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3.1 NASLOVNA STRAN S KLJUČNIMI PODATKI O NAČRTU

3 – NAČRT GRADBENIH KONSTRUKCIJ

INVESTITOR:	***OBČINA POSTOJNA*** ***Ljubljanska cesta 4, 6230 POSTOJNA***
OBJEKT:	***REKONSTRUKCIJA IN DOZIDAVA OSNOVNE ŠOLE ANTONA GLOBOČNIKA V POSTOJNI***
VRSTA PROJEKTNE DOKUMENTACIJE:	**PROJEKT ZA PRIDOBITEV GRADBENEGA DOVOLJENJA - PGD**
ZA GRADNJO:	***NOVA GRADNJA***
PROJEKTANT:	**STATICON IB, d.o.o.** **Lokarjev drevored 1, 5270 Ajdovščina**
Odgovorna oseba projektanta:	**BOGOMIR IPAVEC, univ.dipl.inž.grad.** ..... *podpis:* *žig podjetja.*
ODGOVORNI PROJEKTANT:	**BOGOMIR IPAVEC, univ.dipl.inž.grad.** **G – 0250** ..... *podpis:* *osebni žig.*
ŠTEVILKA NAČRTA:	**436/2018**
KRAJ IN DATUM IZDELAVE :	**AJDOVŠČINA, junij 2018**
	IZTOK N. ČANČULA univ.dipl.inž.arh. **A – 0251** ..... *podpis:* *osebni žig.*

ŠT. IZVODA	1	2	3	4	5	6	A

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3/1.2 KAZALO VSEBINE NAČRTA št. 436/2018

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3/1.3 IZJAVA ODGOVORNEGA PROJEKTANTA NAČRTA V PROJEKTU ZA PRIDOBITEV GRADBENEGA DOVOLJENJA

Odgovorni projektant

Bogomir IPAVEC, univ. dipl. inž. grad.
(ime in priimek)

I Z J A V L J A M,

1. da je **NAČRT GRADBENIH KONSTRUKCIJ** skladen s prostorskim aktom,
2. da je ta načrt skladen z gradbenimi predpisi,
3. da je ta načrt skladen s projektnimi pogoji oziroma soglasji za priključitev,
4. da so bile pri izdelavi načrta upoštevane vse ustrezne bistvene zahteve in da je načrt izdelan tako, da bo gradnja, izvedena v skladu z njim, zanesljiva,
5. da so v načrtu upoštevane zahteve elaboratov.

436/2018
(št. načrta)

Ajdovščina, junij 2018
(kraj in datum)

Bogomir IPAVEC, univ. dipl. inž. grad.

G-0250

.....
(ime in priimek,osebni žig, podpis)

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3/1.4 TEHNIČNI DEL

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3/1.4.1 TEHNIČNO POROČILO

TEHNIČNO POROČILO

objekt: REKONSTRUKCIJA IN DOZIDAVA OSNOVNE ŠOLE ANTONA GLOBOČNIKA V POSTOJNI

Ajdovščina, junij 2018

TEHNIČNO POROČILO

1 SPLOŠNI OPIS

Investitor Občina Postojna namerava v Postojni ob stavbi obstoječe osnovne šole zgraditi novdel šolskega objekta V načrtu gradbenih konstrukcij so obravnavane gradbene konstrukcije za omenjeni objekt. Objekt je nad višinsko koto ±0.0 m sestavljen iz pritličja in ene etaže (P+1) ter pod koto ±0.0 m pa je samo poglobitev za dvigalni jašek. Objekt je konstrukcijsko zasnovan kot armiranobetonska monolitna konstrukcija. Temeljenje objekta je izvedeno kot globoko temeljenje na uvrtanih pilotih premera 80cm, preko katero je izveden sistem povezanih gred in taln eplošče preko gred, tako da se celotno obtežba prenaša na pilote.

Horizontalne dimenzije med zunanjimi osmi objekta so 62.80 m × 32.40 m. Celotni gabariti (vključena fasada) objekta nad koto ±0.0 m so 63.35 m × 32.82 m. Višinske kote etaž objekta so: ±0.0 m (pritličje), +4.14 m (1. nadstropje), +4.89 m (del nadstropja - oder), in 7.14 m (streha). Višinska kota atike je +7.49m. Vertikalna komunikacija v objektu poteka v armiranobetonskem jedru s pomočjo dvoramnih stopnic z vmesnimi podesti ter enojnega dvigala.

2 NOSILNA KONSTRUKCIJA

Nosilna konstrukcija je sestavljena s strešne in etažnih armiranobetonskih monolitnih plošč (v območju AB jedra), strešne iarmiranobetonskih klasično izvedenih sten,

Povzetek geološkega poročila:
Širša lokacija je tipično kraško področje, z hribinsko osnovo iz apnenca, ki jo pokriva kraška glina. Globina podlage je generalno zelo razgibana. Na sami lokaciji je globina med 4 do 8 m. Objekti v bližini, ki niso temeljeni do hribine imajo manjše ali večje poškodbe zaradi neenakomernega posedanja. Področje je skoraj ravno na koti ≈ +540.5 m NMV (+-0.30m). V času raziskav je bil na površju terena delno umetni nasip iz sosednjega gradbišča, delno pa tanka plast humusa. Pod humusom in nasipom (N) debeline cca 1m se nahaja plast zaglinjenega melja z gruščem premera (ML/CL) do 3 cm, ki mu sledi bolj peščena plast s koščki preperelega peščenjaka in apnenca (SM/SC). Na globinah od 4 do 7.5 m se pojavi preperina apnenca (P), ki je tipično debela do 0.5m in preide v apneno hribinsko podlago (H).

Objekt bi se zaradi neenakomerne sestave tal v primeru plitvega temeljenja posedel, zato
ga e potrebno temeljiti na pilotih.

Pomiki globoko temeljenega objekta bodo zanemarljivo majhni.

Pilota naj bodo uvrtani, izvedeni vsaj 1.5 m v hribinsko podlago iz apnenca.
V dnu izkopa se na 50% pilotov se izvede SPT test.

Dimenzije nosilnih elementov:

element		dimenzije/debelina
AB piloti	Vsi piloti	Premer 80cm
AB stebri	V oseh G in F	25/25cm
AB nosilci	V temeljni plošči	100/80cm
	V oseh G in F	25/50cm
	V oseh 11 in 13	25/70cm
AB stene	Vse stene	25cm
AB plošče	temeljna plošča	20 cm
	stropna plošča na pritličjem	22 cm
	strešna plošča	20 cm
	podesti	20 cm
	stopnice	20 cm

Karakteristike uporabljenih materialov:

element		beton	armatura
AB piloti	Vsi piloti	C 30/37 XC1, Cl 0.2, D_{max}=16 mm	S 500B
AB stebri	V oseh G in F	C 30/37 XC1, Cl 0.2, D_{max}=16 mm	S 500B
AB nosilci	V temeljni plošči	C 30/37 XC1; Cl 0.2, D_{max}=16 mm	S 500B
	V oseh G in F	C 30/37 XC1; Cl 0.2, D_{max}=16 mm	S 500B
	V oseh 11 in 13	C 30/37 XC1; Cl 0.2, D_{max}=16 mm	S 500B
AB stene	Vse stene	C 25/30 XC1; Cl 0.2, D_{max}=16 mm	S 500B ali MA 500/560
AB plošče	temeljna plošča	C 30/37 XC4; XD3; PV-II; Cl 0.2, D_{max}=16 mm	S 500B ali MA 500/560
	stropna plošča na pritličjem	C 30/37 XC1; Cl 0.2, D_{max}=16 mm	S 500B ali MA 500/560
	strešna plošča	C 30/37 XC1; Cl 0.2, D_{max}=16 mm	S 500B ali MA 500/560
	podesti	C 30/37 XC1; Cl 0.2, D_{max}=16 mm	S 500B ali MA 500/560
	stopnice	C 25/30 XC1; Cl 0.2, D_{max}=16 mm	S 500B ali MA 500/560

3 ANALIZA ZUNANJIH VPLIVOV

1 Vpliv lastne teže

Za vse konstrukcijske elemente je lastna teža v izračunu upoštevana avtomatsko (računalniški program *Tower*) s prostorninsko težo armiranega betona $\gamma_{bet} = 25$ **kN/m^3**.

2 Vpliv stalne teže

1.1 Strešna plošča – ravna nepogodna streha

Zaščitni sloji – membranska folija 0.5 cm	= 0.20 kN/m^2
zaščita HI - XPS 10 cm	= 0.18 kN/m^2
hidroizolacija 0.5 cm	
toplotna izolacija - EPS 16 cm	= 0.25 kN/m^2
paroizenačevalni sloj in parna zapora 0.5 cm	
AB plošča 20 cm *(lastna teža konstr. je računana posebej)*	
Inštalacije in spuščen strop	= 0.30 kN/m^2
	g = 0.93 kN/m^2

1.2 Strešna plošča – nadstreški

Zaščitni sloj – membranska folija 0.5 cm	= 0.20 kN/m^2
Naklonski beton	= 2.00 kN/m^2
AB plošča 20 cm *(lastna teža konstr. je računana posebej)*	
	g = 2.20 kN/m^2

1.3 Tipična etažna plošča – učilnice

predelne stene	= 0.50 kN/m^2
finalni tlak (keramika 15 mm , guma …) 1.5-2 cm	= 0.40 kN/m^2
lepilo in izravnalna masa	
armiran cementni estrih 7 cm	= 1.75 kN/m^2
akustična folija 1 cm	= 0.10 kN/m^2
AB plošča 22 cm *(lastna teža konstr. je računana posebej)*	
Inštalacije in spuščen strop	= 0.30 kN/m^2
	g = 3.05 kN/m^2

1.4 Temeljna plošča

predelne stene	= 0.20 kN/m^2
finalni tlak keramika 15 mm , guma …) 1.5-2 cm	= 0.40 kN/m^2
lepilo in izravnalna masa	
armiran cementni estrih 7 cm	= 1.75 kN/m^2
AB plošča 40 cm*(lastna teža konstr. je računana posebej)*	
	g = 2.35 kN/m^2

1.5 Stopnice in podesti

a.) stopnice

betonska stopnica	= 2.00 kN/m^2
	g = 2.0 kN/m^2

b.) podesti

predelne stene	= 0.50 kN/m^2
finalni tlak (keramika 15 mm , parket 20 mm) 1.5-2 cm	= 0.40 kN/m^2

lepilo in izravnalna masa	
armiran cementni estrih 8 cm	= 1.90 kN/m^2
PE folija	
penjeni polietilen 5 cm	= 0.20 kN/m^2
AB plošča 20 cm *(lastna teža konstr. je računana posebej)*	
inštalacije	= 0.50 kN/m^2
	g = 3.5 kN/m^2

3 Spremenljivi vplivi (koristna obtežba)

1.6 Strešna plošča

nepohodna streha (kategorija H) **q = 0.40 kN/m^2**

1.7 Tipična etažna plošča

Učilnice (kategorija C1)	**q = 3.0 kN/m^2**
Knjižnica (kategorija C2)	**q = 4.0 kN/m^2**
avla, glavni vhod, glavne stopnice s podesti (kategorija C3)	**q = 5.0 kN/m2**

1.8 Plošča nad piloti

celotna površina **q = 3.0 kN/m^2**

1.9 Stopnice in podesti

q = 3.5 kN/m^2

4 Zemeljski pritiski (pritisk na dvigalni jašek)

Predpostavljene lastnosti temeljnih tal:

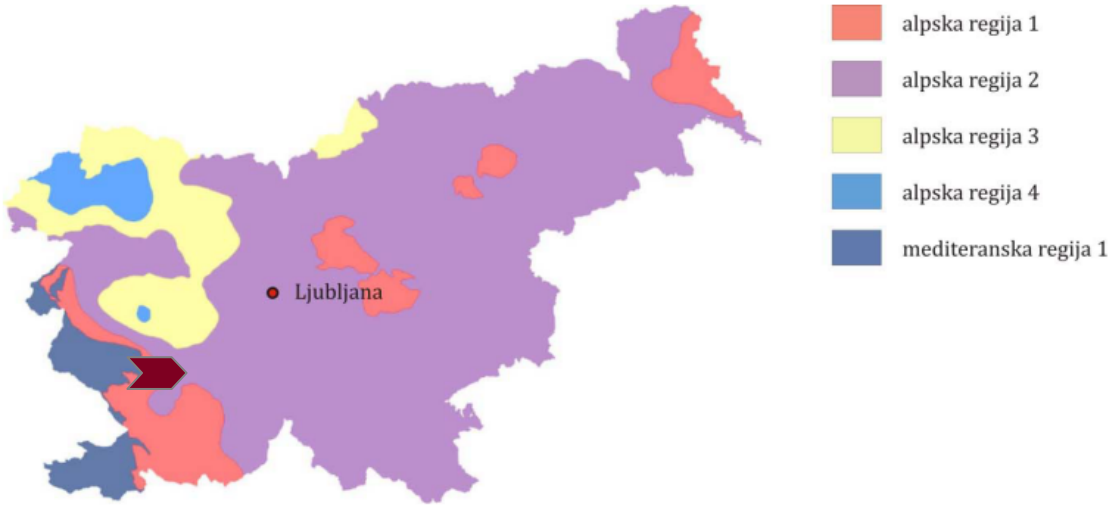
- **φ_{zem} = 32°**
- **γ_{zem} = 22.0 kN/m^3** (nenasičena zemljina)

Koeficient mirnega zemeljskega pritiska: **K_m =** 1-sin(φ_{zem}) = 1-sin(32°) = **0.47**

a.) Zemeljski pritiski brez podtalne vode *(samo horizonalni pritiski)*:

$H_{ref,0}$=0.0 m *(kota zunanje ureditve)*	: 22.0×0.47×0.0	= 0.0 kN/m^2
$H_{ref,1}$=-1.40 m *(sp. rob temeljne plošče)*	: 22.0×0.47×1.40	= 14.47 kN/m^2

5 Vplivi snega

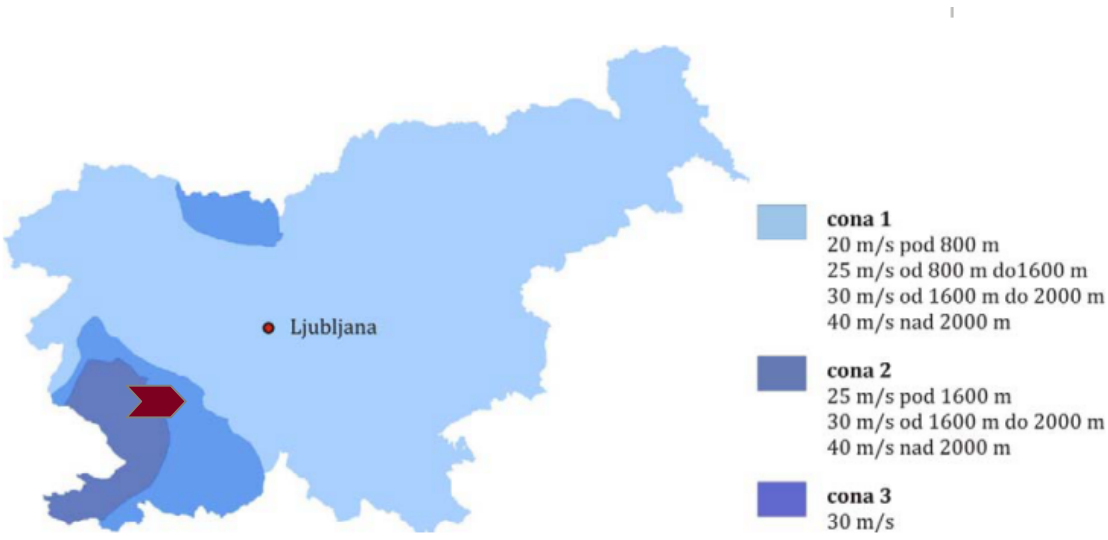


Slika 1: Regije za določitev obtežbe zaradi snega

Lokacija – Postojna: A2, nadmorska višina: A=450 m, $s_k = 1.293[1+(A/728)^2]$
ravna streha → $\mu_1 = 1.0$,
koef. izpostavljenosti: $C_e = 0.80$
toplotni koeficient: $C_t = 1.0$,
$s_k = 0.289\ [1+(106/425)2] = 1.79$ kN/m2

$\mathbf{q_s = \mu_1 \times C_e \times C_t \times s_k = 1.0 \times 1.0 \times 0.80 \times 1.79 = 1.43\ kN/m^2}$

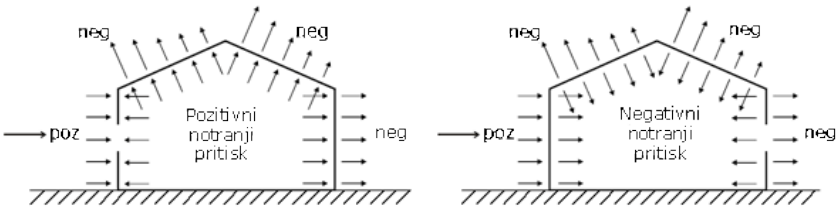
6 Vplivi vetra



Slika 2: Cone za določitev obtežbe zaradi vetra

$\mathbf{q_w} = q_{ref} \times c_d \times c_e(z_e) \times c_{pe} = 0.563 \times 1.0 \times 2.35 \times c_{pe} = \mathbf{1.323 \times c_{p,?}}$

$q_{ref} = 0.5 \times \rho \times v_{ref}^2 = 0.5 \times 1.25 \times 30^2 = 0.563$ kN/m^2
$\rho = 1.25$ kg/m^3
$v_{ref} = c_{DIR} \times c_{TEM} \times c_{ALT} \times v_{ref,0} = 30$ m/s
$c_{DIR} = c_{TEM} = c_{ALT} = 1.0$
$v_{ref,0} = 25$ m/s (cona 2, Postojna)
c_e ($z_e \approx 8$ m, II. kategorija terena) ≈ 2.35
$c_d = 1.0$ (dinamični koeficient)
$\mu = 0.75$ (razmerje med površinami odprtin – enakomerna razporeditev)



1.10 Horizontalna

a.) koeficienti pritiskov za privetrno stran objekta

zunanji pritisk: $c_{pe} = +0.8$
notranji pritisk: c_{pi} (μ=0.75)= -0.25
najbolj neugodna komb.: $c_{p,net}$=0.8+0.25=1.05

b.) koeficienti pritiskov za zavetrno stran objekta

zunanji pritisk: $c_{pe} = -0.3$
notranji pritisk: c_{pi} (μ=0.75)= -0.25
neugodna komb.: $c_{p,net}$=(-0.3)+(-0.25)=-0.55

c.) koeficienti pritiskov na steno objekta, ki leži v ravnini vzporedno s smerjo delovanja vetra:

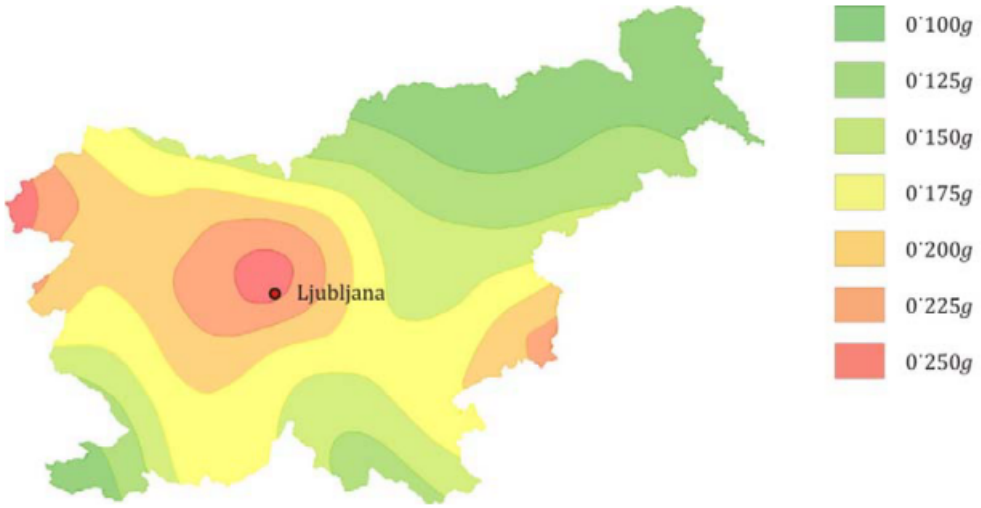
zunanji pritisk: $c_{pe} = -0.8$

7 Potresni vplivi

Račun učinkov potresnih vplivov na konstrukcijo je izveden s pomočjo modalne analize s projektnim spektrom odziva (projektni spekter tipa 1 po EC8) v obeh horizontalnih smereh. Vplivi različnih nihajnih oblik so kombinirani s pomočjo CQC metode, pri čemer vsota efektivnih modalnih mas znaša več kot 90% celotne mase konstrukcije (upoštevanih je bilo 21 nihajnih oblik). Učinki potresnih vplivov zaradi kombinacije horizontalnih komponent potresne obremenitve so bili izračunani po principu E_{Edx}"+"$0.3E_{Edy}$ oz. $0.3E_{Edx}$"+"E_{Edy}. Masa, ki je bila upoštevana v modalni analizi, je bila določena po receptu: $1.0 \times G_{lastna}$ "+" $1.0 \times Gs_{talna}$ "+" $0.30 \times Q_{koristna,streha}$ "+" $0.15 \times Q_{koristna,ostale\ etaže}$. V primeru računa globalnega modela z modalno analizo s projektnim spektrom odziva je bila upoštevana polovična upogibna togost za vse vertikalne elemente modela (stebri, stene) in glavne nosilce. Upoštevan je bil tudi vpliv slučajne torzije skladno s standardom EC8.

Lastnosti projektnega spektra po EC8:

- proj. pospešek tem. tal (Postojna): **0.200 g**
- kvaliteta temeljnih tal: **C**
- faktor obnašanja konstrukcije (DCM): **q = 3.0**



Slika 3: Karta projektnih pospeškov temeljnih tal za povratno dobo 475 let

4 ZAKLJUČNE OPOMBE

V statičnih izračunih je bila obtežba upoštevana po slovenskih standardih SIST EN 1991-1-X:2004/2005 (EC1) in SIST EN 1998-1:2005 (EC8). Dimenzioniranje AB elementov je izvedeno skladno s slovensko-evropskimi standardi: SIST EN 1992-1-1:2005 (EC2) in SIST EN 1998-1:2005 (EC8) za armiranobetonske elemente. V statičnem izračunu so bili upoštevani naslednji vplivi: vpliv lastne in stalne teže, spremenljivi vplivi (koristna obtežba), zemeljski pritiski na zunanje jaška, vpliv snega (cona: A2, nadmorska višina: 450 m – Postojna), vplivi vetra, potresni vplivi. Za potresno analizo (modalna analiza s projektnim spektrom odziva) je bil uporabljen projektni spekter tipa 1 po EC8, kvaliteta tem. tal C, projektnim pospeškom temeljnih tal 0.200 g in faktorjem obnašanja q = 3.0 (stenasta konstrukcija, DCM). Za statično analizo z obtežbo vetra so bile upoštevane naslednje karakteristike po SIST EN 1991-1-4: temeljna vrednost osnovne hitrosti vetra $v_{b,0}$ = 25 m/s (cona 2) in II. kategorija terena.

Investitor je med gradnjo objekta dolžan zagotoviti strokovni nadzor in kontrolo izdelave z vsemi ustreznimi meritvami vgrajenega materiala po veljavnih predpisih in standardih.

Pred izvedbo posameznih elementov objekta je treba obvezno uskladiti gradbene in instalacijske načrte, da se izdela vse potrebne odprtine in preboje.

Izdelavo betonskih delov konstrukcije je potrebno izvesti v skladu s SIST EN 13670. Pri geometrijski natančnosti je poleg SIST EN 1090 potrebno upoštevati arhitekturne zahteve.

V primeru kakršnih koli odstopanj, ki so navedene v tem projektu. se je potrebno predhodno posvetovati z odgovornim projektantom gradbenih konstrukcij.

Kontrole horizontalnih pomikov globalnega modela:

Maksimalni horizontalni pomiki se pojavijo v primeru potresnih vplivov.

Maksimalni pomik celotne se izračuna s pomočjo izračunanega elastičnega pomika modela in redukcijskega faktorja obnašanja za potresne vplive $q = 3.0$, po formuli $u_{X,Y} = u_{X,Y,el} \times q$.

	elastični pomik v posamezni smeri	dejanski pomik v posamezni smeri	kombiniran pomik v obeh smereh
maks. pomik v X smeri	0.34 cm	1.02 cm	1.90 cm
prip. pomik v Y smeri	0.19 cm	0.57 cm	
maks. pomik v Y smeri	0.23 cm	0.69cm	0.76cm
prip. pomik v X smeri	0.11cm	0.33 cm	
maks. kombiniran pomik v obeh smereh (D_{max})			**1.90cm**

* kombiniran pomik v obeh smereh se izračuna s pomočjo korena vsote kvadratov $\sqrt{u_X^2 + u_Y^2}$ posameznega maksimalnega pomika v obravnavani horizontalni smeri in pripadajočega pomika v drugi pravokotni horizontalni smeri

Maksimalni relativni pomik za celoten objakt (globalni zamik preko vseh etaž; n = 2) znaša:

H = 10.50 m
D_{max} = 1.90 cm
$\Delta_{max,tot} = D_{max}/H = 1.90 / 1050 =$ **0.0018 = 0.18% = 1/552**

Če predpostavimo, da prirastki horizontalnih pomikov naraščajo linearno po višini stolpnice, lahko izračunamo oceno maksimalnega etažnega zamika zaradi projektnih potresnih vplivov po spodnjih izrazih.

<u>Kontrola omejitve etažnih pomikov za nekonstrukcijske elemente iz krhkih materialov (EC8, poglavje 4.4.3.2):</u>

h_{et} = 4.00 m ... etažna višina ostalih nadstropij
n = 2 ... število etaž
ν = 0.5 ... redukcijski faktor

$\Delta_{max,et2\text{-}12} = (D_{max}/n)/h_{et} = 1.90/2/400 =$ **<u>0.0023</u>** < $0.005/\nu = 0.005/0.5 =$ **<u>0.01</u>** ✓

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3/1.4.2 STATIČNI RAČUN

Item: obtežba snega in vetra

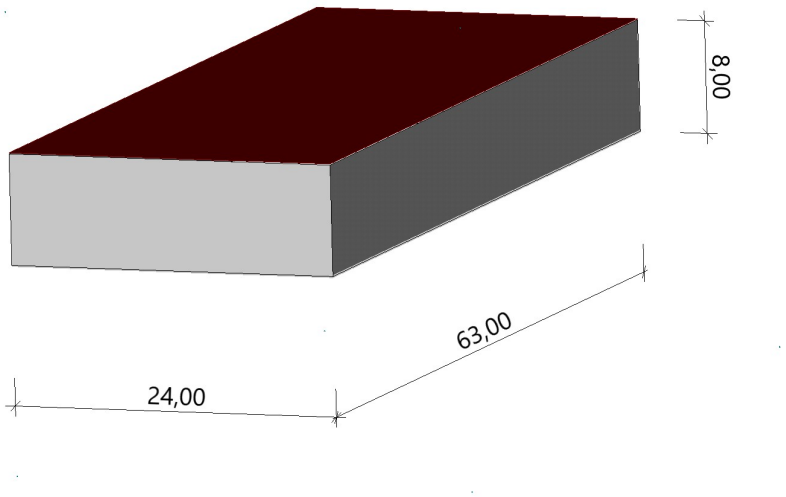
Wind and Snow Loads LWS 02/2017 (Frilo R-2017-2/P11)

TERRAIN			
Terrain height	H<S..	=	450.0 m

BASICVALUES			
climatic region		=	Alpine Region
Snow zone		=	2
Snow load at ground	s_k	=	**1.79 kN/m2**
Basic wind pressure	$q_{b,0}$	=	0.00 kN/m2
Basic wind velocity	$v_{b,0}$	=	25.00 m/s
Terrain		=	category II

BUILDING - flat roof						
height	h_f	=	8.00 m			
Width of building	l_x	=	24.00 m			
length of building	l_y	=	63.00 m			
with **flat roof**						
Overhang left,right	o_{le}	=	0.00 m	o_{ri}	=	0.00 m
front,behind	o_1	=	0.00 m	o_2	=	0.00 m
Roof width/-length	d_x	=	24.00 m	d_y	=	63.00 m

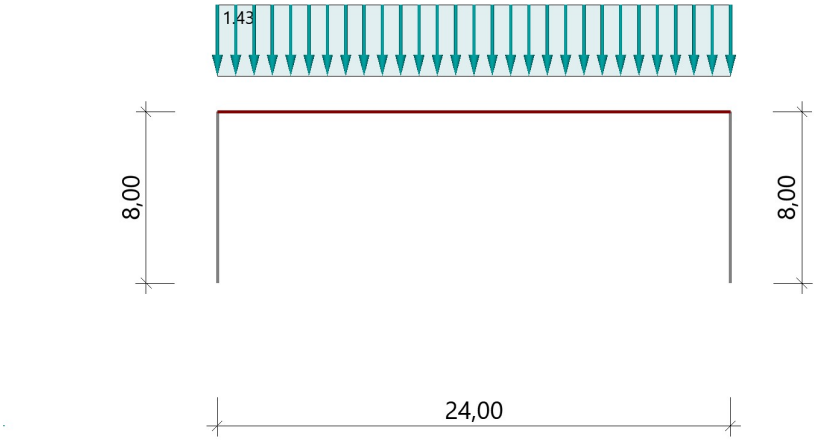
Scale 1 : 500



LOAD BASIC VALUES			
acc.toEN 1991-1-3:2010-12, EN 1991-1-4:2010-12			
Snow load at ground	s_k	=	**1.79 kN/m2**
Reference height	z_e	=	8.00 m
Wind pressure	q_p	=	**0.86 kN/m2**
Wind pressure	$q_{p,90}$	=	**0.86 kN/m2**

SNOWLOADS

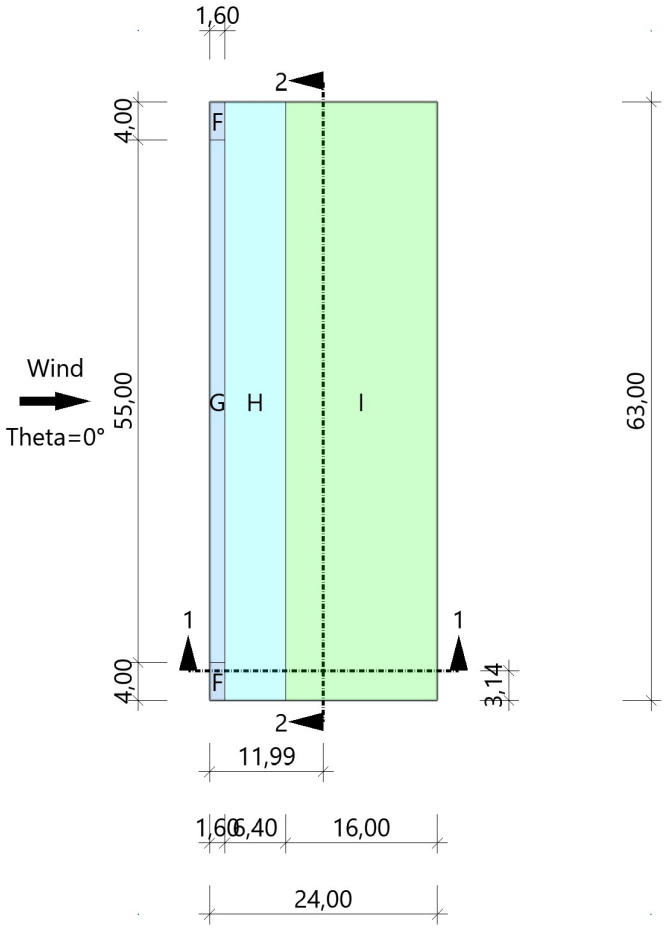
Scale 1 : 333



μ	s_i [kN/m2]	$S_{e,le}$ [kN/m]	$S_{e,ri}$ [kN/m]
0.80	1.43		

External wind pressure by wind blowing direction Θ =0 degree

Scale 1 : 750

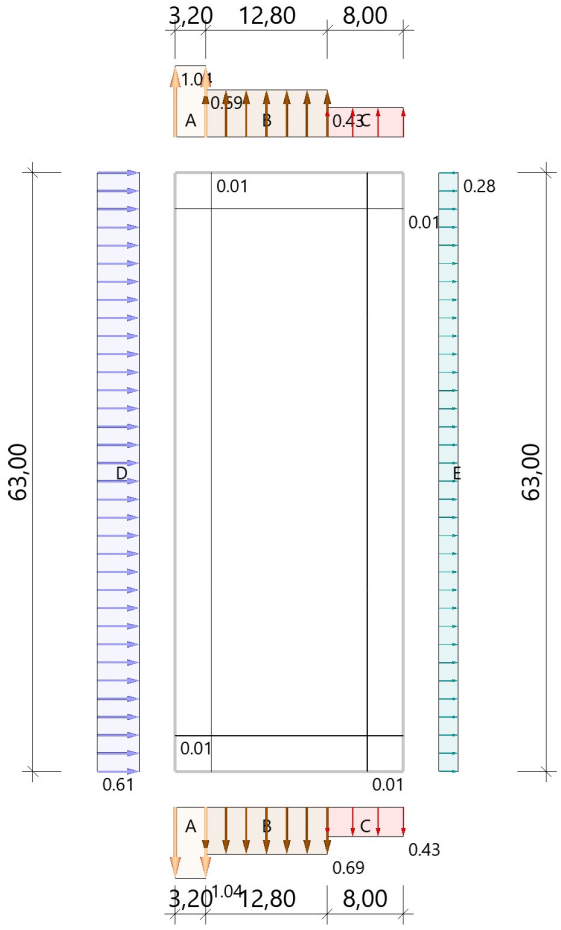


effect. width [m]

e	e/10	e/4	e/2
16.00	1.60	4.00	8.00

area	member	$c_{pe,10}$	$c_{pe,1}$	$c_{pe,x}$	$w_{e,10}$ [kN/m2]	$w_{e,1}$ [kN/m2]	$w_{e,x}$ [kN/m2]
F		-1.80	-2.50		-1.56	-2.16	
G		-1.20	-2.00		-1.04	-1.73	
H		-0.70	-1.20		-0.60	-1.04	
I		0.20	0.20		0.17	0.17	
		-0.20	-0.20		-0.17	-0.17	

External wind pressure on walls by wind blowing direction Θ =0 degree
Scale 1 : 750



effect. width [m]

e	e/5	l_A	l_B	l_C	h/d	e/d
16.00	3.20	3.20	12.80	8.00	0.33	0.67

area	h [m]	q [kN/m2]	$c_{pe,10}$	$c_{pe,1}$	$c_{pe,x}$	$w_{e,10}$ [kN/m2]	$w_{e,1}$ [kN/m2]	$w_{e,x}$ [kN/m2]
A		0.86	-1.20	-1.40		-1.04	-1.21	
B		0.86	-0.80	-1.10		-0.69	-0.95	
C		0.86	-0.50	-0.50		-0.43	-0.43	
D		0.86	0.71	1.00		0.61	0.86	
E		0.86	-0.32	-0.32		-0.28	-0.28	

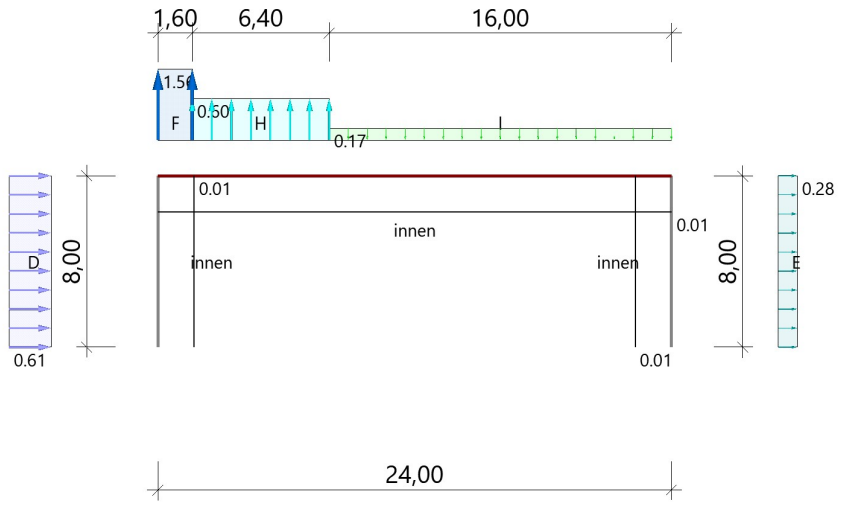
for completely closed buildings
provided that max 1 wall contains holes > 30%.
ΔA_{li}=0.1%, ΔA_{re}=0.1%, ΔA_{ob}=0.1%, ΔA_{un}=0.1%

δ_{li}=0.568, δ_{re}=0.568, δ_{ob}=0.160, δ_{un}=0.160
Keine dominante Seite vorhanden.

Θ [degree]	μ	$c_{p,e}$	$c_{p,i}$	w_i [kN/m2]
0	0.64		-0.01	-0.01

wind load in cross section by wind blowing direction Θ =0 degree

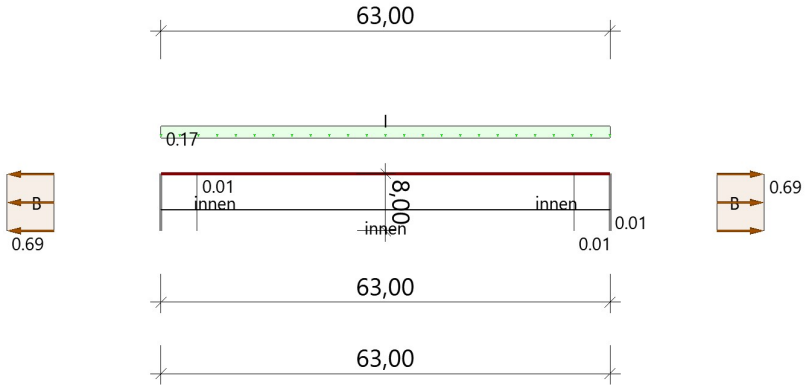
Scale 1 : 333



dy= 3.14 m

wind load in longitudinal section by wind blowing direction Θ =0 degree

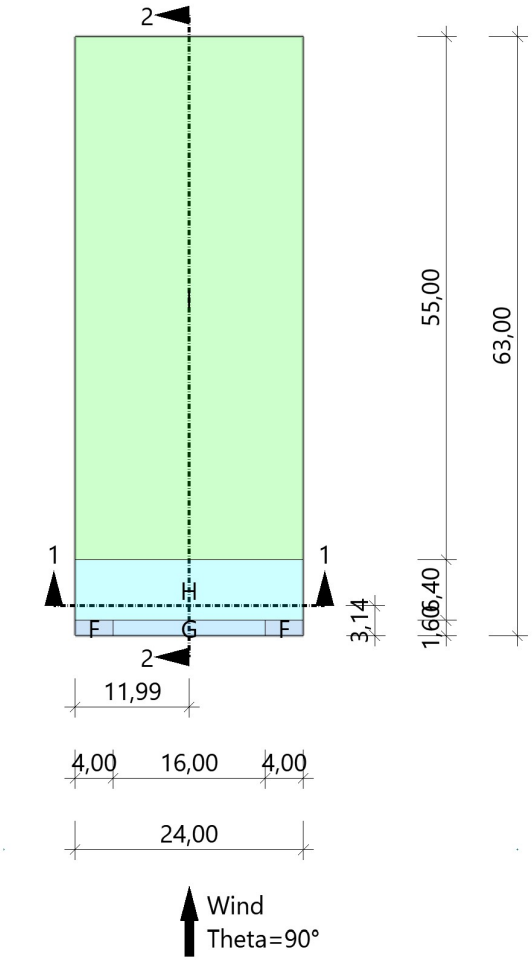
Scale 1 : 1000



dx= 11.99 m

External wind pressure by wind blowing direction Θ =90 degree

Scale 1 : 750

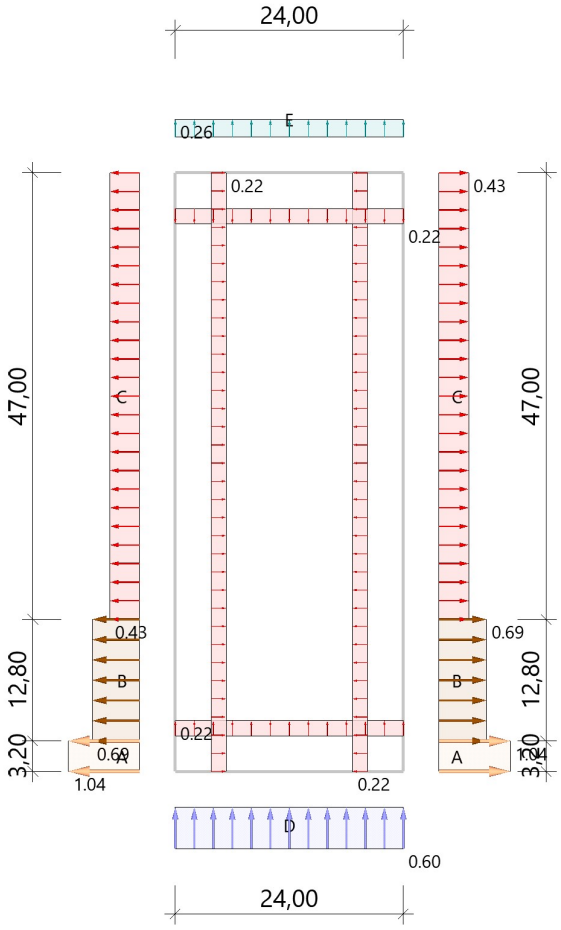


effect. width [m]

e	e/10	e/4	e/2
16.00	1.60	4.00	8.00

area	member	$c_{pe,10}$	$c_{pe,1}$	$c_{pe,x}$	$w_{e,10}$ [kN/m2]	$w_{e,1}$ [kN/m2]	$w_{e,x}$ [kN/m2]
F		-1.80	-2.50		-1.56	-2.16	
G		-1.20	-2.00		-1.04	-1.73	
H		-0.70	-1.20		-0.60	-1.04	
I		0.20	0.20		0.17	0.17	
		-0.20	-0.20		-0.17	-0.17	

External wind pressure on walls by wind blowing direction Θ =90 degree
Scale 1 : 750



effect. width [m]

e	e/5	l_A	l_B	l_C	h/d	e/d
16.00	3.20	3.20	12.80	47.00	0.13	0.25

area	h [m]	q [kN/m2]	$c_{pe,10}$	$c_{pe,1}$	$c_{pe,x}$	$w_{e,10}$ [kN/m2]	$w_{e,1}$ [kN/m2]	$w_{e,x}$ [kN/m2]
A		0.86	-1.20	-1.40		-1.04	-1.21	
B		0.86	-0.80	-1.10		-0.69	-0.95	
C		0.86	-0.50	-0.50		-0.43	-0.43	
D		0.86	0.70	1.00		0.60	0.86	
E		0.86	-0.30	-0.30		-0.26	-0.26	

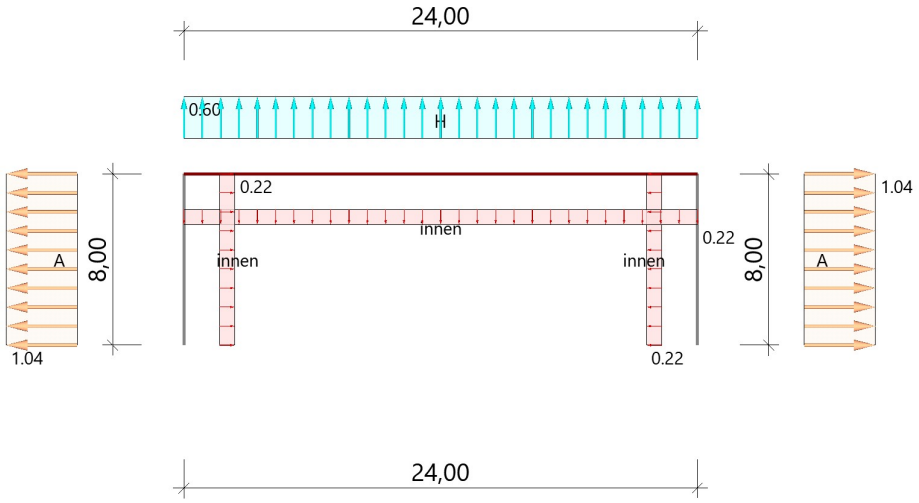
for completely closed buildings
provided that max 1 wall contains holes > 30%.
ΔA_{li}=0.1%, ΔA_{re}=0.1%, ΔA_{ob}=0.1%, ΔA_{un}=0.1%

δ_{li}=0.568, δ_{re}=0.568, δ_{ob}=0.160, δ_{un}=0.160
Keine dominante Seite vorhanden.

Θ [degree]	μ e]	$c_{p,e}$	$c_{p,i}$	w_i [kN/m2]
90	0.86		-0.26	-0.22

wind load in cross section by wind blowing direction Θ =90 degree

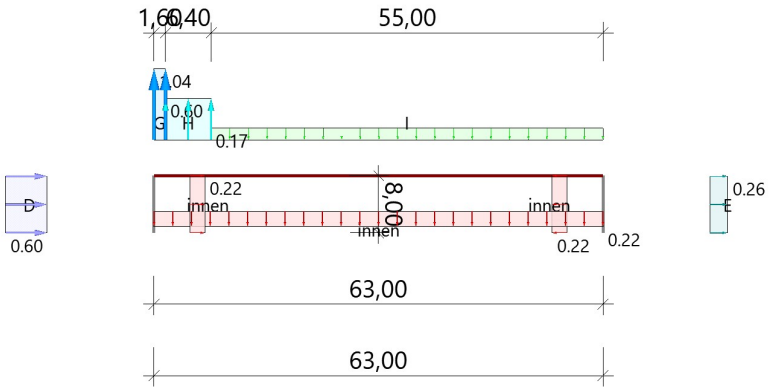
Scale 1 : 333



dy= 3.14 m

wind load in longitudinal section by wind blowing direction Θ =90 degree

Scale 1 : 1000



dx= 11.99 m

Vsebina

Osnovni podatki o modelu

Datoteka: model.twp
Datum preračuna:

Način preračuna: 3D model

☐ Teorija I-ga reda ☒ Modalna analiza ☐ Stabilnost

☐ Teorija II-ga reda ☐ Seizmični preračun ☐ Faze gradnje

☐ Nelinearen preračun

Velikost modela

Število vozlišč:	10695
Število ploskovnih elementov:	0
Število grednih elementov	0
Število robnih elementov	0
Število osnovnih obtežnih primerov:	10
Število kombinacij obtežb:	1

Enote mer

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

Vhodni podatki - Konstrukcija

Shema nivojev

Naziv	z [m]	h [m]
	10.50	3.00
	7.50	2.60
	4.90	0.90

Naziv	z [m]	h [m]
	4.00	4.00
	0.00	7.00
	-7.00	

Tabele materialov

No	Naziv materiala	E[kN/m2]	μ	γ[kN/m3]	αt[1/C]	Em[kN/m2]	μm
1	Beton C 30	2.750e+7	0.20	25.00	1.000e-5	2.750e+7	0.20
2	Beton C 25	2.583e+7	0.20	25.00	1.000e-5	2.583e+7	0.20
3	Beton MB 30	3.150e+7	0.20	25.00	1.000e-5	3.150e+7	0.20

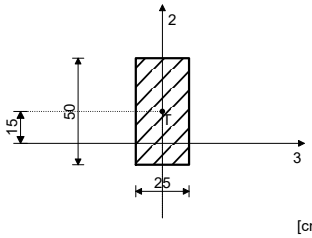
Seti plošč

No	d[m]	e[m]	Material	Tip preračuna	Ortotropija	E2[kN/m2]	G[kN/m2]	α
<1>	0.220	0.110	1	Tanka plošča	Izotropna			
<2>	0.200	0.100	1	Tanka plošča	Izotropna			
<3>	0.220	0.110	1	Tanka plošča	Izotropna			
<4>	0.250	0.125	2	Tanka plošča	Izotropna			
<5>	0.250	0.125	2	Tanka plošča	Izotropna			

Seti gred

Set: 1 Prerez: b/d=25/50, Fiktivna ekscentričnost

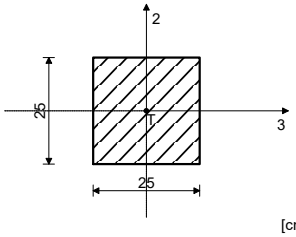
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton C 30	1.250e-1	1.042e-1	1.042e-1	1.788e-3	6.510e-4	2.604e-3



[cm]

Set: 3 Prerez: b/d=25/25, Fiktivna ekscentričnost

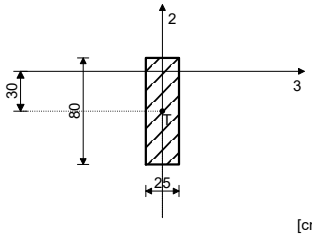
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton C 30	6.250e-2	5.208e-2	5.208e-2	5.501e-4	3.255e-4	3.255e-4



[cm]

Set: 4 Prerez: b/d=25/80, Fiktivna ekscentričnost

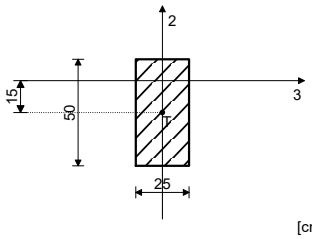
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton C 30	2.000e-1	1.667e-1	1.667e-1	3.347e-3	1.042e-3	1.067e-2



[cm]

Set: 5 Prerez: b/d=25/50, Fiktivna ekscentričnost

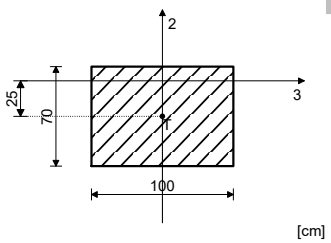
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton C 30	1.250e-1	1.042e-1	1.042e-1	1.788e-3	6.510e-4	2.604e-3



[cm]

Set: 6 Prerez: b/d=100/70, Fiktivna ekscentričnost

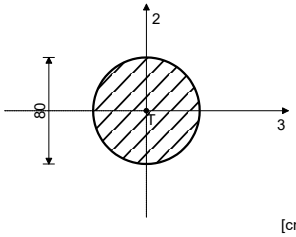
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton C 30	7.000e-1	5.833e-1	5.833e-1	6.492e-2	5.833e-2	2.858e-2



[cm]

Set: 7 Prerez: D=80, Fiktivna ekscentričnost

Mat.	A1	A2	A3	I1	I2	I3
3 - Beton MB 30	5.027e-1	4.524e-1	4.524e-1	4.021e-2	2.011e-2	2.011e-2



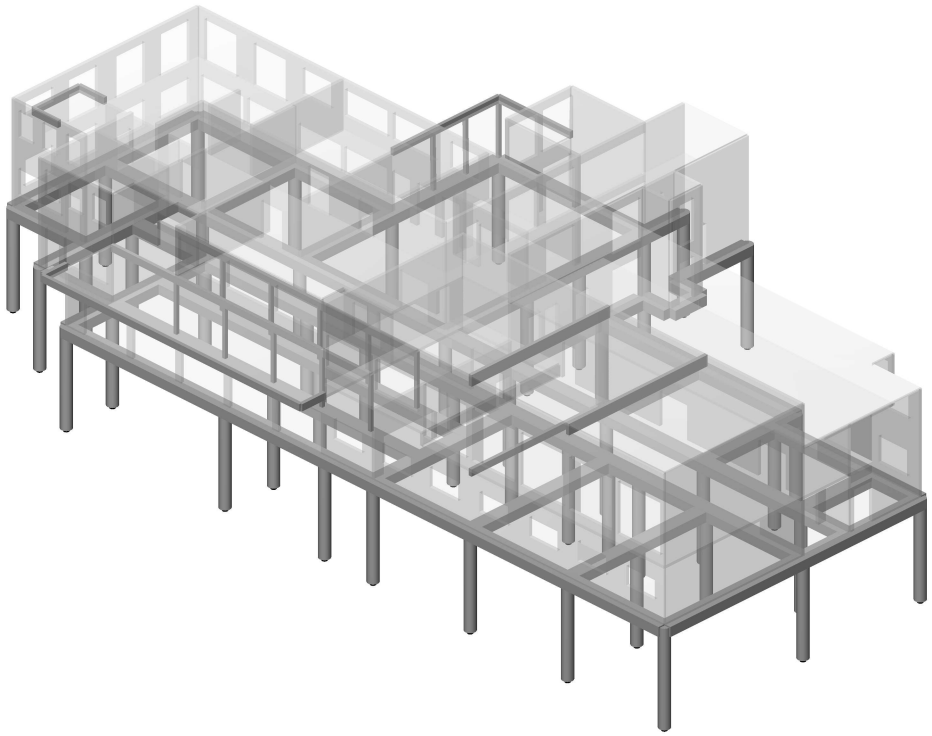
[cm]

Seti linijskih podpor

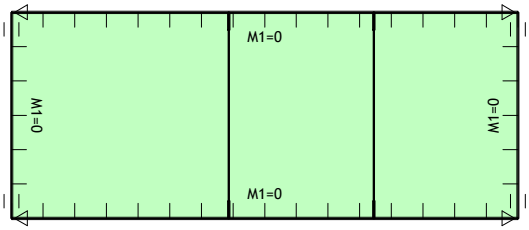
Set	K,R1	K,R2	K,R3	K,M1	Tla [m]
1	1.000e+0	7.000e+4	7.000e+4		0.800
2	1.000e+0	2.500e+4	2.500e+4		0.800

Seti točkovnih podpor

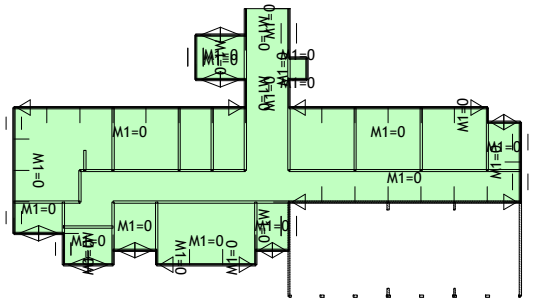
	K,R1	K,R2	K,R3	K,M1	K,M2	K,M3
1			1.000e+10			



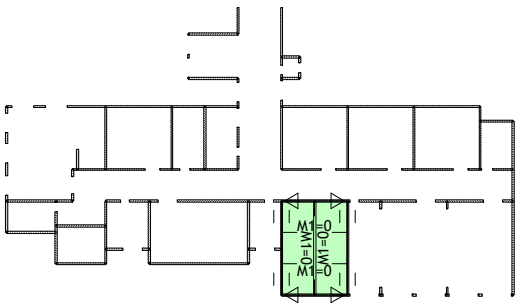
Izometrija



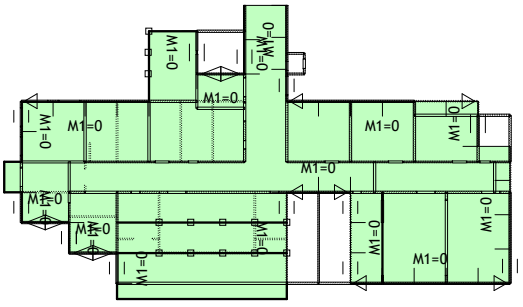
Nivo: [10.50 m]



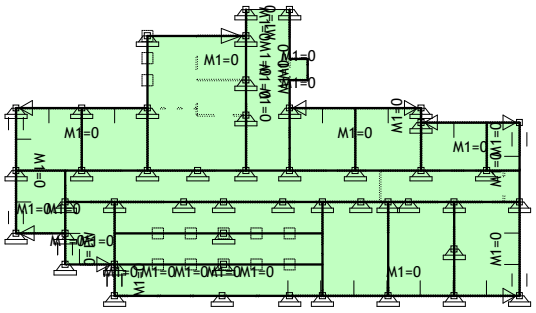
Nivo: [7.50 m]



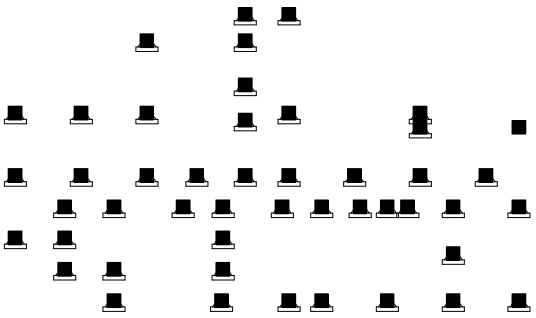
Nivo: [4.90 m]



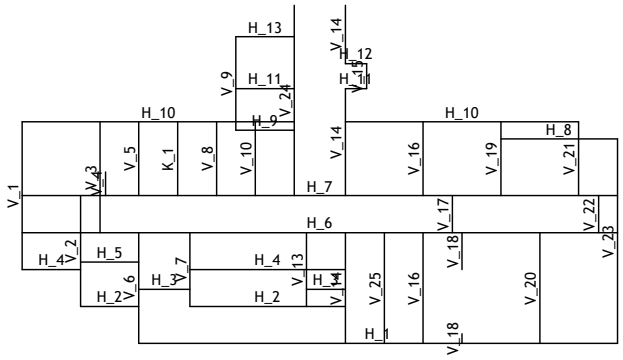
Nivo: [4.00 m]



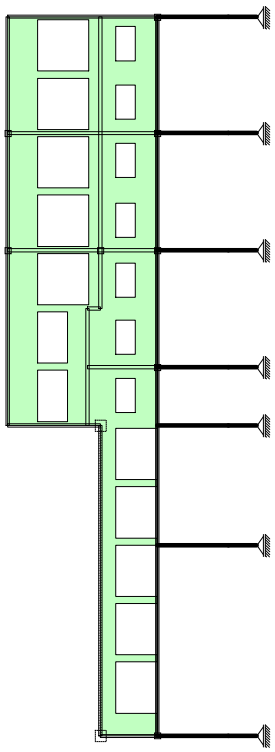
Nivo: [0.00 m]



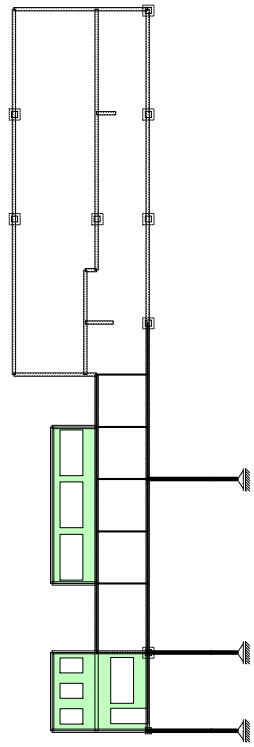
Nivo: [-7.00 m]



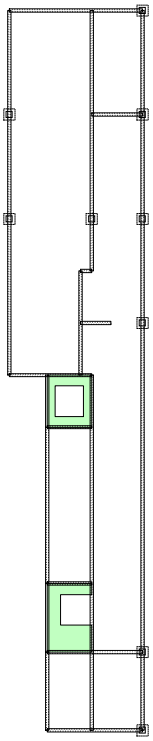
Dispozicija okvirjev



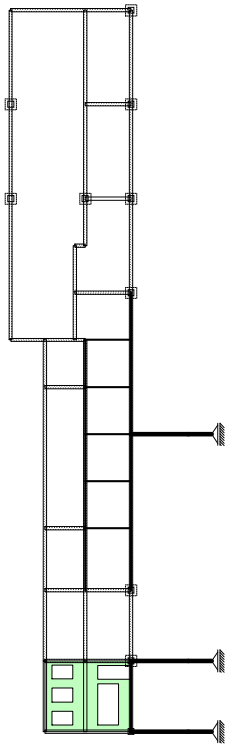
Okvir: H_1



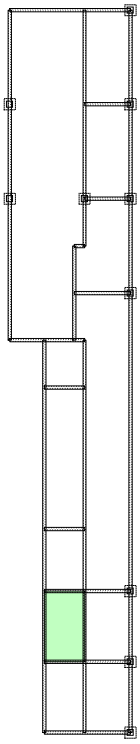
Okvir: H_2



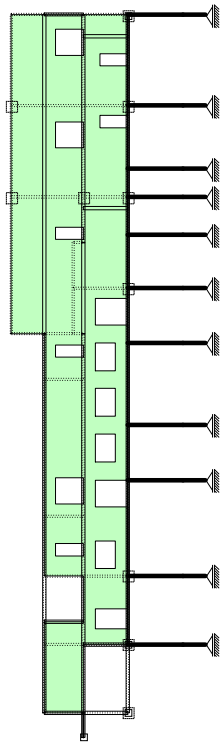
Okvir: H_3



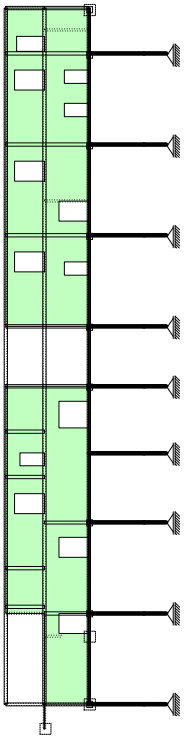
Okvir: H_4



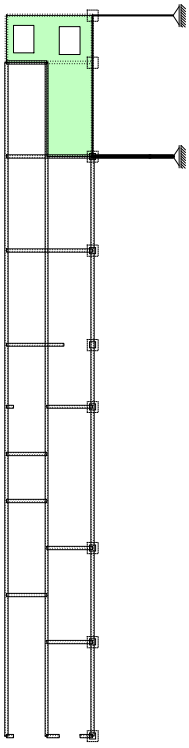
Okvir: H_5



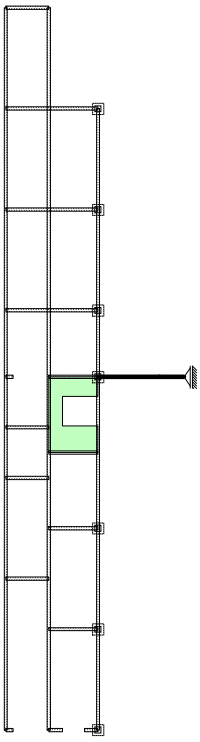
Okvir: H_6



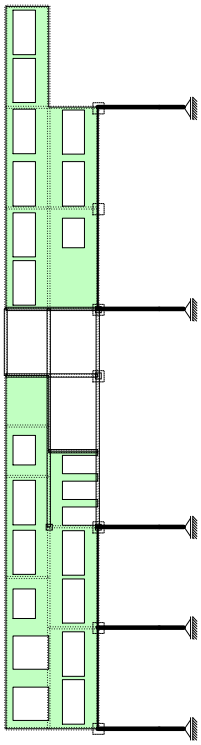
Okvir: H_7



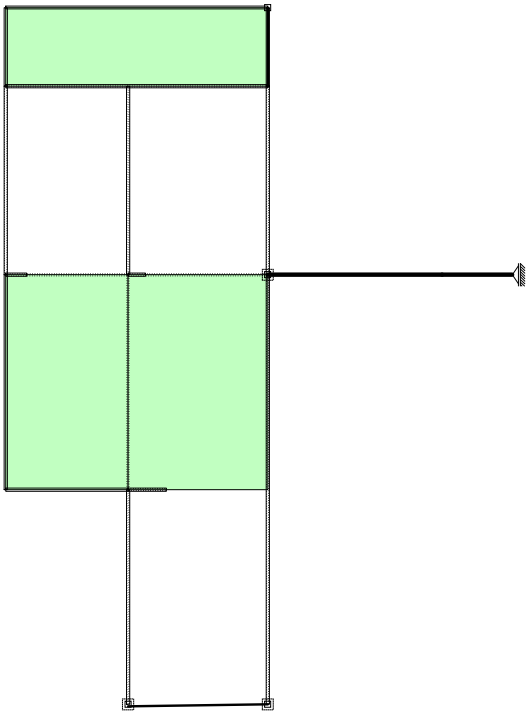
Okvir: H_8



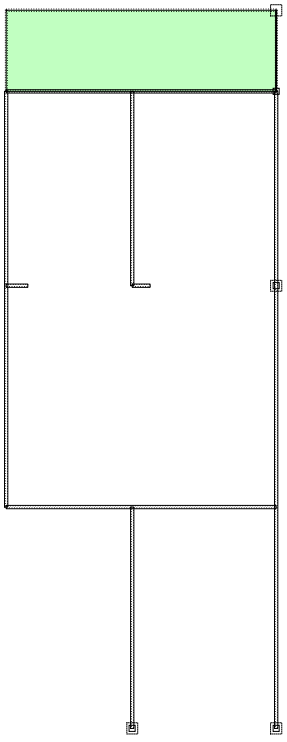
Okvir: H_9



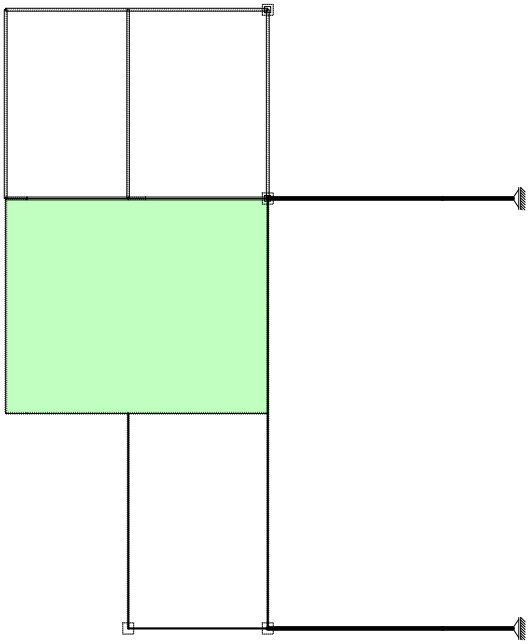
Okvir: H_10



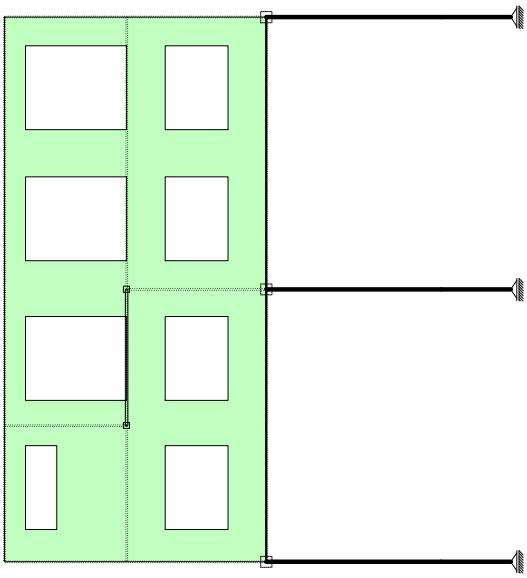
Okvir: H_11



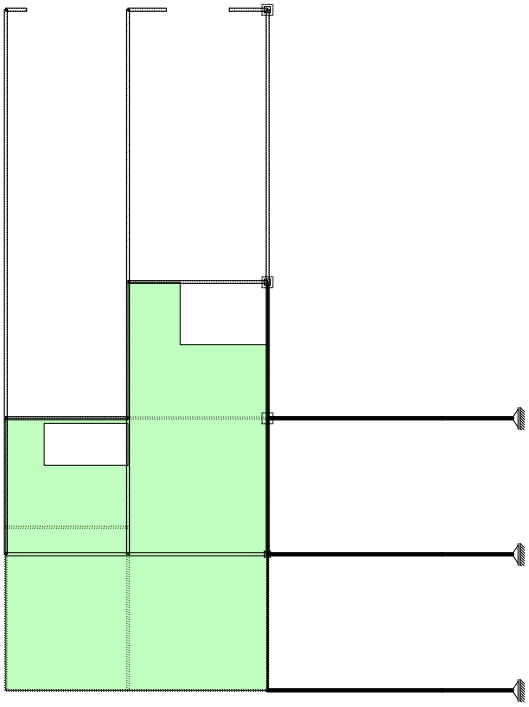
Okvir: H_12



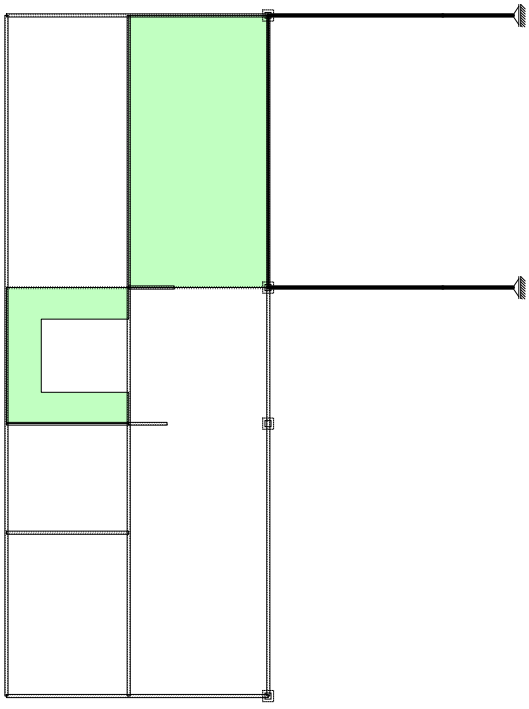
Okvir: H_13



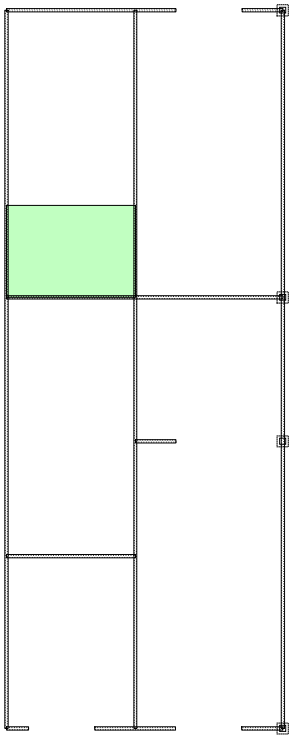
Okvir: V_1



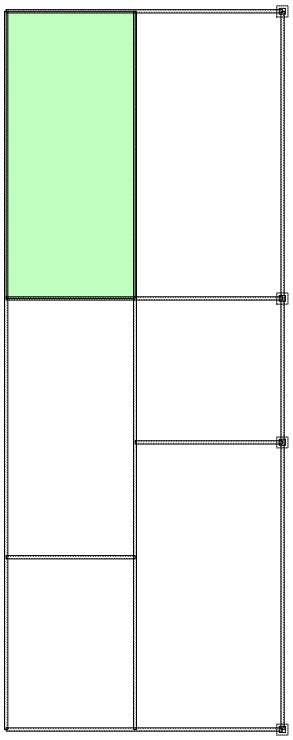
Okvir: V_2



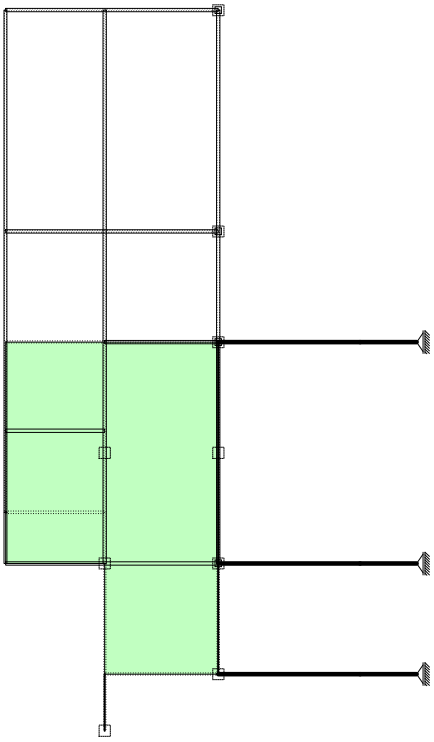
Okvir: V_3



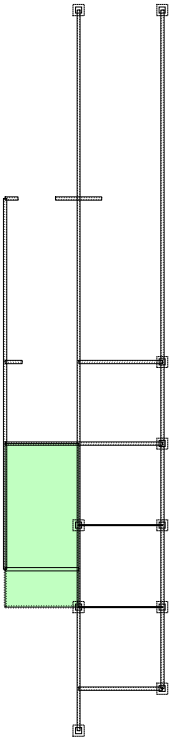
Okvir: V_4



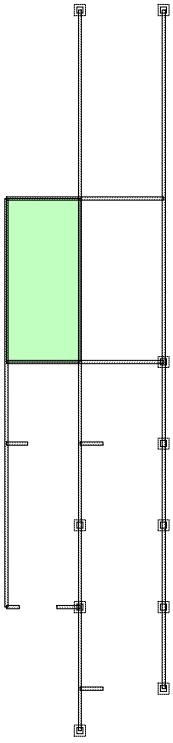
Okvir: V_5



Okvir: V_6



Okvir: V_7



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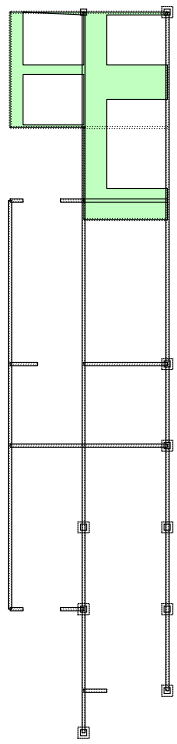

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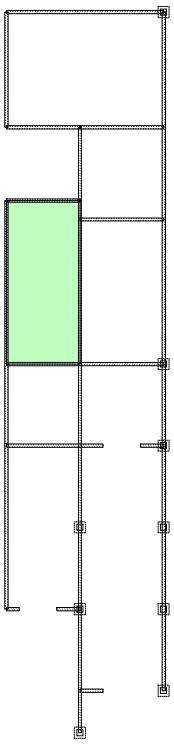

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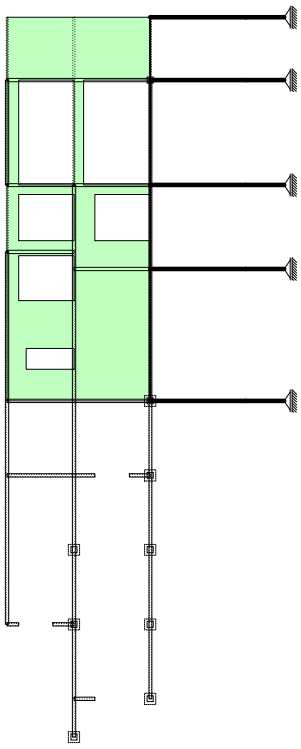

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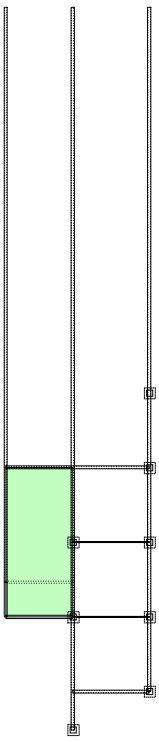

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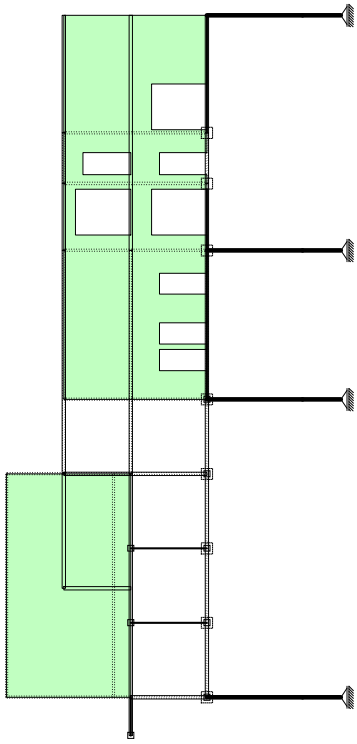
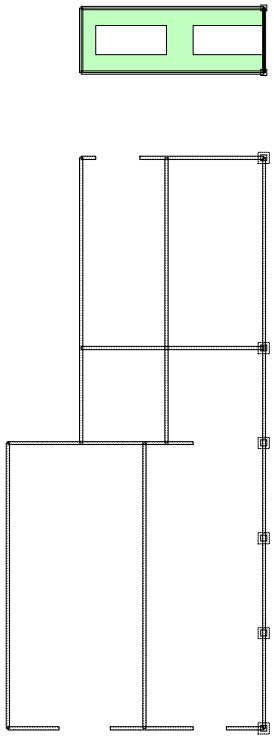
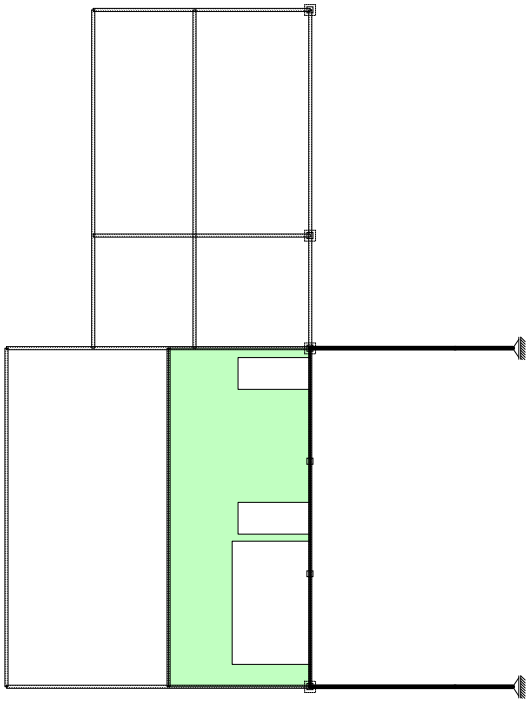


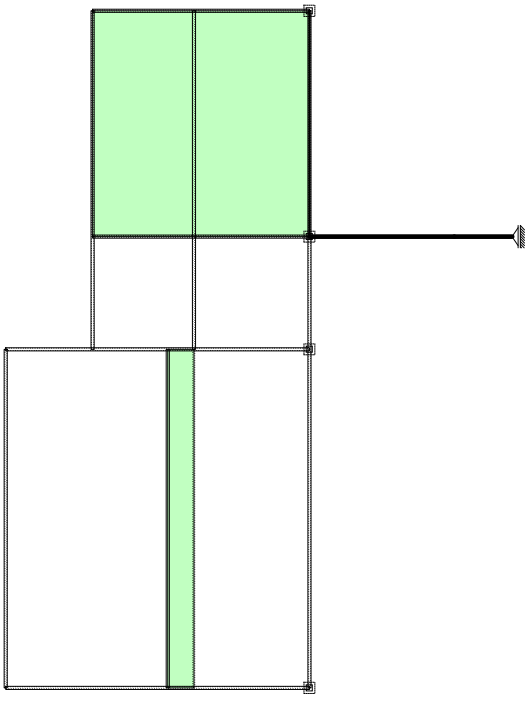
Okvir: V_14



Okvir: V_15



Okvir: V_25



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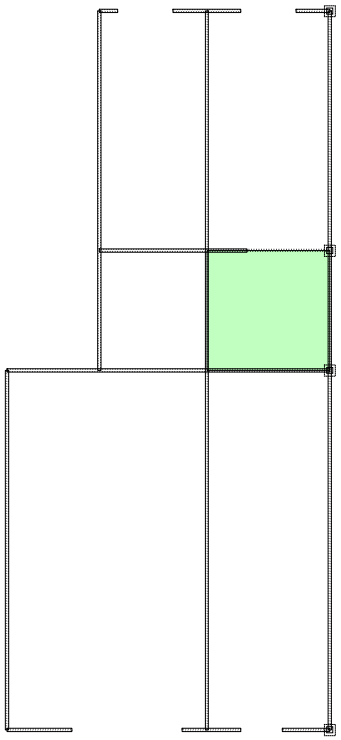
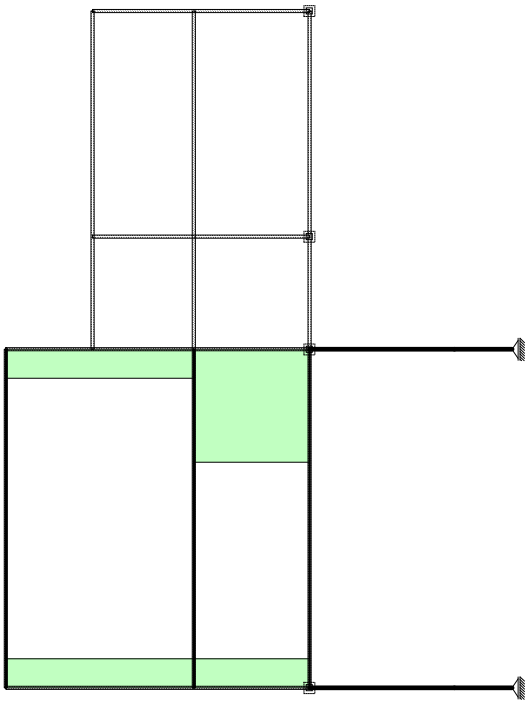
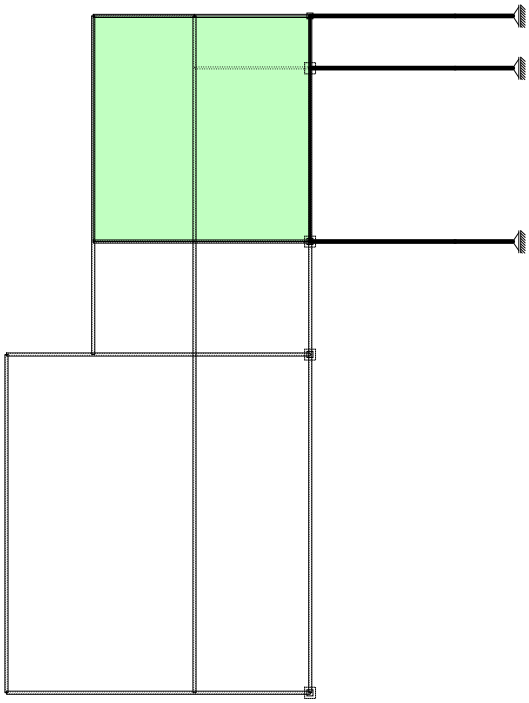


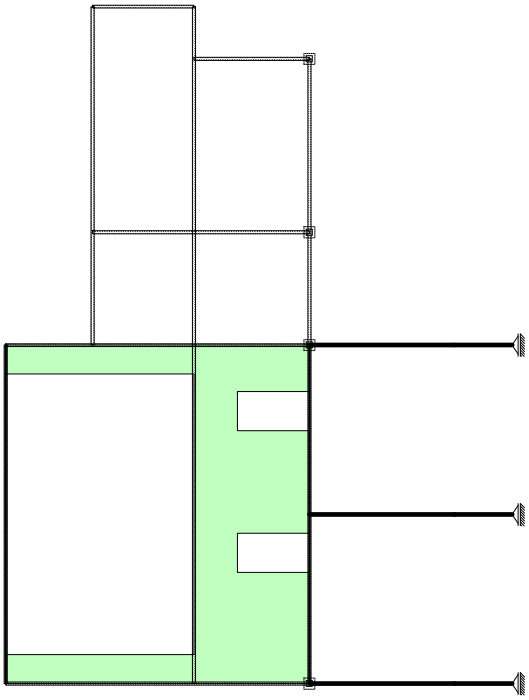
Okvir: V_17



Okvir: V_18



Okvir: V_19



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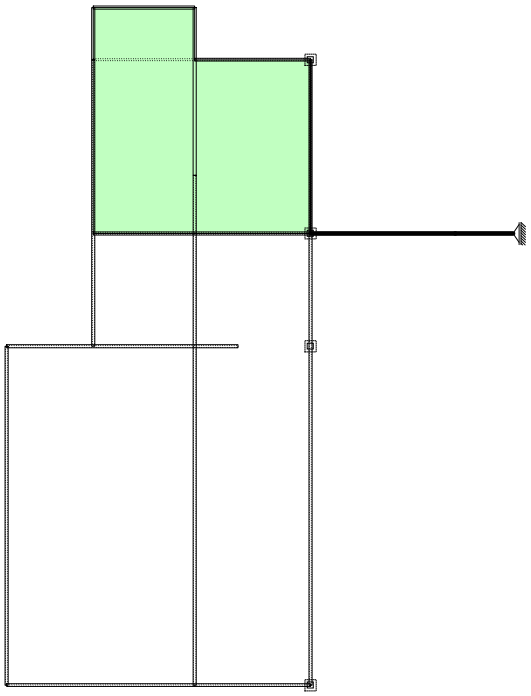

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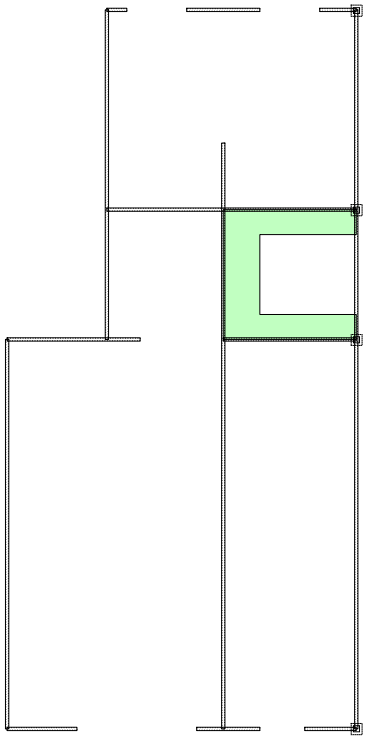

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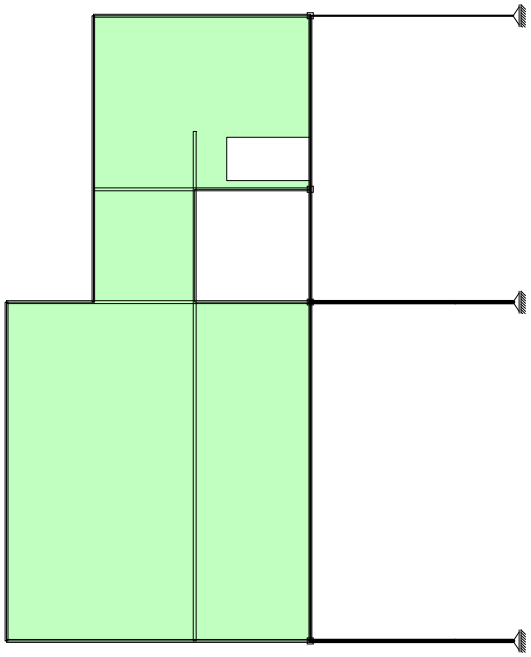
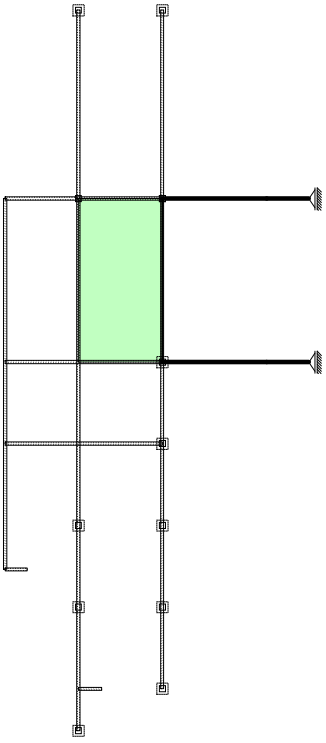


Okvir: V_23



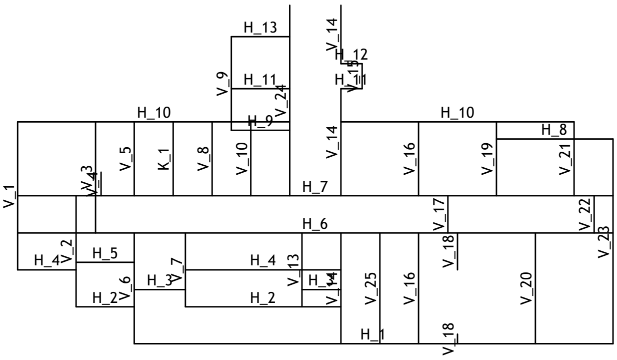
Okvir: K_1

STATICON IB

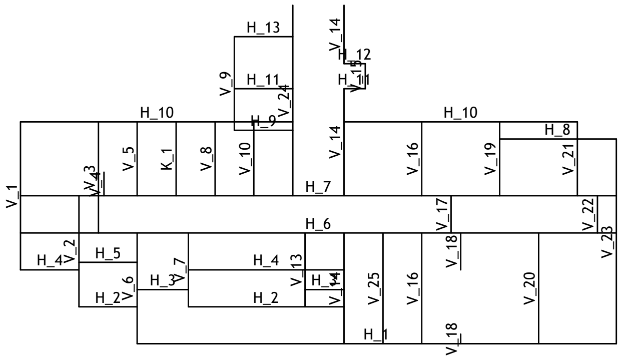
Objekt: ***DOZIDAVA OSNOVNE ŠOLE ANTONA GLOBOÈNIKA***

Pozicija:KONSTRUKCIJA

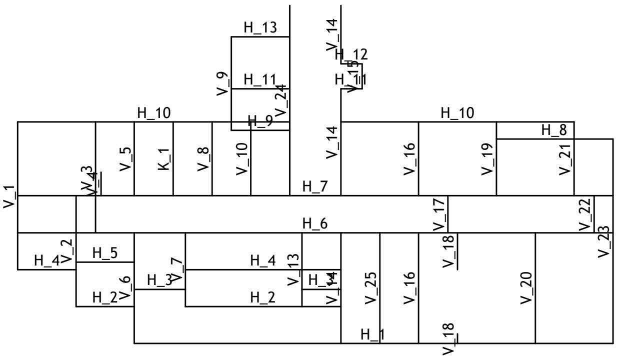
načrt št
436/2018



Dispozicija okvirjev



Dispozicija okvirjev



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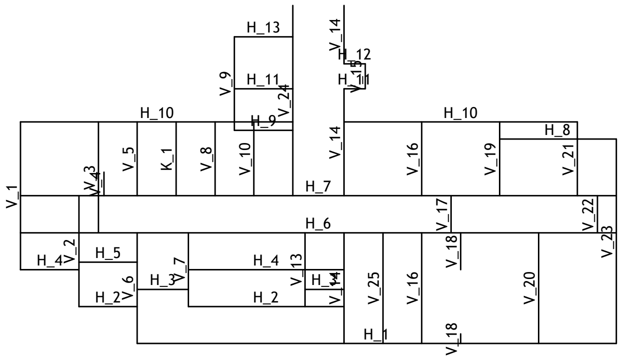

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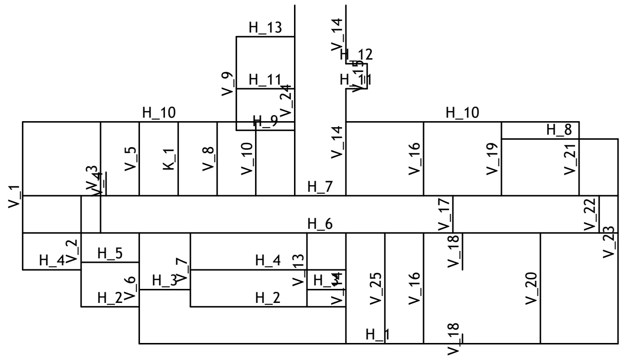

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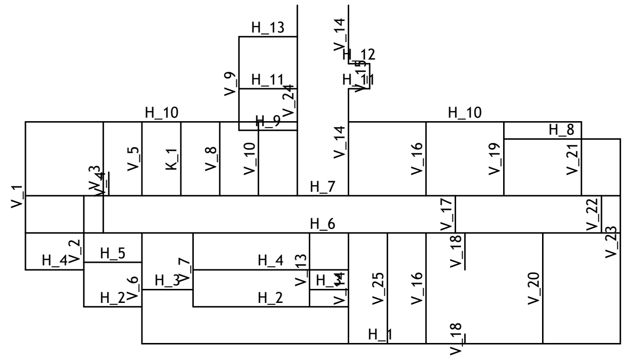

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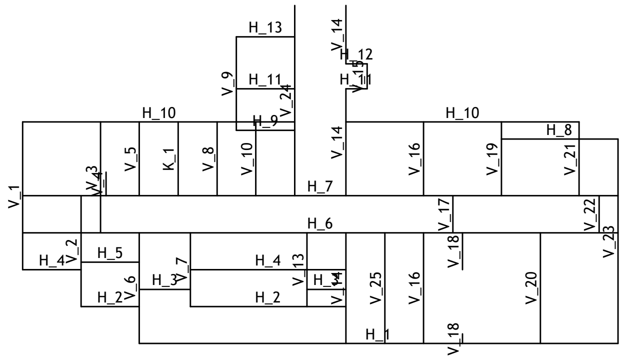

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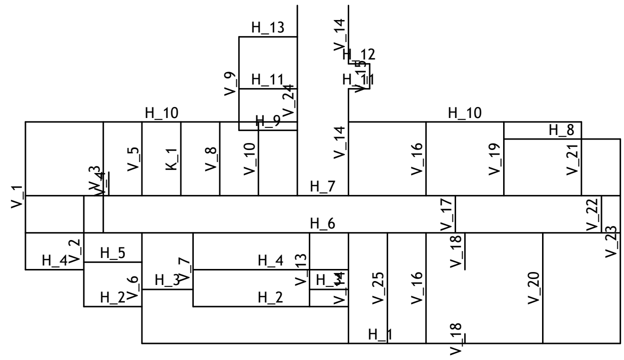


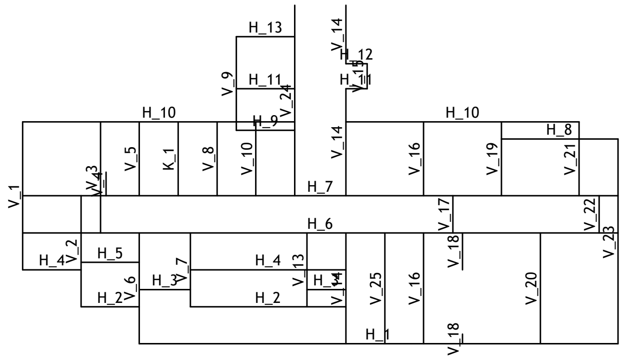
Dispozicija okvirjev

STATICON IB

Objekt: ***DOZIDAVA OSNOVNE ŠOLE ANTONA GLOBOÈNIKA***

Pozicija:KONSTRUKCIJA

načrt št
436/2018



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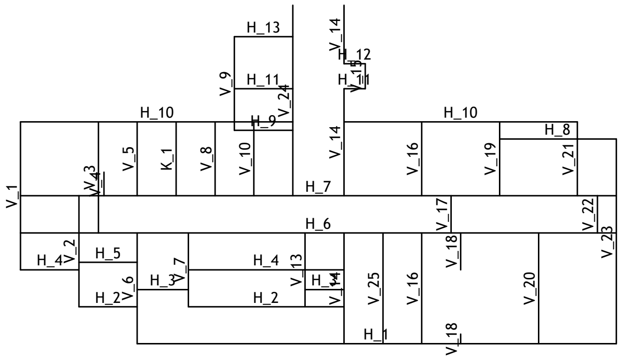
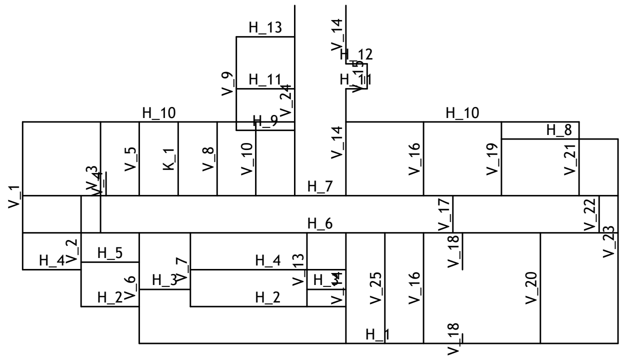


Dispozicija okvirjev



Dispozicija okvirjev

Objekt: ***DOZIDAVA OSNOVNE ŠOLE ANTONA GLOBOÈNIKA***	
Pozicija:KONSTRUKCIJA	načrt št 436/2018

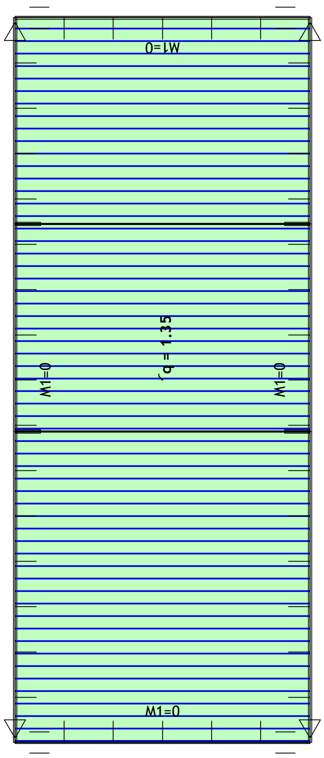
Vhodni podatki - Obtežba

Lista obtežnih primerov

No	Naziv
1	stalna (g)
2	koristna celota
3	koristna šahovska 1
4	koristna šahovska 2
5	sneg
6	koristna na strehi

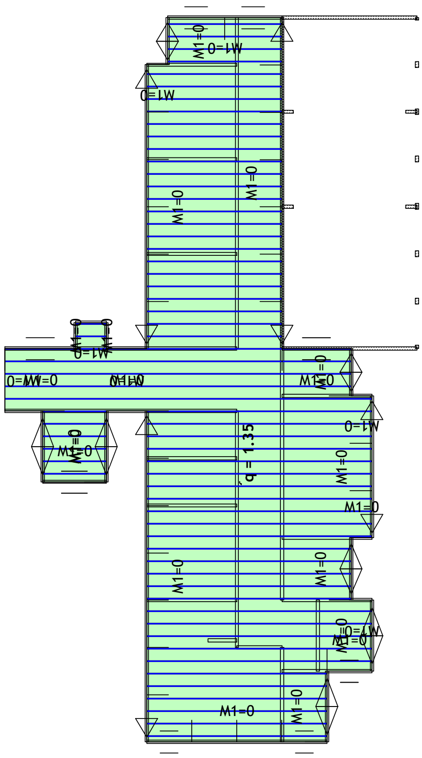
No	Naziv
7	veter +x
8	veter -x
9	veter +y
10	veter -y
11	Komb.: I+II+V

Obt. 1: stalna (g)



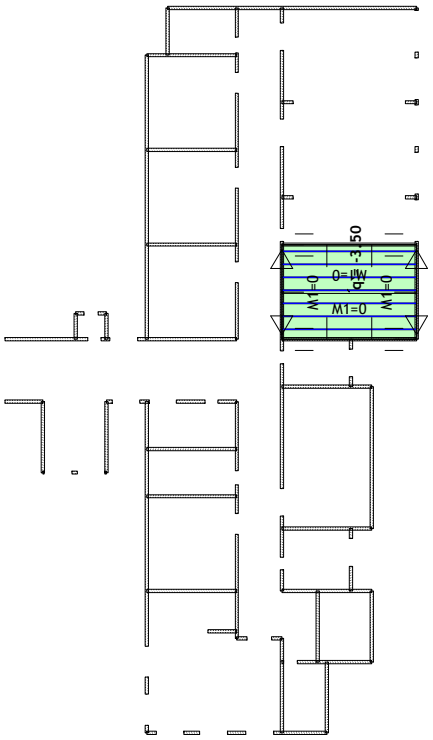
Nivo: [10.50 m]

Obt. 1: stalna (g)



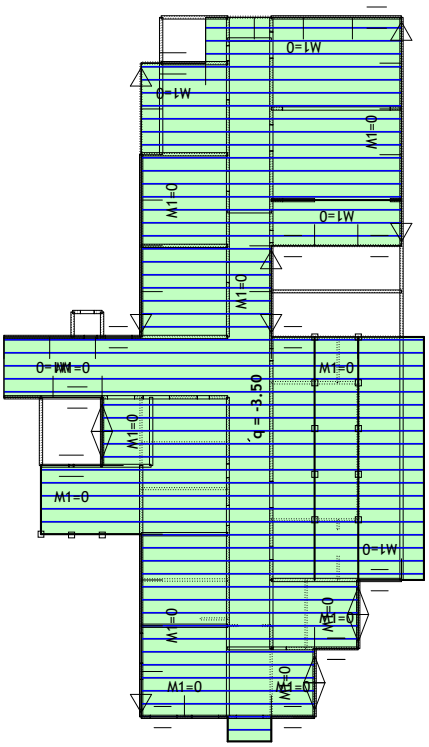
Nivo: [7.50 m]

Obt. 1: stalna (g)



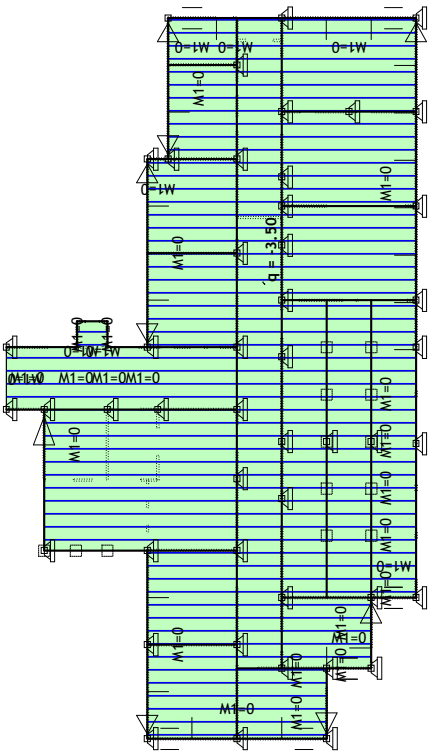
Nivo: [4.90 m]

Obt. 1: stalna (g)



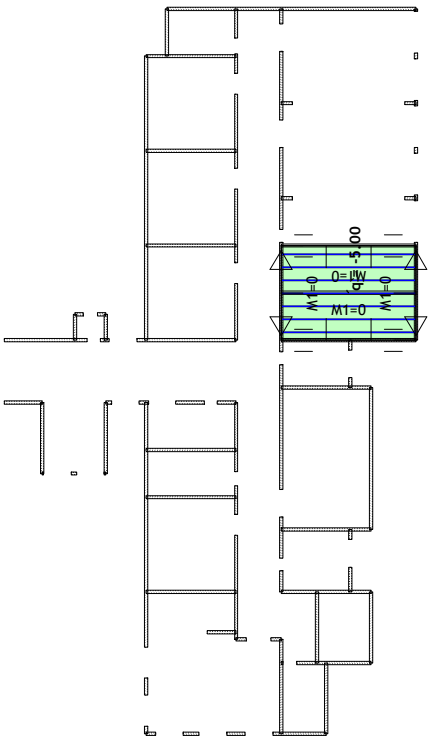
Nivo: [4.00 m]

Obt. 1: stalna (g)



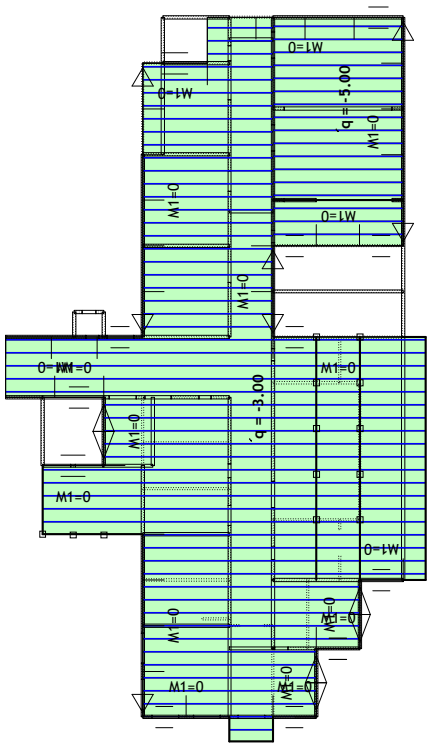
Nivo: [0.00 m]

Obt. 2: koristna celota



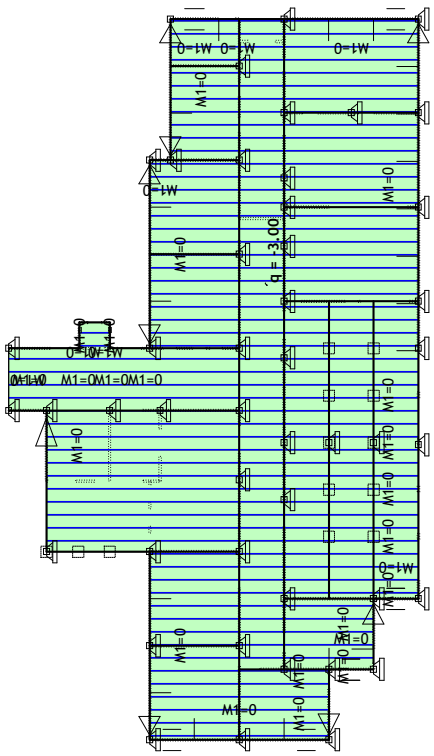
Nivo: [4.90 m]

Obt. 2: koristna celota



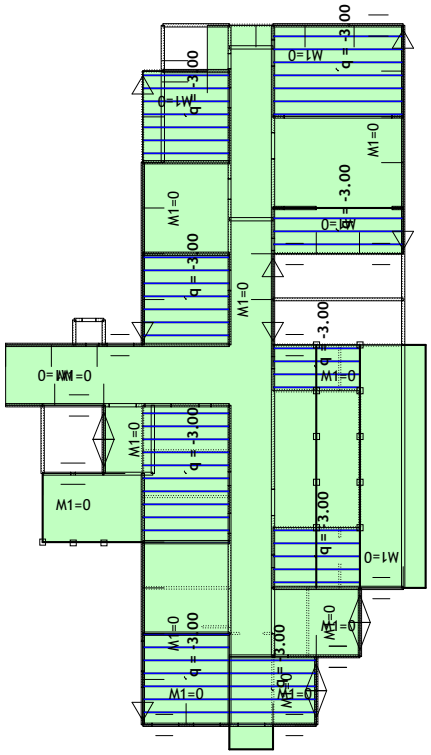
Nivo: [4.00 m]

Obt. 2: koristna celota



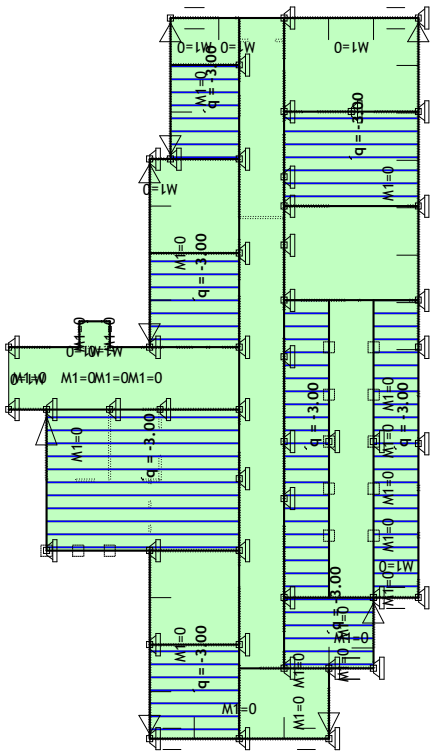
Nivo: [0.00 m]

Obt. 3: koristna šahovska 1



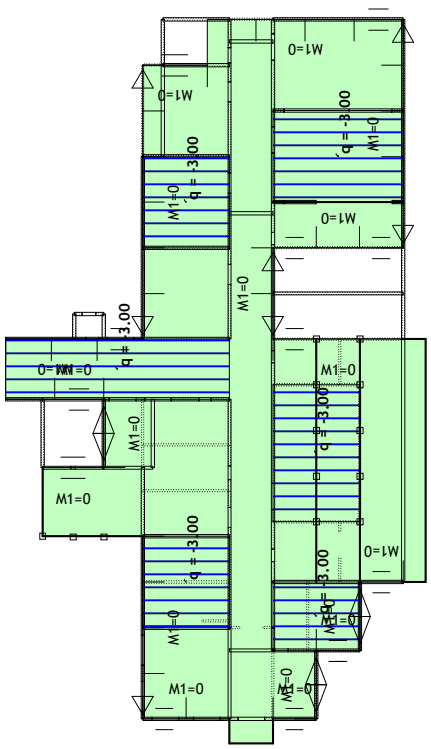
Nivo: [4.00 m]

Obt. 3: koristna šahovska 1



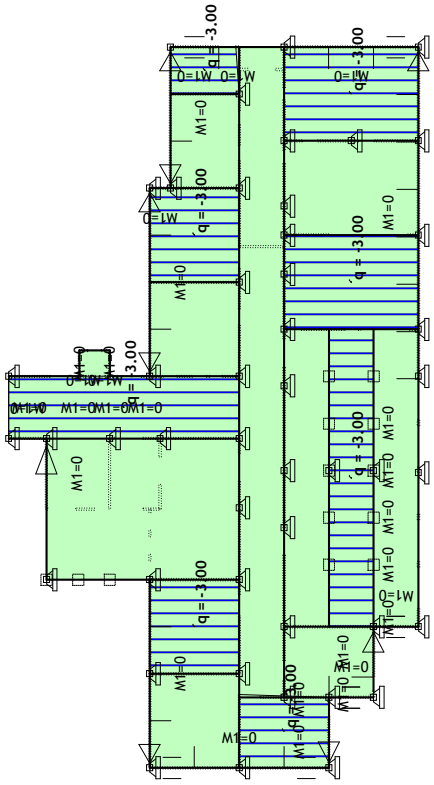
Nivo: [0.00 m]

Obt. 4: koristna šahovska 2



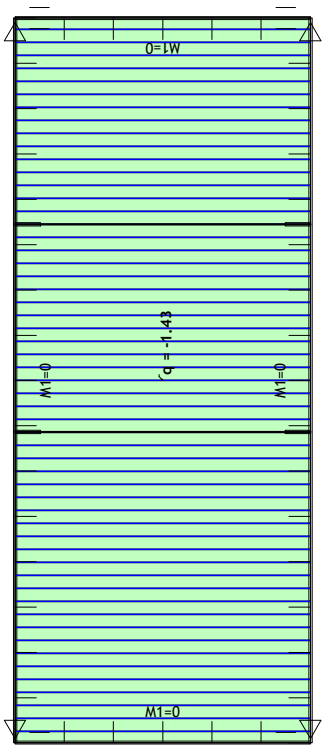
Nivo: [4.00 m]

Obt. 4: koristna šahovska 2



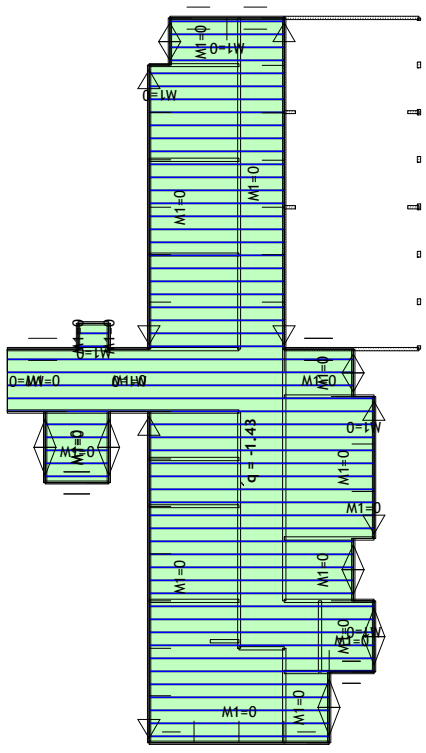
Nivo: [0.00 m]

Obt. 5: sneg



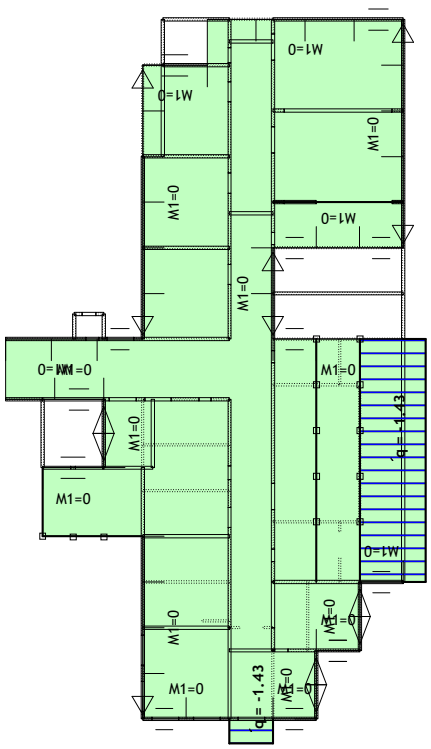
Nivo: [10.50 m]

Obt. 5: sneg



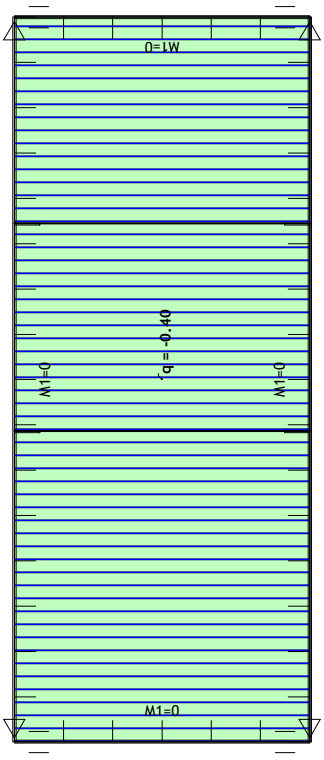
Nivo: [7.50 m]

Obt. 5: sneg



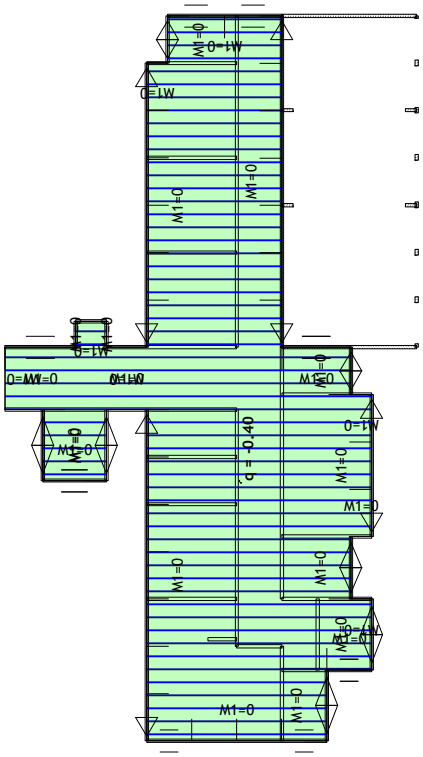
Nivo: [4.00 m]

Obt. 6: koristna na strehi



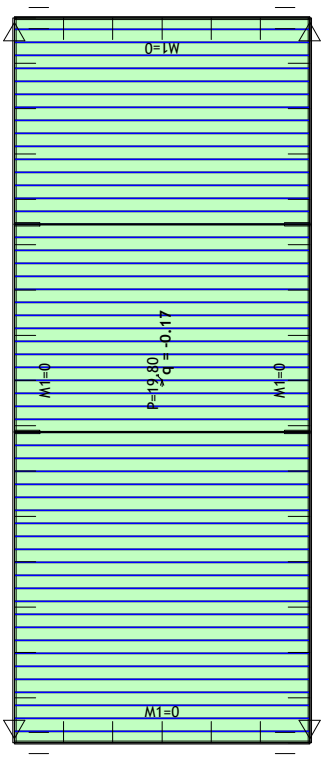
Nivo: [10.50 m]

Obt. 6: koristna na strehi



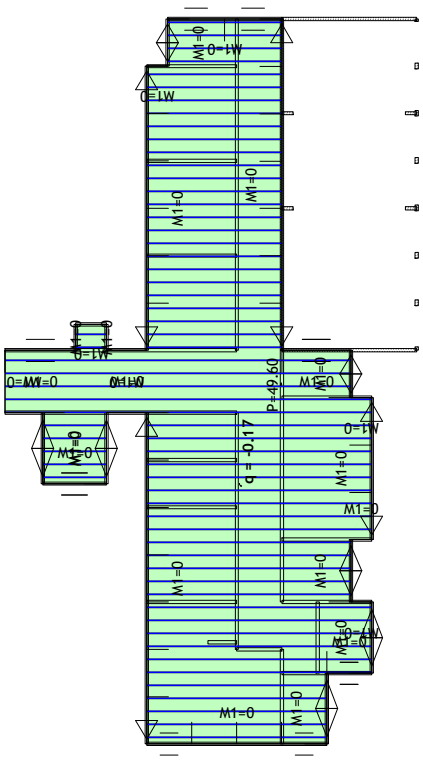
Nivo: [7.50 m]

Obt. 7: veter +x



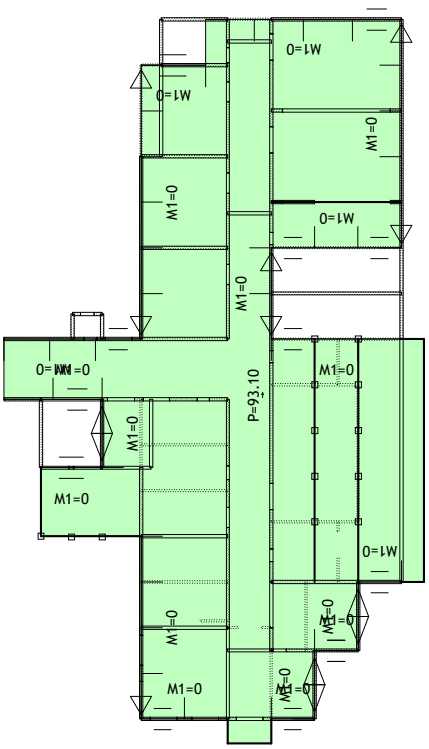
Nivo: [10.50 m]

Obt. 7: veter +x



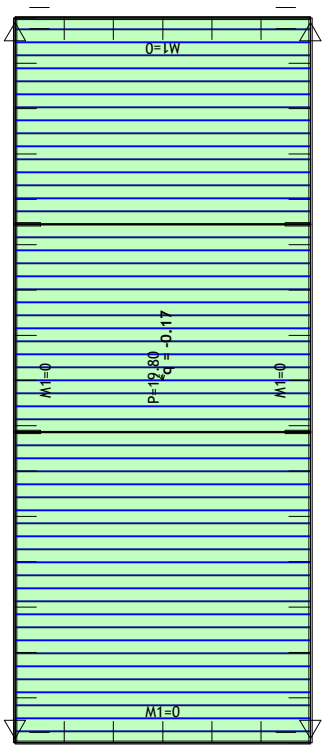
Nivo: [7.50 m]

Obt. 7: veter +x



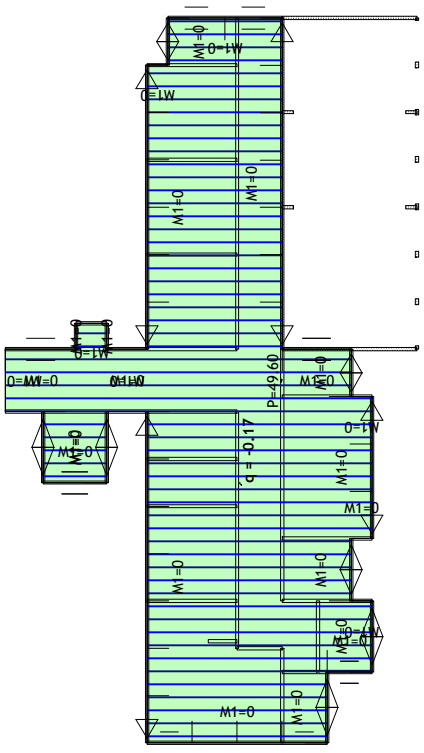
Nivo: [4.00 m]

Obt. 8: veter -x



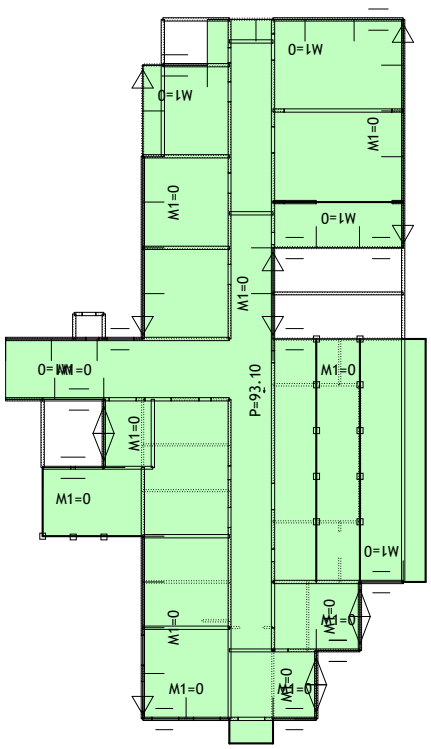
Nivo: [10.50 m]

Obt. 8: veter -x



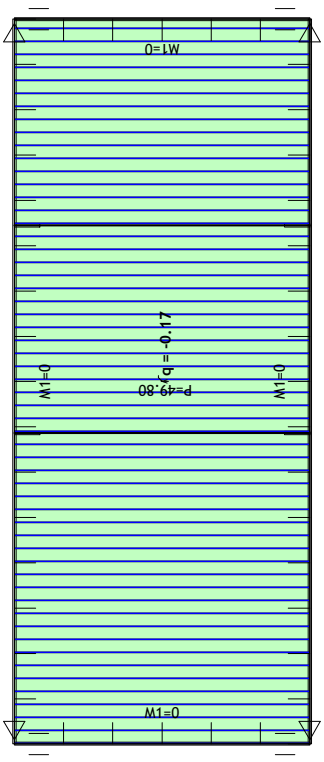
Nivo: [7.50 m]

Obt. 8: veter -x



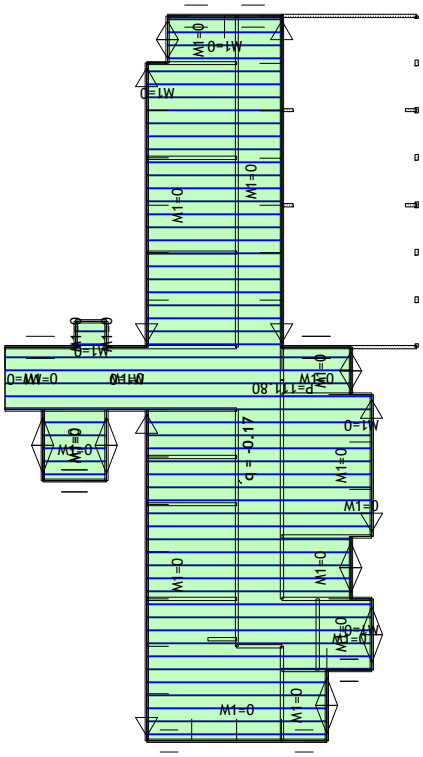
Nivo: [4.00 m]

Obt. 9: veter +y



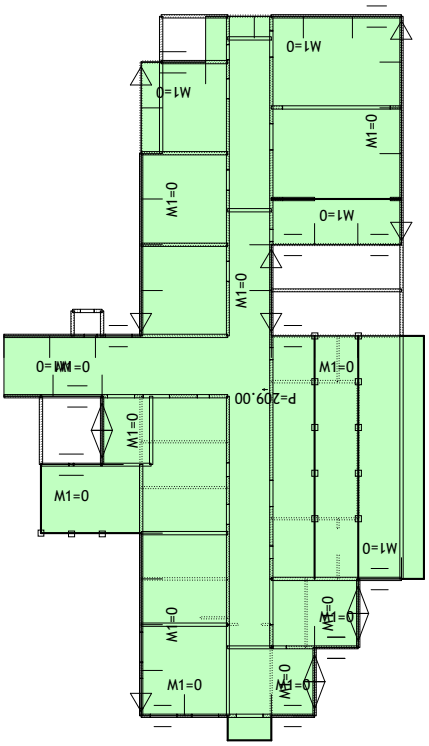
Nivo: [10.50 m]

Obt. 9: veter +y



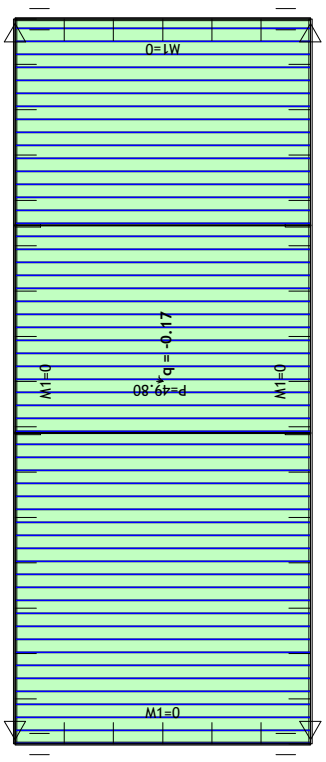
Nivo: [7.50 m]

Obt. 9: veter +y



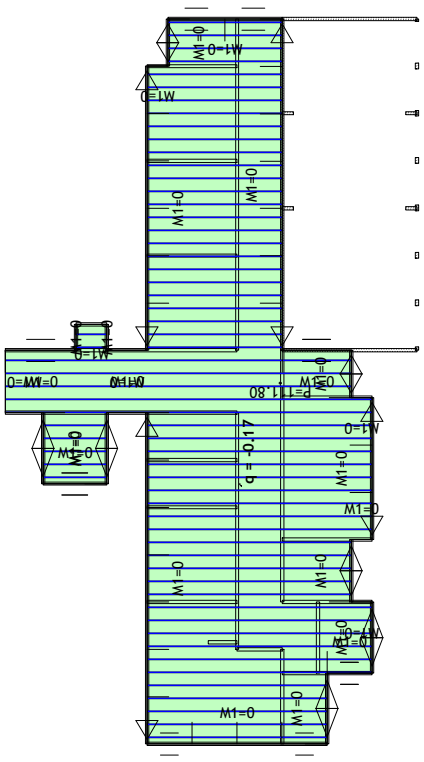
Nivo: [4.00 m]

Obt. 10: veter -y



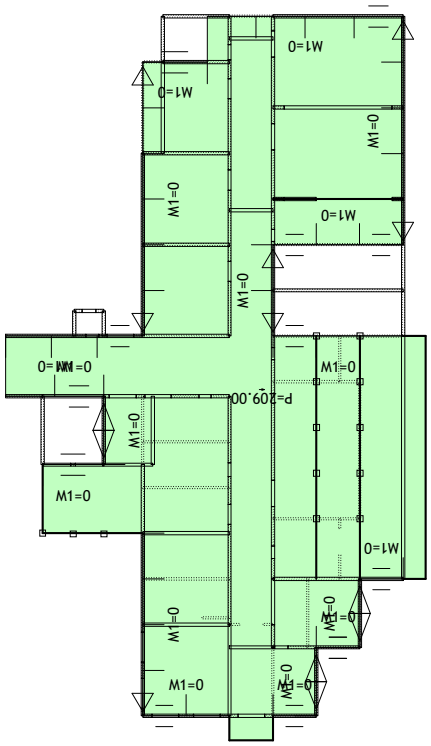
Nivo: [10.50 m]

Obt. 10: veter -y



Nivo: [7.50 m]

Obt. 10: veter -y



Nivo: [4.00 m]

Modalna analiza

Napredne opcije seizmičnega preračuna:

Mase grupirane v nivojih izbranih etaž
Grede - redukcija togosti na upogib: 0.500
Zidovi - redukcija togosti na upogib: 0.500
Zidovi - redukcija osne togosti: 0.500
Stebri - redukcija osne togosti: 0.500
Sodelovanje zidov: 6.000 x d
Preprečeno nihanje v Z smeri

Faktorji obtežb za preračun mas

No	Naziv	Koeficient	No	Naziv	Koeficient
1	stalna (g)	1.00	6	koristna na strehi	0.00
2	koristna celota	1.00	7	veter +x	0.00
3	koristna šahovska 1	0.00	8	veter -x	0.00
4	koristna šahovska 2	0.00	9	veter +y	0.00
5	sneg	0.00	10	veter -y	0.00

Razporeditev mas po višini objekta

Nivo	Z [m]	X [m]	Y [m]	Masa [T]	T/m2
	14.60	0.00	0.00	0.00	
	11.70	0.00	0.00	0.00	
	8.80	0.00	0.00	0.00	
	5.90	-39.91	21.14	7662.89	
	3.00	0.00	0.00	0.00	
Skupno:	5.90	-39.91	21.14	7662.89	

Položaj centra togosti po višini objekta

Nivo	Z [m]	X [m]	Y [m]
	8.80	-14.35	5.85
	5.90	-13.81	13.05
	3.00	-34.22	8.76

Ekscentriciteta po višini objekta

Nivo	Z [m]	eox [m]	eoy [m]
	8.80	14.35	5.85
	5.90	26.10	8.09
	3.00	34.22	8.76

Nihajne dobe konstrukcije

No	T [s]	f [Hz]	No	T [s]	f [Hz]	No	T [s]	f [Hz]
1	0.9945	1.0055	8	0.2260	4.4257	15	0.1169	8.5541
2	0.6266	1.5960	9	0.2122	4.7119	16	0.1095	9.1346
3	0.4610	2.1694	10	0.1855	5.3917	17	0.0962	10.3965
4	0.3706	2.6983	11	0.1613	6.1982	18	0.0928	10.7806
5	0.3483	2.8710	12	0.1579	6.3350	19	0.0906	11.0324
6	0.3427	2.9176	13	0.1458	6.8567	20	0.0901	11.0961
7	0.2585	3.8687	14	0.1190	8.3998	21	0.0853	11.7181

Seizmični preračun

Seizmični preračun: EC8 SLO

Kategorija tal:	D
Kategorija pomena:	III (γ=1.2)
Razmerje ag/g:	0.20
Faktor obnašanja:	3
Koeficient dušenja:	0.05
S:	1
Tb:	0.15
Tc:	0.4
Td:	2

Faktorji smeri potresa:

Naziv	Kx	Ky	Kz
potres x	1.000	0.300	0.000
potres y	0.300	1.000	0.000

potres x

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]
	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.90	2.39	867.81	-8.46	6072.1	247.59	-67.93	236.43	1271.2	-58.55
	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	-7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Σ=	2.39	867.81	-8.46	6072.1	247.59	-67.93	236.43	1271.2	-58.55

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]
	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.90	1196.0	1199.0	-128.78	2938.7	-1174.29	-57.91	890.89	-201.22	-23.27
	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	-7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Σ=	1196.0	1199.0	-128.78	2938.7	-1174.29	-57.91	890.89	-201.22	-23.27

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]
	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.90	-69.25	523.40	-52.95	7.50	54.65	-8.15	-0.06	0.89	-0.19
	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	-7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Σ=	-69.25	523.40	-52.95	7.50	54.65	-8.15	-0.06	0.89	-0.19

Nivo	Z [m]	Ton 10			Ton 11			Ton 12		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.90	14.51	34.34	-6.48	32.57	1.27	-2.65	129.25	54.04	-30.19
	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	-7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Σ=	14.51	34.34	-6.48	32.57	1.27	-2.65	129.25	54.04	-30.19

Nivo	Z [m]	Ton 13			Ton 14			Ton 15		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.90	1.14	3.72	-3.22	0.68	-0.29	-2.55	28.10	2.50	-8.91
	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	-7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Σ=	1.14	3.72	-3.22	0.68	-0.29	-2.55	28.10	2.50	-8.91

Nivo	Z [m]	Ton 16			Ton 17			Ton 18		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.90	0.10	-0.01	0.03	19.43	-1.50	-7.70	15.79	-3.55	8.34
	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	-7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Σ=	0.10	-0.01	0.03	19.43	-1.50	-7.70	15.79	-3.55	8.34

Nivo	Z [m]	Ton 19			Ton 20			Ton 21		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.90	6.14	-0.92	-6.00	0.01	-0.02	-0.09	3.54	-0.16	-2.33
	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	-7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Σ=	6.14	-0.92	-6.00	0.01	-0.02	-0.09	3.54	-0.16	-2.33

Nivo	Z [m]	Vsi toni		
		Px [kN]	Py [kN]	Pz [kN]
	10.50	0.00	0.00	0.00

	7.50	0.00	0.00	0.00
	4.90	11526.0	2878.4	-467.96
	4.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00
	-7.00	0.00	0.00	0.00
	Σ=	11526.0	2878.4	-467.96

potres y

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]
	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.90	7.90	2868.8	-27.98	2044.2	83.35	-22.87	513.64	2761.7	-127.19
	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	-7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Σ=	7.90	2868.8	-27.98	2044.2	83.35	-22.87	513.64	2761.7	-127.19

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]
	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.90	1197.6	1200.6	-128.95	-332.54	132.88	6.55	70.84	-16.00	-1.85
	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	-7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Σ=	1197.6	1200.6	-128.95	-332.54	132.88	6.55	70.84	-16.00	-1.85

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]
	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.90	-396.57	2997.3	-303.22	17.87	130.11	-19.40	-0.24	3.72	-0.78
	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	-7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Σ=	-396.57	2997.3	-303.22	17.87	130.11	-19.40	-0.24	3.72	-0.78

Nivo	Z [m]	Ton 10			Ton 11			Ton 12		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.90	22.63	53.57	-10.11	10.91	0.43	-0.89	82.47	34.48	-19.27
	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	-7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Σ=	22.63	53.57	-10.11	10.91	0.43	-0.89	82.47	34.48	-19.27

Nivo	Z [m]	Ton 13			Ton 14			Ton 15		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.90	2.05	6.69	-5.80	-0.10	0.04	0.36	10.64	0.95	-3.37
	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	-7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Σ=	2.05	6.69	-5.80	-0.10	0.04	0.36	10.64	0.95	-3.37

Nivo	Z [m]	Ton 16			Ton 17			Ton 18		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.90	0.02	-0.00	0.00	4.43	-0.34	-1.76	1.27	-0.29	0.67
	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	-7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Σ=	0.02	-0.00	0.00	4.43	-0.34	-1.76	1.27	-0.29	0.67

Nivo	Z [m]	Ton 19			Ton 20			Ton 21		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.90	0.97	-0.14	-0.95	-0.04	0.06	0.26	0.91	-0.04	-0.60
	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	-7.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Σ=	0.97	-0.14	-0.95	-0.04	0.06	0.26	0.91	-0.04	-0.60

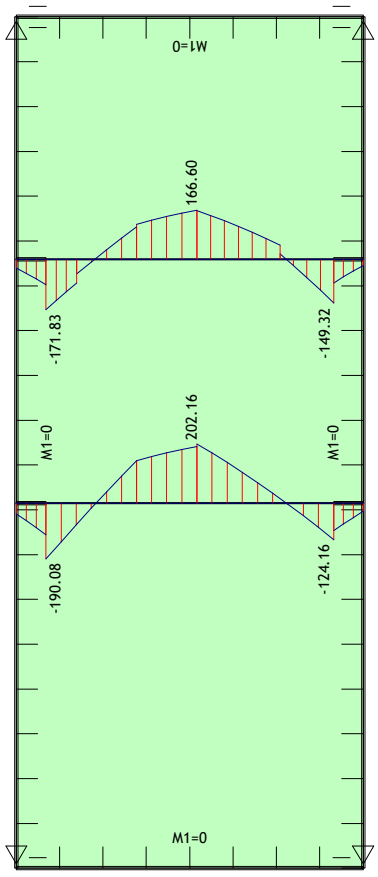
Nivo	Z [m]	Vsi toni		
		Px [kN]	Py [kN]	Pz [kN]
	10.50	0.00	0.00	0.00
	7.50	0.00	0.00	0.00
	4.90	3258.9	10257.8	-667.14
	4.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00
	-7.00	0.00	0.00	0.00
	Σ=	3258.9	10257.8	-667.14

Faktorji participacije - relativno sodelovanje		
Ton \ Naziv	1. potres x	2. potres y
1	0.021	0.256
2	0.496	0.062
3	0.050	0.260
4	0.126	0.139
5	0.209	0.003
6	0.067	0.000
7	0.007	0.256
8	0.002	0.012
9	0.000	0.000
10	0.002	0.005
11	0.003	0.000
12	0.012	0.005
13	0.000	0.001
14	0.000	0.000
15	0.002	0.000
16	0.000	0.000
17	0.002	0.000
18	0.001	0.000
19	0.000	0.000
20	0.000	0.000
21	0.000	0.000

Faktorji participacije - angažiranje mase						
Ton	UX (%)	UY (%)	UZ (%)	ΣUX (%)	ΣUY (%)	ΣUZ (%)
1	0.00	47.42	0.00	0.00	47.42	0.00
2	62.52	0.10	0.01	62.52	47.52	0.01
3	0.69	20.06	0.04	63.21	67.58	0.05
4	6.12	6.15	0.07	69.33	73.73	0.13
5	22.22	3.55	0.01	91.55	77.27	0.13
6	6.36	0.32	0.00	97.91	77.60	0.14
7	0.36	20.77	0.21	98.27	98.37	0.35
8	0.02	0.83	0.02	98.29	99.20	0.37
9	0.00	0.03	0.00	98.29	99.22	0.37
10	0.06	0.32	0.01	98.34	99.54	0.38
11	0.21	0.00	0.00	98.56	99.54	0.38
12	0.76	0.13	0.04	99.32	99.67	0.43
13	0.00	0.04	0.03	99.32	99.71	0.46
14	0.01	0.00	0.08	99.33	99.72	0.53
15	0.19	0.00	0.02	99.52	99.72	0.55
16	0.00	0.00	0.00	99.52	99.72	0.55
17	0.14	0.00	0.02	99.66	99.72	0.57
18	0.12	0.01	0.03	99.79	99.72	0.61
19	0.05	0.00	0.04	99.83	99.72	0.65
20	0.00	0.00	0.01	99.83	99.73	0.66
21	0.03	0.00	0.01	99.86	99.73	0.67

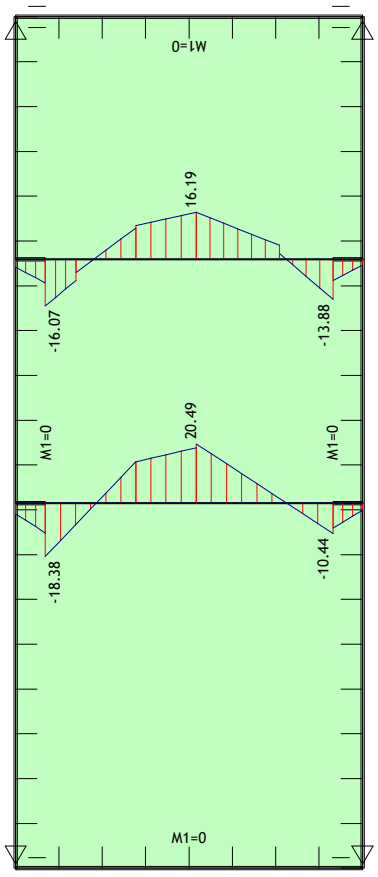
Statični preračun

Obt. 1: stalna (g)



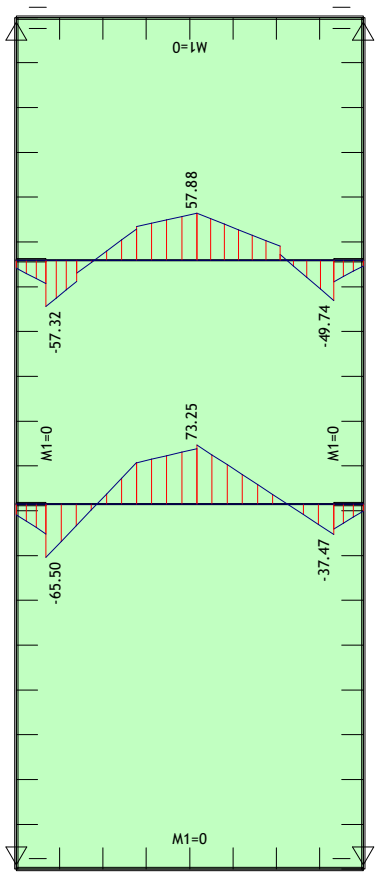
Nivo: [10.50 m]
Vplivi v gredi: max M3= 202.16 / min M3= -190.08 kNm

Obt. 6: koristna na strehi



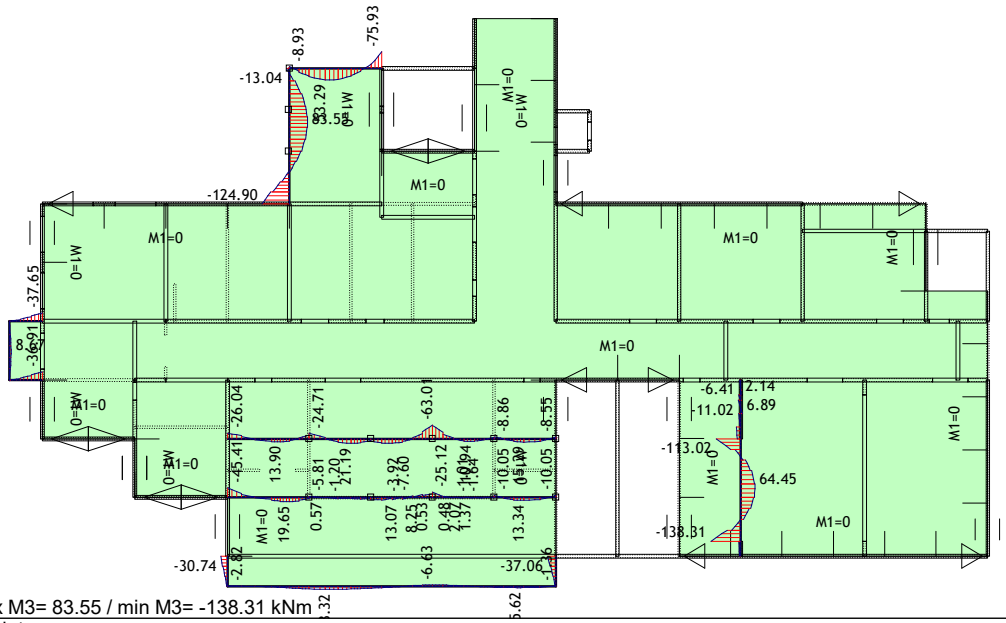
Nivo: [10.50 m]
Vplivi v gredi: max M3= 20.49 / min M3= -18.38 kNm

Obt. 5: sneg



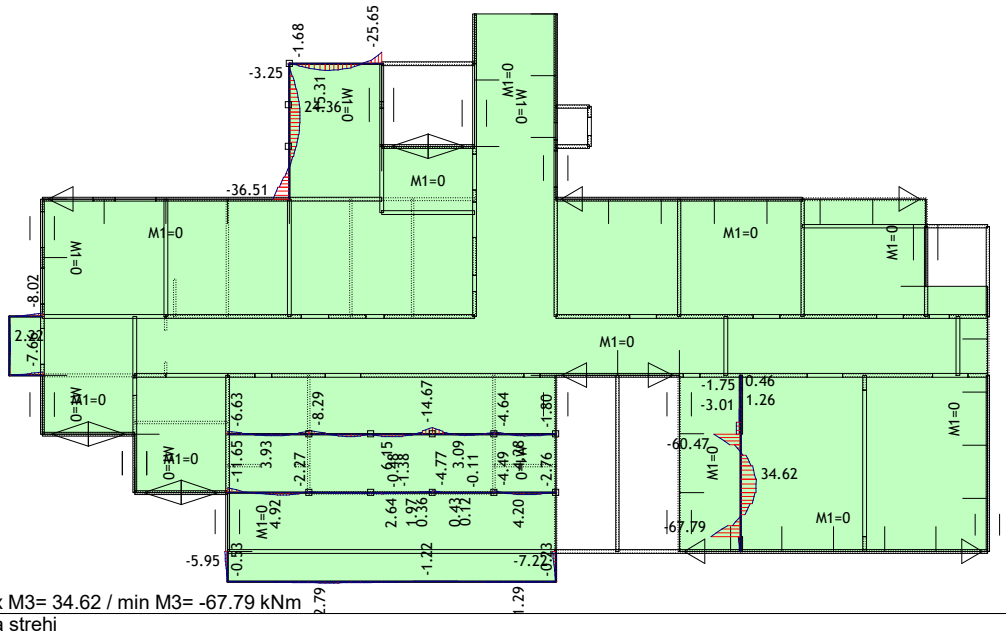
Nivo: [10.50 m]
Vplivi v gredi: max M3= 73.25 / min M3= -65.50 kNm

Obt. 1: stalna (g)



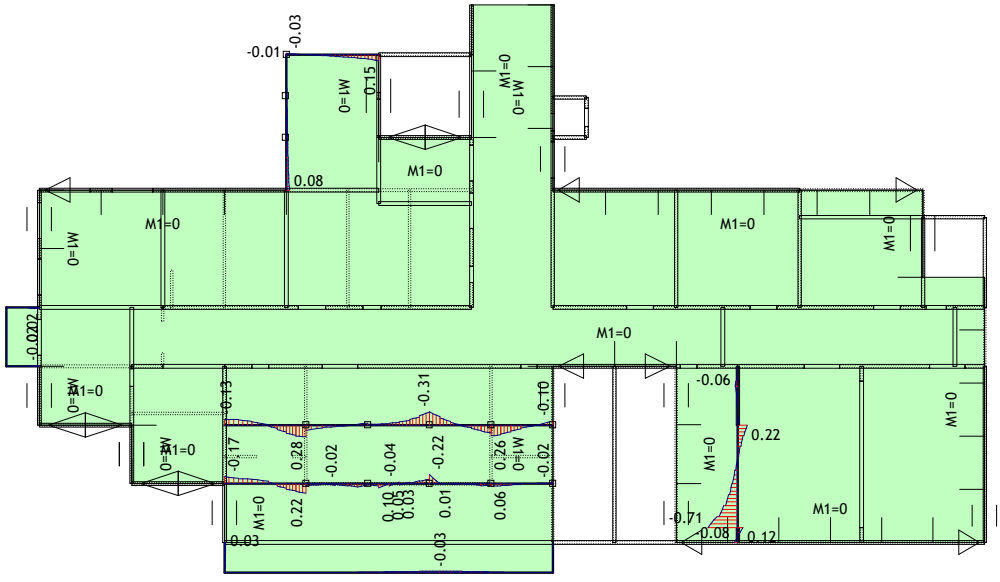
Nivo: [4.00 m]
Vplivi v gredi: max M3= 83.55 / min M3= -138.31 kNm

Obt. 2: koristna celota



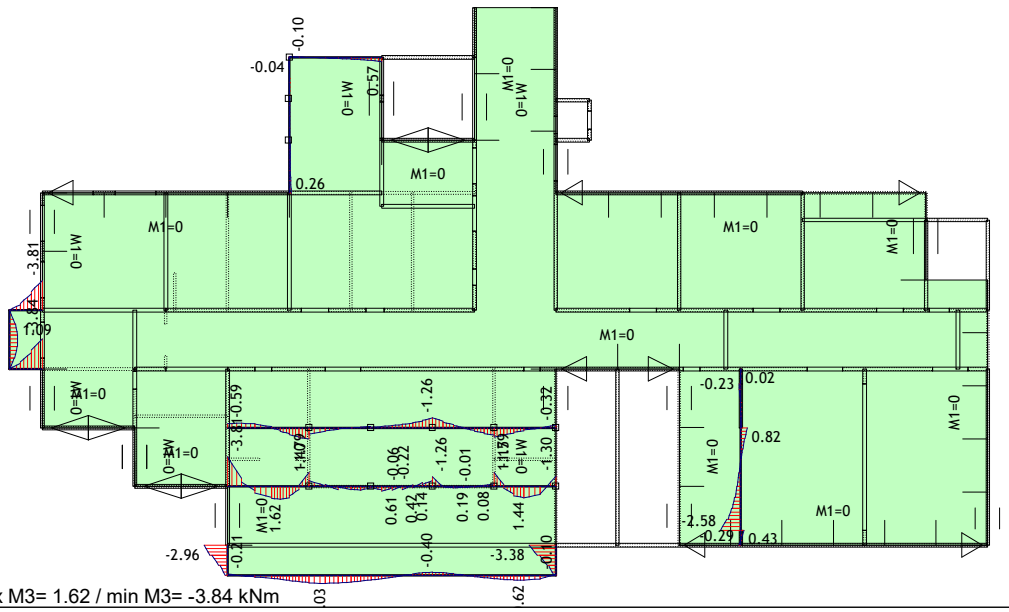
Nivo: [4.00 m]
Vplivi v gredi: max M3= 34.62 / min M3= -67.79 kNm

Obt. 6: koristna na strehi



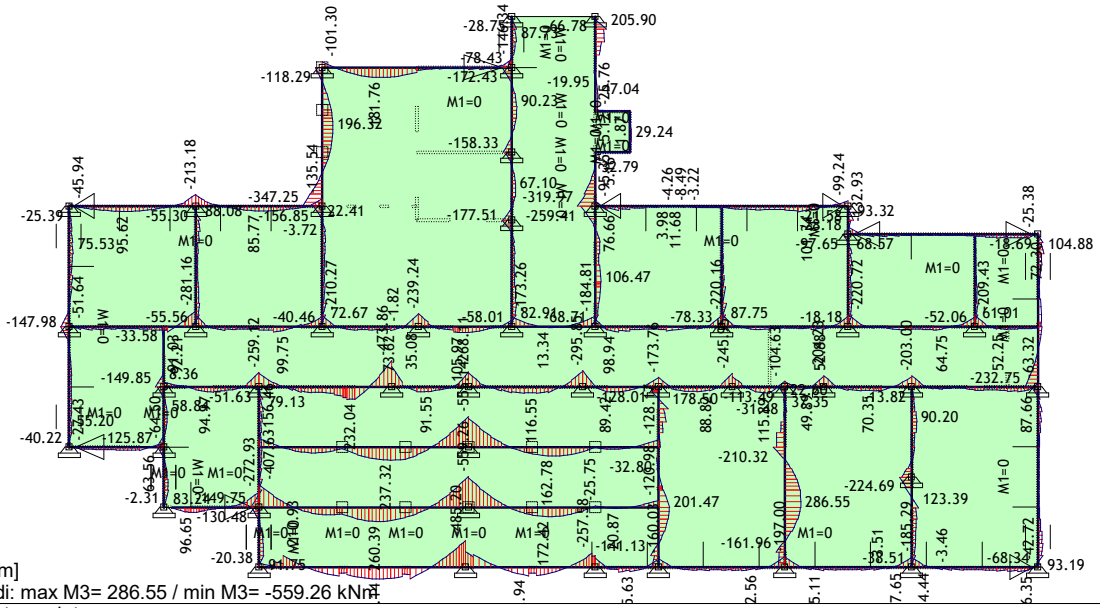
Nivo: [4.00 m]
Vplivi v gredi: max M3= 0.28 / min M3= -0.71 kNm

Obt. 5: sneg



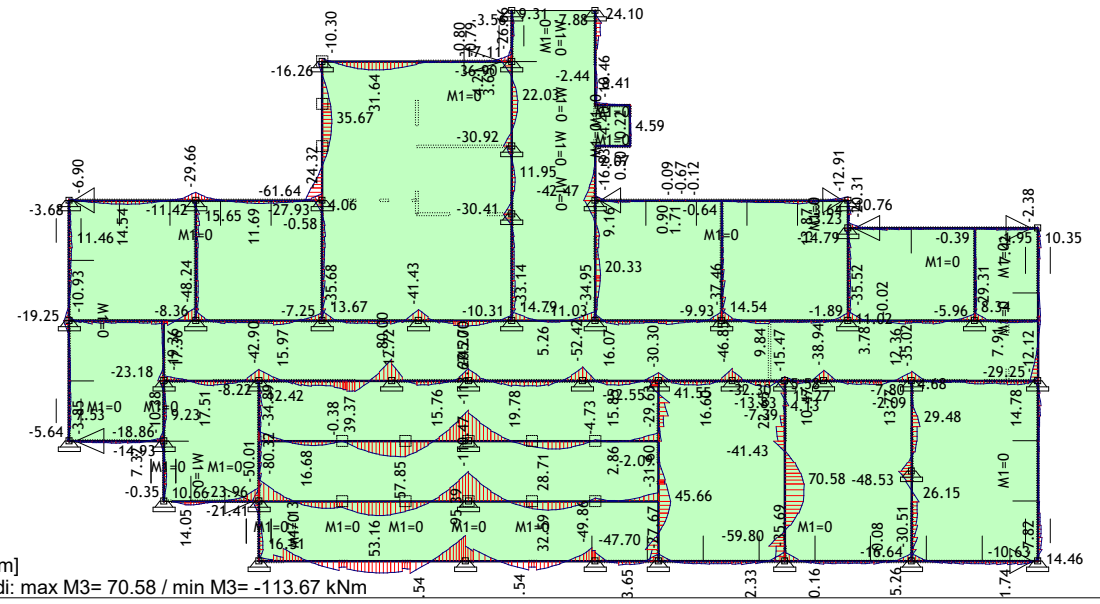
Nivo: [4.00 m]
Vplivi v gredi: max M3= 1.62 / min M3= -3.84 kNm

Obt. 1: stalna (g)



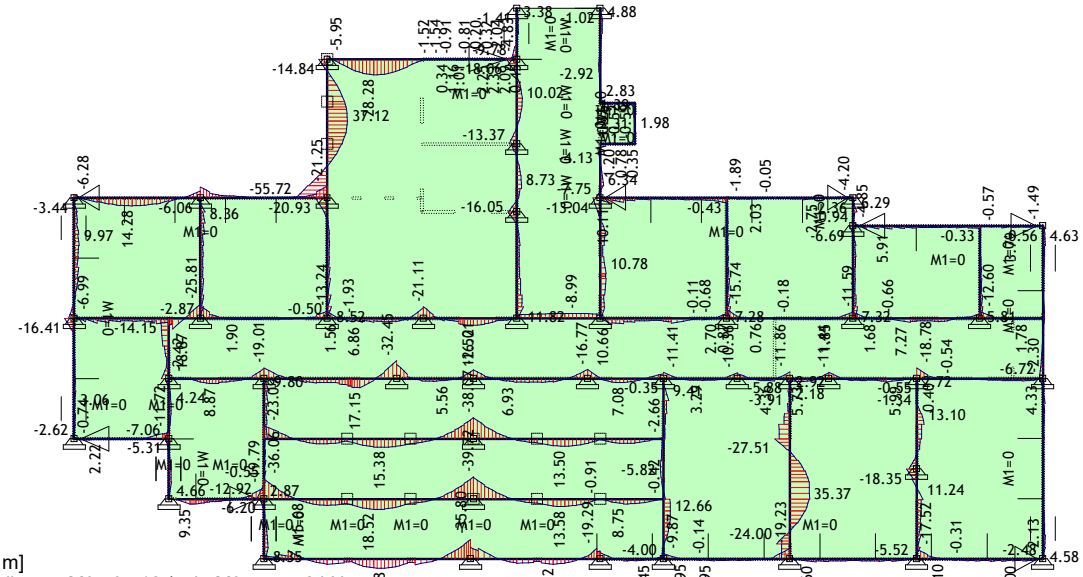
Nivo: [0.00 m]
Vplivi v gredi: max M3= 286.55 / min M3= -559.26 kNm

Obt. 2: koristna celota



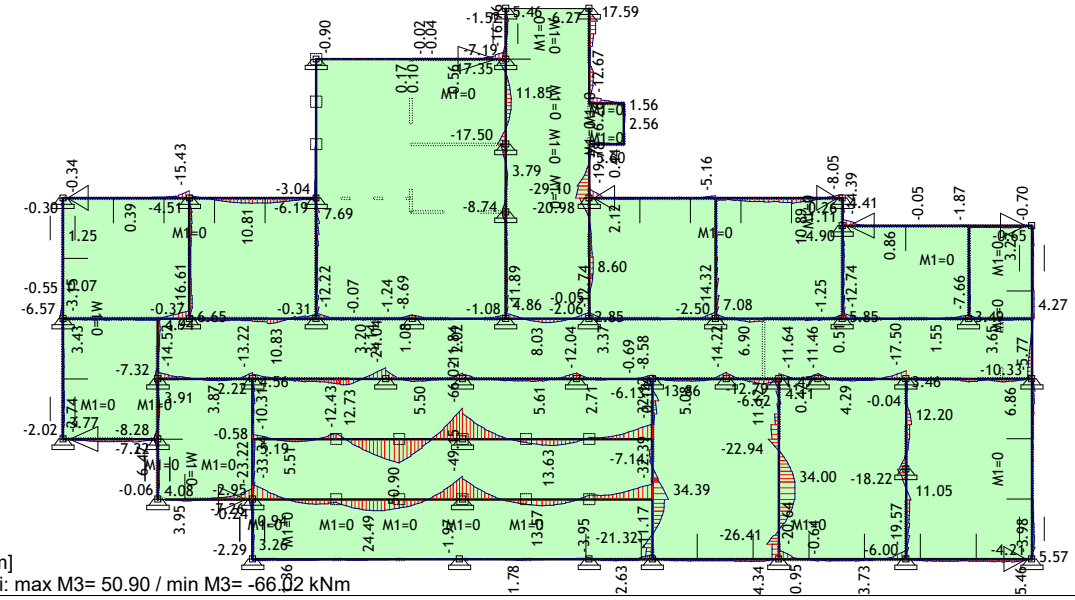
Nivo: [0.00 m]
Vplivi v gredi: max M3= 70.58 / min M3= -113.67 kNm

Obt. 3: koristna šahovska 1



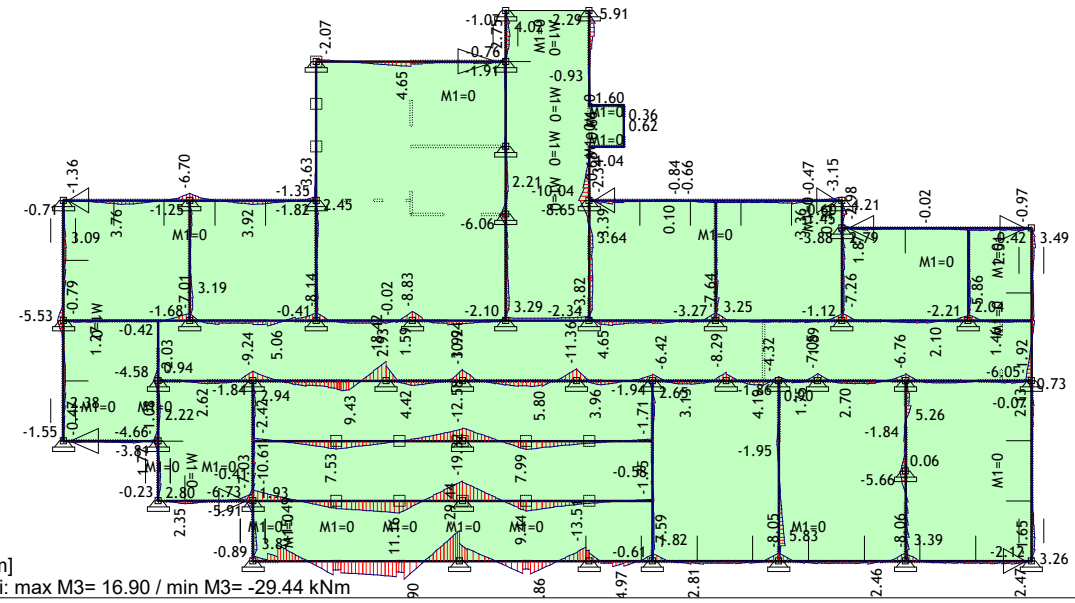
Nivo: [0.00 m]
Vplivi v gredi: max M3= 37.12 / min M3= -55.72 kNm

Obt. 4: koristna šahovska 2



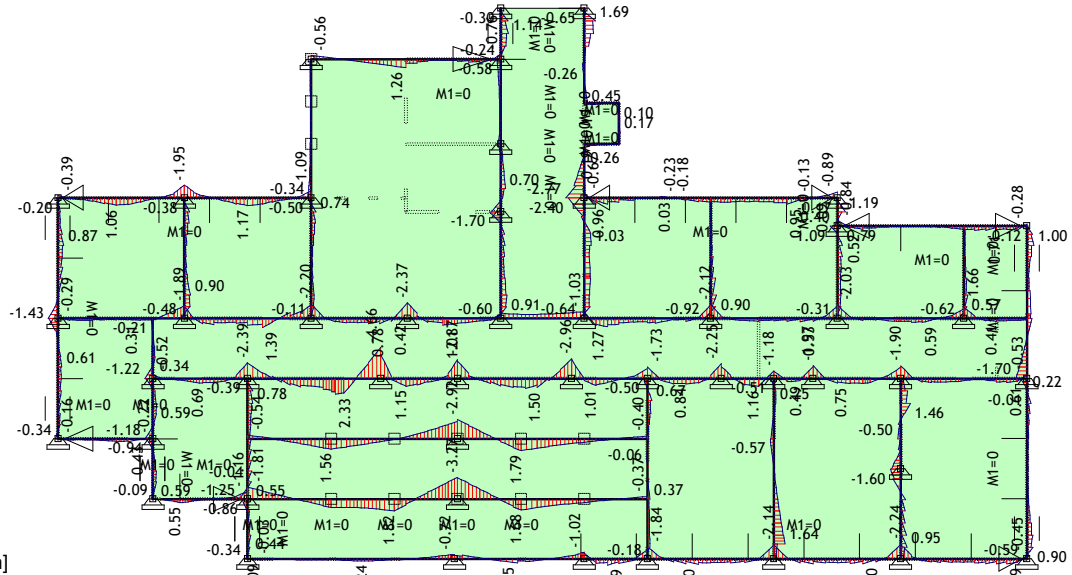
Nivo: [0.00 m]
Vplivi v gredi: max M3= 50.90 / min M3= -66.02 kNm

Obt. 5: sneg



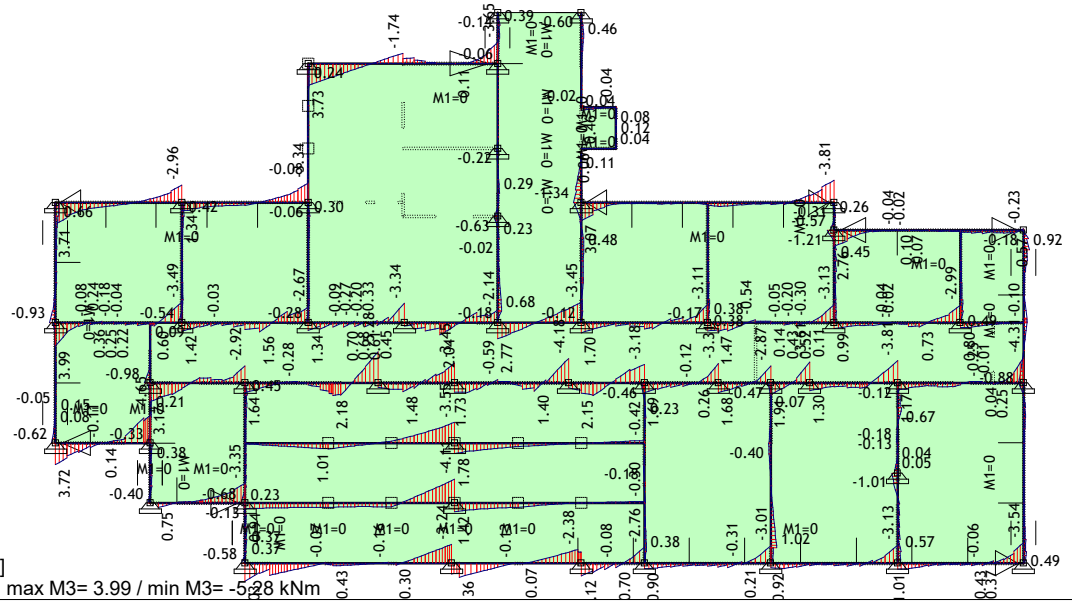
Nivo: [0.00 m]
Vplivi v gredi: max M3= 16.90 / min M3= -29.44 kNm

Obt. 6: koristna na strehi



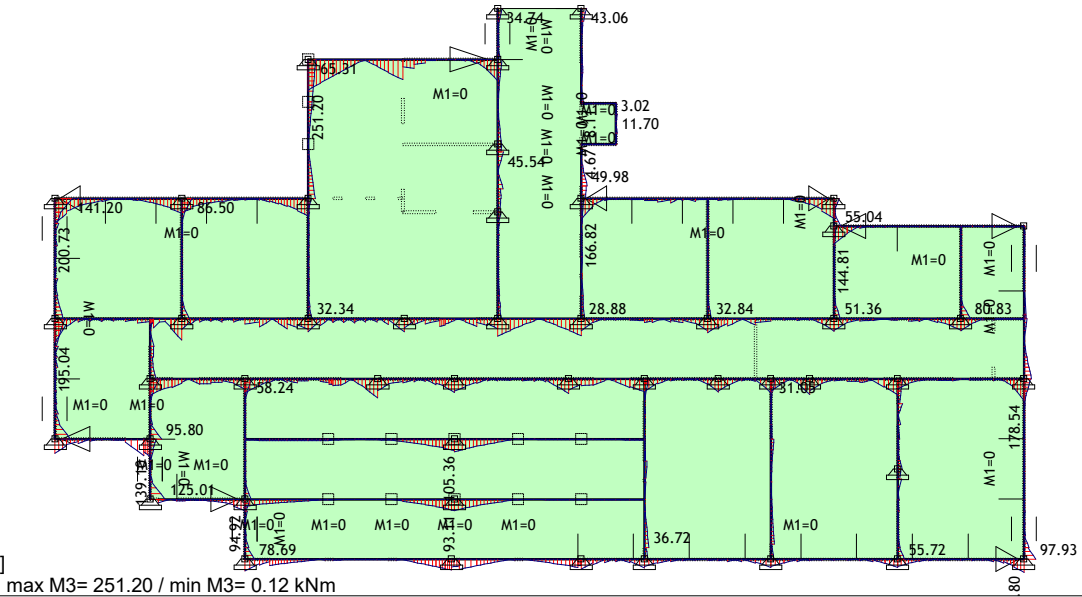
Nivo: [0.00 m]
Vplivi v gredi: max M3= 2.33 / min M3= -4.66 kNm

Obt. 7: veter +x



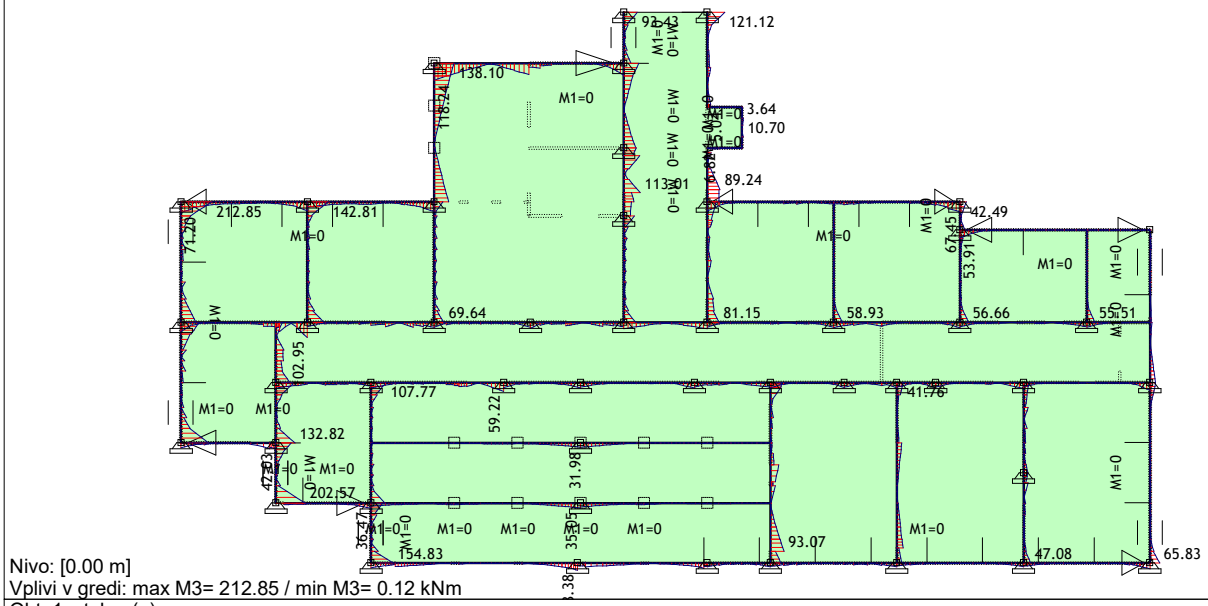
Nivo: [0.00 m]
Vplivi v gredi: max M3= 3.99 / min M3= -5.28 kNm

Obt. 11: potres x



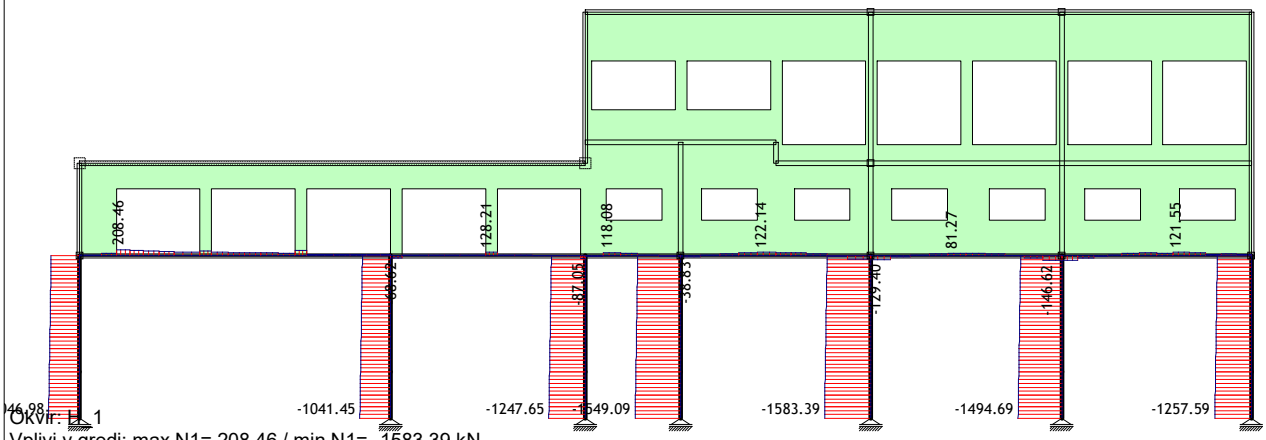
Nivo: [0.00 m]
Vplivi v gredi: max M3= 251.20 / min M3= 0.12 kNm

Obt. 12: potres y



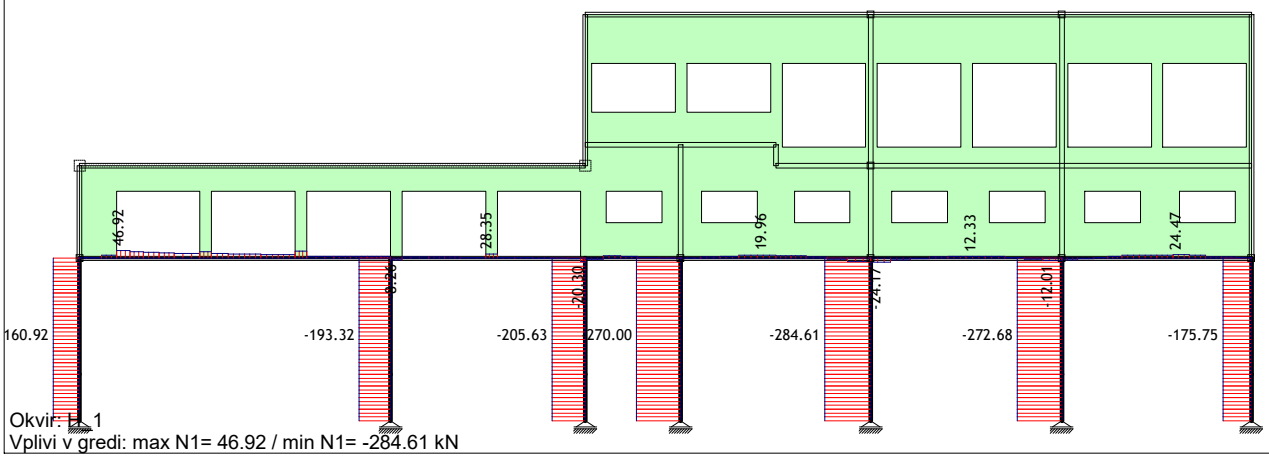
Nivo: [0.00 m]
Vplivi v gredi: max M3= 212.85 / min M3= 0.12 kNm

Obt. 1: stalna (g)



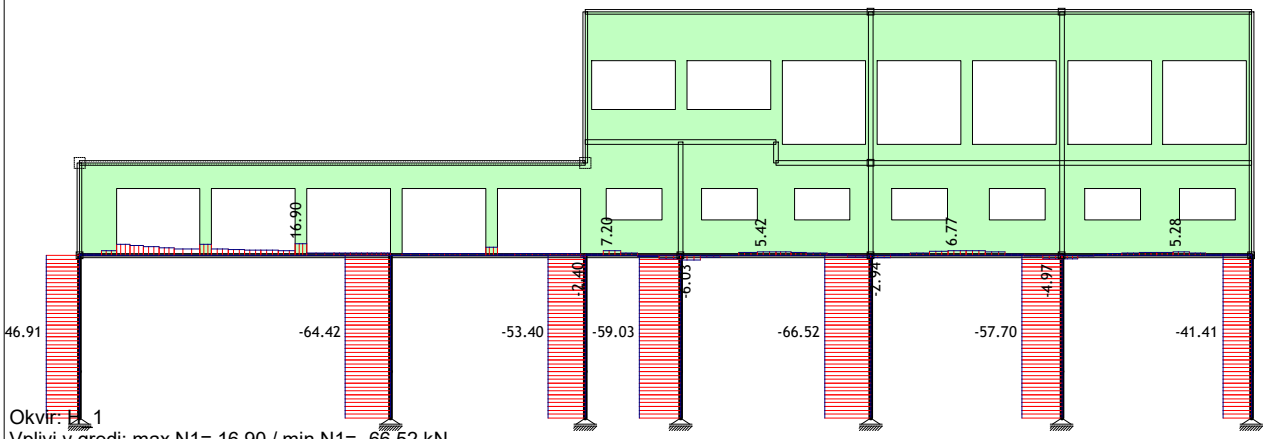
Okvir: L. 1
Vplivi v gredi: max N1= 208.46 / min N1= -1583.39 kN

Obt. 2: koristna celota



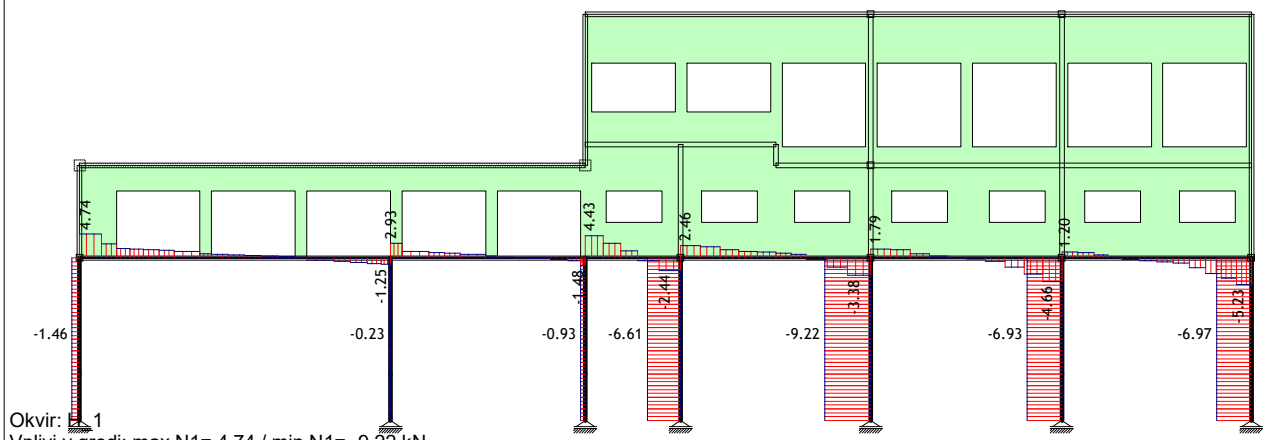
Okvir: L. 1
Vplivi v gredi: max N1= 46.92 / min N1= -284.61 kN

Obt. 5: sneg



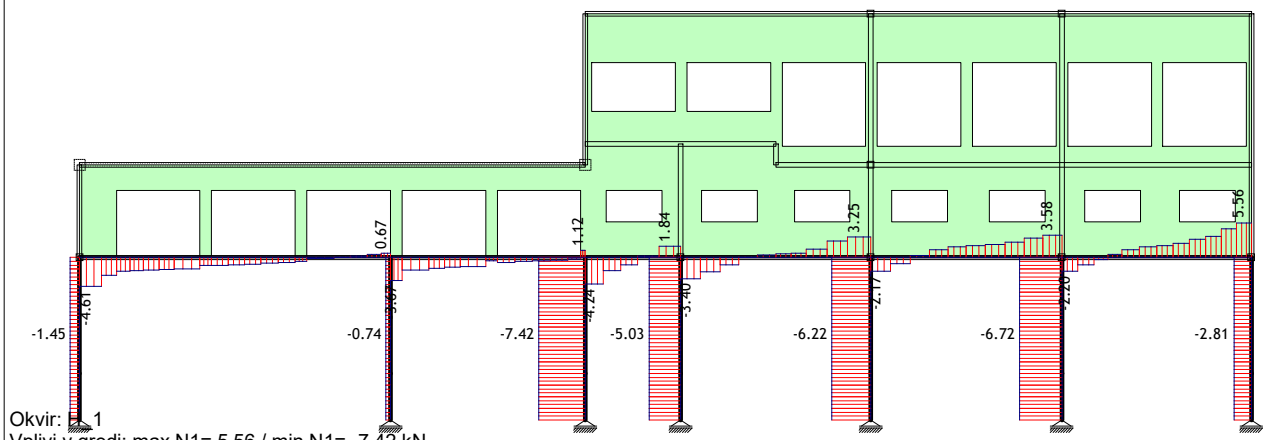
Okvir: H_1
Vplivi v gredi: max N1= 16.90 / min N1= -66.52 kN

Obt. 7: veter +x



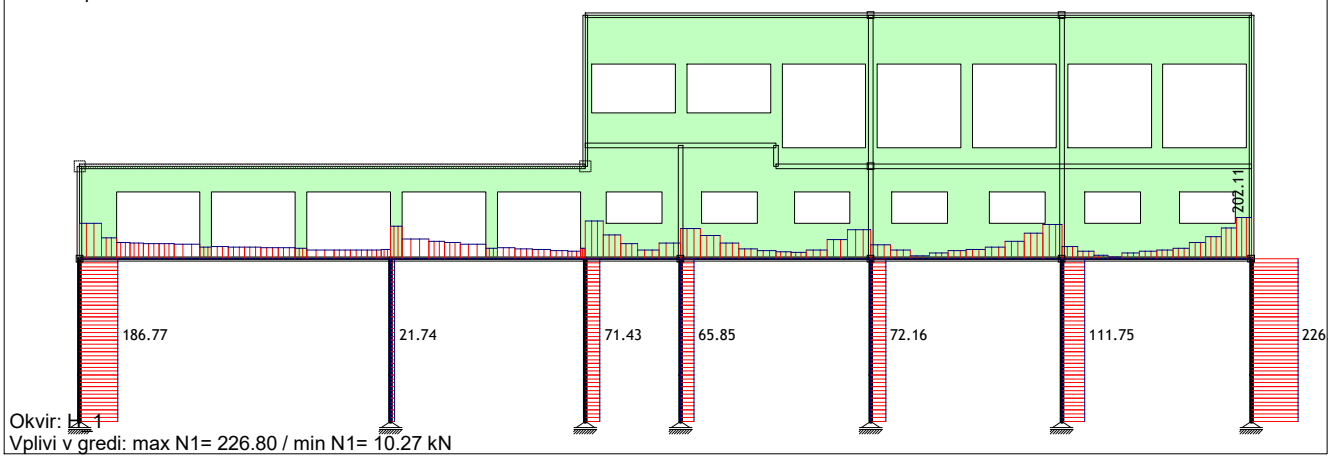
Okvir: H_1
Vplivi v gredi: max N1= 4.74 / min N1= -9.22 kN

Obt. 8: veter -x



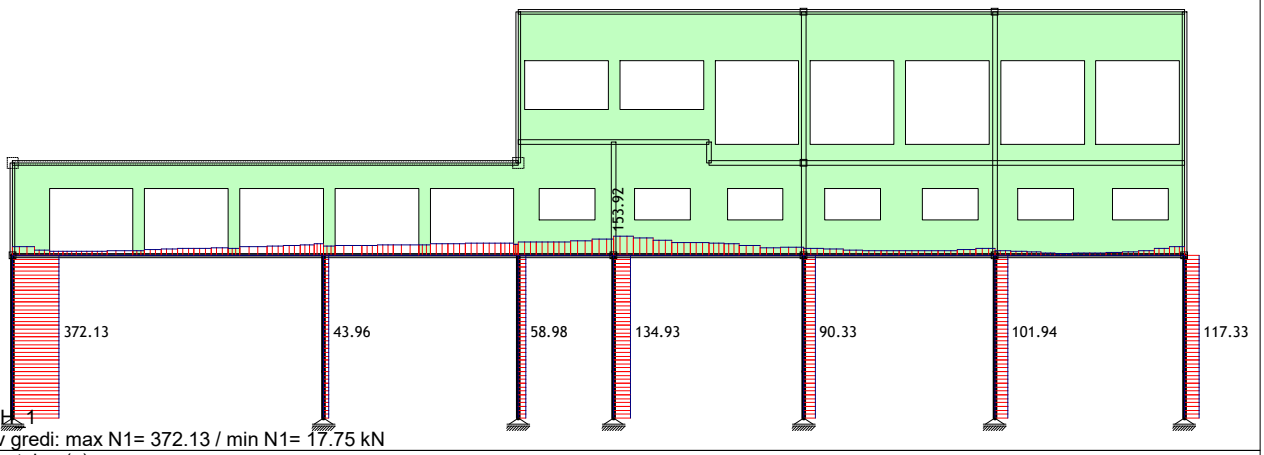
Okvir: H_1
Vplivi v gredi: max N1= 5.56 / min N1= -7.42 kN

Obt. 11: potres x



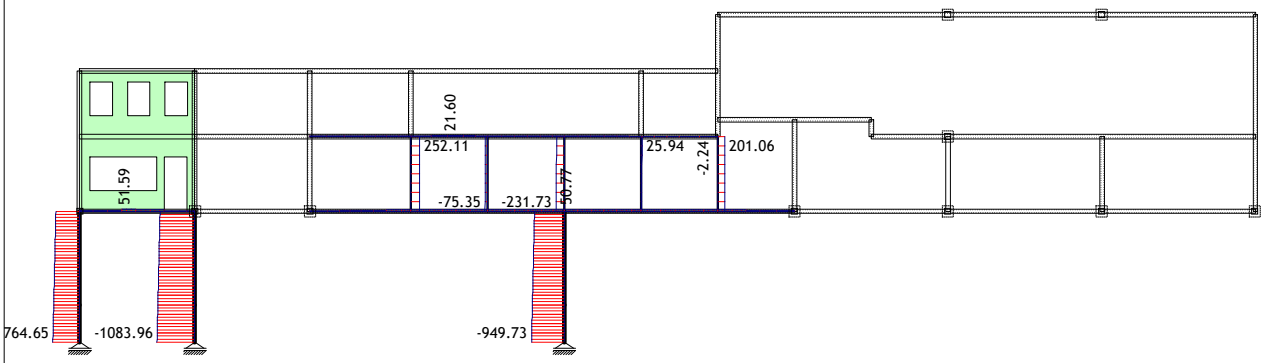
Okvir: H_1
Vplivi v gredi: max N1= 226.80 / min N1= 10.27 kN

Obt. 12: potres y



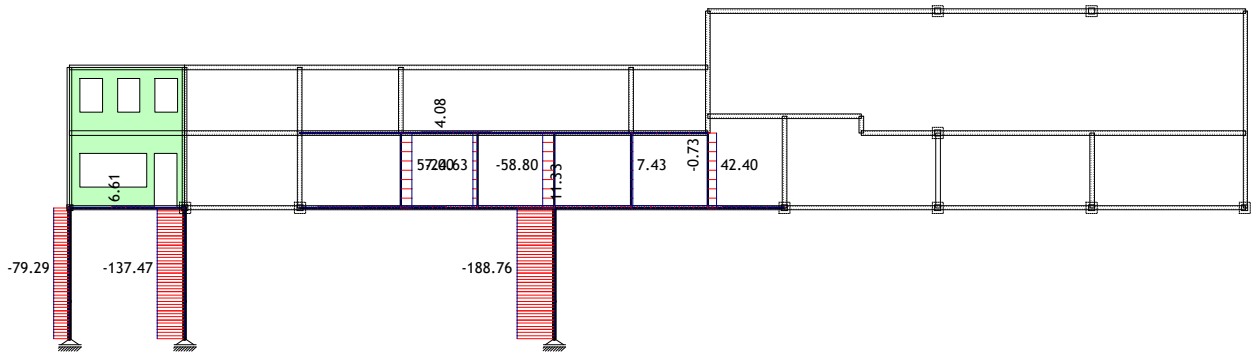
Okvir: H_1
Vplivi v gredi: max N1= 372.13 / min N1= 17.75 kN

Obt. 1: stalna (g)



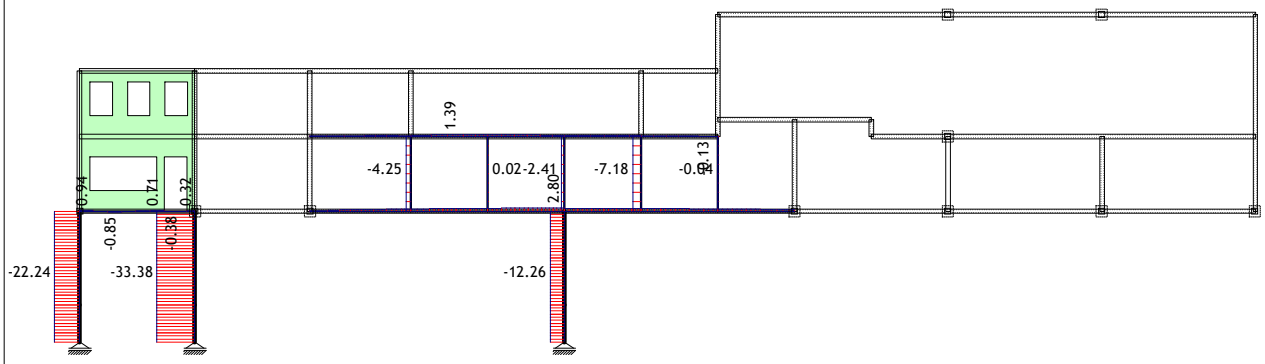
Okvir: H_4
Vplivi v gredi: max N1= 252.11 / min N1= -1083.96 kN

Obt. 2: koristna celota



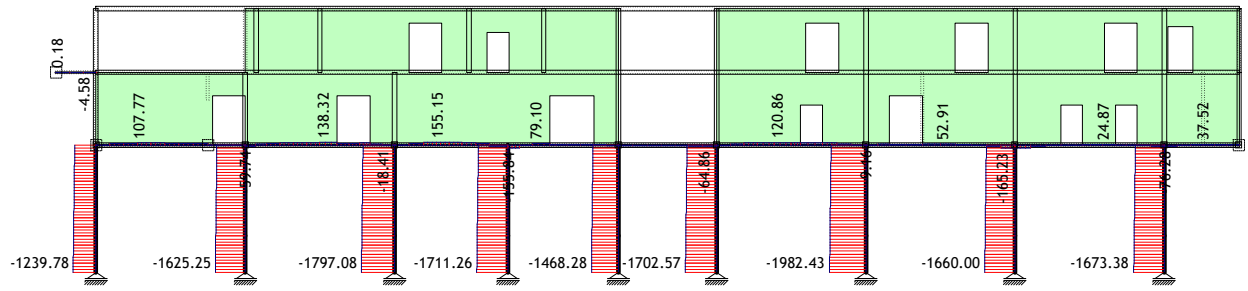
Okvir: H_4
Vplivi v gredi: max N1= 57.00 / min N1= -188.76 kN

Obt. 5: sneg



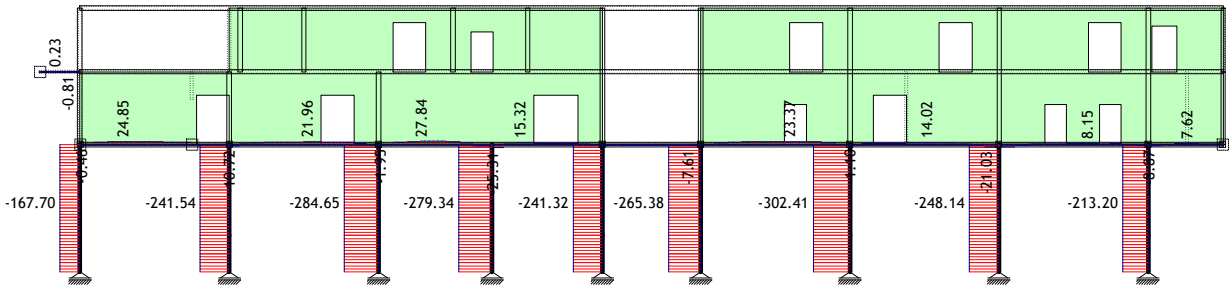
Okvir: H_4
Vplivi v gredi: max N1= 2.80 / min N1= -33.38 kN

Obt. 1: stalna (g)



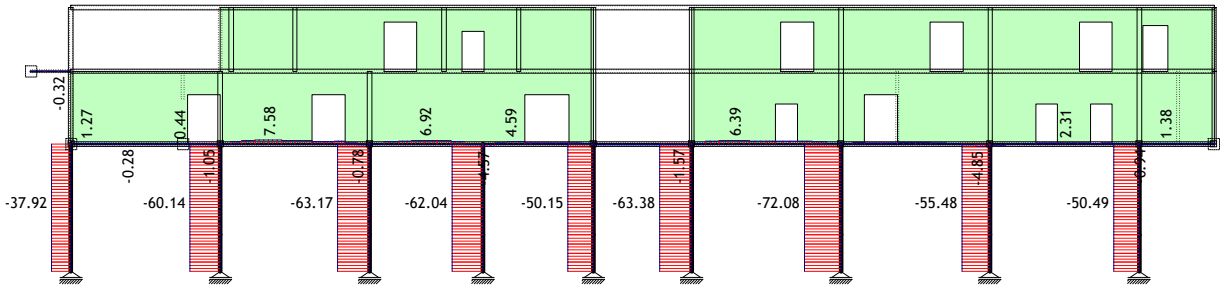
Okvir: H_7
Vplivi v gredi: max N1= 155.15 / min N1= -1982.43 kN

Obt. 2: koristna celota



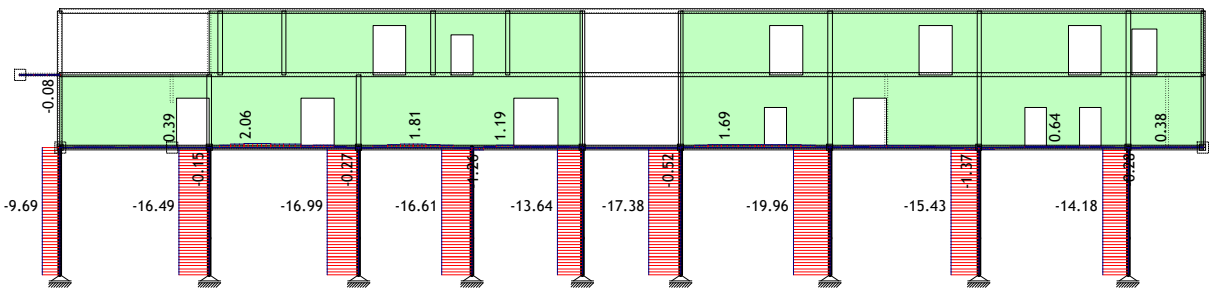
Okvir: H_7
Vplivi v gredi: max N1= 27.84 / min N1= -302.41 kN

Obt. 5: sneg



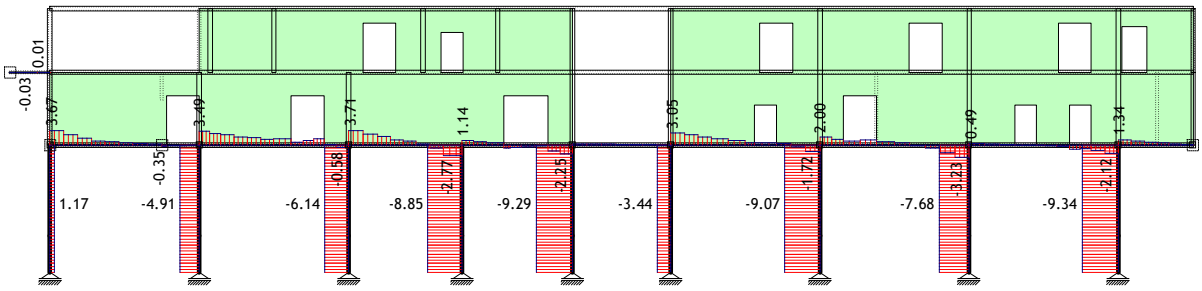
Okvir: H_7
Vplivi v gredi: max N1= 7.58 / min N1= -72.08 kN

Obt. 6: koristna na strehi



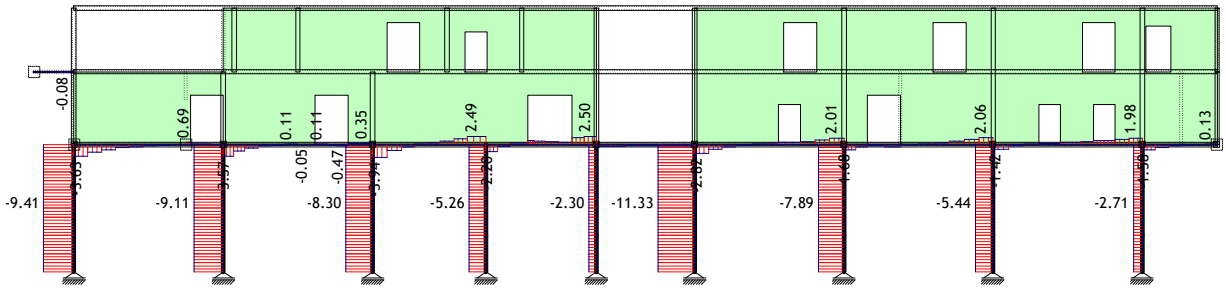
Okvir: H_7
Vplivi v gredi: max N1= 2.06 / min N1= -19.96 kN

Obt. 7: veter +x



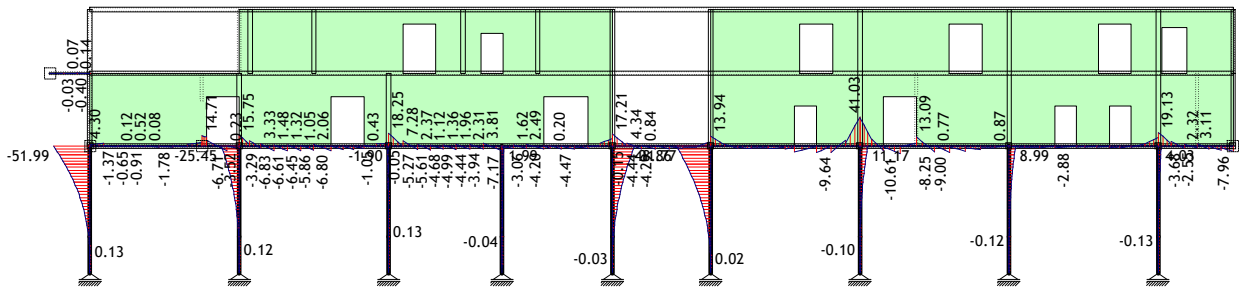
Okvir: H_7
Vplivi v gredi: max N1= 3.71 / min N1= -9.34 kN

Obt. 8: veter -x



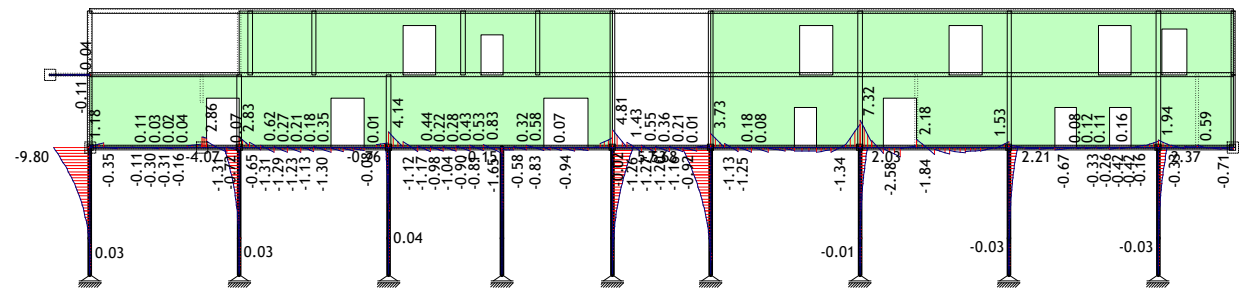
Okvir: H_7
Vplivi v gredi: max N1= 2.50 / min N1= -11.33 kN

Obt. 1: stalna (g)



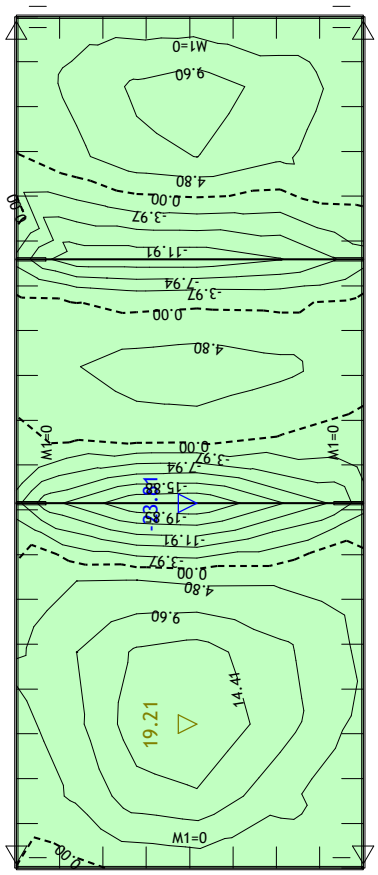
Okvir: H_7
Vplivi v gredi: max M2= 41.03 / min M2= -51.99 kNm

Obt. 2: koristna celota



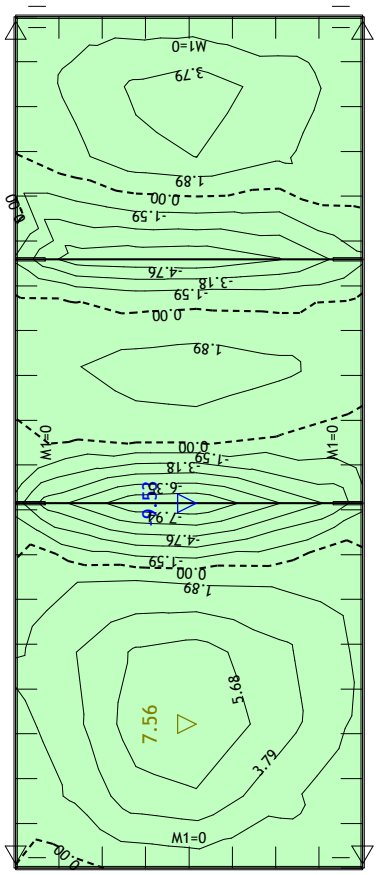
Okvir: H_7
Vplivi v gredi: max M2= 7.32 / min M2= -9.80 kNm

Obt. 1: stalna (g)



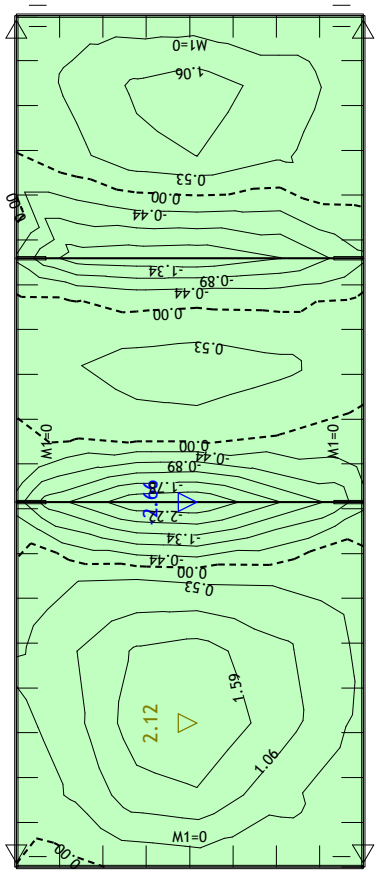
Nivo: [10.50 m]
Vplivi v plošči: max Mx= 19.21 / min Mx= -23.81 kNm/m

Obt. 5: sneg



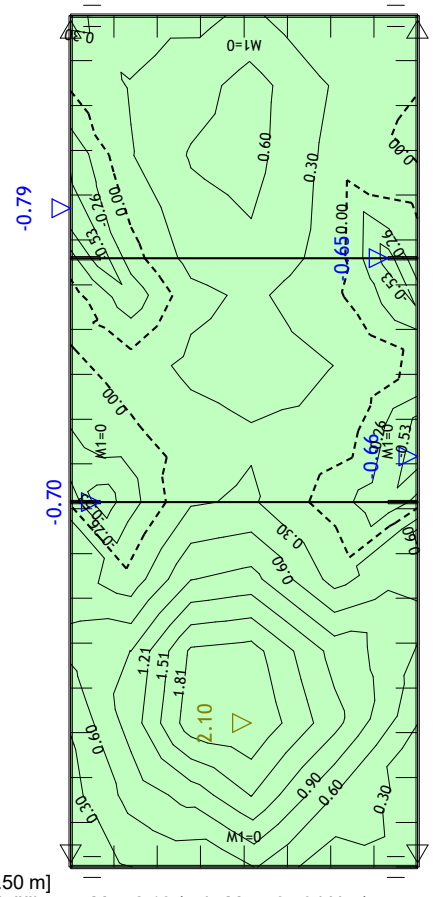
Nivo: [10.50 m]
Vplivi v plošči: max Mx= 7.56 / min Mx= -9.53 kNm/m

Obt. 6: koristna na strehi



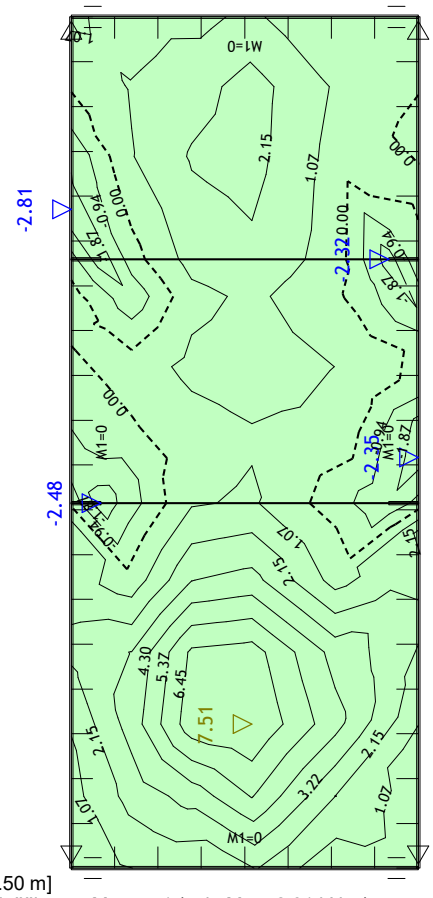
Nivo: [10.50 m]
Vplivi v plošči: max Mx= 2.12 / min Mx= -2.66 kNm/m

Obt. 6: koristna na strehi



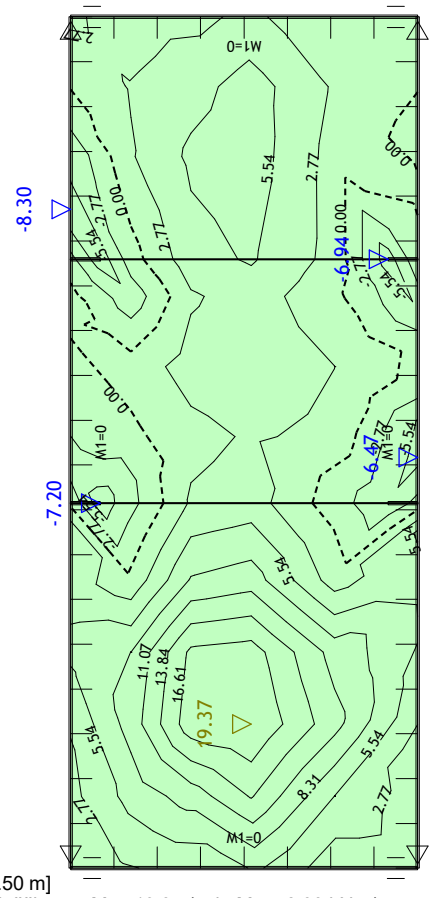
Nivo: [10.50 m]
Vplivi v plošči: max My= 2.10 / min My= -0.79 kNm/m

Obt. 5: sneg



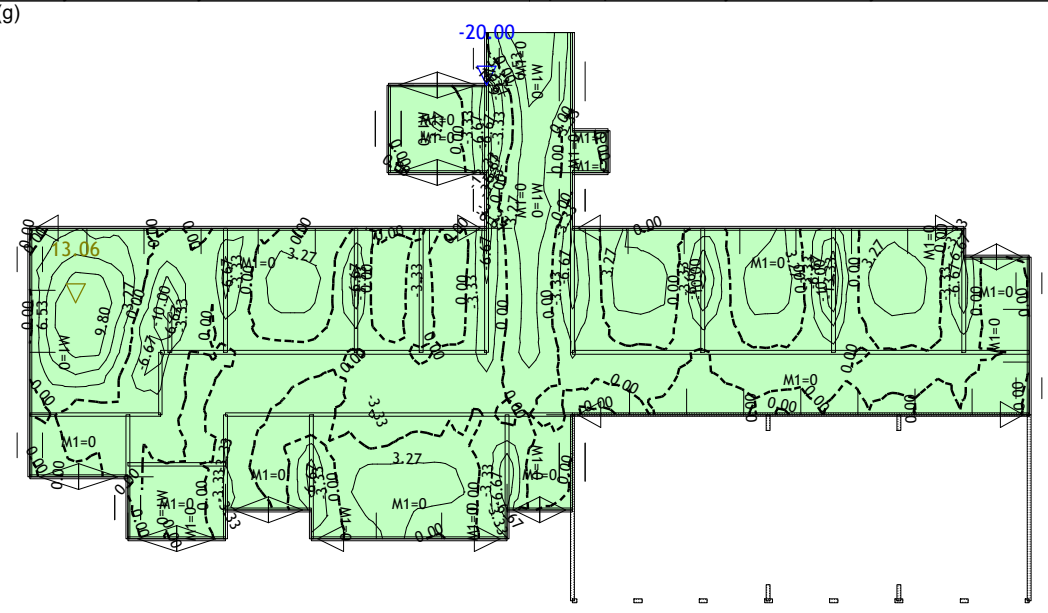
Nivo: [10.50 m]
Vplivi v plošči: max My= 7.51 / min My= -2.81 kNm/m

Obt. 1: stalna (g)



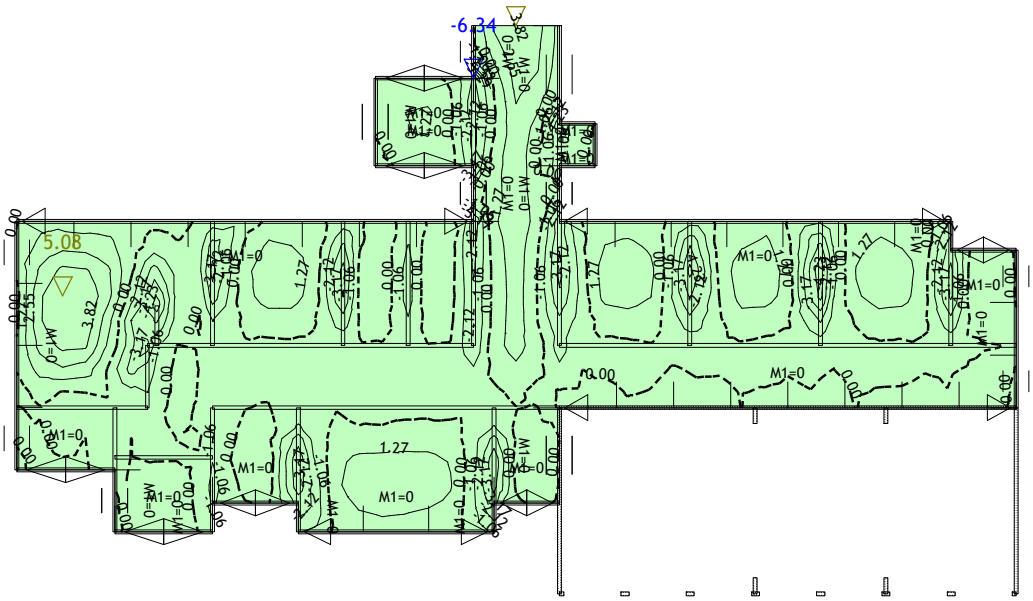
Nivo: [10.50 m]
Vplivi v plošči: max My= 19.37 / min My= -8.30 kNm/m

Obt. 1: stalna (g)



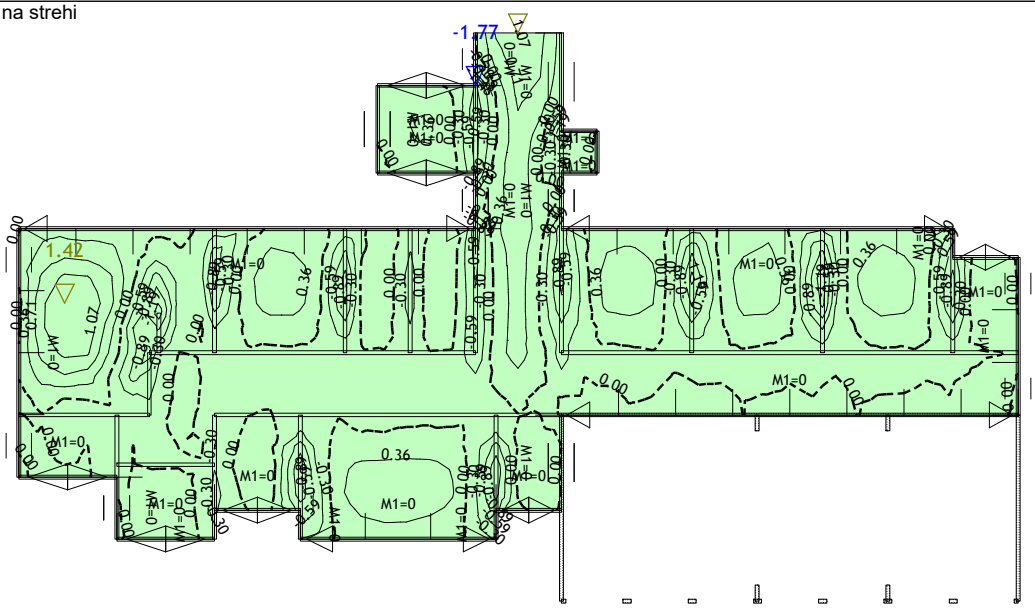
Nivo: [7.50 m]
Vplivi v plošči: max Mx= 13.06 / min Mx= -20.00 kNm/m

Obt. 5: sneg



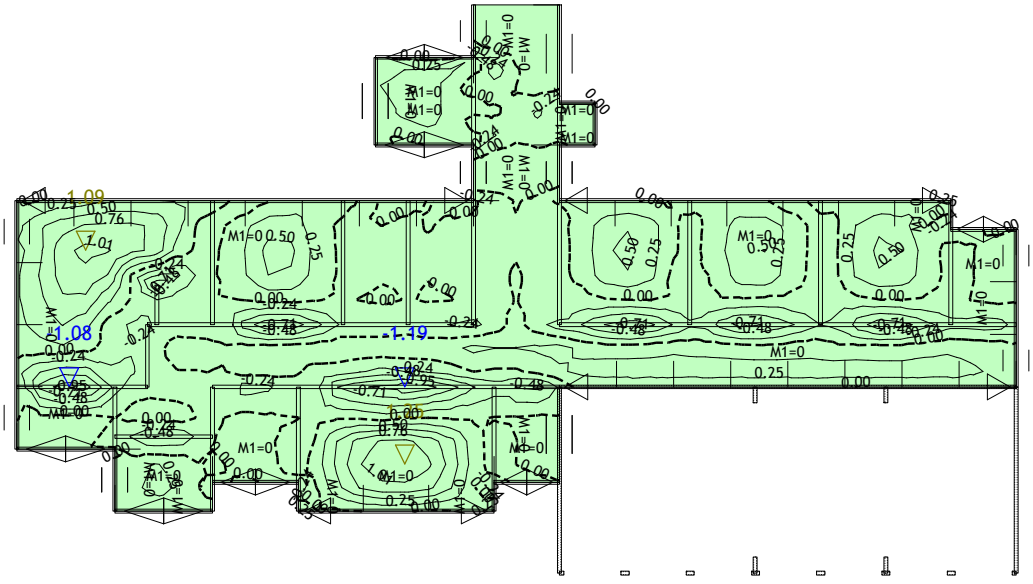
Nivo: [7.50 m]
Vplivi v plošči: max Mx= 5.08 / min Mx= -6.34 kNm/m

Obt. 6: koristna na strehi



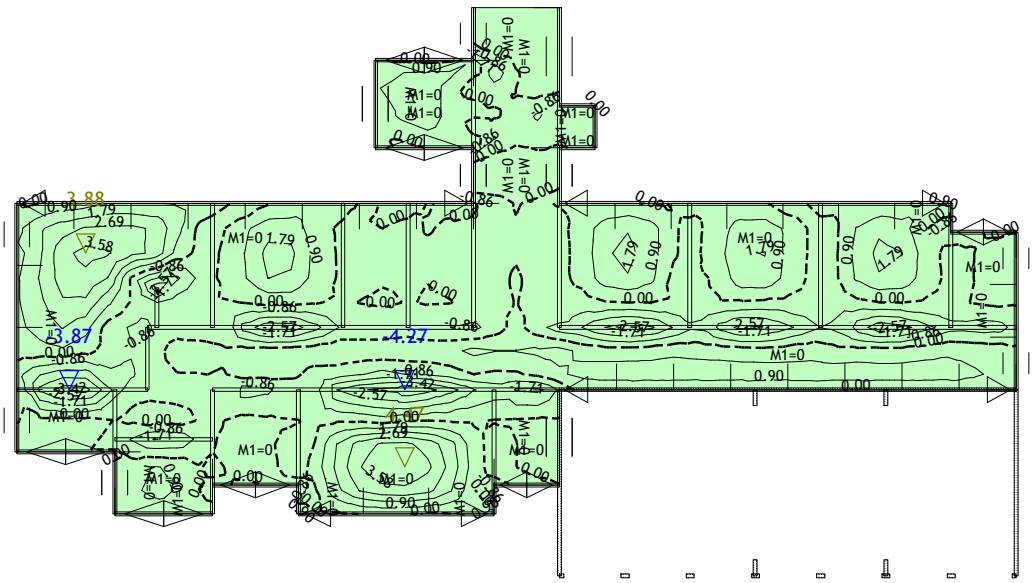
Nivo: [7.50 m]
Vplivi v plošči: max Mx= 1.42 / min Mx= -1.77 kNm/m

Obt. 6: koristna na strehi



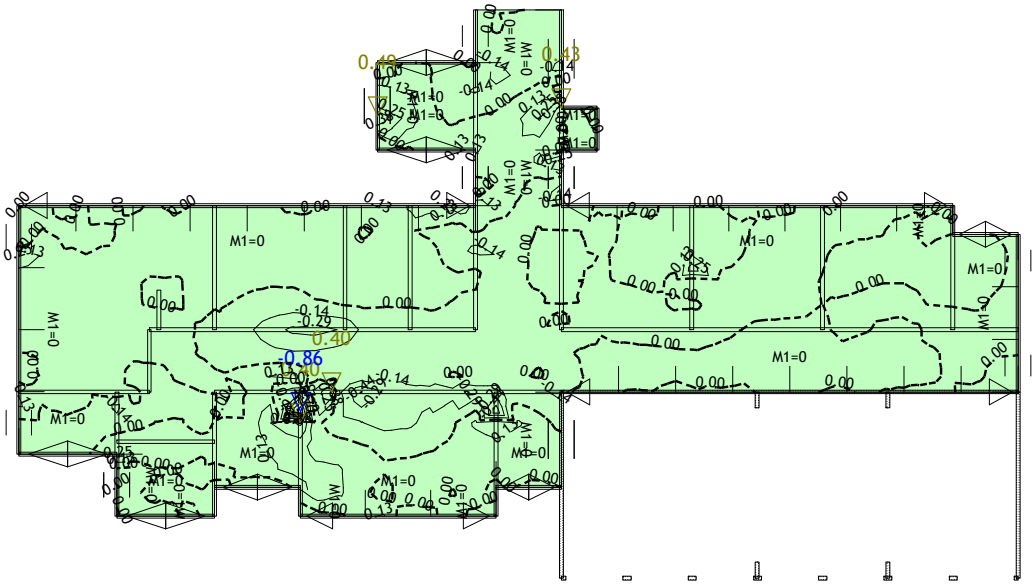
Nivo: [7.50 m]
Vplivi v plošči: max My= 1.25 / min My= -1.19 kNm/m

Obt. 5: sneg



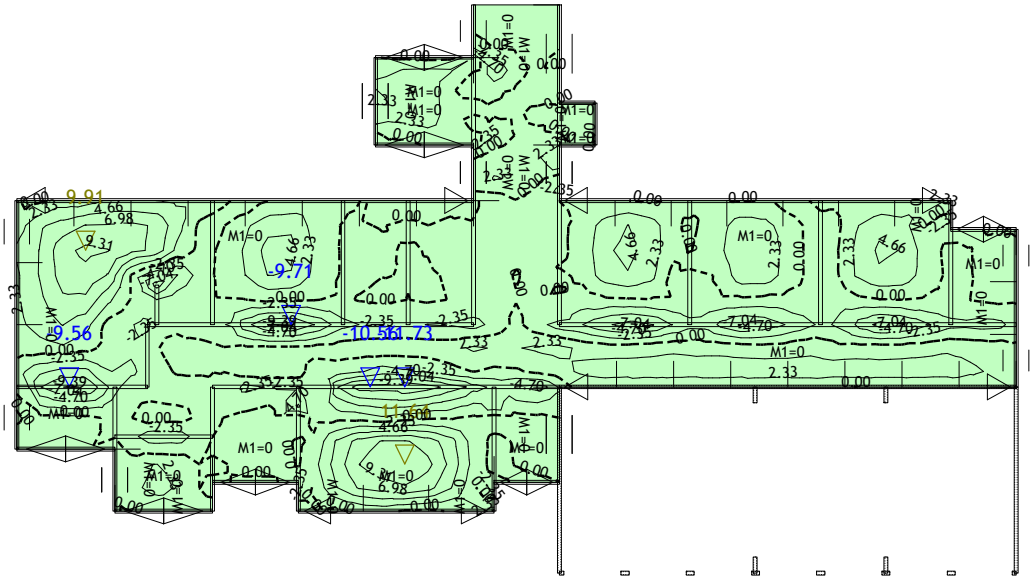
Nivo: [7.50 m]
Vplivi v plošči: max My= 4.47 / min My= -4.27 kNm/m

Obt. 2: koristna celota



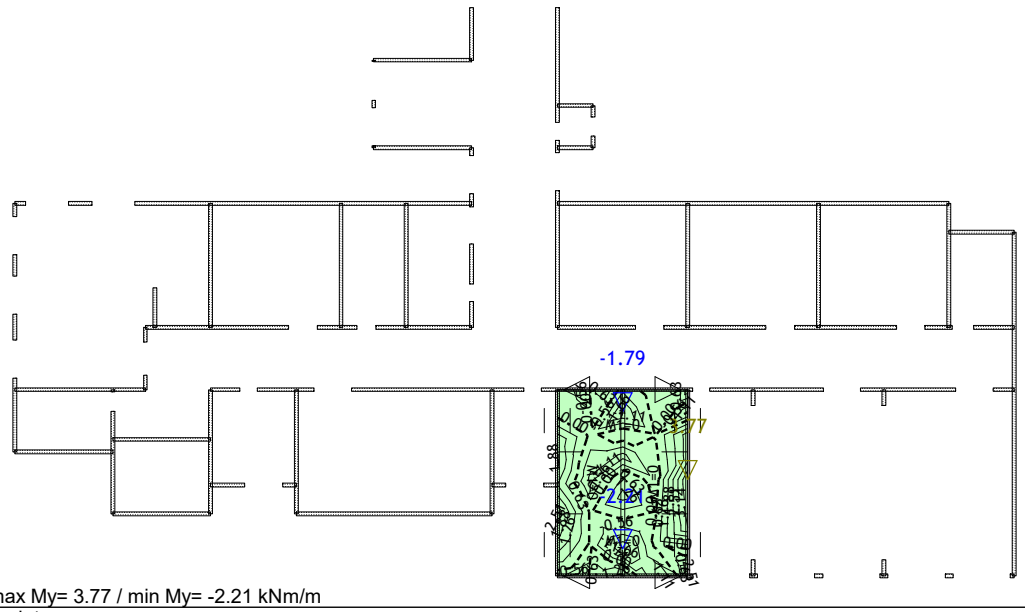
Nivo: [7.50 m]
Vplivi v plošči: max My= 0.49 / min My= -0.86 kNm/m

Obt. 1: stalna (g)



Nivo: [7.50 m]
Vplivi v plošči: max My= 11.64 / min My= -11.73 kNm/m

Obt. 1: stalna (g)



Nivo: [4.90 m]
Vplivi v plošči: max My= 3.77 / min My= -2.21 kNm/m

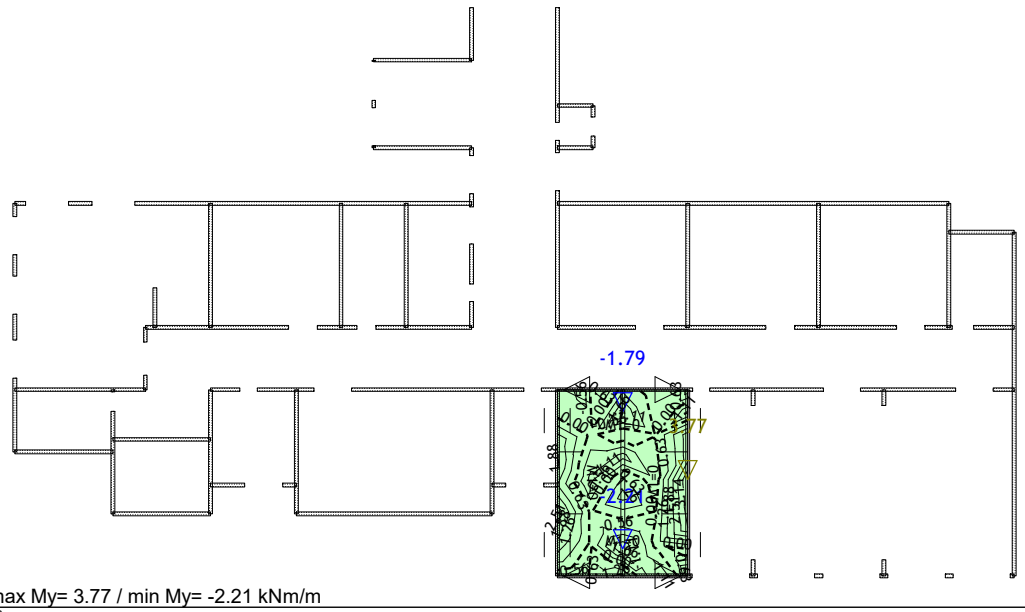
Obt. 2: koristna celota

Nivo: [4.90 m]
Vplivi v plošči: max My= 1.86 / min My= -1.00 kNm/m

Obt. 2: koristna celota

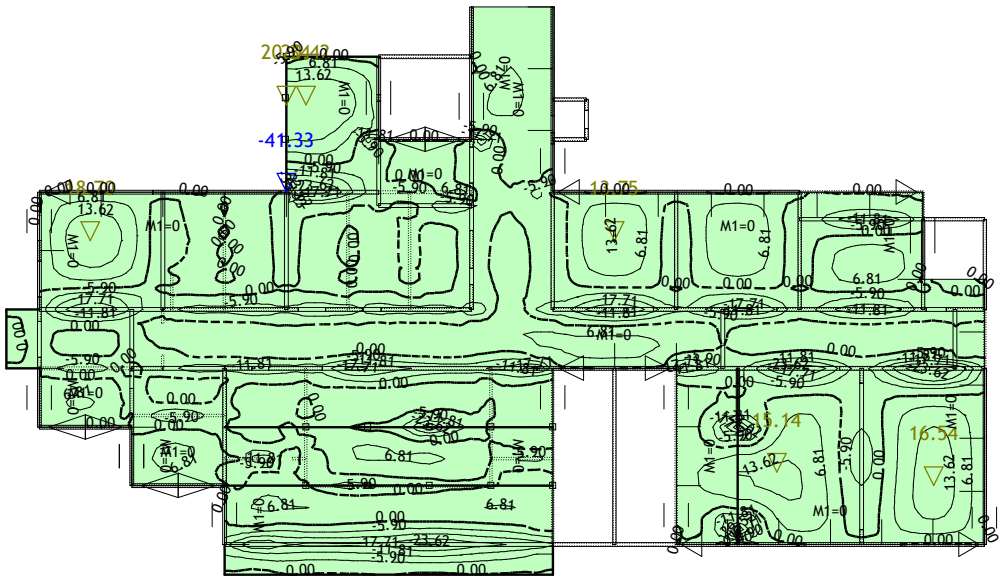
Nivo: [4.90 m]
Vplivi v plošči: max My= 1.86 / min My= -1.00 kNm/m

Obt. 1: stalna (g)



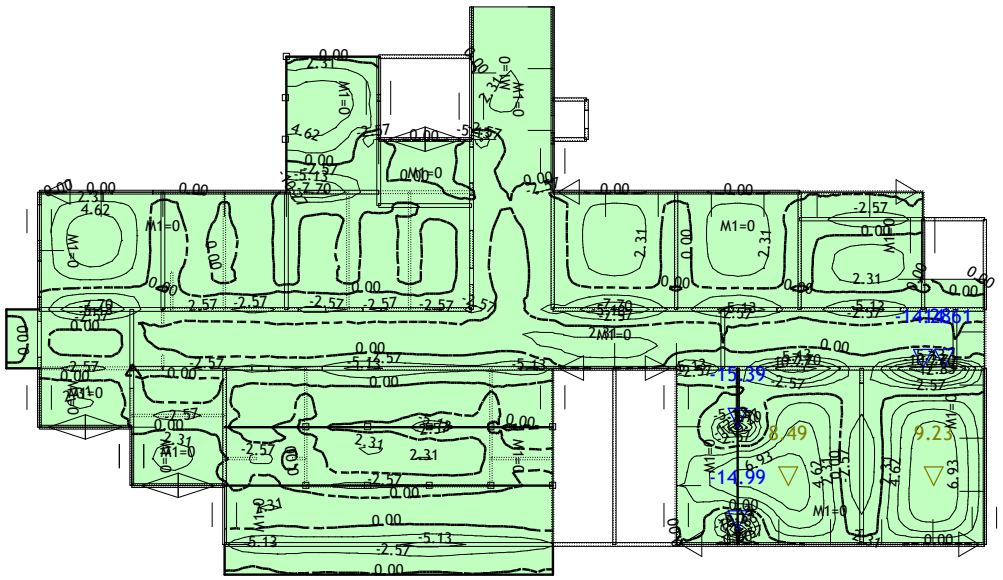
Nivo: [4.90 m]
Vplivi v plošči: max My= 3.77 / min My= -2.21 kNm/m

Obt. 1: stalna (g)



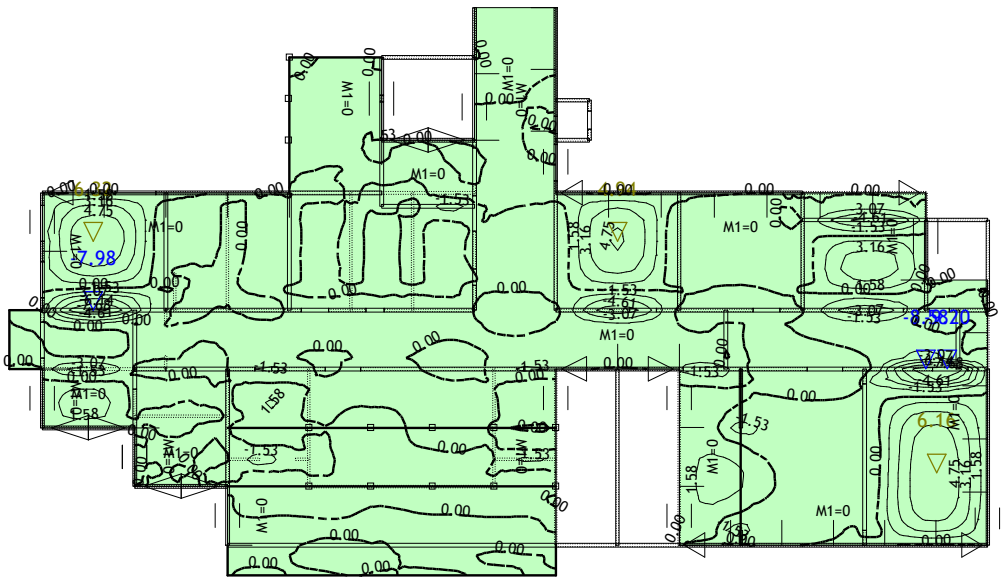
Nivo: [4.00 m]
Vplivi v plošči: max My= 20.42 / min My= -41.33 kNm/m

Obt. 2: koristna celota



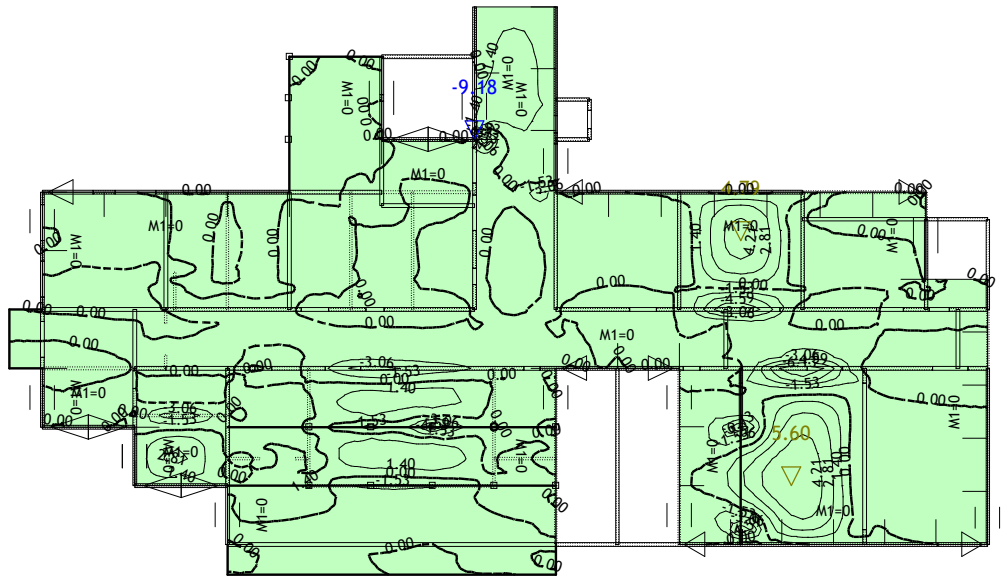
Nivo: [4.00 m]
Vplivi v plošči: max My= 9.23 / min My= -15.39 kNm/m

Obt. 3: koristna šahovska 1



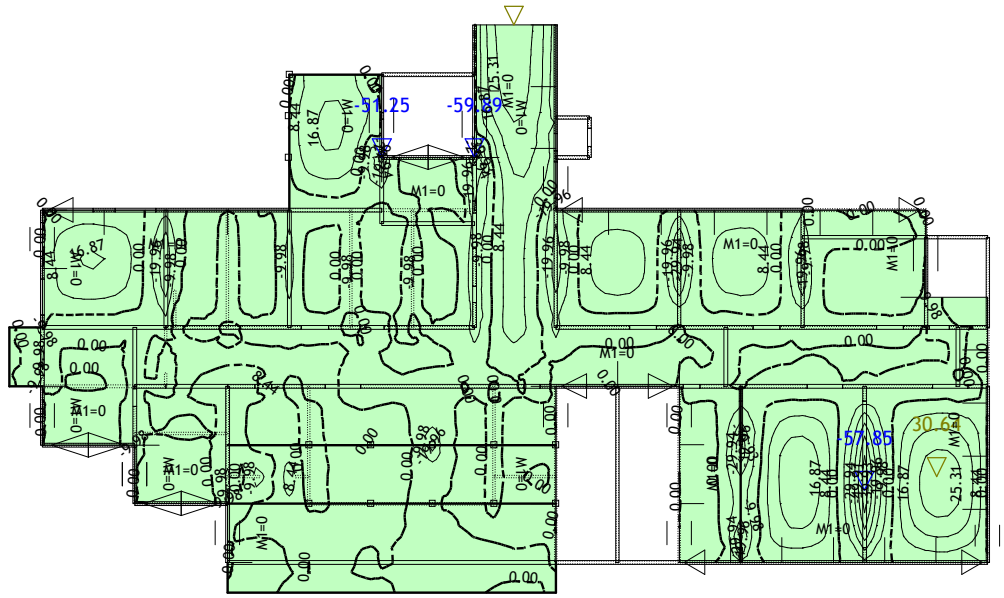
Nivo: [4.00 m]
Vplivi v plošči: max My= 6.32 / min My= -9.20 kNm/m

Obt. 4: koristna šahovska 2



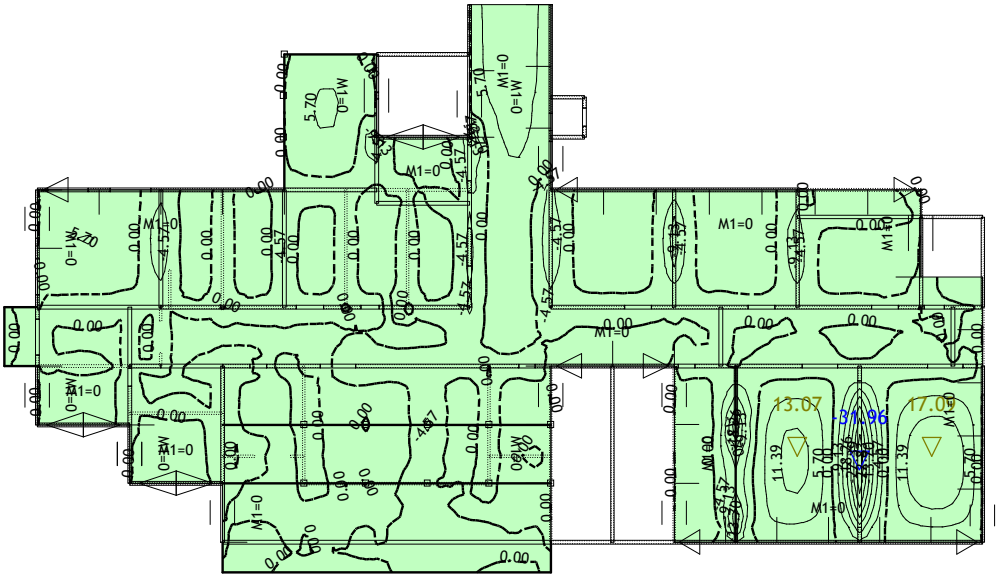
Nivo: [4.00 m]
Vplivi v plošči: max My= 5.60 / min My= -9.18 kNm/m

Obt. 1: stalna (g)



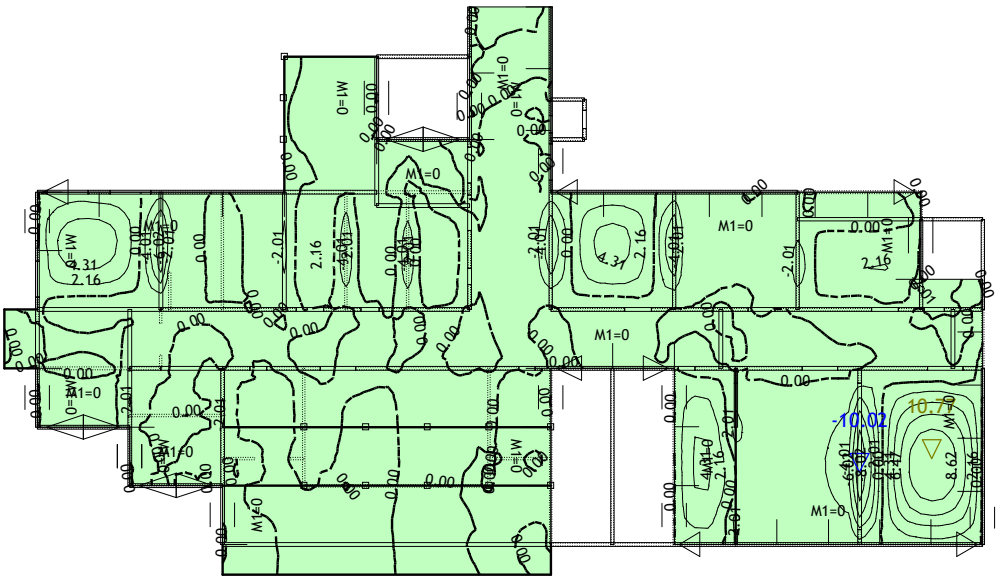
Nivo: [4.00 m]
Vplivi v plošči: max Mx= 33.74 / min Mx= -59.89 kNm/m

Obt. 2: koristna celota



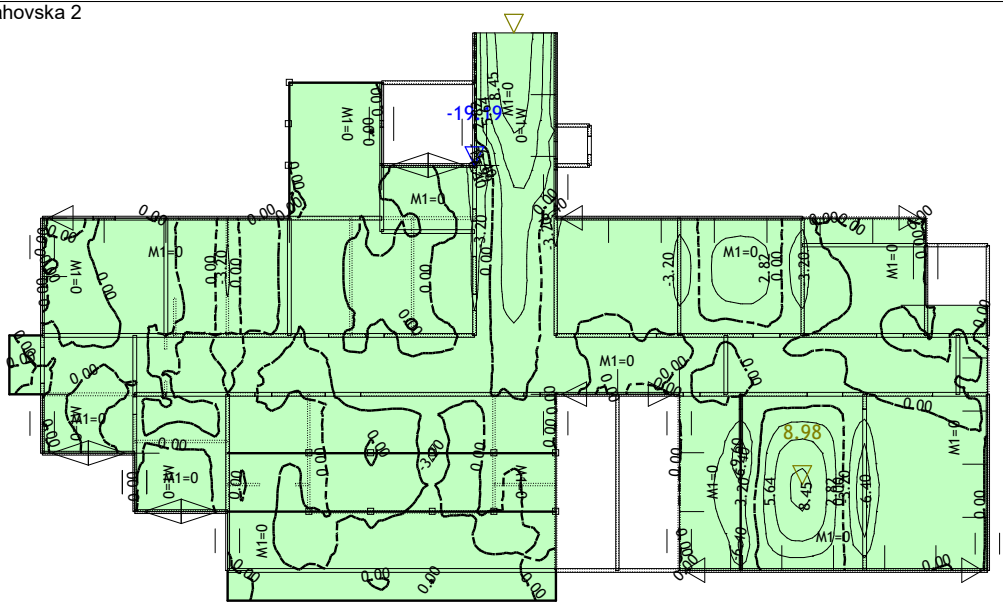
Nivo: [4.00 m]
Vplivi v plošči: max Mx= 17.09 / min Mx= -31.96 kNm/m

Obt. 3: koristna šahovska 1



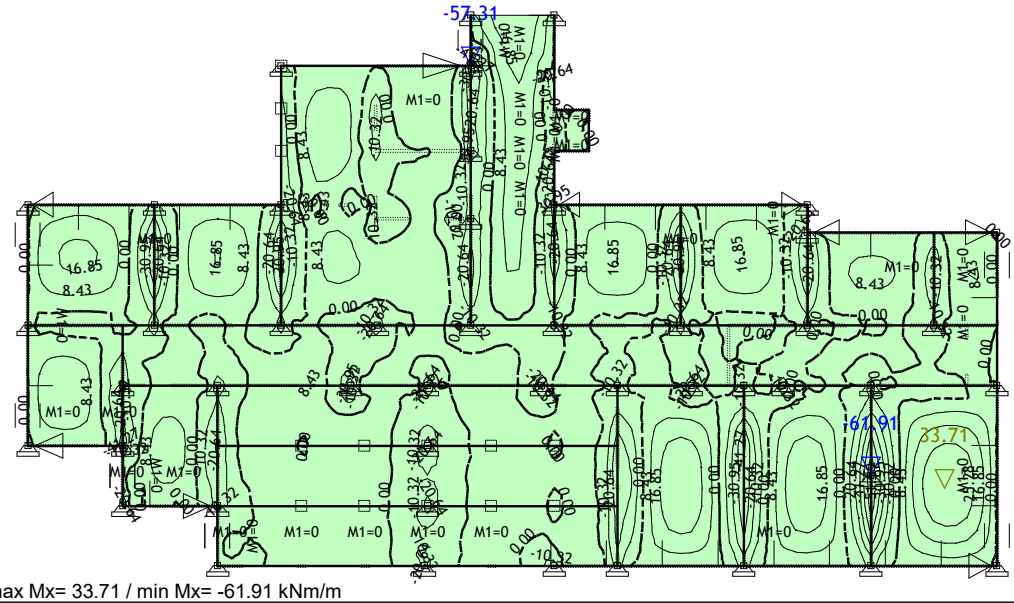
Nivo: [4.00 m]
Vplivi v plošči: max Mx= 10.77 / min Mx= -10.02 kNm/m

Obt. 4: koristna šahovska 2



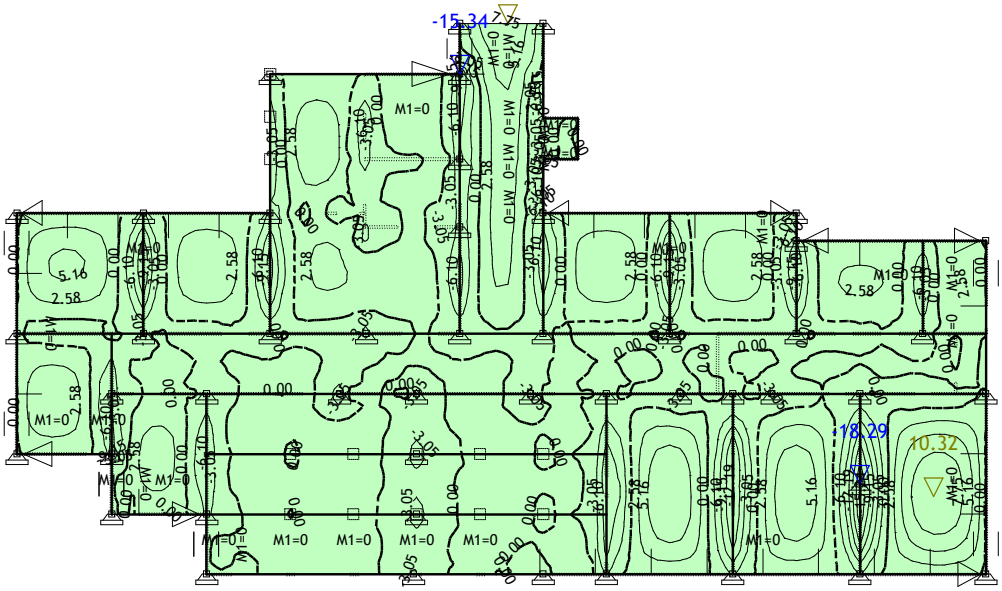
Nivo: [4.00 m]
Vplivi v plošči: max Mx= 11.26 / min Mx= -19.19 kNm/m

Obt. 1: stalna (g)



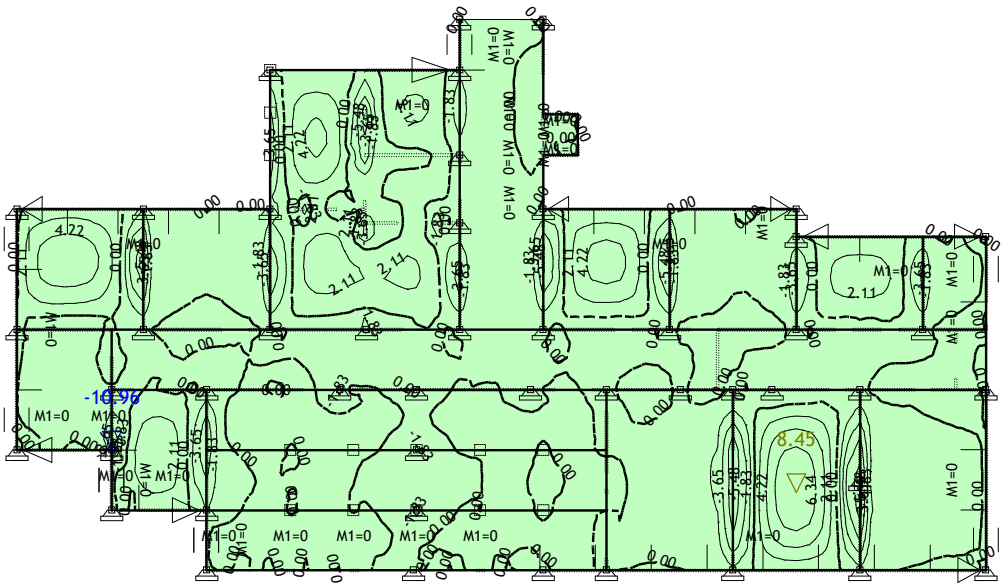
Nivo: [0.00 m]
Vplivi v plošči: max Mx= 33.71 / min Mx= -61.91 kNm/m

Obt. 2: koristna celota



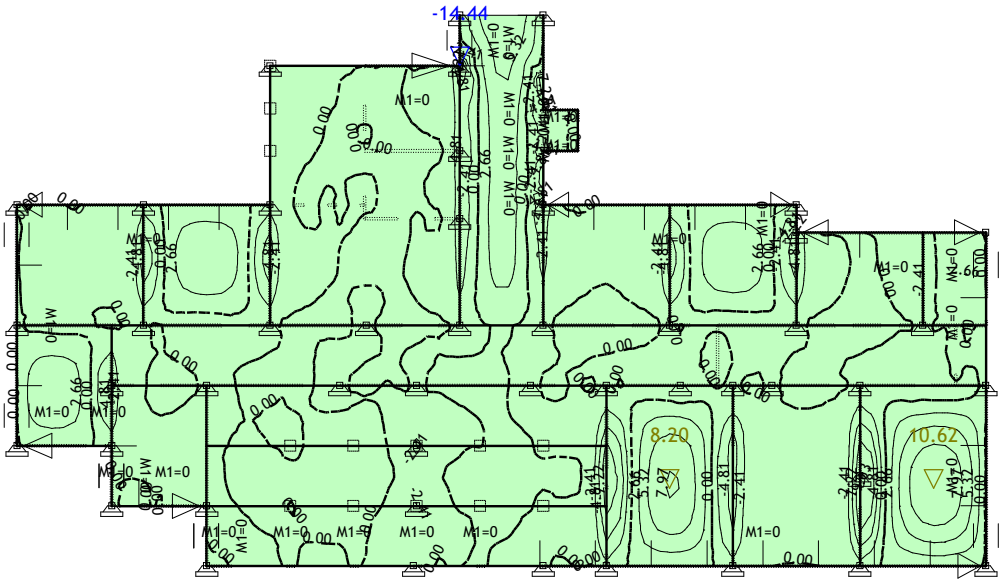
Nivo: [0.00 m]
Vplivi v plošči: max Mx= 10.32 / min Mx= -18.29 kNm/m

Obt. 3: koristna šahovska 1



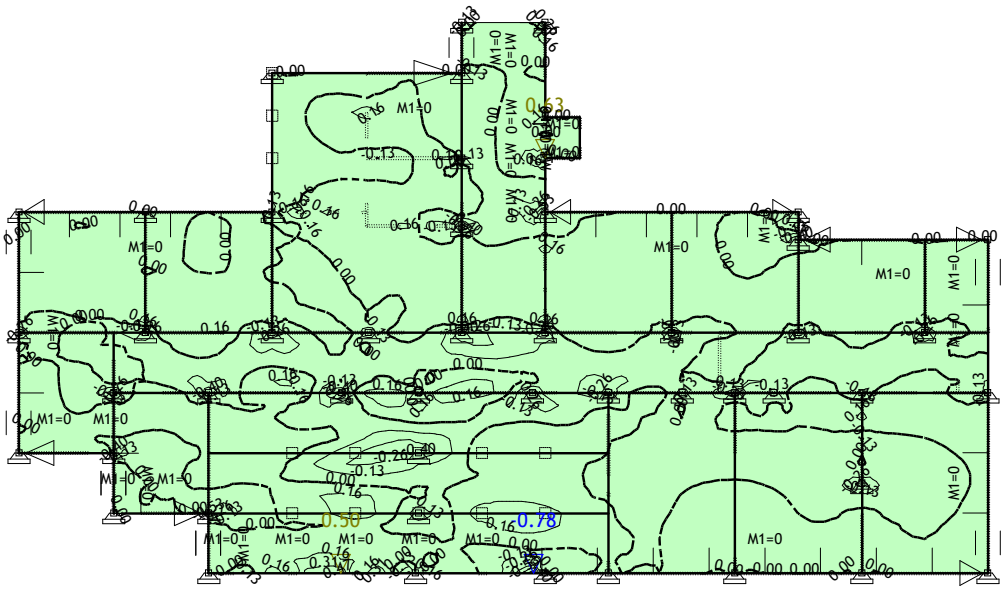
Nivo: [0.00 m]
Vplivi v plošči: max Mx= 8.45 / min Mx= -10.96 kNm/m

Obt. 4: koristna šahovska 2



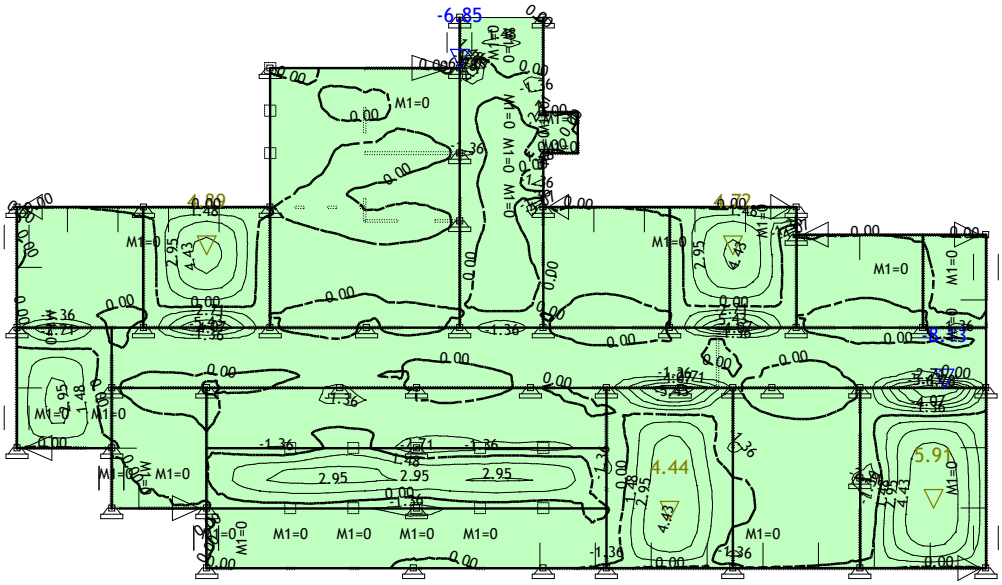
Nivo: [0.00 m]
Vplivi v plošči: max Mx= 10.62 / min Mx= -14.44 kNm/m

Obt. 5: sneg



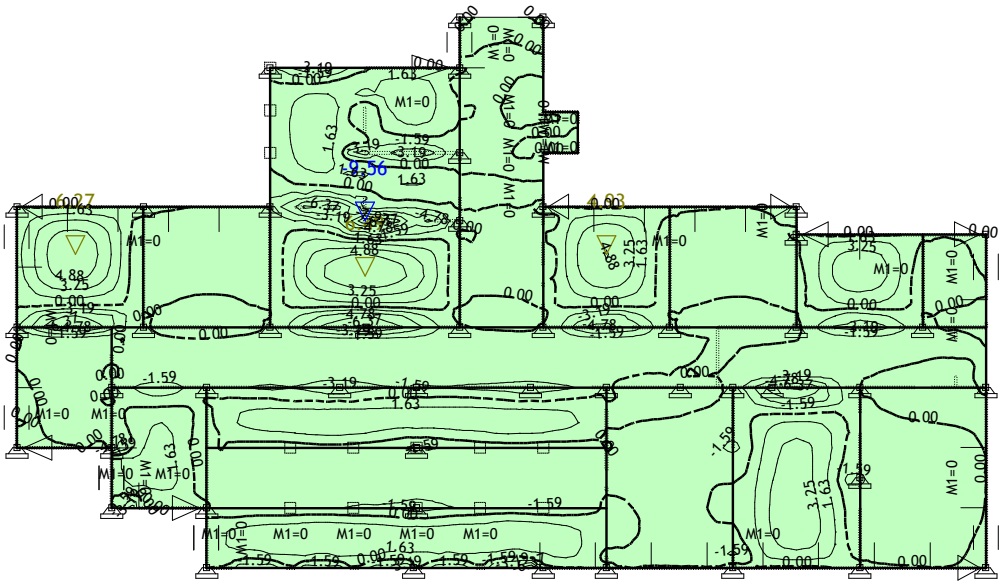
Nivo: [0.00 m]
Vplivi v plošči: max My= 0.63 / min My= -0.78 kNm/m

Obt. 4: koristna šahovska 2



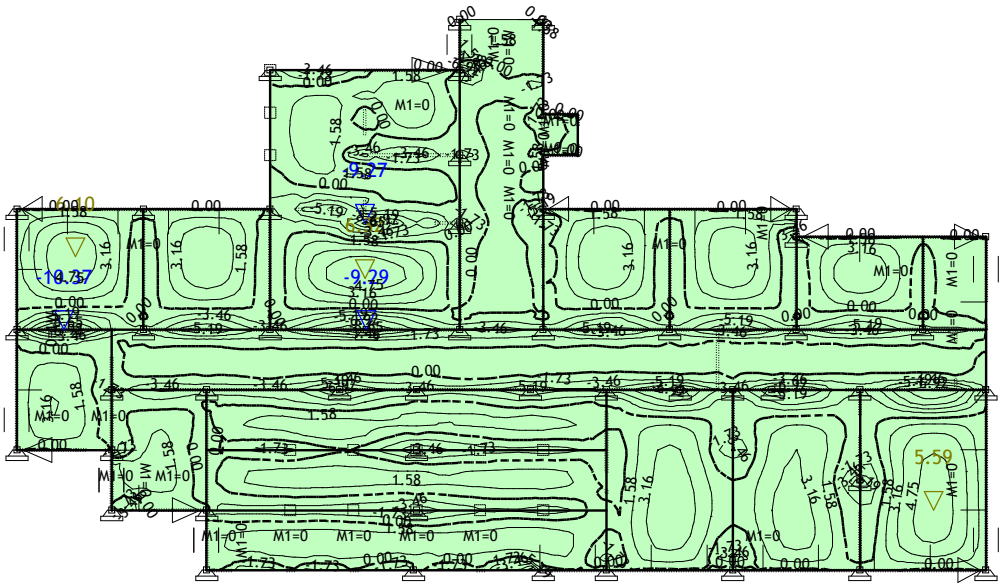
Nivo: [0.00 m]
Vplivi v plošči: max My= 5.91 / min My= -8.13 kNm/m

Obt. 3: koristna šahovska 1



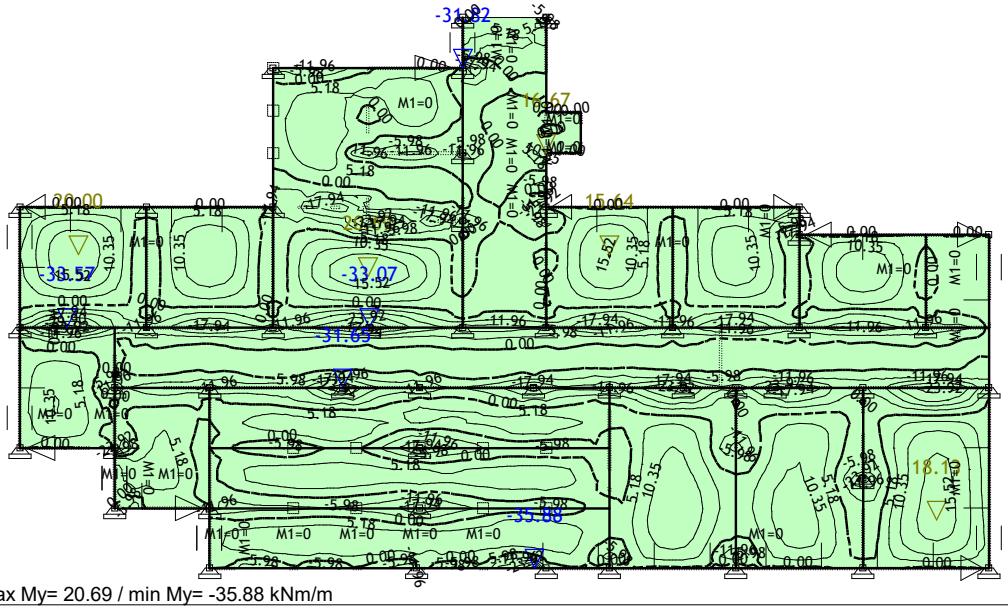
Nivo: [0.00 m]
Vplivi v plošči: max My= 6.49 / min My= -9.56 kNm/m

Obt. 2: koristna celota



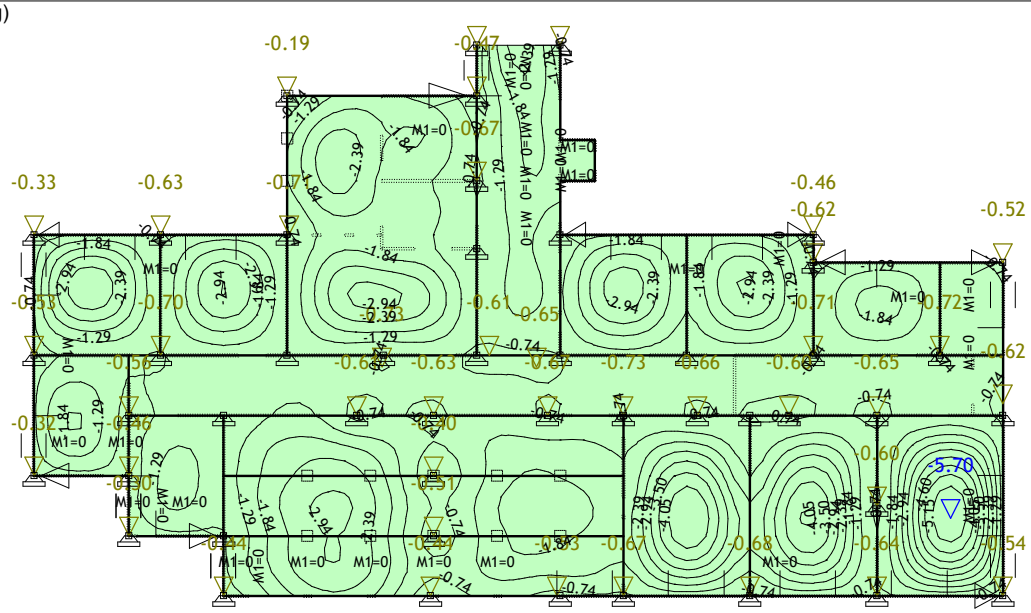
Nivo: [0.00 m]
Vplivi v plošči: max My= 6.32 / min My= -10.37 kNm/m

Obt. 1: stalna (g)



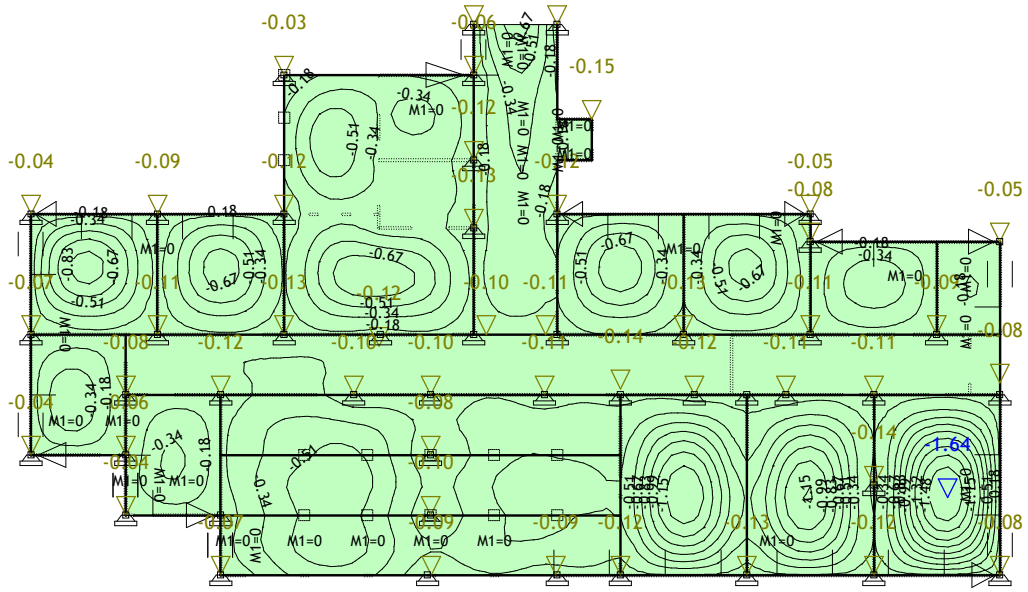
Nivo: [0.00 m]
Vplivi v plošči: max My= 20.69 / min My= -35.88 kNm/m

Obt. 1: stalna (g)



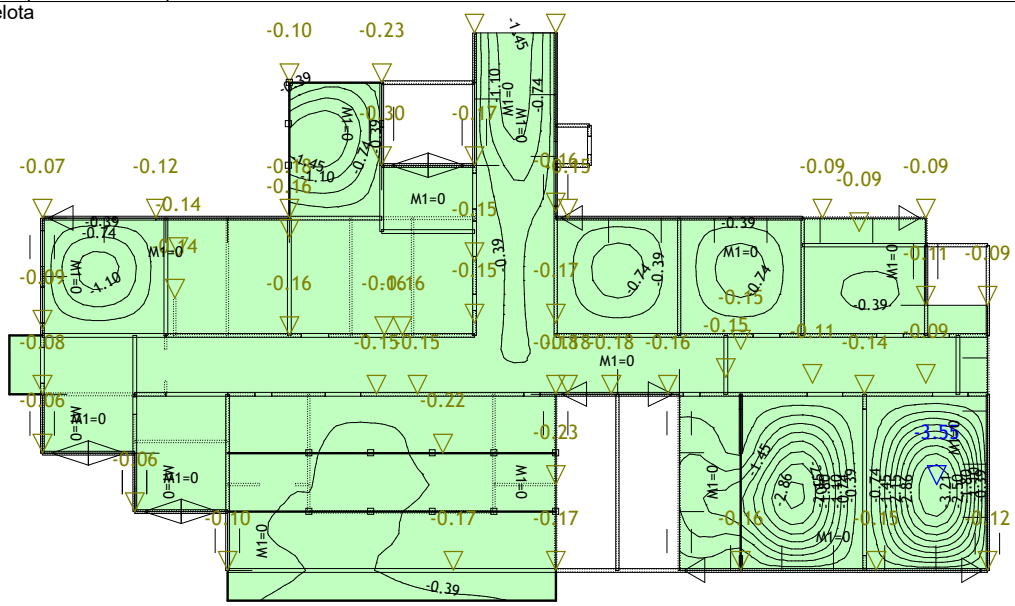
Nivo: [0.00 m]
Vplivi v plošči: max Zp= -0.19 / min Zp= -5.70 m / 1000

Obt. 2: koristna celota



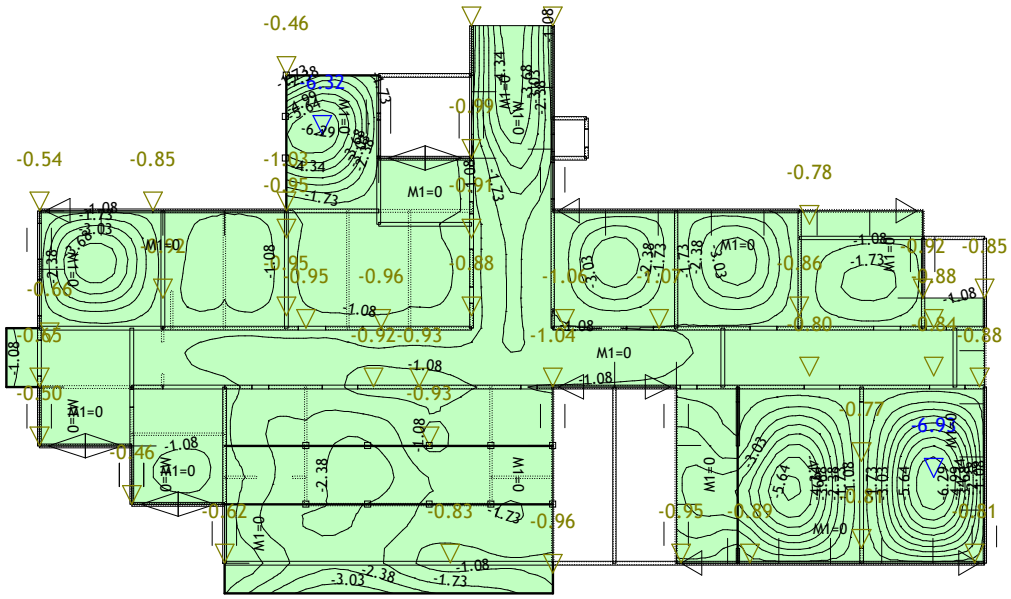
Nivo: [0.00 m]
Vplivi v plošči: max Zp= -0.03 / min Zp= -1.64 m / 1000

Obt. 2: koristna celota



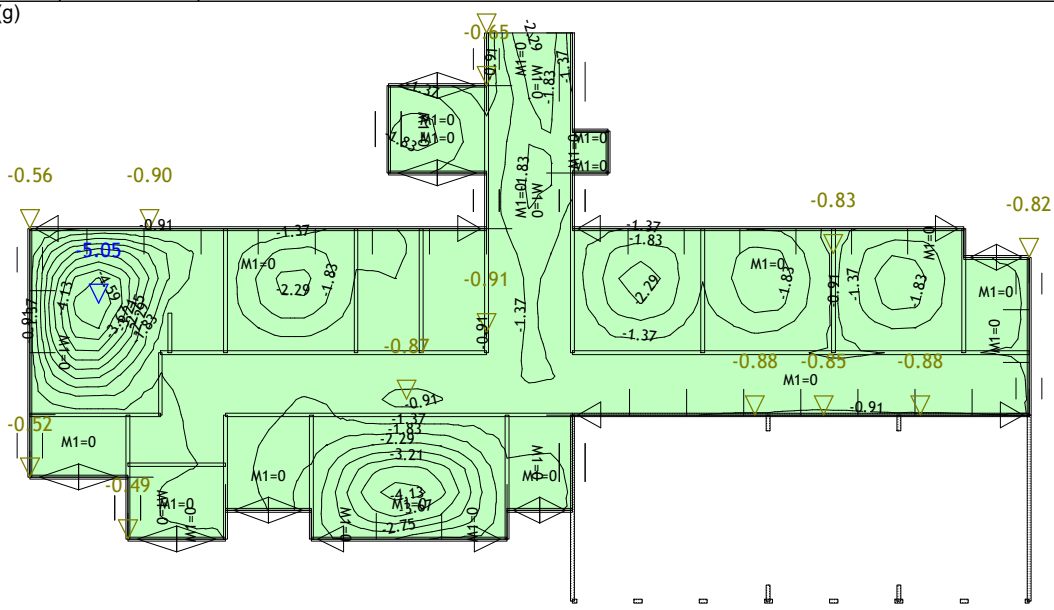
Nivo: [4.00 m]
Vplivi v plošči: max Zp= -0.05 / min Zp= -3.55 m / 1000

Obt. 1: stalna (g)



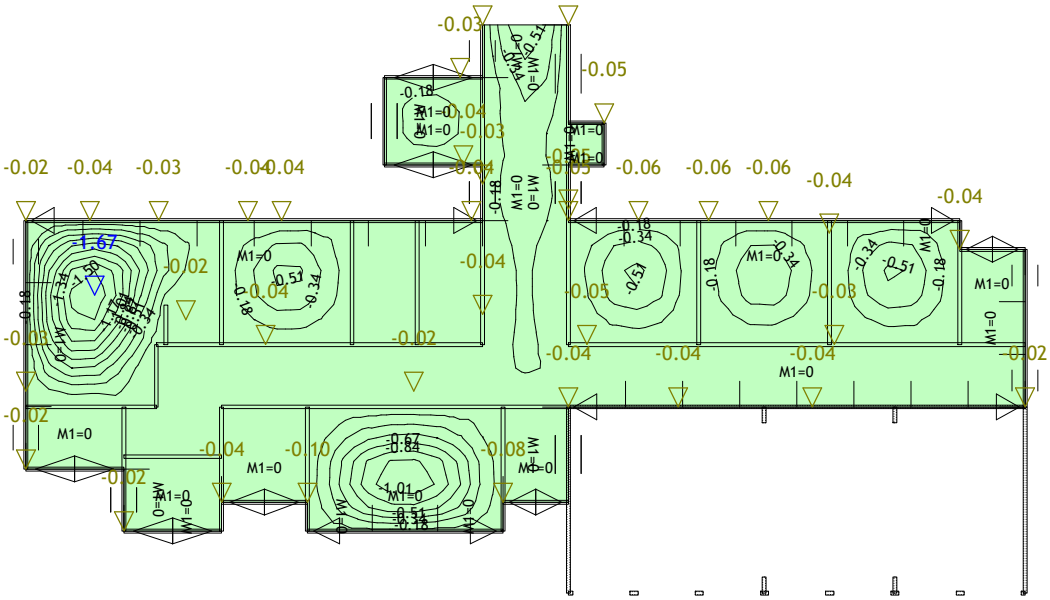
Nivo: [4.00 m]
Vplivi v plošči: max Zp= -0.44 / min Zp= -6.93 m / 1000

Obt. 1: stalna (g)



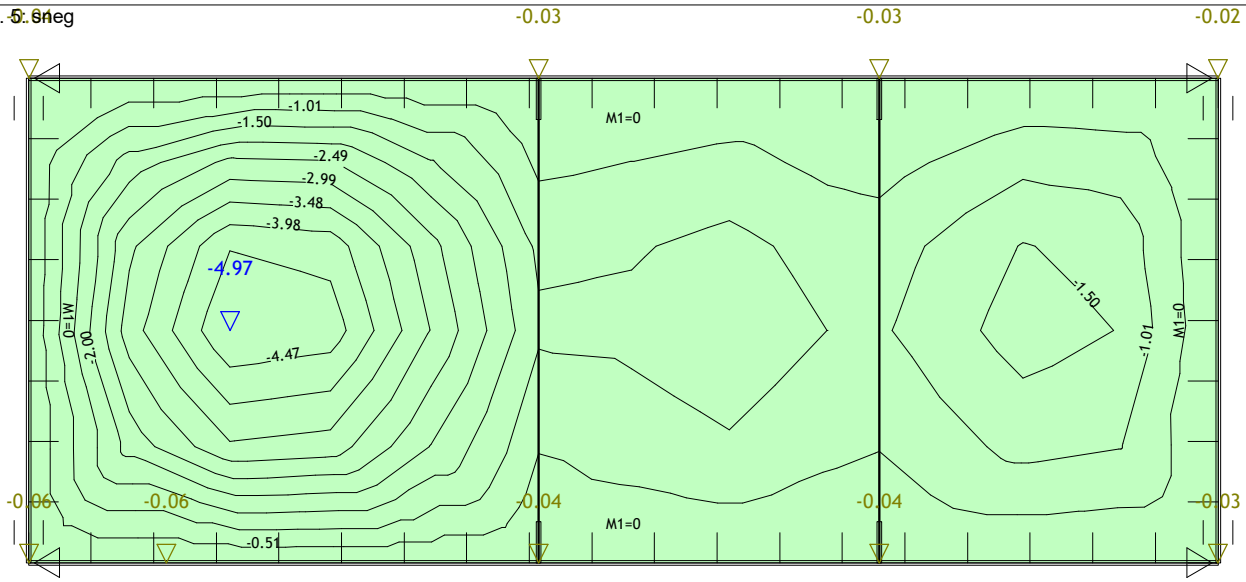
Nivo: [7.50 m]
Vplivi v plošči: max Zp= -0.45 / min Zp= -5.05 m / 1000

Obt. 5: sneg



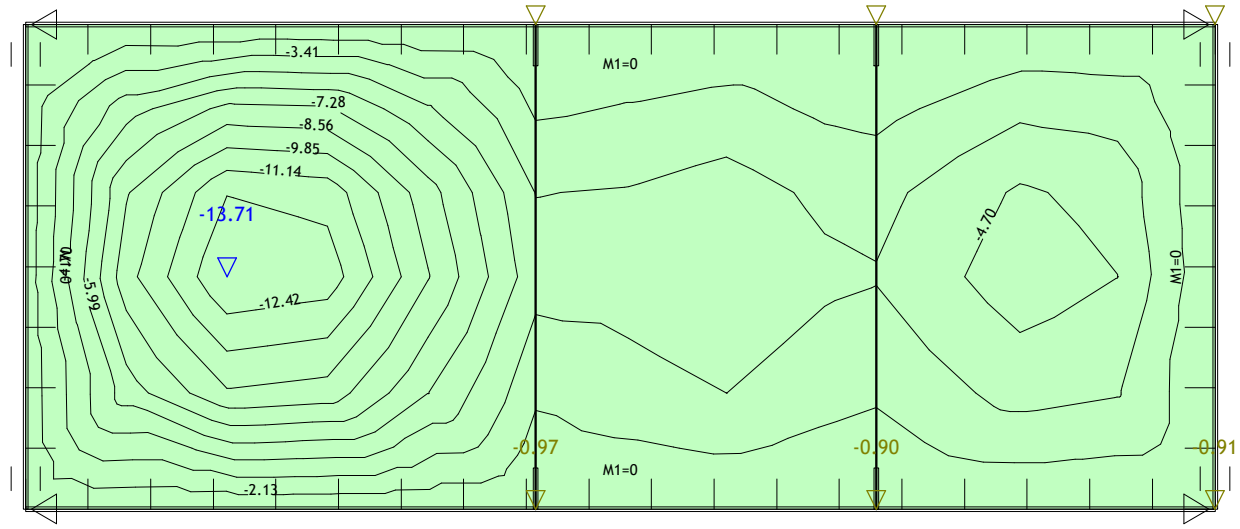
Nivo: [7.50 m]
Vplivi v plošči: max Zp= -0.02 / min Zp= -1.67 m / 1000

Obt. 5: sneg



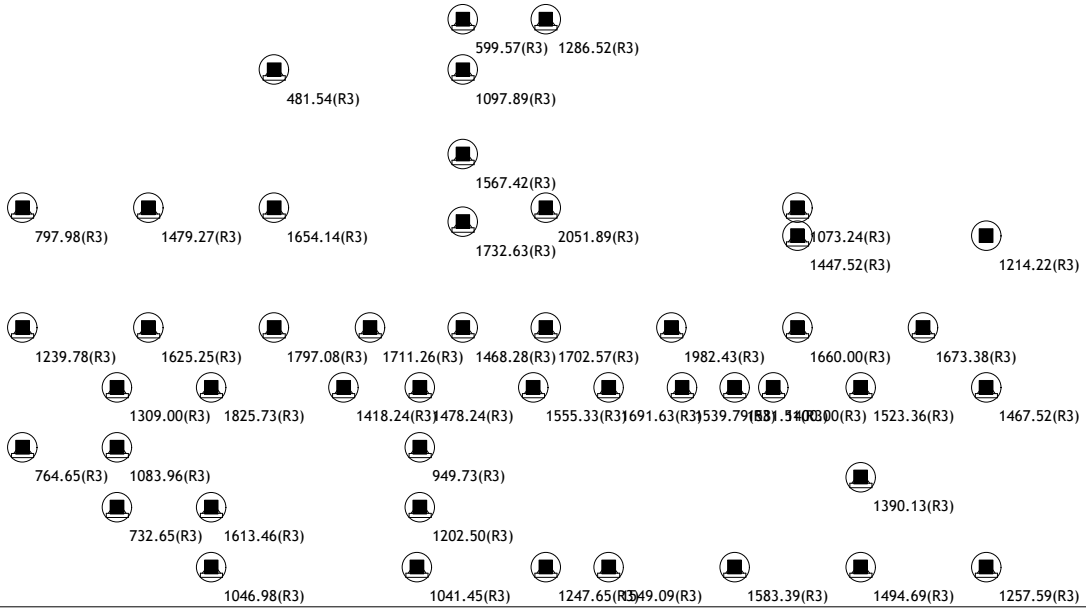
Nivo: [10.50 m]
Vplivi v plošči: max Zp= -0.02 / min Zp= -4.97 m / 1000

Obt. 1: stalna (g)



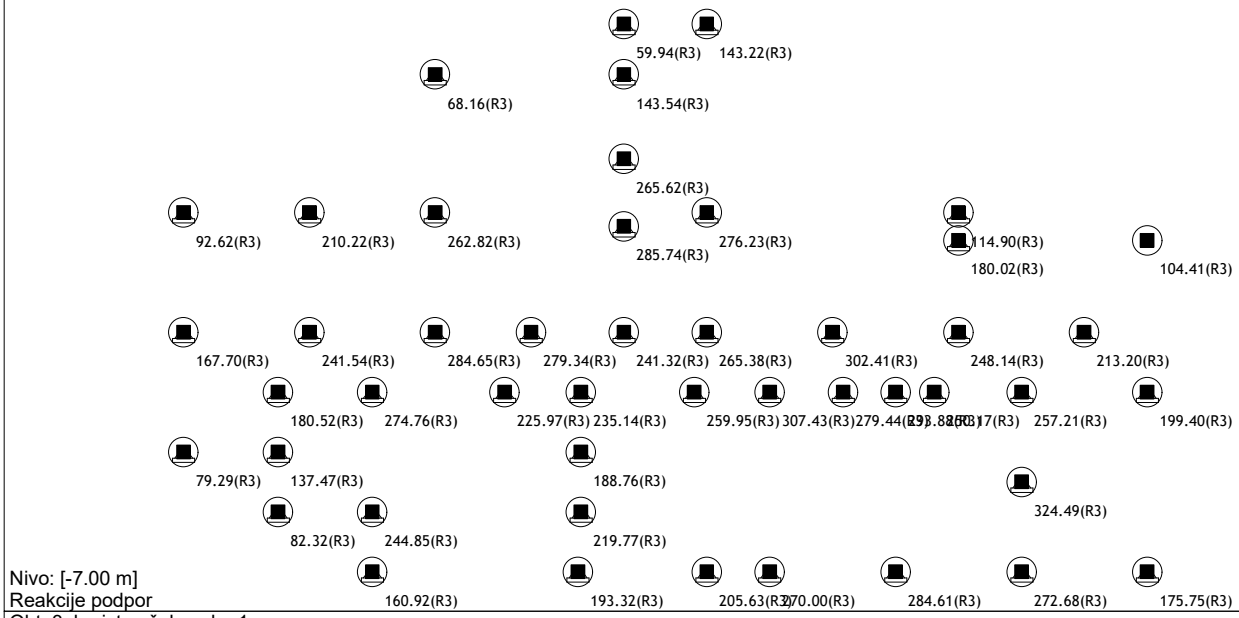
Nivo: [10.50 m]
Vplivi v plošči: max Zp= -0.85 / min Zp= -13.71 m / 1000

Obt. 1: stalna (g)



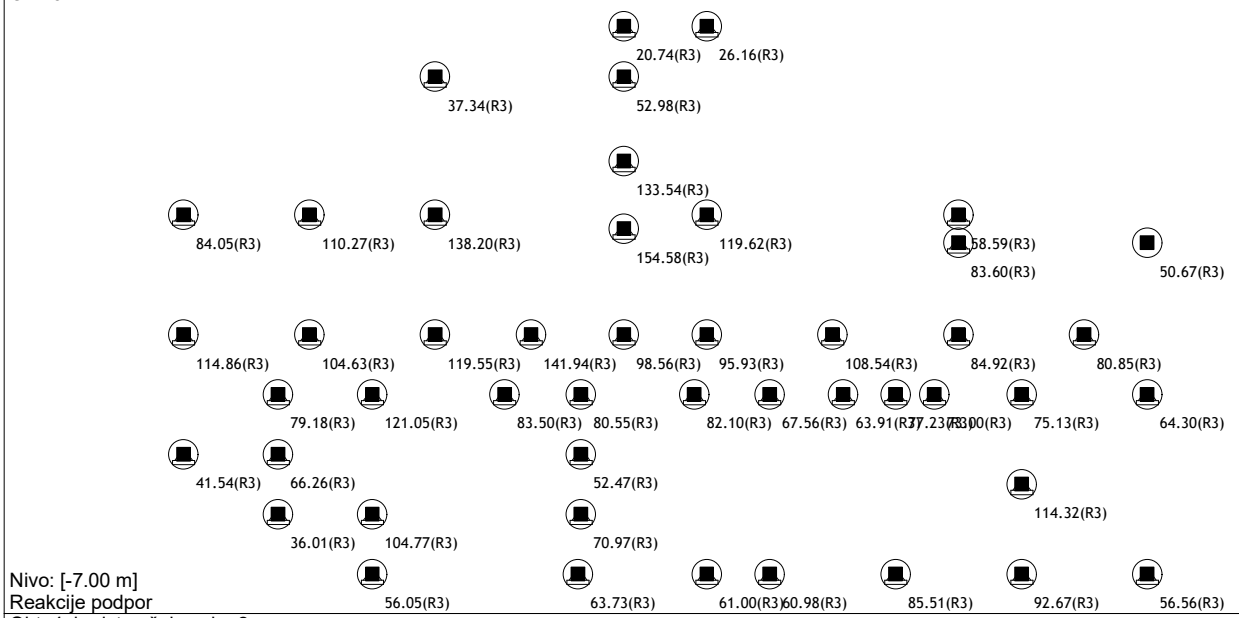
Nivo: [-7.00 m]
Reakcije podpor

Obt. 2: koristna celota



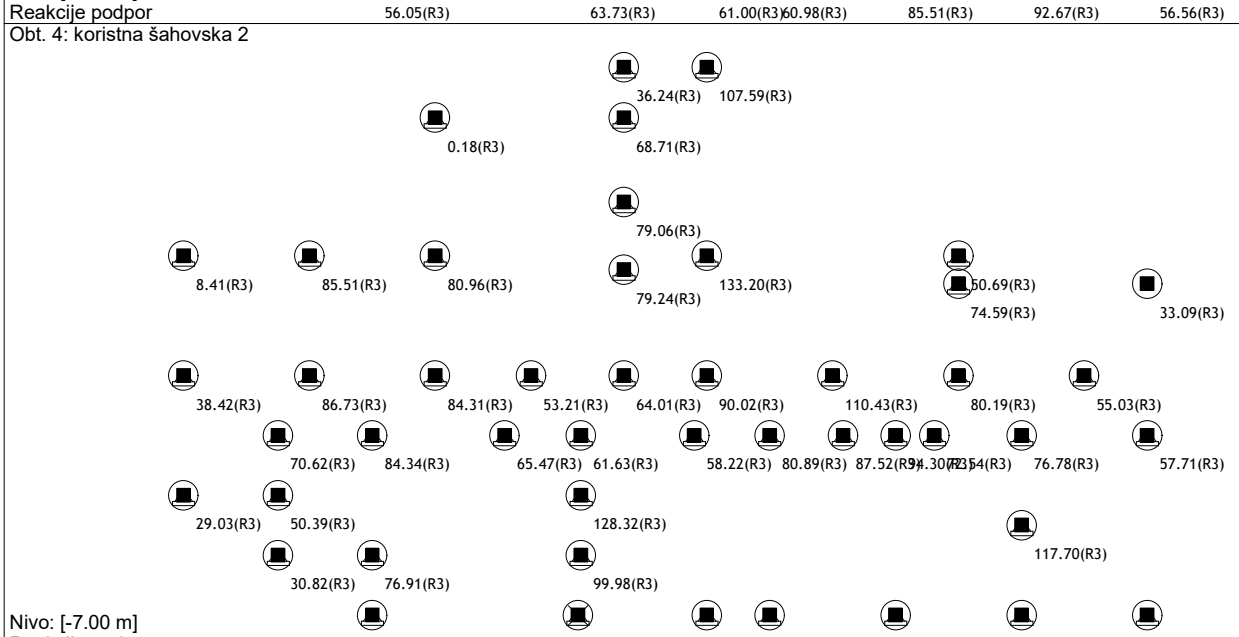
Nivo: [-7.00 m]
Reakcije podpor

Obt. 3: koristna šahovska 1



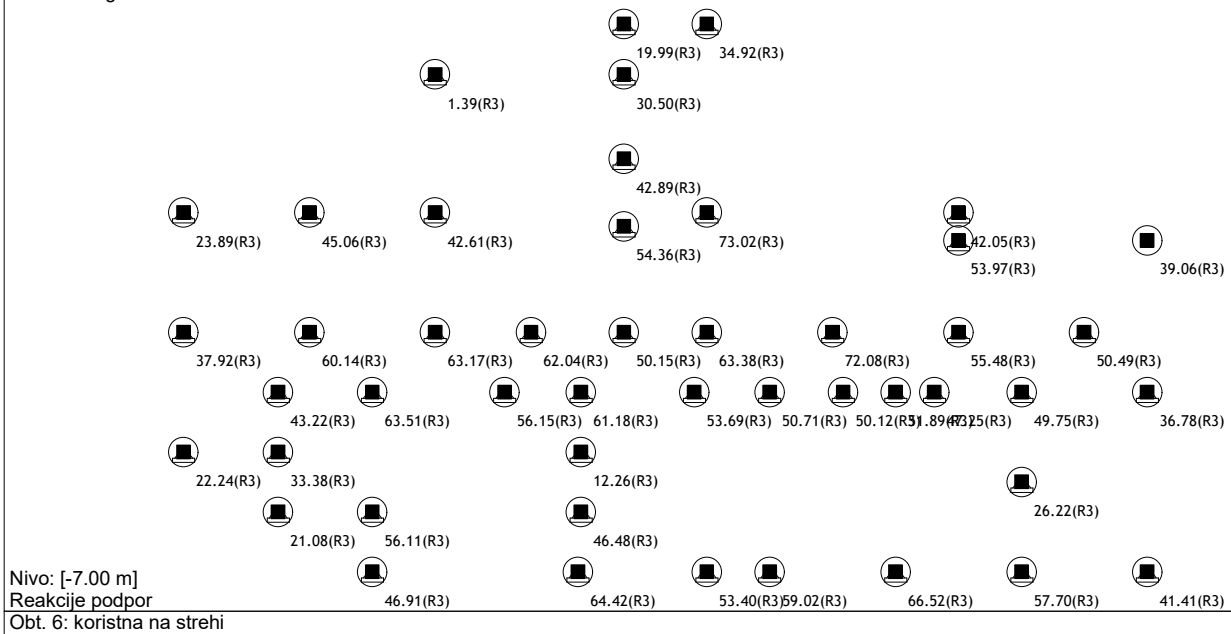
Nivo: [-7.00 m]
Reakcije podpor

Obt. 4: koristna šahovska 2



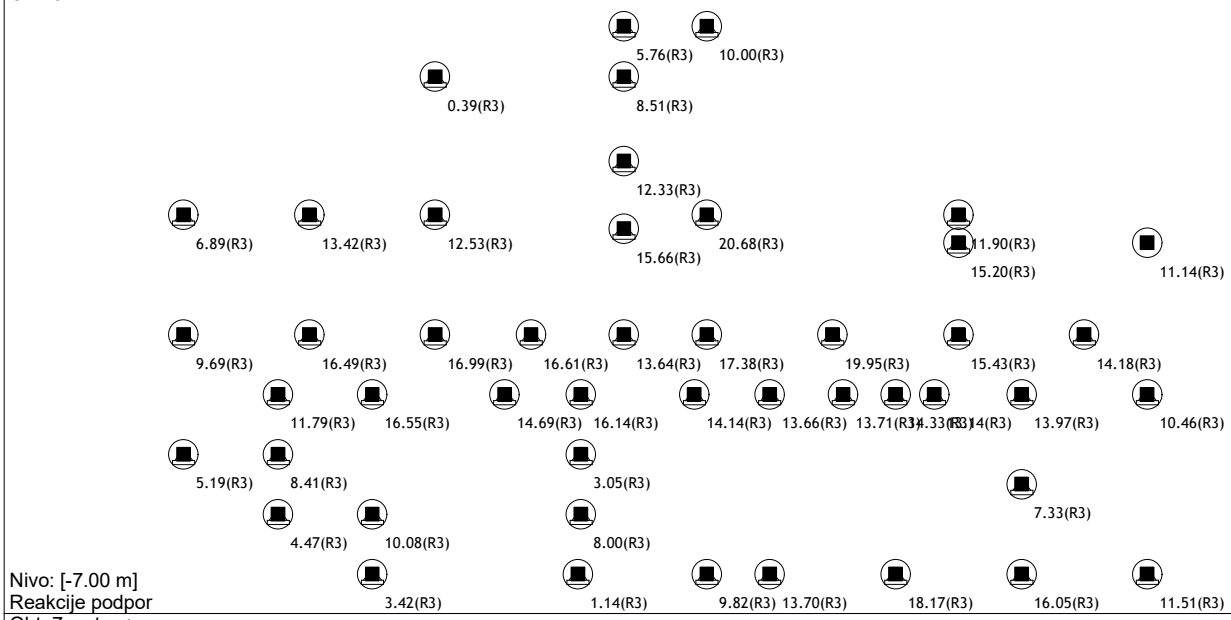
Nivo: [-7.00 m]
Reakcije podpor

Obt. 5: sneg



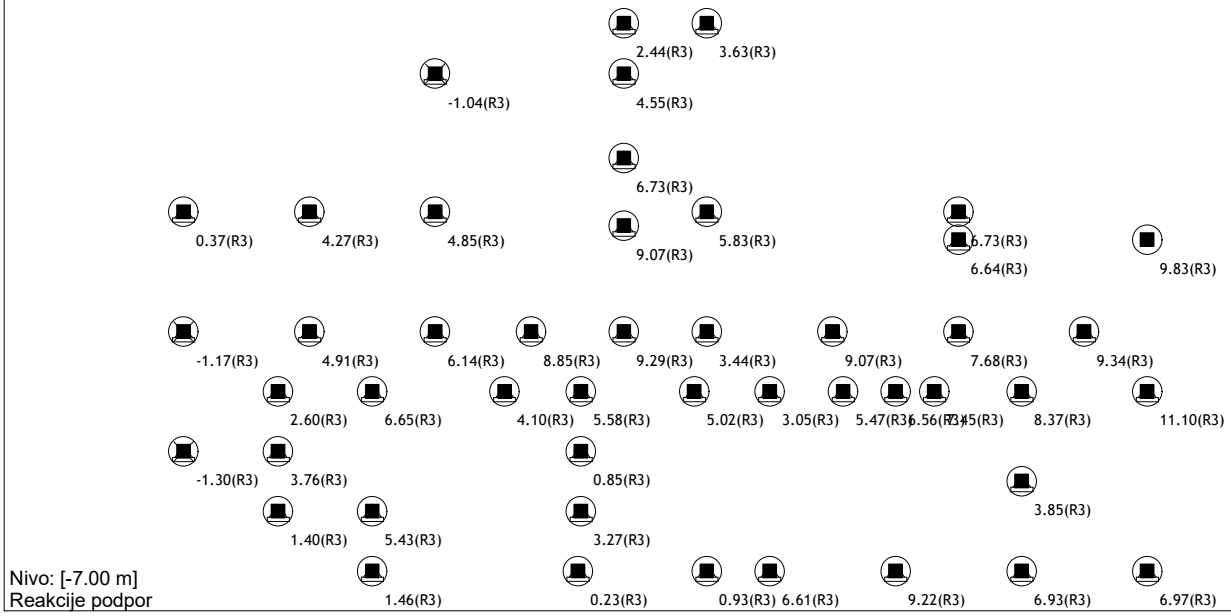
Nivo: [-7.00 m]
Reakcije podpor

Obt. 6: koristna na strehi



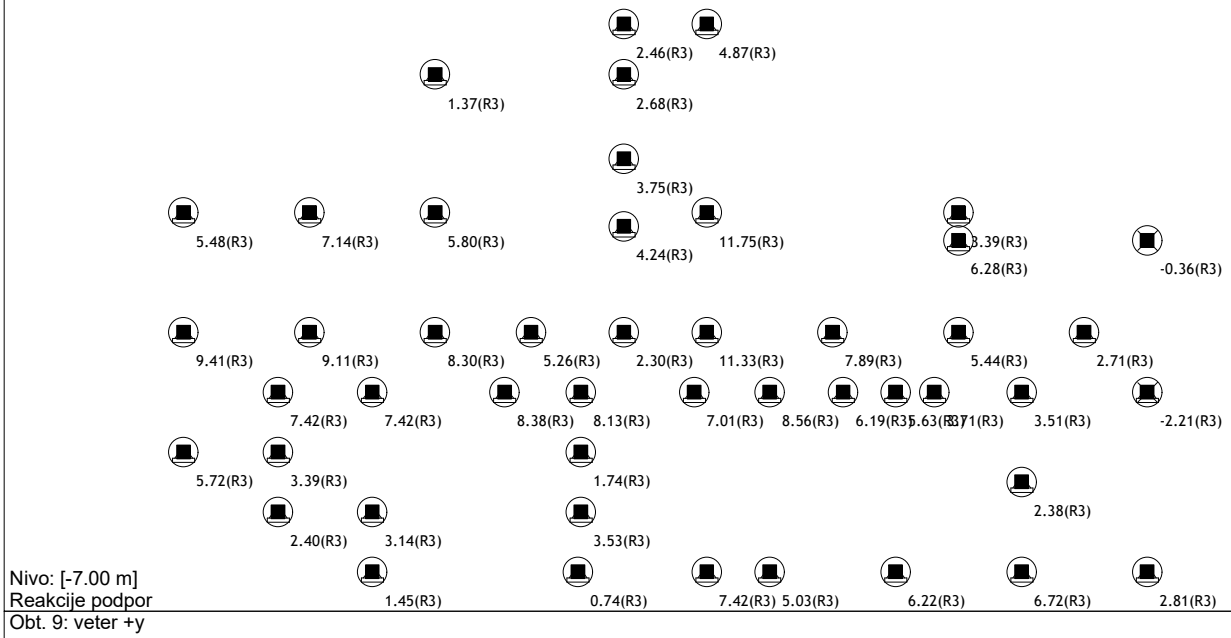
Nivo: [-7.00 m]
Reakcije podpor

Obt. 7: veter +x



Nivo: [-7.00 m]
Reakcije podpor

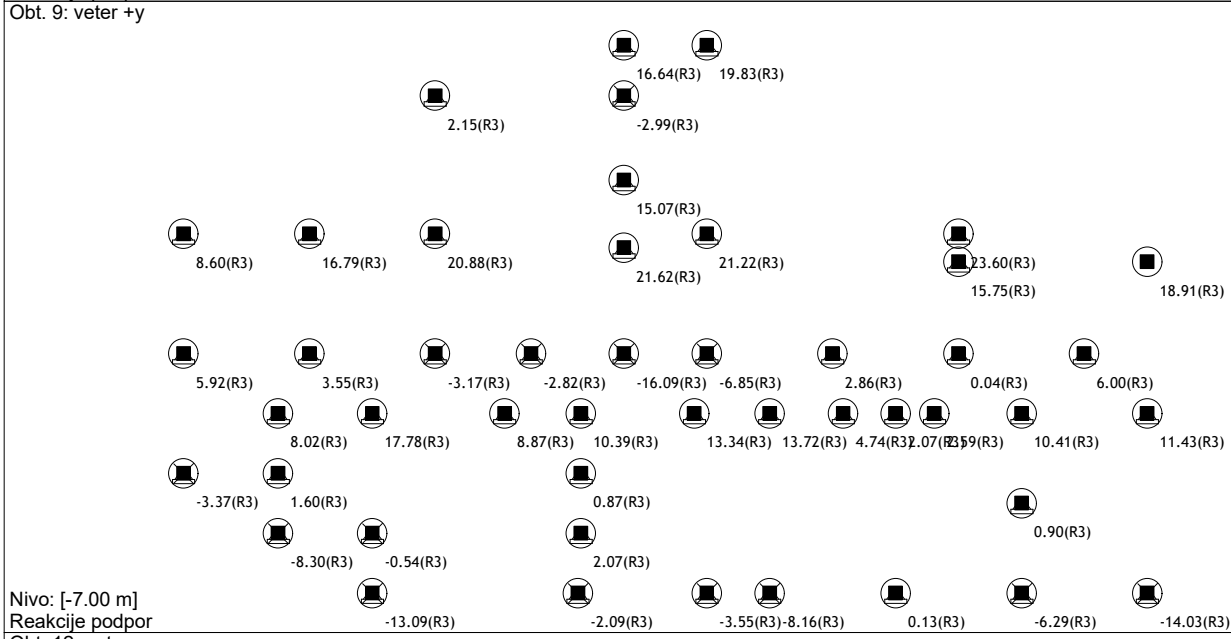
Obt. 8: veter -x



Nivo: [-7.00 m]
Reakcije podpor

1.45(R3) 0.74(R3) 7.42(R3) 5.03(R3) 6.22(R3) 6.72(R3) 2.81(R3)

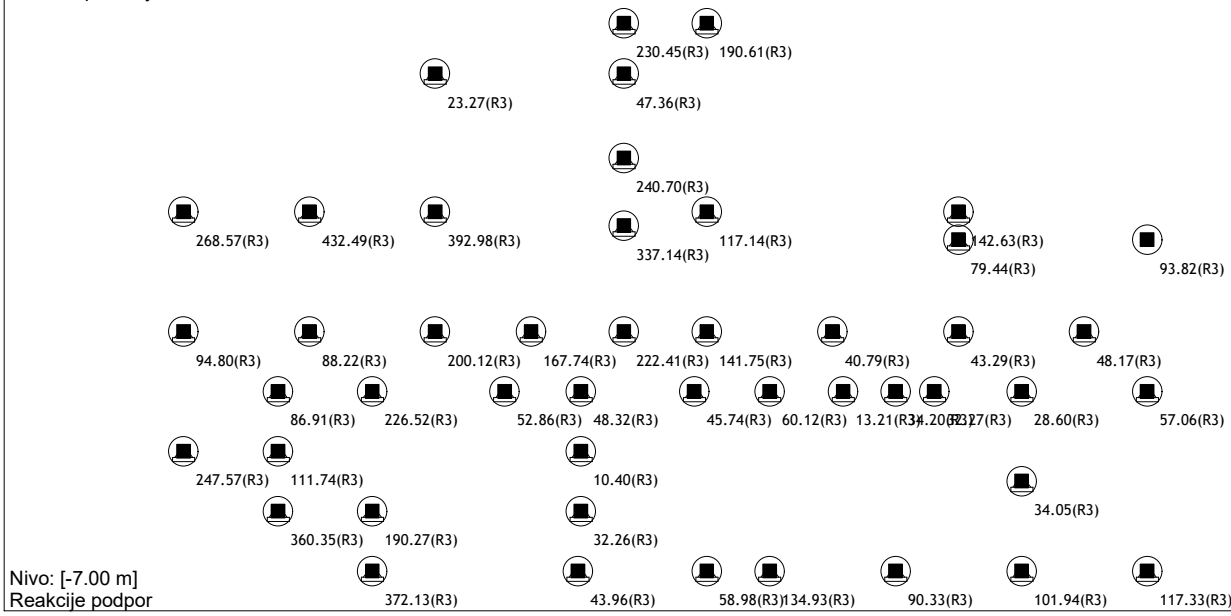
Obt. 9: veter +y



Nivo: [-7.00 m]
Reakcije podpor

-13.09(R3) -2.09(R3) -3.55(R3) -8.16(R3) 0.13(R3) -6.29(R3) -14.03(R3)

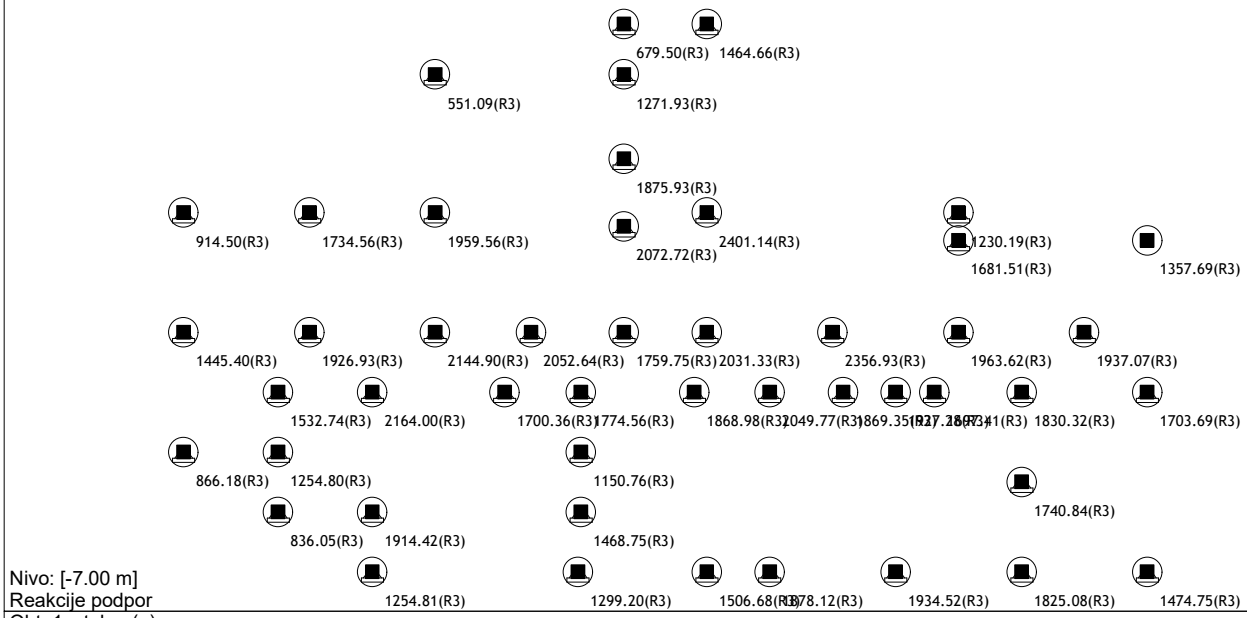
Obt. 12: potres y



Nivo: [-7.00 m]
Reakcije podpor

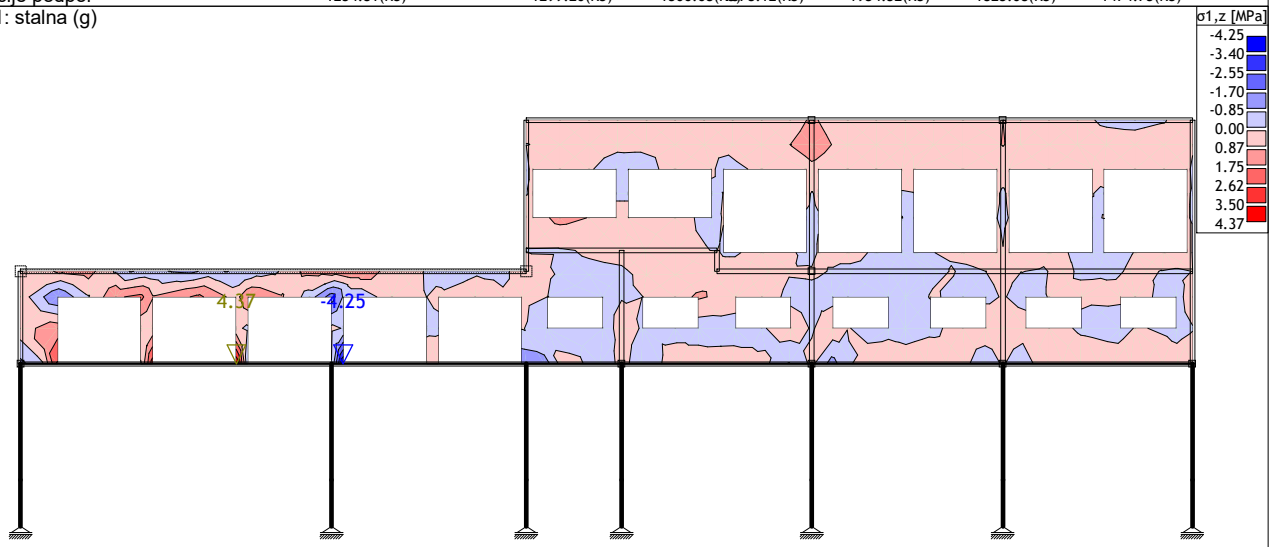
372.13(R3) 43.96(R3) 58.98(R3) 134.93(R3) 90.33(R3) 101.94(R3) 117.33(R3)

Obt. 13: I+II+V



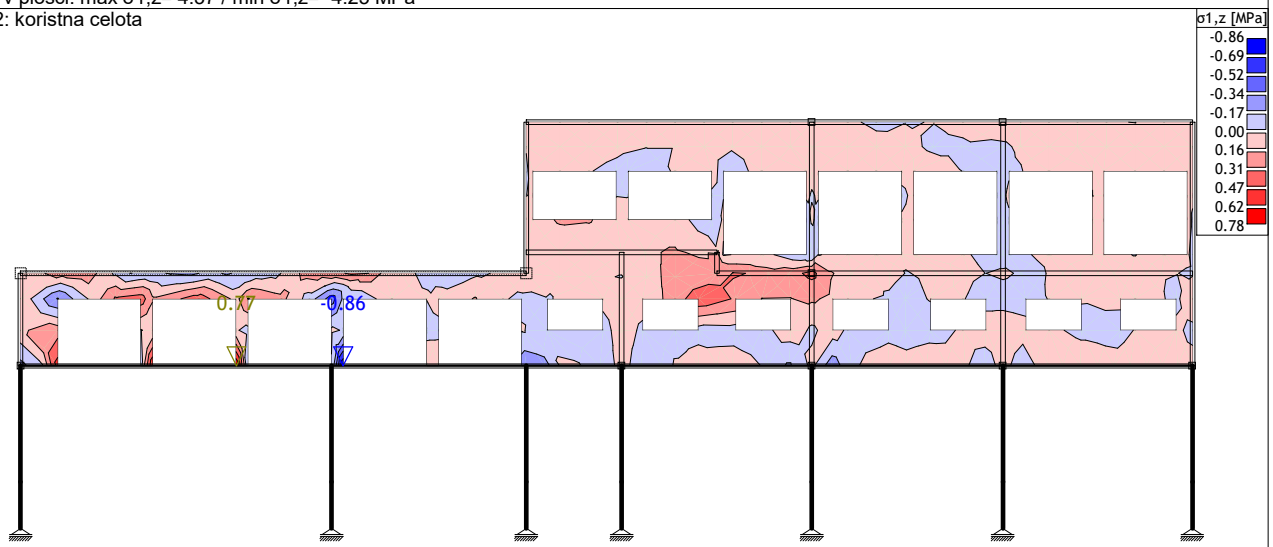
Nivo: [-7.00 m]
Reakcije podpor

Obt. 1: stalna (g)



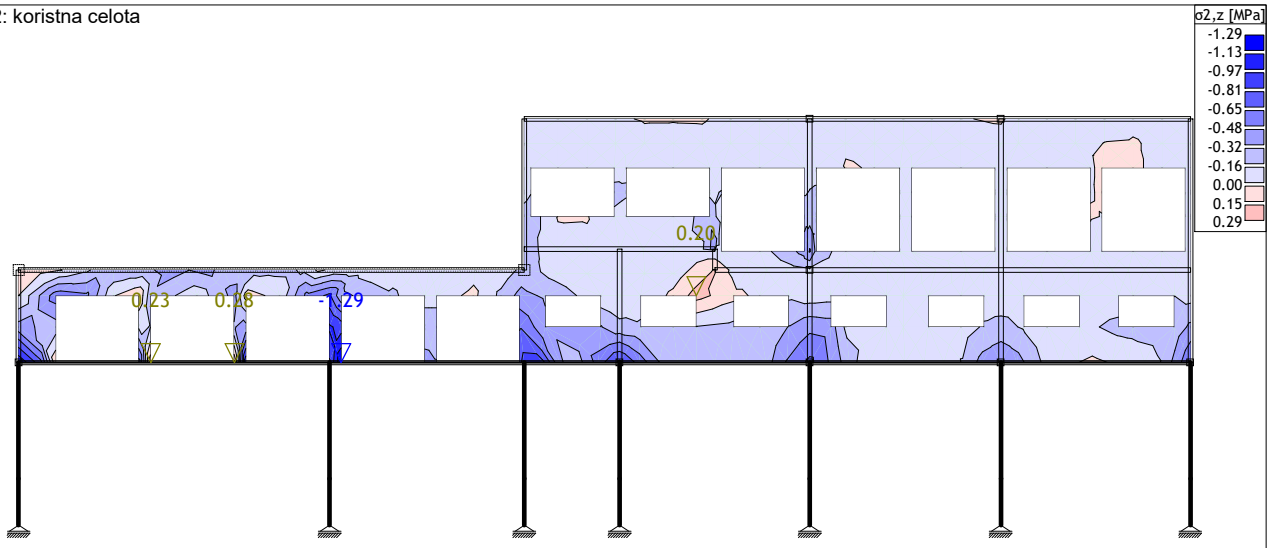
Okvir: H_1
Vplivi v plošči: max σ1,z= 4.37 / min σ1,z= -4.25 MPa

Obt. 2: koristna celota



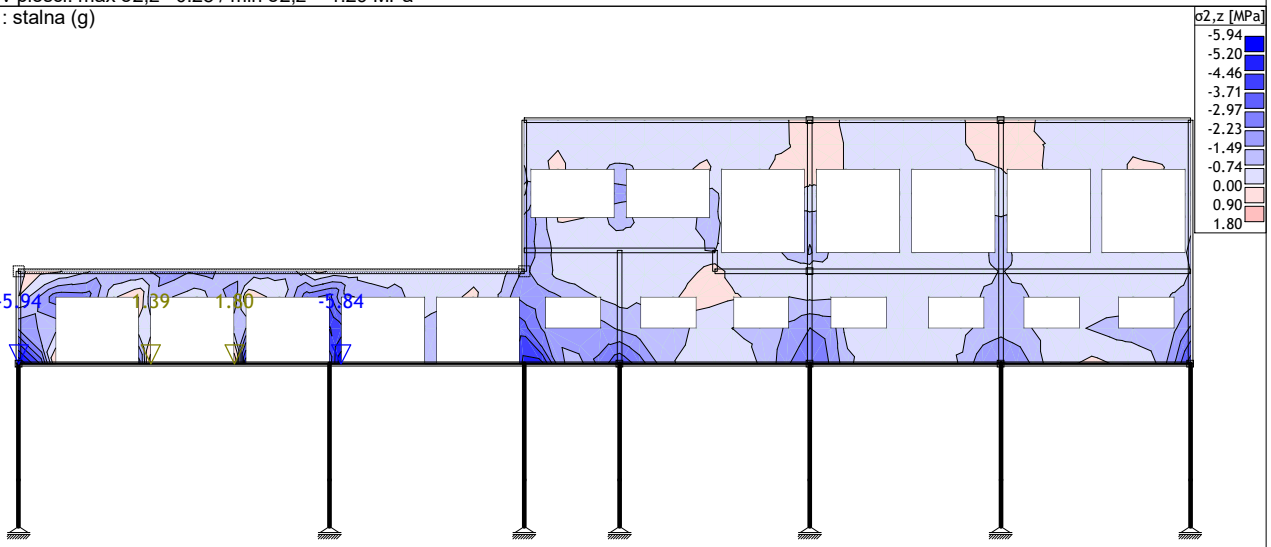
Okvir: H_1
Vplivi v plošči: max σ1,z= 0.77 / min σ1,z= -0.86 MPa

Obt. 2: koristna celota



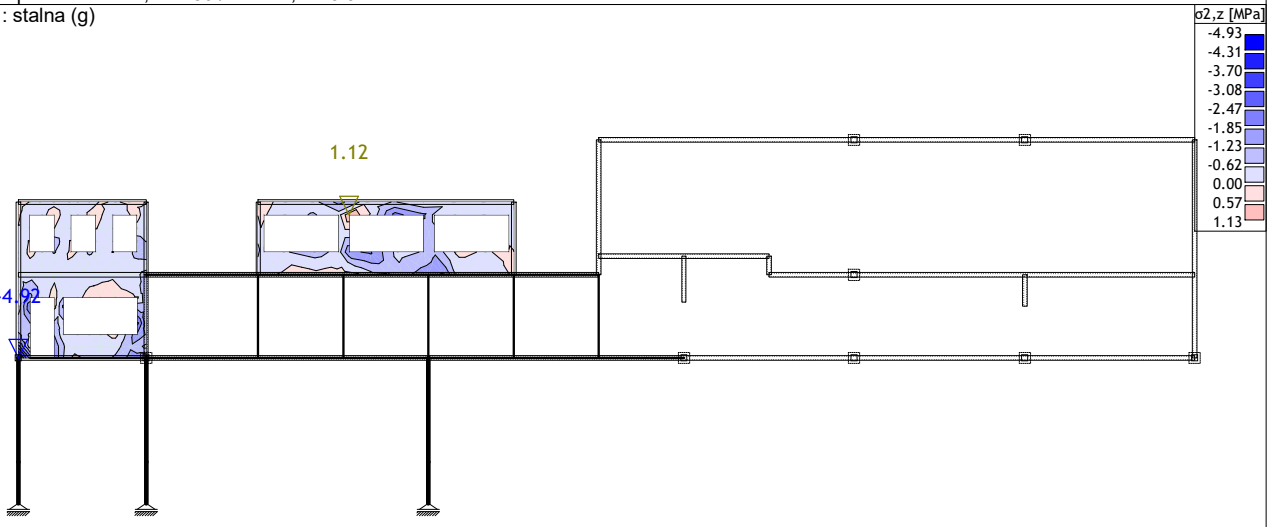
Okvir: H_1
Vplivi v plošči: max σ2,z= 0.28 / min σ2,z= -1.29 MPa

Obt. 1: stalna (g)



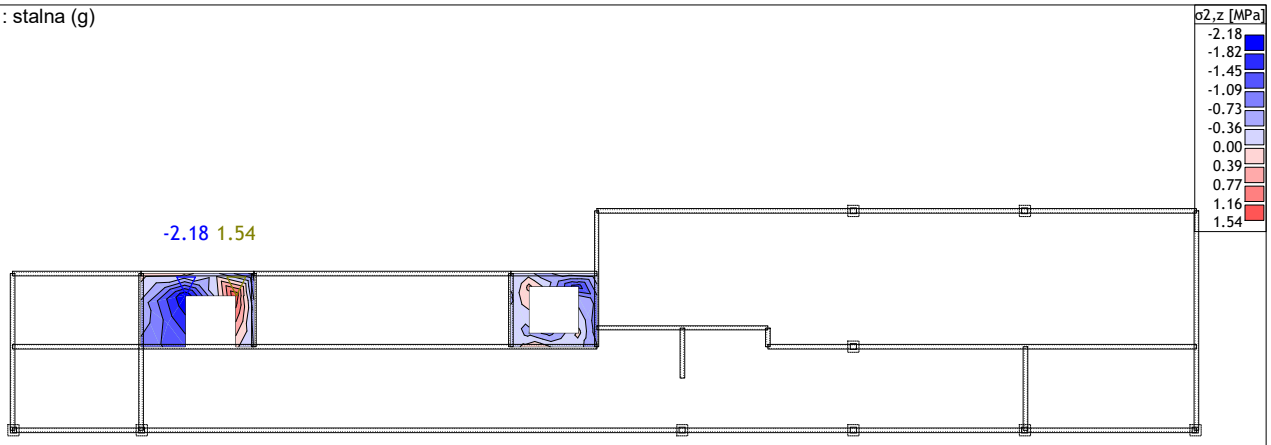
Okvir: H_1
Vplivi v plošči: max σ2,z= 1.80 / min σ2,z= -5.94 MPa

Obt. 1: stalna (g)



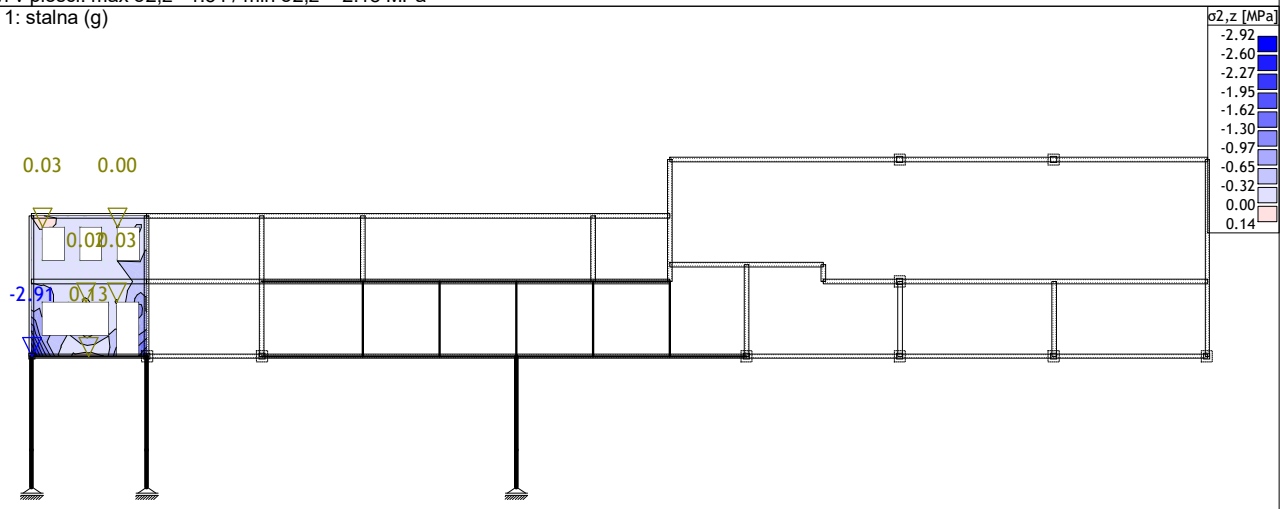
Okvir: H_2
Vplivi v plošči: max σ2,z= 1.12 / min σ2,z= -4.92 MPa

Obt. 1: stalna (g)



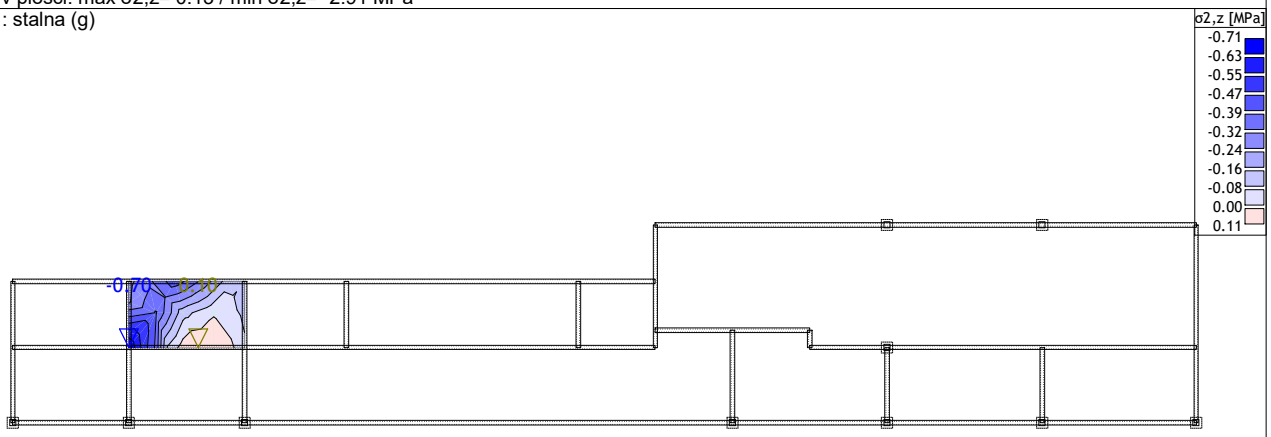
Okvir: H_3
Vplivi v plošči: max σ2,z= 1.54 / min σ2,z= -2.18 MPa

Obt. 1: stalna (g)



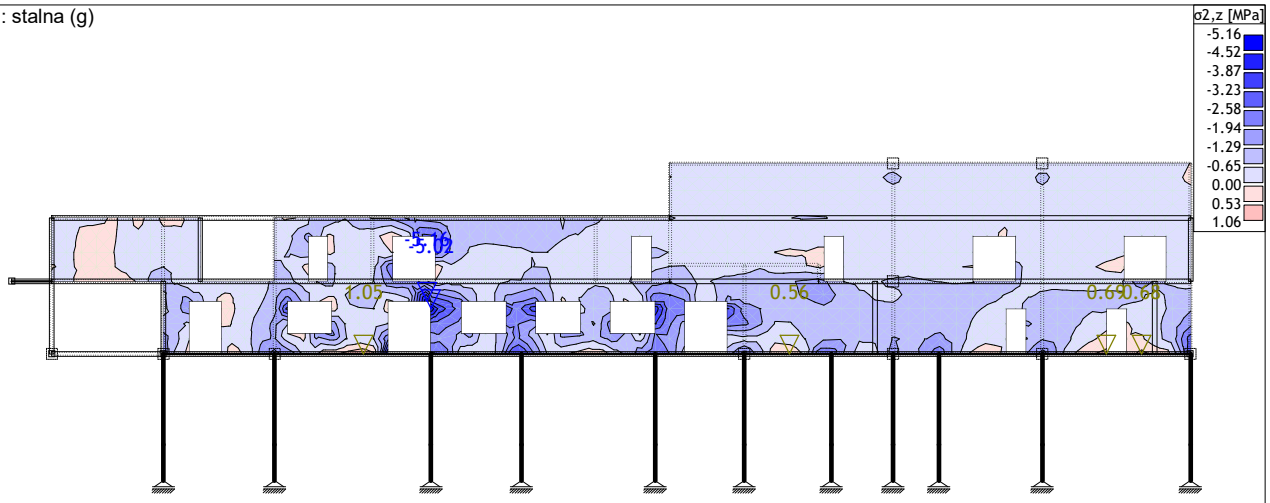
Okvir: H_4
Vplivi v plošči: max σ2,z= 0.13 / min σ2,z= -2.91 MPa

Obt. 1: stalna (g)



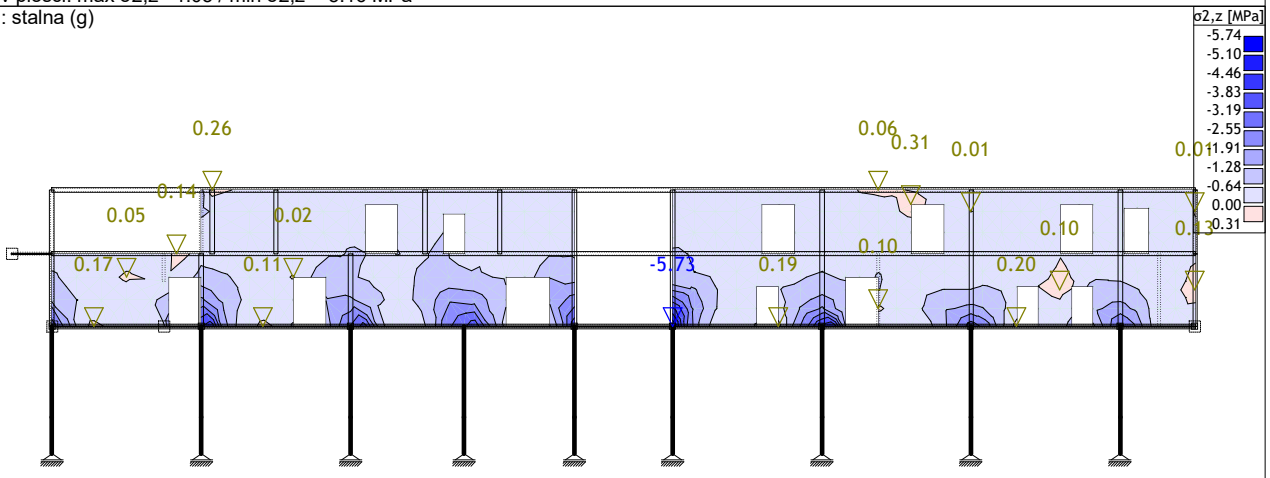
Okvir: H_5
Vplivi v plošči: max σ2,z= 0.10 / min σ2,z= -0.70 MPa

Obt. 1: stalna (g)



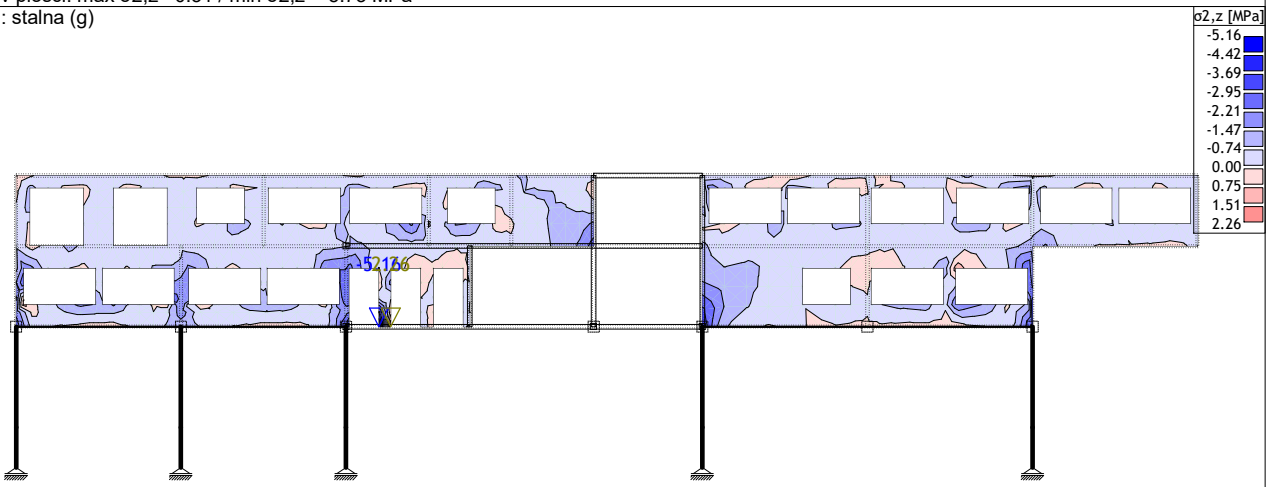
Okvir: H_6
Vplivi v plošči: max σ2,z= 1.05 / min σ2,z= -5.16 MPa

Obt. 1: stalna (g)



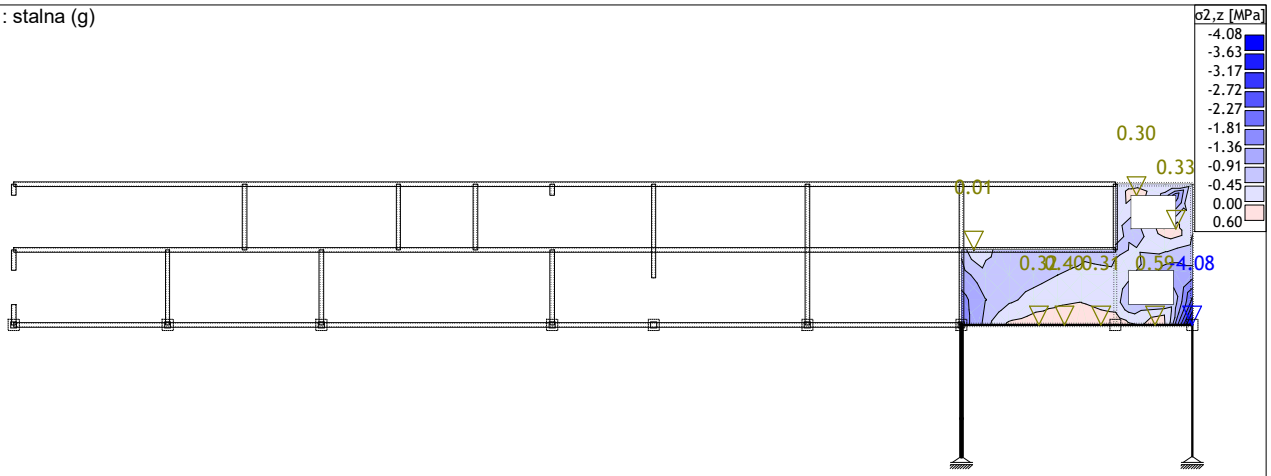
Okvir: H_7
Vplivi v plošči: max σ2,z= 0.31 / min σ2,z= -5.73 MPa

Obt. 1: stalna (g)



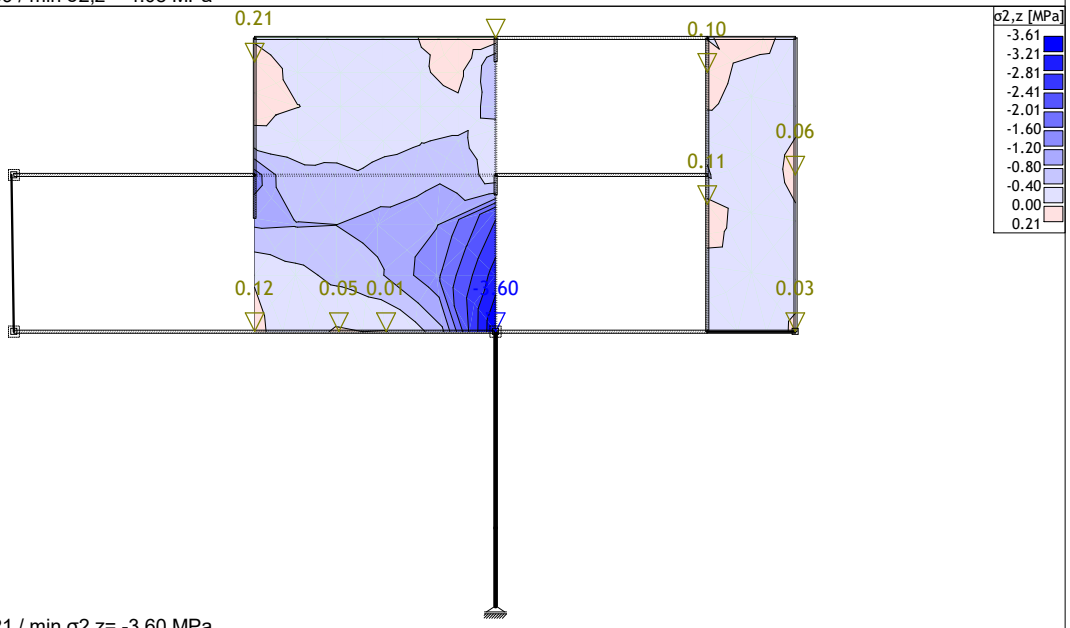
Okvir: H_10
Vplivi v plošči: max σ2,z= 2.26 / min σ2,z= -5.16 MPa

Obt. 1: stalna (g)



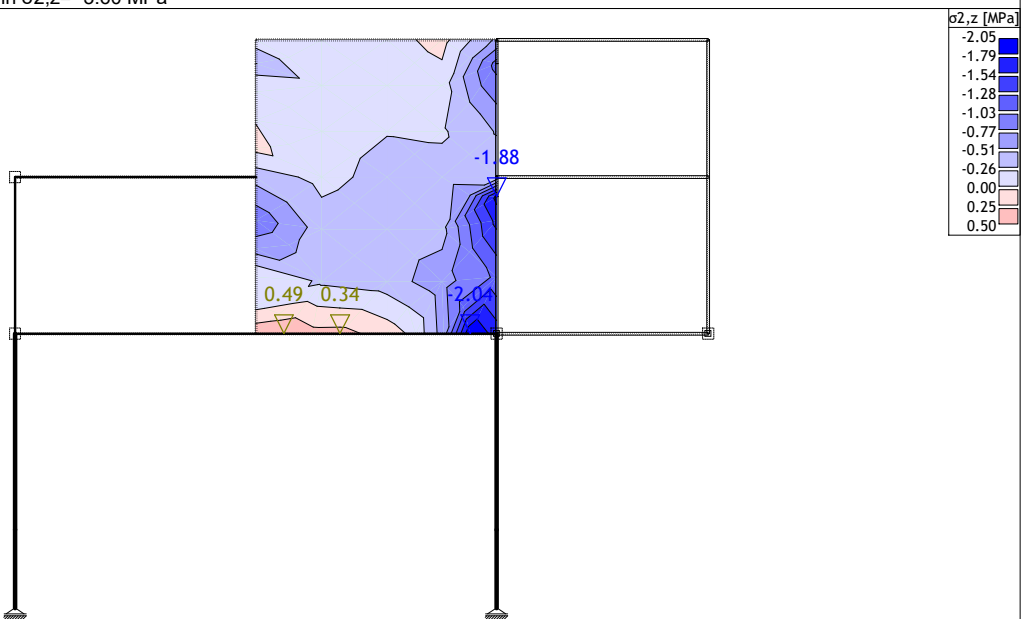
Okvir: H_8
Vplivi v plošči: max σ2,z= 0.59 / min σ2,z= -4.08 MPa

Obt. 1: stalna (g)



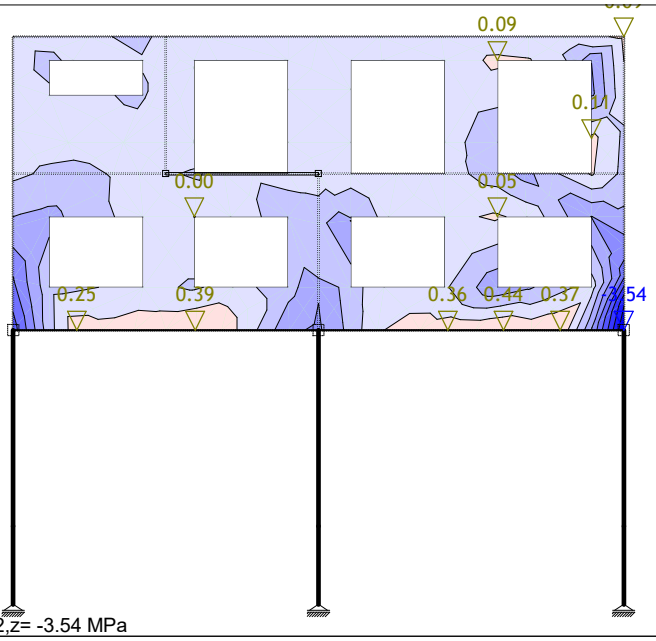
Okvir: H_11
Vplivi v plošči: max σ2,z= 0.21 / min σ2,z= -3.60 MPa

Obt. 1: stalna (g)



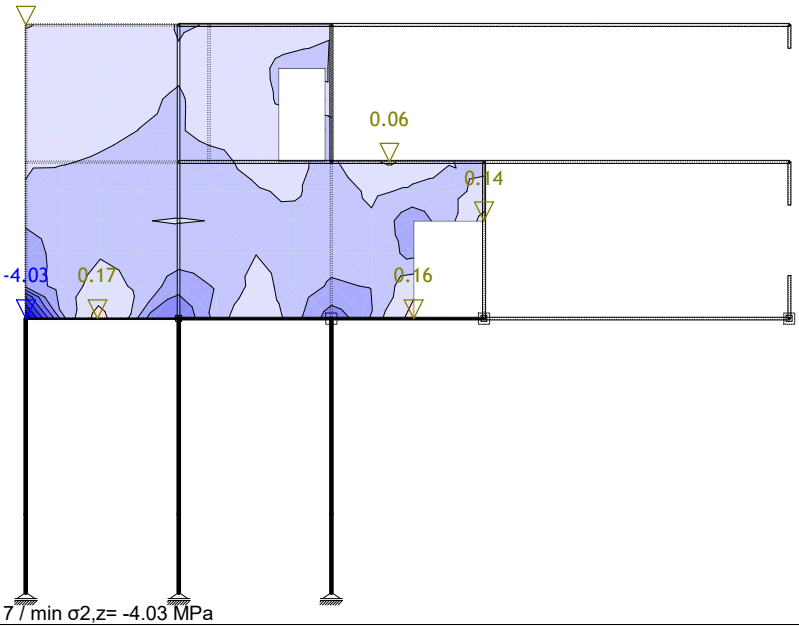
Okvir: H_13
Vplivi v plošči: max σ2,z= 0.49 / min σ2,z= -2.04 MPa

Obt. 1: stalna (g)



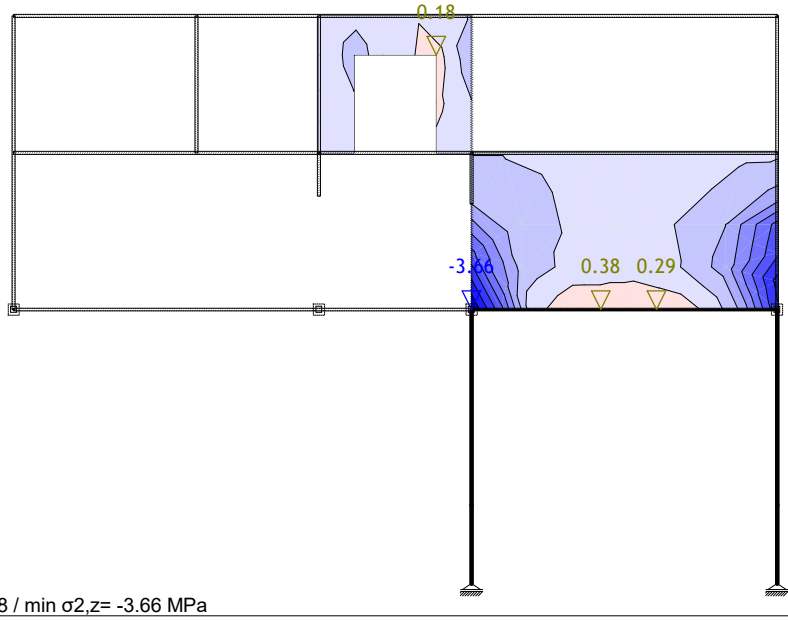
Okvir: V_1
Vplivi v plošči: max σ2,z= 0.44 / min σ2,z= -3.54 MPa

Obt. 1: stalna (g)



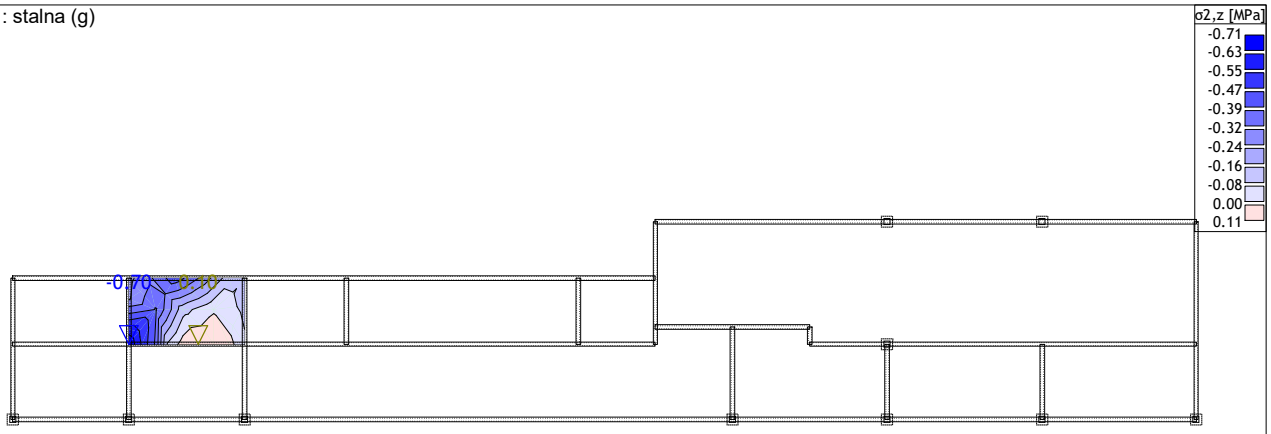
Okvir: V_2
Vplivi v plošči: max σ2,z= 0.17 / min σ2,z= -4.03 MPa

Obt. 1: stalna (g)



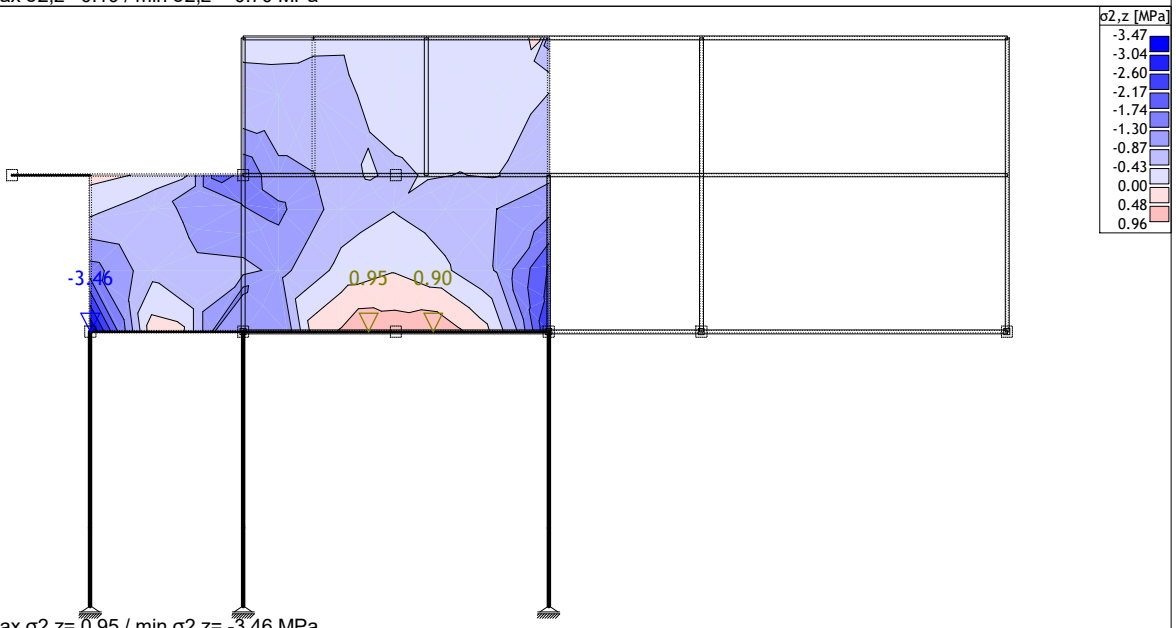
Okvir: V_3
Vplivi v plošči: max σ2,z= 0.38 / min σ2,z= -3.66 MPa

Obt. 1: stalna (g)



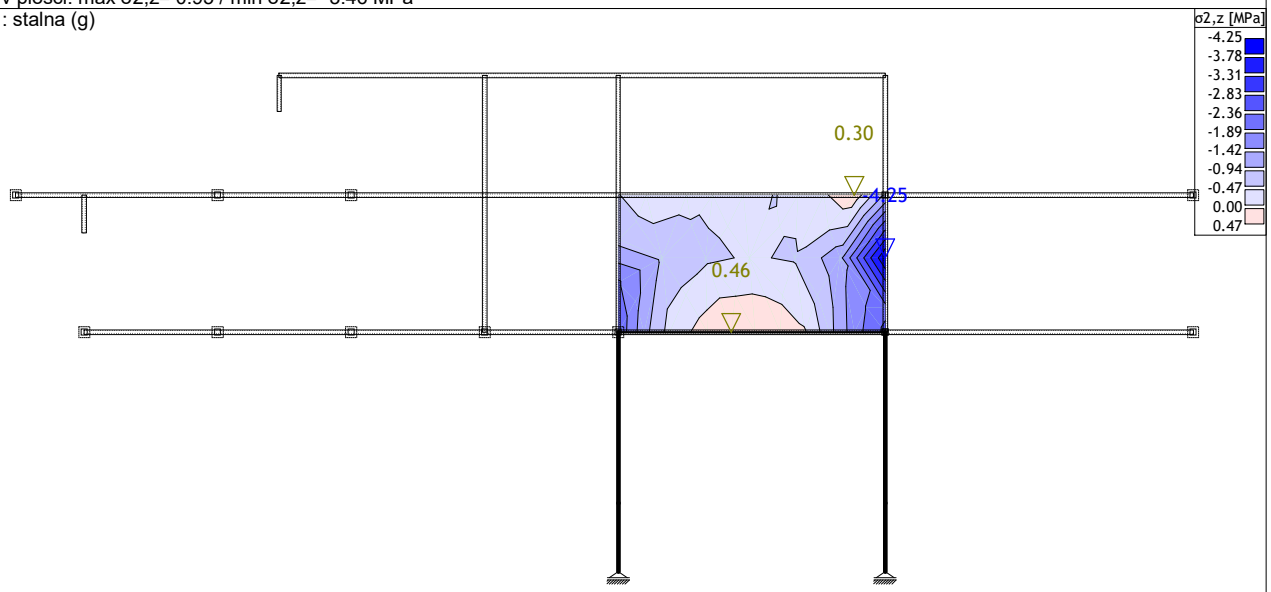
Okvir: H_5
Vplivi v plošči: max σ2,z= 0.10 / min σ2,z= -0.70 MPa

Obt. 1: stalna (g)



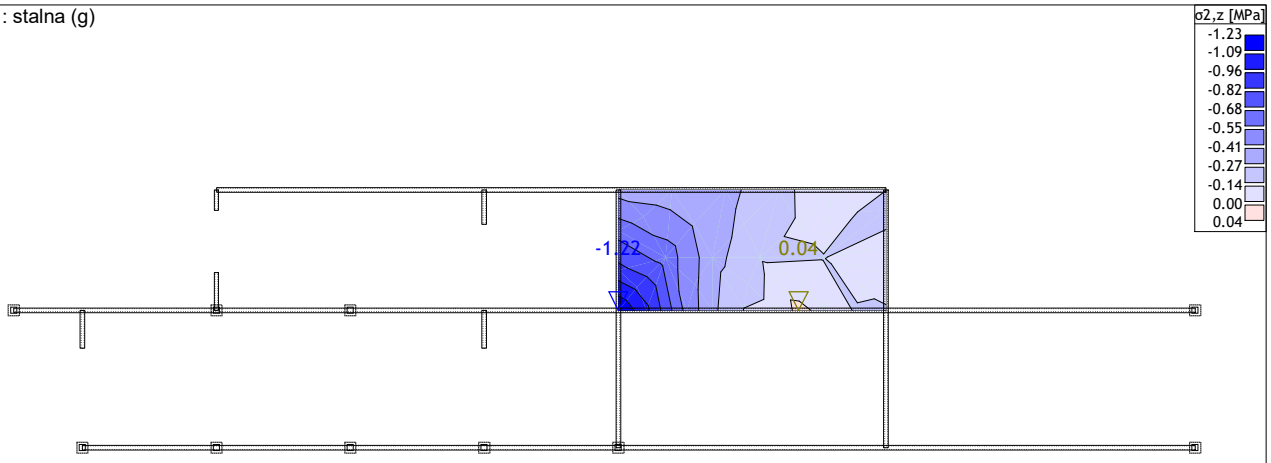
Okvir: V_6
Vplivi v plošči: max σ2,z= 0.95 / min σ2,z= -3.46 MPa

Obt. 1: stalna (g)



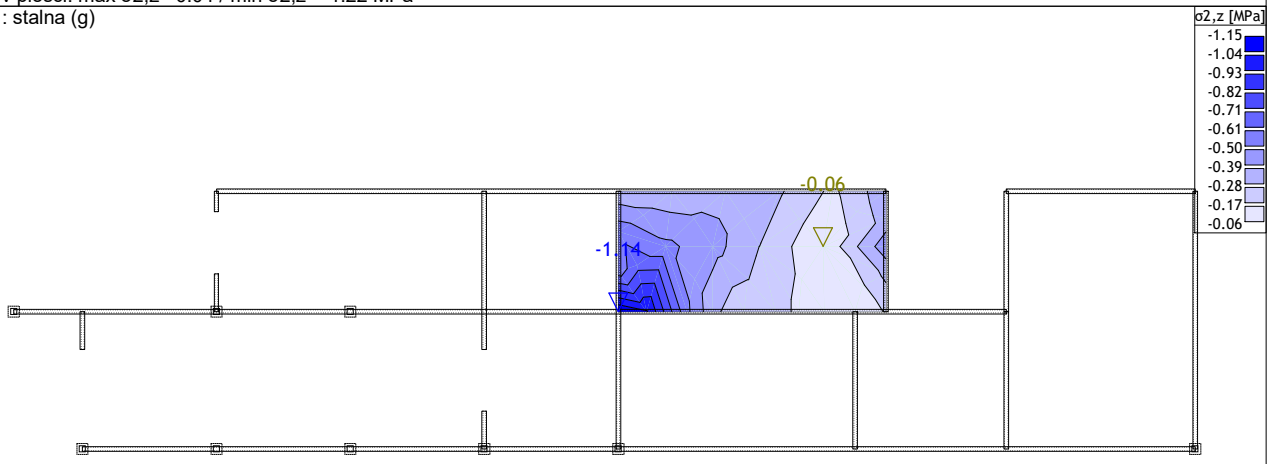
Okvir: K_1
Vplivi v plošči: max σ2,z= 0.46 / min σ2,z= -4.25 MPa

Obt. 1: stalna (g)



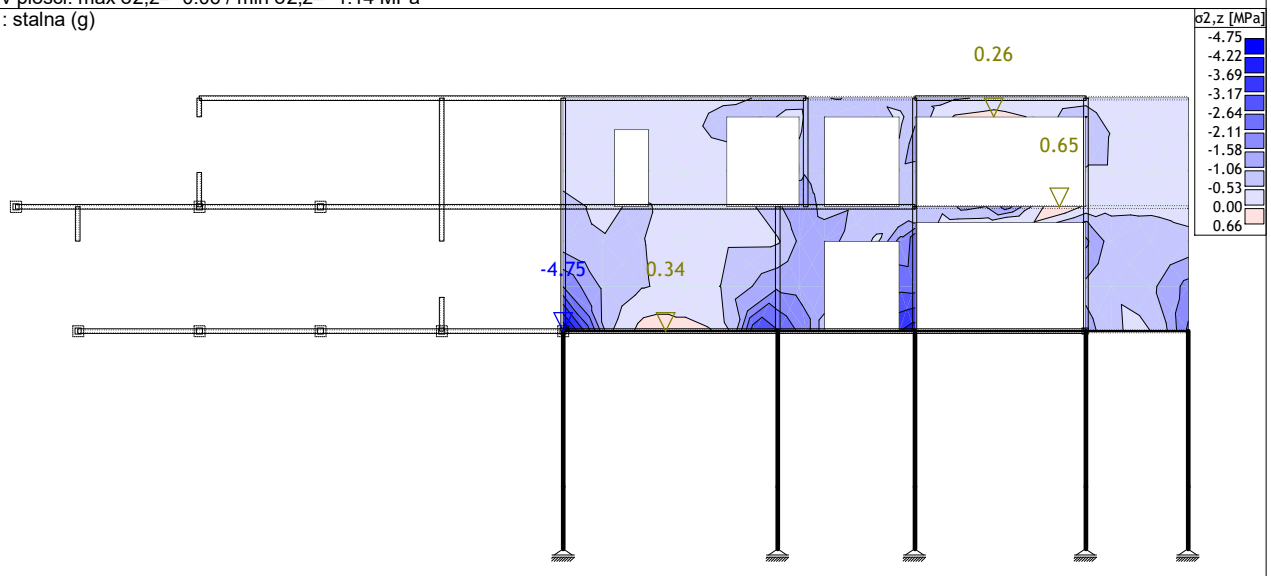
Okvir: V_8
Vplivi v plošči: max σ2,z= 0.04 / min σ2,z= -1.22 MPa

Obt. 1: stalna (g)



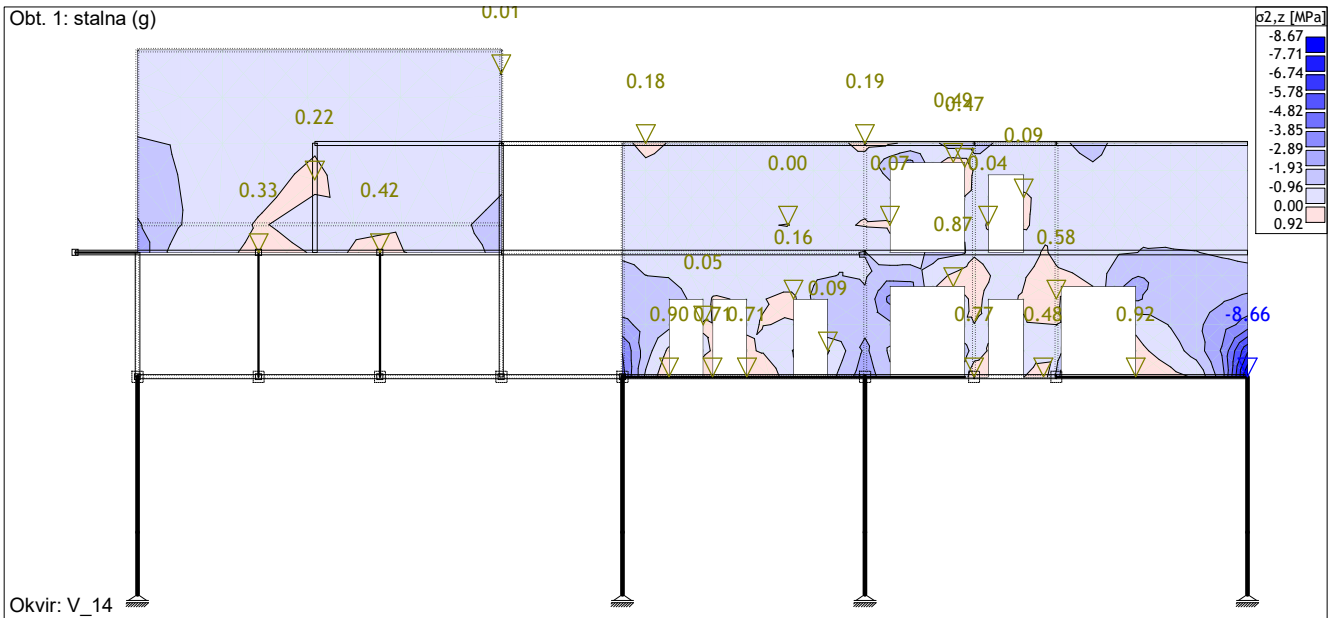
Okvir: V_10
Vplivi v plošči: max σ2,z= -0.06 / min σ2,z= -1.14 MPa

Obt. 1: stalna (g)



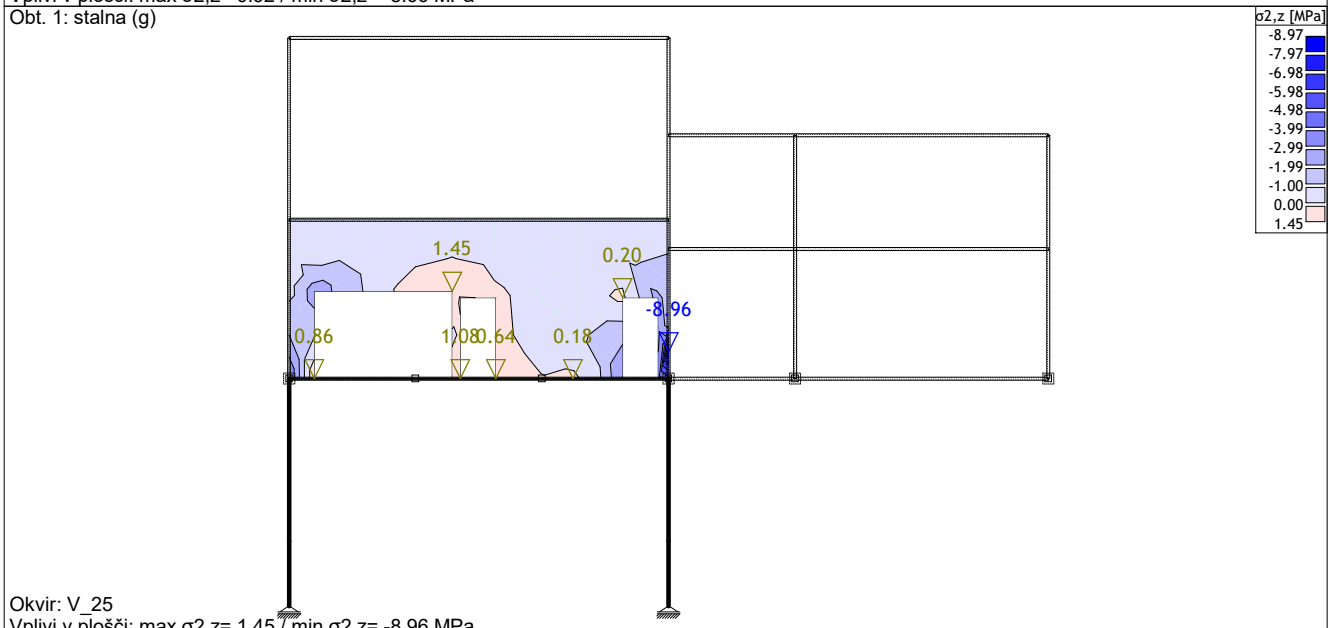
Okvir: V_24
Vplivi v plošči: max σ2,z= 0.65 / min σ2,z= -4.75 MPa

Obt. 1: stalna (g)



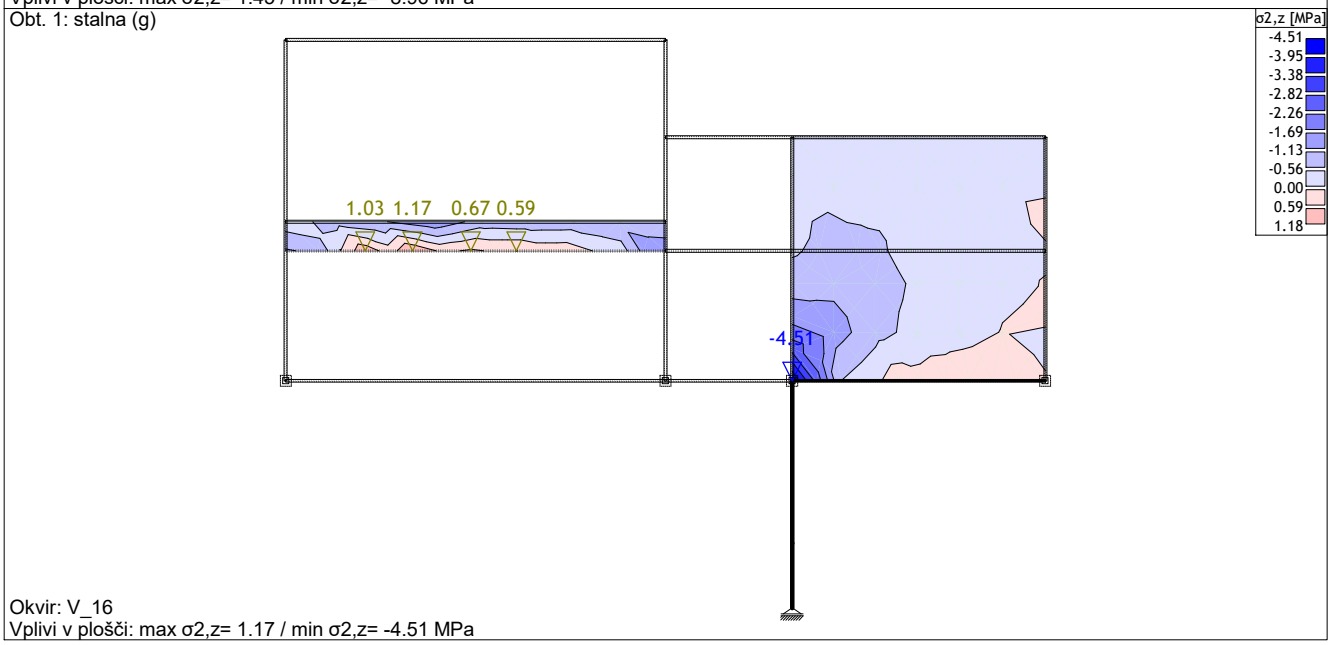
Okvir: V_14
Vplivi v plošči: max σ2,z= 0.92 / min σ2,z= -8.66 MPa

Obt. 1: stalna (g)



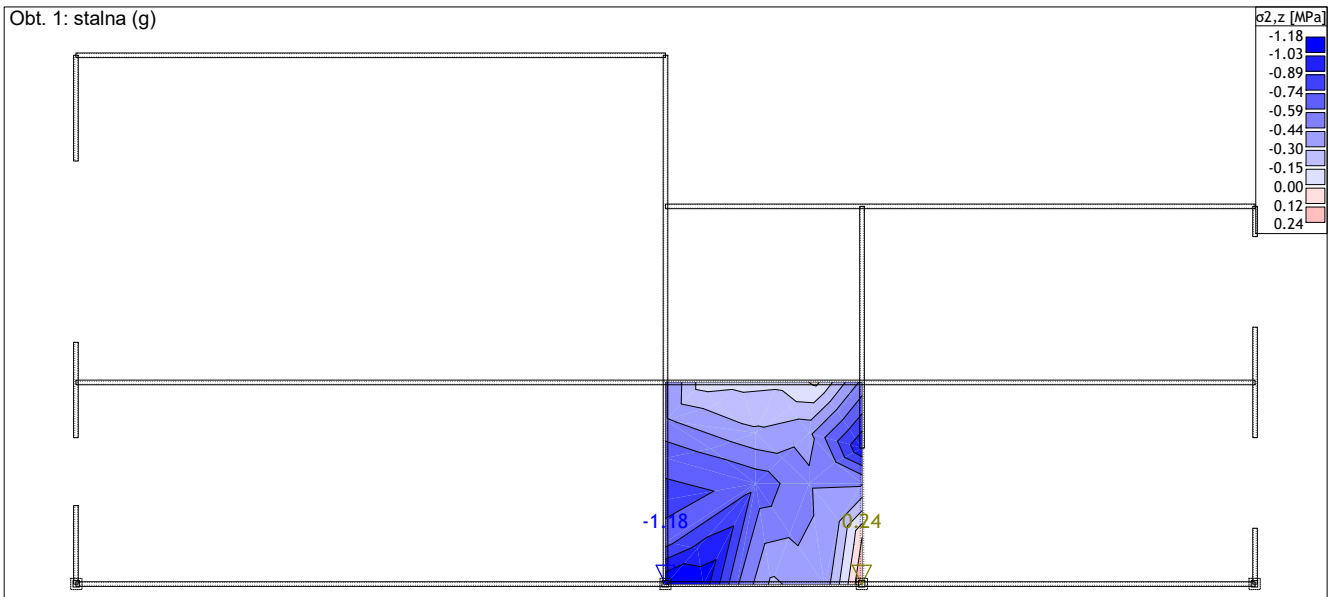
Okvir: V_25
Vplivi v plošči: max σ2,z= 1.45 / min σ2,z= -8.96 MPa

Obt. 1: stalna (g)



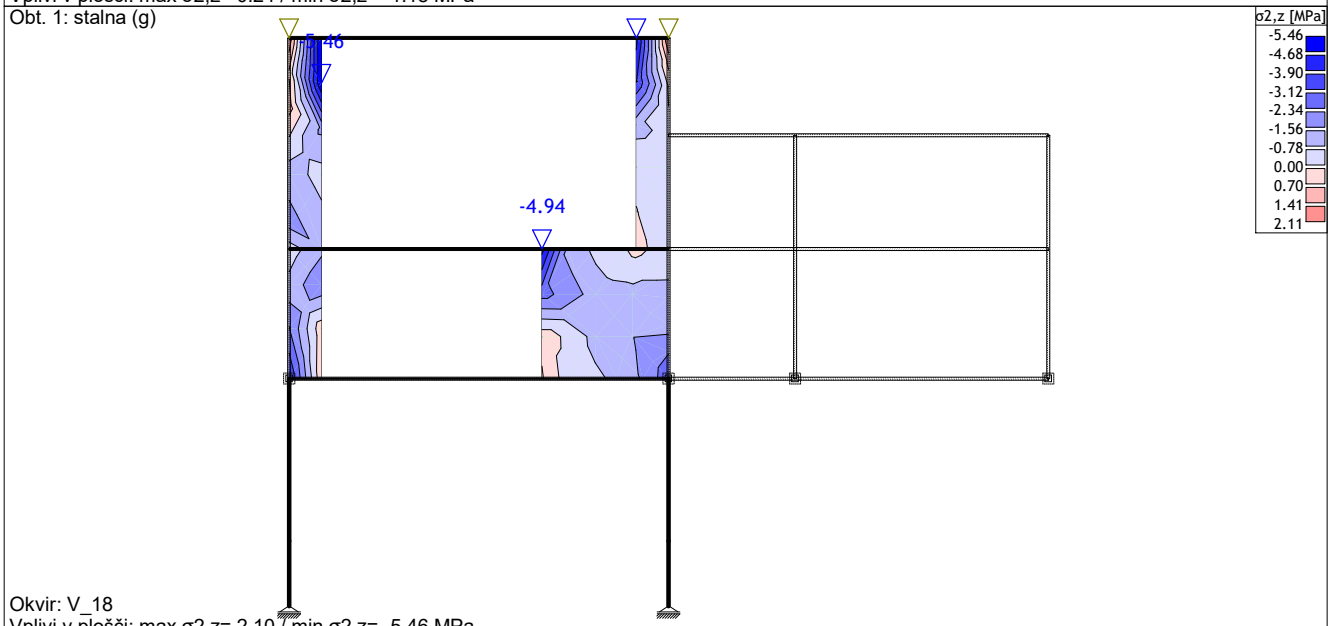
Okvir: V_16
Vplivi v plošči: max σ2,z= 1.17 / min σ2,z= -4.51 MPa

Obt. 1: stalna (g)



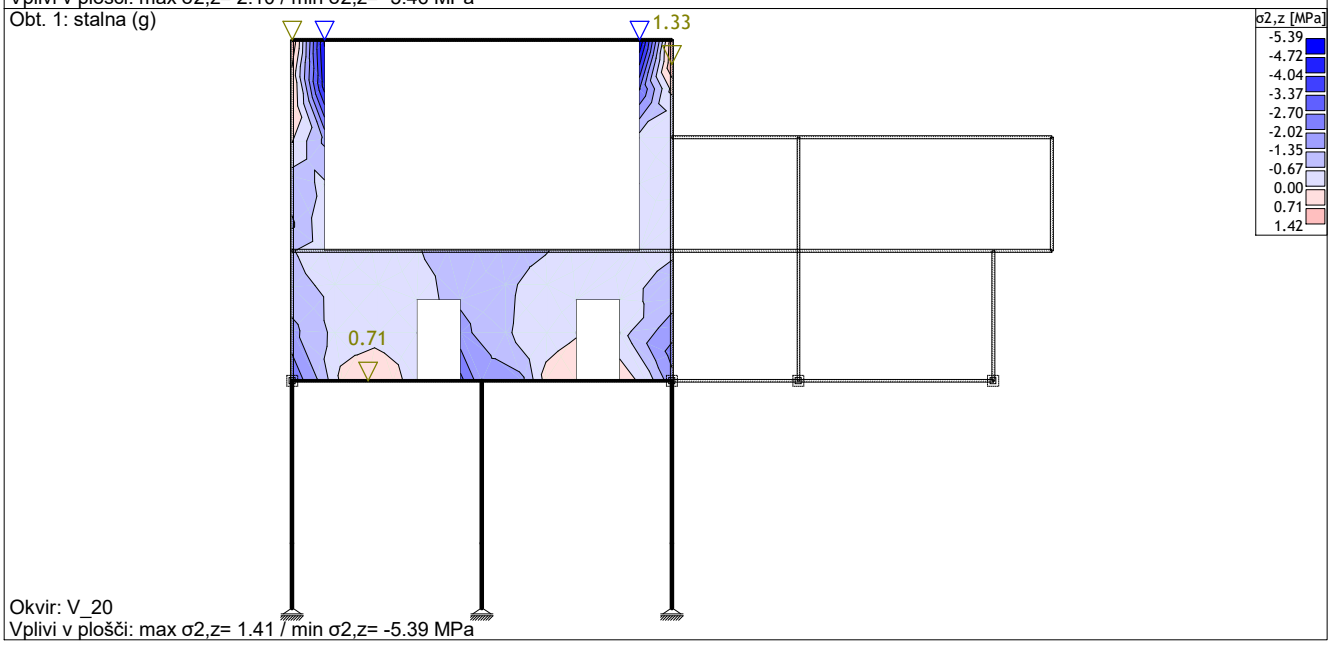
Okvir: V_17
Vplivi v plošči: max σ2,z= 0.24 / min σ2,z= -1.18 MPa

Obt. 1: stalna (g)



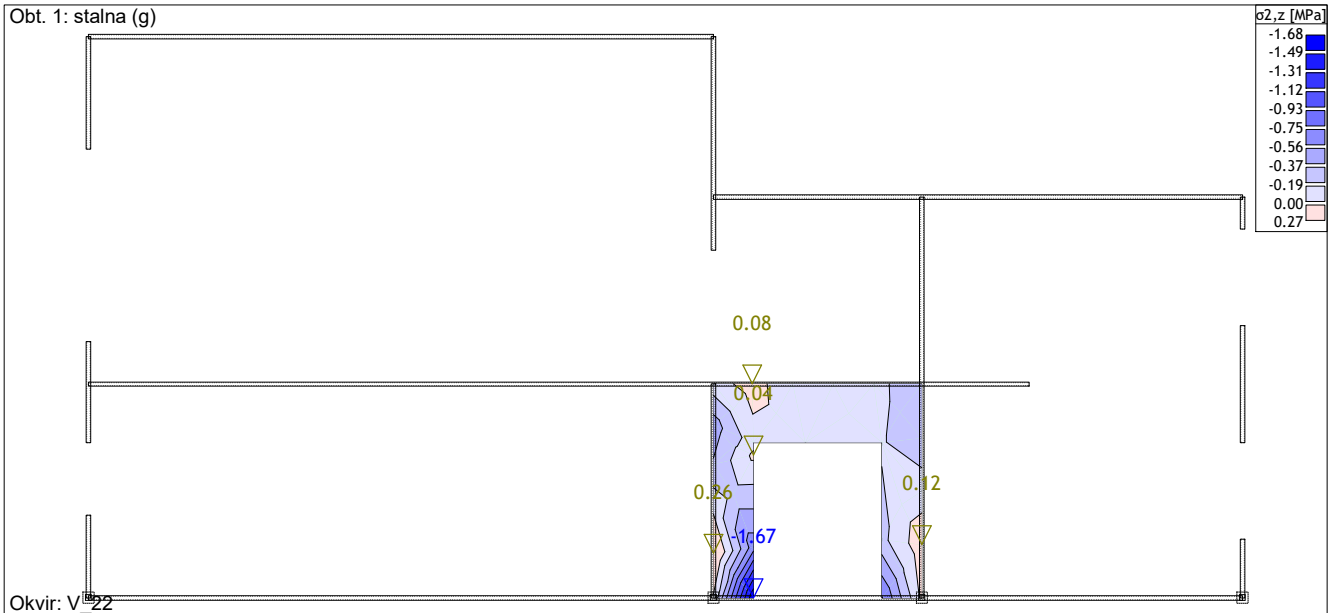
Okvir: V_18
Vplivi v plošči: max σ2,z= 2.10 / min σ2,z= -5.46 MPa

Obt. 1: stalna (g)



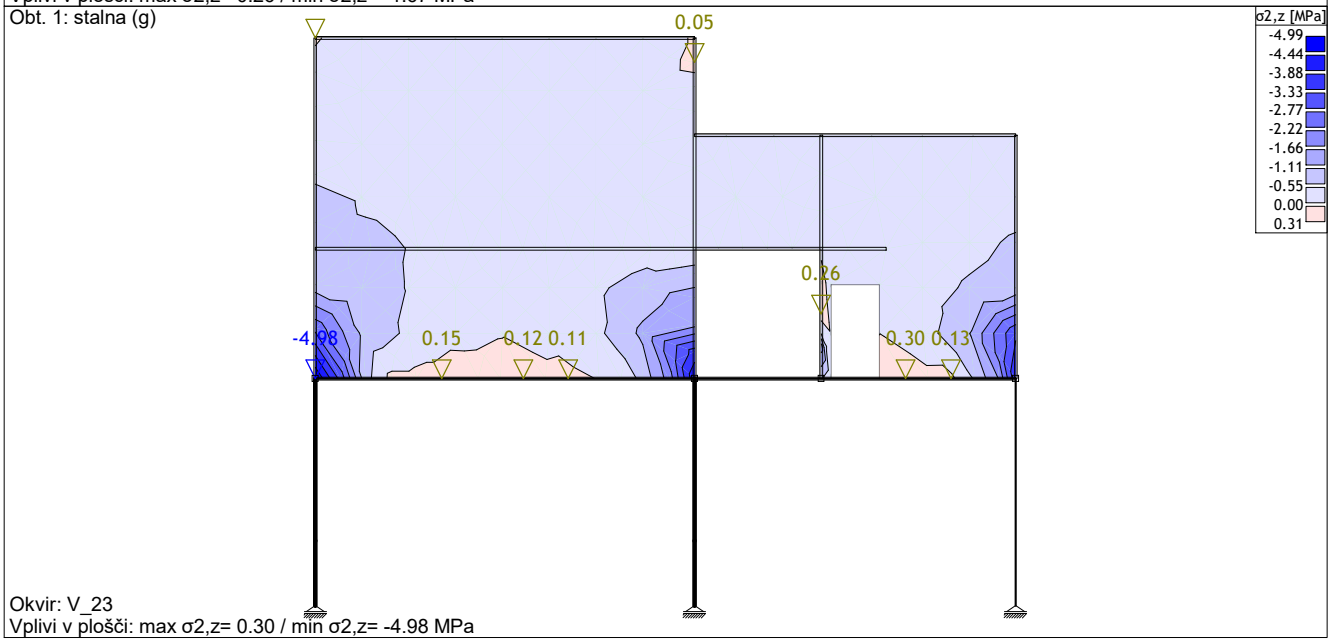
Okvir: V_20
Vplivi v plošči: max σ2,z= 1.41 / min σ2,z= -5.39 MPa

Obt. 1: stalna (g)



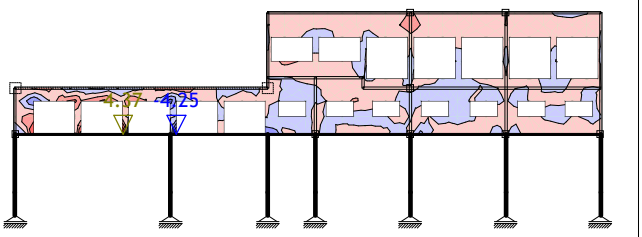
Okvir: V_22
Vplivi v plošči: max σ2,z= 0.26 / min σ2,z= -1.67 MPa

Obt. 1: stalna (g)



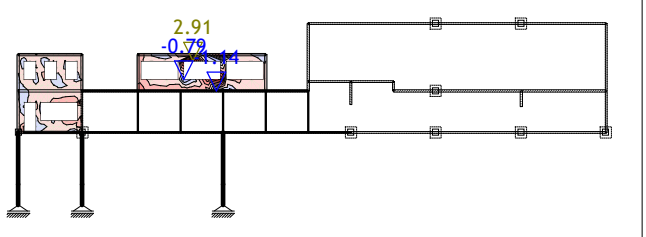
Okvir: V_23
Vplivi v plošči: max σ2,z= 0.30 / min σ2,z= -4.98 MPa

Obt. 1: stalna (g)



Okvir: H_1
Vplivi v plošči: max σ1,z= 4.37 / min σ1,z= -4.25 MPa

Obt. 1: stalna (g)



Okvir: H_2
Vplivi v plošči: max σ1,z= 2.91 / min σ1,z= -1.14 MPa

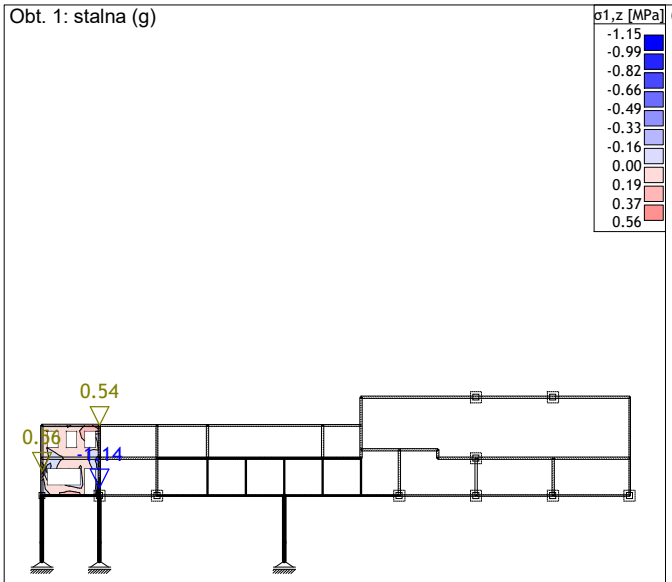
Obt. 1: stalna (g)

Okvir: H_4
Vplivi v plošči: max σ1,z= 0.56 / min σ1,z= -1.14 MPa

Obt. 1: stalna (g)

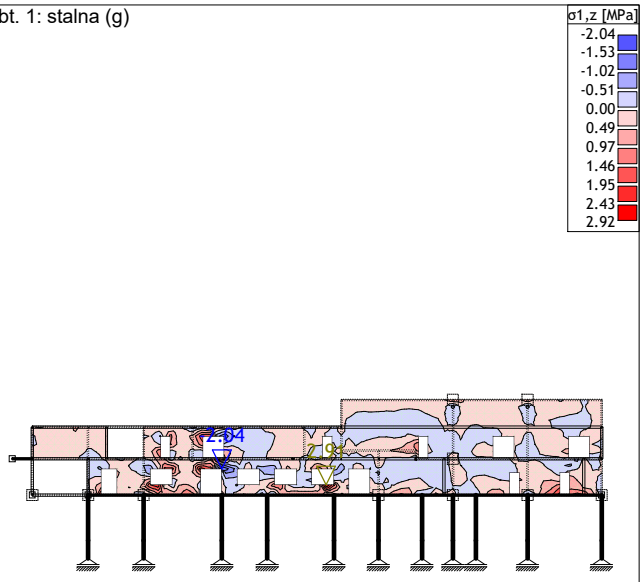
Okvir: H_5
Vplivi v plošči: max σ1,z= 0.58 / min σ1,z= -0.03 MPa

Obt. 1: stalna (g)



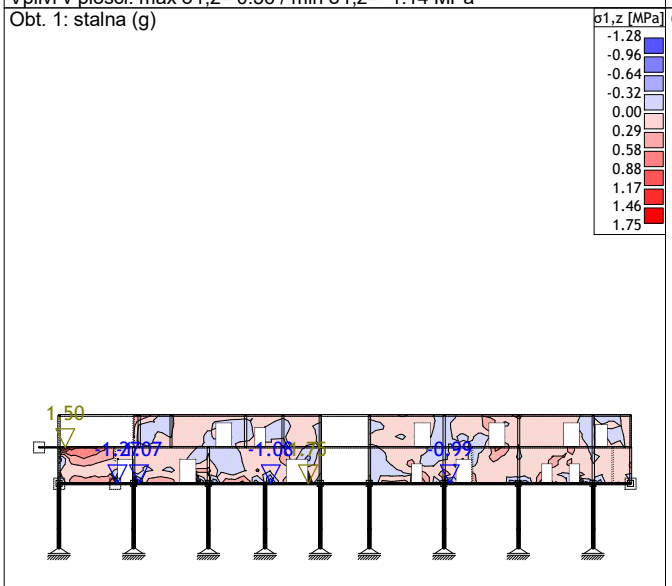
Okvir: H_4
Vplivi v plošči: max σ1,z= 0.56 / min σ1,z= -1.14 MPa

Obt. 1: stalna (g)



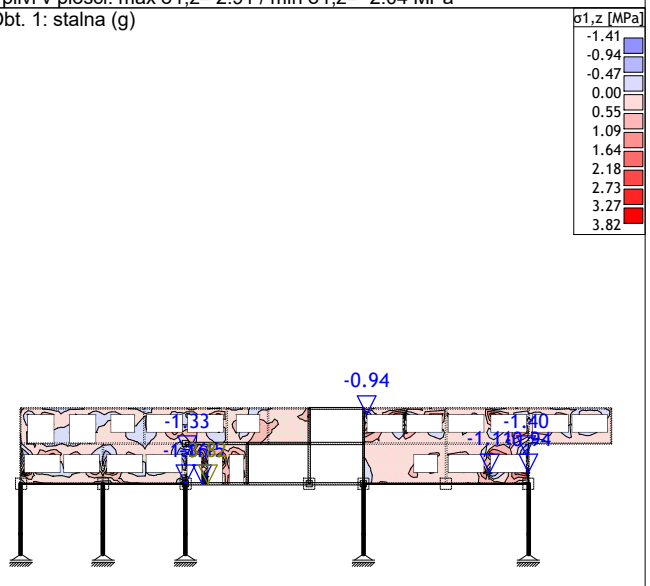
Okvir: H_6
Vplivi v plošči: max σ1,z= 2.91 / min σ1,z= -2.04 MPa

Obt. 1: stalna (g)



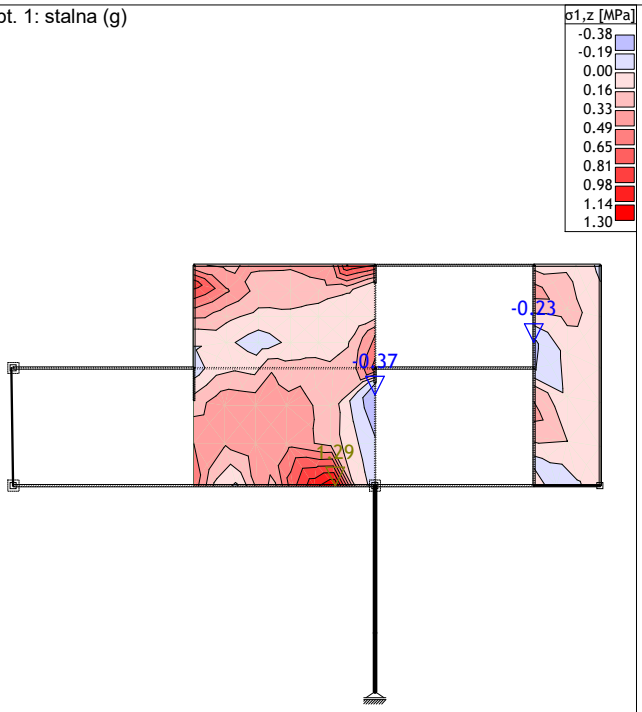
Okvir: H_7
Vplivi v plošči: max σ1,z= 1.75 / min σ1,z= -1.27 MPa

Obt. 1: stalna (g)



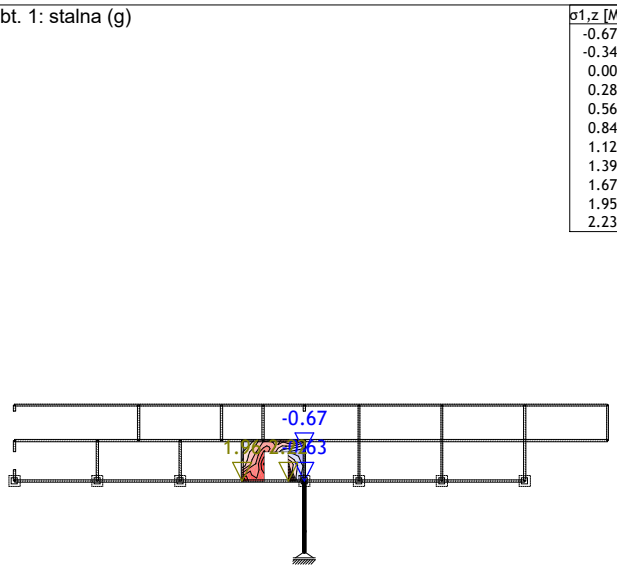
Okvir: H_10
Vplivi v plošči: max σ1,z= 3.82 / min σ1,z= -1.40 MPa

Obt. 1: stalna (g)



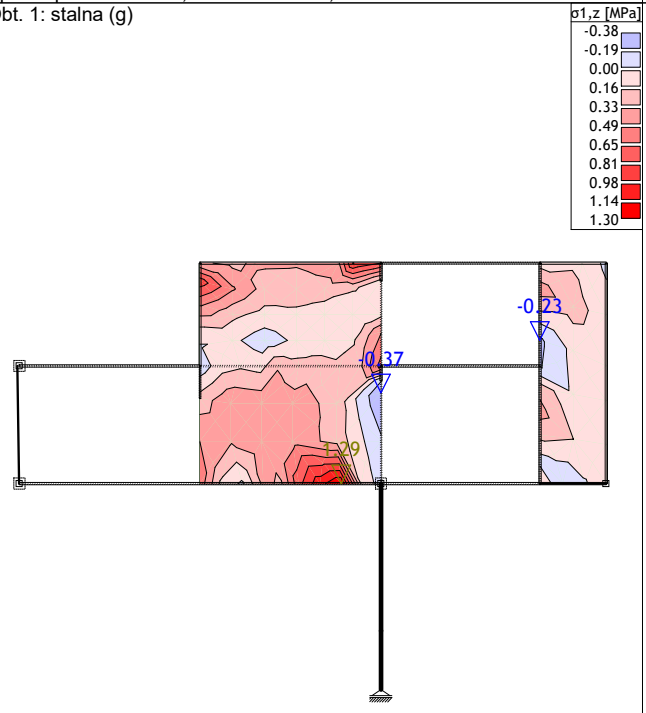
Okvir: H_11
Vplivi v plošči: max σ1,z= 1.29 / min σ1,z= -0.37 MPa

Obt. 1: stalna (g)



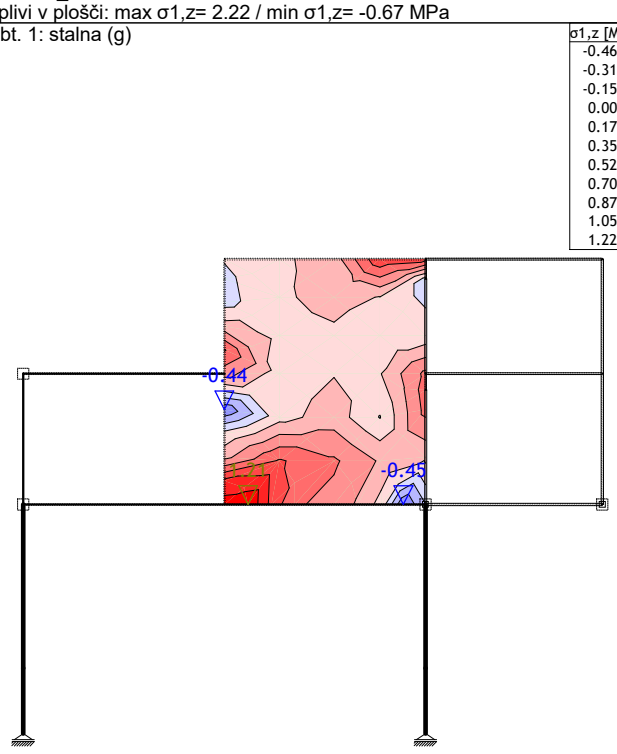
Okvir: H_9
Vplivi v plošči: max σ1,z= 2.22 / min σ1,z= -0.67 MPa

Obt. 1: stalna (g)



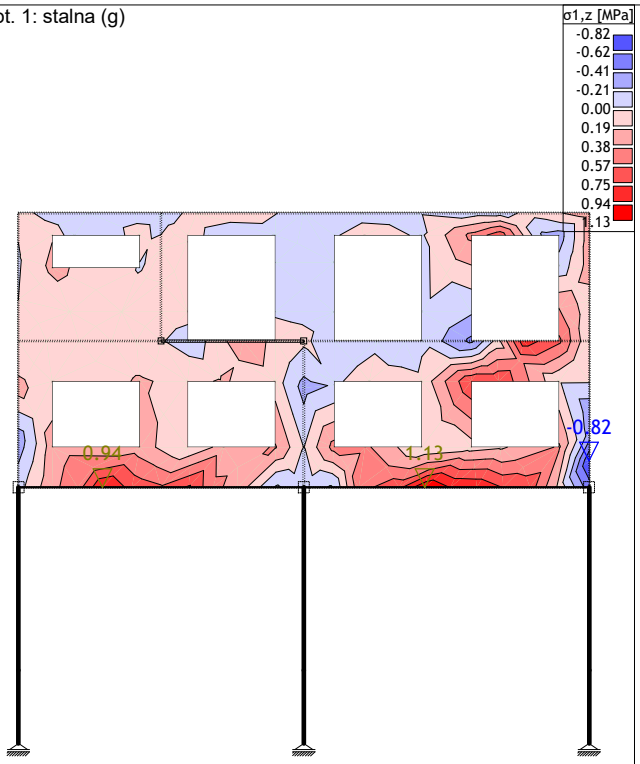
Okvir: H_11
Vplivi v plošči: max σ1,z= 1.29 / min σ1,z= -0.37 MPa

Obt. 1: stalna (g)



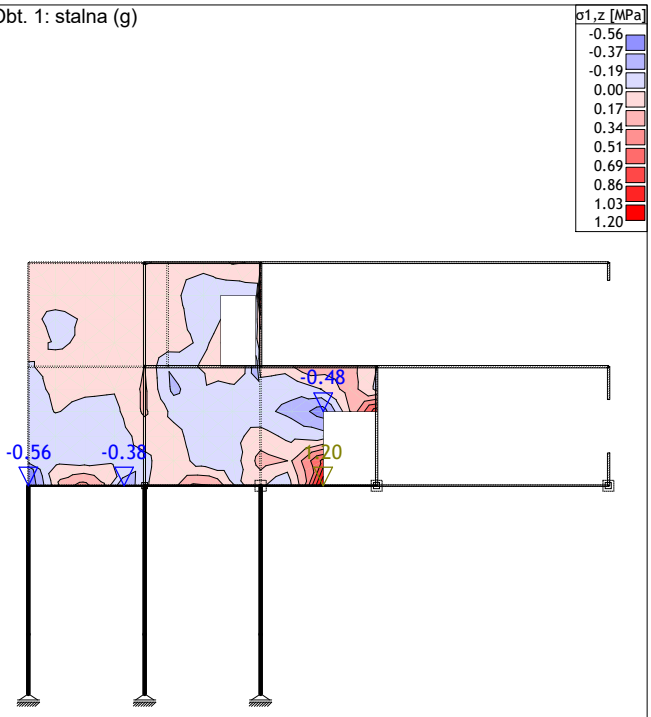
Okvir: H_13
Vplivi v plošči: max σ1,z= 1.21 / min σ1,z= -0.45 MPa

Obt. 1: stalna (g)



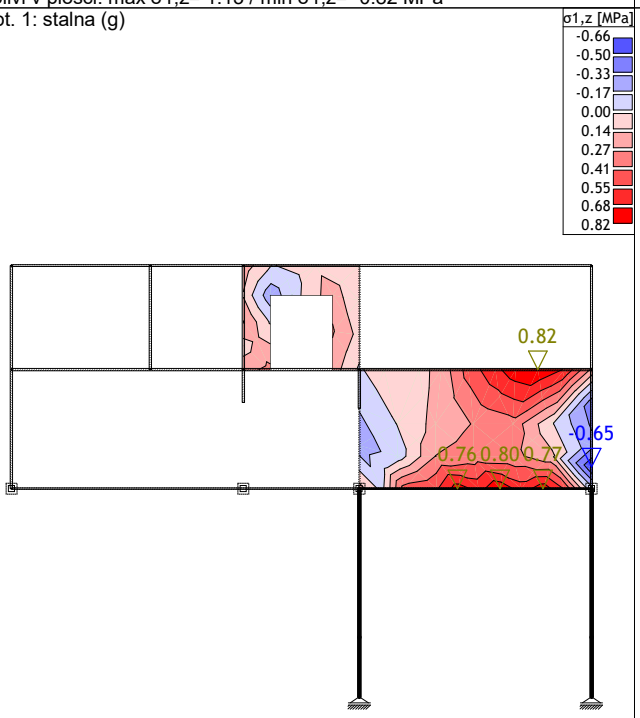
Okvir: V_1
Vplivi v plošči: max σ1,z= 1.13 / min σ1,z= -0.82 MPa

Obt. 1: stalna (g)



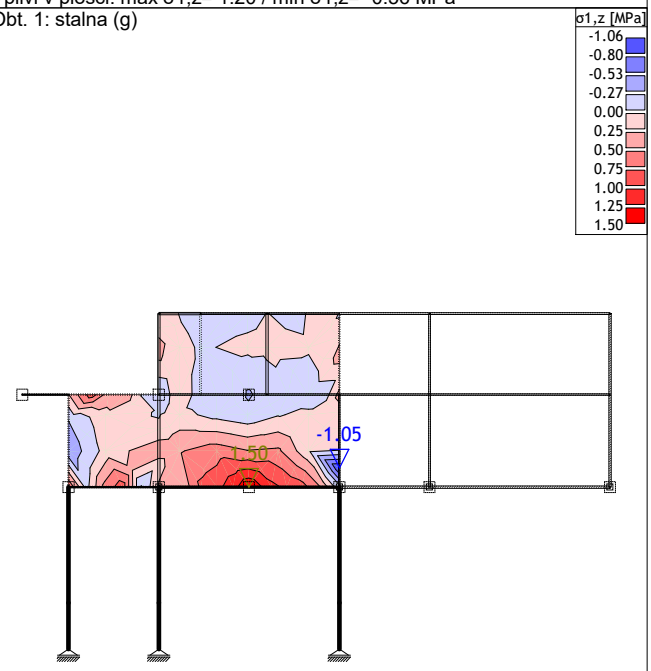
Okvir: V_2
Vplivi v plošči: max σ1,z= 1.20 / min σ1,z= -0.56 MPa

Obt. 1: stalna (g)



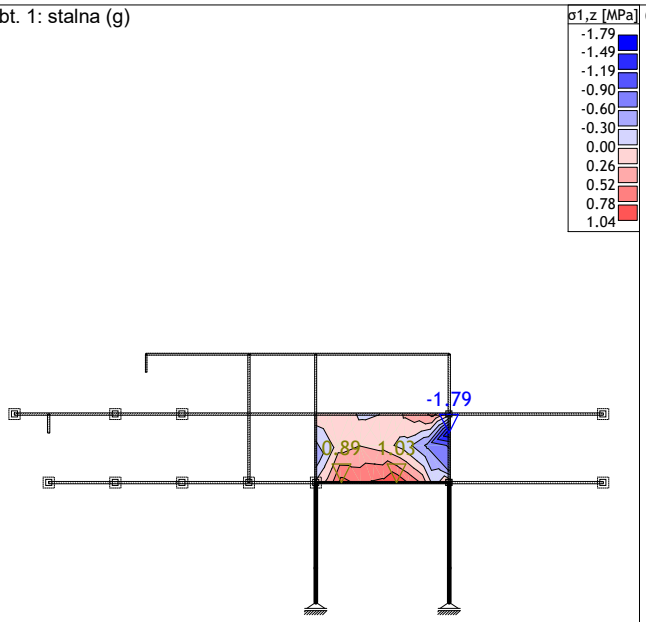
Okvir: V_3
Vplivi v plošči: max σ1,z= 0.82 / min σ1,z= -0.65 MPa

Obt. 1: stalna (g)



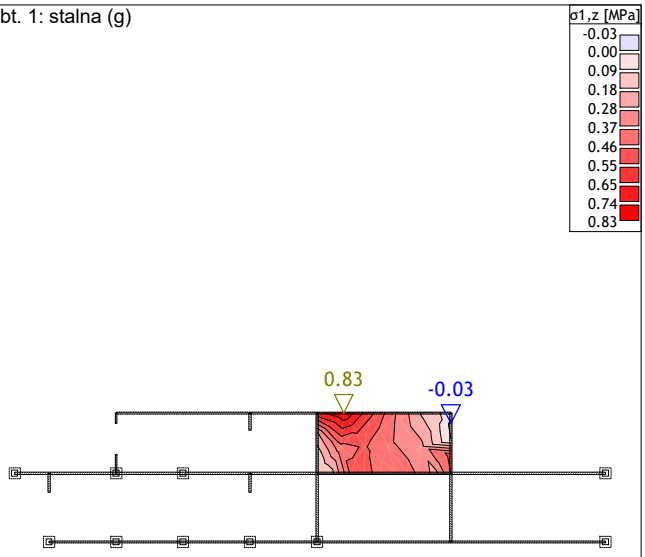
Okvir: V_6
Vplivi v plošči: max σ1,z= 1.50 / min σ1,z= -1.05 MPa

Obt. 1: stalna (g)



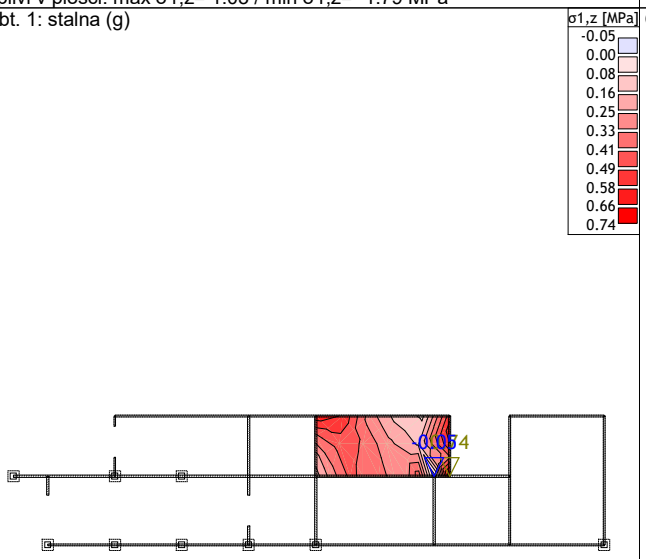
Okvir: K_1
Vplivi v plošči: max σ1,z= 1.03 / min σ1,z= -1.79 MPa

Obt. 1: stalna (g)



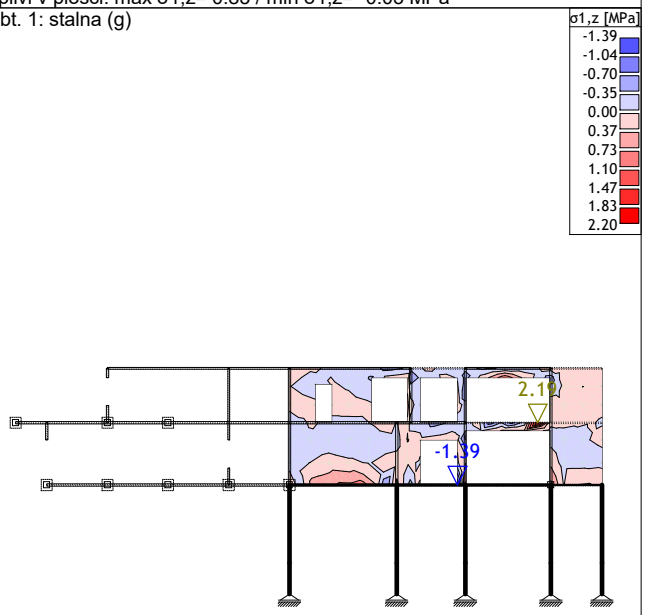
Okvir: V_8
Vplivi v plošči: max σ1,z= 0.83 / min σ1,z= -0.03 MPa

Obt. 1: stalna (g)



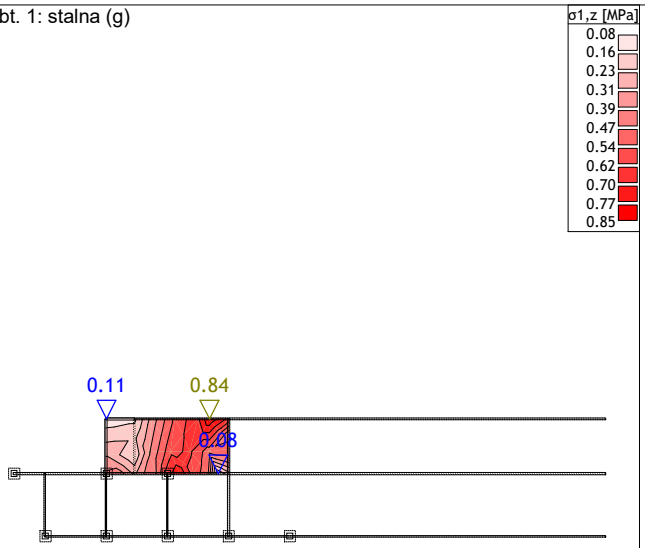
Okvir: V_10
Vplivi v plošči: max σ1,z= 0.74 / min σ1,z= -0.05 MPa

Obt. 1: stalna (g)



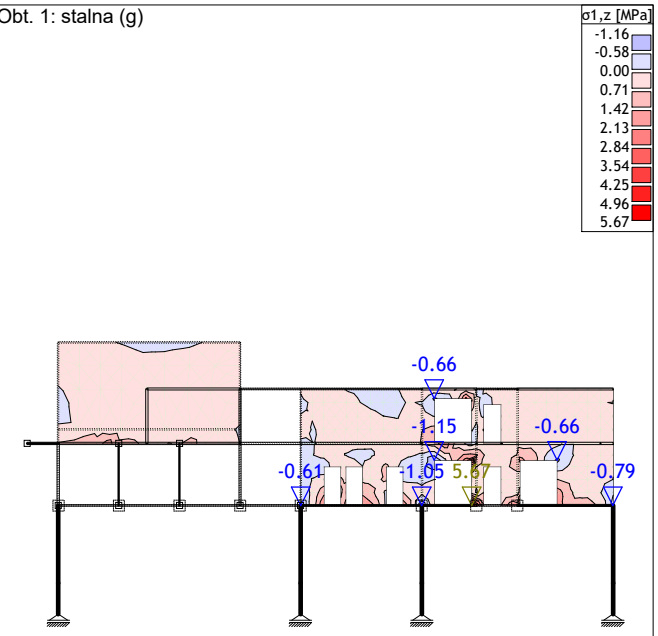
Okvir: V_24
Vplivi v plošči: max σ1,z= 2.19 / min σ1,z= -1.39 MPa

Obt. 1: stalna (g)



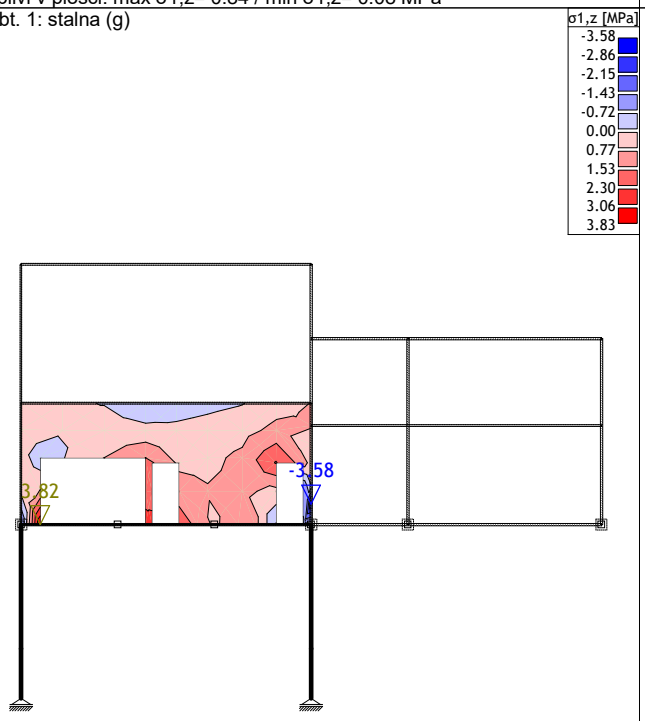
Okvir: V_13
Vplivi v plošči: max σ1,z= 0.84 / min σ1,z= 0.08 MPa

Obt. 1: stalna (g)



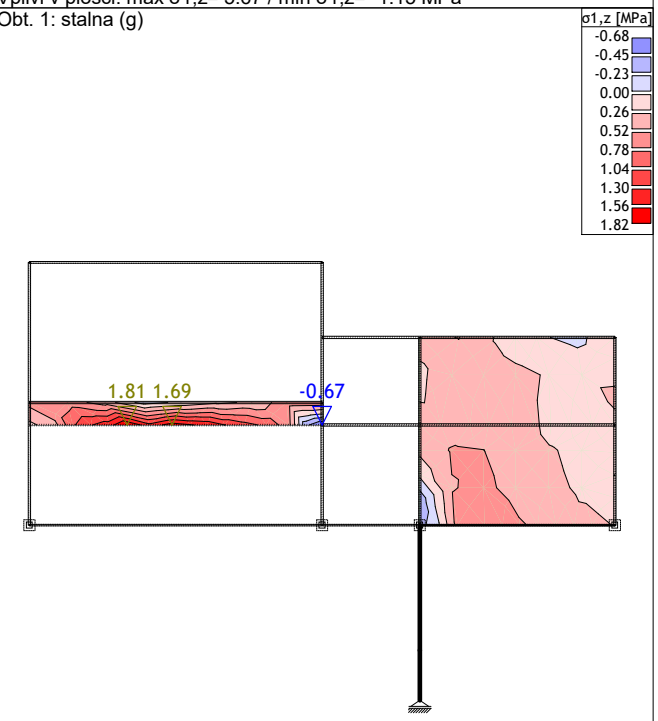
Okvir: V_14
Vplivi v plošči: max σ1,z= 5.67 / min σ1,z= -1.15 MPa

Obt. 1: stalna (g)



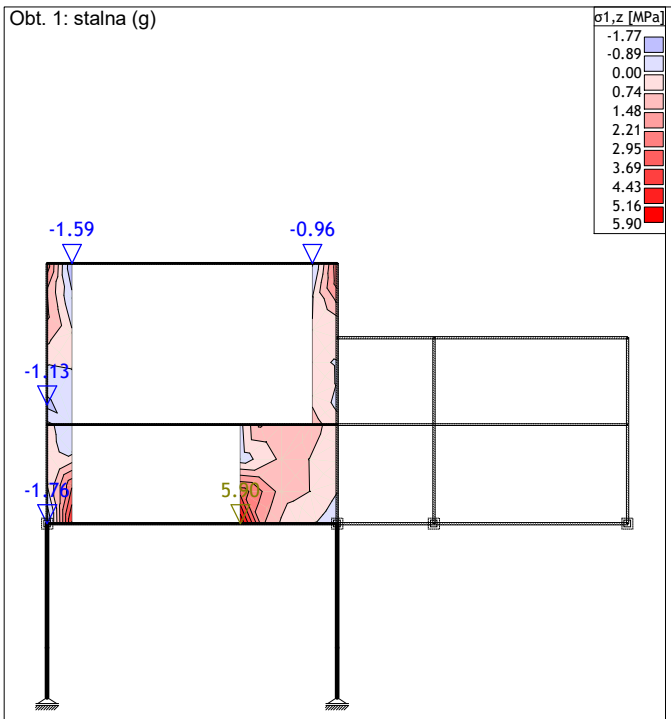
Okvir: V_25
Vplivi v plošči: max σ1,z= 3.82 / min σ1,z= -3.58 MPa

Obt. 1: stalna (g)



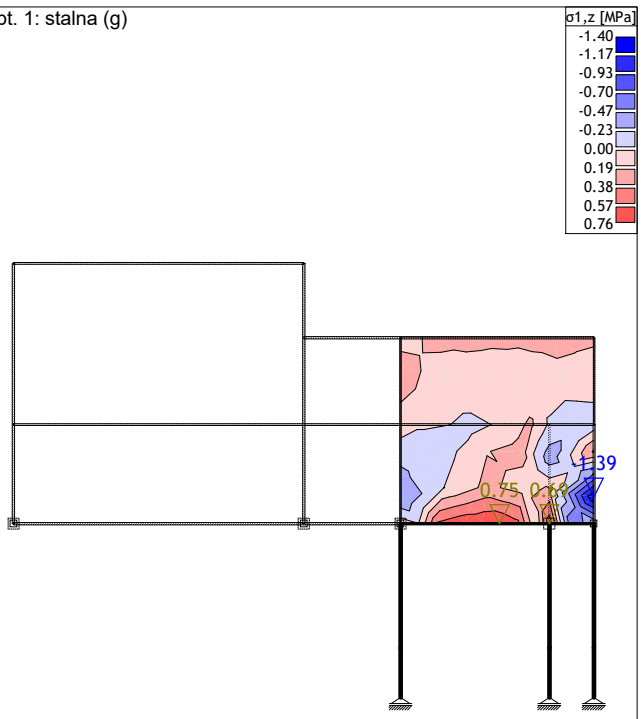
Okvir: V_16
Vplivi v plošči: max σ1,z= 1.81 / min σ1,z= -0.67 MPa

Obt. 1: stalna (g)



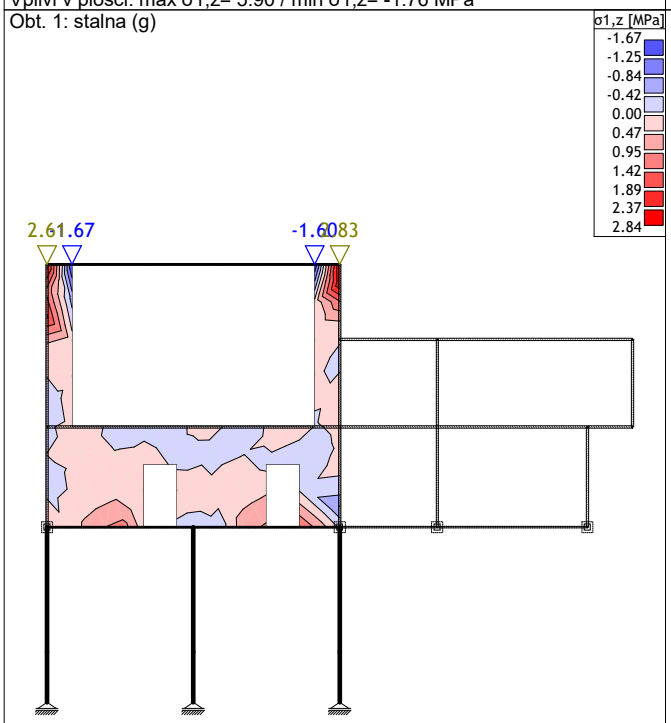
Okvir: V_18
Vplivi v plošči: max σ1,z= 5.90 / min σ1,z= -1.76 MPa

Obt. 1: stalna (g)



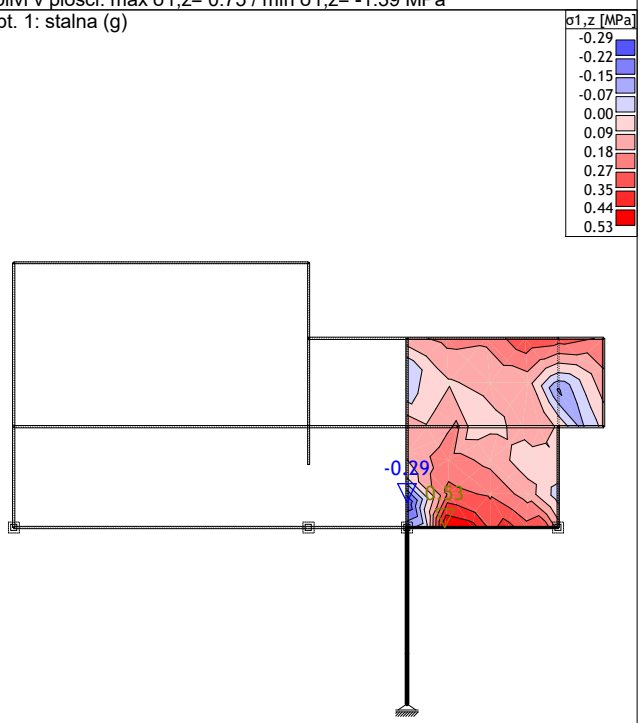
Okvir: V_19
Vplivi v plošči: max σ1,z= 0.75 / min σ1,z= -1.39 MPa

Obt. 1: stalna (g)



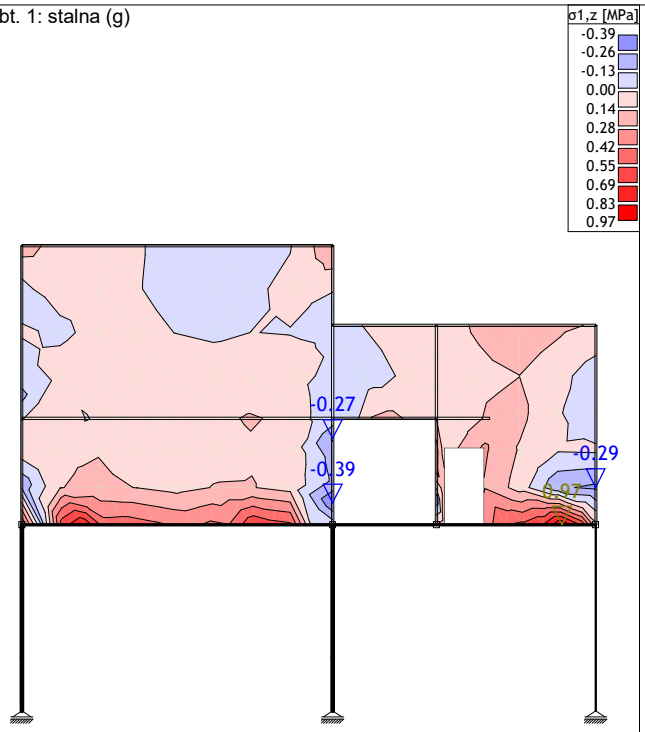
Okvir: V_20
Vplivi v plošči: max σ1,z= 2.83 / min σ1,z= -1.67 MPa

Obt. 1: stalna (g)



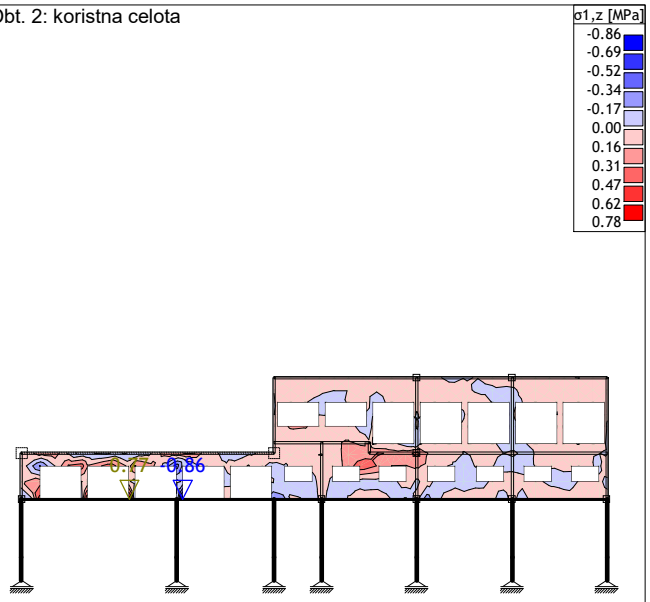
Okvir: V_21
Vplivi v plošči: max σ1,z= 0.53 / min σ1,z= -0.29 MPa

Obt. 1: stalna (g)



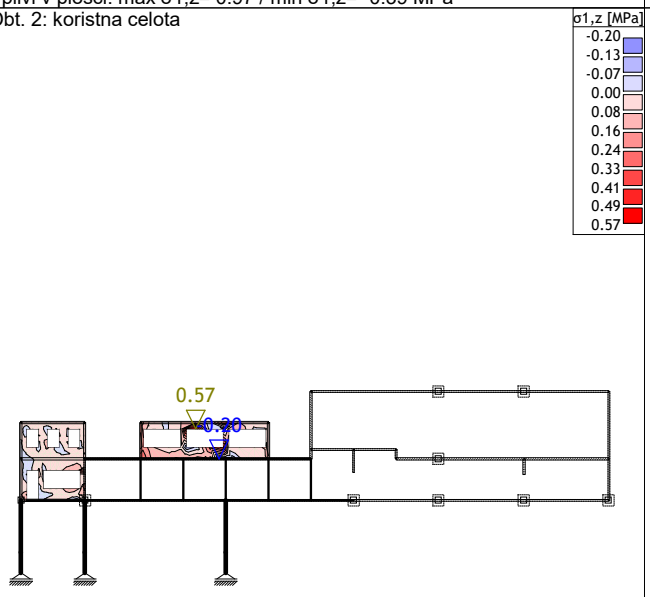
Okvir: V_23
Vplivi v plošči: max σ1,z= 0.97 / min σ1,z= -0.39 MPa

Obt. 2: koristna celota



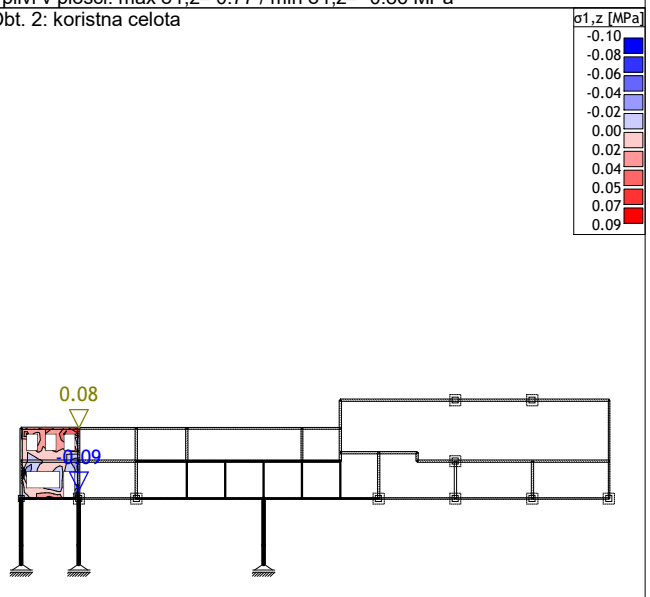
Okvir: H_1
Vplivi v plošči: max σ1,z= 0.77 / min σ1,z= -0.86 MPa

Obt. 2: koristna celota



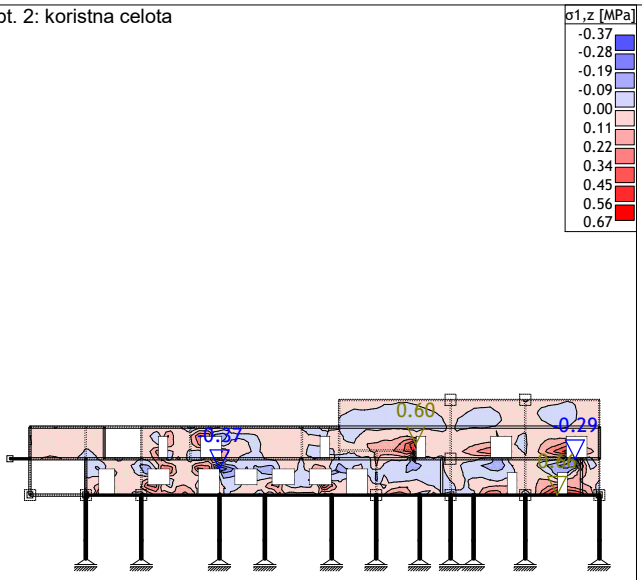
Okvir: H_2
Vplivi v plošči: max σ1,z= 0.57 / min σ1,z= -0.20 MPa

Obt. 2: koristna celota



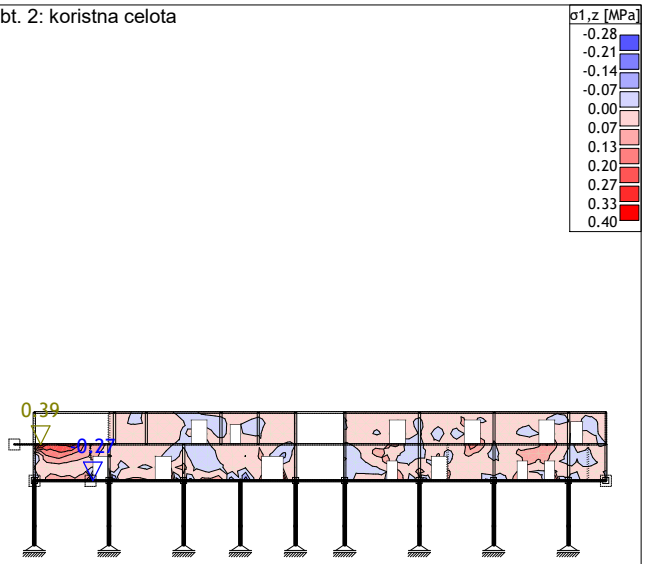
Okvir: H_4
Vplivi v plošči: max σ1,z= 0.08 / min σ1,z= -0.09 MPa

Obt. 2: koristna celota



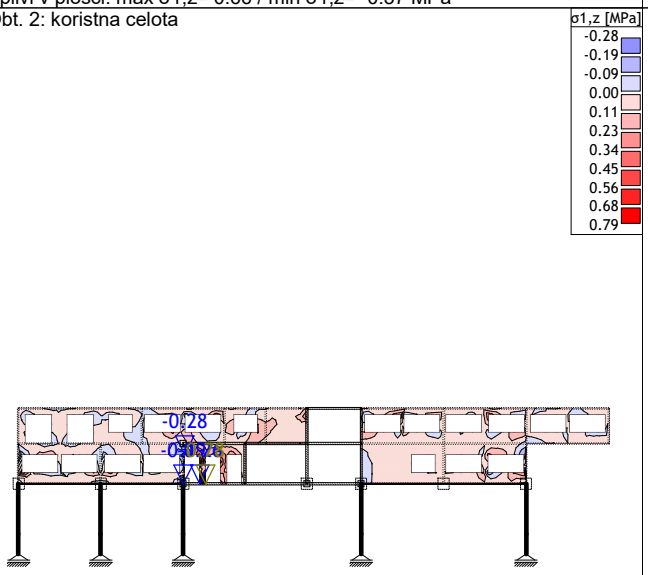
Okvir: H_6
Vplivi v plošči: max σ1,z= 0.66 / min σ1,z= -0.37 MPa

Obt. 2: koristna celota



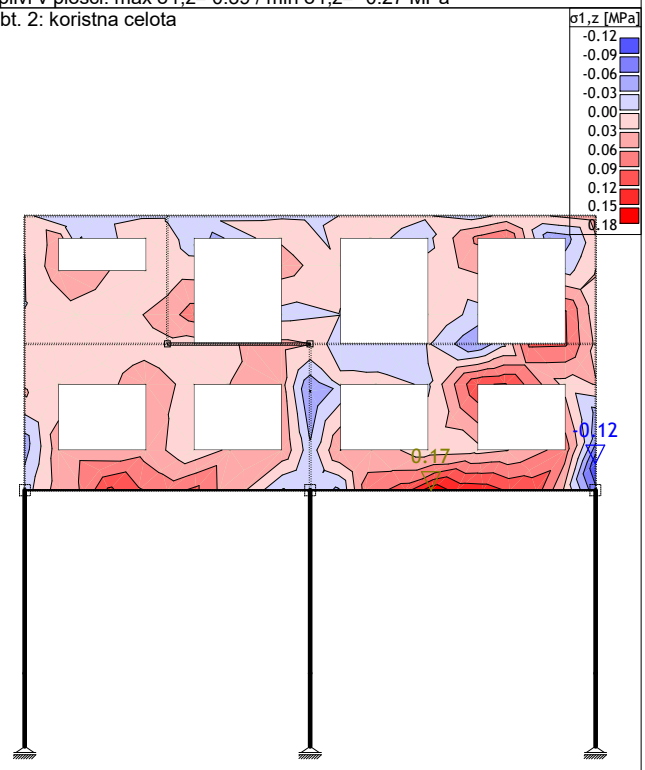
Okvir: H_7
Vplivi v plošči: max σ1,z= 0.39 / min σ1,z= -0.27 MPa

Obt. 2: koristna celota



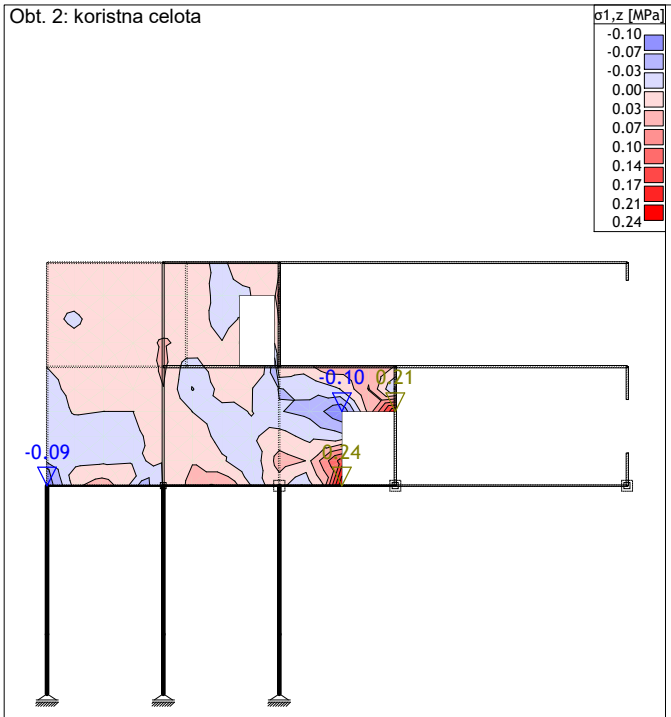
Okvir: H_10
Vplivi v plošči: max σ1,z= 0.78 / min σ1,z= -0.28 MPa

Obt. 2: koristna celota



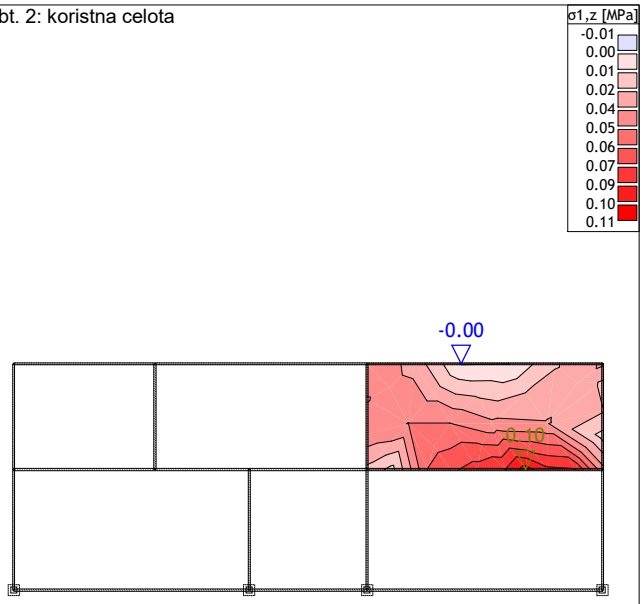
Okvir: V_1
Vplivi v plošči: max σ1,z= 0.17 / min σ1,z= -0.12 MPa

Obt. 2: koristna celota



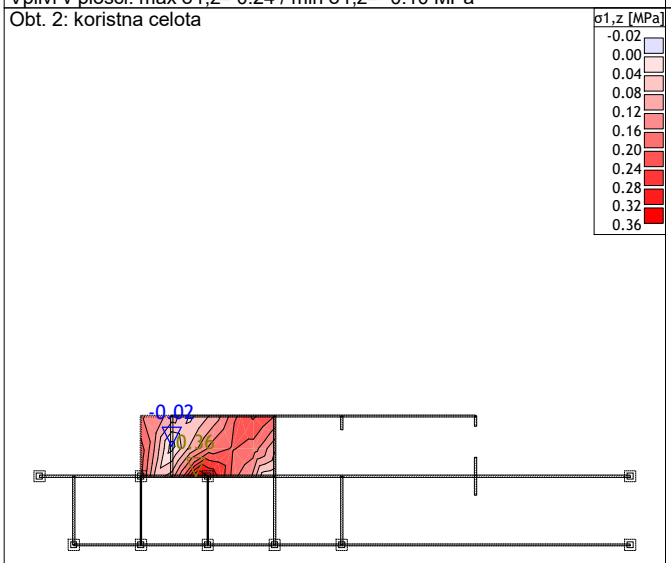
Okvir: V_2
Vplivi v plošči: max σ1,z= 0.24 / min σ1,z= -0.10 MPa

Obt. 2: koristna celota



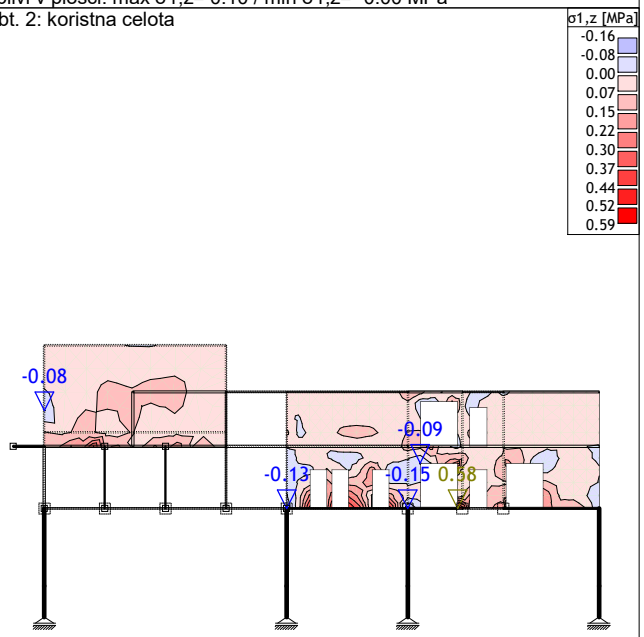
Okvir: V_5
Vplivi v plošči: max σ1,z= 0.10 / min σ1,z= -0.00 MPa

Obt. 2: koristna celota



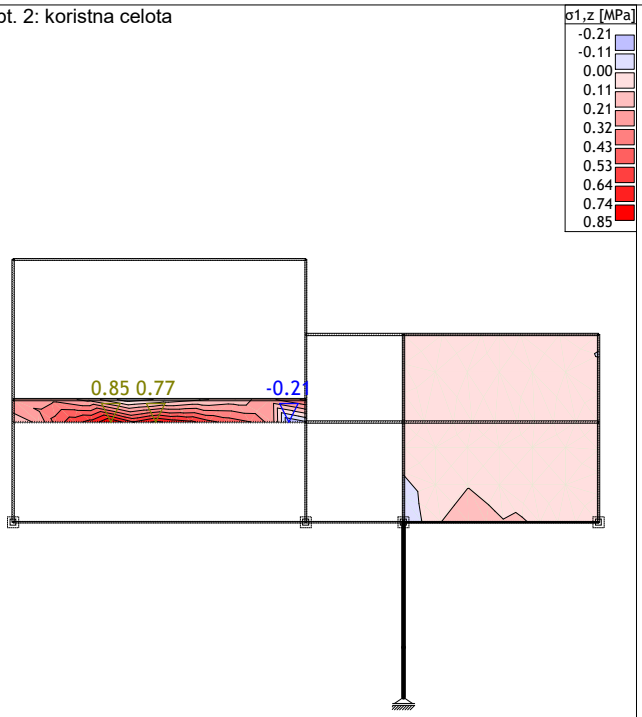
Okvir: V_7
Vplivi v plošči: max σ1,z= 0.36 / min σ1,z= -0.02 MPa

Obt. 2: koristna celota



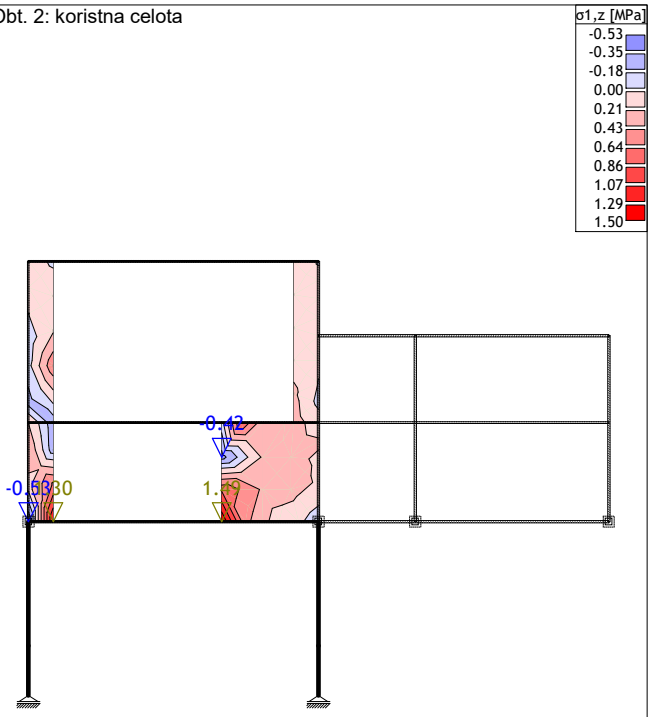
Okvir: V_14
Vplivi v plošči: max σ1,z= 0.58 / min σ1,z= -0.15 MPa

Obt. 2: koristna celota



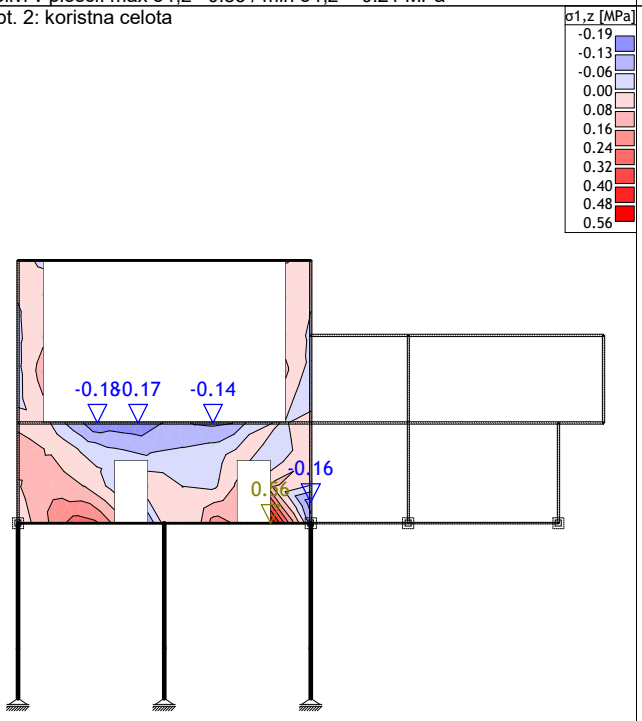
Okvir: V_16
Vplivi v plošči: max σ1,z= 0.85 / min σ1,z= -0.21 MPa

Obt. 2: koristna celota



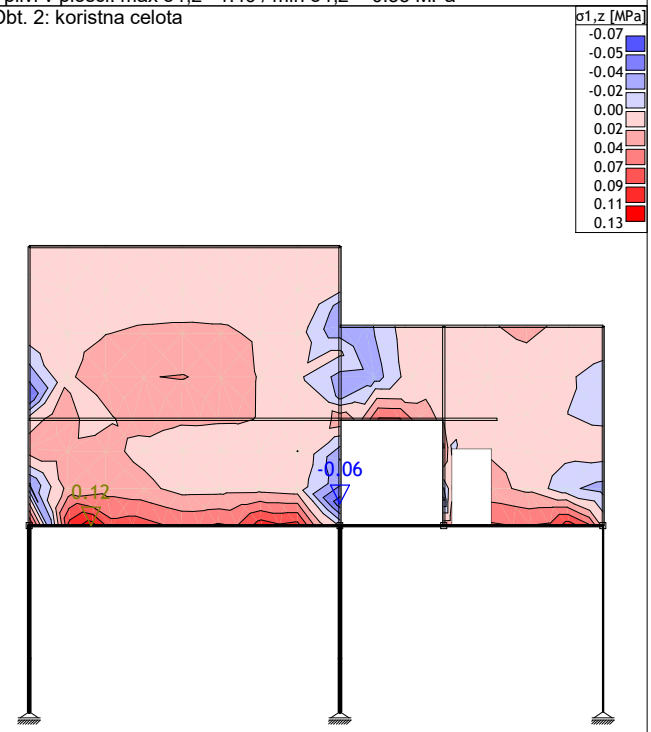
Okvir: V_18
Vplivi v plošči: max σ1,z= 1.49 / min σ1,z= -0.53 MPa

Obt. 2: koristna celota



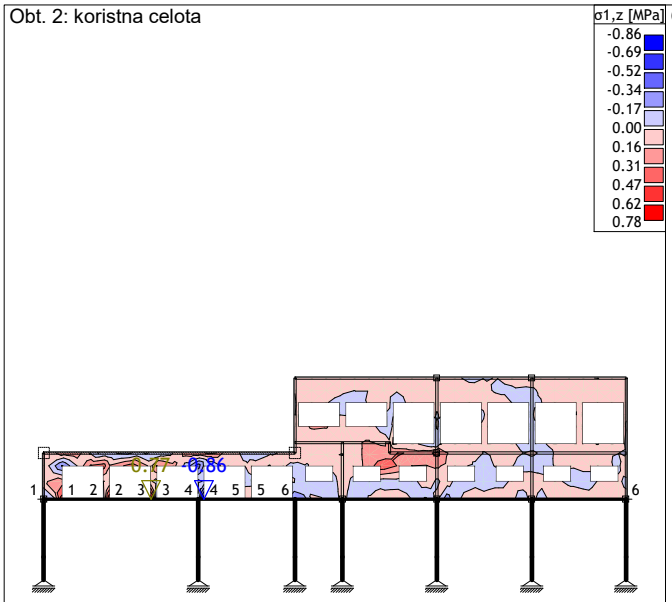
Okvir: V_20
Vplivi v plošči: max σ1,z= 0.56 / min σ1,z= -0.18 MPa

Obt. 2: koristna celota



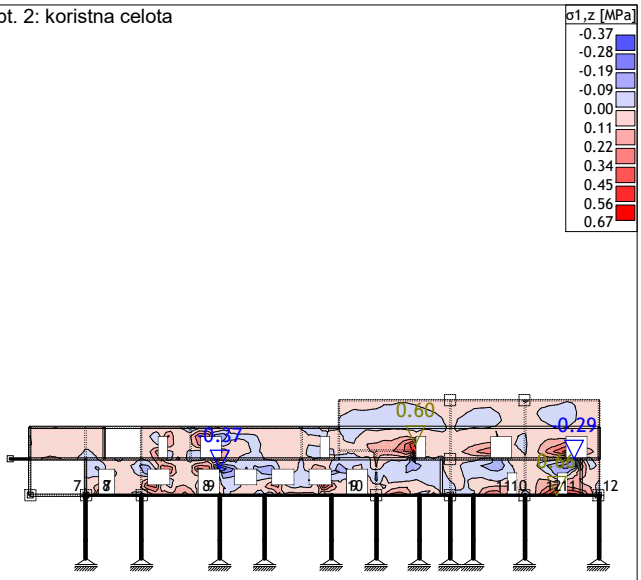
Okvir: V_23
Vplivi v plošči: max σ1,z= 0.12 / min σ1,z= -0.06 MPa

Obt. 2: koristna celota



Okvir: H_1
Vplivi v plošči: max σ1,z= 0.77 / min σ1,z= -0.86 MPa

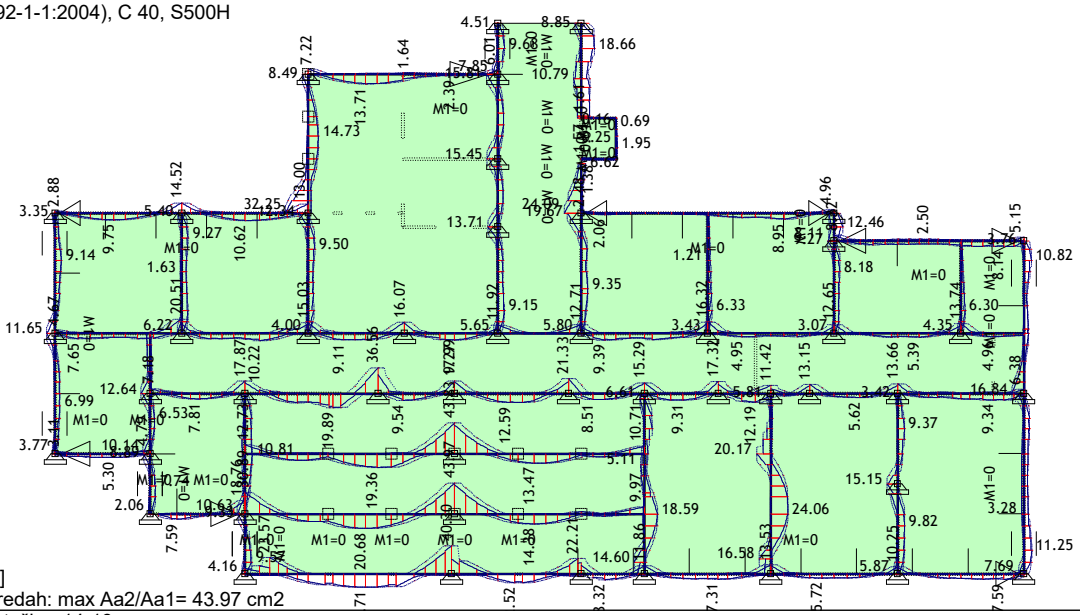
Obt. 2: koristna celota



Okvir: H_6
Vplivi v plošči: max σ1,z= 0.66 / min σ1,z= -0.37 MPa

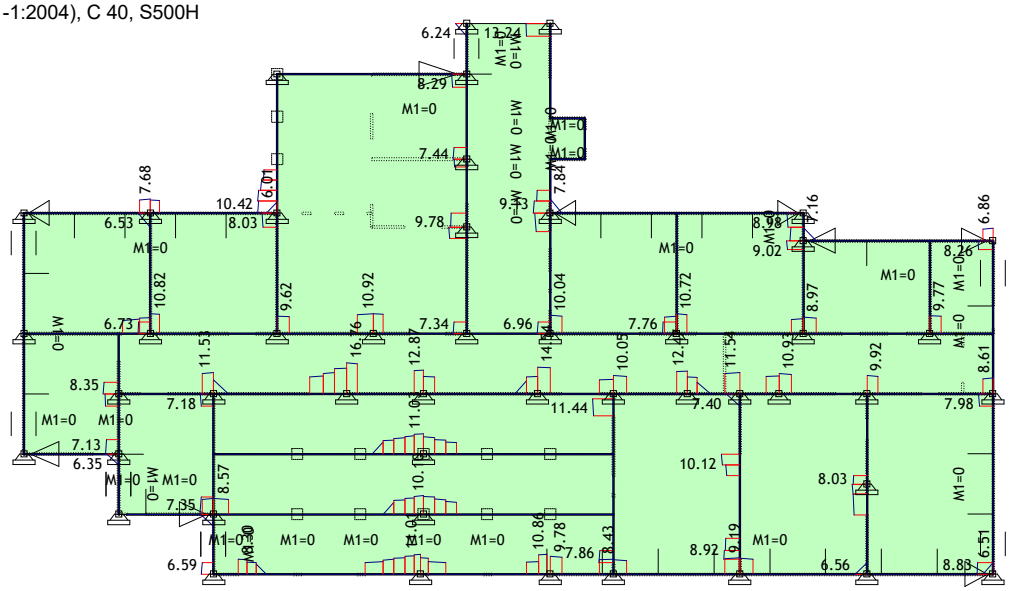
Dimenzioniranje (beton)

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 40, S500H



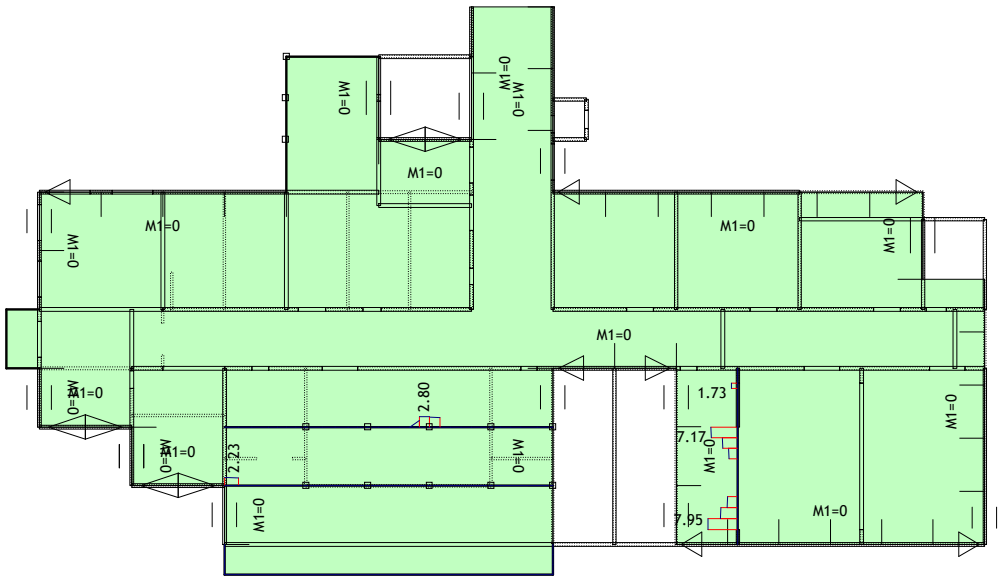
Nivo: [0.00 m]
Armatura v gredah: max Aa2/Aa1= 43.97 cm2

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 40, S500H



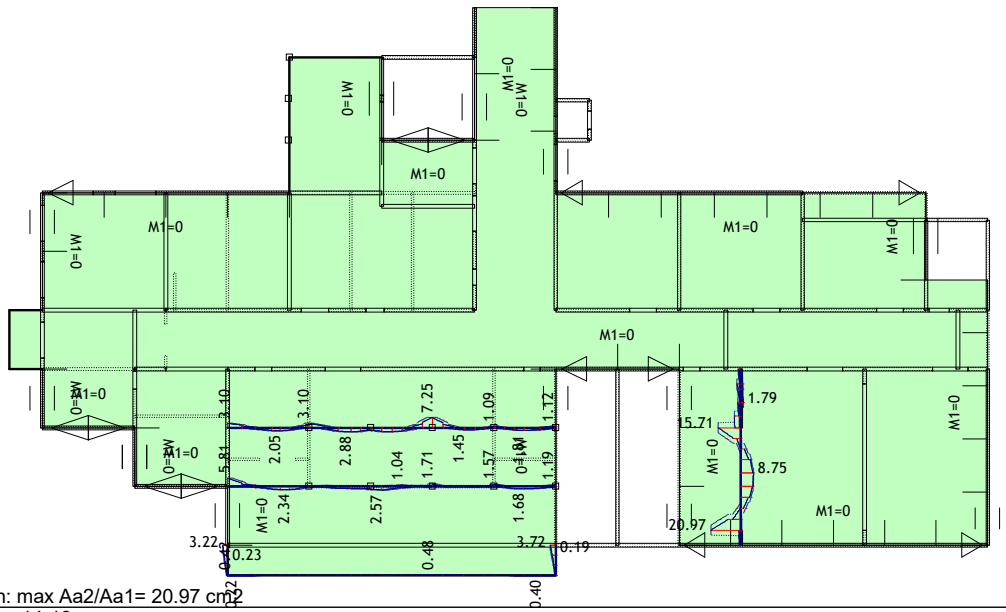
Nivo: [0.00 m]
Armatura v gredah: max Aa,st= 16.76 cm2

EC 2 (EN 1992-1-1:2004), C 40, S500H



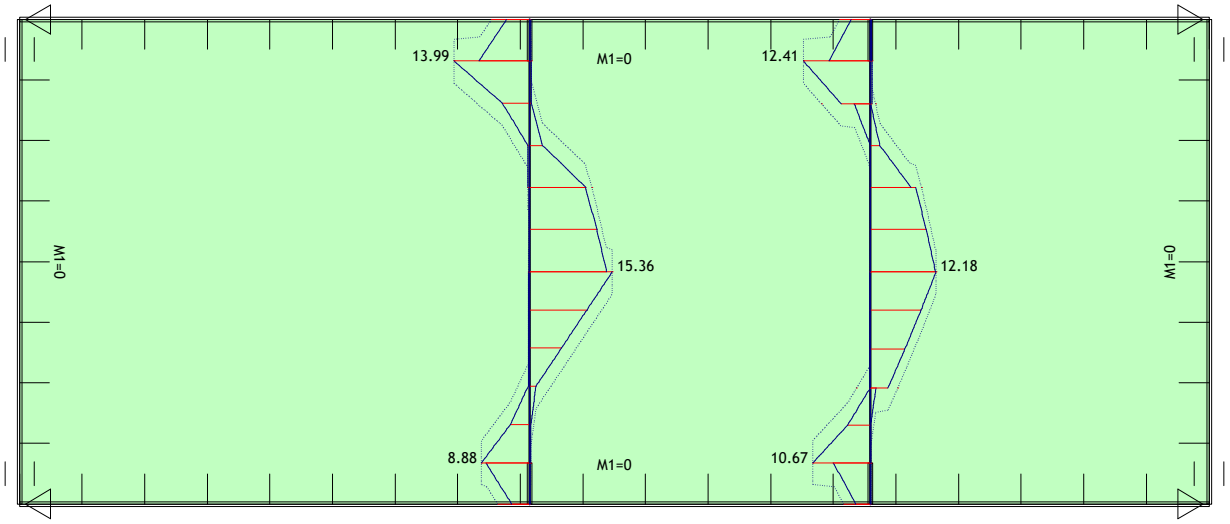
Nivo: [4.00 m]
Armatura v gredah: max Aa,st= 7.95 cm2

EC 2 (EN 1992-1-1:2004), C 40, S500H



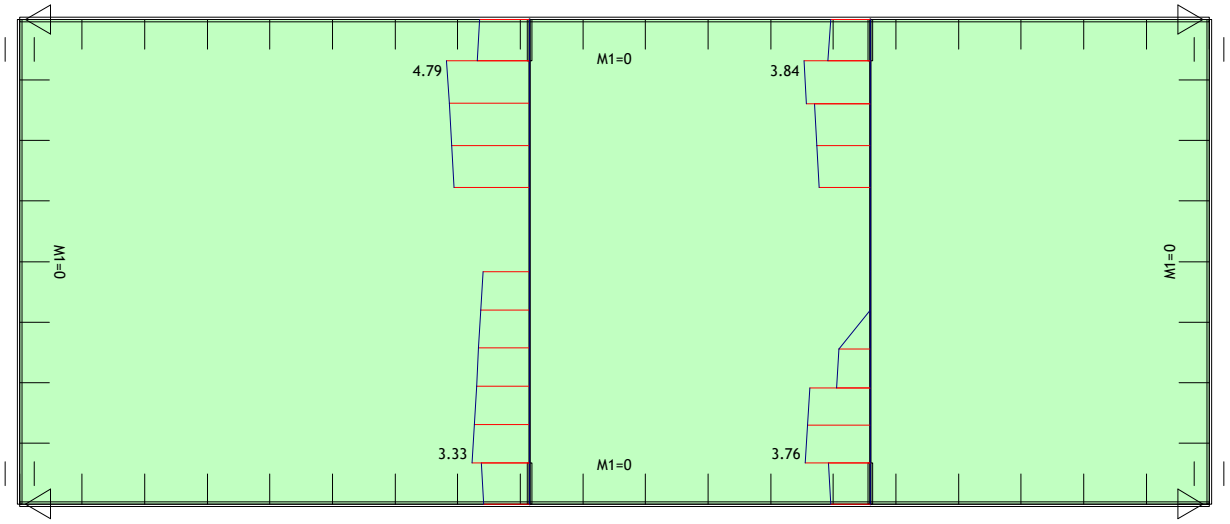
Nivo: [4.00 m]
Armatura v gredah: max Aa2/Aa1= 20.97 cm2

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 40, S500H



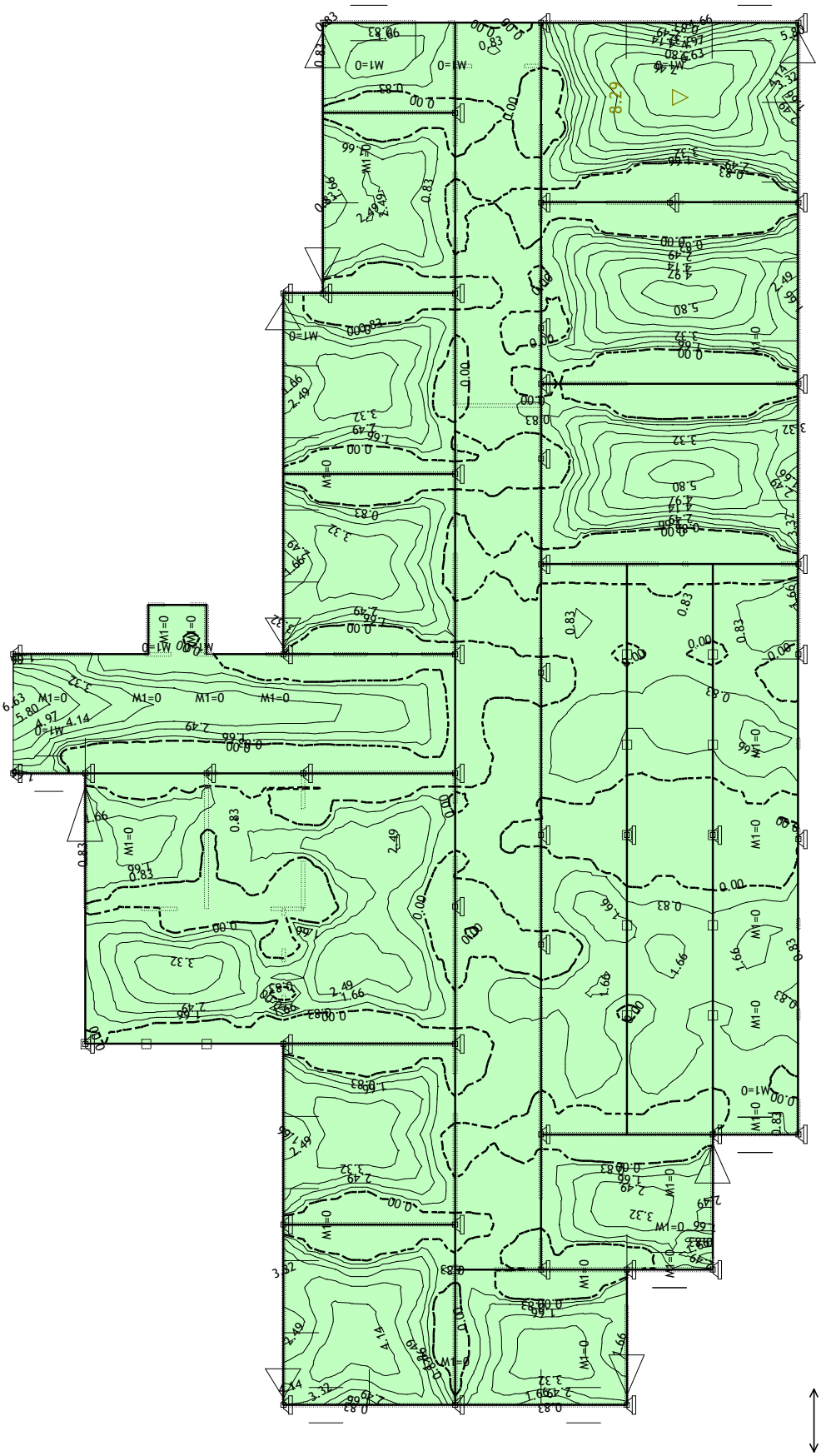
Nivo: [10.50 m]
Armatura v gredah: max Aa2/Aa1= 15.36 cm2

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 40, S500H



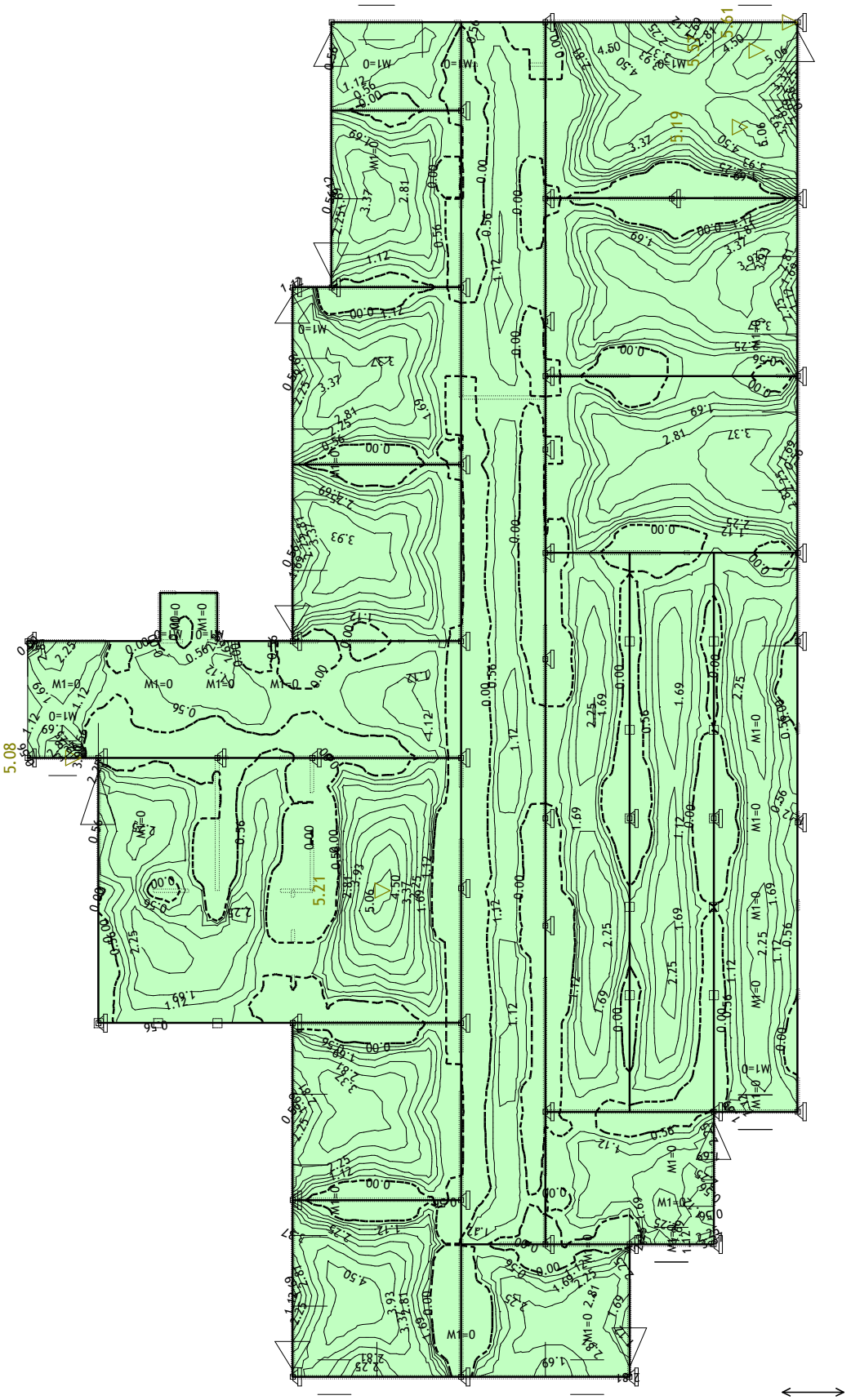
Nivo: [10.50 m]
Armatura v gredah: max Aa,st= 4.79 cm2

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



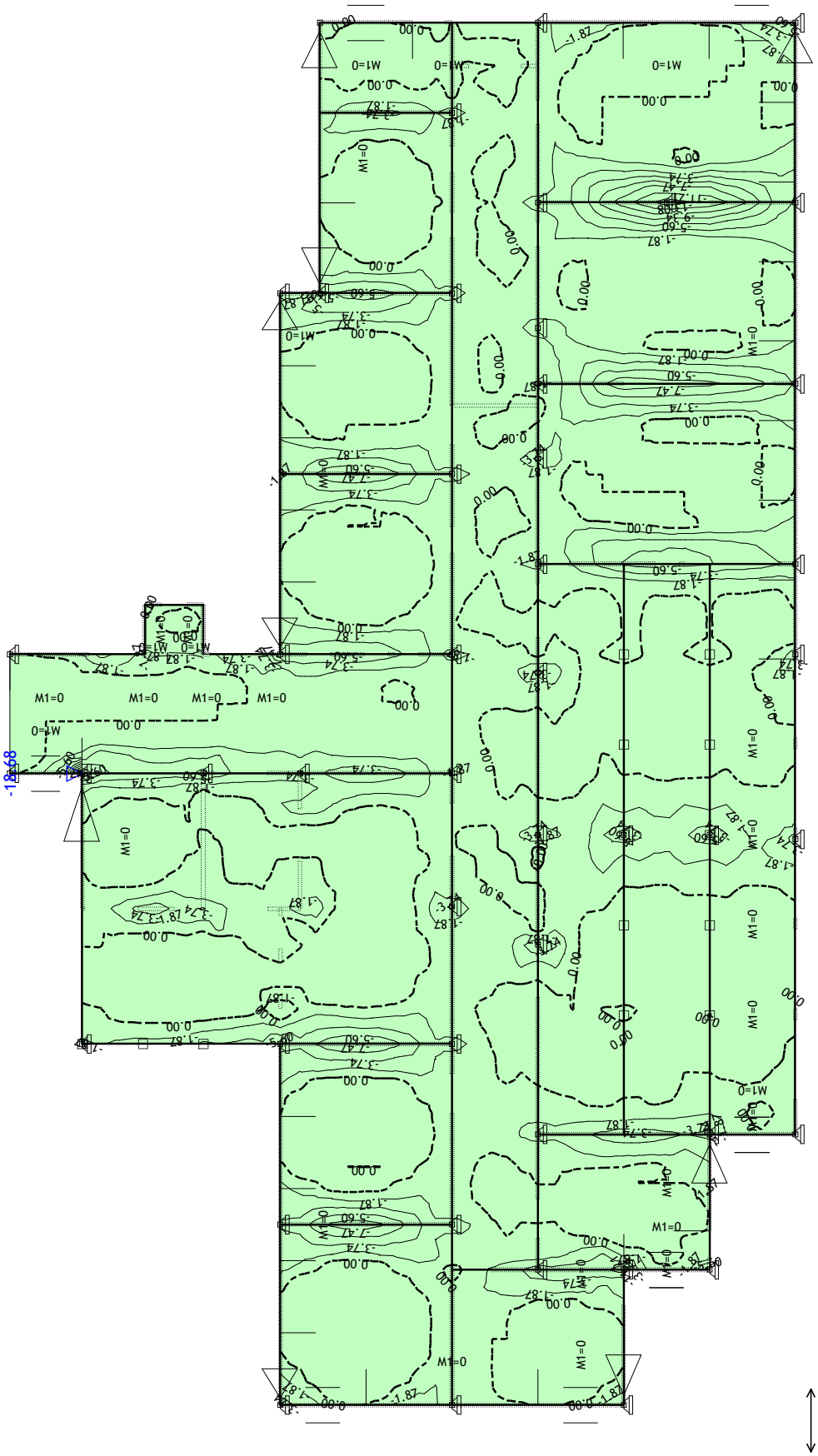
Nivo: [0.00 m]
Aa - sp.cona - Smer 1 - max Aa1,s= 8.29 cm2/m

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



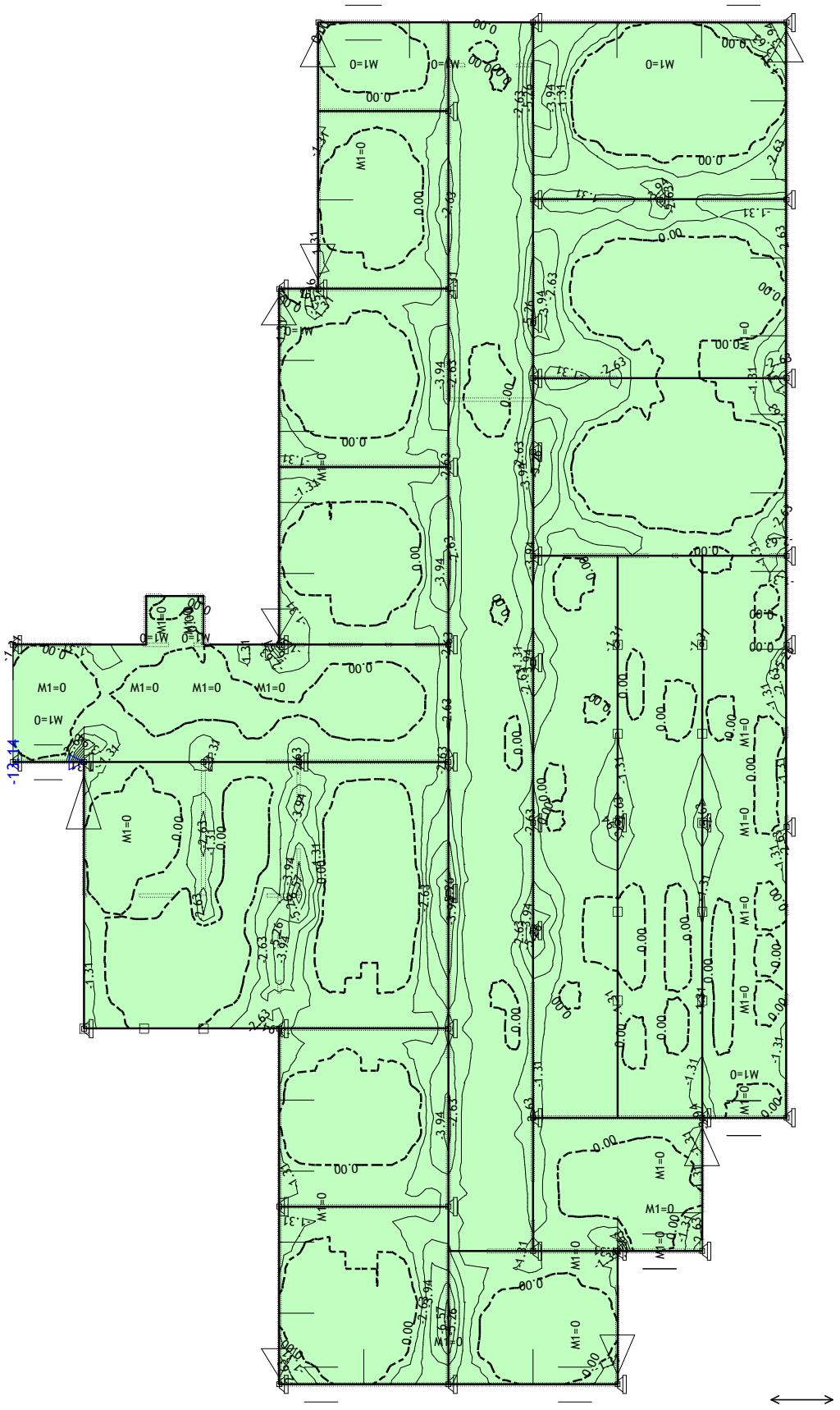
Nivo: [0.00 m]
Aa - sp.cona - Smer 2 - max Aa2,s= 5.61 cm2/m

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



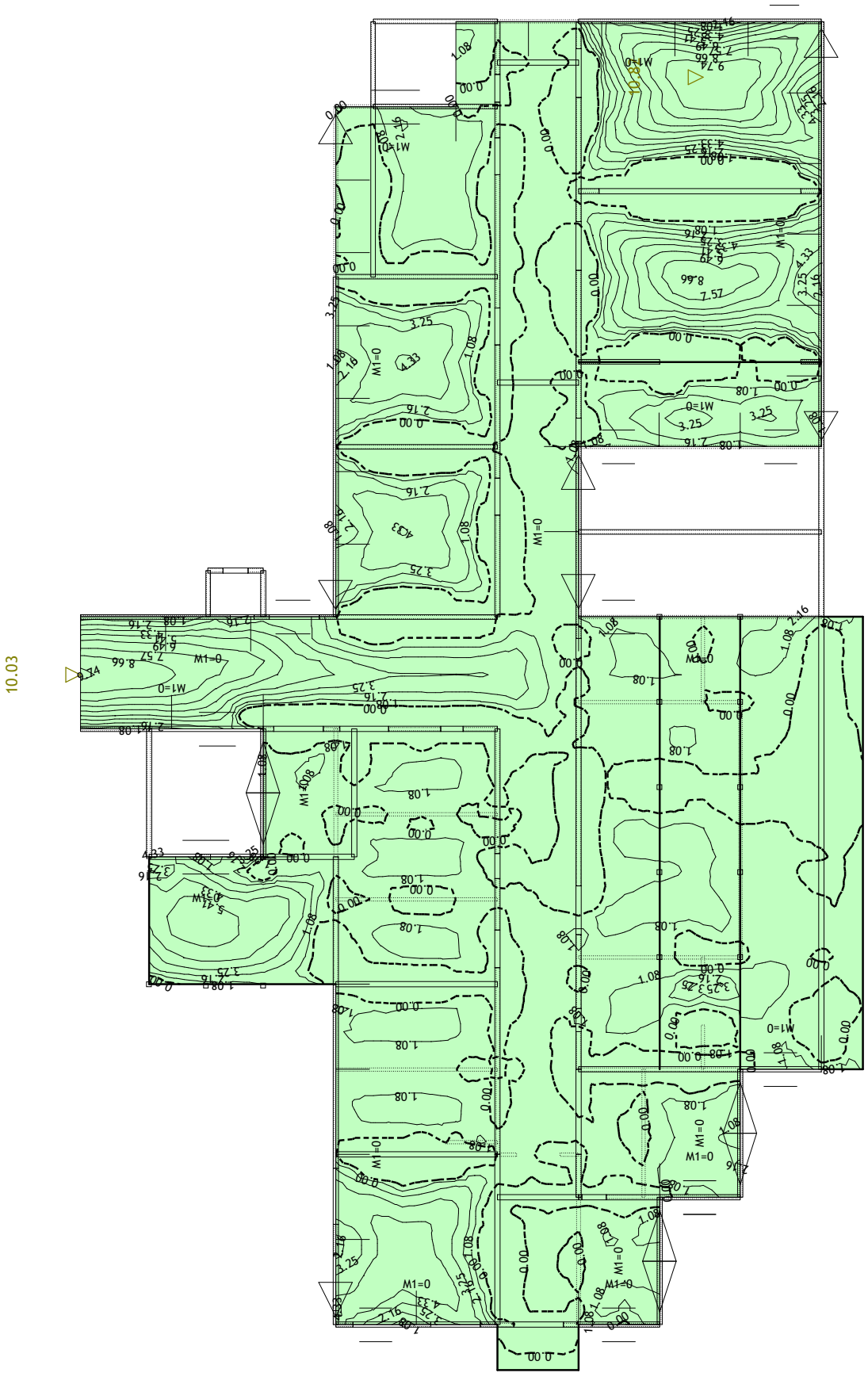
Nivo: [0.00 m]
Aa - zg.cona - Smer 1 - max Aa1,z= -18.68 cm2/m

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



Nivo: [0.00 m]
Aa - zg.cona - Smer 2 - max Aa2,z= -13.14 cm2/m

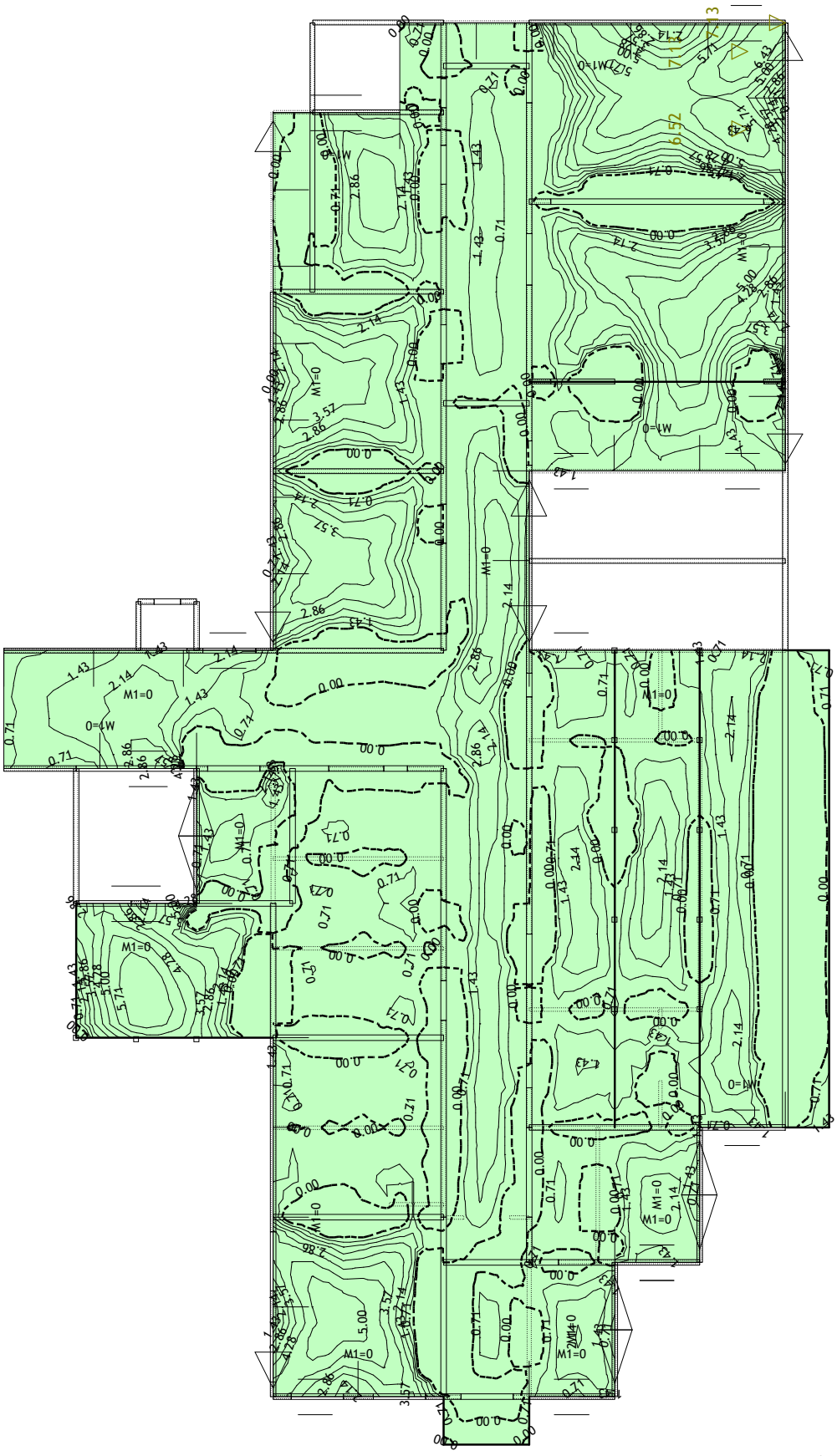
Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



Nivo: [4.00 m]
Aa - sp.cona - Smer 1 - max Aa1,s= 10.82 cm2/m

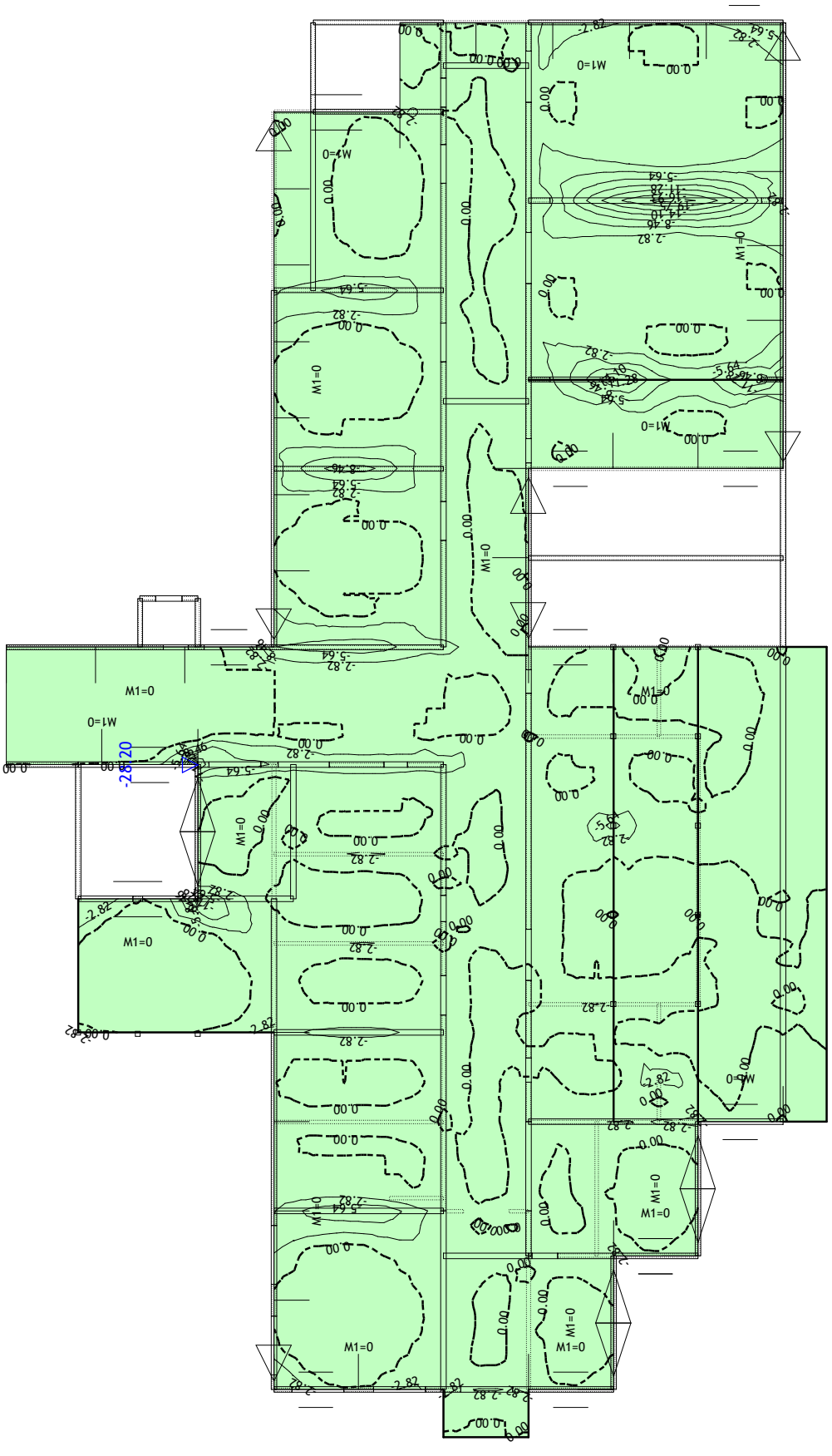
STATICON IB	Objekt: ***DOZIDAVA OSNOVNE ŠOLE ANTONA GLOBOÈNIKA***	
	Pozicija:KONSTRUKCIJA	načrt št 436/2018

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



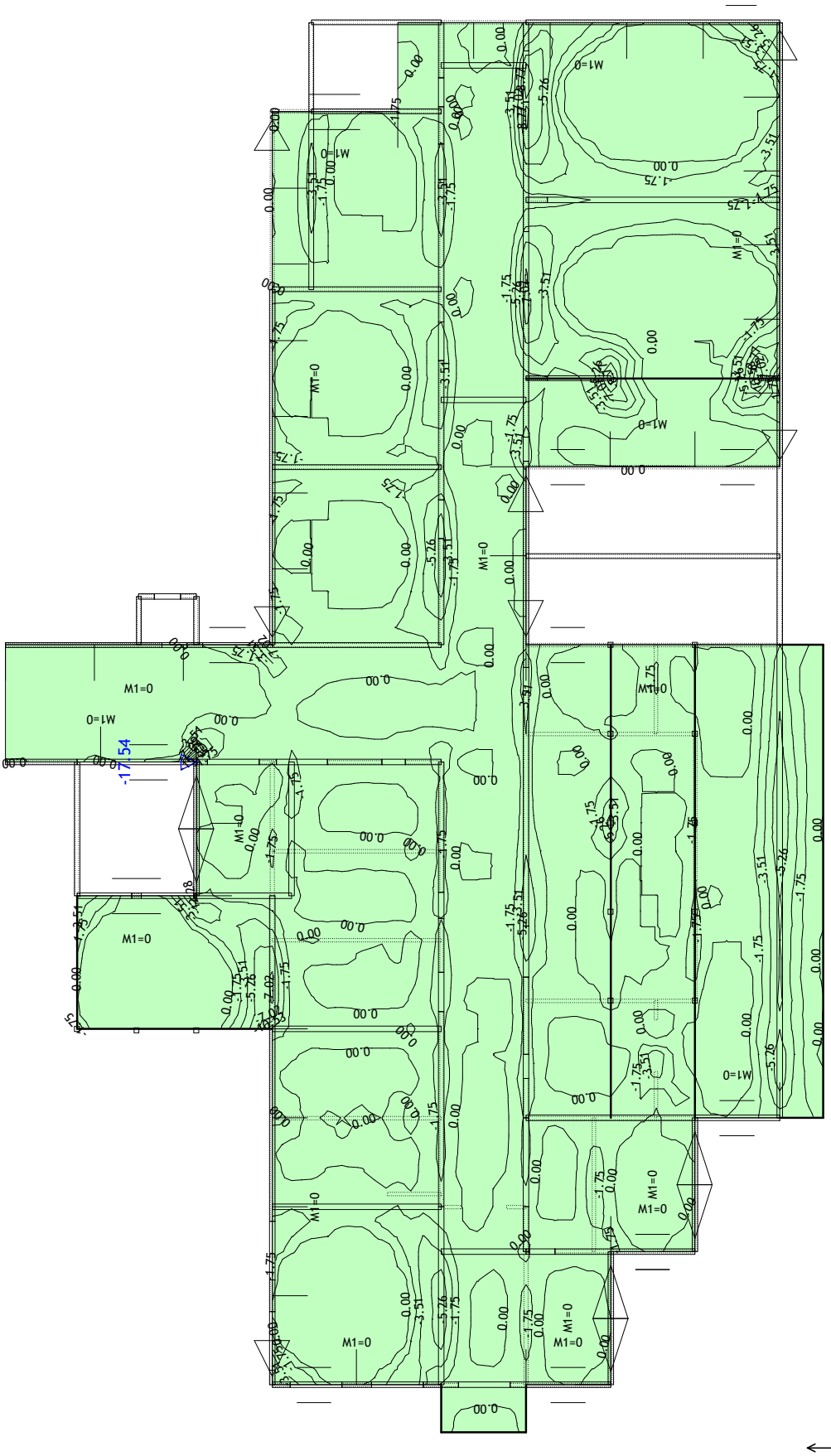
Nivo: [4.00 m]
Aa - sp.cona - Smer 2 - max Aa2,s= 7.13 cm2/m

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



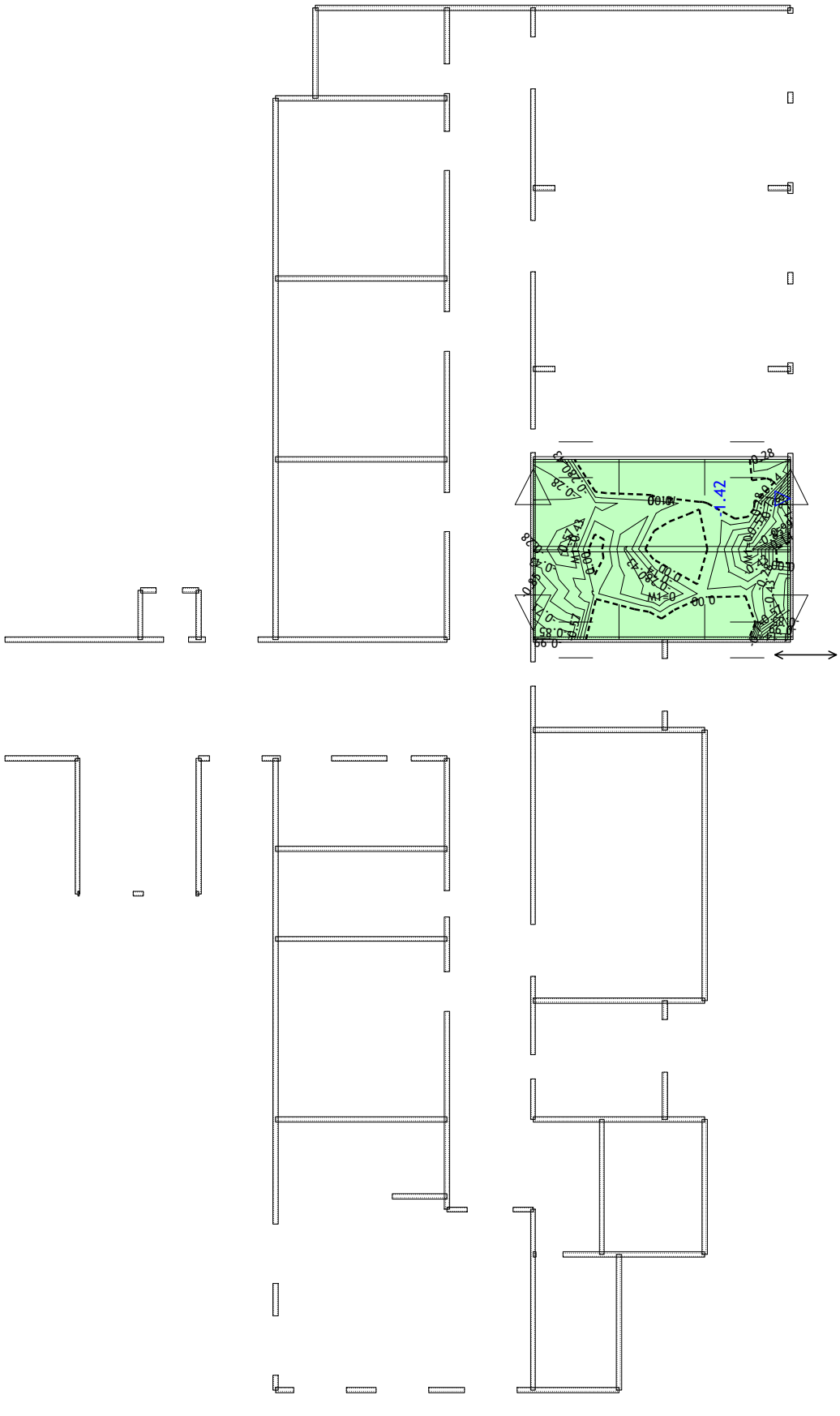
Nivo: [4.00 m]
Aa - zg.cona - Smer 1 - max Aa1,z= -28.20 cm2/m

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



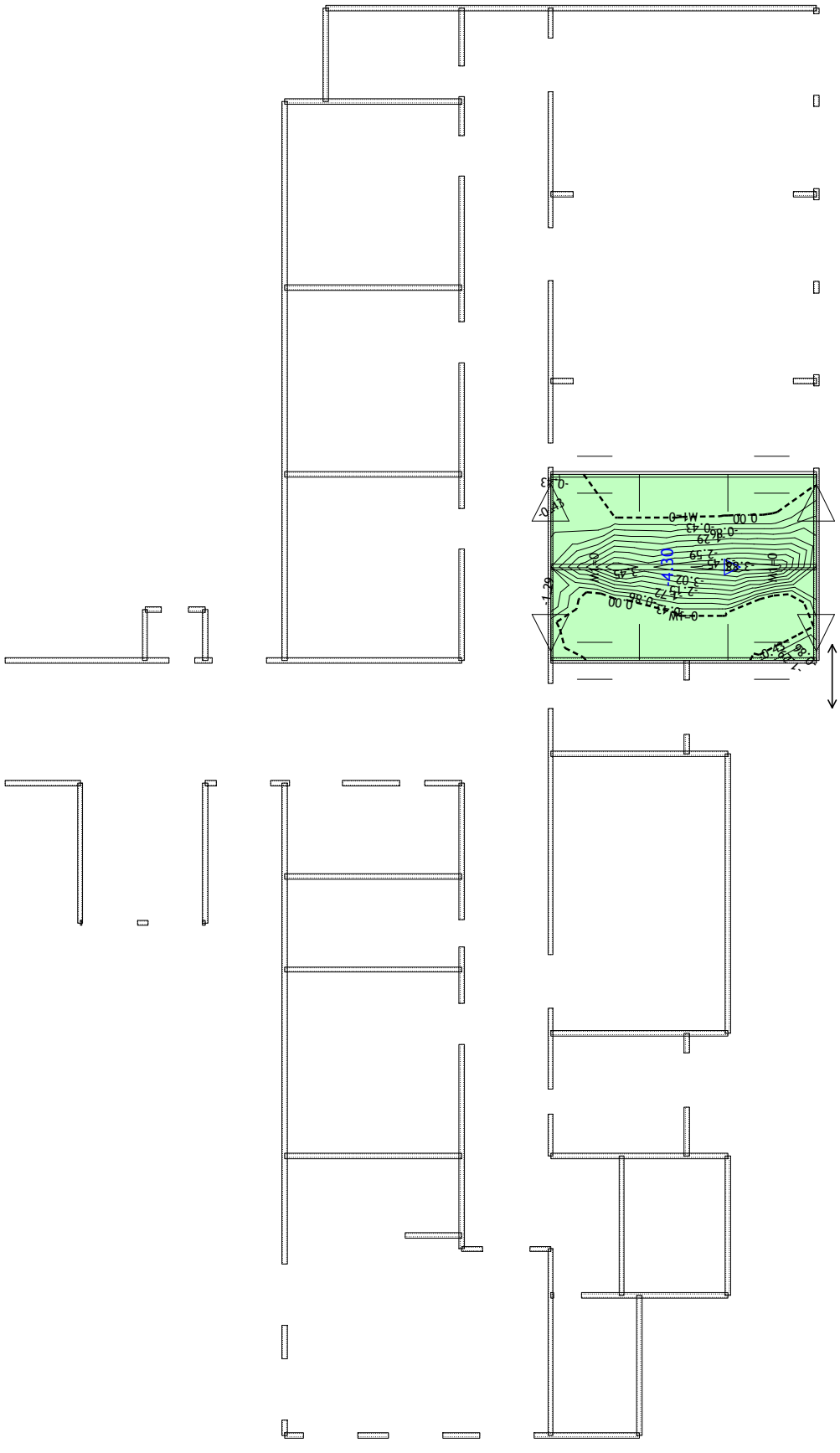
Nivo: [4.00 m]
Aa - zg.cona - Smer 2 - max Aa2,z= -17.54 cm2/m

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



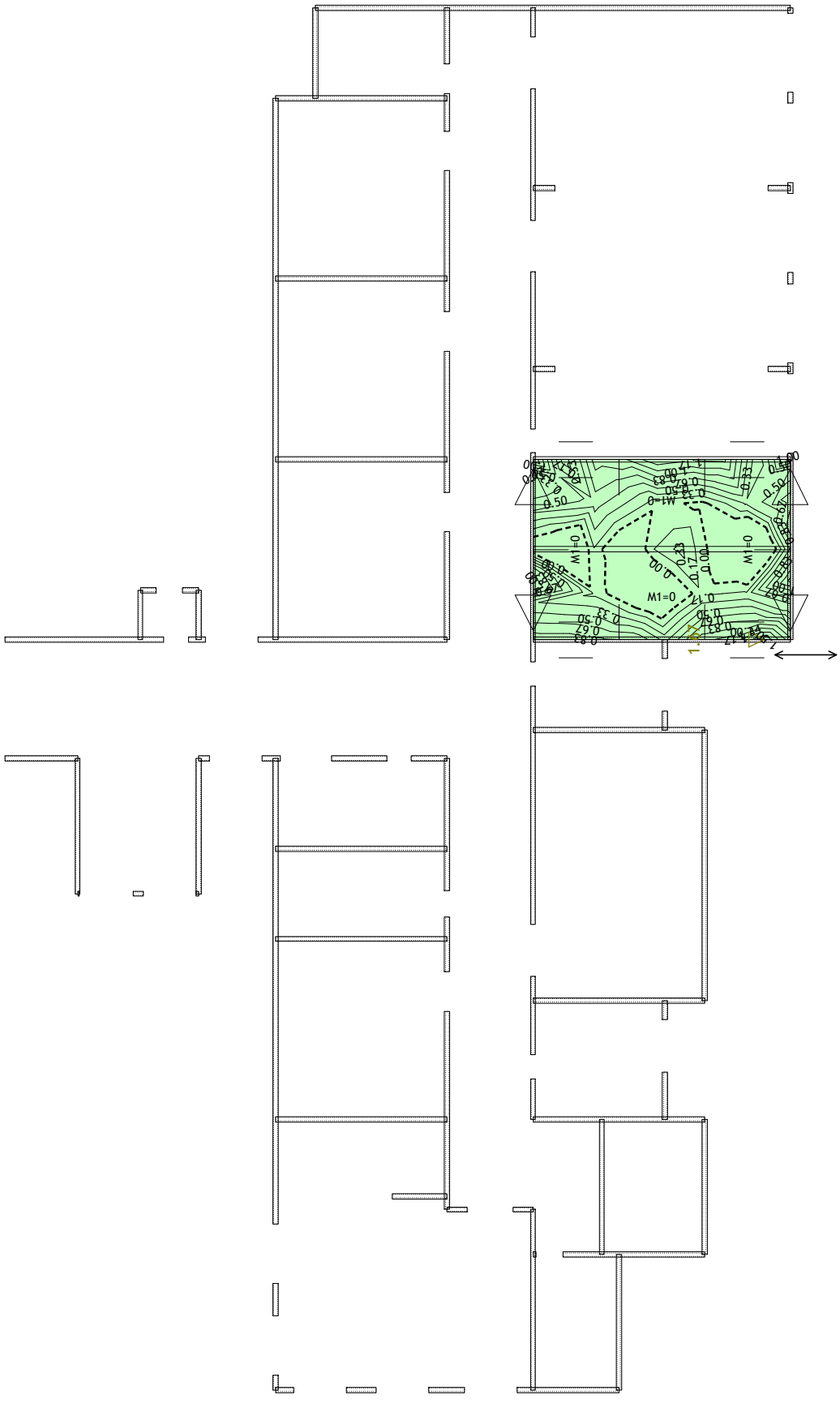
Nivo: [4.90 m]
Aa - zg.cona - Smer 2 - max Aa2,z= -1.42 cm2/m

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



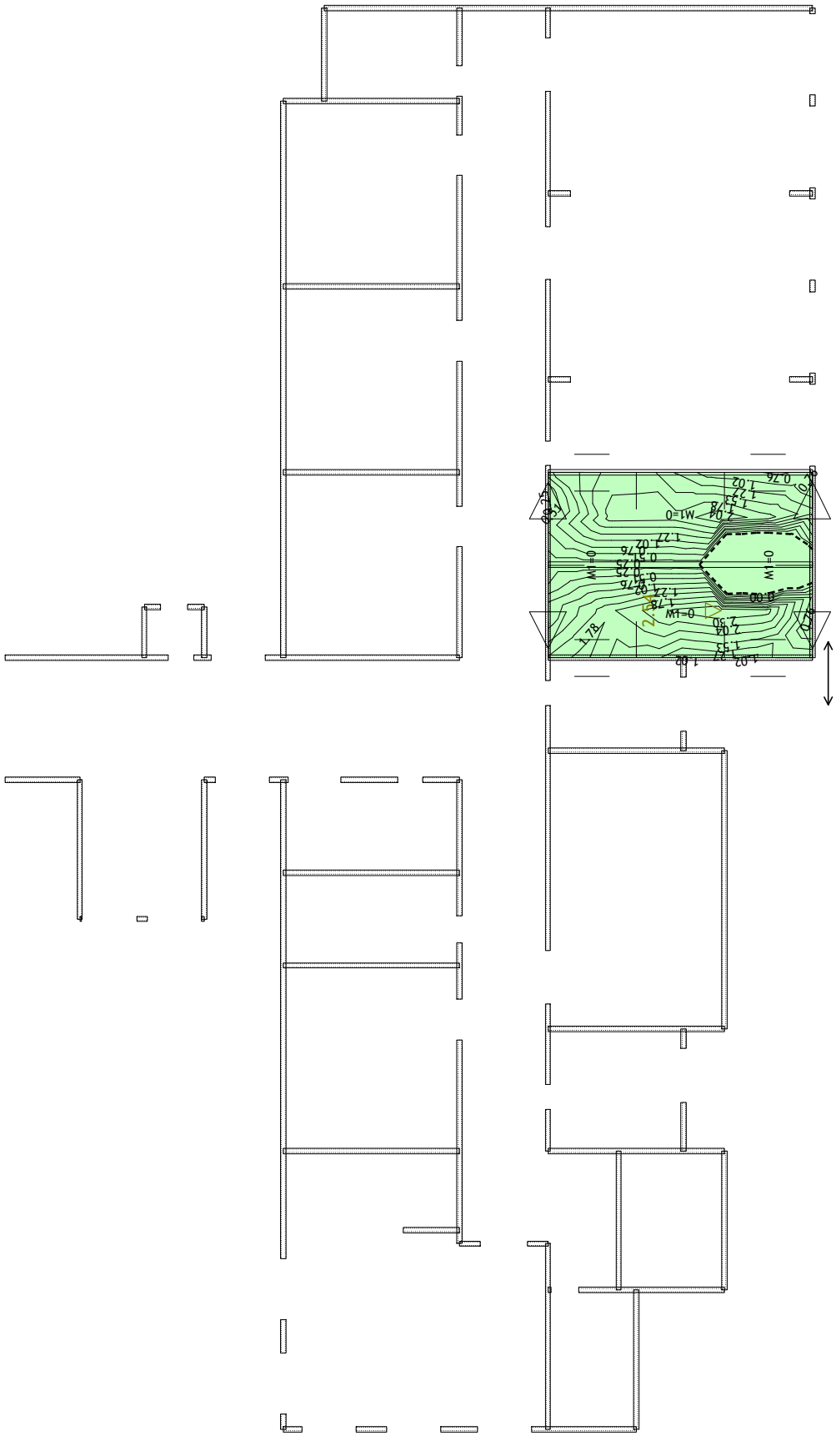
Nivo: [4.90 m]
Aa - zg.cona - Smer 1 - max Aa1,z= -4.30 cm2/m

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



Nivo: [4.90 m]
Aa - sp.cona - Smer 2 - max Aa2,s= 1.67 cm2/m

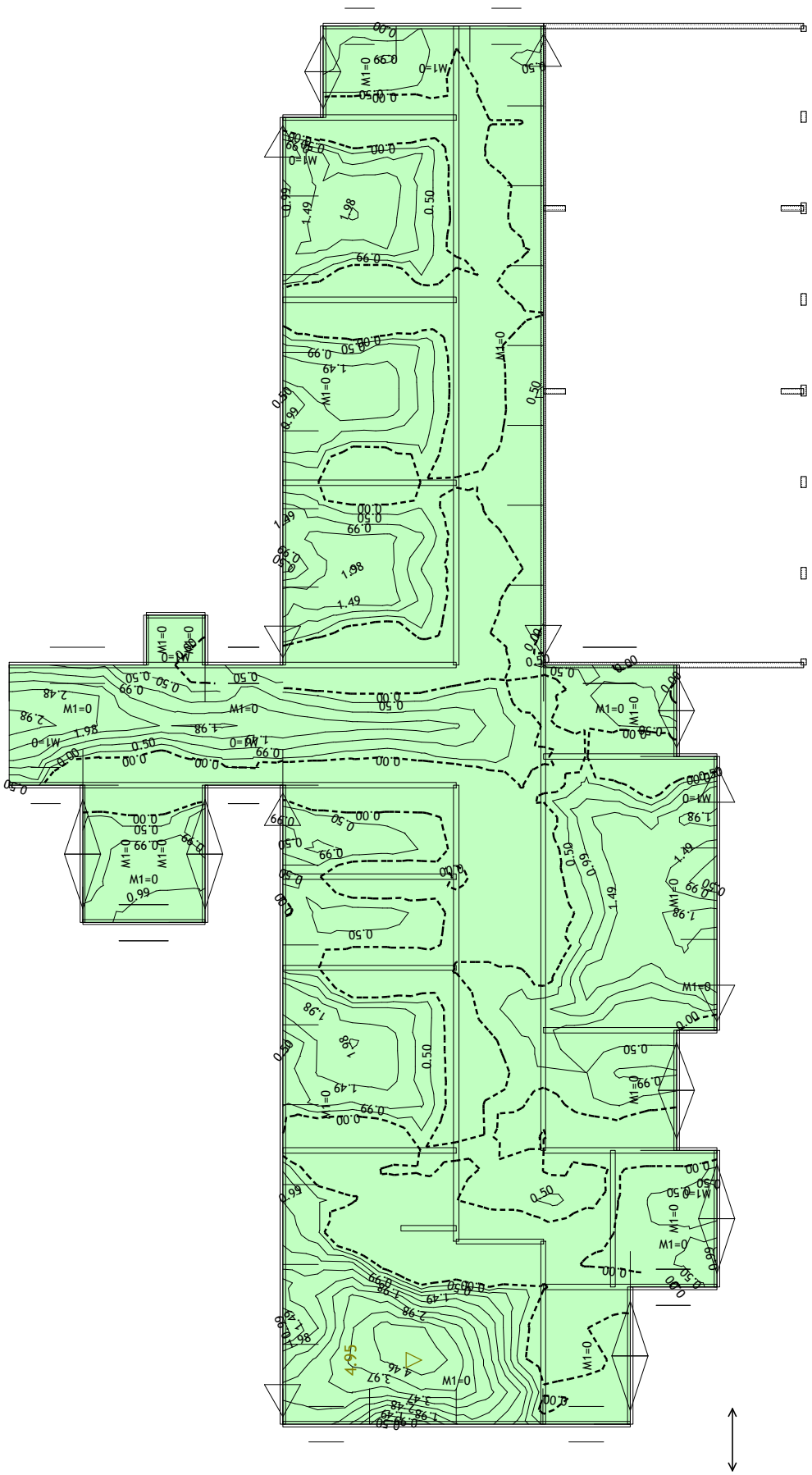
Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



Nivo: [4.90 m]
Aa - sp.cona - Smer 1 - max Aa1,s= 2.54 cm2/m

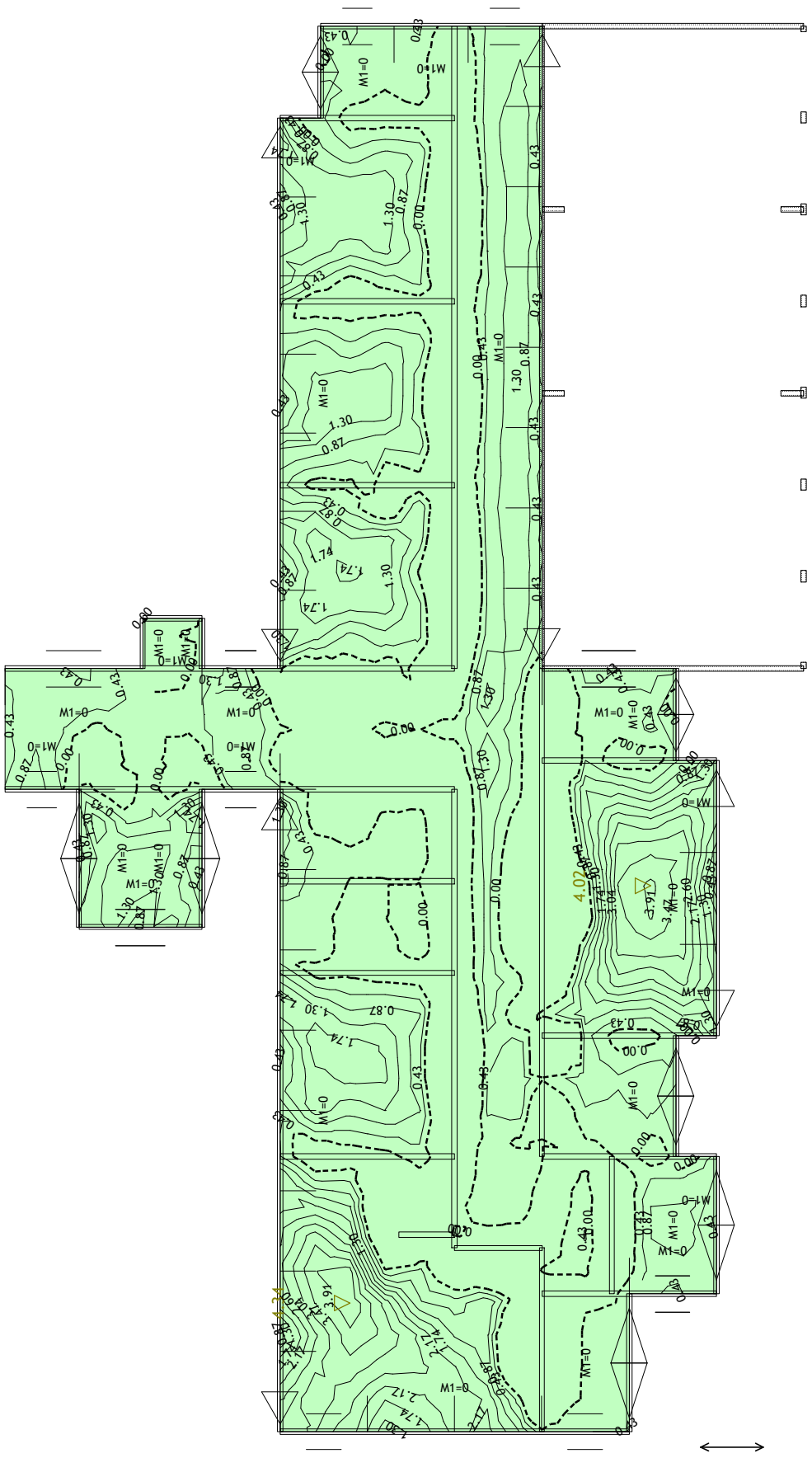
STATICON IB	Objekt: ***DOZIDAVA OSNOVNE ŠOLE ANTONA GLOBOÈNIKA***	
	Pozicija:KONSTRUKCIJA	načrt št 436/2018

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



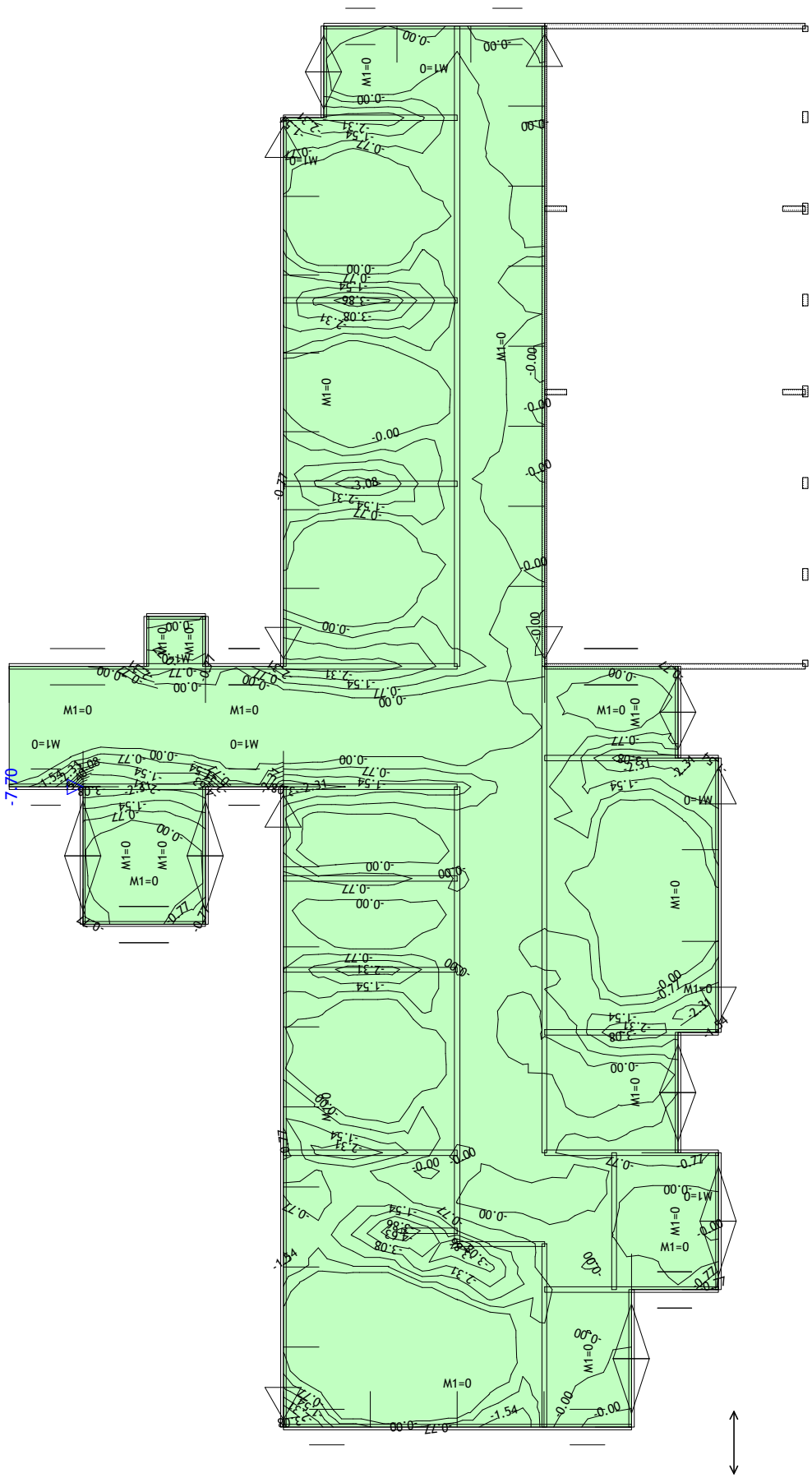
Nivo: [7.50 m]
Aa - sp.cona - Smer 1 - max Aa1,s= 4.95 cm2/m

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



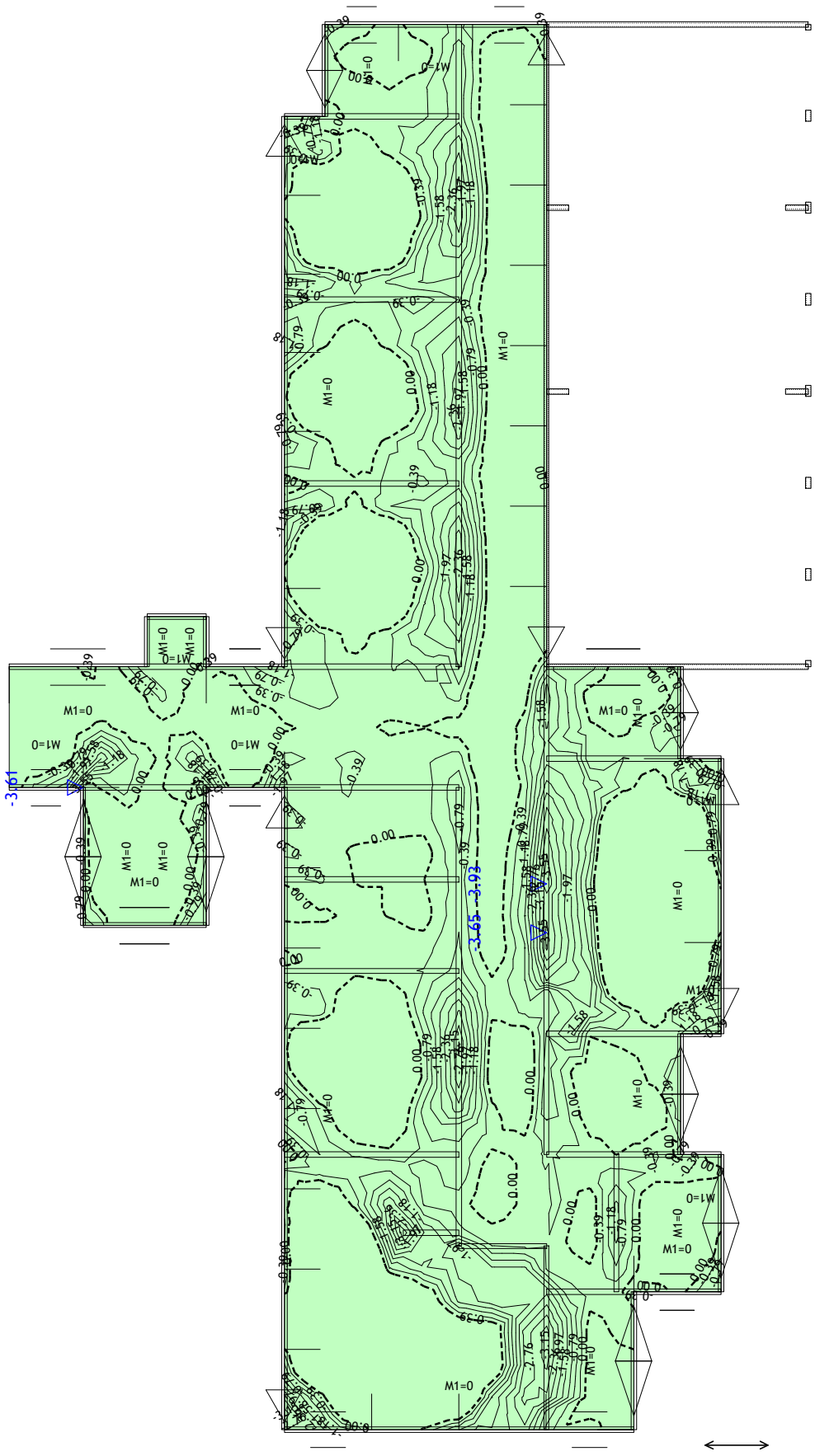
Nivo: [7.50 m]
Aa - sp.cona - Smer 2 - max Aa2,s= 4.34 cm2/m

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



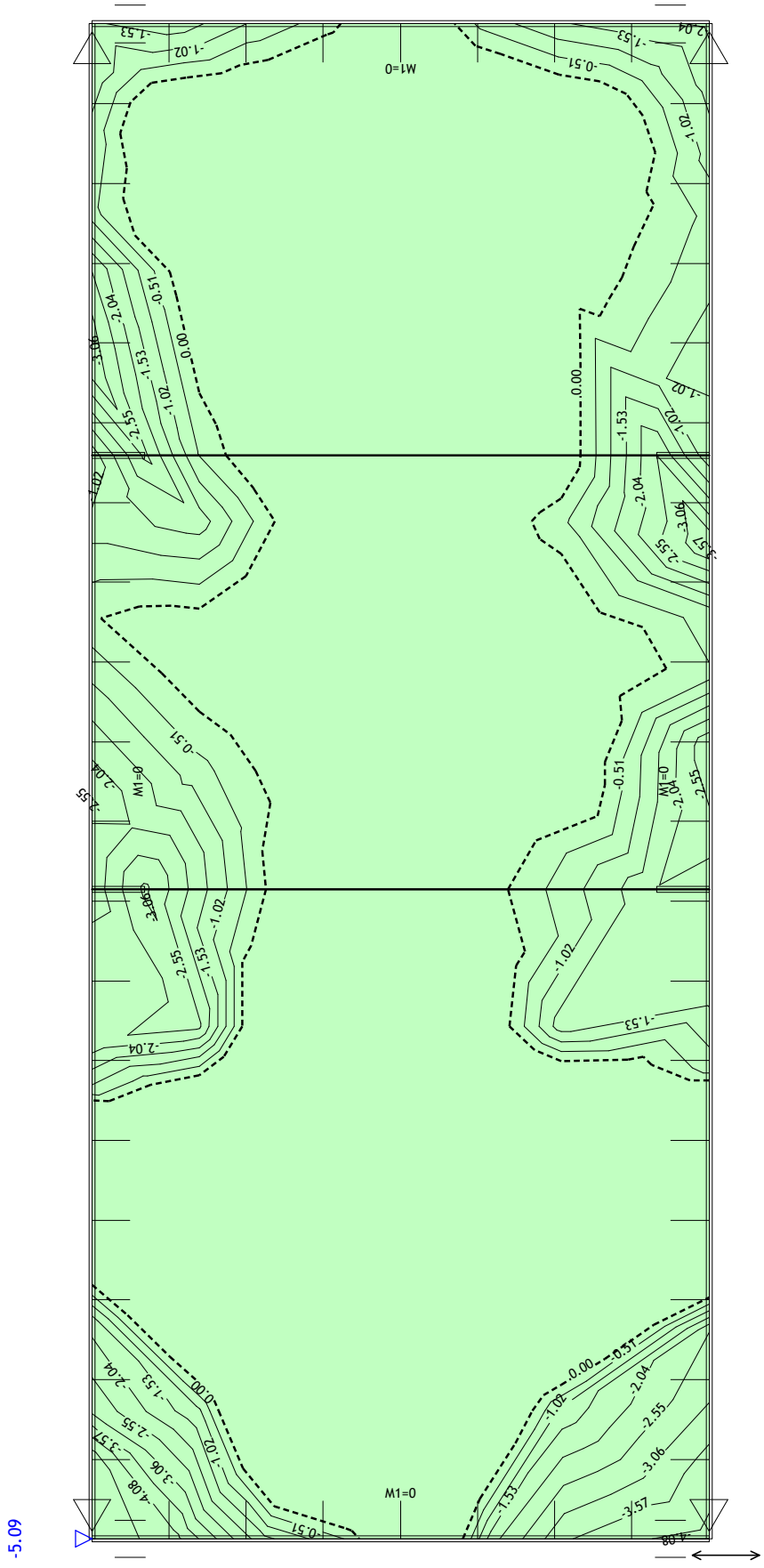
Nivo: [7.50 m]
Aa - zg.cona - Smer 1 - max Aa1,z= -7.70 cm2/m

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



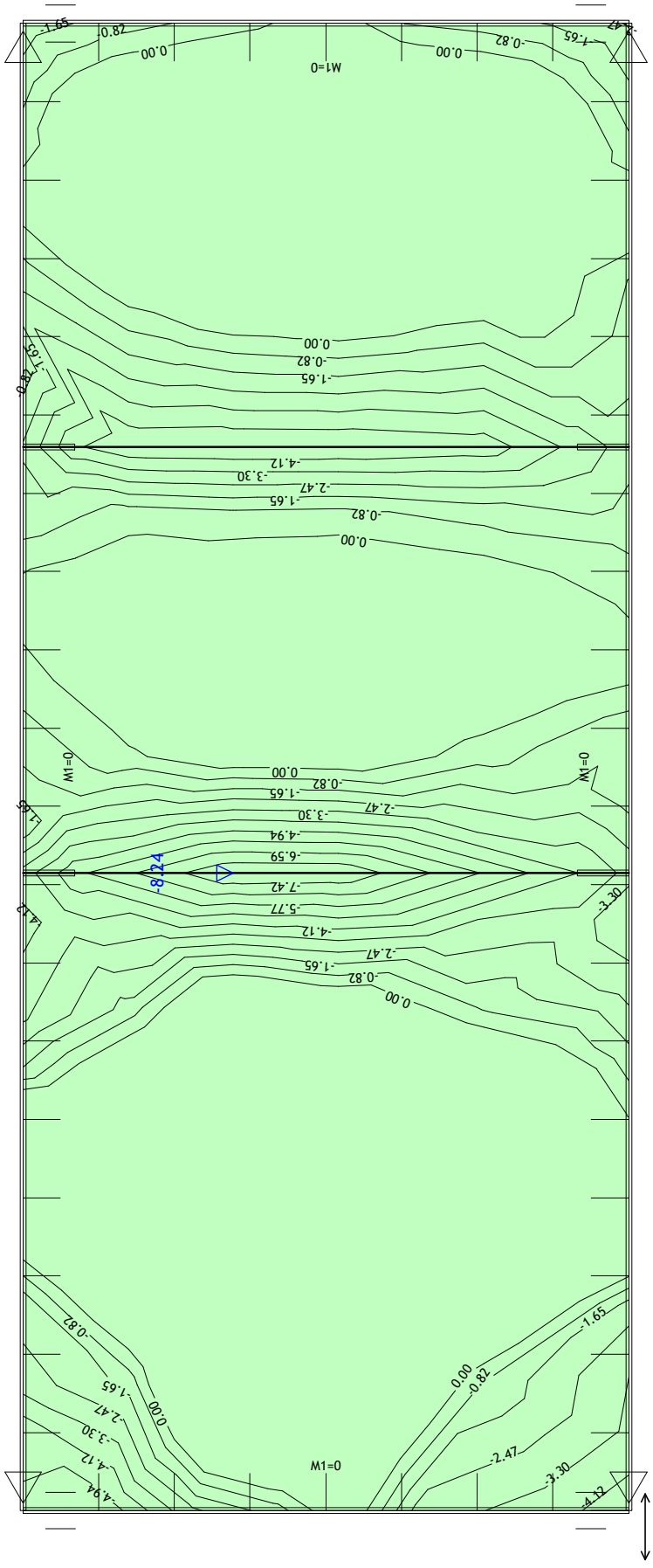
Nivo: [7.50 m]
Aa - zg.cona - Smer 2 - max Aa2,z= -3.93 cm2/m

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



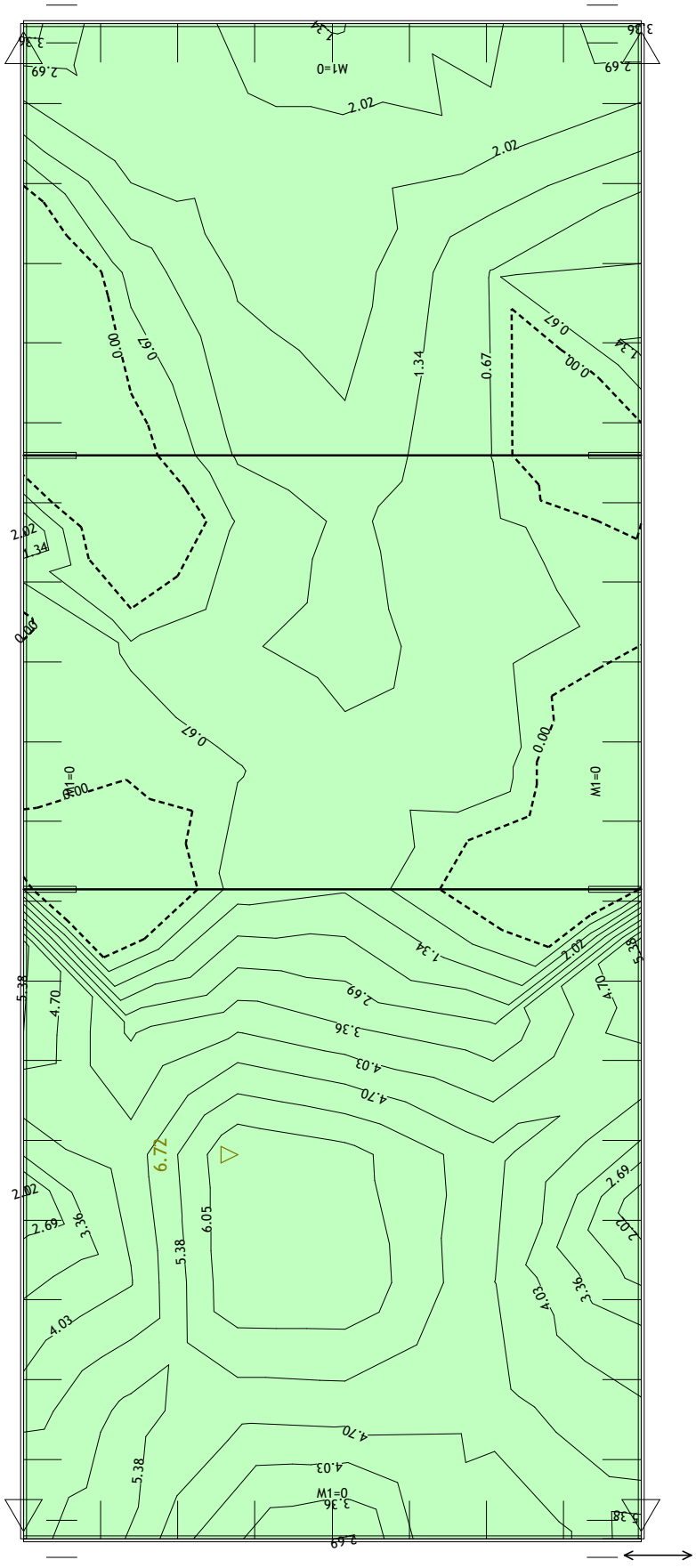
Nivo: [10.50 m]
Aa - zg.cona - Smer 2 - max Aa2,z= -5.09 cm2/m

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



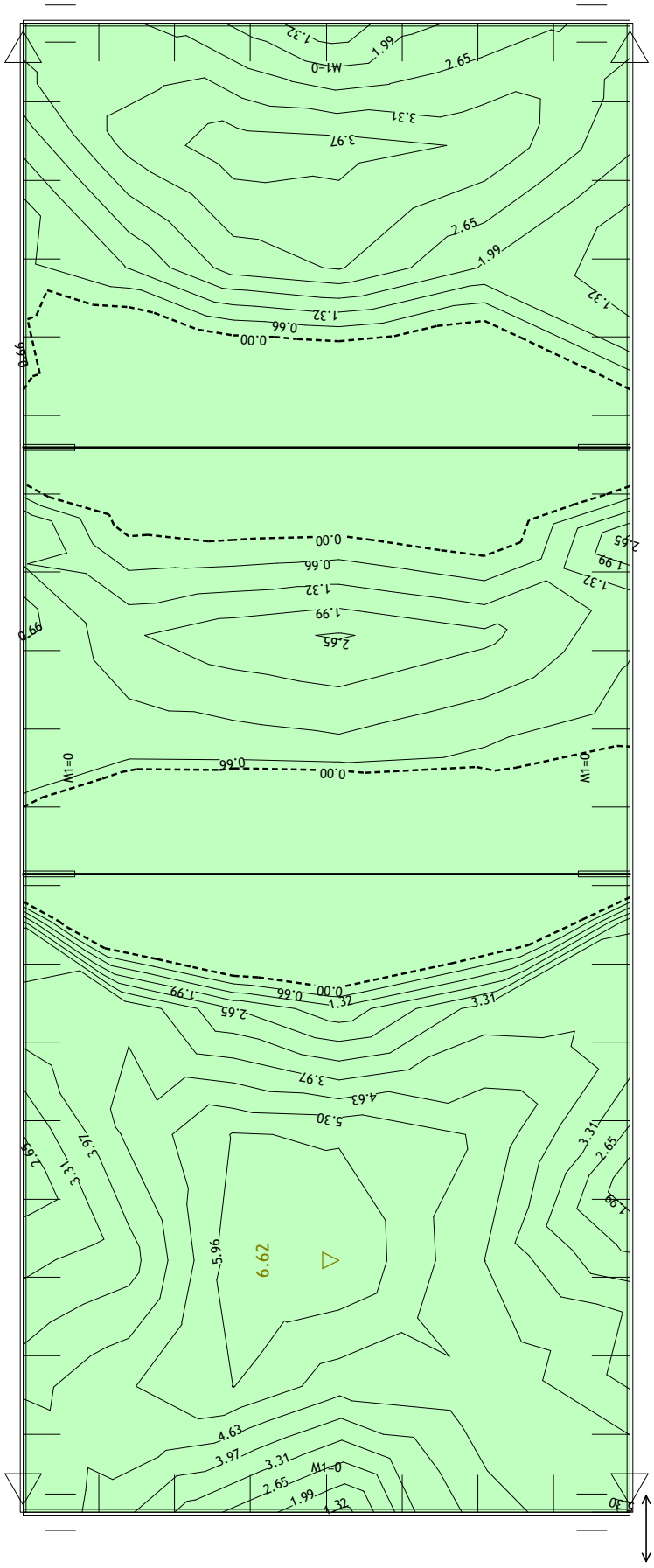
Nivo: [10.50 m]
Aa - zg.cona - Smer 1 - max Aa1,z= -8.24 cm2/m

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



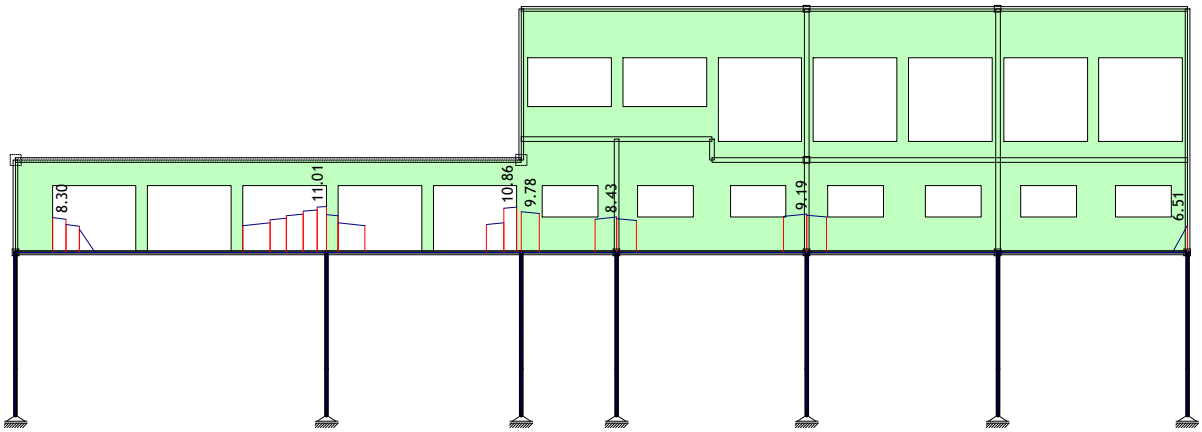
Nivo: [10.50 m]
Aa - sp.cona - Smer 2 - max Aa2,s= 6.72 cm2/m

Merodajna obtežba: 14-16
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



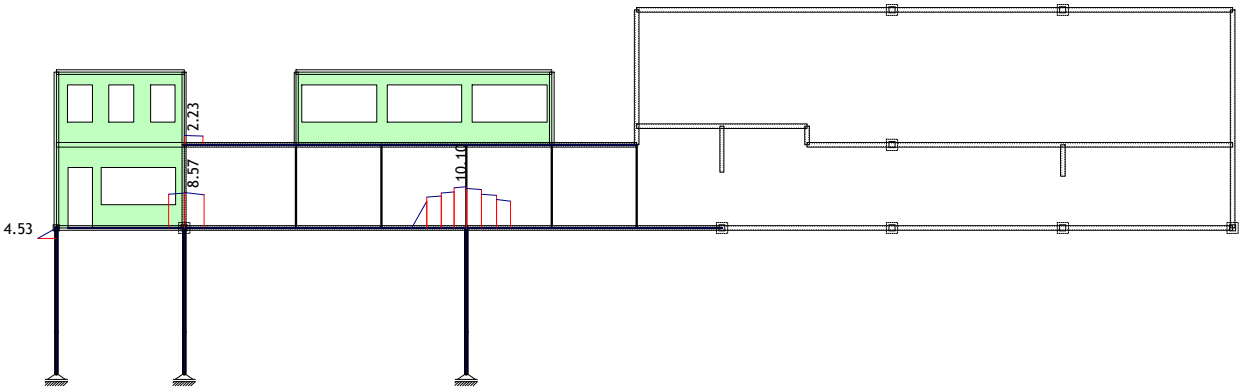
Nivo: [10.50 m]
Aa - sp.cona - Smer 1 - max Aa1,s= 6.62 cm2/m

EC 2 (EN 1992-1-1:2004), C 40, S500H



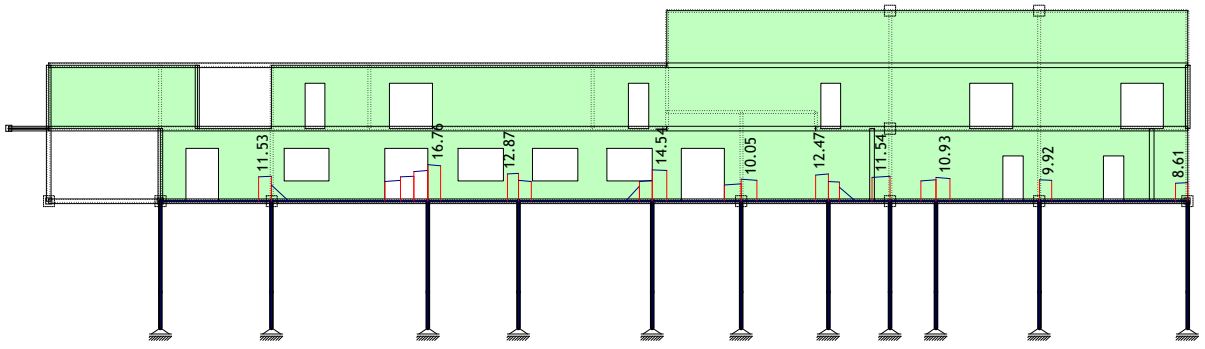
Okvir: H_1
Armatura v gredah: max Aa,st= 11.01 cm2

EC 2 (EN 1992-1-1:2004), C 40, S500H



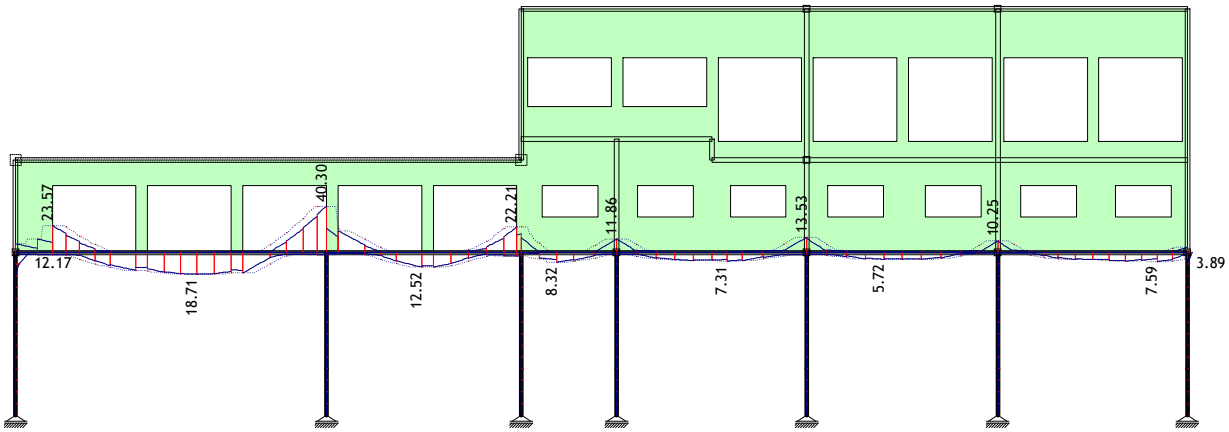
Okvir: H_2
Armatura v gredah: max Aa,st= 10.10 cm2

EC 2 (EN 1992-1-1:2004), C 40, S500H



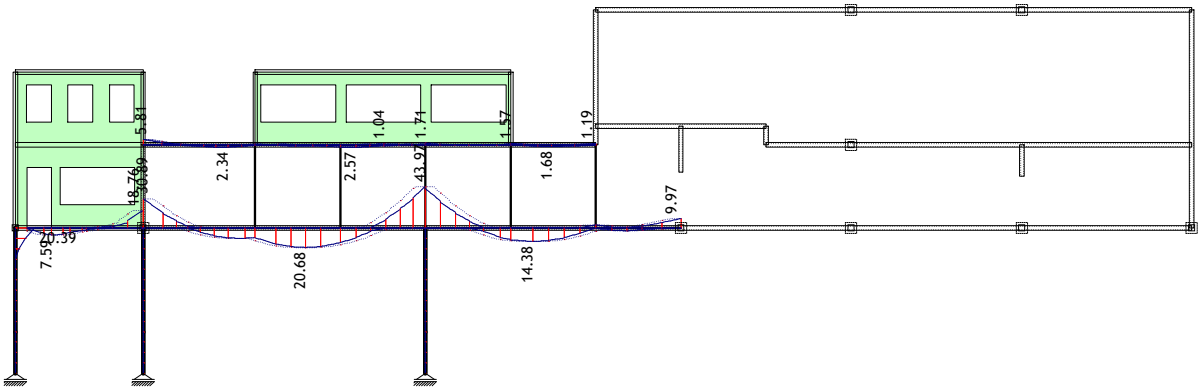
Okvir: H_6
Armatura v gredah: max Aa,st= 16.76 cm2

EC 2 (EN 1992-1-1:2004), C 40, S500H



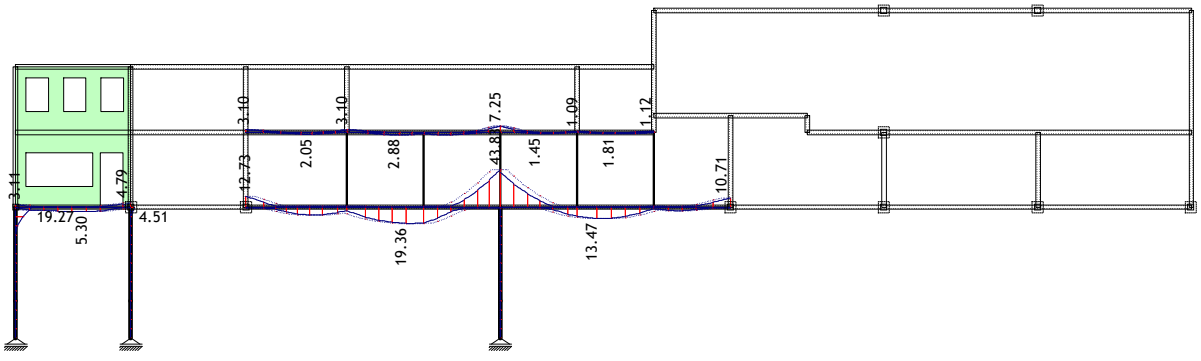
Okvir: H_1
Armatura v gredah: max Aa2/Aa1= 40.30 cm2

EC 2 (EN 1992-1-1:2004), C 40, S500H



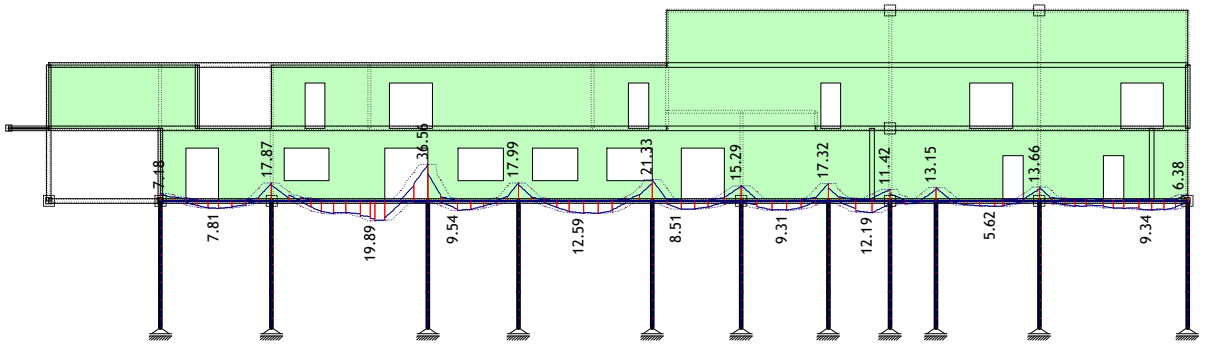
Okvir: H_2
Armatura v gredah: max Aa2/Aa1= 43.97 cm2

EC 2 (EN 1992-1-1:2004), C 40, S500H



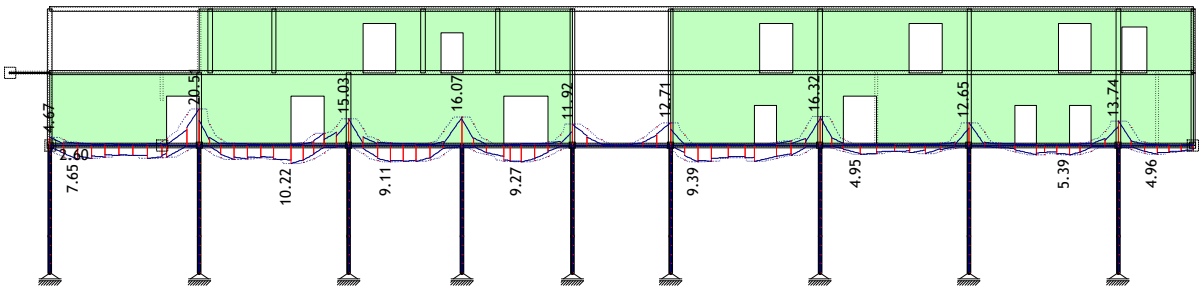
Okvir: H_4
Armatura v gredah: max Aa2/Aa1= 43.83 cm2

EC 2 (EN 1992-1-1:2004), C 40, S500H



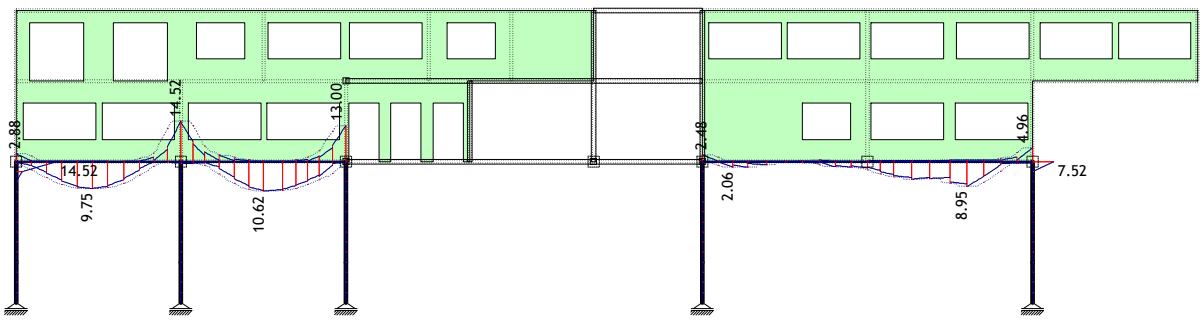
Okvir: H_6
Armatura v gredah: max Aa2/Aa1= 36.56 cm2

EC 2 (EN 1992-1-1:2004), C 40, S500H



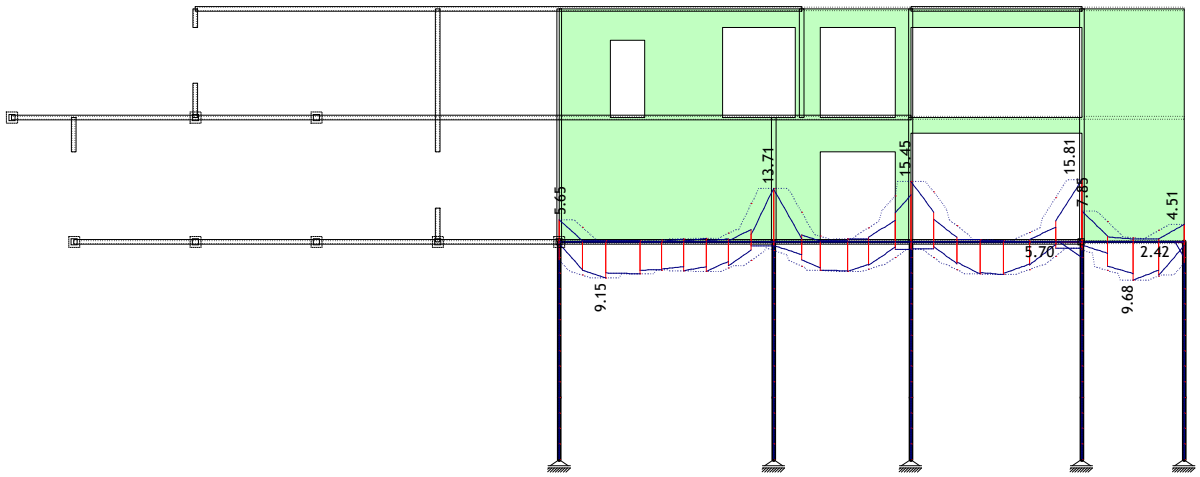
Okvir: H_7
Armatura v gredah: max Aa2/Aa1= 20.51 cm2

EC 2 (EN 1992-1-1:2004), C 40, S500H



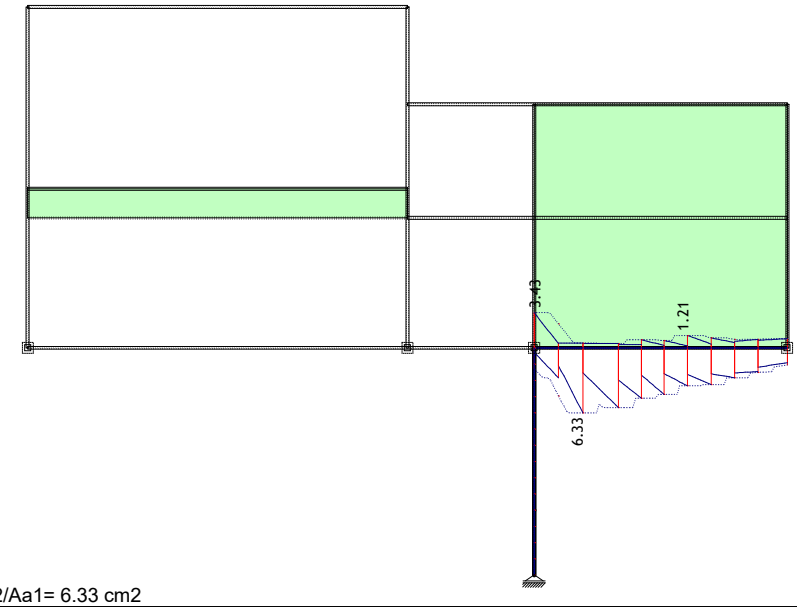
Okvir: H_10
Armatura v gredah: max Aa2/Aa1= 14.52 cm2

EC 2 (EN 1992-1-1:2004), C 40, S500H



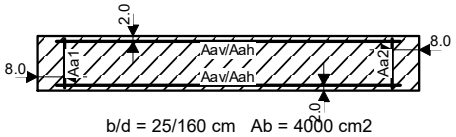
Okvir: V_24
Armatura v gredah: max Aa2/Aa1= 15.81 cm2

EC 2 (EN 1992-1-1:2004), C 40, S500H



Okvir: V_16
Armatura v gredah: max Aa2/Aa1= 6.33 cm2

Prerez 1 - 1
EC 2 (EN 1992-1-1:2004)
C 30
Vogalna armatura S500N
Vzdolžna armatura S500N
Kompletna obtežna shema



b/d = 25/160 cm Ab = 4000 cm2

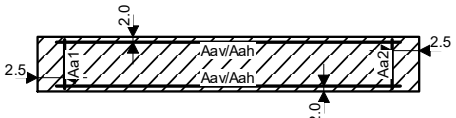
No	N [kN]	T [kN]	M [kNm]
I	-750.7	515.8	373.0
II	-136.5	100.9	70.4
III	-50.5	38.4	29.1
IV	-17.3	4.4	6.4
V	-38.9	29.6	18.7
VI	-2.3	0.8	0.8
VII	1.1	-1.6	1.5
VIII	-3.1	2.2	-0.8
IX	3.9	-2.3	-1.7
X	-5.9	2.9	2.5
XI	89.5	51.1	41.3
XII	84.1	24.9	39.1

Merodajna kombinacija za upogib:
1.35xI+1.50xII+1.05xIII+1.05xIV+0.75xV+0.90xVIII+0.90xX
Merodajna kombinacija za strig:
1.35xI+1.50xII+1.05xIII+1.05xIV+0.75xV+0.90xVIII+0.90xX
Mu = 662.00 kNm
Nu = -1326.58 kN
Tu = 919.45 kN

Aa1 = 0.00 cm2 (min:6.00)
Aa2 = 0.00 cm2 (min:6.00)
Aav = ±0.00 cm2/m (min:±1.88)
Aah = ±8.53 cm2/m (min:±2.50)

Prerez 2 - 2
EC 2 (EN 1992-1-1:2004)
C 30
Vogalna armatura S500N
Vzdolžna armatura S500N

Kompletna obtežna shema



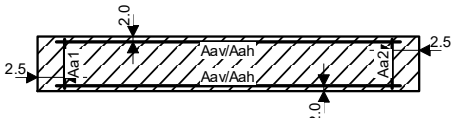
b/d = 25/50 cm Ab = 1250 cm2

No	N [kN]	T [kN]	M [kNm]
I	78.6	103.2	24.2
II	7.0	23.3	5.5
III	19.2	6.9	1.6
IV	0.7	-0.4	-0.1
V	-5.6	7.9	1.9
VI	0.2	0.1	0.0
VII	0.6	-1.3	-0.3
VIII	-0.4	1.4	0.3
IX	-0.2	-1.6	-0.4
X	0.4	1.7	0.4
XI	14.4	33.8	8.2
XII	10.1	15.8	3.8

Merodajna kombinacija za upogib:
1.35xI+1.50xII+1.05xIII+1.05xIV+0.75xV+0.90xVIII+0.90xX
Merodajna kombinacija za strig:
1.35xI+1.50xII+1.05xIII+0.75xV+0.90xVIII+0.90xX
Mu = 44.49 kNm
Nu = 133.27 kN
Tu = 190.27 kN

εb/εa = -1.405/25.000 ‰
Aa1 = 3.57 cm2 (min:1.88)
Aa2 = 3.57 cm2 (min:1.88)
Aav = ±1.88 cm2/m (min:±1.88)
Aah = ±5.65 cm2/m (min:±2.50)

Prerez 3 - 3
EC 2 (EN 1992-1-1:2004)
C 30
Vogalna armatura S500N
Vzdolžna armatura S500N
Kompletna obtežna shema



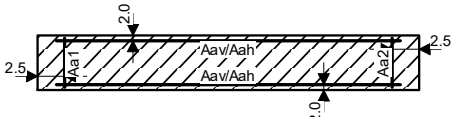
b/d = 25/50 cm Ab = 1250 cm2

No	N [kN]	T [kN]	M [kNm]
I	-39.1	-171.8	-40.6
II	-15.4	-33.1	-7.8
III	10.7	-11.6	-2.7
IV	0.2	-1.8	-0.4
V	-12.6	-10.8	-2.6
VI	-0.0	-0.2	-0.1
VII	-0.8	-1.5	-0.4
VIII	0.7	1.3	0.3
IX	-0.4	-1.7	-0.4
X	0.4	1.5	0.4
XI	26.1	34.6	8.3
XII	9.0	19.1	4.5

Merodajna kombinacija za upogib:
1.35xI+1.05xII+1.50xIII+1.05xIV+0.90xVII+0.90xIX
Merodajna kombinacija za strig:
1.35xI+1.50xII+1.05xIII+1.05xIV+0.75xV+0.90xVII+0.90xIX
Mu = -68.17 kNm
Nu = -53.70 kN
Tu = -306.67 kN

εb/εa = -2.625/25.000 ‰
Aa1 = 2.48 cm2 (min:1.88)
Aa2 = 2.48 cm2 (min:1.88)
Aav = ±1.88 cm2/m (min:±1.88)
Aah = ±9.11 cm2/m (min:±2.50)

Prerez 4 - 4
EC 2 (EN 1992-1-1:2004)
C 30
Vogalna armatura S500N
Vzdolžna armatura S500N
Kompletna obtežna shema



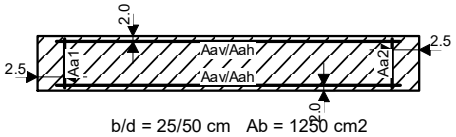
b/d = 25/50 cm Ab = 1250 cm2

No	N [kN]	T [kN]	M [kNm]
I	-558.4	14.4	-13.0
II	-121.2	3.2	-2.5
III	-24.1	0.6	-0.9
IV	-0.6	0.3	0.1
V	-47.6	0.4	-1.0
VI	-0.7	0.2	0.0
VII	0.5	-0.3	-0.0
VIII	-1.1	0.5	0.1
IX	0.5	-1.5	-0.3
X	-1.0	1.6	0.4
XI	29.5	4.7	2.0
XII	13.4	9.6	2.2

Merodajna kombinacija za upogib:
1.35xI+1.50xII+1.05xIII+1.05xIV+0.75xV+0.90xVIII+0.90xX
Merodajna kombinacija za strig:
1.35xI+1.50xII+1.05xIII+1.05xIV+0.75xV+0.90xVIII+0.90xX
Mu = -22.56 kNm
Nu = -999.11 kN
Tu = 27.39 kN

Aa1 = 0.00 cm2 (min:1.88)
Aa2 = 0.00 cm2 (min:1.88)
Aav = ±0.00 cm2/m (min:±1.88)
Aah = ±0.81 cm2/m (min:±2.50)

Prerez 5 - 5
EC 2 (EN 1992-1-1:2004)
C 30
Vogalna armatura S500N
Vzdolžna armatura S500N
Kompletna obtežna shema



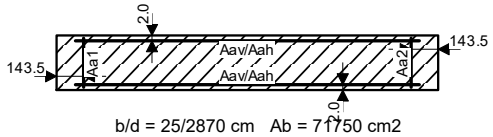
b/d = 25/50 cm Ab = 1250 cm2

No	N [kN]	T [kN]	M [kNm]
I	-55.1	7.9	1.7
II	-17.8	1.0	0.2
III	10.7	0.6	0.1
IV	-2.9	1.5	0.4
V	-12.2	-0.9	-0.2
VI	-0.5	0.4	0.1
VII	0.1	-1.1	-0.3
VIII	-0.5	1.4	0.3
IX	-0.1	-1.0	-0.2
X	-0.3	1.3	0.3
XI	9.8	36.6	8.6
XII	5.3	14.9	3.6

Merodajna kombinacija za upogib:
I+0.30xIII+XI
Merodajna kombinacija za strig:
I+0.30xII+0.30xIII+0.30xIV+XI
Mu = 10.36 kNm
Nu = -42.10 kN
Tu = 45.50 kN

εb/εa = -1.173/25.000 ‰
Aa1 = 0.00 cm2 (min:1.88)
Aa2 = 0.00 cm2 (min:1.88)
Aav = ±0.02 cm2/m (min:±1.88)
Aah = ±1.35 cm2/m (min:±2.50)

Prerez 6 - 6
EC 2 (EN 1992-1-1:2004)
C 30
Vogalna armatura S500N
Vzdolžna armatura S500N
Kompletna obtežna shema



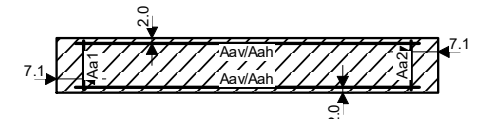
b/d = 25/2870 cm Ab = 71750 cm2

No	N [kN]	T [kN]	M [kNm]
I	-4338.7	56.7	20881.8
II	-839.2	8.2	4232.5
III	-211.6	14.7	604.1
IV	-221.0	6.5	1084.0
V	-231.3	2.5	951.7
VI	-56.6	3.0	173.2
VII	-23.2	-24.3	-78.5
VIII	-24.9	26.8	225.7
IX	7.5	9.1	-131.8
X	-55.6	-6.6	279.0
XI	60.6	750.2	4051.6
XII	193.5	341.4	1772.3

Merodajna kombinacija za upogib:
1.35xI+1.50xII+1.05xIII+1.05xIV+0.75xV+0.90xVIII+0.90xX
Merodajna kombinacija za strig:
I+0.30xII+0.30xIII+0.30xIV+XI
Mu = 37479.64 kNm
Nu = -7816.12 kN
Tu = 815.73 kN

Aa1 = 0.00 cm2 (min:107.63)
Aa2 = 0.00 cm2 (min:107.63)
Aav = ±0.00 cm2/m (min:±1.88)
Aah = ±0.42 cm2/m (min:±2.50)

Prerez 7 - 7
EC 2 (EN 1992-1-1:2004)
C 30
Vogalna armatura S500N
Vzdolžna armatura S500N
Kompletna obtežna shema



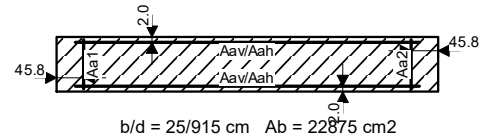
b/d = 25/142.5 cm Ab = 3562.5 cm2

No	N [kN]	T [kN]	M [kNm]
I	14.4	152.9	-139.3
II	7.5	24.7	-23.5
III	17.3	12.6	-14.2
IV	-25.7	3.8	-0.8
V	-4.7	5.3	-3.9
VI	-1.3	1.4	-1.1
VII	1.1	-0.2	0.4
VIII	-2.2	1.4	-1.3
IX	0.0	0.7	-0.8
X	-1.1	0.5	-0.1
XI	87.3	23.4	37.8
XII	38.9	7.2	15.9

Merodajna kombinacija za upogib:
1.35xI+1.50xII+1.05xIII+0.75xV+0.90xVII+0.90xIX
Merodajna kombinacija za strig:
1.35xI+1.50xII+1.05xIII+1.05xIV+0.75xV+0.90xVIII+0.90xIX
Mu = -241.56 kNm
Nu = 46.27 kN
Tu = 266.55 kN

εb/εa = -1.688/25.000 ‰
Aa1 = 3.15 cm2 (min:5.34)
Aa2 = 3.15 cm2 (min:5.34)
Aav = ±1.87 cm2/m (min:±1.88)
Aah = ±2.78 cm2/m (min:±2.50)

Prerez 8 - 8
EC 2 (EN 1992-1-1:2004)
C 30
Vogalna armatura S500N
Vzdolžna armatura S500N
Kompletna obtežna shema



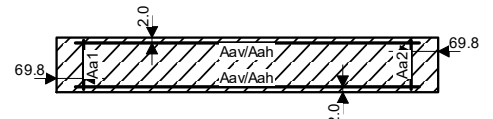
b/d = 25/915 cm Ab = 22875 cm2

No	N [kN]	T [kN]	M [kNm]
I	-1124.5	15.2	-596.1
II	-159.8	8.7	-112.4
III	-65.2	2.9	-53.7
IV	-89.8	2.8	-35.7
V	-62.4	3.1	-3.3
VI	-16.2	0.7	-1.7
VII	-7.8	-7.7	21.3
VIII	-6.0	8.3	-22.8
IX	-11.5	-0.9	7.1
X	-2.3	1.5	-8.5
XI	81.7	311.1	997.6
XII	104.7	93.0	361.6

Merodajna kombinacija za upogib:
1.35xI+1.50xII+1.05xIII+1.05xIV+0.75xV+0.90xVIII+0.90xX
Merodajna kombinacija za strig:
I+0.30xII+0.30xIII+0.30xIV+XI
Mu = -1097.76 kNm
Nu = -1974.72 kN
Tu = 330.62 kN

Aa1 = 0.00 cm2 (min:34.31)
Aa2 = 0.00 cm2 (min:34.31)
Aav = ±0.00 cm2/m (min:±1.88)
Aah = ±0.54 cm2/m (min:±2.50)

Prerez 9 - 9
EC 2 (EN 1992-1-1:2004)
C 30
Vogalna armatura S500N
Vzdolžna armatura S500N
Kompletna obtežna shema



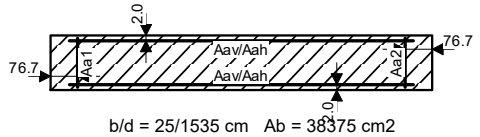
b/d = 25/1395 cm Ab = 34875 cm2

No	N [kN]	T [kN]	M [kNm]
I	-3133.9	261.6	-1651.5
II	-501.0	51.2	-229.1
III	-131.9	13.7	-115.3
IV	-182.4	4.0	-105.9
V	-173.6	6.2	-133.8
VI	-45.8	2.0	-36.6
VII	-19.0	-18.9	27.9
VIII	-19.9	20.6	-59.0
IX	-34.6	1.9	9.4
X	-4.4	-0.2	-40.5
XI	65.4	511.6	1187.0
XII	167.3	155.3	391.5

Merodajna kombinacija za upogib:
1.35xI+1.50xII+1.05xIII+1.05xIV+0.75xV+0.90xVIII+0.90xX
Merodajna kombinacija za strig:
I+0.30xII+0.30xIII+0.30xIV+XI
Mu = -2995.34 kNm
Nu = -5464.34 kN
Tu = 793.87 kN

Aa1 = 0.00 cm2 (min:52.31)
Aa2 = 0.00 cm2 (min:52.31)
Aav = ±0.00 cm2/m (min:±1.88)
Aah = ±0.85 cm2/m (min:±2.50)

Prerez 10 - 10
EC 2 (EN 1992-1-1:2004)
C 30
Vogalna armatura S500N
Vzdolžna armatura S500N
Kompletna obtežna shema



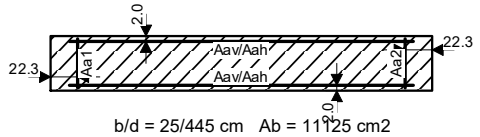
b/d = 25/1535 cm Ab = 38375 cm2

No	N [kN]	T [kN]	M [kNm]
I	-3794.6	-65.0	-3498.3
II	-695.3	-4.9	-735.6
III	-165.6	5.9	-411.5
IV	-215.2	7.2	40.2
V	-167.6	2.5	-84.9
VI	-46.1	1.0	-21.6
VII	-16.6	-19.7	38.1
VIII	-22.6	20.5	-56.4
IX	-11.3	-5.2	-32.3
X	-27.9	6.0	14.0
XI	54.6	729.3	1474.9
XII	85.7	225.6	496.4

Merodajna kombinacija za upogib:
1.35xI+1.50xII+1.05xIII+1.05xIV+0.75xV+0.90xVIII+0.90xIX
Merodajna kombinacija za strig:
I+0.30xII-1.00xXI
Mu = -6359.53 kNm
Nu = -6721.52 kN
Tu = -795.75 kN

Aa1 = 0.00 cm2 (min:57.56)
Aa2 = 0.00 cm2 (min:57.56)
Aav = ±0.00 cm2/m (min:±1.88)
Aah = ±0.77 cm2/m (min:±2.50)

Prerez 11 - 11
EC 2 (EN 1992-1-1:2004)
C 30
Vogalna armatura S500N
Vzdolžna armatura S500N
Kompletna obtežna shema



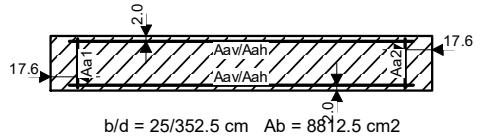
b/d = 25/445 cm Ab = 11125 cm2

No	N [kN]	T [kN]	M [kNm]
I	-568.9	274.2	-1287.1
II	-94.5	48.5	-242.8
III	-56.4	17.7	-52.3
IV	-14.1	12.2	-123.9
V	-31.7	6.7	-33.1
VI	-8.9	1.9	-9.2
VII	-3.4	-1.8	-3.0
VIII	-4.2	3.4	-4.8
IX	-2.3	1.1	-3.3
X	-5.3	0.5	-4.5
XI	24.9	97.2	18.3
XII	17.5	29.6	15.8

Merodajna kombinacija za upogib:
1.35xI+1.05xII+1.50xIV
Merodajna kombinacija za strig:
1.35xI+1.50xII+1.05xIII+1.05xIV+0.75xV+0.90xVIII+0.90xIX
Mu = -2178.29 kNm
Nu = -888.28 kN
Tu = 483.37 kN

εb/εa = -2.229/25.000 ‰
Aa1 = 0.00 cm2 (min:16.69)
Aa2 = 0.00 cm2 (min:16.69)
Aav = ±0.52 cm2/m (min:±1.88)
Aah = ±1.61 cm2/m (min:±2.50)

Prerez 12 - 12
EC 2 (EN 1992-1-1:2004)
C 30
Vogalna armatura S500N
Vzdolžna armatura S500N
Kompletna obtežna shema



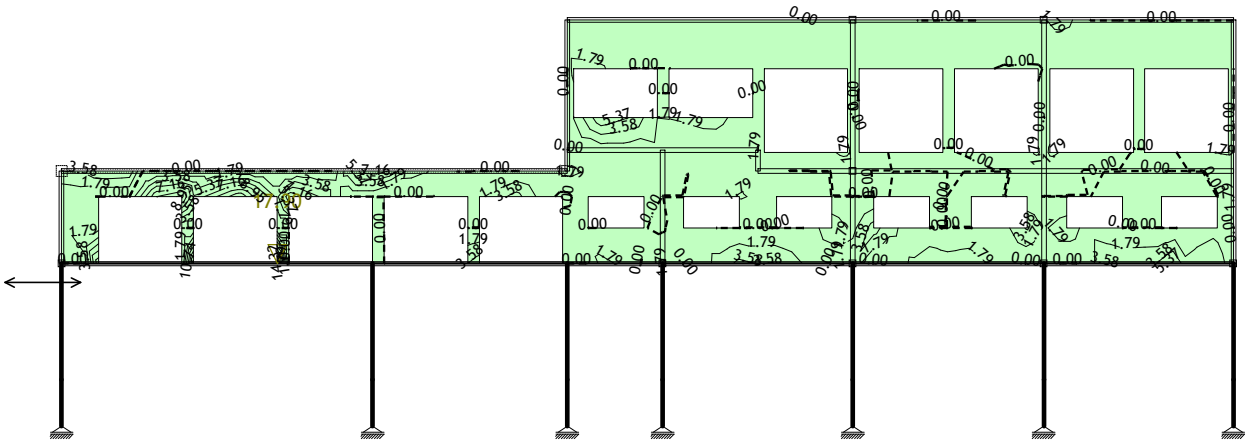
b/d = 25/352.5 cm Ab = 8812.5 cm2

No	N [kN]	T [kN]	M [kNm]
I	-169.6	-238.5	752.8
II	-2.6	-52.9	136.6
III	-24.3	-11.4	27.0
IV	39.7	-20.6	68.9
V	-10.4	-7.8	20.7
VI	-2.9	-2.2	5.9
VII	-5.5	-4.5	8.3
VIII	3.0	2.6	-3.3
IX	-1.7	-0.5	2.2
X	-0.8	-1.3	2.8
XI	170.8	124.1	274.8
XII	56.1	39.5	93.9

Merodajna kombinacija za upogib:
I+0.30xII+0.30xIV+XI
Merodajna kombinacija za strig:
1.35xI+1.50xII+1.05xIII+1.05xIV+0.75xV+0.90xVII+0.90xX
Mu = 1089.26 kNm
Nu = 12.30 kN
Tu = -445.92 kN

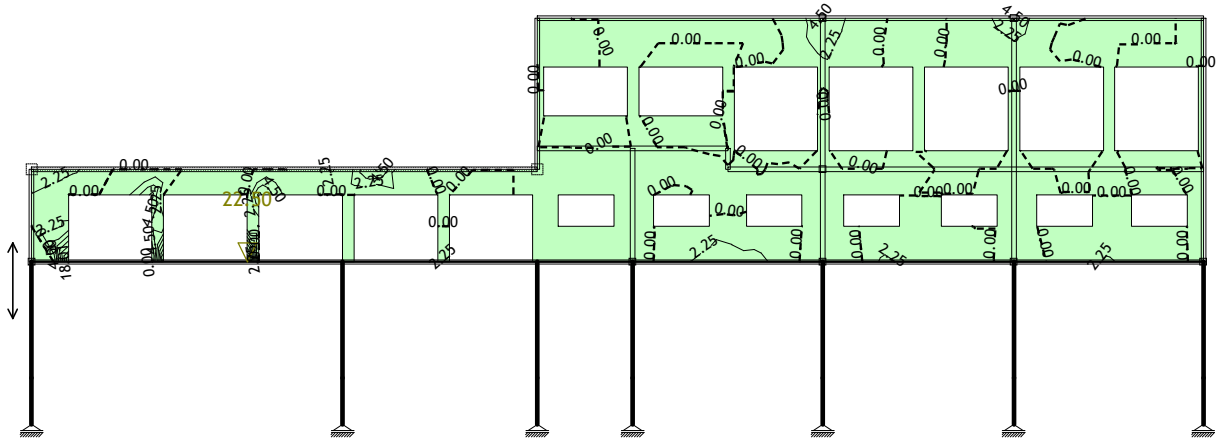
εb/εa = -1.612/25.000 ‰
Aa1 = 3.06 cm2 (min:13.22)
Aa2 = 3.06 cm2 (min:13.22)
Aav = ±1.88 cm2/m (min:±1.88)
Aah = ±1.88 cm2/m (min:±2.50)

Merodajna obtežba: Kompletna shema
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



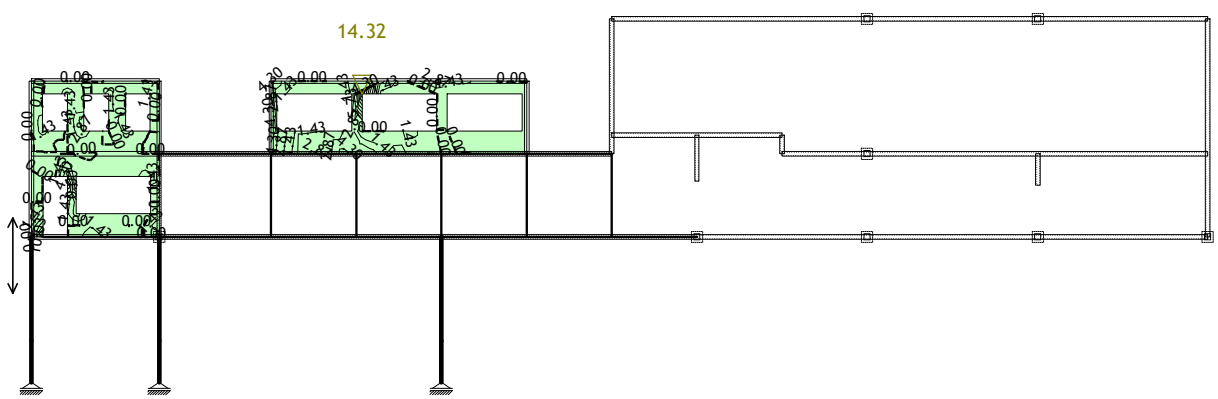
Okvir: H_1
Aa - sp.cona - Smer 1 - max Aa1,s= 17.90 cm2/m

Merodajna obtežba: Kompletna shema
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



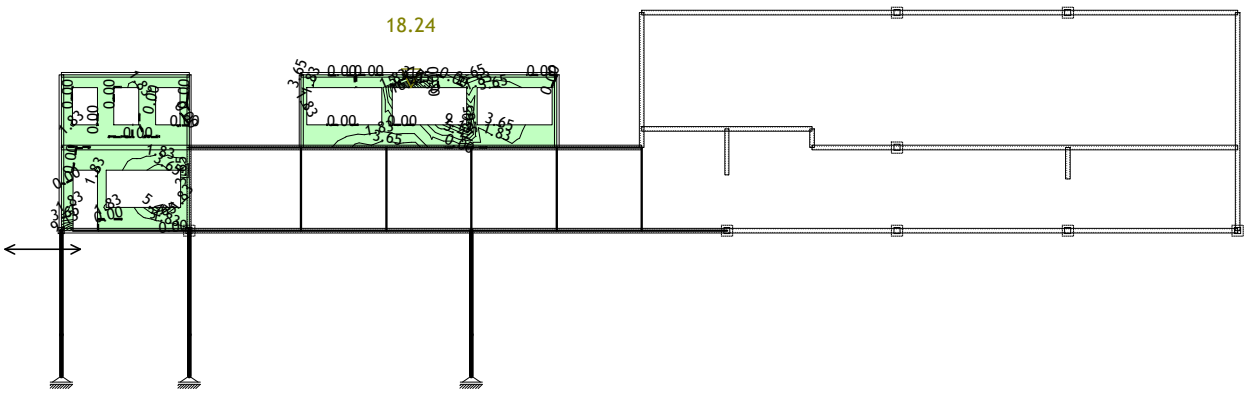
Okvir: H_1
Aa - sp.cona - Smer 2 - max Aa2,s= 22.50 cm2/m

Merodajna obtežba: Kompletna shema
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



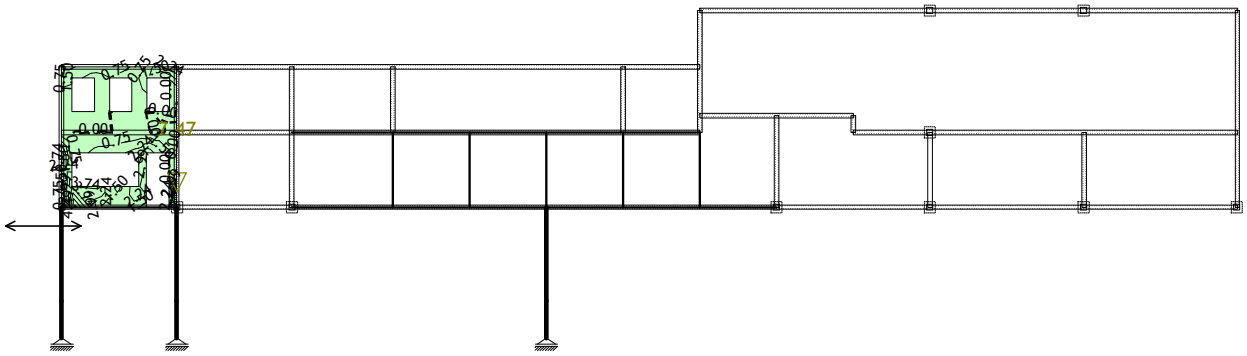
Okvir: H_2
Aa - sp.cona - Smer 2 - max Aa2,s= 14.32 cm2/m

Merodajna obtežba: Kompletna shema
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



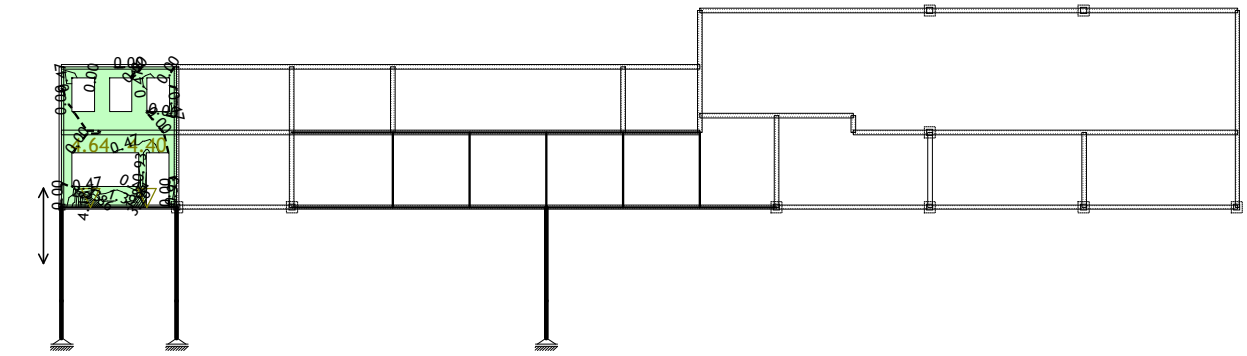
Okvir: H_2
Aa - sp.cona - Smer 1 - max Aa1,s= 18.24 cm2/m

Merodajna obtežba: Kompletna shema
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



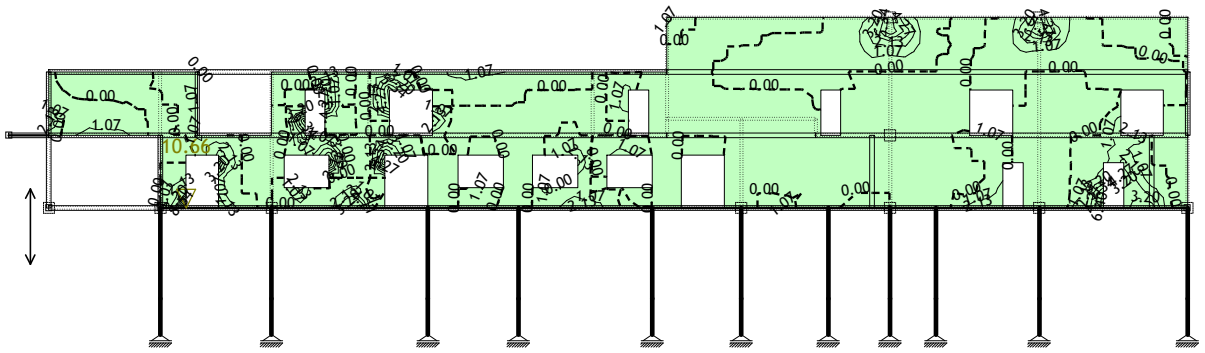
Okvir: H_4
Aa - sp.cona - Smer 1 - max Aa1,s= 7.47 cm2/m

Merodajna obtežba: Kompletna shema
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



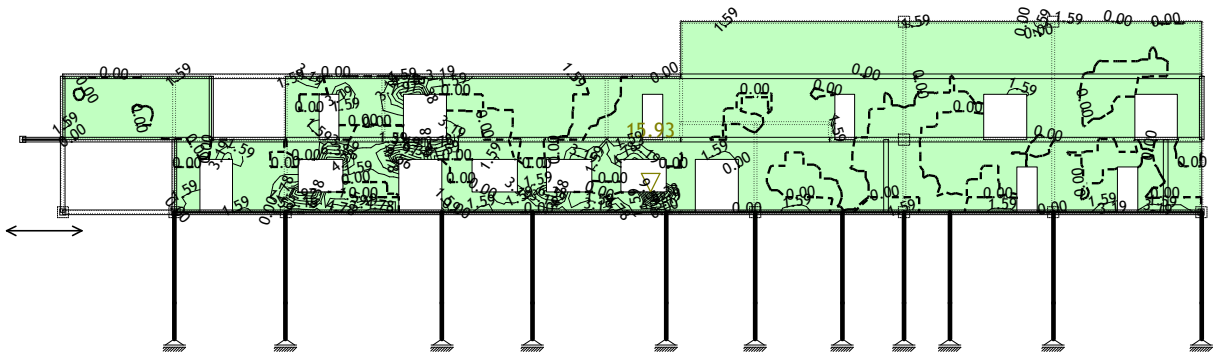
Okvir: H_4
Aa - sp.cona - Smer 2 - max Aa2,s= 4.64 cm2/m

Merodajna obtežba: Kompletna shema
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



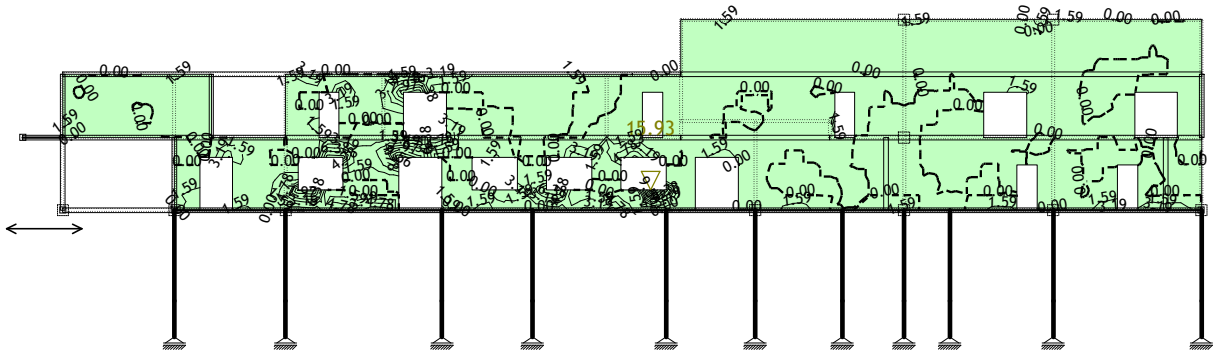
Okvir: H_6
Aa - sp.cona - Smer 2 - max Aa2,s= 10.66 cm2/m

Merodajna obtežba: Kompletna shema
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



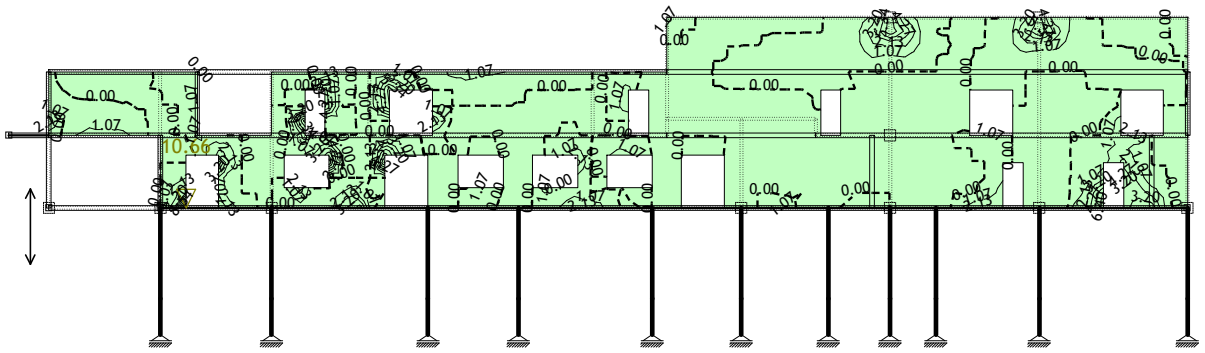
Okvir: H_6
Aa - sp.cona - Smer 1 - max Aa1,s= 15.93 cm2/m

Merodajna obtežba: Kompletna shema
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



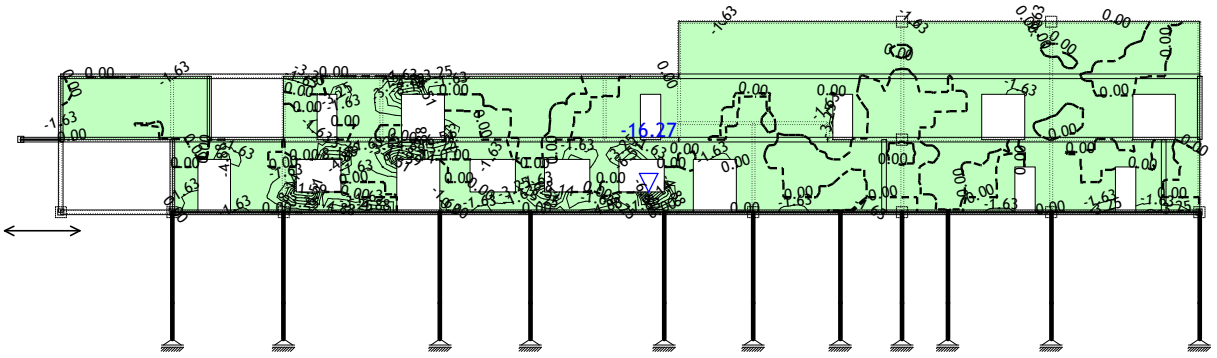
Okvir: H_6
Aa - sp.cona - Smer 1 - max Aa1,s= 15.93 cm2/m

Merodajna obtežba: Kompletna shema
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



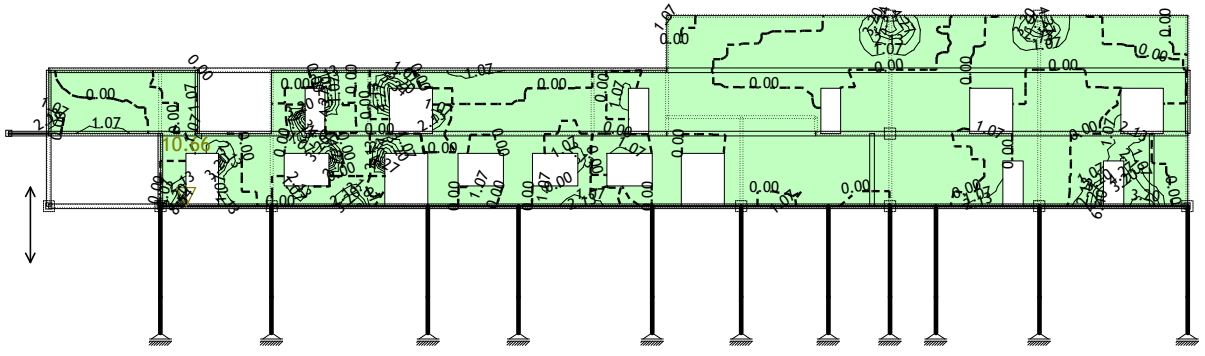
Okvir: H_6
Aa - sp.cona - Smer 2 - max Aa2,s= 10.66 cm2/m

Merodajna obtežba: Kompletna shema
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



Okvir: H_6
Aa - zg.cona - Smer 1 - max Aa1,z= -16.27 cm2/m

Merodajna obtežba: Kompletna shema
EC 2 (EN 1992-1-1:2004), C 30, S500H, a=4.00 cm



Okvir: H_6
Aa - sp.cona - Smer 2 - max Aa2,s= 10.66 cm2/m

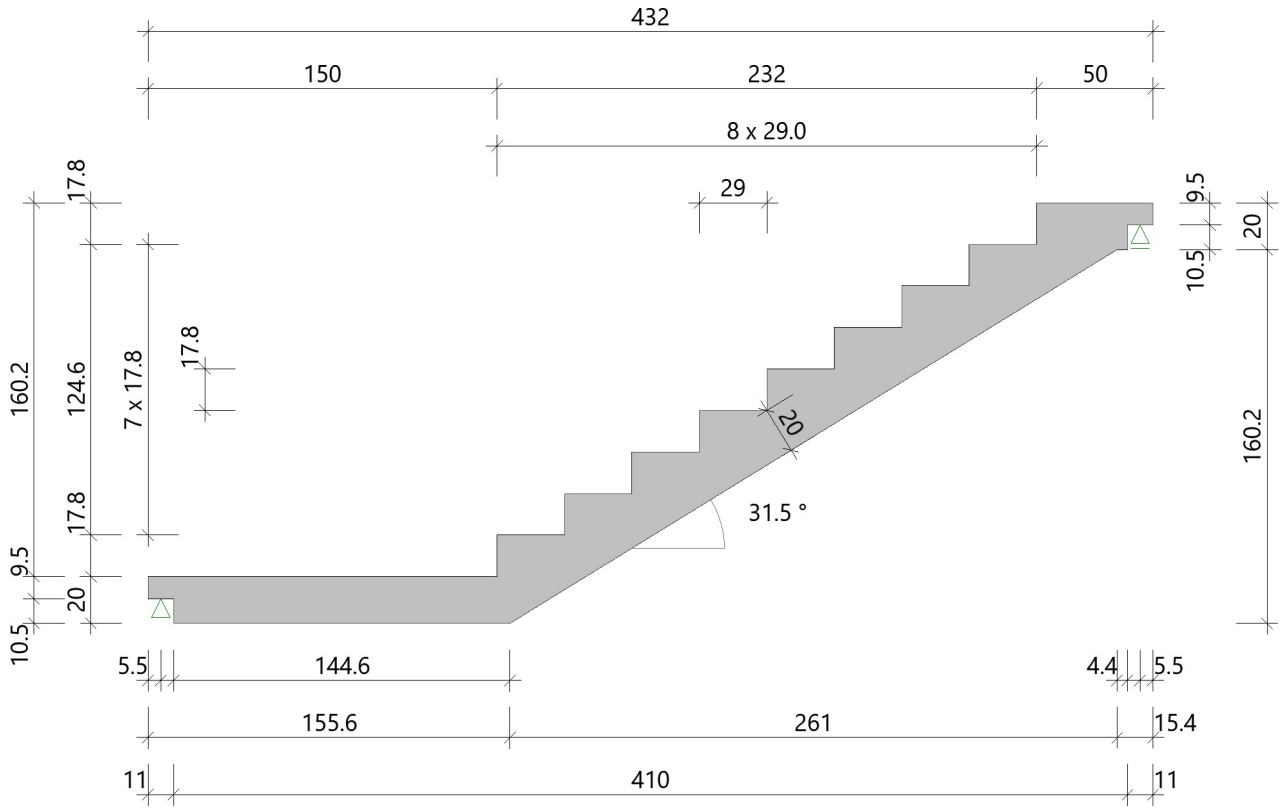
Item: stopnišèe 2

Flight of Stairs B7+ 02/18A (Frilo R-2018-2/P04)

System

System graphics

Scale 1 : 32.6



Geometry

Rf b floor landing top - Rf b floor landing bottom	H_1 =	160.2	cm
Length from 1-st to to last step tread	L_1 =	232.0	cm
Length lower landing to FE support	L_2 =	150.0	cm
Length upper landing to FE support	L_3 =	50.0	cm
width of flight	B_1 =	120.0	cm
Width of cover	B_2 =	120.0	cm
Live load width	B_3 =	120.0	cm
Number of steps	n_s =	9	
Height of step bottom	H_u =	17.8	cm
Height of step top	H_o =	17.8	cm
Stairs	H_s / L_s =	17.8 / 29.0	cm
Nosing	u =	0.0	cm
Thickness of stairs	D_1 =	20.0	cm
Thickness lower landing	D_2 =	20.0	cm
Thickness upper landing	D_3 =	20.0	cm
Length of the staircase bottom view in plan	L_4 =	261.0	cm
Distance 1st step to break point bottom	L_5 =	5.6	cm
Length of lower support console	L_6 =	11.0	cm
Length of top support console	L_7 =	11.0	cm
Thickness lower support console	D_6 =	9.5	cm
Deep of upper support console	D_7 =	9.5	cm
Distance lower support to console end	L_{14} =	5.5	cm
Distance of the upper support from the end of the lower console	L_{15} =	5.5	cm

bearing

bttm: hinged with console
top: hinged with console

Support

Location -	horizontal kN/m	vertical kN/m	turning kNm/rad
left	rigid	rigid	free
right	free	rigid	free

Durability

Requirements durability

attack on concrete		X0			
attack on reinforc.		XC1			
min. concrete class		C 16/20			
long. reinforcement	ϕ,m	=	10	mm	
allowance in design	Δc_{dev}	=	10	mm	
longitudinal bars	$c_{min,m}$	=	10	mm	*5
concrete coverage	$c_{nom,m}$	=	20	mm	
laying dist. link	$c_{,l}$	=	20	mm	
all. crack width	w_{max}	=	0.40	mm	

*5: bond decisive

Loads

Safety and combination factors

Action group	γ_G	γ_Q	ψ_0	ψ_1	ψ_2
Cat. A: domestic, residental areas	1.35	1.5	0.7	0.5	0.3

Load

Location -	Type -	g kN/m²	q kN/m²
lower landing/ console	Covering	2.00	-
	Live load	-	4.00
Stairway	Covering	3.00	-
	Live load	-	4.00
upper landing/console	Covering	1.00	-
	Live load	-	3.00

Resulting loading (relative to the horizontal surface)

Location -	Type -	g kN/m²	q kN/m²
lower landing/ console	Self weight	5.00	-
	Covering	2.00	-
	Live load	-	4.00
	Total	7.00	4.00
Stairway	Self weight	8.09	-
	Covering	3.00	-
	Live load	-	4.00
	Total	11.09	4.00
upper landing/console	Self weight	5.00	-
	Covering	1.00	-
	Live load	-	3.00
	Total	6.00	3.00

The dead weight is with gamma = 25.00 kN/m^3 considered.

Standard, Materials und Reinforcement layer

Design acc.to DIN EN 1992-1-1/NA/A1:2015-12

Construction materials: Concrete C25/30 Steel B500A
γ_c = 1.50 γ_s = 1.15
f_{ck} = 25.0 N/mm² f_{yk} = 500.0 N/mm²

Individual lengths(for framework calculation)

	lower landing	Stairway	upper landing
Dimension	1.47 m	3.06 m (L_{tot}) 2.61 m (L_{hor}) 1.60 m (L_{vert})	0.13 m

Reinforcement layer bottom d_1 = 3.0 cm
Reinforcement upper layer d_2 = 3.0 cm

Results

Bending design

All design results per m stair width!

Flexural reinforcement

Location -	h cm	M_{Ed} kNm/m	N_{Ed} kN/m	req. a_{sb} cm²/m	req. a_{st} cm²/m	&About -
lower landing, lower reinforcement	20.0	38.36	0.0	5.2	0.0	
Stairway, lower reinforcement	20.0	43.41	0.9	6.0	0.0	
upper landing, lower reinforcement	20.0	5.18	0.0	2.2	0.0	*)
*) Minimum longitudinal reinforcement acc.to DIN EN 1992-1-1/NA/A1:2015-12 9.2.1.1 (1) is decisive.						

exist. reinforcement

lower reinforcement 7 O 12 / 18.3 cm (Suggestion from program for number O)
exist. a_{sbtm} = 6.60 cm²/m

Note: existing a_s (related reinforcement) = existing A_s (absolute reinforcement) / B_1 (running width).

Shear design

Shear reinforcement B500A

Location -	V_{Ed} kN/m	N_{Ed} kN/m	k_z -	θ Degree	a_{sL} cm²/m	$V_{Rd,c}$ kN/m	$V_{Rd,max}$ kN/m	req. a_{sStir} cm²/m²
lower landing left	37.4	0.0	0.76	18.4	0.0	84.1	414.4	0.0
lower landing right	14.7	0.0	0.76	18.4	5.2	84.1	414.4	0.0
Stairway left	12.5	-7.7	0.76	18.4	5.1	84.9	414.4	0.0
Stairway right	-34.2	21.0	0.76	18.4	2.6	82.0	414.4	0.0
Upper landing left	-40.1	0.0	0.76	18.4	2.2	84.1	414.4	0.0
Upper landing right	-41.7	0.0	0.76	18.4	0.0	84.1	414.4	0.0

Crack width check

The check is carried out with the quasi-permanent action combination

Crack width limitation stairs:

Location -	h cm	M_{Ed} kNm	N_{Ed} kN	exist. A_{sb} cm²	exist. A_{st} cm²	Env.Cl -	$d_{s,exist}$ mm	$d_{s,limit}$ mm	exist. w mm	perm. w mm
Stairway, bottom side	20.0	30.01	0.5	7.9	0.0	XC1	12	23	0.20	0.40

Deformation

The calculation will be done with quasi permanent Action combination at state I (E_{cm} = 31000 N/mm²).

max. f = 0.2 cm (in staircase at x = 0.77 m)

Note: The deflection value is to be understood perpendicular to the corresponding member axis. The x-value refers to the beginning of the member (beginning lower platform, staircase or upper platform) and runs in the direction of the member axis.

Support reactions

Definition supporting forces

(A) support left (v) vertical supporting force
(B) support right (v) horizontal supporting force

Support reactions per m stair width

	A_v kN/m	A_h kN/m	B_v kN/m	B_h kN/m
γ = 1.0				
Total	26.8	0.0	30.0	0.0
from g	18.4	0.0	21.7	0.0
from q	8.4	0.0	8.3	0.0
γ-times				
Total	37.4	0.0	41.7	0.0
from g	24.8	0.0	29.2	0.0
from q	12.6	0.0	12.4	0.0

Self weight of stairs

The self-weight of the stair (without covering) G_k is 34.9 kN

Note :

The consoles has to be dimensioned separately.

Internal forces table(design LC)

The shear forces and the reinforcement refer to one meter of stairway width.

lower landing (h = 20.0 cm)

No. -	Location m	Q_{Ed} kN/m	N_{Ed} kN/m	M_{Ed} kNm/m	e/h -	req. a_{sb} cm²/m	req. a_{st} cm²/m
0	0.00	37.4	0.0	0.00	-	0.0	0.0
1	0.15	35.1	0.0	5.35	∞	2.2*)	0.0
2	0.29	32.9	0.0	10.36	∞	2.2*)	0.0
3	0.44	30.6	0.0	15.03	∞	2.2*)	0.0
4	0.59	28.3	0.0	19.37	∞	2.6	0.0
5	0.74	26.0	0.0	23.37	∞	3.1	0.0

No. -	Location m	Q_{Ed} kN/m	N_{Ed} kN/m	M_{Ed} kNm/m	e/h -	req. a_{sb} cm^2/m	req. a_{st} cm^2/m
6	0.88	23.8	0.0	27.04	∞	3.6	0.0
7	1.03	21.5	0.0	30.37	∞	4.1	0.0
8	1.18	19.2	0.0	33.37	∞	4.5	0.0
9	1.33	16.9	0.0	36.03	∞	4.9	0.0
10	1.47	14.7	0.0	38.36	∞	5.2	0.0
*) Minimum longitudinal reinforcement is decisive.							

Stairway (h = 20.0 cm)

No. -	Location m	Q_{Ed} kN/m	N_{Ed} kN/m	M_{Ed} kNm/m	e/h -	req. a_{sb} cm^2/m	req. a_{st} cm^2/m
0	0.00	12.5	-7.7	38.36	-25.01	5.1	0.0
1	0.15	10.2	-6.2	40.10	-32.15	5.4	0.0
2	0.31	7.8	-4.8	41.47	-43.16	5.6	0.0
3	0.46	5.5	-3.4	42.49	-63.00	5.8	0.0
4	0.61	3.2	-1.9	43.16	-111.19	5.9	0.0
5	0.77	0.8	-0.5	43.46	-427.01	6.0	0.0
6	0.92	-1.5	0.9	43.41	235.19	6.0	0.0
7	1.07	-3.8	2.4	43.00	91.31	5.9	0.0
8	1.22	-6.2	3.8	42.24	55.77	5.8	0.0
9	1.38	-8.5	5.2	41.11	39.39	5.7	0.0
10	1.53	-10.8	6.7	39.63	29.80	5.5	0.0
11	1.68	-13.2	8.1	37.79	23.38	5.2	0.0
12	1.84	-15.5	9.5	35.60	18.71	4.9	0.0
13	1.99	-17.8	10.9	33.05	15.10	4.6	0.0
14	2.14	-20.2	12.4	30.14	12.17	4.2	0.0
15	2.30	-22.5	13.8	26.87	9.73	3.8	0.0
16	2.45	-24.8	15.2	23.25	7.63	3.3	0.0
17	2.60	-27.2	16.7	19.27	5.78	2.8	0.0
18	2.76	-29.5	18.1	14.93	4.12	2.5*)	0.0
19	2.91	-31.8	19.5	10.23	2.62	2.5*)	0.0
20	3.06	-34.2	21.0	5.18	1.24	2.6*)	0.0
*) Minimum longitudinal reinforcement is decisive.							

upper landing (h = 20.0 cm)

No. -	Location m	Q_{Ed} kN/m	N_{Ed} kN/m	M_{Ed} kNm/m	e/h -	req. a_{sb} cm^2/m	req. a_{st} cm^2/m
0	0.00	-40.1	0.0	5.18	∞	2.2*)	0.0
1	0.06	-40.9	0.0	2.62	∞	2.2*)	0.0
2	0.13	-41.7	0.0	0.00	-	0.0	0.0
*) Minimum longitudinal reinforcement is decisive.							

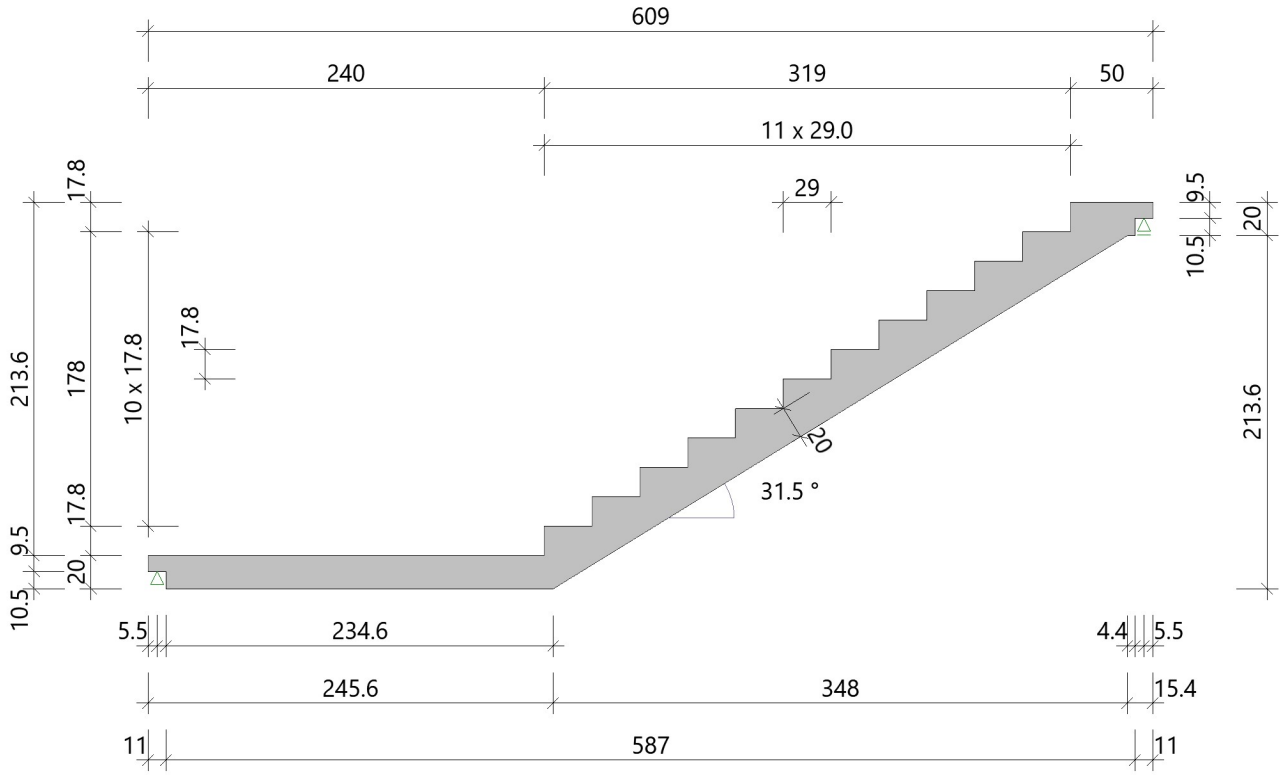
Item: stopnišèe 1

Flight of Stairs B7+ 02/18A (Frilo R-2018-2/P04)

System

System graphics

Scale 1 : 46.0



Geometry

Rfb floor landing top - Rfb floor landing bottom	H_1 =	213.6	cm
Length from 1-st to to last step tread	L_1 =	319.0	cm
Length lower landing to FE support	L_2 =	240.0	cm
Length upper landing to FE support	L_3 =	50.0	cm
width of flight	B_1 =	120.0	cm
Width of cover	B_2 =	120.0	cm
Live load width	B_3 =	120.0	cm
Number of steps	n_s =	12	
Height of step bottom	H_u =	17.8	cm
Height of step top	H_o =	17.8	cm
Stairs	H_s / L_s =	17.8 / 29.0	cm
Nosing	u =	0.0	cm
Thickness of stairs	D_1 =	20.0	cm
Thickness lower landing	D_2 =	20.0	cm
Thickness upper landing	D_3 =	20.0	cm
Length of the staircase bottom view in plan	L_4 =	348.0	cm
Distance 1st step to break point bottom	L_5 =	5.6	cm
Length of lower support console	L_6 =	11.0	cm
Length of top support console	L_7 =	11.0	cm
Thickness lower support console	D_6 =	9.5	cm
Deep of upper support console	D_7 =	9.5	cm
Distance lower support to console end	L_{14} =	5.5	cm
Distance of the upper support from the end of the lower console	L_{15} =	5.5	cm

bearing

bttm: hinged with console
top: hinged with console

Support

Location -	horizontal kN/m	vertical kN/m	turning kNm/rad
left	rigid	rigid	free
right	free	rigid	free

Durability

Requirements durability

attack on concrete		X0		
attack on reinforc.		XC1		
min. concrete class		C 16/20		
long. reinforcement	ϕ,m =	10	mm	
allowance in design	Δc_{dev} =	10	mm	
longitudinal bars	$c_{min,m}$ =	10	mm	*5
concrete coverage	$c_{nom,m}$ =	20	mm	
laying dist. link	$c_{,l}$ =	20	mm	
all. crack width	w_{max} =	0.40	mm	

*5: bond decisive

Loads

Safety and combination factors

Action group	γ_G	γ_Q	ψ_0	ψ_1	ψ_2
Cat. A: domestic, residental areas	1.35	1.5	0.7	0.5	0.3

Load

Location -	Type -	g kN/m²	q kN/m²
lower landing/ console	Covering	2.00	-
	Live load	-	4.00
Stairway	Covering	3.00	-
	Live load	-	4.00
upper landing/console	Covering	1.00	-
	Live load	-	3.00

Resulting loading (relative to the horizontal surface)

Location -	Type -	g kN/m²	q kN/m²
lower landing/ console	Self weight	5.00	-
	Covering	2.00	-
	Live load	-	4.00
	Total	7.00	4.00
Stairway	Self weight	8.09	-
	Covering	3.00	-
	Live load	-	4.00
	Total	11.09	4.00
upper landing/console	Self weight	5.00	-
	Covering	1.00	-
	Live load	-	3.00
	Total	6.00	3.00

The dead weight is with gamma = 25.00 kN/m ^{3} considered.

Standard, Materials und Reinforcement layer

Design acc.to DIN EN 1992-1-1/NA/A1:2015-12

Construction materials: Concrete C25/30 Steel B500A
γ_c = 1.50 γ_s = 1.15
f_{ck} = 25.0 N/mm² f_{yk} = 500.0 N/mm²

Individual lengths(for framework calculation)

	lower landing	Stairway	upper landing
Dimension	2.37 m	4.08 m (L_{tot}) 3.48 m (L_{hor}) 2.14 m (L_{vert})	0.13 m

Reinforcement layer bottom d_1 = 3.0 cm
Reinforcement upper layer d_2 = 3.0 cm

Results

Bending design

All design results per m stair width!

Flexural reinforcement

Location -	h cm	M_{Ed} kNm/m	N_{Ed} kN/m	req. a_{sb} cm²/m	req. a_{st} cm²/m	&About -
lower landing, lower reinforcement	20.0	80.36	0.0	12.1	0.0	
Stairway, lower reinforcement	20.0	86.10	0.1	13.1	0.0	
upper landing, lower reinforcement	20.0	7.39	0.0	2.2	0.0	*)
*) Minimum longitudinal reinforcement acc.to DIN EN 1992-1-1/NA/A1:2015-12 9.2.1.1 (1) is decisive.						

exist. reinforcement

lower reinforcement 8 O 16 / 15.7 cm (Suggestion from program for number O)
exist. a_{sbtm} = 13.40 cm²/m

Note: existing a_s (related reinforcement) = existing A_s (absolute reinforcement) / B_1 (running width).

Shear design

Shear reinforcement B500A

Location -	V_{Ed} kN/m	N_{Ed} kN/m	k_z -	θ Degree	a_{sL} cm²/m	$V_{Rd,c}$ kN/m	$V_{Rd,max}$ kN/m	req. a_{sStir} cm²/m²
lower landing left	52.2	0.0	0.76	18.4	0.0	84.1	414.4	0.0
lower landing right	15.5	0.0	0.76	18.4	12.1	88.7	414.4	0.0
Stairway left	13.2	-8.1	0.76	18.4	12.0	89.3	414.4	0.0
Stairway right	-49.0	30.1	0.76	18.4	2.7	81.1	414.4	0.0
Upper landing left	-57.5	0.0	0.76	18.4	2.2	84.1	414.4	0.0
Upper landing right	-59.1	0.0	0.76	18.4	0.0	84.1	414.4	0.0

Crack width check

The check is carried out with the quasi-permanent action combination

Crack width limitation stairs:

Location -	h cm	M_{Ed} kNm	N_{Ed} kN	exist. A_{sb} cm²	exist. A_{st} cm²	Env.Cl -	$d_{s,exist}$ mm	$d_{s,limit}$ mm	exist. w mm	perm. w mm
Stairway, bottom side	20.0	59.10	0.7	16.1	0.0	XC1	16	39	0.16	0.40

Deformation

The calculation will be done with quasi permanent Action combination at state I (E_{cm} = 31000 N/mm²).

max. f = 0.9 cm (in lower landing at x = 2.37 m)

Note: The deflection value is to be understood perpendicular to the corresponding member axis. The x-value refers to the beginning of the member (beginning lower platform, staircase or upper platform) and runs in the direction of the member axis.

Support reactions

Definition supporting forces

(A) support left (v) vertical supporting force
(B) support right (v) horizontal supporting force

Support reactions per m stair width

	A_v kN/m	A_h kN/m	B_v kN/m	B_h kN/m
γ = 1.0				
Total	37.3	0.0	42.4	0.0
from g	25.4	0.0	30.6	0.0
from q	12.0	0.0	11.8	0.0
γ-times				
Total	52.2	0.0	59.1	0.0
from g	34.3	0.0	41.3	0.0
from q	17.9	0.0	17.8	0.0

Self weight of stairs

The self-weight of the stair (without covering) G_k is 48.8 kN

Note :

The consoles has to be dimensioned separately.

Internal forces table(design LC)

The shear forces and the reinforcement refer to one meter of stairway width.

lower landing (h = 20.0 cm)

No. -	Location m	Q_{Ed} kN/m	N_{Ed} kN/m	M_{Ed} kNm/m	e/h -	req. a_{sb} cm²/m	req. a_{st} cm²/m
0	0.00	52.2	0.0	0.00	-	0.0	0.0
1	0.15	49.9	0.0	7.57	∞	2.2*)	0.0
2	0.30	47.6	0.0	14.80	∞	2.2*)	0.0
3	0.44	45.3	0.0	21.69	∞	2.9	0.0
4	0.59	43.0	0.0	28.25	∞	3.8	0.0
5	0.74	40.7	0.0	34.46	∞	4.7	0.0

No. -	Location m	Q_{Ed} kN/m	N_{Ed} kN/m	M_{Ed} kNm/m	e/h -	req. a_{sb} cm²/m	req. a_{st} cm²/m
6	0.89	38.4	0.0	40.33	∞	5.5	0.0
7	1.04	36.2	0.0	45.86	∞	6.4	0.0
8	1.19	33.9	0.0	51.06	∞	7.2	0.0
9	1.33	31.6	0.0	55.91	∞	8.0	0.0
10	1.48	29.3	0.0	60.42	∞	8.7	0.0
11	1.63	27.0	0.0	64.59	∞	9.4	0.0
12	1.78	24.7	0.0	68.42	∞	10.0	0.0
13	1.93	22.4	0.0	71.92	∞	10.6	0.0
14	2.08	20.1	0.0	75.07	∞	11.2	0.0
15	2.22	17.8	0.0	77.88	∞	11.6	0.0
16	2.37	15.5	0.0	80.36	∞	12.1	0.0

*) Minimum longitudinal reinforcement is decisive.

Stairway (h = 20.0 cm)

No. -	Location m	Q_{Ed} kN/m	N_{Ed} kN/m	M_{Ed} kNm/m	e/h -	req. a_{sb} cm²/m	req. a_{st} cm²/m
0	0.00	13.2	-8.1	80.36	-49.47	12.0	0.0
1	0.15	11.0	-6.8	82.12	-60.76	12.3	0.0
2	0.29	8.8	-5.4	83.57	-77.46	12.6	0.0
3	0.44	6.6	-4.0	84.69	-105.05	12.8	0.0
4	0.58	4.3	-2.7	85.48	-160.24	13.0	0.0
5	0.73	2.1	-1.3	85.95	-329.66	13.1	0.0
6	0.87	-0.1	0.1	86.10	7180.52	13.1	0.0
7	1.02	-2.3	1.4	85.93	301.80	13.1	0.0
8	1.17	-4.5	2.8	85.43	153.25	13.0	0.0
9	1.31	-6.8	4.2	84.60	101.91	12.9	0.0
10	1.46	-9.0	5.5	83.45	75.67	12.7	0.0
11	1.60	-11.2	6.9	81.98	59.60	12.4	0.0
12	1.75	-13.4	8.2	80.19	48.65	12.1	0.0
13	1.90	-15.6	9.6	78.06	40.64	11.8	0.0
14	2.04	-17.9	11.0	75.62	34.47	11.4	0.0
15	2.19	-20.1	12.3	72.85	29.54	10.9	0.0
16	2.33	-22.3	13.7	69.76	25.47	10.4	0.0
17	2.48	-24.5	15.1	66.34	22.03	9.8	0.0
18	2.62	-26.8	16.4	62.60	19.06	9.2	0.0
19	2.77	-29.0	17.8	58.54	16.46	8.6	0.0
20	2.92	-31.2	19.2	54.15	14.14	7.9	0.0
21	3.06	-33.4	20.5	49.44	12.05	7.1	0.0
22	3.21	-35.6	21.9	44.40	10.15	6.4	0.0
23	3.35	-37.9	23.2	39.04	8.40	5.6	0.0
24	3.50	-40.1	24.6	33.36	6.78	4.8	0.0
25	3.65	-42.3	26.0	27.35	5.27	4.0	0.0
26	3.79	-44.5	27.3	21.02	3.85	3.1	0.0
27	3.94	-46.8	28.7	14.36	2.50	2.7*)	0.0
28	4.08	-49.0	30.1	7.39	1.23	2.7*)	0.0

*) Minimum longitudinal reinforcement is decisive.

upper landing (h = 20.0 cm)

No. -	Location m	Q_{Ed} kN/m	N_{Ed} kN/m	M_{Ed} kNm/m	e/h -	req. a_{sb} cm²/m	req. a_{st} cm²/m
0	0.00	-57.5	0.0	7.39	∞	2.2*)	0.0
1	0.06	-58.3	0.0	3.72	∞	2.2*)	0.0
2	0.13	-59.1	0.0	0.00	-	0.0	0.0

*) Minimum longitudinal reinforcement is decisive.

STATICON IB
družba za projektiranje, inženiring in svetovanje d.o.o.
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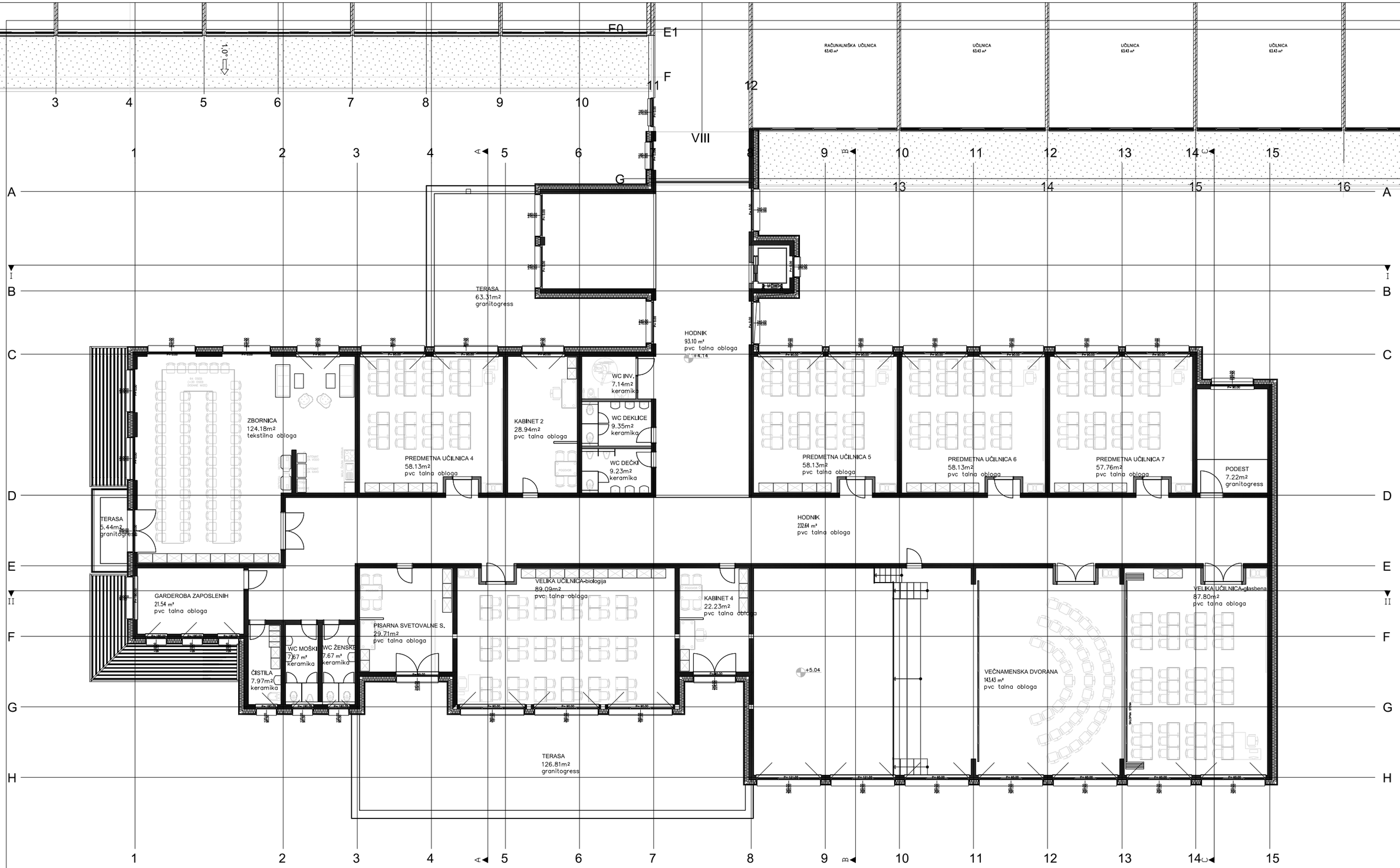
Telefon + 386 (0)5 99 66 290

3/1.5 RISBE – pozicijski načrti



2

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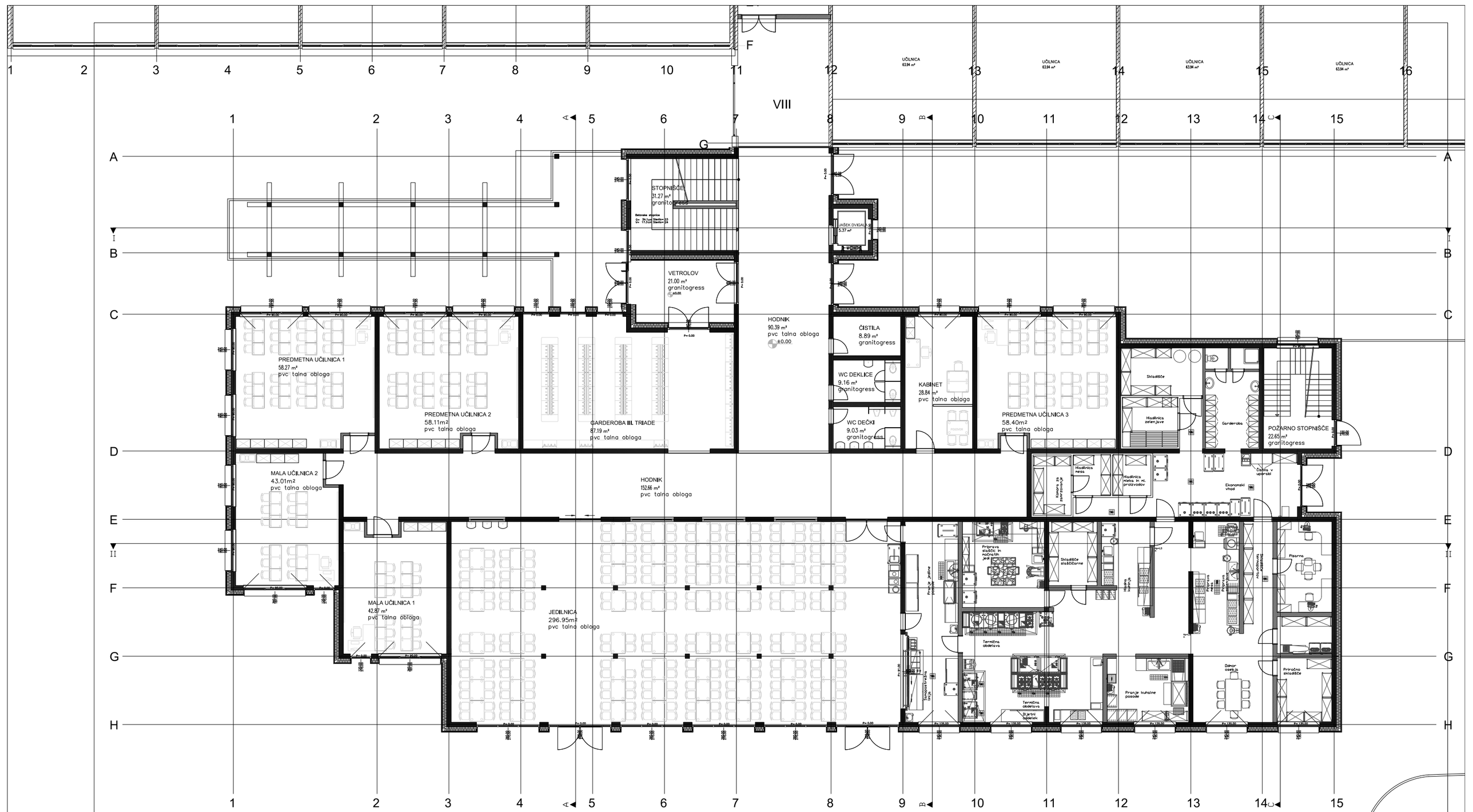
telefon: 05 99 66 290 i

odg.vod. proj.	IZTOK N. ČANČULA, udia
odg.projektant:	BOGOMIR IPAVEC, udig
vr. dokumen.	PGD
številka načrta:	436/2018
datum:	junij 2018

objekt
REKONSTRUKCIJA IN DOZIDAVA OSNOVNE ŠOLE ANTONA GLOBOČNIKA V POSTOJNI

risba
POZICIJE - NADSTROPJE



1

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STATICON IB d.o.o. Lokarjev drevored 1, 5270 Ajdovščina telefon: 05 99 66 290 i	odg.projektant: BOGOMIR IPAVEC, udig
	vr. dokumen. PGD
	številka načrta: 436/2018
	datum: junij 2018

objekt
REKONSTRUKCIJA IN DOZIDAVA OSNOVNE ŠOLE ANTONA GLOBOČNIKA V POSTOJNI

risba
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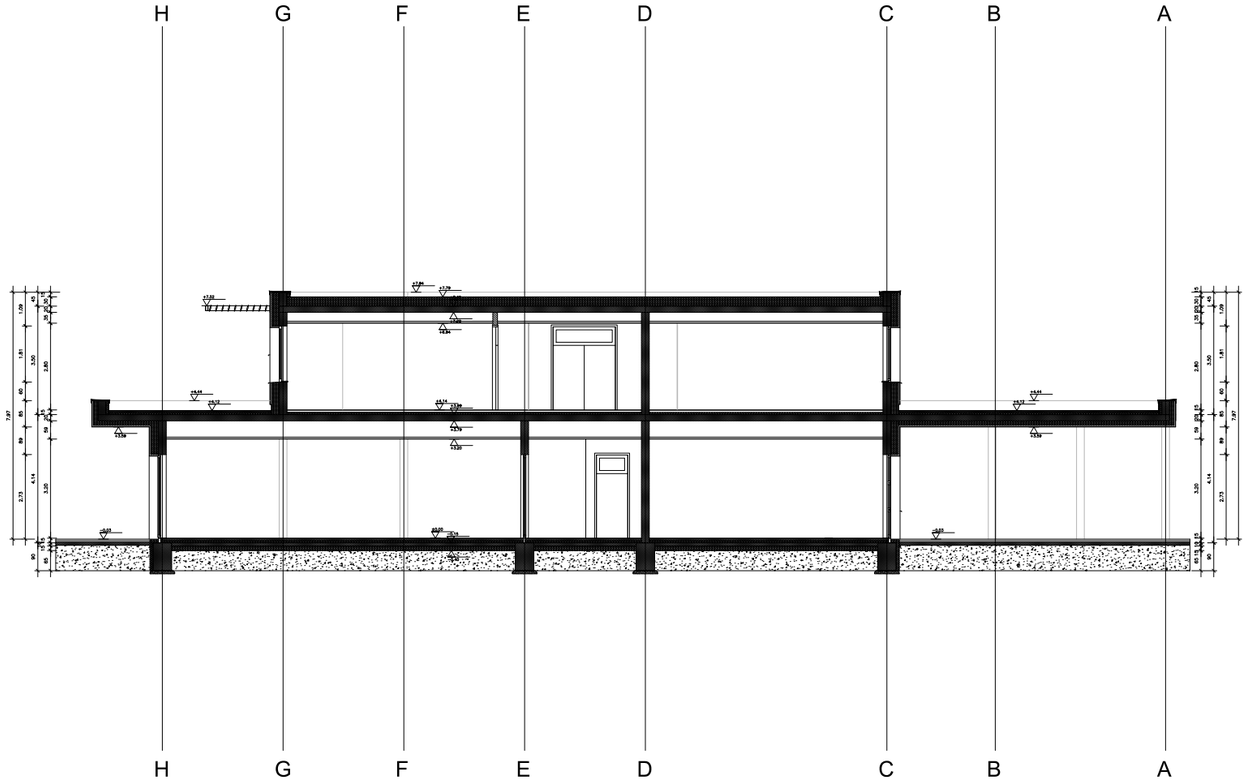

3

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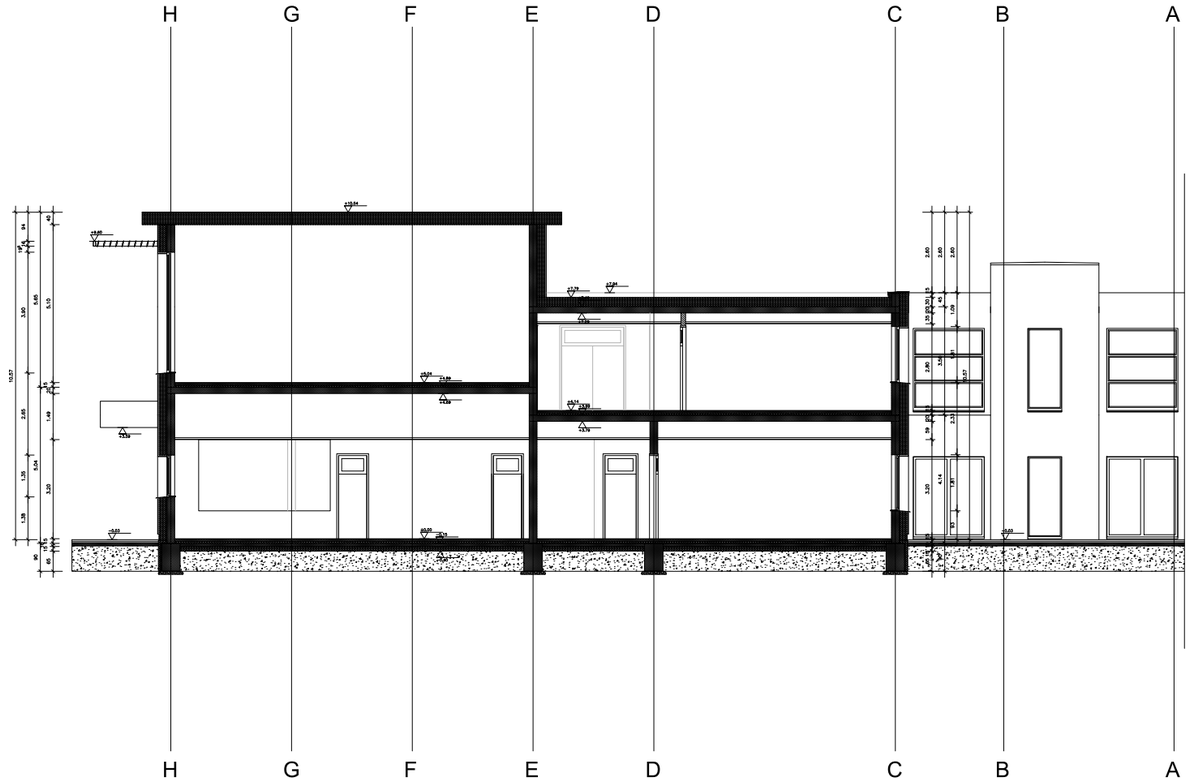
vr. dokumen. PGD
številka načrta: 436/2018
datum: junij 2018

objekt
REKONSTRUKCIJA IN DOZIDAVA OSNOVNE ŠOLE ANTONA GLOBOČNIKA V POSTOJNI

risba
POZICIJE - PREREZ 1



4

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odg.vod. proj. IZTOK N. ČANČULA, udia

odg.projektant: BOGOMIR IPAVEC, udig

vr. dokumen. PGD

številka načrta: 436/2018

datum: junij 2018

objekt
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risba
POZICIJE - PREREZ 2