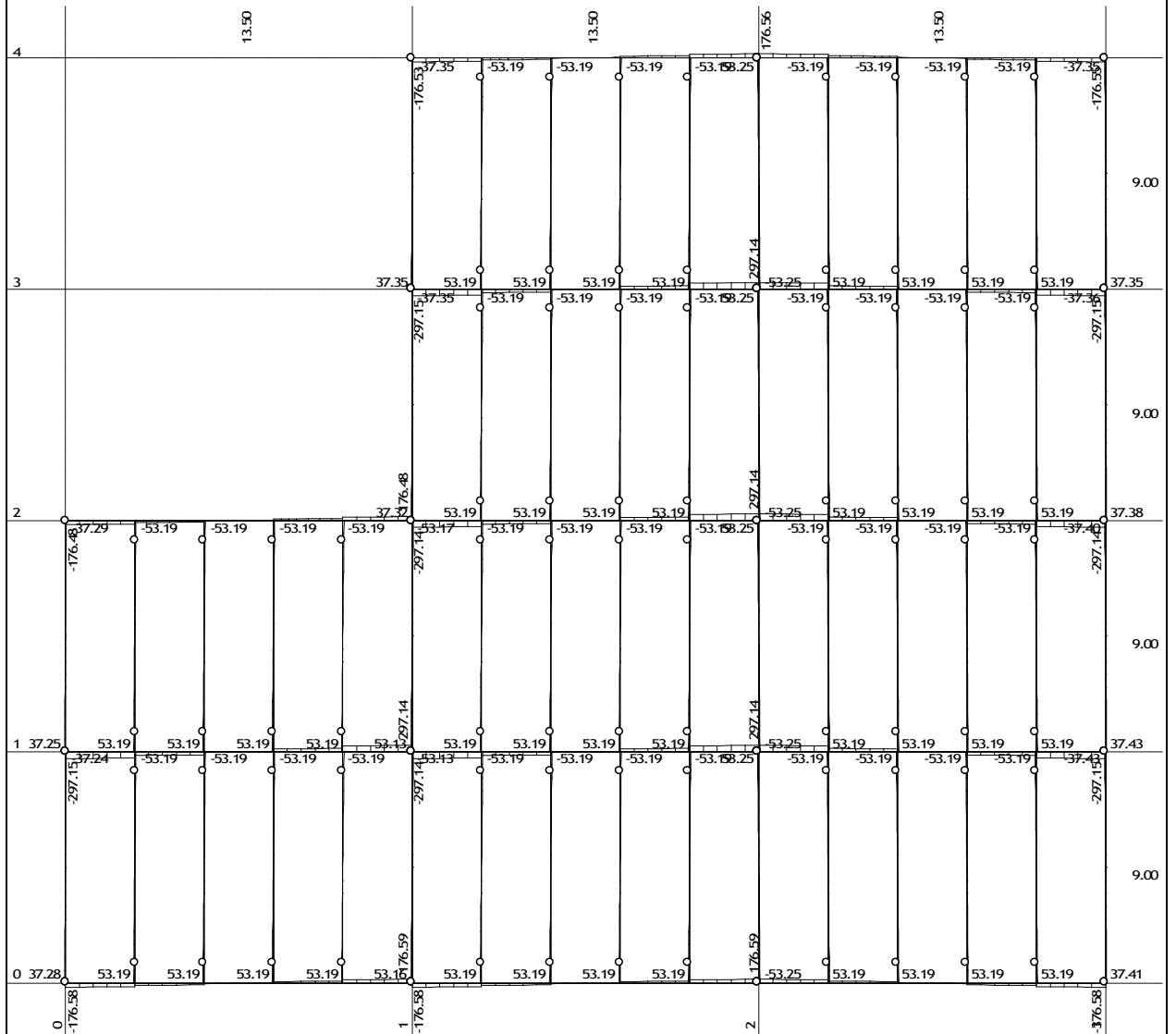
Pogled: Klevo+Klesno
 Ulicaji ugredi: max MB= 1153.05 / min MB= 0.00 kNm



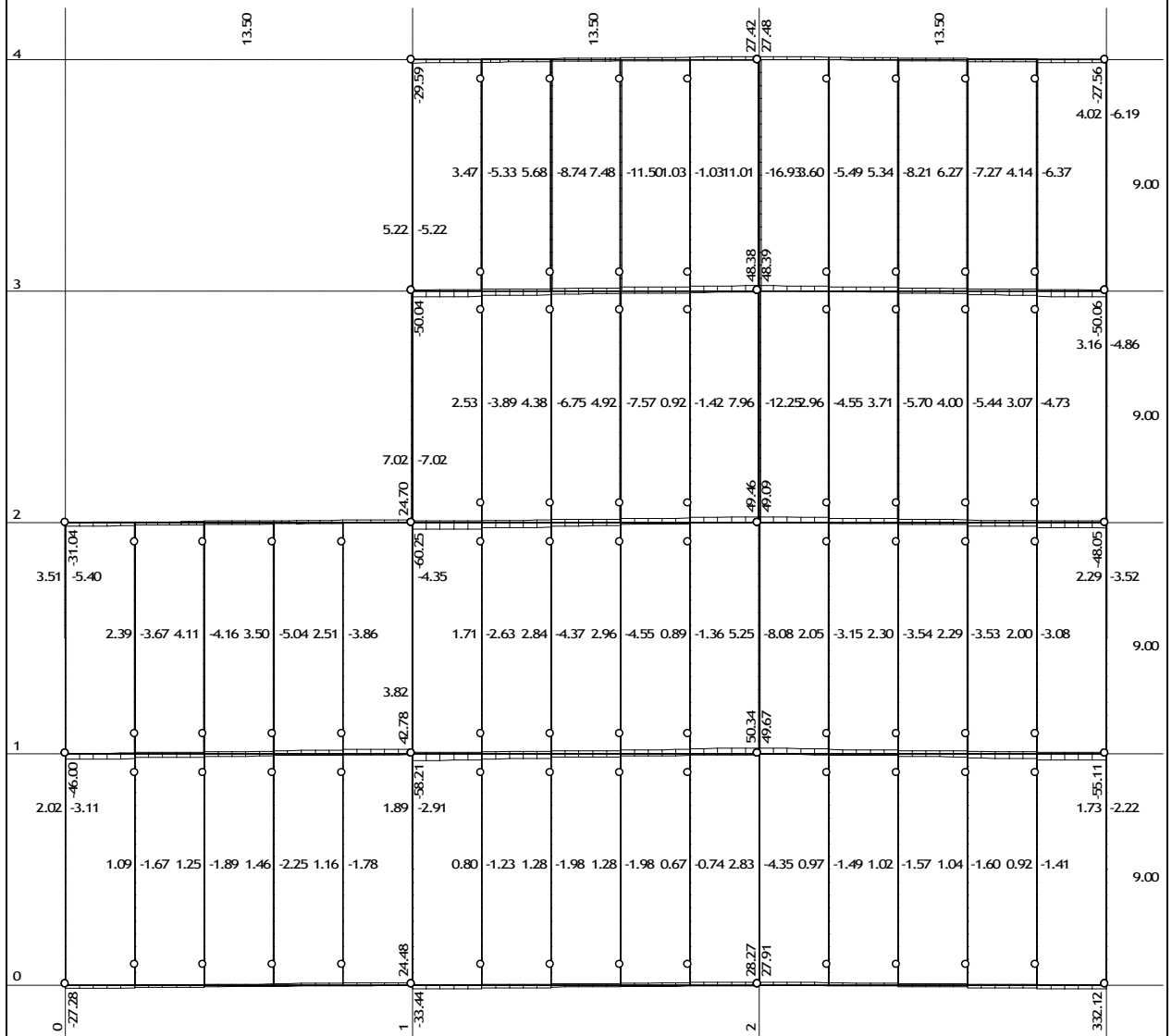
Pogled: Klevo+Kdesno
 Ulicaji u gredi: max M2= 33.54 / min M2= -33.54 kNm



Pogled: Klevo+Kdesno
 Ulicaji u gredi: max T3=9.52 / min T3=-13.91 kN



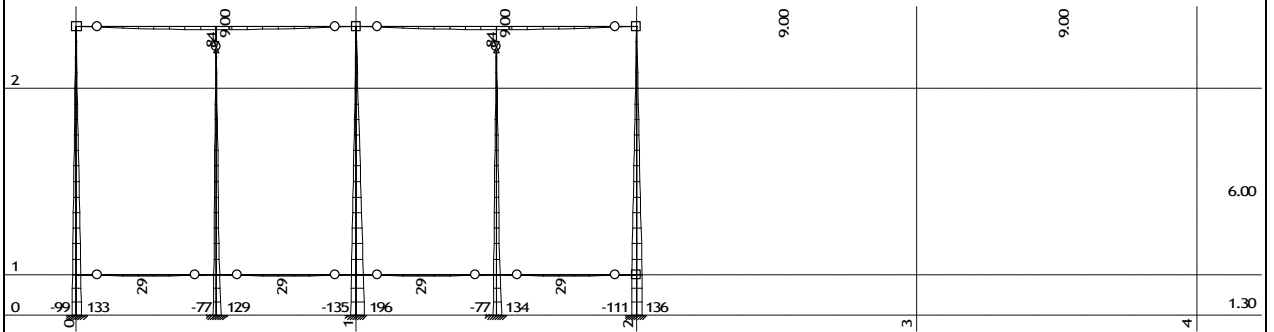
Pogled: Klevo+Kdesno
 Ulicaji u gredi: max T2= 297.15 / min T2= -297.15 kN



Pogled: Kleva+Klesno

Ulicaji u gredi: max N1= 50.34 / min N1= -60.25 kN

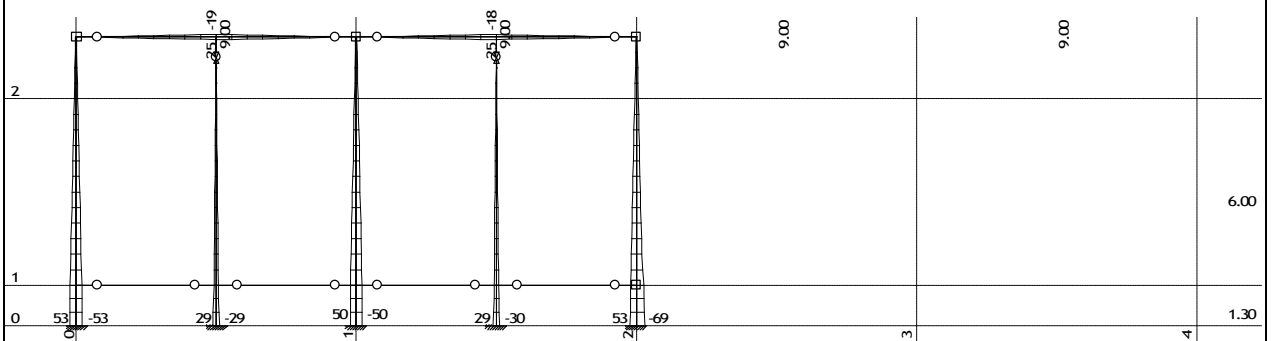
Opt. 78: [Ans] 9.55,74-77



Param V_1

Uticaji u gred: max M8= 196 / min M8= -135 kNm

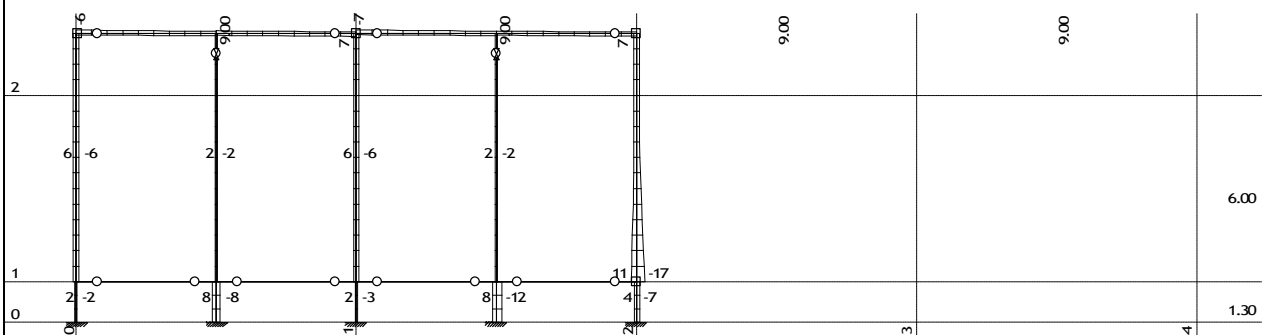
Opt. 78: [Ans] 9.55,74-77



Param V_1

Uticaji u gred: max M2= 53 / min M2= -69 kNm

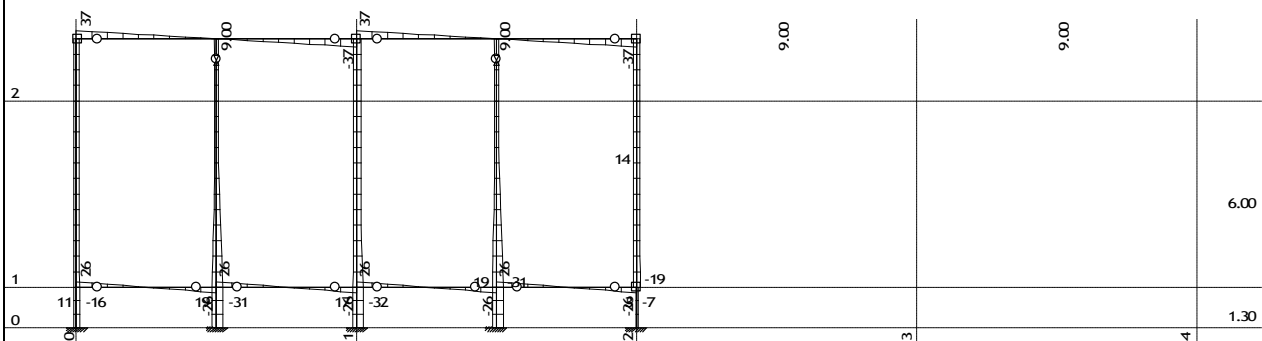
Opt. 78: [Anv] 9-55,74-77



Ram: V_1

Uticaji u gredi: $\max T_3 = 11 / \min T_3 = -17 \text{ kN}$

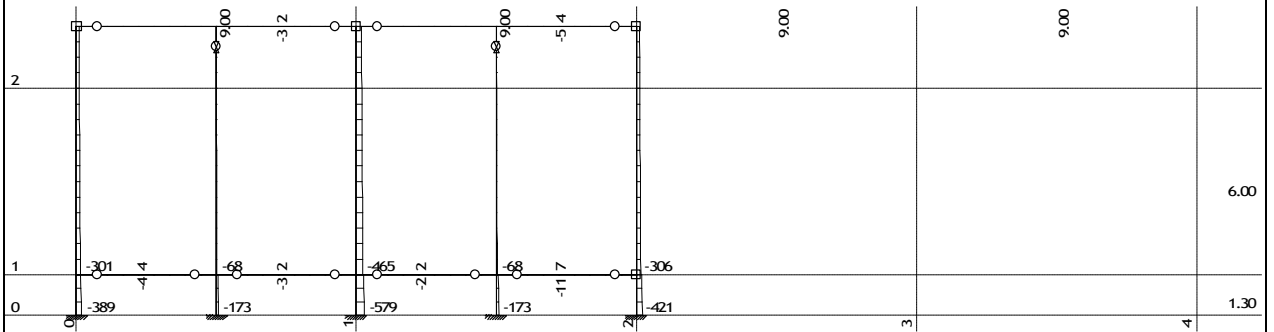
Opt. 78: [Anv] 9-55,74-77



Ram: V_1

Uticaji u gred: $\max T_2 = 37 / \min T_2 = -37 \text{ kN}$

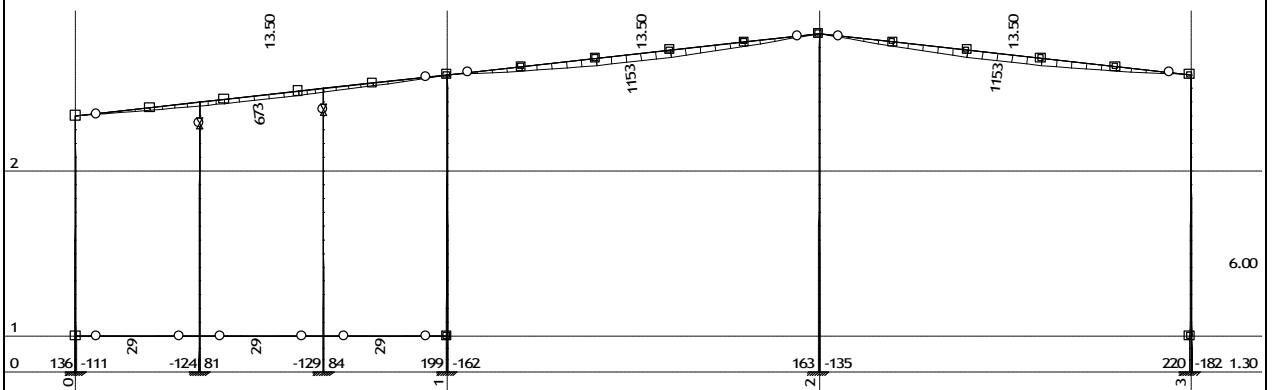
Opt. 78: [Ans] 9.55,74-77



Ram: V_1

Uticaji u gred: max N1 = 7 / min N1 = -579 kN

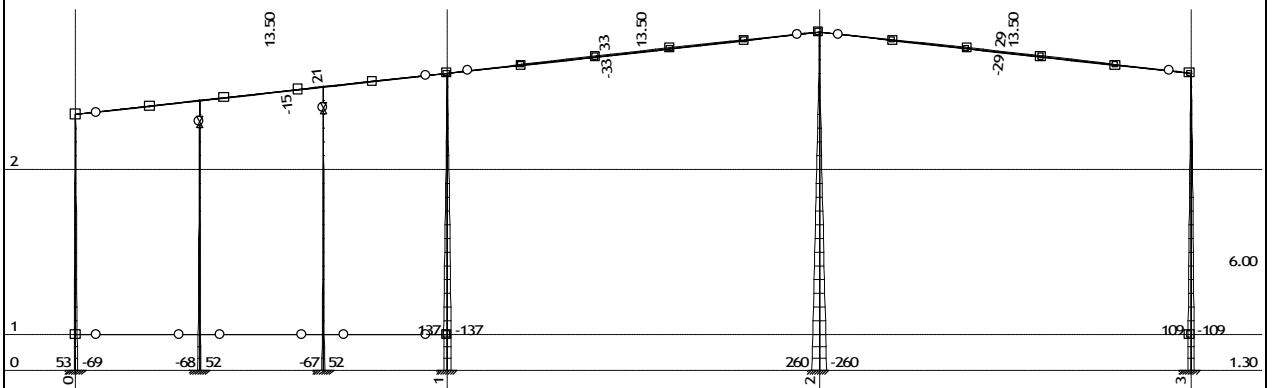
Opt. 78: [Ans] 9.55,74-77



Ram: H_1

Uticaji u gred: max M8 = 1153 / min M8 = -182 kNm

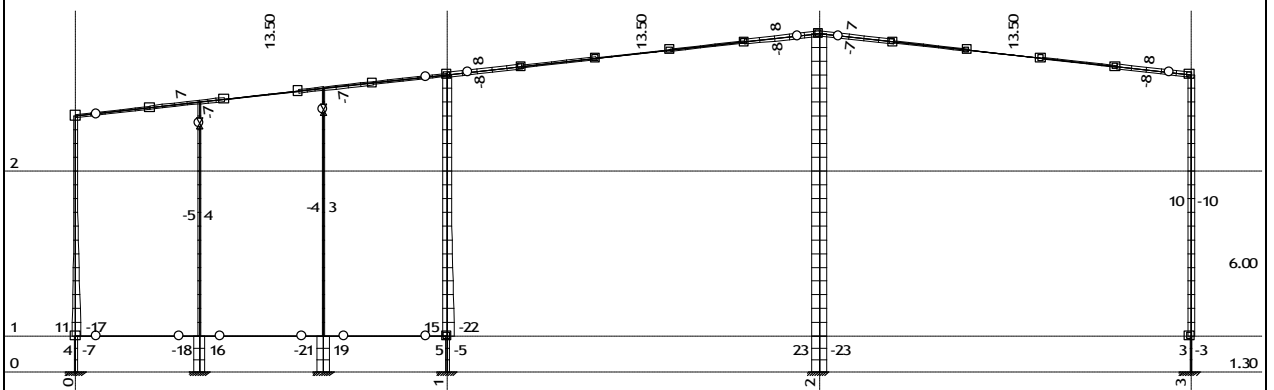
Opt. 78: [Ans] 9.55,74-77



Ram: H_1

Uticaji u gred: max M2= 260 / min M2= -260 kNm

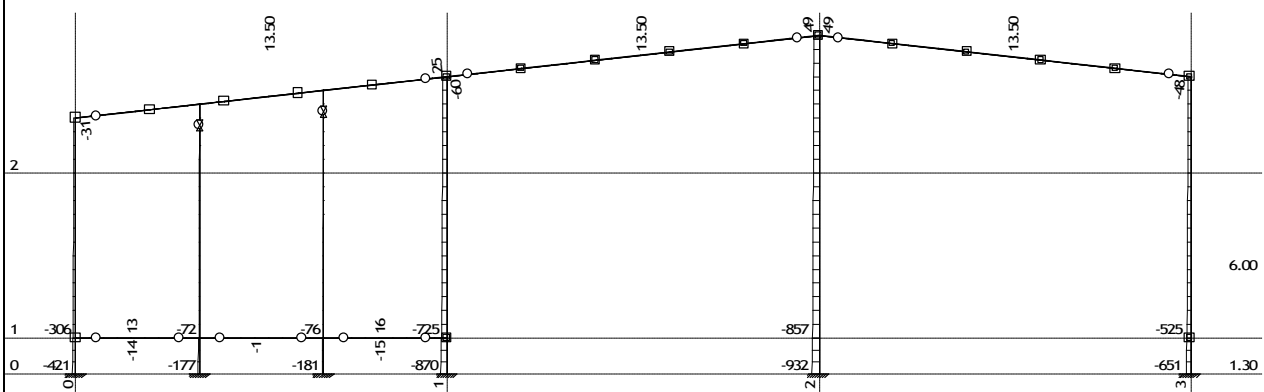
Opt. 78: [Ans] 9.55,74-77



Ram: H_1

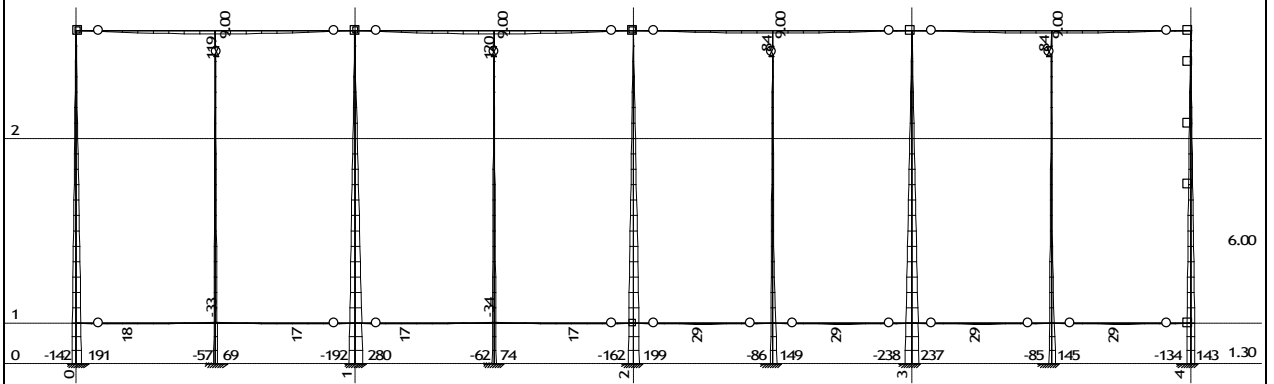
Uticaji u gred: max T3= 23 / min T3= -23 kN

Opt. 78: [Anv] 9-55,74-77



Uticaji u gred: $\max N_I = 49 / \min N_I = -932 \text{ kN}$

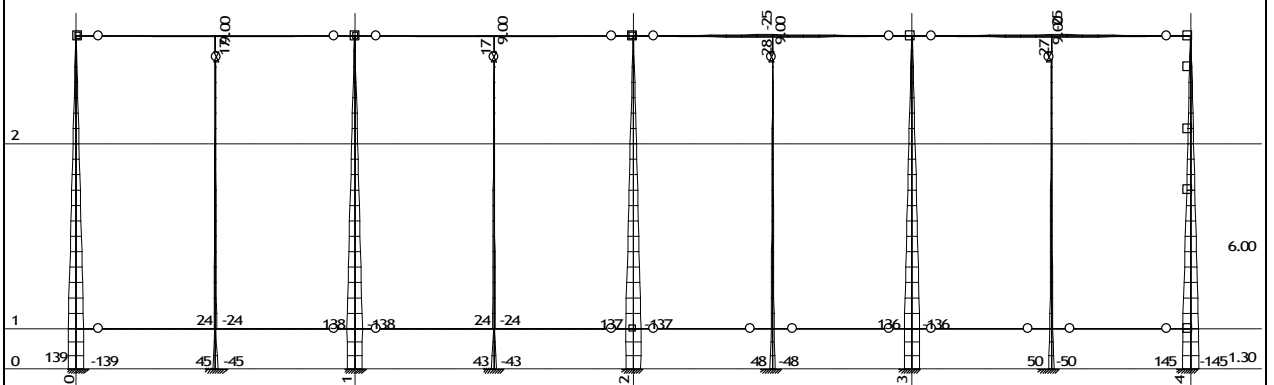
Opt. 78: [Am] 9.55,74-77



Param. V.6

Uticaji u gred: max M8= 280 / min M8= -238 kNm

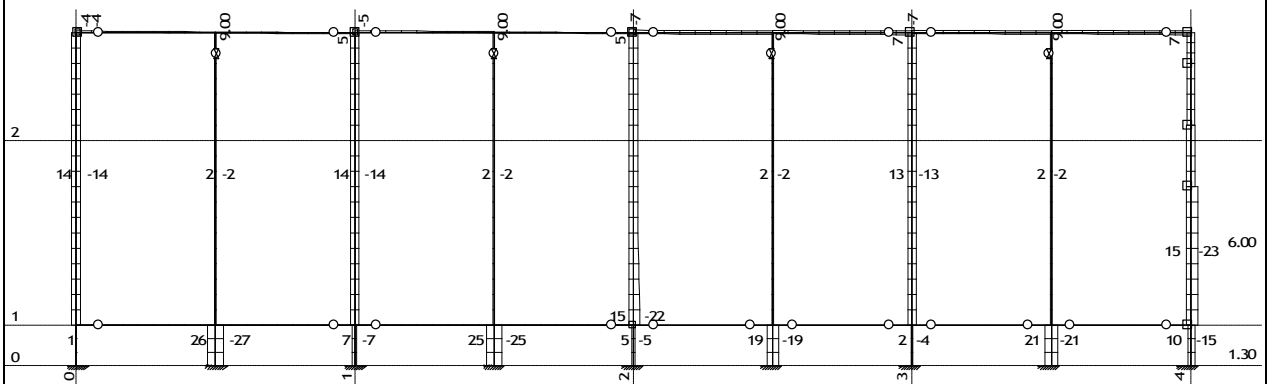
Opt. 78: [Am] 9.55,74-77



Param. V.6

Uticaji u gred: max M2= 145 / min M2= -145 kNm

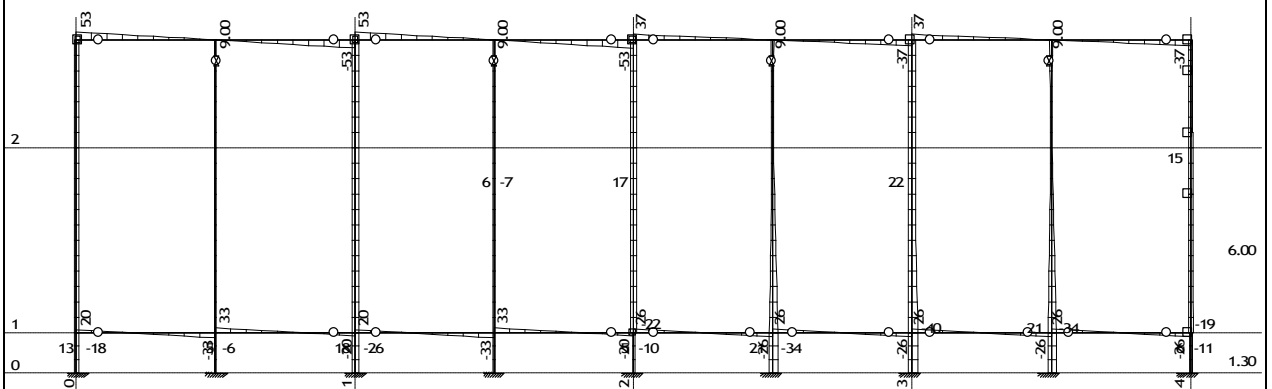
Opt. 78: [Am] 9.55,74-77



Param. V.6

Uticaji u gred: max T3= 26 / min T3= -27 kN

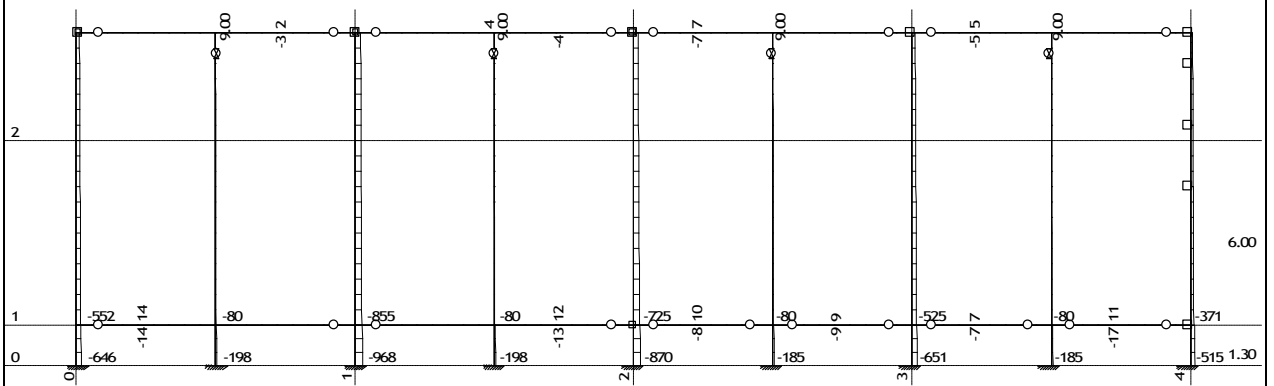
Opt. 78: [Am] 9.55,74-77



Param. V.6

Uticaji u gred: max T2= 53 / min T2= -53 kN

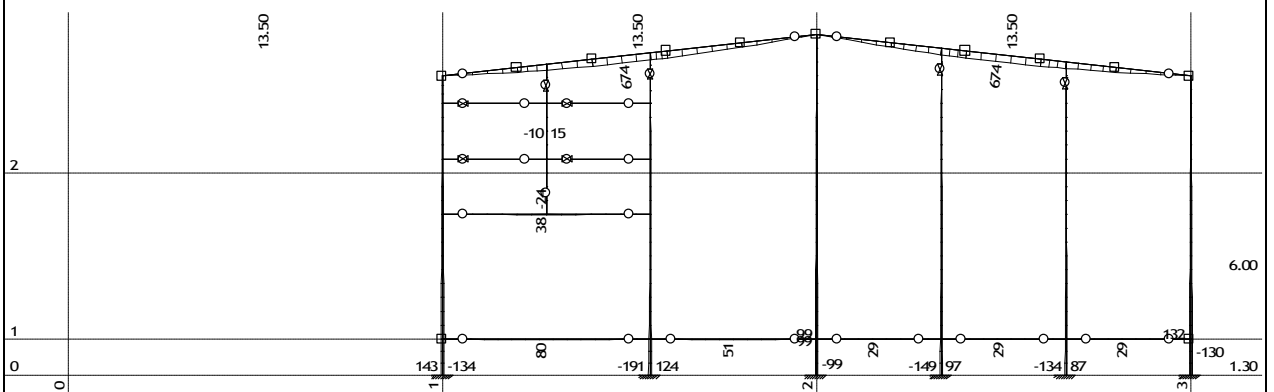
Opt. 78: [Ans] 9.55,74-77



Ram: V.6

Uticaji u gred: max N1= 14 / min N1= -968 kN

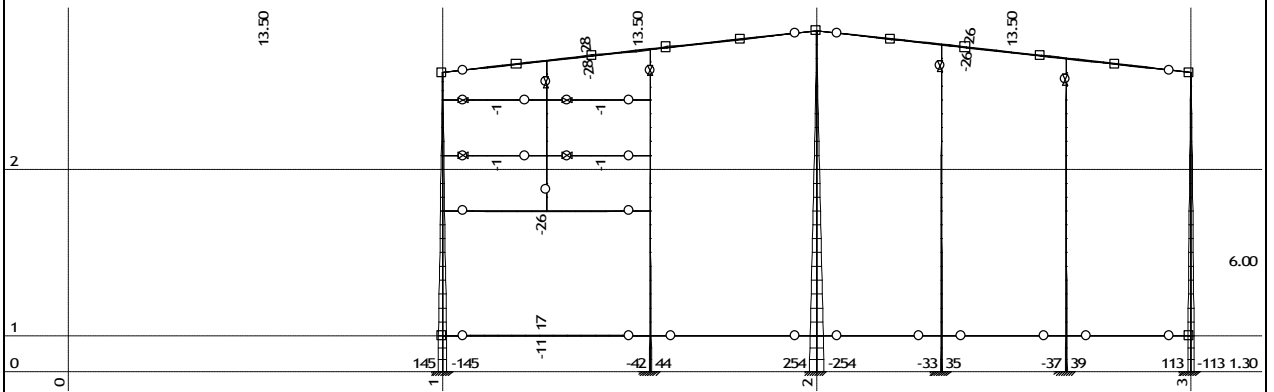
Opt. 78: [Ans] 9.55,74-77



Ram: H.3

Uticaji u gred: max M8= 674 / min M8= -191 kNm

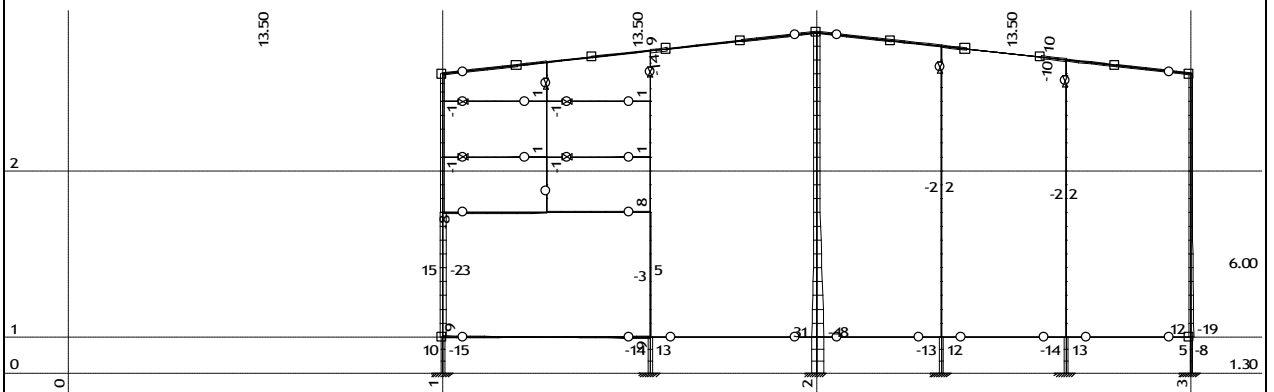
Opt. 78: [Ans] 9:55,74-77



Ram: H.3

Uticaji u gred: max M2= 254 / min M2= -254 kNm

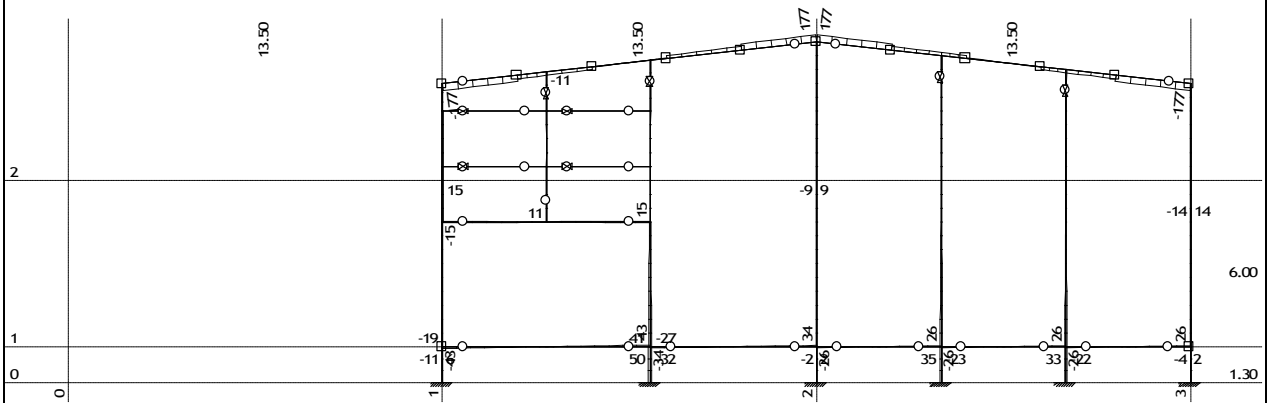
Opt. 78: [Ans] 9:55,74-77



Ram: H.3

Uticaji u gred: max T3= 31 / min T3= -48 kN

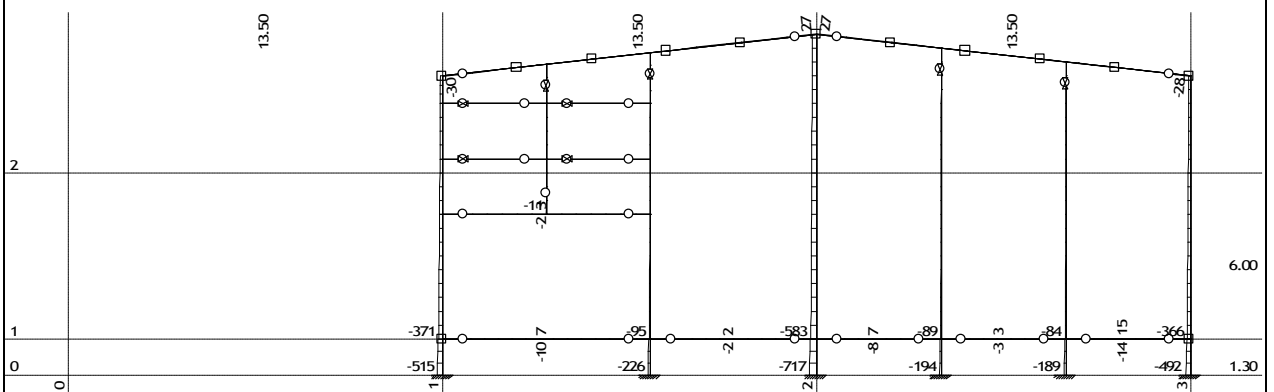
Opt. 78: [Ans] 9:55,74-77



Ram: H.3

Uticaji u gred: max T2= 177 / min T2= -177 kN

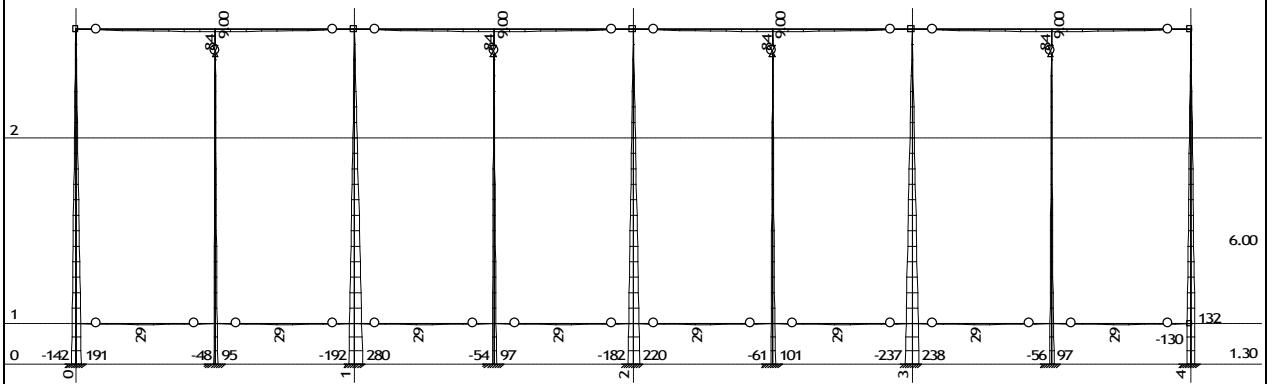
Opt. 78: [Ans] 9:55,74-77



Ram: H.3

Uticaji u gred: max N1= 27 / min N1= -717 kN

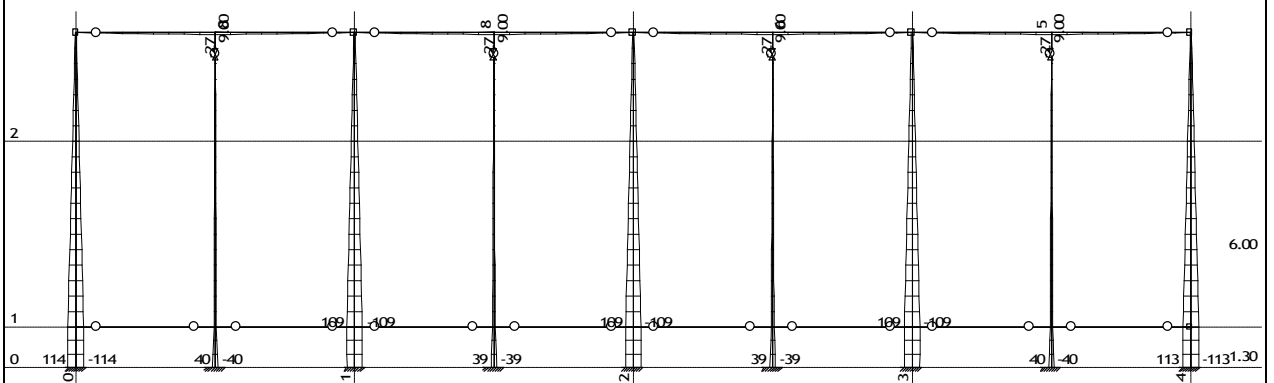
Opt. 78: [Am] 9:55,74-77



Ram: V_16

Uticaji u gred: max M8= 280 / min M8= -237 kNm

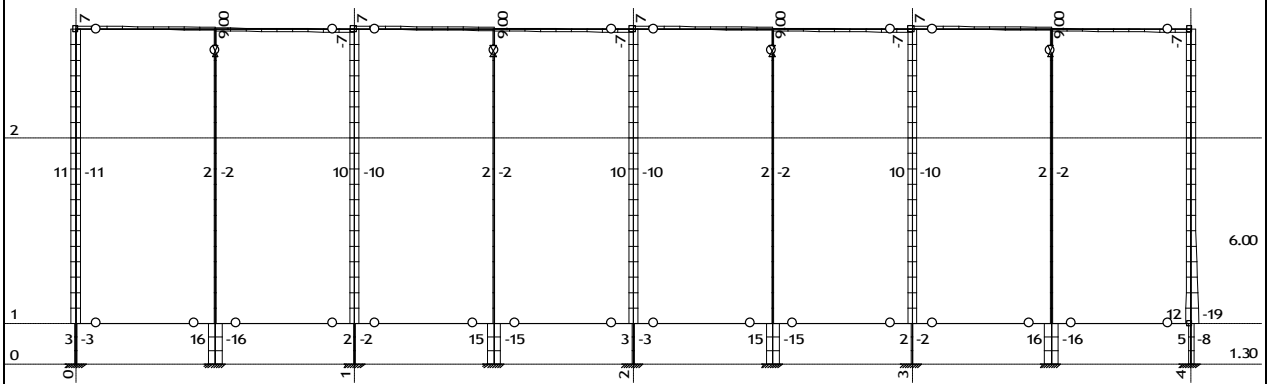
Opt. 78: [Am] 9:55,74-77



Ram: V_16

Uticaji u gred: max M2= 114 / min M2= -114 kNm

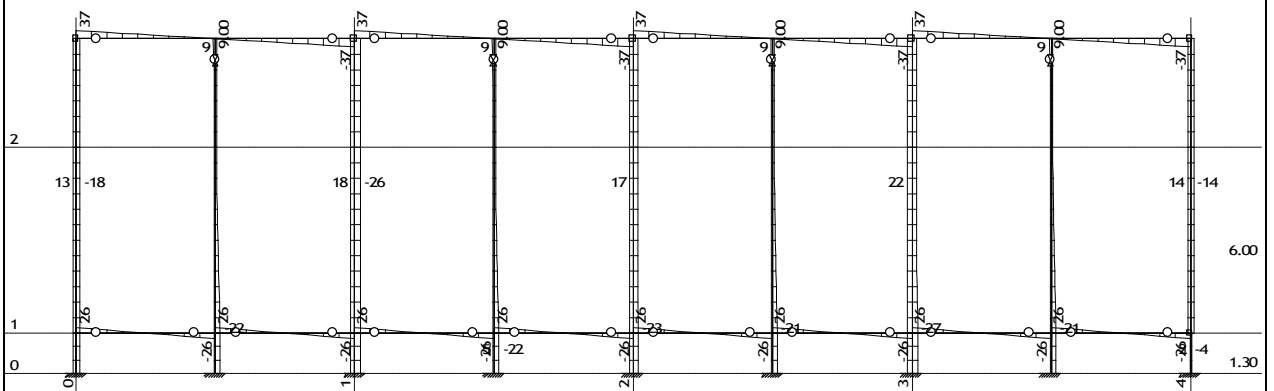
Opt. 78: [Am] 9.55,74-77



Ram: V_16

Uticaji u gred: max T3= 16/ min T3= -19 kN

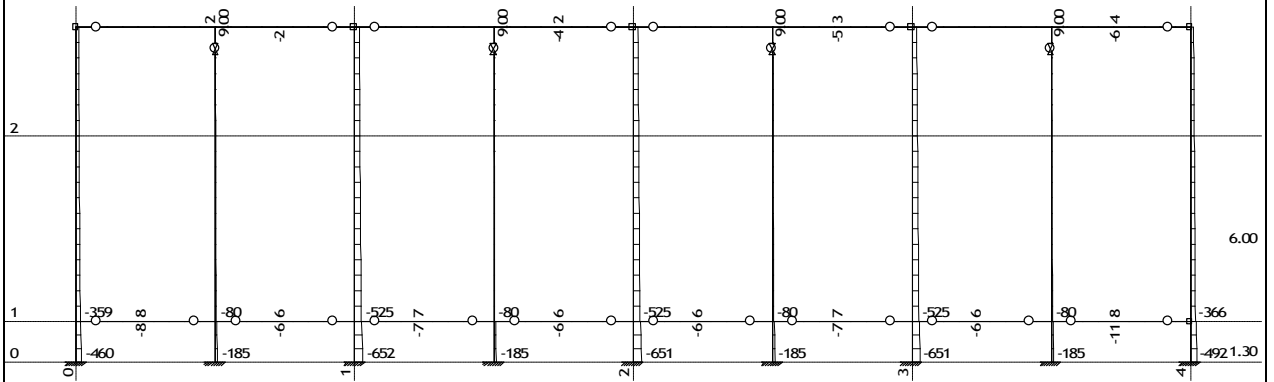
Opt. 78: [Am] 9.55,74-77



Ram: V_16

Uticaji u gred: max T2= 37/ min T2= -37 kN

Opt. 78: [Am] 9.55,74-77



Pam: V_16
Uticaji u gred: max N1= 8 / min N1= -652 kN

Utjecaji u tackastim osloncima - Ekstremne vrednosti - Opterecenje: 78. [Anv] 9-55,74-77

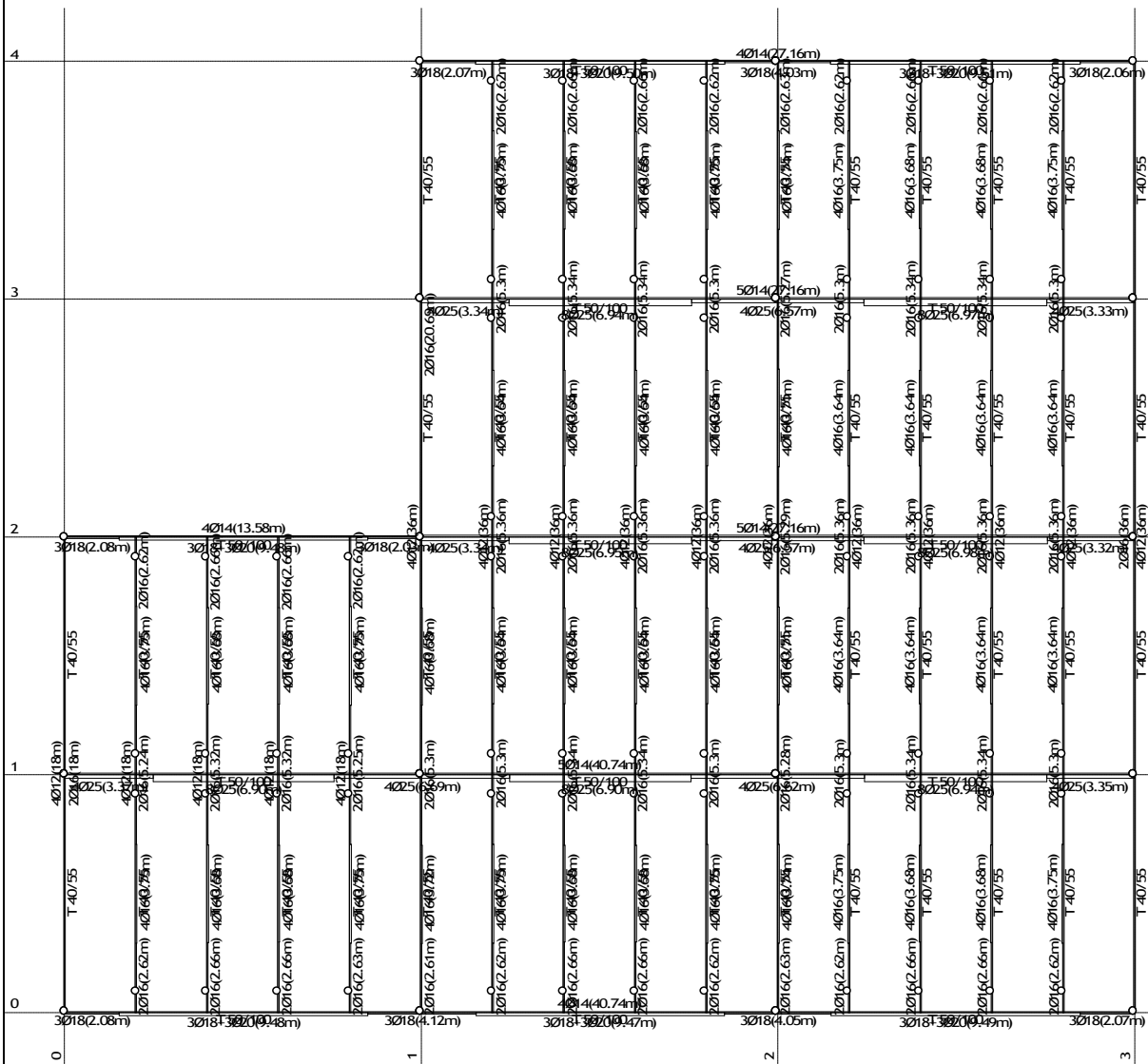
Oznaka	LC	R1 [kN]	R2 [kN]	R3 [kN]	M1 [kNm]	M2 [kNm]	M3 [kNm]
61	A(R1-)	-39.614	-1.557	282.02	36.991	-207.23	0.138
50	A(R1-)	-34.140	-6.724	115.78	14.695	-148.79	1.312
71	A(R1-)	-33.762	-8.372	115.78	16.827	-144.63	-2.569
5	A(R1-)	-31.703	-1.100	523.94	19.141	-138.82	0.044
9	A(R1-)	-31.207	-5.113	107.87	12.825	-134.21	-0.626
3	A(R1-)	-30.610	-3.298	107.87	10.473	-128.66	2.160
134	A(R1-)	-26.807	-0.895	503.17	30.235	-167.02	-0.416
82	A(R1-)	-26.261	0.000	520.46	0.000	-279.94	0.000
24	A(R1-)	-26.192	-0.068	766.57	0.088	-279.79	0.000
107	A(R1-)	-23.483	0.604	434.36	28.254	-133.85	-0.412
101	A(R2+)	0.914	49.929	141.25	-191.38	3.380	0.607
119	A(R2+)	1.073	48.177	354.35	-251.06	1.021	-0.154
133	A(R2+)	-0.805	35.344	121.06	-149.09	-0.103	-1.080
143	A(R2+)	-2.379	33.441	118.42	-134.46	-2.057	-4.199
101	A(R2-)	-7.483	-32.454	219.72	124.40	-20.013	-0.395
30	A(R2+)	3.541	31.713	113.14	-129.42	3.953	-1.886
119	A(R2-)	-1.562	-31.315	327.58	163.19	-39.322	0.100
23	A(R2+)	3.561	30.652	110.51	-124.47	3.919	2.487
16	A(R2+)	-0.592	26.636	161.12	-44.609	-6.452	0.798
16	A(R2-)	-0.592	-26.143	161.12	45.017	-6.452	0.798
24	A(R3+)	-5.698	-0.086	967.64	0.111	-60.318	0.000
92	A(R3+)	0.033	0.000	932.76	0.000	0.026	0.000
70	A(R3+)	-1.591	0.000	931.90	0.000	-19.662	0.000
49	A(R3+)	-3.695	0.000	930.78	0.000	-44.639	0.000
43	A(R3+)	-1.649	0.028	869.78	-0.034	-25.472	0.000
119	A(R3+)	1.274	0.000	717.48	0.000	0.878	0.000
82	A(R3+)	-5.703	0.000	651.60	0.000	-60.366	0.000
107	A(R3+)	-2.485	0.000	651.15	0.000	-26.876	0.000
61	A(R3+)	0.067	0.000	650.81	0.000	0.325	0.000
134	A(R3+)	0.011	0.000	650.80	0.000	-0.407	0.000
49	A(M1+)	-2.679	-22.733	736.93	259.78	-32.362	0.223
49	A(M1-)	-2.679	-22.733	736.93	-259.78	-32.362	-0.223
70	A(M1-)	-1.146	22.727	737.75	-259.77	-14.166	-0.230
70	A(M1+)	-1.146	-22.727	737.75	259.77	-14.166	0.230
92	A(M1-)	0.024	22.714	738.37	-259.70	0.019	-0.242
92	A(M1+)	0.024	-22.714	738.37	259.70	0.019	0.242
31	A(M1+)	-1.445	-21.802	509.03	255.20	-18.033	0.147
31	A(M1-)	-1.445	21.802	509.03	-255.20	-18.033	-0.147
119	A(M1+)	1.005	-21.737	573.20	254.13	0.693	0.116
119	A(M1-)	1.005	21.737	573.20	-254.13	0.693	-0.116
82	A(M2-)	-26.261	0.000	520.46	0.000	-279.94	0.000
24	A(M2-)	-26.192	-0.068	766.57	0.088	-279.79	0.000
134	A(M2-)	-22.271	0.000	519.90	0.000	-237.77	0.000
61	A(M2+)	22.329	0.000	519.90	0.000	237.72	0.000
61	A(M2-)	-22.227	0.000	517.67	0.000	-237.18	0.000
134	A(M2+)	22.281	0.000	517.67	0.000	237.11	0.000
107	A(M2-)	-20.381	0.000	519.67	0.000	-220.41	0.000
49	A(M2-)	-17.036	0.000	736.97	0.000	-207.55	0.000
43	A(M2-)	-4.007	0.021	691.49	-0.026	-199.06	0.000
5	A(M2-)	-21.490	0.000	459.23	0.000	-196.01	0.000
143	A(M3+)	-0.681	-6.871	153.94	77.685	1.264	7.939
143	A(M3-)	-0.681	6.871	153.94	-77.685	1.264	-7.939
3	A(M3+)	-9.196	0.000	140.23	0.000	-86.318	4.385
71	A(M3+)	5.691	0.000	150.51	0.000	62.230	3.851
142	A(M3+)	5.063	0.000	150.51	0.000	55.540	3.843
142	A(M3-)	-5.721	0.000	150.51	0.000	-62.544	-3.792
69	A(M3+)	-6.822	0.000	150.51	0.000	-74.681	3.789
71	A(M3-)	-5.093	0.000	150.51	0.000	-55.899	-3.784
16	A(M3+)	-6.406	0.247	161.12	0.204	-69.463	3.705
23	A(M3-)	-0.837	-6.281	143.66	61.467	-7.763	-3.699

Utjecaji u tackastim osloncima - Ekstremne vrednosti - Opterecenje: 78. [Anv] 56-73

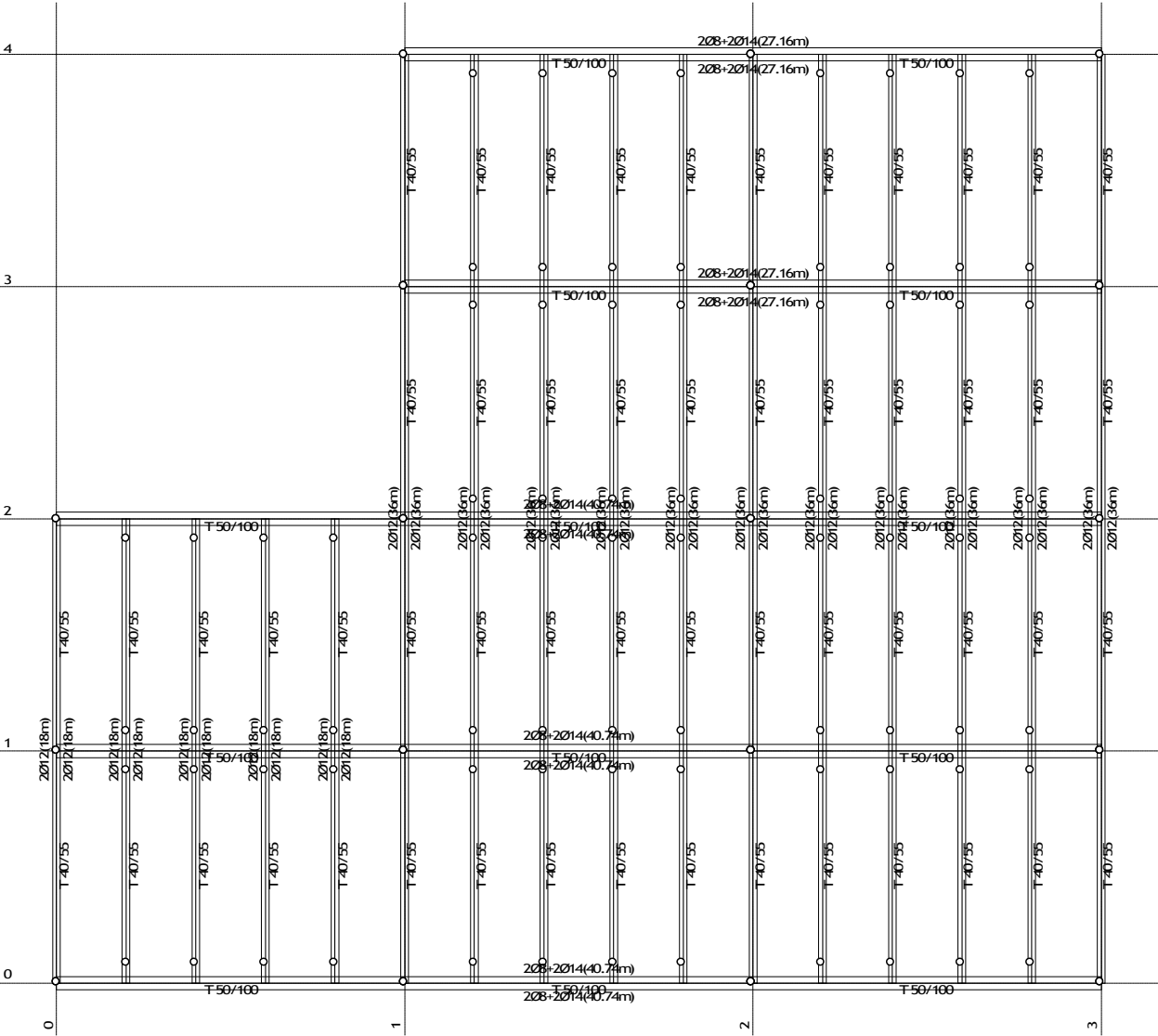
Oznaka	LC	R1 [kN]	R2 [kN]	R3 [kN]	M1 [kNm]	M2 [kNm]	M3 [kNm]
61	A(R1-)	-25.444	-0.432	315.13	10.275	-125.99	0.038
50	A(R1-)	-22.679	-1.867	115.78	4.080	-96.241	0.688
71	A(R1-)	-22.459	-2.326	115.78	4.674	-93.829	-1.418
5	A(R1-)	-20.712	-0.306	331.97	5.317	-87.277	0.012
9	A(R1-)	-20.597	-1.420	107.87	3.563	-86.093	-0.449
3	A(R1-)	-20.280	-0.916	107.87	2.909	-83.146	1.264
82	A(R1-)	-20.201	0.000	400.35	0.000	-215.34	0.000
24	A(R1-)	-20.148	-0.052	589.67	0.068	-215.22	0.000
61	A(R1+)	17.177	0.000	399.92	0.000	182.86	0.000
134	A(R1+)	17.139	0.000	398.21	0.000	182.39	0.000
101	A(R2+)	0.108	33.748	141.25	-129.36	1.367	0.411
119	A(R2+)	0.720	32.564	373.54	-169.70	0.577	-0.104
133	A(R2+)	-0.440	23.890	121.06	-100.78	0.508	-0.730
143	A(R2+)	-0.949	22.603	118.42	-90.883	-0.050	-2.838
30	A(R2+)	1.278	21.436	113.14	-87.478	0.359	-1.275
23	A(R2+)	1.344	20.719	110.51	-84.129	0.301	1.681
16	A(R2+)	-0.456	20.489	123.94	-34.315	-4.963	0.614
16	A(R2-)	-0.456	-20.110	123.94	34.629	-4.963	0.614
32	A(R2-)	-0.399	-19.365	124.02	33.342	-4.348	-0.796
32	A(R2+)	-0.399	19.224	124.02	-33.405	-4.348	-0.796
24	A(R3+)	-20.148	-0.052	589.67	0.068	-215.22	0.000
70	A(R3+)	-10.130	0.000	568.44	0.000	-125.36	0.000
92	A(R3+)	-11.105	0.000	567.98	0.000	-135.51	0.000
49	A(R3+)	-13.104	0.000	566.90	0.000	-159.65	0.000
43	A(R3+)	-0.981	4.226	533.21	100.01	-14.187	0.522
119	A(R3+)	0.808	0.000	440.94	0.000	76.154	0.000
82	A(R3+)	-20.201	0.000	400.35	0.000	-215.34	0.000
61	A(R3+)	17.177	0.000	399.92	0.000	182.86	0.000
134	A(R3+)	-17.132	0.000	399.92	0.000	-182.90	0.000
107	A(R3+)	-15.677	0.000	399.75	0.000	-169.54	0.000
49	A(M1+)	-2.061	-17.487	566.87	199.83	-24.894	0.172
49	A(M1-)	-2.061	17.487	566.87	-199.83	-24.894	-0.172
70	A(M1-)	-0.882	17.482	567.50	-199.82	-10.897	-0.177
70	A(M1+)	-0.882	-17.482	567.50	199.82	-10.897	0.177
92	A(M1-)	0.018	17.472	567.98	-199.77	0.015	-0.186
92	A(M1+)	0.018	-17.472	567.98	199.77	0.015	0.186
31	A(M1+)	-1.112	-16.771	391.56	196.31	-13.871	0.113
31	A(M1-)	-1.112	16.771	391.56	-196.31	-13.871	-0.113

119	A(M1+)	0.773	-16.721	440.92	[195.48]	0.533	0.089
119	A(M1-)	0.773	16.721	440.92	[-195.48]	0.533	-0.089
82	A(M2-)	-20.201	0.000	400.35	0.000	[-215.34]	0.000
24	A(M2-)	-20.148	-0.052	589.67	0.068	[-215.22]	0.000
134	A(M2-)	-17.132	0.000	399.92	0.000	[-182.90]	0.000
61	A(M2+)	-17.177	0.000	399.92	0.000	[182.86]	0.000
61	A(M2-)	-17.098	0.000	398.21	0.000	[-182.44]	0.000
134	A(M2+)	17.139	0.000	398.21	0.000	[182.39]	0.000
107	A(M2-)	-15.677	0.000	399.75	0.000	[-169.54]	0.000
49	A(M2-)	-13.104	0.000	566.90	0.000	[-159.65]	0.000
43	A(M2-)	-3.082	0.016	531.92	-0.020	[-153.12]	0.000
5	A(M2-)	-16.531	0.000	353.25	0.000	[-150.77]	0.000
143	A(M3+)	-0.524	-5.285	118.42	59.757	0.972	[6.107]
143	A(M3-)	-0.524	5.285	118.42	-59.757	0.972	[-6.107]
3	A(M3+)	-7.074	0.000	107.87	0.000	-66.399	[3.373]
71	A(M3+)	4.378	0.000	115.78	0.000	47.869	[2.963]
142	A(M3+)	3.895	0.000	115.78	0.000	42.723	[2.956]
142	A(M3-)	-4.401	0.000	115.78	0.000	-48.111	[-2.917]
69	A(M3+)	-5.248	0.000	115.78	0.000	-57.447	[2.914]
71	A(M3-)	-3.918	0.000	115.78	0.000	-42.999	[-2.910]
16	A(M3+)	-4.927	0.190	123.94	0.157	-53.433	[2.850]
23	A(M3-)	-0.644	-4.831	110.51	47.283	-5.971	[-2.845]

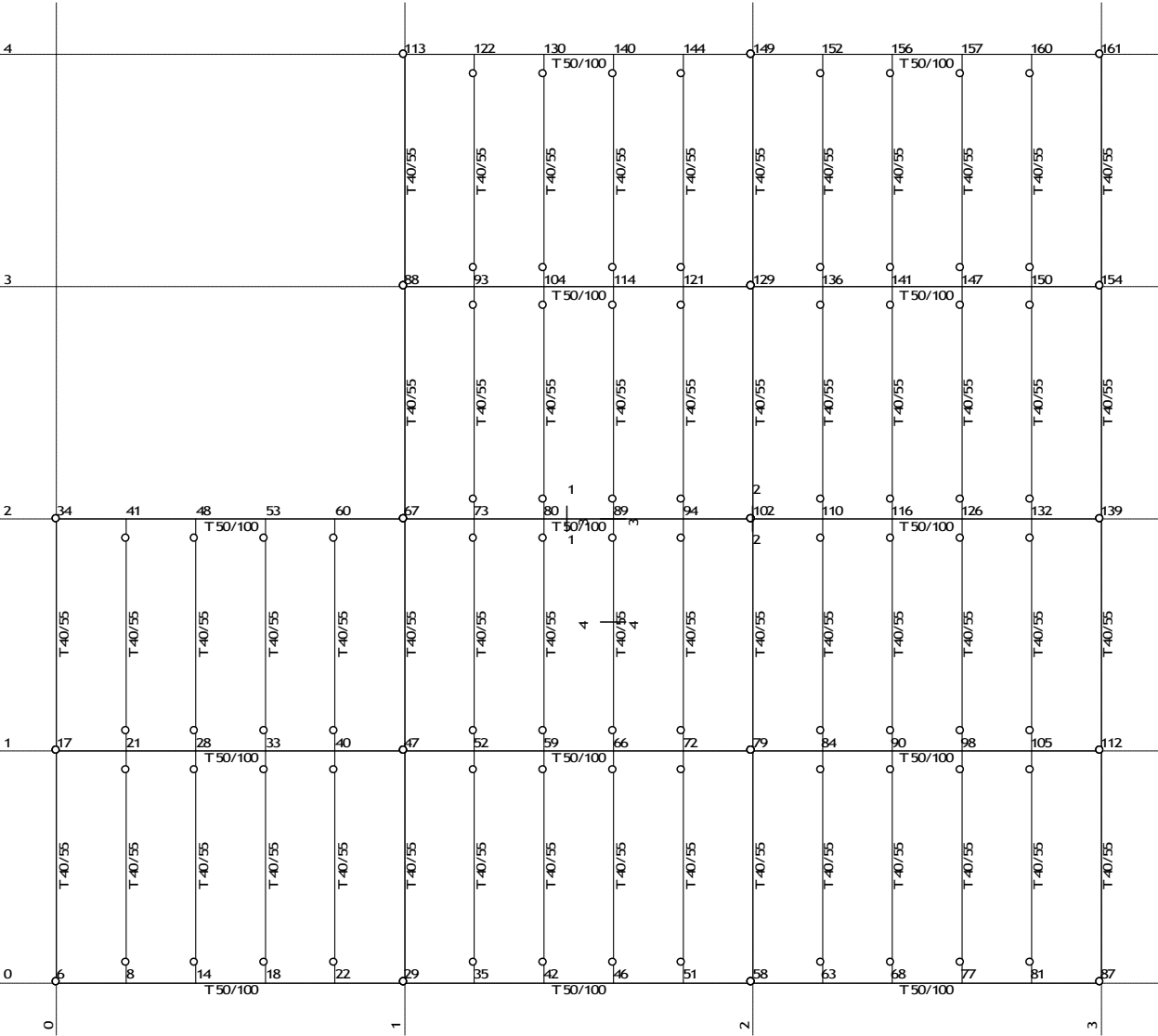
Usvojena armatura
@1@PBAB87, MB30, B500



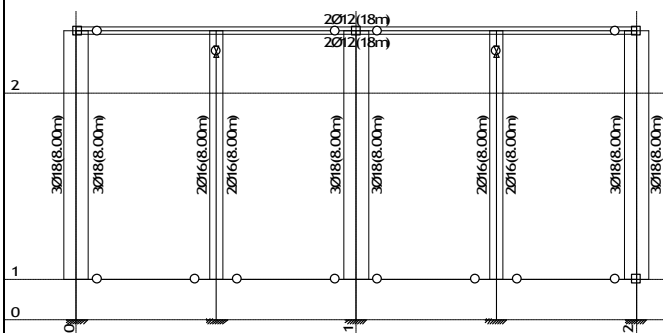
Pogled: Klevo+Kdesno
Armatura u gredama: Aa2/Aa1



Pogled: Klevo+Kdesno
Armatura u gredama: Aa3/Aa4

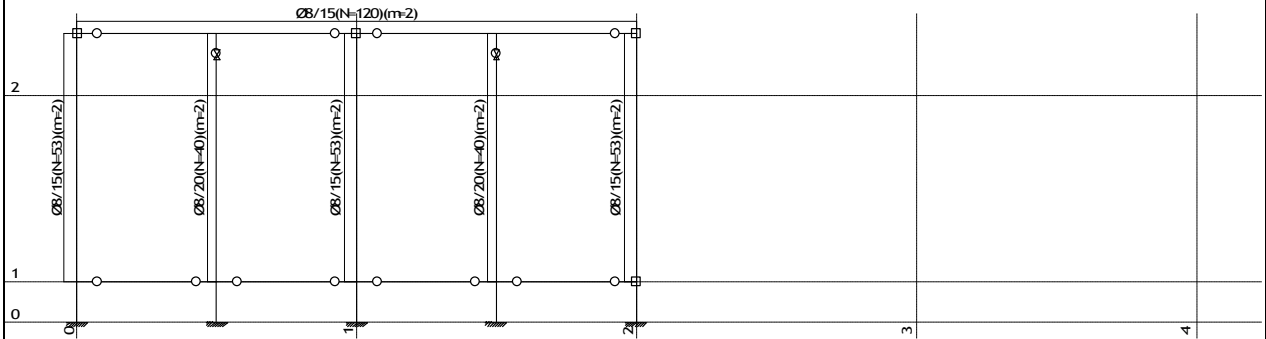


Usvojena armatura
@1@PBAB 87, MB 30, B500



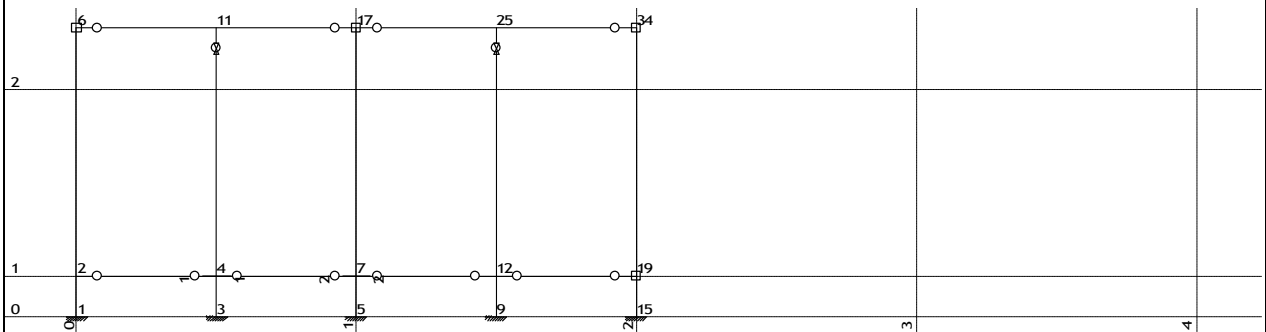
Tower - 3D Model Builder 6.0

Uvojena armatura
@1@PBAB 87, MB 30, B500



Ramt V_1
Armatura u gredama: A_u, A_z

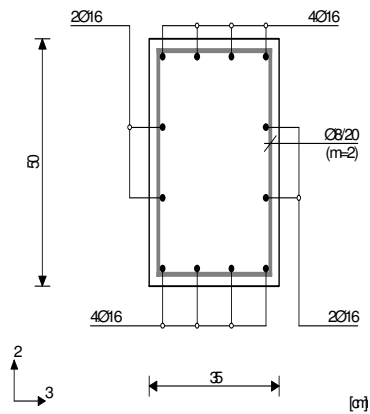
Uvojena armatura
@1@PBAB 87, MB 30, B500



Ramt V_1
Dispozicija greda

Greda 11-4
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 1-1 x = 8.00m



Merodavna kombinacija za savijanje:
 $1.00xI+1.00xII+1.80xIII+1.80xIV$
 $N1u = -42.20 \text{ kN}$
 $M2u = 6.18 \text{ kNm}$
 $M3u = 89.36 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $M1u = -4.39 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.00xI+1.30xII+1.30xIII+1.30xVII$
 $T2u = -9.29 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = -4.38 \text{ kNm}$

$eb/ea = -1.865/10.000 \%$

$Aa1 = 2.47$	+	$0.11'$	=	2.58 cm^2
$Aa2 = 2.45$	+	$0.11'$	=	2.56 cm^2
$Aa3 = 1.27$	+	$0.16'$	=	1.43 cm^2
$Aa4 = 1.26$	+	$0.16'$	=	1.41 cm^2
$Aa_{uz} = 0.00$		cm^2/m		$(m=2)$

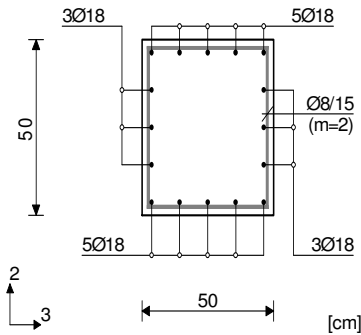
[Uvojenio $Aa_{uz} = 0.08/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$\tau_y = 0.62 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.56 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.38%

*) - dodatna poduzna armatura za prijem torzije.

Greda 17-7
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja
 $li,2 = 8.00 \text{ m} (\lambda_2 = 55.43)$
 $li,3 = 8.00 \text{ m} (\lambda_3 = 55.43)$
 Pomerljiva konstrukcija

Presek 2-2 x = 8.00m



Merodavna kombinacija za savijanje:
 $1.00xI+1.00xII+1.30xIII+1.30xVII$
 $N1u = -299.87 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 169.05 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII+1.30xVIII$
 $M1u = 0.49 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xIV$
 $T2u = -27.12 \text{ kN}$
 $T3u = 2.16 \text{ kN}$
 $M1u = -0.04 \text{ kNm}$

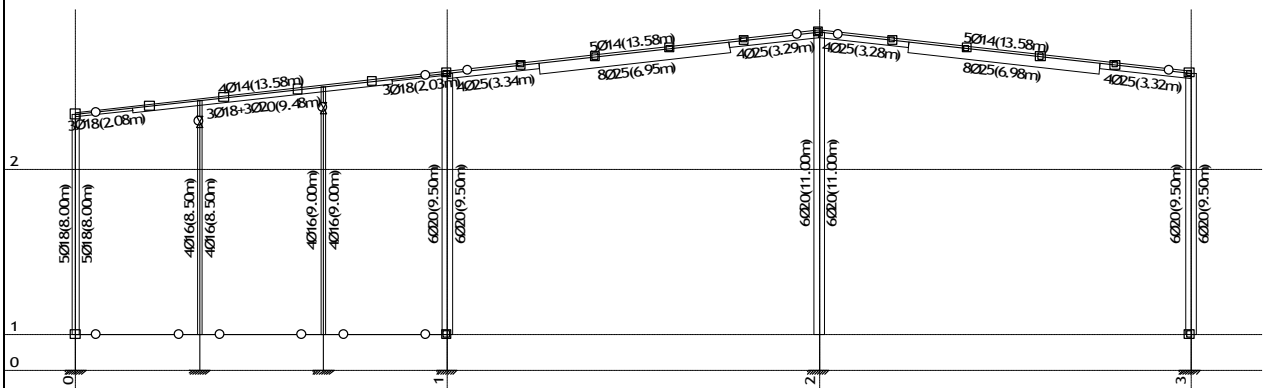
$\Delta e2 = 2.7 < e0 > + 6.3 < e1 > = 9.0 \text{ cm}$
 $|\Delta M2| = 26.95 \text{ kNm}$
 $\Delta e3 = 2.7 < e0 > + 6.3 < e1 > = 9.0 \text{ cm}$
 $|\Delta M3| = 26.95 \text{ kNm}$
 $eb/ea = -2.912/10.000 \%$

$Aa1 = 3.26$	cm^2
$Aa2 = 3.23$	cm^2
$Aa3 = 3.26$	cm^2
$Aa4 = 3.23$	cm^2
$Aa_{uz} = 0.00$	$\text{cm}^2/\text{m} \quad (m=2)$

[Uvojenio $Aa_{uz} = 0.08/15(m=2) = 3.35 \text{ cm}^2/\text{m}$]

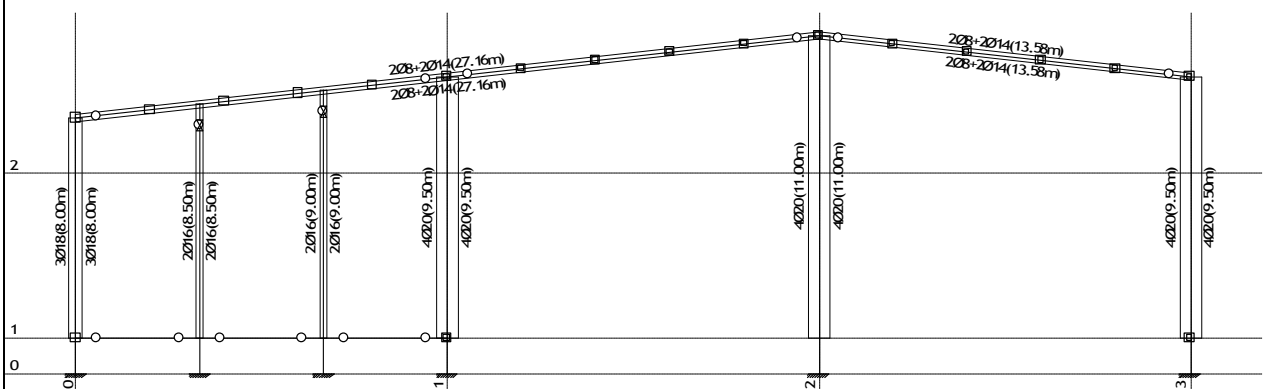
$\tau_y = 0.14 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.01 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.63%

Usvojena armatura
@1@PBAB 87, MB 30, B500



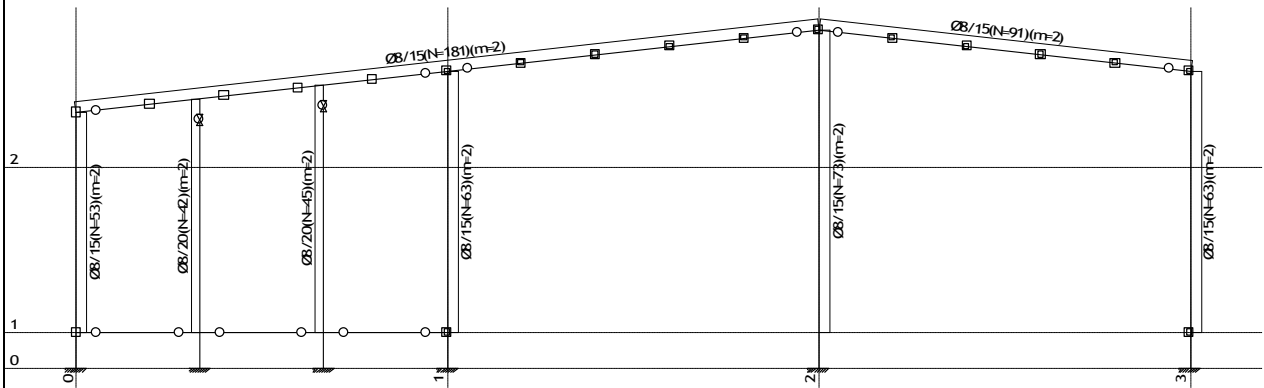
Ram: H_1
Armatura u gredama: A2/Aa1

Usvojena armatura
@1@PBAB 87, MB 30, B500



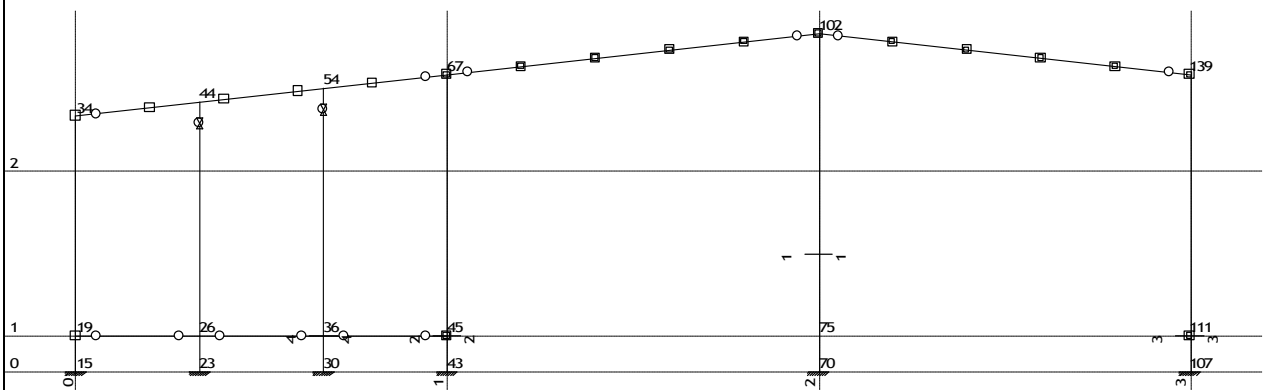
Ram: H_1
Armatura u gredama: A3/Aa4

Usvojena armatura
@1@PBAB 87, MB 30, B500



Ram: H_1
Armatura u gredama: A_u, u_z

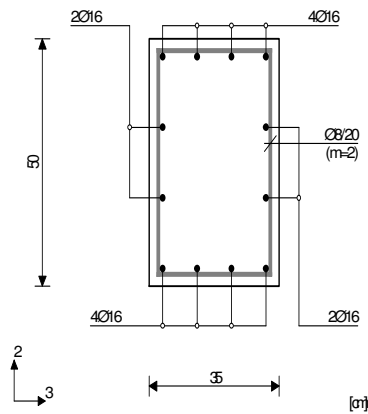
Usvojena armatura
@1@PBAB 87, MB 30, B500



Ram: H_1
Dispozicija greda

Greda 54-36
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 4-4 x = 9.00m



Merodavna kombinacija za savijanje:

1.00xI+1.00xII+1.80xIII+1.80xV
 N1u = -47.48 kN
 M2u = -6.12 kNm
 M3u = -88.58 kNm

Merodavna kombinacija za torziju:

1.60xI+1.60xII+1.80xIII+1.80xV
 M1u = 1.89 kNm

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIII+1.80xV
 T2u = 31.71 kN
 T3u = -0.78 kN
 M1u = 1.89 kNm

eb/ea = -1.862/10.000 %

Aa1 =	2.42	+	0.05'	=	2.47	cm ²
Aa2 =	2.40	+	0.05'	=	2.45	cm ²
Aa3 =	1.25	+	0.07'	=	1.32	cm ²
Aa4 =	1.23	+	0.07'	=	1.30	cm ²
Aa,uz =	0.00	cm ² /m	(m=2)			

[Uvođeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

ty = 0.46MPa < tr, tr = 1.10MPa

tz = 0.25MPa < tr, tr = 1.10MPa

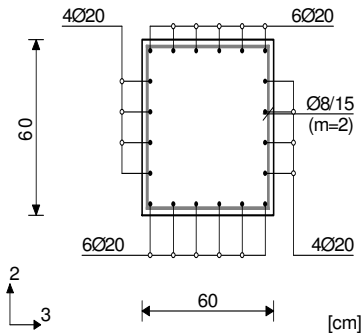
Procentat armiranja: 1.38%

*) - dodatna poduzna armatura za prijem torzije.

Greda 67-45

@1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja
 li,2 = 9.50 m (A2 = 54.85)
 li,3 = 9.50 m (A3 = 54.85)
 Pomerljiva konstrukcija

Presek 2-2 x = 9.50m



Merodavna kombinacija za savijanje:

1.00xI+1.00xII+1.30xIII+1.30xVII
 N1u = -468.67 kN
 M2u = 0.00 kNm
 M3u = 194.81 kNm

Merodavna kombinacija za torziju:

1.30xI+1.30xII+1.30xIII+1.30xVIII
 M1u = 0.68 kNm

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xV
 T2u = 6.65 kN
 T3u = -22.37 kN
 M1u = 0.31 kNm

Δe2 = 3.2<e0> + 7.4<e1> = 10.6 cm

|ΔM2| = 49.65 kNm

Δe3 = 3.2<e0> + 7.4<e1> = 10.6 cm

|ΔM3| = 49.65 kNm

eb/ea = -2.688/10.000 %

Aa1 = 2.47 cm²

Aa2 = 2.44 cm²

Aa3 = 2.46 cm²

Aa4 = 2.44 cm²

Aa,uz = 0.00 cm²/m (m=2)

[Uvođeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

ty = 0.03MPa < tr, tr = 1.10MPa

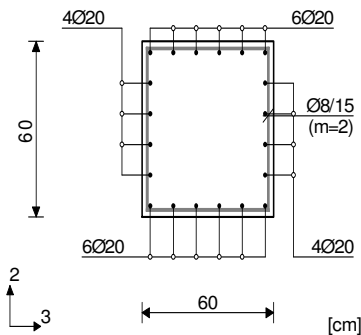
tz = 0.09MPa < tr, tr = 1.10MPa

Procentat armiranja: 1.75%

Greda 102-75

@1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja
 li,2 = 22.00 m (A2 = 127.02)
 li,3 = 22.00 m (A3 = 127.02)
 Pomerljiva konstrukcija

Presek 1-1 x = 8.00m



Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII+1.80xV
 N1u = -760.85 kN
 M2u = -76.60 kNm
 M3u = 11.01 kNm

Merodavna kombinacija za torziju:

1.60xI+1.60xII+1.80xIII+1.80xV
 M1u = 0.23 kNm

Merodavna kombinacija za smicanje:

1.30xI+1.30xII+1.30xIII+1.30xVIII
 T2u = -1.15 kN
 T3u = -22.73 kN
 M1u = 0.23 kNm

Δe2 = 11.0<e0> + 49.8<e1> = 60.8 cm

|ΔM2| = 462.55 kNm

Δe3 = 11.0<e0> + 49.8<e1> = 60.8 cm

|ΔM3| = 462.55 kNm

eb/ea = -3.500/4.586 %

Aa1 = 16.56 cm²

Aa2 = 16.43 cm²

Aa3 = 11.05 cm²

Aa4 = 10.93 cm²

Aa,uz = 0.00 cm²/m (m=2)

[Uvođeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

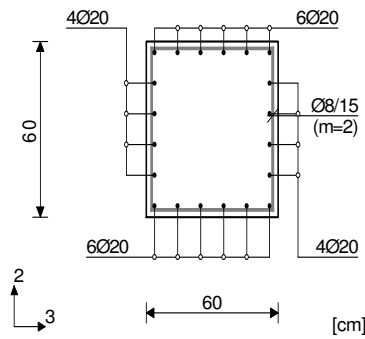
ty = 0.01MPa < tr, tr = 1.10MPa

tz = 0.09MPa < tr, tr = 1.10MPa

Procentat armiranja: 1.75%

Greda 139-111
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja
 $l_{i,2} = 9.50 \text{ m}$ ($\lambda_2 = 54.85$)
 $l_{i,3} = 9.50 \text{ m}$ ($\lambda_3 = 54.85$)
 Pomerljiva konstrukcija

Presek 3-3 $x = 9.50 \text{ m}$



Merodavna kombinacija za savijanje:
 $1.00 \times I + 1.00 \times II + 1.30 \times III + 1.30 \times VII$
 $N1u = -339.54 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 194.79 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30 \times I + 1.30 \times II + 1.30 \times III + 1.30 \times VIII$
 $M1u = -1.21 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.00 \times I + 1.60 \times II + 1.80 \times IV + 1.80 \times VI$
 $T2u = -20.98 \text{ kN}$
 $T3u = 2.67 \text{ kN}$
 $M1u = 0.41 \text{ kNm}$

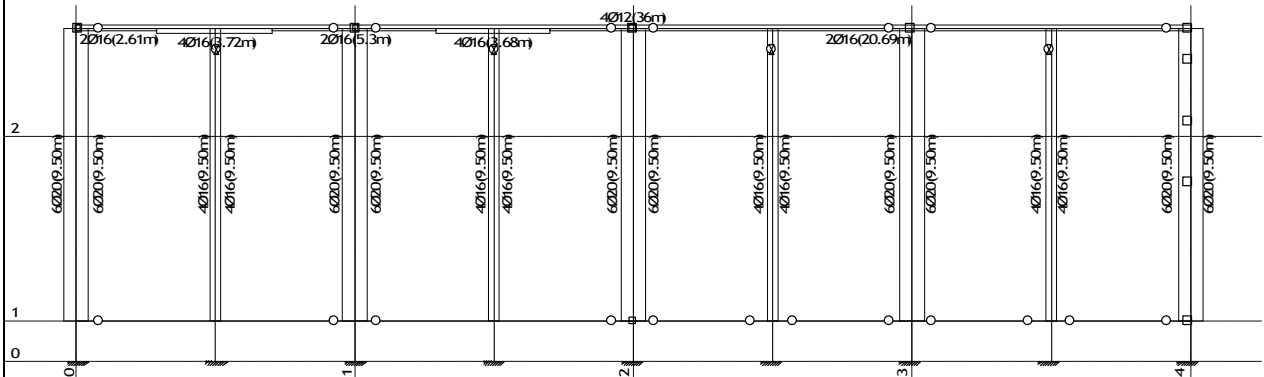
$\Delta e2 = 3.2 < e0 > + 7.4 < cell > = 10.6 \text{ cm}$
 $| \Delta M2 | = 35.97 \text{ kNm}$
 $\Delta e3 = 3.2 < e0 > + 7.4 < cell > = 10.6 \text{ cm}$
 $| \Delta M3 | = 35.97 \text{ kNm}$
 $cb/ \epsilon_a = -2.352 / 10.000 \text{ ‰}$

$Aa1 =$	2.80	+	0.03'	=	2.83	cm ²
$Aa2 =$	2.77	+	0.03'	=	2.80	cm ²
$Aa3 =$	2.80	+	0.03'	=	2.82	cm ²
$Aa4 =$	2.77	+	0.03'	=	2.80	cm ²
$Aa_{uz} =$	0.00	cm ² /m	(m=2)			

[usvojeno $Aa_{uz} = \text{Ø}8/15(m=2) = 3.35 \text{ cm}^2/\text{m}$]

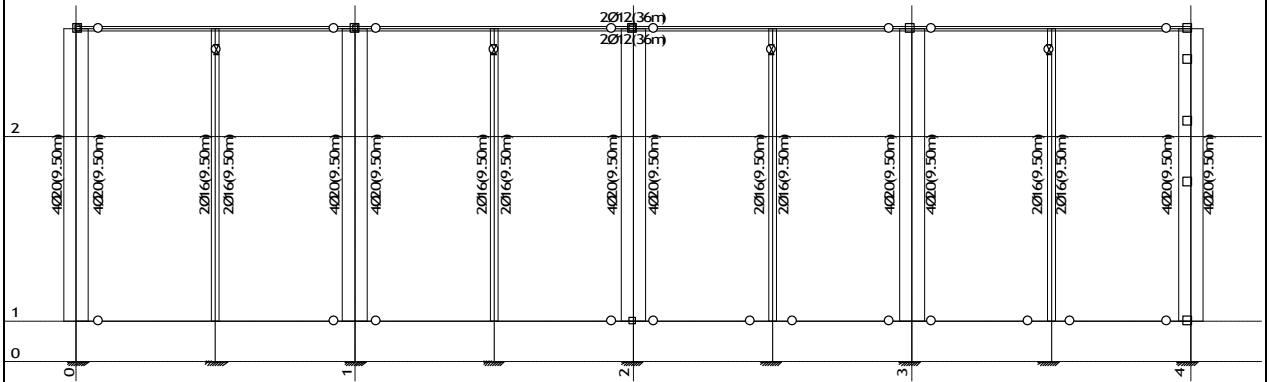
$\tau_y = 0.05 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.08 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procent armiranja: 1.75%
 *) - dodatna poduzna armatura za prijem torzije.

Usvojena armatura
 @1@PBAB 87, MB 30, B500



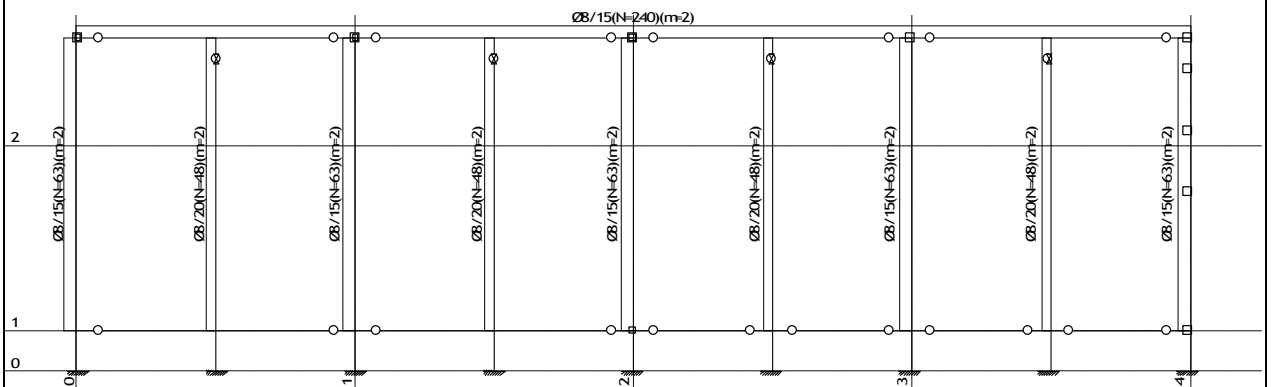
Pan: V.6
 Armatura u gredama: Aa2/Aa1

Usvojena armatura
@1@PBAB 87, MB 30, B500

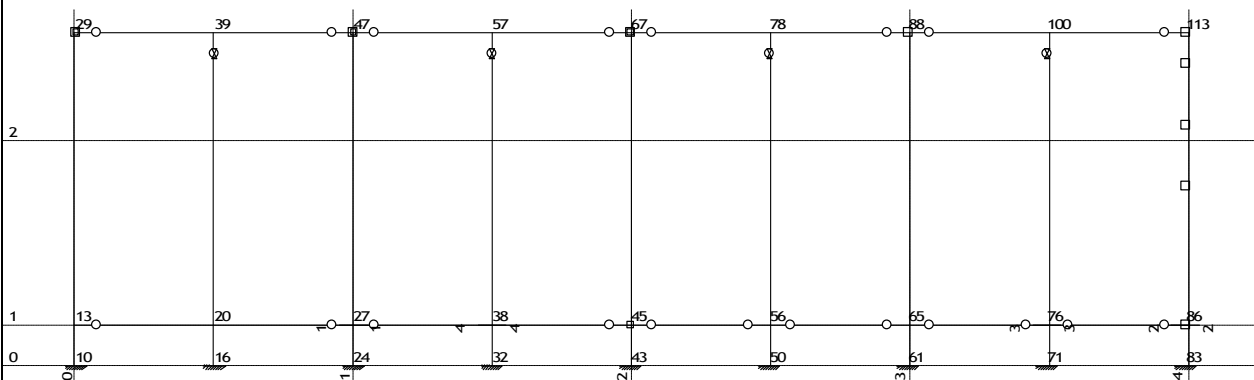


Ramt V.6
Armatura u gredama: Aa3/Aa4

Usvojena armatura
@1@PBAB 87, MB 30, B500



Ramt V.6
Armatura u gredama: Aa,uz

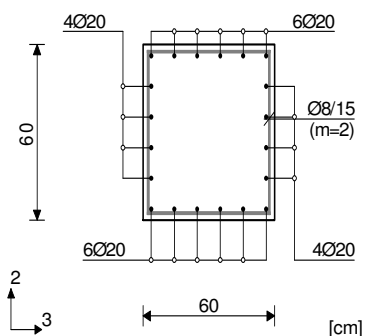


Ram: V.6
Dispozicija greda

Greda 47-27
@1@PBAB 87
MB 30
B500

Kompletna sema opterećenja
 $l_{i,2} = 9.50 \text{ m}$ ($\lambda_2 = 54.85$)
 $l_{i,3} = 9.50 \text{ m}$ ($\lambda_3 = 54.85$)
Pomerljiva konstrukcija

Presek 1-1 $x = 9.50 \text{ m}$



Merodavna kombinacija za savijanje:

$1.00xI + 1.00xII + 1.30xIII + 1.30xVII$
 $N1u = -555.89 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 246.90 \text{ kNm}$

Merodavna kombinacija za torziju:

$1.30xI + 1.30xII + 1.30xIII + 1.30xVIII$
 $M1u = 0.50 \text{ kNm}$

Merodavna kombinacija za smicanje:

$1.30xI + 1.00xII + 1.30xIII + 1.30xVII$
 $T2u = -26.25 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = 0.00 \text{ kNm}$

$\Delta e2 = 3.2 < e0 > + 7.4 < e1 > = 10.6 \text{ cm}$

$|\Delta M2| = 58.90 \text{ kNm}$

$\Delta e3 = 3.2 < e0 > + 7.4 < e1 > = 10.6 \text{ cm}$

$|\Delta M3| = 58.90 \text{ kNm}$

$\epsilon_b / \epsilon_a = -3.095 / 10.000 \text{ ‰}$

$Aa1 = 3.39 \text{ cm}^2$

$Aa2 = 3.35 \text{ cm}^2$

$Aa3 = 3.38 \text{ cm}^2$

$Aa4 = 3.35 \text{ cm}^2$

$Aa_{uz} = 0.00 \text{ cm}^2/\text{m} \quad (m=2)$

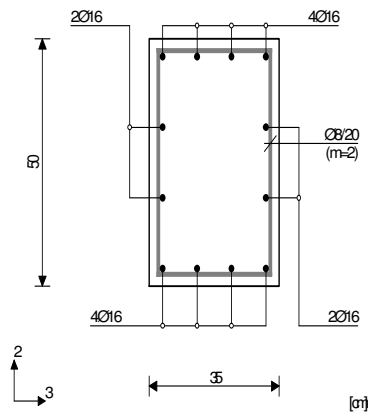
[Usvojeno $Aa_{uz} = Ø8/15(m=2) = 3.35 \text{ cm}^2/\text{m}$]

$\tau_y = 0.09 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$

Procenat armiranja: 1.75%

Greda 57-38
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 4-4 x = 9.50m



Merodavna kombinacija za savijanje:
 $1.00xI+1.00xII+1.30xIII+1.30xVII$
 $N1u = -50.11 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 64.58 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $M1u = 2.53 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $T2u = -6.70 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = 2.53 \text{ kNm}$

$eb/ea = -1.375/10.000 \text{ ‰}$

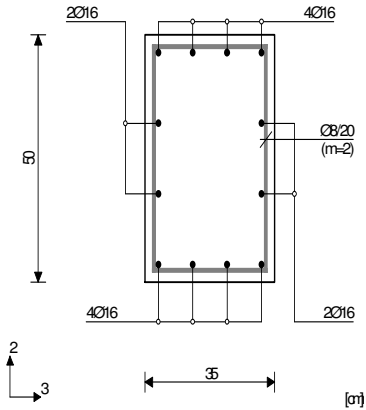
$Aa1 = 1.46$	+	$0.06'$	=	1.53 cm^2
$Aa2 = 1.45$	+	$0.06'$	=	1.51 cm^2
$Aa3 = 0.98$	+	$0.09'$	=	1.07 cm^2
$Aa4 = 0.97$	+	$0.09'$	=	1.06 cm^2
$Aa_{uz} = 0.00$		cm^2/m		$(m=2)$

[Usvojeno $Aa_{uz} = Ø8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$\tau_y = 0.37 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.32 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.38%
 *) - dodatna poduzna armatura za prijem torzije.

Greda 100-76
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 3-3 x = 9.50m



Merodavna kombinacija za savijanje:
 $1.00xI+1.00xII+1.80xIII+1.80xIV$
 $N1u = -50.11 \text{ kN}$
 $M2u = 5.94 \text{ kNm}$
 $M3u = 101.43 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $M1u = -3.85 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.00xI+1.00xII+1.80xIV$
 $T2u = -33.68 \text{ kN}$
 $T3u = 0.63 \text{ kN}$
 $M1u = 2.57 \text{ kNm}$

$eb/ea = -2.028/10.000 \text{ ‰}$

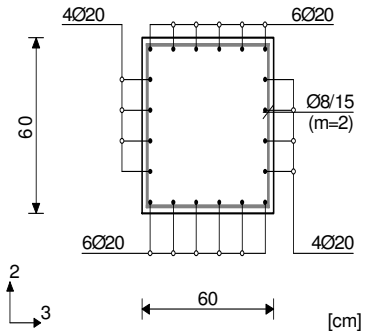
$Aa1 = 2.56$	+	$0.10'$	=	2.65 cm^2
$Aa2 = 2.54$	+	$0.10'$	=	2.63 cm^2
$Aa3 = 1.71$	+	$0.14'$	=	1.84 cm^2
$Aa4 = 1.69$	+	$0.14'$	=	1.83 cm^2
$Aa_{uz} = 0.00$		cm^2/m		$(m=2)$

[Usvojeno $Aa_{uz} = Ø8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$\tau_y = 0.57 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.33 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.38%
 *) - dodatna poduzna armatura za prijem torzije.

Greda 113-86
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja
 $li,2 = 9.50 \text{ m} (\lambda_2 = 54.85)$
 $li,3 = 9.50 \text{ m} (\lambda_3 = 54.85)$
 Pomerljiva konstrukcija

Presek 2-2 x = 9.50m



Merodavna kombinacija za savijanje:
 $1.00xI+1.00xII+1.30xVIII$
 $N1u = -197.54 \text{ kN}$
 $M2u = 139.86 \text{ kNm}$
 $M3u = 2.38 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII+1.30xVIII$
 $M1u = 0.66 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xV$
 $T2u = 4.43 \text{ kN}$
 $T3u = -22.71 \text{ kN}$
 $M1u = 0.11 \text{ kNm}$

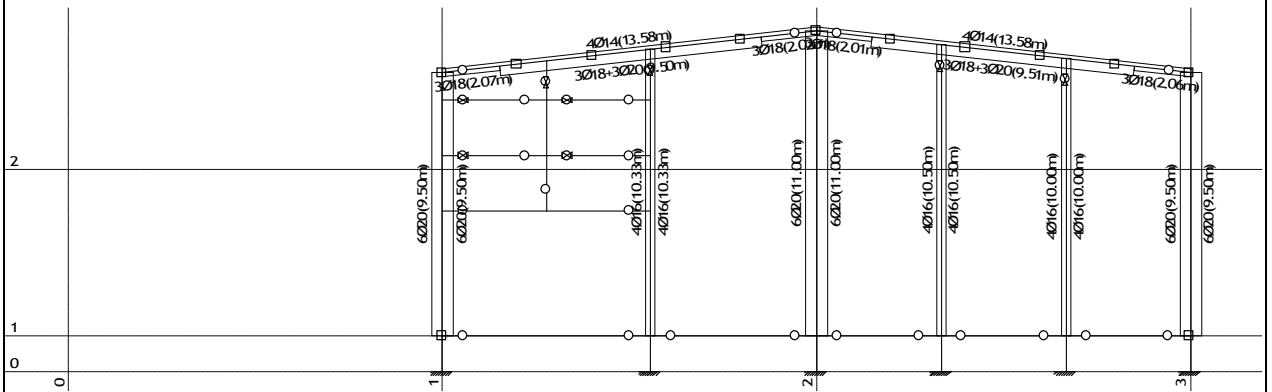
$\Delta e2 = 3.2 < e0 > + 7.4 < eII > = 10.6 \text{ cm}$
 $|\Delta M2| = 20.93 \text{ kNm}$
 $\Delta e3 = 3.2 < e0 > + 7.4 < eII > = 10.6 \text{ cm}$
 $|\Delta M3| = 20.93 \text{ kNm}$
 $eb/ea = -1.820/10.000 \text{ ‰}$

$Aa1 = 2.07$		cm^2
$Aa2 = 2.05$		cm^2
$Aa3 = 2.07$		cm^2
$Aa4 = 2.05$		cm^2
$Aa_{uz} = 0.00$		$\text{cm}^2/\text{m} \quad (m=2)$

[Usvojeno $Aa_{uz} = Ø8/15(m=2) = 3.35 \text{ cm}^2/\text{m}$]

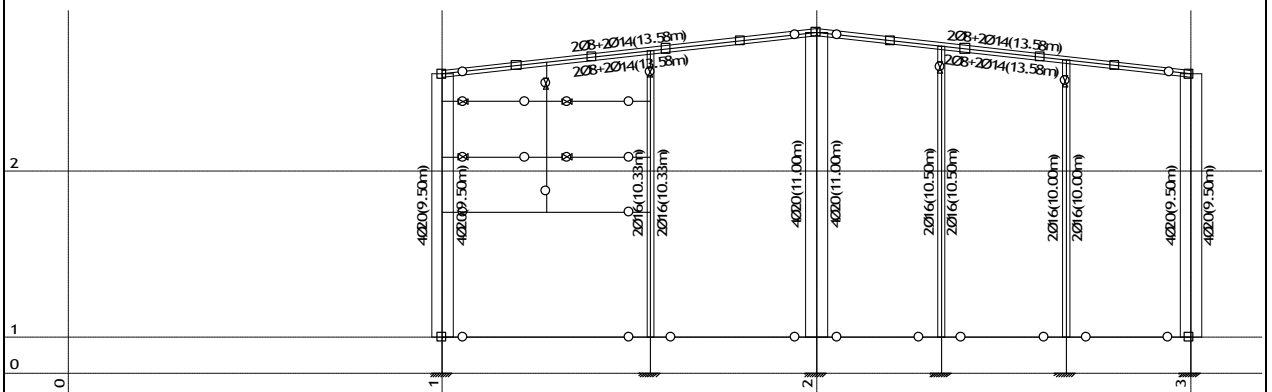
$\tau_y = 0.02 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.08 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.75%

Usvojena armatura
@1@PBAB 87, MB 30, B500



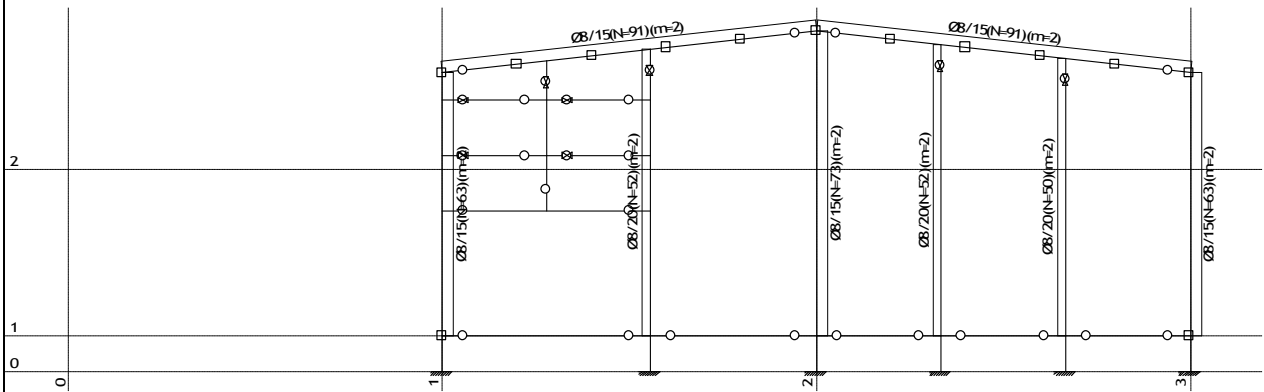
Ram: H.3
Armatura u gredama: A2/Aa1

Usvojena armatura
@1@PBAB 87, MB 30, B500



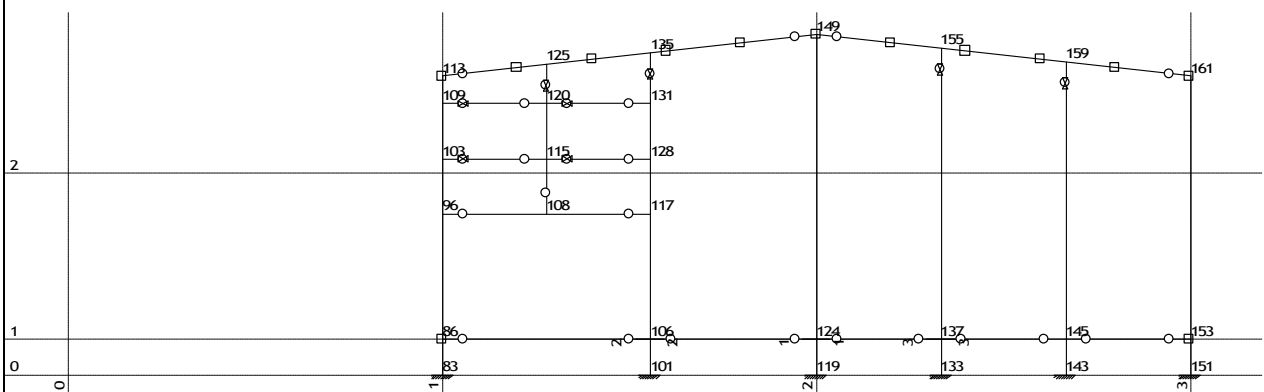
Ram: H.3
Armatura u gredama: A3/Aa4

Usvojena armatura
@1@PBAB 87, MB 30, B500



Ram: H.3
Armatura u gredama: A_g, u_z

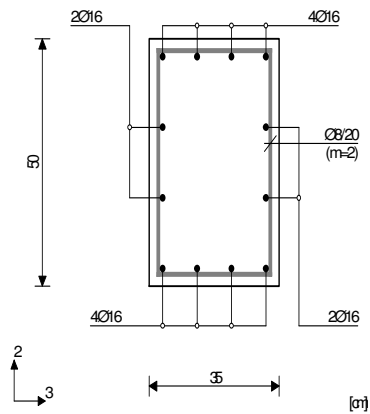
Usvojena armatura
@1@PBAB 87, MB 30, B500



Ram: H.3
Dispozicija greda

Greda 135-106
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 2-2 x = 10.33m



Merodavna kombinacija za savijanje:
 1.00xI+1.00xII+1.80xIII+1.80xV
 N1u = -59.56 kN
 M2u = 2.67 kNm
 M3u = -127.02 kNm

Merodavna kombinacija za torziju:
 1.30xI+1.30xII+1.30xIII+1.30xVIII
 M1u = -2.51 kNm

Merodavna kombinacija za smicanje:
 1.30xI+1.30xII+1.30xIII+1.30xVIII
 T2u = 8.88 kN
 T3u = 1.28 kN
 M1u = -2.51 kNm

$eb/ea = -2.068/10.000 \%$

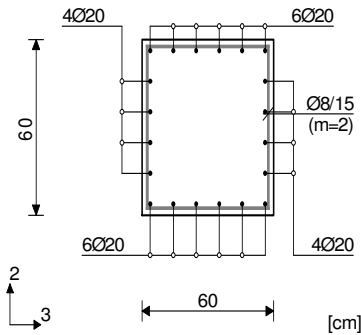
Aa1 =	3.61	+	0.06'	=	3.67	cm ²
Aa2 =	3.58	+	0.06'	=	3.65	cm ²
Aa3 =	1.86	+	0.09'	=	1.95	cm ²
Aa4 =	1.84	+	0.09'	=	1.93	cm ²
Aa,uz =	0.00	cm ² /m	(m=2)			

[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.38\text{MPa} < \tau_r, \tau_r = 1.10\text{MPa}$
 $\tau_z = 0.33\text{MPa} < \tau_r, \tau_r = 1.10\text{MPa}$
 Procenat armiranja: 1.38%
 *) - dodatna poduzna armatura za prijem torzije.

Greda 149-124
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja
 li,2 = 22.00 m (A2 = 127.02)
 li,3 = 22.00 m (A3 = 127.02)
 Pomerljiva konstrukcija

Presek 1-1 x = 11.00m



Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII+1.80xV
 N1u = -556.18 kN
 M2u = -188.32 kNm
 M3u = 0.80 kNm

Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII+1.80xV
 M1u = 0.15 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII+1.80xV
 T2u = -0.07 kN
 T3u = -48.18 kN
 M1u = 0.15 kNm

$\Delta e2 = 7.3 < e0 > + 39.8 < ell > = 47.2 \text{ cm}$
 $|\Delta M2| = 262.34 \text{ kNm}$
 $\Delta e3 = 7.3 < e0 > + 39.8 < ell > = 47.2 \text{ cm}$
 $|\Delta M3| = 262.34 \text{ kNm}$
 $eb/ea = -3.500/5.955 \%$

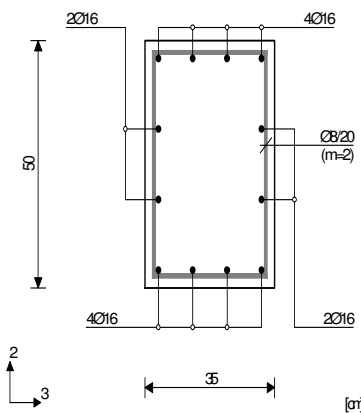
Aa1 =	10.37	cm ²
Aa2 =	10.29	cm ²
Aa3 =	6.92	cm ²
Aa4 =	6.84	cm ²
Aa,uz =	0.00	cm ² /m (m=2)

[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

$\tau_z = 0.17\text{MPa} < \tau_r, \tau_r = 1.10\text{MPa}$
 Procenat armiranja: 1.75%

Greda 155-137
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 3-3 x = 10.50m



Merodavna kombinacija za savijanje:
 1.00xI+1.00xII+1.80xIII+1.80xV
 N1u = -55.39 kN
 M2u = 1.61 kNm
 M3u = -103.20 kNm

Merodavna kombinacija za torziju:
 1.30xI+1.30xII+1.30xIII+1.30xVIII
 M1u = 1.52 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xV
 T2u = 35.34 kN
 T3u = 0.15 kN
 M1u = 1.08 kNm

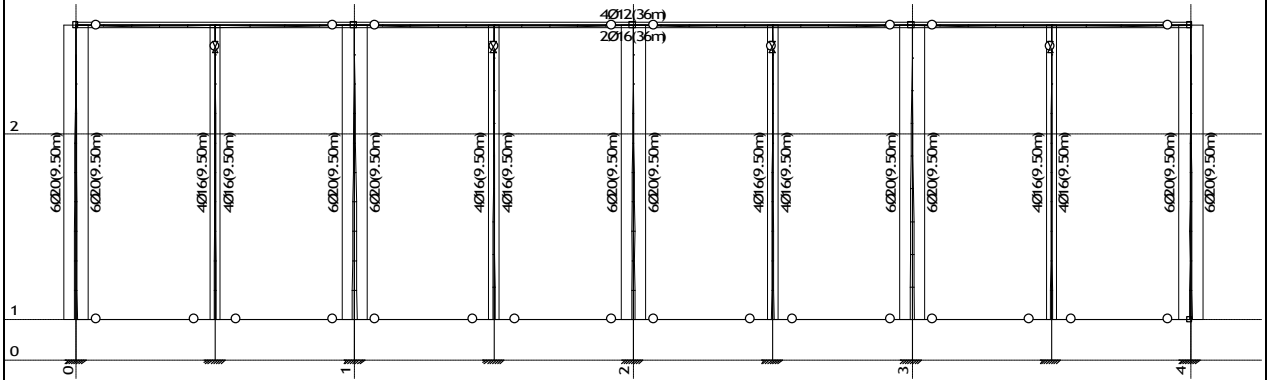
$eb/ea = -1.790/10.000 \%$

Aa1 =	2.84	+	0.04'	=	2.88	cm ²
Aa2 =	2.82	+	0.04'	=	2.86	cm ²
Aa3 =	1.47	+	0.05'	=	1.52	cm ²
Aa4 =	1.45	+	0.05'	=	1.50	cm ²
Aa,uz =	0.00	cm ² /m	(m=2)			

[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

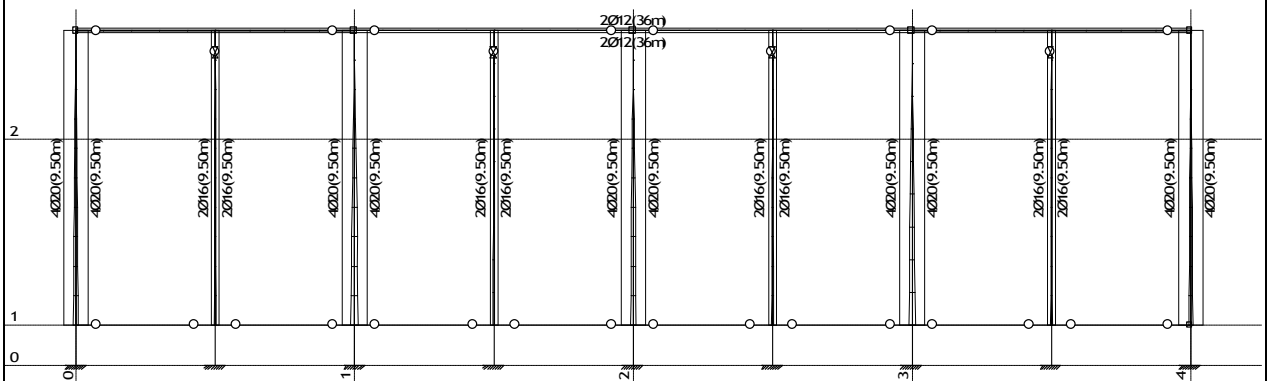
$\tau_y = 0.39\text{MPa} < \tau_r, \tau_r = 1.10\text{MPa}$
 $\tau_z = 0.14\text{MPa} < \tau_r, \tau_r = 1.10\text{MPa}$
 Procenat armiranja: 1.38%
 *) - dodatna poduzna armatura za prijem torzije.

Usvojena armatura
@1@PBAB 87, MB 30, B500



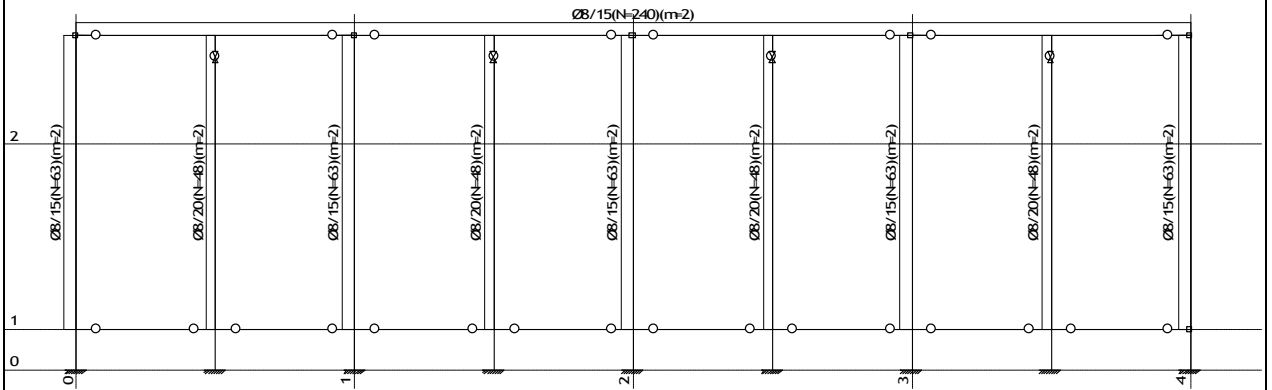
Ramt V_16
Armatura u gredama: A_{s2}/A_{s1}

Usvojena armatura
@1@PBAB 87, MB 30, B500



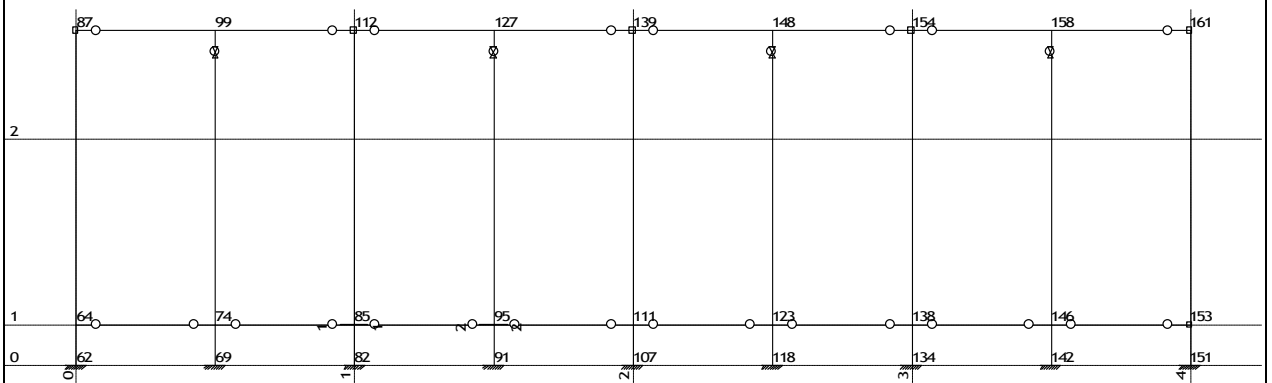
Ramt V_16
Armatura u gredama: A_{s3}/A_{s4}

Usvojena armatura
@1@PBAB 87, MB 30, B500



Ram: V_16
Armatura u gredama: A_u, L_z

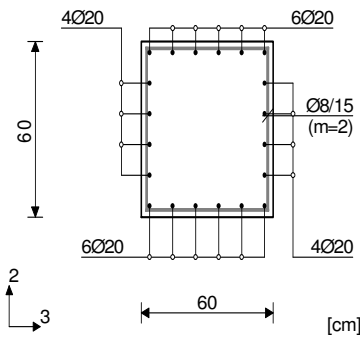
Usvojena armatura
@1@PBAB 87, MB 30, B500



Ram: V_16
Dispozicija greda

Greda 112-85
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja
 $l_{i,2} = 9.50 \text{ m}$ ($\lambda_2 = 54.85$)
 $l_{i,3} = 9.50 \text{ m}$ ($\lambda_3 = 54.85$)
 Pomerljiva konstrukcija

Presek 1-1 $x = 9.50 \text{ m}$



Merodavna kombinacija za savijanje:
 $1.00xI + 1.00xII + 1.30xIII + 1.30xVII$
 $N1u = -340.32 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 246.81 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI + 1.30xII + 1.30xIII + 1.30xVII$
 $M1u = -1.21 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.30xI + 1.00xII + 1.30xIII + 1.30xVII$
 $T2u = -26.25 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = 0.00 \text{ kNm}$

$\Delta e2 = 3.2 \langle e0 \rangle + 7.4 \langle e1 \rangle = 10.6 \text{ cm}$
 $|\Delta M2| = 36.06 \text{ kNm}$
 $\Delta e3 = 3.2 \langle e0 \rangle + 7.4 \langle e1 \rangle = 10.6 \text{ cm}$
 $|\Delta M3| = 36.06 \text{ kNm}$
 $eb/ea = -2.550/10.000 \text{ ‰}$

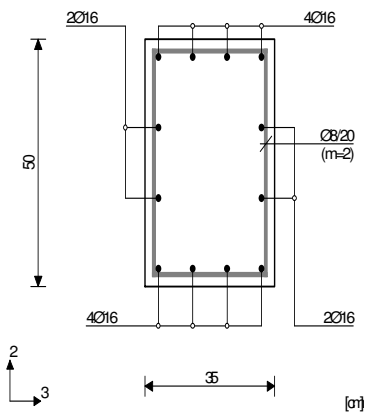
$Aa1 = 3.91$	+	$0.03'$	=	3.94 cm^2
$Aa2 = 3.87$	+	$0.03'$	=	3.90 cm^2
$Aa3 = 3.91$	+	$0.03'$	=	3.93 cm^2
$Aa4 = 3.87$	+	$0.03'$	=	3.90 cm^2
$Aa_{uz} = 0.00$				$\text{cm}^2/\text{m} \quad (m=2)$

[Usvojeno $Aa_{uz} = 0.08/15(m=2) = 3.35 \text{ cm}^2/\text{m}$]

$\tau_y = 0.09 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.75%
 *) - dodatna poduzna armatura za prijem torzije.

Greda 127-95
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 2-2 $x = 9.50 \text{ m}$



Merodavna kombinacija za savijanje:
 $1.00xI + 1.00xII + 1.80xIII + 1.80xIV$
 $+ 1.80xVI$
 $N1u = -50.11 \text{ kN}$
 $M2u = 5.16 \text{ kNm}$
 $M3u = 69.60 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI + 1.30xII + 1.30xIII + 1.30xVII$
 $M1u = 2.51 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.30xI + 1.30xII + 1.30xIII + 1.30xVII$
 $T2u = -7.21 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = 2.51 \text{ kNm}$

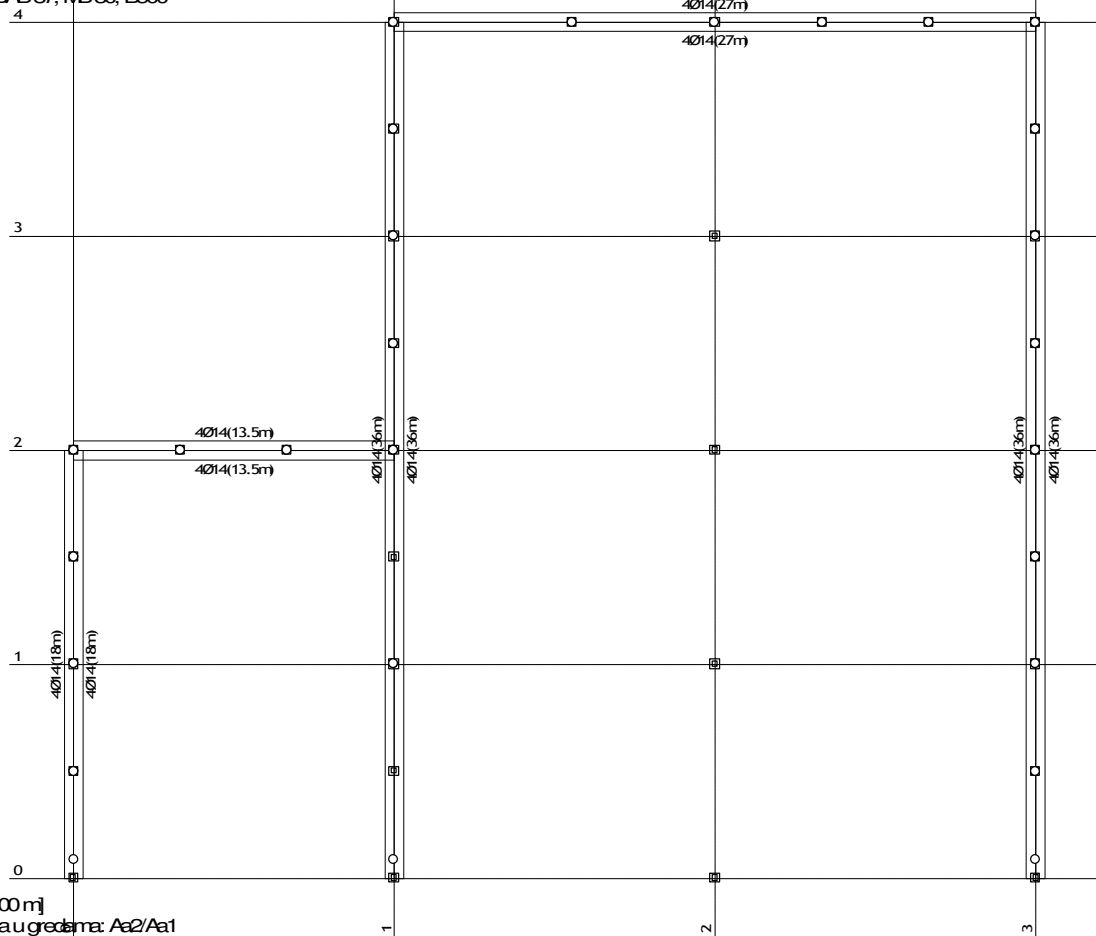
$eb/ea = -1.655/10.000 \text{ ‰}$

$Aa1 = 1.77$	+	$0.06'$	=	1.84 cm^2
$Aa2 = 1.76$	+	$0.06'$	=	1.82 cm^2
$Aa3 = 0.92$	+	$0.09'$	=	1.01 cm^2
$Aa4 = 0.90$	+	$0.09'$	=	0.99 cm^2
$Aa_{uz} = 0.00$				$\text{cm}^2/\text{m} \quad (m=2)$

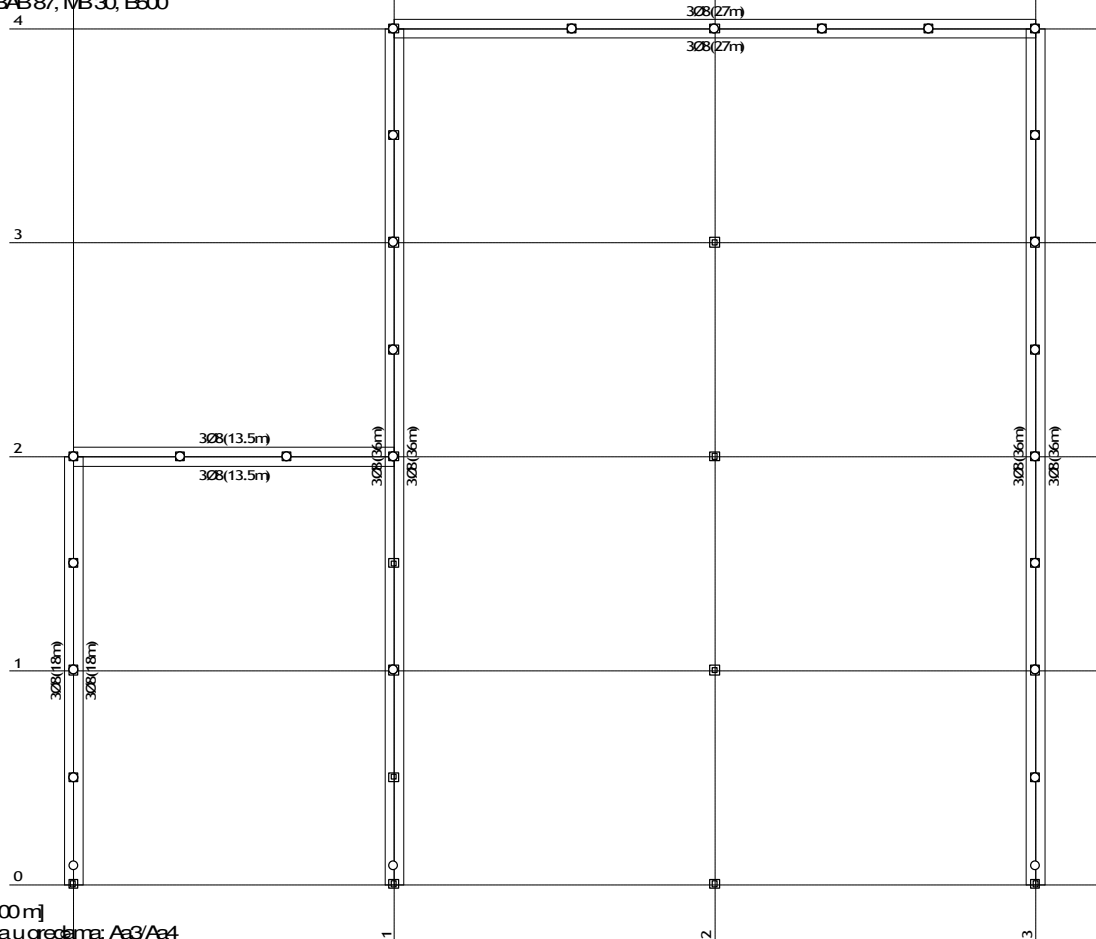
[Usvojeno $Aa_{uz} = 0.08/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$\tau_y = 0.37 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.32 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.38%
 *) - dodatna poduzna armatura za prijem torzije.

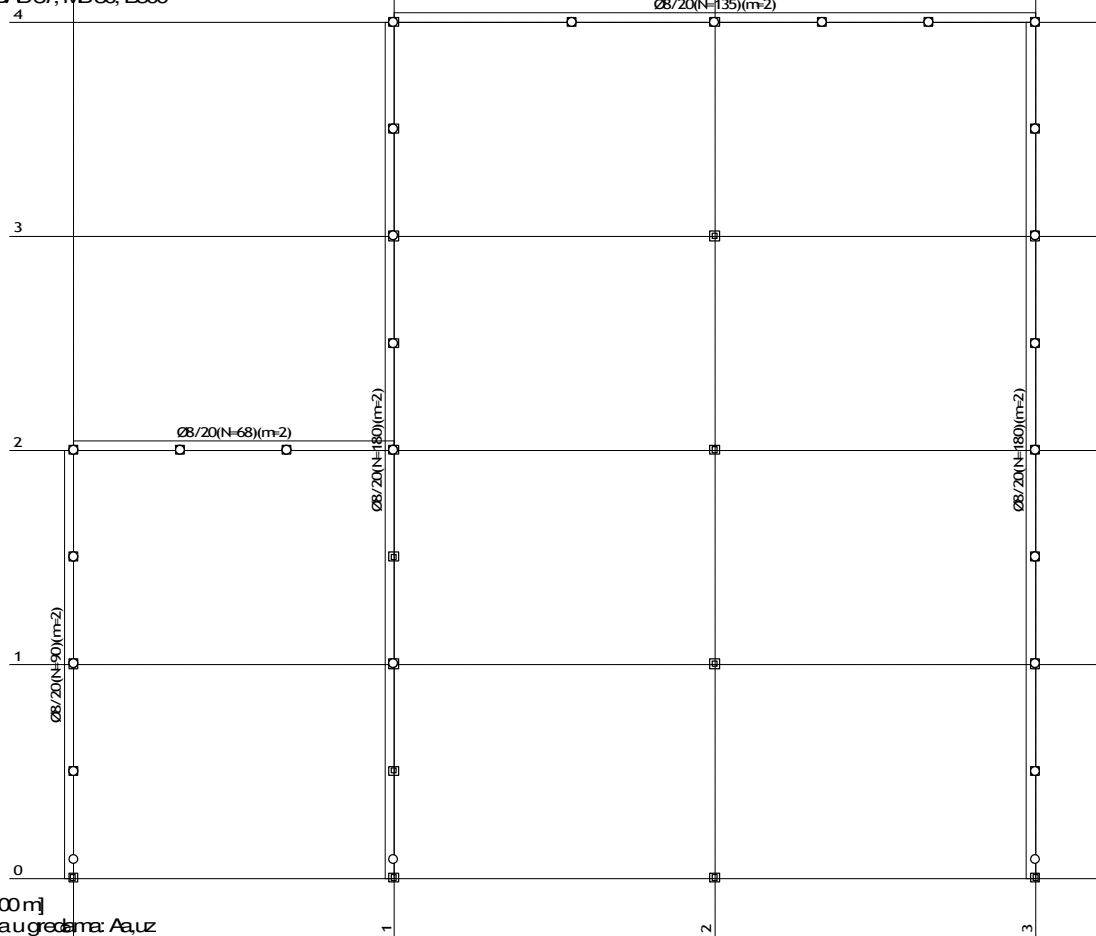
Usvojena armatura
@1@PBAB 87, MB 30, B500



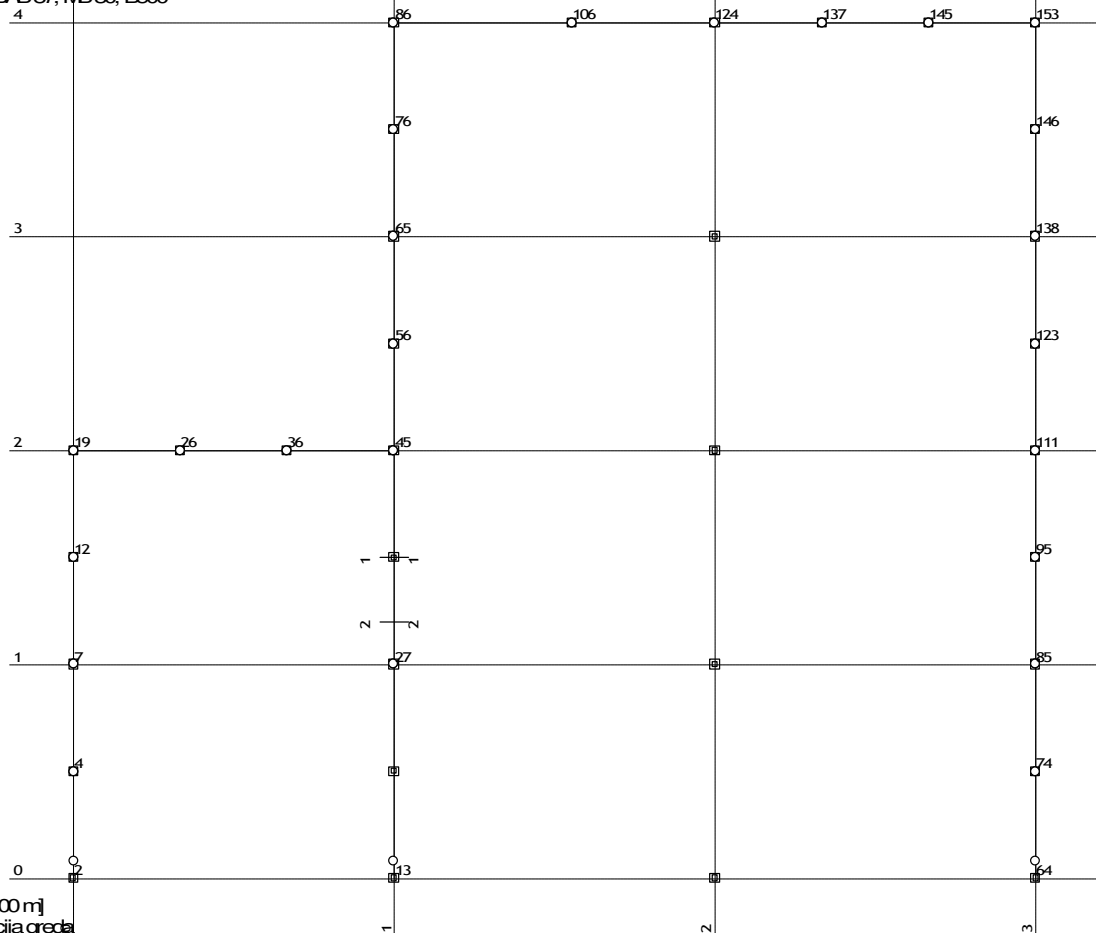
Usvojena armatura
@1@PBAB 87, MB 30, B500



Usvojena armatura
@1@PBAB 87, MB 30, B500

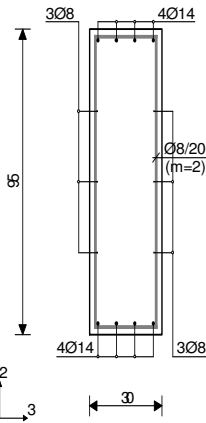


Usvojena armatura
@1@PBAB 87, MB 30, B500



Greda 45-27
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 1-1 x = 4.50m



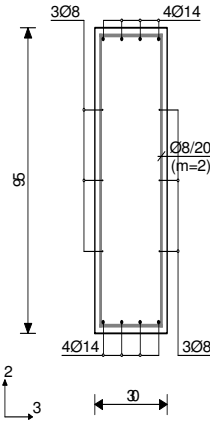
Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 N1u = -2.89 kN
 M2u = 0.00 kNm
 M3u = -32.18 kNm

Merodavna kombinacija za torziju:
 1.30xI+1.30xII+1.30xIII+1.30xVII
 M1u = -0.71 kNm

Merodavna kombinacija za smicanje:
 1.30xI+1.30xII+1.30xIII+1.30xVII
 T2u = -26.22 kN
 T3u = -0.04 kN
 M1u = -0.71 kNm

eb/ea = -0.410/10.000 %
 Aa1 = 0.00 cm²
 Aa2 = 0.73 cm²
 Aa3 = 0.00 cm²
 Aa4 = 0.00 cm²
 Aa,uz = 0.00 cm²/m (m=2)
 [Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]
 ty = 0.18MPa < tr, tr = 1.10MPa
 tz = 0.06MPa < tr, tr = 1.10MPa
 Procenat armiranja: 0.54%

Presek 2-2 x = 7.20m



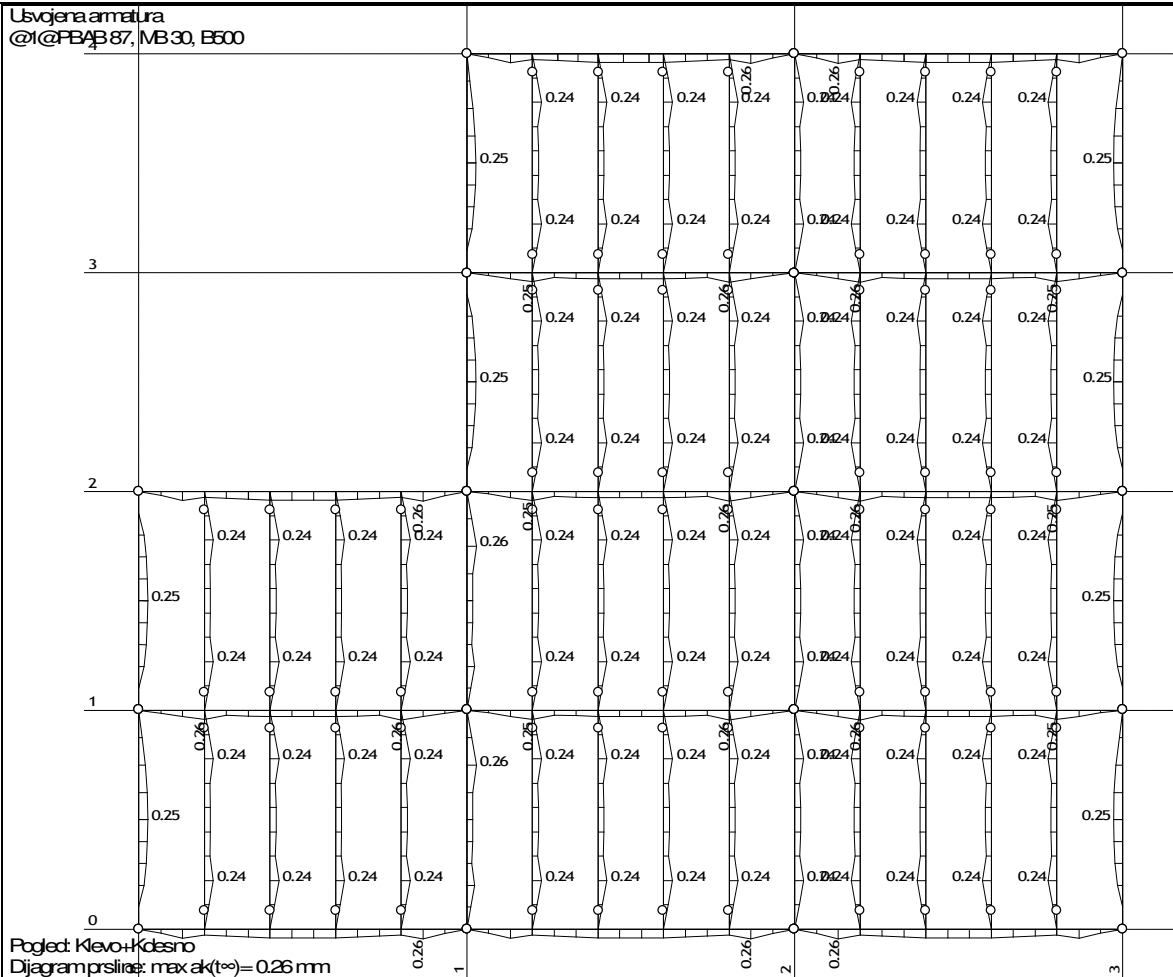
Merodavna kombinacija za savijanje:
 1.30xI+1.00xII+1.30xVIII
 N1u = 11.05 kN
 M2u = 0.00 kNm
 M3u = 15.31 kNm

Merodavna kombinacija za torziju:
 1.30xI+1.30xII+1.30xIII+1.30xVII
 M1u = -0.71 kNm

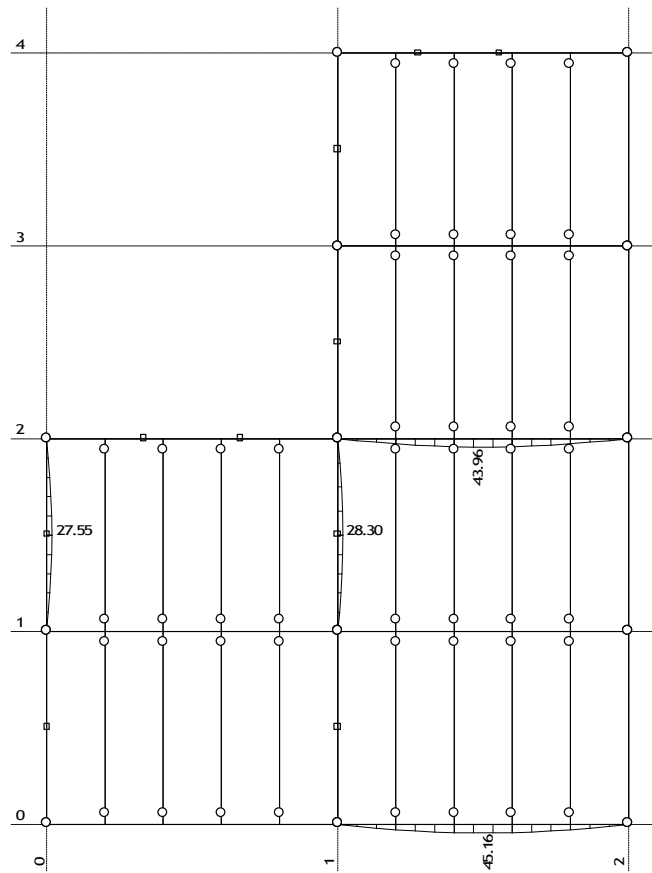
Merodavna kombinacija za smicanje:
 1.30xI+1.30xII+1.30xIII+1.30xVII
 T2u = -1.21 kN
 T3u = -0.04 kN
 M1u = -0.71 kNm

eb/ea = -0.231/10.000 %
 Aa1 = 0.48 cm²
 Aa2 = 0.00 cm²
 Aa3 = 0.00 cm²
 Aa4 = 0.00 cm²
 Aa,uz = 0.00 cm²/m (m=2)
 [Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]
 ty = 0.07MPa < tr, tr = 1.10MPa
 tz = 0.06MPa < tr, tr = 1.10MPa
 Procenat armiranja: 0.54%

Usvojena armatura
 @1@PBAB 87, MB 30, B500



Pogled: Kreso
 Dijagram prsline: max ak(t[∞]) = 0.26 mm



Pogled: Klevo

Dijagram ugiba: $\max u_g(t^{\infty}) = 45.16 \text{ mm} < L/300 = 13580/300 = 45.3 \text{ mm} \dots \text{OK}$

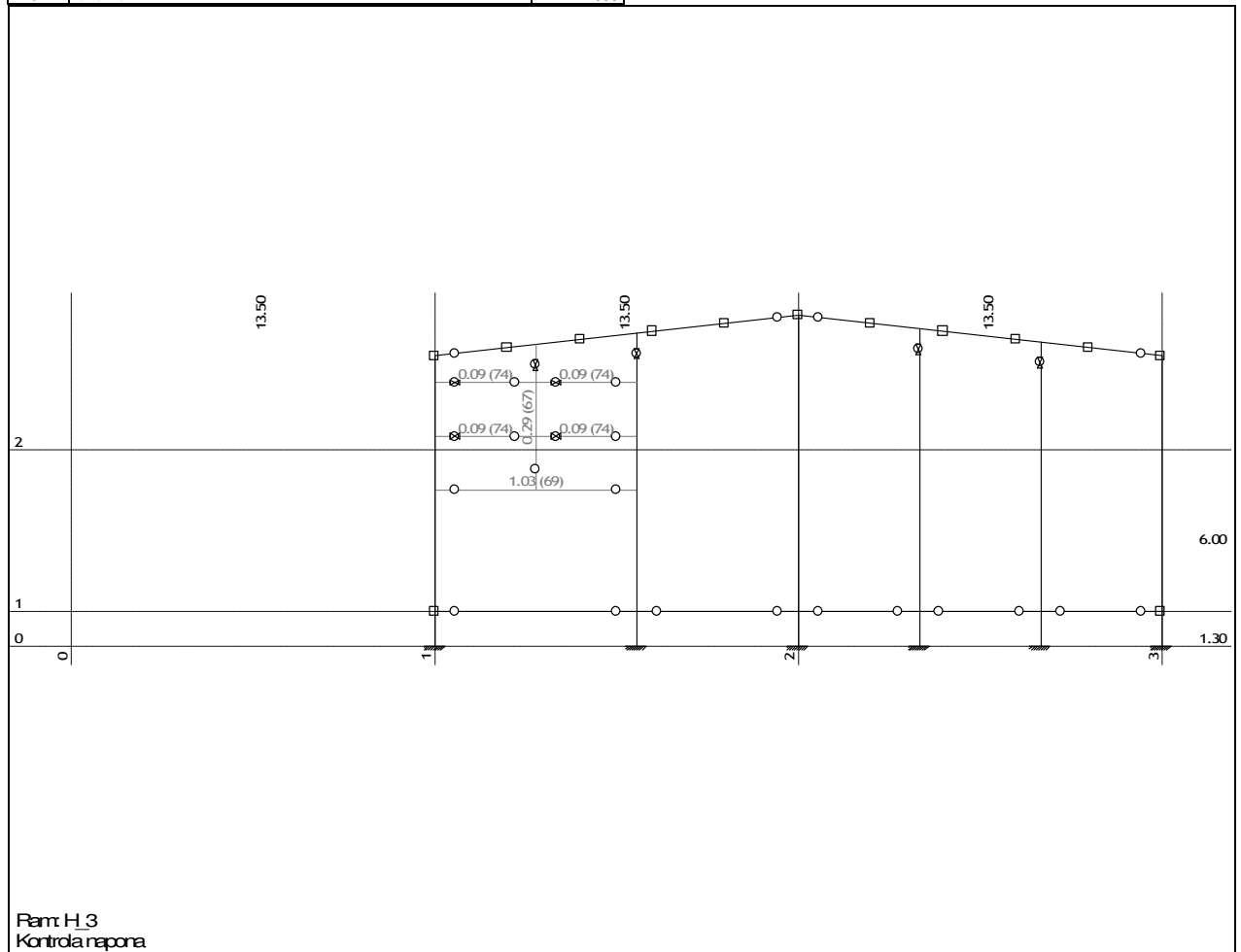
roznjaca: $\max u_g(t^{\infty}) = 28.3 \text{ mm} < L/300 = 9000/300 = 30.0 \text{ mm} \dots \text{OK}$

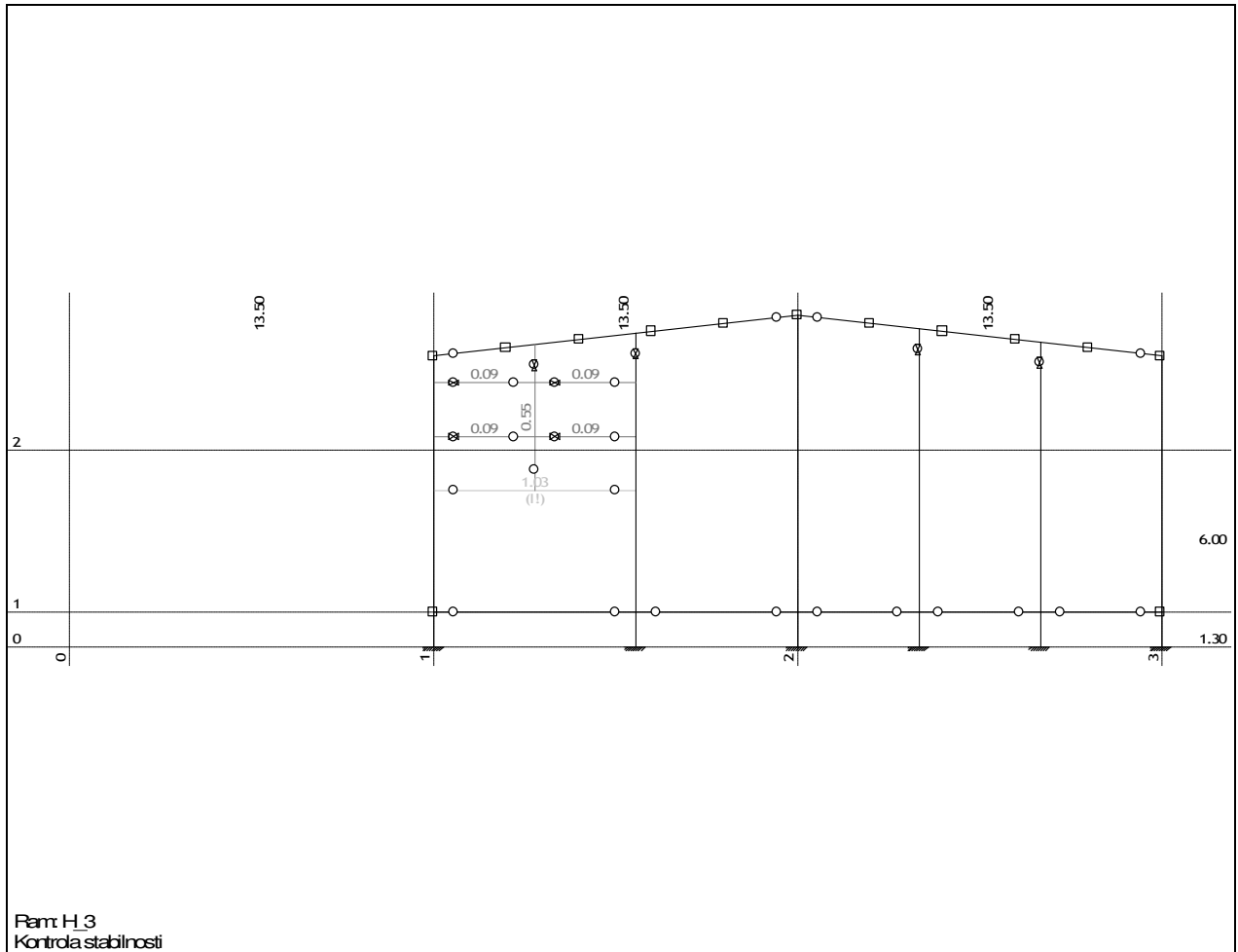
Merodavno opterećenje - @2@JUS

No	Slučajevi opterećenja	Tip
1	SW (g)	osnovno
2	G	osnovno
3	S	dopunsko
4	Wx	dopunsko
5	W-y	dopunsko
6	Wu	dopunsko
7	Sx	izuzetno
8	Sy	izuzetno

No	Kombinacije opterećenja	K.S.
56	I+II	1.500
57	I+II+III	1.333
58	I+II+IV	1.333
59	I+II+III+IV	1.333
60	I+II+V	1.333
61	I+II+III+V	1.333
62	I+II+IV+V	1.333

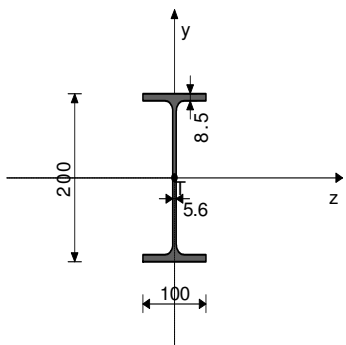
63	I+II+IV-1xVI	1.333
64	I+II+III+IV+VI	1.333
65	I+II+III+IV-1xVI	1.333
66	I+II+V+VI	1.333
67	I+II+V-1xVI	1.333
68	I+II+III+V+VI	1.333
69	I+II+III+V-1xVI	1.333
70	I+II+III+VII	1.200
71	I+II+III-1xVII	1.200
72	I+II+III+VIII	1.200
73	I+II+III-1xVIII	1.200
74	1.3xI+1.3xII+1.3xIII+1.3xVII	1.200
75	1.3xI+1.3xII+1.3xIII-1.3xVII	1.200
76	1.3xI+1.3xII+1.3xIII+1.3xVIII	1.200
77	1.3xI+1.3xII+1.3xIII-1.3xVIII	1.200





STAP 128-115
POPREČNI PRESEK : IPE 200
@2@JUS

GEOMETRIJSKE KARAKTERISTIKE PRESEKA



[mm]

Ax = 28.500 cm²
Ay = 14.016 cm²
Az = 14.484 cm²
Iz = 1940.0 cm⁴
Iy = 142.00 cm⁴
Ix = 7.020 cm⁴
Wy = 28.400 cm³

FAKTORI ISKORIŠĆENJA PO KOMBINACIJAMA OPTEREĆENJA

74. $\gamma=0.09$	75. $\gamma=0.09$	76. $\gamma=0.09$
77. $\gamma=0.09$	56. $\gamma=0.08$	61. $\gamma=0.07$
62. $\gamma=0.07$	63. $\gamma=0.07$	64. $\gamma=0.07$
65. $\gamma=0.07$	66. $\gamma=0.07$	67. $\gamma=0.07$
68. $\gamma=0.07$	69. $\gamma=0.07$	57. $\gamma=0.07$
58. $\gamma=0.07$	59. $\gamma=0.07$	60. $\gamma=0.07$
70. $\gamma=0.07$	71. $\gamma=0.07$	72. $\gamma=0.07$
73. $\gamma=0.07$		

KONTROLA DEFORMACIJA

Maksimalni ugib štapa u = 38.169 mm
(slučaj opterećenja 76, početak štapa)

SLUČAJ OPTEREĆENJA: 74
FAKTOR SIGURNOSTI : 1.20
DOPUŠTENI NAPON : 20.00
MERODAVNI UTICAJI (na 177.6 cm od početka štapa)

Moment savijanja oko y ose My = -0.501 kNm
Transverzalna sila u pravcu Tz = -0.029 kN
Sistemska dužina štapa L = 375.00 cm

ŠTAP IZLOŽEN SAVIJANJU

Normalni napon	$\sigma_{max} =$	1.763 kN/cm ²
Dopušteni napon	$\sigma_{dop} =$	20.000 kN/cm ²

Kontrola napona: $\sigma_{max} \leq \sigma_{dop}$

KONTROLA STABILNOSTI NA IZBOČ.LIMOVA JUS U.E7.121
Provera izbočavanja nožice I preseka

Dimenzije lima a/b/t = 375/5/0.85 (cm)	
Način oslanjanja: B	
Odnos a/b	$\alpha =$ 75.000
Ivični normalni napon u limu	$\sigma_1 =$ -1.763 kN/cm ²
Ivični normalni napon u limu	$\sigma_2 =$ 0.000 kN/cm ²
Odnos σ_1/σ_2	$\Psi =$ -0.000
Koeficijent izbočavanja	$k_{\sigma} =$ 1.700
Ojlerov napon izbočavanja lima	$\sigma_E =$ 548.52 kN/cm ²
Kritični napon izbočavanja	$\sigma_{cr} =$ 932.49 kN/cm ²
Relativna vitkost ploče	$\lambda'_{ps} =$ 0.160
Bezdim. koef. izbočavanja	$k_{ps} =$ 1.000
Korekcionni faktor	$c_{\sigma} =$ 1.250
Korekcionni faktor	$f =$ 0.000
Relativni granični napon	$\sigma_u =$ 1.000
Granični napon izbočavanja	$\sigma_u =$ 24.000 kN/cm ²
Faktorirani napon pritiska	$\sigma =$ 2.116 kN/cm ²

Kontrola napona: $\sigma \leq \sigma_u$

Koeficijent izbočavanja	$k_T =$ 5.341
Ojlerov napon izbočavanja lima	$\sigma_E =$ 548.52 kN/cm ²
Kritični napon izbočavanja	$\tau_{cr} =$ 2929.5 kN/cm ²
Relativna vitkost ploče	$\lambda'_{pt} =$ 0.069
Bezdim. koef. izbočavanja	$k_{pt} =$ 1.000
Korekcionni faktor	$c_T =$ 1.250
Kritični napon izbočavanja	$\tau_{cr} =$ 2929.5 kN/cm ²
Relativni granični napon	$\tau_u =$ 1.000
Granični napon izbočavanja	$\tau_u =$ 13.856 kN/cm ²
Faktorirani smičući napon	$\tau =$ 0.002 kN/cm ²

Kontrola napona: $\tau \leq \tau_u$

Kombinovano naponsko stanje	$\sigma^2 =$ 0.008
-----------------------------	--------------------

Kontrola napona: $\sigma^2 \leq 1$

KONTROLA UPOREDNOG NAPONA

Normalni napon	$\sigma =$ 1.763 kN/cm ²
Smičući napon	$\tau =$ 0.002 kN/cm ²
Maksimalni uporedni napon	$\sigma_{up} =$ 1.763 kN/cm ²
Dopušteni napon	$\sigma_{dop} =$ 20.000 kN/cm ²

Kontrola napona: $\sigma_{up} \leq \sigma_{dop}$

SLUČAJ OPTEREĆENJA: 74
FAKTOR SIGURNOSTI : 1.20
DOPUŠTENI NAPON : 20.00

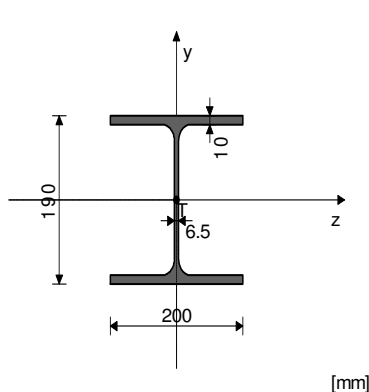
MERODAVNI UTICAJI (početak štapa)

Transverzalna sila u z pravcu	Tz =	-0.545 kN
Sistemska dužina štapa	L =	375.00 cm

STAP 117-96

POPREČNI PRESEK : IPBI 200
@2@JUS

GEOMETRIJSKE KARAKTERISTIKE PRESEKA



Ax =	53.800 cm ²
Ay =	18.050 cm ²
Az =	35.750 cm ²
Iz =	3690.0 cm ⁴
Iy =	1340.0 cm ⁴
Ix =	21.100 cm ⁴
Wz =	388.42 cm ³
Wy =	134.00 cm ³

FAKTORI ISKORIŠĆENJA PO KOMBINACIJAMA OPTEREĆENJA

67. $\gamma=1.03$ (II)	69. $\gamma=1.03$ (II)
60. $\gamma=0.96$ (II)	61. $\gamma=0.96$ (II)
68. $\gamma=0.90$ (II)	66. $\gamma=0.90$ (II)
62. $\gamma=0.86$ (II)	64. $\gamma=0.86$ (II)
58. $\gamma=0.80$ (II)	59. $\gamma=0.79$ (II)
76. $\gamma=0.78$ (II)	77. $\gamma=0.78$ (II)
75. $\gamma=0.78$ (II)	74. $\gamma=0.78$ (II)
56. $\gamma=0.75$ (II)	63. $\gamma=0.73$ (II)
65. $\gamma=0.73$ (II)	57. $\gamma=0.67$ (II)
72. $\gamma=0.60$ (II)	73. $\gamma=0.60$ (II)
71. $\gamma=0.60$ (II)	70. $\gamma=0.60$ (II)

KONTROLA DEFORMACIJA

Maksimalni uglob štapa (slučaj opterećenja 76, na 375.0 cm od početka štapa)	u =	36.816 mm
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SLUČAJ OPTEREĆENJA: 69

FAKTOR SIGURNOSTI : 1.33

DOPUŠTENI NAPON : 18.00

MERODAVNI UTICAJI (na 375.0 cm od početka štapa)

Računska normalna sila	N =	1.714 kN
Moment savijanja oko z ose	Mz =	25.443 kNm
Moment savijanja oko y ose	My =	-16.005 kNm
Transverzalna sila u z pravcu	Tz =	3.476 kN
Transverzalna sila u y pravcu	Ty =	3.705 kN
Sistemska dužina štapa	L =	750.00 cm

ŠTAP IZLOŽEN ZATEZANJU I SAVIJANJU

Normalni napon	$\sigma_{\max}$ =	18.526 kN/cm ²
Dopušteni napon	σ_{dop} =	18.000 kN/cm ²

Kontrola napona: $\sigma_{\max} \geq \sigma_{\text{dop}}$

Prekoračenje 2.9% <= 3%

KONTROLA UPOREDNOG NAPONA

Normalni napon	σ =	18.526 kN/cm ²
Smičući napon	τ =	0.302 kN/cm ²
Maksimalni uporedni napon	σ_{up} =	18.534 kN/cm ²
Dopušteni napon	σ_{dop} =	18.000 kN/cm ²

Kontrola napona: $\sigma_{\text{up}} \geq \sigma_{\text{dop}}$

Prekoračenje 3.0% <= 3%

SLUČAJ OPTEREĆENJA: 69

FAKTOR SIGURNOSTI : 1.33

DOPUŠTENI NAPON : 18.00

MERODAVNI UTICAJI (kraj štapa)

Računska normalna sila	N =	1.714 kN
Transverzalna sila u z pravcu	Tz =	5.060 kN
Transverzalna sila u y pravcu	Ty =	9.864 kN
Sistemska dužina štapa	L =	750.00 cm

Smičući napon	τ =	0.688 kN/cm ²
Dopušteni smičući napon	τ_{dop} =	10.392 kN/cm ²

Kontrola napona: $\tau \leq \tau_{\text{dop}}$

SLUČAJ OPTEREĆENJA: 67

FAKTOR SIGURNOSTI : 1.33

DOPUŠTENI NAPON : 18.00

MERODAVNI UTICAJI (na 375.0 cm od početka štapa)

Računska normalna sila	N =	1.335 kN
Moment savijanja oko z ose	Mz =	25.443 kNm
Moment savijanja oko y ose	My =	-16.005 kNm
Transverzalna sila u z pravcu	Tz =	3.476 kN
Transverzalna sila u y pravcu	Ty =	3.705 kN

Smičući napon	τ =	0.038 kN/cm ²
Dopušteni smičući napon	τ_{dop} =	11.547 kN/cm ²

Kontrola napona: $\tau \leq \tau_{\text{dop}}$

Sistemska dužina štapa	L =	750.00 cm
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KONTROLA STABILNOSTI NA IZBOČ.LIMOVA JUS U.E7.121

Provera izbočavanja rebra I preseka

Dimenzije lima	a/b/t = 750/17/0.65 (cm)
Način oslanjanja: A	
Odnos a/b	$\alpha =$ 44.118
Ivični normalni napon u limu	$\sigma_1 =$ -5.836 kN/cm ²
Ivični normalni napon u limu	$\sigma_2 =$ 5.886 kN/cm ²
Odnos σ_1/σ_2	$\Psi =$ -1.009
Koeficijent izbočavanja	$k_{\sigma} =$ 23.900
Ojlerov napon izbočavanja lima	$\sigma_E =$ 27.748 kN/cm ²
Kritični napon izbočavanja	$\sigma_{\text{cr}} =$ 663.17 kN/cm ²
Relativna vitkost ploče	$\lambda_{\text{pr}} =$ 0.190
Bezdim. koef. izbočavanja	$k_{\text{pr}} =$ 1.000
Korekcionni faktor	$c_{\sigma} =$ 1.250
Korekcionni faktor	$f =$ 0.000
Relativni granični napon	$\sigma'_{\text{u}} =$ 1.000
Granični napon izbočavanja	$\sigma_{\text{u}} =$ 24.000 kN/cm ²
Faktorirani napon pritiska	$\sigma =$ 7.781 kN/cm ²

Kontrola napona: $\sigma \leq \sigma_{\text{u}}$

Koeficijent izbočavanja	$k_{\tau} =$ 5.342
Ojlerov napon izbočavanja lima	$\sigma_E =$ 27.748 kN/cm ²
Kritični napon izbočavanja	$\tau_{\text{cr}} =$ 148.23 kN/cm ²
Relativna vitkost ploče	$\lambda_{\text{pr}} =$ 0.306
Bezdim. koef. izbočavanja	$k_{\text{pr}} =$ 1.000
Korekcionni faktor	$c_{\tau} =$ 1.250
Kritični napon izbočavanja	$\tau_{\text{cr}} =$ 148.23 kN/cm ²
Relativni granični napon	$\tau'_{\text{u}} =$ 1.000
Granični napon izbočavanja	$\tau_{\text{u}} =$ 13.856 kN/cm ²
Faktorirani smičući napon	$\tau =$ 0.274 kN/cm ²

Kontrola napona: $\tau \leq \tau_{\text{u}}$

Kombinovano naponsko stanje	$\sigma'^2 =$ 0.106
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Kontrola napona: $\sigma'^2 \leq 1$

KONTROLA STABILNOSTI NA IZBOČ.LIMOVA JUS U.E7.121

Provera izbočavanja nožice I preseka (levo-gore)

Dimenzije lima	a/b/t = 750/10/1 (cm)
Način oslanjanja: B	
Odnos a/b	$\alpha =$ 75.000
Ivični normalni napon u limu	$\sigma_1 =$ -18.469 kN/cm ²
Ivični normalni napon u limu	$\sigma_2 =$ -6.525 kN/cm ²
Odnos σ_1/σ_2	$\Psi =$ 0.353
Koeficijent izbočavanja	$k_{\sigma} =$ 0.834
Ojlerov napon izbočavanja lima	$\sigma_E =$ 189.80 kN/cm ²
Kritični napon izbočavanja	$\sigma_{\text{cr}} =$ 158.23 kN/cm ²
Relativna vitkost ploče	$\lambda_{\text{pr}} =$ 0.389
Bezdim. koef. izbočavanja	$k_{\text{pr}} =$ 1.000
Korekcionni faktor	$c_{\sigma} =$ 1.162
Korekcionni faktor	$f =$ 0.000
Relativni granični napon	$\sigma'_{\text{u}} =$ 1.000
Granični napon izbočavanja	$\sigma_{\text{u}} =$ 24.000 kN/cm ²
Faktorirani napon pritiska	$\sigma =$ 24.626 kN/cm ²

Kontrola napona: $\sigma \geq \sigma_{\text{u}}$

Prekoračenje 2.6% <= 3%

Koeficijent izbočavanja	$k_{\tau} =$ 5.341
Ojlerov napon izbočavanja lima	$\sigma_E =$ 189.80 kN/cm ²
Kritični napon izbočavanja	$\tau_{\text{cr}} =$ 1013.7 kN/cm ²
Relativna vitkost ploče	$\lambda_{\text{pr}} =$ 0.117
Bezdim. koef. izbočavanja	$k_{\text{pr}} =$ 1.000
Korekcionni faktor	$c_{\tau} =$ 1.250
Kritični napon izbočavanja	$\tau_{\text{cr}} =$ 1013.7 kN/cm ²
Relativni granični napon	$\tau'_{\text{u}} =$ 1.000
Granični napon izbočavanja	$\tau_{\text{u}} =$ 13.856 kN/cm ²
Faktorirani smičući napon	$\tau =$ 0.130 kN/cm ²

Kontrola napona: $\tau \leq \tau_{\text{u}}$

Kombinovano naponsko stanje	$\sigma'^2 =$ 1.053
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Prekoračenje napona ! $\sigma'^2 > 1$

KONTROLA STABILNOSTI NA IZBOČ.LIMOVA JUS U.E7.121

Provera izbočavanja nožice I preseka (desno-gore)

Dimenzije lima	a/b/t = 750/10/1 (cm)
Način oslanjanja: B	
Odnos a/b	$\alpha =$ 75.000
Ivični normalni napon u limu	$\sigma_1 =$ -6.525 kN/cm ²
Ivični normalni napon u limu	$\sigma_2 =$ 5.419 kN/cm ²
Odnos σ_1/σ_2	$\Psi =$ -0.830
Koeficijent izbočavanja	$k_{\sigma} =$ 17.643
Ojlerov napon izbočavanja lima	$\sigma_E =$ 189.80 kN/cm ²
Kritični napon izbočavanja	$\sigma_{\text{cr}} =$ 3348.7 kN/cm ²
Relativna vitkost ploče	$\lambda_{\text{pr}} =$ 0.085
Bezdim. koef. izbočavanja	$k_{\text{pr}} =$ 1.000
Korekcionni faktor	$c_{\sigma} =$ 1.250
Korekcionni faktor	$f =$ 0.000
Relativni granični napon	$\sigma'_{\text{u}} =$ 1.000
Granični napon izbočavanja	$\sigma_{\text{u}} =$ 24.000 kN/cm ²
Faktorirani napon pritiska	$\sigma =$ 8.701 kN/cm ²

Kontrola napona: $\sigma \leq \sigma_{\text{u}}$

Koeficijent izbočavanja	$k_{\tau} =$ 5.341
Ojlerov napon izbočavanja lima	$\sigma_E =$ 189.80 kN/cm ²
Kritični napon izbočavanja	$\tau_{\text{cr}} =$ 1013.7 kN/cm ²
Relativna vitkost ploče	$\lambda_{\text{pr}} =$ 0.117
Bezdim. koef. izbočavanja	$k_{\text{pr}} =$ 1.000
Korekcionni faktor	$c_{\tau} =$ 1.250

Kritični napon izbočavanja	$\tau_{cr} =$	1013.7 kN/cm ²
Relativni granični napon	$\tau_u =$	1.000
Granični napon izbočavanja	$\tau_u =$	13.856 kN/cm ²
Faktorisani smičući napon	$\tau =$	0.130 kN/cm ²

Kontrola napona: $\tau \leq \tau_u$

Kombinovano naponsko stanje	$\sigma^2 =$	0.132
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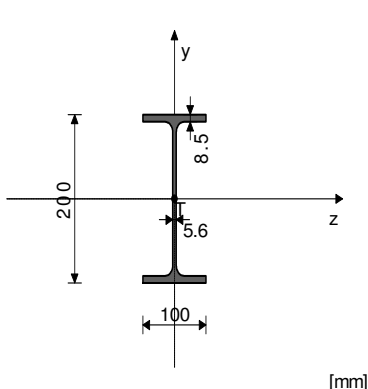
Kontrola napona: $\sigma^2 \leq 1$

KONTROLA STABILNOSTI NA IZBOČ.LIMOVA JUS U.E7.121
Provera izbočavanja nožice I preseka (levo-dole)

Dimenzije lima a/b/t = 750/10/1 (cm)	
Način oslanjanja: B	
Odnos a/b	$\alpha =$ 75.000
Ivični normalni napon u limu	$\sigma_1 =$ -5.369 kN/cm ²
Ivični normalni napon u limu	$\sigma_2 =$ 6.575 kN/cm ²
Odnos σ_1/σ_2	$\psi =$ -1.225
Koeficijent izbočavanja	$k_\sigma =$ 23.800
Ojlerov napon izbočavanja lima	$\sigma_E =$ 189.80 kN/cm ²
Kritični napon izbočavanja	$\sigma_{cr} =$ 4517.2 kN/cm ²
Relativna vitkost ploče	$\lambda'_{ps} =$ 0.073
Bezdim. koef. izbočavanja	$k_{ps} =$ 1.000

STAP 108-125
POPREČNI PRESEK : IPE 200
@2@JUS

GEOMETRIJSKE KARAKTERISTIKE PRESEKA



Ax =	28.500 cm ²
Ay =	14.016 cm ²
Az =	14.484 cm ²
Iz =	1940.0 cm ⁴
Iy =	142.00 cm ⁴
Ix =	7.020 cm ⁴
Wz =	194.00 cm ³

FAKTORI ISKORIŠĆENJA PO KOMBINACIJAMA OPTEREĆENJA

67. $\gamma=0.55$	69. $\gamma=0.55$	60. $\gamma=0.45$
61. $\gamma=0.45$	68. $\gamma=0.36$	66. $\gamma=0.36$
62. $\gamma=0.30$	64. $\gamma=0.30$	58. $\gamma=0.20$
59. $\gamma=0.20$	74. $\gamma=0.12$	75. $\gamma=0.12$
76. $\gamma=0.12$	77. $\gamma=0.12$	56. $\gamma=0.12$
63. $\gamma=0.11$	65. $\gamma=0.11$	57. $\gamma=0.11$
70. $\gamma=0.09$	71. $\gamma=0.09$	72. $\gamma=0.09$
73. $\gamma=0.09$		

KONTROLA DEFORMACIJA

Maksimalni ugib štapa (slučaj opterećenja 69, na 381.7 cm od početka štapa)	$u =$	22.728 mm
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SLUČAJ OPTEREĆENJA: 67
FAKTOR SIGURNOSTI : 1.33
DOPUŠTENI NAPON : 18.00
MERODAVNI UTICAJI (na 281.7 cm od početka štapa)

Računska normalna sila	$N =$	-3.582 kN
Momenat savijanja oko z ose	$M_z =$	9.963 kNm
Transverzalna sila u pravcu	$T_y =$	0.292 kN
Sistemska dužina štapa	$L =$	541.67 cm
Dužina izvijanja oko z ose	$l_{i,z} =$	541.67 cm
Dužina izvijanja oko y ose	$l_{i,y} =$	541.67 cm
Kriva izvijanja za z osu A		
Kriva izvijanja za y osu B		

ŠTAP IZLOŽEN PRITISKU I SAVIJANJU

KONTROLA STAB.PRI EKSC. PRITISKU JUS U.E7.096

Poluprečnik inercije	$i_z =$	8.250 cm
Poluprečnik inercije	$i_y =$	2.232 cm
Vitkost	$\lambda_z =$	65.653
Vitkost	$\lambda_y =$	242.67
Relativna vitkost	$\lambda'_z =$	0.706
Relativna vitkost	$\lambda'_y =$	2.611
Relativni napon	$\sigma' =$	0.007
Koef.zavisan od oblika Mz	$\beta =$	1.000
Bezdimenzionalni koeficijent	$k_z =$	0.845
Bezdimenzionalni koeficijent	$k_y =$	0.129
Koeficijent povećanja uticaja	$k_{mz} =$	1.003
Koeficijent povećanja uticaja	$k_{my} =$	1.000
Uticaj ukupne imperfekc. štapa	$k_{nz} =$	1.107
Uticaj ukupne imperfekc. štapa	$k_{ny} =$	1.861
Koef.zavisan od oblika Mz	$\eta =$	1.120
Razmak viljuškastih oslonaca	$L_{vilj.} =$	541.67 cm
Razmak bočno pridržanih tačaka	$L_{boč.} =$	541.67 cm
Dužina pritisnute zone	$L_{prit.} =$	541.67 cm
Poluprečnik inercije prit.zone	$i_{prit.} =$	2.635 cm
Faktor plastičnosti preseka	$\alpha_p =$	1.081
Vitkost pritisnutog dela	$\lambda_{ky} =$	194.24

Korekcionni faktor	$c_\sigma =$	1.250
Korekcionni faktor	$f =$	0.000
Relativni granični napon	$\sigma'_u =$	1.000
Granični napon izbočavanja	$\sigma_u =$	24.000 kN/cm ²
Faktorisani napon pritiska	$\sigma =$	7.159 kN/cm ²

Kontrola napona: $\sigma \leq \sigma_u$

Koeficijent izbočavanja	$k_\tau =$	5.341
Ojlerov napon izbočavanja lima	$\sigma_E =$	189.80 kN/cm ²
Kritični napon izbočavanja	$\tau_{cr} =$	1013.7 kN/cm ²
Relativna vitkost ploče	$\lambda'_{pt} =$	0.117
Bezdim. koef. izbočavanja	$k_{pt} =$	1.000
Korekcionni faktor	$c_\tau =$	1.250
Kritični napon izbočavanja	$\tau_{cr} =$	1013.7 kN/cm ²
Relativni granični napon	$\tau_u =$	1.000
Granični napon izbočavanja	$\tau_u =$	13.856 kN/cm ²
Faktorisani smičući napon	$\tau =$	0.130 kN/cm ²

Kontrola napona: $\tau \leq \tau_u$

Kombinovano naponsko stanje	$\sigma^2 =$	0.089
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Kontrola napona: $\sigma^2 \leq 1$

Otpornost na torziju preseka	$\sigma_{vd} =$	13.797 kN/cm ²
Otpornost na deplanciju preseka	$\sigma_{wd} =$	5.486 kN/cm ²
Položaj spoljnog opterećenja: SREDINA		
Koef.zavisan od oblika Mz	$\rho =$	0.460
Faktor zavisan od položaja opt.	$F_I =$	1.000
Kritični napon za bočno izvijanje	$\sigma_{crd} =$	14.848 kN/cm ²
Vitkost	$\lambda'_d =$	1.322
Bezdimenzionalni koef.za b.i.	$k_m =$	0.497
Granični napon izvijanja	$\sigma_d =$	12.886 kN/cm ²
Koef.povećanja ut. od b.i.	$\theta =$	1.863
Normalni napon od N	$\sigma(N) =$	0.126 kN/cm ²
Normalni napon od Mz	$\sigma(M_z) =$	5.135 kN/cm ²
Maksimalni napon	$\sigma_{max} =$	9.832 kN/cm ²
Dopušteni napon	$\sigma_{dop} =$	18.000 kN/cm ²

Kontrola napona: $\sigma_{max} \leq \sigma_{dop}$

KONTROLA STABILNOSTI NA IZBOČ.LIMOVA JUS U.E7.121
Provera izbočavanja rebra I preseka

Dimenzije lima a/b/t = 541.667/18.3/0.56 (cm)	
Način oslanjanja: A	
Odnos a/b	$\alpha =$ 29.599
Ivični normalni napon u limu	$\sigma_1 =$ -4.825 kN/cm ²
Ivični normalni napon u limu	$\sigma_2 =$ 4.573 kN/cm ²
Odnos σ_1/σ_2	$\psi =$ -0.948
Koeficijent izbočavanja	$k_\sigma =$ 22.559
Ojlerov napon izbočavanja lima	$\sigma_E =$ 17.773 kN/cm ²
Kritični napon izbočavanja	$\sigma_{cr} =$ 400.95 kN/cm ²
Relativna vitkost ploče	$\lambda'_{ps} =$ 0.245
Bezdim. koef. izbočavanja	$k_{ps} =$ 1.000
Korekcionni faktor	$c_\sigma =$ 1.250
Korekcionni faktor	$f =$ 0.000
Relativni granični napon	$\sigma'_u =$ 1.000
Granični napon izbočavanja	$\sigma_u =$ 24.000 kN/cm ²
Faktorisani napon pritiska	$\sigma =$ 6.433 kN/cm ²

Kontrola napona: $\sigma \leq \sigma_u$

Koeficijent izbočavanja	$k_\tau =$	5.345
Ojlerov napon izbočavanja lima	$\sigma_E =$	17.773 kN/cm ²
Kritični napon izbočavanja	$\tau_{cr} =$	94.991 kN/cm ²
Relativna vitkost ploče	$\lambda'_{pt} =$	0.382
Bezdim. koef. izbočavanja	$k_{pt} =$	1.000
Korekcionni faktor	$c_\tau =$	1.250
Kritični napon izbočavanja	$\tau_{cr} =$	94.991 kN/cm ²
Relativni granični napon	$\tau_u =$	1.000
Granični napon izbočavanja	$\tau_u =$	13.856 kN/cm ²
Faktorisani smičući napon	$\tau =$	0.028 kN/cm ²

Kontrola napona: $\tau \leq \tau_u$

Kombinovano naponsko stanje	$\sigma^2 =$	0.072
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Kontrola napona: $\sigma^2 \leq 1$

KONTROLA STABILNOSTI NA IZBOČ.LIMOVA JUS U.E7.121
Provera izbočavanja nožice I preseka (gore)

Dimenzije lima a/b/t = 541.667/5/0.85 (cm)	
Način oslanjanja: B	
Odnos a/b	$\alpha =$ 108.33
Ivični normalni napon u limu	$\sigma_1 =$ -5.261 kN/cm ²
Ivični normalni napon u limu	$\sigma_2 =$ -5.261 kN/cm ²
Odnos σ_1/σ_2	$\psi =$ 1.000
Koeficijent izbočavanja	$k_\sigma =$ 0.430
Ojlerov napon izbočavanja lima	$\sigma_E =$ 548.52 kN/cm ²
Kritični napon izbočavanja	$\sigma_{cr} =$ 235.86 kN/cm ²
Relativna vitkost ploče	$\lambda'_{ps} =$ 0.319
Bezdim. koef. izbočavanja	$k_{ps} =$ 1.000
Korekcionni faktor	$c_\sigma =$ 1.000
Korekcionni faktor	$f =$ 0.000
Relativni granični napon	$\sigma'_u =$ 1.000
Granični napon izbočavanja	$\sigma_u =$ 24.000 kN/cm ²
Faktorisani napon pritiska	$\sigma =$ 7.015 kN/cm ²

Kontrola napona: $\sigma \leq \sigma_u$

KONTROLA UPOREDNOG NAPONA

Normalni napon	$\sigma =$	5.261 kN/cm ²
Smičući napon	$\tau =$	0.021 kN/cm ²
Maksimalni uporedni napon	$\sigma_{up} =$	5.261 kN/cm ²
Dopušteni napon	$\sigma_{dop} =$	18.000 kN/cm ²

Kontrola napona: $\sigma_{up} \leq \sigma_{dop}$

SLUČAJ OPTEREĆENJA: 67
FAKTOR SIGURNOSTI : 1.33

DOPUŠTENI NAPON : 18.00
MERODAVNI UTICAJI (početak štapa)

Transverzalna sila u y pravcu
Sistemska dužina štapa

Ty = -7.418 kN
L = 541.67 cm

Smičući napon τ = 0.529 kN/cm²
Dopušteni smičući napon τ_{dop} = 10.392 kN/cm²

Kontrola napona: $\tau \leq \tau_{dop}$

Osnovni podaci o modelu

Datoteka: Hale 2 i 3.1-horizontalna
fasada-rev2-stubovi60x60-bezcelika-temelji.twp
Datum proračuna: 10.12.2017

Nacin proračuna: 3D model

- ☒ Teorija I-og reda ☒ Modalna analiza ☐ Stabilnost
☐ Teorija II-og reda ☒ Seizmicki proračun ☐ Faze gradjenja
☐ Nelinearan proračun

Velicina modela

Broj cvorova: 1380
Broj plocašnih elemenata: 888
Broj grednih elemenata: 244
Broj granicnih elemenata: 10656
Broj osnovnih slucajeva opterećenja: 8
Broj kombinacija opterećenja: 61

Jedinice mera

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

Ulazni podaci - Konstrukcija

Tabela materijala

No	Naziv materijala	E[kN/m ²]	μ	γ[kN/m ³]	α[1/C]	Em[kN/m ²]	μm
1	Beton MB 30	3.150e+7	0.20	25.00	1.000e-5	3.150e+7	0.20
2	Celik	2.100e+8	0.30	78.50	1.000e-5	2.100e+8	0.30

Setovi ploca

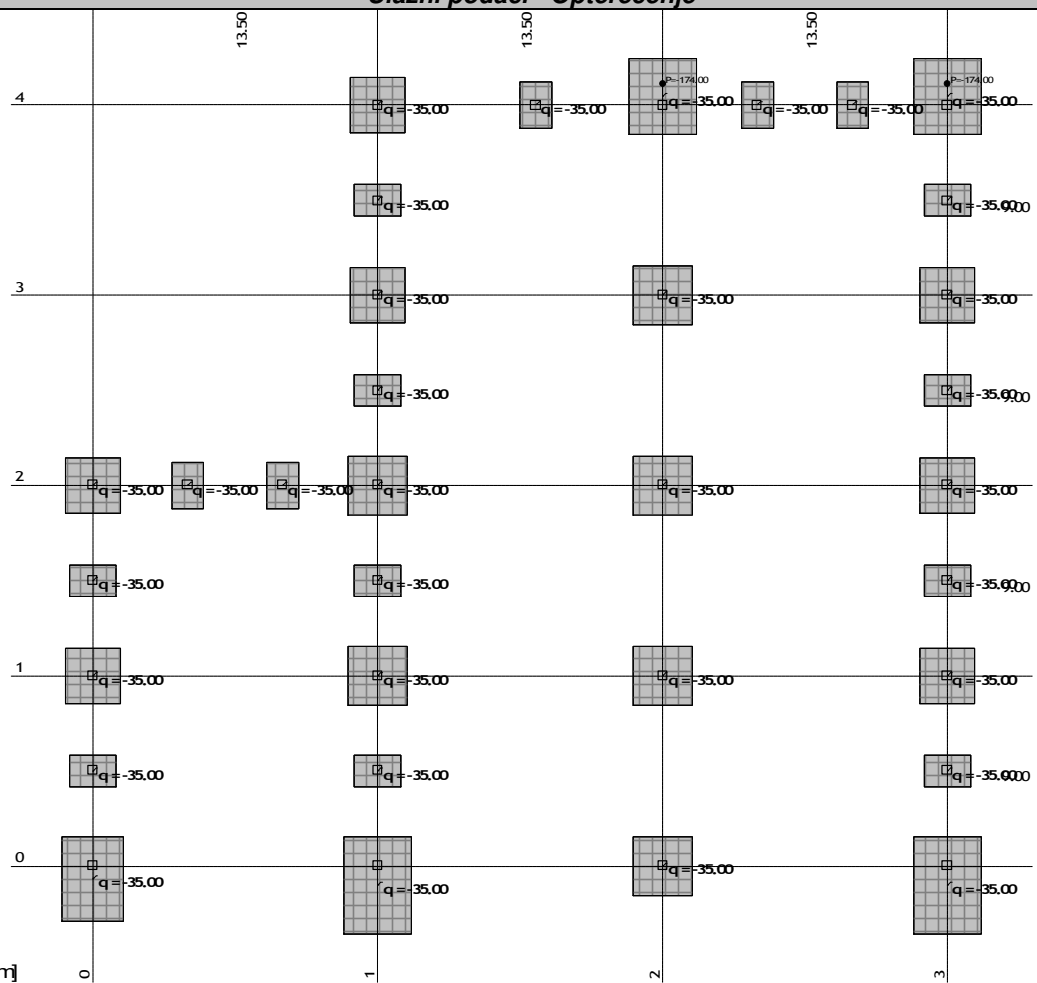
No	d[m]	e[m]	Materijal	Tip proračuna	Ortotropija	E2[kN/m ²]	G[kN/m ²]	α
<1>	0.500	0.250	1	Tanka ploca	Izotropna			

Setovi površinskih oslonaca

@ 1 @	K,R1	K,R2	K,R3
Set			
1	7.000e+3	7.000e+3	7.000e+3

Ulazni podaci - Opterećenje

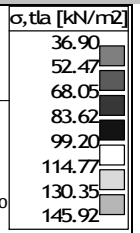
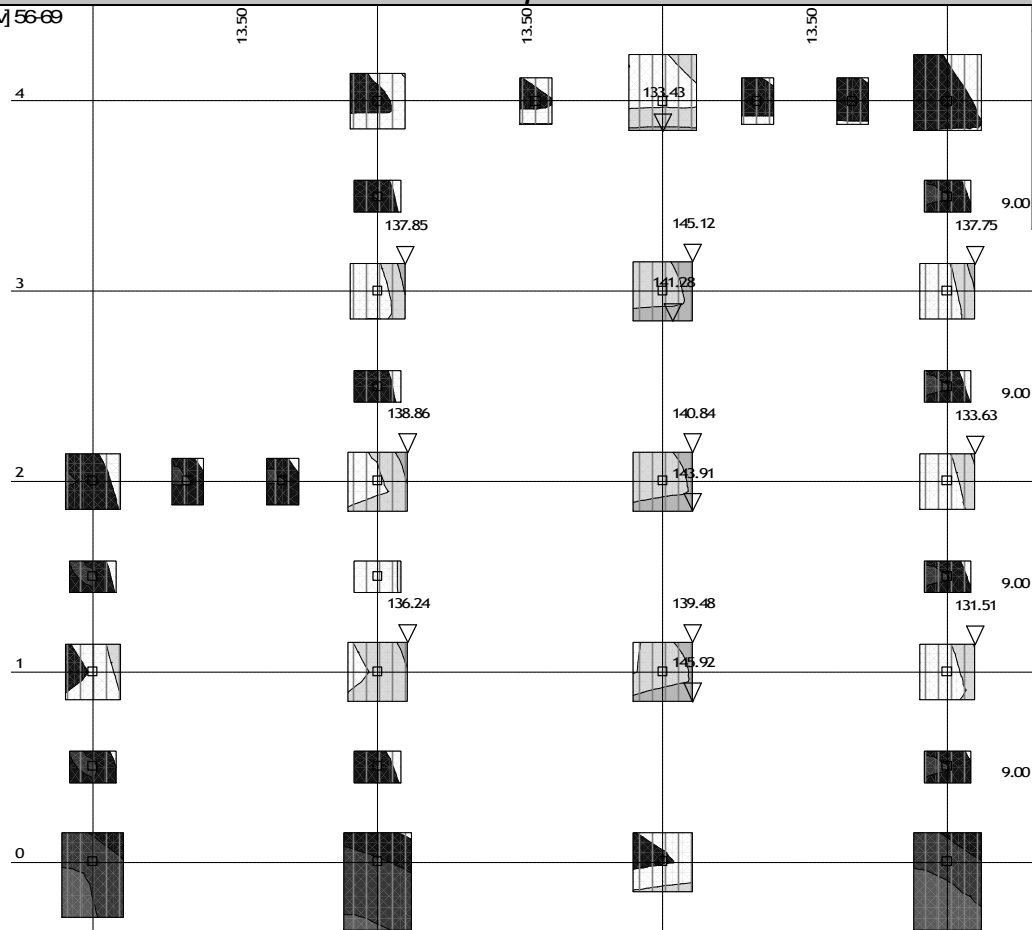
Opt. 2 G



Nvα [-1.30 m]

Statiski proračun

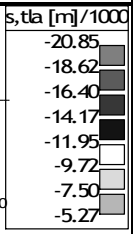
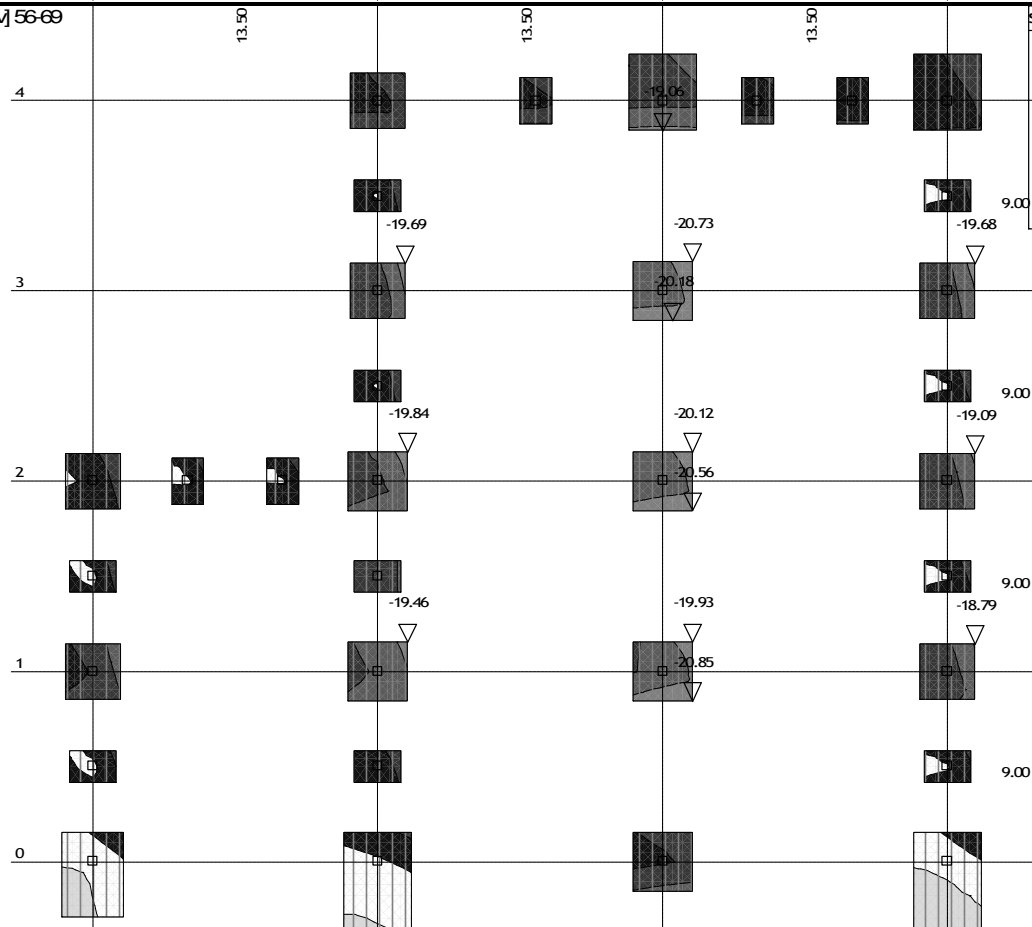
Opt. 78: [Am] 56-69



Nivo: [-1.30 m]

Uticaji u pov. osloncu: $\sigma_{\max}, tla = 145.92 / \min \sigma, tla = 36.91 \text{ kN/m}^2$

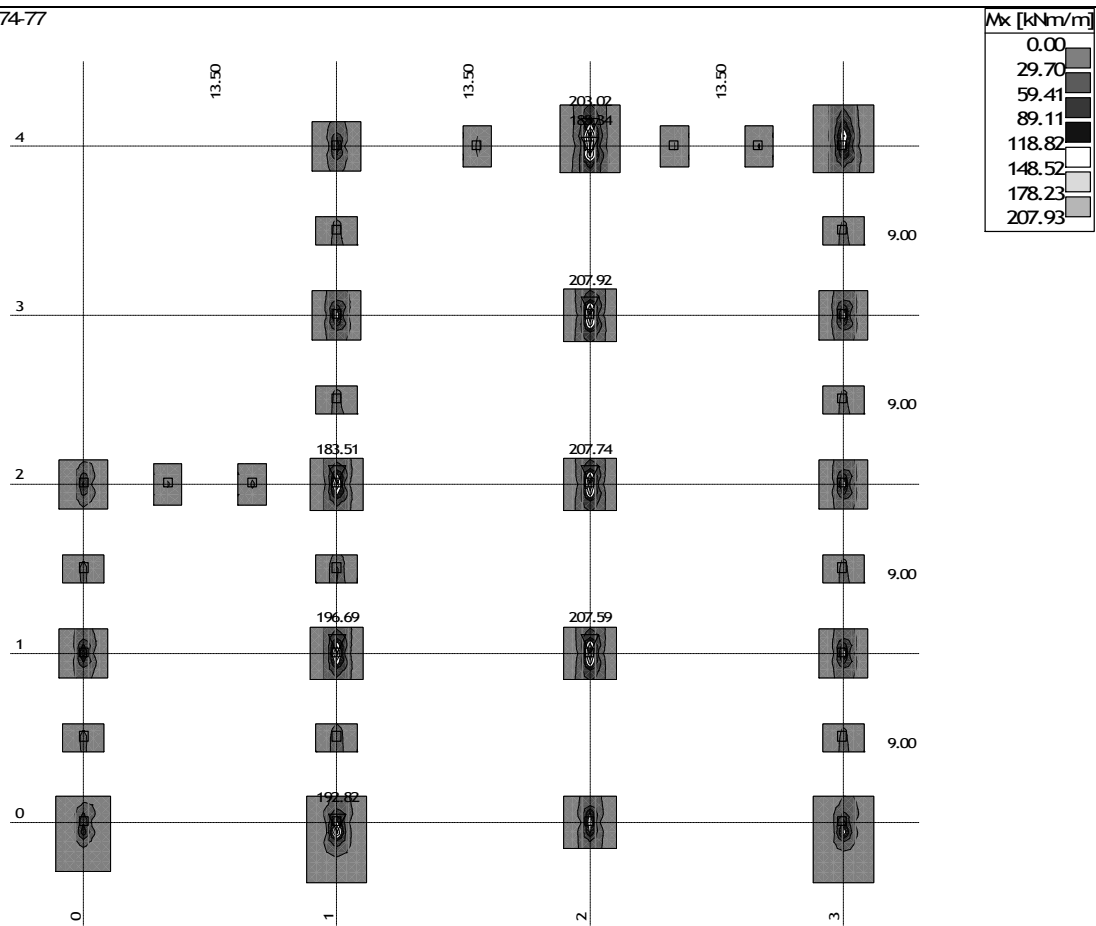
Opt. 78: [Am] 56-69



Nivo: [-1.30 m]

Uticaji u pov. osloncu: $\sigma_{\max}, s, tla = -5.27 / \min s, tla = -20.85 \text{ m} / 1000$

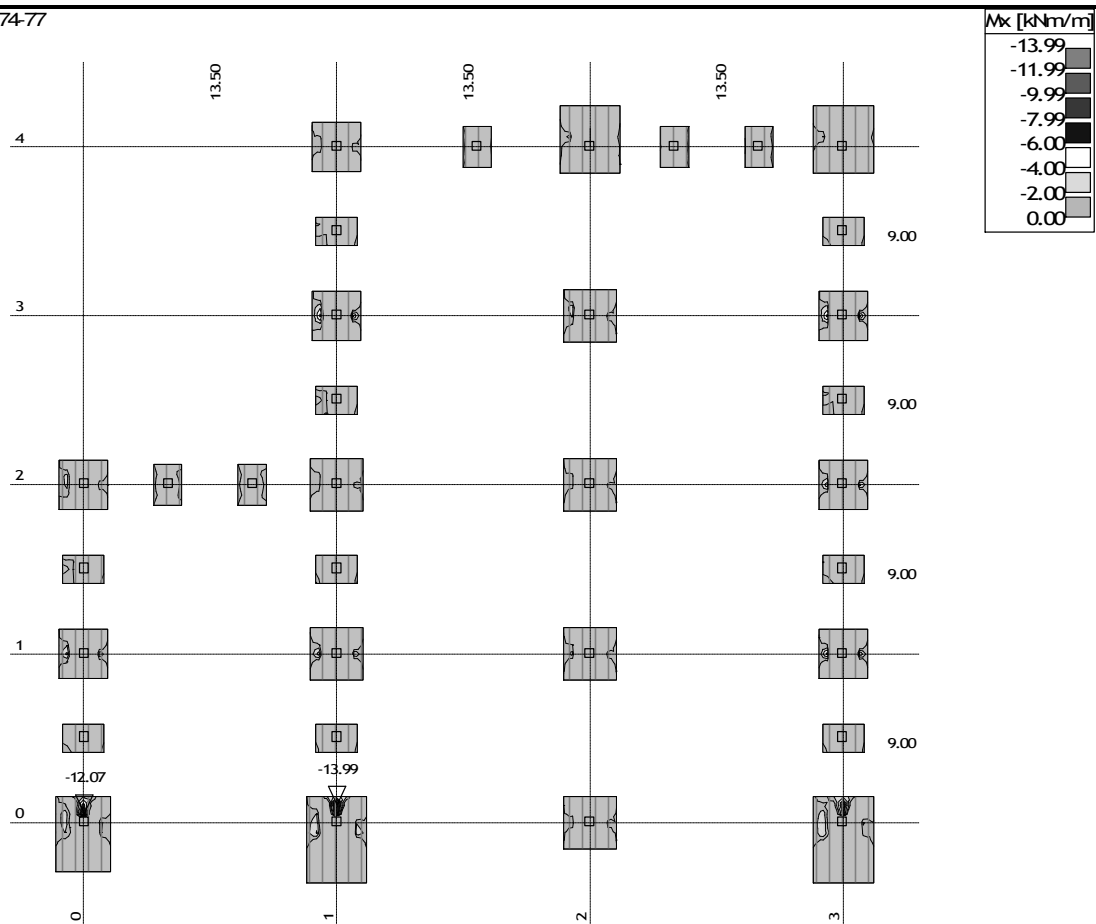
Opt. 78: [Am] 9:55,74-77



Nv: [-1.30 m]

Uticaji uploci: max Mx= 207.92/ min Mx= 0.00 kNm/m

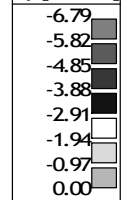
Opt. 78: [Am] 9:55,74-77



Nv: [-1.30 m]

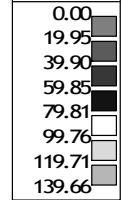
Uticaji uploci: max Mx= 0.00/ min Mx= -13.99 kNm/m

My [kNm/m]



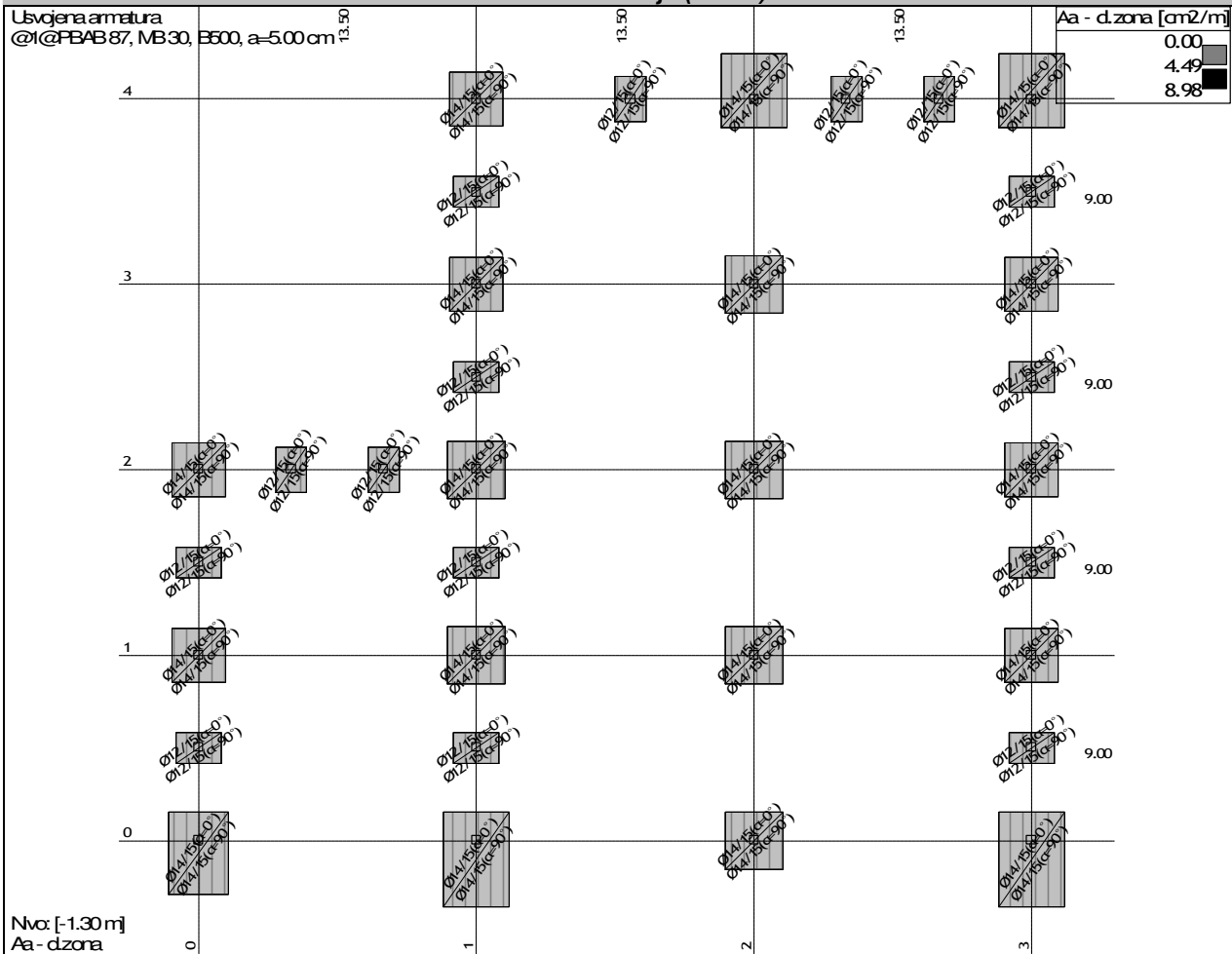
Uticaji u ploči: max $M_y = 0.00$ / min $M_y = -6.78 \text{ kNm/m}$

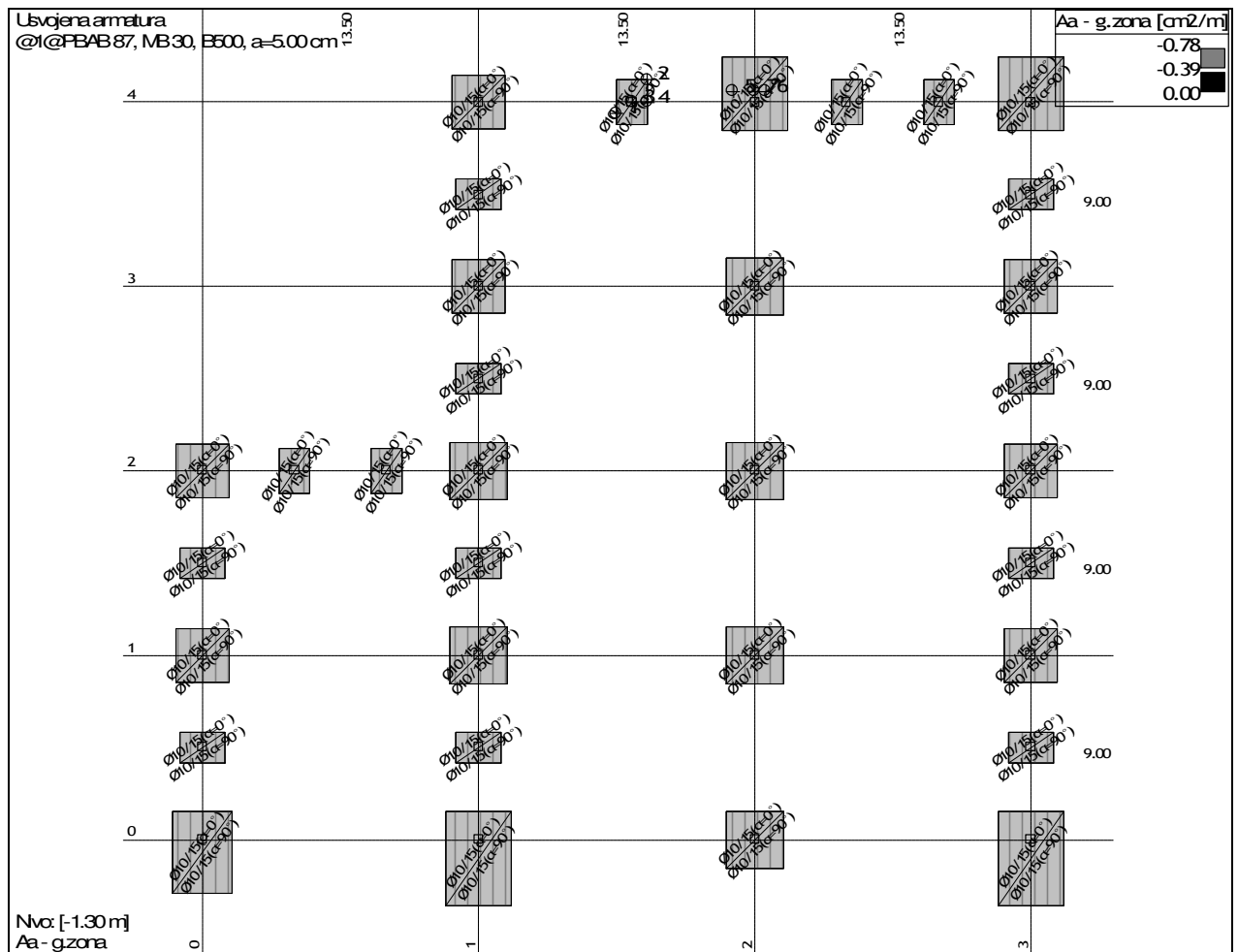
My [kNm/m]



Uticaji u ploci: $\max M_y = 139.66 / \min M_y = 0.00 \text{ kNm/m}$

Dimenzionisanje (beton)





Nivo: [-1.30 m]

@1@PBAB 87

d.pl=50.0 cm

MB 30

Gornja zona: B500 (a=5.0 cm)

Donja zona: B500 (a=5.0 cm)

Kompletna sema opterećenja

Tacka 1

X=-47.12 m; Y=-4.72 m; Z=-1.30 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.30xI+1.00xII+1.30xIII+1.30xVIII

Mu = -1.36 kNm

Nu = 0.00 kN

eb/ea = -0.083/10.000 %

Ag1 = 0.06 cm²/m

Ad1 = 0.00 cm²/m

Usvojeno (gornja zona):

Ø10/15 (5.24 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.26%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xV

Mu = 21.29 kNm

Nu = 0.00 kN

eb/ea = -0.338/10.000 %

Ag2 = 0.00 cm²/m

Ad2 = 0.96 cm²/m

Usvojeno (gornja zona):

Ø10/15 (5.24 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.26%

Tacka 2

X=-45.62 m; Y=-3.07 m; Z=-1.30 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xIV

+1.80xVI

Mu = 7.32 kNm

Nu = 0.00 kN

eb/ea = -0.193/10.000 %

Ag1 = 0.00 cm²/m

Ad1 = 0.33 cm²/m

Usvojeno (gornja zona):

Ø10/15 (5.24 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.26%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.30xI+1.00xII+1.30xIII+1.30xVIII

Mu = -2.20 kNm

Nu = 0.00 kN

eb/ea = -0.107/10.000 %

Ag2 = 0.10 cm²/m

Ad2 = 0.00 cm²/m

Usvojeno (gornja zona):

Ø10/15 (5.24 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.26%

Tacka 3

X=-46.37 m; Y=-4.17 m; Z=-1.30 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.30xI+1.30xII+1.30xIII+1.30xVII

Mu = 21.97 kNm

Nu = 0.00 kN

eb/ea = -0.343/10.000 %

Ag1 = 0.00 cm²/m

Ad1 = 0.99 cm²/m

Usvojeno (gornja zona):

Ø10/15 (5.24 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.26%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xIV

+1.80xVI

Mu = 44.28 kNm

Nu = 0.00 kN

eb/ea = -0.499/10.000 %

Ag2 = 0.00 cm²/m

Ad2 = 2.00 cm²/m

Usvojeno (gornja zona):

Ø10/15 (5.24 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.26%

Tacka 4

X=-45.62 m; Y=-4.17 m; Z=-1.30 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.30xI+1.00xII+1.30xIII+1.30xVII

Mu = -0.83 kNm

Nu = 0.00 kN

eb/ea = -0.099/10.000 %

Ag1 = 0.00 cm²/m

Ad1 = 0.13 cm²/m

Usvojeno (gornja zona):

Ø10/15 (5.24 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.26%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.30xI+1.30xII+1.30xIII+1.30xVII

Mu = 50.01 kNm

Nu = 0.00 kN

eb/ea = -0.532/10.000 %

Ag2 = 0.00 cm²/m

Ad2 = 2.26 cm²/m

Usvojeno (gornja zona):

Ø10/15 (5.24 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.26%

@1@PBAB 87

d.pl=50.0 cm

MB 30

Gornja zona: B500 (a=5.0 cm)

Donja zona: B500 (a=5.0 cm)

Kompletna sema opterećenja

Tacka 5

X=-41.43 m; Y=-3.62 m; Z=-1.30 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xV

Mu = 14.50 kNm

Nu = 0.00 kN

eb/ea = -0.286/10.000 %

Ag1 = 0.15 cm²/m

Ad1 = 0.65 cm²/m

Usvojeno (gornja zona):

Ø10/15 (5.24 cm²/m)

Usvojeno (donja zona):

Ø14/15 (10.26 cm²/m)

Procenat armiranja: 0.31%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 Mu = 84.66 kNm
 Nu = 0.00 kN
 $eb/ea = -0.712/10.000 \text{ ‰}$
 Ag2 = 0.00 cm²/m
 Ad2 = 3.84 cm²/m
 Usvojeno (gornja zona):
 Ø10/15 (5.24 cm²/m)
 Usvojeno (donja zona):
 Ø14/15 (10.26 cm²/m)
 Procentat armiranja: 0.31%

Tacka 6

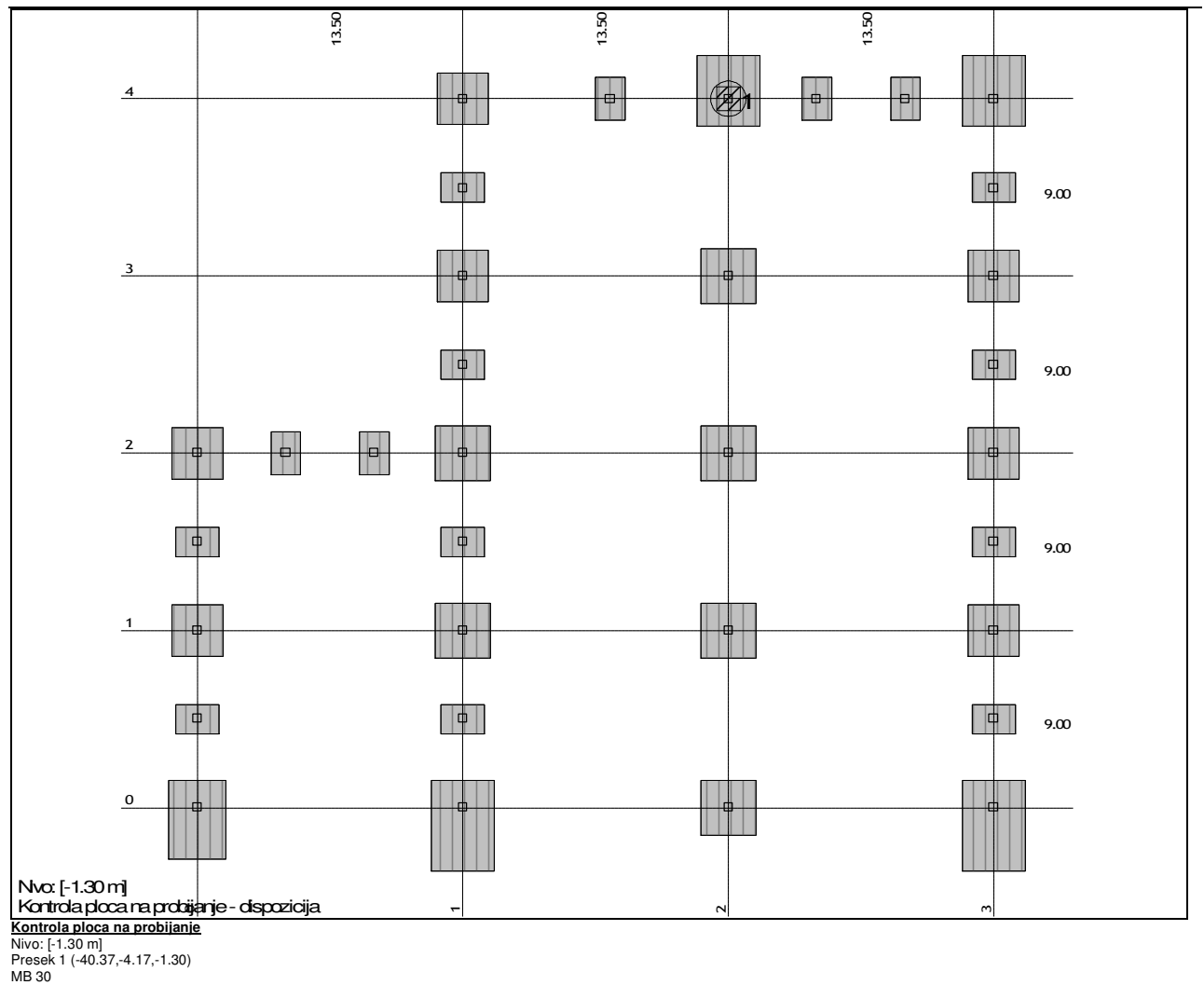
X=-39.83 m; Y=-3.62 m; Z=-1.30 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 Mu = 78.08 kNm
 Nu = 0.00 kN
 $eb/ea = -0.682/10.000 \text{ ‰}$
 Ag1 = 0.00 cm²/m
 Ad1 = 3.55 cm²/m
 Usvojeno (gornja zona):
 Ø10/15 (5.24 cm²/m)
 Usvojeno (donja zona):
 Ø14/15 (10.26 cm²/m)
 Procentat armiranja: 0.31%

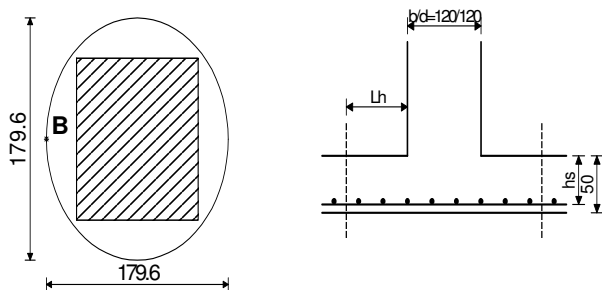
Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 Mu = 109.48 kNm
 Nu = 0.00 kN
 $eb/ea = -0.832/10.000 \text{ ‰}$
 Ag2 = 0.52 cm²/m
 Ad2 = 5.00 cm²/m
 Usvojeno (gornja zona):
 Ø10/15 (5.24 cm²/m)
 Usvojeno (donja zona):
 Ø14/15 (10.26 cm²/m)
 Procentat armiranja: 0.31%

Tacka 7

X=40.37 m; Y=-3.62 m; Z=-1.30 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 Mu = 194.50 kNm
 Nu = 0.00 kN
 $eb/ea = -1.161/10.000 \text{ ‰}$
 Ag1 = 0.00 cm²/m
 Ad1 = 8.98 cm²/m
 Usvojeno (gornja zona):
 Ø10/15 (5.24 cm²/m)
 Usvojeno (donja zona):
 Ø14/15 (10.26 cm²/m)
 Procentat armiranja: 0.31%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 Mu = 92.85 kNm
 Nu = 0.00 kN
 $eb/ea = -0.750/10.000 \text{ ‰}$
 Ag2 = 0.00 cm²/m
 Ad2 = 4.22 cm²/m
 Usvojeno (gornja zona):
 Ø10/15 (5.24 cm²/m)
 Usvojeno (donja zona):
 Ø14/15 (10.26 cm²/m)
 Procentat armiranja: 0.31%





KONTROLA KRITICNOG PRESEKA 1. ($L_h = 0.22\text{m}$ od ivice stuba)
(stub zamenjujućeg kruznog preseka, $d_s = 1.36\text{m}$)

Merodavna kombinacija: I+II+III-1.00xVII

Sila u stubu

$N = 440.93 \text{ kN}$

Merodavni smicuci napon (tacka B)

$\tau = 0.178 \text{ MPa}$

Debljina ploče

$d_{pl} = 0.500 \text{ m}$

Statika visina ploče

$h_s = 0.440 \text{ m}$

Obim kritičnog preseka

$Okp = 5.642 \text{ m}$

Postojeća armatura u ploči

$A_{a,1} = 10.263 \text{ cm}^2$

Povrsina armature - pravac 1

$\mu_1 = 0.233 \%$

Procenat armiranja - pravac 1

$A_{a,2} = 10.263 \text{ cm}^2$

Povrsina armature - pravac 2

$\mu_2 = 0.233 \%$

Procenat armiranja - pravac 2

Srednja vrednost procenta armiranja (usvojena)

$\mu = 0.500 \%$

Koeficijent

$\alpha_a = 1.400$

Koeficijent

$\gamma_1 = 1.287$

Koeficijent

$\gamma_2 = 0.445$

Dopusteni glavni napon zatezanja

$\sigma_a = 0.800$

Dopusteni glavni napon zatezanja

$\sigma_b = 2.200$

Maksimalna otpornost ($\gamma_2 \times \sigma_b$)

$\tau_{max} = 0.980 \text{ MPa}$

Uslov: $\tau \leq \tau_{max}$ ($0.18 \leq 0.98$)

Uslov je ispunjen

Otpornost na probijanje ploče bez dodatne armature za
obezbedjenje ($2/3 \times \gamma_1 \times \sigma_a$)

$\tau_{gr} = 0.686 \text{ MPa}$

Uslov: $\tau \leq \tau_{gr}$ ($0.18 \leq 0.69$)

**Uslov je ispunjen, nije potrebna dodatna armatura za
obezbedjenje od probijanja ploče.**

Osnovni podaci o modelu

Datoteka: Hala 3.2-rev.01.twp
Datum proračuna: 29.10.2017

Nacin proračuna: 3D model

- | | | |
|---|--|---|
| ☒ Teorija I-og reda | ☒ Modalna analiza | ☐ Stabilnost |
| ☐ Teorija II-og reda | ☒ Seizmicki proračun | ☐ Faze gradjenja |
| ☐ Nelinearan proračun | | |

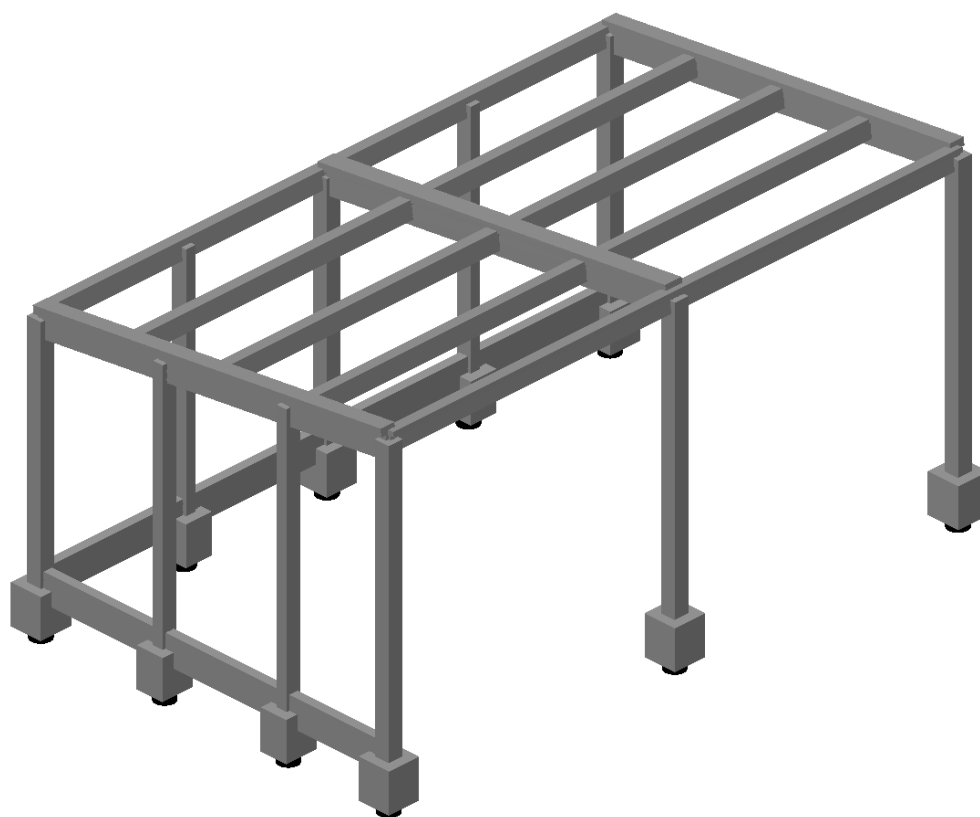
Velicina modela

Broj cvorova:	39
Broj pločastih elemenata:	0
Broj grednih elemenata:	53
Broj granicnih elemenata:	60
Broj osnovnih slučajeva opterećenja:	8
Broj kombinacija opterećenja:	97

Jedinice mera

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

Ulazni podaci - Konstrukcija



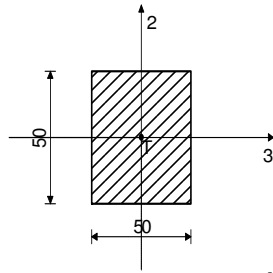
izometrija

Tabela materijala

No	Naziv materijala	E[kN/m ²]	μ	γ [kN/m ³]	α [1/C]	E _m [kN/m ²]	μ _m
1	Beton MB 30	3.150e+7	0.20	25.00	1.000e-5	3.150e+7	0.20

Setovi greda

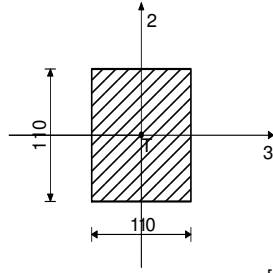
@1@Set: 1 Presek: b/d=50/50, Fiktivna ekscentricnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	2.500e-1	2.083e-1	2.083e-1	8.802e-3	5.208e-3	5.208e-3

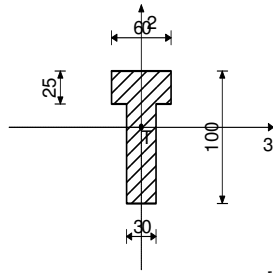
@1@Set: 2 Presek: b/d=110/110, Fiktivna ekscentricnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	1.210e+0	1.008e+0	1.008e+0	2.062e-1	1.220e-1	1.220e-1

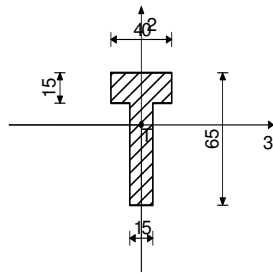
@1@Set: 3 Presek: T 60/100, Fiktivna ekscentricnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	3.750e-1	2.720e-1	3.385e-1	9.875e-3	6.187e-3	3.383e-2

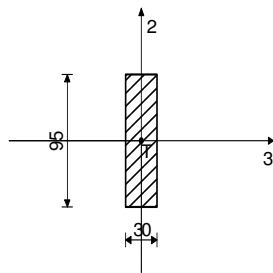
@1@Set: 4 Presek: T 40/65, Fiktivna ekscentricnost



[cm]

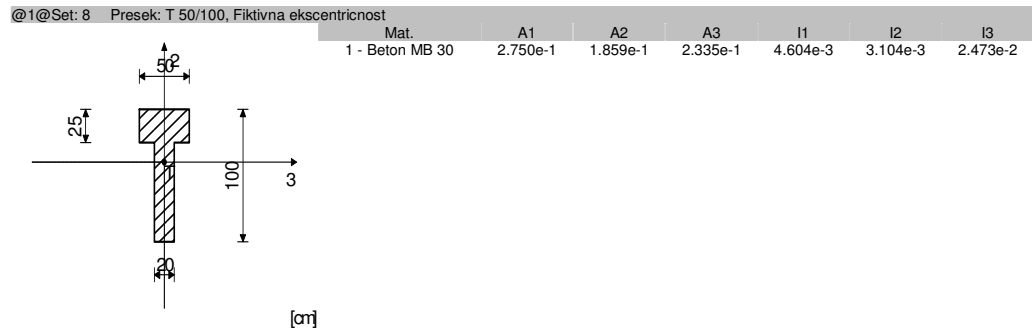
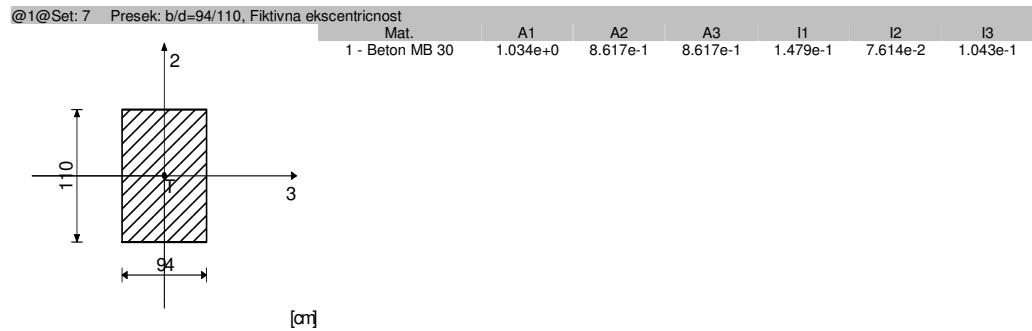
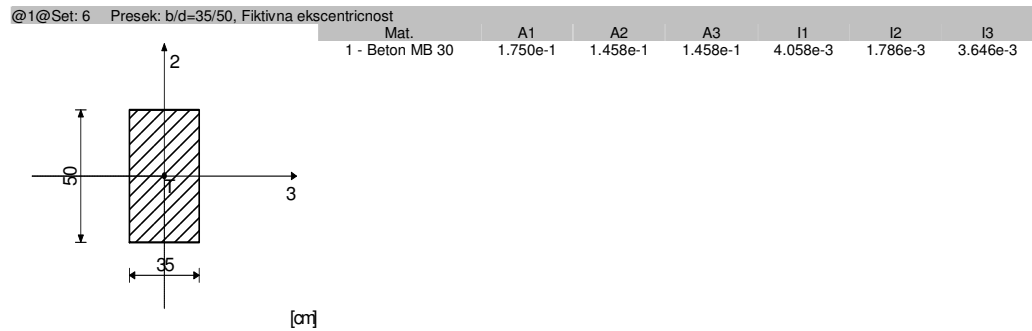
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	1.350e-1	8.990e-2	1.105e-1	1.012e-3	9.406e-4	5.196e-3

@1@Set: 5 Presek: b/d=30/95, Fiktivna ekscentricnost



[cm]

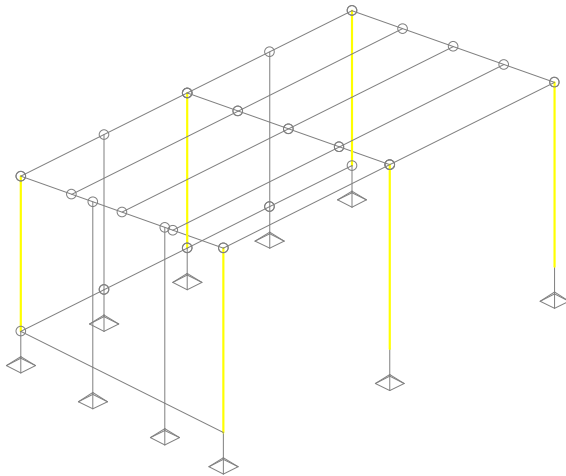
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	2.850e-1	2.375e-1	2.375e-1	6.850e-3	2.138e-3	2.143e-2



Setovi tackastih oslonaca

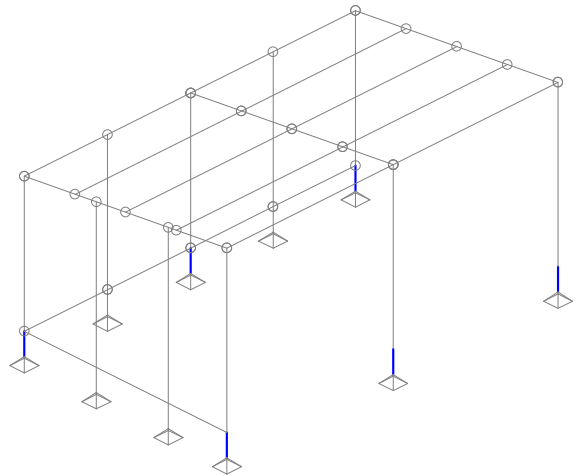
	K,R1	K,R2	K,R3	K,M1	K,M2	K,M3
1	1.000e+10	1.000e+10	1.000e+10	1.000e+10	1.000e+10	1.000e+10

Greda
1. b/d=50/50



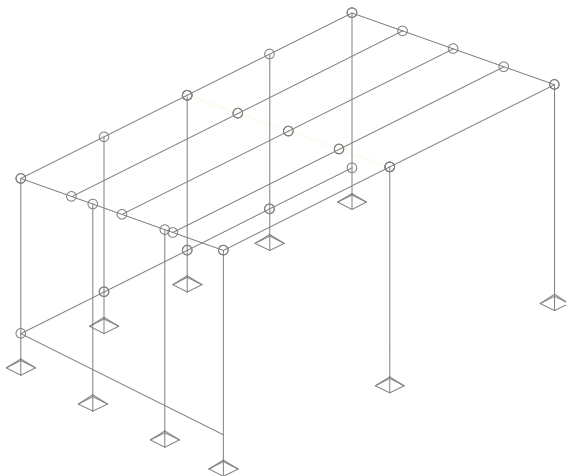
Setovi numerickih podataka
Greda (1)

Greda
2. b/d=110/110



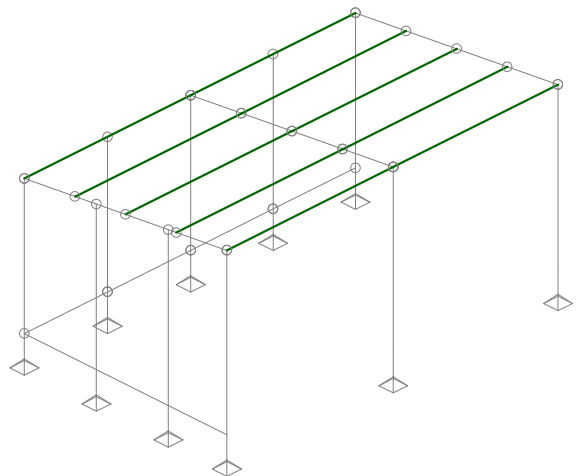
Setovi numerickih podataka
Greda (2)

Greda
3. T 60/100



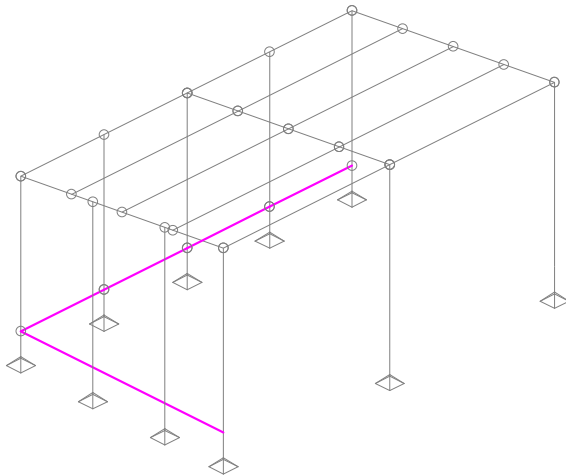
Setovi numerickih podataka
Greda (3)

Greda
4. T 40/65



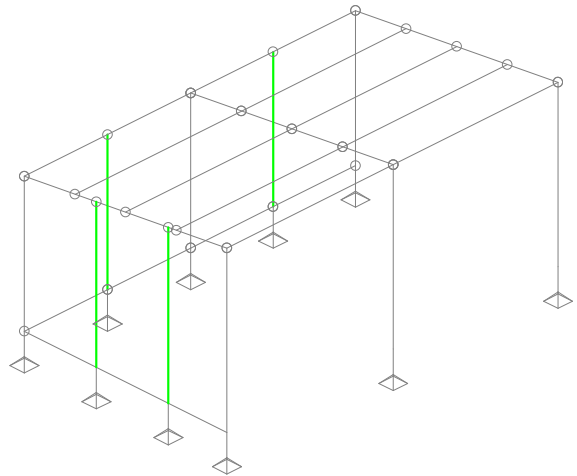
Setovi numerickih podataka
Greda (4)

Greda
5. b/d=30/95



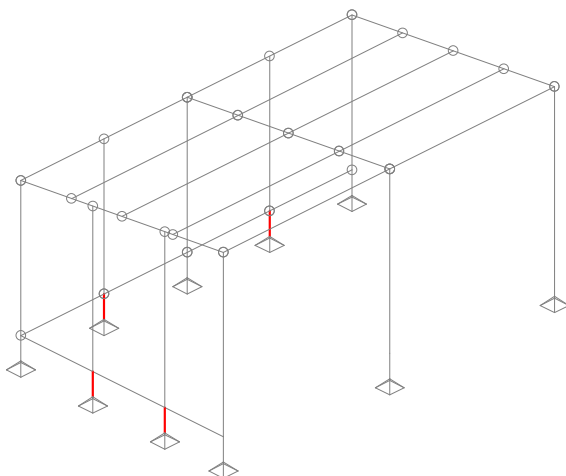
Setovi numerickih podataka
Greda (5)

Greda
6. b/d=35/50



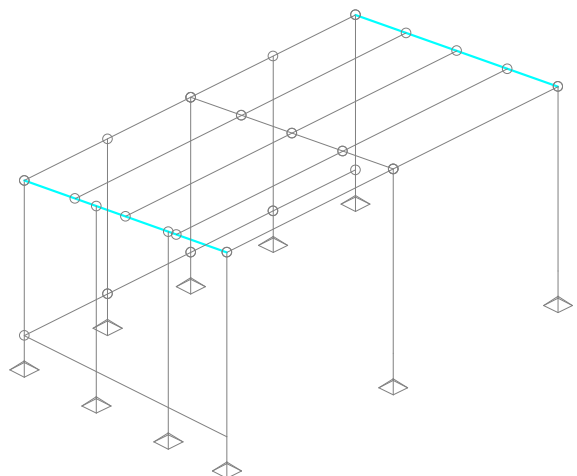
Setovi numerickih podataka
Greda (6)

Greda
7. b/d=94/110



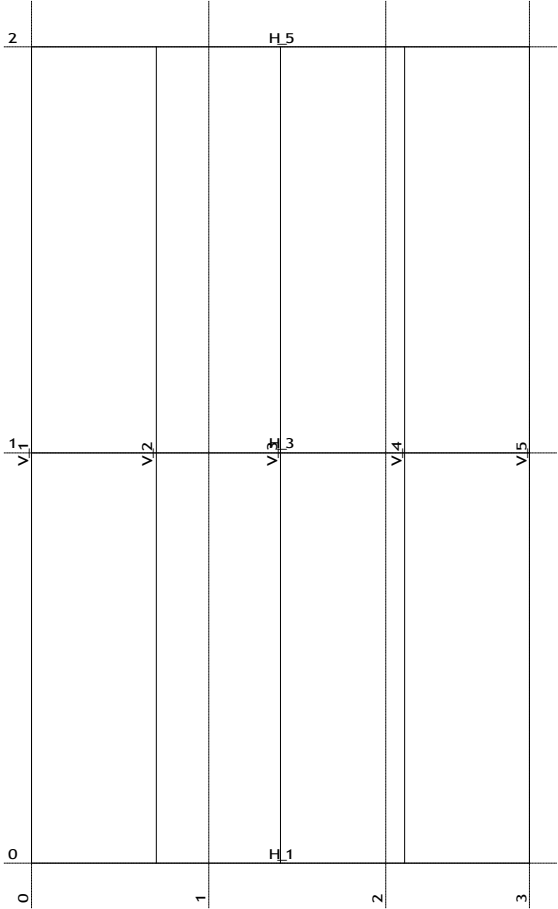
Setovi numerickih podataka
Greda (7)

Greda
8. T 50/100



Setovi numerickih podataka
Greda (8)

Dispozicija ramova

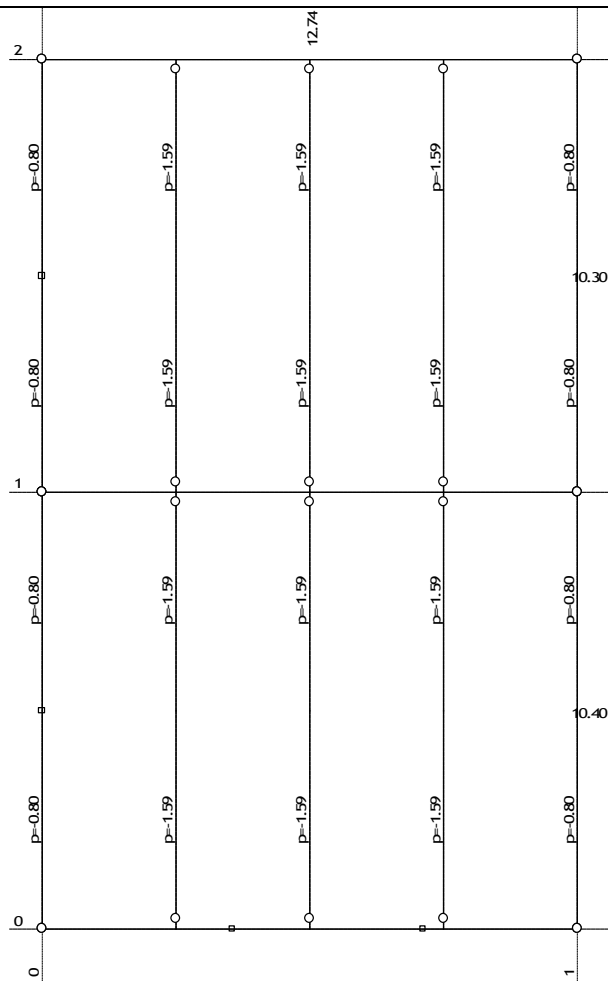


Lista slucajeva opterećenja

No	Naziv
1	SW (g)
2	G
3	S
4	Wx
5	Wy
6	Wu
7	Sx
8	Sy
9	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV+1.8xVI
10	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV+1.8xVI
11	Komb.: 1.6xI+ +II+1.8xIII+1.8xV+1.8xVI
12	Komb.: I+1.6xII+1.8xIII+1 .8xIV+1.8xVI
13	Komb.: 1.6xI+ +II+1.8xIII+1.8xIV+1.8xVI
14	Komb.: I+1.6xII+1.8xIII+1 .8xV+1.8xVI
15	Komb.: I+II+1.8xIII+1.8xV +1.8xVI
16	Komb.: I+II+1.8xIII+1.8xIV+ +1.8xVI
17	Komb.: 1.6xI+1.6xII+ +1.8xIV+1.8xVI
18	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xVI
19	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xV
20	Komb.: 1.6xI+ +1.6xII+1.8xV+1.8xVI
21	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV
22	Komb.: I+1.6xII+ +1.8xIV+1.8xVI
23	Komb.: 1.6xI+II+ +1.8xIV+1.8xVI
24	Komb.: 1.6xI+ +II+1.8xV+1.8xVI
25	Komb.: I+1.6xII+1.8xIII+ +1.8xV
26	Komb.: I+1.6xII+1.8xV+1.8 xVI
27	Komb.: 1.6xI+ +II+1.8xIII+1.8xIV
28	Komb.: I+1.6xII+1.8xIII+1 .8xIV
29	Komb.: 1.6xI+II+1.8xIII+ +1.8xV
30	Komb.: I+1.6xII+1.8xIII+1 .8xVI
31	Komb.: 1.6xI+ +II+1.8xIII+1.8xVI
32	Komb.: I+II+1.8xIV+1.8xVI
33	Komb.: I+II+1.8xIII+1.8xV
34	Komb.: I+II+1.8xV+1.8xVI
35	Komb.: I+II+1.8xIII+1.8xIV
36	Komb.: I+II+1.8xIII+1.8xVI
37	Komb.: 1.3xI+1.3xII+1.3xIII- -1.3xVII
38	Komb.: 1.3xI+ +1.3xII+1.3xIII+1.3xVII
39	Komb.: 1.3xI+1.3xII+ +1.3xIII-1.3xVIII
40	Komb.: 1.3xI+1.3xII+1.3xIII+ +1.3xVIII
41	Komb.: 1.6xI+1.6xII+1.8xIII
42	Komb.: 1.6xI+1.6xII+1.8xV
43	Komb.: 1.6xI+1.6xII+1.8xIV
44	Komb.: 1.6xI+1.6xII+1.8xVI
45	Komb.: 1.3xI+II+ +1.3xIII-1.3xVIII
46	Komb.: 1.3xI+II+1.3xIII+ +1.3xVIII
47	Komb.: I+1.3xII+1.3xIII-

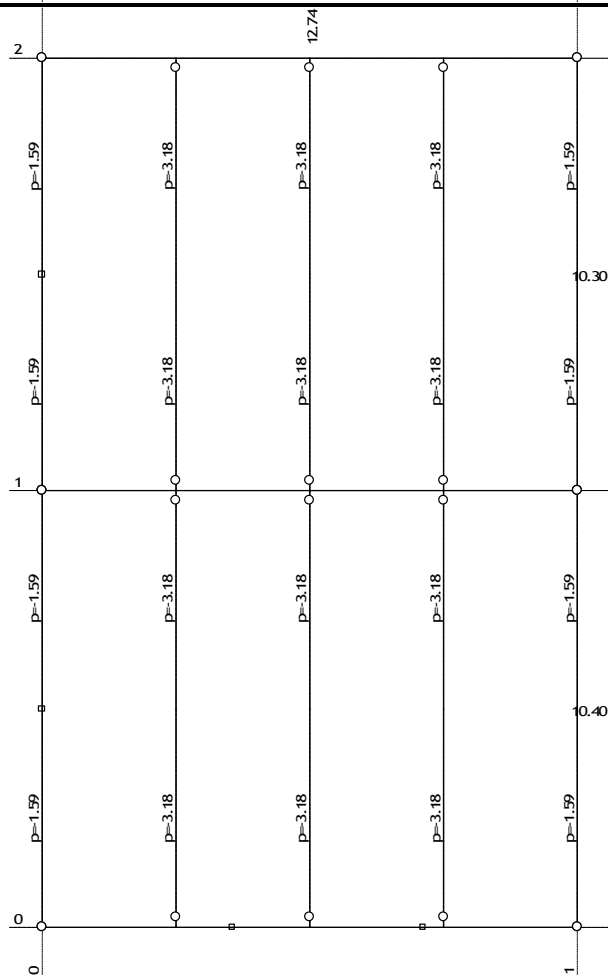
48	-1.3xVII
49	Komb.: 1.3xI+ +II+1.3xIII+1.3xVII
50	Komb.: I+1.3xII+ +1.3xIII-1.3xVIII
51	Komb.: I+1.3xII+1.3xIII+ +1.3xVIII
52	Komb.: I+1.3xII+1.3xIII+1 .3xVII
53	Komb.: I+II+1.3xIII+1.3xVII
54	Komb.: I+II+1.3xIII+1.3xVIII
55	Komb.: I+II+1.3xIII-1.3xVIII
56	Komb.: I+II+1.3xIII-1.3xVII
57	Komb.: I+1.6xII+1.8xIV
58	Komb.: 1.6xI+II+1.8xIII
59	Komb.: 1.6xI+II+1.8xV
60	Komb.: 1.6xI+II+1.8xVI
61	Komb.: I+1.6xII+1.8xV
62	Komb.: I+1.6xII+1.8xVI
63	Komb.: 1.6xI+II+1.8xIV
64	Komb.: I+1.6xII+1.8xIII
65	Komb.: 1.3xI+1.3xII+1.3xVIII
66	Komb.: 1.3xI+1.3xII-1.3xVII
67	Komb.: 1.3xI+1.3xII+1.3xVII
68	Komb.: 1.3xI+1.3xII-1.3xVIII
69	Komb.: I+II+1.8xV
70	Komb.: I+II+1.8xIV
71	Komb.: I+II+1.8xIII
72	Komb.: I+II+1.8xVI
73	Komb.: 1.3xI+II+1.3xVII
74	Komb.: I+1.3xII-1.3xVIII
75	Komb.: 1.3xI+II-1.3xVIII
76	Komb.: 1.3xI+II+1.3xVIII
77	Komb.: I+1.3xII-1.3xVII
78	Komb.: I+1.3xII+1.3xVII
79	Komb.: 1.3xI+II-1.3xVII
80	Komb.: I+1.3xII+1.3xVIII
81	Komb.: I+II+1.3xVIII
82	Komb.: I+II-1.3xVIII
83	Komb.: I+II+1.3xVII
84	Komb.: I+II-1.3xVII
85	Komb.: 1.6xI+1.6xII
86	Komb.: 1.6xI+II
87	Komb.: I+1.6xII
88	Komb.: I+II+III+VII
89	Komb.: I+II+III-1xVII
90	Komb.: I+II+III+VIII
91	Komb.: I+II+III-1xVIII
92	Komb.: I+II
93	Komb.: I+II+III
94	Komb.: I+II+IV
95	Komb.: I+II+III+IV
96	Komb.: I+II+V
97	Komb.: I+II+III+V
98	Komb.: I+II+IV+VI
99	Komb.: I+II+IV-1xVI
100	Komb.: I+II+III+IV+VI
101	Komb.: I+II+III+IV-1xVI
102	Komb.: I+II+V+VI
103	Komb.: I+II+V-1xVI
104	Komb.: I+II+III+V+VI
105	Komb.: I+II+III+V-1xVI

Opt. 2 G



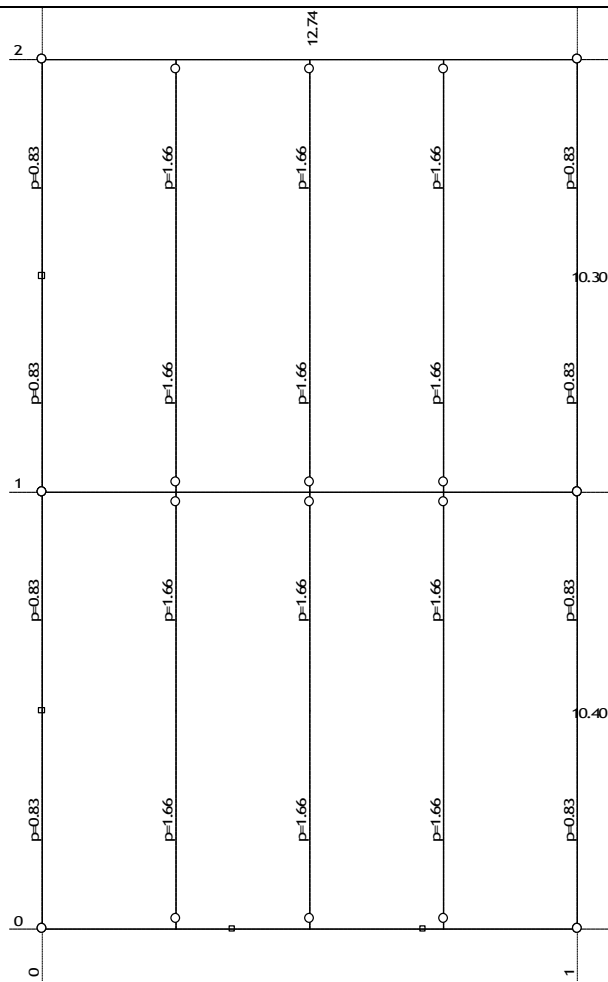
Project: Krov

Opt. 3: S



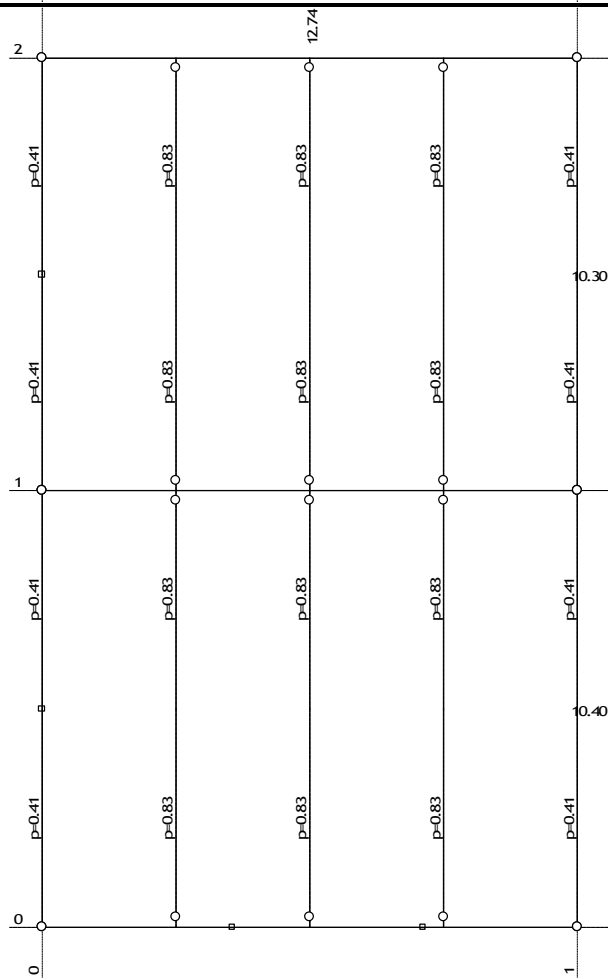
Project: Krov

Opt. 4: Wk



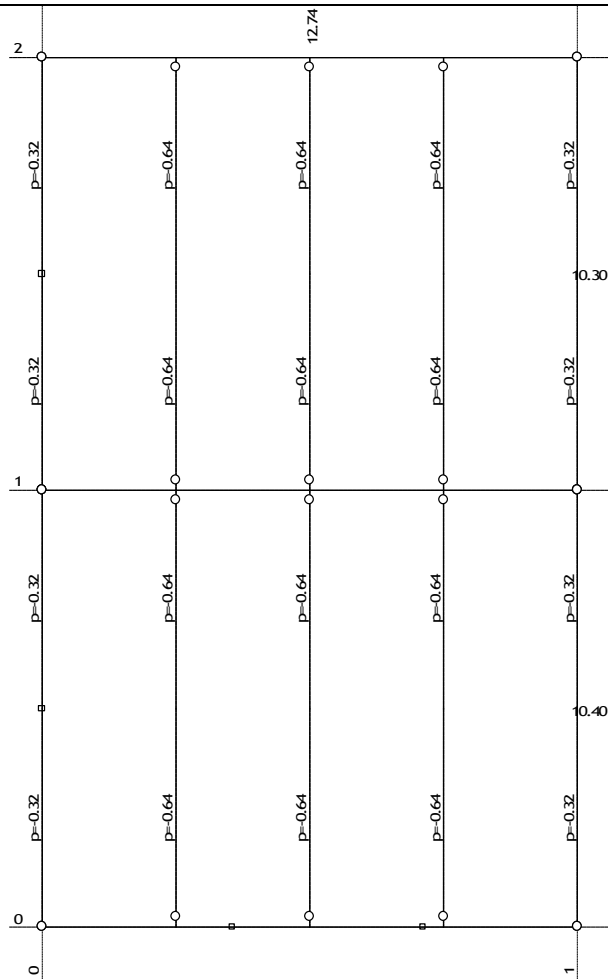
Project: Krov

Opt. 5: Wy



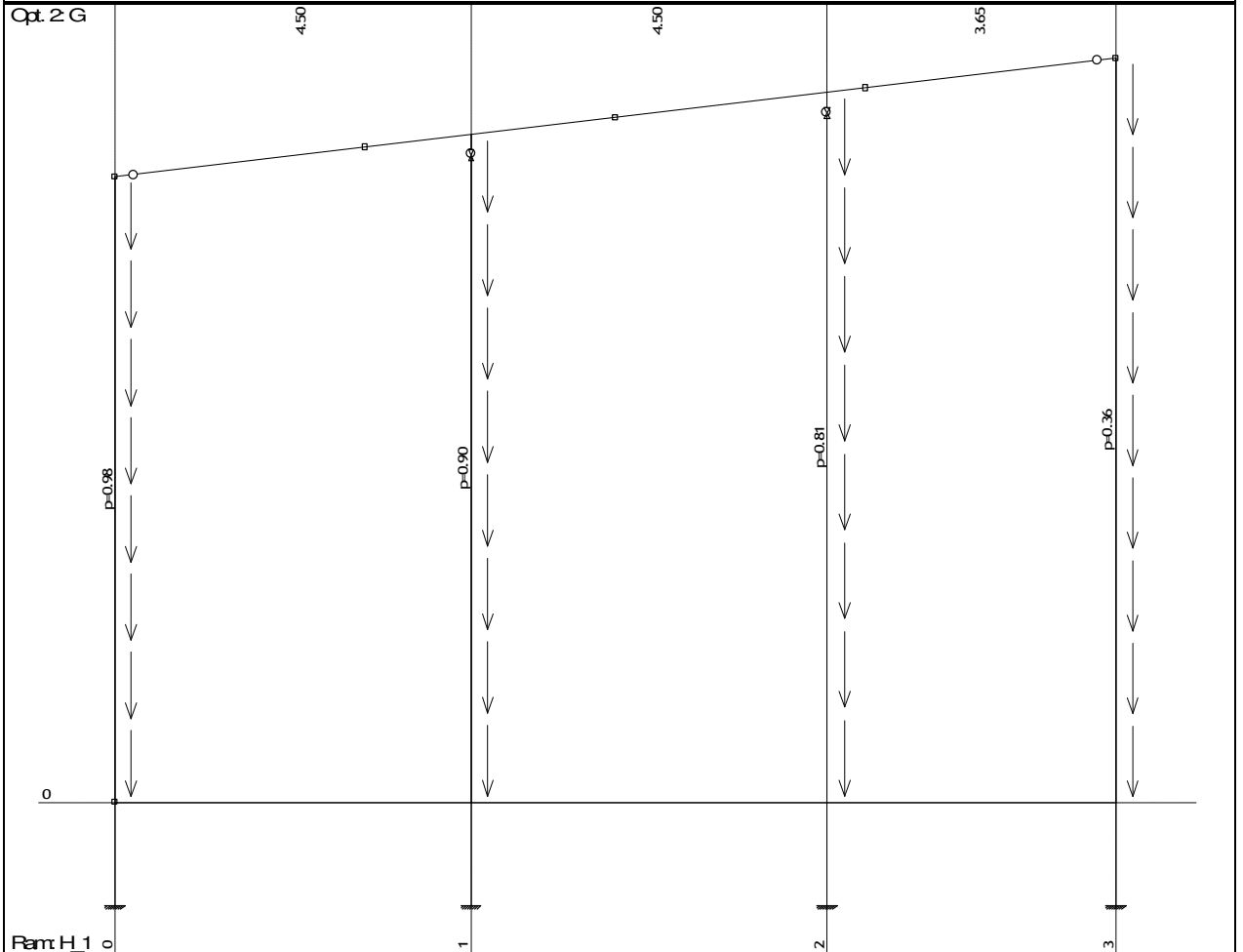
Project: Krov

Opt. 6: W_U

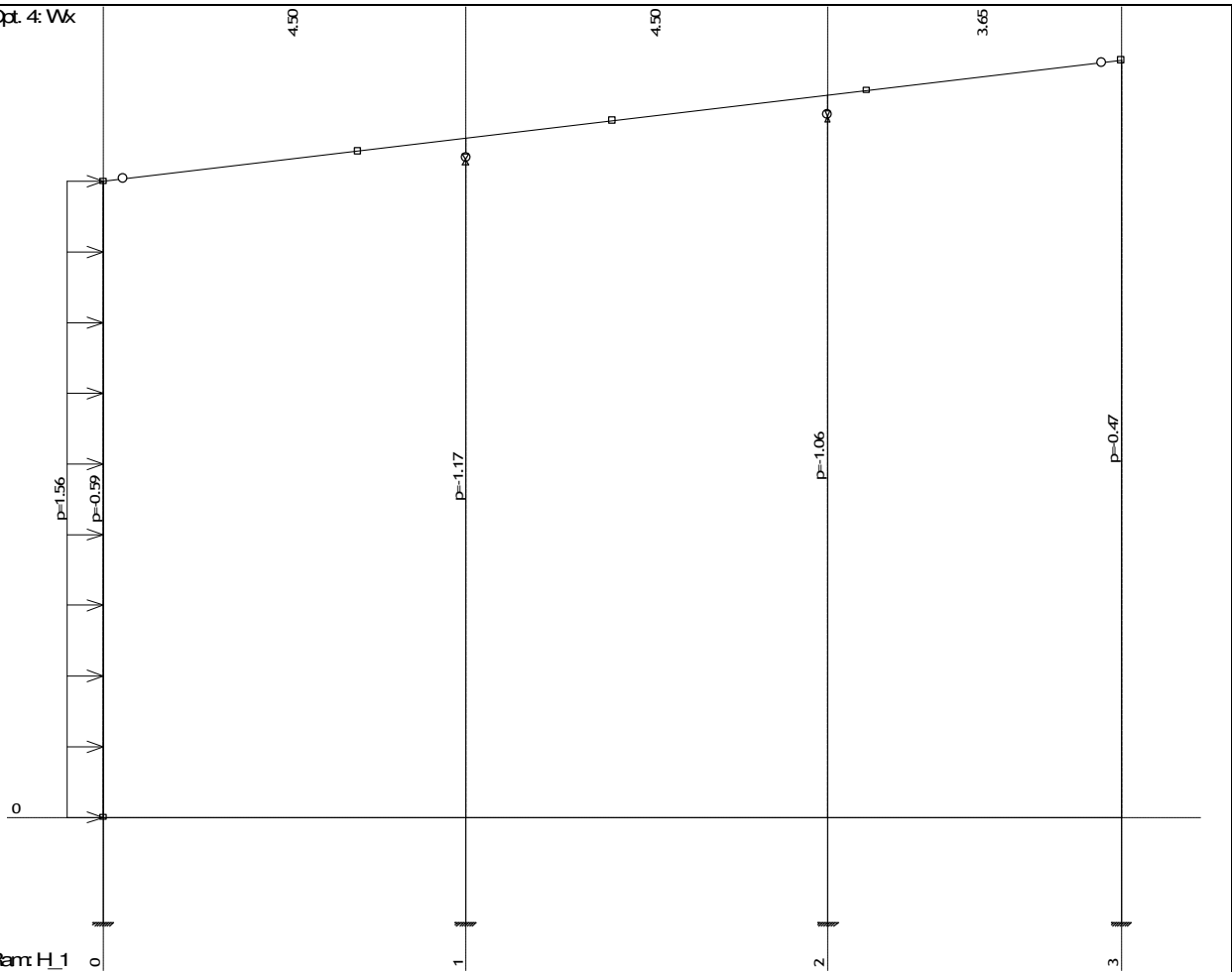


Pogled: Krov

Opt. 2: G

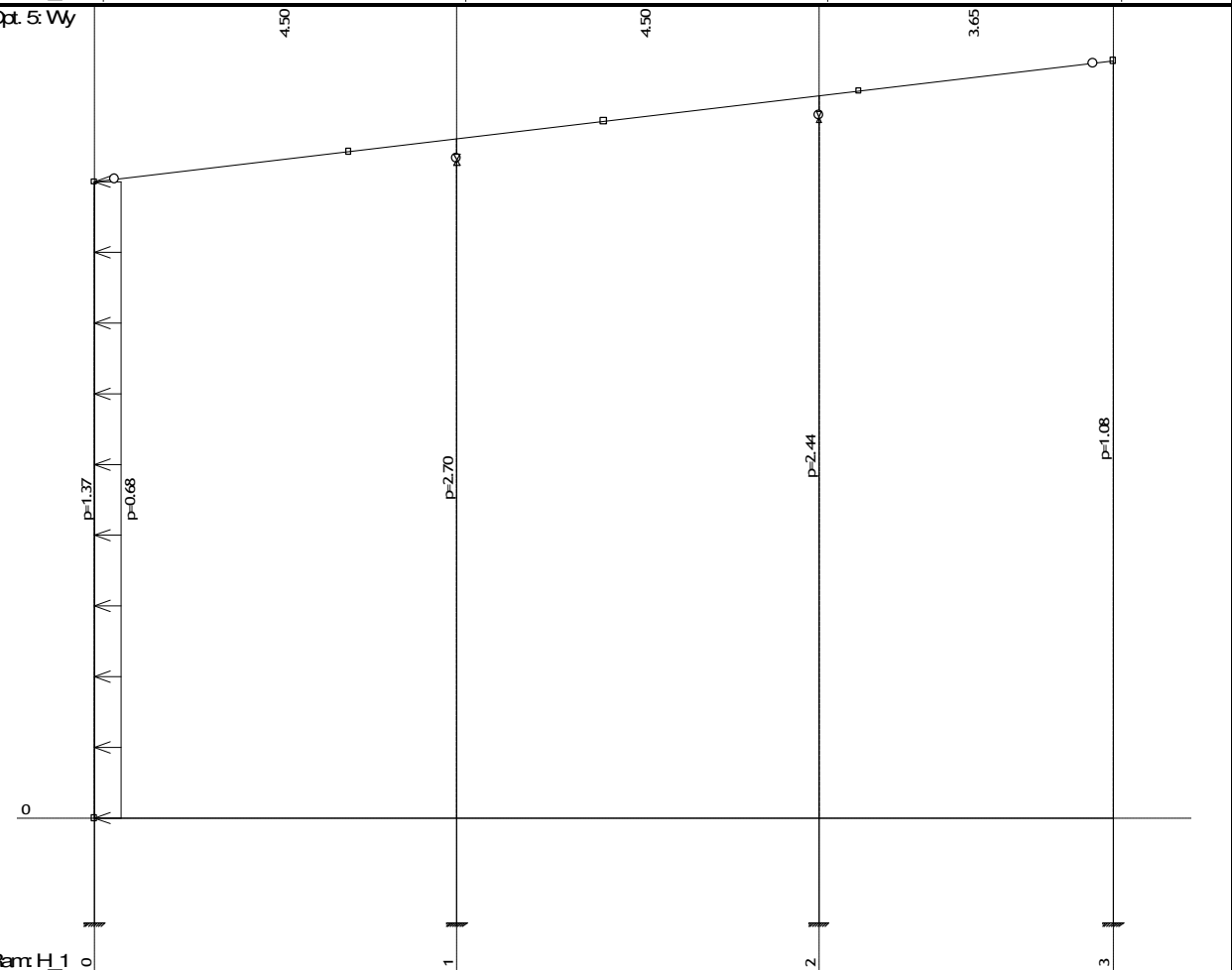


Opt. 4: Wk



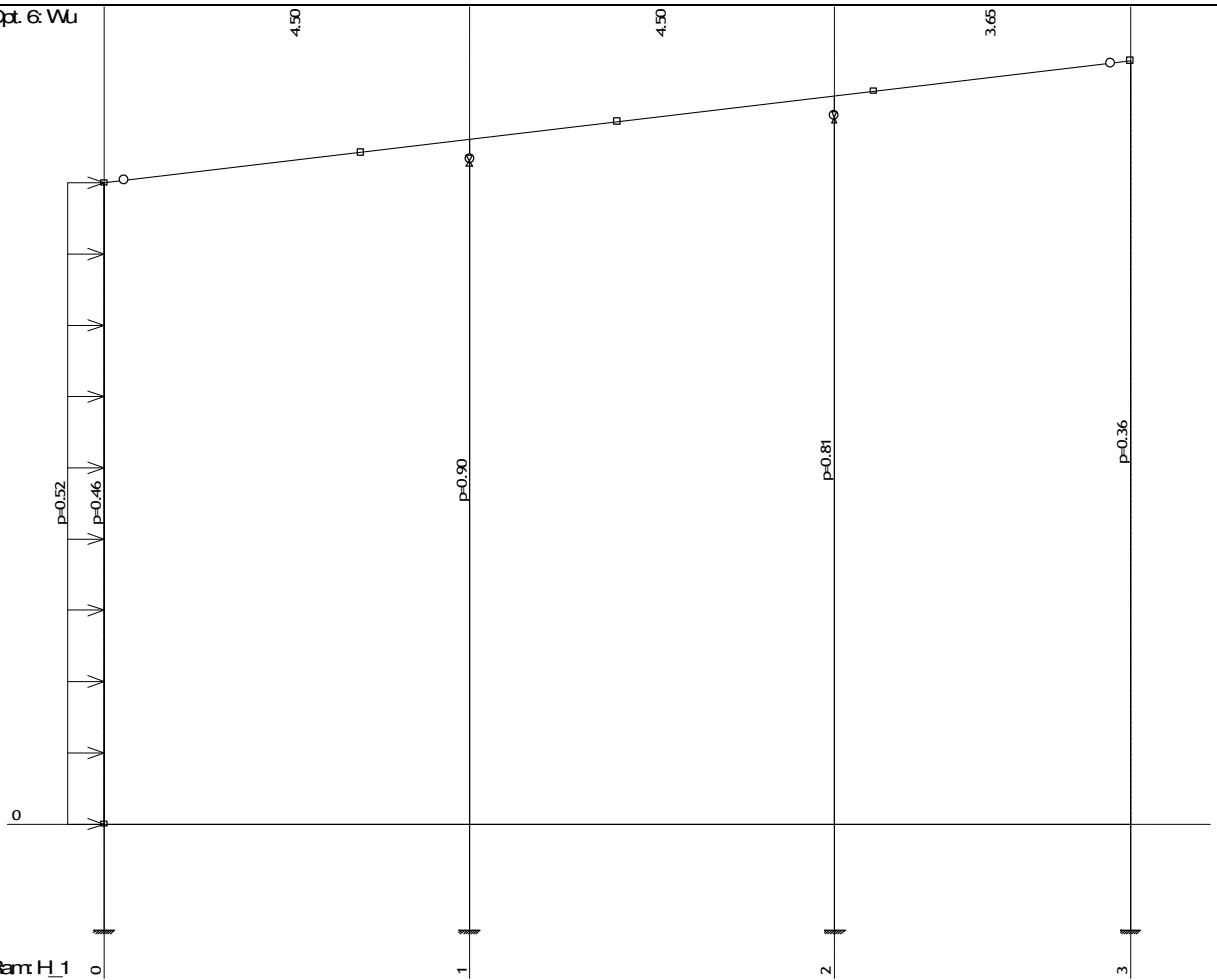
Ram H 1

Opt. 5: Wy



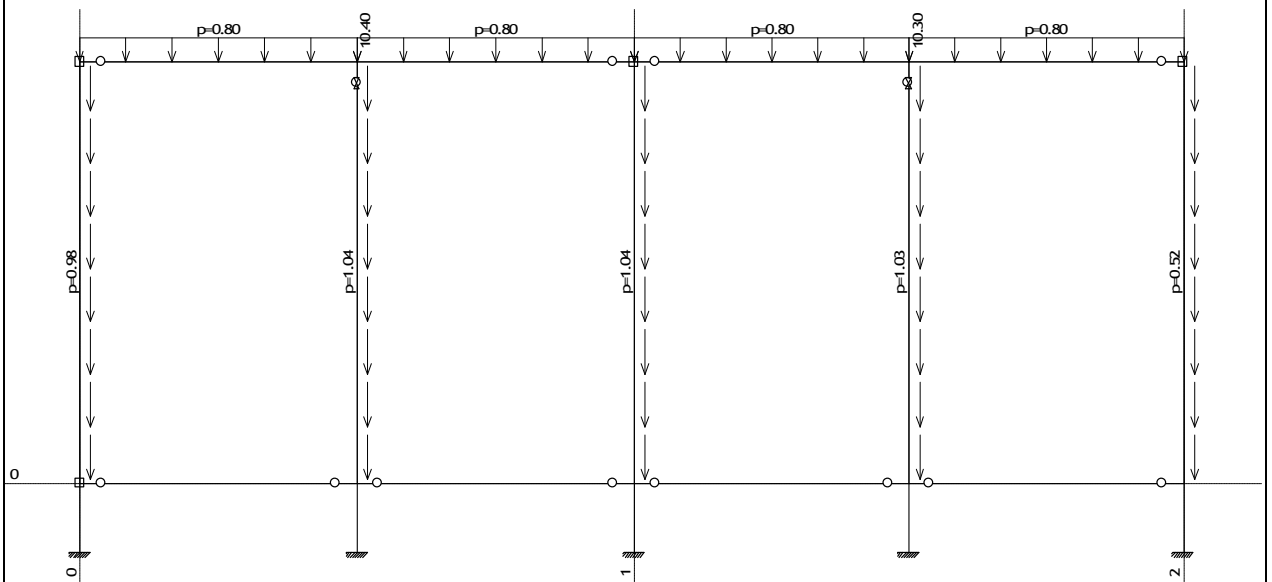
Ram H 1

Opt. 6 Wu



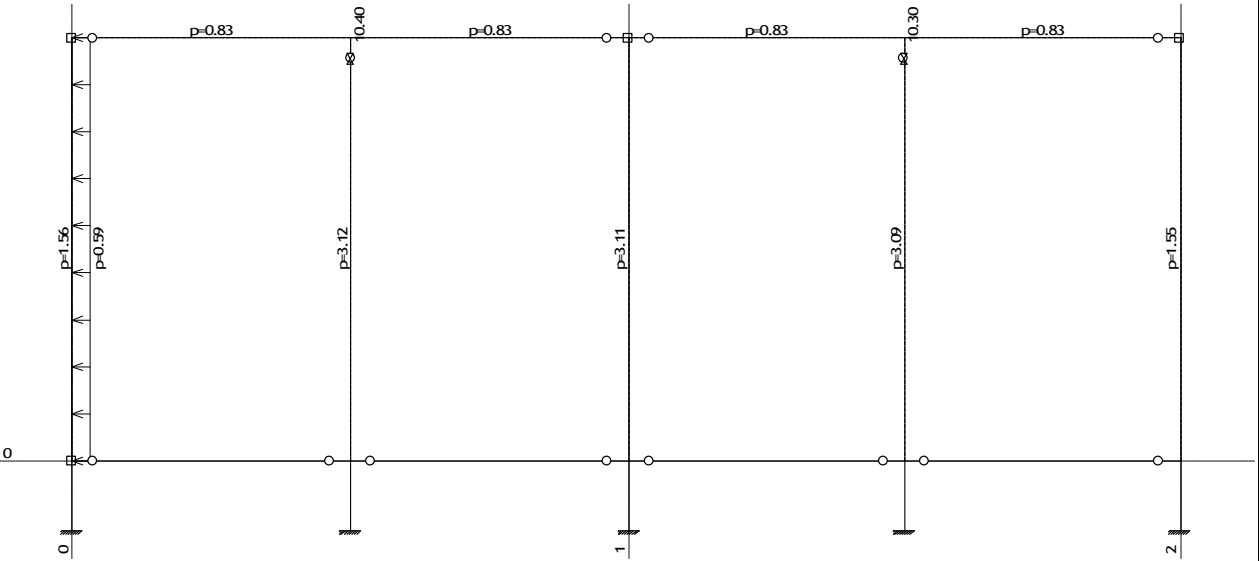
Ram H.1

Opt. 2 G



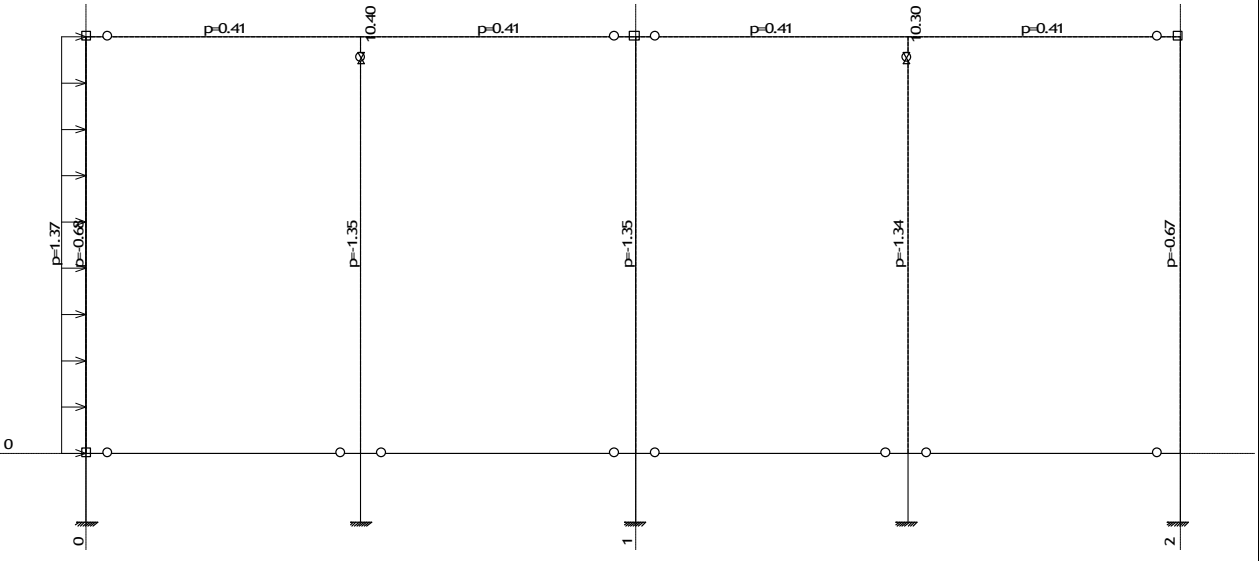
Ram V.1

Opt. 4: Wk

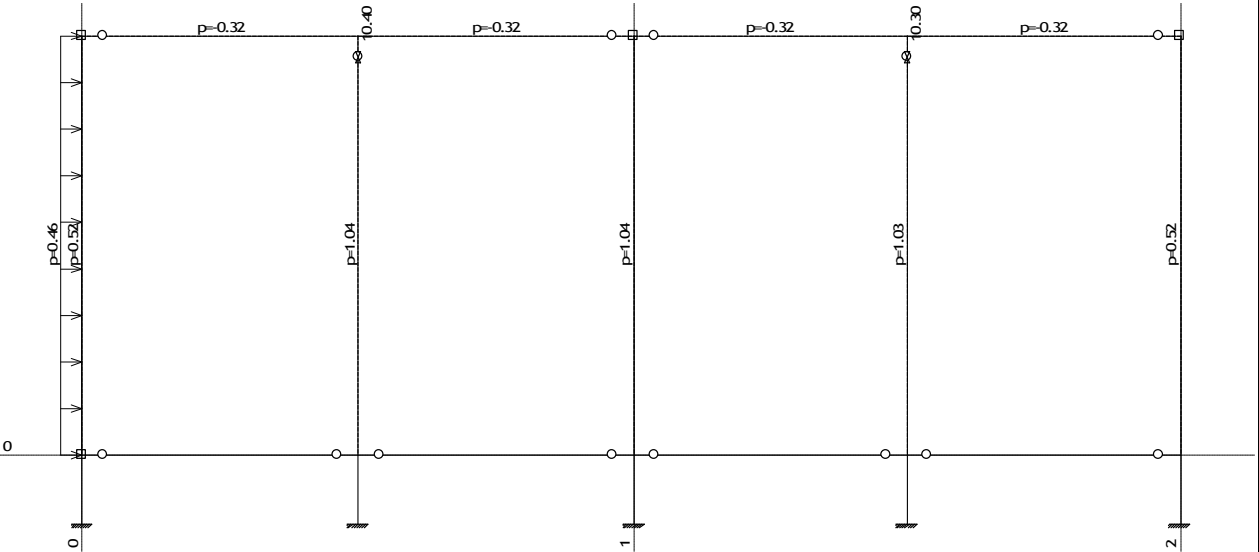


Ram V.1

Opt. 5: Wy



Ram V.1



Modalna analiza

Napredne opcije seizmickog proracuna:

Multiplikator krutosti oslonaca:
Sprećeno oscilovanje u Z pravcu

10000.000

Faktori opterećenja za proračun mase

No	Naziv	Koeficijent
1	SW (g)	1.00
2	G	1.00
3	S	1.00
4	Wx	0.00
5	Wy	0.00
6	Wu	0.00

Raspored mase po visini objekta

Nivo	Z [m]	X [m]	Y [m]	Masa [T]	T/m2
	0.00	-45.30	9.53	246.95	
Ukupno:	0.00	-45.30	9.53	246.95	

Periodi oscilovanja konstrukcije

No	T [s]	f [Hz]
1	1.0186	0.9817
2	0.9689	1.0321
3	0.8411	1.1889

Seizmicki proračun

Seizmicki proračun: JUS (Ekvivalentno staticko opterećenje)

Kategorija tla: II
Seizmicka zona: (Ks = 0.040)
Kategorija objekta: I
Vrsta konstrukcije: 2
Kota uklješćenja: Zd = 0.00 m
Multiplikator krutosti oslonaca: 10000.000

Ugao dejstva zemljotresa:

Naziv	T [sec]	α [°]
Sx	1.019	0.00
Sy	0.969	90.00

Raspored seizmickih sila po visini objekta (Sx)

Nivo	Z [m]	S [kN]
	0.00	65.04
	$\Sigma=$	65.04

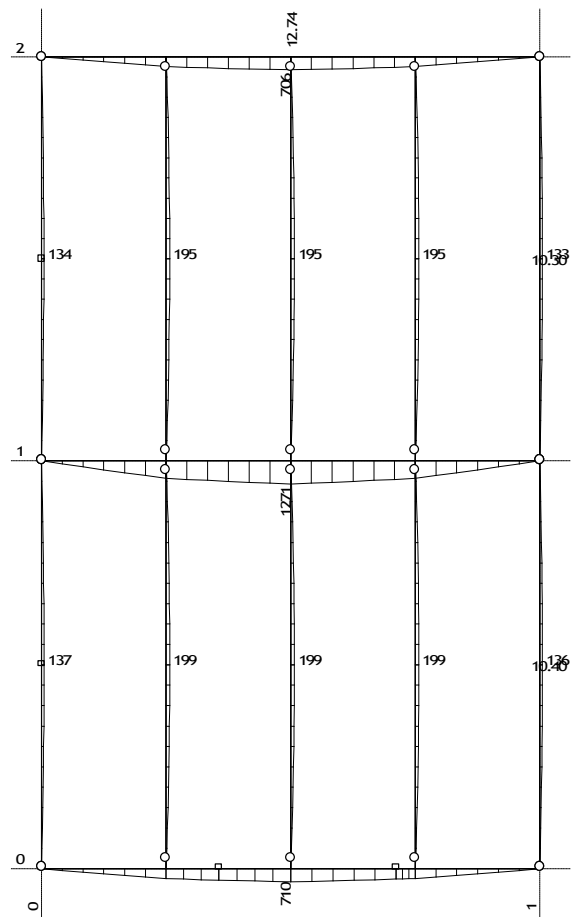
Raspored seizmickih sila po visini objekta (Sy)

Nivo	Z [m]	S [kN]
	0.00	68.38
	$\Sigma=$	68.38

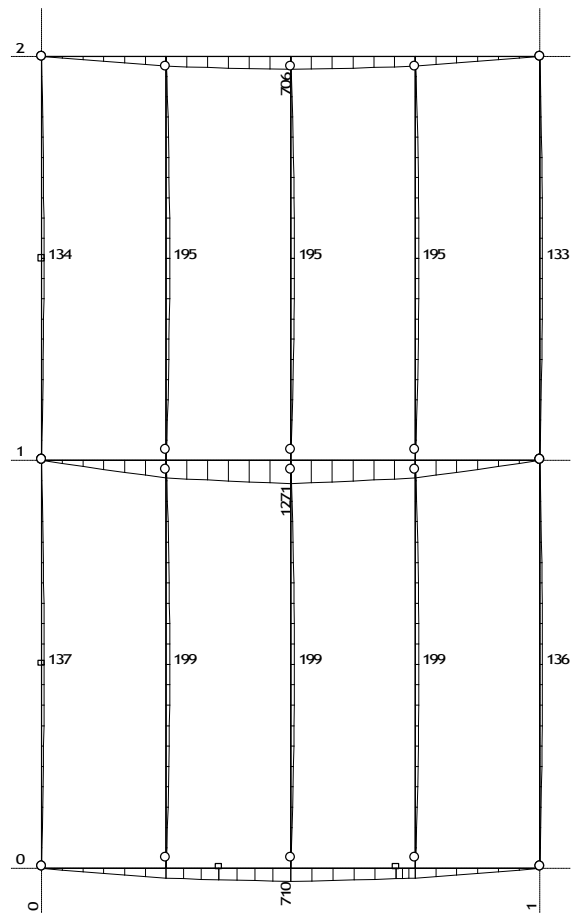
Raspored mase po visini objekta

Nivo	Z [m]	X [m]	Y [m]	Masa [T]	T/m2
	0.00	-45.30	9.53	246.95	
Ukupno:	0.00	-45.30	9.53	246.95	

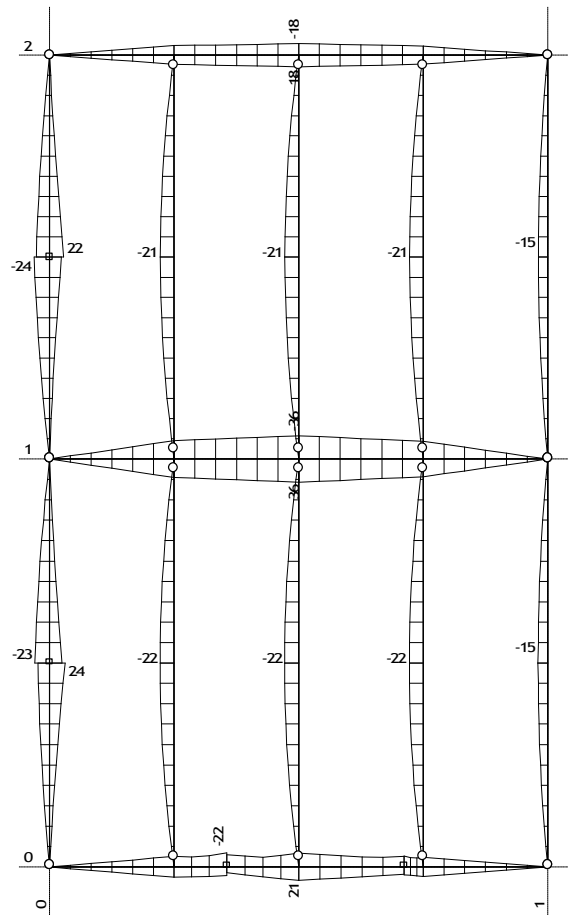
Opt. 106: [Am] 9-87



Opt. 106: [Am] 9-87



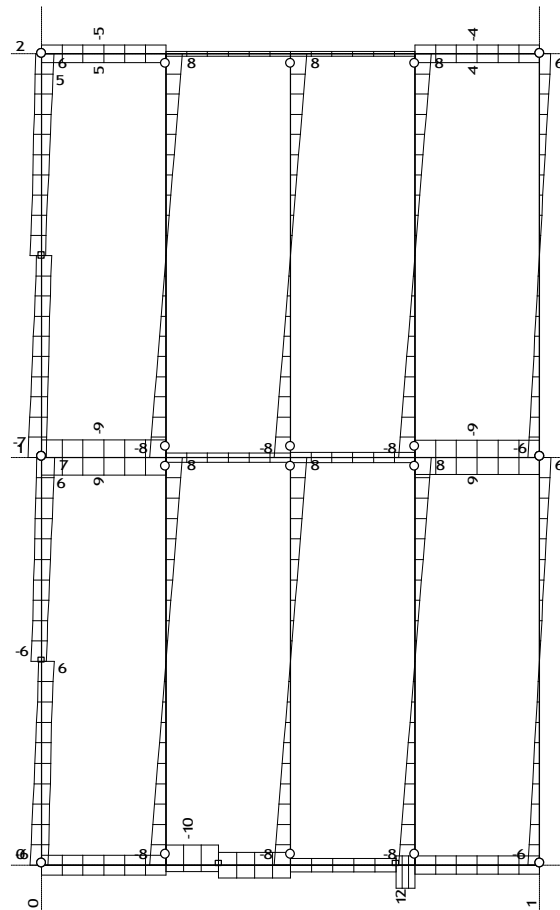
Opt. 106: [Ans] 9-87



Project: Krov

Uticaji u gred: max M2= 36/ min M2= -36 kNm

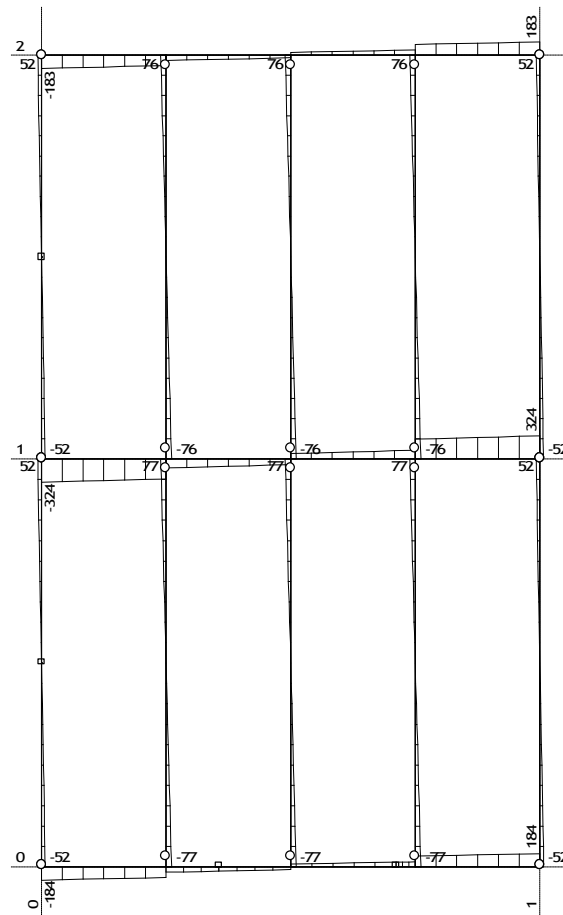
Opt. 106: [Ans] 9-87



Project: Krov

Uticaji u gred: max T3= 12/ min T3= -10 kN

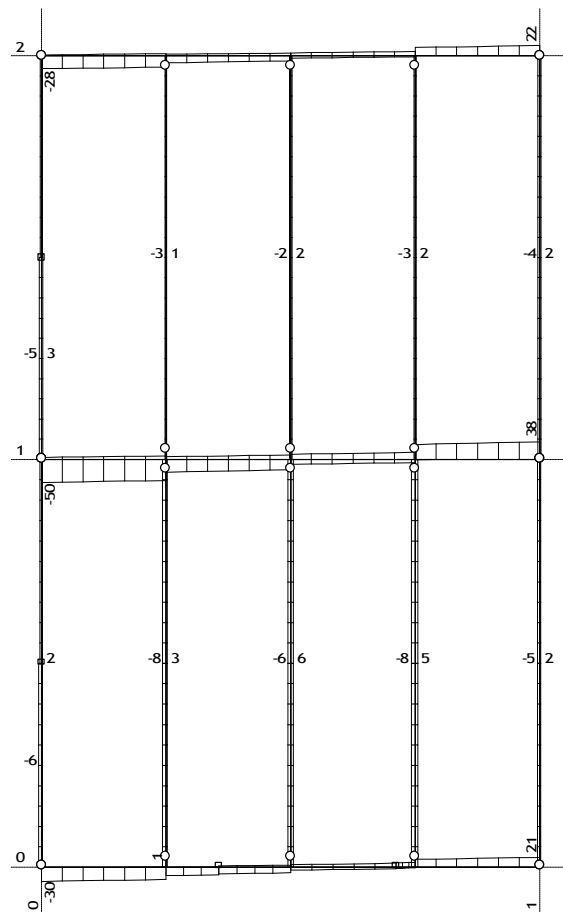
Opt. 106: [Am] 9.87



Projekat: Krov

Uticaji u gred: max T2= 324 / min T2= -324 kN

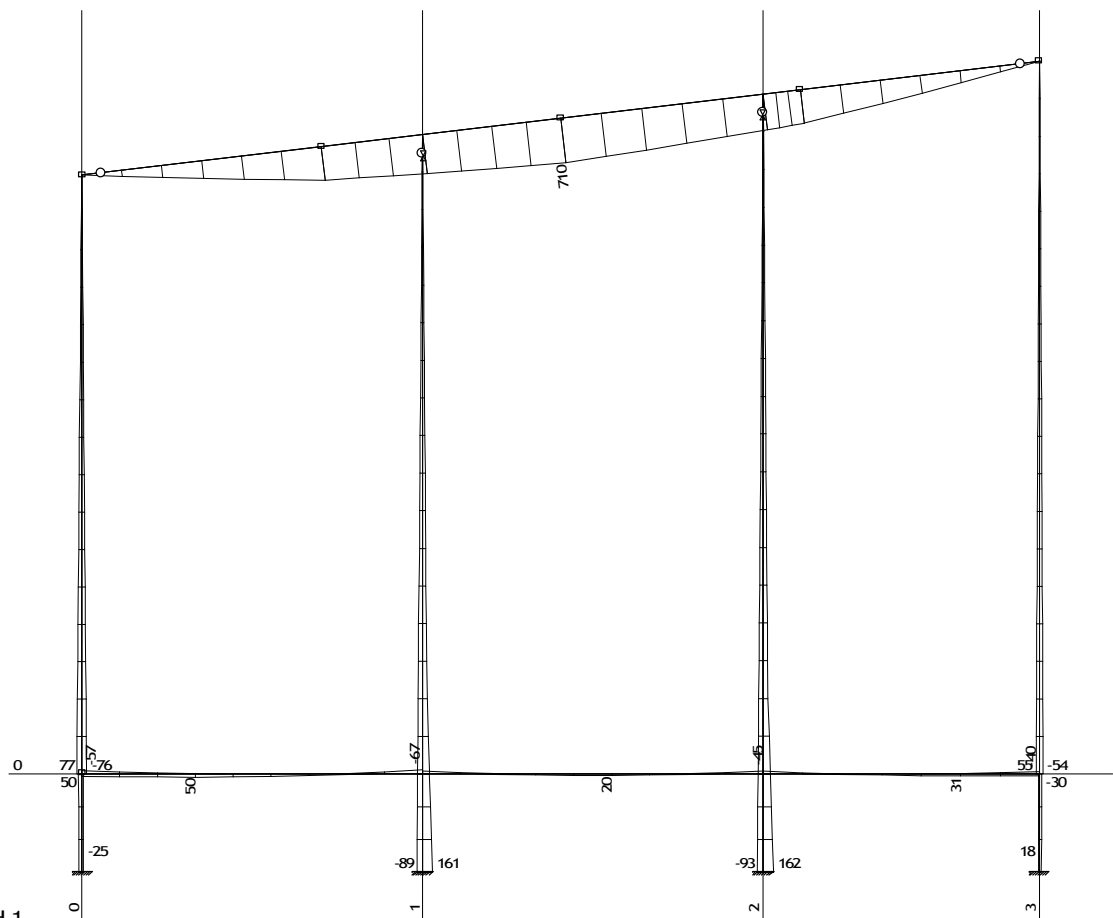
Opt. 106: [Am] 9.87



Projekat: Krov

Uticaji u gred: max N1= 38 / min N1= -50 kN

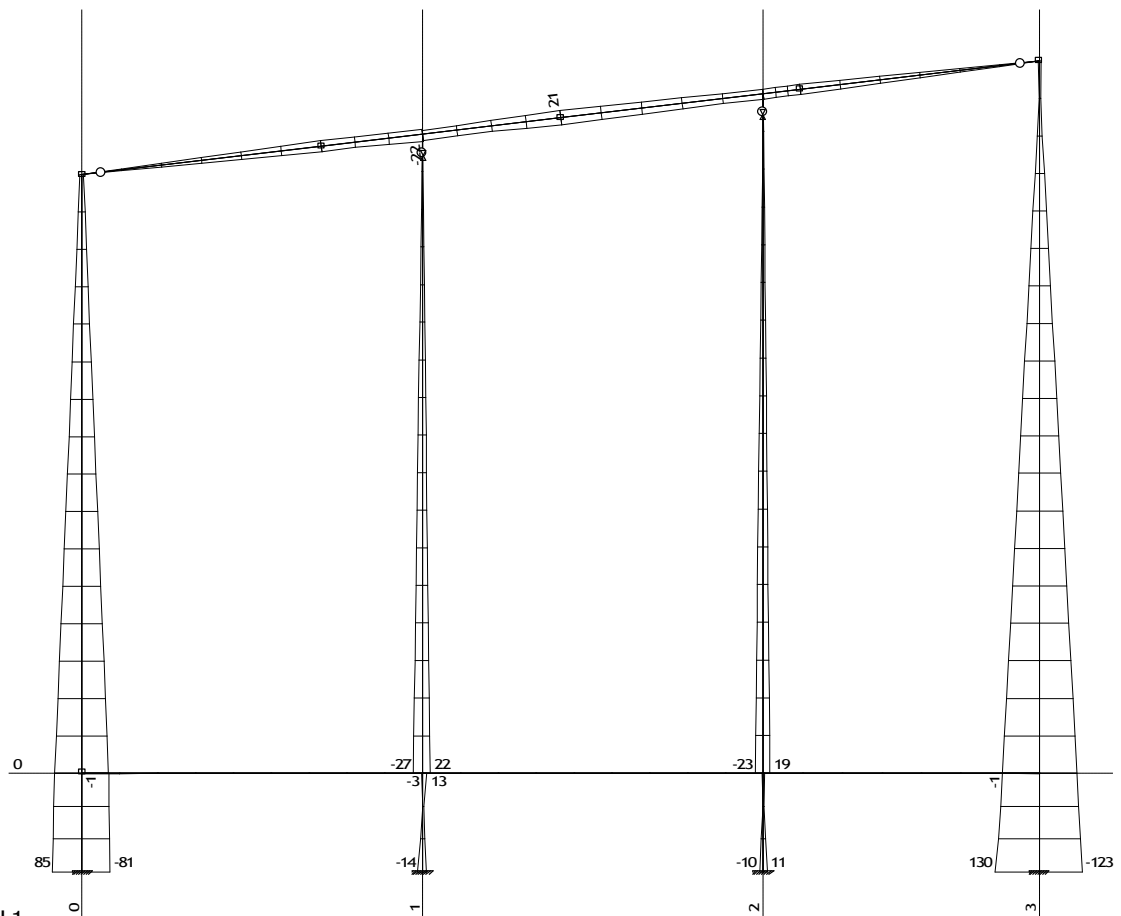
Opt. 106: [Am] 9.87



Ram: H_1

Uticaji u gred: max M8= 710 / min M8= -93 kNm

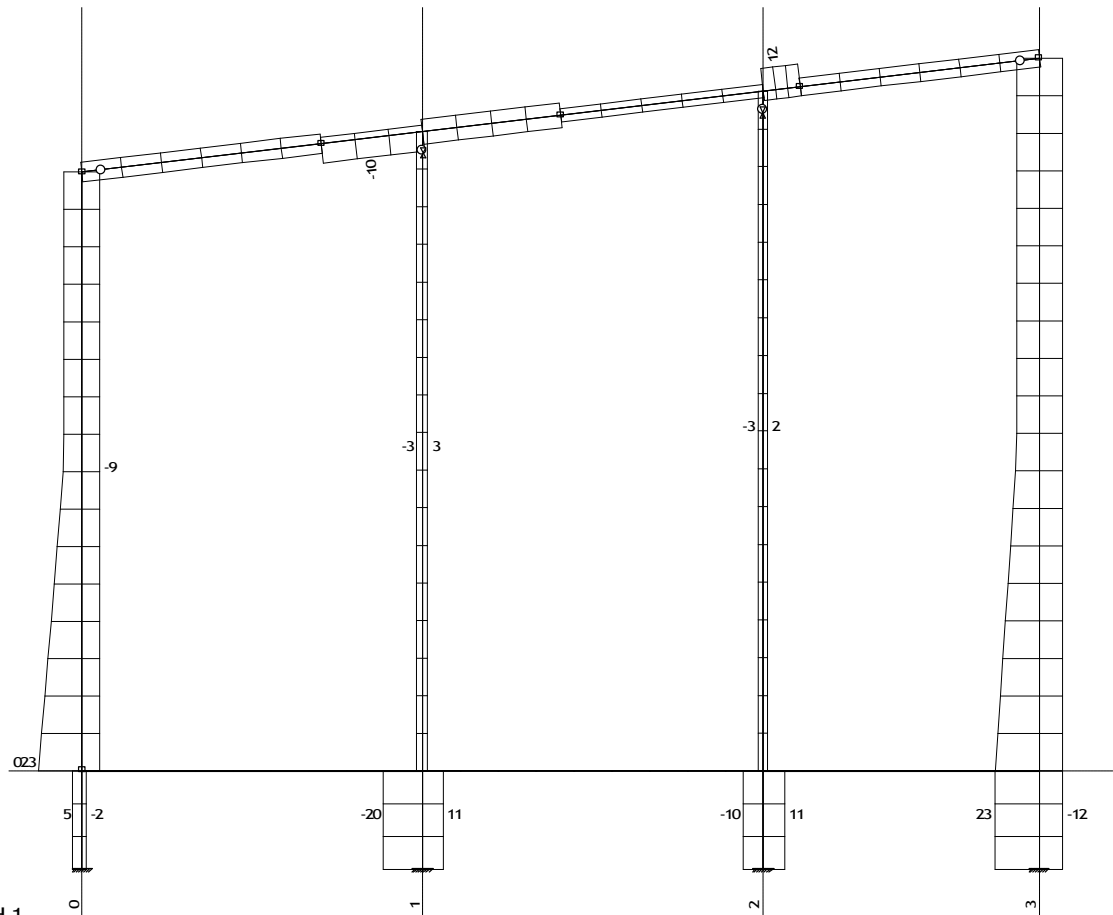
Opt. 106: [Am] 9.87



Ram: H_1

Uticaji u gred: max M2= 130 / min M2= -123 kNm

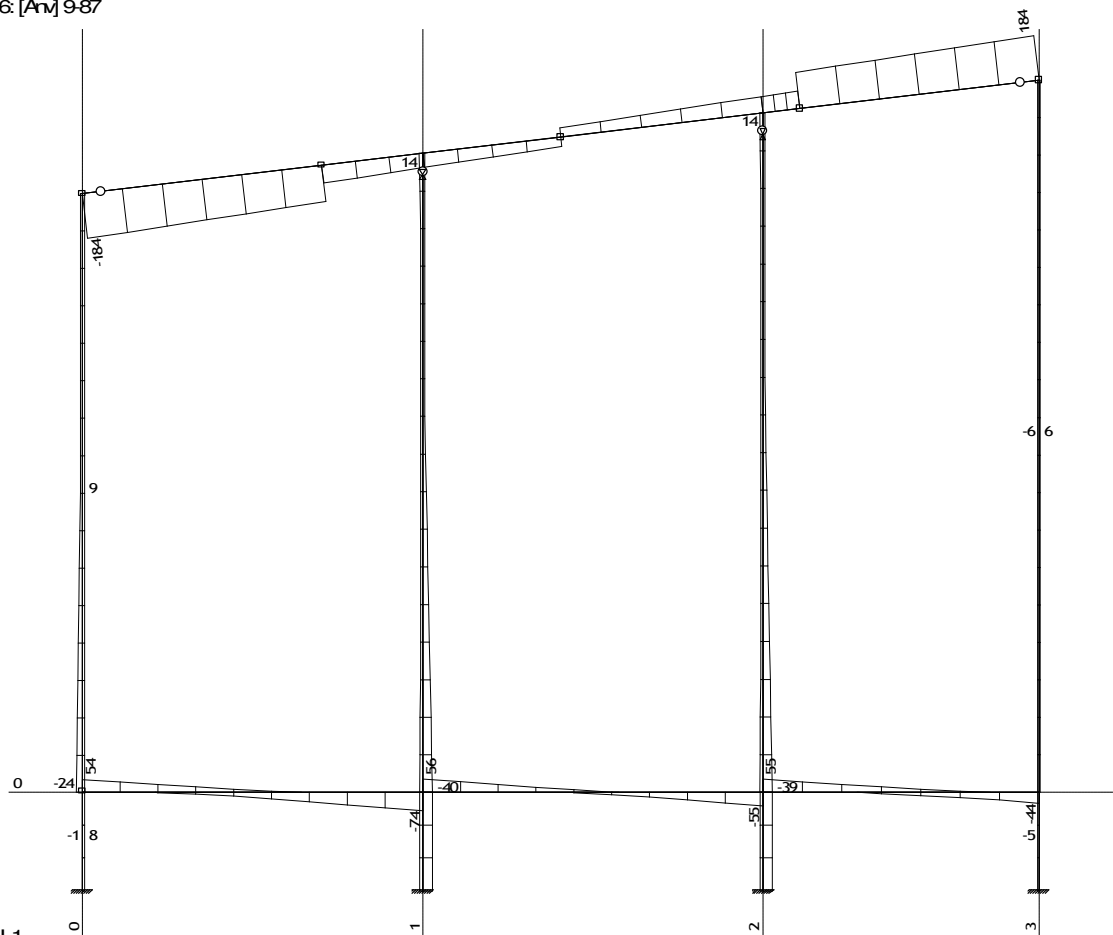
Opt. 106: [Am] 9-87



Ram: H_1

Uticaji u gred: max T3= 23 / min T3= -20 kN

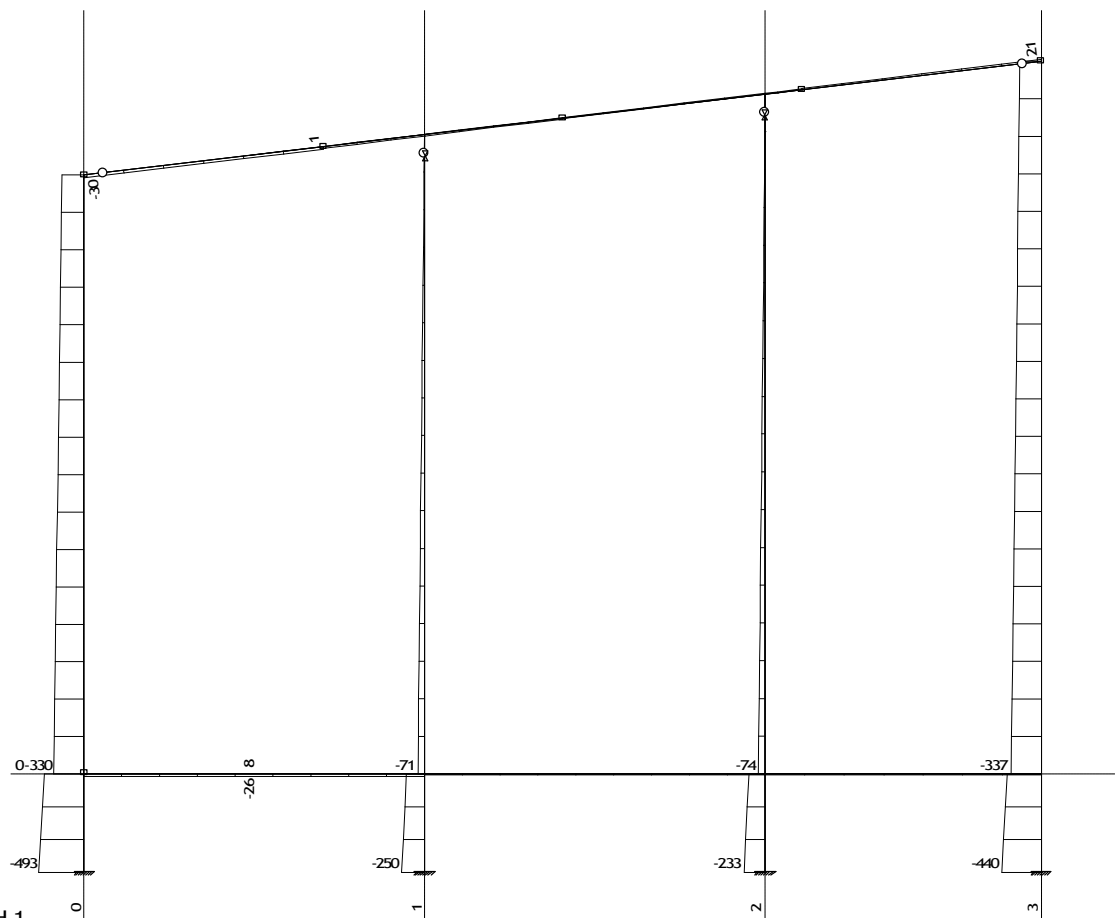
Opt. 106: [Am] 9-87



Ram: H_1

Uticaji u gred: max T2= 184 / min T2= -184 kN

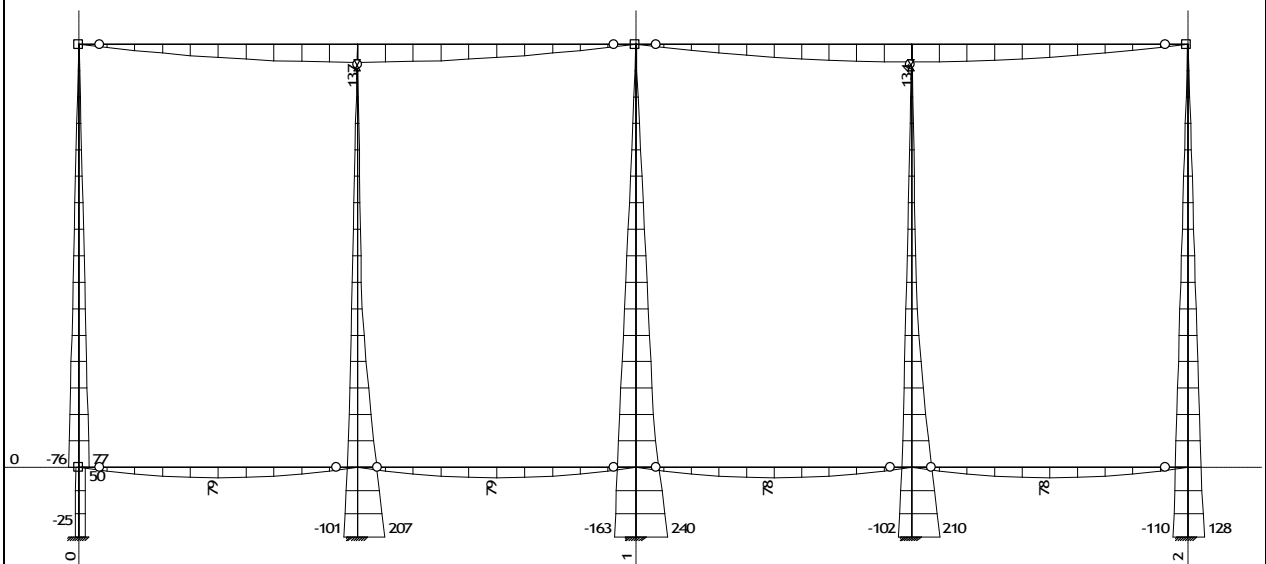
Opt. 106: [Am] 9-87



Ram: H_1

Uticaji u gred: max N1= 21 / min N1= -493 kN

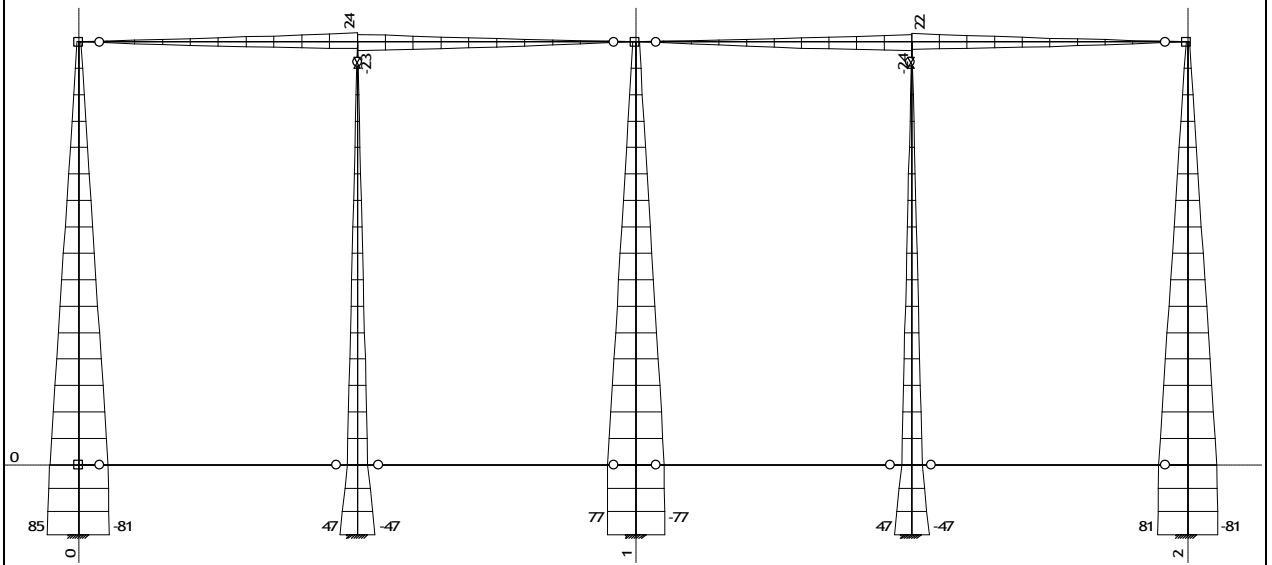
Opt. 106: [Am] 9-87



Ram: V_1

Uticaji u gred: max M8= 240 / min M8= -163 kNm

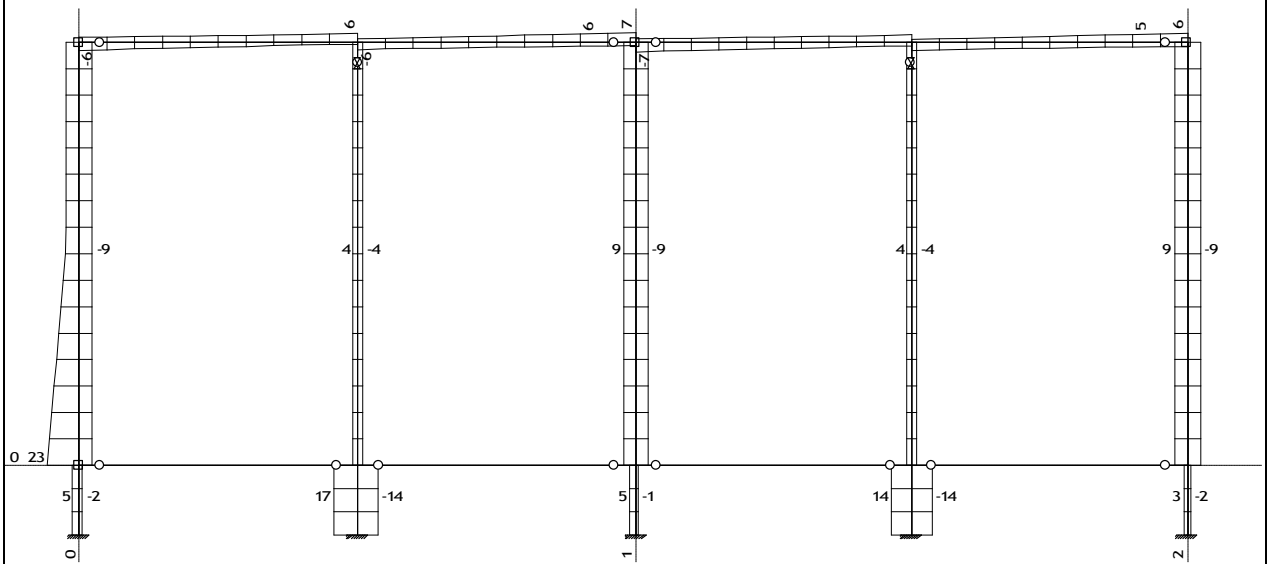
Opt. 106: [Nm] 9-87



Ram: V_1

Uticaji u gred: max M2= 85 / min M2= -81 kNm

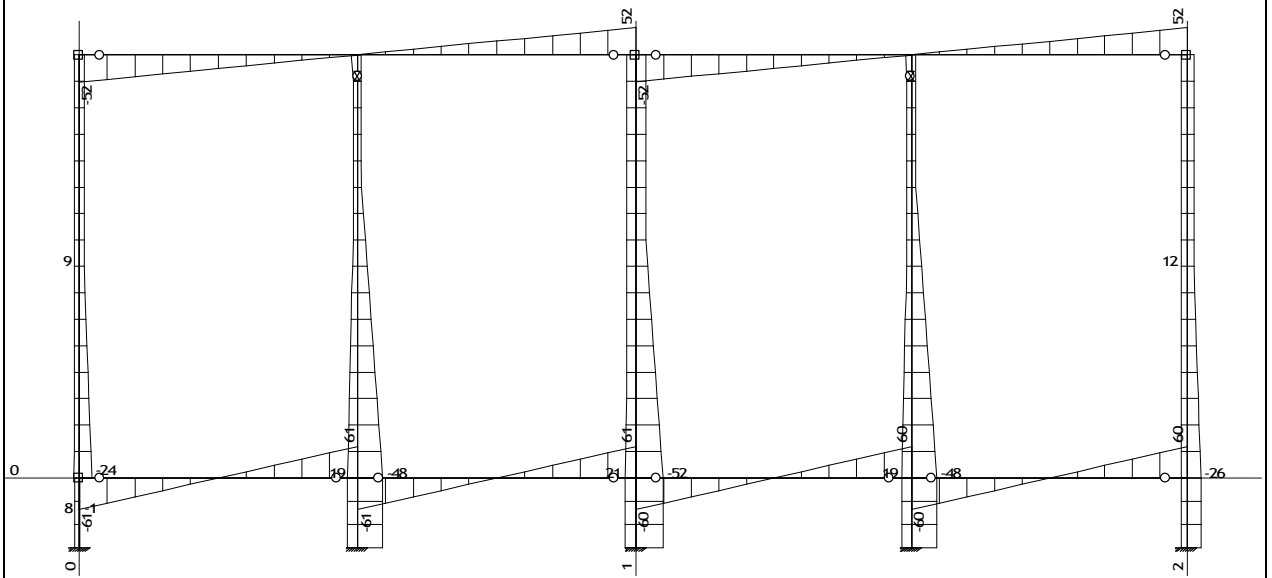
Opt. 106: [Nm] 9-87



Ram: V_1

Uticaji u gred: max T3= 23 / min T3= -14 kN

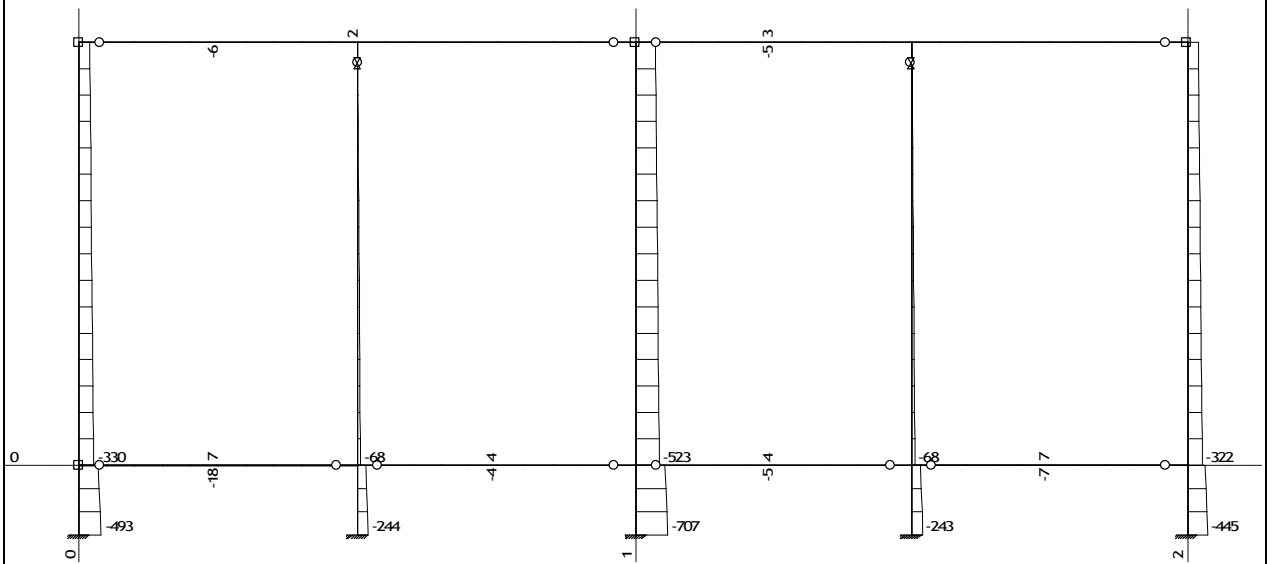
Opt. 106: [Am] 9.87



Ram: V_1

Uticaji u gred: max T2= 61 / min T2= -61 kN

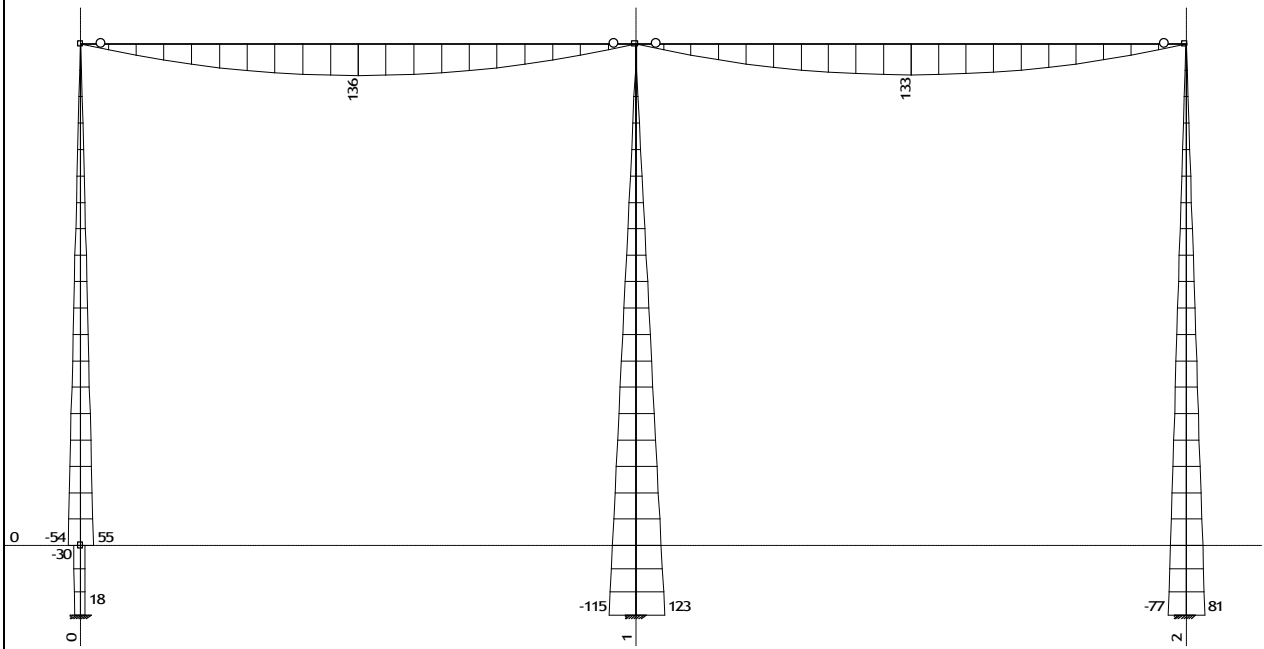
Opt. 106: [Am] 9.87



Ram: V_1

Uticaji u gred: max N1= 7 / min N1= -707 kN

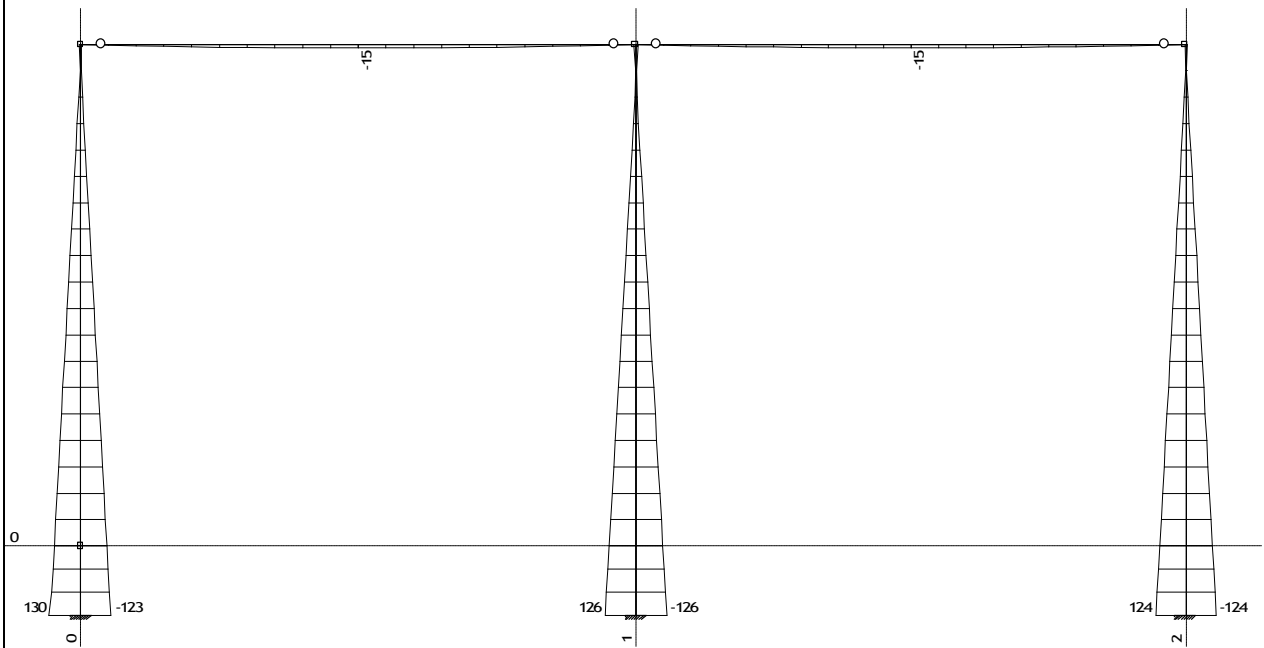
Opt. 106: [Am] 9.87



Param: V.5

Uticaji u gred: max M_B = 136 / min M_B = -115 kNm

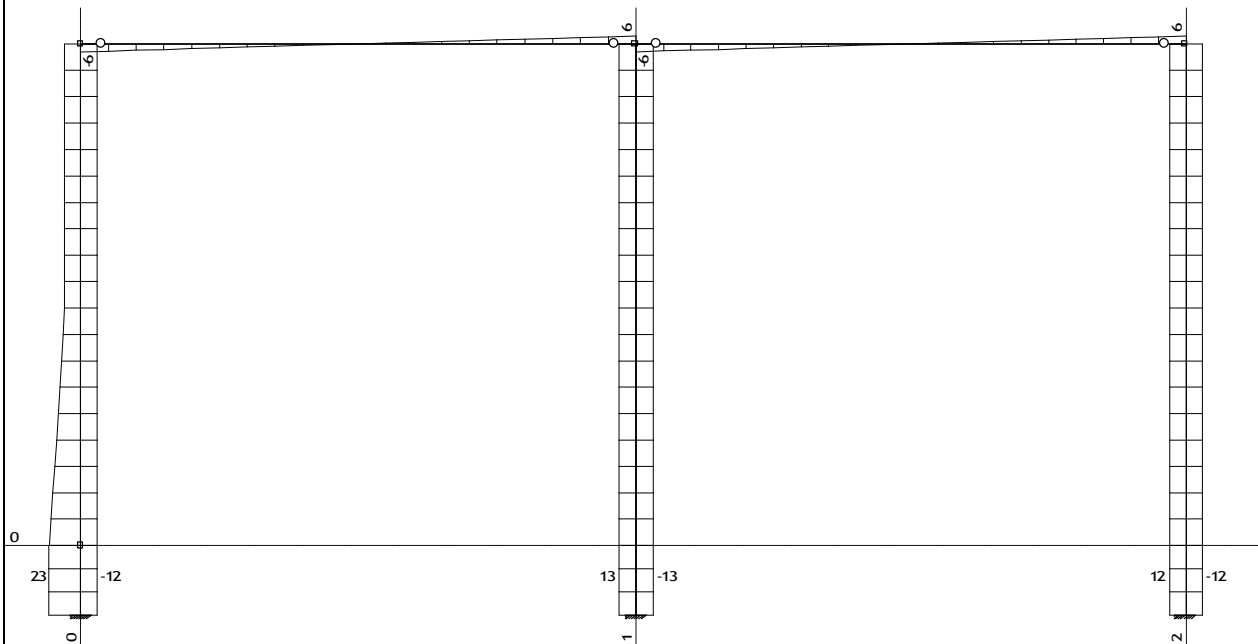
Opt. 106: [Am] 9.87



Param: V.5

Uticaji u gred: max M_B = 130 / min M_B = -126 kNm

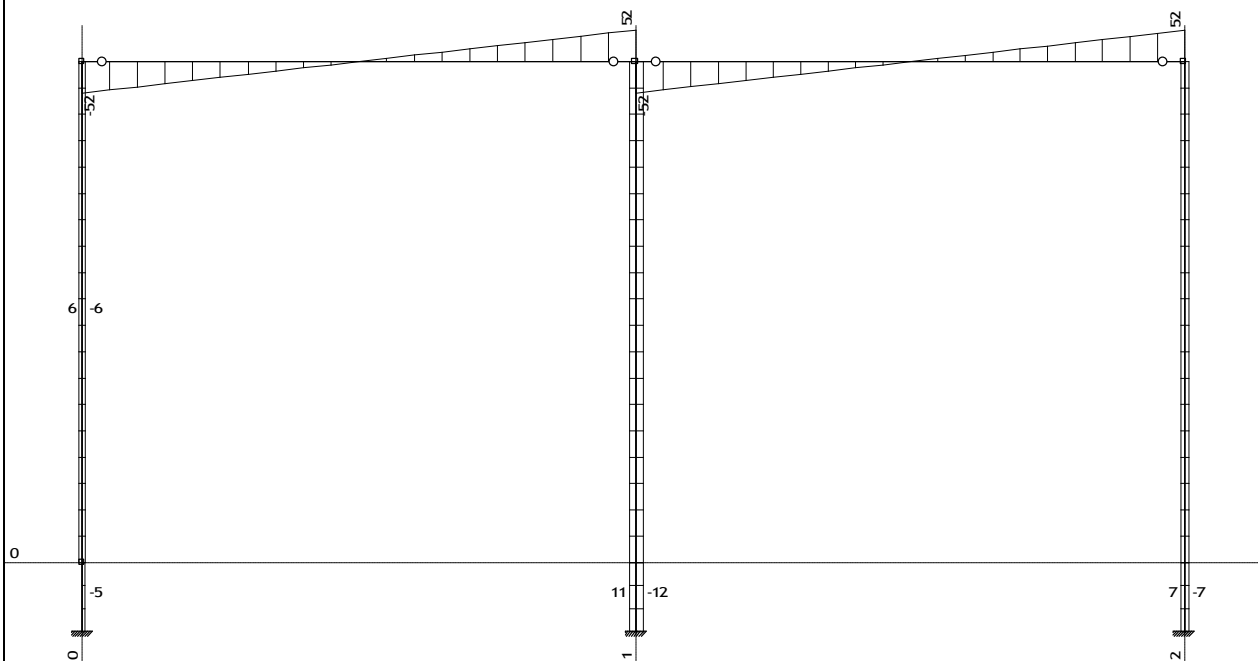
Opt. 106: [Am] 9.87



Param: V.5

Uticaji u gred: max T3= 23 / min T3= -13 kN

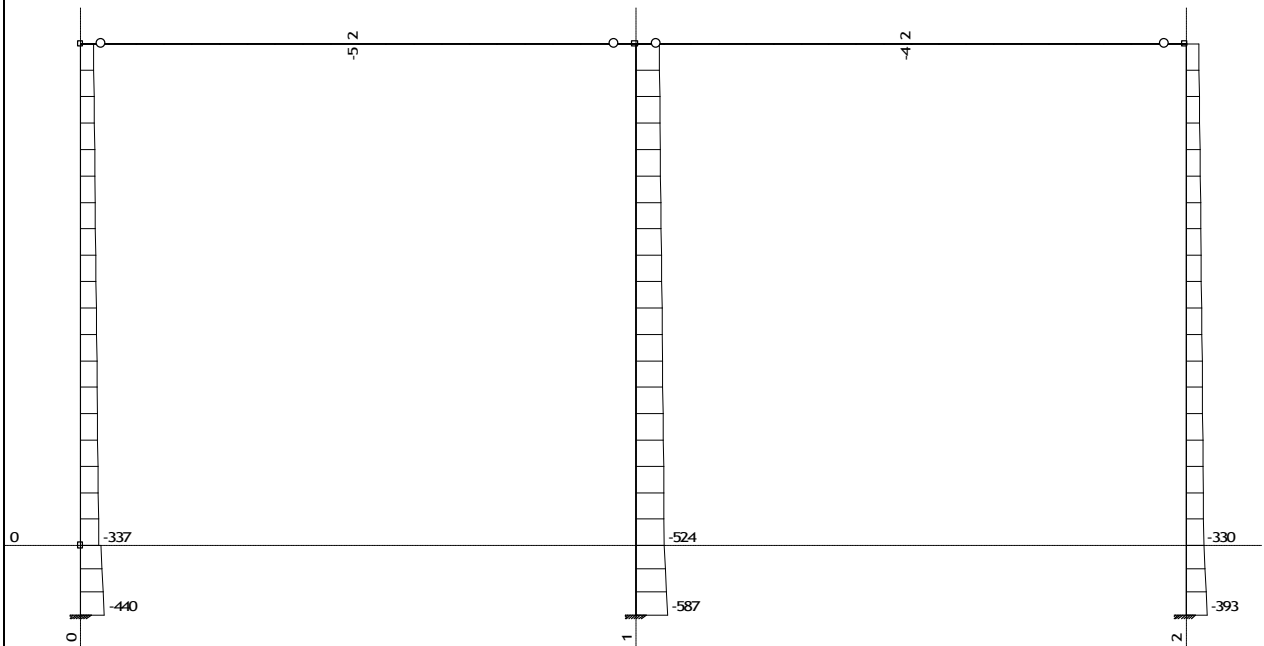
Opt. 106: [Am] 9.87



Param: V.5

Uticaji u gred: max T2= 52 / min T2= -52 kN

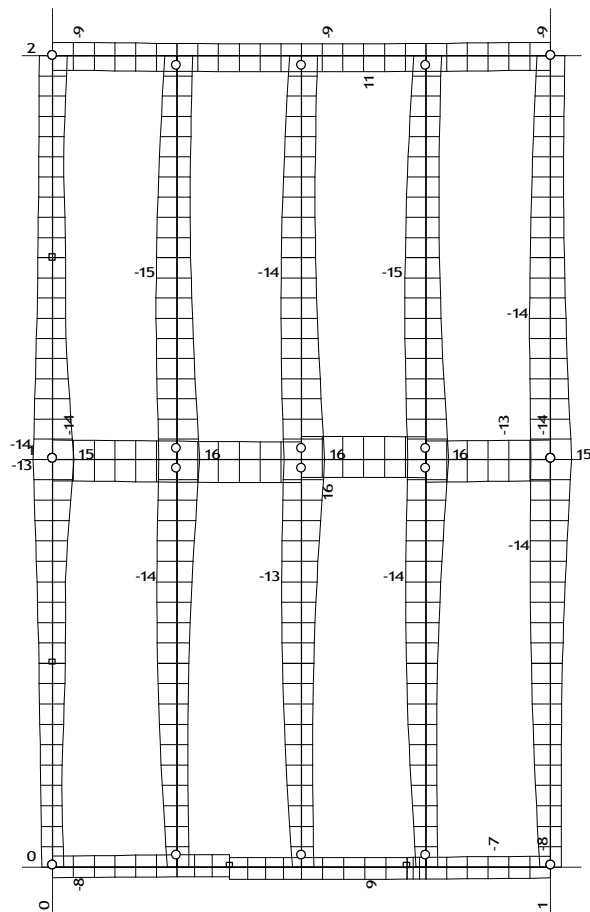
Opt. 106: [Nm] 9-87



Pam: V.5

Uticaji u gred: max $N_1 = 2$ / min $N_1 = -587$ kN

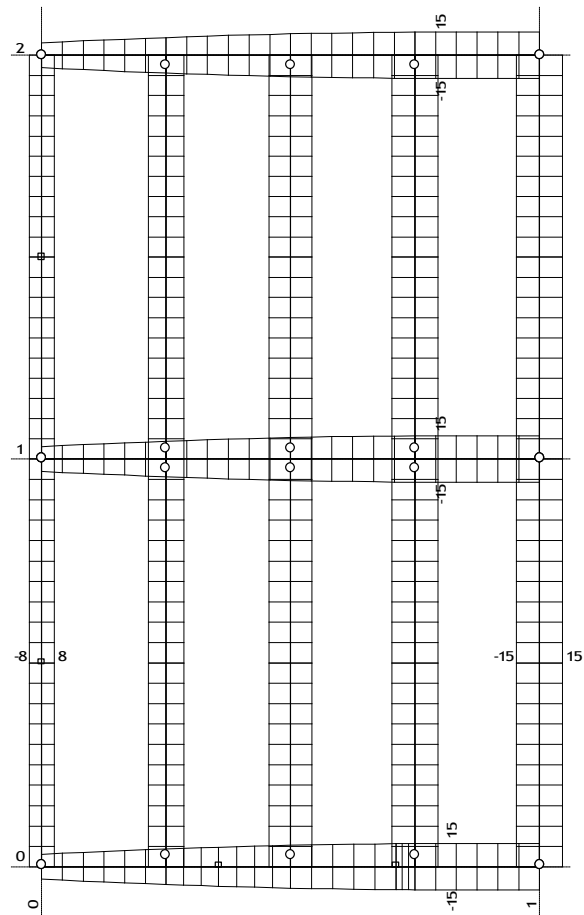
Opt. 106: [Nm] 88-105



Projekt: Krov

Uticaji u gred: max $X_p = 16$ / min $X_p = -15$ m / 1000

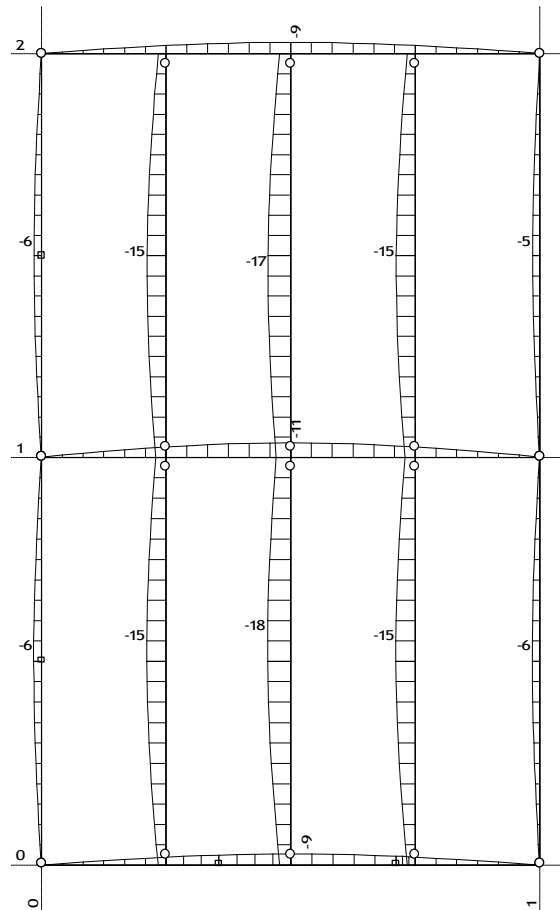
Opt. 106: [An] 88-105



Projekt: Krov

Uticaji u gred: max $Y_p = 15$ / min $Y_p = -15$ m / 1000

Opt. 106: [An] 88-105



Projekt: Krov

Uticaji u gred: max $Z_p = -0$ / min $Z_p = -18$ m / 1000

Utjecaji u tackastim osloncima - Ekstremne vrednosti - Opterecenje: 106. [Anv] 88-105

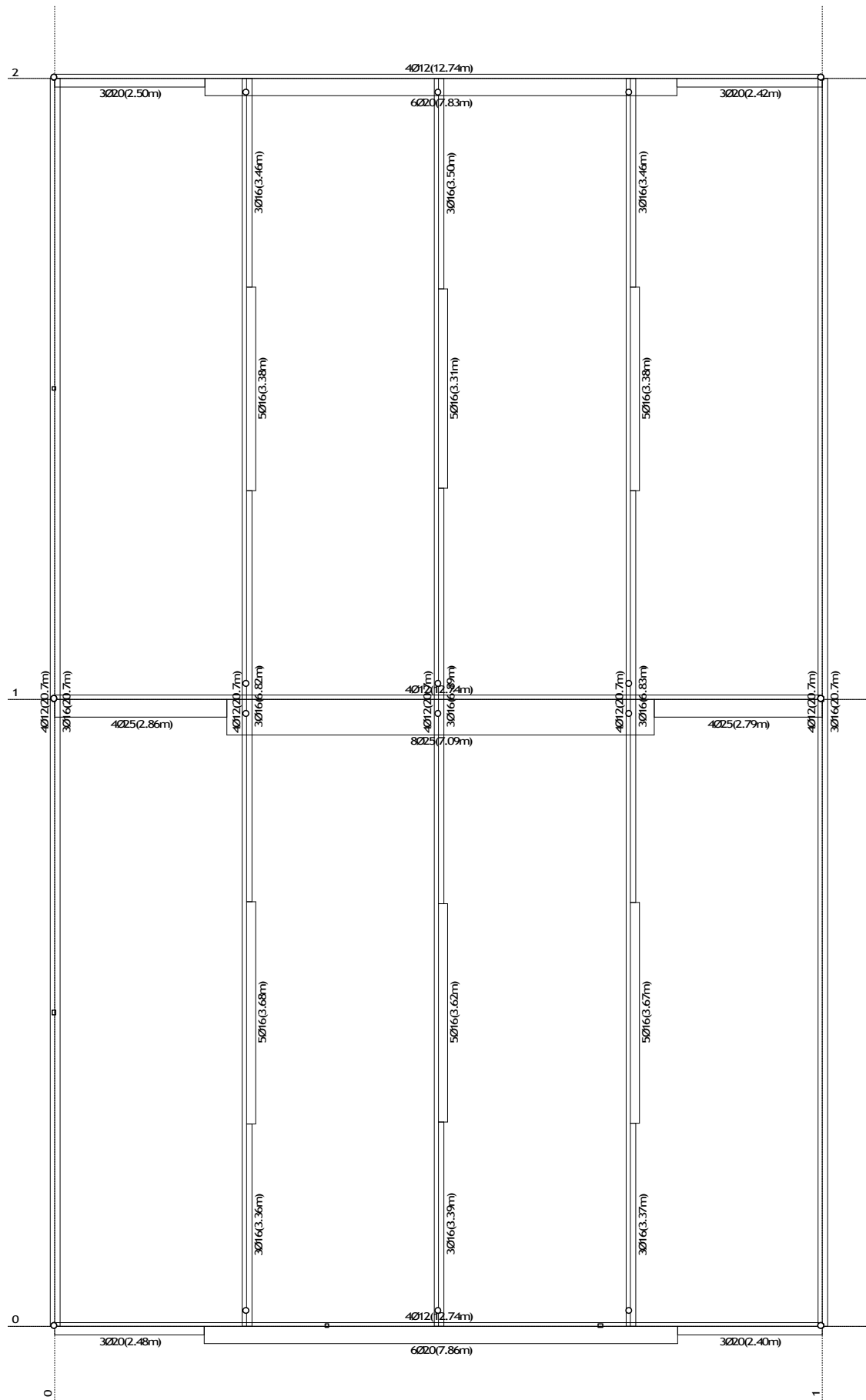
Oznaka	LC	R1 [kN]	R2 [kN]	R3 [kN]	M1 [kNm]	M2 [kNm]	M3 [kNm]
10	A(R1-)	-28.751	0.188	398.44	-2.390	-133.54	-0.027
4	A(R1-)	-26.418	0.701	152.43	-1.689	-112.14	2.574
17	A(R1-)	-26.417	0.462	151.62	-1.380	-113.76	-1.956
10	A(R1+)	20.725	-1.255	322.23	15.933	114.35	0.177
17	A(R1+)	18.410	-3.083	151.62	9.197	94.895	2.085
4	A(R1+)	18.385	-4.674	152.43	11.260	93.400	-2.584
23	A(R1-)	-14.570	0.105	256.91	-2.331	-71.097	-0.014
3	A(R1-)	-12.942	0.000	156.24	0.000	-10.106	0.000
23	A(R1+)	10.588	-0.698	218.96	15.537	61.782	0.094
25	A(R1-)	-9.048	0.000	344.75	0.000	-94.509	0.000
3	A(R2-)	-1.411	-22.232	148.06	89.429	-0.064	-2.102
7	A(R2-)	0.956	-21.375	143.77	89.795	1.290	0.755
12	A(R2-)	-2.316	-12.959	225.52	72.083	4.253	0.229
3	A(R2+)	-4.367	12.784	150.03	-51.422	-2.104	1.209
7	A(R2+)	-0.323	12.290	143.09	-51.632	0.475	-0.434
17	A(R2-)	1.011	-11.138	151.62	35.838	8.931	-0.147
17	A(R2+)	1.011	11.138	151.62	-35.838	8.931	-0.147
4	A(R2-)	1.106	-11.124	152.43	35.822	9.719	0.285
4	A(R2+)	1.106	11.124	152.43	-35.822	9.719	0.285
25	A(R2-)	-0.384	-9.707	343.95	97.241	-3.953	-0.785
10	A(R3+)	13.797	0.000	419.32	0.000	123.31	0.000
25	A(R3+)	-9.048	0.000	344.75	0.000	-94.509	0.000
1	A(R3+)	1.651	0.000	311.08	0.000	18.043	0.000
10	A(R3-)	-10.157	1.443	306.09	-18.323	-29.366	-0.204
12	A(R3+)	-1.334	0.000	271.03	0.000	-13.551	0.000
23	A(R3+)	8.993	0.000	267.34	0.000	83.634	0.000
1	A(R3-)	2.359	1.511	242.84	-27.216	-10.820	0.133
33	A(R3+)	-5.737	0.000	234.94	0.000	-62.307	0.000
25	A(R3-)	-0.022	2.630	230.28	-26.425	-0.209	0.204
23	A(R3-)	-5.069	0.802	210.95	-17.868	-14.763	-0.108
25	A(M1-)	-0.384	9.707	343.95	-97.241	-3.953	0.785
25	A(M1+)	-0.384	-9.707	343.95	97.241	-3.953	-0.785
33	A(M1-)	-0.195	9.213	234.50	-95.064	-2.133	0.416
33	A(M1+)	-0.195	-9.213	234.50	95.064	-2.133	-0.416
12	A(M1-)	-2.189	9.118	260.94	-94.685	2.542	0.524
12	A(M1+)	-2.189	-9.118	260.94	94.685	2.542	-0.524
7	A(M1+)	0.956	-21.375	143.77	89.795	1.290	0.755
3	A(M1+)	-1.411	-22.232	148.06	89.429	-0.064	-2.102
7	A(M1-)	0.464	7.064	143.80	-71.415	0.413	-0.210
3	A(M1-)	-2.684	7.011	149.01	-68.580	-0.942	3.145
10	A(M2-)	-15.063	0.000	417.74	0.000	-133.77	0.000
10	A(M2+)	13.797	0.000	419.32	0.000	123.31	0.000
17	A(M2-)	-26.417	0.462	151.62	-1.380	-113.76	-1.956
4	A(M2-)	-26.418	0.701	152.43	-1.689	-112.14	2.574
17	A(M2+)	18.410	-3.083	151.62	9.197	94.895	2.085
25	A(M2-)	-9.048	0.000	344.75	0.000	-94.509	0.000
4	A(M2+)	18.385	-4.674	152.43	11.260	93.400	-2.584
23	A(M2-)	-9.643	0.000	266.45	0.000	-89.399	0.000
25	A(M2+)	8.281	0.000	343.16	0.000	86.603	0.000
23	A(M2+)	8.993	0.000	267.34	0.000	83.634	0.000
4	A(M3+)	-4.427	0.000	152.43	0.000	-41.625	3.900
4	A(M3-)	6.639	0.000	152.43	0.000	61.063	-3.330
3	A(M3-)	-2.684	-7.011	149.01	68.580	-0.942	-3.145
3	A(M3+)	-2.684	7.011	149.01	-68.580	-0.942	3.145
17	A(M3-)	-5.032	0.000	151.62	0.000	-47.703	-2.638
17	A(M3+)	7.053	0.000	151.62	0.000	65.565	2.344
10	A(M3-)	-0.633	0.549	418.53	-59.344	-5.233	-0.785
10	A(M3+)	-0.633	-0.549	418.53	59.344	-5.233	0.785
25	A(M3-)	-0.384	-9.707	343.95	97.241	-3.953	-0.785
25	A(M3+)	-0.384	9.707	343.95	-97.241	-3.953	0.785

Utjecaji u tackastim osloncima - Ekstremne vrednosti - Opterecenje: 106. [Anv] 9-87

Oznaka	LC	R1 [kN]	R2 [kN]	R3 [kN]	M1 [kNm]	M2 [kNm]	M3 [kNm]
10	A(R1-)	-51.661	0.339	646.67	-4.302	-239.62	-0.048
4	A(R1-)	-48.193	1.262	152.43	-3.040	-207.45	4.466
17	A(R1-)	-48.136	0.832	151.62	-2.483	-209.95	-3.435
23	A(R1-)	-26.178	0.188	415.62	-4.195	-127.56	-0.025
10	A(R1+)	21.093	-3.389	321.70	43.019	116.41	0.479
3	A(R1-)	-20.467	3.001	249.56	-12.073	-13.814	0.284
4	A(R1+)	19.410	-12.620	243.89	30.402	101.23	-2.448
17	A(R1+)	19.375	-8.324	242.60	24.832	102.24	2.027
23	A(R1+)	11.878	0.000	234.66	0.000	110.39	0.000
25	A(R1-)	-11.763	0.000	448.17	0.000	-122.86	0.000
3	A(R2-)	-0.563	-40.018	147.47	160.97	0.612	-3.784
7	A(R2-)	1.484	-38.474	144.10	161.63	1.805	1.359
12	A(R2-)	-2.324	-23.327	223.43	129.75	5.205	0.413
4	A(R2-)	4.858	-16.827	152.43	40.536	26.654	-0.466
17	A(R2-)	0.731	-14.480	151.62	46.589	6.464	-0.106
17	A(R2+)	0.731	14.480	151.62	-46.589	6.464	-0.106
4	A(R2+)	0.801	14.462	152.43	-46.568	7.007	0.208
3	A(R2+)	-12.242	13.006	155.45	-52.316	-8.136	1.230
25	A(R2-)	-0.278	-12.619	278.04	126.41	-2.861	-1.021
25	A(R2+)	-0.278	12.619	278.04	-126.41	-2.861	1.021
10	A(R3+)	-17.626	-1.130	706.61	14.340	-101.12	0.160
25	A(R3+)	-5.126	-2.058	586.87	20.681	-53.190	-0.160
1	A(R3+)	5.291	-1.183	492.73	21.300	-23.196	-0.104
23	A(R3+)	-9.008	-0.628	445.43	13.984	-54.755	0.084
12	A(R3+)	-3.421	-5.832	439.76	32.438	-3.179	0.103
33	A(R3+)	-2.641	-1.957	393.37	20.228	-28.954	-0.084
10	A(R3-)	-34.493	1.469	292.66	-18.642	-142.29	-0.207
3	A(R3+)	-20.467	3.001	249.56	-12.073	-13.814	0.284
4	A(R3+)	1.282	0.000	243.89	0.000	11.211	0.333
17	A(R3+)	1.170	0.000	242.60	0.000	10.342	-0.170
7	A(M1+)	1.484	-38.474	144.10	161.63	1.805	1.359
3	A(M1+)	-0.563	-40.018	147.47	160.97	0.612	-3.784
12	A(M1+)	-2.324	-23.327	223.43	129.75	5.205	0.413
25	A(M1-)	-0.278	12.619	278.04	-126.41	-2.861	1.021
25	A(M1+)	-0.278	-12.619	278.04	126.41	-2.861	-1.021
33	A(M1-)	-0.141	11.976	201.70	-123.58	-1.545	0.541
33	A(M1+)	-0.141	-11.976	201.70	123.58	-1.545	-0.541
12	A(M1-)	-2.307	11.854	228.14	-123.09	3.063	0.681

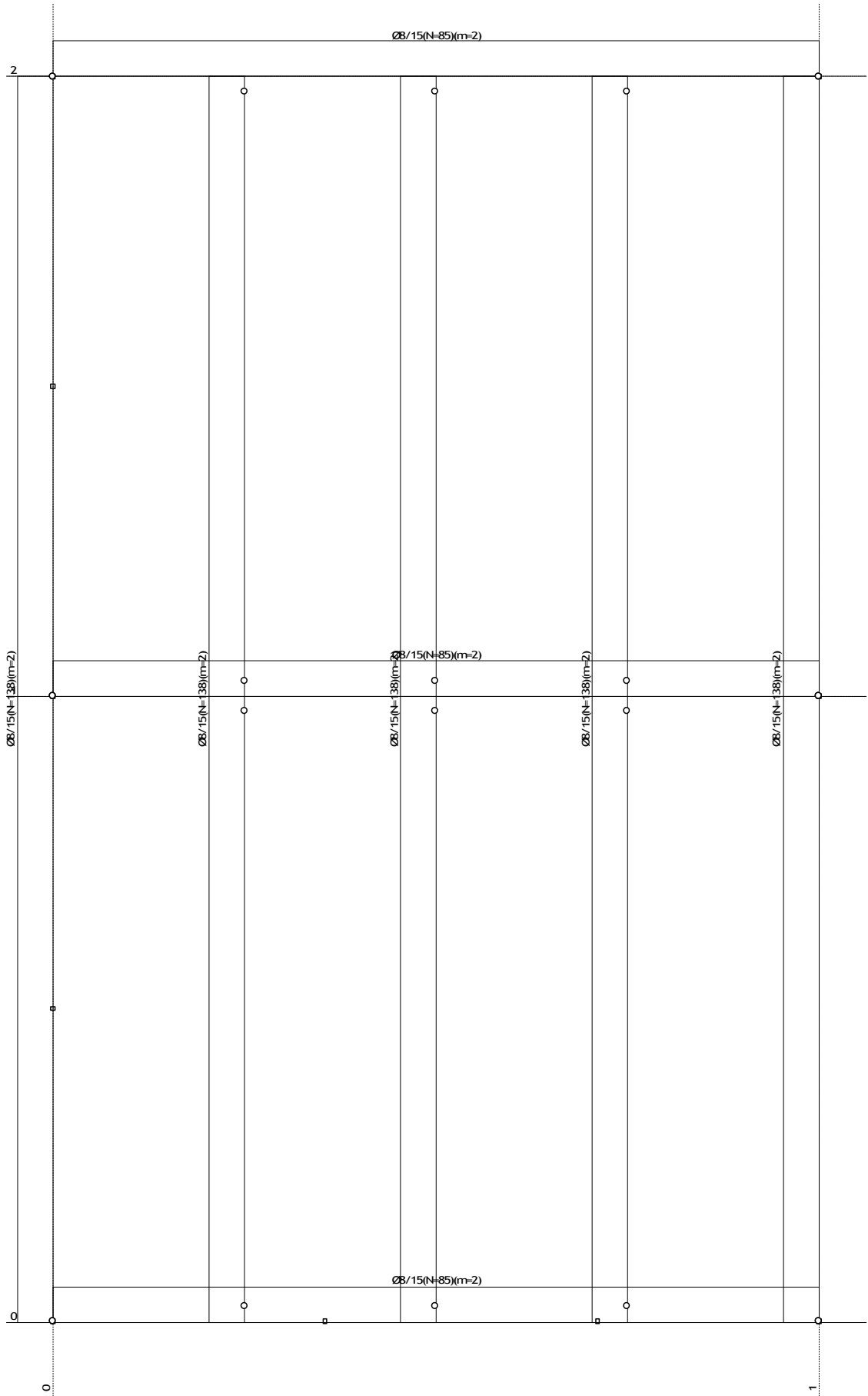
7	A(M1-)	0.296	9.184	143.35	 -92.840 	0.646	-0.273
3	A(M1-)	-2.470	9.114	148.80	 -89.154 	-0.910	4.089
10	A(M2-)	-51.661	0.339	646.67	-4.302	 -239.62 	-0.048
17	A(M2-)	-48.136	0.832	151.62	-2.483	 -209.95 	-3.435
4	A(M2-)	-48.193	1.262	152.43	-3.040	 -207.45 	4.466
10	A(M2+)	18.301	0.000	353.63	0.000	 163.32 	0.000
23	A(M2-)	-26.178	0.188	415.62	-4.195	 -127.56 	-0.025
25	A(M2-)	-11.763	0.000	448.17	0.000	 -122.86 	0.000
25	A(M2+)	10.986	0.000	277.01	0.000	 114.86 	0.000
23	A(M2+)	11.878	0.000	234.66	0.000	 110.39 	0.000
17	A(M2+)	19.375	-8.324	242.60	24.832	 102.24 	2.027
4	A(M2+)	19.410	-12.620	243.89	30.402	 101.23 	-2.448
4	A(M3+)	-5.756	0.000	198.16	0.000	-54.113	 5.070
4	A(M3-)	7.995	0.000	152.43	0.000	73.754	 -4.491
3	A(M3-)	-2.470	-9.114	148.80	89.154	-0.910	 -4.089
3	A(M3+)	-2.470	9.114	148.80	-89.154	-0.910	 4.089
17	A(M3-)	-47.194	0.832	242.60	-2.483	-201.63	 -3.572
17	A(M3+)	8.587	0.000	151.62	0.000	80.088	 3.132
7	A(M3+)	1.484	-38.474	144.10	161.63	1.805	 1.359
10	A(M3+)	-0.458	-0.714	352.60	77.147	-3.788	 1.021
25	A(M3-)	-0.278	-12.619	278.04	126.41	-2.861	 -1.021
10	A(M3-)	-0.458	0.714	352.60	-77.147	-3.788	 -1.021

Usvojena armatura
@1@PBAB87, MB30, B500

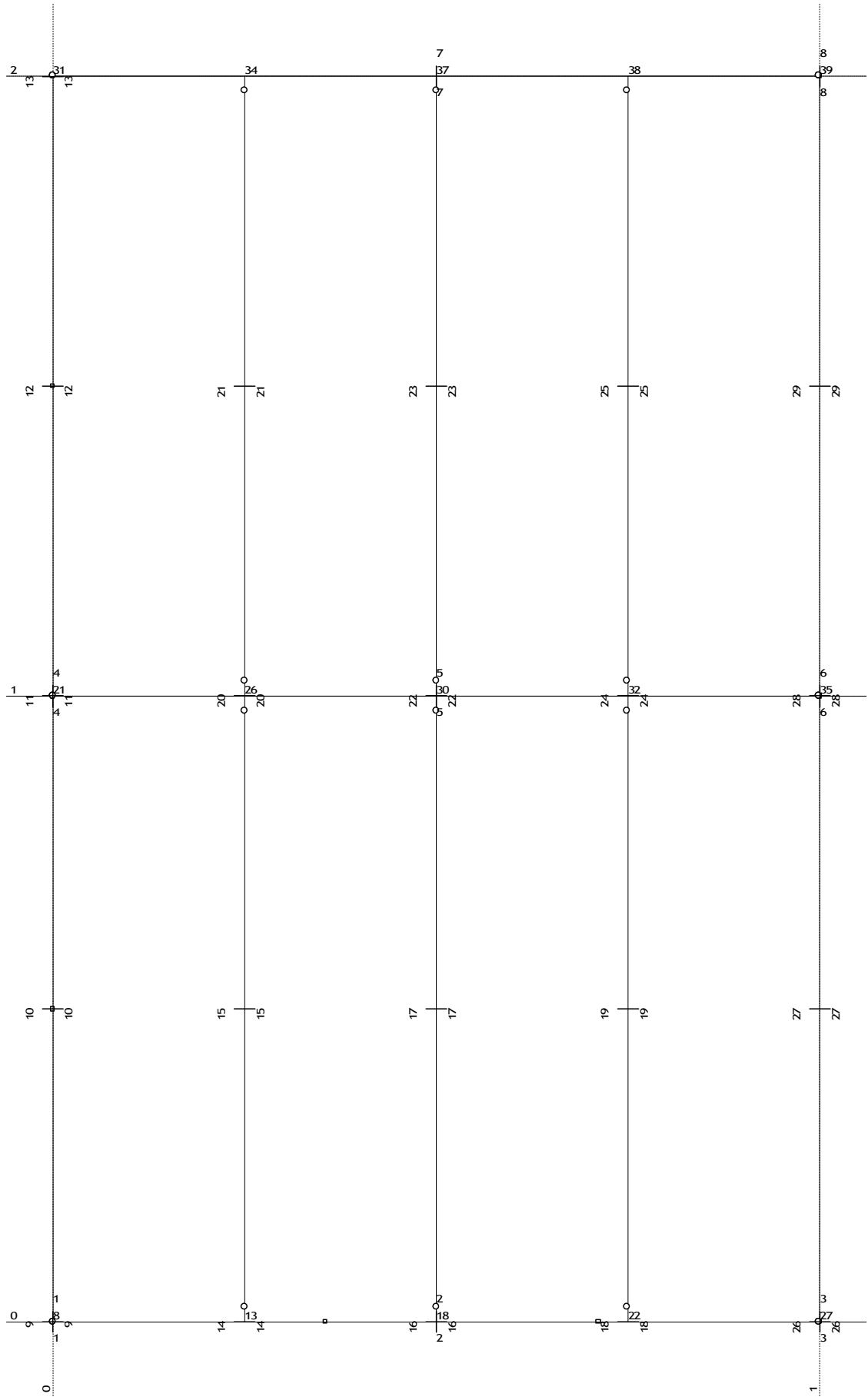


Pogled: Krov
Armatura u gredama: Aa2/Aa1





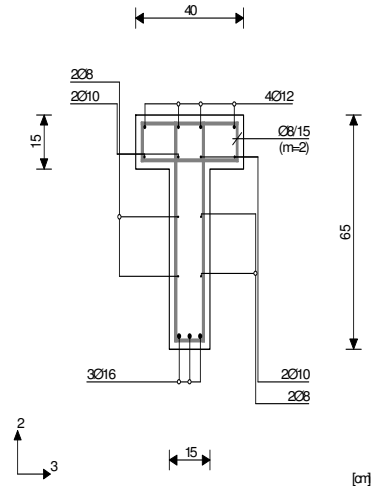
Pogled: Krov
Armatura u gredama: A_a, u_z



Pogled: Krov
Dispozicija greda

Greda 8-21
@1@PBAB 87
MB 30
B500
Kompletna sema opterećenja

Presek 9-9 x = 0.00m



Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII+1.80xIV$
 $N1u = 1.98 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

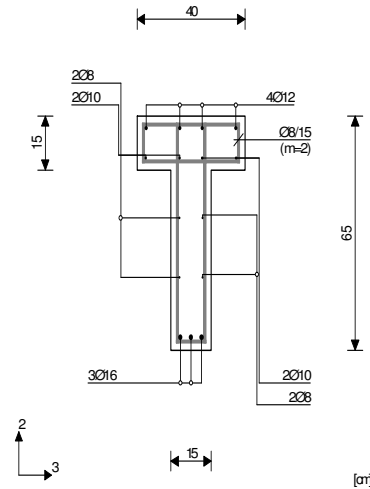
Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $M1u = 2.15 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $T2u = -38.55 \text{ kN}$
 $T3u = -5.78 \text{ kN}$
 $M1u = 2.15 \text{ kNm}$

$\varepsilon_b/\varepsilon_a = 1.256/10.000 \text{ ‰}$
 $Aa1 = 0.00 + 0.07' = 0.07 \text{ cm}^2$
 $Aa2 = 0.02 + 0.23' = 0.25 \text{ cm}^2$
 $Aa3 = 0.00 + 0.09' = 0.09 \text{ cm}^2$
 $Aa4 = 0.00 + 0.09' = 0.09 \text{ cm}^2$
 $Aa,uz = 0.54 \text{ cm}^2/m \text{ (m=2)}$
[Uvođeno $Aa,uz = \text{Ø}8/15(m=2) = 3.35 \text{ cm}^2/m$]

$\tau_y = 1.75 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 1.39 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procentat armiranja: 1.16%
*) - dodatna poduzna armatura za prijem torzije.

Presek 10-10 x = 5.20m



Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $N1u = -1.53 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 136.94 \text{ kNm}$

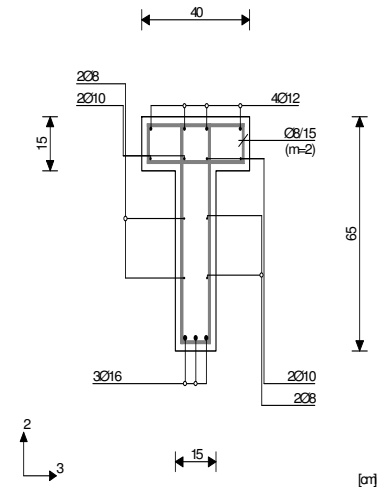
Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $M1u = 2.15 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $T2u = 0.14 \text{ kN}$
 $T3u = -1.19 \text{ kN}$
 $M1u = 2.15 \text{ kNm}$

$\varepsilon_b/\varepsilon_a = -1.155/10.000 \text{ ‰}$
 $Aa1 = 4.73 + 0.07' = 4.80 \text{ cm}^2$
 $Aa2 = 0.00 + 0.23' = 0.23 \text{ cm}^2$
 $Aa3 = 0.00 + 0.09' = 0.09 \text{ cm}^2$
 $Aa4 = 0.00 + 0.09' = 0.09 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m \text{ (m=2)}$
[Uvođeno $Aa,uz = \text{Ø}8/15(m=2) = 3.35 \text{ cm}^2/m$]

$\tau_y = 1.28 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 1.31 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procentat armiranja: 1.16%

Presek 11-11 x = 10.40m



Merodavna kombinacija za savijanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVIII$
 $N1u = 1.93 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $M1u = 2.15 \text{ kNm}$

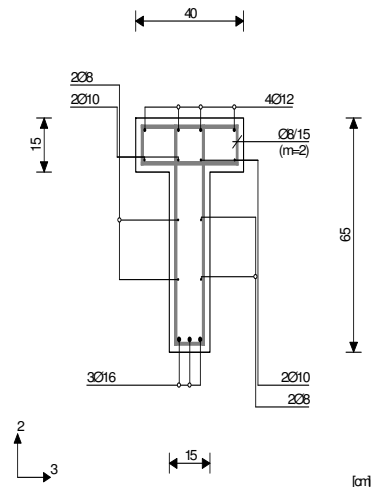
Merodavna kombinacija za smicanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $T2u = 38.43 \text{ kN}$
 $T3u = 6.75 \text{ kN}$
 $M1u = 2.15 \text{ kNm}$

$\varepsilon_b/\varepsilon_a = 1.256/10.000 \text{ ‰}$
 $Aa1 = 0.00 + 0.07' = 0.07 \text{ cm}^2$
 $Aa2 = 0.02 + 0.23' = 0.25 \text{ cm}^2$
 $Aa3 = 0.00 + 0.09' = 0.09 \text{ cm}^2$
 $Aa4 = 0.00 + 0.09' = 0.09 \text{ cm}^2$
 $Aa,uz = 0.54 \text{ cm}^2/m \text{ (m=2)}$
[Uvođeno $Aa,uz = \text{Ø}8/15(m=2) = 3.35 \text{ cm}^2/m$]

$\tau_y = 1.74 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 1.41 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procentat armiranja: 1.16%

Greda 21-31
@1@PBAB 87
MB 30
B500
Kompletna sema opterećenja

Presek 11-11 x = 0.00m



Merodavna kombinacija za savijanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVIII$
 $N1u = 2.71 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

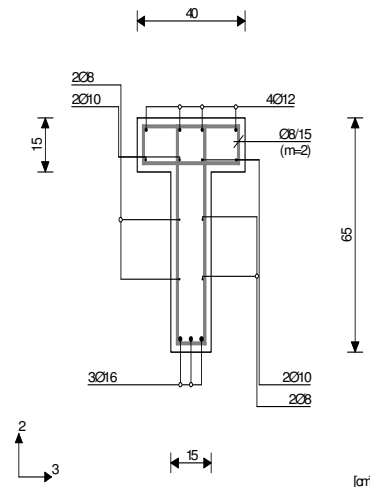
Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $M1u = -1.44 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $T2u = -38.03 \text{ kN}$
 $T3u = -6.95 \text{ kN}$
 $M1u = -1.44 \text{ kNm}$

$\varepsilon_b/\varepsilon_a = 1.256/10.000 \text{ ‰}$
 $Aa1 = 0.03 + 0.05' = 0.07 \text{ cm}^2$
 $Aa2 = 0.03 + 0.15' = 0.18 \text{ cm}^2$
 $Aa3 = 0.00 + 0.06' = 0.06 \text{ cm}^2$
 $Aa4 = 0.00 + 0.06' = 0.06 \text{ cm}^2$
 $Aa,uz = 0.21 \text{ cm}^2/m \text{ (m=2)}$
[Uvođeno $Aa,uz = \text{Ø}8/15(m=2) = 3.35 \text{ cm}^2/m$]

$\tau_y = 1.32 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.99 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procentat armiranja: 1.16%
*) - dodatna poduzna armatura za prijem torzije.

Presek 12-12 x = 5.15m



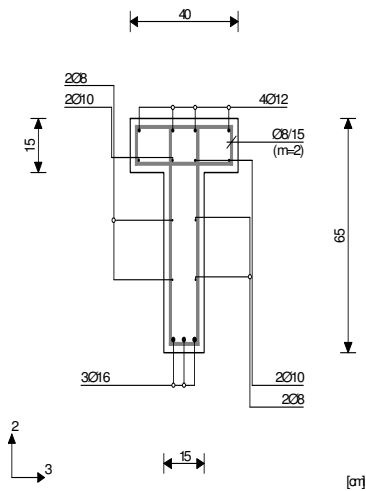
Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $N1u = -0.68 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 134.17 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $M1u = -1.44 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $T2u = -0.21 \text{ kN}$
 $T3u = 1.75 \text{ kN}$
 $M1u = -1.44 \text{ kNm}$

$\varepsilon_b/\varepsilon_a = -1.140/10.000 \text{ ‰}$
 $Aa1 = 4.64 + 0.05' = 4.69 \text{ cm}^2$
 $Aa2 = 0.00 + 0.15' = 0.15 \text{ cm}^2$
 $Aa3 = 0.00 + 0.06' = 0.06 \text{ cm}^2$
 $Aa4 = 0.00 + 0.06' = 0.06 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m \text{ (m=2)}$
[Uvođeno $Aa,uz = \text{Ø}8/15(m=2) = 3.35 \text{ cm}^2/m$]

$\tau_y = 0.86 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.89 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procentat armiranja: 1.16%



Merodavna kombinacija za savijanje:

1.30xI+1.30xII+1.30xIII+1.30xVIII

N1u = 1.66 kN

M2u = 0.00 kNm

M3u = 0.00 kNm

Merodavna kombinacija za torziju:

1.30xI+1.30xII+1.30xIII+1.30xVII

M1u = -1.44 kNm

Merodavna kombinacija za smicanje:

1.30xI+1.30xII+1.30xIII+1.30xVII

T2u = 38.11 kN

T3u = 6.29 kN

M1u = -1.44 kNm

 $eb/ea = 1.256/10.000 \%$ Aa1 = 0.00 + 0.05' = 0.05 cm²Aa2 = 0.00 + 0.15' = 0.15 cm²Aa3 = 0.00 + 0.06' = 0.06 cm²Aa4 = 0.00 + 0.06' = 0.06 cm²Aa,uz = 0.21 cm²/m (m=2)[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

ty = 1.32MPa < 3tr, tr = 1.10MPa

tz = 0.98MPa < tr, tr = 1.10MPa

Procentat armiranja: 1.16%

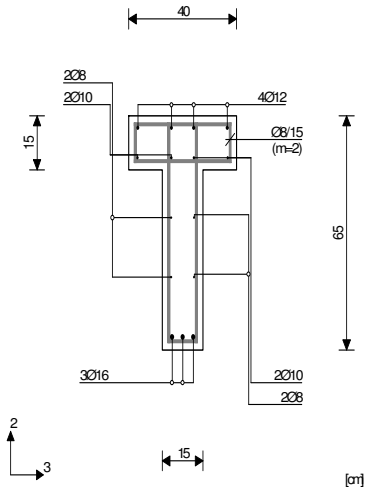
Greda 13-26

@1@PBAB 87

MB 30

B500

Kompletna sema opterećenja

Presek 14-14 x = 0.00m

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIII+1.80xVI

T2u = -76.60 kN

T3u = -8.38 kN

M1u = 1.00 kNm

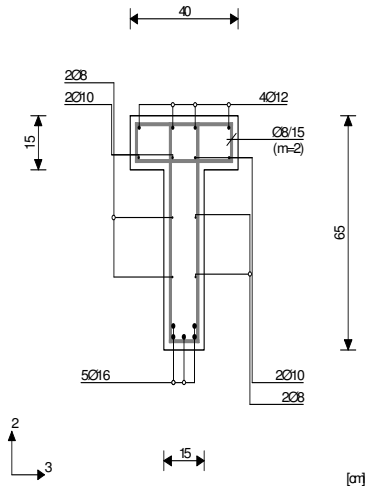
 $eb/ea = 1.256/10.000 \%$ Aa1 = 0.03 + 0.03' = 0.06 cm²Aa2 = 0.03 + 0.11' = 0.14 cm²Aa3 = 0.00 + 0.04' = 0.04 cm²Aa4 = 0.00 + 0.04' = 0.04 cm²Aa,uz = 0.63 cm²/m (m=2)[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

ty = 1.52MPa < 3tr, tr = 1.10MPa

tz = 0.76MPa < tr, tr = 1.10MPa

Procentat armiranja: 1.16%

*) - dodatna poduzna armatura za prijem torzije.

Presek 15-15 x = 5.20m

Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII+1.80xVI

N1u = -1.88 kN

M2u = 0.00 kNm

M3u = 199.17 kNm

Merodavna kombinacija za torziju:

1.60xI+1.60xII+1.80xIII+1.80xVI

M1u = 1.00 kNm

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIII+1.80xVI

T2u = 0.00 kN

T3u = 0.00 kN

M1u = 1.00 kNm

 $eb/ea = -1.466/10.000 \%$ Aa1 = 6.94 + 0.03' = 6.98 cm²Aa2 = 0.00 + 0.11' = 0.11 cm²Aa3 = 0.00 + 0.04' = 0.04 cm²Aa4 = 0.00 + 0.04' = 0.04 cm²Aa,uz = 0.00 cm²/m (m=2)[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

ty = 0.60MPa < tr, tr = 1.10MPa

tz = 0.60MPa < tr, tr = 1.10MPa

Procentat armiranja: 1.46%

Merodavna kombinacija za savijanje:

1.30xI+1.30xII+1.30xIII+1.30xVIII

N1u = 2.80 kN

M2u = 0.00 kNm

M3u = 0.00 kNm

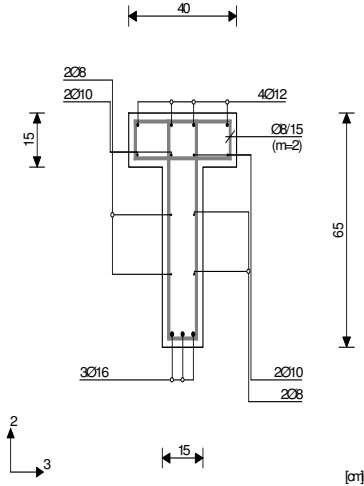
Merodavna kombinacija za torziju:

1.60xI+1.60xII+1.80xIII+1.80xVI

M1u = 1.00 kNm

Greda 26-34
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 20-20 x = 0.00m



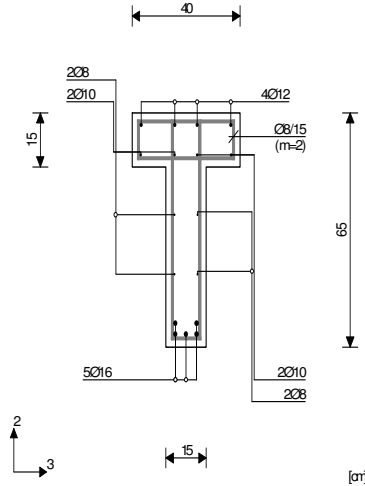
Merodavna kombinacija za savijanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVIII$
 $N1u = 1.23 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $M1u = -1.03 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $T2u = -75.87 \text{ kN}$
 $T3u = -8.30 \text{ kN}$
 $M1u = -1.03 \text{ kNm}$

$eb/ea = 1.256/10.000 \%$
 $Aa1 = 0.00 + 0.03' = 0.03 \text{ cm}^2$
 $Aa2 = 0.00 + 0.11' = 0.11 \text{ cm}^2$
 $Aa3 = 0.00 + 0.05' = 0.05 \text{ cm}^2$
 $Aa4 = 0.00 + 0.05' = 0.05 \text{ cm}^2$
 $Aa,uz = 0.63 \text{ cm}^2/m \quad (m=2)$
 $[Uvojenio Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/m]$
 $ty = 1.53 \text{ MPa} < 3\tau, \tau_r = 1.10 \text{ MPa}$
 $tz = 0.78 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.16%
 *) - dodatna poduzna armatura za prijem torzije.

Presek 21-21 x = 5.15m



Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $N1u = -0.63 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 195.36 \text{ kNm}$

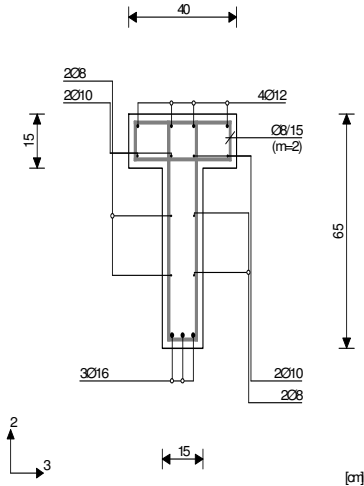
Merodavna kombinacija za torziju:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $M1u = -1.03 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $T2u = 0.00 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = -1.03 \text{ kNm}$

$eb/ea = -1.445/10.000 \%$
 $Aa1 = 6.82 + 0.03' = 6.85 \text{ cm}^2$
 $Aa2 = 0.00 + 0.11' = 0.11 \text{ cm}^2$
 $Aa3 = 0.00 + 0.05' = 0.05 \text{ cm}^2$
 $Aa4 = 0.00 + 0.05' = 0.05 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m \quad (m=2)$
 $[Uvojenio Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/m]$
 $ty = 0.62 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 $tz = 0.62 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.46%

Greda 18-30
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 16-16 x = 0.00m

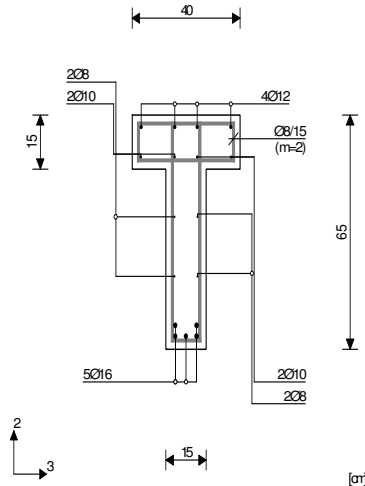


Merodavna kombinacija za savijanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVIII$
 $N1u = 5.65 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $T2u = -76.60 \text{ kN}$
 $T3u = -8.38 \text{ kN}$
 $M1u = 0.00 \text{ kNm}$

$eb/ea = 1.256/10.000 \%$
 $Aa1 = 0.06 \text{ cm}^2$
 $Aa2 = 0.07 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m \quad (m=2)$
 $[Uvojenio Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/m]$
 $ty = 0.92 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 $tz = 0.16 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.16%

Presek 17-17 x = 5.20m

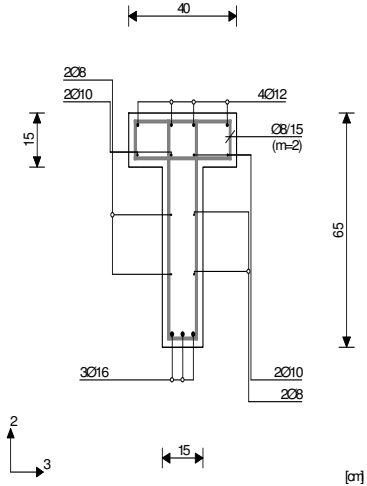


Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $N1u = -1.51 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 199.17 \text{ kNm}$

$eb/ea = -1.466/10.000 \%$
 $Aa1 = 6.95 \text{ cm}^2$
 $Aa2 = 0.00 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m \quad (m=2)$
 $[Uvojenio Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/m]$
 Procenat armiranja: 1.46%

Greda 30-37
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 22-22 $x = 0.00m$

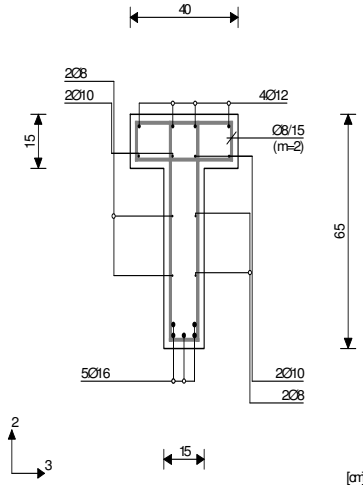


Merodavna kombinacija za savijanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVIII$
 $N1u = 2.26 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $T2u = -75.87 \text{ kN}$
 $T3u = -8.30 \text{ kN}$
 $M1u = -0.00 \text{ kNm}$

$eb/ea = 1.256/10.000 \%$
 $Aa1 = 0.02 \text{ cm}^2$
 $Aa2 = 0.03 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m$ (m=2)
 $[Usvajeno Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/m]$
 $\tau_y = 0.91 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.16 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.16%

Presek 23-23 $x = 5.15m$

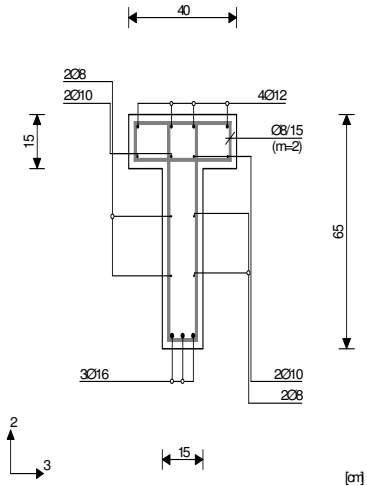


Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $N1u = -0.51 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 195.36 \text{ kNm}$

$eb/ea = -1.445/10.000 \%$
 $Aa1 = 6.82 \text{ cm}^2$
 $Aa2 = 0.00 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m$ (m=2)
 $[Usvajeno Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/m]$
 Procentat armiranja: 1.46%

Greda 22-32
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 18-18 $x = 0.00m$



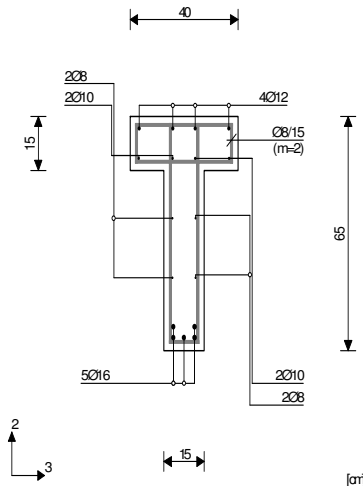
Merodavna kombinacija za savijanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVIII$
 $N1u = 4.97 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $M1u = -1.00 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $T2u = -76.60 \text{ kN}$
 $T3u = -8.38 \text{ kN}$
 $M1u = -1.00 \text{ kNm}$

$eb/ea = 1.256/10.000 \%$
 $Aa1 = 0.05 + 0.03' = 0.08 \text{ cm}^2$
 $Aa2 = 0.06 + 0.10' = 0.16 \text{ cm}^2$
 $Aa3 = 0.00 + 0.04' = 0.04 \text{ cm}^2$
 $Aa4 = 0.00 + 0.04' = 0.04 \text{ cm}^2$
 $Aa,uz = 0.62 \text{ cm}^2/m$ (m=2)
 $[Usvajeno Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/m]$
 $\tau_y = 1.52 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.76 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.16%
 *) - dodatna poduzna armatura za prijem torzije.

Presek 19-19 $x = 5.20m$



Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $N1u = -2.11 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 199.17 \text{ kNm}$

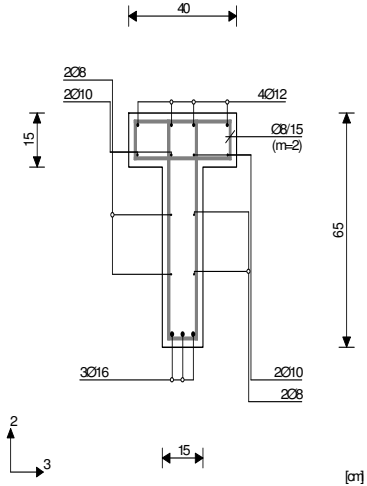
Merodavna kombinacija za torziju:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $M1u = -1.00 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $T2u = 0.00 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = -1.00 \text{ kNm}$

$eb/ea = -1.466/10.000 \%$
 $Aa1 = 6.94 + 0.03' = 6.97 \text{ cm}^2$
 $Aa2 = 0.00 + 0.10' = 0.10 \text{ cm}^2$
 $Aa3 = 0.00 + 0.04' = 0.04 \text{ cm}^2$
 $Aa4 = 0.00 + 0.04' = 0.04 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m$ (m=2)
 $[Usvajeno Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/m]$
 $\tau_y = 0.60 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.60 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.46%

Greda 32-38
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 24-24 x = 0.00m



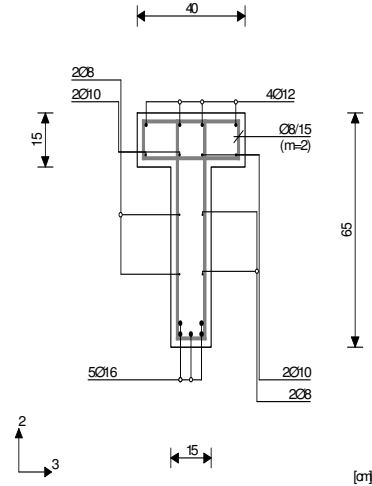
Merodavna kombinacija za savijanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVIII$
 $N1u = 1.97 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $M1u = 1.03 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $T2u = -75.87 \text{ kN}$
 $T3u = -8.30 \text{ kN}$
 $M1u = 1.03 \text{ kNm}$

$eb/ea = 1.256/10.000 \%$
 $Aa1 = 0.00 + 0.03' = 0.03 \text{ cm}^2$
 $Aa2 = 0.02 + 0.11' = 0.13 \text{ cm}^2$
 $Aa3 = 0.00 + 0.04' = 0.04 \text{ cm}^2$
 $Aa4 = 0.00 + 0.04' = 0.04 \text{ cm}^2$
 $Aa,uz = 0.63 \text{ cm}^2/m \quad (m=2)$
 $[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/m]$
 $\tau_y = 1.53 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.77 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.16%
 *) - dodatna poduzna armatura za prijem torzije.

Presek 25-25 x = 5.15m



Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $N1u = -0.70 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 195.36 \text{ kNm}$

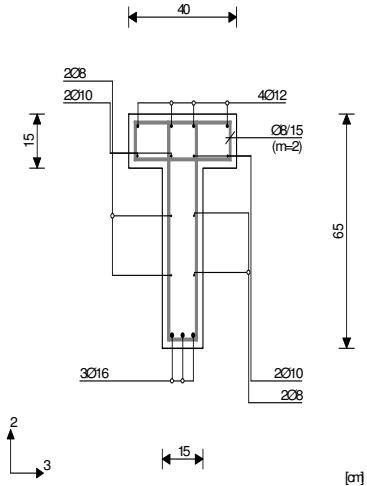
Merodavna kombinacija za torziju:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $M1u = 1.03 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xIII+1.80xVI$
 $T2u = 0.00 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = 1.03 \text{ kNm}$

$eb/ea = -1.445/10.000 \%$
 $Aa1 = 6.82 + 0.03' = 6.85 \text{ cm}^2$
 $Aa2 = 0.00 + 0.11' = 0.11 \text{ cm}^2$
 $Aa3 = 0.00 + 0.04' = 0.04 \text{ cm}^2$
 $Aa4 = 0.00 + 0.04' = 0.04 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m \quad (m=2)$
 $[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/m]$
 $\tau_y = 0.61 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.61 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.46%

Greda 27-35
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 26-26 x = 0.00m



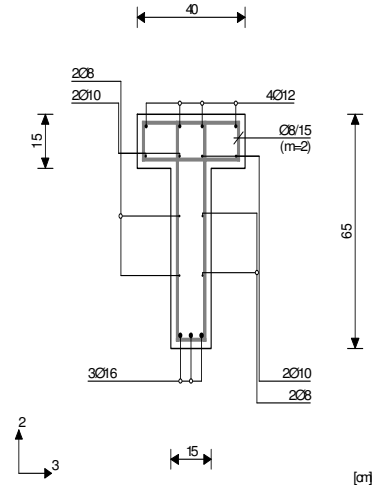
Merodavna kombinacija za savijanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVIII$
 $N1u = 1.82 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $M1u = 1.80 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xIII+1.80xIV$
 $+1.80xVI$
 $T2u = -44.49 \text{ kN}$
 $T3u = -5.84 \text{ kN}$
 $M1u = 1.68 \text{ kNm}$

$eb/ea = 1.256/10.000 \%$
 $Aa1 = 0.00 + 0.06' = 0.06 \text{ cm}^2$
 $Aa2 = 0.02 + 0.19' = 0.21 \text{ cm}^2$
 $Aa3 = 0.00 + 0.08' = 0.08 \text{ cm}^2$
 $Aa4 = 0.00 + 0.08' = 0.08 \text{ cm}^2$
 $Aa,uz = 0.43 \text{ cm}^2/m \quad (m=2)$
 $[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/m]$
 $\tau_y = 1.54 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 1.16 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.16%
 *) - dodatna poduzna armatura za prijem torzije.

Presek 27-27 x = 5.20m



Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII+1.80xIV$
 $N1u = -1.21 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 135.83 \text{ kNm}$

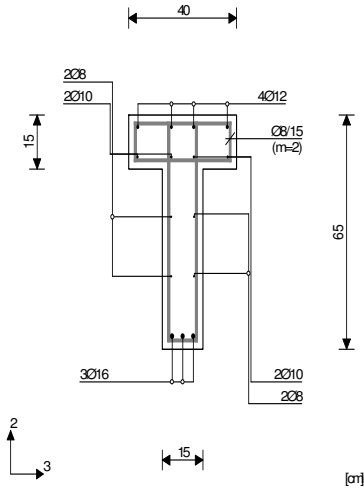
Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $M1u = 1.80 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $T2u = 0.00 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = 1.80 \text{ kNm}$

$eb/ea = -1.149/10.000 \%$
 $Aa1 = 4.69 + 0.06' = 4.75 \text{ cm}^2$
 $Aa2 = 0.00 + 0.19' = 0.19 \text{ cm}^2$
 $Aa3 = 0.00 + 0.08' = 0.08 \text{ cm}^2$
 $Aa4 = 0.00 + 0.08' = 0.08 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m \quad (m=2)$
 $[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/m]$
 $\tau_y = 1.07 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 1.07 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.16%

Greda 35-39
@1@PBAB 87
MB 30
B500
Kompletna sema opterećenja

Presek 28-28 x = 0.00m



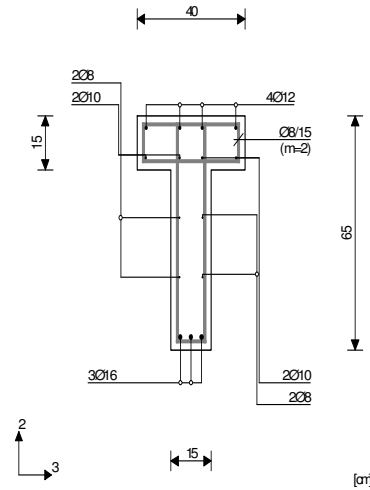
Merodavna kombinacija za savijanje:
1.30xI+1.30xII+1.30xIII-1.30xVIII
N1u = 2.22 kN
M2u = 0.00 kNm
M3u = 0.00 kNm

Merodavna kombinacija za torziju:
1.60xI+1.60xII+1.80xIII+1.80xIV
+1.80xVI
M1u = -1.25 kNm

Merodavna kombinacija za smicanje:
1.60xI+1.60xII+1.80xIII+1.80xIV
+1.80xVI
T2u = -44.07 kN
T3u = -5.79 kN
M1u = -1.25 kNm

$\epsilon_b/\epsilon_a = 1.256/10.000 \%$
Aa1 = 0.02 + 0.04' = 0.06 cm²
Aa2 = 0.03 + 0.13' = 0.16 cm²
Aa3 = 0.00 + 0.05' = 0.05 cm²
Aa4 = 0.00 + 0.05' = 0.05 cm²
Aa,uz = 0.20 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]
 $\tau_y = 1.28 \text{ MPa} < 3\tau$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.86 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procentat armiranja: 1.16%
*) - dodatna poduzna armatura za prijem torzije.

Presek 29-29 x = 5.15m



Merodavna kombinacija za savijanje:
1.60xI+1.60xII+1.80xIII+1.80xVI
N1u = -1.02 kN
M2u = 0.00 kNm
M3u = 133.23 kNm

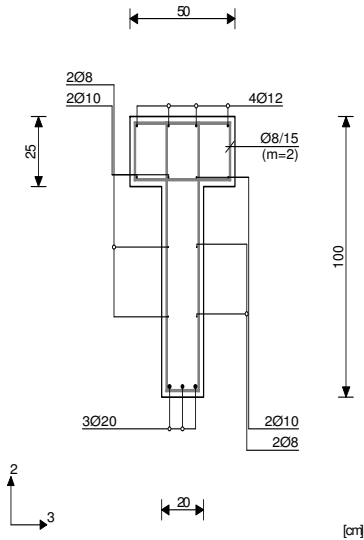
Merodavna kombinacija za torziju:
1.60xI+1.60xII+1.80xIII+1.80xIV
+1.80xVI
M1u = -1.25 kNm

Merodavna kombinacija za smicanje:
1.60xI+1.60xII+1.80xIII+1.80xIV
+1.80xVI
T2u = 0.00 kN
T3u = 0.00 kN
M1u = -1.25 kNm

$\epsilon_b/\epsilon_a = -1.134/10.000 \%$
Aa1 = 4.59 + 0.04' = 4.63 cm²
Aa2 = 0.00 + 0.13' = 0.13 cm²
Aa3 = 0.00 + 0.05' = 0.05 cm²
Aa4 = 0.00 + 0.05' = 0.05 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]
 $\tau_y = 0.75 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.75 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procentat armiranja: 1.16%

Greda 8-27
@1@PBAB 87
MB 30
B500
Kompletna sema opterećenja

Presek 1-1 x = 0.00m



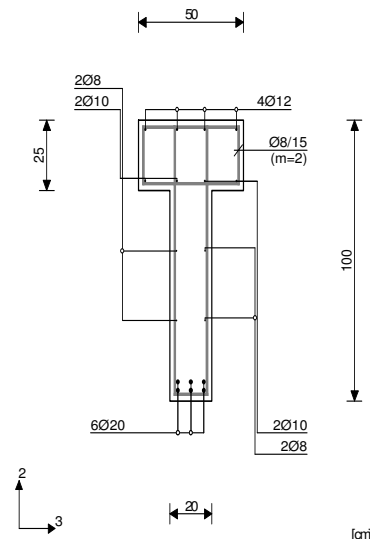
Merodavna kombinacija za savijanje:
1.90xI+1.90xII+2.10xIII+2.10xIV
+2.10xVI
N1u = -35.80 kN
M2u = 0.00 kNm
M3u = 0.00 kNm

Merodavna kombinacija za torziju:
1.30xI+1.30xII+1.30xIII-1.30xVIII
M1u = 4.92 kNm

Merodavna kombinacija za smicanje:
1.30xI+1.30xII+1.30xIII-1.30xVIII
T2u = -138.58 kN
T3u = 5.11 kN
M1u = 4.92 kNm

Aa1 = 0.00 + 0.10' = 0.10 cm²
Aa2 = 0.00 + 0.29' = 0.29 cm²
Aa3 = 0.00 + 0.16' = 0.16 cm²
Aa4 = 0.00 + 0.16' = 0.16 cm²
Aa,uz = 0.76 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]
 $\tau_y = 1.50 \text{ MPa} < 3\tau$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.74 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procentat armiranja: 0.69%
*) - dodatna poduzna armatura za prijem torzije.

Presek 2-2 x = 6.37m



Merodavna kombinacija za savijanje:
1.60xI+1.60xII+1.80xIII+1.80xVI
N1u = 2.64 kN
M2u = 0.00 kNm
M3u = 709.87 kNm

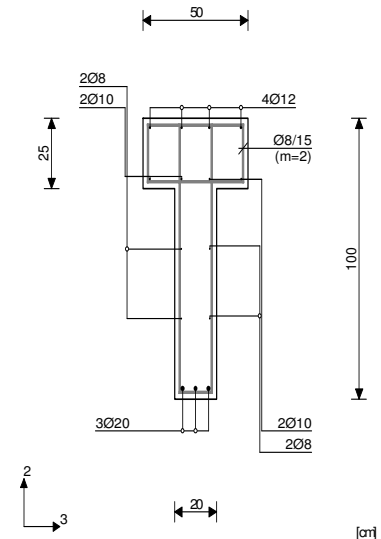
Merodavna kombinacija za torziju:
1.30xI+1.30xII+1.30xIII-1.30xVIII
M1u = 4.39 kNm

Merodavna kombinacija za smicanje:
1.30xI+1.30xII+1.30xIII-1.30xVIII
T2u = 27.36 kN
T3u = -3.41 kN
M1u = 4.39 kNm

$\epsilon_b/\epsilon_a = -1.652/10.000 \%$

Aa1 = 16.20 + 0.09' = 16.29 cm²
Aa2 = 0.00 + 0.26' = 0.26 cm²
Aa3 = 0.00 + 0.14' = 0.14 cm²
Aa4 = 0.00 + 0.14' = 0.14 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]
 $\tau_y = 0.78 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.65 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procentat armiranja: 1.04%

Presek 3-3 x = 12.74m



Merodavna kombinacija za savijanje:
1.60xI+1.60xII+1.80xIII+1.80xV
N1u = 21.21 kN
M2u = 0.00 kNm
M3u = 0.00 kNm

Merodavna kombinacija za torziju:
1.30xI+1.30xII+1.30xIII-1.30xVIII
M1u = 4.43 kNm

Merodavna kombinacija za smicanje:
1.30xI+1.30xII+1.30xIII-1.30xVIII
T2u = 138.58 kN
T3u = -4.60 kN
M1u = 4.43 kNm

$\epsilon_b/\epsilon_a = 1.350/10.000 \%$

Aa1 = 0.21 + 0.09' = 0.30 cm2
 Aa2 = 0.25 + 0.26' = 0.51 cm2
 Aa3 = 0.00 + 0.14' = 0.14 cm2
 Aa4 = 0.00 + 0.14' = 0.14 cm2
 Aa,uz = 0.65 cm2/m (m=2)
 [Uvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm2/m]

ty = 1.44MPa < 3tr, tr = 1.10MPa
 tz = 0.67MPa < tr, tr = 1.10MPa
 Procenat armiranja: 0.69%

Greda 21-35

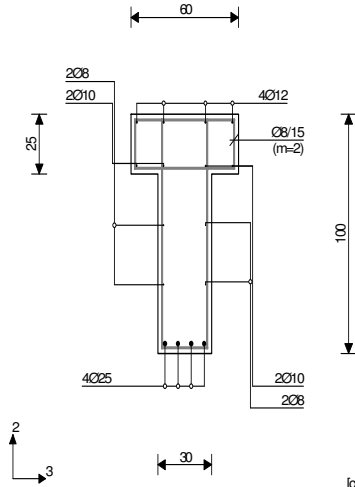
@1@PBAB 87

MB 30

B500

Kompletna sema opterećenja

Presek 4-4 x = 0.00m



Merodavna kombinacija za savijanje:

1.00xI+1.00xII+1.30xVII
 N1u = 4.28 kN
 M2u = 0.00 kNm
 M3u = 0.00 kNm

Merodavna kombinacija za torziju:

1.30xI+1.30xII+1.30xIII-1.30xVIII
 M1u = 8.67 kNm

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIII+1.80xV
 +1.80xVI
 T2u = -300.44 kN
 T3u = -7.16 kN
 M1u = -5.42 kNm

eb/ea = 1.638/10.000 ‰

Aa1 = 0.04 + 0.18' = 0.22 cm2
 Aa2 = 0.05 + 0.40' = 0.45 cm2
 Aa3 = 0.00 + 0.19' = 0.19 cm2
 Aa4 = 0.00 + 0.19' = 0.19 cm2
 Aa,uz = 2.02 cm2/m (m=2)
 [Uvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm2/m]

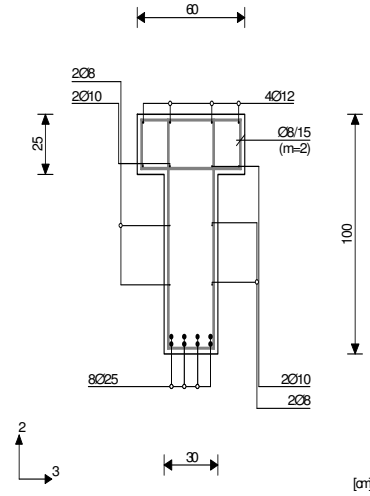
ty = 1.82MPa < 3tr, tr = 1.10MPa

tz = 0.96MPa < tr, tr = 1.10MPa

Procenat armiranja: 0.78%

*) - dodatna poduzna armatura za prijem torzije.

Presek 5-5 x = 6.37m



Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII+1.80xVI
 N1u = 5.99 kN
 M2u = 0.00 kNm
 M3u = 1271.24 kNm

Merodavna kombinacija za torziju:

1.30xI+1.30xII+1.30xIII-1.30xVIII
 M1u = 8.67 kNm

Merodavna kombinacija za smicanje:

1.30xI+1.30xII+1.30xIII-1.30xVIII
 T2u = 54.46 kN
 T3u = -2.66 kN
 M1u = 8.67 kNm

eb/ea = -2.248/10.000 ‰

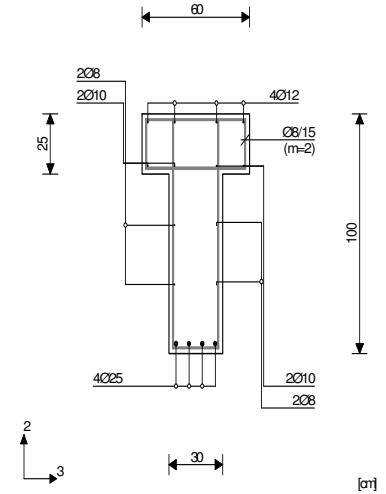
Aa1 = 29.61 + 0.18' = 29.79 cm2
 Aa2 = 0.00 + 0.40' = 0.40 cm2
 Aa3 = 0.00 + 0.19' = 0.19 cm2
 Aa4 = 0.00 + 0.19' = 0.19 cm2
 Aa,uz = 0.00 cm2/m (m=2)
 [Uvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm2/m]

ty = 1.10MPa < tr, tr = 1.10MPa

tz = 0.91MPa < tr, tr = 1.10MPa

Procenat armiranja: 1.31%

Presek 6-6 x = 12.74m



Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII+1.80xV
 N1u = 37.84 kN
 M2u = 0.00 kNm
 M3u = 0.00 kNm

Merodavna kombinacija za torziju:

1.30xI+1.30xII+1.30xIII-1.30xVIII
 M1u = 8.67 kNm

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIII+1.80xV
 +1.80xVI
 T2u = 300.44 kN
 T3u = 7.47 kN
 M1u = -5.42 kNm

eb/ea = 1.639/10.000 ‰

Aa1 = 0.35 + 0.18' = 0.53 cm2
 Aa2 = 0.42 + 0.40' = 0.82 cm2
 Aa3 = 0.00 + 0.19' = 0.19 cm2
 Aa4 = 0.00 + 0.19' = 0.19 cm2
 Aa,uz = 2.02 cm2/m (m=2)
 [Uvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm2/m]

ty = 1.82MPa < 3tr, tr = 1.10MPa

tz = 0.95MPa < tr, tr = 1.10MPa

Procenat armiranja: 0.78%

Greda 31-39

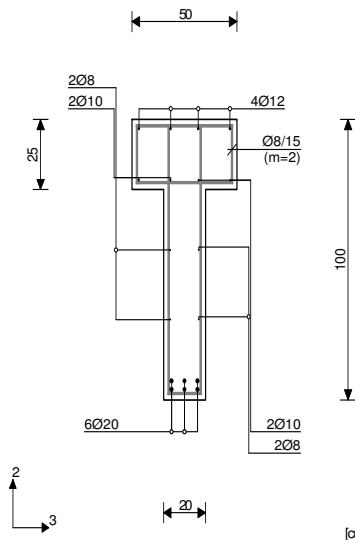
@1@PBAB 87

MB 30

B500

Kompletna sema opterećenja

Presek 7-7 x = 6.37m



Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII+1.80xVI
 N1u = 2.89 kN
 M2u = 0.00 kNm
 M3u = 705.82 kNm

Merodavna kombinacija za torziju:

1.30xI+1.30xII+1.30xIII-1.30xVIII
 M1u = 4.60 kNm

Merodavna kombinacija za smicanje:

1.30xI+1.30xII+1.30xIII-1.30xVIII
 T2u = 27.10 kN
 T3u = -1.29 kN
 M1u = 4.60 kNm

eb/ea = -1.646/10.000 ‰

Aa1 = 16.11 + 0.09' = 16.21 cm2
 Aa2 = 0.00 + 0.27' = 0.27 cm2
 Aa3 = 0.00 + 0.15' = 0.15 cm2
 Aa4 = 0.00 + 0.15' = 0.15 cm2
 Aa,uz = 0.00 cm2/m (m=2)
 [Uvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm2/m]

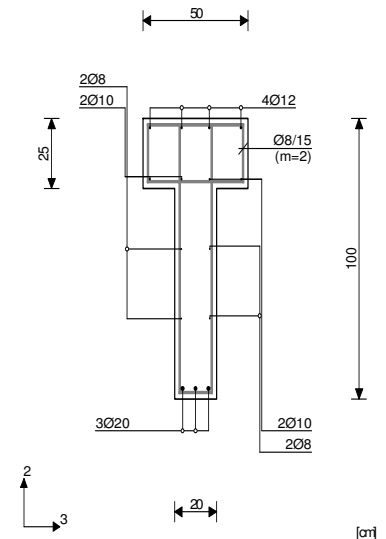
ty = 0.81MPa < tr, tr = 1.10MPa

tz = 0.66MPa < tr, tr = 1.10MPa

Procenat armiranja: 1.04%

*) - dodatna poduzna armatura za prijem torzije.

Presek 8-8 x = 12.74m



Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII+1.80xV
 N1u = 21.58 kN
 M2u = 0.00 kNm
 M3u = 0.00 kNm

Merodavna kombinacija za torziju:

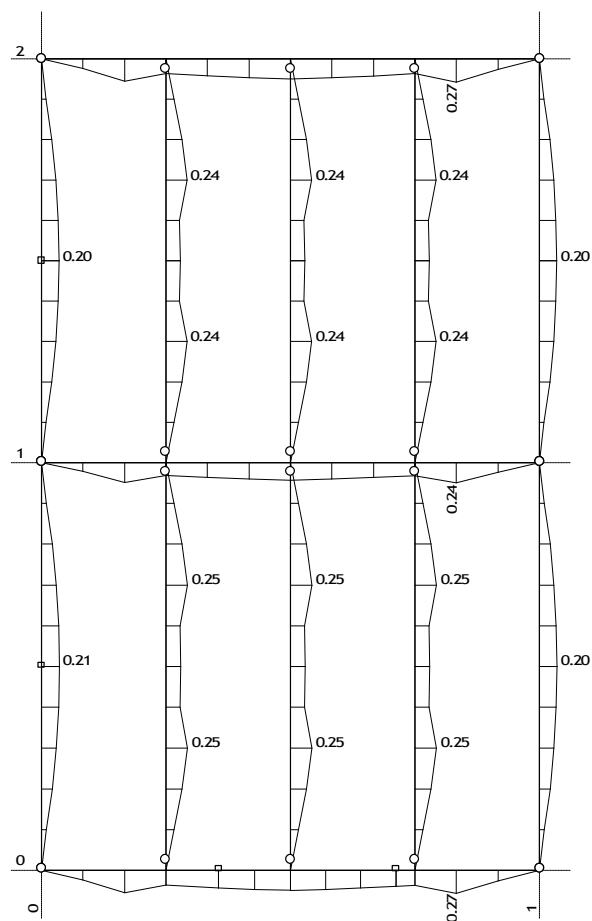
1.30xI+1.30xII+1.30xIII-1.30xVIII
 M1u = 4.60 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII+1.80xV
 +1.80xVI
 T2u = 171.86 kN
 T3u = 3.75 kN
 M1u = -2.87 kNm

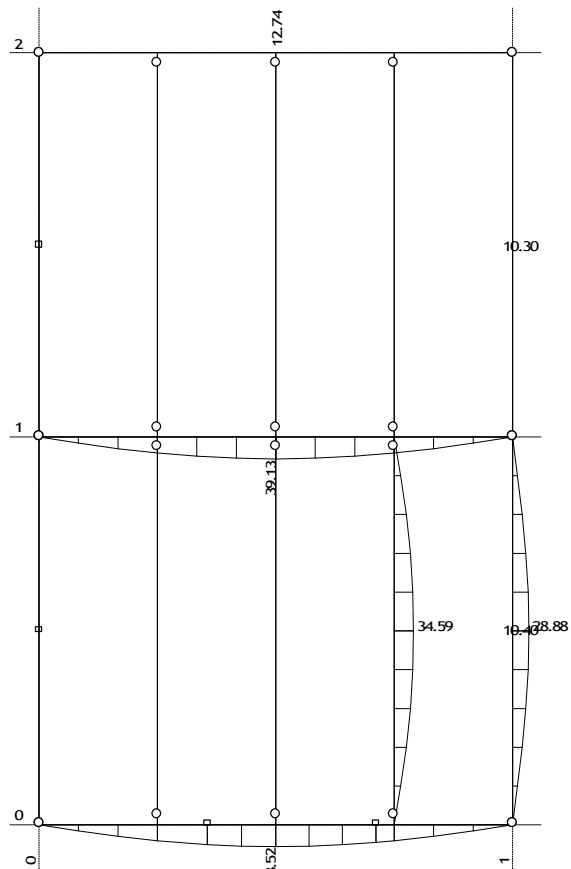
$\epsilon_b/\epsilon_a = 1.350/10.000 \%$
 Aa1 = 0.21 + 0.09' = 0.31 cm2
 Aa2 = 0.25 + 0.27' = 0.52 cm2
 Aa3 = 0.00 + 0.15' = 0.15 cm2
 Aa4 = 0.00 + 0.15' = 0.15 cm2
 Aa,uz = 0.71 cm2/m (m=2)
 [Uvojeno Aa,uz = 0.15(m=2) = 3.35 cm2/m]

$\tau_y = 1.45\text{MPa} < 3\tau_r$, $\tau_r = 1.10\text{MPa}$
 $\tau_z = 0.69\text{MPa} < \tau_r$, $\tau_r = 1.10\text{MPa}$
 Procentat armiranja: 0.69%

@1@PBAB 87, MB 30, B500



Pogled: Krov
 Dijagram prsline: $\max a_k(t^\infty) = 0.27 \text{ mm}$

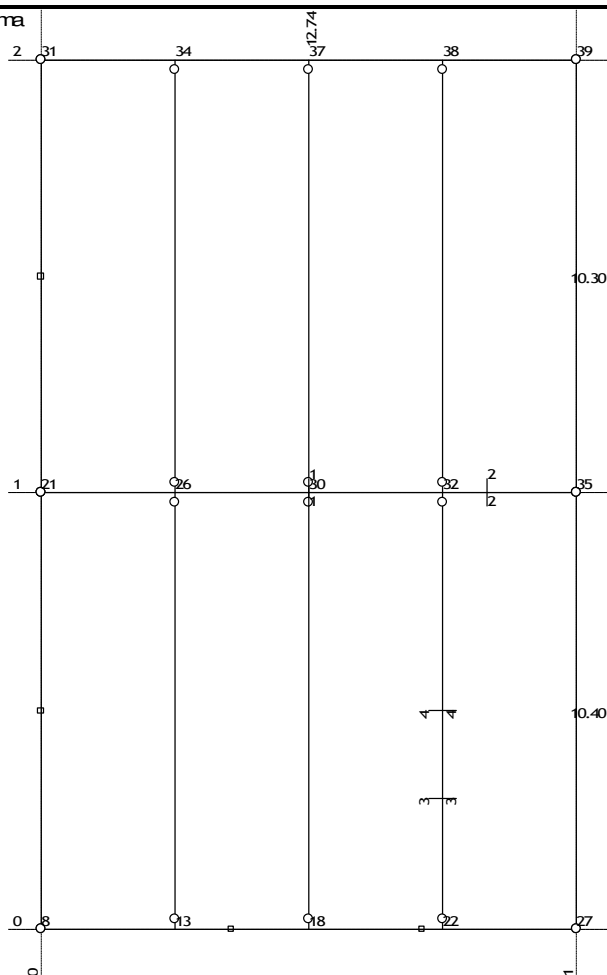


Pogled: Krov

Dijagram ugiba: $\max ug(t^{\infty}) = 39.13 \text{ mm} < L/300 = 12740/300 = 42.5 \text{ mm} \dots \text{OK}$
 roznjaca $\max ug(t^{\infty}) = 34.59 \text{ mm} < L/300 = 10400/300 = 34.7 \text{ mm} \dots \text{OK}$

Merodavno opterećenje: Kompletna sema

@1@PBAB 87, MB 30, B600



Pogled: Krov

Dispozicija grede

Greda 22-32

@1@PBAB 87

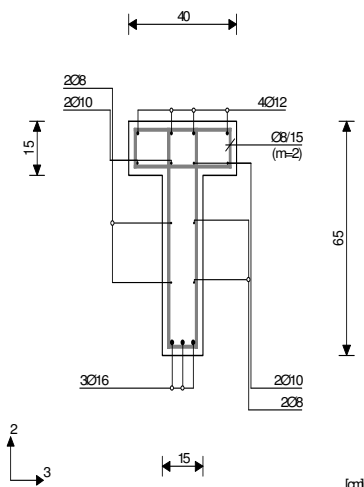
MB 30

B500

 $E_b(t_0) = 3.15e+007 \text{ kN/m}^2$ $E_a = 2e+008 \text{ kN/m}^2$ $f_{bzs} = 1756.41 \text{ kN/m}^2$ $\phi = 2.50$ $X = 1.00$ $\epsilon_s = 0.340\text{‰}$ $k_1 = 0.40$ $\beta_1 = 1.00$

Savijanje oko ose 3

Ugib: Savijanje oko ose 3

Presek 3-3 x = 3.12m $T = 0$ Presek sa prslinom

Merodavna kombinacija: 1.00xI+1.00xII

 $N_1 = 0.00 \text{ kN}$ $M_3 = 56.02 \text{ kNm}$ $M_2 = -6.64 \text{ kNm}$

Ivni naponi u betonu

[-4627.19 , 24400.29] kN/m²

Ivne dilatacije

[-0.15‰ , 0.77‰]

 $k_2 = 0.125$ $\sigma_{a1,II} = 144715.02 \text{ kN/m}^2$ $\beta_2 = 1.00$ $\zeta = 0.79$ $\epsilon_{sr} = 0.57\text{‰}$ $M_r = 25.97 \text{ kNm}$ $N_r = 0.00 \text{ kN}$ $\sigma_{a,r} = 67088.09 \text{ kN/m}^2$ $\mu_z, ef = 1.58\%$

Rastojanje prslina Lps = 13.15 cm

Sirina prslina ak(t₀) = 0.127 mm

Ugib

Merodavna kombinacija: 1.00xI+1.00xII

 $N_1 = 0.00 \text{ kN}$ $M_3 = 56.02 \text{ kNm}$ $M_2 = -6.64 \text{ kNm}$ **ug(t₀) = 8.787 mm** $T = \infty$ Presek sa prslinom

Dugotrajni uticaji

Merodavna kombinacija: 1.00xI+1.00xII

 $N_1 = 0.00 \text{ kN}$ $M_3 = 56.02 \text{ kNm}$ $M_2 = -6.64 \text{ kNm}$

Kratkotrajni uticaji

Merodavna kombinacija: 1.00xIII

+1.00xVI

 $N_1 = -1.17 \text{ kN}$ $M_3 = 43.15 \text{ kNm}$ $M_2 = -4.26 \text{ kNm}$

Ivni naponi u betonu

[-5541.20 , 29387.59] kN/m²

Ivne dilatacije

[-0.67‰ , 1.44‰]

 $k_2 = 0.125$ $\sigma_{a1,II} = 264919.02 \text{ kN/m}^2$ $\beta_2 = 0.50$ $\zeta = 0.97$ $\epsilon_{sr} = 1.28\text{‰}$ $M_r = 26.00 \text{ kNm}$ $N_r = -0.31 \text{ kN}$ $\sigma_{a,r} = 67008.29 \text{ kN/m}^2$ $\mu_z, ef = 1.58\%$

Rastojanje prslina Lps = 11.45 cm

Sirina prslina ak(t₀) = 0.250 mm

Ugib

Dugotrajni uticaji

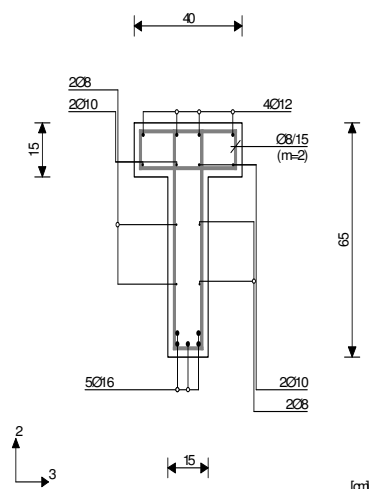
Merodavna kombinacija: 1.00xI+1.00xII

 $N_1 = 0.00 \text{ kN}$ $M_3 = 56.02 \text{ kNm}$ $M_2 = -6.64 \text{ kNm}$

Kratkotrajni uticaji

Merodavna kombinacija:

1.00xIII+1.00xVI

 $N_1 = -1.17 \text{ kN}$ $M_3 = 43.15 \text{ kNm}$ $M_2 = -4.26 \text{ kNm}$ **ug(t₀) = 28.712 mm****Presek 4-4 x = 5.20m** $T = 0$ Presek sa prslinom

Merodavna kombinacija: 1.00xI+1.00xII

 $N_1 = 0.00 \text{ kN}$ $M_3 = 66.69 \text{ kNm}$ $M_2 = -7.91 \text{ kNm}$

Ivni naponi u betonu

[-4583.98 , 19273.87] kN/m²

Ivne dilatacije

[-0.15‰ , 0.61‰]

 $k_2 = 0.125$ $\sigma_{a1,II} = 113984.23 \text{ kN/m}^2$ $\beta_2 = 1.00$ $\zeta = 0.83$ $\epsilon_{sr} = 0.47\text{‰}$ $M_r = 27.31 \text{ kNm}$ $N_r = 0.00 \text{ kN}$ $\sigma_{a,r} = 46678.74 \text{ kN/m}^2$ $\mu_z, ef = 2.37\%$

Rastojanje prslina Lps = 9.76 cm

Sirina prslina ak(t₀) = 0.079 mm

Ugib

Merodavna kombinacija: 1.00xI+1.00xII

 $N_1 = 0.00 \text{ kN}$ $M_3 = 66.69 \text{ kNm}$ $M_2 = -7.91 \text{ kNm}$ **ug(t₀) = 10.732 mm** $T = \infty$ Presek sa prslinom

Dugotrajni uticaji

Merodavna kombinacija: 1.00xI+1.00xII

 $N_1 = 0.00 \text{ kN}$ $M_3 = 66.69 \text{ kNm}$ $M_2 = -7.91 \text{ kNm}$

Kratkotrajni uticaji

Merodavna kombinacija: 1.00xIII

+1.00xVI

 $N_1 = -1.17 \text{ kN}$ $M_3 = 51.37 \text{ kNm}$ $M_2 = -5.07 \text{ kNm}$

Ivni naponi u betonu

[-5711.73 , 23930.39] kN/m²

Ivne dilatacije

[-0.69‰ , 1.15‰]

 $k_2 = 0.125$ $\sigma_{a1,II} = 208769.61 \text{ kN/m}^2$ $\beta_2 = 0.50$ $\zeta = 0.98$ $\epsilon_{sr} = 1.02\text{‰}$ $M_r = 27.34 \text{ kNm}$ $N_r = -0.27 \text{ kN}$ $\sigma_{a,r} = 46635.92 \text{ kN/m}^2$ $\mu_z, ef = 2.37\%$

Rastojanje prslina Lps = 9.76 cm

Sirina prslina ak(t₀) = 0.169 mm

Ugib

Dugotrajni uticaji

Merodavna kombinacija: 1.00xI+1.00xII

 $N_1 = 0.00 \text{ kN}$ $M_3 = 66.69 \text{ kNm}$ $M_2 = -7.91 \text{ kNm}$

Kratkotrajni uticaji

Merodavna kombinacija:

1.00xIII+1.00xVI

 $N_1 = -1.17 \text{ kN}$ $M_3 = 51.37 \text{ kNm}$ $M_2 = -5.07 \text{ kNm}$ **ug(t₀) = 34.592 mm****Greda 21-35**

@1@PBAB 87

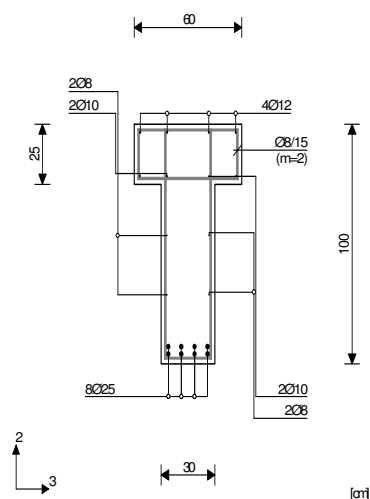
MB 30

B500

 $E_b(t_0) = 3.15e+007 \text{ kN/m}^2$ $E_a = 2e+008 \text{ kN/m}^2$ $f_{bzs} = 1680 \text{ kN/m}^2$ $\phi = 2.50$ $X = 1.00$ $\epsilon_s = 0.340\text{‰}$ $k_1 = 0.40$ $\beta_1 = 1.00$

Savijanje oko ose 3

Ugib: Savijanje oko ose 3

Presek 1-1 x = 6.37m $T = 0$ Presek sa prslinom

Merodavna kombinacija: 1.00xI+1.00xII

 $N_1 = -3.31 \text{ kN}$ $M_3 = 513.34 \text{ kNm}$ $M_2 = 0.00 \text{ kNm}$

Ivni naponi u betonu

[-8033.85 , 25208.76] kN/m²

Ivne dilatacije

[-0.26‰ , 0.80‰]

 $k_2 = 0.125$ $\sigma_{a1,II} = 151507.50 \text{ kN/m}^2$ $\beta_2 = 1.00$ $\zeta = 0.94$ $\epsilon_{sr} = 0.72\text{‰}$ $M_r = 121.43 \text{ kNm}$ $N_r = -0.78 \text{ kN}$ $\sigma_{a,r} = 35834.14 \text{ kN/m}^2$ $\mu_z, ef = 3.82\%$

Rastojanje prslina Lps = 10.33 cm

Sirina prslina ak(t₀) = 0.126 mm

Ugib

Merodavna kombinacija: 1.00xI+1.00xII

 $N_1 = -3.31 \text{ kN}$ $M_3 = 513.34 \text{ kNm}$ $M_2 = 0.00 \text{ kNm}$ **ug(t₀) = 15.853 mm** $T = \infty$ Presek sa prslinom

Dugotrajni uticaji

Merodavna kombinacija: 1.00xI+1.00xII

 $N_1 = -3.31 \text{ kN}$ $M_3 = 513.34 \text{ kNm}$ $M_2 = 0.00 \text{ kNm}$

Kratkotrajni uticaji

Merodavna kombinacija: 1.00xIII

+1.00xVI

 $N_1 = -3.00 \text{ kN}$ $M_3 = 249.94 \text{ kNm}$ $M_2 = -4.12 \text{ kNm}$

Ivni naponi u betonu

[-9299.24 , 23081.49] kN/m²

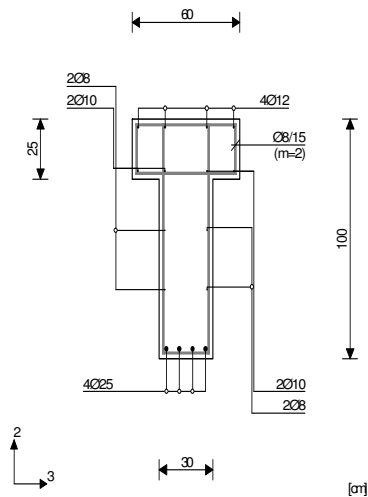
Ivne dilatacije

[-1.06‰ , 1.25‰]

 $k_2 = 0.125$ $\sigma_{a1,II} = 231674.15 \text{ kN/m}^2$ $\beta_2 = 0.50$ $\zeta = 0.99$ $\epsilon_{sr} = 1.14\text{‰}$

$M_r = 121.47 \text{ kNm}$
 $N_r = -1.00 \text{ kN}$
 $\sigma_{a,r} = 35824.30 \text{ kN/m}^2$
 $\mu_{z,ef} = 3.82\%$
 Rastojanje prsline Lps = 10.33 cm
Sirina prsline $ak(t^\infty) = 0.201 \text{ mm}$
 Ugib
 Dugotrajni uticaji
 Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = -3.31 \text{ kN}$
 $M_3 = 513.34 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
 Kratkotrajni uticaji
 Merodavna kombinacija:
 1.00xIII+1.00xVI
 $N_1 = -3.00 \text{ kN}$
 $M_3 = 249.94 \text{ kNm}$
 $M_2 = -4.12 \text{ kNm}$
 $ug(t^\infty) = 39.131 \text{ mm}$

Presek 2-2 x = 10.62m

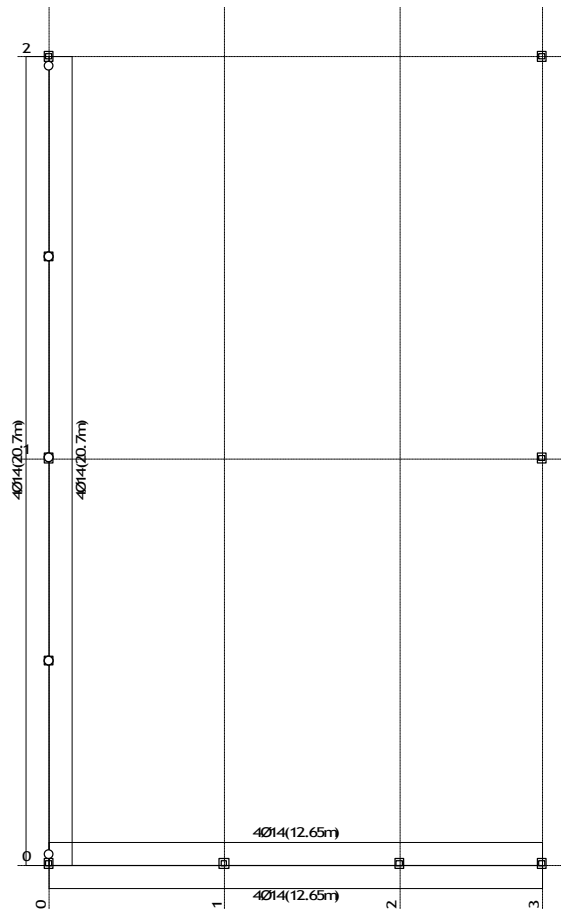


$T = 0$ Presek sa prslinom
 Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = 13.49 \text{ kN}$
 $M_3 = 267.50 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
 Ivicni naponi u betonu
 $[-5348.53, 24644.43] \text{ kN/m}^2$
 Ivicne dilatacije
 $[-0.17\text{‰}, 0.78\text{‰}]$
 $k_2 = 0.125$
 $\sigma_{a1,II} = 223211.84 \text{ kN/m}^2$
 $\beta_2 = 1.00$
 $\zeta = 0.83$
 $esr = 0.62\text{‰}$
 $M_r = 110.16 \text{ kNm}$
 $N_r = 5.56 \text{ kN}$
 $\sigma_{a,r} = 61297.62 \text{ kN/m}^2$
 $\mu_{z,ef} = 2.10\%$
 Rastojanje prsline Lps = 14.52 cm

Sirina prsline $ak(t_0) = 0.152 \text{ mm}$
 Ugib
 Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = 13.49 \text{ kN}$
 $M_3 = 267.50 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
 $ug(t_0) = 8.113 \text{ mm}$

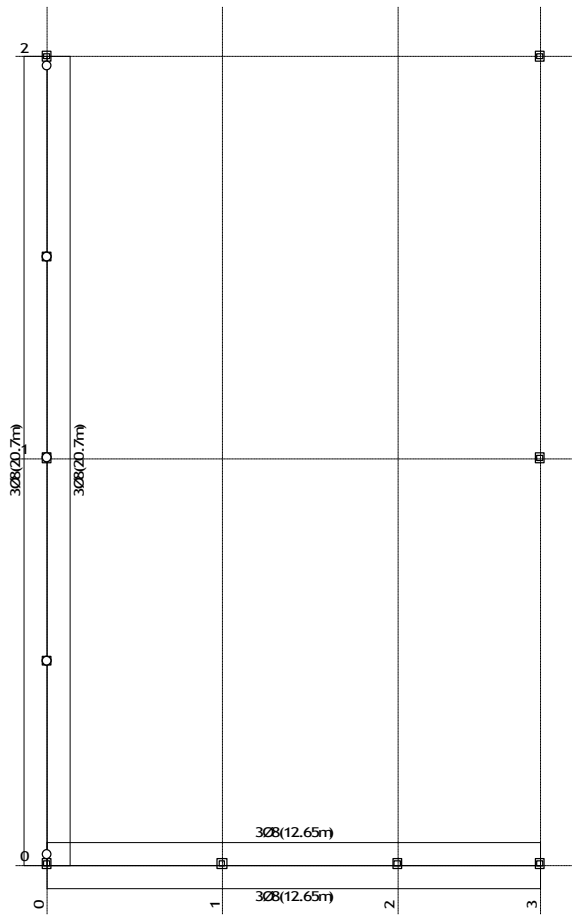
$T = \infty$ Presek sa prslinom
 Dugotrajni uticaji
 Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = 13.49 \text{ kN}$
 $M_3 = 267.50 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
 Kratkotrajni uticaji
 Merodavna kombinacija: 1.00xIII
 +1.00xVI
 $N_1 = 4.77 \text{ kN}$
 $M_3 = 125.23 \text{ kNm}$
 $M_2 = -2.20 \text{ kNm}$
 Ivicni naponi u betonu
 $[-5757.67, 22032.97] \text{ kN/m}^2$
 Ivicne dilatacije
 $[-0.78\text{‰}, 1.20\text{‰}]$
 $k_2 = 0.125$
 $\sigma_{a1,II} = 223211.84 \text{ kN/m}^2$
 $\beta_2 = 0.50$
 $\zeta = 0.96$
 $esr = 1.07\text{‰}$
 $M_r = 110.23 \text{ kNm}$
 $N_r = 5.13 \text{ kN}$
 $\sigma_{a,r} = 61255.62 \text{ kN/m}^2$
 $\mu_{z,ef} = 2.10\%$
 Rastojanje prsline Lps = 13.00 cm
Sirina prsline $ak(t^\infty) = 0.237 \text{ mm}$
 Ugib
 Dugotrajni uticaji
 Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = 13.49 \text{ kN}$
 $M_3 = 267.50 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
 Kratkotrajni uticaji
 Merodavna kombinacija:
 1.00xIII+1.00xVI
 $N_1 = 4.77 \text{ kN}$
 $M_3 = 125.23 \text{ kNm}$
 $M_2 = -2.20 \text{ kNm}$
 $ug(t^\infty) = 20.546 \text{ mm}$

Usvojena armatura
 @1@PBAB 87, MB 30, B500



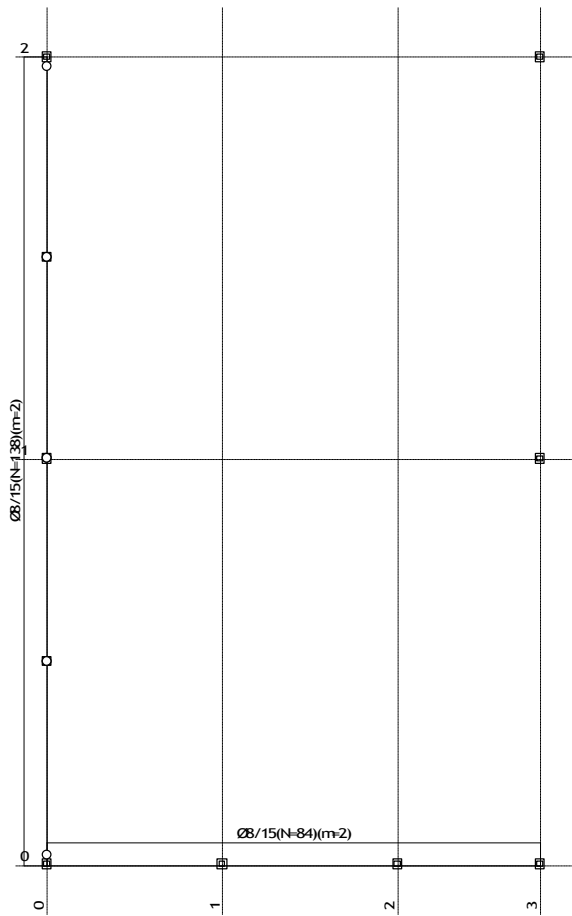
Nivo: [0.00m]
 Armatura u gredama: Aa2/Aa1

Usvojena armatura
@1@PBAB 87, MB 30, B500

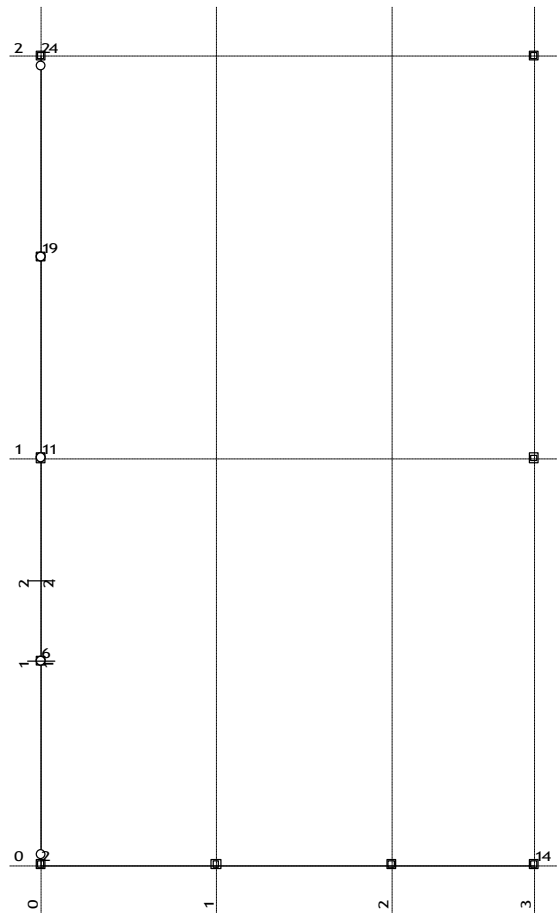


Nivo: [0.00m]
Armatura u gradama: A3/A4

Usvojena armatura
@1@PBAB 87, MB 30, B500



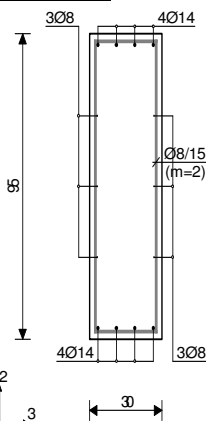
Nivo: [0.00m]
Armatura u gradama: A3/A4



Nivo: [0.00m]
Dispozicija greda

Greda 6-11
@1@PBAB 87
MB 30
B500
Kompletna sema opterećenja

Presek 1-1 x = 0.00m



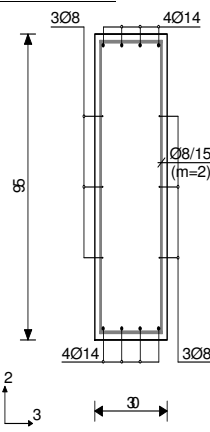
Merodavna kombinacija za savijanje:
1.30xI+1.30xII+1.30xIII+1.30xVIII
N1u = 3.59 kN
M2u = 0.00 kNm
M3u = 0.00 kNm

Merodavna kombinacija za torziju:
1.30xI+1.30xII+1.30xIII+1.30xVII
M1u = 0.61 kNm

Merodavna kombinacija za smicanje:
1.30xI+1.30xII+1.30xIII+1.30xVII
T2u = -24.08 kN
T3u = 0.00 kN
M1u = 0.61 kNm

$\epsilon_b/\epsilon_a = 10.000/10.000 \%$
Aa1 = 0.04 cm²
Aa2 = 0.04 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]
 $\tau_y = 0.16\text{MPa} < \tau_r = 1.10\text{MPa}$
 $\tau_z = 0.06\text{MPa} < \tau_r = 1.10\text{MPa}$
Procenat armiranja: 0.54%

Presek 2-2 x = 2.08m



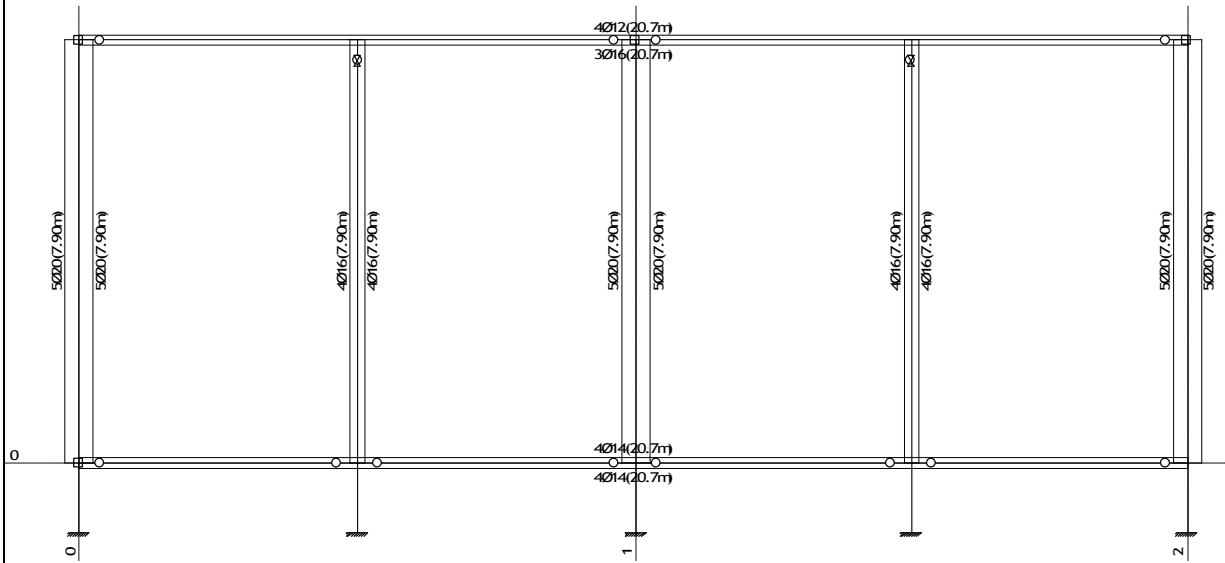
Merodavna kombinacija za savijanje:
1.60xI+1.60xII+1.80xIII+1.80xIV
+1.80xVI
N1u = 0.05 kN
M2u = 0.00 kNm
M3u = 36.99 kNm

Merodavna kombinacija za torziju:
1.30xI+1.30xII+1.30xIII+1.30xVII
M1u = 0.61 kNm

Merodavna kombinacija za smicanje:
1.30xI+1.30xII+1.30xIII+1.30xVII
T2u = -4.82 kN
T3u = 0.00 kN
M1u = 0.61 kNm

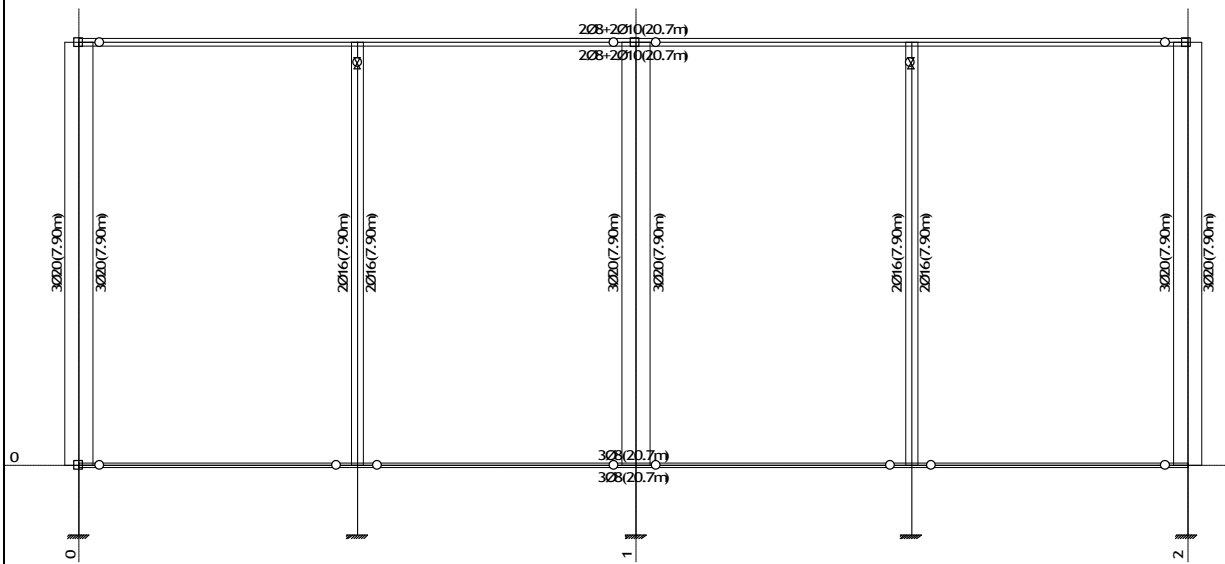
$\epsilon_b/\epsilon_a = -0.434/10.000 \%$
Aa1 = 0.88 cm²
Aa2 = 0.00 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]
 $\tau_y = 0.08\text{MPa} < \tau_r = 1.10\text{MPa}$
 $\tau_z = 0.06\text{MPa} < \tau_r = 1.10\text{MPa}$
Procenat armiranja: 0.54%

Usvojena armatura
@1@PBAB 87, MB 30, B500



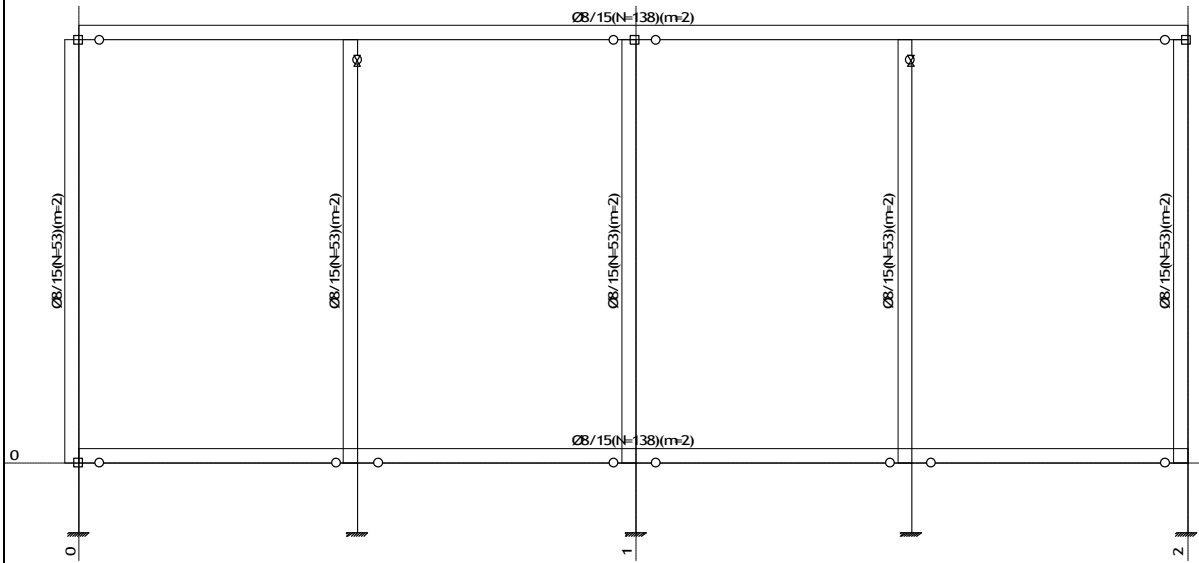
Ramt V_1
Armatura u gredama: Aa2/Aa1

Usvojena armatura
@1@PBAB 87, MB 30, B500



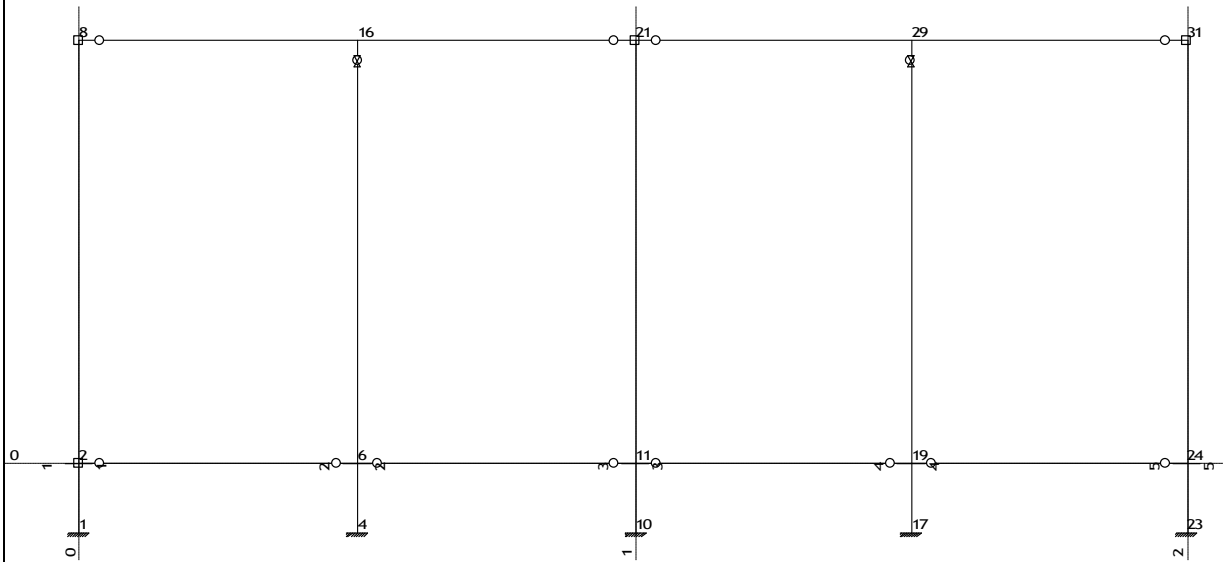
Ramt V_1
Armatura u gredama: Aa3/Aa4

Uvojena armatura
@1@PBAB 87, MB 30, B500



Ram: V_1
Armatura u gredama: A_g u z

Uvojena armatura
@1@PBAB 87, MB 30, B500



Ram: V_1
Dispozicija greda

Greda 8-2

@1@PBAB 87

MB 30

B500

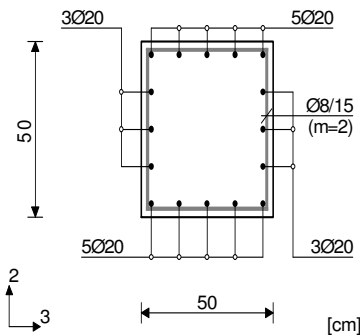
Kompletna sema opterećenja

li,2 = 15.80 m (A2 = 109.47)

li,3 = 15.80 m (A3 = 109.47)

Pomerljiva konstrukcija

Presek 1-1 x = 7.90m



Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII+1.80xV
+1.80xVI

N1u = -314.19 kN

M2u = 77.80 kNm

M3u = -8.75 kNm

Merodavna kombinacija za torziju:

1.30xI+1.30xII+1.30xIII+1.30xVIII

M1u = 0.58 kNm

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xV

T2u = 9.84 kN

T3u = 16.88 kN

M1u = -0.25 kNm

 $\Delta e2 = 5.3 < e0 > + 24.7 < ell > = 29.9$ cm $|\Delta M2| = 94.01$ kNm $\Delta e3 = 5.3 < e0 > + 24.7 < ell > = 29.9$ cm $|\Delta M3| = 94.01$ kNm $eb/ea = -3.500/7.750$ ‰Aa1 = 3.77 cm²Aa2 = 3.74 cm²Aa3 = 2.51 cm²Aa4 = 2.48 cm²Aa,uz = 0.00 cm²/m (m=2)[Izvořeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

ty = 0.06MPa < tr , tr = 1.10MPa

tz = 0.10MPa < tr , tr = 1.10MPa

Procentat armiranja: 2.01%

Greda 16-6

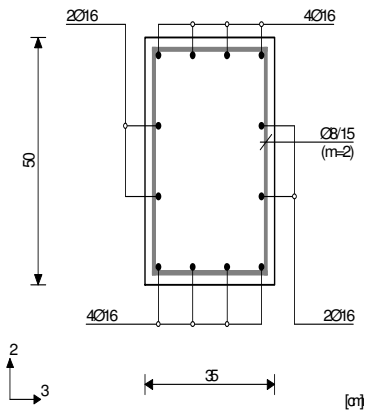
@1@PBAB 87

MB 30

B500

Kompletna sema opterećenja

Presek 2-2 x = 7.90m



Merodavna kombinacija za savijanje:

1.00xI+1.00xII+1.80xIV+1.80xVI

N1u = -42.78 kN

M2u = -1.40 kNm

M3u = 147.15 kNm

Merodavna kombinacija za torziju:

1.30xI+1.30xII+1.30xIII+1.30xVII

M1u = -5.03 kNm

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIII+1.80xIV

+1.80xVI

T2u = -47.18 kN

T3u = -0.18 kN

M1u = -4.70 kNm

 $eb/ea = -2.125/10.000$ ‰Aa1 = 4.37 + 0.13' = 4.50 cm²Aa2 = 4.34 + 0.13' = 4.47 cm²Aa3 = 2.26 + 0.18' = 2.44 cm²Aa4 = 2.23 + 0.18' = 2.41 cm²Aa,uz = 0.00 cm²/m (m=2)[Izvořeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

ty = 0.68MPa < tr , tr = 1.10MPa

tz = 0.64MPa < tr , tr = 1.10MPa

Procentat armiranja: 1.38%

*) - dodatna poduzna armatura za prijem torzije.

Greda 21-11

@1@PBAB 87

MB 30

B500

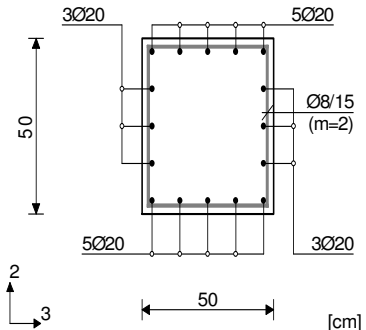
Kompletna sema opterećenja

li,2 = 15.80 m (A2 = 109.47)

li,3 = 15.80 m (A3 = 109.47)

Pomerljiva konstrukcija

Presek 3-3 x = 7.90m



Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII+1.80xIV

+1.80xVI

N1u = -462.66 kN

M2u = -3.86 kNm

M3u = 172.67 kNm

Merodavna kombinacija za torziju:

1.30xI+1.30xII+1.30xIII+1.30xVIII

M1u = 1.02 kNm

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIV

T2u = -34.77 kN

T3u = -1.90 kN

M1u = 0.21 kNm

 $\Delta e2 = 5.3 < e0 > + 24.7 < ell > = 29.9$ cm $|\Delta M2| = 138.44$ kNm $\Delta e3 = 5.3 < e0 > + 24.7 < ell > = 29.9$ cm $|\Delta M3| = 138.44$ kNm $eb/ea = -3.500/5.748$ ‰Aa1 = 8.72 + 0.03' = 8.75 cm²Aa2 = 8.66 + 0.03' = 8.68 cm²Aa3 = 4.50 + 0.03' = 4.53 cm²Aa4 = 4.44 + 0.03' = 4.47 cm²Aa,uz = 0.00 cm²/m (m=2)[Izvořeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

ty = 0.18MPa < tr , tr = 1.10MPa

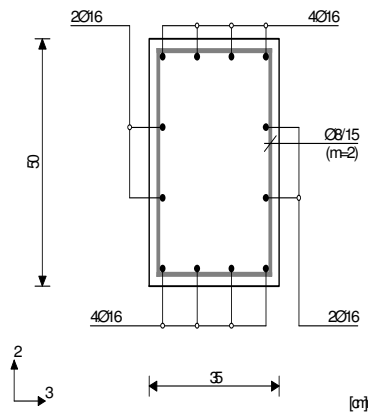
tz = 0.02MPa < tr , tr = 1.10MPa

Procentat armiranja: 2.01%

*) - dodatna poduzna armatura za prijem torzije.

Greda 29-19
@1@PBAB 87
MB 30
B500
Kompletna sema opterećenja

Presek 4-4 x = 7.90m



Merodavna kombinacija za torziju:

1.60xI+1.60xII+1.80xIII+1.80xIV
+1.80xVI
M1u = 3.57 kNm

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIII+1.80xIV
+1.80xVI
T2u = -47.19 kN
T3u = -0.18 kN
M1u = 3.57 kNm

εb/εa = -2.137/10.000 ‰

Aa1 =	4.43	+	0.09'	=	4.52	cm2
Aa2 =	4.40	+	0.09'	=	4.49	cm2
Aa3 =	2.29	+	0.13'	=	2.41	cm2
Aa4 =	2.26	+	0.13'	=	2.39	cm2
Aa,uz =	0.00	cm2/m	(m=2)			

[Uvođeno Aa,uz = 0.00/15(m=2) = 3.35 cm2/m]

ty = 0.79MPa < tr , tr = 1.10MPa

tz = 0.46MPa < tr , tr = 1.10MPa

Procentat armiranja: 1.38%

*) - dodatna poduzna armatura za prijem torzije.

Merodavna kombinacija za savijanje:

1.00xI+1.00xII+1.80xIV+1.80xVI
N1u = -42.70 kN
M2u = -1.40 kNm
M3u = 148.84 kNm

Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII+1.80xIV
+1.80xVI
N1u = -292.44 kN
M2u = -3.95 kNm
M3u = 92.31 kNm

Merodavna kombinacija za torziju:

1.30xI+1.30xII+1.30xIII+1.30xVIII
M1u = 0.54 kNm

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIV
T2u = -17.55 kN
T3u = -2.05 kN
M1u = 0.11 kNm

Δe2 = 5.3<e0> + 24.7<ell> = 29.9 cm

|ΔM2| = 87.51 kNm

Δe3 = 5.3<e0> + 24.7<ell> = 29.9 cm

|ΔM3| = 87.51 kNm

εb/εa = -3.500/8.329 ‰

Aa1 = 4.24 cm2

Aa2 = 4.21 cm2

Aa3 = 2.19 cm2

Aa4 = 2.16 cm2

Aa,uz = 0.00 cm2/m

(m=2)

[Uvođeno Aa,uz = 0.00/15(m=2) = 3.35 cm2/m]

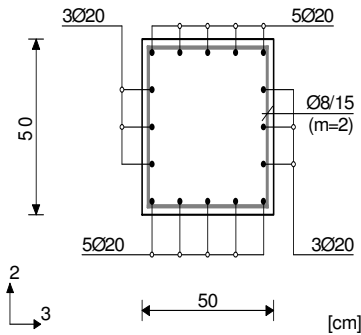
ty = 0.09MPa < tr , tr = 1.10MPa

tz = 0.02MPa < tr , tr = 1.10MPa

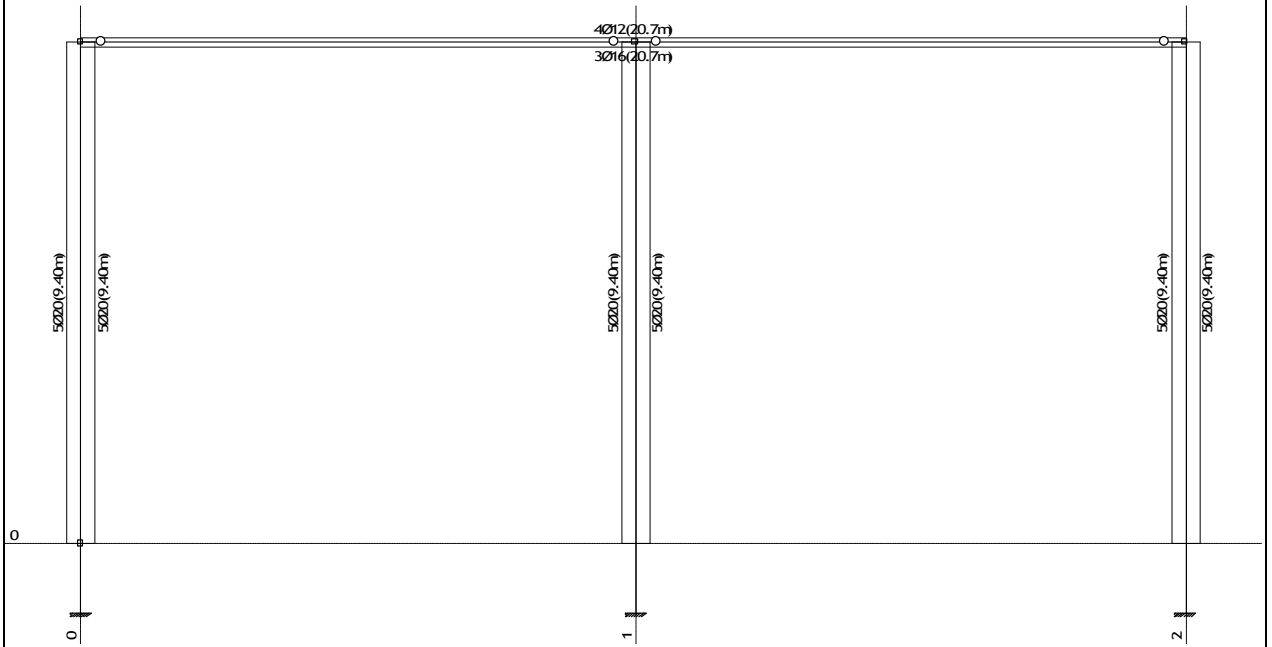
Procentat armiranja: 2.01%

Greda 31-24
@1@PBAB 87
MB 30
B500
Kompletna sema opterećenja
li,2 = 15.80 m (A2 = 109.47)
li,3 = 15.80 m (A3 = 109.47)
Pomerljiva konstrukcija

Presek 5-5 x = 7.90m

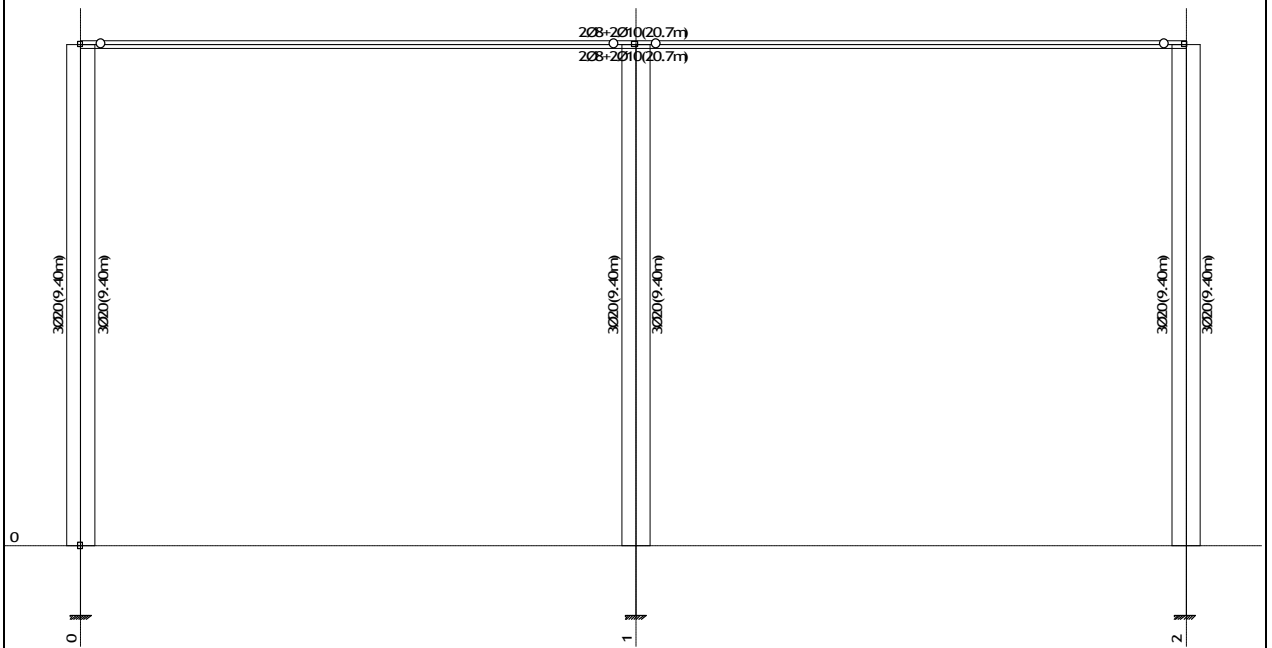


Usvojena armatura
@1@PBAB 87, MB 30, B500



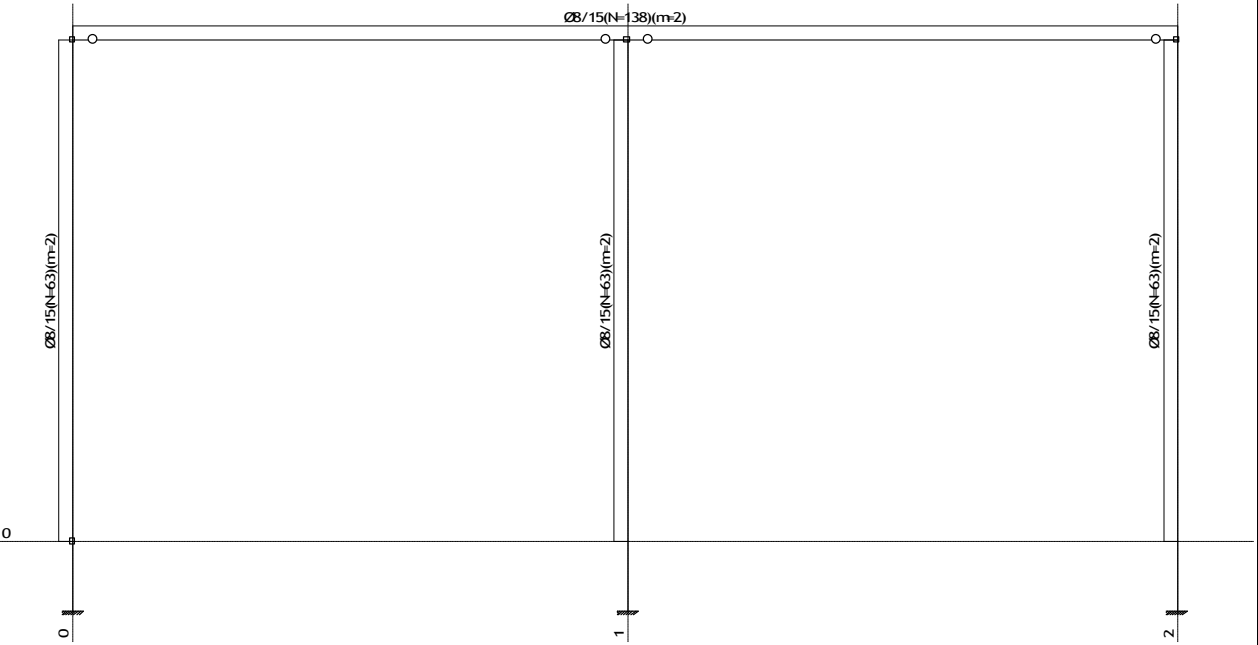
Ram: V.5
Armatura u gredama: A2/Aa1

Usvojena armatura
@1@PBAB 87, MB 30, B500



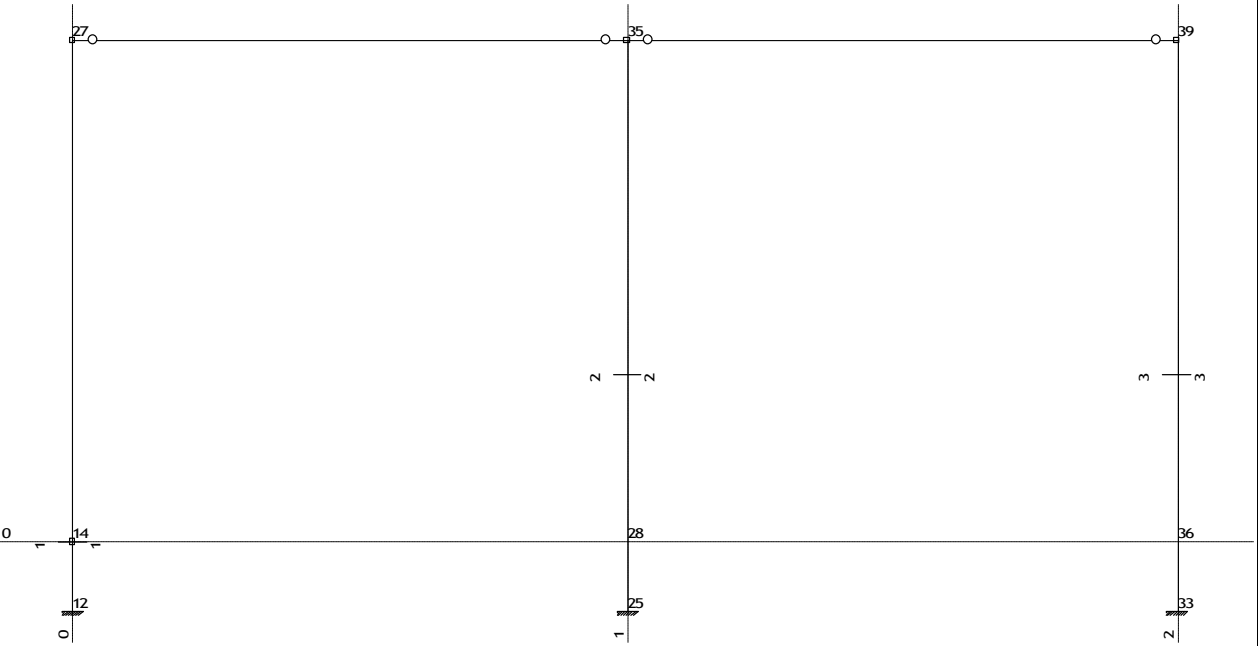
Ram: V.5
Armatura u gredama: A3/Aa4

Usvojena armatura
@1@PBAB 87, MB 30, B500



Ram: V.5
Armatura u gredama: A_guz

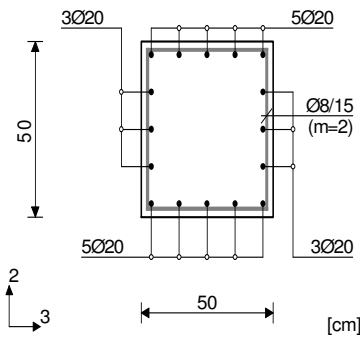
Usvojena armatura
@1@PBAB 87, MB 30, B500



Ram: V.5
Dispozicija greda

Greda 27-14
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja
 $l_{i,2} = 18.80 \text{ m}$ ($A_2 = 130.25$)
 $l_{i,3} = 18.80 \text{ m}$ ($A_3 = 130.25$)
 Pomerljiva konstrukcija

Presek 1-1 $x = 9.40 \text{ m}$



Merodavna kombinacija za savijanje:
 $1.60xI + 1.60xII + 1.80xIII + 1.80xV + 1.80xVI$
 $N1u = -322.24 \text{ kN}$
 $M2u = 98.56 \text{ kNm}$
 $M3u = -4.30 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI + 1.30xII + 1.30xIII - 1.30xVIII$
 $M1u = -0.52 \text{ kNm}$

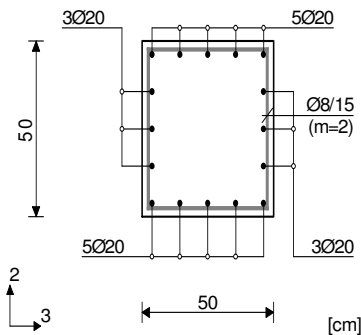
Merodavna kombinacija za smicanje:
 $1.60xI + 1.60xII + 1.80xV$
 $T2u = 2.23 \text{ kN}$
 $T3u = 17.22 \text{ kN}$
 $M1u = 0.22 \text{ kNm}$

$\Delta e2 = 6.3 < e0 > + 34.9 < ell > = 41.2 \text{ cm}$
 $|\Delta M2| = 132.68 \text{ kNm}$
 $\Delta e3 = 6.3 < e0 > + 34.9 < ell > = 41.2 \text{ cm}$
 $|\Delta M3| = 132.68 \text{ kNm}$
 $eb/ea = -3.500/6.514 \%$
 $Aa1 = 6.25 \text{ cm}^2$
 $Aa2 = 6.20 \text{ cm}^2$
 $Aa3 = 4.17 \text{ cm}^2$
 $Aa4 = 4.12 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/\text{m}$ ($m=2$)
[Usvojeno $Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/\text{m}$]

$\tau_y = 0.02 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.10 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 Procent armiranja: 2.01%

Greda 35-28
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja
 $l_{i,2} = 18.80 \text{ m}$ ($A_2 = 130.25$)
 $l_{i,3} = 18.80 \text{ m}$ ($A_3 = 130.25$)
 Pomerljiva konstrukcija

Presek 2-2 $x = 6.27 \text{ m}$



Merodavna kombinacija za savijanje:
 $1.60xI + 1.60xII + 1.80xIII + 1.80xVI$
 $N1u = -492.62 \text{ kN}$
 $M2u = 11.55 \text{ kNm}$
 $M3u = 30.47 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI + 1.30xII + 1.30xIII - 1.30xVIII$
 $M1u = -1.02 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.30xI + 1.30xII + 1.30xIII - 1.30xVIII$
 $T2u = -0.50 \text{ kN}$
 $T3u = -12.62 \text{ kN}$
 $M1u = -1.02 \text{ kNm}$

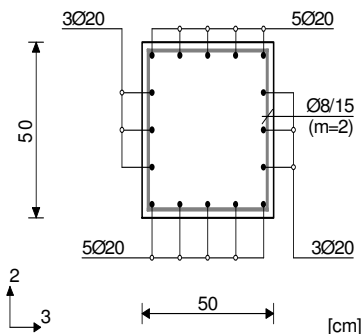
$\Delta e2 = 9.4 < e0 > + 43.6 < ell > = 53.0 \text{ cm}$
 $|\Delta M2| = 261.26 \text{ kNm}$
 $\Delta e3 = 9.4 < e0 > + 43.6 < ell > = 53.0 \text{ cm}$
 $|\Delta M3| = 261.26 \text{ kNm}$
 $eb/ea = -3.500/4.709 \%$
 $Aa1 = 10.84 + 0.03' = 10.87 \text{ cm}^2$
 $Aa2 = 10.75 + 0.03' = 10.78 \text{ cm}^2$
 $Aa3 = 7.23 + 0.03' = 7.26 \text{ cm}^2$
 $Aa4 = 7.15 + 0.03' = 7.18 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/\text{m}$ ($m=2$)
[Usvojeno $Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/\text{m}$]

$\tau_y = 0.07 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.13 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 Procent armiranja: 2.01%

*) - dodatna poduzna armatura za prijem torzije.

Greda 39-36
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja
 $l_{i,2} = 18.80 \text{ m}$ ($A_2 = 130.25$)
 $l_{i,3} = 18.80 \text{ m}$ ($A_3 = 130.25$)
 Pomerljiva konstrukcija

Presek 3-3 $x = 6.27 \text{ m}$



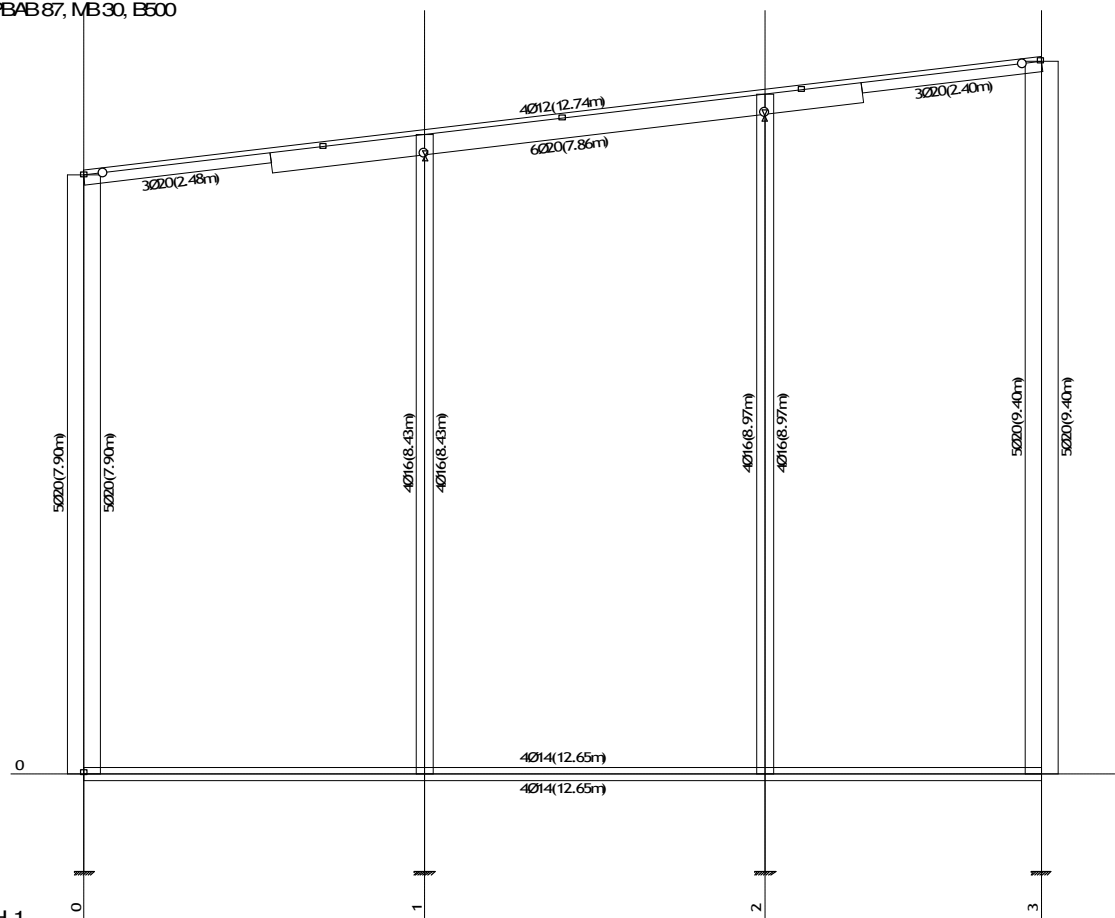
Merodavna kombinacija za savijanje:
 $1.60xI + 1.60xII + 1.80xIII + 1.80xV + 1.80xVI$
 $N1u = -284.02 \text{ kN}$
 $M2u = 46.21 \text{ kNm}$
 $M3u = -2.44 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI + 1.30xII + 1.30xIII - 1.30xVIII$
 $M1u = -0.54 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.30xI + 1.30xII + 1.30xIII - 1.30xVIII$
 $T2u = -0.25 \text{ kN}$
 $T3u = -11.98 \text{ kN}$
 $M1u = -0.54 \text{ kNm}$

$\Delta e2 = 9.4 < e0 > + 43.6 < ell > = 53.0 \text{ cm}$
 $|\Delta M2| = 150.63 \text{ kNm}$
 $\Delta e3 = 9.4 < e0 > + 43.6 < ell > = 53.0 \text{ cm}$
 $|\Delta M3| = 150.63 \text{ kNm}$
 $eb/ea = -3.500/6.514 \%$
 $Aa1 = 5.65 \text{ cm}^2$
 $Aa2 = 5.60 \text{ cm}^2$
 $Aa3 = 3.77 \text{ cm}^2$
 $Aa4 = 3.73 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/\text{m}$ ($m=2$)
[Usvojeno $Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/\text{m}$]

$\tau_y = 0.04 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.09 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 Procent armiranja: 2.01%



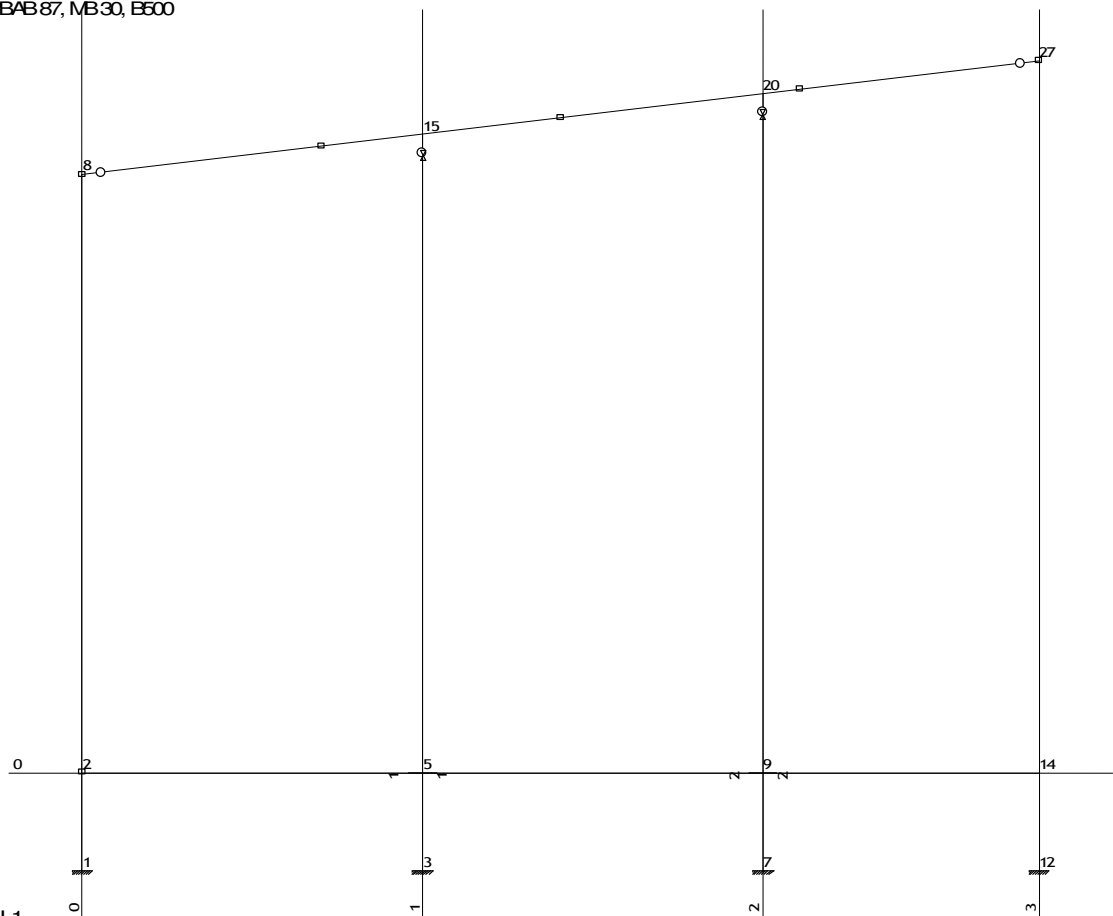
Ram: H_1
Armatura u gredama: Aa3/Aa4

Usvojena armatura
@1@PBAB 87, MB 30, B500



Ram: H_1
Armatura u gredama: A_g u z

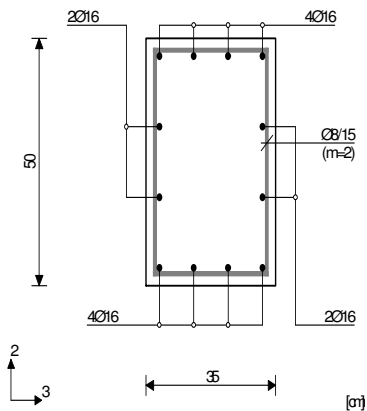
Usvojena armatura
@1@PBAB 87, MB 30, B500



Ram: H_1
Dispozicija greda

Greda 15-5
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 1-1 x = 8.43m



Merodavna kombinacija za savijanje:
 $1.00xI + 1.00xII + 1.80xIII + 1.80xV + 1.80xVI$
 $N1u = -44.49 \text{ kN}$
 $M2u = -0.53 \text{ kNm}$
 $M3u = 110.09 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI + 1.30xII + 1.30xIII + 1.30xVIII$
 $M1u = -4.48 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI + 1.60xII + 1.80xIII + 1.80xV + 1.80xVI$
 $T2u = -40.38 \text{ kN}$
 $T3u = -0.19 \text{ kN}$
 $M1u = 3.43 \text{ kNm}$

$eb/\epsilon_a = -1.843/10.000 \text{ ‰}$
 $Aa1 = 2.85 + 0.11' = 2.96 \text{ cm}^2$
 $Aa2 = 2.83 + 0.11' = 2.94 \text{ cm}^2$
 $Aa3 = 1.90 + 0.16' = 2.06 \text{ cm}^2$
 $Aa4 = 1.88 + 0.16' = 2.04 \text{ cm}^2$
 $Aa_{uz} = 0.00 \text{ cm}^2/\text{m} \quad (m=2)$

[Usvojeno $Aa_{uz} = Ø8/15(m=2) = 3.35 \text{ cm}^2/\text{m}$]

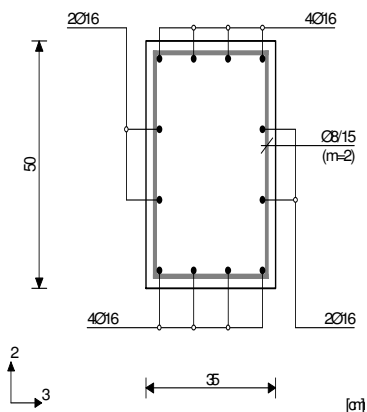
$\tau_y = 0.64 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.57 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.38%

*) - dodatna poduzna armatura za prijem torzije.

Greda 20-9

@1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 2-2 x = 8.97m



Merodavna kombinacija za savijanje:
 $1.00xI + 1.00xII + 1.80xIII + 1.80xV + 1.80xVI$
 $N1u = -46.52 \text{ kN}$
 $M2u = -0.21 \text{ kNm}$
 $M3u = 112.51 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.60xI + 1.60xII + 1.80xIII + 1.80xV + 1.80xVI$
 $M1u = -0.67 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI + 1.60xII + 1.80xIII + 1.80xV + 1.80xVI$
 $T2u = -38.78 \text{ kN}$
 $T3u = -0.12 \text{ kN}$
 $M1u = -0.67 \text{ kNm}$

$eb/\epsilon_a = -1.855/10.000 \text{ ‰}$
 $Aa1 = 2.91 \text{ cm}^2$
 $Aa2 = 2.88 \text{ cm}^2$
 $Aa3 = 1.94 \text{ cm}^2$
 $Aa4 = 1.92 \text{ cm}^2$
 $Aa_{uz} = 0.00 \text{ cm}^2/\text{m} \quad (m=2)$

[Usvojeno $Aa_{uz} = Ø8/15(m=2) = 3.35 \text{ cm}^2/\text{m}$]

$\tau_y = 0.36 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.09 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.38%

Proračun temelja

Datoteka: Hala 3.2-rev.01-temelji.twp
Datum proračuna: 8.11.2017

Nacin proračuna: 3D model

- ☒ Teorija I-og reda ☐ Modalna analiza ☐ Stabilnost
☐ Teorija II-og reda ☐ Seizmicki proračun ☐ Faze gradjenja
☐ Nelinearan proračun

Velicina modela

Broj cvorova: 583
Broj pločastih elemenata: 422
Broj grednih elemenata: 53
Broj granicnih elemenata: 5064
Broj osnovnih slučaja opterećenja: 6
Broj kombinacija opterećenja: 61

Jedinice mera

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

Ulazni podaci - Konstrukcija

Tabela materijala

No	Naziv materijala	E[kN/m ²]	μ	γ [kN/m ³]	α [1/C]	E _m [kN/m ²]	μ_m
1	Betoni MB 30	3.150e+7	0.20	25.00	1.000e-5	3.150e+7	0.20

Setovi ploča

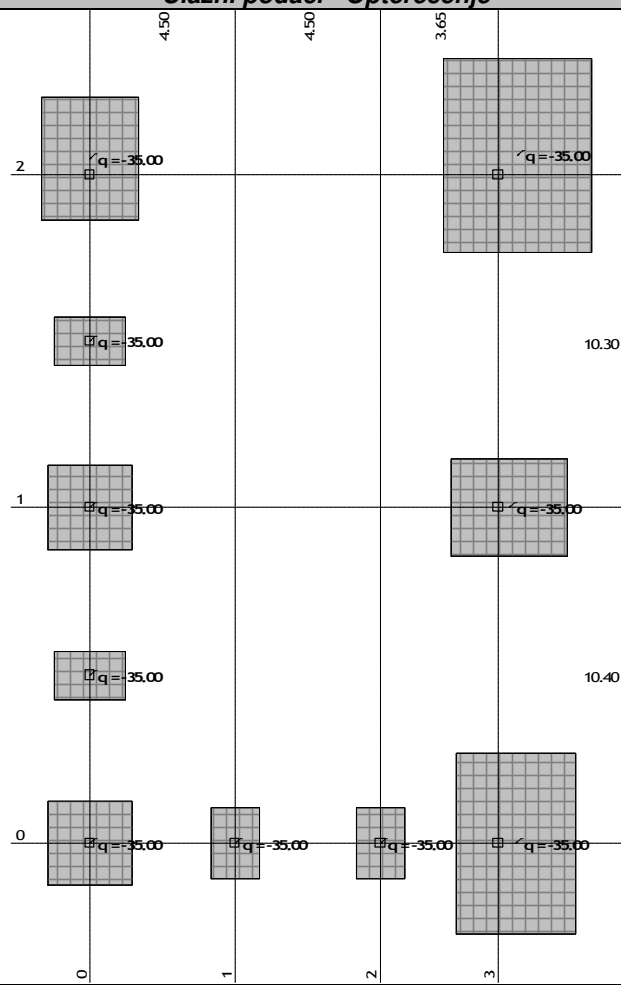
No	d[m]	e[m]	Materijal	Tip proračuna	Ortotropija	E ₂ [kN/m ²]	G[kN/m ²]	α
<1>	0.500	0.250	1	Tanka ploča	Izotropna			

Setovi površinskih oslonaca

@1@ Set	K,R1	K,R2	K,R3
1	7.000e+3	7.000e+3	7.000e+3

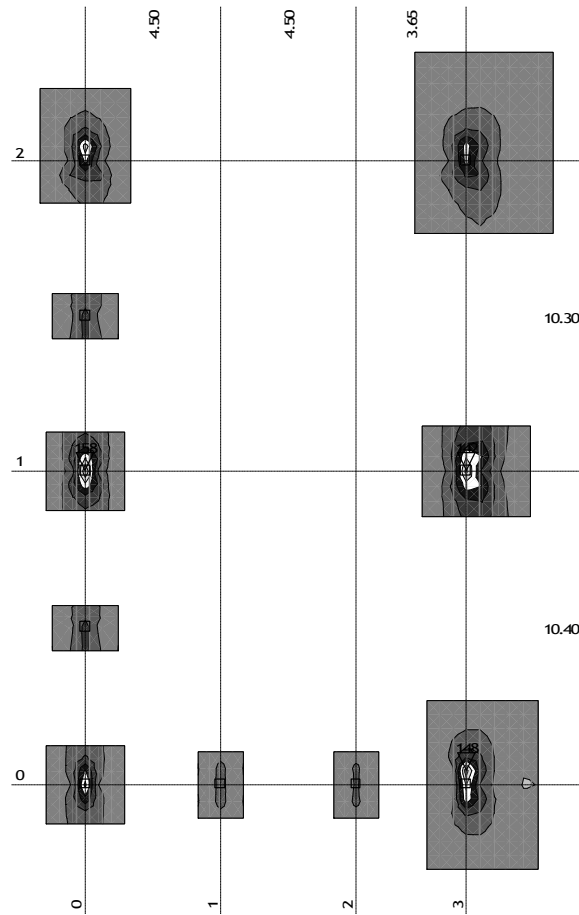
Ulazni podaci - Opterećenje

Opt. 2 G



Nivo [-1.30 m]

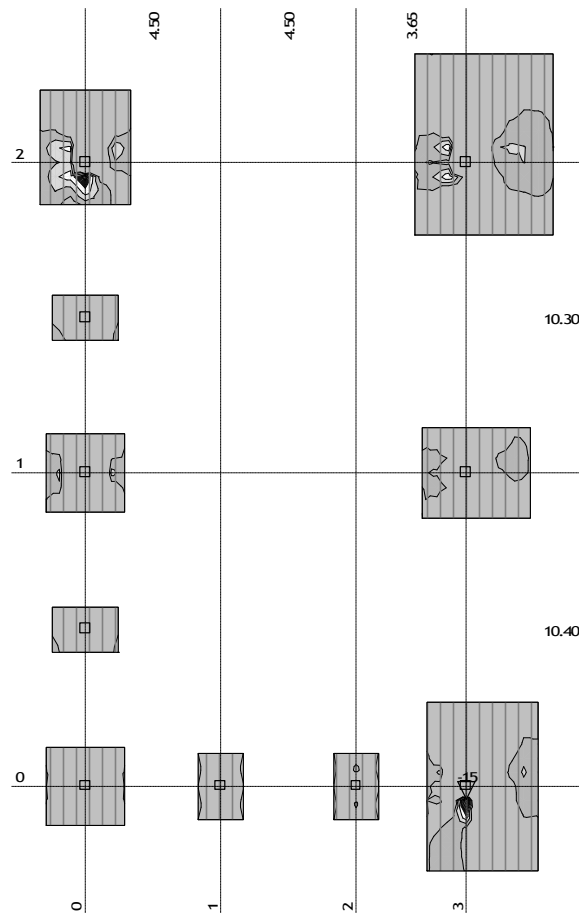
Opt. 78: [Am] 9-55,74-77



Nivo: [-1.30 m]

Uticaji uplozi: $\max M_k = 158$ / $\min M_k = 0$ kNm/m

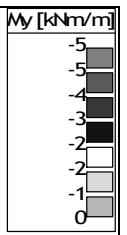
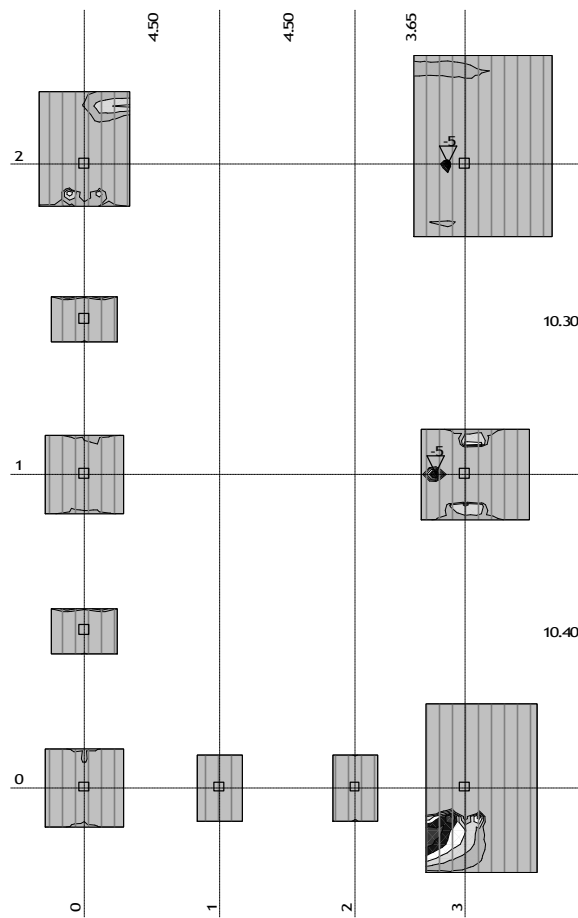
Opt. 78: [Am] 9-55,74-77



Nivo: [-1.30 m]

Uticaji uplozi: $\max M_k = 0$ / $\min M_k = -15$ kNm/m

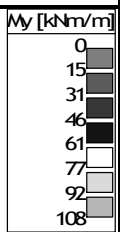
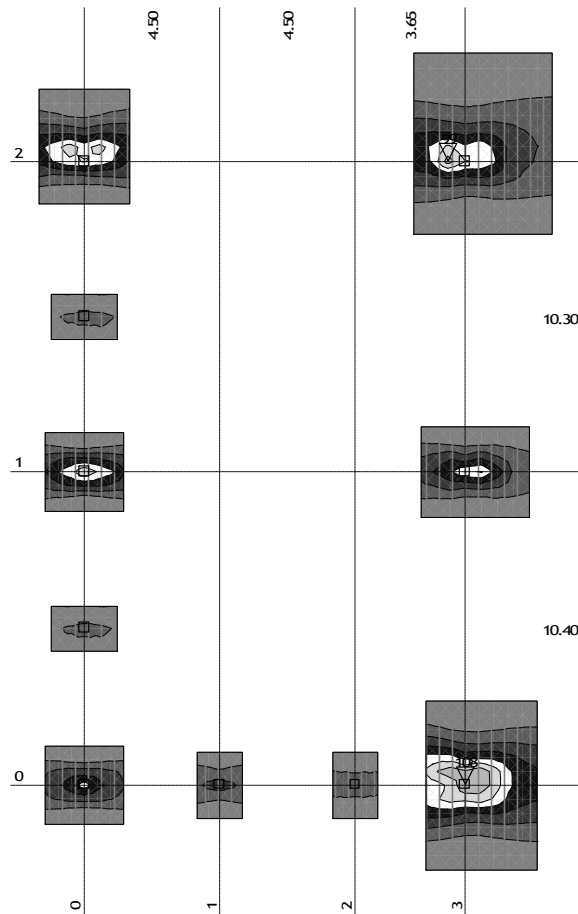
Opt. 78: [Am] 9:55,74-77



Nivo: [-1.30 m]

Uticaji uplozi: $\max M_y = 0 / \min M_y = -5 \text{ kNm/m}$

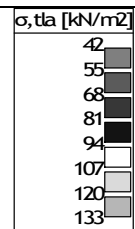
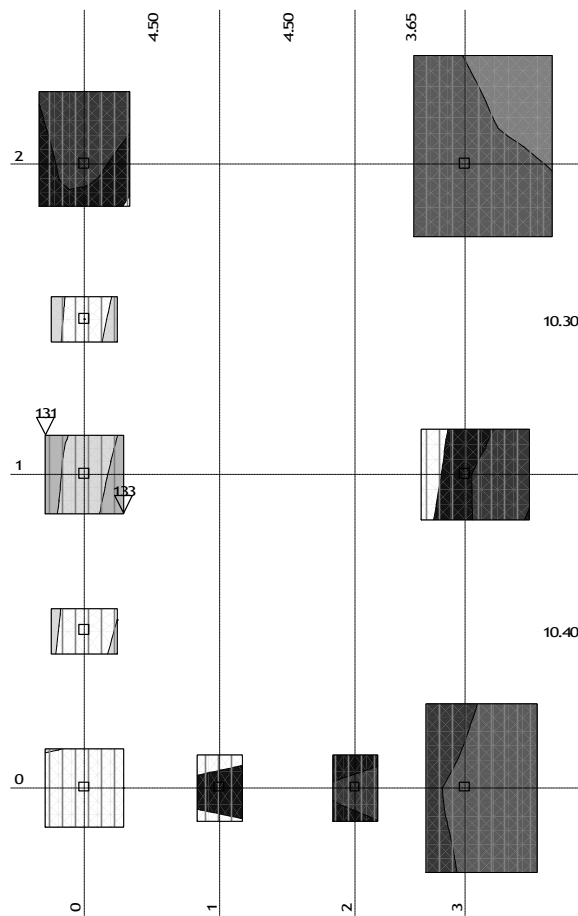
Opt. 78: [Am] 9:55,74-77



Nivo: [-1.30 m]

Uticaji uplozi: $\max M_y = 108 / \min M_y = 0 \text{ kNm/m}$

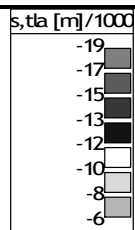
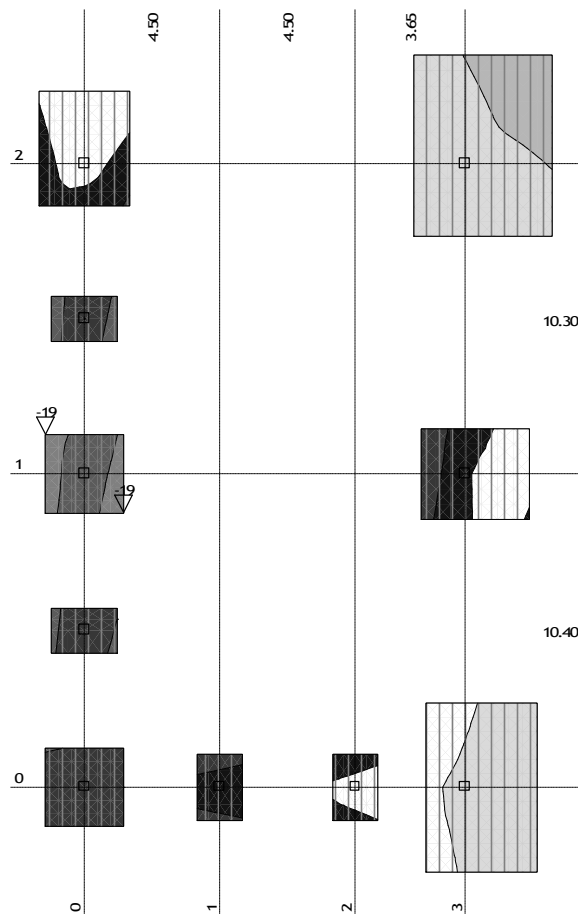
Opt. 78: [Am] 56-69



Nivo: [-1.30 m]

Uticaji u pov. osloncu: max σ , tla = 133 / min σ , tla = 42 kN/m²

Opt. 78: [Am] 56-69



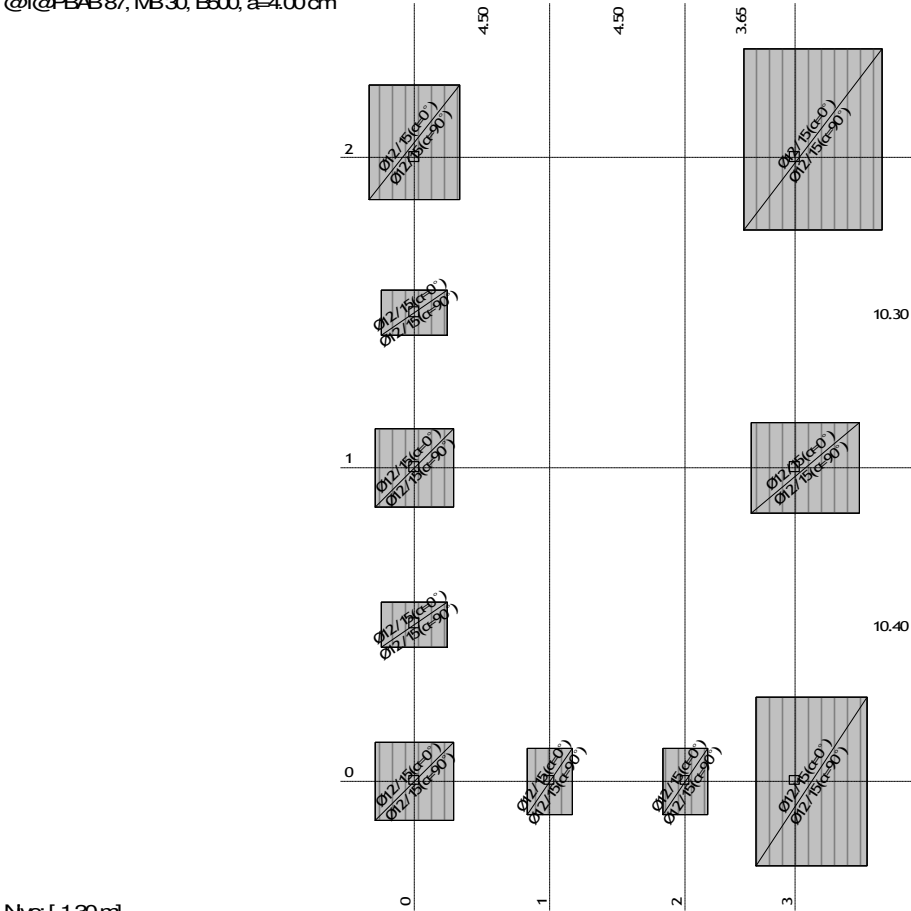
Nivo: [-1.30 m]

Uticaji u pov. osloncu: max s , tla = -6 / min s , tla = -19 m / 1000

Dimenzionisanje (beton)

Usvojena armatura
@1@PBAB 87, MB 30, B500, a=4.00 cm

Aa - d.zona [cm ² /m]	
0	
3	
6	

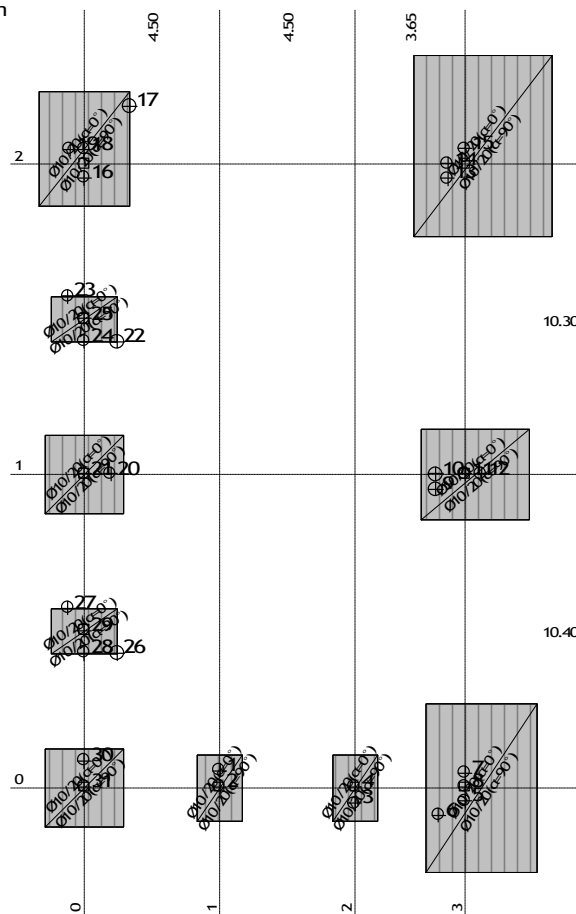


Nivo: [-1.30 m]
Aa - d.zona

Usvojena armatura
@1@PBAB 87, MB 30, B500, a=4.00 cm

Aa - g.zona [cm²/m]

-1
0
0



Nivo: [-1.30 m]
Aa - g.zona

Nivo: [-1.30 m]

@1@PBAB 87

d.pl=50.0 cm

MB 30

Gornja zona: B500 (a=4.0 cm)

Donja zona: B500 (a=4.0 cm)

Kompletna sema opterecenja

Tacka 1

X=-46 m; Y=1 m; Z=-1 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.30xI+1.30xII+1.30xIII+1.30xVIII

Mu = 16.11 kNm

Nu = 0.00 kN

eb/ea = -0.288/10.000 %

Ag1 = 0.07 cm²/m

Ad1 = 0.71 cm²/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.23%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xV

+1.80xVI

Mu = 14.53 kNm

Nu = 0.00 kN

eb/ea = -0.270/10.000 %

Ag2 = 0.00 cm²/m

Ad2 = 0.64 cm²/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.23%

Tacka 2

X=-46 m; Y=1 m; Z=-1 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xVI

Mu = 19.19 kNm

Nu = 0.00 kN

eb/ea = -0.312/10.000 %

Ag1 = 0.00 cm²/m

Ad1 = 0.85 cm²/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.23%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xVI

Mu = 39.12 kNm

Nu = 0.00 kN

eb/ea = -0.455/10.000 %

Ag2 = 0.00 cm²/m

Ad2 = 1.72 cm²/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.23%

@1@PBAB 87

d.pl=50.0 cm

MB 30

Gornja zona: B500 (a=4.0 cm)

Donja zona: B500 (a=4.0 cm)

Kompletna sema opterecenja

Tacka 3

X=-41 m; Y=0 m; Z=-1 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.30xI+1.30xII+1.30xIII+1.30xVIII

Mu = 14.89 kNm

Nu = 0.00 kN

eb/ea = -0.281/10.000 %

Ag1 = 0.15 cm²/m

Ad1 = 0.65 cm²/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.23%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xIV

Mu = 9.69 kNm

Nu = 0.00 kN

eb/ea = -0.219/10.000 %

Ag2 = 0.00 cm²/m

Ad2 = 0.42 cm²/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.23%

Tacka 4

X=-41 m; Y=1 m; Z=-1 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xVI

Mu = 14.14 kNm

Nu = 0.00 kN

eb/ea = -0.265/10.000 %

Ag1 = 0.00 cm²/m

Ad1 = 0.62 cm²/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.23%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xVI

Mu = 28.85 kNm

Nu = 0.00 kN

eb/ea = -0.386/10.000 %

Ag2 = 0.00 cm²/m

Ad2 = 1.27 cm²/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.23%

@1@PBAB 87

d.pl=50.0 cm

MB 30

Gornja zona: B500 (a=4.0 cm)

Donja zona: B500 (a=4.0 cm)

Kompletna sema opterecenja

Tacka 5

X=-38 m; Y=0 m; Z=-1 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xIV

Mu = 97.78 kNm

Nu = 0.00 kN

eb/ea = -0.761/10.000 %

Ag1 = 0.99 cm²/m

Ad1 = 4.36 cm²/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm²/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm²/m)

Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xIV
Mu = 79.99 kNm
Nu = 0.00 kN
Eb/Ea = -0.673/10.000 %
Ag2 = 0.00 cm2/m
Ad2 = 3.55 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Tacka 6

X=-39 m; Y=0 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xIV
Mu = 6.11 kNm
Nu = 0.00 kN
Eb/Ea = -0.172/10.000 %
Ag1 = 0.00 cm2/m
Ad1 = 0.27 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xIV
Mu = 53.07 kNm
Nu = 0.00 kN
Eb/Ea = -0.541/10.000 %
Ag2 = 0.25 cm2/m
Ad2 = 2.34 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Tacka 7

X=-38 m; Y=1 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xV
+1.80xVI
Mu = 129.21 kNm
Nu = 0.00 kN
Eb/Ea = -0.886/10.000 %
Ag1 = 0.00 cm2/m
Ad1 = 5.79 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xV
+1.80xVI
Mu = 94.26 kNm
Nu = 0.00 kN
Eb/Ea = -0.738/10.000 %
Ag2 = 0.00 cm2/m
Ad2 = 4.19 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Tacka 8

X=-38 m; Y=1 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xVI
Mu = 94.32 kNm
Nu = 0.00 kN
Eb/Ea = -0.738/10.000 %
Ag1 = 0.00 cm2/m
Ad1 = 4.19 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xVI
Mu = 107.53 kNm
Nu = 0.00 kN
Eb/Ea = -0.795/10.000 %
Ag2 = 0.00 cm2/m
Ad2 = 4.79 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

@1@PBAB 87

d.pl=50.0 cm

MB 30

Gornja zona: B500 (a=4.0 cm)

Donja zona: B500 (a=4.0 cm)

Kompletna sema opterecenja

Tacka 9

X=-39 m; Y=11 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xV
Mu = 10.65 kNm
Nu = 0.00 kN
Eb/Ea = -0.236/10.000 %
Ag1 = 0.11 cm2/m
Ad1 = 0.46 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII
Mu = 30.23 kNm
Nu = 0.00 kN
Eb/Ea = -0.396/10.000 %
Ag2 = 0.00 cm2/m
Ad2 = 1.33 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Tacka 10

X=-39 m; Y=11 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.00xI+1.00xII-1.30xVII
Mu = -1.07 kNm
Nu = 0.00 kN
Eb/Ea = -0.128/10.000 %
Ag1 = 0.00 cm2/m
Ad1 = 0.36 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xV
Mu = 48.00 kNm
Nu = 0.00 kN
Eb/Ea = -0.512/10.000 %
Ag2 = 0.22 cm2/m
Ad2 = 2.12 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Tacka 11

X=-38 m; Y=11 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xVI
Mu = 119.70 kNm
Nu = 0.00 kN
Eb/Ea = -0.846/10.000 %
Ag1 = 0.00 cm2/m
Ad1 = 5.34 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xVI
Mu = 74.63 kNm
Nu = 0.00 kN
Eb/Ea = -0.648/10.000 %
Ag2 = 0.00 cm2/m
Ad2 = 3.32 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Tacka 12

X=-37 m; Y=11 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xIV
+1.80xVI
Mu = 75.00 kNm
Nu = 0.00 kN
Eb/Ea = -0.650/10.000 %
Ag1 = 0.00 cm2/m
Ad1 = 3.33 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xIV
+1.80xVI
Mu = 77.55 kNm
Nu = 0.00 kN
Eb/Ea = -0.662/10.000 %
Ag2 = 0.00 cm2/m
Ad2 = 3.45 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

@1@PBAB 87

d.pl=50.0 cm

MB 30

Gornja zona: B500 (a=4.0 cm)

Donja zona: B500 (a=4.0 cm)

Kompletna sema opterecenja

Tacka 13

X=-38 m; Y=21 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xV
Mu = 36.36 kNm
Nu = 0.00 kN
Eb/Ea = -0.448/10.000 %
Ag1 = 0.36 cm2/m
Ad1 = 1.60 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xIV
Mu = 50.33 kNm
Nu = 0.00 kN
Eb/Ea = -0.522/10.000 %
Ag2 = 0.00 cm2/m
Ad2 = 2.23 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Tacka 14

X=-38 m; Y=21 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xV
Mu = 23.22 kNm
Nu = 0.00 kN
Eb/Ea = -0.345/10.000 %
Ag1 = 0.00 cm2/m
Ad1 = 1.02 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xV
Mu = 98.97 kNm
Nu = 0.00 kN
Eb/Ea = -0.761/10.000 %
Ag2 = 0.46 cm2/m
Ad2 = 4.40 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Tacka 15

X=-38 m; Y=22 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xV
+1.80xVI
Mu = 95.72 kNm
Nu = 0.00 kN
Eb/Ea = -0.745/10.000 %
Ag1 = 0.00 cm2/m
Ad1 = 4.26 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)

Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xV
+1.80xVI
Mu = 63.61 kNm
Nu = 0.00 kN
Eb/Ea = -0.593/10.000 %
Ag2 = 0.00 cm2/m
Ad2 = 2.82 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

@1@PBAB 87
d.pl=50.0 cm
MB 30
Gornja zona: B500 (a=4.0 cm)
Donja zona: B500 (a=4.0 cm)
Kompletna sema opterećenja

Tacka 16

X=-50 m; Y=21 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xIV
Mu = 56.50 kNm
Nu = 0.00 kN
eb/ea = -0.564/10.000 %
Ag1 = 0.57 cm2/m
Ad1 = 2.49 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII
Mu = 30.56 kNm
Nu = 0.00 kN
eb/ea = -0.400/10.000 %
Ag2 = 0.00 cm2/m
Ad2 = 1.35 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Tacka 17

X=-49 m; Y=23 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xV
Mu = 1.76 kNm
Nu = 0.00 kN
eb/ea = -0.092/10.000 %
Ag1 = 0.00 cm2/m
Ad1 = 0.08 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xV
Mu = 10.35 kNm
Nu = 0.00 kN
eb/ea = -0.233/10.000 %
Ag2 = 0.10 cm2/m
Ad2 = 0.45 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Tacka 18

X=-50 m; Y=22 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xV
+1.80xVI
Mu = 112.40 kNm
Nu = 0.00 kN
eb/ea = -0.817/10.000 %
Ag1 = 0.00 cm2/m
Ad1 = 5.02 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xV
+1.80xVI
Mu = 70.84 kNm
Nu = 0.00 kN
eb/ea = -0.629/10.000 %
Ag2 = 0.00 cm2/m
Ad2 = 3.14 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Tacka 19

X=-51 m; Y=22 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.00xI+1.00xII+1.80xIV+1.80xVI
Mu = -5.06 kNm
Nu = 0.00 kN
eb/ea = -0.272/10.000 %
Ag1 = 0.19 cm2/m
Ad1 = 1.78 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xV
+1.80xVI
Mu = 85.03 kNm
Nu = 0.00 kN
eb/ea = -0.697/10.000 %
Ag2 = 0.00 cm2/m
Ad2 = 3.79 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

@1@PBAB 87

d.pl=50.0 cm
MB 30
Gornja zona: B500 (a=4.0 cm)
Donja zona: B500 (a=4.0 cm)
Kompletna sema opterećenja

Tacka 20

X=-50 m; Y=11 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.00xI+1.00xII+1.30xVII
Mu = -4.20 kNm
Nu = 0.00 kN
eb/ea = -0.185/10.000 %
Ag1 = 0.17 cm2/m
Ad1 = 0.46 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xIV
+1.80xVI
Mu = 66.17 kNm
Nu = 0.00 kN
eb/ea = -0.606/10.000 %
Ag2 = 0.00 cm2/m
Ad2 = 2.94 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Tacka 21

X=-50 m; Y=11 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xVI
Mu = 124.76 kNm
Nu = 0.00 kN
eb/ea = -0.867/10.000 %
Ag1 = 0.00 cm2/m
Ad1 = 5.58 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xVI
Mu = 91.13 kNm
Nu = 0.00 kN
eb/ea = -0.724/10.000 %
Ag2 = 0.00 cm2/m
Ad2 = 4.05 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

@1@PBAB 87

d.pl=50.0 cm
MB 30
Gornja zona: B500 (a=4.0 cm)
Donja zona: B500 (a=4.0 cm)
Kompletna sema opterećenja

Tacka 22

X=-49 m; Y=15 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.00xII+1.80xIV+1.80xVI
Mu = -2.34 kNm
Nu = 0.00 kN
eb/ea = -0.106/10.000 %
Ag1 = 0.10 cm2/m
Ad1 = 0.00 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xIV
+1.80xVI
Mu = 7.46 kNm
Nu = 0.00 kN
eb/ea = -0.192/10.000 %
Ag2 = 0.00 cm2/m
Ad2 = 0.33 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Tacka 23

X=-51 m; Y=17 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xV
Mu = 20.25 kNm
Nu = 0.00 kN
eb/ea = -0.321/10.000 %
Ag1 = 0.00 cm2/m
Ad1 = 0.89 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
Merodavna kombinacija:
1.60xI+1.00xII+1.80xIII+1.80xV
+1.80xVI
Mu = -1.33 kNm
Nu = 0.00 kN
eb/ea = -0.080/10.000 %
Ag2 = 0.06 cm2/m
Ad2 = 0.00 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Tacka 24

X=-50 m; Y=15 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.30xI+1.30xII+1.30xIII+1.30xVIII
Mu = 50.93 kNm
Nu = 0.00 kN
eb/ea = -0.526/10.000 %
Ag1 = 0.00 cm2/m
Ad1 = 2.26 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
Merodavna kombinacija:
1.30xI+1.30xII+1.30xIII+1.30xVIII
Mu = 2.39 kNm
Nu = 0.00 kN
eb/ea = -0.111/10.000 %
Ag2 = 0.00 cm2/m
Ad2 = 0.11 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Tacka 25

X=-50 m; Y=16 m; Z=-1 m

Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII+1.80xIV
+1.80xVI
Mu = 47.42 kNm
Nu = 0.00 kN
eb/ea = -0.505/10.000 %
Ag1 = 0.00 cm2/m
Ad1 = 2.10 cm2/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm2/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm2/m)
Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xV
 +1.80xVI
 Mu = 22.05 kNm
 Nu = 0.00 kN
 $eb/ea = -0.335/10.000\%$
 Ag2 = 0.00 cm2/m
 Ad2 = 0.97 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

@1@PBAB 87
 d.pl=50.0 cm
 MB 30
 Gornja zona: B500 (a=4.0 cm)
 Donja zona: B500 (a=4.0 cm)
 Kompletna sema opterećenja

Tacka 26
X=-49 m; Y=5 m; Z=-1 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.60xI+1.00xII+1.80xIII+1.80xIV
 +1.80xVI
 Mu = -2.21 kNm
 Nu = 0.00 kN
 $eb/ea = -0.103/10.000\%$
 Ag1 = 0.10 cm2/m
 Ad1 = 0.00 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 Mu = 7.24 kNm
 Nu = 0.00 kN
 $eb/ea = -0.188/10.000\%$
 Ag2 = 0.00 cm2/m
 Ad2 = 0.32 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Tacka 27
X=-51 m; Y=7 m; Z=-1 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xV
 Mu = 19.76 kNm
 Nu = 0.00 kN
 $eb/ea = -0.317/10.000\%$
 Ag1 = 0.00 cm2/m
 Ad1 = 0.87 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.60xI+1.00xII+1.80xIII+1.80xV
 +1.80xVI
 Mu = -1.34 kNm
 Nu = 0.00 kN
 $eb/ea = -0.080/10.000\%$
 Ag2 = 0.06 cm2/m
 Ad2 = 0.00 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Tacka 28
X=-50 m; Y=5 m; Z=-1 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.30xI+1.30xII+1.30xIII+1.30xVIII
 Mu = 51.22 kNm
 Nu = 0.00 kN
 $eb/ea = -0.528/10.000\%$
 Ag1 = 0.00 cm2/m
 Ad1 = 2.27 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.30xI+1.30xII+1.30xIII+1.30xVIII
 Mu = 2.40 kNm
 Nu = 0.00 kN
 $eb/ea = -0.111/10.000\%$
 Ag2 = 0.00 cm2/m
 Ad2 = 0.11 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Tacka 29
X=-50 m; Y=6 m; Z=-1 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 Mu = 47.67 kNm
 Nu = 0.00 kN
 $eb/ea = -0.507/10.000\%$
 Ag1 = 0.00 cm2/m
 Ad1 = 2.11 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xV
 +1.80xVI
 Mu = 22.17 kNm
 Nu = 0.00 kN
 $eb/ea = -0.337/10.000\%$
 Ag2 = 0.00 cm2/m
 Ad2 = 0.98 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

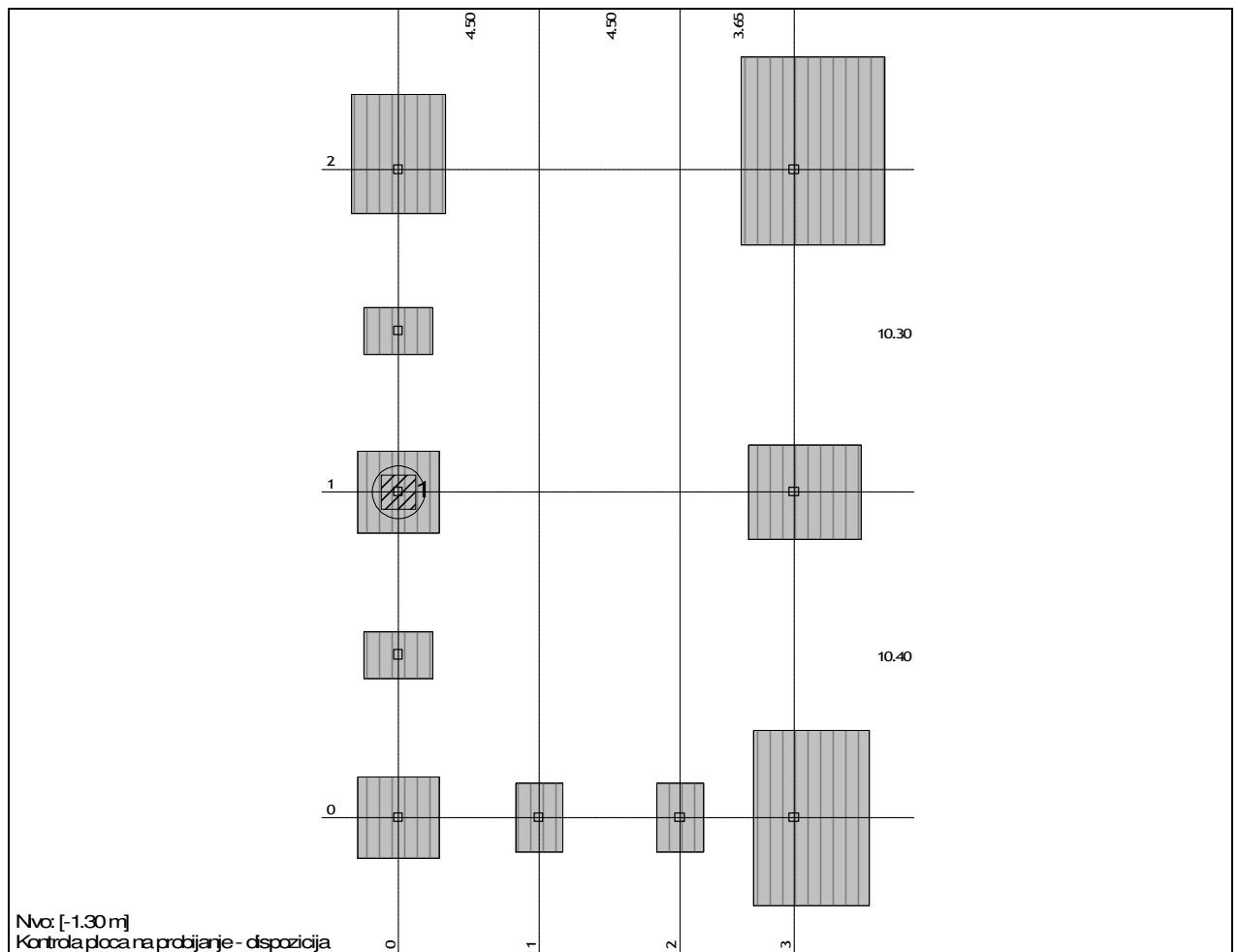
@1@PBAB 87
 d.pl=50.0 cm
 MB 30
 Gornja zona: B500 (a=4.0 cm)
 Donja zona: B500 (a=4.0 cm)
 Kompletna sema opterećenja

Tacka 30
X=-50 m; Y=2 m; Z=-1 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xV
 +1.80xVI
 Mu = 49.02 kNm
 Nu = 0.00 kN
 $eb/ea = -0.514/10.000\%$
 Ag1 = 0.00 cm2/m
 Ad1 = 2.16 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.30xI+1.30xII+1.30xIII+1.30xVIII
 Mu = 5.37 kNm
 Nu = 0.00 kN
 $eb/ea = -0.166/10.000\%$
 Ag2 = 0.05 cm2/m
 Ad2 = 0.23 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Tacka 31
X=-50 m; Y=1 m; Z=-1 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xV
 Mu = 94.13 kNm
 Nu = 0.00 kN
 $eb/ea = -0.738/10.000\%$
 Ag1 = 0.00 cm2/m
 Ad1 = 4.19 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xV
 +1.80xVI
 Mu = 68.64 kNm
 Nu = 0.00 kN
 $eb/ea = -0.619/10.000\%$
 Ag2 = 0.00 cm2/m
 Ad2 = 3.05 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

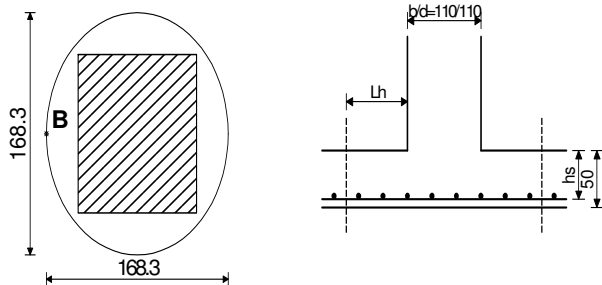


Kontrola ploca na probijanje

Nivo: [-1.30 m]

Presek 1 (-50.50,11.06,-1.30)

MB 30



KONTROLA KRITICNOG PRESEKA 1. ($L_h = 0.22\text{m}$ od ivice stuba)
(stub zamenjujućeg kruznog preseka, $d_s = 1.24\text{m}$)

Merodavna kombinacija: I+II+III-1.00xVII

Sila u stubu

$N = 419.51 \text{ kN}$

Merodavni smicuci napon (tačka B)

$\tau = 0.180 \text{ MPa}$

Debljina ploce

$d_{pl} = 0.500 \text{ m}$

Staticka visina ploce

$h_s = 0.440 \text{ m}$

Obim kritičnog preseka

$O_{kp} = 5.287 \text{ m}$

Postojeća armatura u ploci

$A_{a,1} = 7.540 \text{ cm}^2$

Povrsina armature - pravac 1

$\mu_1 = 0.171 \%$

Procenat armiranja - pravac 1

$A_{a,2} = 7.540 \text{ cm}^2$

Povrsina armature - pravac 2

$\mu_2 = 0.171 \%$

Procenat armiranja - pravac 2

Srednja vrednost procenta armiranja (usvojena)

$\mu = 0.500 \%$

Koeficijent

$\alpha_a = 1.400$

Koeficijent

$\gamma_1 = 1.287$

Koeficijent

$\gamma_2 = 0.445$

Dopusteni glavni napon zatezanja

$\tau_a = 0.800$

Dopusteni glavni napon zatezanja

$\tau_b = 2.200$

Maksimalna otpornost ($\gamma_2 \times \tau_b$)

$\tau_{max} = 0.980 \text{ MPa}$

Uslov: $\tau \leq \tau_{max}$ ($0.18 \leq 0.98$)

Uslov je ispunjen

Otpornost na probijanje ploce bez dodatne armature za obezbedjenje ($2/3 \times \gamma_1 \times \tau_a$)

$\tau_{gr} = 0.686 \text{ MPa}$

Uslov: $\tau \leq \tau_{gr}$ ($0.18 \leq 0.69$)

Uslov je ispunjen, nije potrebna dodatna armatura za obezbedjenje od probijanja ploce.

Osnovni podaci o modelu

Datoteka: Hala 4-horizontalna fasada-rev01.twp
Datum proračuna: 29.10.2017

Nacin proračuna: 3D model

- | | | |
|---|--|---|
| ☒ Teorija I-og reda | ☒ Modalna analiza | ☐ Stabilnost |
| ☐ Teorija II-og reda | ☒ Seizmicki proračun | ☐ Faze gradjenja |
| ☐ Nelinearan proračun | | |

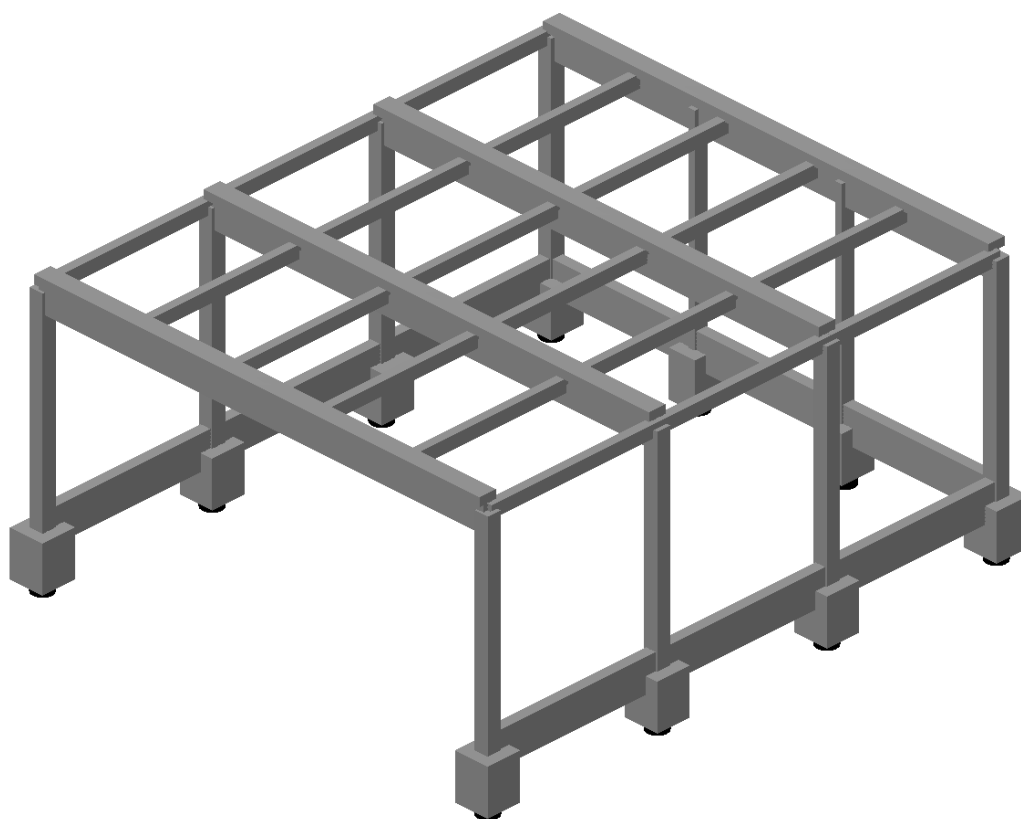
Velicina modela

Broj cvorova:	46
Broj pločastih elemenata:	0
Broj grednih elemenata:	69
Broj granicnih elemenata:	60
Broj osnovnih slučajeva opterećenja:	8
Broj kombinacija opterećenja:	61

Jedinice mera

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

Ulazni podaci - Konstrukcija



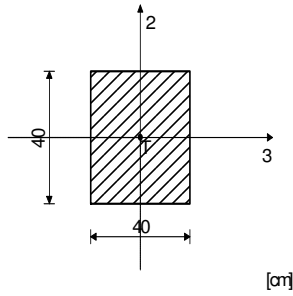
izometrija

Tabela materijala

No	Naziv materijala	E[kN/m ²]	μ	γ [kN/m ³]	α [1/C]	E _m [kN/m ²]	μ_m
1	Beton MB 30	3.150e+7	0.20	25.00	1.000e-5	3.150e+7	0.20

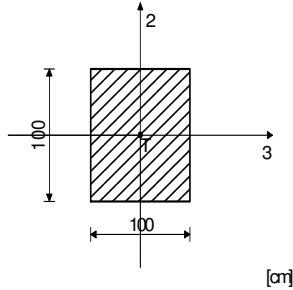
Setovi greda

@1@Set: 1 Presek: b/d=40/40, Fiktivna ekscentricnost



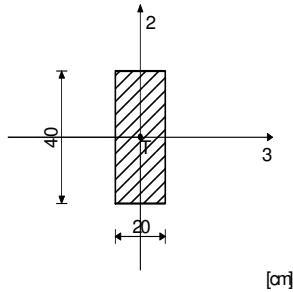
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	1.600e-1	1.333e-1	1.333e-1	3.605e-3	2.133e-3	2.133e-3

@1@Set: 2 Presek: b/d=100/100, Fiktivna ekscentricnost



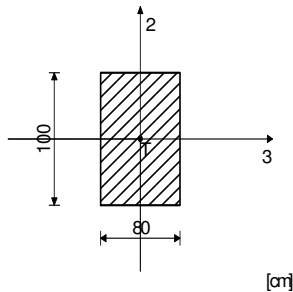
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	1.000e+0	8.333e-1	8.333e-1	1.408e-1	8.333e-2	8.333e-2

@1@Set: 3 Presek: b/d=20/40, Fiktivna ekscentricnost



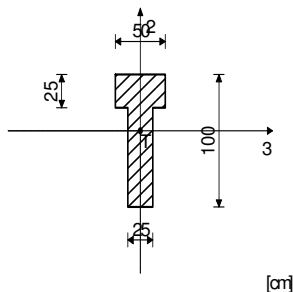
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	8.000e-2	6.667e-2	6.667e-2	7.324e-4	2.667e-4	1.067e-3

@1@Set: 4 Presek: b/d=80/100, Fiktivna ekscentricnost



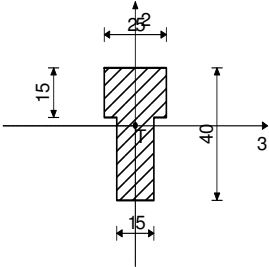
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	8.000e-1	6.667e-1	6.667e-1	8.759e-2	4.267e-2	6.667e-2

@1@Set: 5 Presek: T 50/100, Fiktivna ekscentricnost



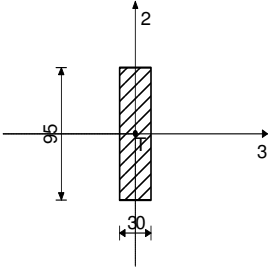
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	3.125e-1	2.266e-1	2.821e-1	6.510e-3	3.581e-3	2.819e-2

@1@Set: 6	Presek: T 25/40, Fiktivna ekscentricnost						
	Mat.	A1	A2	A3	I1	I2	I3
	1 - Beton MB 30	7.500e-2	5.749e-2	6.868e-2	5.625e-4	2.656e-4	1.016e-3



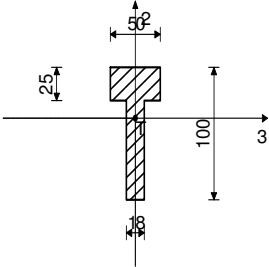
[cm]

@1@Set: 7	Presek: b/d=30/95, Fiktivna ekscentricnost						
	Mat.	A1	A2	A3	I1	I2	I3
	1 - Beton MB 30	2.850e-1	2.375e-1	2.375e-1	6.850e-3	2.138e-3	2.143e-2



[cm]

@1@Set: 8	Presek: T 50/100, Fiktivna ekscentricnost						
	Mat.	A1	A2	A3	I1	I2	I3
	1 - Beton MB 30	2.600e-1	1.693e-1	2.133e-1	4.062e-3	2.969e-3	2.321e-2

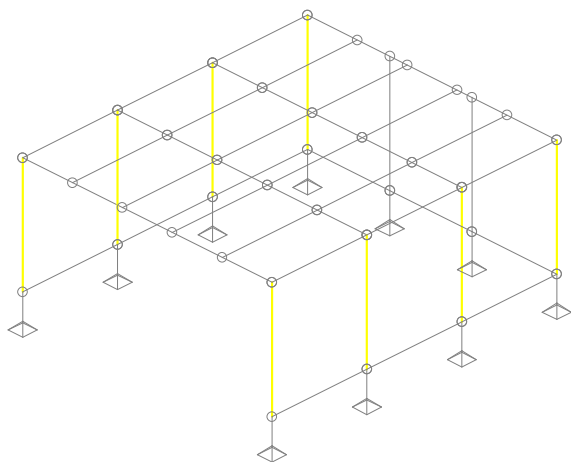


[cm]

Setovi tackastih oslonaca

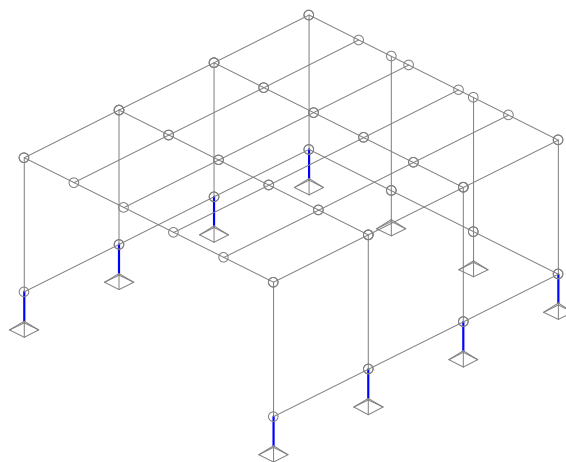
	K,R1	K,R2	K,R3	K,M1	K,M2	K,M3
1	1.000e+10	1.000e+10	1.000e+10	1.000e+10	1.000e+10	1.000e+10

Greda
1. $b/d=40/40$



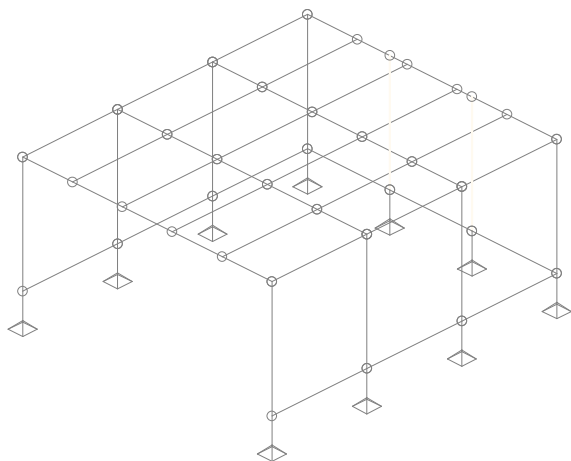
Setovi numerickih podataka
Greda (1)

Greda
2. $b/d=100/100$



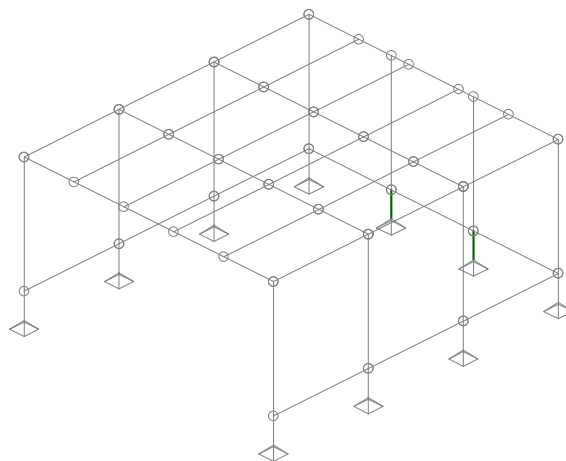
Setovi numerickih podataka
Greda (2)

Greda
3. $b/d=20/40$



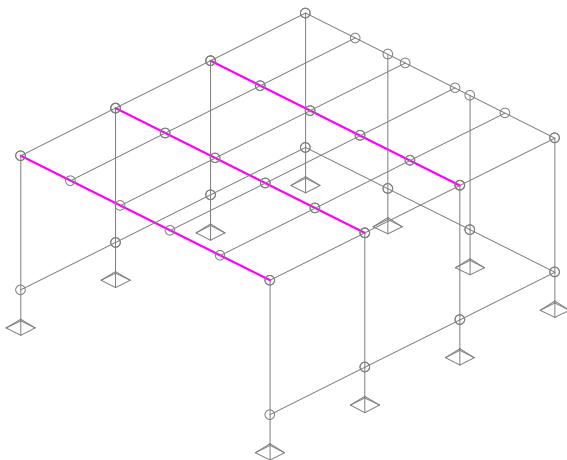
Setovi numerickih podataka
Greda (3)

Greda
4. $b/d=80/100$



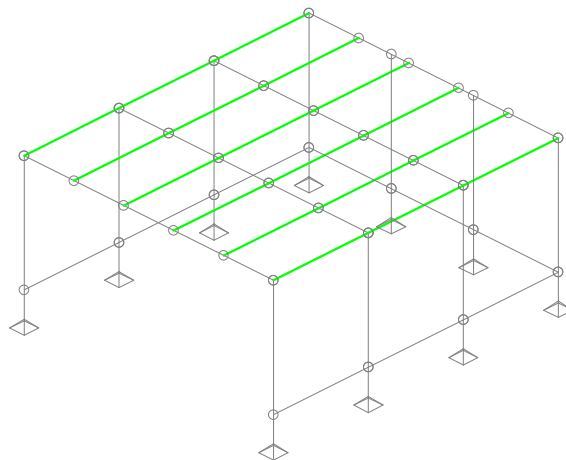
Setovi numerickih podataka
Greda (4)

Greda
5. T 50/100



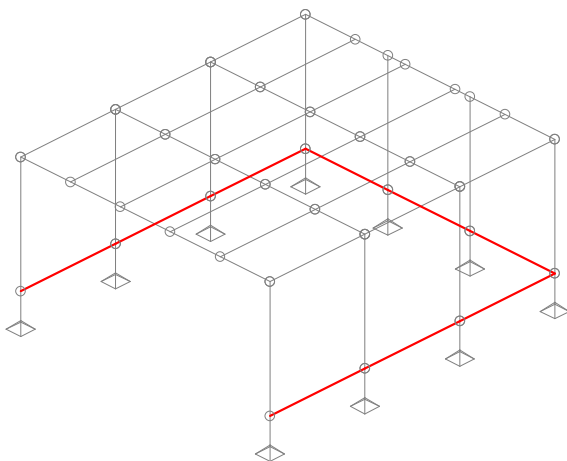
Setovi numerickih podataka
Greda (5)

Greda
6. T 25/40



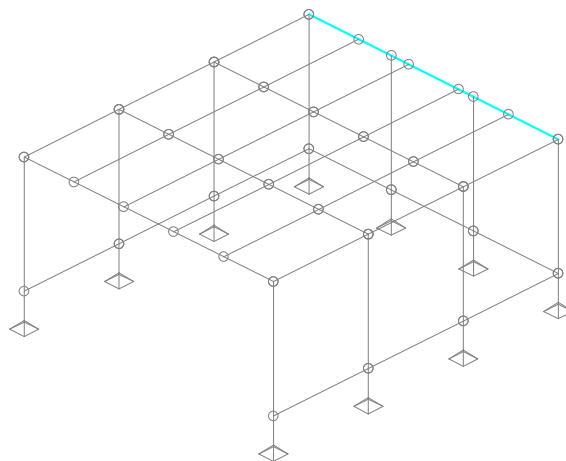
Setovi numerickih podataka
Greda (6)

Greda
7. b/d=30/95



Setovi numerickih podataka
Greda (7)

Greda
8. T 50/100



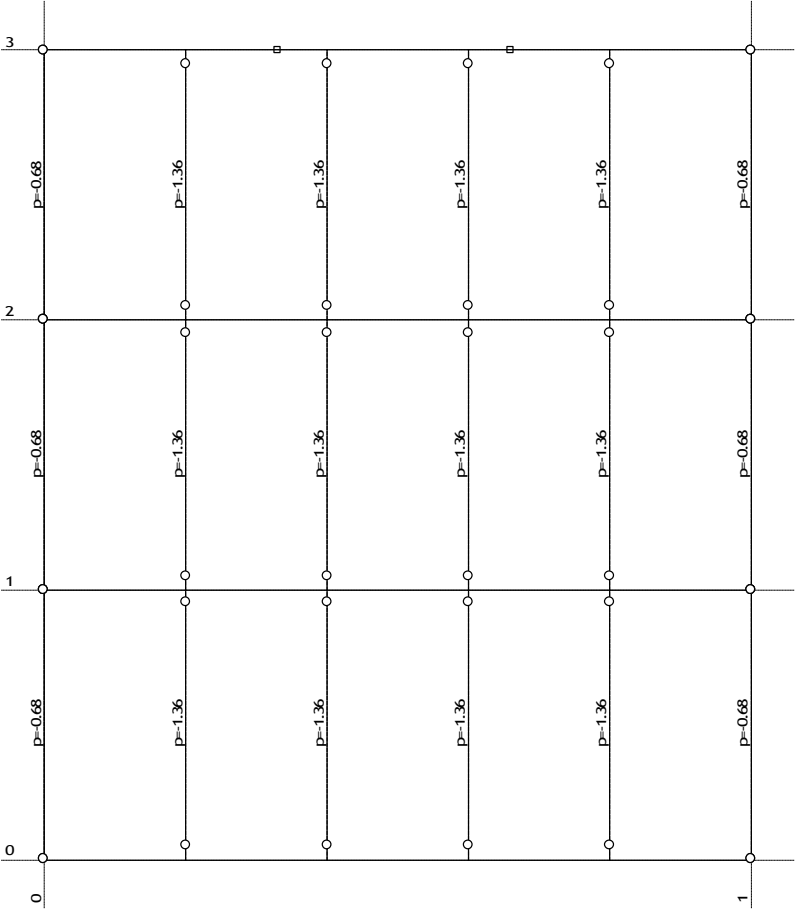
Setovi numerickih podataka
Greda (8)

Lista slucajeva opterećenja

No	Naziv
1	SW (g)
2	G
3	S
4	Wx
5	W-y
6	Wu
7	Sx
8	Sy
9	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV+1.8xVI
10	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xV+1.8xVI
11	Komb.: 1.6xI+ +II+1.8xIII+1.8xV+1.8xVI
12	Komb.: I+1.6xII+1.8xIII+1 .8xIV+1.8xVI
13	Komb.: 1.6xI+ +II+1.8xIII+1.8xIV+1.8xVI
14	Komb.: I+1.6xII+1.8xIII+1 .8xV+1.8xVI
15	Komb.: I+II+1.8xIII+1.8xV +1.8xVI
16	Komb.: I+II+1.8xIII+1.8xIV+ +1.8xVI
17	Komb.: 1.6xI+1.6xII+ +1.8xIV+1.8xVI
18	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xVI
19	Komb.: 1.6xI+1.6xII+1.8xIII+ +1.8xV
20	Komb.: 1.6xI+ +1.6xII+1.8xV+1.8xVI
21	Komb.: 1.6xI+ +1.6xII+1.8xIII+1.8xIV
22	Komb.: I+1.6xII+ +1.8xIV+1.8xVI
23	Komb.: 1.6xI+II+ +1.8xIV+1.8xVI
24	Komb.: 1.6xI+ +II+1.8xV+1.8xVI
25	Komb.: I+1.6xII+1.8xIII+ +1.8xV
26	Komb.: I+1.6xII+1.8xV+1.8 xVI
27	Komb.: 1.6xI+ +II+1.8xIII+1.8xIV
28	Komb.: I+1.6xII+1.8xIII+1 .8xIV
29	Komb.: 1.6xI+II+1.8xIII+ +1.8xV
30	Komb.: I+1.6xII+1.8xIII+1 .8xVI
31	Komb.: 1.6xI+ +II+1.8xIII+1.8xVI
32	Komb.: I+II+1.8xIV+1.8xVI
33	Komb.: I+II+1.8xIII+1.8xV

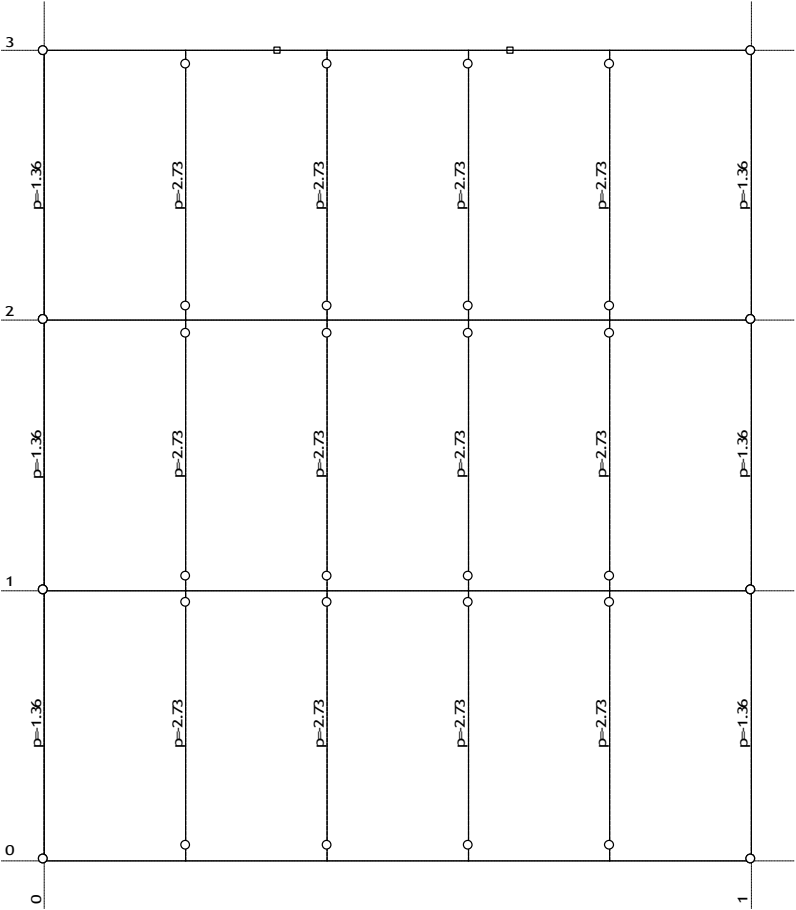
34	Komb.: I+II+1.8xV+1.8xVI
35	Komb.: I+II+1.8xIII+1.8xIV
36	Komb.: I+II+1.8xIII+1.8xVI
37	Komb.: 1.6xI+1.6xII+1.8xIII
38	Komb.: 1.6xI+1.6xII+1.8xV
39	Komb.: 1.6xI+1.6xII+1.8xIV
40	Komb.: 1.6xI+1.6xII+1.8xVI
41	Komb.: I+1.6xII+1.8xIV
42	Komb.: 1.6xI+II+1.8xIII
43	Komb.: 1.6xI+II+1.8xV
44	Komb.: 1.6xI+II+1.8xVI
45	Komb.: I+1.6xII+1.8xV
46	Komb.: I+1.6xII+1.8xVI
47	Komb.: 1.6xI+II+1.8xIV
48	Komb.: I+1.6xII+1.8xIII
49	Komb.: I+II+1.8xV
50	Komb.: I+II+1.8xIV
51	Komb.: I+II+1.8xIII
52	Komb.: I+II+1.8xVI
53	Komb.: 1.6xI+1.6xII
54	Komb.: 1.6xI+II
55	Komb.: I+1.6xII
56	Komb.: I+II
57	Komb.: I+II+III
58	Komb.: I+II+IV
59	Komb.: I+II+III+IV
60	Komb.: I+II+V
61	Komb.: I+II+III+V
62	Komb.: I+II+IV+VI
63	Komb.: I+II+IV-1xVI
64	Komb.: I+II+III+IV+VI
65	Komb.: I+II+III+IV-1xVI
66	Komb.: I+II+V+VI
67	Komb.: I+II+V-1xVI
68	Komb.: I+II+III+V+VI
69	Komb.: I+II+III+V-1xVI
70	Komb.: I+II+III+VII
71	Komb.: I+II+III-1xVII
72	Komb.: I+II+III+VIII
73	Komb.: I+II+III-1xVIII
74	Komb.: 1.3xI+ +1.3xII+1.3xIII+1.3xVII
75	Komb.: 1.3xI+1.3xII+1.3xIII- -1.3xVII
76	Komb.: 1.3xI+1.3xII+1.3xIII+ +1.3xVIII
77	Komb.: 1.3xI+1.3xII+ +1.3xIII-1.3xVIII

Qr. 2 G



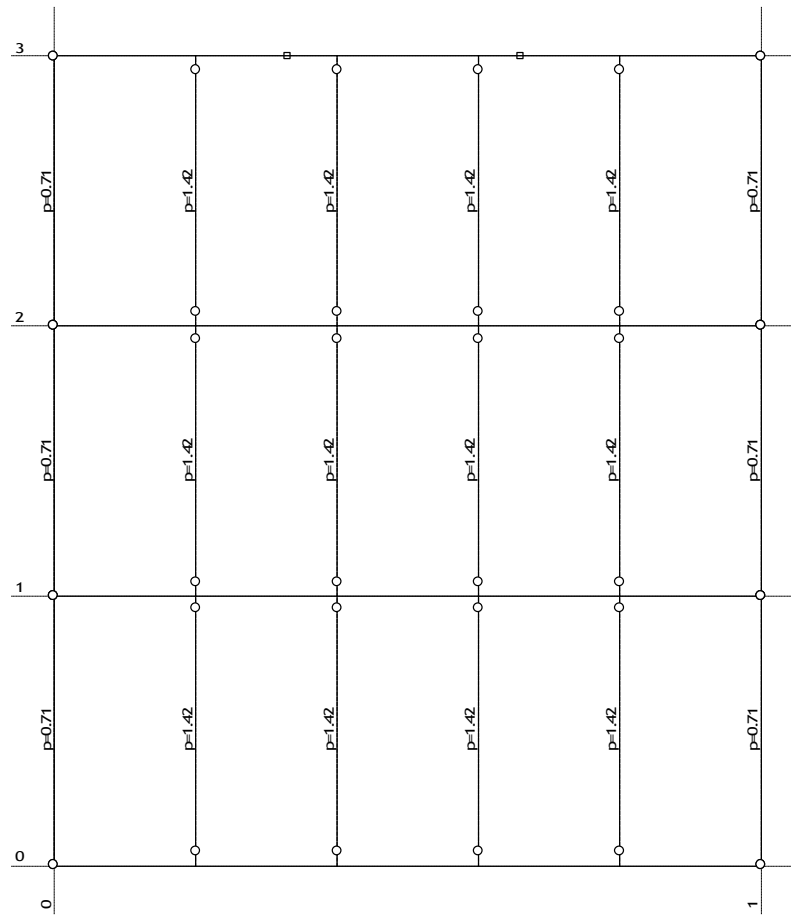
Nva [6.00m]

Qr. 3 S



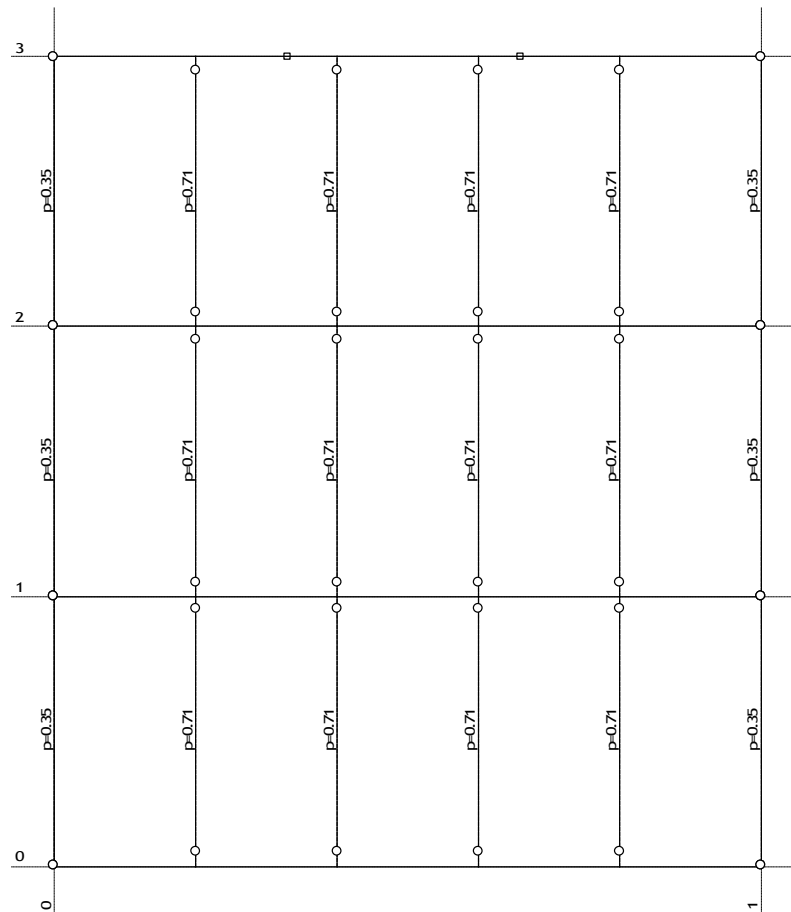
Nva [6.00m]

Opt. 4: Wx



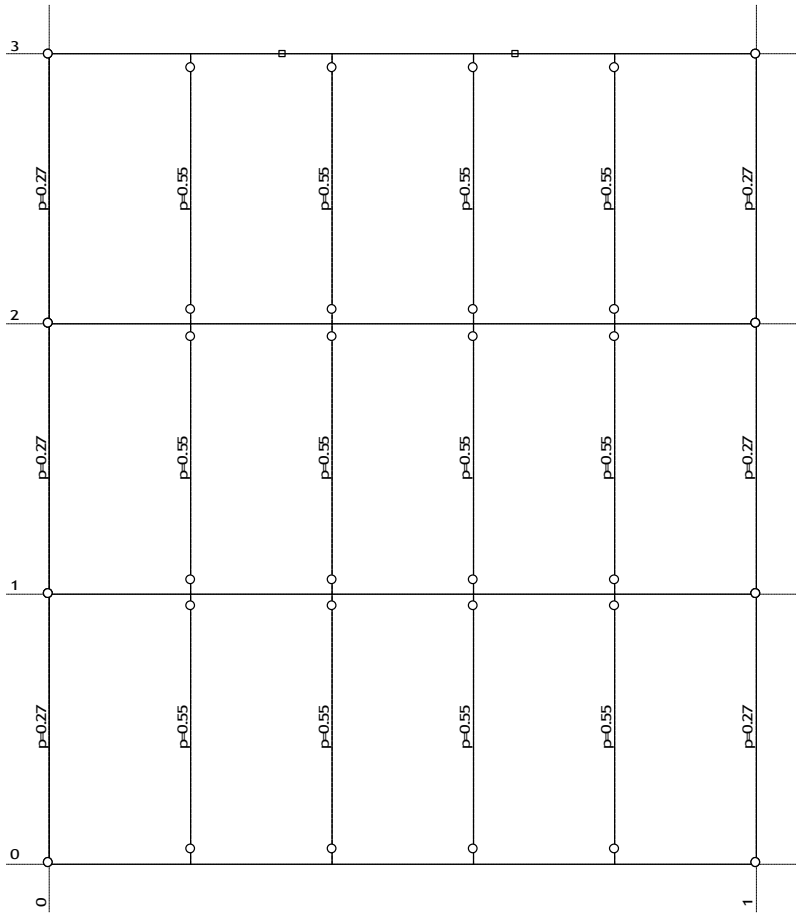
Nva [6.00m]

Opt. 5: Wy



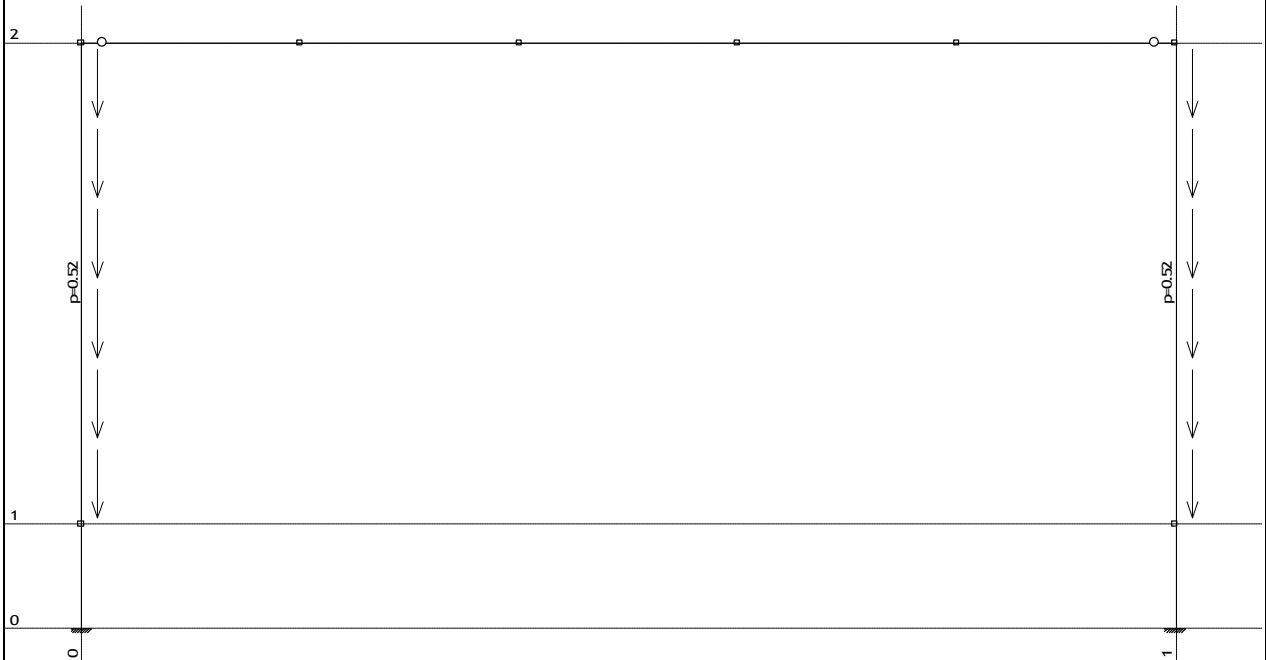
Nva [6.00m]

Opt. 6: Wu



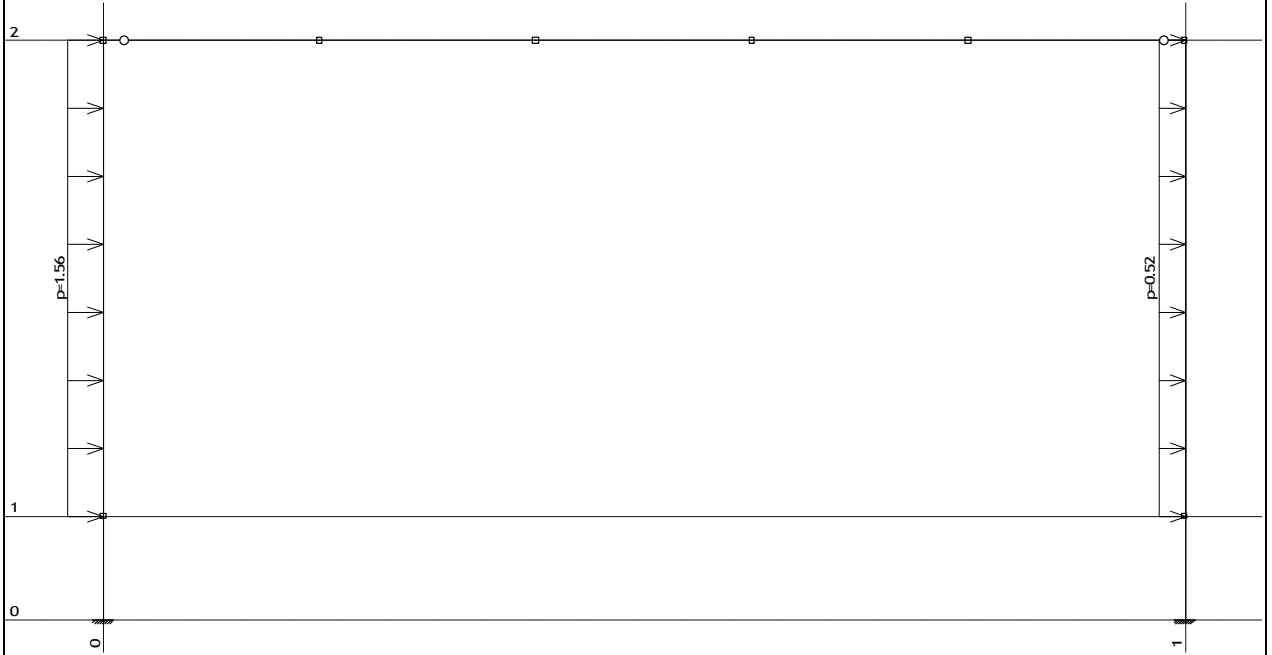
Nvo: [6.00 m]

Opt. 2 G



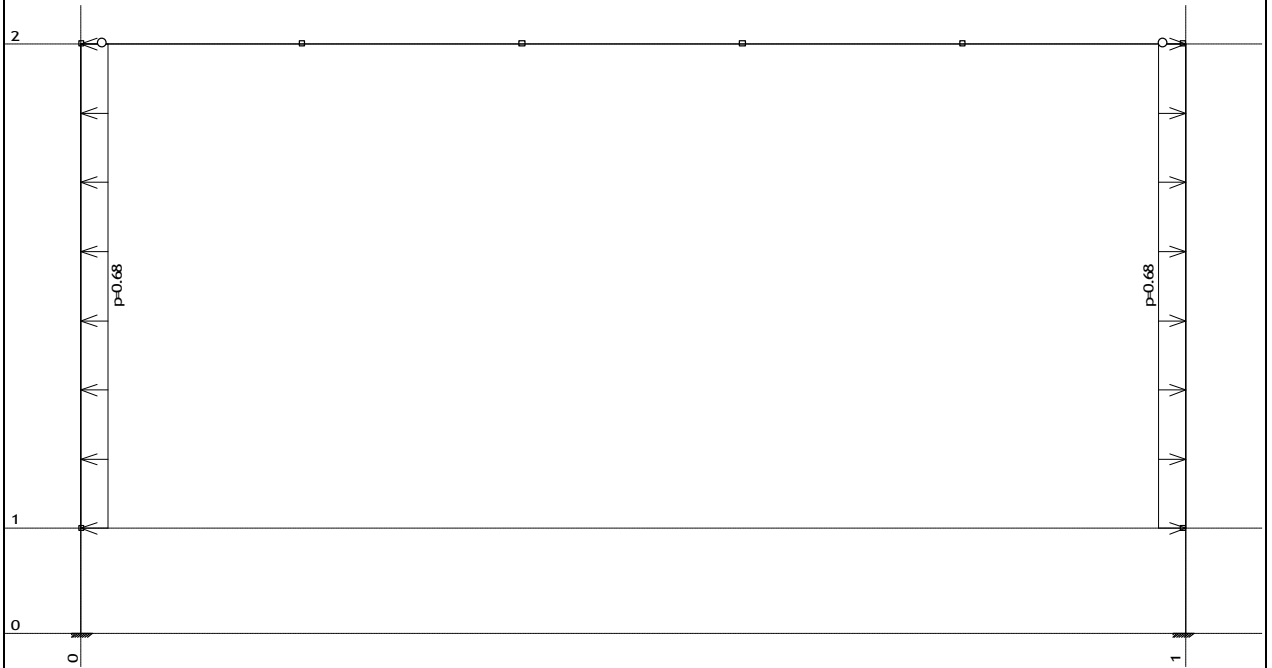
Ram: H_1

Opt. 4: Wx



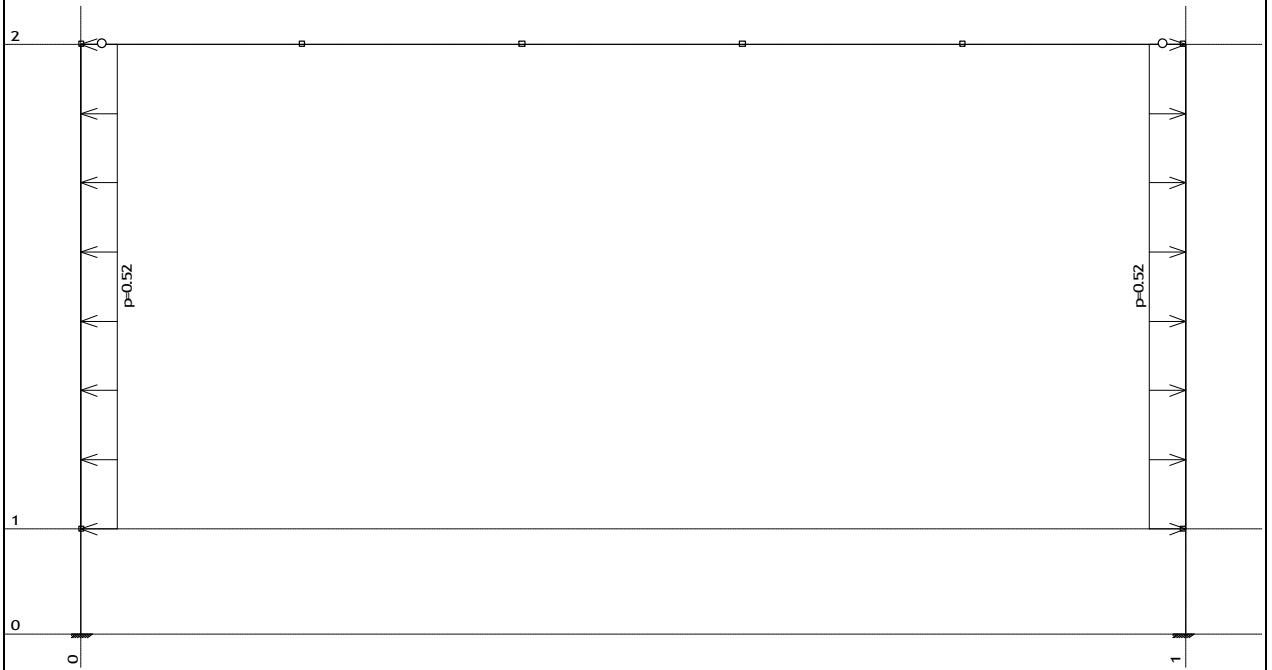
Ram: H 1

Opt. 5: Wy



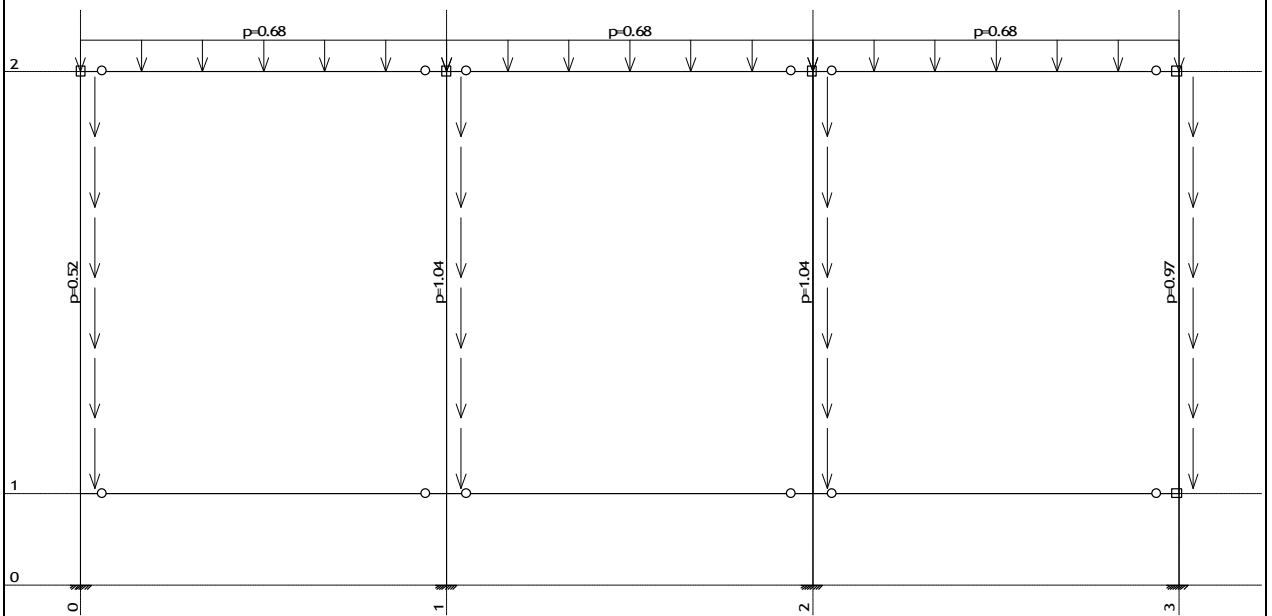
Ram: H 1

Opt. 6 Wu



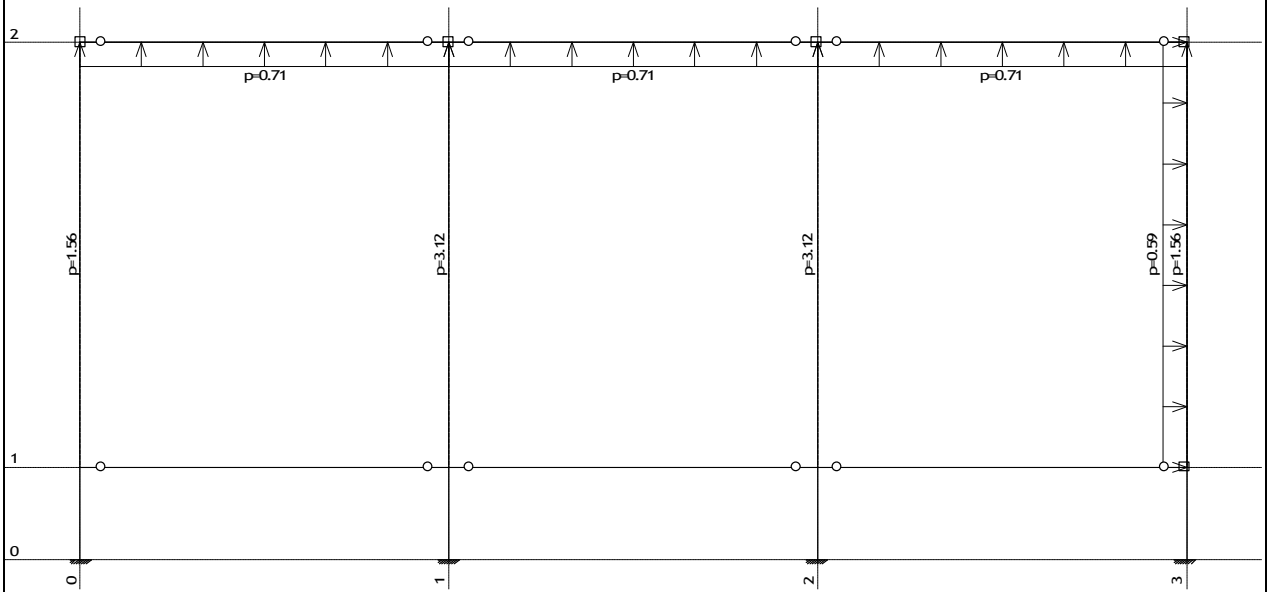
Ram H 1

Opt. 2 G



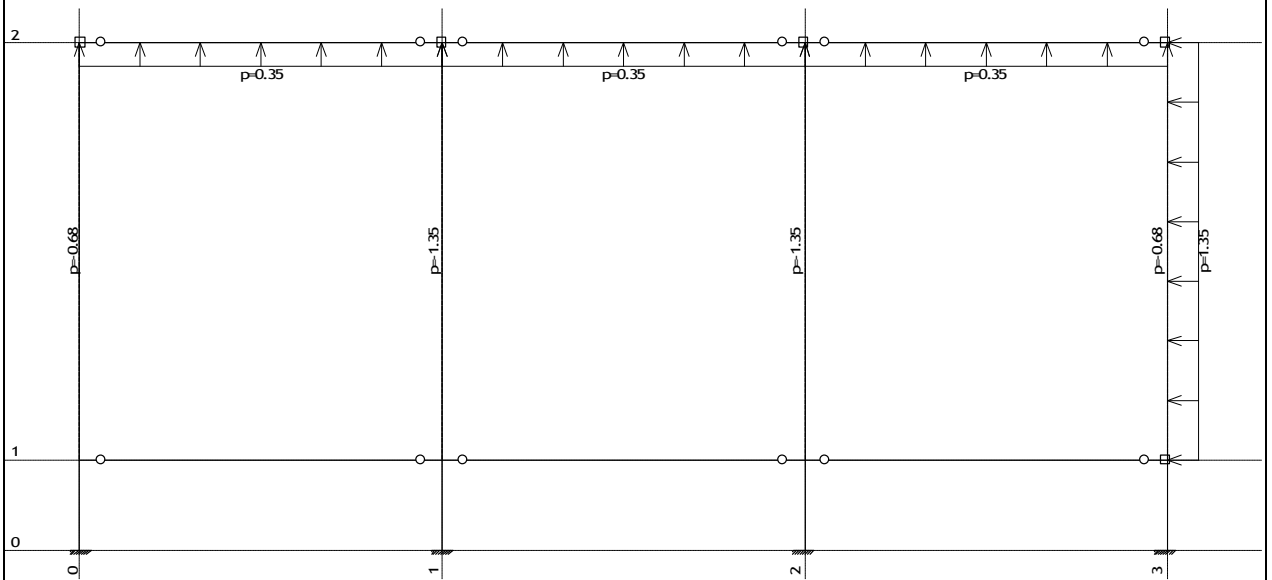
Ram V 1

Opt. 4: Wk



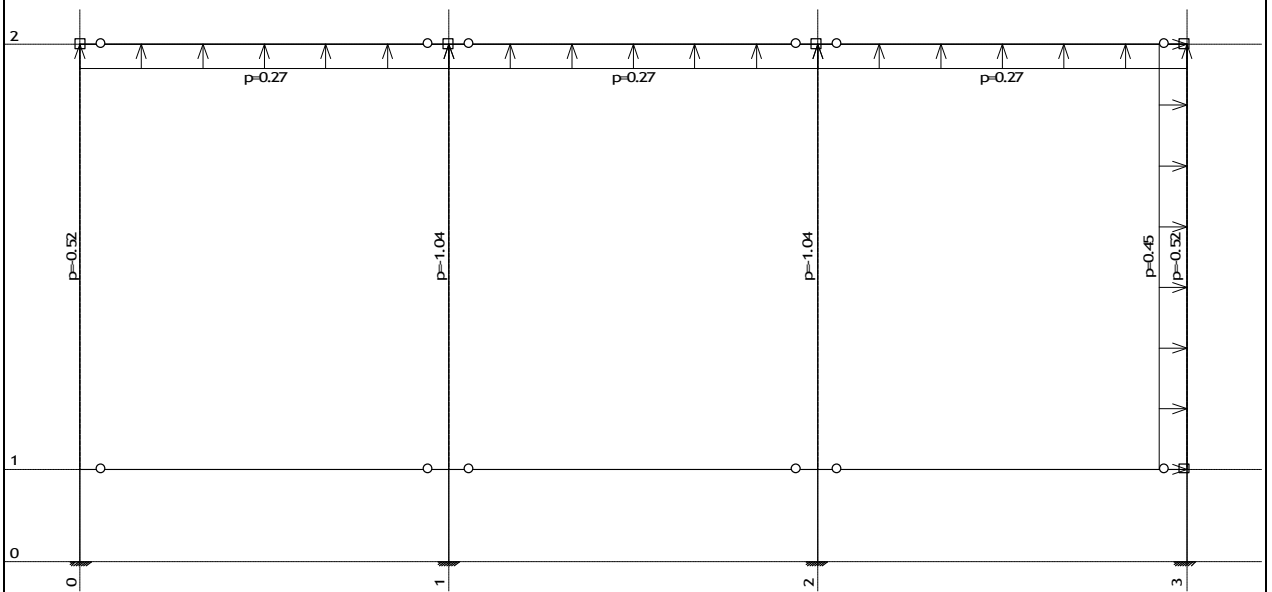
Ram V.1

Opt. 5: Wy



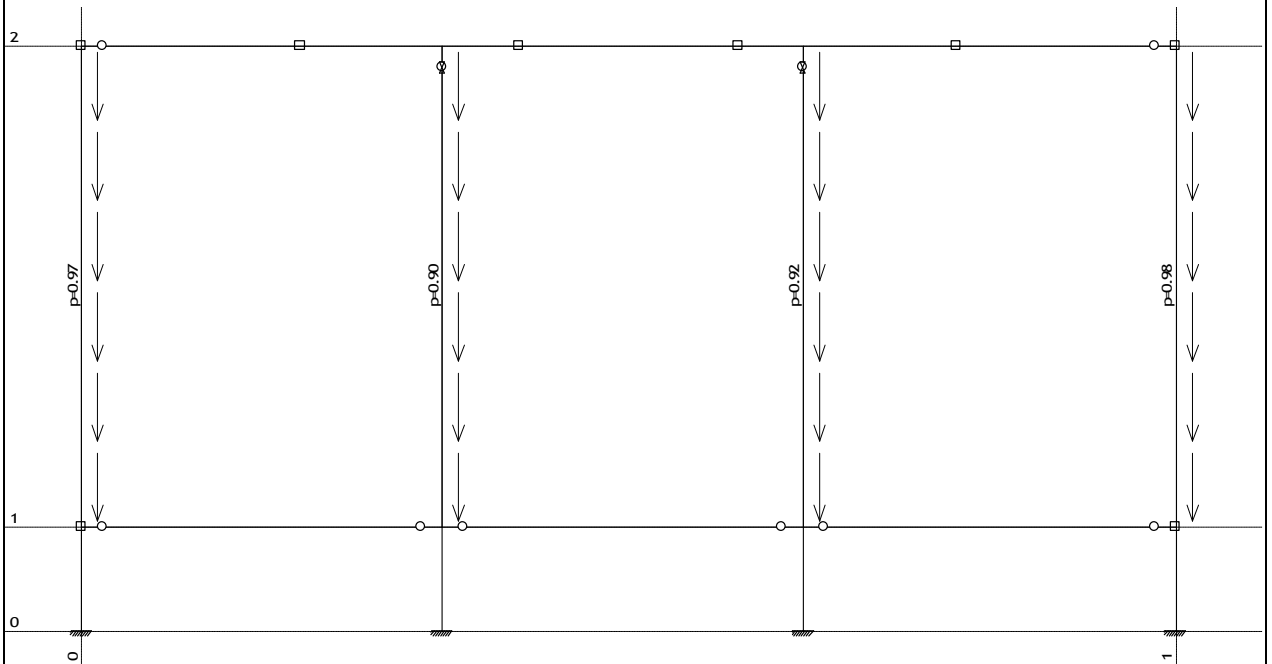
Ram V.1

Opt. 6 Wu



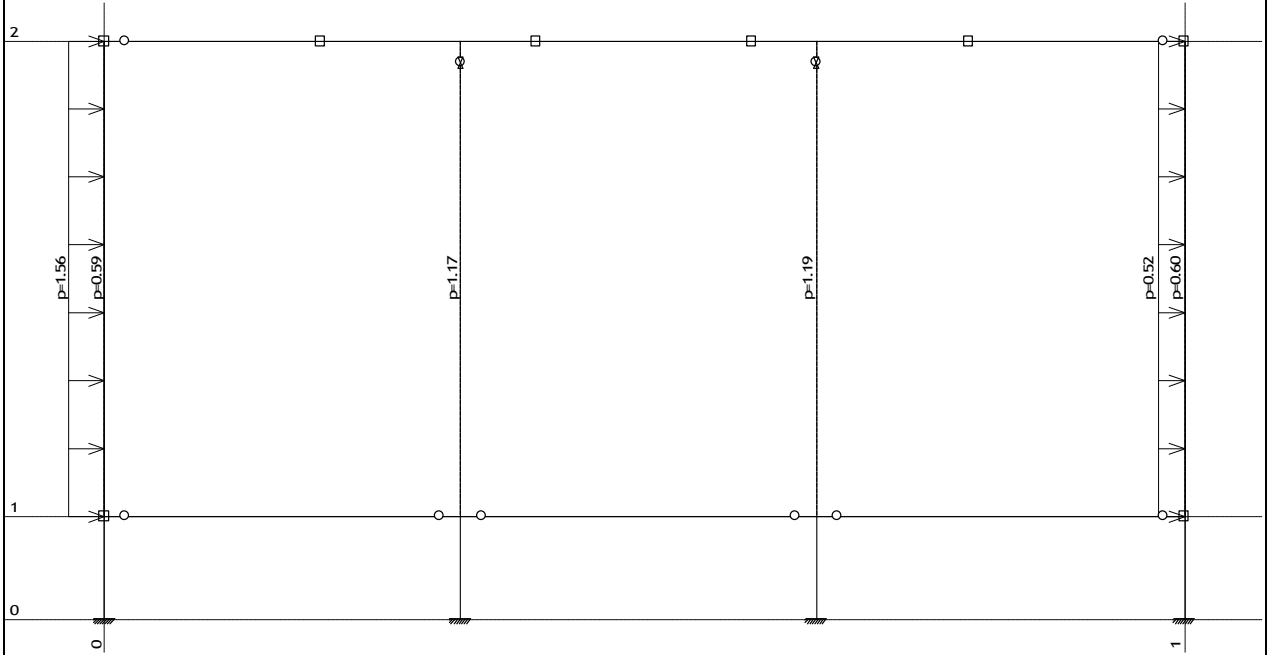
Ram V.1

Opt. 2 G



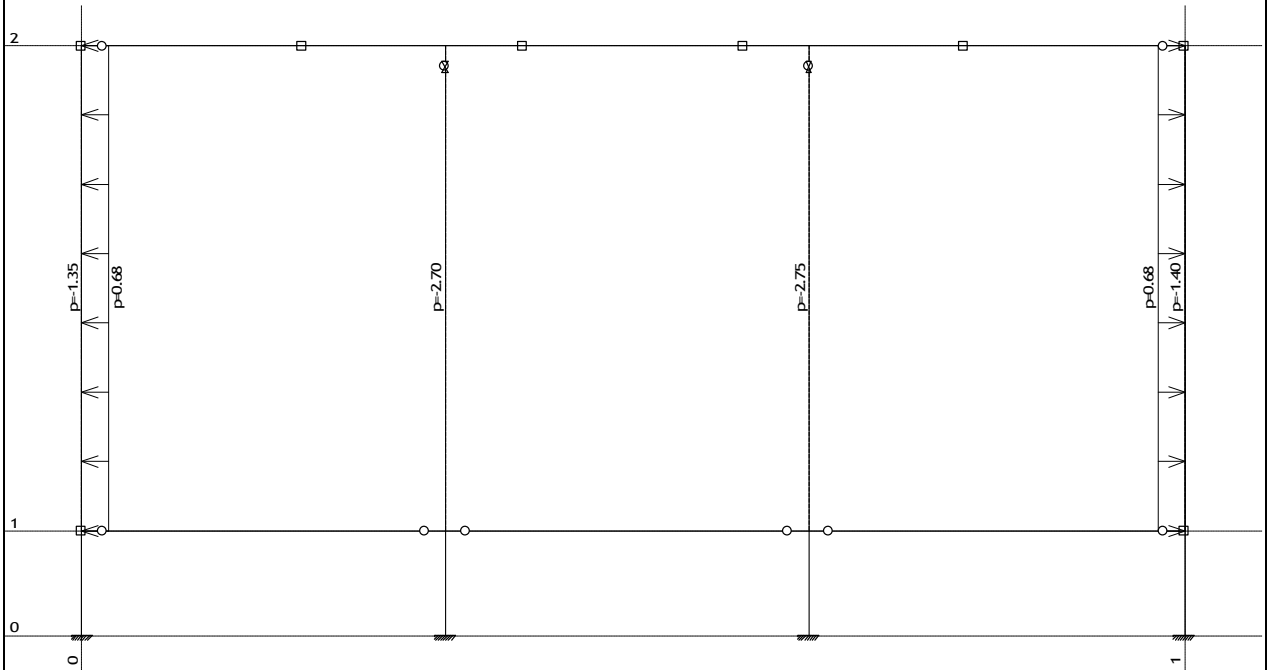
Ram H.4

Opt. 4: Wk



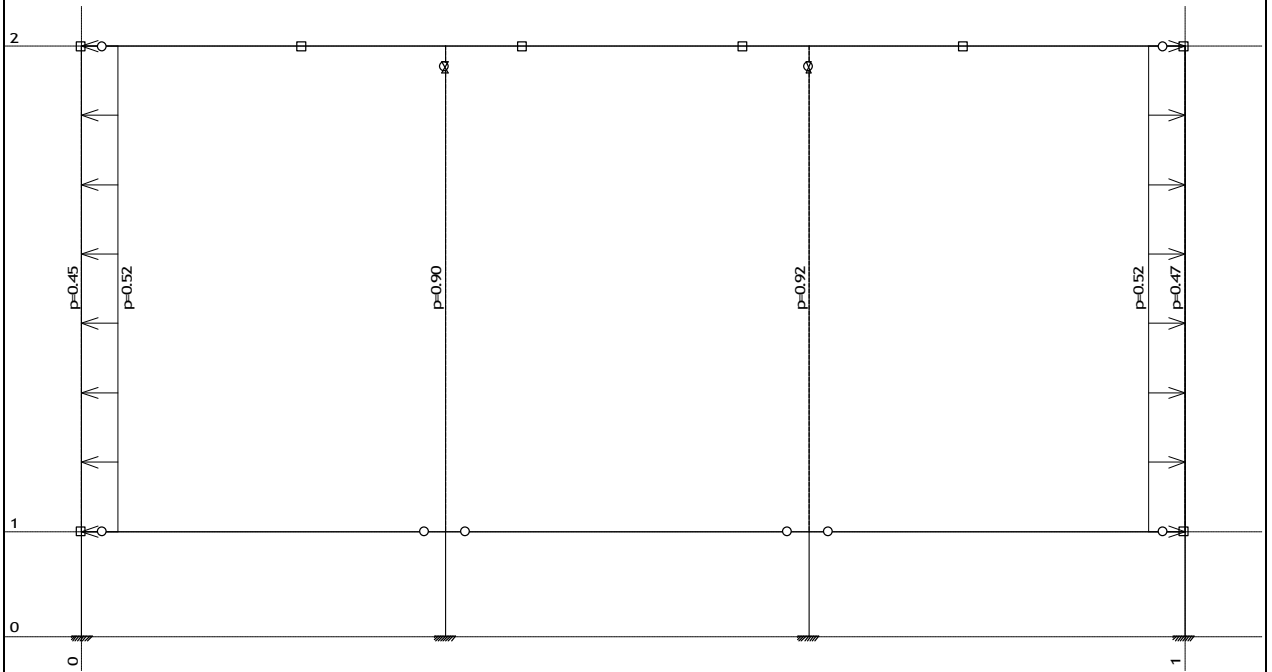
Ram H.4

Opt. 5: Wy



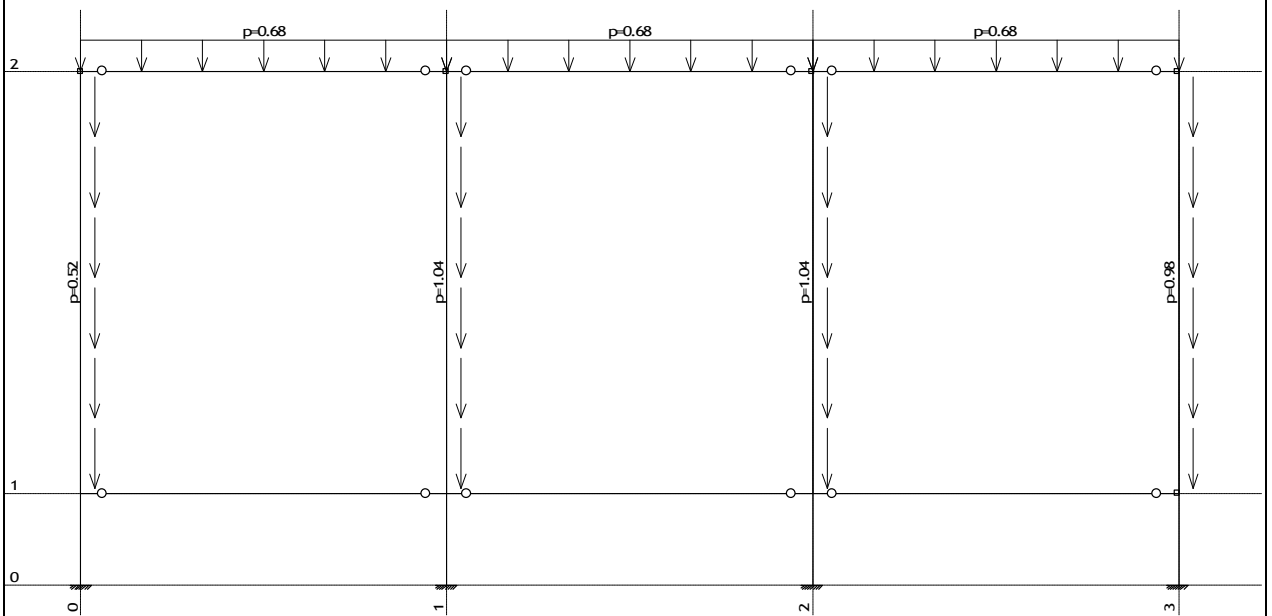
Ram H.4

Opt. 6 Wu



Ram H.4

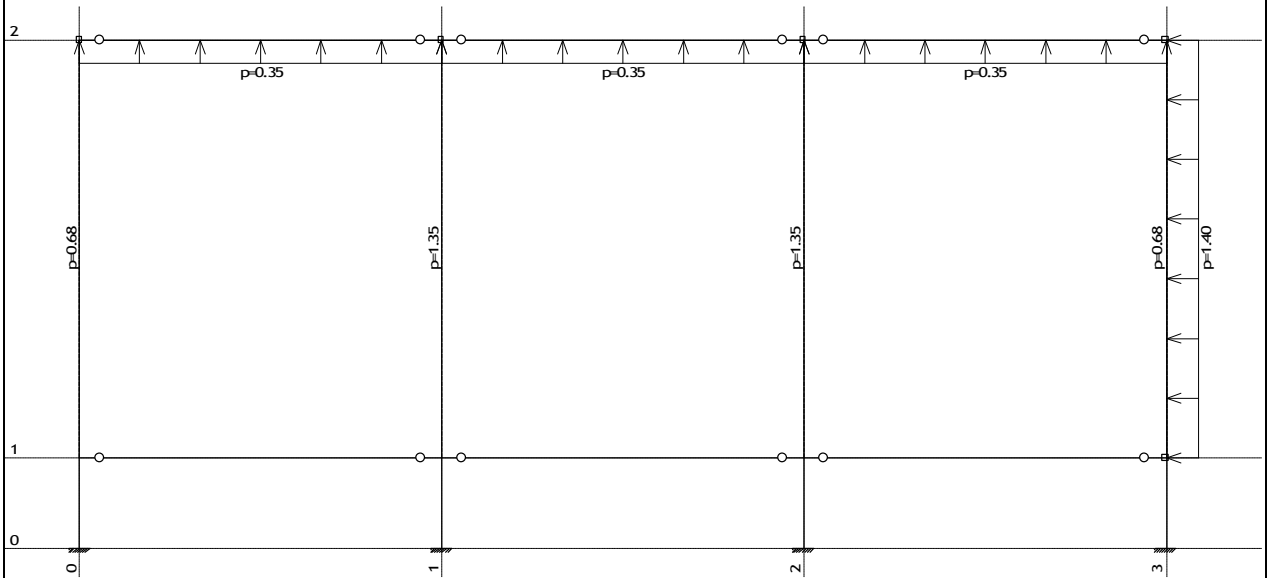
Opt. 2 G



Ram V.6

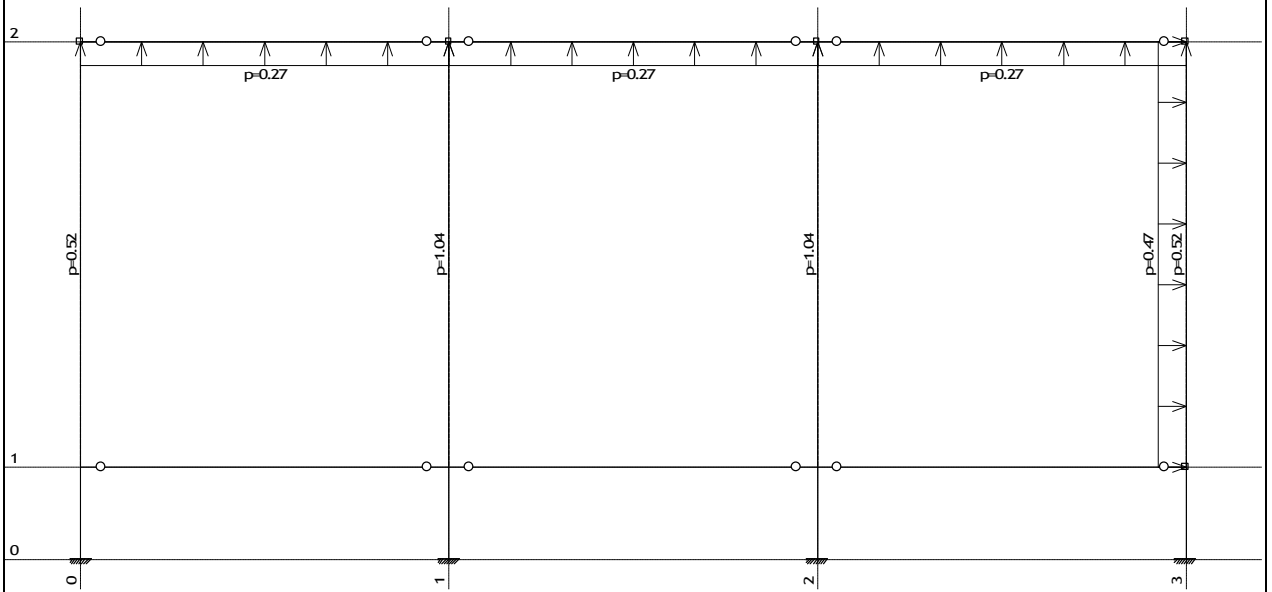
The diagram illustrates a frame structure with four vertical columns and two horizontal levels. The columns are labeled 0, 1, 2, and 3 at the base. The levels are labeled 0, 1, and 2. The columns are fixed at the base. The horizontal members are labeled with $p=0.71$. The vertical members are labeled with $p=0.52$, $p=1.04$, $p=1.04$, and $p=0.60$. The diagram shows the distribution of loads and the resulting internal forces.

Opt. 5: W-y



Radimpex - www.radimpex.rs

Opt. 6: Wu



Ram V.6

Napredne opcije seizmickog proracuna:

Multiplikator krutosti oslonaca: 10000.000
Spreteno oscilovanje u Z pravcu

Faktori opterecenja za proracun masa

No	Naziv	Koeficijent
1	SW (g)	1.00
2	G	1.00
3	S	1.00
4	Wx	0.00
5	Wy	0.00
6	Wu	0.00

Raspored masa po visini objekta

Nivo	Z [m]	X [m]	Y [m]	Masa [T]	T/m2
	6.00	-33.54	-12.08	104.12	
	0.00	-33.55	-9.97	64.03	
	-1.30	-33.55	-10.67	15.91	
Ukupno:	3.28	-33.54	-11.23	184.05	

Položaj centara krutosti po visini objekta

Nivo	Z [m]	X [m]	Y [m]
	6.00	-33.55	-11.73
	0.00	-33.55	-11.10
	-1.30	-33.55	-11.08

Ekscentricitet po visini objekta

Nivo	Z [m]	eox [m]	eoy [m]
	6.00	0.01	0.35
	0.00	0.01	1.13
	-1.30	0.00	0.41

Periodi oscilovanja konstrukcije

No	T [s]	f [Hz]
1	0.7896	1.2664
2	0.7757	1.2891
3	0.7354	1.3598
4	0.6558	1.5249
5	0.6008	1.6645

Seizmicki proracun

Seizmicki proracun: JUS (Ekvivalentno staticko opterecenje)

Kategorija tla: II
Seizmicka zona: (Ks = 0.040)
Kategorija objekta: I
Vrsta konstrukcije: 2
Kota ukljescenja: Zd = 0.00 m
Multiplikator krutosti oslonaca: 10000.000

Ugao dejstva zemljotresa:

Naziv	T [sec]	α [%]
Sx	0.790	0.00
Sy	0.776	90.00

Raspored seizmickih sila po visini objekta (Sx)

Nivo	Z [m]	S [kN]
	6.00	70.60
	0.00	0.00
	-1.30	0.00
	Σ	70.60

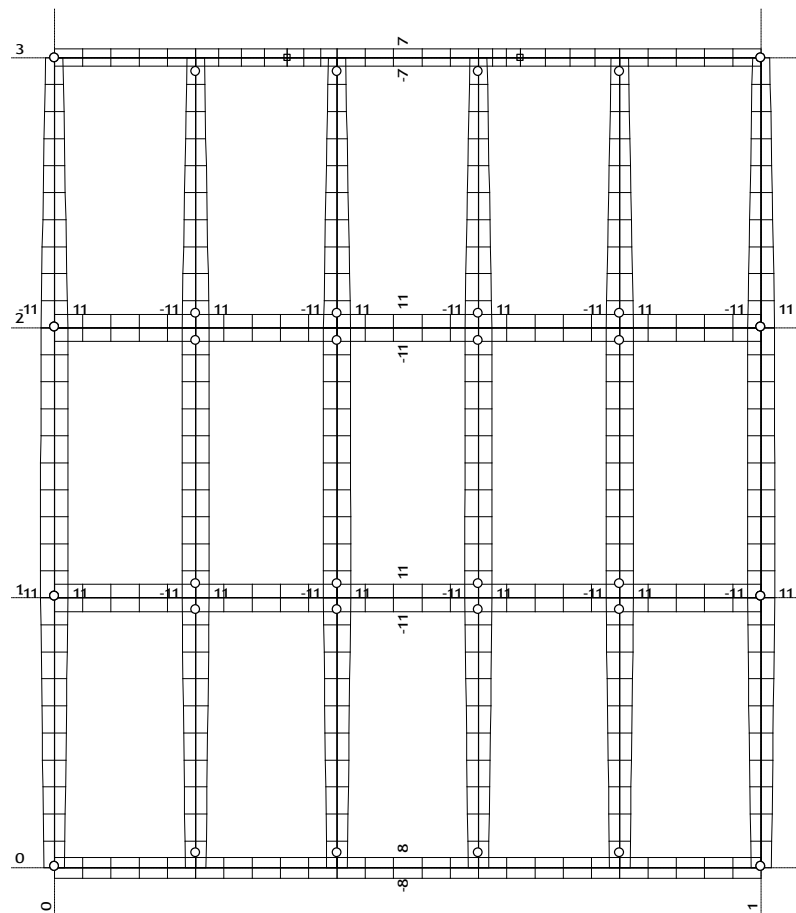
Raspored seizmickih sila po visini objekta (Sy)

Nivo	Z [m]	S [kN]
	6.00	71.86
	0.00	0.00
	-1.30	0.00
	Σ	71.86

Raspored masa po visini objekta

Nivo	Z [m]	X [m]	Y [m]	Masa [T]	T/m2
	6.00	-33.54	-12.08	104.12	
	0.00	-33.55	-9.97	64.03	
	-1.30	-33.55	-10.67	15.91	
Ukupno:	3.28	-33.54	-11.23	184.05	

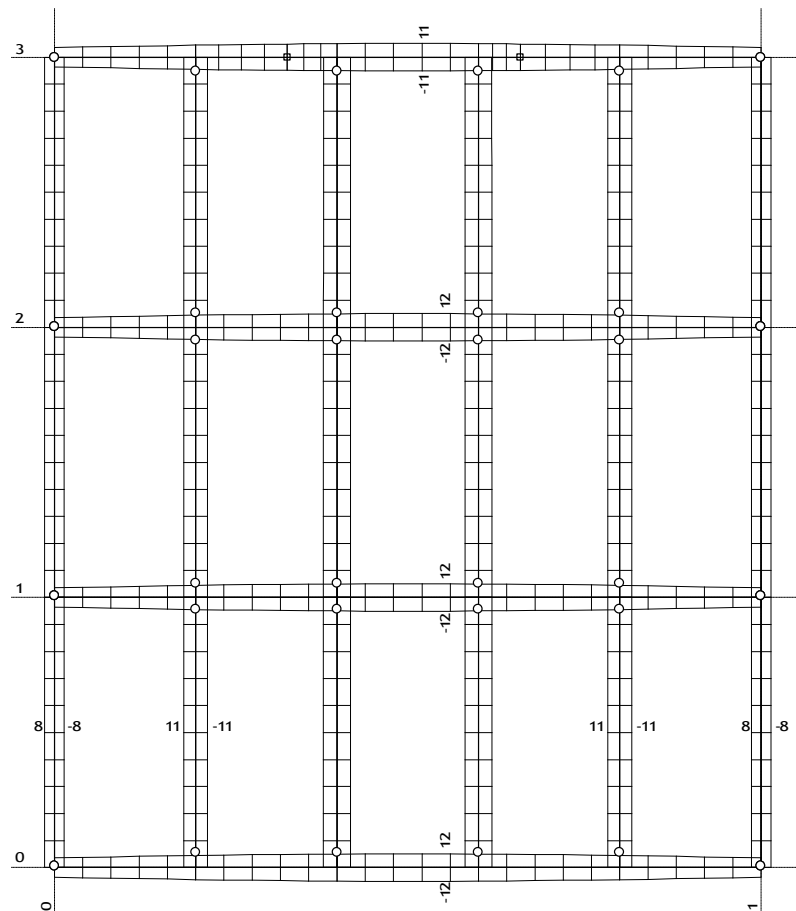
Opt. 78: [Am] 56-73



Nivo: [6.00 m]

Uticaji u gred: max $X_p = 11$ / min $X_p = -11$ m / 1000

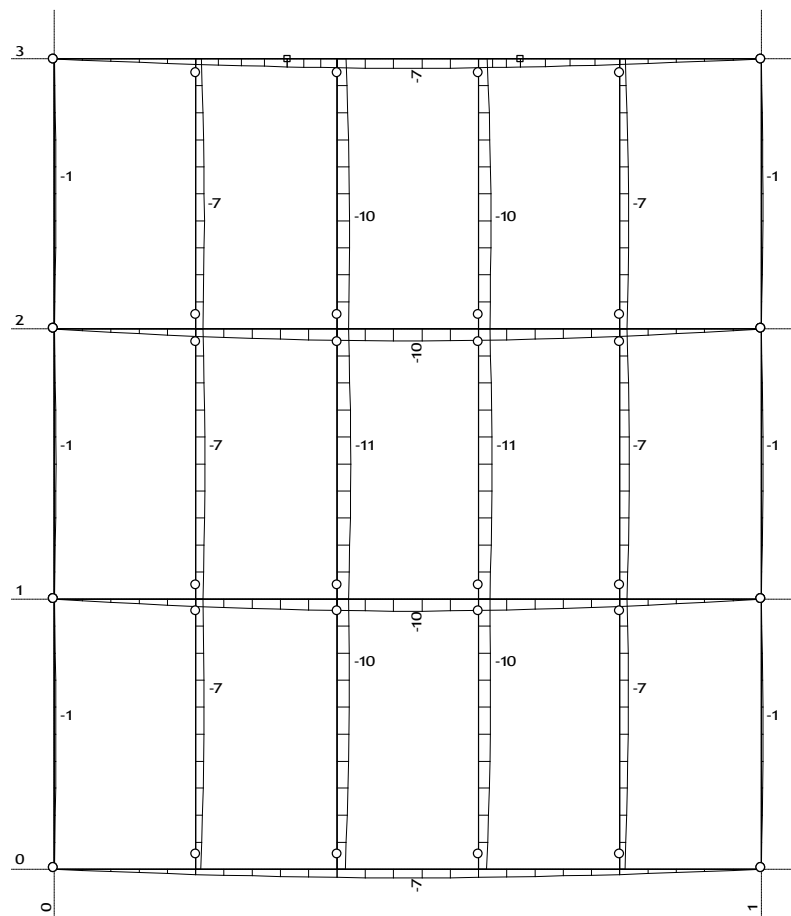
Opt. 78: [Am] 56-73



Nivo: [6.00 m]

Uticaji u gred: max $Y_p = 12$ / min $Y_p = -12$ m / 1000

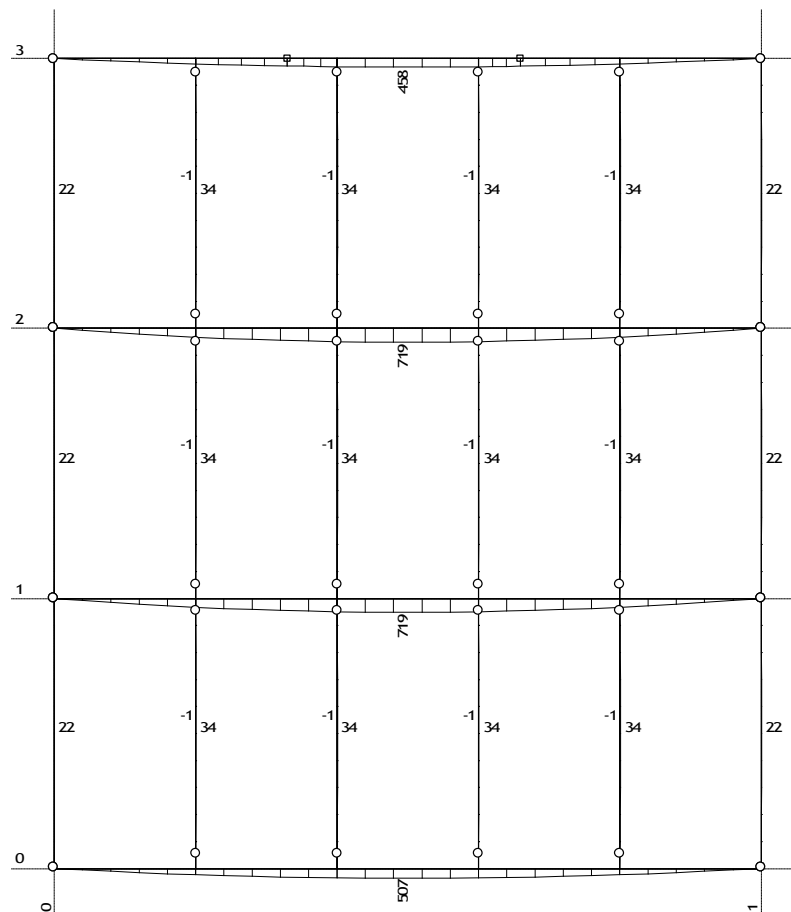
Opt. 78: [Am] 56-73



Nivo: [6.00 m]

Uticaji u gred: max $Z_p = -0$ / min $Z_p = -11$ m / 1000

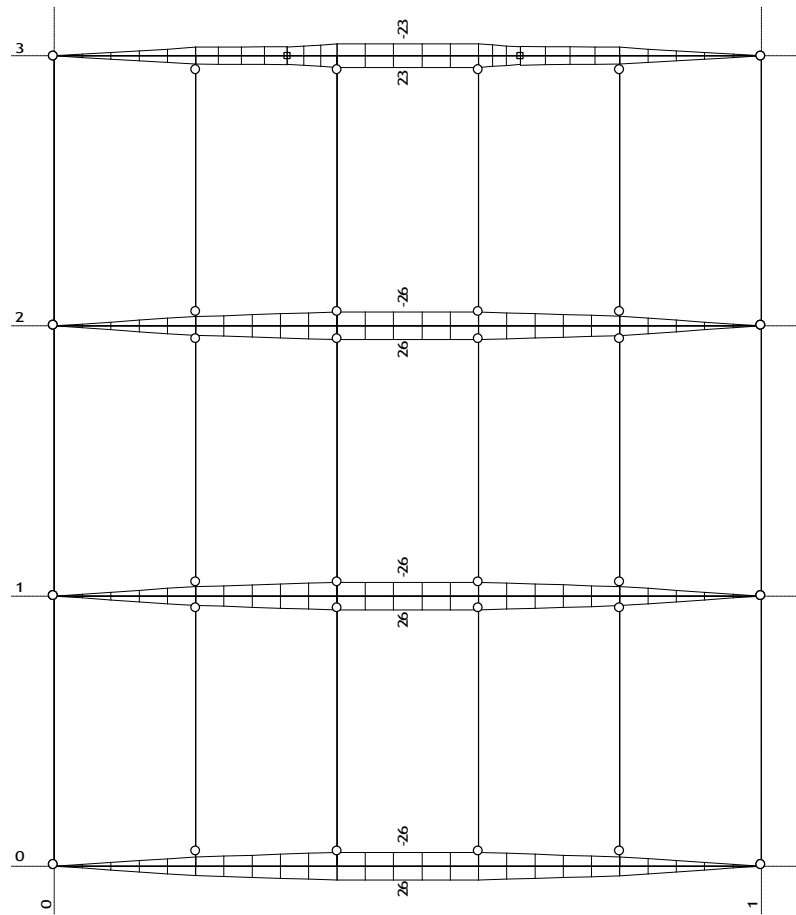
Opt. 78: [Am] 9-55,74-77



Nivo: [6.00 m]

Uticaji u gred: max $M_B = 719$ / min $M_B = -1$ kNm

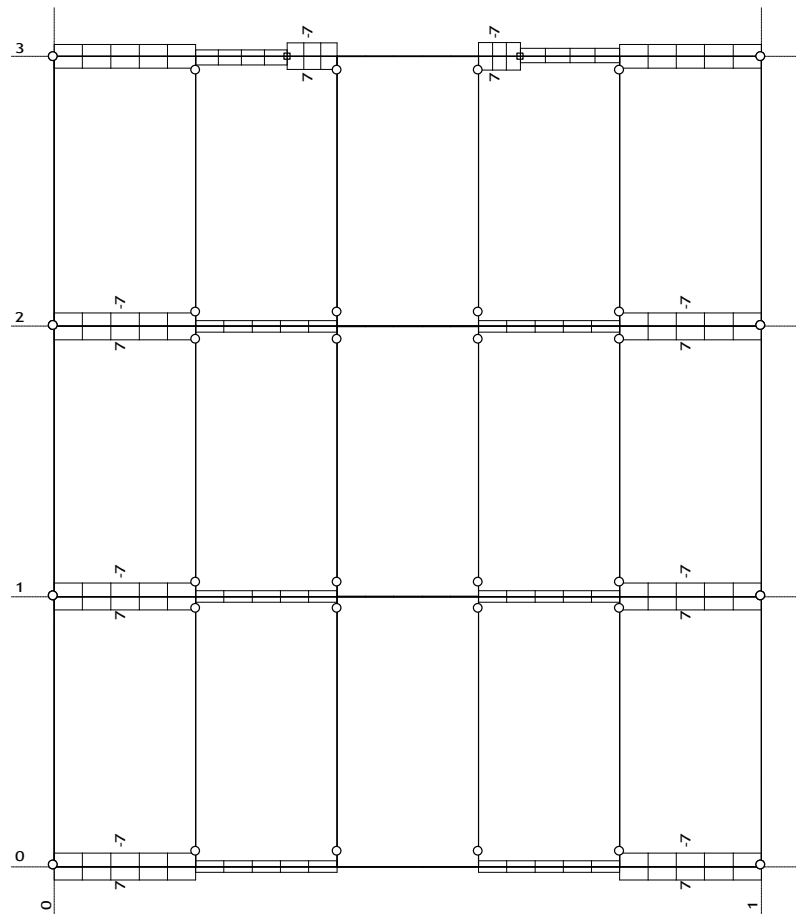
Opt. 78: [Ans] 9:55,74-77



Nivo: [6.00 m]

Uticaji u gred: max $M_2 = 26$ / min $M_2 = -26$ kNm

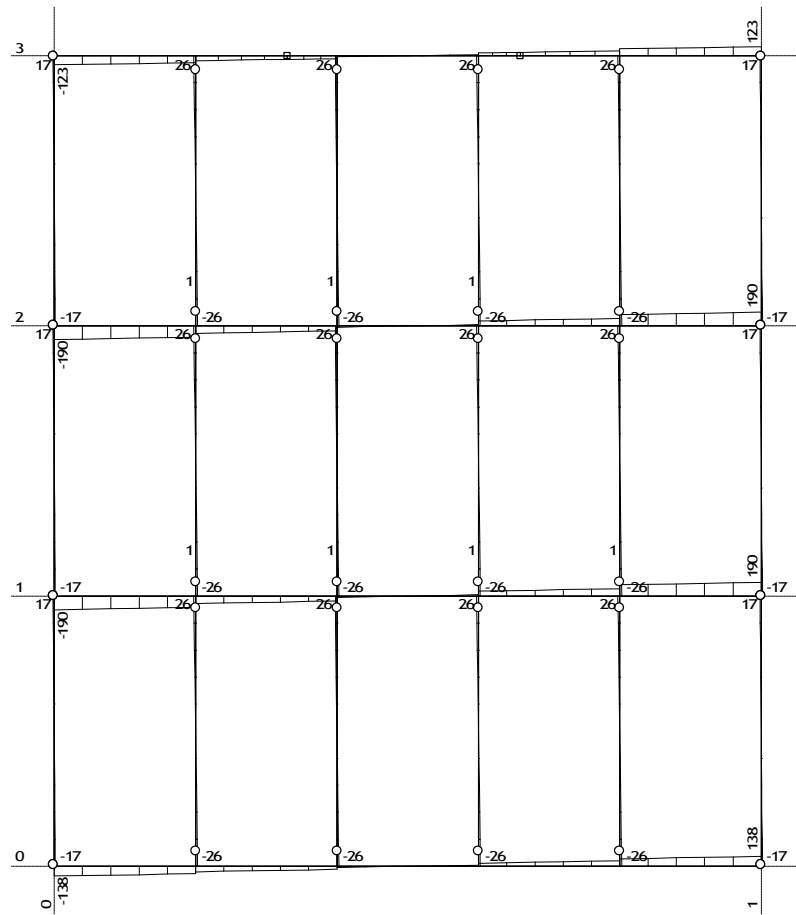
Opt. 78: [Ans] 9:55,74-77



Nivo: [6.00 m]

Uticaji u gred: max $T_3 = 7$ / min $T_3 = -7$ kN

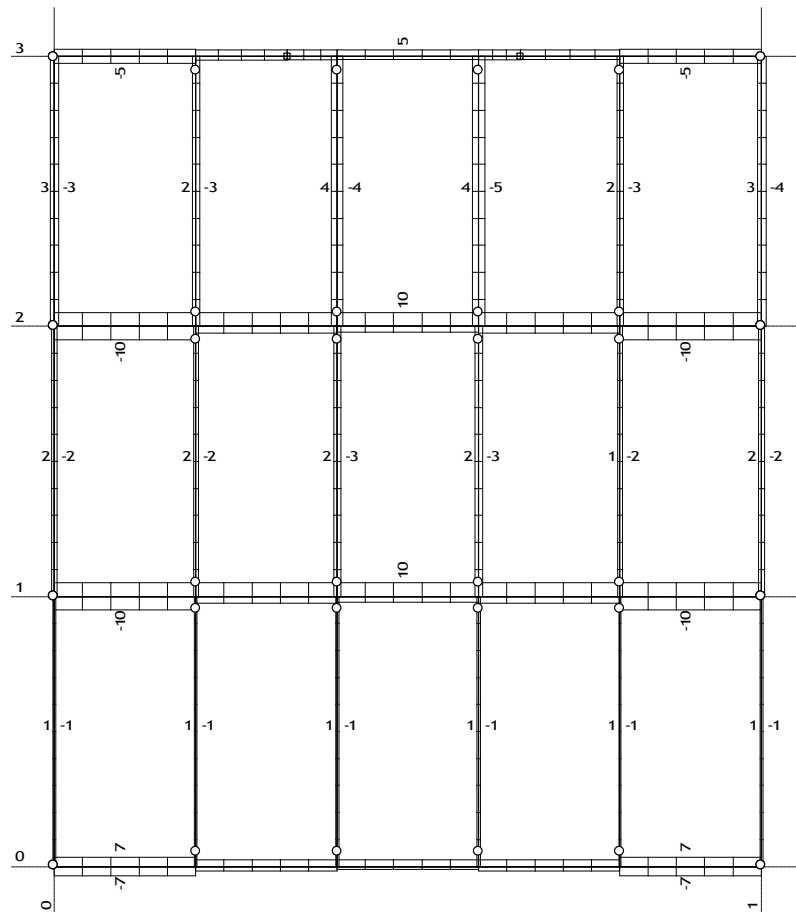
Opt. 78: [Ans] 9:55,74-77



N_{ax} [6.00 m]

Uticaji u gred: max T2= 190 / min T2= -190 kN

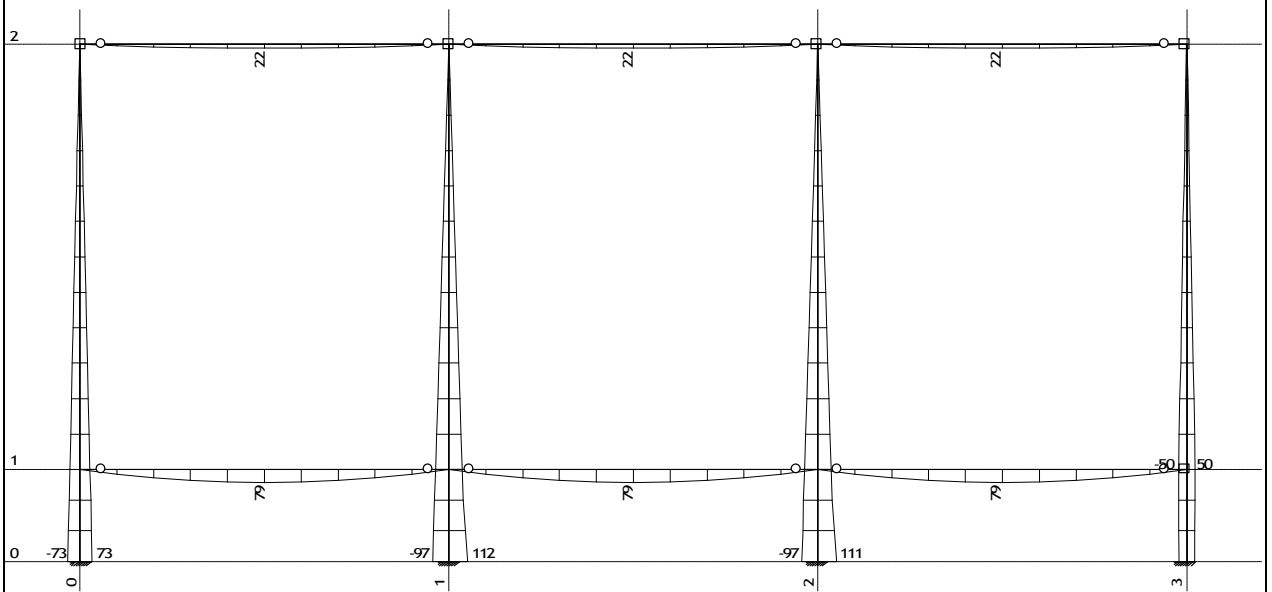
Opt. 78: [Ans] 9:55,74-77



N_{ax} [6.00 m]

Uticaji u gred: max N1= 10 / min N1= -10 kN

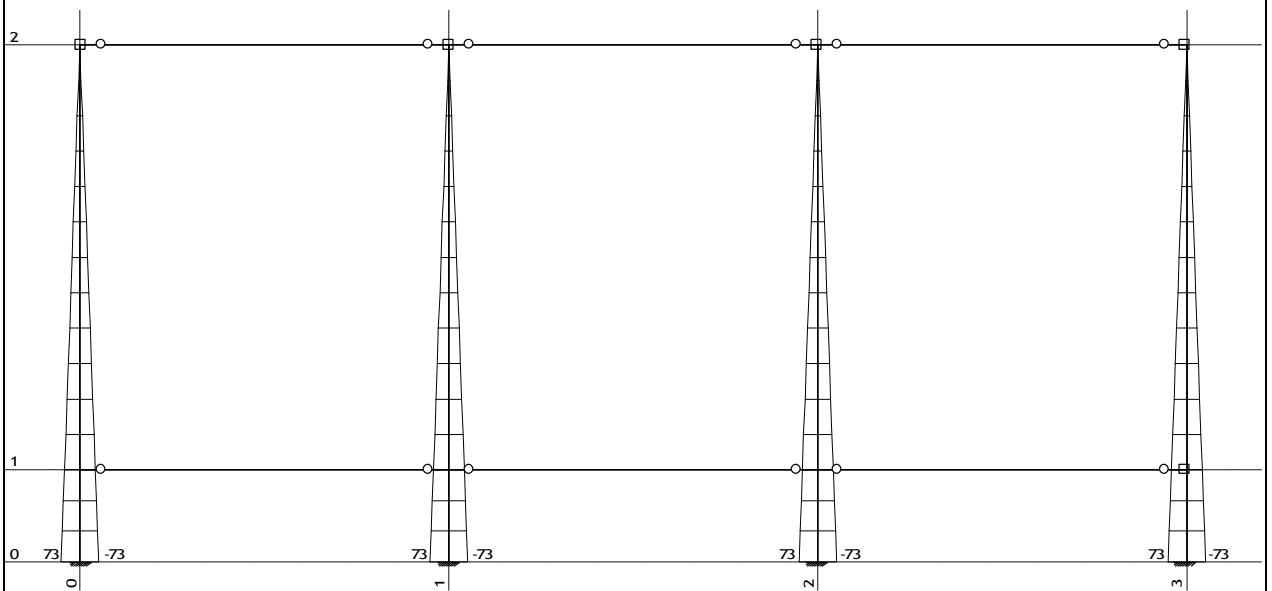
Opt. 78: [Am] 9.55,74-77



Param V_1

Uticaji u gred: max M8= 112 / min M8= -97 kNm

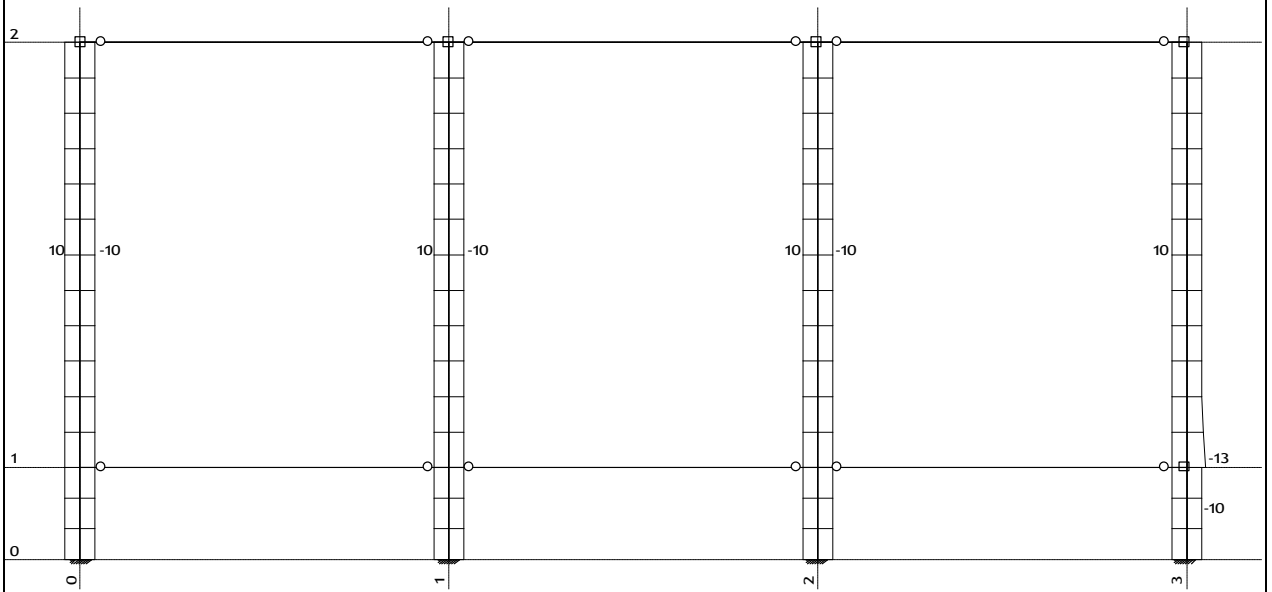
Opt. 78: [Am] 9.55,74-77



Param V_1

Uticaji u gred: max M2= 73 / min M2= -73 kNm

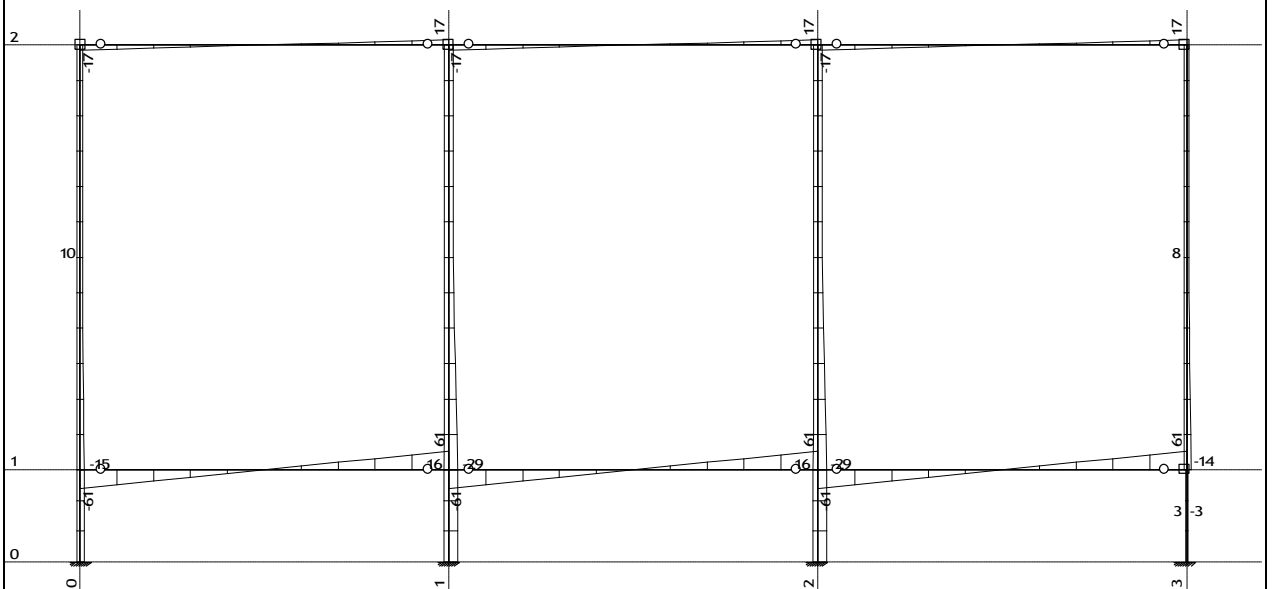
Opt. 78: [Ans] 9.55,74-77



Ram: V_1

Uticaji u gred: max T3= 10 / min T3= -13 kN

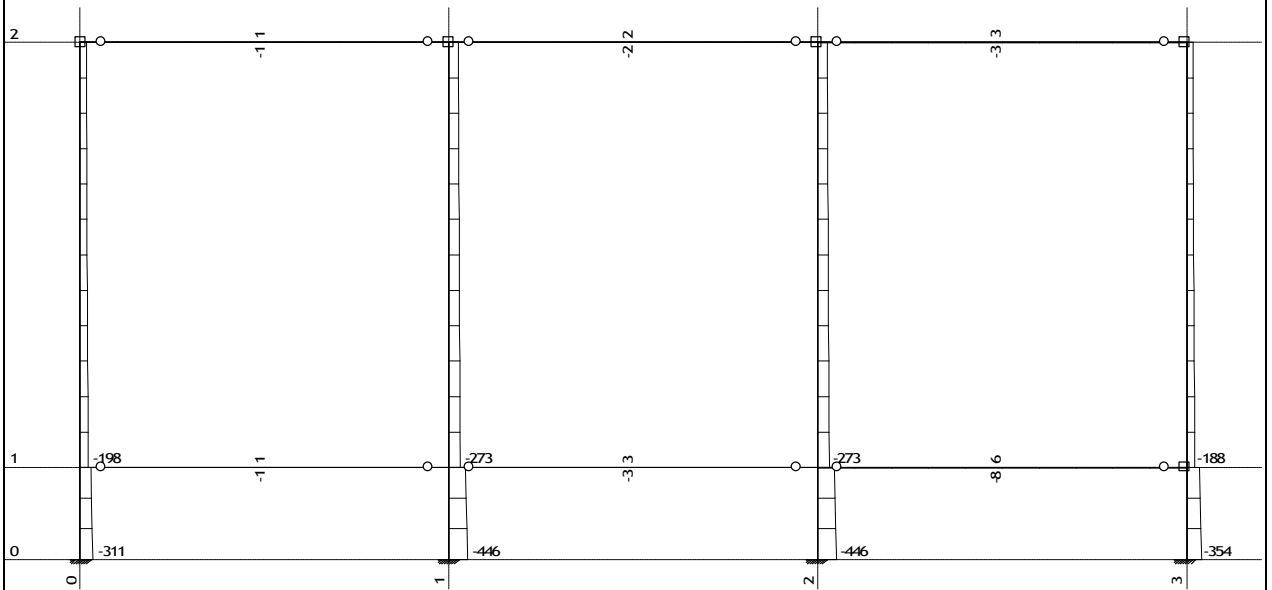
Opt. 78: [Ans] 9.55,74-77



Ram: V_1

Uticaji u gred: max T2= 61 / min T2= -61 kN

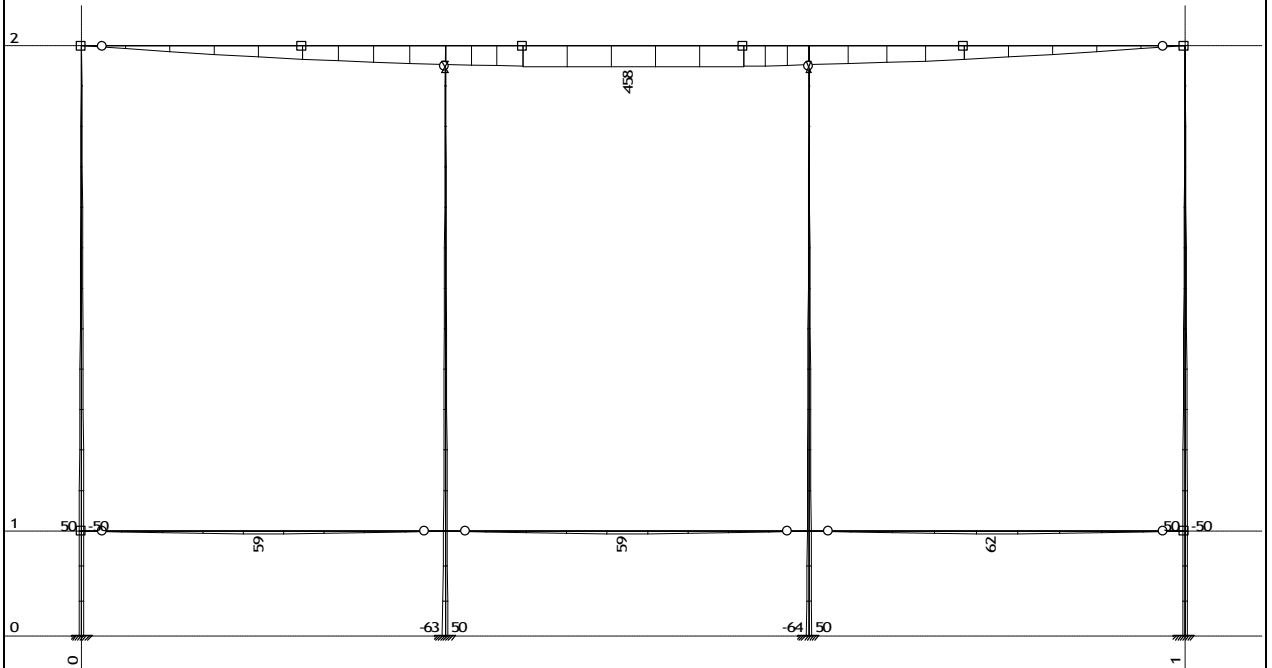
Opt. 78: [Ans] 9:55,74-77



Param: V_1

Uticaji u gred: max N1= 6 / min N1= -446 kN

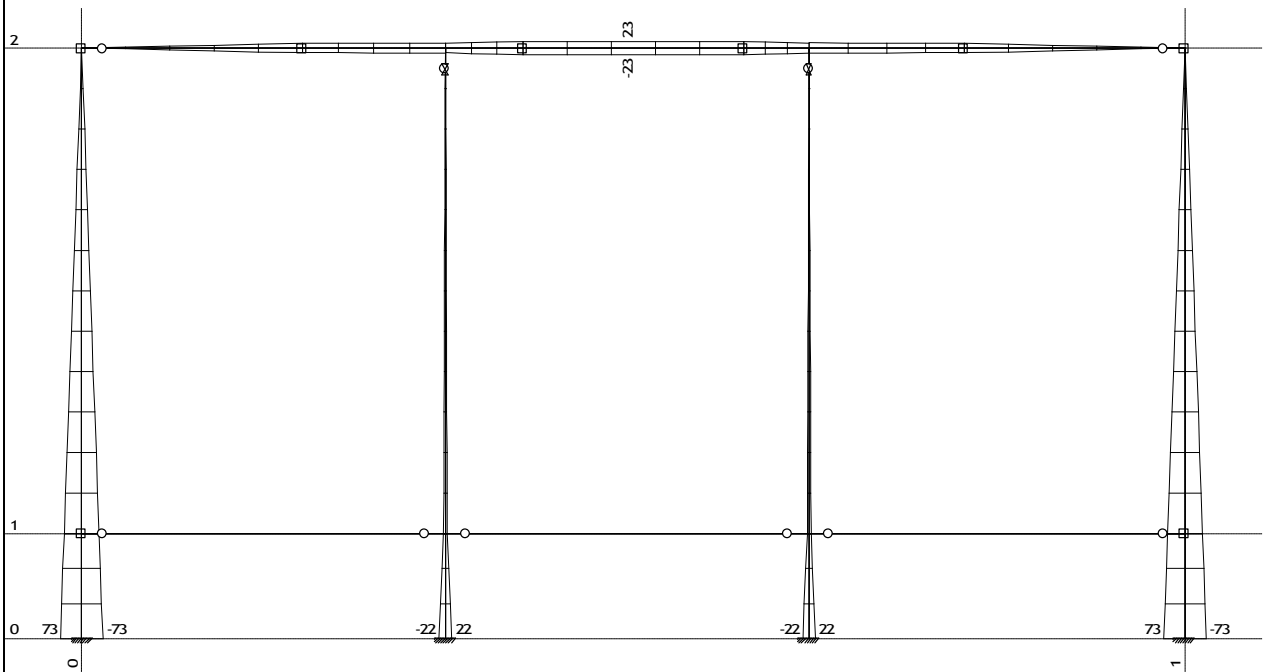
Opt. 78: [Ans] 9:55,74-77



Param: H_4

Uticaji u gred: max M8= 458 / min M8= -64 kNm

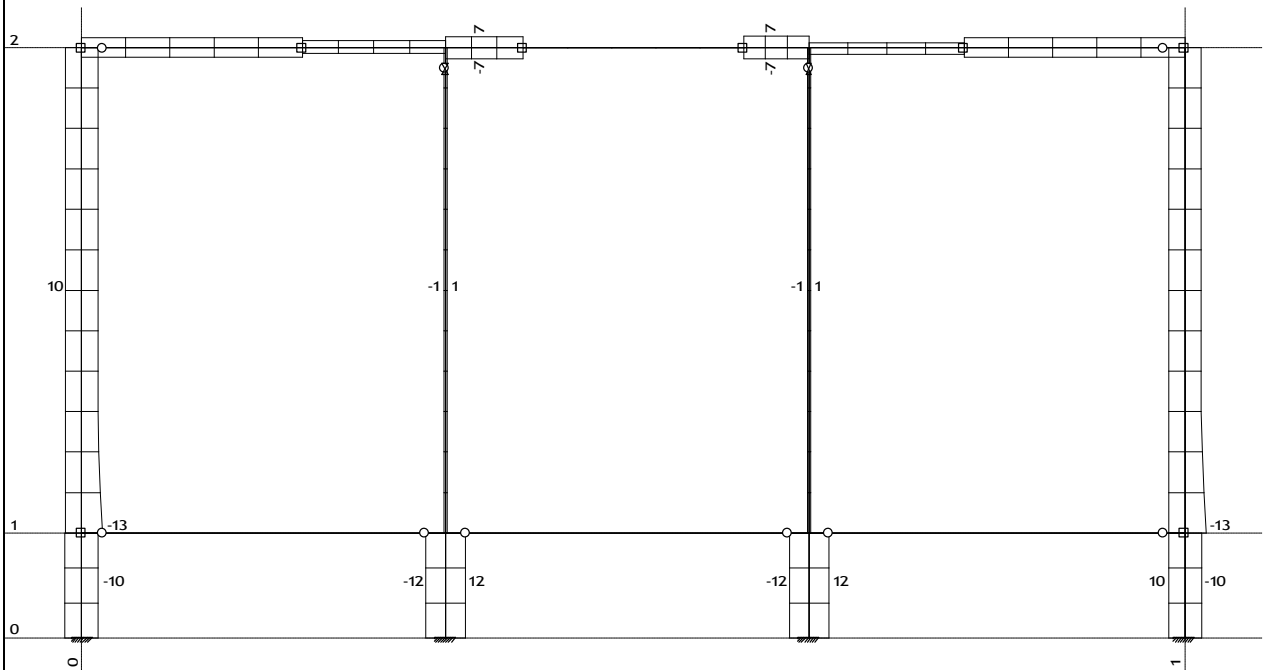
Opt. 78: [Am] 9.55,74-77



Ram: H.4

Uticaji u gred: max $M_2 = 73$ / min $M_2 = -73$ kNm

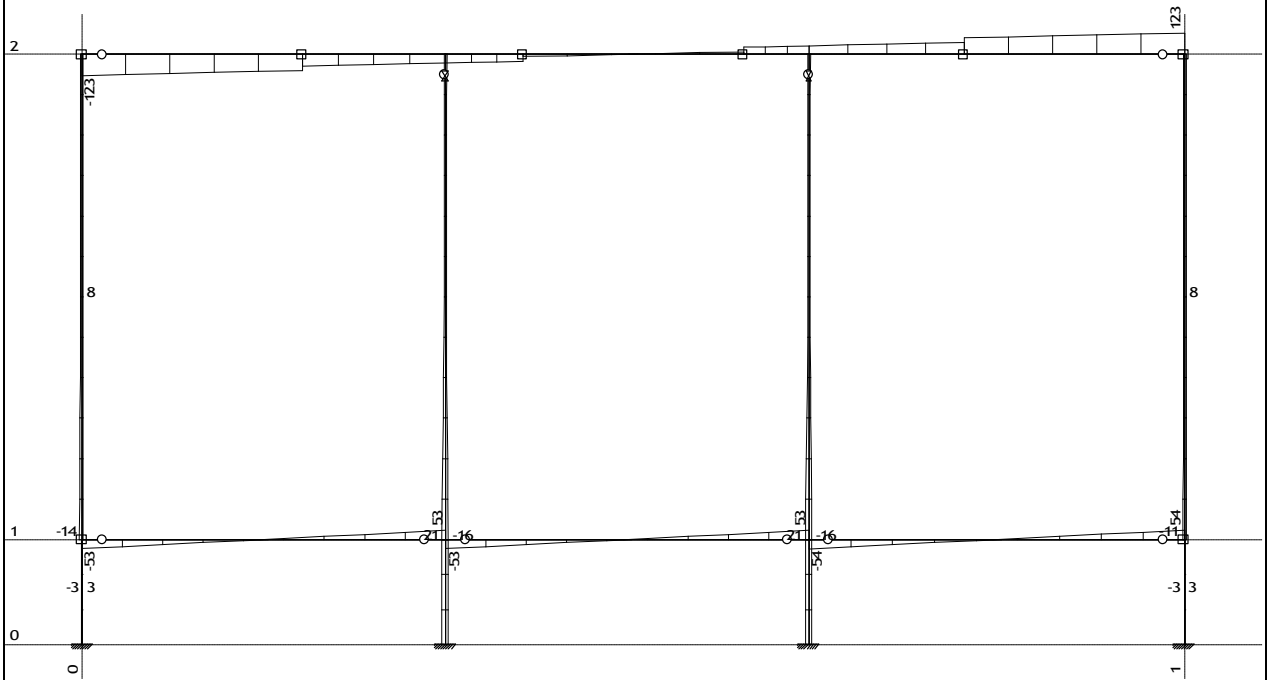
Opt. 78: [Am] 9.55,74-77



Ram: H.4

Uticaji u gred: max $T_3 = 12$ / min $T_3 = -13$ kN

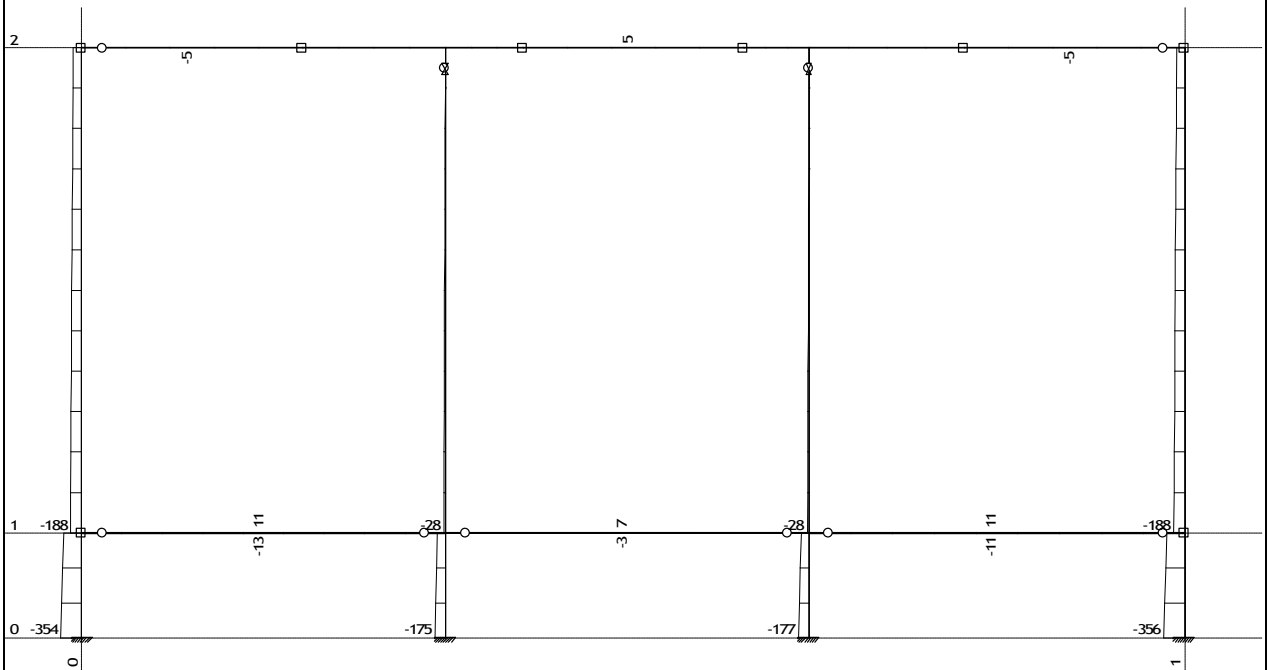
Opt. 78: [Am] 9:55,74-77



Ram: H.4

Uticaji u gred: max T2= 123 / min T2= -123 kN

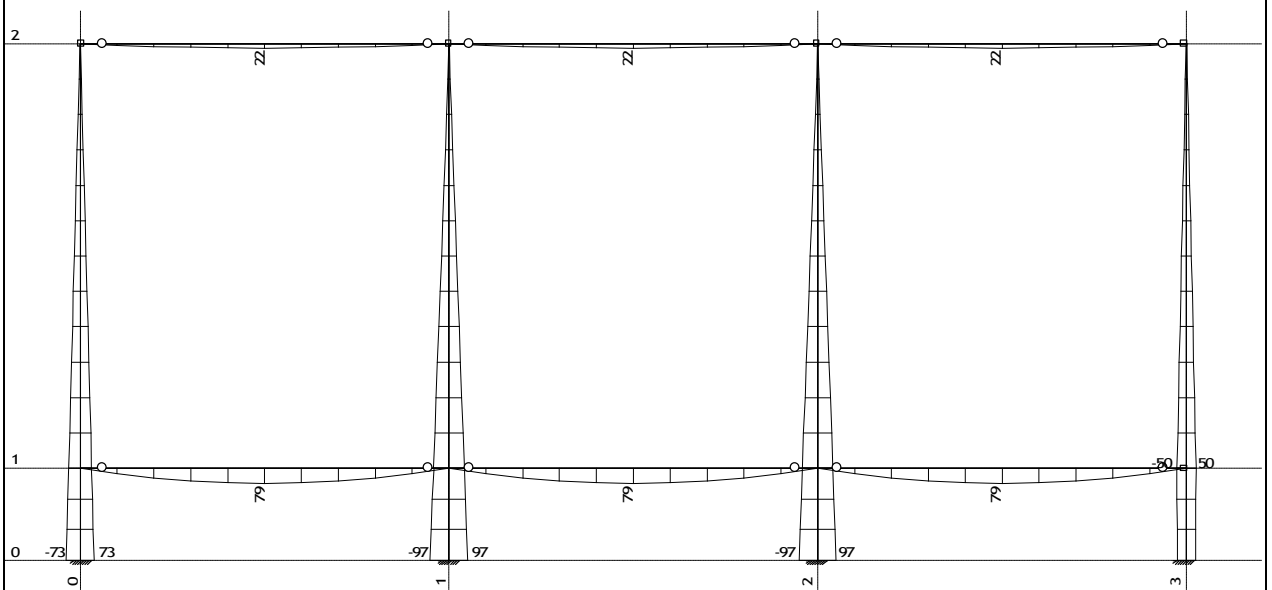
Opt. 78: [Am] 9:55,74-77



Ram: H.4

Uticaji u gred: max N1= 11 / min N1= -356 kN

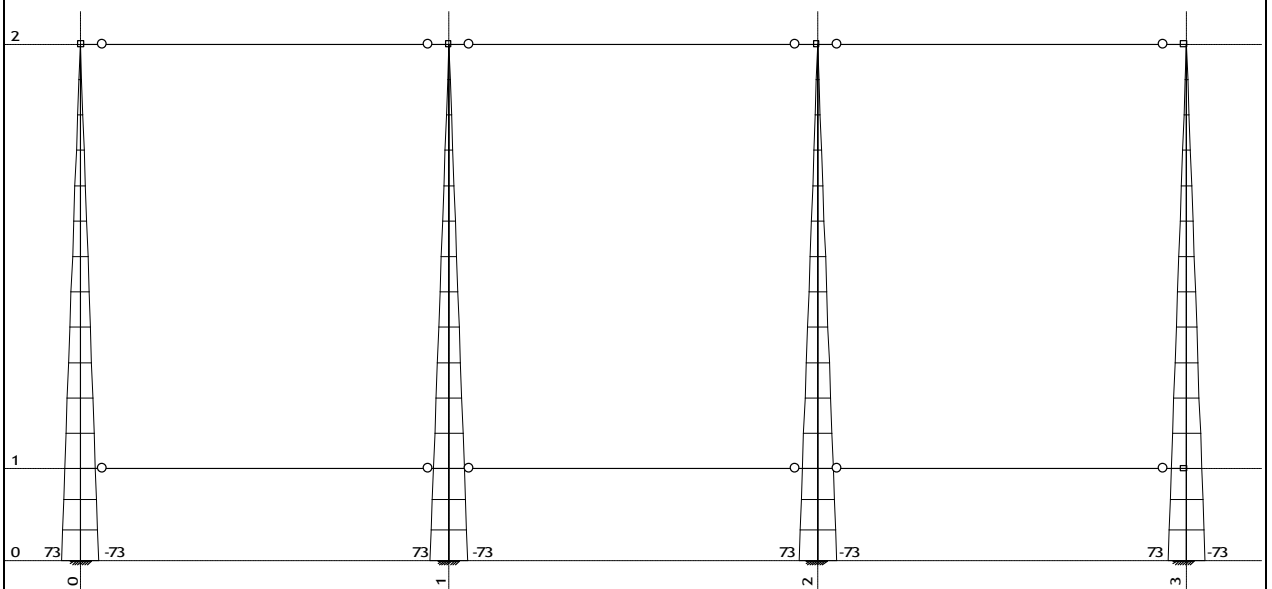
Opt. 78: [Am] 9.55,74-77



Param V.6

Uticaji u gred: max MB= 97 / min MB= -97 kNm

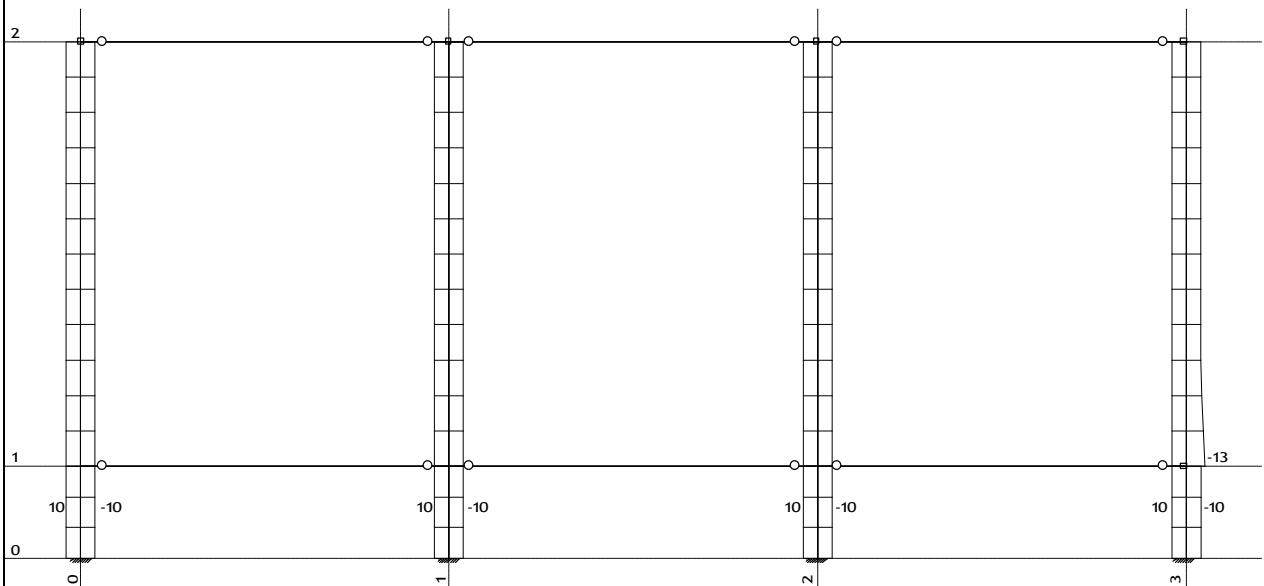
Opt. 78: [Am] 9.55,74-77



Param V.6

Uticaji u gred: max MB= 73 / min MB= -73 kNm

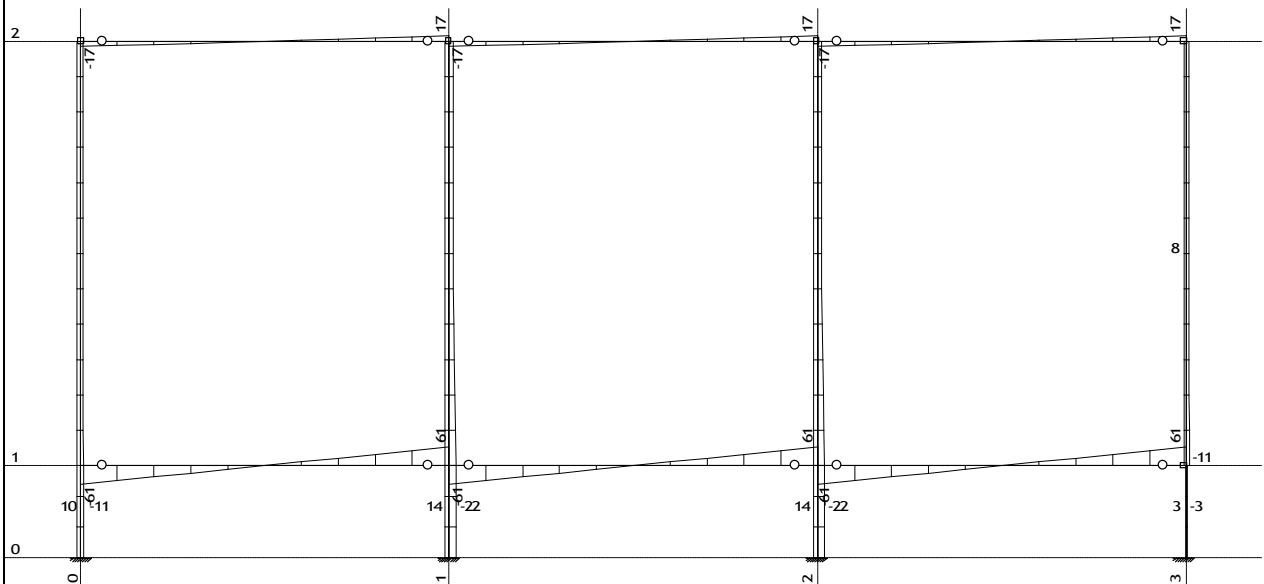
Opt. 78: [Ans] 9-55,74-77



Ram: V_6

Uticaji u gred: $\max T_3 = 10 / \min T_3 = -13 \text{ kN}$

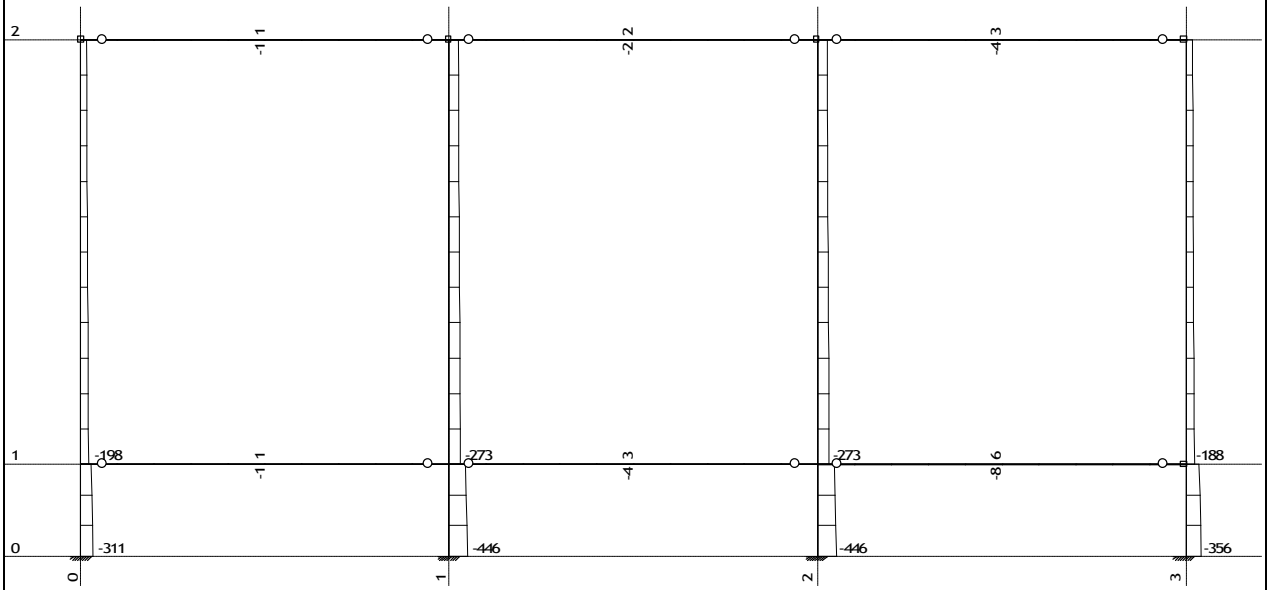
Opt. 78: [Anv] 9-55,74-77



Ram: V_6

Uticaji u gred: $\max T_2 = 61 / \min T_2 = -61 \text{ kN}$

Opt. 78: [Am] 9.55,74-77



Pam: V.6
Uticaji u gred: max N1= 6 / min N1= -446 kN

Utjecaji u tackastim osloncima - Ekstremne vrednosti - Opterecenje: 78. [Anv] 9-55,74-77

Oznaka	LC	R1 [kN]	R2 [kN]	R3 [kN]	M1 [kNm]	M2 [kNm]	M3 [kNm]
3	A(R1-)	-29.421	-2.469	205.89	12.406	-111.74	0.000
7	A(R1-)	-29.421	-3.523	205.89	13.775	-111.40	0.000
30	A(R1-)	-22.464	-6.350	193.11	24.573	-94.387	0.000
20	A(R1-)	-22.464	-4.429	193.11	22.078	-94.681	0.000
3	A(R1+)	16.001	3.798	209.72	-19.087	39.230	0.000
7	A(R1+)	16.001	5.419	209.72	-21.192	39.129	0.000
1	A(R1-)	-14.742	-2.080	157.85	11.901	-58.997	0.000
30	A(R1+)	13.568	0.000	356.97	0.000	96.614	0.000
20	A(R1+)	13.568	0.000	356.97	0.000	97.360	0.000
21	A(R1-)	-12.006	0.000	141.98	0.000	-21.975	0.000
31	A(R2+)	-0.712	20.978	110.40	-63.596	-0.924	-0.301
21	A(R2+)	0.742	20.661	109.21	-62.766	0.963	0.325
31	A(R2-)	-9.882	-16.083	110.40	48.757	-15.912	0.231
21	A(R2-)	-9.897	-15.840	109.21	48.121	-15.932	-0.249
40	A(R2-)	0.000	-10.055	286.06	72.724	0.000	0.000
40	A(R2+)	0.000	10.055	286.06	-72.724	0.000	0.000
15	A(R2-)	0.000	-10.023	284.51	72.530	0.000	0.000
15	A(R2+)	0.000	10.023	284.51	-72.530	0.000	0.000
11	A(R2-)	0.000	-9.971	249.87	72.826	0.000	0.000
11	A(R2+)	0.000	9.971	249.87	-72.826	0.000	0.000
3	A(R3+)	0.000	0.000	446.45	0.000	0.000	0.000
30	A(R3+)	0.000	0.000	446.45	0.000	0.000	0.000
20	A(R3+)	0.000	0.000	446.45	0.000	0.000	0.000
7	A(R3+)	0.000	0.000	446.45	0.000	0.000	0.000
40	A(R3+)	0.000	0.000	355.62	0.000	0.000	0.000
15	A(R3+)	0.000	0.000	353.72	0.000	0.000	0.000
11	A(R3+)	0.000	0.000	311.08	0.000	0.000	0.000
1	A(R3+)	0.000	0.000	311.08	0.000	0.000	0.000
30	A(R3-)	-22.464	-6.350	193.11	24.573	-94.387	0.000
3	A(R3-)	-22.464	-4.367	193.11	21.950	-94.681	0.000
11	A(M1-)	0.000	9.971	249.87	-72.826	0.000	0.000
11	A(M1+)	0.000	-9.971	249.87	72.826	0.000	0.000
20	A(M1-)	0.000	9.959	356.97	-72.816	0.000	0.000
20	A(M1+)	0.000	-9.959	356.97	72.816	0.000	0.000
30	A(M1-)	0.000	9.939	356.97	-72.784	0.000	0.000
30	A(M1+)	0.000	-9.939	356.97	72.784	0.000	0.000
40	A(M1-)	0.000	10.055	286.06	-72.724	0.000	0.000
40	A(M1+)	0.000	-10.055	286.06	72.724	0.000	0.000
1	A(M1-)	0.000	9.937	249.87	-72.630	0.000	0.000
1	A(M1+)	0.000	-9.937	249.87	72.630	0.000	0.000
3	A(M2-)	-29.421	-2.469	205.89	12.406	-111.74	0.000
7	A(M2-)	-29.421	-3.523	205.89	13.775	-111.40	0.000
20	A(M2-)	-13.568	0.000	356.97	0.000	-97.360	0.000
20	A(M2+)	13.568	0.000	356.97	0.000	97.360	0.000
3	A(M2+)	13.568	0.000	356.97	0.000	97.360	0.000
30	A(M2-)	-13.568	0.000	356.97	0.000	-96.614	0.000
30	A(M2+)	13.568	0.000	356.97	0.000	96.614	0.000
7	A(M2+)	13.568	0.000	356.97	0.000	96.613	0.000
11	A(M2-)	-9.720	0.000	249.87	0.000	-72.572	0.000
11	A(M2+)	9.720	0.000	249.87	0.000	72.572	0.000
21	A(M3-)	0.000	-6.834	141.98	50.100	0.000	-0.850
21	A(M3+)	0.000	6.834	141.98	-50.100	0.000	0.850
31	A(M3-)	0.000	6.875	143.52	-50.373	0.000	-0.795
31	A(M3+)	0.000	-6.875	143.52	50.373	0.000	0.795

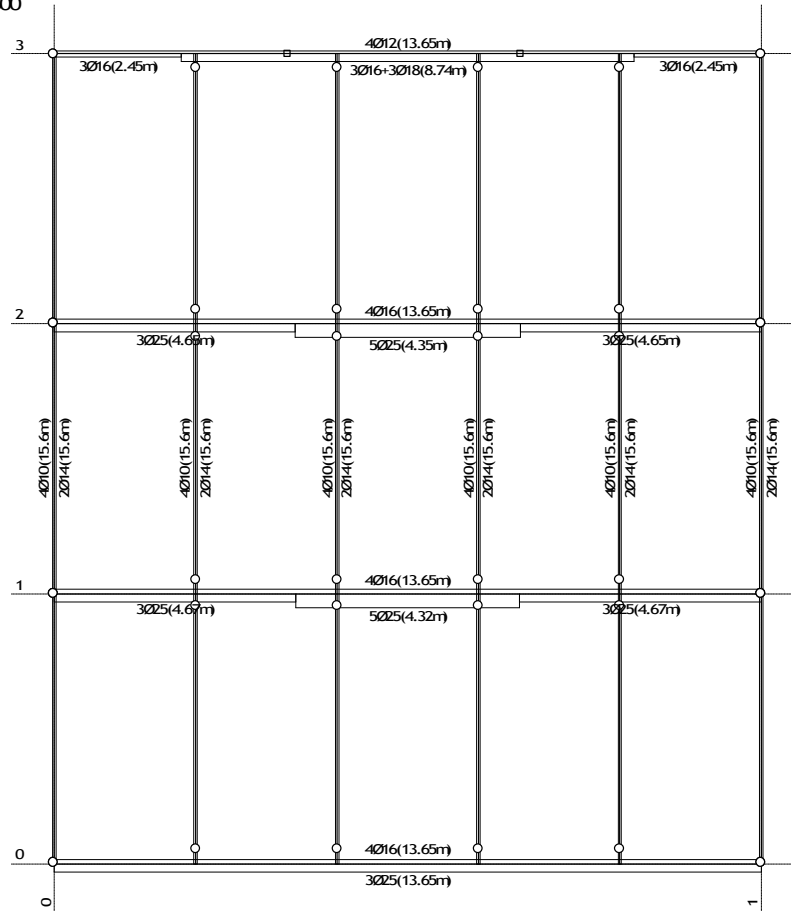
Utjecaji u tackastim osloncima - Ekstremne vrednosti - Opterecenje: 78. [Anv] 56-73

Oznaka	LC	R1 [kN]	R2 [kN]	R3 [kN]	M1 [kNm]	M2 [kNm]	M3 [kNm]
3	A(R1-)	-20.210	-0.316	227.75	1.591	-71.552	0.000
7	A(R1-)	-20.210	-0.452	227.75	1.766	-71.340	0.000
30	A(R1-)	-12.480	-3.528	213.55	13.652	-52.437	0.000
20	A(R1-)	-12.480	-2.461	213.55	12.265	-52.600	0.000
30	A(R1+)	10.437	0.000	274.60	0.000	74.318	0.000
20	A(R1+)	10.437	0.000	274.60	0.000	74.892	0.000
3	A(R1+)	10.437	0.000	274.60	0.000	74.892	0.000
7	A(R1+)	10.437	0.000	274.60	0.000	74.317	0.000
1	A(R1-)	-10.140	-0.267	168.78	1.526	-37.670	0.000
21	A(R1-)	-9.236	0.000	109.21	0.000	-16.904	0.000
31	A(R2+)	-0.091	15.539	110.40	-47.108	-0.118	-0.223
21	A(R2+)	0.095	15.304	109.21	-46.494	0.123	0.241
31	A(R2-)	-5.490	-8.935	110.40	27.087	-8.840	0.128
21	A(R2-)	-5.498	-8.800	109.21	26.734	-8.851	-0.138
40	A(R2-)	0.000	-7.735	220.04	55.941	0.000	0.000
40	A(R2+)	0.000	7.735	220.04	-55.941	0.000	0.000
15	A(R2-)	0.000	-7.710	218.86	55.793	0.000	0.000
15	A(R2+)	0.000	7.710	218.86	-55.793	0.000	0.000
11	A(R2-)	0.000	-7.670	192.21	56.020	0.000	0.000
11	A(R2+)	0.000	7.670	192.21	-56.020	0.000	0.000
3	A(R3+)	0.000	0.000	274.60	0.000	0.000	0.000
30	A(R3+)	0.000	0.000	274.60	0.000	0.000	0.000
20	A(R3+)	0.000	0.000	274.60	0.000	0.000	0.000
7	A(R3+)	0.000	0.000	274.60	0.000	0.000	0.000
40	A(R3+)	0.000	0.000	220.04	0.000	0.000	0.000
15	A(R3+)	0.000	0.000	218.86	0.000	0.000	0.000
20	A(R3-)	-12.480	-2.461	213.55	12.265	-52.600	0.000
3	A(R3-)	-12.480	-2.426	213.55	12.194	-52.600	0.000
30	A(R3-)	-12.480	-3.528	213.55	13.652	-52.437	0.000
7	A(R3-)	-12.480	-3.462	213.55	13.539	-52.437	0.000
11	A(M1-)	0.000	7.670	192.21	-56.020	0.000	0.000
11	A(M1+)	0.000	-7.670	192.21	56.020	0.000	0.000
20	A(M1-)	0.000	7.661	274.60	-56.012	0.000	0.000
20	A(M1+)	0.000	-7.661	274.60	56.012	0.000	0.000
30	A(M1-)	0.000	7.645	274.60	-55.988	0.000	0.000
30	A(M1+)	0.000	-7.645	274.60	55.988	0.000	0.000
40	A(M1-)	0.000	7.735	220.04	-55.941	0.000	0.000
40	A(M1+)	0.000	-7.735	220.04	55.941	0.000	0.000
1	A(M1-)	0.000	7.644	192.21	-55.869	0.000	0.000
1	A(M1+)	0.000	-7.644	192.21	55.869	0.000	0.000
20	A(M2-)	-10.437	0.000	274.60	0.000	-74.892	0.000
20	A(M2+)	10.437	0.000	274.60	0.000	74.892	0.000
3	A(M2-)	-10.437	0.000	274.60	0.000	-74.892	0.000
3	A(M2+)	10.437	0.000	274.60	0.000	74.892	0.000

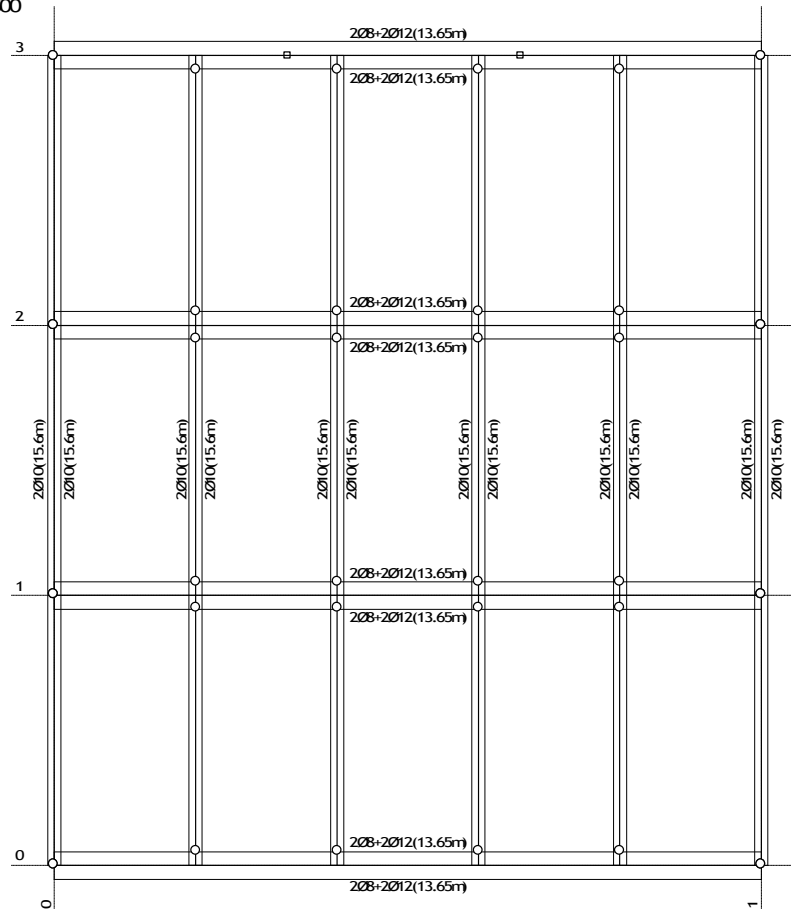
30	A(M2-)	-10.437	0.000	274.60	0.000	 -74.318 	0.000
30	A(M2+)	10.437	0.000	274.60	0.000	[74.318]	0.000
7	A(M2-)	-10.437	0.000	274.60	0.000	 -74.317 	0.000
7	A(M2+)	10.437	0.000	274.60	0.000	[74.317]	0.000
11	A(M2-)	-7.477	0.000	192.21	0.000	 -55.825 	0.000
11	A(M2+)	7.477	0.000	192.21	0.000	[55.825]	0.000
21	A(M3-)	0.000	-5.257	109.21	38.539	0.000	 -0.654
21	A(M3+)	0.000	5.257	109.21	-38.539	0.000	[0.654]
31	A(M3-)	0.000	5.288	110.40	-38.748	0.000	 -0.612
31	A(M3+)	0.000	-5.288	110.40	38.748	0.000	[0.612]

Dimenzionisanje (beton)

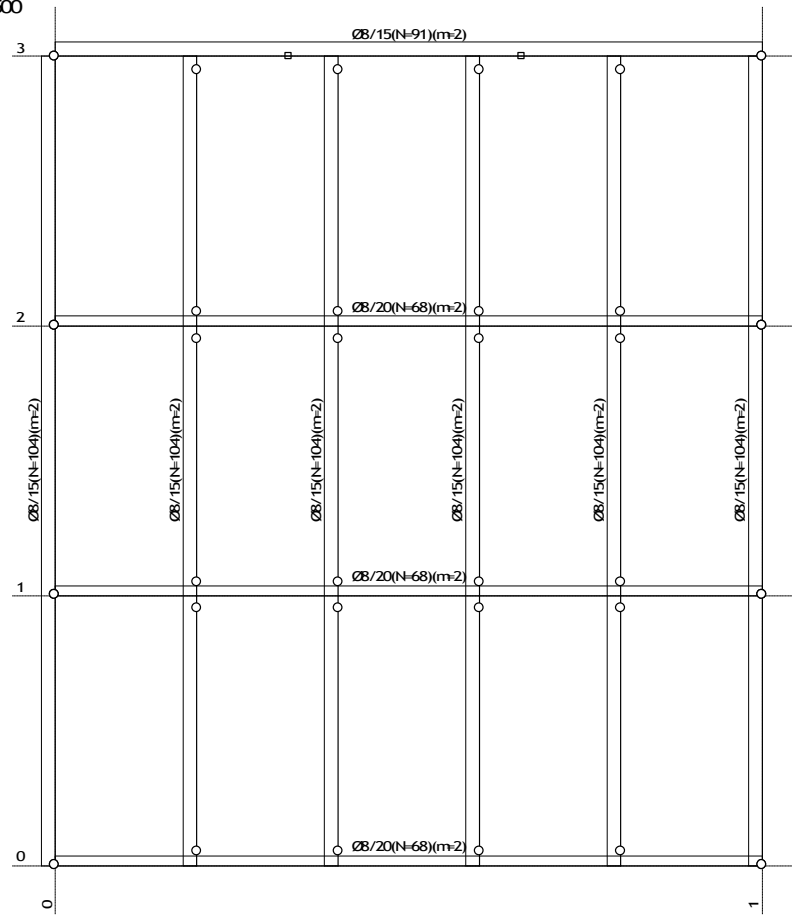
Usvojena armatura
@1@PBAB 87, MB 30, B500



Usvojena armatura
@1@PBAB 87, MB 30, B500

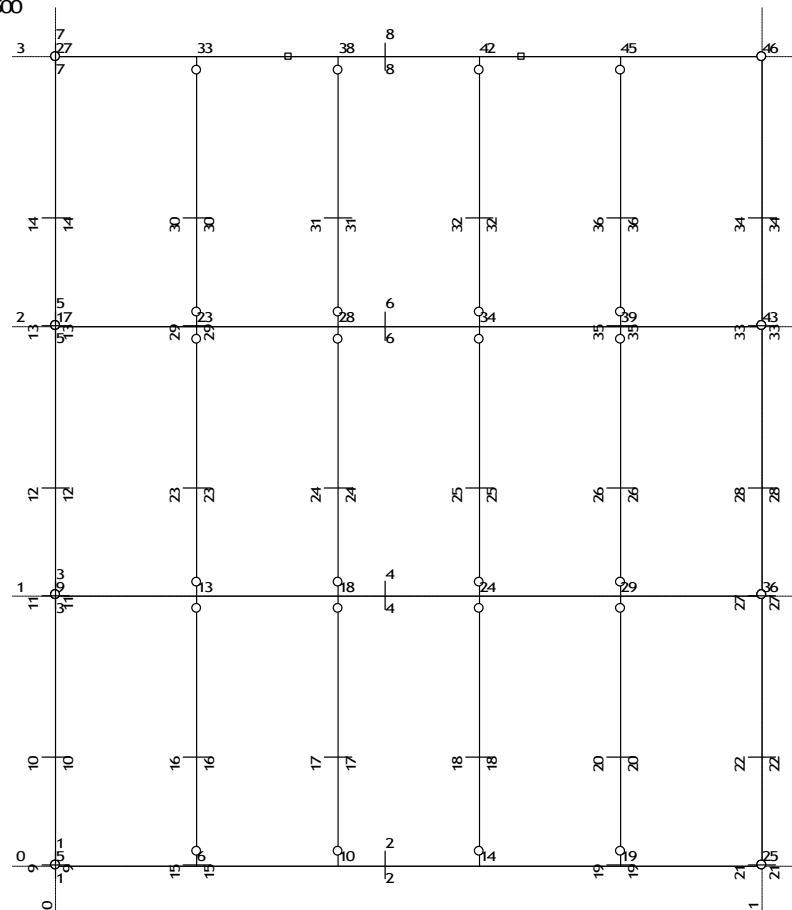


Usvojena armatura
@1@PBAB 87, MB 30, B500



Nivo: [6.00 m]
Armatura u gredama: A_g u z

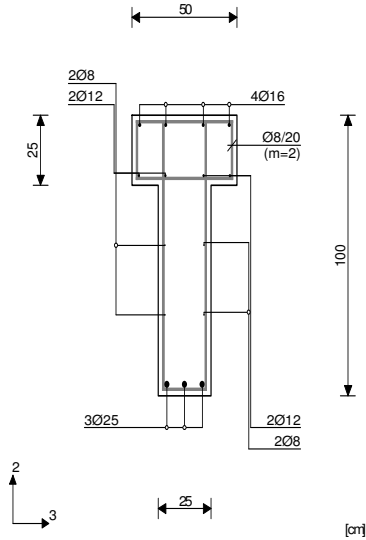
Usvojena armatura
@1@PBAB 87, MB 30, B500



Nivo: [6.00 m]
Dispozicija greda

Greda 5-25
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 1-1 $x = 0.00m$



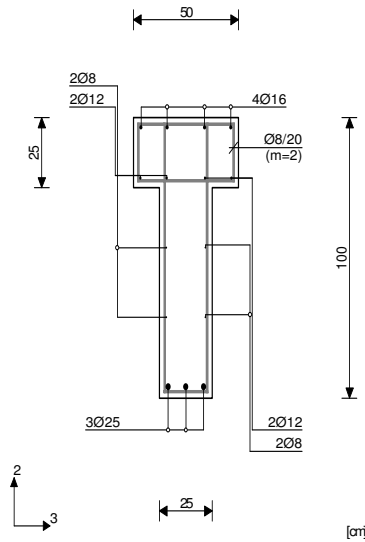
Merodavna kombinacija za savijanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $N1u = 6.84 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII+1.30xVIII$
 $M1u = 0.03 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xIII$
 $T2u = -137.82 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = 0.00 \text{ kNm}$

$eb/ea = 1.638/10.000 \%$
 $Aa1 = 0.06 \text{ cm}^2$
 $Aa2 = 0.08 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m$ (m=2)
 $[Usvojeno Aa,uz = 0.08/20(m=2) = 2.51 \text{ cm}^2/m]$
 $\tau_y = 0.64 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 0.94%

Presek 2-2 $x = 6.37m$



Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII$
 $N1u = 0.00 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 506.14 \text{ kNm}$

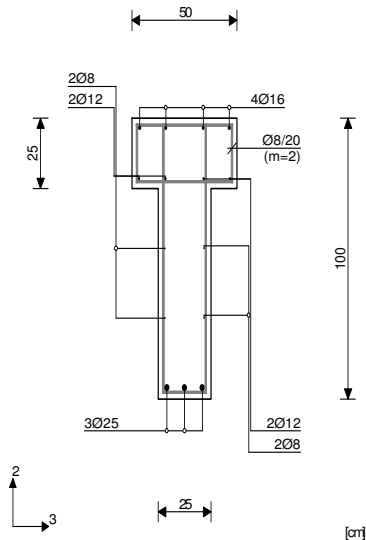
Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII+1.30xVIII$
 $M1u = 0.03 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xV$
 $T2u = -5.69 \text{ kN}$
 $T3u = 0.01 \text{ kN}$
 $M1u = 0.01 \text{ kNm}$

$eb/ea = -1.321/10.000 \%$
 $Aa1 = 11.43 \text{ cm}^2$
 $Aa2 = 0.00 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m$ (m=2)
 $[Usvojeno Aa,uz = 0.08/20(m=2) = 2.51 \text{ cm}^2/m]$
 $\tau_y = 0.03 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 0.94%

Greda 9-36
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 3-3 $x = 0.00m$



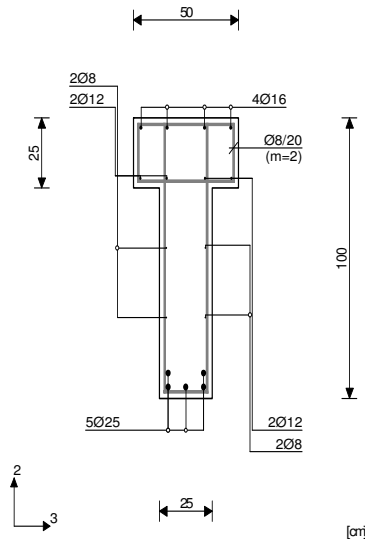
Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII+1.80xV$
 $+1.80xVI$
 $N1u = 9.83 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII+1.30xVIII$
 $M1u = 0.03 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xIII$
 $T2u = -190.33 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = 0.00 \text{ kNm}$

$eb/ea = 1.638/10.000 \%$
 $Aa1 = 0.09 \text{ cm}^2$
 $Aa2 = 0.11 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m$ (m=2)
 $[Usvojeno Aa,uz = 0.08/20(m=2) = 2.51 \text{ cm}^2/m]$
 $\tau_y = 0.89 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 0.94%

Presek 4-4 $x = 6.37m$



Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII$
 $N1u = 0.00 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 717.78 \text{ kNm}$

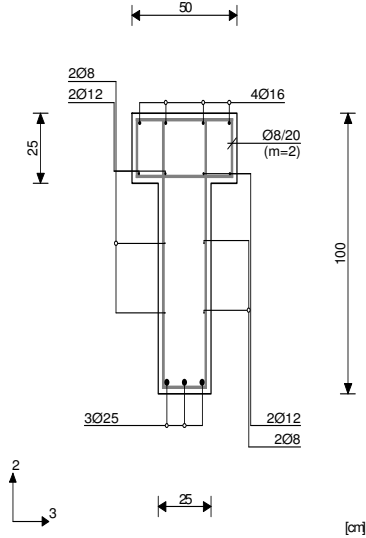
Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII+1.30xVIII$
 $M1u = 0.03 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xV$
 $T2u = -5.69 \text{ kN}$
 $T3u = 0.02 \text{ kN}$
 $M1u = 0.01 \text{ kNm}$

$eb/ea = -1.669/10.000 \%$
 $Aa1 = 16.39 \text{ cm}^2$
 $Aa2 = 0.00 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m$ (m=2)
 $[Usvojeno Aa,uz = 0.08/20(m=2) = 2.51 \text{ cm}^2/m]$
 $\tau_y = 0.03 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.25%

Greda 17-43
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 5-5 $x = 0.00m$



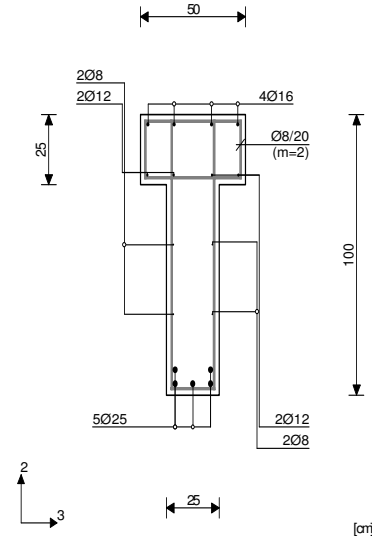
Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII+1.80xV$
 $+1.80xVI$
 $N1u = 9.83 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII-1.30xVIII$
 $M1u = 0.03 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xIII$
 $T2u = -190.33 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = 0.00 \text{ kNm}$

$eb/ea = 1.638/10.000 \%$
 $Aa1 = 0.09 \text{ cm}^2$
 $Aa2 = 0.11 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa_{uz} = 0.00 \text{ cm}^2/m$ (m=2)
 $[Uvojenost Aa_{uz} = 0.8/20(m=2) = 2.51 \text{ cm}^2/m]$
 $\tau_y = 0.89 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 0.94%

Presek 6-6 $x = 6.37m$



Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII$
 $N1u = 0.00 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 718.17 \text{ kNm}$

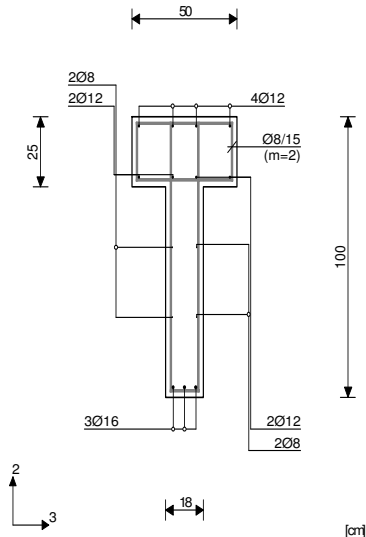
Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII-1.30xVIII$
 $M1u = 0.03 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xV$
 $T2u = -5.69 \text{ kN}$
 $T3u = 0.04 \text{ kN}$
 $M1u = 0.01 \text{ kNm}$

$eb/ea = -1.669/10.000 \%$
 $Aa1 = 16.39 \text{ cm}^2$
 $Aa2 = 0.00 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa_{uz} = 0.00 \text{ cm}^2/m$ (m=2)
 $[Uvojenost Aa_{uz} = 0.8/20(m=2) = 2.51 \text{ cm}^2/m]$
 $\tau_y = 0.03 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.25%

Greda 27-46
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 7-7 $x = 0.00m$



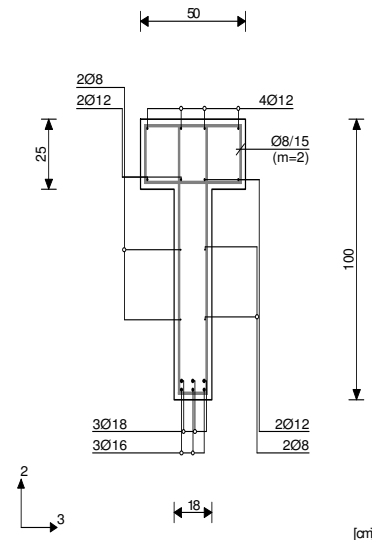
Merodavna kombinacija za savijanje:
 $1.30xI+1.30xII+1.30xIII+1.30xVII$
 $N1u = 5.10 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII-1.30xVIII$
 $M1u = 0.02 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xIII$
 $T2u = -123.49 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = 0.00 \text{ kNm}$

$eb/ea = 1.835/10.000 \%$
 $Aa1 = 0.04 \text{ cm}^2$
 $Aa2 = 0.07 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa_{uz} = 0.00 \text{ cm}^2/m$ (m=2)
 $[Uvojenost Aa_{uz} = 0.8/15(m=2) = 3.35 \text{ cm}^2/m]$
 $\tau_y = 0.80 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 0.66%

Presek 8-8 $x = 6.37m$



Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII$
 $N1u = 0.00 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 457.13 \text{ kNm}$

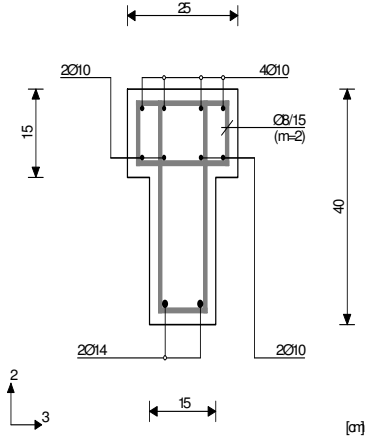
Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII-1.30xVIII$
 $M1u = 0.02 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xV$
 $T2u = -4.73 \text{ kN}$
 $T3u = 0.08 \text{ kN}$
 $M1u = -0.01 \text{ kNm}$

$eb/ea = -1.239/10.000 \%$
 $Aa1 = 10.29 \text{ cm}^2$
 $Aa2 = 0.00 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa_{uz} = 0.00 \text{ cm}^2/m$ (m=2)
 $[Uvojenost Aa_{uz} = 0.8/15(m=2) = 3.35 \text{ cm}^2/m]$
 $\tau_y = 0.03 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 0.95%

Greda 5-9
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 9-9 $x = 0.00m$



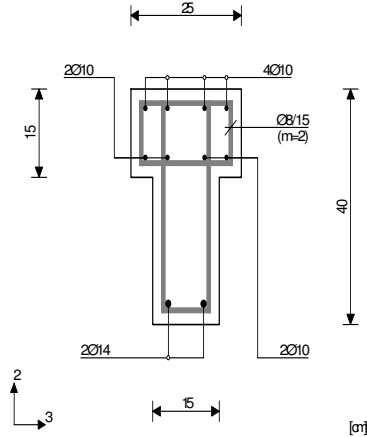
Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII+1.80xIV+1.80xVI$
 $N1u = 0.85 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII-1.30xVII$
 $M1u = -1.17 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.30xI+1.30xII+1.30xIII-1.30xVII$
 $T2u = -13.26 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = -1.17 \text{ kNm}$

$eb/ea = 1.691/10.000 \%$
 $Aa1 = 0.00 + 0.05' = 0.05 \text{ cm}^2$
 $Aa2 = 0.00 + 0.09' = 0.09 \text{ cm}^2$
 $Aa3 = 0.00 + 0.06' = 0.06 \text{ cm}^2$
 $Aa4 = 0.00 + 0.06' = 0.06 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m \quad (m=2)$
 $[Usvajeno Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/m]$
 $\sigma_y = 1.16 \text{ MPa} < 3\sigma_r, \sigma_r = 1.10 \text{ MPa}$
 $\sigma_z = 0.90 \text{ MPa} < \sigma_r, \sigma_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.25%
 *) - dodatna poduzna armatura za prijem torzije.

Presek 10-10 $x = 2.08m$



Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII$
 $N1u = 0.00 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 21.25 \text{ kNm}$

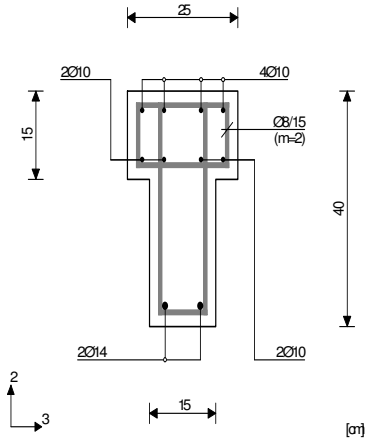
Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII-1.30xVII$
 $M1u = -1.17 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.30xI+1.30xII+1.30xIII-1.30xVII$
 $T2u = -2.65 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = -1.17 \text{ kNm}$

$eb/ea = -0.879/10.000 \%$
 $Aa1 = 1.17 + 0.05' = 1.21 \text{ cm}^2$
 $Aa2 = 0.00 + 0.09' = 0.09 \text{ cm}^2$
 $Aa3 = 0.00 + 0.06' = 0.06 \text{ cm}^2$
 $Aa4 = 0.00 + 0.06' = 0.06 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m \quad (m=2)$
 $[Usvajeno Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/m]$
 $\sigma_y = 0.95 \text{ MPa} < \sigma_r, \sigma_r = 1.10 \text{ MPa}$
 $\sigma_z = 0.90 \text{ MPa} < \sigma_r, \sigma_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.25%

Greda 9-17
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 11-11 $x = 0.00m$



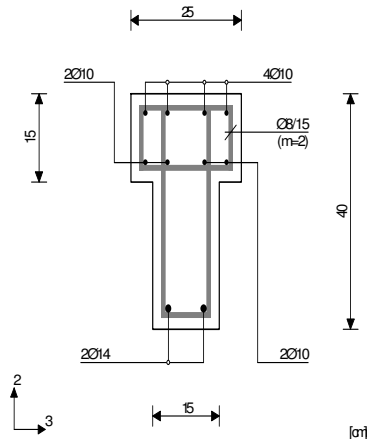
Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII+1.80xIV+1.80xVI$
 $N1u = 1.71 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII-1.30xVII$
 $M1u = 0.06 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI+1.60xII+1.80xIII$
 $T2u = -17.03 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = 0.00 \text{ kNm}$

$eb/ea = 1.660/10.000 \%$
 $Aa1 = 0.02 \text{ cm}^2$
 $Aa2 = 0.02 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m \quad (m=2)$
 $[Usvajeno Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/m]$
 $\sigma_y = 0.33 \text{ MPa} < \sigma_r, \sigma_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.25%

Presek 12-12 $x = 2.08m$



Merodavna kombinacija za savijanje:
 $1.60xI+1.60xII+1.80xIII$
 $N1u = 0.00 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = 21.25 \text{ kNm}$

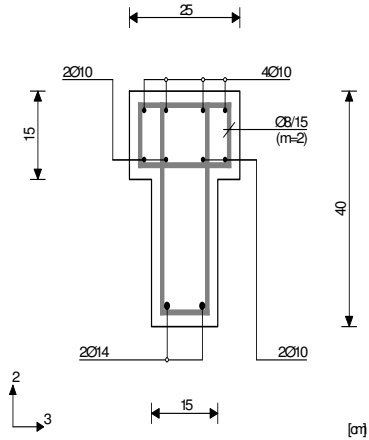
Merodavna kombinacija za torziju:
 $1.30xI+1.30xII+1.30xIII-1.30xVII$
 $M1u = 0.06 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.30xI+1.30xII+1.30xIII-1.30xVII$
 $T2u = -2.65 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = 0.06 \text{ kNm}$

$eb/ea = -0.879/10.000 \%$
 $Aa1 = 1.17 \text{ cm}^2$
 $Aa2 = 0.00 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/m \quad (m=2)$
 $[Usvajeno Aa,uz = Ø8/15(m=2) = 3.35 \text{ cm}^2/m]$
 $\sigma_y = 0.09 \text{ MPa} < \sigma_r, \sigma_r = 1.10 \text{ MPa}$
 $\sigma_z = 0.04 \text{ MPa} < \sigma_r, \sigma_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.25%

Greda 17-27
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 13-13 x = 0.00m



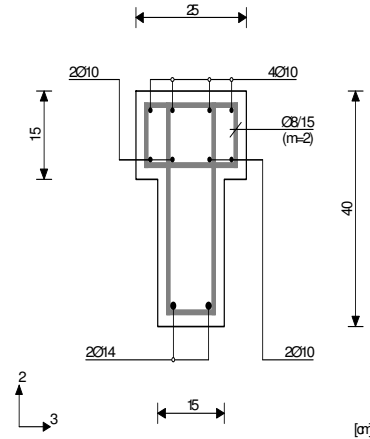
Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 N1u = 2.59 kN
 M2u = 0.00 kNm
 M3u = 0.00 kNm

Merodavna kombinacija za torziju:
 1.30xI+1.30xII+1.30xIII-1.30xVII
 M1u = 1.72 kNm

Merodavna kombinacija za smicanje:
 1.30xI+1.30xII+1.30xIII-1.30xVII
 T2u = -13.26 kN
 T3u = 0.00 kN
 M1u = 1.72 kNm

$eb/ea = 1.660/10.000 \%$
 $Aa1 = 0.02 + 0.07' = 0.09 \text{ cm}^2$
 $Aa2 = 0.03 + 0.13' = 0.16 \text{ cm}^2$
 $Aa3 = 0.00 + 0.10' = 0.10 \text{ cm}^2$
 $Aa4 = 0.00 + 0.10' = 0.10 \text{ cm}^2$
 $Aa,uz = 0.34 \text{ cm}^2/\text{m} \quad (m=2)$
 $[Uvojenio Aa,uz = 0.8/15(m=2) = 3.35 \text{ cm}^2/\text{m}]$
 $ty = 1.59 \text{ MPa} < 3tr, tr = 1.10 \text{ MPa}$
 $tz = 1.33 \text{ MPa} < 3tr, tr = 1.10 \text{ MPa}$
 Procentat armiranja: 1.25%
 *) - dodatna poduzna armatura za prijem torzije.

Presek 14-14 x = 2.08m



Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII
 N1u = 0.00 kN
 M2u = 0.00 kNm
 M3u = 21.25 kNm

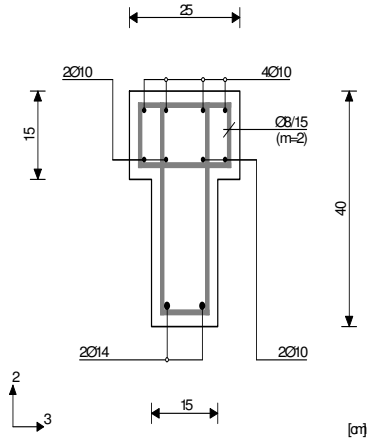
Merodavna kombinacija za torziju:
 1.30xI+1.30xII+1.30xIII-1.30xVII
 M1u = 1.72 kNm

Merodavna kombinacija za smicanje:
 1.30xI+1.30xII+1.30xIII-1.30xVII
 T2u = -2.65 kN
 T3u = 0.00 kN
 M1u = 1.72 kNm

$eb/ea = -0.879/10.000 \%$
 $Aa1 = 1.17 + 0.07' = 1.24 \text{ cm}^2$
 $Aa2 = 0.00 + 0.13' = 0.13 \text{ cm}^2$
 $Aa3 = 0.00 + 0.10' = 0.10 \text{ cm}^2$
 $Aa4 = 0.00 + 0.10' = 0.10 \text{ cm}^2$
 $Aa,uz = 0.13 \text{ cm}^2/\text{m} \quad (m=2)$
 $[Uvojenio Aa,uz = 0.8/15(m=2) = 3.35 \text{ cm}^2/\text{m}]$
 $ty = 1.38 \text{ MPa} < 3tr, tr = 1.10 \text{ MPa}$
 $tz = 1.33 \text{ MPa} < 3tr, tr = 1.10 \text{ MPa}$
 Procentat armiranja: 1.25%

Greda 6-13
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 15-15 x = 0.00m



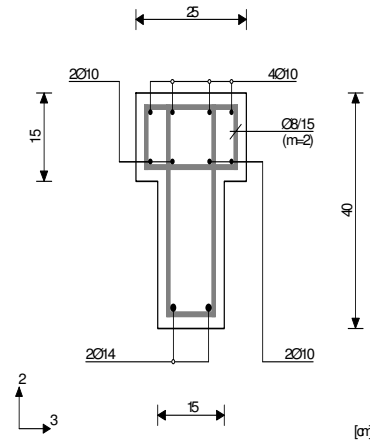
Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 N1u = 0.77 kN
 M2u = 0.00 kNm
 M3u = 0.00 kNm

Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII
 M1u = 1.23 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII
 T2u = -26.25 kN
 T3u = 0.00 kN
 M1u = 1.23 kNm

$eb/ea = 1.629/10.000 \%$
 $Aa1 = 0.00 + 0.05' = 0.05 \text{ cm}^2$
 $Aa2 = 0.00 + 0.10' = 0.10 \text{ cm}^2$
 $Aa3 = 0.00 + 0.07' = 0.07 \text{ cm}^2$
 $Aa4 = 0.00 + 0.07' = 0.07 \text{ cm}^2$
 $Aa,uz = 0.38 \text{ cm}^2/\text{m} \quad (m=2)$
 $[Uvojenio Aa,uz = 0.8/15(m=2) = 3.35 \text{ cm}^2/\text{m}]$
 $ty = 1.46 \text{ MPa} < 3tr, tr = 1.10 \text{ MPa}$
 $tz = 0.95 \text{ MPa} < 3tr, tr = 1.10 \text{ MPa}$
 Procentat armiranja: 1.25%
 *) - dodatna poduzna armatura za prijem torzije.

Presek 16-16 x = 2.08m



Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII
 N1u = 0.00 kN
 M2u = 0.00 kNm
 M3u = 32.77 kNm

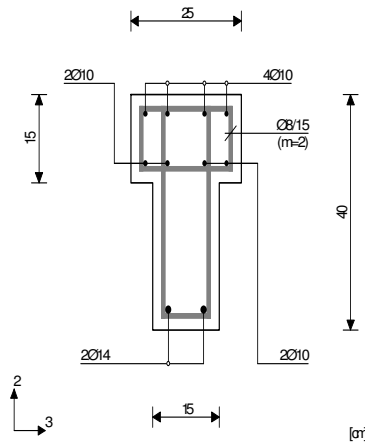
Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII
 M1u = 1.23 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII
 T2u = -5.25 kN
 T3u = 0.00 kN
 M1u = 1.23 kNm

$eb/ea = -1.123/10.000 \%$
 $Aa1 = 1.81 + 0.05' = 1.86 \text{ cm}^2$
 $Aa2 = 0.19 + 0.10' = 0.29 \text{ cm}^2$
 $Aa3 = 0.00 + 0.07' = 0.07 \text{ cm}^2$
 $Aa4 = 0.00 + 0.07' = 0.07 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/\text{m} \quad (m=2)$
 $[Uvojenio Aa,uz = 0.8/15(m=2) = 3.35 \text{ cm}^2/\text{m}]$
 $ty = 1.05 \text{ MPa} < 3tr, tr = 1.10 \text{ MPa}$
 $tz = 0.95 \text{ MPa} < 3tr, tr = 1.10 \text{ MPa}$
 Procentat armiranja: 1.25%

Greda 10-18
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 17-17 x = 2.08m



Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII
 N1u = 0.00 kN
 M2u = 0.00 kNm
 M3u = 32.77 kNm

Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII
 M1u = 0.46 kNm

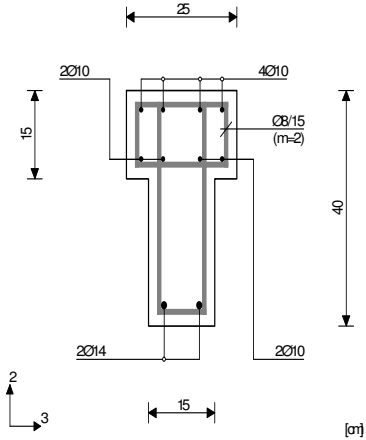
Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII
 T2u = -5.25 kN
 T3u = 0.00 kN
 M1u = 0.46 kNm

eb/ea = -1.123/10.000 %
 Aa1 = 1.81 + 0.00' = 1.81 cm2
 Aa2 = 0.19 + 0.04' = 0.23 cm2
 Aa3 = 0.00 + 0.03' = 0.03 cm2
 Aa4 = 0.00 + 0.03' = 0.03 cm2
 Aa,uz = 0.00 cm2/m (m=2)
 [Uvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm2/m]

ty = 0.46MPa < tr , tr = 1.10MPa
 tz = 0.36MPa < tr , tr = 1.10MPa
 Procenat armiranja: 1.25%
 *) - dodatna poduzna armatura za prijem torzije.

Greda 14-24
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 18-18 x = 2.08m



Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII
 N1u = 0.00 kN
 M2u = 0.00 kNm
 M3u = 32.77 kNm

Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII
 M1u = -0.46 kNm

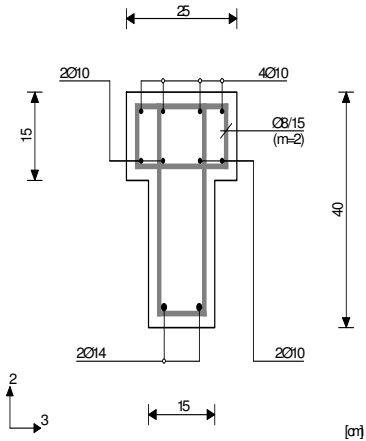
Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII
 T2u = -5.25 kN
 T3u = 0.00 kN
 M1u = -0.46 kNm

eb/ea = -1.123/10.000 %
 Aa1 = 1.81 + 0.00' = 1.81 cm2
 Aa2 = 0.19 + 0.04' = 0.23 cm2
 Aa3 = 0.00 + 0.03' = 0.03 cm2
 Aa4 = 0.00 + 0.03' = 0.03 cm2
 Aa,uz = 0.00 cm2/m (m=2)
 [Uvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm2/m]

ty = 0.46MPa < tr , tr = 1.10MPa
 tz = 0.36MPa < tr , tr = 1.10MPa
 Procenat armiranja: 1.25%
 *) - dodatna poduzna armatura za prijem torzije.

Greda 19-29
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 19-19 x = 0.00m



Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII
 T2u = -26.25 kN
 T3u = 0.00 kN
 M1u = -1.23 kNm

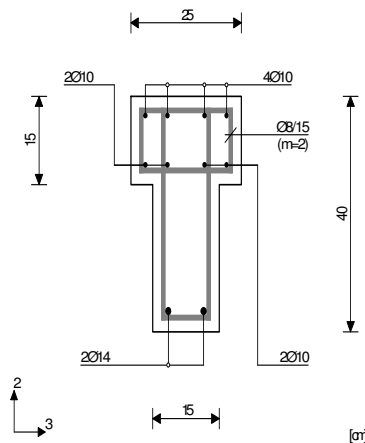
Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII
 M1u = -1.23 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII
 T2u = -5.25 kN
 T3u = 0.00 kN
 M1u = -1.23 kNm

eb/ea = 1.629/10.000 %
 Aa1 = 0.00 + 0.05' = 0.05 cm2
 Aa2 = 0.00 + 0.10' = 0.10 cm2
 Aa3 = 0.00 + 0.07' = 0.07 cm2
 Aa4 = 0.00 + 0.07' = 0.07 cm2
 Aa,uz = 0.38 cm2/m (m=2)
 [Uvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm2/m]

ty = 1.46MPa < 3tr , tr = 1.10MPa
 tz = 0.95MPa < tr , tr = 1.10MPa
 Procenat armiranja: 1.25%
 *) - dodatna poduzna armatura za prijem torzije.

Presek 20-20 x = 2.08m



Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII
 N1u = 0.00 kN
 M2u = 0.00 kNm
 M3u = 32.77 kNm

Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII
 M1u = -1.23 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII
 T2u = -5.25 kN
 T3u = 0.00 kN
 M1u = -1.23 kNm

eb/ea = -1.123/10.000 %
 Aa1 = 1.81 + 0.05' = 1.86 cm2
 Aa2 = 0.19 + 0.10' = 0.29 cm2
 Aa3 = 0.00 + 0.07' = 0.07 cm2
 Aa4 = 0.00 + 0.07' = 0.07 cm2
 Aa,uz = 0.00 cm2/m (m=2)
 [Uvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm2/m]

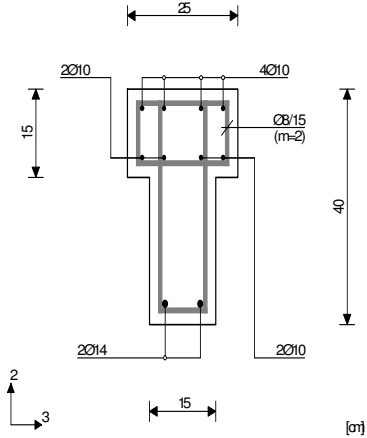
ty = 1.05MPa < tr , tr = 1.10MPa
 tz = 0.95MPa < tr , tr = 1.10MPa
 Procenat armiranja: 1.25%

Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 N1u = 0.72 kN
 M2u = 0.00 kNm
 M3u = 0.00 kNm

Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII
 M1u = -1.23 kNm

Greda 25-36
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 21-21 x = 0.00m



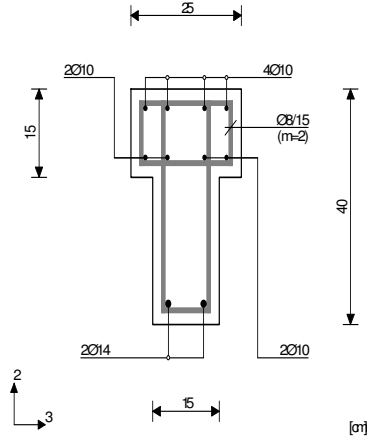
Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 N1u = 0.89 kN
 M2u = 0.00 kNm
 M3u = 0.00 kNm

Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 M1u = 1.24 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 T2u = -13.71 kN
 T3u = 0.00 kN
 M1u = 1.24 kNm

$eb/ea = 1.691/10.000 \%$
 $Aa1 = 0.00 + 0.05' = 0.05 \text{ cm}^2$
 $Aa2 = 0.00 + 0.10' = 0.10 \text{ cm}^2$
 $Aa3 = 0.00 + 0.07' = 0.07 \text{ cm}^2$
 $Aa4 = 0.00 + 0.07' = 0.07 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/\text{m} \quad (m=2)$
 [Uvojeno $Aa,uz = \phi 8/15(m=2) = 3.35 \text{ cm}^2/\text{m}$]
 $\tau_y = 1.22 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.96 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.25%
 *) - dodatna poduzna armatura za prijem torzije.

Presek 22-22 x = 2.08m



Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII
 N1u = 0.00 kN
 M2u = 0.00 kNm
 M3u = 21.25 kNm

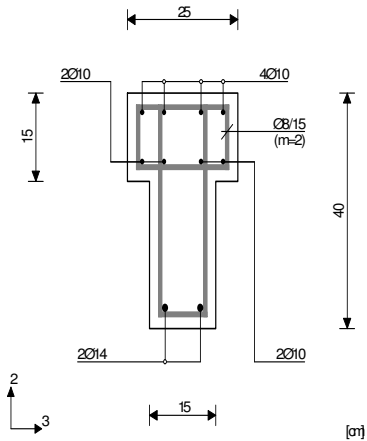
Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 M1u = 1.24 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 T2u = -2.74 kN
 T3u = 0.00 kN
 M1u = 1.24 kNm

$eb/ea = -0.879/10.000 \%$
 $Aa1 = 1.17 + 0.05' = 1.22 \text{ cm}^2$
 $Aa2 = 0.00 + 0.10' = 0.10 \text{ cm}^2$
 $Aa3 = 0.00 + 0.07' = 0.07 \text{ cm}^2$
 $Aa4 = 0.00 + 0.07' = 0.07 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/\text{m} \quad (m=2)$
 [Uvojeno $Aa,uz = \phi 8/15(m=2) = 3.35 \text{ cm}^2/\text{m}$]
 $\tau_y = 1.01 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.96 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.25%

Greda 13-23
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 23-23 x = 2.08m



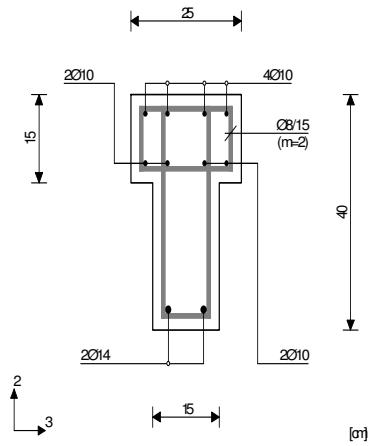
Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII
 N1u = 0.00 kN
 M2u = 0.00 kNm
 M3u = 32.77 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII
 T2u = -5.25 kN
 T3u = 0.00 kN
 M1u = 0.00 kNm

$eb/ea = -1.123/10.000 \%$
 $Aa1 = 1.81 \text{ cm}^2$
 $Aa2 = 0.19 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/\text{m} \quad (m=2)$
 [Uvojeno $Aa,uz = \phi 8/15(m=2) = 3.35 \text{ cm}^2/\text{m}$]
 $\tau_y = 0.10 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.25%

Greda 18-28
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 24-24 x = 2.08m



Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII
 N1u = 0.00 kN
 M2u = 0.00 kNm
 M3u = 32.77 kNm

Merodavna kombinacija za smicanje:

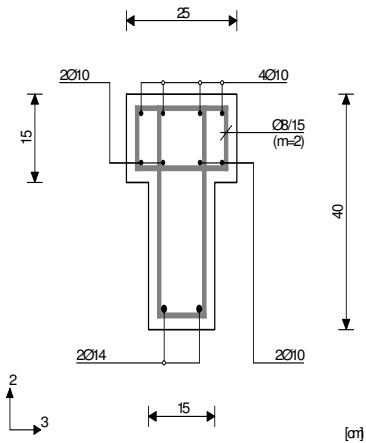
1.60xI+1.60xII+1.80xIII
 T2u = -5.25 kN
 T3u = 0.00 kN
 M1u = 0.00 kNm

$\epsilon_b/\epsilon_a = -1.123/10.000 \%$
 Aa1 = 1.81 cm²
 Aa2 = 0.19 cm²
 Aa3 = 0.00 cm²
 Aa4 = 0.00 cm²
 Aa,uz = 0.00 cm²/m (m=2)
 [Usvajeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

$\tau_y = 0.10 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.25%

Greda 24-34
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 25-25 x = 2.08m



Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII
 N1u = 0.00 kN
 M2u = 0.00 kNm
 M3u = 32.77 kNm

Merodavna kombinacija za smicanje:

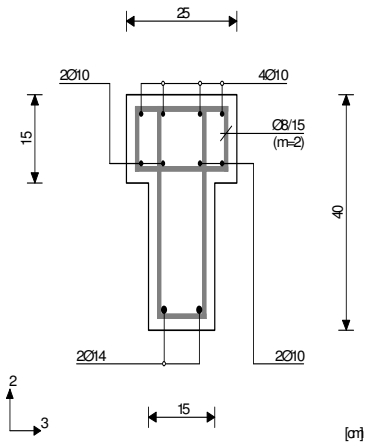
1.60xI+1.60xII+1.80xIII
 T2u = -5.25 kN
 T3u = 0.00 kN
 M1u = 0.00 kNm

$\epsilon_b/\epsilon_a = -1.123/10.000 \%$
 Aa1 = 1.81 cm²
 Aa2 = 0.19 cm²
 Aa3 = 0.00 cm²
 Aa4 = 0.00 cm²
 Aa,uz = 0.00 cm²/m (m=2)
 [Usvajeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

$\tau_y = 0.10 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.25%

Greda 29-39
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 26-26 x = 2.08m



Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII
 N1u = 0.00 kN
 M2u = 0.00 kNm
 M3u = 32.77 kNm

Merodavna kombinacija za smicanje:

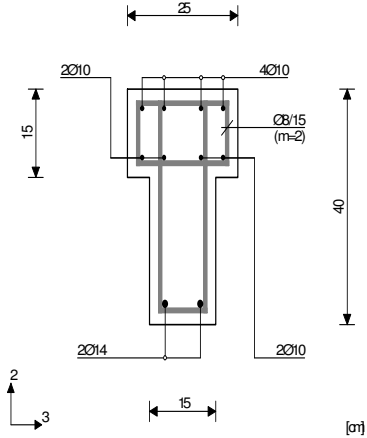
1.60xI+1.60xII+1.80xIII
 T2u = -5.25 kN
 T3u = 0.00 kN
 M1u = 0.00 kNm

$\epsilon_b/\epsilon_a = -1.123/10.000 \%$
 Aa1 = 1.81 cm²
 Aa2 = 0.19 cm²
 Aa3 = 0.00 cm²
 Aa4 = 0.00 cm²
 Aa,uz = 0.00 cm²/m (m=2)
 [Usvajeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

$\tau_y = 0.10 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.25%

Greda 36-43
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 27-27 x = 0.00m



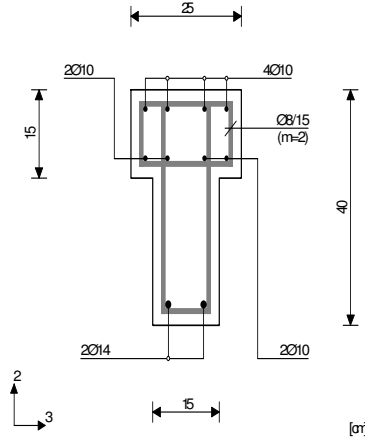
Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 N1u = 1.79 kN
 M2u = 0.00 kNm
 M3u = 0.00 kNm

Merodavna kombinacija za torziju:
 1.30xI+1.30xII+1.30xIII-1.30xVII
 M1u = 0.06 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII
 T2u = -17.03 kN
 T3u = 0.00 kN
 M1u = 0.00 kNm

$eb/ea = 1.660/10.000 \%$
 Aa1 = 0.02 cm²
 Aa2 = 0.02 cm²
 Aa3 = 0.00 cm²
 Aa4 = 0.00 cm²
 Aa,uz = 0.00 cm²/m (m=2)
 [Uvojenio Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]
 $\tau_y = 0.33\text{MPa} < \tau_r, \tau_r = 1.10\text{MPa}$
 Procentat armiranja: 1.25%

Presek 28-28 x = 2.08m



Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII
 N1u = 0.00 kN
 M2u = 0.00 kNm
 M3u = 21.25 kNm

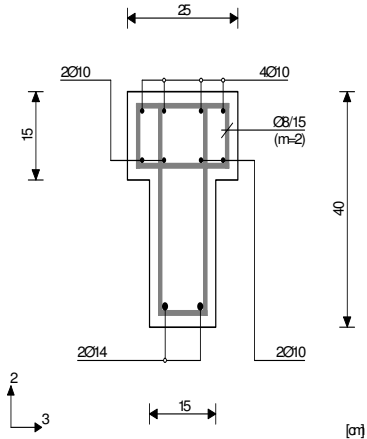
Merodavna kombinacija za torziju:
 1.30xI+1.30xII+1.30xIII-1.30xVII
 M1u = 0.06 kNm

Merodavna kombinacija za smicanje:
 1.30xI+1.30xII+1.30xIII-1.30xVII
 T2u = -2.65 kN
 T3u = 0.00 kN
 M1u = 0.06 kNm

$eb/ea = -0.879/10.000 \%$
 Aa1 = 1.17 cm²
 Aa2 = 0.00 cm²
 Aa3 = 0.00 cm²
 Aa4 = 0.00 cm²
 Aa,uz = 0.00 cm²/m (m=2)
 [Uvojenio Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]
 $\tau_y = 0.10\text{MPa} < \tau_r, \tau_r = 1.10\text{MPa}$
 $\tau_z = 0.04\text{MPa} < \tau_r, \tau_r = 1.10\text{MPa}$
 Procentat armiranja: 1.25%

Greda 29-33
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 29-29 x = 0.00m



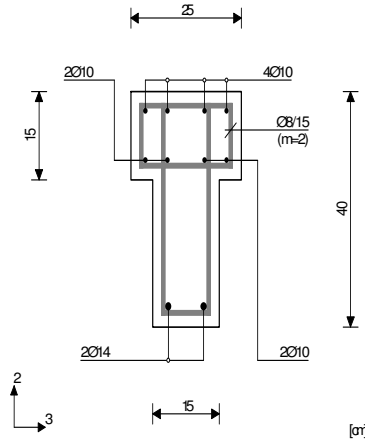
Merodavna kombinacija za savijanje:
 1.30xI+1.30xII+1.30xIII-1.30xVIII
 N1u = 2.33 kN
 M2u = 0.00 kNm
 M3u = 0.00 kNm

Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII
 M1u = -0.95 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII
 T2u = -26.25 kN
 T3u = 0.00 kN
 M1u = -0.95 kNm

$eb/ea = 1.660/10.000 \%$
 Aa1 = 0.02 + 0.04' = 0.06 cm²
 Aa2 = 0.03 + 0.07' = 0.10 cm²
 Aa3 = 0.00 + 0.05' = 0.05 cm²
 Aa4 = 0.00 + 0.05' = 0.05 cm²
 Aa,uz = 0.17 cm²/m (m=2)
 [Uvojenio Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]
 $\tau_y = 1.24\text{MPa} < 3\tau_r, \tau_r = 1.10\text{MPa}$
 $\tau_z = 0.73\text{MPa} < \tau_r, \tau_r = 1.10\text{MPa}$
 Procentat armiranja: 1.25%
 *) - dodatna poduzna armatura za prijem torzije.

Presek 30-30 x = 2.08m



Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII
 N1u = 0.00 kN
 M2u = 0.00 kNm
 M3u = 32.77 kNm

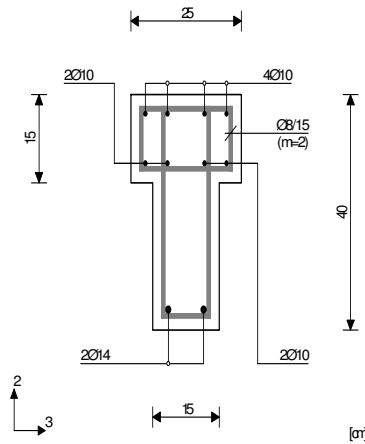
Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII
 M1u = -0.95 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII
 T2u = -5.25 kN
 T3u = 0.00 kN
 M1u = -0.95 kNm

$eb/ea = -1.123/10.000 \%$
 Aa1 = 1.81 + 0.04' = 1.85 cm²
 Aa2 = 0.19 + 0.07' = 0.26 cm²
 Aa3 = 0.00 + 0.05' = 0.05 cm²
 Aa4 = 0.00 + 0.05' = 0.05 cm²
 Aa,uz = 0.00 cm²/m (m=2)
 [Uvojenio Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]
 $\tau_y = 0.83\text{MPa} < \tau_r, \tau_r = 1.10\text{MPa}$
 $\tau_z = 0.73\text{MPa} < \tau_r, \tau_r = 1.10\text{MPa}$
 Procentat armiranja: 1.25%

Greda 28-38
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 31-31 x = 2.08m



Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII
 N1u = 0.00 kN
 M2u = 0.00 kNm
 M3u = 32.77 kNm

Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII
 M1u = -0.36 kNm

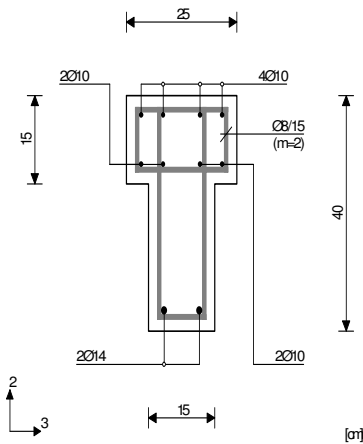
Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII
 T2u = -5.25 kN
 T3u = 0.00 kN
 M1u = -0.36 kNm

eb/ea = -1.123/10.000 %
 Aa1 = 1.81 cm²
 Aa2 = 0.19 cm²
 Aa3 = 0.00 cm²
 Aa4 = 0.00 cm²
 Aa,uz = 0.00 cm²/m (m=2)
 [Uvođeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

ty = 0.38MPa < tr, tr = 1.10MPa
 tz = 0.27MPa < tr, tr = 1.10MPa
 Procenat armiranja: 1.25%

Greda 34-42
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 32-32 x = 2.08m



Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII
 N1u = 0.00 kN
 M2u = 0.00 kNm
 M3u = 32.77 kNm

Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII
 M1u = 0.36 kNm

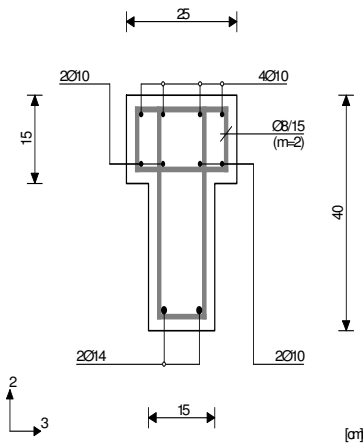
Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII
 T2u = -5.25 kN
 T3u = 0.00 kN
 M1u = 0.36 kNm

eb/ea = -1.123/10.000 %
 Aa1 = 1.81 cm²
 Aa2 = 0.19 cm²
 Aa3 = 0.00 cm²
 Aa4 = 0.00 cm²
 Aa,uz = 0.00 cm²/m (m=2)
 [Uvođeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

ty = 0.38MPa < tr, tr = 1.10MPa
 tz = 0.27MPa < tr, tr = 1.10MPa
 Procenat armiranja: 1.25%

Greda 43-46
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 33-33 x = 0.00m



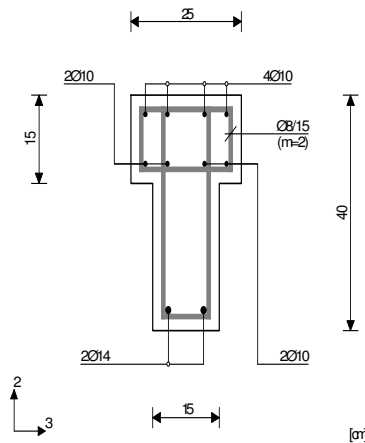
Merodavna kombinacija za savijanje:
 1.30xI+1.30xII+1.30xIII-1.30xVII
 T2u = -13.26 kN
 T3u = 0.00 kN
 M1u = 1.72 kNm

eb/ea = 1.660/10.000 %
 Aa1 = 0.03 + 0.07' = 0.10 cm²
 Aa2 = 0.03 + 0.13' = 0.16 cm²
 Aa3 = 0.00 + 0.10' = 0.10 cm²
 Aa4 = 0.00 + 0.10' = 0.10 cm²
 Aa,uz = 0.34 cm²/m (m=2)
 [Uvođeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

ty = 1.59MPa < 3tr, tr = 1.10MPa
 tz = 1.33MPa < 3tr, tr = 1.10MPa
 Procenat armiranja: 1.25%

*) - dodatna poduzna armatura za prijem torzije.

Presek 34-34 x = 2.08m



Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII
 N1u = 0.00 kN
 M2u = 0.00 kNm
 M3u = 21.25 kNm

Merodavna kombinacija za torziju:
 1.30xI+1.30xII+1.30xIII-1.30xVII
 M1u = 1.72 kNm

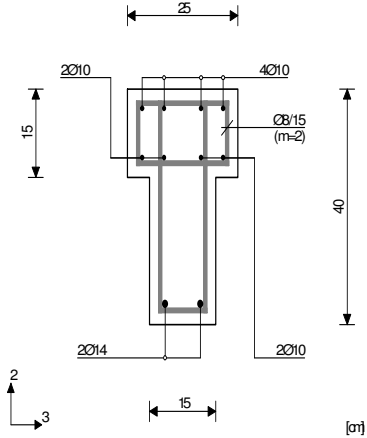
Merodavna kombinacija za smicanje:
 1.30xI+1.30xII+1.30xIII-1.30xVII
 T2u = -2.65 kN
 T3u = 0.00 kN
 M1u = 1.72 kNm

eb/ea = -0.879/10.000 %
 Aa1 = 1.17 + 0.07' = 1.24 cm²
 Aa2 = 0.00 + 0.13' = 0.13 cm²
 Aa3 = 0.00 + 0.10' = 0.10 cm²
 Aa4 = 0.00 + 0.10' = 0.10 cm²
 Aa,uz = 0.13 cm²/m (m=2)
 [Uvođeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

ty = 1.38MPa < 3tr, tr = 1.10MPa
 tz = 1.33MPa < 3tr, tr = 1.10MPa
 Procenat armiranja: 1.25%

Greda 39-45
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 35-35 x = 0.00m



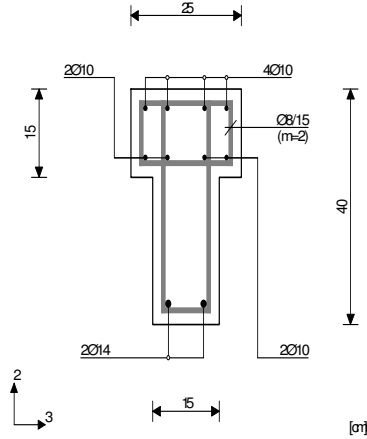
Merodavna kombinacija za savijanje:
 1.30xI+1.30xII+1.30xIII-1.30xVIII
 N1u = 2.07 kN
 M2u = 0.00 kNm
 M3u = 0.00 kNm

Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII
 M1u = 0.95 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII
 T2u = -26.25 kN
 T3u = 0.00 kN
 M1u = 0.95 kNm

$eb/ea = 1.660/10.000 \%$
 $Aa1 = 0.00 + 0.04' = 0.04 \text{ cm}^2$
 $Aa2 = 0.02 + 0.07' = 0.10 \text{ cm}^2$
 $Aa3 = 0.00 + 0.05' = 0.05 \text{ cm}^2$
 $Aa4 = 0.00 + 0.05' = 0.05 \text{ cm}^2$
 $Aa,uz = 0.17 \text{ cm}^2/\text{m} \quad (m=2)$
 $\gamma_y = 1.24 \text{ MPa} < 3\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.73 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procent armiranja: 1.25%
 *) - dodatna poduzna armatura za prijem torzije.

Presek 36-36 x = 2.08m



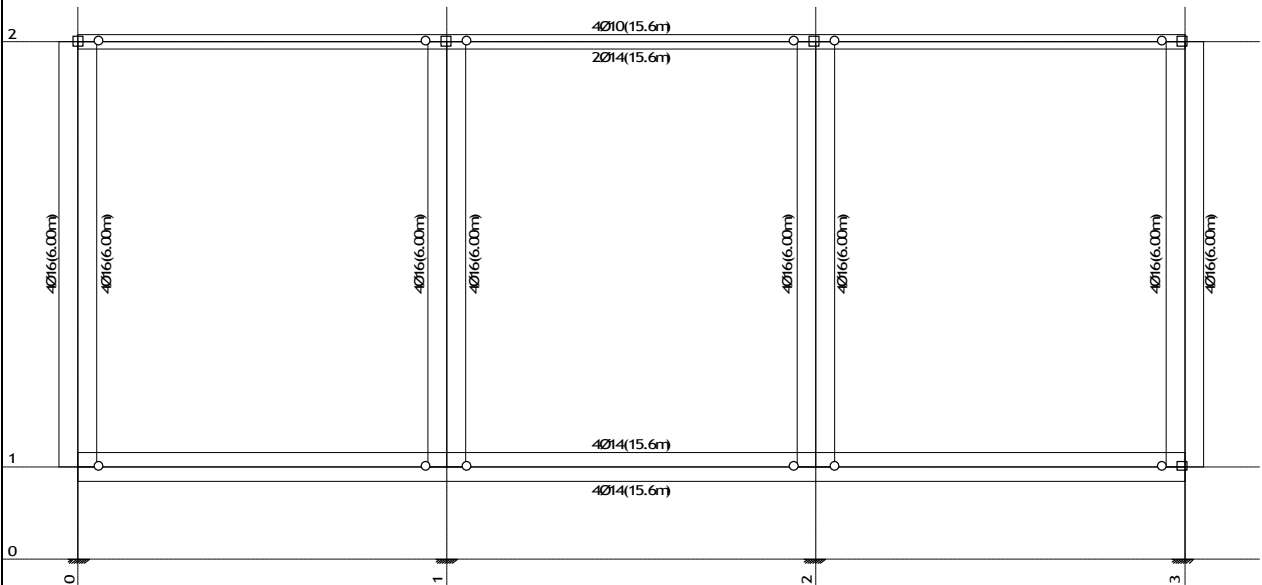
Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII
 N1u = 0.00 kN
 M2u = 0.00 kNm
 M3u = 32.77 kNm

Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII
 M1u = 0.95 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII
 T2u = -5.25 kN
 T3u = 0.00 kN
 M1u = 0.95 kNm

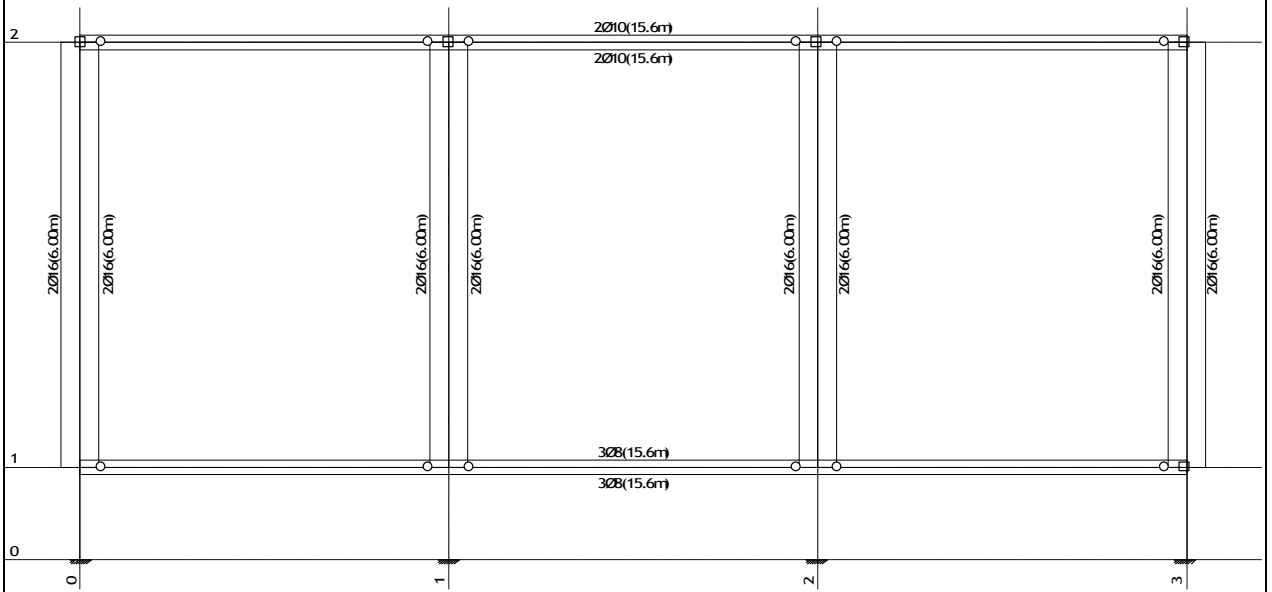
$eb/ea = -1.123/10.000 \%$
 $Aa1 = 1.81 + 0.04' = 1.85 \text{ cm}^2$
 $Aa2 = 0.19 + 0.07' = 0.26 \text{ cm}^2$
 $Aa3 = 0.00 + 0.05' = 0.05 \text{ cm}^2$
 $Aa4 = 0.00 + 0.05' = 0.05 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/\text{m} \quad (m=2)$
 $\gamma_y = 0.83 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.73 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 Procent armiranja: 1.25%

Usvojena armatura
 @1@PBAB 87, MB 30, B500



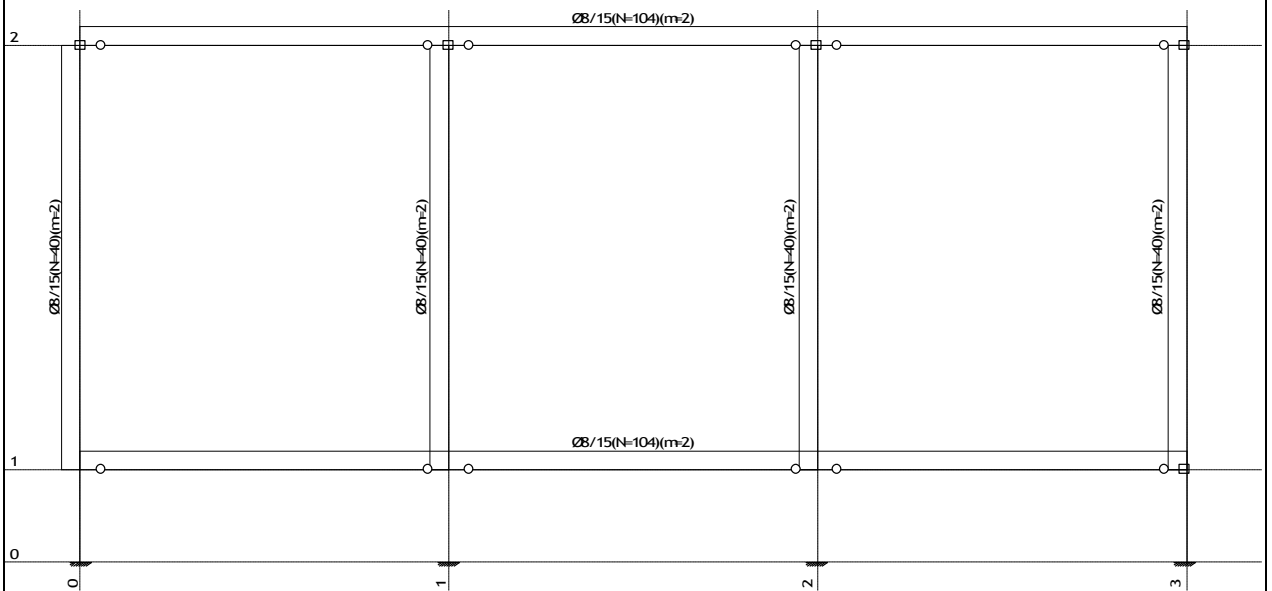
Ram: V.1
 Armatura u gredama: Aa2/Aa1

Usvojena armatura
@1@PBAB 87, MB 30, B500

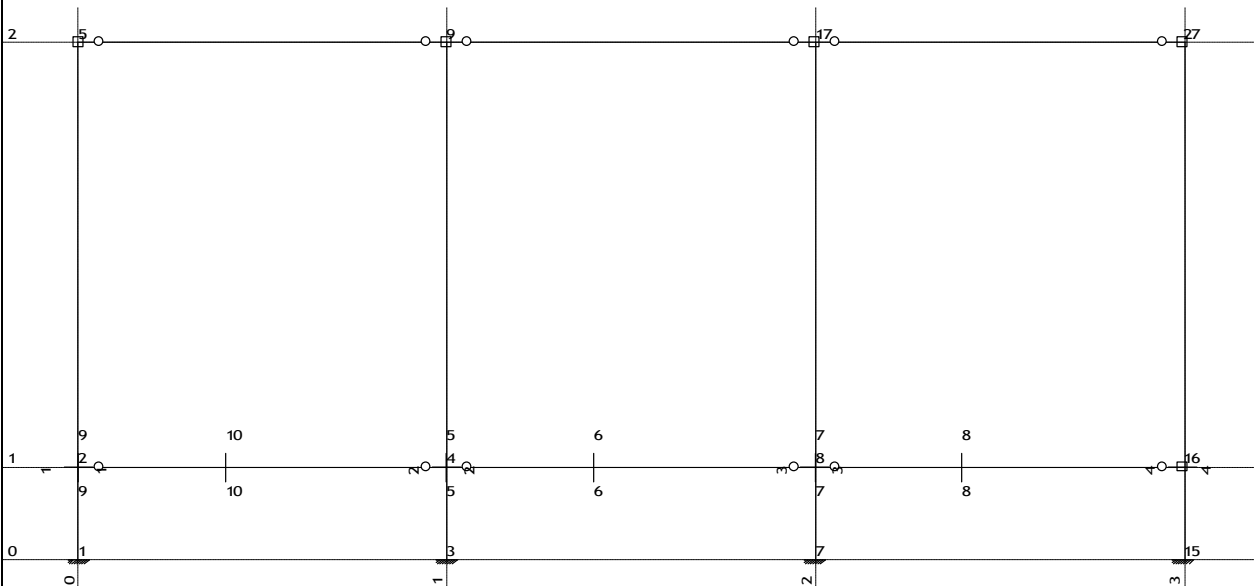


Pan: V_1
Armatura u gredama: A3/A4

Usvojena armatura
@1@PBAB 87, MB 30, B500



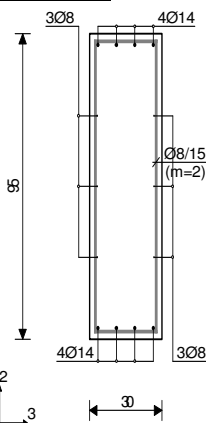
Pan: V_1
Armatura u gredama: A4,uz



Ram: V.1
Dispozicija greda

Greda 4-8
@1@PBAB 87
MB 30
B500
Kompletna sema opterećenja

Presek 5-5 x = 0.00m



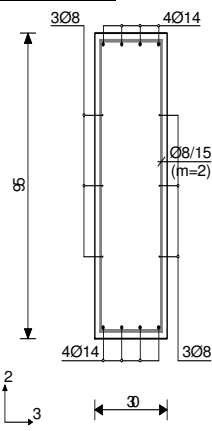
Merodavna kombinacija za savijanje:
1.60xI+1.60xII+1.80xIII+1.80xIV
+1.80xVI
N1u = 1.39 kN
M2u = 0.00 kNm
M3u = 0.00 kNm

Merodavna kombinacija za smicanje:
1.60xI+1.60xII+1.80xIII
T2u = -29.64 kN
T3u = 0.00 kN
M1u = 0.00 kNm

$\epsilon_b/\epsilon_a = 10.000/10.000 \%$
Aa1 = 0.01 cm²
Aa2 = 0.01 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = 0.08/15(m=2) = 3.35 cm²/m]

$\tau_y = 0.13 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
Procent armiranja: 0.54%

Presek 6-6 x = 2.08m



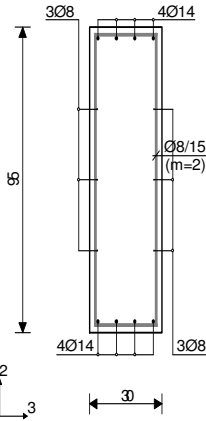
Merodavna kombinacija za savijanje:
1.60xI+1.60xII+1.80xIII+1.80xIV
+1.80xVI
N1u = 1.39 kN
M2u = 0.00 kNm
M3u = 36.99 kNm

Merodavna kombinacija za smicanje:
1.60xI+1.60xII+1.80xIII
T2u = -5.93 kN
T3u = 0.00 kN
M1u = 0.00 kNm

$\epsilon_b/\epsilon_a = -0.431/10.000 \%$
Aa1 = 0.89 cm²
Aa2 = 0.00 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = 0.08/15(m=2) = 3.35 cm²/m]
 $\tau_y = 0.03 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
Procent armiranja: 0.54%

Greda 8-16
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 7-7 x = 0.00m



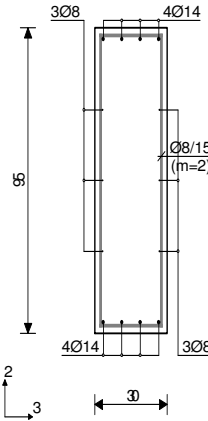
Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 N1u = 4.39 kN
 M2u = 0.00 kNm
 M3u = 0.00 kNm

Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 M1u = -0.46 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 T2u = -29.64 kN
 T3u = 0.00 kN
 M1u = -0.46 kNm

$eb/ea = 10.000/10.000 \%$
 Aa1 = 0.04 cm²
 Aa2 = 0.04 cm²
 Aa3 = 0.00 cm²
 Aa4 = 0.00 cm²
 Aa,uz = 0.00 cm²/m (m=2)
 [Usvajeno Aa,uz = 0.8/15(m=2) = 3.35 cm²/m]
 $\tau_y = 0.17\text{MPa} < \tau_r = 1.10\text{MPa}$
 $\tau_z = 0.04\text{MPa} < \tau_r = 1.10\text{MPa}$
 Procenat armiranja: 0.54%

Presek 8-8 x = 2.08m



Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 N1u = 4.39 kN
 M2u = 0.00 kNm
 M3u = 36.99 kNm

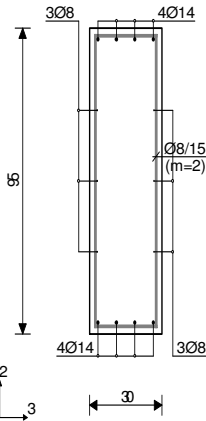
Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 M1u = -0.46 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 T2u = -5.93 kN
 T3u = 0.00 kN
 M1u = -0.46 kNm

$eb/ea = -0.422/10.000 \%$
 Aa1 = 0.92 cm²
 Aa2 = 0.00 cm²
 Aa3 = 0.00 cm²
 Aa4 = 0.00 cm²
 Aa,uz = 0.00 cm²/m (m=2)
 [Usvajeno Aa,uz = 0.8/15(m=2) = 3.35 cm²/m]
 $\tau_y = 0.07\text{MPa} < \tau_r = 1.10\text{MPa}$
 $\tau_z = 0.04\text{MPa} < \tau_r = 1.10\text{MPa}$
 Procenat armiranja: 0.54%

Greda 2-4
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja

Presek 9-9 x = 0.00m



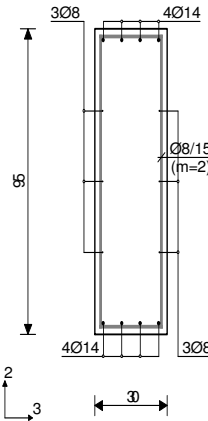
Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 N1u = 0.40 kN
 M2u = 0.00 kNm
 M3u = 0.00 kNm

Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 M1u = 0.38 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 T2u = -29.64 kN
 T3u = 0.00 kN
 M1u = 0.38 kNm

$eb/ea = 10.000/10.000 \%$
 Aa1 = 0.00 cm²
 Aa2 = 0.00 cm²
 Aa3 = 0.00 cm²
 Aa4 = 0.00 cm²
 Aa,uz = 0.00 cm²/m (m=2)
 [Usvajeno Aa,uz = 0.8/15(m=2) = 3.35 cm²/m]
 $\tau_y = 0.16\text{MPa} < \tau_r = 1.10\text{MPa}$
 $\tau_z = 0.03\text{MPa} < \tau_r = 1.10\text{MPa}$
 Procenat armiranja: 0.54%

Presek 10-10 x = 2.08m



Merodavna kombinacija za savijanje:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 N1u = 0.40 kN
 M2u = 0.00 kNm
 M3u = 36.99 kNm

Merodavna kombinacija za torziju:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 M1u = 0.38 kNm

Merodavna kombinacija za smicanje:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 T2u = -5.93 kN
 T3u = 0.00 kN
 M1u = 0.38 kNm

$eb/ea = -0.432/10.000 \%$
 Aa1 = 0.88 cm²
 Aa2 = 0.00 cm²
 Aa3 = 0.00 cm²
 Aa4 = 0.00 cm²
 Aa,uz = 0.00 cm²/m (m=2)
 [Usvajeno Aa,uz = 0.8/15(m=2) = 3.35 cm²/m]
 $\tau_y = 0.06\text{MPa} < \tau_r = 1.10\text{MPa}$
 $\tau_z = 0.03\text{MPa} < \tau_r = 1.10\text{MPa}$
 Procenat armiranja: 0.54%

Greda 5-2

@1@PBAB 87

MB 30

B500

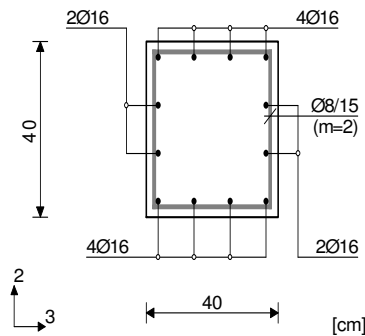
Kompletna sema opterećenja

li,2 = 12.00 m (A2 = 103.92)

li,3 = 12.00 m (A3 = 103.92)

Pomerljiva konstrukcija

Presek 1-1 x = 6.00m



Merodavna kombinacija za savijanje:

1.30xI+1.30xII+1.30xIII+1.30xVIII

N1u = -158.19 kN

M2u = 59.71 kNm

M3u = 0.00 kNm

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIII+1.80xIV

T2u = -14.74 kN

T3u = 1.53 kN

M1u = 0.00 kNm

 $\Delta e2 = 4.0 < e0 > + 17.8 < ell > = 21.8$ cm $|\Delta M2| = 34.45$ kNm $\Delta e3 = 4.0 < e0 > + 17.8 < ell > = 21.8$ cm $|\Delta M3| = 34.45$ kNm $cb/ea = -3.500/9.596$ ‰Aa1 = 2.63 cm²Aa2 = 2.61 cm²Aa3 = 1.76 cm²Aa4 = 1.74 cm²Aa,uz = 0.00 cm²/m (m=2)[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m] $\tau_y = 0.11$ MPa < τ_r , $\tau_r = 1.10$ MPa $\tau_z = 0.01$ MPa < τ_r , $\tau_r = 1.10$ MPa

Procentat armiranja: 1.51%

Greda 9-4

@1@PBAB 87

MB 30

B500

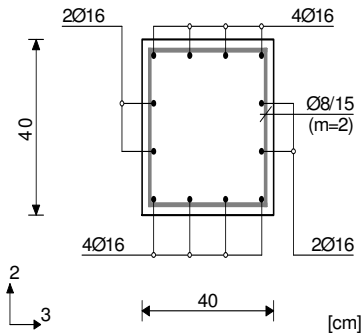
Kompletna sema opterećenja

li,2 = 12.00 m (A2 = 103.92)

li,3 = 12.00 m (A3 = 103.92)

Pomerljiva konstrukcija

Presek 2-2 x = 6.00m



Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII+1.80xIV

N1u = -239.55 kN

M2u = 9.20 kNm

M3u = 74.35 kNm

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIII+1.80xIV

T2u = -29.42 kN

T3u = 1.53 kN

M1u = 0.00 kNm

 $\Delta e2 = 4.0 < e0 > + 17.8 < ell > = 21.8$ cm $|\Delta M2| = 52.17$ kNm $\Delta e3 = 4.0 < e0 > + 17.8 < ell > = 21.8$ cm $|\Delta M3| = 52.17$ kNm $cb/ea = -3.500/6.688$ ‰Aa1 = 3.83 cm²Aa2 = 3.80 cm²Aa3 = 2.55 cm²Aa4 = 2.53 cm²Aa,uz = 0.00 cm²/m (m=2)[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m] $\tau_y = 0.23$ MPa < τ_r , $\tau_r = 1.10$ MPa $\tau_z = 0.01$ MPa < τ_r , $\tau_r = 1.10$ MPa

Procentat armiranja: 1.51%

Greda 17-8

@1@PBAB 87

MB 30

B500

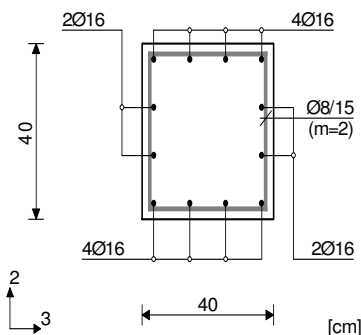
Kompletna sema opterećenja

li,2 = 12.00 m (A2 = 103.92)

li,3 = 12.00 m (A3 = 103.92)

Pomerljiva konstrukcija

Presek 3-3 x = 6.00m



Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII+1.80xIV

N1u = -239.55 kN

M2u = 9.20 kNm

M3u = 74.22 kNm

Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIII+1.80xIV

T2u = -29.42 kN

T3u = 1.53 kN

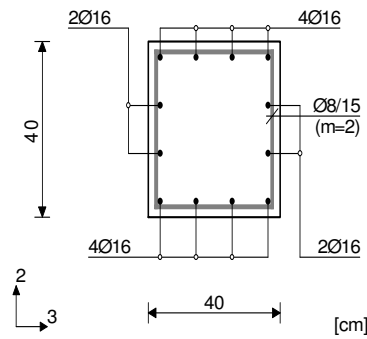
M1u = 0.00 kNm

 $\Delta e2 = 4.0 < e0 > + 17.8 < ell > = 21.8$ cm $|\Delta M2| = 52.17$ kNm $\Delta e3 = 4.0 < e0 > + 17.8 < ell > = 21.8$ cm $|\Delta M3| = 52.17$ kNm $cb/ea = -3.500/6.688$ ‰Aa1 = 3.83 cm²Aa2 = 3.80 cm²Aa3 = 2.55 cm²Aa4 = 2.52 cm²Aa,uz = 0.00 cm²/m (m=2)[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m] $\tau_y = 0.23$ MPa < τ_r , $\tau_r = 1.10$ MPa $\tau_z = 0.01$ MPa < τ_r , $\tau_r = 1.10$ MPa

Procentat armiranja: 1.51%

Greda 27-16
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja
 li,2 = 12.00 m (A2 = 103.92)
 li,3 = 12.00 m (A3 = 103.92)
 Pomerljiva konstrukcija

Presek 4-4 x = 6.00m



Merodavna kombinacija za savijanje:
 1.30xI+1.30xII+1.30xIII+1.30xVIII
 N1u = -150.05 kN
 M2u = 59.70 kNm
 M3u = 0.00 kNm

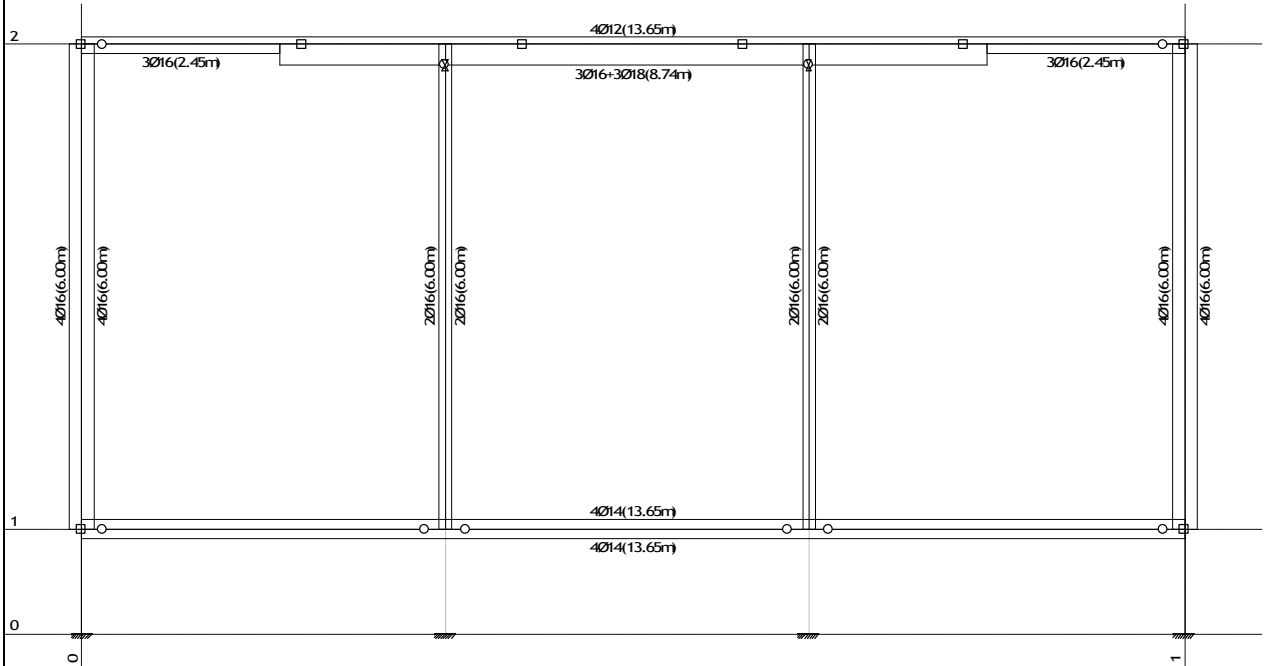
Merodavna kombinacija za smicanje:

1.60xI+1.60xII+1.80xIII+1.80xIV
 T2u = -14.24 kN
 T3u = 5.47 kN
 M1u = 0.00 kNm

$\Delta e2 = 4.0 < e0 > + 17.8 < ell > = 21.8$ cm
 $| \Delta M2 | = 32.68$ kNm
 $\Delta e3 = 4.0 < e0 > + 17.8 < ell > = 21.8$ cm
 $| \Delta M3 | = 32.68$ kNm
 $eb/ea = -3.500/9.917$ ‰
 Aa1 = 2.59 cm²
 Aa2 = 2.56 cm²
 Aa3 = 1.72 cm²
 Aa4 = 1.71 cm²
 Aa,uz = 0.00 cm²/m (m=2)
 [Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

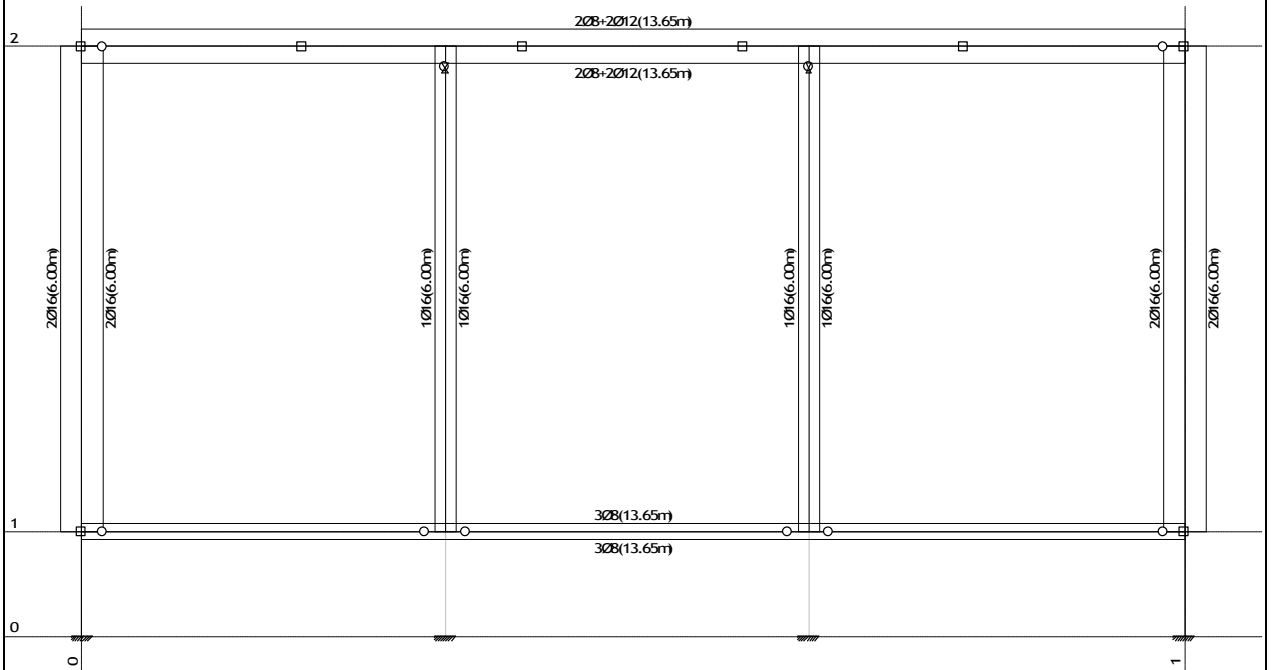
$\tau_y = 0.11 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.04 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.51%

Usvojena armatura
 @1@PBAB 87, MB 30, B500



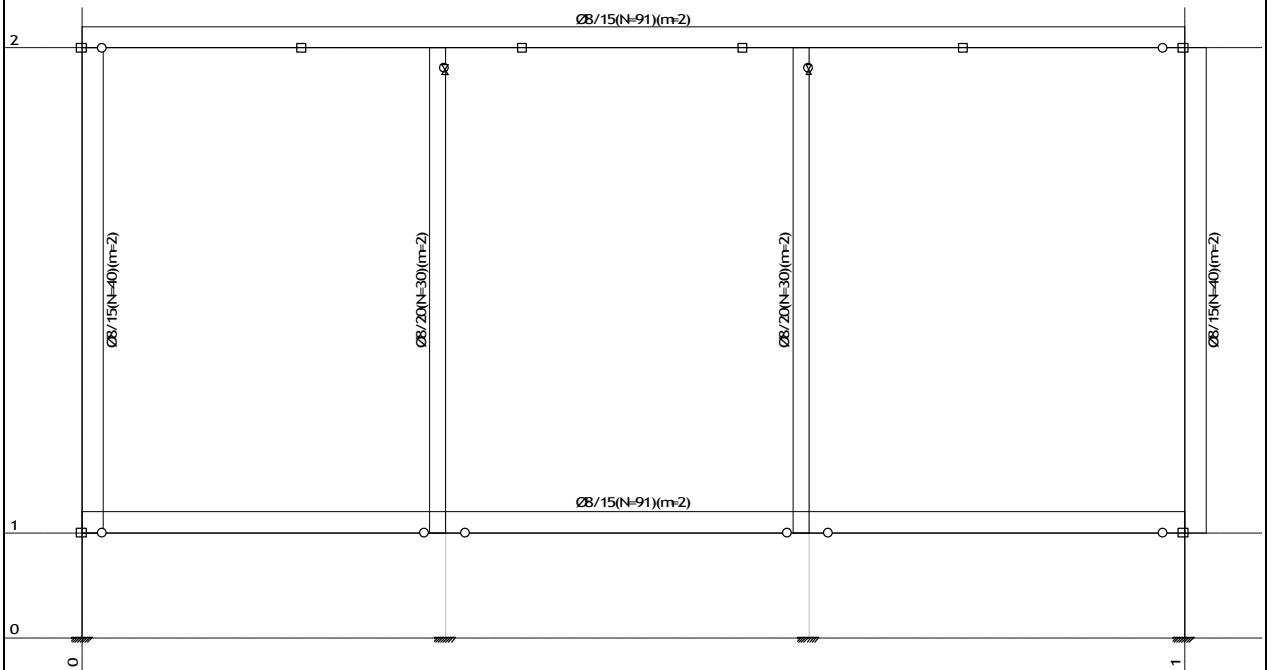
Ram H.4
 Armatura u gredama: Aa2/Aa1

Usvojena armatura
@1@PBAB 87, MB 30, B500

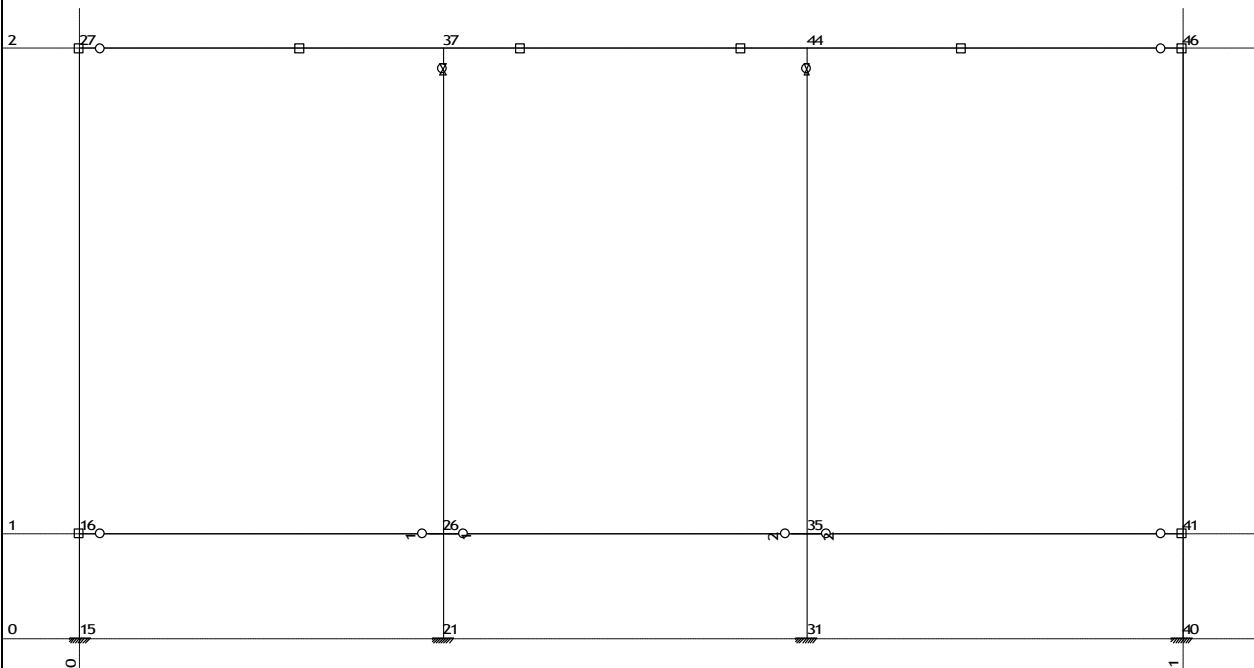


Ramt H.4
Armatura u gredama: Aa3/Aa4

Usvojena armatura
@1@PBAB 87, MB 30, B500



Ramt H.4
Armatura u gredama: Aa,uz



Ram: H.4
Dispozicija greda

Greda 37-26

@1@PBAB 87

MB 30

B500

Kompletna sema opterećenja

li,2 = 12.00 m (A2 = 207.85)

li,3 = 12.00 m (A3 = 103.92)

Pomerljiva konstrukcija

Merodavna kombinacija za savijanje:

1.60xI+1.60xII+1.80xIII+1.80xV

N1u = -27.84 kN

M2u = -0.00 kNm

M3u = -36.48 kNm

Merodavna kombinacija za torziju:

1.30xI+1.30xII+1.30xIII-1.30xVIII

M1u = -0.85 kNm

Merodavna kombinacija za smicanje:

1.30xI+1.30xII+1.30xIII-1.30xVIII

T2u = 6.83 kN

T3u = 0.00 kN

M1u = -0.85 kNm

$\Delta e2 = 4.0 \cdot e0 + 35.6 \cdot e1 = 39.6 \text{ cm}$

$|\Delta M2| = 11.01 \text{ kNm}$

$\Delta e3 = 4.0 \cdot e0 + 17.8 \cdot e1 = 21.8 \text{ cm}$

$|\Delta M3| = 6.06 \text{ kNm}$

$eb/ea = -3.500/9.682 \%$

Aa1 = 1.47 + 0.03' = 1.50 cm²

Aa2 = 1.46 + 0.03' = 1.49 cm²

Aa3 = 0.98 + 0.05' = 1.03 cm²

Aa4 = 0.97 + 0.05' = 1.02 cm²

Aa,uz = 0.00 cm²/m (m=2)

[Usvojeno Aa,uz = 0.8/20(m=2) = 2.51 cm²/m]

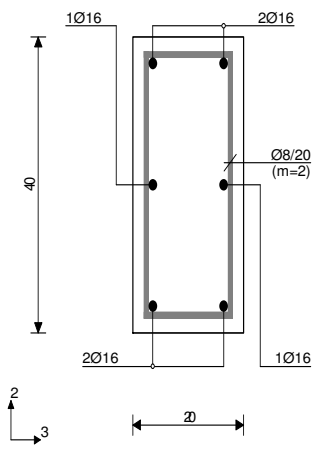
$\tau_y = 0.52 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$

$\tau_z = 0.42 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$

Procentat armiranja: 1.51%

*) - dodatna poduzna armatura za prijem torzije.

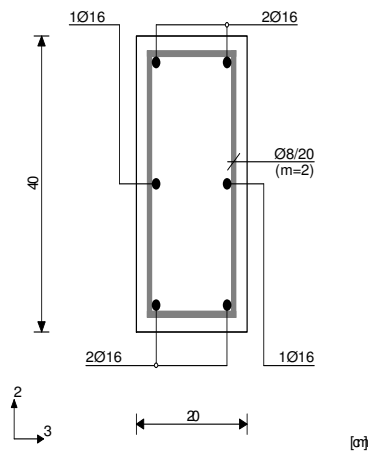
Presek 1-1 x = 6.00m



[m]

Greda 44-35
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja
 $l_{i,2} = 12.00 \text{ m}$ ($\lambda_2 = 207.85$)
 $l_{i,3} = 12.00 \text{ m}$ ($\lambda_3 = 103.92$)
 Pomerljiva konstrukcija

Presek 2-2 $x = 6.00 \text{ m}$



Merodavna kombinacija za torziju:
 $1.30xI + 1.30xII + 1.30xIII - 1.30xVIII$
 $M1u = 0.80 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.30xI + 1.30xII + 1.30xIII - 1.30xVIII$
 $T2u = 6.87 \text{ kN}$
 $T3u = 0.00 \text{ kN}$
 $M1u = 0.80 \text{ kNm}$

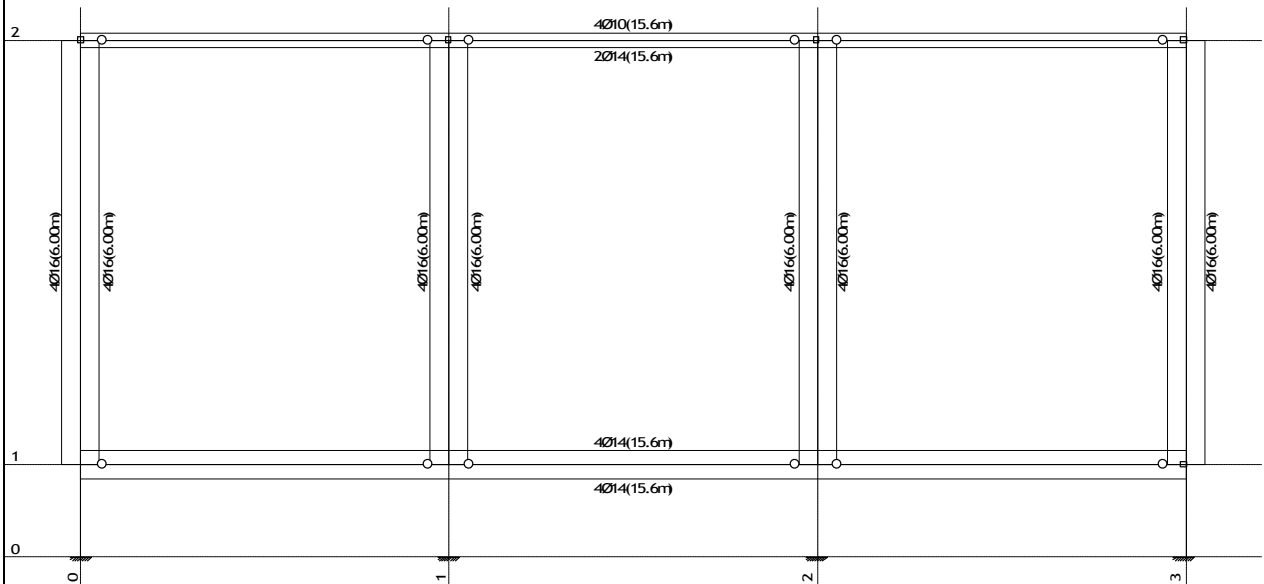
$\Delta e2 = 4.0 < e0 > + 35.6 < e_{ll} > = 39.6 \text{ cm}$
 $|\Delta M2| = 11.07 \text{ kNm}$
 $\Delta e3 = 4.0 < e0 > + 17.8 < e_{ll} > = 21.8 \text{ cm}$
 $|\Delta M3| = 6.09 \text{ kNm}$
 $eb/ea = -3.500/9.639 \text{ ‰}$
 $Aa1 = 1.49 + 0.02' = 1.52 \text{ cm}^2$
 $Aa2 = 1.48 + 0.02' = 1.50 \text{ cm}^2$
 $Aa3 = 0.99 + 0.05' = 1.04 \text{ cm}^2$
 $Aa4 = 0.98 + 0.05' = 1.03 \text{ cm}^2$
 $Aa_{uz} = 0.00 \text{ cm}^2/\text{m} \quad (m=2)$
[Usvojeno $Aa_{uz} = 0.08/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$\tau_y = 0.49 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.39 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$

Procent armiranja: 1.51%
 *) dodatna poduzna armatura za prijem torzije.

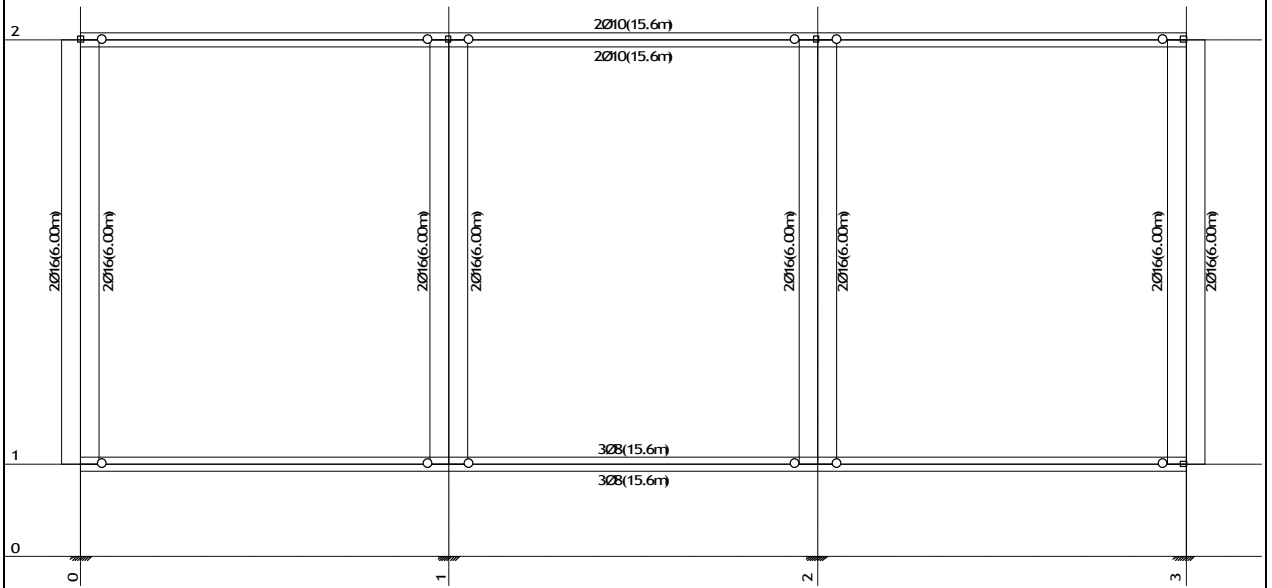
Merodavna kombinacija za savijanje:
 $1.60xI + 1.60xII + 1.80xIII + 1.80xV$
 $N1u = -27.98 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = -36.92 \text{ kNm}$

Usvojena armatura
 @1@PBAB 87, MB 30, B600



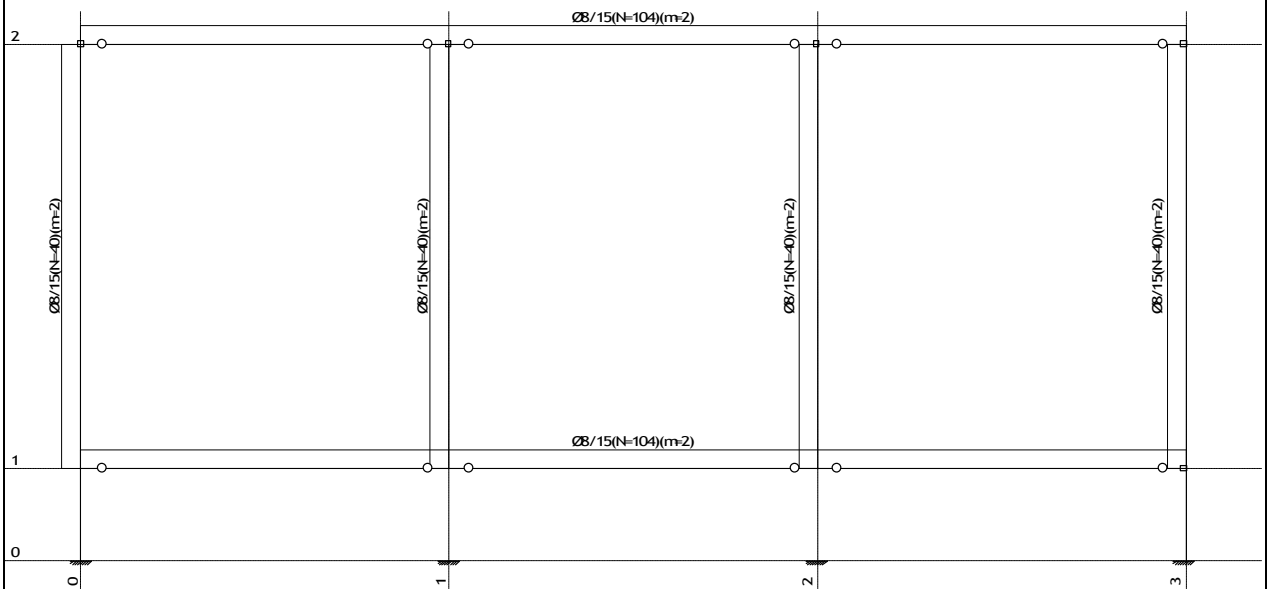
Ram: V.6
 Armatura u gredama: Aa2/Aa1

Usvojena armatura
@1@PBAB 87, MB 30, B500

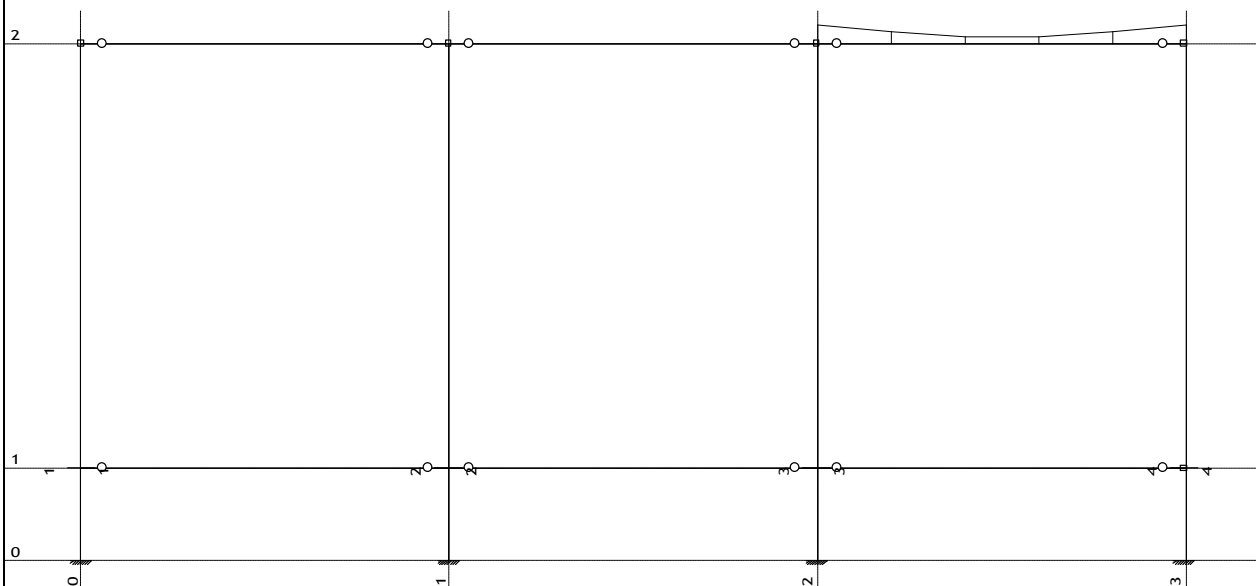


Plan: V.6
Armatura u gredama: A_{s3}/A_{s4}

Usvojena armatura
@1@PBAB 87, MB 30, B500



Plan: V.6
Armatura u gredama: A_{s1}/A_{s2}

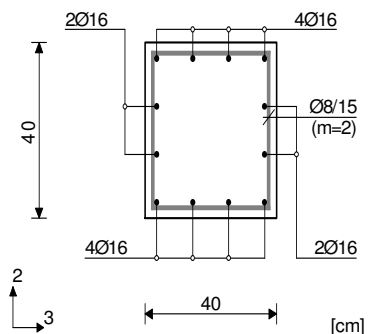


Pan: V.6
Amatura u gredama: max $A_{a,uz} = 0 \text{ cm}^2$

Greda 25-12
@1@PBAB 87
MB 30
B500

Kompletna sema opterećenja
 $l_{i,2} = 12.00 \text{ m}$ ($\lambda_2 = 103.92$)
 $l_{i,3} = 12.00 \text{ m}$ ($\lambda_3 = 103.92$)
Pomerljiva konstrukcija

Presek 1-1 $x = 6.00 \text{ m}$



Merodavna kombinacija za savijanje:
 $1.30 \times I + 1.30 \times II + 1.30 \times III + 1.30 \times VIII$
 $N1u = -158.19 \text{ kN}$
 $M2u = 59.86 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60 \times I + 1.60 \times II + 1.80 \times III + 1.80 \times IV$
 $+ 1.80 \times VI$
 $T2u = -11.23 \text{ kN}$
 $T3u = 2.72 \text{ kN}$
 $M1u = 0.00 \text{ kNm}$

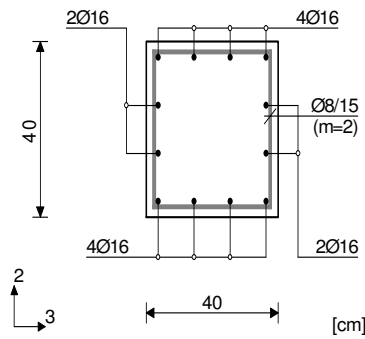
$\Delta e2 = 4.0 \times e0 + 17.8 \times e1 = 21.8 \text{ cm}$
 $|\Delta M2| = 34.45 \text{ kNm}$
 $\Delta e3 = 4.0 \times e0 + 17.8 \times e1 = 21.8 \text{ cm}$
 $|\Delta M3| = 34.45 \text{ kNm}$
 $eb/ea = -3.500/9.596 \%$

$Aa1 = 2.64 \text{ cm}^2$
 $Aa2 = 2.62 \text{ cm}^2$
 $Aa3 = 1.76 \text{ cm}^2$
 $Aa4 = 1.74 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/\text{m}$ (m=2)
[Ubojeno $Aa,uz = 0.8/15(m=2) = 3.35 \text{ cm}^2/\text{m}$]

$\tau_y = 0.09 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.02 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.51%

Greda 36-22
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja
 $l_{i,2} = 12.00 \text{ m}$ ($\lambda_2 = 103.92$)
 $l_{i,3} = 12.00 \text{ m}$ ($\lambda_3 = 103.92$)
 Pomerljiva konstrukcija

Presek 2-2 $x = 6.00 \text{ m}$

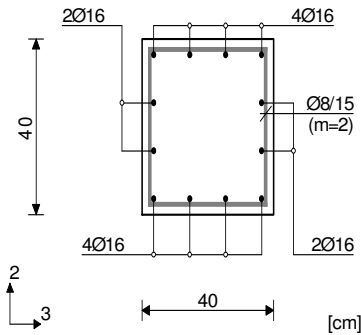


Merodavna kombinacija za savijanje:
 $1.30xI + 1.30xII + 1.30xIII - 1.30xVII$
 $N1u = -215.86 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = -80.17 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI + 1.60xII + 1.80xIII + 1.80xIV + 1.80xVI$
 $T2u = -22.46 \text{ kN}$
 $T3u = 2.72 \text{ kN}$
 $M1u = 0.00 \text{ kNm}$
 $\Delta e2 = 4.0 < e0 > + 17.8 < ell > = 21.8 \text{ cm}$
 $|\Delta M2| = 47.01 \text{ kNm}$
 $\Delta e3 = 4.0 < e0 > + 17.8 < ell > = 21.8 \text{ cm}$
 $|\Delta M3| = 47.01 \text{ kNm}$
 $eb/ea = -3.500/7.654 \text{ ‰}$
 $Aa1 = 3.74 \text{ cm}^2$
 $Aa2 = 3.71 \text{ cm}^2$
 $Aa3 = 2.50 \text{ cm}^2$
 $Aa4 = 2.47 \text{ cm}^2$
 $Aa_{uz} = 0.00 \text{ cm}^2/\text{m}$ (m=2)
 $[Usvojeno Aa_{uz} = 0.08/15(m=2) = 3.35 \text{ cm}^2/\text{m}]$
 $\tau_y = 0.17 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.02 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.51%

Greda 43-32
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja
 $l_{i,2} = 12.00 \text{ m}$ ($\lambda_2 = 103.92$)
 $l_{i,3} = 12.00 \text{ m}$ ($\lambda_3 = 103.92$)
 Pomerljiva konstrukcija

Presek 3-3 $x = 6.00 \text{ m}$



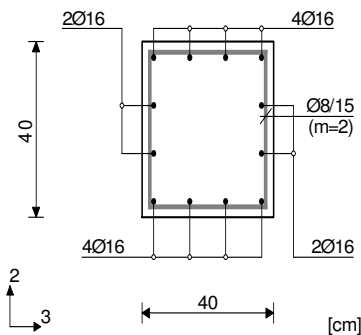
Merodavna kombinacija za savijanje:
 $1.30xI + 1.30xII + 1.30xIII - 1.30xVII$
 $N1u = -215.86 \text{ kN}$
 $M2u = 0.00 \text{ kNm}$
 $M3u = -79.73 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI + 1.60xII + 1.80xIII + 1.80xIV + 1.80xVI$
 $T2u = -22.46 \text{ kN}$
 $T3u = 2.72 \text{ kN}$
 $M1u = 0.00 \text{ kNm}$

$\Delta e2 = 4.0 < e0 > + 17.8 < ell > = 21.8 \text{ cm}$
 $|\Delta M2| = 47.01 \text{ kNm}$
 $\Delta e3 = 4.0 < e0 > + 17.8 < ell > = 21.8 \text{ cm}$
 $|\Delta M3| = 47.01 \text{ kNm}$
 $eb/ea = -3.500/7.654 \text{ ‰}$
 $Aa1 = 3.73 \text{ cm}^2$
 $Aa2 = 3.70 \text{ cm}^2$
 $Aa3 = 2.49 \text{ cm}^2$
 $Aa4 = 2.46 \text{ cm}^2$
 $Aa_{uz} = 0.00 \text{ cm}^2/\text{m}$ (m=2)
 $[Usvojeno Aa_{uz} = 0.08/15(m=2) = 3.35 \text{ cm}^2/\text{m}]$
 $\tau_y = 0.17 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.02 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.51%

Greda 46-41
 @1@PBAB 87
 MB 30
 B500
 Kompletna sema opterećenja
 $l_{i,2} = 12.00 \text{ m}$ ($\lambda_2 = 103.92$)
 $l_{i,3} = 12.00 \text{ m}$ ($\lambda_3 = 103.92$)
 Pomerljiva konstrukcija

Presek 4-4 $x = 6.00 \text{ m}$

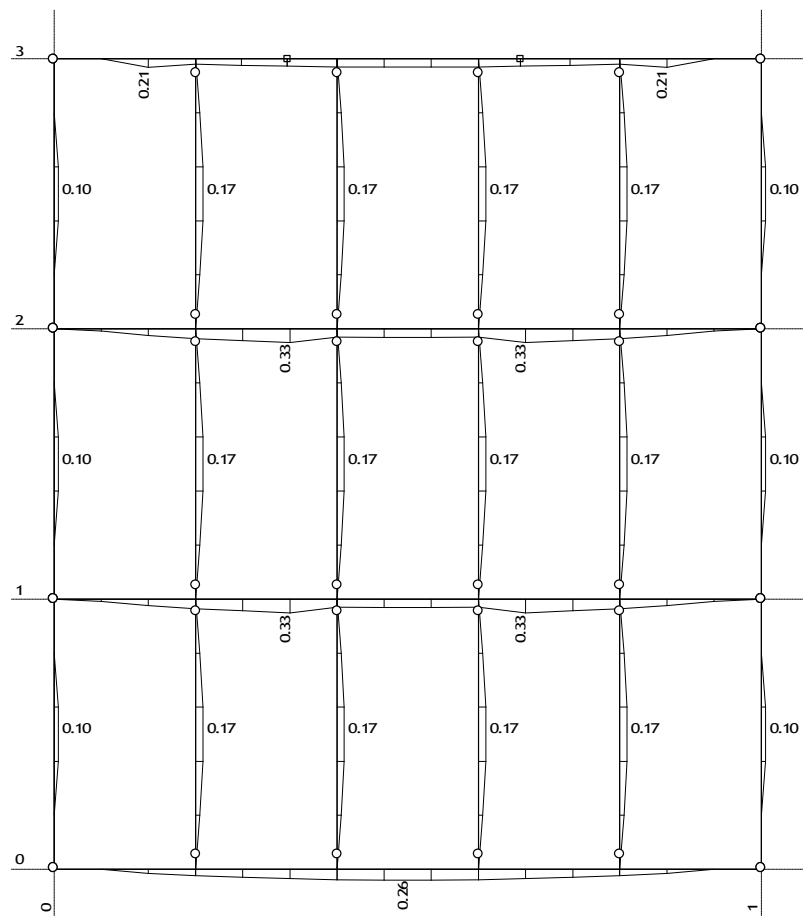


Merodavna kombinacija za savijanje:
 $1.30xI + 1.30xII + 1.30xIII + 1.30xVIII$
 $N1u = -150.17 \text{ kN}$
 $M2u = 59.85 \text{ kNm}$
 $M3u = 0.00 \text{ kNm}$

Merodavna kombinacija za smicanje:
 $1.60xI + 1.60xII + 1.80xIII + 1.80xV$
 $T2u = -4.57 \text{ kN}$
 $T3u = -12.93 \text{ kN}$
 $M1u = 0.00 \text{ kNm}$

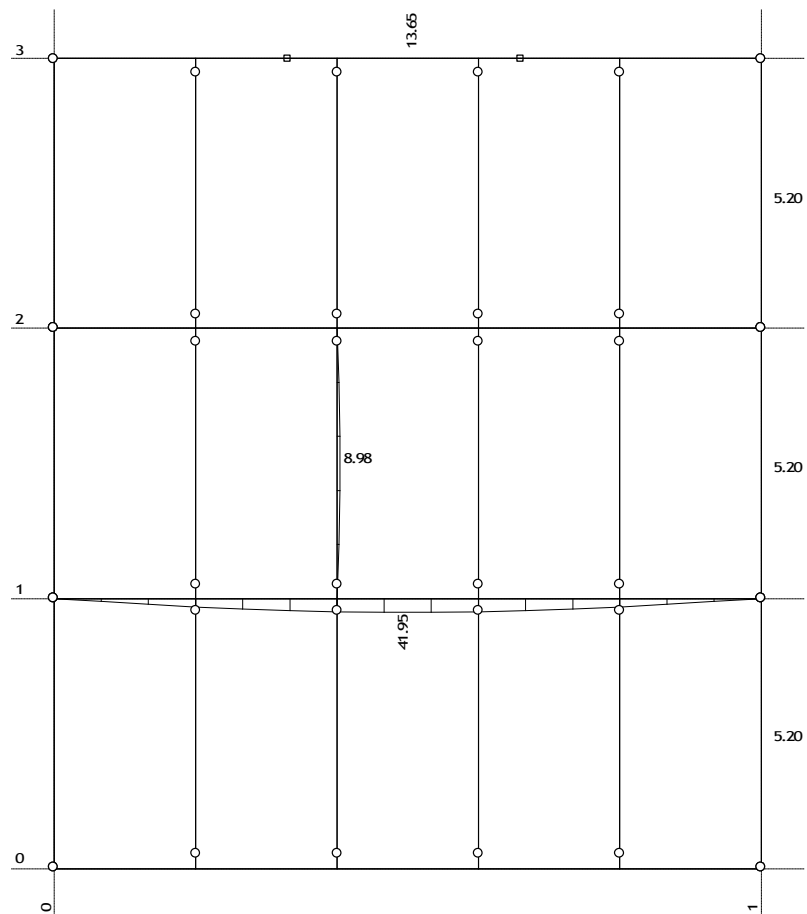
$\Delta e2 = 4.0 < e0 > + 17.8 < ell > = 21.8 \text{ cm}$
 $|\Delta M2| = 32.70 \text{ kNm}$
 $\Delta e3 = 4.0 < e0 > + 17.8 < ell > = 21.8 \text{ cm}$
 $|\Delta M3| = 32.70 \text{ kNm}$
 $eb/ea = -3.500/9.910 \text{ ‰}$
 $Aa1 = 2.59 \text{ cm}^2$
 $Aa2 = 2.57 \text{ cm}^2$
 $Aa3 = 1.73 \text{ cm}^2$
 $Aa4 = 1.71 \text{ cm}^2$
 $Aa_{uz} = 0.00 \text{ cm}^2/\text{m}$ (m=2)
 $[Usvojeno Aa_{uz} = 0.08/15(m=2) = 3.35 \text{ cm}^2/\text{m}]$
 $\tau_y = 0.04 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.10 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procentat armiranja: 1.51%

@1@PBAB 87, MB 30, B600



Nv: [6.00 m]
Djagram prsline: max ak(t ∞)= 0.33 mm

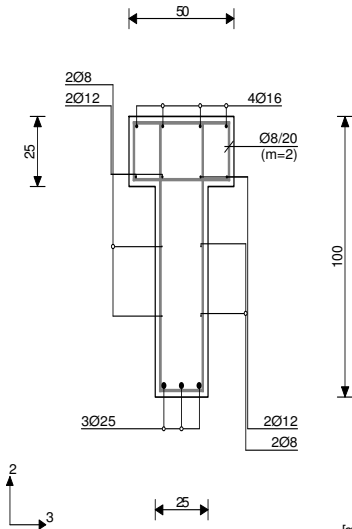
@1@PBAB 87, MB 30, B600



Nv: [6.00 m]
Djagram ugba: max ug(t ∞)= 41.95 mm < L/300 = 13650/300 = 45.5 mm..OK

Greda 9-36

@1@PBAB 87
MB 30
B500
 $E_b(t_0) = 3.15e+007 \text{ kN/m}^2$
 $E_a = 2e+008 \text{ kN/m}^2$
 $f_{bzs} = 1680 \text{ kN/m}^2$
 $\phi = 2.50$
 $X = 1.00$
 $\epsilon_s = 0.340\text{‰}$
 $k_1 = 0.40$
 $\beta_1 = 1.00$
Savijanje oko ose 3
Ugib: Savijanje oko ose 3

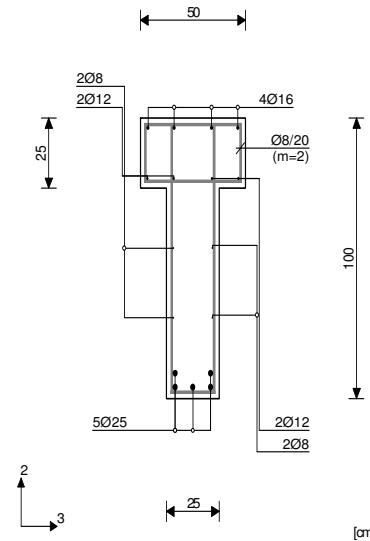
Presek 1-1 $x = 4.55\text{m}$ 

$T = 0$ Presek sa prslinom
Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 283.74 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
Ivni naponi u betonu
[-7014.82 , 33679.85] kN/m^2
Ivne dilatacije
[-0.22‰ , 1.07‰]
 $k_2 = 0.125$
 $\sigma_{a1,II} = 203375.97 \text{ kN/m}^2$
 $\beta_2 = 1.00$
 $\zeta = 0.89$
 $\epsilon_{sr} = 0.91\text{‰}$
 $M_r = 92.32 \text{ kNm}$
 $N_r = 0.00 \text{ kN}$
 $\sigma_{a,r} = 66171.89 \text{ kN/m}^2$
 $\mu_{z,ef} = 1.83\%$
Rastojanje prslina $L_{ps} = 14.88 \text{ cm}$
Sirina prslina $ak(t_0) = 0.230 \text{ mm}$
Ugib
Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 283.74 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
 $ug(t_0) = 17.081 \text{ mm}$

$T = \infty$ Presek sa prslinom
Dugotrajni uticaji
Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 283.74 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
Kratkotrajni uticaji
Merodavna kombinacija: 1.00xIII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 103.01 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
Ivni naponi u betonu
[-6168.73 , 25431.63] kN/m^2
Ivne dilatacije
[-0.82‰ , 1.52‰]
 $k_2 = 0.125$
 $\sigma_{a1,II} = 284112.65 \text{ kN/m}^2$
 $\beta_2 = 0.50$
 $\zeta = 0.97$
 $\epsilon_{sr} = 1.38\text{‰}$
 $M_r = 92.32 \text{ kNm}$
 $N_r = 0.00 \text{ kN}$
 $\sigma_{a,r} = 66171.89 \text{ kN/m}^2$
 $\mu_{z,ef} = 1.83\%$
Rastojanje prslina $L_{ps} = 14.11 \text{ cm}$
Sirina prslina $ak(t_\infty) = 0.332 \text{ mm}$
Ugib
Dugotrajni uticaji
Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 283.74 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
Kratkotrajni uticaji
Merodavna kombinacija: 1.00xIII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 103.01 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
 $ug(t_\infty) = 37.235 \text{ mm}$

Presek 2-2 $x = 6.37\text{m}$

[m]

 $T = 0$ Presek sa prslinom

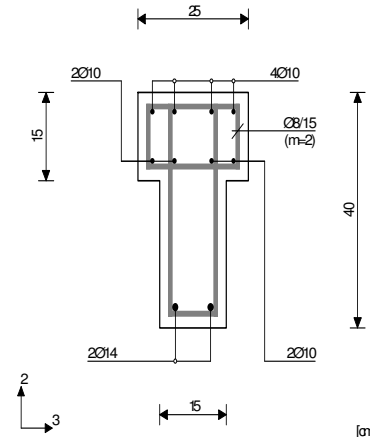
Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 318.33 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
Ivni naponi u betonu
[-6590.61 , 24683.93] kN/m^2
Ivne dilatacije
[-0.21‰ , 0.78‰]
 $k_2 = 0.125$
 $\sigma_{a1,II} = 148681.37 \text{ kN/m}^2$
 $\beta_2 = 1.00$
 $\zeta = 0.91$
 $\epsilon_{sr} = 0.67\text{‰}$
 $M_r = 97.09 \text{ kNm}$
 $N_r = 0.00 \text{ kN}$
 $\sigma_{a,r} = 45349.11 \text{ kN/m}^2$
 $\mu_{z,ef} = 2.77\%$
Rastojanje prslina $L_{ps} = 12.58 \text{ cm}$
Sirina prslina $ak(t_0) = 0.144 \text{ mm}$
Ugib
Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 318.33 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
 $ug(t_0) = 19.280 \text{ mm}$

$T = \infty$ Presek sa prslinom
Dugotrajni uticaji
Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 318.33 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
Kratkotrajni uticaji
Merodavna kombinacija: 1.00xIII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 115.81 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
Ivni naponi u betonu
[-6057.73 , 19590.15] kN/m^2
Ivne dilatacije
[-0.82‰ , 1.12‰]
 $k_2 = 0.125$
 $\sigma_{a1,II} = 209027.61 \text{ kN/m}^2$
 $\beta_2 = 0.50$
 $\zeta = 0.98$
 $\epsilon_{sr} = 1.02\text{‰}$
 $M_r = 97.09 \text{ kNm}$
 $N_r = 0.00 \text{ kN}$
 $\sigma_{a,r} = 45349.11 \text{ kN/m}^2$
 $\mu_{z,ef} = 2.77\%$
Rastojanje prslina $L_{ps} = 11.81 \text{ cm}$
Sirina prslina $ak(t_\infty) = 0.205 \text{ mm}$
Ugib
Dugotrajni uticaji
Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 318.33 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
Kratkotrajni uticaji
Merodavna kombinacija: 1.00xIII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 115.81 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
 $ug(t_\infty) = 41.950 \text{ mm}$

[m]

Greda 18-28

@1@PBAB 87
MB 30
B500
 $E_b(t_0) = 3.15e+007 \text{ kN/m}^2$
 $E_a = 2e+008 \text{ kN/m}^2$
 $f_{bzs} = 1853 \text{ kN/m}^2$
 $\phi = 2.50$
 $X = 1.00$
 $\epsilon_s = 0.340\text{‰}$
 $k_1 = 0.40$
 $\beta_1 = 1.00$
Savijanje oko ose 3
Ugib: Savijanje oko ose 3

Presek 3-3 $x = 2.08\text{m}$ 

$T = 0$ Presek sa prslinom
Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 10.51 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
Ivni naponi u betonu
[-3572.53 , 16896.00] kN/m^2
Ivne dilatacije
[-0.11‰ , 0.54‰]

$k_2 = 0.125$
 $\sigma_{a1,II} = 95904.80 \text{ kN/m}^2$
 $\beta_2 = 1.00$
 $\zeta = 0.40$
 $\epsilon_{sr} = 0.19\text{‰}$
 $M_r = 9.17 \text{ kNm}$
 $N_r = 0.00 \text{ kN}$
 $\sigma_{a,r} = 83633.27 \text{ kN/m}^2$
 $\mu_{z,ef} = 1.49\%$
Rastojanje prslina $L_{ps} = 11.90 \text{ cm}$
Sirina prslina $ak(t_0) = 0.039 \text{ mm}$
Ugib
Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 10.51 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
 $ug(t_0) = 1.106 \text{ mm}$

$T = \infty$ Presek sa prslinom
Dugotrajni uticaji
Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 10.51 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
Kratkotrajni uticaji
Merodavna kombinacija: 1.00xIII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 8.86 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
Ivni naponi u betonu
[-3997.09 , 23010.64] kN/m^2
Ivne dilatacije
[-0.55‰ , 1.09‰]
 $k_2 = 0.125$
 $\sigma_{a1,II} = 188810.78 \text{ kN/m}^2$
 $\beta_2 = 0.50$
 $\zeta = 0.90$

$\varepsilon_{sr} = 0.85\%$
 $M_r = 9.17 \text{ kNm}$
 $N_r = 0.00 \text{ kN}$
 $\sigma_{a,r} = 83633.27 \text{ kN/m}^2$
 $\mu_{z,ef} = 1.49\%$
Rastojanje prslina $L_{ps} = 11.90 \text{ cm}$
Sirina prslina $a_k(t^\infty) = 0.172 \text{ mm}$

Ugib
Dugotrajni uticaji
Merodavna kombinacija: 1.00xI+1.00xII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 10.51 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
Kratkotrajni uticaji

Merodavna kombinacija:
1.00xIII
 $N_1 = 0.00 \text{ kN}$
 $M_3 = 8.86 \text{ kNm}$
 $M_2 = 0.00 \text{ kNm}$
 $u_g(t^\infty) = 8.981 \text{ mm}$

Proračun temelja

Datoteka: Hala 4-horizontalna fasada-rev01-temelji.twp
Datum proračuna: 9.12.2017

Nacin proračuna: 3D model

☒ Teorija I-og reda ☒ Modalna analiza ☐ Stabilnost
☐ Teorija II-og reda ☒ Seizmicki proračun ☐ Faze gradjenja
☐ Nelinearan proračun

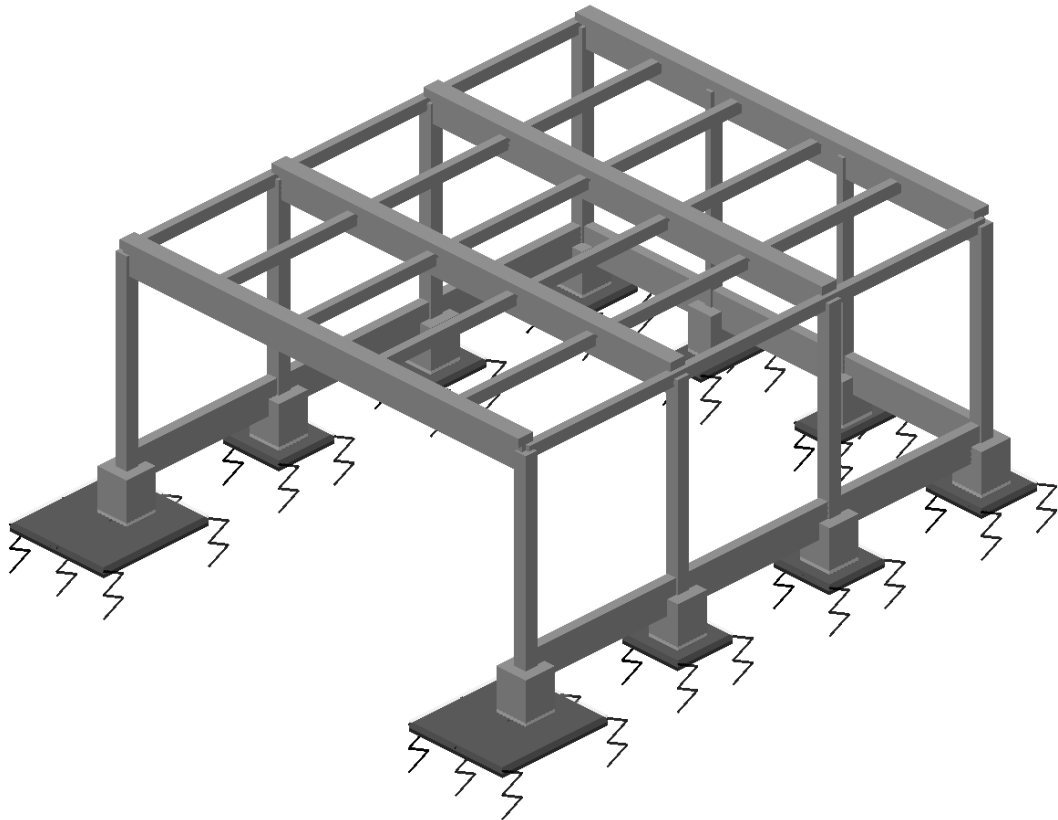
Velicina modela

Broj cvorova: 328
 Broj plocah elemenata: 196
 Broj grednih elemenata: 69
 Broj granicnih elemenata: 2352
 Broj osnovnih slucajeva opterecenja: 8
 Broj kombinacija opterecenja: 69

Jedinice mera

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

Ulazni podaci - Konstrukcija



Izometrija

Tabela materijala

No	Naziv materijala	E[kN/m ²]	μ	γ [kN/m ³]	α [1/C]	Em[kN/m ²]	μ_m
1	Beton MB 30	3.150e+7	0.20	25.00	1.000e-5	3.150e+7	0.20

Setovi ploca

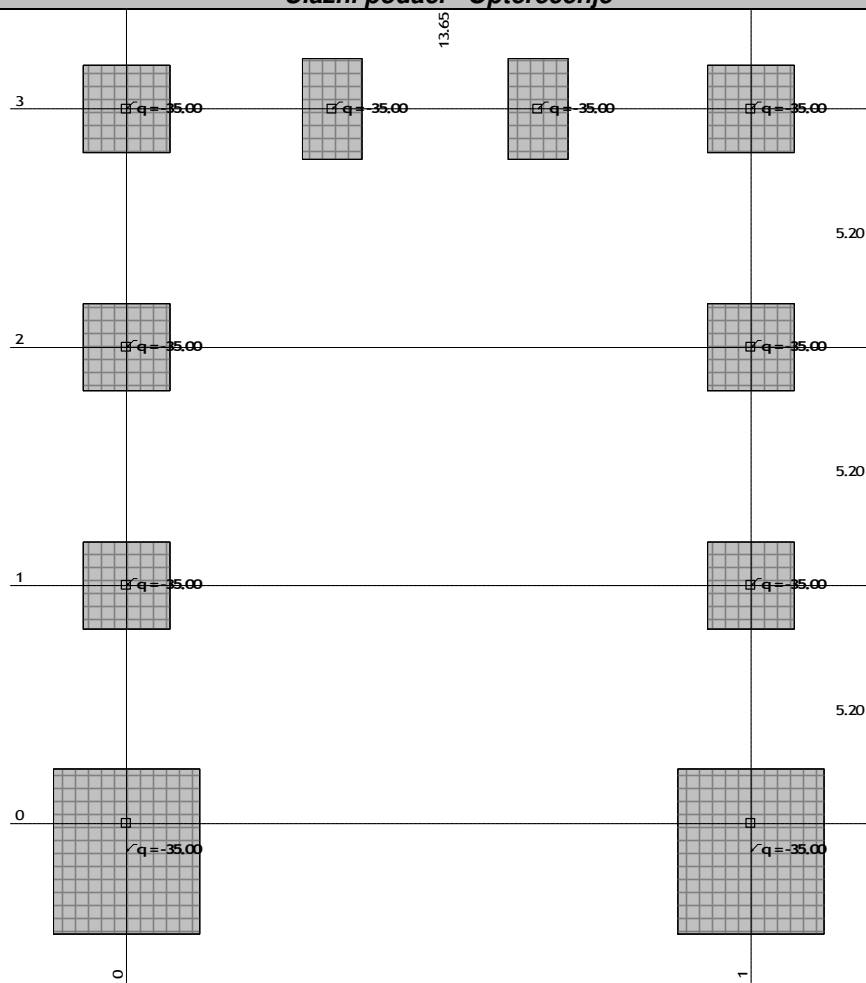
No	d[m]	e[m]	Materijal	Tip proračuna	Ortotropija	E2[kN/m ²]	G[kN/m ²]	α
<1>	0.500	0.250	1	Tanka ploca	Izotropna			

Setovi povrinskih oslonaca

@1@	K,R1	K,R2	K,R3
Set			
1	7.000e+3	7.000e+3	7.000e+3

Ulazni podaci - Opterećenje

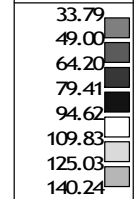
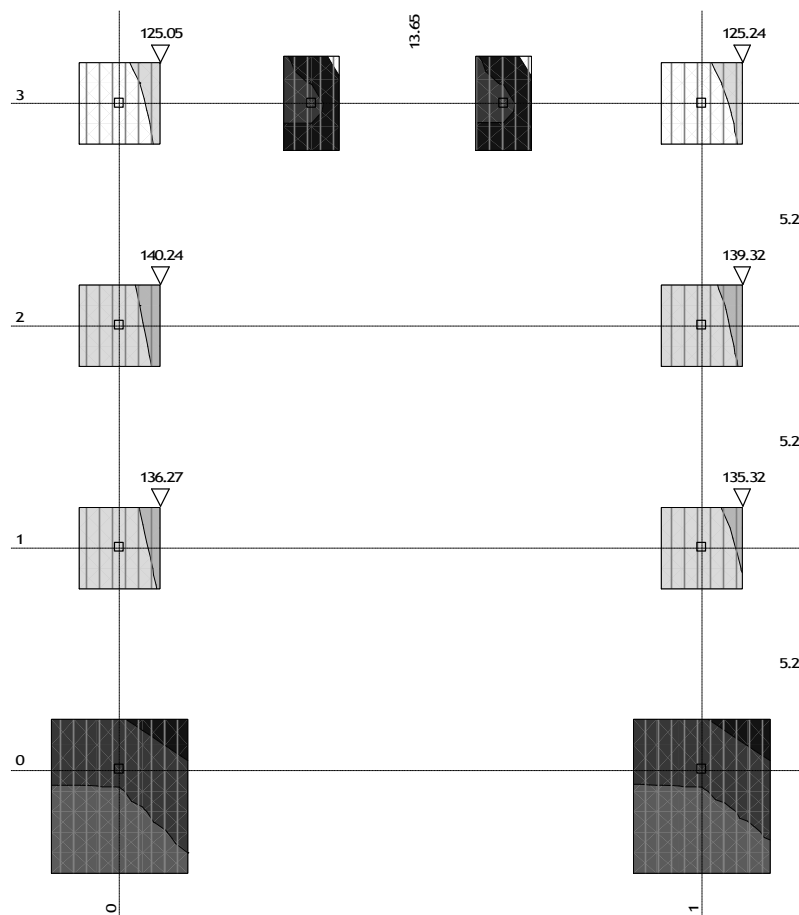
Opt. 2 G



Nivo [-1.30 m]

Opt. 78: [Am] 56-69

σ, tla [kN/m²]

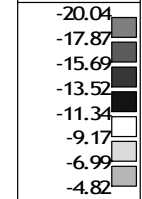
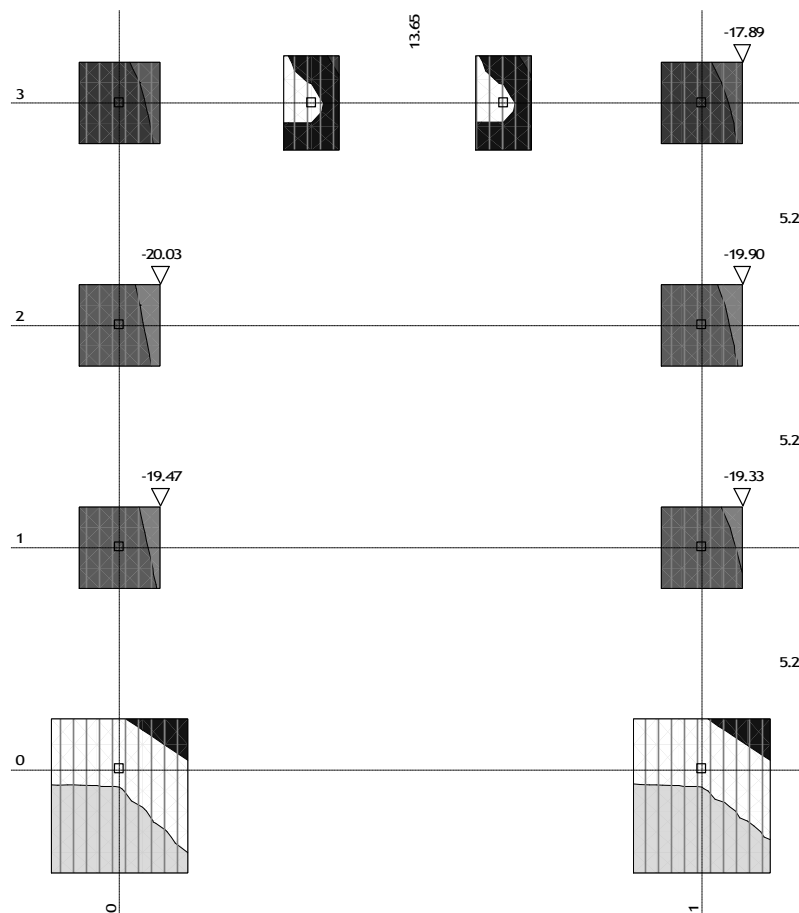


Nivo: [-1.30 m]

Uticaji u pov. osloncu: max σ, tla = 140.24 / min σ, tla = 33.79 kN/m²

Opt. 78: [Am] 56-69

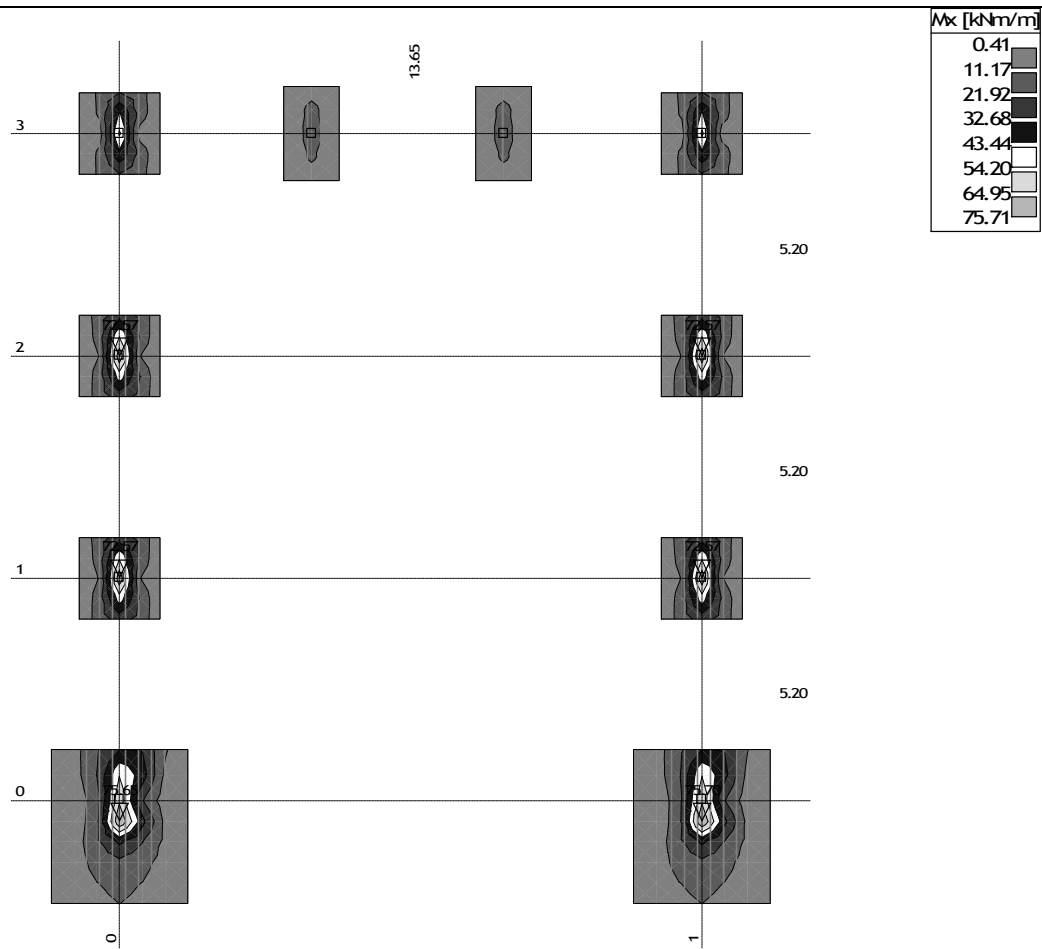
s, tla [m]/1000



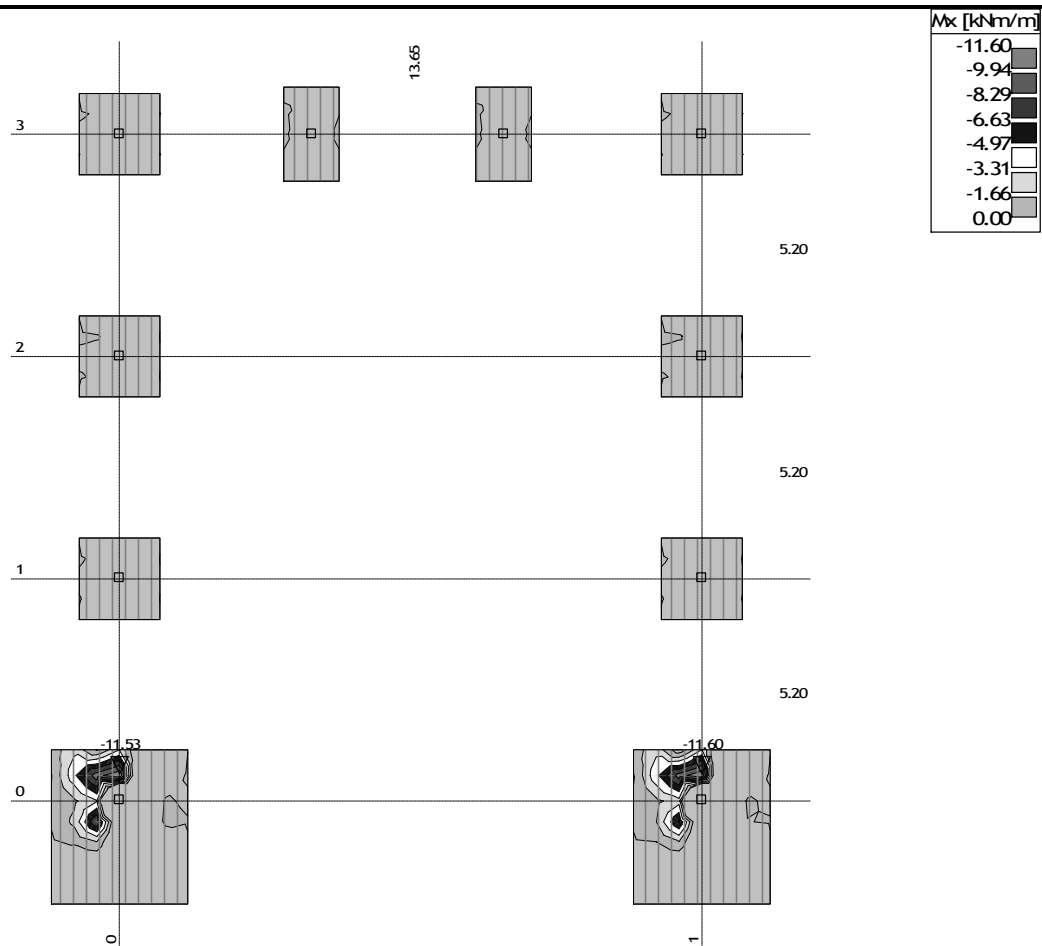
Nivo: [-1.30 m]

Uticaji u pov. osloncu: max s, tla = -4.83 / min s, tla = -20.03 m / 1000

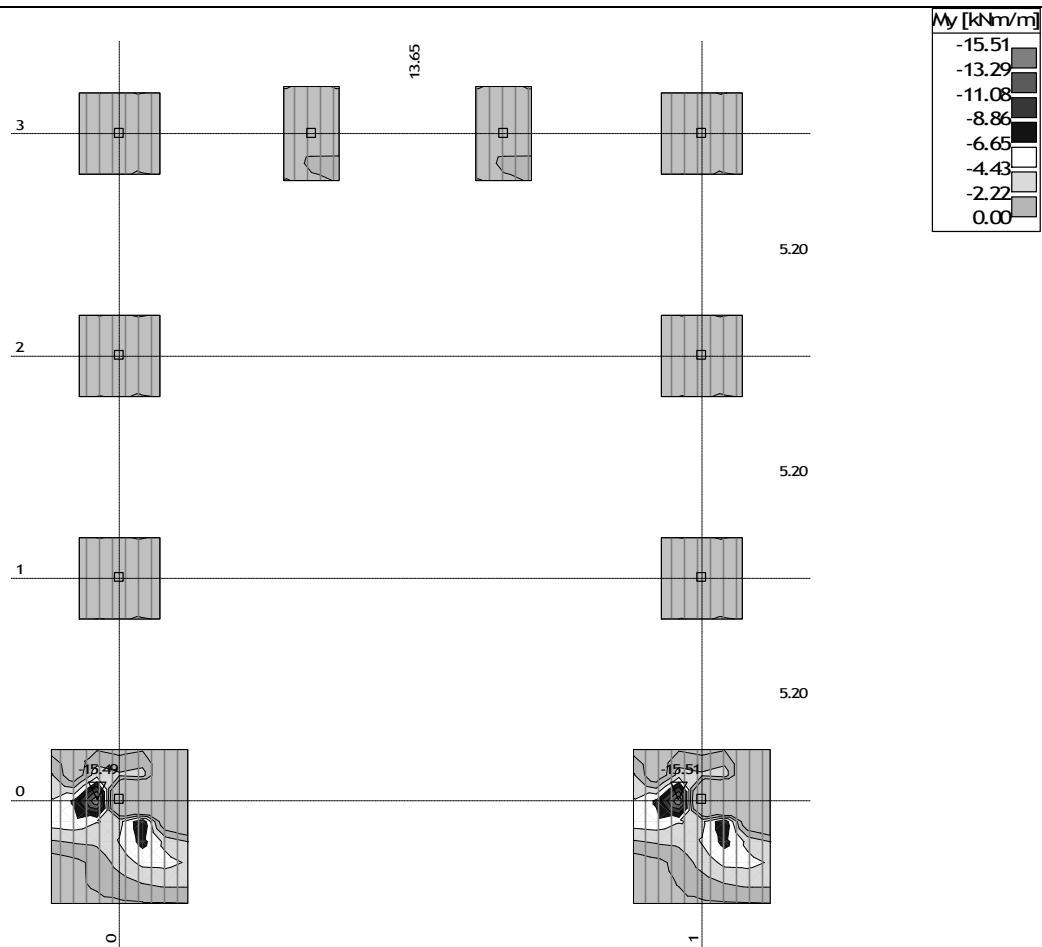
Opt. 78: [Am] 9.55,70-73



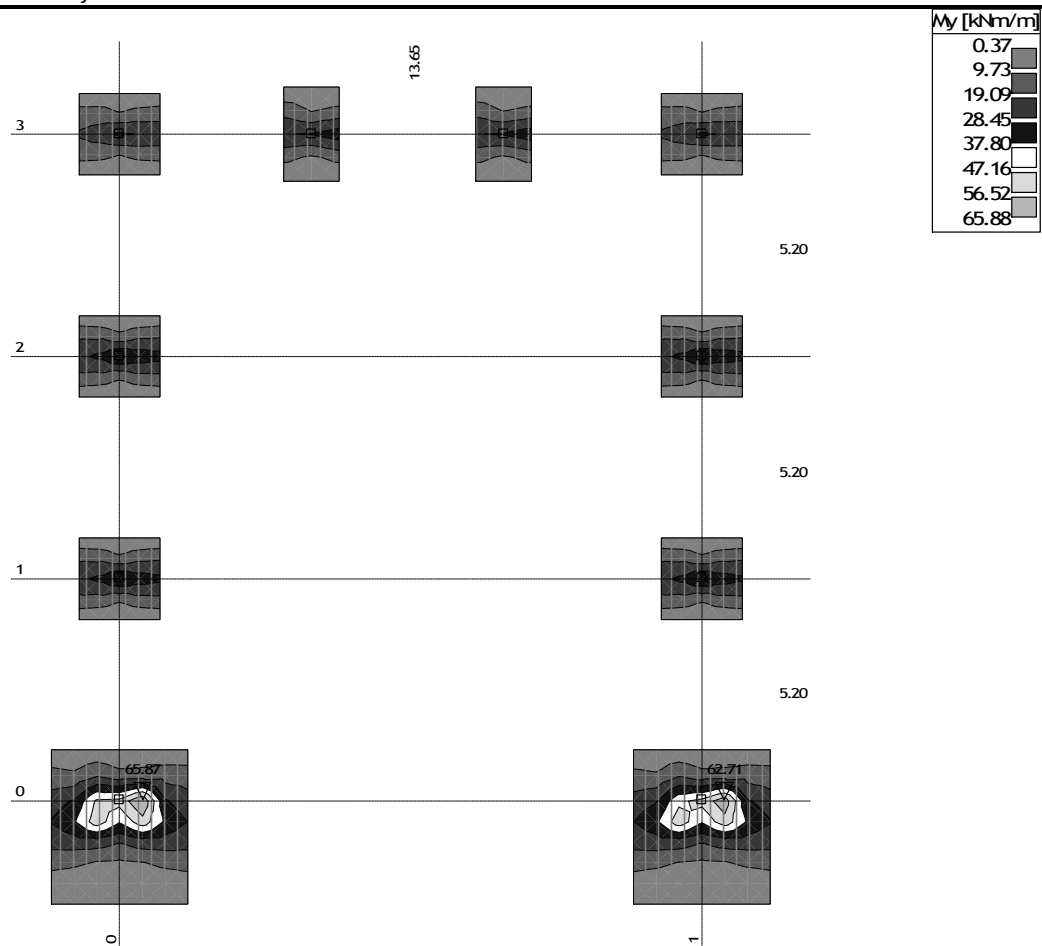
Opt. 78: [Am] 9.55,70-73



Opt. 78: [Am] 9.55,70-73



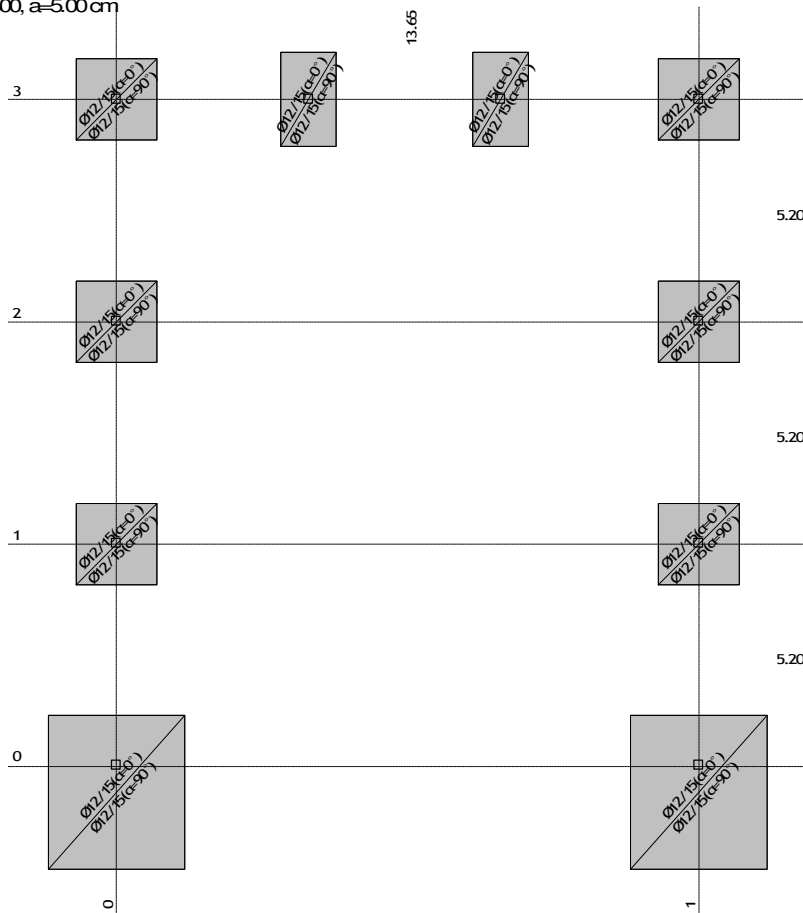
Opt. 78: [Am] 9.55,70-73



Dimenzionisanje (beton)

Usvojena armatura
@1@PBAB 87, MB 30, B600, a=5.00 cm

Aa - d.zona [cm ² /m]
0.00
1.67
3.34

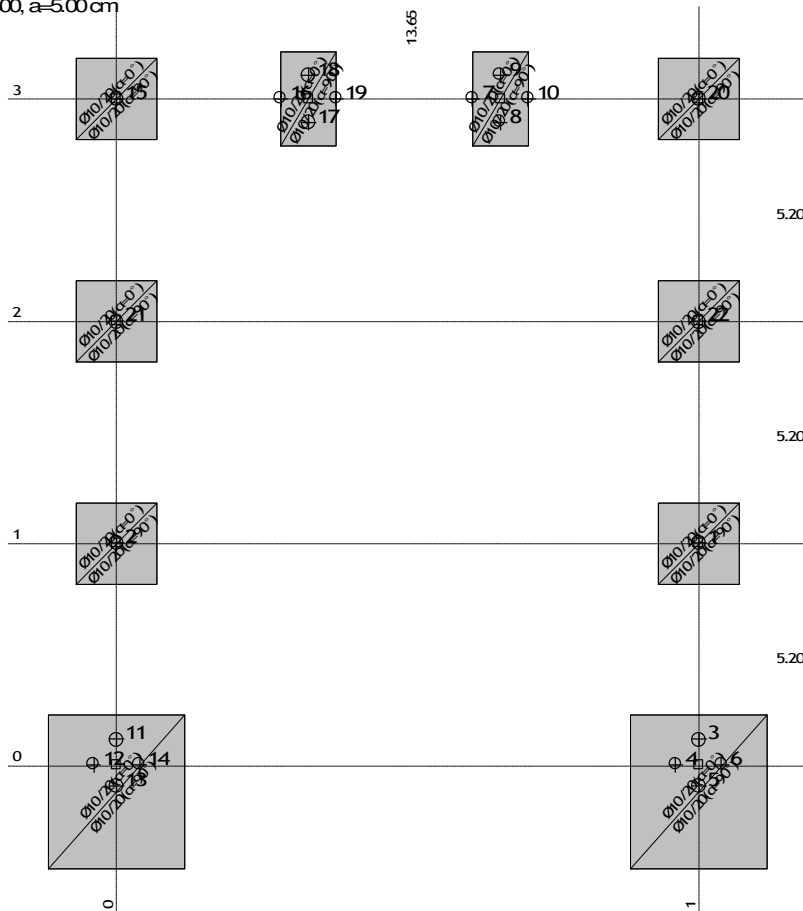


Nivo: [-1.30 m]

Aa - d.zona

Usvojena armatura
@1@PBAB 87, MB 30, B600, a=5.00 cm

Aa - g.zona [cm ² /m]
-0.84
-0.42
0.00



Nivo: [-1.30 m]

Aa - g.zona

Nivo: I-1.30 m]

@1@PBAB 87

d.pl=50.0 cm

MB 30

Gornja zona: B500 (a=5.0 cm)

Donja zona: B500 (a=5.0 cm)

Kompletna sema opterećenja

Tacka 1X=-26.72 m; Y=-14.57 m; Z=-1.30 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII

Mu = 58.89 kNm

Nu = 0.00 kN

eb/ea = -0.583/10.000 ‰

Ag1 = 0.00 cm2/m

Ad1 = 2.67 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII

Mu = 38.96 kNm

Nu = 0.00 kN

eb/ea = -0.465/10.000 ‰

Ag2 = 0.00 cm2/m

Ad2 = 1.75 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

@1@PBAB 87

d.pl=50.0 cm

MB 30

Gornja zona: B500 (a=5.0 cm)

Donja zona: B500 (a=5.0 cm)

Kompletna sema opterećenja

Tacka 2X=-40.37 m; Y=-14.57 m; Z=-1.30 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII

Mu = 58.89 kNm

Nu = 0.00 kN

eb/ea = -0.583/10.000 ‰

Ag1 = 0.00 cm2/m

Ad1 = 2.67 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII

Mu = 38.96 kNm

Nu = 0.00 kN

eb/ea = -0.465/10.000 ‰

Ag2 = 0.00 cm2/m

Ad2 = 1.75 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

@1@PBAB 87

d.pl=50.0 cm

MB 30

Gornja zona: B500 (a=5.0 cm)

Donja zona: B500 (a=5.0 cm)

Kompletna sema opterećenja

Tacka 3X=-26.72 m; Y=-19.17 m; Z=-1.30 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xIV

Mu = 53.79 kNm

Nu = 0.00 kN

eb/ea = -0.569/10.000 ‰

Ag1 = 0.55 cm2/m

Ad1 = 2.42 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.30xI+1.30xII+1.30xIII+1.30xVIII

Mu = 12.68 kNm

Nu = 0.00 kN

eb/ea = -0.272/10.000 ‰

Ag2 = 0.21 cm2/m

Ad2 = 0.56 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

Tacka 4X=-27.25 m; Y=-19.77 m; Z=-1.30 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.00xI+1.00xII+1.80xIV+1.80xVI

Mu = -2.63 kNm

Nu = 0.00 kN

eb/ea = -0.214/10.000 ‰

Ag1 = 0.09 cm2/m

Ad1 = 0.81 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xV

Mu = 44.88 kNm

Nu = 0.00 kN

eb/ea = -0.527/10.000 ‰

Ag2 = 0.76 cm2/m

Ad2 = 2.01 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

Tacka 5X=-26.72 m; Y=-20.25 m; Z=-1.30 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xV

Mu = 73.49 kNm

Nu = 0.00 kN

eb/ea = -0.659/10.000 ‰

Ag1 = 0.00 cm2/m

Ad1 = 3.34 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xV

Mu = 39.04 kNm

Nu = 0.00 kN

eb/ea = -0.472/10.000 ‰

Ag2 = 0.18 cm2/m

Ad2 = 1.75 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

Tacka 6X=-26.18 m; Y=-19.77 m; Z=-1.30 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xIV

Mu = 22.31 kNm

Nu = 0.00 kN

eb/ea = -0.346/10.000 ‰

Ag1 = 0.00 cm2/m

Ad1 = 1.01 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xIV

Mu = 62.71 kNm

Nu = 0.00 kN

eb/ea = -0.604/10.000 ‰

Ag2 = 0.00 cm2/m

Ad2 = 2.85 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

@1@PBAB 87

d.pl=50.0 cm

MB 30

Gornja zona: B500 (a=5.0 cm)

Donja zona: B500 (a=5.0 cm)

Kompletna sema opterećenja

Tacka 7X=-32.02 m; Y=-4.17 m; Z=-1.30 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.00xI+1.30xII+1.30xIII+1.30xVII

Mu = 1.87 kNm

Nu = 0.00 kN

eb/ea = -0.111/10.000 ‰

Ag1 = 0.07 cm2/m

Ad1 = 0.08 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.30xI+1.30xII+1.30xIII+1.30xVII

Mu = 28.11 kNm

Nu = 0.00 kN

eb/ea = -0.390/10.000 ‰

Ag2 = 0.00 cm2/m

Ad2 = 1.26 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

Tacka 8X=-31.37 m; Y=-4.72 m; Z=-1.30 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xV

Mu = 12.51 kNm

Nu = 0.00 kN

eb/ea = -0.255/10.000 ‰

Ag1 = 0.00 cm2/m

Ad1 = 0.56 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.30xI+1.30xII+1.30xVIII

Mu = 8.28 kNm

Nu = 0.00 kN

eb/ea = -0.214/10.000 ‰

Ag2 = 0.08 cm2/m

Ad2 = 0.37 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

Tacka 9X=-31.37 m; Y=-3.62 m; Z=-1.30 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xIV

Mu = 13.81 kNm

Nu = 0.00 kN

eb/ea = -0.269/10.000 ‰

Ag1 = 0.00 cm2/m

Ad1 = 0.62 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.30xI+1.30xII+1.30xIII+1.30xVIII

Mu = 9.30 kNm

Nu = 0.00 kN

eb/ea = -0.223/10.000 ‰

Ag2 = 0.00 cm2/m

Ad2 = 0.42 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

Tacka 10X=-30.72 m; Y=-4.17 m; Z=-1.30 m

Pravac 1: (α=0°)

Merodavna kombinacija:

1.00xI+1.30xII+1.30xIII+1.30xVII

Mu = 1.87 kNm

Nu = 0.00 kN

eb/ea = -0.111/10.000 ‰

Ag1 = 0.07 cm2/m

Ad1 = 0.08 cm2/m

Usvojeno (gornja zona):

Ø10/20 (3.93 cm2/m)

Usvojeno (donja zona):

Ø12/15 (7.54 cm2/m)

Procenat armiranja: 0.23%

Pravac 2: (α=90°)

Merodavna kombinacija:

1.60xI+1.60xII+1.80xIII+1.80xIV

Mu = 34.11 kNm

Nu = 0.00 kN

eb/ea = -0.432/10.000 ‰

Ag2 = 0.00 cm2/m

Ad2 = 1.53 cm2/m

Tacka 11
X=-40.37 m; Y=-19.17 m; Z=-1.30 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 Mu = 53.71 kNm
 Nu = 0.00 kN
 eb/ea = -0.569/10.000 %
 Ag1 = 0.55 cm2/m
 Ad1 = 2.42 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.30xI+1.30xII+1.30xIII-1.30xVIII
 Mu = 12.66 kNm
 Nu = 0.00 kN
 eb/ea = -0.272/10.000 %
 Ag2 = 0.21 cm2/m
 Ad2 = 0.56 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Tacka 12
X=-40.90 m; Y=-19.77 m; Z=-1.30 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.30xI+1.30xII+1.30xIII+1.30xVII
 Mu = 17.03 kNm
 Nu = 0.00 kN
 eb/ea = -0.310/10.000 %
 Ag1 = 0.17 cm2/m
 Ad1 = 0.75 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xV
 Mu = 48.96 kNm
 Nu = 0.00 kN
 eb/ea = -0.551/10.000 %
 Ag2 = 0.83 cm2/m
 Ad2 = 2.20 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Tacka 13
X=-40.37 m; Y=-20.25 m; Z=-1.30 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xV
 Mu = 73.44 kNm
 Nu = 0.00 kN
 eb/ea = -0.659/10.000 %
 Ag1 = 0.00 cm2/m
 Ad1 = 3.34 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xV
 Mu = 39.01 kNm
 Nu = 0.00 kN
 eb/ea = -0.472/10.000 %
 Ag2 = 0.18 cm2/m
 Ad2 = 1.75 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Tacka 14
X=-39.83 m; Y=-19.77 m; Z=-1.30 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 Mu = 22.76 kNm
 Nu = 0.00 kN
 eb/ea = -0.350/10.000 %
 Ag1 = 0.00 cm2/m
 Ad1 = 1.03 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 Mu = 65.87 kNm
 Nu = 0.00 kN
 eb/ea = -0.620/10.000 %
 Ag2 = 0.00 cm2/m
 Ad2 = 2.99 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

@1@PBAB 87
 d,pl=50.0 cm
 MB 30
 Gornja zona: B500 (a=5.0 cm)
 Donja zona: B500 (a=5.0 cm)
 Kompletna sema opterecenja

Tacka 15
X=-40.37 m; Y=-4.17 m; Z=-1.30 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII
 Mu = 45.50 kNm
 Nu = 0.00 kN
 eb/ea = -0.506/10.000 %
 Ag1 = 0.00 cm2/m
 Ad1 = 2.06 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII
 Mu = 30.16 kNm
 Nu = 0.00 kN
 eb/ea = -0.405/10.000 %
 Ag2 = 0.00 cm2/m
 Ad2 = 1.36 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

@1@PBAB 87
 d,pl=50.0 cm
 MB 30
 Gornja zona: B500 (a=5.0 cm)
 Donja zona: B500 (a=5.0 cm)
 Kompletna sema opterecenja

Tacka 16
X=-36.52 m; Y=-4.17 m; Z=-1.30 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.00xI+1.30xII+1.30xIII+1.30xVII
 Mu = 1.88 kNm
 Nu = 0.00 kN
 eb/ea = -0.111/10.000 %
 Ag1 = 0.07 cm2/m
 Ad1 = 0.08 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.30xI+1.30xII+1.30xIII-1.30xVII
 Mu = 27.95 kNm
 Nu = 0.00 kN
 eb/ea = -0.390/10.000 %
 Ag2 = 0.00 cm2/m
 Ad2 = 1.26 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Tacka 17
X=-35.87 m; Y=-4.72 m; Z=-1.30 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xV
 Mu = 12.42 kNm
 Nu = 0.00 kN
 eb/ea = -0.254/10.000 %
 Ag1 = 0.00 cm2/m
 Ad1 = 0.55 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.30xI+1.30xII+1.30xVIII
 Mu = 8.23 kNm
 Nu = 0.00 kN
 eb/ea = -0.214/10.000 %
 Ag2 = 0.08 cm2/m
 Ad2 = 0.37 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Tacka 18
X=-35.87 m; Y=-3.62 m; Z=-1.30 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 Mu = 13.73 kNm
 Nu = 0.00 kN
 eb/ea = -0.269/10.000 %
 Ag1 = 0.00 cm2/m
 Ad1 = 0.62 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.30xI+1.30xII+1.30xIII-1.30xVIII
 Mu = 9.25 kNm
 Nu = 0.00 kN
 eb/ea = -0.223/10.000 %
 Ag2 = 0.00 cm2/m
 Ad2 = 0.42 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Tacka 19
X=-35.22 m; Y=-4.17 m; Z=-1.30 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.00xI+1.30xII+1.30xIII-1.30xVII
 Mu = 1.88 kNm
 Nu = 0.00 kN
 eb/ea = -0.111/10.000 %
 Ag1 = 0.07 cm2/m
 Ad1 = 0.08 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII+1.80xIV
 +1.80xVI
 Mu = 33.91 kNm
 Nu = 0.00 kN
 eb/ea = -0.432/10.000 %
 Ag2 = 0.00 cm2/m
 Ad2 = 1.53 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

@1@PBAB 87
 d,pl=50.0 cm
 MB 30
 Gornja zona: B500 (a=5.0 cm)
 Donja zona: B500 (a=5.0 cm)
 Kompletna sema opterecenja

Tacka 20
X=-26.72 m; Y=-4.17 m; Z=-1.30 m
 Pravac 1: ($\alpha=0^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII
 Mu = 45.65 kNm
 Nu = 0.00 kN
 eb/ea = -0.506/10.000 %
 Ag1 = 0.00 cm2/m
 Ad1 = 2.06 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
 Merodavna kombinacija:
 1.60xI+1.60xII+1.80xIII
 Mu = 30.26 kNm
 Nu = 0.00 kN
 eb/ea = -0.407/10.000 %
 Ag2 = 0.00 cm2/m
 Ad2 = 1.37 cm2/m
 Usvojeno (gornja zona):
 Ø10/20 (3.93 cm2/m)
 Usvojeno (donja zona):
 Ø12/15 (7.54 cm2/m)
 Procenat armiranja: 0.23%

@1@PBAB 87
d.pl=50.0 cm
MB 30
Gornja zona: B500 (a=5.0 cm)
Donja zona: B500 (a=5.0 cm)
Kompletna sema opterećenja

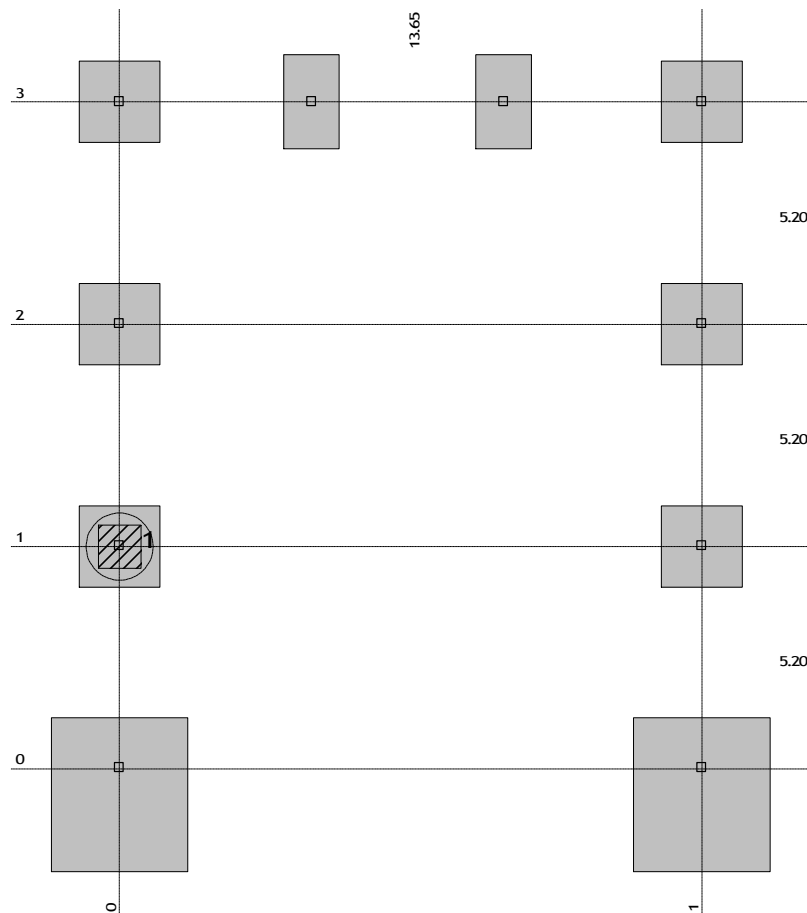
Tacka 21
X=-40.37 m; Y=-9.37 m; Z=-1.30 m
Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII
Mu = 58.89 kNm
Nu = 0.00 kN
eb/ea = -0.583/10.000 ‰
Ag1 = 0.00 cm²/m
Ad1 = 2.67 cm²/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm²/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm²/m)
Procentat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII
Mu = 38.96 kNm
Nu = 0.00 kN
eb/ea = -0.465/10.000 ‰
Ag2 = 0.00 cm²/m
Ad2 = 1.75 cm²/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm²/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm²/m)
Procentat armiranja: 0.23%

@1@PBAB 87
d.pl=50.0 cm
MB 30
Gornja zona: B500 (a=5.0 cm)
Donja zona: B500 (a=5.0 cm)
Kompletna sema opterećenja

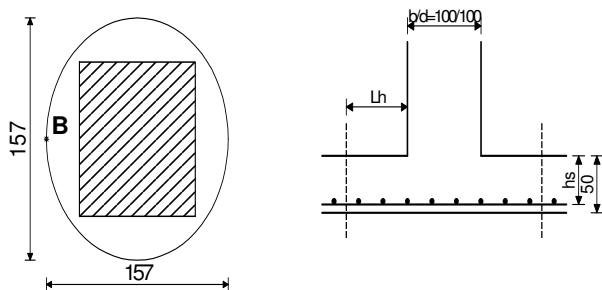
Tacka 22
X=-26.72 m; Y=-9.37 m; Z=-1.30 m
Pravac 1: ($\alpha=0^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII
Mu = 58.89 kNm
Nu = 0.00 kN
eb/ea = -0.583/10.000 ‰
Ag1 = 0.00 cm²/m
Ad1 = 2.67 cm²/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm²/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm²/m)
Procentat armiranja: 0.23%

Pravac 2: ($\alpha=90^\circ$)
Merodavna kombinacija:
1.60xI+1.60xII+1.80xIII
Mu = 38.96 kNm
Nu = 0.00 kN
eb/ea = -0.465/10.000 ‰
Ag2 = 0.00 cm²/m
Ad2 = 1.75 cm²/m
Usvojeno (gornja zona):
Ø10/20 (3.93 cm²/m)
Usvojeno (donja zona):
Ø12/15 (7.54 cm²/m)
Procentat armiranja: 0.23%



Nivo: [-1.30 m]
Kontrola ploča na probijanje - dispozicija

Kontrola ploča na probijanje
Nivo: [-1.30 m]
Presek 1 (-40.37,-14.57,-1.30)
MB 30



KONTROLA KRITICNOG PRESEKA 1. ($L_h = 0.22\text{m}$ od ivice stuba)
(stub zamenjujućeg kruznog preseka, $d_s = 1.13\text{m}$)

Merodavna kombinacija: I+II+III-1.00xVIII	
Sila u stubu	$N = 235.60 \text{ kN}$
Merodavni smicuci napon (tacka B)	$\tau = 0.109 \text{ MPa}$
Debljina ploče	$d,pl = 0.500 \text{ m}$
Statika visina ploče	$h_s = 0.440 \text{ m}$
Obim kritičnog preseka	$Okp = 4.932 \text{ m}$
Postojeća armatura u ploči	
Površina armature - pravac 1	$A_{a,1} = 7.540 \text{ cm}^2$
Procenat armiranja - pravac 1	$\mu,1 = 0.171 \%$
Površina armature - pravac 2	$A_{a,2} = 7.540 \text{ cm}^2$
Procenat armiranja - pravac 2	$\mu,2 = 0.171 \%$
Srednja vrednost procenta armiranja (usvojena)	$\mu = 0.500 \%$
Koeficijent	$\alpha_a = 1.400$
Koeficijent	$\gamma_1 = 1.287$
Koeficijent	$\gamma_2 = 0.445$
Dopusteni glavni napon zatezanja	$\sigma_a = 0.800$
Dopusteni glavni napon zatezanja	$\sigma_b = 2.200$
Maksimalna otpornost ($\gamma_2 \times \sigma_b$)	$\tau_{max} = 0.980 \text{ MPa}$

Uslov: $\tau \leq \tau_{max}$ ($0.11 \leq 0.98$)

Uslov je ispunjen

Otpornost na probijanje ploče bez dodatne armature za obezbedjenje ($2/3 \times \gamma_1 \times \sigma_a$)

$\tau_{gr} = 0.686 \text{ MPa}$

Uslov: $\tau \leq \tau_{gr}$ ($0.11 \leq 0.69$)

Uslov je ispunjen, nije potrebna dodatna armatura za obezbedjenje od probijanja ploče.

Tankvana za otpadna ulja

1. GEOMETRIJSKE KARAKTERISTIKE

Širina:	B=	4.00 m	
Dužina:	L=	4.00 m	
Dimenzije zidova:	h_{1z} =	3.05 m	h_{z2} = 3.05 m
	l_{z1} =	4.00 m	l_{z2} = 3.40 m
	d_{z2} =	0.30 m	$d_{z3,4}$ = 0.30 m
Debljina gornje ploče	d_{pl} =	0.30 m	
Debljina temeljne ploče:	d_{tpi} =	0.30 m	

2. ANALIZA OPTEREĆENJA

2.1 Sopstvena težina konstrukcije program uzima sam u obzir
(zapreminska masa betona $\gamma_b=25 \text{ kN/m}^2$)

2.3 Pritisak vode unutar rezervoara:

radni:	visina vode u rezervoaru	h_{v1} =	2.4 m
	zapreminska masa vode	γ_{v1} =	10 kN/m ³
	pritisak vode	max,pv=	24 kN/m ²

test:	visina vode u rezervoaru	h_{v1} =	2.75 m
	zapreminska masa vode	γ_{v1} =	10 kN/m ³
	pritisak vode	max,pv=	27.5 kN/m ²

2.4 Horizontalni pritisak tla:

zapreminska masa tla.....	γ =	20 kN/m ³
ugao unutrašnjeg trenja.....	ϕ =	23 °
dubina tla.....	H1 =	3.40 m
horizontalni pritisak tla p_1	$p_{k1} = \gamma \cdot H1 \cdot (1 - \sin \phi_k)$	41.43 kN/m ²

2.5 Težina zemlje na gornjoj ploči d_{z2} = 0.35 m g_z = 7.00 kN/m²

2.6 Korisno opterećenje po terenu

	p =	10 kN/m ²
horizontalno opterećenje na zid rezervoara.....	$p_z = p \cdot (1 - \sin \phi)$	6.09 kN/m ²
	$p_1 = p_{k1} + p_z$	47.52 kN/m ²

3. KONTROLA NA ISPLIVAVANJE

Prema geomehničkom elaboratu nivo podzemne vode nalazi se na -9.20 od kote terena, tako da nije potrebna kontrola na isplivavanje.

Proračun urađen pomoću programskog paketa Tower

Tabela materijala

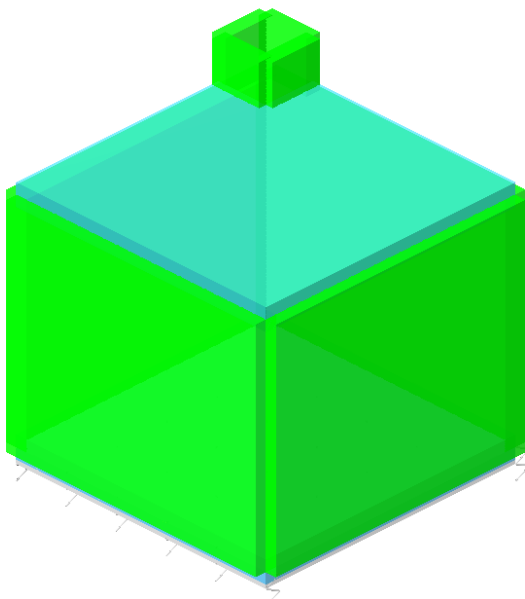
No	Naziv materijala	E[kN/m ²]	μ	γ[kN/m ³]	α[1/C]	Em[kN/m ²]	μm
1	Beton MB 30	3.150e+7	0.20	25.00	1.000e-5	3.150e+7	0.20

Setovi ploča

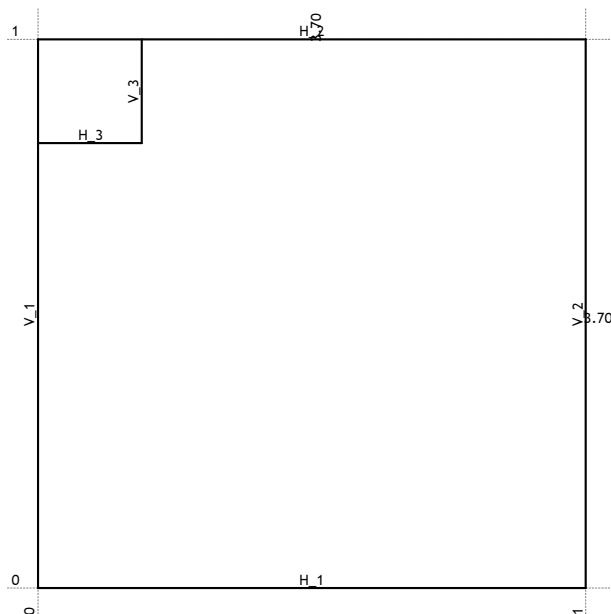
No	d[m]	e[m]	Materijal	Tip proračuna	Ortotropija	E2[kN/m ²]	G[kN/m ²]	α
<1>	0.300	0.150	1	Tanka ploča	Izotropna			
<2>	0.300	0.150	1	Debela ploča	Izotropna			
<3>	0.200	0.100	1	Tanka ploča	Izotropna			

Setovi površinskih oslonaca

Set	K,R1	K,R2	K,R3
1	1.000e+10	1.000e+10	5.000e+3



Izometrija

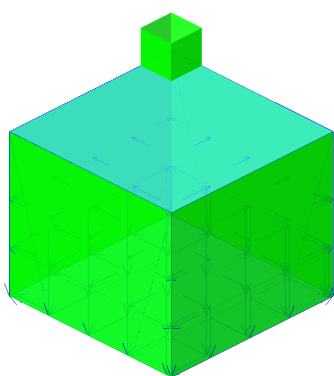


Dispozicija ramova

Lista slučajeva opterećenja

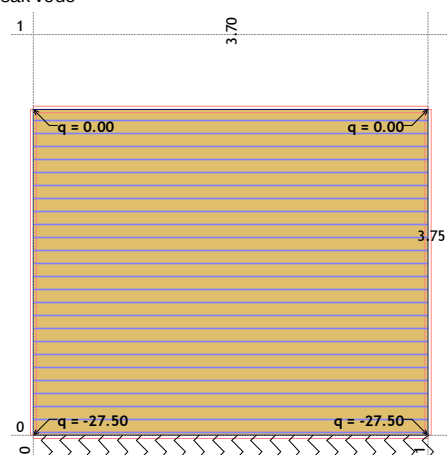
No	Naziv
1	sopstvena težina (g)
2	pritisak vode
3	pritisak zemlje
4	korisno opt po terenu
5	Komb.: I
6	Komb.: I+IV
7	Komb.: I+II
8	Komb.: I+II+IV
9	Komb.: I+III
10	Komb.: I+II+IV
11	Komb.: 1.6xI
12	Komb.: 1.6xI+1.8xIV
13	Komb.: 1.6xI+1.8xII
14	Komb.: 1.6xI+1.8xII+1.8xIV
15	Komb.: 1.6xI+1.8xIII
16	Komb.: 1.6xI+1.8xIII+1.8xIV

Opt. 2: pritisak vode



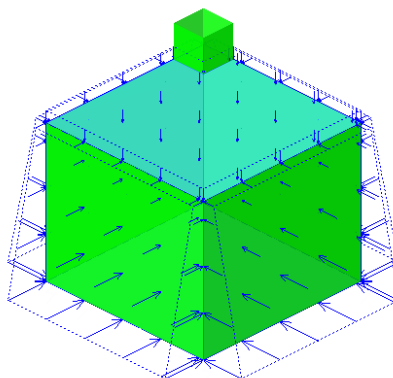
Izometrija

Opt. 2: pritisak vode



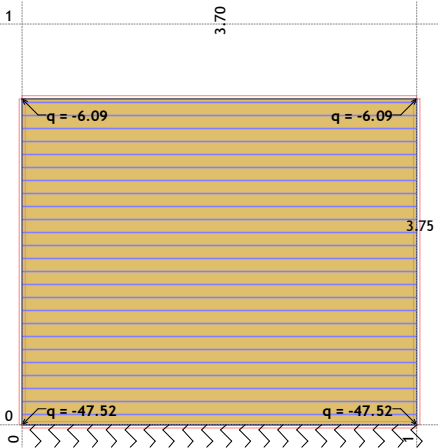
Ram: V_2

Opt. 3: pritisak zemlje



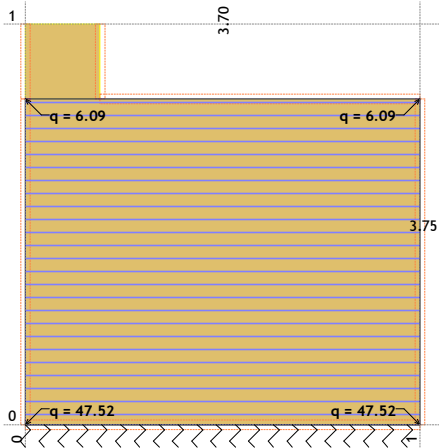
Izometrija

Opt. 3: pritisak zemlje



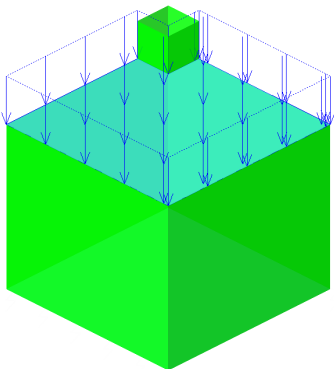
Ram: V_2

Opt. 3: pritisak zemlje



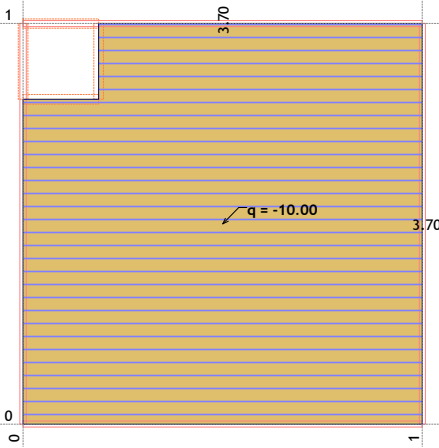
Ram: H_2

Opt. 4: korisno opt po terenu



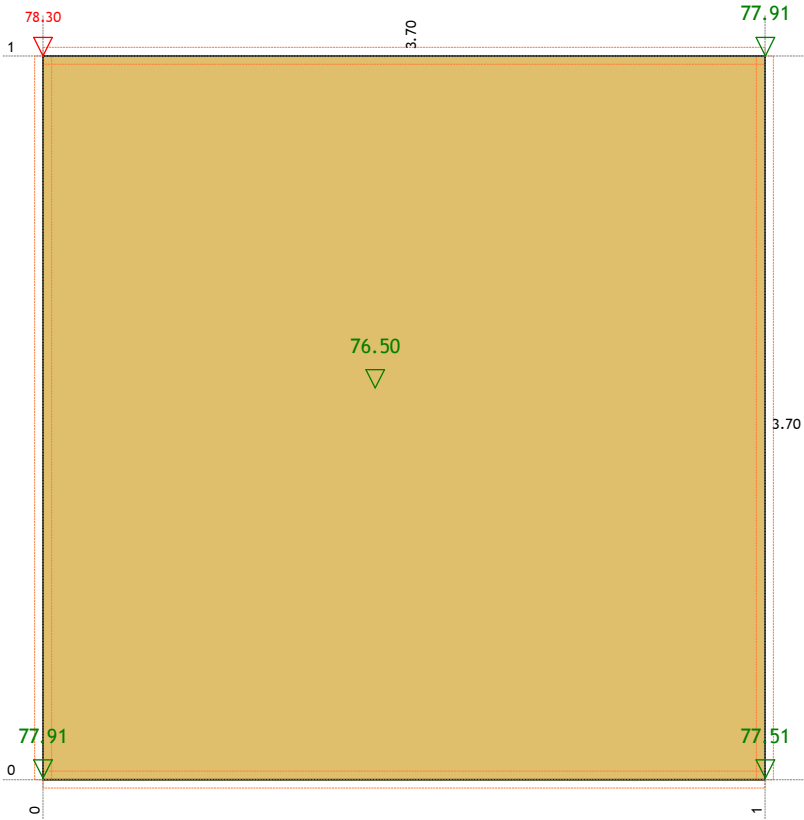
Izometrija

Opt. 4: korisno opt po terenu

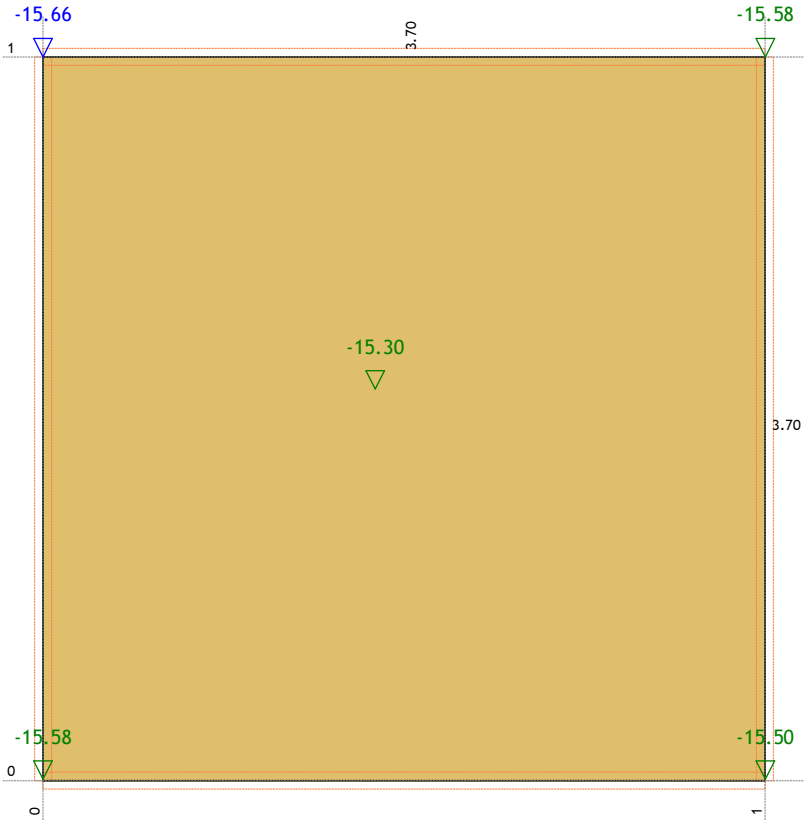


Nivo: [3.05 m]

Opt. 17: [bez koeficijenata] 5-10

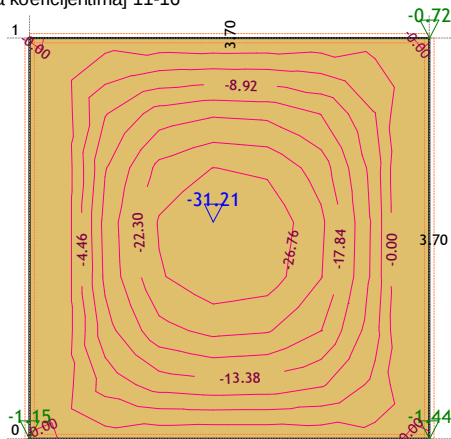


Nivo: [0.00 m]
Uticaji u pov. osloncu: max σ_{tla} = 78.30 / min σ_{tla} = 38.48 kN/m²
Opt. 17: [bez koeficijenata] 5-10



Nivo: [0.00 m]
Uticaji u pov. osloncu: max s_{tla} = -7.70 / min s_{tla} = -15.66 m / 1000

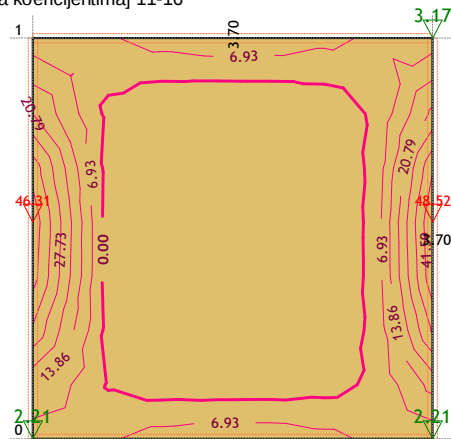
Opt. 18: [sa koeficijentima] 11-16



Nivo: [0.00 m]

Uticaji u ploči: max $M_x = 0.00$ / min $M_x = -31.21$ kNm/m

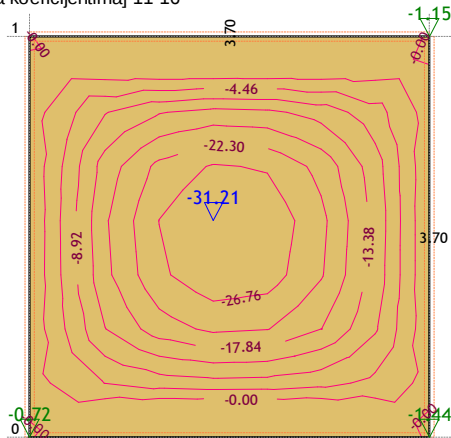
Opt. 18: [sa koeficijentima] 11-16



Nivo: [0.00 m]

Uticaji u ploči: max $M_x = 48.52$ / min $M_x = 0.00$ kNm/m

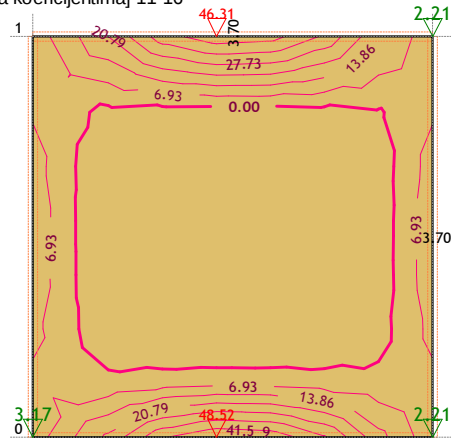
Opt. 18: [sa koeficijentima] 11-16



Nivo: [0.00 m]

Uticaji u ploči: max $M_y = 0.00$ / min $M_y = -31.21$ kNm/m

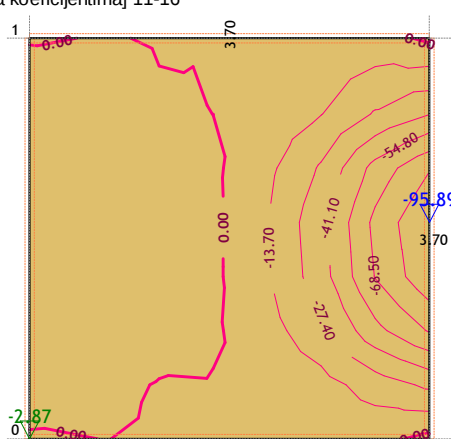
Opt. 18: [sa koeficijentima] 11-16



Nivo: [0.00 m]

Uticaji u ploči: max $M_y = 48.52$ / min $M_y = 0.00$ kNm/m

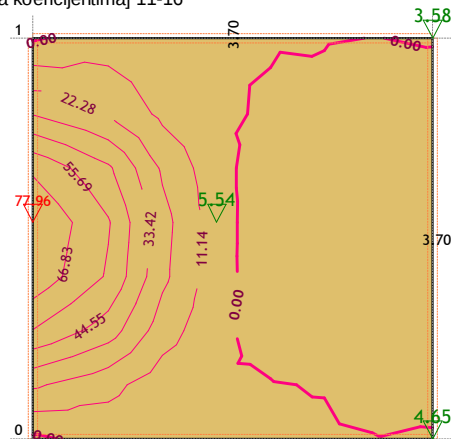
Opt. 18: [sa koeficijentima] 11-16



Nivo: [0.00 m]

Uticaji u ploči: max $T_{z,x} = 0.00$ / min $T_{z,x} = -95.89$ kN/m

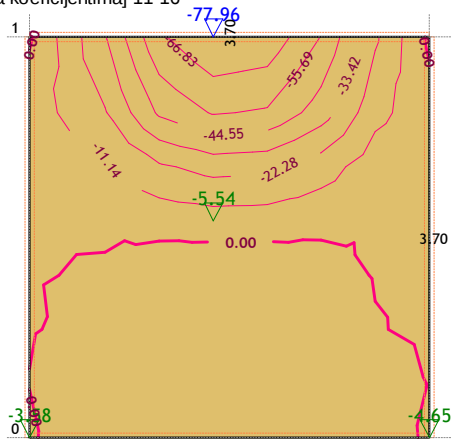
Opt. 18: [sa koeficijentima] 11-16



Nivo: [0.00 m]

Uticaji u ploči: max $T_{z,x} = 77.96$ / min $T_{z,x} = 0.00$ kN/m

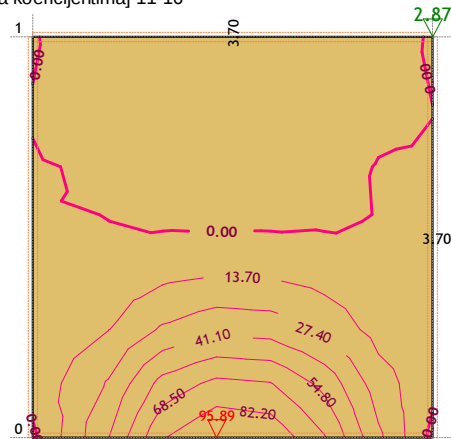
Opt. 18: [sa koeficijentima] 11-16



Nivo: [0.00 m]

Uticaji u ploči: max $T_{z,y} = 0.00$ / min $T_{z,y} = -77.96$ kN/m

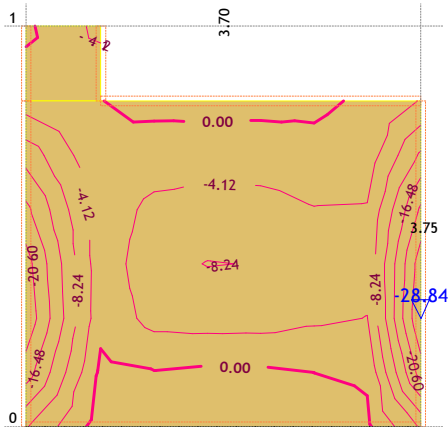
Opt. 18: [sa koeficijentima] 11-16



Nivo: [0.00 m]

Uticaji u ploči: max $T_{z,y} = 95.89$ / min $T_{z,y} = 0.00$ kN/m

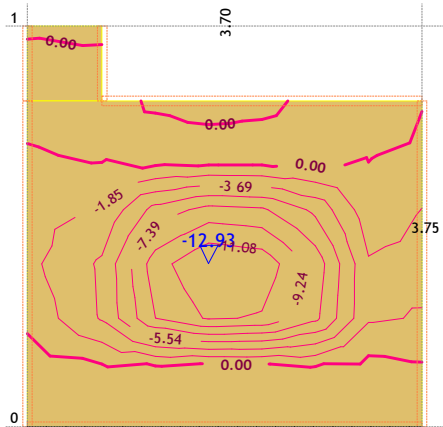
Opt. 18: [sa koeficijentima] 11-16



Ram: H_2

Uticaji u ploči: max Mx= 0.00 / min Mx= -28.84 kNm/m

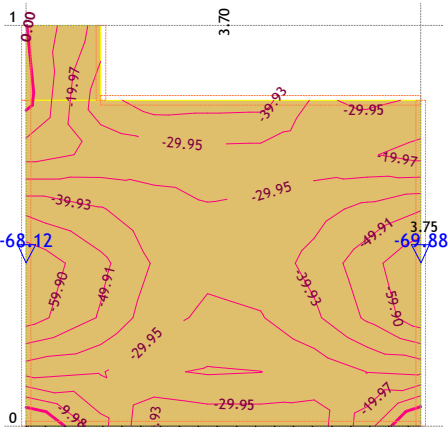
Opt. 18: [sa koeficijentima] 11-16



Ram: H_2

Uticaji u ploči: max My= 0.00 / min My= -12.93 kNm/m

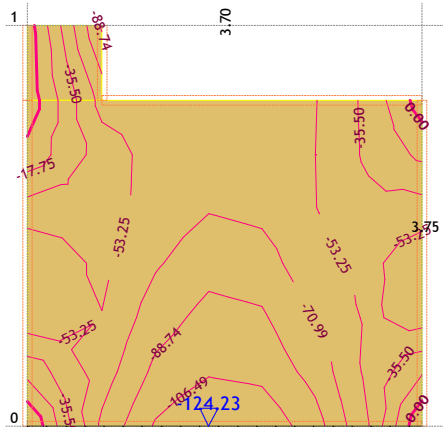
Opt. 18: [sa koeficijentima] 11-16



Ram: H_2

Uticaji u ploči: max Nx= 0.00 / min Nx= -69.88 kNm/m

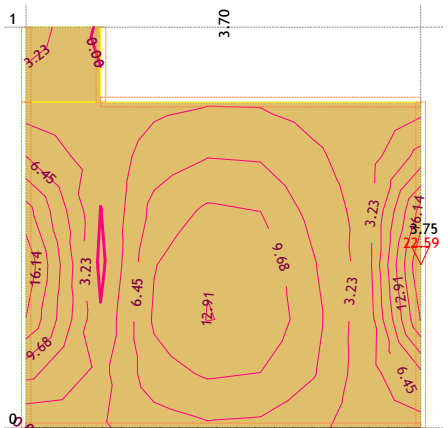
Opt. 18: [sa koeficijentima] 11-16



Ram: H_2

Uticaji u ploči: max Ny= 0.00 / min Ny= -124.23 kNm/m

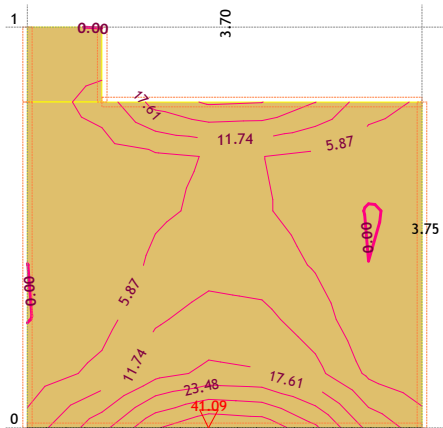
Opt. 18: [sa koeficijentima] 11-16



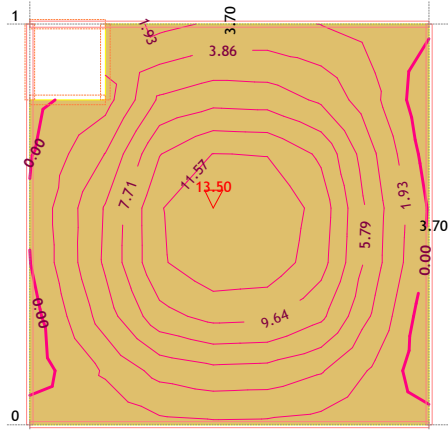
Ram: H_2

Uticaji u ploči: max Mx= 22.59 / min Mx= 0.00 kNm/m

Opt. 18: [sa koeficijentima] 11-16

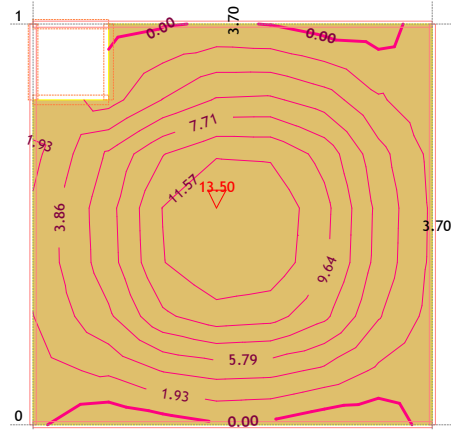


Opt. 18: [sa koeficijentima] 11-16



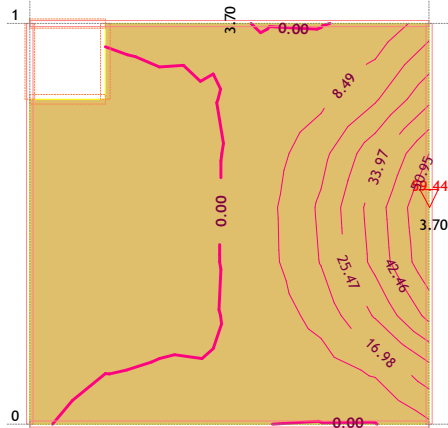
Nivo: [3.05 m]
Uticaji u ploči: max $M_x = 13.50$ / min $M_x = 0.00$ kNm/m

Opt. 18: [sa koeficijentima] 11-16



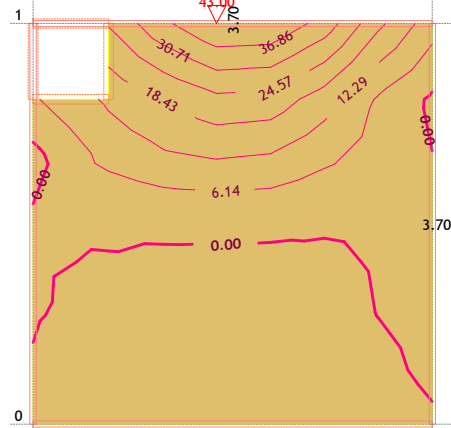
Nivo: [3.05 m]
Uticaji u ploči: max $M_y = 13.50$ / min $M_y = 0.00$ kNm/m

Opt. 18: [sa koeficijentima] 11-16



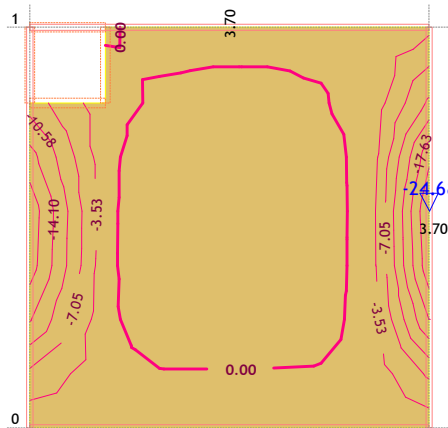
Nivo: [3.05 m]
Uticaji u ploči: max $T_{z,x} = 59.44$ / min $T_{z,x} = 0.00$ kN/m

Opt. 18: [sa koeficijentima] 11-16



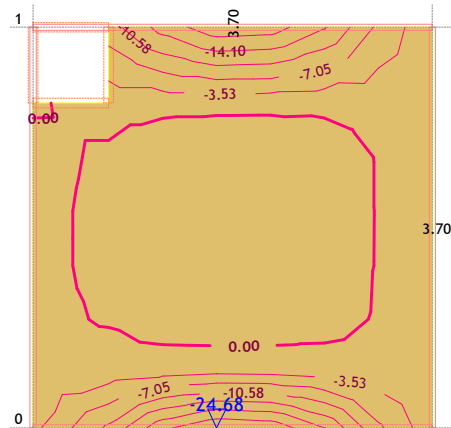
Nivo: [3.05 m]
Uticaji u ploči: max $T_{z,y} = 43.00$ / min $T_{z,y} = 0.00$ kN/m

Opt. 18: [sa koeficijentima] 11-16



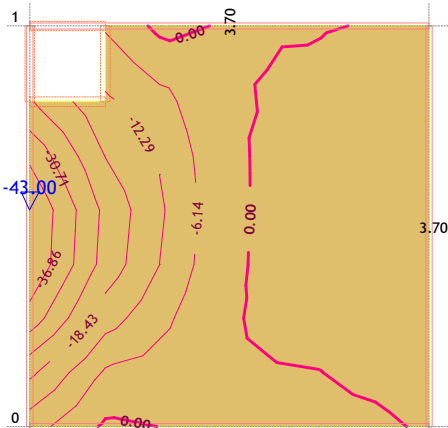
Nivo: [3.05 m]
Uticaji u ploči: max $M_x = 0.00$ / min $M_x = -24.68$ kNm/m

Opt. 18: [sa koeficijentima] 11-16



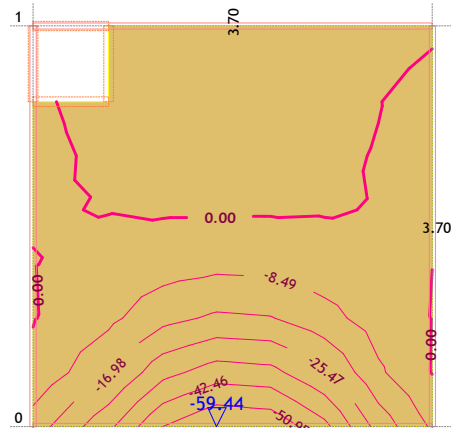
Nivo: [3.05 m]
Uticaji u ploči: max $M_y = 0.00$ / min $M_y = -24.68$ kNm/m

Opt. 18: [sa koeficijentima] 11-16



Nivo: [3.05 m]
Uticaji u ploči: max $T_{z,x} = 0.00$ / min $T_{z,x} = -43.00$ kN/m

Opt. 18: [sa koeficijentima] 11-16

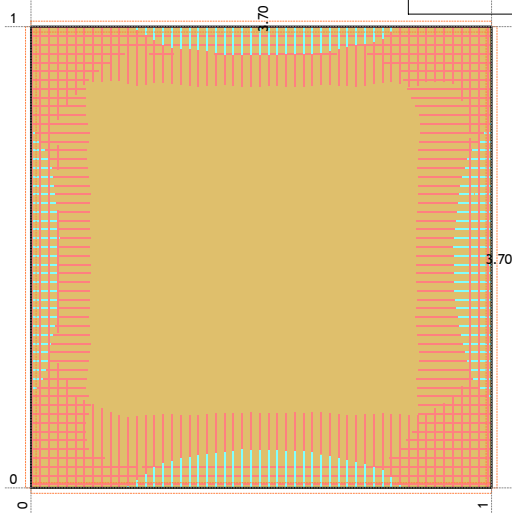


Nivo: [3.05 m]
Uticaji u ploči: max $T_{z,y} = 0.00$ / min $T_{z,y} = -59.44$ kN/m

Potrebna armatura

Merodavno opterećenje: Kompletna šema
PBAB 87, MB 30, B 500, a=3.00 cm

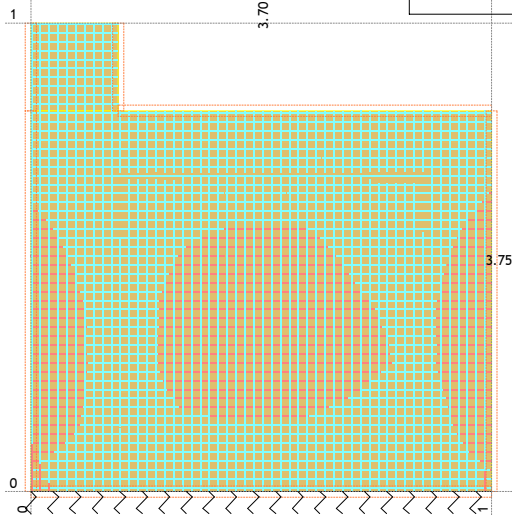
Aa - d.zona [cm²/m]
0.00
1.26
2.51



Nivo: [0.00 m]
Aa - d.zona - max Aa,d= 2.51 cm²/m

Merodavno opterećenje: Kompletna šema
PBAB 87, MB 30, B 500, a=3.00 cm

Aa - g.zona [cm²/m]
-2.32
-1.16
0.00



Ram: H_2
Aa - g.zona - max Aa,g= -2.32 cm²/m

Merodavno opterećenje: Kompletna šema
PBAB 87, MB 30, B 500, a=3.00 cm

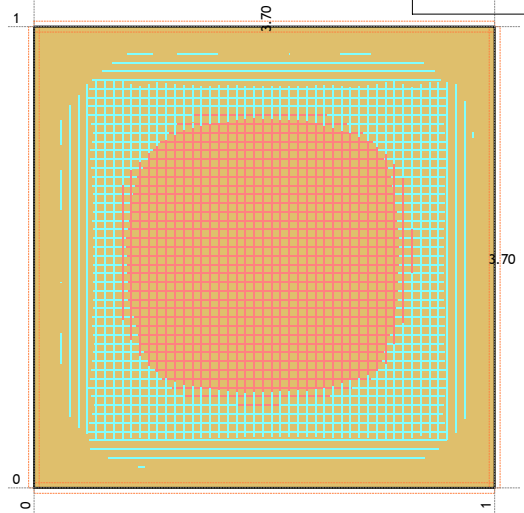
Aa - d.zona [cm²/m]
0.00
1.16
2.32



Ram: V_2
Aa - d.zona - max Aa,d= 2.31 cm²/m

Merodavno opterećenje: Kompletna šema
PBAB 87, MB 30, B 500, a=3.00 cm

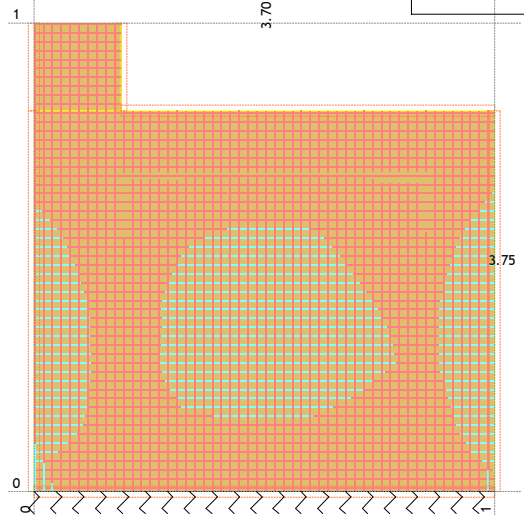
Aa - g.zona [cm²/m]
-2.37
-1.19
0.00



Nivo: [0.00 m]
Aa - g.zona - max Aa,g= -2.37 cm²/m

Merodavno opterećenje: Kompletna šema
PBAB 87, MB 30, B 500, a=3.00 cm

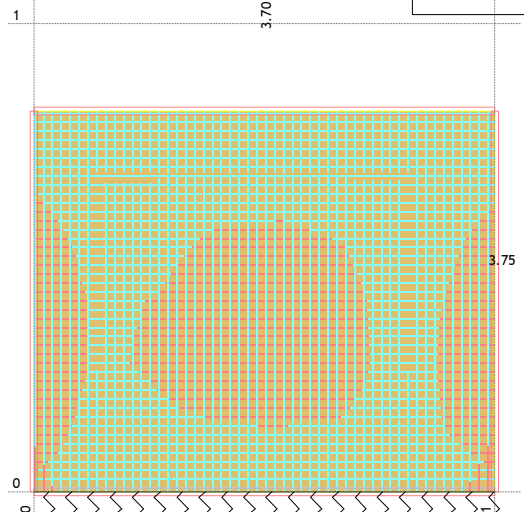
Aa - d.zona [cm²/m]
0.00
1.17
2.33



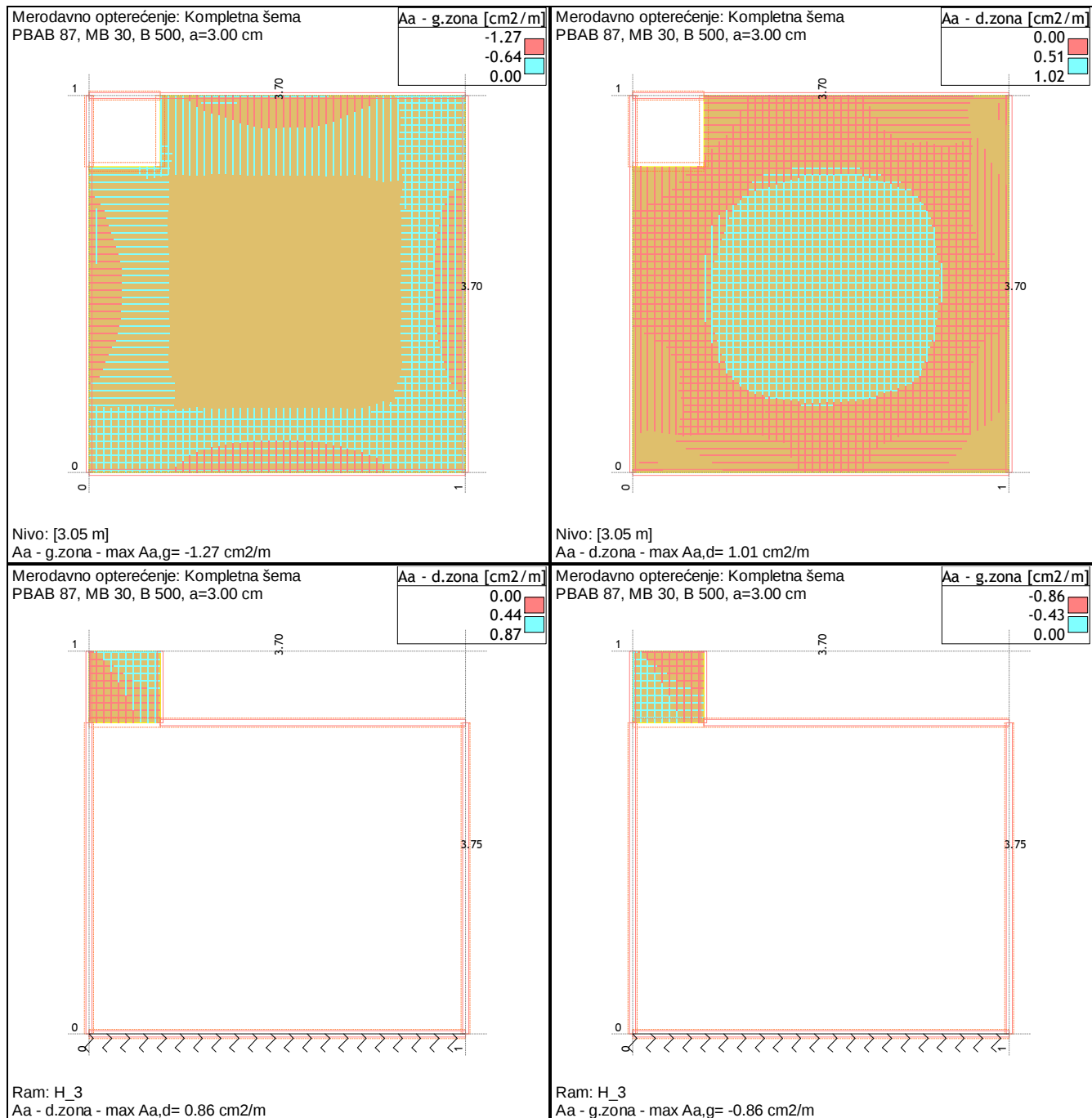
Ram: H_2
Aa - d.zona - max Aa,d= 2.33 cm²/m

Merodavno opterećenje: Kompletna šema
PBAB 87, MB 30, B 500, a=3.00 cm

Aa - g.zona [cm²/m]
-2.31
-1.16
0.00



Ram: V_2
Aa - g.zona - max Aa,g= -2.30 cm²/m



	Investitor:	JAVNO PREDUZEĆE „ELEKTROPRIVREDA SRBIJE” BEOGRAD, Ul. Carice Milice br.2, 11000 Beograd			
	Objekat:	Magacin za smeštaj opreme, Lokacija: TE Kostolac, K.P. 303, K.O. Kostolac selo			
	Vrsta teh. dokum.:	IDP - IDEjni Projekat			
Deo projekta:	26/17-10/11-01-IDP-2.1 -00	Projekat konstrukcije	List:	1.6.2.1	Rev.: 0
1.6.2		Procenjena investiciona vrednost			

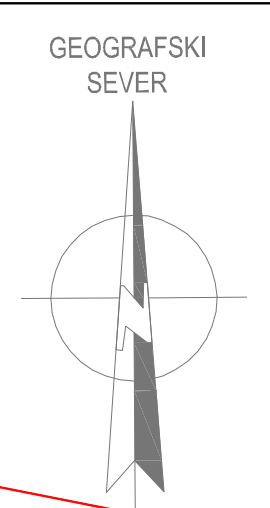
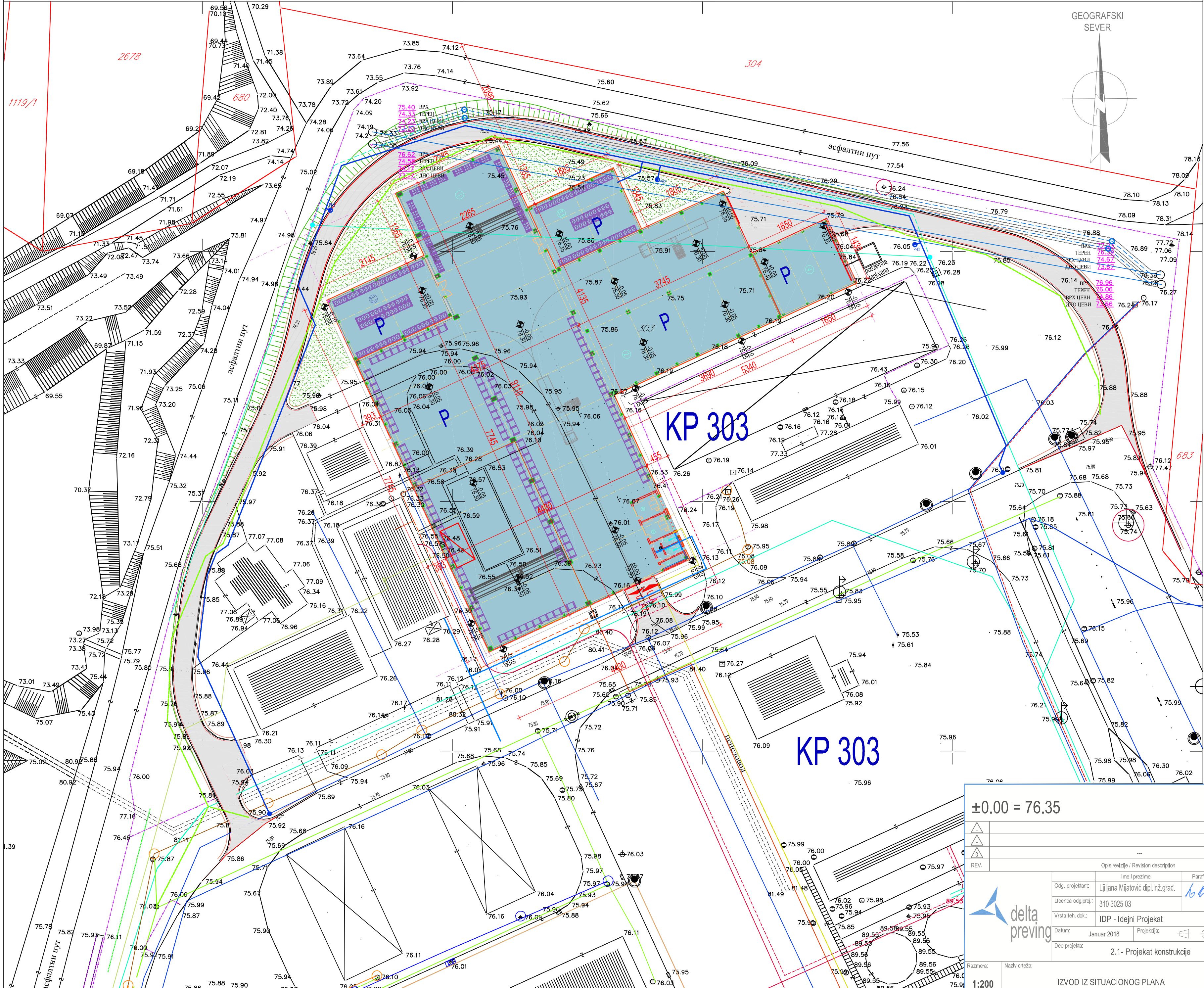
Procenjena investiciona vrednost projekta konstrukcije iznosi 108,000,000.00 RSD.

Odgovorni projektant:	Ljiljana Mijatović, dipl.inž.građ.	
Broj licence:	310 3025 03	

	Investitor:	JAVNO PREDUZEĆE „ELEKTROPRIVREDA SRBIJE” BEOGRAD, Ul. Carice Milice br.2, 11000 Beograd					
	Objekat:	Magacin za smeštaj opreme, Lokacija: TE Kostolac, K.P. 303, K.O. Kostolac selo					
	Vrsta teh. dokum.:	IDP - IDEjni Projekat					
Deo projekta:	26/17-10/11-01-IDP-2.1 -00	Projekat konstrukcije		List:	1.7.1	Rev.:	0

1.7

GRAFIČKA DOKUMENTACIJA



LEGENDA

- KP 303**
- GRANICA PARCELE
 - GRADEVINSKA LINIJA
 - OGRADA KOMPLEKSA
 - ULAZ U OBJEKT
 - VISINSKA KOTA
 - PROJEKTOVANA INTERNA SAOBRAĆAJNICA
 - NOVOPROJEKTOVANI OBJEKT SKLADIŠTA
 - ZELENE POVRŠINE
- LEGENDA SPOLJNIH INSTALACIJA:**
- DRENAŽA KOPA DRVINO - POSTOJEĆA
 - DRENAŽA KOPA DRVINO - IZMEŠTANJE
 - TEHNIČKA VODA - POSTOJEĆA
 - TEHNIČKA VODA - IZMEŠTANJE
 - HIDRANTSKA MREŽA-POSTOJEĆE
 - HIDRANTSKA MREŽA-NOVOPROJEKTOVANO
 - KIŠNA KANALIZACIJA
 - KIŠNA KANALIZACIJA-NOVOPROJEKTOVANO
 - FEKALNA KANALIZACIJA
 - TOPLOVOD - POSTOJEĆE
 - TOPLOVOD - IZMEŠTANJE
 - ELEKTROINSTALACIJE-SPOLJNI RAZVOD
 - ELEKTROINSTALACIJE-NOVOPROJEKTOVANO-SPOLJNI RAZVOD
 - SANTARNA VODA-POSTOJEĆI RAZVOD
 - SANTARNA VODA-NOVOPROJEKTOVANO

±0.00 = 76.35

REV.	Opis revizije / Revision description	Datum/Date	Crtao/Drawn	Overlo/Appr.

Odg. projektant:	Ime i prezime	Paraf	Investitor:
Lilijana Mijatović dipl.inž.grad.			JAVNO PREDUZEĆE "ELEKTROPRIVREDA SRBIJE" BEOGRAD
Licenca odg.proj.:	310 3025 03		Objekat:
Vrsta teh. dok.:	IDP - Idejni Projekat		TE KOSTOLAC B
Datum:	Januar 2018	Projekcija:	MAGACIN ZA SMEŠTAJ OPREME
Deo projekta:	2.1- Projekat konstrukcije		K.P. 303,K.O. Kostolac Selo

Razmera: 1:200

Nadiv crteža:

Crtaj broj: 26/17-10/11-01-IDP-2.1-01

Istod: 1/1

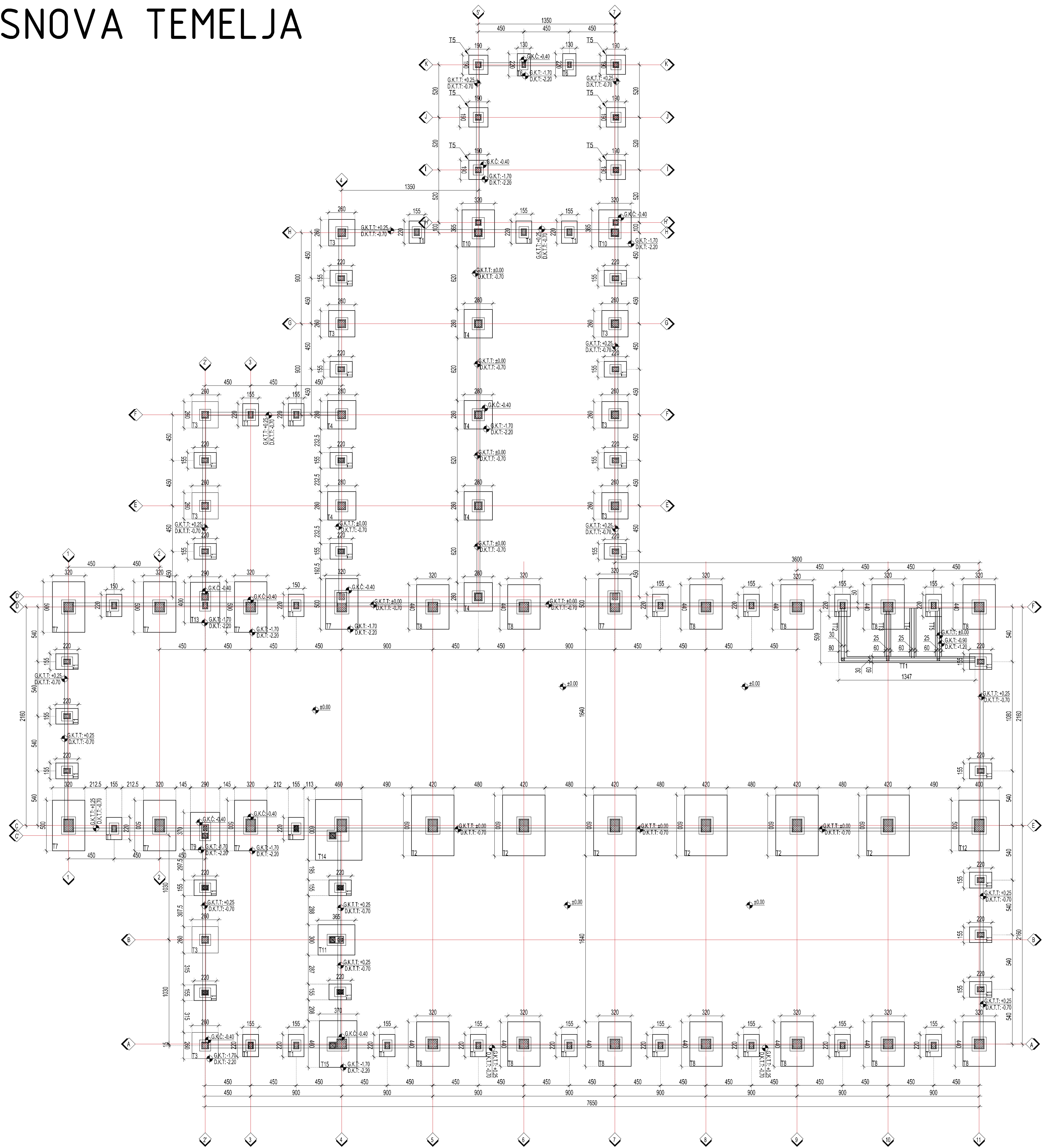
Rev.

IZVOD IZ SITUACIONOG PLANA

delta preving

ЉИЈАНА П. МИЈАТОВИЋ
инж.град.инж.
310 3025 03
ОДЛУЖБЕНИ ПРОЈЕКТАНТ

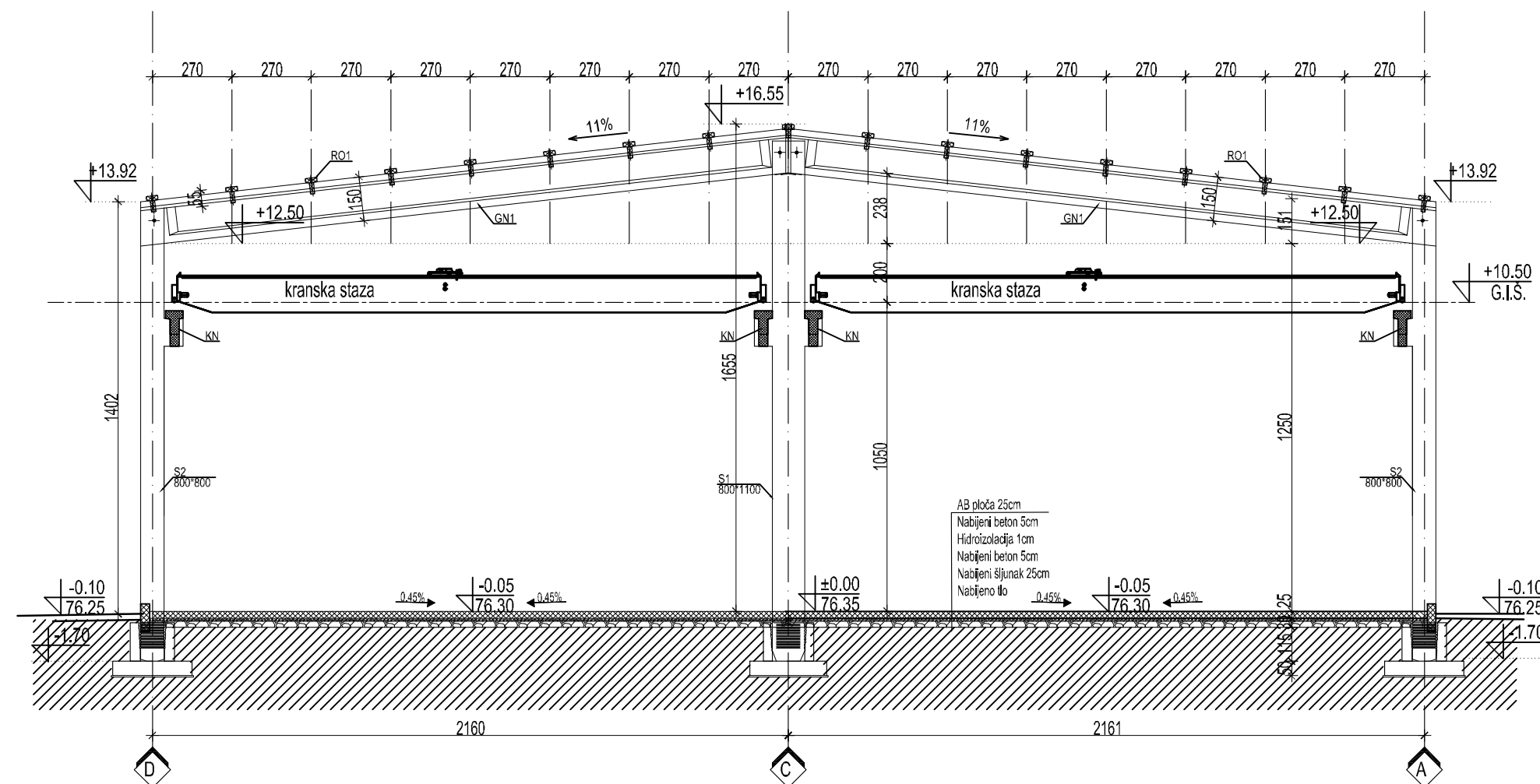
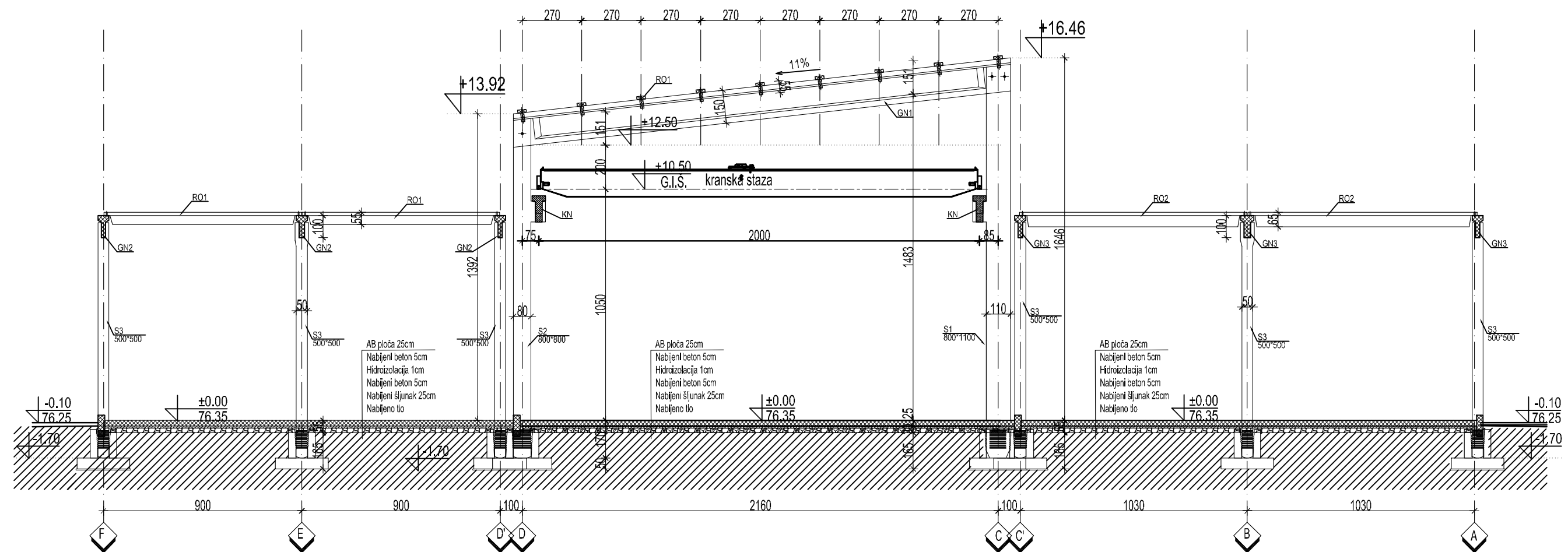
OSNOVA TEMELJA



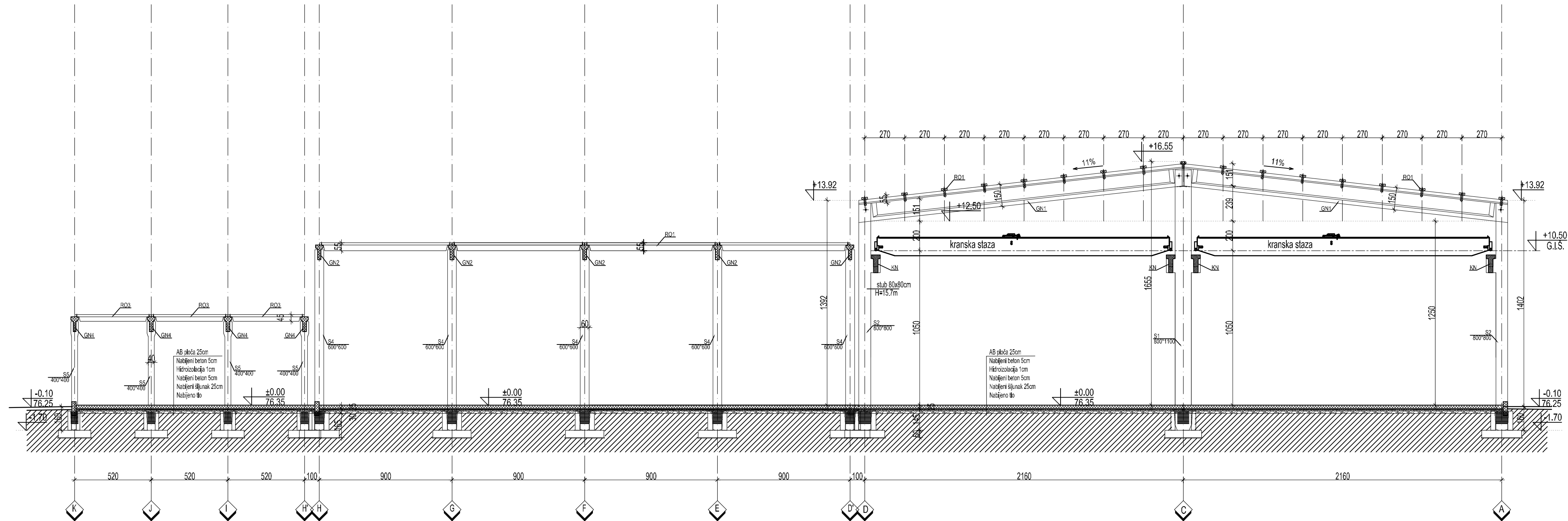
REV.		Opis revizije / Revision description				Datum Date		Criso/Drawn		Oversto/Appro.	
delta preving		Ime i prezime / Name		Paraf/Sign.		Investitor/Customer:		JAVNO PREDUZEĆE "ELEKTROPRIVREDA SRBIJE" BEOGRAD UJ. cara Milice br. 2, Beograd TE KOSTOLAC B MAGACIN ZA SMEŠTAJ OPREME K.P. 303.K.O. Kostolac Selo			
		Odp. projektant/ Respon. designer:		310 3025 03		Objekt/					
		Ljiljana Mijatović dipl.inž.grad.				Facility:					
		Učenica odg.prijet. Res. des. license:		310 3025 03							
		Vrsta del. dok. Project type:		IDP - Idejni Projekat							
Datum: Date:		Januar 2018.		Priprema: Preparation:							
Dio projekta: Project part:		2.1 - Projekat konstrukcije									
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REV.		Opis revizije / Revision description				Datum/Date			
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delta prevring		Ime i prezime / Name		Paraf/Sign.		Investitor: Client:			
		Odg. projektant: Respon. designer:		Ljiljana Mijatović dipl.inž.grad.		666		JAVNO PREDUZEĆE "ELEKTROPRIVREDA SRBIJE" BEOGRAD Ul. carice Milice br.2, Beograd	
		Licenca odg.proj.: Res. des. license:		310 3025 03				Objekat: Facility:	
		Vrsta teh. dok.: Project type:		IDP - Idejni Projekat				TE KOSTOLAC B MAGACIN ZA SMEŠTAJ OPREME K.P. 303,K.O. Kostolac Selo	
		Datum: Date:		Januar 2018.		Projekcija: Projection:			
Deo projekta: Project part:		2.1- Projekat konstrukcije							
Razmera: Scale:		Naziv crteža: Drawing name:		Crtež broj: Drawing number:		List/od: Page/of:			
1:50		PRESEK 1-1, PRESEK 2-2		26/17-10/11-01-IDP-2.1-04		1/1			
						Rev.			



						OPŠTINI PROJEKAT								
REV.		Opis revizije / Revision description						Datum/Date		Crtao/Drawn		Overio/Appr.		
delta previing		Ime i prezime / Name		Paraf/Sign.		Investitor: Client:		JAVNO PREDUZEĆE "ELEKTROPRIVREDA SRBIJE" BEOGRAD						
		Odg. projektant: Respon. designer:		Ljiljana Mijatović dipl.inž.grad.				Objekat: Facility:		TE KOSTOLAC B				
		Licenca odg.proj.: Res. des. license:		310 3025 03						MAGACIN ZA SMEŠTAJ OPREME				
		Vrsta teh. dok.: Project type:		IDP - Idejni Projekat						K.P. 303,K.O. Kostolac Selo				
		Datum: Date:		Januar 2018.		Projekcija: Projection:		 						
Deo projekta: Project part:		2.1- Projekat konstrukcije												
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1:50		PRESEK 3-3, PRESEK 5-5						26/17-10/11-01-IDP-2.1-05				1/1		
												Rev, 		

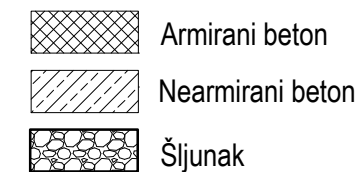


PRESEK 4-4

	Odg. projektant: Respon. designer:		Ime i prezime / Name		Paraf./Sign.		Investitor: Client:		JAVNO PREDUZEĆE "ELEKTROPRIVREDA SRBIJE" BEOGRAD Ul. carice Milice br.2, Beograd		
	Licenca odg.proj.: Res. des. license:		310 3025 03				Objekat: Facility:		TE KOSTOLAC B MAGACIN ZA SMEŠTAJ OPREME K.P. 303,K.O. Kostolac Selo		
	Vrsta teh. dok.: Project type:		IDP - Idejni Projekat								
	Datum: Date:		Januar 2018.		Projekcija: Projection:		 				
	Dio projekta: Project part:				2.1- Projekat konstrukcije						
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Tankvana za otpadna ulja

OSNOVA I PRESEK



Projektovana kota terena (KTP): $\pm 0.00 = 76.35$



		Odg. projektant: Respon. designer: Ljiljana Mijatović dipl.inž.građ.		Ime i prezime / Name: Ljiljana Mijatović Parafr/Sign. <i>bm</i>		Investitor: JAVNO PREDUZEĆE "ELEKTROPRIVREDA SRBIJE" BEOGRAD Client: Ul. carice Milice br.2, Beograd	
		Licenca odg.proj.: Res. des. license: 310 3025 03				Objekat: TE KOSTOLAC B Facility: MAGACIN ZA SMEŠTAJ OPREME K.P. 303,K.O. Kostolac Selo	
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