

2 - ПРОЈЕКАТ КОНСТРУКЦИЈЕ

Инвеститор:

ГРАД КРАЉЕВО

Објект:

Стамбени објект 2,
II фазе Пројекта урбане регенерације
насеља у Доситејевој улици, у Краљеву,
КП 3352/1, 3352/9, 3352/14, 3352/15,
КО Краљево

Врста техничке документације:

ПЗИ

Пројекат за извођење

За грађење/извођење радова:

Нова градња

Пројектант:

ПД "GATE" д.о.о. Ваљево
Ул. Вука Караџића 30

Одговорно лице пројектанта:
Печат:

Александар Митровић, дипл. инг.
Потпис:



Одговорни пројектант:
Број лиценце ИКС:
Печат:

Љиљана Петковић, дипл. инж. грађ.
310 3679 03
Потпис:



Број дела пројекта:

184 К

Место и датум:

Ваљево, нов 2017. год.

САДРЖАЈ ПРОЈЕКТА КОНСТРУКЦИЈЕ

- 2.1. Решење о одређивању одговорног пројектанта за Пројекат конструкције
- 2.2. Изјава одговорног пројектанта Пројекта конструкције
- 2.3. Текстуална документација
- 2.4. Нумеричка документација
- 2.5. Графичка документација

2.1. РЕШЕЊЕ О ОДРЕЂИВАЊУ ОДГОВОРНОГ ПРОЈЕКТАНТА

На основу члана 128. Закона о планирању и изградњи ("Службени гласник РС", br.72/09, 81/09 – исправка, 64/10 одлука УС, 24/11, 121/12, 42/13 – одлука УС, 50/13 – одлука УС, 98/13 – одлука УС, 132/14 и 145/14) и одредби Правилника о садржини, начину и поступку израде и начина вршења контроле техничке документације према класи и намени објекта ("Службени гласник РС", br.23/2015) као:

ОДГОВОРНИ ПРОЈЕКТАНТ

За израду 2 – ПРОЈЕКТА КОНСТРУКЦИЈЕ, који је део Пројекта за извођење, за нову градњу, Стамбеног објекта 2, II фазе Пројекта урбане регенерације насеља у Доситејевој улици, у Краљеву, КП 3352/1, 3352/9, 3352/14, 3352/15, КО Краљево, одређује се:

Љиљана Петковић, дипл. инж. грађ бр. лиценце ИКС 310 3679 03

Пројектант:

ПД "GATE" д.о.о. Ваљево
Ул. Вука Караџића 30

Одговорно лице пројектанта:
Печат:

Александар Митровић, дипл. инж.
Потпис:



Број дела пројекта:

184 К

Место и датум:

Ваљево, нов 2017. год.

2.2. ИЗЈАВА ОДГОВОРНОГ ПРОЈЕКТАНТА ПРОЈЕКТА КОНСТРУКЦИЈЕ

Као одговорни пројектант ПРОЈЕКТА КОНСТРУКЦИЈЕ, који је део Пројекта за извођење, за нову градњу, Стамбеног објекта 2, II фазе Пројекта урбане регенерације насеља у Доситејевој улици, у Краљеву, КП 3352/1, 3352/9, 3352/14, 3352/15, КО Краљево

Љиљана Петковић, дипл. инж. грађ.
број лиценце ИКС 310 3679 03

ИЗЈАВЉУЈЕМ

1. да је пројекат у свему у складу са издатим Локацијским условима;
2. да је пројекат израђен у складу са Законом о планирању и изградњи, прописима, стандардима и нормативима из области изградње објекта и правилима струке;
3. да су при изради пројекта поштоване све прописане и утврђене мере и препоруке за испуњење основних захтева за објекат и да је пројекат израђен у складу са мерама и препорукама којима се доказује испуњеност основних захтева.

Одговорни пројектант
Пројекта конструкције за ПЗИ:
Број лиценце ИКС:
Печат:

Љиљана Петковић, дипл. инж. грађ.
310 3679 03
Потпис:



Број дела пројекта:
Место и датум:

184 К
Ваљево, нов 2017.год.

2.3. ТЕКСТУАЛНА ДОКУМЕНТАЦИЈА

Технички опис

Предмет Пројекта је армиранобетонска конструкција вишеспратне стамбене зграде са локацијом у Краљеву у Доситејевој улици. Пројекат конструкције је урађен је на основу архитектонског дела Пројекта за извођење који је урађен од стране пројектних бироа "re:a.c.t" и "GATE d.o.o."

1.1 Локација објекта, опис конструкције и опште карактеристике објекта

Објекат је лоциран у Краљеву, Србија. Локацијом су одређени услови сеизмичности и категорије тла. На основу геотехничких истраживања урађених од стране предузећа за геотехнику и инжењеринг "Centar M Geotehnika d.o.o." утврђено је да тло договара према нашем стандарду средњем тлу а према EN: 1998-1 тлу типа Е.

Конструкција зграде је у целини армирано-бетонска, а формирају је хоризонтални елементи – међуспратне конструкције и вертикални елементи – зидови.

У основи објекат је неправилног облика и састоји се од две дилатационе целине: леве ламеле (Л1), унутар правоугаоних габарита 29.19x15.85 m оивичене осама А-Ј и 2-20 и десне ламеле (Л2) унутар правоугаоних габарита: 27.55x15.85 m оивичене осама К-Ѕ и 1-19. Дилатационе целине спојене су везним делом између оса Ј-К који се преко кратких елемената ослања на њих. Кратки елементи формирани су са сеизмичким дилатацијама од по 4.5cm са обе стране и тефлонском облогом.

По висини, објекат има укупно 9 етажа и то: један подрумски ниво, приземље и 7 спратова.

Спратна висине стамбеног дела је 2.89 m а подрумских етажа 2.74 (2.4). Висина објекта од коте ±0.00 (204.80 мнв) износи 24.5 m. Приближна бруто површина објекта је 7534.31 m². Кота фундирања је -3.35 (201.45 мнв) m од коте ±0.00, односно 2.75 m од коте терена.

Вертикална комуникација у објекту остварује се са три лифта и двокраким степеништем у свакој дилатационој целини као и на везном делу, а хоризонтална комуникација ходницима. Кров објекта је раван – непроходан.

1.2 Услови фундирања – извод из геомеханичког елабората

Након анализе просторних односа литолошких средина издвојених у локалном профилу терена и резултата лабораторијских испитивања узорака, дефинисан је геотехнички модел терена у коме су за сваку средину утврђене меродавне вредности физичко-механичких параметара.

Насип (n) и хумизирани површински слоја (h) у профилу терена залежу на дубини од 0,3 m (у профилу бушотине К-9) до 1,0 m (у бушотинама К-1 и К-2). Према пројекту фундирање будућих објеката у оквиру насеља "Пиц мала" биће изведено на дубини од око ~1,5-2,5 m у односу на садашњу површину терена тако да ће ове две средине приликом израде темељног ископа у потпуности бити одстрањене. Вредности параметра за ову средину су:

- запреминска тежина $\gamma = 17,0-18,0 \text{ kN/m}^3$
- угао унутрашњег трења $\varphi = 18-20^\circ$
- кохезија $c = 5-10 \text{ kN/m}^2$
- модул стишљивости $M_s = 2\ 500-3\ 500 \text{ kN/m}^2$

За слој прашине, глиновито-песковите (GPPR) која се у профилу терена појављују испод насипа и залеже на дубини до 3,0-3,5 m (локално и до 3,6 m у бушотини K-10), вредности основних физичко-механичких параметара су у распону:

- запреминска тежина $\gamma = 17,7-18,5 \text{ kN/m}^3$
- угао унутрашњег трења $\varphi = 24-27^\circ$
- кохезија $c = 16-20 \text{ kN/m}^2$
- модул стишљивости $M_s = 6\,700-13\,000 \text{ kN/m}^2$

За терасне седименте, пескове и шљункове (П,Ш) издвојене на дубини од 3,0 m (3,6 m) до завршне дубине истраживања у бушотинама чија је дубина износила 15,0 m, односно до 21,0 m у профилу бушотине Kp-3, вредности основних физичко-механичких параметара су:

- запреминска тежина $\gamma = 20,2-21,2 \text{ kN/m}^3$
- угао унутрашњег трења $\varphi = 30-33^\circ$
- кохезија $c = 0-5 \text{ kN/m}^2$
- модул стишљивости $M_s = 40\,000-80\,000 \text{ kN/m}^2$

Након изведеног истражног бушења на геотехничком моделу усвојен је **ниво подземне воде** на дубини од 6.5 m (K-1) до 7.2 m (K-7 и K-8). У односу на коту површине терена, ката нивоа подземне воде је на 197.10-197.60 мнв.

У зависности од димензија темељне плоче, вредности дозвољеног оптерећења су у границама $q_a = 244,3-339,5 \text{ kN/m}^2$. У односу на број подземних и надземних етажа (По+Пр+7), очекује се да ће контактни напон у нивоу темељне спојнице бити у границама $\leq 80 \text{ kN/m}^2$. Обзиром да су прорачунске вредности знатно веће од контактеног напона закључак је да не постоји опасност од пролома темељног тла.

Фундирање сва четири објекта биће изведено у слоју глиновито-песковите прашине (GPPR). Физичко-механичке карактеристике ове средине омогућавају израду широког ископа дубине до 3,0 m без примене заштитне подграде под условом да је нагиб шарпе темељне јаме $\alpha \leq 75^\circ$

Сеизмичке одлике терена.

На бази резултата MASW (Multi-Channel Analysis of Surface Waves) геофизичких истраживања, на локацији су издвојене три микрозоне. Вредности амплификације сеизмичког дејства у централном делу локације су највеће па је у конзервативном приступу она одабрана као основа за прорачун спектра одговора. Срачунати средњи спектри у опсегу сопствених периода објеката се могу апроксимирати спектром типа I за тло типа E по EN1998-1 са прилагођеним фактором тла $S=1.73$. Специфични спектри одговора са модификованим фактором тла потпуно обухватају срачунате средње спектре на катама усвојене површине терена.

Утврђени параметри специфичног и еластичног спектра одговора за локацију "Пиц Мала" за пројектовање у складу са EN1998-1 тачка 3.2.2 приказани су у табели 6.

Контролни, детерминистички прорачун, са синтетичким акцелерацијама показао је да се предложеним спектром S_{max} могу моделовати очекивана сеизмичка дејства блиских земљотреса на локацији која имају кључни утицај на сеизмички хазард изнад периода $T=0.36\text{s}$.

Анализа услова за појаву ликвефакције, на темељу расподеле величине честица и својства материјала добијених из лабораторијских тестова на локацији "Пиц Мала" у Краљеву показала је да на локацији нема услова за њену појаву.

<i>Tabela br. 6</i> Usvojena površina terena	Elastični spektar odgovora EC8-1 Tip I tlo tipa E	Specifični spektar odgovora lokalnog tla vezan za max Se SSmax	Specifični spektar odgovora lokalnog tla vezan za PGA SSmin
TB (s)	0.15	0.15	0.15
Tc (s)	0.5	0.5	0.5
TD (s)	2	2	2
S i Ss	1.4	1.73	1.4
η	5%	5%	5%
agR (g)	0.14	0.14	0.14
γ_l	1.0	1.0	1.0

1.3 Конструктивни систем

Конструктивни систем је осмишљен у облику просторне конструкције, коју формирају АБ зидови оријентисани у два ортогонална правца затворене контуре ошупљени низом правоугаоних отвора (отвори за врата и прозоре), у основи објекта темељени на плочи, пуне армиранобетонске међуспратне плоче, греде и стубови . На овај начин, формирана је, захваљујући просторном распореду, крута конструкција која се карактерише малом деформабилношћу.

АБ зидову су димензија 18, 20 cm распоређени у два ортогонална правца. Сви зидови су константне дебљине целом својом висином. Изузетак представљају зидови лифтовског језгра који су целом висином објекта пројектовани дебљине 15cm. По ободу подрумски зидови формирају “круту кутију”.

Међуспратне конструкције чине пуне АБ плоче дебљине 18 cm. Плоче су константне дебљине у целом објекту.

Армирано-бетонска конструкција се фунда на темељној плочи висине 50 cm која својим обликом прати најнижу етажу и није дилатирна.

На конструкцији су присутни и неконструктивни елементи у виду вертикалних и хоризонталних серклажа.

Степениште се састоји од два крака и међуподеста које савладава међуспрату висину од 2.89 (2.80 m - подрумско). Дебљина степениште плоче и плоче међуподеста је 18 cm. Димензије степеника су 17(17.5)/28 cm. Распон између подеста савладавају косе степенишне пуне армирано-бетонске плоче, које оптерећење преносе у једном правцу (нису спојене са зидовима, како би се избегла потреба косог прекида њиховог бетонирања).

1.4 Дејства на конструкцију

Конструкција је прорачуната на дејство свих релеватних оптерећења и то:

- Сталног оптерећења од сопствене тежине конструктивних (плоче, зидови, греде, стубови) и неконструктивних елемената (тежине подова и плафона, те преградних и фасадних зидова). Сопствена тежина АБ елемената генерисана је програмом док је додатно стално оптерећење аплицирано као површинско и линијско. Корисна оптерећења су анализирана у складу са Стандардом SRPS U.C7.121/1988 и аплицирана на међуспратним конструкцијама као површински расподељена.

- Оптерећење снегом је узето као еквивалентно површинско оптерећење интензитета 1.0 kN/m^2 , у складу са Привременим техничким прописима за оптерећење зграда (Сл. лист СФРЈ 61/48).

- Оптерећења притиска тла на подрумске зидове

- Сеизмичког оптерећења које је према захтевима пројектног задатка прорачунато у складу са стандардом EN 1998-1: 2004.

Приликом контроле напрезања, померања и приликом димензионисања елемената, разматране су све релевантне комбинације експлоатационих и граничних оптерећења.

1.5 Прорачун конструктивних елемената

Структурална анализа је спроведена коришћењем тродимензионалног модела конструкције и специјализованог софтвера – “Radimpex Tower”. Сви зидови и таванице су моделирани површинским елементима, а стубови и греде као линијски елементи. Свим елементима су придружене механичке и геометријске карактеристике које максимално блиско описују реалне.

У циљу реалнијег моделирања стварног понашања конструкције, а и због потребе сагледавања утицаја интеракције конструкција-темељ-тло, у вертикалном правцу конструкција је ослоњена на еластичну подлогу – тло представљено једнопараметарским Винклер-овим моделом. За параметар тла, модул реакције, усвојена је вредност од 8000 kN/m^3 на основу препоруке Геомеханичког елабората.

Хоризонтално, модел је непомерљив у нивоу плоче изнад подрума јер се подрумска етажа са ободним зидовима сматра довољно крутом да представља укљештење.

Усвојени конструкцијски систем предметног објекта у складу са одредбама EC8 је:

- У подужном правцу дуктилни систем зидова са усвојеним фактором понашања за хоризонталана сеизмичка дејства $q = 3$.
- У попречном правцу систем великих лако армираних зидова са усвојеним фактором понашања за хоризонталана сеизмичка дејства $q = 2$.

За оба правца хоризонтална арматура димензионисана је за укупну трансвералну силу увећану за 50% $V_{Ed} = (q+1)/2 \times V'_{Ed}$.

Објекат је подељен у 2 сеизмичка модела леву и десну дилатациону целину. Сprovedена је модална анализа оба модела, која резултира параметрима (периоди и својствени облици осциловања) који дефинишу динамичке карактеристике конструкције. Искоришћена је софтверска могућност генерисања маса од аплицираних оптерећења. Резултујући највиши периоди осциловања указују на висок степен постигнуте крутости конструкције.

Добијени периоди осциловања:

Ламела 1		Ламела 2
$T_1 [s]$	0.452530	0.382604
$T_2 [s]$	0.376369	0.349724
$T_3 [s]$	0.326644	0.294373

Комбинација хоризонталних компоненти сеизмичког дејства узета је у обзир као корен квадрата вредности сеизмичких сила у својственом облику осциловања. ($E_E = \sqrt{\sum E_{Ei}^2}$)

Армирано-бетонски зидови попречног (Y) правца контролисани су на савијање као сеизмички зидови, у најнеповољнијим пресецима, а за најнеповољније комбинације граничних оптерећења. Потребна арматура прорачуната је за једноструко армирани пресек, па је усвојена једнака на оба краја зида. Минимална арматура усвојена је према “Правилнику о техничким нормативима за изградњу објеката високоградње у сеизмичким подручјима” (“Службени лист СФРЈ” бр. 31/81, 49.82, 29/83, 21/88, 52/90) као $0.15l_w \times b_w$ и распоређена у зонама ивичних елемената зидова на дужини $\sim 0.1l_w$, при чему су испоштовани захтеви обезбеђивања локалне дуктилности великих лако армираних зидова у складу са одредбом EC8 5.4.3.5.3. Такође је извршена и контрола бочне нестабилности у складу са одредбом 5.9 EC2 као и утицај ефеката другог реда према одредби 12.6.5 EC2 који је узет у обзир преко коефицијента φ којим се редукује носивост при дејству аксијалне силе.

Армирано-бетонски зидови подужног (X) правца димензионисани су као дуктилни зидови према EC8 правилнику у складу са одредбом 5.4.3.4. Потребна арматура прорачуната је за најнеповољније комбинације граничних оптерећења за једноструко армирани пресек, па је усвојена једнака на оба краја зида.

Контролисани су максимални експлоатациони напони у зидовима и стубовима конструкције и констатовано је да не прелазе допуштене напоне одређене сеизмичким критеријумима.

Армирано-бетонске таванице су димензионисане према ПБАБ87 на најнеповољније граничне утицаје момената савијања са циљем одређивања потребних количина арматуре у два ортогонална правца, посебно у доњој, а посебно у горњој зони. Резултујући проценти армирања су у домену уобичајених и повољних.

У АБ таваницама контролисани су максимални угиби за комбинацију оптерећења $3.5g+1p$ при чему је констатовано да су угиби у границама дозвољених.

POS	0+	100+	200+	300+	400+	500+	600+	700+	800
Угиб [mm] Ламела 1	8.68	16.88	14.76	14.76	14.76	14.53	14.53	14.52	17.08

POS	0+	100+	200+	300+	400+	500+	600+	700+	800
Угиб [mm] Ламела 2	8.68	11.40	11.40	13.68	13.68	11.40	11.50	12.61	14.94

Све везне греде АБ зидова претежно су напегнуте попречним силама па су стога димензионисане на смичући силу тј. на главна коса напрезања.

Контролисана су максимална хоризонтална померања врха зграде за најнеповољније комбинације експлоатационих оптерећења.

Ламела I	X – правац [mm]	53.97	Ламела II	X-правац [mm]	35.88
	Y – правац [mm]	32.04		Y – правац [mm]	20.74

Контролисана су максимална релативна спратна померања према одредби EC8 4.4.3.2 при чему је констатована сигурна испуњеност услова максимално допуштених релативних спратних померања померања.

Контролисана су максимална напрезања у контактної површи између темеља и тла. Констатовано је да су максимални напони за не-сеизмичке комбинације оптерећења у границама до 156.39 kN/m^2 , а одговарајуће слегање 19.55 mm што је мање од процењене носивости и слегања тла предметне локације ($<180 \text{ kN/m}^2$, $s < 2.5 \text{ cm}$) добијених на основу геомеханичког елабората предузећа за геотехнику и инжењеринг “Centar M Geotehnika d.o.o.”

Сви конструктивни армирано-бетонски елементи су пројектовани у бетону марке МБ30 (C25/30)

Сва димензионисања су спроведена уз претпоставку армирања ребрастом арматуром В500В.

За све спроведене контроле и прорачуне дата је одговарајућа текстуална и графичка доказница.

2.4. НУМЕРИЧКА ДОКУМЕНТАЦИЈА

2.4. НУМЕРИЧКА ДОКУМЕНТАЦИЈА

Садржај
Анализа оптерећења
П 800+
Везни део - П 800+
Степеништа St01-02, St03-St74, St05-St76
Р 700+
Р 600+
Челична степеништа C1 – C4
Везни део - П 600+ - П 700+
Р 500+
Везни део - П 200+ - П 500+
П 400+
П 300+
П 200+
П 100+
Везни део - П 100+
П 0+
П 0+_LOKALI
Сеизмика_ ламела 1
Димензионисање карактеристичних зидова ламеле 1
Сеизмика_ ламела 2
Димензионисање карактеристичних зидова ламеле 2
Димензионисање зидова лифта
Темељна плоча
Подрумски зидови

Анализа оптерећења

Таванице

М-к1 (соба)

- паркет 2.2 cm	=	0.20 kN/m ²
- цеметна кошуљица 5 cm	=	1.05 kN/m ²
- PVC фолија		
- полистирен за под 4 cm	=	0.02 kN/m ²
- АБ плоча 18 cm		
- глет маса на лепку	=	0.03 kN/m ²
	g =	1.30 kN/m²
- корисно	p =	1.50 kN/m²

М-к3 (кухиња)

- керамичке плочице 1 cm	=	0.20 kN/m ²
- цеметна кошуљица 6 cm	=	1.26 kN/m ²
- PVC фолија		
- полистирен за под 4 cm	=	0.02 kN/m ²
- АБ плоча 18 cm		
- глет маса на лепку	=	0.03 kN/m ²
	g =	1.51 kN/m²
- корисно	p =	1.50 kN/m²

М-к4sp (ходник)

- терацо плочице 1.5 cm	=	0.36 kN/m ²
- грађ. лепак 2.5 cm	=	0.05 kN/m ²
- АБ плоча 18 cm		
- глет маса на лепку	=	0.03 kN/m ²
	g =	0.44 kN/m²
- корисно	p =	2.50 kN/m²

М-к5 (ходник)

- терацо плочице 2.5 cm	=	0.60 kN/m ²
- грађевински лепак 1 cm		
- цем. кошуљица 5.5 cm	=	1.16 kN/m ²
- EPS 2 cm	=	0.01 kN/m ²
- АБ плоча 18 cm		
- глет маса на лепку	=	0.03 kN/m ²
	g =	1.80 kN/m²
- корисно	p =	2.50 kN/m²

М-к1u (соба)

- паркет 2.2 cm	=	0.20 kN/m ²
- цеметна кошуљица 5 cm	=	1.05 kN/m ²
- PVC фолија		
- полистирен плоче 4 cm	=	0.02 kN/m ²
- АБ плоча 18 cm		
- тврда мин. вуна 14 cm	=	0.21 kN/m ²
	g =	1.48 kN/m²
- корисно	p =	1.50 kN/m²

М-к2 (купатило)

- керамичке плочице 0.8 cm	=	0.20 kN/m ²
- грађевински лепак 1 cm		
- хидроизолација 3 mm		
- цем. кошуљица 4- 5 cm	=	1.05 kN/m ²
- PVC фолија		
- полистирен за под 4 cm	=	0.02 kN/m ²
- АБ плоча 18 cm		
- глет маса на лепку	=	0.03 kN/m ²
	g =	1.30 kN/m²
- корисно	p =	1.50 kN/m²

М-к4s (степениште)

- терацо талпе 3 cm	=	0.72 kN/m ²
- грађевински лепак 1 cm		
- АБ газашта (h=17 cm)	=	2.04 kN/m ²
- глет маса на лепку	=	0.03 kN/m ²
	g =	2.79 kN/m²
- корисно	p =	2.50 kN/m²

М-к6 (улаз ветробран)

- кулир плоче на лепку 2.5+1 cm	=	0.70 kN/m ²
- цем. кошуљица 7.5 cm	=	1.58 kN/m ²
- АБ плоча 18 cm		
- камена вуна 8 cm	=	0.12 kN/m ²
	g =	2.40 kN/m²
- корисно	p =	2.50 kN/m²

М-к2u (купатио)

- керамичке плочице 0.8 cm	=	0.20 kN/m ²
- грађевински лепак 1 cm		
- бит. хидроизолација 3 mm		
- цем. кошуљица 4-5 cm	=	1.05 kN/m ²
- PVC фолија		
- полистирен за под 4 cm	=	0.02 kN/m ²
- АБ плоча 18 cm		
- тврда мин. вуна 14 cm	=	0.21 kN/m ²
	g =	1.48 kN/m²
- корисно	p =	1.50 kN/m²

М-к1р (соба)

- паркет 2.2 см	=	0.20 kN/m ²
- цеметна кошуљица 5 см	=	1.05 kN/m ²
- PVC фолија		
- полистирен 4 см	=	0.02 kN/m ²
- АБ плоча 18 см		
- тврда мин. вуна 8 см	=	0.12 kN/m ²
	g =	1.39 kN/m²
- корисно	p =	1.50 kN/m²

М-к3р (кухиња)

- кер. плочице 1 см	=	0.20 kN/m ²
- цем. кошуљица 6 см	=	1.26 kN/m ²
- PVC фолија		
- полистирен 4 см	=	0.02 kN/m ²
- АБ плоча 18 см		
- тврда мин. вуна 8 см	=	0.12 kN/m ²
	g =	1.60 kN/m²
- корисно	p =	1.50 kN/m²

К-Л1а (тераса)

- кер. плочице 0.8 см	=	0.20 kN/m ²
- грађ. лепак 1 см		
- хидроизолација 3 mm		
- цем. кошуљица 4-6 см	=	1.05 kN/m ²
- полист./цем. кош. 3 см	=	0.02 kN/m ²
- АБ плоча 18 см		
- камена вуна 14 см	=	0.21 kN/m ²
- паропропусна фасада на мрежици и лепку 0.4 см	=	0.07 kN/m ²
	g =	1.55 kN/m²
- корисно	p =	2.50 kN/m²

К-Л2

- кулир пл. на лепку 2.5+1 см	=	0.70 kN/m ²
- АБ плоча 12 см		
- шљунак 15 см	=	2.30 kN/m ²
	g =	3.00 kN/m²
- корисно	p =	2.50 kN/m²

М-к2р (купатило)

- кер. плочице 0.8 см	=	0.20 kN/m ²
- грађевински лепак 1 см		
- битуменска хидроизол.		
- цем. кошуљица 4-5 см	=	1.05 kN/m ²
- PVC фолија		
- полистирен за под 4 см	=	0.02 kN/m ²
- АБ плоча 18 см		
- тврда мин. вуна 8 см	=	0.12 kN/m ²
	g =	1.39 kN/m²
- корисно	p =	1.50 kN/m²

К-Л1 (тераса)

- кер. плочице 0.8 см	=	0.20 kN/m ²
- грађ. лепак 1 см		
- хидроизолација 3 mm		
- цем. кошуљица 4-6 см	=	1.05 kN/m ²
- полист./цем. кош. 3 см	=	0.02 kN/m ²
- АБ плоча 18 см		
- камена вуна 3 см	=	0.05
- паропропусна фасада на мрежици и лепку 0.4 см	=	0.07 kN/m ²
	g =	1.39 kN/m²
- корисно	p =	2.50 kN/m²

К-Л1р

- кер. плочице 0.8 см	=	0.20 kN/m ²
- грађ. лепак 1 см		
- хидроизолација 3 mm		
- цем. кошуљица 4-6 см	=	1.05 kN/m ²
- полист./цем. кош. 3 см	=	0.02 kN/m ²
- АБ плоча 18 см		
- камена вуна 8 см	=	0.12 kN/m ²
	g =	1.39 kN/m²
- корисно	p =	2.50 kN/m²

ТР- 1

- цем. кошуљица 5 см	=	1.05 kN/m ²
- АБ плоча 50 см		
	g =	1.05 kN/m²
- корисно	p =	1.50 kN/m²

R-k10 (кров)

- шљунак 16/32 10 cm	=	1.50 kN/m ²
- геотекстил 300 g/m ²	=	0.11 kN/m ²
- XPS полистирен 25 cm	=	0.02 kN/m ²
- танка PE фолија 0.15 mm	=	1.0 ÷ 3.0 kN/m ²
- хидроизолација 9 mm	=	0.03 kN/m ²
- слој за нагиб мр. бетон 4-12 cm	=	0.03 kN/m ²
- АБ плоча 18 cm	=	0.03 kN/m ²
- глет маса на лепку	=	0.03 kN/m ²
	g₁ =	2.66 kN/m²
	g₂ =	4.66 kN/m²
	p =	1.50 kN/m²
- корисно		

R-k10d (кров)

- кер. плочице 0.8 cm	=	0.20 kN/m ²
- грађ. лепак 1 cm	=	
- хидроизолација 3 mm	=	1.05 kN/m ²
- цем. кошуљица мин 4 cm	=	0.11 kN/m ²
- танка PE фолија 0.15 mm	=	0.11 kN/m ²
- XPS полистирен 25 cm	=	0.05 kN/m ²
- парна брана 3 mm	=	0.07 kN/m ²
- АБ плоча 18 cm	=	0.07 kN/m ²
- камена вуна 3 cm	=	0.07 kN/m ²
- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
	g =	1.48 kN/m²
- корисно	p =	1.50 kN/m²

Фасадни зидовиспратна висина $h_{sp} = 2.71m$ **FZ-10**

- шупља фас. опека 12 cm	=	1.70 kN/m ²
- ваздух 2 cm	=	0.15 kN/m ²
- тврда мин. вуна 10 cm	=	0.03 kN/m ²
- АБ зид 20 cm	=	0.03 kN/m ²
- глет маса на лепку	=	0.03 kN/m ²
	g =	1.88 kN/m²
	g' =	5.09 kN/m'

FZ-10b

- шупља фас. опека 12 cm	=	1.70 kN/m ²
- ваздух 4 cm	=	0.15 kN/m ²
- тврда мин. вуна 10 cm	=	0.03 kN/m ²
- АБ зид 20 cm	=	0.03 kN/m ²
- глет маса на лепку	=	0.03 kN/m ²
	g =	1.88 kN/m²
	g' =	5.09 kN/m'

FZ-10c

- шупља фас. опека 12 cm	=	1.70 kN/m ²
- ваздух 6 cm	=	0.15 kN/m ²
- тврда мин. вуна 10 cm	=	0.03 kN/m ²
- АБ зид 20 cm	=	0.03 kN/m ²
- глет маса на лепку	=	0.03 kN/m ²
	g =	1.88 kN/m²
	g' =	5.09 kN/m'

FZ-10d

- шупља фас. опека 12 cm	=	1.70 kN/m ²
- ваздух 8 cm	=	0.15 kN/m ²
- тврда мин. вуна 10 cm	=	0.03 kN/m ²
- АБ зид 20 cm	=	0.03 kN/m ²
- глет маса на лепку	=	0.03 kN/m ²
	g =	1.88 kN/m²
	g' =	5.09 kN/m'

FZ-11a

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 12 cm	=	0.18 kN/m ²
- АБ зид 20 cm	=	0.20 kN/m ²
- кер. пл. на лепку 0.8 cm	=	0.20 kN/m ²
	g =	0.45 kN/m²
	g' =	1.22 kN/m'

FZ-11

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 12 cm	=	0.18 kN/m ²
- АБ зид 20 cm	=	0.03 kN/m ²
- глет маса на лепку	=	0.03 kN/m ²
	g =	0.28 kN/m²
	g' =	0.76 kN/m'

FZ-11d

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 14 cm	=	0.21 kN/m ²
- АБ зид 20 cm	=	0.20 kN/m ²
- кер. пл. на лепку 0.8 cm	=	0.20 kN/m ²
	g =	0.48 kN/m²
	g' =	1.30 kN/m'

FZ-11b

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 14 cm	=	0.21 kN/m ²
- АБ зид 20 cm	=	0.03 kN/m ²
- глет маса на лепку	=	0.03 kN/m ²
	g =	0.31 kN/m²
	g' =	0.84 kN/m'

FZ-11e

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 16 cm	=	0.24 kN/m ²
- АБ зид 20 cm	=	0.03 kN/m ²
- глет маса на лепку	=	<u>0.34 kN/m²</u>
g =		0.92 kN/m'

FZ-12

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 12 cm	=	0.18 kN/m ²
- АБ зид 18 cm	=	0.03 kN/m ²
- глет маса на лепку	=	<u>0.28 kN/m²</u>
g =		0.76 kN/m'

FZ-15a

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 12 cm	=	0.18 kN/m ²
- АБ зид 15 cm	=	0.03 kN/m ²
g =		0.25 kN/m²
g' =		0.68 kN/m'

FZ-17

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 5 cm	=	0.08 kN/m ²
- АБ зид 20 cm	=	0.03 kN/m ²
- глет маса на лепку	=	<u>0.18 kN/m²</u>
g =		0.47 kN/m'

FZ-20a

- шупља фас. опека 12 cm	=	0.00 kN/m ²
- ваздух 4 cm	=	0.15 kN/m ²
- тврда мин. вуна 10 cm	=	1.80 kN/m ²
- опекарски блок са хор. шупљинама 19 cm	=	0.38 kN/m ²
- малтер 2 cm	=	<u>2.33 kN/m²</u>
g =		6.31 kN/m'

+ опт. од фас. опеке
дато уз прор. фас. гредица

FZ-12a

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 12 cm	=	0.18 kN/m ²
- АБ зид 18 cm	=	0.03 kN/m ²
- кер. пл. на лепку 0.8 cm	=	<u>0.45 kN/m²</u>
g =		1.22 kN/m'

FZ-15

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 16 cm	=	0.24 kN/m ²
- АБ зид 15 cm	=	0.03 kN/m ²
- глет маса на лепку	=	<u>0.34 kN/m²</u>
g =		0.92 kN/m'

FZ-16

- проф. поц. пластиф. челични лим 0.8 mm	=	0.05 kN/m ²
- паропропусна-водонепропусна фолија (+дупло лепљена трака)	=	0.18 kN/m ²
- камена вуна 12 cm	=	1.80 kN/m ²
- опекарски блок са хор. шупљинама 19 cm	=	0.03 kN/m ²
- АБ зид 20 cm	=	<u>2.06 kN/m²</u>
- глет маса на лепку	=	5.58 kN/m'

FZ-20

- шупља фас. опека 12 cm	=	0.00 kN/m ²
- ваздух 2 cm	=	0.15 kN/m ²
- тврда мин. вуна 10 cm	=	1.80 kN/m ²
- опекарски блок са хор. шупљинама 19 cm	=	0.38 kN/m ²
- малтер 2 cm	=	<u>2.33 kN/m²</u>
g =		6.31 kN/m'

+ опт. од фас. опеке
дато уз прор. фас. гредица

FZ-20b

- шупља фас. опека 12 cm	=	0.00 kN/m ²
- ваздух 8 cm	=	0.15 kN/m ²
- тврда мин. вуна 10 cm	=	1.80 kN/m ²
- опекарски блок са хор. шупљинама 19 cm	=	0.38 kN/m ²
- малтер 2 cm	=	<u>2.33 kN/m²</u>
g =		6.31 kN/m'

+ опт. од фас. опеке
дато уз прор. фас. гредица

FZ-21a

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 10 cm	=	0.15 kN/m ²
- опекарски блок са хор. шупљинама 19 cm	=	1.80 kN/m ²
- малтер 2 cm	=	0.38 kN/m ²
- кер. плочице на лепку	=	0.20 kN/m ²
g	=	2.60 kN/m²
g'	=	7.05 kN/m'

FZ-22a

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 16 cm	=	0.24 kN/m ²
- опекарски блок са хор. шупљинама 19 cm	=	1.80 kN/m ²
- малтер 2 cm	=	0.38 kN/m ²
g	=	2.49 kN/m²
g'	=	6.75 kN/m'

FZ-24a

- проф. поц. пластиф. челични лим 0.8 mm	=	0.05 kN/m ²
- паропропусна-водонепропусна фолија (+дупло лепљена трака)	=	0.15 kN/m ²
- камена вуна 10 cm	=	0.15 kN/m ²
- опекарски блок са хор. шупљинама 19 cm	=	1.80 kN/m ²
- малтер 2 cm	=	0.38 kN/m ²
g	=	2.38 kN/m²
g'	=	6.45 kN/m'

SZ- 1a

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 12 cm	=	0.18 kN/m ²
- АБ зид 20 cm	=	
- камена вуна 5 cm	=	0.08 kN/m ²
- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
g	=	0.40 kN/m²
g'	=	1.07 kN/m'

FZ-21

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 10 cm	=	0.15 kN/m ²
- опекарски блок са хор. шупљинама 19 cm	=	1.80 kN/m ²
- малтер 2 cm	=	0.38 kN/m ²
g	=	2.40 kN/m²
g'	=	6.50 kN/m'

FZ-22

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 12 cm	=	0.18 kN/m ²
- опекарски блок са хор. шупљинама 19 cm	=	1.80 kN/m ²
- малтер 2 cm	=	0.38 kN/m ²
g	=	2.43 kN/m²
g'	=	6.59 kN/m'

FZ-24

- проф. поц. пластиф. челични лим 0.8 mm	=	0.05 kN/m ²
- паропропусна-водонепропусна фолија (+дупло лепљена трака)	=	0.18 kN/m ²
- камена вуна 12 cm	=	0.18 kN/m ²
- опекарски блок са хор. шупљинама 19 cm	=	1.80 kN/m ²
- малтер 2 cm	=	0.38 kN/m ²
g	=	2.41 kN/m²
g'	=	6.53 kN/m'

SZ- 3

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 5 cm	=	0.08 kN/m ²
- опекарски блок са хор. шупљинама 19 cm	=	1.80 kN/m ²
- камена вуна 5 cm	=	0.08 kN/m ²
- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
g	=	2.10 kN/m²
g'	=	5.69 kN/m'

Унутрашњи зидови

спратна висина $h_{sp}=2.71m$

UZ-11 (стан-ходник)

- глет маса на лепку	=	0.03 kN/m ²
- АБ зид 18 см	=	0.12 kN/m ²
- тврда мин. вуна 8 см	=	0.13 kN/m ²
- гипс карт. плоче 1.25 см	=	
g =		0.28 kN/m²
g' =		0.76 kN/m'

UZ-21 (стан-ходник)

- малтер 2 см	=	0.38 kN/m ²
- опекарски блок са хор.		
шупљинама 19 см	=	1.80 kN/m ²
- тврда мин. вуна 8 см	=	0.12 kN/m ²
- гипс карт. плоче 1.25 см	=	0.13 kN/m ²
g =		2.43 kN/m²
g' =		6.59 kN/m'

UZ-22 (стан-ходник)

- кер. пл. на лепку 0.8 см	=	0.20 kN/m ²
- малтер 2 см	=	0.38 kN/m ²
- пуна опека на кант 7 см	=	1.20 kN/m ²
- вен. канал 22 см		
- пуна опека 12 см	=	2.03 kN/m ²
- тврда мин. вуна 8 см	=	0.12 kN/m ²
- ваздух 6 см		
- гипс карт. плоче 1.25 см	=	0.13 kN/m ²
g =		4.06 kN/m²
g' =		11.00 kN/m'

UZ-32 (кухиња)

- малтер 2 см	=	0.38 kN/m ²
- опекарски шупљи		
преградни блок 12 см	=	1.15 kN/m ²
- малтер 2 см	=	0.38 kN/m ²
g =		1.91 kN/m²
g' =		5.18 kN/m'

UZ-20

- малтер 2 см	=	0.38 kN/m ²
- опекарски блок са хор.		
шупљинама 19 см	=	1.8 kN/m ²
- малтер 2 см	=	0.38 kN/m ²
g =		2.56 kN/m²
g' =		6.94 kN/m'

UZ-21a (стан-ходник)

- кер. пл. на лепку 0.8 см	=	0.20 kN/m ²
- малтер 2 см	=	0.38 kN/m ²
- опекарски блок са хор.		
шупљинама 19 см	=	1.80 kN/m ²
- тврда мин. вуна 8 см	=	0.12 kN/m ²
- гипс карт. плоче 1.25 см	=	0.13 kN/m ²
g =		2.63 kN/m²
g' =		7.13 kN/m'

UZ-31 (купатило)

- кер. пл. на лепку 0.8 см	=	0.20 kN/m ²
- малтер 2 см	=	0.38 kN/m ²
- опекарски шупљи		
преградни блок 12 см	=	1.15 kN/m ²
- малтер 2 см	=	0.38 kN/m ²
g =		2.11 kN/m²
g' =		5.72 kN/m'

UZ-41

- гипс карт. плоче 1.25 см	=	0.13 kN/m ²
- минерална вуна 7.5 см	=	0.12 kN/m ²
- гипс карт. плоче 1.25 см	=	0.13 kN/m ²
g =		0.38 kN/m²
g' =		1.03 kN/m'

Назидци

назидци $h_1=1.56m$ / $h_1=1.46m$ / $h_3=0.56m$

N-11

- паропропусна фасада на		
мрежици и лепку 0.4 см	=	0.07 kN/m ²
- камена вуна 12 см	=	0.18 kN/m ²
- АБ зид 12 см	=	2.88 kN/m ²
- хидроизол. 4+5=9 mm	=	0.02 kN/m ²
g =		3.15 kN/m²
g₃' =		1.76 kN/m'

N-12

- паропропусна фасада на		
мрежици и лепку 0.4 см	=	0.07 kN/m ²
- камена вуна 12 см	=	0.18 kN/m ²
- АБ зид 12 см	=	2.88 kN/m ²
- камена вуна 3 см	=	0.05 kN/m ²
- паропропусна фасада на		
мрежици и лепку 0.4 см	=	0.07 kN/m ²
g =		3.25 kN/m²
g₁' =		5.07 kN/m'
g₂' =		4.75 kN/m'
g₃' =		1.82 kN/m'

N-12b

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 10 cm	=	0.15 kN/m ²
- АБ зид 12 cm	=	2.88 kN/m ²
- камена вуна 3 cm	=	0.05 kN/m ²
- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
g	=	3.22 kN/m²
g₁'	=	5.02 kN/m'
g₂'	=	4.70 kN/m'

N-15

- маска од поцинкованог пласт. челич. лима 0.8 mm	=	0.07 kN/m ²
- камена вуна 3 cm	=	0.05 kN/m ²
- АБ зид 12 cm	=	2.88 kN/m ²
- хидроизол. 3 mm	=	0.02 kN/m ²
g	=	3.02 kN/m²
g₃'	=	1.69 kN/m'

Ограде

ограде h=0.78m

OG-10

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 3 cm	=	0.05 kN/m ²
- АБ зид 12 cm	=	2.88 kN/m ²
g	=	3.00 kN/m²
g'	=	2.34 kN/m'

OG-12

- проф. поц. пластиф. челични лим 0.8 mm	=	0.05 kN/m ²
- ваздух 3 cm	=	
- АБ зид 12 cm	=	2.88 kN/m ²
- хидроизол. 3 mm	=	0.02 kN/m ²
g	=	2.95 kN/m²
g'	=	2.30 kN/m'

Сабирне вент. цев

спољ. мера 22x35.5 cm
 h₁= 26.95 m - из подрума
 h₂= 24.25 m - из подрума
 h₃= 21.50 m - из локала
 h₄= 21.30 m - са првог спрата
 h₅= 18.60 m - са првог спрата

Једноструки димњак

спољ. мера 40x40 cm
 h₁= 26.95 m - из подрума
 h₂= 24.25 m - из подрума
 h₃= 21.30 m - са првог спрата
 h₄= 18.60 m - са првог спрата

N-12c

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 14 cm	=	0.21 kN/m ²
- АБ зид 12 cm	=	2.88 kN/m ²
- камена вуна 3 cm	=	0.05 kN/m ²
- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
g	=	3.28 kN/m²
g₁'	=	5.12 kN/m'

OG-11

- паропропусна фасада на мрежици и лепку 0.4 cm	=	0.07 kN/m ²
- камена вуна 3 cm	=	0.05 kN/m ²
- АБ зид 12 cm	=	2.88 kN/m ²
- хидроизол. 3 mm	=	0.02 kN/m ²
g	=	3.02 kN/m²
g'	=	2.36 kN/m'

OG-13

- шупља фас. опека 12 cm	=	1.70 kN/m ²
- ваздух 2 cm	=	
- АБ зид 12 cm	=	2.88 kN/m ²
g	=	4.58 kN/m²
g'	=	3.57 kN/m'

$$g' = 0.55 \text{ kN/m'}$$

$$P_1 = \text{#### kN}$$

$$P_2 = \text{#### kN}$$

$$P_3 = \text{#### kN}$$

$$P_4 = \text{#### kN}$$

$$P_5 = \text{#### kN}$$

$$g' = 1.03 \text{ kN/m'}$$

$$P_1 = \text{#### kN}$$

$$P_2 = \text{#### kN}$$

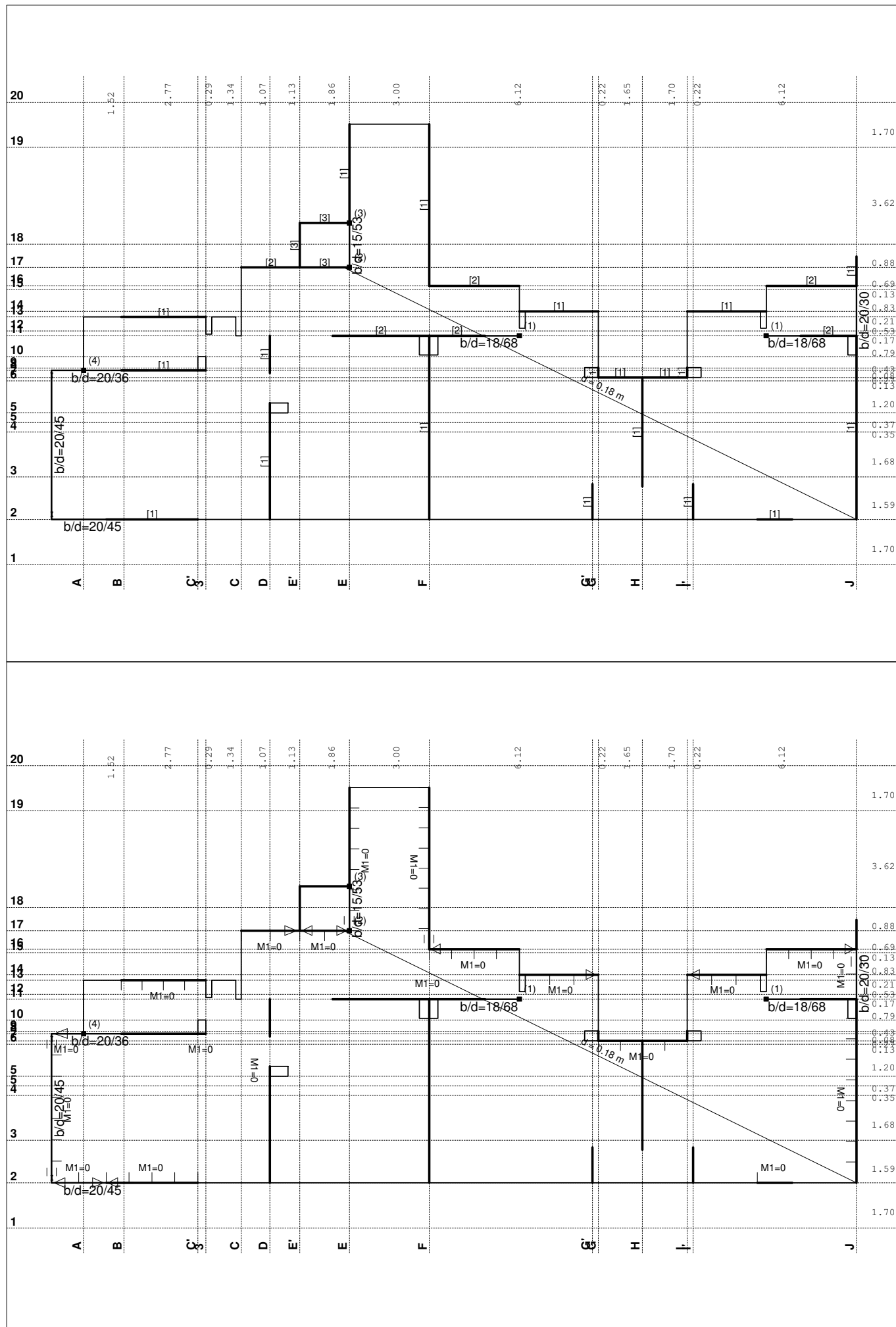
$$P_3 = \text{#### kN}$$

$$P_4 = \text{#### kN}$$

Фасадне гредице

FZ20 - h= 2.69m	g = 2.33 kN/m ²	g' = 6.00 kN/m'
FZ15 - h= 0.78m	g = 0.34 kN/m ²	g' = 0.27 kN/m'
FZ10 - h= 2.69m	g = 1.88 kN/m ²	g' = 5.06 kN/m'

POS 800+ - KONSTRUKCIJA KROVA



Lista slučajeva opterećenja

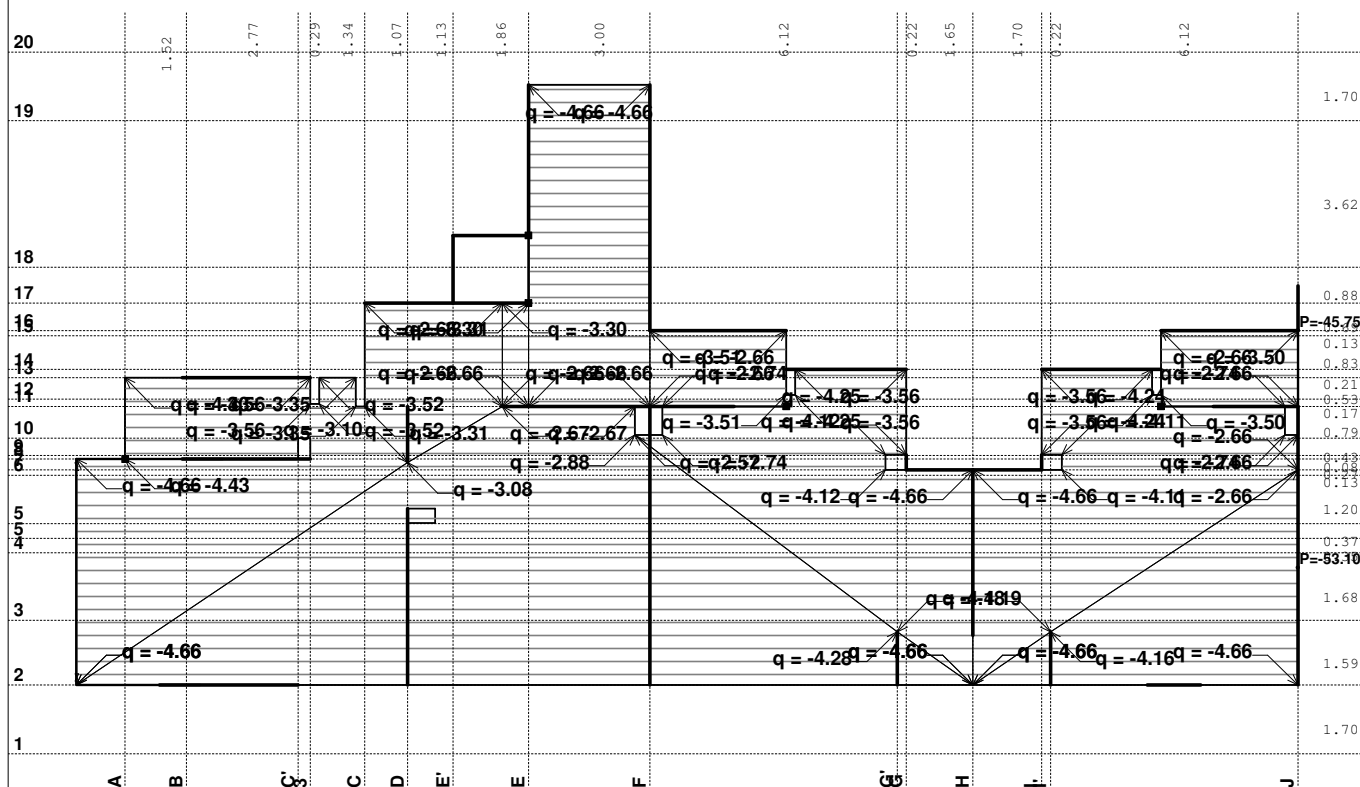
LC	Naziv
1	g (g)
2	p

Opt. 1: g (g)

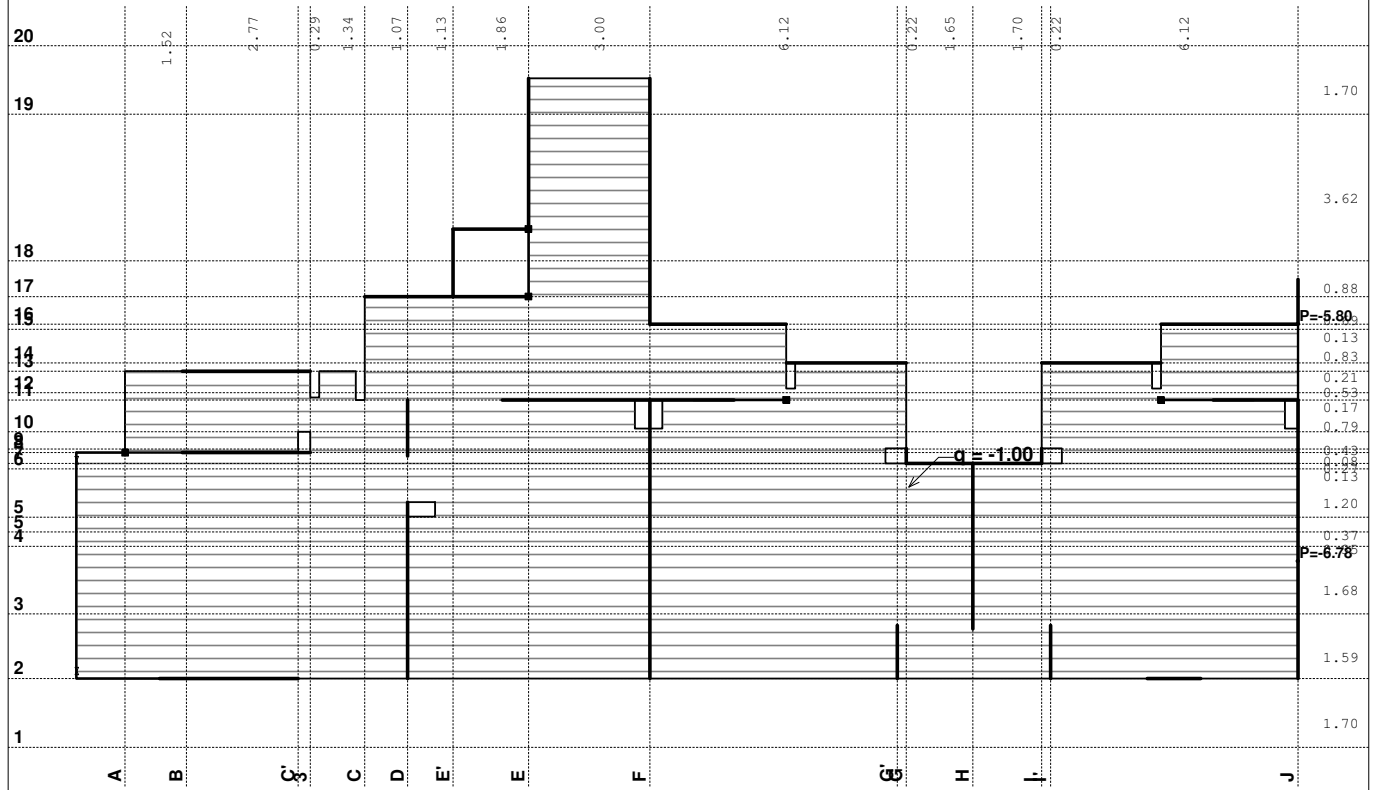
LC	Naziv
3	Komb.: 1.6xl+1.8xII
4	Komb.: 3.5xl+II



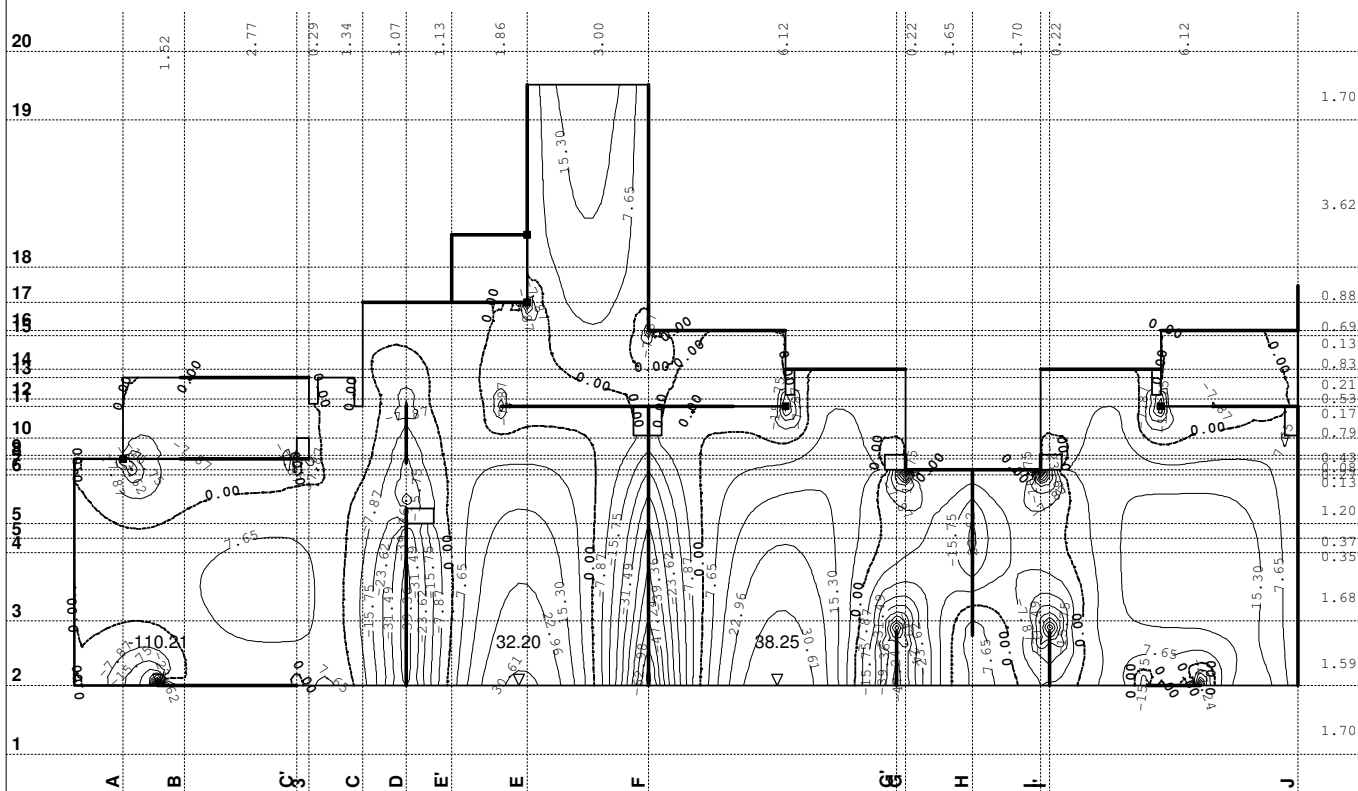
Opt. 1: g (g)



Opt. 2: p

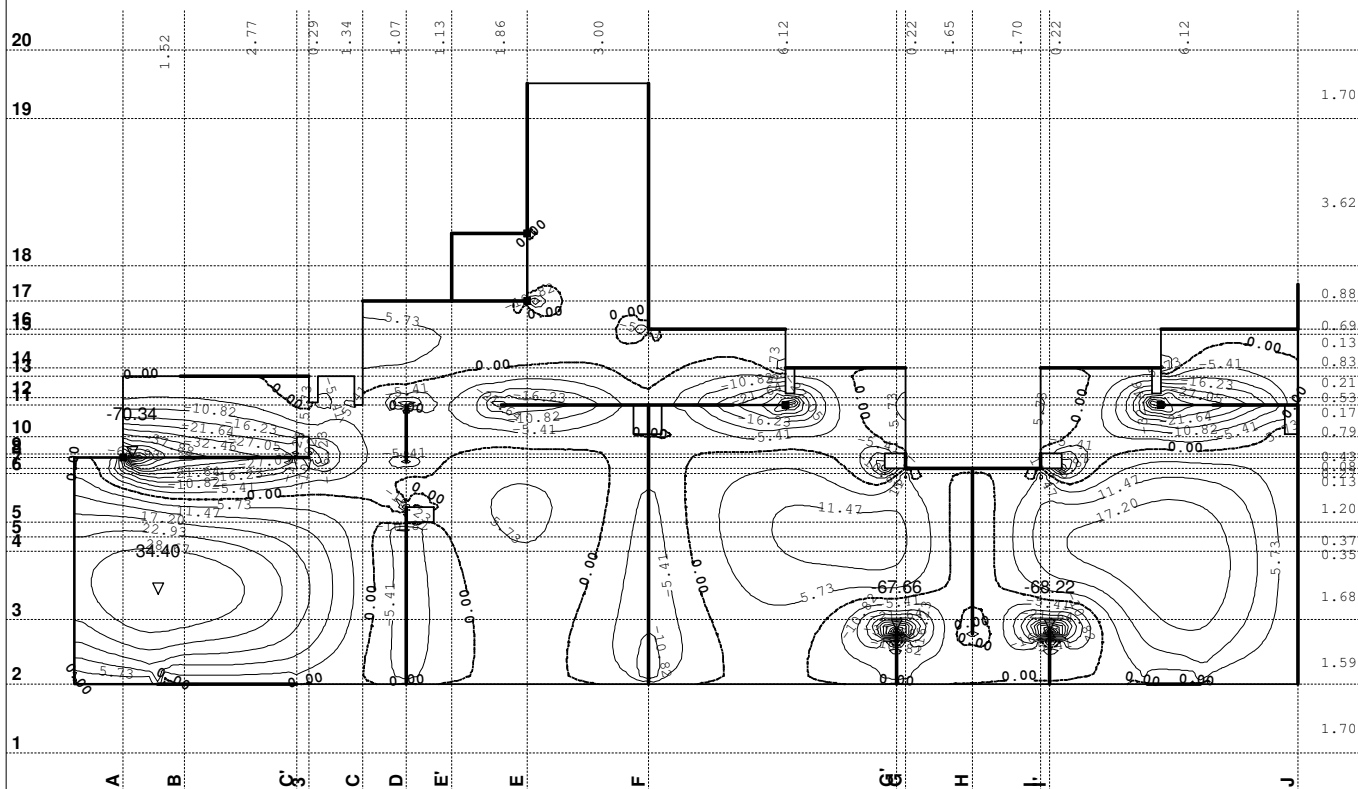


Opt. 3: 1.6xl+1.8xll

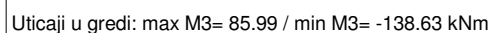
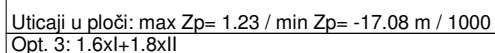


Utjecaji u ploči: max M_x = 38.25 / min M_x = -110.21 kNm/m

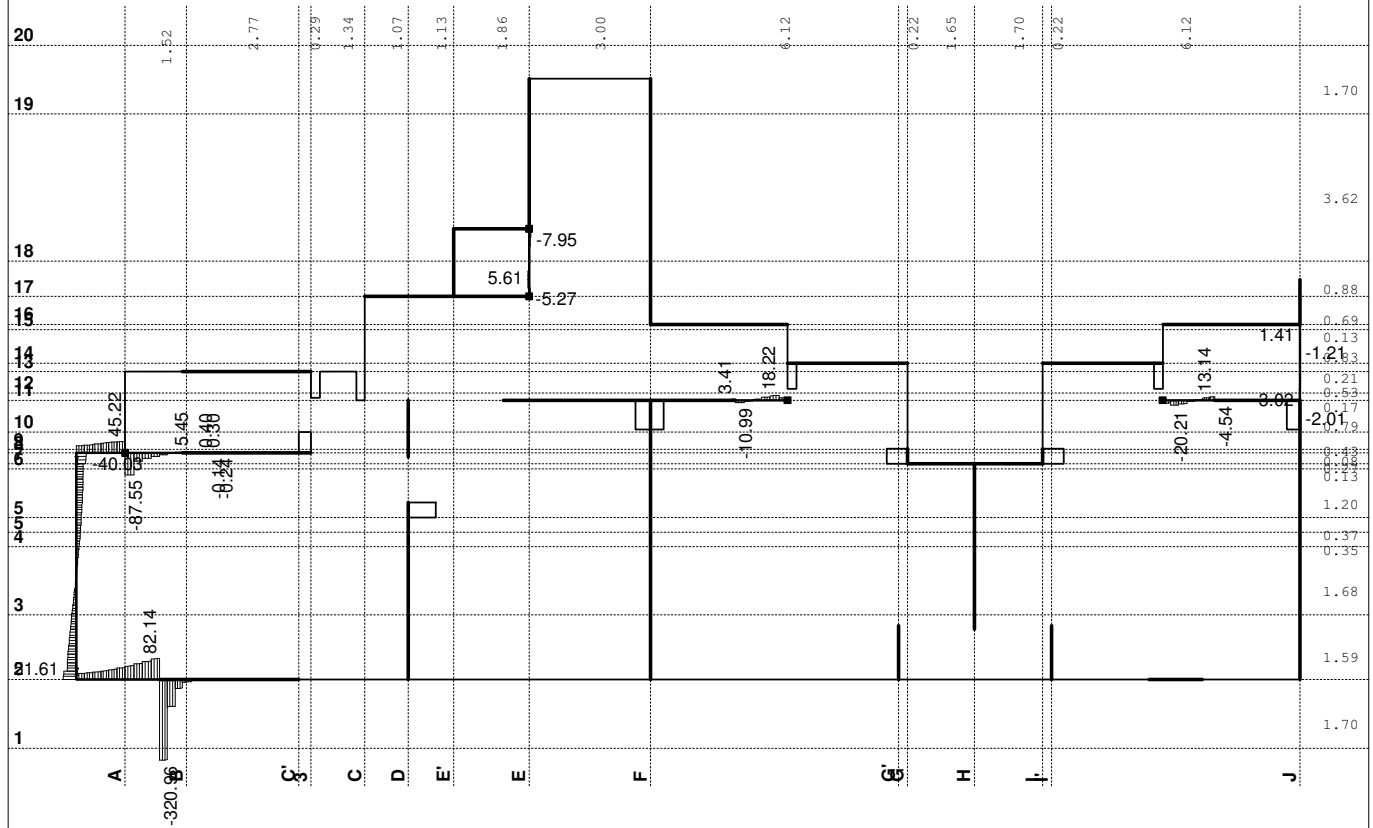
Opt. 3: 1.6xl+1.8xll



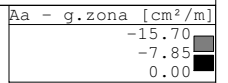
Utjecaji u ploči: max M_y = 34.40 / min M_y = -70.34 kNm/m



Opt. 3: 1.6xl+1.8xII



Aa - d.zona [cm ² /m]
0.00
2.52
5.03



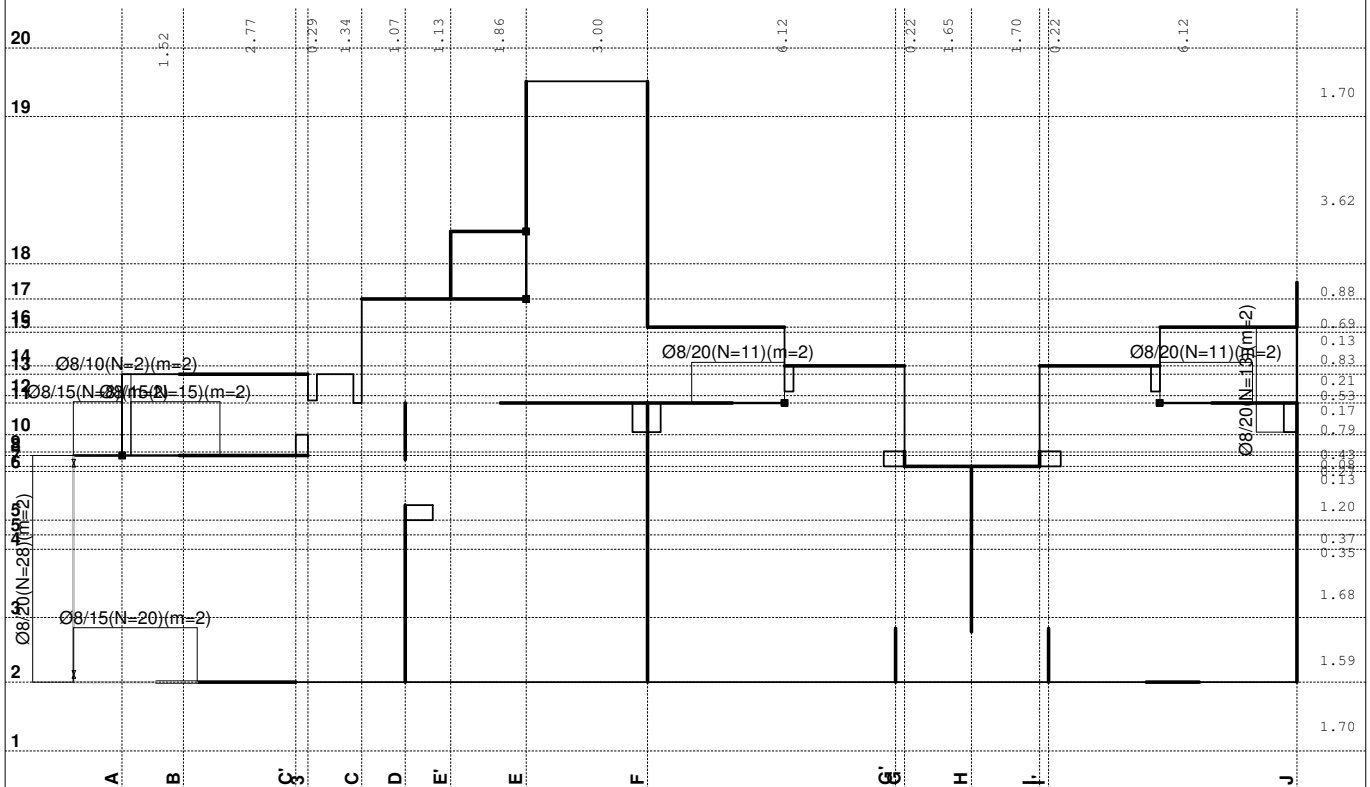
Aa - g.zona

Usvojena armatura
PBAB 87, MB 30, MA 500/600



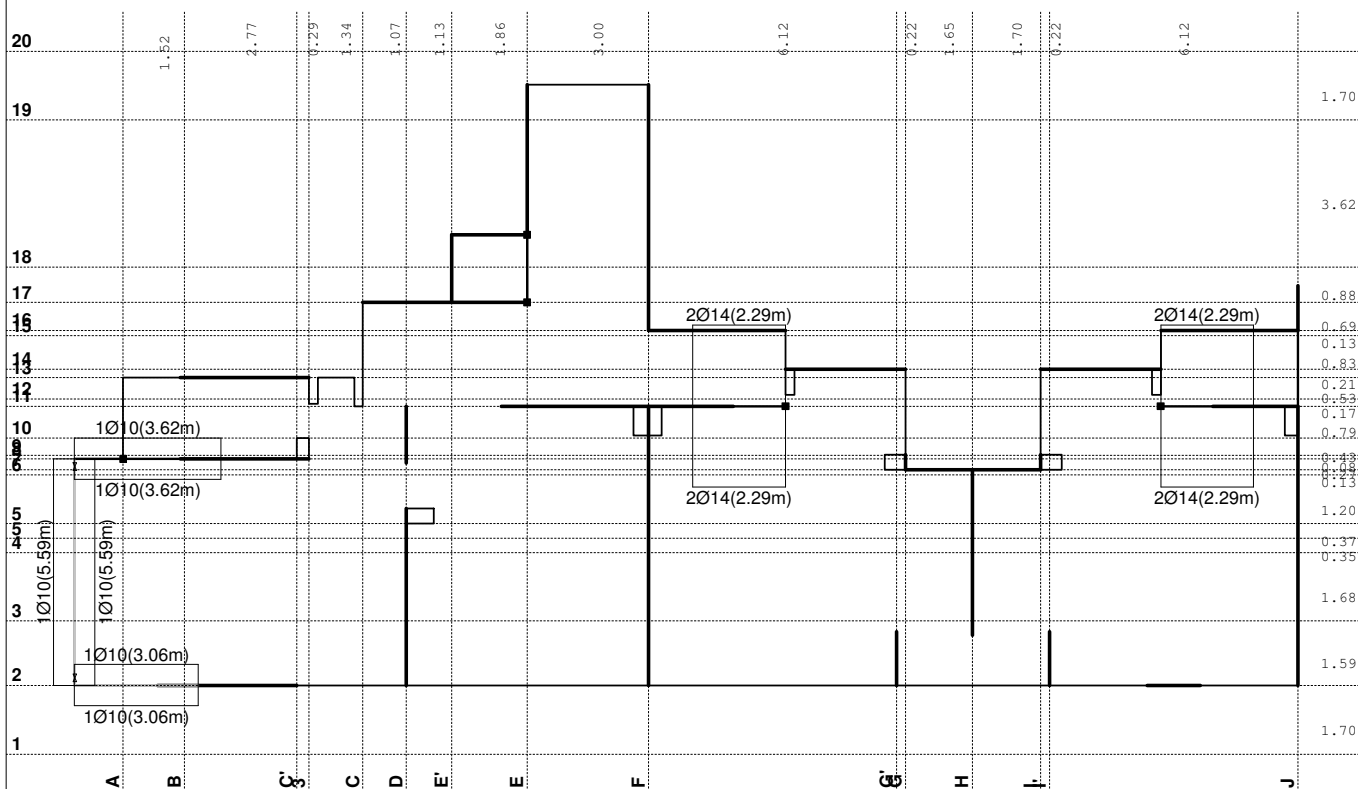
Armatura u gredama: Aa2/Aa1

Usvojena armatura
PBAB 87, MB 30, MA 500/600



Armatura u gredama: Aa,uz

Usvojena armatura
PBAB 87, MB 30, MA 500/600

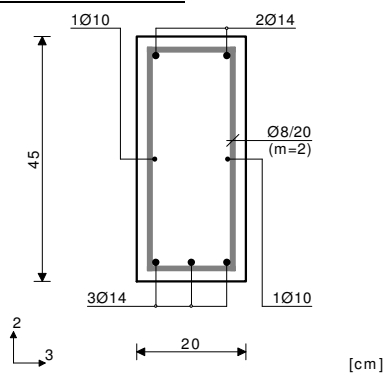


Armatura u gredama: Aa3/Aa4

Greda 526-2

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 2.97m



T2u = 0.52 kN
M1u = 3.31 kNm
M3u = 85.99 kNm

$\epsilon_b/\epsilon_a = -2.372/10.000 \text{ ‰}$

Aa1 = 4.59 + 0.09' = 4.68 cm²

Aa2 = 0.00 + 0.09' = 0.09 cm²

Aa3 = 0.00 + 0.21' = 0.21 cm²

Aa4 = 0.00 + 0.21' = 0.21 cm²

Aa,uz = 0.21 cm²/m (m=2)

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

$\tau_y = 1.44 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$

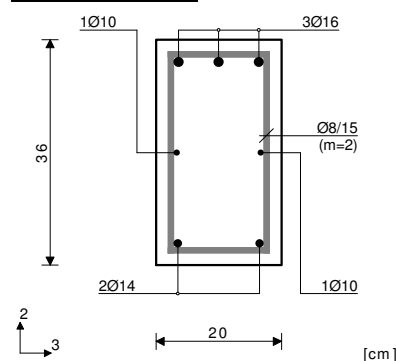
$\tau_z = 1.43 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$

Procenat armiranja: 1.03%

*) - dodatna podužna armatura za prijem torzije.

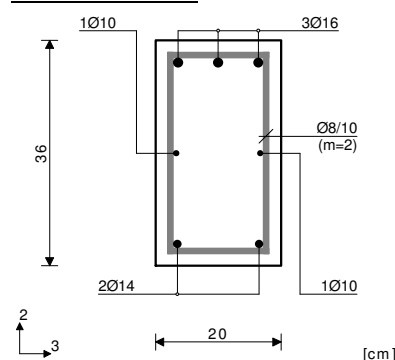
Greda 526-1124

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.20m

T2u = 45.22 kN
M1u = -0.02 kNm
M3u = -75.29 kNm

$\epsilon_b/\epsilon_a = -3.229/10.000 \%$
Aa1 = 0.00 cm²
Aa2 = 5.16 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]
 $\tau_y = 0.79 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.01 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.48%

Presek 1-1 x = 1.20m

T2u = -87.55 kN
M1u = 3.81 kNm
M3u = -65.84 kNm

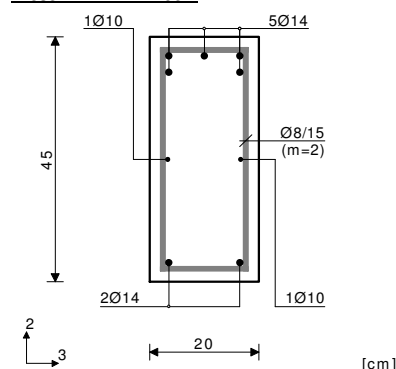
$\epsilon_b/\epsilon_a = -2.808/10.000 \%$
Aa1 = 0.00 + 0.13' = 0.13 cm²
Aa2 = 4.45 + 0.13' = 4.59 cm²
Aa3 = 0.00 + 0.24' = 0.24 cm²
Aa4 = 0.00 + 0.24' = 0.24 cm²
Aa,uz = 3.83 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/10(m=2) = 5.03 cm²/m]

$\tau_y = 3.57 \text{ MPa} < 5\tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 2.07 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.48%

*) - dodatna podužna armatura za prijem torzije.

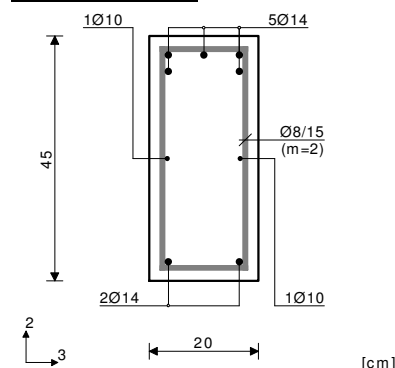
Greda 2-196

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 2.06m

T2u = 82.14 kN
M3u = -138.63 kNm

$\epsilon_b/\epsilon_a = -3.500/7.959 \%$
Aa1 = 0.00 cm²
Aa2 = 8.04 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.17 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]
 $\tau_y = 1.16 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.37%

Presek 1-1 x = 2.06m

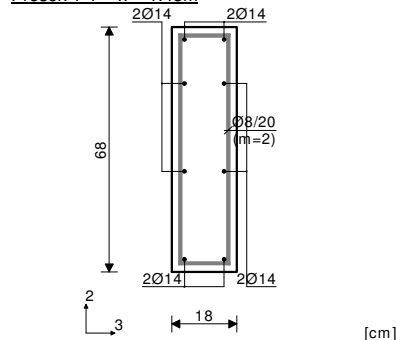
T2u = -320.96 kN
M3u = -125.27 kNm

$\epsilon_b/\epsilon_a = -3.500/9.378 \%$
Aa1 = 0.00 cm²
Aa2 = 7.15 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 9.03 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

$\tau_y = 4.51 \text{ MPa} < 5\tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.37%

Greda 3997-4716

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.43m

T2u = -3.74 kN
M1u = 2.40 kNm
M3u = 2.52 kNm

$\epsilon_b/\epsilon_a = -0.197/10.000 \%$
Aa1 = 0.08 + 0.04' = 0.13 cm²
Aa2 = 0.00 + 0.04' = 0.04 cm²
Aa3 = 0.00 + 0.17' = 0.17 cm²
Aa4 = 0.00 + 0.17' = 0.17 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]
 $\tau_y = 0.94 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.90 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.01%

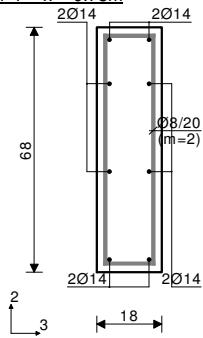
*) - dodatna podužna armatura za prijem torzije.

Greda 6714-6976

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 0.78\text{m}$ 

[cm]

$$\begin{aligned} T2_u &= 1.60 \text{ kN} \\ M1_u &= -0.93 \text{ kNm} \\ M3_u &= 3.81 \text{ kNm} \end{aligned}$$

$$\varepsilon_b/\varepsilon_a = -0.244/10.000 \text{ ‰}$$

$$Aa1 = 0.13 + 0.00' = 0.13 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.00' = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.07' = 0.07 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.07' = 0.07 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.37 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.35 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.01%

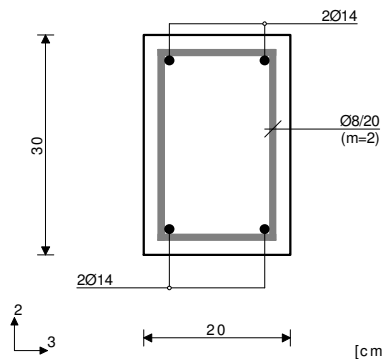
*) - dodatna podužna armatura za prijem torzije.

Greda 7012-7156

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 1.21\text{m}$ 

[cm]

$$\begin{aligned} T2_u &= 1.23 \text{ kN} \\ M3_u &= -0.89 \text{ kNm} \end{aligned}$$

$$\varepsilon_b/\varepsilon_a = -0.253/10.000 \text{ ‰}$$

$$Aa1 = 0.00 \text{ cm}^2$$

$$Aa2 = 0.07 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

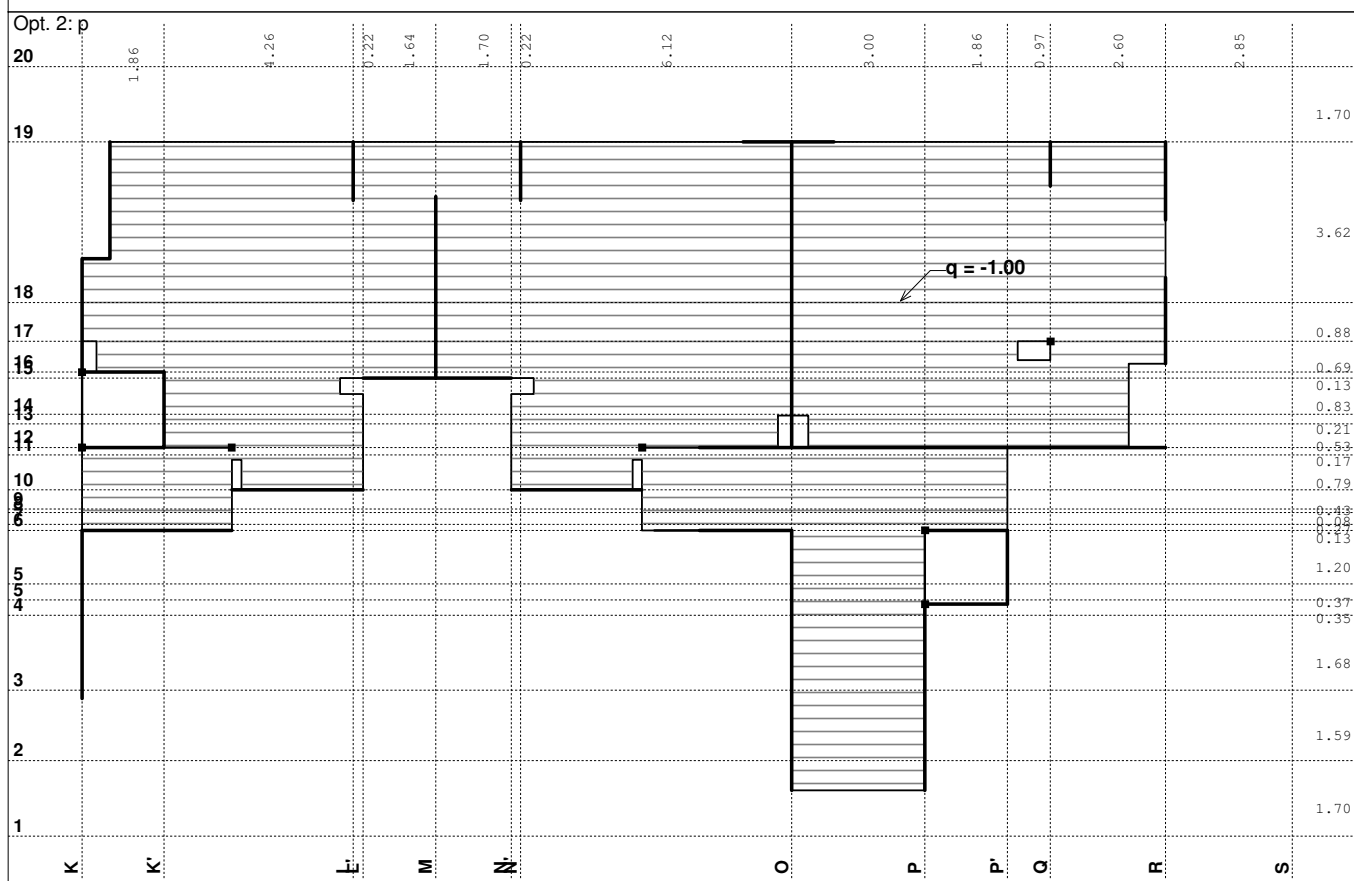
$$Aa_{uz} = 0.00 \text{ cm}^2/\text{m} \quad (m=2)$$

[Usvojeno $Aa_{uz} = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.03 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.03%

Opt. 1: g (g)

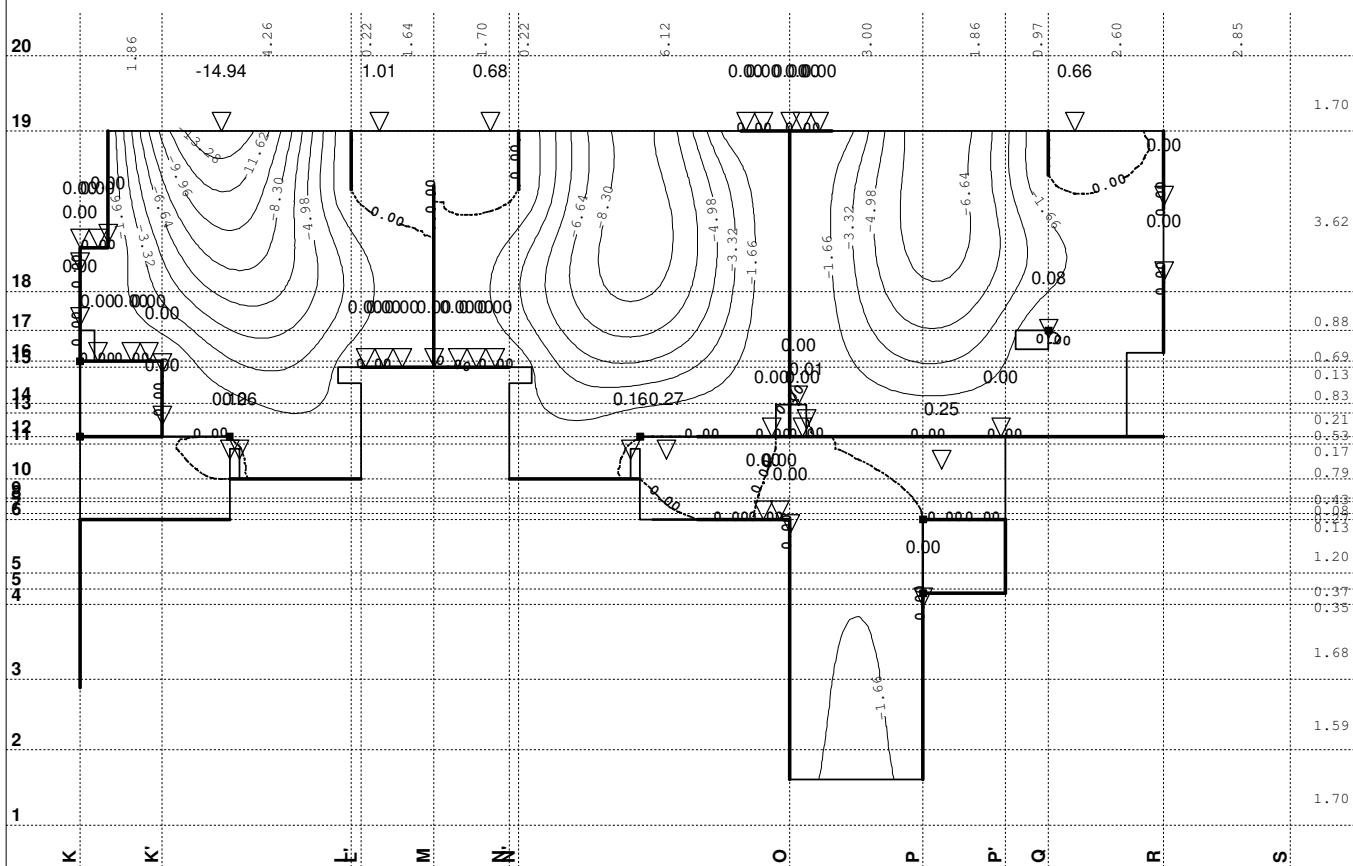


LC	Naziv
1	g (g)
2	p

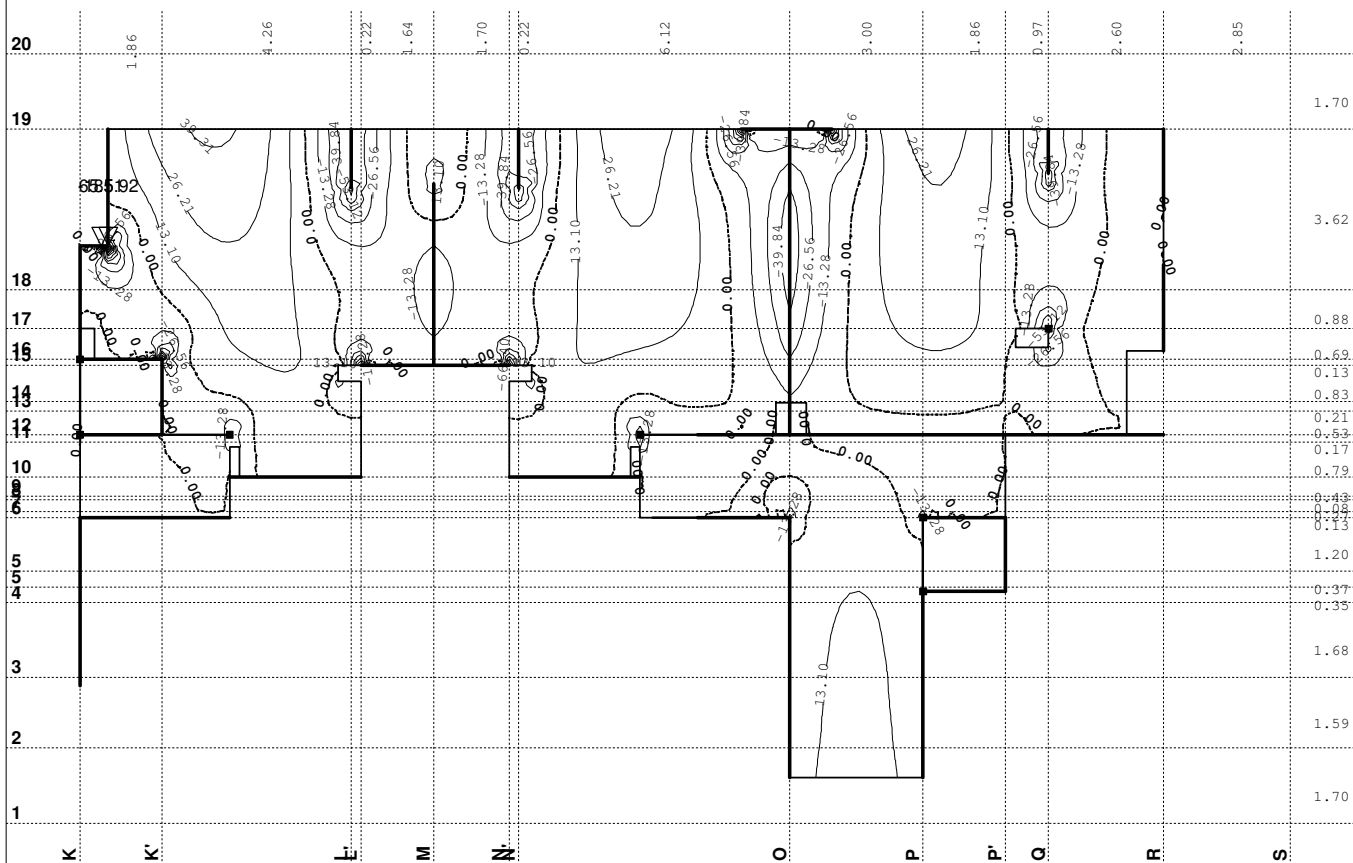
LC	Naziv
3	Komb.: 1.6xI+1.8xII
4	Komb.: 3.5xI+II

Statički proračun

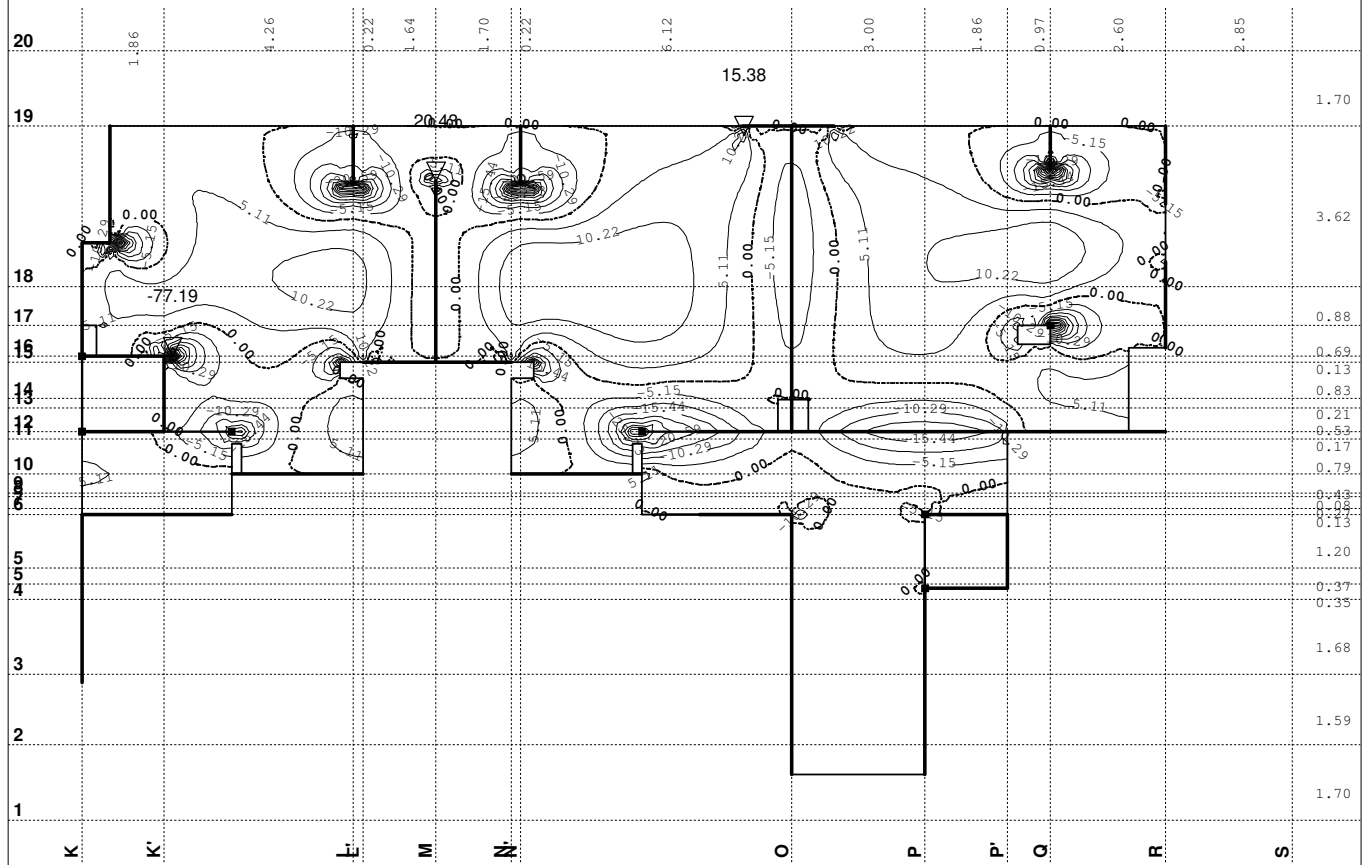
Opt. 4: 3.5xl+II


 Uticaji u ploči: max $Z_p = 1.01$ / min $Z_p = -14.94$ m / 1000

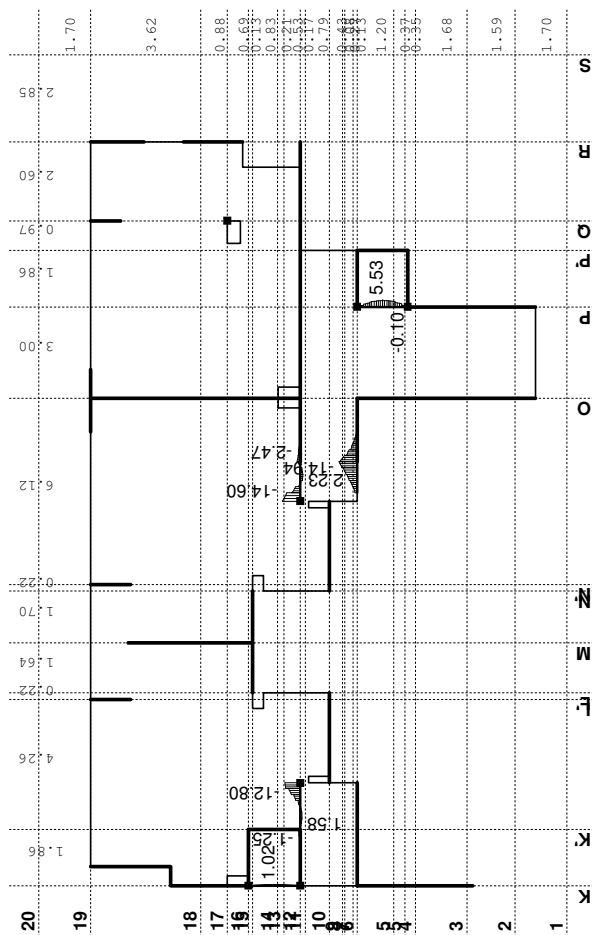
Opt. 3: 1.6xl+1.8xII


 Uticaji u ploči: max $M_x = 65.51$ / min $M_x = -185.92$ kNm/m

Opt. 3: 1.6xl+1.8xII

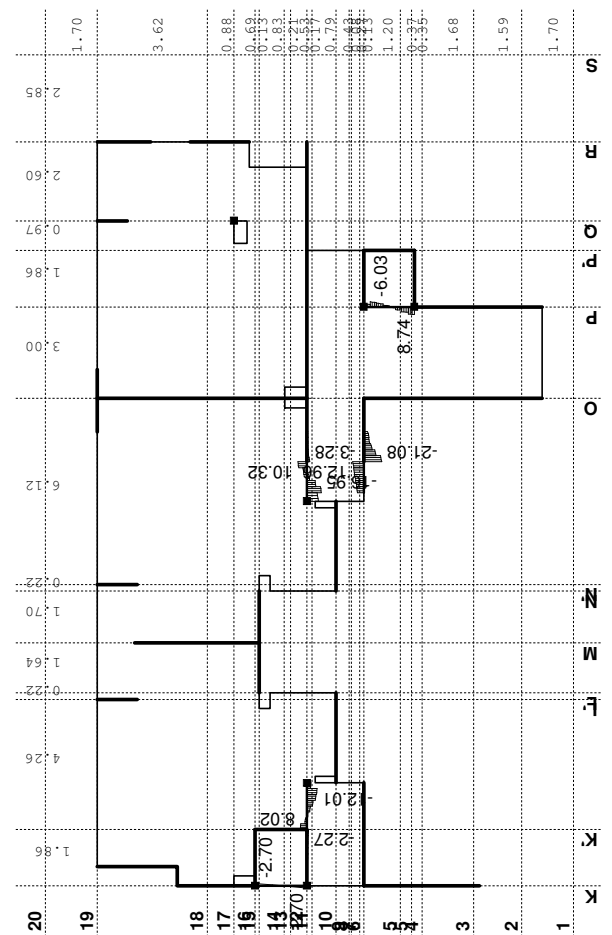


Utjecaji u ploči: max $M_y = 20.43$ / min $M_y = -77.19$ kNm/m
Opt. 3: 1.6xl+1.8xII



Utjecaji u gredi: max $M_3 = 5.53$ / min $M_3 = -14.94$ kNm

Opt. 3: 1.6xl+1.8xII

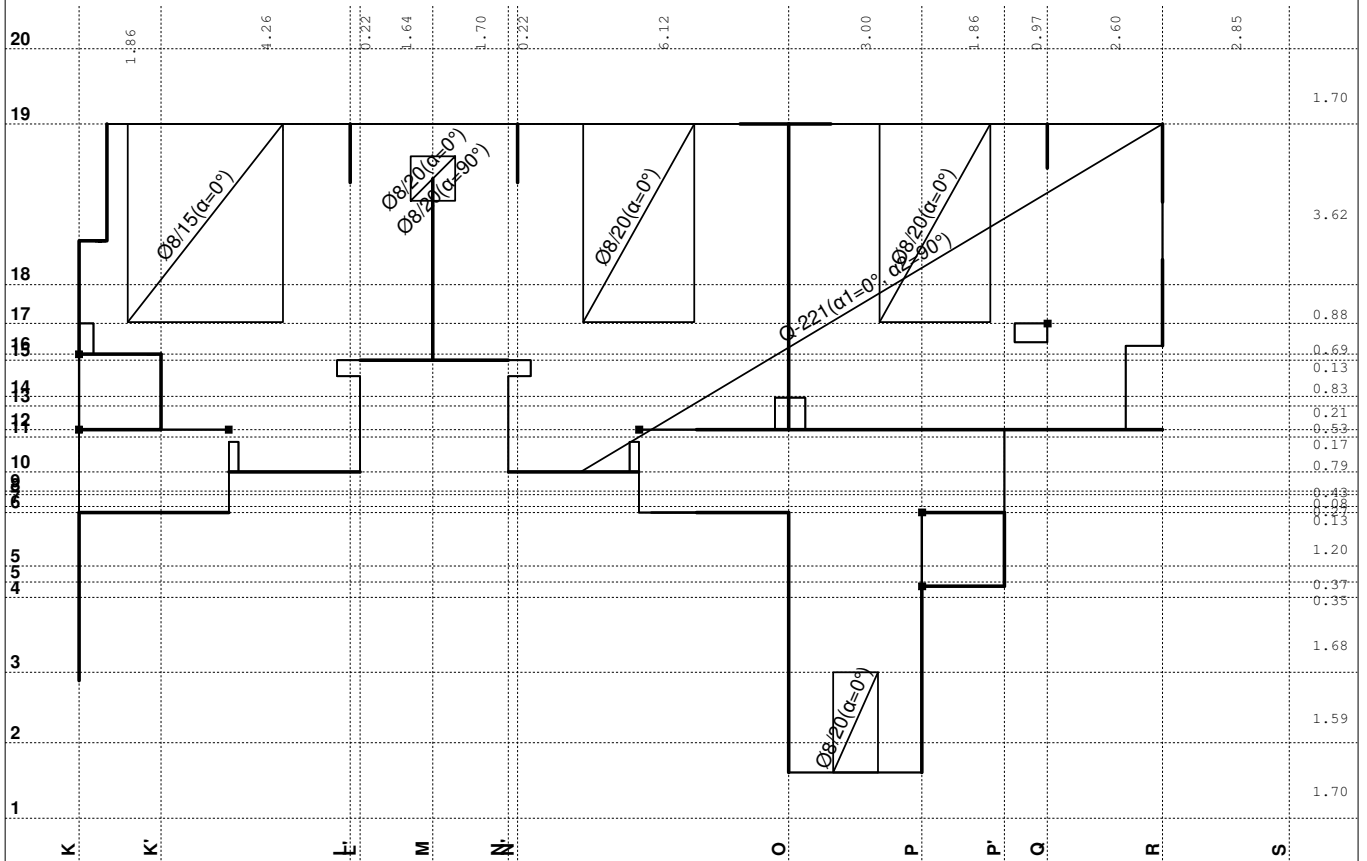


Utjecaji u gredi: max $T_2 = 12.96$ / min $T_2 = -21.08$ kN

Dimenzionisanje (beton)

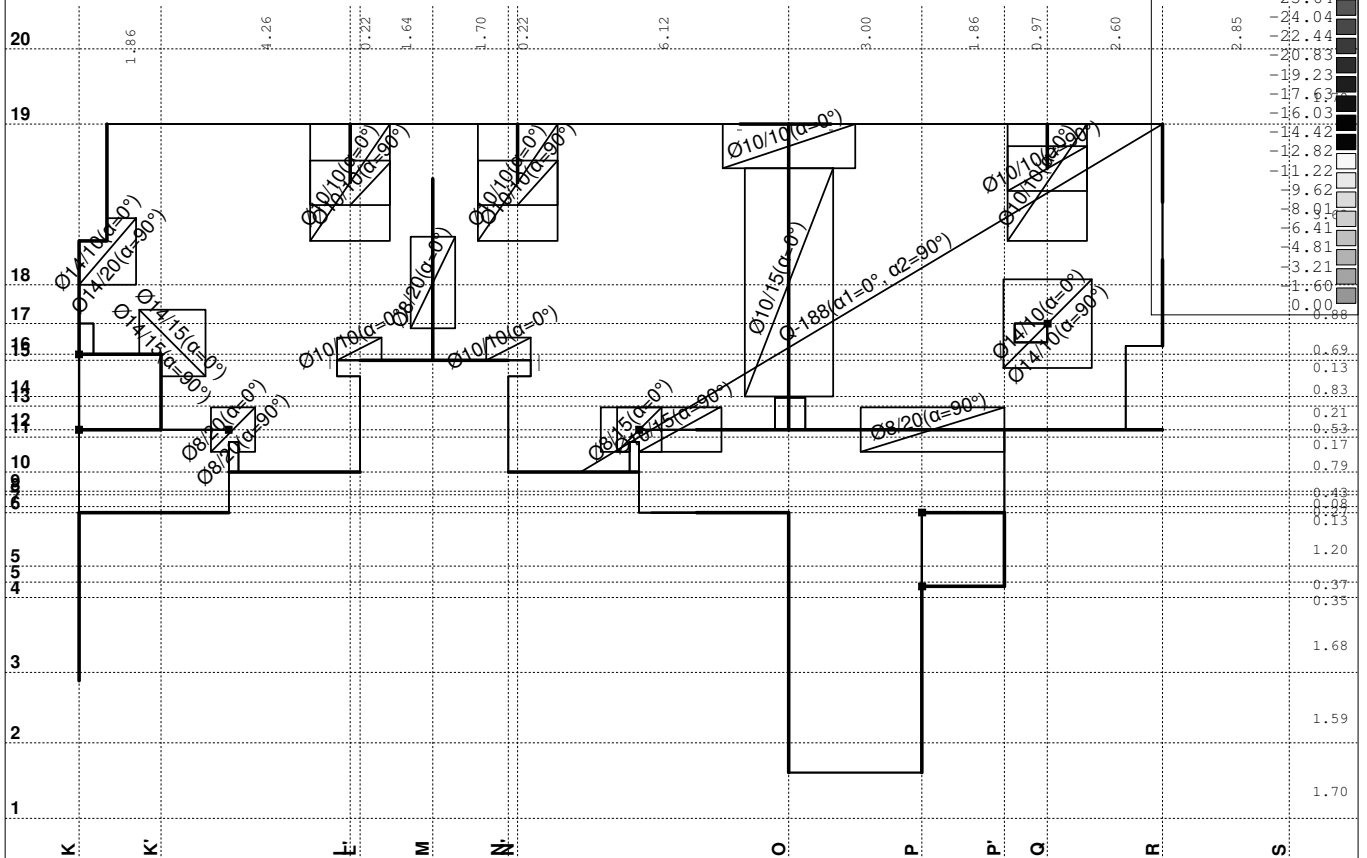
Usvojena armatura
PBAB 87, MB 30, MA 500/560, a=2.00 cm

Aa - d.zona [cm ² /m]
0.00
4.42
8.84



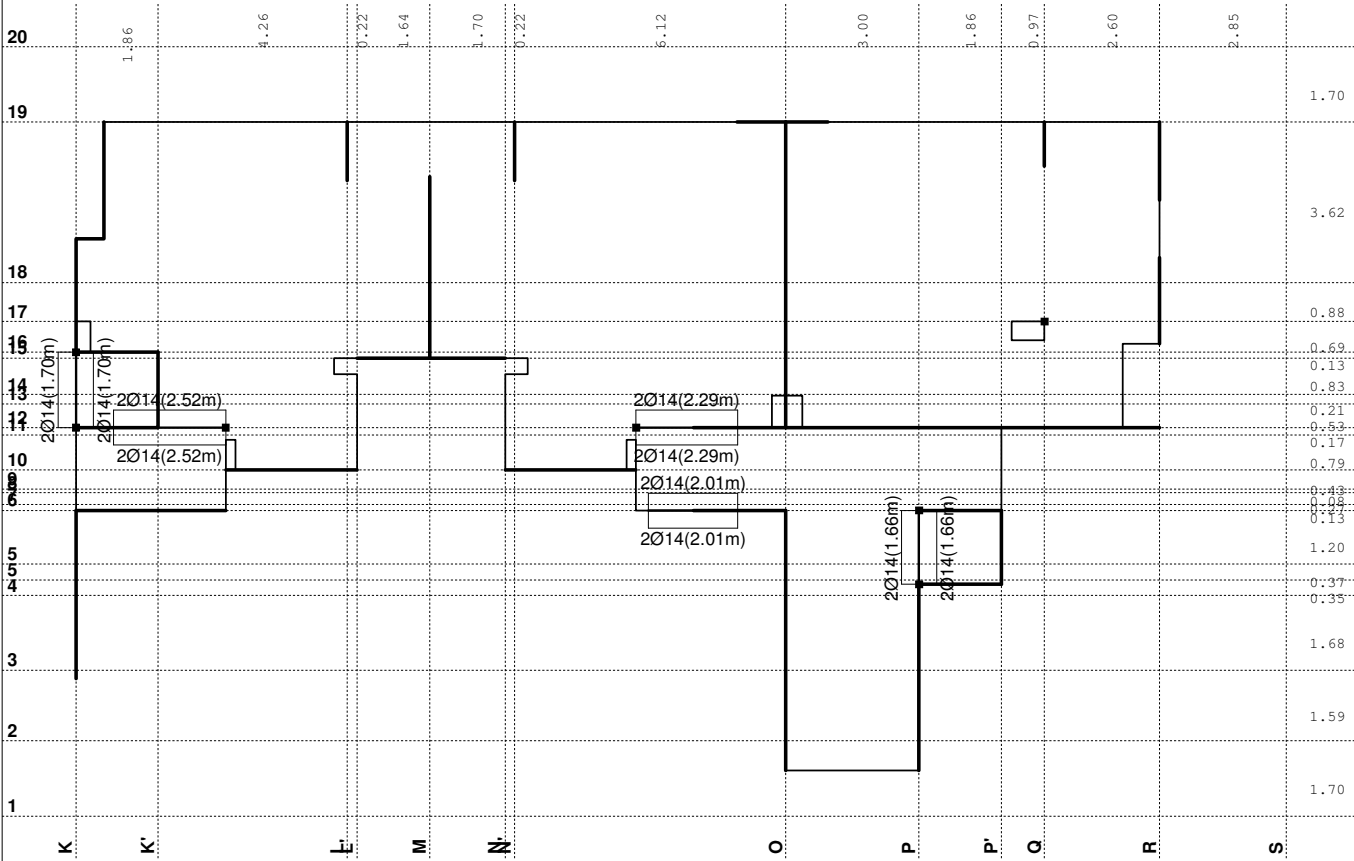
Aa - d.zona
Usvojena armatura
PBAB 87, MB 30, MA 500/560, a=2.00 cm

Aa - g.zona [cm ² /m]
-30.45
-28.85
-27.24
-25.64
-24.04
-22.44
-20.83
-19.23
-17.63
-16.03
-14.42
-12.82
-11.22
-9.62
-8.01
-6.41
-4.81
-3.21
-1.60
0.00
0.60
0.69
0.13
0.83
0.21
0.53
0.17
0.79
0.43
0.08
0.13
1.20
0.37
0.35
1.68
1.59
1.70

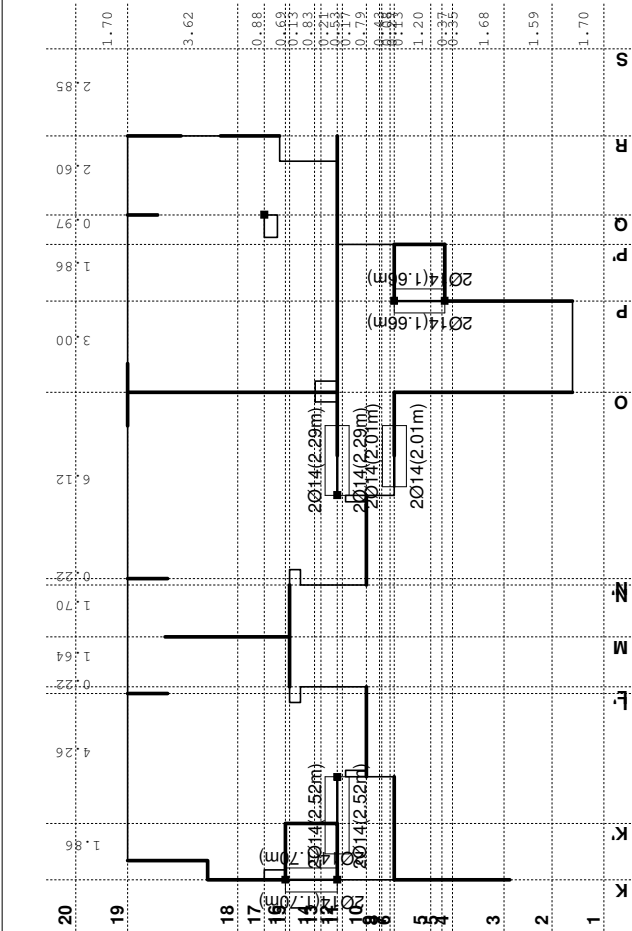


Aa - g.zona

Usvojena armatura
PBAB 87, MB 30, MA 500/560

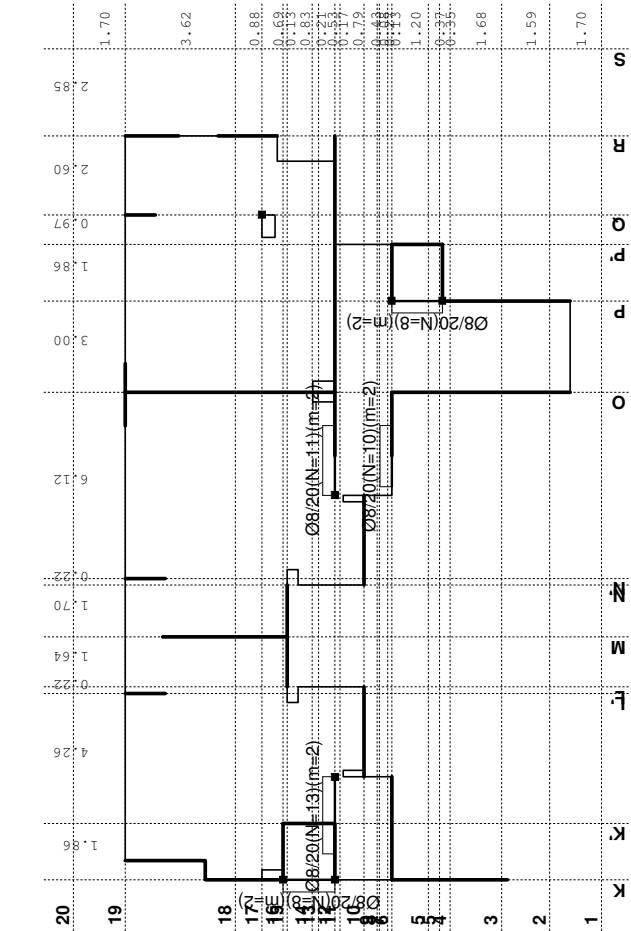


Armatura u gredama: Aa2/Aa1
Usvojena armatura
PBAB 87, MB 30, MA 500/560



Armatura u gredama: Aa3/Aa4

Usvojena armatura
PBAB 87, MB 30, MA 500/560



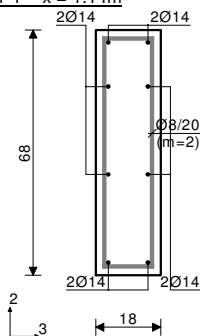
Armatura u gredama: Aa,uz

P 801 (394-153)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 1.14\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -0.60 \text{ kN} \\ M1u &= -3.33 \text{ kNm} \\ M3u &= 1.58 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.155/10.000 \text{ ‰}$$

$$Aa1 = 0.05 + 0.06' = 0.11 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.06' = 0.06 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.24' = 0.24 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.24' = 0.24 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 1.25 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 1.25 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.01%

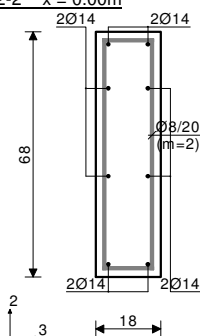
*) - dodatna podužna armatura za prijem torzije.

Z12 (2296-3029)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 2-2 $x = 0.00\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -13.34 \text{ kN} \\ M1u &= 2.02 \text{ kNm} \\ M3u &= -14.60 \text{ kNm} \end{aligned}$$

$$Aa1 = 0.00 + 0.04' = 0.04 \text{ cm}^2$$

$$Aa2 = 0.48 + 0.04' = 0.52 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.14' = 0.14 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.14' = 0.14 \text{ cm}^2$$

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

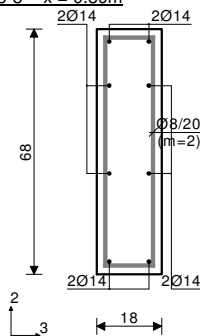
[Usvojeno $Aa,uz = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.89 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.76 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.01%

*) - dodatna podužna armatura za prijem torzije.

Presek 3-3 $x = 0.89\text{m}$ 

[cm]

$$T2u = 3.51 \text{ kN}$$

$$M1u = 2.60 \text{ kNm}$$

$$M3u = 2.14 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.181/10.000 \text{ ‰}$$

$$Aa1 = 0.07 + 0.05' = 0.12 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.05' = 0.05 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.19' = 0.19 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.19' = 0.19 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 1.01 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.98 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.01%

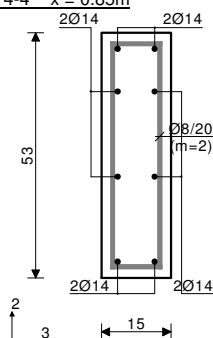
$$\epsilon_b/\epsilon_a = -0.496/10.000 \text{ ‰}$$

ZK" (217-93)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 4-4 $x = 0.85\text{m}$ 

[cm]

$$M3u = 1.02 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.176/10.000 \text{ ‰}$$

$$Aa1 = 0.04 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

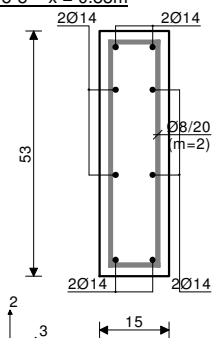
Procenat armiranja: 1.55%

ZP" (3599-3171)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 5-5 $x = 0.83\text{m}$ 

[cm]

$$T2u = 0.42 \text{ kN}$$

$$M3u = 5.53 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.424/10.000 \text{ ‰}$$

$$Aa1 = 0.23 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

$$Aa,uz = 0.00 \text{ cm}^2/\text{m}$$

(m=2)

$$[\text{Usvojeno } Aa,uz = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}]$$

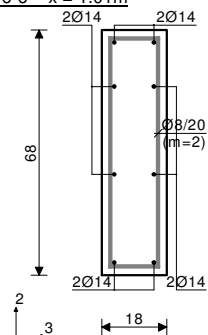
Procenat armiranja: 1.55%

Z6b (1787-2439)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 6-6 $x = 1.01\text{m}$ 

[cm]

$$T2u = 12.96 \text{ kN}$$

$$M3u = -14.94 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.502/10.000 \text{ ‰}$$

$$Aa1 = 0.00 \text{ cm}^2$$

$$Aa2 = 0.50 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

$$Aa,uz = 0.00 \text{ cm}^2/\text{m}$$

(m=2)

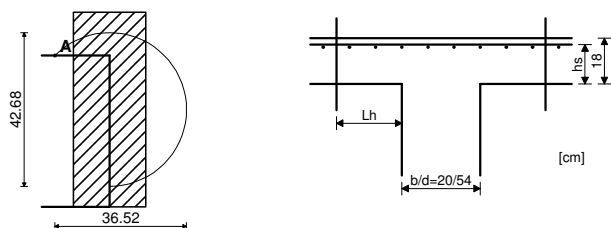
$$[\text{Usvojeno } Aa,uz = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}]$$

$$\tau_y = 0.13 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.01%

Kontrola ploča na probijanje

Nivo: POS 800+ [0.00 m]
 Presek 1 (190.60,-108.22,0.00)
 MB 30



KONTROLA KRITIČNOG PRESEKA 1. ($L_h = 0.07\text{m}$ od ivice stuba)
 (stub zamenjujućeg kružnog preseka, $d_s = 0.28\text{m}$)

Merodavna kombinacija: I+II	
Sila u stubu	$N = 115.08\text{ kN}$
Faktor povećanja napona zbog ekscentričnosti	$\beta = 1.400$
Merodavni smičući napon (tačka A)	$\tau = 1.280\text{ MPa}$
Debljina ploče	$d_{pl} = 0.180\text{ m}$
Statička visina ploče	$h_s = 0.150\text{ m}$
Obim kritičnog preseka	$O_{kp} = 0.839\text{ m}$
Postojeća armatura u ploči	
Površina armature - pravac 1	$A_{a,1} = 17.279\text{ cm}^2$
Procenat armiranja - pravac 1	$\mu_1 = 1.152\%$
Površina armature - pravac 2	$A_{a,2} = 17.279\text{ cm}^2$
Procenat armiranja - pravac 2	$\mu_2 = 1.152\%$
Srednja vrednost procenta armiranja	$\mu = 1.152\%$
Koeficijent	$\alpha_a = 1.400$
Koeficijent	$\gamma_1 = 1.953$
Koeficijent	$\gamma_2 = 0.676$
Dopušteni glavni napon zatezanja	$\tau_a = 0.800$
Dopušteni glavni napon zatezanja	$\tau_b = 2.200$
Maksimalna otpornost ($\gamma_2 \times \tau_b$)	$\tau_{max} = 1.488\text{ MPa}$

Uslov: $\tau \leq \tau_{max}$ ($1.28 \leq 1.49$)

Uslov je ispunjen.

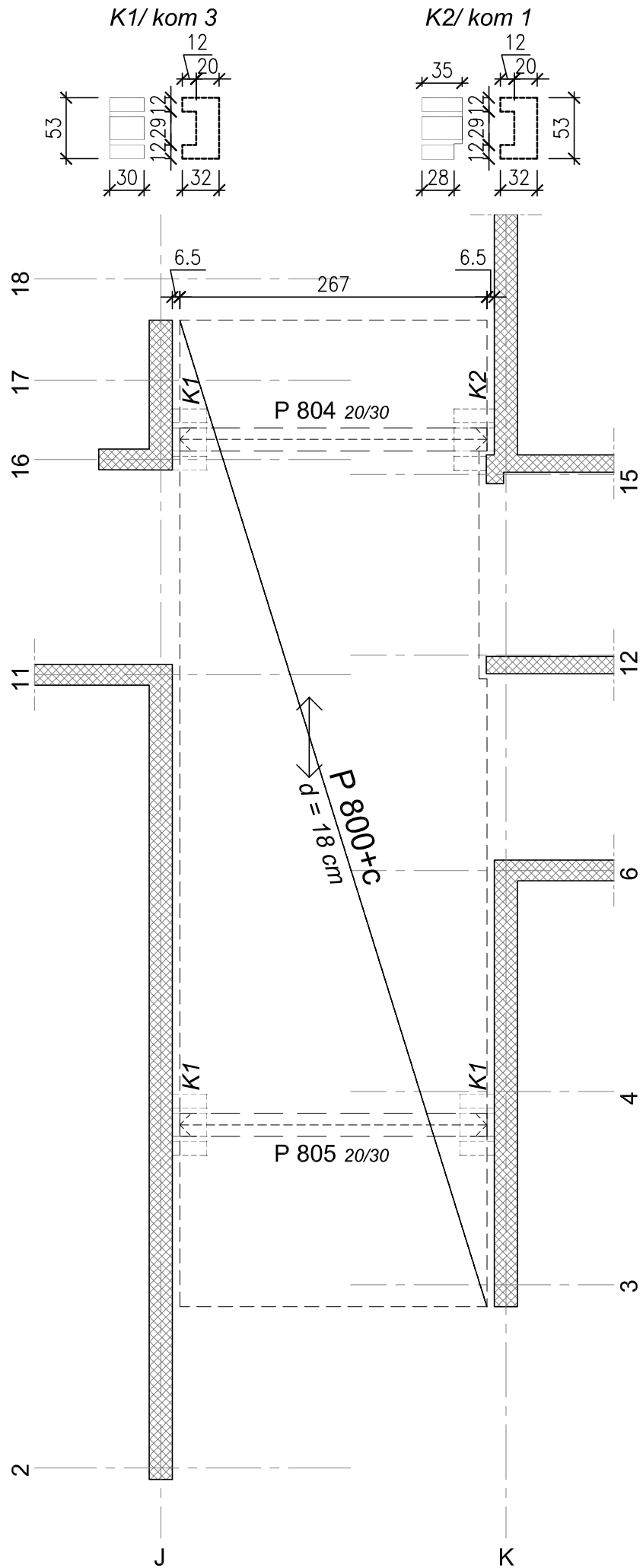
Otpornost na probijanje ploče bez dodatne armature za
 obezbeđenje ($2/3 \times \gamma_1 \times \tau_a$) $\tau_{gr} = 1.042\text{ MPa}$

Uslov: $\tau \leq \tau_{gr}$ ($1.28 \leq 1.04$)

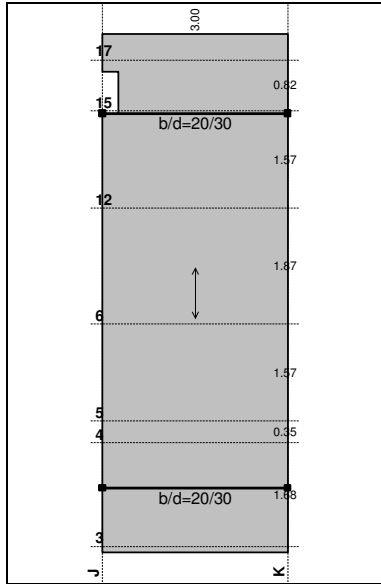
Potrebna je dodatna armatura za obezbeđenje od probijanja ploče.

Armatura za obezbeđenje od probijanja ploče MA 500/560
 Potrebna površina armature $A_{ak} = 3.107\text{ cm}^2$

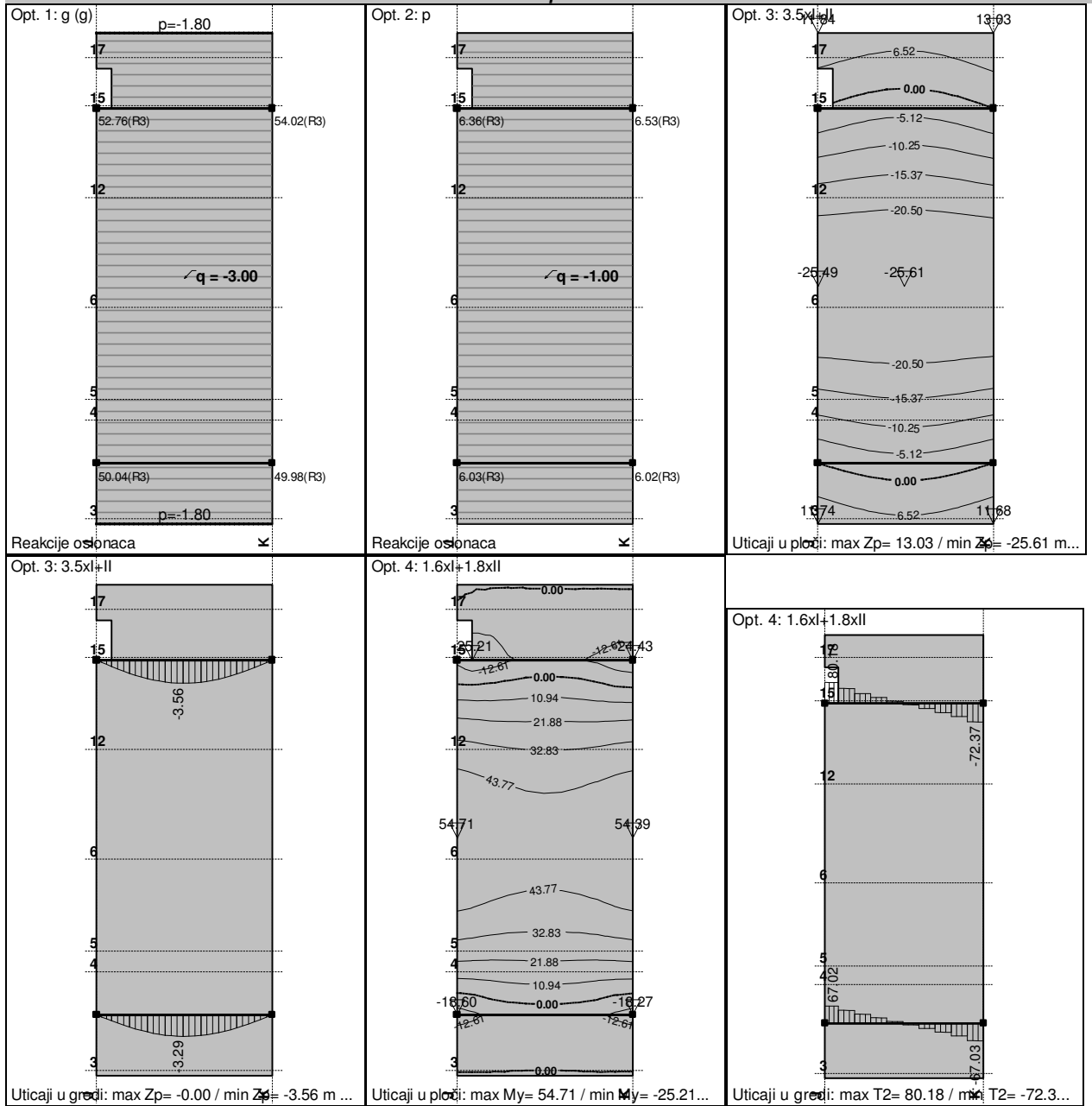
P 800+



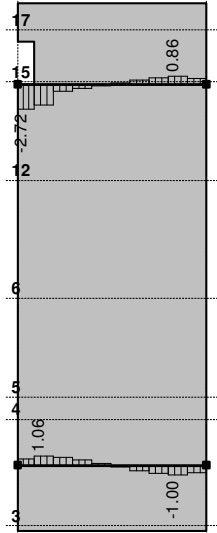
K1, K2 - Arm. bet. kratki elementi P 800+



Statički proračun

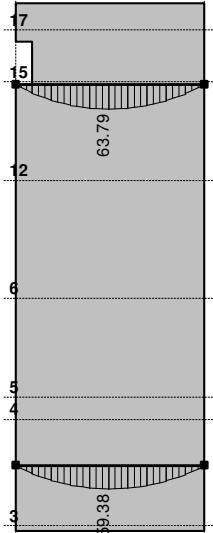


Opt. 4: 1.6xl+1.8xll



Uticaji u gredi: max M1= 1.06 / min M1= -2.72...

Opt. 4: 1.6xl+1.8xll



Uticaji u gredi: max M3= 63.79 / min M3= 0.9...

Dimenzionisanje (beton)

Usvojena armatura

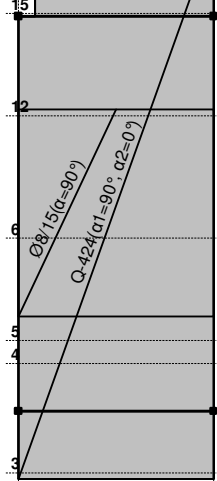
PBAB 87, MB 30, MA 500/600, a=2.00 cm

Aa - d.zona [cm²/m]

0.00

3.65

7.30



Aa - d.zona

K

Usvojena armatura

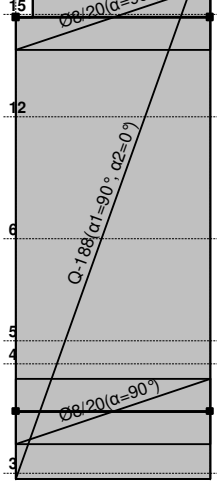
PBAB 87, MB 30, MA 500/600, a=2.00 cm

Aa - g.zona [cm²/m]

-3.28

-1.64

0.00

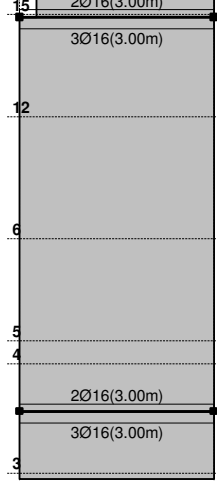


Aa - g.zona

K

Usvojena armatura

PBAB 87, MB 30, MA 500/600

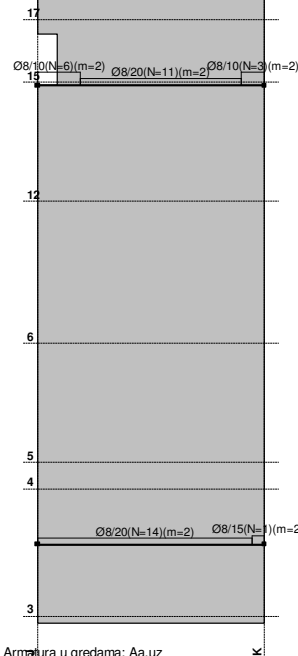


Armatura u gredama: Aa2/Aa1

K

Usvojena armatura

PBAB 87, MB 30, MA 500/600



Armatura u gredama: Aa,uz

K

Димензионисање кратких елемената

K1

$$Q_u = 1.6 \cdot 61.65 + 1.8 \cdot 12.03 = 120.3 kN$$

$$M_u = 120.3 \cdot 0.285 = 34.29 kNm$$

$$G_u = 1.6 \cdot 1.01 = 1.62 kN$$

$$M_u(G_u) = 1.62 \cdot 0.25 = 0.41 kNm$$

$$\sum Q_u = 120.3 + 1.62 = 121.92 kNm$$

$$Q_{u1} = \frac{121.92}{2} = 60.96 kN$$

$$M_{u1} = \frac{34.7}{2} = 17.35 kN$$

$$A_1 = \frac{17.35}{0.8 \cdot 0.32 \cdot 50} = 1.36 cm^2 \Rightarrow \pm 2R\phi 12$$

$$\tau = \frac{60.96}{12 \cdot 0.8 \cdot 32} = 0.198 \frac{kN}{cm^2}$$

$$A_h = \frac{60.96}{50} = 1.22 cm^2 \Rightarrow RU \phi 8 / 10 (n = 3 kom.)$$

$$A_k = \frac{1.22}{\sqrt{2}} = 0.86 cm^2 \Rightarrow RU \phi 8 (n = 3 kom.)$$

K2

$$Q_u = 1.6 \cdot 54.02 + 1.8 \cdot 6.53 = 98.2 kN$$

Armatura K2 ista kao K1

K4

$$G_u = 0.2 \cdot 25 \cdot 0.3 \cdot 1.6 = 0.48 kN$$

$$Q_u = 1.6 \cdot 19.08 + 0.48 + 1.8 \cdot 14.04 = 56.28 kN$$

$$M_u = 55.8 \cdot 0.285 + 0.48 \cdot 0.25 = 16.02 kNm$$

$$A_1 = \frac{16.02}{0.8 \cdot 0.2 \cdot 50} = 2.0 cm^2 \Rightarrow 3R\phi 10$$

$$A_h = \frac{16.02}{50} = 0.32 cm^2 \Rightarrow RU \phi 8 / 10 (n = 3 kom.)$$

$$A_k = \frac{0.32}{\sqrt{2}} = 0.23 cm^2$$

Ulazni podaci - Konstrukcija, Ulazni podaci - Opterećenje

St01-02, St11-72 - Arm. bet. kolenasta ploca stepenista dpl = 18 cm

Opterećenje

1. Stalno g(g) kN/m²

2. Povremeno p kN/m²

St01-02

odmoriste St01-02

- teraco pločice 1.5 cm = 0.36

- gradj. lepak 2.5 cm = 0.05

- glet masa na lepku = 0.03

$g1(g) = 0.44 \text{ kN/m}^2$

- korisno

$p = 2.50 \text{ kN/m}^2$

St01-02

- stepenici 17.5/28 = 2.10 kN/m²

- hor. obloga teraco talpe na lepku 3cm = 0.72 kN/m²

- ver.obloga 17.5/28*0.03*24 = 0.45 kN/m²

- glet masa na lepku = 0.03 kN/m²

$g2(g) = 3.30 \text{ kN/m}^2$

- korisno 2.50x0.848

$p2 = 2.12 \text{ kN/m}^2$

St11-72

- stepenici 17/28 = 2.04 kN/m²

- hor. obloga teraco talpe na lepku 3cm = 0.72 kN/m²

- ver.obloga 17.5/28*0.03*24 = 0.45 kN/m²

- glet masa na lepku = 0.03 kN/m²

$g3(g) = 3.24 \text{ kN/m}^2$

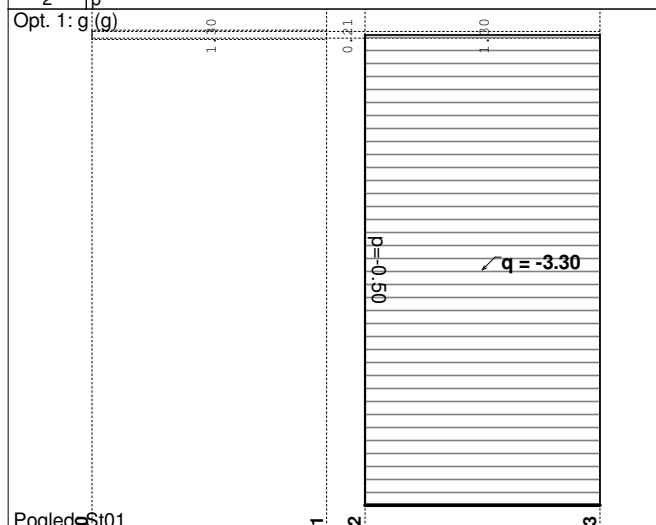
- korisno 2.50x0.857

$p3 = 2.14 \text{ kN/m}^2$

Lista slučajeva opterećenja

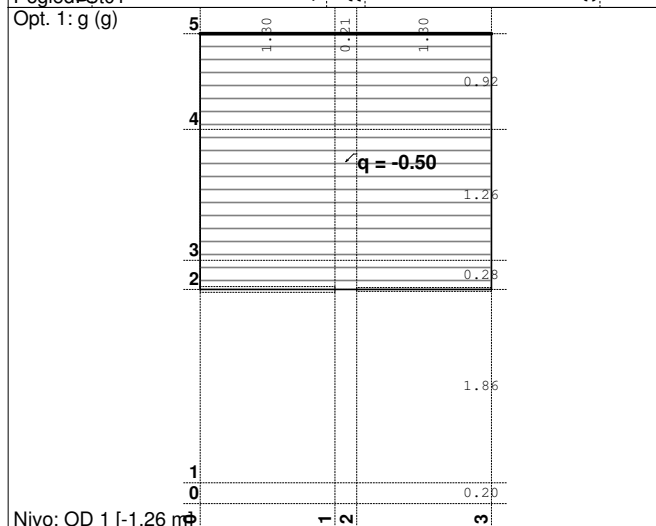
LC	Naziv
1	g (g)
2	p

Opt. 1: g (g)



Pogled St01

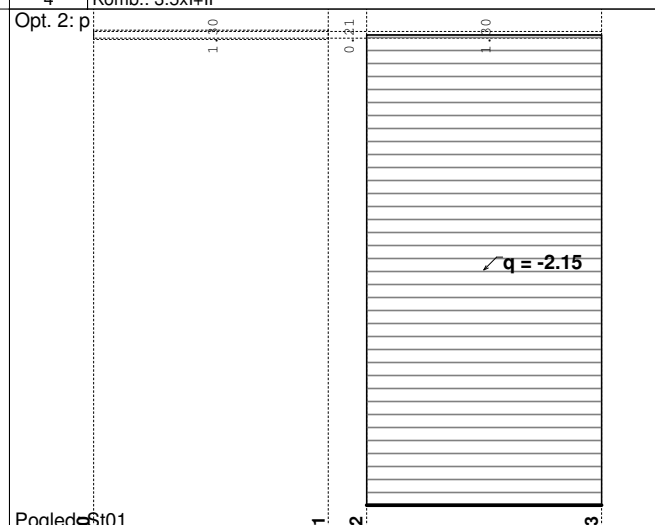
Opt. 1: g (g)



Nivo: OD 1 [-1.26 m]

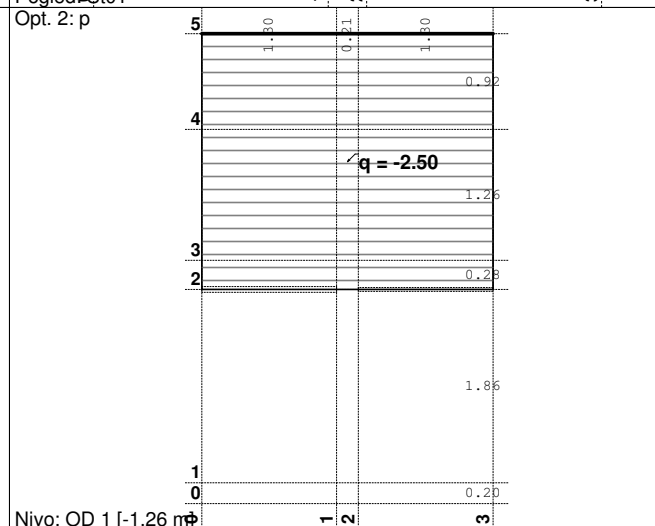
LC	Naziv
3	Komb.: 1.6xl+1.8xII
4	Komb.: 3.5xl+II

Opt. 2: p

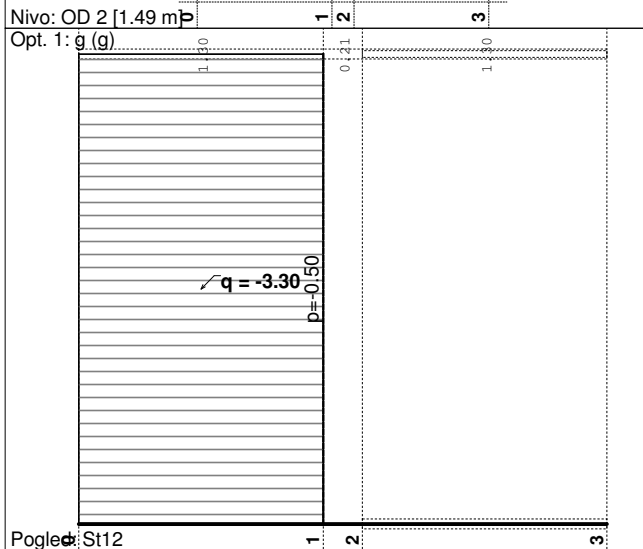
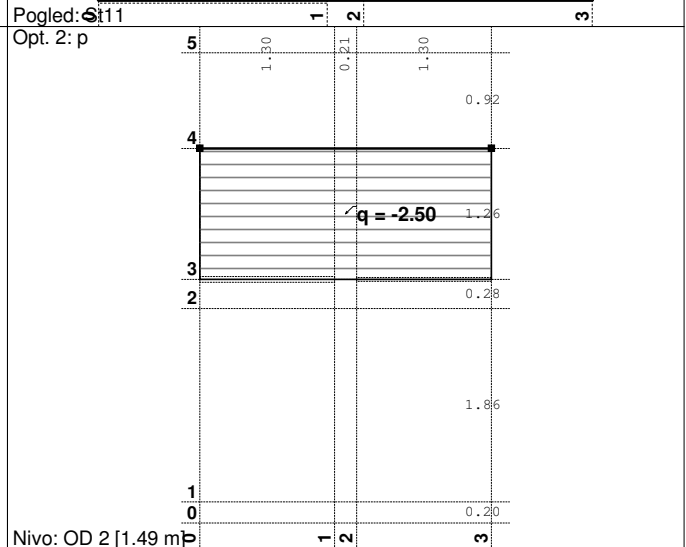
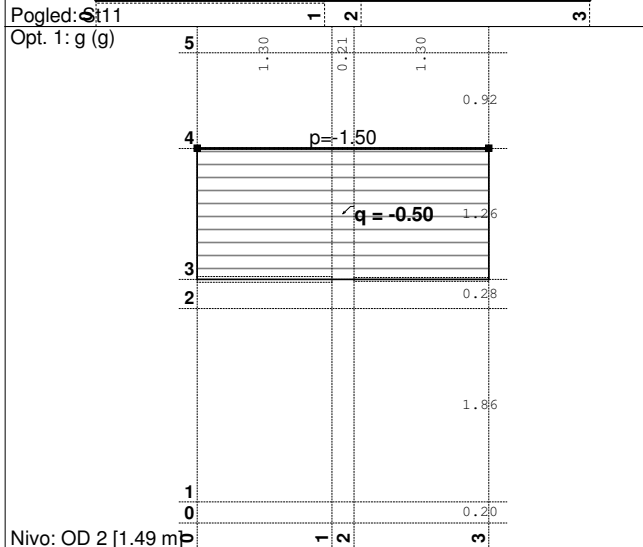
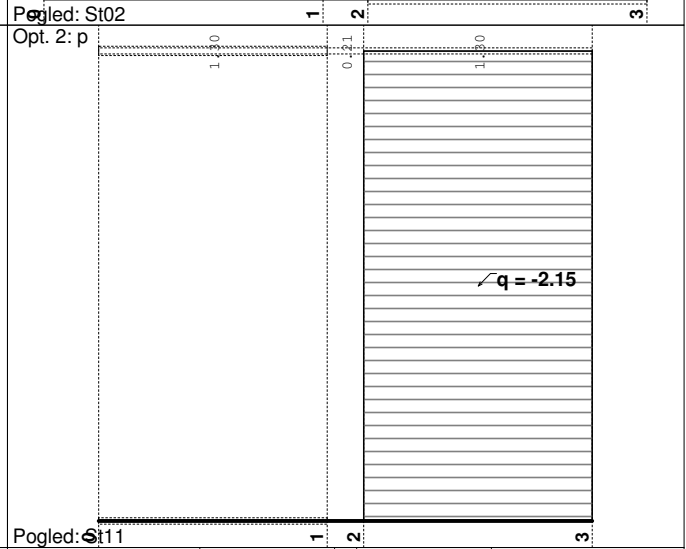
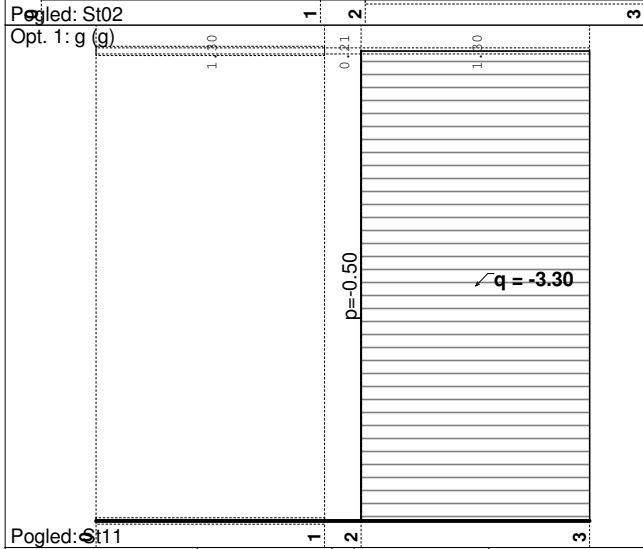
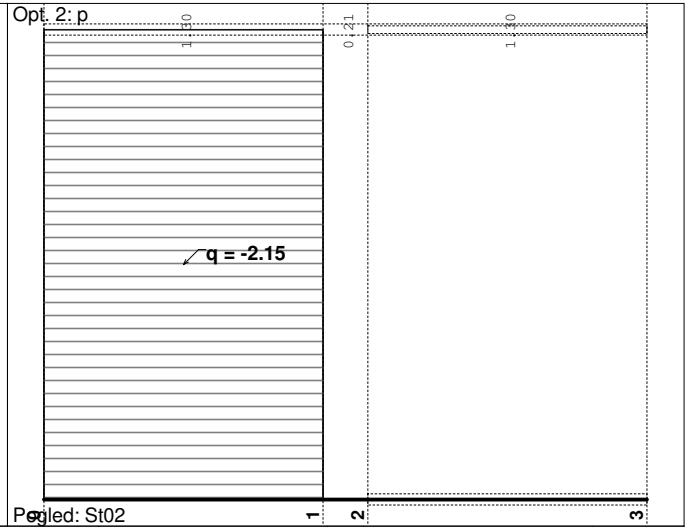
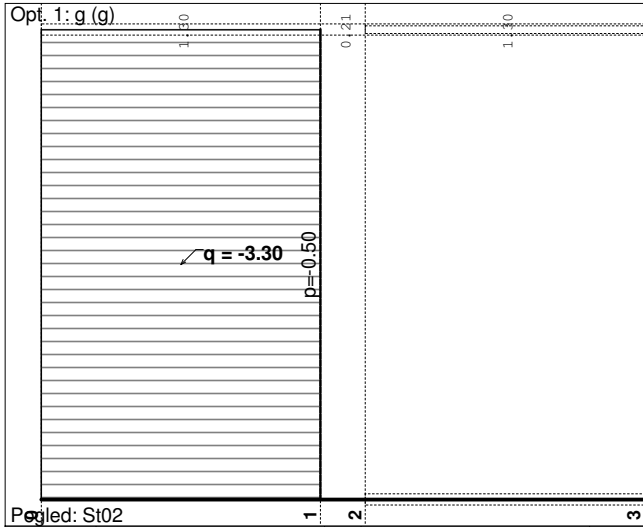


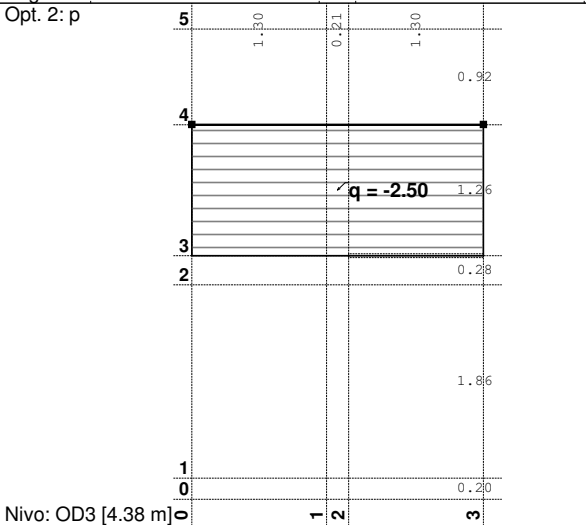
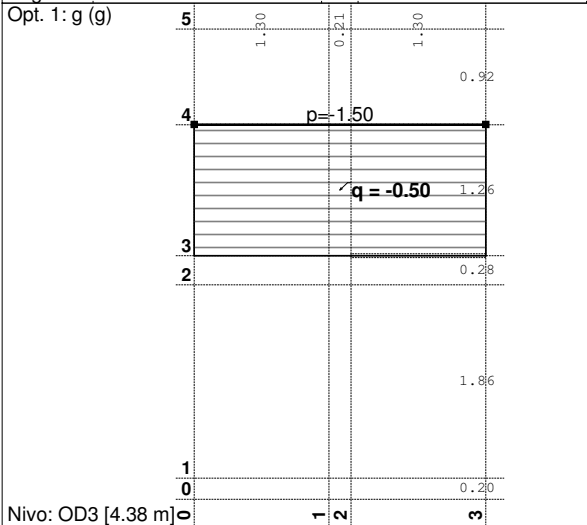
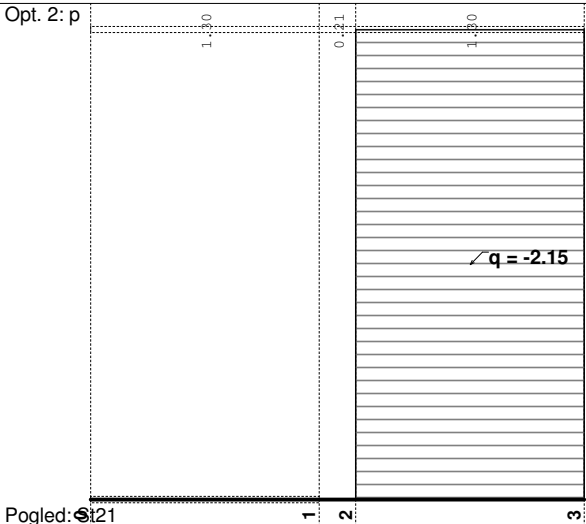
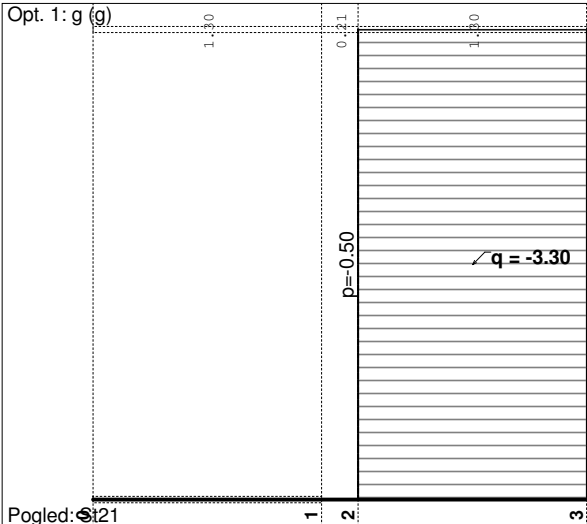
Pogled St01

Opt. 2: p



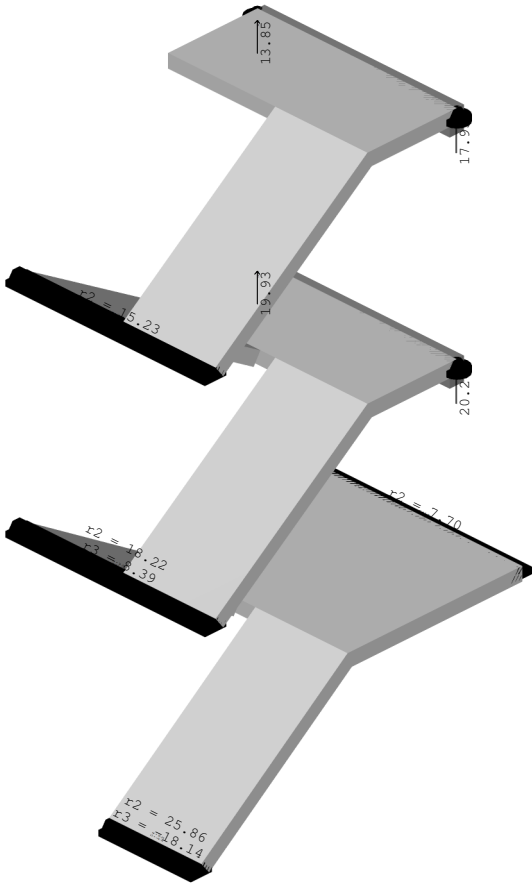
Nivo: OD 1 [-1.26 m]



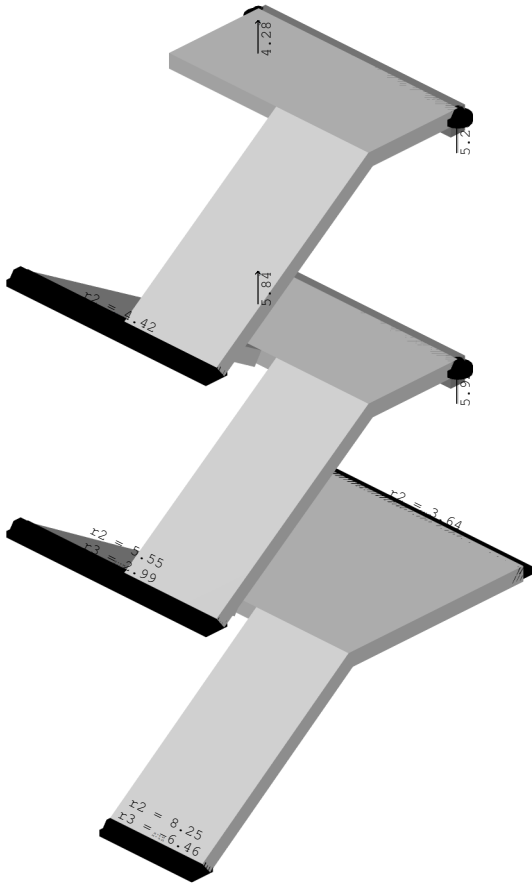


Statički proračun

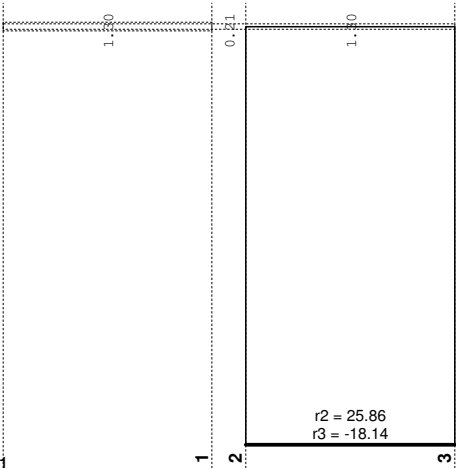
Opt. 1: g (g)



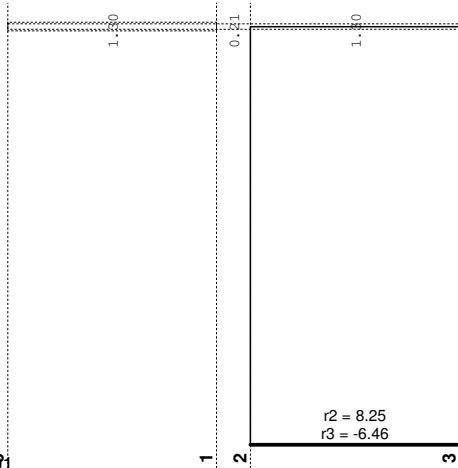
Opt. 2: p



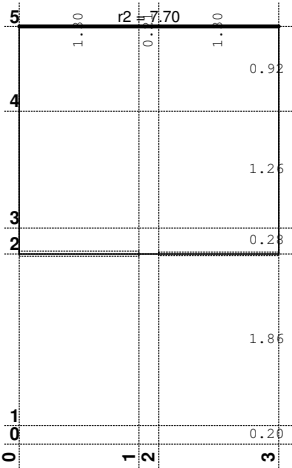
Izometrija
Reakcije oslonaca
Opt. 1: g (g)



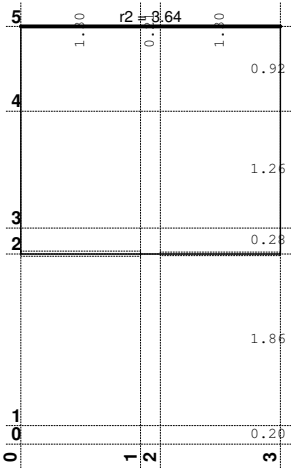
Izometrija
Reakcije oslonaca
Opt. 2: p



Pogled: St01
Reakcije oslonaca
Opt. 1: g (g)



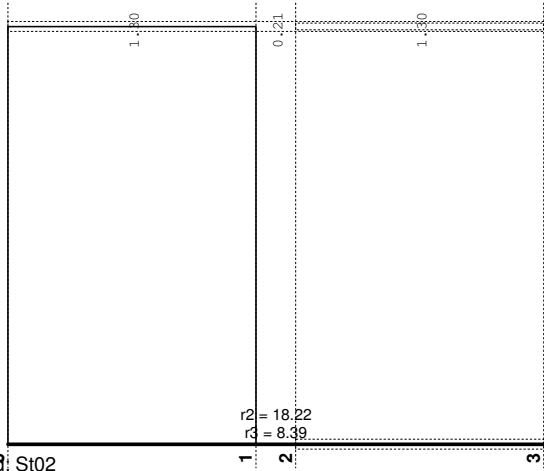
Pogled: St01
Reakcije oslonaca
Opt. 2: p



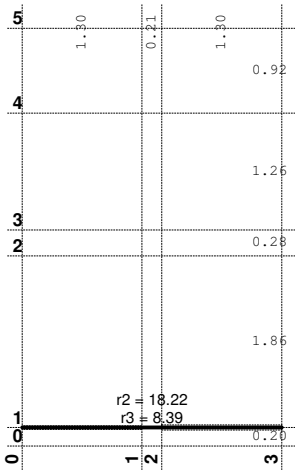
Nivo: OD 1 [-1.26 m]
Reakcije oslonaca

Nivo: OD 1 [-1.26 m]
Reakcije oslonaca

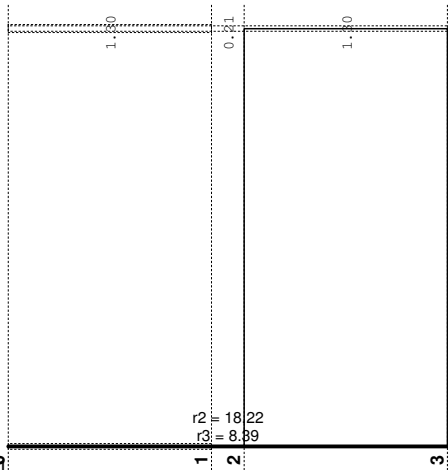
Opt. 1: g (g)



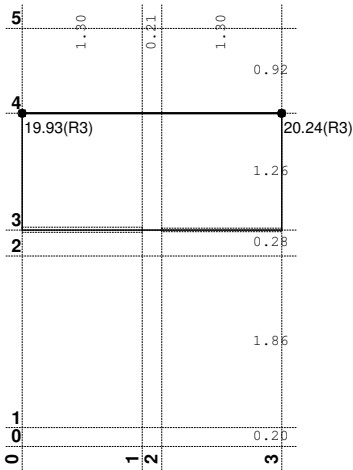
Pogled: St02
Reakcije oslonaca
Opt. 1: g (g)



Nivo: P 0+ [-0.11 m]
Reakcije oslonaca
Opt. 1: g (g)

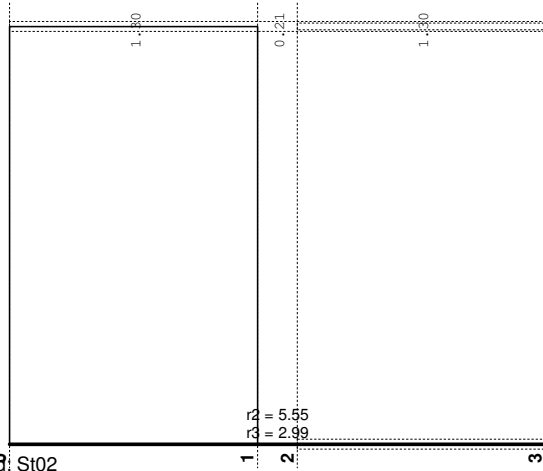


Pogled: St02
Reakcije oslonaca
Opt. 1: g (g)

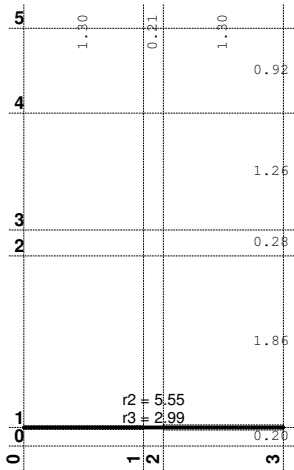


Nivo: OD 2 [1.49 m]
Reakcije oslonaca

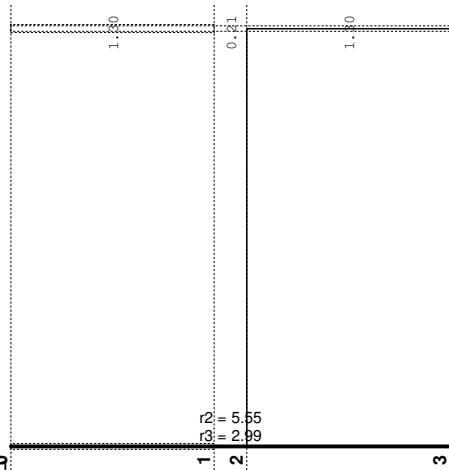
Opt. 2: p



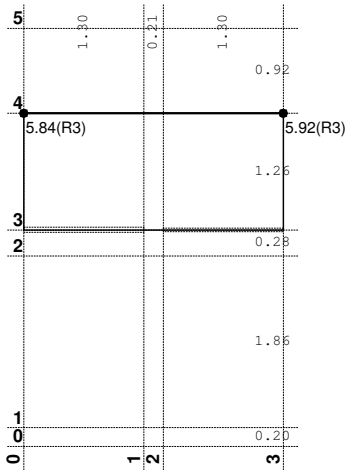
Pogled: St02
Reakcije oslonaca
Opt. 2: p



Nivo: P 0+ [-0.11 m]
Reakcije oslonaca
Opt. 2: p

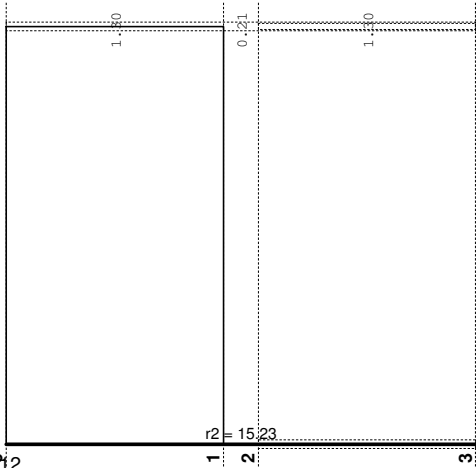


Pogled: St02
Reakcije oslonaca
Opt. 2: p

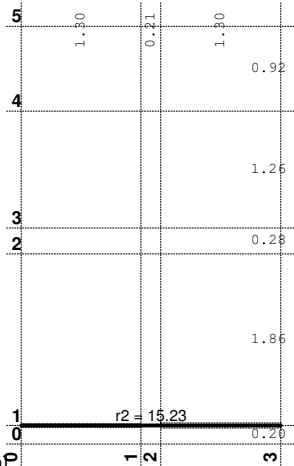


Nivo: OD 2 [1.49 m]
Reakcije oslonaca

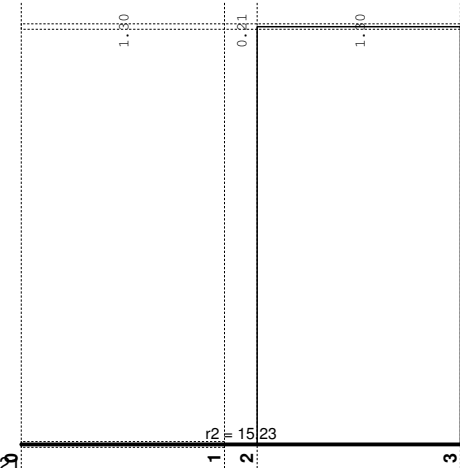
Opt. 1: g (g)



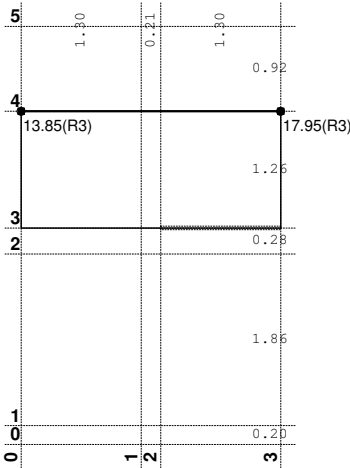
Pogled: St12
Reakcije oslonaca
Opt. 1: g (g)



Nivo: P 100+ [2.78 m]
Reakcije oslonaca
Opt. 1: g (g)

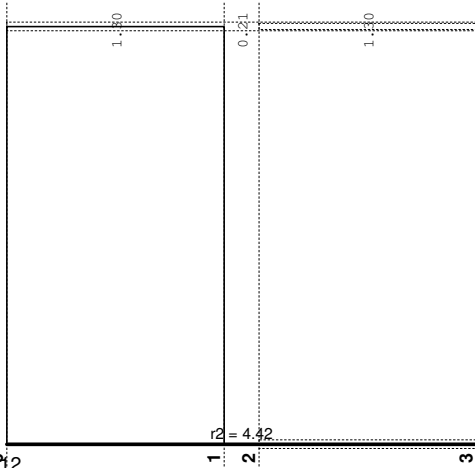


Pogled: St2
Reakcije oslonaca
Opt. 1: g (g)

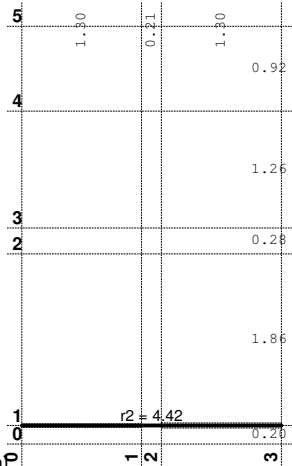


Nivo: OD3 [4.38 m]
Reakcije oslonaca

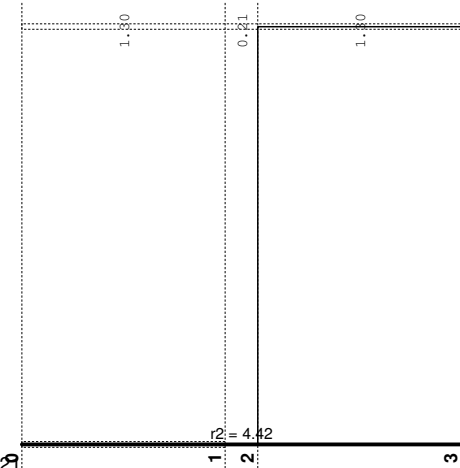
Opt. 2: p



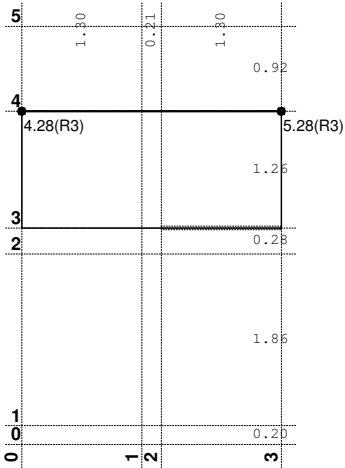
Pogled: St12
Reakcije oslonaca
Opt. 2: p



Nivo: P 100+ [2.78 m]
Reakcije oslonaca
Opt. 2: p

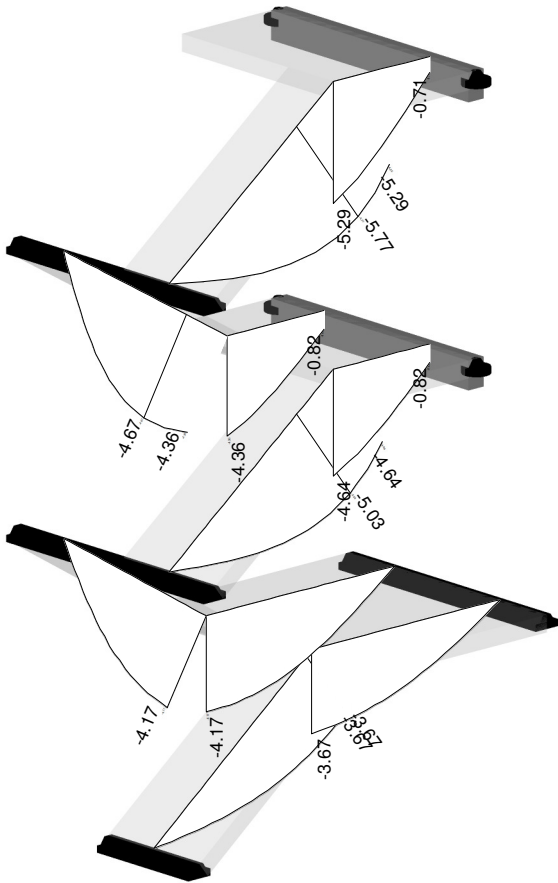


Pogled: St2
Reakcije oslonaca
Opt. 2: p

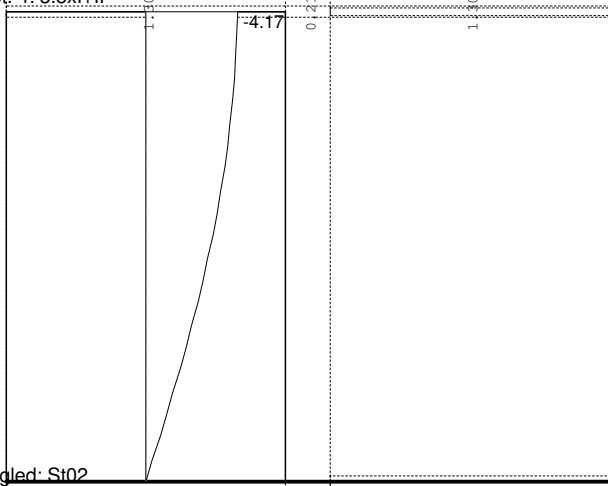


Nivo: OD3 [4.38 m]
Reakcije oslonaca

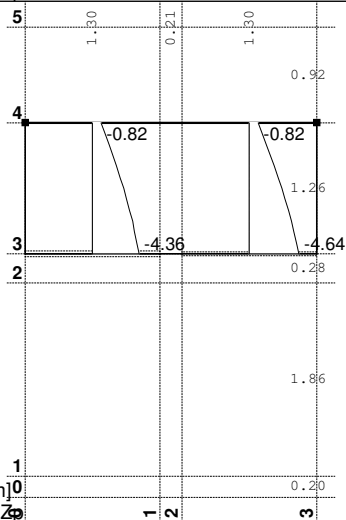
Opt. 4: 3.5xl+II



Izometrija
Vektorski presezi: Zp
Opt. 4: 3.5xl+II

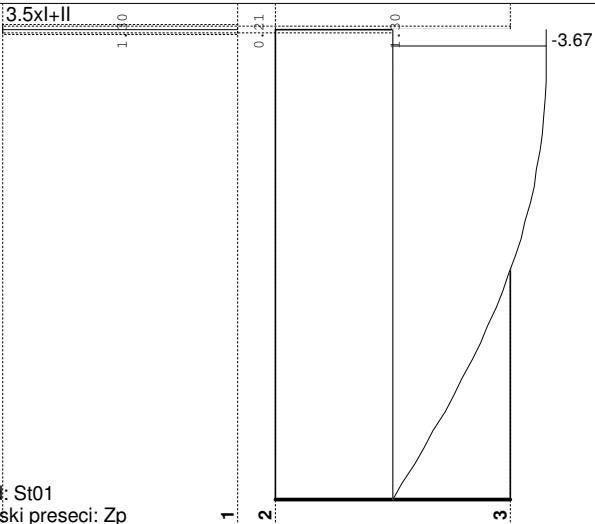


Pogled: St02
Vektorski presezi: Zp
Opt. 4: 3.5xl+II

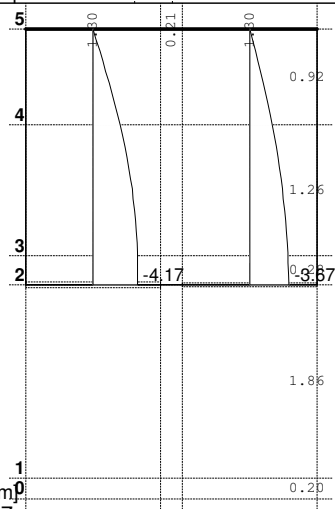


Nivo: OD 2 [1.49 m]
Vektorski presezi: Zp
Opt. 4: 3.5xl+II

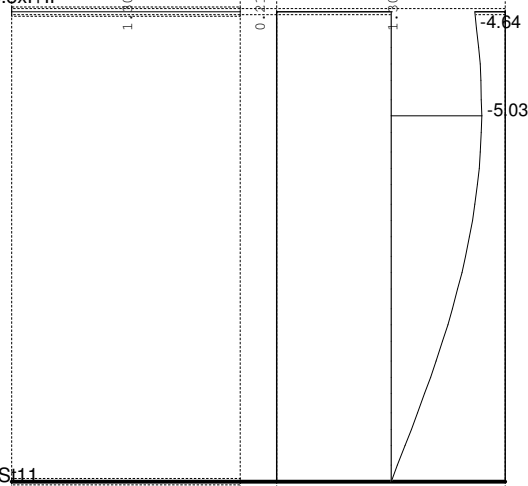
Opt. 4: 3.5xl+II



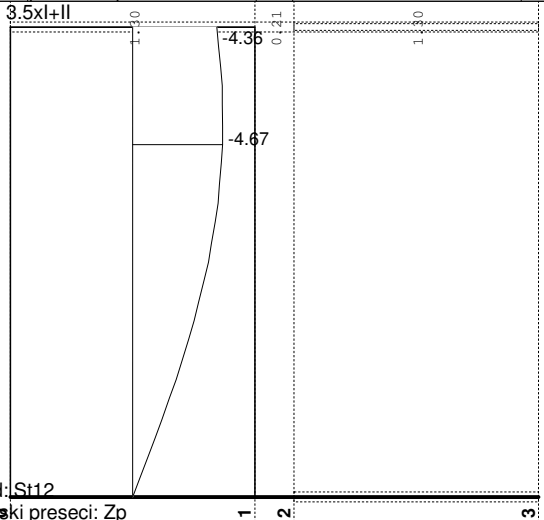
Pogled: St01
Vektorski presezi: Zp
Opt. 4: 3.5xl+II



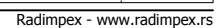
Nivo: OD 1 [-1.26 m]
Vektorski presezi: Zp
Opt. 4: 3.5xl+II

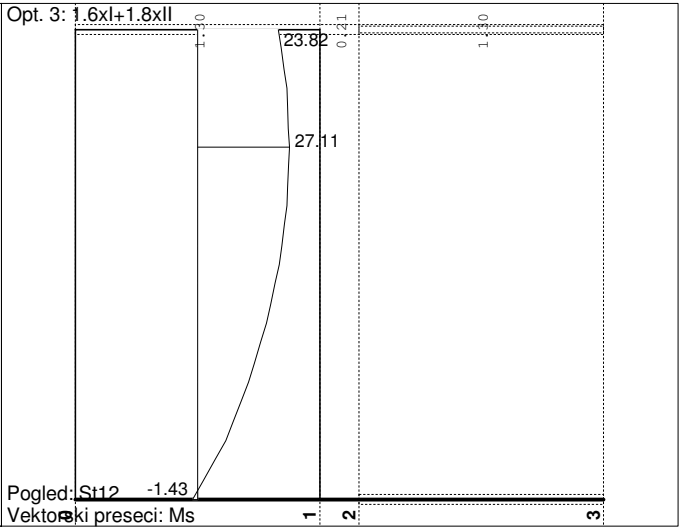
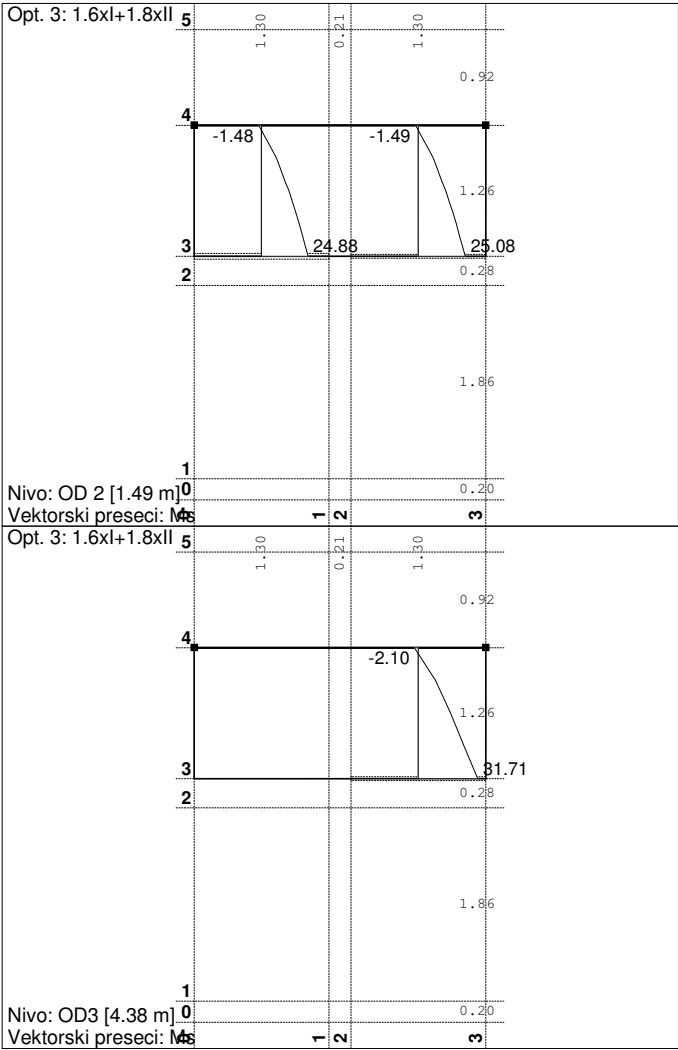


Pogled: St11
Vektorski presezi: Zp
Opt. 4: 3.5xl+II

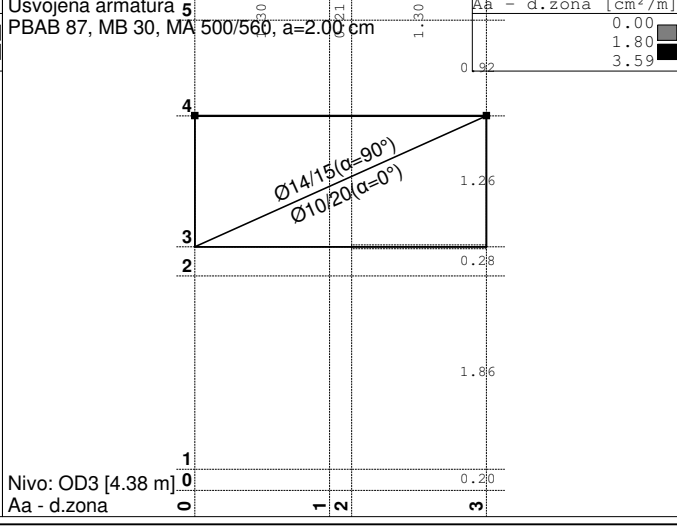
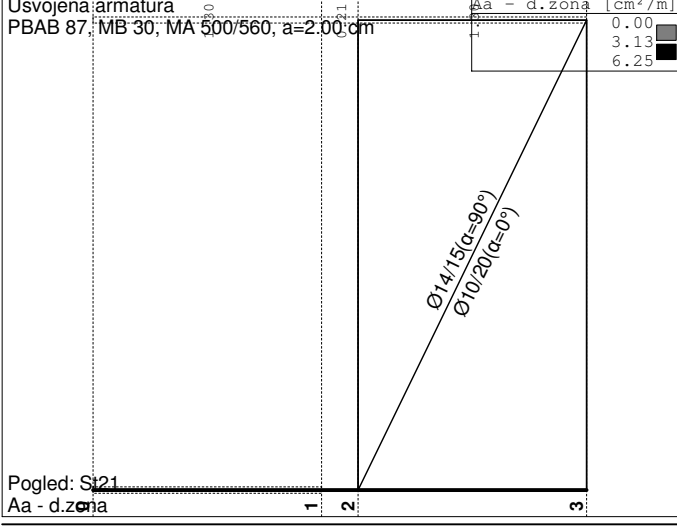
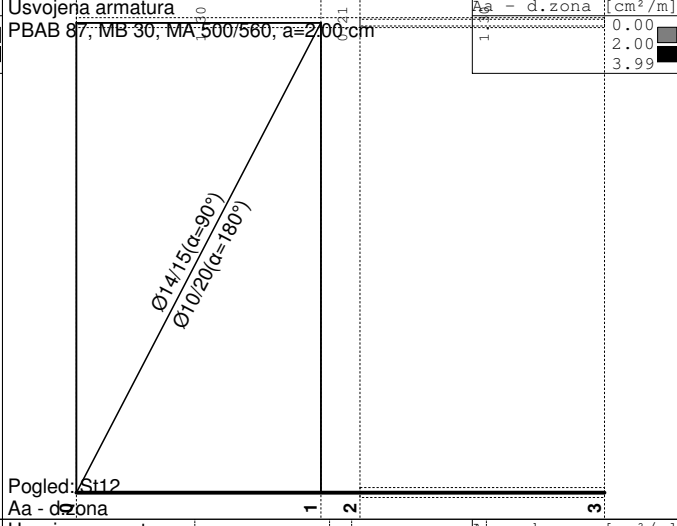
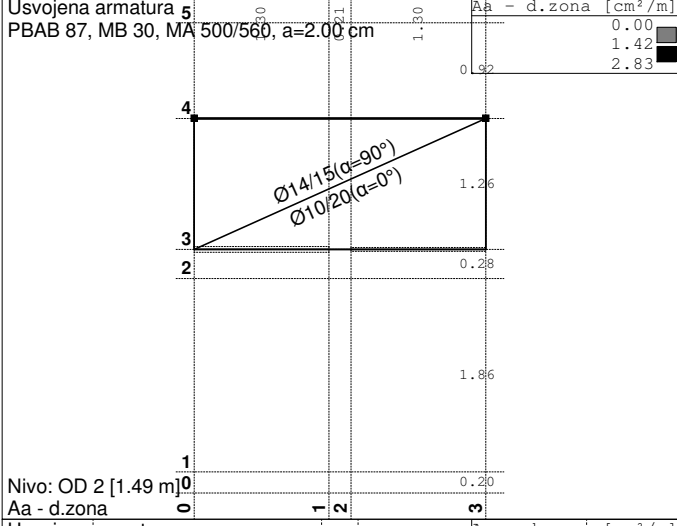
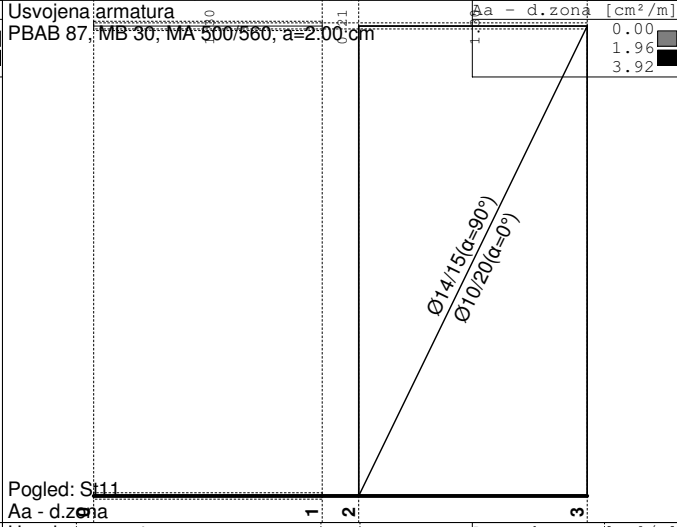
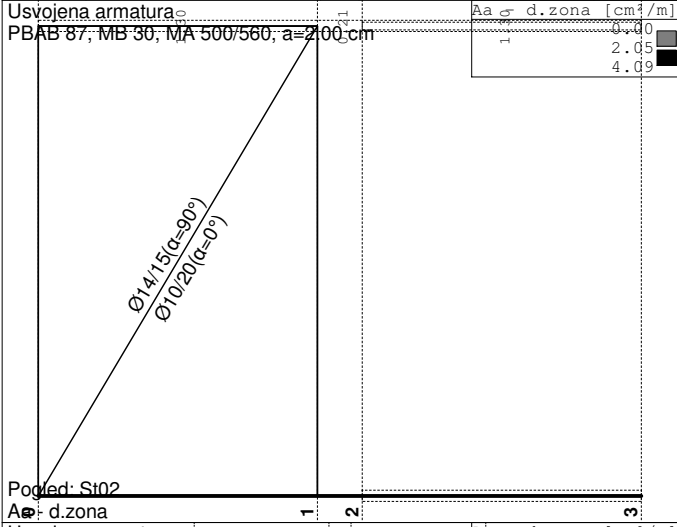
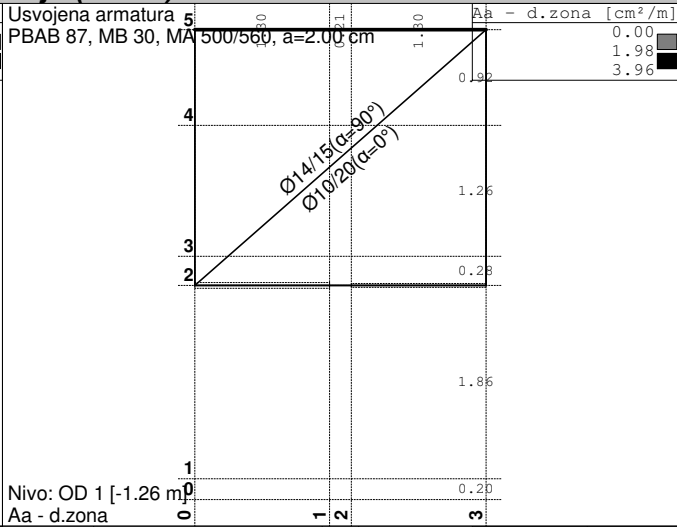
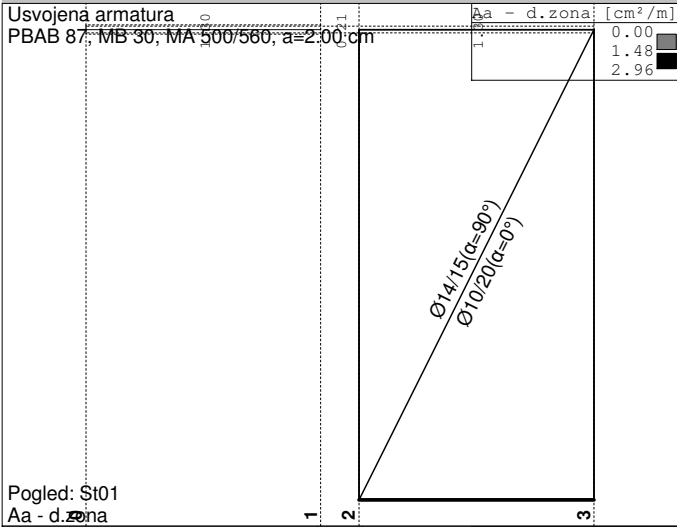


Pogled: St12
Vektorski presezi: Zp
Opt. 4: 3.5xl+II



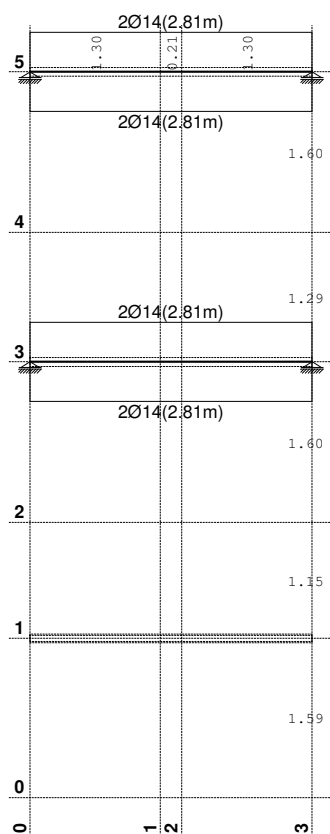


Dimenzionisanje (beton)



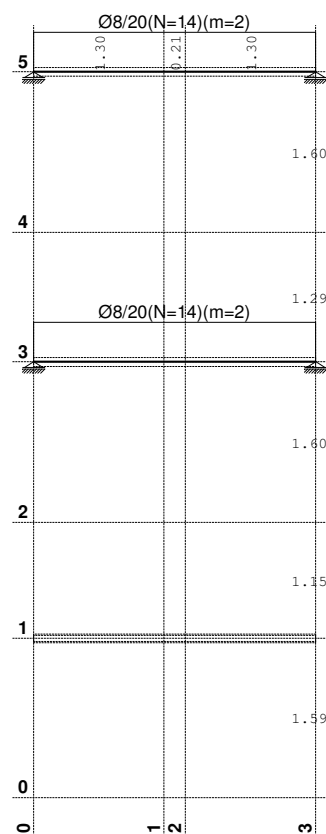
AB stepenišne podvlake b/d=20/30

Usvojena armatura
PBAB 87, MB 30, MA 500/560



Pogled: Stepenište podvlake
Armatura u gredama: Aa2/Aa1

Usvojena armatura
PBAB 87, MB 30, MA 500/560

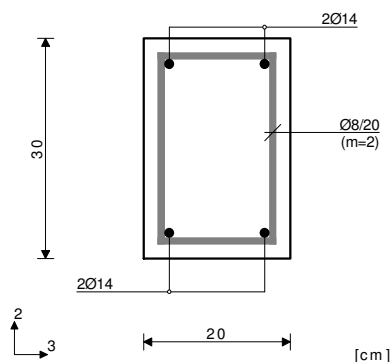


Pogled: Stepenište podvlake
Armatura u gredama: Aa,uz

Greda 311-443

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60x1+1.80xII

Presek 1-1 x = 1.40m



N1u = 0.31 kN
T2u = 2.93 kN
T3u = -0.52 kN
M3u = 28.47 kNm

$\epsilon_b/\epsilon_a = -1.864/10.000 \%$
Aa1 = 2.24 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]

$\tau_y = 0.06 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.01 \text{ MPa} < \tau_r = 1.10 \text{ MPa}$
Procent armiranja: 1.03%

Ulazni podaci - Konstrukcija

St03-04, St13-74 - Arm. bet. kolenasta ploca stepenista dpl = 18 cm

Opterećenje1. Stalno g(g) kN/m²2. Povremeno p kN/m²**St03-04****odmoriste St03-04**

- teraco pločice 1.5 cm	= 0.36
- gradj. lepak 2.5 cm	= 0.05
- glet masa na lepku	= 0.03
<hr/>	
	g1(g) = 0.44 kN/m ²

- korisno

p = 2.50 kN/m²**kosa ploca St03-04**

- stepenici 17.5/28	= 2.10 kN/m ²
- hor. obloga teraco talpe na lepku 3cm	= 0.72 kN/m ²
- ver.obloga 17.5/28*0.03*24	= 0.45 kN/m ²
- glet masa na lepku	= 0.03 kN/m ²
<hr/>	
	g2(g) = 3.30 kN/m ²

- korisno 2.50x0.848

p2 = 2.12 kN/m²**St13-74**

- stepenici 17/28	= 2.04 kN/m ²
- hor. obloga teraco talpe na lepku 3cm	= 0.72 kN/m ²
- ver.obloga 17.5/28*0.03*24	= 0.45 kN/m ²
- glet masa na lepku	= 0.03 kN/m ²
<hr/>	
	g3(g) = 3.24 kN/m ²

- korisno 2.50x0.857

p3 = 2.14 kN/m²**Hodnik**

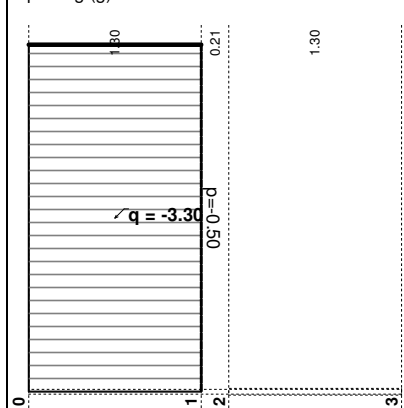
- teraco pločice 2.5cm	= 0.60 kN/m ²
- cem. košuljica 5.5cm	= 1.16 kN/m ²
- EPS 2cm	= 0.01 kN/m ²
- glet masa na lepku	= 0.03 kN/m ²
<hr/>	
	g4(g) = 1.8 kN/m ²

p = 2.50 kN/m²**Ulazni podaci - Opterećenje****Lista slučajeva opterećenja**

LC	Naziv
1	g (g)
2	p

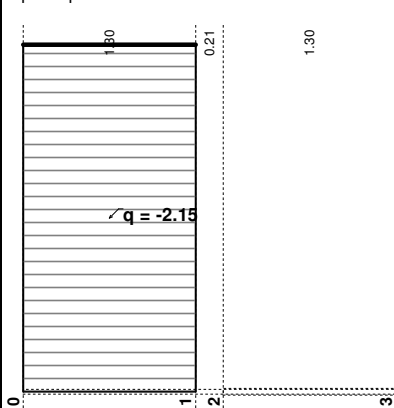
3	Komb.: 1.6xI+1.8xII
4	Komb.: 3.5xI+II

Opt. 1: g (g)



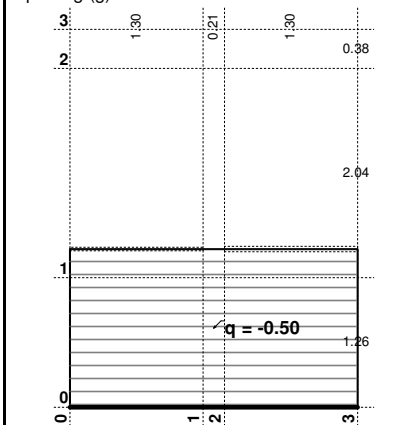
Pogled: St03

Opt. 2: p

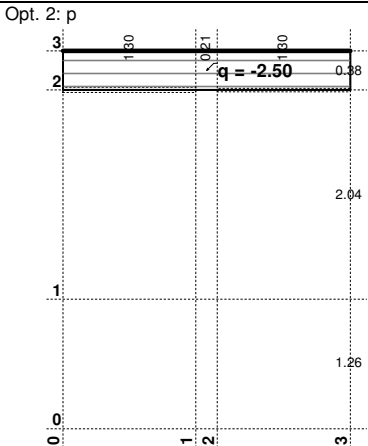


Pogled: St03

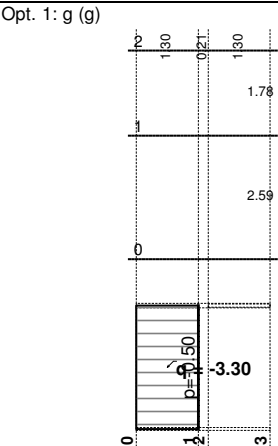
Opt. 1: g (g)



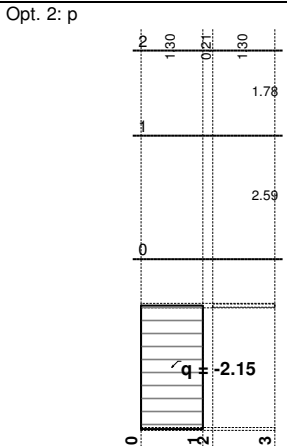
Nivo: OD 1 [-1.26 m]



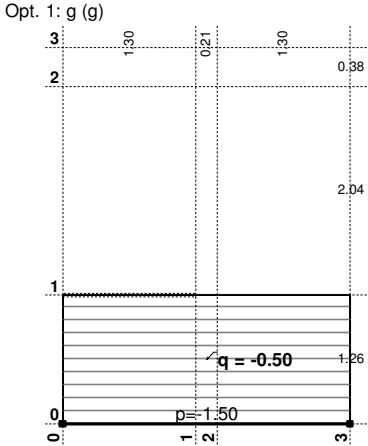
Nivo: P 100+ [2.78 m]



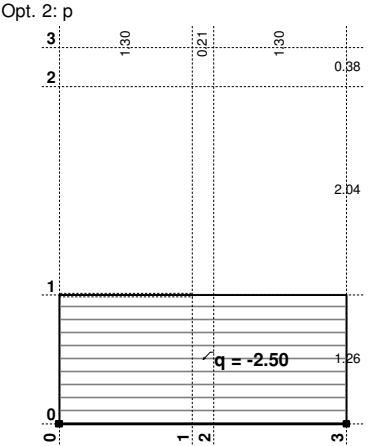
Pogled: St23



Pogled: St23

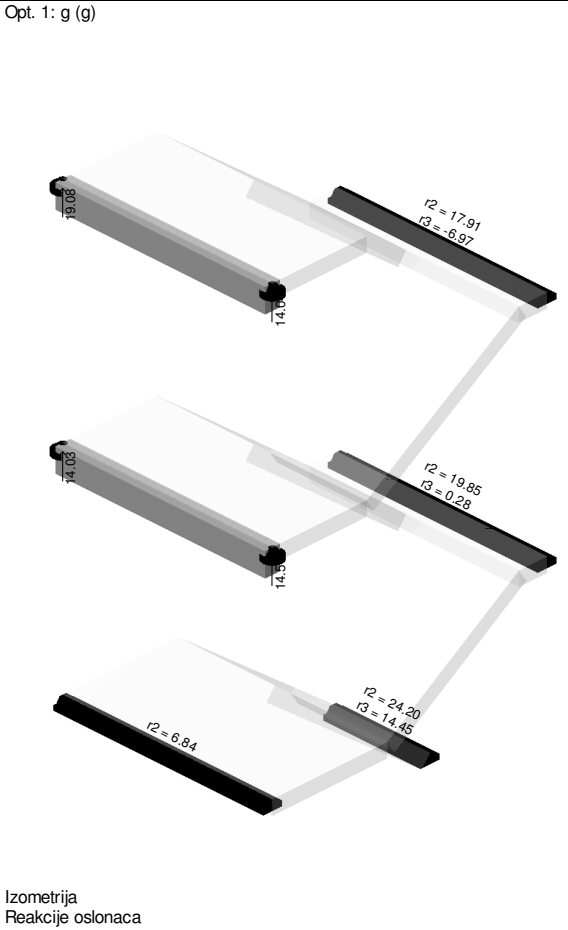


Nivo: OD3 [4.38 m]

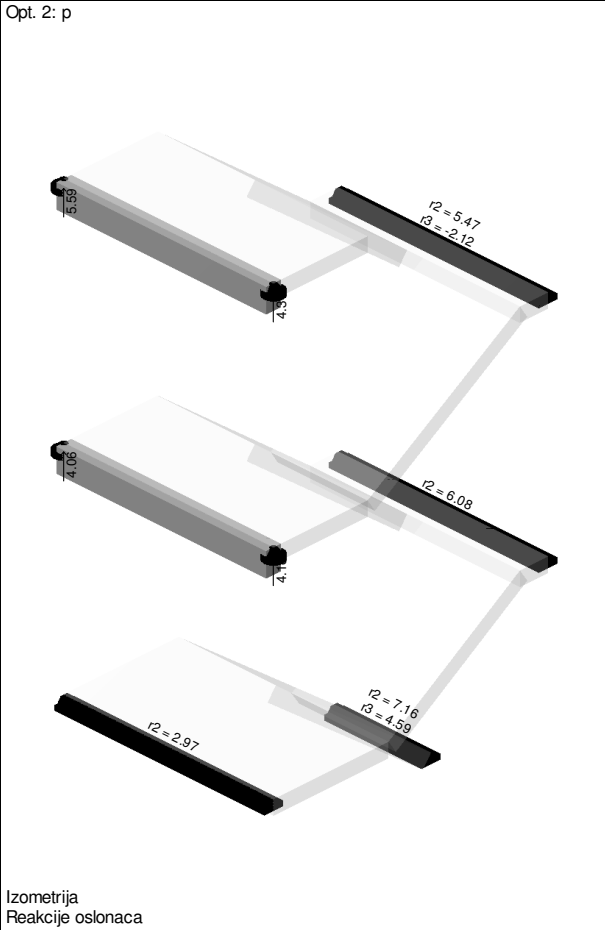


Nivo: OD3 [4.38 m]

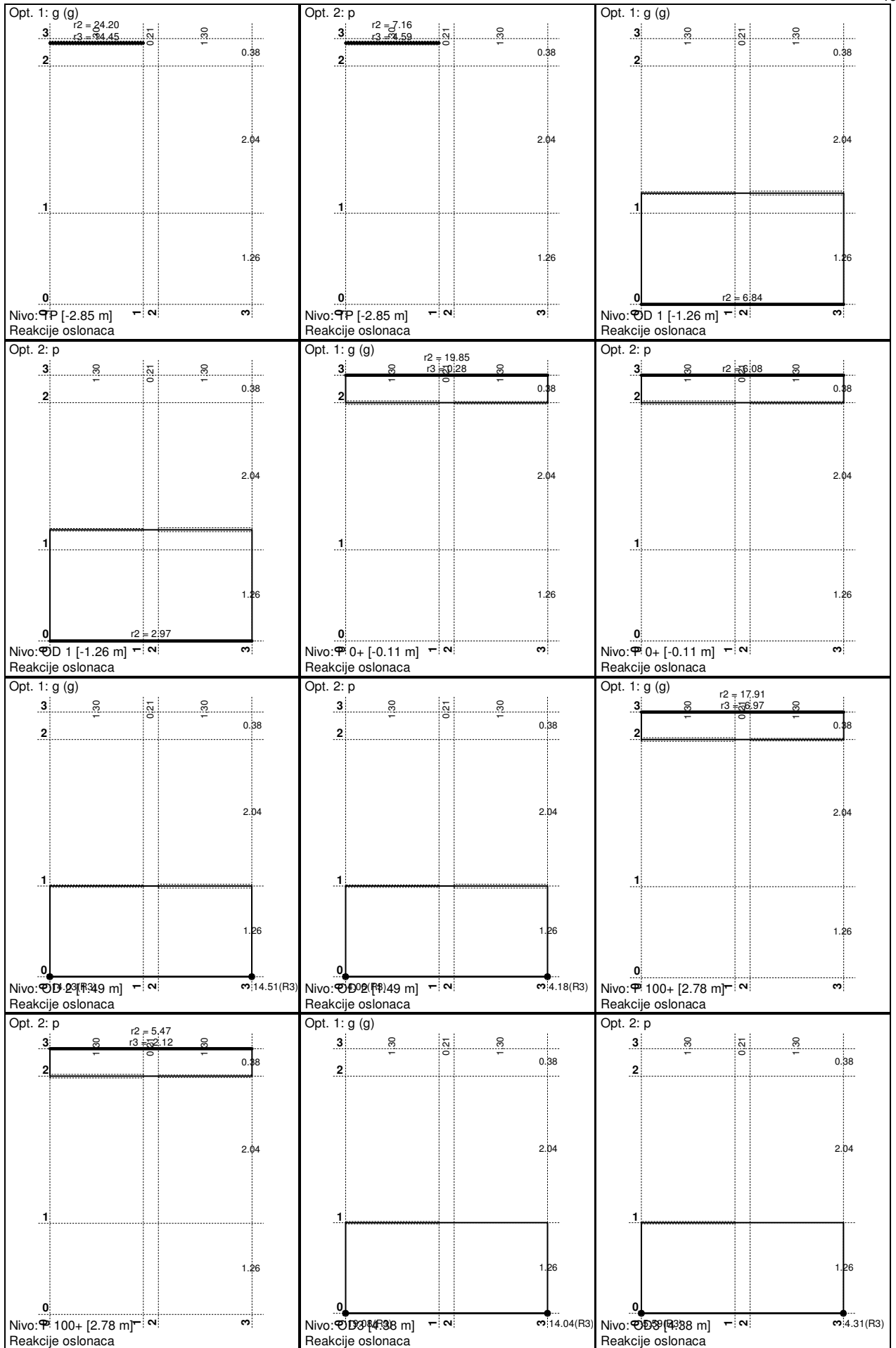
Statički proračun



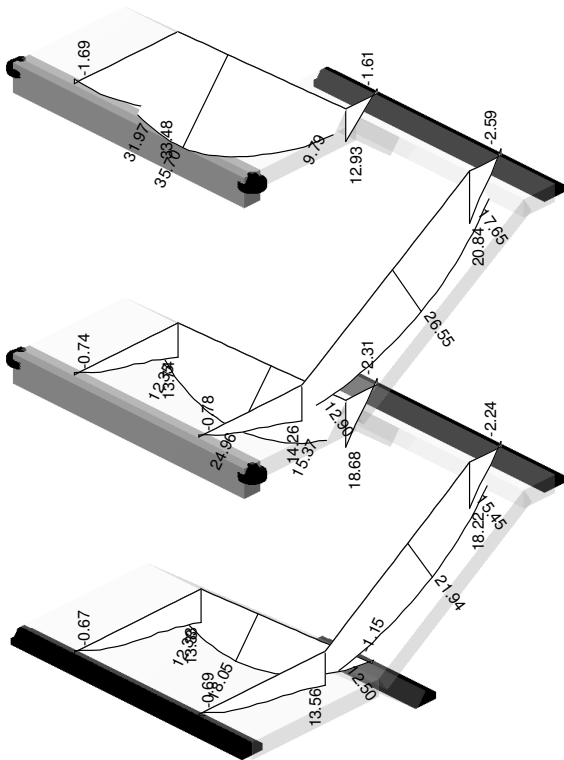
Izometrija
Reakcije oslonaca



Izometrija
Reakcije oslonaca

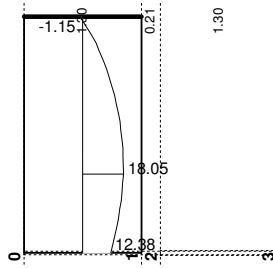


Opt. 3: 1.6xl+1.8xll



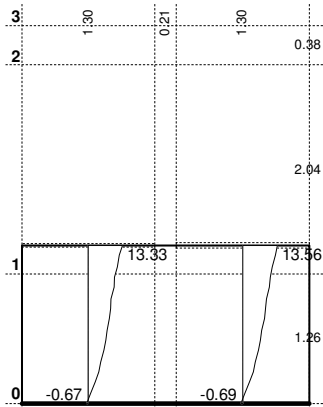
Izometrija
Vektorski presecki: Ms

Opt. 3: 1.6xl+1.8xll



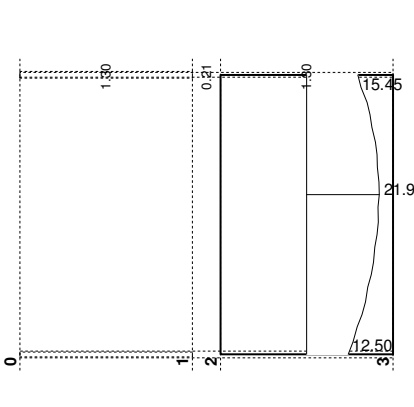
Pogled: St03
Vektorski presecki: Ms

Opt. 3: 1.6xl+1.8xll



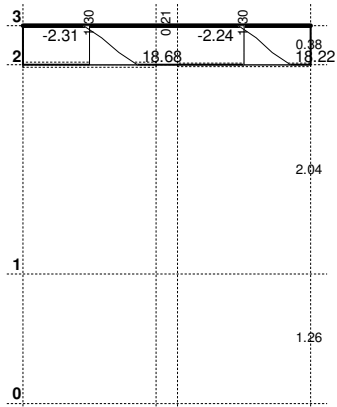
Nivo: D 1 [-1.26 m]
Vektorski presecki: Ms

Opt. 3: 1.6xl+1.8xll



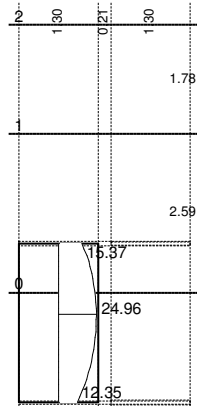
Pogled: St04
Vektorski presecki: Ms

Opt. 3: 1.6xl+1.8xll



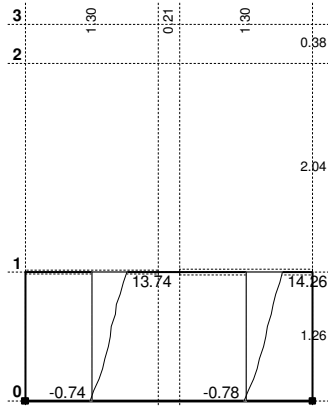
Nivo: 0+ [-0.11 m]
Vektorski presecki: Ms

Opt. 3: 1.6xl+1.8xll



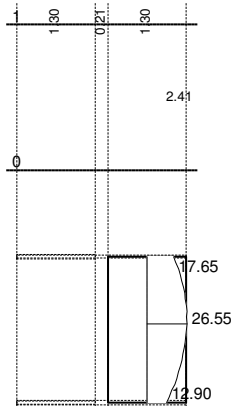
Pogled: St13
Vektorski presecki: Ms

Opt. 3: 1.6xl+1.8xll



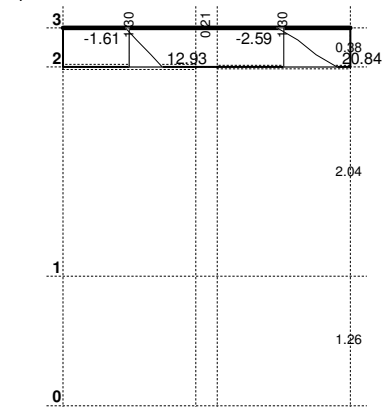
Nivo: D 2 [1.49 m]
Vektorski presecki: Ms

Opt. 3: 1.6xl+1.8xll



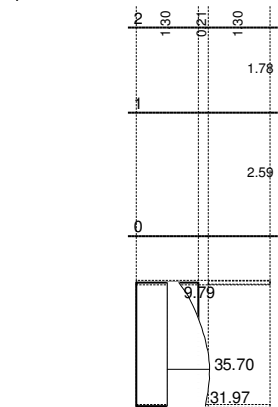
Pogled: St14
Vektorski presecki: Ms

Opt. 3: 1.6xl+1.8xII



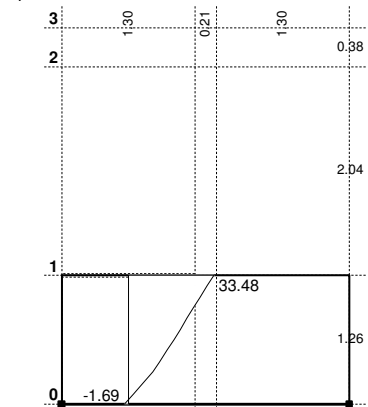
Nivo: Φ 100+ [2.78 m]
Vektorski presezi: Ms

Opt. 3: 1.6xl+1.8xII



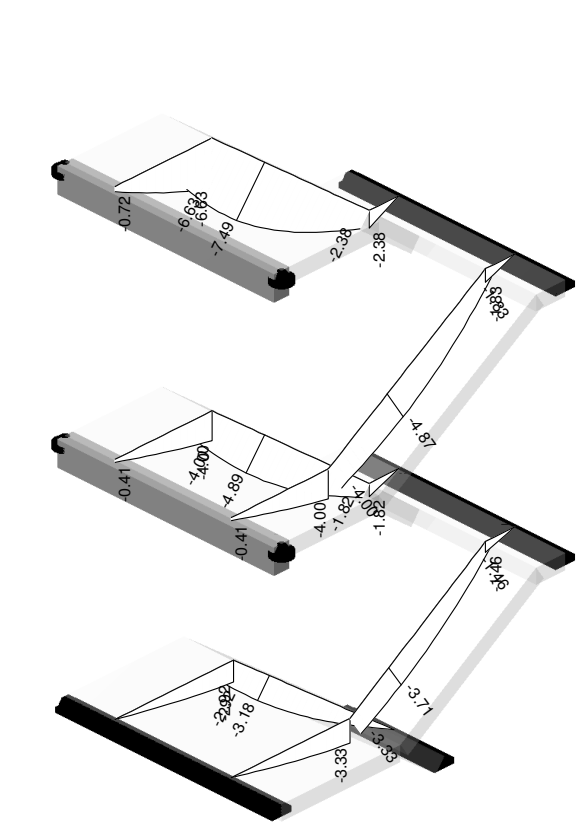
Pogled: St23
Vektorski presezi: Ms

Opt. 3: 1.6xl+1.8xII



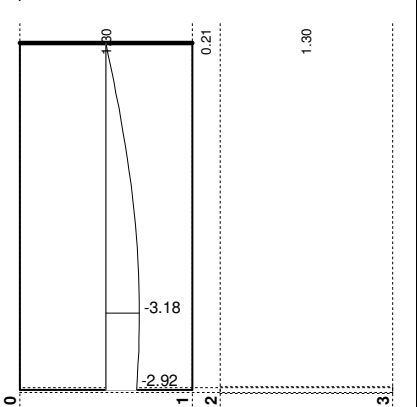
Nivo: Φ D3 [4.38 m]
Vektorski presezi: Ms

Opt. 4: 3.5xl+II



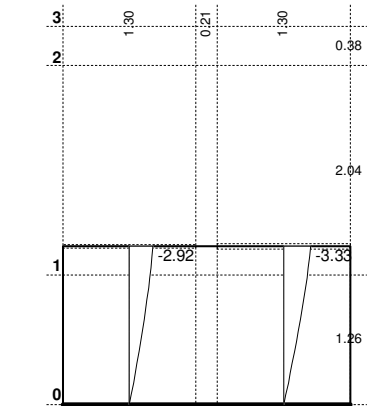
Izometrija
Vektorski presezi: Zp

Opt. 4: 3.5xl+II



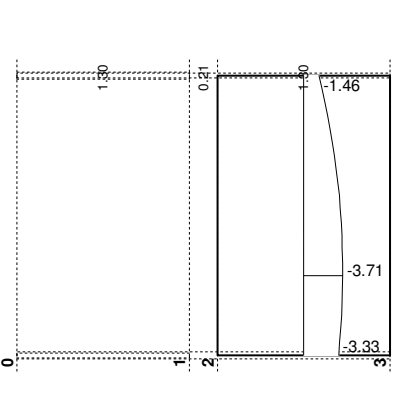
Pogled: St03
Vektorski presezi: Zp

Opt. 4: 3.5xl+II



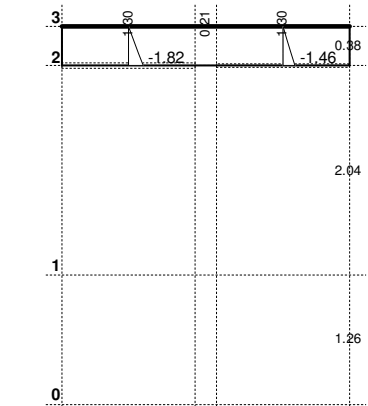
Nivo: Φ D 1 [-1.26 m]
Vektorski presezi: Zp

Opt. 4: 3.5xl+II

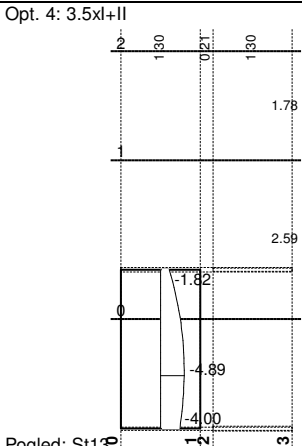


Pogled: St04
Vektorski presezi: Zp

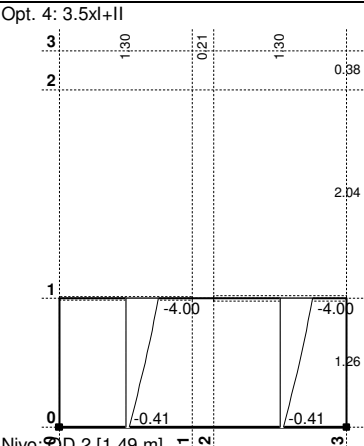
Opt. 4: 3.5xl+II



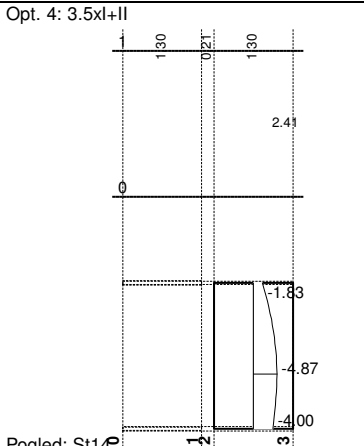
Nivo: Φ 0+ [-0.11 m]
Vektorski presezi: Zp



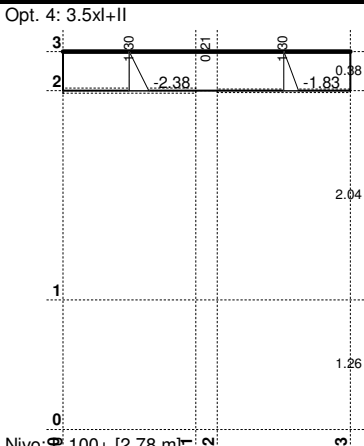
Pogled: St13P
Vektorski presezi: Zp



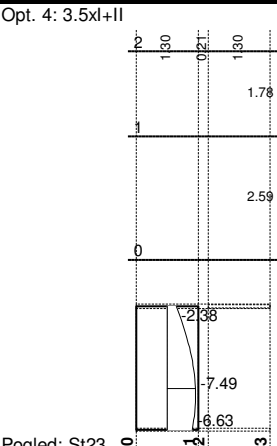
Nivo: D 2 [1.49 m]
Vektorski presezi: Zp



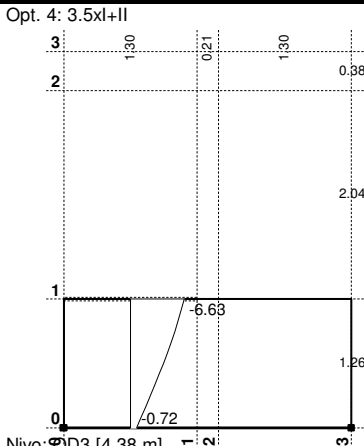
Pogled: St14P
Vektorski presezi: Zp



Nivo: P 100+ [2.78 m]
Vektorski presezi: Zp

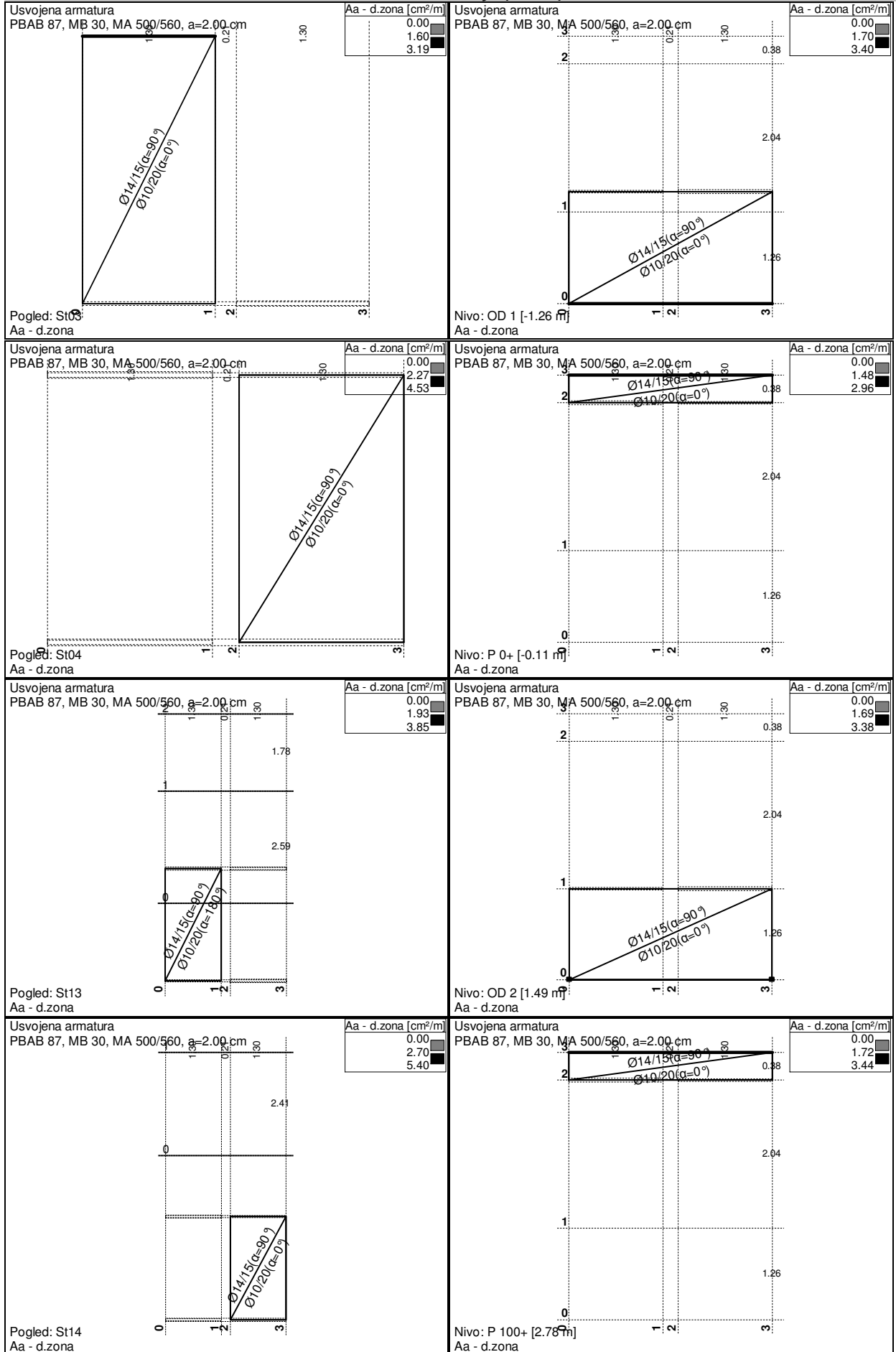


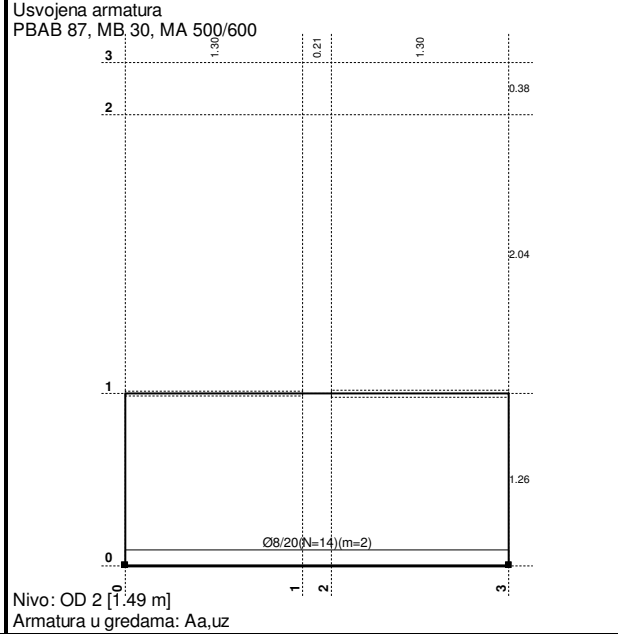
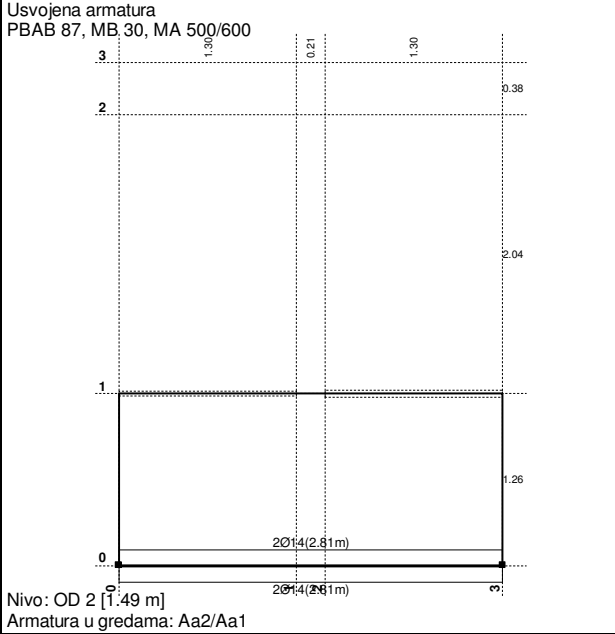
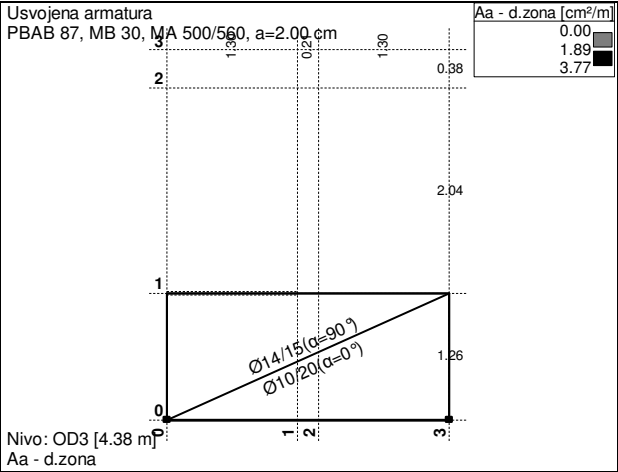
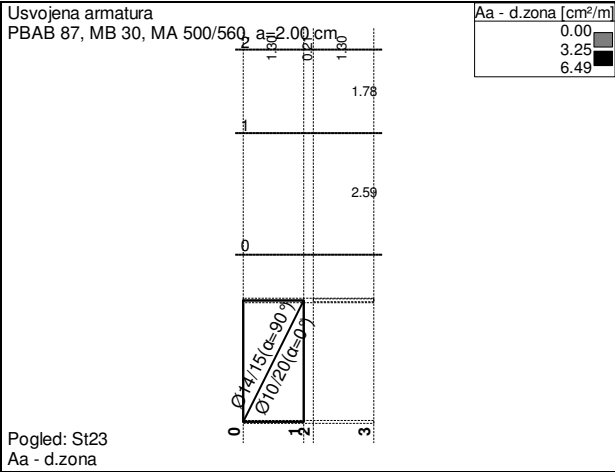
Pogled: St23
Vektorski presezi: Zp



Nivo: D3 [4.38 m]
Vektorski presezi: Zp

Dimenzionisanje (beton)





Ulazni podaci - Konstrukcija, Ulazni podaci - Opterećenje

St05-06, St15-76 - Arm. bet. kolenasta ploca stepenista dpl = 18 cm

Opterećenje

1. Stalno g(g) kN/m²

2. Povremeno p kN/m²

St05-06

odmoriste St05-06

- teraco pločice 1.5 cm	= 0.36
- gradj. lepak 2.5 cm	= 0.05
- glet masa na lepku	= 0.03
	<hr/>
	g1(g) = 0.44 kN/m ²

- korisno

p = 2.50 kN/m²

kosa ploca St05-06

- stepenici 17.5/28	= 2.10 kN/m ²
- hor. obloga teraco talpe na lepku 3cm	= 0.72 kN/m ²
- ver.obloga 17.5/28*0.03*24	= 0.45 kN/m ²
- glet masa na lepku	= 0.03 kN/m ²
	<hr/>
	g2(g) = 3.30 kN/m ²

- korisno 2.50x0.848

p2 = 2.12 kN/m²

St11-76

- stepenici 17/28	= 2.04 kN/m ²
- hor. obloga teraco talpe na lepku 3cm	= 0.72 kN/m ²
- ver.obloga 17.5/28*0.03*24	= 0.45 kN/m ²
- glet masa na lepku	= 0.03 kN/m ²
	<hr/>
	g3(g) = 3.24 kN/m ²

- korisno 2.50x0.857

p3 = 2.14 kN/m²

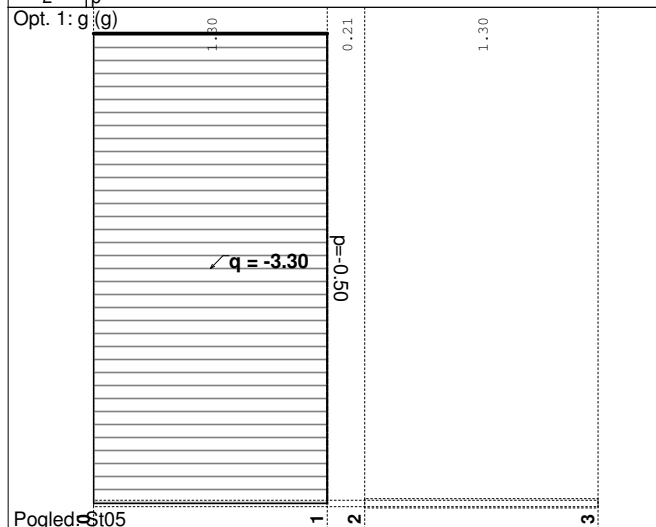
Hodnik

- teraco pločice 1.5cm	= 0.36 kN/m ²
- gradj. lepak 2.5cm	= 0.05 kN/m ²
- glet masa na lepku	= 0.03 kN/m ²
	<hr/>
	g4(g) = 2.8 kN/m ²

p = 2.50 kN/m²

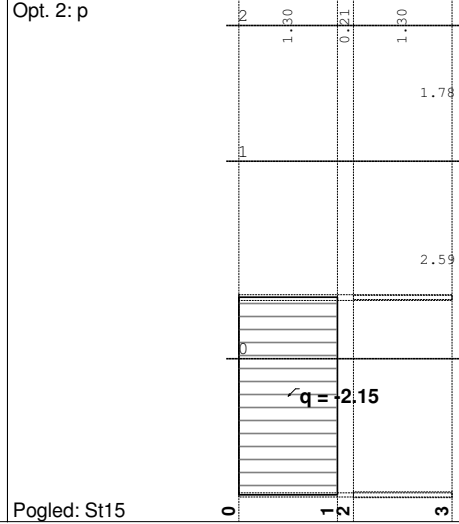
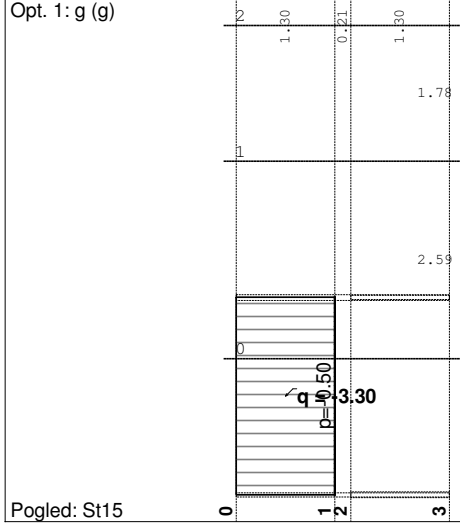
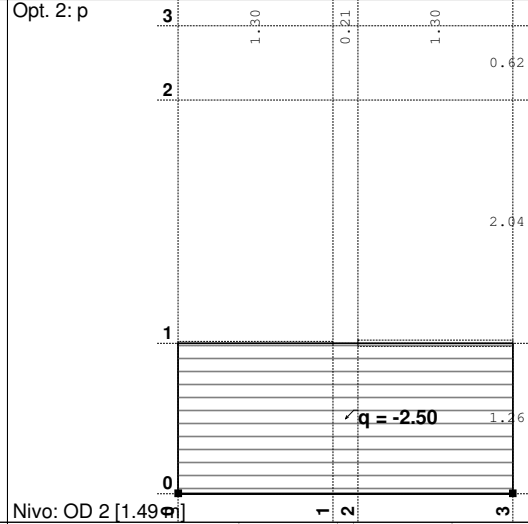
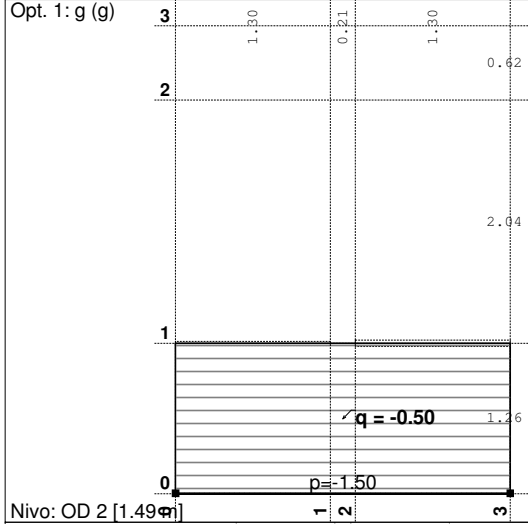
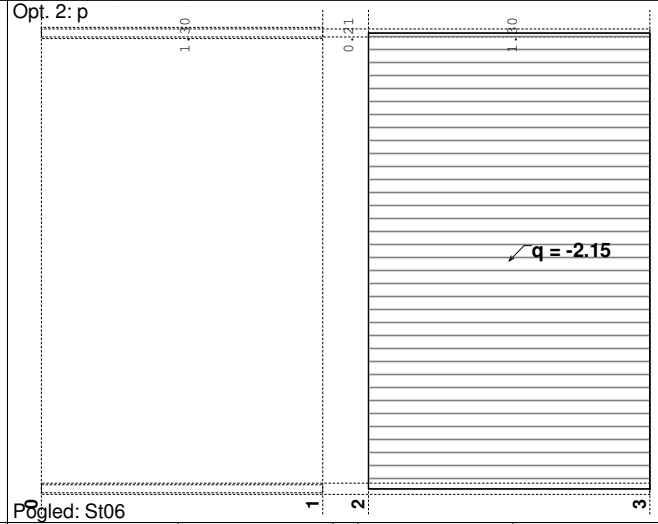
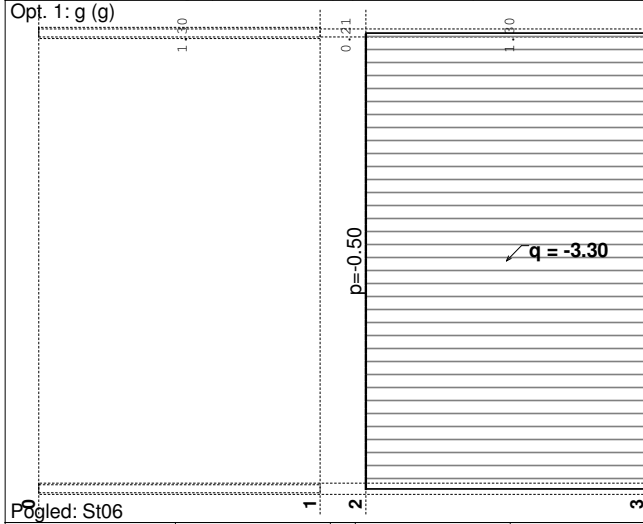
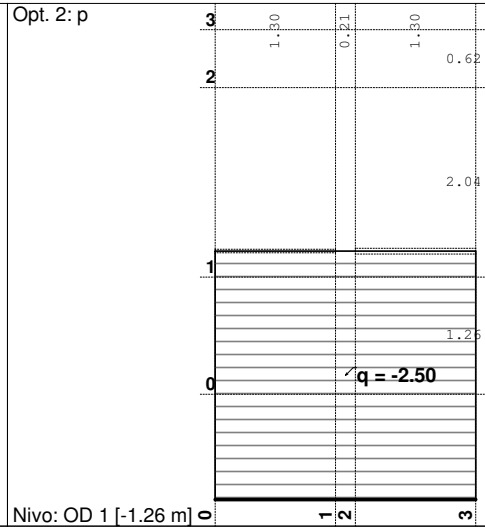
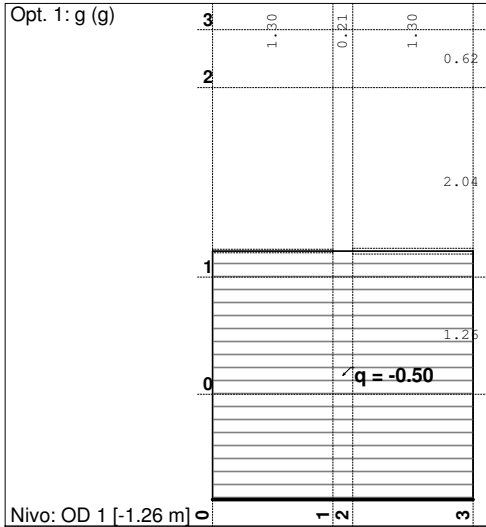
Lista slučajeva opterećenja

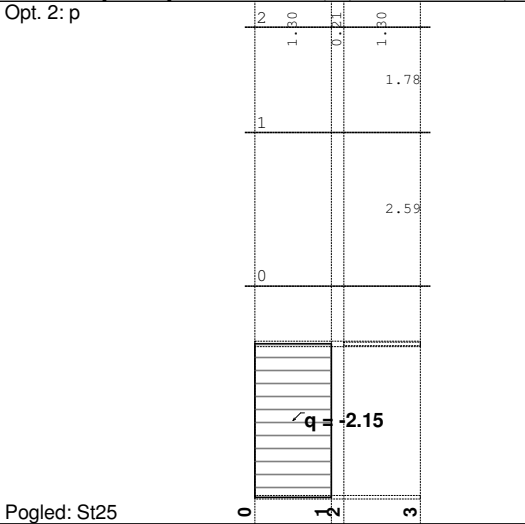
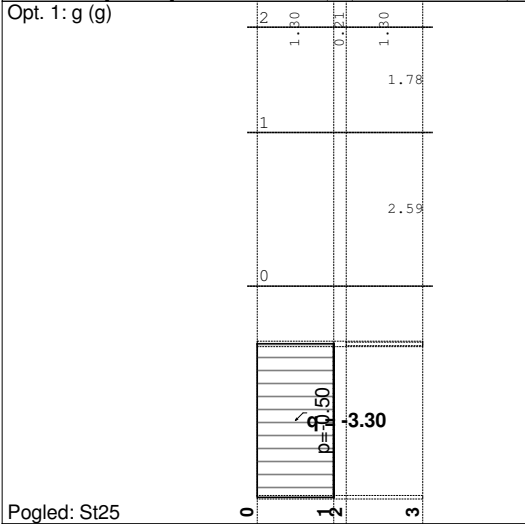
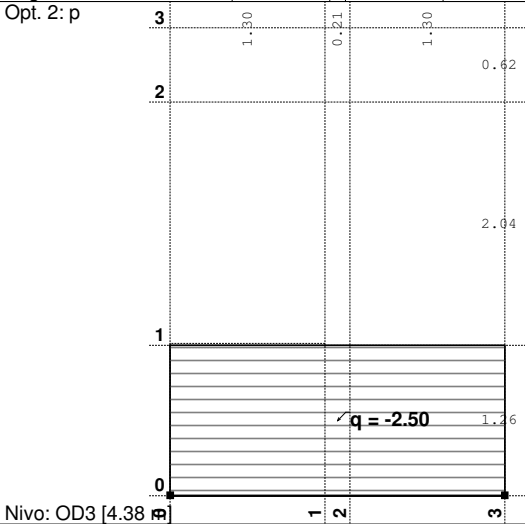
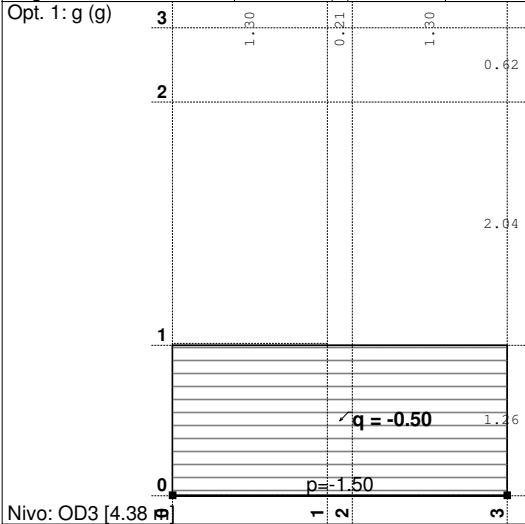
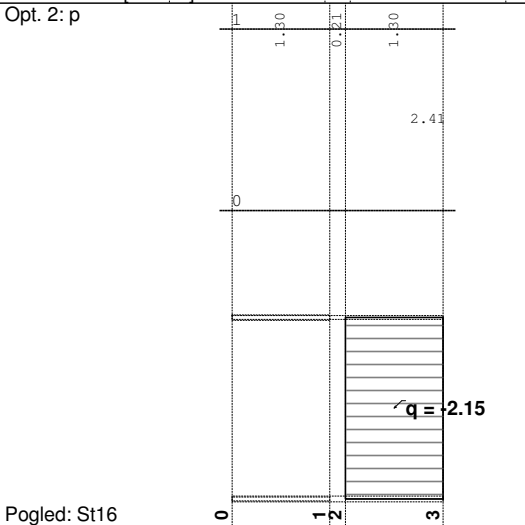
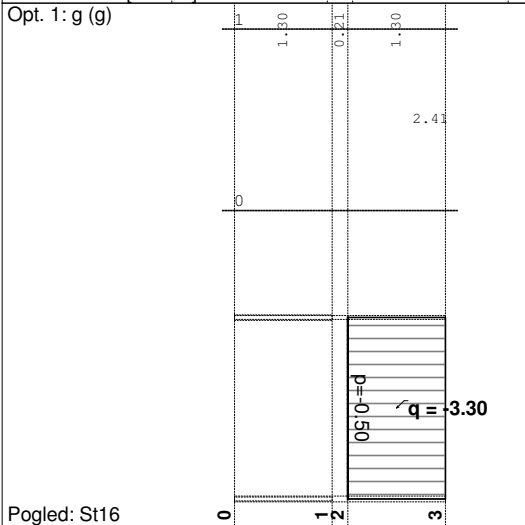
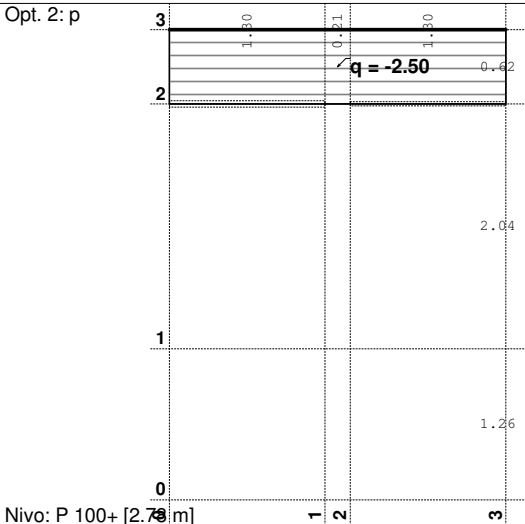
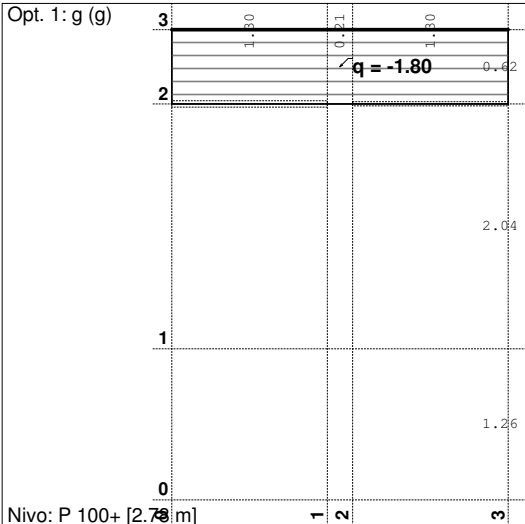
LC	Naziv
1	g (g)
2	p



LC	Naziv
3	Komb.: 1.6xI+1.8xII
4	Komb.: 3.5xI+II

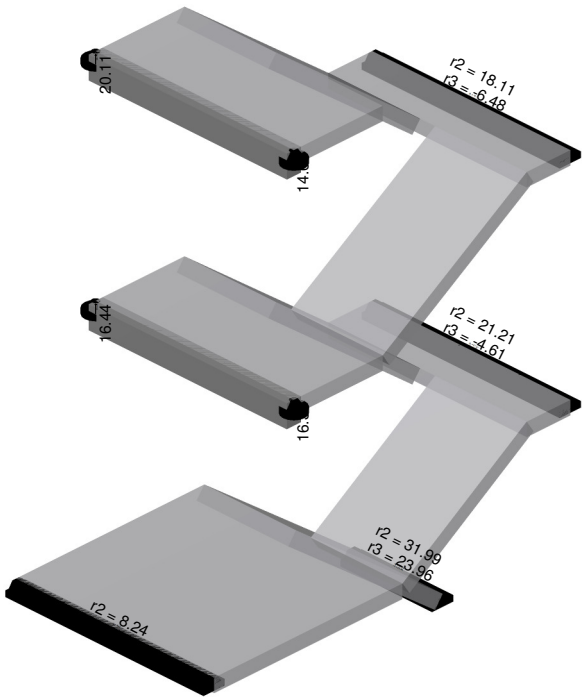




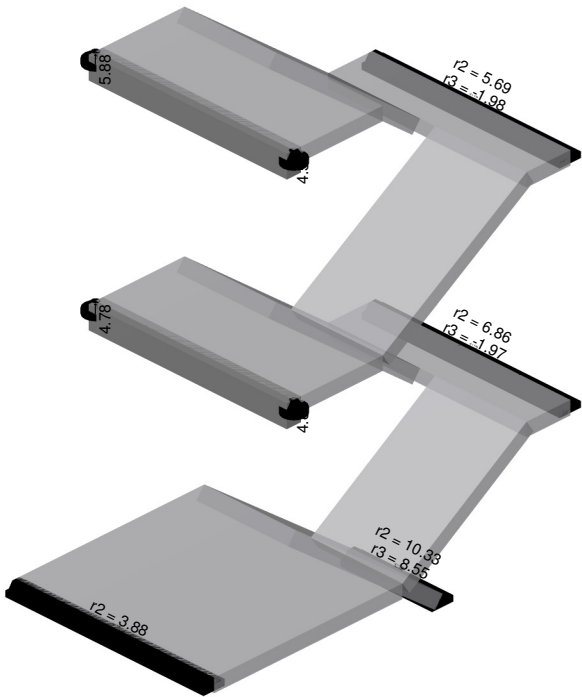


Statički proračun

Opt. 1: g (g)

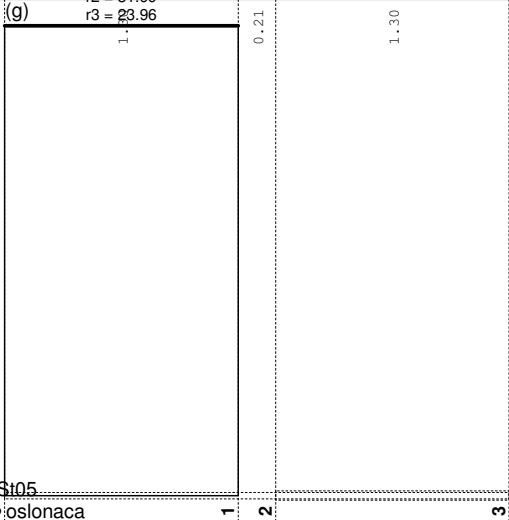


Opt. 2: p



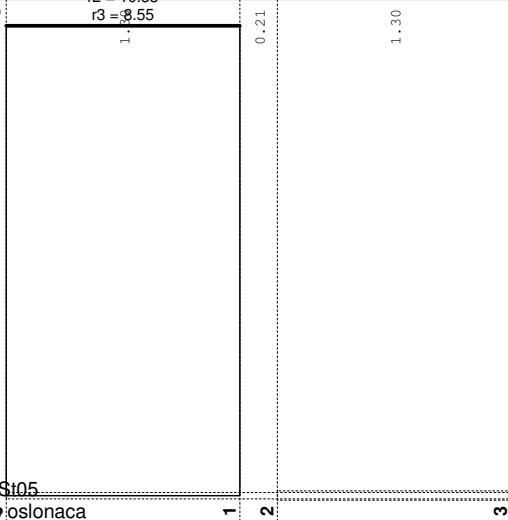
Izometrija
Reakcije oslonaca

Opt. 1: g (g)



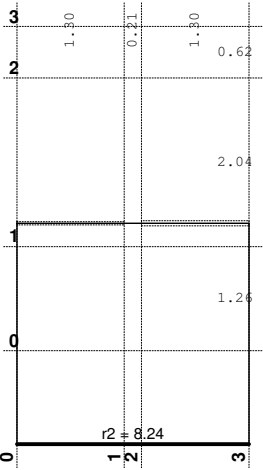
Izometrija
Reakcije oslonaca

Opt. 2: p



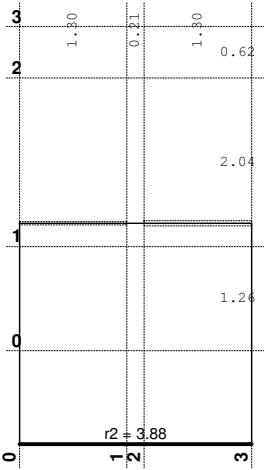
Pogled: S105
Reakcije oslonaca

Opt. 1: g (g)



Pogled: S105
Reakcije oslonaca

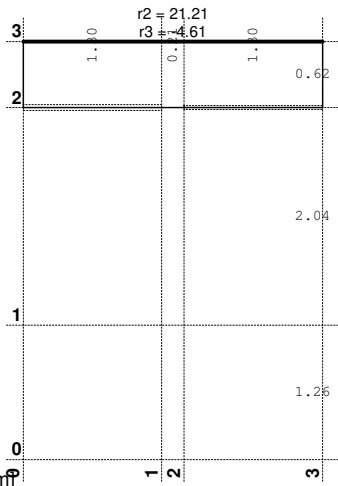
Opt. 2: p



Nivo: OD 1 [-1.26 m]
Reakcije oslonaca

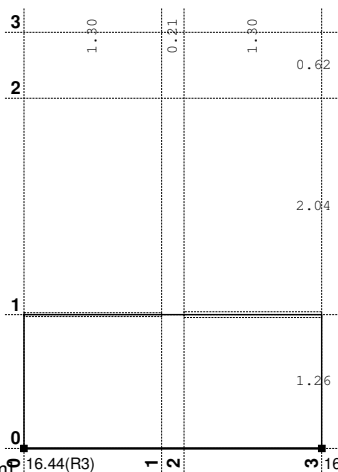
Nivo: OD 1 [-1.26 m]
Reakcije oslonaca

Opt. 1: g (g)



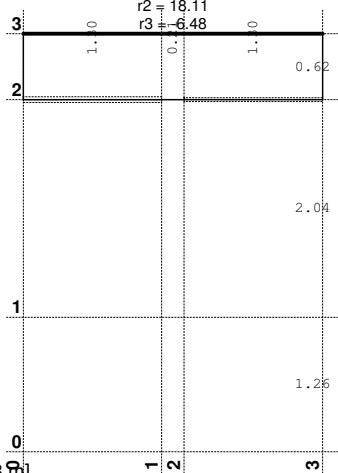
Nivo: P 0+ [-0.11 m]
Reakcije oslonaca

Opt. 1: g (g)



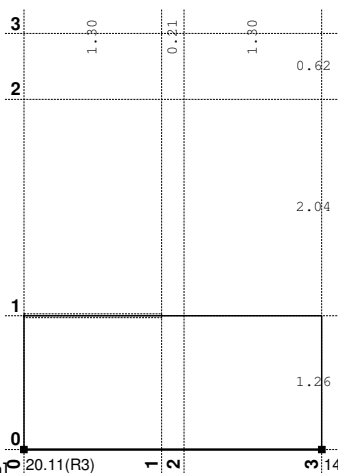
Nivo: OD 2 [1.49 m]
Reakcije oslonaca

Opt. 1: g (g)



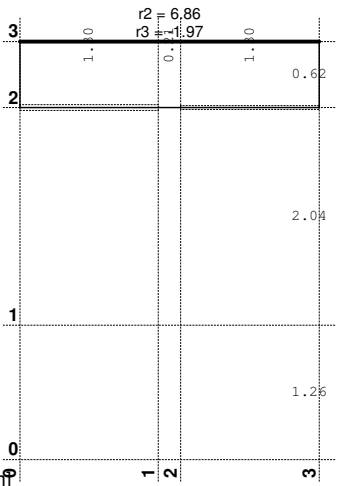
Nivo: P 100+ [2.78 m]
Reakcije oslonaca

Opt. 1: g (g)



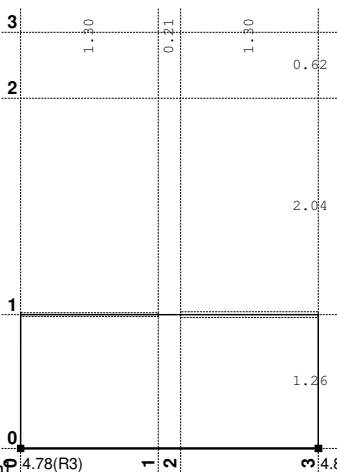
Nivo: OD3 [4.38 m]
Reakcije oslonaca

Opt. 2: p



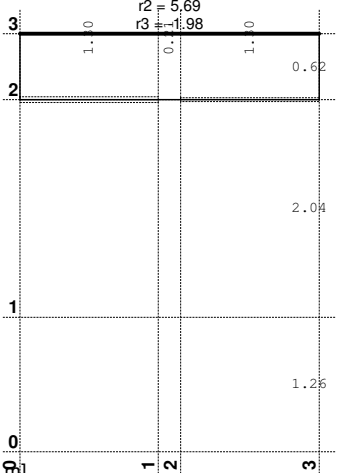
Nivo: P 0+ [-0.11 m]
Reakcije oslonaca

Opt. 2: p



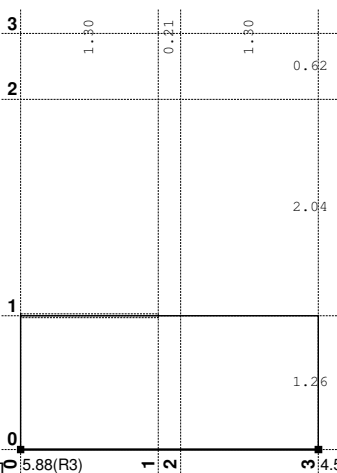
Nivo: OD 2 [1.49 m]
Reakcije oslonaca

Opt. 2: p



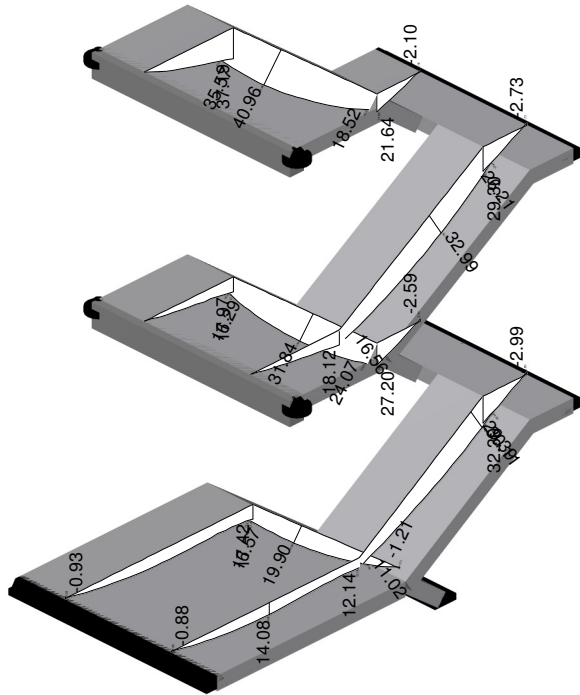
Nivo: P 100+ [2.78 m]
Reakcije oslonaca

Opt. 2: p



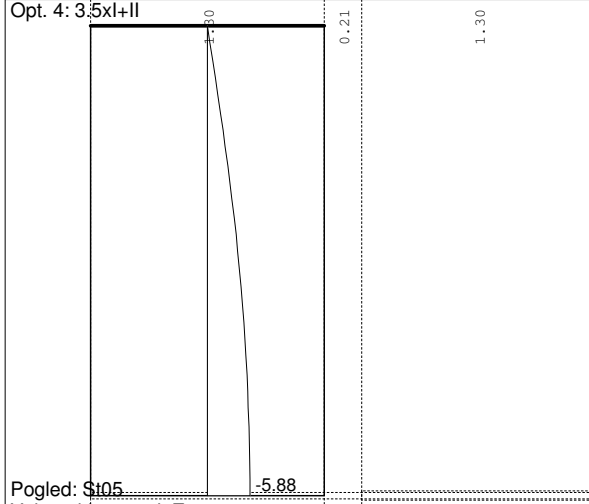
Nivo: OD3 [4.38 m]
Reakcije oslonaca

Opt. 3: 1.6xl+1.8xII



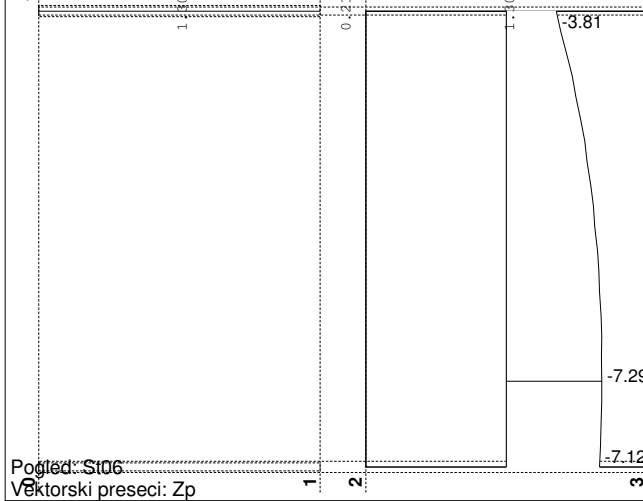
Izometrija
Vektorski presezi: Ms

Opt. 4: 3.5xl+II



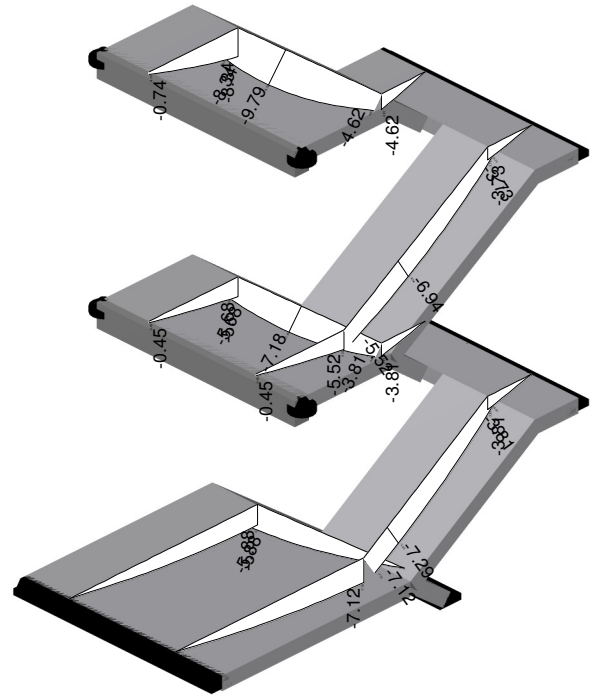
Pogled: S105
Vektorski presezi: Zp

Opt. 4: 3.5xl+II



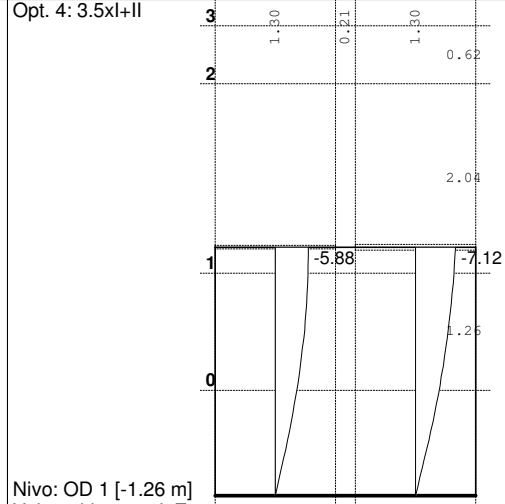
Pogled: S106
Vektorski presezi: Zp

Opt. 4: 3.5xl+II



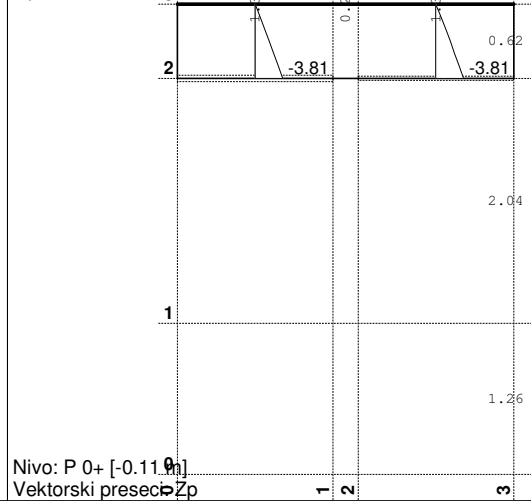
Izometrija
Vektorski presezi: Zp (ugib)

Opt. 4: 3.5xl+II

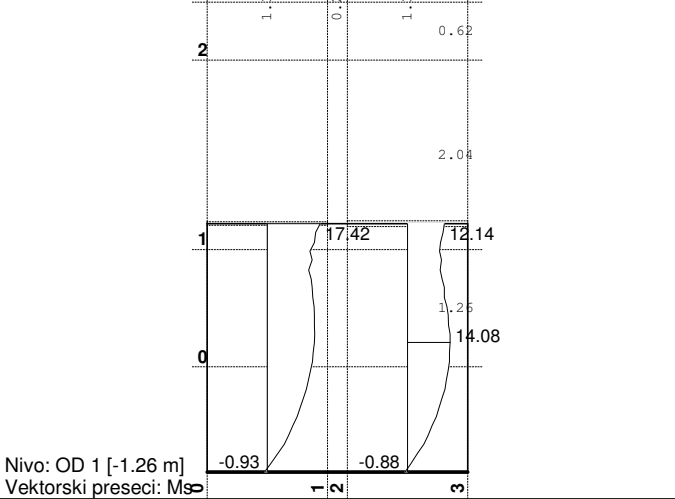
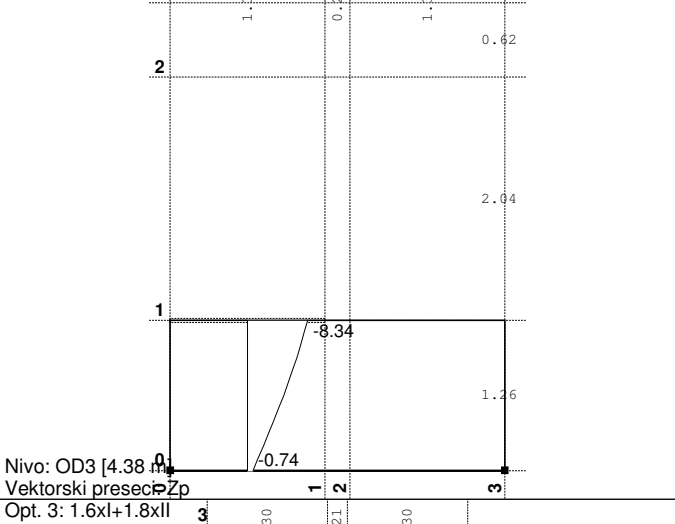
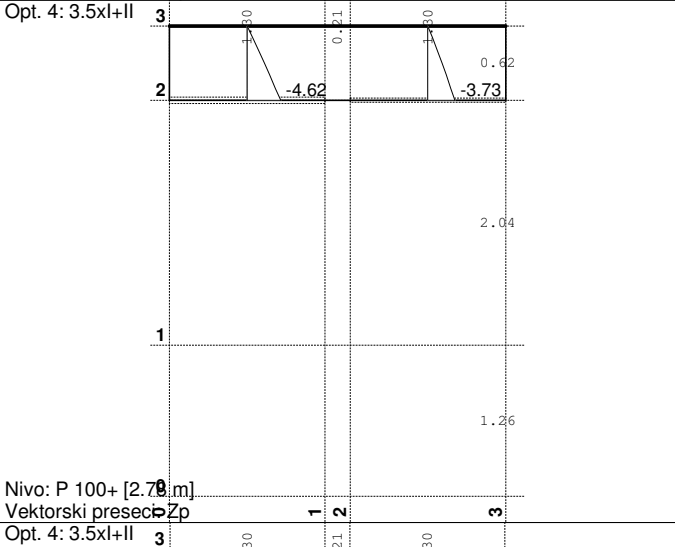
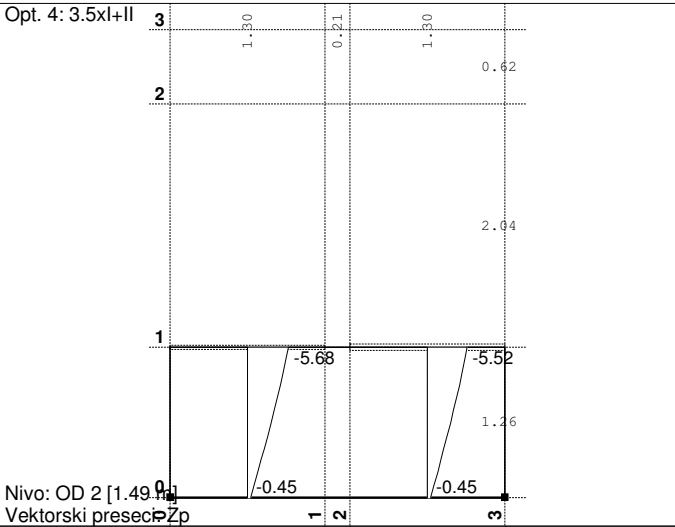
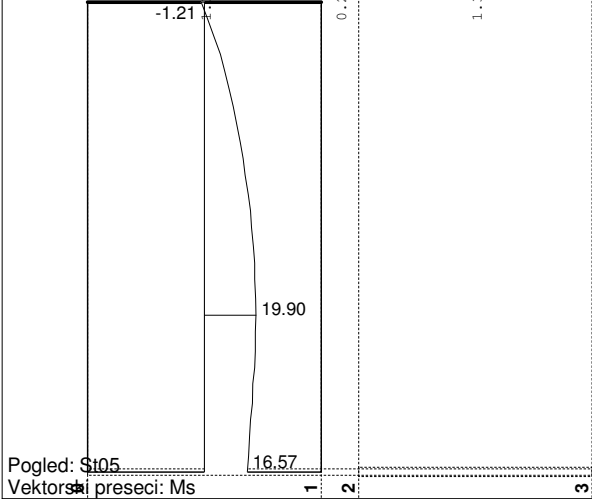
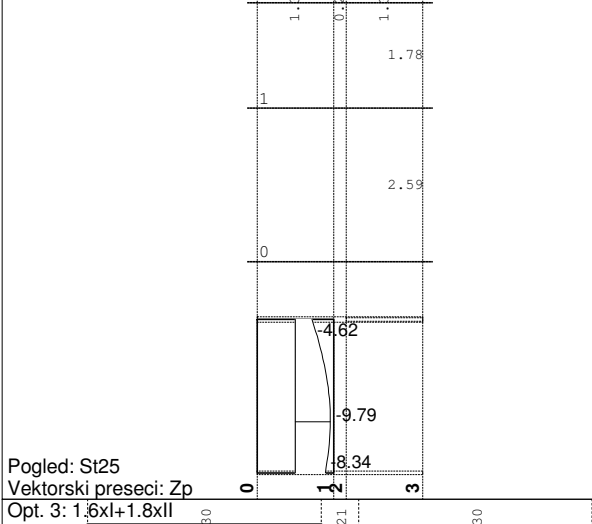
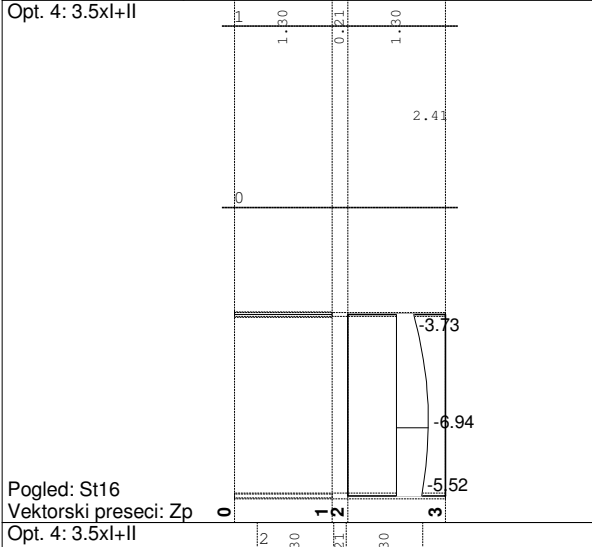
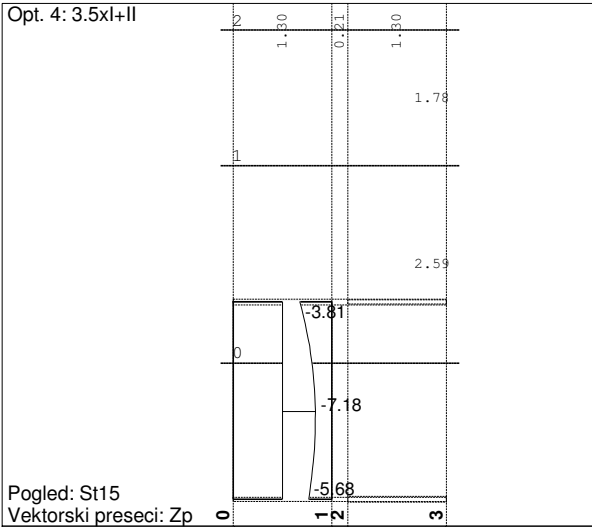


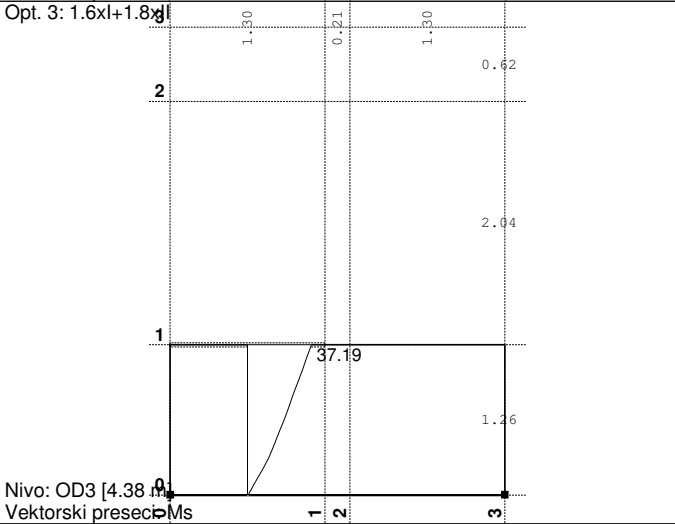
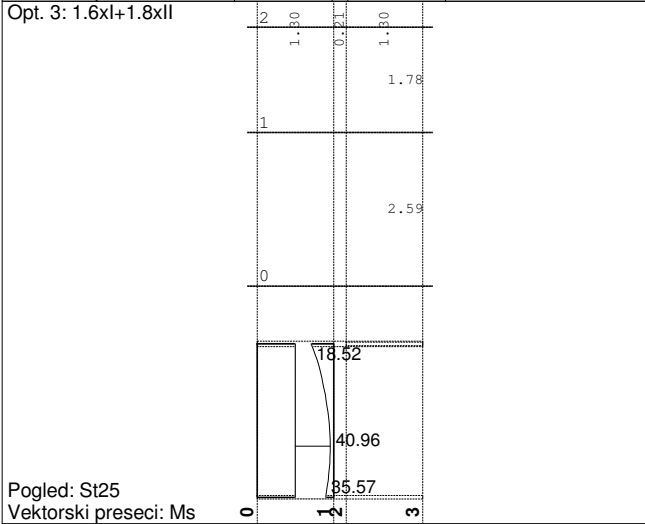
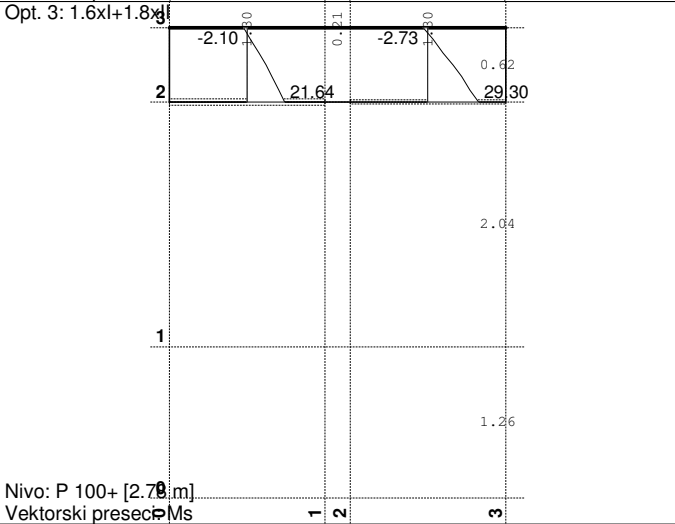
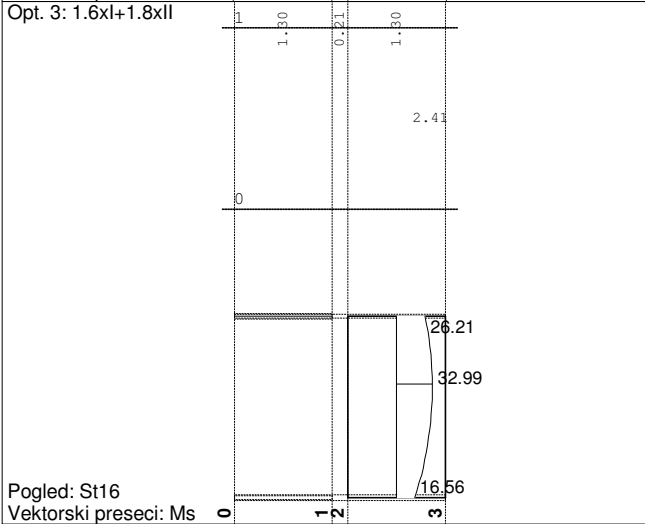
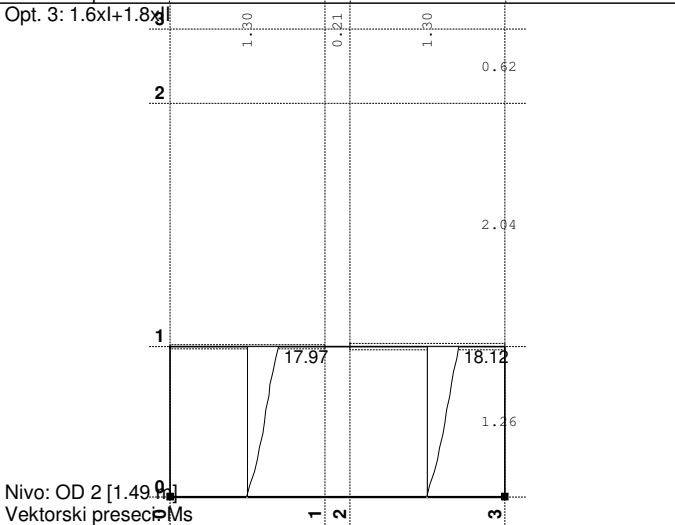
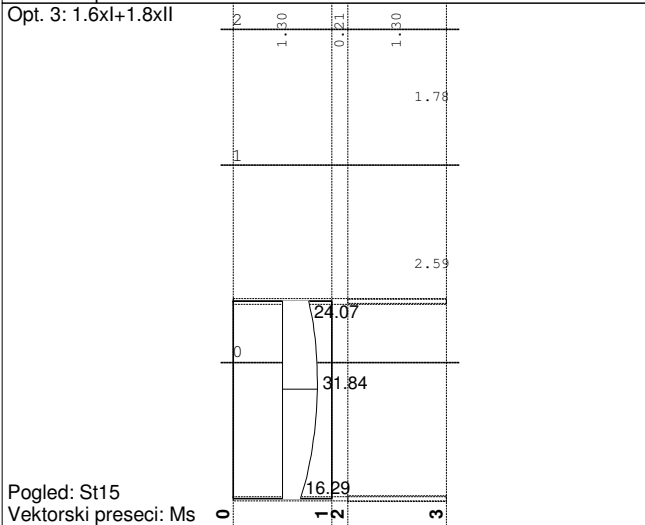
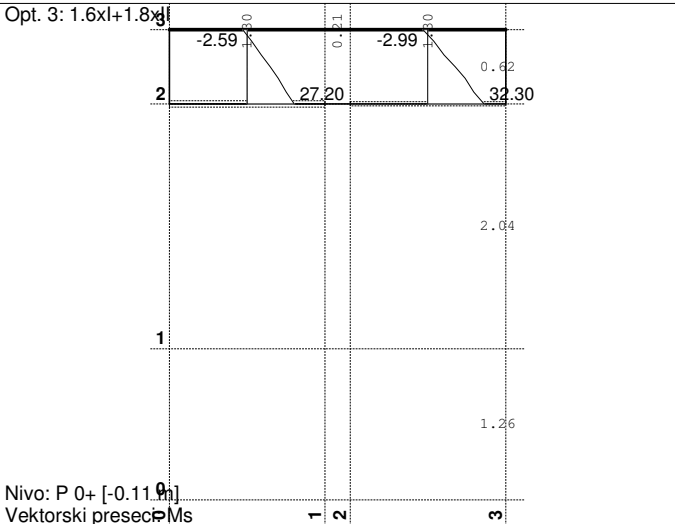
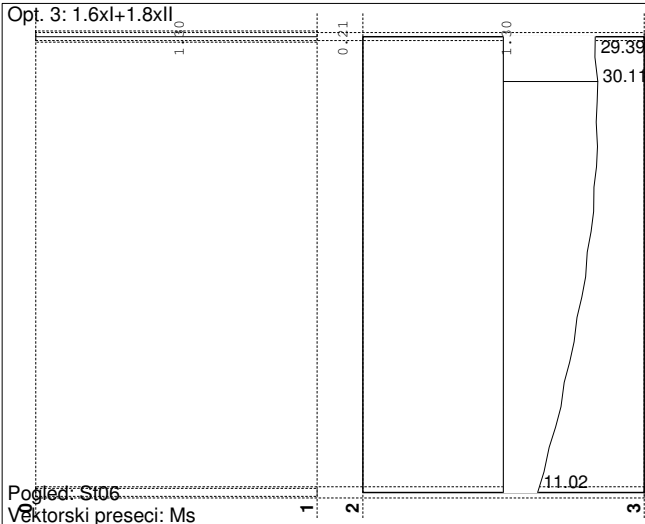
Nivo: OD 1 [-1.26 m]
Vektorski presezi: Zp

Opt. 4: 3.5xl+II

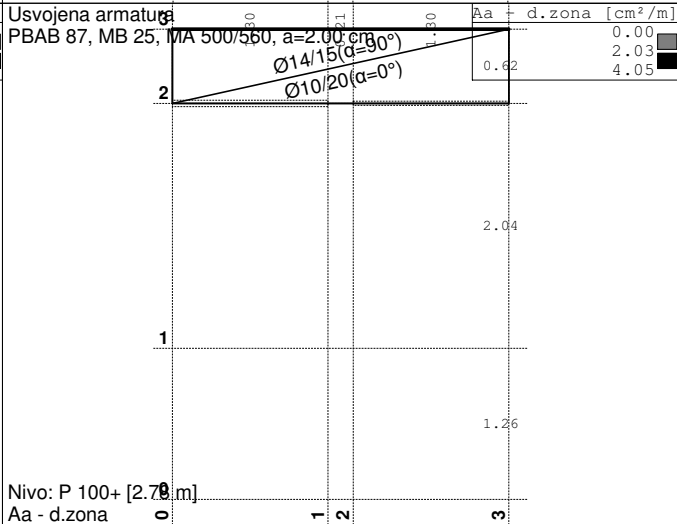
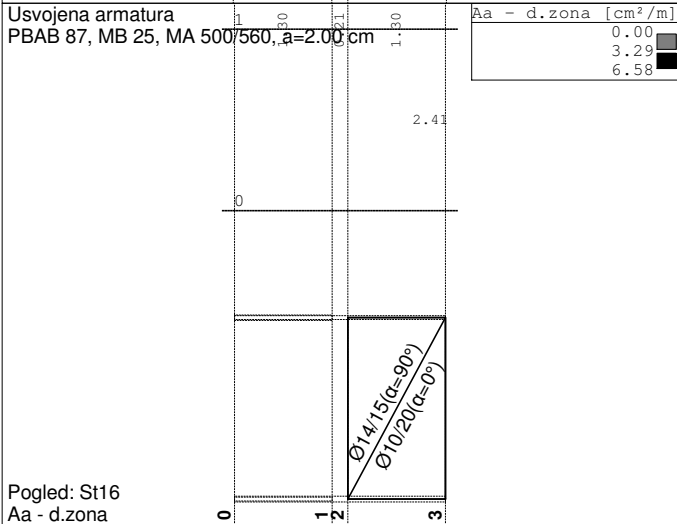
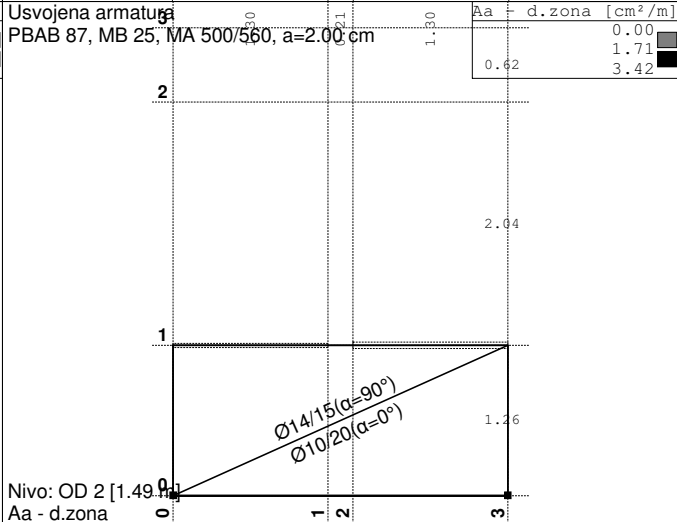
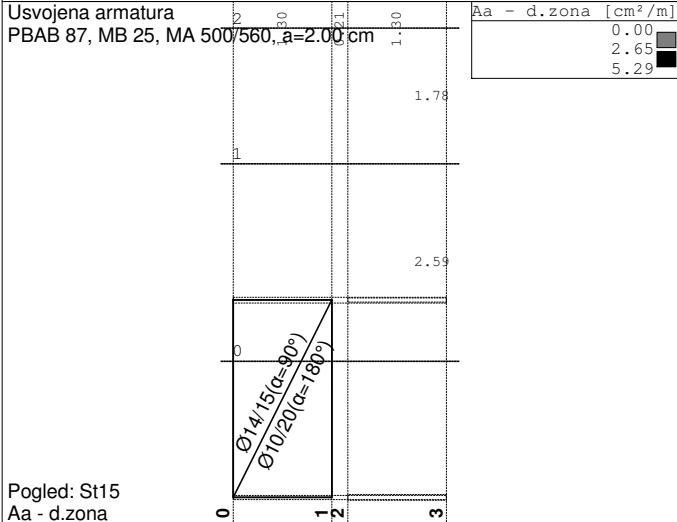
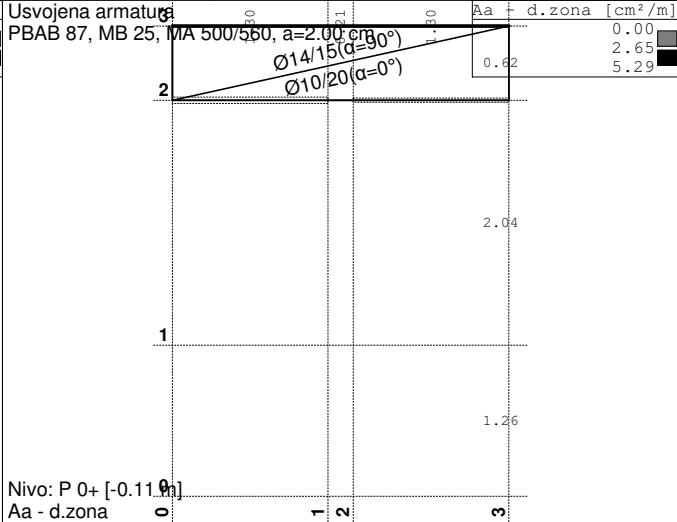
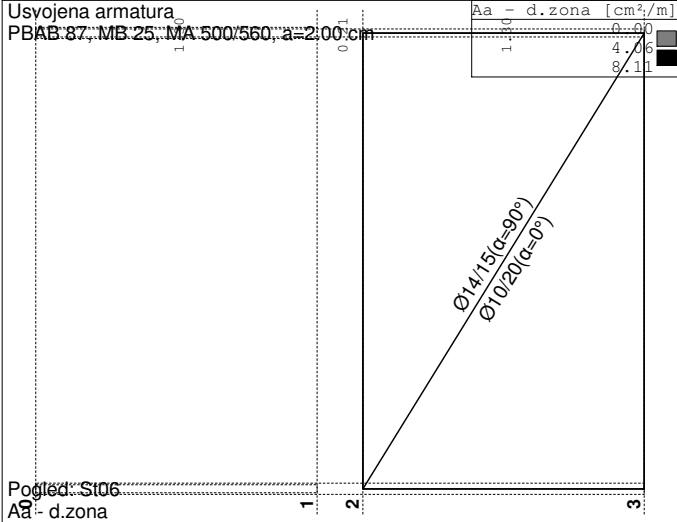
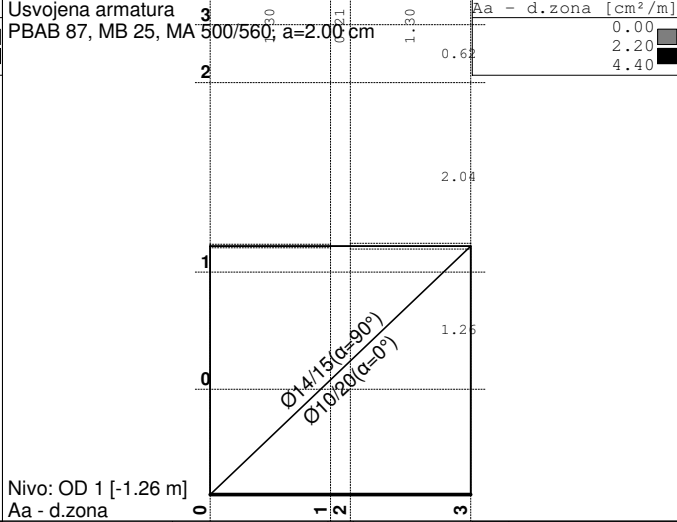
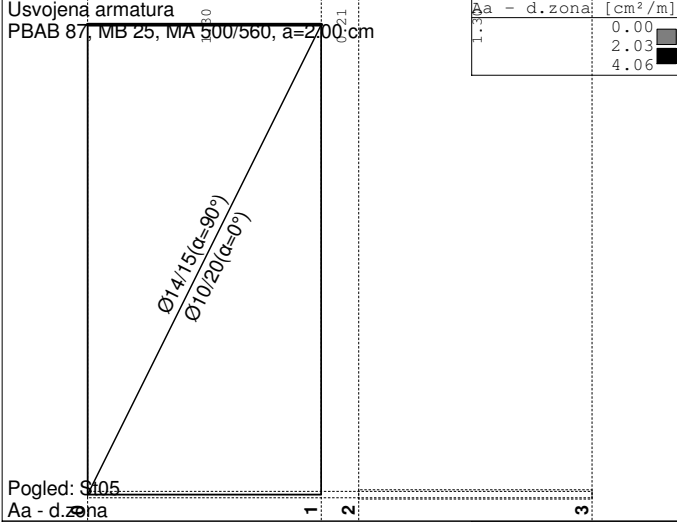


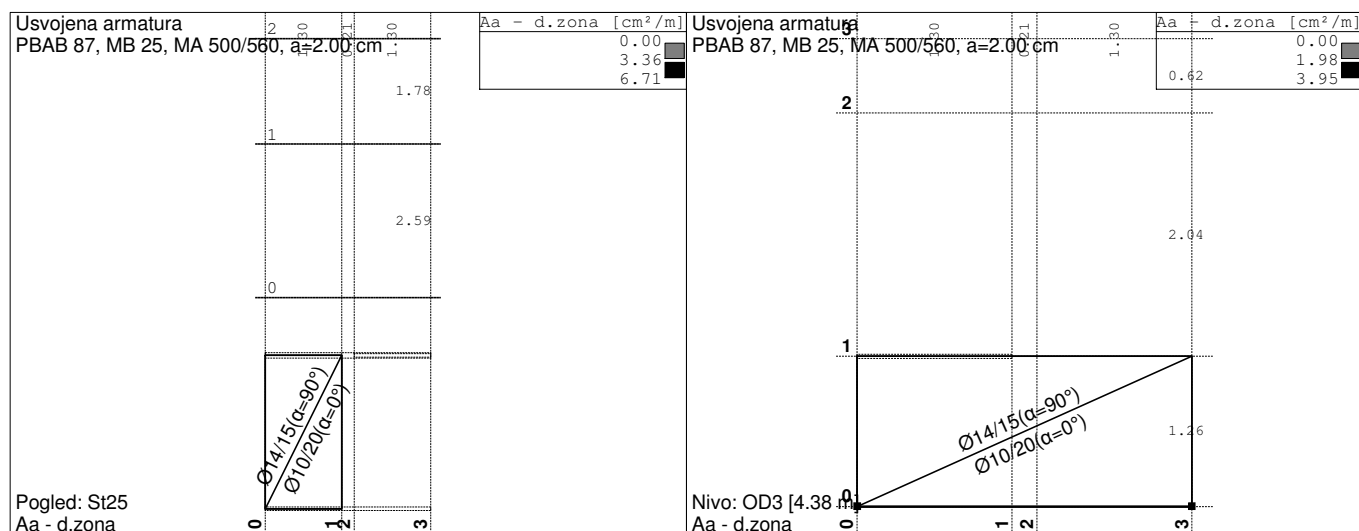
Nivo: P 0+ [-0.11 m]
Vektorski presezi: Zp



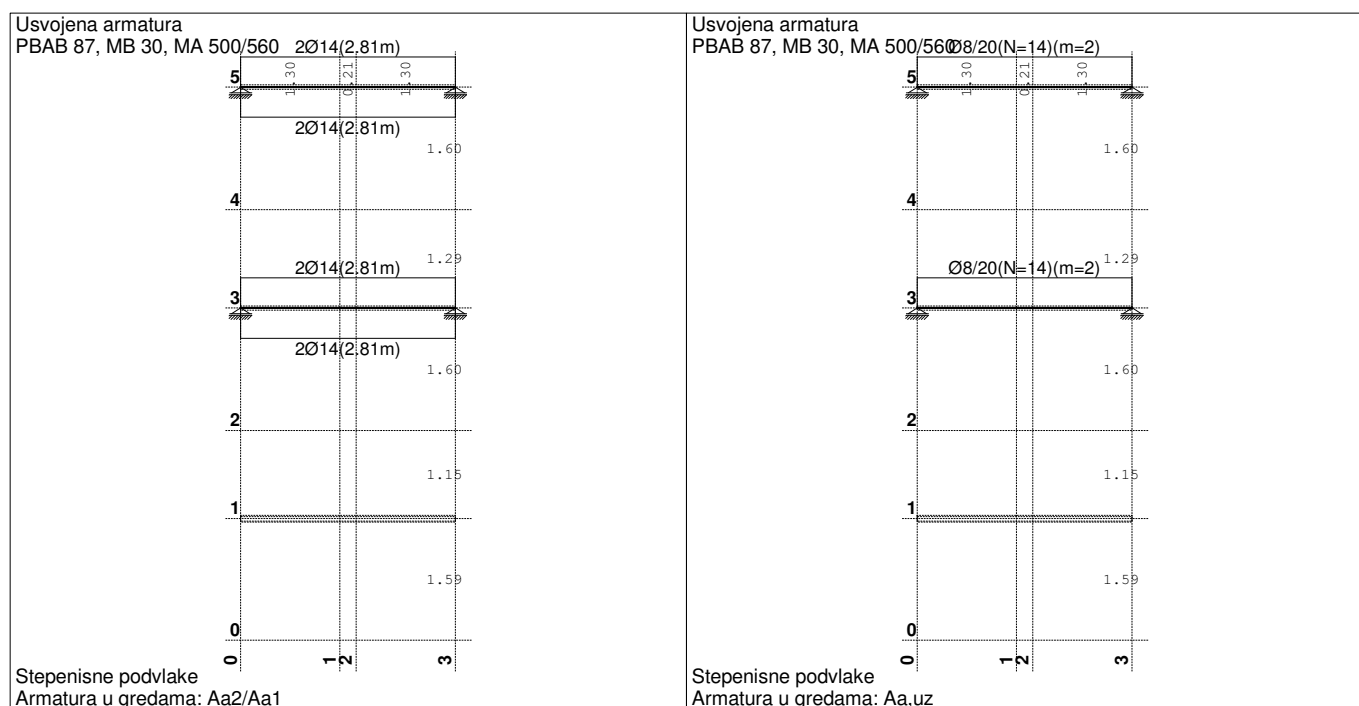


Dimenzionisanje (beton)





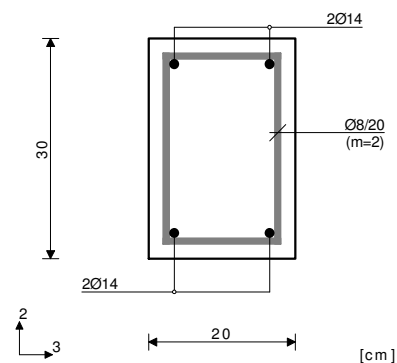
AB stepenišne podvlake b/d=20/30



Greda 294-464

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60x1.80xII

Presek 1-1 $x = 1.30$ m



N1u = -0.63 kN
T2u = 6.28 kN
T3u = 0.87 kN
M1u = -3.78 kNm
M3u = 24.77 kNm

$\epsilon_b/\epsilon_a = -1.689/10.000 \%$

Aa1 = 1.93 + 0.16' = 2.09 cm²
Aa2 = 0.00 + 0.16' = 0.16 cm²
Aa3 = 0.00 + 0.24' = 0.24 cm²
Aa4 = 0.00 + 0.24' = 0.24 cm²
Aa,uz = 1.11 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

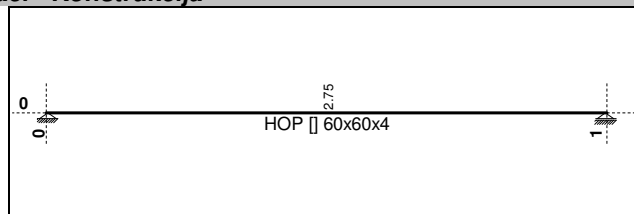
$\tau_y = 2.59 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 2.48 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.03%

*) - dodatna podužna armatura za prijem torzije.

Rž - Челична рожњача атријума

max $\lambda = 1,25$ m

Оптерећење

- покривач (LTC 25 - 6RS35) = 0,05 kN/m²- снег = 0,75 kN/m²Оптерећење рожњаче $g(g) = 0,05 \times 1,25 = 0,06$ kN/m¹

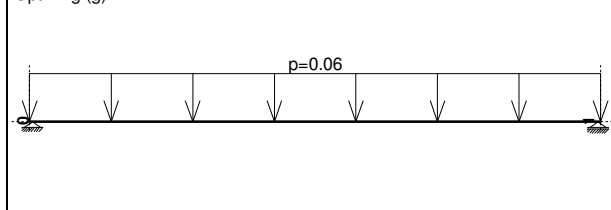
Ulazni podaci - Opterećenje

Lista slučajeva opterećenja

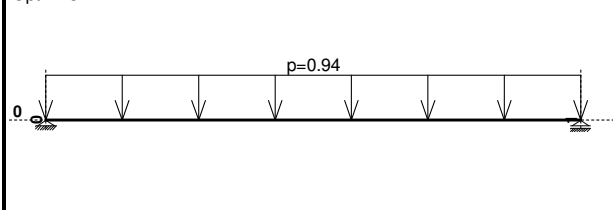
LC	Naziv
1	g (g)
2	s

3	Komb.: I+II
4	Komb.: 1.35xI+1.5xII

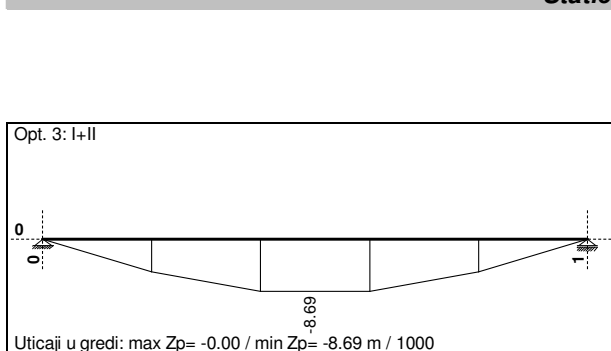
Opt. 1: g (g)



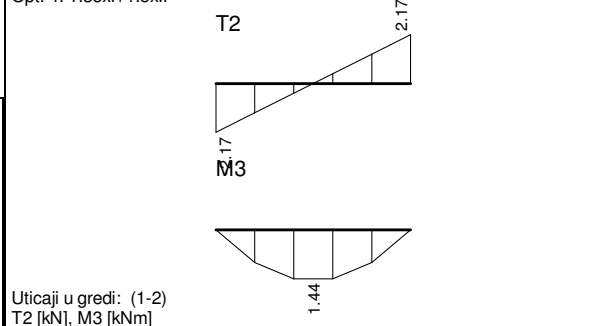
Opt. 2: s



Statički proračun

Utjecaji u gredi: max $Z_p = -0.00$ / min $Z_p = -8.69$ m / 1000

Opt. 4: 1.35xI+1.5xII

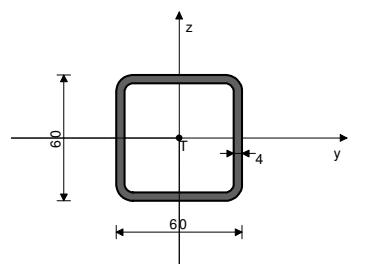
Utjecaji u gredi: (1-2)
T2 [kN], M3 [kNm]

Dimenzionisanje (čelik)

ŠTAP 2-1

POPREČNI PRESEK : HOP 60x60x4 [S 235] [Set: 1]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIJSKE KARAKTERISTIKE PRESEKA

(fy = 23.5 kN/cm², fu = 36.0 kN/cm²)

Ax =	8.550	cm ²
Ay =	4.275	cm ²
Az =	4.275	cm ²
Ix =	70.250	cm ⁴
Iy =	40.920	cm ⁴
Iz =	40.920	cm ⁴
Wy =	13.640	cm ³
Wz =	13.640	cm ³
Wy,pl =	18.848	cm ³
Wz,pl =	18.848	cm ³
yM0 =	1.100	
yM1 =	1.100	
yM2 =	1.250	
Anet/A =	0.900	

[m m]

FAKTORI ISKORIŠĆENJA PO KOMBINACIJAMA OPTEREĆENJA

4. $\gamma = 0.36$ 3. $\gamma = 0.24$

ŠTAP IZLOŽEN SAVIJANJU

(slučaj opterećenja 4, na 117.9 cm od početka štapa)

Transverzalna sila u y pravcu	VEd,y =	-0.041	kN
Transverzalna sila u z pravcu	VEd,z =	-0.308	kN
Moment savijanja oko y ose	MEd,y =	1.423	kNm
Moment savijanja oko z ose	MEd,z =	0.191	kNm
Sistemska dužina štapa	L =	275.00	cm

5.5 KLASIFIKACIJA POPREČNIH PRESEKA

Klasa preseka 1

6.2 NOSIVOST POPREČNIH PRESEKA

6.2.5 Savijanje y-y

Plastični otporni moment

Wy,pl = 18.848 cm³

Računska otpornost na savijanje

Mc,Rd = 4.027 kNm

Uslov 6.12: $MEd,y \leq Mc,Rd,y$ (1.42 \leq 4.03)

6.2.5 Savijanje z-z

Plastični otporni moment

Wz,pl = 18.848 cm³

Računska otpornost na savijanje

Mc,Rd = 4.027 kNm

Uslov 6.12: $MEd,z \leq Mc,Rd,z$ (0.19 \leq 4.03)

6.2.6 Smicanje

Proračunska nosivost na smicanje

Vpl,Rd,z = 52.729 kN

Proračunska nosivost na smicanje

Uslov 6.17: $VEd,z \leq Vc,Rd,z$ (0.31 \leq 52.73)

Vc,Rd,z = 52.729 kN

Proračunska nosivost na smicanje

Uslov 6.17: $VEd,y \leq Vc,Rd,y$ (0.04 \leq 52.73)

Vpl,Rd,y = 52.729 kN

Vc,Rd,y = 52.729 kN

6.2.8 Savijanje i smicanje

Nije potrebna redukcija momenata otpornosti

Uslov: $VEd,z \leq 50\%Vpl,Rd,z$; $VEd,y \leq 50\%Vpl,Rd,y$

6.2.9 Savijanje i aksijalna sila

Koeficijent

 $\alpha = 1.660$ Odnos ($M_y,Ed / M_{pl,Rd,y}$) ^{α}

0.178

Uslov 6.41: (0.18 \leq 1)

6.3 NOSIVOST ELEMENATA NA IZVIJANJE

6.3.2.1 Nosivost na bočno-torziono izvijanje

Koeficijent

C1 = 1.132

Koeficijent

C2 = 0.459

Koeficijent

C3 = 0.525

Koef.efekt.dužine bočnog izvijanja

k = 1.000

Koef.efekt.dužine torzionog uvrta

kw = 1.000

Koordinata

zg = 0.000 cm

Koordinata

zj = 0.000 cm

Razmak bočno pridržanih tačaka

L = 275.00 cm

Sektorski moment inercije

Iw = 0.000 cm⁶

Krit.mom.za bočno tor.izvijanje

Mcr = 90.300 kNm

Odgovarajući otporni moment

Wy = 18.848 cm³

Koeficijent imperf.

 $\alpha_{LT} = 0.760$

Bezdimenziona vitkost

 $\lambda_{LT} = 0.221$

Koeficijent redukcije

 $\chi_{LT} = 0.983$

Računska otpornost na izvijanje

Mb,Rd = 3.959 kNm

Uslov 6.54: $MEd,y \leq Mb,Rd$ (1.42 \leq 3.96)

PROVERA OTPORNOSTI NA SMICANJE

(slučaj opterećenja 4, početak štapa)

Transverzalna sila u y pravcu

VEd,y = -0.289 kN

Transverzalna sila u z pravcu

VEd,z = -2.155 kN

Sistemska dužina štapa

L = 275.00 cm

6.2 NOSIVOST POPREČNIH PRESEKA

6.2.6 Smicanje

Proračunska nosivost na smicanje

Vpl,Rd,z = 52.729 kN

Proračunska nosivost na smicanje

Vc,Rd,z = 52.729 kN

Uslov 6.17: $VEd,z \leq Vc,Rd,z$ (2.16 \leq 52.73)

Proračunska nosivost na smicanje

Vpl,Rd,y = 52.729 kN

Proračunska nosivost na smicanje

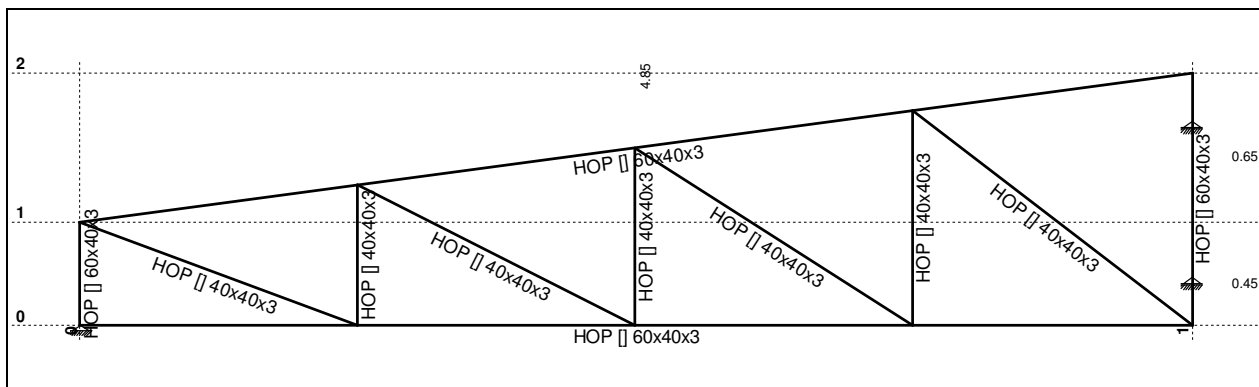
Vc,Rd,y = 52.729 kN

Uslov 6.17: $VEd,y \leq Vc,Rd,y$ (0.29 \leq 52.73)

RG-RI-RL'-RN - Челичне решетке атријума

 $\lambda = 2,95 \text{ m}$

Оптерећење

- покривач (LTC 25 - 6RS35) = $0,05 \text{ kN/m}^2$ - снег = $0,75 \text{ kN/m}^2$ Оптерећење од рожњаче $G = 0,20 \text{ (0,10) kN}$ $S = 1,30 \text{ (0,65) kN}$ 

Ulazni podaci - Opterećenje

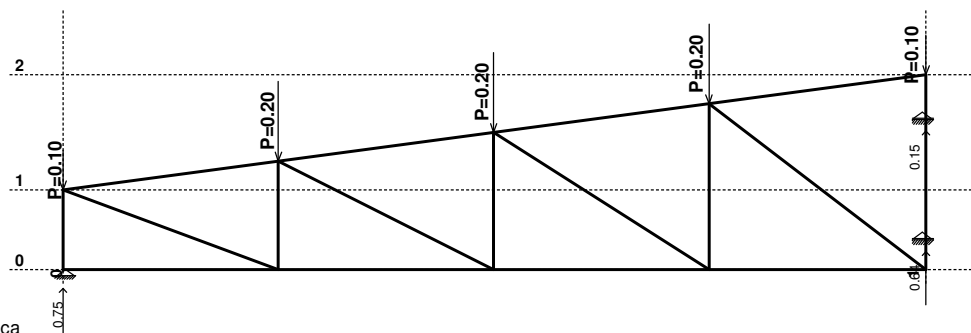
Lista slučajeva opterećenja

LC	Naziv
1	g (g)
2	s

3	Komb.: I+II
4	Komb.: 1.35xI+1.5xII

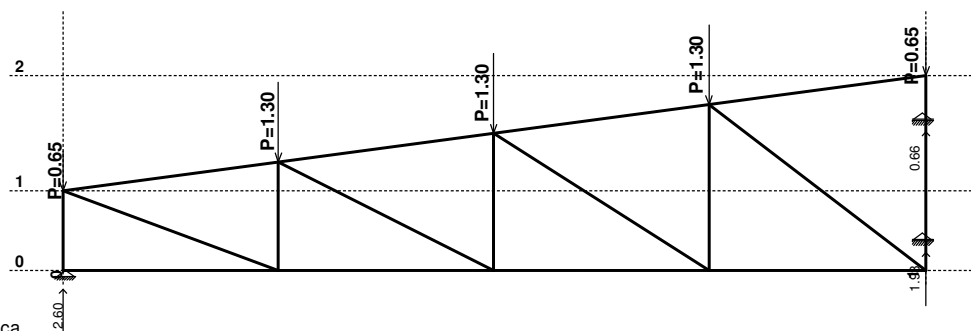
Statički proračun

Opt. 1: g (g)



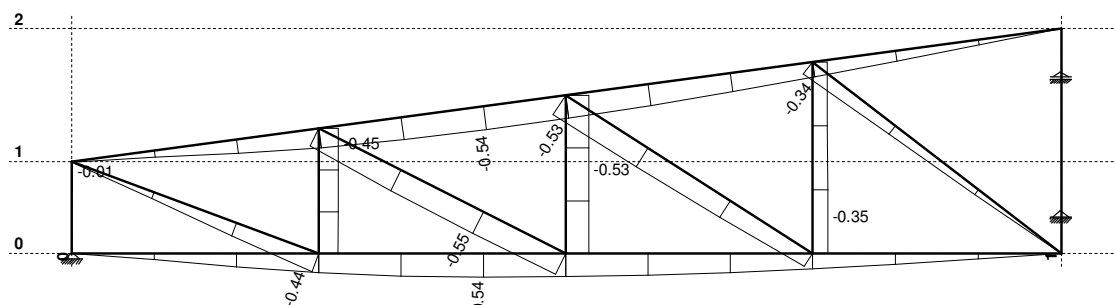
Reakcije oslonaca

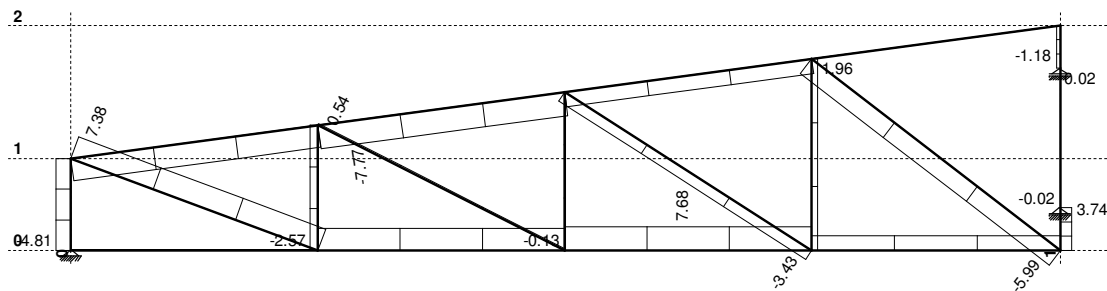
Opt. 2: s



Reakcije oslonaca

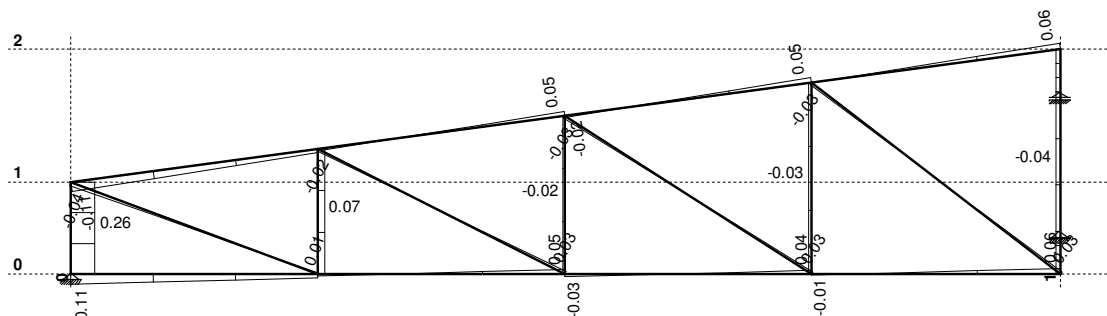
Opt. 3: I+II

Utjecaji u gredi: max $Z_p = -0.00$ / min $Z_p = -0.55 \text{ m} / 1000$



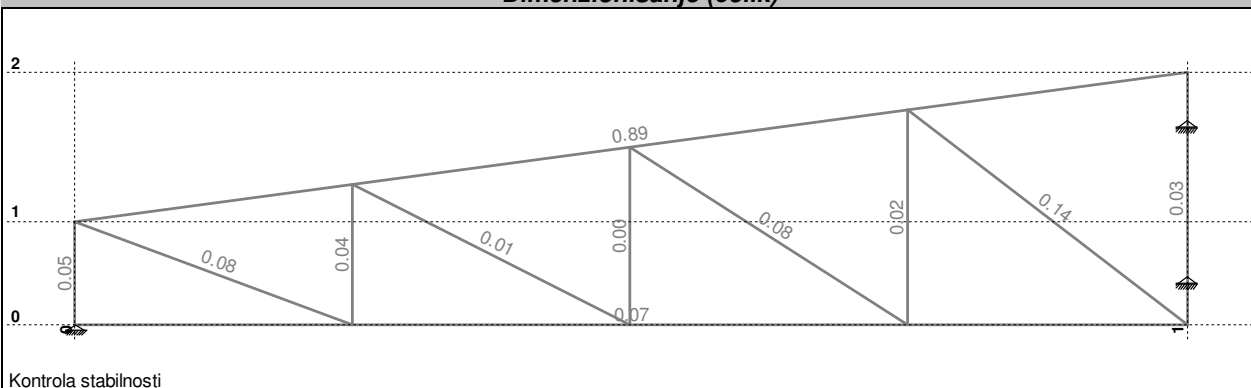
Uticaji u gredi: max N1= 7.68 / min N1= -7.77 kN

Opt. 4: 1.35x1+1.5xII



Uticaji u gredi: max T2= 0.26 / min T2= -0.11 kN

Dimenzionisanje (čelik)

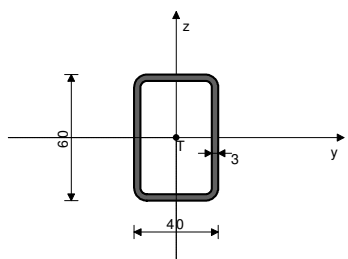


Kontrola stabilnosti

ŠTAP 9-1 – DONJI POJAS

POPREČNI PRESEK : HOP [] 60x40x3 [S 235] [Set: 1]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIJSKE KARAKTERISTIKE PRESEKA



[m m]

($f_y = 23.5 \text{ kN/cm}^2$, $f_u = 36.0 \text{ kN/cm}^2$)

$A_x =$	5.410	cm ²
$A_y =$	2.164	cm ²
$A_z =$	3.246	cm ²
$I_x =$	28.390	cm ⁴
$I_y =$	24.170	cm ⁴
$I_z =$	12.730	cm ⁴
$W_y =$	8.057	cm ³
$W_z =$	6.365	cm ³
$W_{y,pl} =$	11.214	cm ³
$W_{z,pl} =$	8.394	cm ³
$y_{M0} =$	1.100	
$y_{M1} =$	1.100	
$y_{M2} =$	1.250	
$A_{net}/A =$	0.900	

Računska otp. na zatezanje
Uslov 6.5: $N_{Ed} \leq N_{t,Rd}$ (7.68 \leq 115.58)

$N_{t,Rd} = 115.58 \text{ kN}$

6.2.6 Smicanje

Proračunska nosivost na smicanje

$V_{pl,Rd,z} = 40.037 \text{ kN}$

Proračunska nosivost na smicanje

$V_{c,Rd,z} = 40.037 \text{ kN}$

Uslov 6.17: $V_{Ed,z} \leq V_{c,Rd,z}$ (0.03 \leq 40.04)

PROVERA OTPORNOSTI NA SMICANJE (slučaj opterećenja 4, početak štapa)

Računska normalna sila	$N_{Ed} =$	0.257	kN
Transverzalna sila u z pravcu	$V_{Ed,z} =$	-0.110	kN
Moment savijanja oko y ose	$M_{Ed,y} =$	-0.053	kNm
Sistemska dužina štapa	$L =$	485.00	cm

6.2 NOSIVOST POPREČNIH PRESEKA

6.2.6 Smicanje

Proračunska nosivost na smicanje

$V_{pl,Rd,z} = 40.037 \text{ kN}$

Proračunska nosivost na smicanje

$V_{c,Rd,z} = 40.037 \text{ kN}$

Uslov 6.17: $V_{Ed,z} \leq V_{c,Rd,z}$ (0.11 \leq 40.04)

FAKTORI ISKORIŠĆENJA PO KOMBINACIJAMA OPTEREĆENJA
4. $\gamma = 0.07$ 3. $\gamma = 0.04$

ŠTAP IZLOŽEN CENTRIČNOM ZATEZANJU
(slučaj opterećenja 4, na 242.0 cm od početka štapa)

Računska normalna sila	$N_{Ed} =$	7.680	kN
Transverzalna sila u z pravcu	$V_{Ed,z} =$	-0.028	kN
Sistemska dužina štapa	$L =$	485.00	cm

5.5 KLASIFIKACIJA POPREČNIH PRESEKA
Klasa preseka 1

6.2 NOSIVOST POPREČNIH PRESEKA

6.2.3 Zatezanje

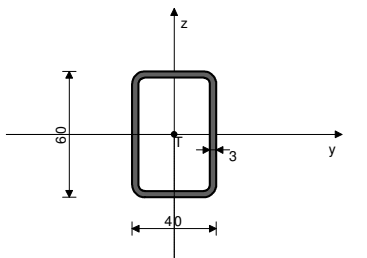
Plast.rač.otpornost bruto preseka
Granična rač.otpornost neto preseka

$N_{pl,Rd} =$	115.58	kN
$N_{u,Rd} =$	126.20	kN

ŠTAP 12-2 – GORNJI POJAS

POPREČNI PRESEK : HOP [] 60x40x3 [S 235] [Set: 1]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIJSKE KARAKTERISTIKE PRESEKA



($f_y = 23.5 \text{ kN/cm}^2$, $f_u = 36.0 \text{ kN/cm}^2$)

A_x	5.410	cm ²
A_y	2.164	cm ²
A_z	3.246	cm ²
I_x	28.390	cm ⁴
I_y	24.170	cm ⁴
I_z	12.730	cm ⁴
W_y	8.057	cm ³
W_z	6.365	cm ³
$W_{y,pl}$	11.214	cm ³
$W_{z,pl}$	8.394	cm ³
y_{M0}	1.100	
y_{M1}	1.100	
y_{M2}	1.250	
A_{net}/A	0.900	

[m m]

FAKTORI ISKORIŠĆENJA PO KOMBINACIJAMA OPTEREĆENJA

4. $\gamma=0.89$ 3. $\gamma=0.61$

ŠTAP IZLOŽEN PRITISKU I SAVIJANJU

(slučaj opterećenja 4, na 162.8 cm od početka štapa)

Računska normalna sila	N_{Ed}	-7.767	kN
Momenat savijanja oko y ose	$M_{Ed,y}$	0.021	kNm
Sistemska dužina štapa	L	489.34	cm

5.5 KLASIFIKACIJA POPREČNIH PRESEKA

Klasa preseka 1

6.2 NOSIVOST POPREČNIH PRESEKA

6.2.4 Pritisak

Računska otpornost na pritisak

Uslov 6.9: $N_{Ed} \leq N_{c,Rd}$ (7.77 <= 115.58) $N_{c,Rd} = 115.58 \text{ kN}$

6.2.5 Savijanje y-y

Plastični otporni moment

Računska otpornost na savijanje

Uslov 6.12: $M_{Ed,y} \leq M_{c,Rd,y}$ (0.02 <= 2.40) $W_{y,pl} = 11.214 \text{ cm}^3$
 $M_{c,Rd} = 2.396 \text{ kNm}$

6.2.9 Savijanje i aksijalna sila

Odnos $N_{Ed} / N_{pl,Rd}$ **Uslov 6.41: (0.01 <= 1)**

0.067

6.3 NOSIVOST ELEMENATA NA IZVIJANJE

6.3.1.1 Nosivost na izvijanje

Dužina izvijanja y-y

Relativna vitkost y-y

Kriva izvijanja za osu y-y: C

Elastična kritična sila

Redukcioni koeficijent

Računska otpornost na izvijanje

Uslov 6.46: $N_{Ed} \leq N_{b,Rd,y}$ (7.77 <= 89.65) $I_{y,y} = 122.33 \text{ cm}$
 $\lambda_{y,y} = 0.616$
 $\alpha = 0.490$
 $N_{cr,y} = 334.73 \text{ kN}$
 $\chi_{y,y} = 0.776$
 $N_{b,Rd,y} = 89.652 \text{ kN}$

Dužina izvijanja z-z	$I_{z,z}$	489.34	cm
Relativna vitkost z-z	$\lambda_{z,z}$	3.397	
Kriva izvijanja za osu z-z: C	α	0.490	
Redukcioni koeficijent	$\chi_{z,z}$	0.076	
Računska otpornost na izvijanje	$N_{b,Rd,z}$	8.734	kN

Uslov 6.46: $N_{Ed} \leq N_{b,Rd,z}$ (7.77 <= 8.73)

6.3.2.1 Nosivost na bočno-torziono izvijanje

Koeficijent

Koeficijent

Koeficijent

Koef. efekt. dužine bočnog izvijanja

Koef. efekt. dužine torzionog uvrtaanja

Koordinata

Koordinata

Razmak bočno pridržanih tačaka

Sektorski momenat inercije

Krit. mom. za bočno tor. izvijanje

Odgovarajući otporni momenat

Koeficijent imperf.

Bezdimenziona vitkost

Koeficijent redukcije

Računska otpornost na izvijanje

Uslov 6.54: $M_{Ed,y} \leq M_{b,Rd}$ (0.02 <= 2.11)

C1 =	1.285	
C2 =	1.562	
C3 =	0.753	
k =	1.000	
kw =	1.000	
zg =	0.000	cm
zj =	0.000	cm
L =	489.34	cm
Iw =	0.000	cm6
Mcr =	20.426	kNm
Wy =	11.214	cm3
α_{LT} =	0.760	
χ_{LT} =	0.359	
χ_{LT} =	0.880	
Mb,Rd =	2.108	kNm

6.3.3 Elementi konstantnog poprečnog preseka opterećeni

savijanjem i aksijalnim pritiskom

Proračun koeficijenata interakcije izvršen je alternativnom

metodom br.2 (Aneks B)

Koeficijent uniformnog momenta

Koeficijent uniformnog momenta

Koeficijent uniformnog momenta

Koeficijent interakcije

Koeficijent interakcije

Koeficijent interakcije

Koeficijent interakcije

C_{my}	0.458
C_{mz}	1.000
C_{mLT}	0.458
k_{yy}	0.475
k_{yz}	1.027
k_{zy}	0.285
k_{zz}	1.711

Redukcioni koeficijent

 $N_{Ed} / (\chi_y N_{Rk} / \gamma_{M1})$ $k_{yy} * (M_{yEd} + M_{yEd}) / \dots$ **Uslov 6.61: (0.09 <= 1)**

χ_y	0.776
	0.087
	0.005

Redukcioni koeficijent

 $N_{Ed} / (\chi_z N_{Rk} / \gamma_{M1})$ $k_{zy} * (M_{yEd} + \Delta M_{yEd}) / \dots$ **Uslov 6.62: (0.89 <= 1)**

χ_z	0.076
	0.889
	0.003

PROVERA OTPORNOSTI NA SMICANJE

(slučaj opterećenja 4, početak štapa)

Računska normalna sila

Transverzalna sila u z pravcu

Momenat savijanja oko y ose

Sistemska dužina štapa

N_{Ed}	-7.233	kN
$V_{Ed,z}$	-0.105	kN
$M_{Ed,y}$	-0.047	kNm
L	489.34	cm

6.2 NOSIVOST POPREČNIH PRESEKA

6.2.6 Smicanje

Proračunska nosivost na smicanje

Proračunska nosivost na smicanje

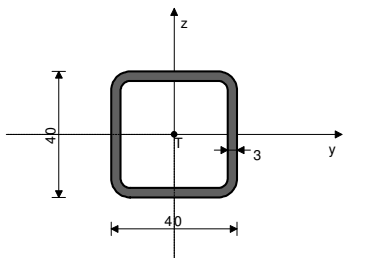
Uslov 6.17: $V_{Ed,z} \leq V_{c,Rd,z}$ (0.11 <= 40.04)

$V_{pl,Rd,z}$	40.037	kN
$V_{c,Rd,z}$	40.037	kN

ŠTAP 9-8 - DIJAGONALA

POPREČNI PRESEK : HOP [] 40x40x3 [S 235] [Set: 2]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIJSKE KARAKTERISTIKE PRESEKA



($f_y = 23.5 \text{ kN/cm}^2$, $f_u = 36.0 \text{ kN/cm}^2$)

A_x	4.210	cm ²
A_y	2.105	cm ²
A_z	2.105	cm ²
I_x	15.200	cm ⁴
I_y	8.620	cm ⁴
I_z	8.620	cm ⁴
W_y	4.310	cm ³
W_z	4.310	cm ³
$W_{y,pl}$	6.174	cm ³
$W_{z,pl}$	6.174	cm ³
y_{M0}	1.100	
y_{M1}	1.100	
y_{M2}	1.250	
A_{net}/A	0.900	

[m m]

FAKTORI ISKORIŠĆENJA PO KOMBINACIJAMA OPTEREĆENJA

4. $\gamma=0.14$ 3. $\gamma=0.10$

ŠTAP IZLOŽEN CENTRIČNOM PRITISKU

(slučaj opterećenja 4, kraj štapa)

Računska normalna sila	N_{Ed}	-5.993	kN
------------------------	----------	--------	----

Transverzalna sila u z pravcu

Sistemska dužina štapa

$V_{Ed,z}$	0.027	kN
L	153.80	cm

5.5 KLASIFIKACIJA POPREČNIH PRESEKA

Klasa preseka 1

6.2 NOSIVOST POPREČNIH PRESEKA

6.2.4 Pritisak

Računska otpornost na pritisak

Uslov 6.9: $N_{Ed} \leq N_{c,Rd}$ (5.99 <= 89.94) $N_{c,Rd} = 89.941 \text{ kN}$

6.2.6 Smicanje

Proračunska nosivost na smicanje

Proračunska nosivost na smicanje

Uslov 6.17: $V_{Ed,z} \leq V_{c,Rd,z}$ (0.03 <= 25.96)

$V_{pl,Rd,z}$	25.964	kN
$V_{c,Rd,z}$	25.964	kN

6.3 NOSIVOST ELEMENATA NA IZVIJANJE

6.3.1.1 Nosivost na izvijanje

Dužina izvijanja y-y

Relativna vitkost y-y

Kriva izvijanja za osu y-y: C

Elastična kritična sila

Redukcioni koeficijent

Računska otpornost na izvijanje

Uslov 6.46: $N_{Ed} \leq N_{b,Rd,y}$ (5.99 <= 41.47)

$I_{y,y}$	153.80	cm
$\lambda_{y,y}$	1.145	
α	0.490	
$N_{cr,y}$	75.530	kN
$\chi_{y,y}$	0.461	
$N_{b,Rd,y}$	41.472	kN

Dužina izvijanja z-z

Relativna vitkost z-z

Kriva izvijanja za osu z-z: C

Redukcioni koeficijent

Računska otpornost na izvijanje

Uslov 6.46: $N_{Ed} \leq N_{b,Rd,z}$ (5.99 <= 41.47)

$I_{z,z}$	153.80	cm
$\lambda_{z,z}$	1.145	
α	0.490	
$\chi_{z,z}$	0.461	
$N_{b,Rd,z}$	41.472	kN

6.2 NOSIVOST POPREČNIH PRESEKA

6.2.3 Zatezanje

Plast.rač.otpornost bruto preseka

Npl,Rd = 115.58 kN

Granična rač.otpornost neto

Nu,Rd = 126.20 kN

preseka

Računska otp. na zatezanje

Nt,Rd = 115.58 kN

Uslov 6.5: $N_{Ed} \leq N_{t,Rd}$ (3.74 \leq 115.58)

6.2.5 Savijanje y-y

Plastični otporni moment

Wy,pl = 11.214 cm³

Računska otpornost na savijanje

Mc,Rd = 2.396 kNm

Uslov 6.12: $M_{Ed,y} \leq M_{c,Rd,y}$ (0.02 \leq 2.40)

6.2.6 Smicanje

Proračunska nosivost na smicanje

Vpl,Rd,z = 40.037 kN

Proračunska nosivost na smicanje

Vc,Rd,z = 40.037 kN

Uslov 6.17: $V_{Ed,z} \leq V_{c,Rd,z}$ (0.04 \leq 40.04)

6.2.10 Savijanje smicanje i aksijalna sila

Nije potrebna redukcija momenata otpornosti

Uslov: $V_{Ed,z} \leq 50\% V_{pl,Rd,z}$

6.2.9 Savijanje i aksijalna sila

Odnos $N_{Ed} / N_{pl,Rd}$ **Uslov 6.41: (0.01 \leq 1)**

0.032

6.3 NOSIVOST ELEMENATA NA IZVIJANJE

6.3.2.1 Nosivost na bočno-torziono izvijanje

Koeficijent

C1 = 2.834

Koeficijent

C2 = 0.000

Koeficijent

C3 = 0.171

Koef.efekt.dužine bočnog izvijanja

k = 1.000

Koef.efekt.dužine torzionog uvrta

kw = 1.000

Koordinata

zg = 0.000 cm

Koordinata

zj = 0.000 cm

Razmak bočno pridržanih tačaka

L = 110.00 cm

Sektorski moment inercije

Iw = 0.000 cm⁶

Krit.mom.za bočno tor.zvijanje

Mcr = 200.39 kNm

Odgovarajući otporni moment

Wy = 11.214 cm³

Koeficijent imperf.

αLT = 0.760

Bezdimenziona vitkost

λLT = 0.115

Koeficijent redukcije

χLT = 1.000

Računska otpornost na izvijanje

Mb,Rd = 2.396 kNm

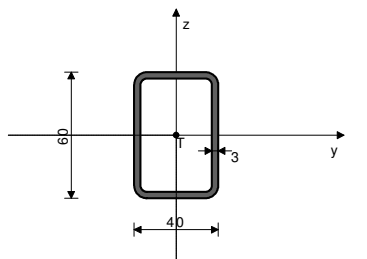
Uslov 6.54: $M_{Ed,y} \leq M_{b,Rd}$ (0.02 \leq 2.40)

ŠTAP 9-12

POPREČNI PRESEK : HOP [] 60x40x3 [S 235] [Set: 1]

EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIJSKE KARAKTERISTIKE PRESEKA



[m m]

(fy = 23.5 kN/cm², fu = 36.0 kN/cm²)

Ax = 5.410 cm²
Ay = 2.164 cm²
Az = 3.246 cm²
Ix = 28.390 cm⁴
Iy = 24.170 cm⁴
Iz = 12.730 cm⁴
Wy = 8.057 cm³
Wz = 6.365 cm³
Wy,pl = 11.214 cm³
Wz,pl = 8.394 cm³
yM0 = 1.100
yM1 = 1.100
yM2 = 1.250
Anet/A = 0.900

FAKTORI ISKORIŠĆENJA PO KOMBINACIJAMA OPTEREĆENJA

4. γ=0.03

3. γ=0.02

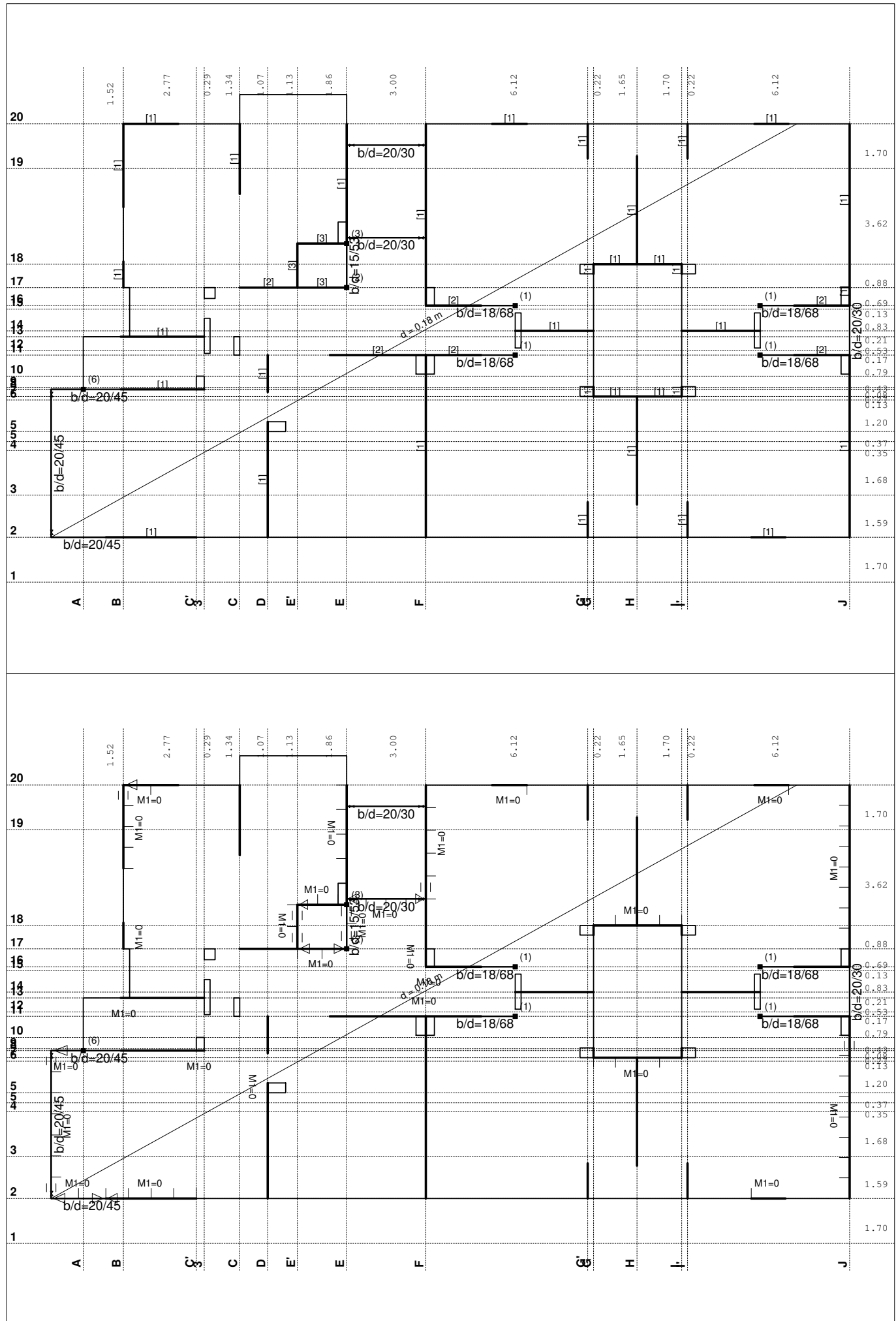
ŠTAP IZLOŽEN ZATEZANJU I SAVIJANJU

(slučaj opterećenja 4, na 89.0 cm od početka štapa)

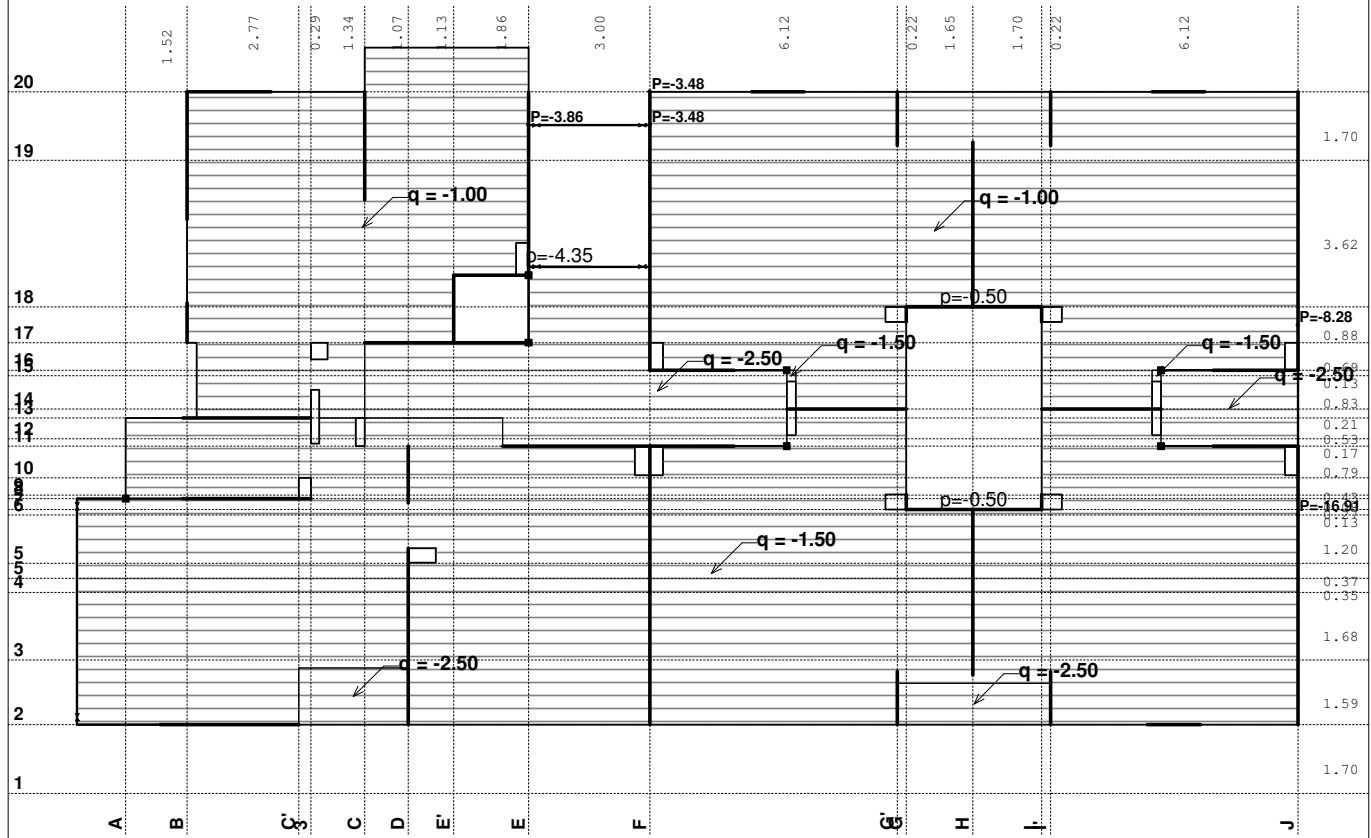
Računska normalna sila NEd = 3.742 kN
Transverzalna sila u z pravcu VEd,z = -0.044 kN
Momenat savijanja oko y ose MEd,y = 0.016 kNm
Sistemska dužina štapa L = 110.00 cm

5.5 KLASIFIKACIJA POPREČNIH PRESEKA

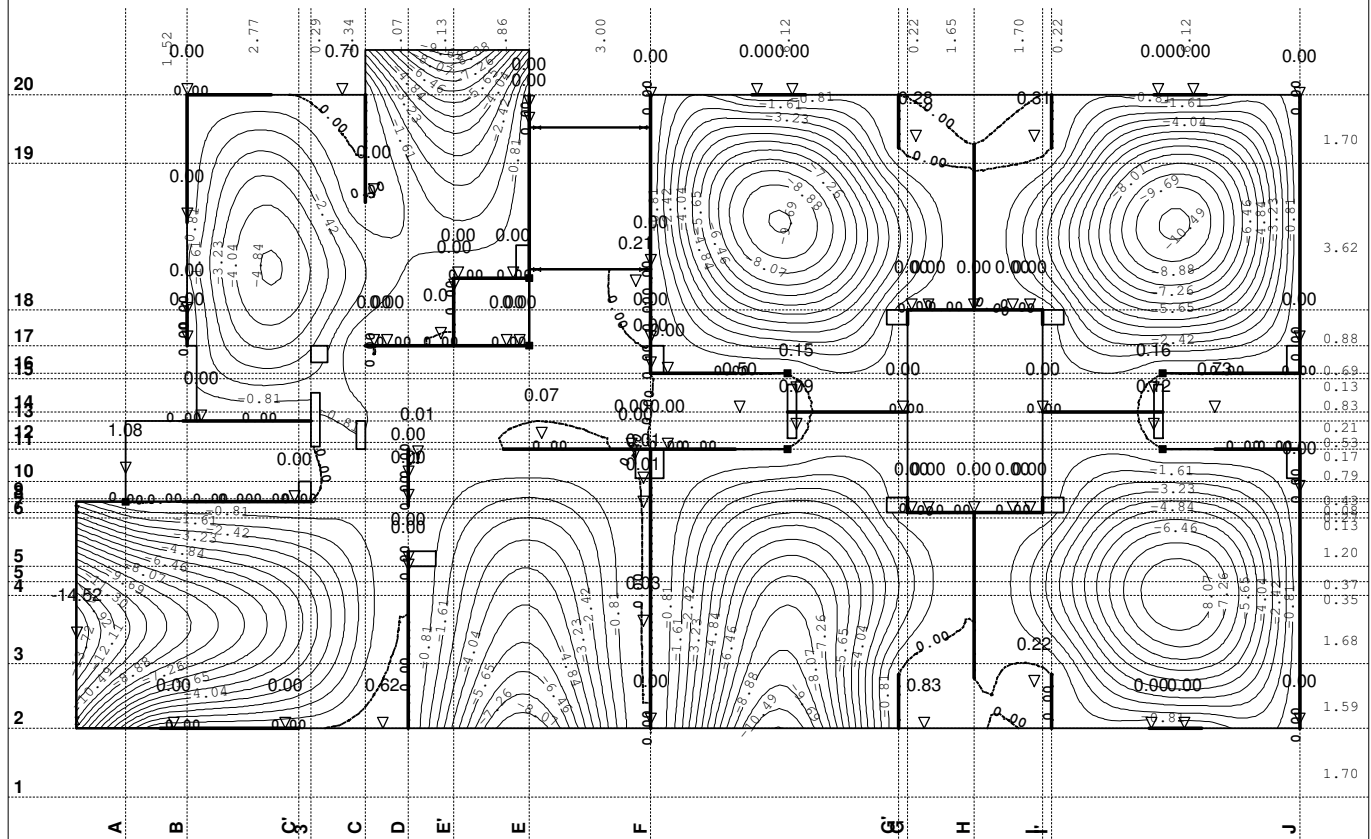
POS 700+ - KONSTRUKCIJA IZNAD ŠESTOG SPRATA



Opt. 2: p

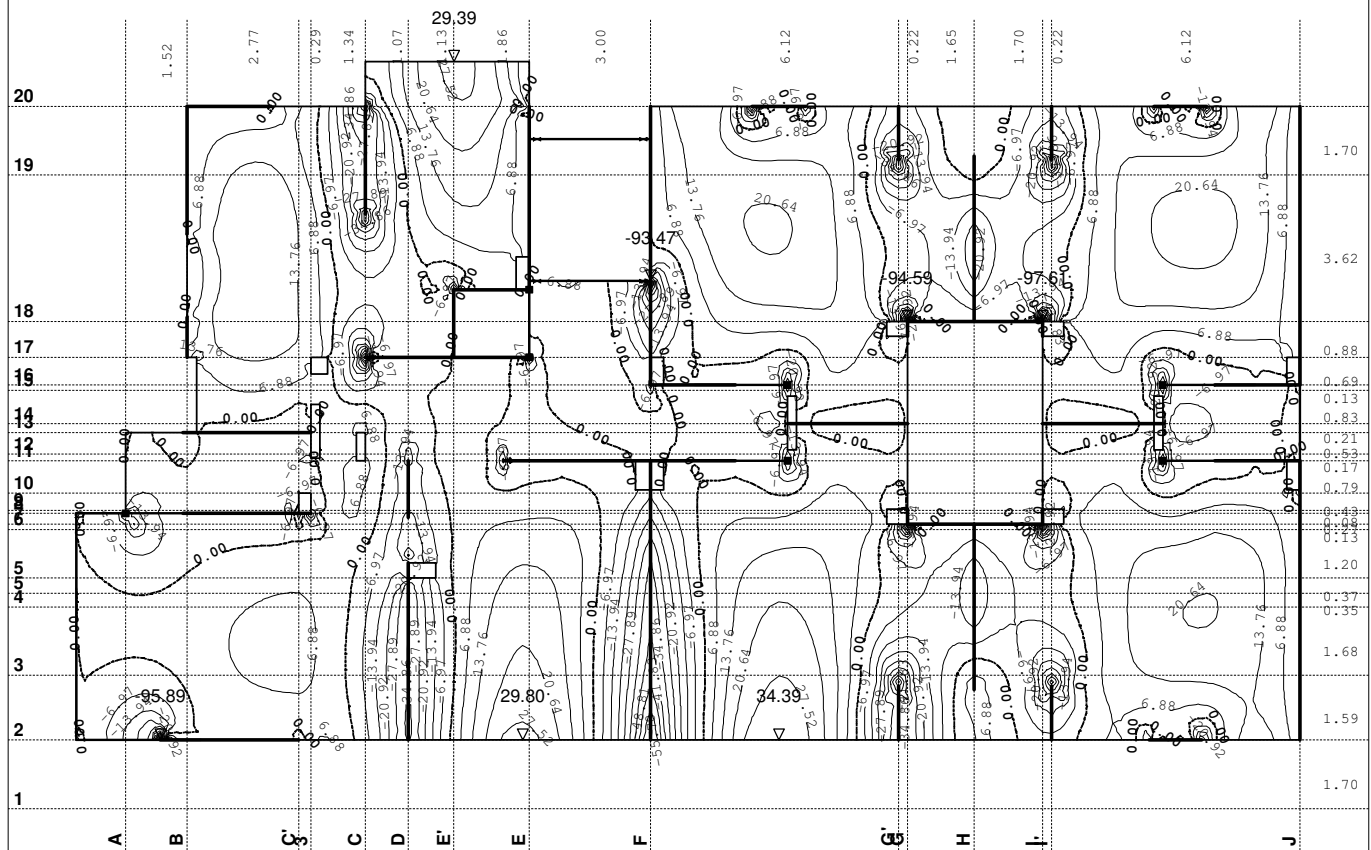


Opt. 4: 3.5xl+II



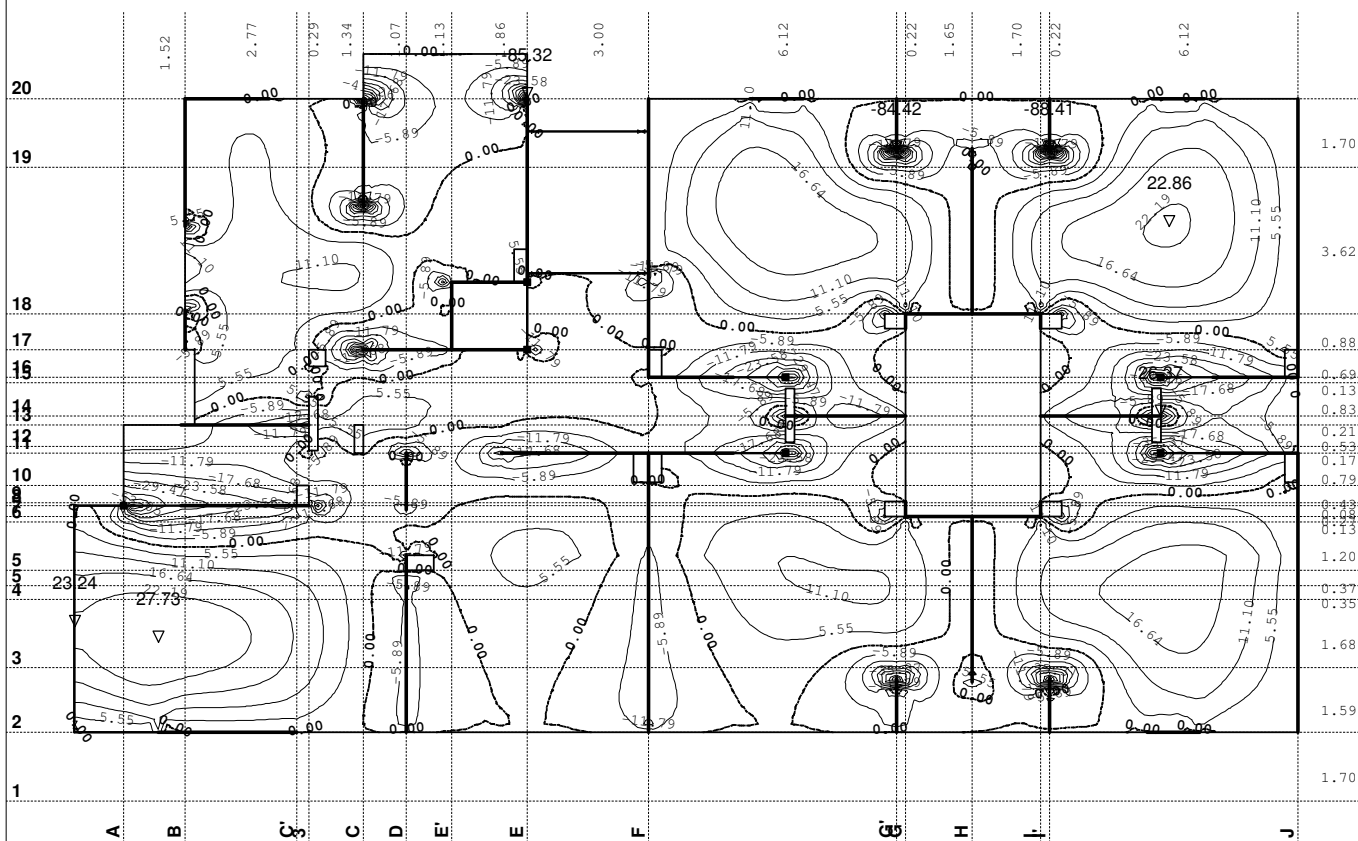
Utjecaji u ploči: max Z_p = 1.08 / min Z_p = -14.52 m / 1000

Opt. 3: 1.6xl+1.8xII

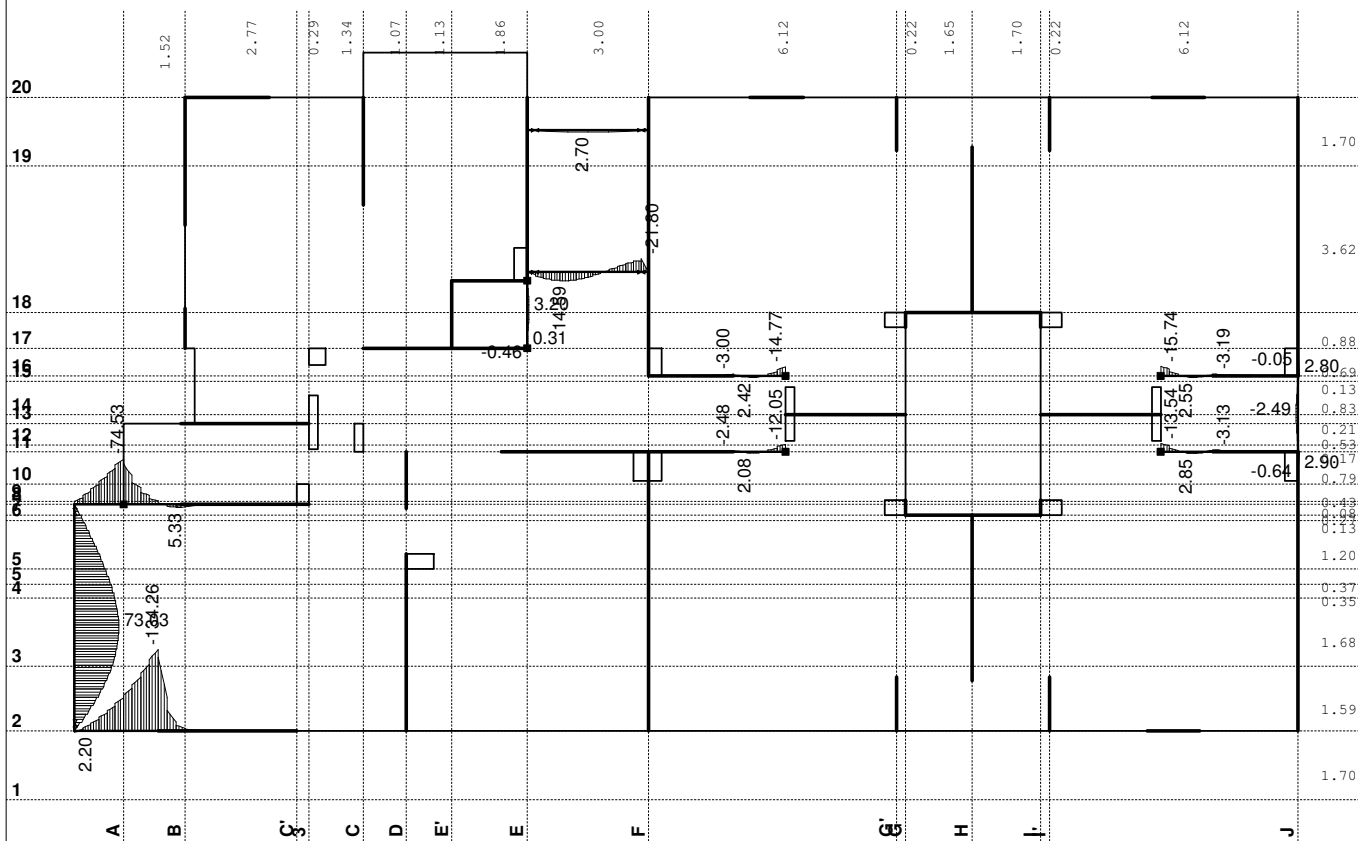


Utjecaji u ploči: max M_x = 34.39 / min M_x = -97.61 kNm/m

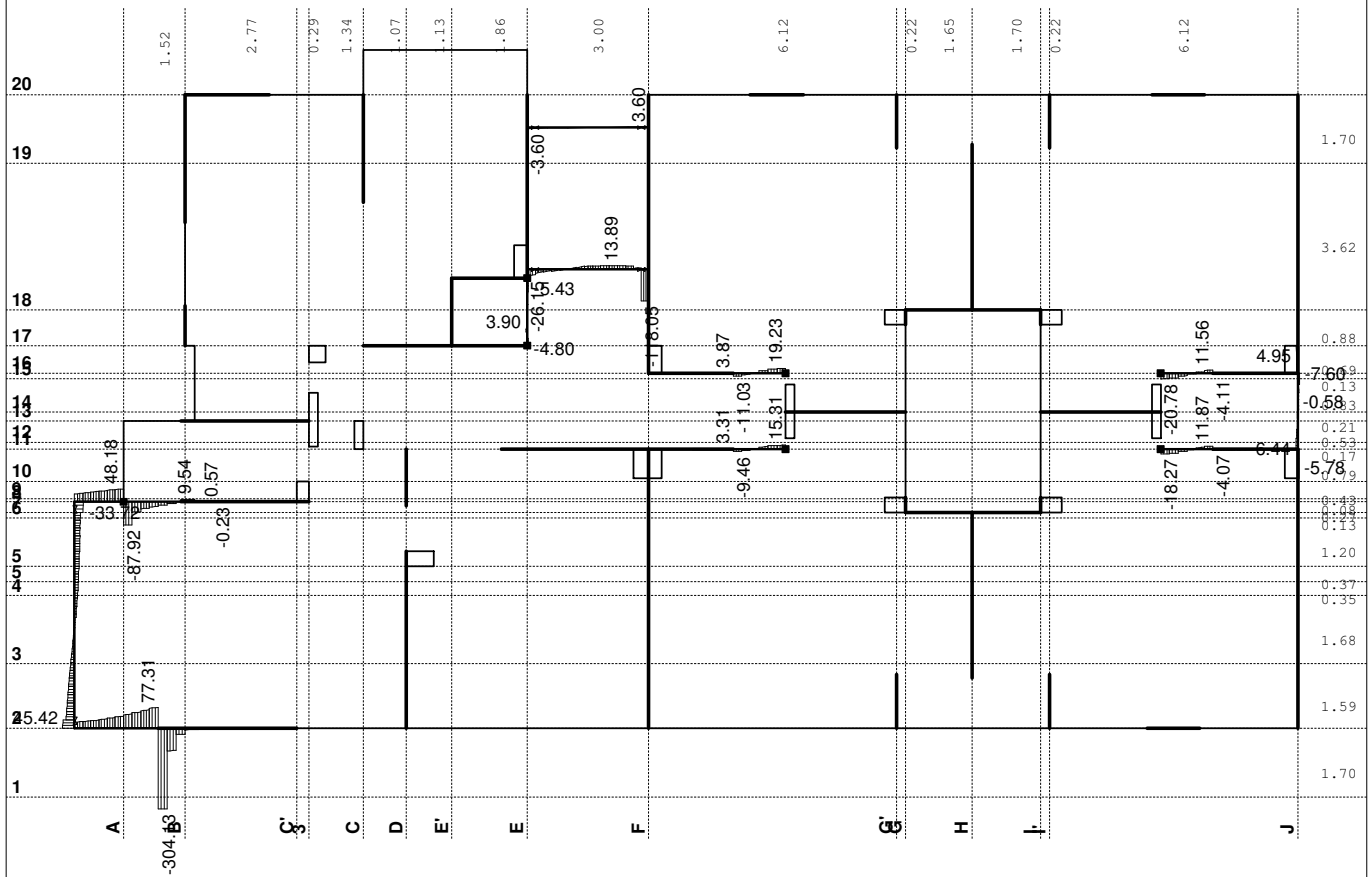
Opt. 3: 1.6xl+1.8xll

Utjecaji u ploči: max M_y = 27.73 / min M_y = -88.41 kNm/m

Opt. 3: 1.6xl+1.8xll

Utjecaji u gredi: max M_3 = 73.04 / min M_3 = -134.26 kNm

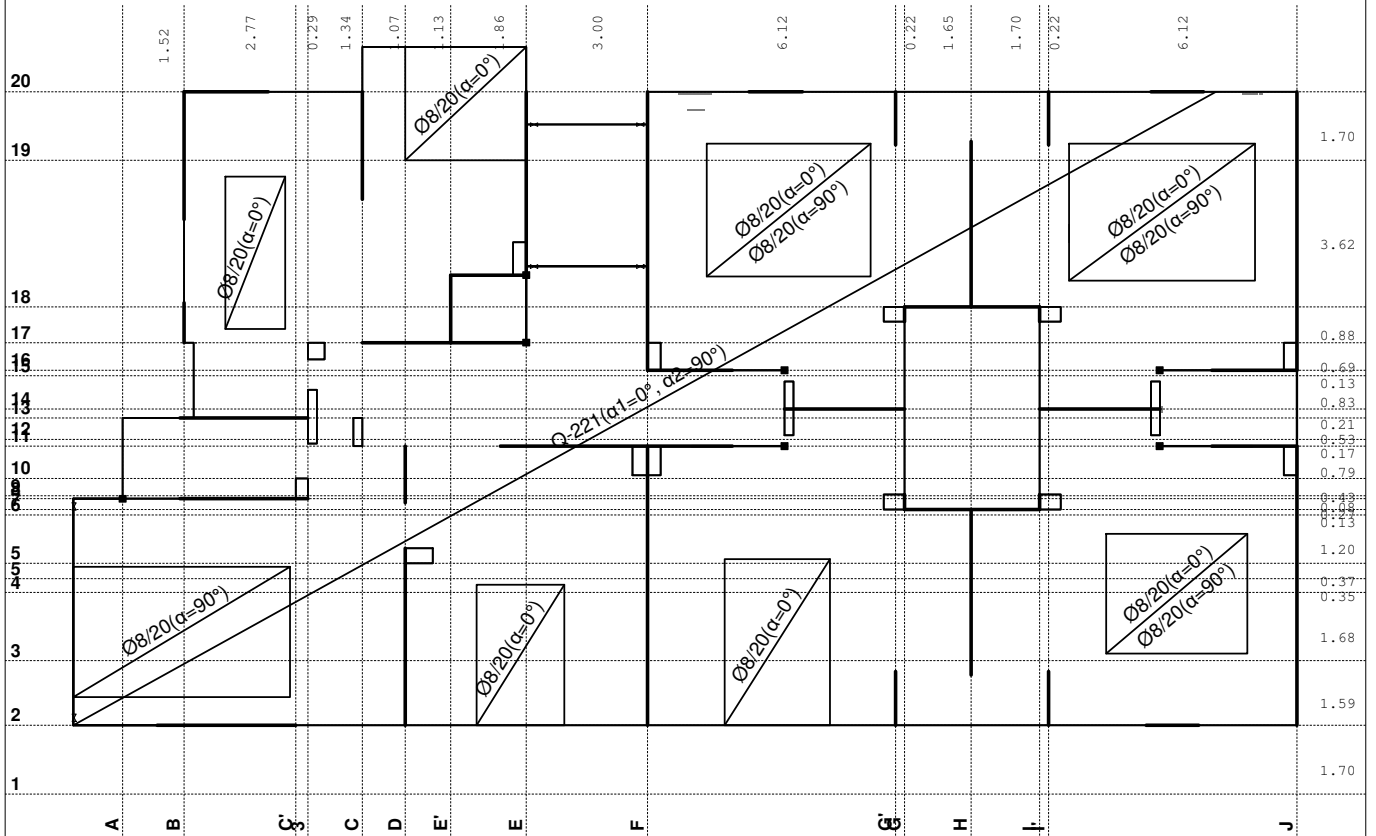
Opt. 3: 1.6xl+1.8xII



Uticaji u gredi: max T2= 77.31 / min T2= -304.13 kN

Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

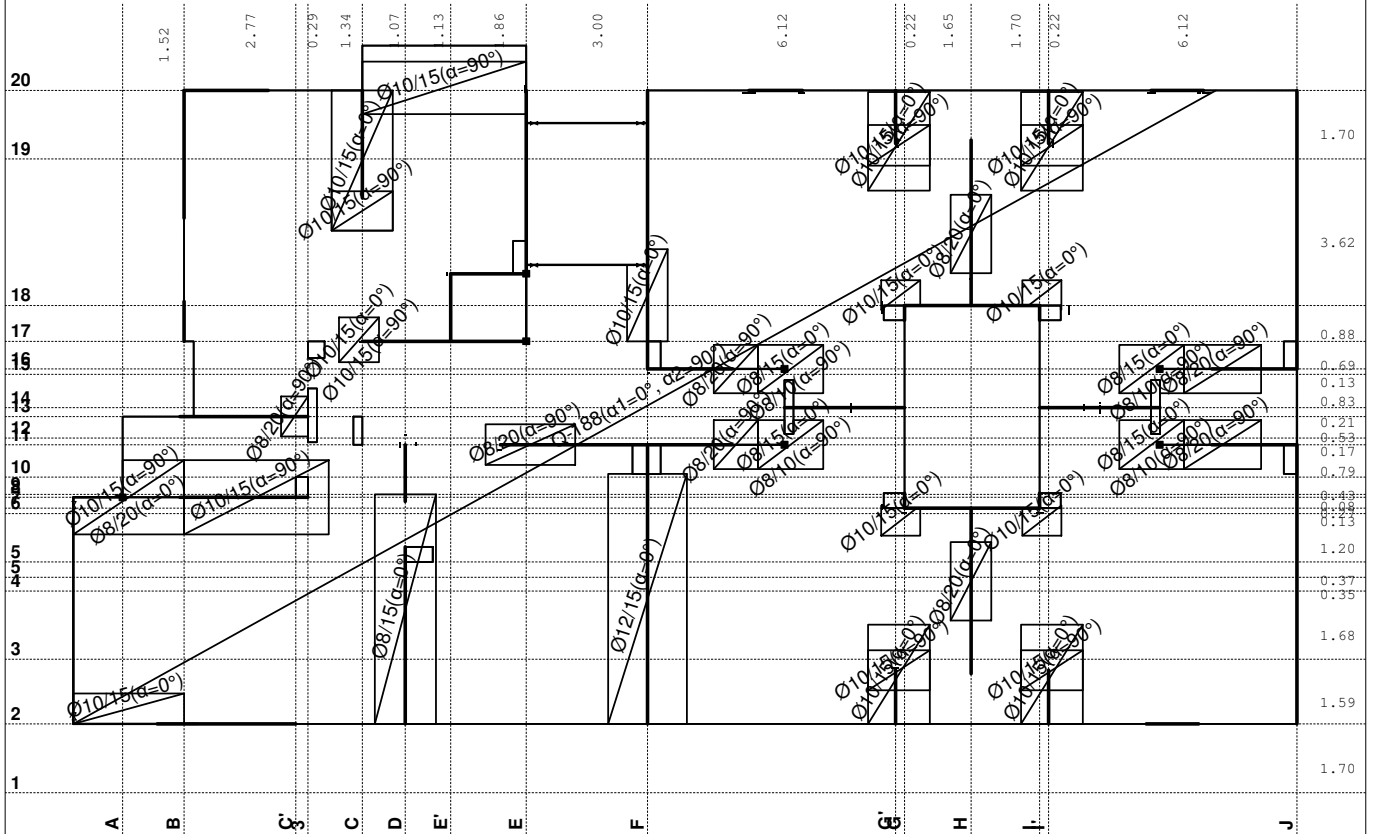
Aa - d.zona [cm ² /m]
0.00
2.26
4.51



Aa - d.zona

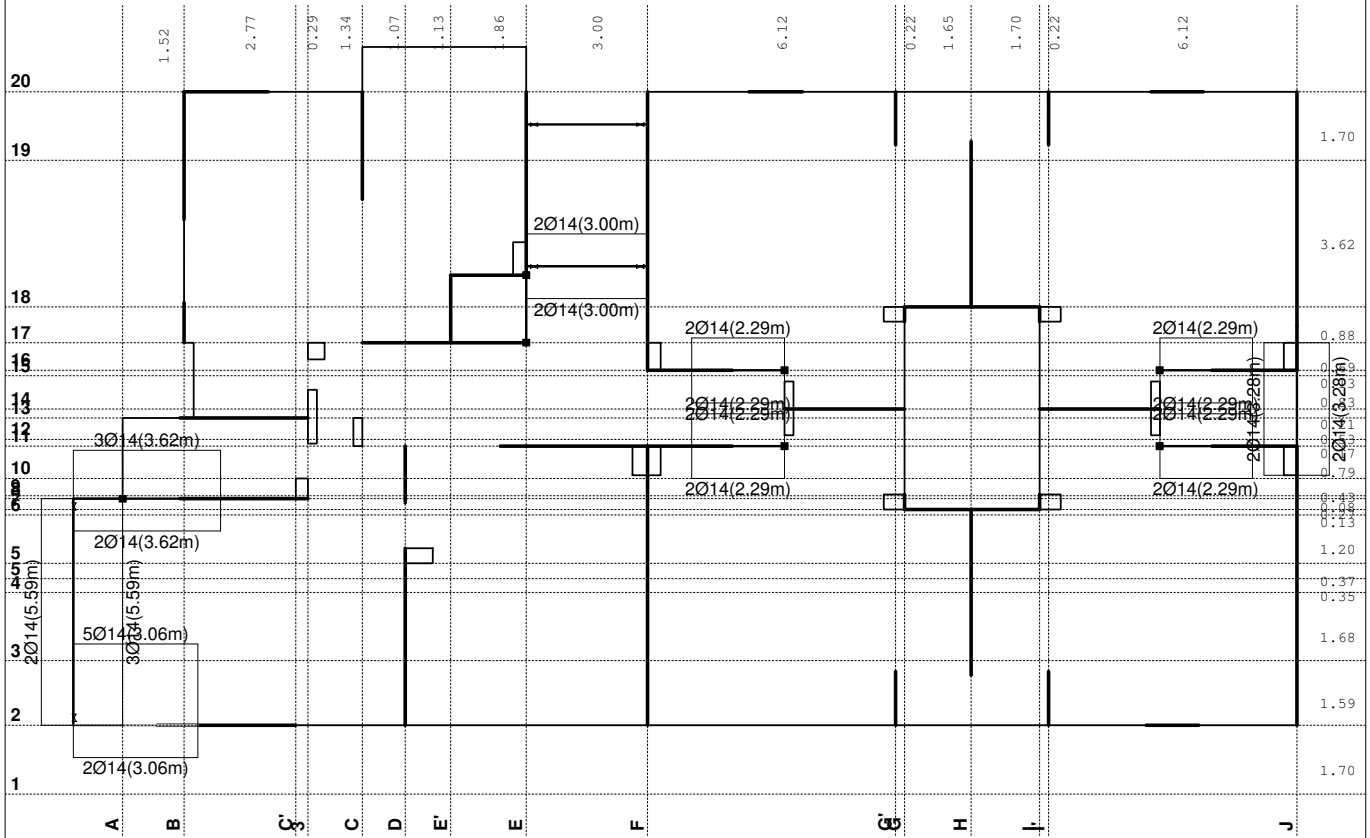
Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

Aa - g.zona [cm ² /m]
-13.66
-6.83
0.00

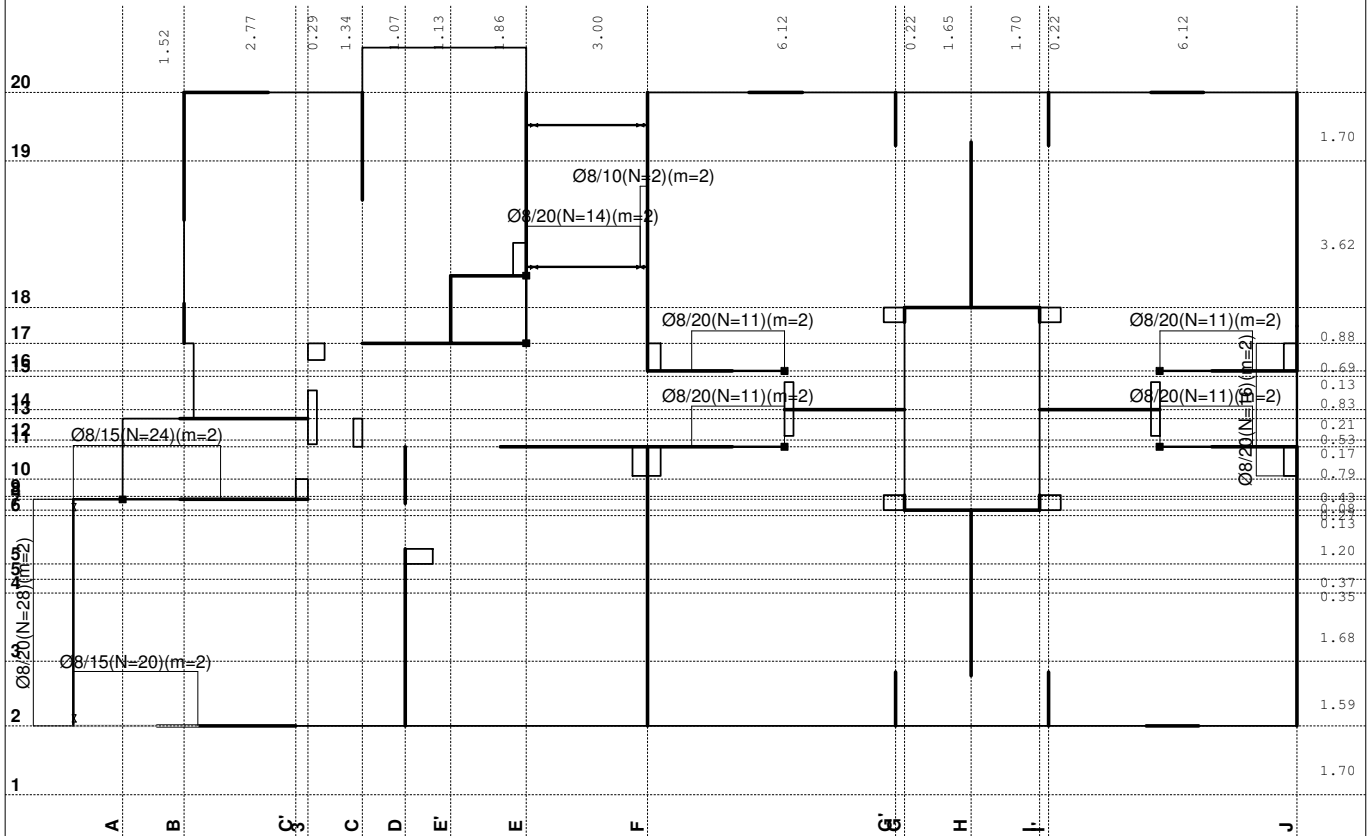


Aa - g.zona

Usvojena armatura
PBAB 87, MB 30, MA 500/600

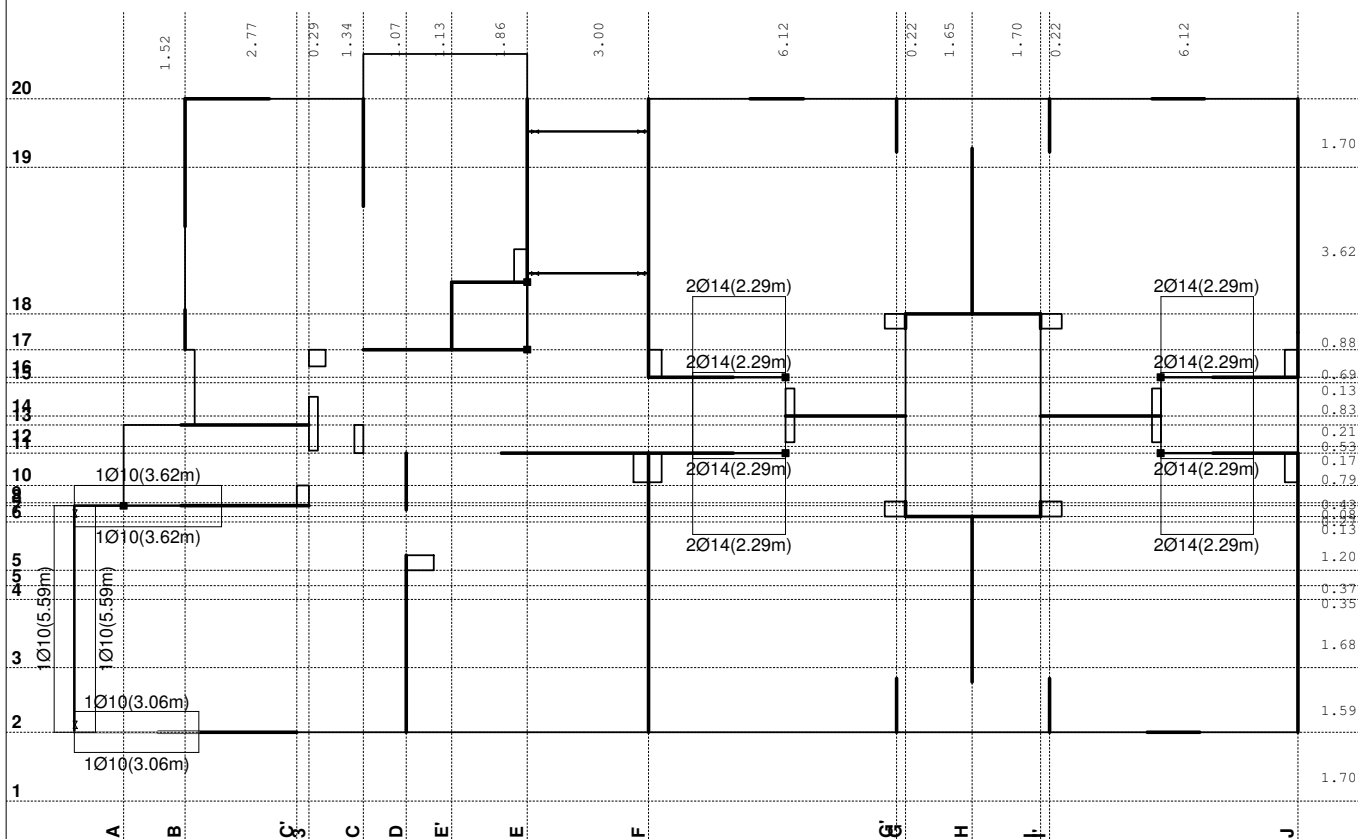


Armatura u gredama: Aa2/Aa1
Usvojena armatura
PBAB 87, MB 30, MA 500/600



Armatura u gredama: Aa,uz

Usvojena armatura
PBAB 87, MB 30, MA 500/600

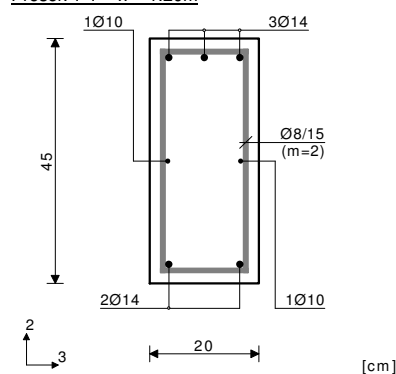


Armatura u gredama: Aa3/Aa4

Greda 511-1091

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

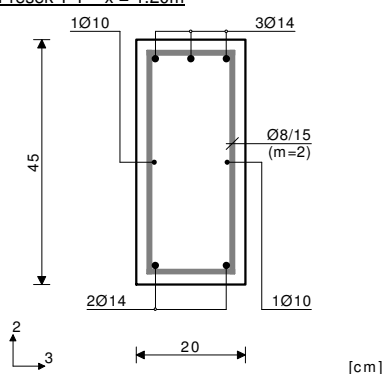
Presek 1-1 x = 1.20m



T2u = 48.18 kN
M1u = -0.02 kNm
M3u = -74.53 kNm

$\epsilon_b/\epsilon_a = -2.100/10.000 \%$
Aa1 = 0.00 cm²
Aa2 = 3.94 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]
 $\tau_y = 0.67 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.03%

Presek 1-1 x = 1.20m



T2u = -87.92 kN
M1u = 2.94 kNm
M3u = -67.10 kNm

$\epsilon_b/\epsilon_a = -1.932/10.000 \%$
Aa1 = 0.00 + 0.08' = 0.08 cm²
Aa2 = 3.53 + 0.08' = 3.61 cm²
Aa3 = 0.00 + 0.18' = 0.18 cm²
Aa4 = 0.00 + 0.18' = 0.18 cm²
Aa,uz = 2.44 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

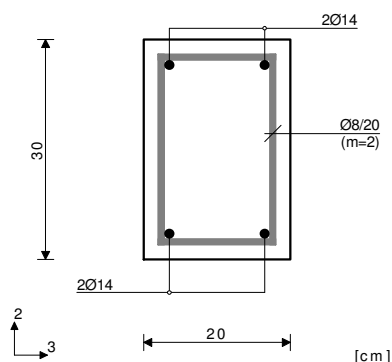
$\tau_y = 2.48 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 1.28 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.03%
) - dodatna podužna armatura za prijem torzije.

Greda 5319-6517

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 1.01\text{m}$ 

$$T2u = 3.28 \text{ kN}$$

$$M3u = 14.44 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -1.183/10.000 \text{ ‰}$$

$$Aa1 = 1.11 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

$$[\text{Usvojeno } Aa_{uz} = \text{Ø}8/20(m=2) = 2.51 \text{ cm}^2/\text{m}]$$

$$\tau_y = 0.07 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

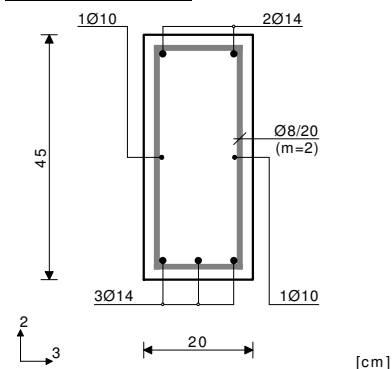
$$\text{Procenat armiranja: } 1.03\%$$

Greda 511-2

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 2.97\text{m}$ 

$$T2u = -0.53 \text{ kN}$$

$$M1u = 3.56 \text{ kNm}$$

$$M3u = 73.03 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -2.065/10.000 \text{ ‰}$$

$$Aa1 = 3.86 + 0.10' = 3.95 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.10' = 0.10 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.22' = 0.22 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.22' = 0.22 \text{ cm}^2$$

$$Aa_{uz} = 0.28 \text{ cm}^2/\text{m} \quad (m=2)$$

$$[\text{Usvojeno } Aa_{uz} = \text{Ø}8/20(m=2) = 2.51 \text{ cm}^2/\text{m}]$$

$$\tau_y = 1.55 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 1.55 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\text{Procenat armiranja: } 1.03\%$$

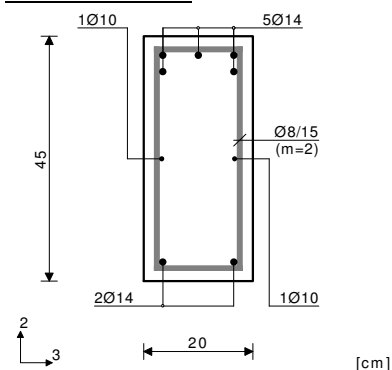
) - dodatna podužna armatura za prijem torzije.

Greda 2-190

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 2.06\text{m}$ 

$$T2u = 77.31 \text{ kN}$$

$$M3u = -134.26 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -3.500/8.041 \text{ ‰}$$

$$Aa1 = 0.00 \text{ cm}^2$$

$$Aa2 = 7.88 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

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

$$\tau_y = 1.10 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$$

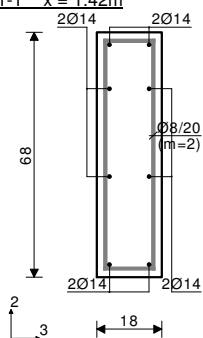
$$\text{Procenat armiranja: } 1.37\%$$

Greda 5946-6825

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 1.42\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -4.31 \text{ kN} \\ M1u &= -1.51 \text{ kNm} \\ M3u &= 2.18 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -0.183/10.000 \text{ ‰} \\ Aa1 &= 0.07 + 0.03' = 0.10 \text{ cm}^2 \\ Aa2 &= 0.00 + 0.03' = 0.03 \text{ cm}^2 \\ Aa3 &= 0.00 + 0.11' = 0.11 \text{ cm}^2 \\ Aa4 &= 0.00 + 0.11' = 0.11 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/\text{m} \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \text{Ø}8/20(m=2) = 2.51 \text{ cm}^2/\text{m}] \end{aligned}$$

$$\tau_y = 0.61 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.57 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procentat armiranja: 1.01%

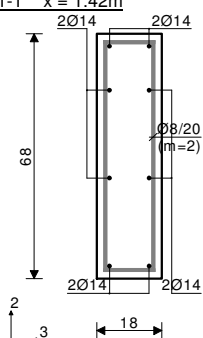
') - dodatna podužna armatura za prijem torzije.

Greda 5174-6110

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 1.42\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -3.57 \text{ kN} \\ M1u &= 1.16 \text{ kNm} \\ M3u &= 1.87 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -0.169/10.000 \text{ ‰} \\ Aa1 &= 0.06 + 0.02' = 0.08 \text{ cm}^2 \\ Aa2 &= 0.00 + 0.02' = 0.02 \text{ cm}^2 \\ Aa3 &= 0.00 + 0.08' = 0.08 \text{ cm}^2 \\ Aa4 &= 0.00 + 0.08' = 0.08 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/\text{m} \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \text{Ø}8/20(m=2) = 2.51 \text{ cm}^2/\text{m}] \end{aligned}$$

$$\tau_y = 0.47 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.43 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procentat armiranja: 1.01%

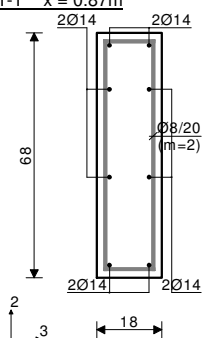
') - dodatna podužna armatura za prijem torzije.

Greda 9782-10302

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 0.87\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -1.39 \text{ kN} \\ M1u &= -0.83 \text{ kNm} \\ M3u &= 2.55 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -0.198/10.000 \text{ ‰} \\ Aa1 &= 0.08 + 0.00' = 0.08 \text{ cm}^2 \\ Aa2 &= 0.00 + 0.00' = 0.00 \text{ cm}^2 \\ Aa3 &= 0.00 + 0.06' = 0.06 \text{ cm}^2 \\ Aa4 &= 0.00 + 0.06' = 0.06 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/\text{m} \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \text{Ø}8/20(m=2) = 2.51 \text{ cm}^2/\text{m}] \end{aligned}$$

$$\tau_y = 0.32 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.31 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procentat armiranja: 1.01%

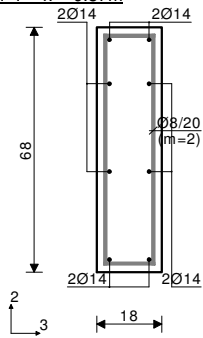
') - dodatna podužna armatura za prijem torzije.

Greda 9243-9895

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 0.87\text{m}$ 

[cm]

$$\begin{aligned} T2_u &= -0.73 \text{ kN} \\ M1_u &= 1.16 \text{ kNm} \\ M3_u &= 2.85 \text{ kNm} \end{aligned}$$

$$\varepsilon_b/\varepsilon_a = -0.210/10.000 \text{ ‰}$$

$$Aa1 = 0.09 + 0.02' = 0.12 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.02' = 0.02 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.08' = 0.08 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.08' = 0.08 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.44 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.43 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.01%

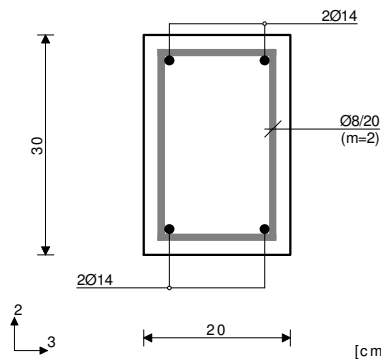
') - dodatna podužna armatura za prijem torzije.

Greda 9979-10631

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 1.63\text{m}$ 

[cm]

$$\begin{aligned} T2_u &= -0.58 \text{ kN} \\ M3_u &= -2.49 \text{ kNm} \end{aligned}$$

$$\varepsilon_b/\varepsilon_a = -0.437/10.000 \text{ ‰}$$

$$Aa1 = 0.00 \text{ cm}^2$$

$$Aa2 = 0.19 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

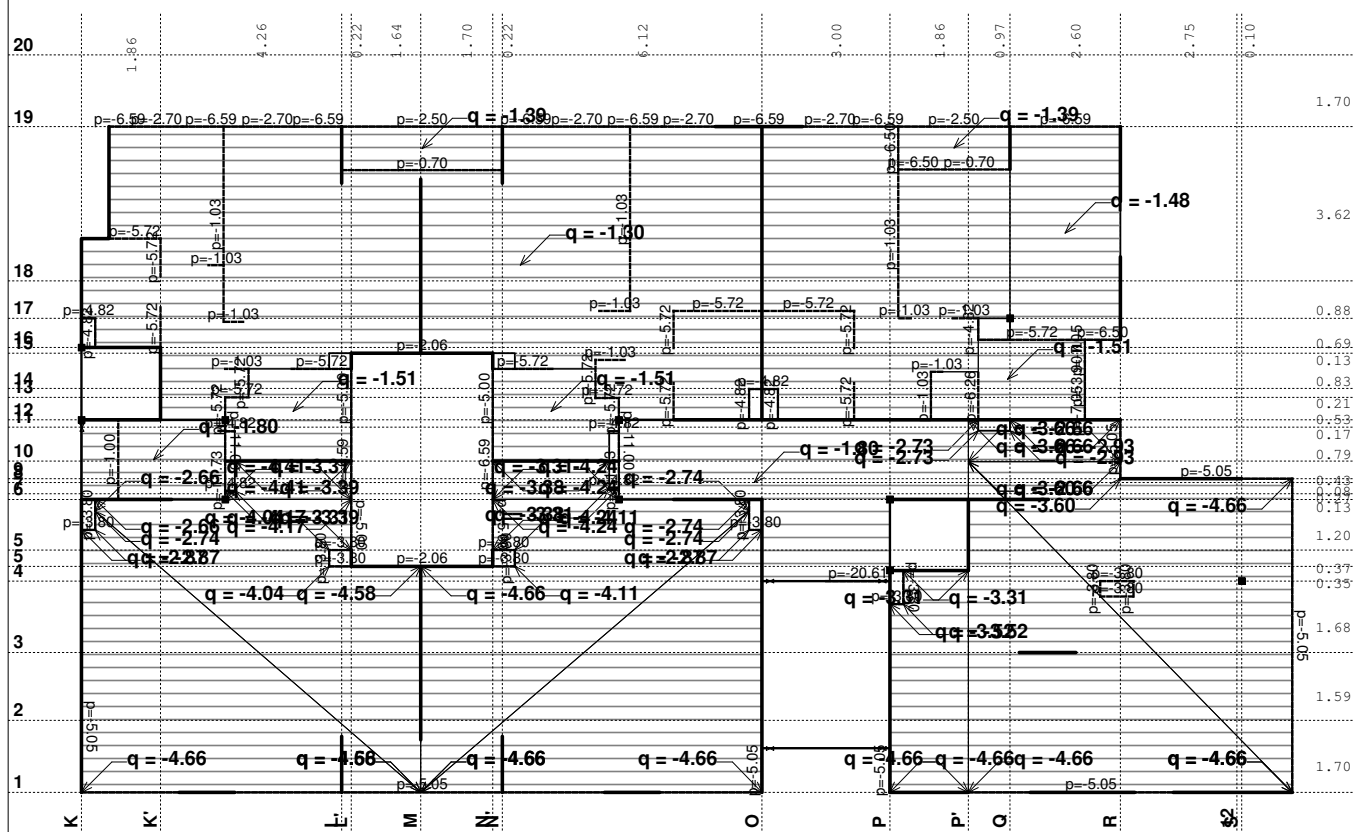
[Usvojeno $Aa_{uz} = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.01 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

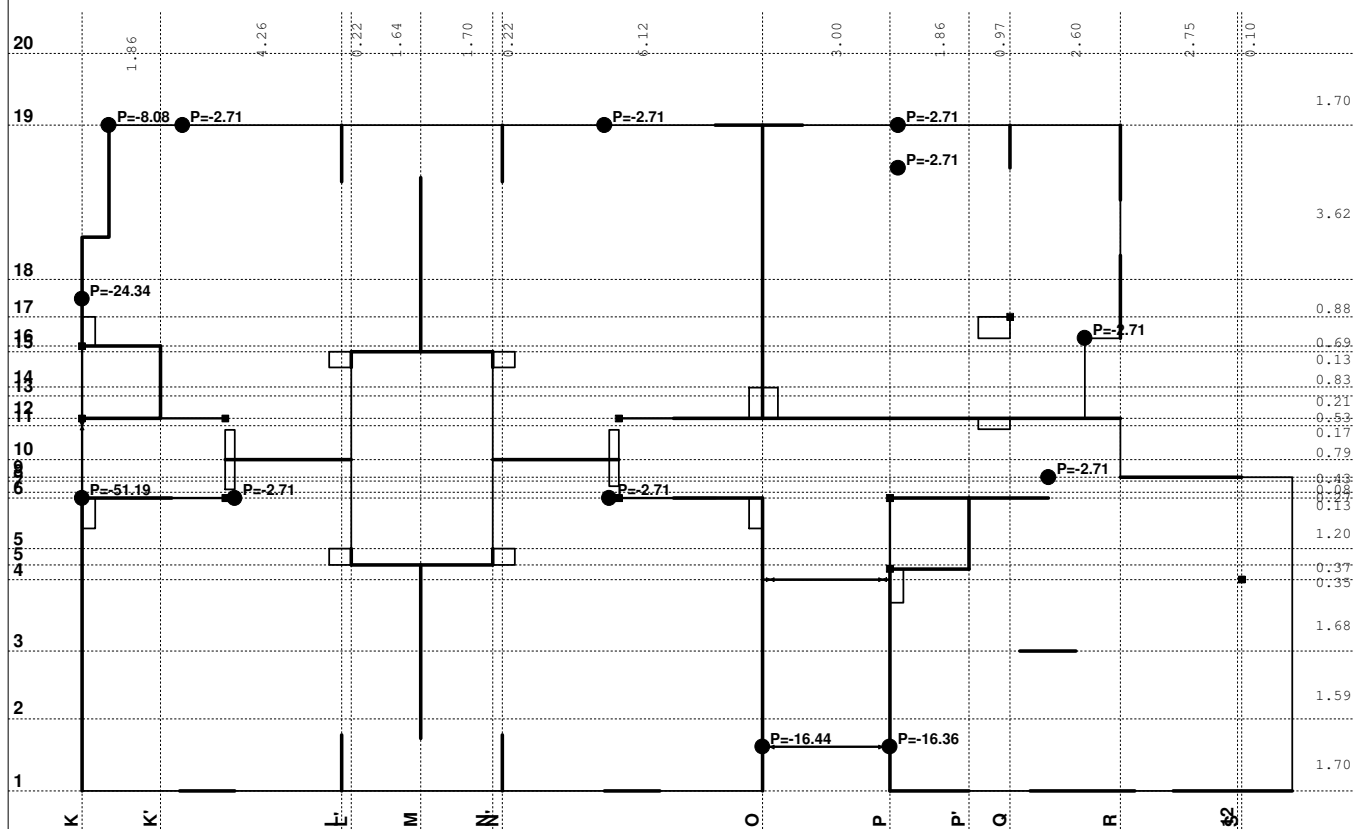
Procenat armiranja: 1.03%

POS 700+ - KONSTRUKCIJA IZNAD VI SPRATA

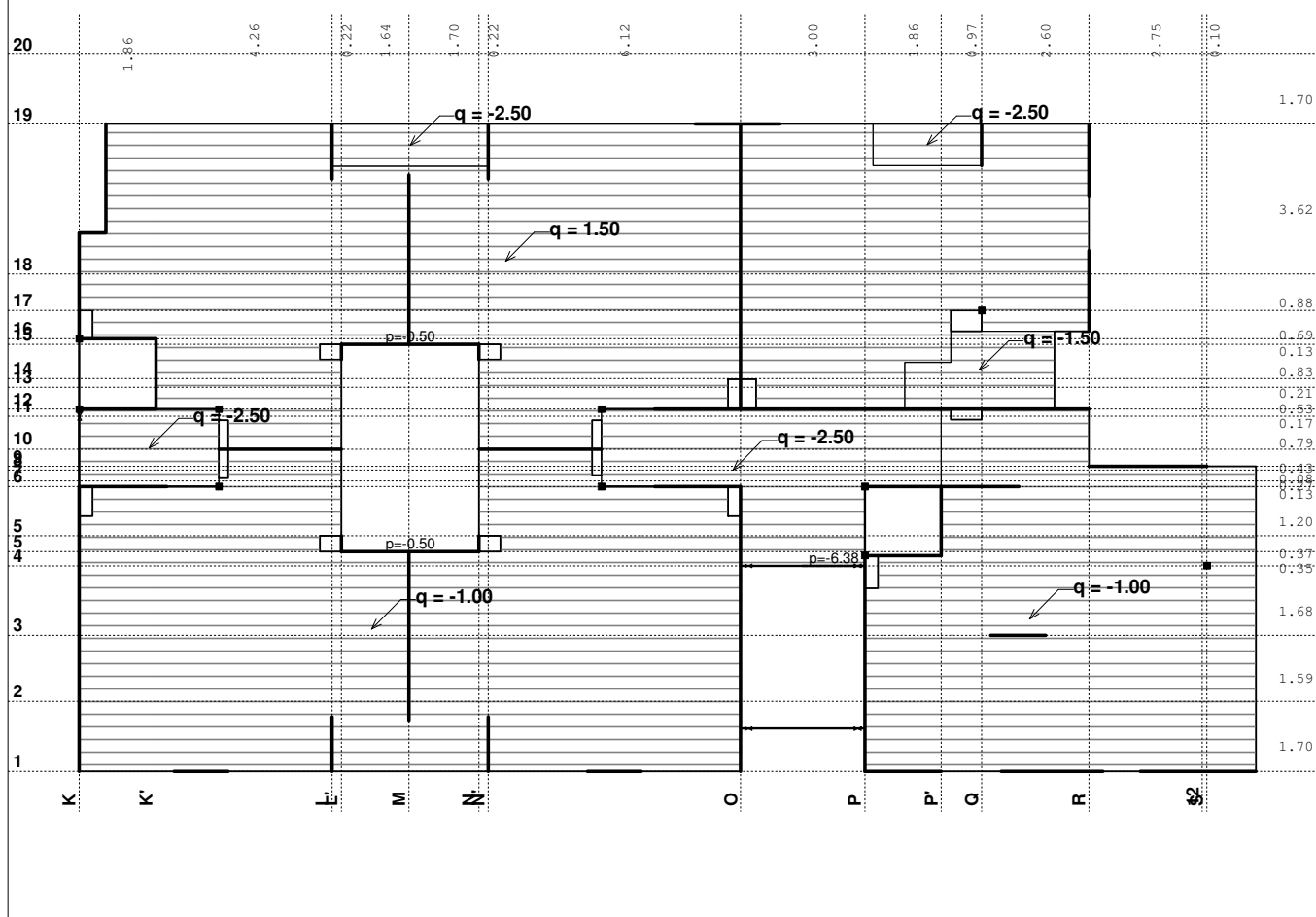
Opt. 1: g (g)



Opt. 1: g (g)



Opt. 2: p



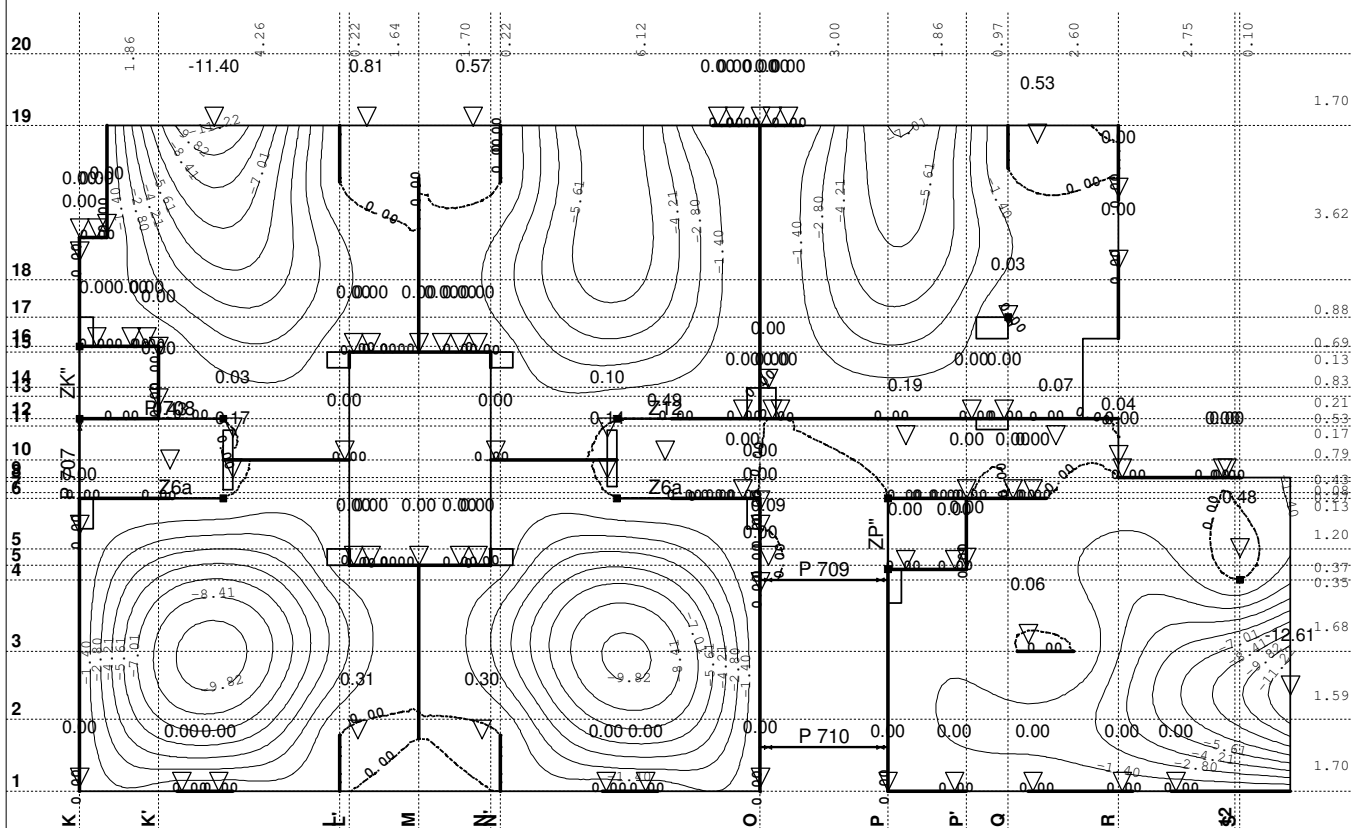
Lista slučajeva opterećenja

LC	Naziv
1	q (g)
2	p
3	Komb.: 1.6xI+1.8xII

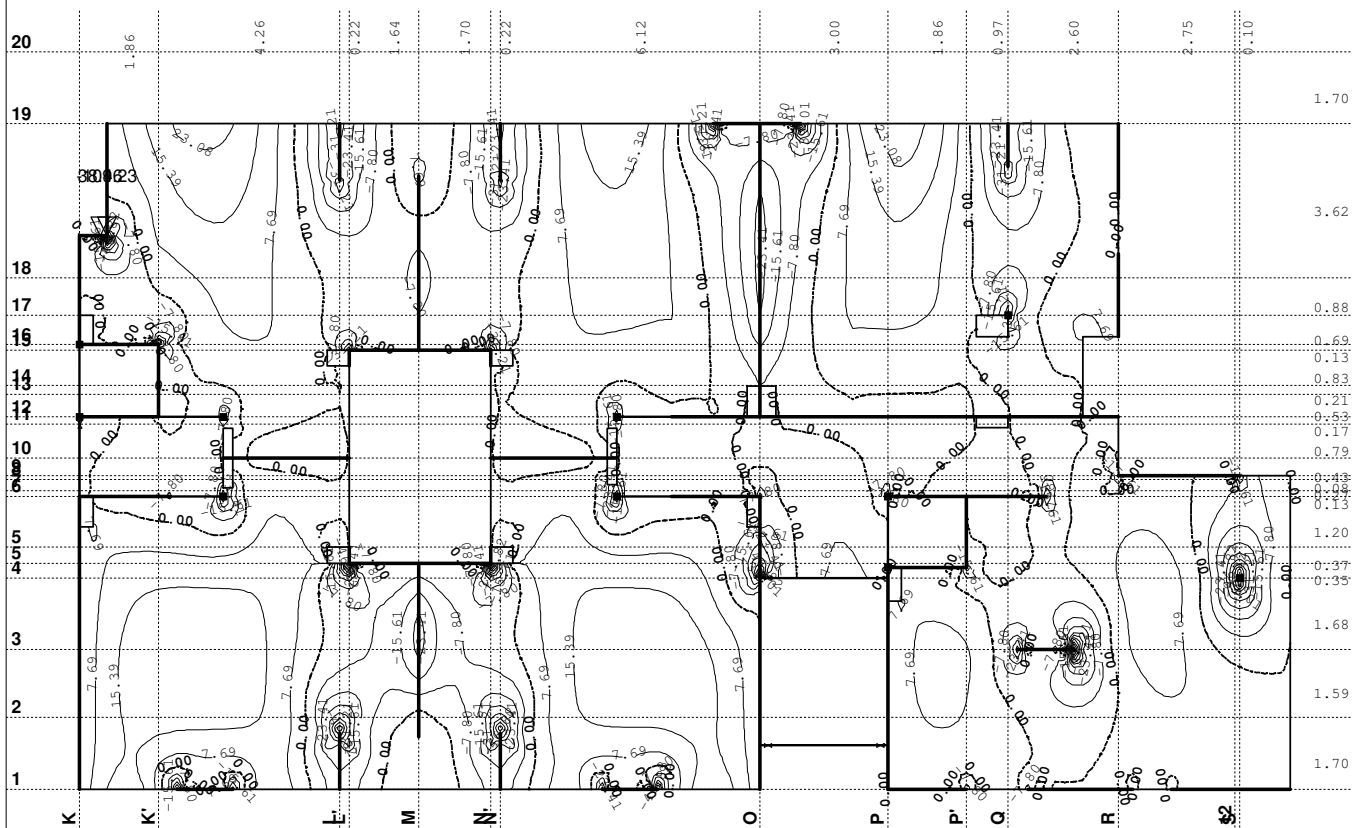
LC	Naziv
4	Komb.: 3.5xI
5	Komb.: I+II

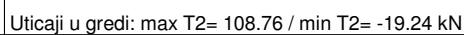
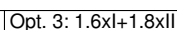
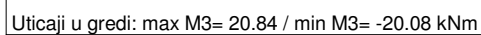
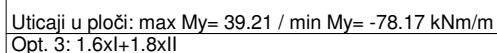
Statički proračun

Opt. 4: 3.5xl+II


 Uticaji u ploči: max $Z_p = 0.81$ / min $Z_p = -12.61$ m / 1000

Opt. 3: 1.6xl+1.8xII

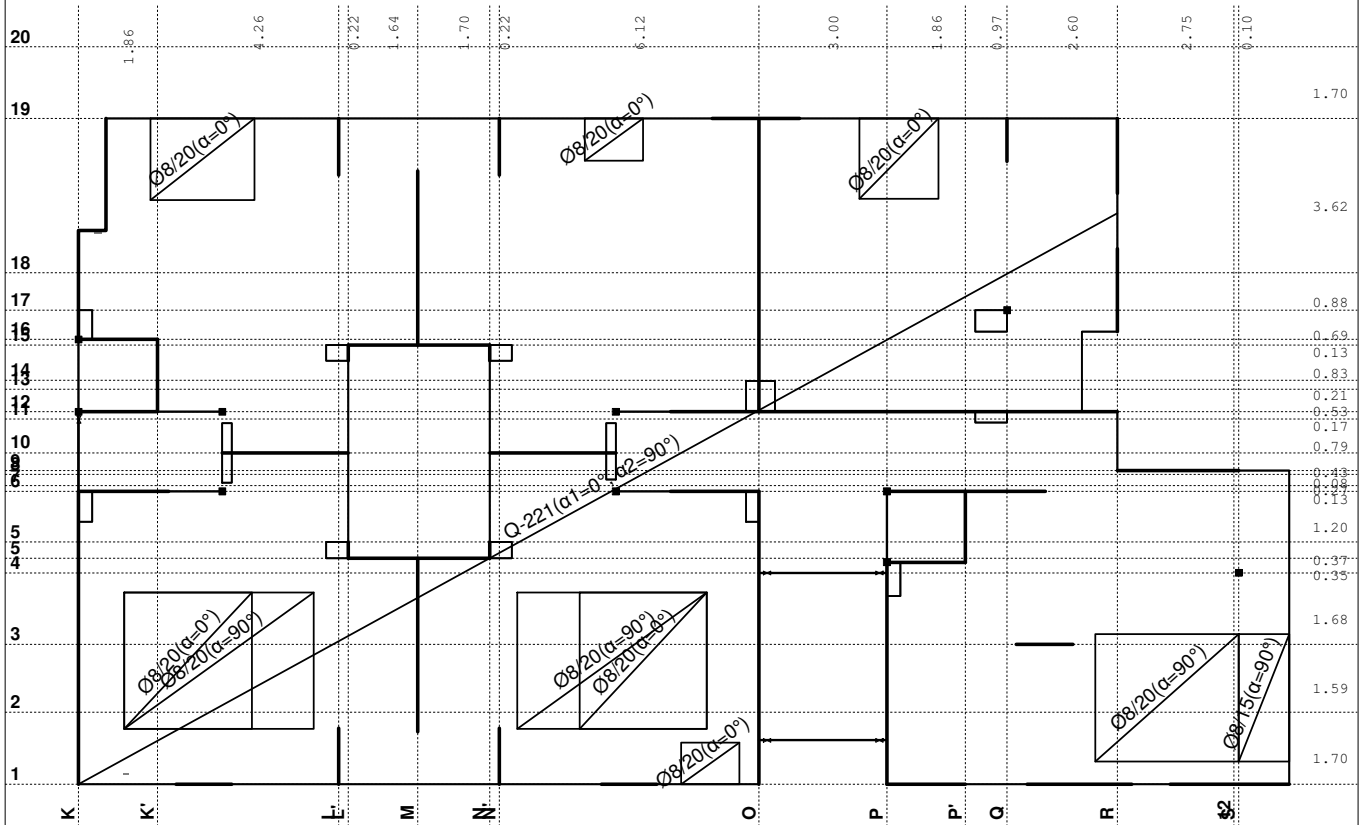

 Uticaji u ploči: max $M_x = 38.46$ / min $M_x = -109.23$ kNm/m



Dimenzionisanje (beton)

Usvojena armatura
PBAB 87, MB 30, MA 500/560, a=2.00 cm

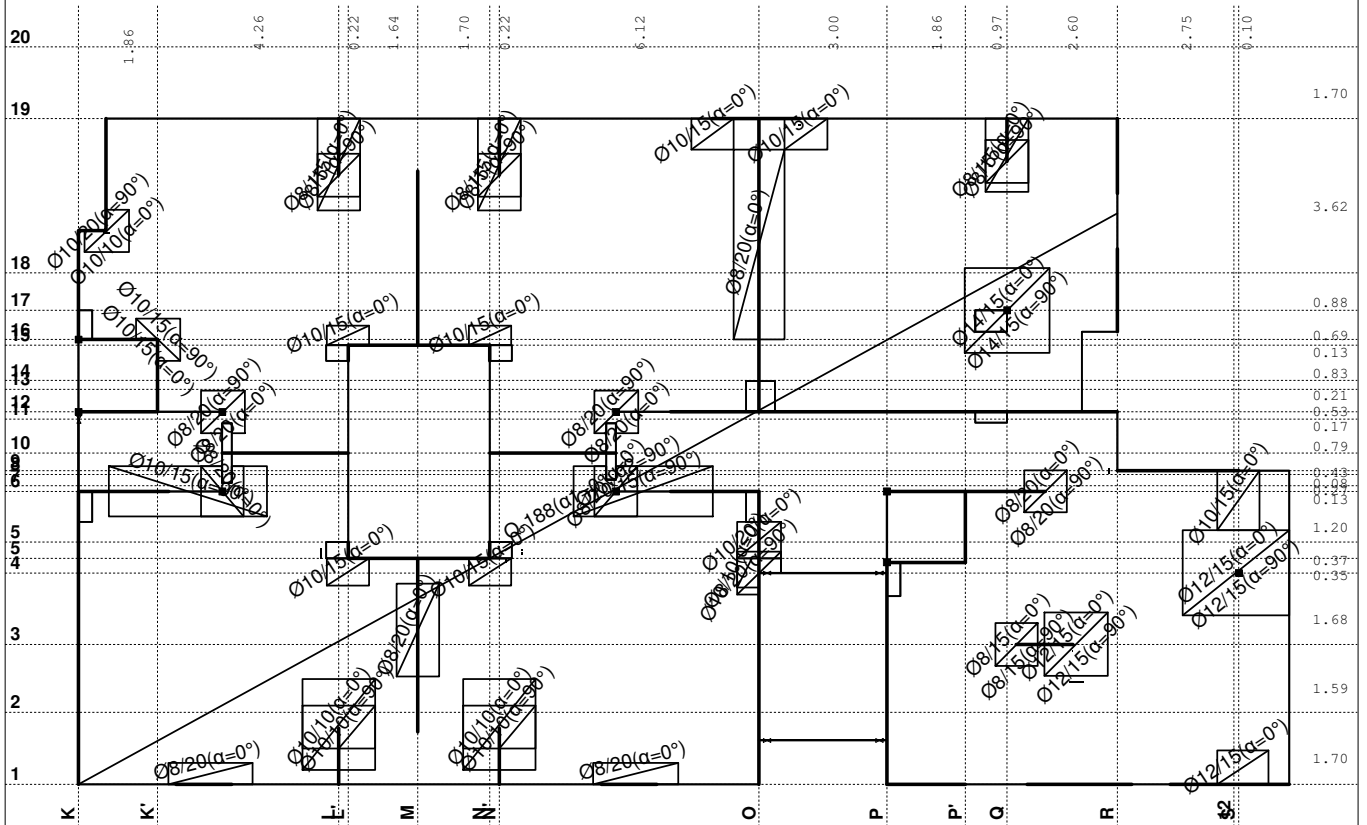
Aa - d.zona [cm ² /m]
0.00
2.58
5.16



Aa - d.zona

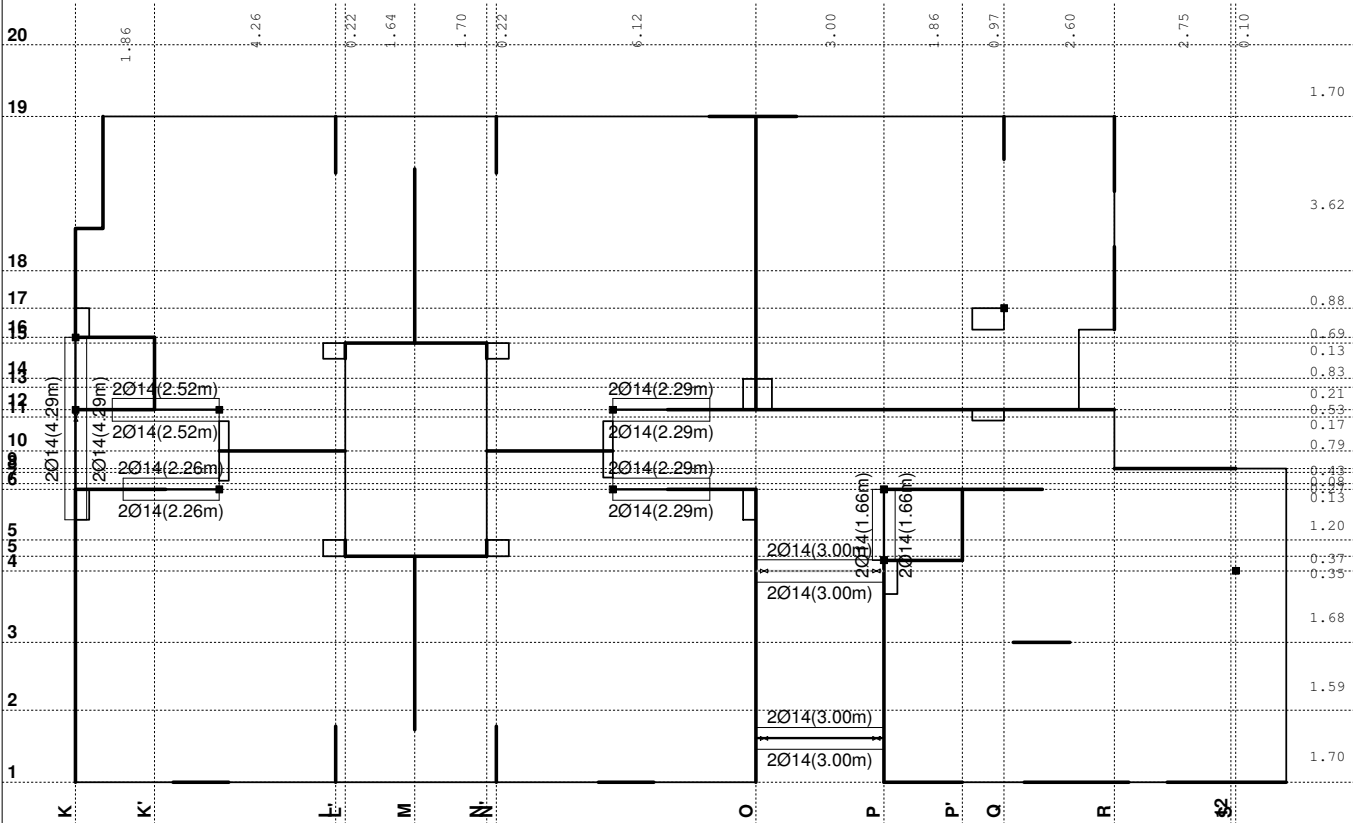
Usvojena armatura
PBAB 87, MB 30, MA 500/560, a=2.00 cm

Aa - g.zona [cm ² /m]
-15.54
-7.77
0.00

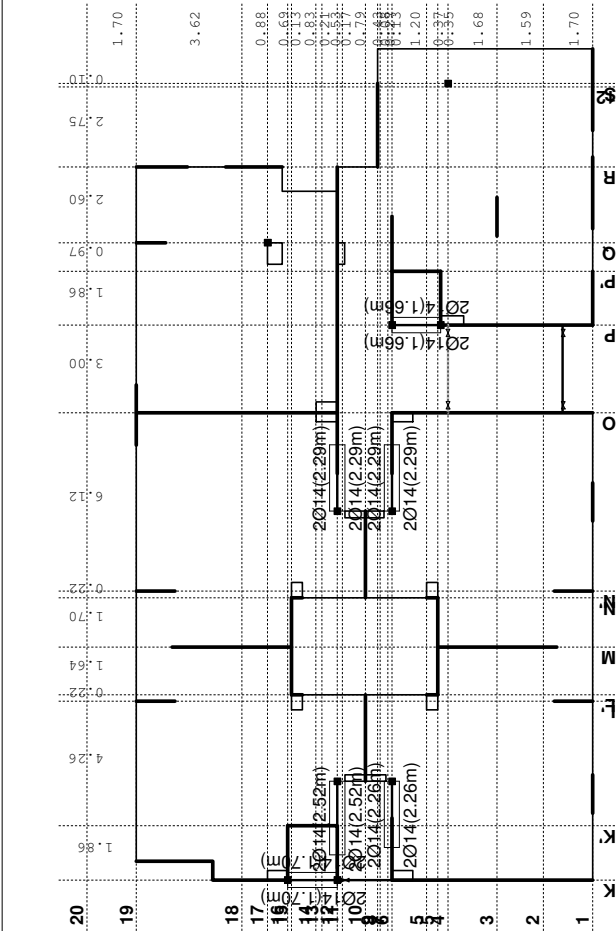


Aa - g.zona

Usvojena armatura
PBAB 87, MB 30, MA 500/560

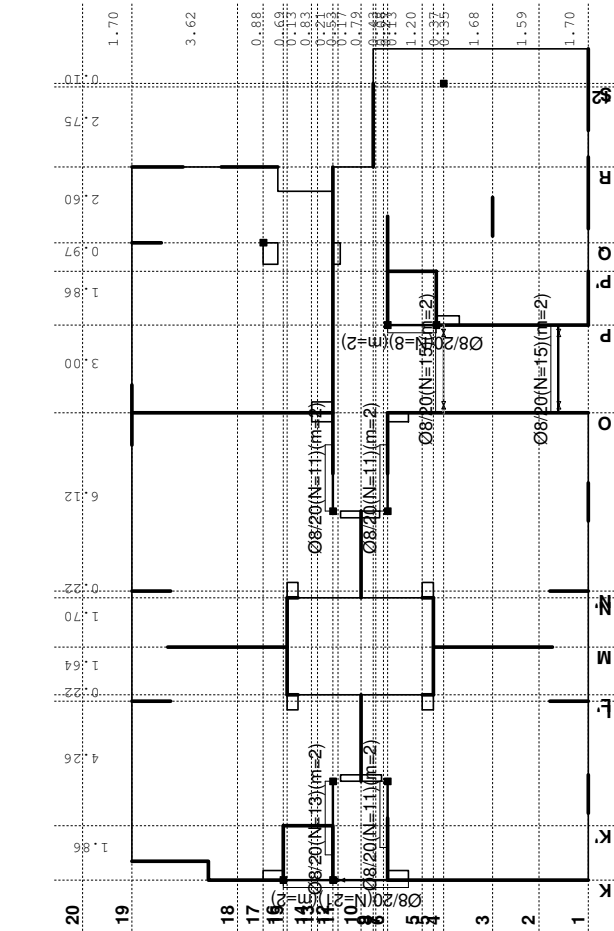


Armatura u gredama: Aa2/Aa1
Usvojena armatura
PBAB 87, MB 30, MA 500/560



Armatura u gredama: Aa3/Aa4

Usvojena armatura
PBAB 87, MB 30, MA 500/560



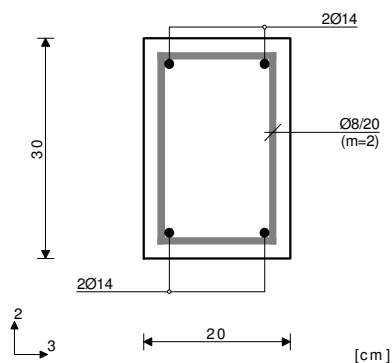
Armatura u gredama: Aa/uz

P 710 (3512-4526)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60x1+1.80xIIPresek 1-1 $x = 1.00\text{m}$ 

$$T2u = -1.20 \text{ kN}$$

$$M3u = 2.40 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.428/10.000 \text{ ‰}$$

$$Aa1 = 0.18 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.02 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

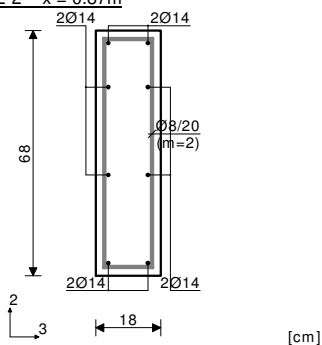
Procenat armiranja: 1.03%

Z6a (1434-925)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 2-2 $x = 0.87\text{m}$ 

$$T2u = 0.21 \text{ kN}$$

$$M1u = 0.52 \text{ kNm}$$

$$M3u = 4.22 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.257/10.000 \text{ ‰}$$

$$Aa1 = 0.14 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.20 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.20 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

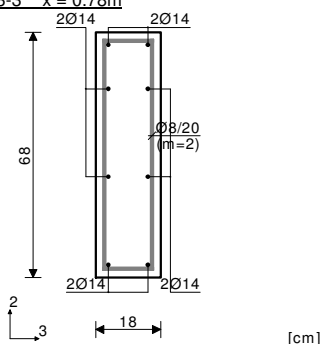
Procenat armiranja: 1.01%

Z6a (4336-5173)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 3-3 $x = 0.78\text{m}$ 

$$T2u = 1.72 \text{ kN}$$

$$M1u = -1.24 \text{ kNm}$$

$$M3u = 3.16 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.221/10.000 \text{ ‰}$$

$$Aa1 = 0.10 + 0.02' = 0.13 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.02' = 0.02 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.09' = 0.09 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.09' = 0.09 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.48 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.47 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.01%

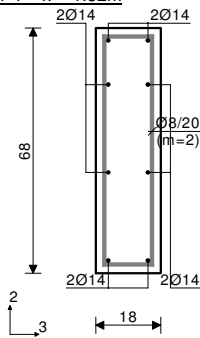
') - dodatna podužna armatura za prijem torzije.

P 708 (1954-1277)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 4-4 $x = 1.52\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -4.85 \text{ kN} \\ M1u &= -2.55 \text{ kNm} \\ M3u &= 0.32 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.069/10.000 \text{ ‰}$$

$$Aa1 = 0.00 + 0.05' = 0.05 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.05' = 0.05 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.18' = 0.18 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.18' = 0.18 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \phi 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 1.01 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.96 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.01%

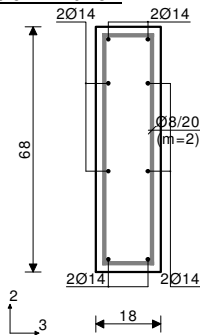
*) - dodatna podužna armatura za prijem torzije.

Z12 (5016-5942)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 5-5 $x = 0.78\text{m}$ 

[cm]

$$\begin{aligned} T2u &= 0.80 \text{ kN} \\ M1u &= 0.25 \text{ kNm} \\ M3u &= 1.46 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.149/10.000 \text{ ‰}$$

$$Aa1 = 0.05 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \phi 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.10 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.09 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

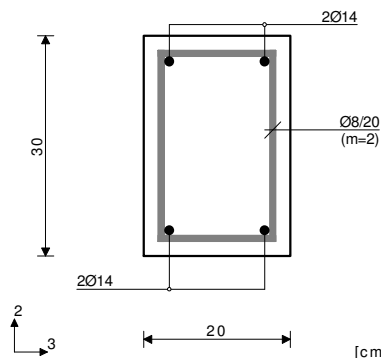
Procenat armiranja: 1.01%

P 707 (587-1087)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 6-6 $x = 1.20\text{m}$ 

[cm]

$$\begin{aligned} T2u &= 1.36 \text{ kN} \\ M3u &= -0.91 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.257/10.000 \text{ ‰}$$

$$Aa1 = 0.00 \text{ cm}^2$$

$$Aa2 = 0.07 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \phi 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.03 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

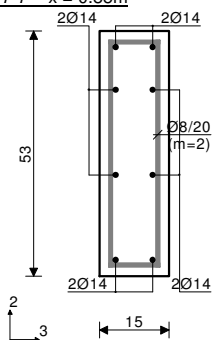
Procenat armiranja: 1.03%

ZK" (1476-1087)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 7-7 $x = 0.85m$ 

[cm]

$$M3u = 1.02 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.176/10.000 \text{ ‰}$$

$$Aa1 = 0.04 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

$$[Usvojeno Aa,uz = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/m]$$

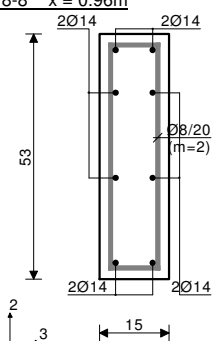
Procenat armiranja: 1.55%

ZP" (6867-6172)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 8-8 $x = 0.96m$ 

[cm]

$$T2u = -0.12 \text{ kN}$$

$$M3u = 4.45 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.378/10.000 \text{ ‰}$$

$$Aa1 = 0.19 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

$$[Usvojeno Aa,uz = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/m]$$

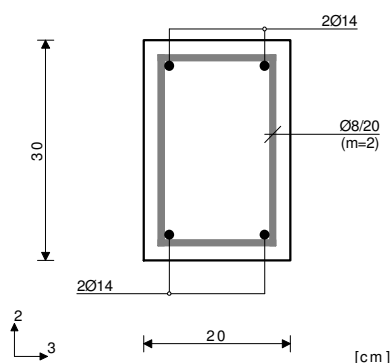
Procenat armiranja: 1.55%

P 709 (4865-6066)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 9-9 $x = 1.97m$ 

[cm]

$$T2u = -3.35 \text{ kN}$$

$$M3u = 20.72 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -1.491/10.000 \text{ ‰}$$

$$Aa1 = 1.61 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

$$[Usvojeno Aa,uz = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/m]$$

$$\tau_y = 0.07 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

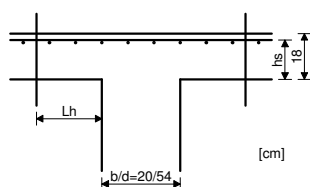
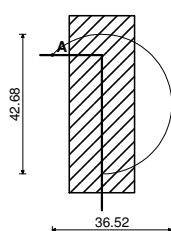
Procenat armiranja: 1.03%

Kontrola ploča na probijanje

Nivo: POS 700+ [0.00 m]

Presek 1 (190.60,-108.22,0.00)

MB 30



[cm]

KONTROLA KRITIČNOG PRESEKA 1. (Lh = 0.07m od ivice stuba)
(stub zamenjujućeg kružnog preseka, ds = 0.28m)

Merodavna kombinacija: I+II		
Sila u stubu	N =	76.645 kN
Faktor povećanja napona zbog ekscentričnosti	β =	1.400
Merodavni smičući napon (tačka A)	τ =	0.852 MPa
Debljina ploče	d,pl =	0.180 m
Statička visina ploče	hs =	0.150 m
Obim kritičnog preseka	Okp =	0.839 m
Postojeća armatura u ploči		
Površina armature - pravac 1	Aa,1 =	12.147 cm ²
Procenat armiranja - pravac 1	μ ,1 =	0.810 %
Površina armature - pravac 2	Aa,2 =	12.147 cm ²
Procenat armiranja - pravac 2	μ ,2 =	0.810 %
Srednja vrednost procenta armiranja	μ =	0.810 %
Koeficijent	α_a =	1.400
Koeficijent	γ_1 =	1.638
Koeficijent	γ_2 =	0.567
Dopušteni glavni napon zatezanja	τ_a =	0.800
Dopušteni glavni napon zatezanja	τ_b =	2.200
Maksimalna otpornost($\gamma_2 \times \tau_b$)	τ_{max} =	1.247 MPa

Uslov: $\tau \leq \tau_{max}$ (0.85 \leq 1.25)

Uslov je ispunjen.

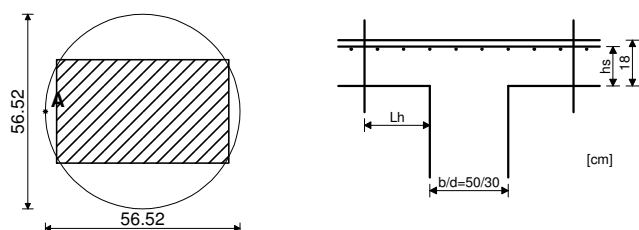
Otpornost na probijanje ploče bez dodatne armature za obezbeđenje (2/3 x $\gamma_1 \times \tau_a$)	τ_{gr} =	0.874 MPa
---	---------------	-----------

Uslov: $\tau \leq \tau_{gr}$ (0.85 \leq 0.87)

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

Kontrola ploča na probijanje

Nivo: POS 700+ [0.00 m]
 Presek 2 (196.05,-114.40,0.00)
 MB 30



KONTROLA KRITIČNOG PRESEKA 1. ($L_h = 0.07\text{m}$ od ivice stuba)
 (stub zamenjujućeg kružnog preseka, $d_s = 0.42\text{m}$)

Merodavna kombinacija: I+II	
Sila u stubu	$N = 179.19\text{ kN}$
Merodavni smičući napon (tačka A)	$\tau = 0.673\text{ MPa}$
Debljina ploče	$d_{pl} = 0.180\text{ m}$
Statička visina ploče	$h_s = 0.150\text{ m}$
Obim kritičnog preseka	$Okp = 1.776\text{ m}$
Postojeća armatura u ploči	
Površina armature - pravac 1	$A_{a,1} = 9.425\text{ cm}^2$
Procenat armiranja - pravac 1	$\mu_1 = 0.628\%$
Površina armature - pravac 2	$A_{a,2} = 9.425\text{ cm}^2$
Procenat armiranja - pravac 2	$\mu_2 = 0.628\%$
Srednja vrednost procenta armiranja	$\mu = 0.628\%$
Koeficijent	$\alpha_a = 1.400$
Koeficijent	$\gamma_1 = 1.443$
Koeficijent	$\gamma_2 = 0.499$
Dopušteni glavni napon zatezanja	$\tau_a = 0.800$
Dopušteni glavni napon zatezanja	$\tau_b = 2.200$
Maksimalna otpornost ($\gamma_2 \times \tau_b$)	$\tau_{max} = 1.099\text{ MPa}$

Uslov: $\tau \leq \tau_{max}$ ($0.67 \leq 1.10$)

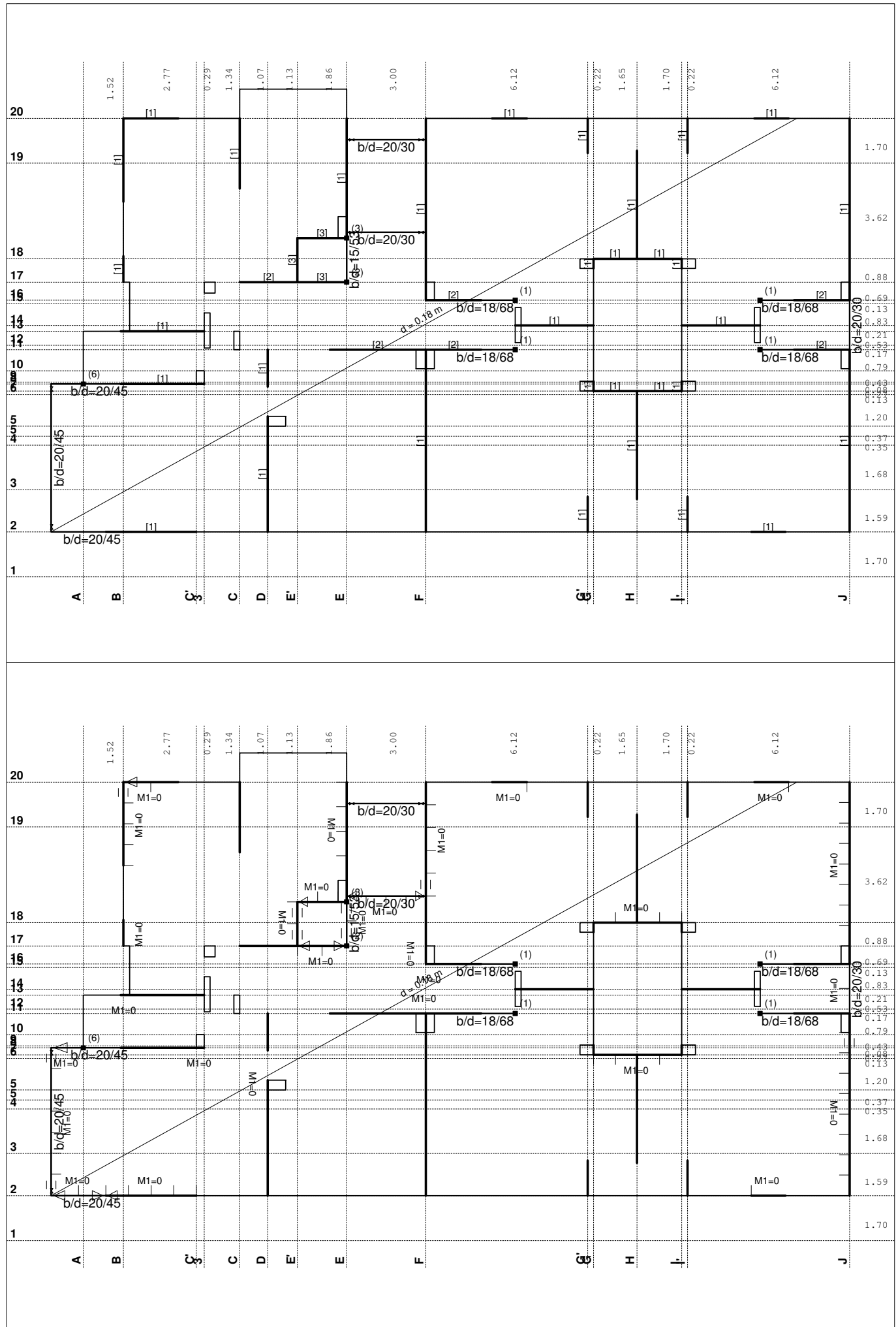
Uslov je ispunjen.

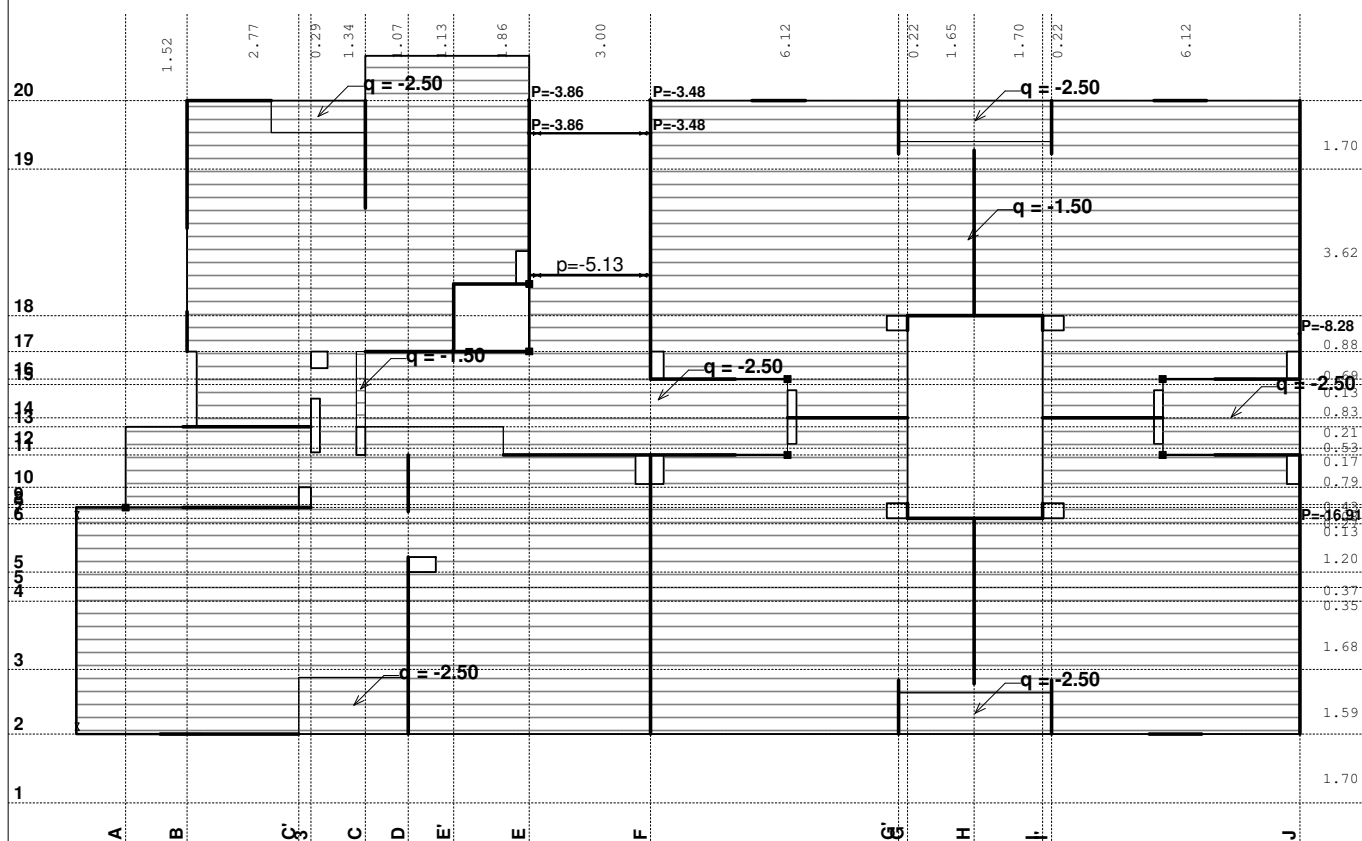
Otpornost na probijanje ploče bez dodatne armature za
 obezbeđenje ($2/3 \times \gamma_1 \times \tau_a$) $\tau_{gr} = 0.769\text{ MPa}$

Uslov: $\tau \leq \tau_{gr}$ ($0.67 \leq 0.77$)

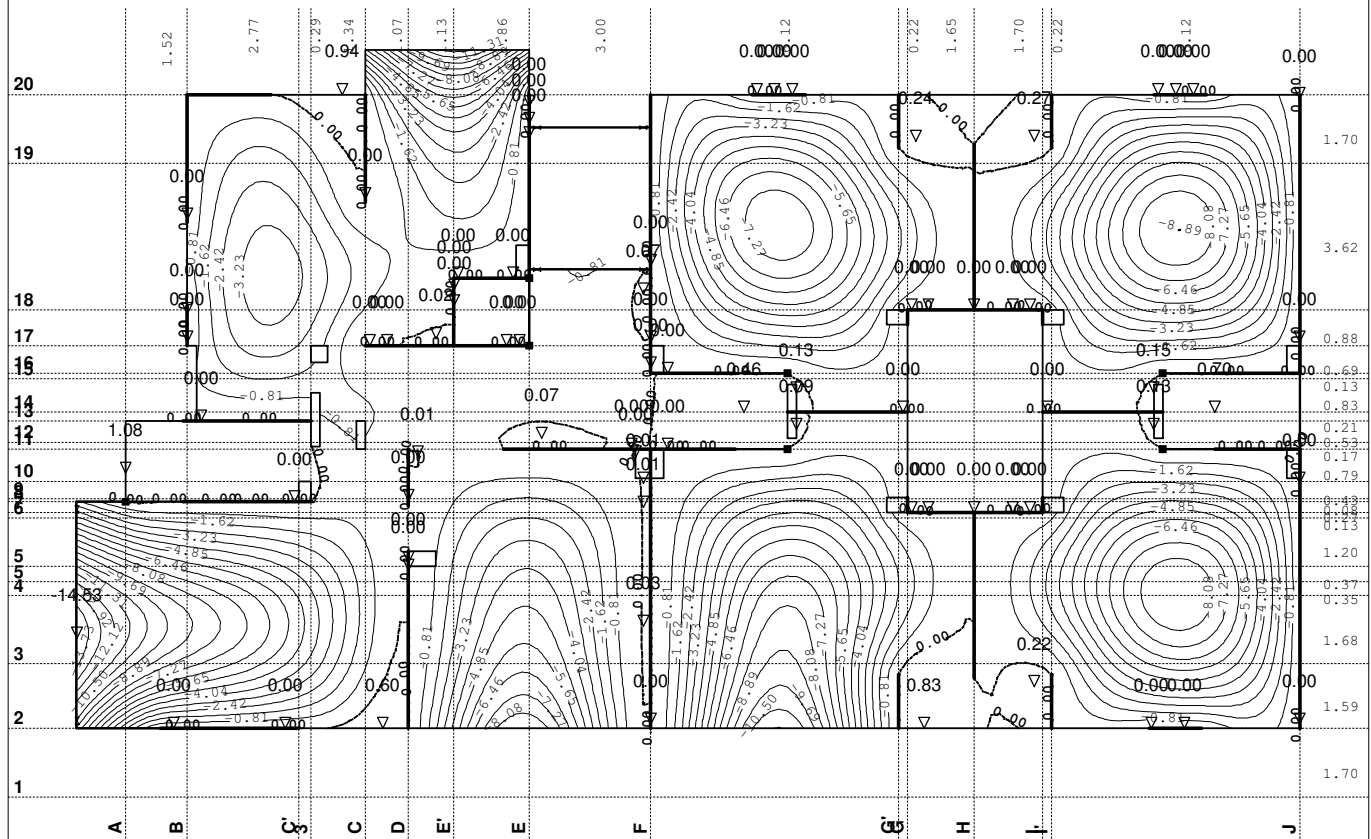
**Uslov je ispunjen, nije potrebna dodatna armatura za obezbeđenje
 od probijanja ploče.**

POS 600+ - KONSTRUKCIJA IZNAD PETOG SPRATA



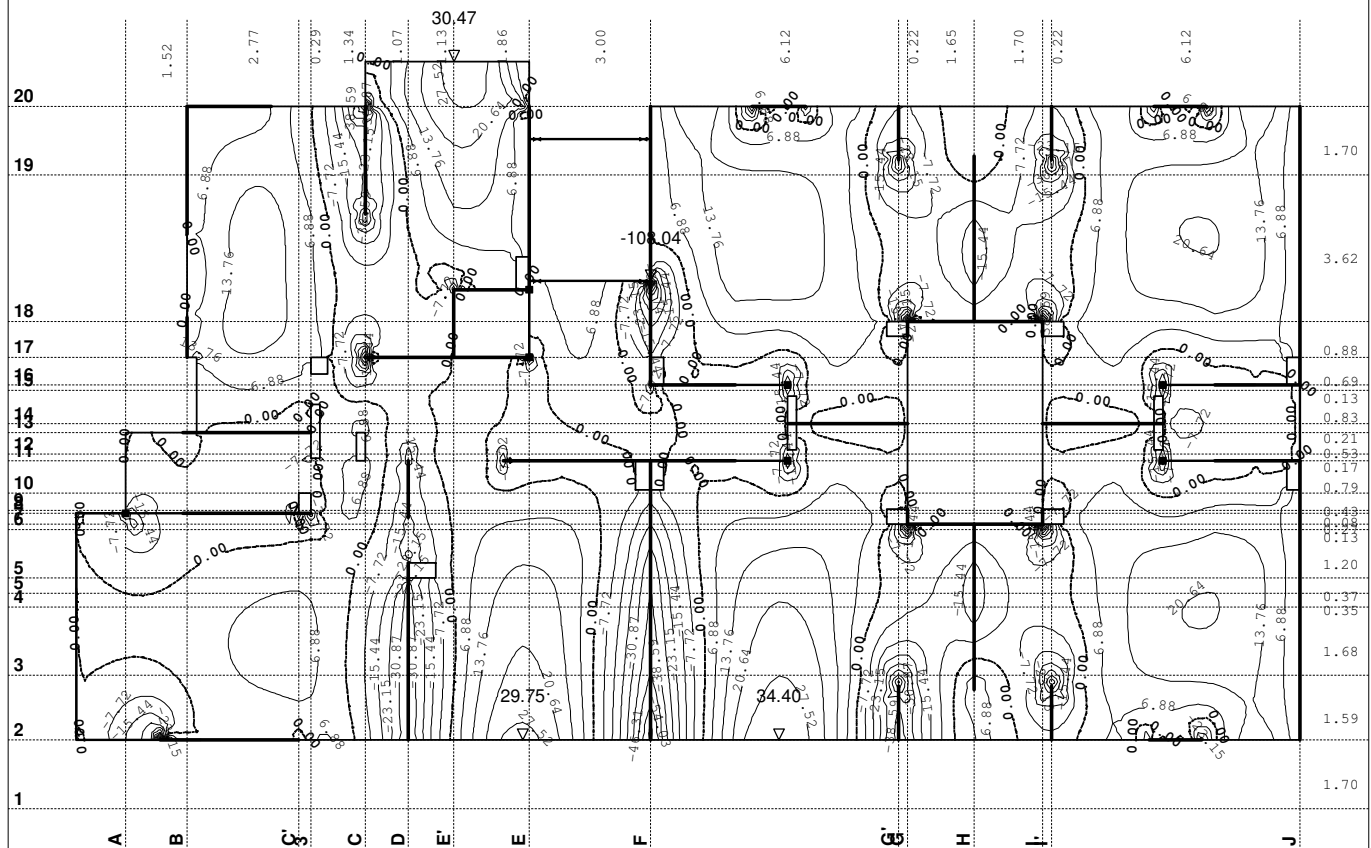


Opt. 4: 3.5xl+II



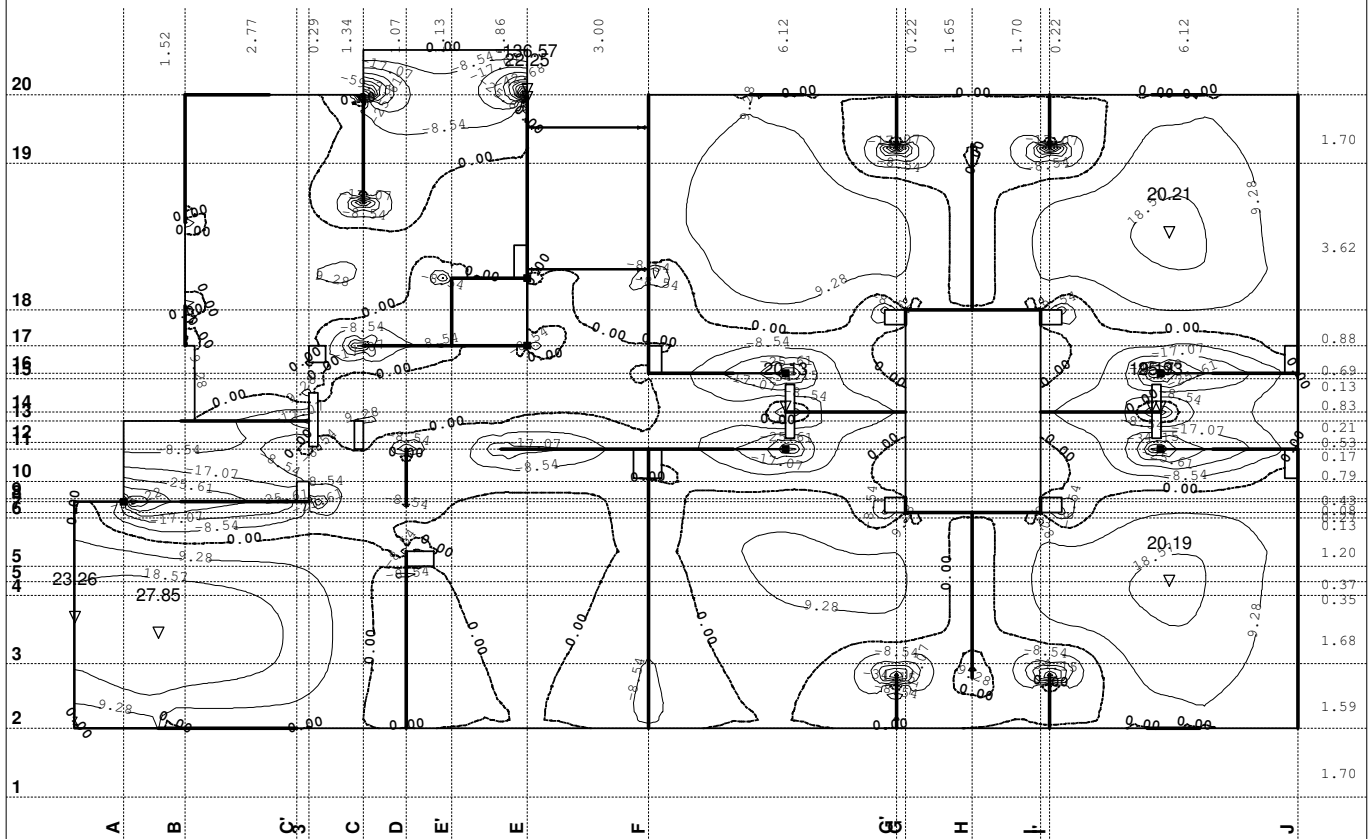
Utjecaji u ploči: max $Z_p = 1.08$ / min $Z_p = -14.53$ m / 1000

Opt. 3: 1.6xl+1.8xII

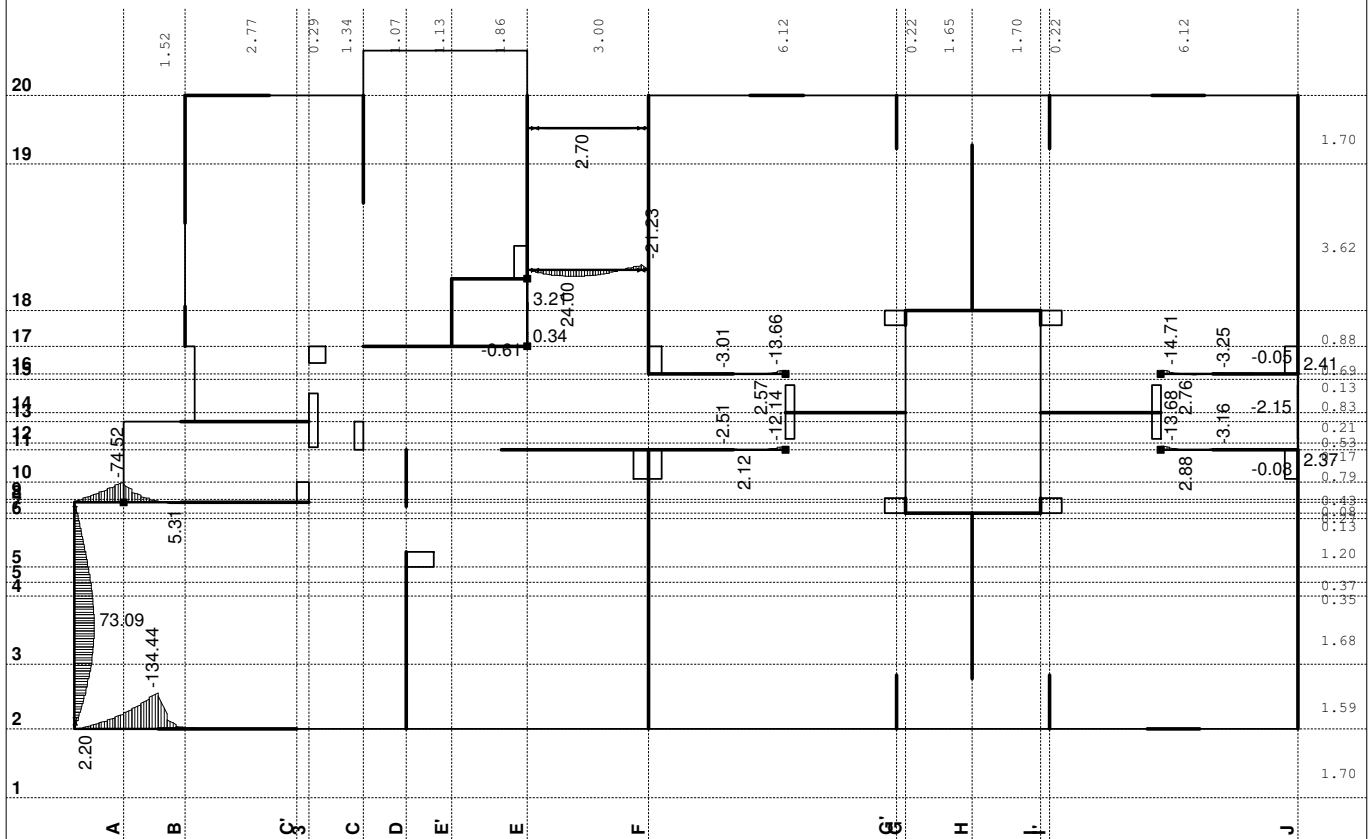


Utjecaji u ploči: max $M_x = 34.40$ / min $M_x = -108.04$ kNm/m

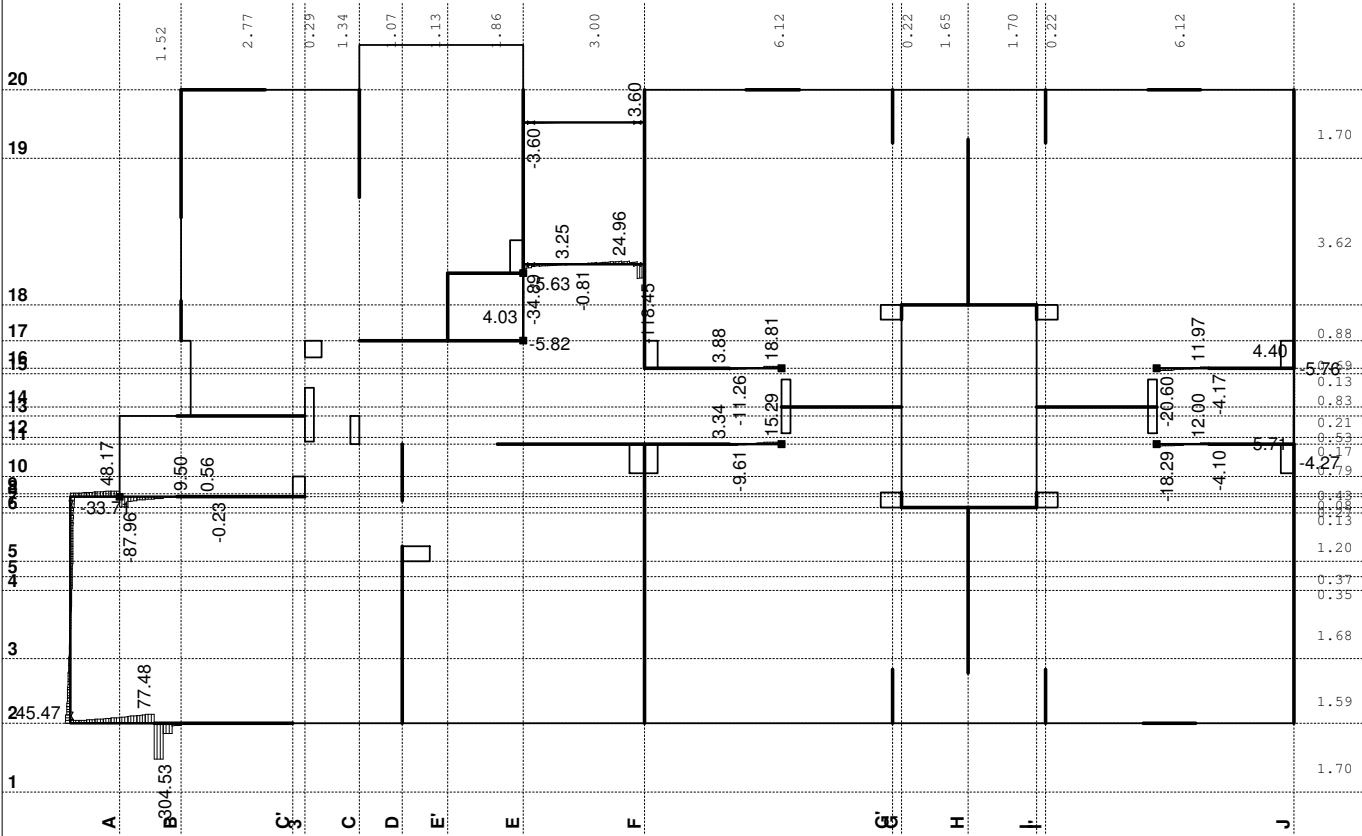
Opt. 3: 1.6xl+1.8xll

Utjecaji u ploči: max $M_y = 27.85$ / min $M_y = -136.57$ kNm/m

Opt. 3: 1.6xl+1.8xll

Utjecaji u gredi: max $M_3 = 73.09$ / min $M_3 = -134.44$ kNm

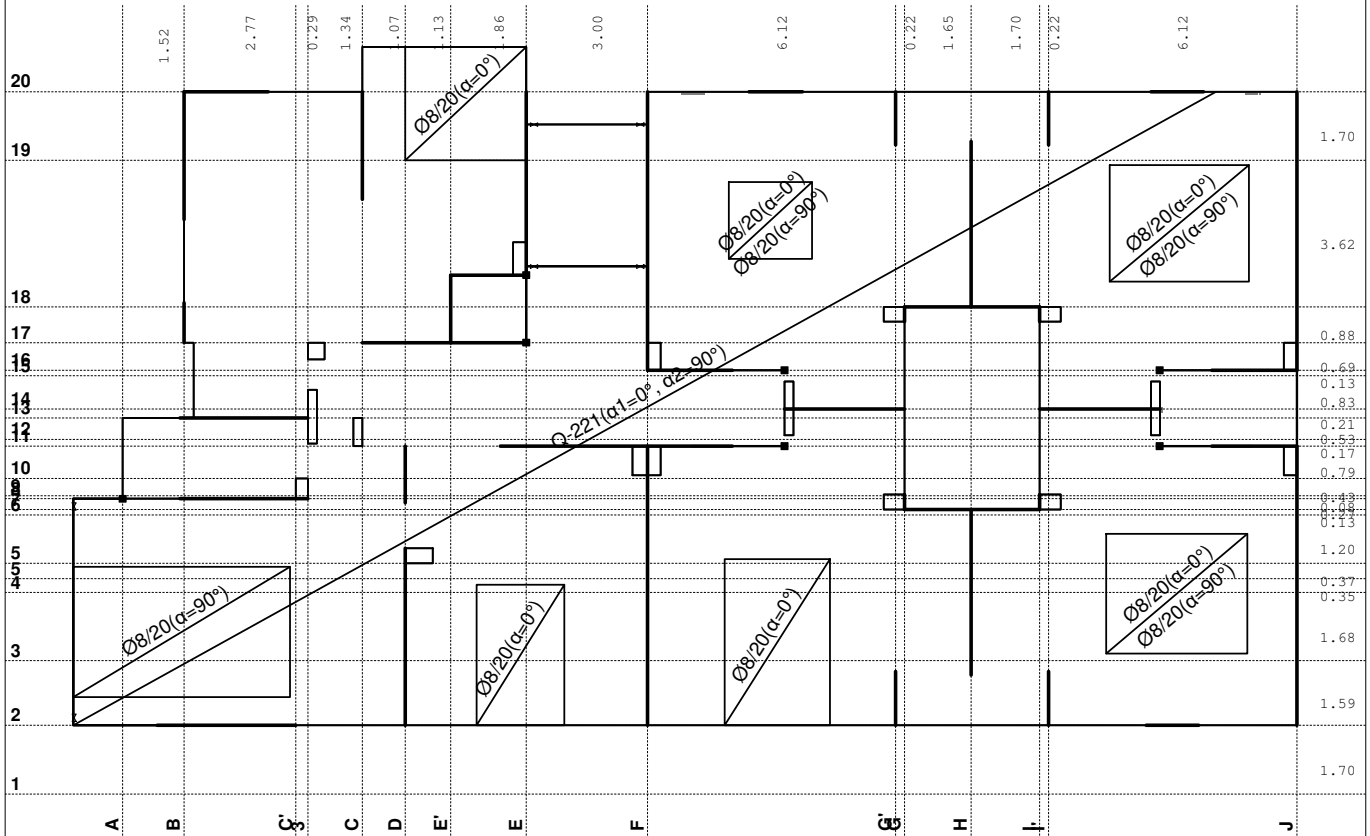
Opt. 3: 1.6xl+1.8xII



Uticaji u gredi: max T2= 77.48 / min T2= -304.53 kN

Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

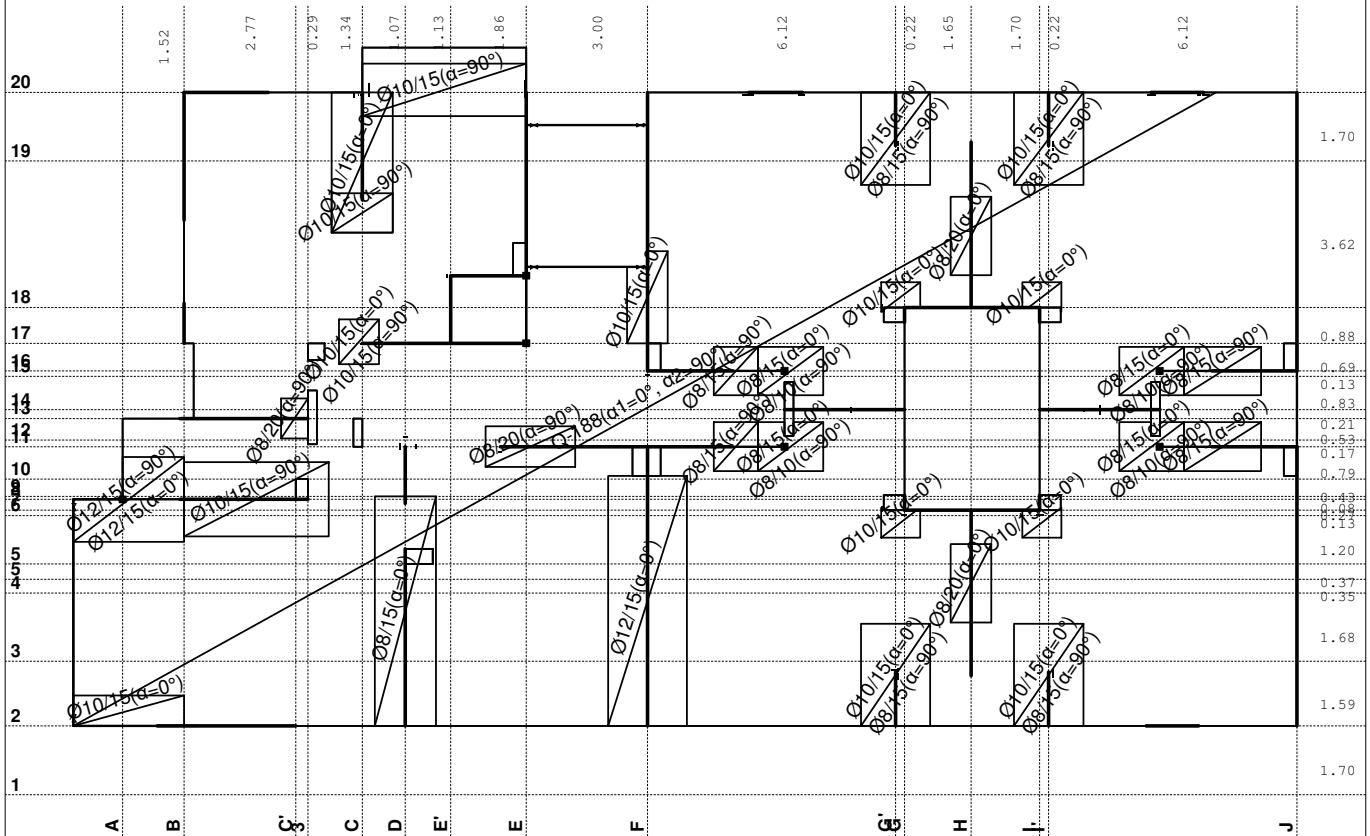
Aa - d.zona [cm ² /m]
0.00
2.26
4.51



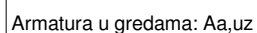
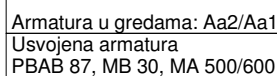
Aa - d.zona

Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

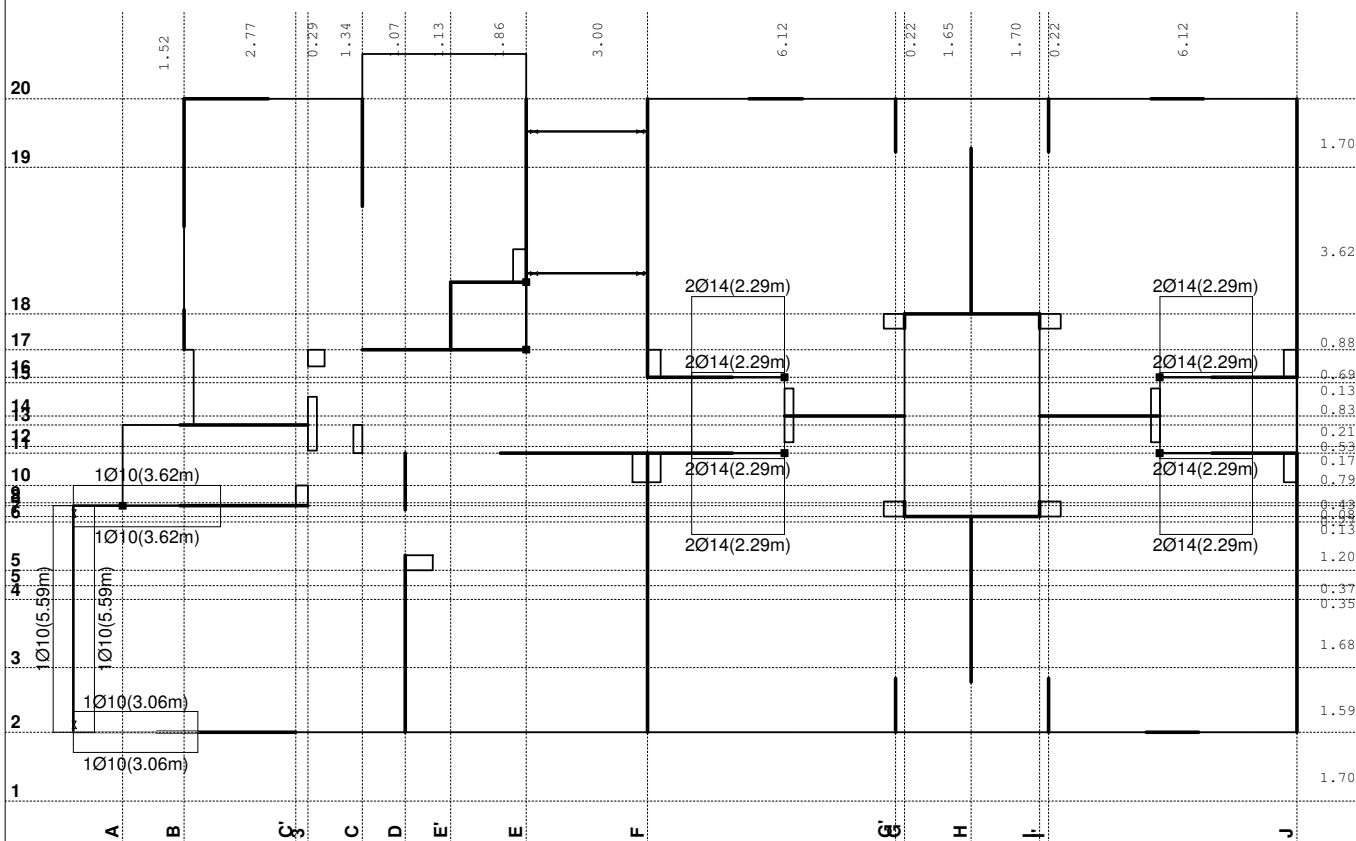
Aa - g.zona [cm ² /m]
-20.28
-10.14
0.00



Aa - g.zona



Usvojena armatura
PBAB 87, MB 30, MA 500/600

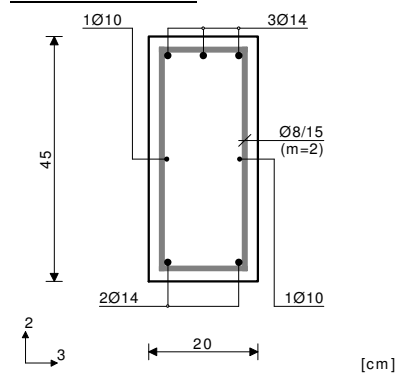


Armatura u gredama: Aa3/Aa4

Greda 511-1091

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

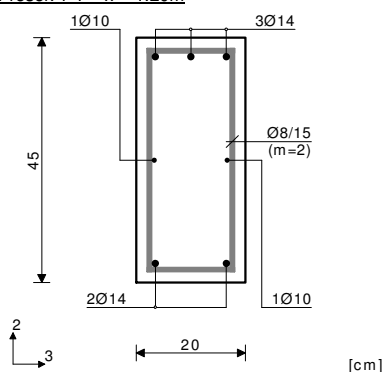
Presek 1-1 x = 1.20m



T2u = 48.17 kN
M1u = -0.02 kNm
M3u = -74.52 kNm

$\epsilon_b/\epsilon_a = -2.099/10.000 \%$
Aa1 = 0.00 cm²
Aa2 = 3.94 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]
 $\tau_y = 0.67 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.03%

Presek 1-1 x = 1.20m



T2u = -87.96 kN
M1u = 2.94 kNm
M3u = -67.09 kNm

$\epsilon_b/\epsilon_a = -1.932/10.000 \%$
Aa1 = 0.00 + 0.08' = 0.08 cm²
Aa2 = 3.53 + 0.08' = 3.61 cm²
Aa3 = 0.00 + 0.18' = 0.18 cm²
Aa4 = 0.00 + 0.18' = 0.18 cm²
Aa,uz = 2.44 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/15(m=2) = 3.35 cm²/m]

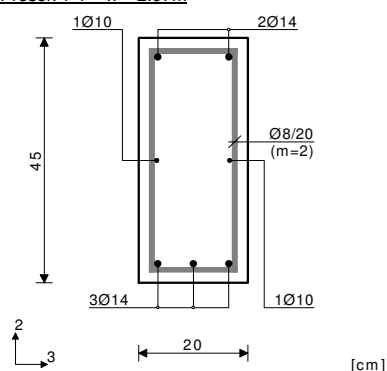
$\tau_y = 2.48 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 1.27 \text{ MPa} < 3\tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.03%
) - dodatna podužna armatura za prijem torzije.

Greda 511-2

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 2.97\text{m}$ 

$$\begin{aligned} T2_u &= -0.54 \text{ kN} \\ M1_u &= 3.57 \text{ kNm} \\ M3_u &= 73.09 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -2.067/10.000 \text{ ‰} \\ Aa1 &= 3.86 + 0.10' = 3.96 \text{ cm}^2 \\ Aa2 &= 0.00 + 0.10' = 0.10 \text{ cm}^2 \\ Aa3 &= 0.00 + 0.22' = 0.22 \text{ cm}^2 \\ Aa4 &= 0.00 + 0.22' = 0.22 \text{ cm}^2 \\ Aa_{uz} &= 0.28 \text{ cm}^2/\text{m} \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}] \end{aligned}$$

$$\tau_y = 1.56 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 1.55 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.03%

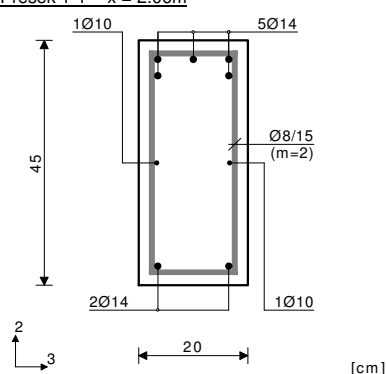
*) - dodatna podužna armatura za prijem torzije.

Greda 2-190

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 2.06\text{m}$ 

$$\begin{aligned} T2_u &= 77.48 \text{ kN} \\ M3_u &= -134.44 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -3.500/8.023 \text{ ‰} \\ Aa1 &= 0.00 \text{ cm}^2 \\ Aa2 &= 7.89 \text{ cm}^2 \\ Aa3 &= 0.00 \text{ cm}^2 \\ Aa4 &= 0.00 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/\text{m} \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \emptyset 8/15(m=2) = 3.35 \text{ cm}^2/\text{m}] \end{aligned}$$

$$\tau_y = 1.11 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$$

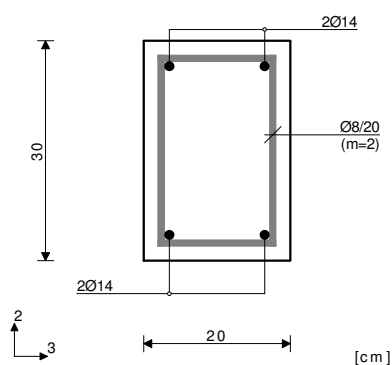
Procenat armiranja: 1.37%

Greda 5319-6517

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 1.21\text{m}$ 

$$\begin{aligned} T2_u &= 3.25 \text{ kN} \\ M3_u &= 23.87 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -1.642/10.000 \text{ ‰} \\ Aa1 &= 1.86 \text{ cm}^2 \\ Aa2 &= 0.00 \text{ cm}^2 \\ Aa3 &= 0.00 \text{ cm}^2 \\ Aa4 &= 0.00 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/\text{m} \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}] \end{aligned}$$

$$\tau_y = 0.07 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

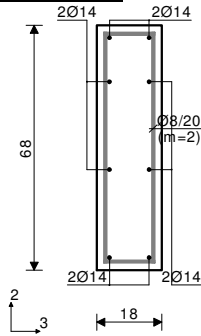
Procenat armiranja: 1.03%

Greda 5946-6825

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 1.42\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -4.41 \text{ kN} \\ M1u &= -1.42 \text{ kNm} \\ M3u &= 2.29 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.187/10.000 \text{ ‰}$$

$$Aa1 = 0.08 + 0.03' = 0.10 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.03' = 0.03 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.10' = 0.10 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.10' = 0.10 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \phi 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.58 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.53 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procentat armiranja: 1.01%

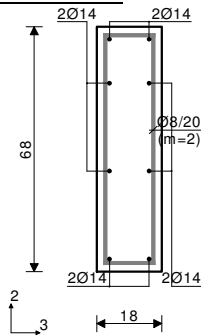
') - dodatna podužna armatura za prijem torzije.

Greda 5174-6110

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 1.42\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -3.62 \text{ kN} \\ M1u &= 1.22 \text{ kNm} \\ M3u &= 1.92 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.171/10.000 \text{ ‰}$$

$$Aa1 = 0.06 + 0.02' = 0.09 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.02' = 0.02 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.09' = 0.09 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.09' = 0.09 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \phi 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.49 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

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

Procentat armiranja: 1.01%

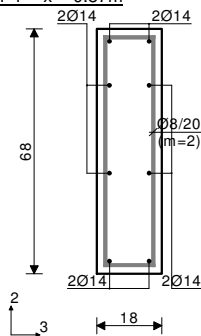
') - dodatna podužna armatura za prijem torzije.

Greda 9782-10310

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 0.87\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -1.00 \text{ kN} \\ M1u &= -1.01 \text{ kNm} \\ M3u &= 2.76 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.206/10.000 \text{ ‰}$$

$$Aa1 = 0.09 + 0.00' = 0.09 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.00' = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.07' = 0.07 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.07' = 0.07 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \phi 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.39 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.38 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procentat armiranja: 1.01%

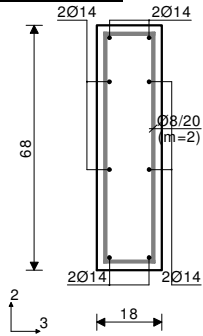
') - dodatna podužna armatura za prijem torzije.

Greda 9243-9895

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 0.87\text{m}$ 

[cm]

$$\begin{aligned} T2_u &= -0.81 \text{ kN} \\ M1_u &= 1.21 \text{ kNm} \\ M3_u &= 2.88 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.211/10.000 \text{ ‰}$$

$$Aa1 = 0.09 + 0.02' = 0.12 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.02' = 0.02 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.09' = 0.09 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.09' = 0.09 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

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

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

Procent armiranja: 1.01%

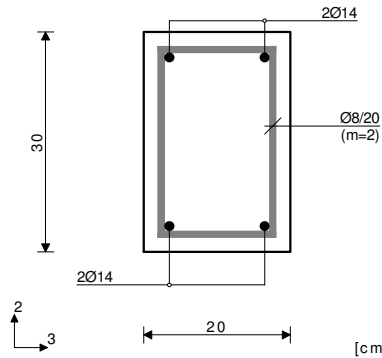
') - dodatna podužna armatura za prijem torzije.

Greda 9979-10649

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 1.63\text{m}$ 

[cm]

$$\begin{aligned} T2_u &= -0.70 \text{ kN} \\ M3_u &= -2.15 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.404/10.000 \text{ ‰}$$

$$Aa1 = 0.00 \text{ cm}^2$$

$$Aa2 = 0.16 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

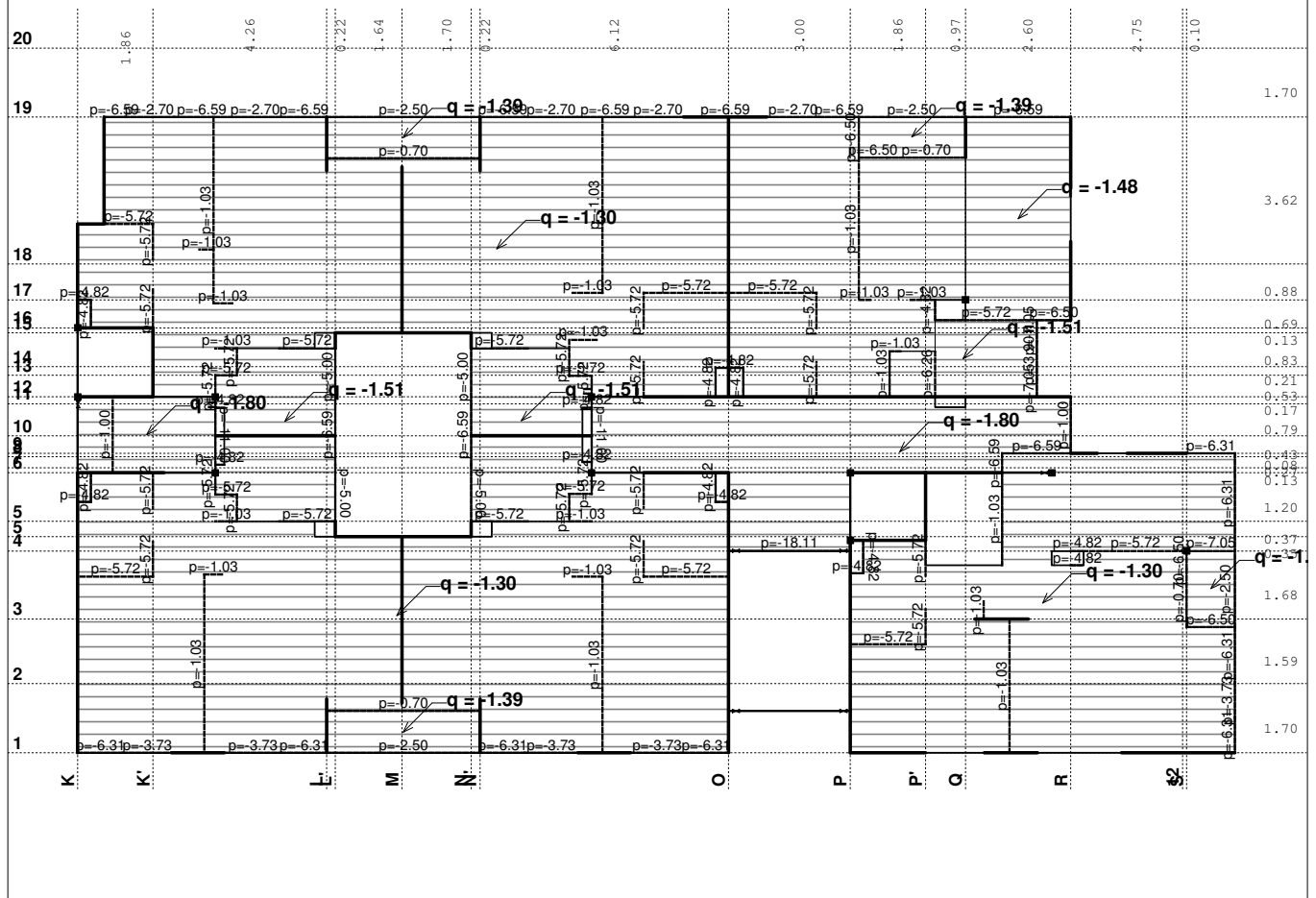
$$\tau_y = 0.01 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procent armiranja: 1.03%

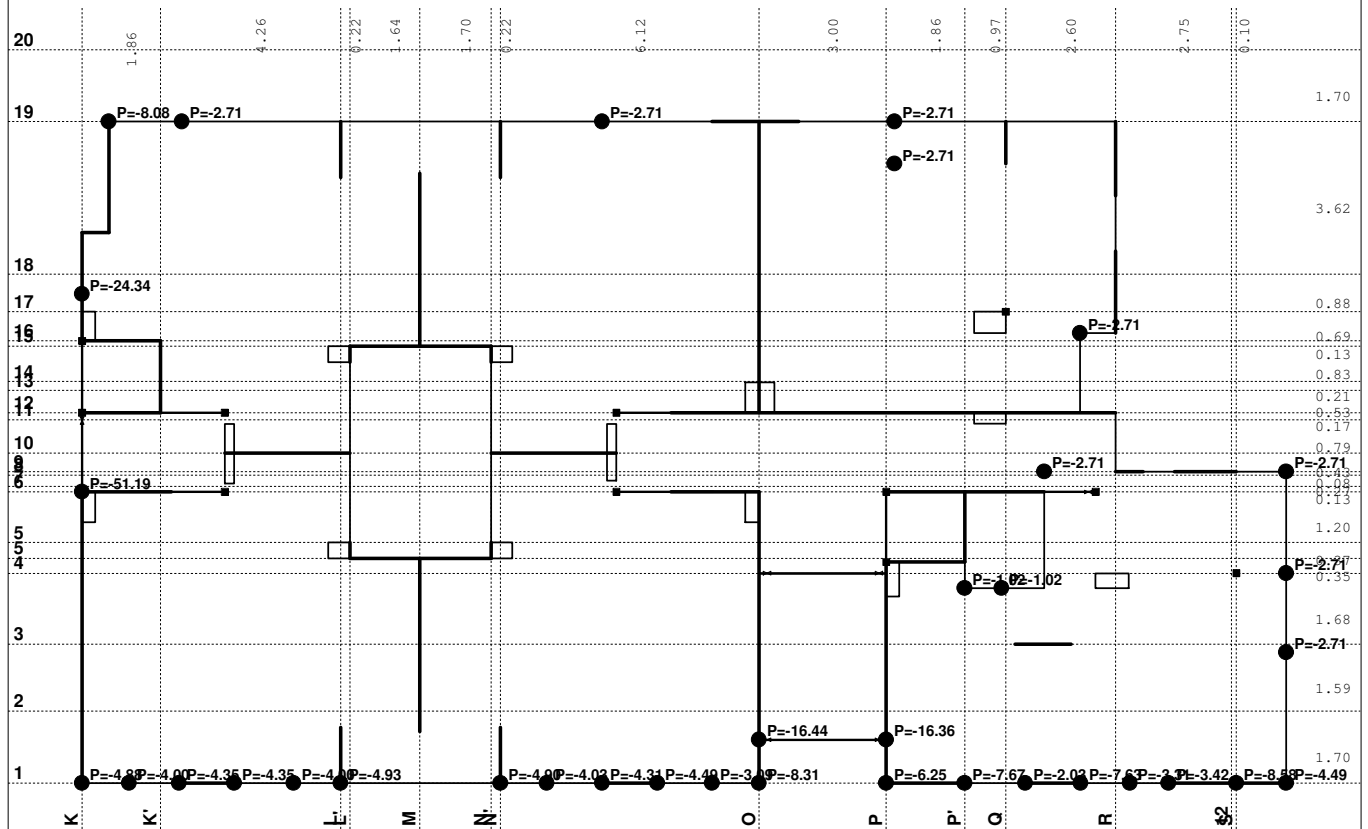
Ulazni podaci - Konstrukcija, Ulazni podaci - Opterećenje

POS 600+ - KONSTRUKCIJA IZNAD V SPRATA

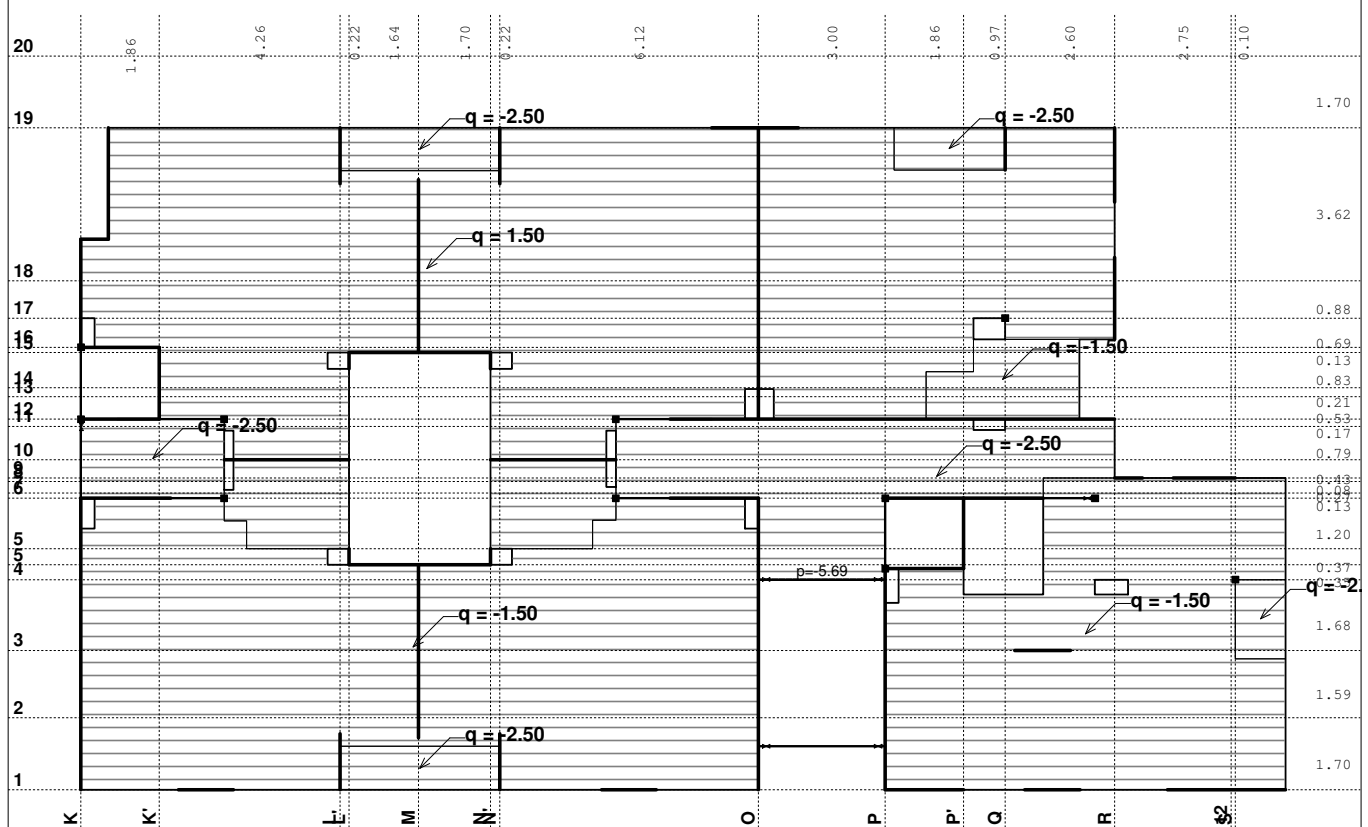
Opt. 1: g (g)



Opt. 1: g (g)

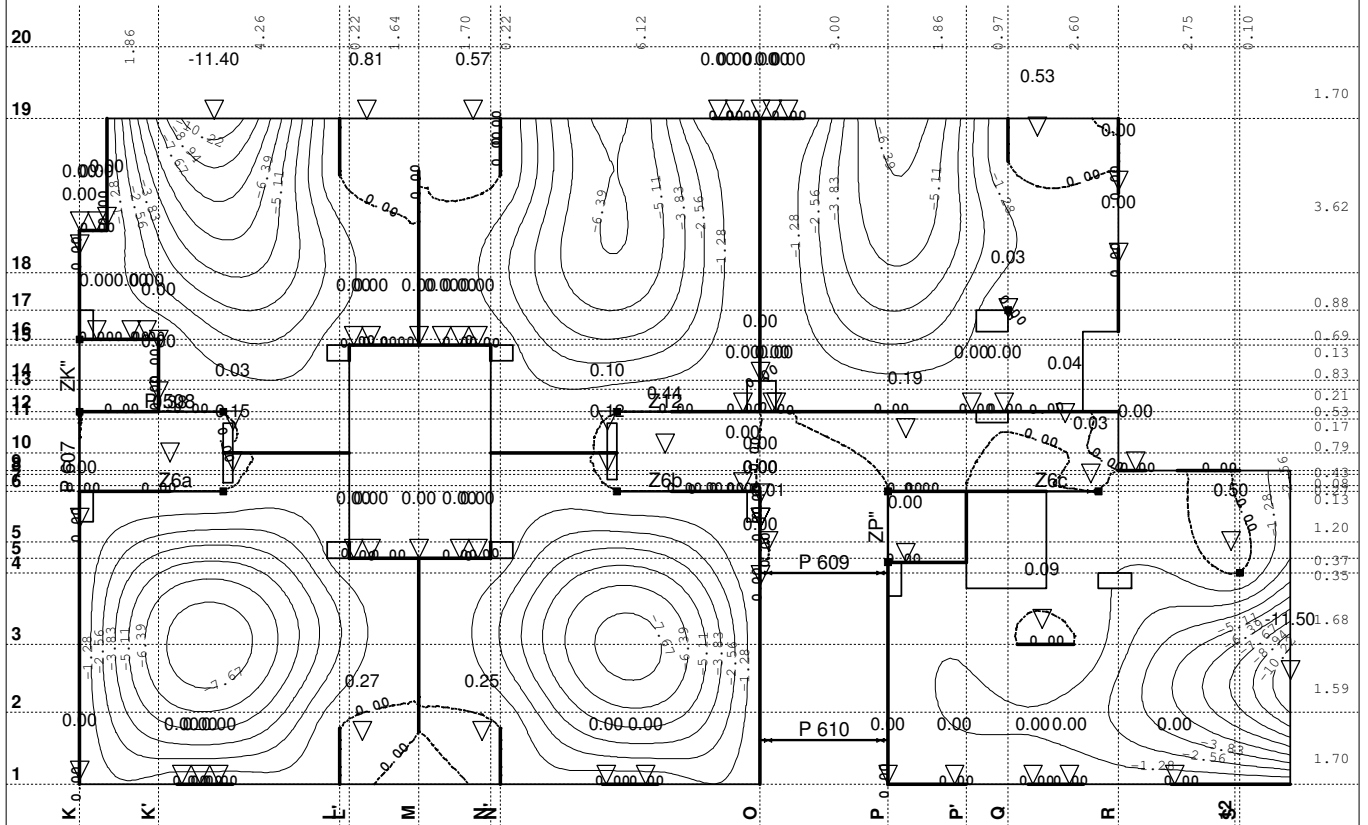


Opt. 2: p



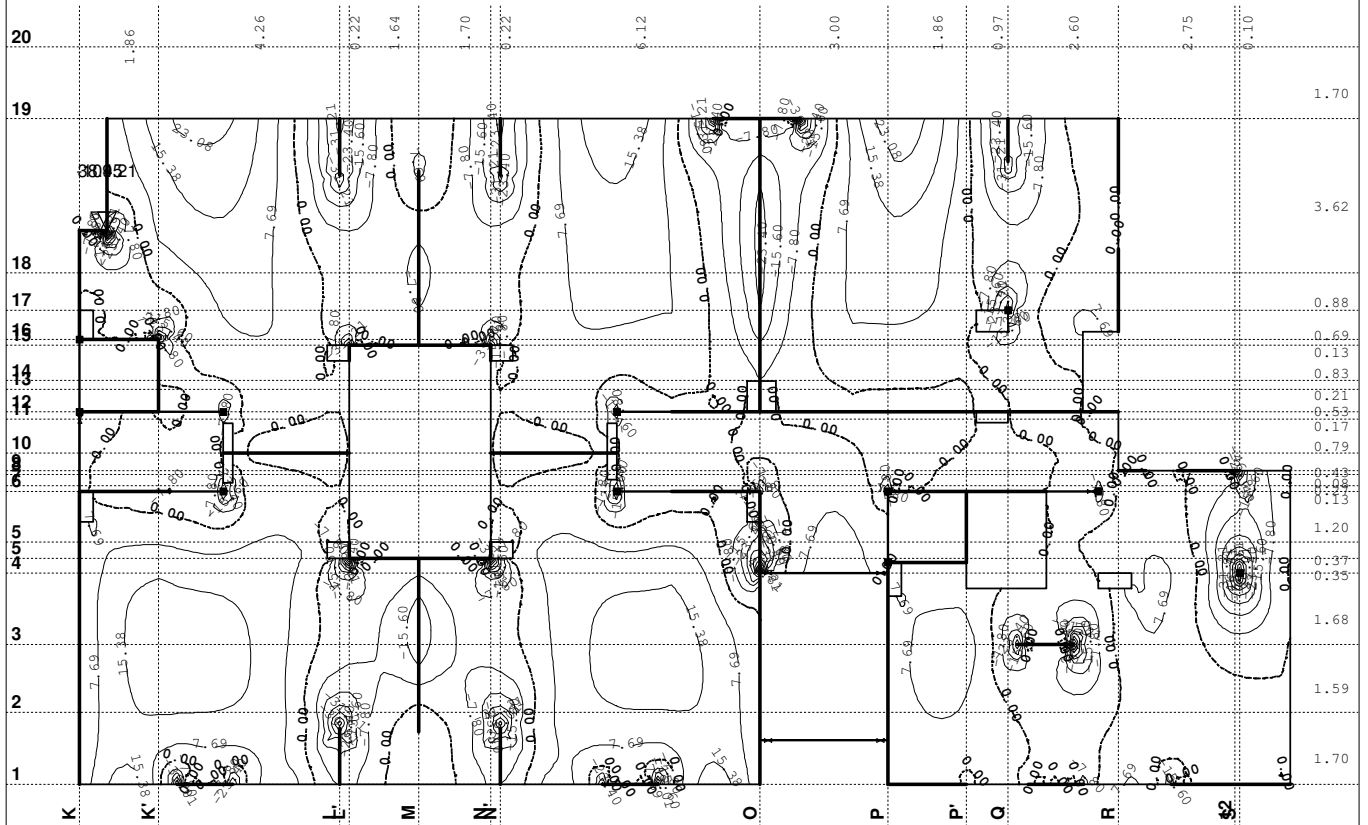
Statički proračun

Opt. 4: 3.5xl+II



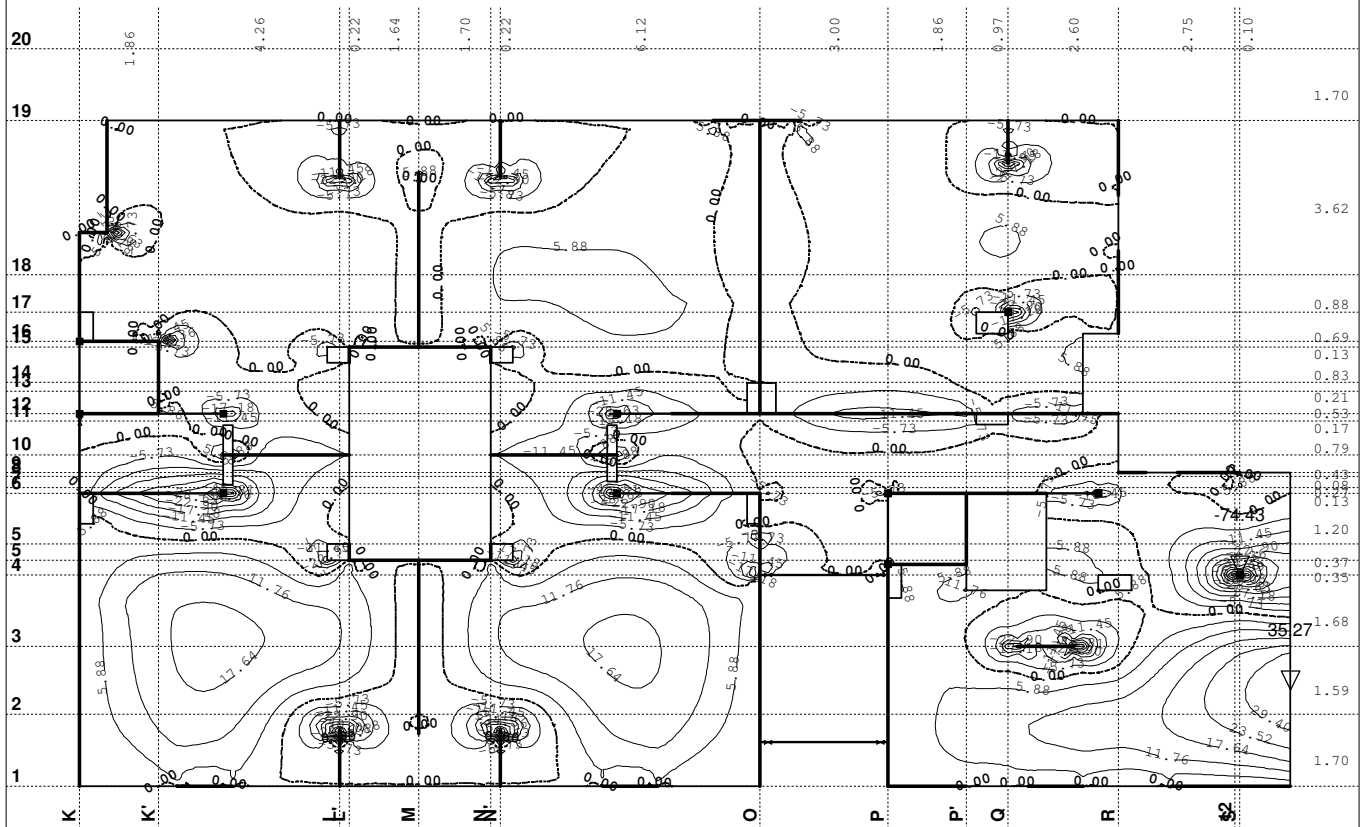
Uticaji u ploči: max Zp= 0.81 / min Zp= -11.50 m / 1000

Opt. 3: 1.6xl+1.8xl

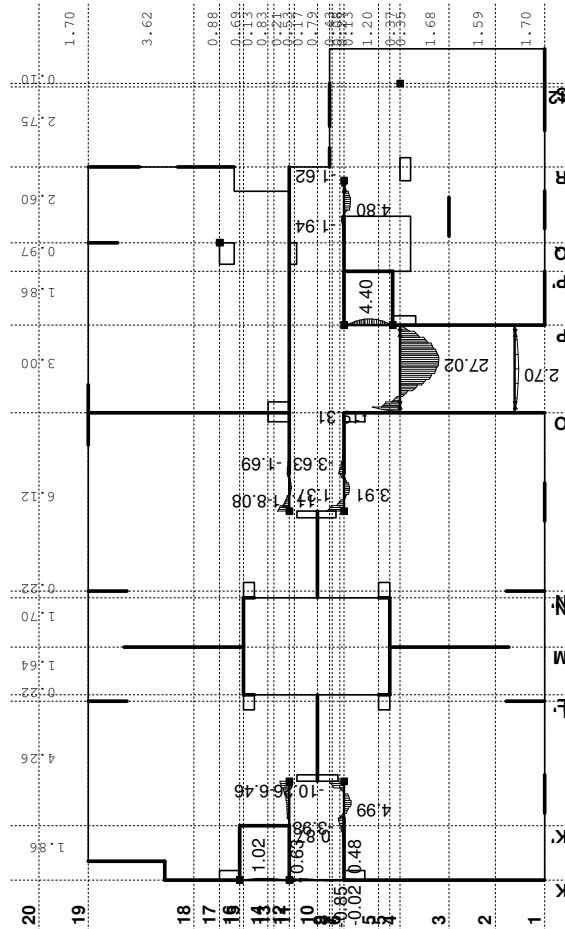


Uticaji u ploči: max Mx= 38.45 / min Mx= -109.21 kNm/m

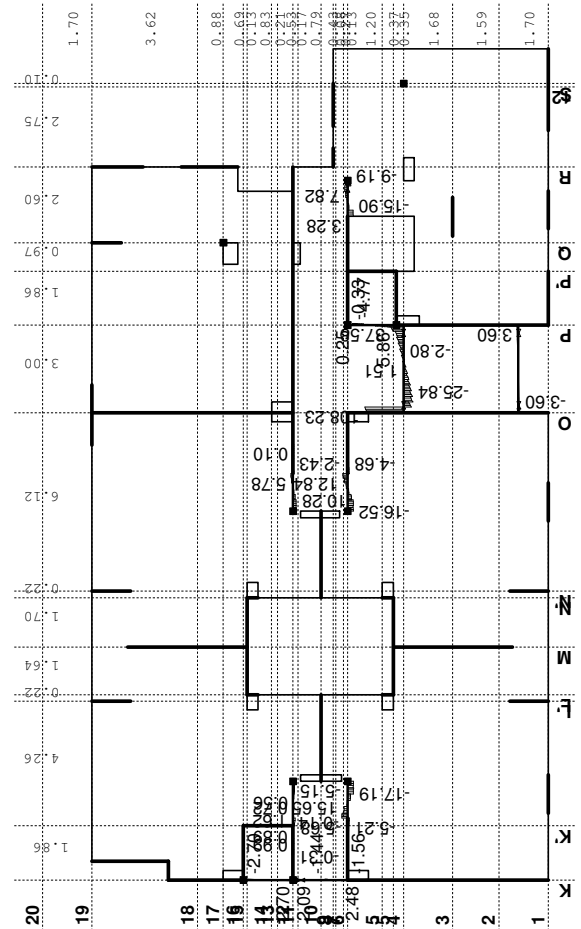
Opt. 3: 1.6xl+1.8xII

Uticaji u ploči: max $M_y = 35.27$ / min $M_y = -74.43$ kNm/m

Opt. 3: 1.6xl+1.8xII

Uticaji u gredi: max $M_3 = 27.02$ / min $M_3 = -19.31$ kNm

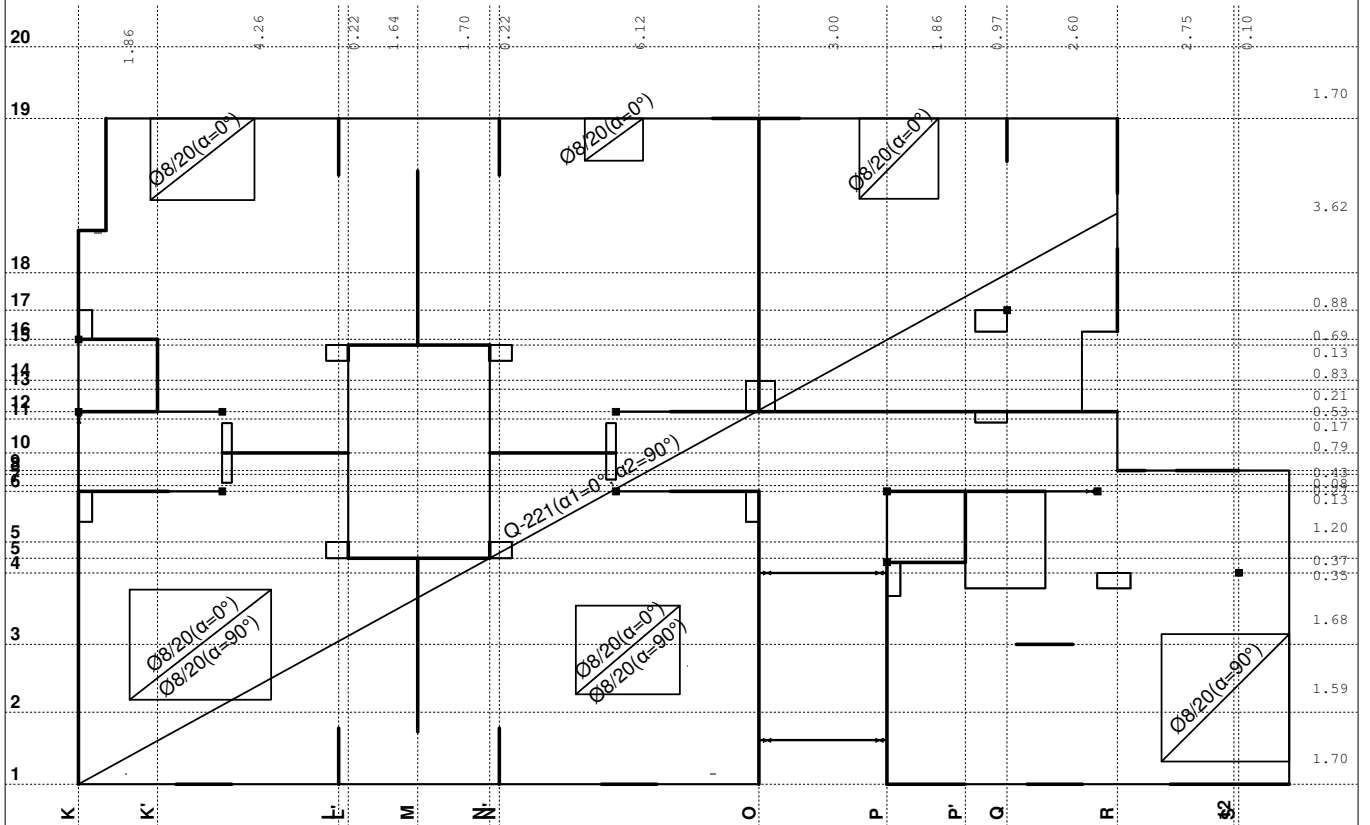
Opt. 3: 1.6xl+1.8xII

Uticaji u gredi: max $T_2 = 108.23$ / min $T_2 = -25.84$ kNm

Dimenzionisanje (beton)

Usvojena armatura
PBAB 87, MB 30, MA 500/560, a=2.00 cm

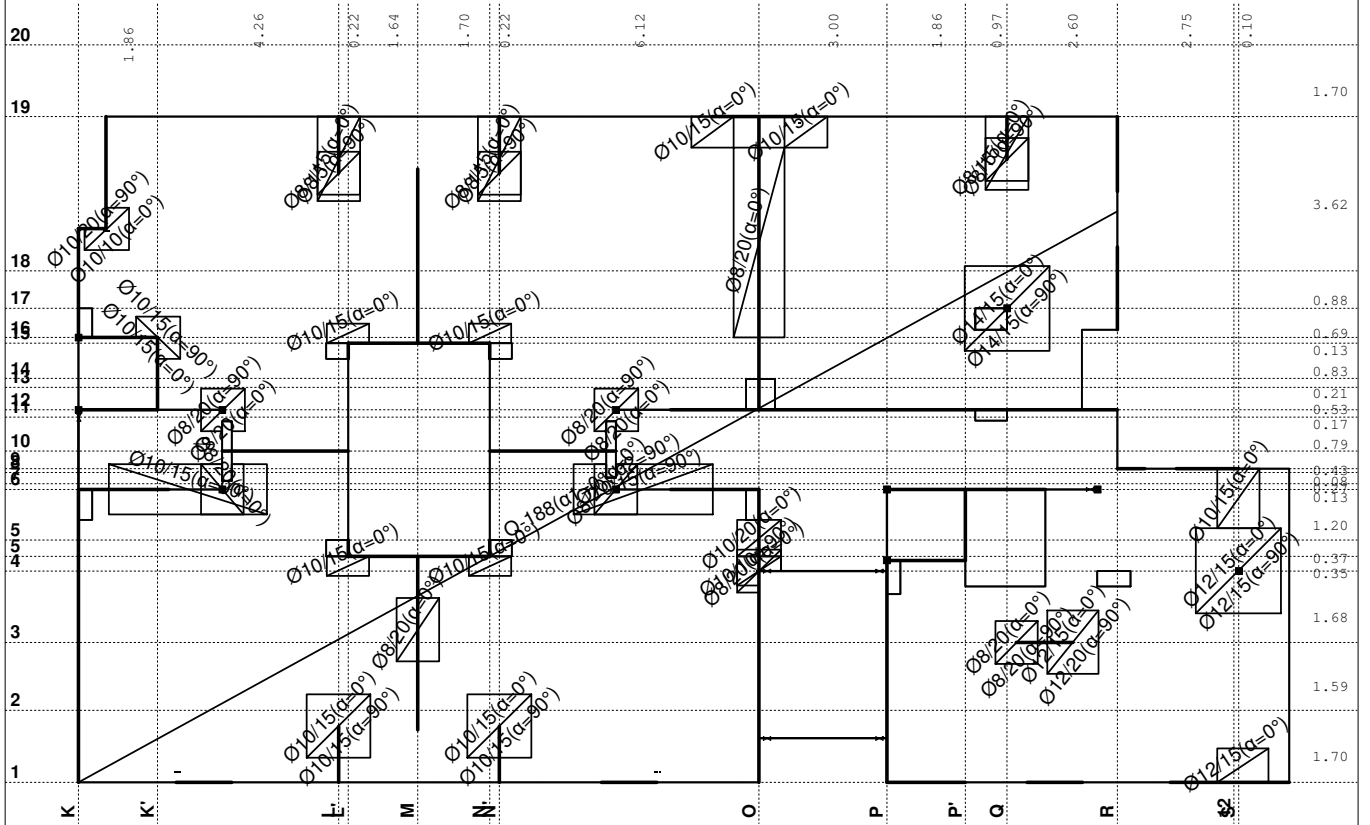
Aa - d.zona [cm ² /m]
0.00
2.53
5.06



Aa - d.zona

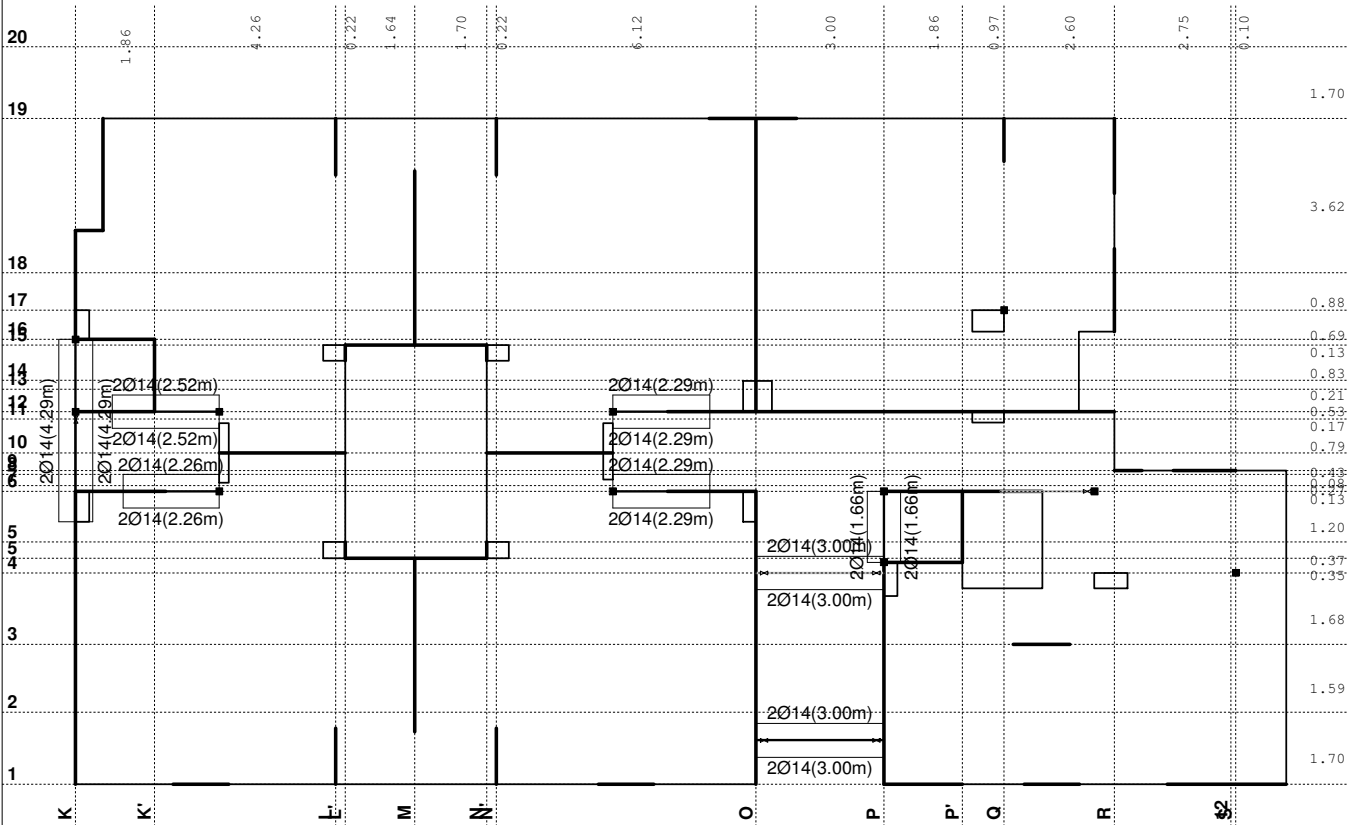
Usvojena armatura
PBAB 87, MB 30, MA 500/560, a=2.00 cm

Aa - g.zona [cm ² /m]
-15.54
-7.77
0.00

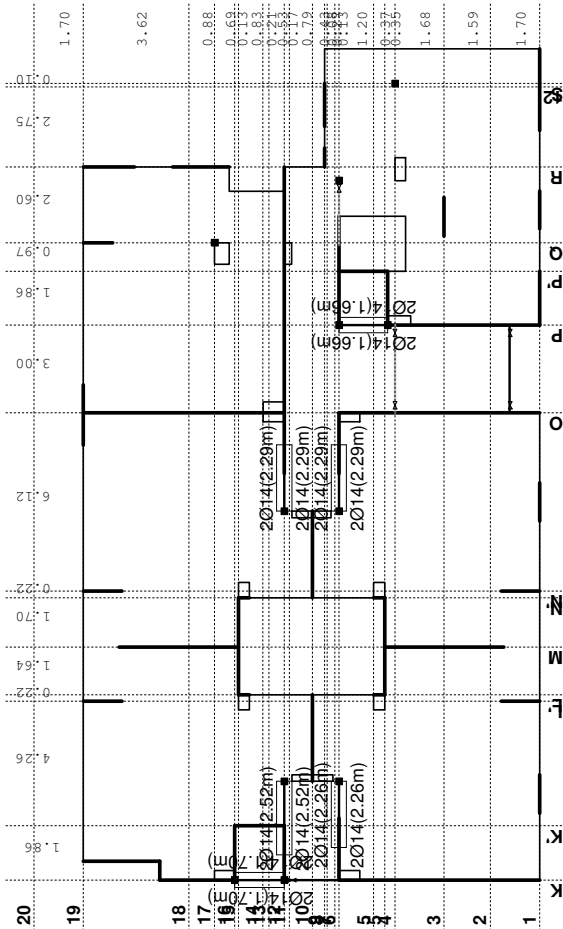


Aa - g.zona

Usvojena armatura
PBAB 87, MB 30, MA 500/560

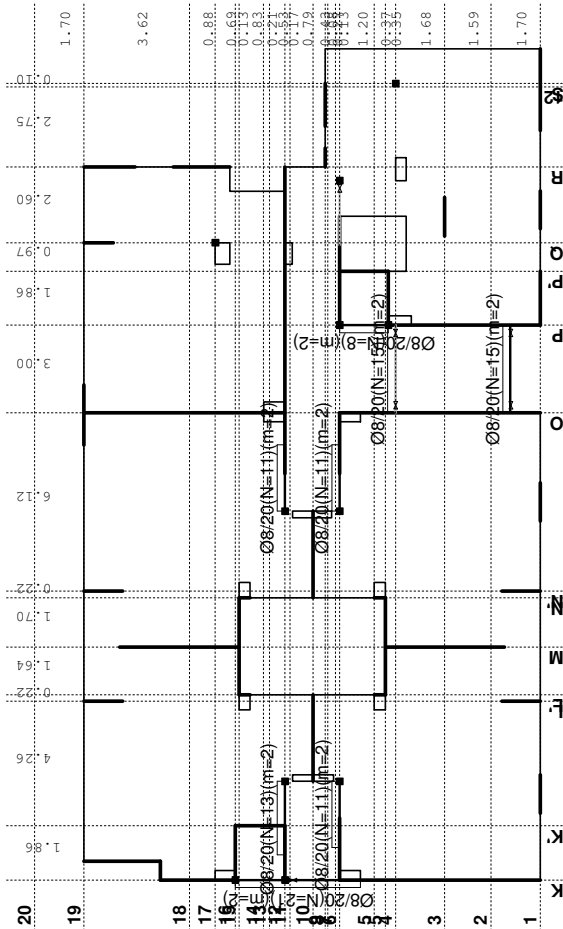


Armatura u gredama: Aa2/Aa1
Usvojena armatura
PBAB 87, MB 30, MA 500/560



Armatura u gredama: Aa3/Aa4

Usvojena armatura
PBAB 87, MB 30, MA 500/560



Armatura u gredama: Aa,uz

Z6c (7908-8762)

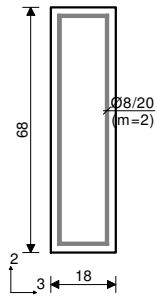
PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.43m



[cm]

T2u = 0.74 kN
M1u = 0.96 kNm
M3u = 4.80 kNm

 $\epsilon_b/\epsilon_a = -0.275/10.000 \text{ ‰}$ Aa1 = 0.16 + 0.00' = 0.16 cm²Aa2 = 0.00 + 0.00' = 0.00 cm²Aa3 = 0.00 + 0.07' = 0.07 cm²Aa4 = 0.00 + 0.07' = 0.07 cm²Aa,uz = 0.00 cm²/m (m=2)[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m] $\tau_y = 0.37 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$ $\tau_z = 0.36 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$

') - dodatna podužna armatura za prijem torzije.

Z12 (5016-5942)

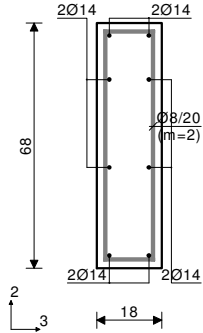
PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 2-2 x = 0.78m



[cm]

T2u = 0.52 kN
M1u = 0.35 kNm
M3u = 1.37 kNm

 $\epsilon_b/\epsilon_a = -0.144/10.000 \text{ ‰}$ Aa1 = 0.05 cm²Aa2 = 0.00 cm²Aa3 = 0.00 cm²Aa4 = 0.00 cm²Aa,uz = 0.00 cm²/m (m=2)[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m] $\tau_y = 0.14 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$ $\tau_z = 0.13 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$

Procenat armiranja: 1.01%

Z6b (4336-5173)

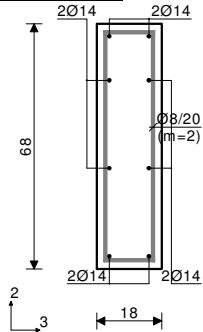
PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 3-3 x = 0.78m



[cm]

T2u = 2.99 kN
M1u = -1.03 kNm
M3u = 3.90 kNm

 $\epsilon_b/\epsilon_a = -0.247/10.000 \text{ ‰}$ Aa1 = 0.13 + 0.00' = 0.13 cm²Aa2 = 0.00 + 0.00' = 0.00 cm²Aa3 = 0.00 + 0.07' = 0.07 cm²Aa4 = 0.00 + 0.07' = 0.07 cm²Aa,uz = 0.00 cm²/m (m=2)[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m] $\tau_y = 0.42 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$ $\tau_z = 0.39 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$

Procenat armiranja: 1.01%

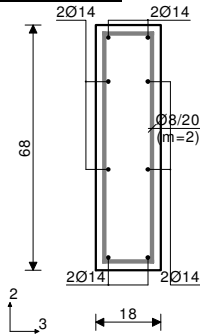
') - dodatna podužna armatura za prijem torzije.

P 508 (1954-1277)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 4-4 $x = 1.52\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -4.38 \text{ kN} \\ M1u &= -2.43 \text{ kNm} \\ M3u &= 0.31 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.068/10.000 \text{ ‰}$$

$$Aa1 = 0.00 + 0.04' = 0.04 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.04' = 0.04 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.17' = 0.17 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.17' = 0.17 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \phi 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.95 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.91 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procent armiranja: 1.01%

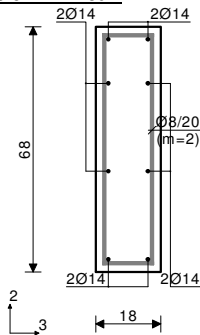
') - dodatna podužna armatura za prijem torzije.

Z6a (1434-925)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 5-5 $x = 1.89\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -1.62 \text{ kN} \\ M1u &= 3.12 \text{ kNm} \\ M3u &= -0.68 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.101/10.000 \text{ ‰}$$

$$Aa1 = 0.00 + 0.06' = 0.06 \text{ cm}^2$$

$$Aa2 = 0.02 + 0.06' = 0.08 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.22' = 0.22 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.22' = 0.22 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \phi 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 1.19 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 1.17 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$$

Procent armiranja: 1.01%

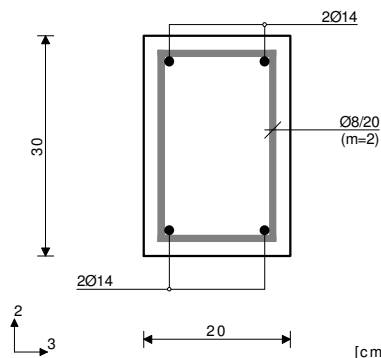
') - dodatna podužna armatura za prijem torzije.

P 609 (4865-6065)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 6-6 $x = 1.76\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -2.80 \text{ kN} \\ M3u &= 26.93 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -1.790/10.000 \text{ ‰}$$

$$Aa1 = 2.11 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \phi 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

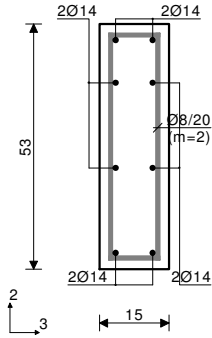
$$\tau_y = 0.06 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procent armiranja: 1.03%

ZP" (6856-6166)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 7-7 $x = 0.96m$



[cm]

$$T2u = -0.28 \text{ kN}$$

$$M3u = 4.40 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.376/10.000 \text{ ‰}$$

$$Aa1 = 0.19 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

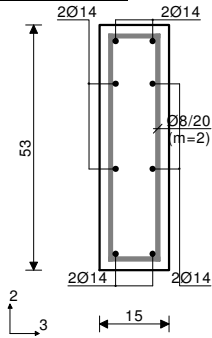
[Usvojeno $Aa,uz = \phi 8/20(m=2) = 2.51 \text{ cm}^2/m$]

Procenat armiranja: 1.55%

ZK" (1476-1087)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 8-8 $x = 0.85m$



[cm]

$$M3u = 1.02 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.176/10.000 \text{ ‰}$$

$$Aa1 = 0.04 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

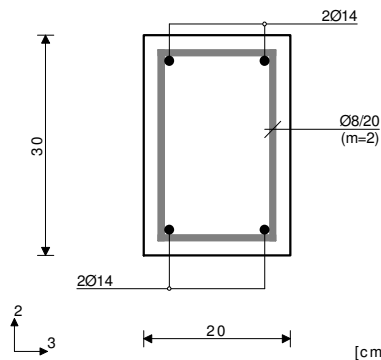
[Usvojeno $Aa,uz = \phi 8/20(m=2) = 2.51 \text{ cm}^2/m$]

Procenat armiranja: 1.55%

P 607 (587-1087)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 9-9 $x = 1.20m$



[cm]

$$T2u = 1.14 \text{ kN}$$

$$M3u = -0.85 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.248/10.000 \text{ ‰}$$

$$Aa1 = 0.00 \text{ cm}^2$$

$$Aa2 = 0.06 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \phi 8/20(m=2) = 2.51 \text{ cm}^2/m$]

$$\tau_y = 0.02 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.03%

P 610 (3512-4526)

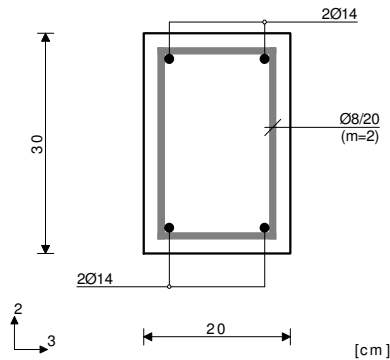
PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 10-10 x = 1.00m



$$T2u = -1.20 \text{ kN}$$

$$M3u = 2.40 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.428/10.000 \text{ ‰}$$

$$Aa1 = 0.18 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

$$[\text{Usvojeno } Aa,uz = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}]$$

$$\tau_y = 0.02 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

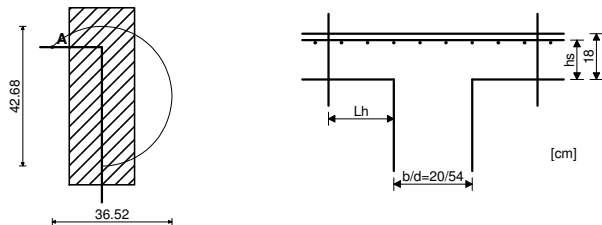
$$\text{Procenat armiranja: } 1.03\%$$

Kontrola ploča na probijanje

Nivo: POS 600+ [0.00 m]

Presek 1 (190.60,-108.22,0.00)

MB 30



KONTROLA KRITIČNOG PRESEKA 1. ($L_h = 0.07\text{m}$ od ivice stuba)
(stub zamenjujućeg kružnog preseka, $d_s = 0.28\text{m}$)

Merodavna kombinacija: I+II

Sila u stubu

Faktor povećanja napona zbog ekscentričnosti

Merodavni smičući napon (tačka A)

Debljina ploče

Statička visina ploče

$$N = 76.028 \text{ kN}$$

$$\beta = 1.400$$

$$\tau = 0.845 \text{ MPa}$$

$$d,pl = 0.180 \text{ m}$$

$$h_s = 0.150 \text{ m}$$

Obim kritičnog preseka

$$Okp = 0.839 \text{ m}$$

Postojeća armatura u ploči

Površina armature - pravac 1

Procenat armiranja - pravac 1

Površina armature - pravac 2

Procenat armiranja - pravac 2

Srednja vrednost procenta armiranja

Koeficijent

Koeficijent

Koeficijent

Dopušteni glavni napon zatezanja

Dopušteni glavni napon zatezanja

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

$$Aa,1 = 12.147 \text{ cm}^2$$

$$\mu,1 = 0.810 \%$$

$$Aa,2 = 12.147 \text{ cm}^2$$

$$\mu,2 = 0.810 \%$$

$$\mu = 0.810 \%$$

$$\alpha_a = 1.400$$

$$\gamma_1 = 1.638$$

$$\gamma_2 = 0.567$$

$$\tau_a = 0.800$$

$$\tau_b = 2.200$$

$$\tau_{\text{max}} = 1.247 \text{ MPa}$$

$$\text{Uslov: } \tau \leq \tau_{\text{max}} (0.85 \leq 1.25)$$

Uslov je ispunjen.

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

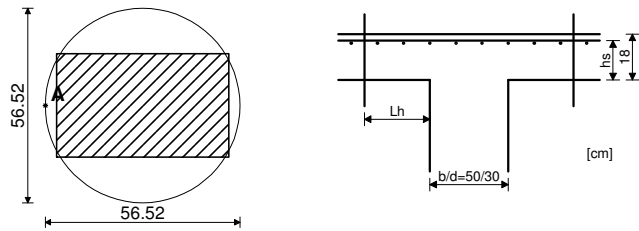
$$\tau_{\text{gr}} = 0.874 \text{ MPa}$$

$$\text{Uslov: } \tau \leq \tau_{\text{gr}} (0.85 \leq 0.87)$$

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

Kontrola ploča na probijanje

Nivo: POS 600+ [0.00 m]
 Presek 2 (196.05,-114.40,0.00)
 MB 30



KONTROLA KRITIČNOG PRESEKA 1. ($L_h = 0.07\text{m}$ od ivice stuba)
 (stub zamenjujućeg kružnog preseka, $d_s = 0.42\text{m}$)

Merodavna kombinacija: I+II	
Sila u stubu	$N = 177.67\text{ kN}$
Merodavni smičući napon (tačka A)	$\tau = 0.667\text{ MPa}$
Debljina ploče	$d_{pl} = 0.180\text{ m}$
Statička visina ploče	$h_s = 0.150\text{ m}$
Obim kritičnog preseka	$Okp = 1.776\text{ m}$
Postojeća armatura u ploči	
Površina armature - pravac 1	$A_{a,1} = 9.425\text{ cm}^2$
Procenat armiranja - pravac 1	$\mu_1 = 0.628\%$
Površina armature - pravac 2	$A_{a,2} = 9.425\text{ cm}^2$
Procenat armiranja - pravac 2	$\mu_2 = 0.628\%$
Srednja vrednost procenta armiranja	$\mu = 0.628\%$
Koeficijent	$\alpha_a = 1.400$
Koeficijent	$\gamma_1 = 1.443$
Koeficijent	$\gamma_2 = 0.499$
Dopušteni glavni napon zatezanja	$\tau_a = 0.800$
Dopušteni glavni napon zatezanja	$\tau_b = 2.200$
Maksimalna otpornost ($\gamma_2 \times \tau_b$)	$\tau_{max} = 1.099\text{ MPa}$

Uslov: $\tau \leq \tau_{max}$ ($0.67 \leq 1.10$)

Uslov je ispunjen.

Otpornost na probijanje ploče bez dodatne armature za
 obezbeđenje ($2/3 \times \gamma_1 \times \tau_a$) $\tau_{gr} = 0.769\text{ MPa}$

Uslov: $\tau \leq \tau_{gr}$ ($0.67 \leq 0.77$)

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

P 700+

P 600+

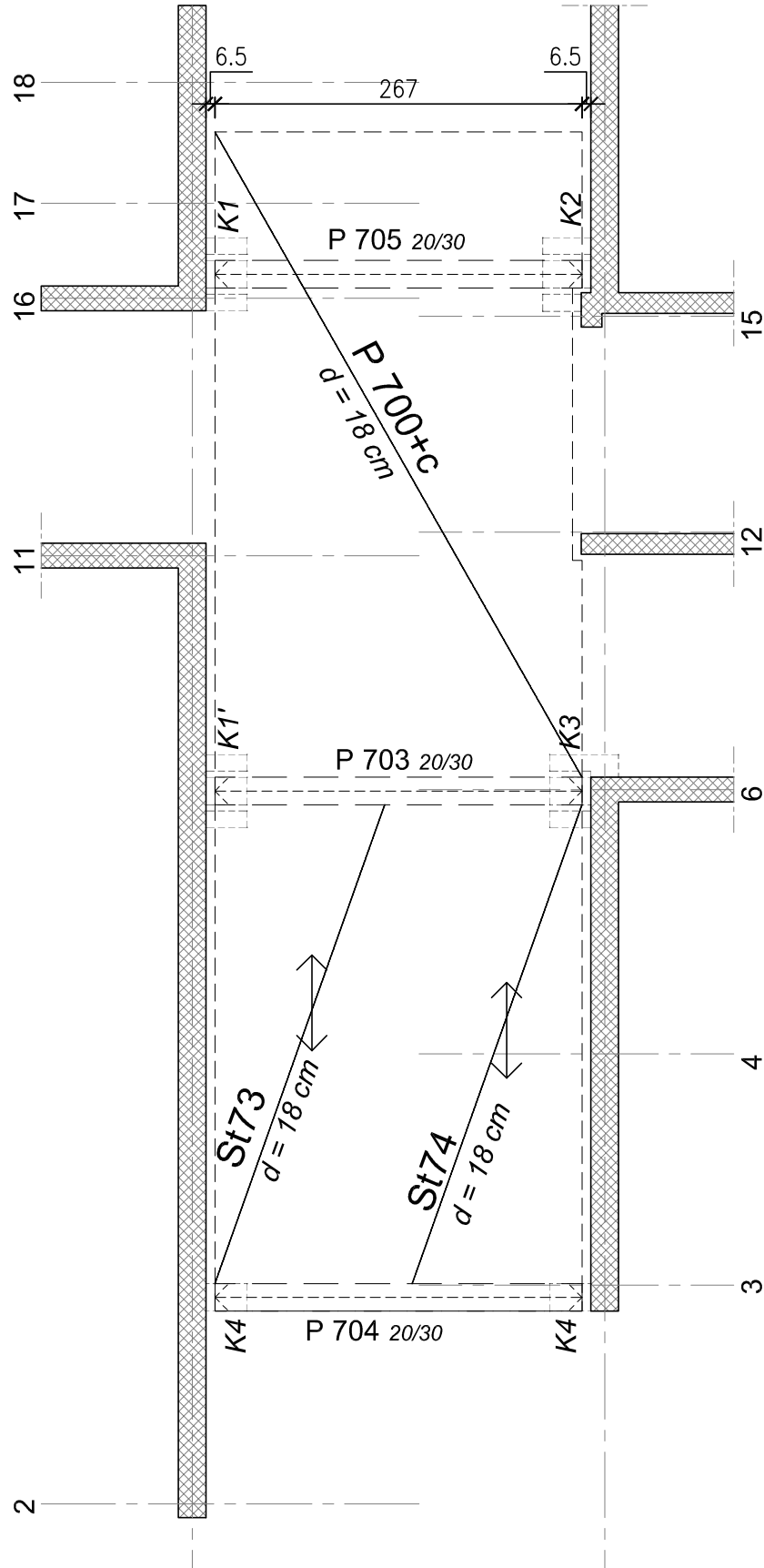
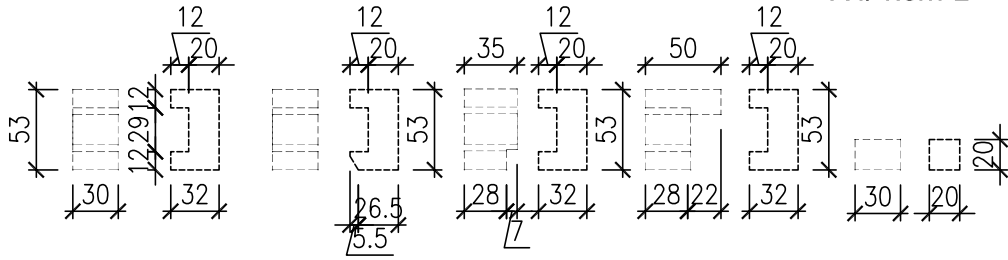
K1/ kom 1

K1'/ kom 1

K2/ kom 1

K3/ kom 1

K4/ kom 2



Analiza opterećenja**Proračun***- Krak 1*

HOP 100x60x4 klasa pp 1

$$\begin{aligned} \text{hor. obl.} &= 0.1 \text{ kN/m'} \\ \text{ver. obl.} &= 0.1 \text{ kN/m'} \\ \text{st. držač} &= 0.1 \text{ kN/m'} \\ \text{ograda} &= \underline{0.50 \text{ kN/m'}} \\ &\mathbf{g = 0.69 \text{ kN/m'}} \end{aligned}$$

$$\text{korisno} \quad \mathbf{p = 1.20 \text{ kN/m'}}$$

- Podest

$$\begin{aligned} &= 0.10 \text{ kN/m'} \\ \text{hor. obl.} &= \underline{0.1 \text{ kN/m'}} \\ &\mathbf{g = 0.18 \text{ kN/m'}} \end{aligned}$$

$$\text{korisno} \quad \mathbf{p = 1.20 \text{ kN/m'}}$$

$$\begin{aligned} W_{pl} &= 37.9 \text{ mm}^3 \times 10^3 \\ f_v &= 235 \text{ N/mm}^2 \\ \varepsilon &= 1.00 \\ \gamma_{m0} &= 1 \end{aligned}$$

$$\begin{aligned} A_v &= 734.36 \text{ mm}^2 \\ h_w/t_w &= 22 \leq 72.00 \end{aligned}$$

$$\begin{aligned} M_a &= 0.50 \text{ kNm} \\ M_d &= 0.83 \text{ kNm} \\ M_{ed} &= 1.92 \text{ kNm} \end{aligned}$$

$$\begin{aligned} V_a &= 0.74 \text{ kN} \\ V_p &= 1.49 \text{ kN} \\ V_{ed} &= 3.23 \text{ kN} \end{aligned}$$

$$\begin{aligned} w_a &= 1.24 \text{ mm} \\ w_d &= 2.04 \text{ mm} \\ w_{tot} &= 3.28 \text{ mm} \end{aligned}$$

$$\begin{aligned} l &= 2.52 \text{ m} \\ M_{c,Rd} &= 8.92 \text{ kNm} \\ V_{pl,Rd} &= 99.64 \text{ kN} \\ M_{ed}/M_{c,Rd} &= 0.22 \leq 1 \\ V_{ed}/V_{c,Rd} &= 0.0325 \leq 1 \\ w_{tot} \leq l/m & 2.92 \leq 8.4 \quad m = 300 \end{aligned}$$

- Krak 2

HOP 100x60x4 klasa pp 1

$$\begin{aligned} \text{hor. obl.} &= 0.1 \text{ kN/m'} \\ \text{vert. obl.} &= 0.1 \text{ kN/m'} \\ \text{st. držač} &= 0.1 \text{ kN/m'} \\ \text{ograda} &= \underline{0.50 \text{ kN/m'}} \\ &\mathbf{g = 0.69 \text{ kN/m'}} \end{aligned}$$

$$\text{korisno} \quad \mathbf{p = 1.20 \text{ kN/m'}}$$

- Podest

$$\begin{aligned} \text{ograda} &= 0.50 \text{ kN/m'} \\ &= 0.10 \text{ kN/m'} \\ \text{hor. obl.} &= \underline{0.1 \text{ kN/m'}} \\ &\mathbf{g = 0.68 \text{ kN/m'}} \end{aligned}$$

$$\text{korisno} \quad \mathbf{p = 1.20 \text{ kN/m'}}$$

$$\begin{aligned} W_{pl} &= 37.9 \text{ mm}^3 \times 10^3 \\ f_v &= 235 \text{ N/mm}^2 \\ \varepsilon &= 1.00 \\ \gamma_{m0} &= 1 \end{aligned}$$

$$\begin{aligned} A_v &= 734.36 \text{ mm}^2 \\ h_w/t_w &= 22 \leq 72.00 \end{aligned}$$

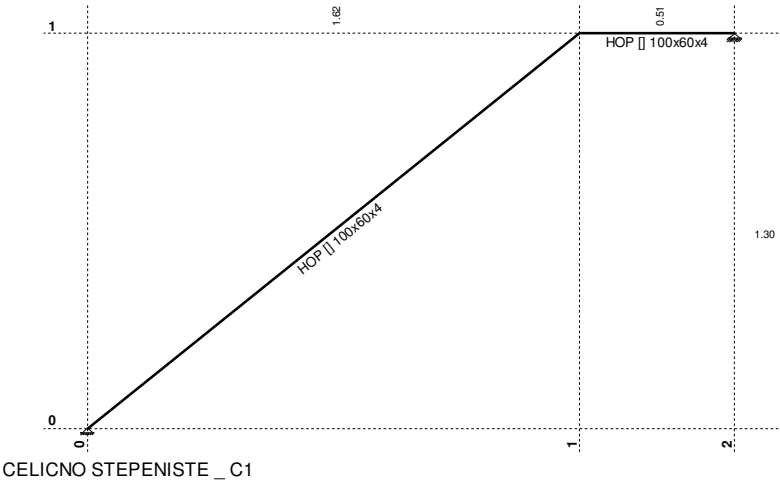
$$\begin{aligned} M_a &= 0.61 \text{ kNm} \\ M_d &= 0.93 \text{ kNm} \\ M_{ed} &= 2.22 \text{ kNm} \end{aligned}$$

$$\begin{aligned} V_a &= 0.98 \text{ kN} \\ V_p &= 1.51 \text{ kN} \\ V_{ed} &= 3.588 \text{ kN} \end{aligned}$$

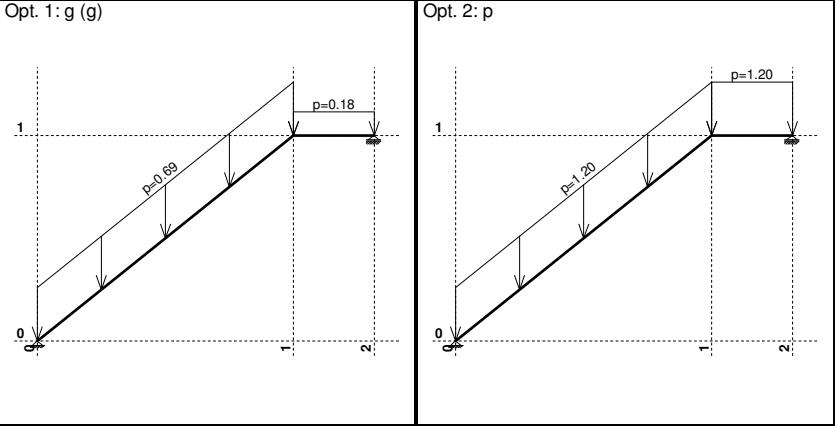
$$\begin{aligned} w_a &= 1.14 \text{ mm} \\ w_d &= 1.75 \text{ mm} \\ w_{tot} &= 2.89 \text{ mm} \end{aligned}$$

$$\begin{aligned} l &= 2.52 \text{ m} \\ M_{c,Rd} &= 8.92 \text{ kNm} \\ V_{pl,Rd} &= 99.636 \text{ kN} \\ M_{ed}/M_{c,Rd} &= 0.25 \leq 1 \\ V_{ed}/V_{c,Rd} &= 0.036 \leq 1 \\ w_{tot} \leq l/m & 2.89 \leq 8.4 \quad m = 300 \end{aligned}$$

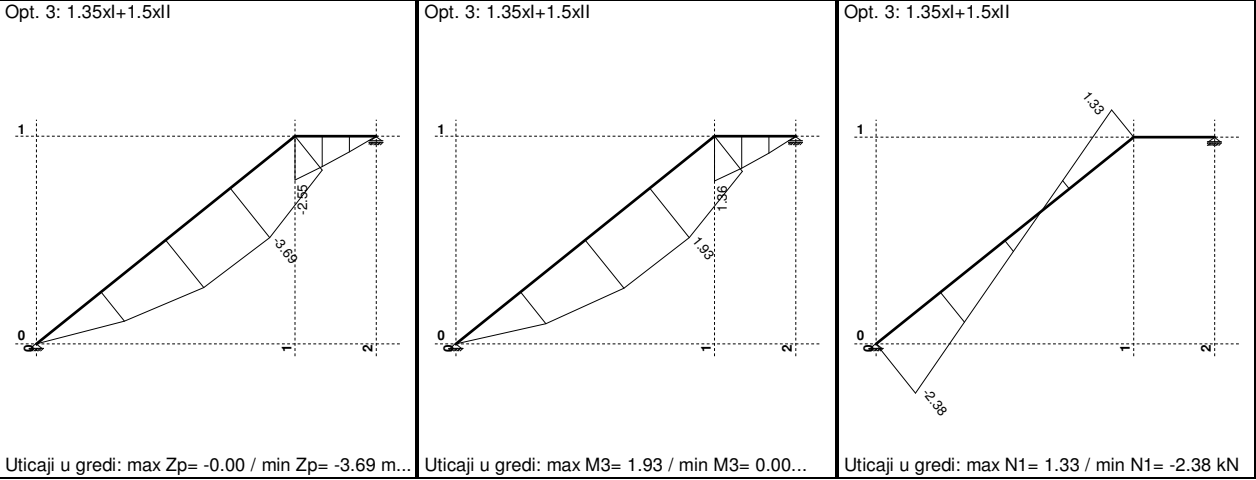
Ulazni podaci - Konstrukcija

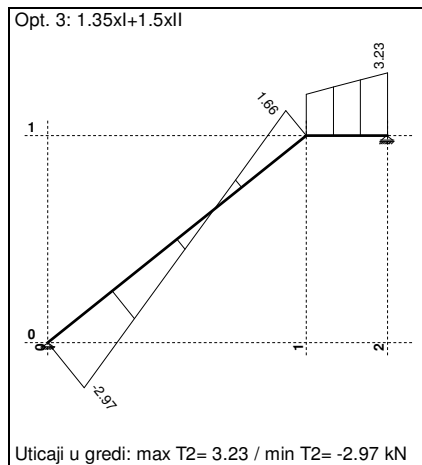


Ulazni podaci - Opterećenje



Statički proračun



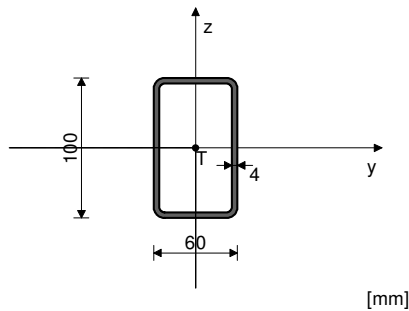


Dimenzionisanje (čelik)

ŠTAP 2-1

POPREČNI PRESEK : HOP [] 100x60x4 [S 235] [Set: 1]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIJSKE KARAKTERISTIKE PRESEKA



Ax =	11.750 cm ²
Ay =	4.406 cm ²
Az =	7.344 cm ²
Ix =	152.11 cm ⁴
Iy =	147.56 cm ⁴
Iz =	66.050 cm ⁴
Wy =	29.512 cm ³
Wz =	22.017 cm ³
Wy,pl =	39.968 cm ³
Wz,pl =	26.880 cm ³
yM0 =	1.100
yM1 =	1.100
yM2 =	1.250
Anet/A =	0.900

(fy = 23.5 kN/cm², fu = 36.0 kN/cm²)

FAKTORI ISKORIŠĆENJA PO KOMBINACIJAMA OPTEREĆENJA

3. γ=0.23

4. γ=0.16

ŠTAP IZLOŽEN ZATEZANJU I SAVIJANJU

(slučaj opterećenja 3, na 145.4 cm od početka štapa)

Računska normalna sila	NEd =	0.215 kN
Transverzalna sila u z pravcu	VED,z =	0.268 kN
Momenat savijanja oko y ose	MEd,y =	1.916 kNm
Sistemska dužina štapa	L =	207.71 cm

5.5 KLASIFIKACIJA POPREČNIH PRESEKA

Klasa preseka 1

6.2 NOSIVOST POPREČNIH PRESEKA

6.2.3 Zatezanje

Plast.rač.otpornost bruto preseka

Npl,Rd = 251.02 kN

Granična rač.otpornost neto

Nu,Rd = 274.10 kN

preseka

Računska otp. na zatezanje

Nt,Rd = 251.02 kN

Uslov 6.5: NEd <= Nt,Rd (0.22 <= 251.02)

6.2.5 Savijanje y-y

Plastični otporni moment

Wy,pl = 39.968 cm³

Računska otpornost na savijanje

Mc,Rd = 8.539 kNm

Uslov 6.12: MEd,y <= Mc,Rd,y (1.92 <= 8.54)

6.2.6 Smicanje

Proračunska nosivost na smicanje

Vpl,Rd,z = 90.580 kN

Proračunska nosivost na smicanje

Vc,Rd,z = 90.580 kN

Uslov 6.17: VEd,z <= Vc,Rd,z (0.27 <= 90.58)

6.2.10 Savijanje smicanje i aksijalna sila

Nije potrebna redukcija momenata otpornosti

Uslov: VEd,z <= 50%Vpl,Rd,z

6.2.9 Savijanje i aksijalna sila

Odnos NEd / Npl,Rd

0.001

Reduk.moment plast.otp.na

MN,y,Rd = 8.539 kNm

savijanje

Koeficijent

α = 1.660

Odnos (My,Ed / MN,y,Rd)^α

0.084

Uslov 6.41: (0.08 <= 1)

6.3 NOSIVOST ELEMENATA NA IZVIJANJE

6.3.2.1 Nosivost na bočno-torziono izvijanje

Koeficijent	C1 =	1.132
Koeficijent	C2 =	0.459
Koeficijent	C3 =	0.525
Koef.efekt.dužine bočnog izvijanja	k =	1.000
Koef.efekt.dužine torzionog uvrta	kw =	1.000
Koordinata	zg =	5.000 cm
Koordinata	zj =	0.000 cm
Razmak bočno pridrţanih taĉaka	L =	207.71 cm
Sektorski momenat inercije	Iw =	0.000 cm ⁶
Krit.mom.za boĉno tor.izvijanje	Mcr =	215.41 kNm
Odgovarajuĉi otporni momenat	Wy =	39.968 cm ³
Koeficijent imperf.	α_{LT} =	0.760
Bezdimenziona vitkost	λ_{LT} =	0.209
Koeficijent redukcije	χ_{LT} =	0.993
Raĉunska otpornost na izvijanje	Mb,Rd =	8.479 kNm

Uslov 6.54: $M_{Ed,y} \leq M_{b,Rd}$ (1.92 \leq 8.48)

PROVERA OTPORNOSTI NA SMICANJE

(sluĉaj opterećenja 3, poĉetak štapa)

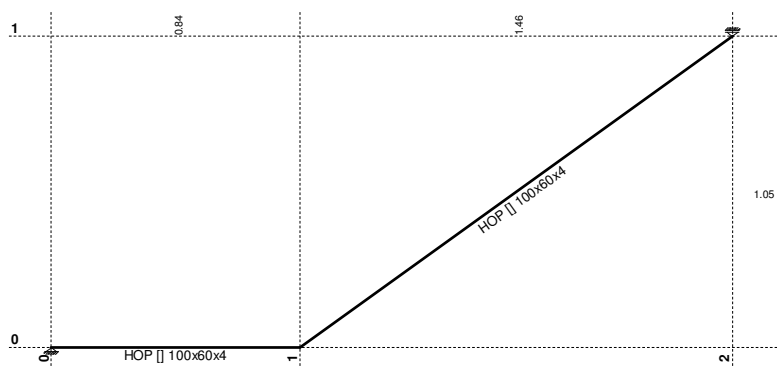
Raĉunska normalna sila	N _{Ed} =	-2.384 kN
Transverzalna sila u z pravcu	V _{Ed,z} =	-2.971 kN
Sistemska duţina štapa	L =	207.71 cm

6.2 NOSIVOST POPREĀNIH PRESEKA

6.2.6 Smicanje

Proraĉunska nosivost na smicanje	V _{pl,Rd,z} =	90.580 kN
Proraĉunska nosivost na smicanje	V _{c,Rd,z} =	90.580 kN

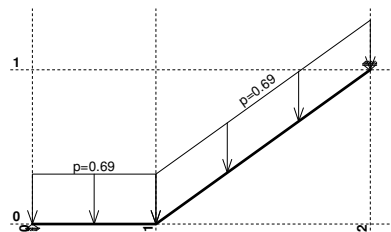
Uslov 6.17: $V_{Ed,z} \leq V_{c,Rd,z}$ (2.97 \leq 90.58)



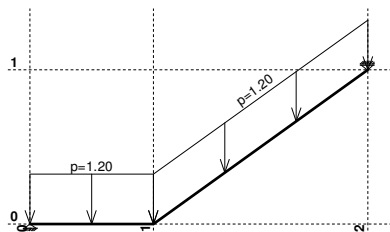
CELICNO STEPENISTE_C2

Ulazni podaci - Opterećenje

Opt. 1: g (g)

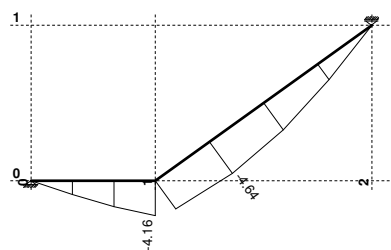


Opt. 2: p



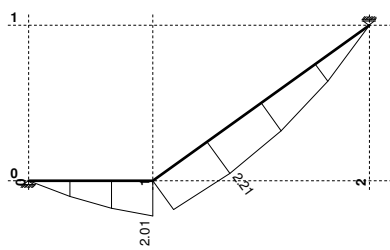
Statički proračun

Opt. 3: 1.35xl+1.5xll



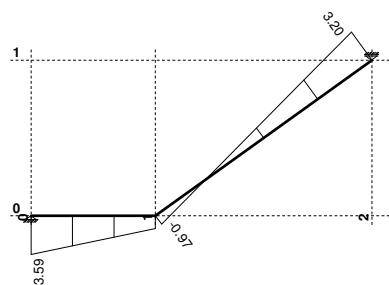
Utjecaji u gredi: max Zp= -0.00 / min Zp= -4.64 m...

Opt. 3: 1.35xl+1.5xll

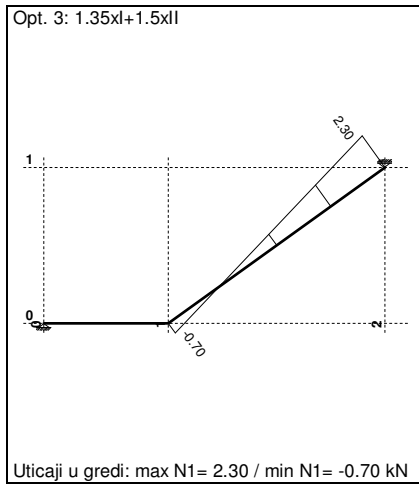


Utjecaji u gredi: max M3= 2.21 / min M3= 0.00...

Opt. 3: 1.35xl+1.5xll



Utjecaji u gredi: max T2= 3.20 / min T2= -3.59 kN

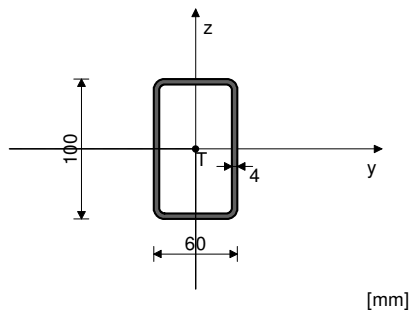


Dimenzionisanje (čelik)

ŠTAP 3-2

POPREČNI PRESEK : HOP [] 100x60x4 [S 235] [Set: 1]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIJSKE KARAKTERISTIKE PRESEKA



Ax =	11.750 cm ²
Ay =	4.406 cm ²
Az =	7.344 cm ²
Ix =	152.11 cm ⁴
Iy =	147.56 cm ⁴
Iz =	66.050 cm ⁴
Wy =	29.512 cm ³
Wz =	22.017 cm ³
Wy,pl =	39.968 cm ³
Wz,pl =	26.880 cm ³
yM0 =	1.100
yM1 =	1.100
yM2 =	1.250
Anet/A =	0.900

(fy = 23.5 kN/cm², fu = 36.0 kN/cm²)

FAKTORI ISKORIŠĆENJA PO KOMBINACIJAMA OPTEREĆENJA

3. γ=0.26

4. γ=0.18

ŠTAP IZLOŽEN PRITISKU I SAVIJANJU

(slučaj opterećenja 3, na 40.0 cm od početka štapa)

Računska normalna sila	NEd =	-0.030 kN
Transverzalna sila u z pravcu	VEd,z =	-0.041 kN
Momenat savijanja oko y ose	MEd,y =	2.187 kNm
Sistemska dužina štapa	L =	179.84 cm

5.5 KLASIFIKACIJA POPREČNIH PRESEKA

Klasa preseka 1

6.2 NOSIVOST POPREČNIH PRESEKA

6.2.4 Pritisak

Računska otpornost na pritisak

Nc,Rd = 251.02 kN

Uslov 6.9: NEd <= Nc,Rd (0.03 <= 251.02)

6.2.5 Savijanje y-y

Plastični otporni moment

Wy,pl = 39.968 cm³

Računska otpornost na savijanje

Mc,Rd = 8.539 kNm

Uslov 6.12: MEd,y <= Mc,Rd,y (2.19 <= 8.54)

6.2.6 Smicanje

Proračunska nosivost na smicanje

Vpl,Rd,z = 90.580 kN

Proračunska nosivost na smicanje

Vc,Rd,z = 90.580 kN

Uslov 6.17: VEd,z <= Vc,Rd,z (0.04 <= 90.58)

6.2.10 Savijanje smicanje i aksijalna sila

Nije potrebna redukcija momenata otpornosti

Uslov: VEd,z <= 50%Vpl,Rd,z

6.2.9 Savijanje i aksijalna sila

Odnos NEd / Npl,Rd

MN,y,Rd = 0.000

Reduk.moment plast.otp.na

8.539 kNm

savijanje

α = 1.660

Koeficijent

Odnos (My,Ed / MN,y,Rd)^α

0.104

Uslov 6.41: (0.10 <= 1)

6.3 NOSIVOST ELEMENATA NA IZVIJANJE

6.3.1.1 Nosivost na izvijanje

Dužina izvijanja y-y	$I_y =$	179.84 cm
Relativna vitkost y-y	$\lambda_y =$	0.540
Kriva izvijanja za osu y-y: C	$\alpha =$	0.490
Elastična kritična sila	$N_{cr,y} =$	945.66 kN
Redukcioni koeficijent	$\chi_y =$	0.820
Računska otpornost na izvijanje	$N_{b,Rd,y} =$	205.88 kN
Uslov 6.46: $N_{Ed} \leq N_{b,Rd,y}$ (0.03 \leq 205.88)		

Dužina izvijanja z-z	$I_z =$	179.84 cm
Relativna vitkost z-z	$\lambda_z =$	0.808
Kriva izvijanja za osu z-z: C	$\alpha =$	0.490
Redukcioni koeficijent	$\chi_z =$	0.657
Računska otpornost na izvijanje	$N_{b,Rd,z} =$	165.01 kN
Uslov 6.46: $N_{Ed} \leq N_{b,Rd,z}$ (0.03 \leq 165.01)		

6.3.2.1 Nosivost na bočno-torziono izvijanje

Koeficijent	$C1 =$	1.132
Koeficijent	$C2 =$	0.459
Koeficijent	$C3 =$	0.525
Koef. efekt. dužine bočnog izvijanja	$k =$	1.000
Koef. efekt. dužine torzionog uvrta	$k_w =$	1.000
Koordinata	$z_g =$	0.000 cm
Koordinata	$z_j =$	0.000 cm
Razmak bočno pridržanih tačaka	$L =$	179.84 cm
Sektorski momenat inercije	$I_w =$	0.000 cm ⁶
Krit. mom. za bočno tor. izvijanje	$M_{cr} =$	258.15 kNm
Odgovarajući otporni momenat	$W_y =$	39.968 cm ³
Koeficijent imperf.	$\alpha_{LT} =$	0.760
Bezdimenziona vitkost	$\lambda_{LT} =$	0.191
Koeficijent redukcije	$\chi_{LT} =$	1.000
Računska otpornost na izvijanje	$M_{b,Rd} =$	8.539 kNm
Uslov 6.54: $M_{Ed,y} \leq M_{b,Rd}$ (2.19 \leq 8.54)		

6.3.3 Elementi konstantnog poprečnog preseka opterećeni savijanjem i aksijalnim pritiskom

Proračun koeficijenata interakcije izvršen je alternativnom metodom br.2 (Aneks B)

Koeficijent uniformnog momenta	$C_{my} =$	0.997
Koeficijent uniformnog momenta	$C_{mz} =$	1.000
Koeficijent uniformnog momenta	$C_{mLT} =$	0.997
Koeficijent interakcije	$k_{yy} =$	0.997
Koeficijent interakcije	$k_{yz} =$	0.600
Koeficijent interakcije	$k_{zy} =$	0.598
Koeficijent interakcije	$k_{zz} =$	1.000

Redukcioni koeficijent	$\chi_y =$	0.820
$N_{Ed} / (\chi_y N_{Rk} / \gamma_{M1})$		0.000
$k_{yy} * (M_{yEd} + \Delta M_{yEd}) / \dots$		0.256
Uslov 6.61: (0.26 \leq 1)		

Redukcioni koeficijent	$\chi_z =$	0.657
$N_{Ed} / (\chi_z N_{Rk} / \gamma_{M1})$		0.000
$k_{zy} * (M_{yEd} + \Delta M_{yEd}) / \dots$		0.153
Uslov 6.62: (0.15 \leq 1)		

PROVERA OTPORNOSTI NA SMICANJE

(slučaj opterećenja 3, kraj štapa)

Računska normalna sila	$N_{Ed} =$	2.303 kN
Transverzalna sila u z pravcu	$V_{Ed,z} =$	3.202 kN
Sistemska dužina štapa	$L =$	179.84 cm

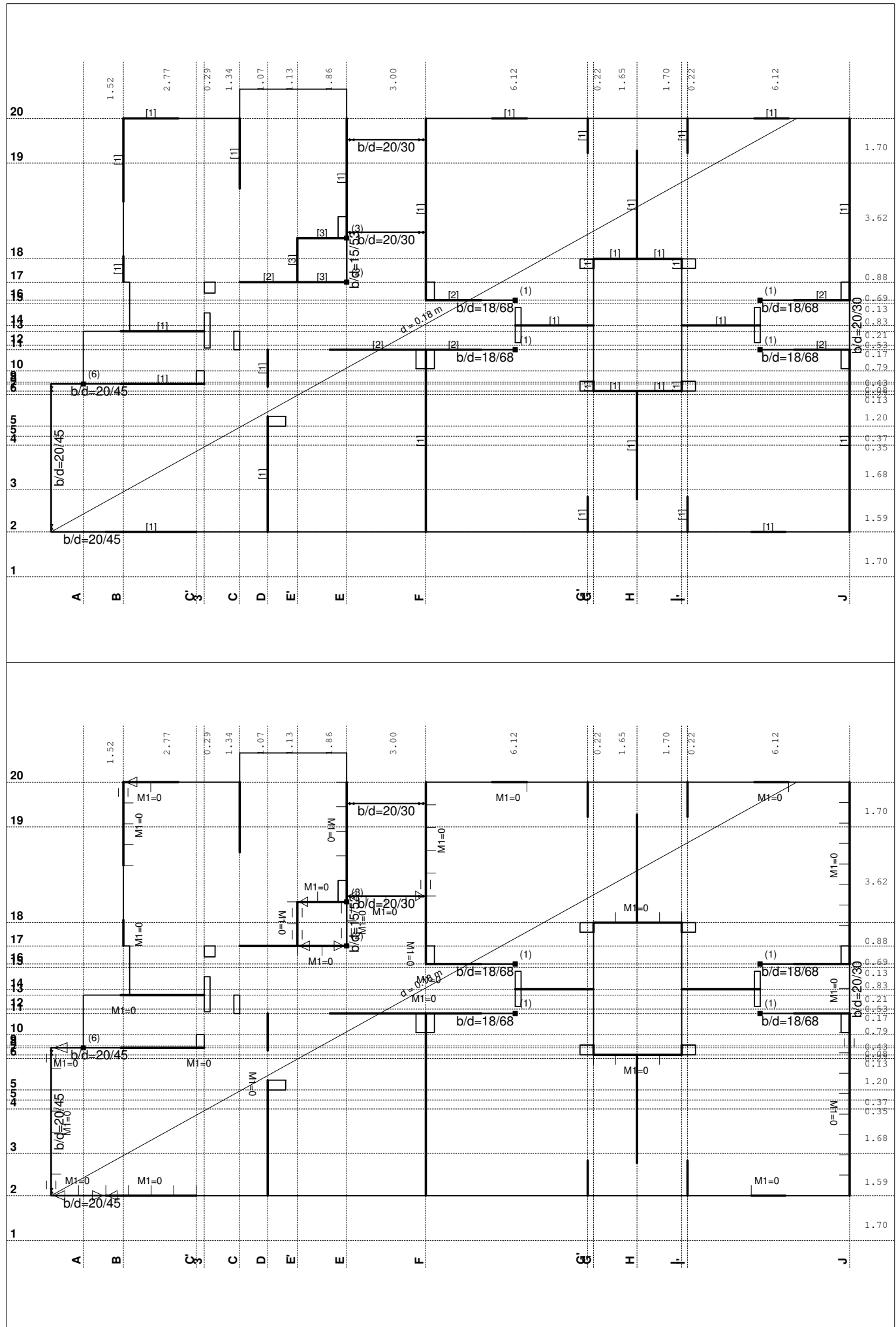
6.2 NOSIVOST POPREČNIH PRESEKA

6.2.6 Smicanje

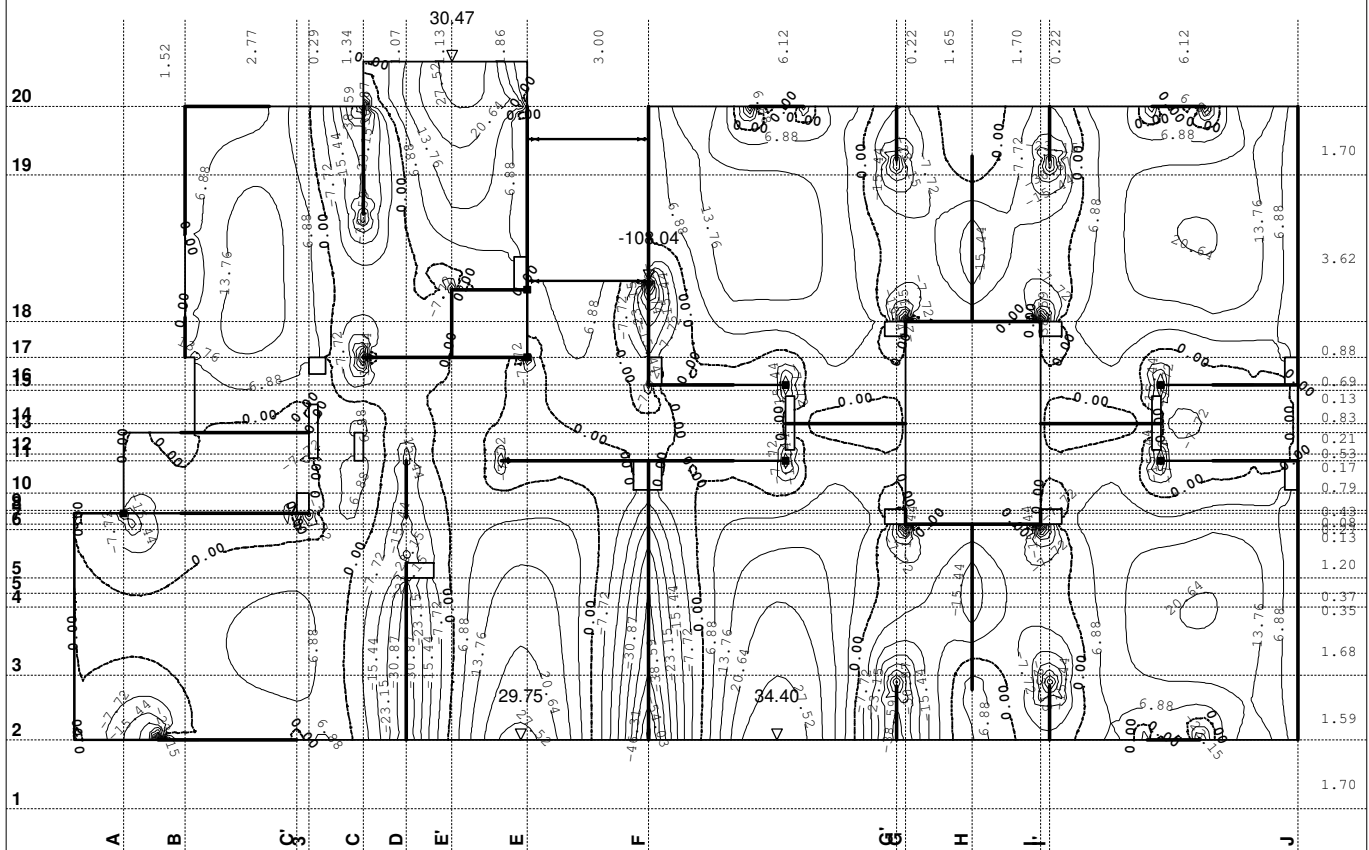
Proračunska nosivost na smicanje	$V_{pl,Rd,z} =$	90.580 kN
Proračunska nosivost na smicanje	$V_{c,Rd,z} =$	90.580 kN

Uslov 6.17: $V_{Ed,z} \leq V_{c,Rd,z}$ (3.20 \leq 90.58)

POS 500+ - KONSTRUKCIJA IZNAD ČETVRTOG SPRATA

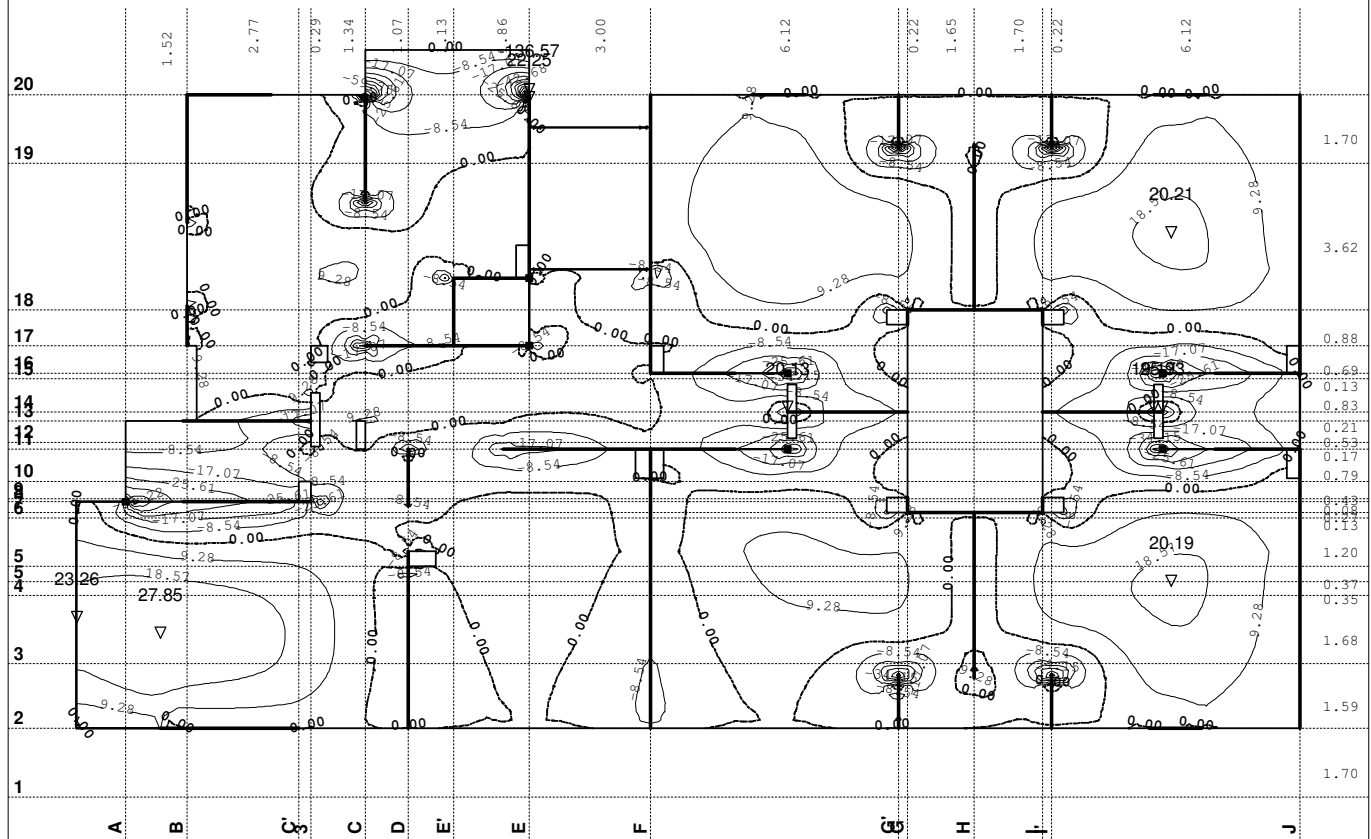


Opt. 3: $1.6x_I + 1.8x_{II}$

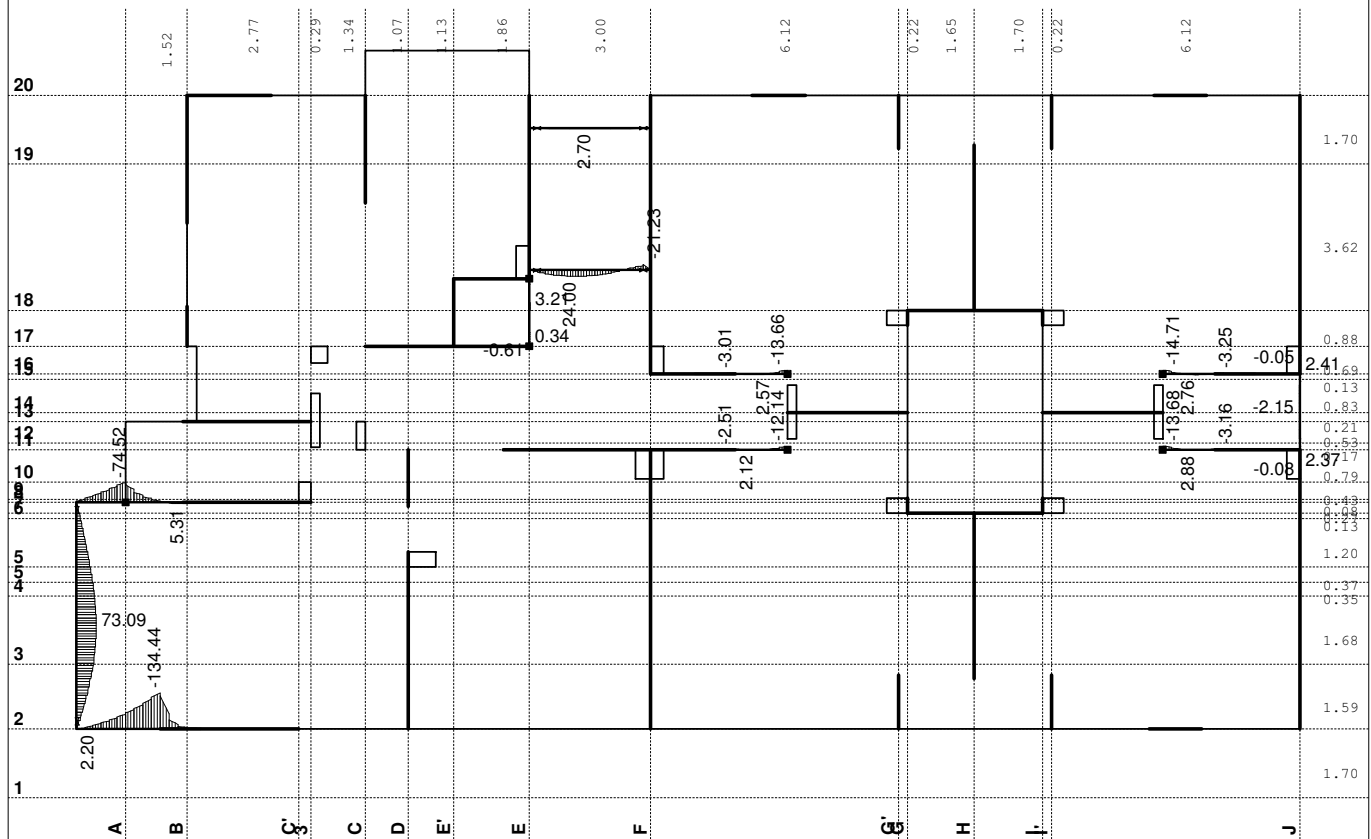


Radimpex - www.radimpex.rs

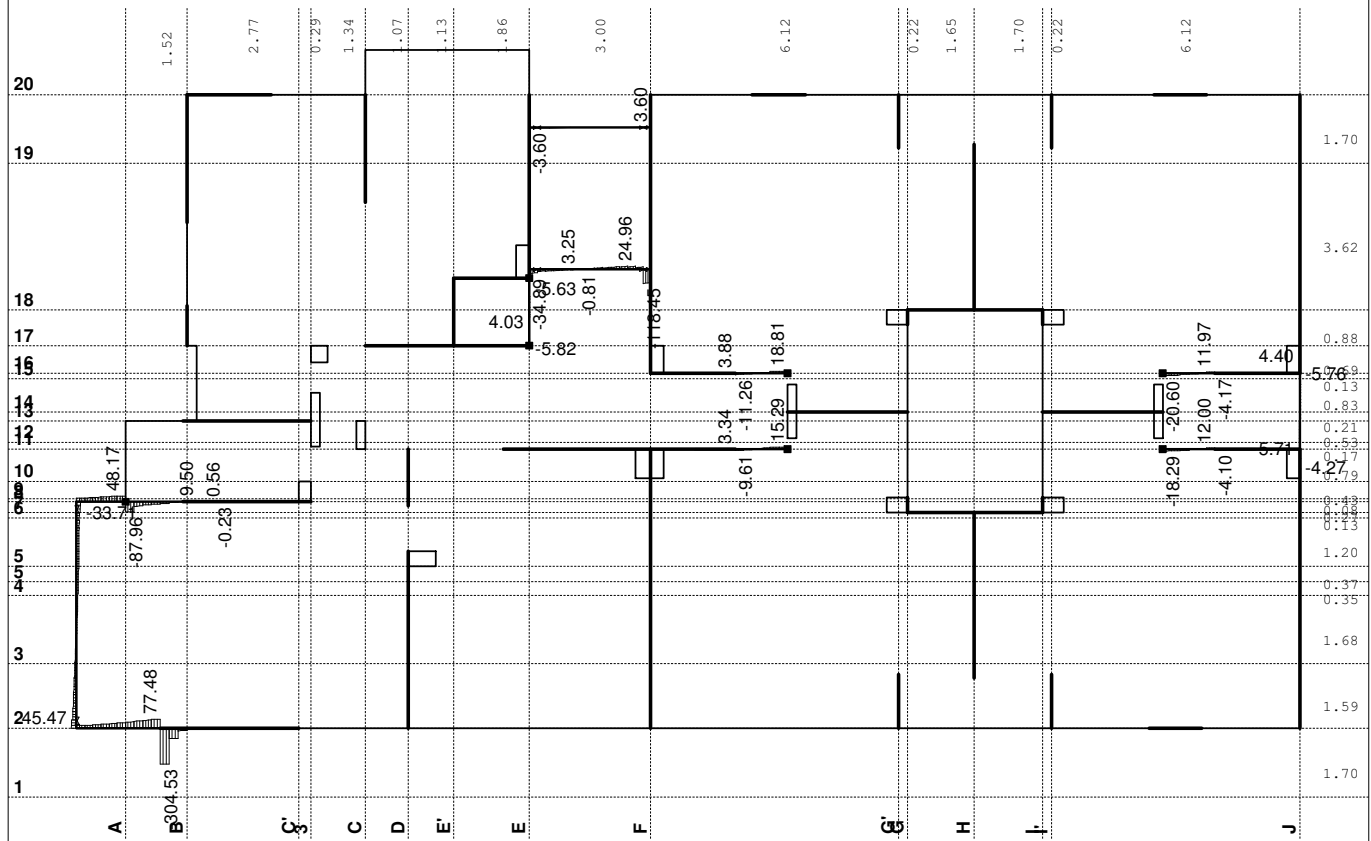
Opt. 3: 1.6xl+1.8xll

Utjecaji u ploči: max $M_y = 27.85$ / min $M_y = -136.57$ kNm/m

Opt. 3: 1.6xl+1.8xll

Utjecaji u gredi: max $M_3 = 73.09$ / min $M_3 = -134.44$ kNm

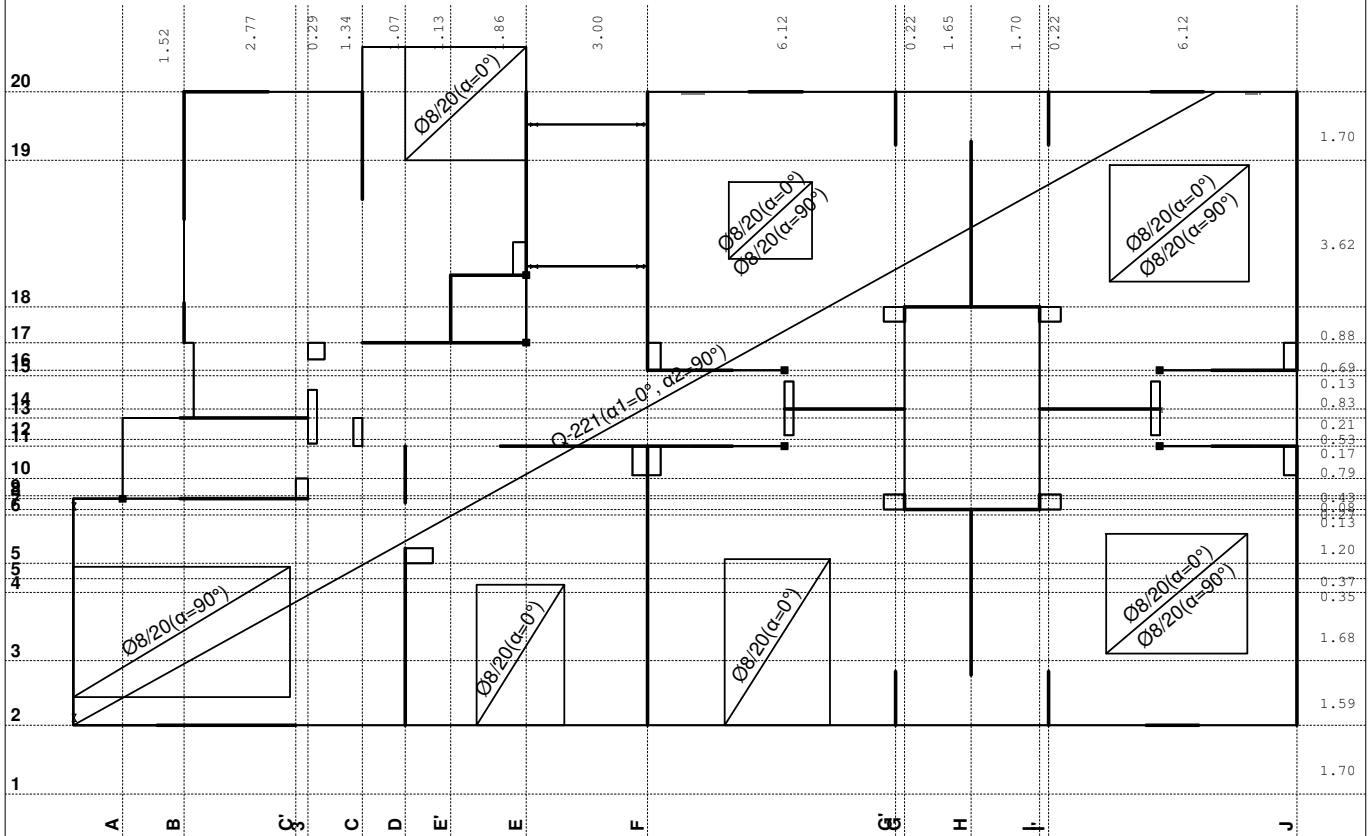
Opt. 3: 1.6xl+1.8xII



Uticaji u gredi: max T2= 77.48 / min T2= -304.53 kN

Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

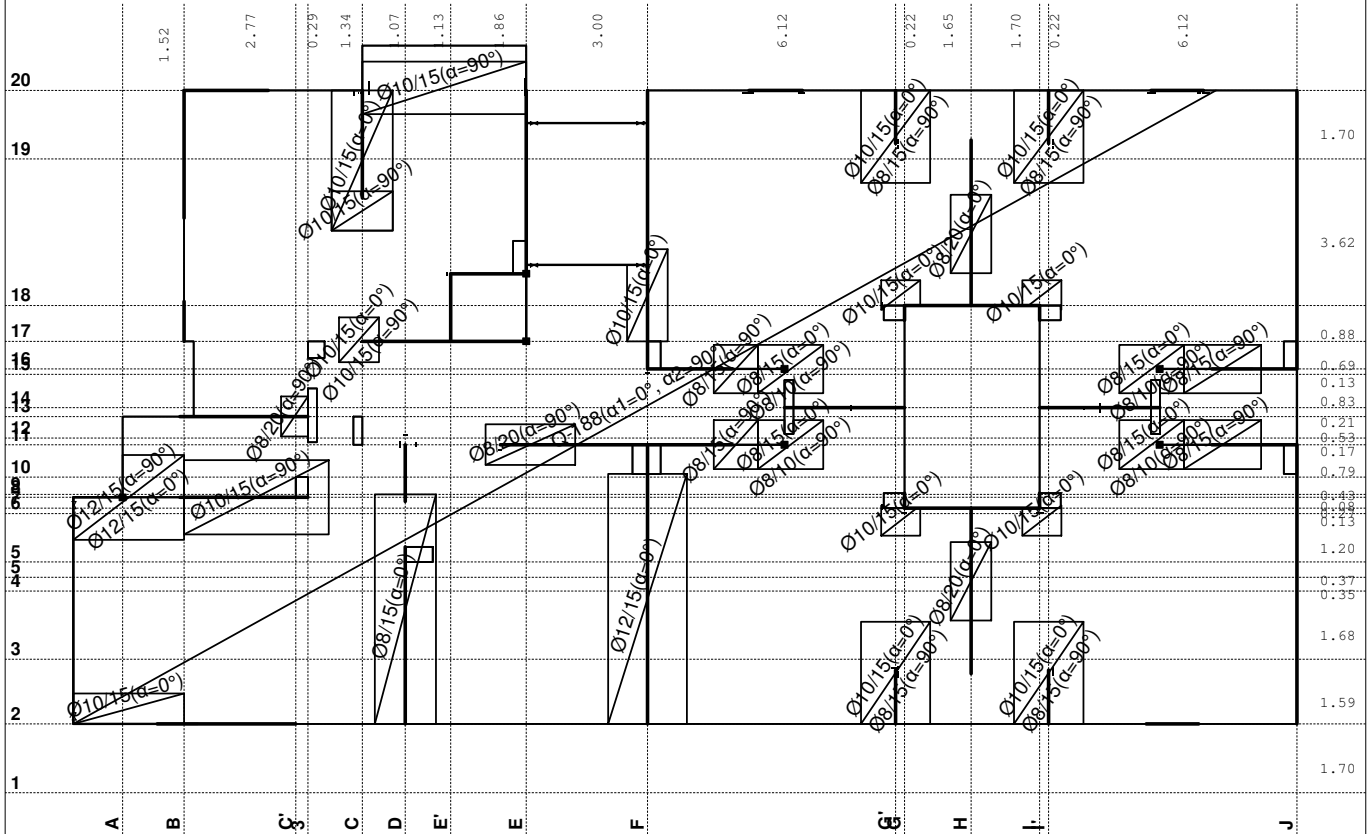
Aa - d.zona [cm ² /m]
0.00
2.26
4.51



Aa - d.zona

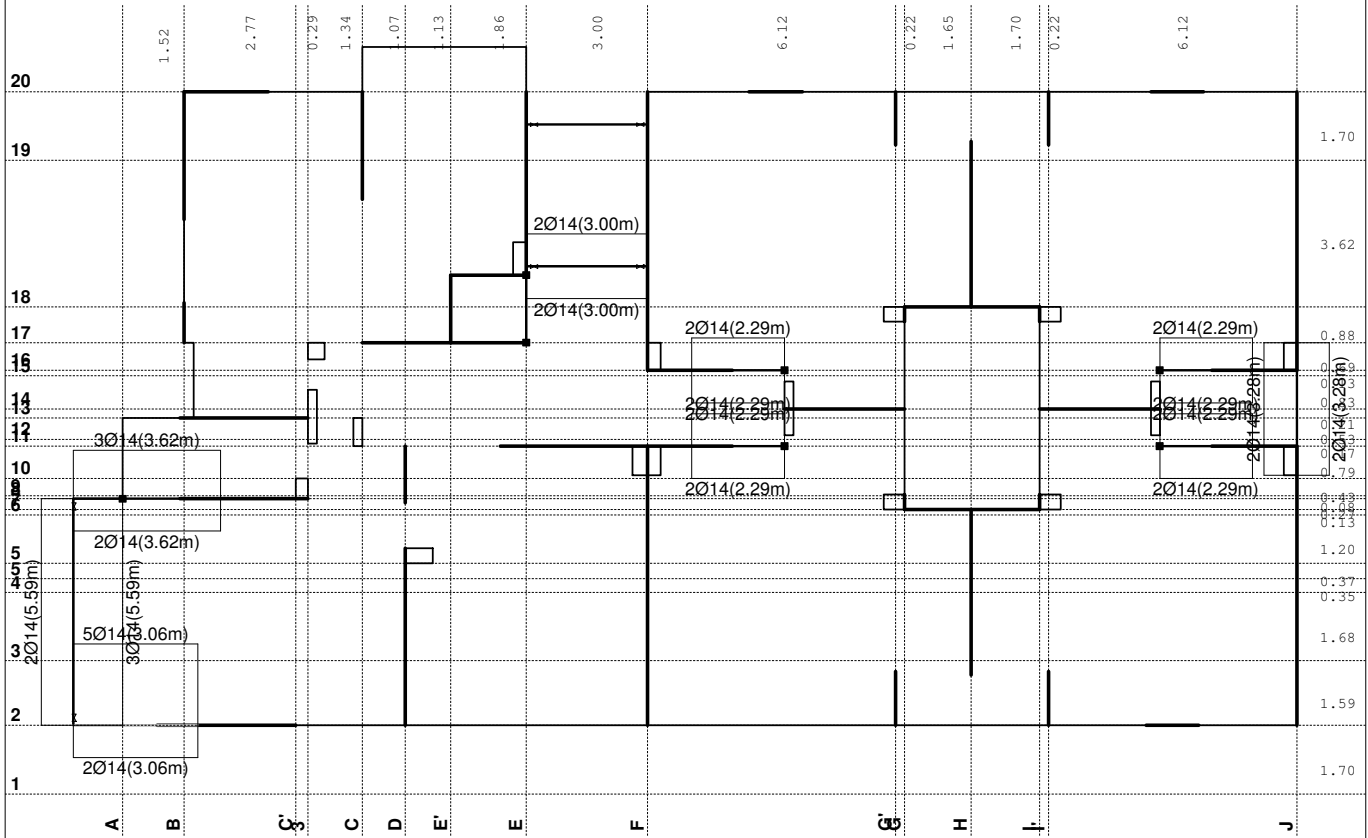
Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

Aa - g.zona [cm ² /m]
-20.28
-10.14
0.00

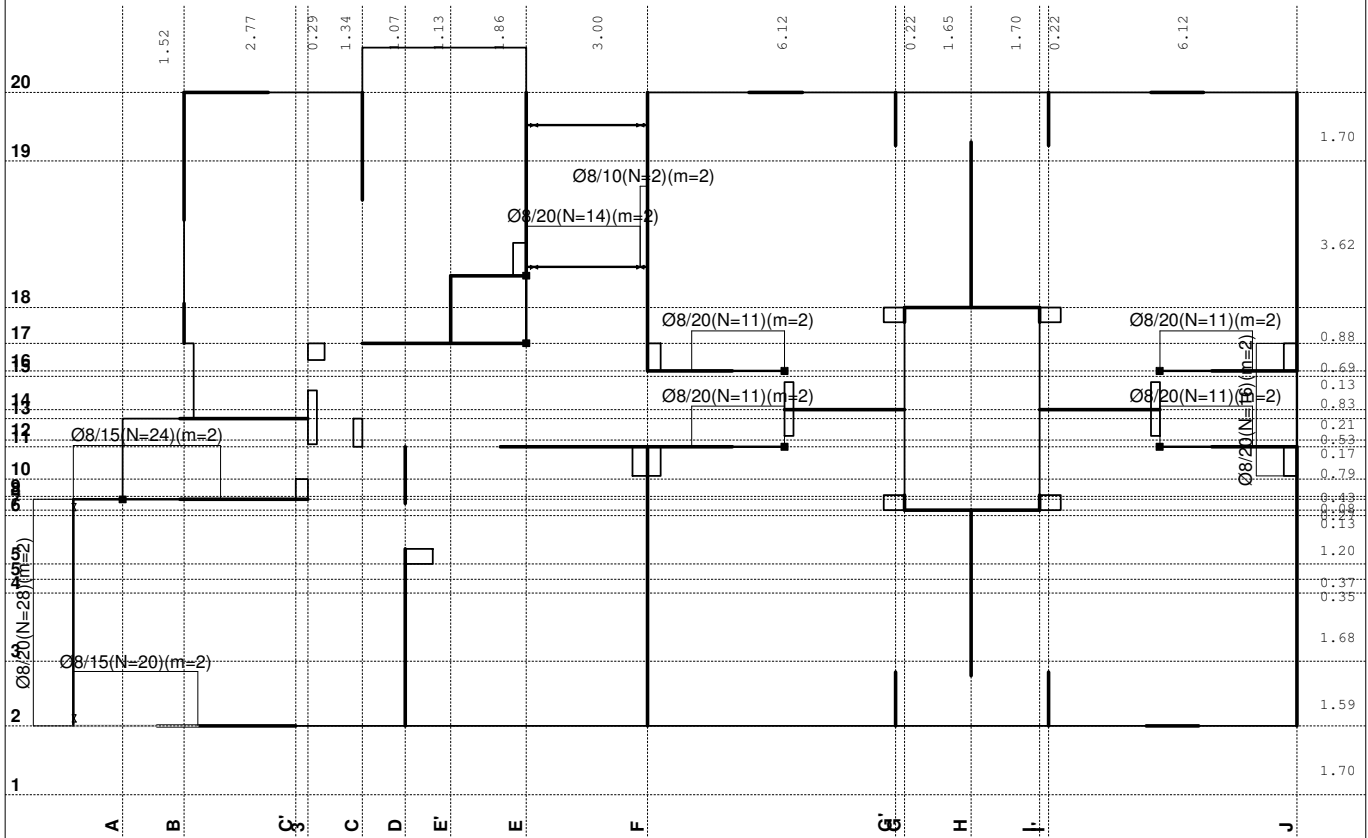


Aa - g.zona

Usvojena armatura
PBAB 87, MB 30, MA 500/600

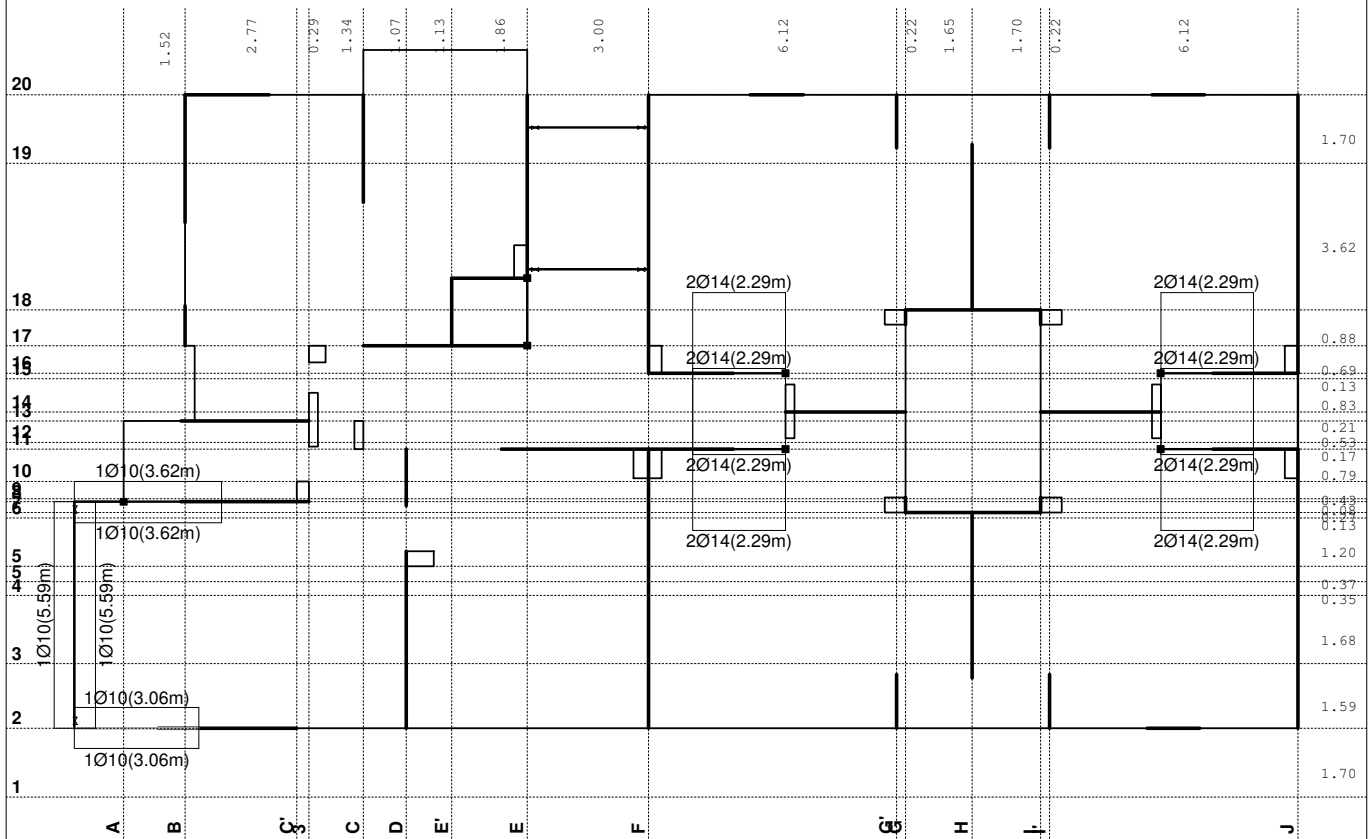


Armatura u gredama: Aa2/Aa1
Usvojena armatura
PBAB 87, MB 30, MA 500/600



Armatura u gredama: Aa,uz

Usvojena armatura
PBAB 87, MB 30, MA 500/600

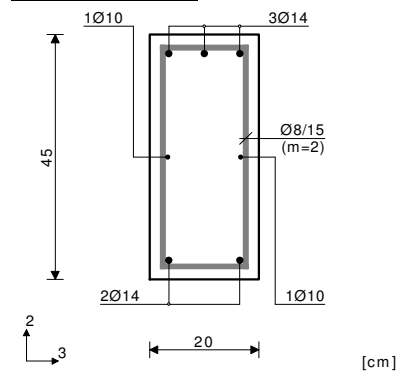


Armatura u gredama: Aa3/Aa4

Greda 511-1091

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.20m



T2u = 48.17 kN
M1u = -0.02 kNm
M3u = -74.52 kNm

$$\epsilon_b/\epsilon_a = -2.099/10.000 \%$$

$$Aa1 = 0.00 \text{ cm}^2$$

$$Aa2 = 3.94 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

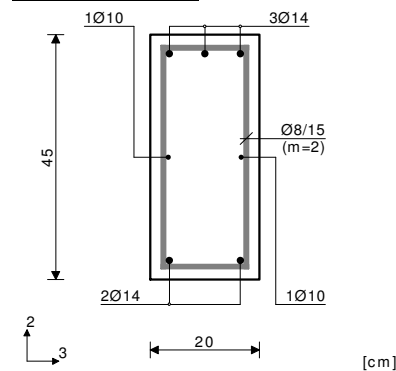
$$Aa_{uz} = 0.00 \text{ cm}^2/\text{m} \quad (m=2)$$

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

$$\tau_y = 0.67 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\text{Procenat armiranja: } 1.03\%$$

Presek 1-1 x = 1.20m



$$T2u = -87.96 \text{ kN}$$

$$M1u = 2.94 \text{ kNm}$$

$$M3u = -67.09 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -1.932/10.000 \%$$

$$Aa1 = 0.00 + 0.08' = 0.08 \text{ cm}^2$$

$$Aa2 = 3.53 + 0.08' = 3.61 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.18' = 0.18 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.18' = 0.18 \text{ cm}^2$$

$$Aa_{uz} = 2.44 \text{ cm}^2/\text{m} \quad (m=2)$$

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

$$\tau_y = 2.48 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 1.27 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\text{Procenat armiranja: } 1.03\%$$

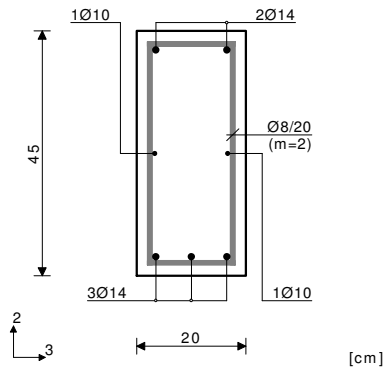
*) - dodatna podužna armatura za prijem torzije.

Greda 511-2

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 2.97\text{m}$ 

$$\begin{aligned} T2u &= -0.54 \text{ kN} \\ M1u &= 3.57 \text{ kNm} \\ M3u &= 73.09 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -2.067/10.000 \text{ ‰} \\ Aa1 &= 3.86 + 0.10' = 3.96 \text{ cm}^2 \\ Aa2 &= 0.00 + 0.10' = 0.10 \text{ cm}^2 \\ Aa3 &= 0.00 + 0.22' = 0.22 \text{ cm}^2 \\ Aa4 &= 0.00 + 0.22' = 0.22 \text{ cm}^2 \\ Aa_{uz} &= 0.28 \text{ cm}^2/\text{m} \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}] \end{aligned}$$

$$\begin{aligned} \tau_y &= 1.56 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa} \\ \tau_z &= 1.55 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa} \end{aligned}$$

Procenat armiranja: 1.03%

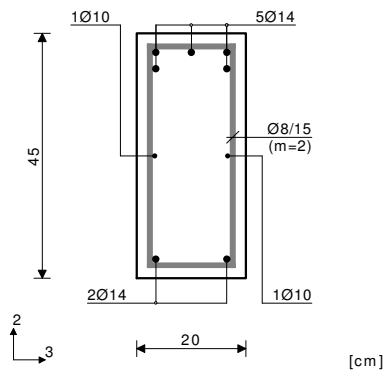
*) - dodatna podužna armatura za prijem torzije.

Greda 2-190

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 2.06\text{m}$ 

$$\begin{aligned} T2u &= 77.48 \text{ kN} \\ M3u &= -134.44 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -3.500/8.023 \text{ ‰} \\ Aa1 &= 0.00 \text{ cm}^2 \\ Aa2 &= 7.89 \text{ cm}^2 \\ Aa3 &= 0.00 \text{ cm}^2 \\ Aa4 &= 0.00 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/\text{m} \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \emptyset 8/15(m=2) = 3.35 \text{ cm}^2/\text{m}] \end{aligned}$$

$$\tau_y = 1.11 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$$

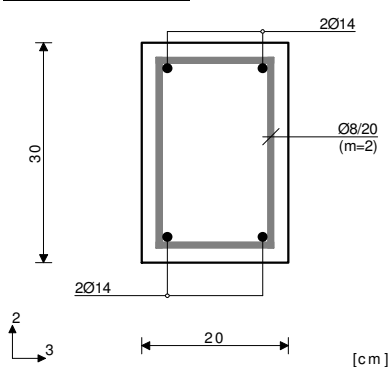
Procenat armiranja: 1.37%

Greda 5319-6517

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 1.21\text{m}$ 

$$\begin{aligned} T2u &= 3.25 \text{ kN} \\ M3u &= 23.87 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -1.642/10.000 \text{ ‰} \\ Aa1 &= 1.86 \text{ cm}^2 \\ Aa2 &= 0.00 \text{ cm}^2 \\ Aa3 &= 0.00 \text{ cm}^2 \\ Aa4 &= 0.00 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/\text{m} \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}] \end{aligned}$$

$$\tau_y = 0.07 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.03%

Greda 5946-6825

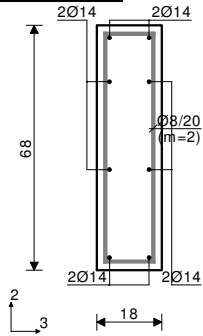
PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.42m



[cm]

$$\begin{aligned} T2u &= -4.41 \text{ kN} \\ M1u &= -1.42 \text{ kNm} \\ M3u &= 2.29 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.187/10.000 \text{ ‰}$$

$$Aa1 = 0.08 + 0.03' = 0.10 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.03' = 0.03 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.10' = 0.10 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.10' = 0.10 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \phi 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.58 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.53 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procentat armiranja: 1.01%

') - dodatna podužna armatura za prijem torzije.

Greda 5174-6110

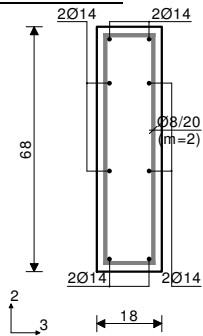
PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.42m



[cm]

$$\begin{aligned} T2u &= -3.62 \text{ kN} \\ M1u &= 1.22 \text{ kNm} \\ M3u &= 1.92 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.171/10.000 \text{ ‰}$$

$$Aa1 = 0.06 + 0.02' = 0.09 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.02' = 0.02 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.09' = 0.09 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.09' = 0.09 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \phi 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.49 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

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

Procentat armiranja: 1.01%

') - dodatna podužna armatura za prijem torzije.

Greda 9782-10310

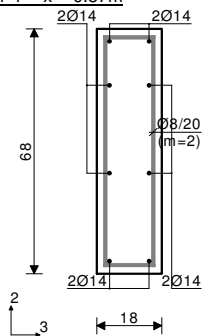
PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 0.87m



[cm]

$$\begin{aligned} T2u &= -1.00 \text{ kN} \\ M1u &= -1.01 \text{ kNm} \\ M3u &= 2.76 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.206/10.000 \text{ ‰}$$

$$Aa1 = 0.09 + 0.00' = 0.09 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.00' = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.07' = 0.07 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.07' = 0.07 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \phi 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.39 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.38 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

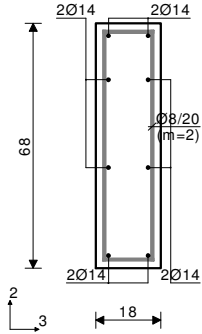
Procentat armiranja: 1.01%

') - dodatna podužna armatura za prijem torzije.

Greda 9243-9895

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 0.87m



[cm]

T2u = -0.81 kN
M1u = 1.21 kNm
M3u = 2.88 kNm

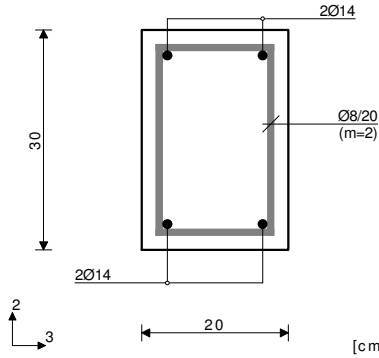
$\epsilon_b/\epsilon_a = -0.211/10.000 \text{ ‰}$
Aa1 = 0.09 + 0.02' = 0.12 cm²
Aa2 = 0.00 + 0.02' = 0.02 cm²
Aa3 = 0.00 + 0.09' = 0.09 cm²
Aa4 = 0.00 + 0.09' = 0.09 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.46 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.46 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.01%
*) - dodatna podužna armatura za prijem torzije.

Greda 9979-10649

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.63m



[cm]

T2u = -0.70 kN
M3u = -2.15 kNm

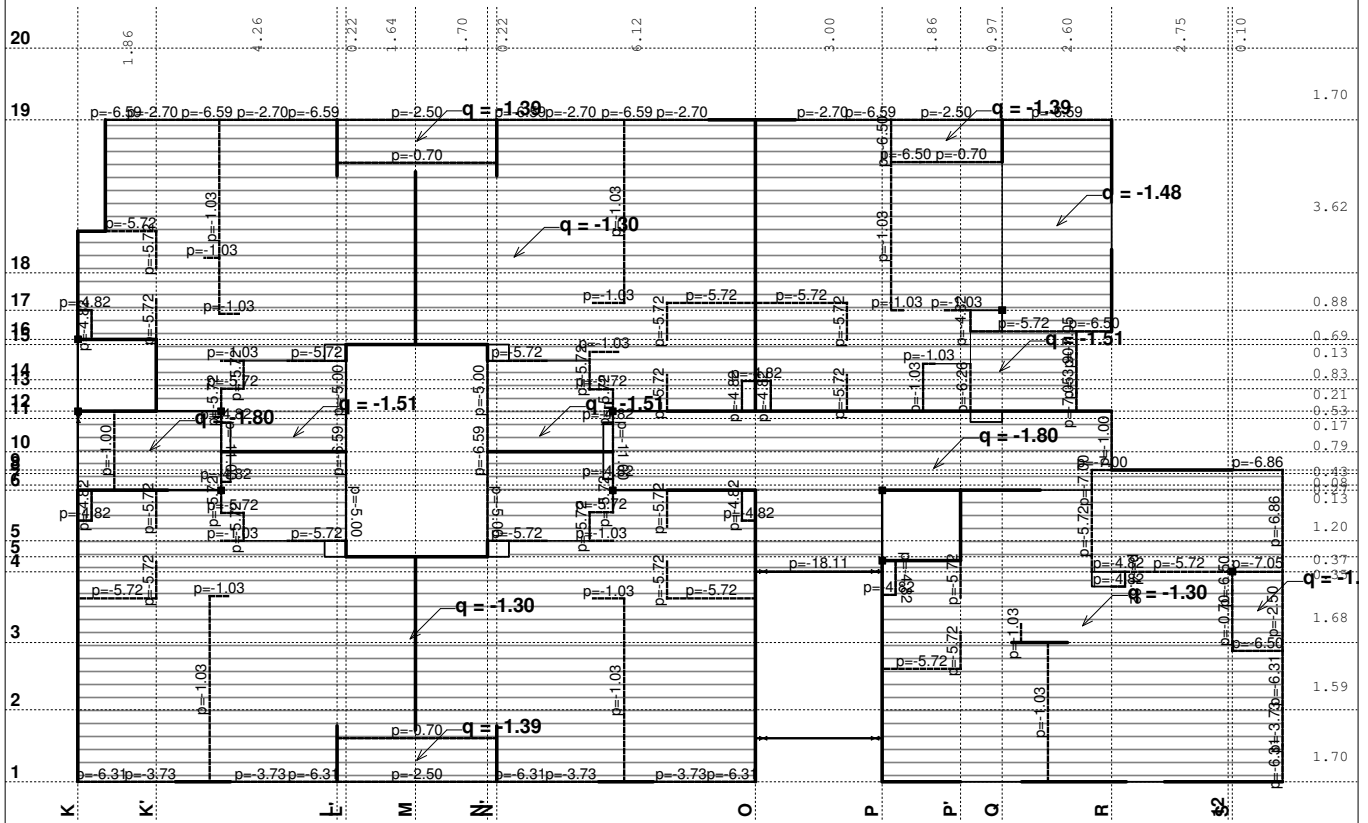
$\epsilon_b/\epsilon_a = -0.404/10.000 \text{ ‰}$
Aa1 = 0.00 cm²
Aa2 = 0.16 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.01 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.03%

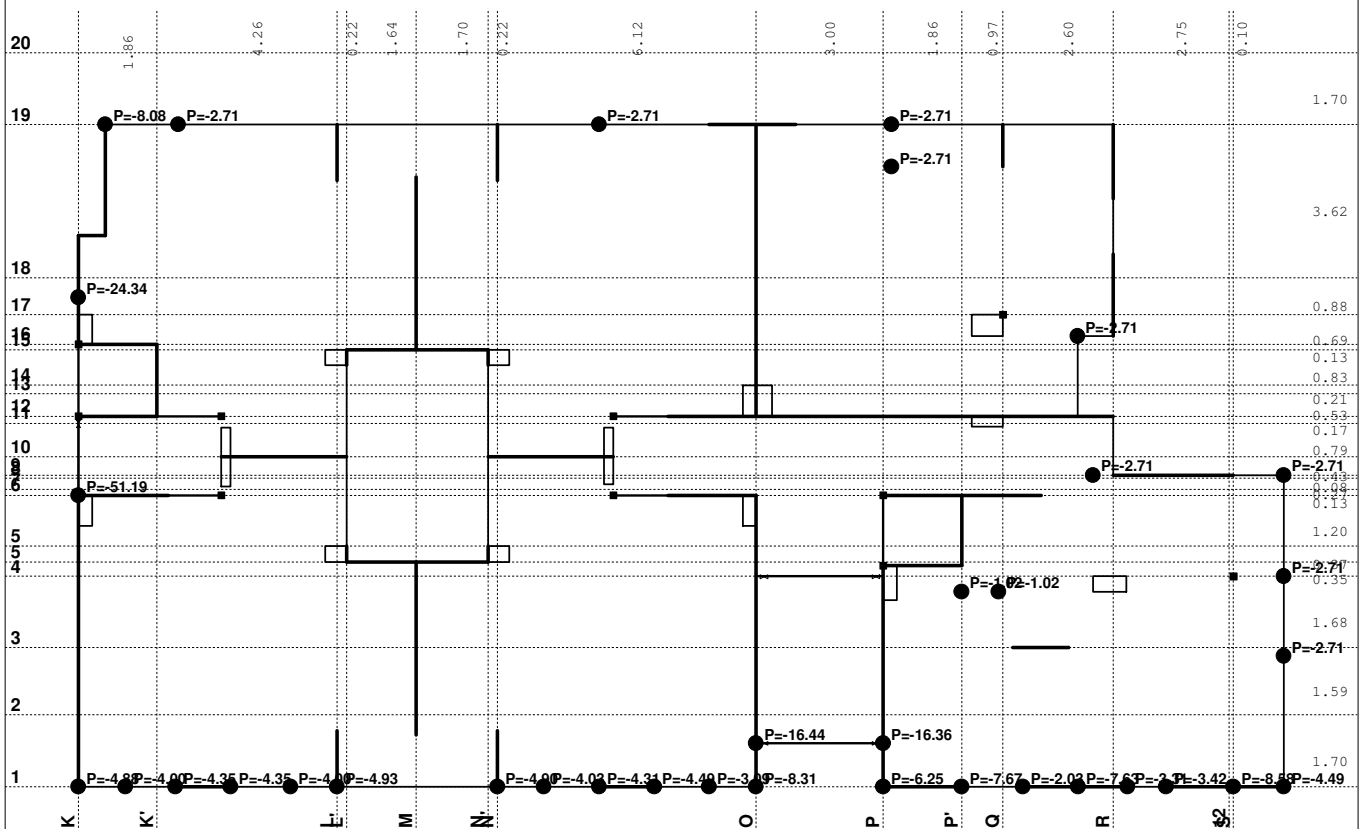
Ulazni podaci - Konstrukcija, Ulazni podaci - Opterećenje

POS 500+ - KONSTRUKCIJA IZNAD IV SPRATA

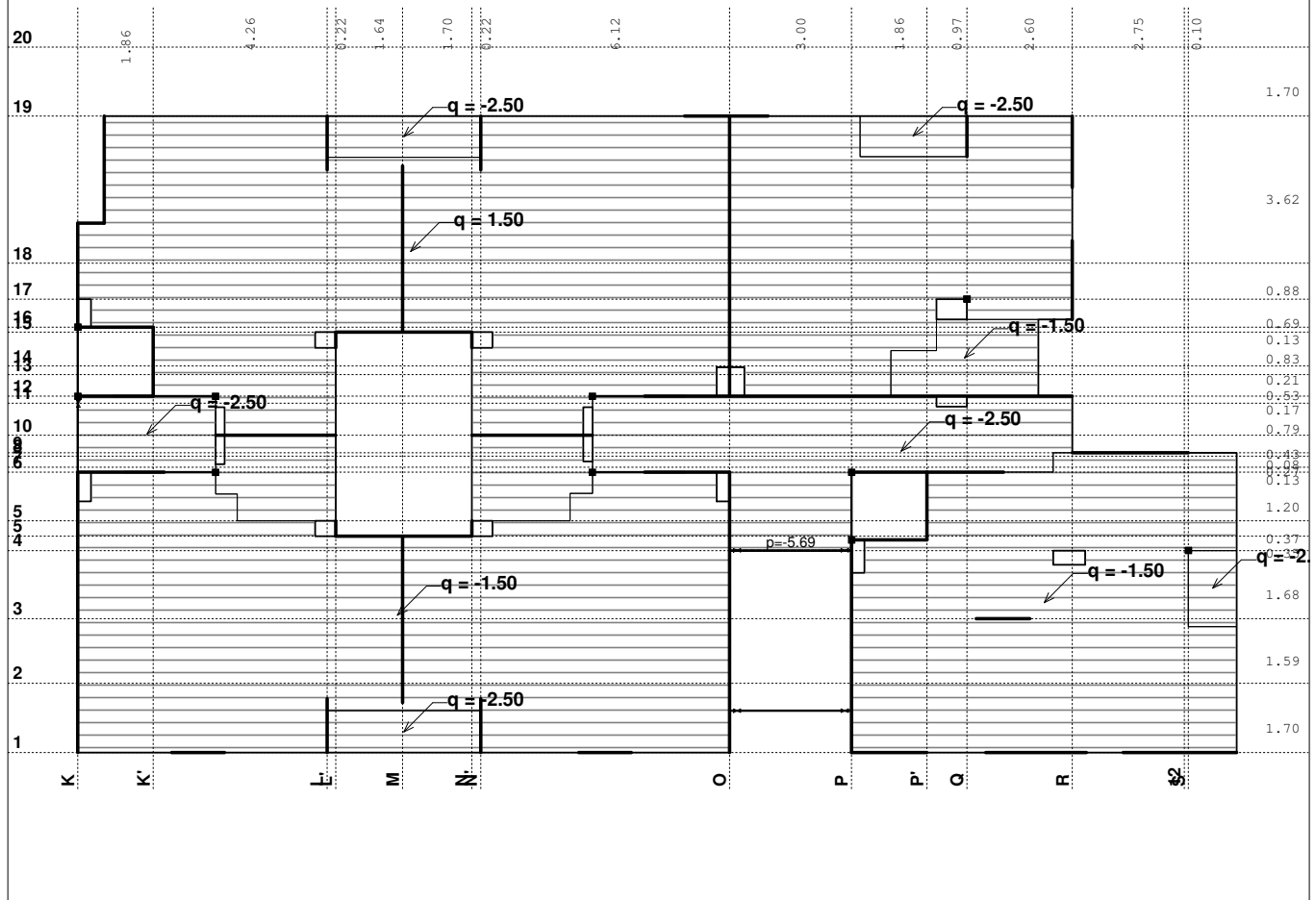
Opt. 1: g (g)



Opt. 1: g (g)



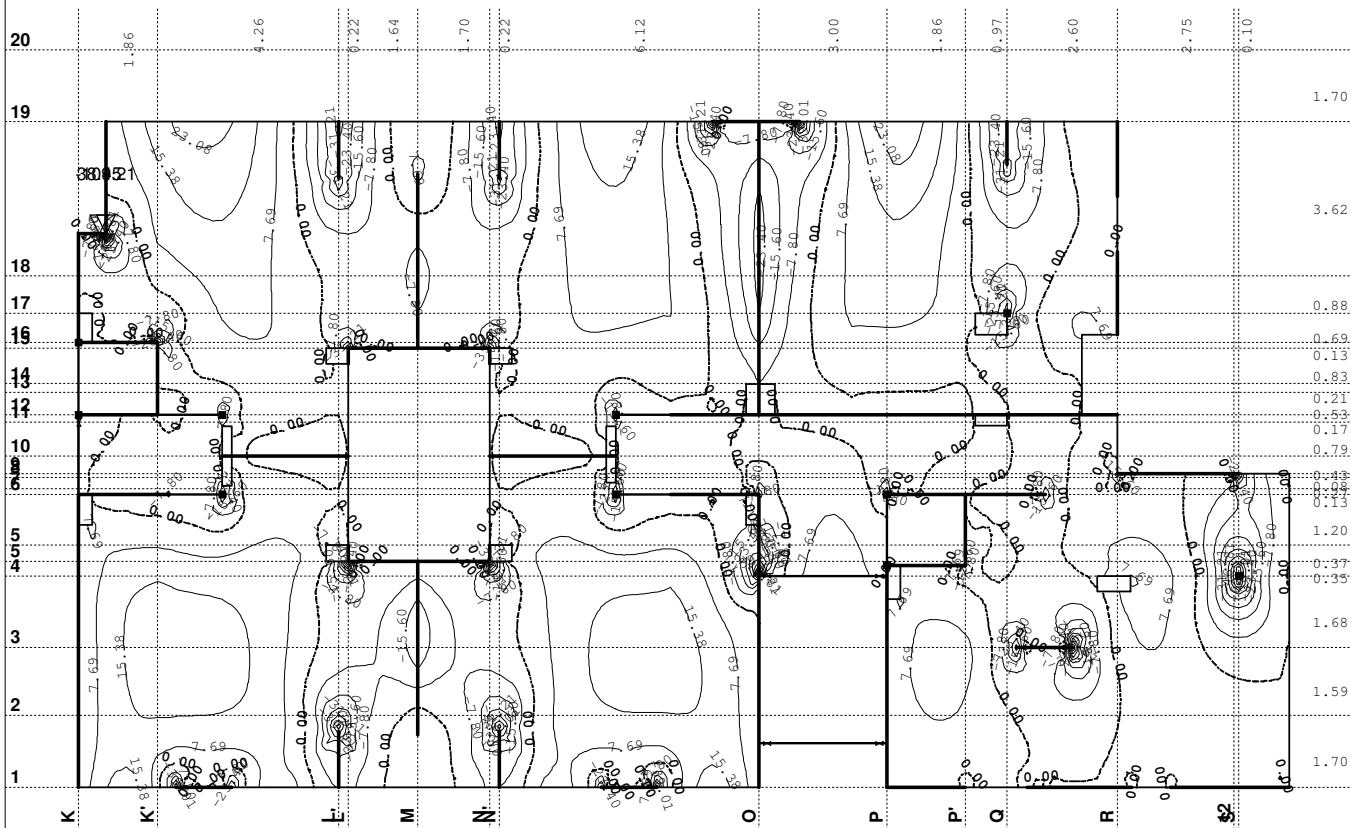
Opt. 2: p



Lista slučajeva opterećenja

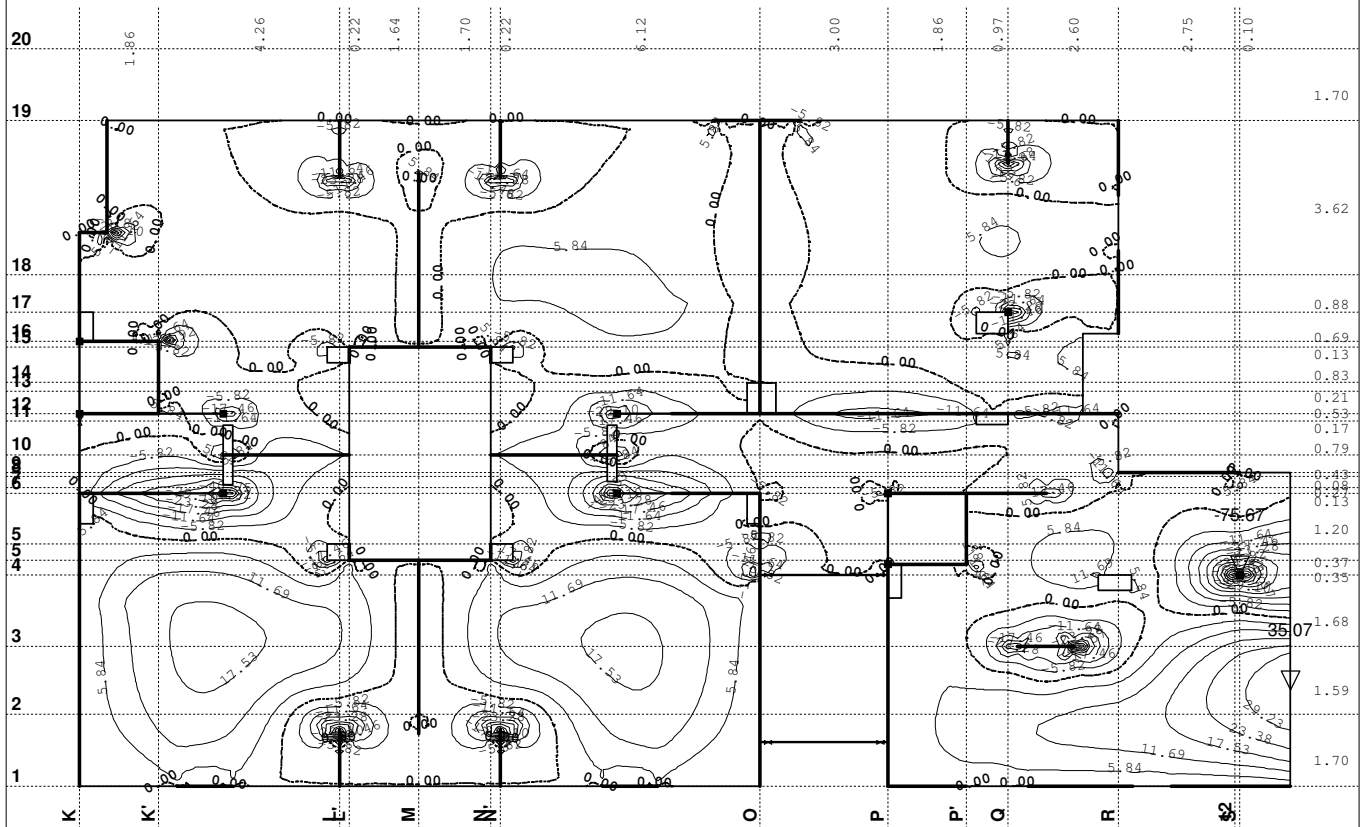
LC	Naziv
1	q (g)
2	p
3	Komb.: 1.6xI+1.8xII

LC	Naziv
4	Komb.: 3.5xI
5	Komb.: I+II

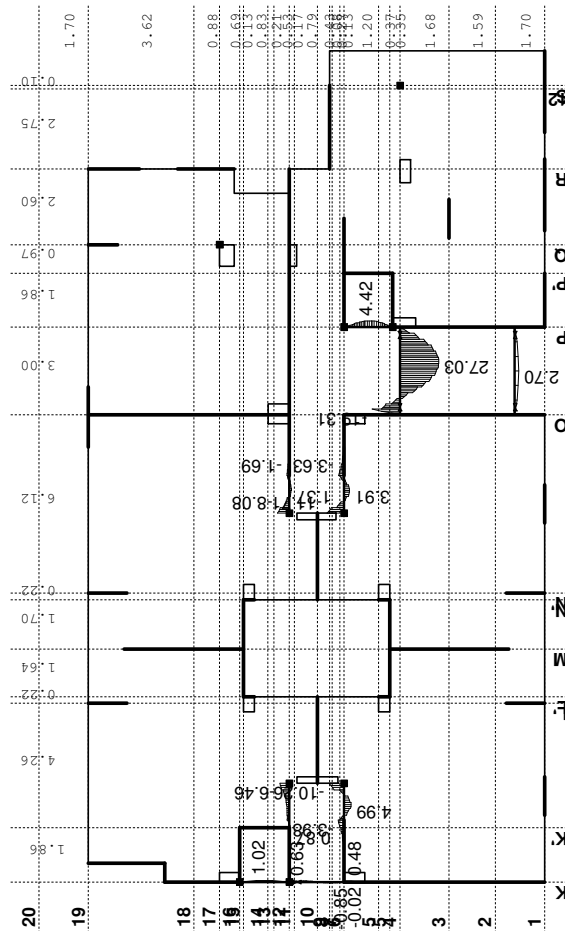
Opt. 3: $1.6x_I + 1.8x_{II}$ 

Radimpex - www.radimpex.rs

Opt. 3: 1.6xl+1.8xII

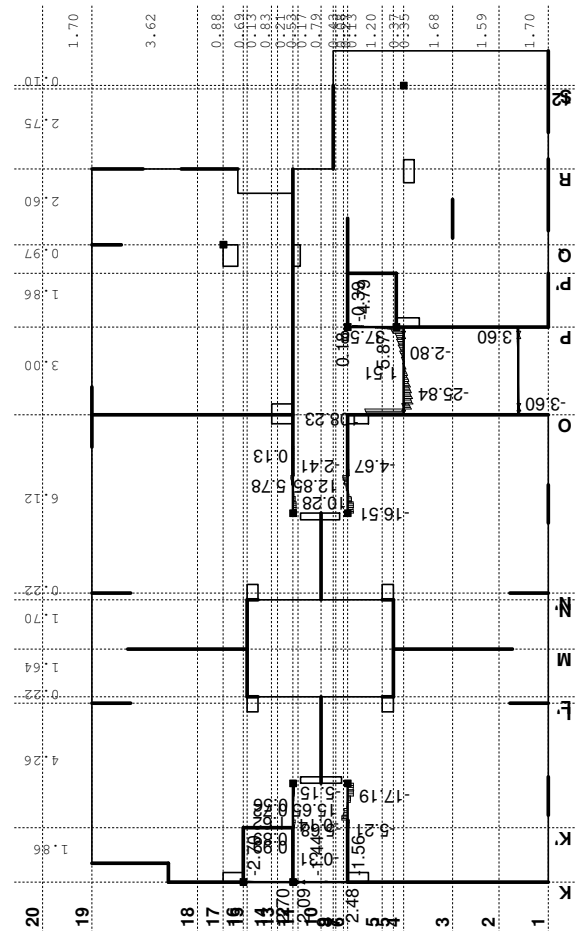


Uticaji u ploči: max $M_y = 35.07$ / min $M_y = -75.67$ kNm/m
Opt. 3: 1.6xl+1.8xII






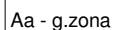
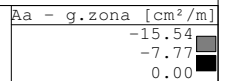
Uticaji u gredi: max $M_3 = 27.03$ / min $M_3 = -19.31$ kNm

Opt. 3: 1.6xl+1.8xII

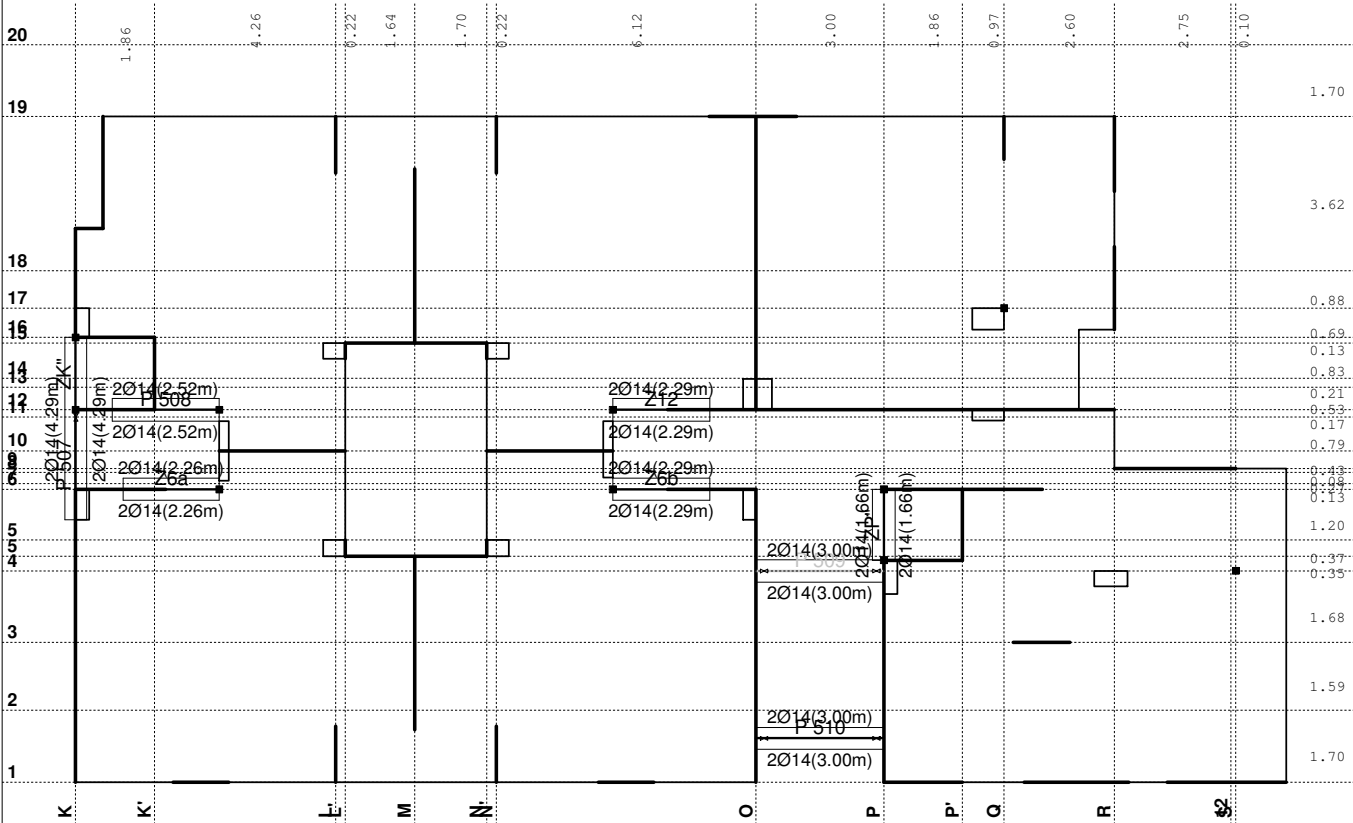


Uticaji u gredi: max $T_2 = 108.23$ / min $T_2 = -25.84$ kNm

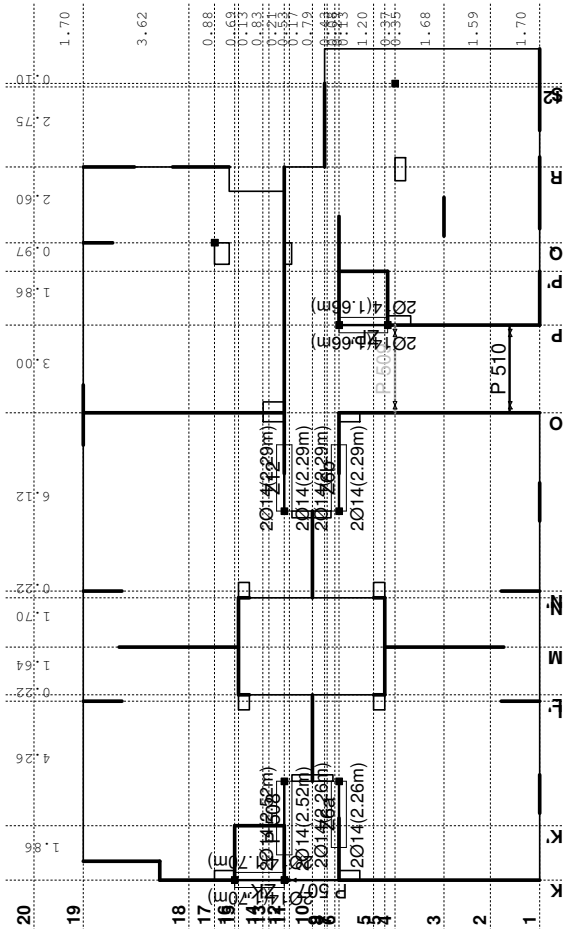
Aa - d.zona [cm ² /m]	
0.00	
2.53	
5.06	



Usvojena armatura
PBAB 87, MB 30, MA 500/560

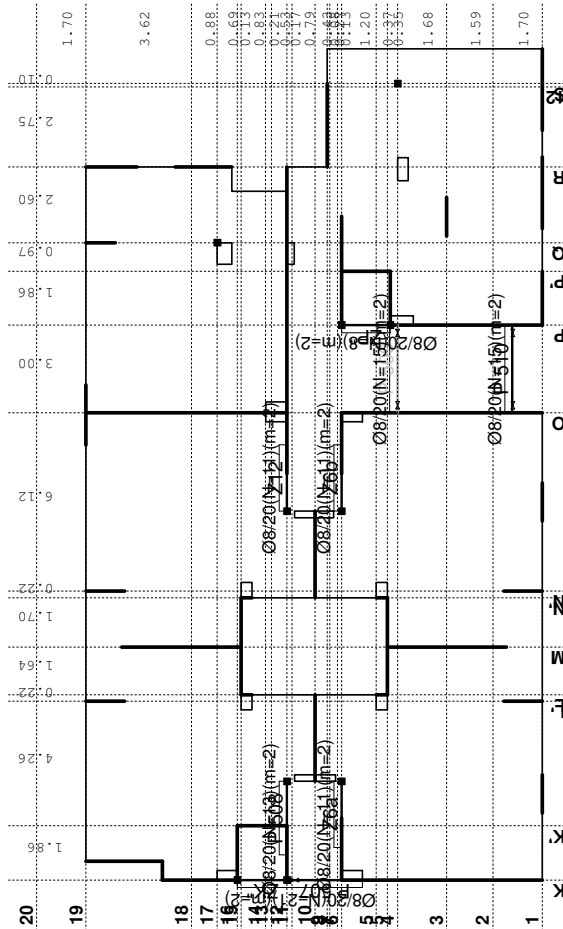


Armatura u gredama: Aa2/Aa1
Usvojena armatura
PBAB 87, MB 30, MA 500/560



Armatura u gredama: Aa3/Aa4

Usvojena armatura
PBAB 87, MB 30, MA 500/560



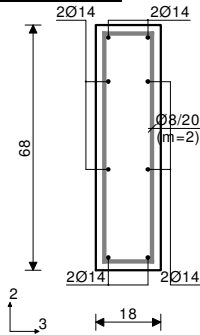
Armatura u gredama: Aa,uz

Z12 (5016-5942)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 0.78m$ 

[cm]

$$\begin{aligned} T2u &= 0.53 \text{ kN} \\ M1u &= 0.35 \text{ kNm} \\ M3u &= 1.37 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -0.144/10.000 \% \\ Aa1 &= 0.04 \text{ cm}^2 \\ Aa2 &= 0.00 \text{ cm}^2 \\ Aa3 &= 0.00 \text{ cm}^2 \\ Aa4 &= 0.00 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/m \quad (m=2) \\ [Usvojeno Aa_{uz} &= \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/m] \end{aligned}$$

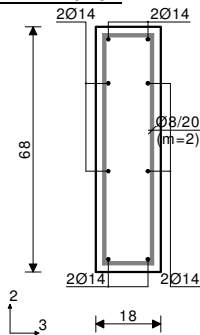
$$\begin{aligned} \tau_y &= 0.14 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \tau_z &= 0.13 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \text{Procenat armiranja: } &1.01\% \end{aligned}$$

Z6b (4338-5175)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 2-2 $x = 0.78m$ 

[cm]

$$\begin{aligned} T2u &= 2.99 \text{ kN} \\ M1u &= -1.03 \text{ kNm} \\ M3u &= 3.90 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -0.247/10.000 \% \\ Aa1 &= 0.13 + 0.00 = 0.13 \text{ cm}^2 \\ Aa2 &= 0.00 + 0.00 = 0.00 \text{ cm}^2 \\ Aa3 &= 0.00 + 0.07 = 0.07 \text{ cm}^2 \\ Aa4 &= 0.00 + 0.07 = 0.07 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/m \quad (m=2) \\ [Usvojeno Aa_{uz} &= \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/m] \end{aligned}$$

$$\begin{aligned} \tau_y &= 0.42 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \tau_z &= 0.39 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \text{Procenat armiranja: } &1.01\% \end{aligned}$$

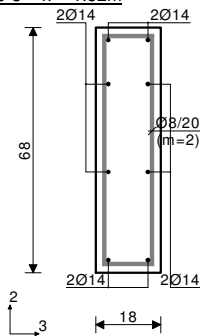
*) - dodatna podužna armatura za prijem torzije.

P 508 (1954-1277)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 3-3 $x = 1.52m$ 

[cm]

$$\begin{aligned} T2u &= -4.38 \text{ kN} \\ M1u &= -2.43 \text{ kNm} \\ M3u &= 0.31 \text{ kNm} \end{aligned}$$

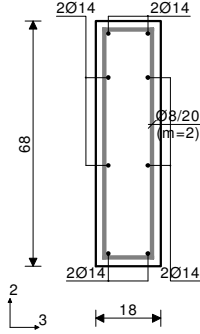
$$\begin{aligned} \epsilon_b/\epsilon_a &= -0.068/10.000 \% \\ Aa1 &= 0.00 + 0.04 = 0.04 \text{ cm}^2 \\ Aa2 &= 0.00 + 0.04 = 0.04 \text{ cm}^2 \\ Aa3 &= 0.00 + 0.17 = 0.17 \text{ cm}^2 \\ Aa4 &= 0.00 + 0.17 = 0.17 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/m \quad (m=2) \\ [Usvojeno Aa_{uz} &= \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/m] \end{aligned}$$

$$\begin{aligned} \tau_y &= 0.95 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \tau_z &= 0.91 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \text{Procenat armiranja: } &1.01\% \end{aligned}$$

*) - dodatna podužna armatura za prijem torzije.

Z6a (1434-925)
 PBAB 87
 MB 30
 MA 500/560
 Dimenzionisanje jednog slučaja
 opterećenja: 1.60xI+1.80xII

Presek 4-4 x = 1.89m



[cm]

T2u = -1.62 kN
 M1u = 3.12 kNm
 M3u = -0.68 kNm

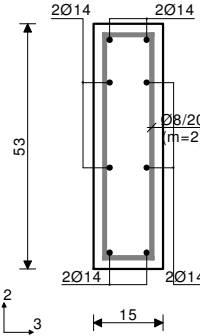
$\epsilon_b/\epsilon_a = -0.101/10.000 \text{ ‰}$
 $A_{a1} = 0.00 + 0.06' = 0.06 \text{ cm}^2$
 $A_{a2} = 0.02 + 0.06' = 0.08 \text{ cm}^2$
 $A_{a3} = 0.00 + 0.22' = 0.22 \text{ cm}^2$
 $A_{a4} = 0.00 + 0.22' = 0.22 \text{ cm}^2$
 $A_{a,uz} = 0.00 \text{ cm}^2/\text{m} \quad (m=2)$
 [Usvojeno $A_{a,uz} = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$\tau_y = 1.19 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 1.17 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.01%
 *) - dodatna podužna armatura za prijem torzije.

ZK" (1476-1087)

PBAB 87
 MB 30
 MA 500/560
 Dimenzionisanje jednog slučaja
 opterećenja: 1.60xI+1.80xII

Presek 5-5 x = 0.85m



[cm]

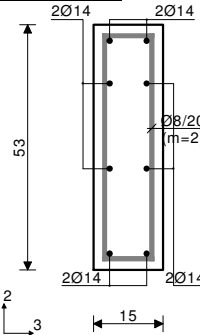
M3u = 1.02 kNm

$\epsilon_b/\epsilon_a = -0.176/10.000 \text{ ‰}$
 $A_{a1} = 0.04 \text{ cm}^2$
 $A_{a2} = 0.00 \text{ cm}^2$
 $A_{a3} = 0.00 \text{ cm}^2$
 $A_{a4} = 0.00 \text{ cm}^2$
 $A_{a,uz} = 0.00 \text{ cm}^2/\text{m} \quad (m=2)$
 [Usvojeno $A_{a,uz} = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]
 Procenat armiranja: 1.55%

ZP" (6868-6173)

PBAB 87
 MB 30
 MA 500/560
 Dimenzionisanje jednog slučaja
 opterećenja: 1.60xI+1.80xII

Presek 6-6 x = 0.96m



[cm]

T2u = -0.27 kN
 M3u = 4.42 kNm

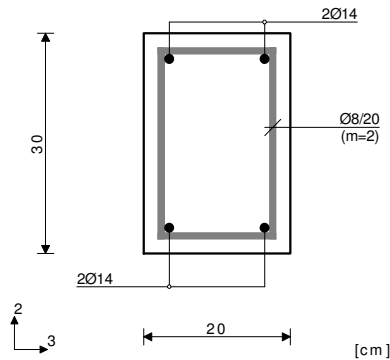
$\epsilon_b/\epsilon_a = -0.377/10.000 \text{ ‰}$
 $A_{a1} = 0.19 \text{ cm}^2$
 $A_{a2} = 0.00 \text{ cm}^2$
 $A_{a3} = 0.00 \text{ cm}^2$
 $A_{a4} = 0.00 \text{ cm}^2$
 $A_{a,uz} = 0.00 \text{ cm}^2/\text{m} \quad (m=2)$
 [Usvojeno $A_{a,uz} = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]
 Procenat armiranja: 1.55%

P 507 (587-1087)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 8-8 $x = 1.20\text{m}$ 

$$T2u = 1.14 \text{ kN}$$

$$M3u = -0.85 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.248/10.000 \text{ ‰}$$

$$Aa1 = 0.00 \text{ cm}^2$$

$$Aa2 = 0.06 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \phi 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.02 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

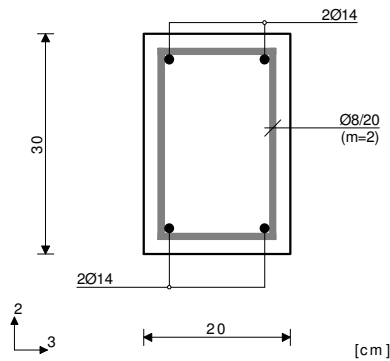
Procenat armiranja: 1.03%

P 509 (4865-6069)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 7-7 $x = 1.76\text{m}$ 

$$T2u = -2.80 \text{ kN}$$

$$M3u = 26.93 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -1.790/10.000 \text{ ‰}$$

$$Aa1 = 2.11 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \phi 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.06 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

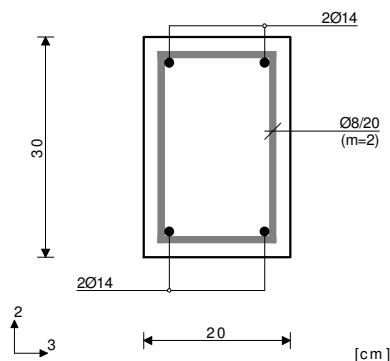
Procenat armiranja: 1.03%

P 510 (3512-4526)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 1.00\text{m}$ 

$$T2u = -1.20 \text{ kN}$$

$$M3u = 2.40 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.428/10.000 \text{ ‰}$$

$$Aa1 = 0.18 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \phi 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.02 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

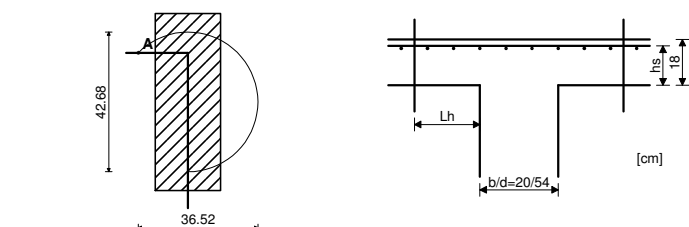
Procenat armiranja: 1.03%

Kontrola ploča na probijanje

Nivo: POS 500+ [0.00 m]

Presek 1 (190.60,-108.22,0.00)

MB 30



KONTROLA KRITIČNOG PRESEKA 1. (Lh = 0.07m od ivice stuba)
(stub zamenjujućeg kružnog preseka, ds = 0.28m)

Merodavna kombinacija: I+II	
Sila u stubu	N = 76.921 kN
Merodavni smičući napon (tačka A)	$\tau = 0.611$ MPa
Debljina ploče	d,pl = 0.180 m
Statička visina ploče	hs = 0.150 m
Obim kritičnog preseka	Okp = 0.839 m
Postojeća armatura u ploči	
Površina armature - pravac 1	Aa,1 = 12.147 cm ²
Procenat armiranja - pravac 1	$\mu_1 = 0.810$ %
Površina armature - pravac 2	Aa,2 = 12.147 cm ²
Procenat armiranja - pravac 2	$\mu_2 = 0.810$ %
Srednja vrednost procenta armiranja	$\mu = 0.810$ %
Koeficijent	$\alpha_a = 1.400$
Koeficijent	$\gamma_1 = 1.638$
Koeficijent	$\gamma_2 = 0.567$
Dopušteni glavni napon zatezanja	$\tau_a = 0.800$
Dopušteni glavni napon zatezanja	$\tau_b = 2.200$
Maksimalna otpornost($\gamma_2 \times \tau_b$)	$\tau_{max} = 1.247$ MPa

Uslov: $\tau \leq \tau_{max}$ (0.61 ≤ 1.25)

Uslov je ispunjen.

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

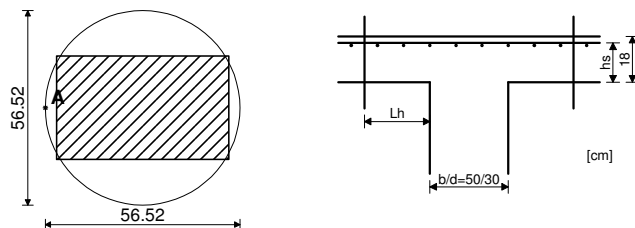
$\tau_{gr} = 0.874$ MPa

Uslov: $\tau \leq \tau_{gr}$ (0.61 ≤ 0.87)

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

Kontrola ploča na probijanje

Nivo: POS 500+ [0.00 m]
Presek 2 (196.05,-114.40,0.00)
MB 30



KONTROLA KRITIČNOG PRESEKA 1. (Lh = 0.07m od ivice stuba)
(stub zamenjujućeg kružnog preseka, ds = 0.42m)

Merodavna kombinacija: I+II	
Sila u stubu	N = 181.70 kN
Merodavni smičući napon (tačka A)	$\tau = 0.682$ MPa
Debljina ploče	d,pl = 0.180 m
Statička visina ploče	hs = 0.150 m
Obim kritičnog preseka	Okp = 1.776 m
Postojeća armatura u ploči	
Površina armature - pravac 1	Aa,1 = 9.425 cm ²
Procenat armiranja - pravac 1	$\mu_1 = 0.628$ %
Površina armature - pravac 2	Aa,2 = 9.425 cm ²
Procenat armiranja - pravac 2	$\mu_2 = 0.628$ %
Srednja vrednost procenta armiranja	$\mu = 0.628$ %
Koeficijent	$\alpha_a = 1.400$
Koeficijent	$\gamma_1 = 1.443$
Koeficijent	$\gamma_2 = 0.499$
Dopušteni glavni napon zatezanja	$\tau_a = 0.800$
Dopušteni glavni napon zatezanja	$\tau_b = 2.200$
Maksimalna otpornost($\gamma_2 \times \tau_b$)	$\tau_{max} = 1.099$ MPa

Uslov: $\tau \leq \tau_{max}$ (0.68 ≤ 1.10)

Uslov je ispunjen.

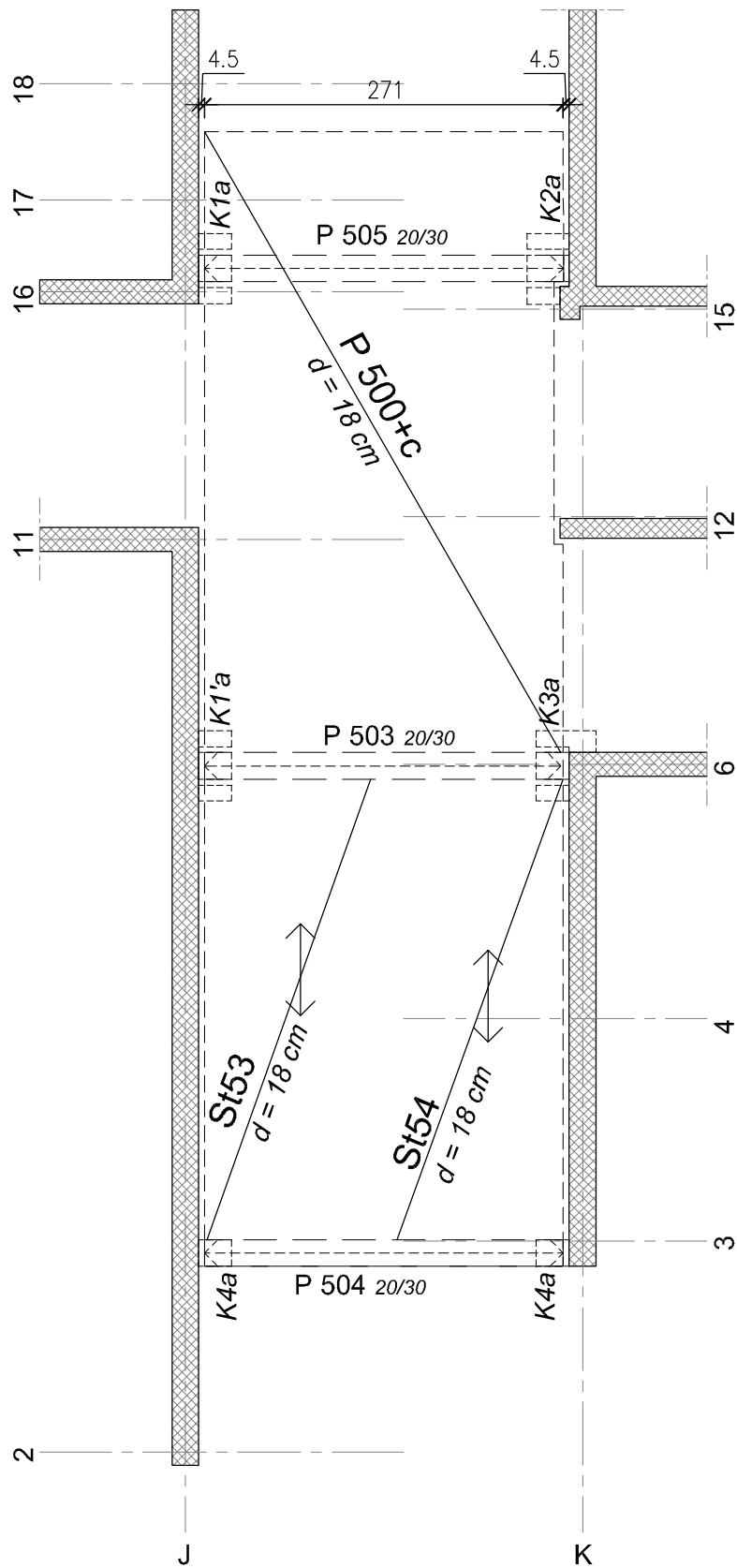
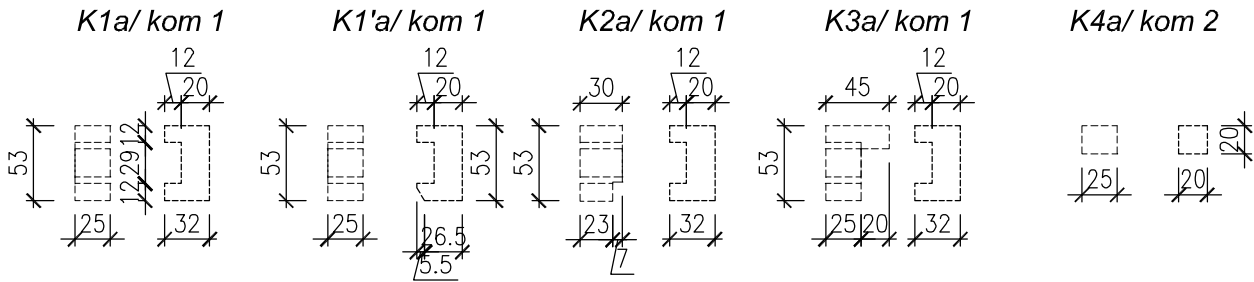
Otpornost na probijanje ploče bez dodatne armature za obezbeđenje ($2/3 \times \gamma_1 \times \tau_a$)

$\tau_{gr} = 0.769$ MPa

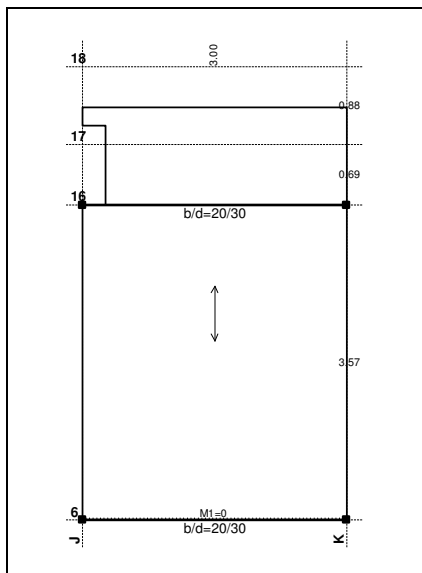
Uslov: $\tau \leq \tau_{gr}$ (0.68 ≤ 0.77)

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

P 500+	P 400+	P 300+	P 200+
--------	--------	--------	--------

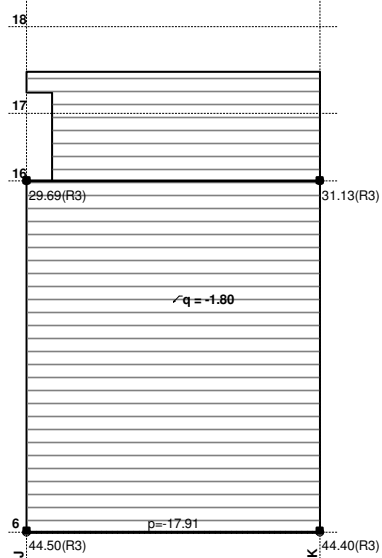


K1, K2 - Arm. bet. kratki elementi P 200-500+



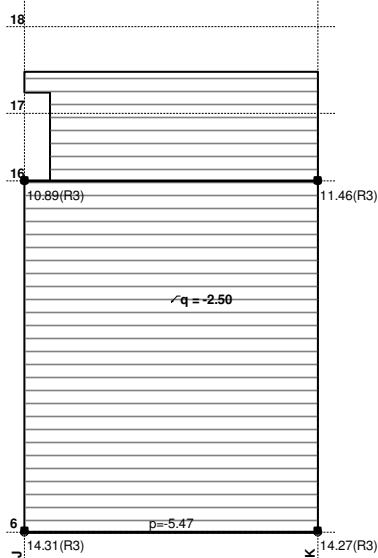
Statički proračun

Opt. 1: g (g)



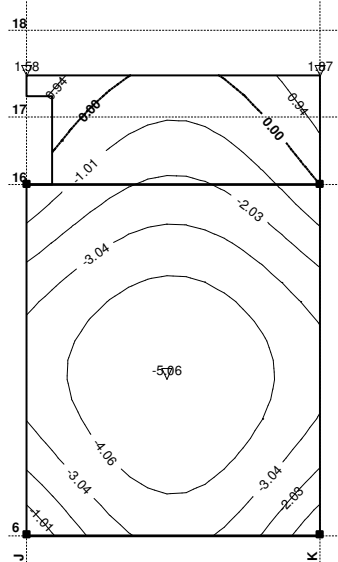
Reakcije oslonaca

Opt. 2: p



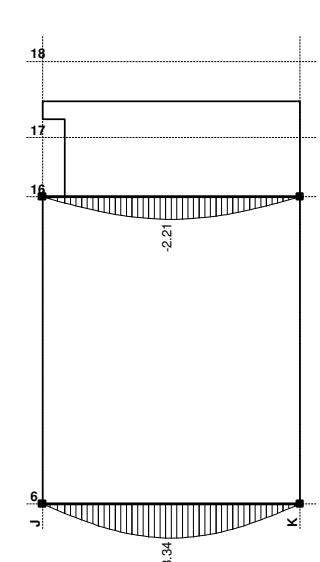
Reakcije oslonaca

Opt. 3: 3.5xl+II



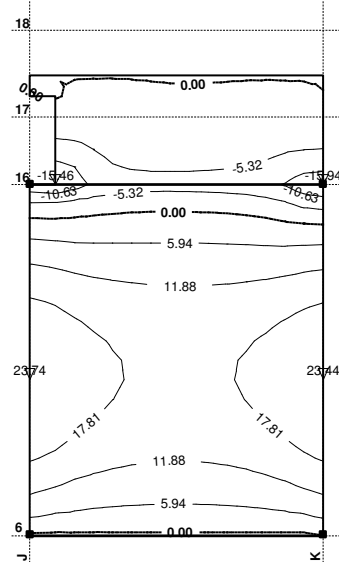
Uticaji u ploči: max Zp= 1.87 / min Zp= -5.06 m / ...

Opt. 3: 3.5xl+II



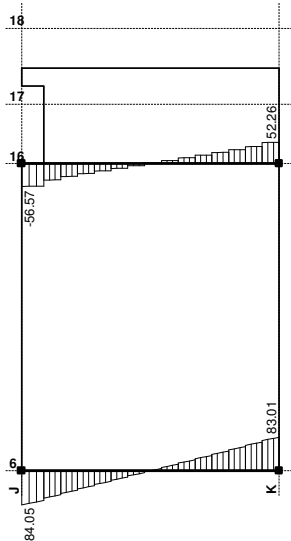
Uticaji u gredi: max Zp= -0.00 / min Zp= -3.34 m ...

Opt. 4: 1.6xl+1.8xII



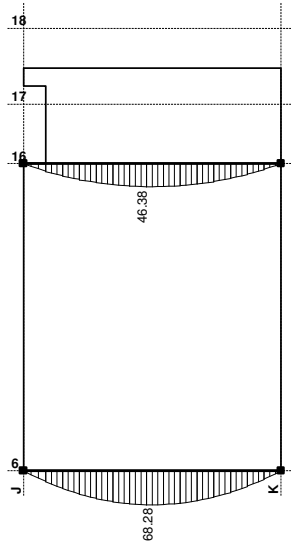
Uticaji u ploči: max My= 23.74 / min My= -15.94...

Opt. 4: 1.6xl+1.8xll



Uticaji u gredi: max T2= 83.01 / min T2= -84.05 kN

Opt. 4: 1.6xl+1.8xll



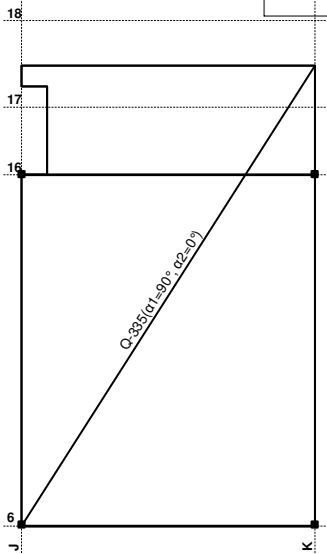
Uticaji u gredi: max M3= 68.28 / min M3= 0.57 kNm

Dimenzionisanje (beton)

Usvojena armatura

PBAB 87, MB 30, MA 500/600, a=2.00 cm

Aa - d.zona [cm ² /m]
0.00
1.54
3.08

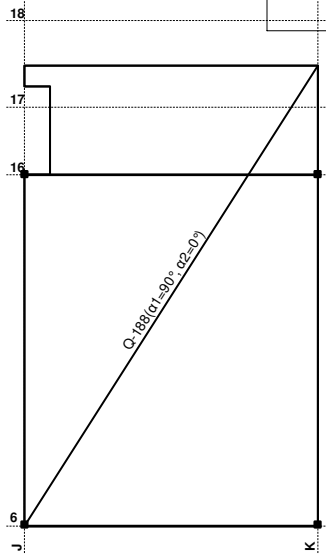


Aa - d.zona_P 200+c

Usvojena armatura

PBAB 87, MB 30, MA 500/600, a=2.00 cm

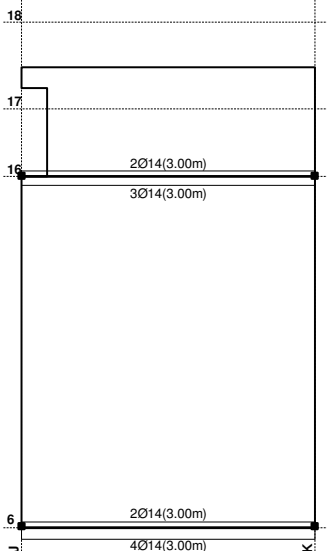
Aa - g.zona [cm ² /m]
-1.79
-1.19
-0.60
0.00



Aa - g.zona_P 200+c

Usvojena armatura

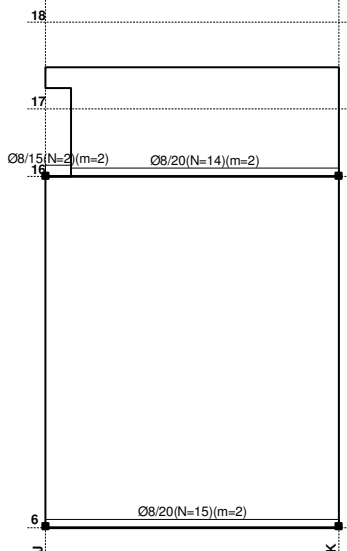
PBAB 87, MB 30, MA 500/600



Armatura u gredama : P 205, 203
Aa2/Aa1

Usvojena armatura

PBAB 87, MB 30, MA 500/600

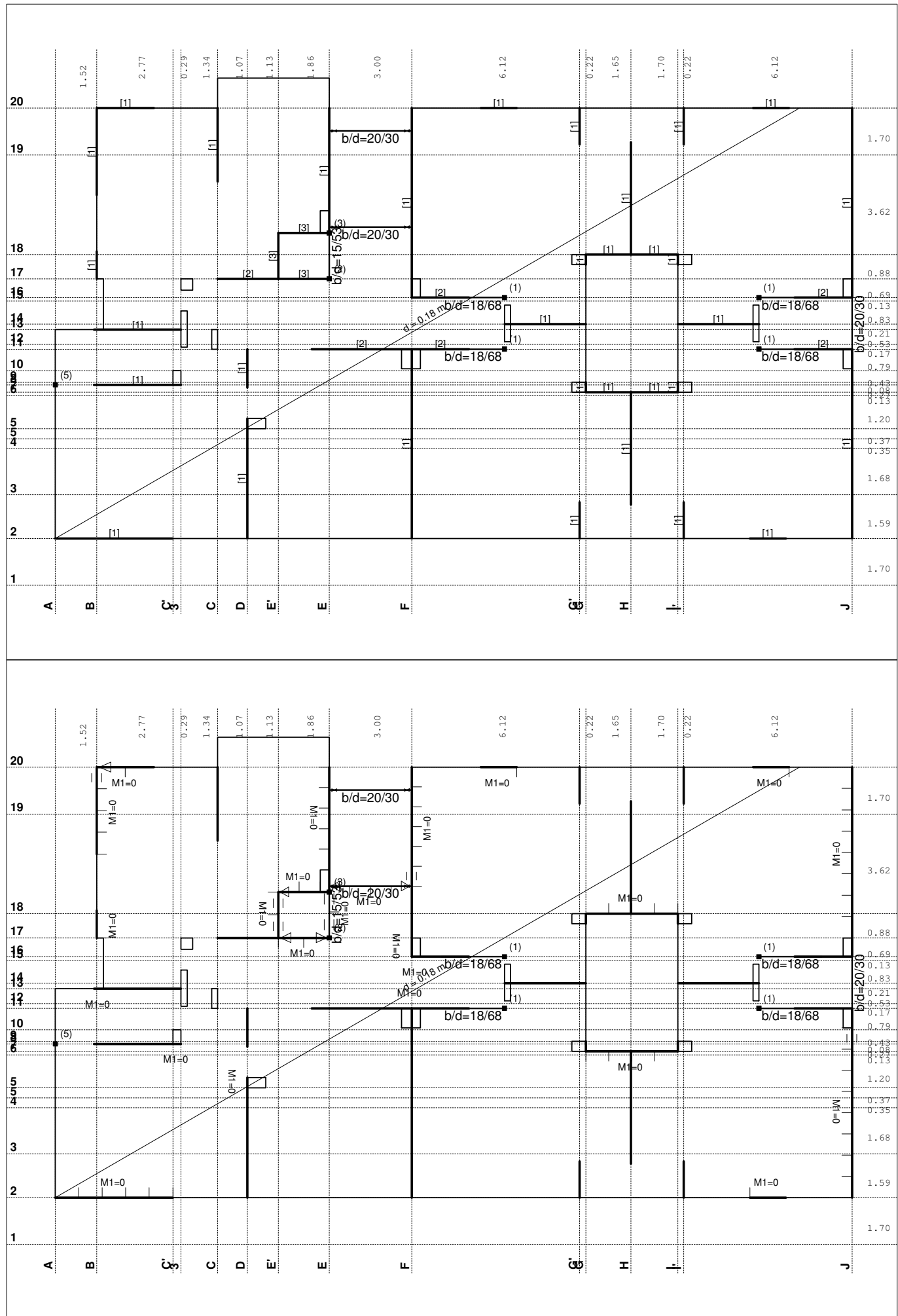


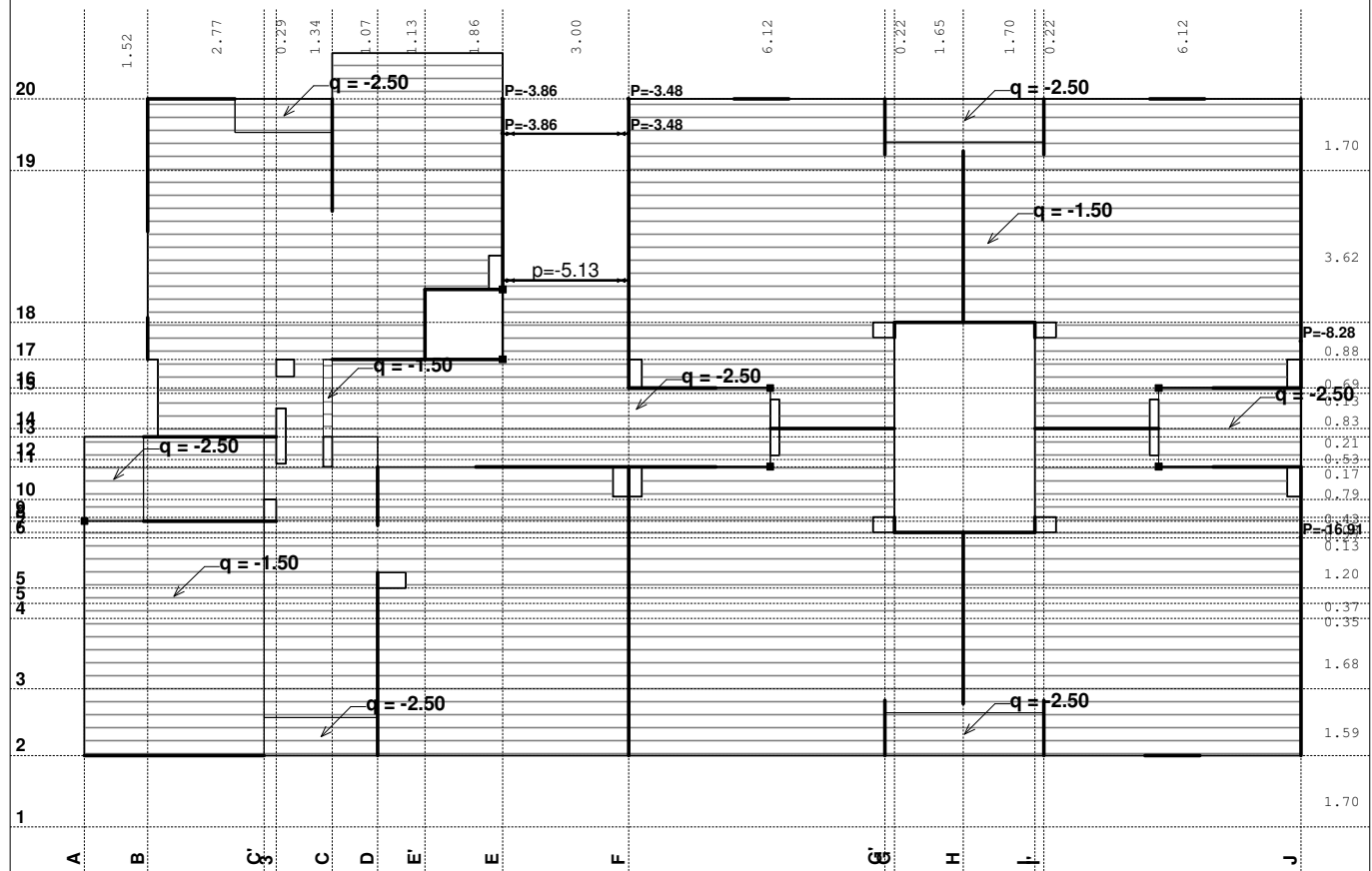
Armatura u gredama : P 205, 203
Aa,uz

*Napomena: P 204-504
dimenzionisane uz St23, St24.*

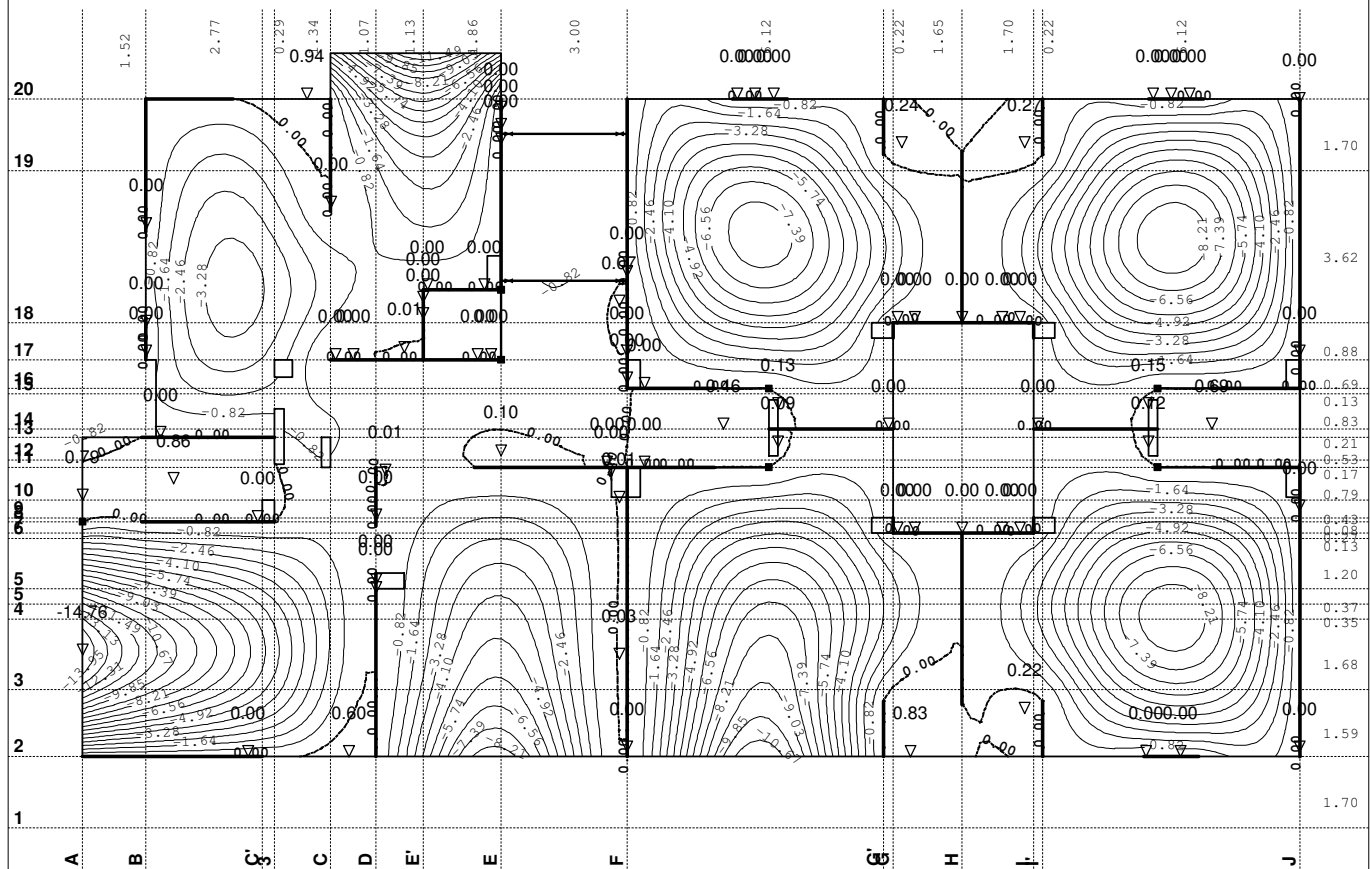
*Za P 600-700+ duzina
KE 30 cm.*

POS 400+ - KONSTRUKCIJA IZNAD TREĆEG SPRATA



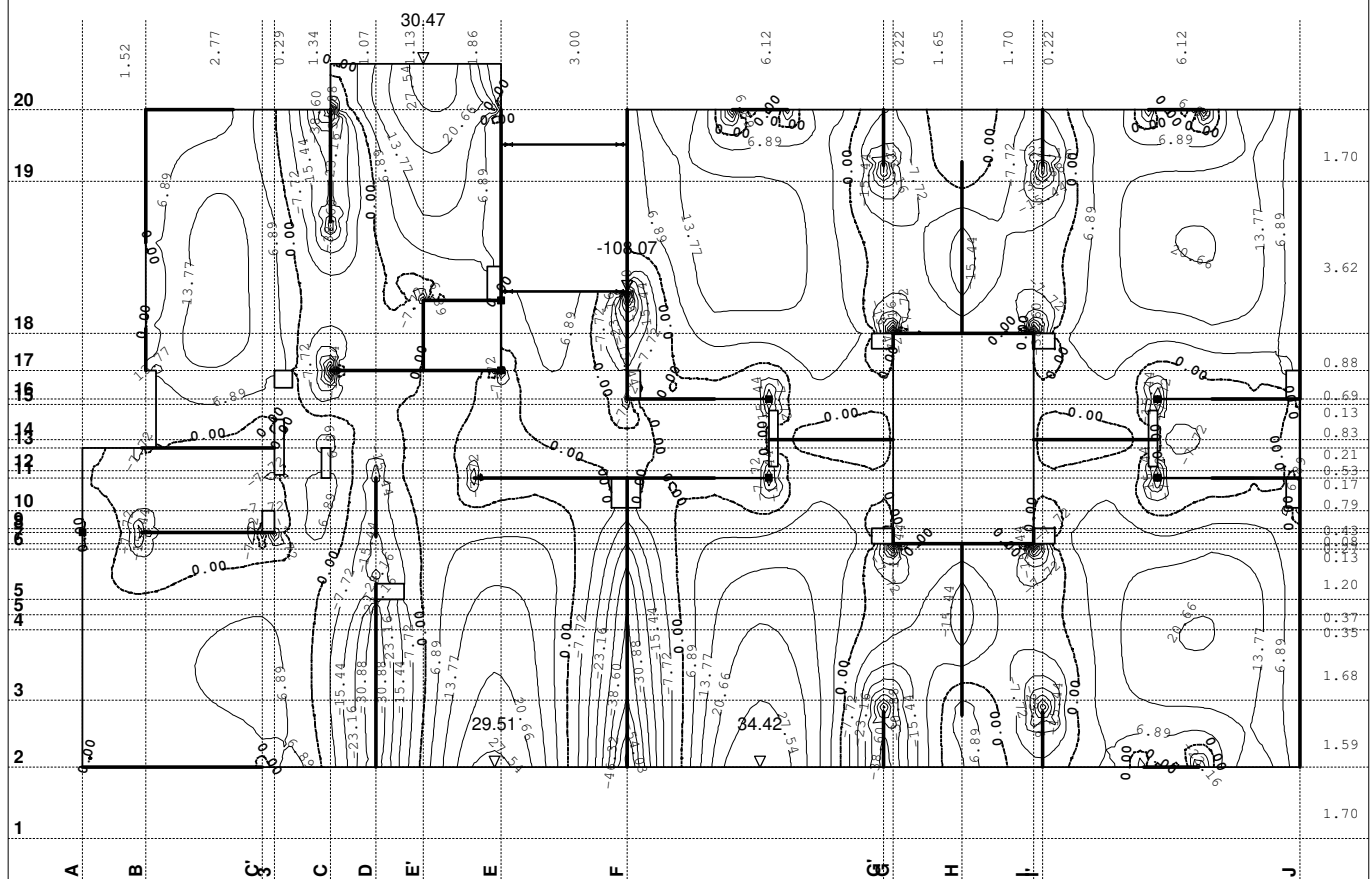


Opt. 5: 3.5xl+II



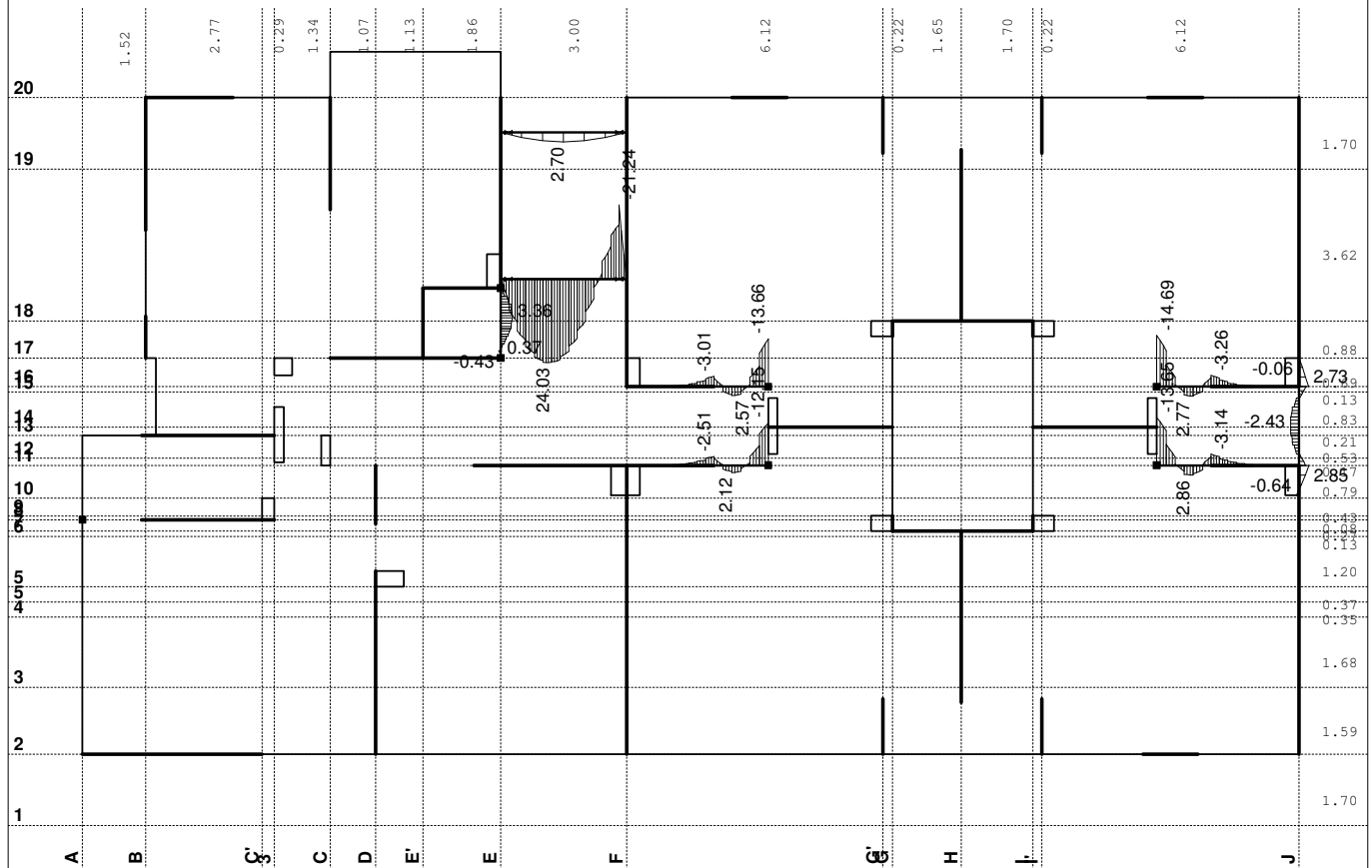
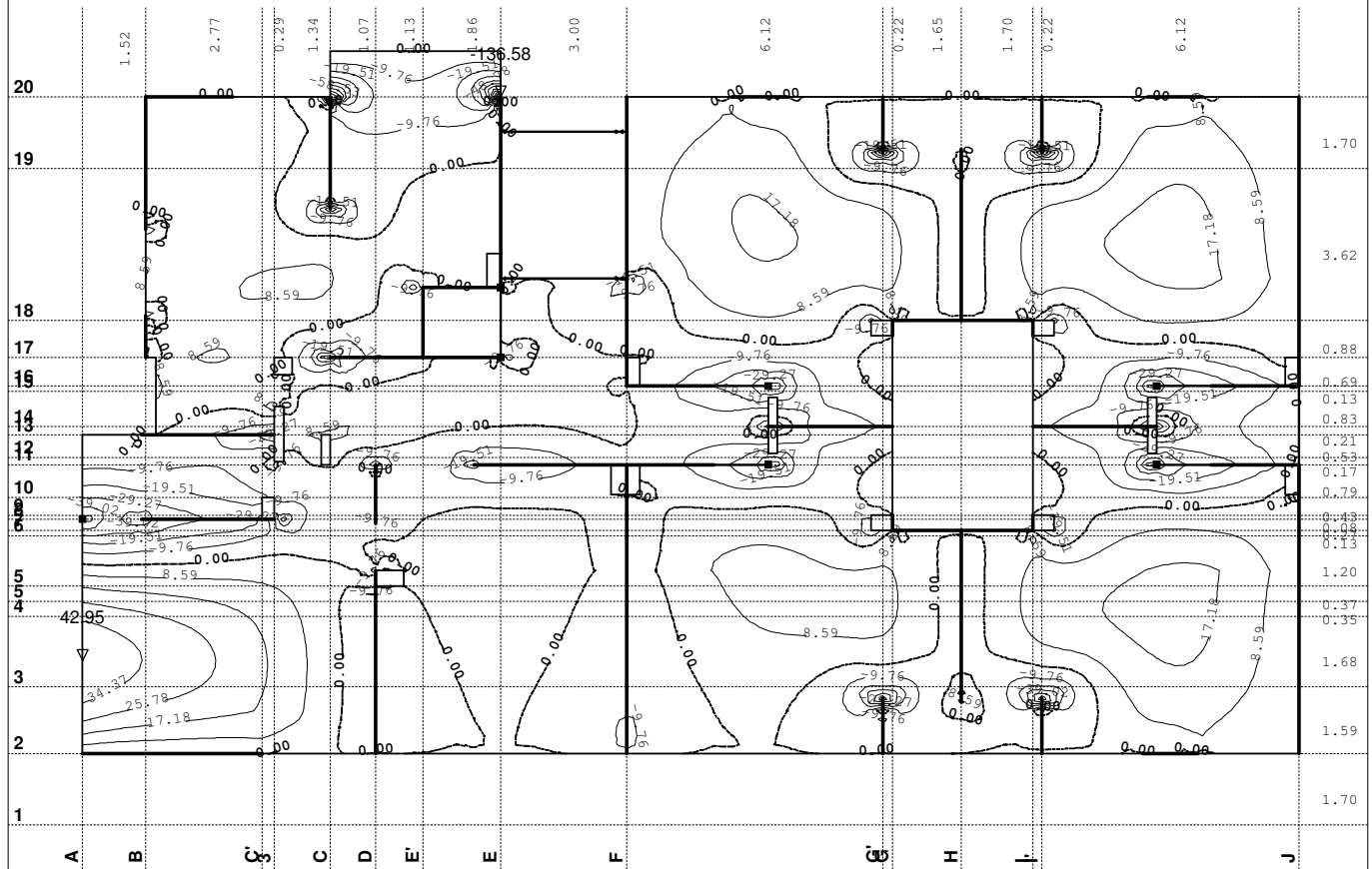
Uticaji u ploči: max $Z_p = 0.94$ / min $Z_p = -14.76$ m / 1000

Opt. 4: 1.6xl+1.8xII

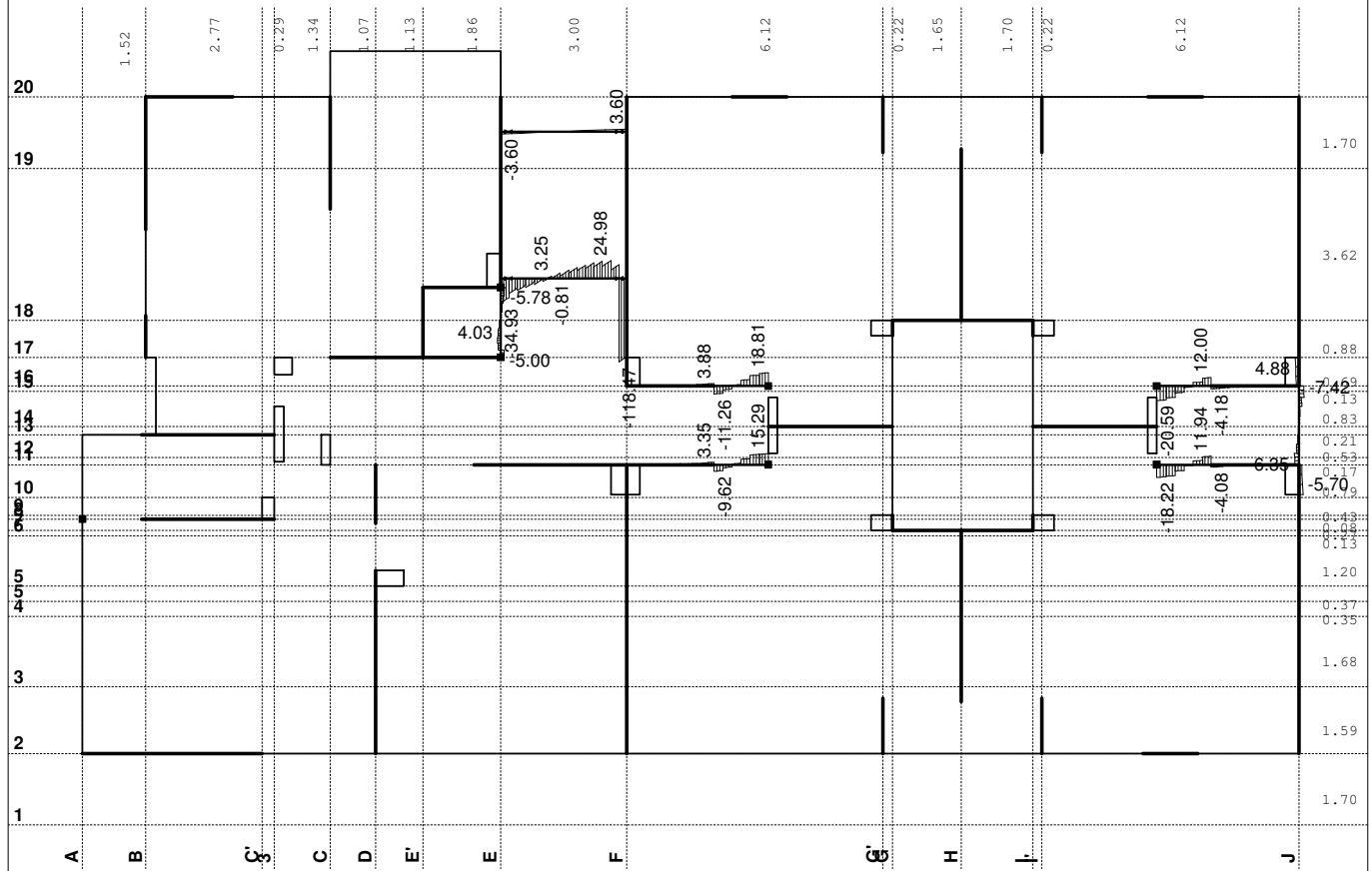


Uticaji u ploči: max $M_x = 34.42$ / min $M_x = -108.07$ kNm/m

Opt. 4: 1.6xl+1.8xll



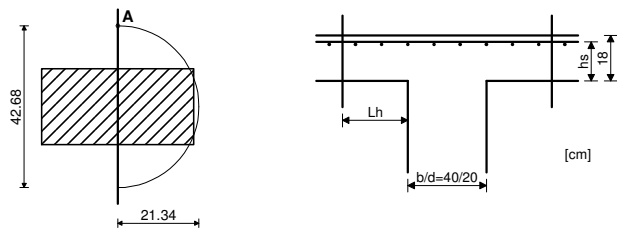
Opt. 4: 1.6xl+1.8xII



Uticaji u gredi: max T2= 24.98 / min T2= -118.47 kN

Kontrola ploča na probijanje

Nivo: POS 300+ [0.00 m]
 Presek 1 (136.76,-112.08,0.00)
 MB 30



KONTROLA KRITIČNOG PRESEKA 1. ($L_h = 0.07\text{m}$ od ivice stuba)
 (stub zamenjujućeg kruznog preseka, $d_s = 0.28\text{m}$)

Merodavna kombinacija: I

Sila u stubu	$N =$	41.182 kN
Faktor povećanja napona zbog ekscentričnosti	$\beta =$	1.400
Merodavni smičući napon (tačka A)	$\tau =$	0.573 MPa
Debljina ploče	$d, pl =$	0.180 m
Statička visina ploče	$h_s =$	0.150 m

Obim kritičnog preseka $Okp = 0.670\text{ m}$

Postojeća armatura u ploči

Površina armature - pravac 1	$A_{a,1} =$	9.425 cm ²
Procenat armiranja - pravac 1	$\mu,1 =$	0.628 %
Površina armature - pravac 2	$A_{a,2} =$	9.425 cm ²
Procenat armiranja - pravac 2	$\mu,2 =$	0.628 %
Srednja vrednost procenta armiranja	$\mu =$	0.628 %
Koeficijent	$\alpha_a =$	1.400
Koeficijent	$\gamma_1 =$	1.443
Koeficijent	$\gamma_2 =$	0.499
Dopušteni glavni napon zatezanja	$\tau_a =$	0.800
Dopušteni glavni napon zatezanja	$\tau_b =$	2.200
Maksimalna otpornost ($\gamma_2 \times \tau_b$)	$\tau_{,max} =$	1.099 MPa

Uslov: $\tau \leq \tau_{,max}$ (0.57 ≤ 1.10)

Uslov je ispunjen.

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

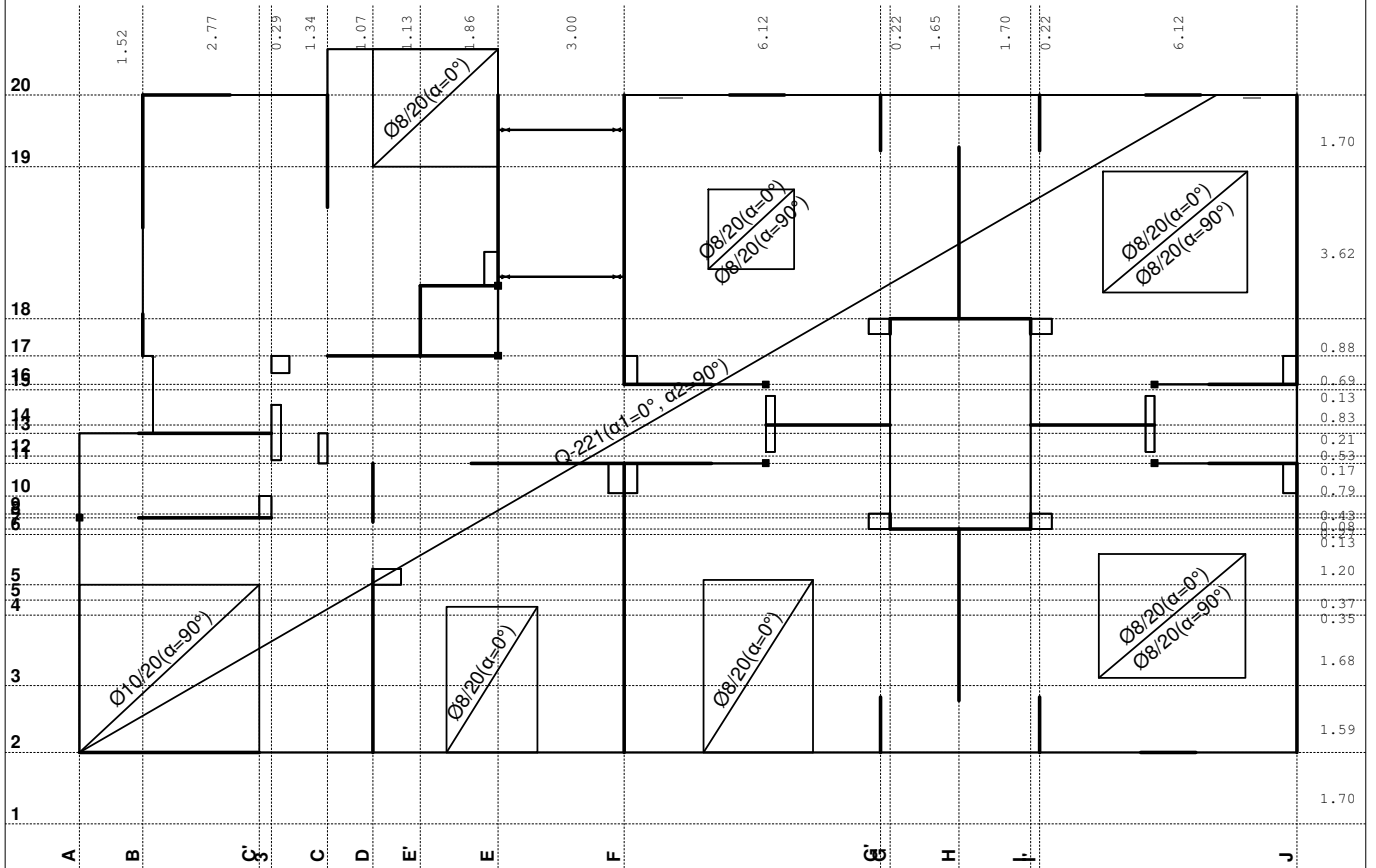
$\tau_{,gr} = 0.769\text{ MPa}$

Uslov: $\tau \leq \tau_{,gr}$ (0.57 ≤ 0.77)

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

Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

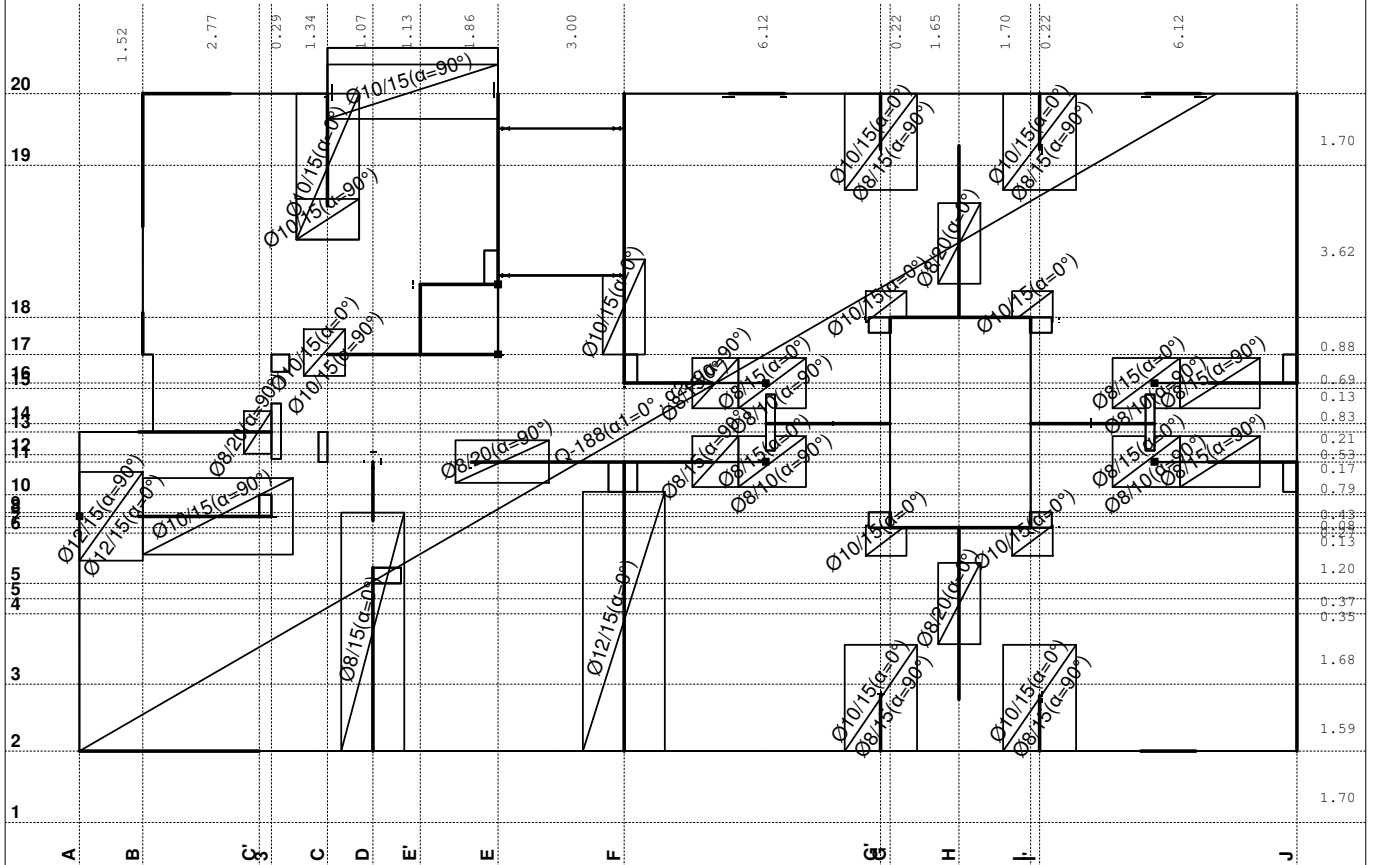
Aa - d.zona [cm ² /m]
0.00
2.84
5.67



Aa - d.zona

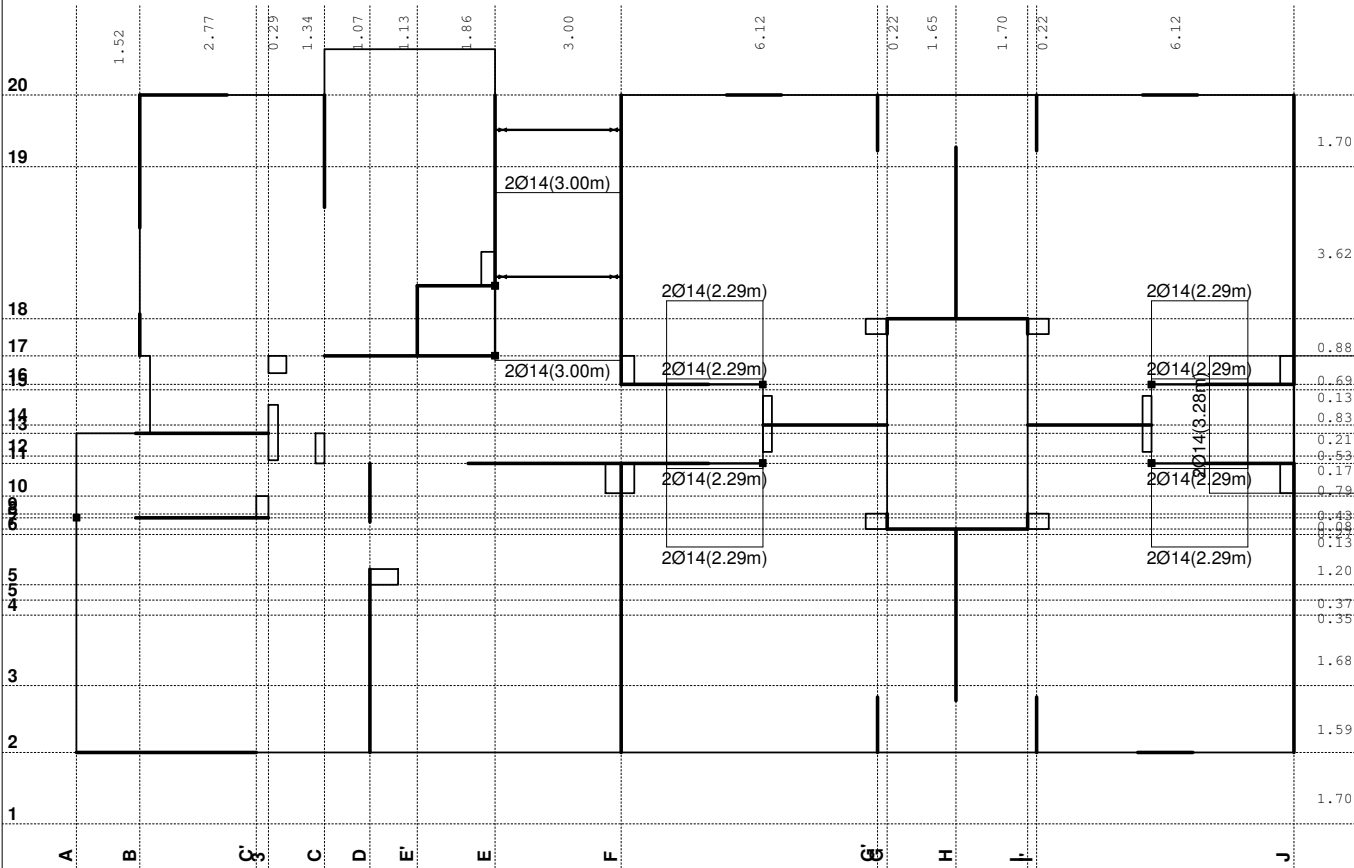
Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

Aa - g.zona [cm ² /m]
-20.28
-10.14
0.00

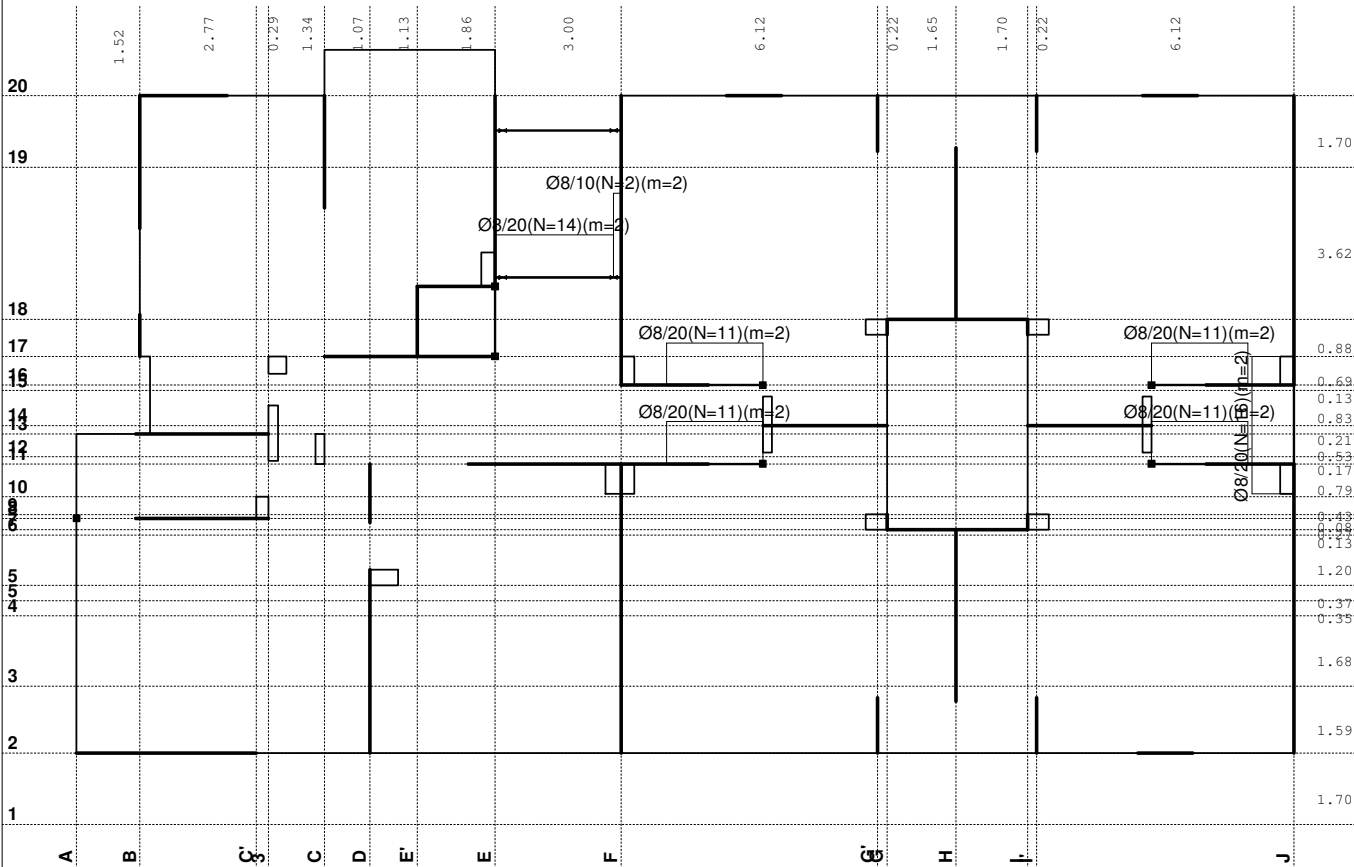


Aa - g.zona

Usvojena armatura
PBAB 87, MB 30, MA 500/600

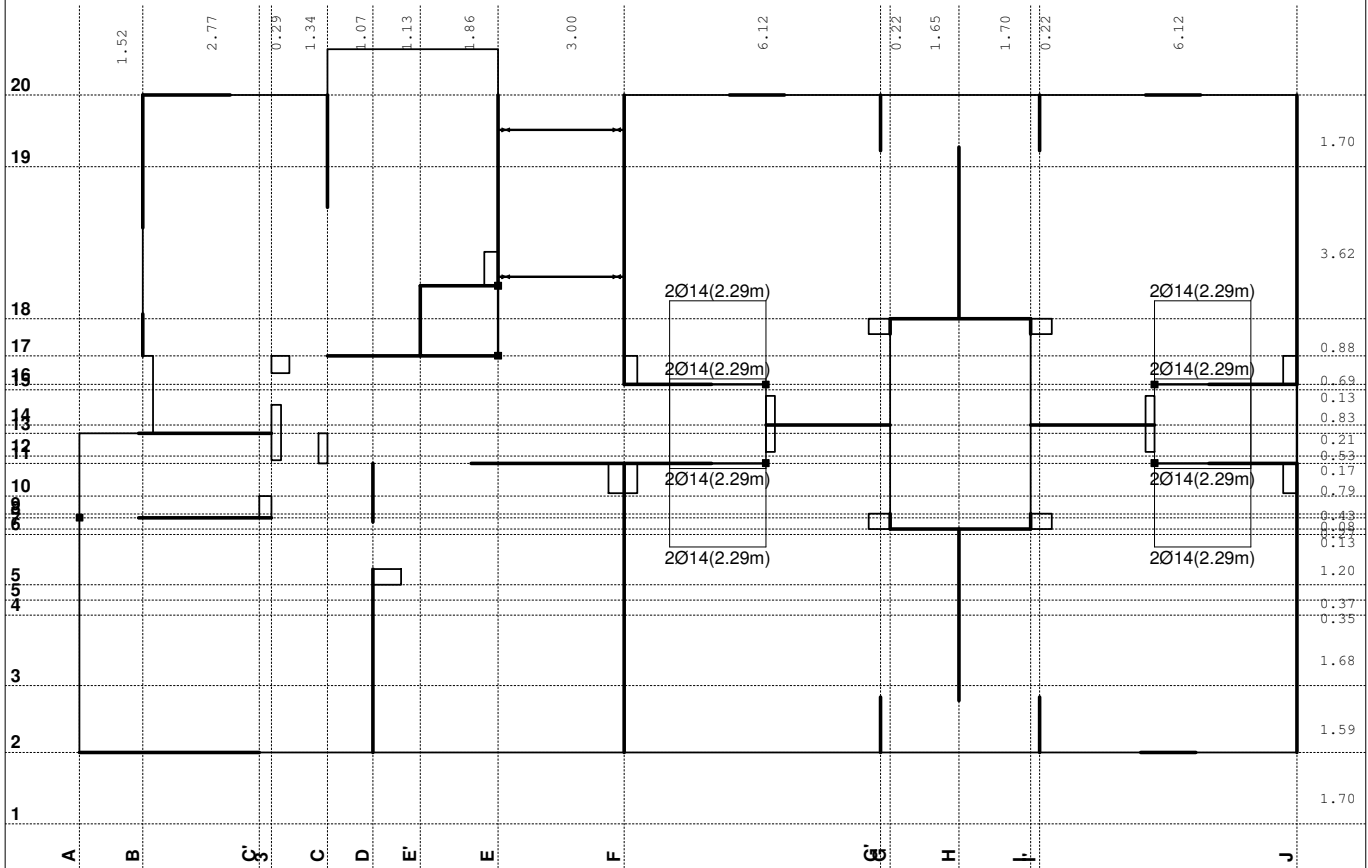


Armatura u gredama: Aa2/Aa1
Usvojena armatura
PBAB 87, MB 30, MA 500/600



Armatura u gredama: Aa,uz

Usvojena armatura
PBAB 87, MB 30, MA 500/600

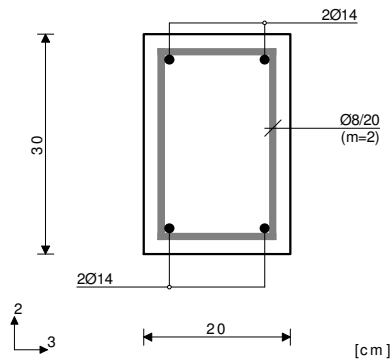


Armatura u gredama: Aa3/Aa4

Greda 5106-6304

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 $x = 1.21m$



$T2u = 3.25 \text{ kN}$
 $M3u = 23.90 \text{ kNm}$

$\epsilon_b/\epsilon_a = -1.644/10.000 \%$
 $Aa1 = 1.87 \text{ cm}^2$
 $Aa2 = 0.00 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa_{uz} = 0.00 \text{ cm}^2/m$ (m=2)
[Usvojeno $Aa_{uz} = \phi 8/20(m=2) = 2.51 \text{ cm}^2/m$]

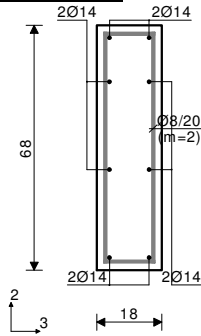
$\tau_y = 0.07 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.03%

Greda 5733-6612

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 1.42\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -4.41 \text{ kN} \\ M1u &= -1.42 \text{ kNm} \\ M3u &= 2.29 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -0.187/10.000 \text{ ‰} \\ Aa1 &= 0.08 + 0.03' = 0.10 \text{ cm}^2 \\ Aa2 &= 0.00 + 0.03' = 0.03 \text{ cm}^2 \\ Aa3 &= 0.00 + 0.10' = 0.10 \text{ cm}^2 \\ Aa4 &= 0.00 + 0.10' = 0.10 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/\text{m} \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}] \end{aligned}$$

$$\begin{aligned} \tau_y &= 0.58 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \tau_z &= 0.53 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \end{aligned}$$

Procentat armiranja: 1.01%

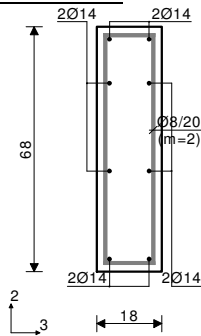
') - dodatna podužna armatura za prijem torzije.

Greda 4961-5897

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 1.42\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -3.62 \text{ kN} \\ M1u &= 1.22 \text{ kNm} \\ M3u &= 1.92 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -0.171/10.000 \text{ ‰} \\ Aa1 &= 0.06 + 0.02' = 0.09 \text{ cm}^2 \\ Aa2 &= 0.00 + 0.02' = 0.02 \text{ cm}^2 \\ Aa3 &= 0.00 + 0.09' = 0.09 \text{ cm}^2 \\ Aa4 &= 0.00 + 0.09' = 0.09 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/\text{m} \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}] \end{aligned}$$

$$\begin{aligned} \tau_y &= 0.49 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \tau_z &= 0.46 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \end{aligned}$$

Procentat armiranja: 1.01%

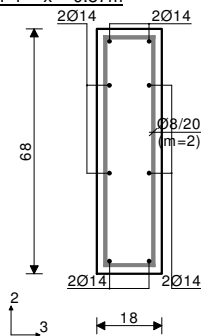
') - dodatna podužna armatura za prijem torzije.

Greda 9569-10089

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 0.87\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -0.99 \text{ kN} \\ M1u &= -0.96 \text{ kNm} \\ M3u &= 2.77 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -0.207/10.000 \text{ ‰} \\ Aa1 &= 0.09 + 0.00' = 0.09 \text{ cm}^2 \\ Aa2 &= 0.00 + 0.00' = 0.00 \text{ cm}^2 \\ Aa3 &= 0.00 + 0.07' = 0.07 \text{ cm}^2 \\ Aa4 &= 0.00 + 0.07' = 0.07 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/\text{m} \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}] \end{aligned}$$

$$\begin{aligned} \tau_y &= 0.37 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \tau_z &= 0.36 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \end{aligned}$$

Procentat armiranja: 1.01%

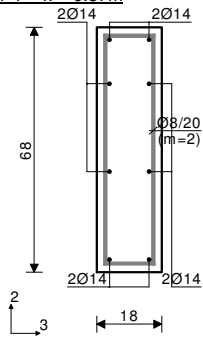
') - dodatna podužna armatura za prijem torzije.

Greda 9030-9682

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 0.87\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -0.81 \text{ kN} \\ M1u &= 1.11 \text{ kNm} \\ M3u &= 2.86 \text{ kNm} \end{aligned}$$

$$\varepsilon_b/\varepsilon_a = -0.210/10.000 \text{ ‰}$$

$$Aa1 = 0.09 + 0.02' = 0.11 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.02' = 0.02 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.08' = 0.08 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.08' = 0.08 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.42 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.42 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.01%

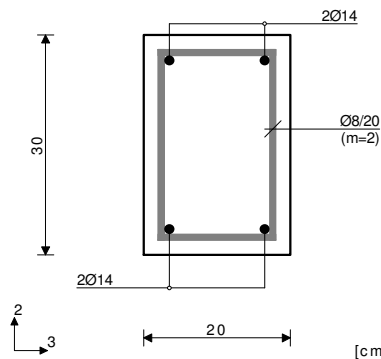
') - dodatna podužna armatura za prijem torzije.

Greda 9766-10418

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 1.63\text{m}$ 

[cm]

$$\begin{aligned} T2u &= -0.59 \text{ kN} \\ M3u &= -2.43 \text{ kNm} \end{aligned}$$

$$\varepsilon_b/\varepsilon_a = -0.431/10.000 \text{ ‰}$$

$$Aa1 = 0.00 \text{ cm}^2$$

$$Aa2 = 0.18 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

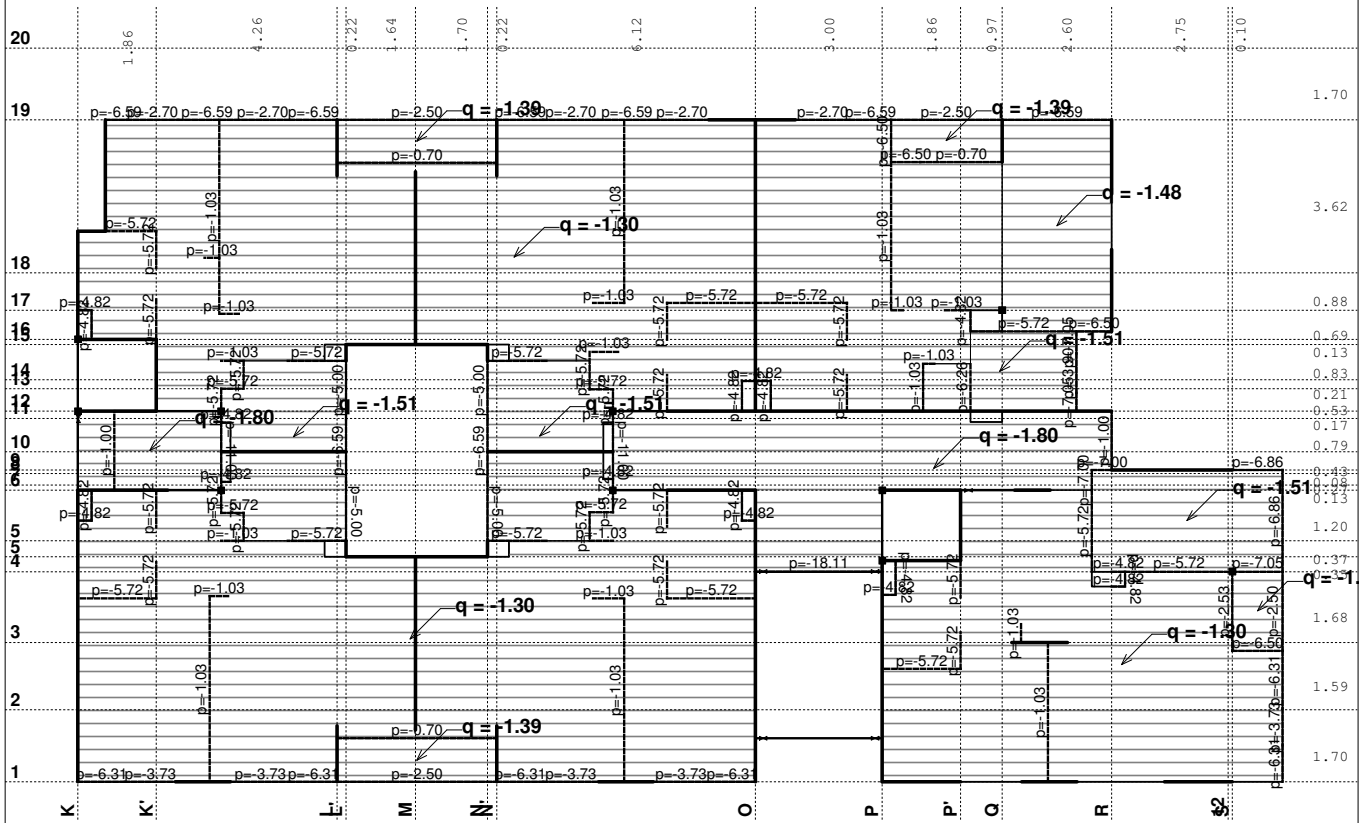
$$\tau_y = 0.01 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.03%

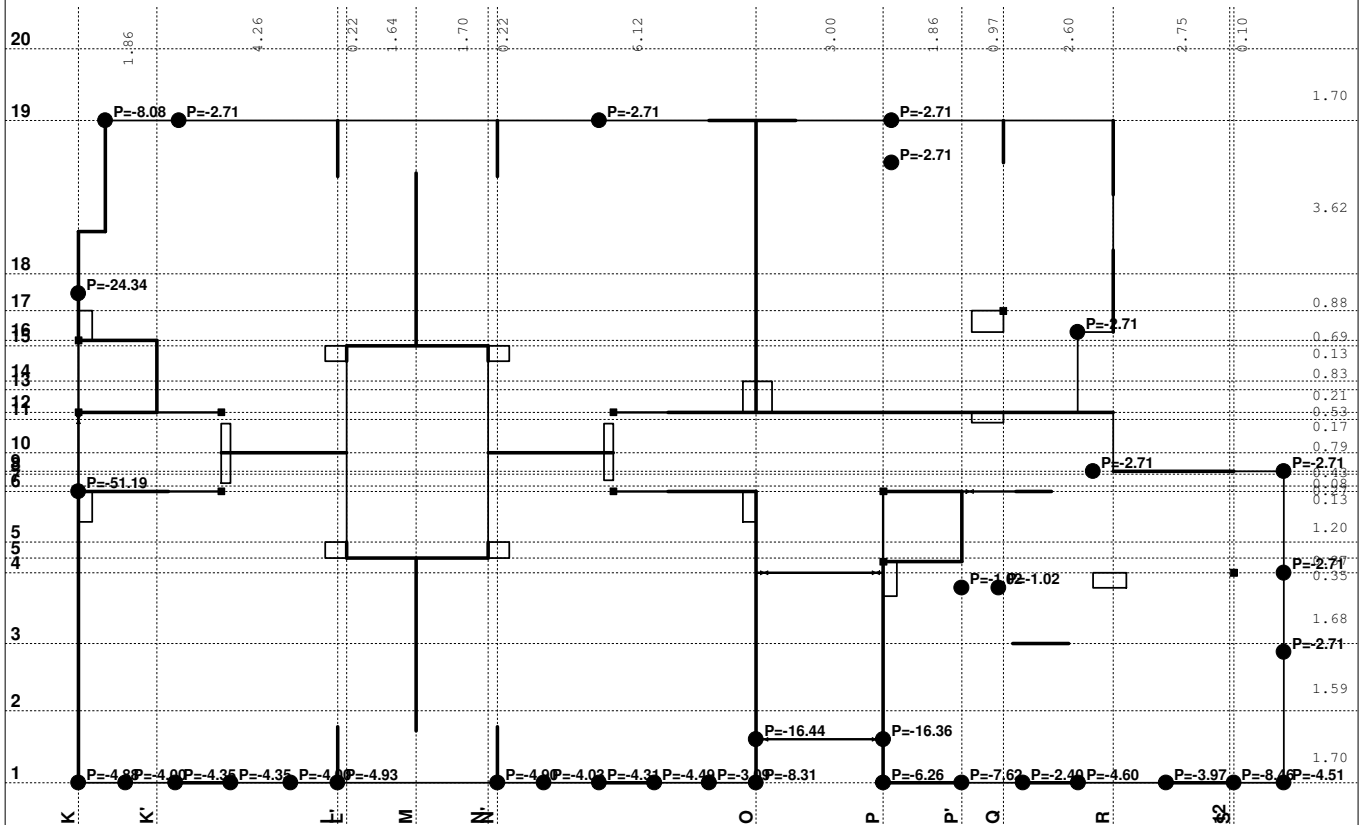
Ulazni podaci - Konstrukcija, Ulazni podaci - Opterećenje

POS 400+ - KONSTRUKCIJA IZNAD II SPRATA

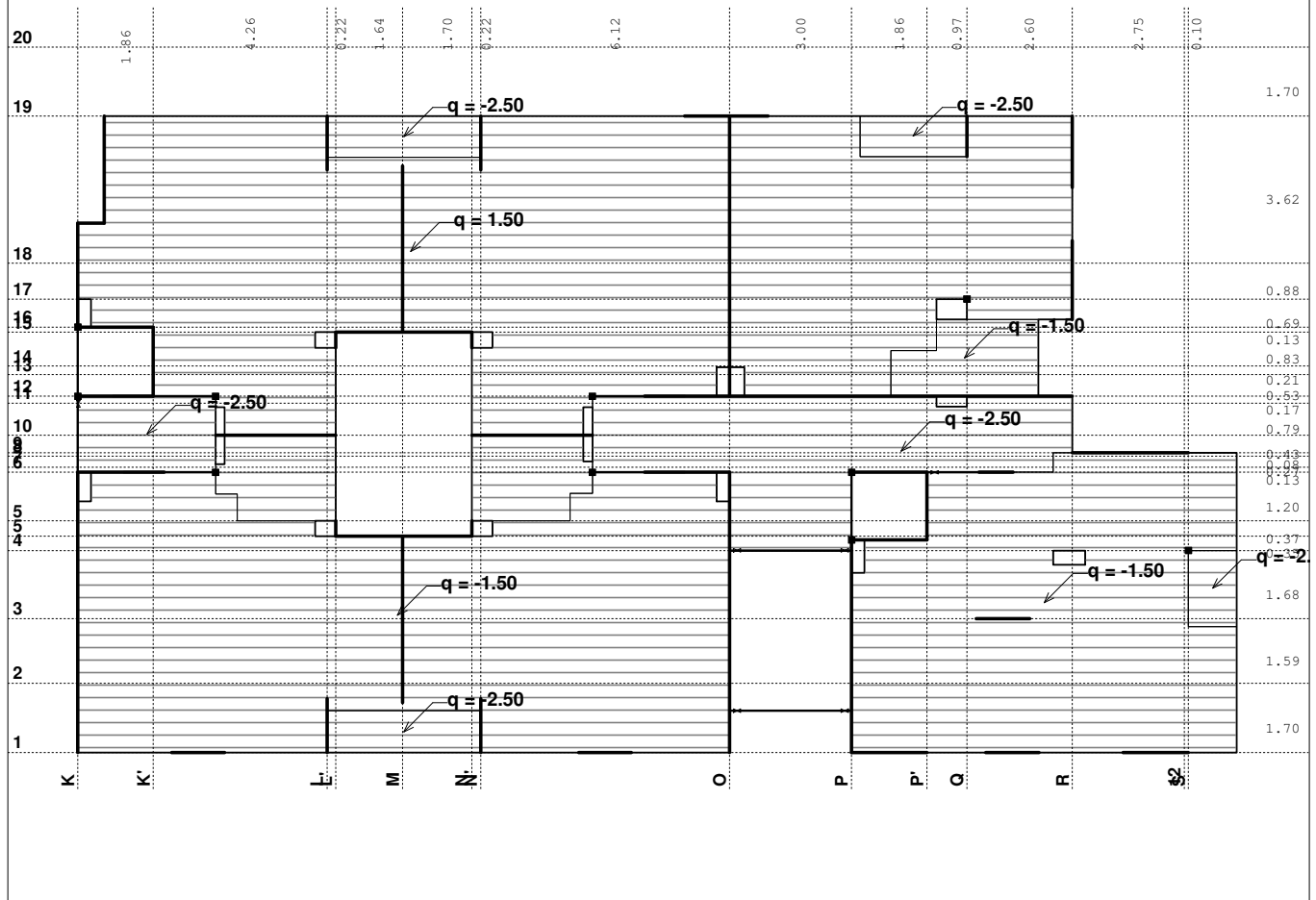
Opt. 1: g (g)



Opt. 1: g (g)



Opt. 2: p



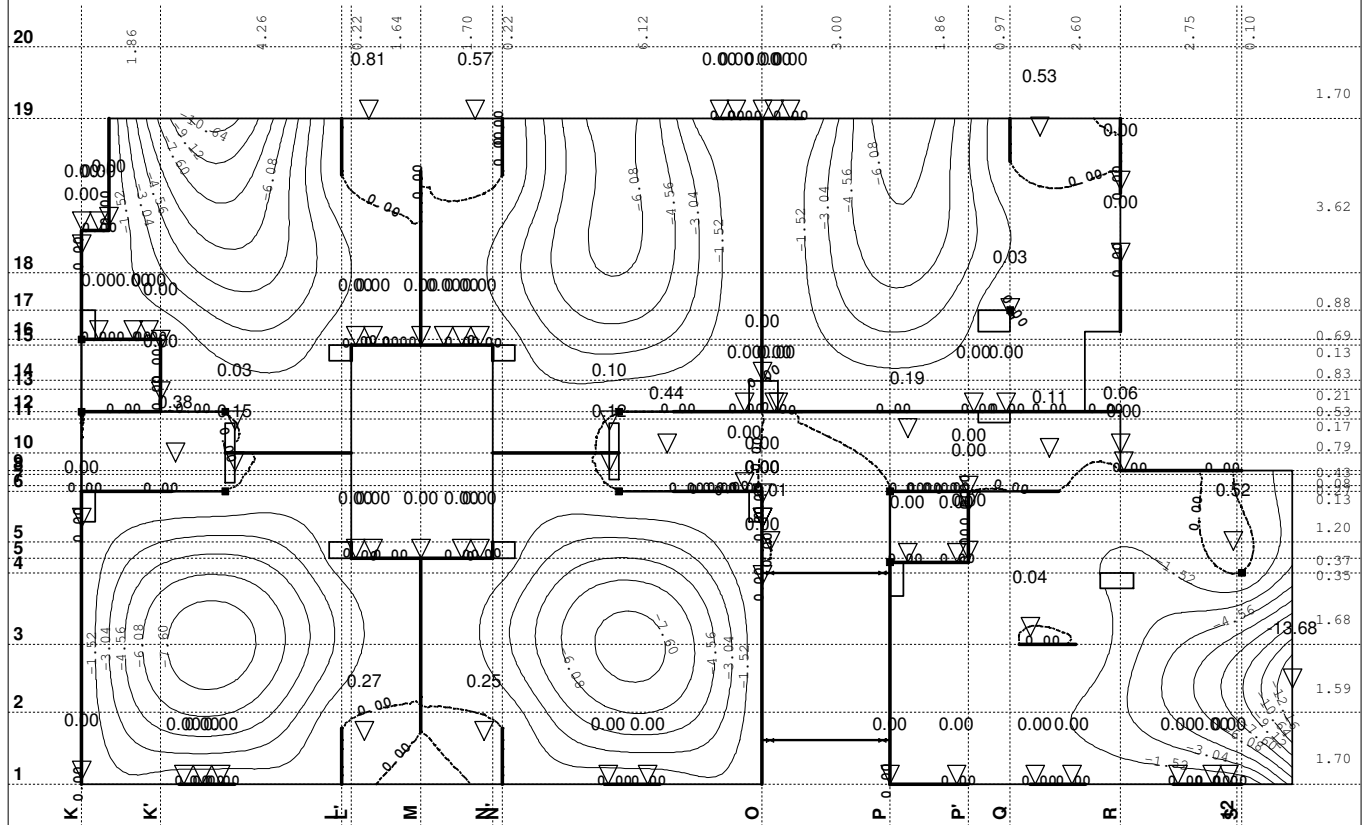
Lista slučajeva opterećenja

LC	Naziv
1	q (g)
2	p
3	Komb.: 1.6xI+1.8xII

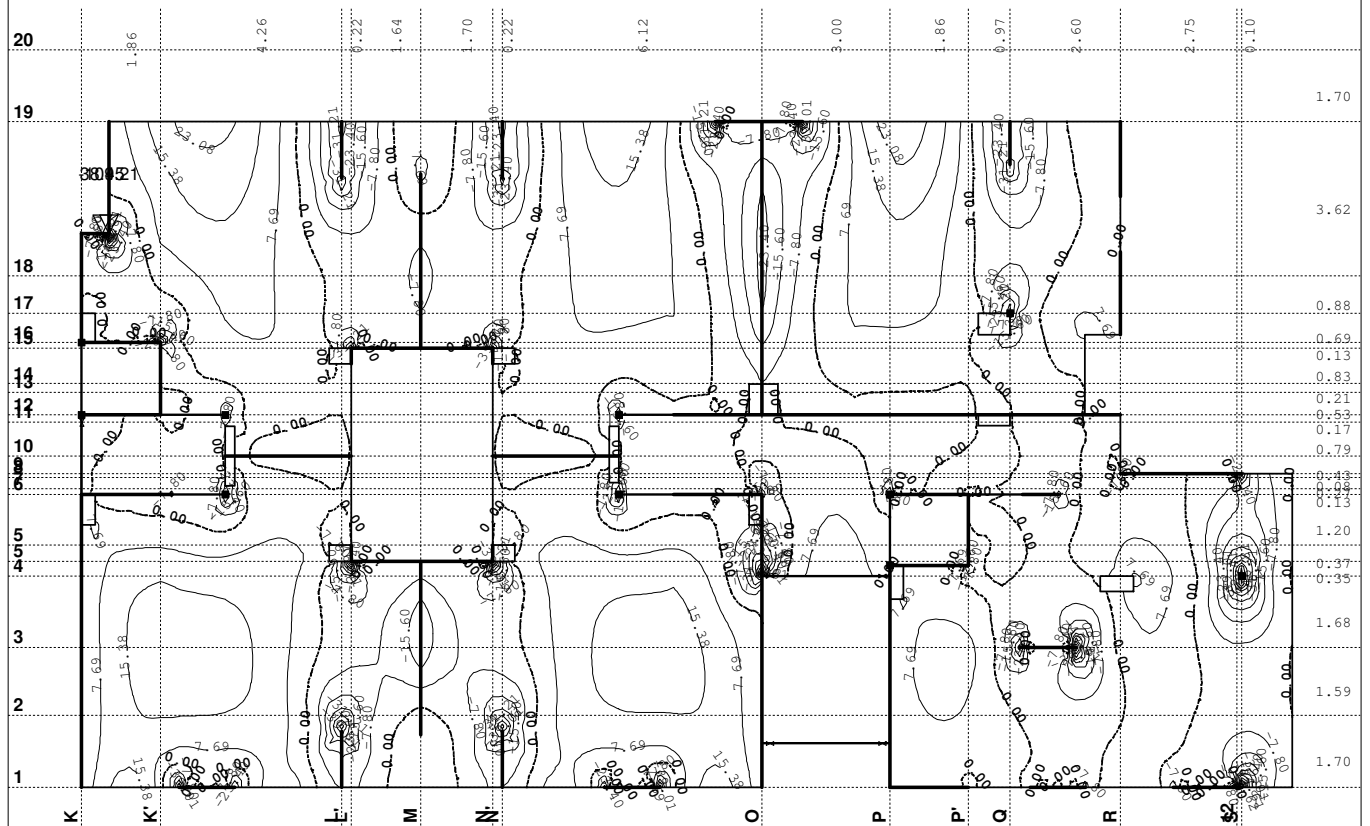
LC	Naziv
4	Komb.: 3.5xI
5	Komb.: I+II

Statički proračun

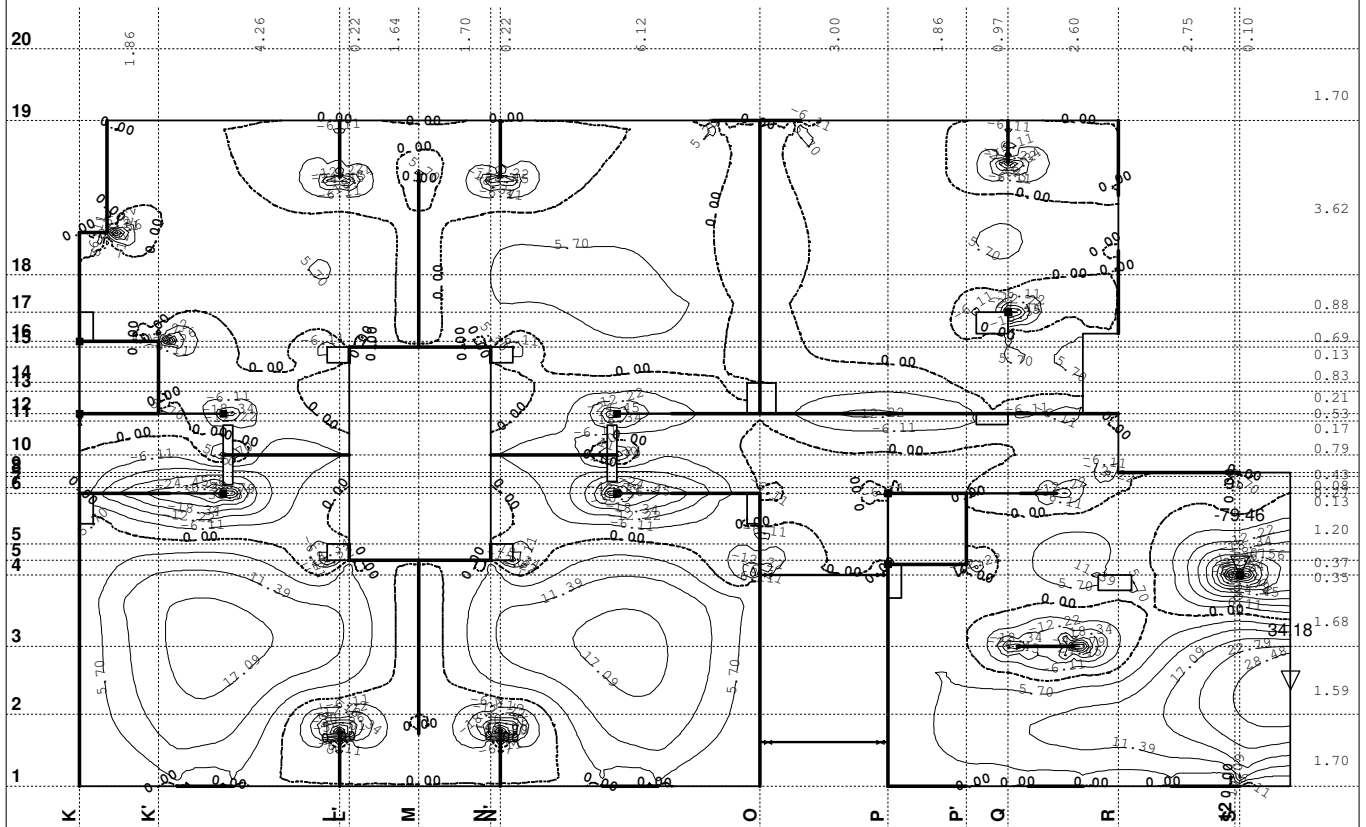
Opt. 4: 3.5xl+II



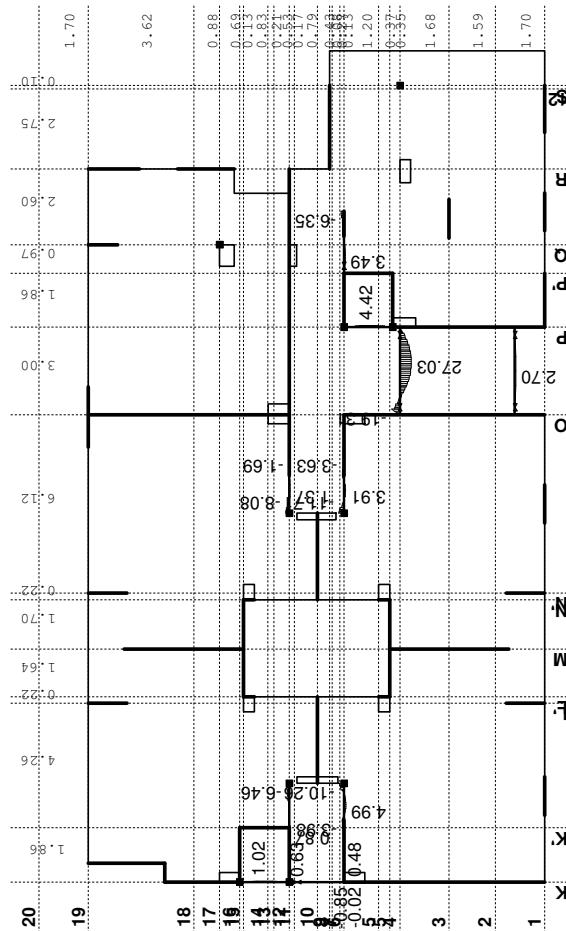
Opt. 3: 1.6xl+1.8xII



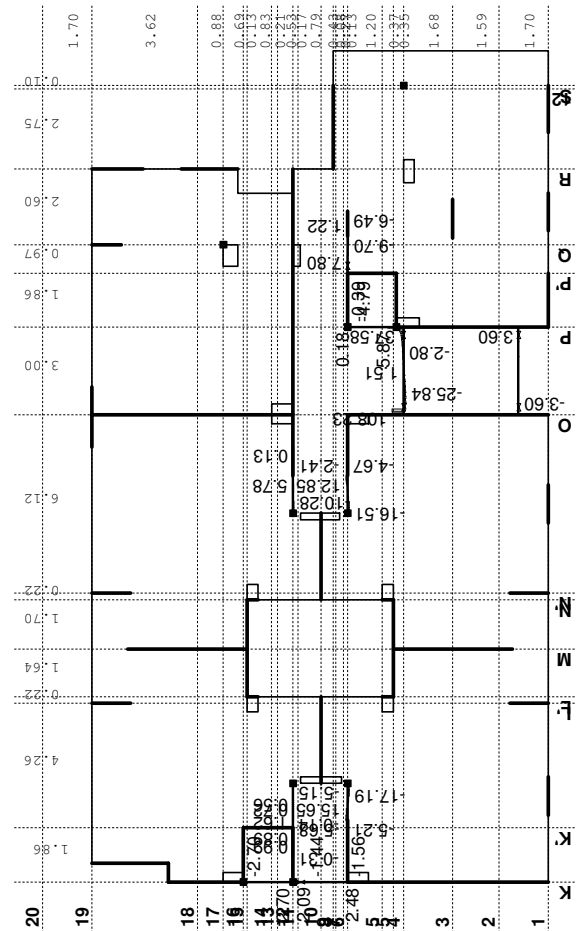
Opt. 3: 1.6xl+1.8xII

Uticaji u ploči: max $M_y = 34.18$ / min $M_y = -79.46$ kNm/m

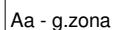
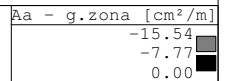
Opt. 3: 1.6xl+1.8xII

Uticaji u gredi: max $M_3 = 27.03$ / min $M_3 = -19.31$ kNm

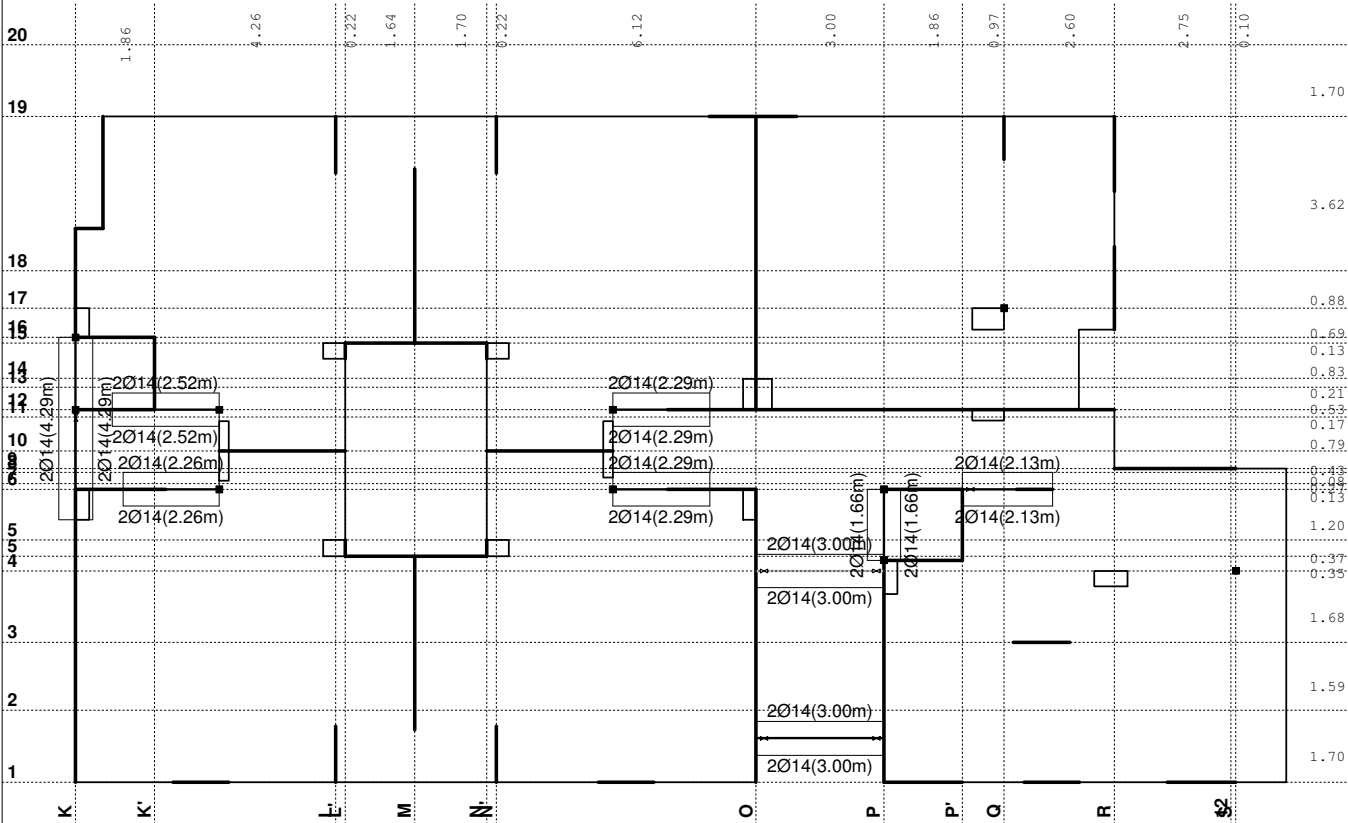
Opt. 3: 1.6xl+1.8xII

Uticaji u gredi: max $T_2 = 108.23$ / min $T_2 = -25.84$ kNm

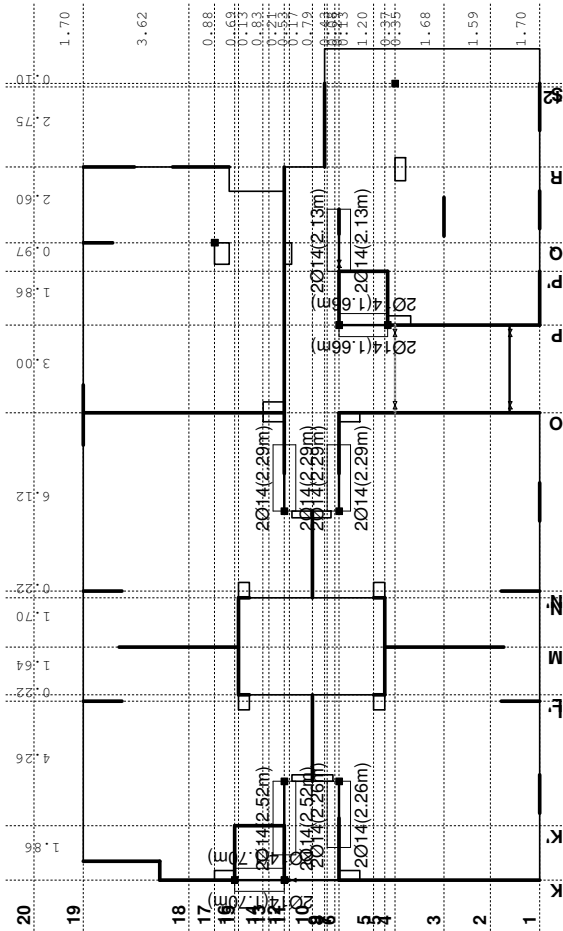
Aa - d.zona [cm ² /m]
0.00
2.53
5.06



Usvojena armatura
PBAB 87, MB 30, MA 500/560

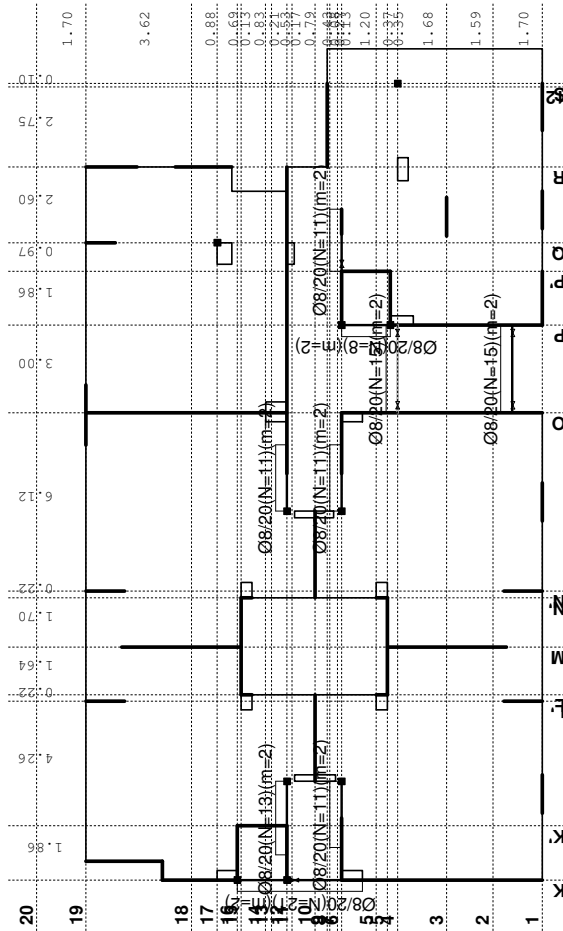


Armatura u gredama: Aa2/Aa1
Usvojena armatura
PBAB 87, MB 30, MA 500/560



Armatura u gredama: Aa3/Aa4

Usvojena armatura
PBAB 87, MB 30, MA 500/560



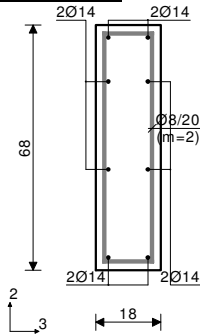
Armatura u gredama: Aa,uz

Z12 (5016-5942)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 0.78m$ 

[cm]

$$\begin{aligned} T2u &= 0.53 \text{ kN} \\ M1u &= 0.35 \text{ kNm} \\ M3u &= 1.37 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -0.144/10.000 \% \\ Aa1 &= 0.04 \text{ cm}^2 \\ Aa2 &= 0.00 \text{ cm}^2 \\ Aa3 &= 0.00 \text{ cm}^2 \\ Aa4 &= 0.00 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/m \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \phi 8/20(m=2) = 2.51 \text{ cm}^2/m] \end{aligned}$$

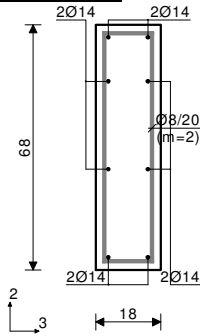
$$\begin{aligned} \tau_y &= 0.14 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \tau_z &= 0.13 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \text{Procenat armiranja: } &1.01\% \end{aligned}$$

Z6b (4338-5175)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 2-2 $x = 0.78m$ 

[cm]

$$\begin{aligned} T2u &= 2.99 \text{ kN} \\ M1u &= -1.03 \text{ kNm} \\ M3u &= 3.90 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -0.247/10.000 \% \\ Aa1 &= 0.13 + 0.00 = 0.13 \text{ cm}^2 \\ Aa2 &= 0.00 + 0.00 = 0.00 \text{ cm}^2 \\ Aa3 &= 0.00 + 0.07 = 0.07 \text{ cm}^2 \\ Aa4 &= 0.00 + 0.07 = 0.07 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/m \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \phi 8/20(m=2) = 2.51 \text{ cm}^2/m] \end{aligned}$$

$$\begin{aligned} \tau_y &= 0.42 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \tau_z &= 0.39 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \text{Procenat armiranja: } &1.01\% \end{aligned}$$

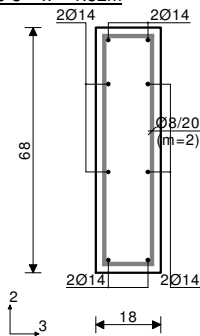
*) - dodatna podužna armatura za prijem torzije.

P 408 (1954-1277)

PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 3-3 $x = 1.52m$ 

[cm]

$$\begin{aligned} T2u &= -4.38 \text{ kN} \\ M1u &= -2.43 \text{ kNm} \\ M3u &= 0.31 \text{ kNm} \end{aligned}$$

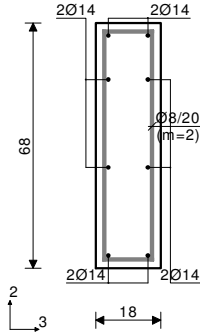
$$\begin{aligned} \epsilon_b/\epsilon_a &= -0.068/10.000 \% \\ Aa1 &= 0.00 + 0.04 = 0.04 \text{ cm}^2 \\ Aa2 &= 0.00 + 0.04 = 0.04 \text{ cm}^2 \\ Aa3 &= 0.00 + 0.17 = 0.17 \text{ cm}^2 \\ Aa4 &= 0.00 + 0.17 = 0.17 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/m \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \phi 8/20(m=2) = 2.51 \text{ cm}^2/m] \end{aligned}$$

$$\begin{aligned} \tau_y &= 0.95 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \tau_z &= 0.91 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \text{Procenat armiranja: } &1.01\% \end{aligned}$$

*) - dodatna podužna armatura za prijem torzije.

Z6a (1434-925)
PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xl+1.80xll

Presek 4-4 x = 1.89m



[cm]

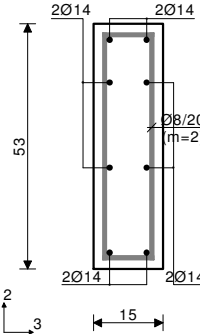
T2u = -1.62 kN
M1u = 3.12 kNm
M3u = -0.68 kNm

$\epsilon_b/\epsilon_a = -0.101/10.000 \text{ ‰}$
Aa1 = 0.00 + 0.06` = 0.06 cm²
Aa2 = 0.02 + 0.06` = 0.08 cm²
Aa3 = 0.00 + 0.22` = 0.22 cm²
Aa4 = 0.00 + 0.22` = 0.22 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 1.19\text{MPa} < 3\tau_r, \tau_r = 1.10\text{MPa}$
 $\tau_z = 1.17\text{MPa} < 3\tau_r, \tau_r = 1.10\text{MPa}$
Procenat armiranja: 1.01%
*) - dodatna podužna armatura za prijem torzije.

ZK" (1476-1087)
PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xl+1.80xll

Presek 5-5 x = 0.85m



[cm]

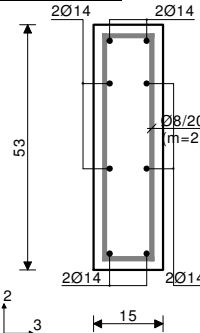
M3u = 1.02 kNm

$\epsilon_b/\epsilon_a = -0.176/10.000 \text{ ‰}$
Aa1 = 0.04 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]

Procenat armiranja: 1.55%

ZP" (6856-6167)
PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xl+1.80xll

Presek 6-6 x = 0.96m



[cm]

T2u = -0.27 kN
M3u = 4.42 kNm

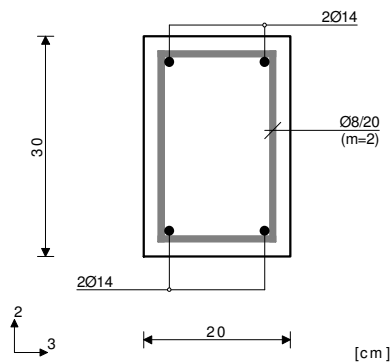
$\epsilon_b/\epsilon_a = -0.377/10.000 \text{ ‰}$
Aa1 = 0.19 cm²
Aa2 = 0.00 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

Procenat armiranja: 1.55%

P 409 (4865-6065)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 7-7 $x = 1.76m$



$$T2u = -2.80 \text{ kN}$$

$$M3u = 26.93 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -1.790/10.000 \text{ ‰}$$

$$Aa1 = 2.11 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \phi 8/20(m=2) = 2.51 \text{ cm}^2/m$]

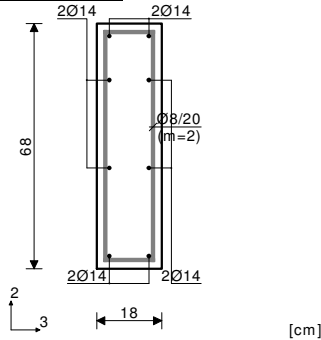
$$\tau_y = 0.06 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procent armiranja: 1.03%

Z6c (8466-7631)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 8-8 $x = 1.52m$



$$T2u = 0.44 \text{ kN}$$

$$M1u = 1.33 \text{ kNm}$$

$$M3u = 3.49 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.233/10.000 \text{ ‰}$$

$$Aa1 = 0.11 + 0.02' = 0.14 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.02' = 0.02 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.10' = 0.10 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.10' = 0.10 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \phi 8/20(m=2) = 2.51 \text{ cm}^2/m$]

$$\tau_y = 0.50 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.50 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

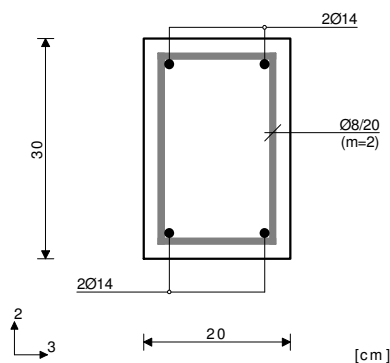
Procent armiranja: 1.01%

*) - dodatna podužna armatura za prijem torzije.

P 407 (587-1087)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 9-9 $x = 1.20m$



$$T2u = 1.14 \text{ kN}$$

$$M3u = -0.85 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.248/10.000 \text{ ‰}$$

$$Aa1 = 0.00 \text{ cm}^2$$

$$Aa2 = 0.06 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \phi 8/20(m=2) = 2.51 \text{ cm}^2/m$]

$$\tau_y = 0.02 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procent armiranja: 1.03%

P 410 (3512-4526)

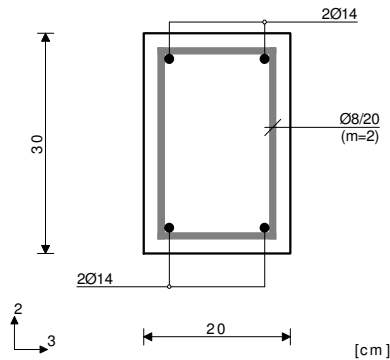
PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 10-10 x = 1.00m



$$T2u = -1.20 \text{ kN}$$

$$M3u = 2.40 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.428/10.000 \text{ ‰}$$

$$Aa1 = 0.18 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

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

$$\tau_y = 0.02 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

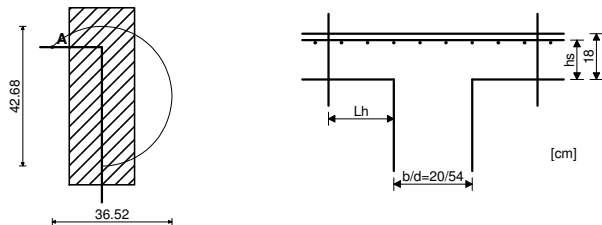
$$\text{Procenat armiranja: } 1.03\%$$

Kontrola ploča na probijanje

Nivo: POS 400+ [0.00 m]

Presek 1 (190.60,-108.22,0.00)

MB 30



KONTROLA KRITIČNOG PRESEKA 1. ($L_h = 0.07 \text{ m}$ od ivice stuba)
(stub zamenjujućeg kružnog preseka, $d_s = 0.28 \text{ m}$)

Merodavna kombinacija: I+II

Sila u stubu

$$N = 76.940 \text{ kN}$$

Merodavni smičući napon (tačka A)

$$\tau = 0.611 \text{ MPa}$$

Debljina ploče

$$d,pl = 0.180 \text{ m}$$

Statička visina ploče

$$h_s = 0.150 \text{ m}$$

Obim kritičnog preseka

$$Okp = 0.839 \text{ m}$$

Postojeća armatura u ploči

$$Aa,1 = 12.147 \text{ cm}^2$$

Površina armature - pravac 1

$$\mu,1 = 0.810 \%$$

Procenat armiranja - pravac 1

$$Aa,2 = 12.147 \text{ cm}^2$$

Površina armature - pravac 2

$$\mu,2 = 0.810 \%$$

Procenat armiranja - pravac 2

$$\mu = 0.810 \%$$

Srednja vrednost procenta armiranja

$$\alpha_a = 1.400$$

Koeficijent

$$\gamma_1 = 1.638$$

Koeficijent

$$\gamma_2 = 0.567$$

Dopušteni glavni napon zatezanja

$$\tau_a = 0.800$$

Dopušteni glavni napon zatezanja

$$\tau_b = 2.200$$

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

$$\tau_{max} = 1.247 \text{ MPa}$$

$$\text{Uslov: } \tau \leq \tau_{max} (0.61 \leq 1.25)$$

Uslov je ispunjen.

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

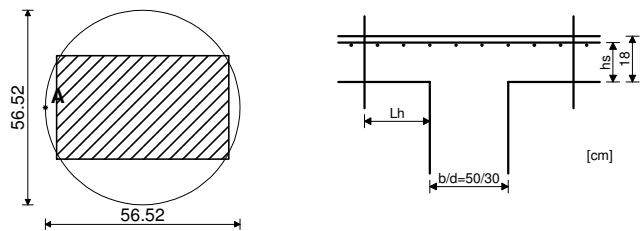
$$\tau_{gr} = 0.874 \text{ MPa}$$

$$\text{Uslov: } \tau \leq \tau_{gr} (0.61 \leq 0.87)$$

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

Kontrola ploča na probijanje

Nivo: POS 400+ [0.00 m]
Presek 1 (196.05,-114.40,0.00)
MB 30



KONTROLA KRITIČNOG PRESEKA 1. (Lh = 0.07m od ivice stuba)
(stub zamenjujućeg kružnog preseka, ds = 0.42m)

Merodavna kombinacija: I+II	
Sila u stubu	N = 187.15 kN
Merodavni smičući napon (tačka A)	$\tau = 0.703 \text{ MPa}$
Debljina ploče	d,pl = 0.180 m
Statička visina ploče	hs = 0.150 m
Obim kritičnog preseka	Okp = 1.776 m
Postojeća armatura u ploči	
Površina armature - pravac 1	Aa,1 = 9.425 cm ²
Procenat armiranja - pravac 1	$\mu_1 = 0.628 \%$
Površina armature - pravac 2	Aa,2 = 9.425 cm ²
Procenat armiranja - pravac 2	$\mu_2 = 0.628 \%$
Srednja vrednost procenta armiranja	$\mu = 0.628 \%$
Koeficijent	$\alpha_a = 1.400$
Koeficijent	$\gamma_1 = 1.443$
Koeficijent	$\gamma_2 = 0.499$
Dopušteni glavni napon zatezanja	$\tau_a = 0.800$
Dopušteni glavni napon zatezanja	$\tau_b = 2.200$
Maksimalna otpornost($\gamma_2 \times \tau_b$)	$\tau_{\text{max}} = 1.099 \text{ MPa}$

Uslov: $\tau \leq \tau_{\text{max}}$ (0.70 \leq 1.10)

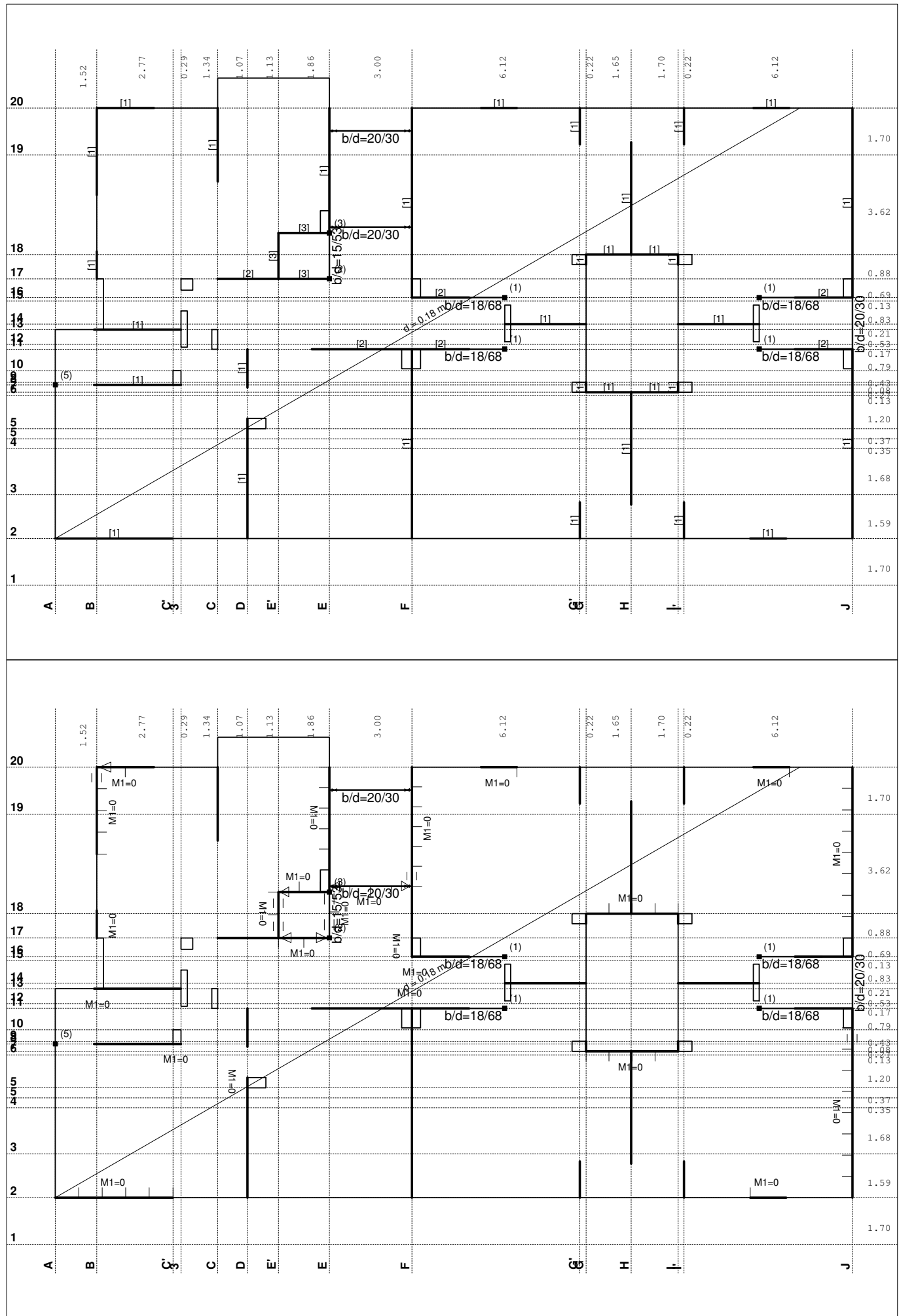
Uslov je ispunjen.

Otpornost na probijanje ploče bez dodatne armature za obezbeđenje (2/3 x $\gamma_1 \times \tau_a$)	$\tau_{\text{gr}} = 0.769 \text{ MPa}$
---	--

Uslov: $\tau \leq \tau_{\text{gr}}$ (0.70 \leq 0.77)

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

POS 300+ - KONSTRUKCIJA IZNAD DRUGOG SPRATA

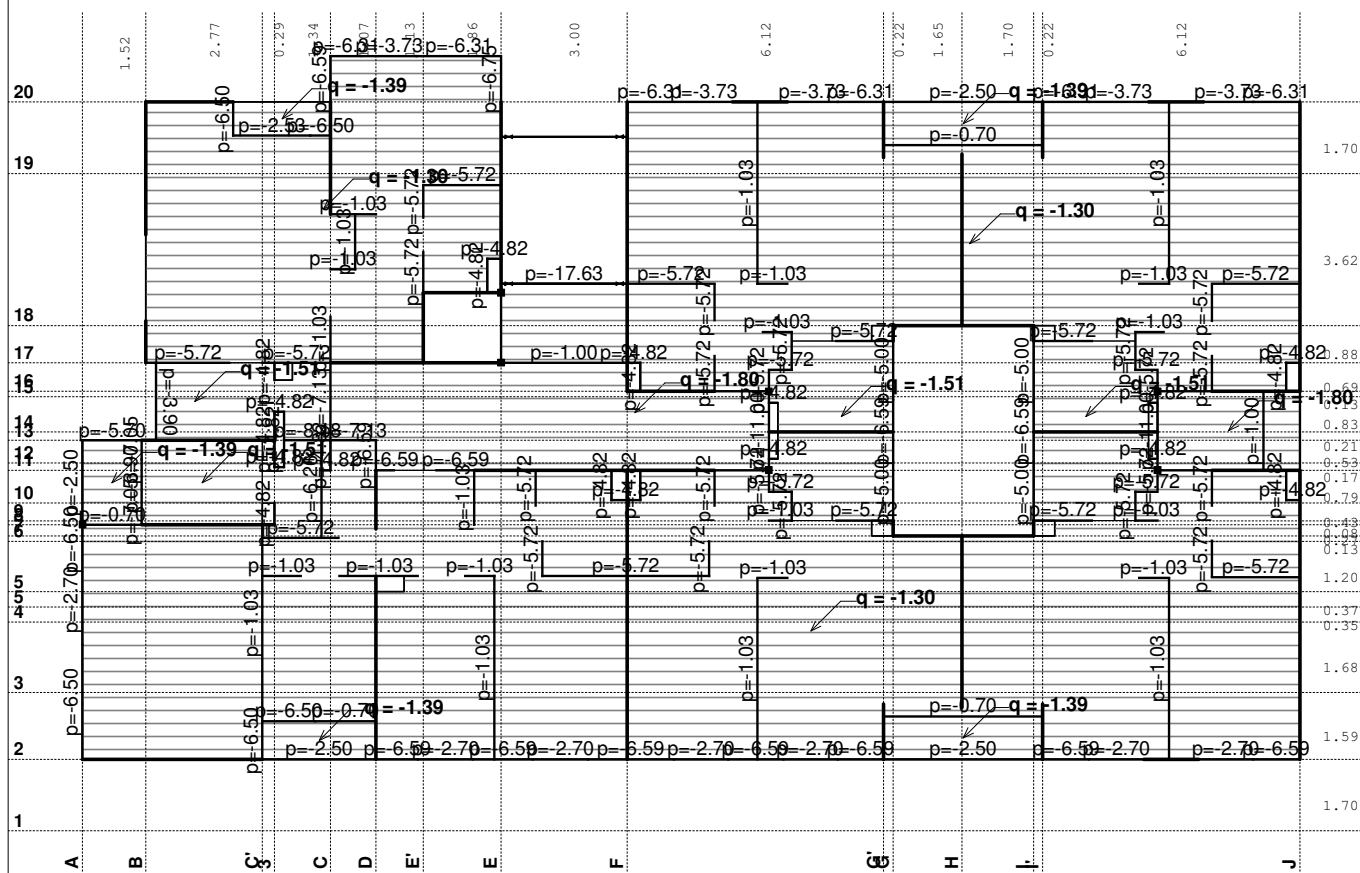


Lista slučajeva opterećenja

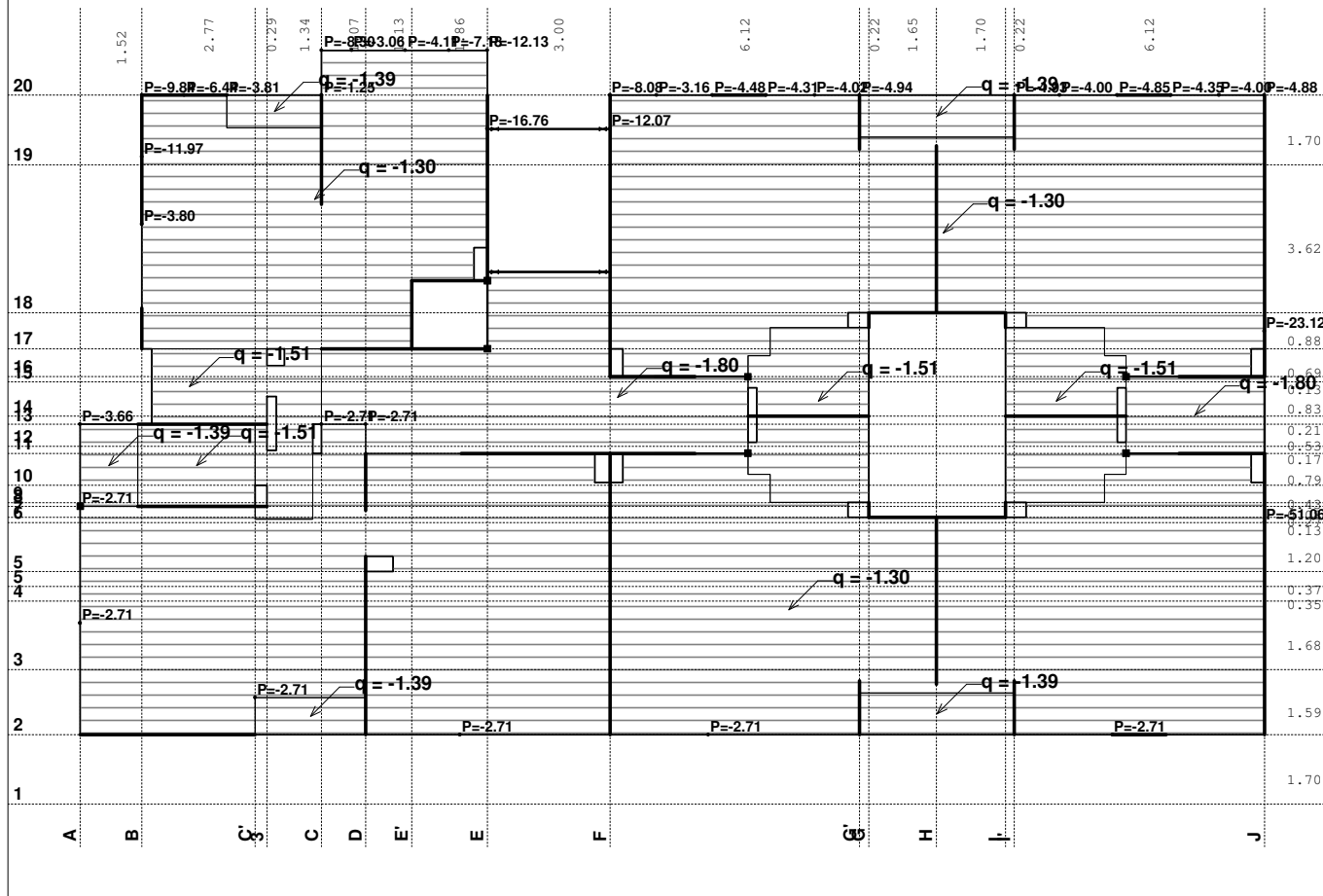
LC	Naziv
1	g (g)
2	p
3	Komb.: I+II

LC	Naziv
4	Komb.: 1.6xI+1.8xII
5	Komb.: 3.5xI+II

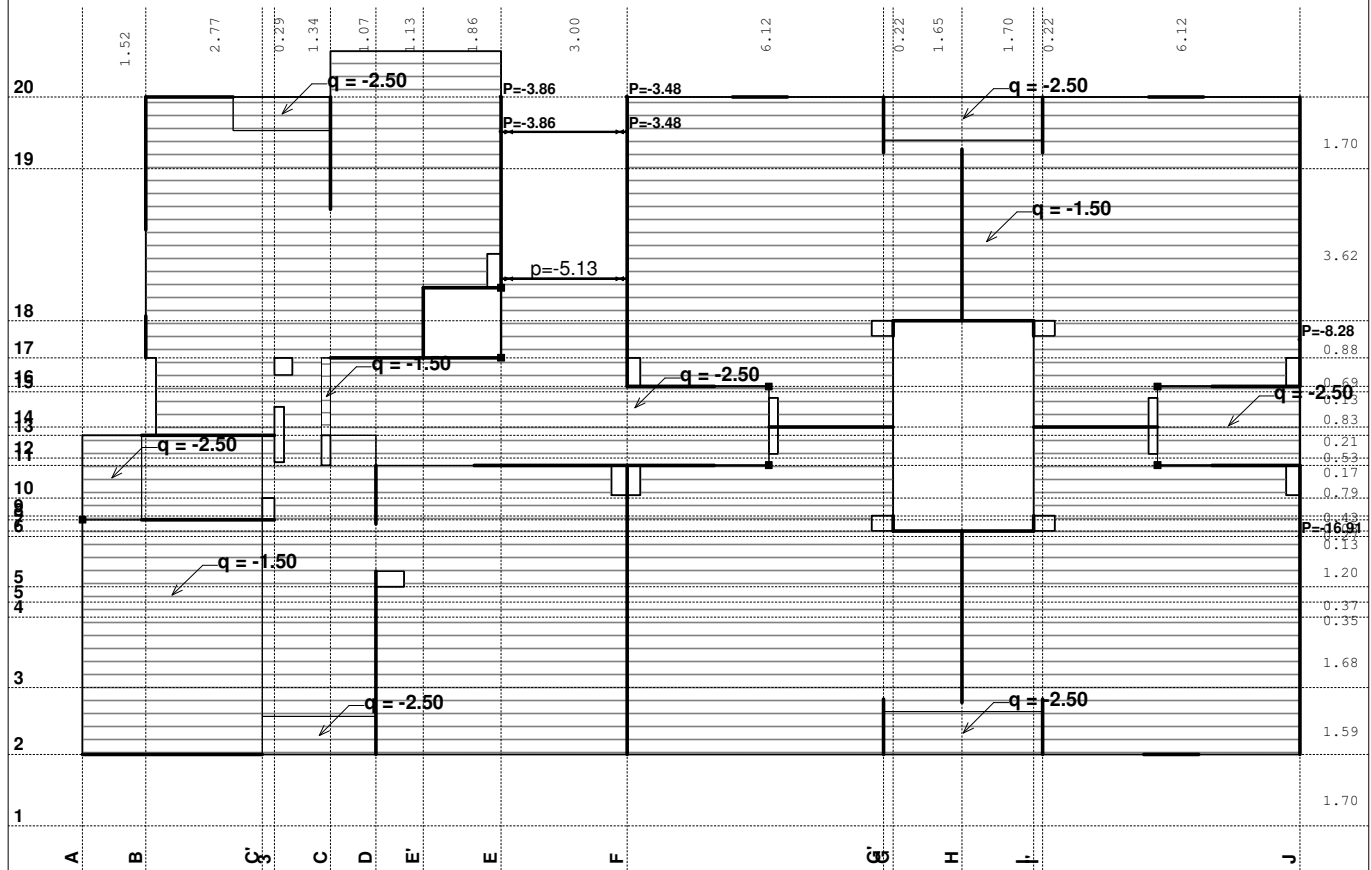
Opt. 1: g (g)



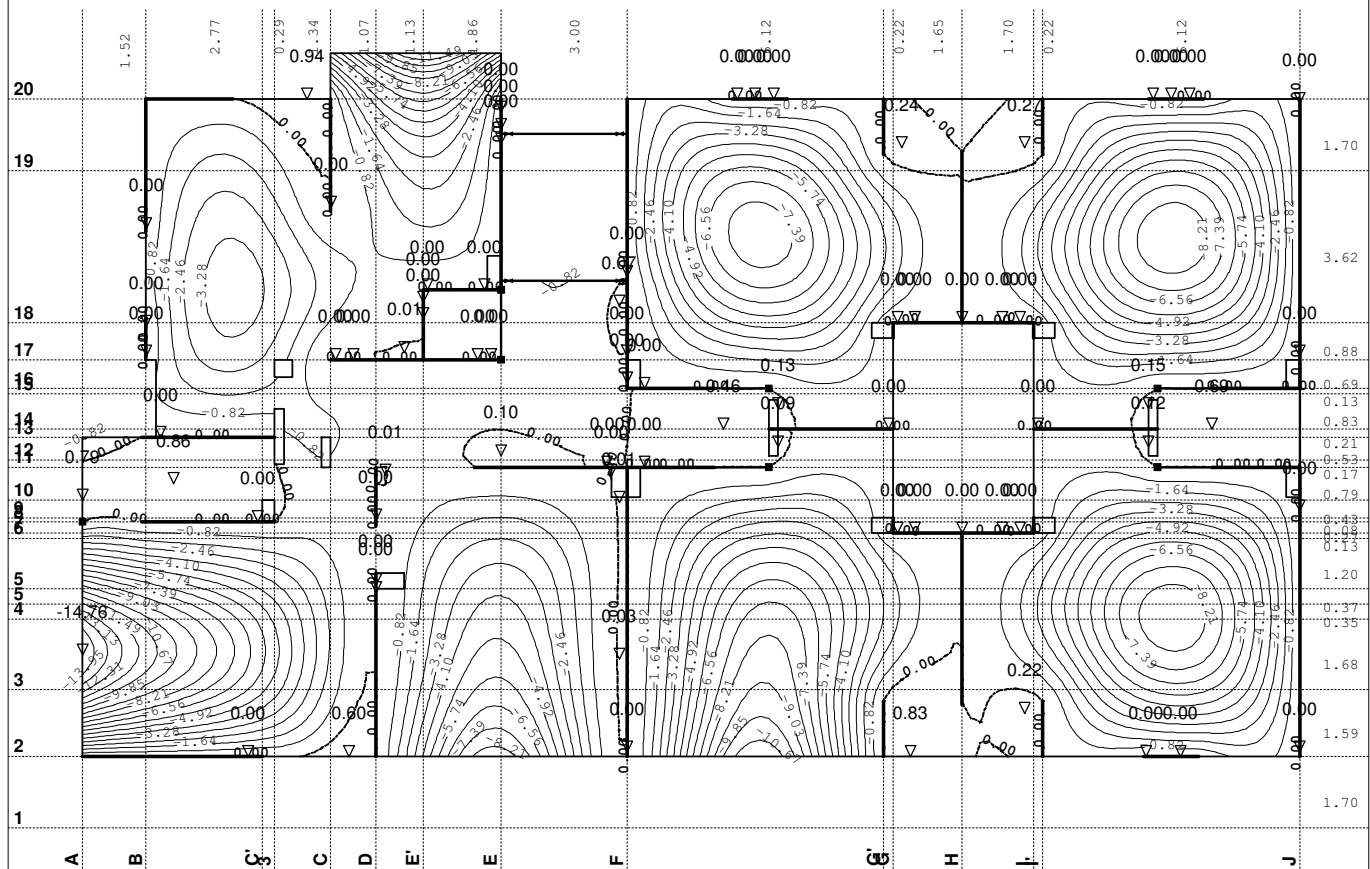
Opt. 1: g (g)



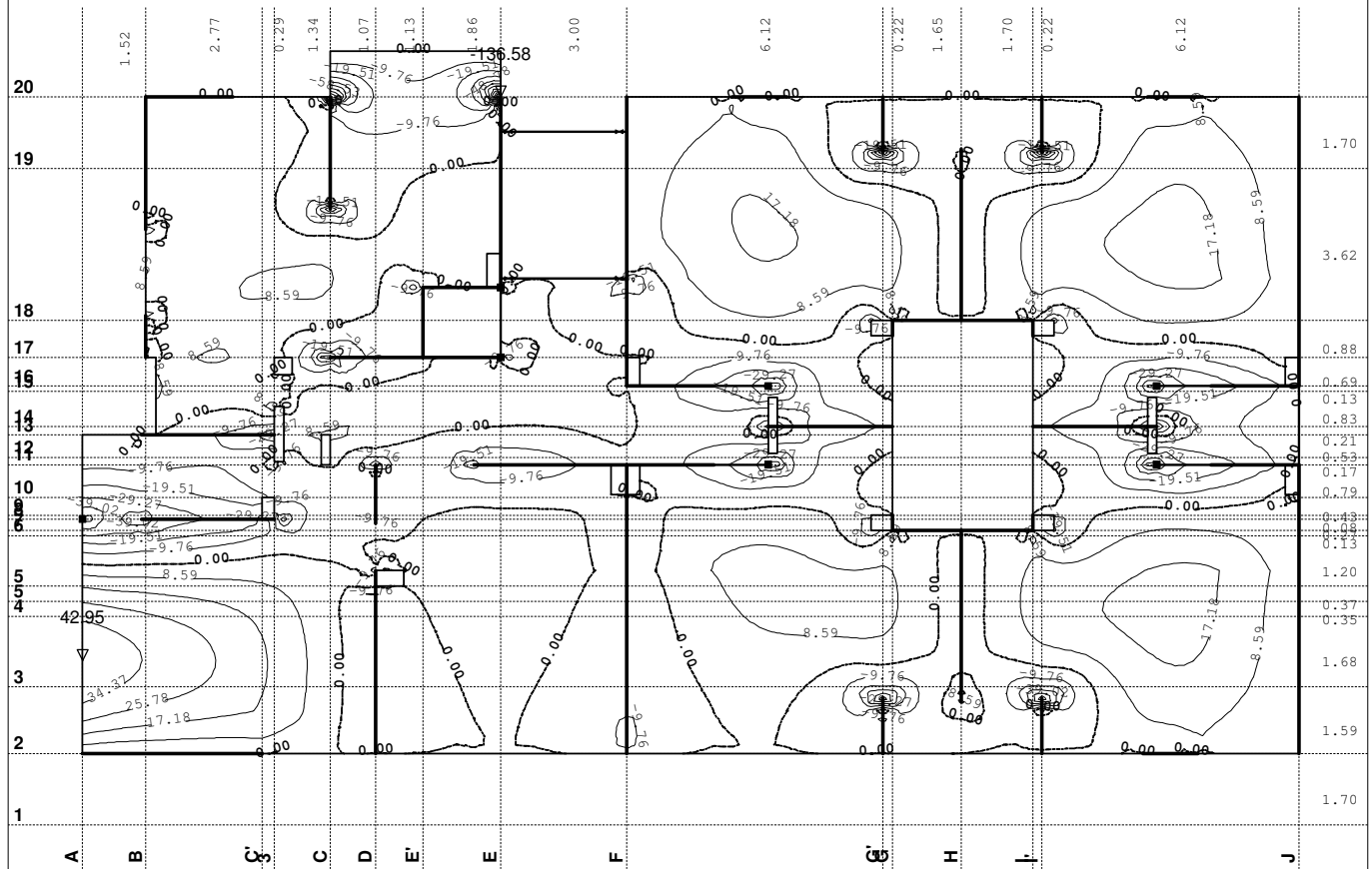
Opt. 2: p



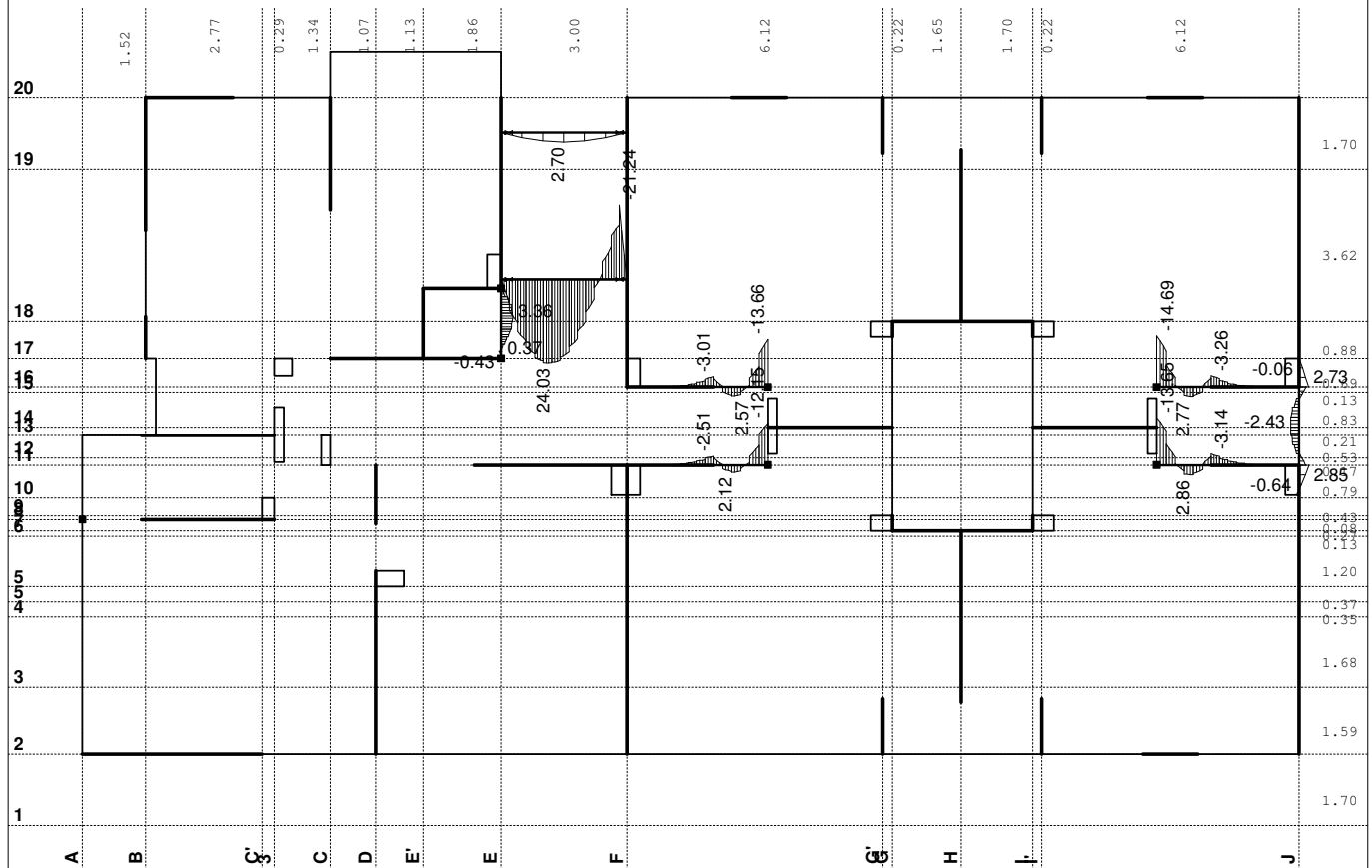
Opt. 5: 3.5xl+II



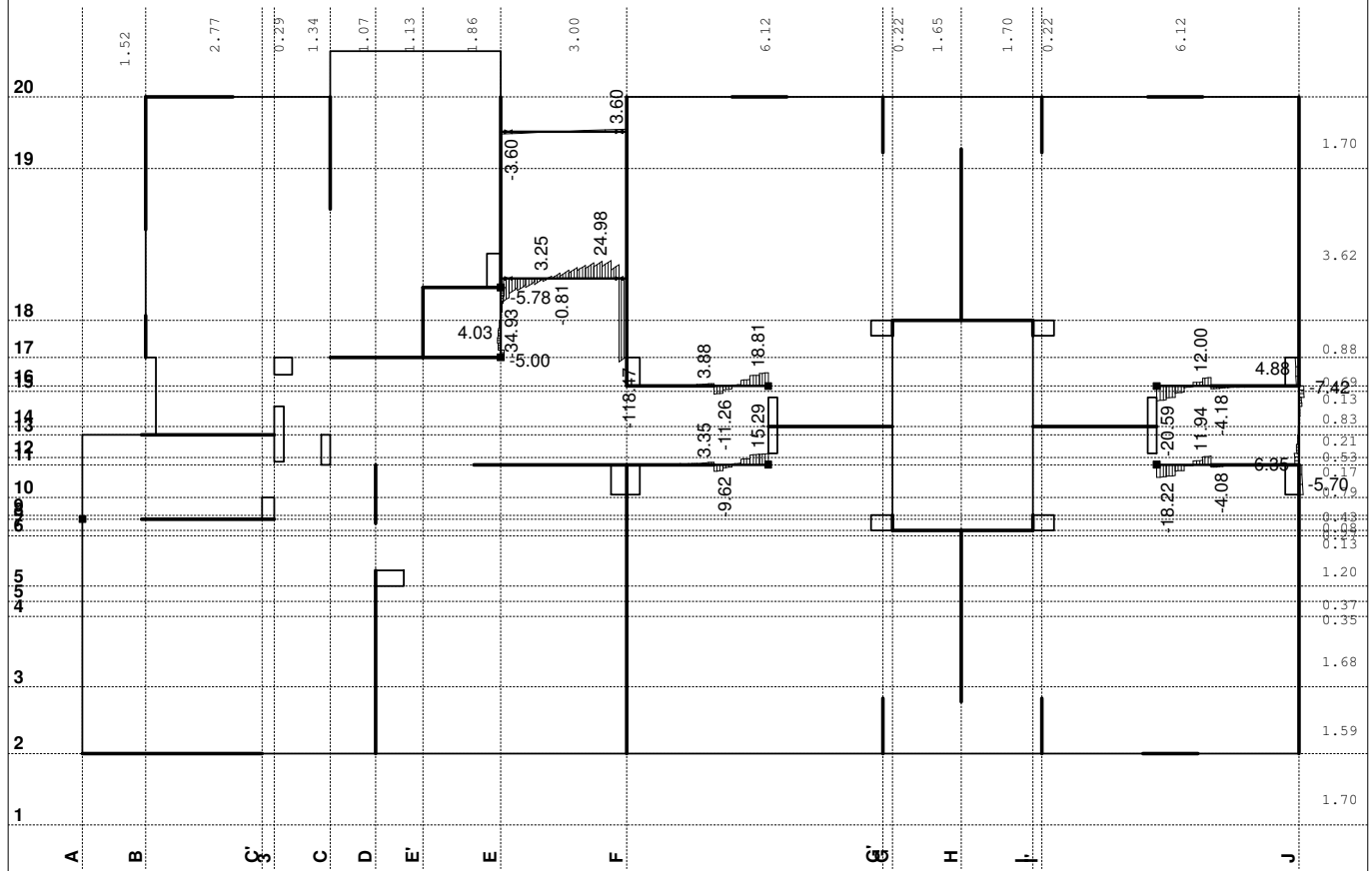
Opt. 4: 1.6xl+1.8xll

Uticaji u ploči: max $M_y = 42.95$ / min $M_y = -136.58$ kNm/m

Opt. 4: 1.6xl+1.8xll

Uticaji u gredi: max $M_3 = 24.03$ / min $M_3 = -21.24$ kNm

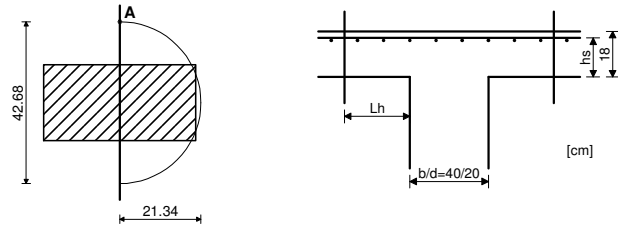
Opt. 4: 1.6xl+1.8xII



Uticaji u gredi: max T2= 24.98 / min T2= -118.47 kN

Kontrola ploča na probijanje

Nivo: POS 300+ [0.00 m]
 Presek 1 (136.76,-112.08,0.00)
 MB 30



KONTROLA KRITIČNOG PRESEKA 1. ($L_h = 0.07\text{m}$ od ivice stuba)
 (stub zamenjujućeg kruznog preseka, $d_s = 0.28\text{m}$)

Merodavna kombinacija: I	
Sila u stubu	$N = 41.182\text{ kN}$
Faktor povećanja napona zbog ekscentričnosti	$\beta = 1.400$
Merodavni smičući napon (tačka A)	$\tau = 0.573\text{ MPa}$
Debljina ploče	$d, pl = 0.180\text{ m}$
Statička visina ploče	$h_s = 0.150\text{ m}$
Obim kritičnog preseka	$O_{kp} = 0.670\text{ m}$
Postojeća armatura u ploči	
Površina armature - pravac 1	$A_{a,1} = 9.425\text{ cm}^2$
Procenat armiranja - pravac 1	$\mu,1 = 0.628\%$
Površina armature - pravac 2	$A_{a,2} = 9.425\text{ cm}^2$
Procenat armiranja - pravac 2	$\mu,2 = 0.628\%$
Srednja vrednost procenta armiranja	$\mu = 0.628\%$
Koeficijent	$\alpha_a = 1.400$
Koeficijent	$\gamma_1 = 1.443$
Koeficijent	$\gamma_2 = 0.499$
Dopušteni glavni napon zatezanja	$\tau_a = 0.800$
Dopušteni glavni napon zatezanja	$\tau_b = 2.200$
Maksimalna otpornost ($\gamma_2 \times \tau_b$)	$\tau_{,max} = 1.099\text{ MPa}$

Uslov: $\tau \leq \tau_{,max}$ ($0.57 \leq 1.10$)

Uslov je ispunjen.

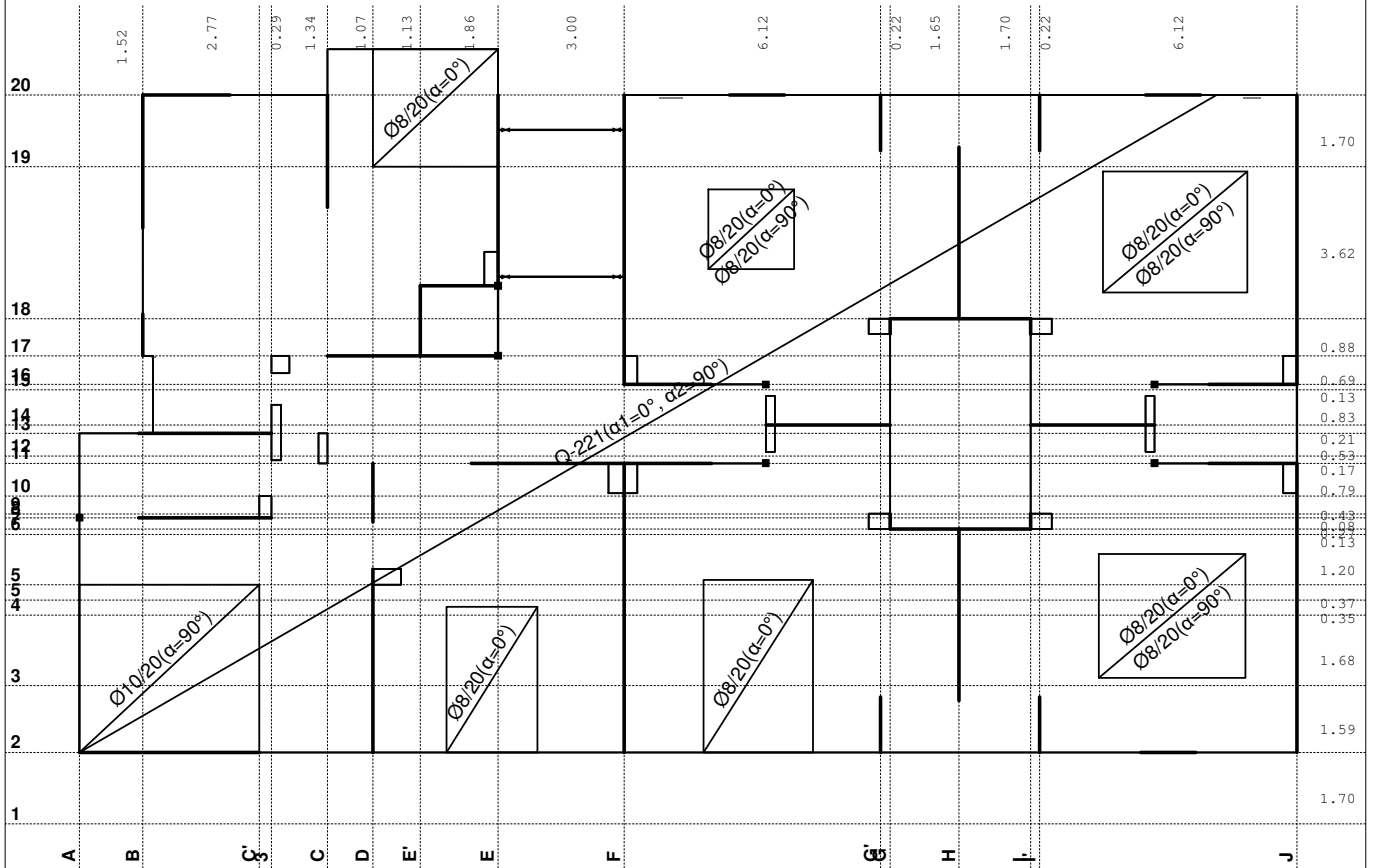
Otpornost na probijanje ploče bez dodatne armature za
 obezbeđenje ($2/3 \times \gamma_1 \times \tau_a$) $\tau_{,gr} = 0.769\text{ MPa}$

Uslov: $\tau \leq \tau_{,gr}$ ($0.57 \leq 0.77$)

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

Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

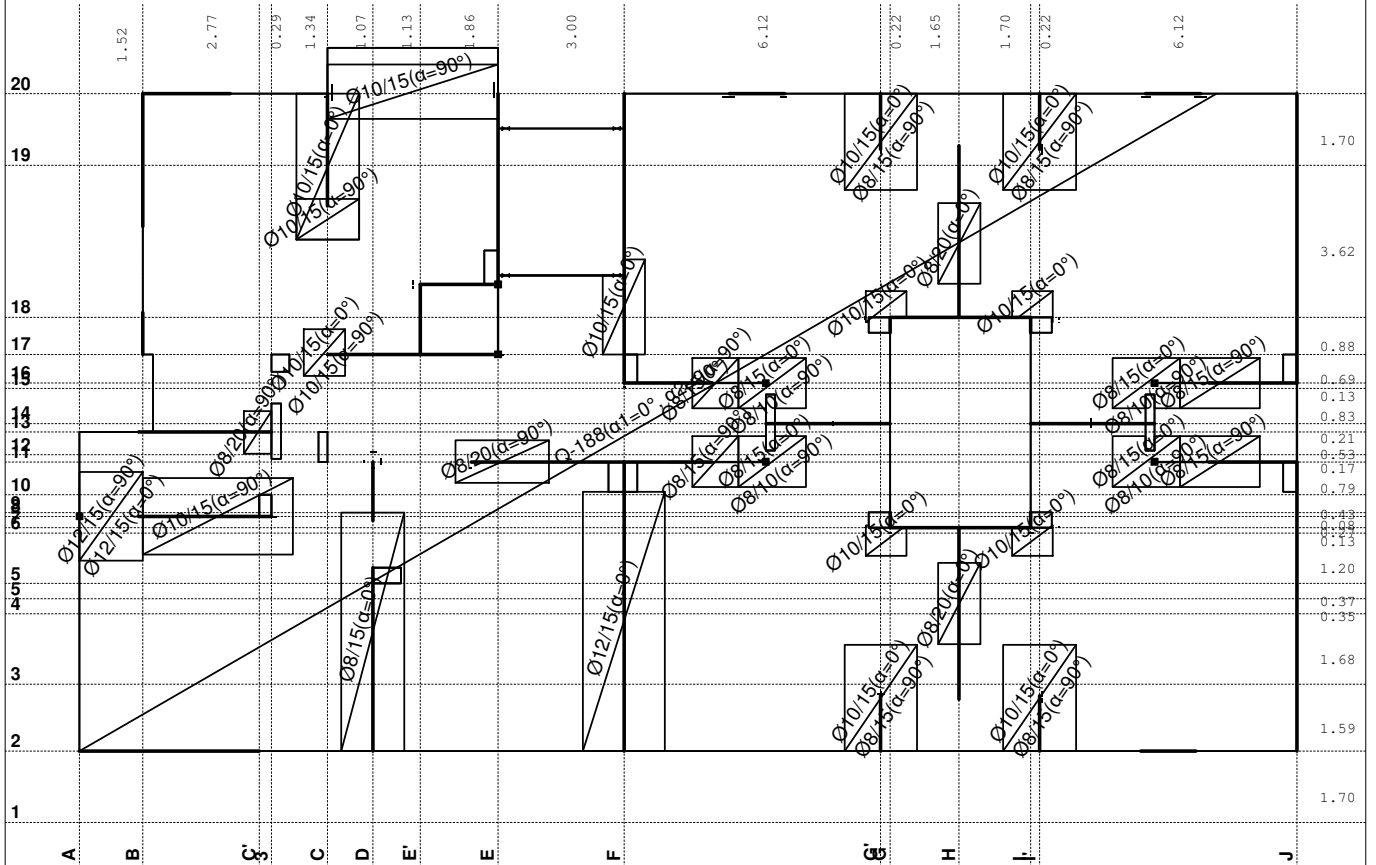
Aa - d.zona [cm ² /m]
0.00
2.84
5.67



Aa - d.zona

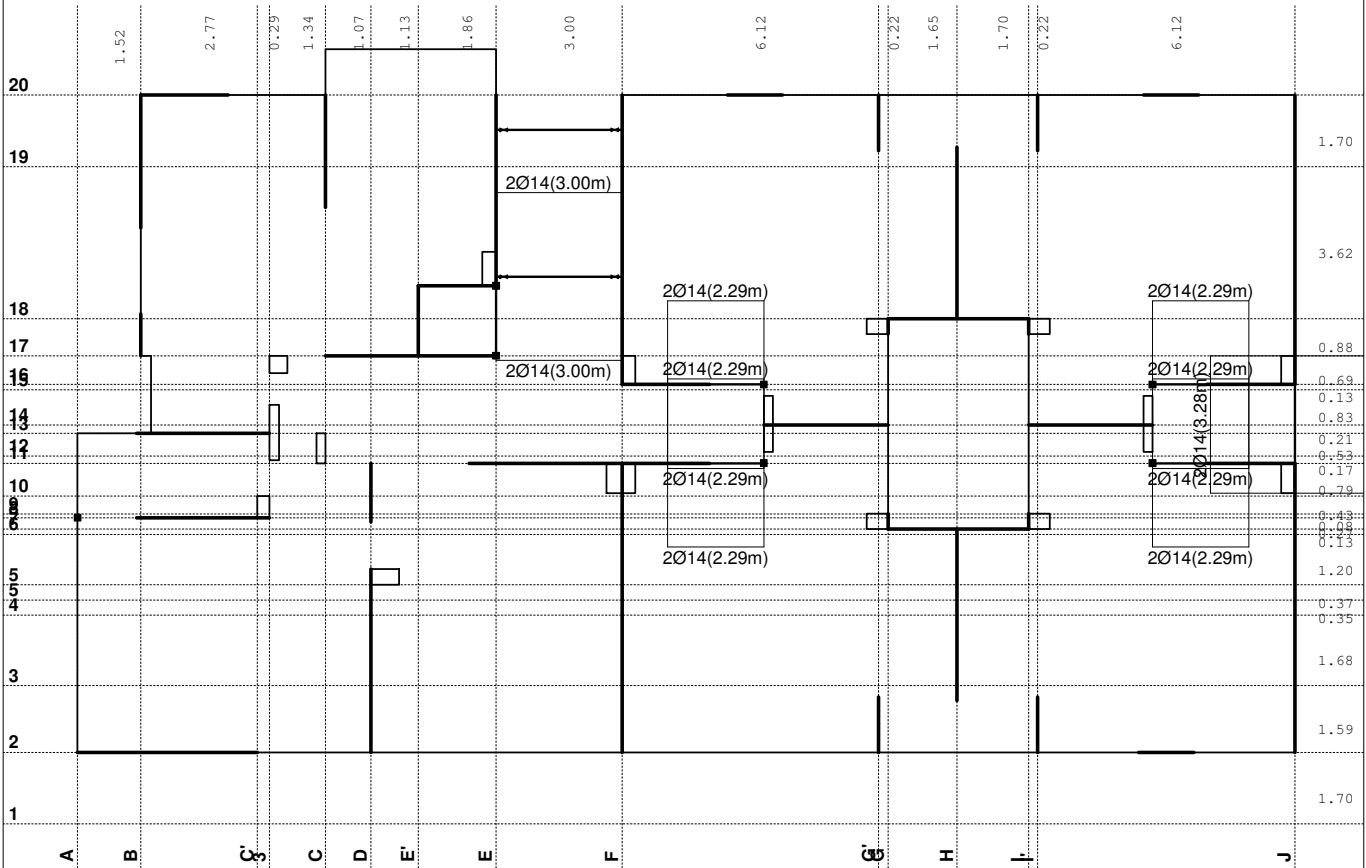
Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

Aa - g.zona [cm ² /m]
-20.28
-10.14
0.00

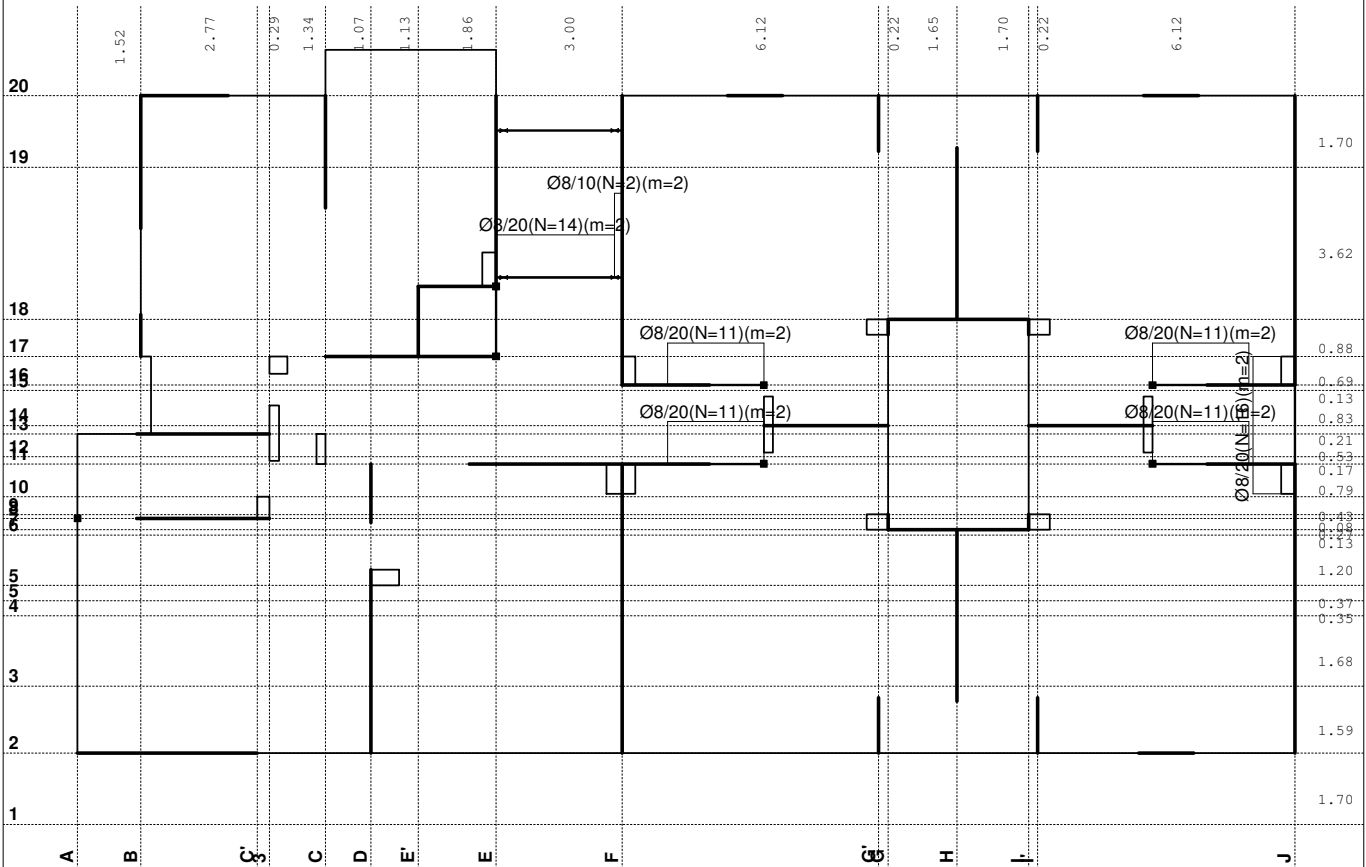


Aa - g.zona

Usvojena armatura
PBAB 87, MB 30, MA 500/600

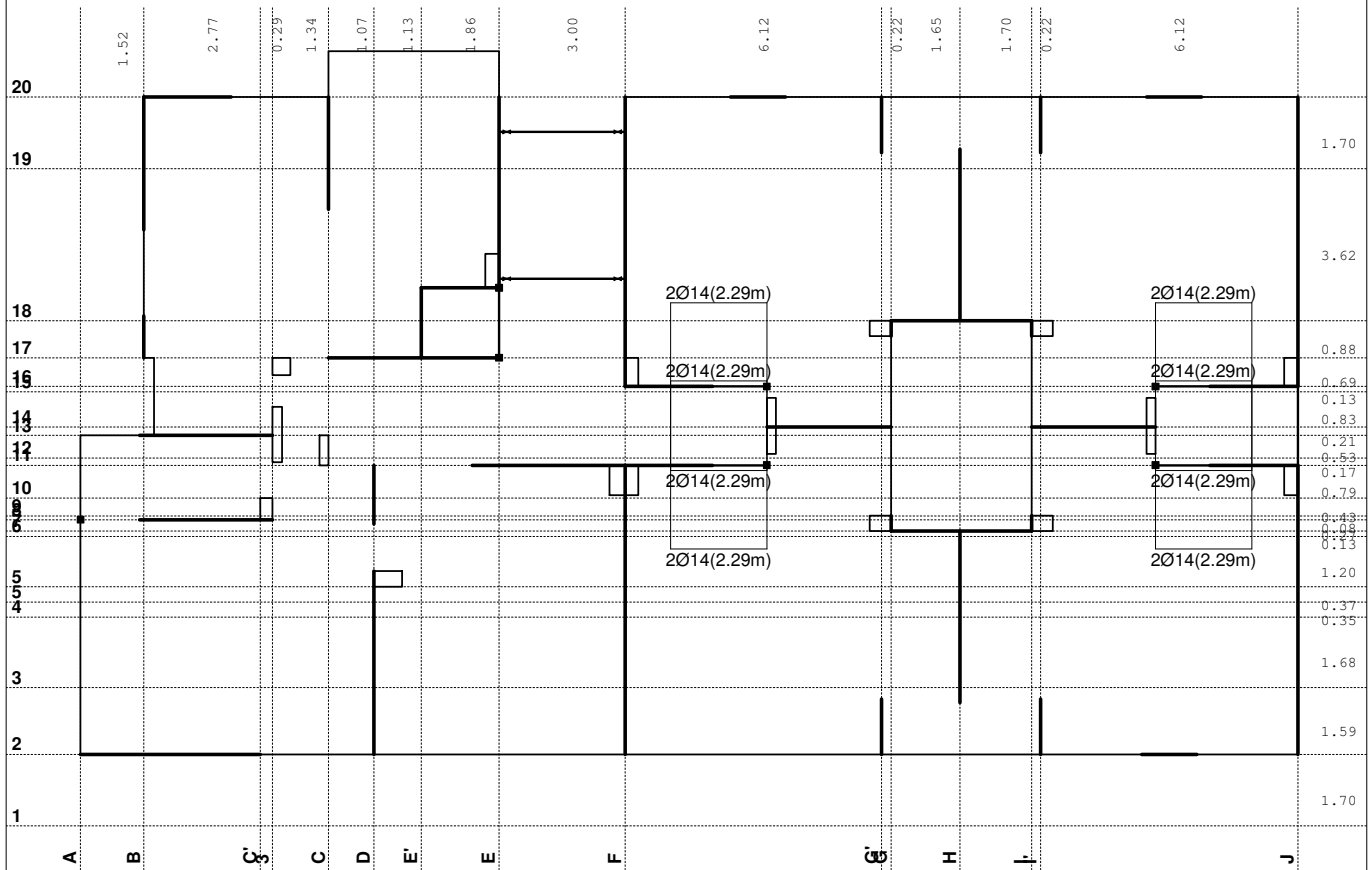


Armatura u gredama: Aa2/Aa1
Usvojena armatura
PBAB 87, MB 30, MA 500/600



Armatura u gredama: Aa,uz

Usvojena armatura
PBAB 87, MB 30, MA 500/600



Armatura u gredama: Aa3/Aa4

Greda 5106-6304

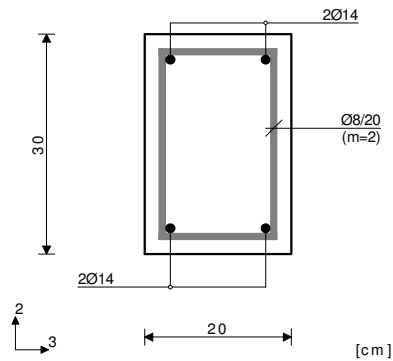
PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 $x = 1.21m$



$T2_u = 3.25 \text{ kN}$
 $M3_u = 23.90 \text{ kNm}$

$\epsilon_b/\epsilon_a = -1.644/10.000 \%$

$Aa1 = 1.87 \text{ cm}^2$

$Aa2 = 0.00 \text{ cm}^2$

$Aa3 = 0.00 \text{ cm}^2$

$Aa4 = 0.00 \text{ cm}^2$

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

[Usvojeno $Aa_{uz} = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/m$]

$\tau_y = 0.07 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$

Procenat armiranja: 1.03%

Greda 5733-6612

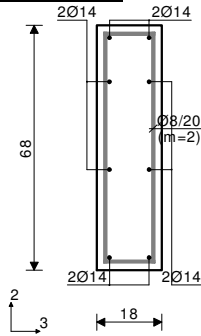
PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.42m



[cm]

$$\begin{aligned} T2u &= -4.41 \text{ kN} \\ M1u &= -1.42 \text{ kNm} \\ M3u &= 2.29 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.187/10.000 \text{ ‰}$$

$$Aa1 = 0.08 + 0.03' = 0.10 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.03' = 0.03 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.10' = 0.10 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.10' = 0.10 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.58 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.53 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procentat armiranja: 1.01%

') - dodatna podužna armatura za prijem torzije.

Greda 4961-5897

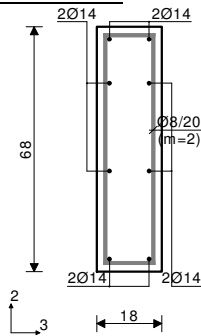
PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.42m



[cm]

$$\begin{aligned} T2u &= -3.62 \text{ kN} \\ M1u &= 1.22 \text{ kNm} \\ M3u &= 1.92 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.171/10.000 \text{ ‰}$$

$$Aa1 = 0.06 + 0.02' = 0.09 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.02' = 0.02 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.09' = 0.09 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.09' = 0.09 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.49 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

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

Procentat armiranja: 1.01%

') - dodatna podužna armatura za prijem torzije.

Greda 9569-10089

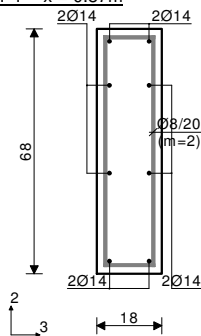
PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 0.87m



[cm]

$$\begin{aligned} T2u &= -0.99 \text{ kN} \\ M1u &= -0.96 \text{ kNm} \\ M3u &= 2.77 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.207/10.000 \text{ ‰}$$

$$Aa1 = 0.09 + 0.00' = 0.09 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.00' = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.07' = 0.07 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.07' = 0.07 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.37 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.36 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procentat armiranja: 1.01%

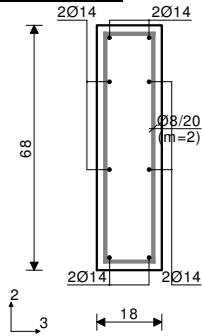
') - dodatna podužna armatura za prijem torzije.

Greda 9030-9682

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 0.87\text{m}$ 

[cm]

$$\begin{aligned} T2_u &= -0.81 \text{ kN} \\ M1_u &= 1.11 \text{ kNm} \\ M3_u &= 2.86 \text{ kNm} \end{aligned}$$

$$\varepsilon_b/\varepsilon_a = -0.210/10.000 \text{ ‰}$$

$$Aa1 = 0.09 + 0.02' = 0.11 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.02' = 0.02 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.08' = 0.08 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.08' = 0.08 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.42 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.42 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.01%

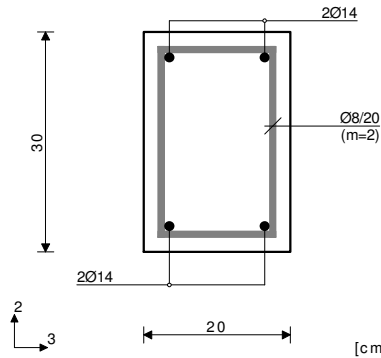
') - dodatna podužna armatura za prijem torzije.

Greda 9766-10418

PBAB 87

MB 30

MA 500/600

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xIIPresek 1-1 $x = 1.63\text{m}$ 

[cm]

$$\begin{aligned} T2_u &= -0.59 \text{ kN} \\ M3_u &= -2.43 \text{ kNm} \end{aligned}$$

$$\varepsilon_b/\varepsilon_a = -0.431/10.000 \text{ ‰}$$

$$Aa1 = 0.00 \text{ cm}^2$$

$$Aa2 = 0.18 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

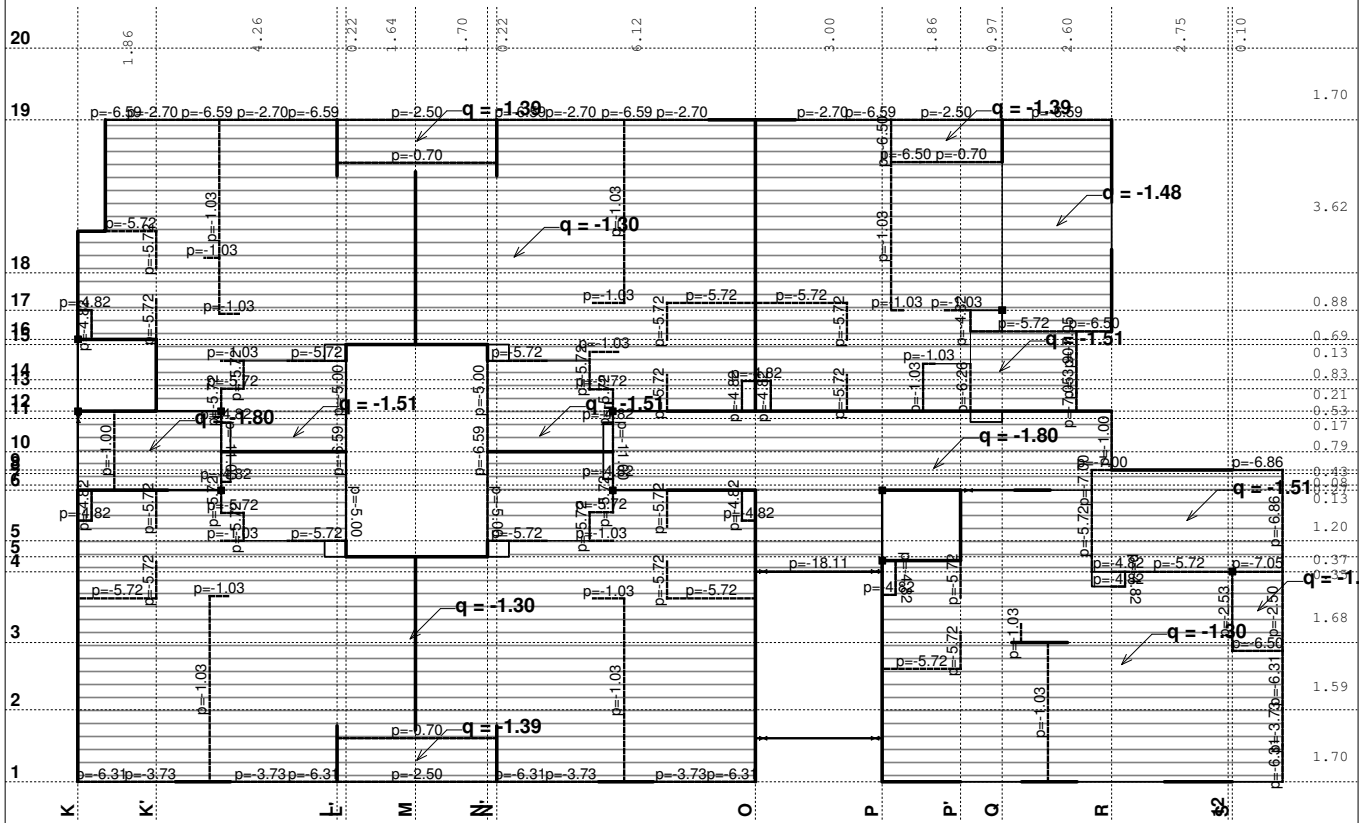
$$\tau_y = 0.01 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.03%

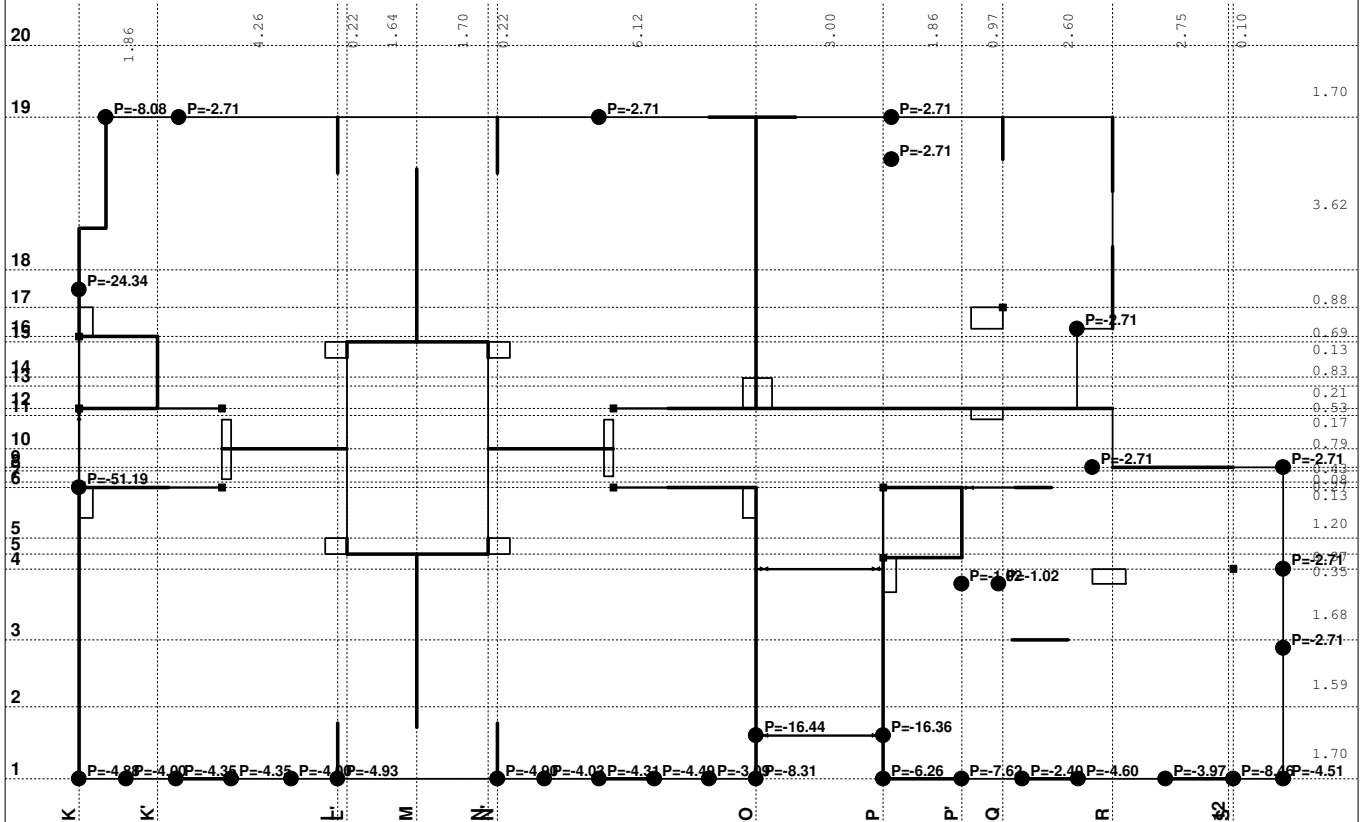
Ulazni podaci - Konstrukcija, Ulazni podaci - Opterećenje

POS 300+ - KONSTRUKCIJA IZNAD II SPRATA

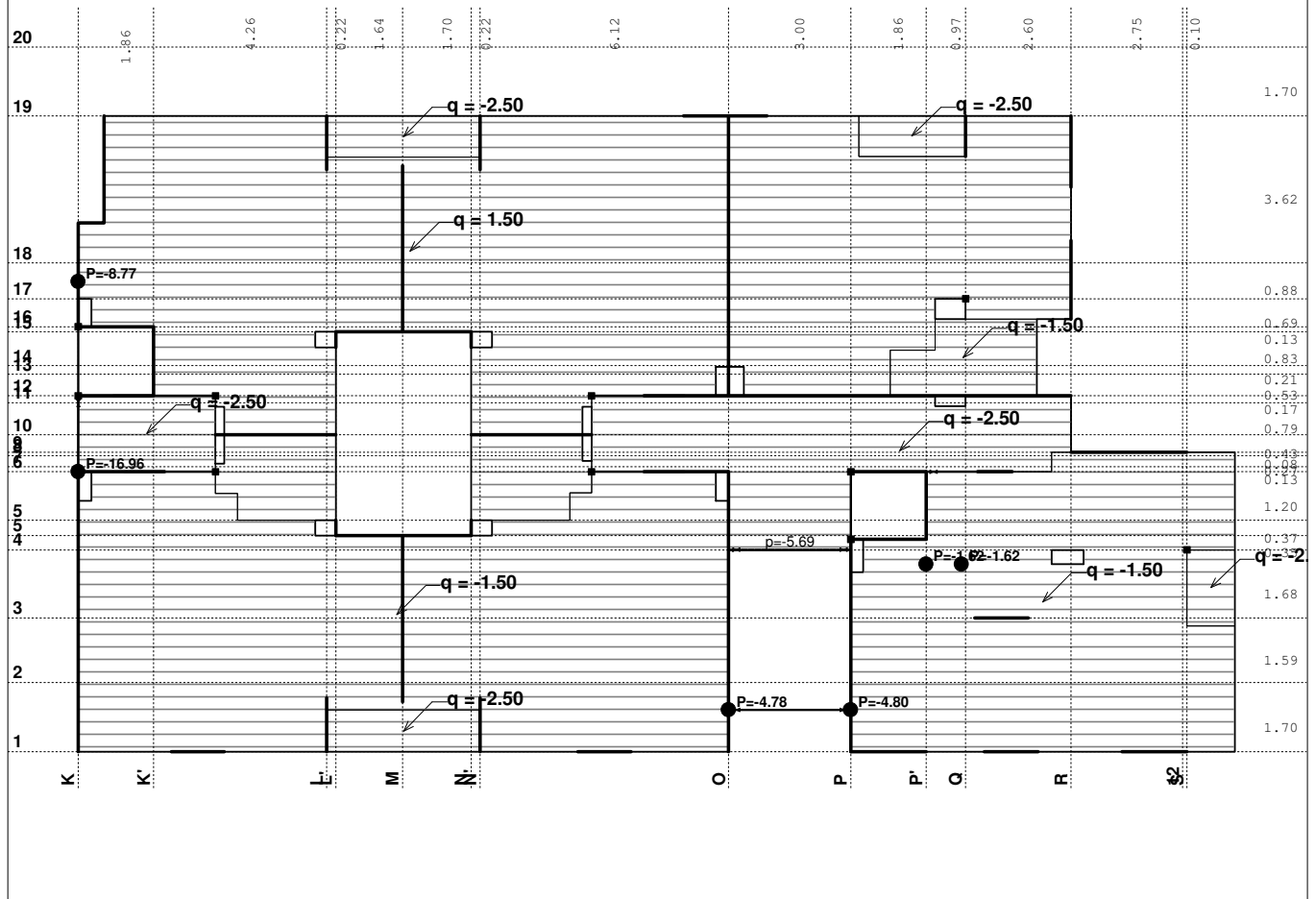
Opt. 1: g (g)



Opt. 1: g (g)



Opt. 2: p



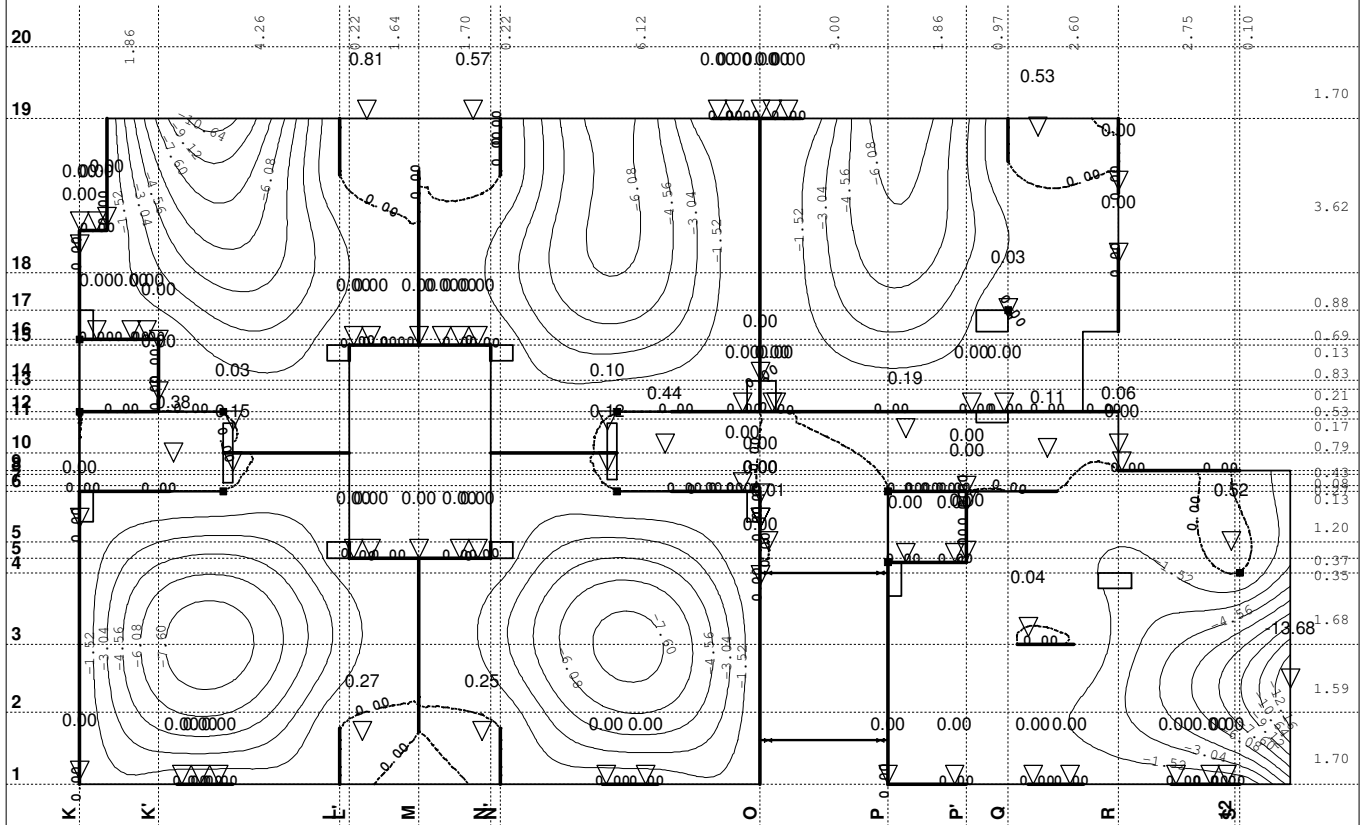
Lista slučajeva opterećenja

LC	Naziv
1	q (g)
2	p
3	Komb.: 1.6xI+1.8xII

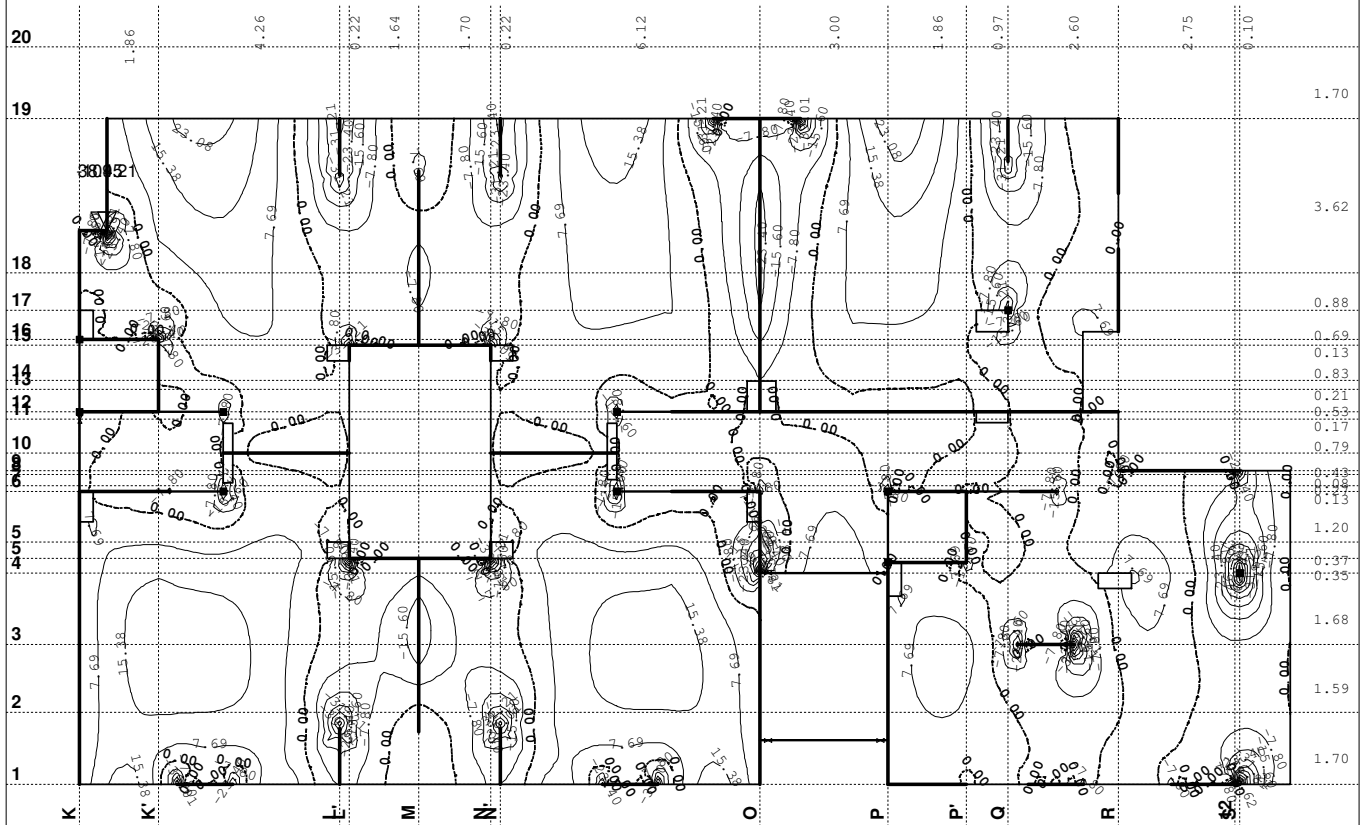
LC	Naziv
4	Komb.: 3.5xI
5	Komb.: I+II

Statički proračun

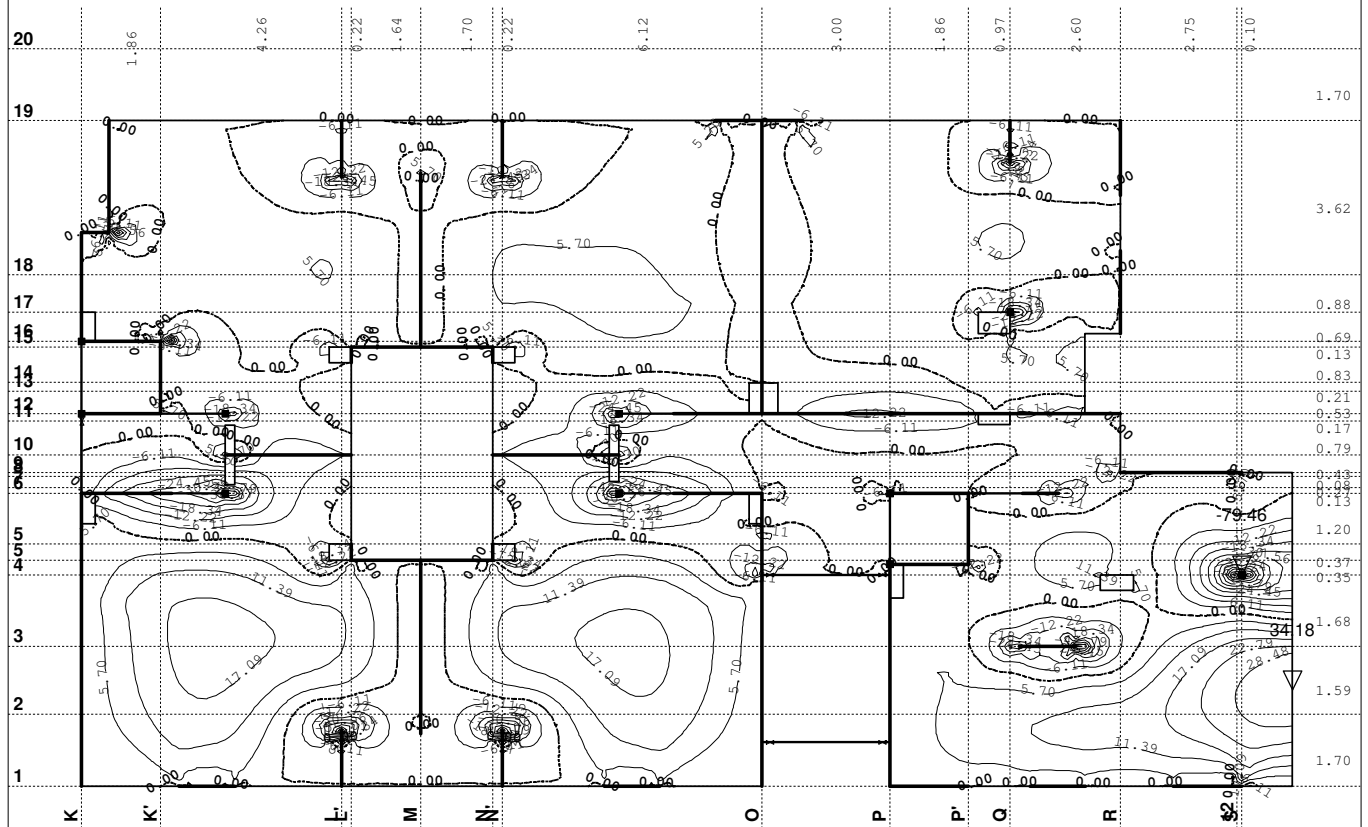
Opt. 4: 3.5xl+II


 Uticaji u ploči: max $Z_p = 0.81$ / min $Z_p = -13.68$ m / 1000

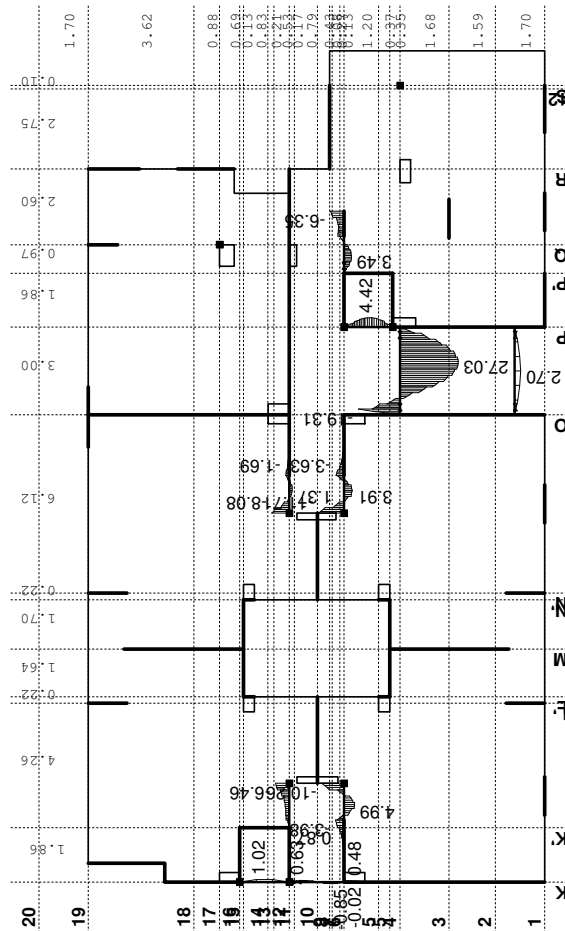
Opt. 3: 1.6xl+1.8xII


 Uticaji u ploči: max $M_x = 38.45$ / min $M_x = -109.21$ kNm/m

Opt. 3: 1.6xl+1.8xII

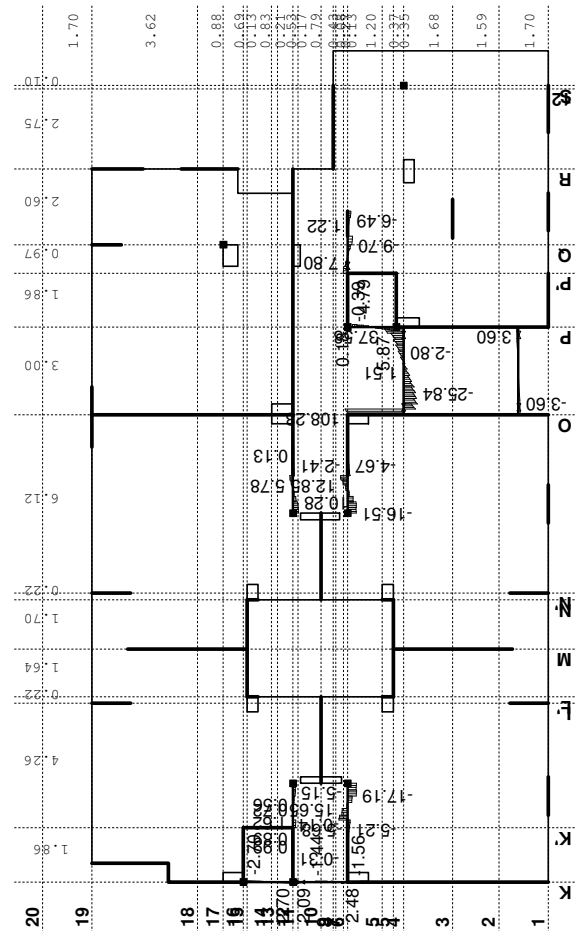


Uticaji u ploči: max $M_y = 34.18$ / min $M_y = -79.46$ kNm/m
Opt. 3: 1.6xl+1.8xII



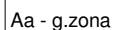
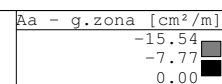
Uticaji u gredi: max $M_3 = 27.03$ / min $M_3 = -19.31$ kNm

Opt. 3: 1.6xl+1.8xII

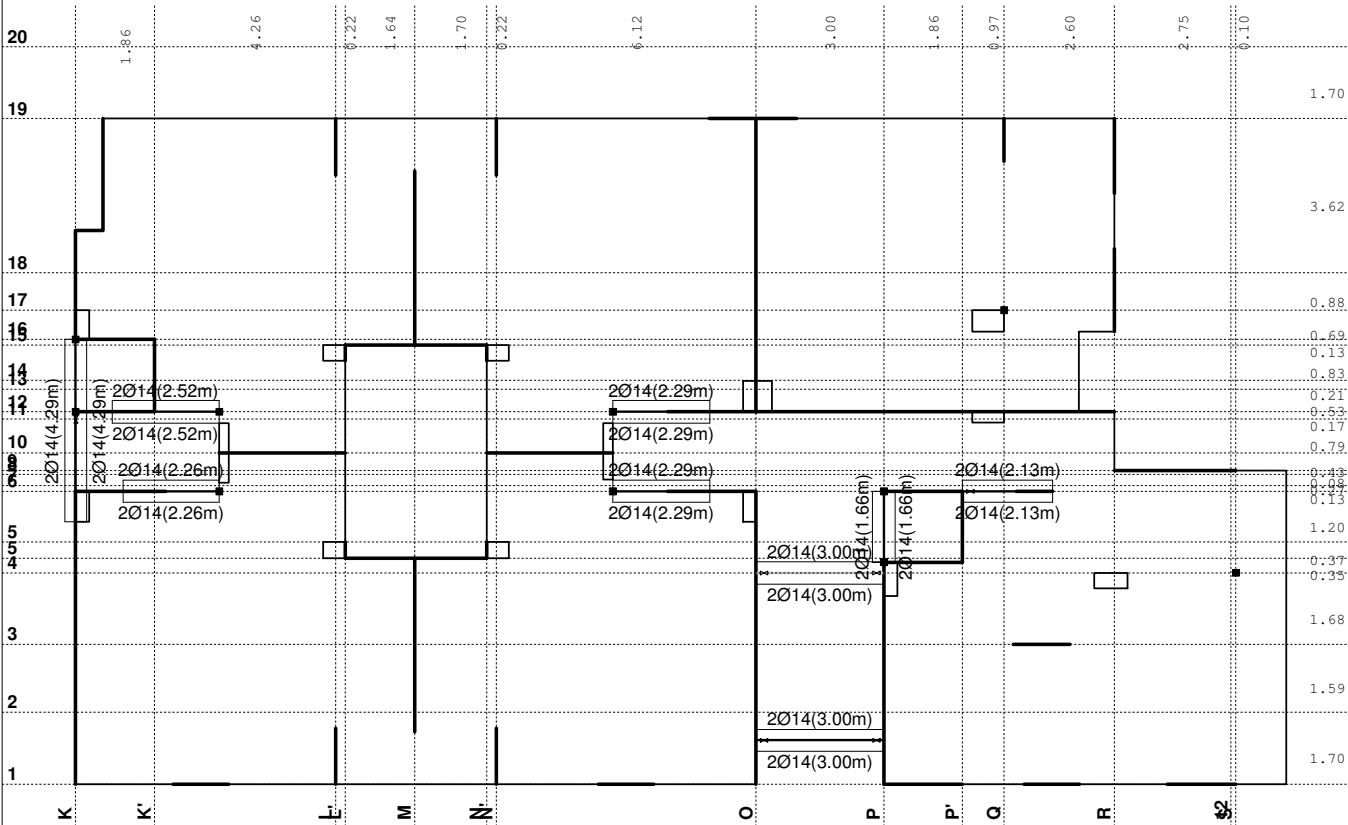


Uticaji u gredi: max $T_2 = 108.23$ / min $T_2 = -25.84$ kNm

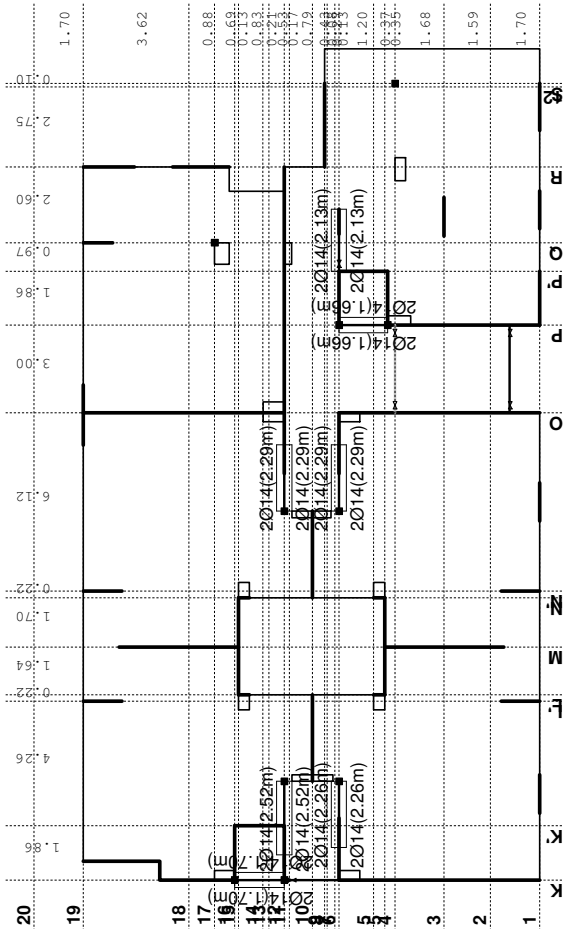
Aa - d.zona [cm ² /m]
0.00
2.53
5.06



Usvojena armatura
PBAB 87, MB 30, MA 500/560

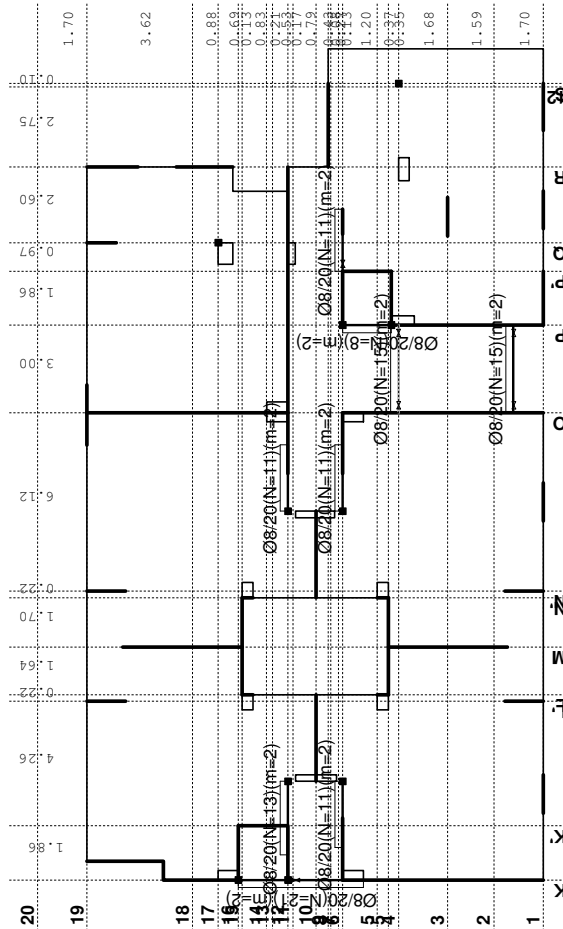


Armatura u gredama: Aa2/Aa1
Usvojena armatura
PBAB 87, MB 30, MA 500/560



Armatura u gredama: Aa3/Aa4

Usvojena armatura
PBAB 87, MB 30, MA 500/560



Armatura u gredama: Aa,uz

Z12 (5016-5942)

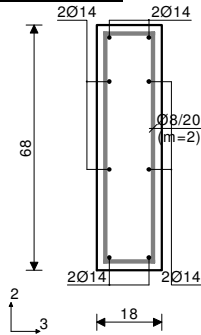
PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 0.78m



[cm]

$$\begin{aligned} T2u &= 0.53 \text{ kN} \\ M1u &= 0.35 \text{ kNm} \\ M3u &= 1.37 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -0.144/10.000 \% \\ Aa1 &= 0.04 \text{ cm}^2 \\ Aa2 &= 0.00 \text{ cm}^2 \\ Aa3 &= 0.00 \text{ cm}^2 \\ Aa4 &= 0.00 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/\text{m} \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \text{Ø}8/20(m=2) = 2.51 \text{ cm}^2/\text{m}] \end{aligned}$$

$$\begin{aligned} \tau_y &= 0.14 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \tau_z &= 0.13 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \text{Procenat armiranja: } &1.01\% \end{aligned}$$

Z6b (4338-5175)

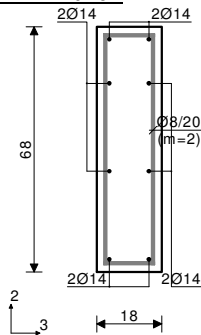
PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 2-2 x = 0.78m



[cm]

$$\begin{aligned} T2u &= 2.99 \text{ kN} \\ M1u &= -1.03 \text{ kNm} \\ M3u &= 3.90 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \epsilon_b/\epsilon_a &= -0.247/10.000 \% \\ Aa1 &= 0.13 + 0.00 = 0.13 \text{ cm}^2 \\ Aa2 &= 0.00 + 0.00 = 0.00 \text{ cm}^2 \\ Aa3 &= 0.00 + 0.07 = 0.07 \text{ cm}^2 \\ Aa4 &= 0.00 + 0.07 = 0.07 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/\text{m} \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \text{Ø}8/20(m=2) = 2.51 \text{ cm}^2/\text{m}] \end{aligned}$$

$$\begin{aligned} \tau_y &= 0.42 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \tau_z &= 0.39 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \text{Procenat armiranja: } &1.01\% \end{aligned}$$

*) - dodatna podužna armatura za prijem torzije.

P 308 (1954-1277)

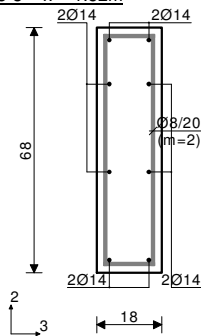
PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 3-3 x = 1.52m



[cm]

$$\begin{aligned} T2u &= -4.38 \text{ kN} \\ M1u &= -2.43 \text{ kNm} \\ M3u &= 0.31 \text{ kNm} \end{aligned}$$

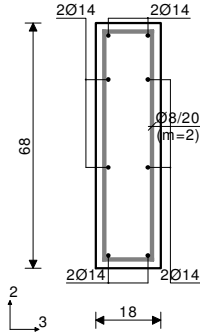
$$\begin{aligned} \epsilon_b/\epsilon_a &= -0.068/10.000 \% \\ Aa1 &= 0.00 + 0.04 = 0.04 \text{ cm}^2 \\ Aa2 &= 0.00 + 0.04 = 0.04 \text{ cm}^2 \\ Aa3 &= 0.00 + 0.17 = 0.17 \text{ cm}^2 \\ Aa4 &= 0.00 + 0.17 = 0.17 \text{ cm}^2 \\ Aa_{uz} &= 0.00 \text{ cm}^2/\text{m} \quad (m=2) \\ &[\text{Usvojeno } Aa_{uz} = \text{Ø}8/20(m=2) = 2.51 \text{ cm}^2/\text{m}] \end{aligned}$$

$$\begin{aligned} \tau_y &= 0.95 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \tau_z &= 0.91 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa} \\ \text{Procenat armiranja: } &1.01\% \end{aligned}$$

*) - dodatna podužna armatura za prijem torzije.

Z6a (1434-925)
 PBAB 87
 MB 30
 MA 500/560
 Dimenzionisanje jednog slučaja
 opterećenja: 1.60xI+1.80xII

Presek 4-4 x = 0.65m



[cm]

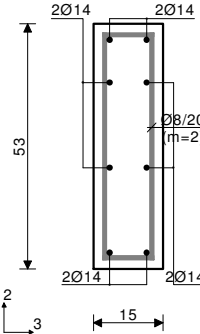
T2u = 0.62 kN
 M1u = 0.24 kNm
 M3u = 4.99 kNm

$\epsilon_b/\epsilon_a = -0.281/10.000 \text{ ‰}$
 Aa1 = 0.16 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]
 $\tau_y = 0.10 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.09 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 Procenat armiranja: 1.01%

ZK" (1476-1087)

PBAB 87
 MB 30
 MA 500/560
 Dimenzionisanje jednog slučaja
 opterećenja: 1.60xI+1.80xII

Presek 5-5 x = 0.85m



[cm]

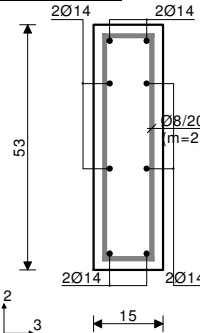
M3u = 1.02 kNm

$\epsilon_b/\epsilon_a = -0.176/10.000 \text{ ‰}$
 Aa1 = 0.04 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]
 Procenat armiranja: 1.55%

ZP" (6856-6167)

PBAB 87
 MB 30
 MA 500/560
 Dimenzionisanje jednog slučaja
 opterećenja: 1.60xI+1.80xII

Presek 6-6 x = 0.96m



[cm]

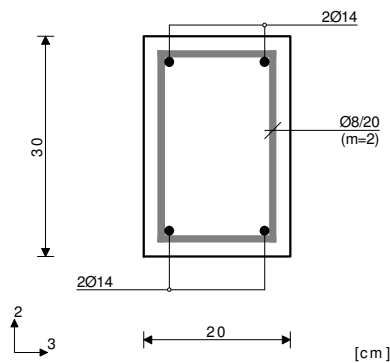
T2u = -0.27 kN
 M3u = 4.42 kNm

$\epsilon_b/\epsilon_a = -0.377/10.000 \text{ ‰}$
 Aa1 = 0.19 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]
 Procenat armiranja: 1.55%

P 309 (4865-6065)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 7-7 $x = 1.76m$



$$T2u = -2.80 \text{ kN}$$

$$M3u = 26.93 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -1.790/10.000 \text{ ‰}$$

$$Aa1 = 2.11 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \phi 8/20(m=2) = 2.51 \text{ cm}^2/m$]

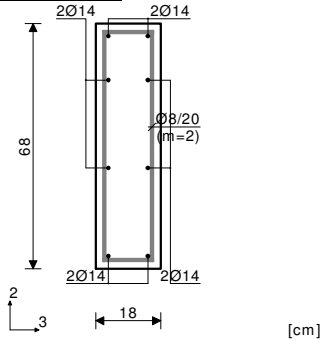
$$\tau_y = 0.06 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.03%

Z6c (8466-7631)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 8-8 $x = 1.52m$



$$T2u = 0.44 \text{ kN}$$

$$M1u = 1.33 \text{ kNm}$$

$$M3u = 3.49 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.233/10.000 \text{ ‰}$$

$$Aa1 = 0.11 + 0.02' = 0.14 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.02' = 0.02 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.10' = 0.10 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.10' = 0.10 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \phi 8/20(m=2) = 2.51 \text{ cm}^2/m$]

$$\tau_y = 0.50 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.50 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

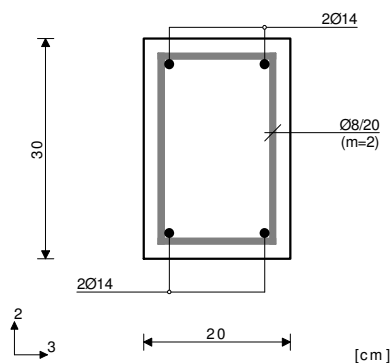
Procenat armiranja: 1.01%

*) - dodatna podužna armatura za prijem torzije.

P 307 (587-1087)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 9-9 $x = 1.20m$



$$T2u = 1.14 \text{ kN}$$

$$M3u = -0.85 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.248/10.000 \text{ ‰}$$

$$Aa1 = 0.00 \text{ cm}^2$$

$$Aa2 = 0.06 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

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

[Usvojeno $Aa,uz = \phi 8/20(m=2) = 2.51 \text{ cm}^2/m$]

$$\tau_y = 0.02 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procenat armiranja: 1.03%

P 310 (3512-4526)

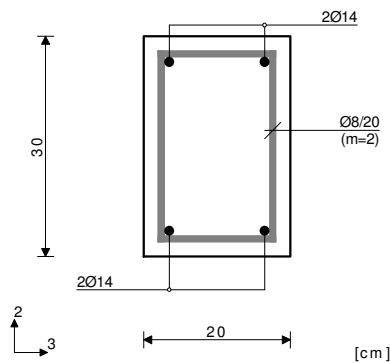
PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 10-10 x = 1.00m



$$T2u = -1.20 \text{ kN}$$

$$M3u = 2.40 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.428/10.000 \text{ ‰}$$

$$Aa1 = 0.18 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

$$Aa,uz = 0.00 \text{ cm}^2/\text{m}$$

$$(m=2)$$

$$[\text{Usvojeno } Aa,uz = \phi 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}]$$

$$\tau_y = 0.02 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

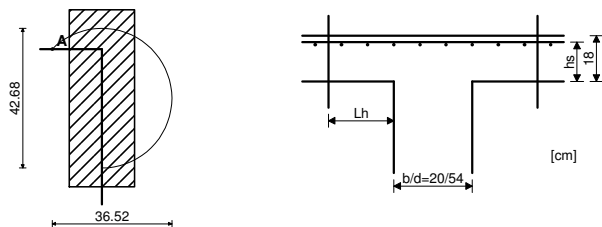
$$\text{Procenat armiranja: } 1.03\%$$

Kontrola ploča na probijanje

Nivo: POS 300+ [0.00 m]

Presek 1 (190.60,-108.22,0.00)

MB 30



KONTROLA KRITIČNOG PRESEKA 1. ($L_h = 0.07\text{m}$ od ivice stuba)
(stub zamenjujućeg kružnog preseka, $d_s = 0.28\text{m}$)

Merodavna kombinacija: I+II

Sila u stubu

$$N = 76.940 \text{ kN}$$

Faktor povećanja napona zbog ekscentričnosti

$$\beta = 1.400$$

Merodavni smičući napon (tačka A)

$$\tau = 0.856 \text{ MPa}$$

Debljina ploče

$$d,pl = 0.180 \text{ m}$$

Statička visina ploče

$$h_s = 0.150 \text{ m}$$

Obim kritičnog preseka

$$Okp = 0.839 \text{ m}$$

Postojeća armatura u ploči

Površina armature - pravac 1

$$Aa,1 = 12.147 \text{ cm}^2$$

Procenat armiranja - pravac 1

$$\mu,1 = 0.810 \%$$

Površina armature - pravac 2

$$Aa,2 = 12.147 \text{ cm}^2$$

Procenat armiranja - pravac 2

$$\mu,2 = 0.810 \%$$

Srednja vrednost procenta armiranja

$$\mu = 0.810 \%$$

Koeficijent

$$\alpha_a = 1.400$$

Koeficijent

$$\gamma_1 = 1.638$$

Koeficijent

$$\gamma_2 = 0.567$$

Dopušteni glavni napon zatezanja

$$\tau_a = 0.800$$

Dopušteni glavni napon zatezanja

$$\tau_b = 2.200$$

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

$$\tau_{\max} = 1.247 \text{ MPa}$$

$$\text{Uslov: } \tau \leq \tau_{\max} (0.86 \leq 1.25)$$

Uslov je ispunjen.

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

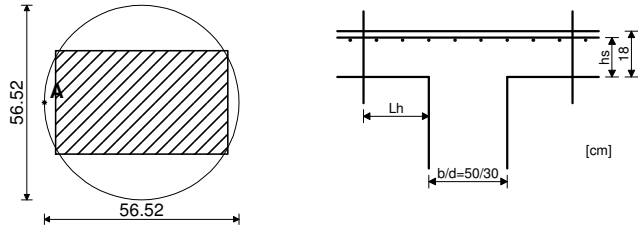
$$\tau_{gr} = 0.874 \text{ MPa}$$

$$\text{Uslov: } \tau \leq \tau_{gr} (0.86 \leq 0.87)$$

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

Kontrola ploča na probijanje

Nivo: POS 300+ [0.00 m]
 Presek 2 (196.05,-114.40,0.00)
 MB 30



KONTROLA KRITIČNOG PRESEKA 1. ($L_h = 0.07\text{m}$ od ivice stuba)
 (stub zamenjujućeg kružnog preseka, $d_s = 0.42\text{m}$)

Merodavna kombinacija: I+II	
Sila u stubu	$N = 187.15\text{ kN}$
Merodavni smičući napon (tačka A)	$\tau = 0.703\text{ MPa}$
Debljina ploče	$d_{pl} = 0.180\text{ m}$
Statička visina ploče	$h_s = 0.150\text{ m}$
Obim kritičnog preseka	$Okp = 1.776\text{ m}$
Postojeća armatura u ploči	
Površina armature - pravac 1	$A_{a,1} = 9.425\text{ cm}^2$
Procenat armiranja - pravac 1	$\mu_1 = 0.628\%$
Površina armature - pravac 2	$A_{a,2} = 9.425\text{ cm}^2$
Procenat armiranja - pravac 2	$\mu_2 = 0.628\%$
Srednja vrednost procenta armiranja	$\mu = 0.628\%$
Koeficijent	$\alpha_a = 1.400$
Koeficijent	$\gamma_1 = 1.443$
Koeficijent	$\gamma_2 = 0.499$
Dopušteni glavni napon zatezanja	$\tau_a = 0.800$
Dopušteni glavni napon zatezanja	$\tau_b = 2.200$
Maksimalna otpornost ($\gamma_2 \times \tau_b$)	$\tau_{max} = 1.099\text{ MPa}$

Uslov: $\tau \leq \tau_{max}$ ($0.70 \leq 1.10$)

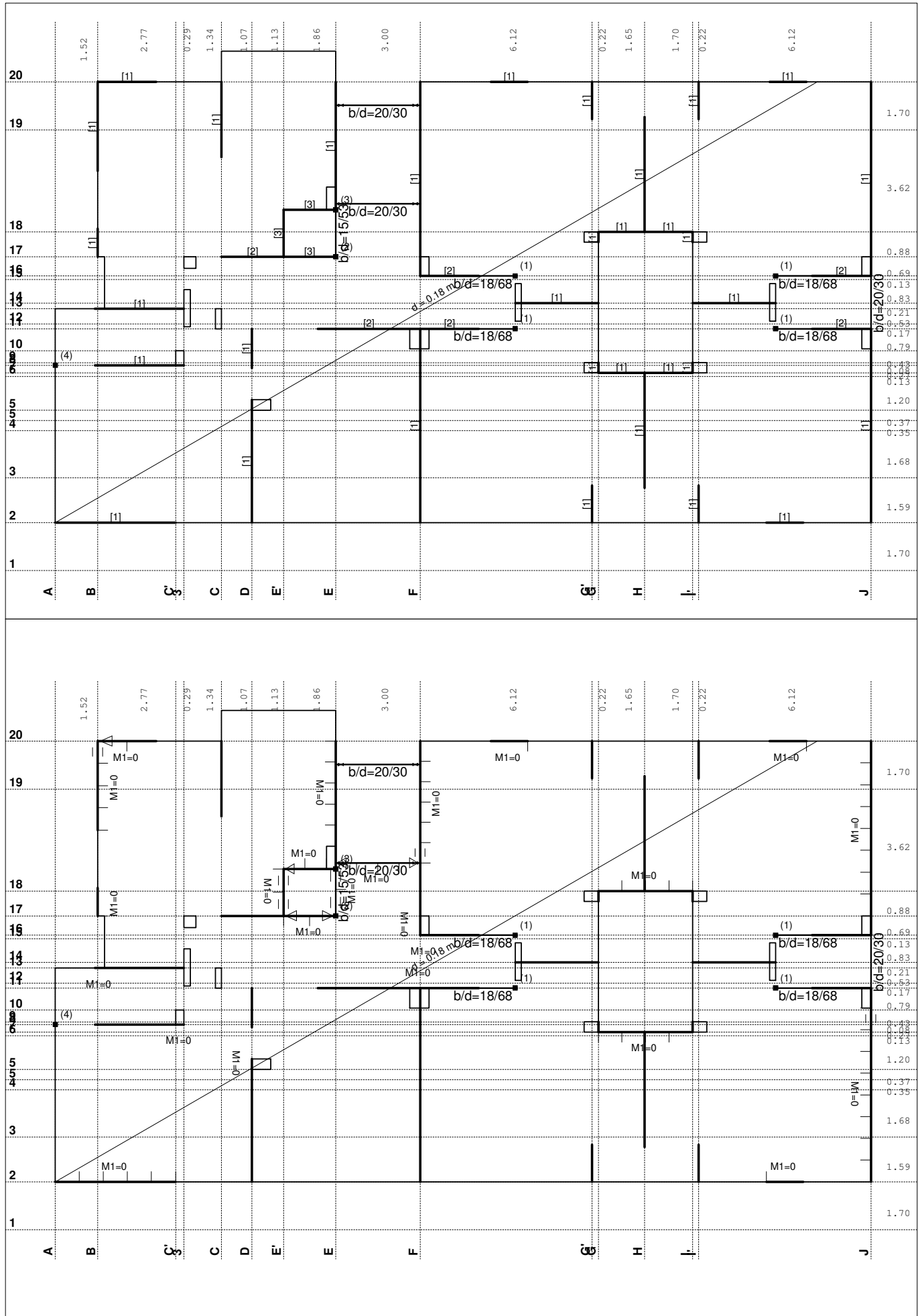
Uslov je ispunjen.

Otpornost na probijanje ploče bez dodatne armature za
 obezbeđenje ($2/3 \times \gamma_1 \times \tau_a$) $\tau_{gr} = 0.769\text{ MPa}$

Uslov: $\tau \leq \tau_{gr}$ ($0.70 \leq 0.77$)

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

POS 200+ - KONSTRUKCIJA IZNAD PRVOG SPRATA

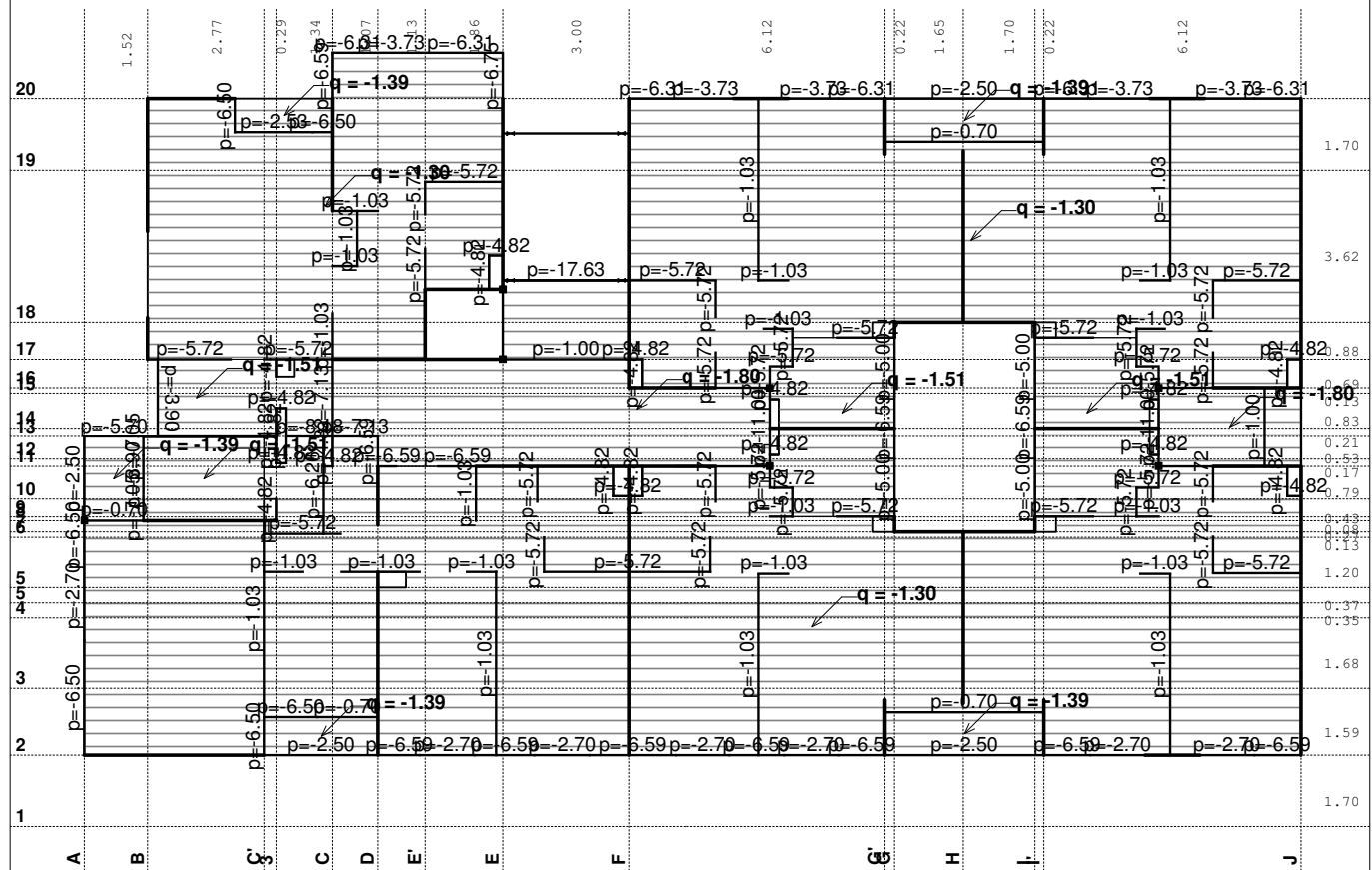


Lista slučajeva opterećenja

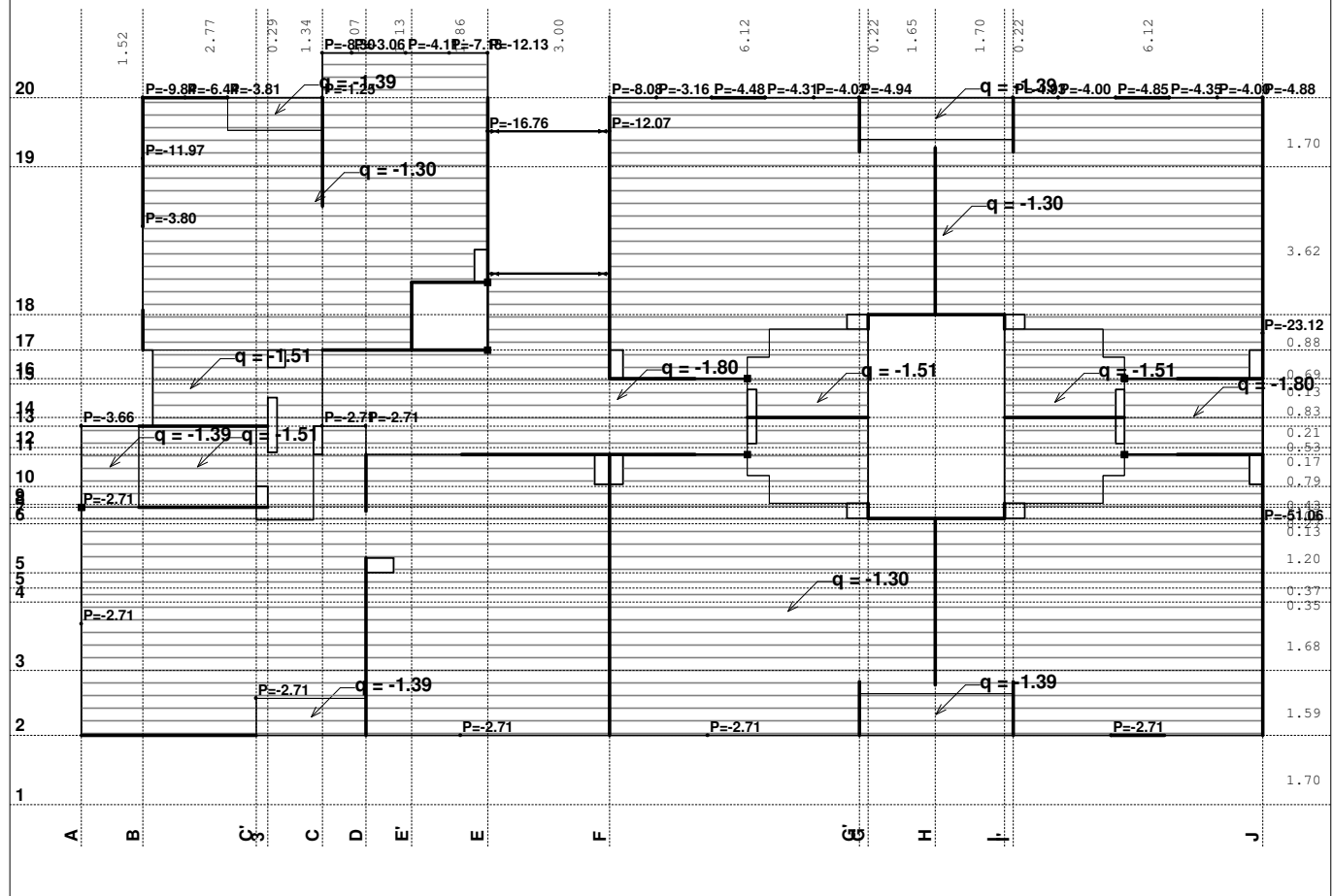
LC	Naziv
1	g (g)
2	p
3	Komb.: I+II

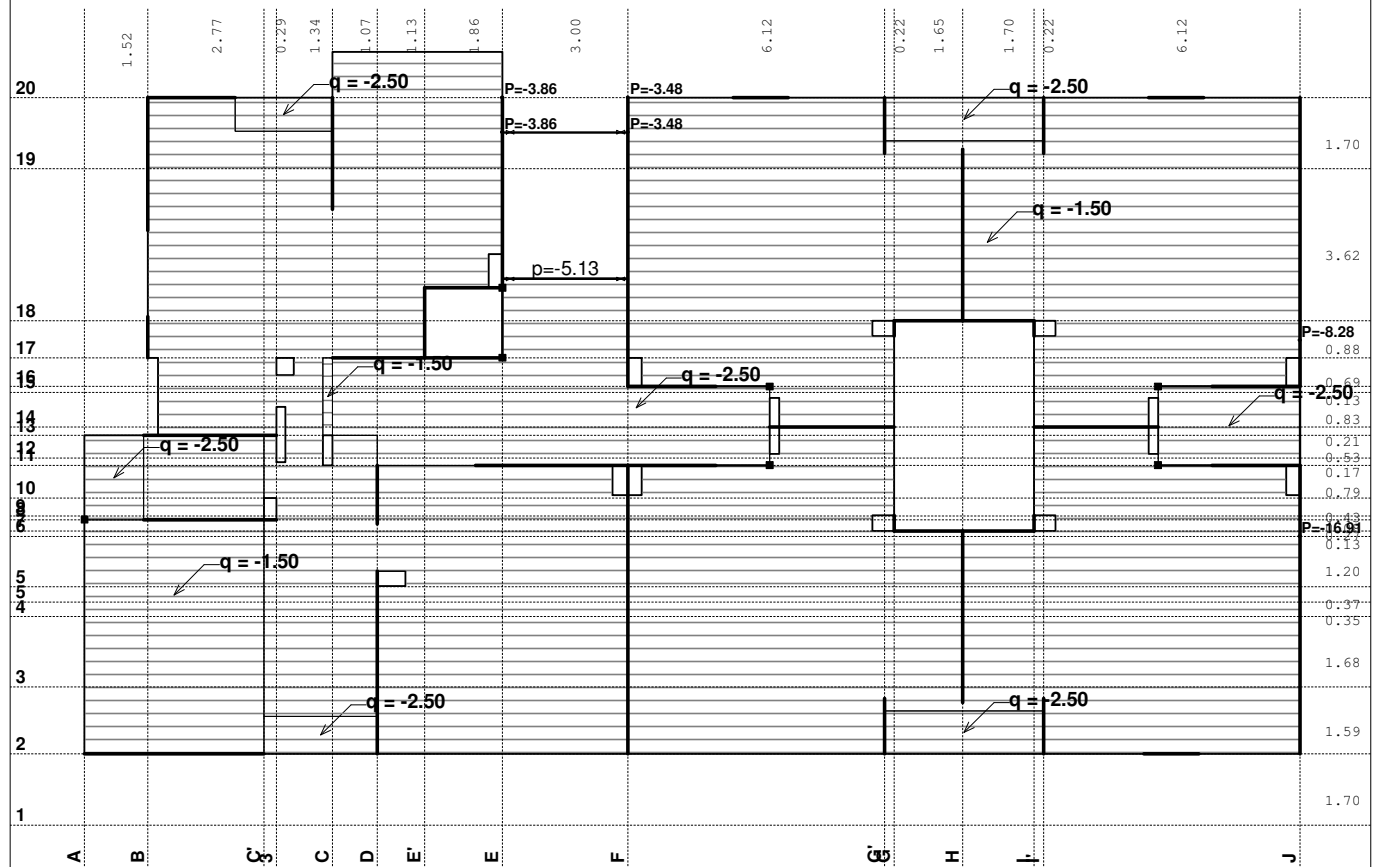
LC	Naziv
4	Komb.: 1.6xI+1.8xII
5	Komb.: 3.5xI+II

Opt. 1: g (g)

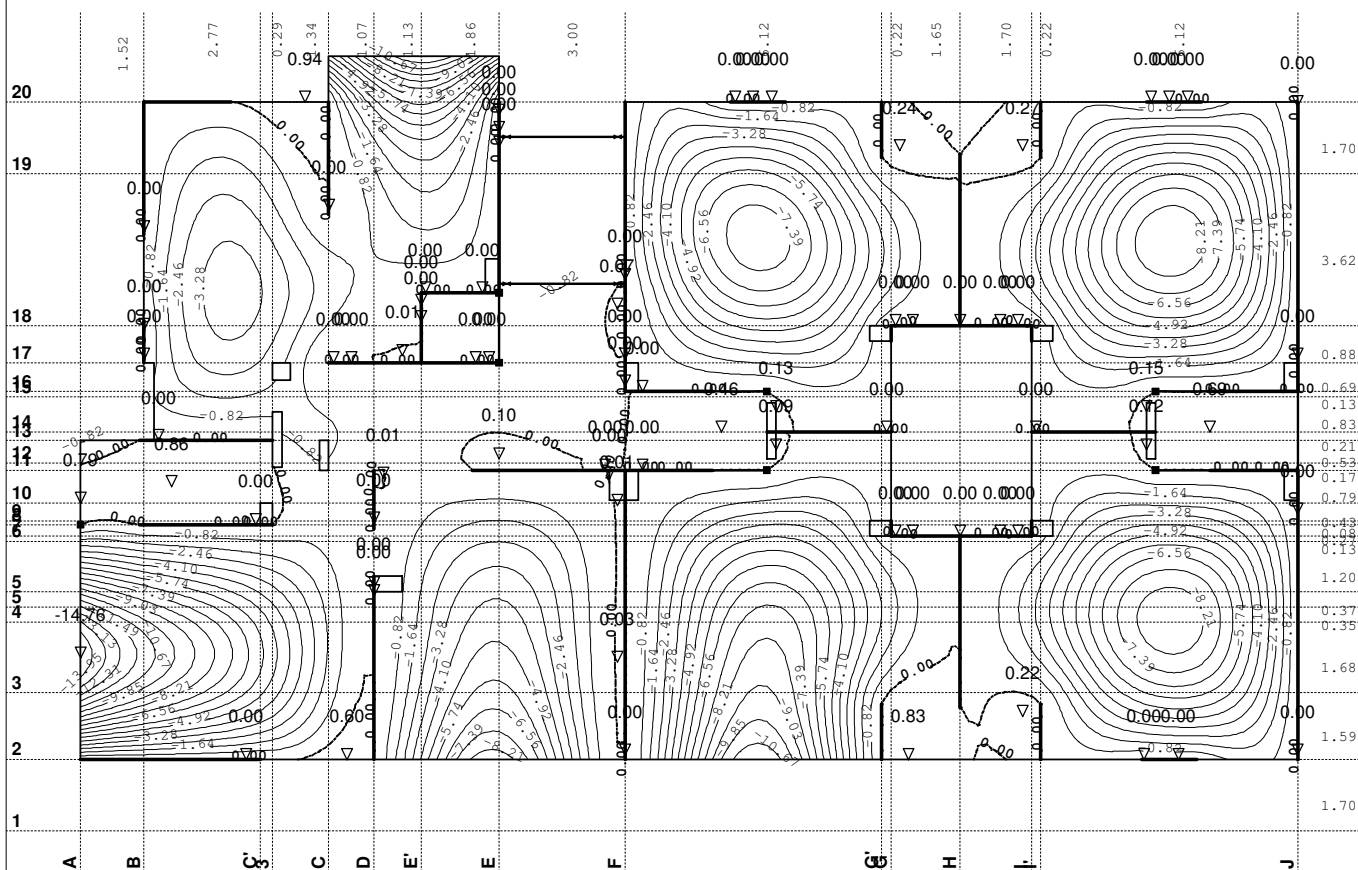


Opt. 1: g (g)



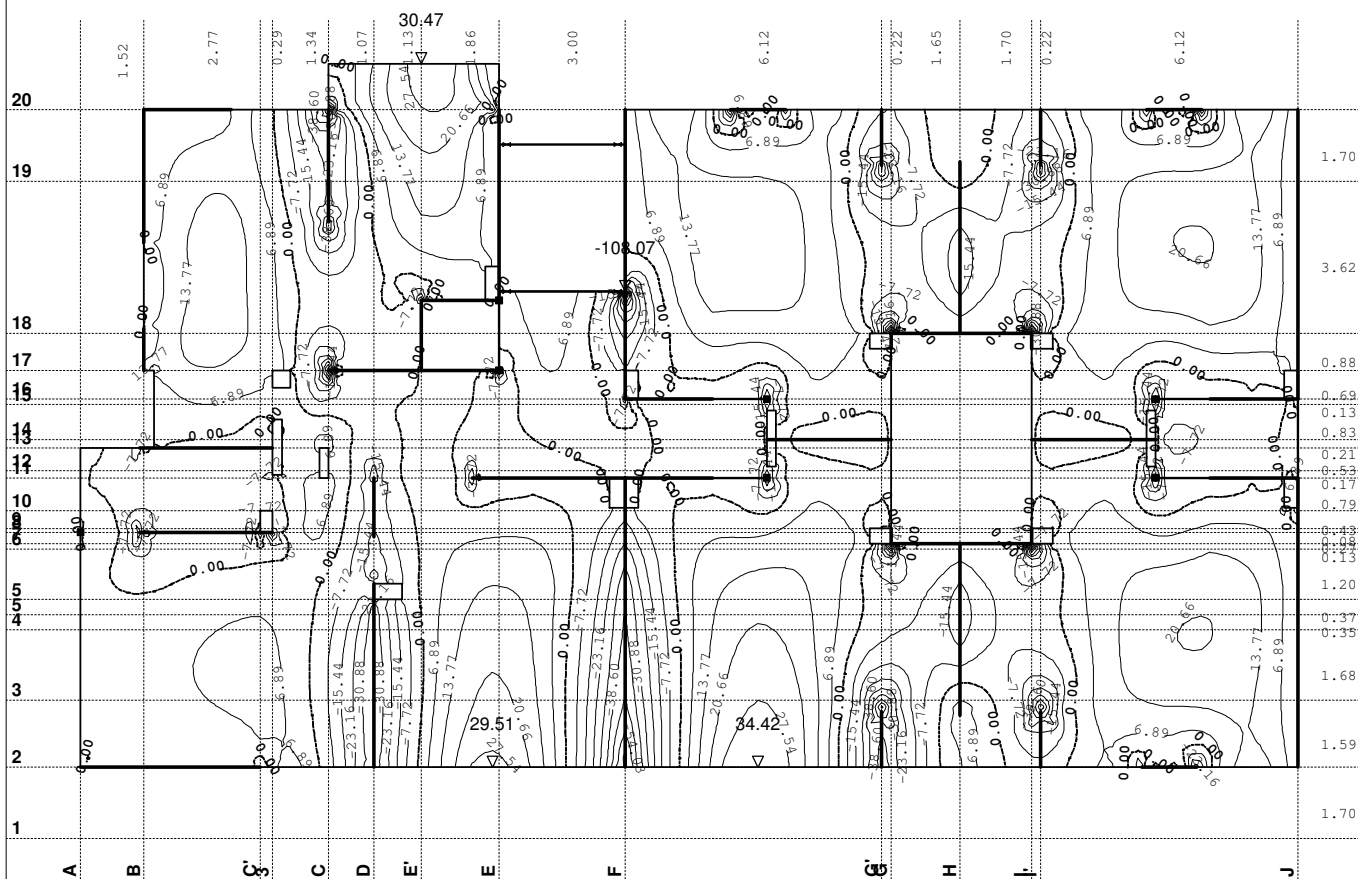


Opt. 5: 3.5xl+II



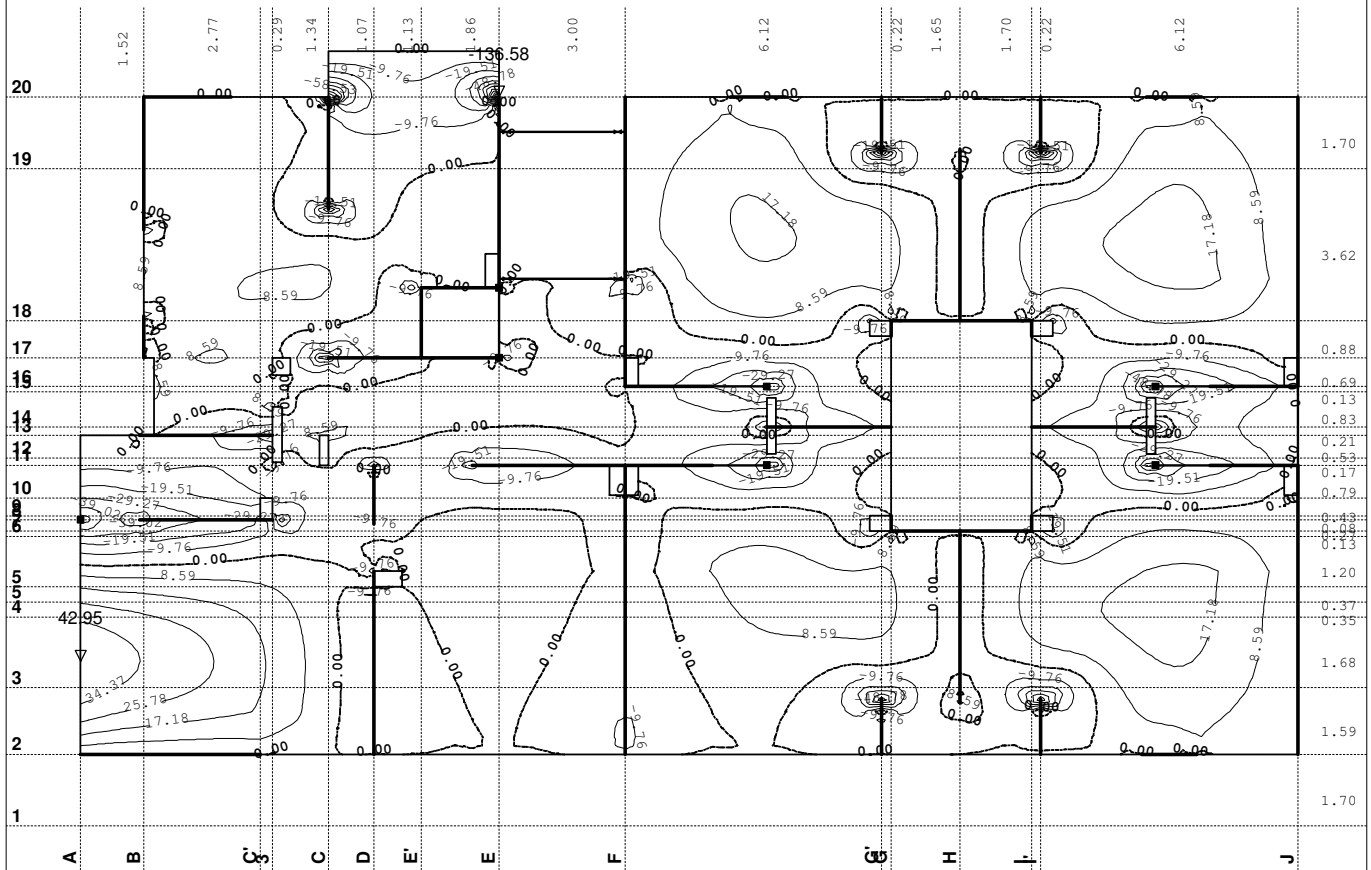
Utjecaji u ploči: max Zp= 0.94 / min Zp= -14.76 m / 1000

Opt. 4: 1.6xl+1.8xII

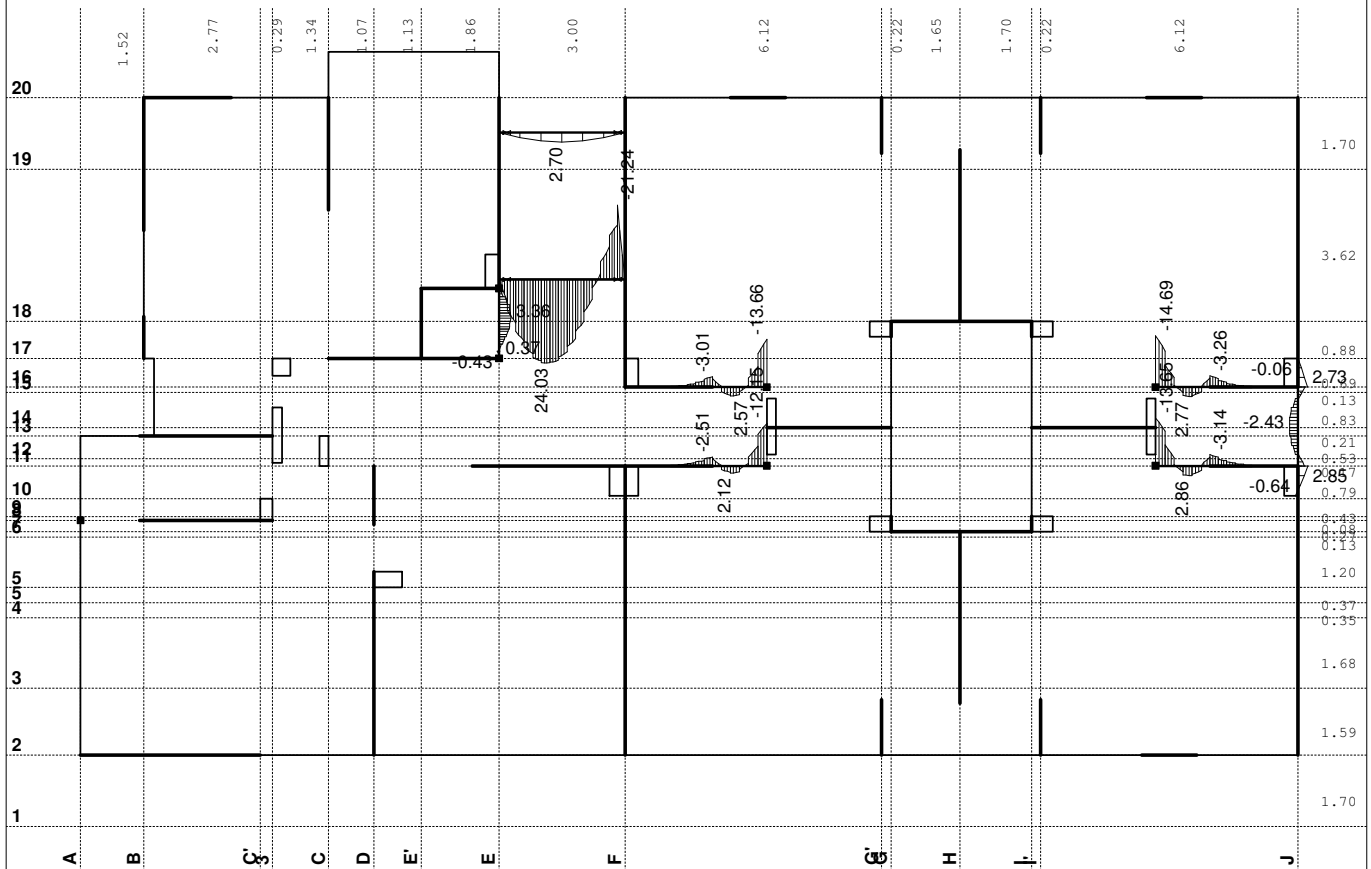


Utjecaji u ploči: max Mx= 34.42 / min Mx= -108.07 kNm/m

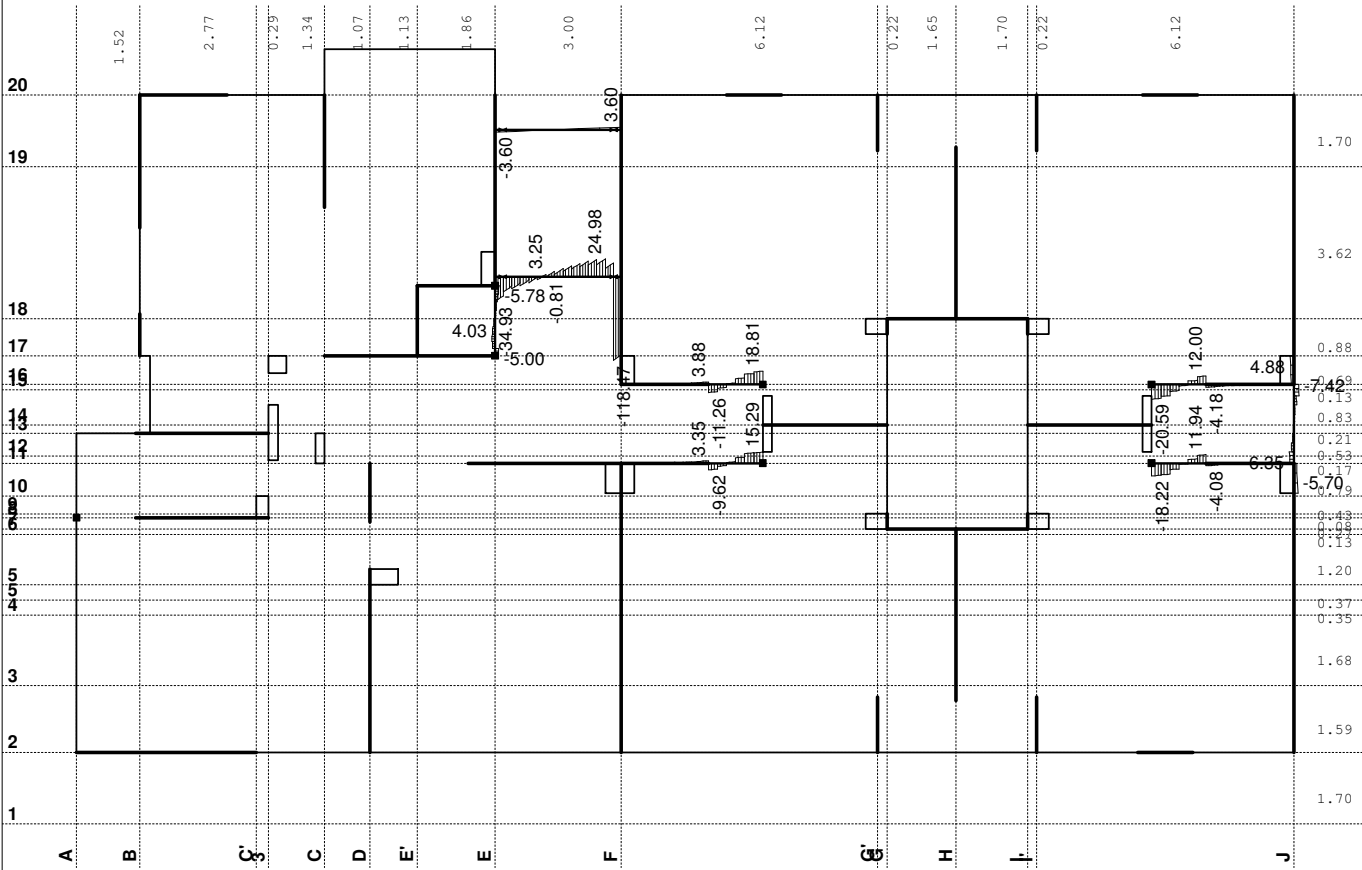
Opt. 4: 1.6xl+1.8xll

Utjecaji u ploči: max M_y = 42.95 / min M_y = -136.58 kNm/m

Opt. 4: 1.6xl+1.8xll

Utjecaji u gredi: max M_3 = 24.03 / min M_3 = -21.24 kNm

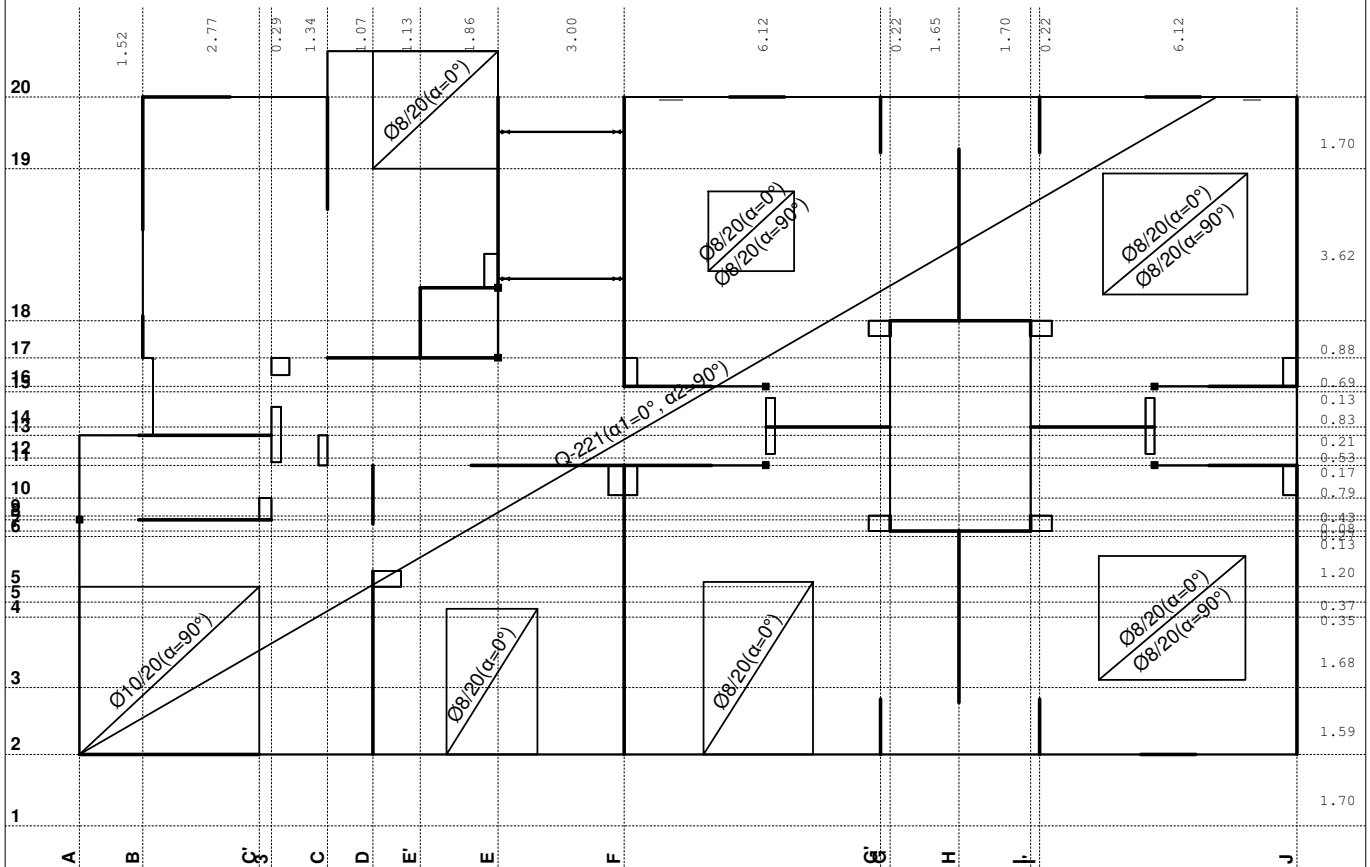
Opt. 4: 1.6xl+1.8xII



Uticaji u gredi: max T2= 24.98 / min T2= -118.47 kN

Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

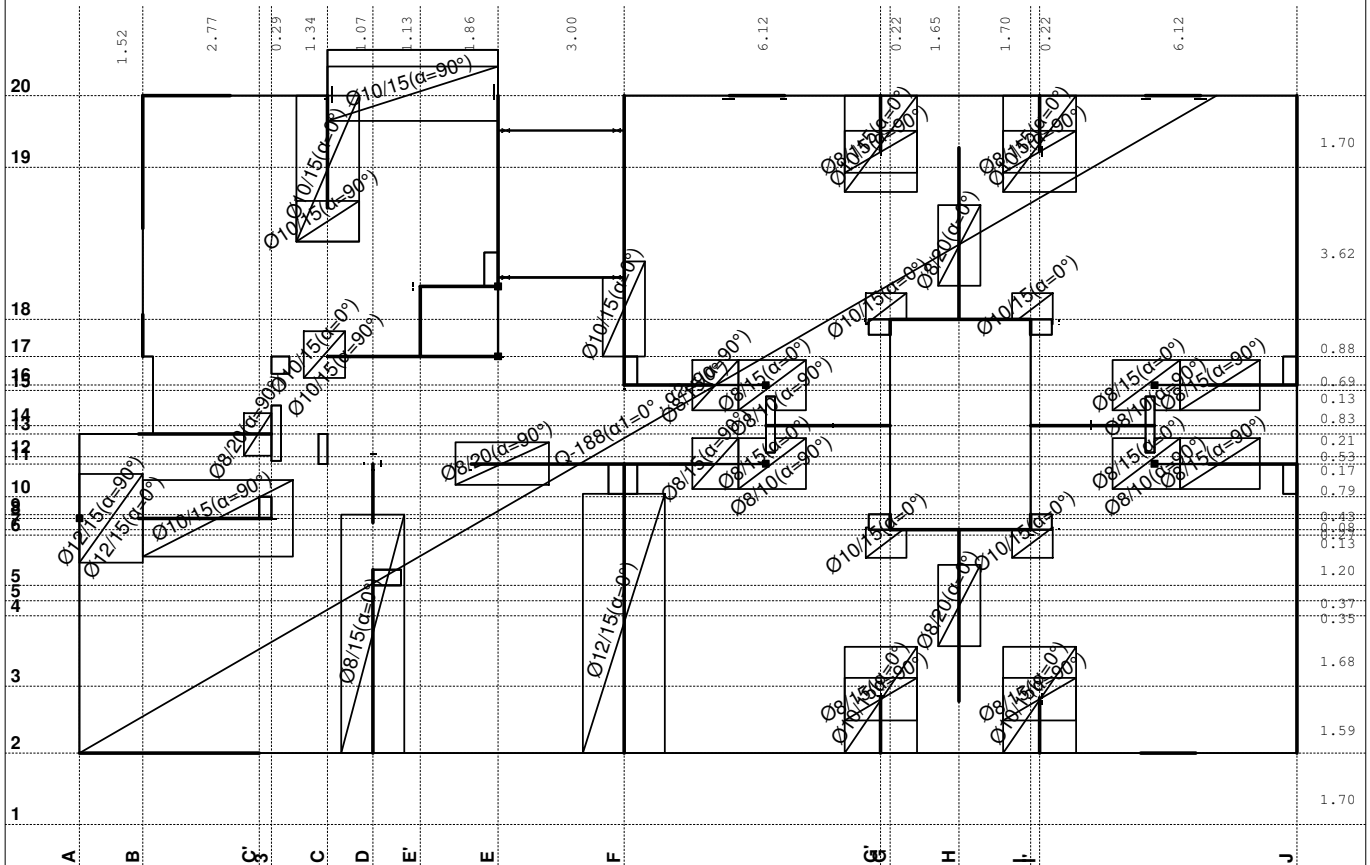
Aa - d.zona [cm ² /m]
0.00
2.84
5.67



Aa - d.zona

Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

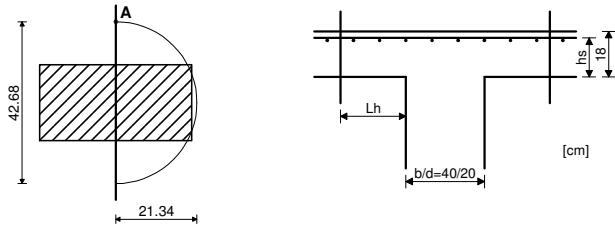
Aa - g.zona [cm ² /m]
-20.28
-10.14
0.00



Aa - g.zona

Kontrola ploča na probijanje

Nivo: POS 200+ [0.00 m]
Presek 1 (136.76,-112.08,0.00)
MB 30



KONTROLA KRITIČNOG PRESEKA 1. (Lh = 0.07m od ivice stuba)
(stub zamenjujućeg kruznog preseka, ds = 0.28m)

Merodavna kombinacija: I+II	
Sila u stubu	N = 46.727 kN
Faktor povećanja napona zbog ekscentričnosti	β = 1.400
Merodavni smičući napon (tačka A)	τ = 0.651 MPa
Debljina ploče	d,pl = 0.180 m
Statička visina ploče	hs = 0.150 m
Obim kritičnog preseka	Okp = 0.670 m
Postojeća armatura u ploči	
Površina armature - pravac 1	Aa,1 = 9.425 cm ²
Procenat armiranja - pravac 1	μ ,1 = 0.628 %
Površina armature - pravac 2	Aa,2 = 9.425 cm ²
Procenat armiranja - pravac 2	μ ,2 = 0.628 %
Srednja vrednost procenta armiranja	μ = 0.628 %
Koeficijent	α a = 1.400
Koeficijent	γ 1 = 1.443
Koeficijent	γ 2 = 0.499
Dopušteni glavni napon zatezanja	τ a = 0.800
Dopušteni glavni napon zatezanja	τ b = 2.200
Maksimalna otpornost(γ 2 x τ b)	τ ,max = 1.099 MPa

Uslov: $\tau \leq \tau_{max}$ (0.65 \leq 1.10)

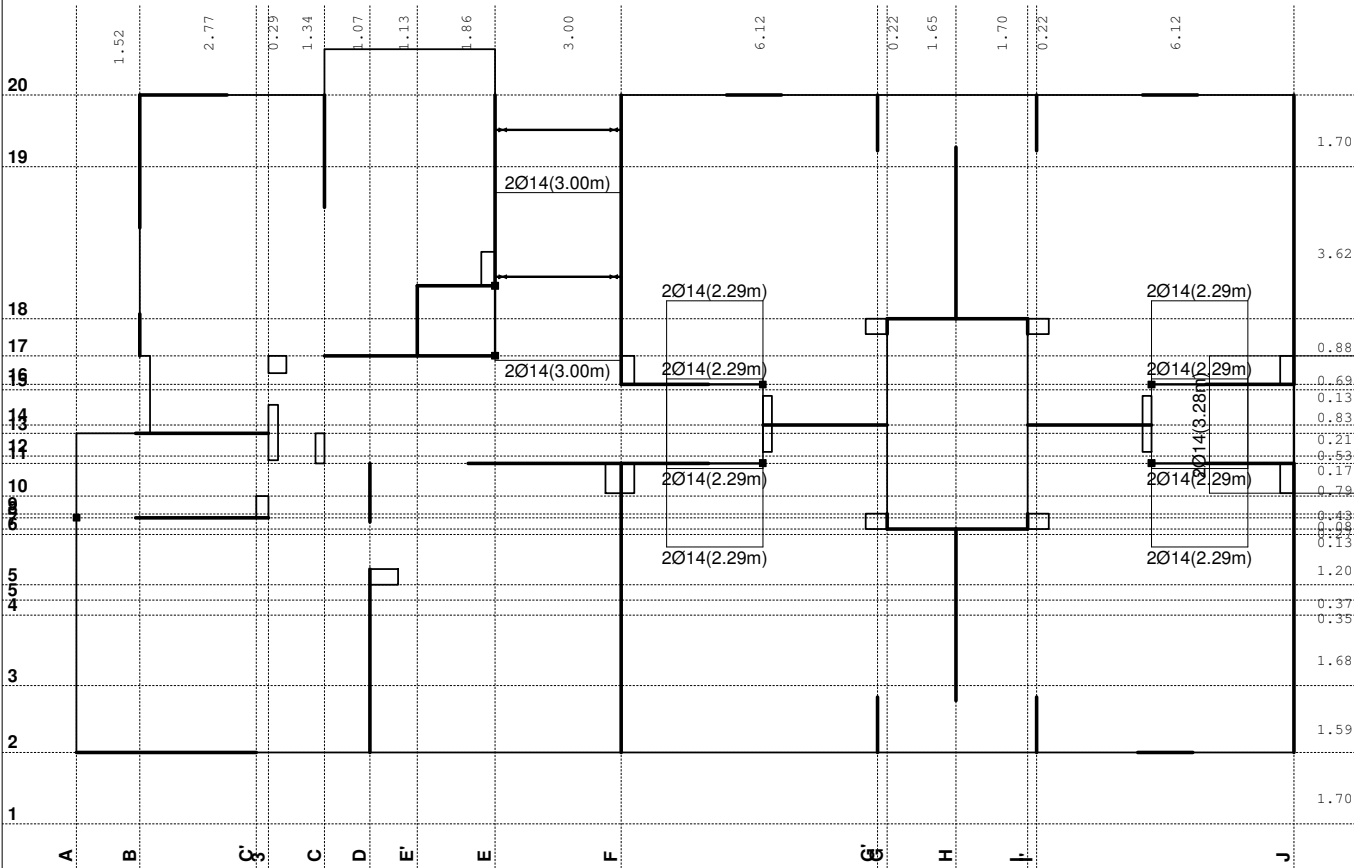
Uslov je ispunjen.

Otpornost na probijanje ploče bez dodatne armature za obezbeđenje (2/3 x γ 1 x τ a)	τ ,gr = 0.769 MPa
---	------------------------

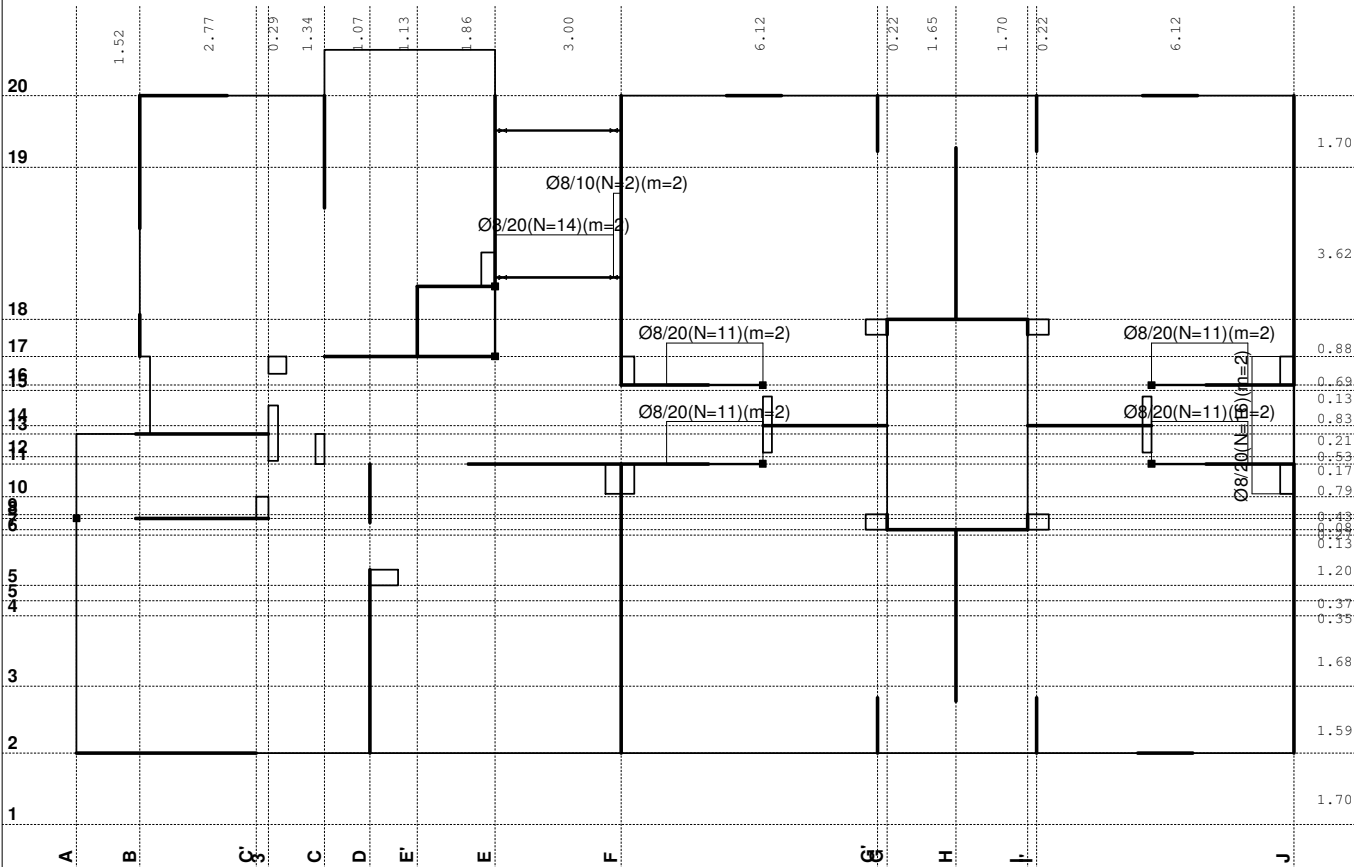
Uslov: $\tau \leq \tau_{gr}$ (0.65 \leq 0.77)

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

Usvojena armatura
PBAB 87, MB 30, MA 500/600

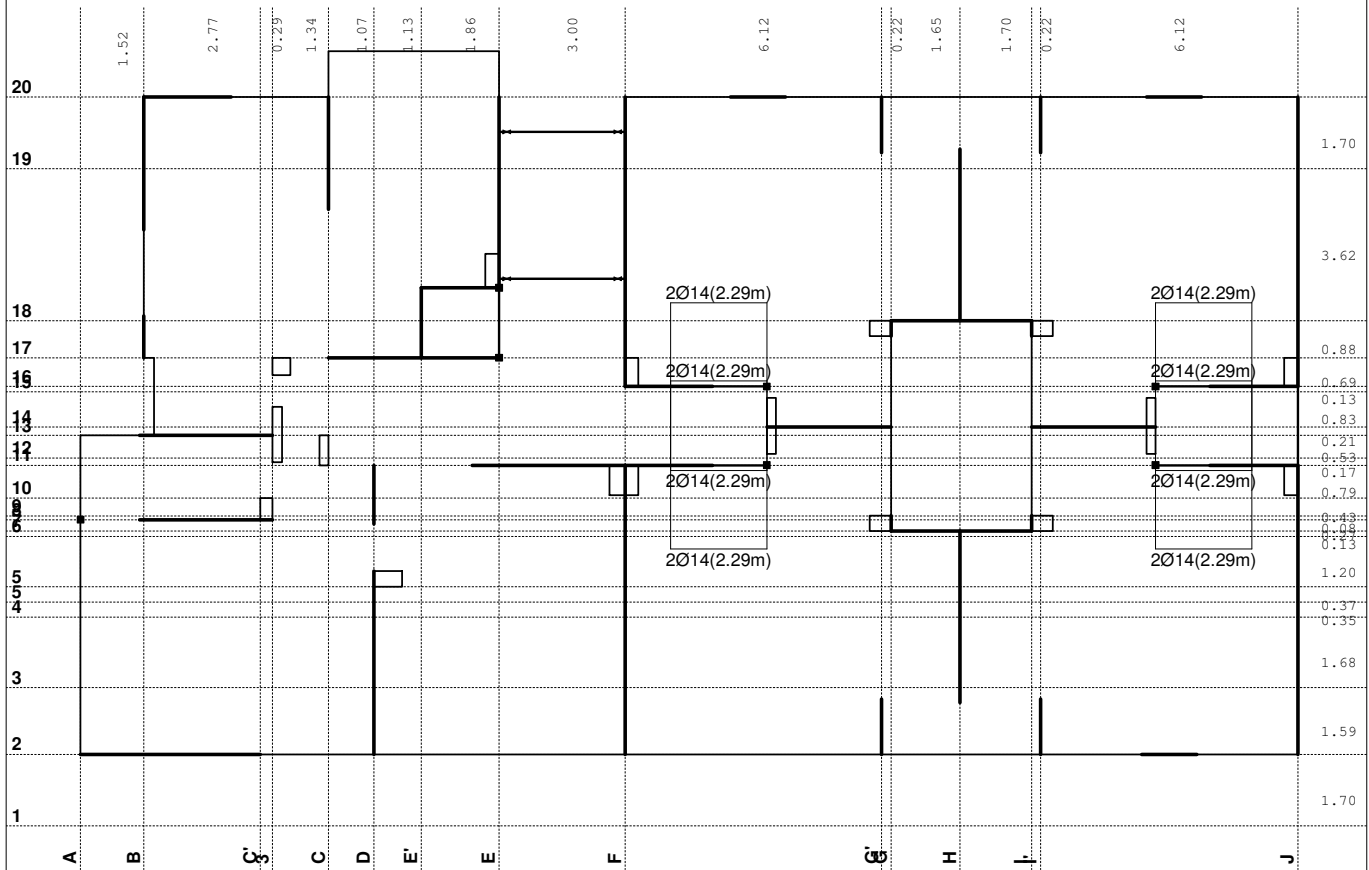


Armatura u gredama: Aa2/Aa1
Usvojena armatura
PBAB 87, MB 30, MA 500/600



Armatura u gredama: Aa,uz

Usvojena armatura
PBAB 87, MB 30, MA 500/600

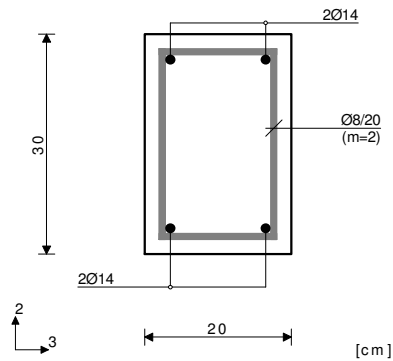


Armatura u gredama: Aa3/Aa4

Greda 9766-10418

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 $x = 1.63m$



$T2u = -0.59 \text{ kN}$
 $M3u = -2.43 \text{ kNm}$

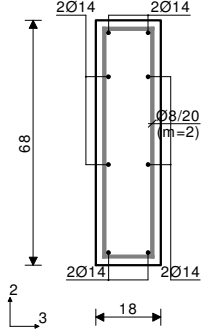
$\epsilon_b/\epsilon_a = -0.431/10.000 \%$
 $Aa1 = 0.00 \text{ cm}^2$
 $Aa2 = 0.18 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa_{uz} = 0.00 \text{ cm}^2/m$ (m=2)
[Usvojeno $Aa_{uz} = \phi 8/20(m=2) = 2.51 \text{ cm}^2/m$]

$\tau_y = 0.01 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.03%

Greda 5733-6612

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.42m



[cm]

T2u = -4.41 kN
M1u = -1.42 kNm
M3u = 2.29 kNm

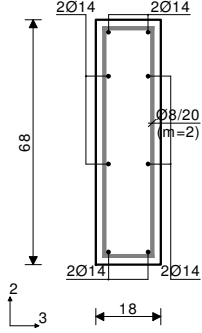
$\epsilon_b/\epsilon_a = -0.187/10.000 \text{ ‰}$
Aa1 = 0.08 + 0.03' = 0.10 cm²
Aa2 = 0.00 + 0.03' = 0.03 cm²
Aa3 = 0.00 + 0.10' = 0.10 cm²
Aa4 = 0.00 + 0.10' = 0.10 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.58 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.53 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procentat armiranja: 1.01%
) - dodatna podužna armatura za prijem torzije.

Greda 4961-5897

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.42m



[cm]

T2u = -3.62 kN
M1u = 1.22 kNm
M3u = 1.92 kNm

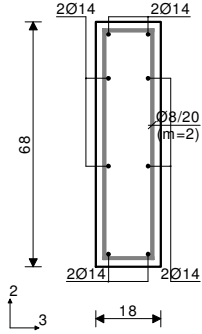
$\epsilon_b/\epsilon_a = -0.171/10.000 \text{ ‰}$
Aa1 = 0.06 + 0.02' = 0.09 cm²
Aa2 = 0.00 + 0.02' = 0.02 cm²
Aa3 = 0.00 + 0.09' = 0.09 cm²
Aa4 = 0.00 + 0.09' = 0.09 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.49 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.46 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procentat armiranja: 1.01%
) - dodatna podužna armatura za prijem torzije.

Greda 9569-10089

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 0.87m



[cm]

T2u = -0.99 kN
M1u = -0.96 kNm
M3u = 2.77 kNm

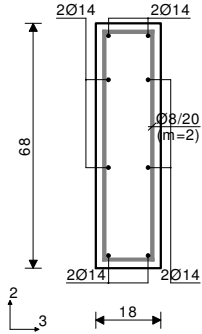
$\epsilon_b/\epsilon_a = -0.207/10.000 \text{ ‰}$
Aa1 = 0.09 + 0.00' = 0.09 cm²
Aa2 = 0.00 + 0.00' = 0.00 cm²
Aa3 = 0.00 + 0.07' = 0.07 cm²
Aa4 = 0.00 + 0.07' = 0.07 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.37 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.36 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procentat armiranja: 1.01%
) - dodatna podužna armatura za prijem torzije.

Greda 9030-9682

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 0.87m



[cm]

T2u = -0.81 kN
M1u = 1.11 kNm
M3u = 2.86 kNm

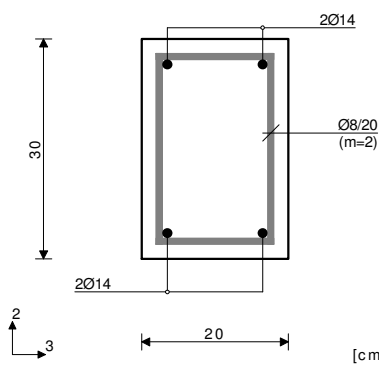
$\epsilon_b/\epsilon_a = -0.210/10.000 \text{ ‰}$
Aa1 = 0.09 + 0.02' = 0.11 cm²
Aa2 = 0.00 + 0.02' = 0.02 cm²
Aa3 = 0.00 + 0.08' = 0.08 cm²
Aa4 = 0.00 + 0.08' = 0.08 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.42 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.42 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.01%
' - dodatna podužna armatura za prijem torzije.

Greda 5106-6304

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.21m



[cm]

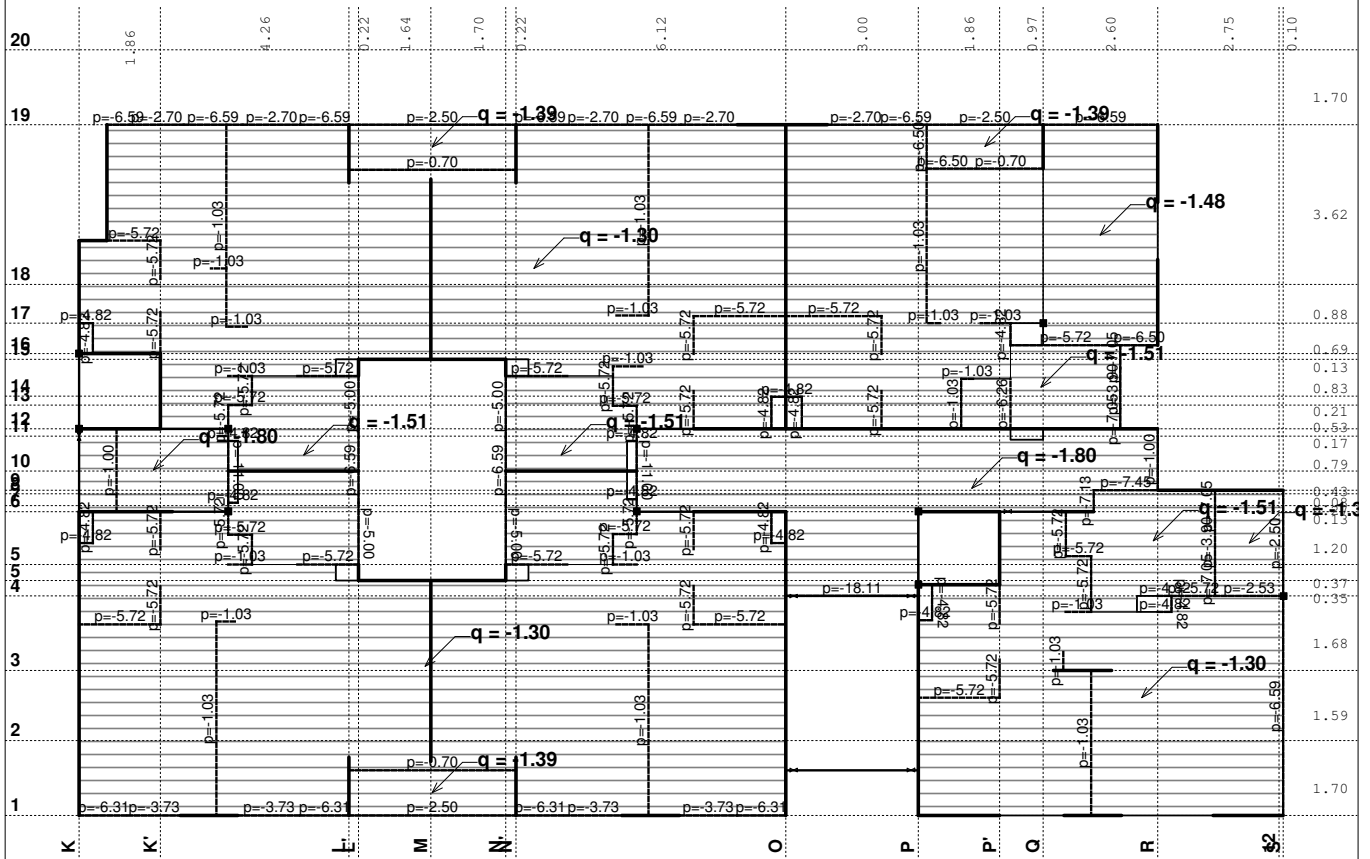
T2u = 3.25 kN
M3u = 23.90 kNm

$\epsilon_b/\epsilon_a = -1.644/10.000 \text{ ‰}$
Aa1 = 1.87 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]

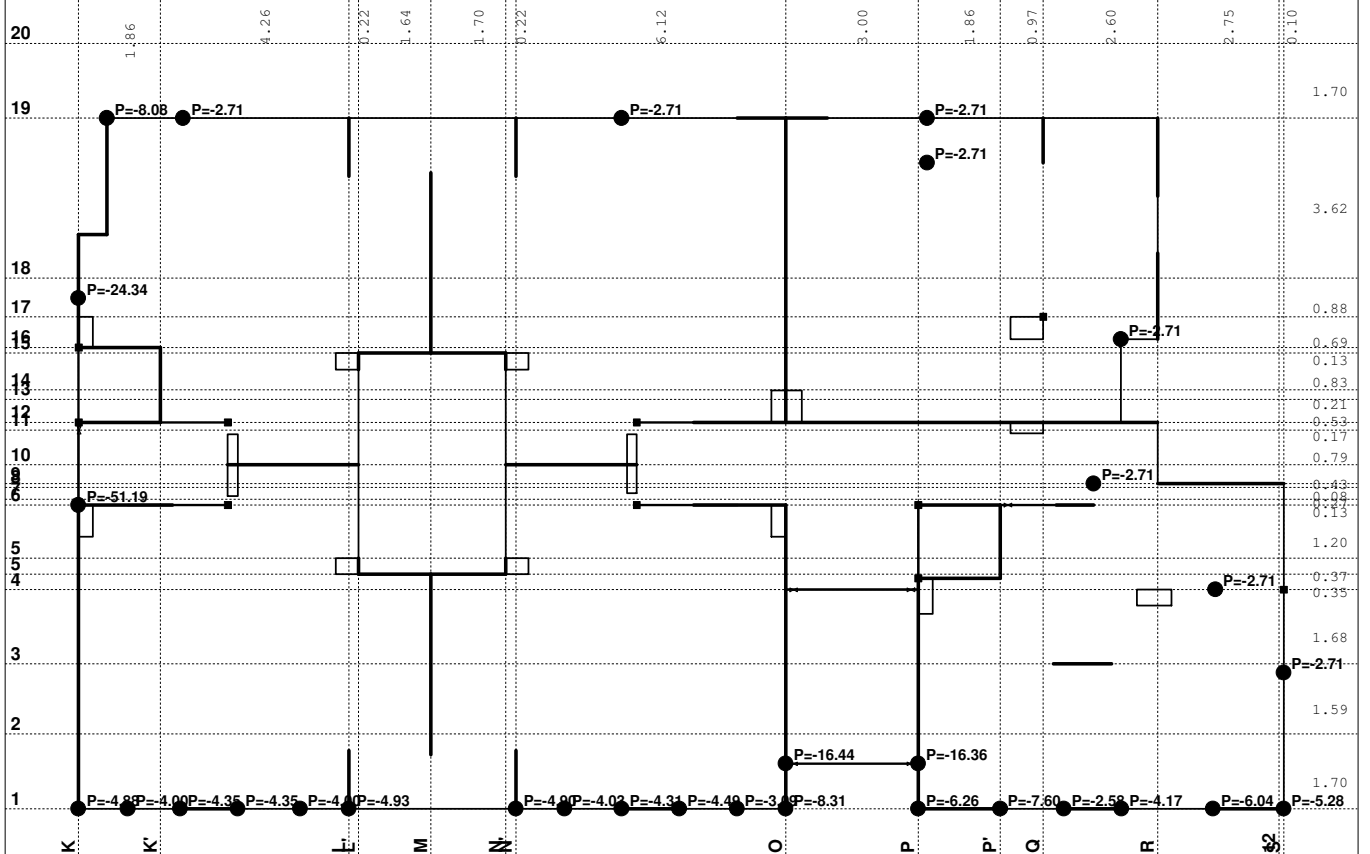
$\tau_y = 0.07 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.03%

POS 200+ - KONSTRUKCIJA IZNAD I SPRATA

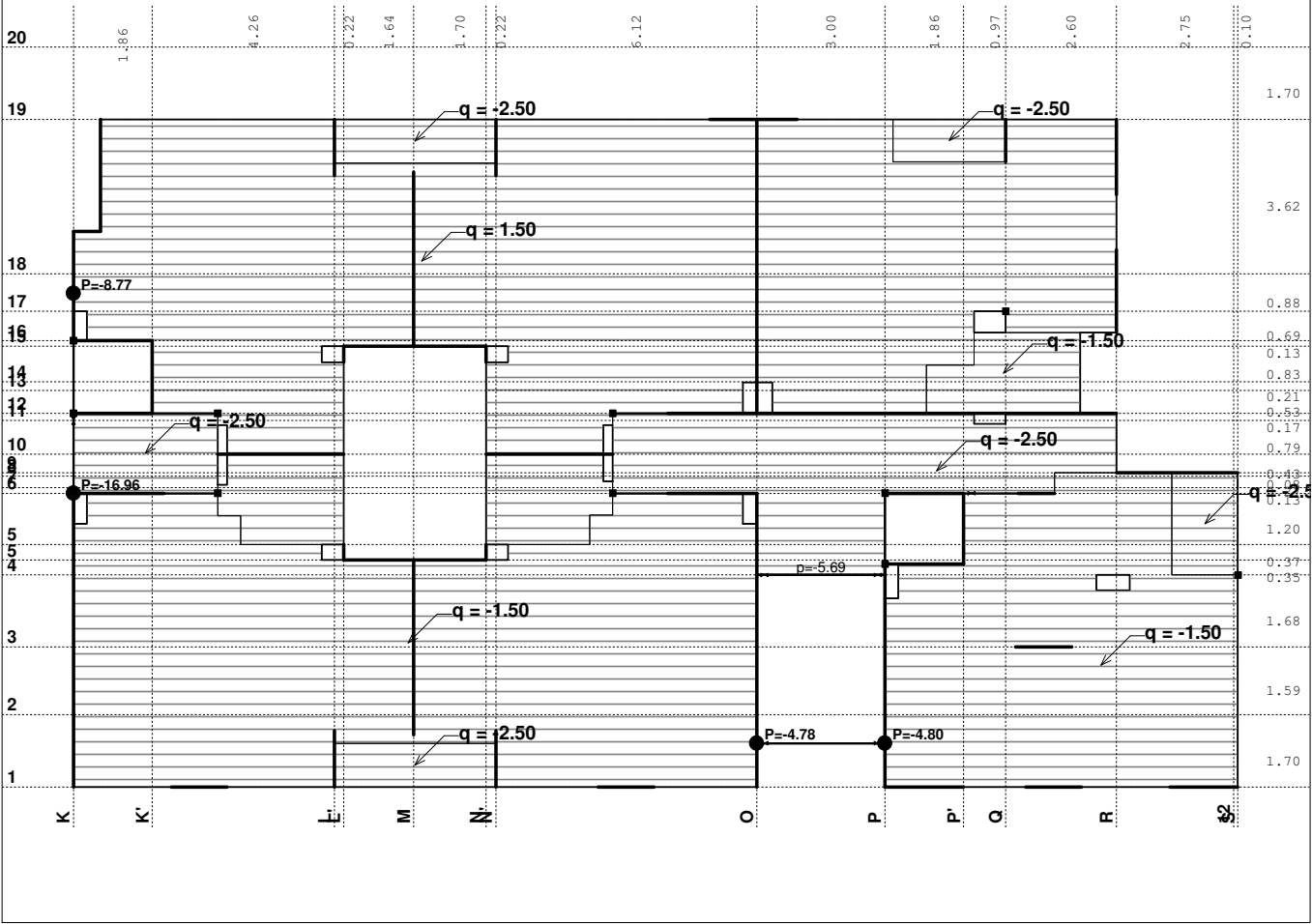
Opt. 1: g (g)



Opt. 1: g (g)



Opt. 2: p

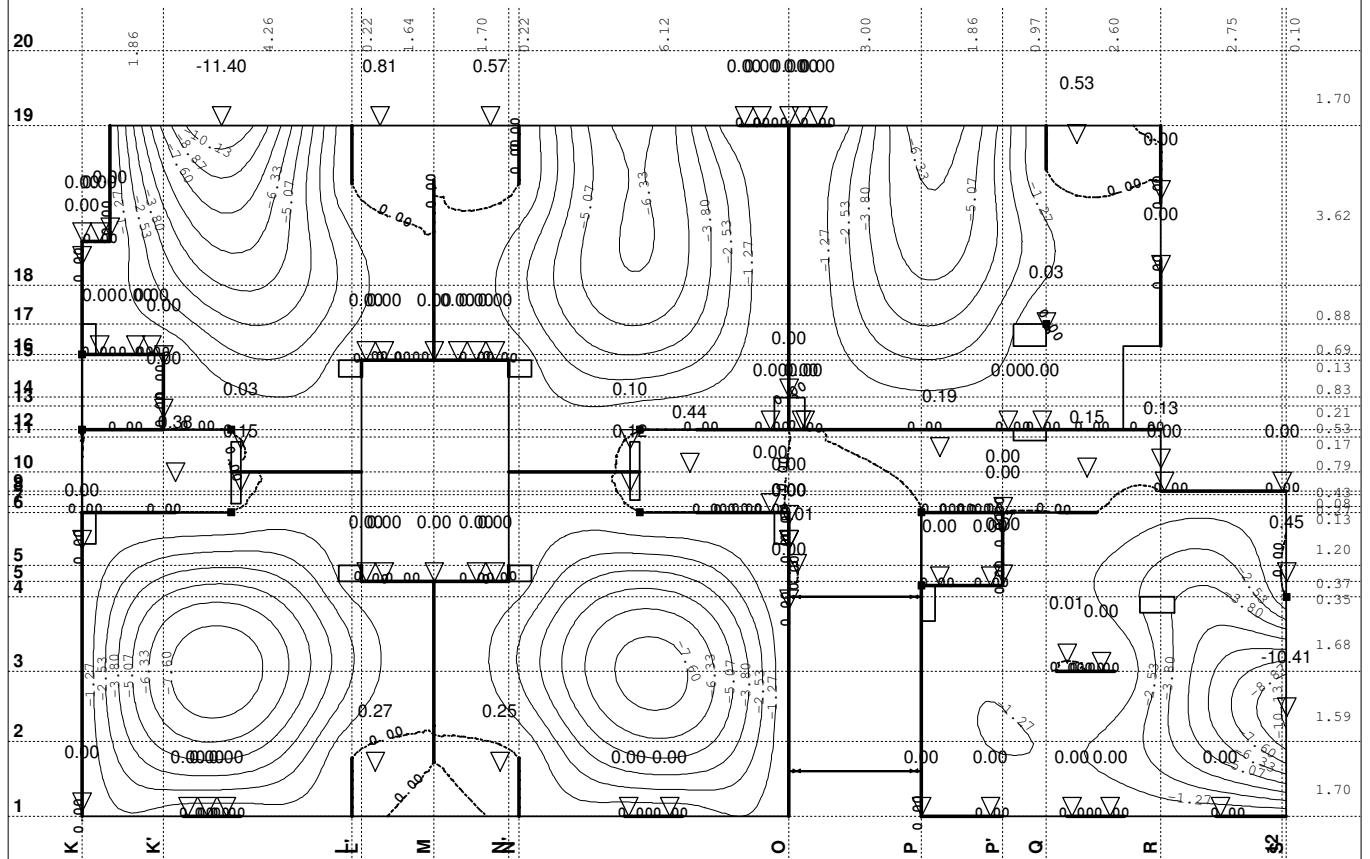


Lista slučajeva opterećenja	
LC	Naziv
1	q (g)
2	p
3	Komb.: 1.6xI+1.8xII

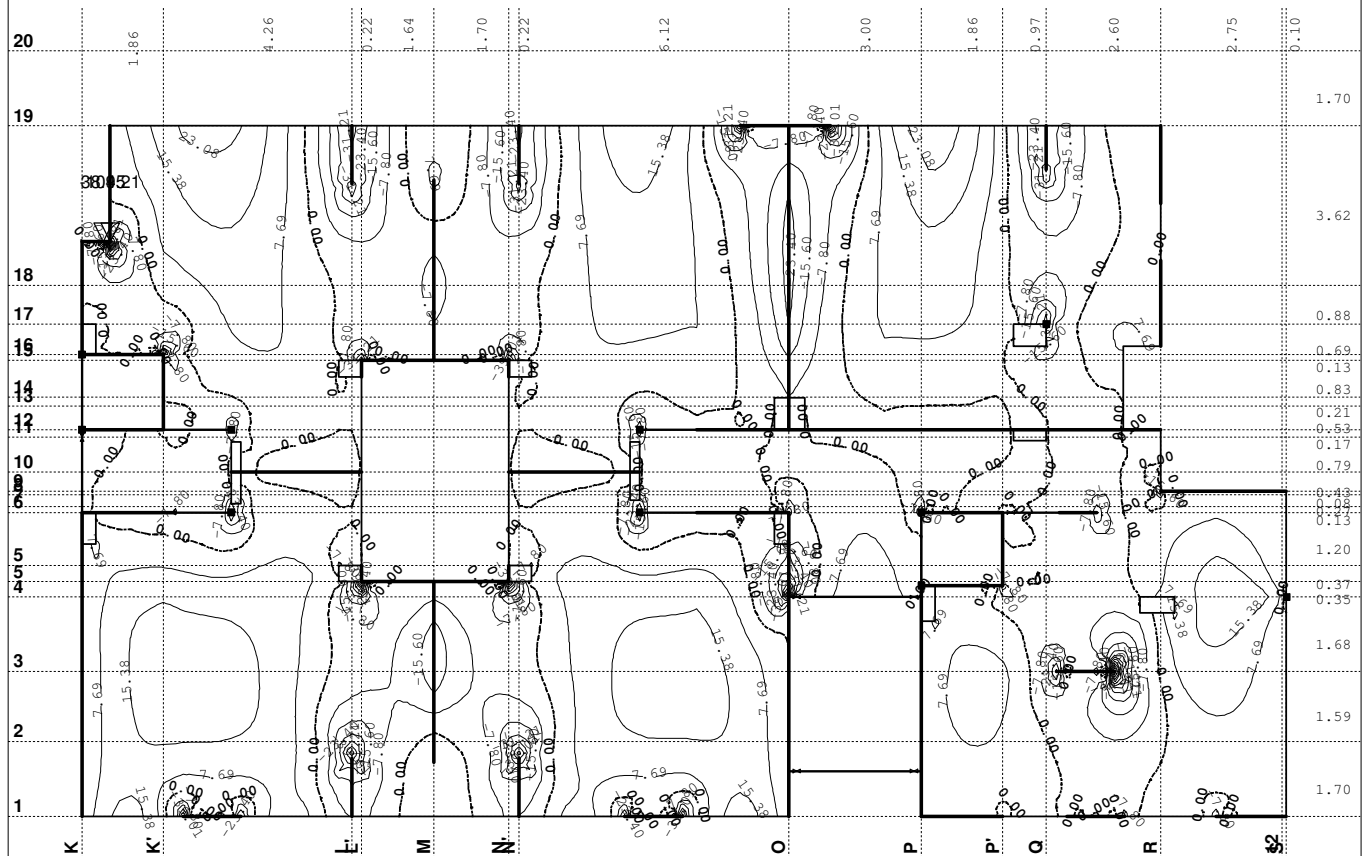
LC	Naziv
4	Komb.: 3.5xI
5	Komb.: I+II

Statički proračun

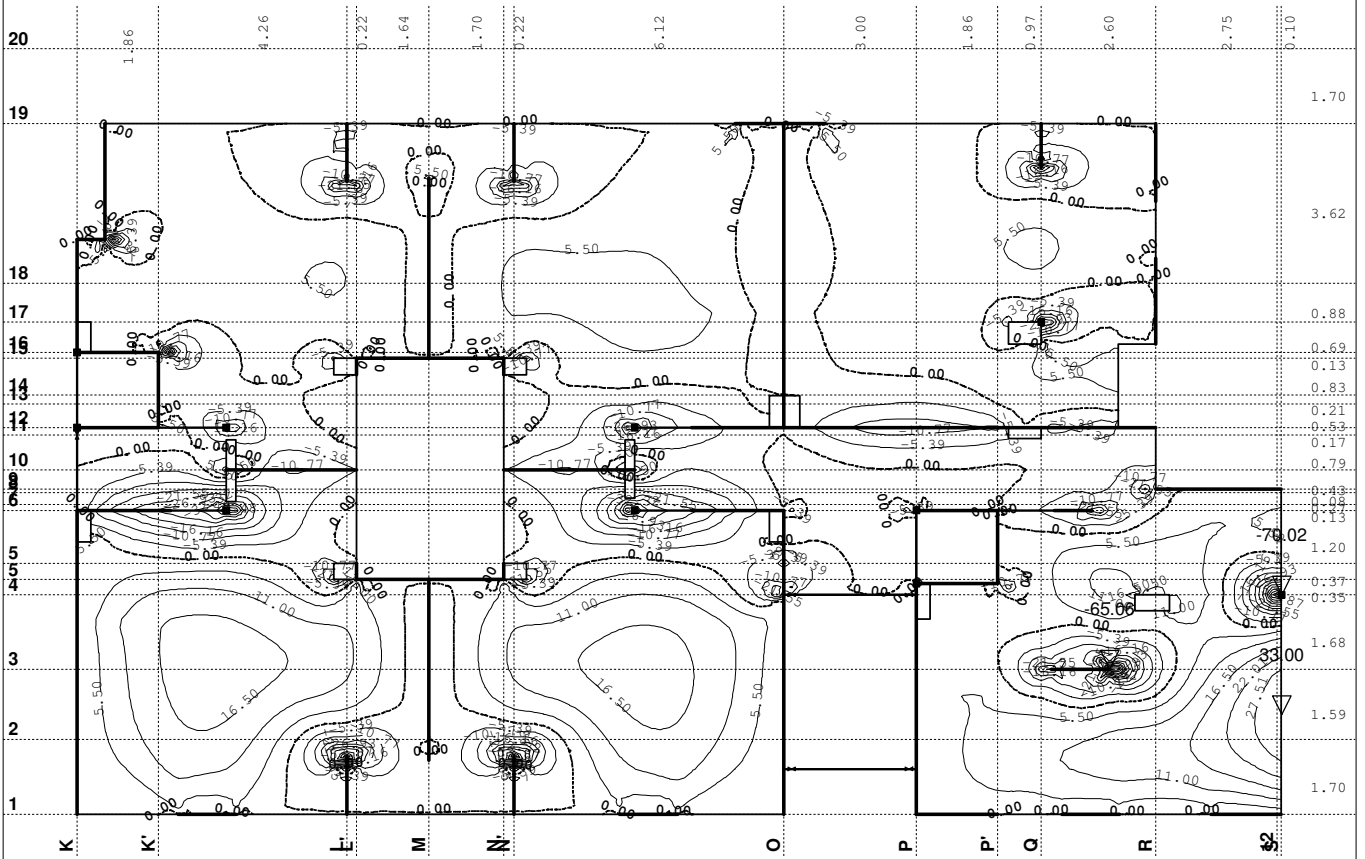
Opt. 4: 3.5xl+II


 Uticaji u ploči: max $Z_p = 0.81$ / min $Z_p = -11.40$ m / 1000

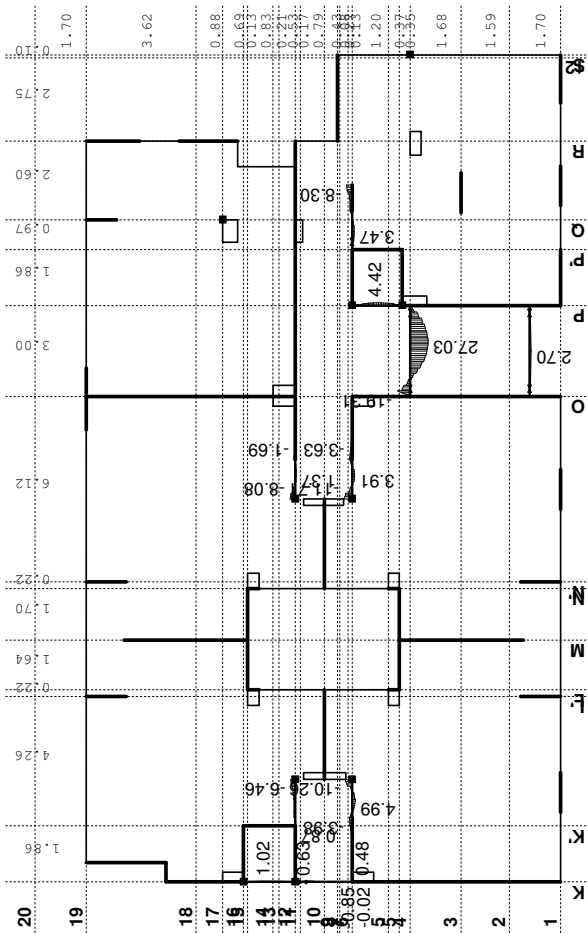
Opt. 3: 1.6xl+1.8xII


 Uticaji u ploči: max $M_x = 38.45$ / min $M_x = -109.21$ kNm/m

Opt. 3: 1.6xl+1.8xII

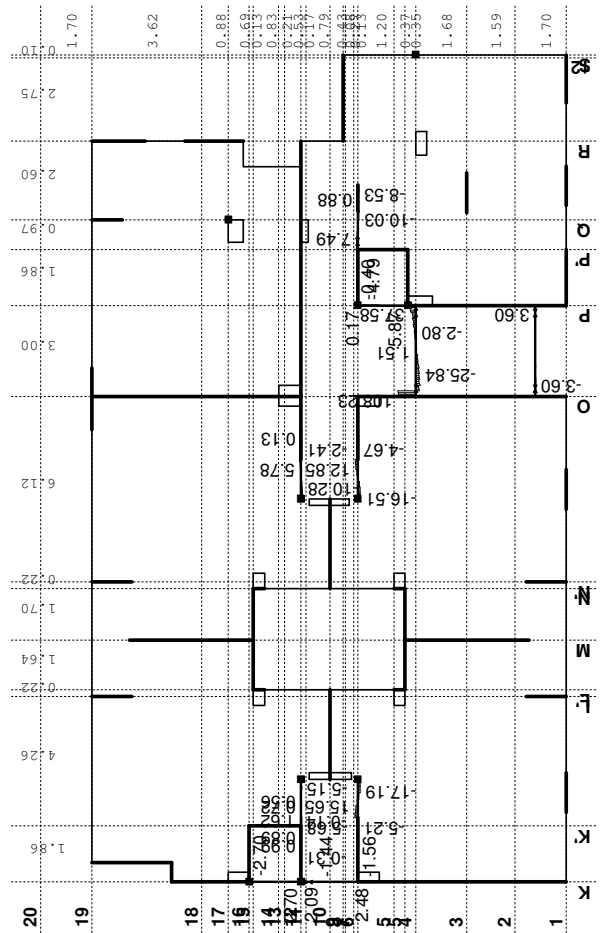


Uticaji u ploči: max $M_y = 33.00$ / min $M_y = -70.02$ kNm/m
Opt. 3: 1.6xl+1.8xII



Uticaji u gredi: max $M_3 = 27.03$ / min $M_3 = -19.31$ kNm

Opt. 3: 1.6xl+1.8xII

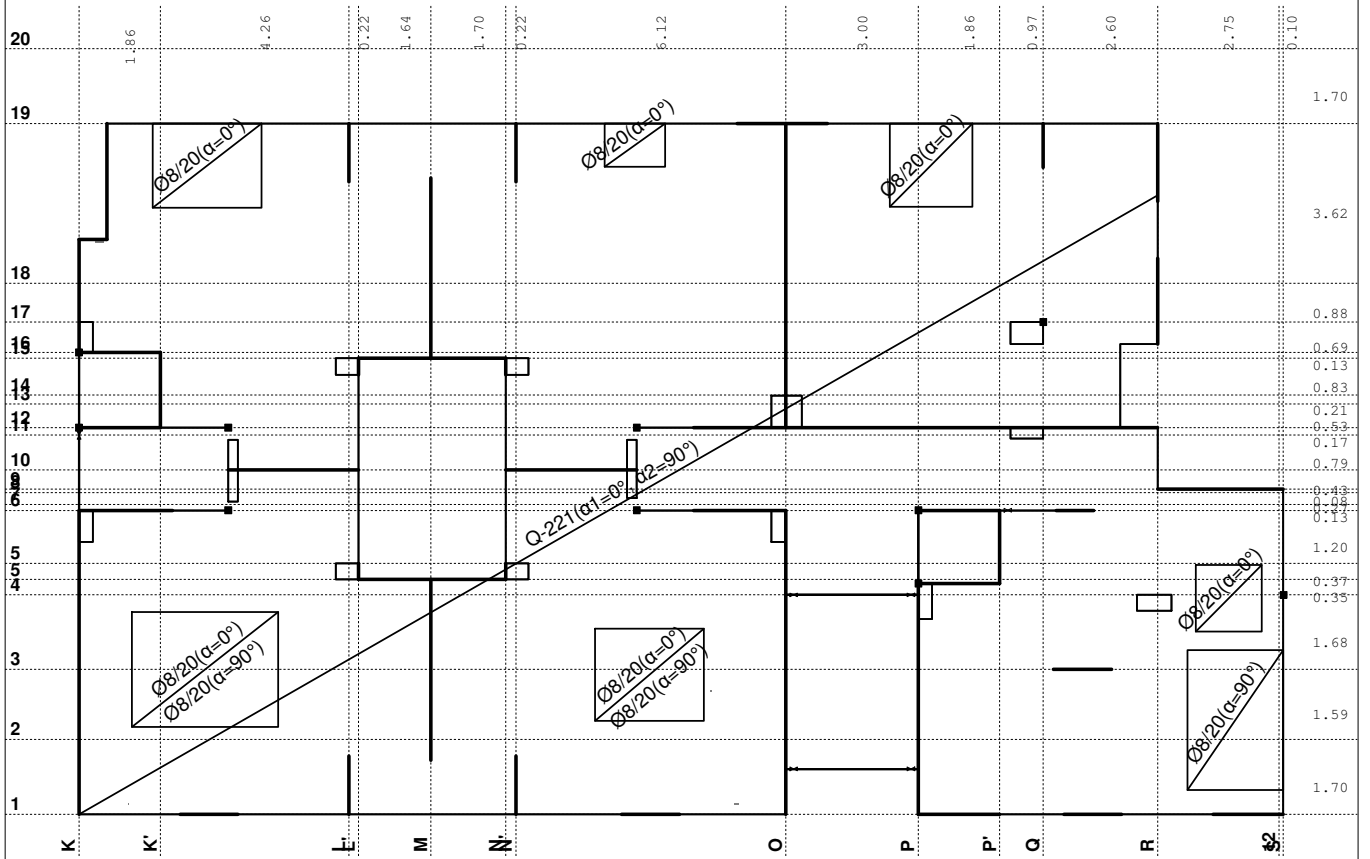


Uticaji u gredi: max $T_2 = 108.23$ / min $T_2 = -25.84$ kNm

Dimenzionisanje (beton)

Usvojena armatura
PBAB 87, MB 30, MA 500/560, a=2.00 cm

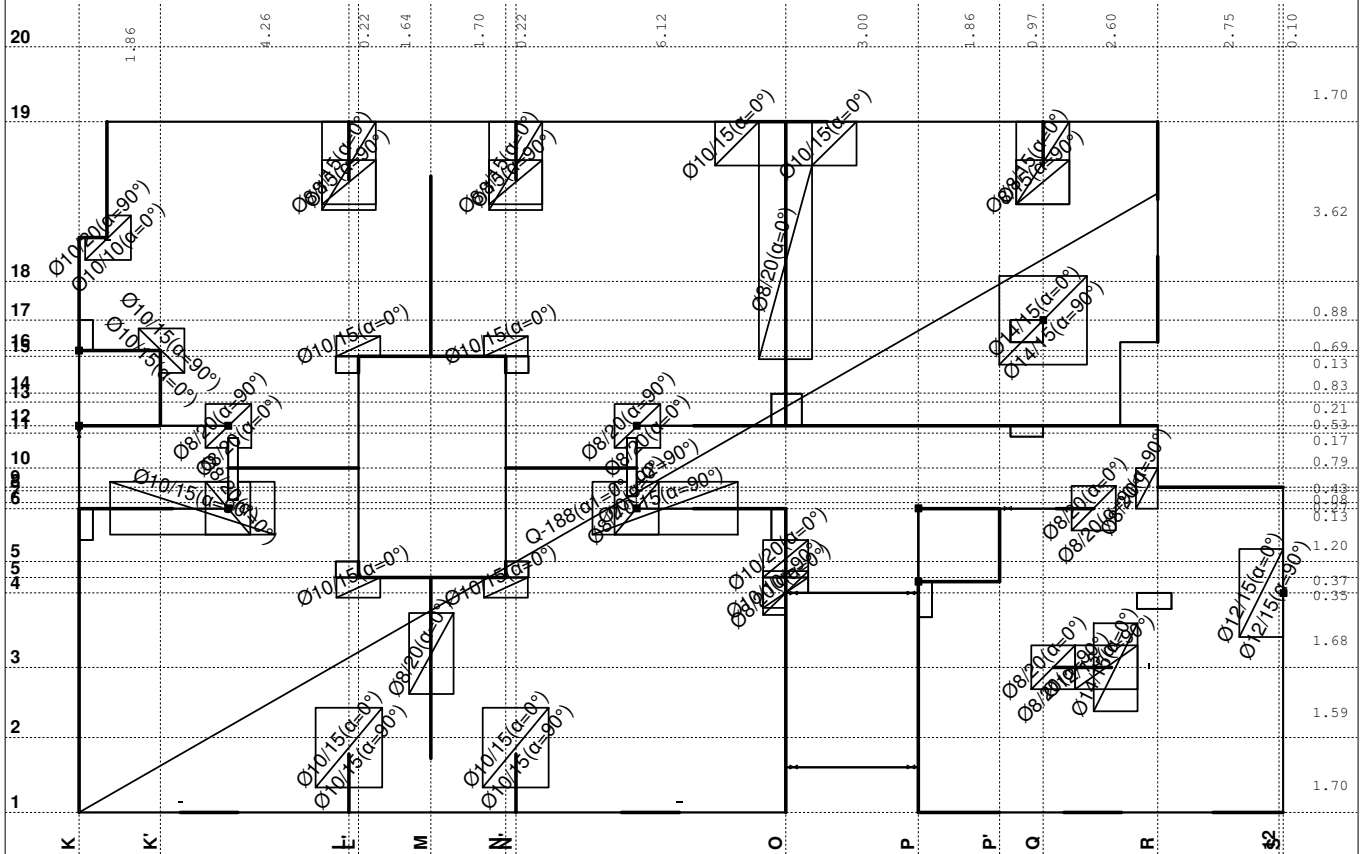
Aa - d.zona [cm ² /m]	
0.00	
2.53	
5.06	



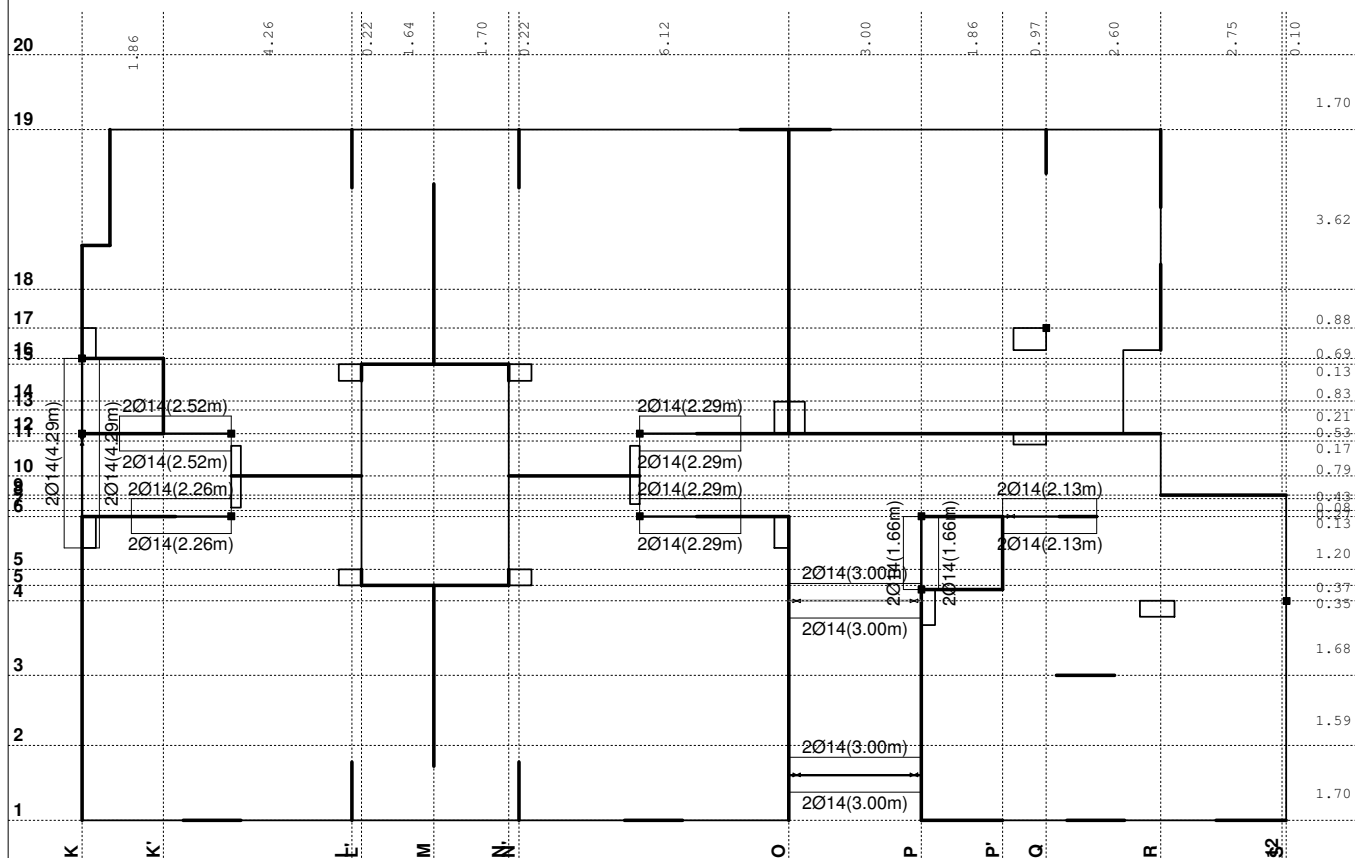
Aa - d.zona

Usvojena armatura
PBAB 87, MB 30, MA 500/560, a=2.00 cm

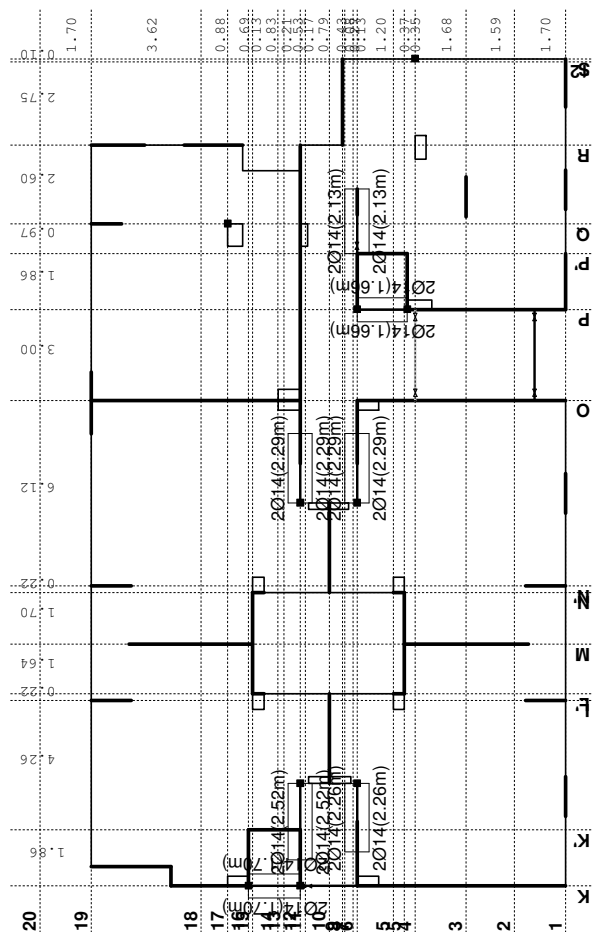
Aa - g.zona [cm ² /m]	
-15.54	
-7.77	
0.00	



Aa - g.zona

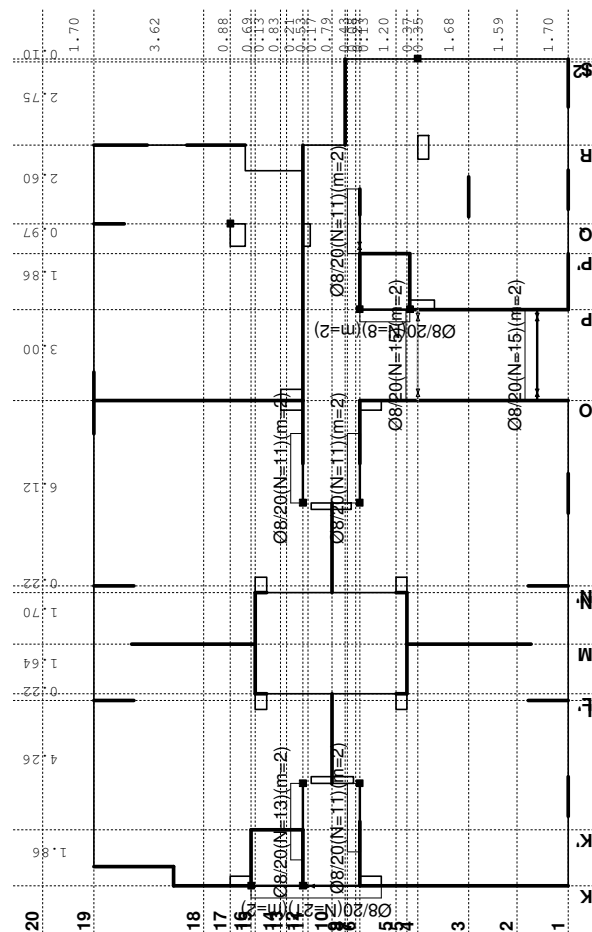


Armatura u gredama: Aa2/Aa1
Usvojena armatura
PBAB 87, MB 30, MA 500/560



Armatura u gredama: Aa3/Aa4

Usvojena armatura PBAB 87, MB 30, MA 500/560

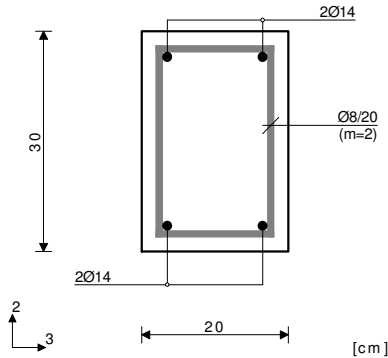


Armatura u gredama: Aa,uz

P 210 (3512-4526)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.00m



T2u = -1.20 kN
M3u = 2.40 kNm

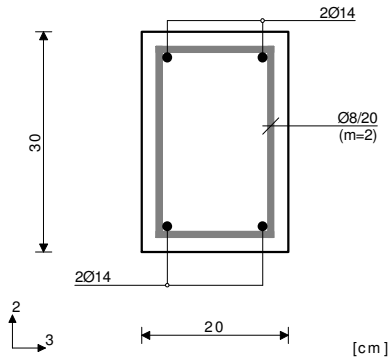
 $\epsilon_b/\epsilon_a = -0.428/10.000 \text{ ‰}$
Aa1 = 0.18 cm²
Aa2 = 0.00 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

 $\tau_y = 0.02\text{MPa} < \tau_r$, $\tau_r = 1.10\text{MPa}$
Procenat armiranja: 1.03%

P 207 (587-1087)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 2-2 x = 1.20m



T2u = 1.14 kN
M3u = -0.85 kNm

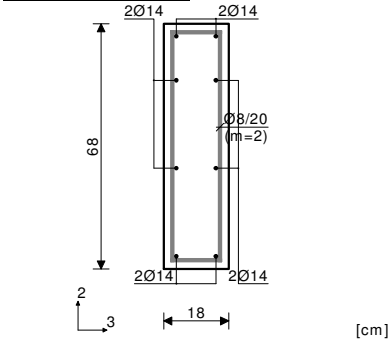
 $\epsilon_b/\epsilon_a = -0.248/10.000 \text{ ‰}$
Aa1 = 0.00 cm²
Aa2 = 0.06 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

 $\tau_y = 0.02\text{MPa} < \tau_r$, $\tau_r = 1.10\text{MPa}$
Procenat armiranja: 1.03%

Z6c (8409-7628)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 3-3 x = 1.52m



T2u = -1.28 kN
M1u = 2.05 kNm
M3u = 3.40 kNm

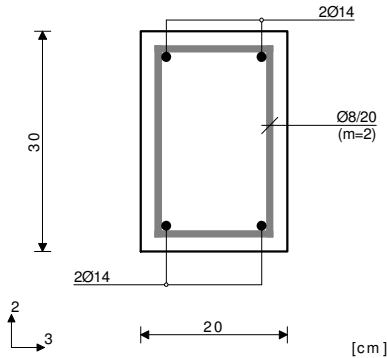
 $\epsilon_b/\epsilon_a = -0.230/10.000 \text{ ‰}$
Aa1 = 0.11 + 0.04' = 0.15 cm²
Aa2 = 0.00 + 0.04' = 0.04 cm²
Aa3 = 0.00 + 0.15' = 0.15 cm²
Aa4 = 0.00 + 0.15' = 0.15 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

 $\tau_y = 0.78\text{MPa} < \tau_r$, $\tau_r = 1.10\text{MPa}$
 $\tau_z = 0.77\text{MPa} < \tau_r$, $\tau_r = 1.10\text{MPa}$
Procenat armiranja: 1.01%
*) - dodatna podužna armatura za prijem torzije.

P 209 (4865-6065)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 4-4 x = 1.76m



T2u = -2.80 kN
M3u = 26.93 kNm

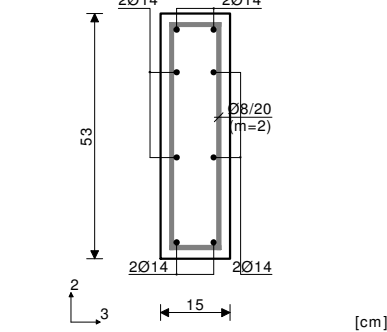
 $\epsilon_b/\epsilon_a = -1.790/10.000 \text{ ‰}$
Aa1 = 2.11 cm²
Aa2 = 0.00 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

 $\tau_y = 0.06 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.03%

Greda 6856-6167

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 5-5 x = 0.96m



T2u = -0.27 kN
M3u = 4.42 kNm

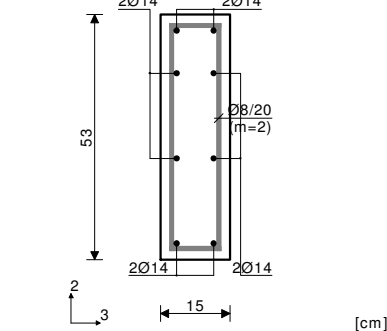
 $\epsilon_b/\epsilon_a = -0.377/10.000 \text{ ‰}$
Aa1 = 0.19 cm²
Aa2 = 0.00 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

Procenat armiranja: 1.55%

ZK" (1476-1087)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 6-6 x = 0.85m



M3u = 1.02 kNm

 $\epsilon_b/\epsilon_a = -0.176/10.000 \text{ ‰}$
Aa1 = 0.04 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]

Procenat armiranja: 1.55%

P 208 (1954-1277)

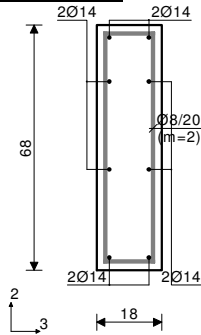
PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 7-7 x = 0.00m



[cm]

$$\begin{aligned} T2u &= -5.15 \text{ kN} \\ M1u &= -0.77 \text{ kNm} \\ M3u &= -6.46 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.321/10.000 \text{ ‰}$$

$$Aa1 = 0.00 + 0.00' = 0.00 \text{ cm}^2$$

$$Aa2 = 0.21 + 0.00' = 0.21 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.05' = 0.05 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.05' = 0.05 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \text{Ø}8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.34 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.29 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procent armiranja: 1.01%

*) - dodatna podužna armatura za prijem torzije.

Z6a (1434-925)

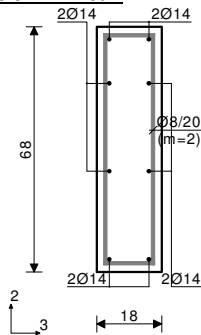
PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 8-8 x = 1.89m



[cm]

$$\begin{aligned} T2u &= -1.62 \text{ kN} \\ M1u &= 3.12 \text{ kNm} \\ M3u &= -0.68 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.101/10.000 \text{ ‰}$$

$$Aa1 = 0.00 + 0.06' = 0.06 \text{ cm}^2$$

$$Aa2 = 0.02 + 0.06' = 0.08 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.22' = 0.22 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.22' = 0.22 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \text{Ø}8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 1.19 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 1.17 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$$

Procent armiranja: 1.01%

*) - dodatna podužna armatura za prijem torzije.

Z6b (4338-5175)

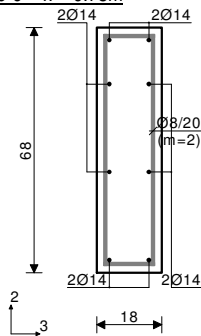
PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 9-9 x = 0.78m



[cm]

$$\begin{aligned} T2u &= 2.99 \text{ kN} \\ M1u &= -1.03 \text{ kNm} \\ M3u &= 3.90 \text{ kNm} \end{aligned}$$

$$\epsilon_b/\epsilon_a = -0.247/10.000 \text{ ‰}$$

$$Aa1 = 0.13 + 0.00' = 0.13 \text{ cm}^2$$

$$Aa2 = 0.00 + 0.00' = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 + 0.07' = 0.07 \text{ cm}^2$$

$$Aa4 = 0.00 + 0.07' = 0.07 \text{ cm}^2$$

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

[Usvojeno $Aa_{uz} = \text{Ø}8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]

$$\tau_y = 0.42 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

$$\tau_z = 0.39 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

Procent armiranja: 1.01%

*) - dodatna podužna armatura za prijem torzije.

Z12 (5016-5942)

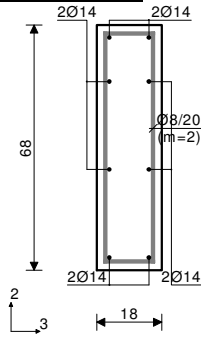
PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60x1+1.80xII

Presek 10-10 x = 0.78m



[cm]

T2u = 0.53 kN
M1u = 0.35 kNm
M3u = 1.37 kNm

 $\epsilon_b/\epsilon_a = -0.144/10.000 \%$ Aa1 = 0.04 cm²Aa2 = 0.00 cm²Aa3 = 0.00 cm²Aa4 = 0.00 cm²Aa,uz = 0.00 cm²/m (m=2)[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m] $\tau_y = 0.14 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$ $\tau_z = 0.13 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$

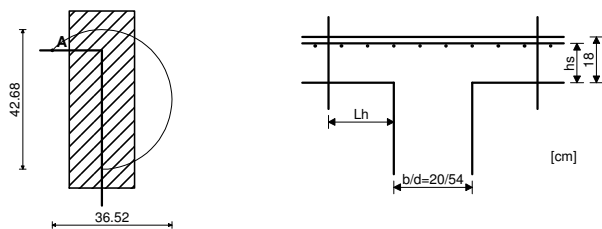
Procenat armiranja: 1.01%

Kontrola ploča na probijanje

Nivo: POS 200+ [0.00 m]

Presek 1 (190.60,-108.22,0.00)

MB 30



[cm]

KONTROLA KRITIČNOG PRESEKA 1. (Lh = 0.07m od ivice stuba)
(stub zamenjujućeg kruznog preseka, ds = 0.28m)

Merodavna kombinacija: I+II

Sila u stubu

Faktor povećanja napona zbog ekscentričnosti

Merodavni smičući napon (tačka A)

Debljina ploče

Statička visina ploče

N = 77.225 kN

 $\beta = 1.400$ $\tau = 0.859 \text{ MPa}$

d,pl = 0.180 m

hs = 0.150 m

Obim kritičnog preseka

Okp = 0.839 m

Postojeća armatura u ploči

Površina armature - pravac 1

Procenat armiranja - pravac 1

Površina armature - pravac 2

Procenat armiranja - pravac 2

Srednja vrednost procenta armiranja

Koeficijent

Koeficijent

Koeficijent

Dopušteni glavni napon zatezanja

Dopušteni glavni napon zatezanja

Maksimalna otpornost ($\gamma_2 \times \tau_b$)Aa,1 = 12.147 cm² $\mu,1 = 0.810 \%$ Aa,2 = 12.147 cm² $\mu,2 = 0.810 \%$ $\mu = 0.810 \%$ $\alpha_a = 1.400$ $\gamma_1 = 1.638$ $\gamma_2 = 0.567$ $\tau_a = 0.800$ $\tau_b = 2.200$ $\tau_{\text{max}} = 1.247 \text{ MPa}$ **Uslov: $\tau \leq \tau_{\text{max}}$ (0.86 <= 1.25)**

Uslov je ispunjen.

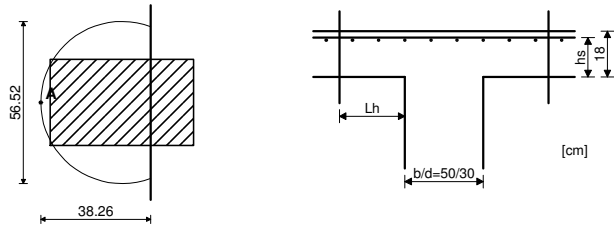
Otpornost na probijanje ploče bez dodatne armature za
obezbeđenje ($2/3 \times \gamma_1 \times \tau_a$)

 $\tau_{\text{gr}} = 0.874 \text{ MPa}$ **Uslov: $\tau \leq \tau_{\text{gr}}$ (0.86 <= 0.87)**

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

Kontrola ploča na probijanje

Nivo: POS 200+ [0.00 m]
 Presek 2 (196.05,-114.40,0.00)
 MB 30



KONTROLA KRITIČNOG PRESEKA 1. ($L_h = 0.07\text{m}$ od ivice stuba)
 (stub zamenjujućeg kružnog preseka, $d_s = 0.42\text{m}$)

Merodavna kombinacija: I+II	
Sila u stubu	$N = 90.405 \text{ kN}$
Faktor povećanja napona zbog ekscentričnosti	$\beta = 1.400$
Merodavni smičući napon (tačka A)	$\tau = 0.773 \text{ MPa}$
Debljina ploče	$d, pl = 0.180 \text{ m}$
Statička visina ploče	$h_s = 0.150 \text{ m}$
Obim kritičnog preseka	$O_{kp} = 1.092 \text{ m}$
Postojeća armatura u ploči	
Površina armature - pravac 1	$A_{a,1} = 9.425 \text{ cm}^2$
Procenat armiranja - pravac 1	$\mu, 1 = 0.628 \%$
Površina armature - pravac 2	$A_{a,2} = 9.425 \text{ cm}^2$
Procenat armiranja - pravac 2	$\mu, 2 = 0.628 \%$
Srednja vrednost procenta armiranja	$\mu = 0.628 \%$
Koeficijent	$\alpha_a = 1.400$
Koeficijent	$\gamma_1 = 1.443$
Koeficijent	$\gamma_2 = 0.499$
Dopušteni glavni napon zatezanja	$\tau_a = 0.800$
Dopušteni glavni napon zatezanja	$\tau_b = 2.200$
Maksimalna otpornost ($\gamma_2 \times \tau_b$)	$\tau_{,max} = 1.099 \text{ MPa}$

Uslov: $\tau \leq \tau_{,max}$ ($0.77 \leq 1.10$)

Uslov je ispunjen.

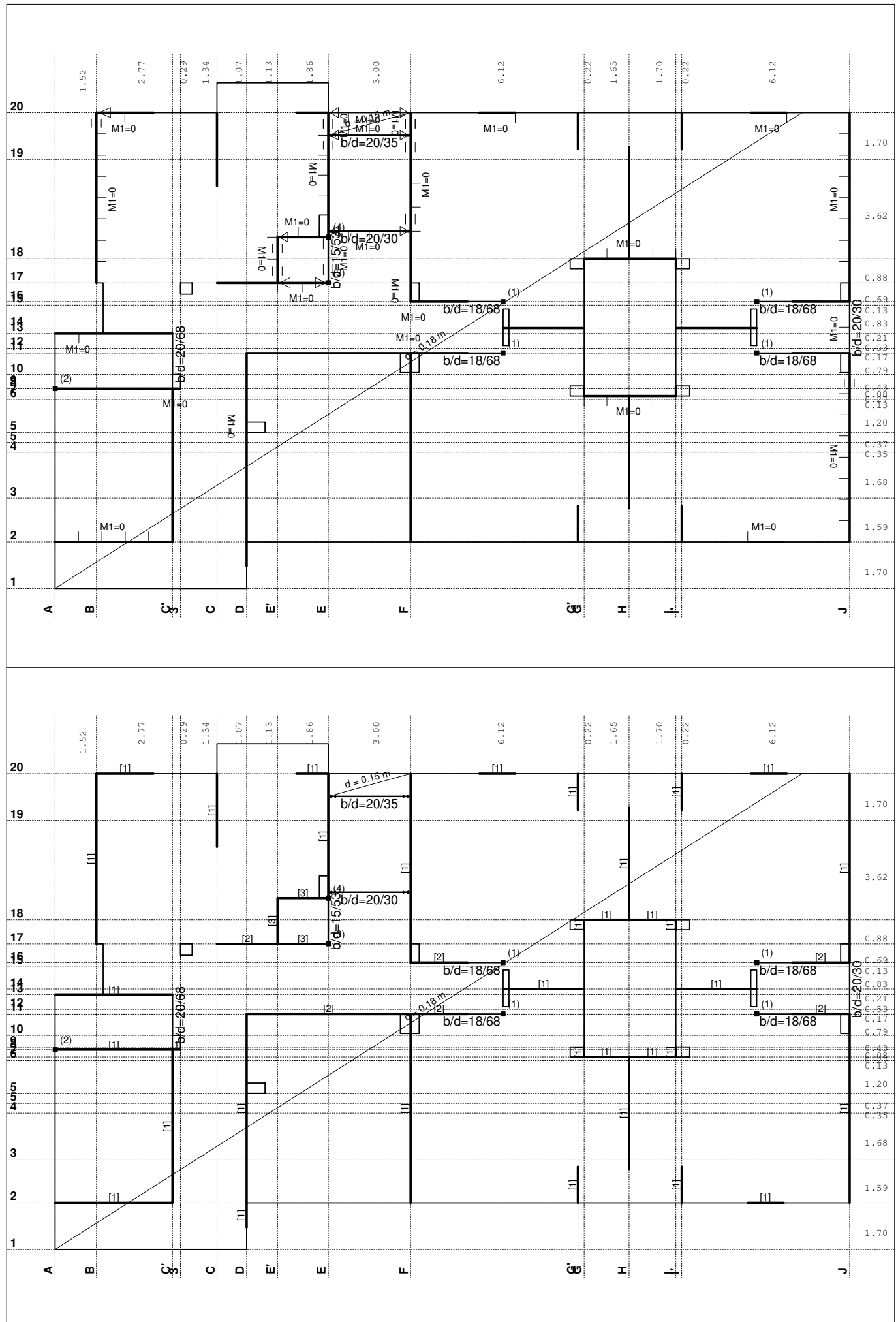
Otpornost na probijanje ploče bez dodatne armature za
 obezbeđenje ($2/3 \times \gamma_1 \times \tau_a$) $\tau_{,gr} = 0.769 \text{ MPa}$

Uslov: $\tau \leq \tau_{,gr}$ ($0.77 \leq 0.77$)

Potrebna je dodatna armatura za obezbeđenje od probijanja ploče.

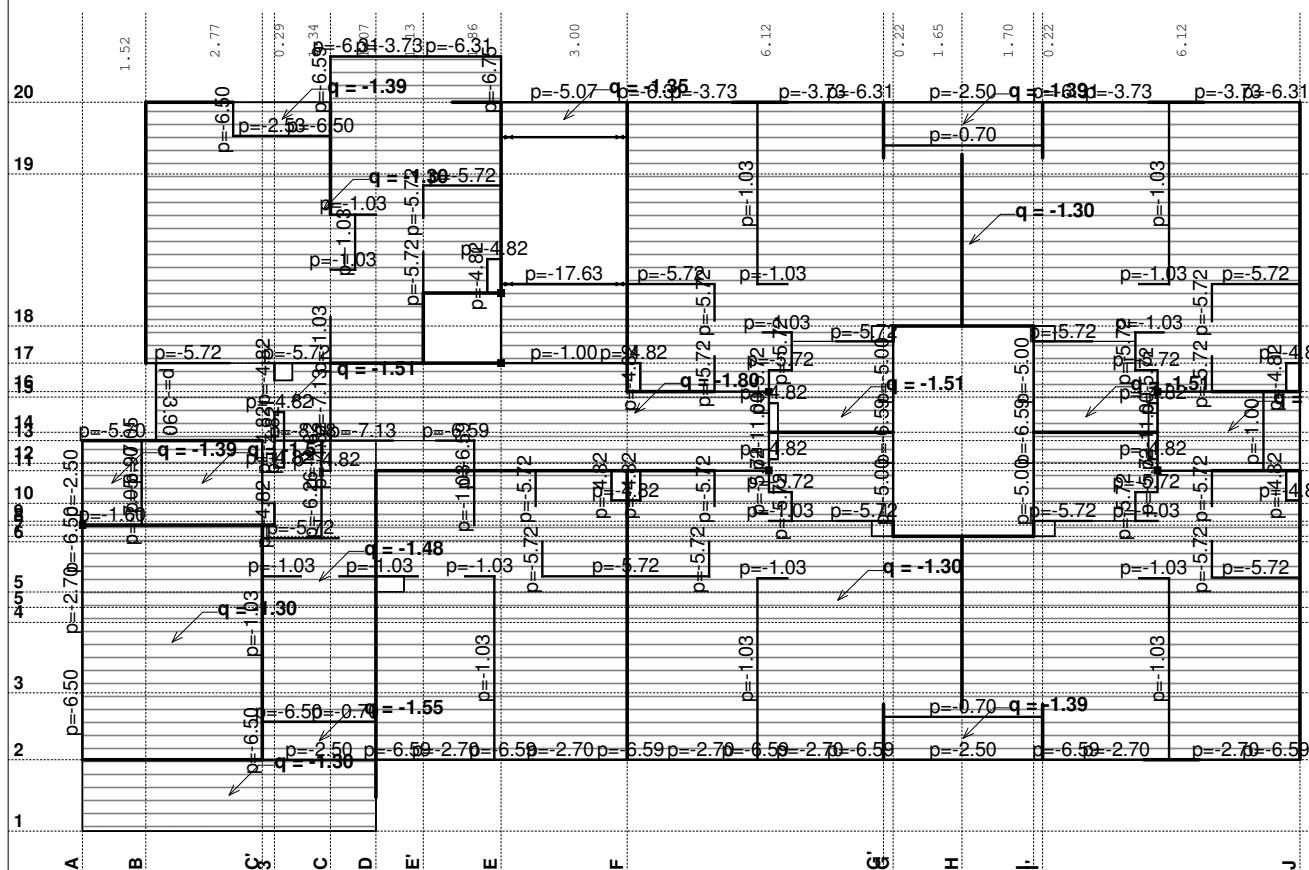
Armatura za obezbeđenje od probijanja ploče MA 500/560
 Potrebna površina armature $A_{ak} = 2.441 \text{ cm}^2$

POS 100+ - KONSTRUKCIJA IZNAD PRIZEMLJA

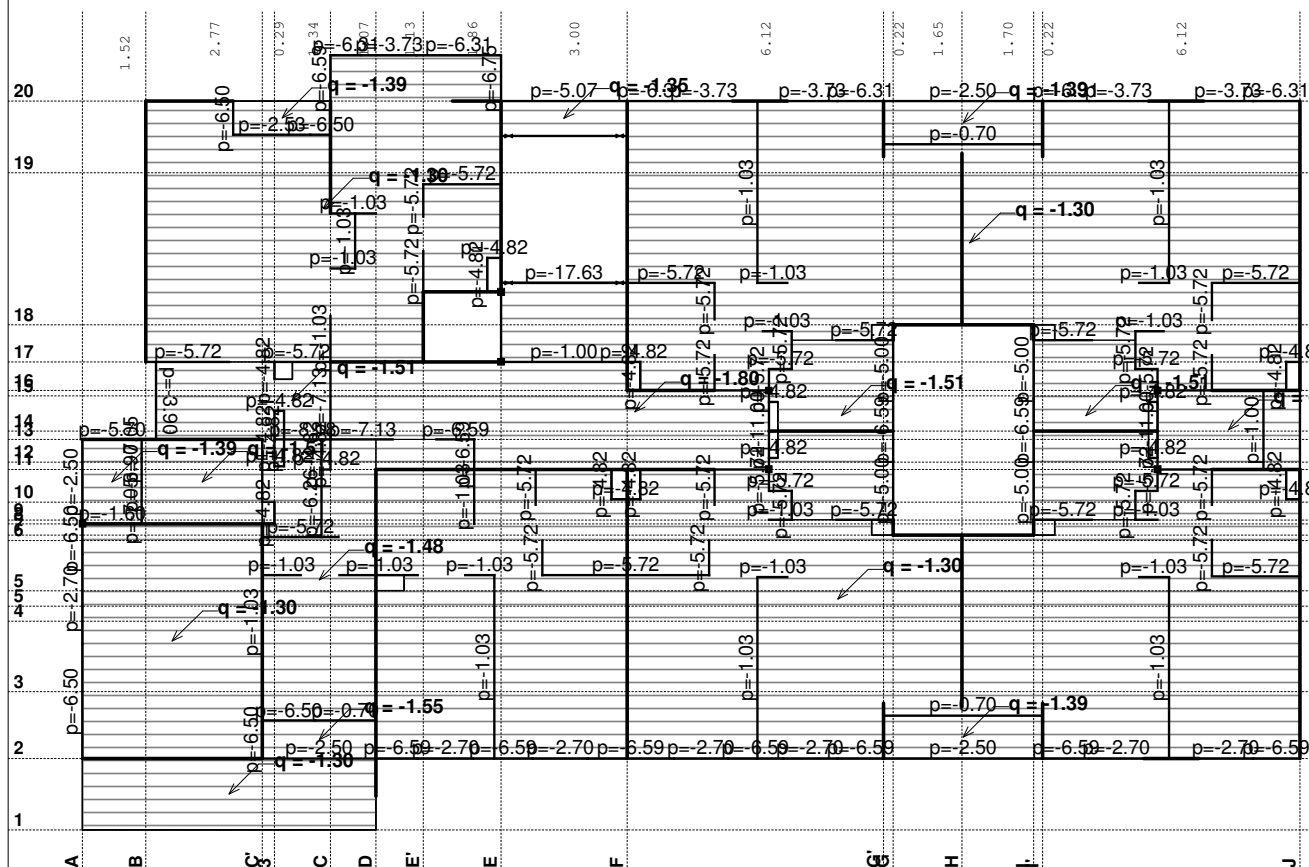


LC	Naziv
3	Komb.: 1.6xI+1.8xII
4	Komb.: 3.5xI+II

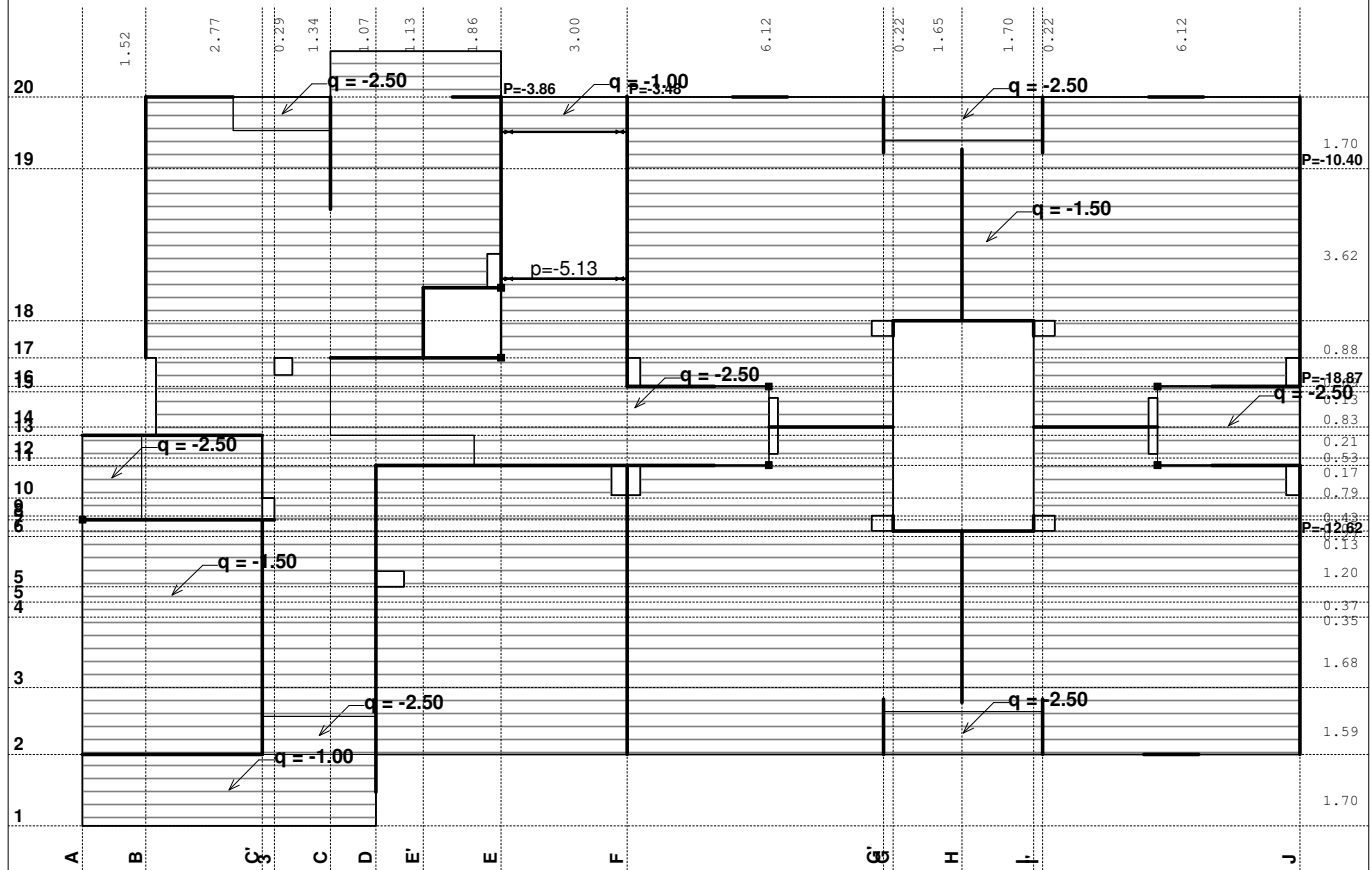
z	p
Opt. 1: g (g)	



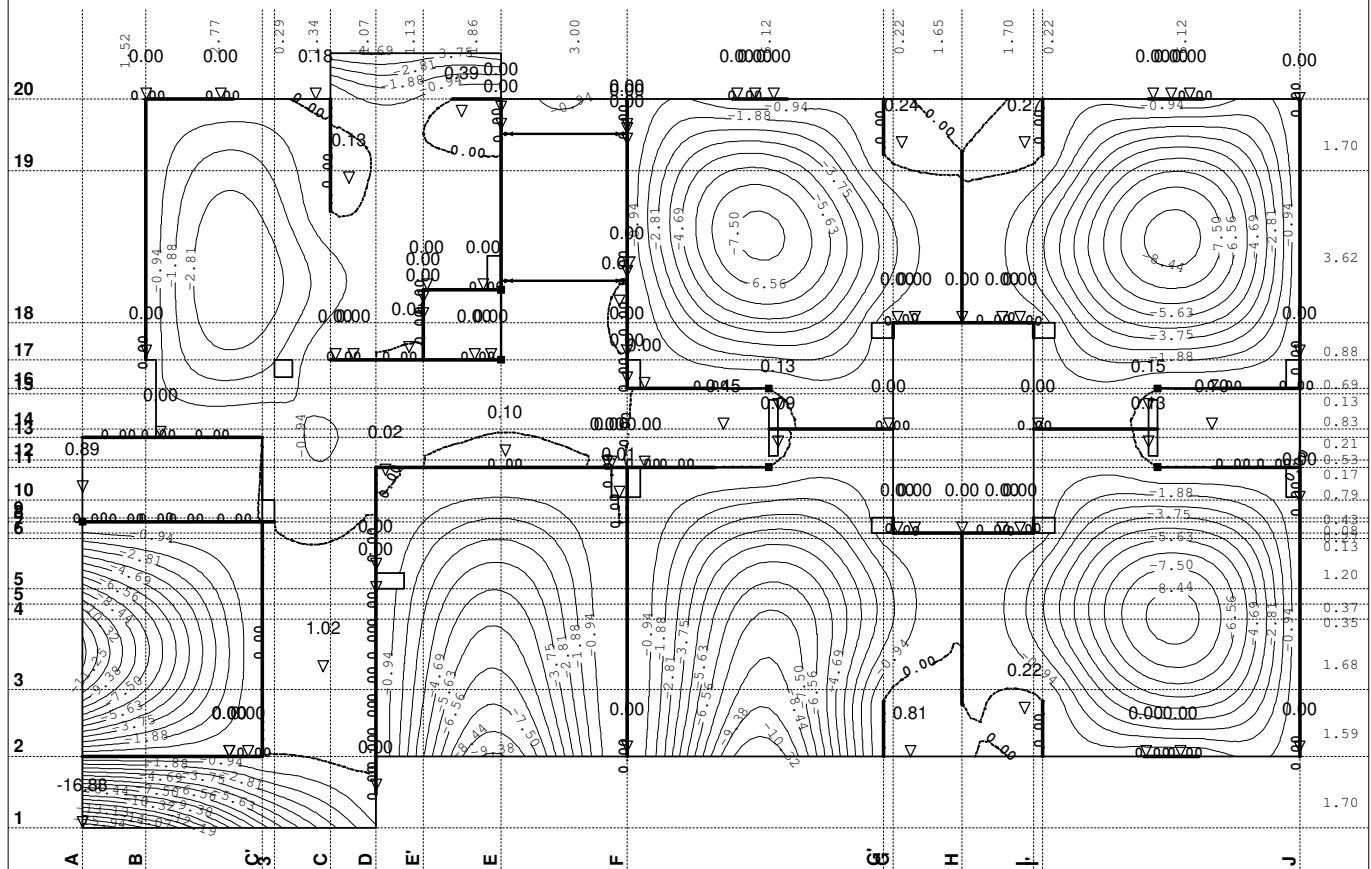
Opt. 1: g (g)



Opt. 2: p

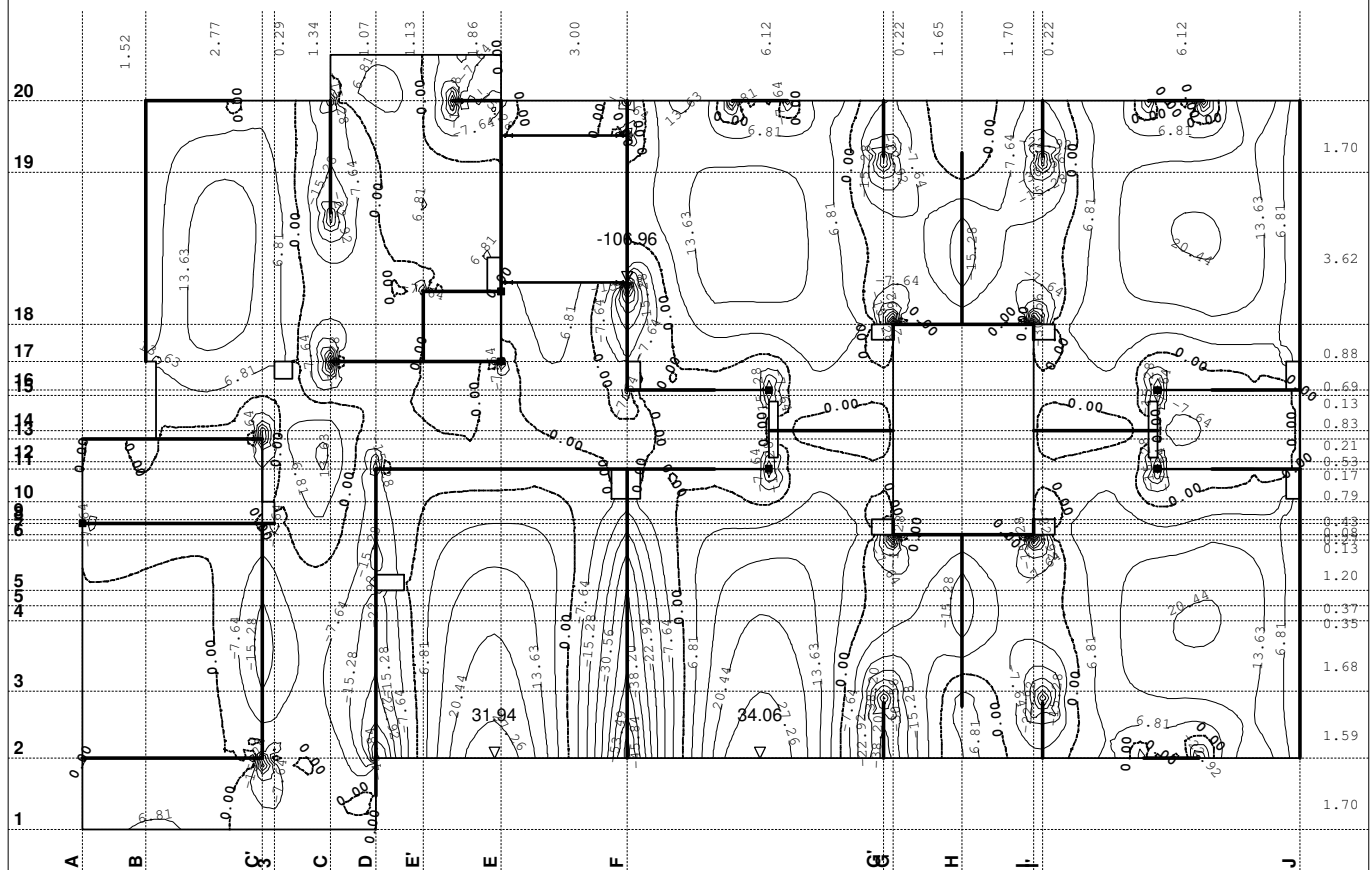


Opt. 4: 3.5xl+II



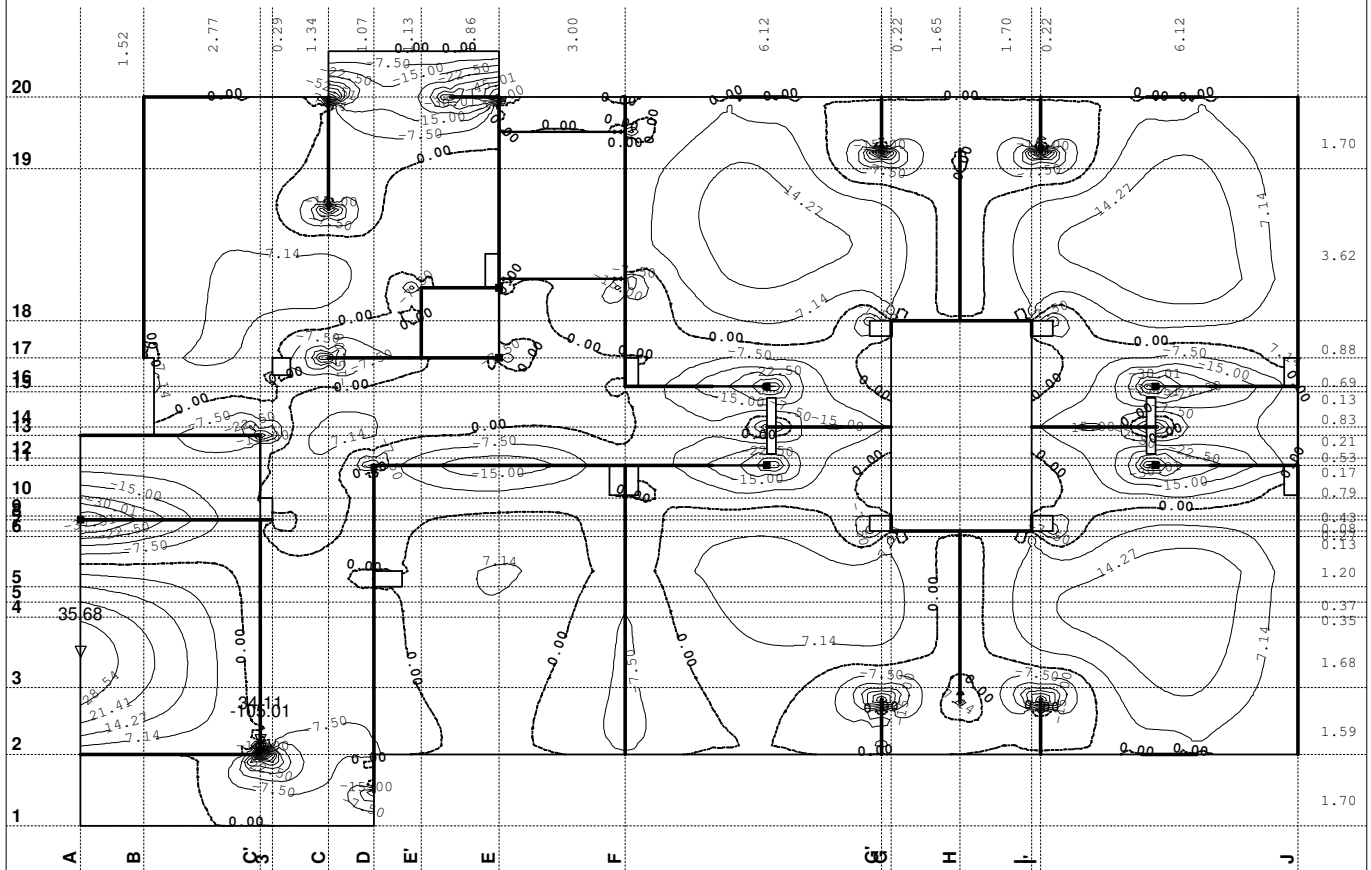
Utjecaji u ploči: max Z_p = 1.02 / min Z_p = -16.88 m / 1000

Opt. 3: 1.6xl+1.8xII

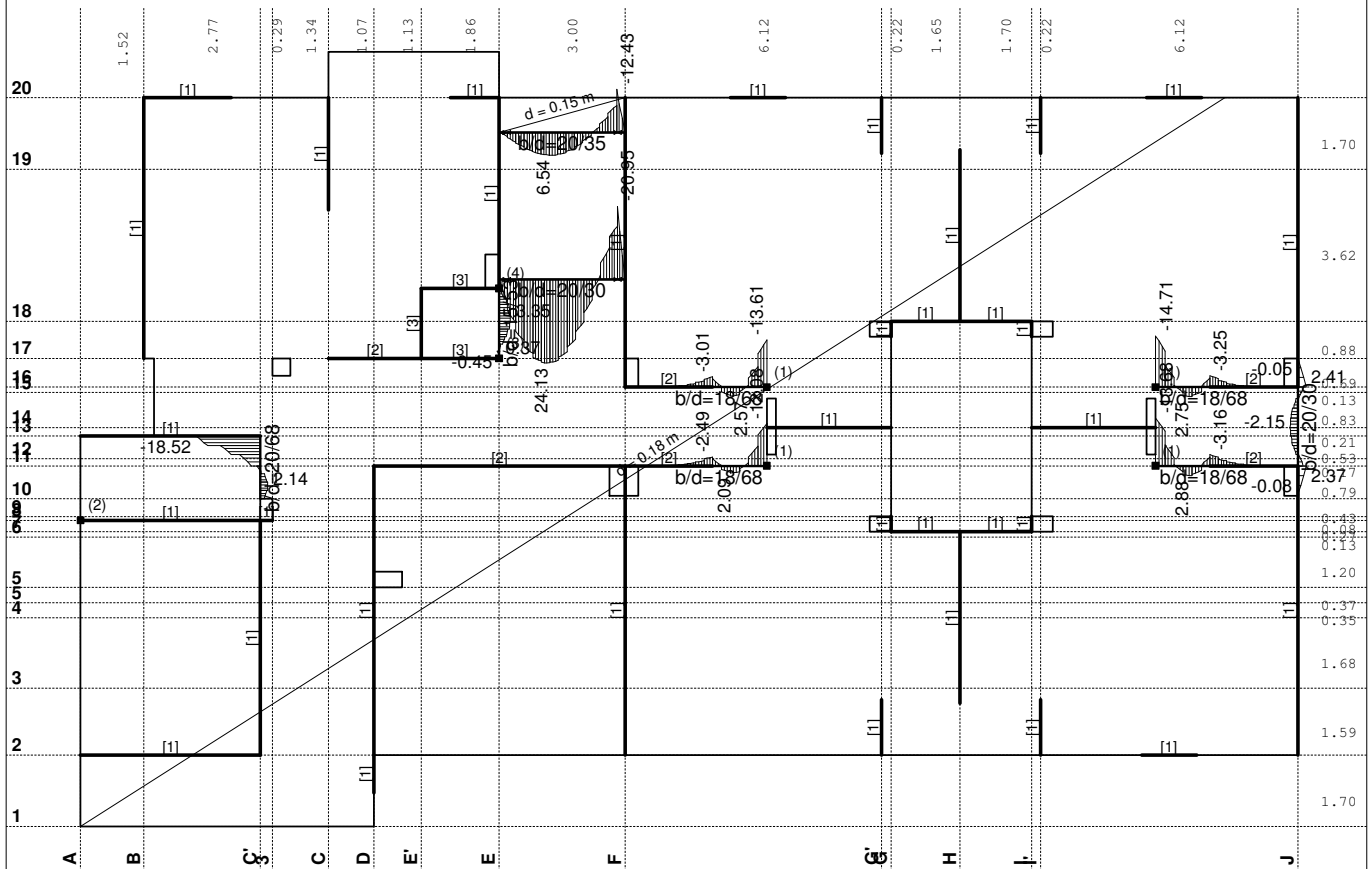


Utjecaji u ploči: max M_x = 34.06 / min M_x = -106.96 kNm/m

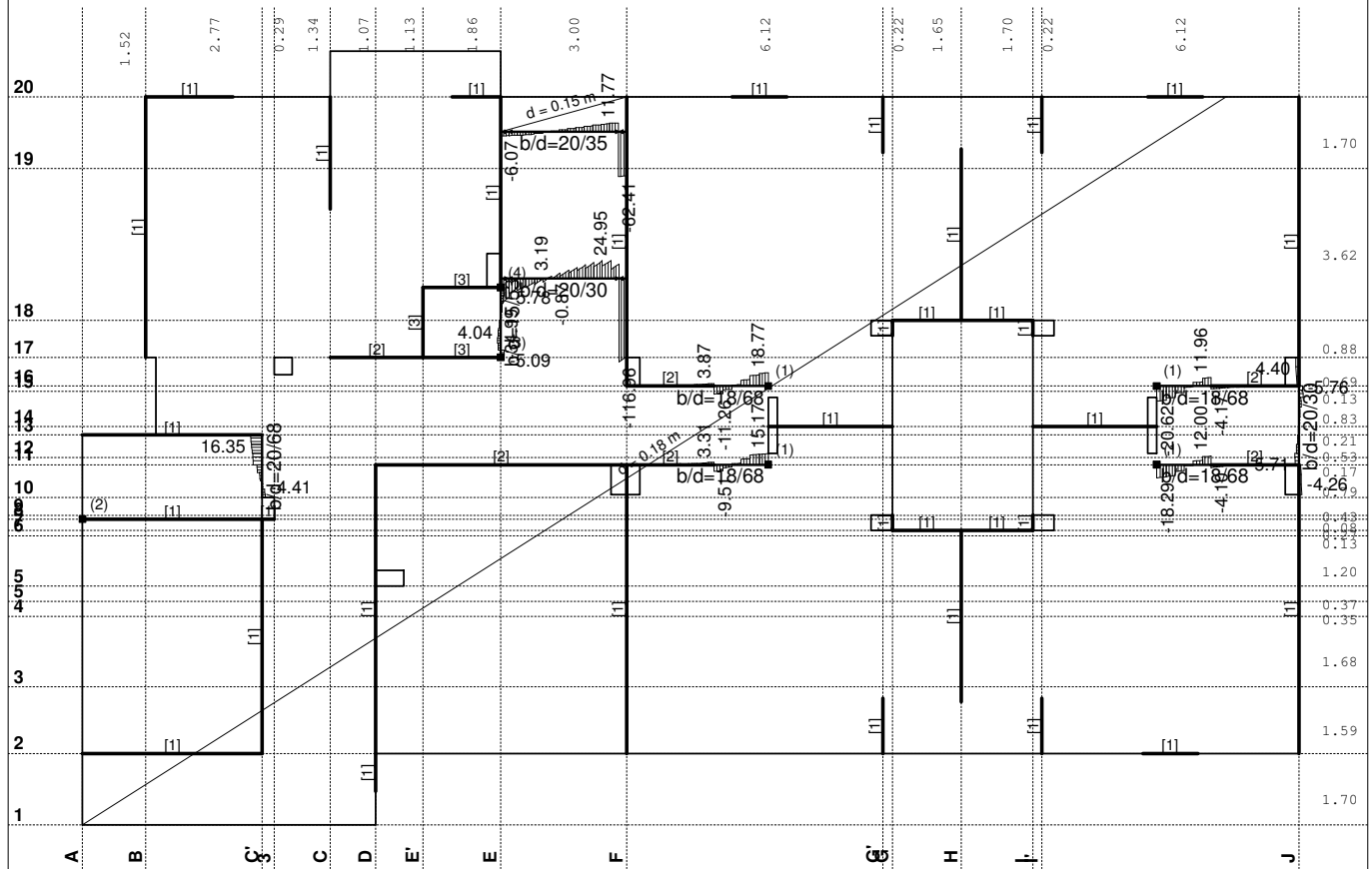
Opt. 3: 1.6xl+1.8xll

Uticaji u ploči: max $M_y = 35.68$ / min $M_y = -105.01$ kNm/m

Opt. 3: 1.6xl+1.8xll

Uticaji u gredi: max $M_3 = 24.13$ / min $M_3 = -20.95$ kNm

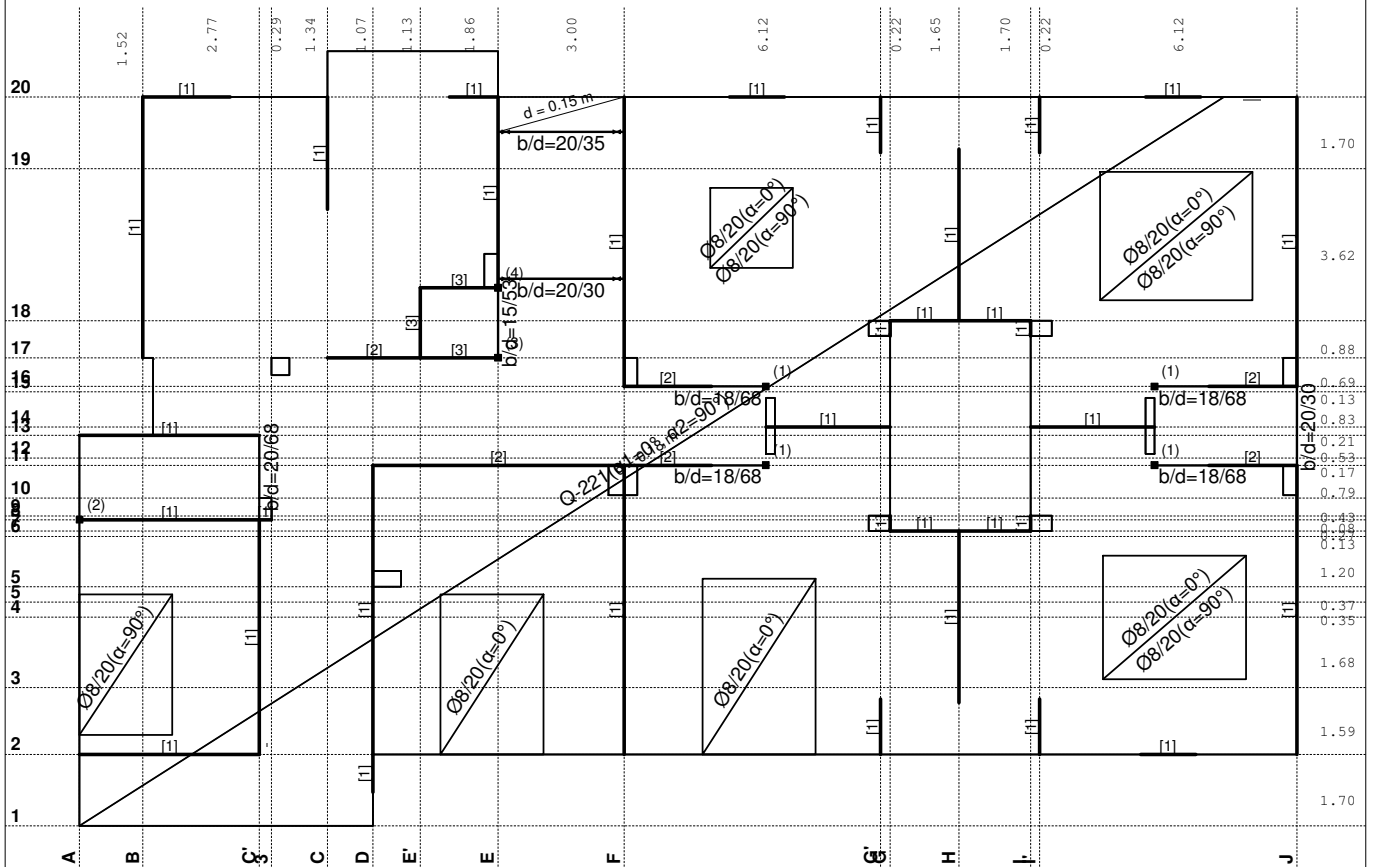
Opt. 3: 1.6xl+1.8xII



Uticaji u gredi: max $T_2=24.95$ / min $T_2=-116.96$ kN

Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

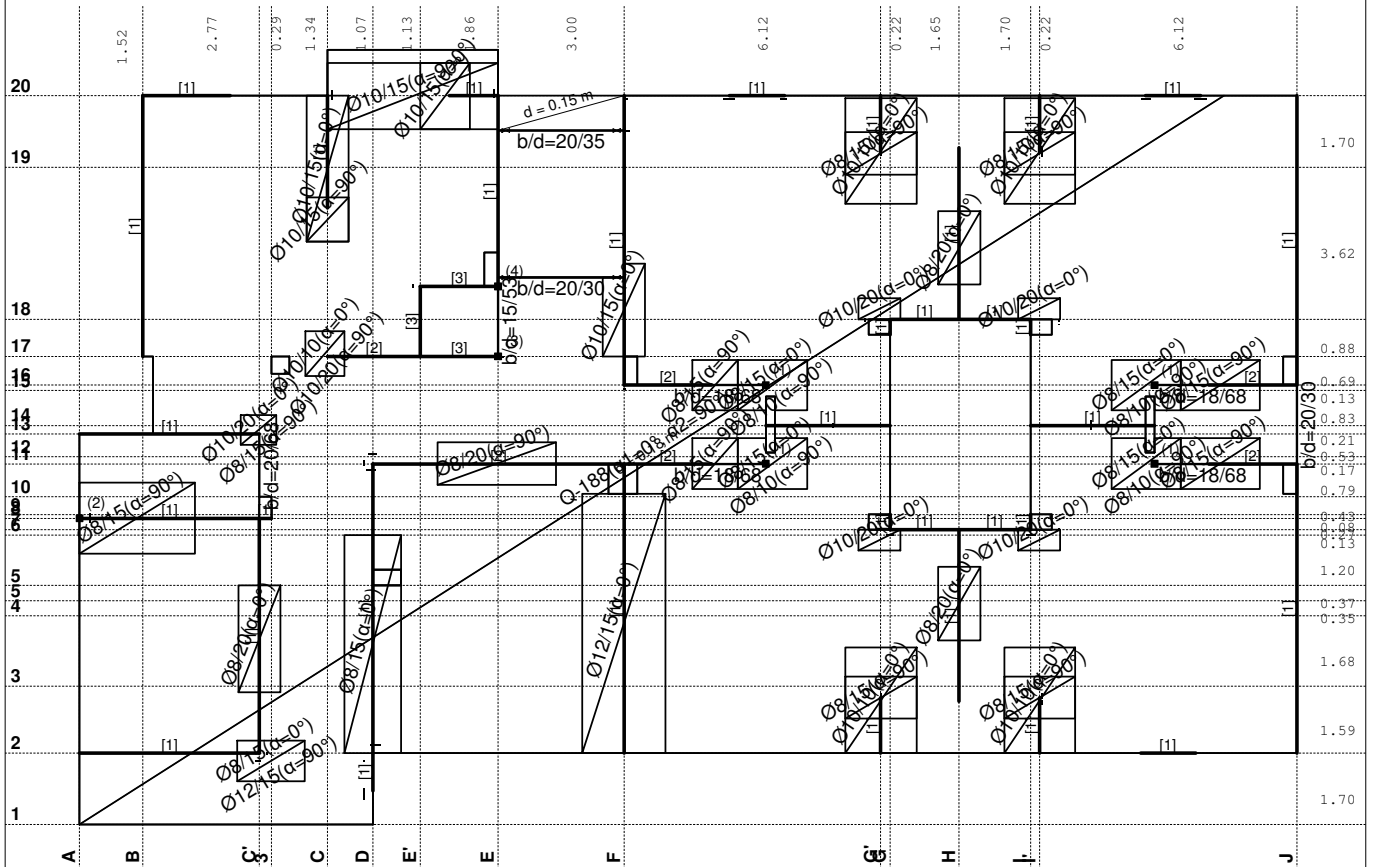
Aa - d.zona [cm ² /m]
0.00
2.34
4.68



Aa - d.zona

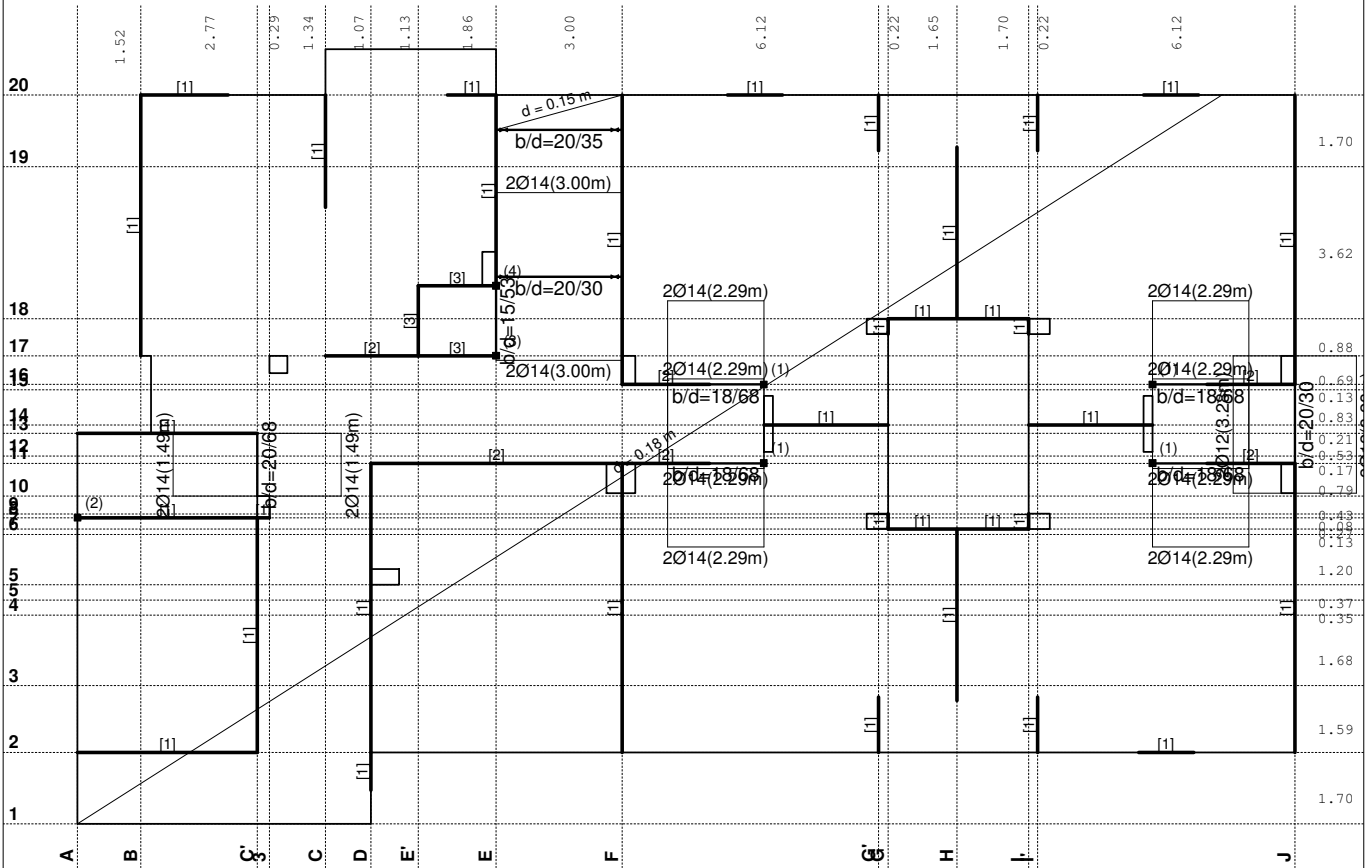
Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

Aa - g.zona [cm ² /m]
-15.17
-7.59
0.00

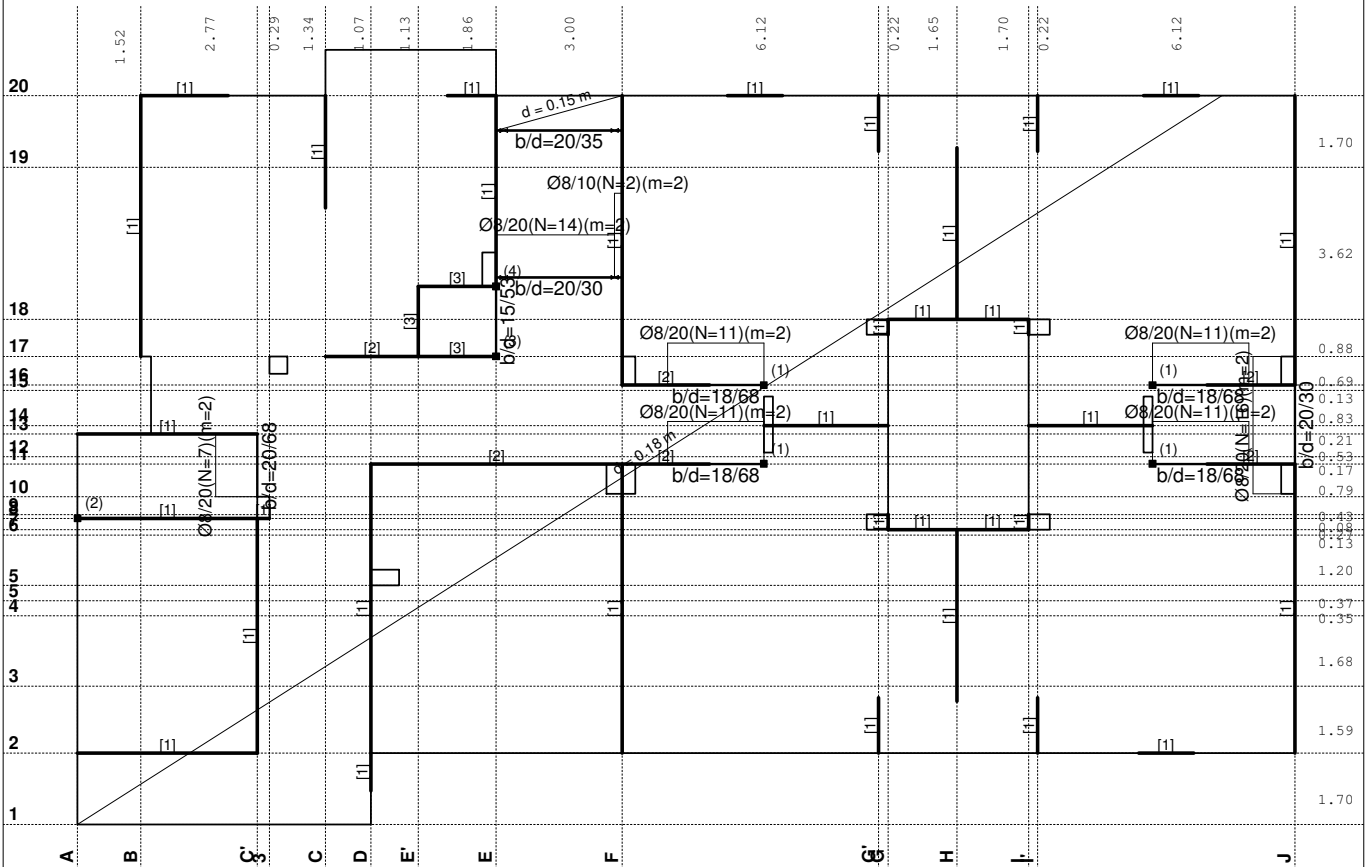


Aa - g.zona

Usvojena armatura
PBAB 87, MB 30, MA 500/600

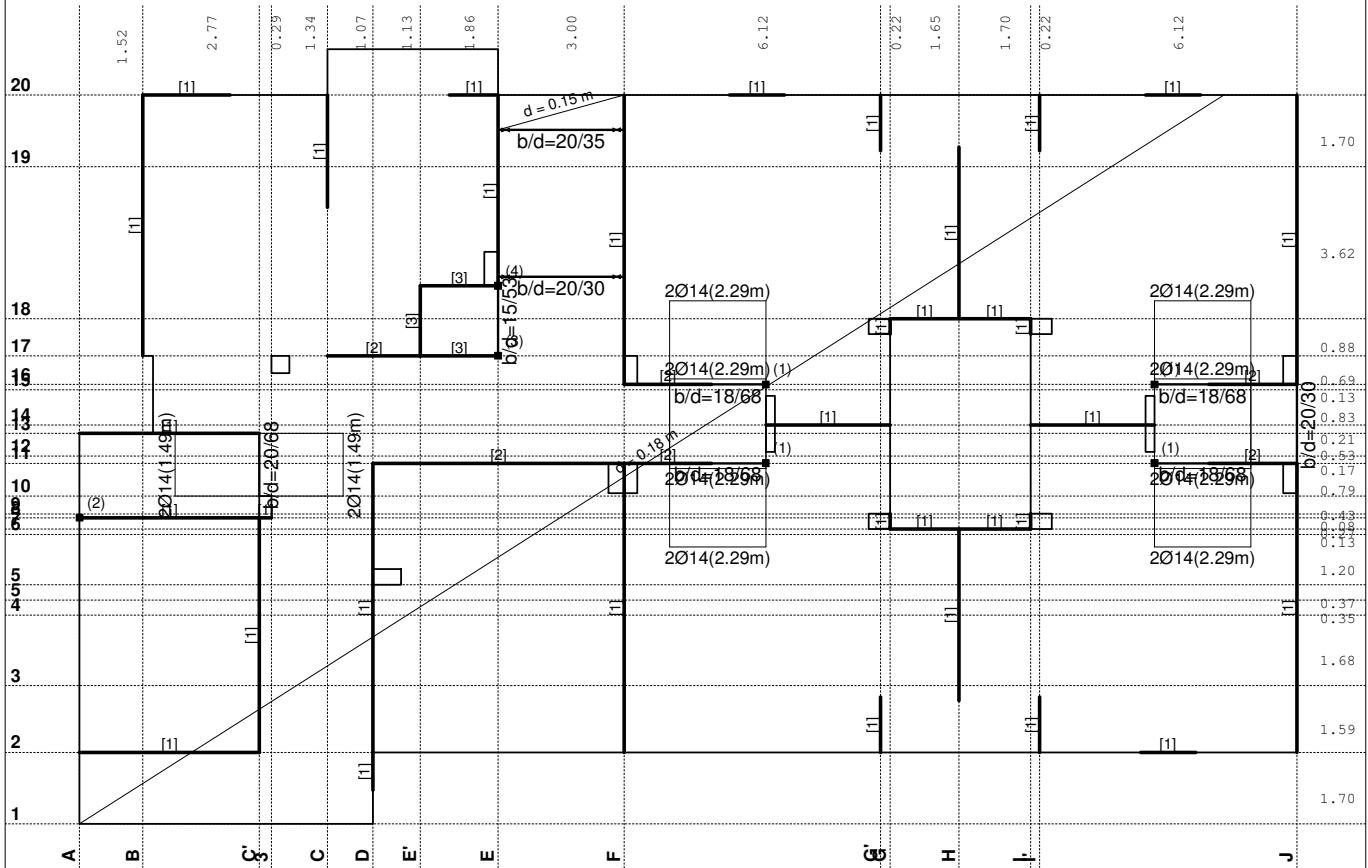


Armatura u gredama: Aa2/Aa1
Usvojena armatura
PBAB 87, MB 30, MA 500/600



Armatura u gredama: Aa,uz

Usvojena armatura
PBAB 87, MB 30, MA 500/600

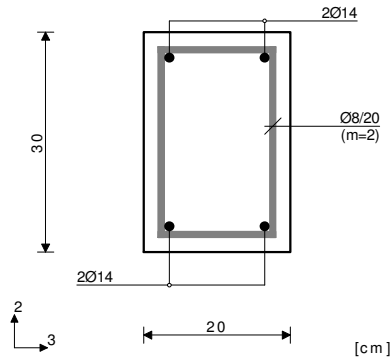


Armatura u gredama: Aa3/Aa4

Greda 5416-6608

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.21m



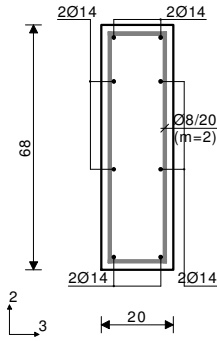
T2u = 3.19 kN
M3u = 24.01 kNm

$\epsilon_b/\epsilon_a = -1.567/10.000 \%$
Aa1 = 1.80 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]
 $\tau_y = 0.06 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.03%

Greda 1672-2035

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 0.39m



[cm]

T2u = 0.44 kN
M1u = 2.01 kNm
M3u = 2.13 kNm

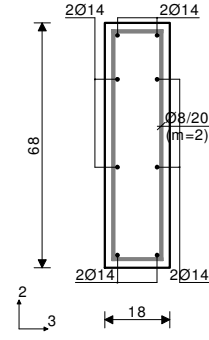
$\epsilon_b/\epsilon_a = -0.171/10.000 \text{ ‰}$
Aa1 = 0.07 + 0.04' = 0.11 cm²
Aa2 = 0.00 + 0.04' = 0.04 cm²
Aa3 = 0.00 + 0.13' = 0.13 cm²
Aa4 = 0.00 + 0.13' = 0.13 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.58 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.58 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 0.91%
*) - dodatna podužna armatura za prijem torzije.

Greda 6038-6918

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.42m



[cm]

T2u = -4.41 kN
M1u = -1.43 kNm
M3u = 2.29 kNm

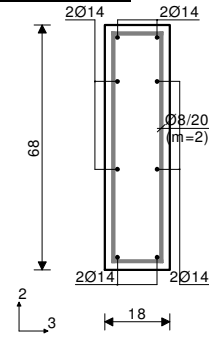
$\epsilon_b/\epsilon_a = -0.187/10.000 \text{ ‰}$
Aa1 = 0.08 + 0.03' = 0.10 cm²
Aa2 = 0.00 + 0.03' = 0.03 cm²
Aa3 = 0.00 + 0.10' = 0.10 cm²
Aa4 = 0.00 + 0.10' = 0.10 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.58 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.54 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.01%
*) - dodatna podužna armatura za prijem torzije.

Greda 5272-6200

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.42m



[cm]

T2u = -3.56 kN
M1u = 1.25 kNm
M3u = 1.89 kNm

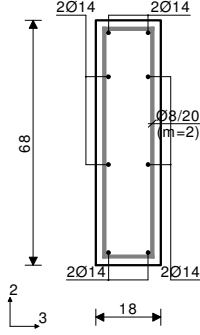
$\epsilon_b/\epsilon_a = -0.170/10.000 \text{ ‰}$
Aa1 = 0.06 + 0.02' = 0.09 cm²
Aa2 = 0.00 + 0.02' = 0.02 cm²
Aa3 = 0.00 + 0.09' = 0.09 cm²
Aa4 = 0.00 + 0.09' = 0.09 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.51 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.47 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.01%
*) - dodatna podužna armatura za prijem torzije.

Greda 9950-10466

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 0.87m



[cm]

T2u = -1.00 kN
M1u = -1.01 kNm
M3u = 2.75 kNm

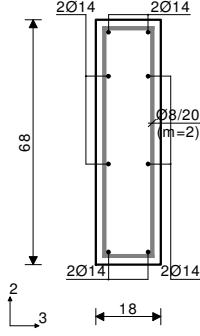
$\epsilon_b/\epsilon_a = -0.206/10.000 \text{ ‰}$
Aa1 = 0.09 + 0.00' = 0.09 cm²
Aa2 = 0.00 + 0.00' = 0.00 cm²
Aa3 = 0.00 + 0.07' = 0.07 cm²
Aa4 = 0.00 + 0.07' = 0.07 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.39 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.38 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.01%
*) - dodatna podužna armatura za prijem torzije.

Greda 9420-10061

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 0.87m



[cm]

T2u = -0.81 kN
M1u = 1.21 kNm
M3u = 2.88 kNm

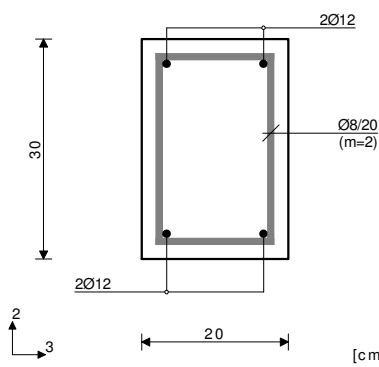
$\epsilon_b/\epsilon_a = -0.211/10.000 \text{ ‰}$
Aa1 = 0.09 + 0.02' = 0.12 cm²
Aa2 = 0.00 + 0.02' = 0.02 cm²
Aa3 = 0.00 + 0.09' = 0.09 cm²
Aa4 = 0.00 + 0.09' = 0.09 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.46 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.46 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.01%
*) - dodatna podužna armatura za prijem torzije.

Greda 10141-10797

PBAB 87
MB 30
MA 500/600
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 1.63m



[cm]

T2u = -0.66 kN
M3u = -2.15 kNm

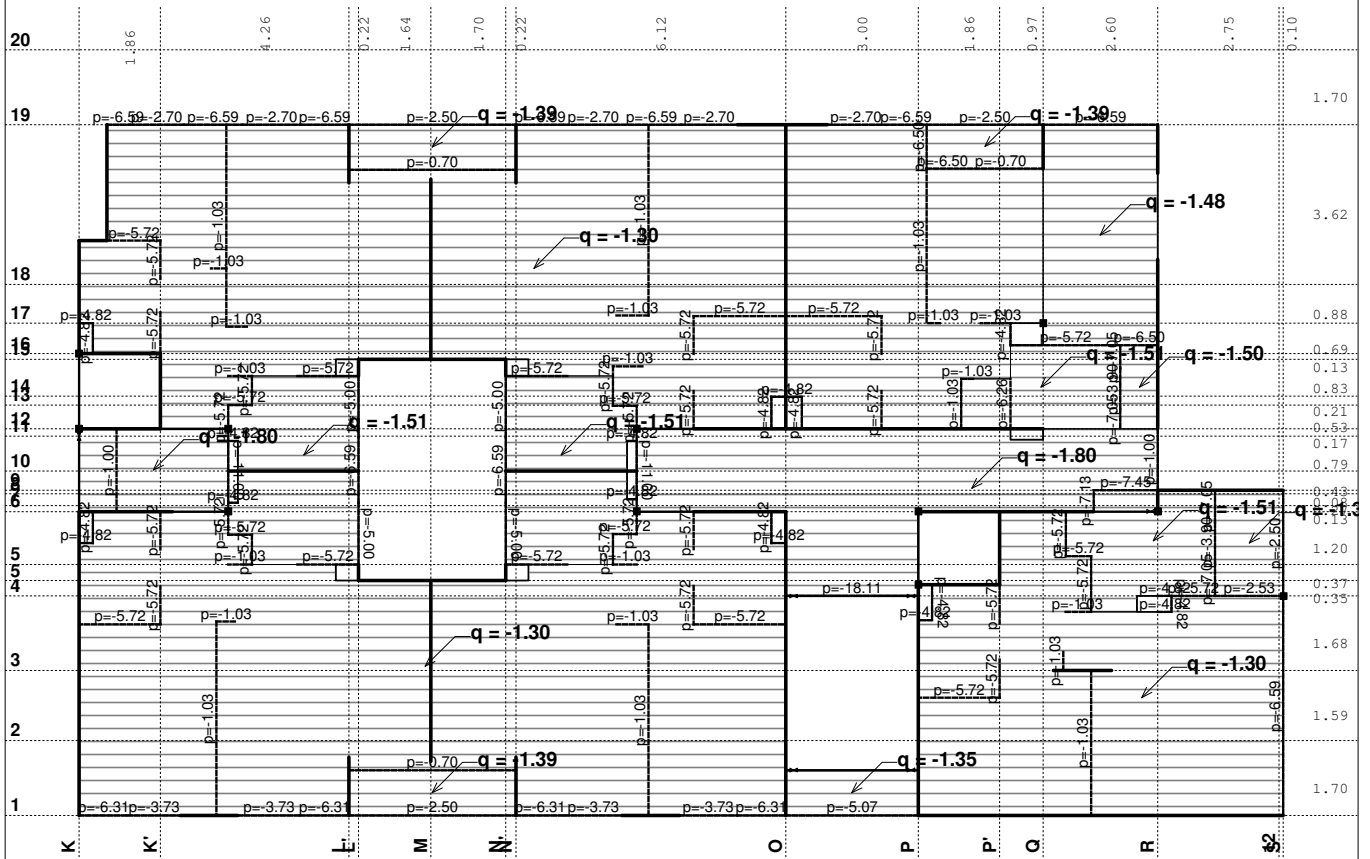
$\epsilon_b/\epsilon_a = -0.403/10.000 \text{ ‰}$
Aa1 = 0.00 cm²
Aa2 = 0.16 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.02 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 0.75%

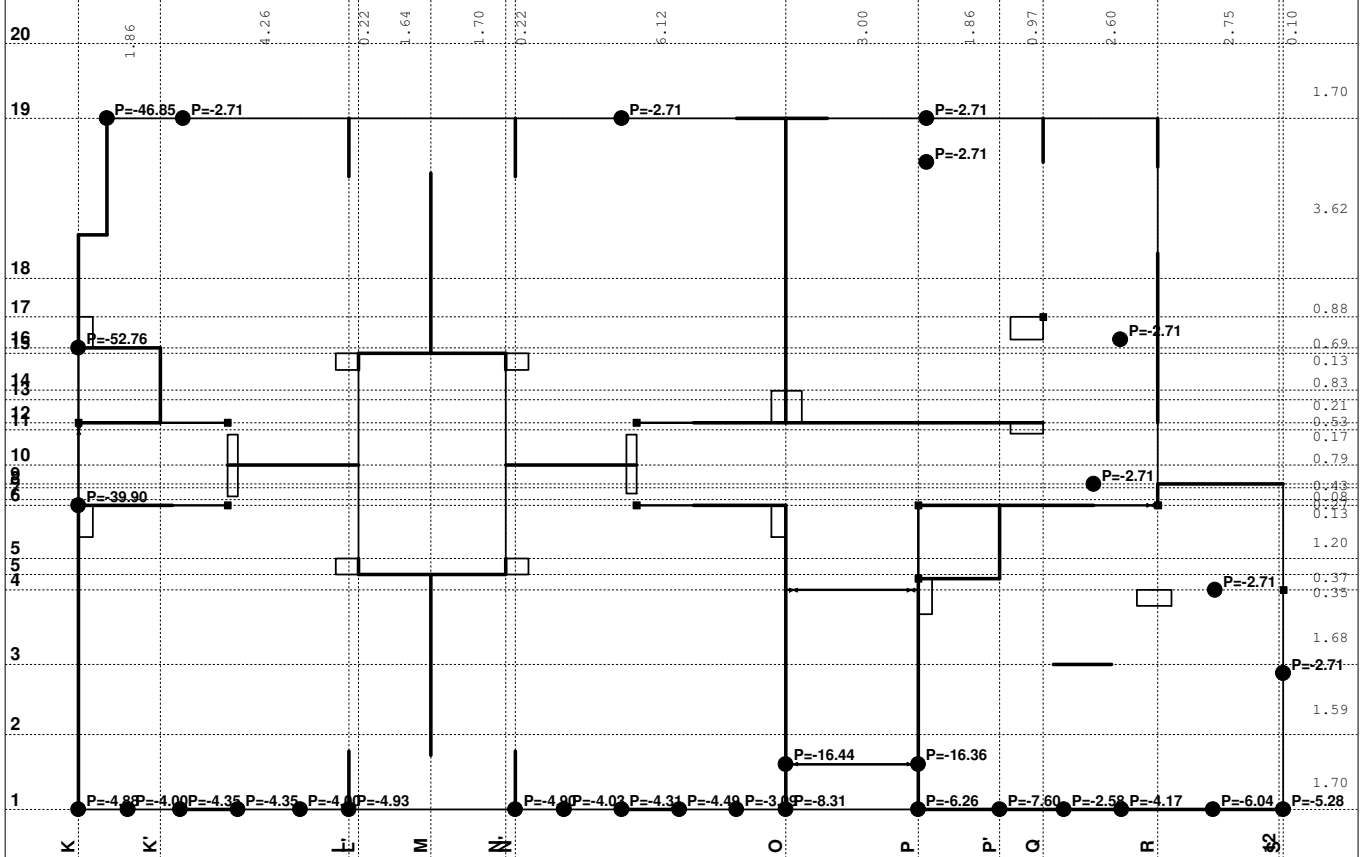
Ulazni podaci - Konstrukcija, Ulazni podaci - Opterećenje

POS 100+ - KONSTRUKCIJA IZNAD PRIZEMLJA

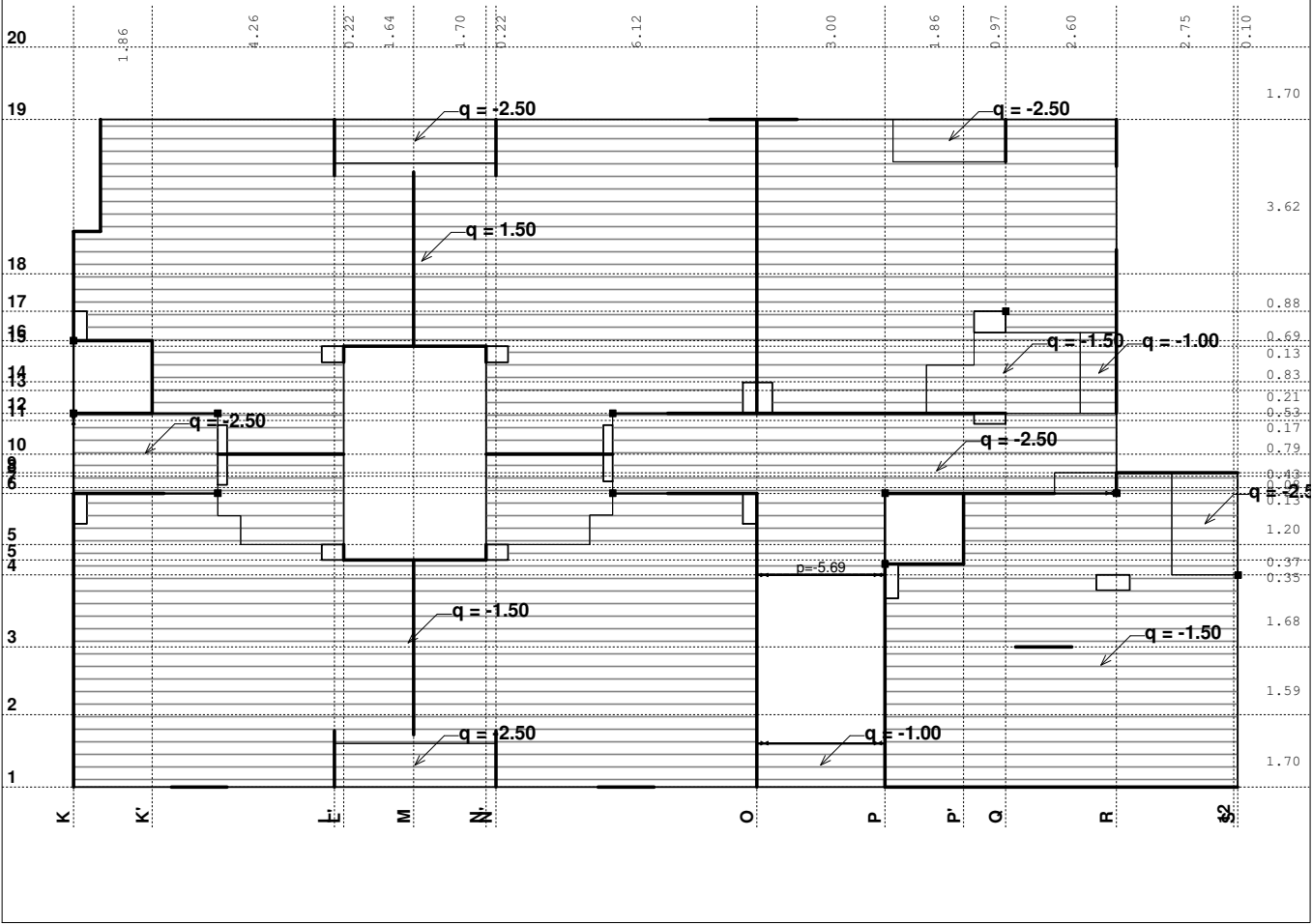
Opt. 1: g (g)



Opt. 1: g (g)



Opt. 2: p

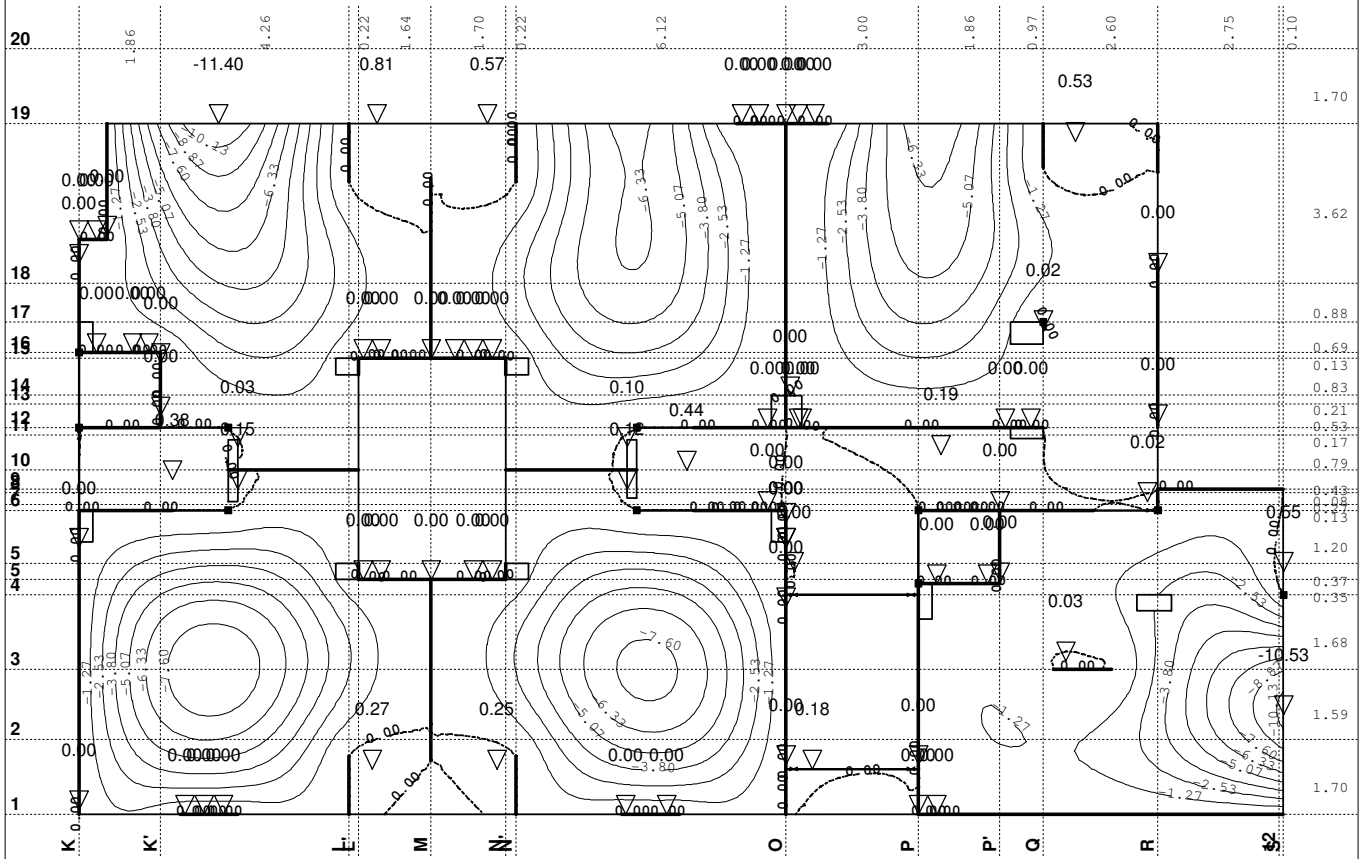


Lista slučajeva opterećenja	
LC	Naziv
1	q (g)
2	p
3	Komb.: 1.6xI+1.8xII

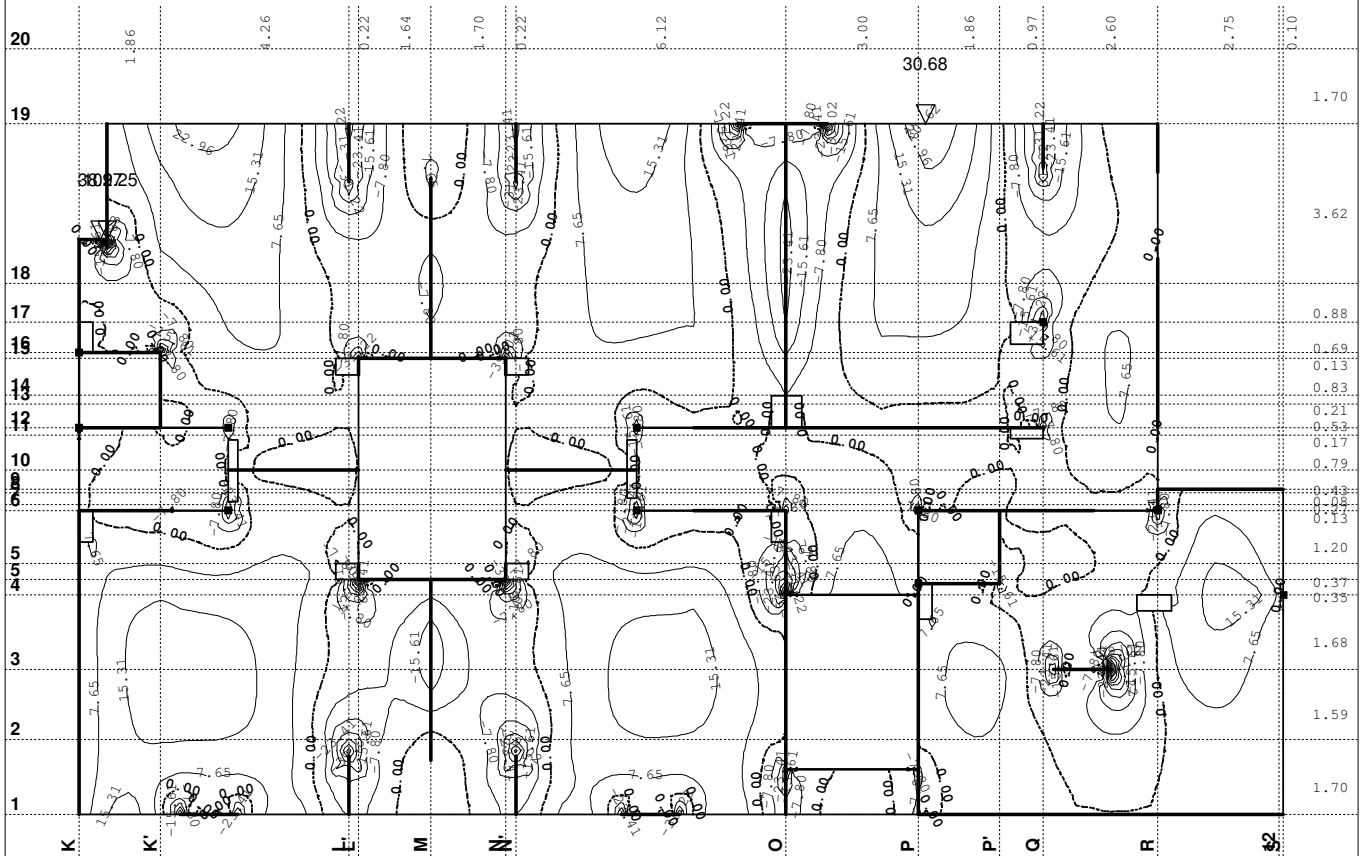
LC	Naziv
4	Komb.: 3.5xI
5	Komb.: I+II

Statički proračun

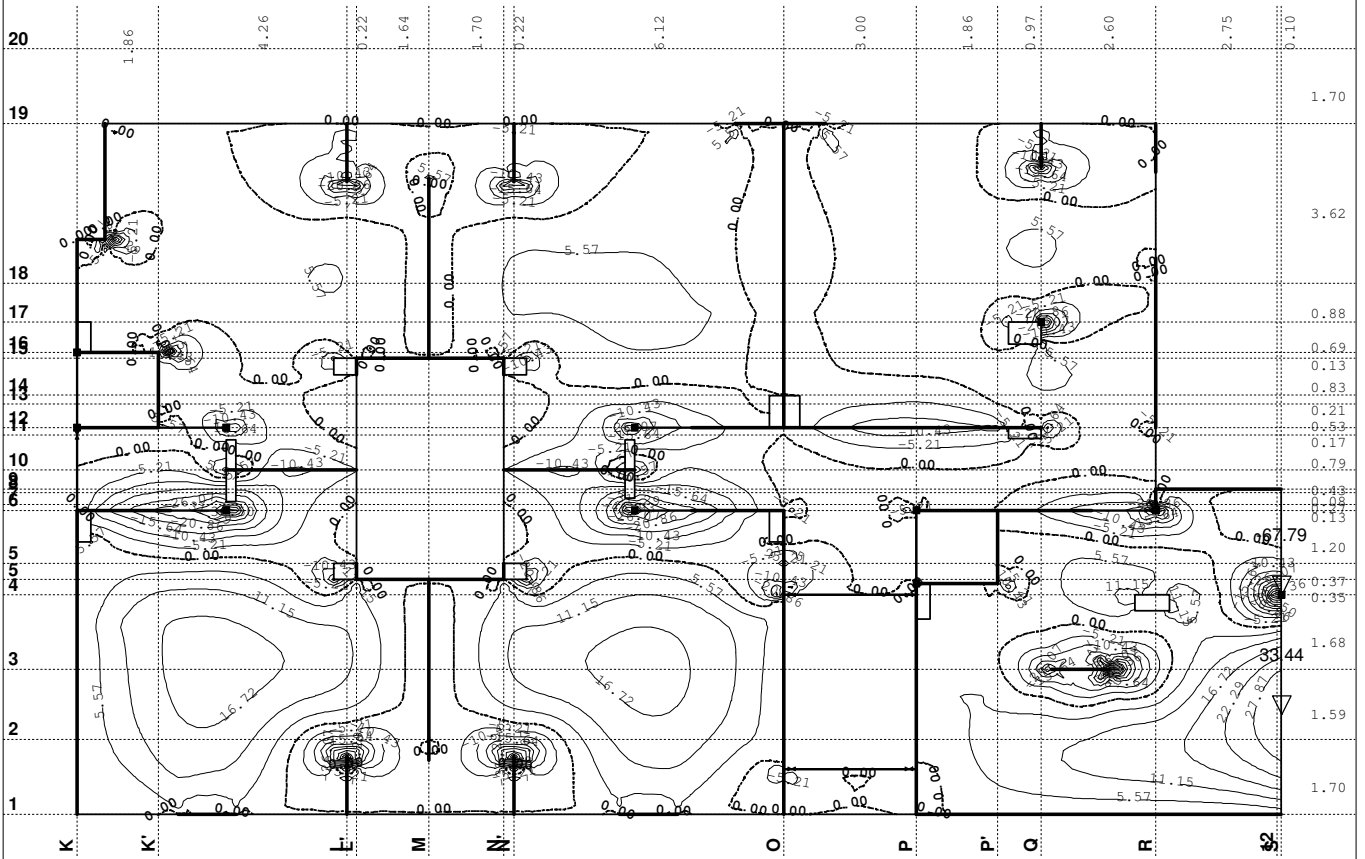
Opt. 4: 3.5xl+II



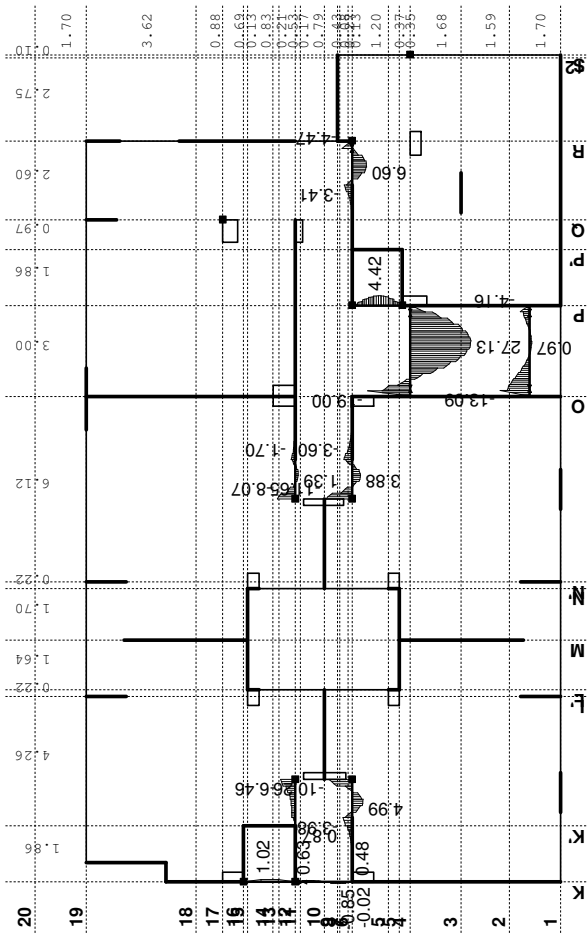
Opt. 3: 1.6xl+1.8xl



Opt. 3: 1.6xI+1.8xII

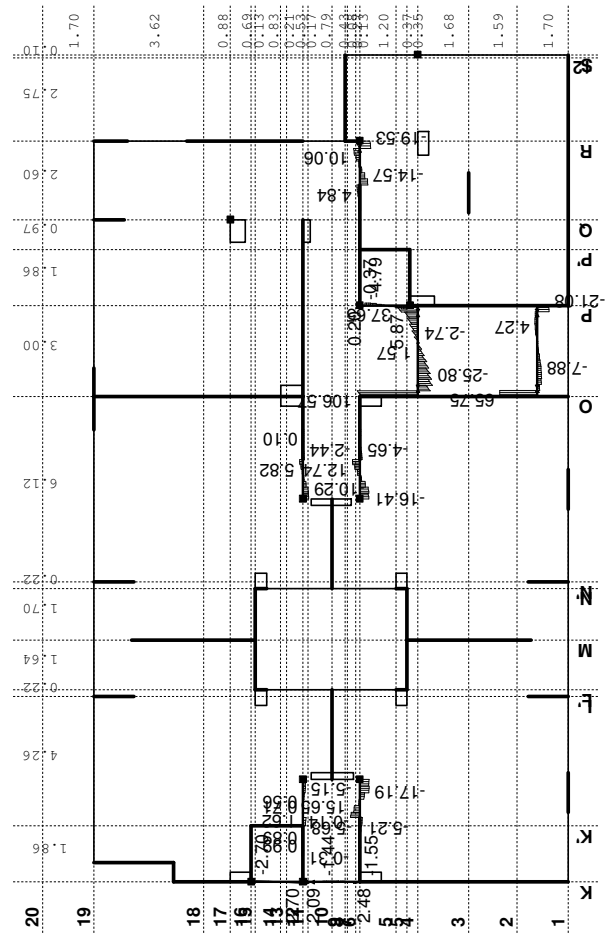


Uticaji u ploči: max $M_y = 33.44$ / min $M_y = -67.79$ kNm/m
Opt. 3: 1.6xI+1.8xII



Uticaji u gredi: max $M_3 = 27.13$ / min $M_3 = -19.00$ kNm

Opt. 3: 1.6xI+1.8xII

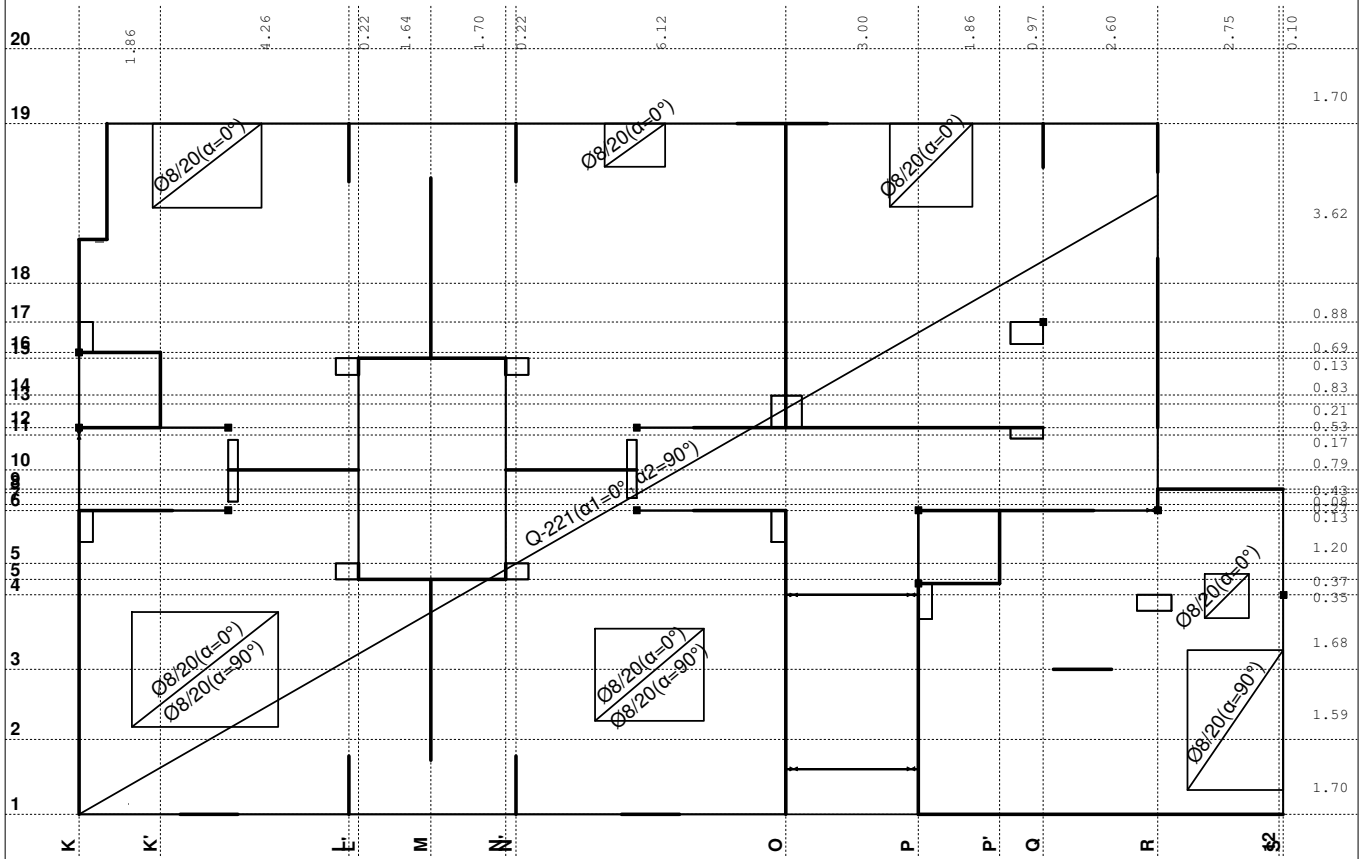


Uticaji u gredi: max $T_2 = 106.57$ / min $T_2 = -25.80$ kNm

Dimenzionisanje (beton)

Usvojena armatura
PBAB 87, MB 30, MA 500/560, a=2.00 cm

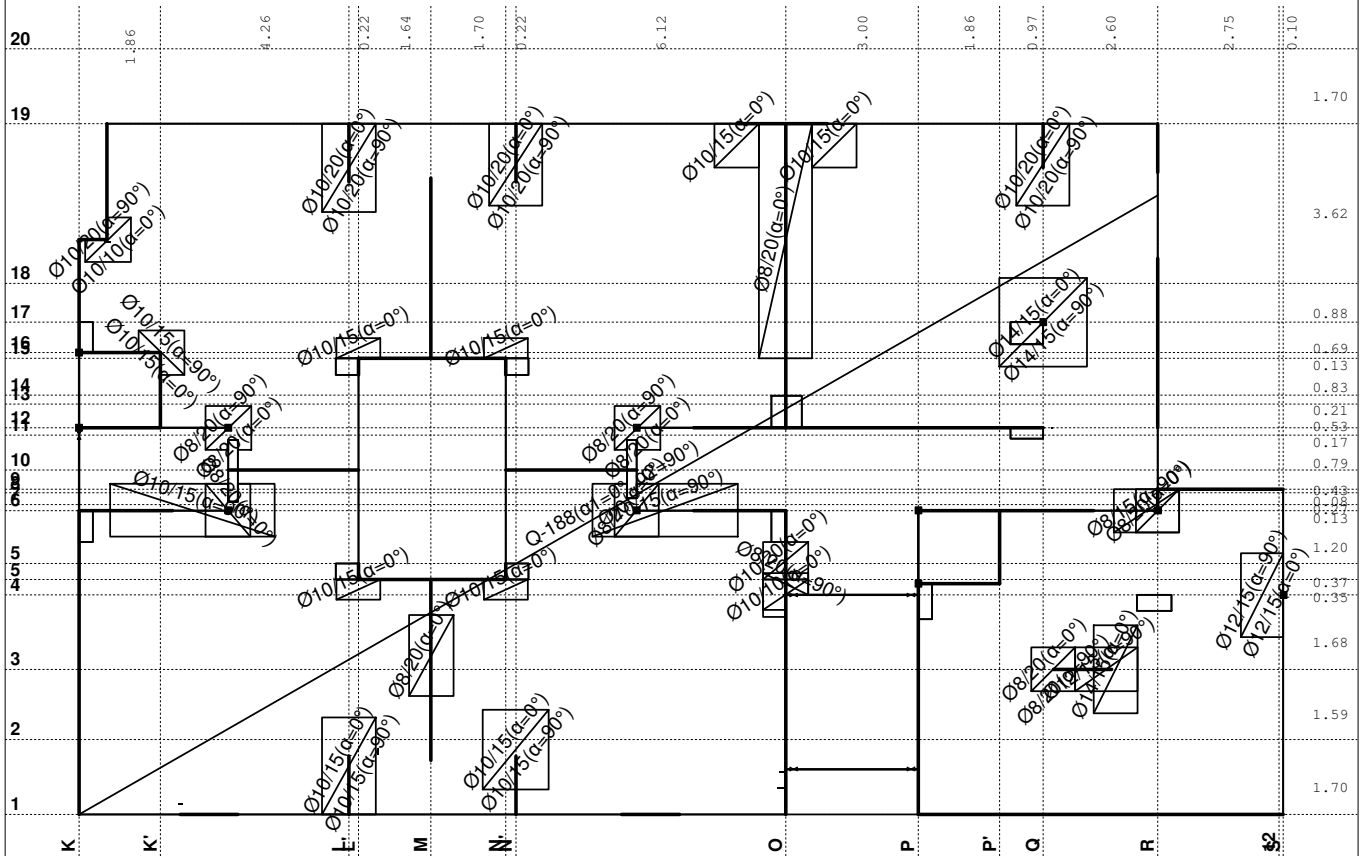
Aa - d.zona [cm ² /m]
0.00
2.52
5.03



Aa - d.zona

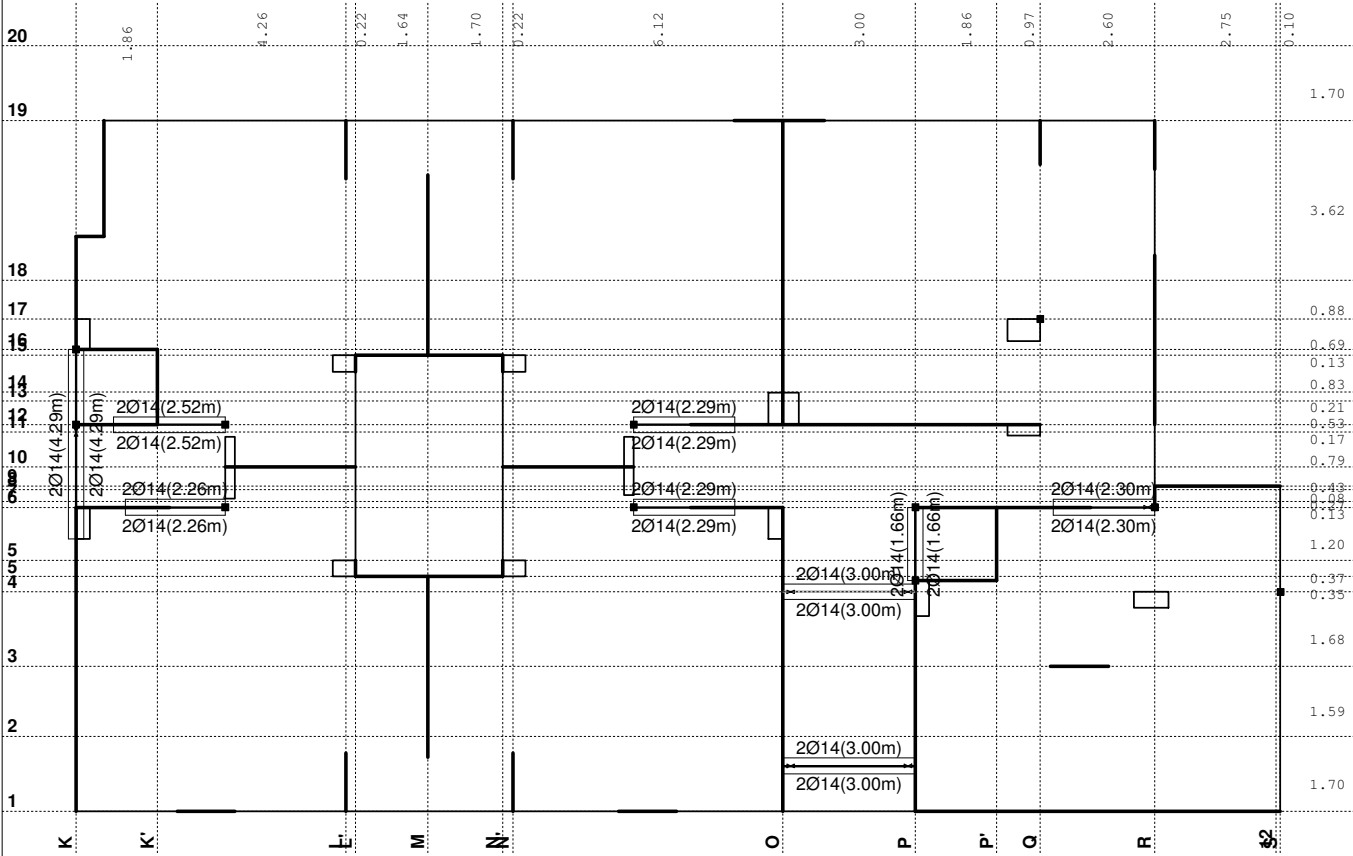
Usvojena armatura
PBAB 87, MB 30, MA 500/560, a=2.00 cm

Aa - g.zona [cm ² /m]
-15.55
-7.78
0.00

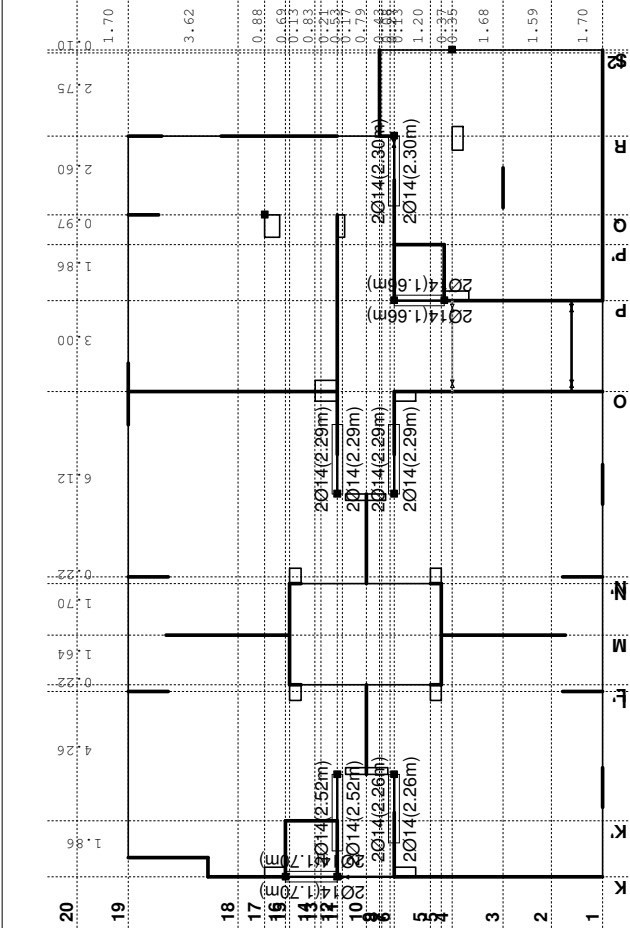


Aa - g.zona

Usvojena armatura
PBAB 87, MB 30, MA 500/560

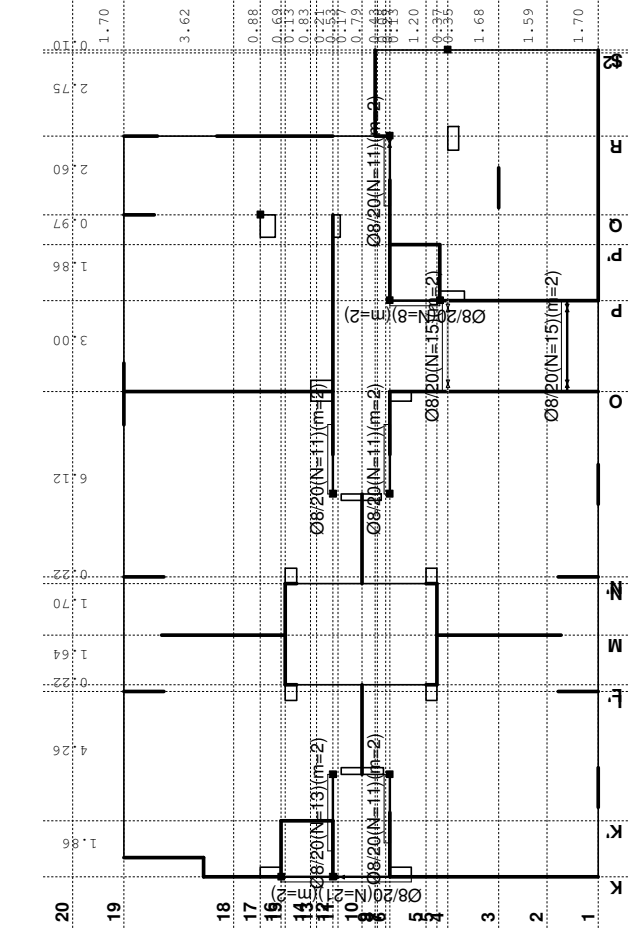


Armatura u gredama: Aa2/Aa1
Usvojena armatura
PBAB 87, MB 30, MA 500/560



Armatura u gredama: Aa3/Aa4

Usvojena armatura
PBAB 87, MB 30, MA 500/560

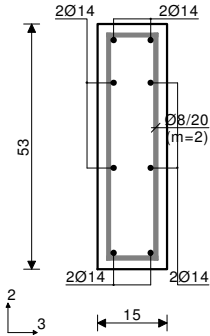


Armatura u gredama: Aa,uz

ZK" (1476-1087)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 1-1 x = 0.85m



[cm]

M3u = 1.02 kNm

$\epsilon_b/\epsilon_a = -0.176/10.000 \text{ ‰}$

Aa1 = 0.04 cm²

Aa2 = 0.00 cm²

Aa3 = 0.00 cm²

Aa4 = 0.00 cm²

Aa,uz = 0.00 cm²/m (m=2)

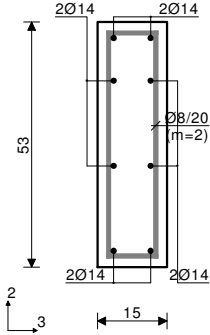
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

Procent armiranja: 1.55%

ZP" (7032-6326)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 2-2 x = 0.96m



[cm]

T2u = -0.28 kN

M3u = 4.42 kNm

$\epsilon_b/\epsilon_a = -0.377/10.000 \text{ ‰}$

Aa1 = 0.19 cm²

Aa2 = 0.00 cm²

Aa3 = 0.00 cm²

Aa4 = 0.00 cm²

Aa,uz = 0.00 cm²/m (m=2)

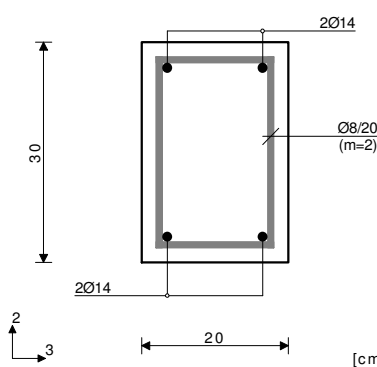
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

Procent armiranja: 1.55%

P 109 (4990-6216)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 3-3 x = 1.76m



[cm]

T2u = -2.74 kN

M3u = 27.04 kNm

$\epsilon_b/\epsilon_a = -1.796/10.000 \text{ ‰}$

Aa1 = 2.12 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]

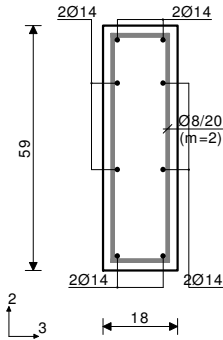
$\tau_y = 0.06 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$

Procent armiranja: 1.03%

Z6c (8312-9110)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 4-4 x = 1.44m



[cm]

T2u = 0.88 kN
M1u = 0.75 kNm
M3u = 6.60 kNm

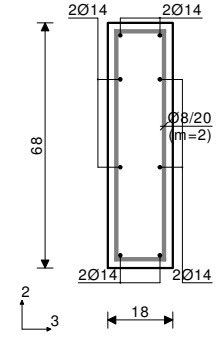
$\epsilon_b/\epsilon_a = -0.377/10.000 \text{ ‰}$
Aa1 = 0.25 + 0.00 = 0.25 cm²
Aa2 = 0.00 + 0.00 = 0.00 cm²
Aa3 = 0.00 + 0.05 = 0.05 cm²
Aa4 = 0.00 + 0.05 = 0.05 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.34 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.33 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.16%
*) - dodatna podužna armatura za prijem torzije.

Z6a (1434-925)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 5-5 x = 0.65m



[cm]

T2u = 0.62 kN
M1u = 0.24 kNm
M3u = 4.99 kNm

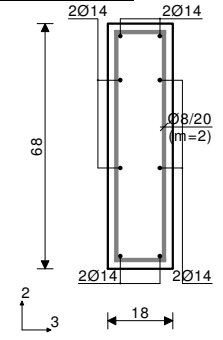
$\epsilon_b/\epsilon_a = -0.281/10.000 \text{ ‰}$
Aa1 = 0.16 cm²
Aa2 = 0.00 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.10 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.09 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.01%

Z6b (4459-5309)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 6-6 x = 0.78m



[cm]

T2u = 2.95 kN
M1u = -1.03 kNm
M3u = 3.86 kNm

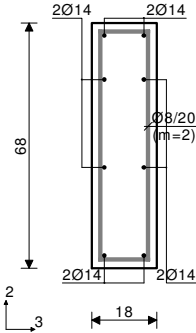
$\epsilon_b/\epsilon_a = -0.246/10.000 \text{ ‰}$
Aa1 = 0.13 + 0.00 = 0.13 cm²
Aa2 = 0.00 + 0.00 = 0.00 cm²
Aa3 = 0.00 + 0.07 = 0.07 cm²
Aa4 = 0.00 + 0.07 = 0.07 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.42 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.39 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.01%
*) - dodatna podužna armatura za prijem torzije.

P 108 (1954-1277)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 7-7 x = 1.52m



[cm]

T2u = -4.39 kN
M1u = -2.43 kNm
M3u = 0.31 kNm

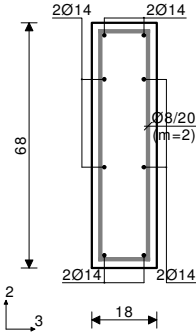
$\epsilon_b/\epsilon_a = -0.068/10.000 \text{ ‰}$
Aa1 = 0.00 + 0.04' = 0.04 cm²
Aa2 = 0.00 + 0.04' = 0.04 cm²
Aa3 = 0.00 + 0.17' = 0.17 cm²
Aa4 = 0.00 + 0.17' = 0.17 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.95 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.91 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.01%
*) - dodatna podužna armatura za prijem torzije.

Z12 (5145-6090)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 8-8 x = 0.78m



[cm]

T2u = 0.55 kN
M1u = 0.36 kNm
M3u = 1.39 kNm

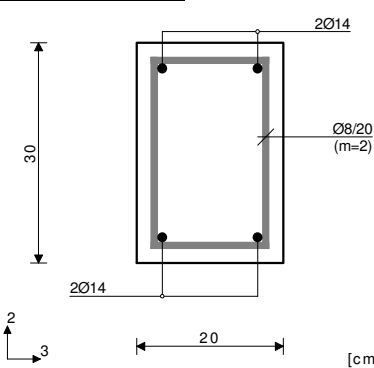
$\epsilon_b/\epsilon_a = -0.145/10.000 \text{ ‰}$
Aa1 = 0.05 cm²
Aa2 = 0.00 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.14 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.14 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.01%

P 107 (587-1087)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 9-9 x = 1.20m



[cm]

T2u = 1.14 kN
M3u = -0.85 kNm

$\epsilon_b/\epsilon_a = -0.248/10.000 \text{ ‰}$
Aa1 = 0.00 cm²
Aa2 = 0.06 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]

$\tau_y = 0.02 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.03%

P 110 (3532-4651)

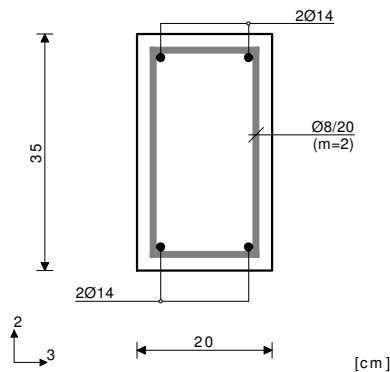
PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 10-10 x = 1.80m



$$T2u = -0.41 \text{ kN}$$

$$M3u = 0.97 \text{ kNm}$$

$$\epsilon_b/\epsilon_a = -0.226/10.000 \text{ ‰}$$

$$Aa1 = 0.06 \text{ cm}^2$$

$$Aa2 = 0.00 \text{ cm}^2$$

$$Aa3 = 0.00 \text{ cm}^2$$

$$Aa4 = 0.00 \text{ cm}^2$$

$$Aa,uz = 0.00 \text{ cm}^2/\text{m}$$

(m=2)

$$[\text{Usvojeno } Aa,uz = \emptyset 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}]$$

$$\tau_y = 0.01 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$$

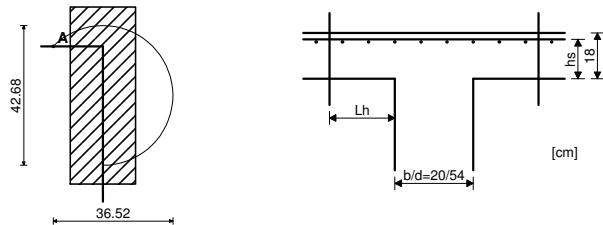
$$\text{Procenat armiranja: } 0.88\%$$

Kontrola ploča na probijanje

Nivo: POS 100+ [0.00 m]

Presek 1 (190.60,-108.22,0.00)

MB 30



KONTROLA KRITIČNOG PRESEKA 1. ($L_h = 0.07\text{m}$ od ivice stuba)
(stub zamenjujućeg kružnog preseka, $d_s = 0.28\text{m}$)

Merodavna kombinacija: I+II

Sila u stubu

$$N = 78.482 \text{ kN}$$

Faktor povećanja napona zbog ekscentričnosti

$$\beta = 1.400$$

Merodavni smičući napon (tačka A)

$$\tau = 0.873 \text{ MPa}$$

Debljina ploče

$$d,pl = 0.180 \text{ m}$$

Statička visina ploče

$$h_s = 0.150 \text{ m}$$

Obim kritičnog preseka

$$O_{kp} = 0.839 \text{ m}$$

Postojeća armatura u ploči

$$Aa,1 = 12.147 \text{ cm}^2$$

Površina armature - pravac 1

$$\mu,1 = 0.810 \%$$

Procenat armiranja - pravac 1

$$Aa,2 = 12.147 \text{ cm}^2$$

Površina armature - pravac 2

$$\mu,2 = 0.810 \%$$

Procenat armiranja - pravac 2

$$\mu = 0.810 \%$$

Srednja vrednost procenta armiranja

$$\alpha_a = 1.400$$

Koeficijent

$$\gamma_1 = 1.638$$

Koeficijent

$$\gamma_2 = 0.567$$

Dopušteni glavni napon zatezanja

$$\tau_a = 0.800$$

Dopušteni glavni napon zatezanja

$$\tau_b = 2.200$$

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

$$\tau_{max} = 1.247 \text{ MPa}$$

$$\text{Uslov: } \tau \leq \tau_{max} (0.87 \leq 1.25)$$

Uslov je ispunjen.

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

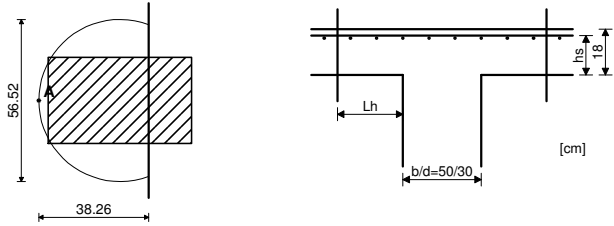
$$\tau_{gr} = 0.874 \text{ MPa}$$

$$\text{Uslov: } \tau \leq \tau_{gr} (0.87 \leq 0.87)$$

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

Kontrola ploča na probijanje

Nivo: POS 100+ [0.00 m]
Presek 1 (196.05,-114.40,0.00)
MB 30



KONTROLA KRITIČNOG PRESEKA 1. (Lh = 0.07m od ivice stuba)
(stub zamenjujućeg kružnog preseka, ds = 0.42m)

Merodavna kombinacija: I	
Sila u stubu	N = 74.709 kN
Faktor povećanja napona zbog ekscentričnosti	β = 1.400
Merodavni smičući napon (tačka A)	τ = 0.638 MPa
Debljina ploče	d,pl = 0.180 m
Statička visina ploče	hs = 0.150 m
Obim kritičnog preseka	Okp = 1.092 m
Postojeća armatura u ploči	
Površina armature - pravac 1	Aa,1 = 9.425 cm ²
Procenat armiranja - pravac 1	μ ,1 = 0.628 %
Površina armature - pravac 2	Aa,2 = 9.425 cm ²
Procenat armiranja - pravac 2	μ ,2 = 0.628 %
Srednja vrednost procenta armiranja	μ = 0.628 %
Koeficijent	α a = 1.400
Koeficijent	γ 1 = 1.443
Koeficijent	γ 2 = 0.499
Dopušteni glavni napon zatezanja	τ a = 0.800
Dopušteni glavni napon zatezanja	τ b = 2.200
Maksimalna otpornost(γ 2 x τ b)	τ ,max = 1.099 MPa

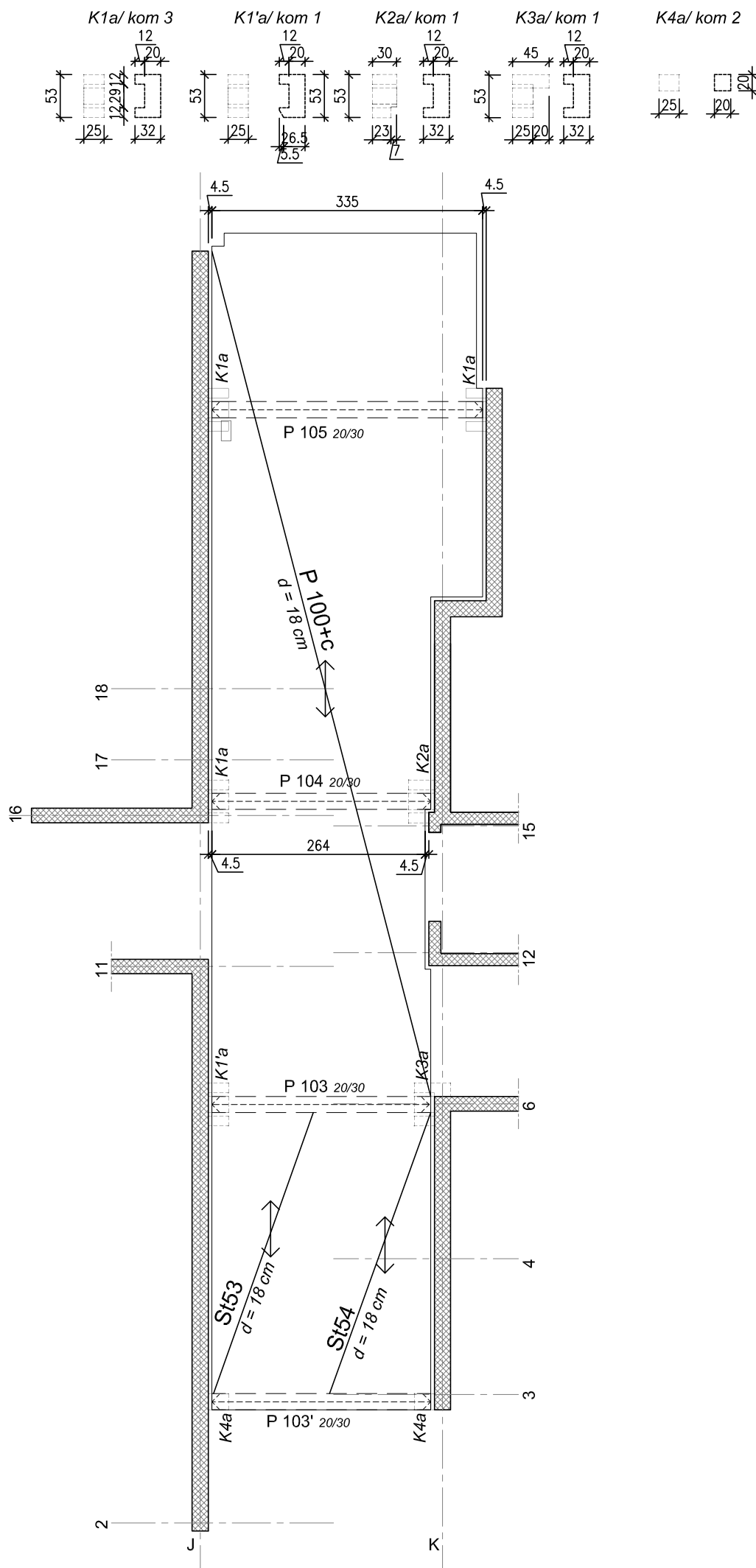
Uslov: $\tau \leq \tau_{max}$ (0.64 <= 1.10)

Uslov je ispunjen.

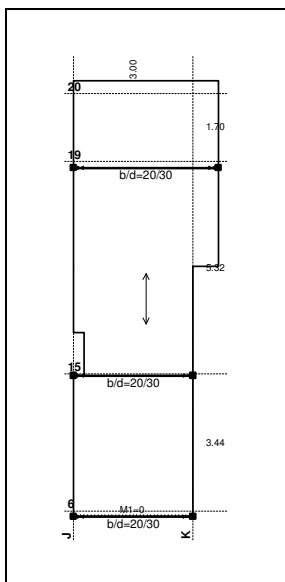
Otpornost na probijanje ploče bez dodatne armature za obezbeđenje (2/3 x γ 1 x τ a)	τ ,gr = 0.769 MPa
---	------------------------

Uslov: $\tau \leq \tau_{gr}$ (0.64 <= 0.77)

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

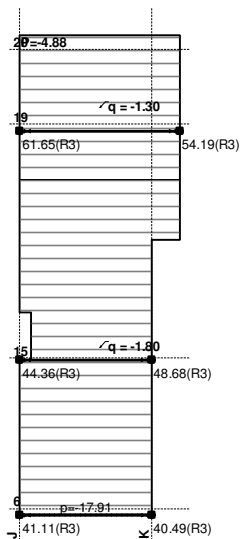


K1a - K4a - Arm. bet. Kratki elementi P 100+



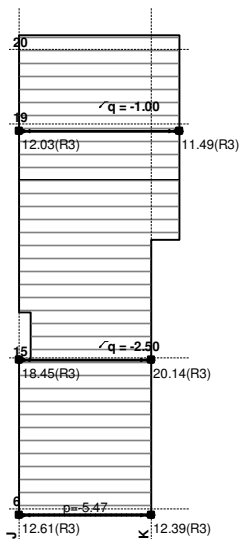
Statički proračun

Opt. 1: g (g)



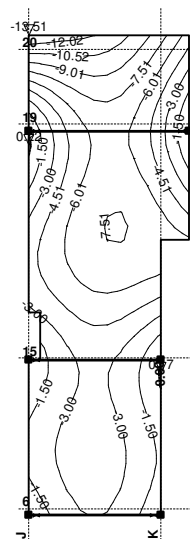
Reakcije oslonaca

Opt. 2: p



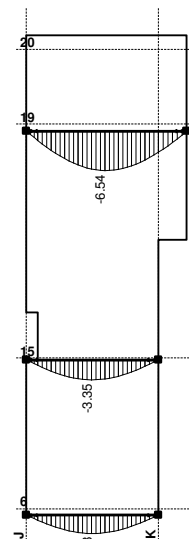
Reakcije oslonaca

Opt. 3: 3.5xl+II



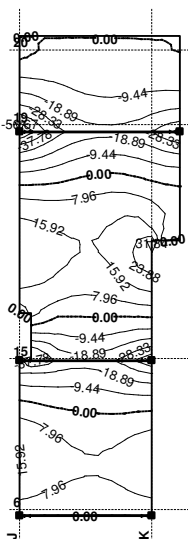
Uticaji u ploči: max Zp= 0.22 / min ...

Opt. 3: 3.5xl+II



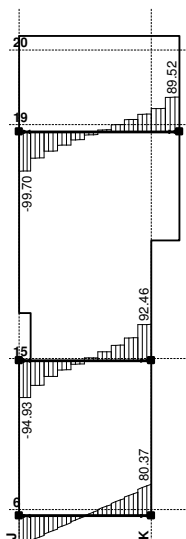
Uticaji u gredi: max Zp= -0.00 / min...

Opt. 4: 1.6xl+1.8xII



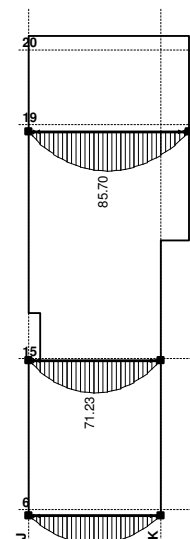
Uticaji u ploči: max My= 31.84 / m...

Opt. 4: 1.6xl+1.8xII



Uticaji u gredi: max T2= 92.46 / m...

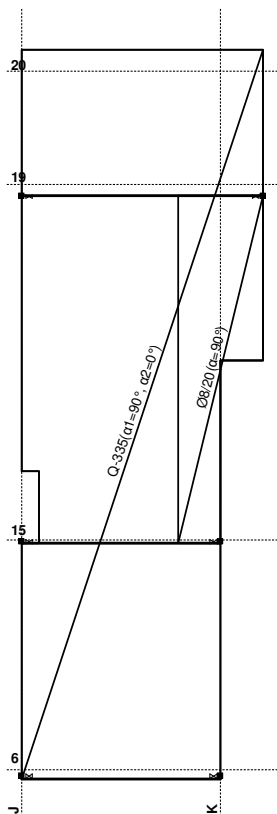
Opt. 4: 1.6xl+1.8xII



Uticaji u gredi: max M3= 85.70 / m...

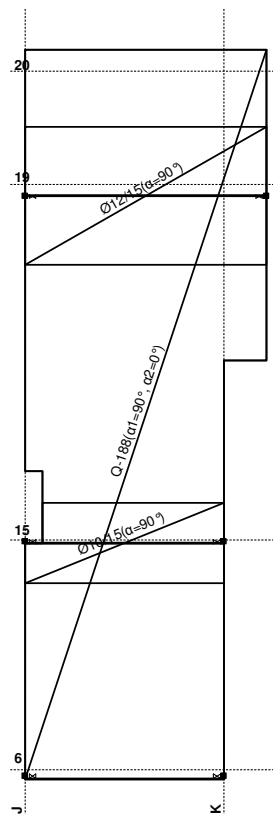
Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

Aa - d.zona [cm ² /m]	
0.00	
0.83	
1.66	
2.50	
3.33	
4.16	



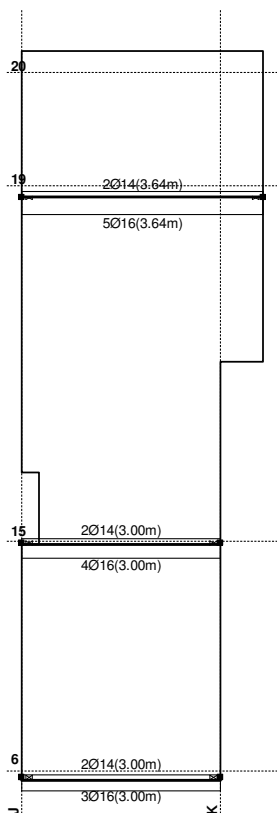
Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

Aa - g.zona [cm ² /m]	
-7.58	
-6.06	
-4.55	
-3.03	
-1.52	
0.00	



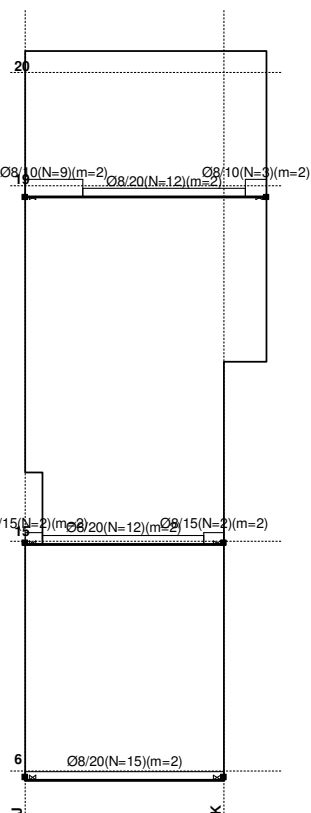
Aa - d.zona

Usvojena armatura
PBAB 87, MB 30, MA 500/600



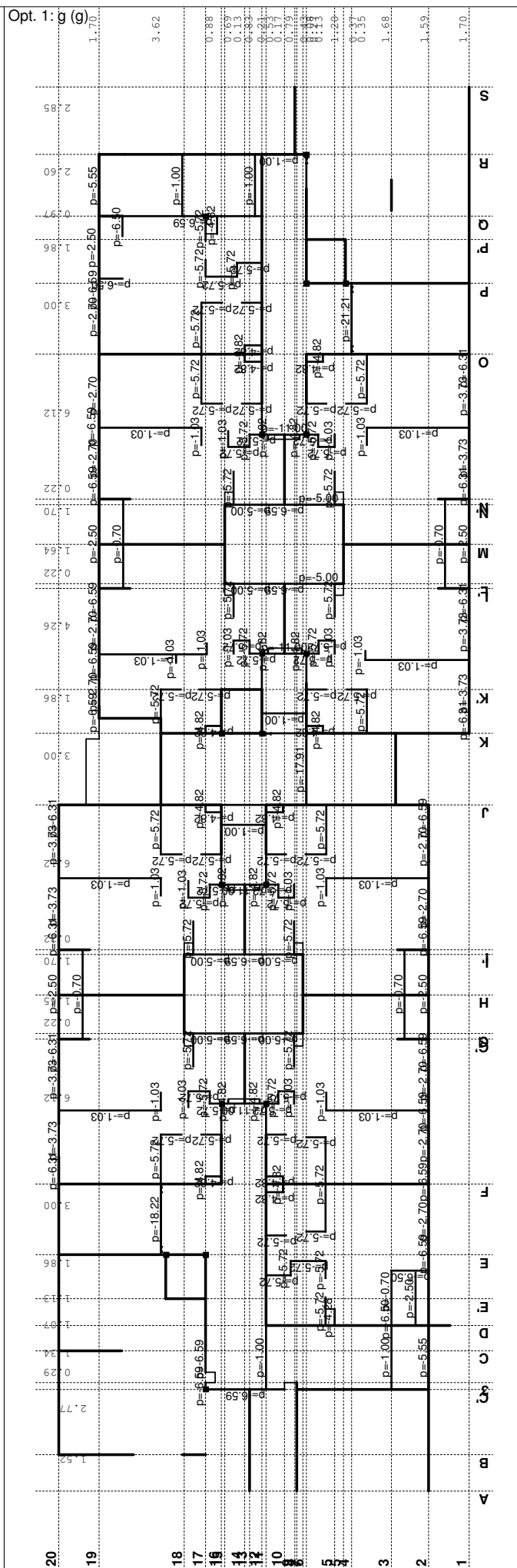
Aa - g.zona

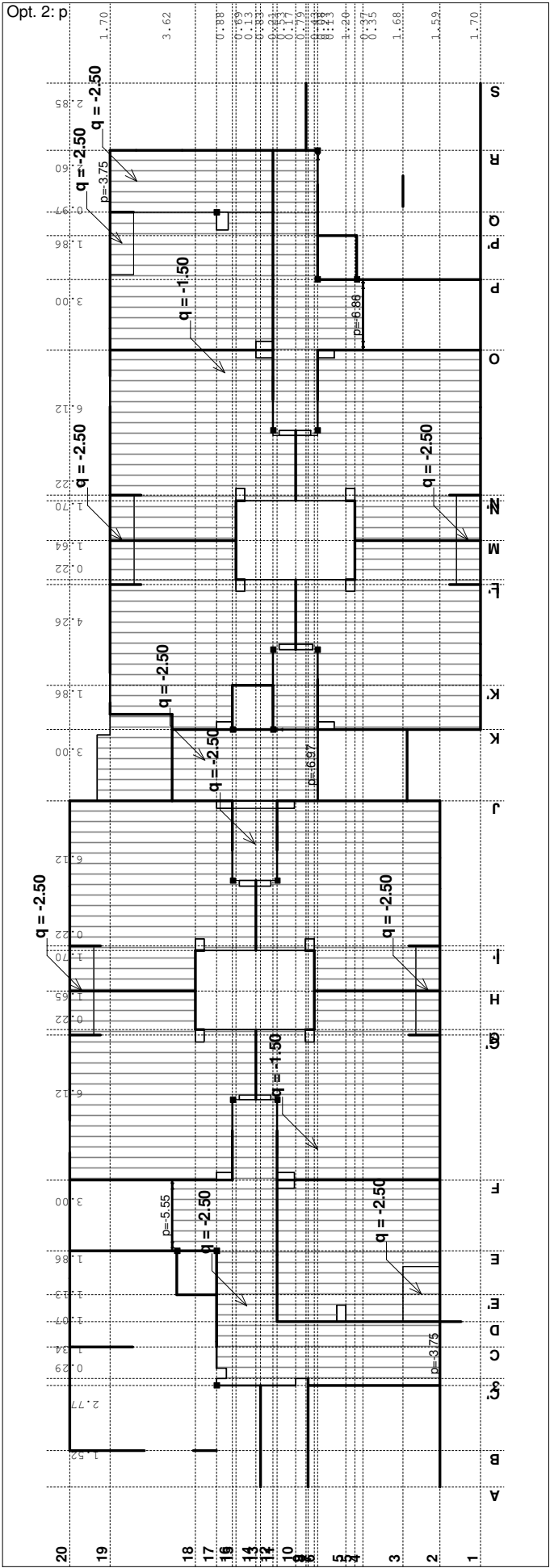
Usvojena armatura
PBAB 87, MB 30, MA 500/600



Armatura u gredama: Aa2/Aa1

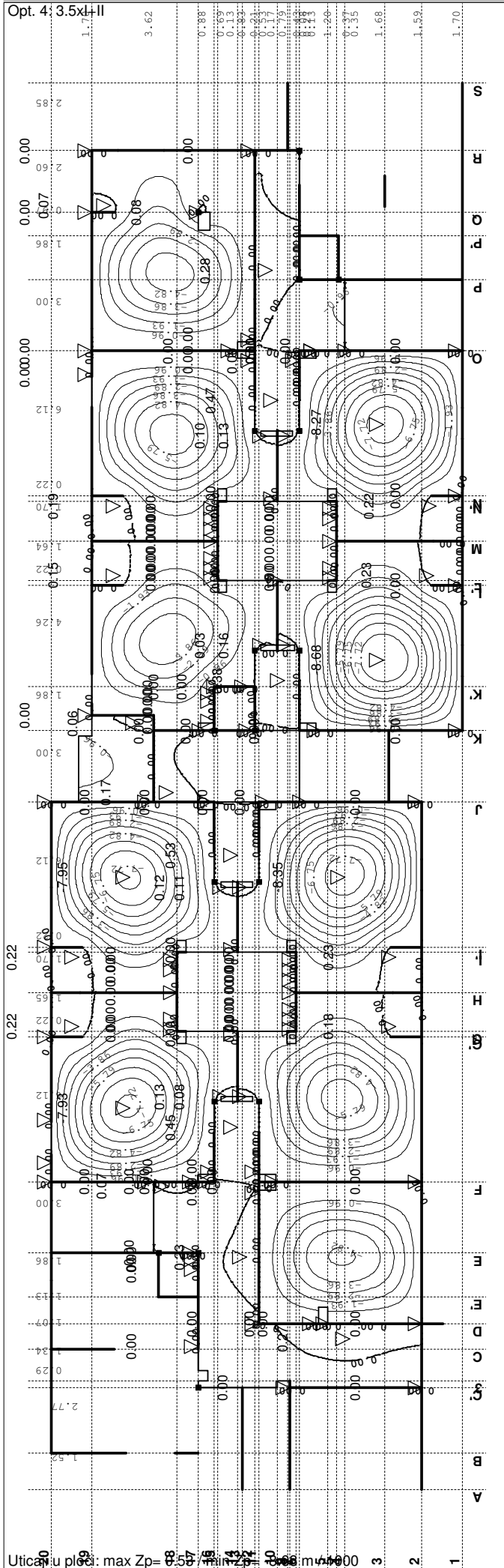
Armatura u gredama: Aa,uz

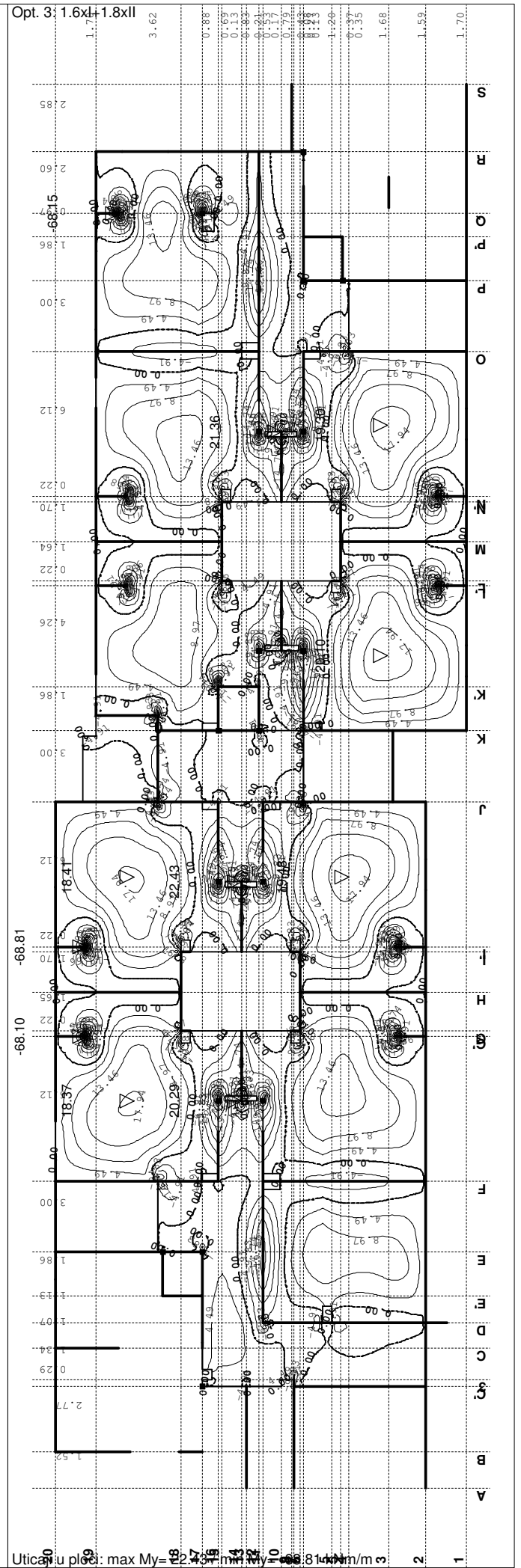
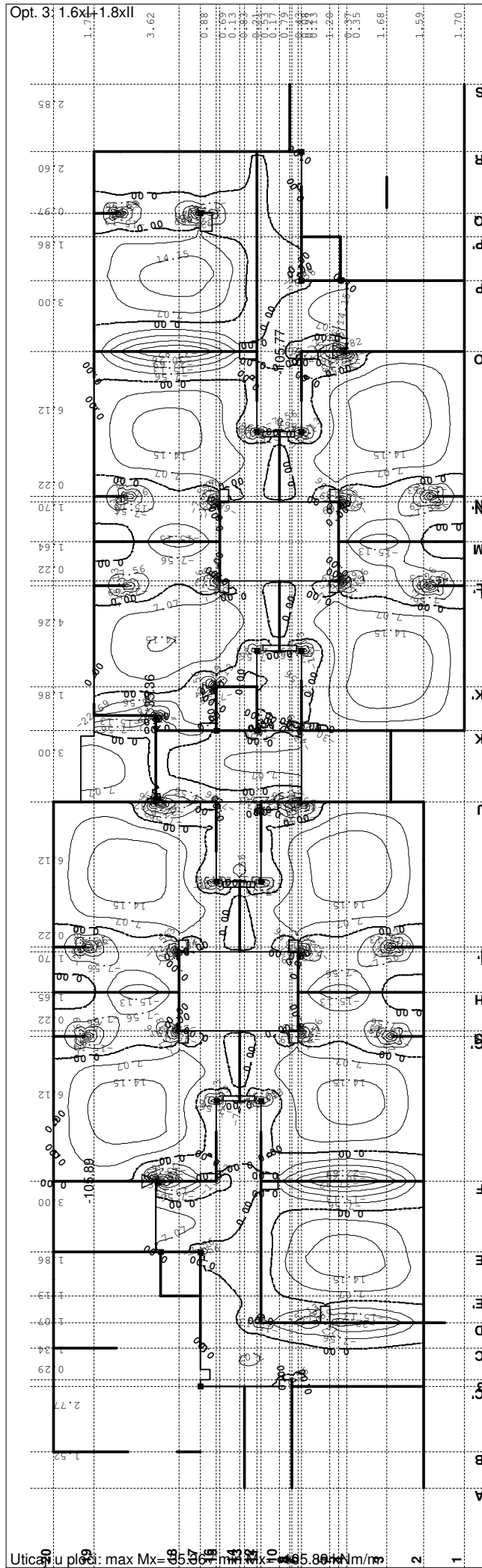




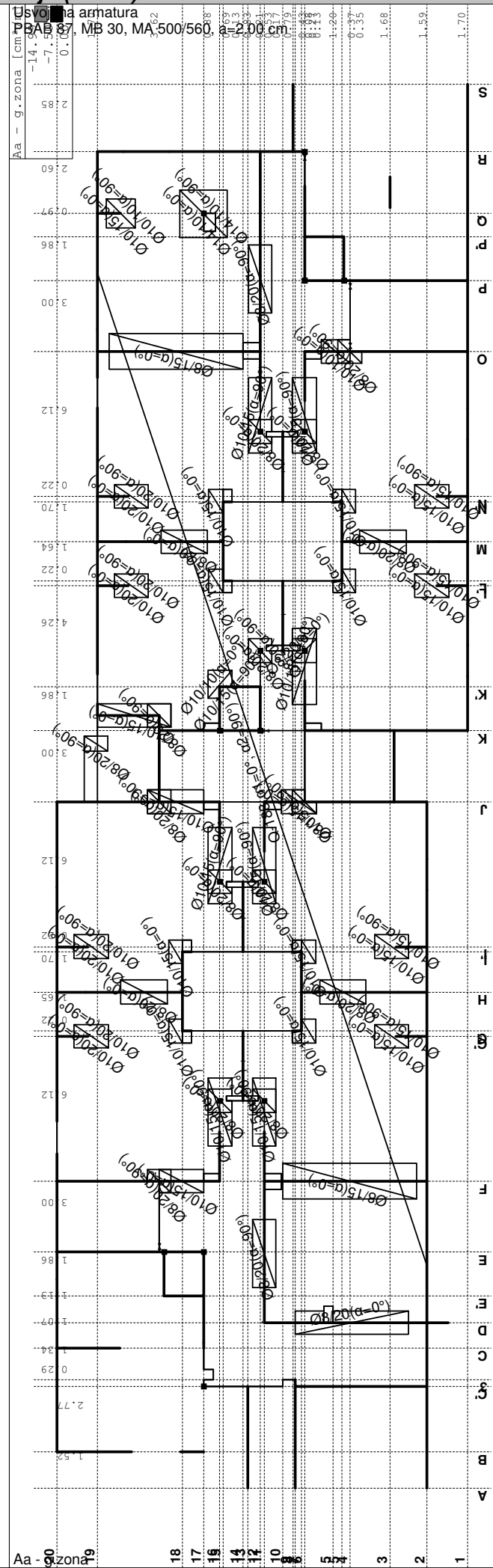
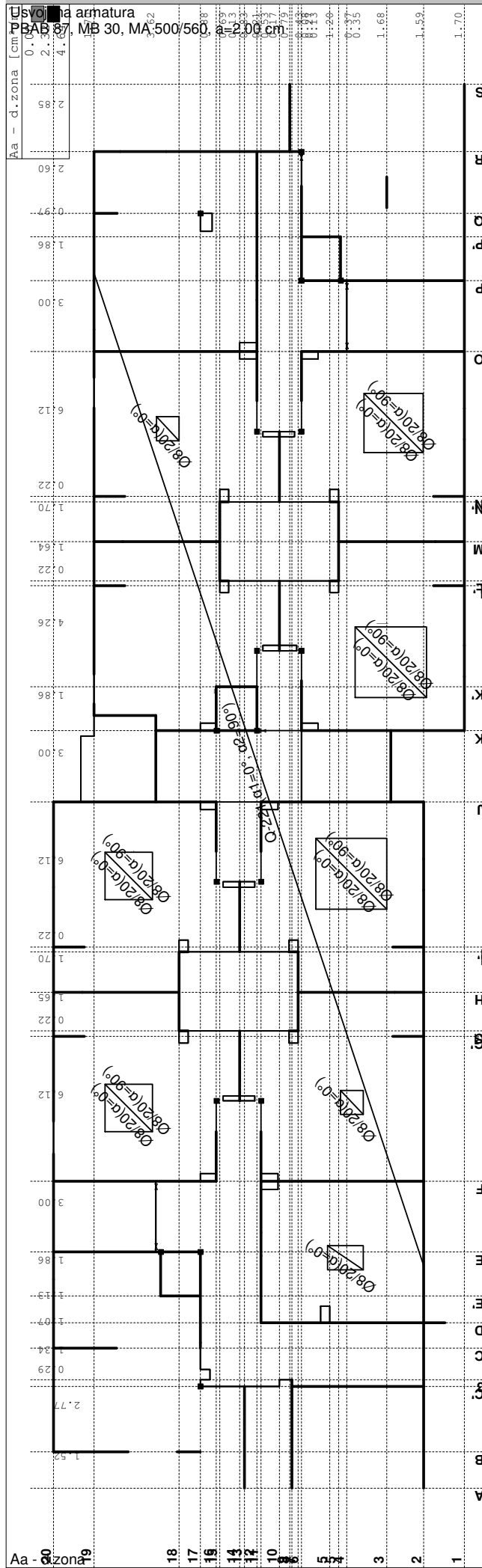
Lista slučajeva opterećenja	
LC	Naziv
1	g (g)
2	p
3	Komb.: 1.6xl+1.8xll

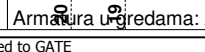
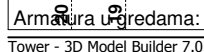
LC	Naziv
4	Komb.: 3.5xl+ll
5	Komb.: l+ll

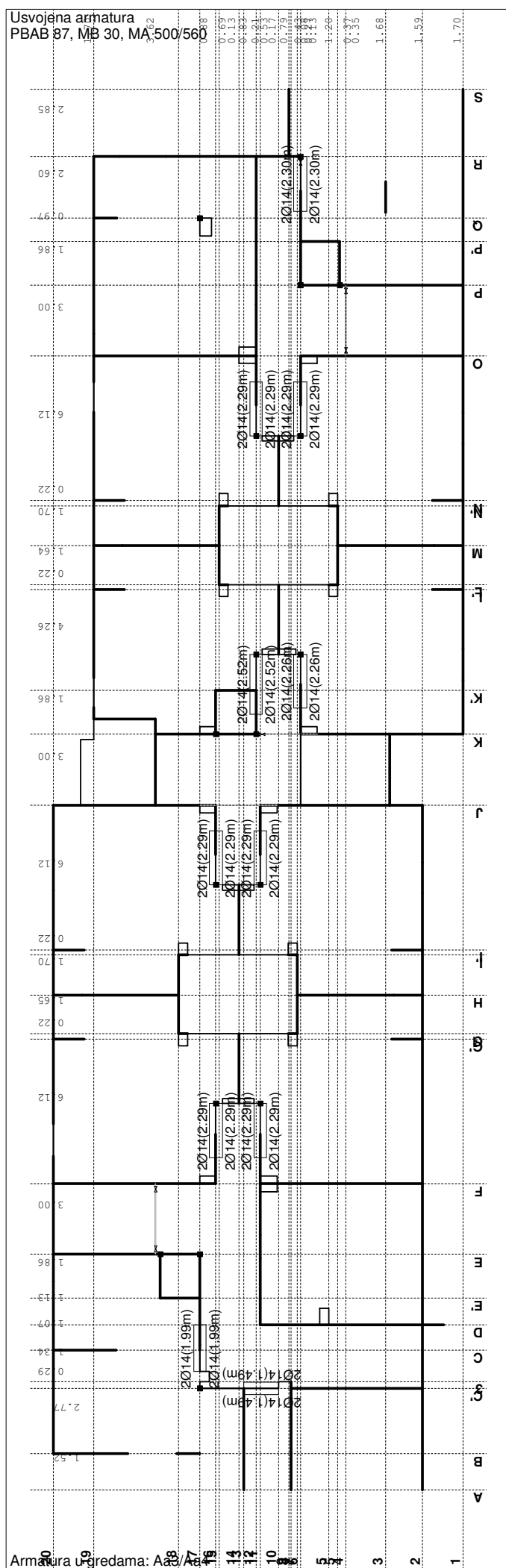




Dimenzionisanje (beton)

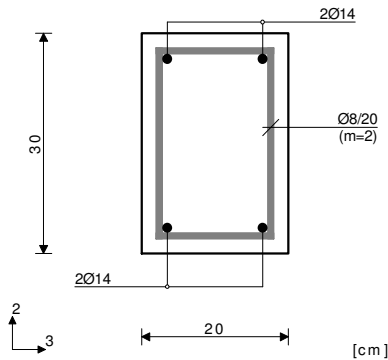






P02 (3333-4260)
PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

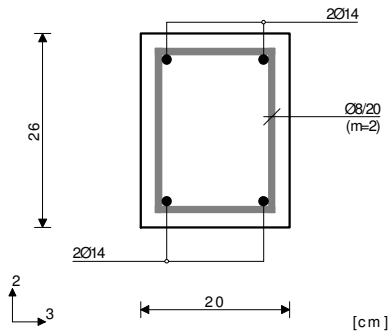
Presek 1-1 x = 1.23m



T2u = 3.60 kN
M3u = 24.79 kNm
 $\epsilon_b/\epsilon_a = -1.687/10.000 \text{ ‰}$
Aa1 = 1.94 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]
 $\tau_y = 0.07 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.03%

Parapet (5775-6750)
PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

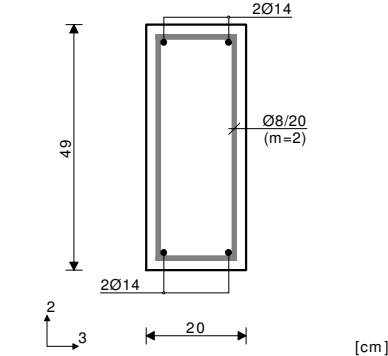
Presek 2-2 x = 1.59m



T2u = 0.12 kN
M3u = 2.88 kNm
 $\epsilon_b/\epsilon_a = -0.551/10.000 \text{ ‰}$
Aa1 = 0.25 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]
Procenat armiranja: 1.18%

P01 (897-1324)
PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

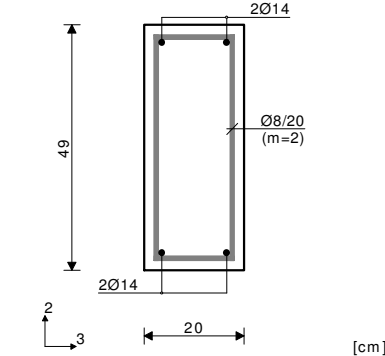
Presek 3-3 x = 0.00m



T2u = -22.43 kN
M3u = -13.73 kNm

$\epsilon_b/\epsilon_a = -0.648/10.000 \text{ ‰}$
Aa1 = 0.00 cm²
Aa2 = 0.64 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]
 $\tau_y = 0.28 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 0.63%

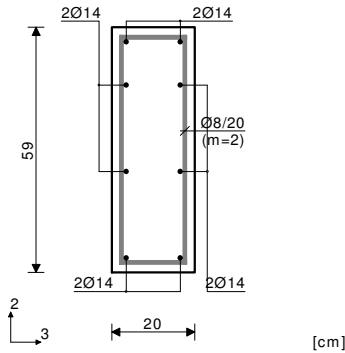
Presek 4-4 x = 1.17m



T2u = 0.40 kN
M3u = 4.66 kNm
 $\epsilon_b/\epsilon_a = -0.361/10.000 \text{ ‰}$
Aa1 = 0.21 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]
Procenat armiranja: 0.63%

N01 (612-897)
PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 5-5 $x = 0.46\text{m}$

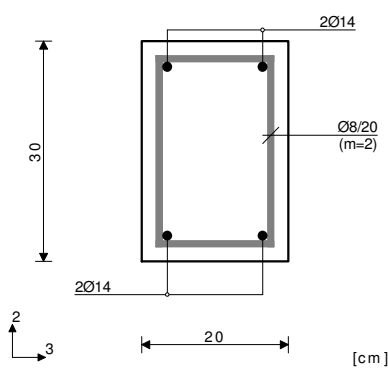


$T2u = -0.28 \text{ kN}$
 $M3u = 3.02 \text{ kNm}$
 $\epsilon_b/\epsilon_a = -0.237/10.000 \text{ ‰}$
 $Aa1 = 0.11 \text{ cm}^2$
 $Aa2 = 0.00 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/\text{m}$ (m=2)
[Usvojeno $Aa,uz = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]
Procenat armiranja: 1.04%

P04 (9000-7708)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 6-6 $x = 1.22\text{m}$

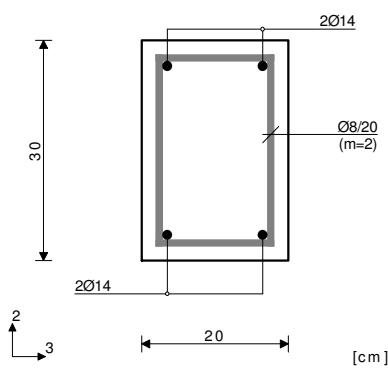


$T2u = -4.22 \text{ kN}$
 $M1u = -0.19 \text{ kNm}$
 $M3u = 21.09 \text{ kNm}$
 $\epsilon_b/\epsilon_a = -1.509/10.000 \text{ ‰}$
 $Aa1 = 1.64 \text{ cm}^2$
 $Aa2 = 0.00 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/\text{m}$ (m=2)
[Usvojeno $Aa,uz = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]
 $\tau_y = 0.21 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.12 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.03%

P03 (8105-9591)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 7-7 $x = 1.63\text{m}$

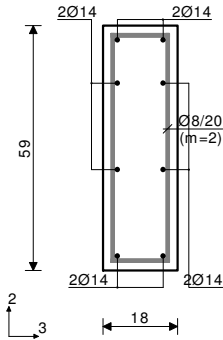


$T2u = -0.15 \text{ kN}$
 $M1u = 0.15 \text{ kNm}$
 $M3u = 2.75 \text{ kNm}$
 $\epsilon_b/\epsilon_a = -0.460/10.000 \text{ ‰}$
 $Aa1 = 0.21 \text{ cm}^2$
 $Aa2 = 0.00 \text{ cm}^2$
 $Aa3 = 0.00 \text{ cm}^2$
 $Aa4 = 0.00 \text{ cm}^2$
 $Aa,uz = 0.00 \text{ cm}^2/\text{m}$ (m=2)
[Usvojeno $Aa,uz = \varnothing 8/20(m=2) = 2.51 \text{ cm}^2/\text{m}$]
 $\tau_y = 0.10 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.09 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.03%

Z16b (7784-8763)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 8-8 x = 0.78m



[cm]

T2u = 0.93 kN
M1u = 0.66 kNm
M3u = 2.50 kNm

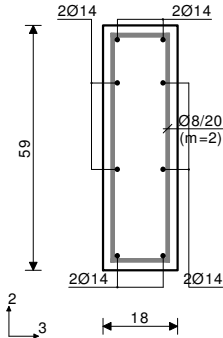
$\epsilon_b/\epsilon_a = -0.227/10.000 \text{ ‰}$
Aa1 = 0.10 + 0.00' = 0.10 cm²
Aa2 = 0.00 + 0.00' = 0.00 cm²
Aa3 = 0.00 + 0.05' = 0.05 cm²
Aa4 = 0.00 + 0.05' = 0.05 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.30 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.29 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.16%
*) - dodatna podužna armatura za prijem torzije.

Z11b (7061-7959)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 9-9 x = 0.78m



[cm]

T2u = 1.12 kN
M1u = -0.59 kNm
M3u = 2.67 kNm

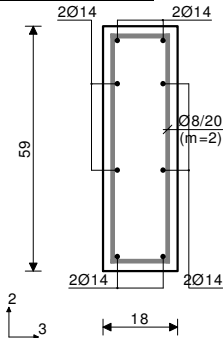
$\epsilon_b/\epsilon_a = -0.235/10.000 \text{ ‰}$
Aa1 = 0.10 + 0.00' = 0.10 cm²
Aa2 = 0.00 + 0.00' = 0.00 cm²
Aa3 = 0.00 + 0.04' = 0.04 cm²
Aa4 = 0.00 + 0.04' = 0.04 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.27 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.26 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.16%
*) - dodatna podužna armatura za prijem torzije.

Z11a (3223-3934)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 10-10 x = 1.42m



[cm]

T2u = -2.74 kN
M1u = 1.08 kNm
M3u = 1.77 kNm

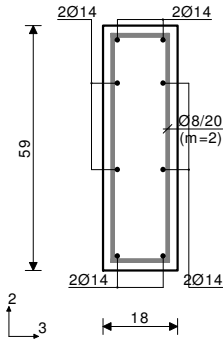
$\epsilon_b/\epsilon_a = -0.190/10.000 \text{ ‰}$
Aa1 = 0.07 + 0.02' = 0.09 cm²
Aa2 = 0.00 + 0.02' = 0.02 cm²
Aa3 = 0.00 + 0.08' = 0.08 cm²
Aa4 = 0.00 + 0.08' = 0.08 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.50 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.47 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.16%
*) - dodatna podužna armatura za prijem torzije.

Z16a (3811-4517)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 11-11 x = 1.42m



[cm]

T2u = -4.06 kN
M1u = -1.25 kNm
M3u = 2.47 kNm

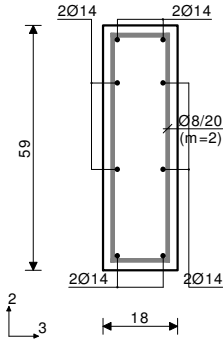
$\epsilon_b/\epsilon_a = -0.226/10.000 \text{ ‰}$
Aa1 = 0.09 + 0.03' = 0.12 cm²
Aa2 = 0.00 + 0.03' = 0.03 cm²
Aa3 = 0.00 + 0.09' = 0.09 cm²
Aa4 = 0.00 + 0.09' = 0.09 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.59 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.54 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.16%
*) - dodatna podužna armatura za prijem torzije.

Z17 (1498-2016)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 12-12 x = 0.92m



[cm]

T2u = -17.39 kN
M3u = -10.50 kNm

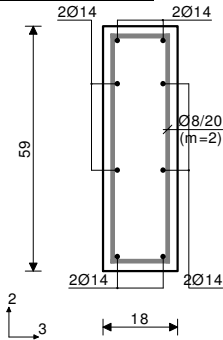
$\epsilon_b/\epsilon_a = -0.484/10.000 \text{ ‰}$
Aa1 = 0.00 cm²
Aa2 = 0.40 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.20 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.16%

Z12 (14634-15317)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 13-13 x = 0.82m



[cm]

T2u = 1.58 kN
M1u = 0.96 kNm
M3u = 2.08 kNm

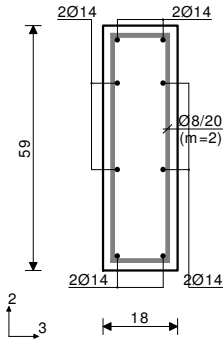
$\epsilon_b/\epsilon_a = -0.207/10.000 \text{ ‰}$
Aa1 = 0.08 + 0.02' = 0.10 cm²
Aa2 = 0.00 + 0.02' = 0.02 cm²
Aa3 = 0.00 + 0.07' = 0.07 cm²
Aa4 = 0.00 + 0.07' = 0.07 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.43 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.41 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.16%
*) - dodatna podužna armatura za prijem torzije.

Z6b (14063-14759)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 14-14 x = 0.82m



[cm]

T2u = 2.93 kN
M1u = -0.93 kNm
M3u = 2.93 kNm

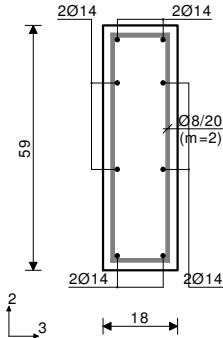
$\epsilon_b/\epsilon_a = -0.246/10.000 \text{ ‰}$
Aa1 = 0.11 + 0.00' = 0.11 cm²
Aa2 = 0.00 + 0.00' = 0.00 cm²
Aa3 = 0.00 + 0.07' = 0.07 cm²
Aa4 = 0.00 + 0.07' = 0.07 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.44 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.40 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.16%
*) - dodatna podužna armatura za prijem torzije.

P06 (11418-10263)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 15-15 x = 1.26m



[cm]

T2u = -6.68 kN
M1u = -3.11 kNm
M3u = -0.75 kNm

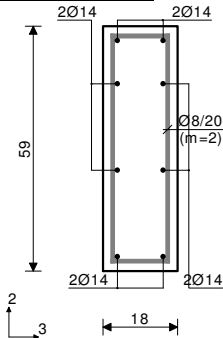
$\epsilon_b/\epsilon_a = -0.123/10.000 \text{ ‰}$
Aa1 = 0.00 + 0.07' = 0.07 cm²
Aa2 = 0.03 + 0.07' = 0.09 cm²
Aa3 = 0.00 + 0.22' = 0.22 cm²
Aa4 = 0.00 + 0.22' = 0.22 cm²
Aa,uz = 0.21 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 1.42 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 1.35 \text{ MPa} < 3\tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.16%
*) - dodatna podužna armatura za prijem torzije.

Z6a (9531-10549)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 16-16 x = 1.45m



[cm]

T2u = 1.33 kN
M1u = 0.19 kNm
M3u = 4.17 kNm

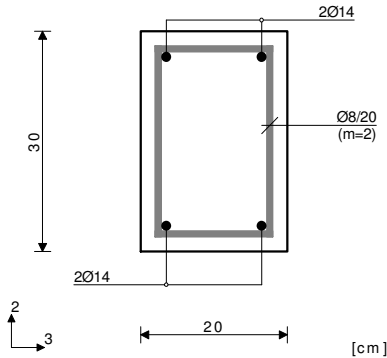
$\epsilon_b/\epsilon_a = -0.296/10.000 \text{ ‰}$
Aa1 = 0.16 cm²
Aa2 = 0.00 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

$\tau_y = 0.10 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
 $\tau_z = 0.08 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.16%

P07 (14508-15391)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 17-17 x = 1.76m

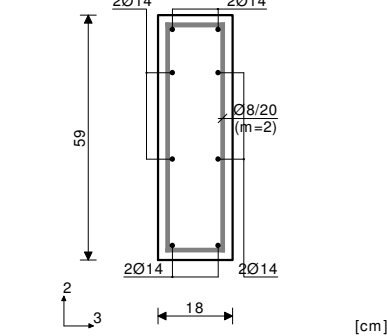


T2u = -3.12 kN
M3u = 30.92 kNm
 $\epsilon_b/\epsilon_a = -1.987/10.000 \text{ ‰}$
Aa1 = 2.44 cm²
Aa2 = 0.00 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]
 $\tau_y = 0.06 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.03%

Z6c (16689-17254)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 18-18 x = 0.85m

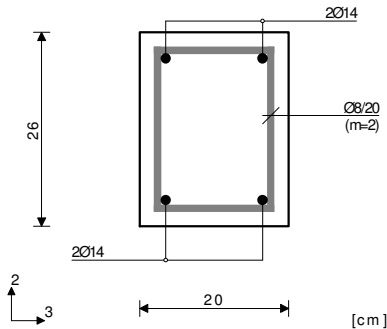


T2u = 2.80 kN
M3u = -1.56 kNm
 $\epsilon_b/\epsilon_a = -0.178/10.000 \text{ ‰}$
Aa1 = 0.00 cm²
Aa2 = 0.06 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]
 $\tau_y = 0.03 \text{ MPa} < \tau_r$, $\tau_r = 1.10 \text{ MPa}$
Procenat armiranja: 1.16%

Parapet (13017-13890)

PBAB 87
MB 30
MA 500/560
Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 19-19 x = 1.22m



T2u = 0.15 kN
M3u = 0.90 kNm
 $\epsilon_b/\epsilon_a = -0.296/10.000 \text{ ‰}$
Aa1 = 0.08 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]
Procenat armiranja: 1.18%

Parapet (16572-17259)

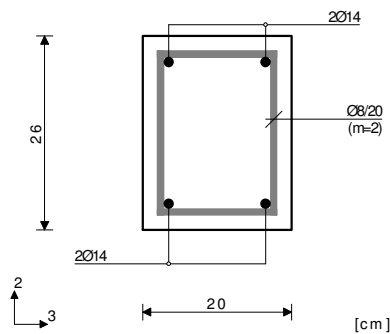
PBAB 87

MB 30

MA 500/560

Dimenzionisanje jednog slučaja
opterećenja: 1.60xI+1.80xII

Presek 20-20 x = 1.42m



T2u = 0.46 kN
M3u = 1.58 kNm

 $\epsilon_b/\epsilon_a = -0.399/10.000 \text{ ‰}$ Aa1 = 0.14 cm²Aa2 = 0.00 cm²Aa3 = 0.00 cm²Aa4 = 0.00 cm²Aa,uz = 0.00 cm²/m (m=2)[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m] $\tau_y = 0.02 \text{ MPa} < \tau_r, \tau_r = 1.10 \text{ MPa}$

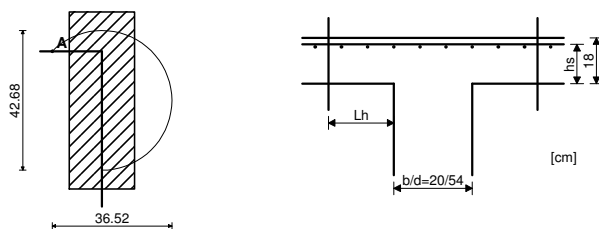
Procenat armiranja: 1.18%

Kontrola ploča na probijanje

Nivo: POS 0+ [0.00 m]

Presek 1 (190.60,-108.22,0.00)

MB 30



KONTROLA KRITIČNOG PRESEKA 1. (Lh = 0.07m od ivice stuba)
(stub zamenjujućeg kružnog preseka, ds = 0.28m)

Merodavna kombinacija: I+II

Sila u stubu

N = 129.95 kN

Faktor povećanja napona zbog ekscentričnosti

 $\beta = 1.400$

Merodavni smičući napon (tačka A)

 $\tau = 1.445 \text{ MPa}$

Debljina ploče

d,pl = 0.180 m

Statička visina ploče

hs = 0.150 m

Obim kritičnog preseka

Okp = 0.839 m

Postojeća armatura u ploči

Aa,1 = 17.279 cm²

Površina armature - pravac 1

 $\mu,1 = 1.152 \text{ ‰}$

Procenat armiranja - pravac 1

Aa,2 = 17.279 cm²

Površina armature - pravac 2

 $\mu,2 = 1.152 \text{ ‰}$

Procenat armiranja - pravac 2

 $\mu = 1.152 \text{ ‰}$

Srednja vrednost procenta armiranja

 $\alpha_a = 1.400$

Koeficijent

 $\gamma_1 = 1.953$

Koeficijent

 $\gamma_2 = 0.676$

Koeficijent

Dopušteni glavni napon zatezanja

 $\tau_a = 0.800$

Dopušteni glavni napon zatezanja

 $\tau_b = 2.200$ Maksimalna otpornost ($\gamma_2 \times \tau_b$) $\tau_{\text{max}} = 1.488 \text{ MPa}$ **Uslov: $\tau \leq \tau_{\text{max}}$ (1.45 ≤ 1.49)**

Uslov je ispunjen.

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

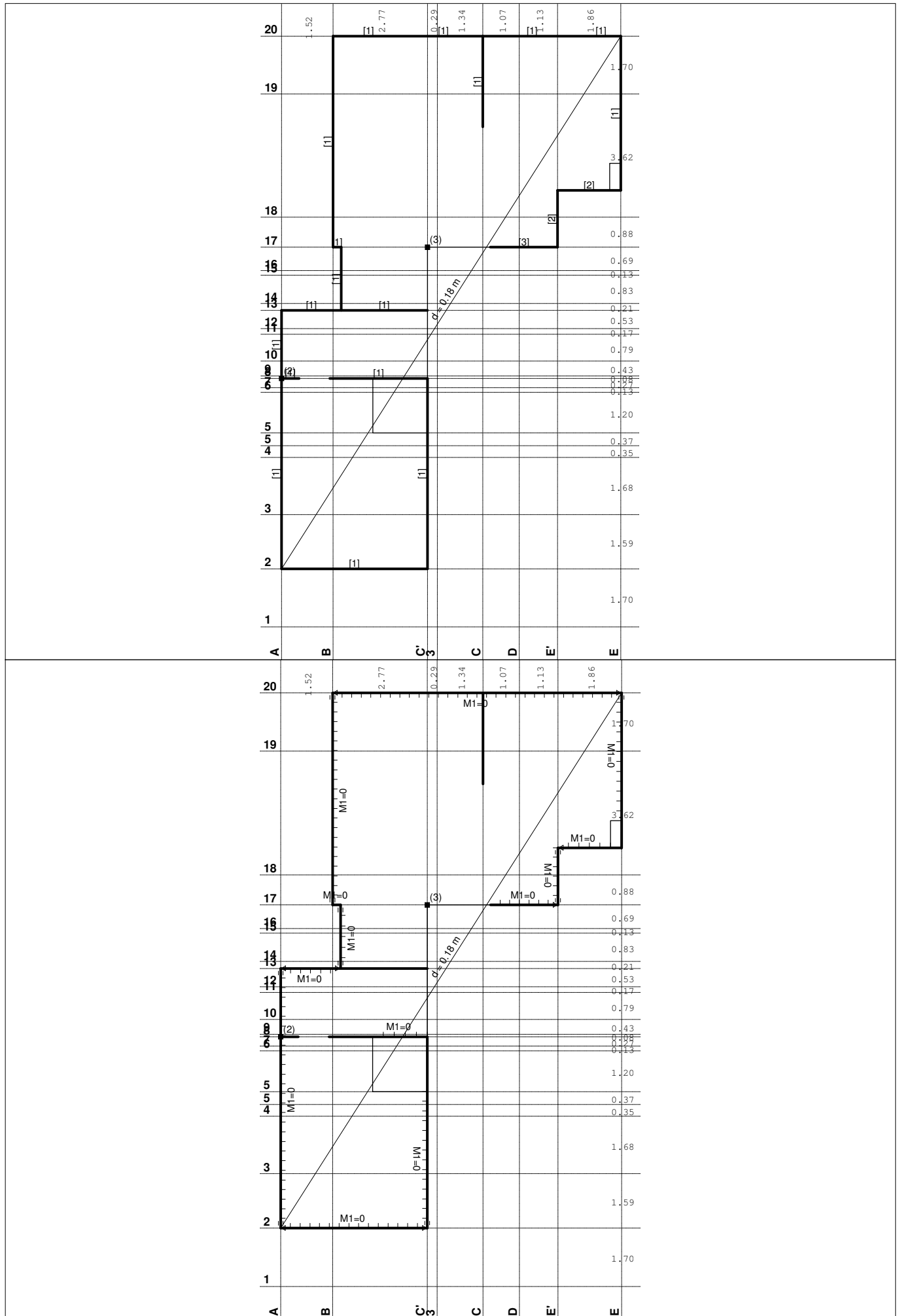
 $\tau_{\text{gr}} = 1.042 \text{ MPa}$ **Uslov: $\tau \leq \tau_{\text{gr}}$ (1.45 ≤ 1.04)****Potrebna je dodatna armatura za obezbeđenje od probijanja ploče.**

Armatura za obezbeđenje od probijanja ploče MA 500/560

Potrebna površina armature

Aak = 3.509 cm²

POS 0+ (LOKALI) - KONSTRUKCIJA IZNAD PODRUMA

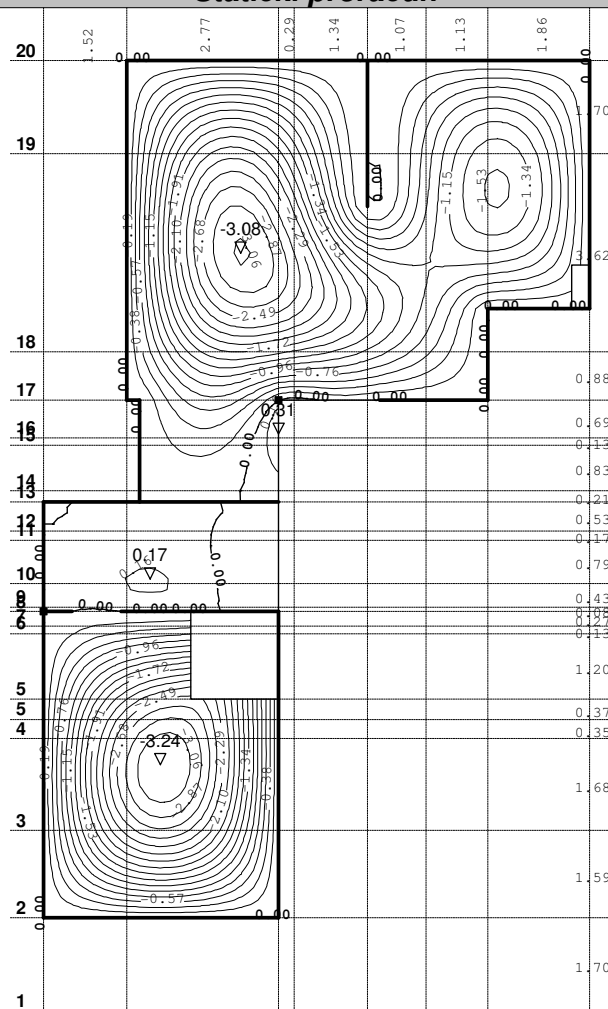


LC	Naziv
4	Komb.: 3.5xI+II
5	Komb.: I+II

Row	Column	Value
20	A	1.52
19	A	2.77
18	A	0.29
17	A	1.34
16	A	1.07
15	A	1.13
14	A	1.86
13	A	1.70
12	A	1.39
11	A	0.88
10	A	0.69
9	A	0.13
8	A	0.83
7	A	0.21
6	A	0.53
5	A	0.17
4	A	0.79
3	A	0.43
2	A	0.34
1	A	0.13
20	B	1.00
19	B	1.725
18	B	1.15
17	B	1.15
16	B	1.15
15	B	1.15
14	B	1.15
13	B	1.15
12	B	1.15
11	B	1.15
10	B	1.15
9	B	1.15
8	B	1.15
7	B	1.15
6	B	1.15
5	B	1.15
4	B	1.15
3	B	1.15
2	B	1.15
1	B	1.15
20	C	1.00
19	C	1.725
18	C	1.15
17	C	1.15
16	C	1.15
15	C	1.15
14	C	1.15
13	C	1.15
12	C	1.15
11	C	1.15
10	C	1.15
9	C	1.15
8	C	1.15
7	C	1.15
6	C	1.15
5	C	1.15
4	C	1.15
3	C	1.15
2	C	1.15
1	C	1.15
20	D	1.00
19	D	1.725
18	D	1.15
17	D	1.15
16	D	1.15
15	D	1.15
14	D	1.15
13	D	1.15
12	D	1.15
11	D	1.15
10	D	1.15
9	D	1.15
8	D	1.15
7	D	1.15
6	D	1.15
5	D	1.15
4	D	1.15
3	D	1.15
2	D	1.15
1	D	1.15
20	E	1.00
19	E	1.725
18	E	1.15
17	E	1.15
16	E	1.15
15	E	1.15
14	E	1.15
13	E	1.15
12	E	1.15
11	E	1.15
10	E	1.15
9	E	1.15
8	E	1.15
7	E	1.15
6	E	1.15
5	E	1.15
4	E	1.15
3	E	1.15
2	E	1.15
1	E	1.15

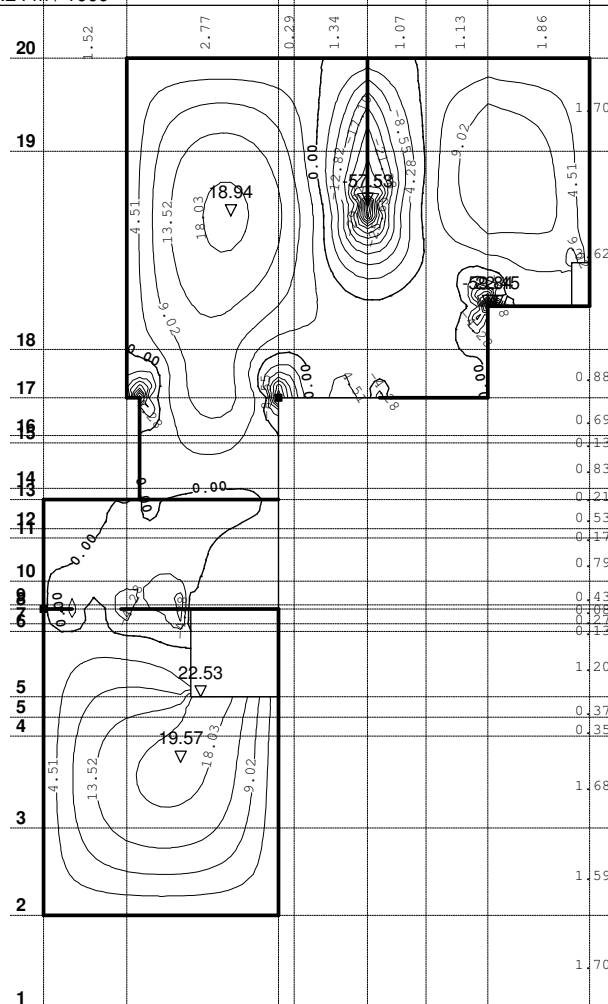
	A	B	C	D	E'	E
20	1.52	2.77	0.29	1.34	1.07	1.13
19						1.70
18						
17						0.88
16						0.69
15						0.13
14						0.83
13						0.21
12						0.53
11						0.17
10						0.79
9						0.43
8						0.58
7						0.13
6						1.20
5						0.37
4						0.35
3						1.68
2						1.59
1						1.70

Opt. 4: 3.5xl+II

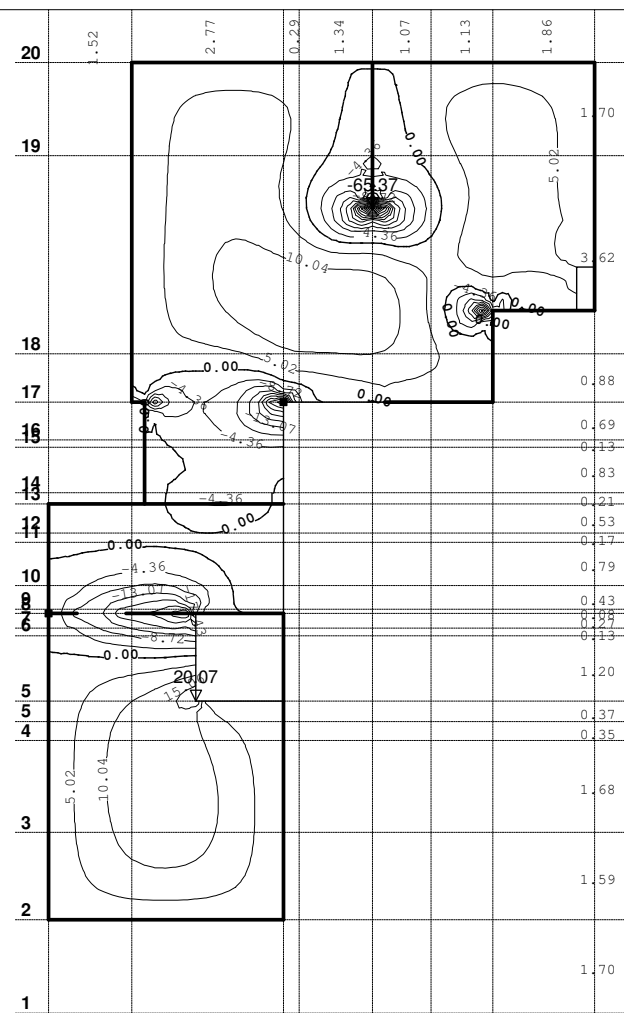


Uticaji u ploči: max $Z_p = 0.31$ / min $Z_p = -3.24$ / 1000

Opt. 3: 1.6xl+1.8xII



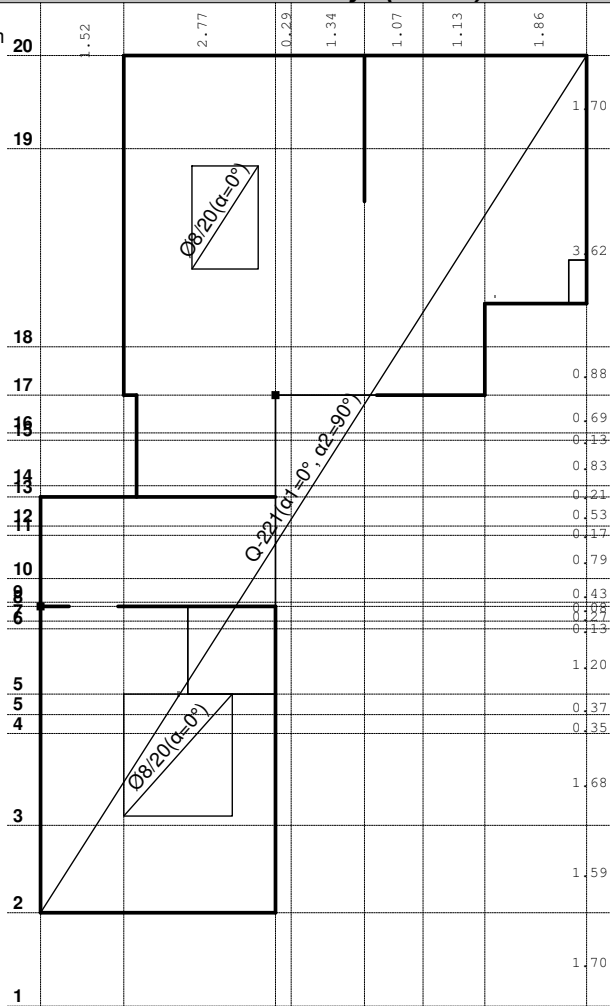
Uticaji u ploči: max $M_x = 22.53$ / min $M_x = -59.84$ kNm/m



Uticaji u ploči: max $M_y = 20.07$ / min $M_y = -65.87$ kNm/m

Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

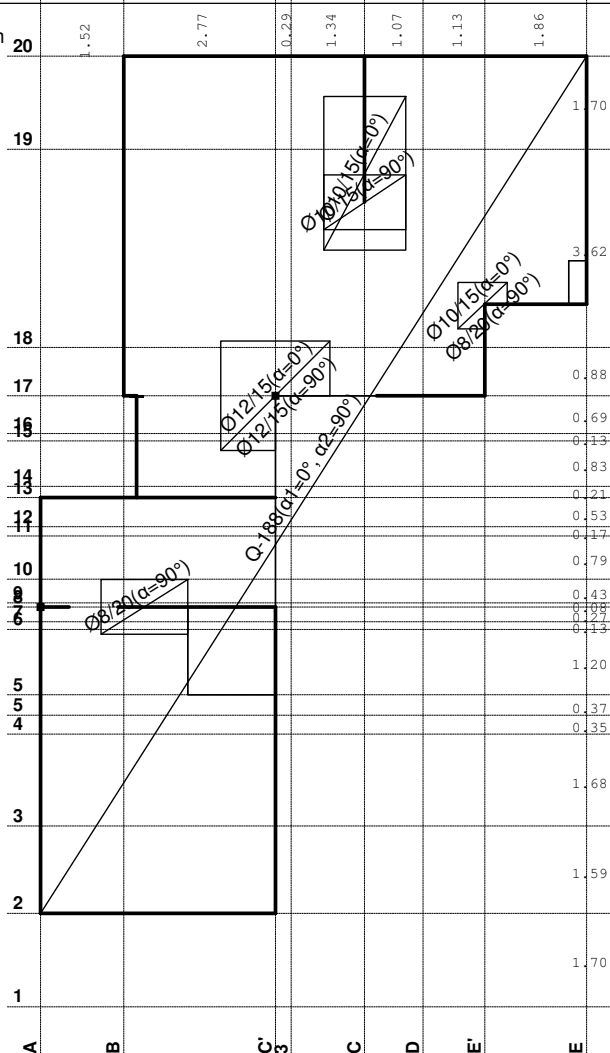
Aa - d.zona [cm ² /m]
0.00
1.46
2.92



Aa - d.zona

Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

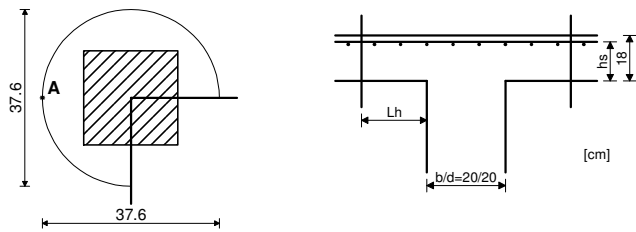
Aa - g.zona [cm ² /m]
-8.82
-4.41
0.00



Aa - g.zona

Kontrola ploča na probijanje

Nivo: POS 0+ LOKALI [0.00 m]
Presek 1 (141.05,-108.22,0.00)
MB 30



KONTROLA KRITIČNOG PRESEKA 1. (Lh = 0.07m od ivice stuba)
(stub zamenjujućeg kružnog preseka, ds = 0.23m)

Merodavna kombinacija: I+II	
Sila u stubu	N = 66.944 kN
Faktor povećanja napona zbog ekscentričnosti	β = 1.400
Merodavni smičući napon (tačka A)	τ = 0.705 MPa
Debljina ploče	d,pl = 0.180 m
Statička visina ploče	hs = 0.150 m
Obim kritičnog preseka	Okp = 0.886 m
Postojeća armatura u ploči	
Površina armature - pravac 1	Aa,1 = 9.425 cm ²
Procenat armiranja - pravac 1	μ ,1 = 0.628 %
Površina armature - pravac 2	Aa,2 = 9.425 cm ²
Procenat armiranja - pravac 2	μ ,2 = 0.628 %
Srednja vrednost procenta armiranja	μ = 0.628 %
Koeficijent	α a = 1.400
Koeficijent	γ 1 = 1.443
Koeficijent	γ 2 = 0.499
Dopušteni glavni napon zatezanja	τ a = 0.800
Dopušteni glavni napon zatezanja	τ b = 2.200
Maksimalna otpornost(γ 2 x τ b)	τ ,max = 1.099 MPa

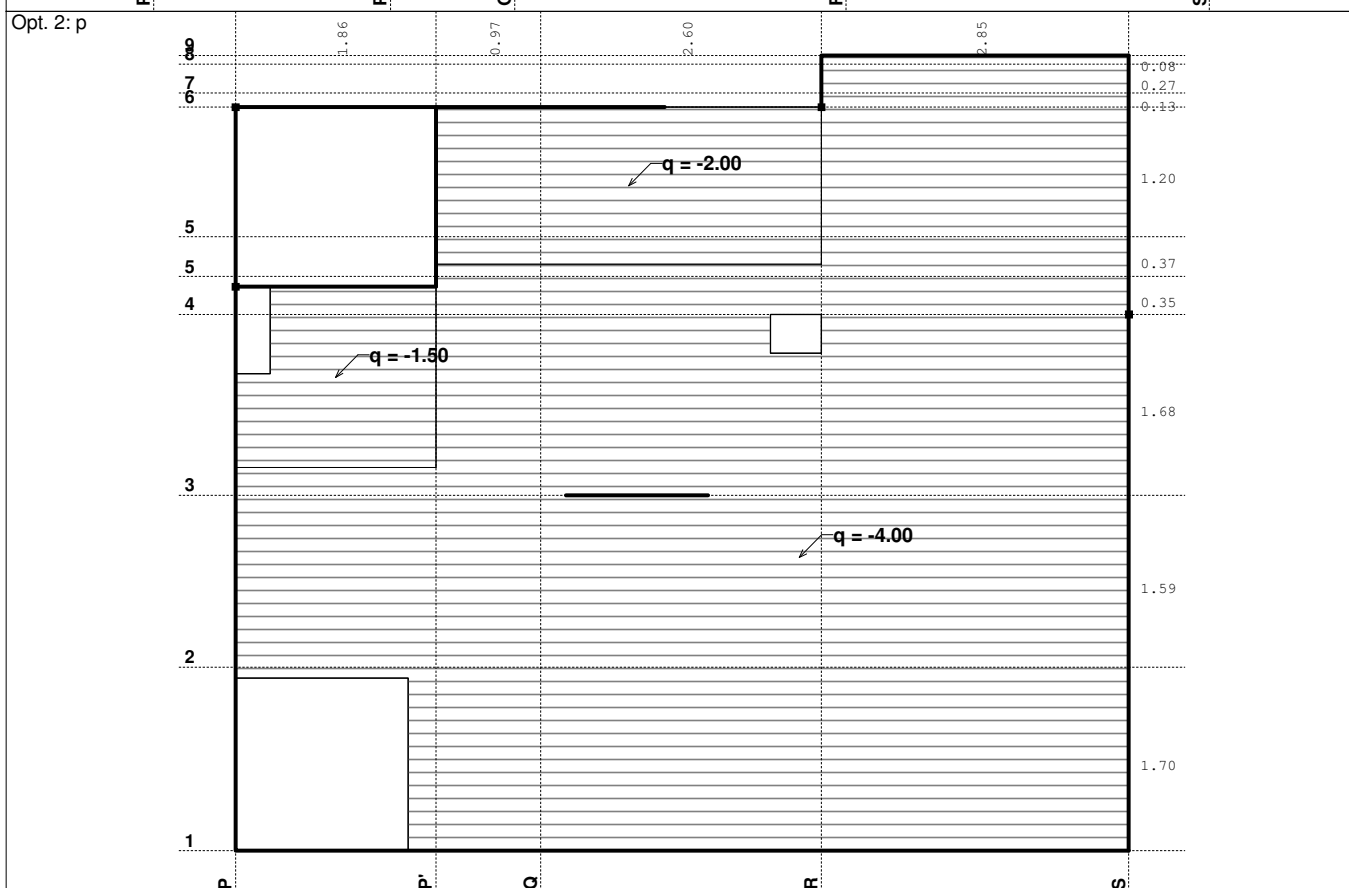
Uslov: $\tau \leq \tau_{max}$ (0.71 \leq 1.10)

Uslov je ispunjen.

Otpornost na probijanje ploče bez dodatne armature za obezbeđenje (2/3 x γ 1 x τ a)	τ ,gr = 0.769 MPa
---	------------------------

Uslov: $\tau \leq \tau_{gr}$ (0.71 \leq 0.77)

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

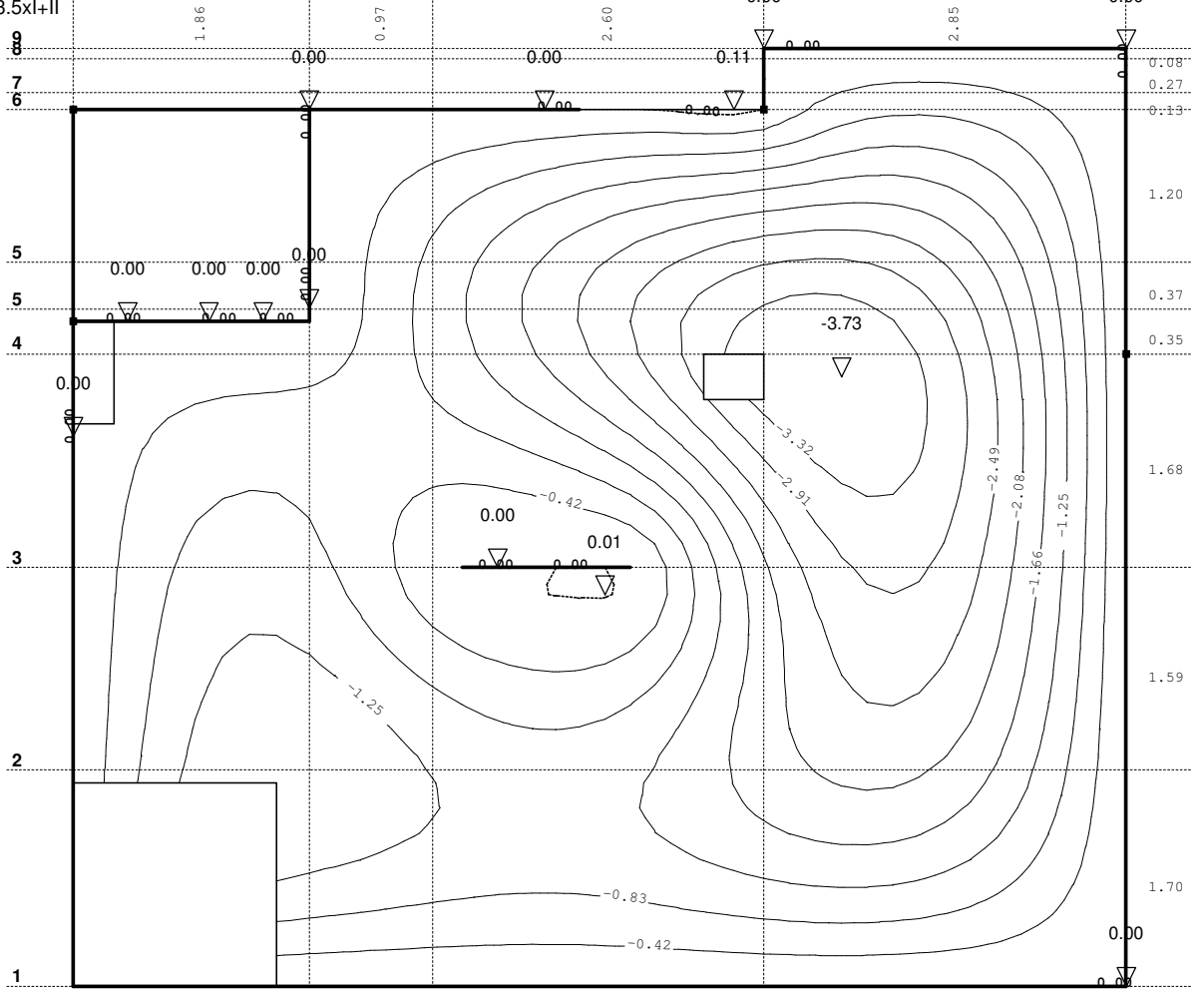
[illegible]

LC	Naziv
1	g (g)
2	p

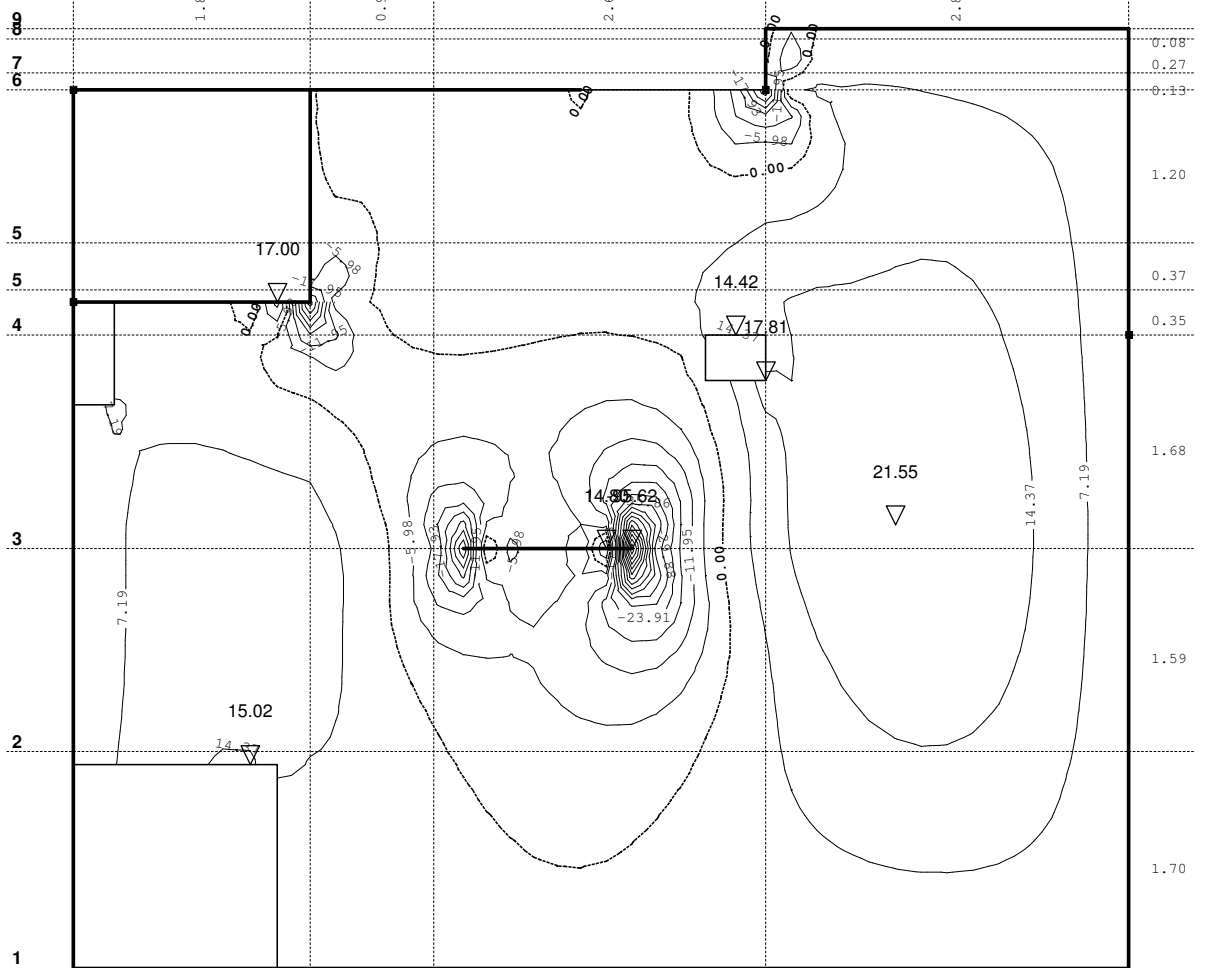
LC	Naziv
3	Komb.: 1.6xI+1.8xII
4	Komb.: 3.5xI+I

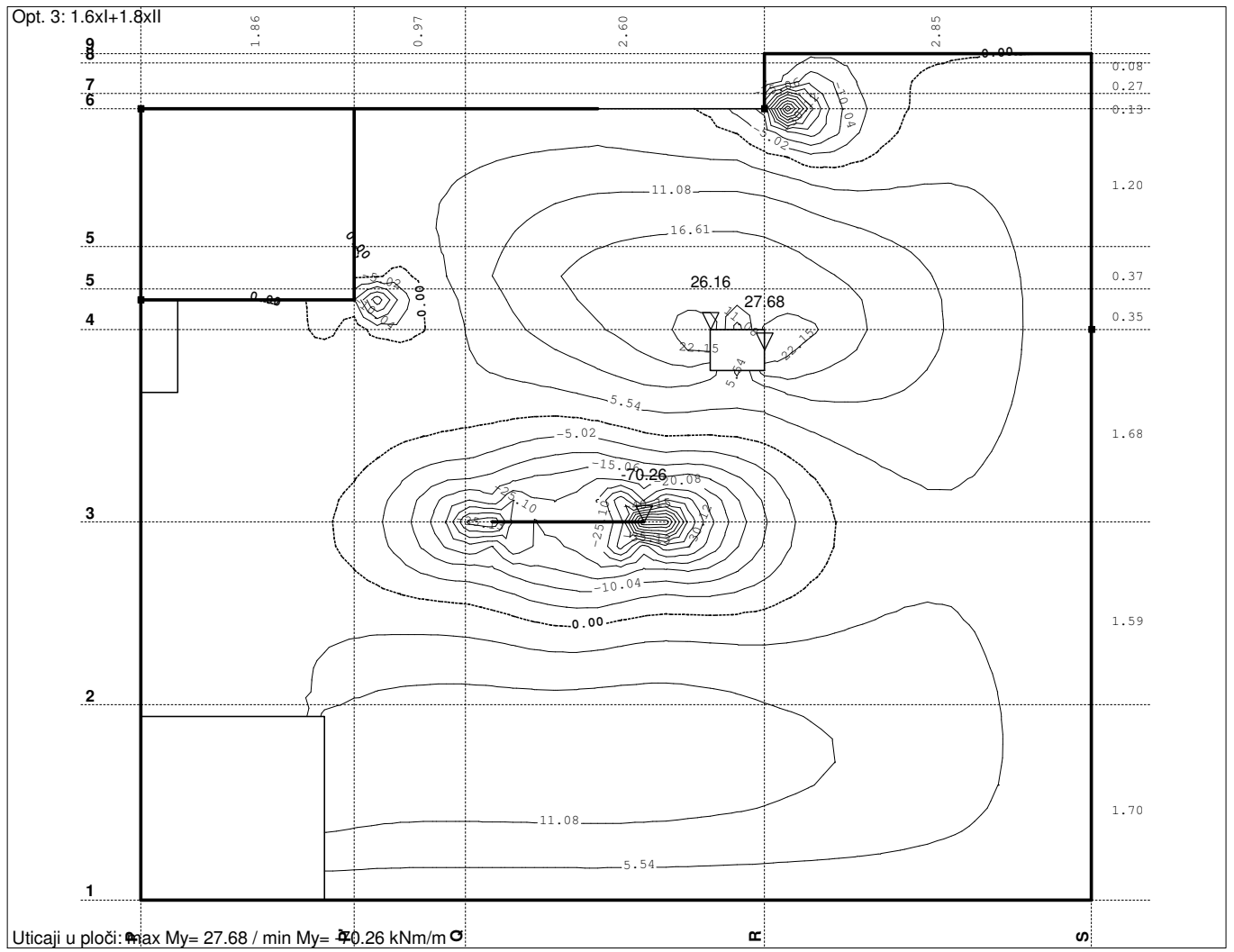
Statički proračun

Opt. 4: 3.5xl+II


 Uticaji u ploči: max $Z_p = 0.11$ / min $Z_p = -3.73$ m / 1000

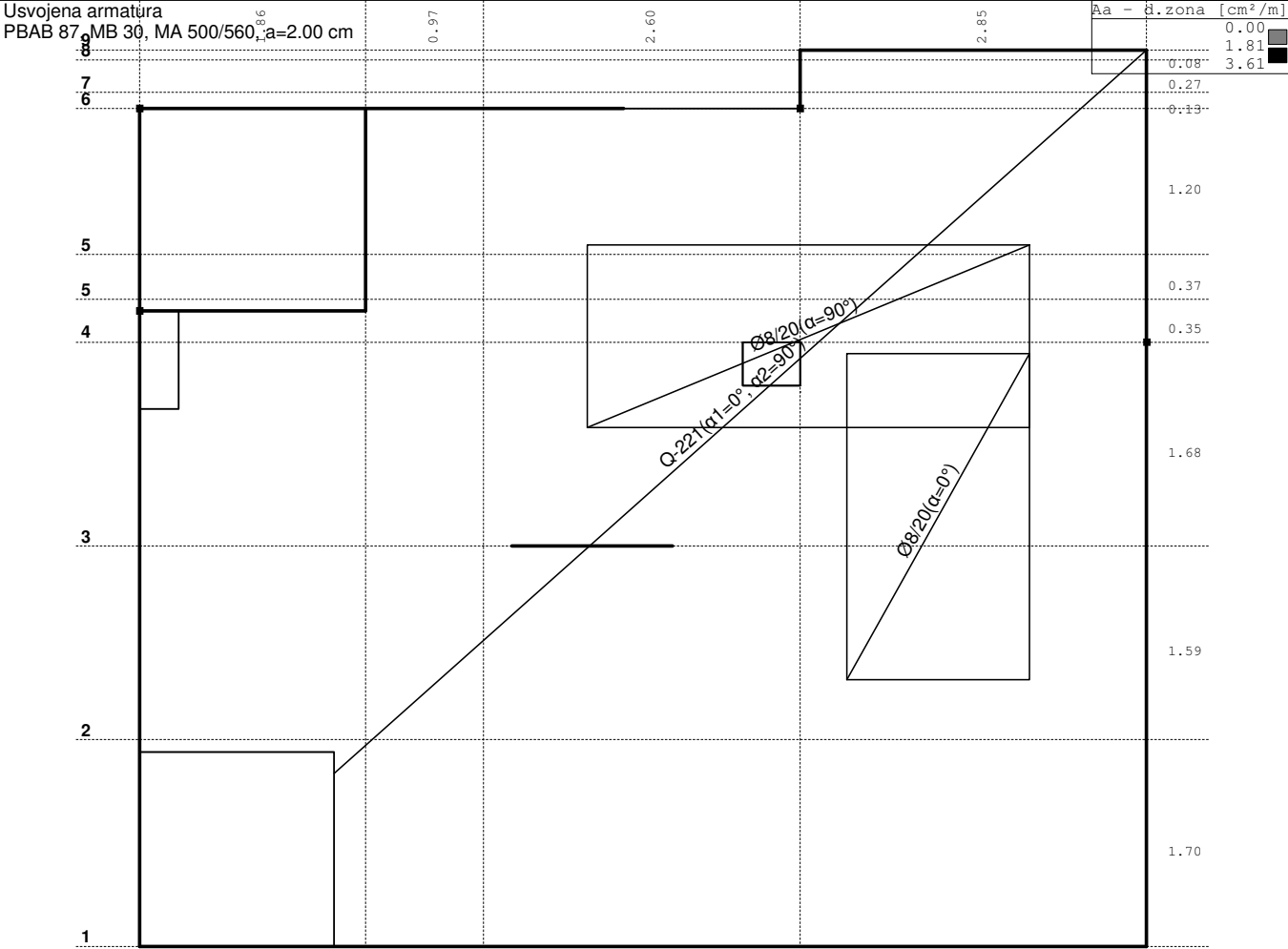
Opt. 3: 1.6xl+1.8xII


 Uticaji u ploči: max $M_x = 21.55$ / min $M_x = -23.91$ kNm/m

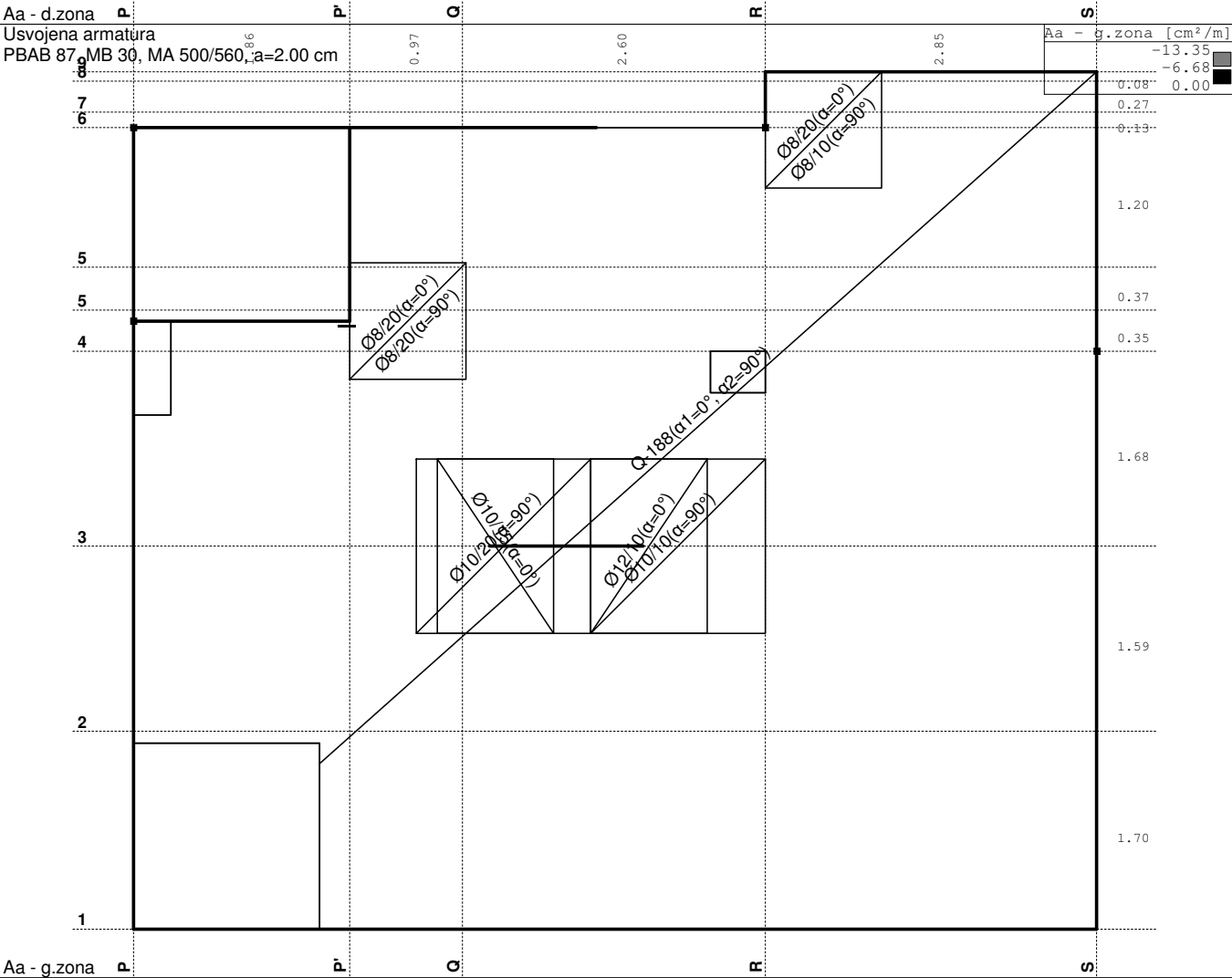


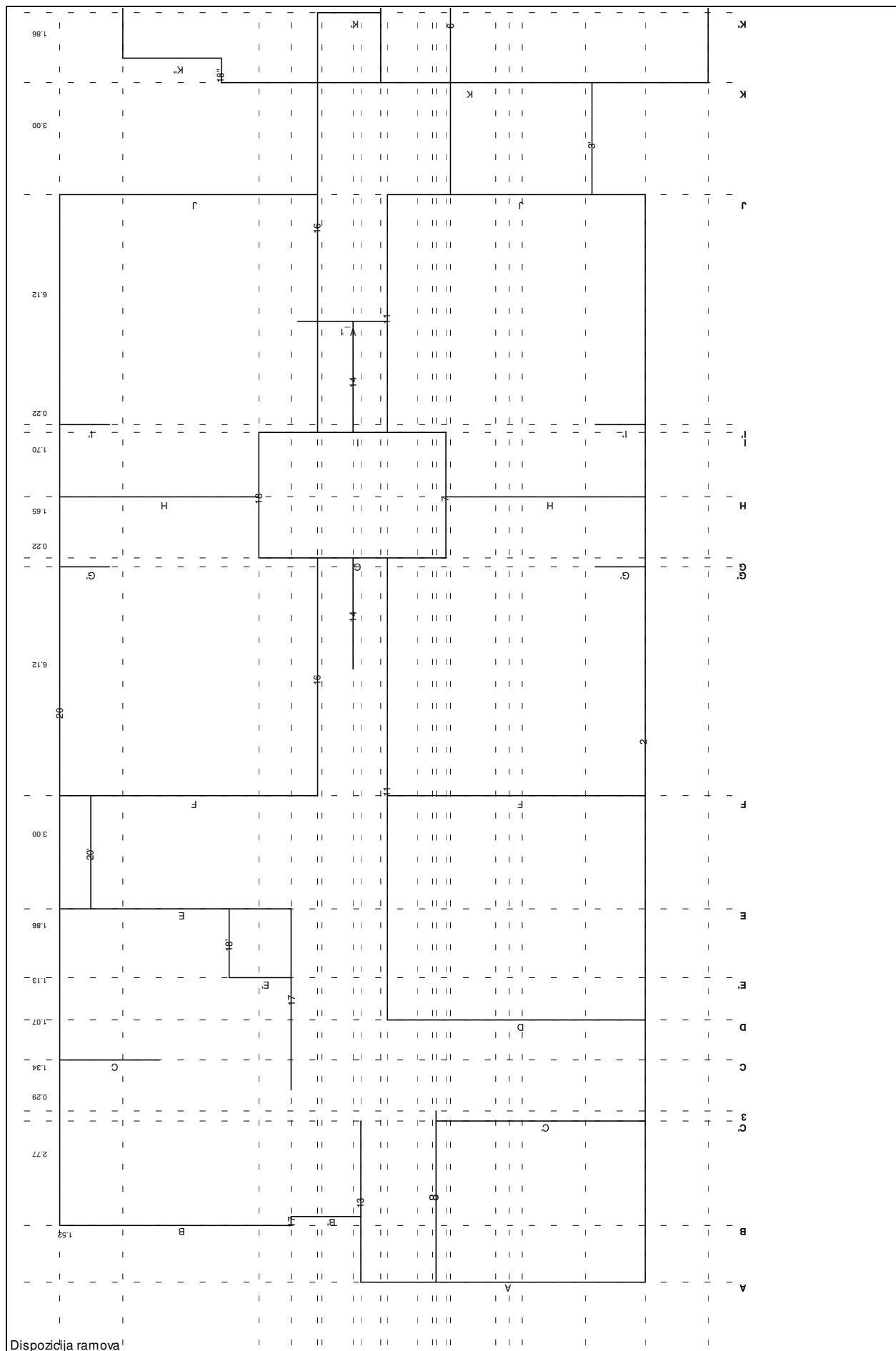
Dimenzionisanje (beton)

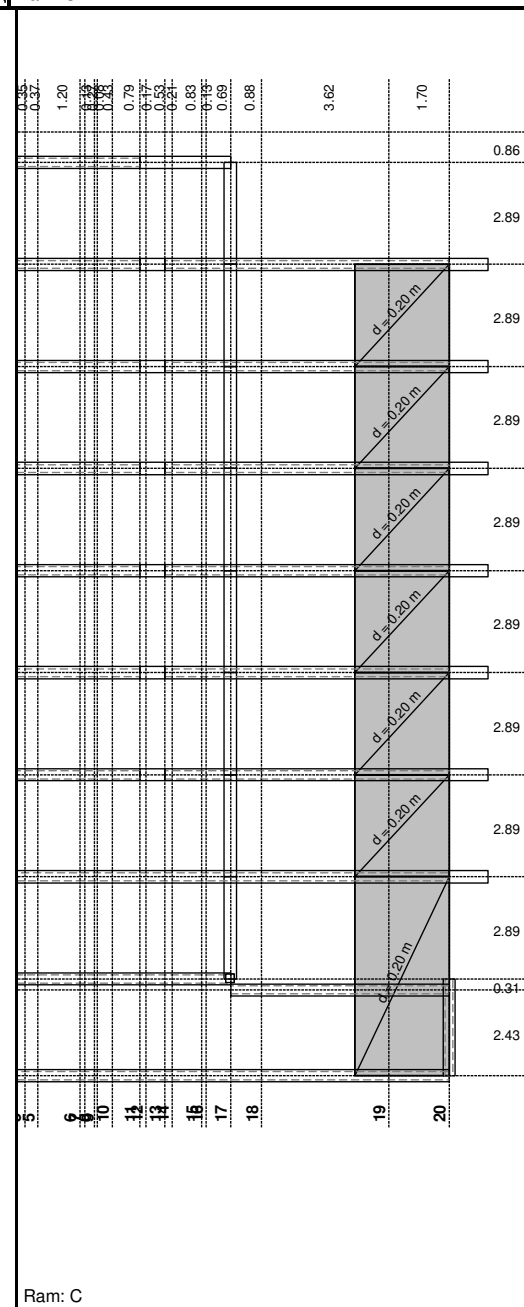
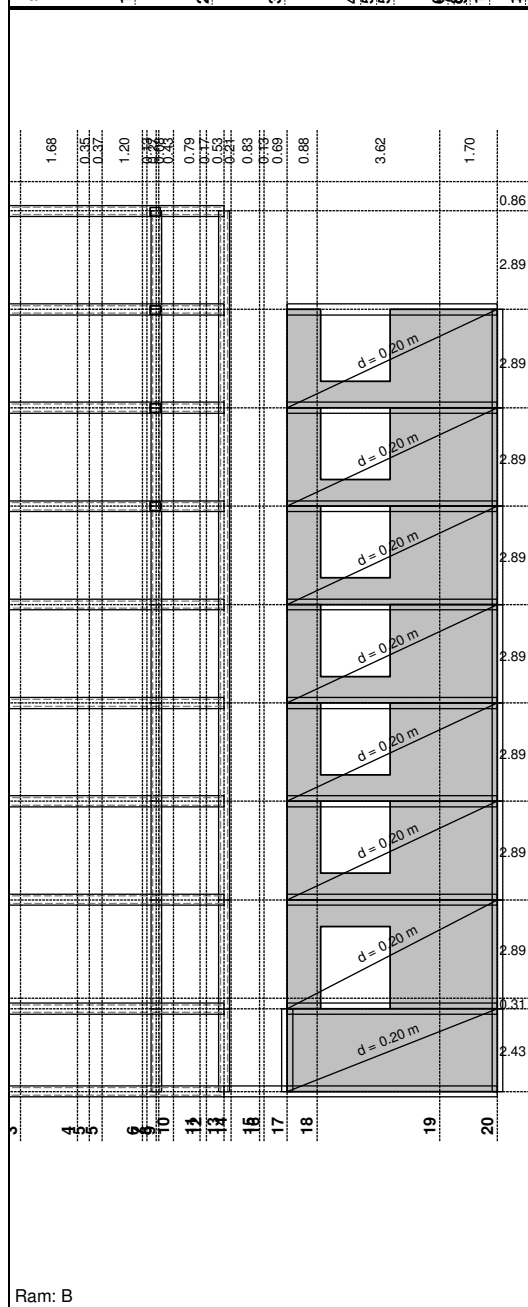
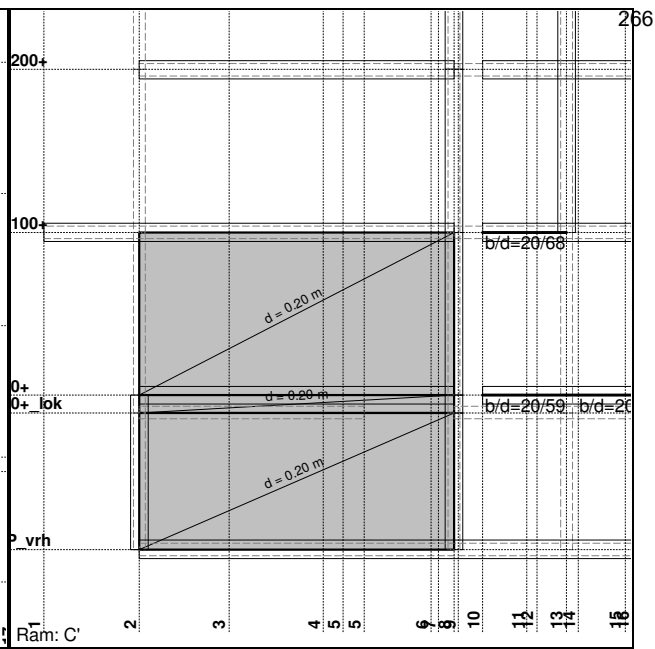
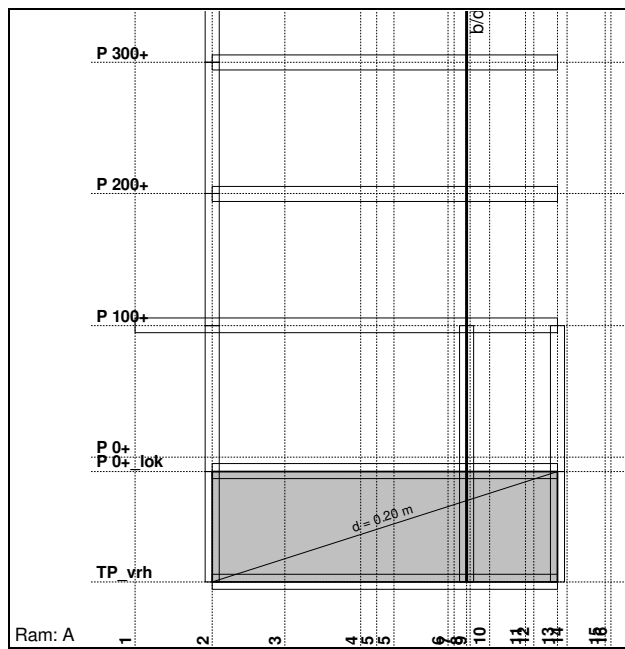
Usvojena armatura
PBAB 87 MB 30, MA 500/560, $a=2.00$ cm

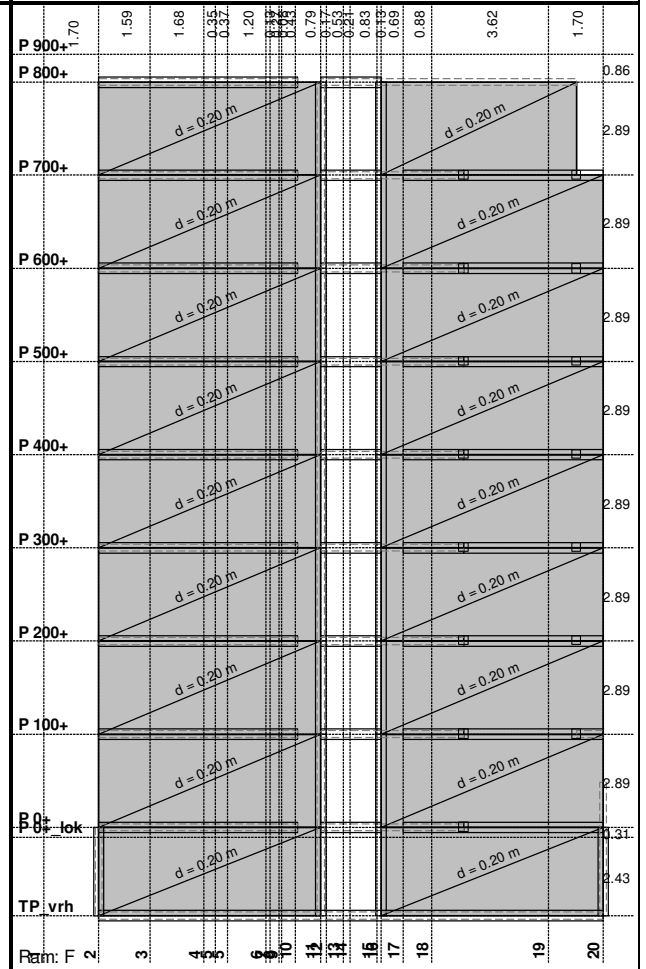
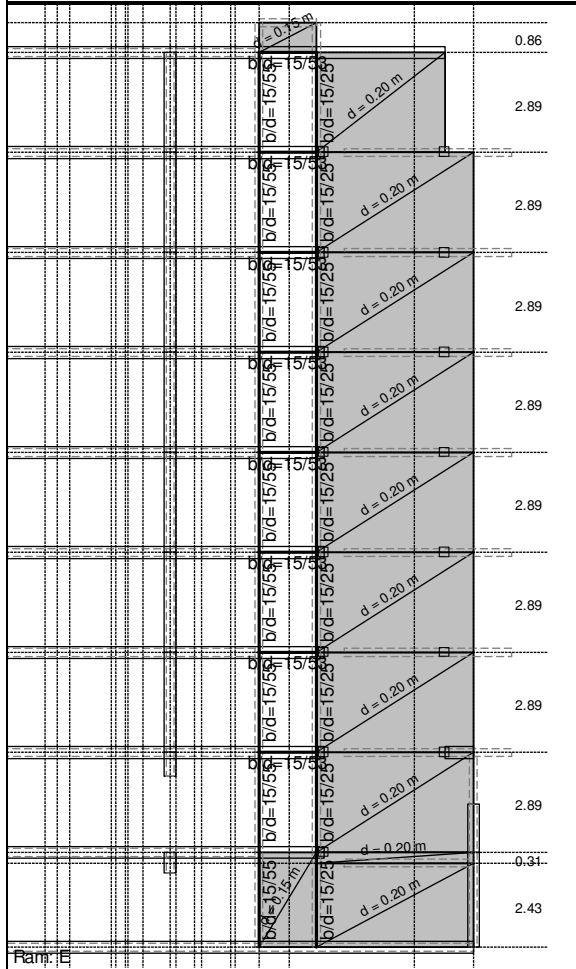
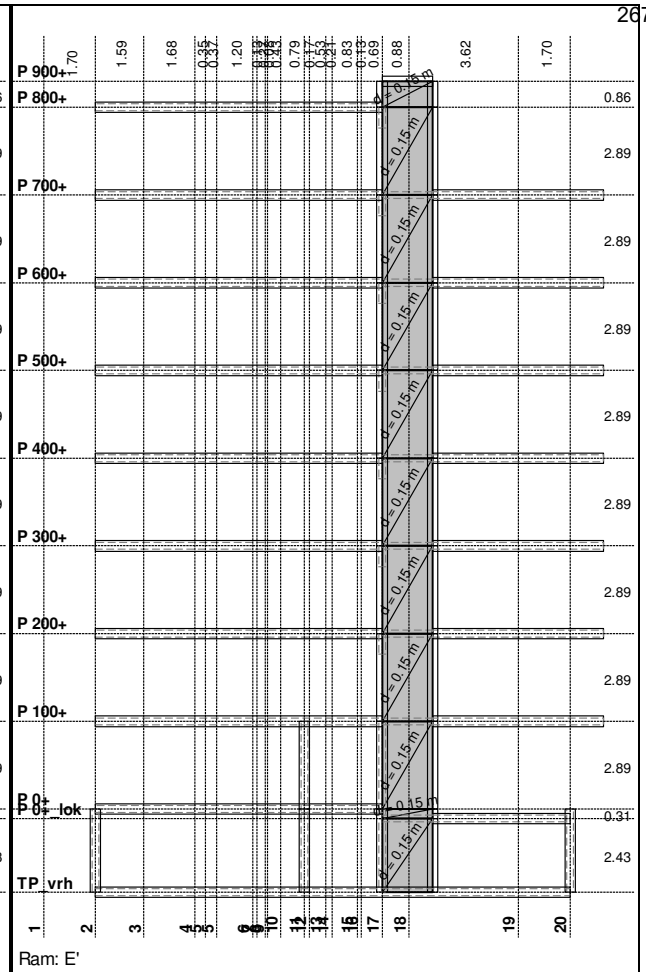
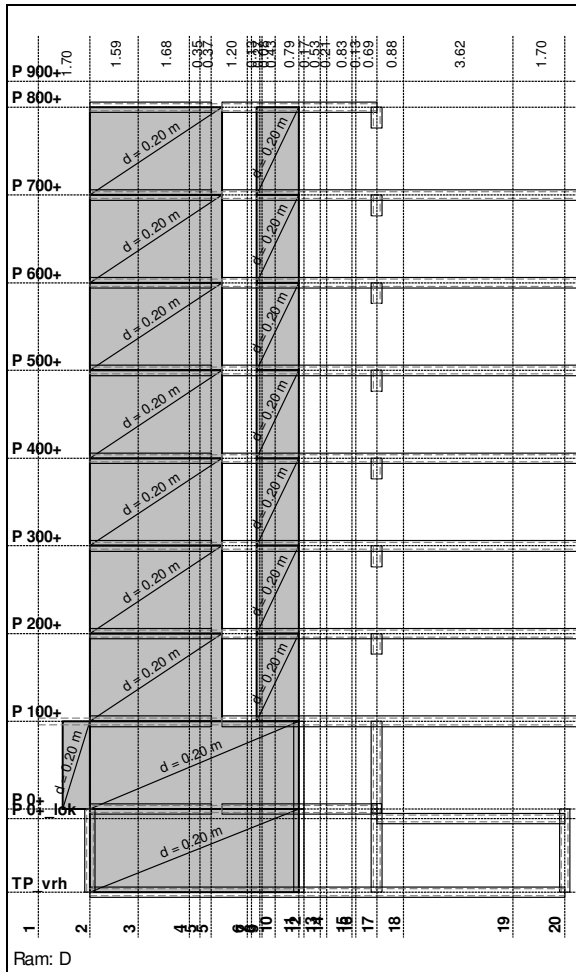


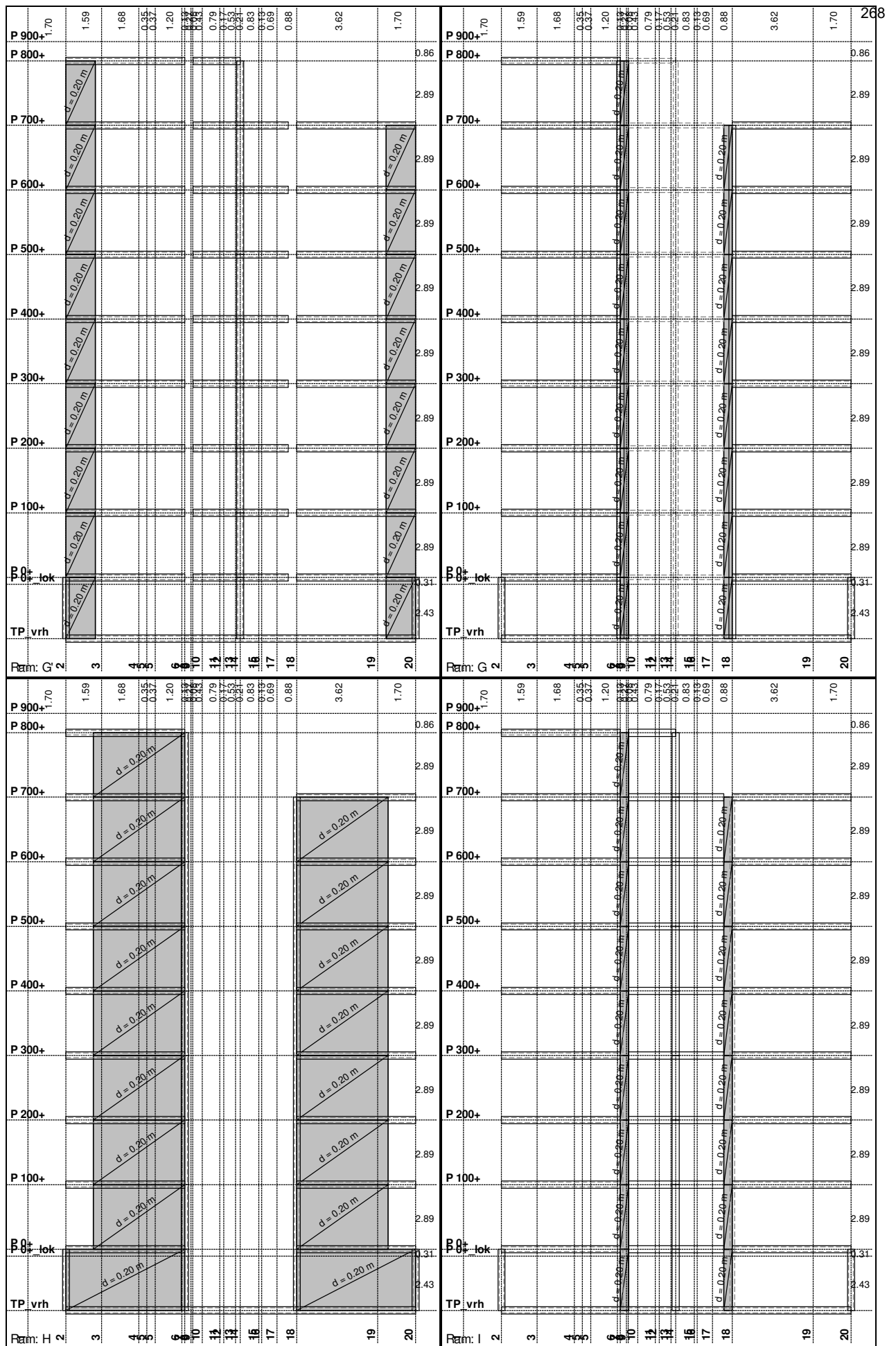
Usvojena armatura
PBAB 87 MB 30, MA 500/560, $a=2.00$ cm

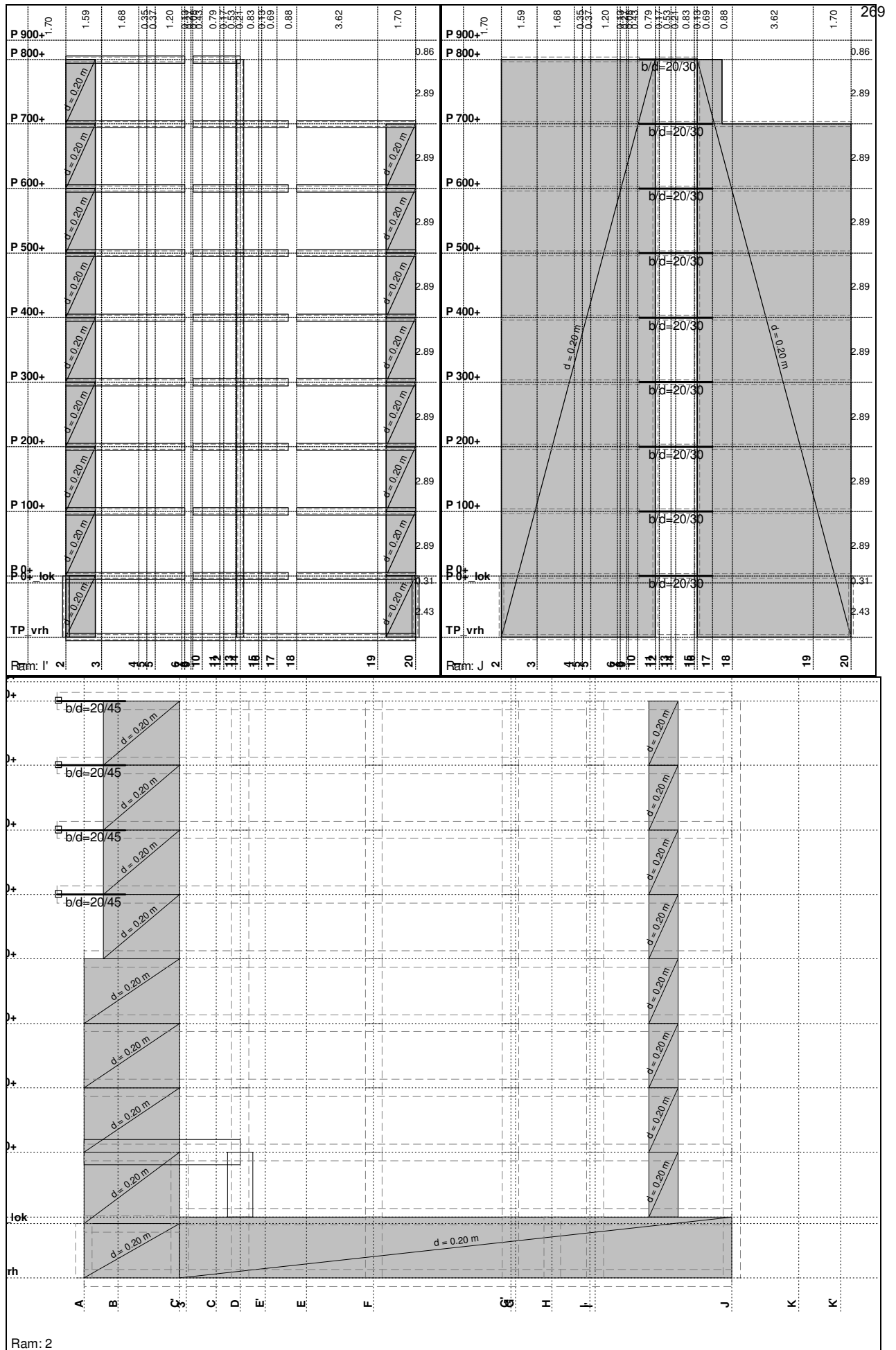


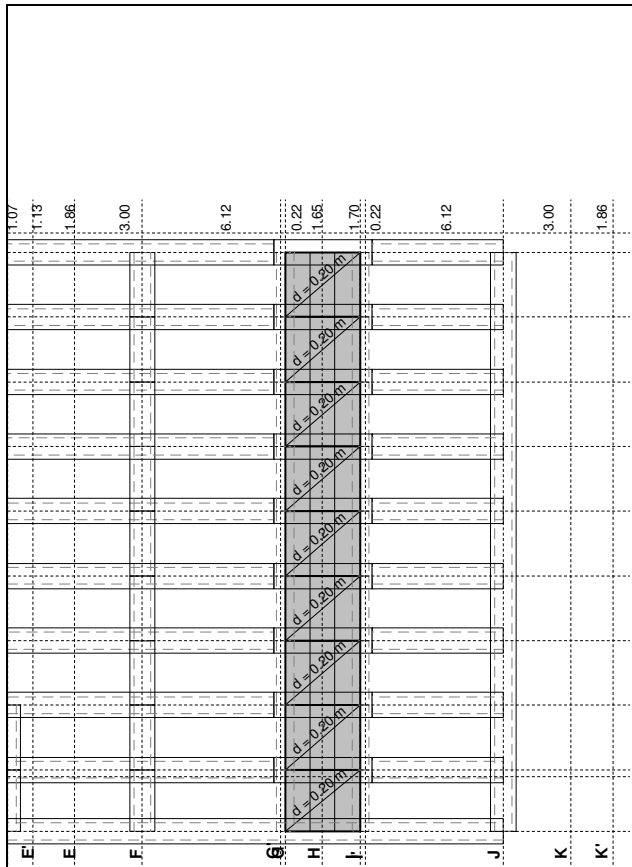
LAMELA 1Dispozicija ramova¹



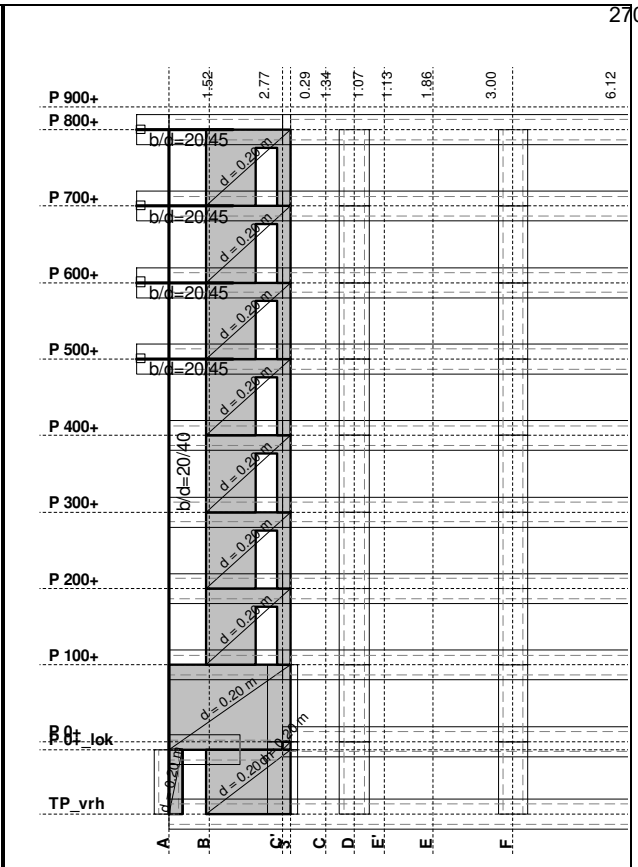




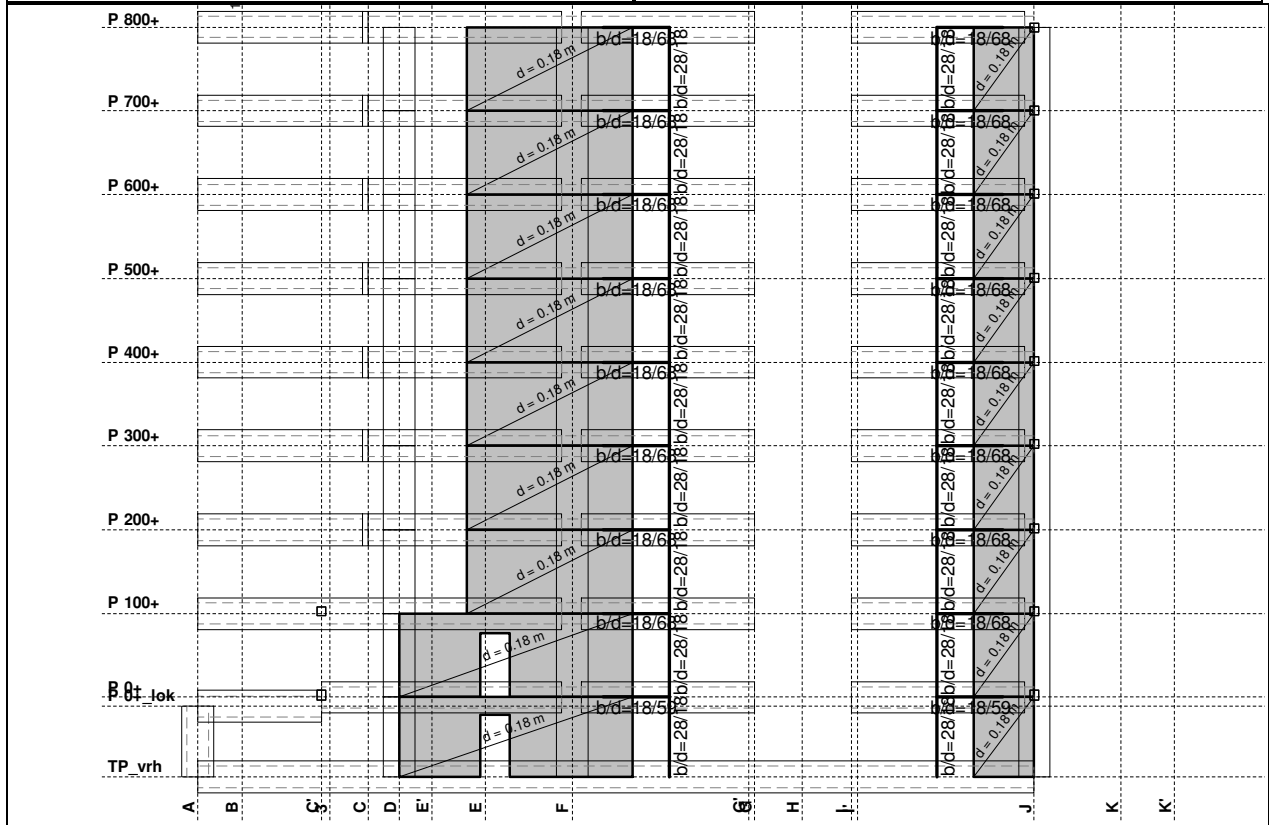




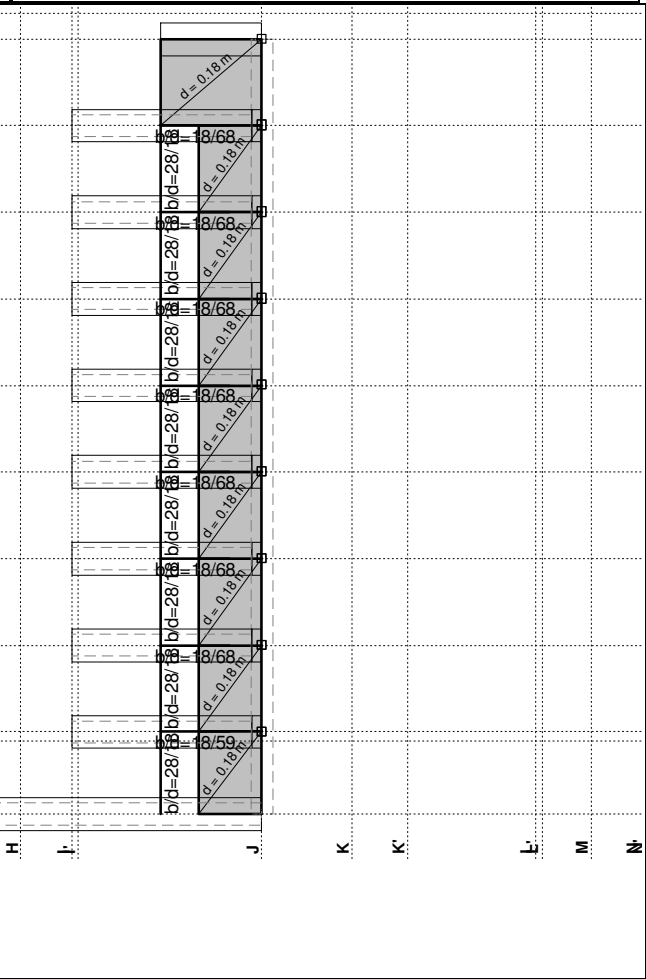
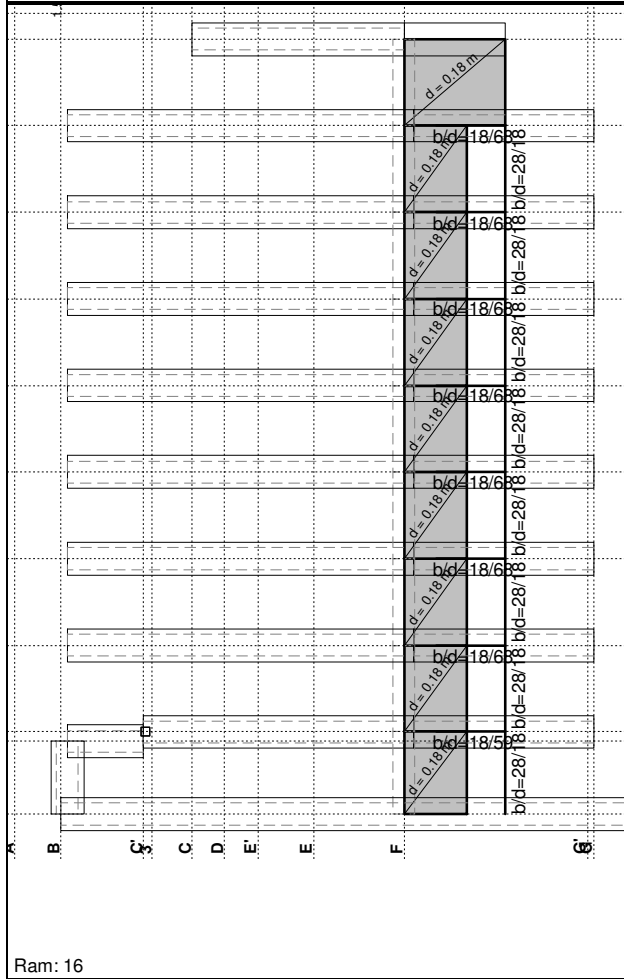
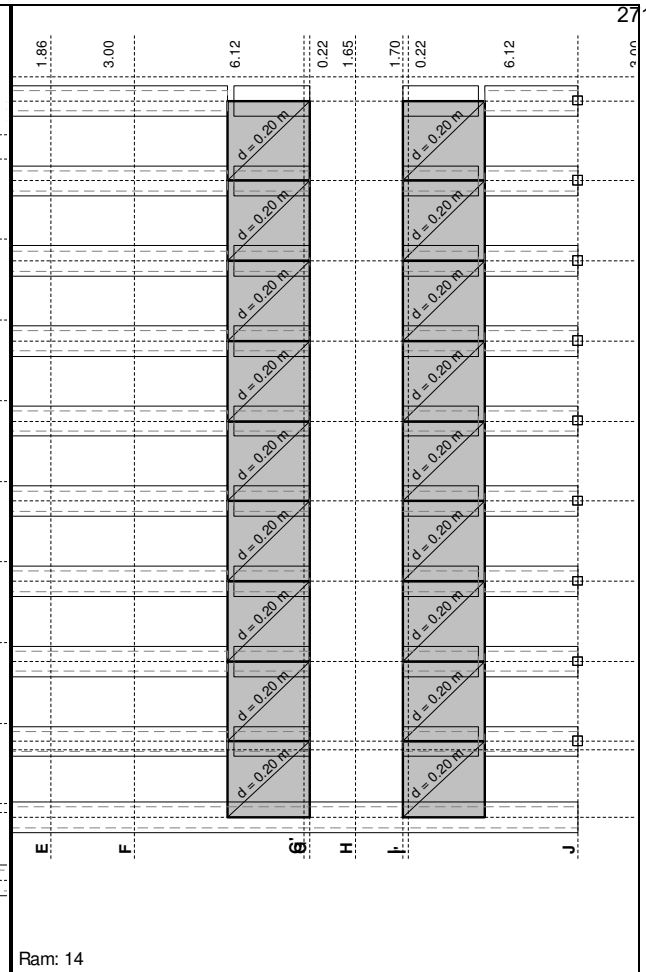
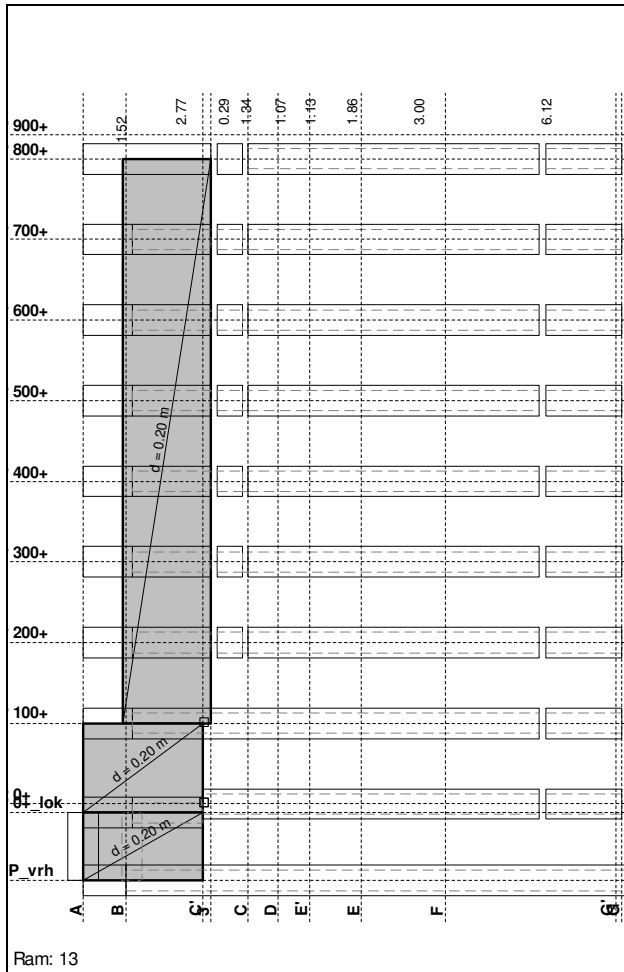
Ram: 7

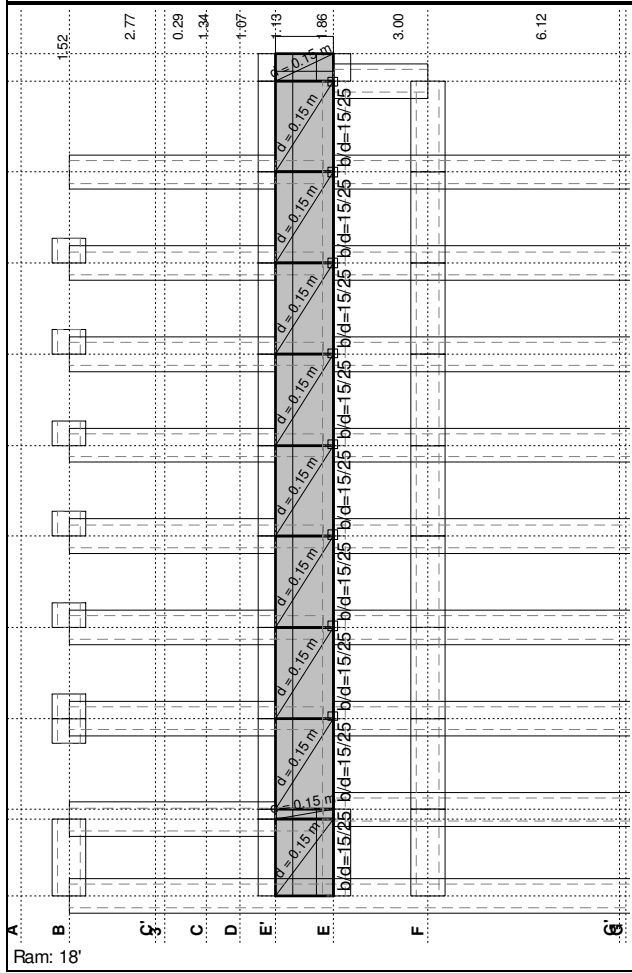
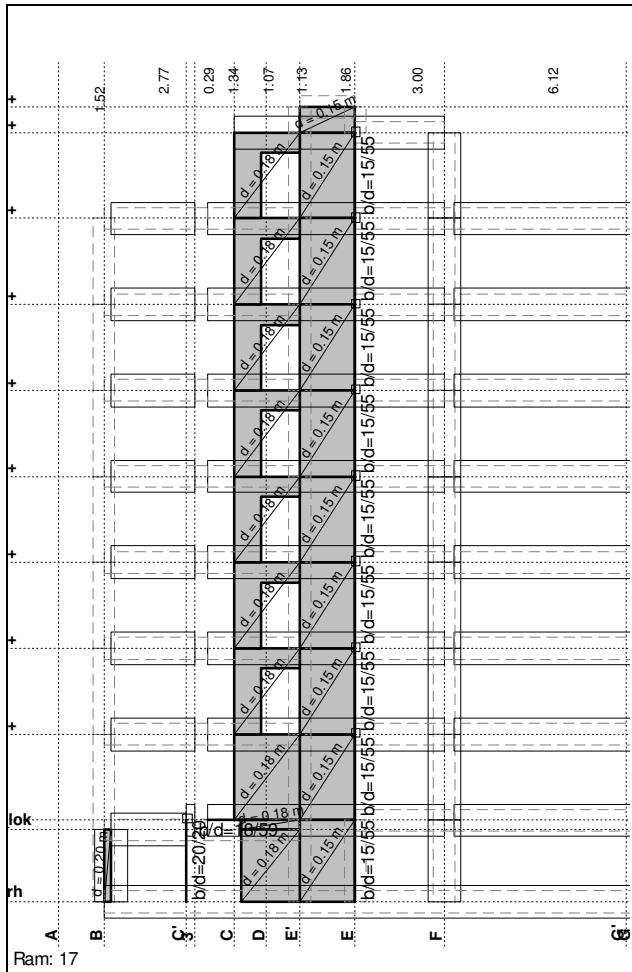


Ram: 8

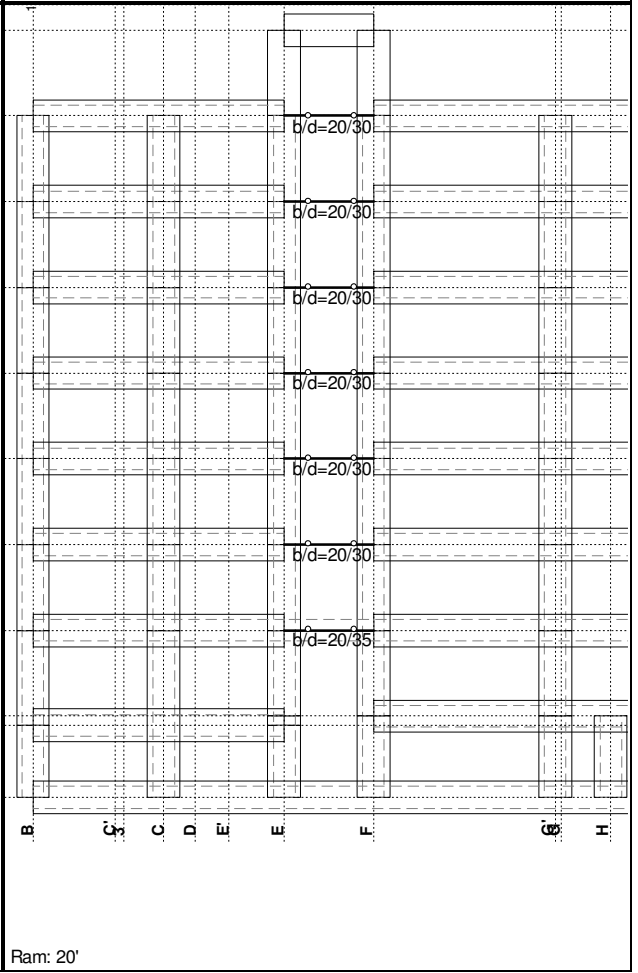
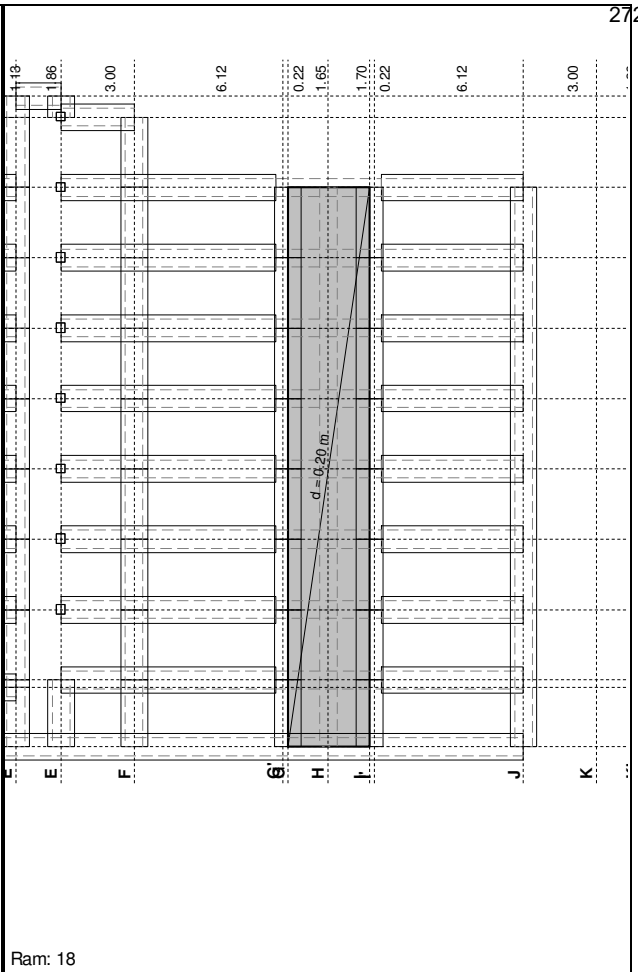


Ram: 11

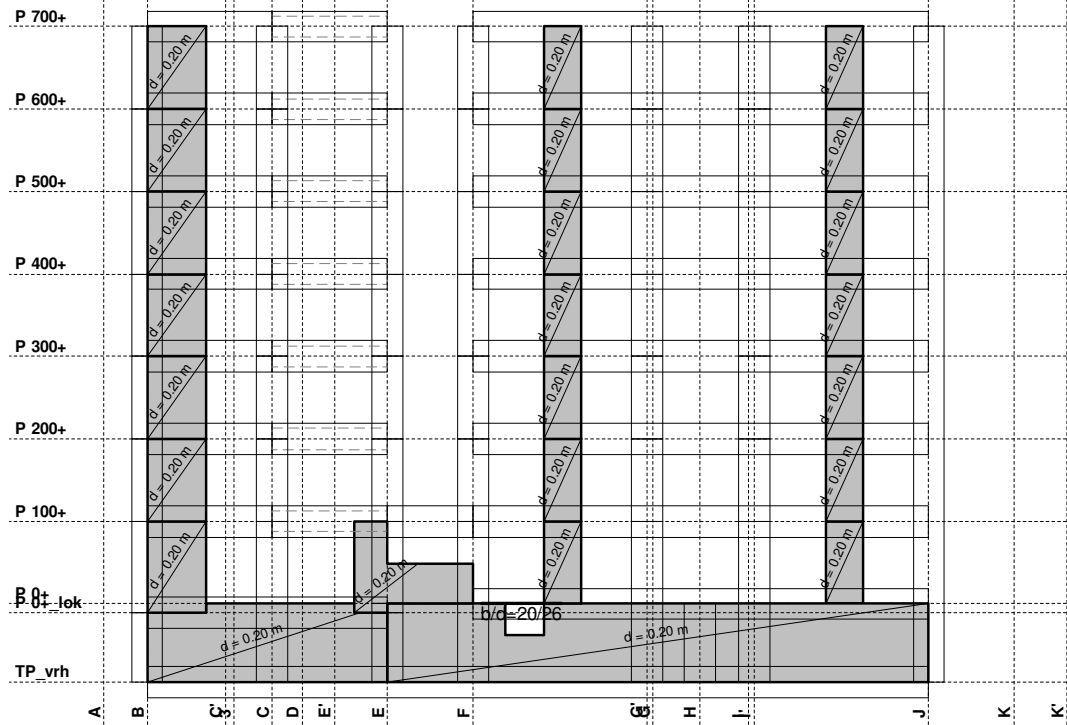




Ram: 18'



Ram: 20'



Ram: 20

Ulazni podaci - Opterećenje

Lista slučajeva opterećenja

LC	Naziv
1	g (g)
2	p
3	Sx (+e)
4	Sx (-e)
5	Sy (+e)

6	Sy (-e)
7	SRSS: MAX(III,IV)+MAX(V,VI)
8	Komb.: I+0.3xII+VII
9	Komb.: I+0.3xII-1xVII

Modalna analiza

Napredne opcije seizmičkog proračuna:

Mase grupisane u nivoima izabranih tavanica

Multiplikator krutosti oslonaca:

10000.000

Sprečeno oscilovanje u Z pravcu

Faktori opterećenja za proračun mase

No	Naziv	Koeficijent
1	g (g)	1.00
2	p	0.30

Raspored mase po visini objekta

Nivo	Z [m]	X [m]	Y [m]	Masa [T]	T/m ²
POS 900+	23.87	145.80	-107.39	3.01	0.98
POS 800+	23.01	150.98	-112.86	337.23	1.32
POS 700+	20.12	151.62	-109.70	552.94	1.33
POS 600+	17.23	151.50	-109.70	545.47	1.31
POS 500+	14.34	151.50	-109.71	545.48	1.31
POS 400+	11.45	151.68	-109.65	539.74	1.32
POS 300+	8.56	151.70	-109.64	538.52	1.32
POS 200+	5.67	151.70	-109.64	538.88	1.32
POS 100+	2.78	151.53	-109.74	564.98	1.33
POS 0+	-0.11	151.35	-109.79	598.36	1.88
TPL_vrh	-2.85	151.52	-109.96	802.72	1.82
Ukupno:	8.84	151.52	-109.93	5567.32	

Položaj centara krutosti po visini objekta (tačna metoda)

Nivo	Z [m]	X [m]	Y [m]
------	-------	-------	-------

POS 900+	23.87	147.76	-108.35
POS 800+	23.01	152.39	-109.72
POS 700+	20.12	152.25	-109.64
POS 600+	17.23	152.16	-109.62
POS 500+	14.34	152.06	-109.61
POS 400+	11.45	151.93	-109.63
POS 300+	8.56	151.78	-109.68

POS 200+	5.67	151.62	-109.274
POS 100+	2.78	151.45	-109.76
POS 0+	-0.11	151.58	-109.94
TPL_vrh	-2.85	151.63	-109.95

Ekscentricitet po visini objekta (tačna metoda)

Nivo	Z [m]	eox [m]	eoy [m]
POS 900+	23.87	1.96	0.97
POS 800+	23.01	1.41	3.13
POS 700+	20.12	0.64	0.07
POS 600+	17.23	0.66	0.08
POS 500+	14.34	0.57	0.09
POS 400+	11.45	0.25	0.02
POS 300+	8.56	0.08	0.04

POS 200+	5.67	0.08	0.09
POS 100+	2.78	0.08	0.02
POS 0+	-0.11	0.23	0.15
TPL_vrh	-2.85	0.11	0.01

Periodi oscilovanja konstrukcije

No	T [s]	f [Hz]
1	0.4993	2.0028
2	0.3898	2.5657
3	0.3320	3.0124
4	0.1335	7.4911
5	0.1029	9.7170

6	0.0846	11.8144
7	0.0652	15.3303
8	0.0634	15.7696
9	0.0566	17.6635
10	0.0469	21.3104

Regularnost u osnovi

Z [m]	eox [m]	eoy [m]	rx [m]	ry [m]	ls [m]	eox<=0.3rx	eoy<=0.3ry	rx>ls	ry>ls
23.87	1.96	0.97	8.77	6.93	9.95	Da	Da	Da	Da
23.01	1.41	3.13	15.53	13.06	9.53	Da	Da	Da	Da
20.12	0.64	0.07	16.10	12.67	9.97	Da	Da	Da	Da
17.23	0.66	0.08	16.25	12.74	10.02	Da	Da	Da	Da
14.34	0.57	0.09	16.30	12.78	10.02	Da	Da	Da	Da
11.45	0.25	0.02	16.24	12.74	9.90	Da	Da	Da	Da
8.56	0.08	0.04	15.94	12.54	9.90	Da	Da	Da	Da
5.67	0.08	0.09	15.18	12.04	9.90	Da	Da	Da	Da
2.78	0.08	0.02	13.65	11.17	10.12	Da	Da	Da	Da
-0.11	0.23	0.15	11.34	10.00	9.61	Da	Da	Da	Da
-2.85	0.11	0.01	9.23	9.23	9.46	Da	Da	Ne	Ne

Seizmički proračun

Seizmički proračun: EC8 (EN 1998)

Kategorija tla:
Kategorija značaja:
Odnos ag/g:
Koeficijent prigušenja:
Slučajni ekscentricitet spratne mase:

B
II (γ=1.0)
0.15
0.05
ei = ± 0.050 x Li

Faktori pravca zemljotresa:

Slučaj opterećenja	Ugao α[°]	kα	kα+90°	kz	Faktor q
Sx	0	1.000	0.000	0.000	3.000
Sy	0	0.000	1.000	0.000	2.000

Tip spektra

Slučaj opterećenja	S	Tb	Tc	Td
Sx	1.730	0.150	0.500	2.000
Sy	1.730	0.150	0.500	2.000

Sx (+e)

Nivo	Z [m]	Ton 1			Ton 2			Ton 3		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	8.88	-1.20	0.03	0.68	1.55	0.09	0.03	-0.18	-0.01
POS 800+	23.01	1042.6	-56.53	6.65	-16.95	84.07	0.45	-2.59	-24.90	-0.64
POS 700+	20.12	1445.1	-65.39	4.51	50.47	102.42	0.90	1.57	-36.30	-0.28
POS 600+	17.23	1217.4	-55.39	4.68	43.92	85.15	0.11	1.49	-29.92	-0.20
POS 500+	14.34	991.13	-43.60	4.81	36.91	66.52	0.10	1.34	-24.05	-0.19
POS 400+	11.45	745.02	-30.17	0.26	29.32	45.71	0.31	1.15	-18.16	-0.15
POS 300+	8.56	510.02	-19.92	0.24	20.98	29.29	0.20	0.85	-12.55	-0.13
POS 200+	5.67	295.63	-11.27	0.04	12.81	15.34	0.14	0.52	-7.55	-0.11
POS 100+	2.78	128.44	-4.48	-1.17	5.72	5.11	0.46	0.19	-3.60	-0.06
POS 0+	-0.11	22.86	-1.33	-3.18	0.99	1.55	-0.17	0.05	-1.06	-0.01
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	0.04	-0.00	0.00	0.00	0.01	0.00	0.00	-0.00	-0.00
Σ=		6407.1	-289.50	16.87	184.85	436.73	2.61	4.61	-158.27	-1.79

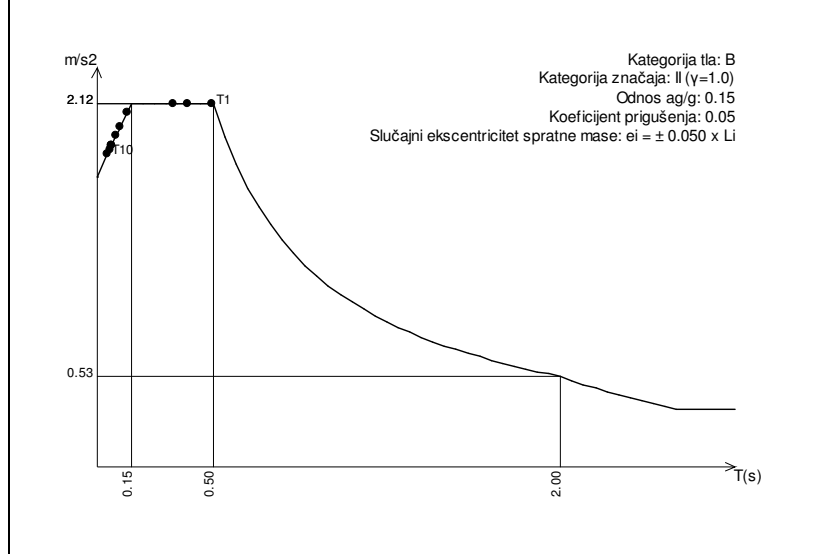
Nivo	Z [m]	Ton 4			Ton 5			Ton 6		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	-4.36	0.37	-0.09	-0.59	-0.68	-0.12	-0.01	0.09	0.01
POS 800+	23.01	-464.31	22.74	-12.93	7.05	-37.69	0.18	1.38	13.10	0.82
POS 700+	20.12	-363.28	9.12	-11.62	-24.69	-11.03	-0.00	-0.85	9.38	0.32
POS 600+	17.23	29.45	-9.01	-9.57	-12.71	13.90	0.62	-1.11	-0.98	0.18
POS 500+	14.34	358.84	-20.86	-6.79	2.90	30.76	0.14	-0.73	-9.57	0.14
POS 400+	11.45	550.05	-22.62	-0.61	17.84	35.08	-0.23	0.05	-14.96	0.07
POS 300+	8.56	575.41	-19.88	-0.23	25.78	31.76	-0.22	0.77	-16.39	0.03
POS 200+	5.67	450.35	-13.57	0.30	23.93	21.32	-0.23	1.03	-13.91	-0.01
POS 100+	2.78	248.40	-5.30	0.28	14.03	8.36	0.32	0.70	-9.00	-0.05
POS 0+	-0.11	53.37	-1.94	-4.69	3.22	2.77	-0.37	0.19	-3.63	-0.01
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	0.12	-0.01	0.01	0.01	0.01	0.00	0.00	-0.01	-0.00
Σ=		1434.0	-60.96	-45.95	56.77	94.56	0.10	1.43	-45.87	1.50

Nivo	Z [m]	Ton 7			Ton 8			Ton 9		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	1.32	0.05	0.02	1.77	-0.05	0.05	-0.11	0.20	0.01
POS 800+	23.01	190.00	-32.64	9.75	51.87	29.74	1.09	1.06	7.55	-0.59
POS 700+	20.12	9.87	29.29	8.79	5.57	-39.56	-1.55	3.48	-5.12	0.22
POS 600+	17.23	-198.26	35.62	3.92	-52.94	-35.19	-0.61	-1.76	-7.02	0.26

POS 500+	14.34	-222.69	11.64	-0.41	-65.31	-5.92	0.10	-4.43	-3.82	0.33
POS 400+	11.45	-61.82	-21.12	-0.13	-22.83	26.23	-0.71	-3.17	2.23	0.09
POS 300+	8.56	151.67	-41.25	-0.17	40.65	44.56	-0.54	1.31	6.25	0.08
POS 200+	5.67	265.04	-40.12	-0.12	76.67	42.55	-0.53	4.81	6.96	0.06
POS 100+	2.78	216.28	-20.71	-0.48	62.11	24.80	0.45	4.45	4.50	0.16
POS 0+	-0.11	55.30	-7.43	-3.93	16.09	9.49	-1.31	1.23	1.81	-0.06
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	0.14	-0.03	0.00	0.04	0.03	0.00	0.00	0.01	-0.00
	$\Sigma=$	406.85	-86.71	17.23	113.70	96.69	-3.55	6.87	13.55	0.58

Nivo	Z [m]	Ton 10		
		Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	-0.04	0.04	0.01
POS 800+	23.01	-0.34	2.48	-0.00
POS 700+	20.12	0.92	-0.79	0.26
POS 600+	17.23	0.21	-1.84	0.23
POS 500+	14.34	-0.68	-1.40	0.18
POS 400+	11.45	-0.70	-0.51	0.05
POS 300+	8.56	0.05	0.57	0.01
POS 200+	5.67	0.66	1.04	-0.03
POS 100+	2.78	0.35	0.96	0.04
POS 0+	-0.11	0.15	0.22	-0.04
POS 0+ LOKALI	-0.42	0.00	0.00	0.00
TPL_vrh	-2.85	0.00	0.00	0.00
	$\Sigma=$	0.58	0.78	0.71

Projektni spektar - Sx (+e)



Sx (-e)

Nivo	Z [m]	Ton 1			Ton 2			Ton 3		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	8.88	-1.20	0.03	0.68	1.55	0.09	0.03	-0.18	-0.01
POS 800+	23.01	1042.6	-56.53	6.65	-16.95	84.07	0.45	-2.59	-24.90	-0.64
POS 700+	20.12	1445.1	-65.39	4.51	50.47	102.42	0.90	1.57	-36.30	-0.28
POS 600+	17.23	1217.4	-55.39	4.68	43.92	85.15	0.11	1.49	-29.92	-0.20
POS 500+	14.34	991.13	-43.80	4.81	36.91	66.52	0.10	1.34	-24.05	-0.19
POS 400+	11.45	745.02	-30.17	0.26	29.32	45.71	0.31	1.15	-18.16	-0.15
POS 300+	8.56	510.02	-19.92	0.24	20.98	29.29	0.20	0.85	-12.55	-0.13
POS 200+	5.67	295.63	-11.27	0.04	12.81	15.34	0.14	0.52	-7.55	-0.11
POS 100+	2.78	128.44	-4.48	-1.17	5.72	5.11	0.46	0.19	-3.60	-0.06
POS 0+	-0.11	22.86	-1.33	-3.18	0.99	1.55	-0.17	0.05	-1.06	-0.01
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	0.04	-0.00	0.00	0.00	0.01	0.00	0.00	-0.00	-0.00
	$\Sigma=$	6407.1	-289.50	16.87	184.85	436.73	2.61	4.61	-158.27	-1.79

Nivo	Z [m]	Ton 4			Ton 5			Ton 6		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	-4.36	0.37	-0.09	-0.59	-0.68	-0.12	-0.01	0.09	0.01
POS 800+	23.01	-464.31	22.74	-12.93	7.05	-37.69	0.18	1.38	13.10	0.82
POS 700+	20.12	-363.28	9.12	-11.62	-24.69	-11.03	-0.00	-0.85	9.38	0.32
POS 600+	17.23	29.45	-9.01	-9.57	-12.71	13.90	0.62	-1.11	-0.98	0.18
POS 500+	14.34	358.84	-20.86	-6.79	2.90	30.76	0.14	-0.73	-9.57	0.14
POS 400+	11.45	550.05	-22.62	-0.61	17.84	35.08	-0.23	0.05	-14.96	0.07
POS 300+	8.56	575.41	-19.88	-0.23	25.78	31.76	-0.22	0.77	-16.39	0.03
POS 200+	5.67	450.35	-13.57	0.30	23.93	21.32	-0.23	1.03	-13.91	-0.01
POS 100+	2.78	248.40	-5.30	0.28	14.03	8.36	0.32	0.70	-9.00	-0.05
POS 0+	-0.11	53.37	-1.94	-4.69	3.22	2.77	-0.37	0.19	-3.63	-0.01
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	0.12	-0.01	0.01	0.01	0.01	0.00	0.00	-0.01	-0.00
	$\Sigma=$	1434.0	-60.96	-45.95	56.77	94.56	0.10	1.43	-45.87	1.50

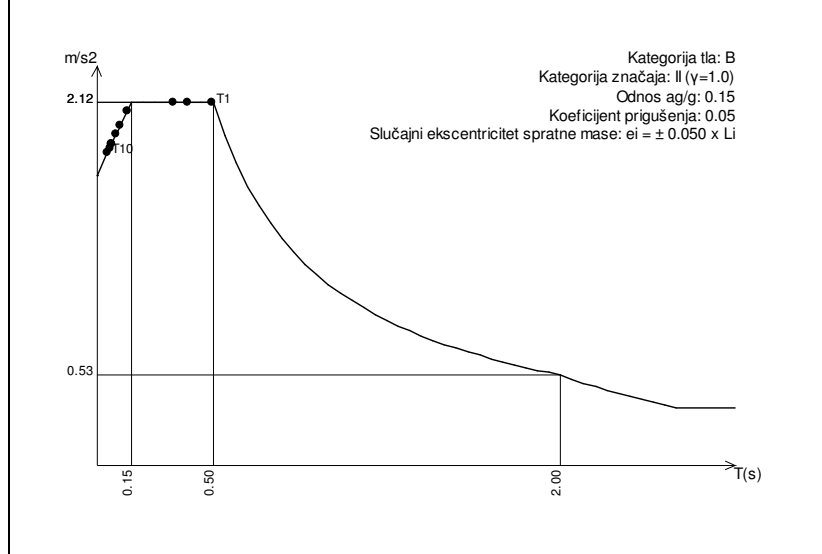
Nivo	Z [m]	Ton 7			Ton 8			Ton 9		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	1.32	0.05	0.02	1.77	-0.05	0.05	-0.11	0.20	0.01
POS 800+	23.01	190.00	-32.64	9.75	51.87	29.74	1.09	1.06	7.55	-0.59
POS 700+	20.12	9.87	29.29	8.79	5.57	-39.56	-1.55	3.48	-5.12	0.22
POS 600+	17.23	-198.26	35.62	3.92	-52.94	-35.19	-0.61	-1.76	-7.02	0.26
POS 500+	14.34	-222.69	11.64	-0.41	-65.31	-5.92	0.10	-4.43	-3.82	0.33
POS 400+	11.45	-61.82	-21.12	-0.13	-22.83	26.23	-0.71	-3.17	2.23	0.09
POS 300+	8.56	151.67	-41.25	-0.17	40.65	44.56	-0.54	1.31	6.25	0.08
POS 200+	5.67	265.04	-40.12	-0.12	76.67	42.55	-0.53	4.81	6.96	0.06
POS 100+	2.78	216.28	-20.71	-0.48	62.11	24.80	0.45	4.45	4.50	0.16
POS 0+	-0.11	55.30	-7.43	-3.93	16.09	9.49	-1.31	1.23	1.81	-0.06
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TPL vrh	-2.85	0.14	-0.03	0.00	0.04	0.03	0.00	0.00	0.01	-0.00
	$\Sigma=$	406.85	-86.71	17.23	113.70	96.69	-3.55	6.87	13.55	0.58

276

Nivo	Z [m]	Ton 10		
		Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	-0.04	0.04	0.01
POS 800+	23.01	-0.34	2.48	-0.00
POS 700+	20.12	0.92	-0.79	0.26
POS 600+	17.23	0.21	-1.84	0.23
POS 500+	14.34	-0.68	-1.40	0.18
POS 400+	11.45	-0.70	-0.51	0.05
POS 300+	8.56	0.05	0.57	0.01
POS 200+	5.67	0.66	1.04	-0.03
POS 100+	2.78	0.35	0.96	0.04
POS 0+	-0.11	0.15	0.22	-0.04
POS 0+ LOKALI	-0.42	0.00	0.00	0.00
TPL vrh	-2.85	0.00	0.00	0.00
	$\Sigma=$	0.58	0.78	0.71

Projektni spektar - Sx (-e)



Sy (+e)

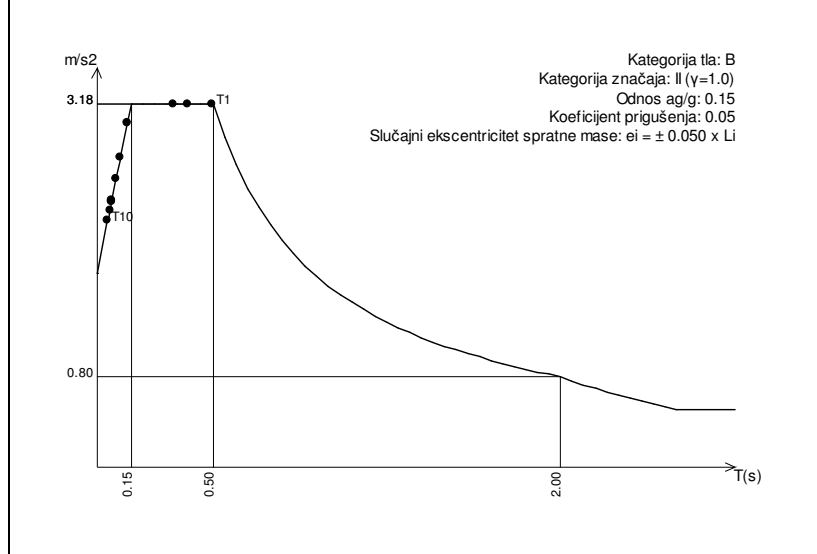
Nivo	Z [m]	Ton 1			Ton 2			Ton 3		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	-0.60	0.08	-0.00	2.40	5.49	0.33	-1.71	9.03	0.52
POS 800+	23.01	-70.66	3.83	-0.45	-60.05	297.95	1.61	133.11	1280.9	32.89
POS 700+	20.12	-97.94	4.43	-0.31	178.86	362.99	3.20	-80.98	1867.7	14.44
POS 600+	17.23	-82.51	3.75	-0.32	155.65	301.76	0.40	-76.65	1539.1	10.18
POS 500+	14.34	-67.17	2.97	-0.33	130.80	235.76	0.34	-68.93	1237.3	9.61
POS 400+	11.45	-50.49	2.04	-0.02	103.90	162.00	1.09	-58.99	934.18	7.86
POS 300+	8.56	-34.57	1.35	-0.02	74.34	103.81	0.71	-43.98	645.81	6.79
POS 200+	5.67	-20.04	0.76	-0.00	45.41	54.35	0.51	-26.99	388.16	5.71
POS 100+	2.78	-8.70	0.30	0.08	20.28	18.10	1.64	-9.94	185.22	3.24
POS 0+	-0.11	-1.55	0.09	0.22	3.49	5.51	-0.59	-2.34	54.73	0.72
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL vrh	-2.85	-0.00	0.00	-0.00	0.01	0.02	0.00	-0.00	0.10	0.00
	$\Sigma=$	-434.24	19.62	-1.14	655.09	1547.7	9.24	-237.41	8142.2	91.96

Nivo	Z [m]	Ton 4			Ton 5			Ton 6		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	0.27	-0.02	0.01	-1.35	-1.55	-0.27	0.36	-3.98	-0.58
POS 800+	23.01	28.72	-1.41	0.80	16.04	-85.76	0.41	-58.12	-550.66	-34.51
POS 700+	20.12	22.47	-0.56	0.72	-56.18	-25.09	-0.00	35.91	-394.43	-13.63
POS 600+	17.23	-1.82	0.56	0.59	-28.92	31.63	1.41	46.59	41.13	-7.43
POS 500+	14.34	-22.19	1.29	0.42	6.61	69.98	0.33	30.72	402.22	-5.81
POS 400+	11.45	-34.02	1.40	0.04	40.59	79.83	-0.51	-2.18	628.75	-2.97
POS 300+	8.56	-35.59	1.23	0.01	58.66	72.27	-0.50	-32.56	689.06	-1.08
POS 200+	5.67	-27.85	0.84	-0.02	54.45	48.51	-0.52	-43.38	584.92	0.53
POS 100+	2.78	-15.36	0.33	-0.02	31.93	19.02	0.73	-29.34	378.12	2.07
POS 0+	-0.11	-3.30	0.12	0.29	7.33	6.30	-0.85	-8.05	152.62	0.49
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL vrh	-2.85	-0.01	0.00	-0.00	0.02	0.03	0.00	-0.01	0.37	0.01
	$\Sigma=$	-88.70	3.77	2.84	129.17	215.18	0.23	-60.05	1928.1	-62.92

Nivo	Z [m]	Ton 7			Ton 8			Ton 9		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	-0.35	-0.01	-0.01	1.87	-0.05	0.05	-0.27	0.49	0.03
POS 800+	23.01	-50.42	8.66	-2.59	54.65	31.34	1.15	2.55	18.10	-1.41
POS 700+	20.12	-2.62	-7.77	-2.33	5.87	-41.68	-1.63	8.33	-12.28	0.53
POS 600+	17.23	52.61	-9.45	-1.04	-55.77	-37.08	-0.64	-4.21	-16.84	0.62
POS 500+	14.34	59.09	-3.09	0.11	-68.81	-6.24	0.11	-10.63	-9.15	0.80
POS 400+	11.45	16.40	5.60	0.03	-24.05	27.63	-0.74	-7.60	5.36	0.22
POS 300+	8.56	-40.25	10.95	0.05	42.83	46.95	-0.57	3.15	14.98	0.20
POS 200+	5.67	-70.33	10.65	0.03	80.78	44.83	-0.56	11.54	16.69	0.14
POS 100+	2.78	-57.39	5.50	0.13	65.44	26.12	0.47	10.68	10.78	0.39
POS 0+	-0.11	-14.68	1.97	1.04	16.95	10.00	-1.38	2.94	4.35	-0.14
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL vrh	-2.85	-0.04	0.01	-0.00	0.04	0.04	0.00	0.01	0.01	-0.00
	$\Sigma=$	-107.96	23.01	-4.57	119.79	101.87	-3.74	16.47	32.50	1.38

Nivo	Z [m]	Ton 10		
		Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	-0.07	0.06	0.01
POS 800+	23.01	-0.54	3.95	-0.00
POS 700+	20.12	1.47	-1.26	0.42
POS 600+	17.23	0.34	-2.94	0.37
POS 500+	14.34	-1.08	-2.23	0.28
POS 400+	11.45	-1.12	-0.81	0.08
POS 300+	8.56	0.09	0.91	0.01
POS 200+	5.67	1.05	1.66	-0.05
POS 100+	2.78	0.55	1.53	0.06
POS 0+	-0.11	0.23	0.35	-0.06
POS 0+ LOKALI	-0.42	0.00	0.00	0.00
TPL_vrh	-2.85	0.00	0.00	0.00
	$\Sigma=$	0.93	1.25	1.12

Projektni spektar - Sy (+e)



Sy (-e)

Nivo	Z [m]	Ton 1			Ton 2			Ton 3		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	-0.60	0.08	-0.00	2.40	5.49	0.33	-1.71	9.03	0.52
POS 800+	23.01	-70.66	3.83	-0.45	-60.05	297.95	1.61	133.11	1280.9	32.89
POS 700+	20.12	-97.94	4.43	-0.31	178.86	362.99	3.20	-80.98	1867.7	14.44
POS 600+	17.23	-82.51	3.75	-0.32	155.65	301.76	0.40	-76.65	1539.1	10.18
POS 500+	14.34	-67.17	2.97	-0.33	130.80	235.76	0.34	-68.93	1237.3	9.61
POS 400+	11.45	-50.49	2.04	-0.02	103.90	162.00	1.09	-58.99	934.18	7.86
POS 300+	8.56	-34.57	1.35	-0.02	74.34	103.81	0.71	-43.98	645.81	6.79
POS 200+	5.67	-20.04	0.76	-0.00	45.41	54.35	0.51	-26.99	388.16	5.71
POS 100+	2.78	-8.70	0.30	0.08	20.28	18.10	1.64	-9.94	185.22	3.24
POS 0+	-0.11	-1.55	0.09	0.22	3.49	5.51	-0.59	-2.34	54.73	0.72
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	-0.00	0.00	-0.00	0.01	0.02	0.00	-0.00	0.10	0.00
	$\Sigma=$	-434.24	19.62	-1.14	655.09	1547.7	9.24	-237.41	8142.2	91.96

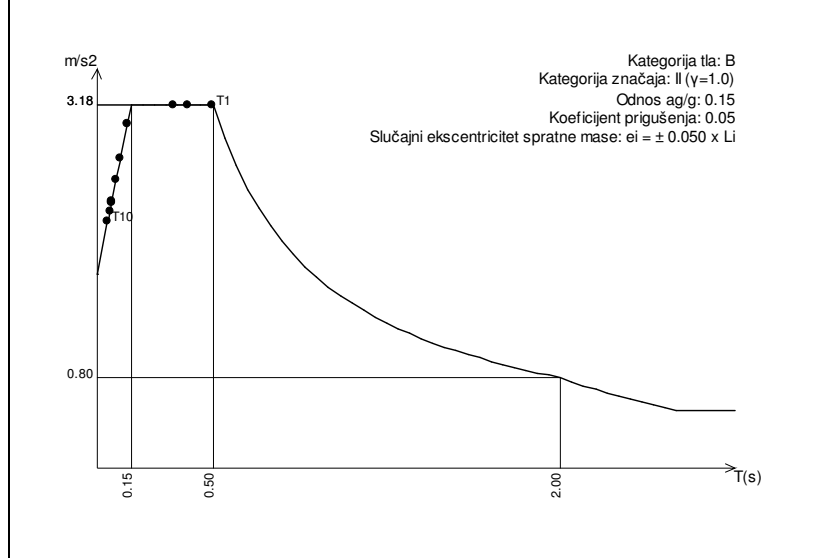
Nivo	Z [m]	Ton 4			Ton 5			Ton 6		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	0.27	-0.02	0.01	-1.35	-1.55	-0.27	0.36	-3.98	-0.58
POS 800+	23.01	28.72	-1.41	0.80	16.04	-85.76	0.41	-58.12	-550.66	-34.51
POS 700+	20.12	22.47	-0.56	0.72	-56.18	-25.09	-0.00	35.91	-394.43	-13.63
POS 600+	17.23	-1.82	0.56	0.59	-28.92	31.63	1.41	46.59	41.13	-7.43
POS 500+	14.34	-22.19	1.29	0.42	6.61	69.98	0.33	30.72	402.22	-5.81
POS 400+	11.45	-34.02	1.40	0.04	40.59	79.83	-0.51	-2.18	628.75	-2.97
POS 300+	8.56	-35.59	1.23	0.01	58.66	72.27	-0.50	-32.56	689.06	-1.08
POS 200+	5.67	-27.85	0.84	-0.02	54.45	48.51	-0.52	-43.38	584.92	0.53
POS 100+	2.78	-15.36	0.33	-0.02	31.93	19.02	0.73	-29.34	378.12	2.07
POS 0+	-0.11	-3.30	0.12	0.29	7.33	6.30	-0.85	-8.05	152.62	0.49
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	-0.01	0.00	-0.00	0.02	0.03	0.00	-0.01	0.37	0.01
	$\Sigma=$	-88.70	3.77	2.84	129.17	215.18	0.23	-60.05	1928.1	-62.92

Nivo	Z [m]	Ton 7			Ton 8			Ton 9		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	-0.35	-0.01	-0.01	1.87	-0.05	0.05	-0.27	0.49	0.03
POS 800+	23.01	-50.42	8.66	-2.59	54.65	31.34	1.15	2.55	18.10	-1.41
POS 700+	20.12	-2.62	-7.77	-2.33	5.87	-41.68	-1.63	8.33	-12.28	0.53
POS 600+	17.23	52.61	-9.45	-1.04	-55.77	-37.08	-0.64	-4.21	-16.84	0.62
POS 500+	14.34	59.09	-3.09	0.11	-68.81	-6.24	0.11	-10.63	-9.15	0.80
POS 400+	11.45	16.40	5.60	0.03	-24.05	27.63	-0.74	-7.60	5.36	0.22
POS 300+	8.56	-40.25	10.95	0.05	42.83	46.95	-0.57	3.15	14.98	0.20
POS 200+	5.67	-70.33	10.65	0.03	80.78	44.83	-0.56	11.54	16.69	0.14
POS 100+	2.78	-57.39	5.50	0.13	65.44	26.12	0.47	10.68	10.78	0.39
POS 0+	-0.11	-14.68	1.97	1.04	16.95	10.00	-1.38	2.94	4.35	-0.14
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	-0.04	0.01	-0.00	0.04	0.04	0.00	0.01	0.01	-0.00
	$\Sigma=$	-107.96	23.01	-4.57	119.79	101.87	-3.74	16.47	32.50	1.38

Nivo	Z [m]	Ton 10		
		Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	-0.07	0.06	0.01
POS 800+	23.01	-0.54	3.95	-0.00
POS 700+	20.12	1.47	-1.26	0.42
POS 600+	17.23	0.34	-2.94	0.37
POS 500+	14.34	-1.08	-2.23	0.28

POS 400+	11.45	-1.12	-0.81	0.08
POS 300+	8.56	0.09	0.91	0.01
POS 200+	5.67	1.05	1.66	-0.05
POS 100+	2.78	0.55	1.53	0.06
POS 0+	-0.11	0.23	0.35	-0.06
POS 0+ LOKALI	-0.42	0.00	0.00	0.00
TPL vrh	-2.85	0.00	0.00	0.00
	$\Sigma=$	0.93	1.25	1.12

Projektni spektar - Sy (-e)



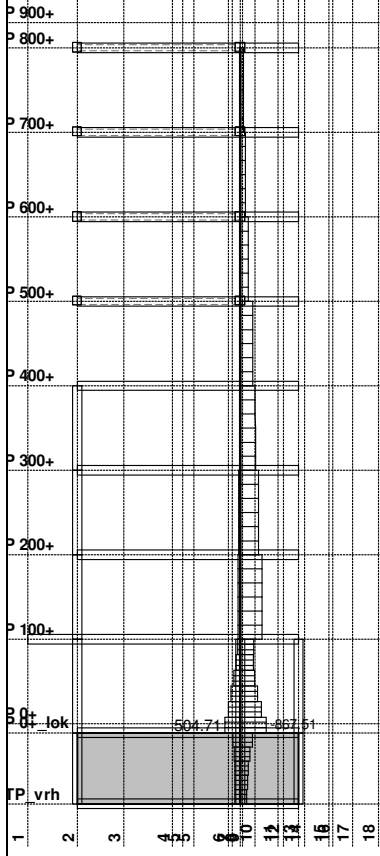
Faktori participacije - relativno učešće

Ton \ Naziv	1. Sx (+e)	2. Sx (-e)	3. Sy (+e)	4. Sy (-e)
1	0.744	0.744	0.002	0.002
2	0.021	0.021	0.129	0.129
3	0.001	0.001	0.678	0.678
4	0.166	0.166	0.000	0.000
5	0.007	0.007	0.018	0.018
6	0.000	0.000	0.160	0.160
7	0.047	0.047	0.002	0.002
8	0.013	0.013	0.008	0.008
9	0.001	0.001	0.003	0.003
10	0.000	0.000	0.000	0.000

Faktori participacije - angažovanje mase

Ton	U [$\alpha=0^\circ$]	U [$\alpha=0^\circ$]
1	54.55	54.55
2	1.58	1.58
3	0.04	0.04
4	12.84	12.84
5	0.53	0.53
6	0.01	0.01
7	4.11	4.11
8	1.13	1.13
9	0.07	0.07
10	0.01	0.01
ΣU (%)	74.87	74.87

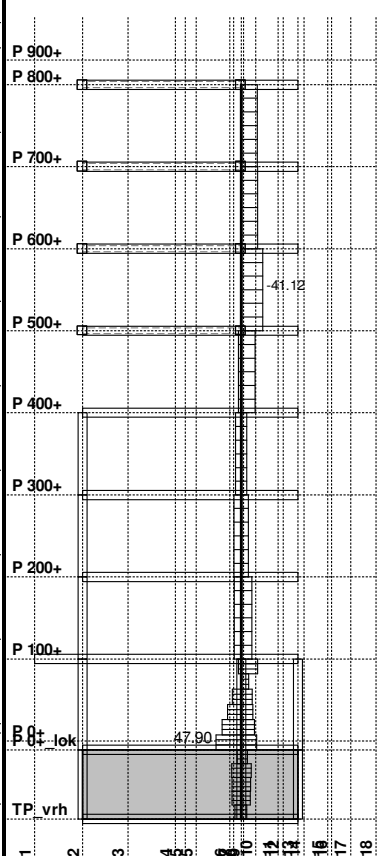
Opt. 10: [Anv 8-9] 8,9



Ram: A

Uticaji u gredi: max N1= 504.71 / min N1= -867.5...

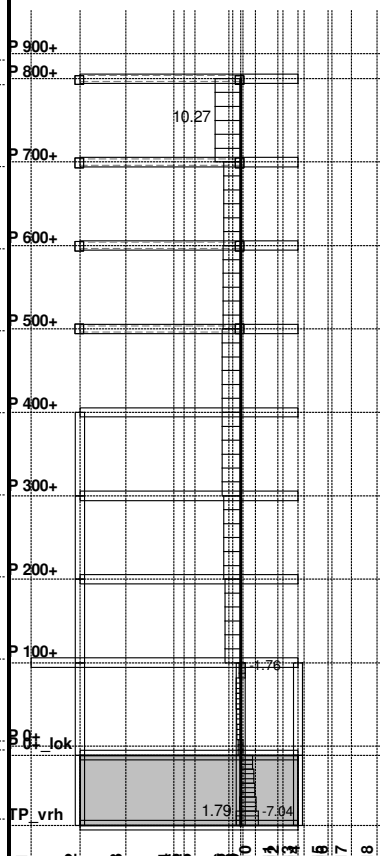
Opt. 10: [Anv 8-9] 8,9



Ram: A

Uticaji u gredi: max T2= 47.90 / min T2= -41.12 kN

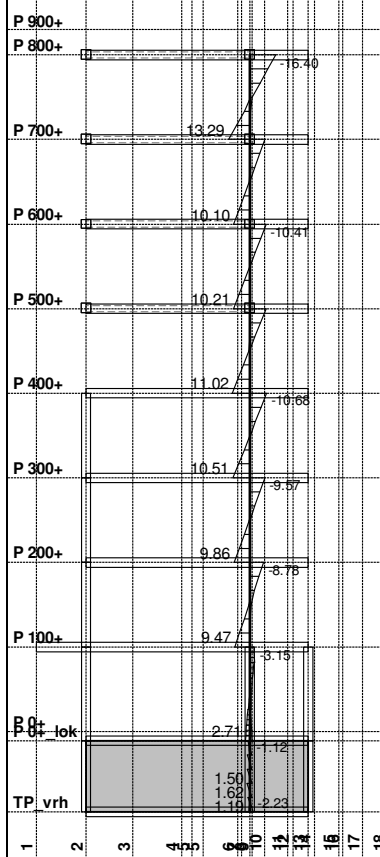
Opt. 10: [Anv 8-9] 8,9



Ram: A

Uticaji u gredi: max T3= 10.27 / min T3= -7.04 kN

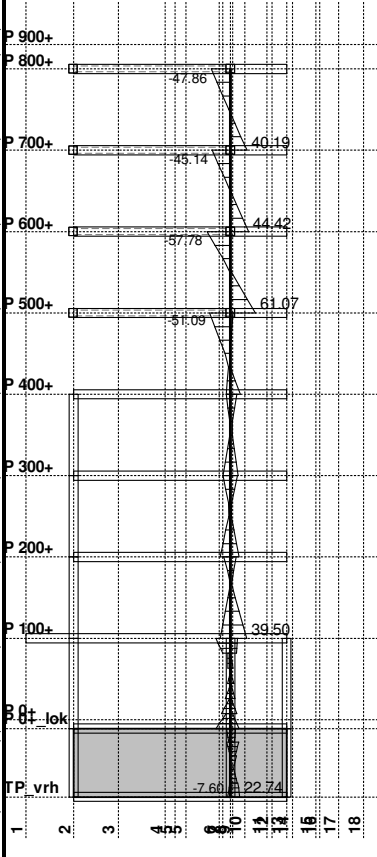
Opt. 10: [Anv 8-9] 8,9



Ram: A

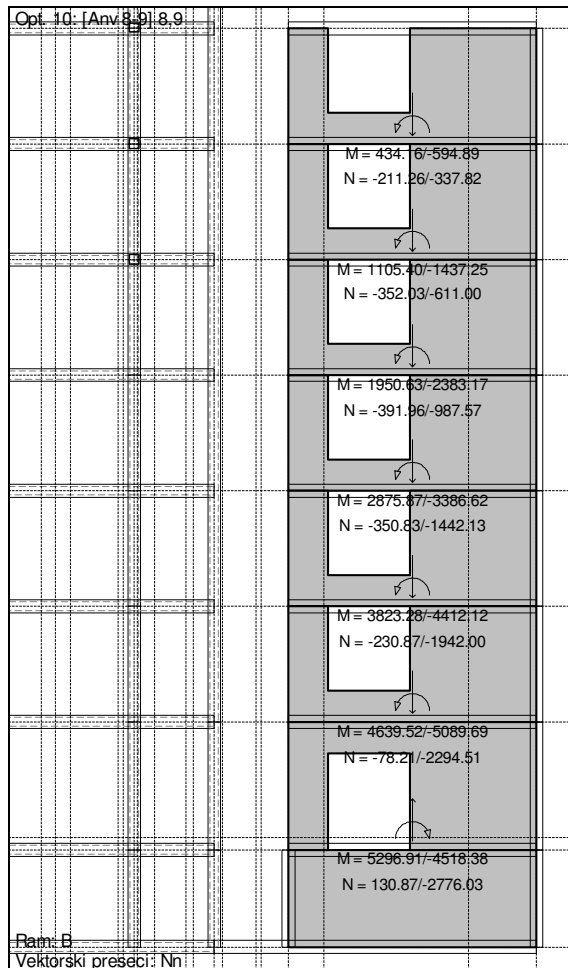
Uticaji u gredi: max M2= 13.29 / min M2= -16.40...

Opt. 10: [Anv 8-9] 8,9



Ram: A

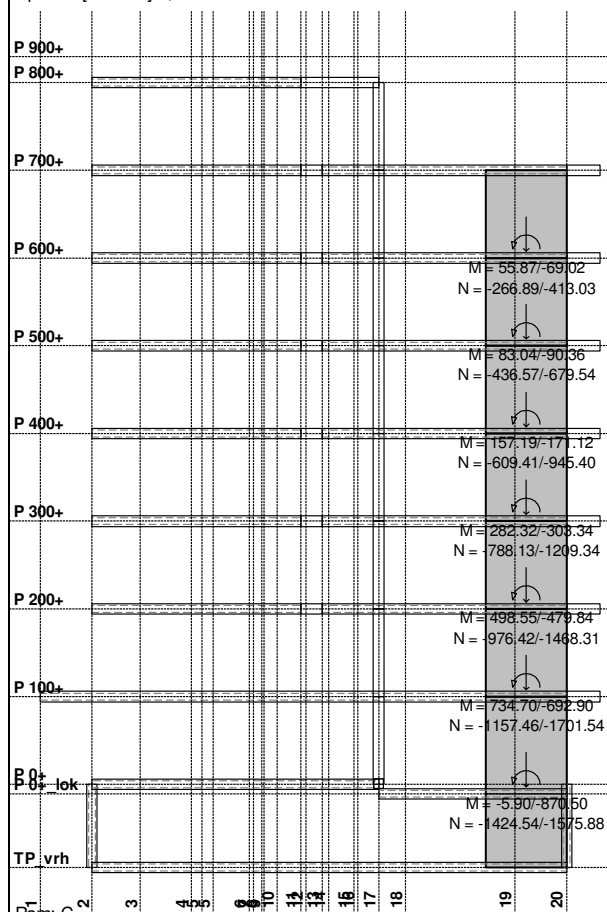
Uticaji u gredi: max M3= 61.07 / min M3= -57.78...



Ram: B

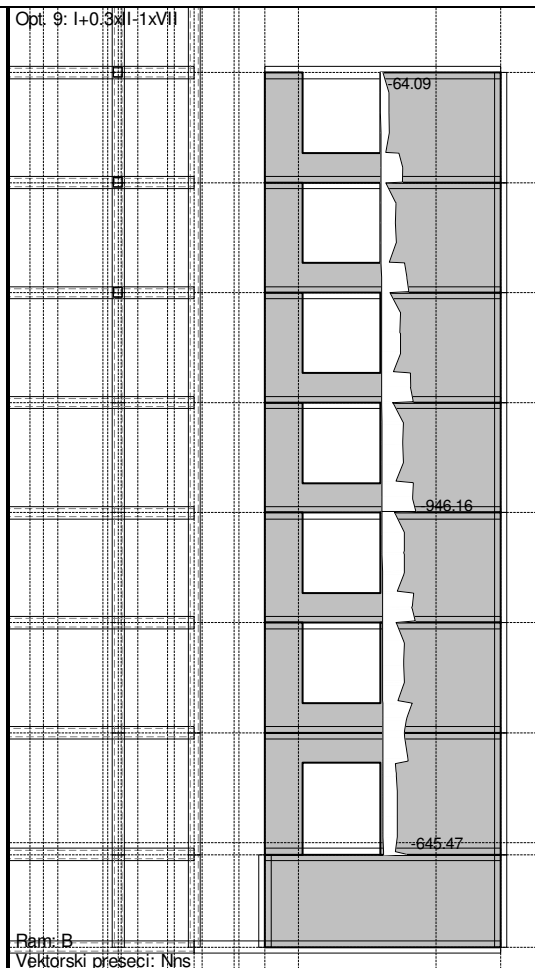
Vektorski preseči: Nn

Opt. 10: [Anv 8-9] 8,9



Ram: C

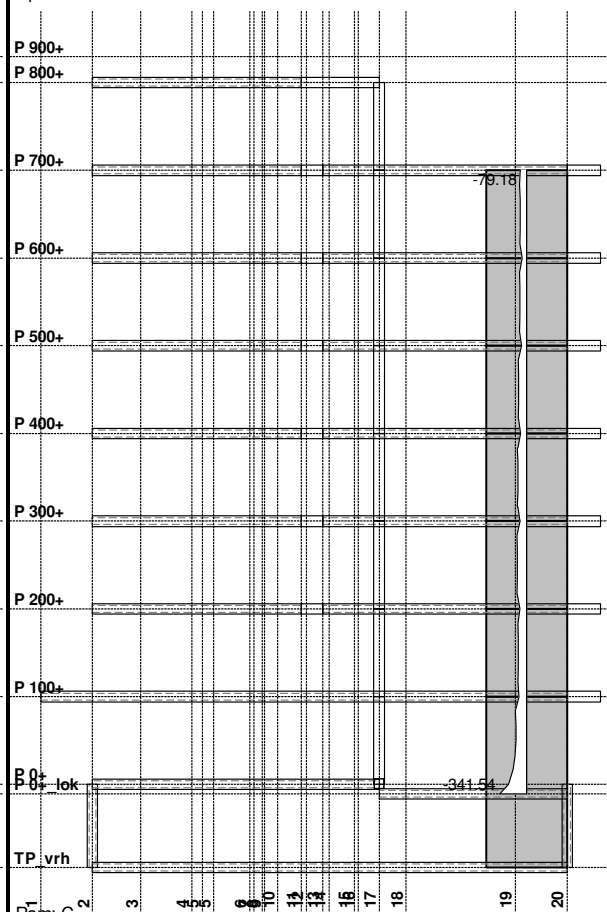
Vektorski preseči: Nn



Ram: B

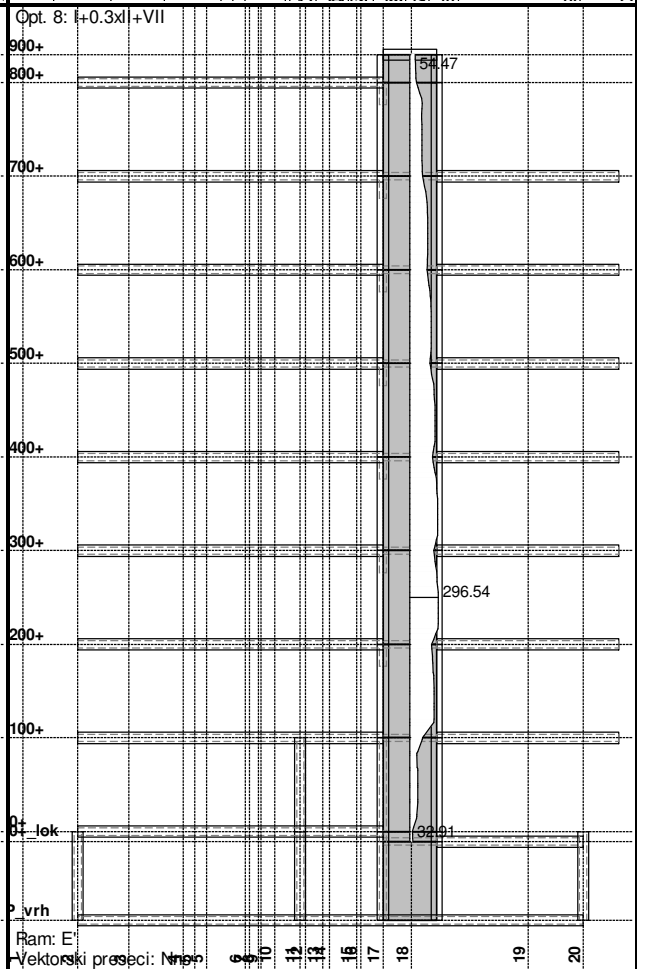
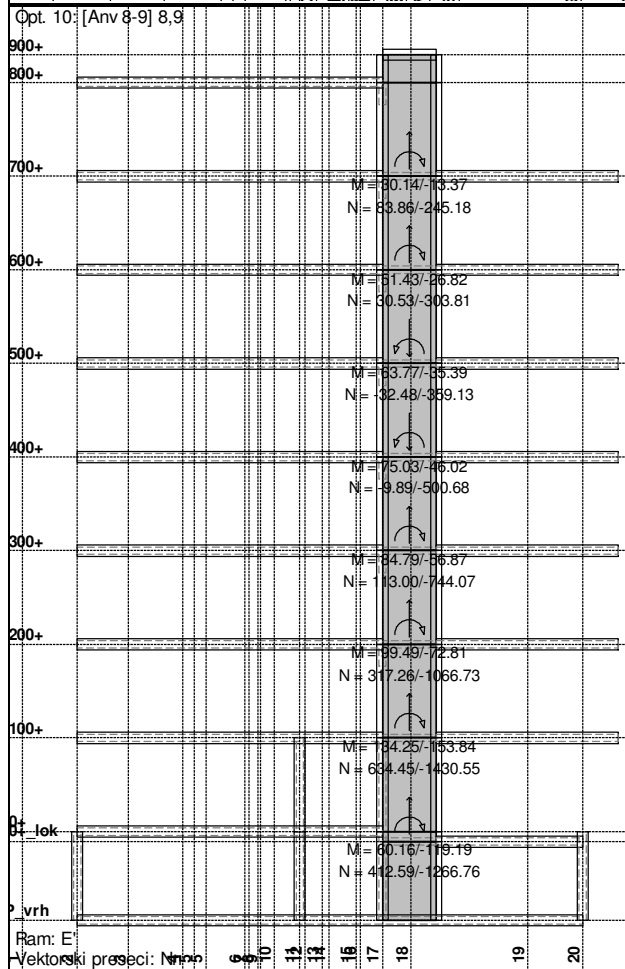
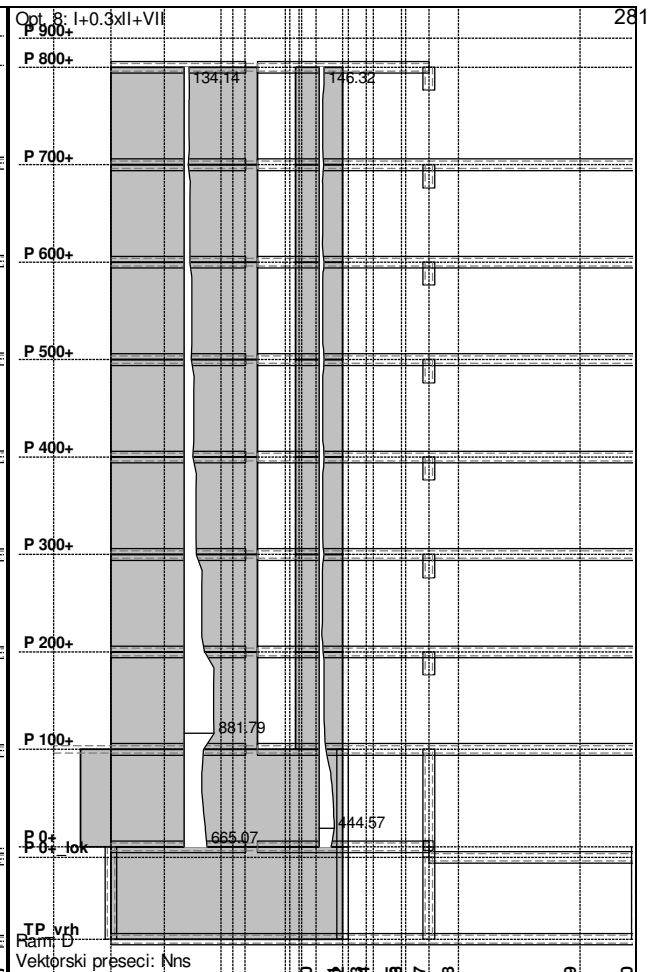
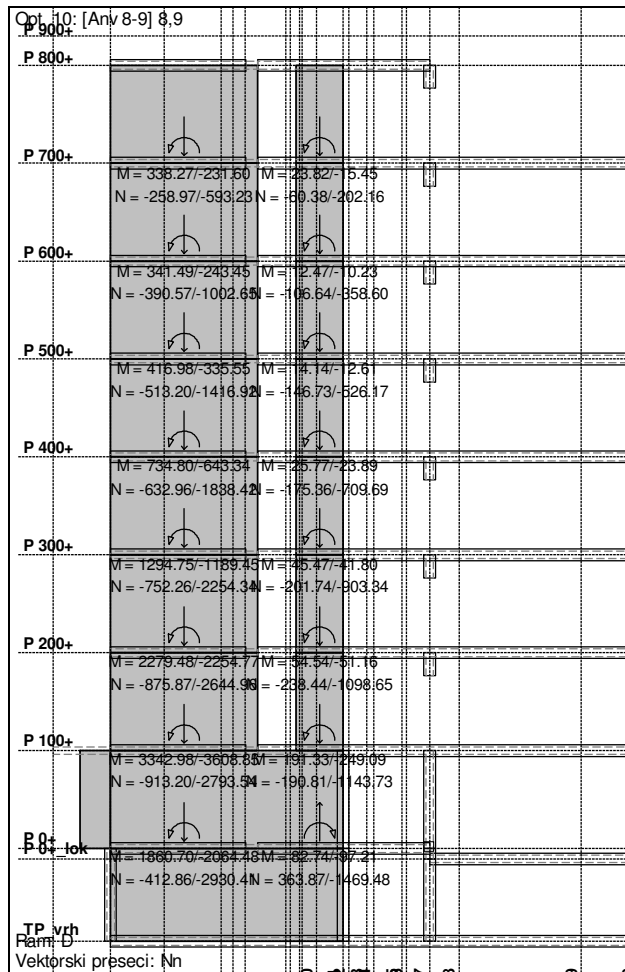
Vektorski preseči: Nns

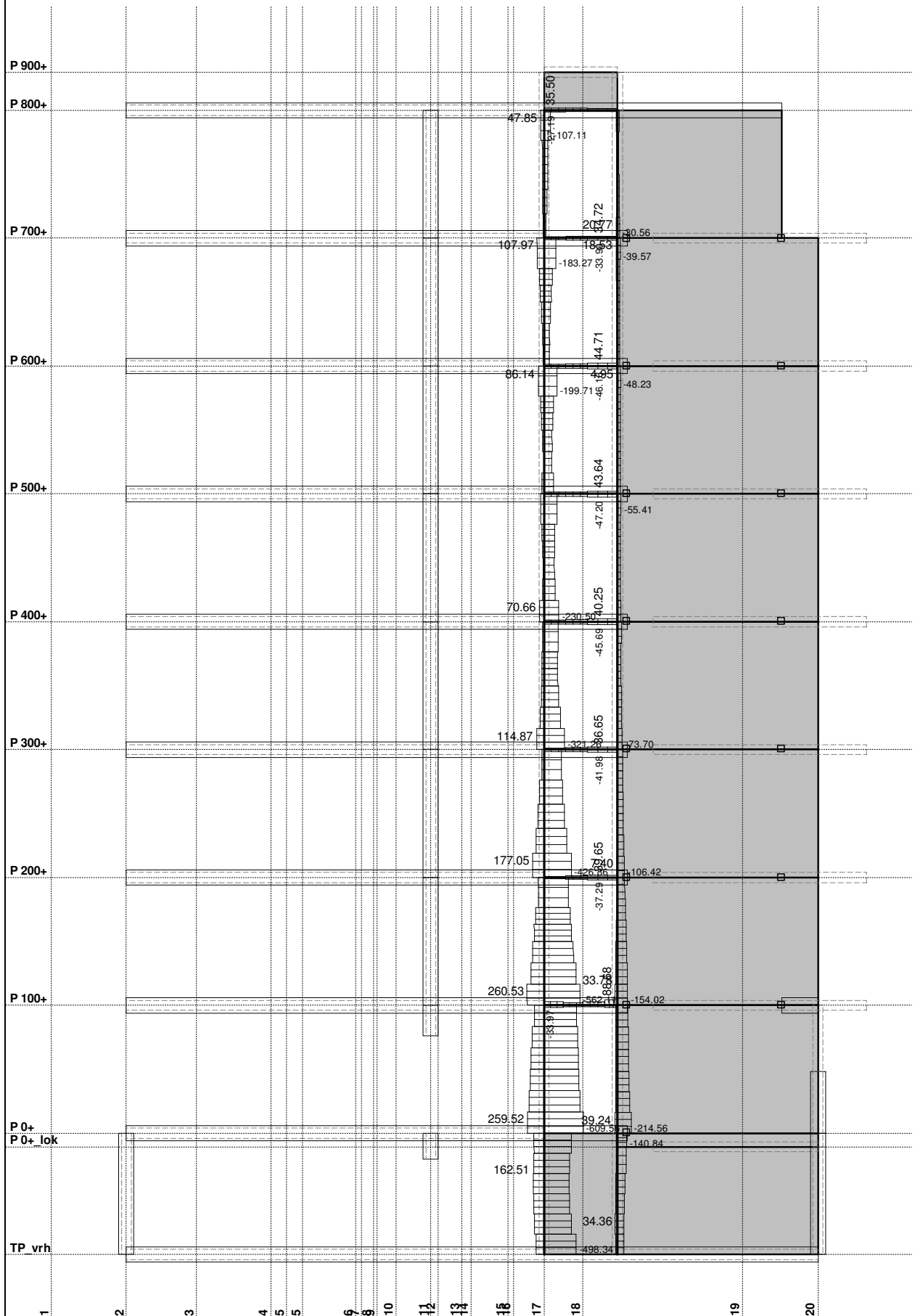
Opt. 9: I+0.5xII-1xVII



Ram: C

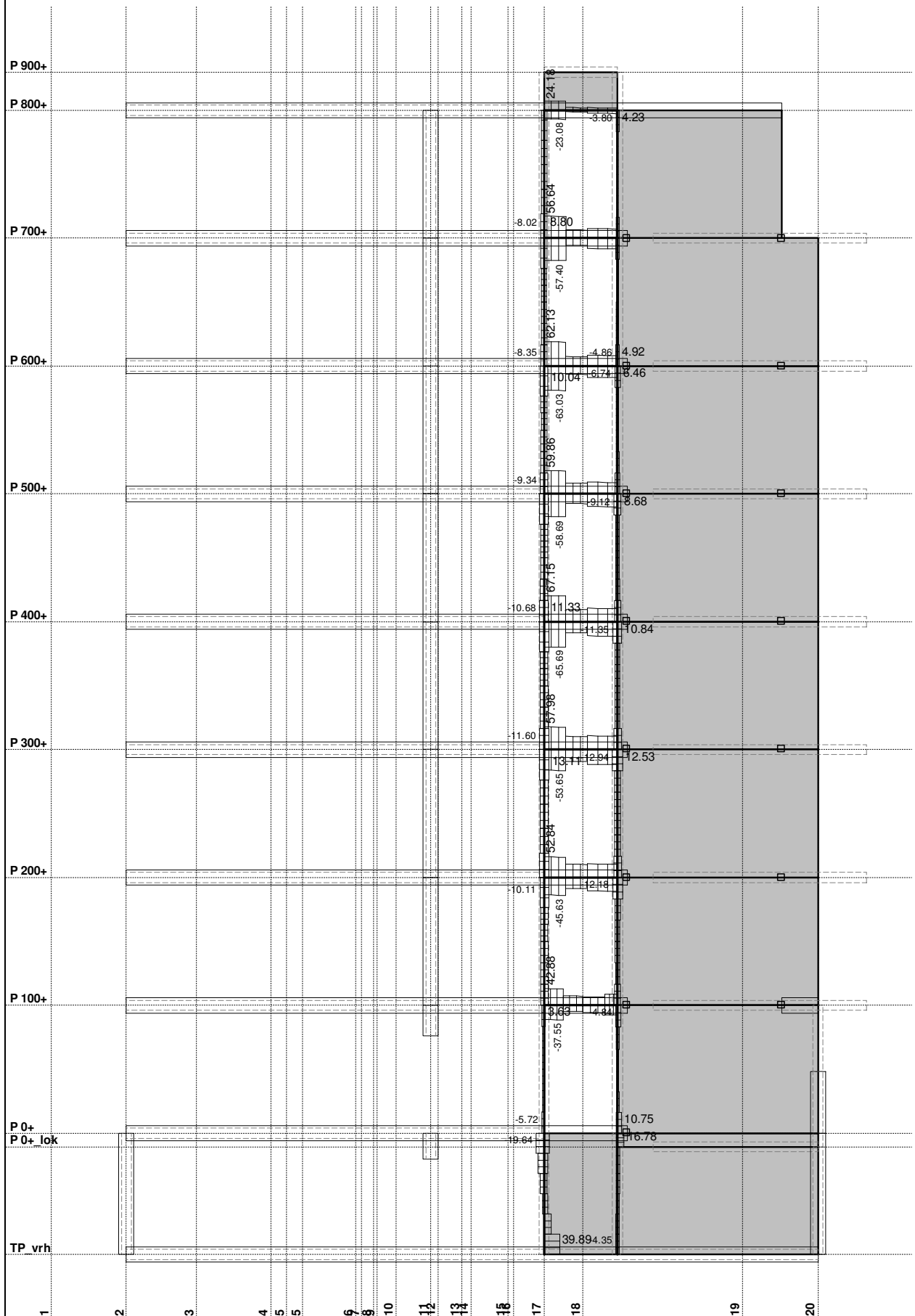
Vektorski preseči: Nns





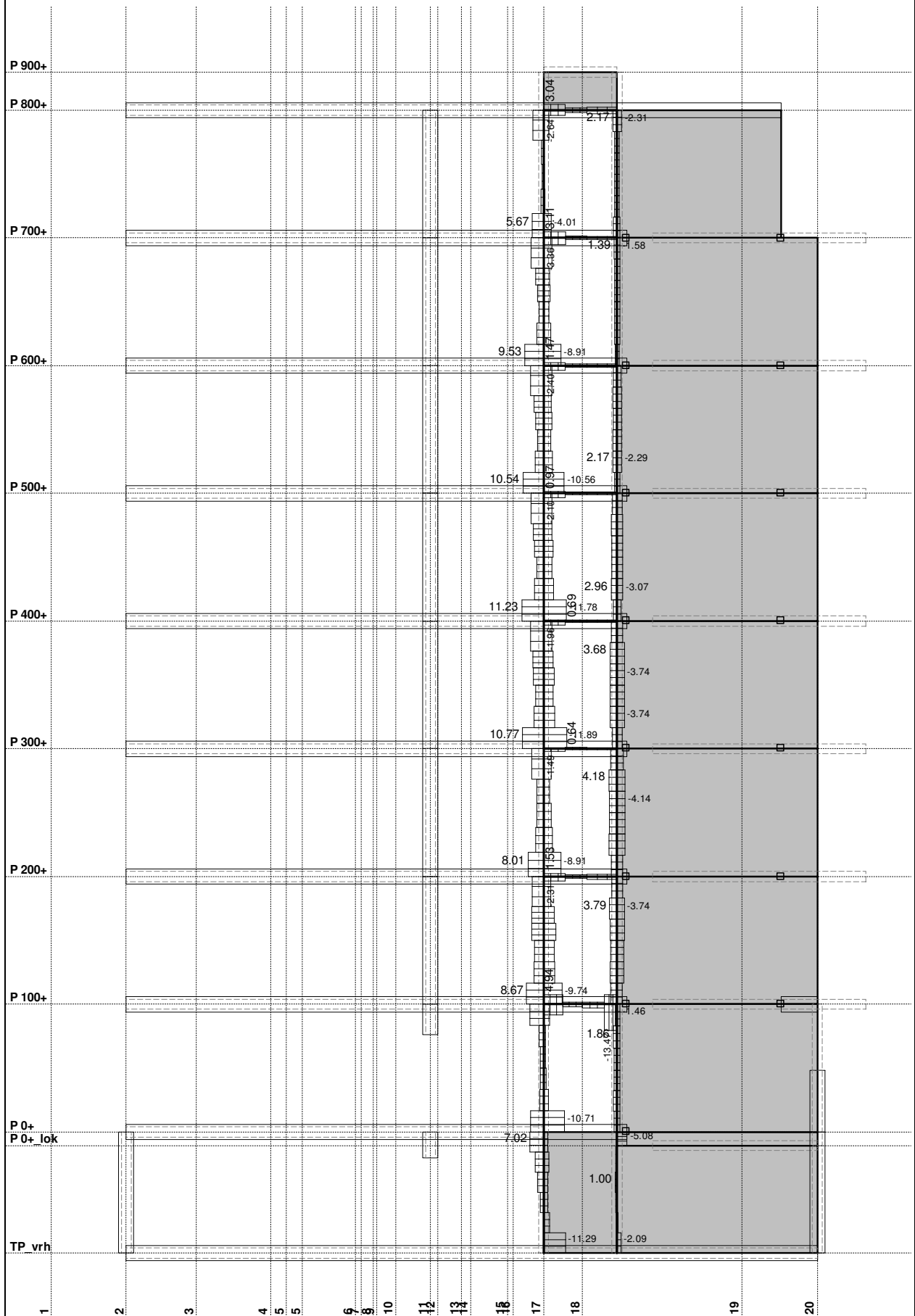
Ram: E

Uticaji u gredi: max N1 = 260.53 / min N1 = -609.56 kN



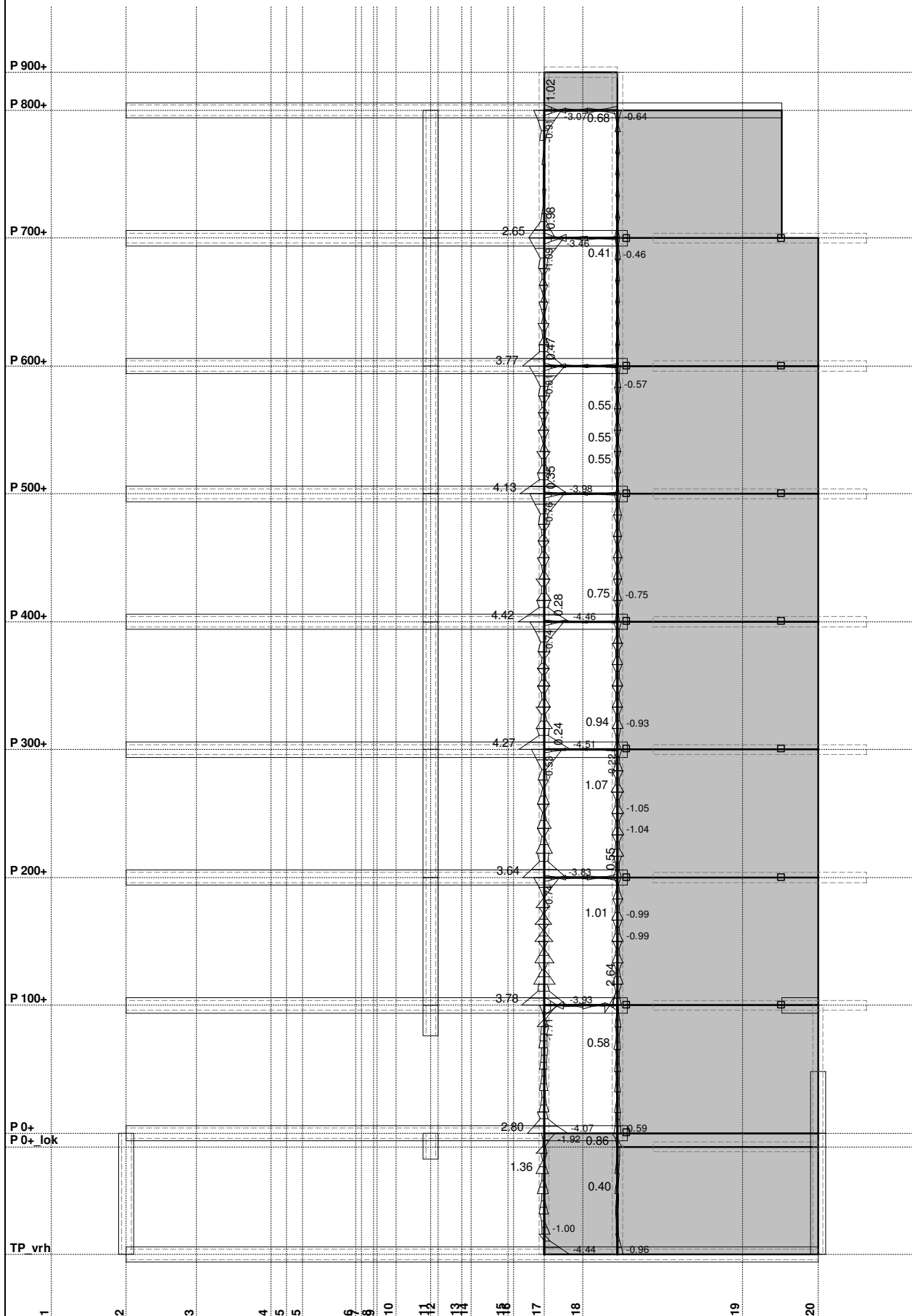
Ram: E

Uticaji u gredi: max T2= 67.15 / min T2= -65.69 kN



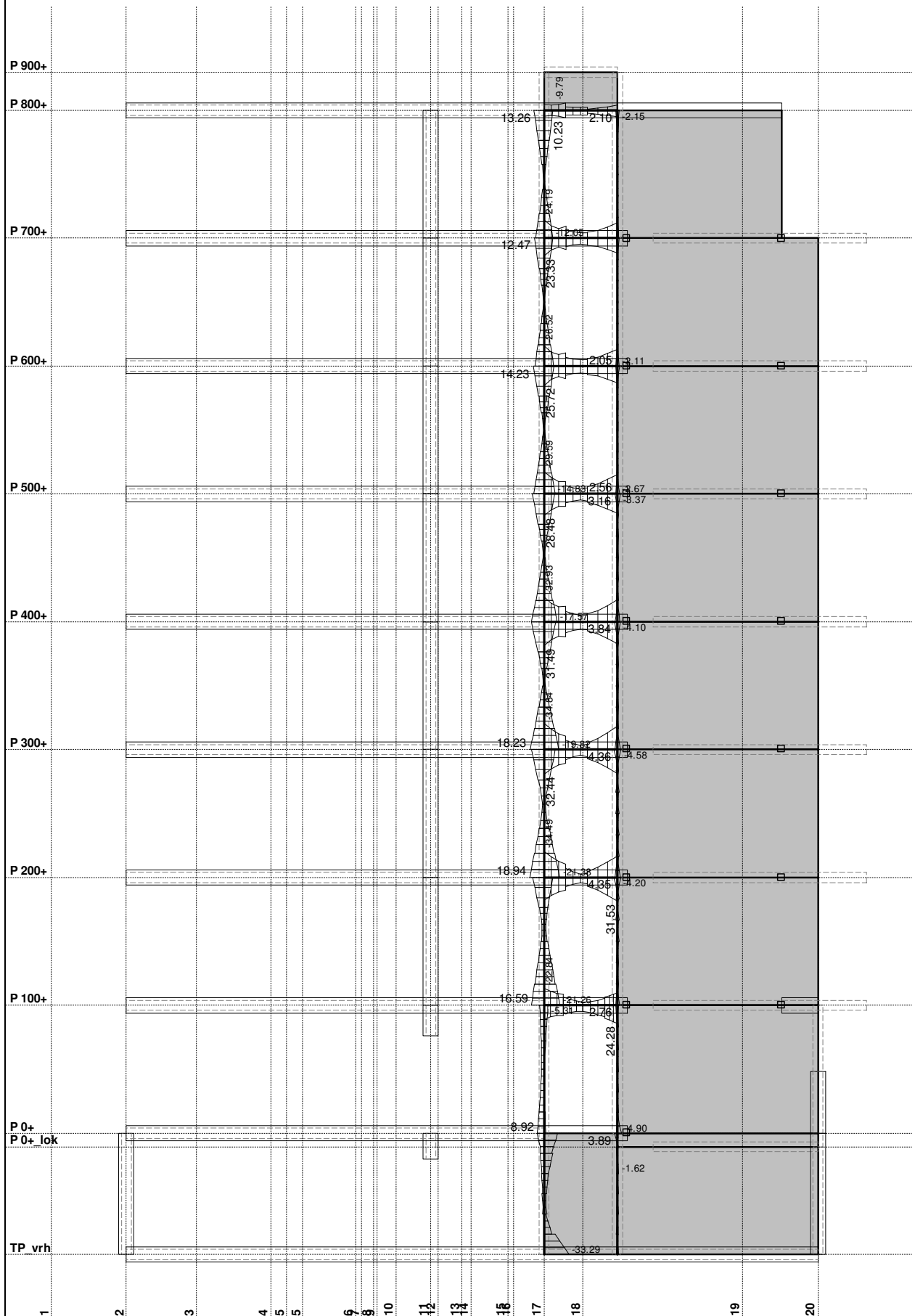
Ram: E

Uticaji u gredi: max T3= 11.23 / min T3= -13.47 kN



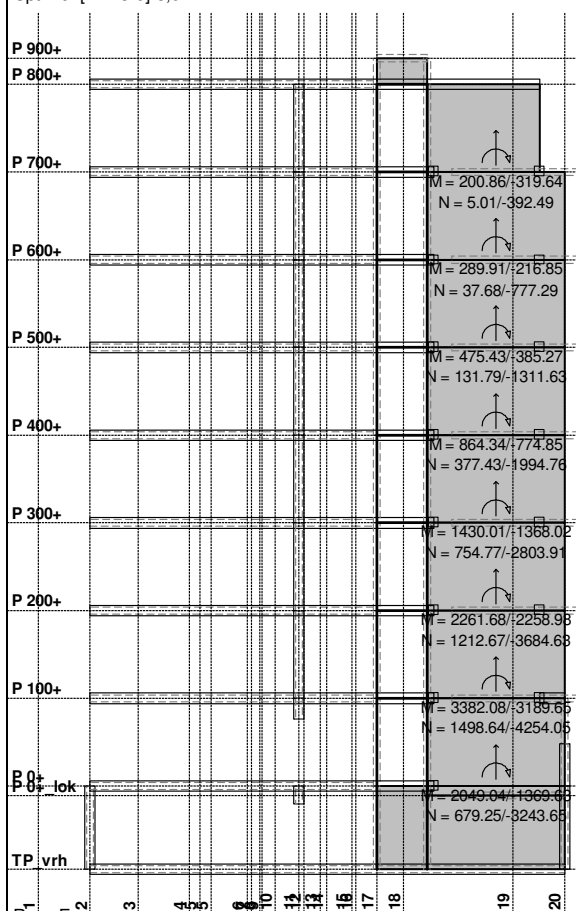
Ram: E

Uticaji u gredi: max M2= 4.42 / min M2= -4.51 kNm

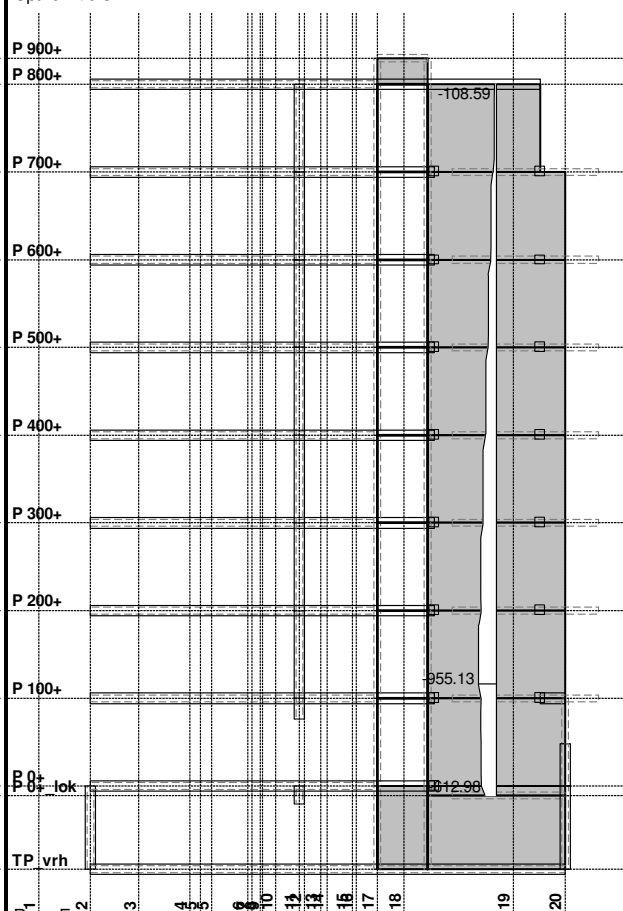


Ram: E

Uticaji u gredi: max M3= 32.44 / min M3= -34.84 kNm

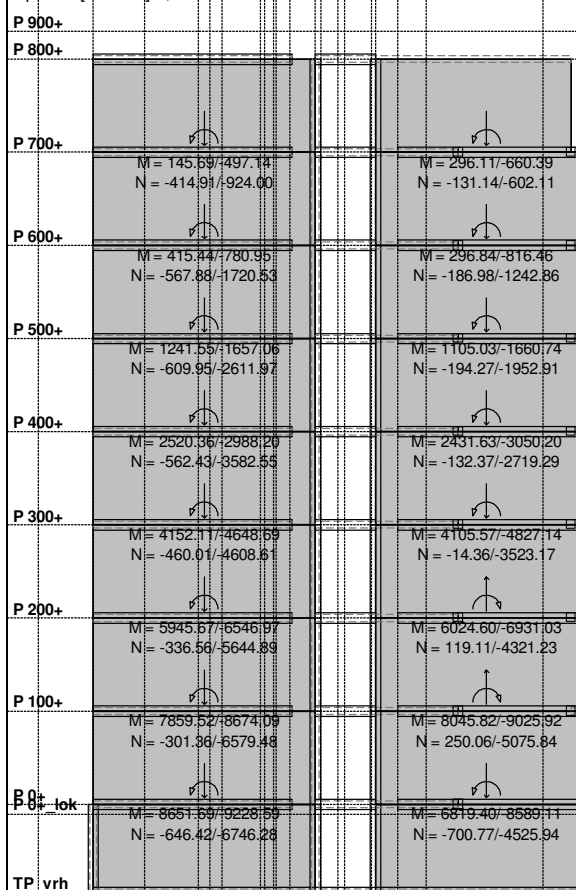


Ram: E
Vektorski preseči: Nn



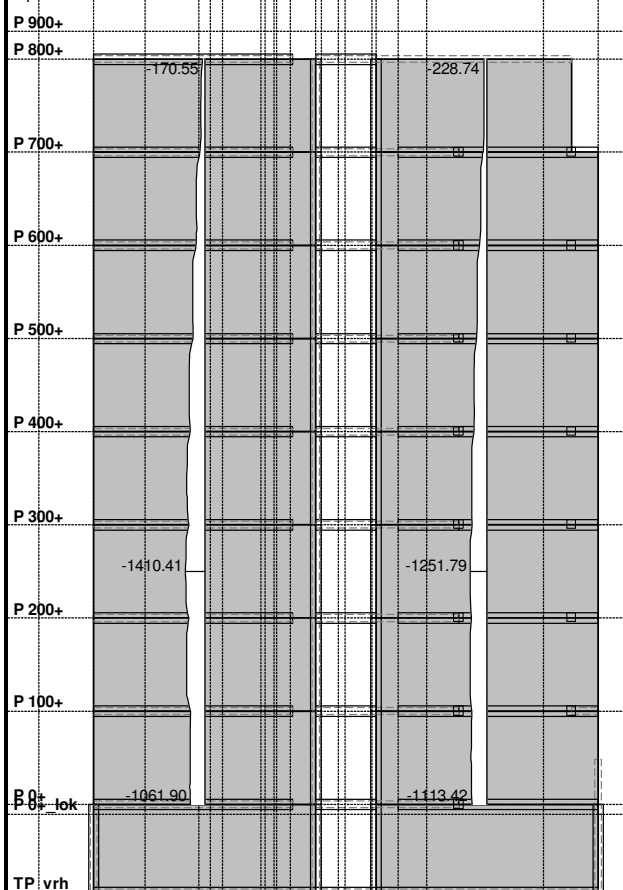
Ram: E
Vektorski preseči: Nns

Opt. 10: [Anv 8-9] 8,9

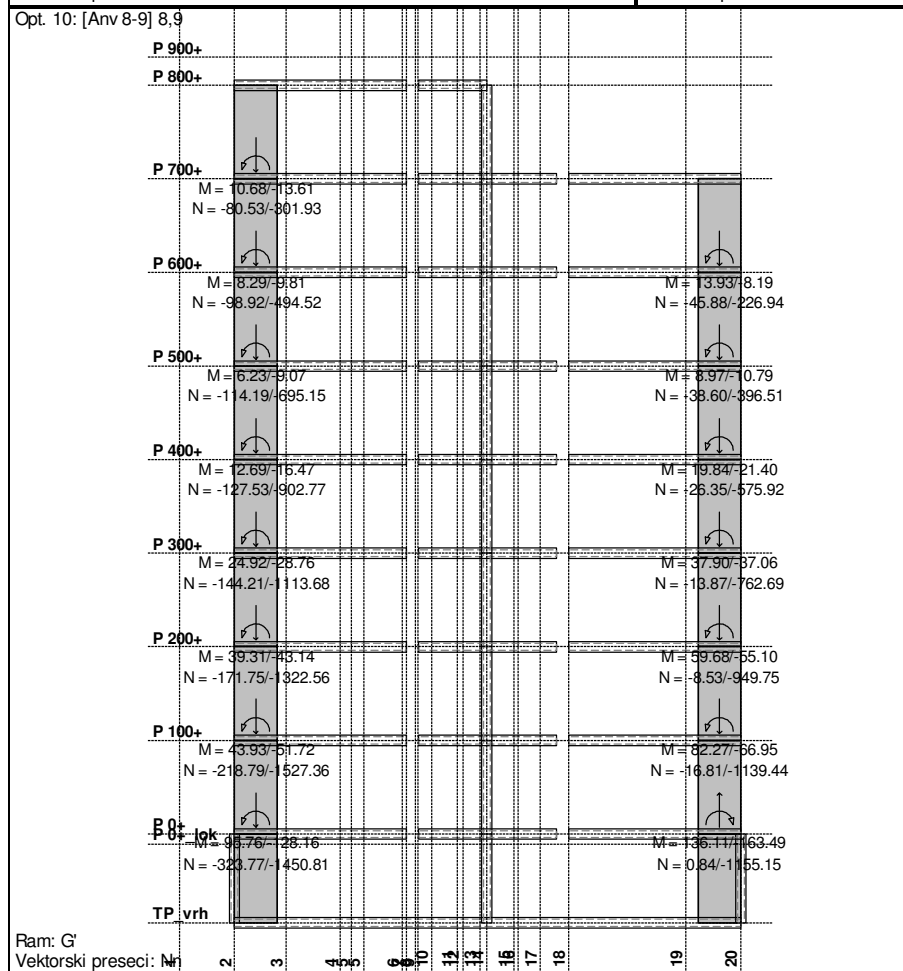
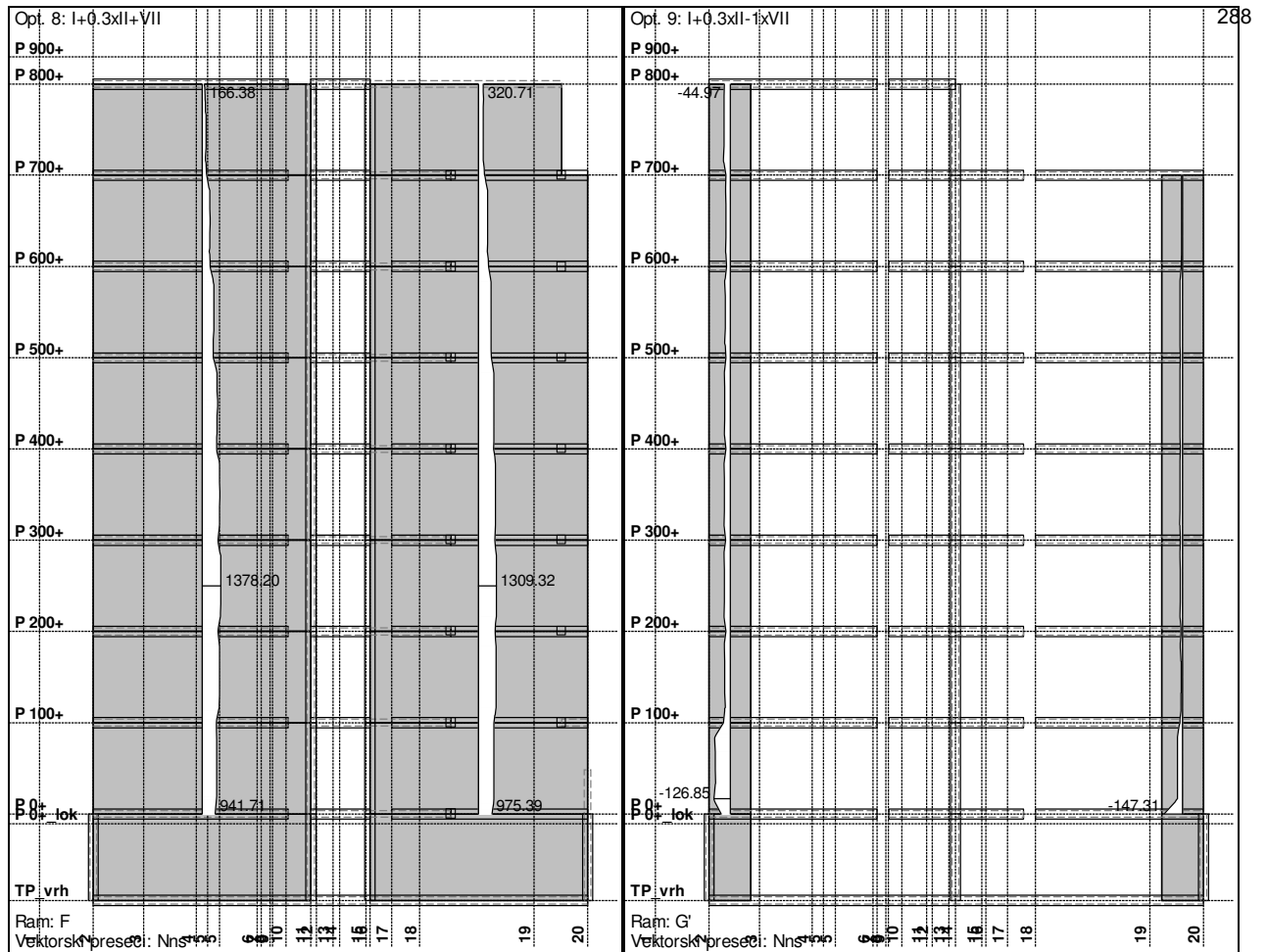


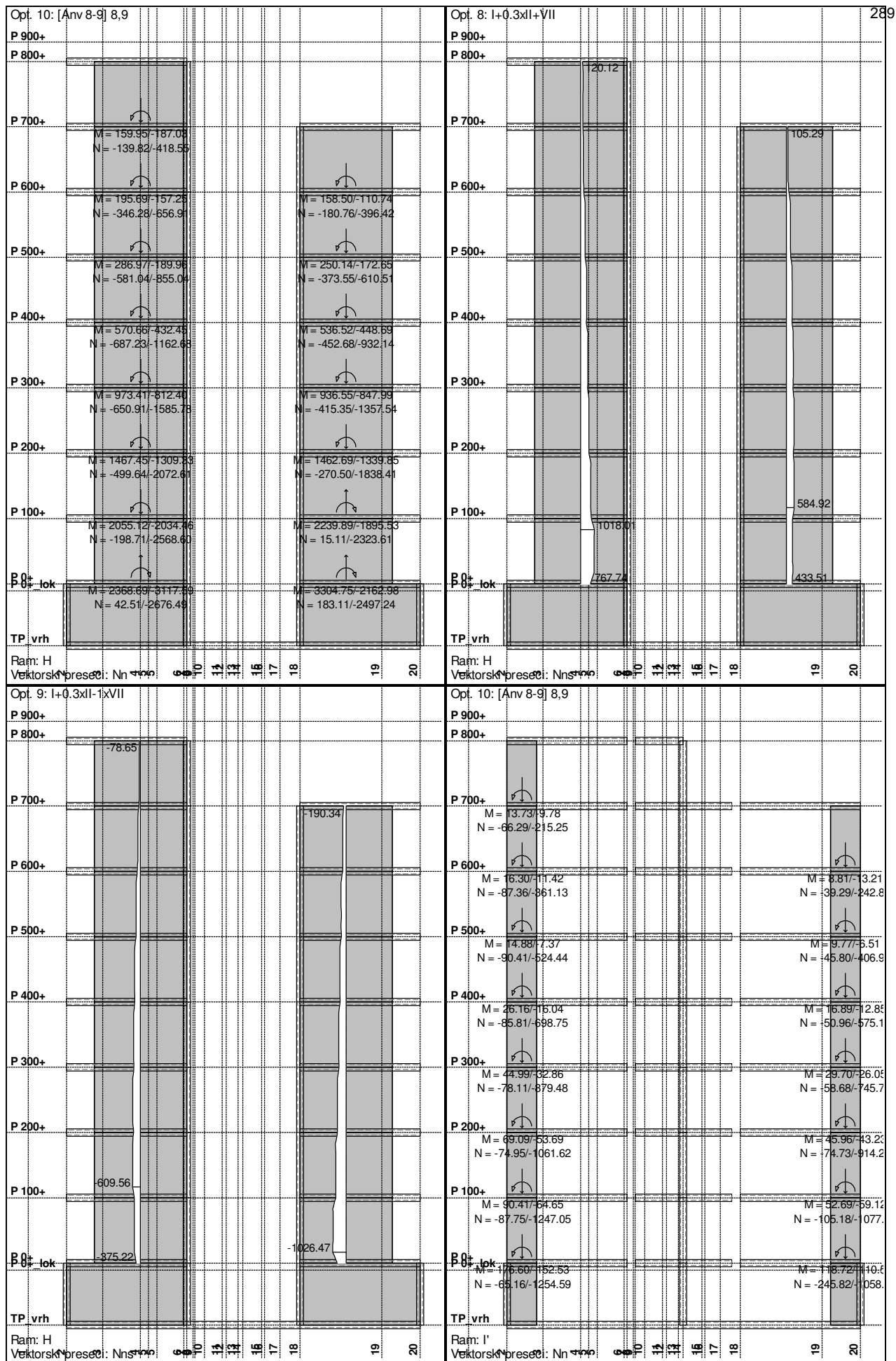
Ram: F
Vektorski preseči: Nn

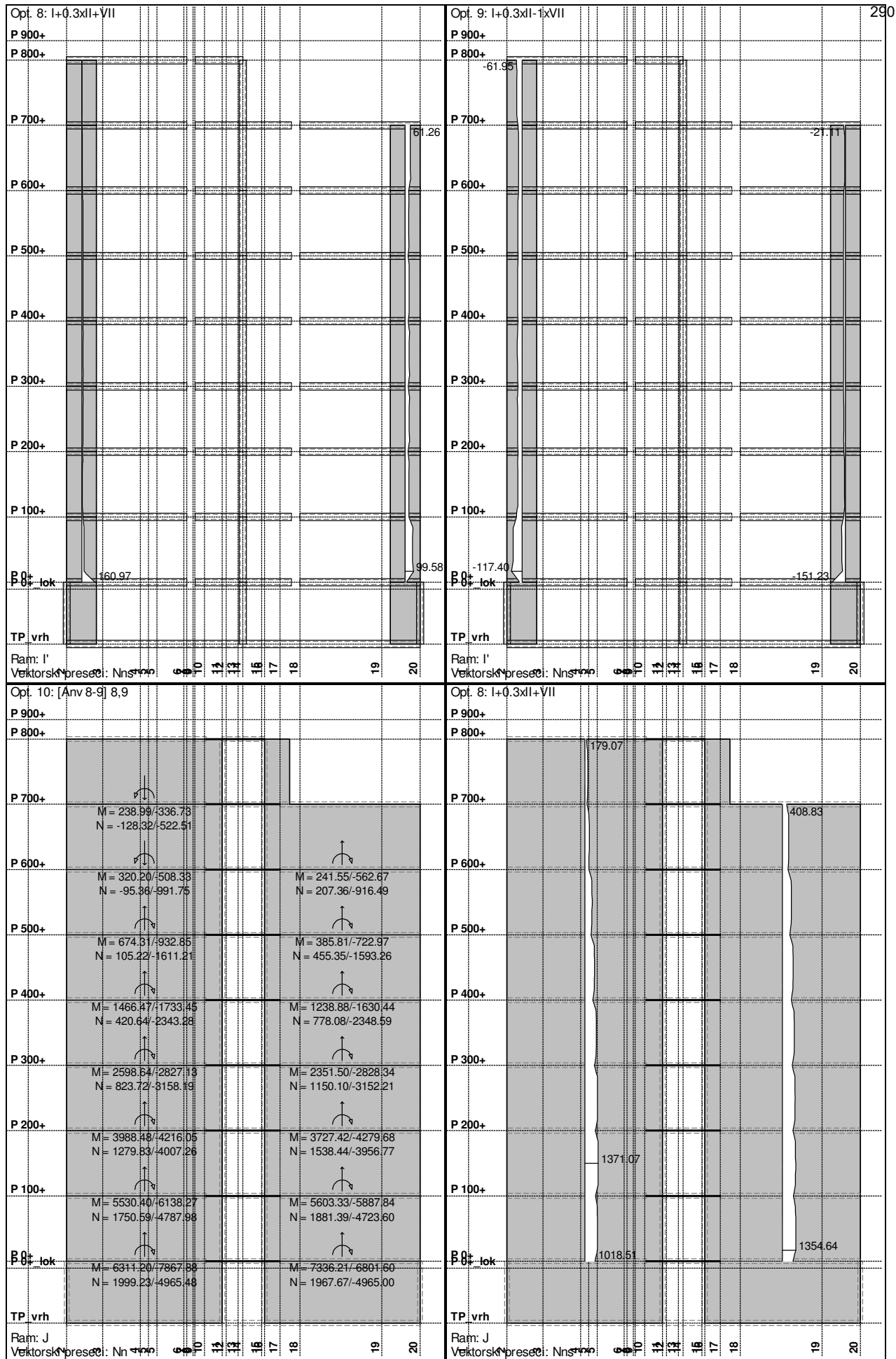
Opt. 9: I+0.3xII-1xVII

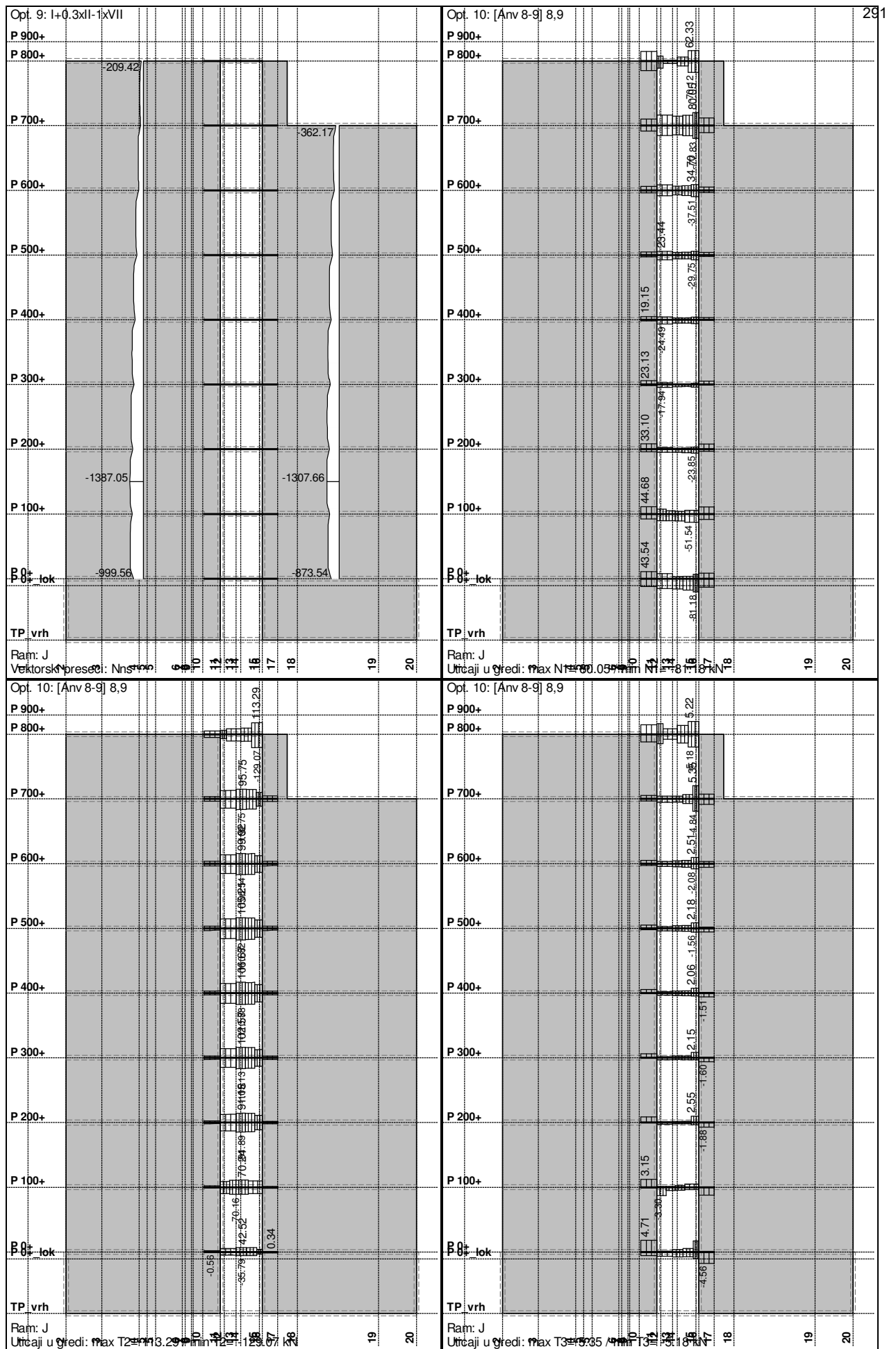


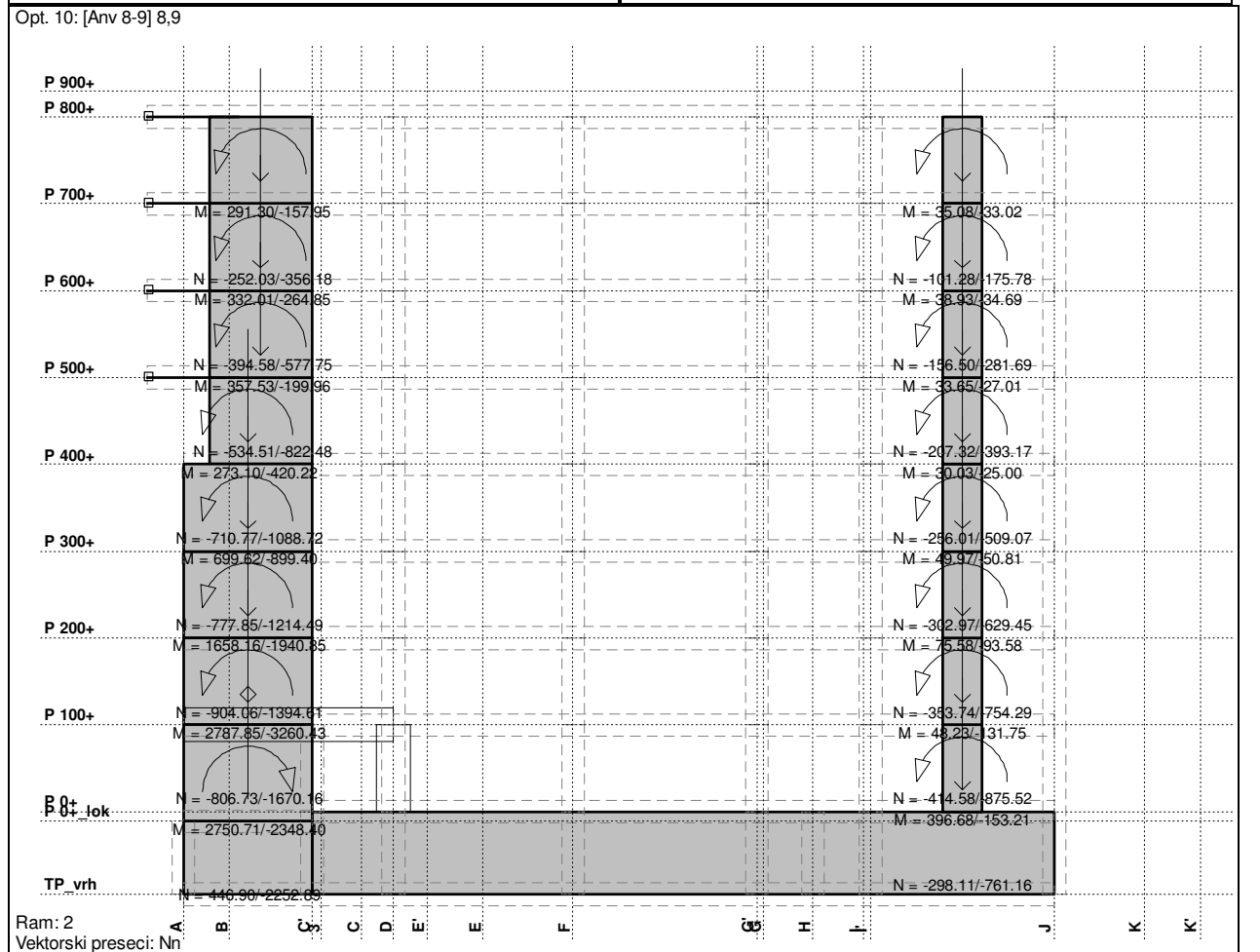
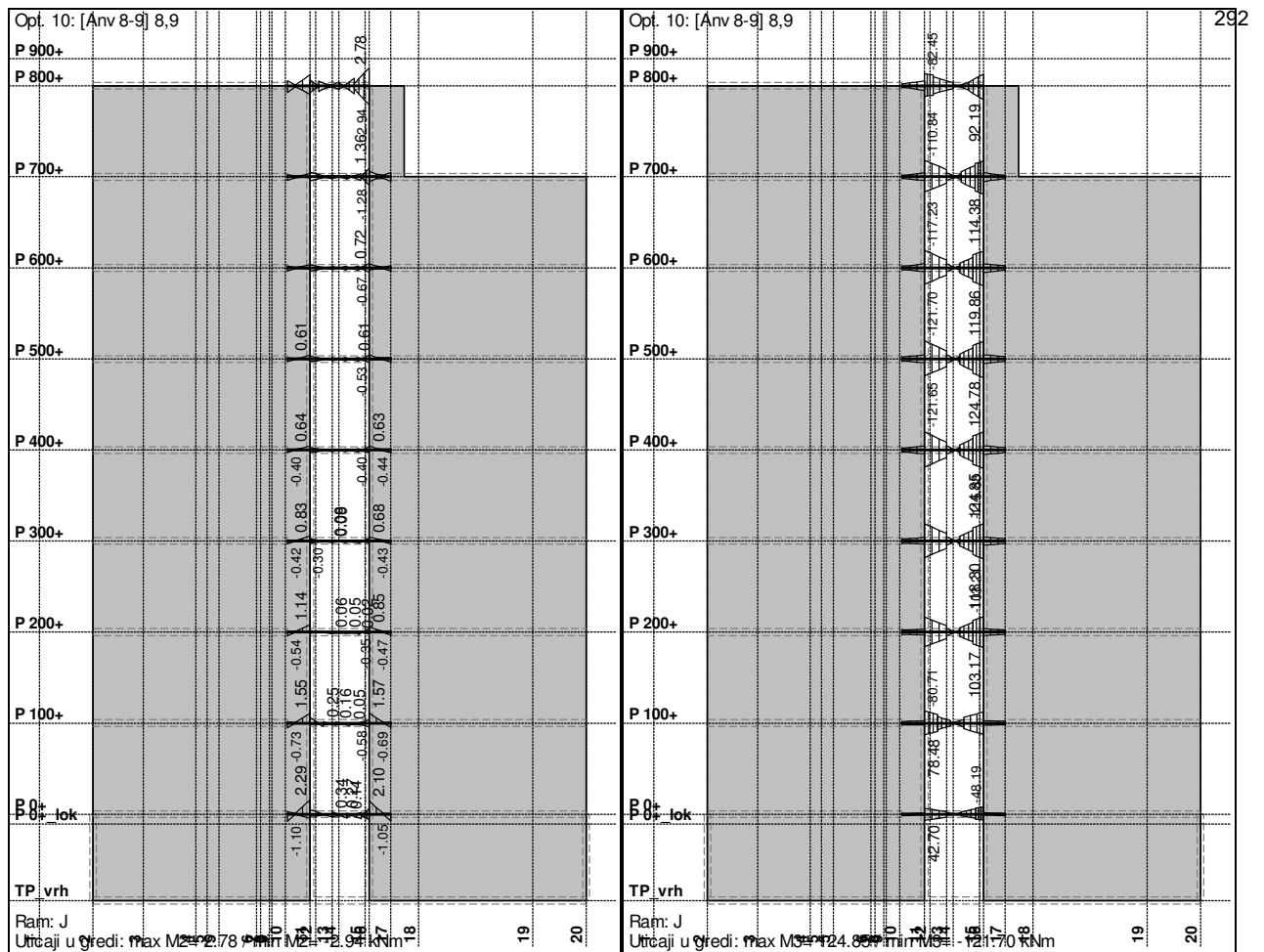
Ram: F
Vektorski preseči: Nns

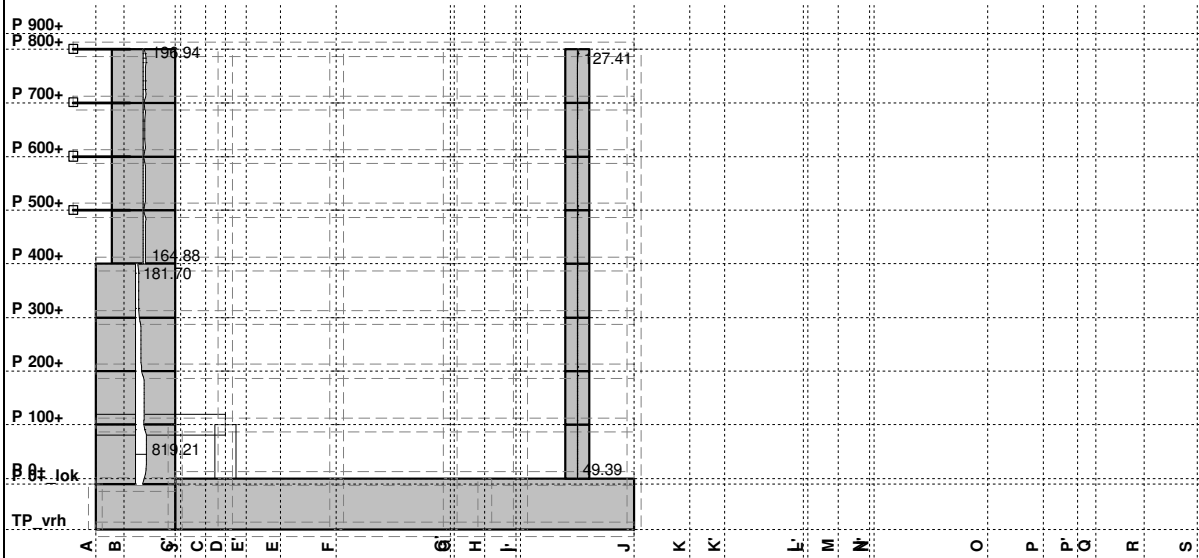






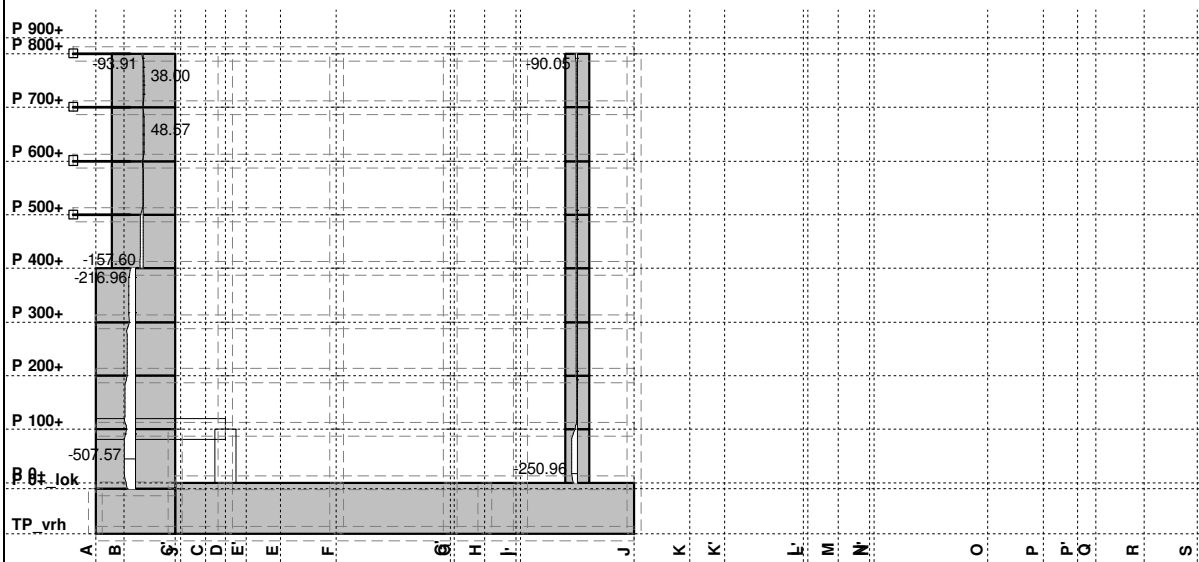




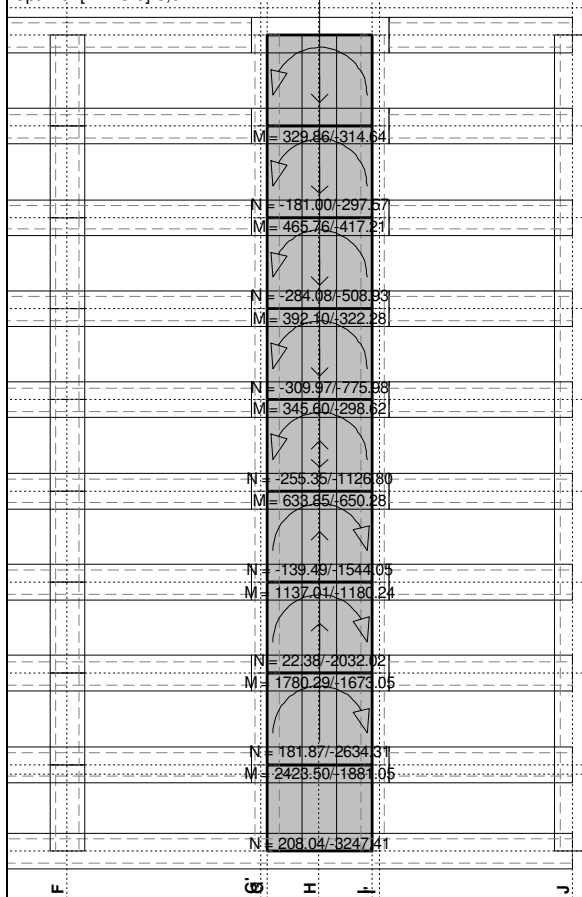


Ram: 2
Vektorski presecci: Nns

Opt. 9: I+0.3xII-1xVII

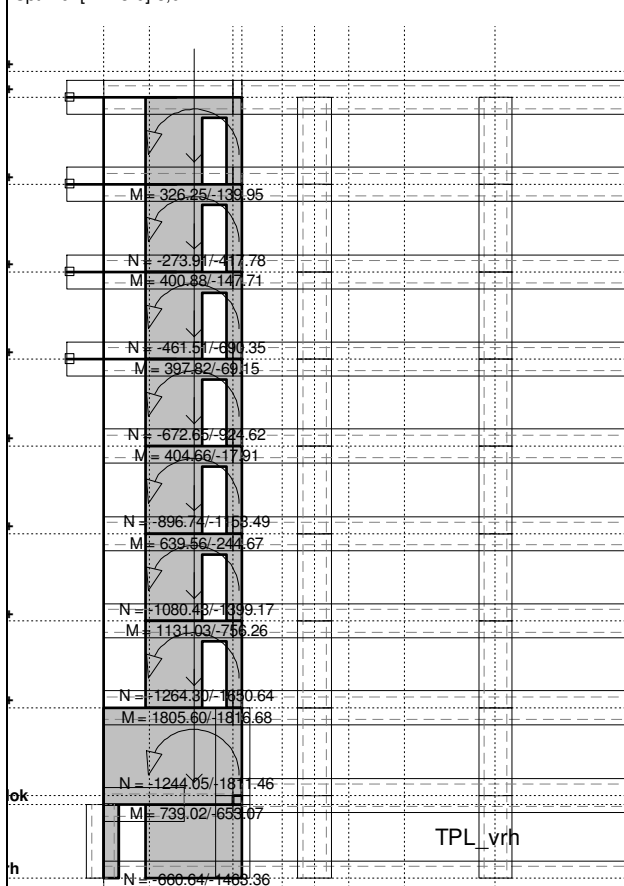


Ram: 2
Vektorski presecci: Nns

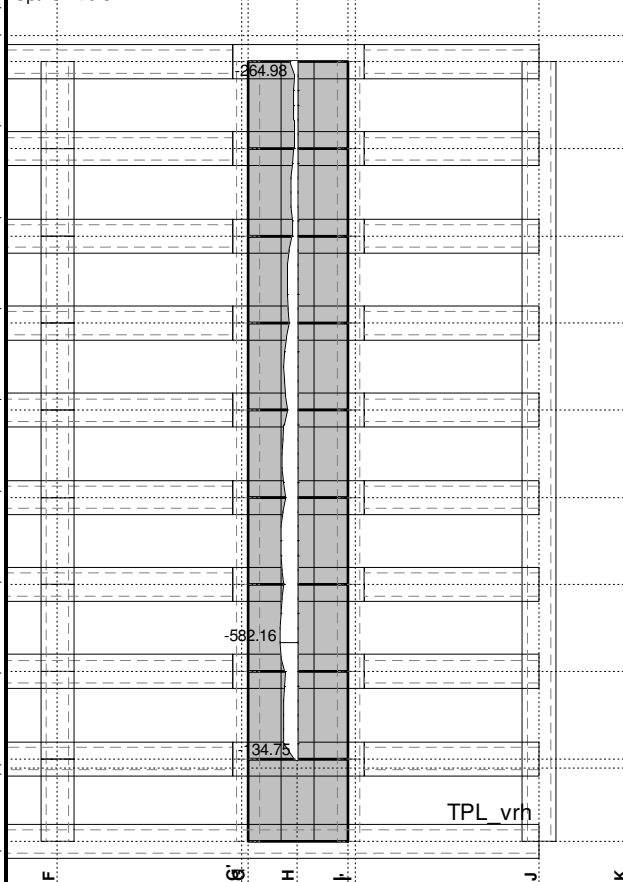


Ram: 7
Vektorski presezi: Nn

Opt. 10: [Anv 8-9] 8,9

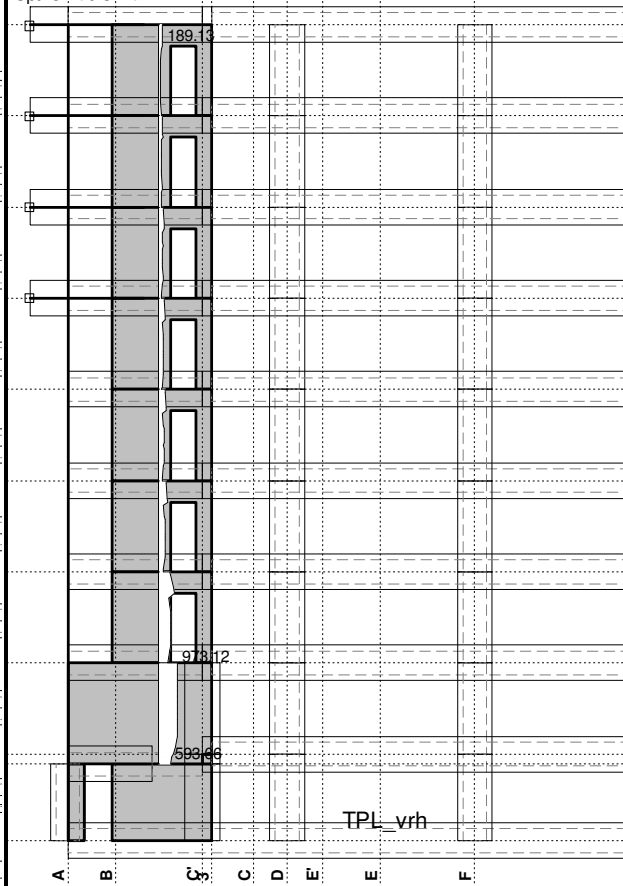


Ram: 8
Vektorski presezi: Nn

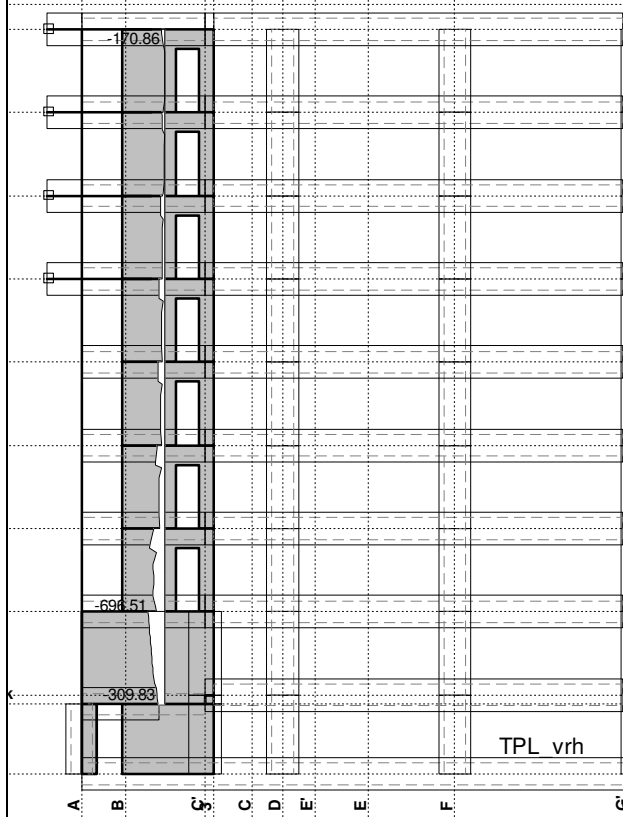


Ram: 7
Vektorski presezi: Nns

Opt. 8: I+0.3xII+VII

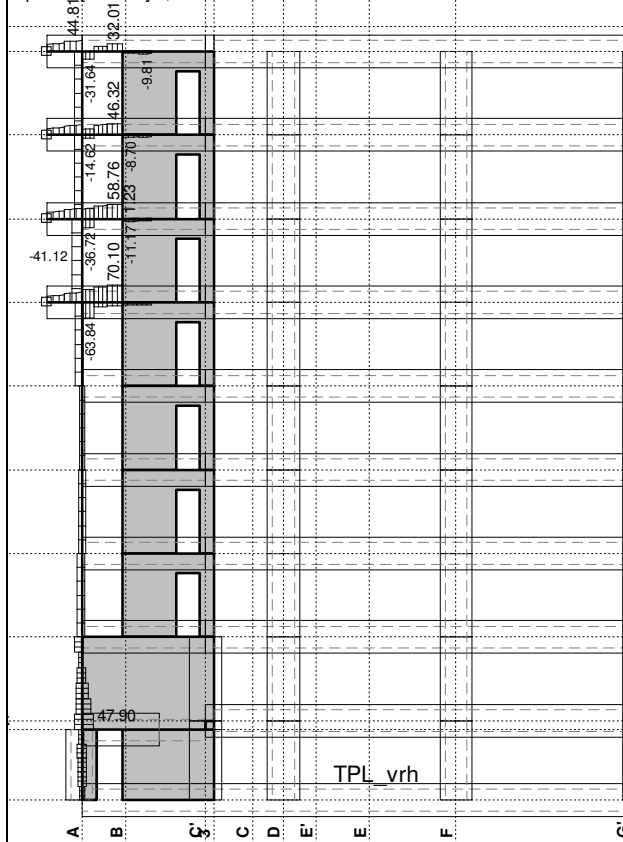


Ram: 8
Vektorski presezi: Nns

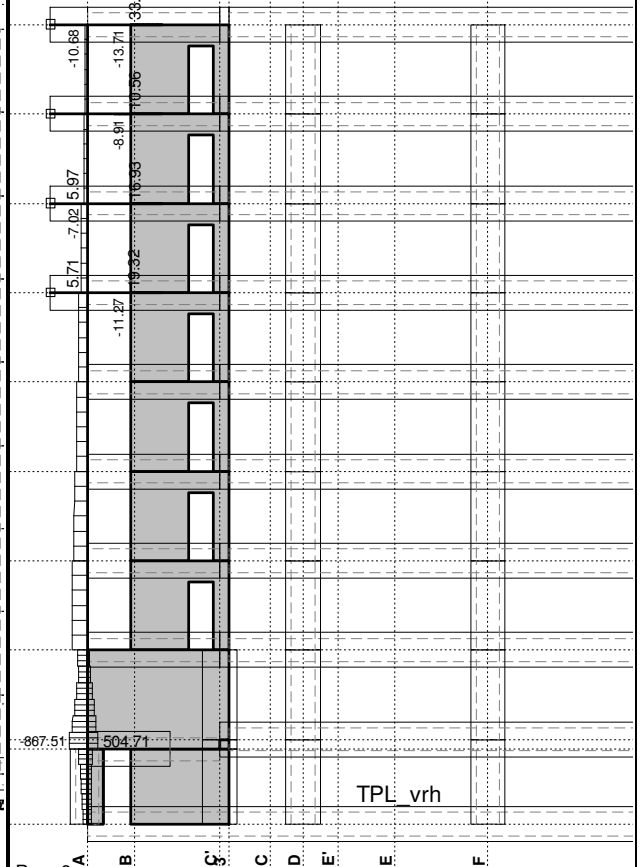


Ram: 8
Vektorski presecci: Nns

Opt. 10: [Anv 8-9] 8,9

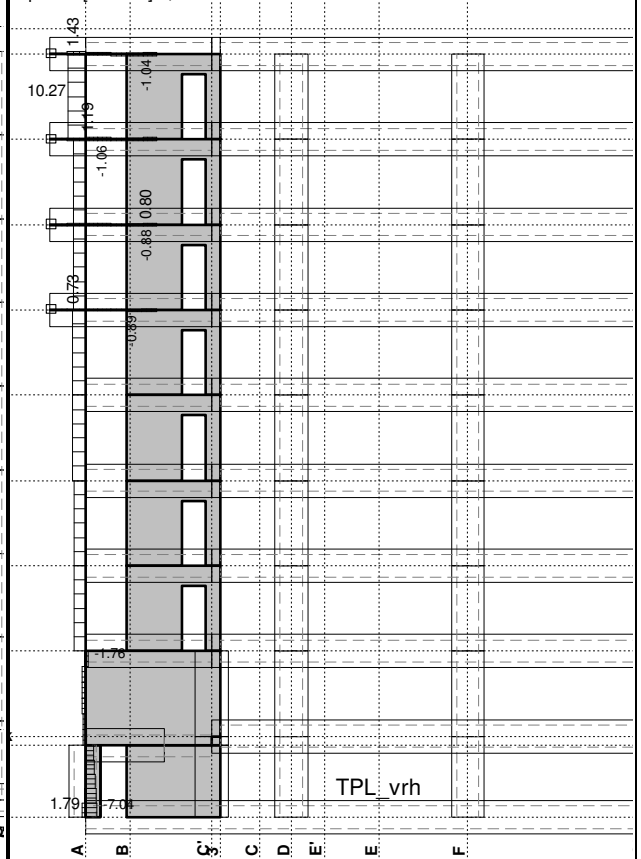


Ram: 8
Uticaji u gredi: max T2= 70.10 / min T2= -63.84 kN



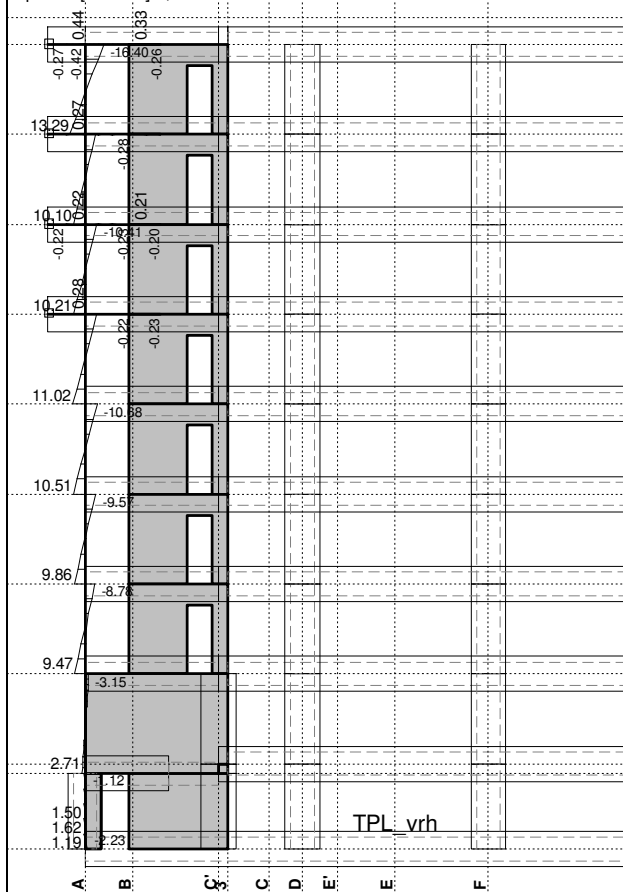
Ram: 8
Uticaji u gredi: max N1= 504.71 / min N1= -867.51 kN

Opt. 10: [Anv 8-9] 8,9



Ram: 8
Uticaji u gredi: max T3= 10.27 / min T3= -7.04 kN

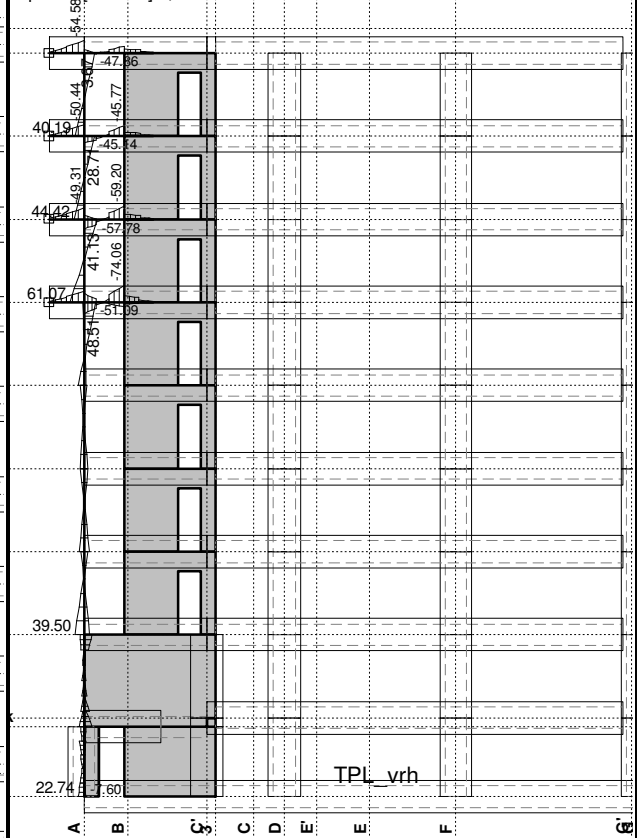
Opt. 10: [Anv 8-9] 8,9



Ram: 8

Utjecaji u gredi: max M2= 13.29 / min M2= -16.40 kNm

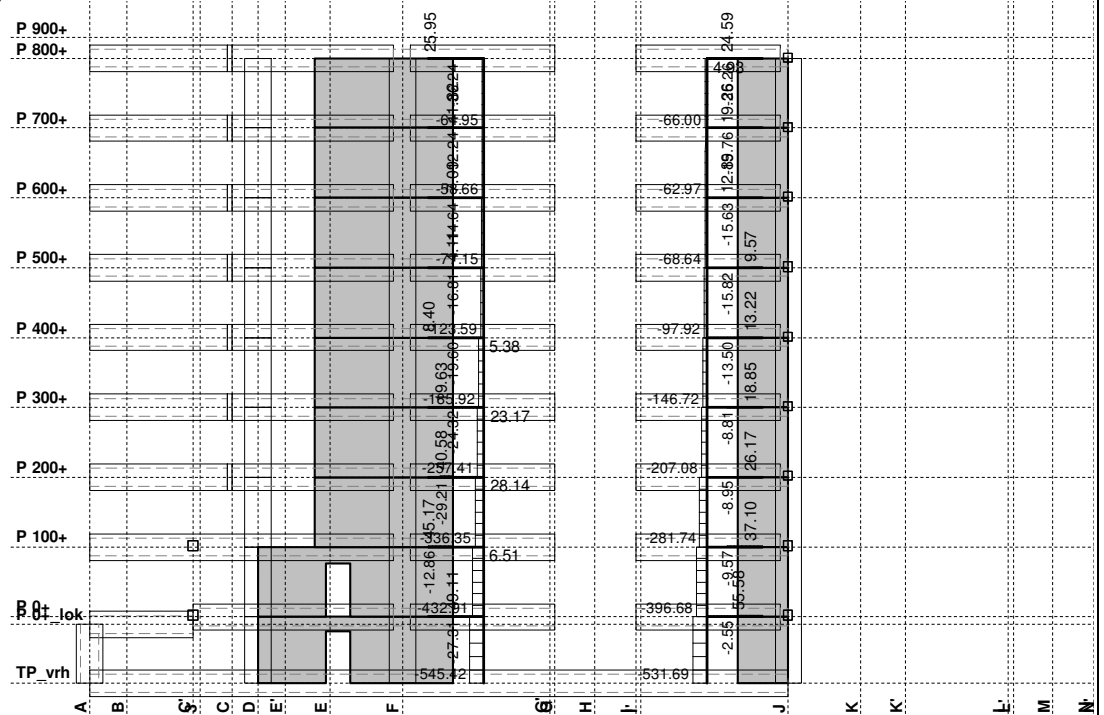
Opt. 10: [Anv 8-9] 8,9



Ram: 8

Utjecaji u gredi: max M3= 61.07 / min M3= -74.06 kNm

Opt. 10: [Anv 8-9] 8,9



Ram: 11

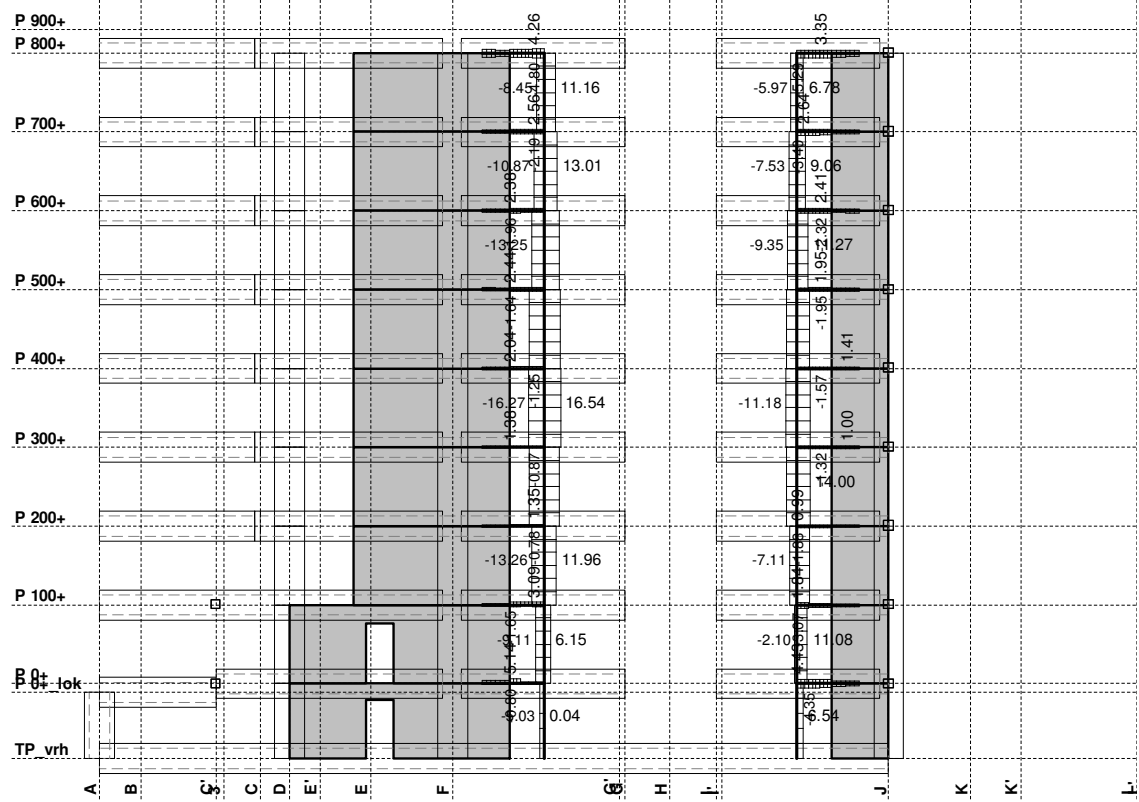
Utjecaji u gredi: max N1= 55.58 / min N1= -545.42 kN



Ram: 11

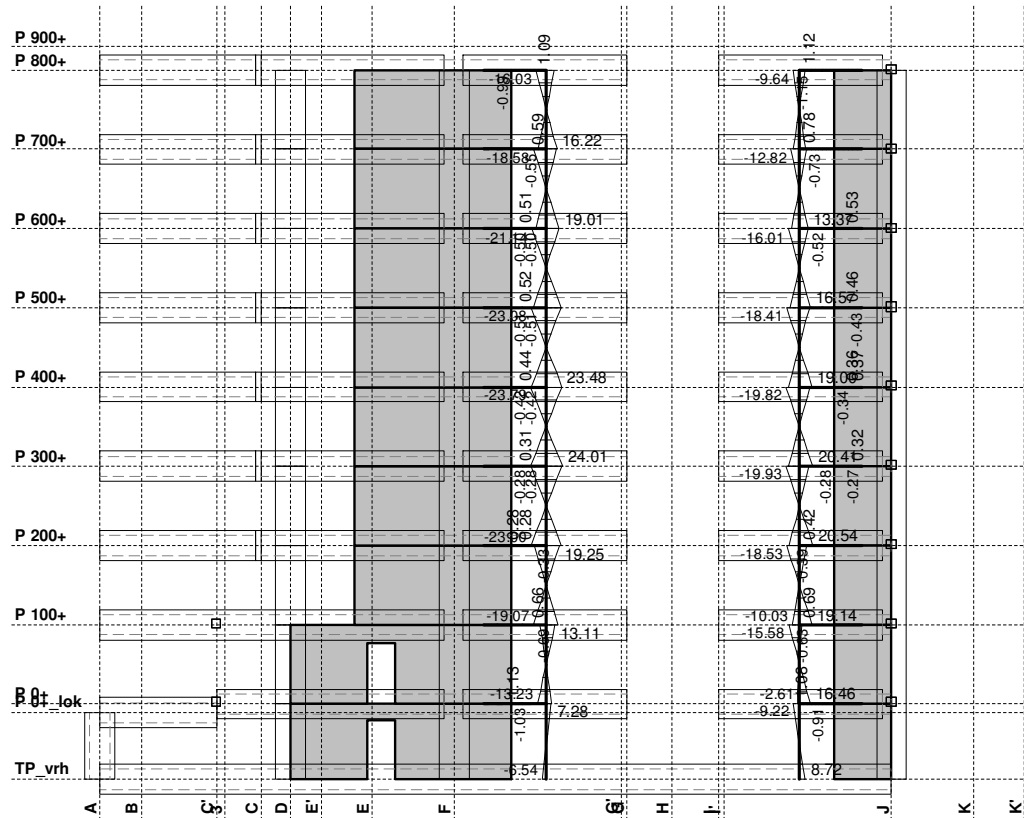
Uticaji u gredi: max T2= 178.58 / min T2= -194.15 kN

Opt. 10: [Anv 8-9] 8,9



Ram: 11

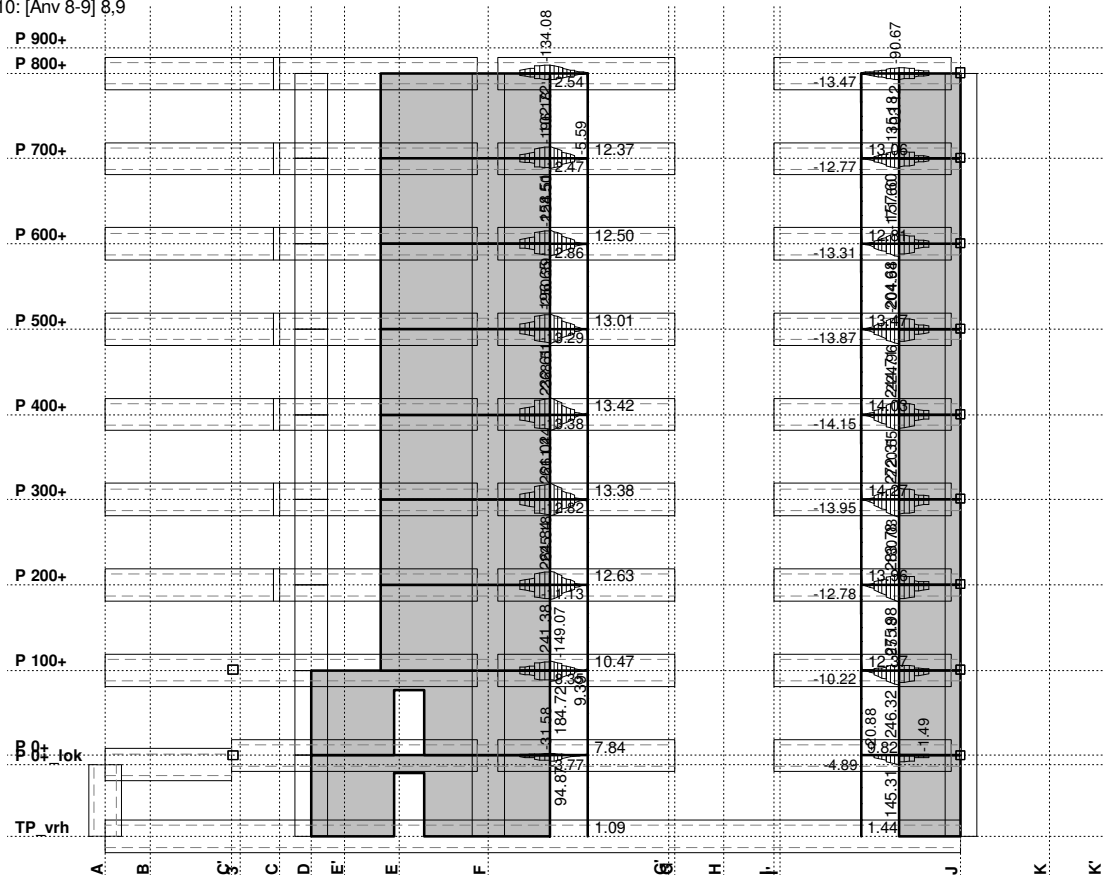
Uticaji u gredi: max T3= 16.54 / min T3= -16.27 kN



Ram: 11

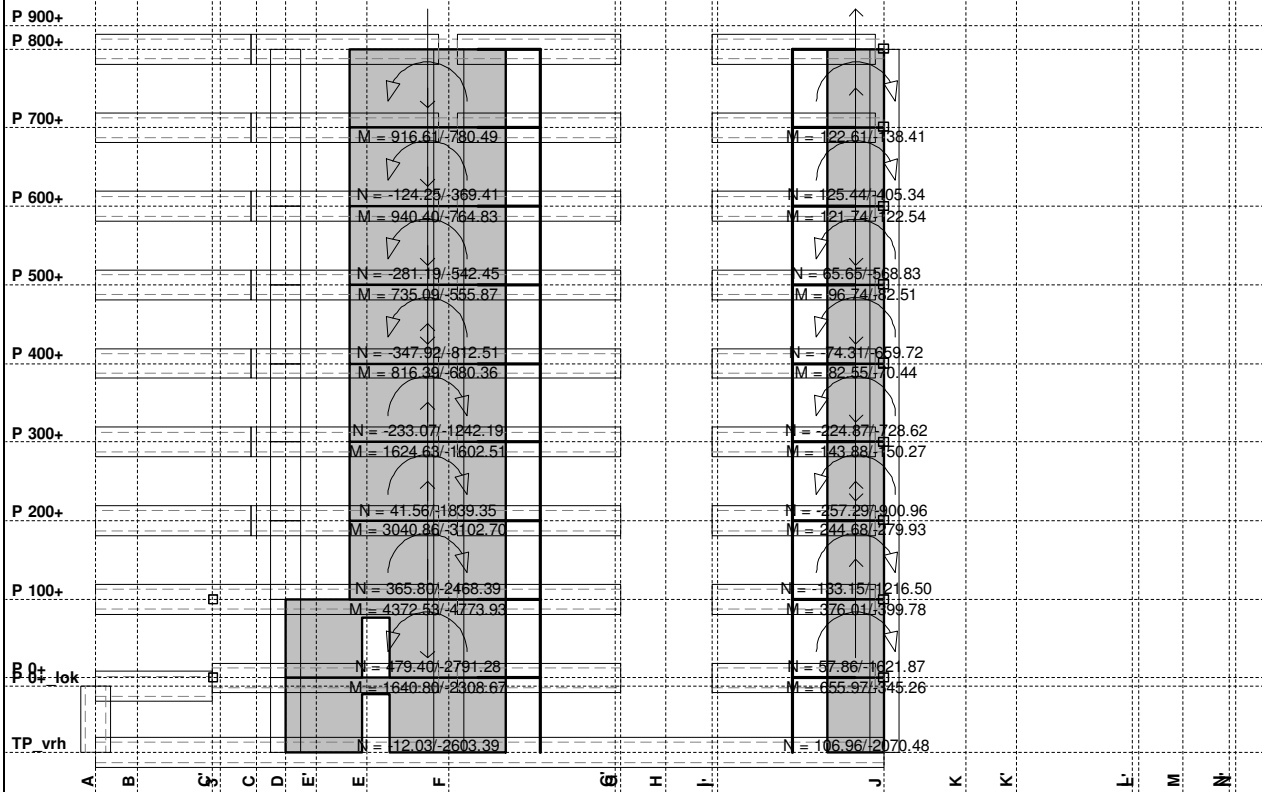
Uticaji u gredi: max M2= 24.01 / min M2= -23.79 kNm

Opt. 10: [Anv 8-9] 8,9



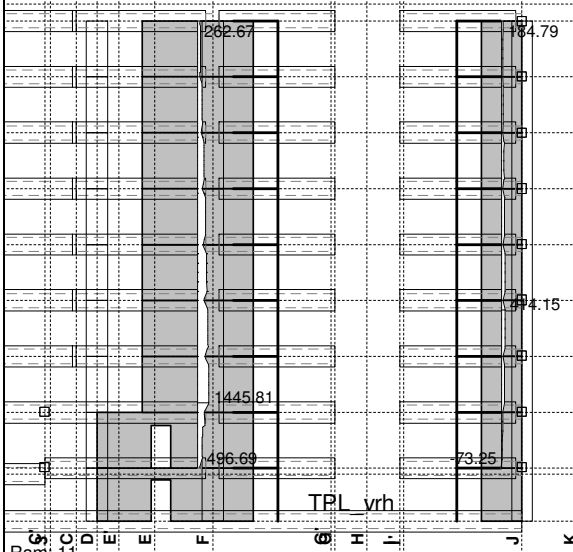
Ram: 11

Uticaji u gredi: max M3= 283.78 / min M3= -268.51 kNm



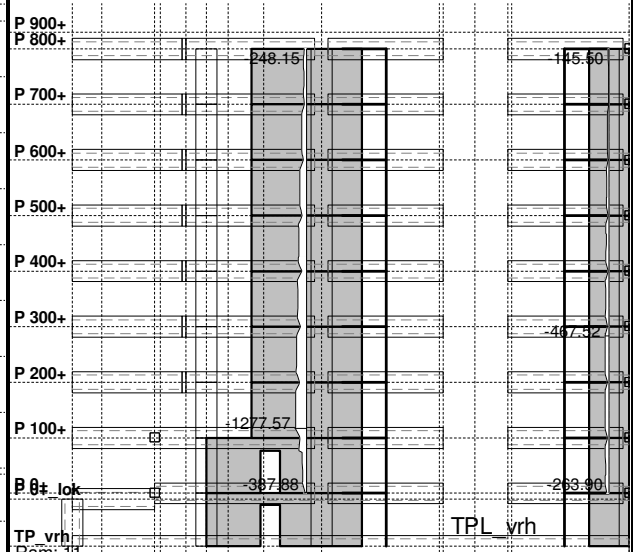
Ram: 11
Vektorski preseči: Nn

Opt. 8: I+0.3xII+VII

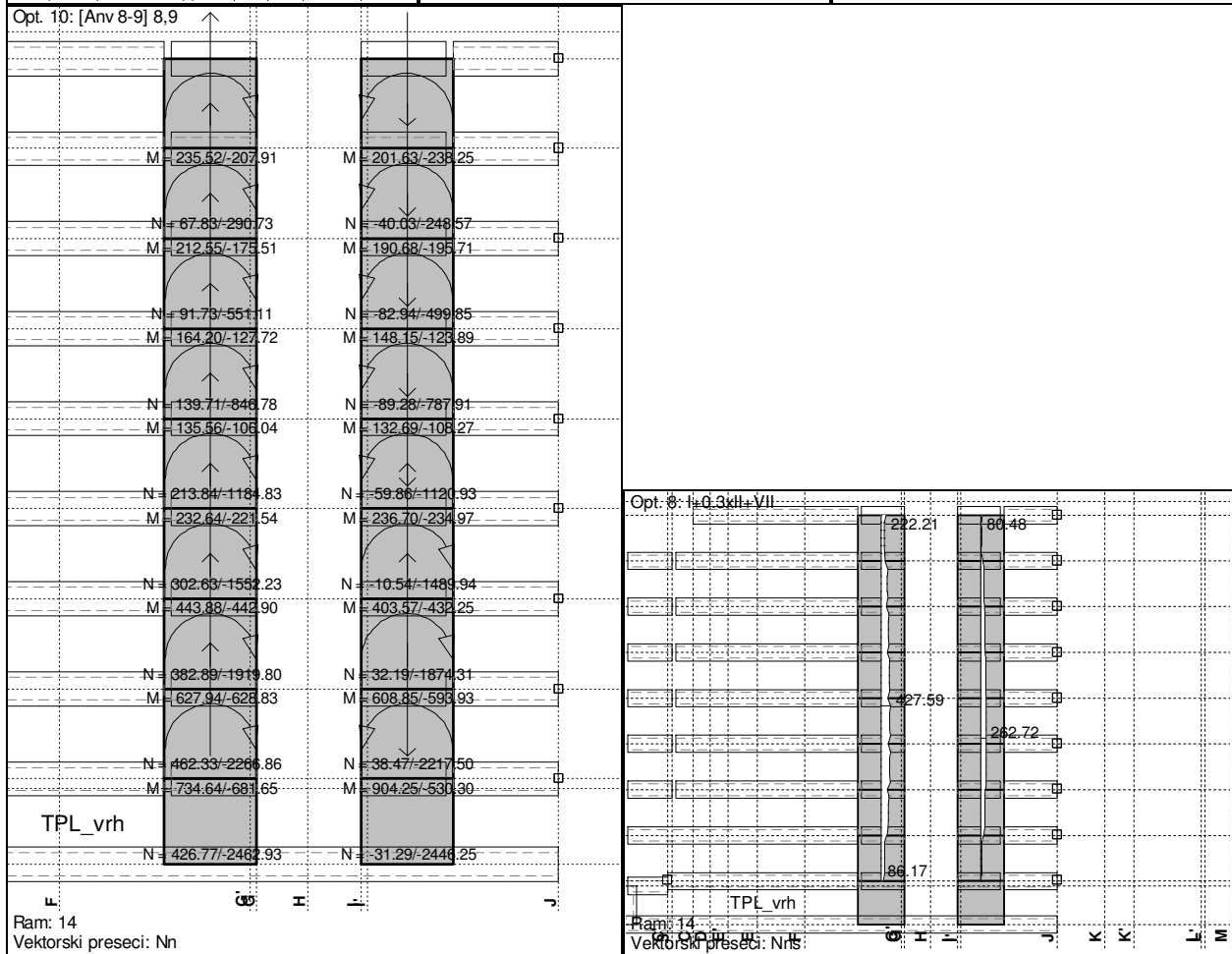
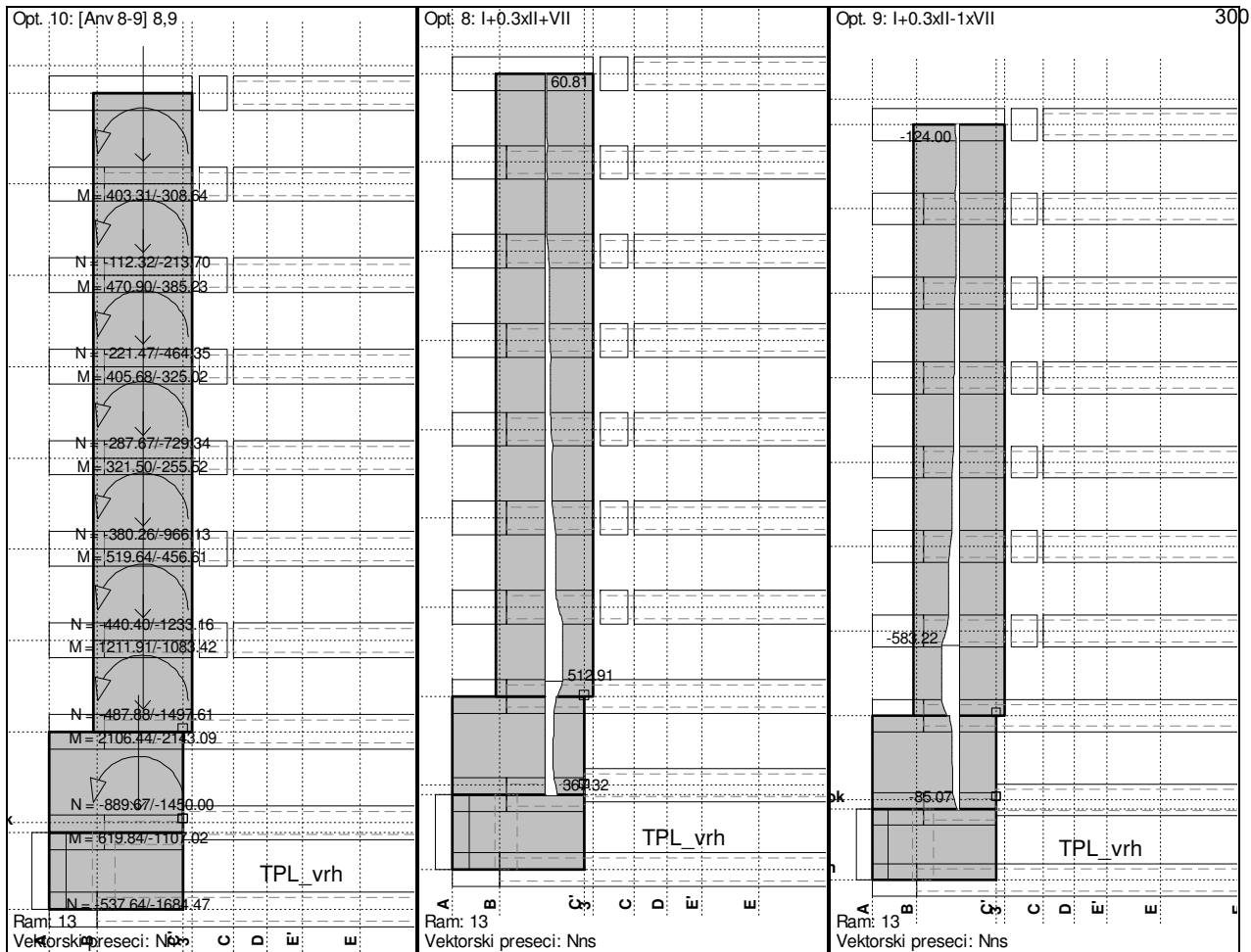


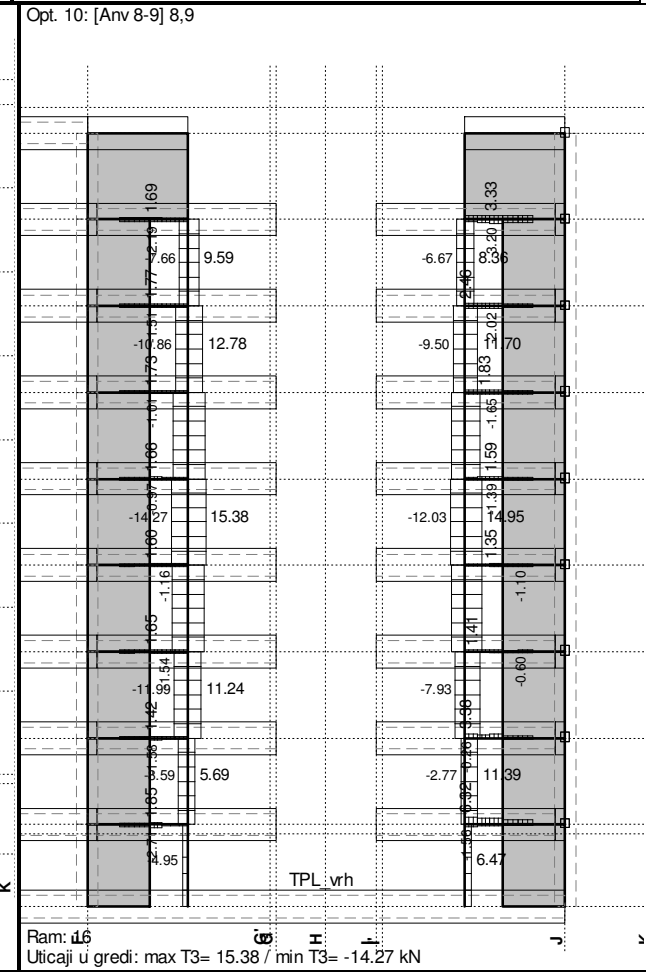
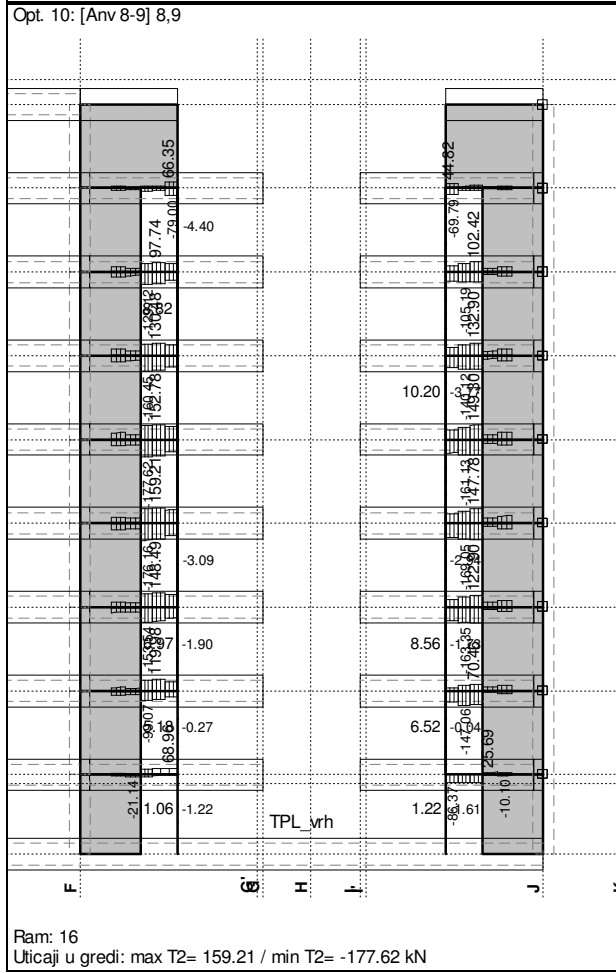
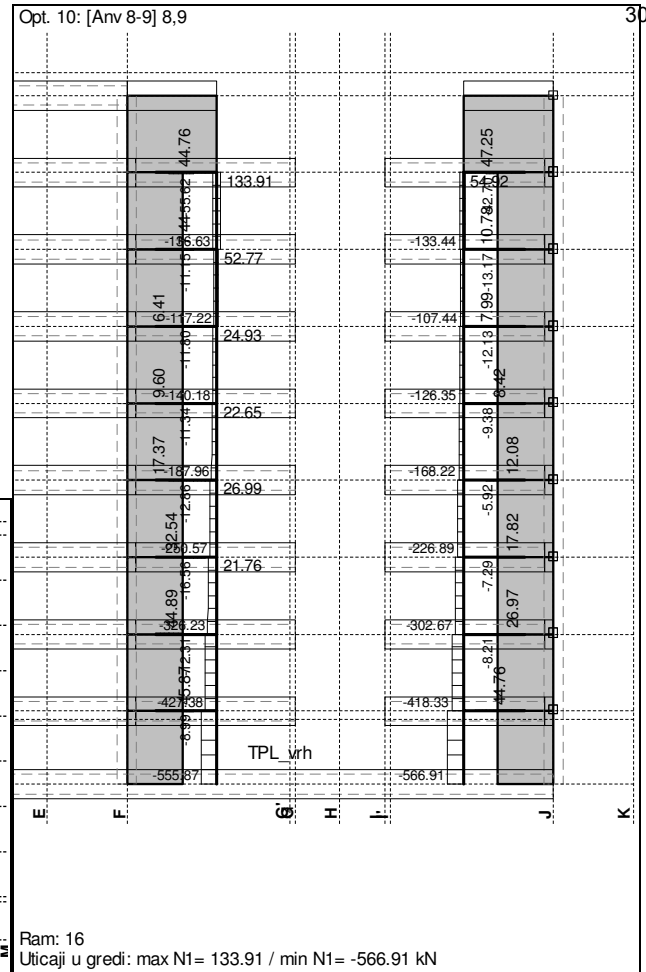
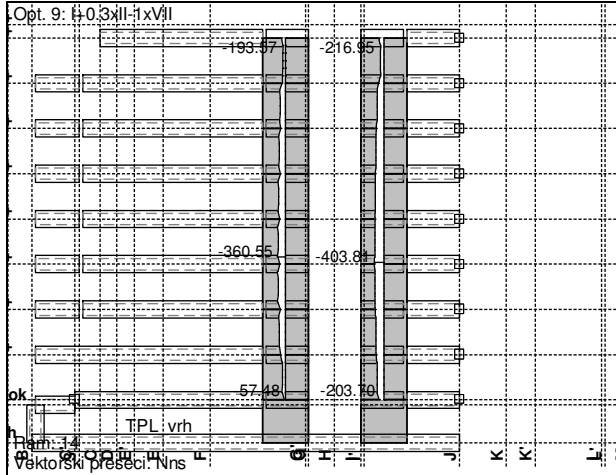
Ram: 11
Vektorski preseči: Nns

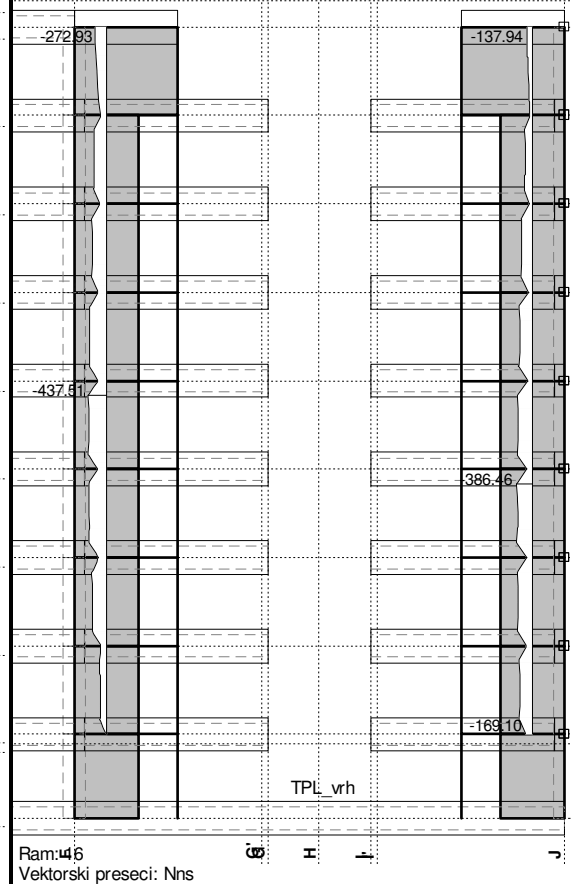
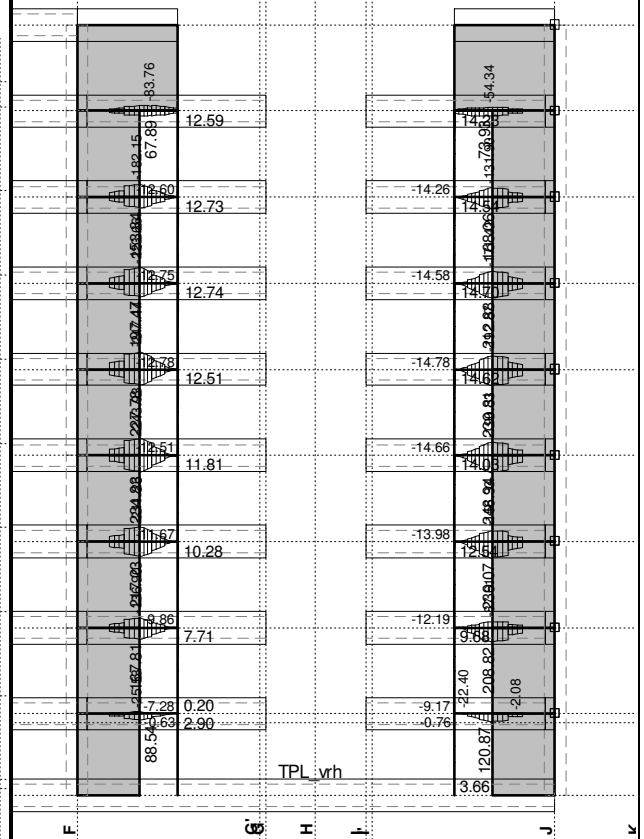
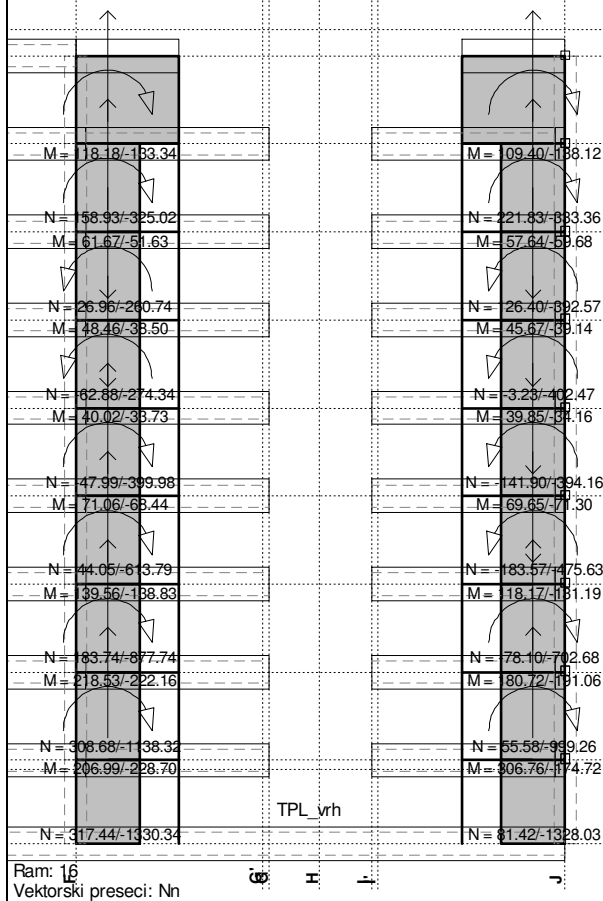
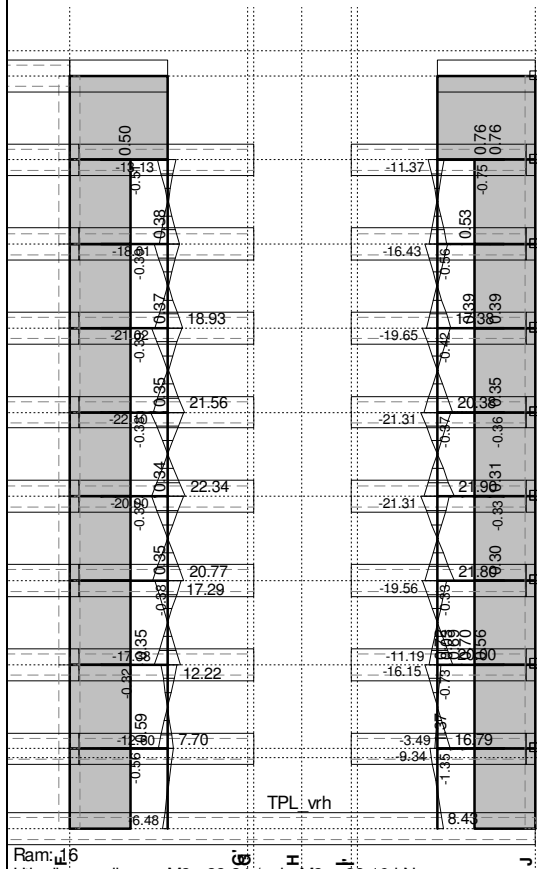
Opt. 9: I+0.3xII+VII

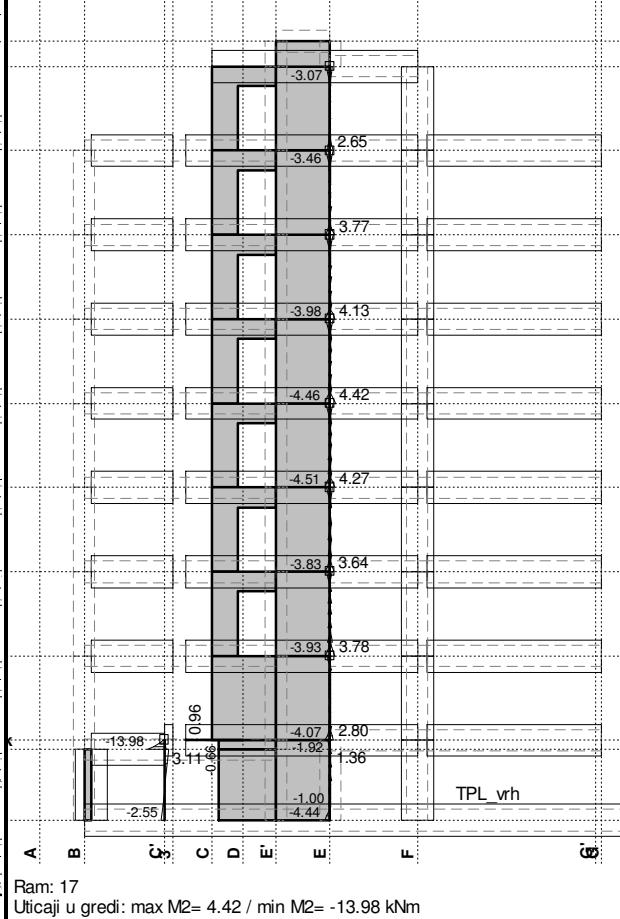
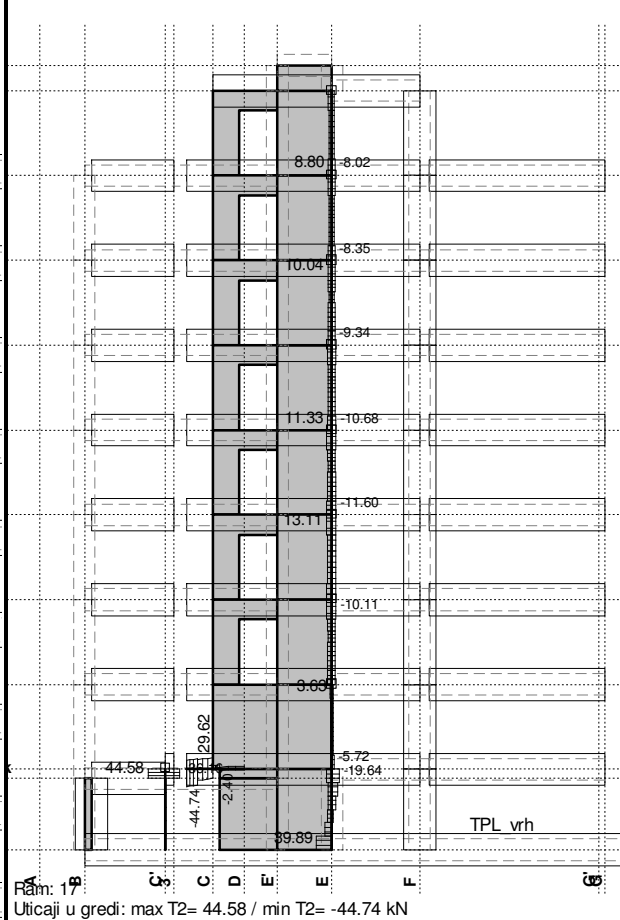
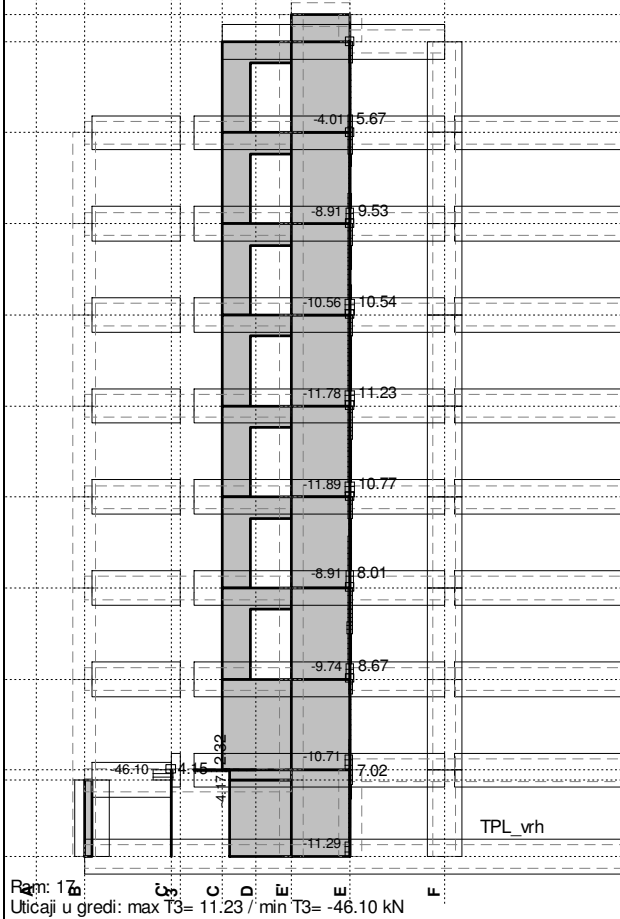
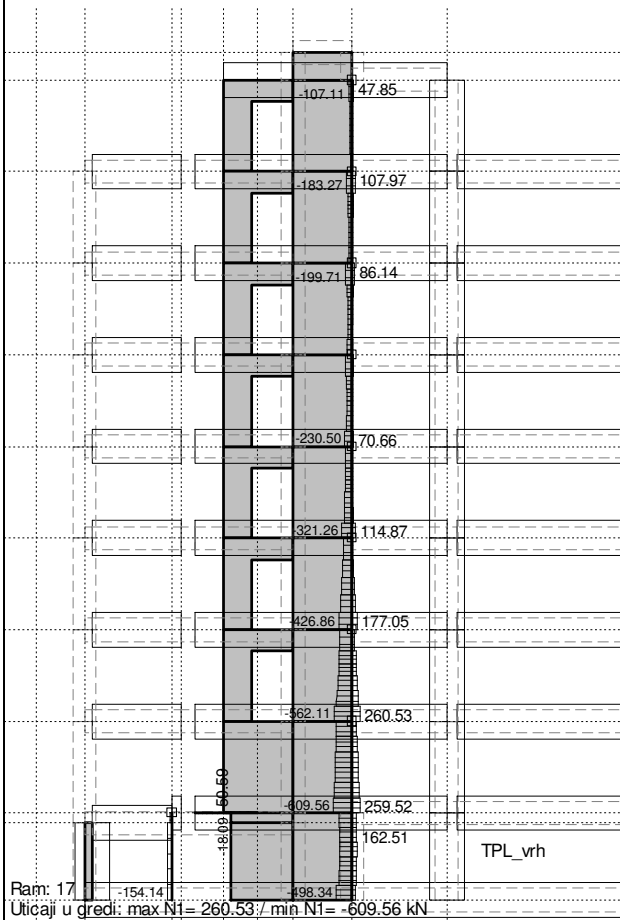


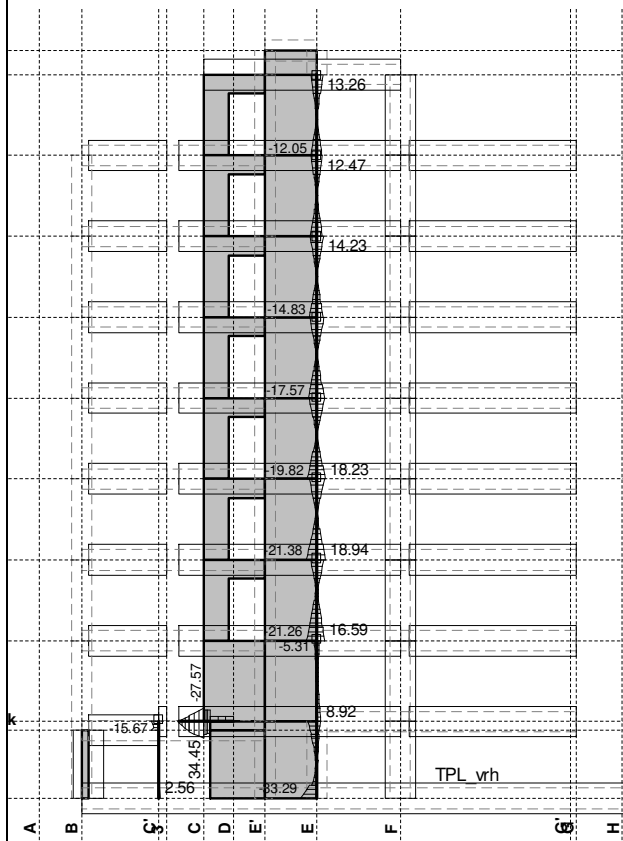
Ram: 11
Vektorski preseči: Nns







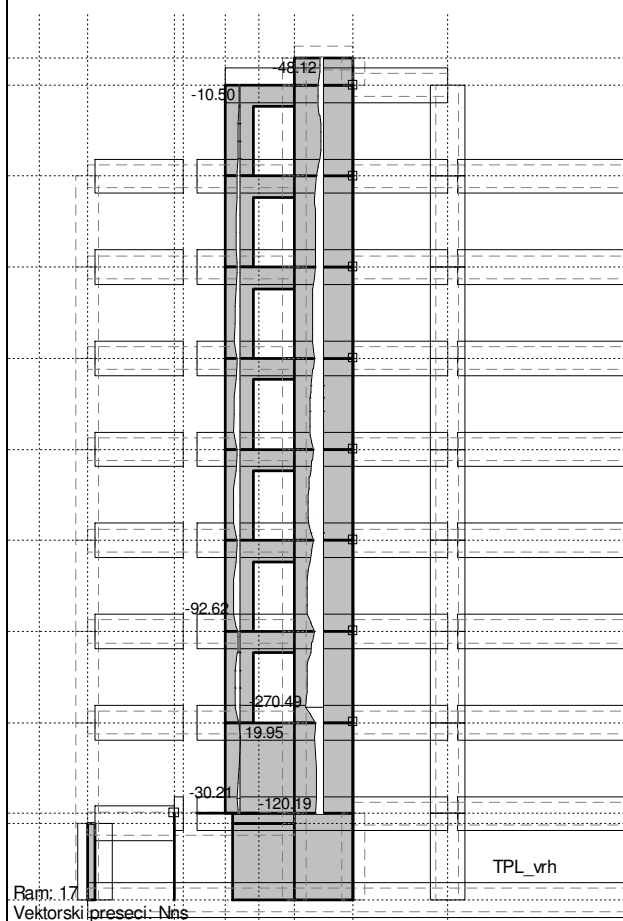




Ram: 17

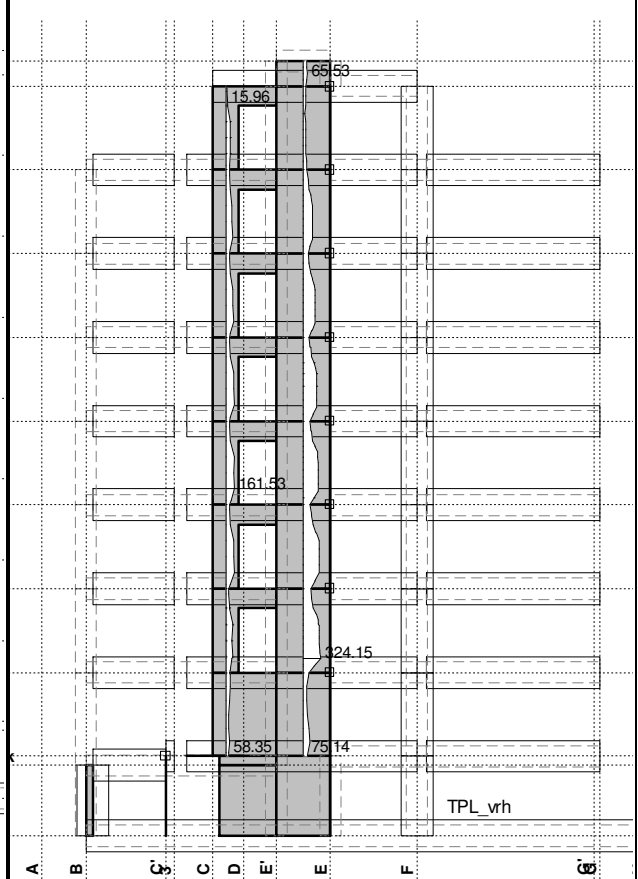
Uticaji u gredi: max M3= 34.45 / min M3= -33.29 kNm

Opt. 9: I+0.3xII-IxVII



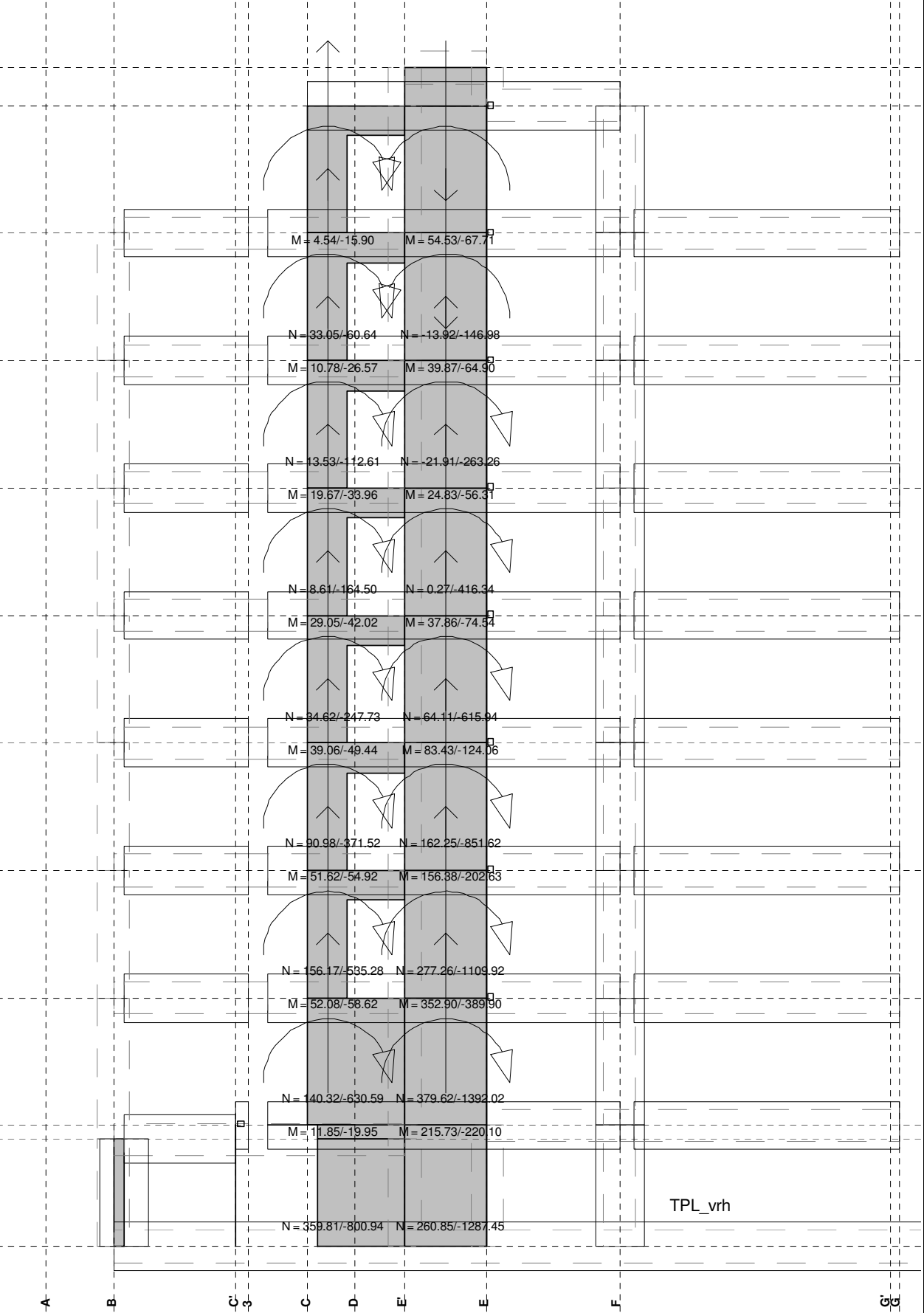
Ram: 17

Vektorski presezi: Nns

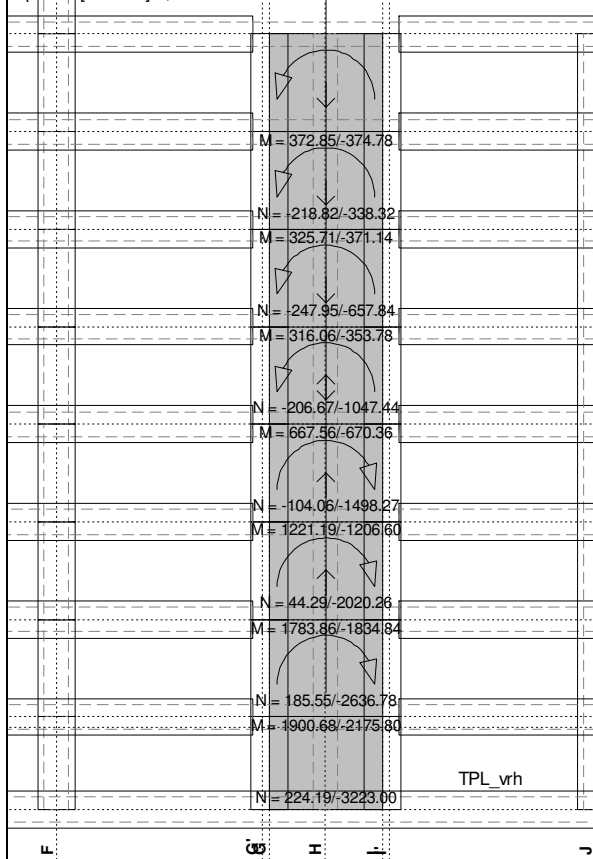


Ram: 17

Vektorski presezi: Nns

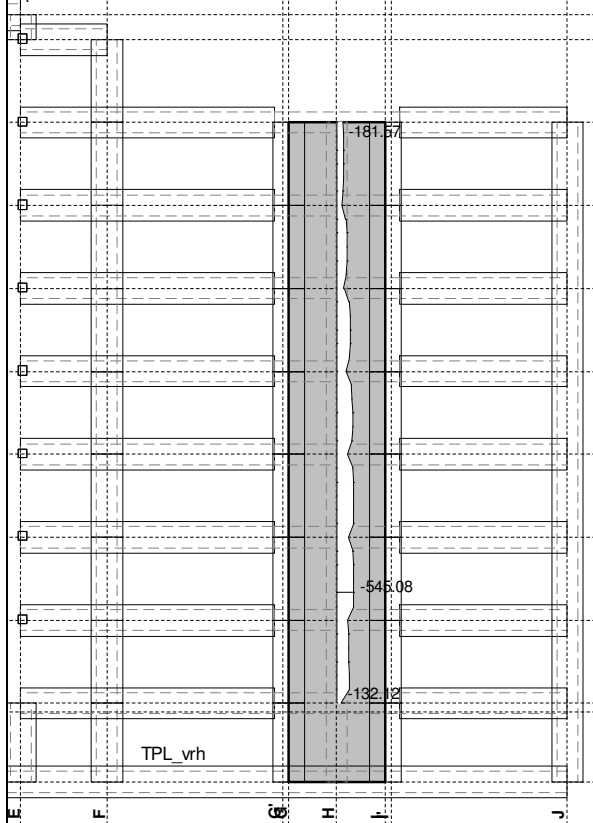


Ram: 17
Vektorski preseki: Nn

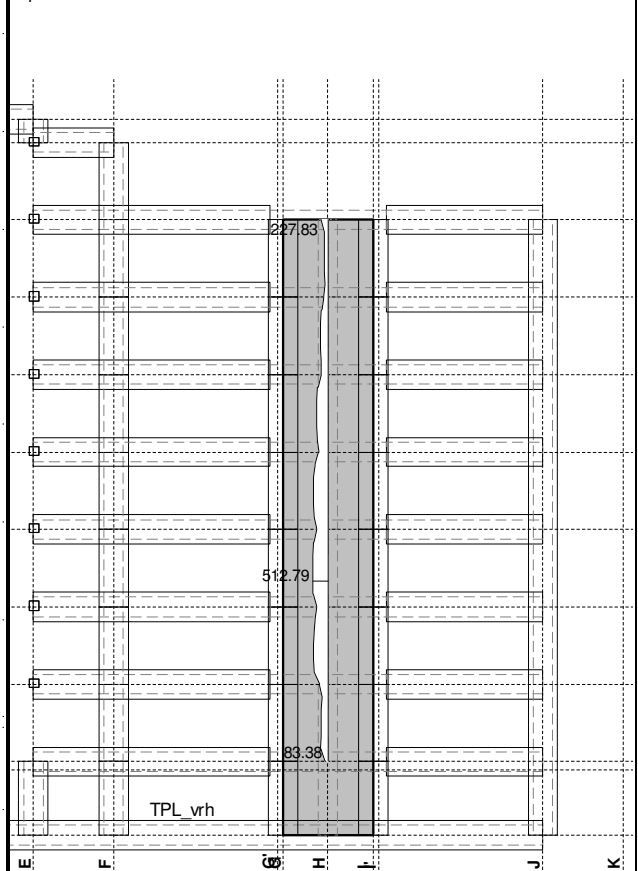


Ram: 18
Vektorski preseči: Nn

Opt. 9: I+0.3xII-1xVII

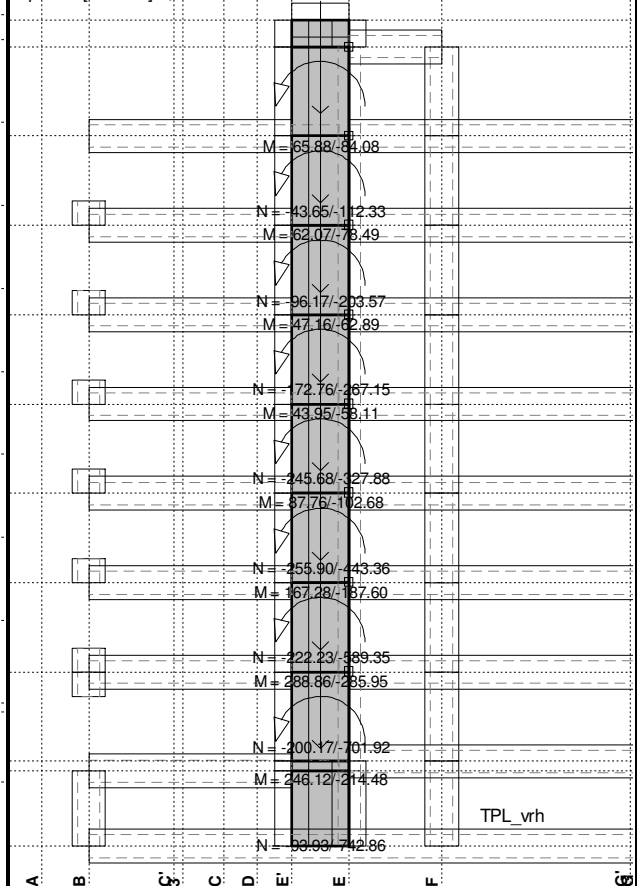


Ram: 18
Vektorski preseči: Nns



Ram: 18
Vektorski preseči: Nns

Opt. 10: [Anv 8-9] 8,9



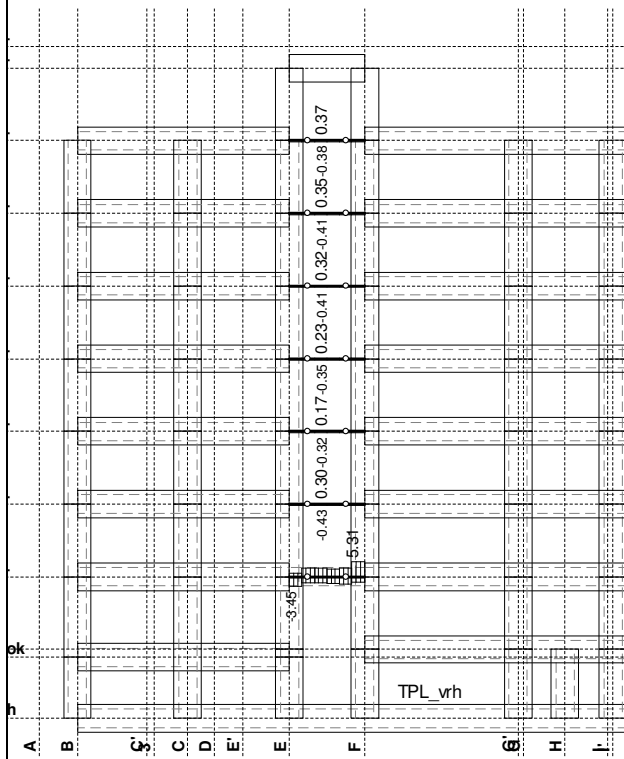
Ram: 18'
Vektorski preseči: Nn

Opt. 10: [Anv 8-9] 8,9

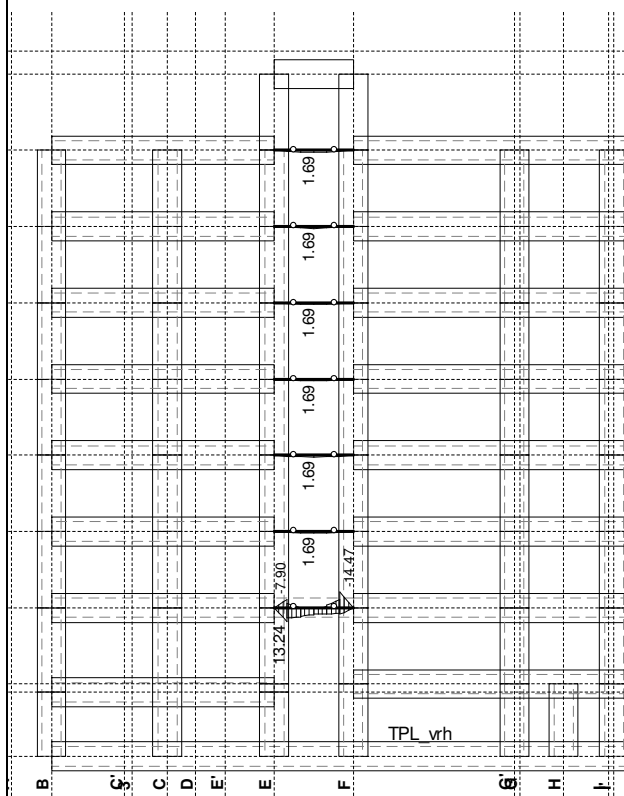
Ram: 20'
Uticaji u gredi: max N1= 150.17 / min N1= -64.70 kN

Ram: 18'
Vektorski preseci: Nns
Opt. 10: [Anv 8-9] 8,9

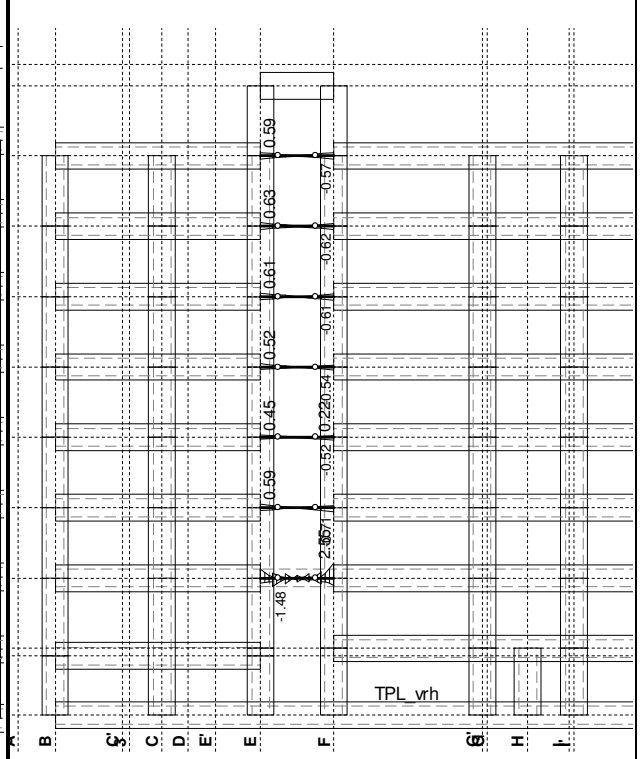
Ram: 20'
Uticaji u gredi: max T2= 16.25 / min T2= -29.38 kN



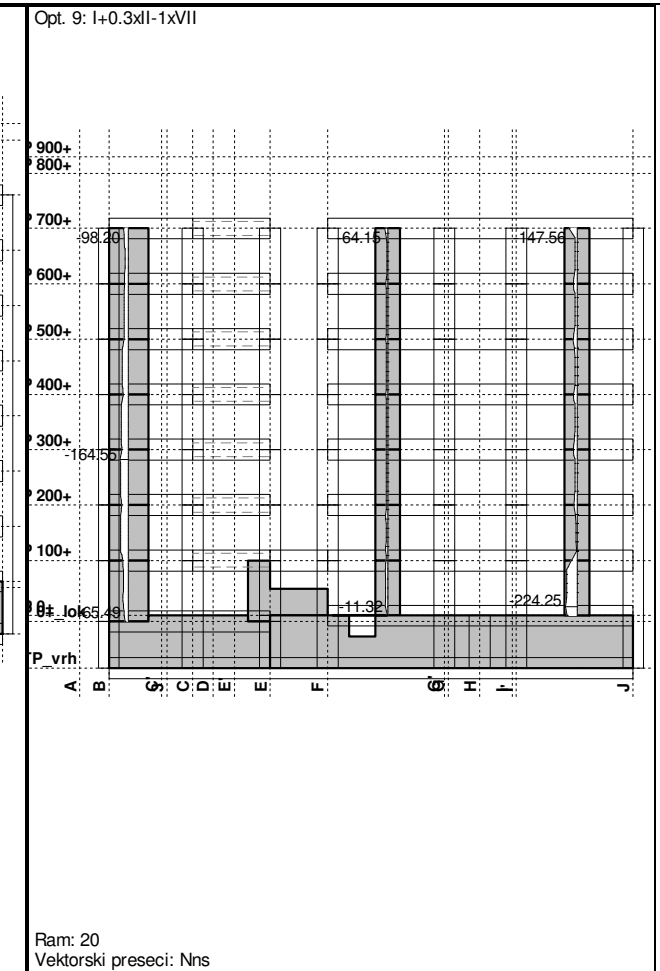
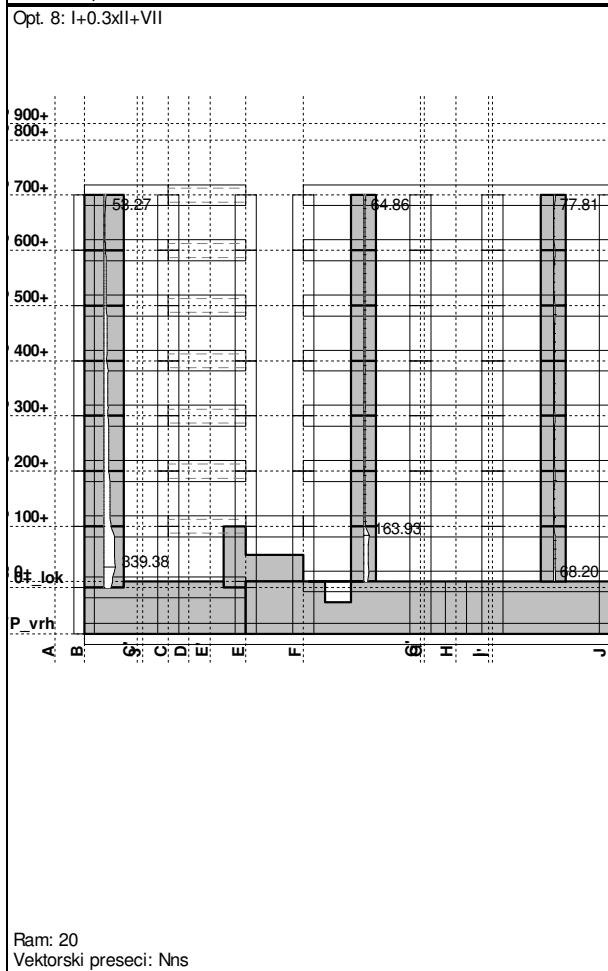
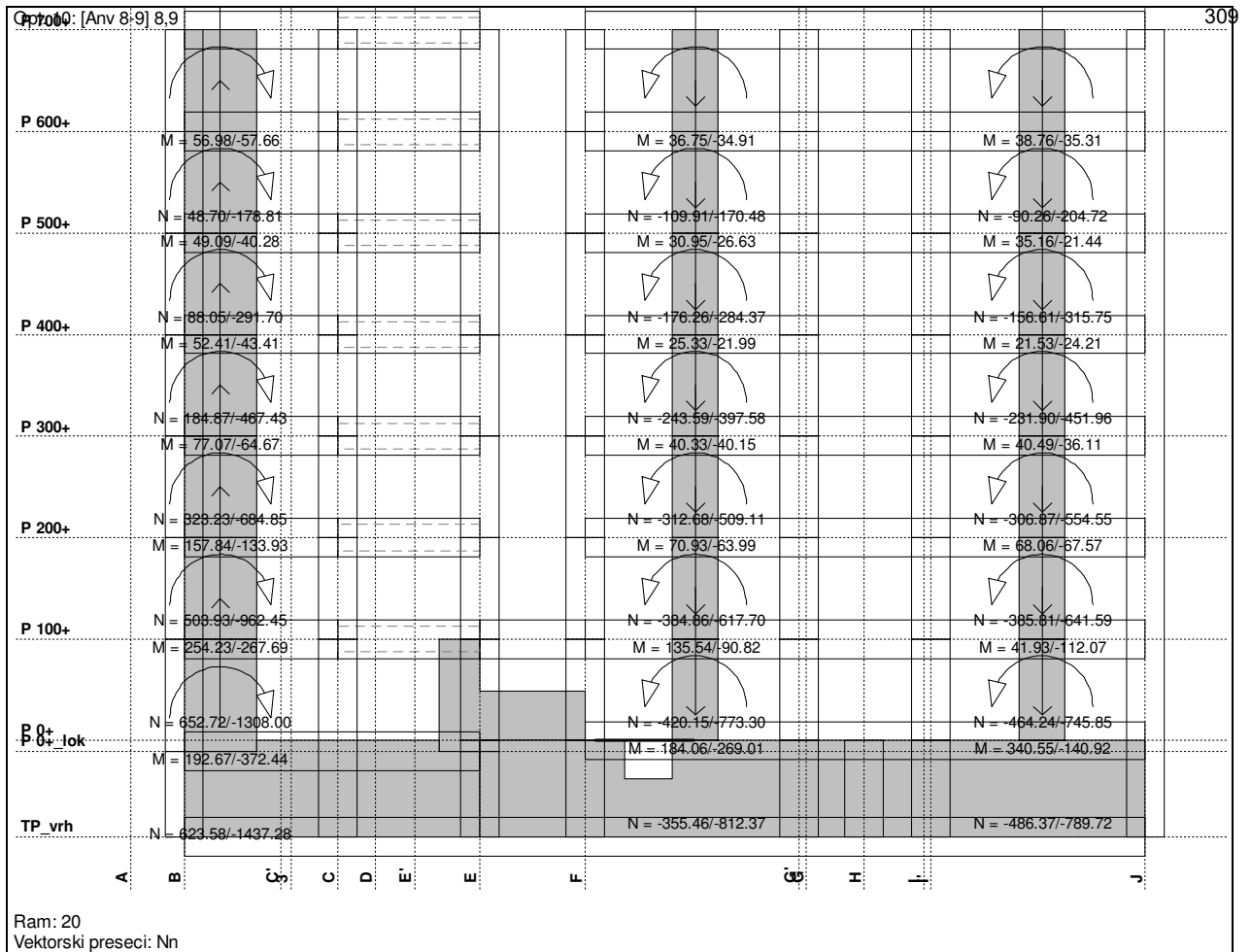
Ram: 20'
 Uticaji u gredi: max T3= 5.31 / min T3= -3.45 kN

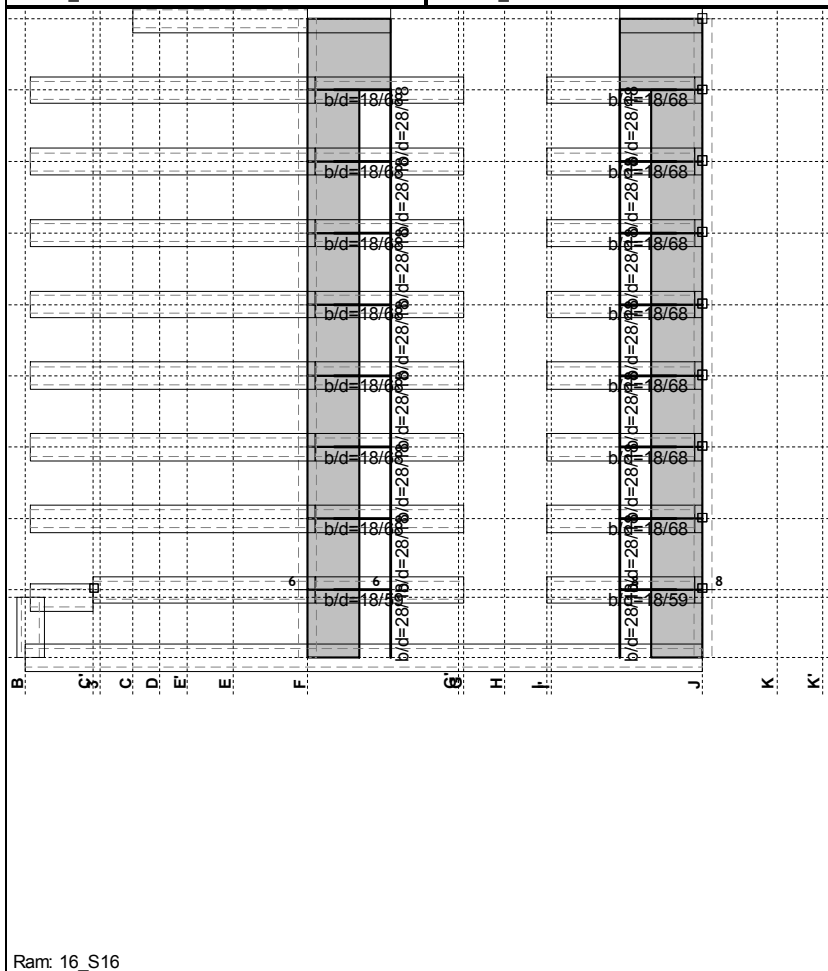
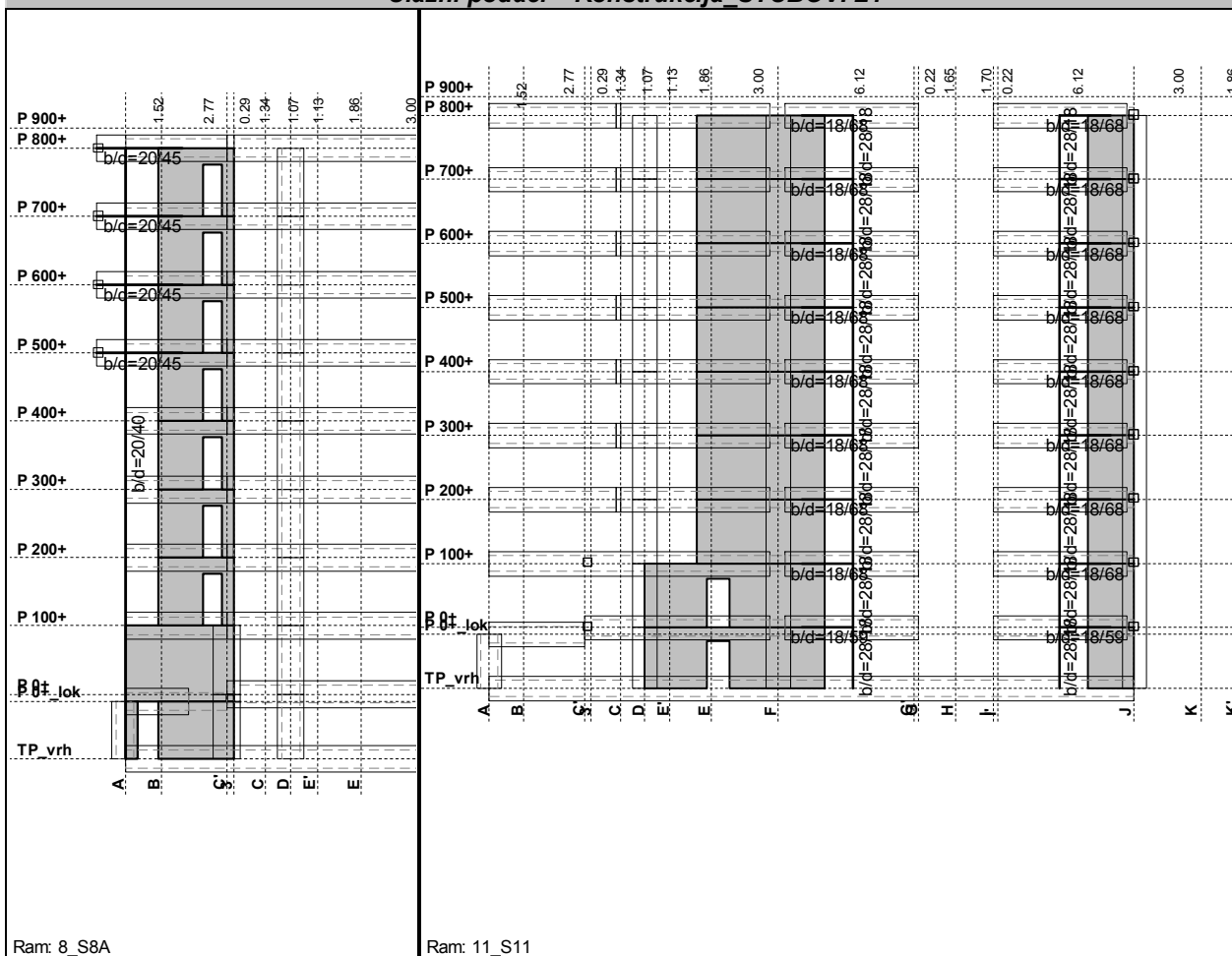


Ram: 20'
 Uticaji u gredi: max M3= 13.24 / min M3= -14.47 kNm

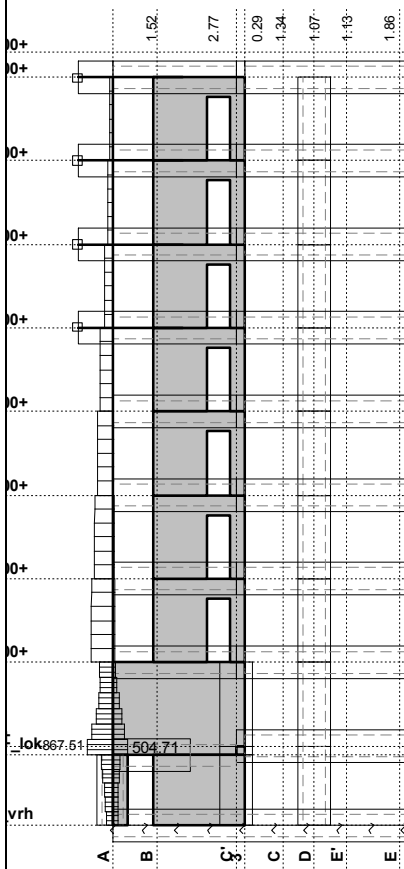


Ram: 20'
 Uticaji u gredi: max M2= 2.55 / min M2= -1.48 kNm





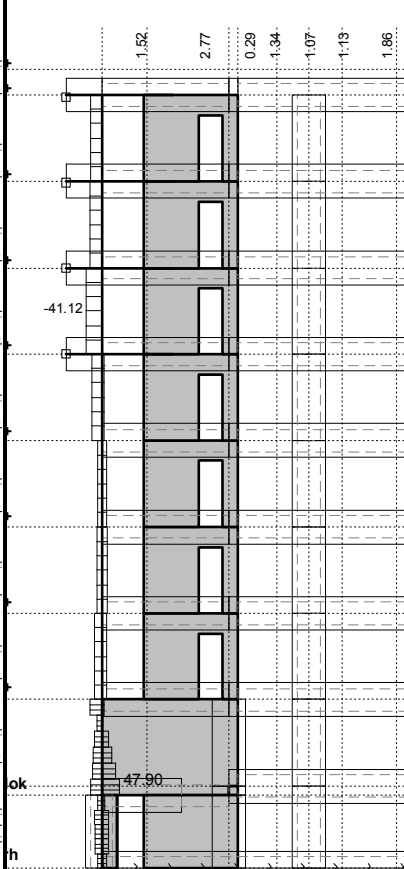
Opt. 10: [Anv 8-9] 8,9



Ram: 8_S8A

Uticaji u gredi: max N1= 504.71 / min N1= -867.5...

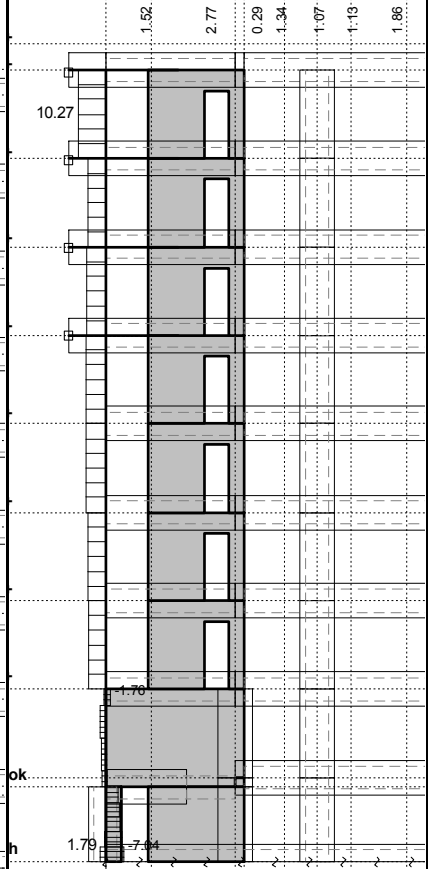
Opt. 10: [Anv 8-9] 8,9



Ram: 8_S8A

Uticaji u gredi: max T2= 70.10 / min T2= -63.84 kN

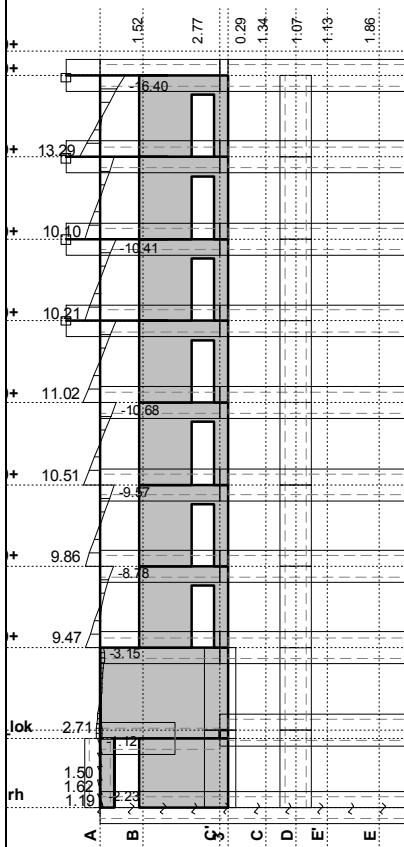
Opt. 10: [Anv 8-9] 8,9



Ram: 8_S8A

Uticaji u gredi: max T3= 10.27 / min T3= -7.04 kN

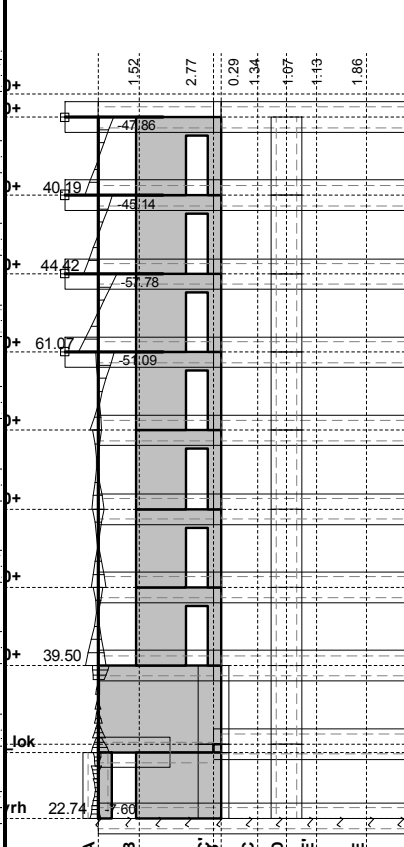
Opt. 10: [Anv 8-9] 8,9



Ram: 8_S8A

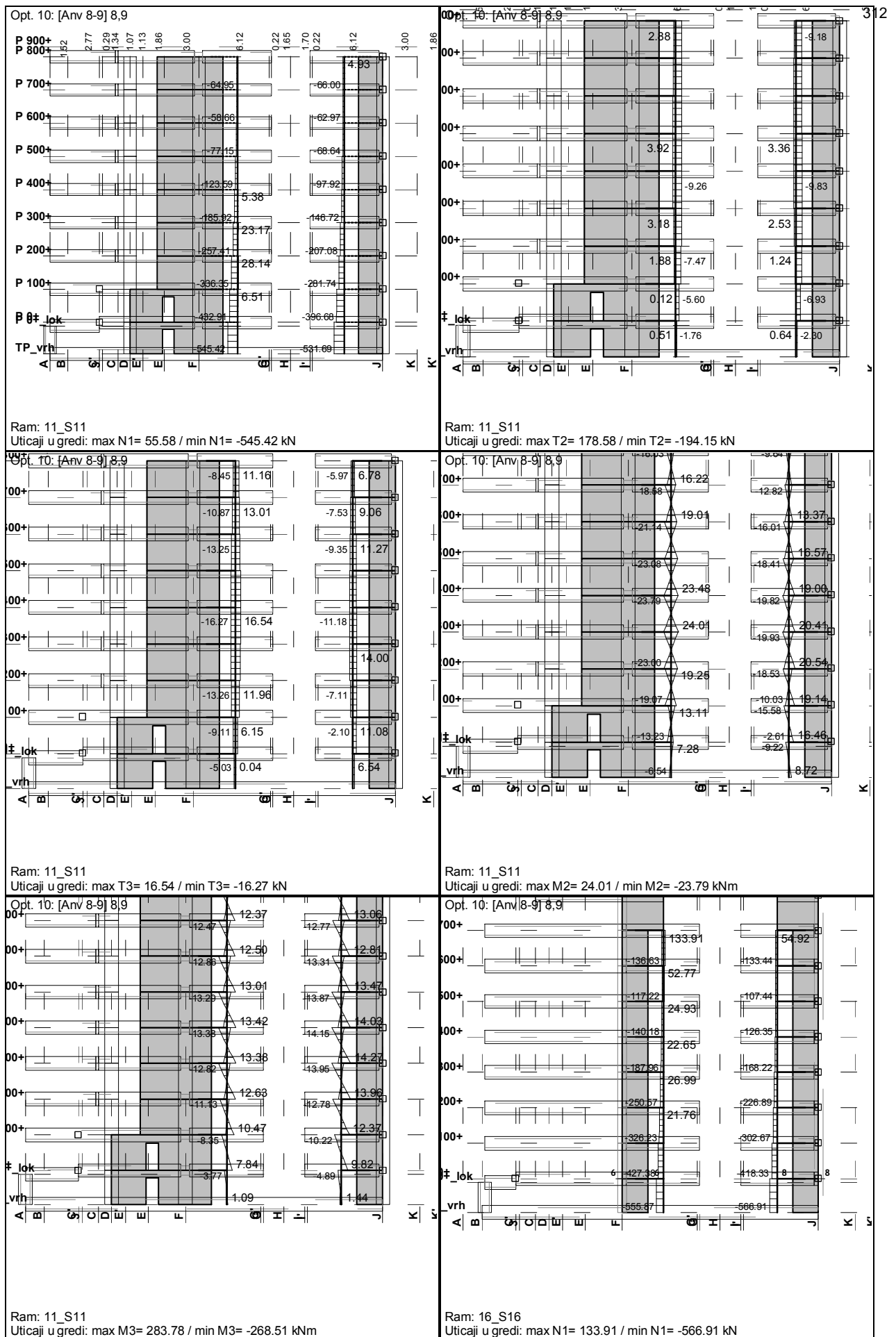
Uticaji u gredi: max M2= 13.29 / min M2= -16.40...

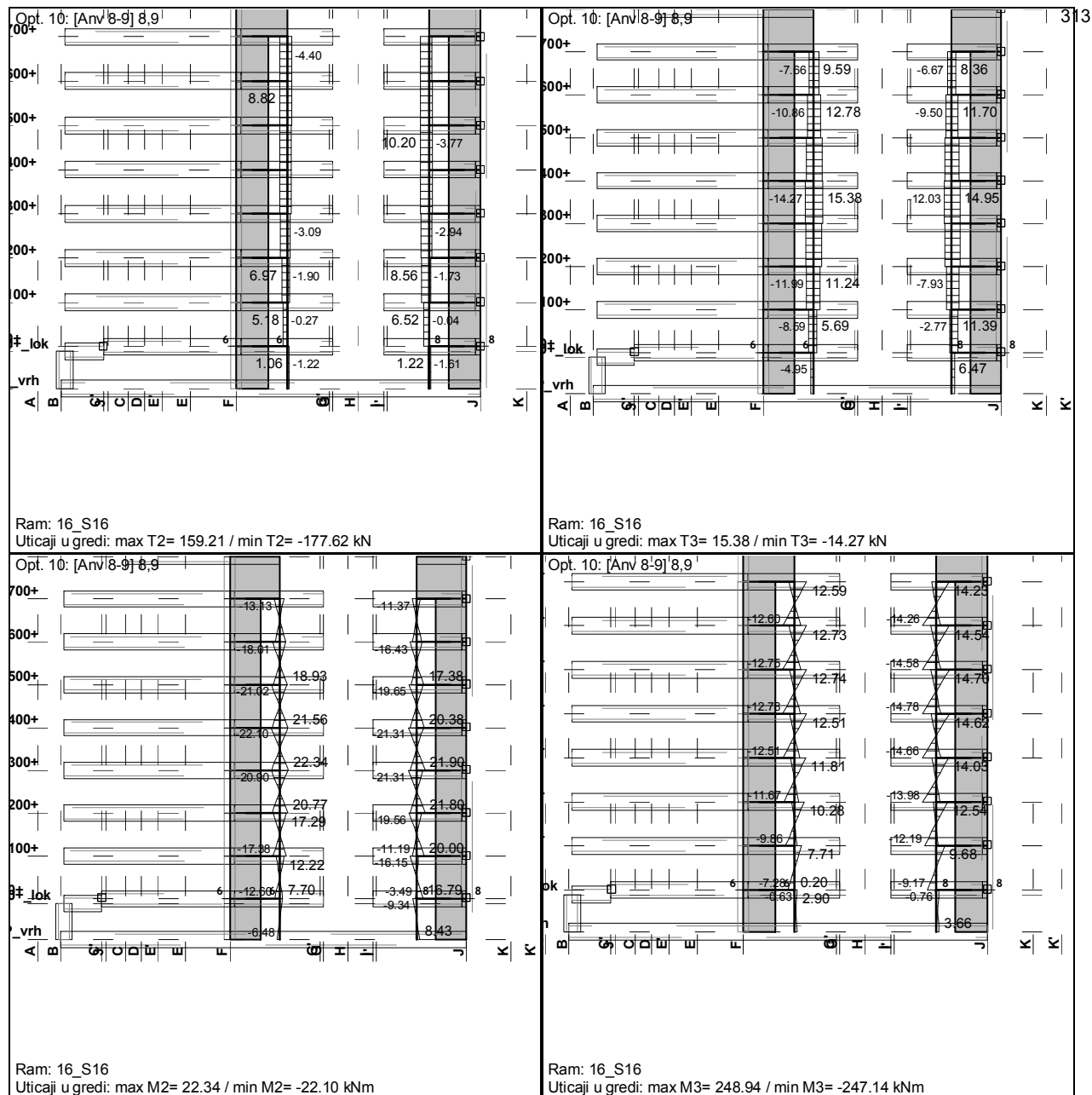
Opt. 10: [Anv 8-9] 8,9

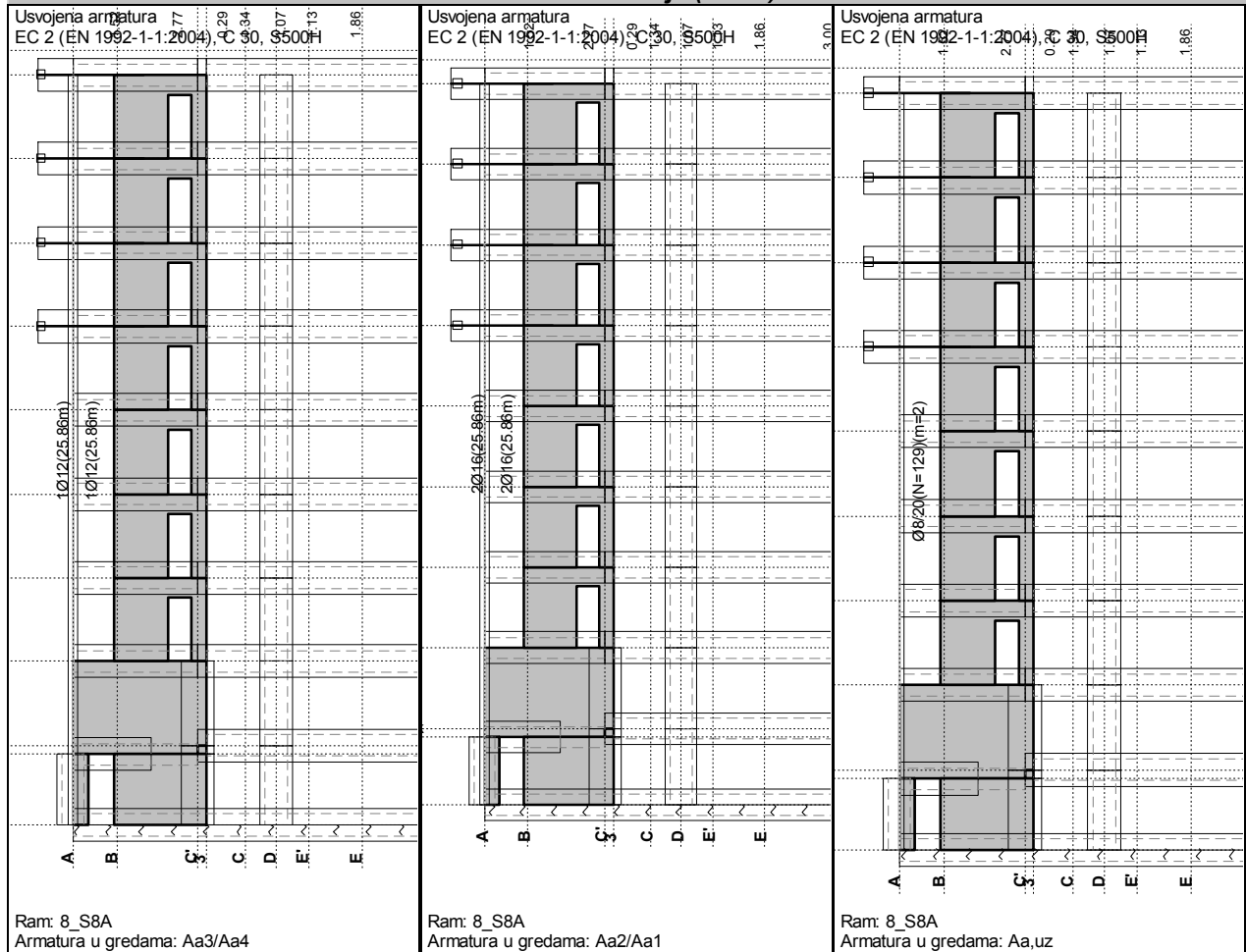


Ram: 8_S8A

Uticaji u gredi: max M3= 61.07 / min M3= -74.06...



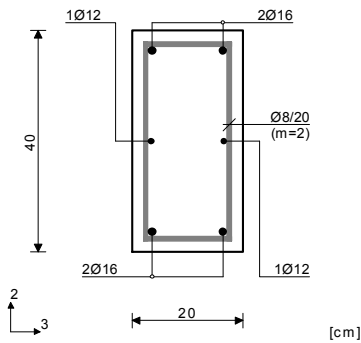




Greda 13212-231

EC 2 (EN 1992-1-1:2004)
C 30 ($\gamma_c = 1.50$, $\gamma_s = 1.15$) [SP]
S500H
Dimenzionisanje grupe slučajeva
opterećenja: 8,9

Presek 1-1 $x = 8.67m$



Merodavna kombinacija za savijanje:

1.00xl+0.30xli-1.00xVII
N1u = -54.61 kN
M2u = 10.21 kNm
M3u = 61.07 kNm

Merodavna kombinacija za torziju:

1.00xl+0.30xli-1.00xVII
M1u = -0.45 kNm

Merodavna kombinacija za smicanje:

1.00xl+0.30xli-1.00xVII
T2u = -41.12 kN
T3u = -0.00 kN
M1u = -0.45 kNm

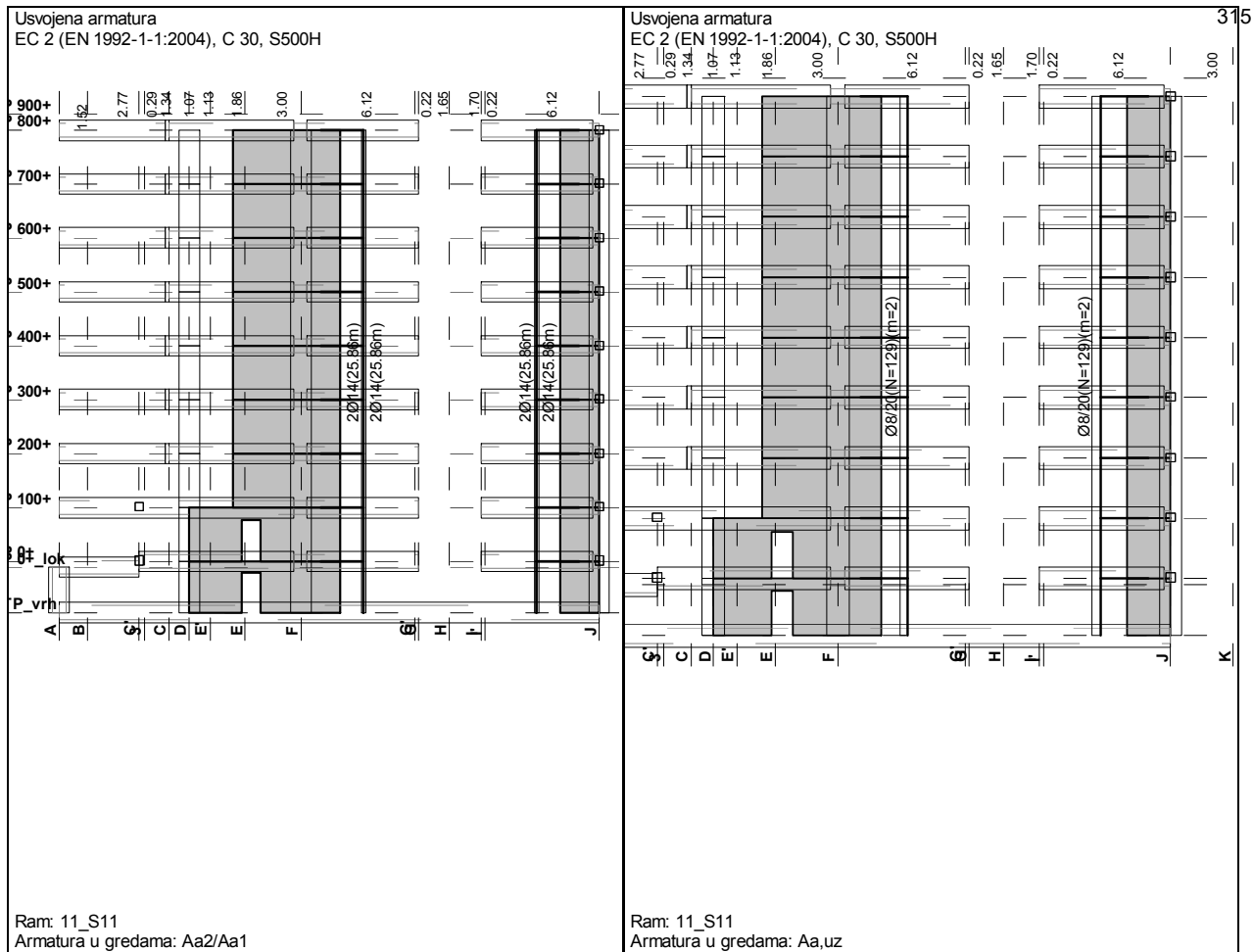
$\epsilon_b/\epsilon_a = -3.500/7.211 \%$

Aa1 =	3.85	+	0.00'	=	3.85	cm ²
Aa2 =	3.85	+	0.00'	=	3.85	cm ²
Aa3 =	0.00	+	0.04'	=	0.04	cm ²
Aa4 =	0.00	+	0.04'	=	0.04	cm ²
Aa,uz =	1.50	cm ² /m	(m=2)			

[Usvojeno Aa,uz = 08/20(m=2) = 2.51 cm²/m]

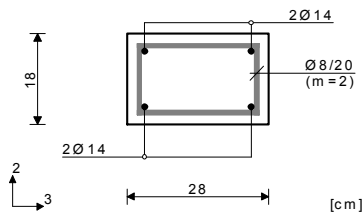
Procenat armiranja: 1.29%

*) - dodatna podužna armatura za prijem torzije.



Greda 31115-30047
EC 2 (EN 1992-1-1:2004)
C 30 ($\gamma_c = 1.50$, $\gamma_s = 1.15$) [SP]
S500H
Dimenzionisanje grupe slučajeva
opterećenja: 8.9
li.2 = 2.89 m ($\lambda_2 = 35.75$)
li.3 = 2.89 m ($\lambda_3 = 55.62$)
Nepomerljiva konstrukcija

Presek 1-1 x = 2.89m



Merodavna kombinacija za savijanje:

1.00xl+0.30xli-1.00xVII
N1u = -14.39 kN
M2u = 13.37 kNm
M3u = 12.81 kNm

Merodavna kombinacija za torziju:

1.00xl+0.30xli-1.00xVII
M1u = -0.18 kNm

Merodavna kombinacija za smicanje:

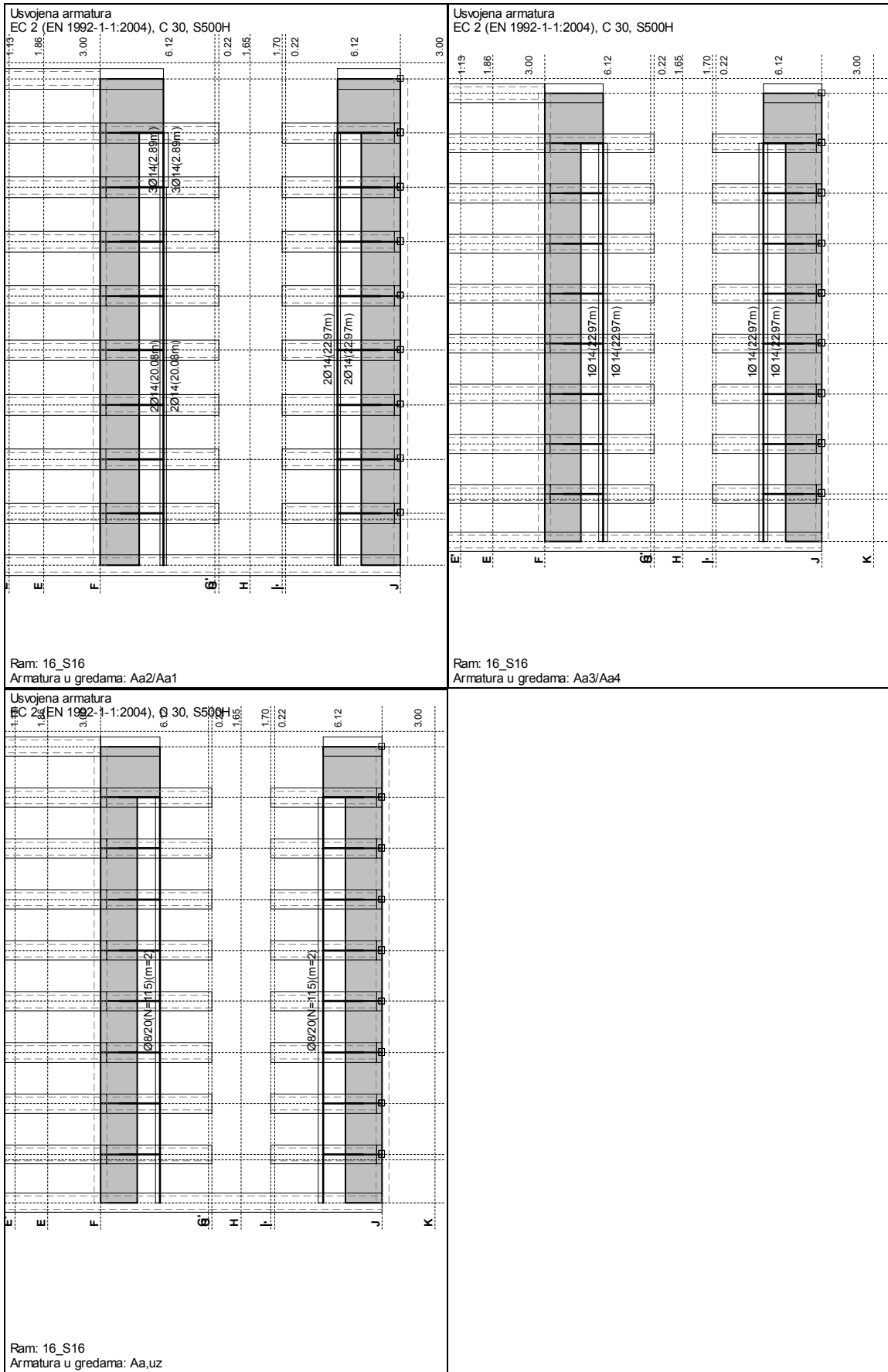
1.00xl+0.30xli-1.00xVII
T2u = -8.85 kN
T3u = -7.53 kN
M1u = -0.18 kNm

eb/ea = -3.500/5.047 ‰

Aa1 = 2.53 cm²
Aa2 = 2.53 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²
Aa,uz = 0.00 cm²/m (m=2)

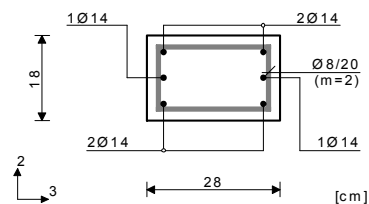
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

Procenat armiranja: 1.22%



Greda 25580-23277
 EC 2 (EN 1992-1-1:2004)
 C 30 ($\gamma_C = 1.50$, $\gamma_S = 1.15$) [SP]
 S500H
 Dimenzionisanje grupe slučajeva
 opterećenja: 8,9
 $l_{i,2} = 2.89$ m ($\lambda_2 = 35.75$)
 $l_{i,3} = 2.89$ m ($\lambda_3 = 55.62$)
 Nepomerljiva konstrukcija

Presek 1-1 $x = 0.00$ m



Merodavna kombinacija za savijanje:

1.00xI+0.30xII-1.00xVII

N1u = 52.77 kN

M2u = -18.01 kNm

M3u = 12.73 kNm

Merodavna kombinacija za torziju:

1.00xI+0.30xII-1.00xVII

M1u = -0.19 kNm

Merodavna kombinacija za smicanje:

1.00xI+0.30xII+1.00xVII

T2u = 8.82 kN

T3u = 12.78 kN

M1u = 0.16 kNm

$\epsilon_{b/ta} = -3.500/5.291$ ‰

Aa1 = 2.21 cm²

Aa2 = 2.21 cm²

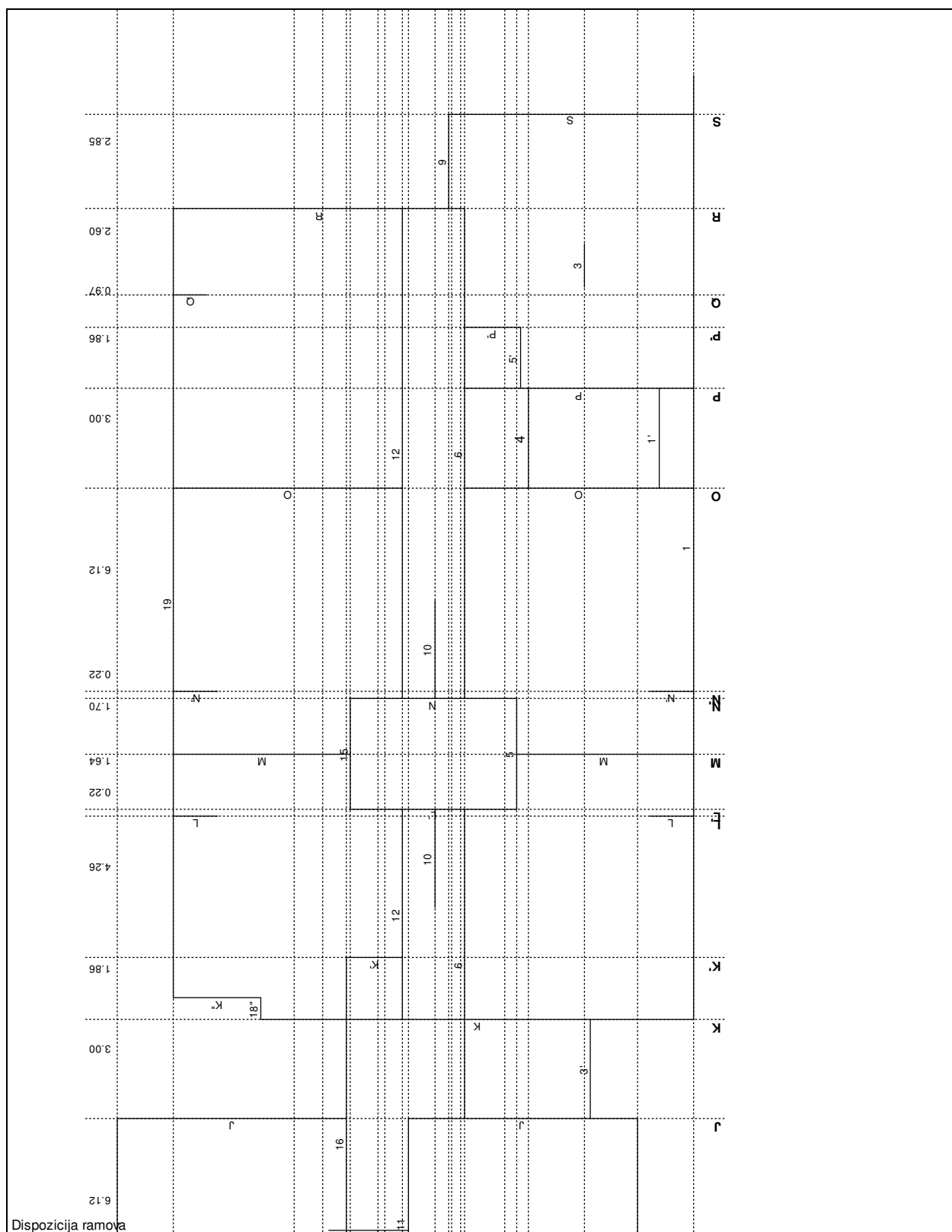
Aa3 = 1.48 cm²

Aa4 = 1.48 cm²

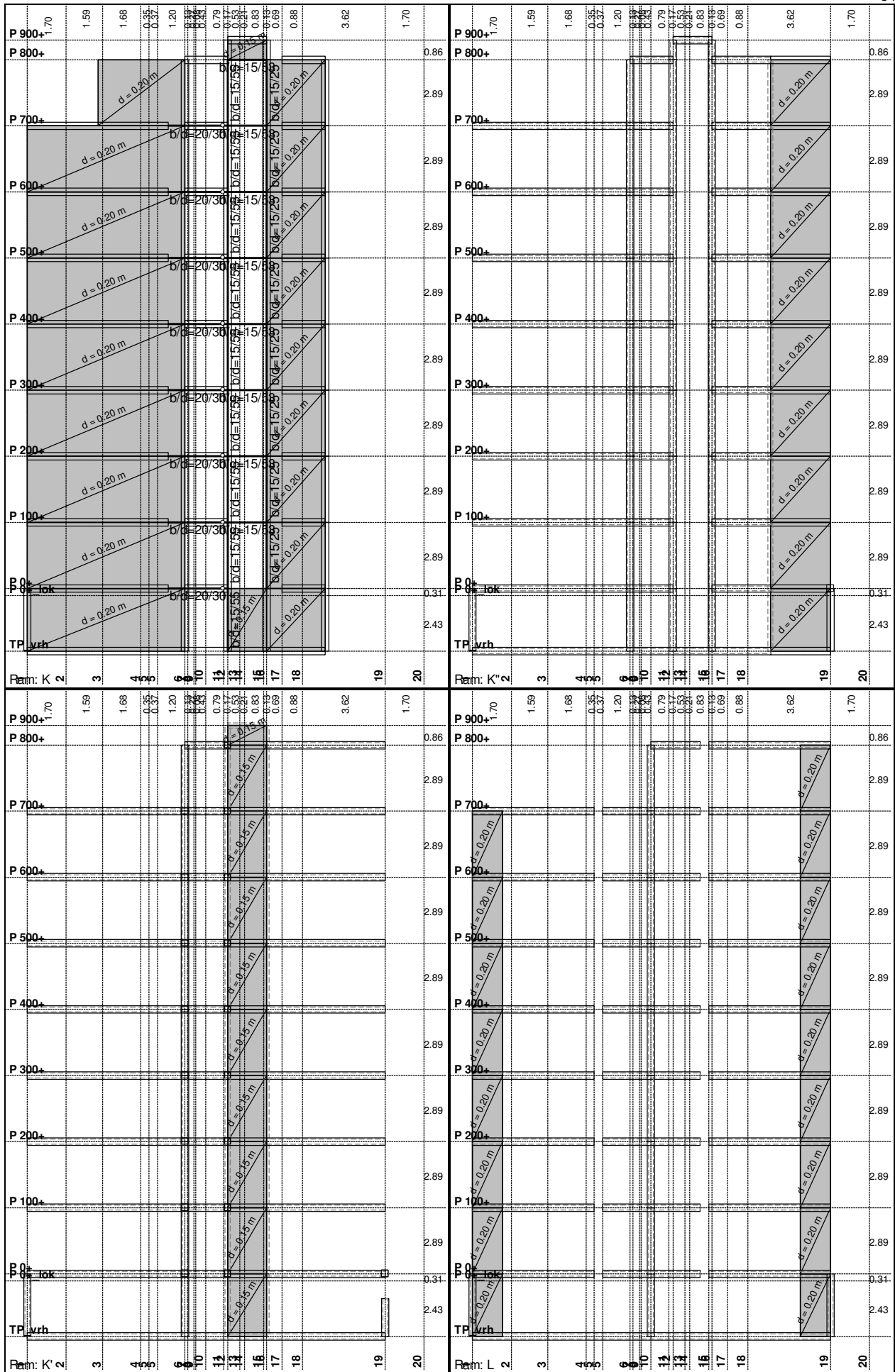
Aa,uz = 0.00 cm²/m (m=2)

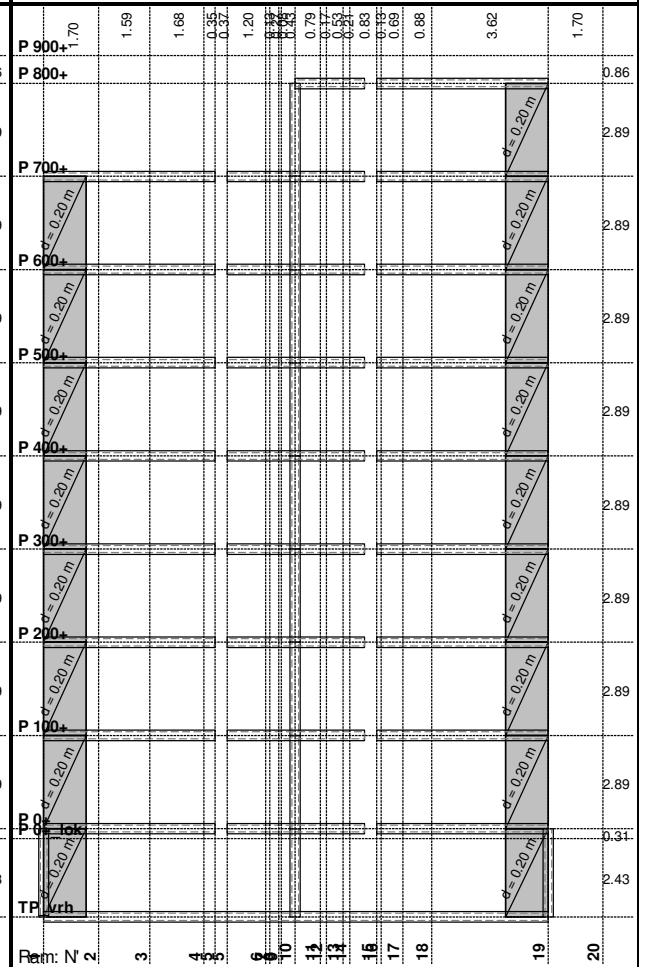
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

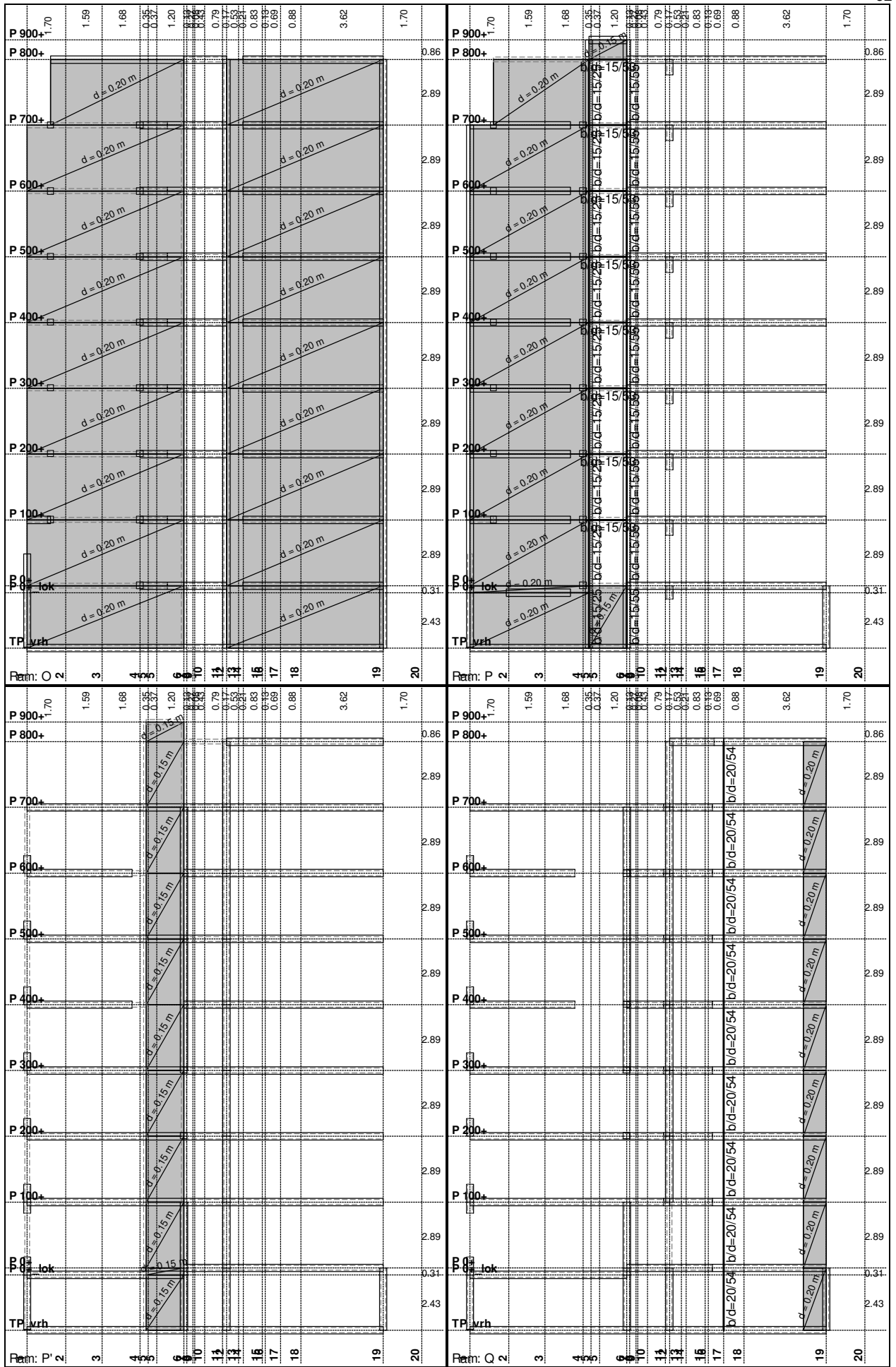
Procenat armiranja: 1.83%

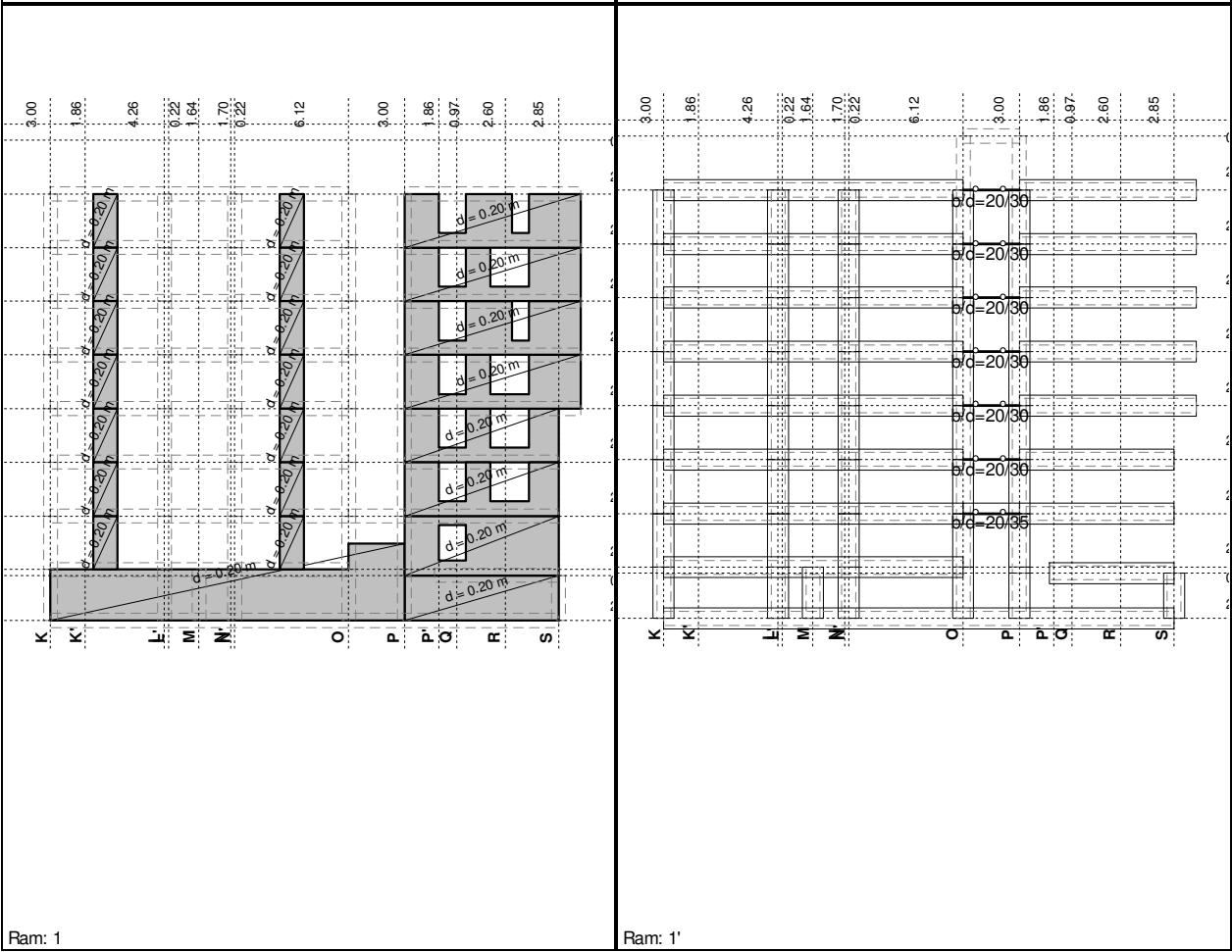
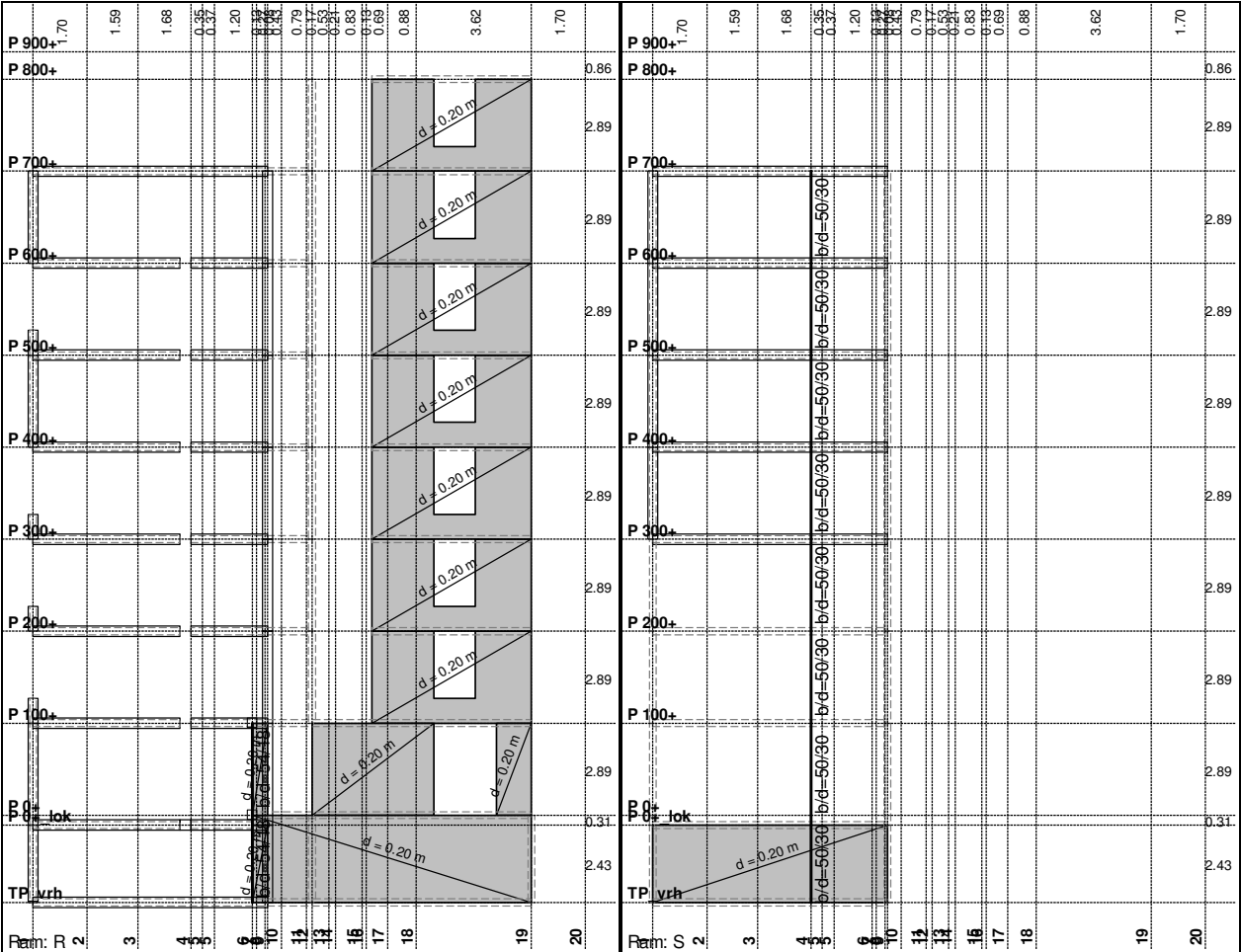
LAMELA 2**Lista slučaja opterećenja**

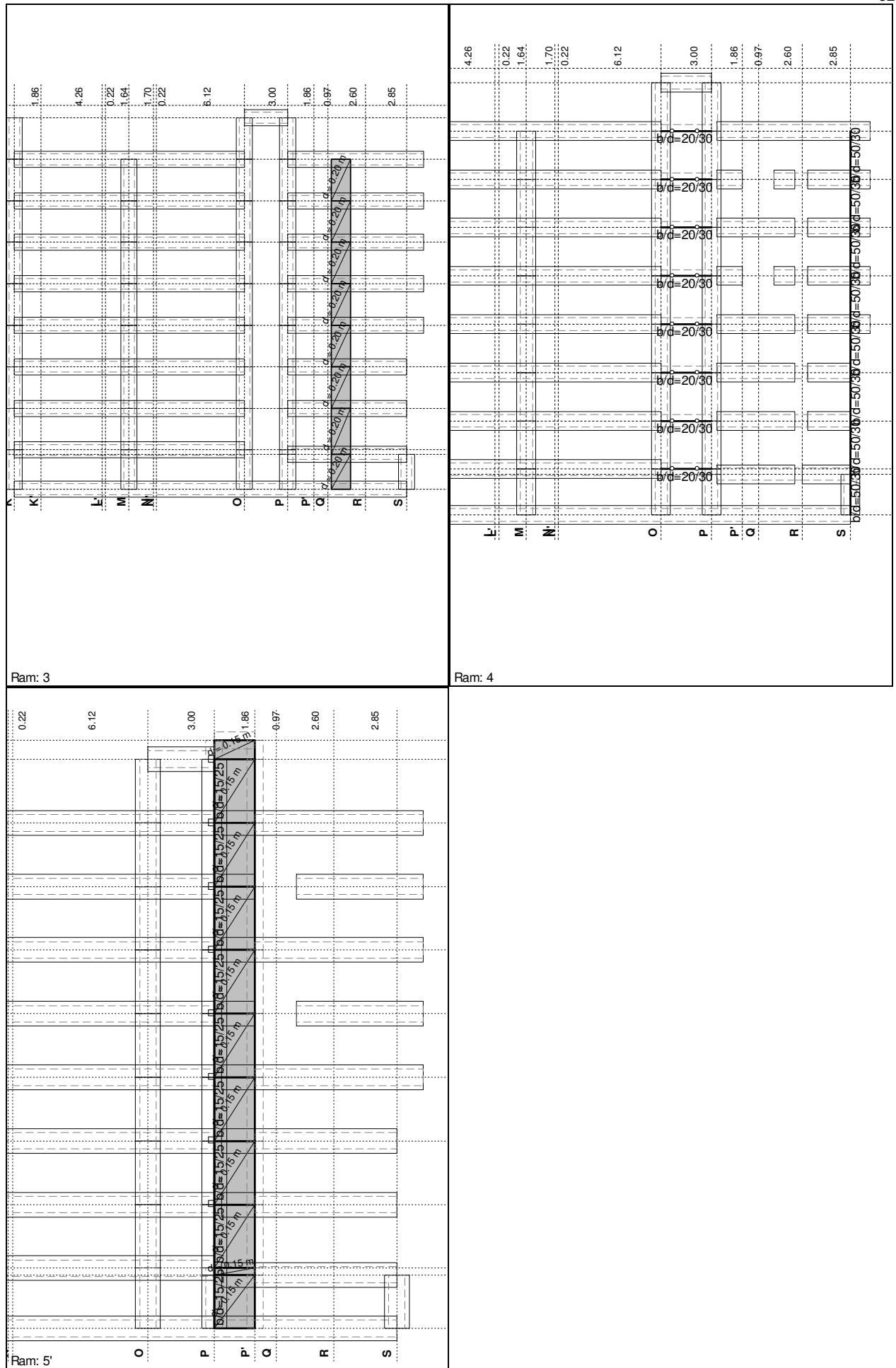
LC	Naziv
1	g (g)
2	p
3	Sx (+e)
4	Sx (-e)
5	Sy (+e)
6	Sy (-e)
7	SRSS: MAX(III,IV)+MAX(V,VI)
8	Komb.: I+0.3xII+VII
9	Komb.: I+0.3xII-1xVII

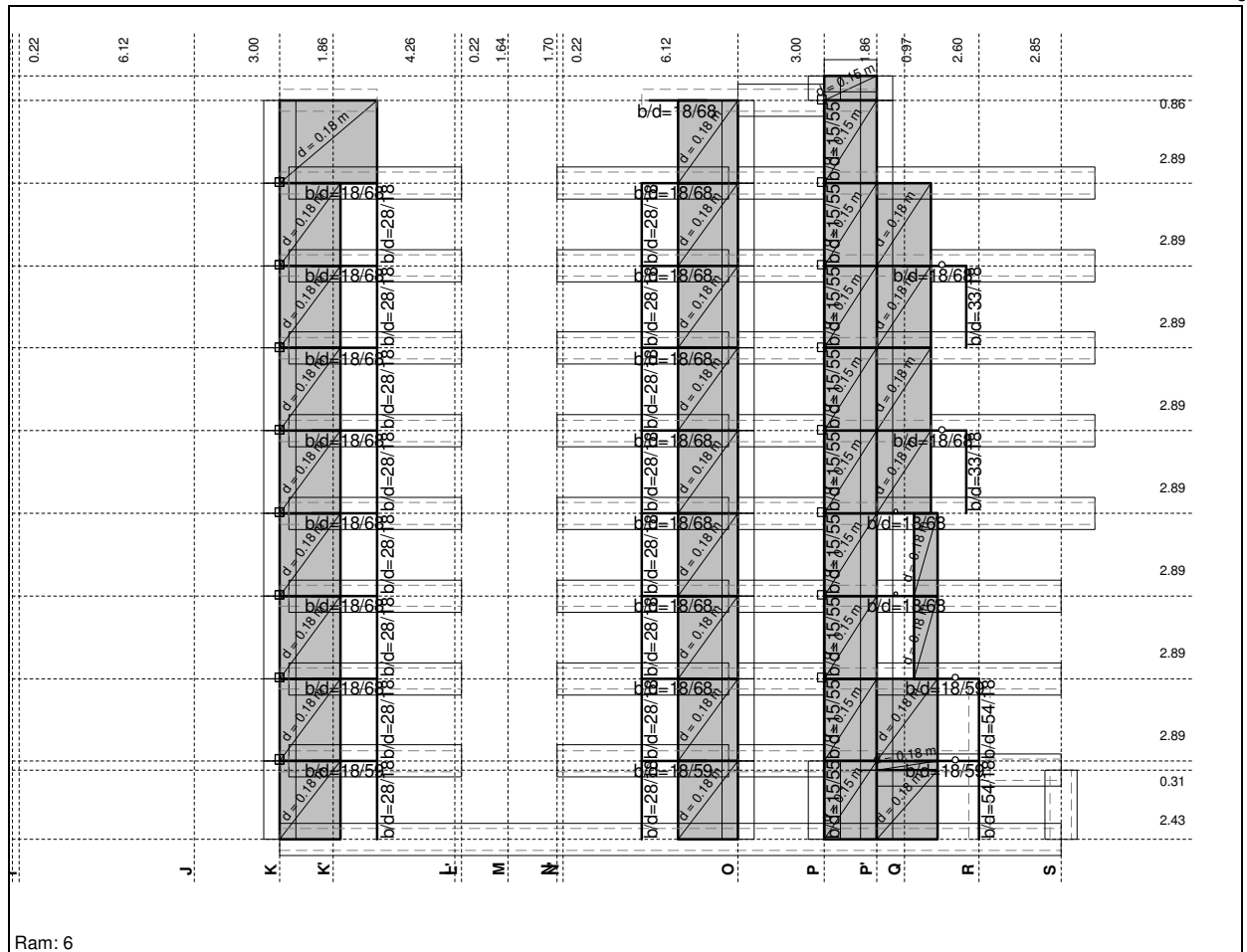




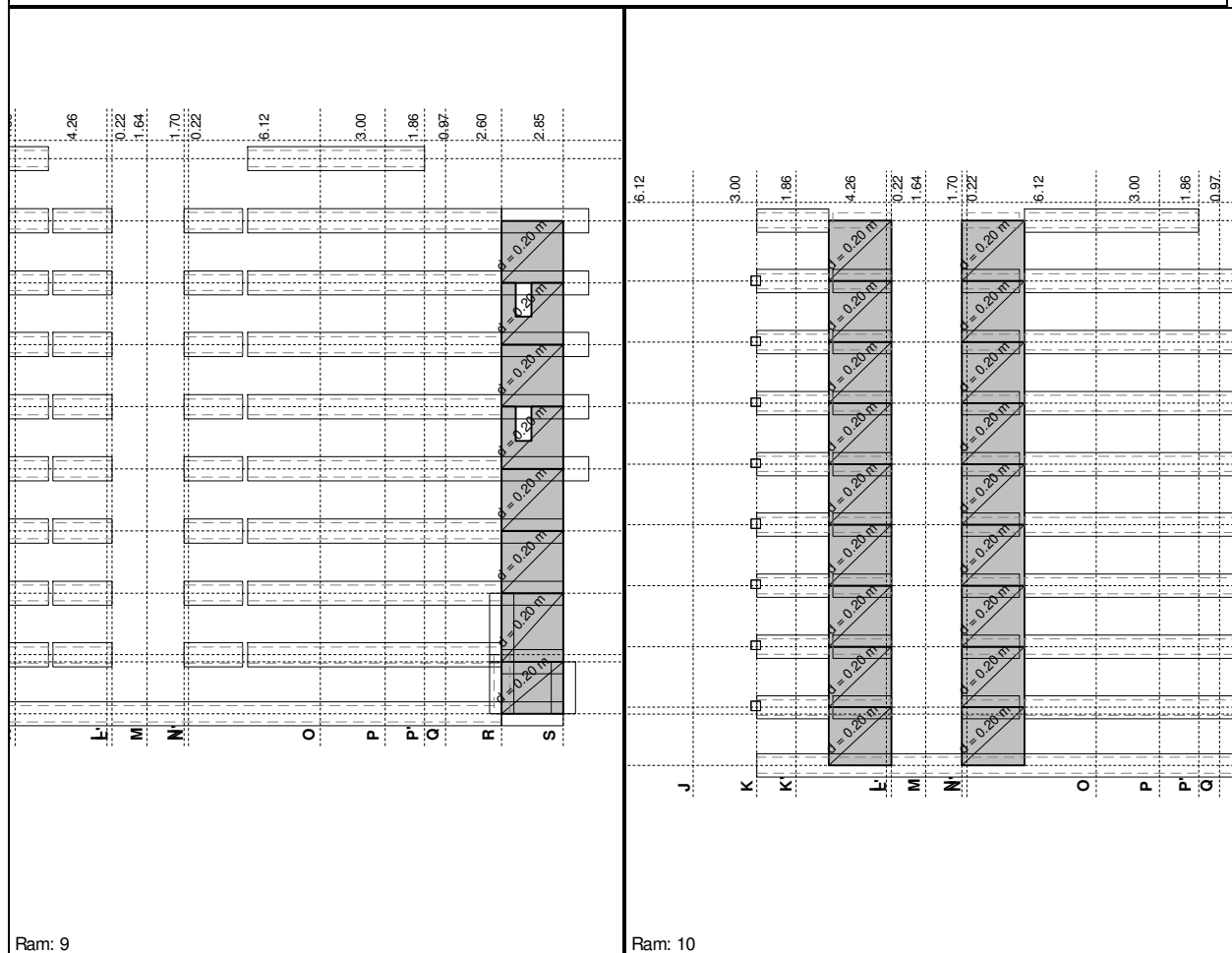






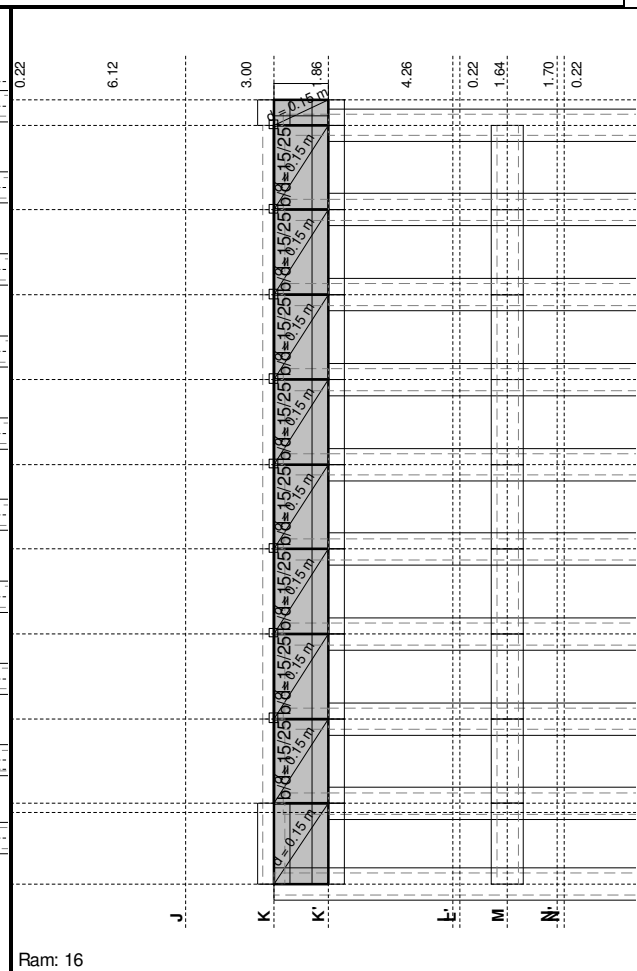


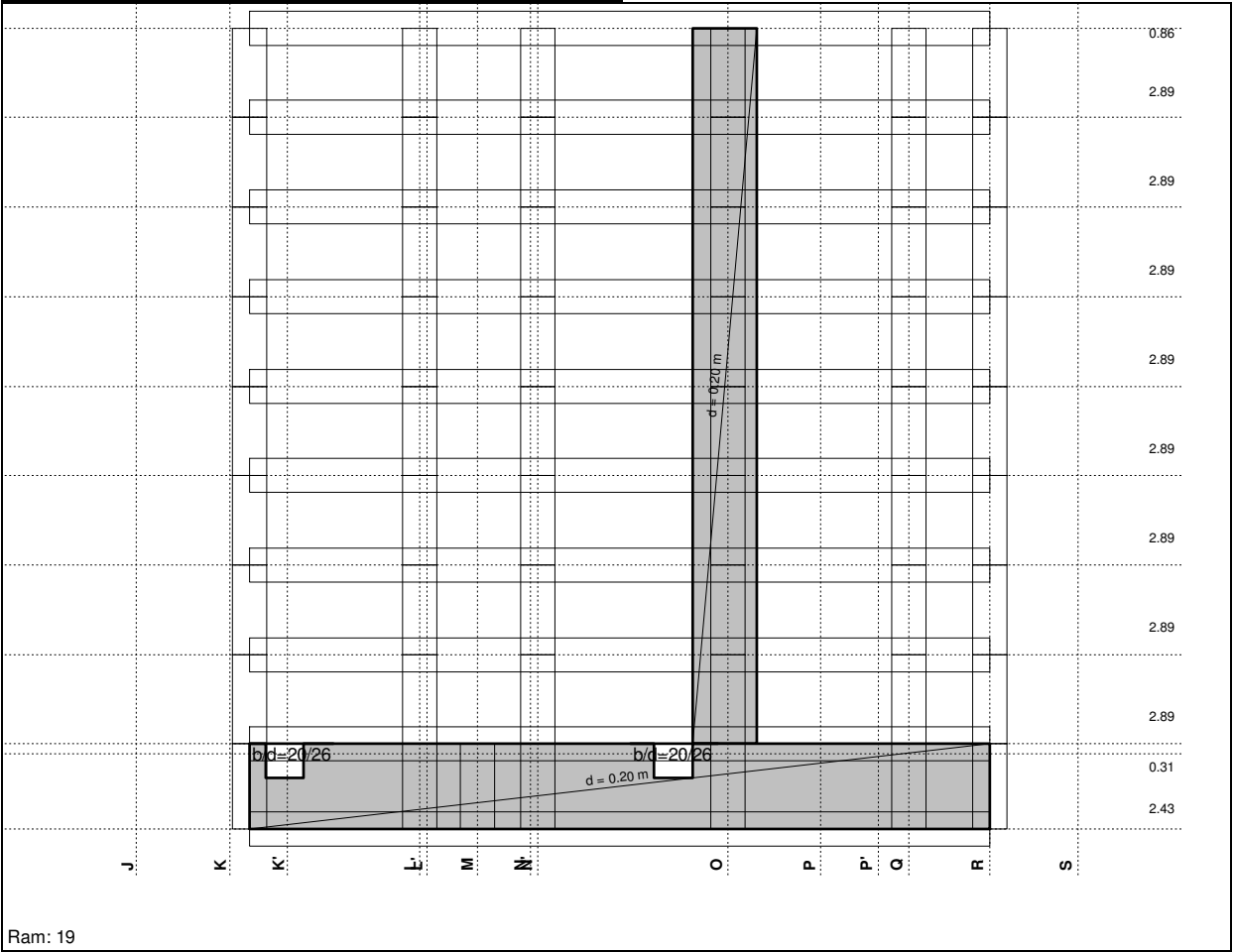
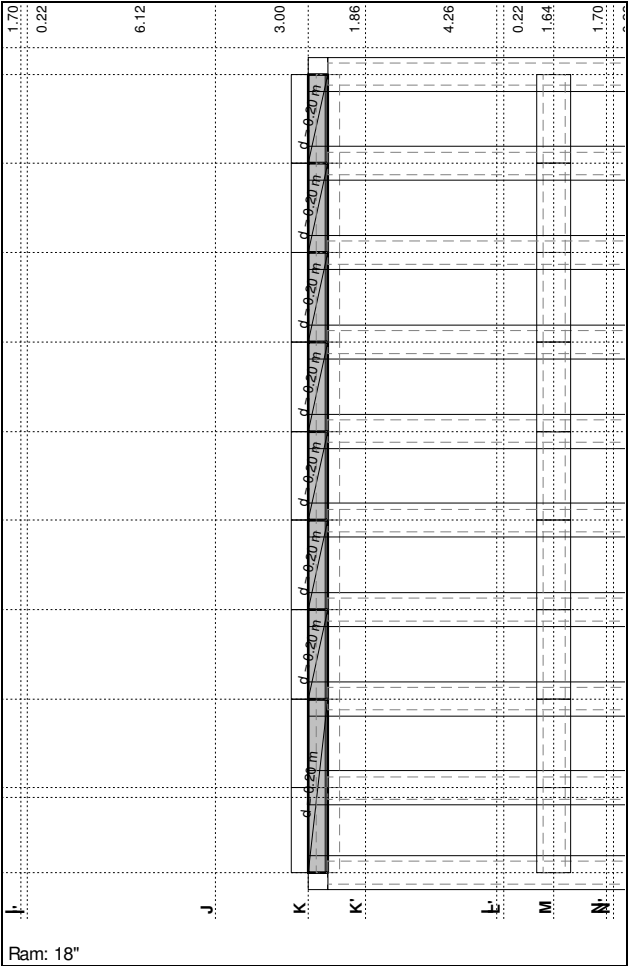
Ram: 6



Ram: 9

Ram: 10





Napredne opcije seizmičkog proračuna:

Mase grupisane u nivoima izabranih tavanica

Multiplikator krutosti oslonaca:

10000.000

Sprečeno oscilovanje u Z pravcu

Faktori opterećenja za proračun masa

No	Naziv	Koeficijent
1	g (g)	1.00
2	p	0.30

Raspored masa po visini objekta

Nivo	Z [m]	X [m]	Y [m]	Masa [T]	T/m²
POS 900+	23.87	179.12	-111.52	6.07	0.97
POS 800+	23.01	180.83	-108.79	281.35	1.41
POS 700+	20.12	181.88	-112.17	496.83	1.35
POS 600+	17.23	181.88	-112.09	483.10	1.33
POS 500+	14.34	181.98	-112.14	486.55	1.32
POS 400+	11.45	181.85	-112.11	480.69	1.32
POS 300+	8.56	181.93	-112.10	484.14	1.32
POS 200+	5.67	181.61	-112.03	474.77	1.32
POS 100+	2.78	181.47	-111.97	484.59	1.33
POS 0+	-0.11	181.85	-111.79	529.64	1.73
TPL vrh	-2.85	181.77	-111.78	747.37	1.86
Ukupno:	8.76	181.74	-111.82	4955.11	

Položaj centara krutosti po visini objekta (tačna metoda)

Nivo	Z [m]	X [m]	Y [m]
POS 900+	23.87	181.41	-112.03
POS 800+	23.01	181.50	-111.55
POS 700+	20.12	181.53	-112.19
POS 600+	17.23	181.55	-112.23
POS 500+	14.34	181.58	-112.26
POS 400+	11.45	181.58	-112.28
POS 300+	8.56	181.65	-112.24
POS 200+	5.67	181.68	-112.26
POS 100+	2.78	181.74	-112.17
POS 0+	-0.11	181.84	-111.76
TPL vrh	-2.85	181.74	-111.79

Ekscentricitet po visini objekta (tačna metoda)

Nivo	Z [m]	eox [m]	eoy [m]
POS 900+	23.87	2.29	0.50
POS 800+	23.01	0.67	2.76
POS 700+	20.12	0.35	0.01
POS 600+	17.23	0.33	0.14
POS 500+	14.34	0.41	0.13
POS 400+	11.45	0.26	0.17
POS 300+	8.56	0.28	0.14
POS 200+	5.67	0.06	0.23
POS 100+	2.78	0.28	0.20
POS 0+	-0.11	0.01	0.03
TPL vrh	-2.85	0.03	0.01

Periodi oscilovanja konstrukcije

No	T [s]	f [Hz]
1	0.4146	2.4120
2	0.3765	2.6562
3	0.3073	3.2540
4	0.1459	6.8528
5	0.1141	8.7627

6	0.0943	10.6088
7	0.0813	12.2955
8	0.0594	16.8363
9	0.0571	17.5180
10	0.0510	19.6226

Regularnost u osnovi

Z [m]	eox [m]	eoy [m]	rx [m]	ry [m]	ls [m]	eox<=0.3rx	eoy<=0.3ry	rx>ls	ry>ls
23.87	2.29	0.50	14.70	11.24	9.72	Da	Da	Da	Da
23.01	0.67	2.76	14.14	11.54	8.31	Da	Da	Da	Da
20.12	0.35	0.01	15.25	11.52	9.49	Da	Da	Da	Da
17.23	0.33	0.14	15.40	11.66	9.50	Da	Da	Da	Da
14.34	0.41	0.13	15.46	11.76	9.52	Da	Da	Da	Da
11.45	0.26	0.17	15.36	11.77	9.49	Da	Da	Da	Da
8.56	0.28	0.14	15.07	11.67	9.50	Da	Da	Da	Da
5.67	0.06	0.23	14.33	11.30	9.31	Da	Da	Da	Da
2.78	0.28	0.20	12.73	10.40	9.43	Da	Da	Da	Da
-0.11	0.01	0.03	10.53	9.36	8.98	Da	Da	Da	Da
-2.85	0.03	0.01	8.66	8.66	8.92	Da	Da	Ne	Ne

Seizmički proračun

Seizmički proračun: EC8 (EN 1998)

Kategorija tla: B
 Kategorija značaja: II ($\gamma=1.0$)
 Odnos a_g/g : 0.15
 Koeficijent prigušenja: 0.05
 Slučajni ekscentricitet spratne mase: $e_i = \pm 0.050 \times L_i$

Faktori pravca zemljotresa:

Slučaj opterećenja	Ugao α [°]	k, α	$k, \alpha+90^\circ$	k_z	Faktor q
Sx	0	1.000	0.000	0.000	3.000*
Sy	0	0.000	1.000	0.000	2.000

Tip spektra

Slučaj opterećenja	S	Tb	Tc	Td
Sx	1.730	0.150	0.500	2.000
Sy	1.730	0.150	0.500	2.000

Sx (+e)

Konstrukcija regularna po visini, Sistem zidova sa nepovezanim zidovima, klasa duktilnosti DC'M':

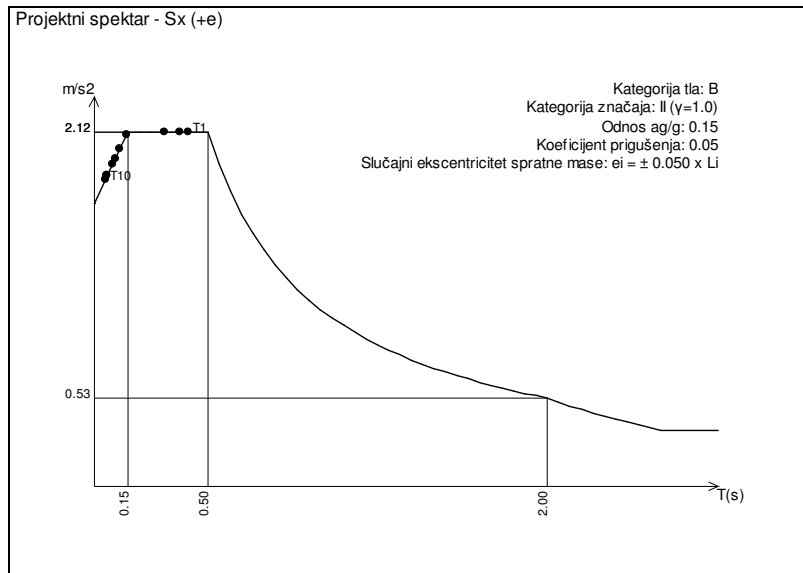
 $q_0=3.0$ Sistem zidova, dvojni sistem sa dominantnim zidovima i sistem sa jezgrom: $\alpha_0=2.00$, $k_w=1.00$.Faktor ponašanja: $q=q_0 \cdot k_w=3.00$

Nivo	Z [m]	Ton 1			Ton 2			Ton 3		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	14.61	4.59	0.47	3.58	-0.12	-0.41	0.88	-4.42	0.12
POS 800+	23.01	761.33	140.73	-1.92	60.67	54.87	1.09	32.10	-193.19	4.71
POS 700+	20.12	991.93	149.36	-8.58	289.03	143.42	-2.03	64.40	-293.60	2.22
POS 600+	17.23	838.56	119.42	-7.18	238.27	116.98	-1.98	55.75	-240.55	1.91
POS 500+	14.34	699.57	91.31	-7.54	200.06	97.50	-2.00	48.56	-195.43	1.66
POS 400+	11.45	543.14	71.40	-6.67	153.56	68.29	-1.64	39.22	-147.38	1.51
POS 300+	8.56	392.77	46.94	-5.98	109.34	47.16	-1.80	29.32	-104.07	1.46
POS 200+	5.67	240.50	30.23	-3.24	64.51	21.48	0.11	18.26	-63.15	1.49
POS 100+	2.78	115.92	13.78	-3.04	29.79	5.96	1.25	8.68	-31.09	1.04
POS 0+	-0.11	21.91	5.09	0.37	6.05	2.45	1.60	1.72	-9.24	0.12
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	0.04	0.01	-0.00	0.01	0.01	-0.00	0.00	-0.02	-0.00
$\Sigma=$		4620.3	672.86	-43.31	1154.9	558.00	-5.81	298.91	-1282.14	16.23

Nivo	Z [m]	Ton 4			Ton 5			Ton 6		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	-0.13	-0.01	-0.01	-7.24	-0.37	-0.45	-1.91	-0.09	0.55
POS 800+	23.01	-35.99	-1.34	-0.08	-308.35	0.27	-1.24	-27.61	-25.16	-1.75
POS 700+	20.12	2.03	0.71	-0.02	-252.12	31.60	5.82	-88.11	-42.39	0.47
POS 600+	17.23	11.49	0.34	0.02	-7.15	11.54	3.30	-20.90	-4.98	0.74
POS 500+	14.34	17.14	0.08	-0.04	205.38	-7.67	2.78	41.48	31.12	0.90
POS 400+	11.45	19.11	-0.09	-0.04	342.29	-18.03	1.76	84.57	52.13	1.08
POS 300+	8.56	17.81	-0.14	-0.06	386.94	-22.38	0.55	103.83	60.71	1.27
POS 200+	5.67	13.12	-0.18	-0.01	321.80	-10.77	-0.11	86.85	40.12	0.69
POS 100+	2.78	7.26	-0.22	-0.00	193.66	-3.48	-1.26	51.14	17.83	1.76
POS 0+	-0.11	1.62	0.05	0.08	44.78	3.28	0.24	13.78	6.14	2.33
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	0.00	-0.00	-0.00	0.11	-0.00	0.01	0.04	0.02	-0.00
$\Sigma=$		53.47	-0.79	-0.17	920.11	-16.02	11.39	243.15	135.44	8.02

Nivo	Z [m]	Ton 7			Ton 8			Ton 9		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	-0.04	0.40	0.00	2.22	-0.11	0.24	1.59	-0.41	-0.22
POS 800+	23.01	-0.06	16.05	-0.97	107.89	-28.29	1.10	51.68	25.93	-0.01
POS 700+	20.12	-1.52	14.26	-0.65	0.17	-10.70	-3.19	-2.99	-15.90	1.88
POS 600+	17.23	-0.84	0.12	-0.52	-99.70	26.50	-1.77	-54.15	-10.94	2.28
POS 500+	14.34	0.13	-12.20	-0.37	-115.25	35.21	-1.16	-62.10	-3.69	2.65
POS 400+	11.45	1.06	-20.42	-0.21	-42.70	12.47	-1.14	-21.85	2.60	2.49
POS 300+	8.56	1.61	-23.25	-0.06	62.18	-20.33	-1.58	38.65	6.30	2.08
POS 200+	5.67	1.51	-19.86	0.07	124.59	-28.65	-0.61	74.11	8.39	0.44
POS 100+	2.78	0.81	-13.09	0.10	108.82	-18.58	-0.86	63.00	5.86	0.53
POS 0+	-0.11	0.22	-5.07	-0.07	29.15	-2.41	-0.80	17.78	4.14	0.00
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	0.00	-0.01	-0.00	0.08	-0.01	0.01	0.05	0.01	0.01
$\Sigma=$		2.89	-63.06	-2.69	177.45	-34.89	-9.76	105.79	22.28	12.13

Nivo	Z [m]	Ton 10		
		Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	1.27	1.06	-0.29
POS 800+	23.01	29.41	-2.04	-0.43
POS 700+	20.12	-1.97	11.30	0.15
POS 600+	17.23	-25.03	-4.13	-0.09
POS 500+	14.34	-29.31	-11.60	-0.13
POS 400+	11.45	-12.02	-6.23	-0.03
POS 300+	8.56	15.72	6.17	0.15
POS 200+	5.67	32.98	9.06	-0.29
POS 100+	2.78	28.46	4.48	0.27
POS 0+	-0.11	8.92	0.90	0.71
POS 0+ LOKALI	-0.42	0.00	0.00	0.00
TPL_vrh	-2.85	0.03	0.00	-0.00
$\Sigma=$		48.46	8.96	0.02



$S_x (-e)$

Konstrukcija regularna po visini, Sistem zidova sa nepovezanim zidovima, klasa duktilnosti DC'M':

$q_0=3.0$

Sistem zidova, dvojni sistem sa dominantnim zidovima i sistem sa jezgrom: $\alpha_0=2.00$, $k_w=1.00$.

Faktor ponašanja: $q=q_0 \cdot k_w=3.00$

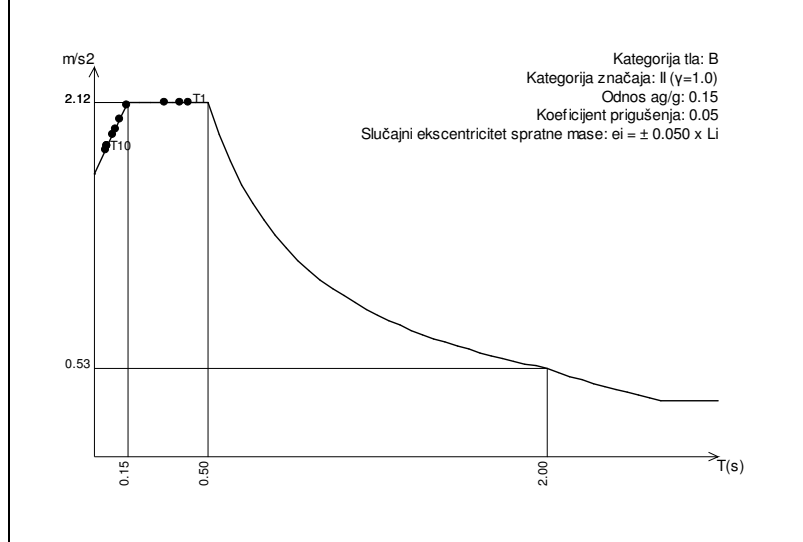
Nivo	Z [m]	Ton 1			Ton 2			Ton 3		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	14.61	4.59	0.47	3.58	-0.12	-0.41	0.88	-4.42	0.12
POS 800+	23.01	761.33	140.73	-1.92	60.67	54.87	1.09	32.10	-193.19	4.71
POS 700+	20.12	991.93	149.36	-8.58	289.03	143.42	-2.03	64.40	-293.60	2.22
POS 600+	17.23	838.56	119.42	-7.18	238.27	116.98	-1.98	55.75	-240.55	1.91
POS 500+	14.34	699.57	91.31	-7.54	200.06	97.50	-2.00	48.56	-195.43	1.66
POS 400+	11.45	543.14	71.40	-6.67	153.56	68.29	-1.64	39.22	-147.38	1.51
POS 300+	8.56	392.77	46.94	-5.98	109.34	47.16	-1.80	29.32	-104.07	1.46
POS 200+	5.67	240.50	30.23	-3.24	64.51	21.48	0.11	18.26	-63.15	1.49
POS 100+	2.78	115.92	13.78	-3.04	29.79	5.96	1.25	8.68	-31.09	1.04
POS 0+	-0.11	21.91	5.09	0.37	6.05	2.45	1.60	1.72	-9.24	0.12
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	0.04	0.01	-0.00	0.01	0.01	-0.00	0.00	-0.02	-0.00
$\Sigma=$		4620.3	672.86	-43.31	1154.9	558.00	-5.81	298.91	-1282.14	16.23

Nivo	Z [m]	Ton 4			Ton 5			Ton 6		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	-0.13	-0.01	-0.01	-7.24	-0.37	-0.45	-1.91	-0.09	0.55
POS 800+	23.01	-35.99	-1.34	-0.08	-308.35	0.27	-1.24	-27.61	-25.16	-1.75
POS 700+	20.12	2.03	0.71	-0.02	-252.12	31.60	5.82	-88.11	-42.39	0.47
POS 600+	17.23	11.49	0.34	0.02	-7.15	11.54	3.30	-20.90	-4.98	0.74
POS 500+	14.34	17.14	0.08	-0.04	205.38	-7.67	2.78	41.48	31.12	0.90
POS 400+	11.45	19.11	-0.09	-0.04	342.29	-18.03	1.76	84.57	52.13	1.08
POS 300+	8.56	17.81	-0.14	-0.06	386.94	-22.38	0.55	103.83	60.71	1.27
POS 200+	5.67	13.12	-0.18	-0.01	321.80	-10.77	-0.11	86.85	40.12	0.69
POS 100+	2.78	7.26	-0.22	-0.00	193.66	-3.48	-1.26	51.14	17.83	1.76
POS 0+	-0.11	1.62	0.05	0.08	44.78	3.28	0.24	13.78	6.14	2.33
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	0.00	-0.00	-0.00	0.11	-0.00	0.01	0.04	0.02	-0.00
$\Sigma=$		53.47	-0.79	-0.17	920.11	-16.02	11.39	243.15	135.44	8.02

Nivo	Z [m]	Ton 7			Ton 8			Ton 9		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	-0.04	0.40	0.00	2.22	-0.11	0.24	1.59	-0.41	-0.22
POS 800+	23.01	-0.06	16.05	-0.97	107.89	-28.29	1.10	51.68	25.93	-0.01
POS 700+	20.12	-1.52	14.26	-0.65	0.17	-10.70	-3.19	-2.99	-15.90	1.88
POS 600+	17.23	-0.84	0.12	-0.52	-99.70	26.50	-1.77	-54.15	-10.94	2.28
POS 500+	14.34	0.13	-12.20	-0.37	-115.25	35.21	-1.16	-62.10	-3.69	2.65
POS 400+	11.45	1.06	-20.42	-0.21	-42.70	12.47	-1.14	-21.85	2.60	2.49
POS 300+	8.56	1.61	-23.25	-0.06	62.18	-20.33	-1.58	38.65	6.30	2.08
POS 200+	5.67	1.51	-19.86	0.07	124.59	-28.65	-0.61	74.11	8.39	0.44
POS 100+	2.78	0.81	-13.09	0.10	108.82	-18.58	-0.86	63.00	5.86	0.53
POS 0+	-0.11	0.22	-5.07	-0.07	29.15	-2.41	-0.80	17.78	4.14	0.00
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	0.00	-0.01	-0.00	0.08	-0.01	0.01	0.05	0.01	0.01
$\Sigma=$		2.89	-63.06	-2.69	177.45	-34.89	-9.76	105.79	22.28	12.13

Nivo	Z [m]	Ton 10		
		Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	1.27	1.06	-0.29
POS 800+	23.01	29.41	-2.04	-0.43
POS 700+	20.12	-1.97	11.30	0.15
POS 600+	17.23	-25.03	-4.13	-0.09
POS 500+	14.34	-29.31	-11.60	-0.13
POS 400+	11.45	-12.02	-6.23	-0.03
POS 300+	8.56	15.72	6.17	0.15

POS 200+	5.67	32.98	9.06	-0.29
POS 100+	2.78	28.46	4.48	0.27
POS 0+	-0.11	8.92	0.90	0.71
POS 0+ LOKALI	-0.42	0.00	0.00	0.00
TPL_vrh	-2.85	0.03	0.00	-0.00
	$\Sigma=$	48.46	8.96	0.02

Projektni spektar - $S_x (-e)$ 

Sy (+e)

Nivo	Z [m]	Ton 1			Ton 2			Ton 3		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	3.19	1.00	0.10	2.60	-0.09	-0.30	-5.66	28.42	-0.78
POS 800+	23.01	166.31	30.74	-0.42	43.97	39.77	0.79	-206.55	1243.0	-30.28
POS 700+	20.12	216.69	32.63	-1.87	209.47	103.94	-1.47	-414.34	1889.0	-14.31
POS 600+	17.23	183.18	26.09	-1.57	172.69	84.78	-1.44	-358.70	1547.7	-12.27
POS 500+	14.34	152.82	19.95	-1.65	145.00	70.66	-1.45	-312.45	1257.4	-10.67
POS 400+	11.45	118.65	15.60	-1.46	111.29	49.49	-1.19	-252.37	948.25	-9.70
POS 300+	8.56	85.80	10.25	-1.31	79.24	34.18	-1.30	-188.67	669.61	-9.39
POS 200+	5.67	52.54	6.60	-0.71	46.75	15.57	0.08	-117.50	406.33	-9.56
POS 100+	2.78	25.32	3.01	-0.66	21.59	4.32	0.91	-55.84	200.04	-6.71
POS 0+	-0.11	4.79	1.11	0.08	4.38	1.78	1.16	-11.09	59.44	-0.77
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	0.01	0.00	-0.00	0.01	0.00	-0.00	-0.03	0.12	0.00
	$\Sigma=$	1009.3	146.99	-9.46	837.00	404.41	-4.21	-1923.21	8249.3	-104.44

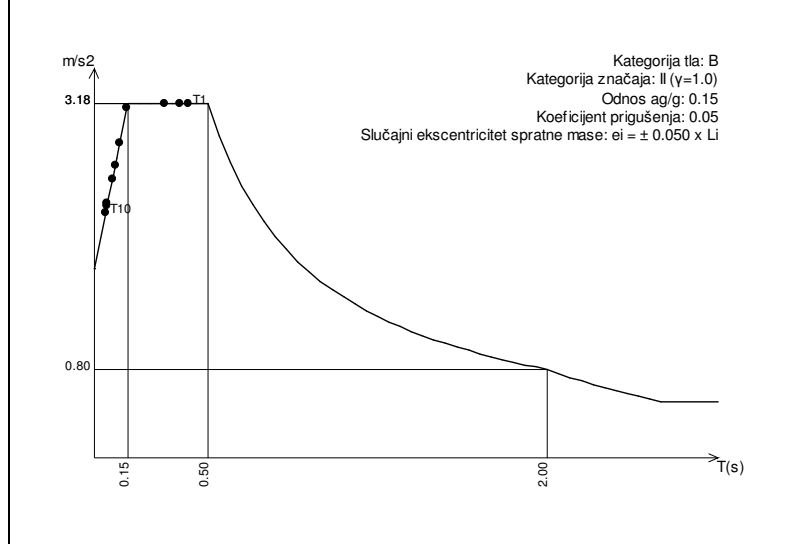
Nivo	Z [m]	Ton 4			Ton 5			Ton 6		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	0.00	0.00	0.00	0.18	0.01	0.01	-1.43	-0.07	0.41
POS 800+	23.01	0.79	0.03	0.00	7.52	-0.01	0.03	-20.61	-18.79	-1.31
POS 700+	20.12	-0.04	-0.02	0.00	6.15	-0.77	-0.14	-65.79	-31.66	0.35
POS 600+	17.23	-0.25	-0.01	-0.00	0.17	-0.28	-0.08	-15.61	-3.72	0.55
POS 500+	14.34	-0.38	-0.00	0.00	-5.01	0.19	-0.07	30.97	23.24	0.68
POS 400+	11.45	-0.42	0.00	0.00	-8.35	0.44	-0.04	63.15	38.92	0.81
POS 300+	8.56	-0.39	0.00	0.00	-9.44	0.55	-0.01	77.53	45.33	0.94
POS 200+	5.67	-0.29	0.00	0.00	-7.85	0.26	0.00	64.85	29.96	0.51
POS 100+	2.78	-0.16	0.00	0.00	-4.73	0.09	0.03	38.19	13.31	1.32
POS 0+	-0.11	-0.04	-0.00	-0.00	-1.09	-0.08	-0.01	10.29	4.58	1.74
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	-0.00	0.00	0.00	-0.00	0.00	-0.00	0.03	0.01	-0.00
	$\Sigma=$	-1.17	0.02	0.00	-22.45	0.39	-0.28	181.56	101.14	5.99

Nivo	Z [m]	Ton 7			Ton 8			Ton 9		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	1.06	-11.43	-0.04	-0.53	0.03	-0.06	0.41	-0.10	-0.06
POS 800+	23.01	1.67	-456.33	27.69	-26.03	6.82	-0.26	13.25	6.65	-0.00
POS 700+	20.12	43.23	-405.33	18.59	-0.04	2.58	0.77	-0.77	-4.08	0.48
POS 600+	17.23	23.85	-3.40	14.68	24.05	-6.39	0.43	-13.89	-2.81	0.58
POS 500+	14.34	-3.74	346.69	10.48	27.81	-8.50	0.28	-15.92	-0.95	0.68
POS 400+	11.45	-30.22	580.53	6.05	10.30	-3.01	0.28	-5.60	0.67	0.64
POS 300+	8.56	-45.87	660.82	1.79	-15.00	4.91	0.38	9.91	1.62	0.53
POS 200+	5.67	-42.88	564.42	-2.12	-30.06	6.91	0.15	19.00	2.15	0.11
POS 100+	2.78	-22.96	372.20	-2.81	-26.26	4.48	0.21	16.16	1.50	0.14
POS 0+	-0.11	-6.12	144.02	2.10	-7.03	0.58	0.19	4.56	1.06	0.00
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	-0.02	0.38	0.00	-0.02	0.00	-0.00	0.01	0.00	0.00
	$\Sigma=$	-82.01	1792.6	76.41	-42.82	8.42	2.36	27.13	5.71	3.11

Nivo	Z [m]	Ton 10		
		Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	0.28	0.23	-0.06
POS 800+	23.01	6.50	-0.45	-0.10
POS 700+	20.12	-0.44	2.50	0.03
POS 600+	17.23	-5.54	-0.91	-0.02
POS 500+	14.34	-6.48	-2.57	-0.03
POS 400+	11.45	-2.66	-1.38	-0.01

POS 300+	8.56	3.48	1.36	0.03
POS 200+	5.67	7.29	2.00	-0.06
POS 100+	2.78	6.29	0.99	0.06
POS 0+	-0.11	1.97	0.20	0.16
POS 0+ LOKALI	-0.42	0.00	0.00	0.00
TPL_vrh	-2.85	0.01	0.00	-0.00
	$\Sigma=$	10.72	1.98	0.01

Projektni spektar - Sy (+e)



Sy (-e)

Nivo	Z [m]	Ton 1			Ton 2			Ton 3		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	3.19	1.00	0.10	2.60	-0.09	-0.30	-5.66	28.42	-0.78
POS 800+	23.01	166.31	30.74	-0.42	43.97	39.77	0.79	-206.55	1243.0	-30.28
POS 700+	20.12	216.69	32.63	-1.87	209.47	103.94	-1.47	-414.34	1889.0	-14.31
POS 600+	17.23	183.18	26.09	-1.57	172.69	84.78	-1.44	-358.70	1547.7	-12.27
POS 500+	14.34	152.82	19.95	-1.65	145.00	70.66	-1.45	-312.45	1257.4	-10.67
POS 400+	11.45	118.65	15.60	-1.46	111.29	49.49	-1.19	-252.37	948.25	-9.70
POS 300+	8.56	85.80	10.25	-1.31	79.24	34.18	-1.30	-188.67	669.61	-9.39
POS 200+	5.67	52.54	6.60	-0.71	46.75	15.57	0.08	-117.50	406.33	-9.56
POS 100+	2.78	25.32	3.01	-0.66	21.59	4.32	0.91	-55.84	200.04	-6.71
POS 0+	-0.11	4.79	1.11	0.08	4.38	1.78	1.16	-11.09	59.44	-0.77
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	0.01	0.00	-0.00	0.01	0.00	-0.00	-0.03	0.12	0.00
	$\Sigma=$	1009.3	146.99	-9.46	837.00	404.41	-4.21	-1923.21	8249.3	-104.44

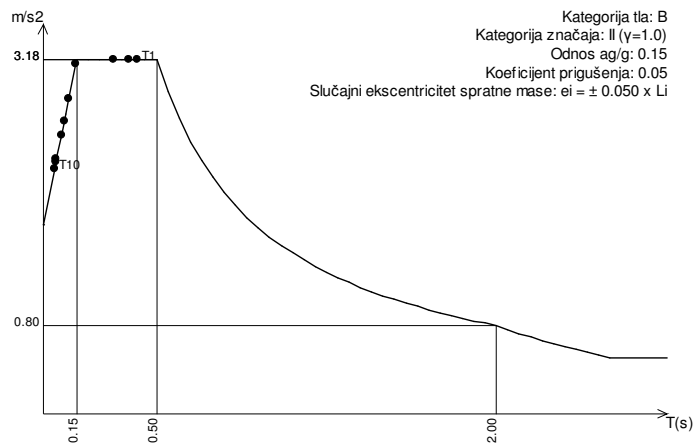
Nivo	Z [m]	Ton 4			Ton 5			Ton 6		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	0.00	0.00	0.00	0.18	0.01	0.01	-1.43	-0.07	0.41
POS 800+	23.01	0.79	0.03	0.00	7.52	-0.01	0.03	-20.61	-18.79	-1.31
POS 700+	20.12	-0.04	-0.02	0.00	6.15	-0.77	-0.14	-65.79	-31.66	0.35
POS 600+	17.23	-0.25	-0.01	-0.00	0.17	-0.28	-0.08	-15.61	-3.72	0.55
POS 500+	14.34	-0.38	-0.00	0.00	-5.01	0.19	-0.07	30.97	23.24	0.68
POS 400+	11.45	-0.42	0.00	0.00	-8.35	0.44	-0.04	63.15	38.92	0.81
POS 300+	8.56	-0.39	0.00	0.00	-9.44	0.55	-0.01	77.53	45.33	0.94
POS 200+	5.67	-0.29	0.00	0.00	-7.85	0.26	0.00	64.85	29.96	0.51
POS 100+	2.78	-0.16	0.00	0.00	-4.73	0.09	0.03	38.19	13.31	1.32
POS 0+	-0.11	-0.04	-0.00	-0.00	-1.09	-0.08	-0.01	10.29	4.58	1.74
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	-0.00	0.00	0.00	-0.00	0.00	-0.00	0.03	0.01	-0.00
	$\Sigma=$	-1.17	0.02	0.00	-22.45	0.39	-0.28	181.56	101.14	5.99

Nivo	Z [m]	Ton 7			Ton 8			Ton 9		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	1.06	-11.43	-0.04	-0.53	0.03	-0.06	0.41	-0.10	-0.06
POS 800+	23.01	1.67	-456.33	27.69	-26.03	6.82	-0.26	13.25	6.65	-0.00
POS 700+	20.12	43.23	-405.33	18.59	-0.04	2.58	0.77	-0.77	-4.08	0.48
POS 600+	17.23	23.85	-3.40	14.68	24.05	-6.39	0.43	-13.89	-2.81	0.58
POS 500+	14.34	-3.74	346.69	10.48	27.81	-8.50	0.28	-15.92	-0.95	0.68
POS 400+	11.45	-30.22	580.53	6.05	10.30	-3.01	0.28	-5.60	0.67	0.64
POS 300+	8.56	-45.87	660.82	1.79	-15.00	4.91	0.38	9.91	1.62	0.53
POS 200+	5.67	-42.88	564.42	-2.12	-30.06	6.91	0.15	19.00	2.15	0.11
POS 100+	2.78	-22.96	372.20	-2.81	-26.26	4.48	0.21	16.16	1.50	0.14
POS 0+	-0.11	-6.12	144.02	2.10	-7.03	0.58	0.19	4.56	1.06	0.00
POS 0+ LOKALI	-0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPL_vrh	-2.85	-0.02	0.38	0.00	-0.02	0.00	-0.00	0.01	0.00	0.00
	$\Sigma=$	-82.01	1792.6	76.41	-42.82	8.42	2.36	27.13	5.71	3.11

Nivo	Z [m]	Ton 10		
		Px [kN]	Py [kN]	Pz [kN]
POS 900+	23.87	0.28	0.23	-0.06
POS 800+	23.01	6.50	-0.45	-0.10
POS 700+	20.12	-0.44	2.50	0.03
POS 600+	17.23	-5.54	-0.91	-0.02
POS 500+	14.34	-6.48	-2.57	-0.03

POS 400+	11.45	-2.66	-1.38	-0.01
POS 300+	8.56	3.48	1.36	0.03
POS 200+	5.67	7.29	2.00	-0.06
POS 100+	2.78	6.29	0.99	0.06
POS 0+	-0.11	1.97	0.20	0.16
POS 0+ LOKALI	-0.42	0.00	0.00	0.00
TPL_vrh	-2.85	0.01	0.00	-0.00
	$\Sigma=$	10.72	1.98	0.01

Projektni spektar - Sy (-e)



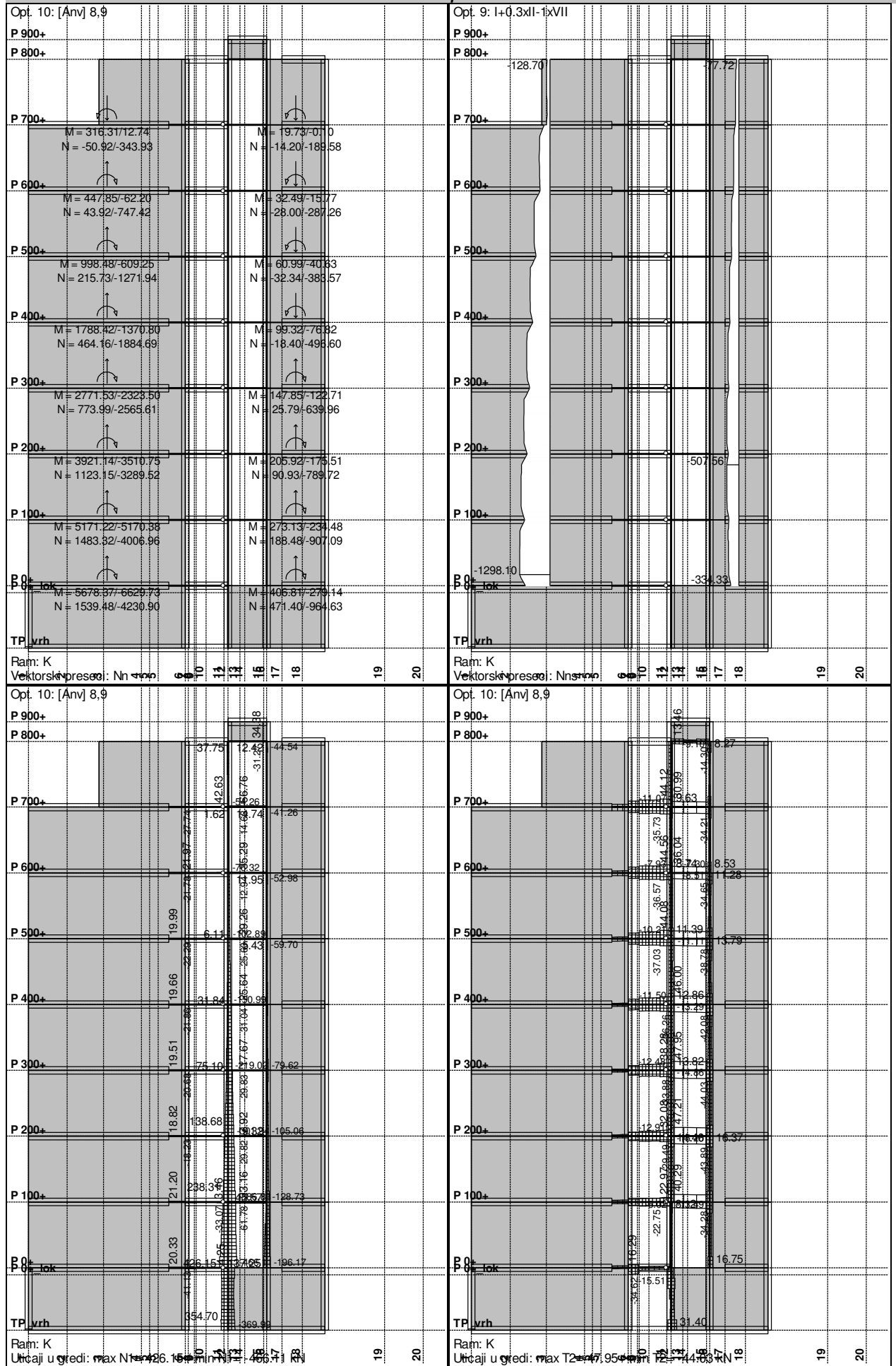
Faktori participacije - relativno učešće

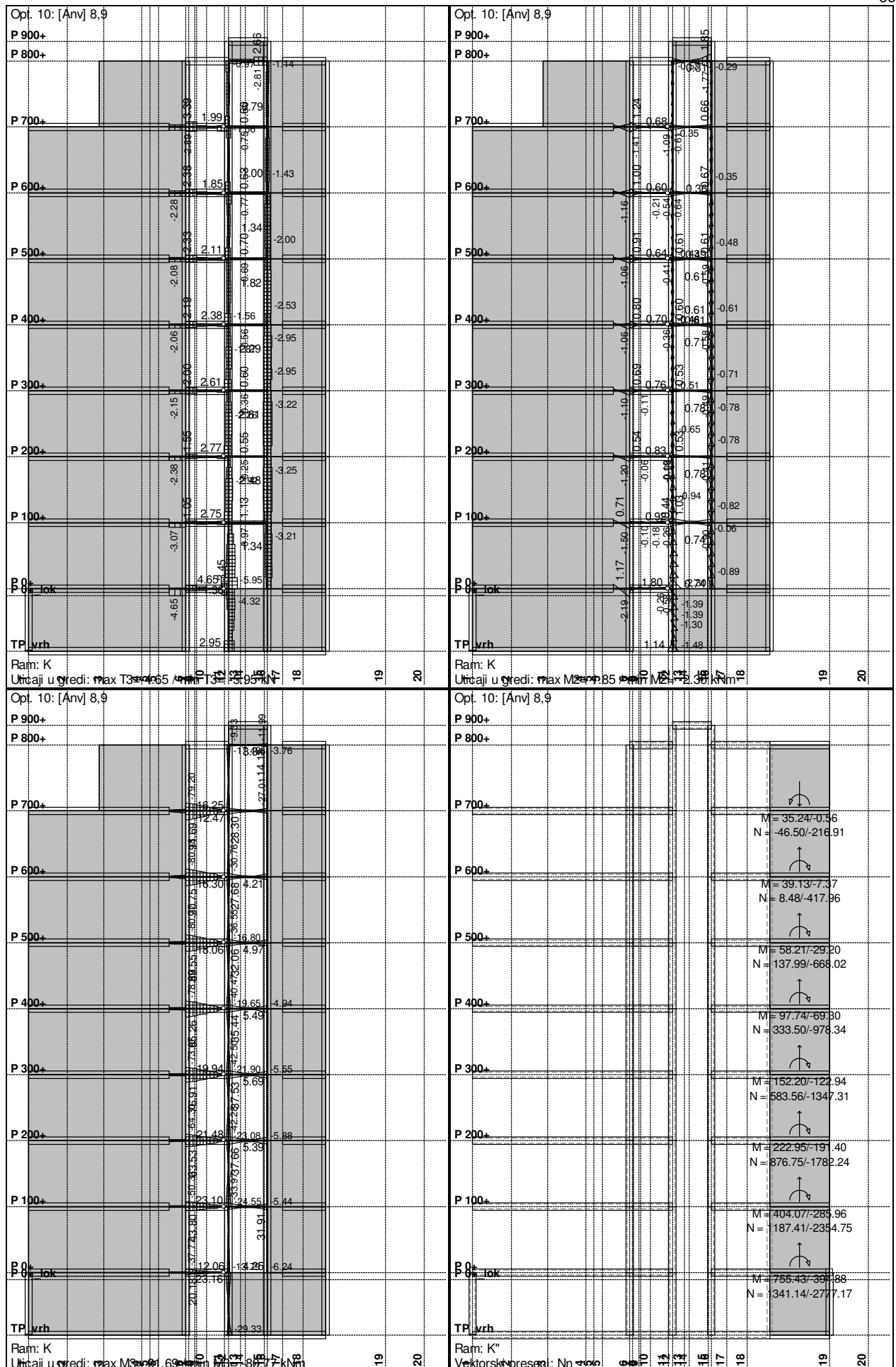
Ton \ Naziv	1. Sx (+e)	2. Sx (-e)	3. Sy (+e)	4. Sy (-e)
1	0.606	0.606	0.014	0.014
2	0.151	0.151	0.038	0.038
3	0.039	0.039	0.770	0.770
4	0.007	0.007	0.000	0.000
5	0.121	0.121	0.000	0.000
6	0.032	0.032	0.009	0.009
7	0.000	0.000	0.167	0.167
8	0.023	0.023	0.001	0.001
9	0.014	0.014	0.001	0.001
10	0.006	0.006	0.000	0.000

Faktori participacije - angažovanje mase

Ton	U [$\alpha=0^\circ$]	U [$\alpha=0^\circ$]
1	44.24	44.24
2	11.09	11.09
3	2.88	2.88
4	0.51	0.51
5	9.43	9.43
6	2.59	2.59
7	0.03	0.03
8	1.97	1.97
9	1.19	1.19
10	0.55	0.55
ΣU (%)	74.47	74.47

Statički proračun





Opt. 8: I+0.3xII+VII

P 900+

P 800+

P 700+

P 600+

P 500+

P 400+

P 300+

P 200+

P 100+

P 0+

TP 0+ lok

TP 0+ vrh

Ram: K"

Vektorski presjek: Nn

Opt. 9: I+0.3xII+VII

P 900+

P 800+

P 700+

P 600+

P 500+

P 400+

P 300+

P 200+

P 100+

P 0+

TP 0+ lok

TP 0+ vrh

Ram: K'

Vektorski presjek: Nn

Opt. 10: [Anv] 8,9

P 900+

P 800+

P 700+

P 600+

P 500+

P 400+

P 300+

P 200+

P 100+

P 0+

TP 0+ lok

TP 0+ vrh

Ram: K'

Vektorski presjek: Nn

Opt. 10: [Anv] 8,9

P 900+

P 800+

P 700+

P 600+

P 500+

P 400+

P 300+

P 200+

P 100+

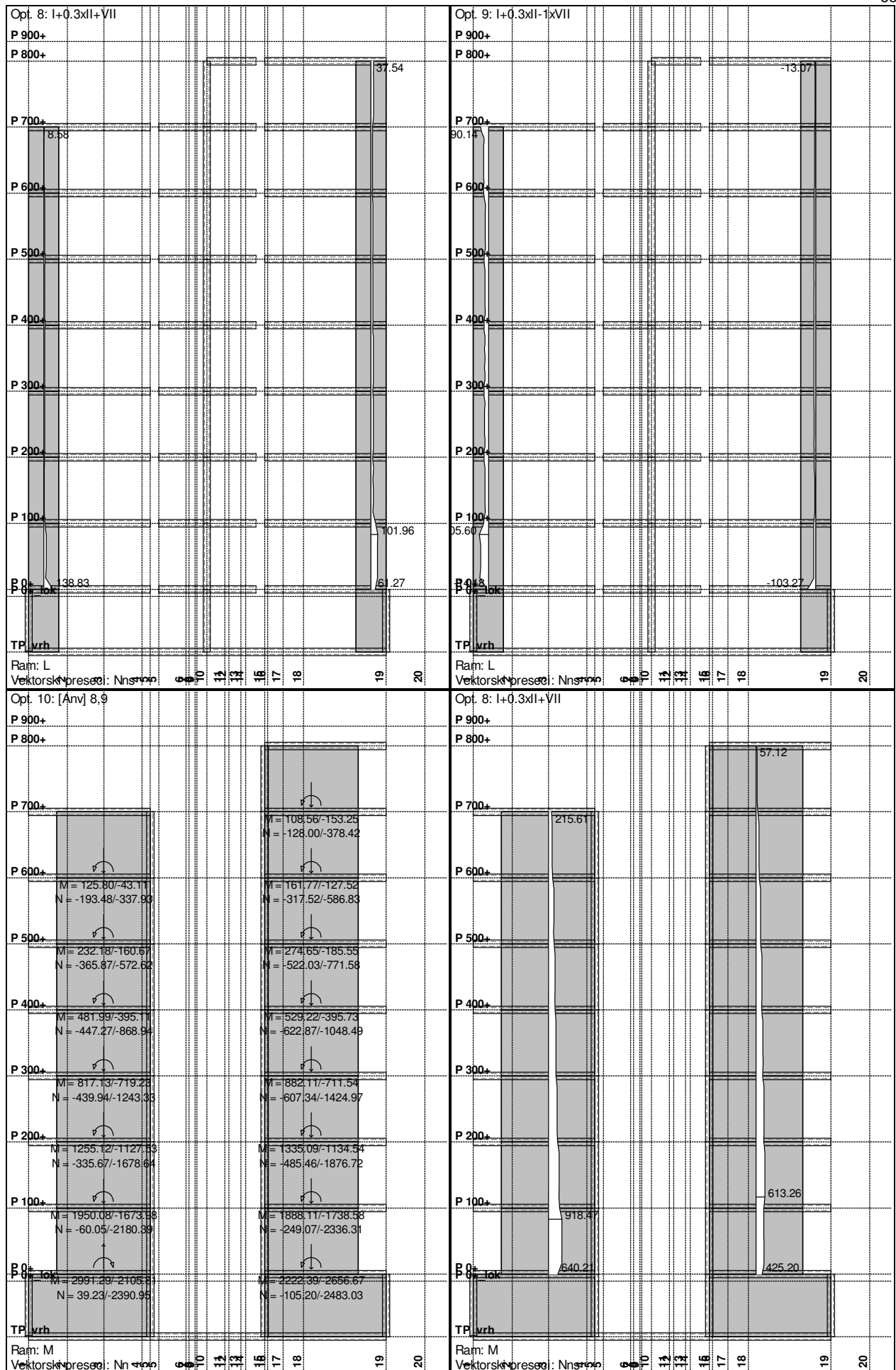
P 0+

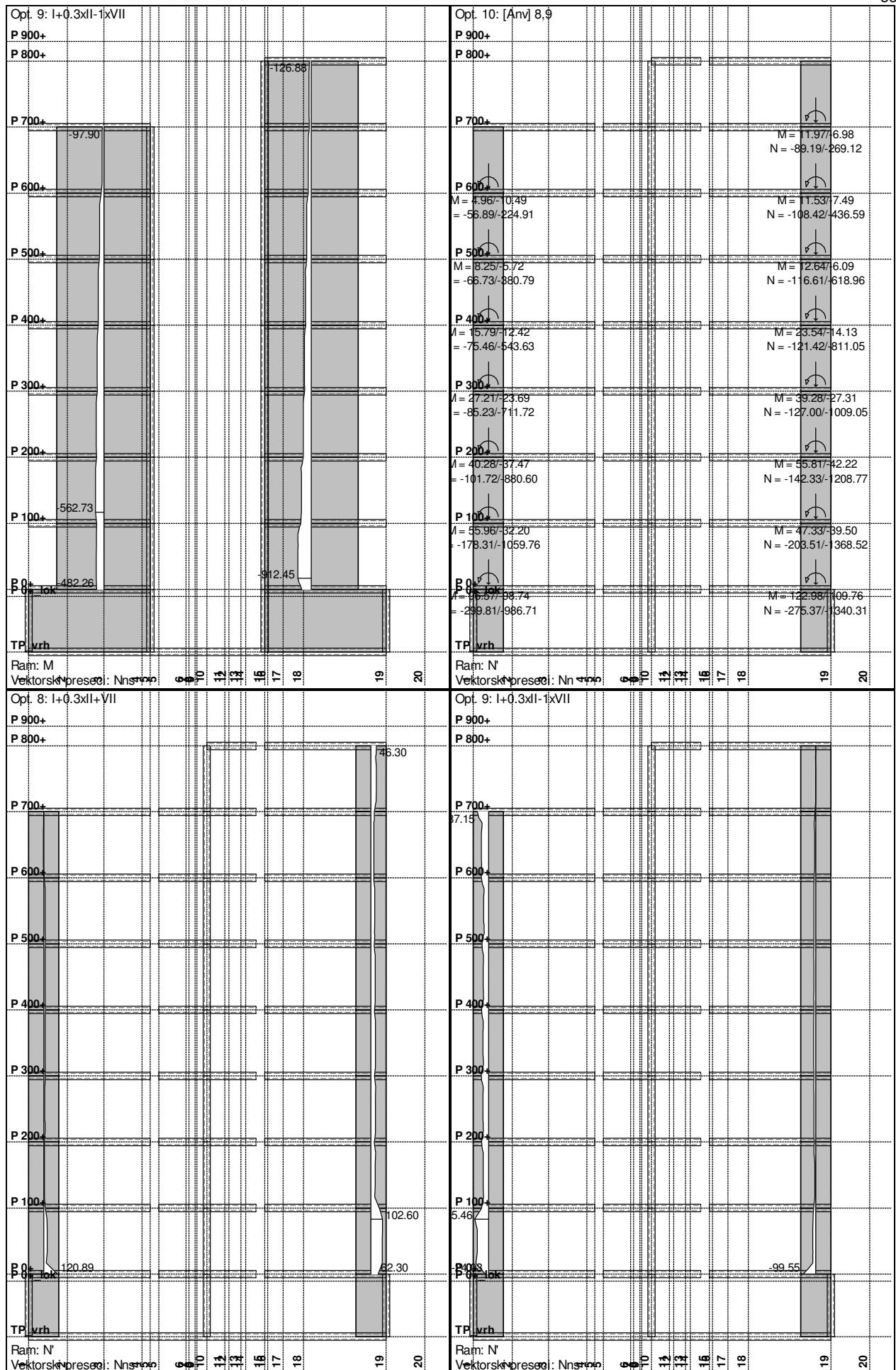
TP 0+ lok

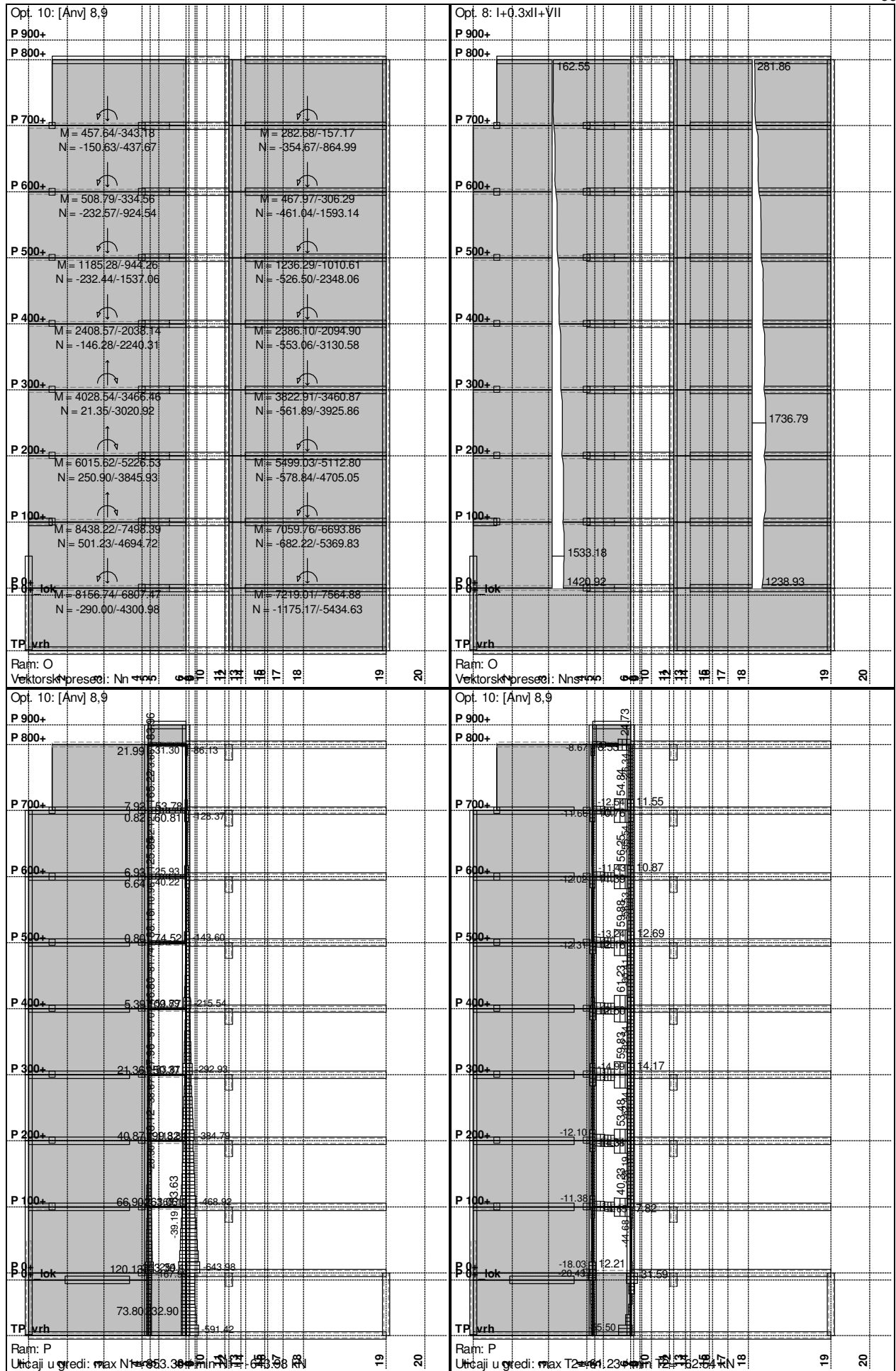
TP 0+ vrh

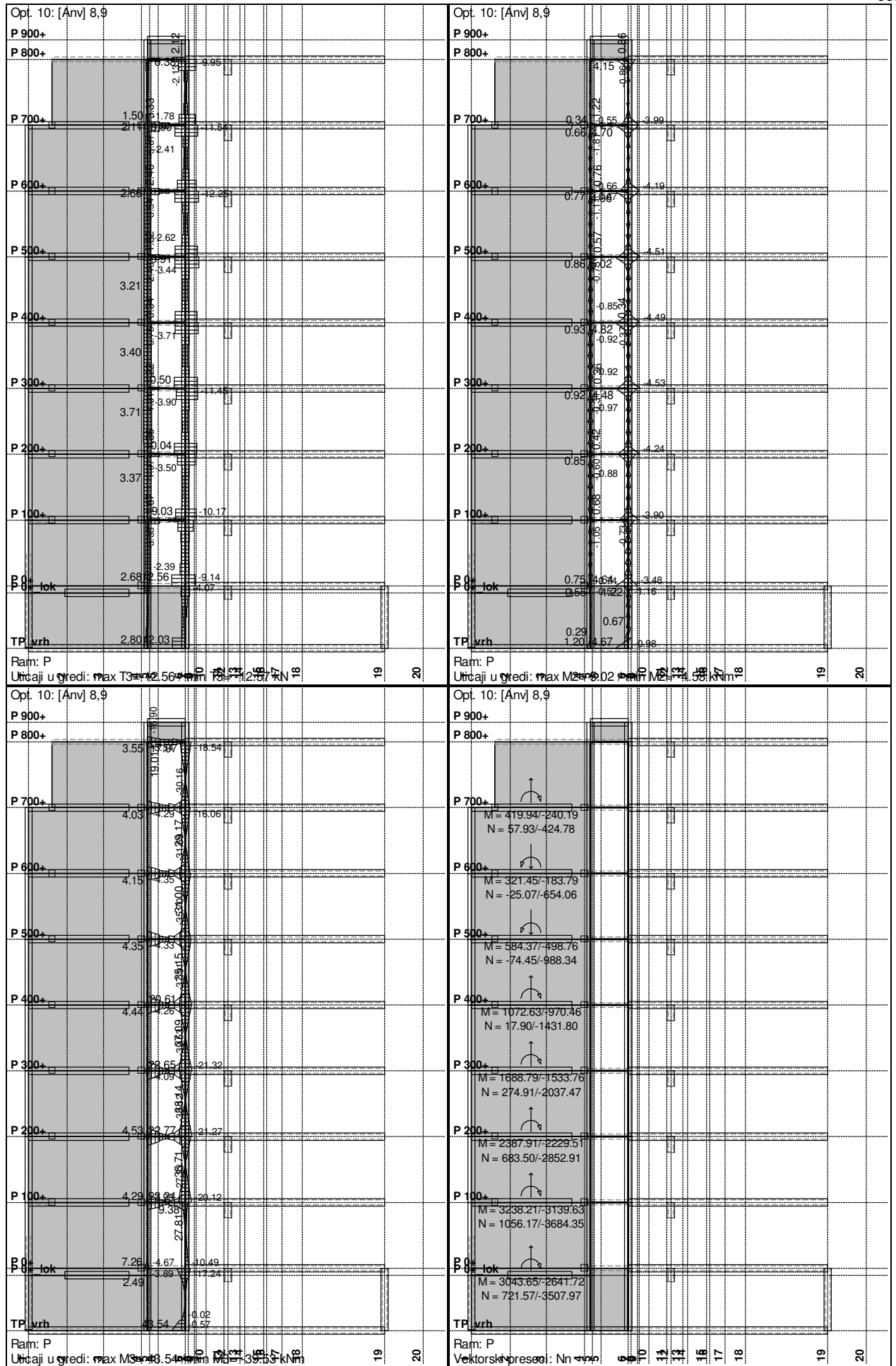
Ram: L

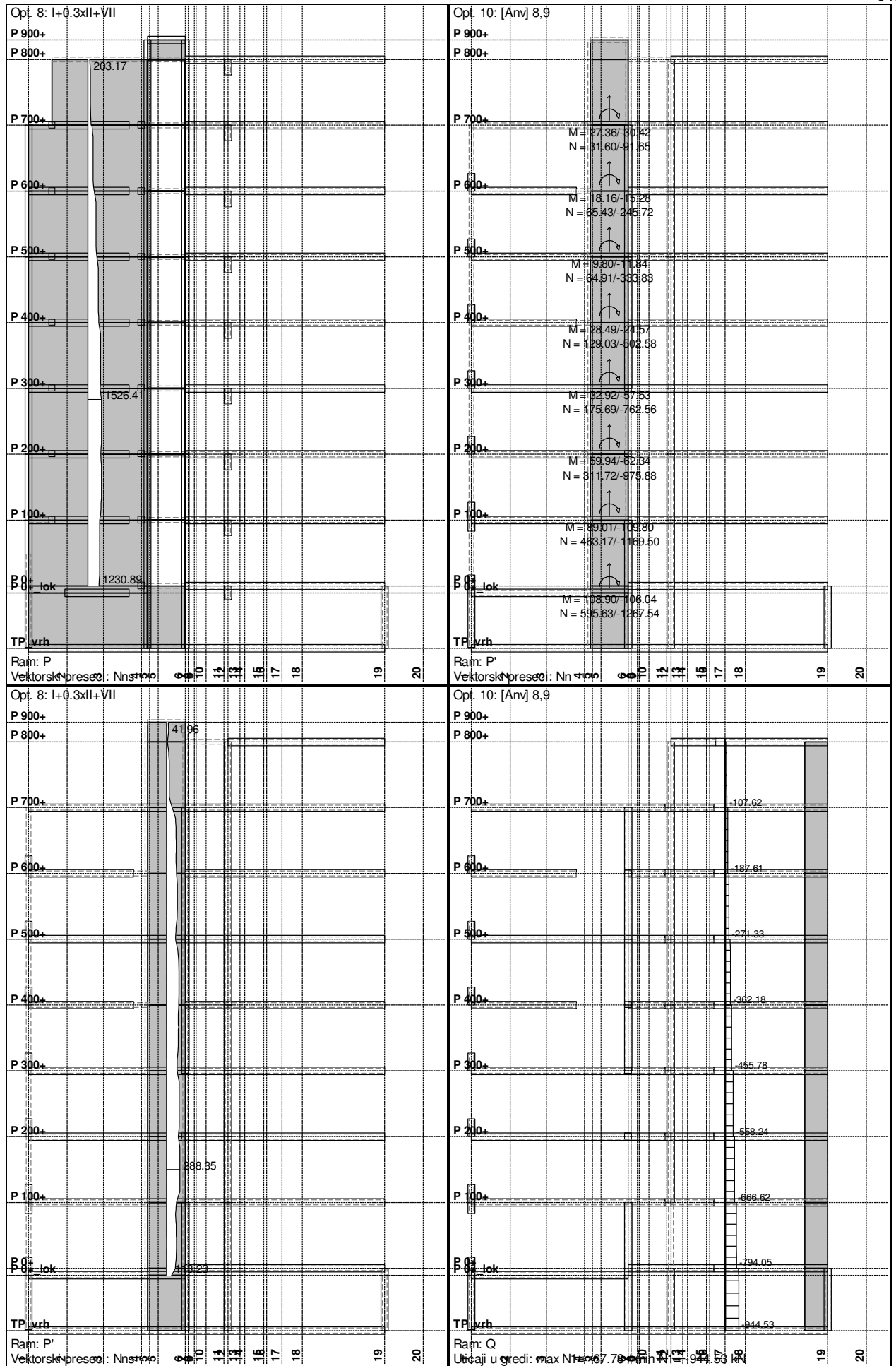
Vektorski presjek: Nn





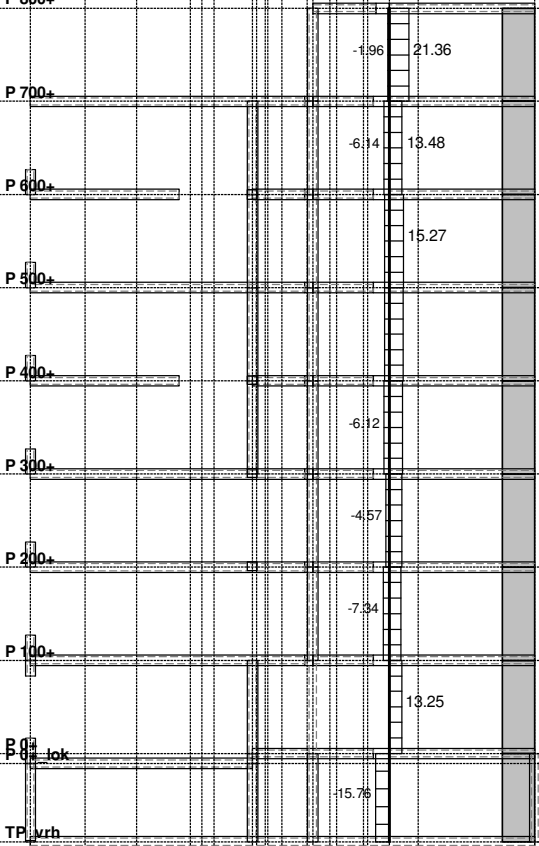






Opt. 10: [Anv] 8,9

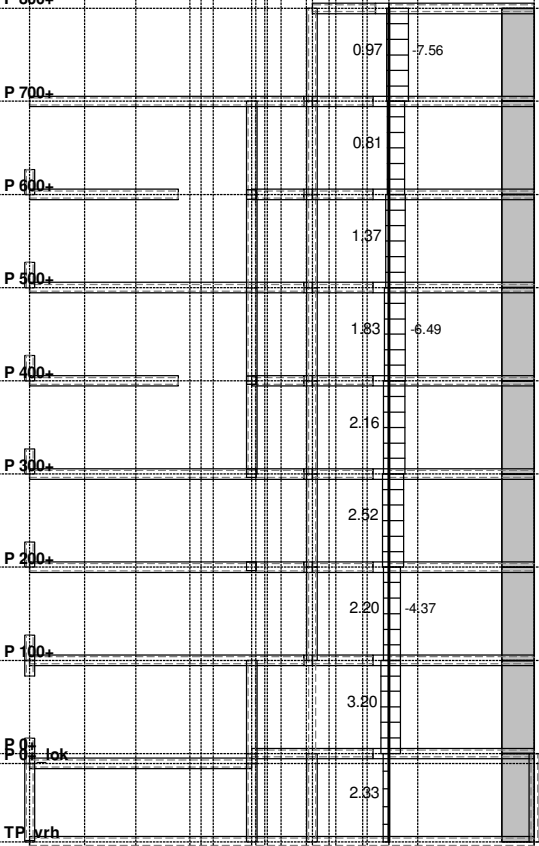
P 900+
P 800+



Ram: Q
Urcaji u gredi: max T2=21.36 kN min T2=-15.76 kN

Opt. 10: [Anv] 8,9

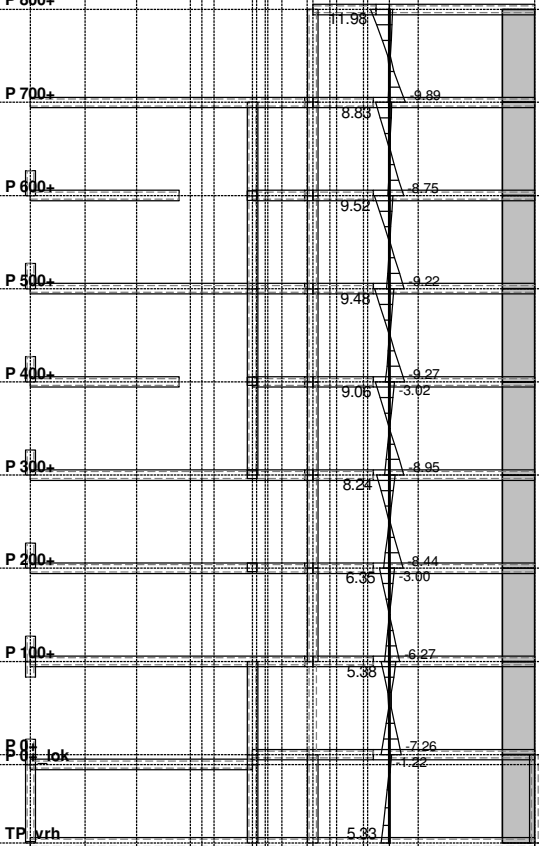
P 900+
P 800+



Ram: Q
Urcaji u gredi: max T3=4.37 kN min T3=0.81 kN

Opt. 10: [Anv] 8,9

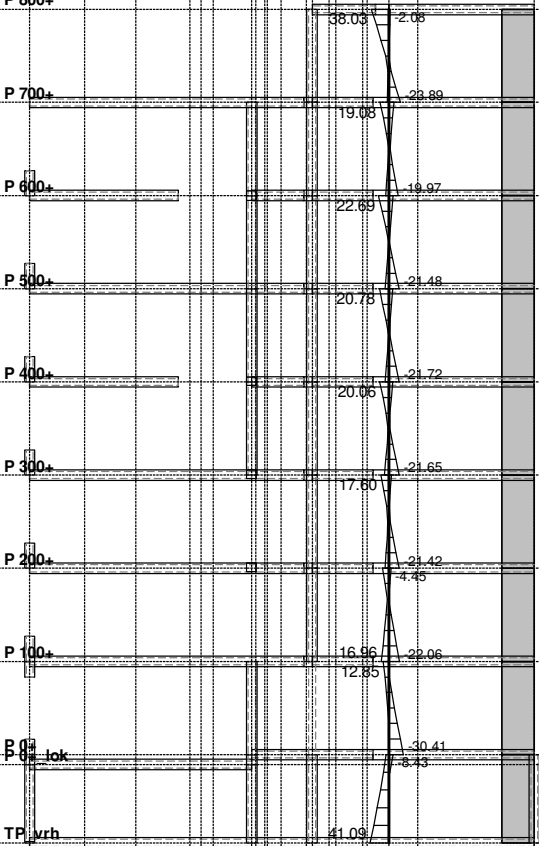
P 900+
P 800+



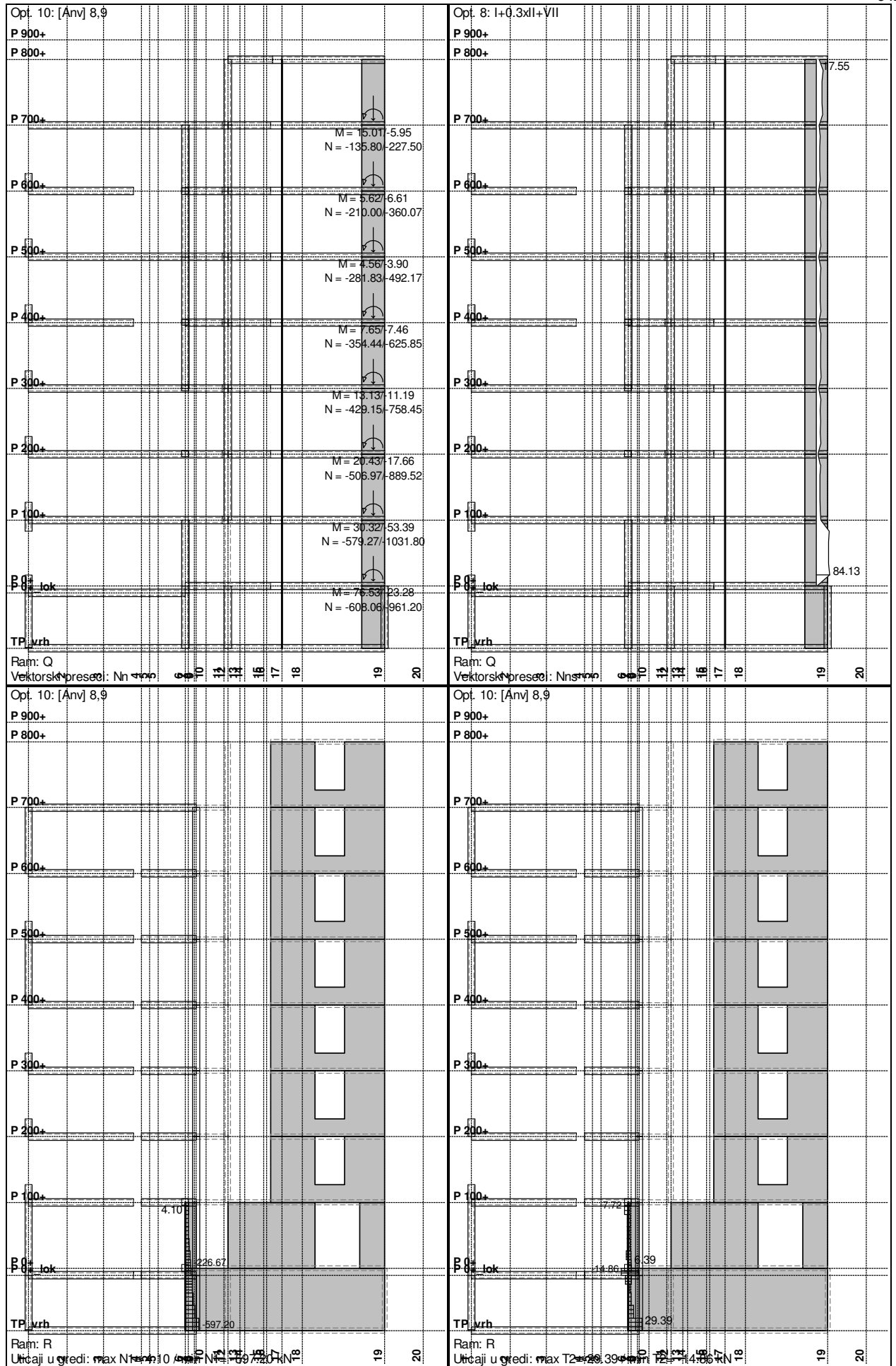
Ram: Q
Urcaji u gredi: max M2=11.98 kNm min M2=-9.45 kNm

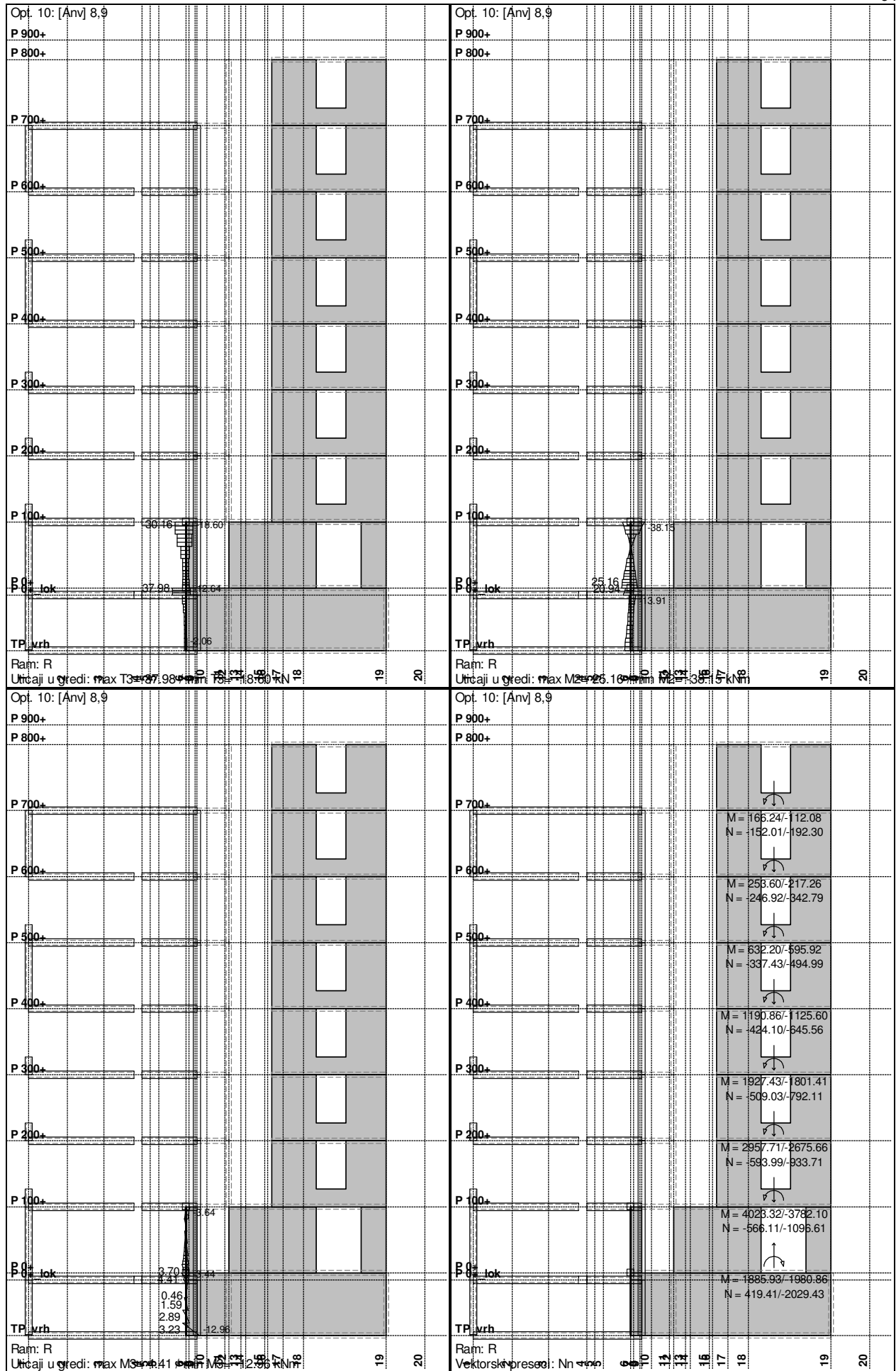
Opt. 10: [Anv] 8,9

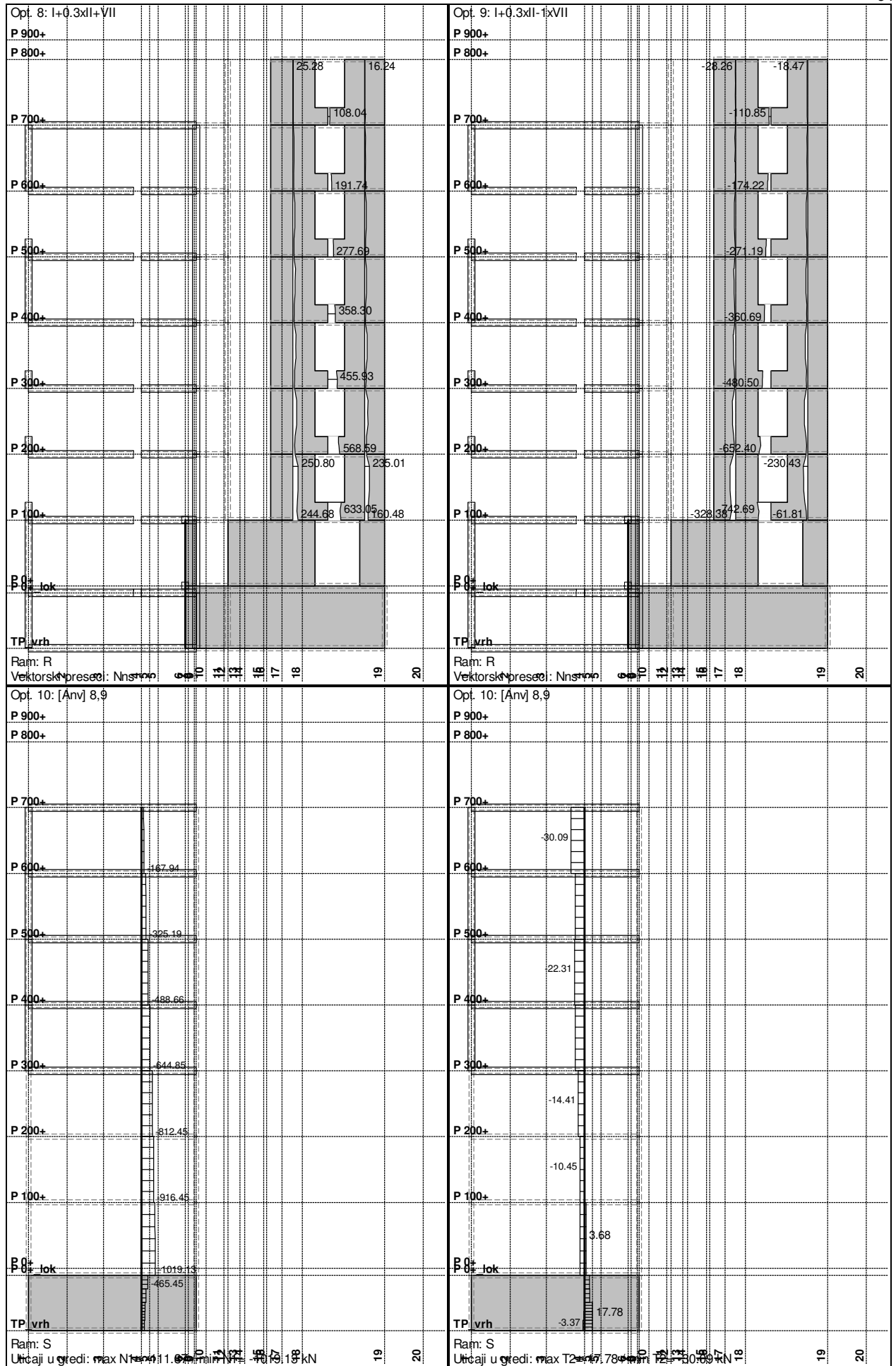
P 900+
P 800+

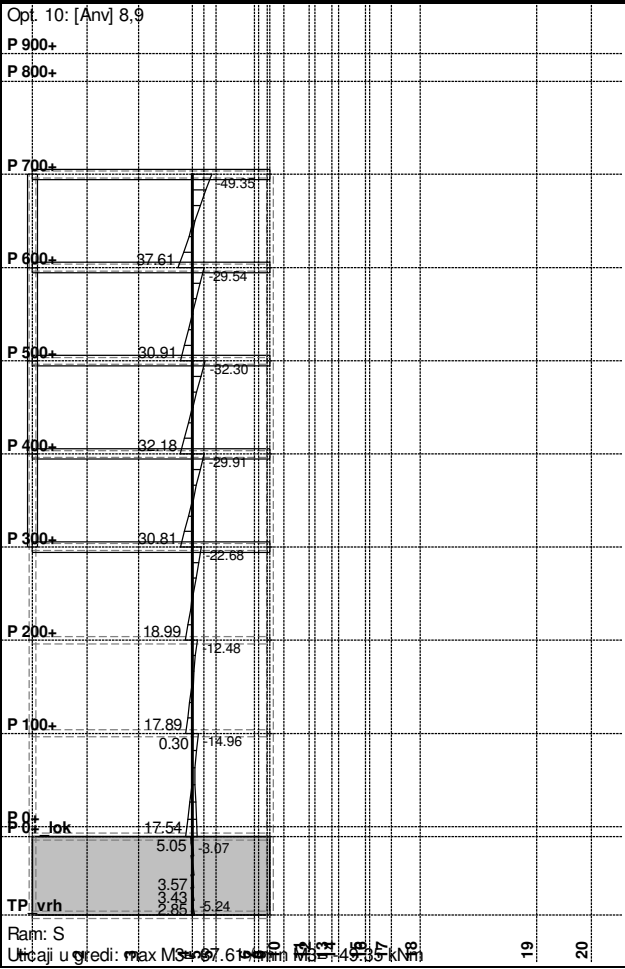
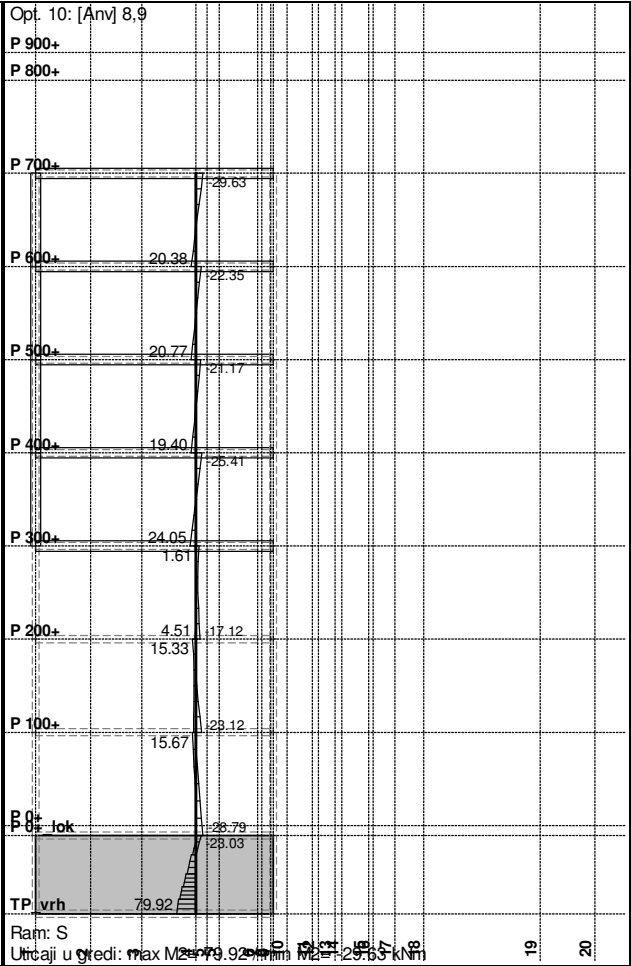
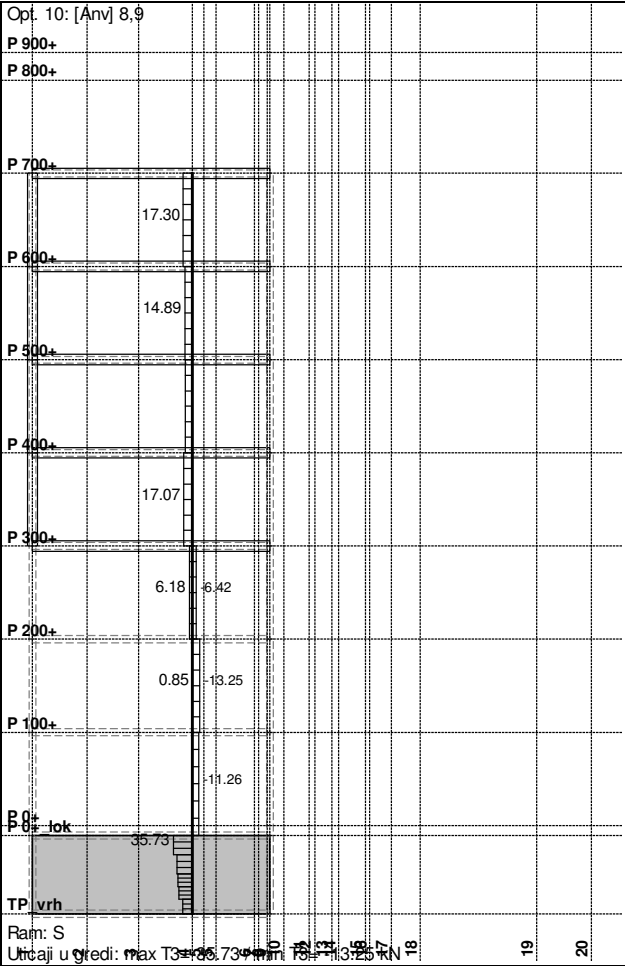


Ram: Q
Urcaji u gredi: max M3=41.09 kNm min M3=-8.43 kNm

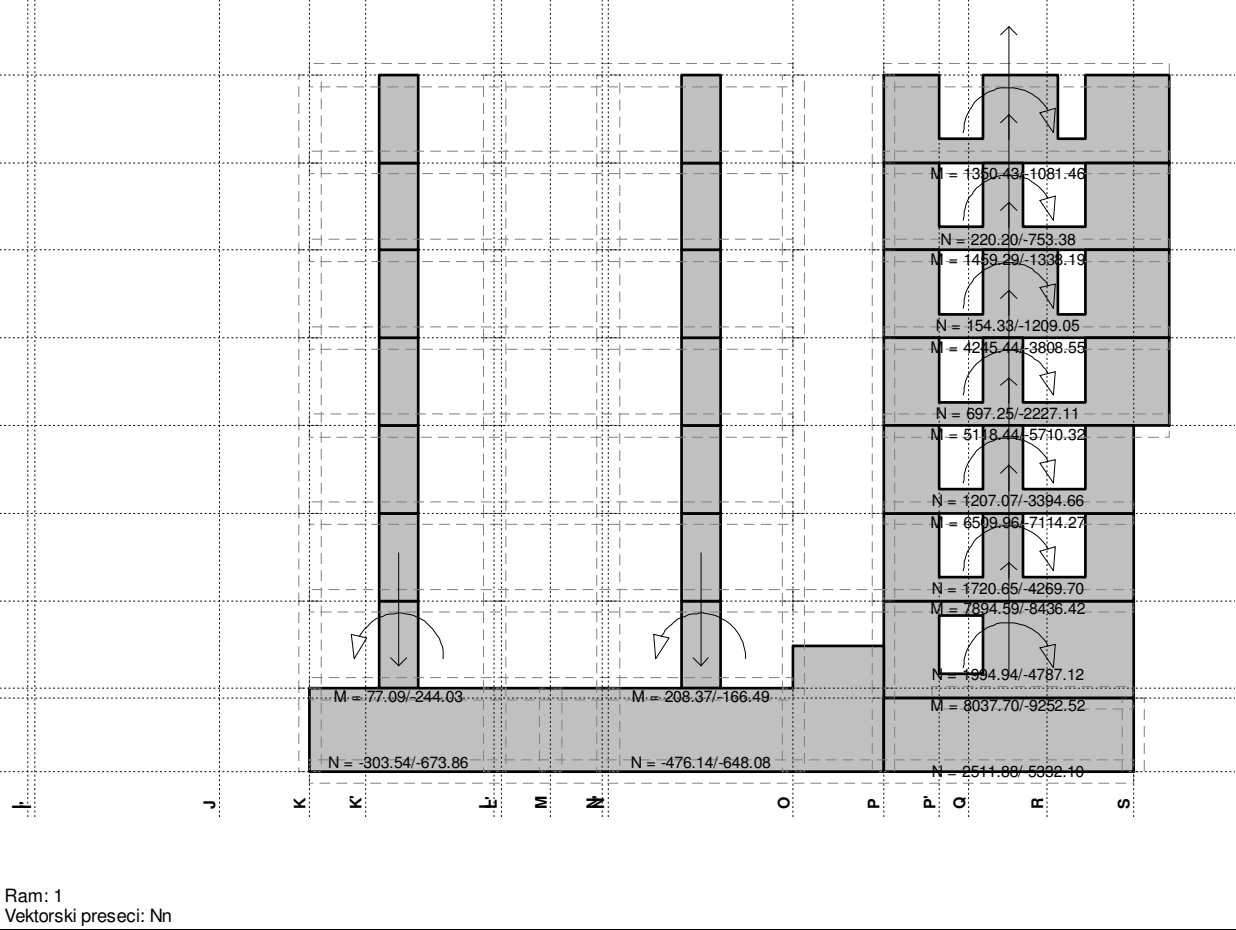






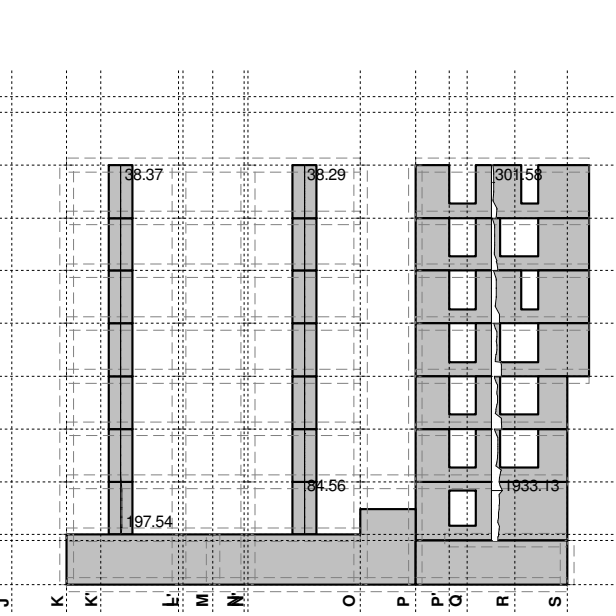


Opt. 10: {Anv} 8,9



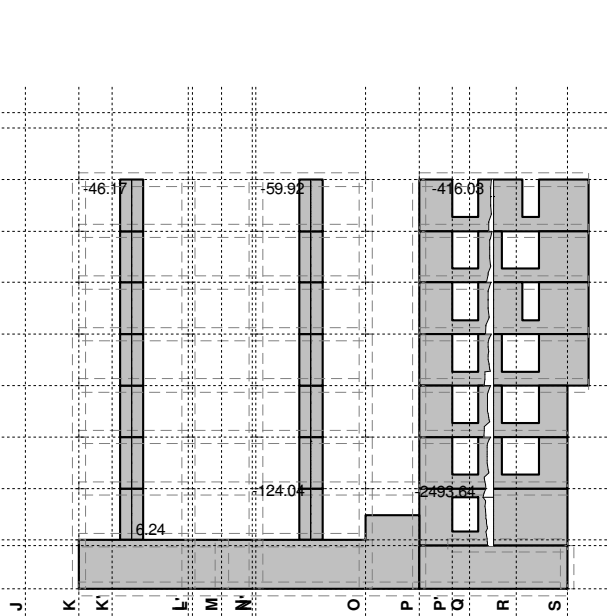
Ram: 1
Vektorski preseci: Nn

Opt. 8: I+0.3xII+VII



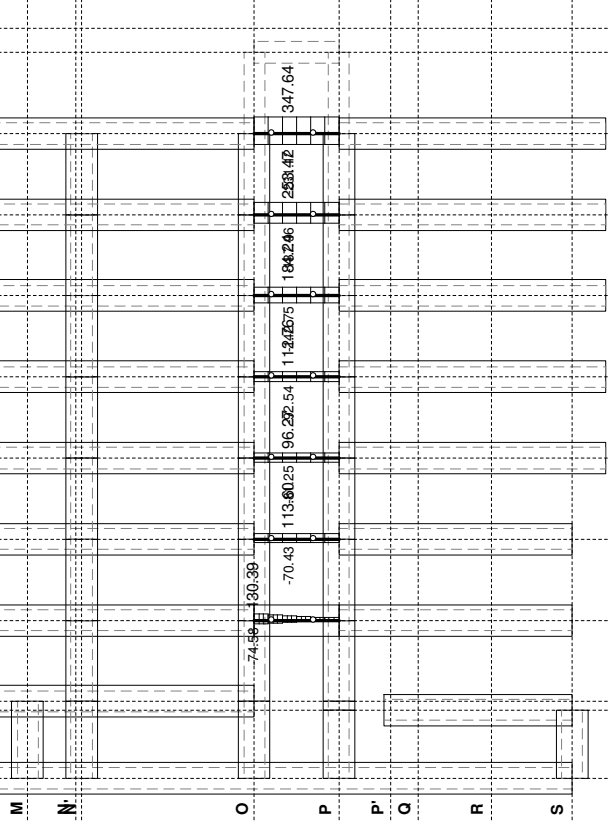
Ram: 1
Vektorski preseci: Nns

Opt. 9: I+0.3xII-1xVII



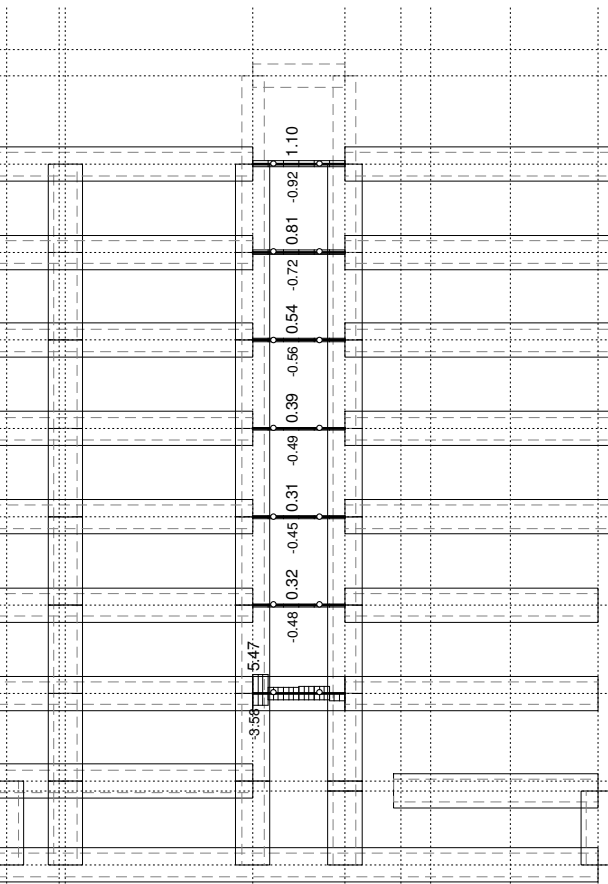
Ram: 1
Vektorski preseci: Nns

Opt. 10: [Anv] 8,9



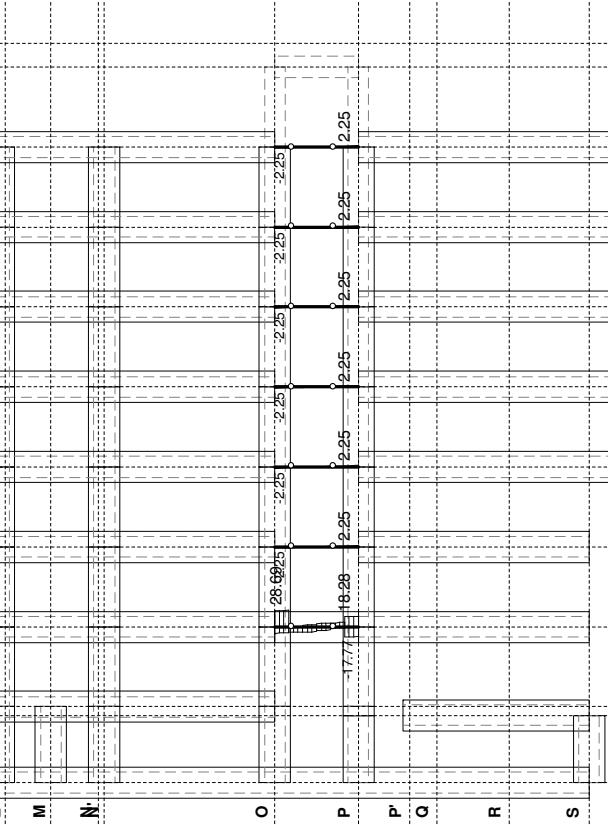
Ram: 1'
Uticaji u gredi: max N1= 347.64 / min N1= -231.12 kN

Opt. 10: [Anv] 8,9



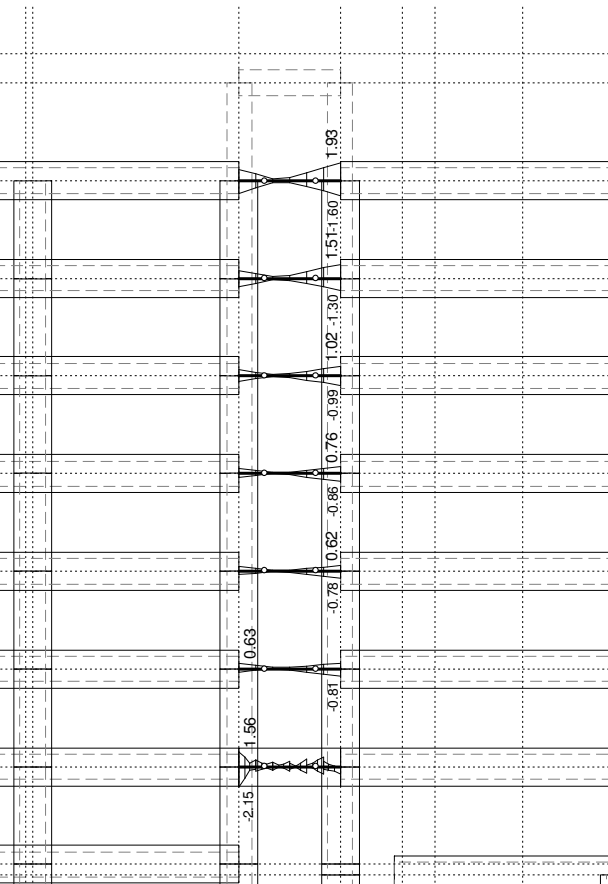
Ram: 1'
Uticaji u gredi: max T3= 5.47 / min T3= -3.58 kN

Opt. 10: [Anv] 8,9



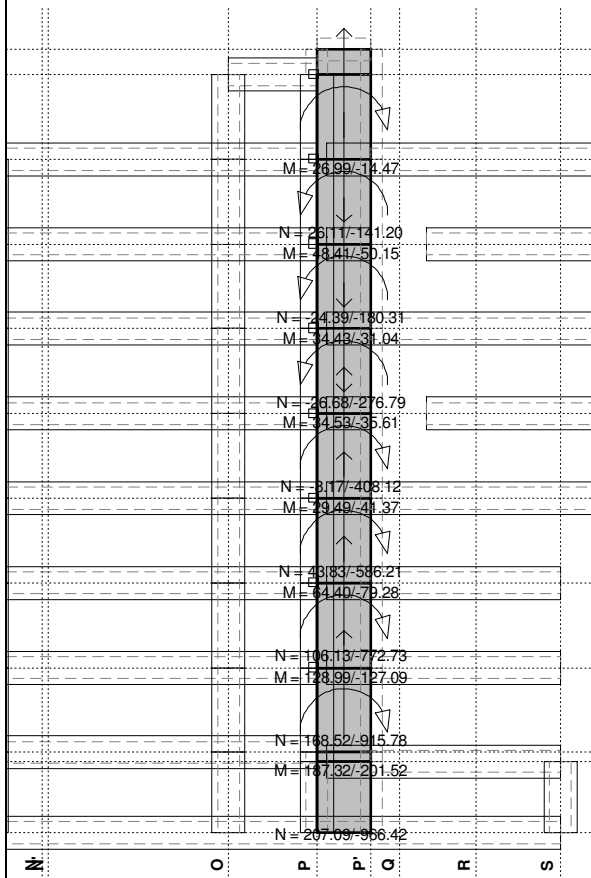
Ram: 1'
Uticaji u gredi: max T2= 28.69 / min T2= -17.77 kN

Opt. 10: [Anv] 8,9



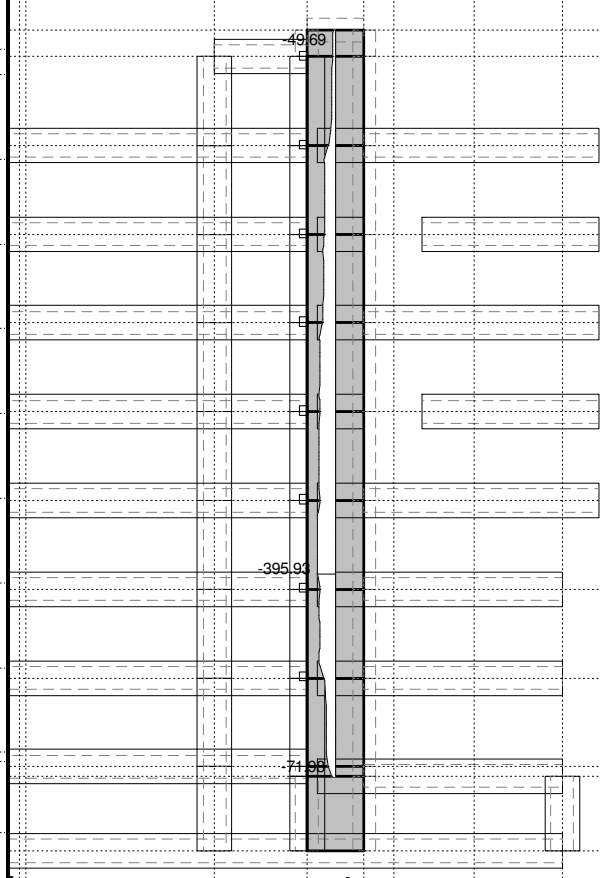
Ram: 1'
Uticaji u gredi: max M2= 1.93 / min M2= -2.15 kNm

Opt. 10: [Anv] 8,9



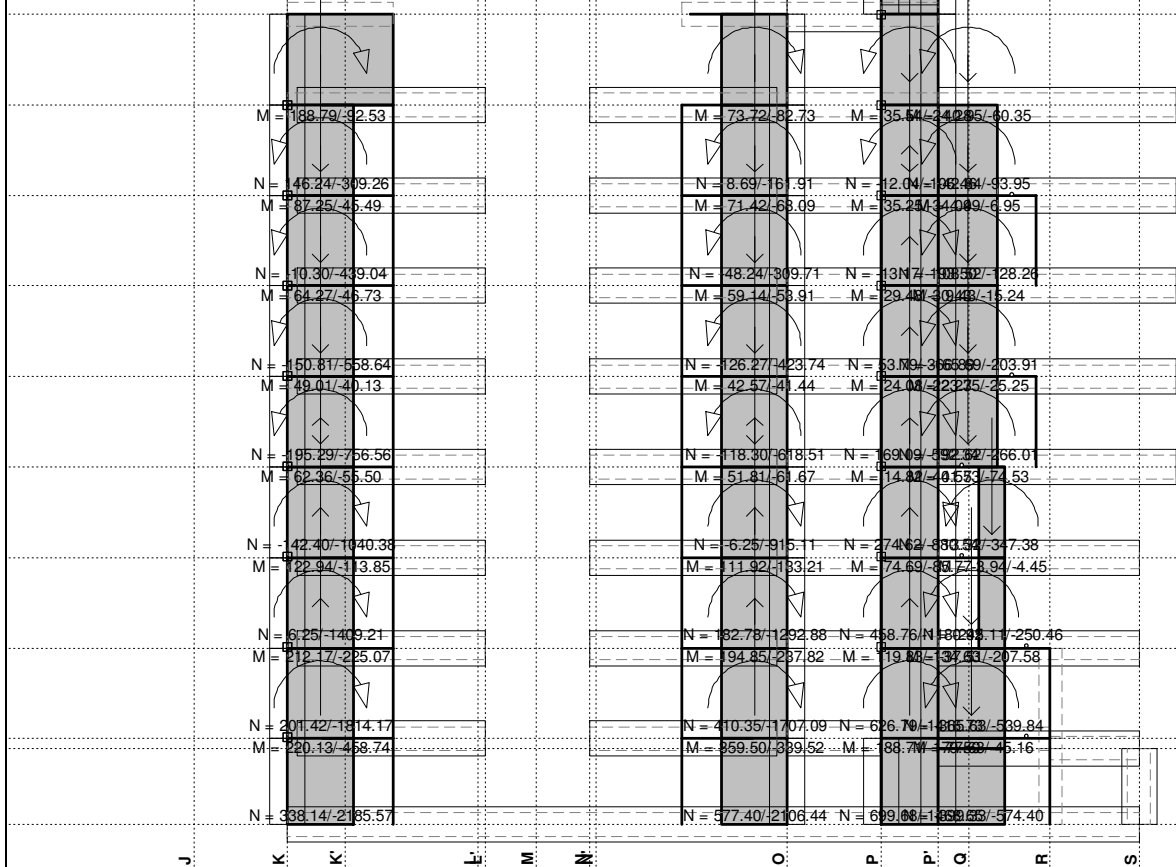
Ram: 5'
Vektorski preseki: Nn

Opt. 9: I+0.3xII-1xVII



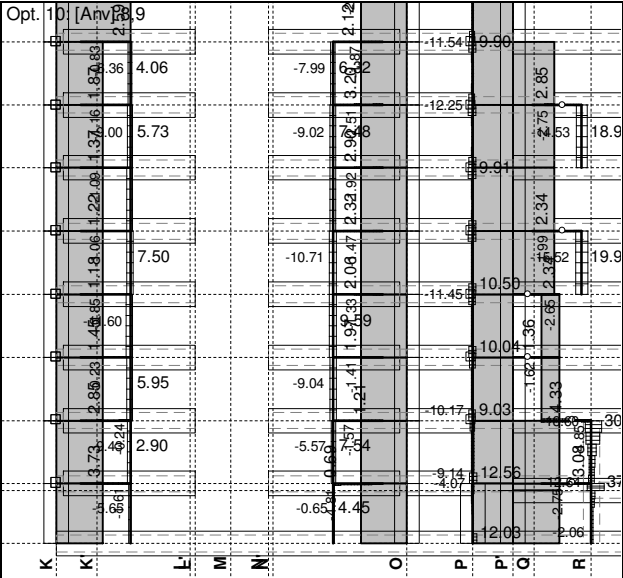
Ram: 5'
Vektorski preseki: Nns

Opt. 10: [Anv] 8,9

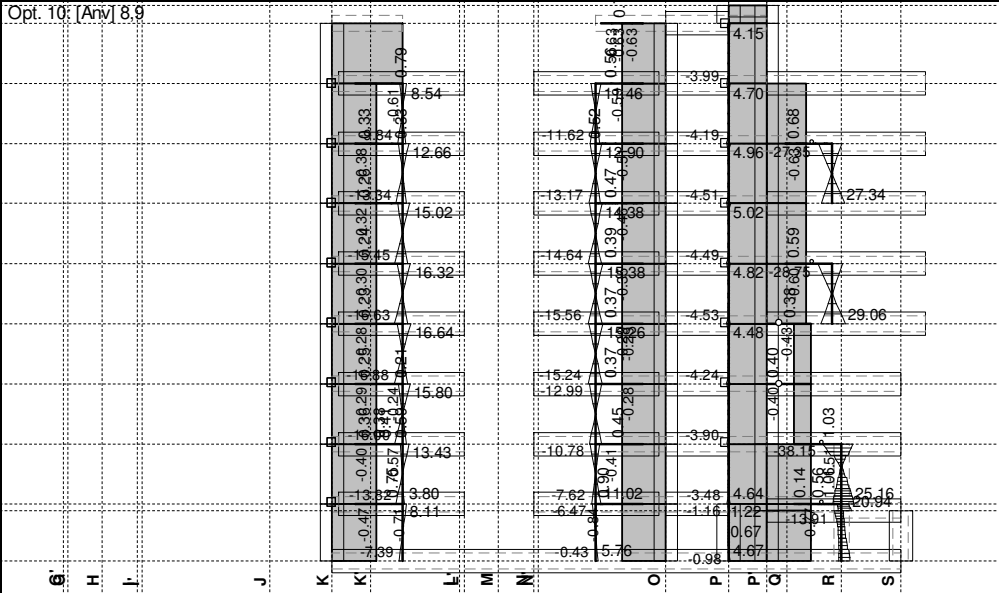


Ram: 6'
Vektorski preseki: Nn

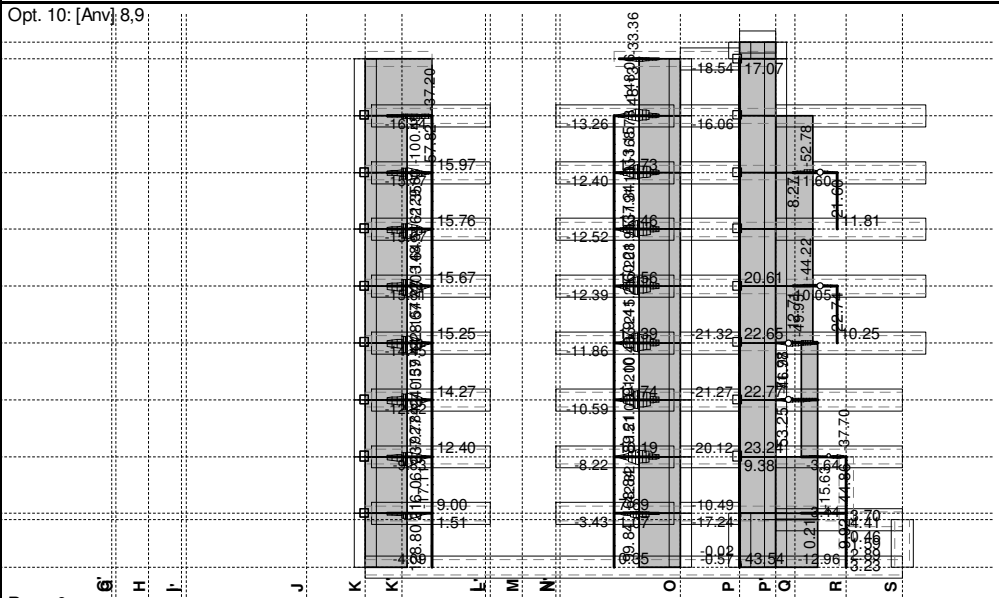
Radimpex - www.radimpex.rs



Ram: 6
Uticaji u gredi: max T3= 37.98 / min T3= -18.60 kN



Ram: 6
Uticaji u gredi: max M2= 29.06 / min M2= -38.15 kNm



Ram: 6
Uticaji u gredi: max M3= 240.57 / min M3= -215.21 kNm

Opt. 10: [Anv] 8.89

Element	Height	Width
1	37.00	17.00
2	1.66	17.00
3	1.66	17.00
4	1.66	17.00
5	1.66	17.00
6	1.66	17.00
7	1.66	17.00
8	1.66	17.00
9	1.66	17.00
10	1.66	17.00

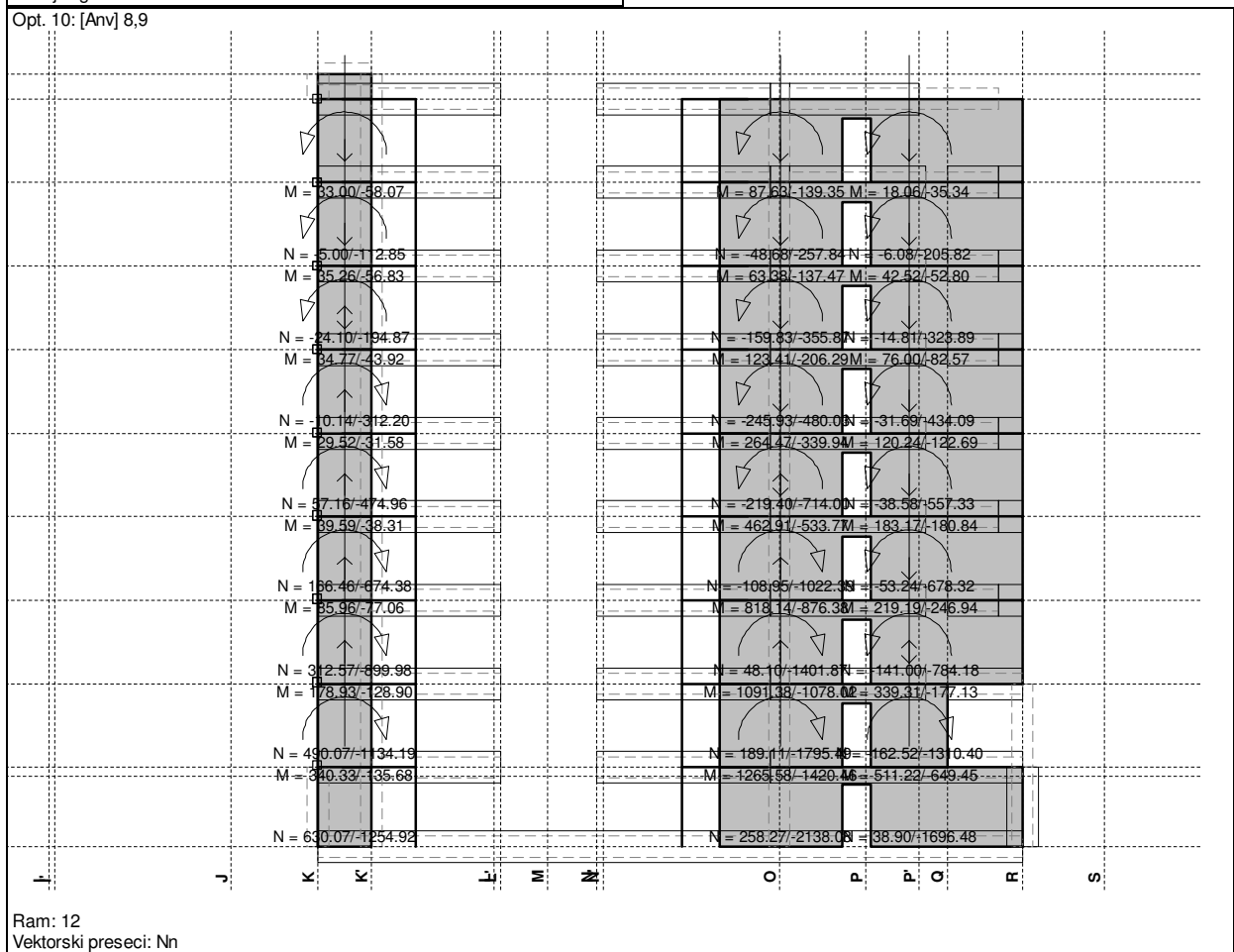
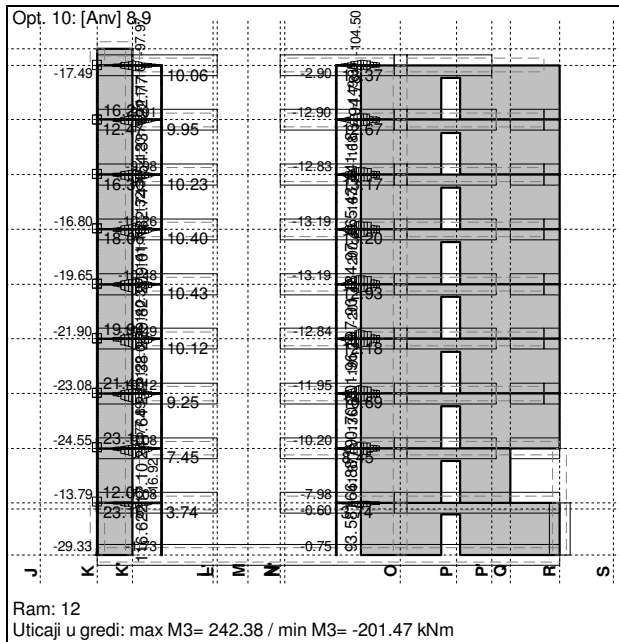
J K L M N O P Q R

Figure 1 displays two panels showing the evolution of the electron density profile $n_e(r)$ for Opt. 10. The left panel shows the profile at $t = 0.000$, and the right panel shows it at $t = 0.001$. Both panels plot n_e (cm⁻³) on the y-axis (ranging from 0 to 15.5) against r (cm) on the x-axis (ranging from 0 to 100). The profiles are shown as a series of horizontal bars with error bars, representing the density at different radii. The right panel shows a more developed profile with a distinct peak around $r = 50$ cm.

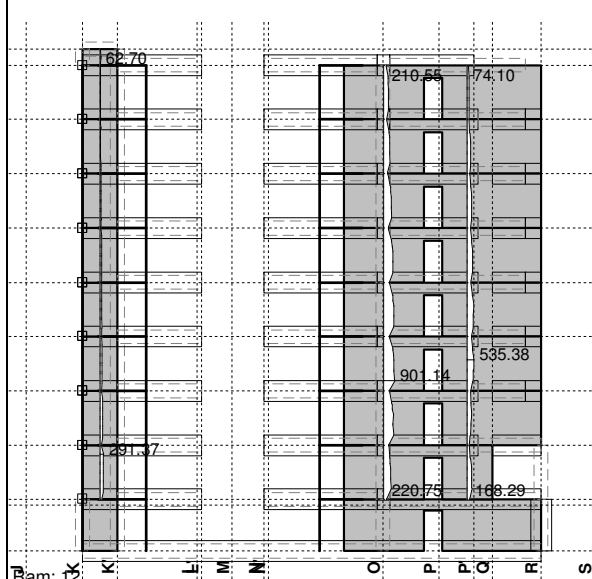
Opt. 10: [Anv] 8.9

[illegible]

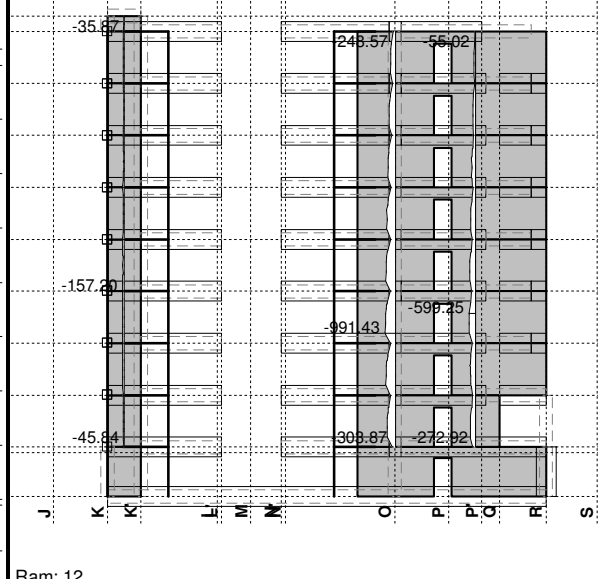
Radimpex - www.radimpex.rs



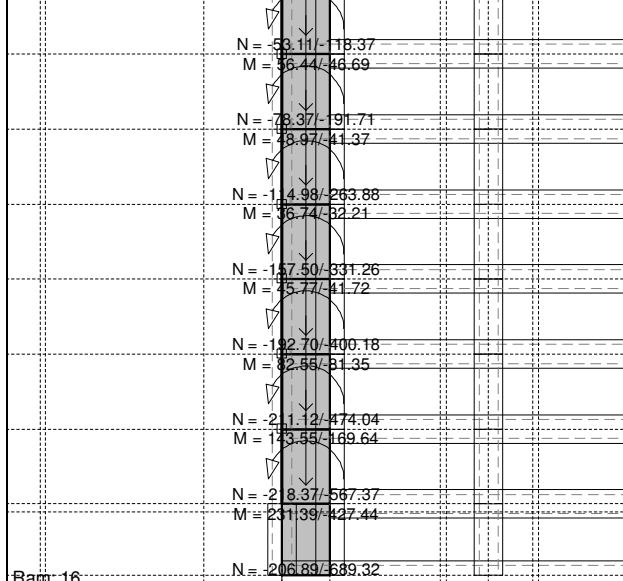
Opt. 8: I+0.3xII+VII



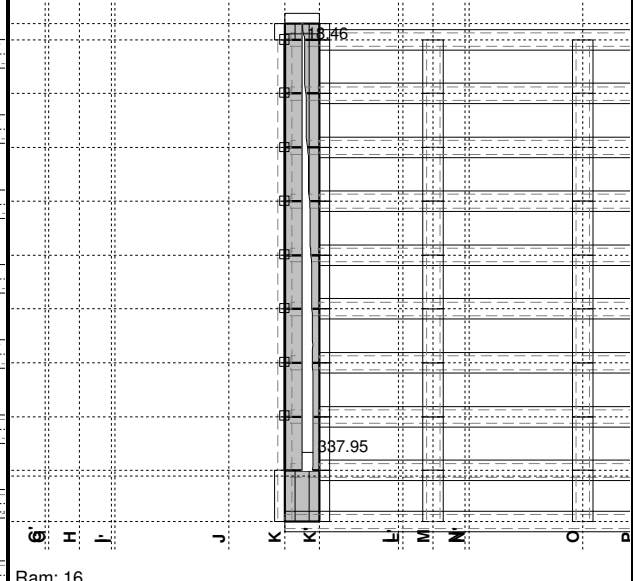
Opt. 9: I+0.3xII-1xVII



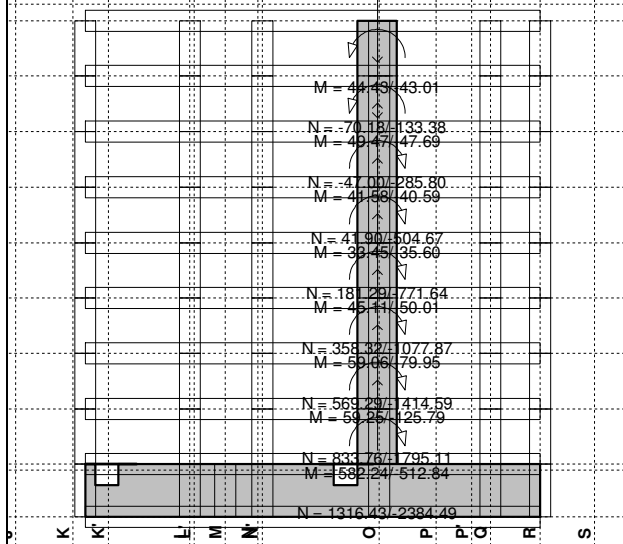
Opt. 10: [Anv] 8,9



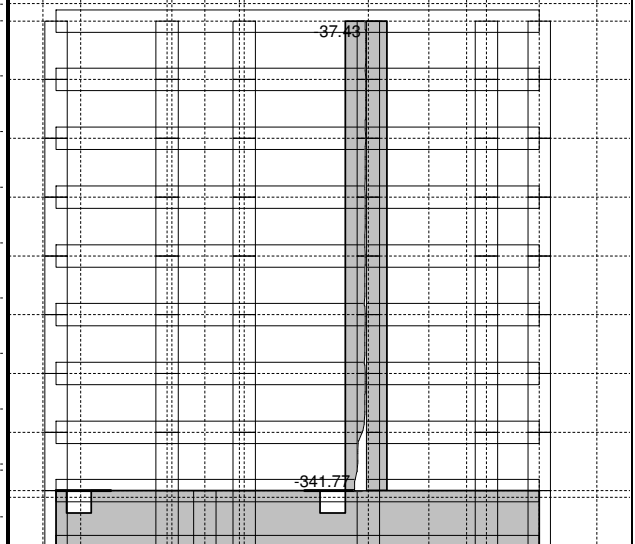
Opt. 8: I+0.3xII+VII



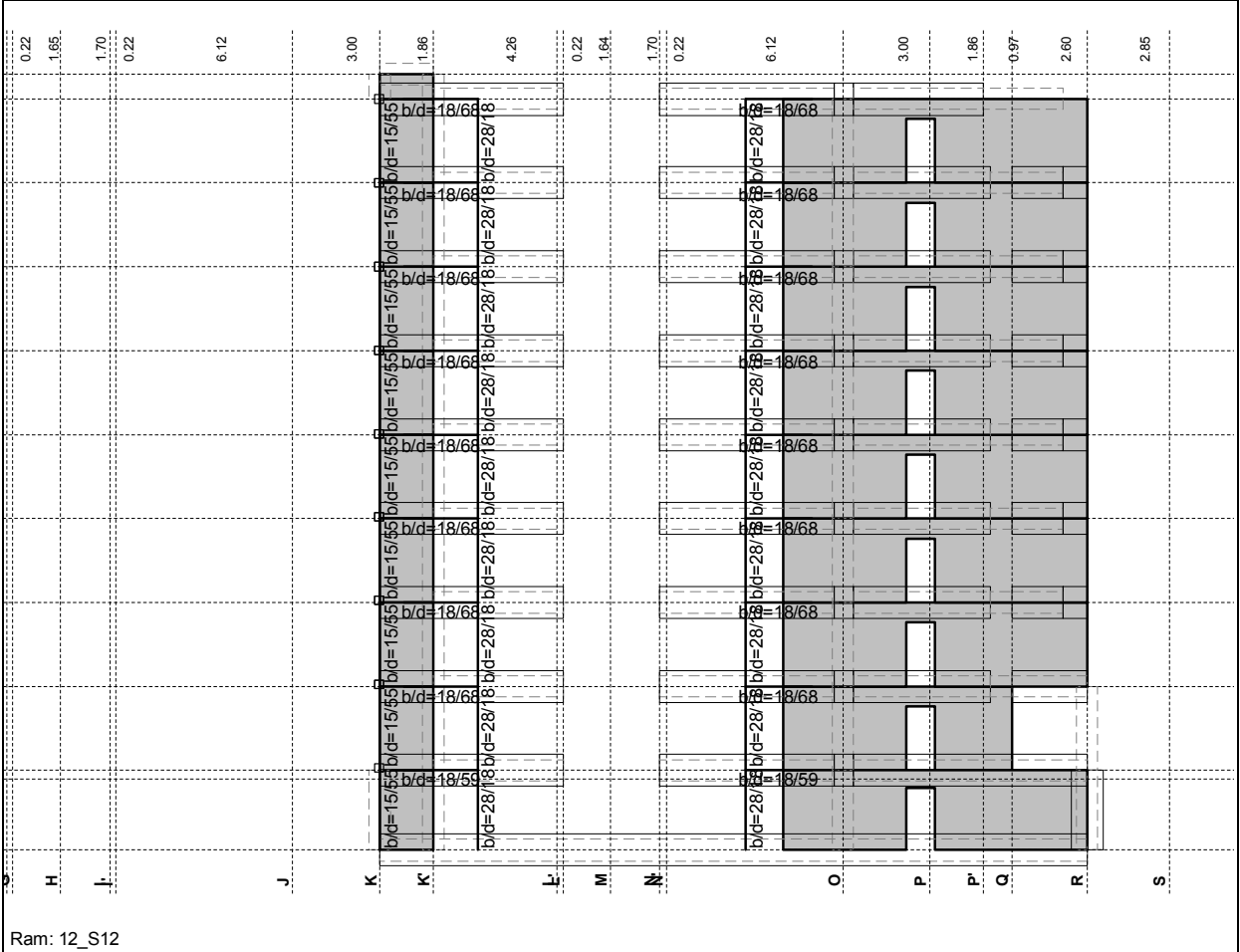
Opt. 10: [Anv] 8,9



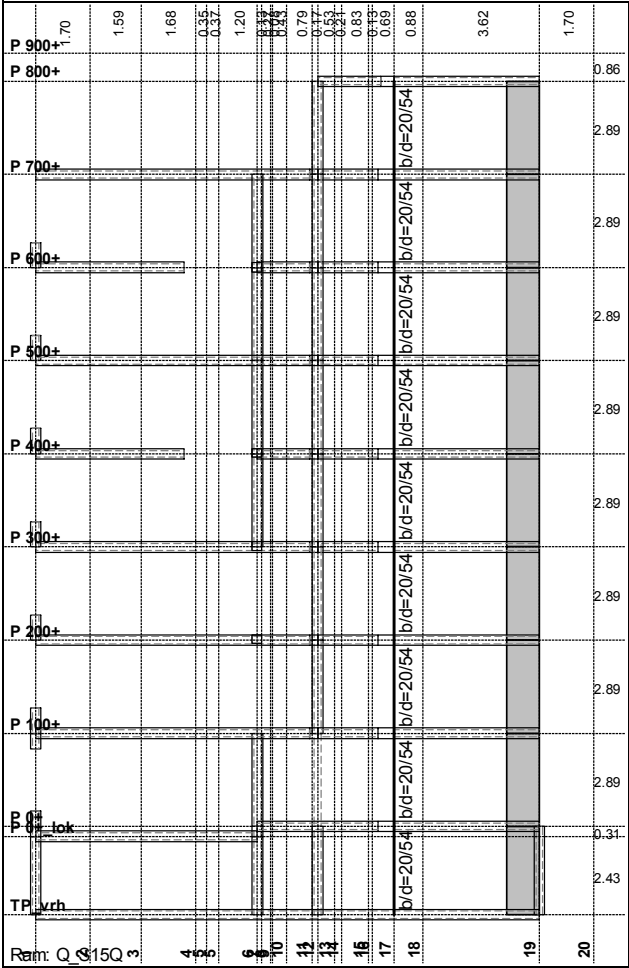
Opt. 9: I+0.3xII-1xVII



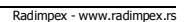
[illegible]

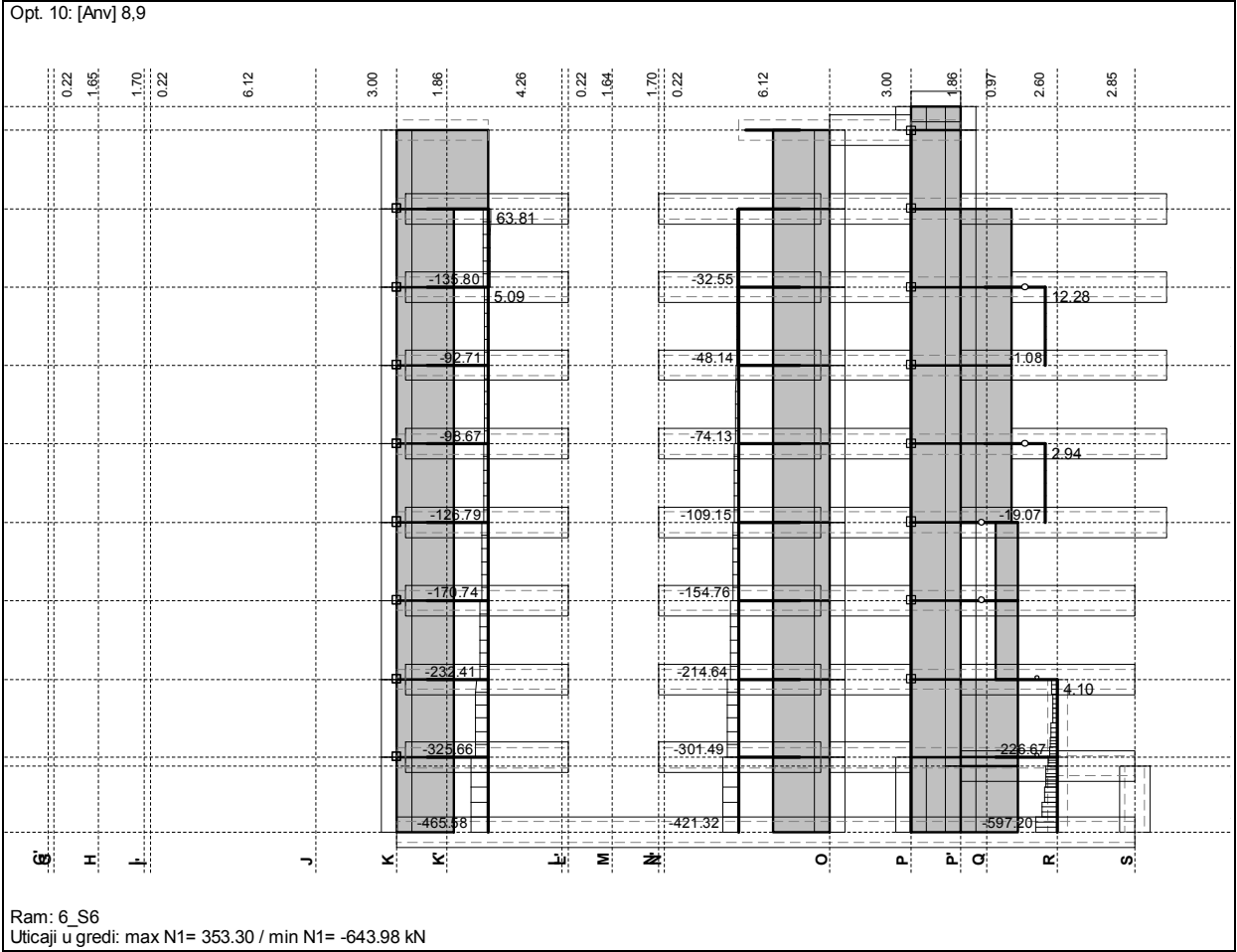
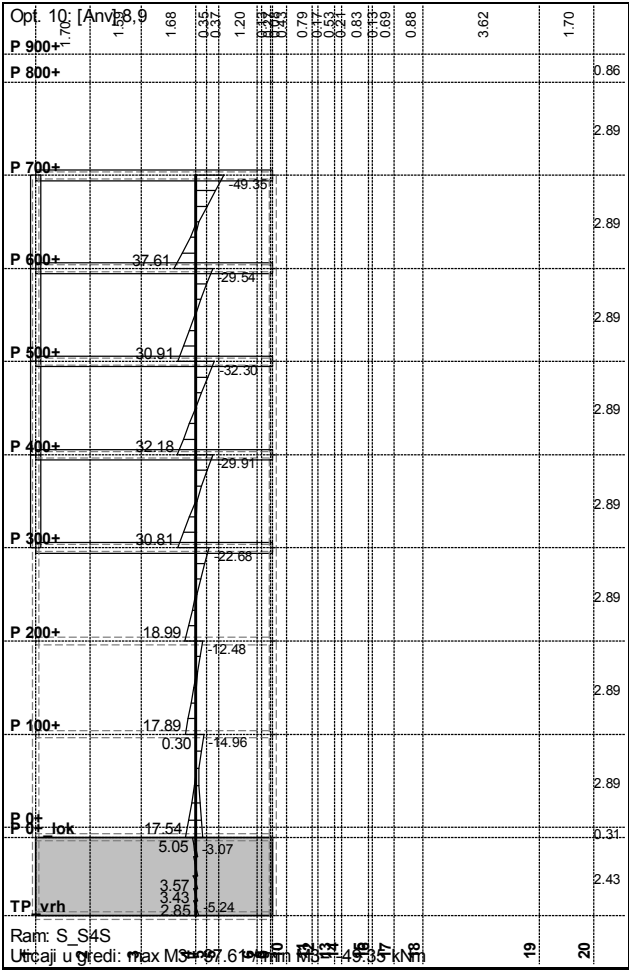


Ram: 12_S12

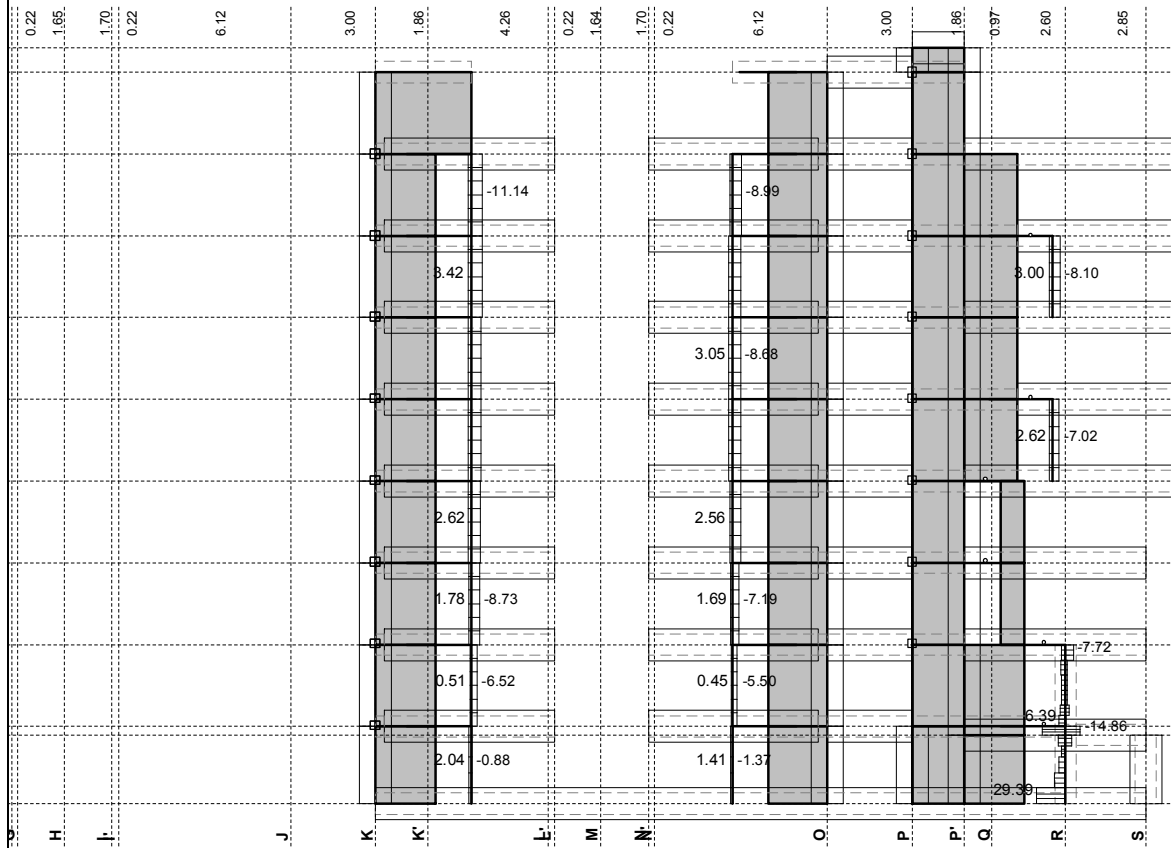


Ram: Q 15Q 3





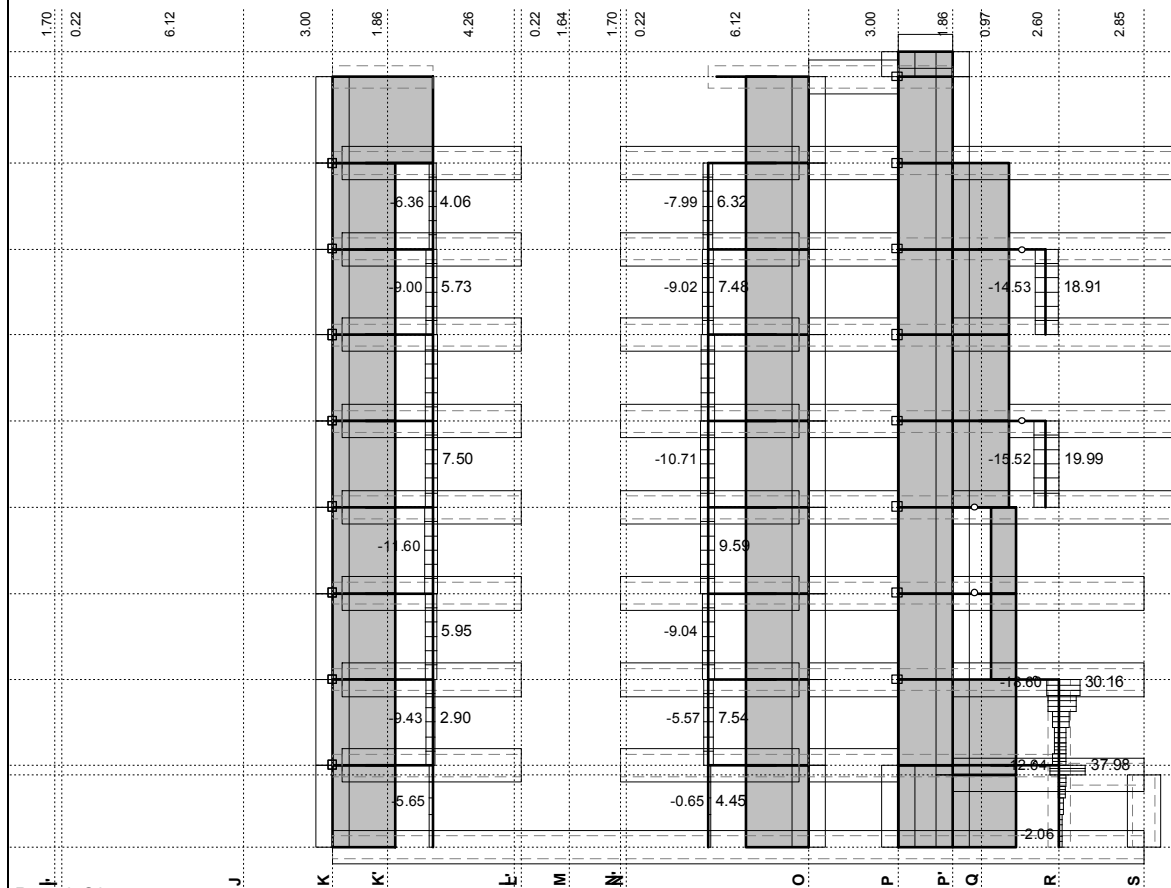
Opt. 10: [Anv] 8,9



Ram: 6_S6

Uticaji u gredi: max T2= 152.46 / min T2= -192.32 kN

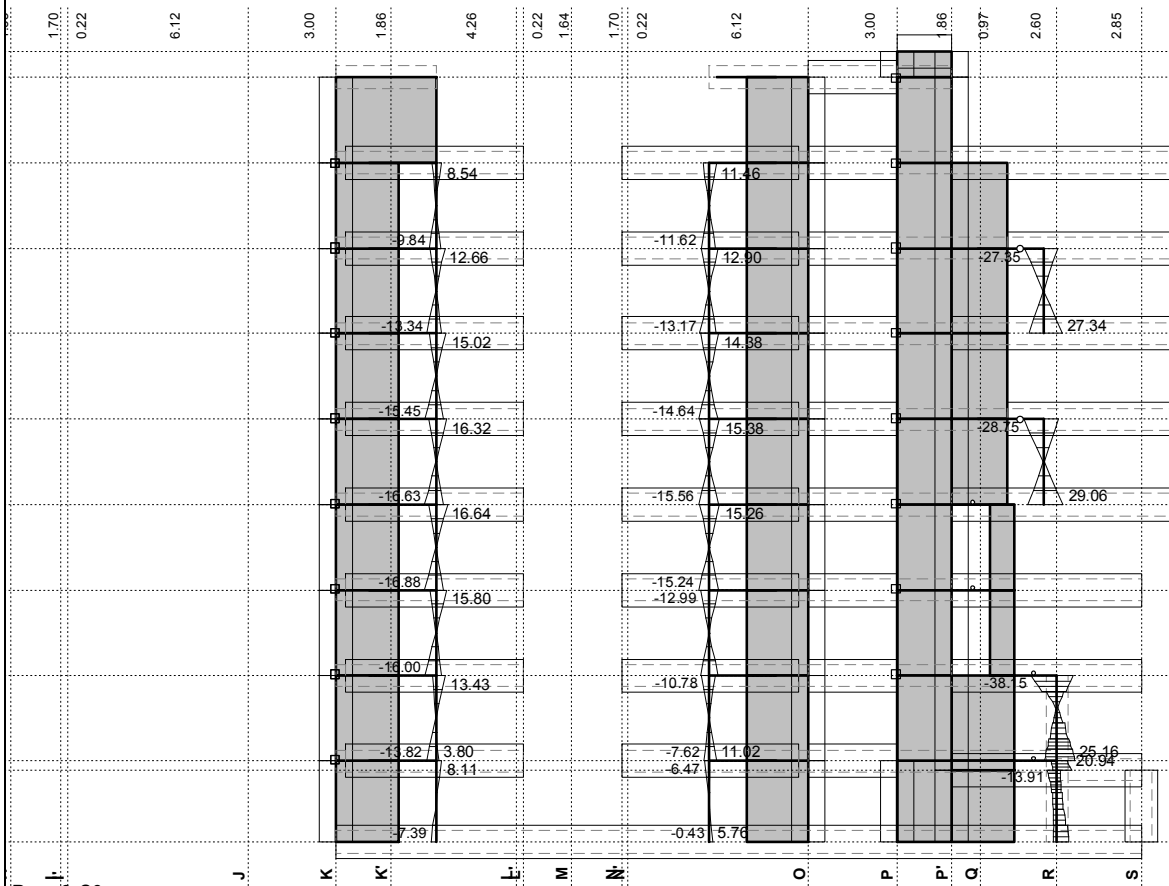
Opt. 10: [Anv] 8,9



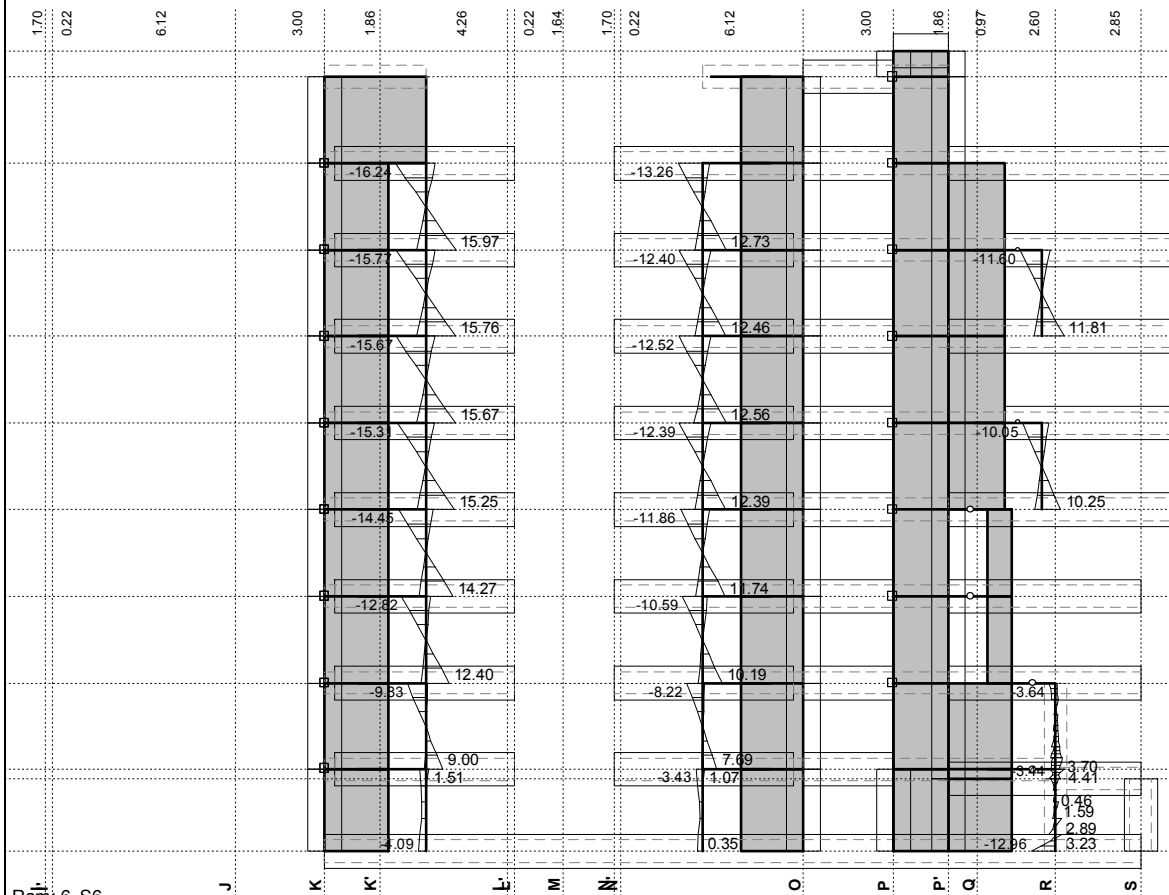
Ram: 6_S6

Uticaji u gredi: max T3= 37.98 / min T3= -18.60 kN

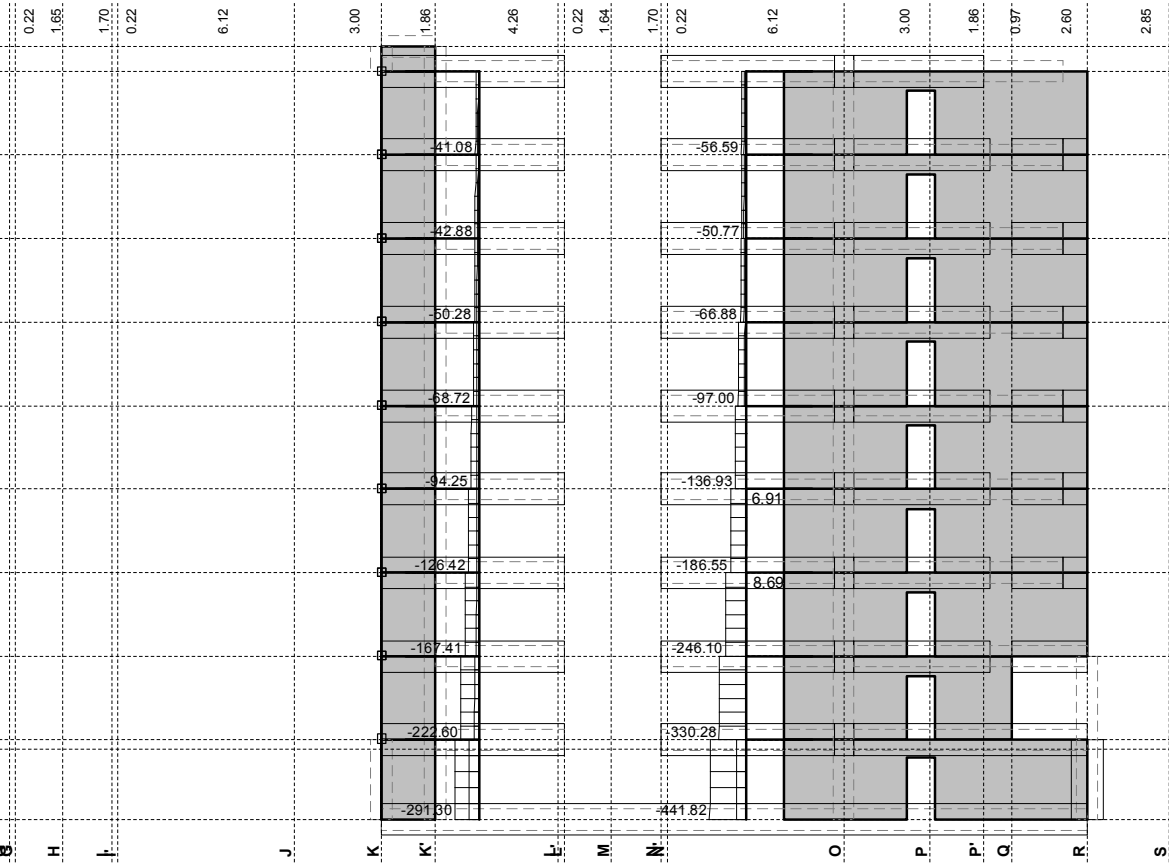
Opt. 10: [Anv] 8,9



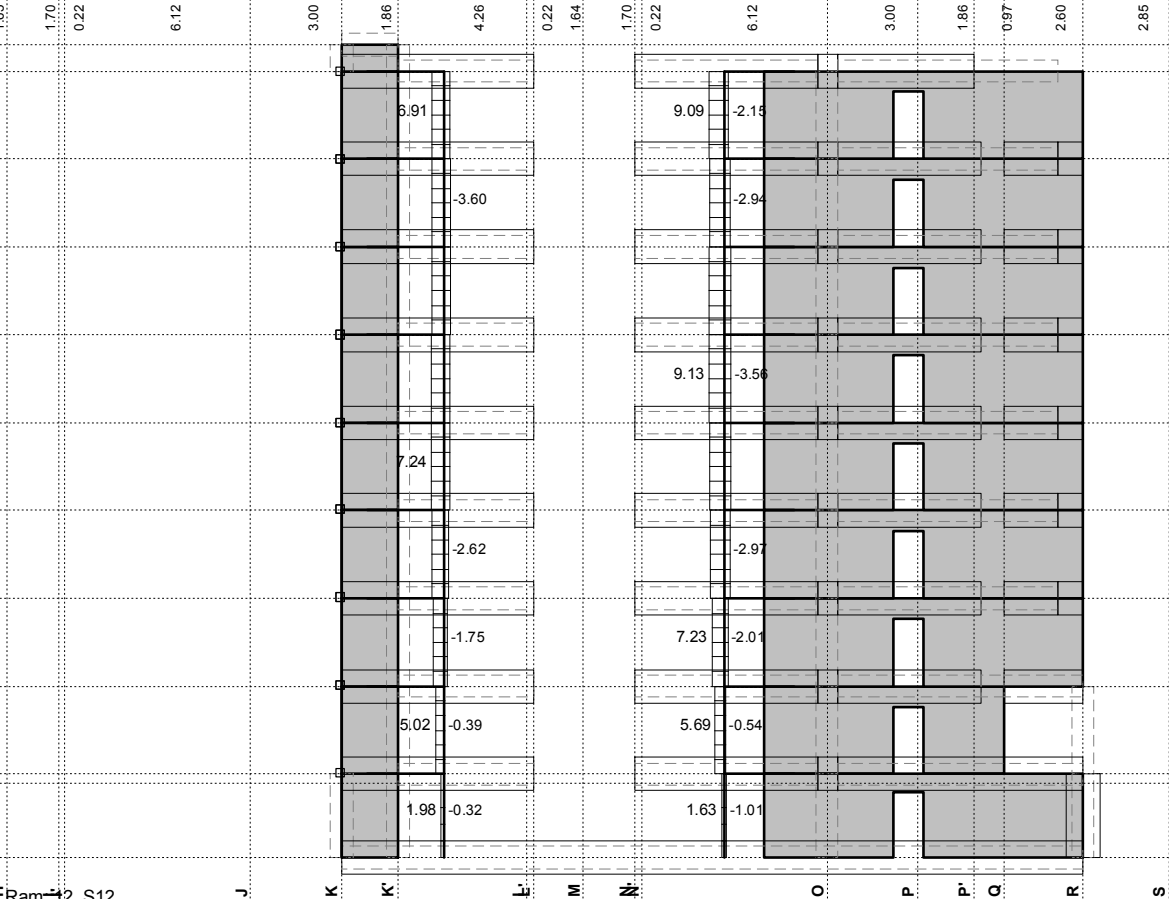
Opt. 10: [Anv] 8,9



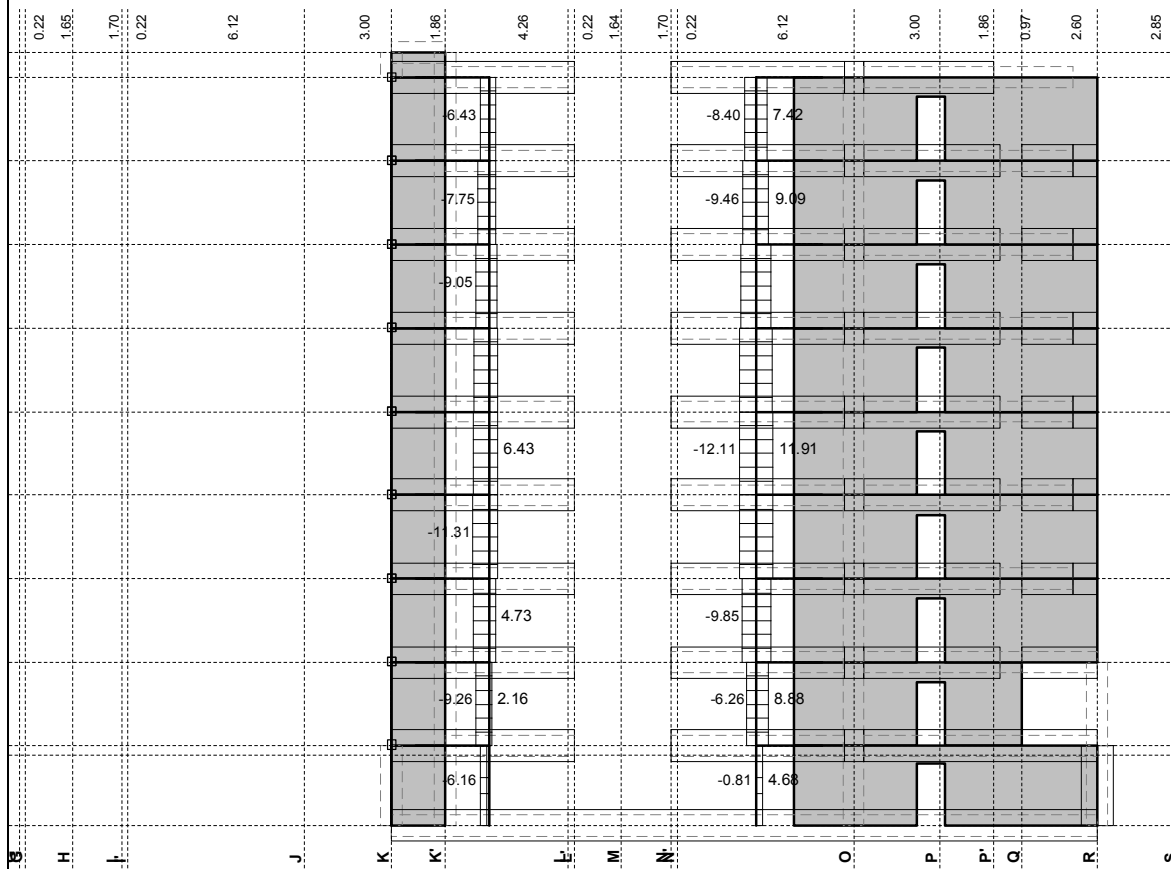
Opt. 10: [Anv] 8,9



Opt. 10: [Anv] 8,9



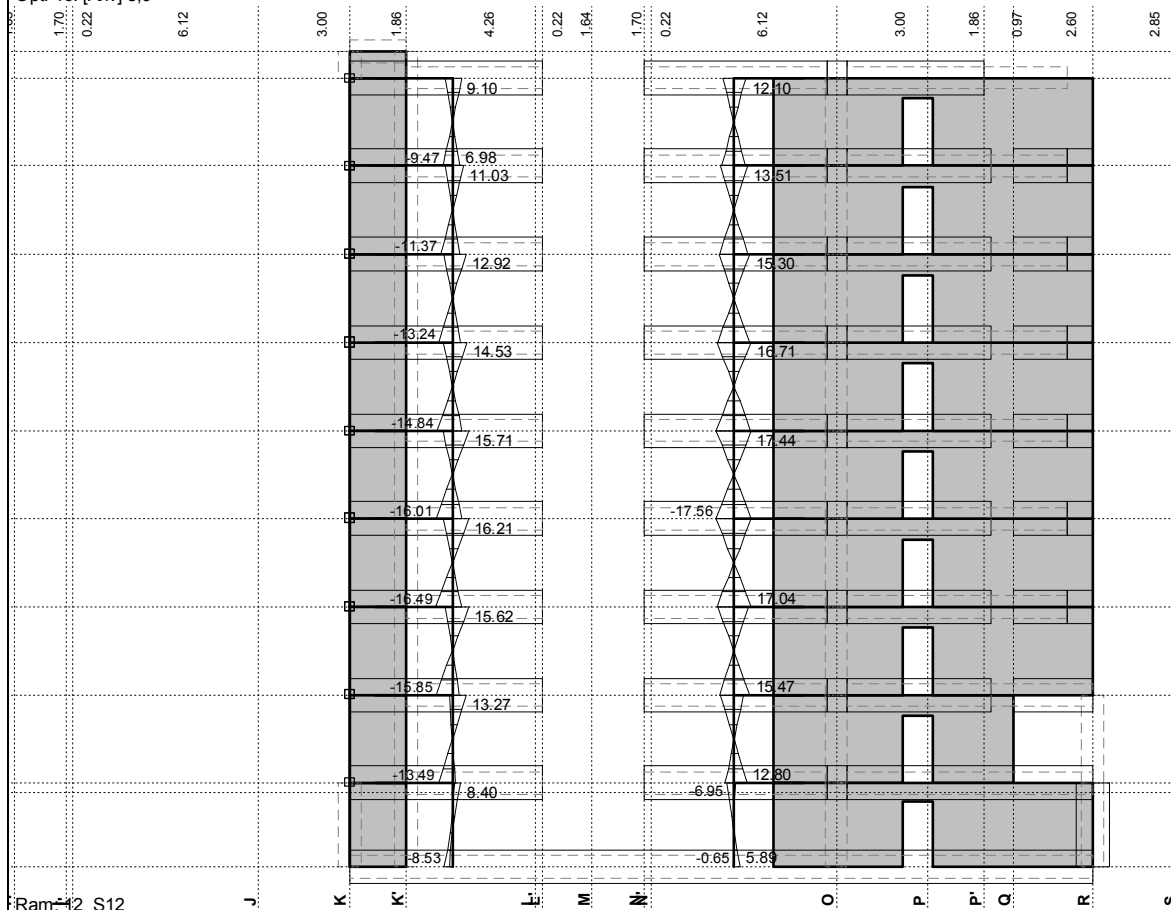
Opt. 10: [Anv] 8,9



Ram: 12_S12

Uticaji u gredi: max T3= 11.91 / min T3= -12.11 kN

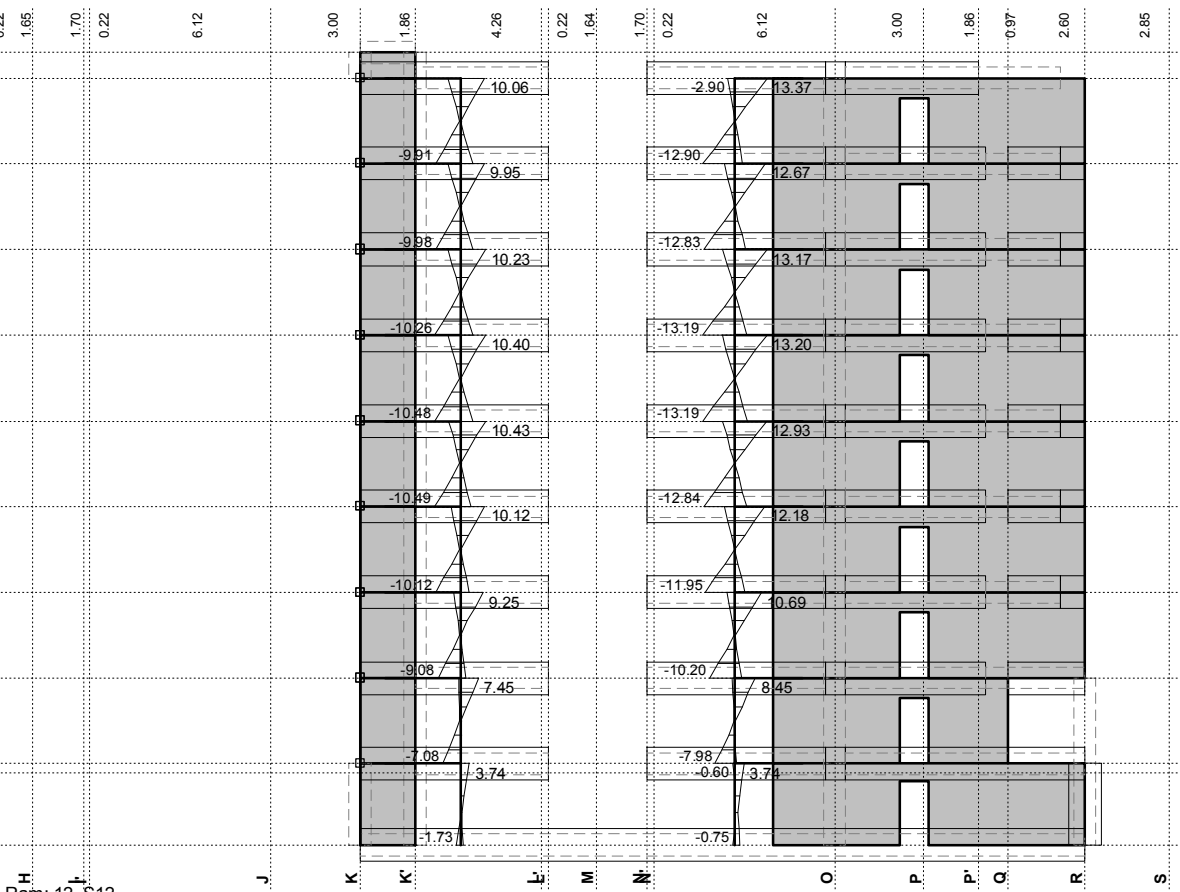
Opt. 10: [Anv] 8,9



Ram: 12_S12

Uticaji u gredi: max M2= 17.44 / min M2= -17.56 kNm

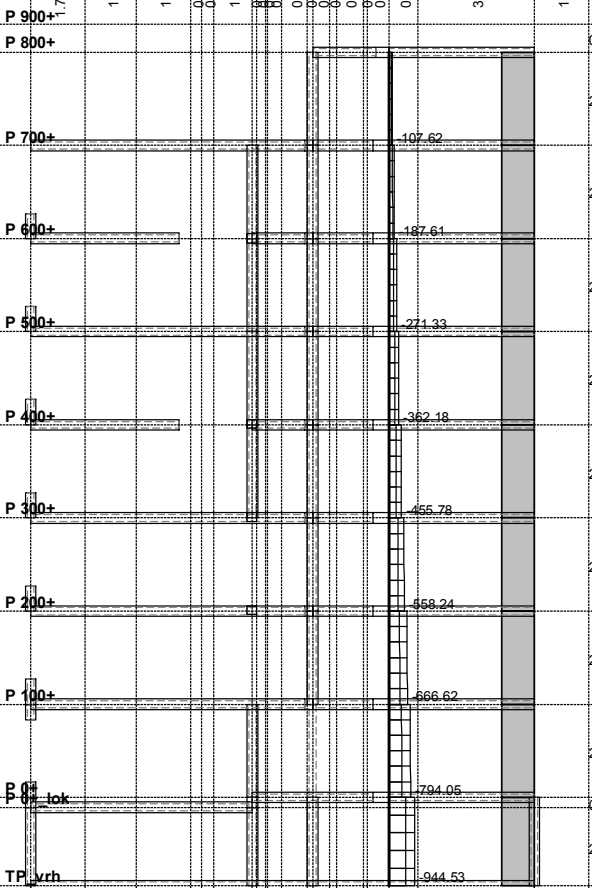
Opt 10: [Anv] 8,9



Ram: 12_S12

Uticaji u gredi: max M3= 242.38 / min M3= -201.47 kNm

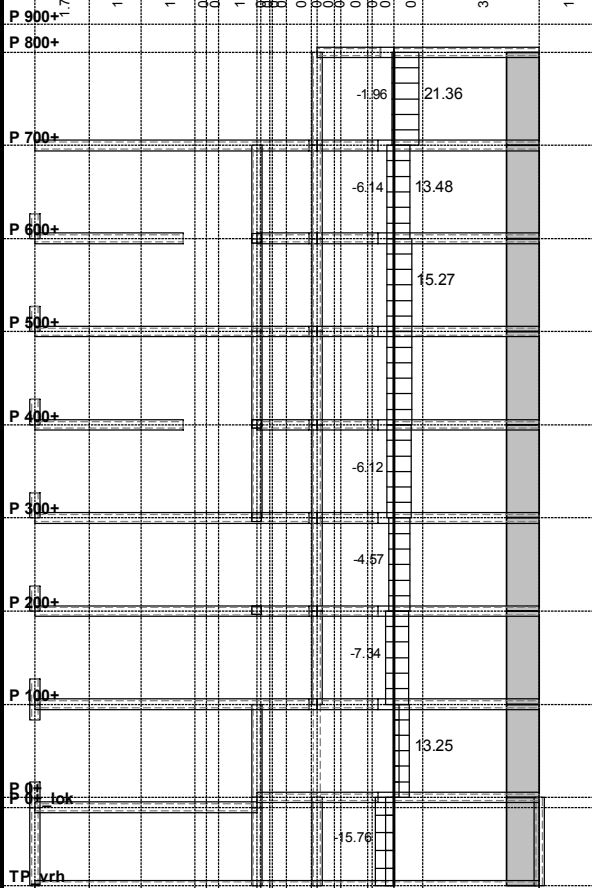
Opt 10: [Anv] 8,9



Ram: Q_S15Q

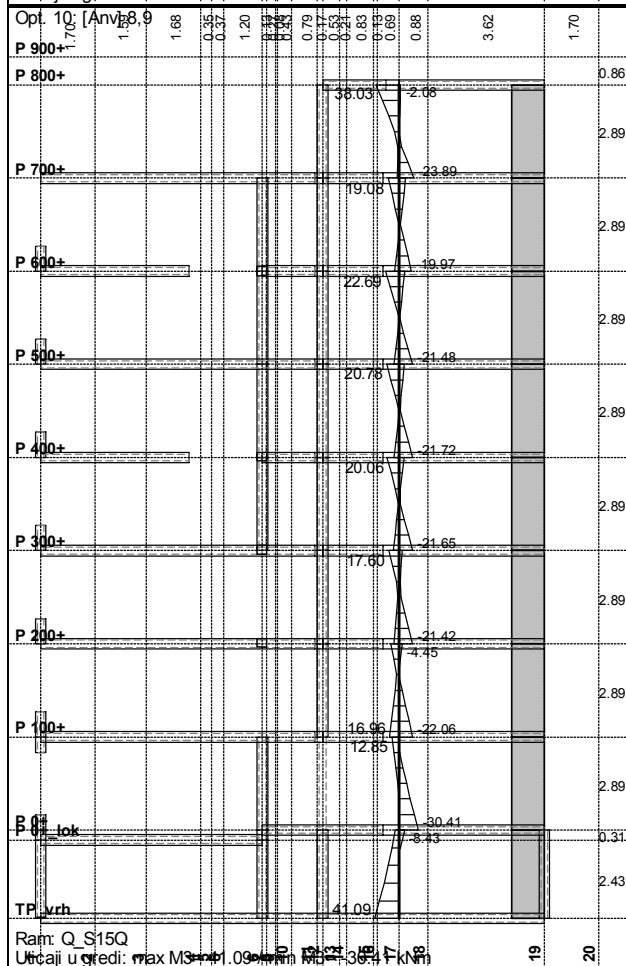
Uticaji u gredi: max N1= 146.79 / min N1= -944.53 kN

Opt 10: [Anv] 8,9



Ram: Q_S15Q

Uticaji u gredi: max T2= 21.36 / min T2= -15.76 kN



Dimenzionisanje (beton)

Usvojena armatura EC 2 (EN 1992-1-1:2004), C 30, S500H																		Usvojena armatura EC 2 (EN 1992-1-1:2004), C 30, S500H																		Usvojena armatura EC 2 (EN 1992-1-1:2004), C 30, S500H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
P 900+	1.70	1.59	1.68	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	P 900+	1.70	1.59	1.68	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	P 900+	1.70	1.59	1.68	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39

Greda 28710-27925

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

C 30 ($\gamma_C = 1.50$, $\gamma_S = 1.15$) [SP]

S500H

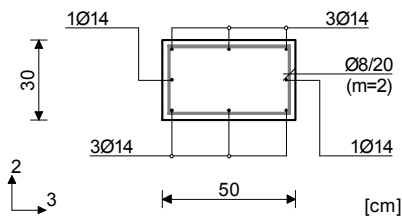
Dimenzionisanje grupe slučajeva

opterećenja: 8,9

li,2 = 2.89 m ($\lambda_2 = 20.02$)li,3 = 2.89 m ($\lambda_3 = 33.37$)

Nepomerljiva konstrukcija

Presek 1-1 x = 0.00m



Merodavna kombinacija za savijanje:

1.00xl+0.30xII-1.00xVII

N1u = -112.18 kN

M2u = -29.63 kNm

M3u = -49.35 kNm

Merodavna kombinacija za torziju:

1.00xl+0.30xII+1.00xVII

M1u = 1.22 kNm

Merodavna kombinacija za smicanje:

1.00xl+0.30xII-1.00xVII

T2u = -30.09 kN

T3u = 5.80 kN

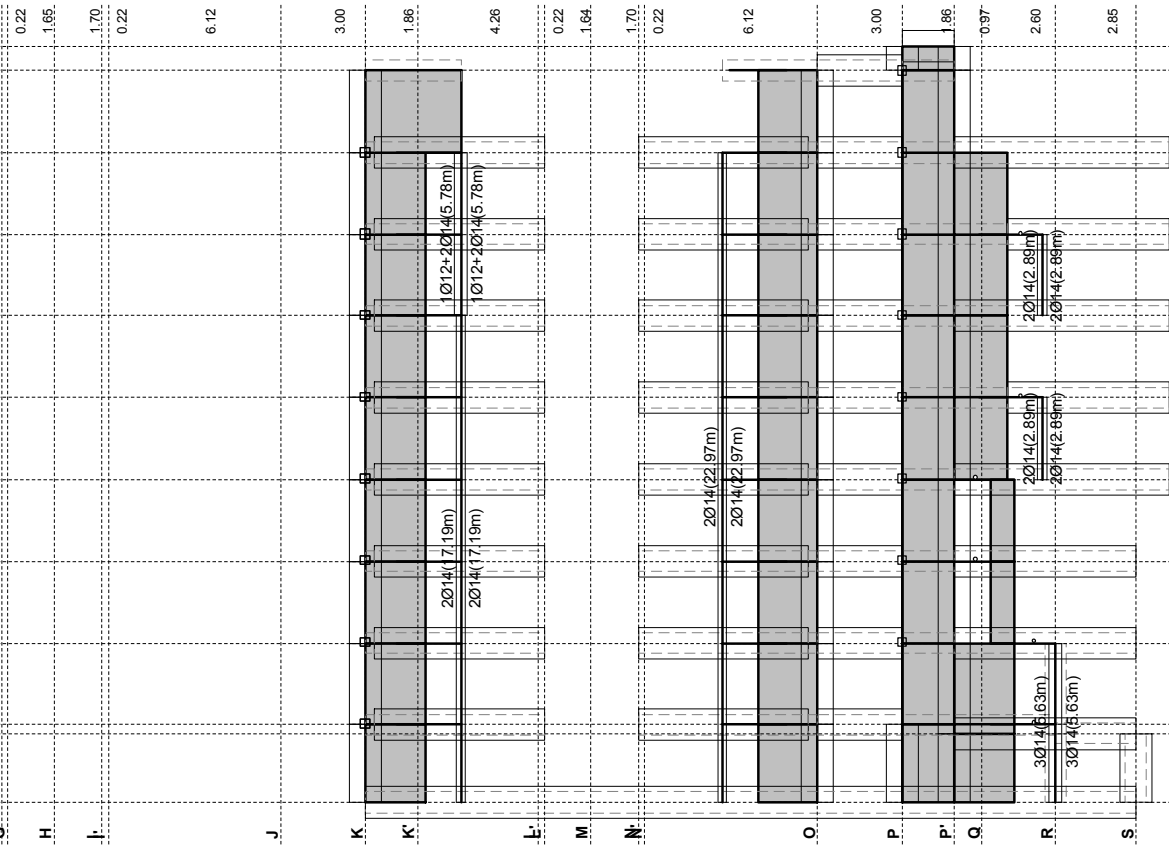
M1u = -1.15 kNm

 $\epsilon_b/\epsilon_a = -3.500/10.937 \%$ Aa1 = 3.40 + 0.06' = 3.46 cm²Aa2 = 3.40 + 0.06' = 3.46 cm²Aa3 = 0.00 + 0.03' = 0.03 cm²Aa4 = 0.00 + 0.03' = 0.03 cm²Aa,uz = 0.00 cm²/m (m=2)(Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m)

Procenat armiranja: 0.82%

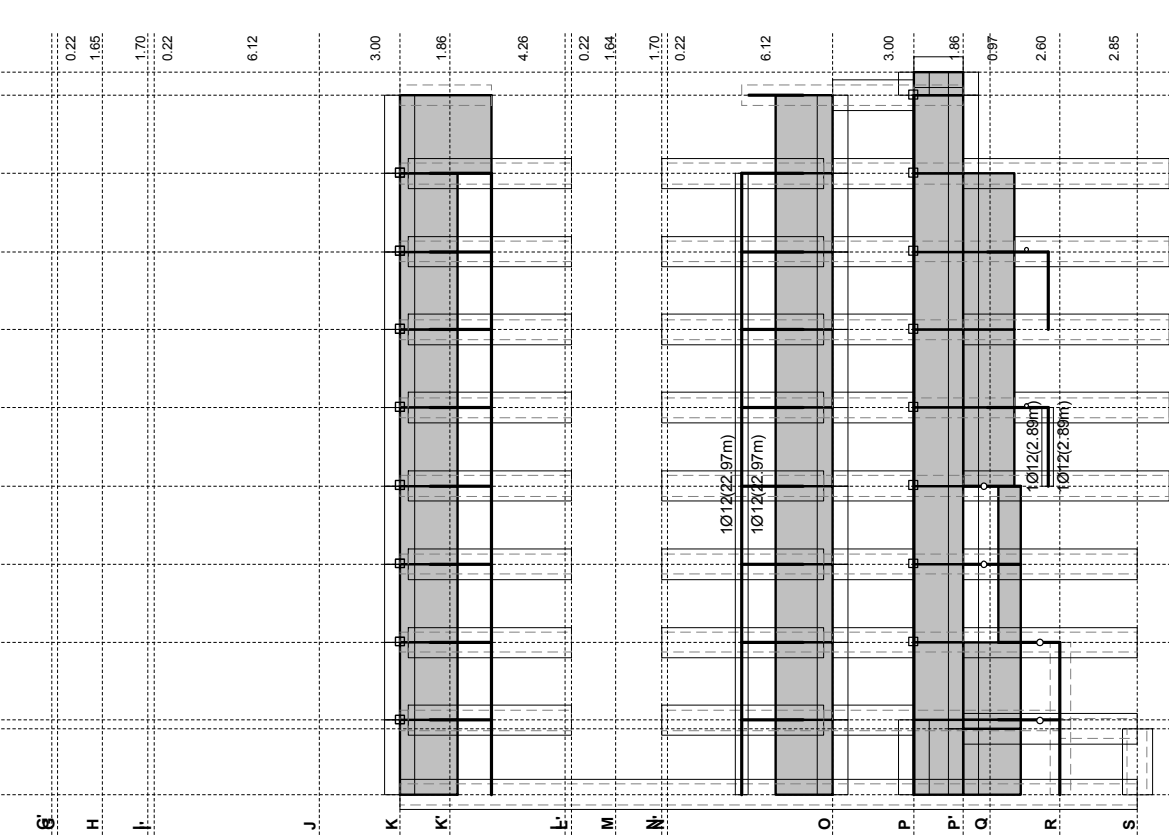
*) - dodatna podužna armatura za prijem torzije

Usvojena armatura
EC 2 (EN 1992-1-1:2004), C 30, S500H



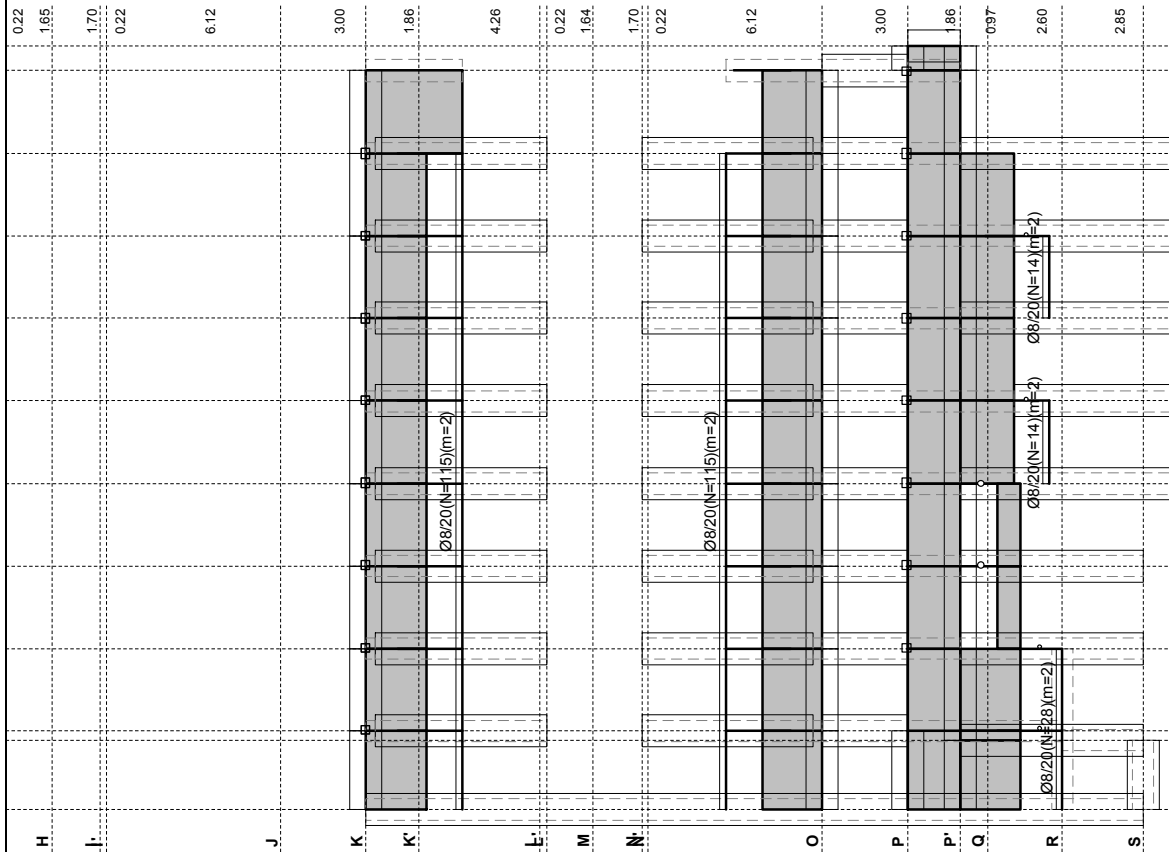
Ram: 6_S6
Armatura u gredama: Aa2/Aa1

Usvojena armatura
EC 2 (EN 1992-1-1:2004), C 30, S500H



Ram: 66_S6
Armatura u gredama: Aa3/Aa4

Usvojena armatura
EC 2 (EN 1992-1-1:2004), C 30, S500H

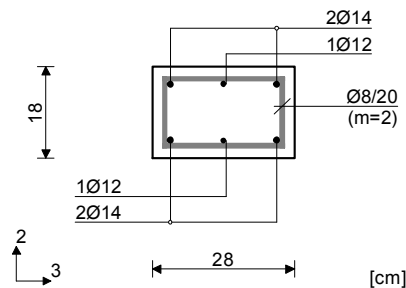


Ram: 66_S6
Armatura u gredama: Aa,uz

Greda 14828-12185

EC 2 (EN 1992-1-1:2004)
C 30 ($\gamma_C = 1.50$, $\gamma_S = 1.15$) [SP]
S500H
Dimenzionisanje grupe slučajeva
opterećenja: 8,9
 $l_i, 2 = 2.89$ m ($\lambda_2 = 35.75$)
 $l_i, 3 = 2.89$ m ($\lambda_3 = 55.62$)
Nepomerljiva konstrukcija

Presek 1-1 $x = 0.00$ m



Merodavna kombinacija za savijanje:

1.00xI+0.30xII-1.00xVII
N1u = 63.81 kN
M2u = 8.54 kNm
M3u = -16.24 kNm

Merodavna kombinacija za torziju:

1.00xI+0.30xII-1.00xVII
M1u = -0.15 kNm

Merodavna kombinacija za smicanje:

1.00xI+0.30xII-1.00xVII
T2u = -11.14 kN
T3u = -6.36 kN
M1u = -0.15 kNm

$\epsilon_b/\epsilon_a = -3.500/6.712 \text{ ‰}$

Aa1 = 3.87 cm²
Aa2 = 3.87 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²

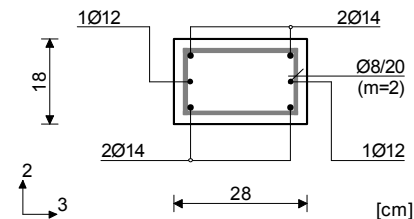
Aa,uz = 0.00 cm²/m
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

Procenat armiranja: 1.67%

Greda 22596-20410

EC 2 (EN 1992-1-1:2004)
C 30 ($\gamma_C = 1.50$, $\gamma_S = 1.15$) [SP]
S500H
Dimenzionisanje grupe slučajeva
opterećenja: 8,9
 $l_i, 2 = 2.89$ m ($\lambda_2 = 35.75$)
 $l_i, 3 = 2.89$ m ($\lambda_3 = 55.62$)
Nepomerljiva konstrukcija

Presek 2-2 $x = 0.00$ m



Merodavna kombinacija za savijanje:

1.00xI+0.30xII-1.00xVII
N1u = -12.84 kN
M2u = 11.46 kNm
M3u = -13.26 kNm

Merodavna kombinacija za torziju:

1.00xI+0.30xII-1.00xVII
M1u = -0.14 kNm

Merodavna kombinacija za smicanje:

1.00xI+0.30xII-1.00xVII
T2u = -8.99 kN
T3u = -7.99 kN
M1u = -0.14 kNm

$\epsilon_b/\epsilon_a = -3.500/5.376 \text{ ‰}$

Aa1 = 2.49 cm²
Aa2 = 2.49 cm²
Aa3 = 0.00 cm²
Aa4 = 0.00 cm²

Aa,uz = 0.00 cm²/m
[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

Procenat armiranja: 1.67%

Greda 27417-26124

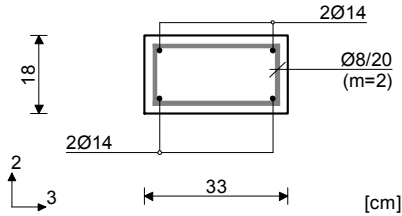
EC 2 (EN 1992-1-1:2004)

C 30 ($\gamma_C = 1.50$, $\gamma_S = 1.15$) [SP]

S500H

Dimenzionisanje grupe slučajeva
opterećenja: 8,9 $l_{i,2} = 2.89$ m ($\lambda_2 = 30.34$) $l_{i,3} = 2.89$ m ($\lambda_3 = 55.62$)

Nepomerljiva konstrukcija

Presek 3-3 $x = 0.00$ m

Merodavna kombinacija za savijanje:

1.00xI+0.30xII-1.00xVII

N1u = 12.28 kN

M2u = -27.35 kNm

M3u = -11.60 kNm

Merodavna kombinacija za torziju:

1.00xI+0.30xII-1.00xVII

M1u = -0.18 kNm

Merodavna kombinacija za smicanje:

1.00xI+0.30xII-1.00xVII

T2u = -8.10 kN

T3u = -14.53 kN

M1u = -0.18 kNm

 $\epsilon_b/\epsilon_a = -3.500/5.371$ ‰Aa1 = 0.00 cm²Aa2 = 0.00 cm²Aa3 = 3.24 cm²Aa4 = 3.24 cm²Aa_{uz} = 0.00 cm²/m (m=2)[Usvojeno Aa_{uz} = Ø8/20(m=2) = 2.51 cm²/m]

Procenat armiranja: 1.04%

Greda 18197-15582

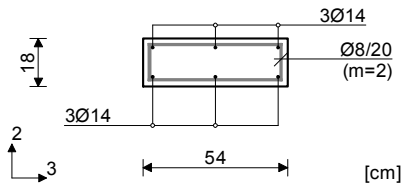
EC 2 (EN 1992-1-1:2004)

C 30 ($\gamma_C = 1.50$, $\gamma_S = 1.15$) [SP]

S500H

Dimenzionisanje grupe slučajeva
opterećenja: 8,9 $l_{i,2} = 2.89$ m ($\lambda_2 = 18.54$) $l_{i,3} = 2.89$ m ($\lambda_3 = 55.62$)

Nepomerljiva konstrukcija

Presek 4-4 $x = 2.89$ m

Merodavna kombinacija za savijanje:

1.00xI+0.30xII-1.00xVII

N1u = -1.91 kN

M2u = 25.16 kNm

M3u = -2.25 kNm

Merodavna kombinacija za torziju:

1.00xI+0.30xII+1.00xVII

M1u = 0.83 kNm

Merodavna kombinacija za smicanje:

1.00xI+0.30xII+1.00xVII

T2u = 6.39 kN

T3u = 9.15 kN

M1u = 0.83 kNm

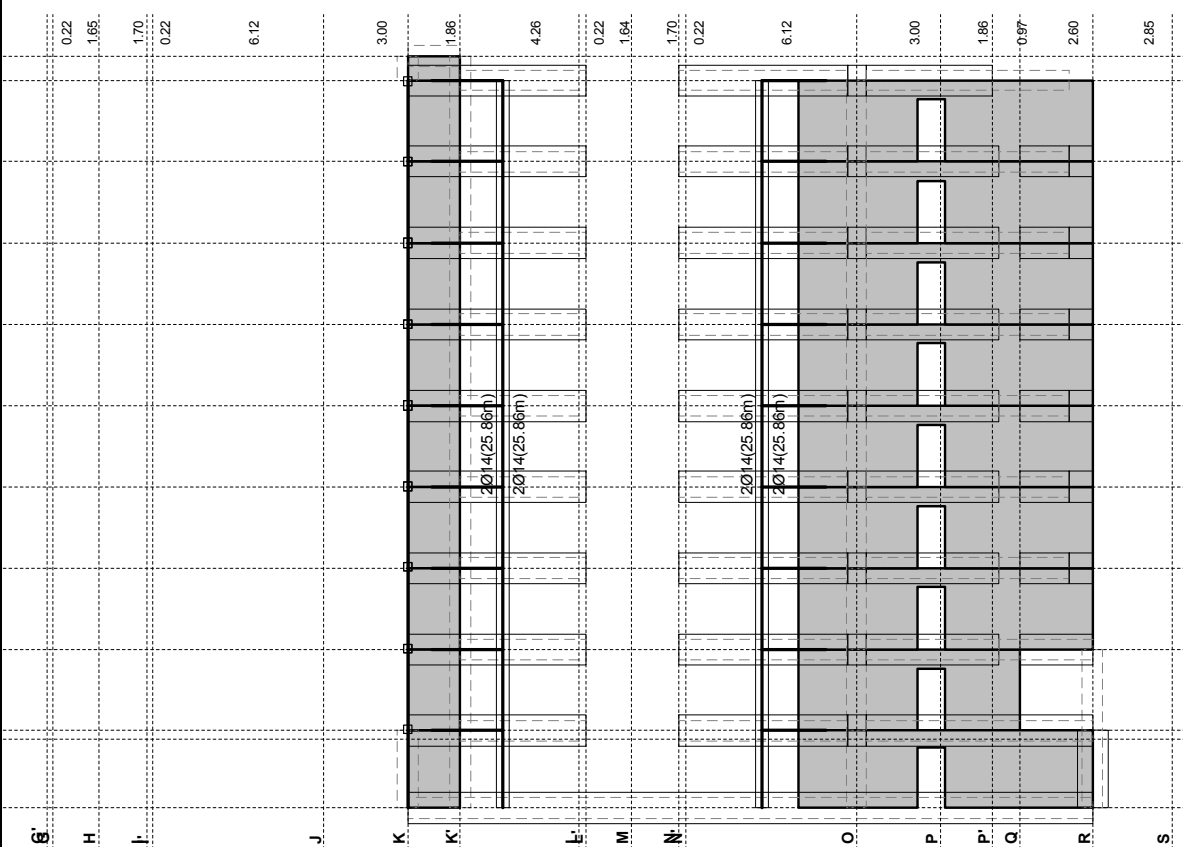
 $\epsilon_b/\epsilon_a = -3.473/25.000$ ‰Aa1 = 1.03 + 0.10' = 1.12 cm²Aa2 = 1.03 + 0.10' = 1.12 cm²Aa3 = 0.12 + 0.02' = 0.14 cm²Aa4 = 0.12 + 0.02' = 0.14 cm²Aa_{uz} = 0.00 cm²/m (m=2)[Usvojeno Aa_{uz} = Ø8/20(m=2) = 2.51 cm²/m]

Procenat armiranja: 0.95%

*) - dodatna podužna armatura za prijem torzije.

Usvojena armatura

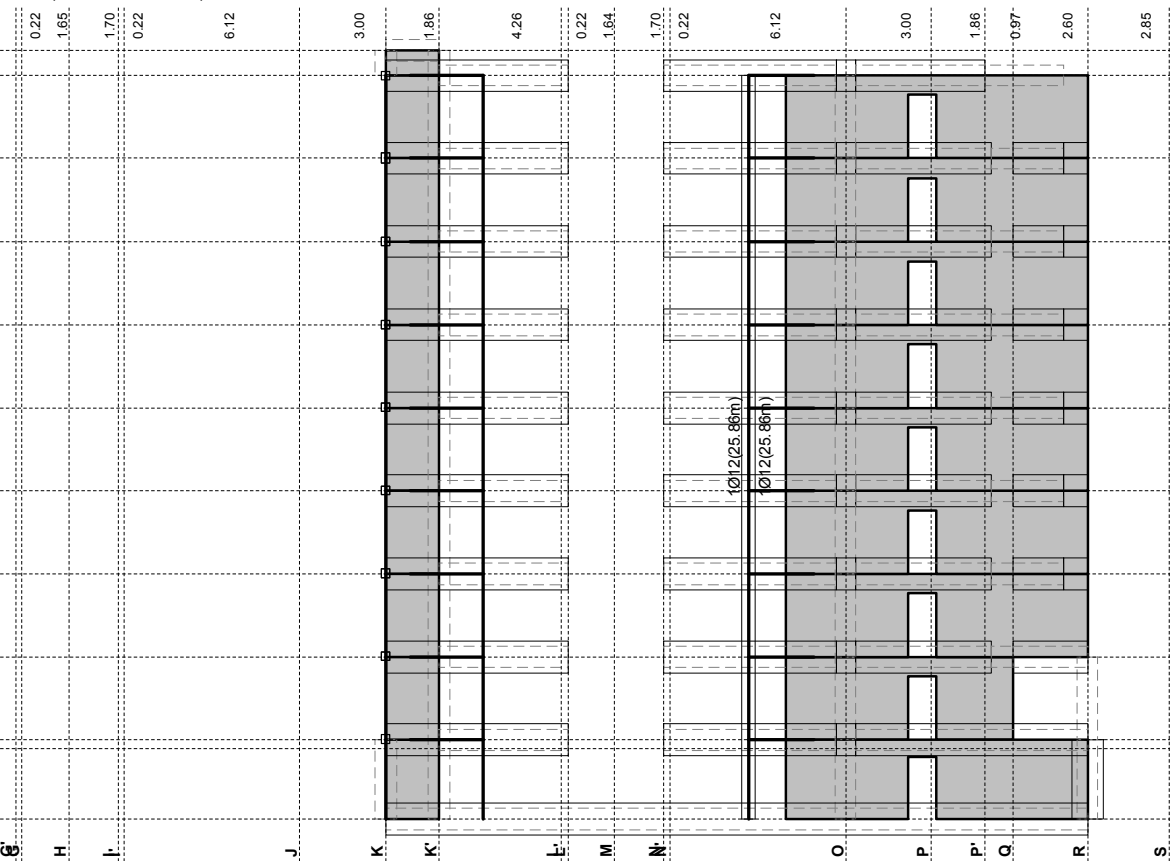
EC 2 (EN 1992-1-1:2004), C 30, S500H



Ram: 12_S12

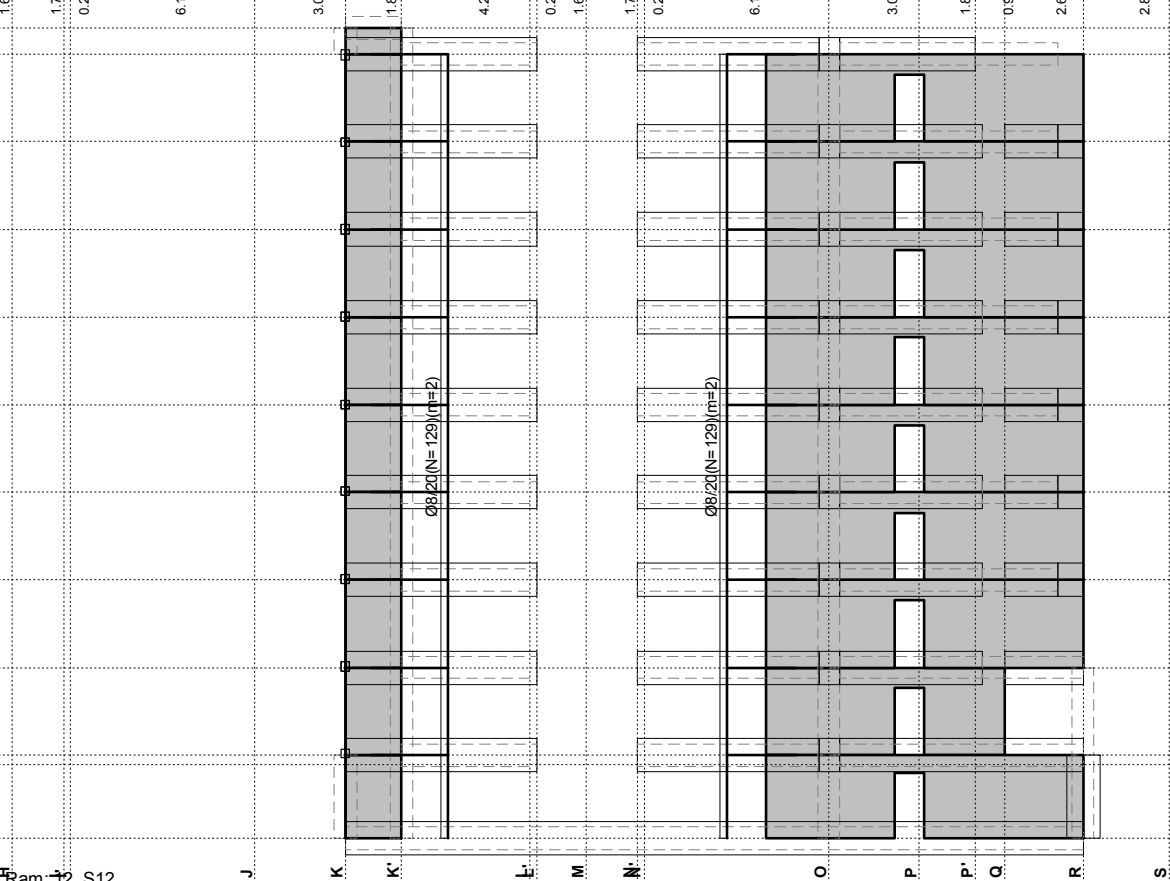
Armatura u gredama: Aa2/Aa1

Usvojena armatura
EC 2 (EN 1992-1-1:2004), C 30, S500H



Ram: 12_S12
Armatura u gredama: Aa3/Aa4

Usvojena armatura
EC 2 (EN 1992-1-1:2004), C 30, S500H



Ram: 12_S12
Armatura u gredama: Aa,uz

Greda 19089-16542

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

C 30 ($\gamma_C = 1.50$, $\gamma_S = 1.15$) [SP]

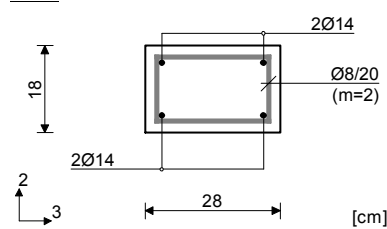
S500H

Dimenzionisanje grupe slučajeva
opterećenja: 8,9li,2 = 2.89 m ($\lambda_2 = 35.75$)li,3 = 2.89 m ($\lambda_3 = 55.62$)

Nepomerljiva konstrukcija

Presek 1-1 x =

2.89m



Merodavna kombinacija za savijanje:

1.00xI+0.30xII-1.00xVII

N1u = -12.92 kN

M2u = -9.47 kNm

M3u = -9.91 kNm

Merodavna kombinacija za torziju:

1.00xI+0.30xII-1.00xVII

M1u = -0.18 kNm

Merodavna kombinacija za smicanje:

1.00xI+0.30xII+1.00xVII

T2u = 6.91 kN

T3u = 4.85 kN

M1u = 0.10 kNm

 $\epsilon_b/\epsilon_a = -3.500/6.429 \%$ Aa1 = 1.71 cm²Aa2 = 1.71 cm²Aa3 = 0.00 cm²Aa4 = 0.00 cm²Aa,uz = 0.00 cm²/m (m=2)(Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m)

Procenat armiranja: 1.22%

Greda 25689-23892

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

C 30 ($\gamma_C = 1.50$, $\gamma_S = 1.15$) [SP]

S500H

Dimenzionisanje grupe slučajeva
opterećenja: 8,9li,2 = 2.89 m ($\lambda_2 = 35.75$)li,3 = 2.89 m ($\lambda_3 = 55.62$)

Nepomerljiva konstrukcija

Merodavna kombinacija za savijanje:

1.00xI+0.30xII-1.00xVII

N1u = -26.45 kN

M2u = -12.19 kNm

M3u = -12.90 kNm

Merodavna kombinacija za torziju:

1.00xI+0.30xII+1.00xVII

M1u = 0.15 kNm

Merodavna kombinacija za smicanje:

1.00xI+0.30xII+1.00xVII

T2u = 9.09 kN

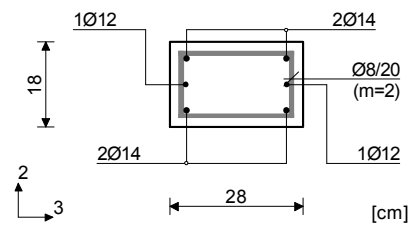
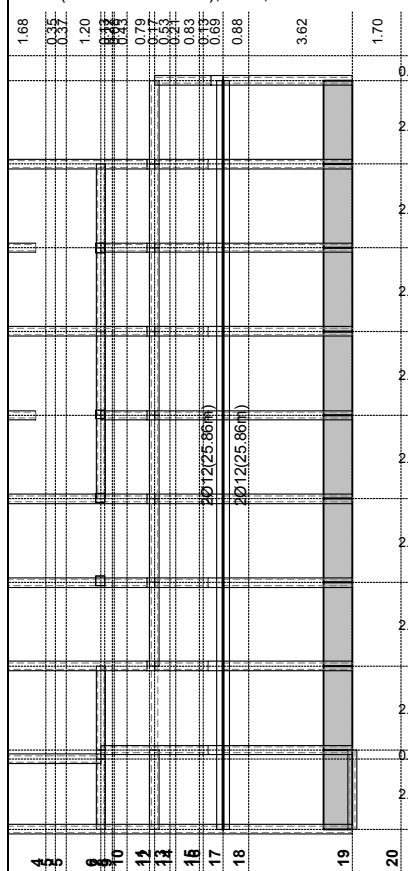
T3u = 7.42 kN

M1u = 0.15 kNm

 $\epsilon_b/\epsilon_a = -3.500/5.115 \%$ Aa1 = 2.31 cm²Aa2 = 2.31 cm²Aa3 = 0.00 cm²Aa4 = 0.00 cm²Aa,uz = 0.00 cm²/m (m=2)(Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m)

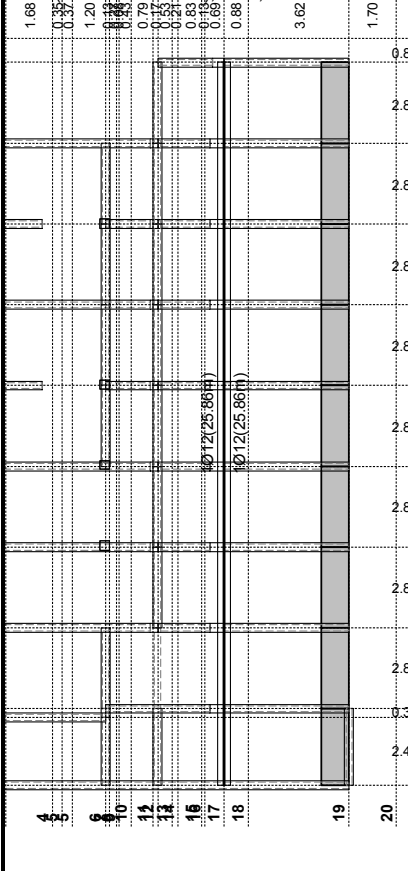
Procenat armiranja: 1.67%

Presek 2-2 x = 2.89m

Usvojena armatura
EC 2 (EN 1992-1-1:2004), C 30, S500H

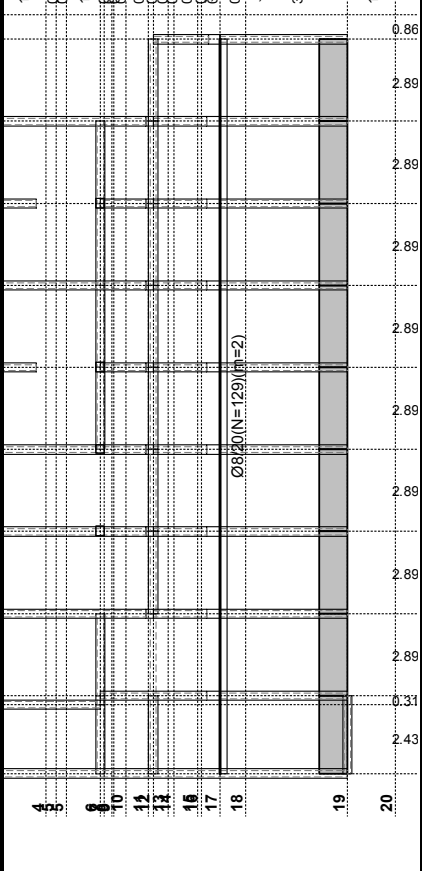
Ram: Q_S15Q

Armatura u gredama: Aa2/Aa1

Usvojena armatura
EC 2 (EN 1992-1-1:2004), C 30, S500H

Ram: Q_S15Q

Armatura u gredama: Aa3/Aa4

Usvojena armatura
EC 2 (EN 1992-1-1:2004), C 30, S500H

Ram: Q_S15Q

Armatura u gredama: Aa,uz

Greda 29238-28844

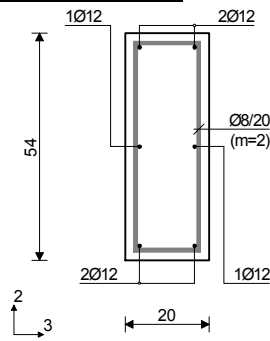
EC 2 (EN 1992-1-1:2004)

C 30 ($\gamma_C = 1.50$, $\gamma_S = 1.15$) [SP]

S500H

Dimenzionisanje grupe slučajeva
opterećenja: 8,9 $l_{i,2} = 2.89$ m ($\lambda_2 = 50.06$) $l_{i,3} = 2.89$ m ($\lambda_3 = 18.54$)

Nepomerljiva konstrukcija

Presek 1-1 $x = 2.89$ m

[cm]

Merodavna kombinacija za savijanje:

1.00xI+0.30xII-1.00xVII

N1u = -75.58 kN

M2u = -9.89 kNm

M3u = -23.89 kNm

Merodavna kombinacija za torziju:

1.00xI+0.30xII-1.00xVII

M1u = -0.49 kNm

Merodavna kombinacija za smicanje:

1.00xI+0.30xII+1.00xVII

T2u = 21.36 kN

T3u = 0.97 kN

M1u = 0.46 kNm

 $\epsilon_b/\epsilon_a = -3.500/10.444$ ‰Aa1 = 0.00 + 0.00` = 0.00 cm²Aa2 = 0.00 + 0.00` = 0.00 cm²Aa3 = 0.59 + 0.05` = 0.64 cm²Aa4 = 0.59 + 0.05` = 0.64 cm²Aa,uz = 0.00 cm²/m (m=2)[Usvojeno Aa,uz = Ø8/20(m=2) = 2.51 cm²/m]

Procenat armiranja: 0.63%

*) - dodatna podužna armatura za prijem torzije.

Zidovi lamele 1 X pravac

Z2	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	429	20	435	16.67	8	2.5	14.2	3	0.5	0.5		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$	
	-2359.98	2630.09	464.02	3143.57	7400		1234.00		8.266		4.42	
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$			$v_d=N_{Ed}/b_{wo}l_w f_{cd}$	$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$	$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$			$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
3.1988			0.1650	0.0022	0.0022	0.0577	134.54	0.0305			0.0065	
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida					$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$	$l_{c,min}=0.15l_w$	
15.29	$A_{sh}: \pm Q221 \pm R\emptyset 8/20$ (9.45 cm ² /m)				usvojeno: 10R \emptyset 14/15 (15.40 cm ²)					62.60	64.35	
	$A_{sv}: \pm Q221$ (4.42 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\sum b_i^2/6b_0h_0$	$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
64	10	2520	0.5379	0.5973		0.3212		130.68		9088.00		0.3752
									$\alpha\omega_{wd}$	30 $\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.12054	0.0305		

Z2a	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	130	20	435	16.67	8	2.5	14.2	3	0.5	0.5		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$	
	-763.12	158.27	-311.88	422.97	850		376.00		8.311		5.75	
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$			$v_d=N_{Ed}/b_{wo}l_w f_{cd}$	$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$	$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$			$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
1.6758			0.1761	0.0022	0.0029	0.0750	45.97	0.0037			0.0039	
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida					$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$	$l_{c,min}=0.15l_w$	
1.69	$A_{sh}: \pm R\emptyset 10/15$ (10.47 cm ² /m)				usvojeno: 6R \emptyset 14/15 (9.24 cm ²)					4.36	19.50	
	$A_{sv}: \pm R\emptyset 8/17.5$ (5.75 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\sum b_i^2/6b_0h_0$	$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
29	10	1057	0.5722	0.5362		0.3068		48.79		4118.00		0.3092
									$\alpha\omega_{wd}$	30 $\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.09486	0.0037		

Z7	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)		
	334	20	435	16.67	8	2.5		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)		$1.5V_{Ed}$ (kN)		
	-3131.7	1907.36	301.9	2444.04		875.00		
	$v_d=N_{Ed}/b_{wo}l_wf_{cd}$		$potA_{sh}=V_{Ed}/zf_{yd}cotg\theta$ (cm ² /m)			$A_{sv,usv}$	$potA_a$ (cm ²)	
	0.2812		7.528			2.21	16.03	
Armatura rebra (cm ² /m)				Ivična armatura zida				
A_{sh} : ±Q221±RØ8/30 (7.77 cm ² /m)				usvojeno: 8RØ16/12.5 (16.08 cm2)				
A_{sv} : ±Q221 (4.42 cm ² /m)								
Na krajevima ovog zida zbog postojanja flanse nije potrebno formirati utegnuti ivicni element prema odredbi EC8 5.4.3.4.2 (7)								

Z8	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1			
	185	20	435	16.67	8	2.5	14.2	3	0.5	0.5			
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)		$M_{Rd,Nmin}$ (KNm)	$1.5V_{Ed}$ (kN)		$potA_{sh}=V_{Ed}/zf_{yd}cotg\theta$ (cm ² /m)		$A_{sv,usv}$		
	-1849.56	1352.27	-505.02	1110.49		2140	870.00		13.514		4.42		
$\mu_6=1.5[2+(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_wf_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{sv}/A_c$	$\omega_v=\rho_vf_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_wb_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$		
5.6871		0.2999		0.0022	0.0022	0.0577	93.16		0.1519		0.0187		
$potA_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida				$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$		
10.46	A_{sh} : ±Q221±RØ10/15 (14.89 cm ² /m)				usvojeno: 6RØ16/12.5 (12.06 cm ²)				26.00		30.00		
	A_{sv} : ±Q221 (4.42 cm ² /m)												
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$													
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\sum b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
29	10	1057	0.5722		0.5362		0.3068		48.79		4118.00		0.3092

	$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$
	0.09486	0.1519

Z11a	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1			
	573	18	435	16.67	8	2.5	12.2	3	0.5	0.5			
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$		
	-2994.48	6130.25	696.27	5904.35		13450		2200.00		11.033		3.76	
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$			$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$		$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$
4.1020			0.1742		0.0022		0.0021	0.0545	193.32		0.0553		0.0090
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida						$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
23.14	$A_{sh}: \pm Q188 \pm R\emptyset 10/15$ (14.23 cm ² /m)				usvojeno: 12R \emptyset 16/17.5 (24.12 cm ²)						84.32		85.95
	$A_{sv}: \pm Q188$ (3.76 cm ² /m)												
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$													
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
91.5	10	3662.5	0.4532		0.5579		0.2528		146.88		11163.00		0.3433
									$\alpha\omega_{wd}$		$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.08681		0.0553		

Z11b	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1			
	209	18	435	16.67	8	2.5	12.2	3	0.5	0.5			
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$		
	-2193.46	373.21	199.26	830.06		2300		711.00		9.776		3.76	
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$			$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$		$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$
1.4604			0.3498		0.0022		0.0021	0.0545	124.66		0.0218		0.0057
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida						$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
9.21	$A_{sh}: \pm Q188 \pm R\emptyset 8/15$ (10.46 cm ² /m)				usvojeno: 6R \emptyset 14/15 (9.24 cm ²)						32.32		31.35
	$A_{sv}: \pm Q188$ (3.76 cm ² /m)												
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$													
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
34	10	1200	0.5178		0.5034		0.2607		50.80		4148.00		0.3196
									$\alpha\omega_{wd}$		$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.08331		0.0218		

Z13	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1				
	316	20	435	16.67	8	2.5	14.2	3	0.5	0.5				
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$			
	-1484.58	2481.92	-606.96	2949.67	4000		850.00		7.730		4.42			
$\mu_\theta=1.5[2+2(q_0 M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$		$\rho_v = A_{s,v}/A_c$		$\omega_v=\rho_v f_{yd}/f_{cd}$		$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$	$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
5.5843		0.1409		0.0022		0.0022		0.0577		88.38		0.0669		0.0102
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida						$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$	
11.84	$A_{sh}: \pm Q221\pm R\emptyset 8/30$ (7.77 cm ² /m)				usvojeno: 8RØ16/15 (16.08 cm ²)						45.06		47.40	
	$A_{sv}: \pm Q221$ (4.42 cm ² /m)													
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$														
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_h f_{yd}/V_0 f_{cd}$	
49	10	1926	0.5387		0.5818		0.3134		93.36		6958.00		0.3501	
									$\alpha\omega_{wd}$		$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$			
									0.10972		0.0669			

Z14a	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1				
	296	20	435	16.67	8	2.5	14.2	3	0.5	0.5				
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$			
	-2362.44	788.65	385.57	827.98	4350		632.00		6.135		4.42			
$\mu_\theta=1.5[2+2(q_0 M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$		$\rho_v = A_{s,v}/A_c$		$\omega_v=\rho_v f_{yd}/f_{cd}$		$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$	$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
1.6317		0.2394		0.0022		0.0022		0.0577		123.84		0.0095		0.0045
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida						$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$	
5.89	$A_{sh}: \pm Q221\pm R\emptyset 8/30$ (7.77 cm ² /m)				usvojeno: 8RØ14/15 (12.32 cm ²)						26.54		44.40	
	$A_{sv}: \pm Q221$ (4.42 cm ² /m)													
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$														
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_h f_{yd}/V_0 f_{cd}$	
49	10	1926	0.5387		0.5818		0.3134		93.36		6958.00		0.3501	
									$\alpha\omega_{wd}$		$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$			
									0.10972		0.0095			

Z14b	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	296	20	435	16.67	8	2.5	14.2	3	0.5	0.5		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$	
	-2291.9	633.37	-65.42	1141.44	4300		567.00		5.504		4.42	
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$			$v_d=N_{Ed}/b_{wo}l_w f_{cd}$	$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$	$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$			$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
1.3257			0.2322	0.0022	0.0022	0.0577	120.86	0.0003			0.0035	
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida				$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$	
3.42	$A_{sh}: \pm Q221\pm R\emptyset 8/30$ (7.77 cm ² /m)				usvojeno: 8RØ14/15 (12.32 cm ²)				1.09		44.40	
	$A_{sv}: \pm Q221$ (4.42 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\sum b_i^2/6b_0h_0$	$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$	$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$	
49	10	1926	0.5387	0.5818	0.3134		93.36		6958.00		0.3501	
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.10972	0.0003		

Z16a	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	209	18	435	16.67	8	2.5	12.2	3	0.5	0.5		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$	
	-1353.24	332.31	368.29	247.92	1960		510.00		7.012		3.76	
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$			$v_d=N_{Ed}/b_{wo}l_w f_{cd}$	$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$	$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$			$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
1.5259			0.2158	0.0022	0.0021	0.0545	83.35	0.0047			0.0040	
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida				$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$	
4.9	$A_{sh}: \pm Q188\pm R\emptyset 8/30$ (7.11 cm ² /m)				usvojeno: 6RØ14/15 (9.24 cm ²)				9.88		31.35	
	$A_{sv}: \pm Q188$ (3.76 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\sum b_i^2/6b_0h_0$	$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$	$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$	
34	10	1200	0.5178	0.5034	0.2607		50.80		4148.00		0.3196	
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.08331	0.0047		

Z16b	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	209	18	435	16.67	8	2.5	12.2	3	0.5	0.5		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$	
	-1406.29	435.01	168.22	181.39	2000		505.00		6.943		3.76	
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
1.9575		0.2242		0.0022	0.0021	0.0545	85.96		0.0175		0.0053	
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida					$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
3.87	$A_{sh}: \pm Q188 \pm R\emptyset 8/30$ (7.11 cm ² /m)				usvojeno: 6R $\emptyset 14/15$ (9.24 cm ²)					28.69		31.35
	$A_{sv}: \pm Q188$ (3.76 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)	$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_h f_{yd}/V_0 f_{cd}$
34	10	1200	0.5178		0.5034		0.2607		50.80	4148.00		0.3196
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.08331	0.0175		

Z17	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	220	18	435	16.67	8	2.5	12.2	3	0.5	0.5		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$	
	-1010.4	85.12	169.55	185.78	1200		490.00		6.400		5.75	
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
0.6384		0.1531		0.0022	0.0032	0.0834	76.74		-0.0205		0.0015	
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida					$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
1.35	$A_{sh}: \pm R\emptyset 8/15$ (6.70 cm ² /m)				usvojeno: 6R $\emptyset 14/15$ (9.24 cm ²)					-108.11		33.00
	$A_{sv}: \pm R\emptyset 8/17.5$ (5.75 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)	$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_h f_{yd}/V_0 f_{cd}$
24	10	700	0.6015		0.4672		0.2811		40.74	2928.00		0.3631
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.10204	-0.0205		

Z18'	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)		
	186	15	435	16.67	8	2.5		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$1.5V_{Ed}$ (kN)			
	-796.53	306.95	-136.82	239.12	650.00			
	$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$pot A_{sh}=V_{Ed}/z f_{yd} cotg\theta$ (cm ² /m)			$A_{sv,usv}$	$pot A_a$ (cm ²)	
	0.1713		10.042			4.42	0	
Armatura rebra (cm ² /m)			Ivična armatura zida					
$A_{sh}: \pm R\emptyset 8/10$ (10.06 cm ² /m)			usvojeno: 4R \emptyset 14/10 (6.16 cm ²)					
$A_{sv}: \pm R\emptyset 8/20$ (5.03 cm ² /m)								
Na krajevima ovog zida zbog postojanja flanse nije potrebno formirati utegnuti ivicni element prema odredbi EC8 5.4.3.4.2 (7)								

Z20	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1	
	208	20	435	16.67	8	2.5	14.2	3	0.5	0.5	
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)	$1.5V_{Ed}$ (kN)	$pot A_{sh}=V_{Ed}/z f_{yd} cotg\theta$ (cm ² /m)		$A_{sv,usv}$		
	-1747.64	702.49	757.57	335.79	2500	490.00	6.769		4.42		
$\mu_6=1.5[2+2(q_0 M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_w f_{cd}$	$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v= A_{sv}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$	$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$		
2.5290		0.2520	0.0022	0.0022	0.0577	90.72	0.0370		0.0072		
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida				$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
12.24	$A_{sh}: \pm Q221\pm R\emptyset 8/30$ (7.77 cm ² /m)				usvojeno: 8R \emptyset 14/12.5 (12.32 cm ²)				32.20		31.20
	$A_{sv}: \pm Q221$ (4.42 cm ² /m)										
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$											
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\sum b_i^2/6b_0h_0$	$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)	$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_h f_{yd}/V_0 f_{cd}$
41.5	10	1513.5	0.5719	0.5698		0.3259		83.30	5893.00		0.3689
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$	
									0.12022	0.0370	

Z20b	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1			
	130	20	435	16.67	8	2.5	14.2	3	0.5	0.5			
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)		$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/zf_{yd}cot\theta$ (cm ² /m)		$A_{sv,usv}$	
	-862.27	190.25	-289.13	268.16		800		220.00		4.863		4.42	
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_wf_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$		$\rho_v = A_{s,v}/A_c$	$\omega_v=\rho_vf_{yd}/f_{cd}$		$x_u=(v_d+\omega_v)l_wb_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$
2.1403		0.1989		0.0022		0.0022	0.0577		46.99		0.0155		0.0050
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida					$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$	
0	$A_{sh}: \pm R\varnothing 8/15$ (6.70 cm ² /m)				usvojeno: 6RØ14/12.5 (9.24 cm ²)					14.41		19.50	
	$A_{sv}: \pm R\varnothing 8/20$ (5.03 cm ² /m)												
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$													
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\sum b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
29	10	1057	0.5722		0.5362		0.3068		48.79		4118.00		0.3092
										$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
										0.09486	0.0155		

Zidovi lamele 2 X pravac

Z1 uz P	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	186	20	435	16.67	8	2.5	14.2	3	0.5	0.41		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)		$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} cotg \theta$ (cm ² /m)		$A_{sv,usv}$
	-1423.06	199.95	791.18	254.54		1670		466.00		7.199		4.42
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$			$v_d=N_{Ed}/b_{wo}l_w f_{cd}$	$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$	$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$			$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
0.6556			0.2295	0.0022	0.0022	0.0577	75.23	-0.0177			0.0017	
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida				$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$	
9.23	$A_{sh}: \pm Q221 \pm R\emptyset 8/30$ (7.77 cm ² /m)				usvojeno: 6R \emptyset 16/2.5 (12.06 cm ²)				-76.96		30.00	
	$A_{sv}: \pm Q221$ (4.42 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$	$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
29	10	1057	0.5722	0.5362		0.3068		48.79		4118.00		0.3092
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.09486	-0.0177		

Z1 sred.	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	130	20	435	16.67	8	2.5	14.2	3	0.5	0.41		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)		$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} cotg \theta$ (cm ² /m)		$A_{sv,usv}$
	-859.86	304.38	-300	250.21		620		182.00		4.023		5.75
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$			$v_d=N_{Ed}/b_{wo}l_w f_{cd}$	$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$	$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$			$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
4.7298			0.1984	0.0022	0.0029	0.0750	50.06	0.0838			0.0119	
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida				$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$	
2.85	$A_{sh}: \pm R\emptyset 8/20$ (5.03 cm ² /m)				usvojeno: 4R \emptyset 14/15 (6.16 cm ²)				20.20		19.50	
	$A_{sv}: \pm R\emptyset 8/20$ (5.03 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$	$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
20	10	738	0.5669	0.4859		0.2755		23.33		2840.00		0.2144
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.05905	0.0838		

Z1 uz S	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	160	20	435	16.67	8	2.5	14.2	3	0.5	0.41		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$	
	-1026.88	693.05	-260.94	423.22	1230		255.00		4.580		4.41	
$\mu_\theta=1.5[2+2(q_0 M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo} l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v = A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
5.5257		0.1925		0.0022	0.0022	0.0575	56.35		0.0920		0.0127	
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida					$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
5.6	$A_{sh}: \pm Q221$ (4.42 cm ² /m)				usvojeno: 6RØ14/12.5 (9.24 cm ²)					30.10		24.00
	$A_{sv}: \pm Q221$ (4.42 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)	$\omega_{wd}=V_h f_{yd}/V_0 f_{cd}$
29	10	1057	0.5722		0.5362		0.3068		48.79		4118.00	0.3092
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.09486	0.0920		

Z1a	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	130	20	435	16.67	8	2.5	14.2	3	0.5	0.41		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$	
	-672.05	272.47	-472	227.16	350		155.00		3.426		5.03	
$\mu_\theta=1.5[2+2(q_0 M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo} l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v = A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
7.8858		0.1551		0.0022	0.0025	0.0656	40.41		0.1249		0.0160	
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida					$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
0	$A_{sh}: \pm RØ8/15$ (6.70 cm ² /m)				usvojeno: 6RØ14/12.5 (9.24 cm ²)					31.56		19.50
	$A_{sv}: \pm RØ8/20$ (5.03 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)	$\omega_{wd}=V_h f_{yd}/V_0 f_{cd}$
29	10	1057	0.5722		0.5362		0.3068		48.79		4118.00	0.3092
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.09486	0.1249		

Z6a	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1			
	209	18	435	16.67	8	2.5	12.2	3	0.5	0.41			
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$		
	-2233.07	647.91	721.06	554.85		2300		465.00		6.393		3.76	
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$		
2.4333		0.3561		0.0022	0.0021	0.0545	126.61		0.0612		0.0096		
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida						$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
12.05	$A_{sh}: \pm Q188 \pm R\emptyset 8/20$ (8.79 cm ² /m)				usvojeno: 8RØ14/12.5 (12.06 cm ²)				40.10		31.35		
	$A_{sv}: \pm Q188$ (3.76 cm ² /m)												
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$													
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
41.5	10	1337.5	0.5597		0.5191		0.2905		79.27		5063.00		0.4086
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$			
									0.1187	0.0612			

Z6b	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1			
	209	18	435	16.67	8	2.5	12.2	3	0.5	0.41			
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$		
	-2134.54	408.5	189.35	806.36		2250		475.00		6.531		3.76	
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$		
1.3341		0.3404		0.0022	0.0021	0.0545	121.76		0.0157		0.0051		
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida						$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
8.72	$A_{sh}: \pm Q188 \pm R\emptyset 8/20$ (8.79 cm ² /m)				usvojeno: 8RØ14/12.5 (12.06 cm ²)				39.65		31.35		
	$A_{sv}: \pm Q188$ (3.76 cm ² /m)												
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$													
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
41.5	10	1337.5	0.5597		0.5191		0.2905		79.27		5063.00		0.4086
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$			
									0.1187	0.0157			

Z6c	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	213	18	435	16.67	8	2.5	12.2	3	0.5	0.41		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$	
	-561.81	118.85	-320	39.13		1300		160.00		2.159		3.76
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
0.3449		0.0879		0.0022	0.0021	0.0545	44.75		-0.0303		0.0005	
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida					$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
0	$A_{sh}: \pm Q188$ (3.76 cm ² /m)				usvojeno: 4RØ14/15 (6.16 cm ²)					-286.52		31.95
	$A_{sv}: \pm Q188$ (3.76 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)	$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
20	10	738	0.4959		0.4426		0.2195		23.33	2440.00		0.2495
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.05477	-0.0303		

Z9	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	285	20	435	16.67	8	2.5	14.2	3	0.5	0.41		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$	
	-1785.1	1286.17	850.79	1779.82		4000		400.00		4.033		4.42
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
2.8706		0.1879		0.0022	0.0022	0.0577	98.56		0.0298		0.0065	
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida					$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
15.7	$A_{sh}: \pm Q221$ (4.42 cm ² /m)				usvojeno: 8RØ16/15 (16.08 cm ²)					45.31		42.75
	$A_{sv}: \pm Q221$ (4.42 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)	$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
49	10	1926	0.5387		0.5818		0.3134		93.36	6958.00		0.3501
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.10972	0.0298		

Z10a	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	296	20	435	16.67	8	2.5	14.2	3	0.5	0.41		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$potA_{sh}=V_{Ed}/zf_{yd}cotg\theta$ (cm ² /m)		$A_{sv,usv}$	
	-2689.85	1056.39	-136.9	1808.03	4500		580.00		5.631		4.42	
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_wf_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$		$\rho_v = A_{s,v}/A_c$	$\omega_v=\rho_vf_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_wb_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$
1.9180		0.2726		0.0022		0.0022	0.0577	137.68		0.0232		0.0058
$potA_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida					$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
8.84	$A_{sh}: \pm Q221\pm R\emptyset 8/30$ (7.77 cm ² /m)				usvojeno: 8RØ16/20 (16.08 cm ²)					54.90		44.40
	$A_{sv}: \pm Q221$ (4.42 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)	$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
64	10	2976	0.4542		0.5973		0.2713		113.48	9088.00		0.3258
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.0884	0.0232		

Z10b	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	296	20	435	16.67	8	2.5	14.2	3	0.5	0.41		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$potA_{sh}=V_{Ed}/zf_{yd}cotg\theta$ (cm ² /m)		$A_{sv,usv}$	
	-2871.13	1495.38	492.11	1529.17	4500		460.00		4.466		4.42	
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_wf_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$		$\rho_v = A_{s,v}/A_c$	$\omega_v=\rho_vf_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_wb_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$
2.9887		0.2909		0.0022		0.0022	0.0577	145.33		0.0608		0.0096
$potA_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida					$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
13.5	$A_{sh}: \pm Q221$ (4.42 cm ² /m)				usvojeno: 8RØ16/20 (16.08 cm ²)					59.30		44.40
	$A_{sv}: \pm Q221$ (4.42 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)	$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
64	10	2976	0.4542		0.5973		0.2713		113.48	9088.00		0.3258
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.0884	0.0608		

Z12a	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1				
	426	18	435	16.67	8	2.5	12.2	3	0.5	0.41				
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$			
	-2303.85	1880.45	421.71	2021.3		6900		1155.02		7.791		3.76		
$\mu_\theta=1.5[2+2(q_0 M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$		$\rho_v = A_{s,v}/A_c$		$\omega_v=\rho_v f_{yd}/f_{cd}$		$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$	$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
2.3326		0.1802		0.0022		0.0021		0.0545		147.54		0.0177		0.0053
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida						$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$	
4.73	$A_{sh}: \pm Q188\pm R\emptyset 8/15$ (10.47 cm ² /m)				usvojeno: 10R \emptyset 14/15 (15.4 cm ²)						49.58		63.90	
	$A_{sv}: \pm Q188$ (3.76 cm ² /m)													
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$														
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_h f_{yd}/V_0 f_{cd}$	
64	10	2300	0.5091		0.5441		0.2770		125.65		7808.00		0.4199	
									$\alpha\omega_{wd}$		$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$			
									0.1163		0.0177			

Z12b	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1				
	265	18	435	16.67	8	2.5	12.2	3	0.5	0.41				
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$			
	-2100	985.92	394.11	1010.72		3200		607.00		6.582		3.76		
$\mu_\theta=1.5[2+2(q_0 M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$		$\rho_v = A_{s,v}/A_c$		$\omega_v=\rho_v f_{yd}/f_{cd}$		$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$	$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
2.7230		0.2641		0.0022		0.0021		0.0545		124.57		0.0485		0.0084
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida						$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$	
5.08	$A_{sh}: \pm Q188\pm R\emptyset 8/15$ (10.46 cm ² /m)				usvojeno: 8R \emptyset 14/15 (12.32 cm ²)						39.56		39.75	
	$A_{sv}: \pm Q188$ (3.76 cm ² /m)													
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$														
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_h f_{yd}/V_0 f_{cd}$	
43	10	1750	0.4440		0.5215		0.2316		89.33		5246.00		0.4443	
									$\alpha\omega_{wd}$		$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$			
									0.1029		0.0485			

Z12'	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)		
	186	15	435	16.67	8	2.5		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$1.5V_{Ed}$ (kN)			
	-1211.4	432.85	520.64	192.4	365.00			
	$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)			$A_{sv,usv}$	$pot A_a$ (cm ²)	
	0.2605		5.639			2.21	5.76	
Armatura rebra (cm ² /m)			Ivična armatura zida					
A _{sh} : ±RØ8/15 (6.70 cm ² /m)			usvojeno: 4RØ14/10 (6.16 cm2)					
A _{sv} : ±RØ8/20 (5.03 cm ² /m)								
Na krajevima ovog zida zbog postojanja flanse nije potrebno formirati utegnuti ivicni element prema odredbi EC8 5.4.3.4.2 (7)								

Z19	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1
	205	20	435	16.67	8	2.5	14.2	3	0.5	0.41
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (KNm)	$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)	$A_{sv,usv}$	
	-2501.28	717.24	1378.31	649.55	3000	384.00		5.383	5.75	
$\mu_\theta=1.5[2+2(q_0 M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v= A_{sv}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$	$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$
1.9655		0.3660		0.0022	0.0029	0.0750	127.33	0.0447		0.0080
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida				$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$	$l_{c,min}=0.15l_w$
18.34	A _{sh} : ±RØ10/20 (7.85 cm ² /m)				usvojeno: 6RØ20/15 (18.84 cm ²)				31.50	30.75
	A _{sv} : ±RØ8/20 (5.03 cm ² /m)									
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$										
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$	V_h (cm ³)	$V_0=b_0h_0s_w$ (cm ³)	$\omega_{wd}=V_h f_{yd}/V_0 f_{cd}$
34	10	1332	0.5402		0.5526		0.2985	53.82	4828.00	0.2909
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$
									0.08684	0.0447

Zidovi lamele 1 Y pravac

ZB	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	316	20	435	16.67	8	2.5	14.2	2	0.5	0.5		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)		$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$
	-1763.55	1647.7	183.66	927.86		4100		766.25		6.968		4.42
$\mu_\theta=1.5[2+2(q_0 M_{Ed}/M_{Rd}-1)T_c/T_1]$			$v_d=N_{Ed}/b_{w0}l_w f_{cd}$	$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$			$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$
2.4113			0.1674	0.0022	0.0022	0.0577	100.17		0.0149			0.0050
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida						$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$	$l_{c,min}=0.15l_w$
9.73	$A_{sh}: \pm Q221 \pm R\emptyset 8/30$ (7.77 cm ² /m)				usvojeno: 6R \emptyset 16/20 (12.06 cm ²)						29.87	47.40
	$A_{sv}: \pm Q221$ (4.42 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)	$\omega_{wd}=V_h f_{yd}/V_0 f_{cd}$
44	10	2030	0.4585		0.5743		0.2633		63.88		6248.00	0.2668
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.07025	0.0149		

ZC	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	267	20	435	16.67	8	2.5	14.2	2	0.5	0.5		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)		$M_{Rd,Nmin}$ (kNm)		$1.5V_{Ed}$ (kN)		$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$
	-1651.11	417.2	-1333.28	888.35		3200		400.00		4.305		4.42
$\mu_\theta=1.5[2+2(q_0 M_{Ed}/M_{Rd}-1)T_c/T_1]$			$v_d=N_{Ed}/b_{w0}l_w f_{cd}$	$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_v f_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$			$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$
0.7823			0.1855	0.0022	0.0022	0.0577	91.44		-0.0175			0.0017
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida						$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$	$l_{c,min}=0.15l_w$
0	$A_{sh}: \pm Q221$ (4.42 cm ² /m)				usvojeno: 8R \emptyset 14/12.5 (12.32 cm ²)						-91.65	40.05
	$A_{sv}: \pm Q221$ (4.42 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)	$\omega_{wd}=V_h f_{yd}/V_0 f_{cd}$
41.5	10	1513.5	0.5719		0.5698		0.3259		83.30		5893.00	0.3689
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.12022	-0.0175		

ZE	b _{wo} (cm)	l _w (cm)	l _{w,Ash} (cm)	f _{yd} =f _{yk} /γ _s	f _{cd} =f _{ck} /γ _c	l _o (cm)	φ=1.14(1-2e/b _{wo})	N _{Ed,max}	M _{Ed,odg}	N _{Ed,min}	M _{Ed,odg}	l _c ≥b _{wo} 3(1-ε _{c2} /3ε _{cu2}), ε _{c2} =0.002, ε _{cu2} =0.005	
	20	453	453	435	16.67	271	0.79	-4328.98	3702.00	1641.25	3589.82	52.00	
	1.5V _{Ed} (kN)	pot A _{sh} =V _{Ed} /zf _{yd} cotgθ (cm ² /m)				[JUS] A _{s,min} =0.15b _{wo} l _w (cm ²)			[EC8] A _{s,min} =0.2A _c (cm ²)			(h _{st} /b _{wo})(l _w /b _{wo}) ^{1/3}	
	1450.00	9.198				13.59			2.08			40.88	<70
	Armatura rebra					Ivična armatura zida					N _{Rd} = 11958.04		
	A _{sh} : ±Q221+RØ8/15 (11.13 cm ² /m)					usvojeno: 10RØ20/15 (31.4 cm ²)							
	A _{sv} : ±Q221 (4.42 cm ² /cm)												

ZF1	b _{wo} (cm)	l _w (cm)	l _{w,Ash} (cm)	f _{yd} =f _{yk} /γ _s	f _{cd} =f _{ck} /γ _c	l _o (cm)	φ=1.14(1-2e/b _{wo})	N _{Ed,max}	M _{Ed,odg}	N _{Ed,min}	M _{Ed,odg}	l _c ≥b _{wo} 3(1-ε _{c2} /3ε _{cu2}), ε _{c2} =0.002, ε _{cu2} =0.005	
	20	689	689	435	16.67	271	0.79	-7248.00	9691.61	-181.41	11058.62	52.00	
	1.5V _{Ed} (kN)	pot A _{sh} =V _{Ed} /zf _{yd} cotgθ (cm ² /m)				[JUS] A _{s,min} =0.15b _{wo} l _w (cm ²)			[EC8] A _{s,min} =0.2A _c (cm ²)			(h _{st} /b _{wo})(l _w /b _{wo}) ^{1/3}	
	2155.00	8.988				20.67			2.08			47.02	<70
	Armatura rebra					Ivična armatura zida					N _{Rd} = 18187.84		
	A _{sh} : ±Q221+RØ8/15 (11.13 cm ² /m)					usvojeno: 10RØ20/15 (31.4 cm ²)							
	A _{sv} : ±Q221 (4.42 cm ² /cm)												

ZF2	b _{wo} (cm)	l _w (cm)	l _{w,Ash} (cm)	f _{yd} =f _{yk} /γ _s	f _{cd} =f _{ck} /γ _c	l _o (cm)	φ=1.14(1-2e/b _{wo})	N _{Ed,max}	M _{Ed,odg}	N _{Ed,min}	M _{Ed,odg}	l _c ≥b _{wo} 3(1-ε _{c2} /3ε _{cu2}), ε _{c2} =0.002, ε _{cu2} =0.005	
	20	689	689	435	16.67	271	0.79	-5326.00	8954.13	231.75	9987.70	52.00	
	1.5V _{Ed} (kN)	pot A _{sh} =V _{Ed} /zf _{yd} cotgθ (cm ² /m)				[JUS] A _{s,min} =0.15b _{wo} l _w (cm ²)			[EC8] A _{s,min} =0.2A _c (cm ²)			(h _{st} /b _{wo})(l _w /b _{wo}) ^{1/3}	
	1850.00	7.716				20.67			2.08			47.02	<70
	Armatura rebra					Ivična armatura zida					N _{Rd} = 18187.84		
	A _{sh} : ±Q221+RØ8/30 (7.77 cm ² /m)					usvojeno: 10RØ20/15 (31.4 cm ²)							
	A _{sv} : ±Q221 (4.42 cm ² /cm)												

ZG'	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	132	20	435	16.67	8	2.5	14.2	2	0.5	0.5		
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)	$1.5V_{Ed}$ (kN)	$potA_{sh}=V_{Ed}/zf_{yd}cotg\theta$ (cm ² /m)	$A_{sv,usv}$				
	-1646.22	102.92	-261.75	329.89	1120	181.00	3.940	5.03				
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_wf_{cd}$	$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_vf_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_wb_{wo}/b_o$	$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$	$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$				
0.5514		0.3741	0.0022	0.0025	0.0656	81.75	-0.0127	0.0022				
$potA_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida				$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$	$l_{c,min}=0.15l_w$		
0.72	$A_{sh}: \pm R\emptyset 8/20$ (5.03 cm ² /m)				usvojeno: 6RØ14/12.5 (9.24 cm ²)				-46.67	19.80		
	$A_{sv}: \pm R\emptyset 8/20$ (5.03 cm ² /m)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$	$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$	$\alpha=\alpha_n\alpha_s$	V_h (cm ³)	$V_0=b_0h_0s_w$ (cm ³)	$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$				
29	10	1057	0.5722	0.5362	0.3068	48.79	4118.00	0.3092				

									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$
									0.09486	-0.0127

ZG''	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1			
	132	20	435	16.67	8	2.5	14.2	2	0.5	0.5			
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)		$M_{Rd,Nmin}$ (KNm)		$1.5V_{Ed}$ (kN)		$_{pot}A_{sh}=V_{Ed}/zf_{yd}cotg\theta$ (cm ² /m)		$A_{sv,usv}$	
	-1100.78	277.45	-110.24	138.83		1000		173.00		3.766		5.03	
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$			$v_d=N_{Ed}/b_{wo}l_wf_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$		$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_vf_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_wb_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$
1.6647			0.2501		0.0022		0.0025	0.0656	58.70		0.0133		0.0048
$_{pot}A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida					$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$	
1.31	$A_{sh}: \pm R\emptyset 8/20$ (5.03 cm ² /m)				usvojeno: 6RØ14/12.5 (9.24 cm ²)					16.17		19.80	
	$A_{sv}: \pm R\emptyset 8/20$ (5.03 cm ² /m)												
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$													
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
29	10	1057	0.5722		0.5362		0.3068		48.79		4118.00		0.3092

									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$
									0.09486	0.0133

ZH1	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1			
	409	20	435	16.67	8	2.5	14.2	2	0.5	0.5			
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)	$1.5V_{Ed}$ (kN)	$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$				
	-2952.7	2925.44	344.38	3600	9500	1560.00	10.960		4.42				
$\mu_\theta=1.5[2+2(q_0 M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$		$\rho_v=A_{s,v}/A_c$		$\omega_v=\rho_v f_{yd}/f_{cd}$		$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$	$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$
1.8476		0.2165		0.0022		0.0022		0.0577		157.96		0.0116	0.0047
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida					$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$	
18.01	$A_{sh}: \pm Q221\pm R\emptyset 8/15$ (11.13 cm ² /m)				usvojeno: 8R $\emptyset 20/12.5$ (25.12 cm ²)					39.22		61.35	
	$A_{sv}: \pm Q221$ (4.42 cm ² /m)												
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$													
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_h f_{yd}/V_0 f_{cd}$
41.5	10	1513.5	0.5719		0.5698		0.3259		83.30		5893.00		0.3689
										$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
										0.12022	0.0116		

ZH2	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1			
	409	20	435	16.67	8	2.5	14.2	2	0.5	0.5			
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)	$M_{Rd,Nmin}$ (kNm)	$1.5V_{Ed}$ (kN)	$pot A_{sh}=V_{Ed}/z f_{yd} \cot \theta$ (cm ² /m)		$A_{sv,usv}$				
	-2728.93	3820.65	544.54	2642.06	9300	1555.00	10.925		4.42				
$\mu_\theta=1.5[2+2(q_0 M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_w f_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$		$\rho_v=A_{s,v}/A_c$		$\omega_v=\rho_v f_{yd}/f_{cd}$		$x_u=(v_d+\omega_v)l_w b_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$	$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$
2.4649		0.2001		0.0022		0.0022		0.0577		148.50		0.0234	0.0058
$pot A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida					$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$	
21.89	$A_{sh}: \pm Q221\pm R\emptyset 8/15$ (11.13 cm ² /m)				usvojeno: 8R $\emptyset 20/12.5$ (25.12 cm ²)					59.50		61.35	
	$A_{sv}: \pm Q221$ (4.42 cm ² /m)												
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$													
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_h f_{yd}/V_0 f_{cd}$
41.5	10	1513.5	0.5719		0.5698		0.3259		83.30		5893.00		0.3689
										$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
										0.12022	0.0234		

ZI'	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1				
	132	20	435	16.67	8	2.5	14.2	2	0.5	0.5				
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)		$M_{Rd,Nmin}$ (KNm)		$1.5V_{Ed}$ (kN)		$\rho_{ot}A_{sh}=V_{Ed}/zf_{yd}\cot\theta$ (cm ² /m)		$A_{sv,usv}$		
	-1107.78	148.52	-274.35	125.71		800		230.00		5.007		5.03		
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_\theta/T_1]$			$v_d=N_{Ed}/b_{wo}l_wf_{cd}$		$\varepsilon_{sy,d}=f_{yd}/E_s$		$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_vf_{yd}/f_{cd}$		$x_u=(v_d+\omega_v)l_wb_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\varepsilon_{sy,d}b_w/b_o-0.035$	$\varepsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
1.1139			0.2517		0.0022		0.0025	0.0656		59.00		-0.0025		0.0032
$\rho_{ot}A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida						$l_c=x_u(1-\varepsilon_{cu2}/\varepsilon_{cu2,c})$		$l_{c,min}=0.15l_w$	
0	$A_{sh}:\pm R\varnothing 8/20$ (5.03 cm ² /m)				usvojeno: 6R \varnothing 14/12.5 (9.24 cm ²)						-4.57		19.80	
	$A_{sv}:\pm R\varnothing 8/20$ (5.03 cm ² /m)													
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd}\geq 30\mu_\phi(v_d+\omega_v)\varepsilon_{sy,d}b_w/b_o-0.035$														
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$	
29	10	1057	0.5722		0.5362		0.3068		48.79		4118.00		0.3092	

									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$
									0.09486	-0.0025

ZI''	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1				
	132	20	435	16.67	8	2.5	14.2	2	0.5	0.5				
	$N_{Ed,min}$ (kN)	$M_{Ed,odg}$ (kNm)	$N_{Ed,max}$ (kN)	$M_{Ed,odg}$ (kNm)		$M_{Rd,Nmin}$ (KNm)		$1.5V_{Ed}$ (kN)		$\rho_{ot}A_{sh}=V_{Ed}/zf_{yd}\cot\theta$ (cm ² /m)		$A_{sv,usv}$		
	-1046.51	149.52	-251.18	123.25		750		230.00		5.007		5.03		
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$			$v_d=N_{Ed}/b_{wo}l_wf_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$		$\rho_v=A_{s,v}/A_c$	$\omega_v=\rho_vf_{yd}/f_{cd}$		$x_u=(v_d+\omega_v)l_wb_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$	$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
1.1962			0.2378		0.0022		0.0025	0.0656		56.41		-0.0016		0.0033
$\rho_{ot}A_a$ (cm ²)	Armatura rebra (cm ² /m)				Ivična armatura zida						$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$	
0	$A_{sh}: \pm R\emptyset 8/20$ (5.03 cm ² /m)				usvojeno: 6R \emptyset 14/12.5 (9.24 cm ²)						-2.78		19.80	
	$A_{sv}: \pm R\emptyset 8/20$ (5.03 cm ² /m)													
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$														
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-\Sigma b_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$	
29	10	1057	0.5722		0.5362		0.3068		48.79		4118.00		0.3092	

									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$
									0.09486	-0.0016

ZJ1	b _{wo} (cm)	l _w (cm)	l _{w,Ash} (cm)	f _{yd} =f _{yk} /γ _s	f _{cd} =f _{ck} /γ _c	l _o (cm)	φ=1.14(1-2e/b _{wo})-	N _{Ed,max}	M _{Ed,odg}	N _{Ed,min}	M _{Ed,odg}	l _c ≥b _{wo} 3(1-ε _{c2} /3ε _{cu2}), ε _{c2} =0.002, ε _{cu2} =0.005	
	20	689	689	435	16.67	271	0.79	-5244.00	7074.98	2122.52	9132.84	52.00	
	1.5V _{Ed} (kN)	pot A _{sh} =V _{Ed} /zf _{yd} cotgθ (cm ² /m)				[JUS] A _{s,min} =0.15b _{wo} l _w (cm ²)			[EC8] A _{s,min} =0.2A _c (cm ²)			(h _{st} /b _{wo})(l _w /b _{wo}) ^{1/3}	
	2100.00	8.758				20.67			2.08			47.02	<70
	Armatura rebra					Ivična armatura zida					N _{Rd} =		18187.84
	A _{sh} : ±Q335+RØ8/15 (13.40 cm ² /m)					usvojeno: 12RØ20/12.5 (37.68 cm ²)							
A _{sv} : ±Q335 (6.70 cm ² /cm)													

ZJ2	b _{wo} (cm)	l _w (cm)	l _{w,Ash} (cm)	f _{yd} =f _{yk} /γ _s	f _{cd} =f _{ck} /γ _c	l _o (cm)	φ=1.14(1-2e/b _{wo})-	N _{Ed,max}	M _{Ed,odg}	N _{Ed,min}	M _{Ed,odg}	l _c ≥b _{wo} 3(1-ε _{c2} /3ε _{cu2}), ε _{c2} =0.002, ε _{cu2} =0.005	
	20	689	689	435	16.67	271	0.79	-5166.00	8587.80	2110.00	7638.30	52.00	
	1.5V _{Ed} (kN)	pot A _{sh} =V _{Ed} /zf _{yd} cotgθ (cm ² /m)				[JUS] A _{s,min} =0.15b _{wo} l _w (cm ²)			[EC8] A _{s,min} =0.2A _c (cm ²)			(h _{st} /b _{wo})(l _w /b _{wo}) ^{1/3}	
	2100.00	8.758				20.67			2.08			47.02	<70
	Armatura rebra					Ivična armatura zida					N _{Rd} =		18187.84
	A _{sh} : ±Q335+RØ8/15 (13.40 cm ² /m)					usvojeno: 12RØ20/12.5 (37.68 cm ²)							
A _{sv} : ±Q335 (6.70 cm ² /cm)													

ZK3	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1	
	263	20	435	16.67	8	2.5	14.2	2	0.5	0.41	
	N_{Ed} (kN)	$1.5V_{Ed}$ (kN)	M_{ed} (KNm)		$M_{Rd,odg}$ (KNm)		$\rho_{ot}A_{sh}=V_{Ed}/zf_{yd}cotg\theta$ (cm ² /cm)			$A_{sv,usv}$	
	2777.17	803.04	394.88		4300		0.088			4.42	
$\mu_0=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{w0}l_wf_{cd}$	$\varepsilon_{sy,d}=f_{yd}/E_s$	$\rho_v = A_{s,v}/A_c$	$\omega_v=\rho_vf_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_wb_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\varepsilon_{sy,d}b_w/b_o-0.035$		$\varepsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
0.0134		0.3167	0.0022	0.0022	0.0577	138.68		-0.0345		0.0000	
Armatura rebra (cm ² /m)			Ivična arm. zida_prema uticajima						$l_c=x_u(1-\varepsilon_{cu2}/\varepsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
Ash: ±Q221+RØ8/20 (0.094 cm ² /cm)			usvojeno: 6RØ20/17.5 (18.85 cm ²)						-10382.10		39.45
A _{sv} : ±Q221 (0.0442 cm ² /cm)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\varepsilon_{sy,d}b_w/b_o-0.035$											
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-Sb_i^2/6b_0h_0$	$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_n (cm ³)	$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
37.8	10	1657	0.4855	0.5622		0.2729		58.85	5367.60		0.2861
								$\alpha\omega_{wd}$	30μ _φ (v _d +ω _v)ε _{sy,d} b _w /b _o -0.035		
								0.07809	-0.0345		

ZL	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1	
	132	20	435	16.67	8	2.5	14.2	2	0.5	0.41	
	N_{Ed} (kN)	$1.5V_{Ed}$ (kN)	M_{Ed} (KNm)		$M_{Rd,odg}$ (KNm)		$_{pot}A_{sh}=V_{Ed}/zf_{yd}cotg\theta$ (cm ² /cm)			$A_{sv,usv}$	
	1006.55	208.25	105.24		940		0.045			5.03	
$\mu_0=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_wf_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{sv,v}/A_c$	$\omega_v=\rho_vf_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_wb_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$
0.1607		0.2287		0.0022	0.0025	0.0656	54.72		-0.0307		0.0004
Armatura rebra (cm ² /m)				Ivična arm. zida_prema uticajima						$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$	$l_{c,min}=0.15l_w$
Ash: ±RØ8/20 (0.0503 cm ² /cm)				usvojeno: 6RØ14/12.5 (9.24 cm ²)						-385.98	19.80
Asv: ±RØ8/20 (0.0503 cm ² /cm)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$											
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-Sb_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)	$V_0=b_0h_0s_w$ (cm ³)	$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
14.2	10	1057	0.1263		0.4198		0.0530		48.79	2016.40	0.6314
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$	
									0.03348	-0.0307	

ZL"	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1	
	132	20	435	16.67	8	2.5	14.2	2	0.5	0.41	
	N_{Ed} (kN)	$1.5V_{Ed}$ (kN)	M_{Ed} (KNm)		$M_{Rd,odg}$ (KNm)		$_{pot}A_{sh}=V_{Ed}/zf_{yd}cotg\theta$ (cm ² /cm)			$A_{sv,usv}$	
	1320	154.91	115.67		937		0.034			5.03	
$\mu_0=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_wf_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{sv,v}/A_c$	$\omega_v=\rho_vf_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_wb_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$
0.2447		0.2999		0.0022	0.0025	0.0656	67.96		-0.0268		0.0008
Armatura rebra (cm ² /m)				Ivična arm. zida_prema uticajima						$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$	$l_{c,min}=0.15l_w$
Ash: ±RØ8/20 (0.0503 cm ² /cm)				usvojeno: 6RØ14/12.5 (9.24 cm ²)						-221.35	19.80
Asv: ±RØ8/20 (0.0503 cm ² /cm)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$											
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-Sb_i^2/6b_0h_0$		$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)	$V_0=b_0h_0s_w$ (cm ³)	$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
14.2	10	1057	0.1263		0.4198		0.0530		48.79	2016.40	0.6314
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$	
									0.03348	-0.0268	

ZN'	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	132	20	435	16.67	8	2.5	14.2	2	0.5	0.41		
	N_{Ed} (kN)	$1.5V_{Ed}$ (kN)	M_{Ed} (kNm)		$M_{Rd,odg}$ (kNm)		$_{pot}A_{sh}=V_{Ed}/z f_{yd}cotg\theta$ (cm ² /cm)			$A_{sv,usv}$		
	986.71	181.34	98.74		934		0.039			5.03		
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_wf_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{sv,v}/A_c$	$\omega_v=\rho_vf_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_wb_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
0.1150		0.2242		0.0022	0.0025	0.0656	53.88		-0.0319		0.0003	
Armatura rebra (cm ² /m)				Ivična arm. zida_prema uticajima				-561.78		$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
Ash: ±RØ8/15 (0.0667 cm ² /cm)				usvojeno: 6RØ14/12.5 (9.24 cm ²)						19.80		
Asv: ±RØ8/20 (0.0503 cm ² /cm)												
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-Sb_i^2/6b_0h_0$	$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)	$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$	
14.2	10	1057	0.1263	0.4198		0.0530		48.79	2016.40		0.6314	
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.03348	-0.0319		

ZN''	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	132	20	435	16.67	8	2.5	14.2	2	0.5	0.41		
	N_{Ed} (kN)	$1.5V_{Ed}$ (kN)	M_{Ed} (kNm)		$M_{Rd,odg}$ (kNm)		$_{pot}A_{sh}=V_{Ed}/z f_{yd}cotg\theta$ (cm ² /cm)			$A_{sv,usv}$		
	1340.31	153.90	109.76		1000		0.034			5.03		
$\mu_\theta=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_wf_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{sv,v}/A_c$	$\omega_v=\rho_vf_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_wb_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
0.1446		0.3046		0.0022	0.0025	0.0656	68.82		-0.0301		0.0005	
Armatura rebra (cm ² /m)				Ivična arm. zida_prema uticajima				-420.89		$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
Ash: ±RØ8/15 (0.0667 cm ² /cm)				usvojeno: 6RØ14/12.5 (9.24 cm ²)						19.80		
Asv: ±RØ8/20 (0.0503 cm ² /cm)												
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-Sb_i^2/6b_0h_0$	$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)	$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$	
14.2	10	1057	0.1263	0.4198		0.0530		48.79	2016.40		0.6314	
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.03348	-0.0301		

ZQ	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1	
	100	20	435	16.67	8	2.5	14.2	2	0.5	0.41	
	N_{Ed} (kN)	$1.5V_{Ed}$ (kN)	M_{Ed} (KNm)		$M_{Rd,odg}$ (KNm)		$\rho_{ot}A_{sh}=V_{Ed}/zf_{yd}\cot\theta$ (cm ² /cm)			$A_{sv,usv}$	
	961.2	126.20	23.28		614		0.036			5.03	
$\mu_0=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_wf_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_s,v/A_c$	$\omega_v=\rho_vf_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_wb_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$
-0.3811		0.2883		0.0022	0.0025	0.0656	49.85		-0.0474		-0.0012
Armatura rebra (cm ² /m)				Ivična arm. zida_prema uticajima						$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$	$l_{c,min}=0.15l_w$
Ash: ±RØ8/20 (0.0503 cm ² /cm)				usvojeno: 6RØ14/12.5 (9.24 cm ²)						190.60	15.00
Asv: ±RØ8/20 (0.0503 cm ² /cm)											
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$											
h_0 (cm)	s_w	sb_l^2	$\alpha_n=1-Sb_l^2/6b_0h_0$	$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)	$V_0=b_0h_0s_w$ (cm ³)		$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$
14.2	10	1057	0.1263	0.4198		0.0530		50.70	2016.40		0.6561
								$\alpha\omega_{wd}$	30μφ(v _d +ω _v)ε _{sy,d} b _w /b _o -0.035		
								0.03479	-0.0474		

ZR uz osu 19	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	383	20	435	16.67	8	2.5	14.2	2	0.5	0.41		
	N_{Ed} (kN)	$1.5V_{Ed}$ (kN)	M_{Ed} (kNm)		1697		$_{pot}A_{sh}=V_{Ed}/zf_{yd}cotg\theta$ (cm ² /cm)			$A_{sv,usv}$		
	1134.1	1323.77	113		614		0.099			5.03		
$\mu_0=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_wf_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{sv}/A_c$	$\omega_v=\rho_vf_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_wb_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
0.6881		0.0888		0.0022	0.0025	0.0656	83.31		-0.0252		0.0010	
Armatura rebra (cm ² /m)				Ivična arm. zida_prema uticajima						$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
Ash:±Q221 ±RØ8/15 (0.112 cm2/cm)				usvojeno: 6RØ14/12.5 (9.24 cm ²)						-215.25		57.45
Asv: ±RØ8/20 (0.0503 cm ² /cm)												
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-Sb_i^2/6b_0h_0$	$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)	$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$	
14.2	10	1057	0.1263	0.4198		0.0530		48.79		2016.40	0.6314	
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.03348	-0.0252		

ZR uz osu 17	l_w (cm)	b_{wo} (cm)	$f_{yd}=f_{yk}/\gamma_s$	$f_{cd}=f_{ck}/\gamma_c$	d_{bw} (mm)	c_{nom} (cm)	b_0 (cm)	q_0	T_c	T_1		
	110	20	435	16.67	8	2.5	14.2	2	0.5	0.41		
	N_{Ed} (kN)	$1.5V_{Ed}$ (kN)	M_{Ed} (kNm)		$M_{Rd,odg}$ (kNm)		$_{pot}A_{sh}=V_{Ed}/zf_{yd}cotg\theta$ (cm ² /cm)			$A_{sv,usv}$		
	609.81	245.16	279.67		1410		0.064			5.03		
$\mu_0=1.5[2+2(q_0M_{Ed}/M_{Rd}-1)T_c/T_1]$		$v_d=N_{Ed}/b_{wo}l_wf_{cd}$		$\epsilon_{sy,d}=f_{yd}/E_s$	$\rho_v=A_{sv}/A_c$	$\omega_v=\rho_vf_{yd}/f_{cd}$	$x_u=(v_d+\omega_v)l_wb_{wo}/b_o$		$\alpha\omega_{wd}=30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		$\epsilon_{cu2,c}=0.0035+0.1\alpha\omega_{wd}$	
0.7928		0.1663		0.0022	0.0025	0.0656	35.93		-0.0181		0.0017	
Armatura rebra (cm ² /m)				Ivična arm. zida_prema uticajima						$l_c=x_u(1-\epsilon_{cu2}/\epsilon_{cu2,c})$		$l_{c,min}=0.15l_w$
Ash:±Q221 ±RØ8/30 (0.077 cm2/cm)				usvojeno: 6RØ14/12.5 (9.24 cm ²)						-38.50		16.50
Asv: ±Q221 (0.0442 cm2/cm)												
Kontrola mehaničkog zapreminskog koeficijenta armature za utezanje u ivičnim elementima prema EC8 5.4.3.4.2 paragraf 4 $\alpha\omega_{wd} \geq 30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$												
h_0 (cm)	s_w	sb_i^2	$\alpha_n=1-Sb_i^2/6b_0h_0$	$\alpha_s=(1-s_w/2b_0)(1-s_w/2h_0)$		$\alpha=\alpha_n\alpha_s$		V_h (cm ³)		$V_0=b_0h_0s_w$ (cm ³)	$\omega_{wd}=V_hf_{yd}/V_0f_{cd}$	
14.2	10	1057	0.1263	0.4198		0.0530		48.79		2016.40	0.6314	
									$\alpha\omega_{wd}$	$30\mu_\phi(v_d+\omega_v)\epsilon_{sy,d}b_w/b_o-0.035$		
									0.03348	-0.0181		

Димензионисање зидова лифта

Напомена: Утицаји зидовима лифта добијени су коришћењем опције “Редуктор оптерећења” из програма Tower. На тај начин АБ лифтовско језгро посматра се као конзолни штап, а утицају у зидовима који га формирају распоређују се пропорционално њиховој крутости.

Зидови лифта ламеле I: ZE', Z18' Z17'

$$M_3^{P100+} (Z18'-Z17') = 854.18/2 = 427.09 \text{ kNm}$$

$$T_{2,\max} (Z18'-Z17') = 596.62/2 = 298.31 \text{ kN}$$

$$Z_{\max}^{P100+} = 514.85/4 = 128.71 \text{ kN}$$

$$M_2^{P100+} (ZE'-ZE'') = 1001.30/2 = 500.65 \text{ kNm}$$

$$T_{3,\max} (ZE'-ZE'') = 346.95/2 = 173.48 \text{ kN}$$

Z18', Z17'

$$Ash = \frac{1.5 \times 298.31}{0.8 \times 1.86 \times 43.5} = 6.91 \text{ cm}^2 / \text{m}' \Rightarrow \pm R \phi 10 / 15, \text{ изнад } P200+ \pm R \phi 8 / 15, \text{ изнад } P500+ \pm Q221$$

$$M_{Eds} = M_{Ed} + N_{Ed} \cdot (h/2 - d_1)$$

$$\mu = \frac{M_{Eds}}{b \cdot d^2 \cdot f_{cd}}$$

$$A_{s1} = \omega \cdot b \cdot d \cdot \frac{f_{cd}}{f_{yd}} - \frac{N_{Ed}}{f_{yd}}$$

$$M_{Eds} = 427.09 - 127.71 \cdot (1.86/2 - 0.1) = 321.09 \text{ kNm}$$

$$\mu = \frac{321.09 \cdot 100}{15 \cdot 176^2 \cdot 1.667} = 0.0505 \Rightarrow \omega = 0.0514$$

$$A_{s1} = 0.0514 \cdot 15 \cdot 176 \cdot \frac{1.667}{43.5} + \frac{127.71}{43.5} = 8.13 \text{ cm}^2$$

$$A_{\min} = 0.15 \cdot 0.15 \cdot 186 = 4.18 \text{ cm}^2$$

Допринос силе затезања из ZE', ZE''

$$Z = 500.65 / 1.66 = 301.20 \Rightarrow A_{s1} = \frac{301.20}{43.5} = 6.92 \text{ cm}^2$$

$$A_{s1}(Z7') = 8.13 + 6.92 = 15.05 \text{ cm}^2$$

Усвојено : $\pm 5R\phi 14/10$

ZE'

$$A_{sh} = \frac{1.5 \times 173.48}{0.8 \times 1.66 \times 43.5} = 4.50 \text{ cm}^2 / \text{m} \Rightarrow \pm R \phi 8 / 15, \text{ изнад P200+ } \pm Q221$$

$$M_{Eds} = 500.65 - 127.71 \cdot (1.66 / 2 - 0.10) = 407.42 \text{ kNm}$$

$$\mu = \frac{407.42 \cdot 100}{15 \cdot 166^2 \cdot 1.667} = 0.059 \Rightarrow \omega = 0.0620$$

$$A_{s1} = 0.0620 \cdot 15 \cdot 166 \cdot \frac{1.667}{43.5} + \frac{127.71}{43.5} = 8.85 \text{ cm}^2, A_{\min} = 0.15 \cdot 0.15 \cdot 166 = 3.74 \text{ cm}^2$$

Допринос силе затезања из Z18'

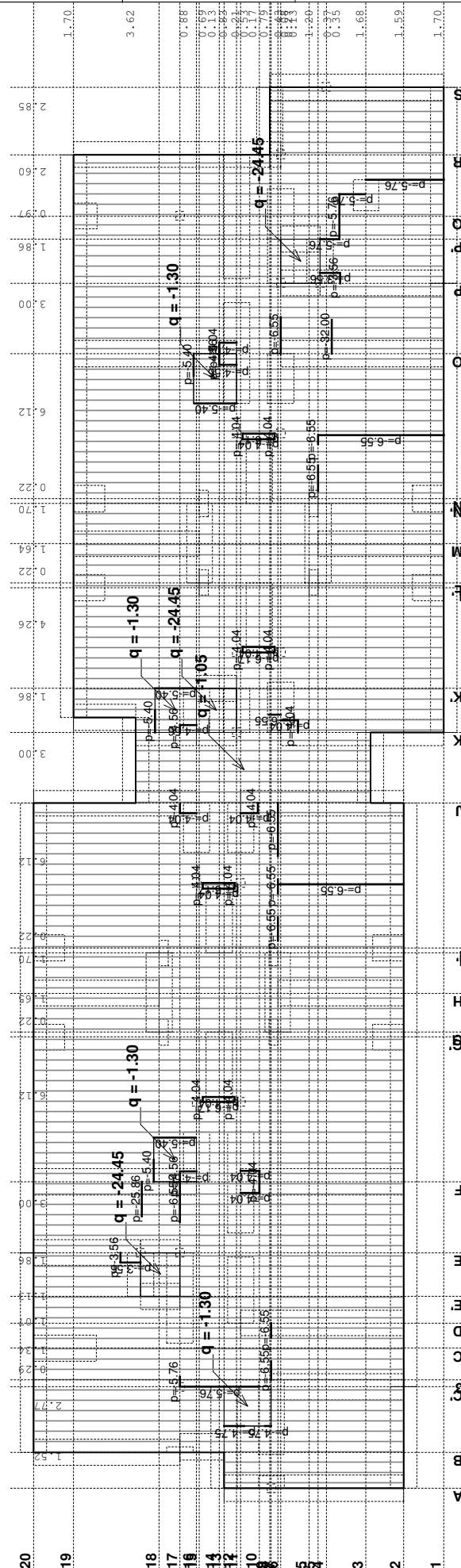
$$Z = 427.09 / 1.86 = 229.62 \Rightarrow A_{s1} = \frac{229.62}{43.5} = 5.28 \text{ cm}^2$$

$$A_{s1}(ZE') = 8.85 + 5.28 = 14.13 \text{ cm}^2$$

Усвојено : $\pm 5R\phi 14 / 10$

Setovi površinskih oslonaca

Opt. 1: g (g)



Radimpex - www.radimpex.rs

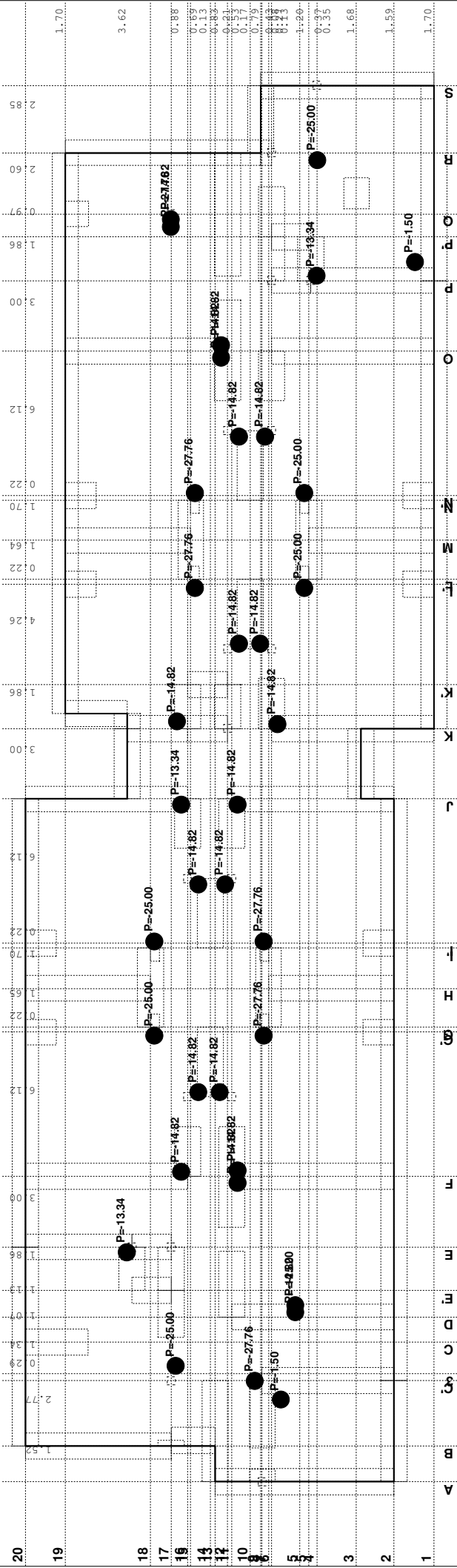
Opt. 1: g (g)

Nivo: TPL_vrh [-2.85 m]

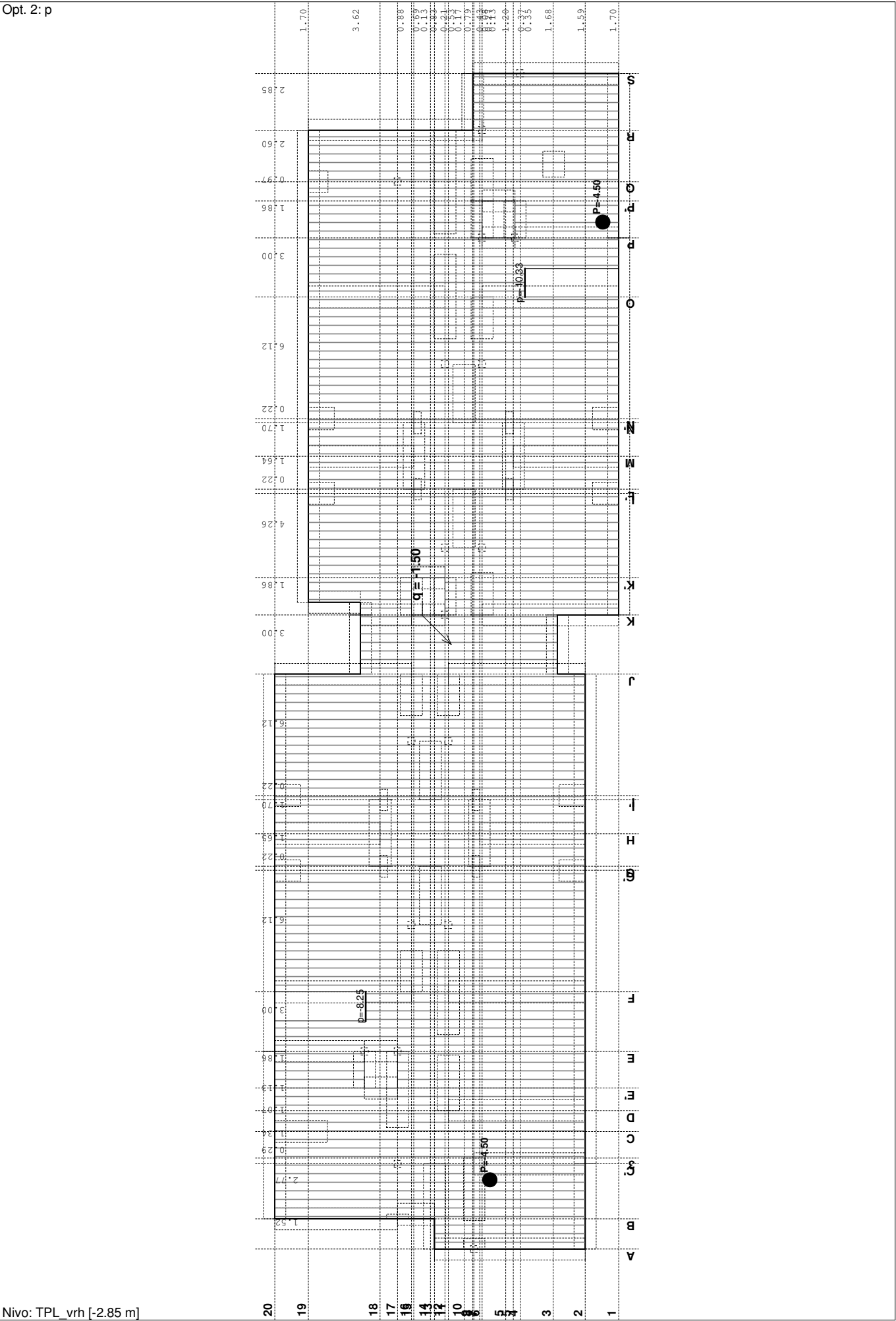
Tower - 3D Model Builder 7.0

Registered to GATE

Radimpex - www.radimpex.rs



Opt. 2: p

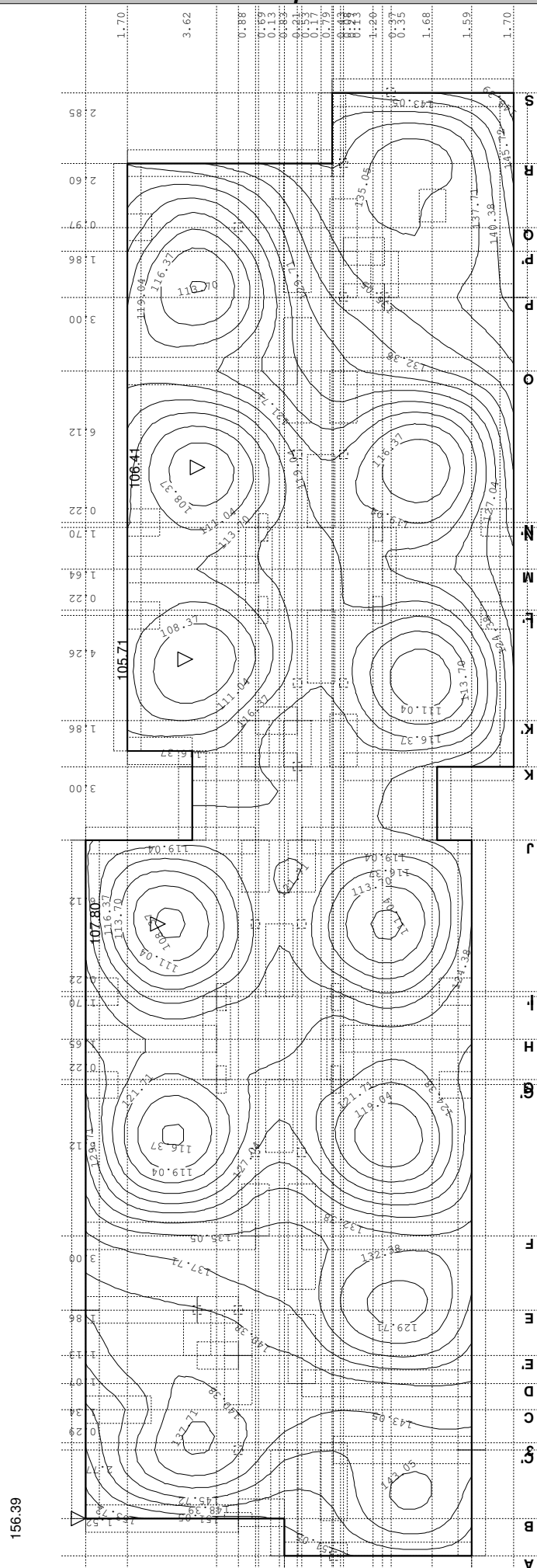


Nivo: TPL_vrh [-2.85 m]

Lista slučajeva opterećenja	
LC	Naziv
1	g (g)
2	p

LC	Naziv
3	Komb.: I+II
4	Komb.: 1.6xI+1.8xII

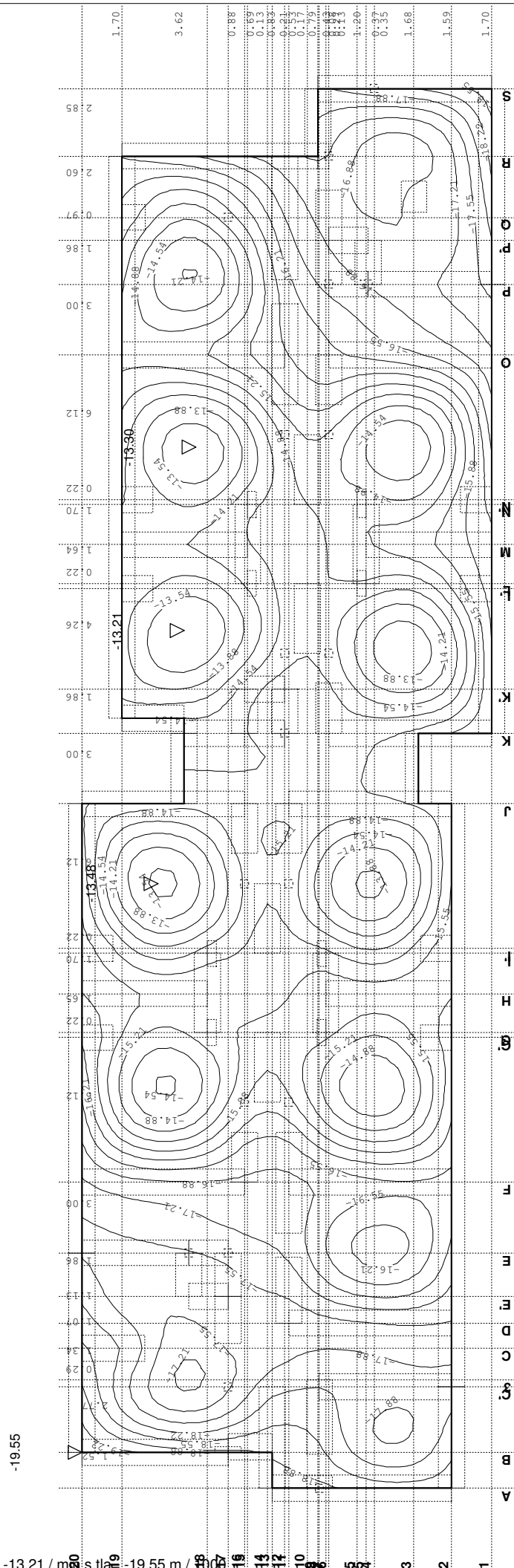
Opt. 3: I+II



Nivo: TPL_vrh [-2.85 m]

Uticaji u pov. osloncu: max σ_{tla} = 156.39 / mm σ_{tla} = 105.71 kN/m

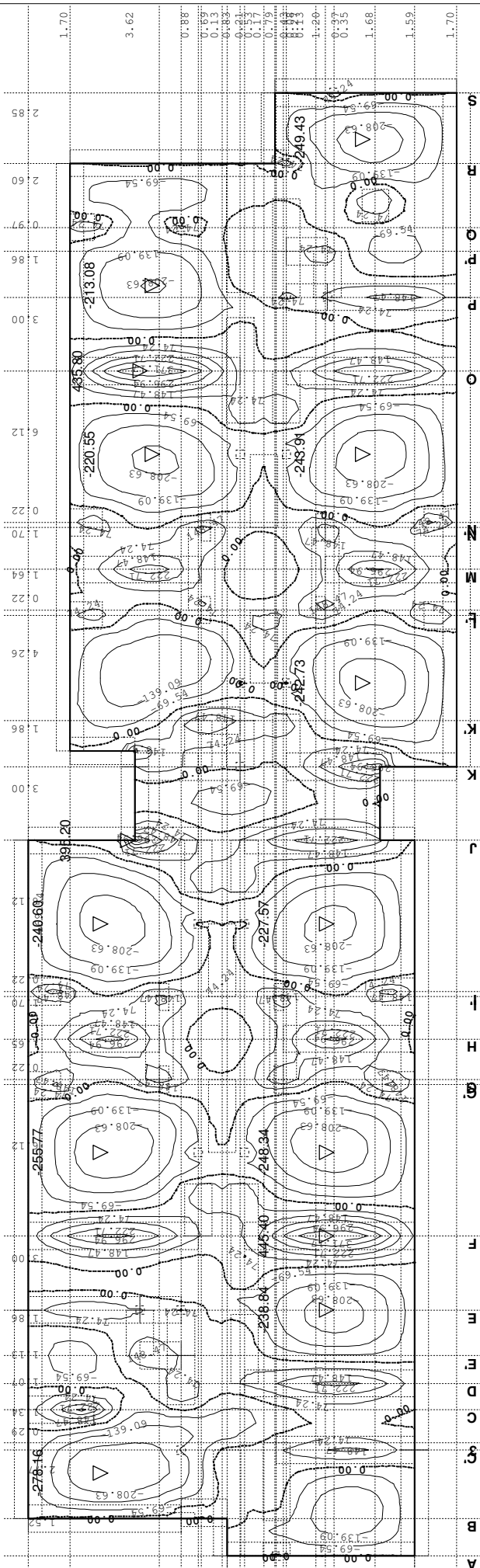
Opt. 3: I+II



Nivo: TPL_vrh [-2.85 m]

Uticaji u pov. osloncu: max s, tla = -13.21 / min s, tla = -19.55 m / 1000

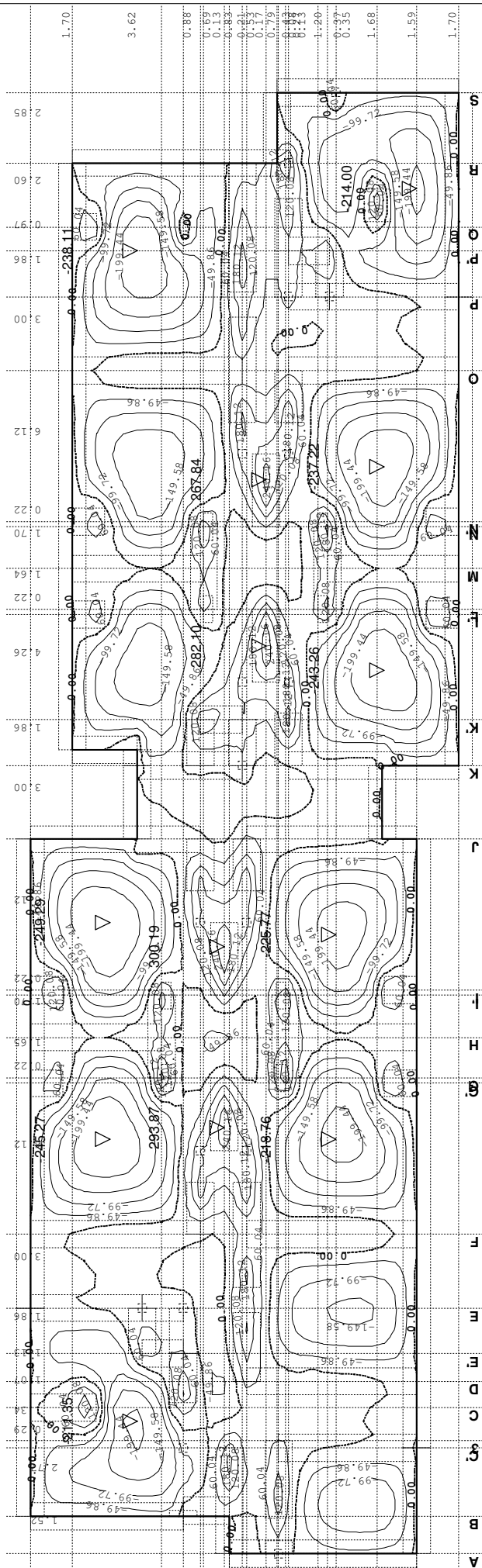
Opt. 4: 1.6xl+1.8xll



Nivo: TPL_vrh [-2.85 m]

Uticaji u ploči: max Mx= 445.40 / min Mx= -278.16 kNm/m

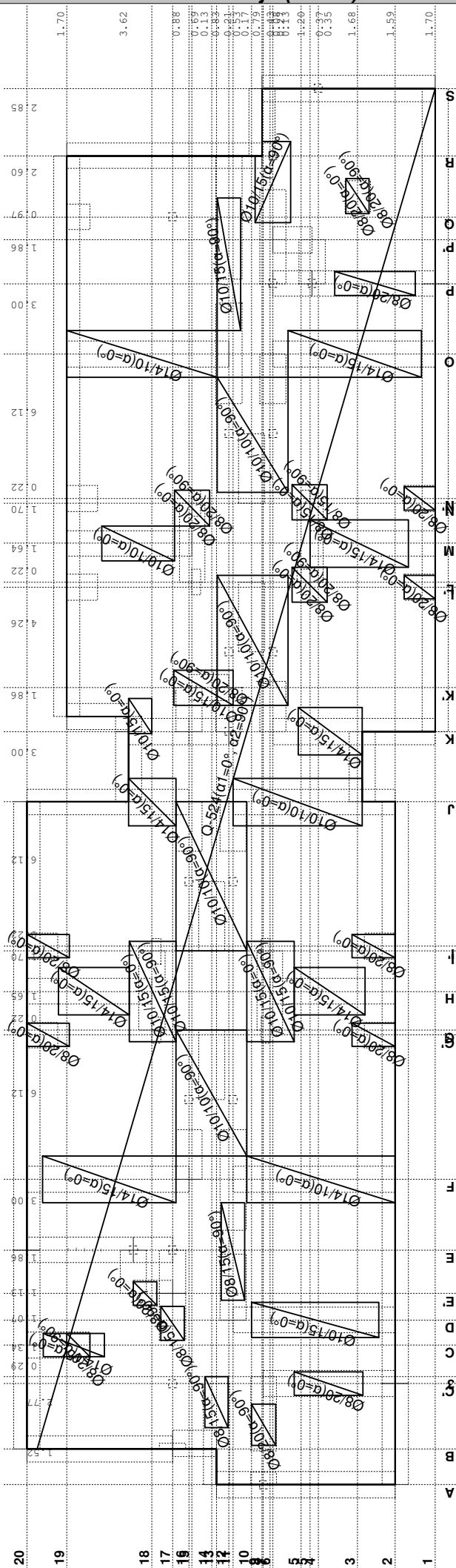
Opt. 4: 1.6xl+1.8xII



Nivo: TPL_vrh [-2.85 m]

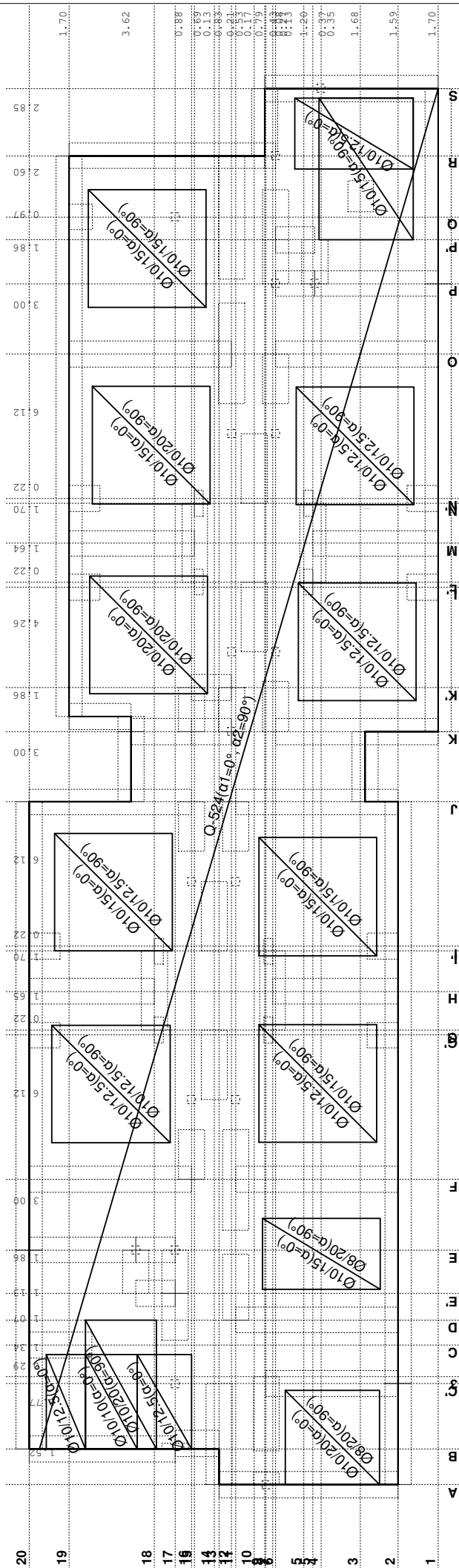
Uticaji u ploči: max $M_y = 300.19$ / min $M_y = -99.72$ N/m

Aa - d.zona [cm ² /m]
0.00
9.85
19.70



Nivo: TPL_vrh [-2.85 m]
Aa - d.zona

Aa - g.zona [cm ² /m]
-12.11
-9.69
-7.27
-4.84
-2.42
0.00



Nivo: TPL_vrh [-2.85 m]
Aa - g.zona

ARM. BET. OBODNI - PODRUMSKI ZIDOVI

Opterećenje

visina nasipa hz - 2.25 m,
 korisno p = 5.0 kN/m²
 trotoar: 0.10x24,0 = 2.4 kN/m²
 sljunak: 0.15x18,0 = 2.7 kN/m²
 $q_1 = 10.1 \text{ kN/m}^2$

$q_0 = 0.334 \times 10.1 = 3.37 \text{ kN/m}^2$
 $\Delta q = 0.334 \times 18.0 \times 2.25 = 13.53 \text{ kN/m}^2$
 $q = 16.90 \text{ kN/m}^2$

Zidovi na rampi

visina nasipa hz - 2.63 m,
 korisno p = 5.0 kN/m²
 rampa: 0.12x25,0 = 3.0 kN/m²
 sljunak: 0.1x18,0 = 1.8 kN/m²
 $q_1 = 9.8 \text{ kN/m}^2$

$q_0 = 0.334 \times 9.8 = 3.27 \text{ kN/m}^2$
 $\Delta q = 0.334 \times 18.0 \times 2.63 = 15.81 \text{ kN/m}^2$
 $q = 19.18 \text{ kN/m}^2$

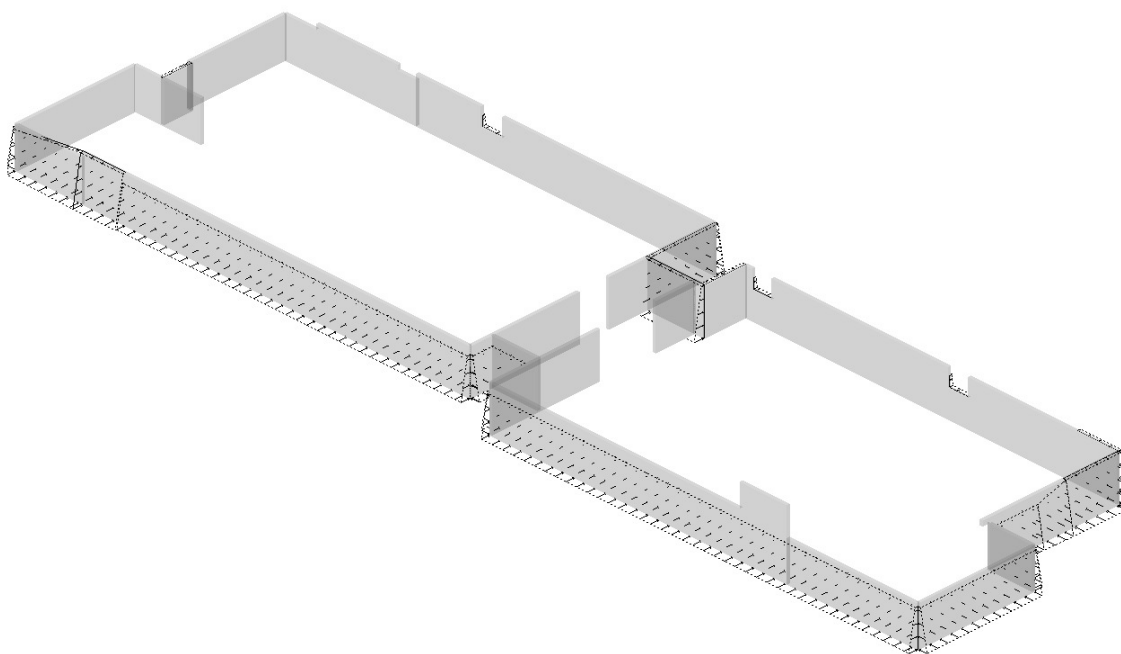
Setovi površinskih oslonaca

Set	K,R1	K,R2	K,R3
1	8.000e+3	8.000e+3	8.000e+3

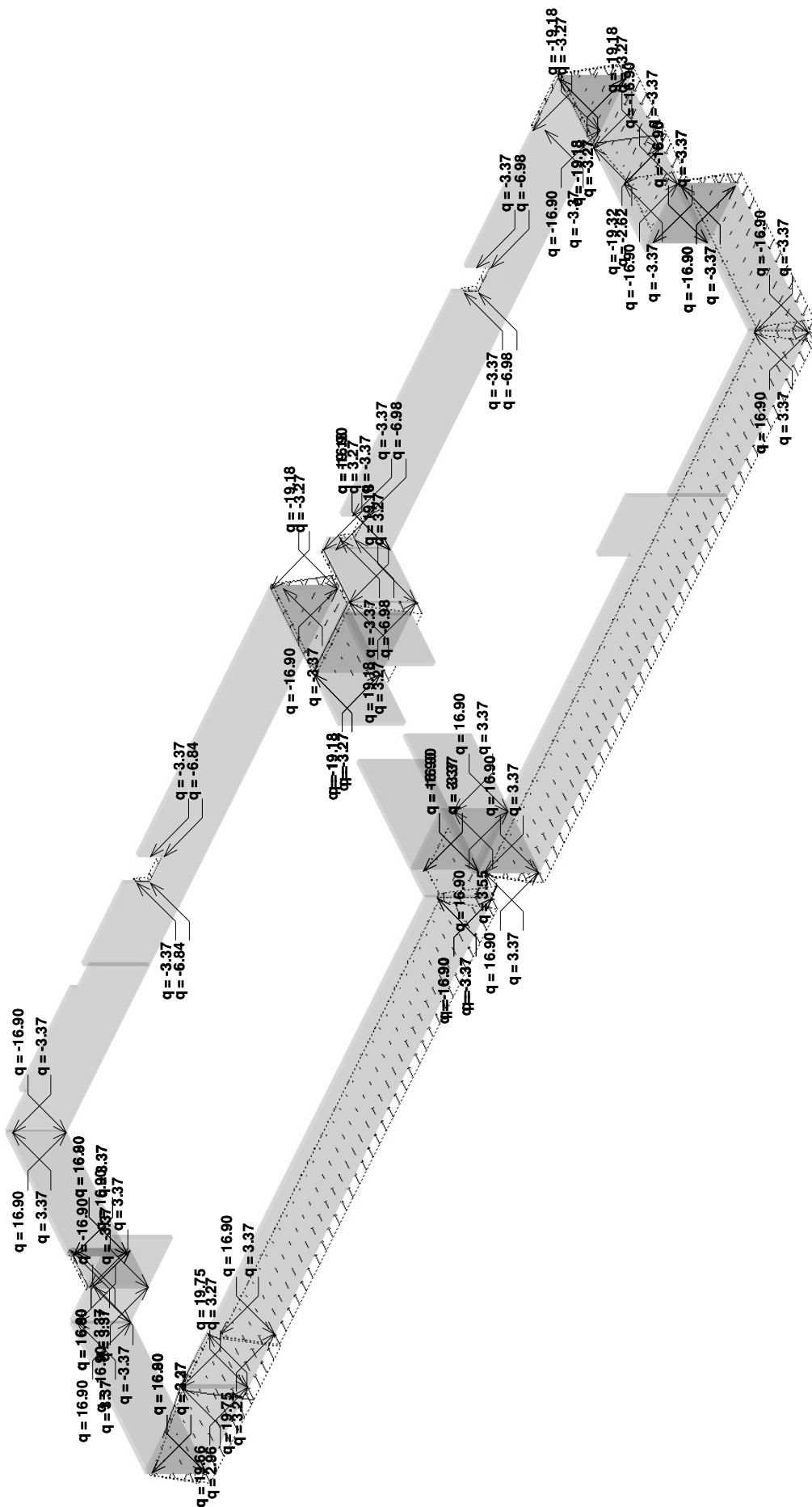
Lista slučajeva opterećenja

LC	Naziv
1	g (g)
2	p
3	qz
4	Komb.: I+1.8xIII
5	Komb.: 1.6xI+II+1.8xIII
6	Komb.: 1.6xI+1.8xII+1.8xIII

Opt. 3: qz

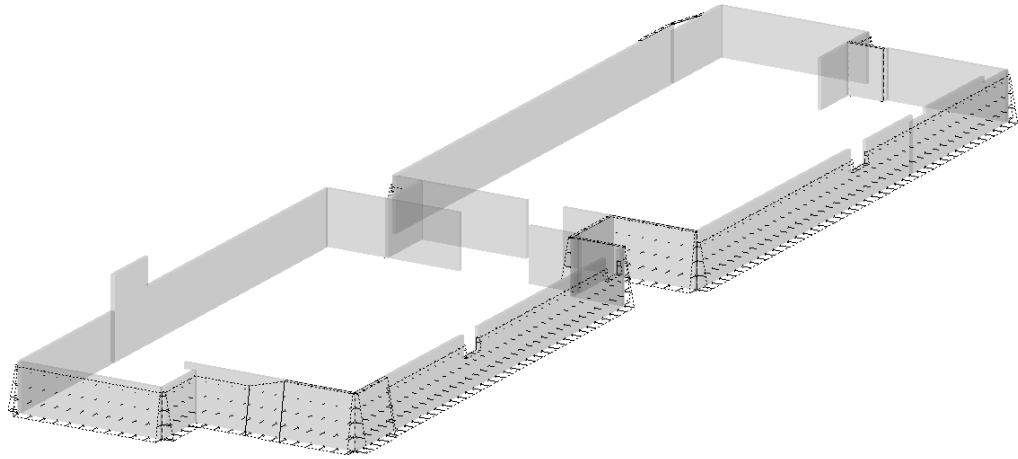


Grupa: Podrumski zidovi



Grupa: Podrumski zidovi

Opt. 3: qz



Grupa: Podrumski zidovi

Opt. 7: [ANV] 4-6

00+

00+

00+

+ lok

vrh

Rām: 2 - Grupa: Podrumski zidovi

Uticaji u ploči: max $M_y = 6.97$ / min $M_y = 0.00$ kNm/m

Opt. 7: [ANV] 4-6

P 300+

P 200+

P 100+

P 0+

P 0+ tok

TP vrh

Rām: 2 - Grupa: Podrumski zidovi

Uticaji u ploči: max $M_y = 0.00$ / min $M_y = -36.46$ kNm/m

Opt. 7: [ANV] 4-6

P 200+

P 100+

P 0+

P 0+ tok

TP vrh

Rām: 2 - Grupa: Podrumski zidovi

Uticaji u ploči: max $M_x = 5.90$ / min $M_x = 0.00$ kNm/m

Opt. 7: [ANV] 4-6

P 200+

P 100+

P 0+

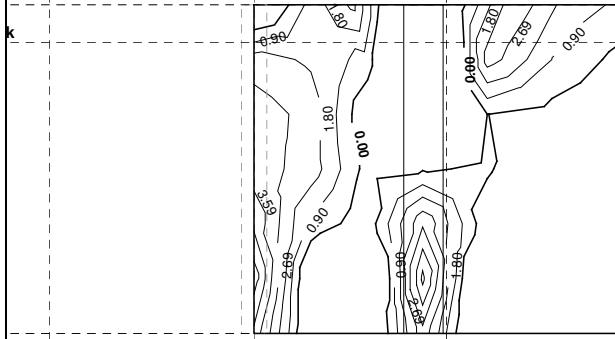
P 0+ tok

TP vrh

Rām: 2 - Grupa: Podrumski zidovi

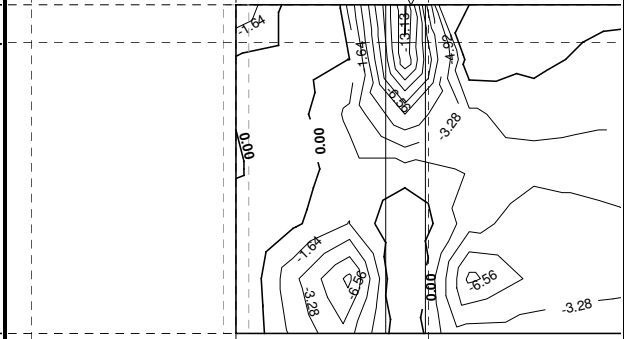
Uticaji u ploči: max $M_x = 0.00$ / min $M_x = -8.74$ kNm/m

Opt. 7: [ANV] 4-6



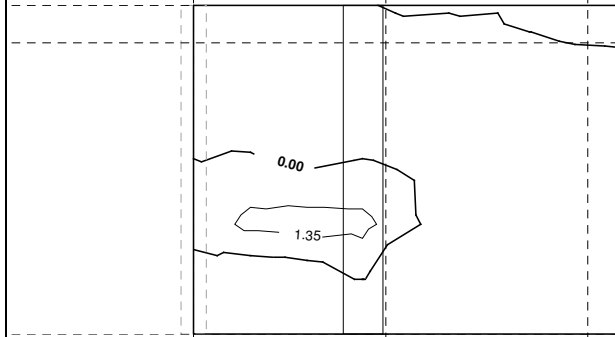
Ram: J - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_x = 8.98$ / min $M_x = 0.00$ kNm/m

Opt. 7: [ANV] 4-6



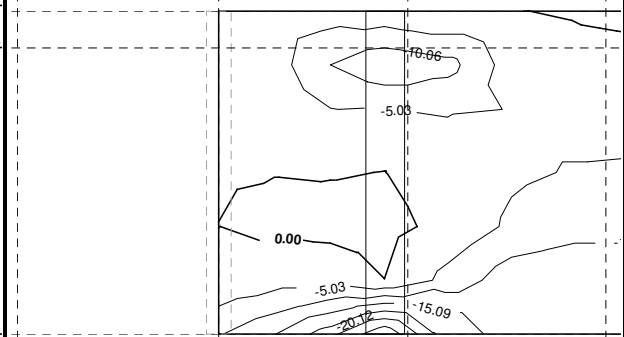
Ram: J - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_x = 0.00$ / min $M_x = -16.40$ kNm/m

Opt. 7: [ANV] 4-6



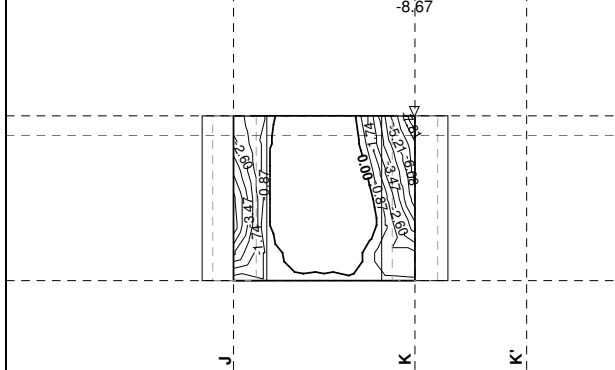
Ram: J - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_y = 13.46$ / min $M_y = 0.00$ kNm/m

Opt. 7: [ANV] 4-6



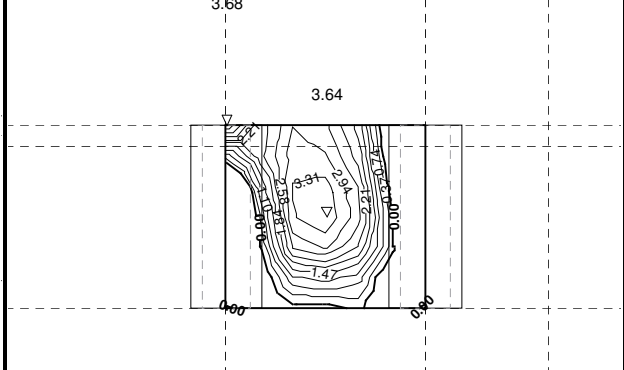
Ram: J - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_y = 0.00$ / min $M_y = -50.03$ kNm/m

Opt. 7: [ANV] 4-6



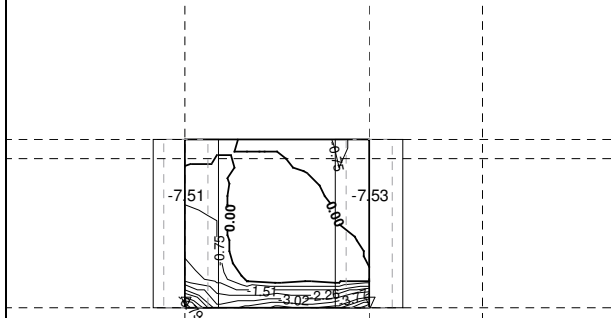
Ram: 3' - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_x = 0.00$ / min $M_x = -8.67$ kNm/m

Opt. 7: [ANV] 4-6



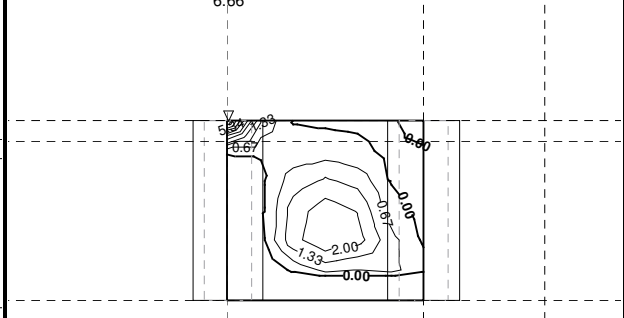
Ram: 3' - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_x = 3.68$ / min $M_x = 0.00$ kNm/m

Opt. 7: [ANV] 4-6



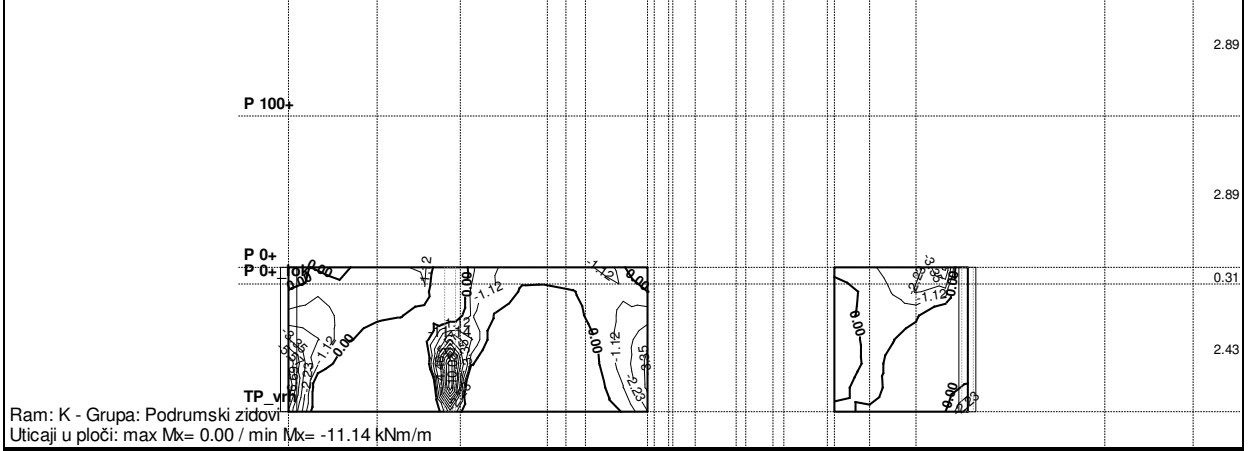
Ram: 3' - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_y = 0.00$ / min $M_y = -7.53$ kNm/m

Opt. 7: [ANV] 4-6

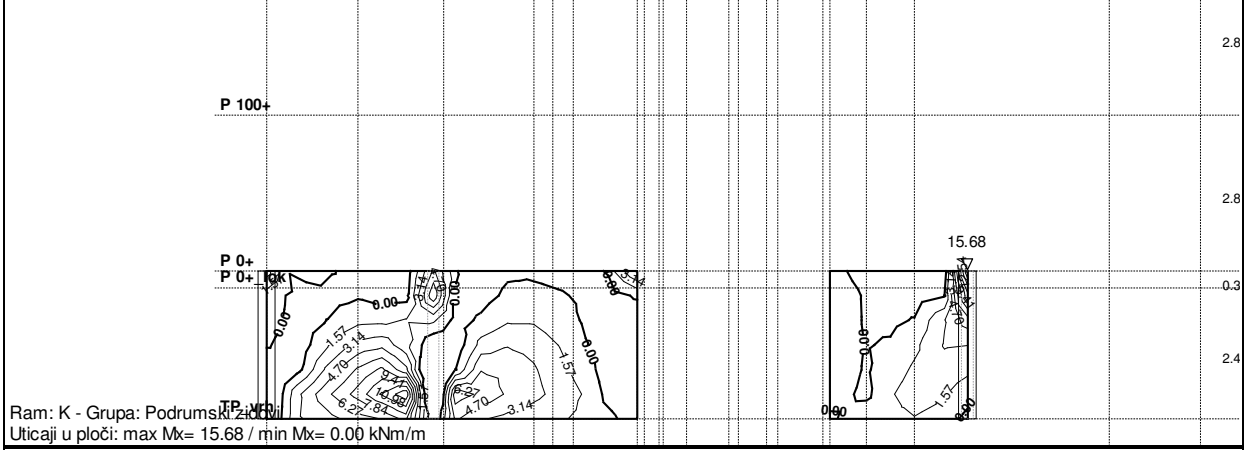


Ram: 3' - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_y = 6.66$ / min $M_y = 0.00$ kNm/m

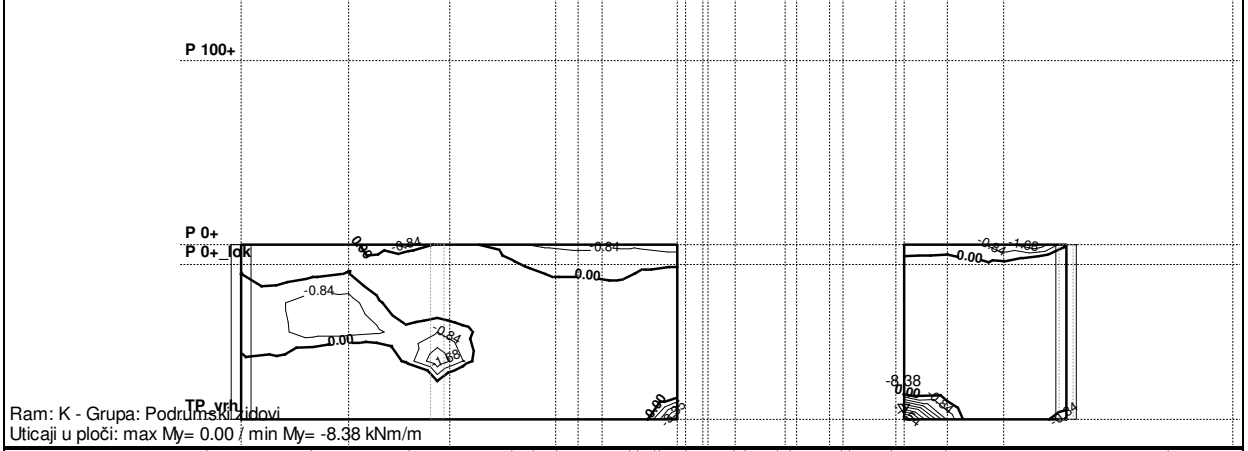
Opt. 7: [ANV] 4-6



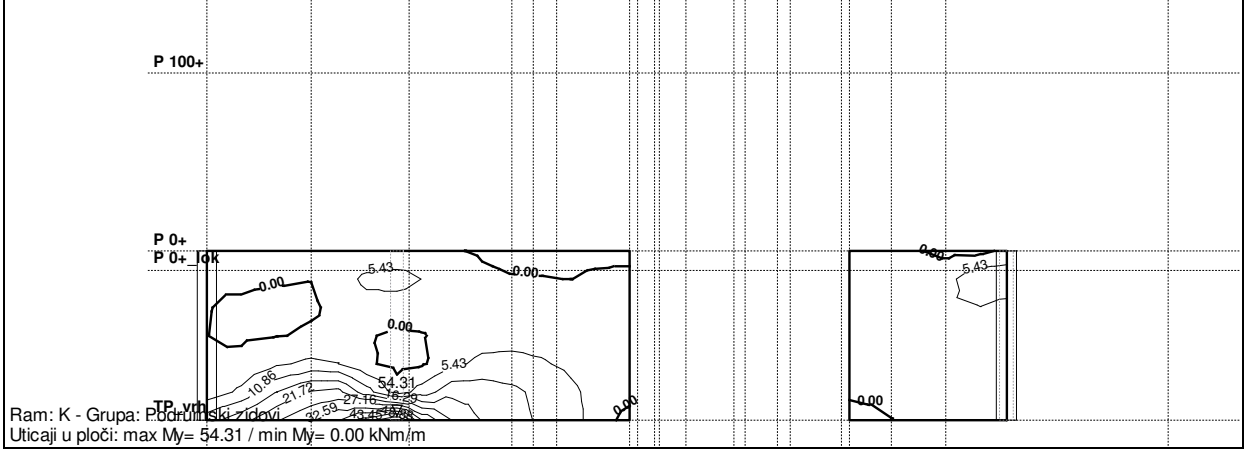
Opt. 7: [ANV] 4-6



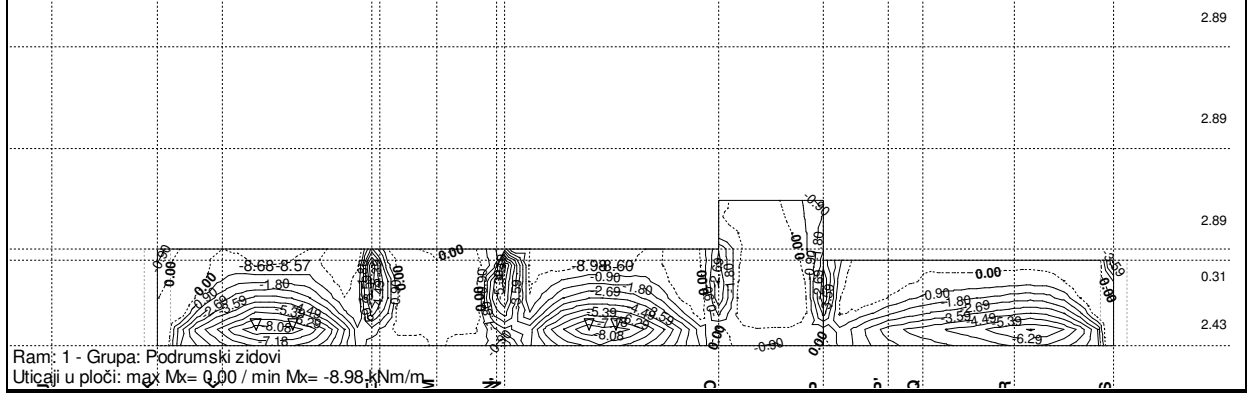
Opt. 7: [ANV] 4-6



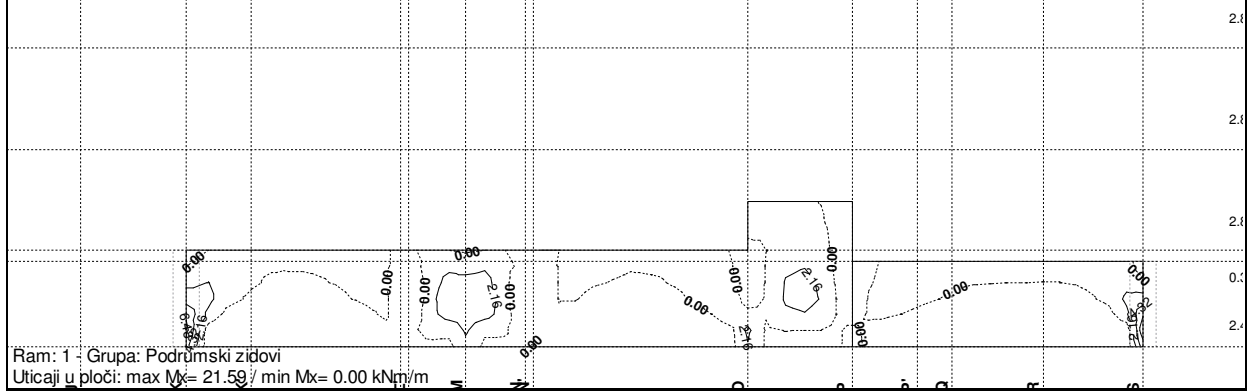
Opt. 7: [ANV] 4-6



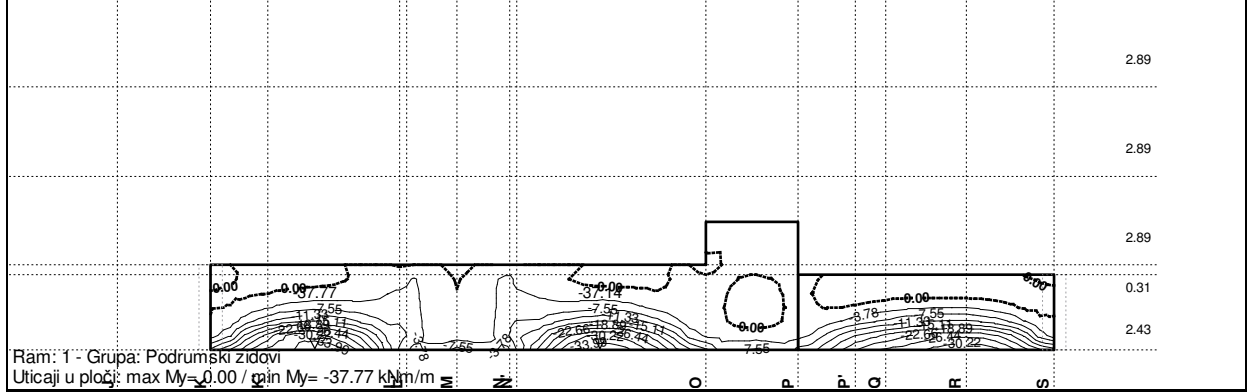
Opt. 7: [ANV] 4-6



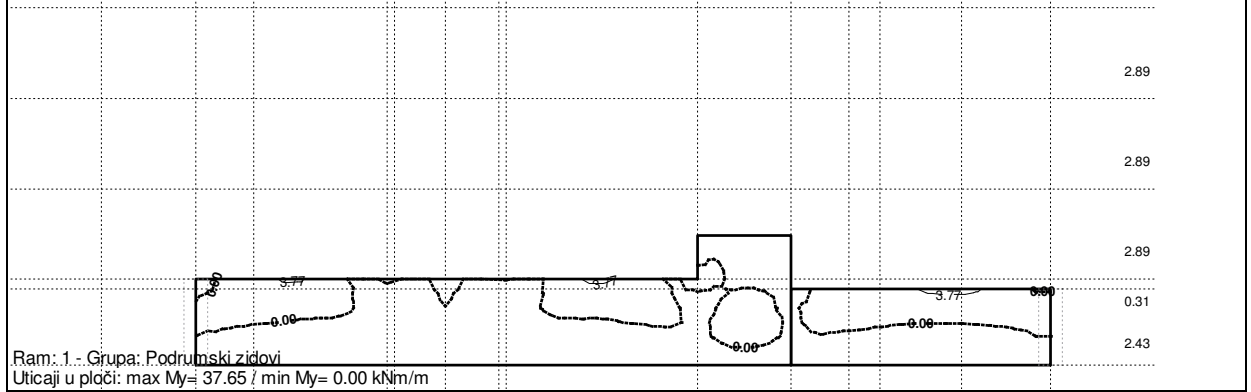
Opt. 7: [ANV] 4-6



Opt. 7: [ANV] 4-6



Opt. 7: [ANV] 4-6



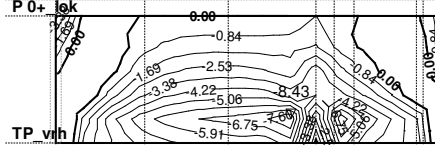
Opt. 7: [ANV] 4-6

P 100+

P 0+

P 0+ lok

TP vrt



Ram: S - Grupa: Podrumski zidovi

Uticaji u ploči: max $M_x = 0.00$ / min $M_x = -8.43$ kNm/m

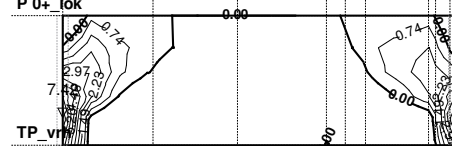
Opt. 7: [ANV] 4-6

P 100+

P 0+

P 0+ lok

TP vrt



Ram: S - Grupa: Podrumski zidovi

Uticaji u ploči: max $M_x = 7.42$ / min $M_x = 0.00$ kNm/m

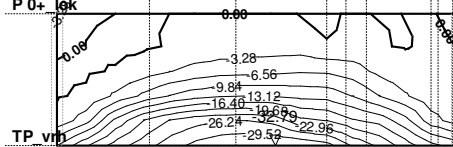
Opt. 7: [ANV] 4-6

P 100+

P 0+

P 0+ lok

TP vrt



Ram: S - Grupa: Podrumski zidovi

Uticaji u ploči: max $M_y = 0.00$ / min $M_y = -32.79$ kNm/m

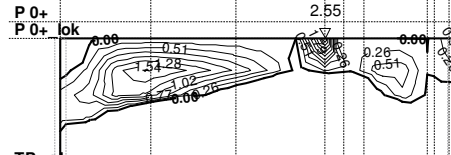
Opt. 7: [ANV] 4-6

P 100+

P 0+

P 0+ lok

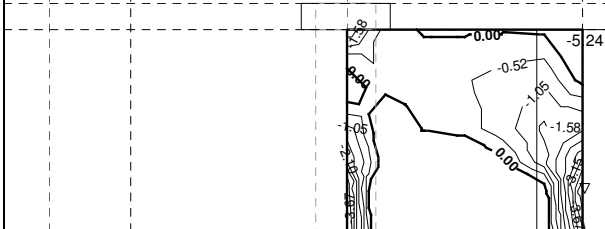
TP vrt



Ram: S - Grupa: Podrumski zidovi

Uticaji u ploči: max $M_y = 2.55$ / min $M_y = 0.00$ kNm/m

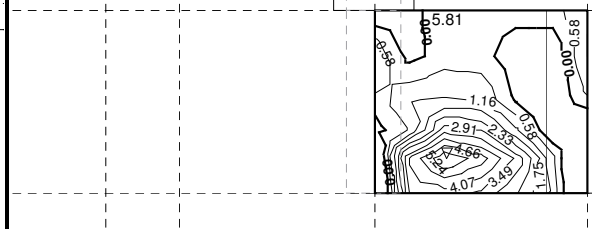
Opt. 7: [ANV] 4-6



Ram: 9 - Grupa: Podrumski zidovi

Uticaji u ploči: max $M_x = 0.00$ / min $M_x = -5.24$ kNm/m

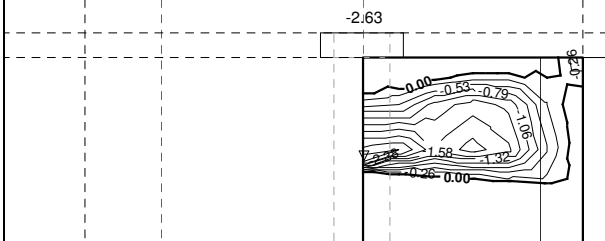
Opt. 7: [ANV] 4-6



Ram: 9 - Grupa: Podrumski zidovi

Uticaji u ploči: max $M_x = 5.81$ / min $M_x = 0.00$ kNm/m

Opt. 7: [ANV] 4-6



Ram: 9 - Grupa: Podrumski zidovi

Uticaji u ploči: max $M_y = 0.00$ / min $M_y = -2.63$ kNm/m

Opt. 7: [ANV] 4-6



Ram: 9 - Grupa: Podrumski zidovi

Uticaji u ploči: max $M_y = 22.61$ / min $M_y = 0.00$ kNm/m

Opt. 7: [ANV] 4-6

P 200+

2.89

P 100+

2.89

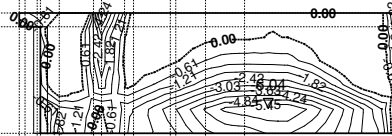
P 0+
P 0+ lok

2.89

0.31

2.43

Ram: R - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_x = 0.00$ / min $M_x = -6.04$ kNm/m



Opt. 7: [ANV] 4-6

P 300+

2.89

P 200+

2.89

P 100+

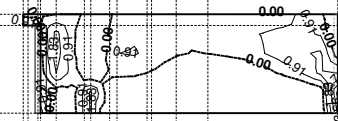
2.89

P 0+
P 0+ lok

0.31

2.43

Ram: R - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_x = 9.14$ / min $M_x = 0.00$ kNm/m



Opt. 7: [ANV] 4-6

P 300+

2.89

P 200+

2.89

P 100+

2.89

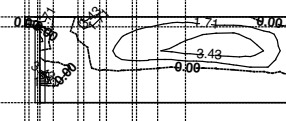
P 0+
P 0+ lok

2.89

0.31

2.43

Ram: R - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_y = 17.13$ / min $M_y = 0.00$ kNm/m



Opt. 7: [ANV] 4-6

P 300+

2.89

P 200+

2.89

P 100+

2.89

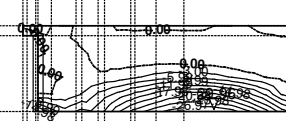
P 0+
P 0+ lok

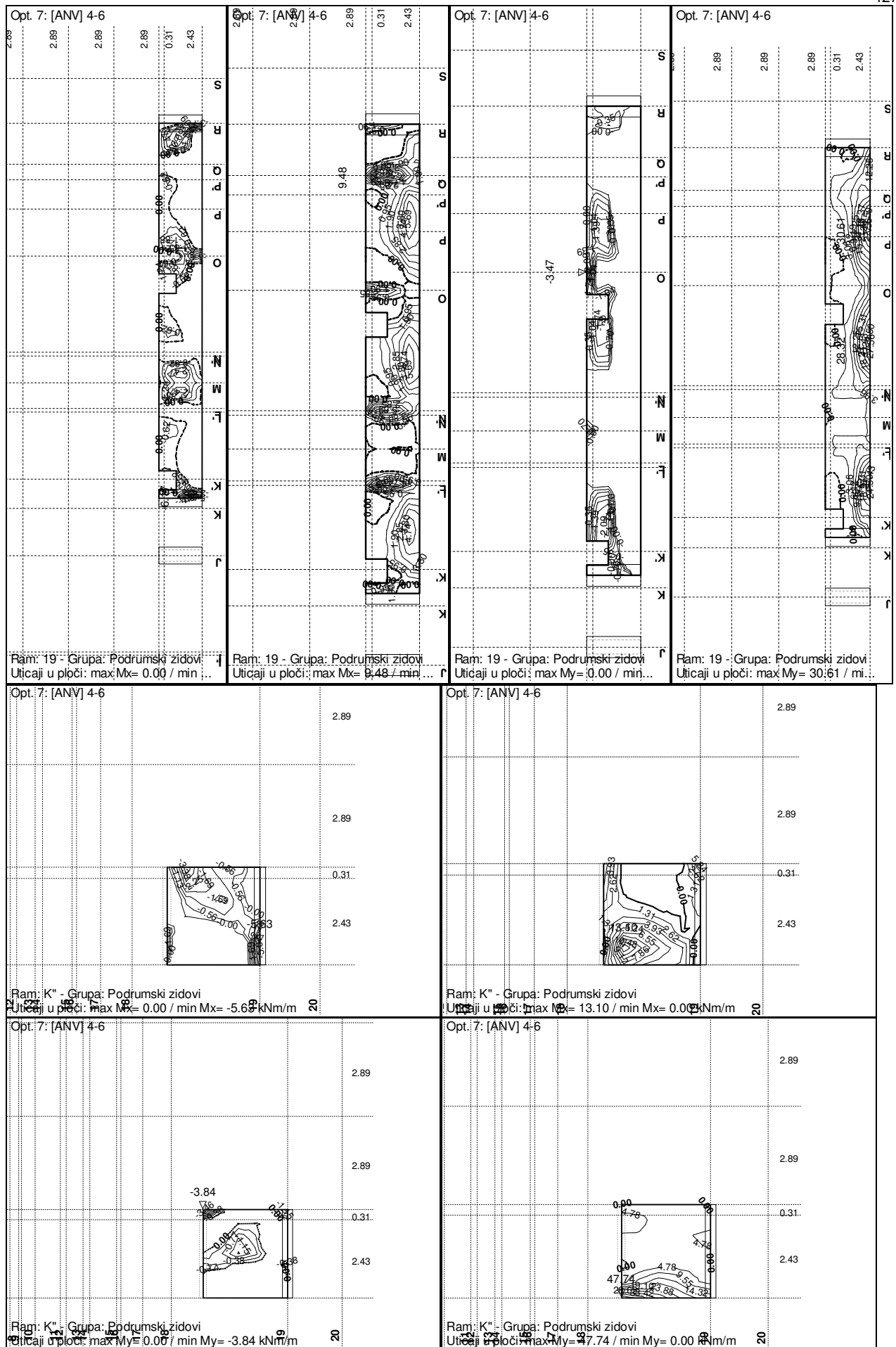
2.89

0.31

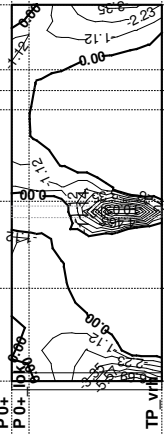
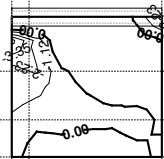
2.43

Ram: R - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_y = 0.00$ / min $M_y = -29.96$ kNm/m





Opt. 7: [ANV] 4-6



P 200+

P 100+

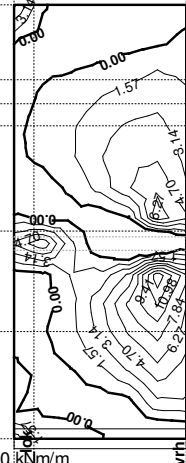
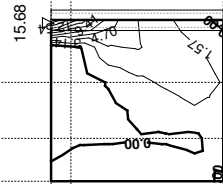
P 0+

TP v

Ram: K - Grupa: Podrumski zidovi

Uticaji u ploči: max $M_x = 0.00$ / min $M_x = -11.14$ kNm/m

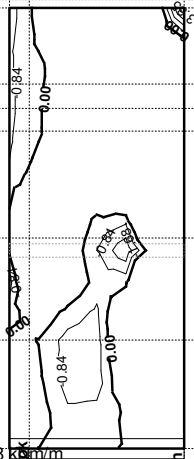
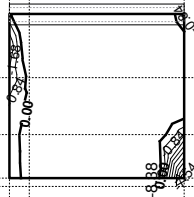
Opt. 7: [ANV] 4-6



Ram: K - Grupa: Podrumski zidovi

Uticaji u ploči: max $M_x = 15.68$ / min $M_x = 0.00$ kNm/m

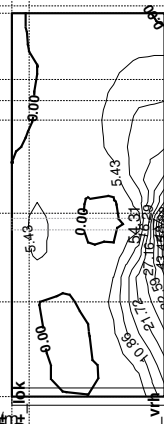
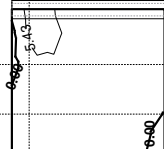
Opt. 7: [ANV] 4-6



Ram: K - Grupa: Podrumski zidovi

Uticaji u ploči: max $M_y = 0.00$ / min $M_y = -8.38$ kNm/m

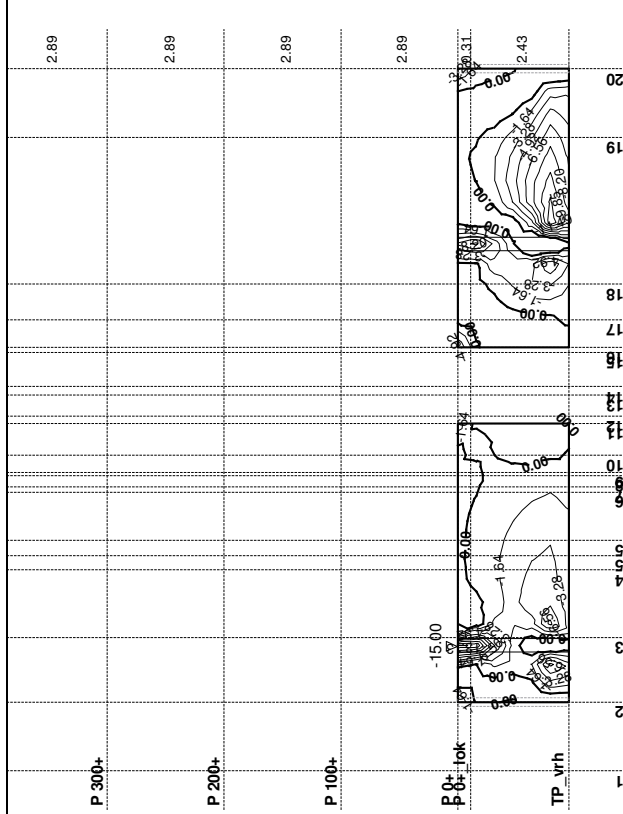
Opt. 7: [ANV] 4-6



Ram: K - Grupa: Podrumski zidovi

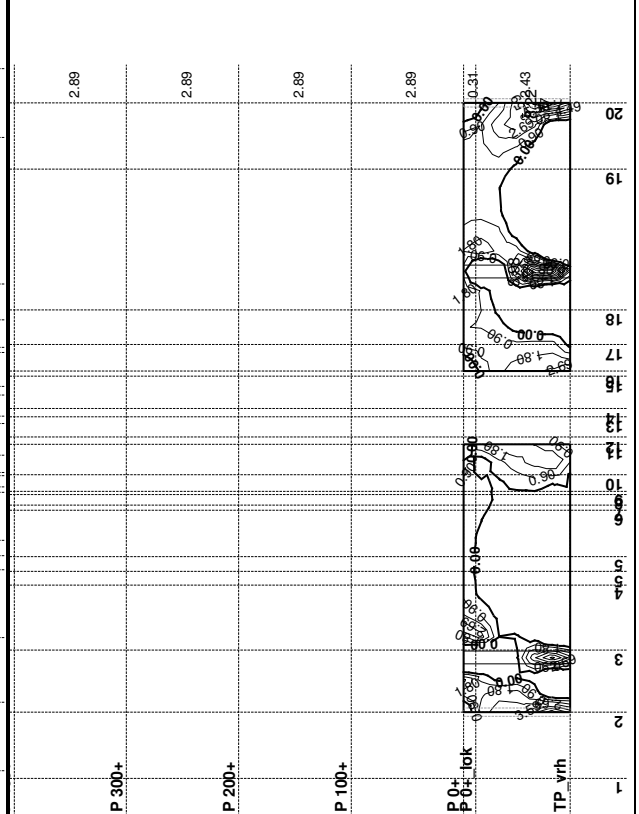
Uticaji u ploči: max $M_y = 54.31$ / min $M_y = 0.00$ kNm/m

Opt. 7: [ANV] 4-6



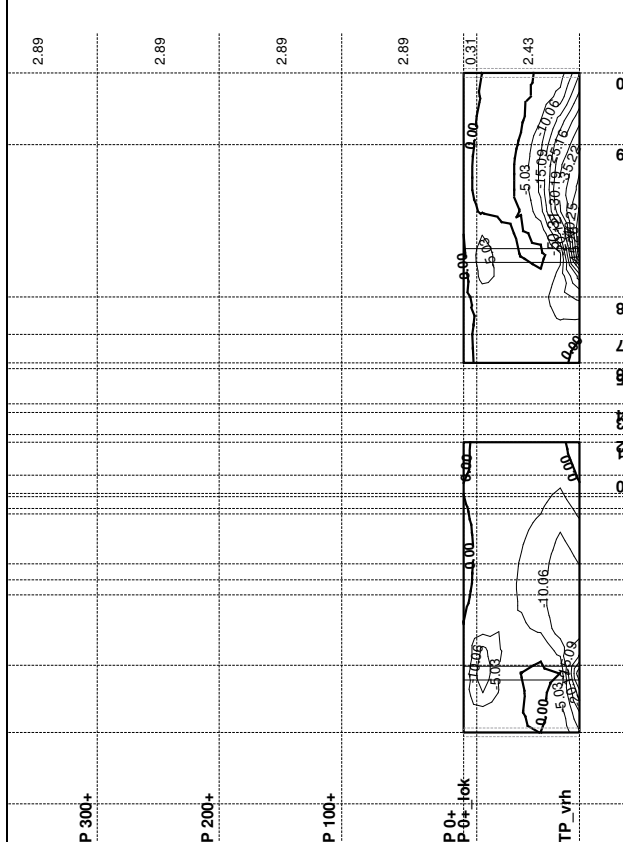
Ram: J - Grupa: Podrumski zidovi
 Uticaji u ploči: max Mx= 0.00 / min Mx= -16.40 kNm/m

Opt. 7: [ANV] 4-6



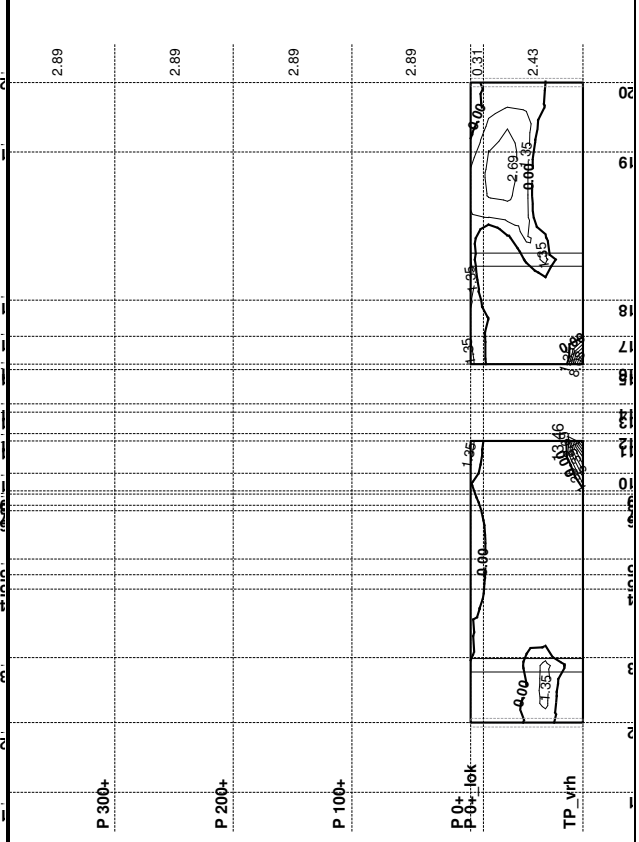
Ram: J - Grupa: Podrumski zidovi
 Uticaji u ploči: max Mx= 8.98 / min Mx= 0.00 kNm/m

Opt. 7: [ANV] 4-6

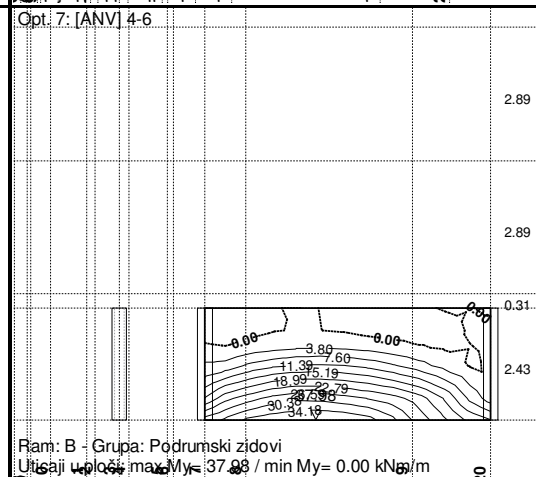
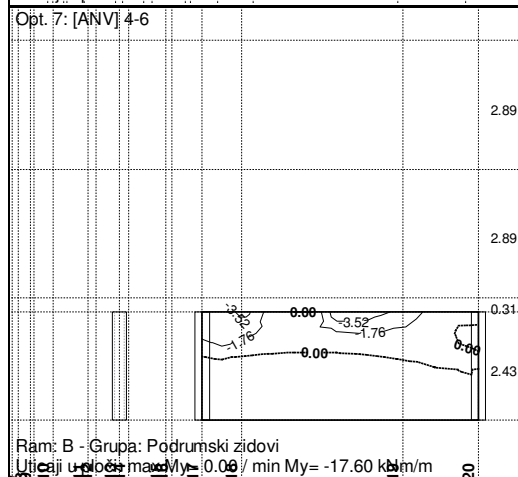
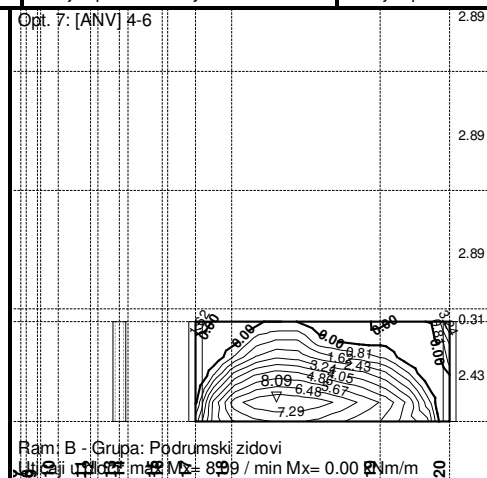
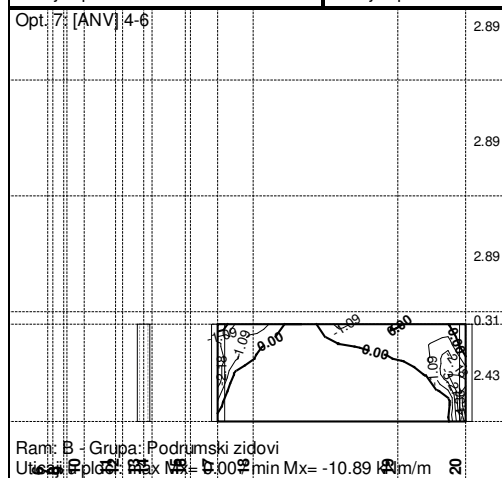
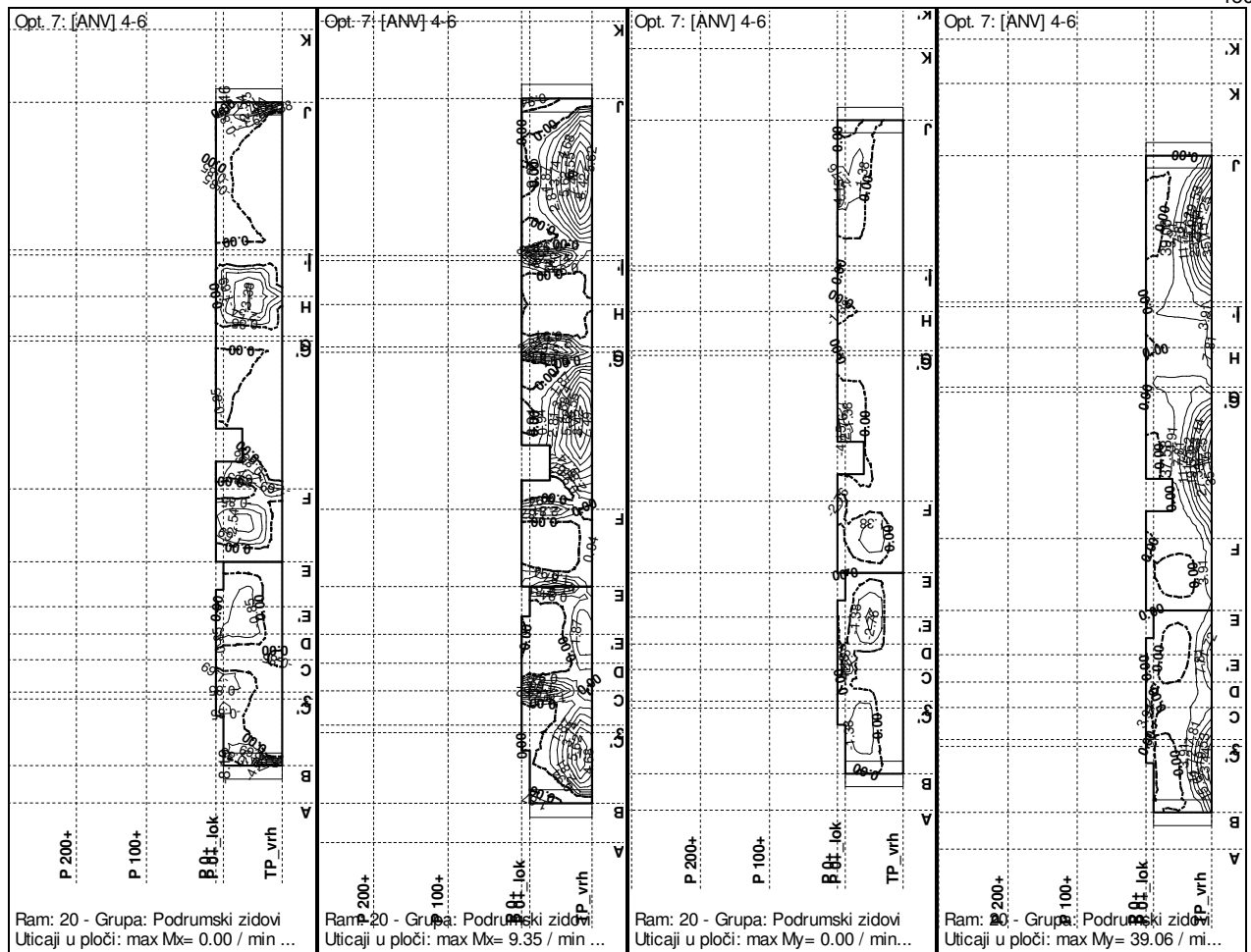


Ram: J - Grupa: Podrumski zidovi
 Uticaji u ploči: max My= 0.00 / min My= -50.31 kNm/m

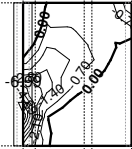
Opt. 7: [ANV] 4-6



Ram: J - Grupa: Podrumski zidovi
 Uticaji u ploči: max My= 13.46 / min My= 0.00 kNm/m

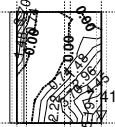


Opt. 7: [ANV] 4-6



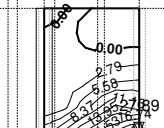
Ram: B' - Grupa: Podrumski zidovi 13
 Uticaji u ploči: max $M_x = 0.00$ / min $M_x = -6.99$ kNm/m

Opt. 7: [ANV] 4-6



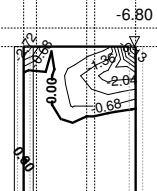
Ram: B' - Grupa: Podrumski zidovi 13
 Uticaji u ploči: max $M_x = 7.41$ / min $M_x = 0.00$ kNm/m

Opt. 7: [ANV] 4-6



Ram: B' - Grupa: Podrumski zidovi 13
 Uticaji u ploči: max $M_y = 27.89$ / min $M_y = 0.00$ kNm/m

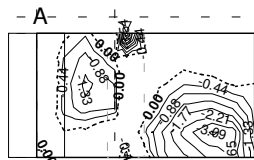
Opt. 7: [ANV] 4-6



Ram: B' - Grupa: Podrumski zidovi 13
 Uticaji u ploči: max $M_y = 0.00$ / min $M_y = -6.80$ kNm/m

Opt. 7: [ANV] 4-6

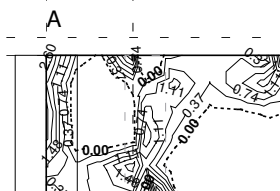
-4.41



Ram: 13 - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_x = 0.00$ / min $M_x = -4.41$ kNm/m

Opt. 7: [ANV] 4-6

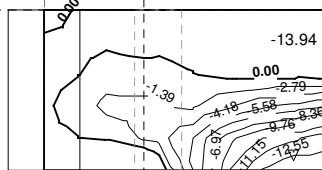
3.71



Ram: 13 - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_x = 3.71$ / min $M_x = 0.00$ kNm/m

Opt. 7: [ANV] 4-6

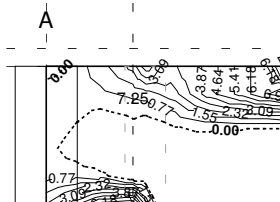
A



Ram: 13 - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_y = 0.00$ / min $M_y = -13.94$ kNm/m

Opt. 7: [ANV] 4-6

7.73



Ram: 13 - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_y = 7.73$ / min $M_y = 0.00$ kNm/m

Opt. 7: [ANV] 4-6

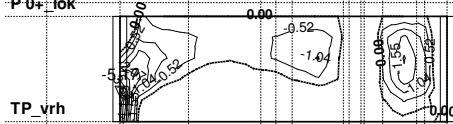
P 200+

P 100+

P 0+

P 0+ lok

TP_vrh



Ram: A - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_x = 0.00$ / min $M_x = -5.17$ kNm/m

Opt. 7: [ANV] 4-6

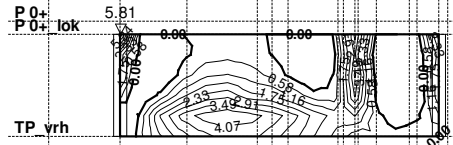
P 200+

P 100+

P 0+

P 0+ lok

TP_vrh



Ram: A - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_x = 5.81$ / min $M_x = 0.00$ kNm/m

Opt. 7: [ANV] 4-6

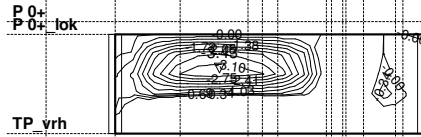
P 200+

P 100+

P 0+

P 0+ lok

TP_vrh



Ram: A - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_y = 0.00$ / min $M_y = -3.43$ kNm/m

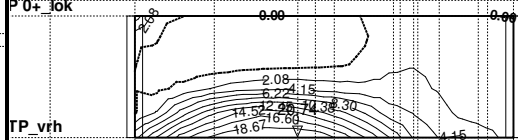
Opt. 7: [ANV] 4-6

P 100+

P 0+

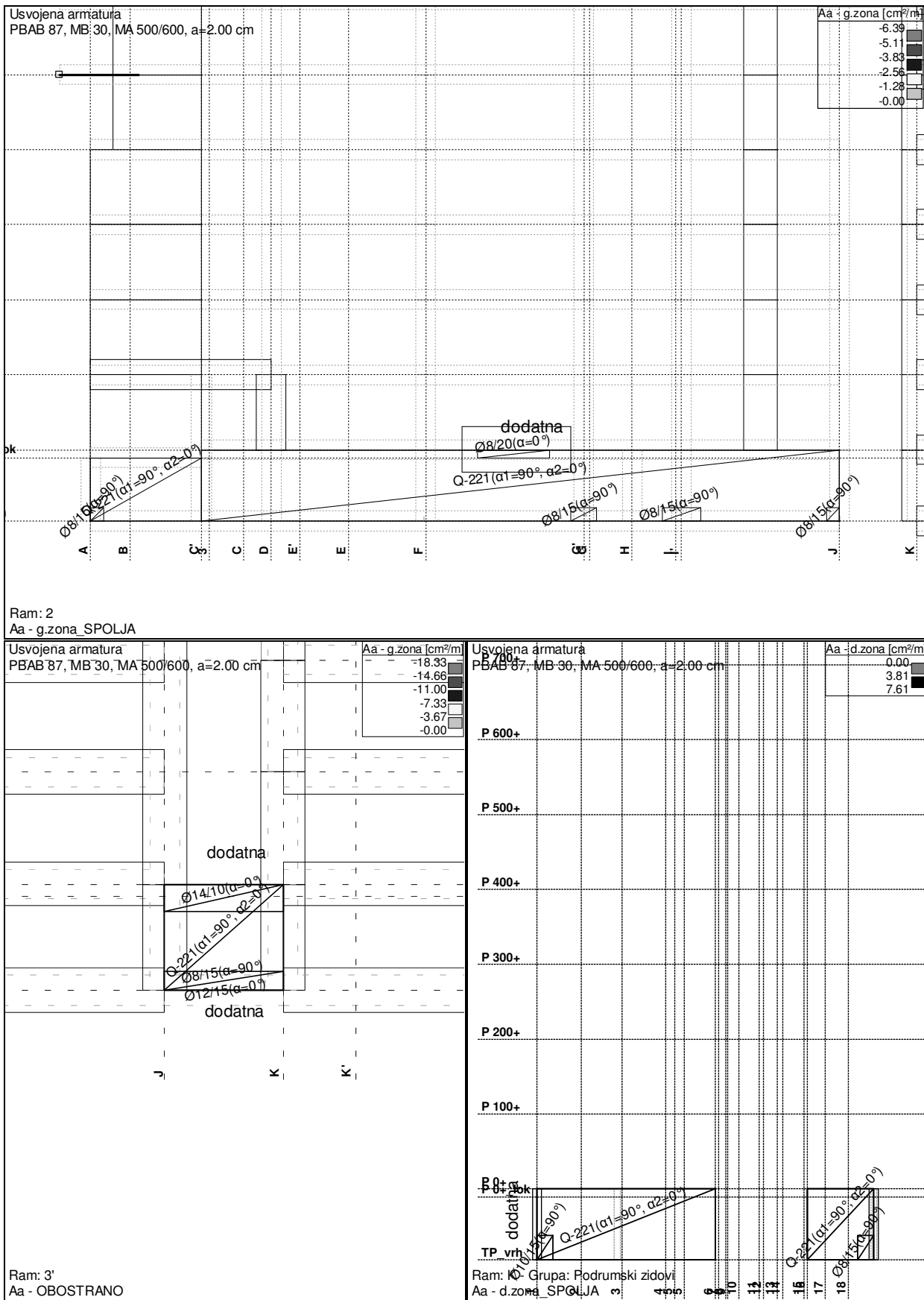
P 0+ lok

TP_vrh

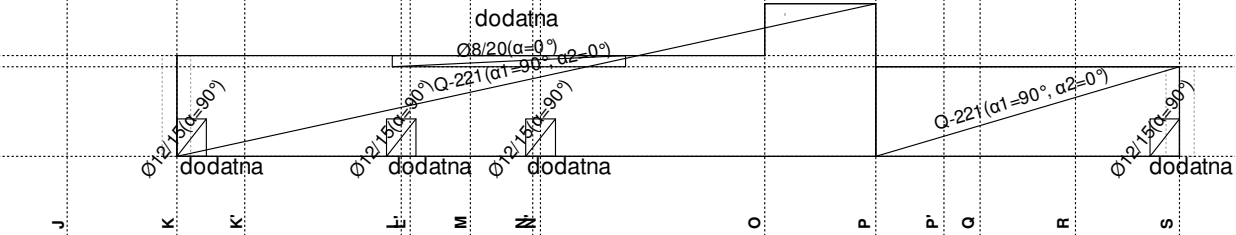
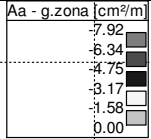


Ram: A - Grupa: Podrumski zidovi
 Uticaji u ploči: max $M_y = 20.74$ / min $M_y = 0.00$ kNm/m

Napomena: U svim podrumskim zidovima usvojena je obostrana mreza Q221. Potrebna dodatna armatura nadomestena je vec postojećom armaturom tj. ankerima i ivicnom armaturom zidova i ploca IZUZEV OVDE OZNACENIH ZIDOVA. U **ZJ** - ose 2, 20, **ZK** - uz osu 18, **ZS** - ose 1 i 9, **ZR** - u osi 19, **Z19** - ose K, O, Q, R, **Z20** - ose G i I, **ZA** - u osi 2 - ankeri $\Phi 8/15$ visine 100 cm.

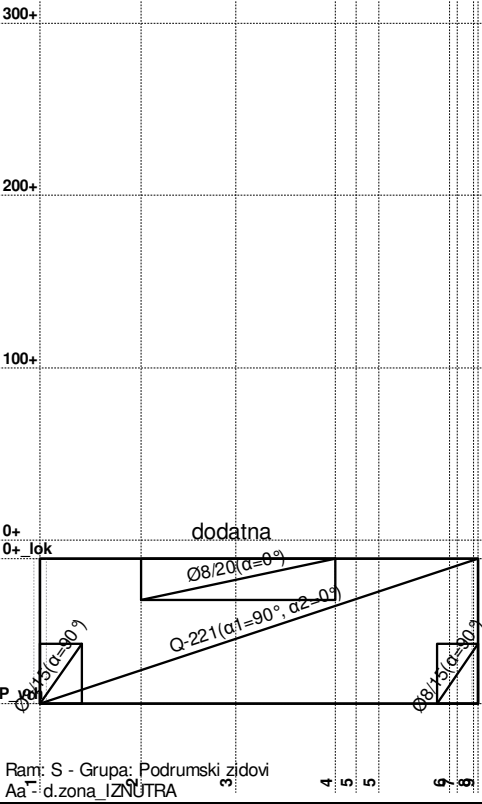
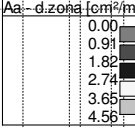


Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm



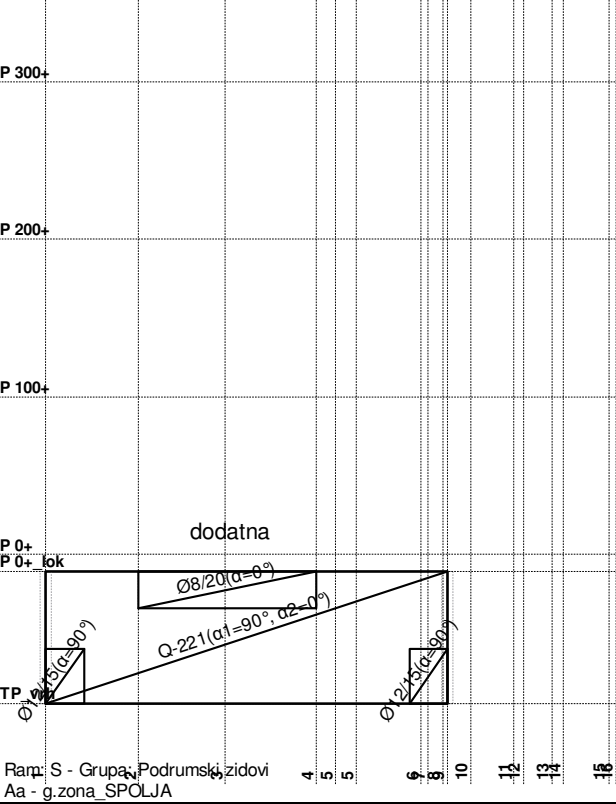
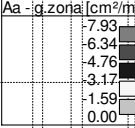
Ram: 1 - Grupa: Podrumski zidovi
Aa - g.zona_SPOLJA

Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm

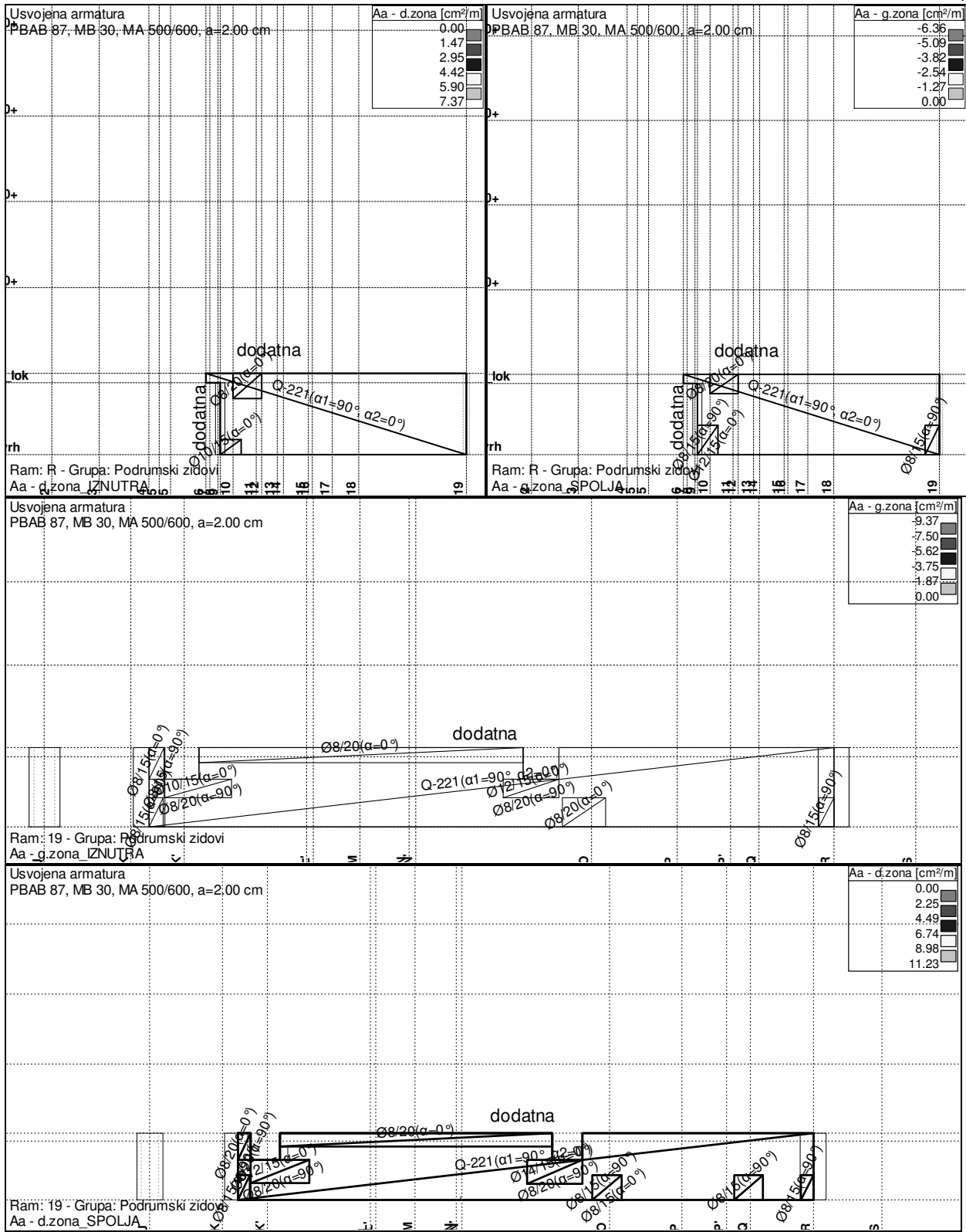


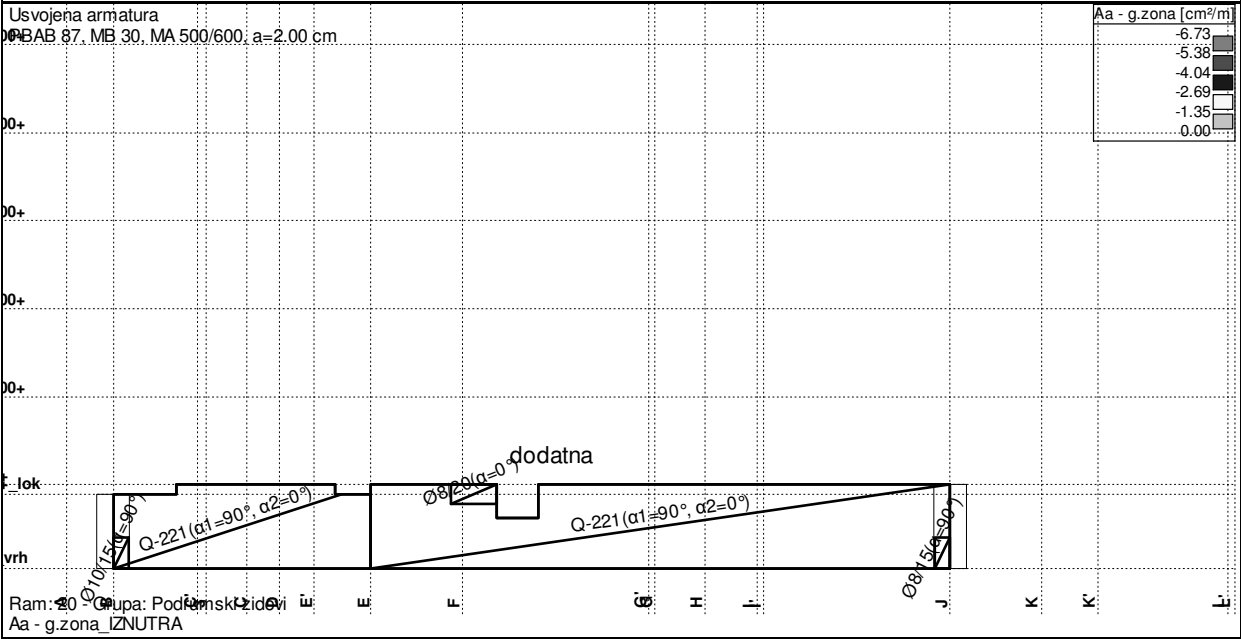
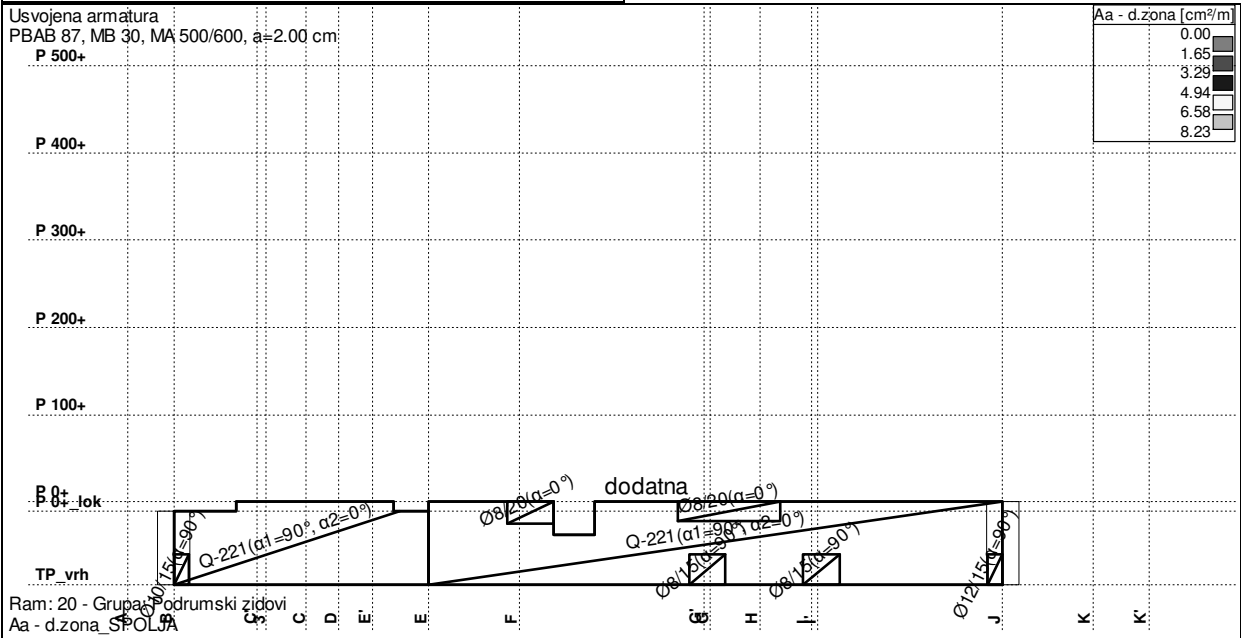
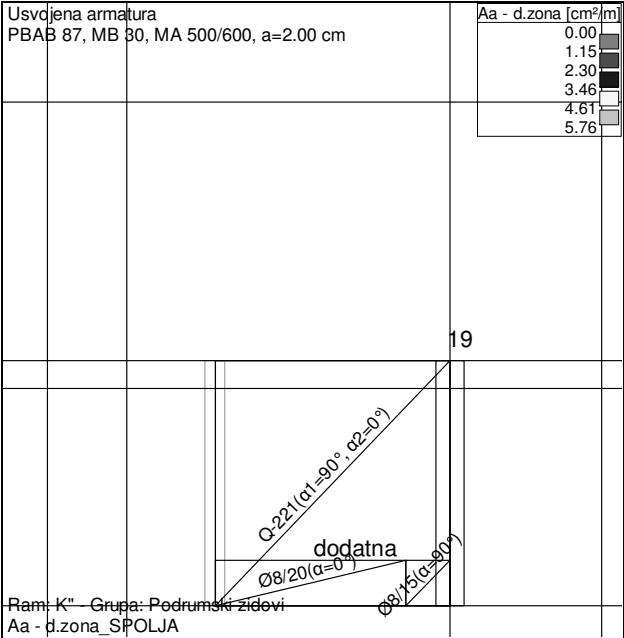
Ram: S - Grupa: Podrumski zidovi
Aa - d.zona_IZNUTRA

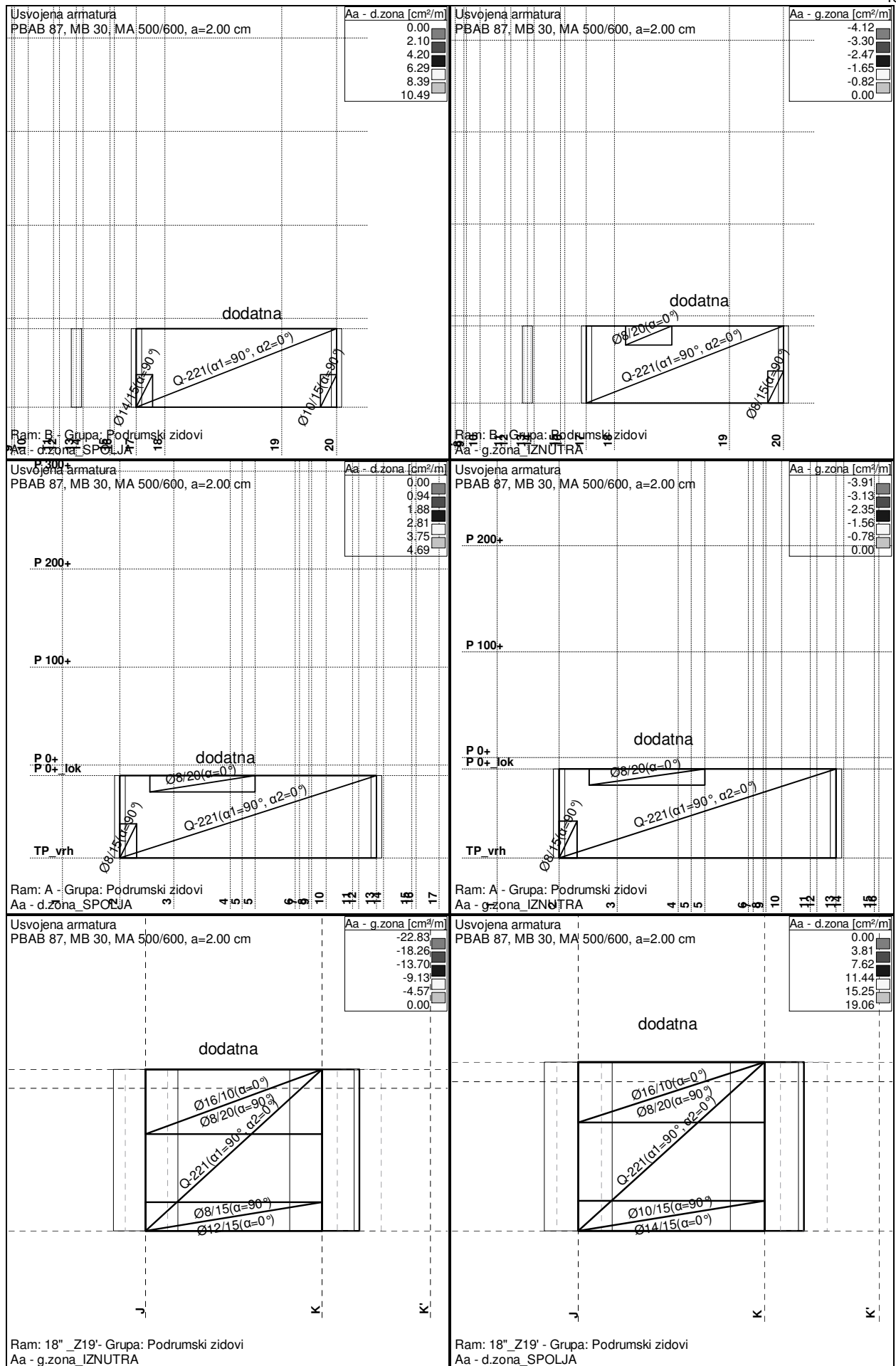
Usvojena armatura
PBAB 87, MB 30, MA 500/600, a=2.00 cm



Ram: S - Grupa: Podrumski zidovi
Aa - g.zona_SPOLJA







2.5. ГРАФИЧКА ДОКУМЕНТАЦИЈА

2.5. ГРАФИЧКА ДОКУМЕНТАЦИЈА

Садржај				
редни број	цртеж	размера	цртеж број	формат папира
1	Ситуација	1:100	1	594/840
2	Основа темеља	1:75	2	900/420
3	Основа подрума ПОС 0+	1:75	3	900/420
4	Основа приземља ПОС 100+	1:75	4	900/420
5	Основа 1. спрата ПОС 200+	1:75	5	900/420
6	Основа 2. спрата ПОС 300+	1:75	6	900/420
7	Основа 3. спрата ПОС 400+	1:75	7	900/420
8	Основа 4. спрата ПОС 500+	1:75	8	900/420
9	Основа 5. спрата ПОС 600+	1:75	9	900/420
10	Основа 6. спрата ПОС 700+	1:75	10	900/420
11	Основа 7. спрата ПОС 800+	1:75	11	900/420
12	Пресек 1 - 1	1:75	12	900/420
13	Пресек 2 - 2	1:75	13	440/535
14	Пресек 3 - 3	1:75	14	440/535
15	Пресек 4 - 4	1:75	15	440/535
16	Пресек 5 - 5	1:75	16	440/535
17	Пресек 6 - 6	1:75	17	950/535
18	Пресек 7 - 7	1:75	18	396/535

204.09

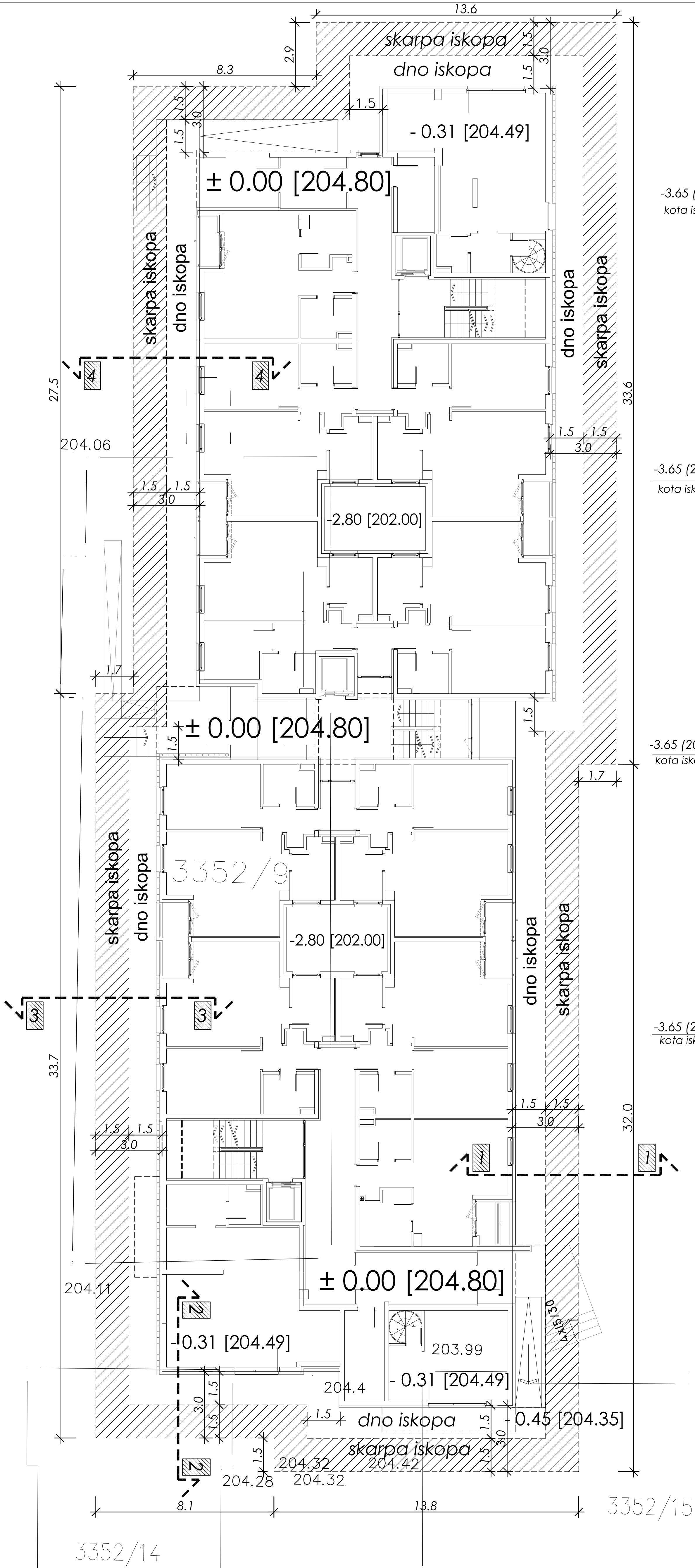
204.18

204.28

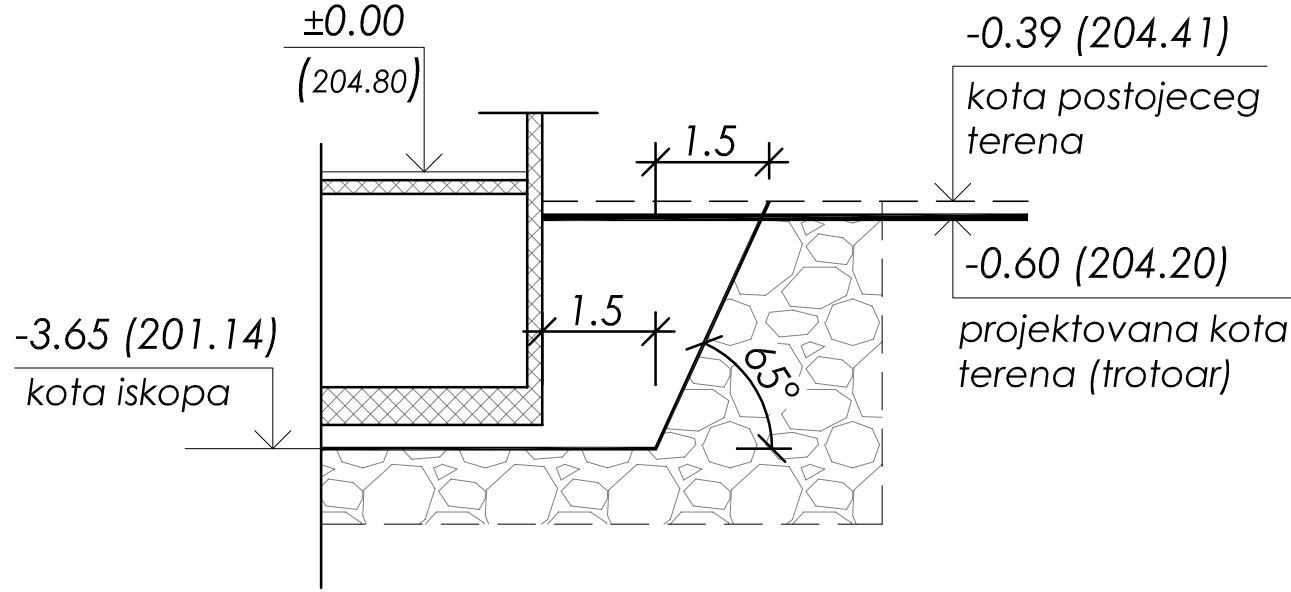
204.41

204.36

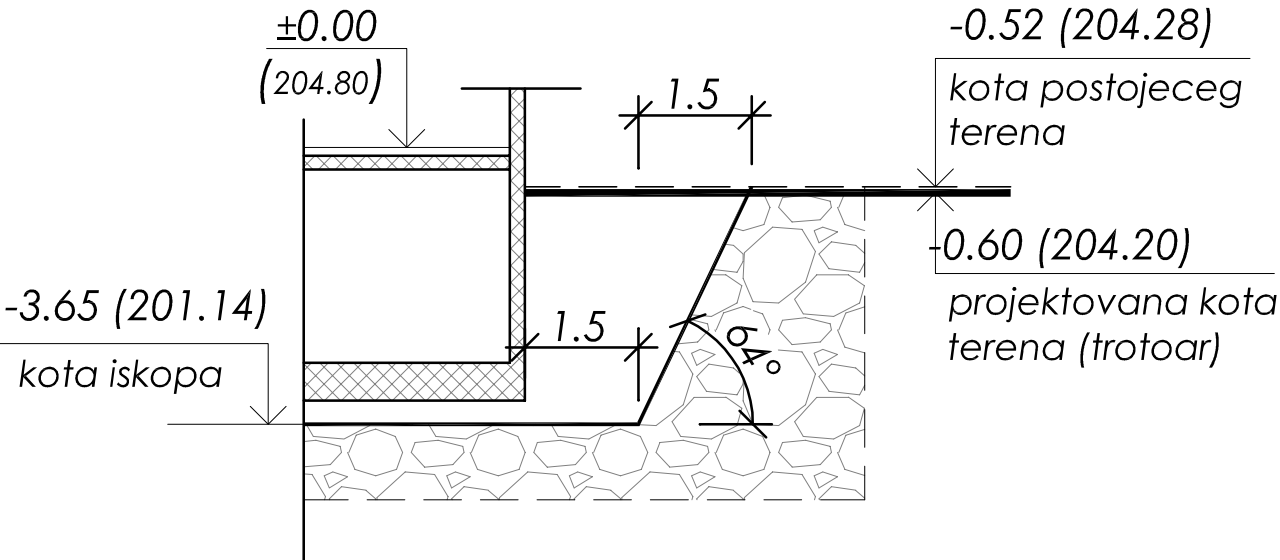
204.42



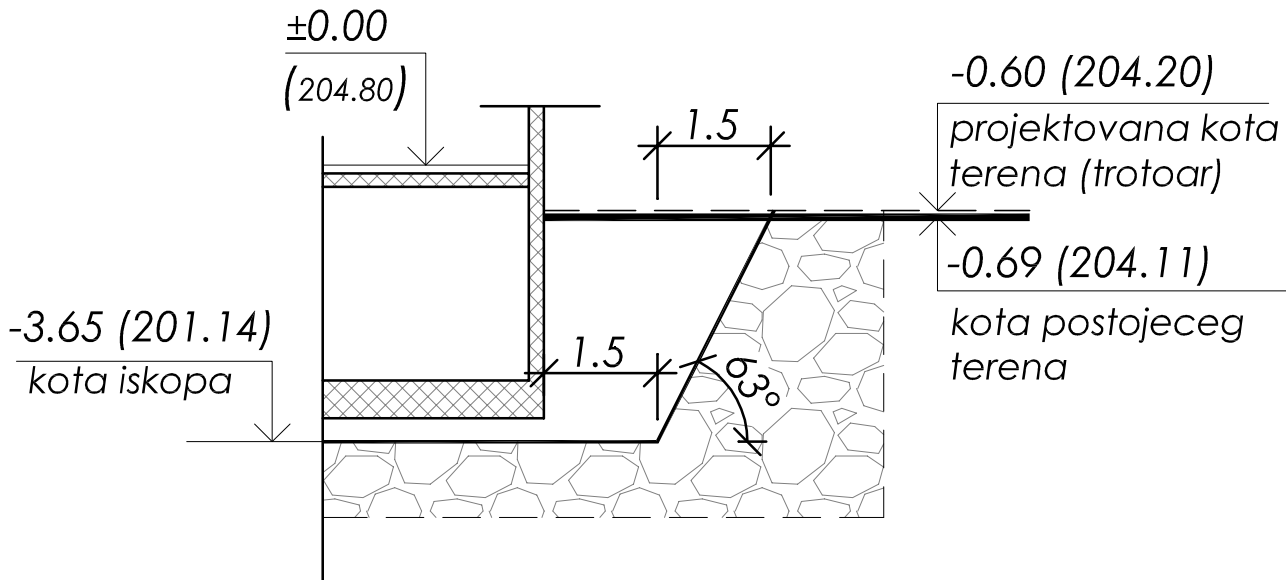
Presek 1-1



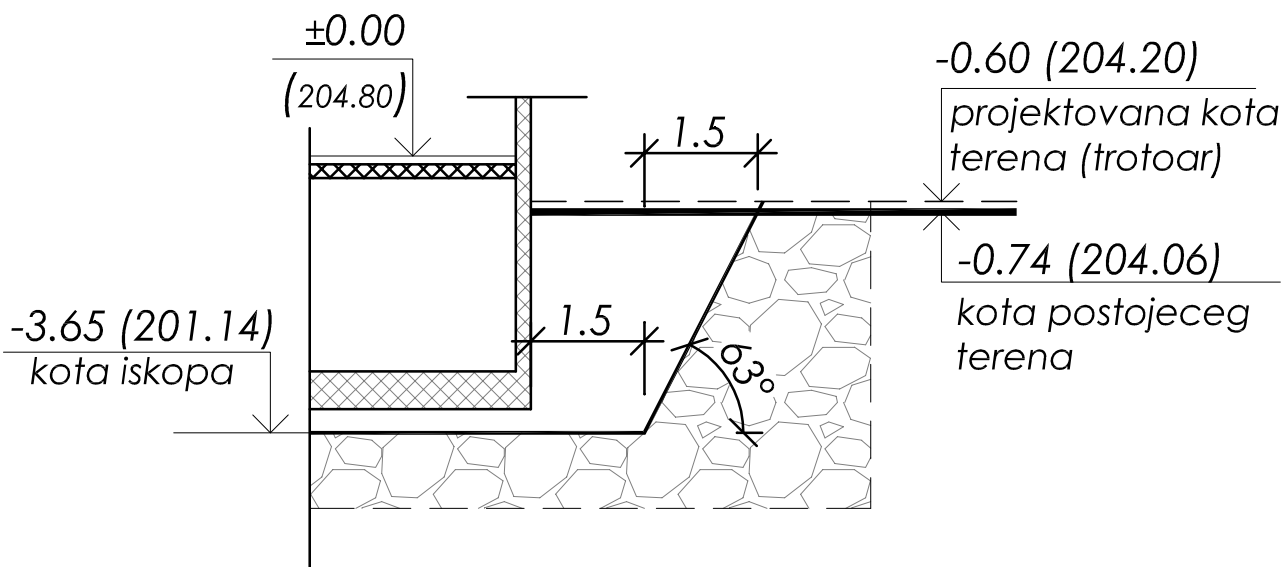
Presek 2-2



Presek 3-3



Presek 4-4



204.41

204.43

Program Evropske Unije
CARDS i IPA Program za
Zapadni Balkan Podrška
infrastrukturnim
projektima
u zemljama Zapadnog
Balkana
WB10-SER-SOC-01
The European Union's
CARDS Programme and
IPA Programme for
the Western Balkans
Infrastructure Projects
Facility in the Western
Balkans

PD GATE d.o.o. + re:a.c.t

INVESTITOR/ CLIENT
GRAD KRALJEVO / CITY of KRALJEVO

OBJEKT I LOKACIJA/ OBJECT AND LOCATION
STAMBENI OBJEKT 2
II FAZA PROJEKTA URBANE REGENERACIJE
NASELJA U DOSITEJEVOJ ULICI U KRALJEVO

OZNAKA PROJEKTA/ CODE OF THE PROJECT
10 - PROJEKAT PRIPREMNIH RADOVA /
10 - DESIGN OF PRELIMINARY WORKS

POTPIS/ SIGNATURE

ODGOVORNI PROJEKTANT/ RESPONSIBLE
DESIGNER

LJ. PETKOVIĆ d.i.g.

licenca br. 310 3679 03

PROJEKTANT SARADNIK/ ASSOCIATE DESIGNER

A. POŠARAC d.i.g./ T. MITROVIĆ d.i.g.

CRTEŽ/ DRAWING

SITUACIJA/SITUATION

VRSTA TEHNIČKE
DOKUMENTACIJE/
TYPE OF DOCUMENTATION

PZI

BROJ
PROJEKTA/
NUMBER OF PROJECT

184

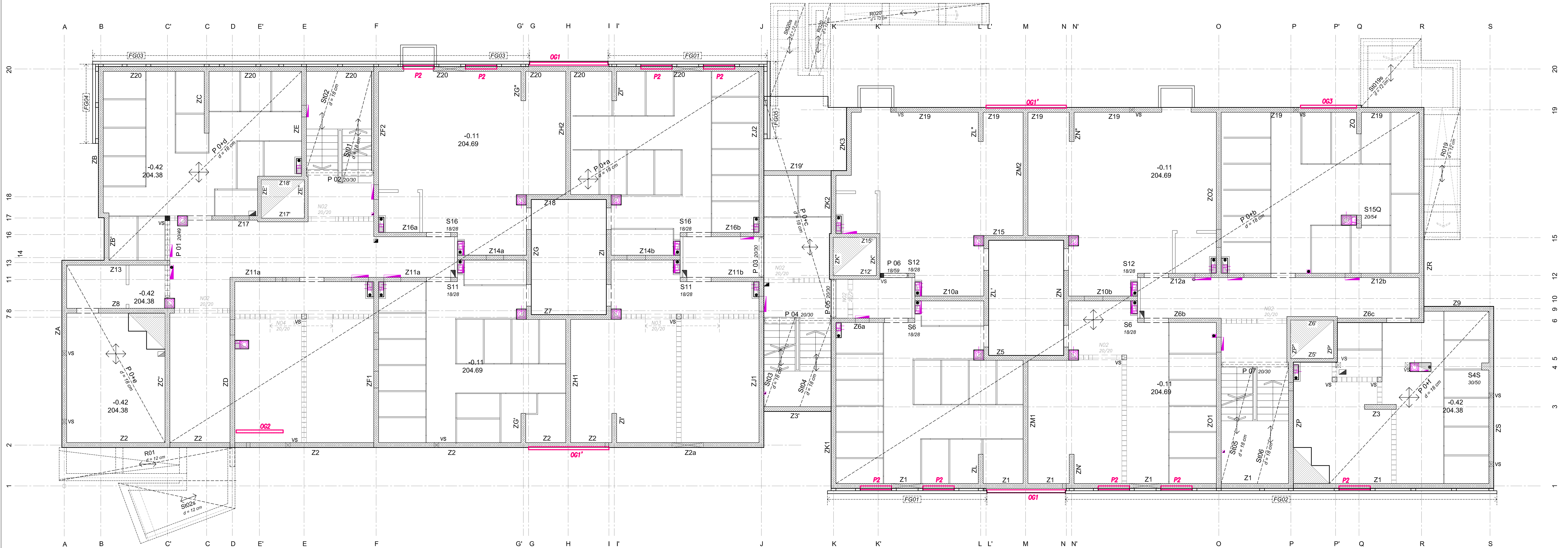
DATUM/DATE
avg 2017.

RAZMERA/SCALE

1:100

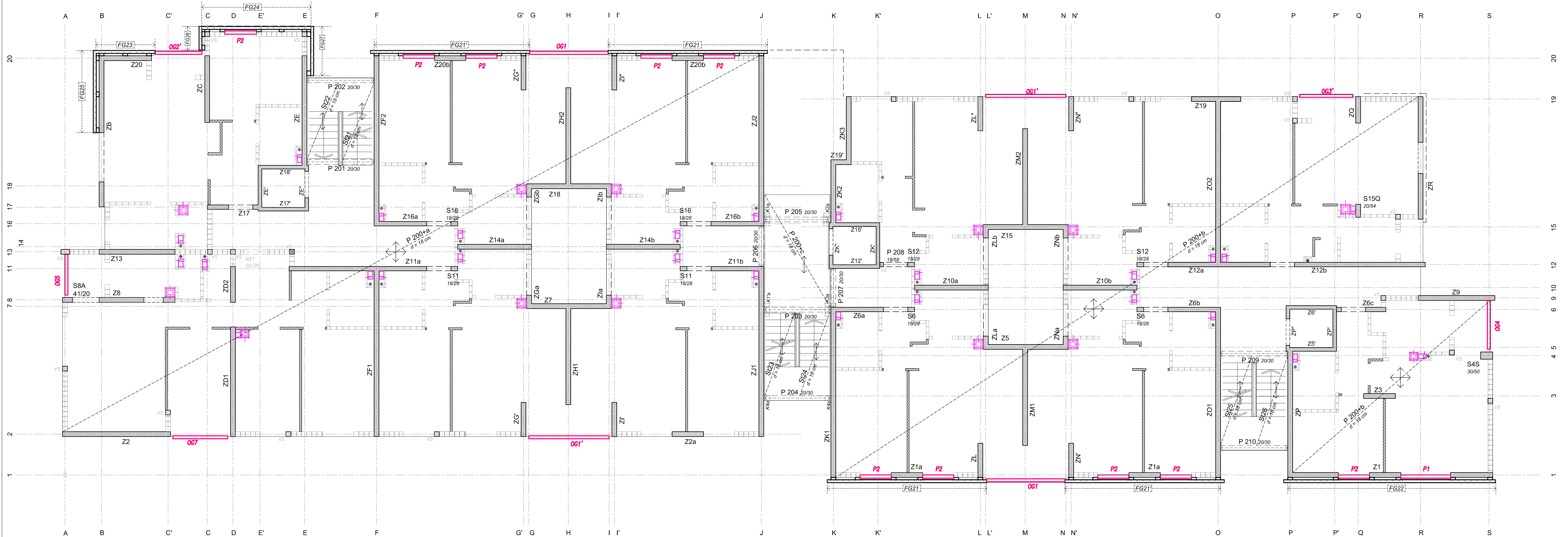
BROJ CRTEŽA/
NUMBER OF
DRAWING


1



VS ☐ VS podrum, završavaju se
VS ☐ VS podrum
VS ☐ oznaki VS prijemlja

	PD GATE d.o.o. + re:a.c.t.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
--	-----------------------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--





Program Evropske Unije
CARDS I IPA Program za
Zapadni Balkan Podrška
infrastrukturnim
projektima
u zemljama Zapadnog
Balkana
WB10-SER-SOC-01

The European Union's
CARDS Programme and
IPA Programme for
the Western Balkans
Infrastructure Projects
Facility in the Western
Balkans

PD GATE d.o.o. + re:a.c.t.

INVESTITOR / CLIENT
GRAD KRALJEVO / CITY OF KRALJEVO

OBJEKAT / LOCATION / OBJECT AND LOCATION
STAMBENI OBJEKAT 2
II FAZA PROJEKTA URBANE REGENERACIJE
NASELJA U DOSITEJEVOJ ULICI U KRALJEVO

OZNAKA PROJEKTA / CODE OF THE PROJECT
2 - PROJEKAT KONSTRUKCIJE /
2 - STRUCTURAL DESIGN

POTPIS / SIGNATURE
[Signature]

ODGOVORNI PROJEKTANT / RESPONSIBLE
DESIGNER
LJ. PETKOVIĆ d.i.g.
licenca br. 310 3673 03

PROJEKTANTI SARADNO / ASSOCIATE DESIGNERS
A. POSARAC d.i.g. / T. MITROVIC d.i.g.


OSNOVA PRVOG SPRATA - POS 200+
FIRST FLOOR PLAN

VRSTA TEHNIČKE
DOKUMENTACIJE / PZI
BROJ PROJEKTA /
NUMBER OF PROJECT
184

DATUM / DATE
avg 2017.

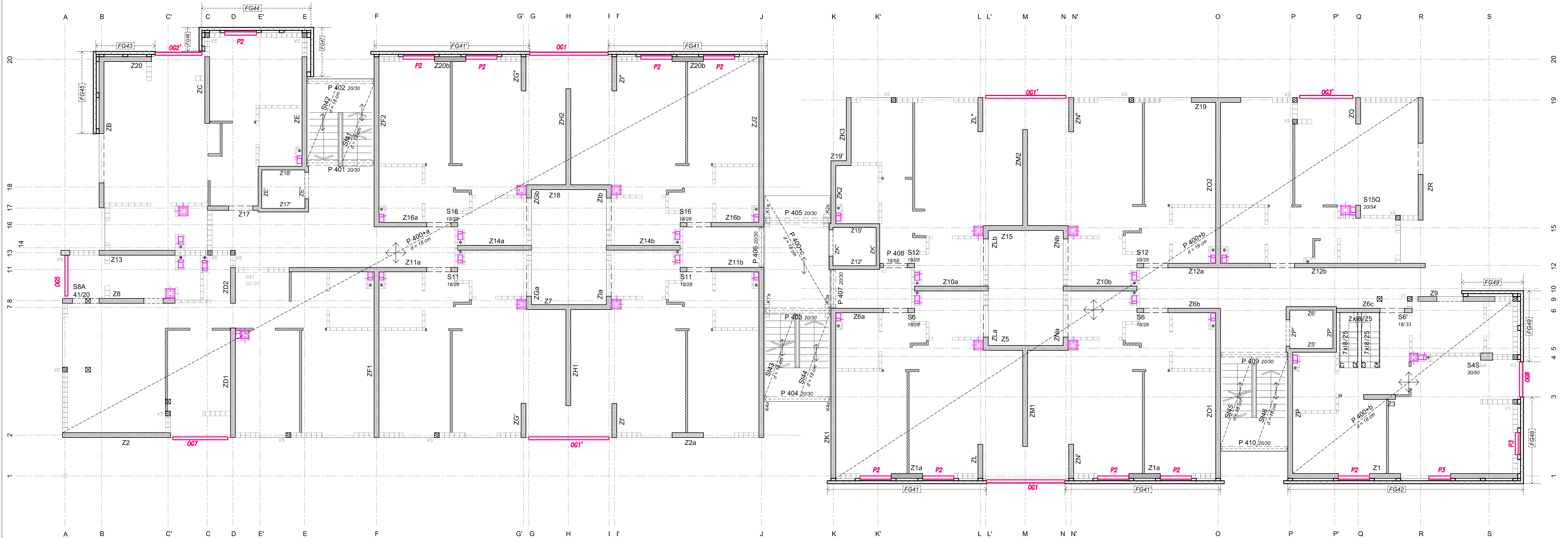
RAZMERA / SCALE
1:75


BROJ CRTEZA /
NUMBER OF
DRAWING
5



Western Balkans
Investment Framework
WBIF

Mati MacDonald IPF CONSORTIUM





Program Evropske Unije
CARDS I IPA Program za
Zapadni Balkan Podrška
infrastrukturnim
projektima
u zemljama Zapadnog
Balkana
WB10-SER-SOC-01
The European Union's
CARDS Programme and
IPA Programme for
the Western Balkans
Infrastructure Projects
Facility in the Western
Balkans

PD GATE d.o.o. + re:a.c.t

INVESTITOR / CLIENT
GRAD KRALJEVO / CITY OF KRALJEVO

OBJEKAT / LOCATION / OBJECT AND LOCATION
STAMBENI OBJEKAT 2
II FAZA PROJEKTA URBANE REGENERACIJE
NASELJA U DOSITEJEVOJ ULICI U KRALJEVO

OZNAKA PROJEKTA / CODE OF THE PROJECT
2 - PROJEKAT KONSTRUKCIJE /
2 - STRUCTURAL DESIGN

POTPIS / SIGNATURE
[Signature]

ODGOVORNI PROJEKTANT / RESPONSIBLE
DESIGNER
LJ. PETKOVIĆ d.i.g.
licenca br. 310 3673 03

PROJEKTANTI SARADNO / ASSOCIATE DESIGNERS
A. POSARAC d.i.g. / T. MITROVIC d.i.g.

CRTEŽ / DRAWING
OSNOVA TREĆEG SPRATA - POS 400+
THIRD FLOOR PLAN

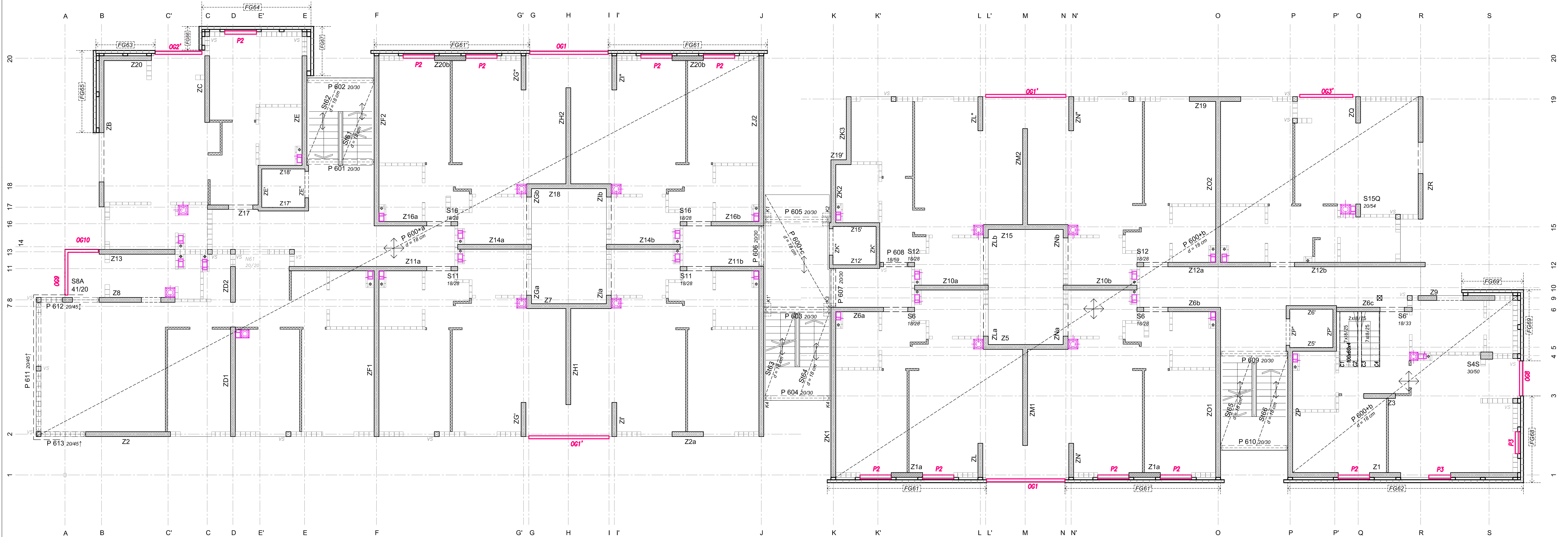
VISTA / TENDENCE
DOKUMENTACIJA /
TYPE OF DOCUMENTATION
PZI

BROJ
PROJEKTA /
NUMBER OF PROJECT
184

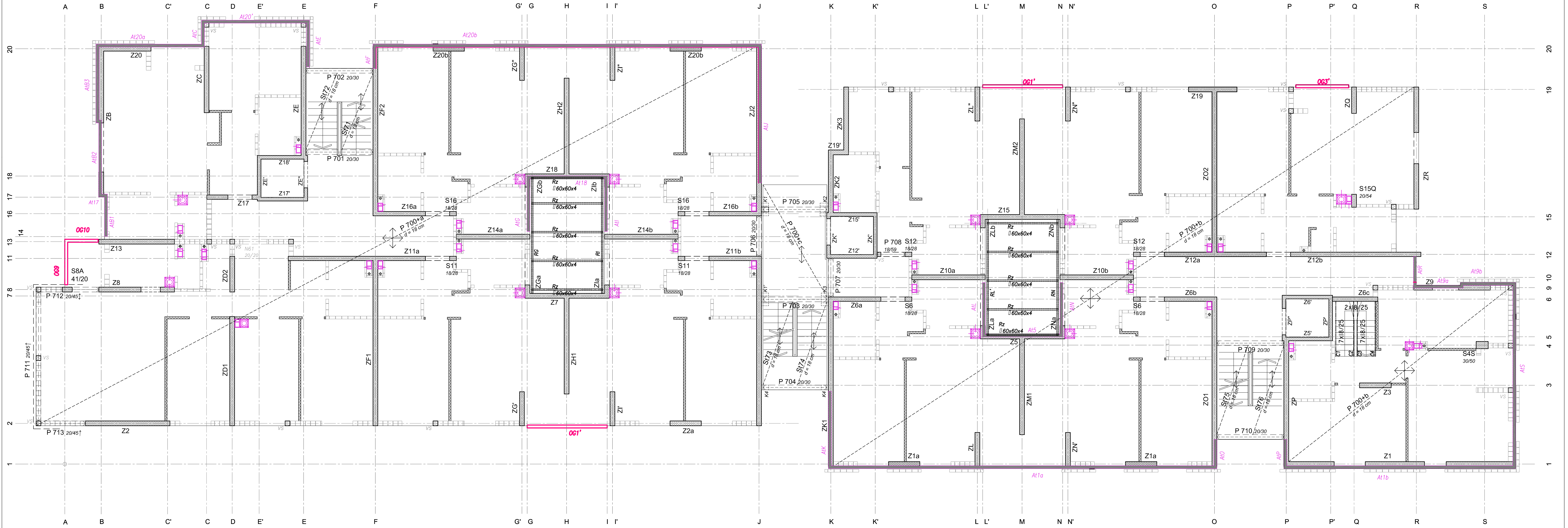
DATUM / DATE
avg 2017.


RAZMERA / SCALE
1:75

BROJ CRTEŽA /
NUMBER OF
DRAWING
7



	PD GATE d.o.o. + re:a.c.t.									
<small>Program Evropske Unije CARDS I IPA Program za Zapadni Balkan Podrška infrastrukturnim projektima u zemljama Zapadnog Balkana WB10-SER-SOC-01 The European Union's CARDS Programme and IPA Programme for the Western Balkans Infrastructure Projects Facility in the Western Balkans</small>	<small>INVESTITOR / CLIENT GRAD KRALJEVO / CITY OF KRALJEVO OBJEKAT / LOCATION STAMBENI OBJEKAT 2 II FAZA PROJEKTA URBANE REGENERACIJE NASELJA U DOSITEJEVOJ ULICI U KRALJEVO OZNAKA PROJEKTA / CODE OF THE PROJECT 2 - PROJEKAT KONSTRUKCIJE / 2 - STRUCTURAL DESIGN</small>	<table><tr><td><small>POTPIS / SIGNATURE </small></td><td><small>ODGOVORNI PROJEKTANT / RESPONSIBLE DESIGNER LJ. PETKOVIĆ d.i.g. licenca br. 310 3613 03</small></td></tr><tr><td><small>CRTEŽ / DRAWING OSNOVA PETOG SPRATA - POS 600+ FIFTH FLOOR PLAN</small></td><td><small>RAZMERA / SCALE 1:75</small></td></tr><tr><td><small>VISTA / TECHNICAL DOKUMENTACIJA / TYPE OF DOCUMENTATION PZI</small></td><td><small>BROJ PROJEKTA / NUMBER OF PROJECT 184</small></td></tr><tr><td><small>DATUM / DATE avg 2017.</small></td><td><small>BROJ CRTEŽA / NUMBER OF DRAWING 9</small></td></tr></table>	<small>POTPIS / SIGNATURE </small>	<small>ODGOVORNI PROJEKTANT / RESPONSIBLE DESIGNER LJ. PETKOVIĆ d.i.g. licenca br. 310 3613 03</small>	<small>CRTEŽ / DRAWING OSNOVA PETOG SPRATA - POS 600+ FIFTH FLOOR PLAN</small>	<small>RAZMERA / SCALE 1:75</small>	<small>VISTA / TECHNICAL DOKUMENTACIJA / TYPE OF DOCUMENTATION PZI</small>	<small>BROJ PROJEKTA / NUMBER OF PROJECT 184</small>	<small>DATUM / DATE avg 2017.</small>	<small>BROJ CRTEŽA / NUMBER OF DRAWING 9</small>
<small>POTPIS / SIGNATURE </small>	<small>ODGOVORNI PROJEKTANT / RESPONSIBLE DESIGNER LJ. PETKOVIĆ d.i.g. licenca br. 310 3613 03</small>									
<small>CRTEŽ / DRAWING OSNOVA PETOG SPRATA - POS 600+ FIFTH FLOOR PLAN</small>	<small>RAZMERA / SCALE 1:75</small>									
<small>VISTA / TECHNICAL DOKUMENTACIJA / TYPE OF DOCUMENTATION PZI</small>	<small>BROJ PROJEKTA / NUMBER OF PROJECT 184</small>									
<small>DATUM / DATE avg 2017.</small>	<small>BROJ CRTEŽA / NUMBER OF DRAWING 9</small>									





Program Evropske Unije
CARDS i IPA Program za
Zapadni Balkan Podrška
infrastrukturnim
projektima
u zemljama Zapadnog
Balkana
WB10-SER-SOC-01
The European Union's
CARDS Programme and
IPA Programme for
the Western Balkans
Infrastructure Projects
Facility in the Western
Balkans

PD GATE d.o.o. + re:a.c.t

INVESTITOR/ CLIENT
GRAD KRALJEVO / CITY OF KRALJEVO

OBJEKT I LOKACIJA/ OBJECT AND LOCATION
STAMBENI OBJEKT 2
II FAZA PROJEKTA URBANE REGENERACIJE
NASELJA U DOSITEJEVOJ ULICI U KRALJEVO

OZNAKA PROJEKTA/ CODE OF THE PROJECT
2 - PROJEKAT KONSTRUKCIJE /
2 - STRUCTURAL DESIGN

POTPIS/ SIGNATURE
[Signature]

OSNOVA ŠESTOG SPRATA - POS 700+
SIXTH FLOOR PLAN

VISTA TEHNIČKE
DOKUMENTACIJE /
TYPE OF DOCUMENTATION
PZI

BROJ
PROJEKTA/
NUMBER OF PROJECT
184

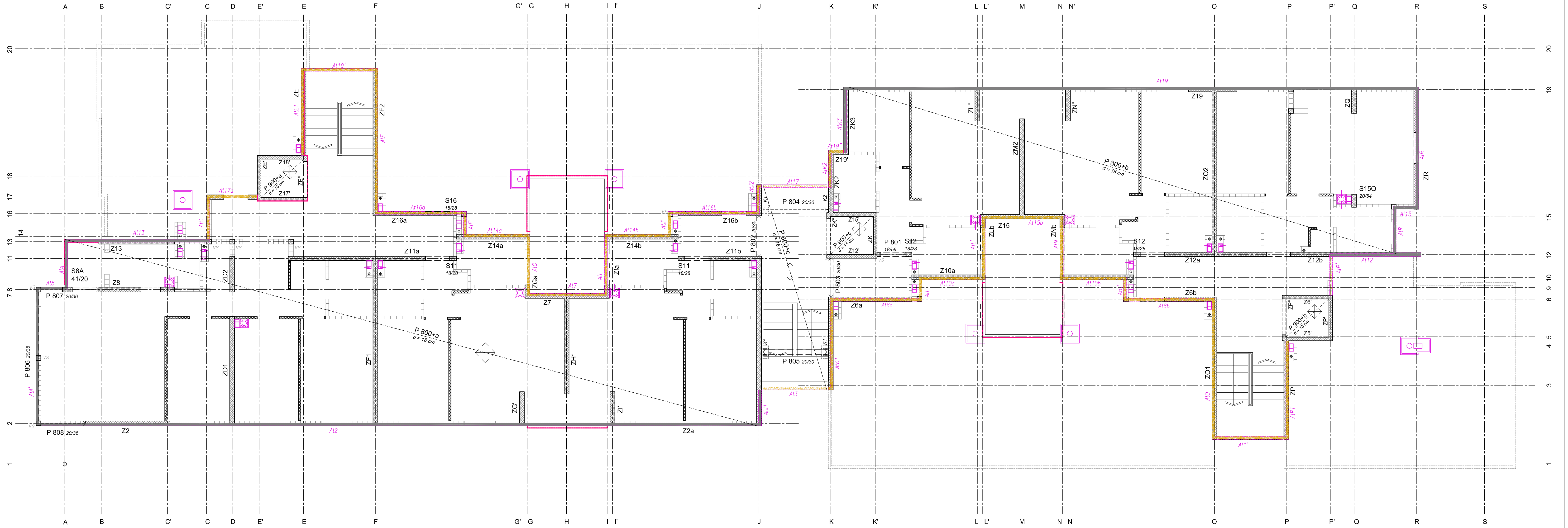
DATUM/DATE
avg 2017.


ODGOVORNI PROJEKTANT/ RESPONSIBLE
DESIGNER
LJ. PETKOVIĆ d.i.g.

PROJEKTANTI SARADNO/ ASSOCIATE DESIGNERS
A. POSARAC d.i.g./ T. MITROVIĆ d.i.g.

RAZMERA/SCALE
1:75

BROJ CRTEŽA/
NUMBER OF
DRAWING
10






Program Evropske Unije
CARDS i IPA Program za
Zapadni Balkan Podrška
infrastrukturnim
projektima
u zemljama Zapadnog
Balkana
WB10-SER-SOC-01
The European Union's
CARDS Programme and
IPA Programme for
the Western Balkans
Infrastructure Projects
Facility in the Western
Balkans

PD GATE d.o.o. + re:a.c.t

INVESTITOR / CLIENT
GRAD KRALJEVO / CITY OF KRALJEVO

OBJEKAT / LOCATION / OBJECT AND LOCATION
STAMBENI OBJEKAT 2
II FAZA PROJEKTA URBANE REGENERACIJE
NASELJA U DOSITEJEVOJ ULICI U KRALJEVO

OZNAKA PROJEKTA / CODE OF THE PROJECT
2 - PROJEKAT KONSTRUKCIJE /
2 - STRUCTURAL DESIGN

POTPIS / SIGNATURE


ODGOVORNI PROJEKTANT / RESPONSIBLE
DESIGNER
LJ. PETKOVIĆ d.i.g.

PROJEKTANTI SARADNO / ASSOCIATE DESIGNERS
A. POSARAC d.i.g. / T. MITROVIĆ d.i.g.

CRTEŽ / DRAWING
OSNOVA SEDMOG SPRATA - POS 800+
SEVENTH FLOOR PLAN

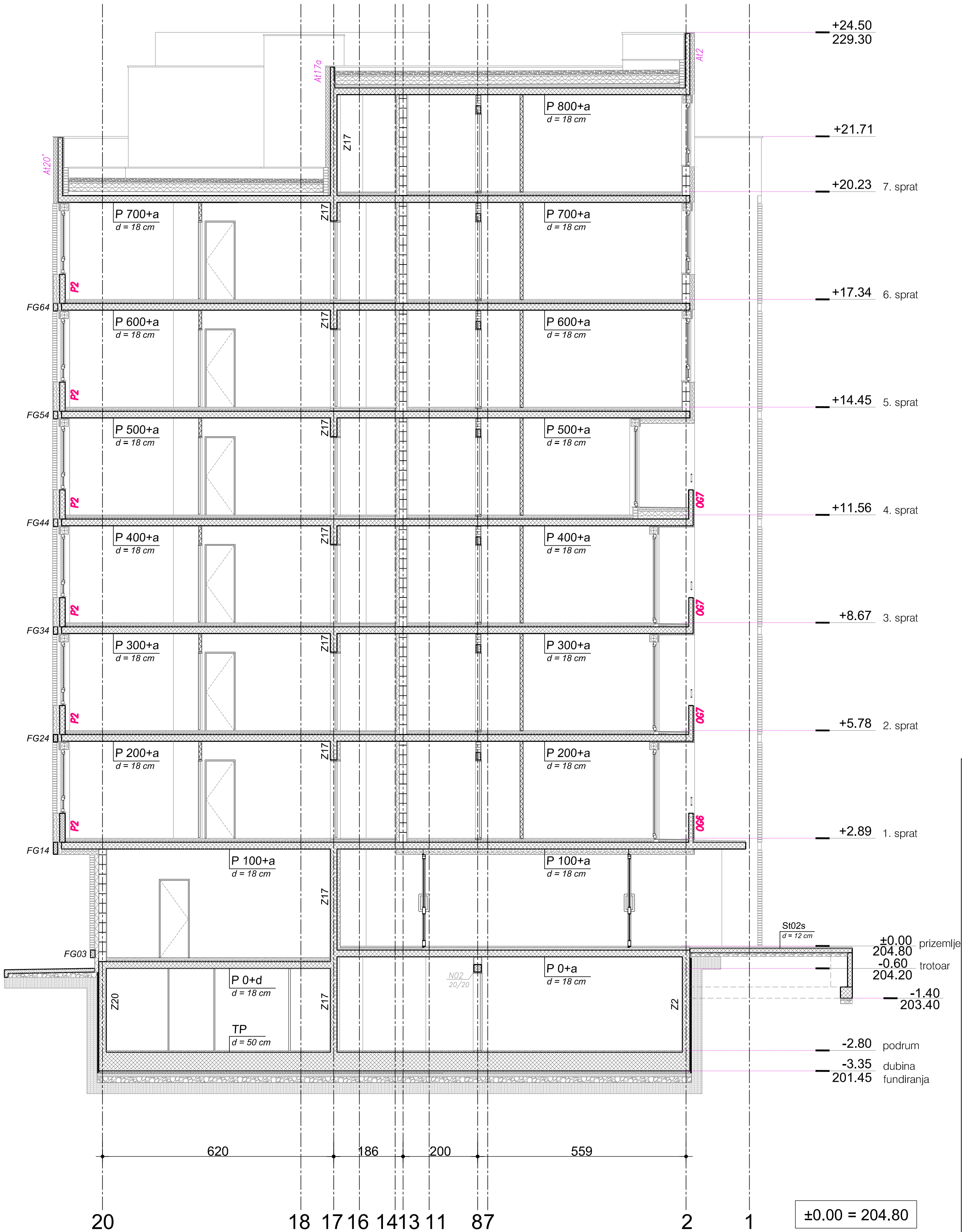
VISTA / VIEW
OSNOVA
PZI


BROJ PROJEKTA / NUMBER OF PROJECT
184

DATUM / DATE
avg 2017.

RAZMERA / SCALE
1:75

BROJ CRTEŽA / NUMBER OF
DRAWING
11





Program Evropske Unije
CARDS i IPA Program za
Zapadni Balkan Podrška
projektnim
u zemljama Zapadnog
Balkana
WB10-SER-SOC-01
This European Union's
CARDS Programme and
IPA Programme for
the Western Balkans
Facility in the Western
Balkans

PD GATE d.o.o. + re:a.c.t.

INVESTITOR / CLIENT
GRAD KRALJEVO / CITY OF KRALJEVO

OBJEKT / LOCATION / OBJECT AND LOCATION
STAMBENI OBJEKTAT 2
II FAZA PROJEKTA URBANE REGENERACIJE
NASELJA U DOSITEJEVOJ ULICI U KRALJEVO

OBJEKTAT / LOCATION / OBJECT AND LOCATION
STAMBENI OBJEKTAT 2
II FAZA PROJEKTA URBANE REGENERACIJE
NASELJA U DOSITEJEVOJ ULICI U KRALJEVO

POTPIS / SIGNATURE
LJ. PETKOVIC d.i.g.
licenca br. 310 3679 03
PROJEKTANT SARADNIK / ASSOCIATE DESIGNERS
A. POŠARAC d.i.g. / T. MITROVIC d.i.g.

PROJEKTANT / RESPONSIBLE DESIGNER
LJ. PETKOVIC d.i.g.
licenca br. 310 3679 03
PROJEKTANT SARADNIK / ASSOCIATE DESIGNERS
A. POŠARAC d.i.g. / T. MITROVIC d.i.g.

PROJEKTANT / RESPONSIBLE DESIGNER
LJ. PETKOVIC d.i.g.
licenca br. 310 3679 03
PROJEKTANT SARADNIK / ASSOCIATE DESIGNERS
A. POŠARAC d.i.g. / T. MITROVIC d.i.g.

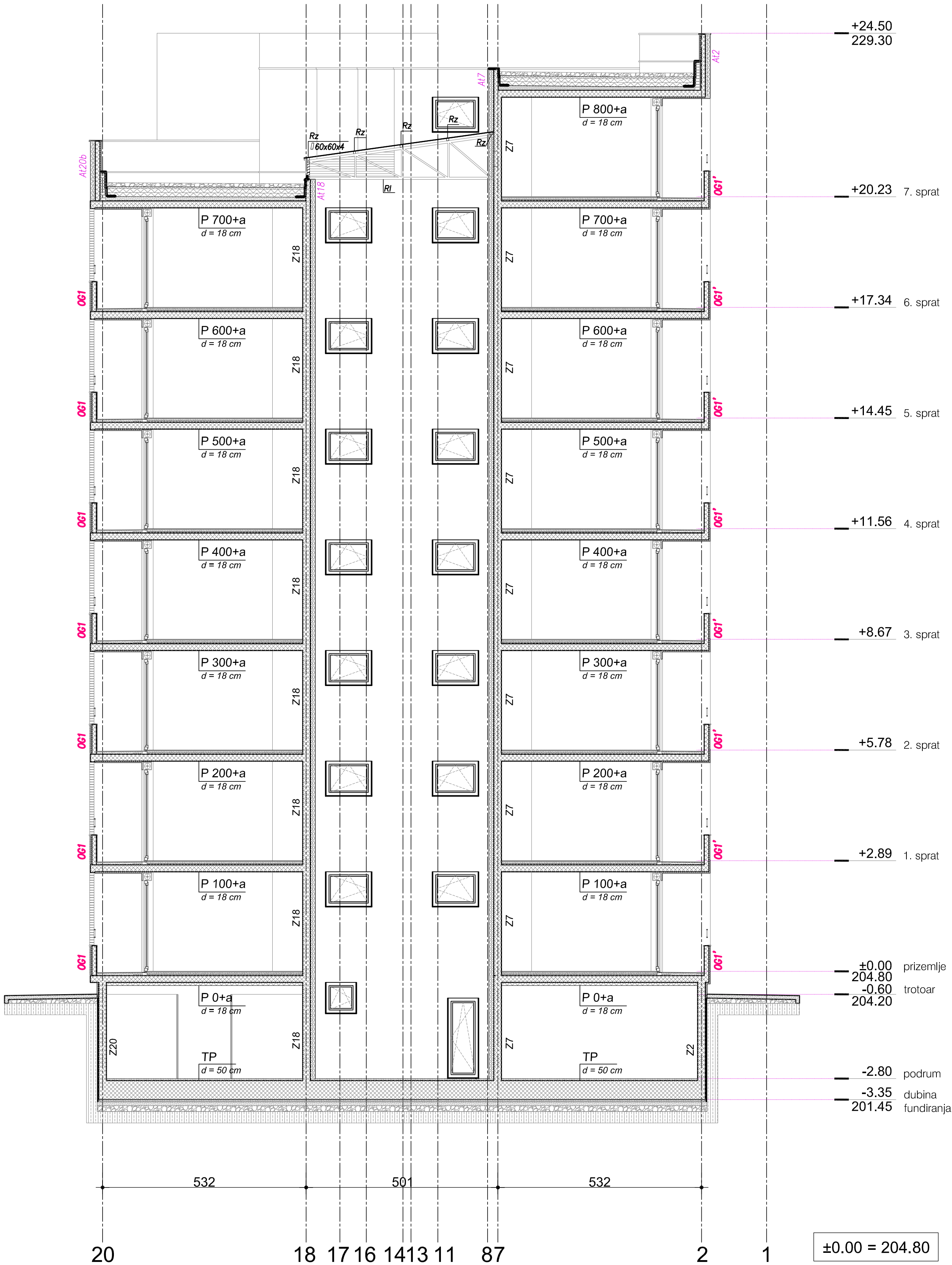
PRESEK 1-1
SECTION 1-1

VRSTA TEHNIČKE DOKUMENTACIJE / TYPE OF DOCUMENTATION
PZI

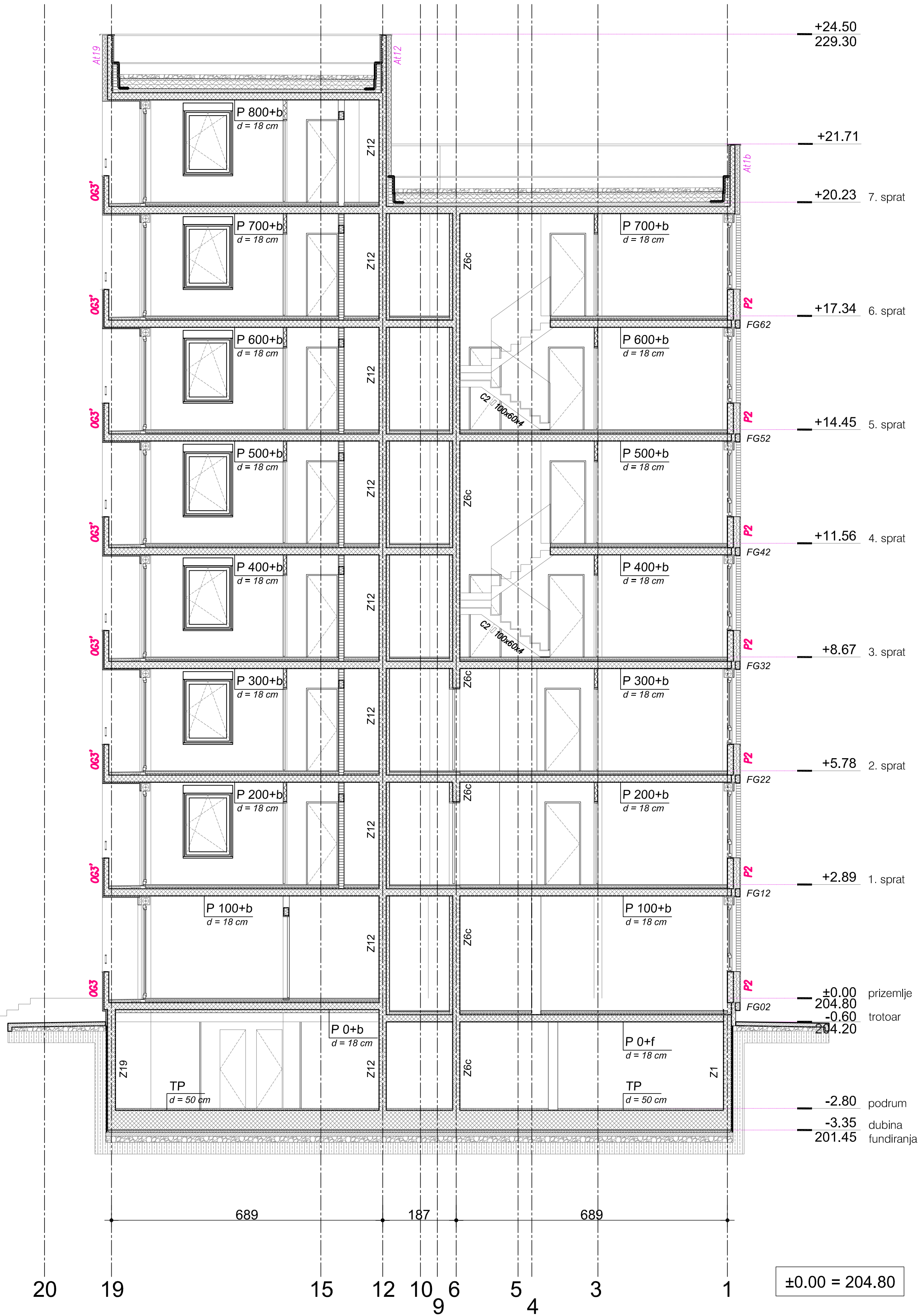
BROJ CRTEŽA / NUMBER OF DRAWING
184


DATAUM/DATE
avg 2017.

BROJ DOKUMENTACIJE / NUMBER OF PROJECT
12



Program Evropske Unije za regionalni razvoj Zapadni Balkan Infrastruktura Projektna inicijativa Balkan WB10-SER-SOC-01		The European Union's ERDF Programme and ERDF Programme for the Western Balkans Infrastructure Projects Facility in the Western Balkans	
PD GATE d.o.o. + re:a.c.t.		PRESEK 3 - 3 SECTION 3 - 3	
INVESTITOR / CLIENT GRAD KRALJEVO / CITY of KRALJEVO		CITEZ / DRAWING 1:75	
OBJEKAT / LOCATION STAMBENI OBJEKAT 2		BROJ CRTEZA / DRAWING NUMBER 14	
II Faza projekta urbane regeneracije NASELJA U DOSITEJEVOJ ULICI U KRALJEVO		BROJ PROJEKTA / NUMBER OF PROJECT 184	
OZNAKA PROJEKTA / CODE OF THE PROJECT 2 - PROJEKAT KONSTRUKCIJE / 2 - STRUCTURAL DESIGN		DATUM / DATE avg 2017.	
PROJEKTOVANJE / RESPONSIBLE DESIGNER LJ. PETKOVIĆ d.i.g.		VISTA TEHNIČKE DOKUMENTACIJE / TYPE OF DOCUMENTATION PZI	
PROJEKTOVANJE / ASSOCIATE DESIGNERS A. POŠARAC d.i.g. / T. MITROVIĆ d.i.g.		VISTA TEHNIČKE DOKUMENTACIJE / TYPE OF DOCUMENTATION PZI	
MONT MACDONALD IPF CONSORTIUM		VISTA TEHNIČKE DOKUMENTACIJE / TYPE OF DOCUMENTATION PZI	
WBIF		VISTA TEHNIČKE DOKUMENTACIJE / TYPE OF DOCUMENTATION PZI	





Program Evropske Unije
CARDS i IPA Program za
Zapadni Balkan Podrška
projektnim
u zemljama Zapadnog
Balkana
WB10-SER-SOC-01


This European Union's
CARDS Programme and
IPA Programme for
the Western Balkans
Facility in the Western
Balkans

PD GATE d.o.o. + re:a.c.t.

INVESTITOR / CLIENT
GRAD KRALJEVO / CITY OF KRALJEVO

OBJEKAT / LOCATION / OBJECT AND LOCATION
STAMBENI OBJEKAT 2
II FAZA PROJEKTA URBANE REGENERACIJE
NASELJA U DOSITEJEVOJ ULICI U KRALJEVO

OZNAKA PROJEKTA / CODE OF THE PROJECT
2 - PROJEKAT KONSTRUKCIJE /
2 - STRUCTURAL DESIGN

POTPIS / SIGNATURE


ODGOVORNI PROJEKTANT / RESPONSIBLE DESIGNER
LJ. PETKOVIĆ d.i.g.
licenca br. 310 3679 03

PROJEKTANT SARADNIK / ASSOCIATE DESIGNERS
A. POŠARAC d.i.g. / T. MITROVIĆ d.i.g.

CRTEŽ / DRAWING
PRESEK 4 - 4
SECTION 4 - 4

VRSTA TEHNIČKE DOKUMENTACIJE / TYPE OF DOCUMENTATION
PZI

POTPREDSJEDNIK / PF CONSORTIUM
Mot MacDonald

PROJEKTANT / RESPONSIBLE DESIGNER
LJ. PETKOVIĆ d.i.g.
licenca br. 310 3679 03

PROJEKTANT SARADNIK / ASSOCIATE DESIGNERS
A. POŠARAC d.i.g. / T. MITROVIĆ d.i.g.

RAZMERA / SCALE
1:75

BROJ CRTEŽA / NUMBER OF DRAWING
15

BROJ PROJEKTA / NUMBER OF PROJECT
184

DATUM / DATE
avg 2017.

