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Osnovni podatki o modelu

Naslov:	VIO Dole
Objekt:	VIO Dole
Mesto:	Dole pri Litiji
Investitor:	PGD Dole, Občina Litija
Projektant:	Grega Uratnik, G 3958

Datoteka:	vio dole.twp
Datum preračuna:	29.5.2024
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:	8019
Število ploskovnih elementov:	7081
Število grednih elementov	160
Število robnih elementov	4836
Število osnovnih obtežnih primerov:	9
Število kombinacij obtežb:	10

Enote mer

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

Vhodni podatki - Konstrukcija

Shema nivojev

Naziv	z [m]	h [m]
podest nadstropja	7.70	3.00
etažna/temeljna plošča	4.70	2.20

Naziv	z [m]	h [m]
podest	2.50	2.50
	0.00	

Tabele materialov

No	Naziv materiala	E[kN/m2]	μ	γ[kN/m3]	αt[1/C]	Em[kN/m2]	μm
1	C 25/30	3.100e+7	0.20	25.00	1.000e-5	3.100e+7	0.20
2	Les-lglavci-Lamelirani	1.100e+7	0.20	5.00	1.000e-5	1.100e+7	0.20
3	Stahl	2.100e+8	0.30	78.50	1.000e-5	2.100e+8	0.30

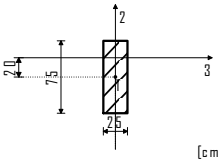
Seti plošč

No	d[m]	e[m]	Material	Tip preračuna	Ortotropija	E2[kN/m2]	G[kN/m2]	α
<1>	0.300	0.150	1	Tanka plošča	Izotropna			
<2>	0.250	0.125	1	Tanka plošča	Izotropna			
<3>	0.450	0.225	1	Tanka plošča	Izotropna			
<4>	0.300	0.150	1	Tanka plošča	Izotropna			
<5>	0.160	0.080	1	Tanka plošča	Izotropna			
<6>	0.220	0.110	2	Tanka plošča	Izotropna			
<7>	0.160	0.080	2	Tanka plošča	Izotropna			
<8>	0.200	0.100	1	Tanka plošča	Izotropna			

Seti gred

Set: 1 Prerez: b/d=25/75, Fiktivna ekscentričnost

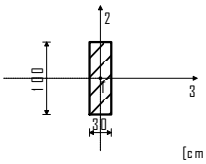
Mat.	Al	A2	A3	Il	I2	I3
1 - C 25/30	1.875e-1	1.563e-1	1.563e-1	3.087e-3	9.766e-4	8.789e-3



[cm]

Set: 2 Prerez: b/d=30/110, Fiktivna ekscentričnost

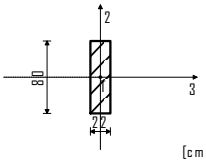
Mat.	Al	A2	A3	Il	I2	I3
2 - Les-lglavci-L...	3.000e-1	2.500e-1	2.500e-1	7.300e-3	2.250e-3	2.500e-2



[cm]

Set: 3 Prerez: b/d=22/80, Fiktivna ekscentričnost

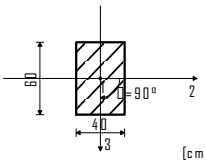
Mat.	Al	A2	A3	Il	I2	I3
2 - Les-lglavci-L...	1.760e-1	1.467e-1	1.467e-1	2.348e-3	7.099e-4	9.387e-3



[cm]

Set: 4 Prerez: b/d=40/60, Fiktivna ekscentričnost

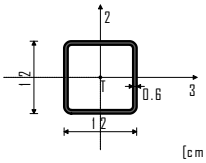
Mat.	Al	A2	A3	Il	I2	I3
2 - Les-lglavci-L...	2.400e-1	2.000e-1	2.000e-1	7.512e-3	7.200e-3	3.200e-3



[cm]

Set: 5 Prerez: HOP [] 120x120x6, Fiktivna ekscentričnost

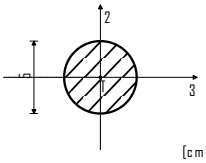
Mat.	Al	A2	A3	Il	I2	I3
3 - Stahl	2.643e-3	1.440e-3	1.440e-3	9.103e-6	5.621e-6	5.621e-6



[cm]

Set: 6 Prerez: D=5, Fiktivna ekscentričnost

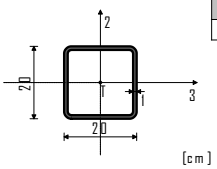
Mat.	Al	A2	A3	Il	I2	I3
3 - Stahl	1.963e-3	1.767e-3	1.767e-3	6.136e-7	3.068e-7	3.068e-7



[cm]

Set: 7 Prerez: HOP [] 200x200x10, Fiktivna ekscentriČnost

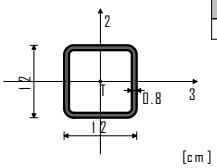
Mat.	A1	A2	A3	I1	I2	I3
3 - Stahl	7.342e-3	4.000e-3	4.000e-3	7.024e-5	4.338e-5	4.338e-5



[cm]

Set: 8 Prerez: HOP [] 120x120x8, Fiktivna ekscentriČnost

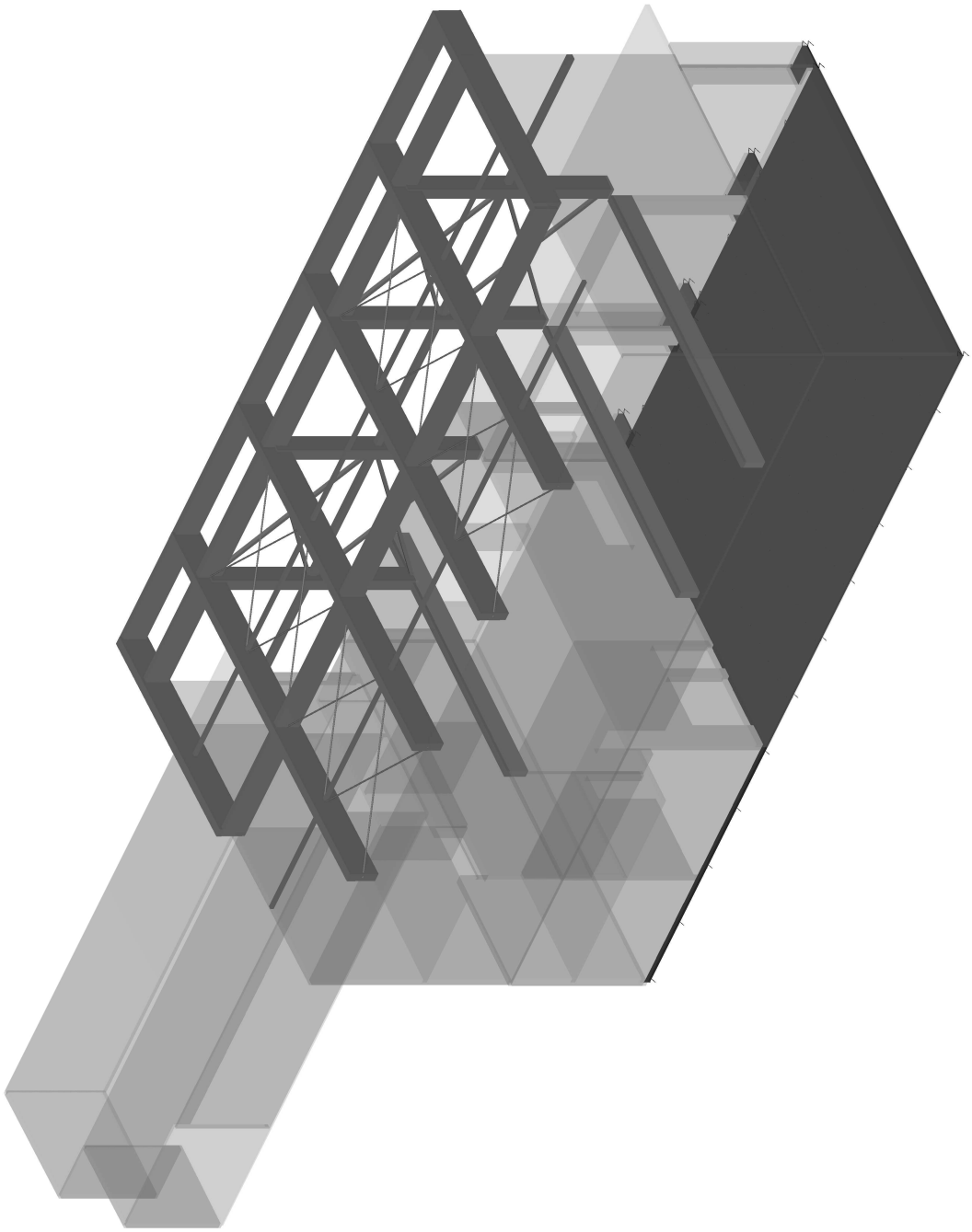
Mat.	A1	A2	A3	I1	I2	I3
3 - Stahl	3.419e-3	1.920e-3	1.920e-3	1.155e-5	6.968e-6	6.968e-6



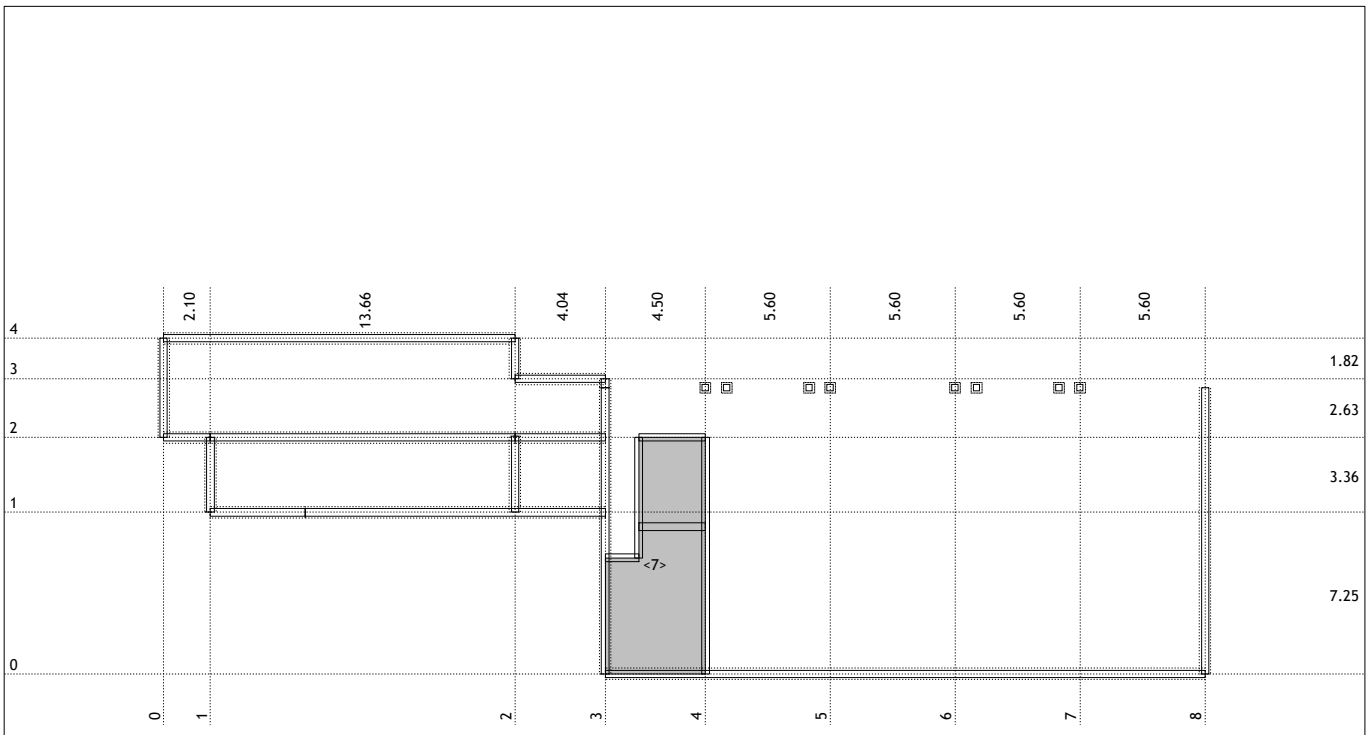
[cm]

Seti površinskih podpor

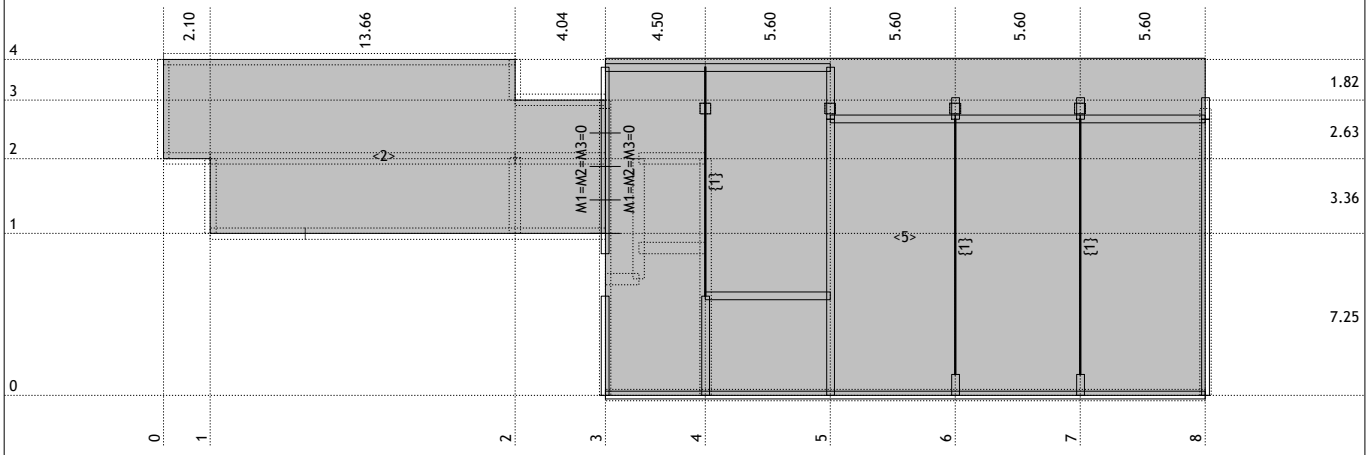
Set	K,R1	K,R2	K,R3
1	1.000e+4	1.000e+4	1.000e+4



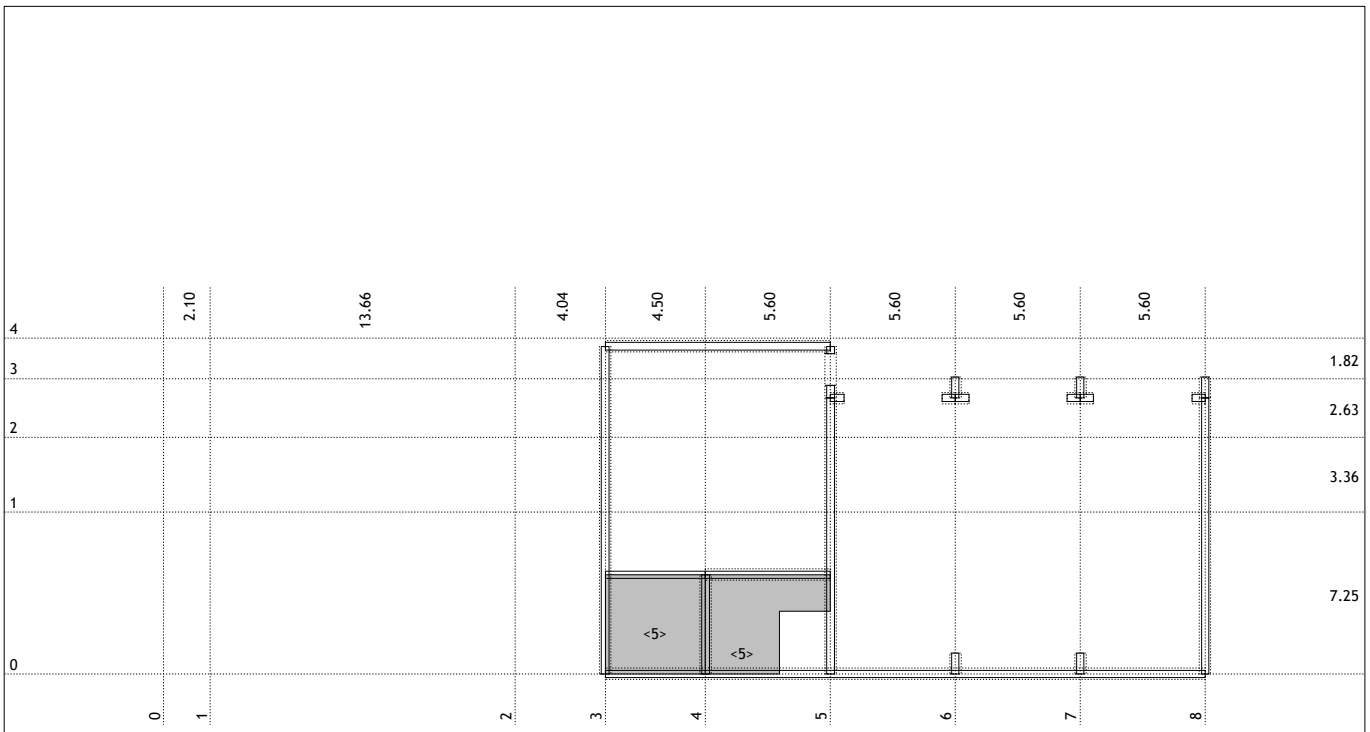
Izometrija



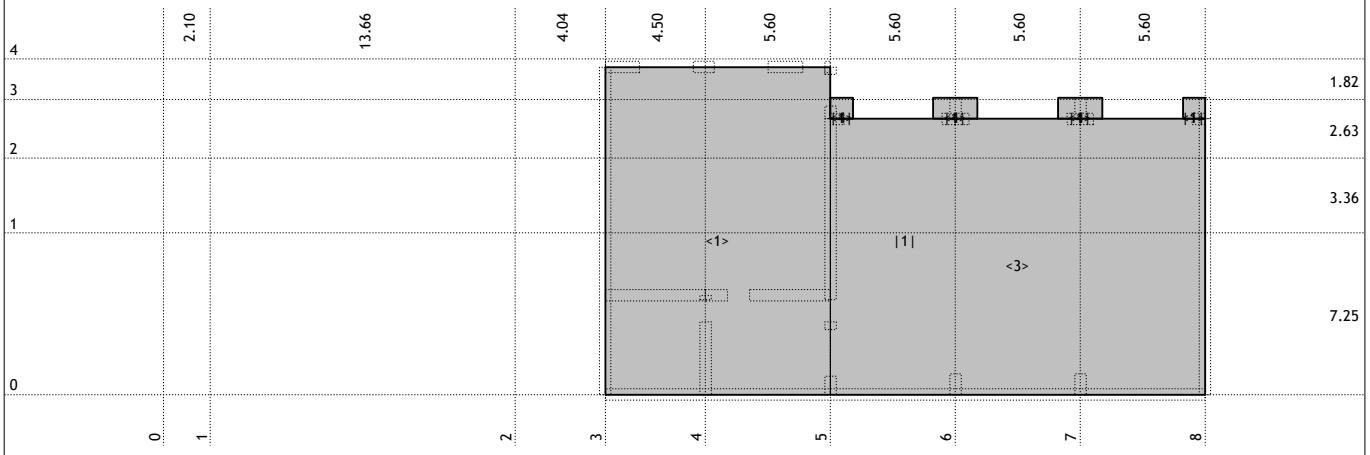
Nivo: podest nadstropja [7.70 m]



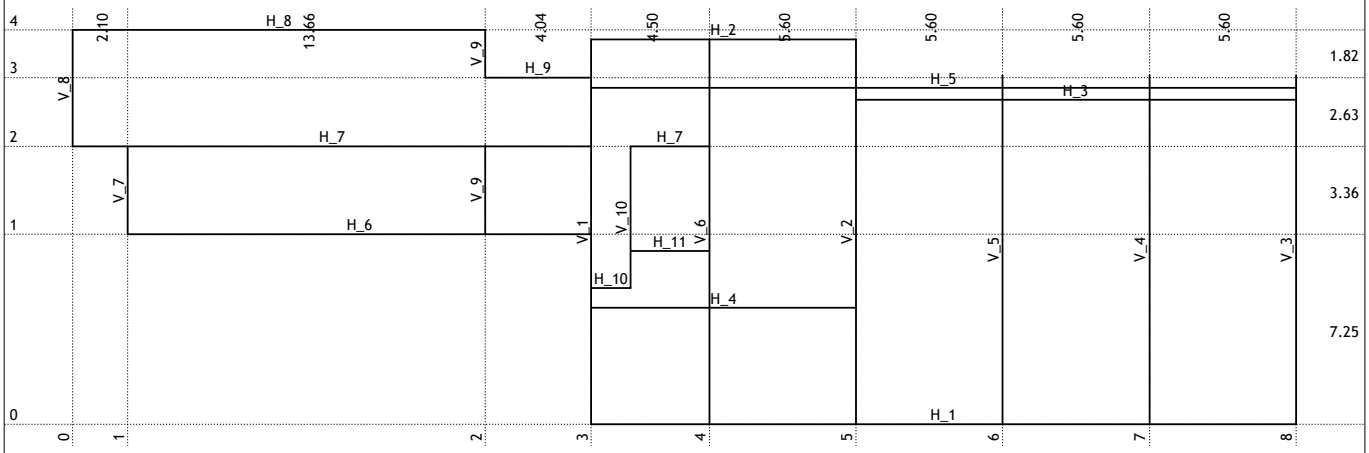
Nivo: etažna/temeljna plošča [4.70 m]



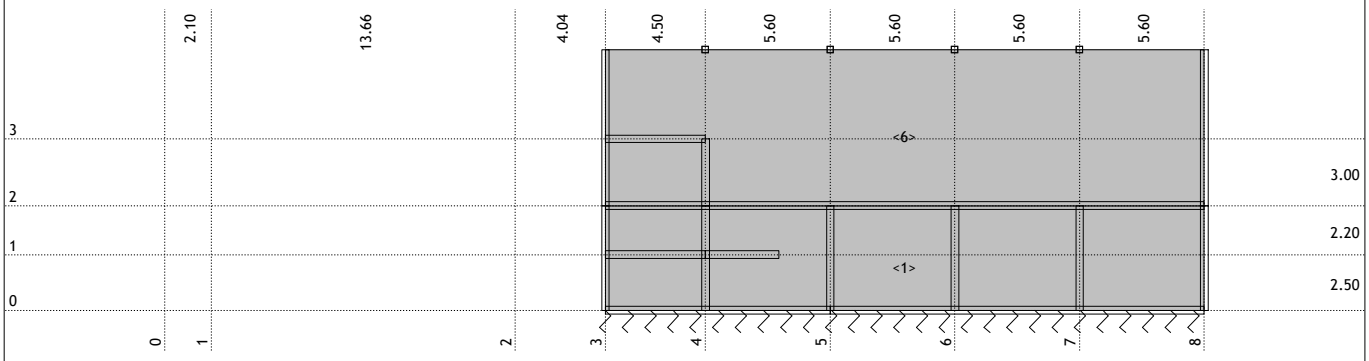
Niva: podest [2.50 m]



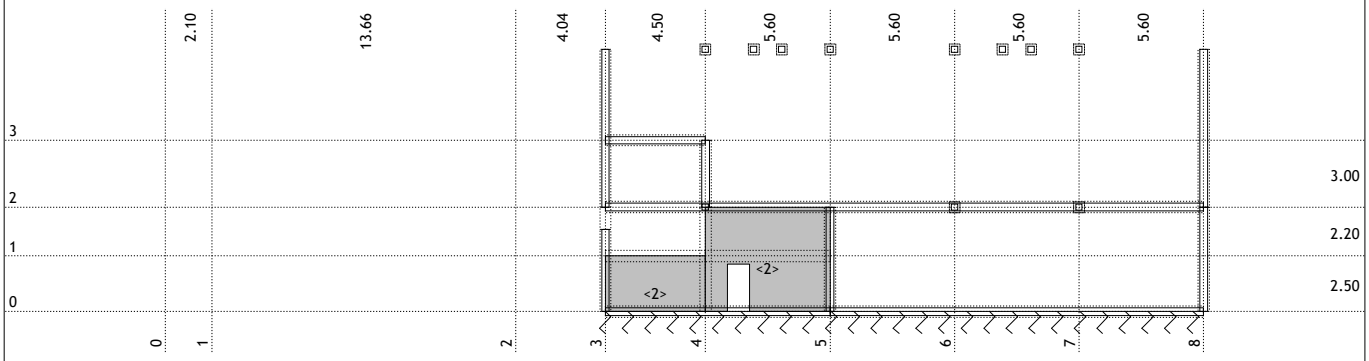
Niva: [0.00 m]



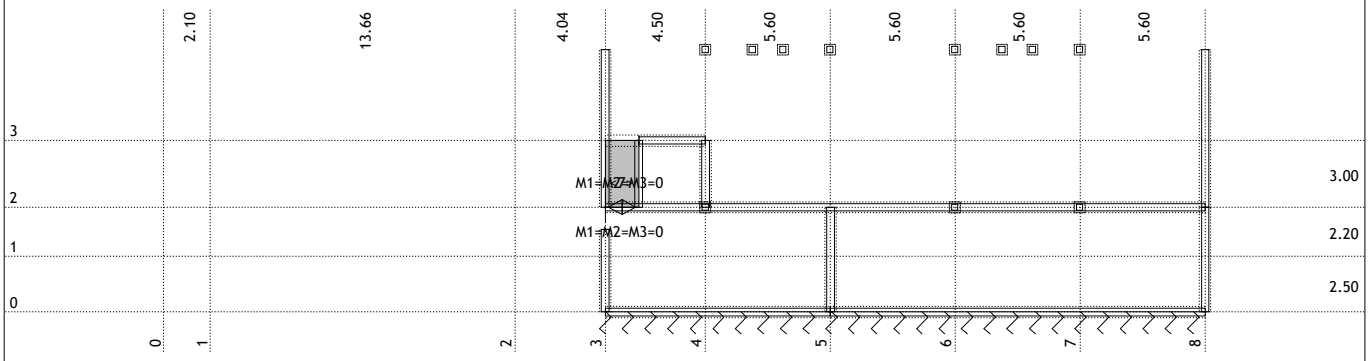
Dispozicija okvirjev



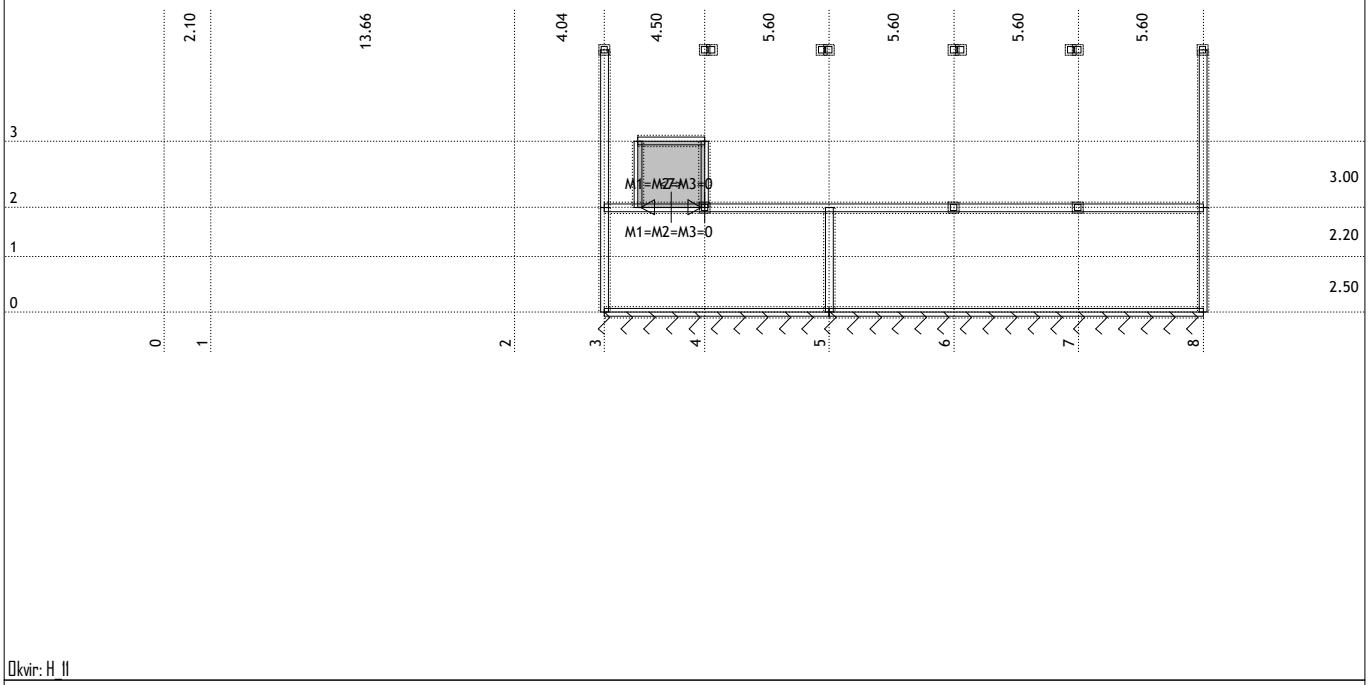
Okvir: H_1



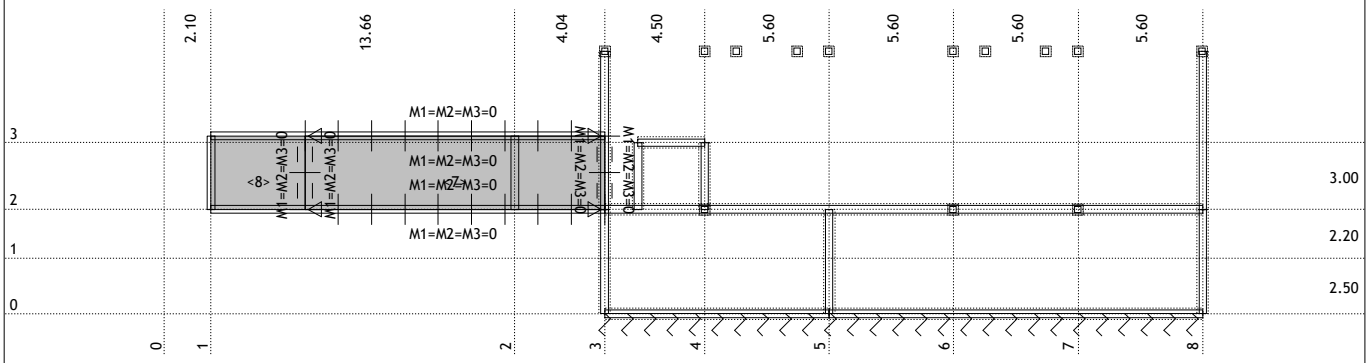
Okvir: H_4



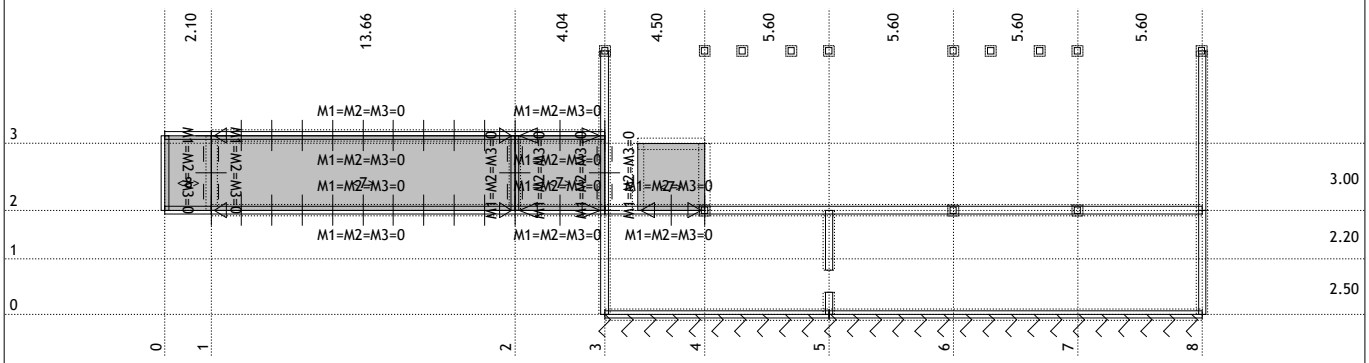
Okvir: H_10



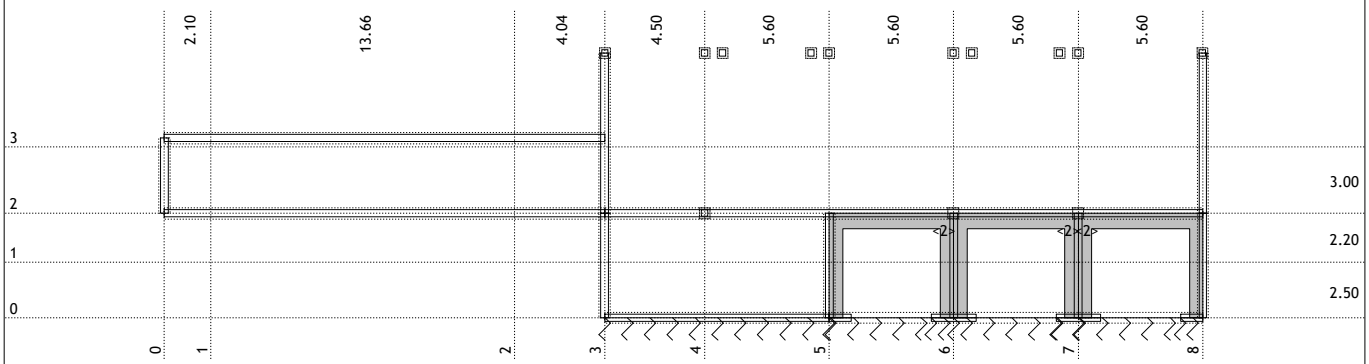
Okvir: H_II



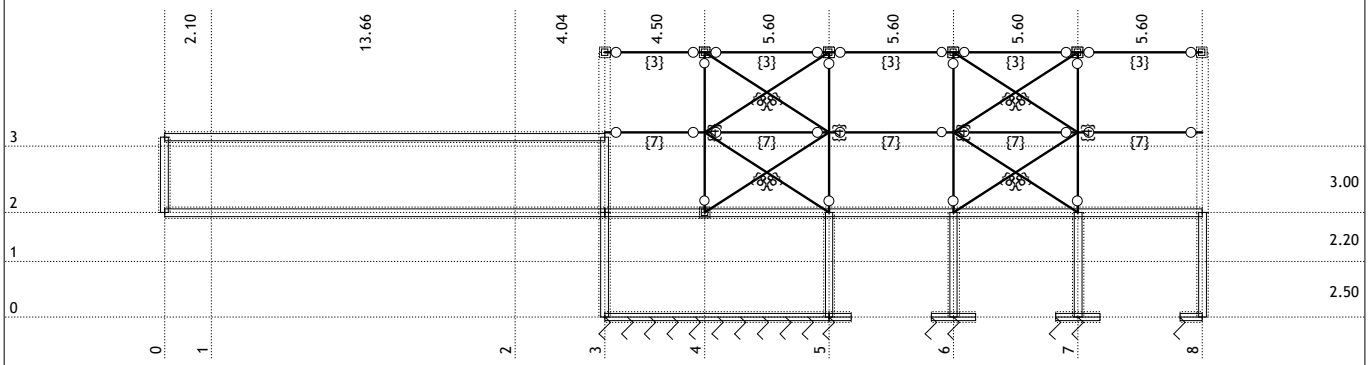
Okvir: H_6



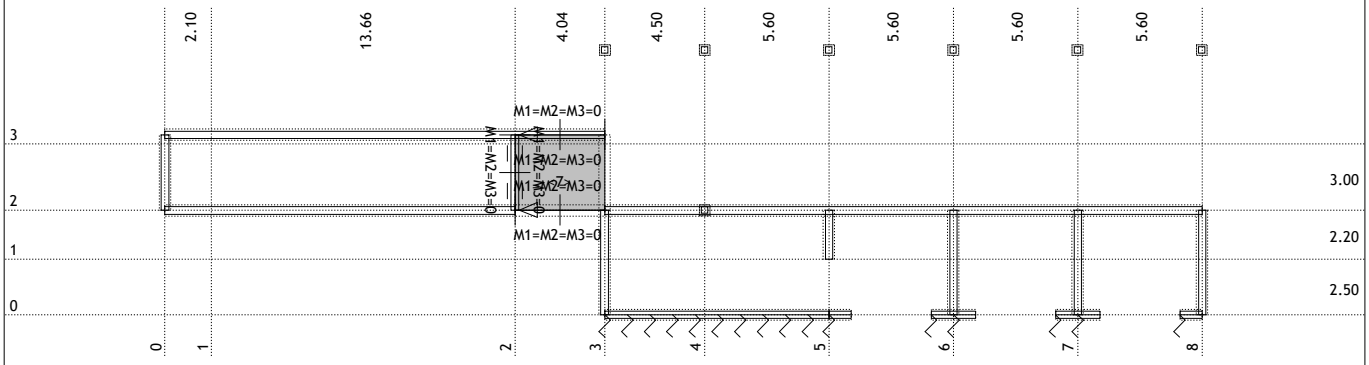
Okvir: H 7



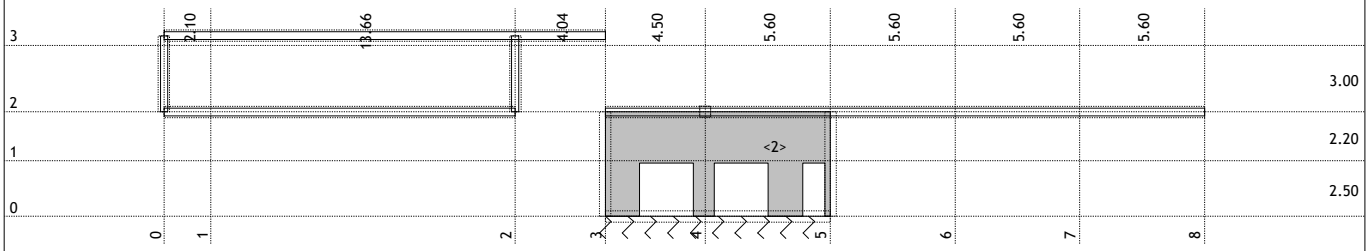
Okvir: H 3



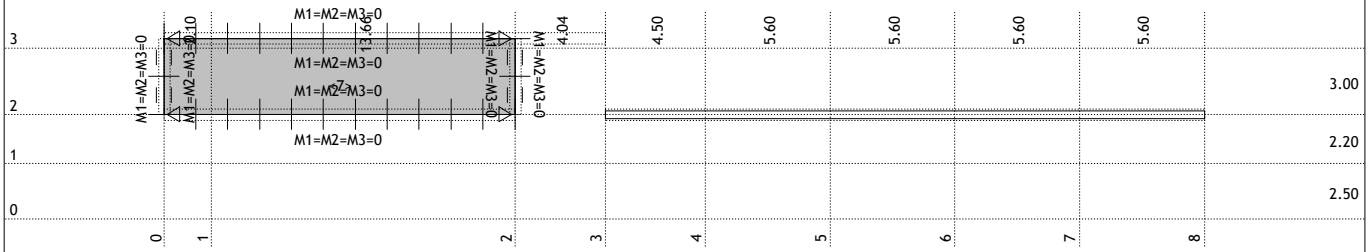
Okvir: H 5



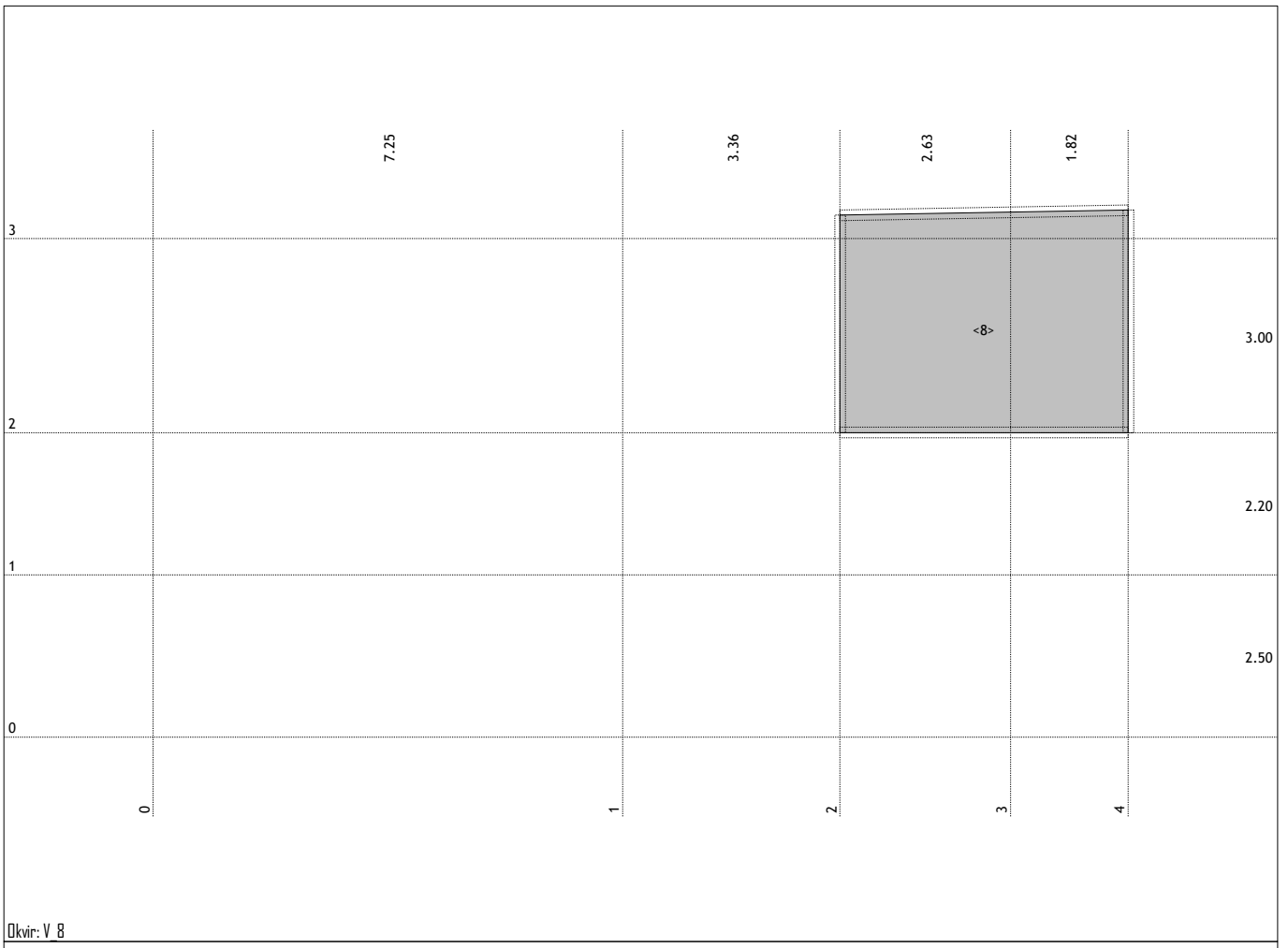
Okvir: H 9



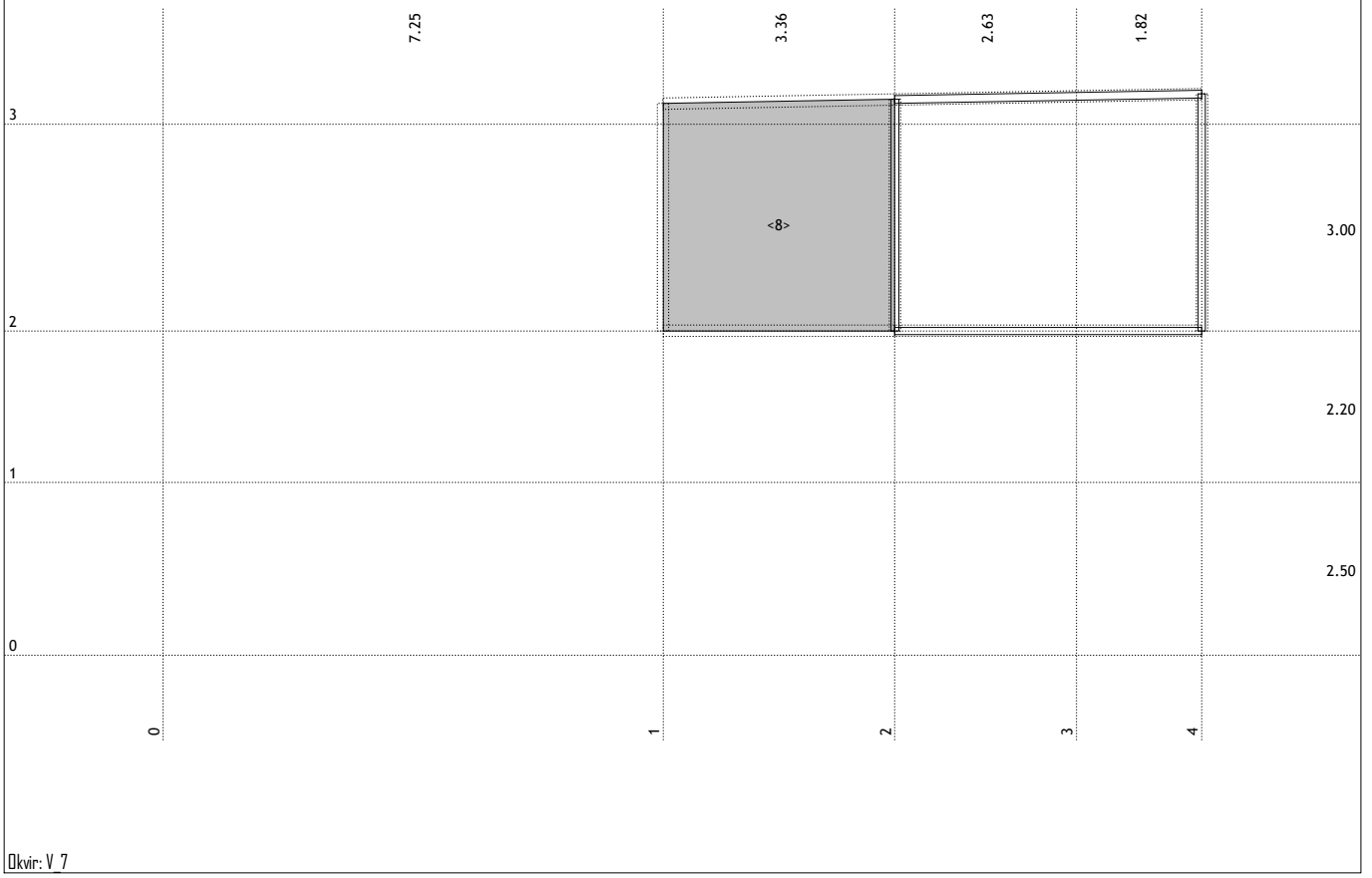
Okvir: H 2



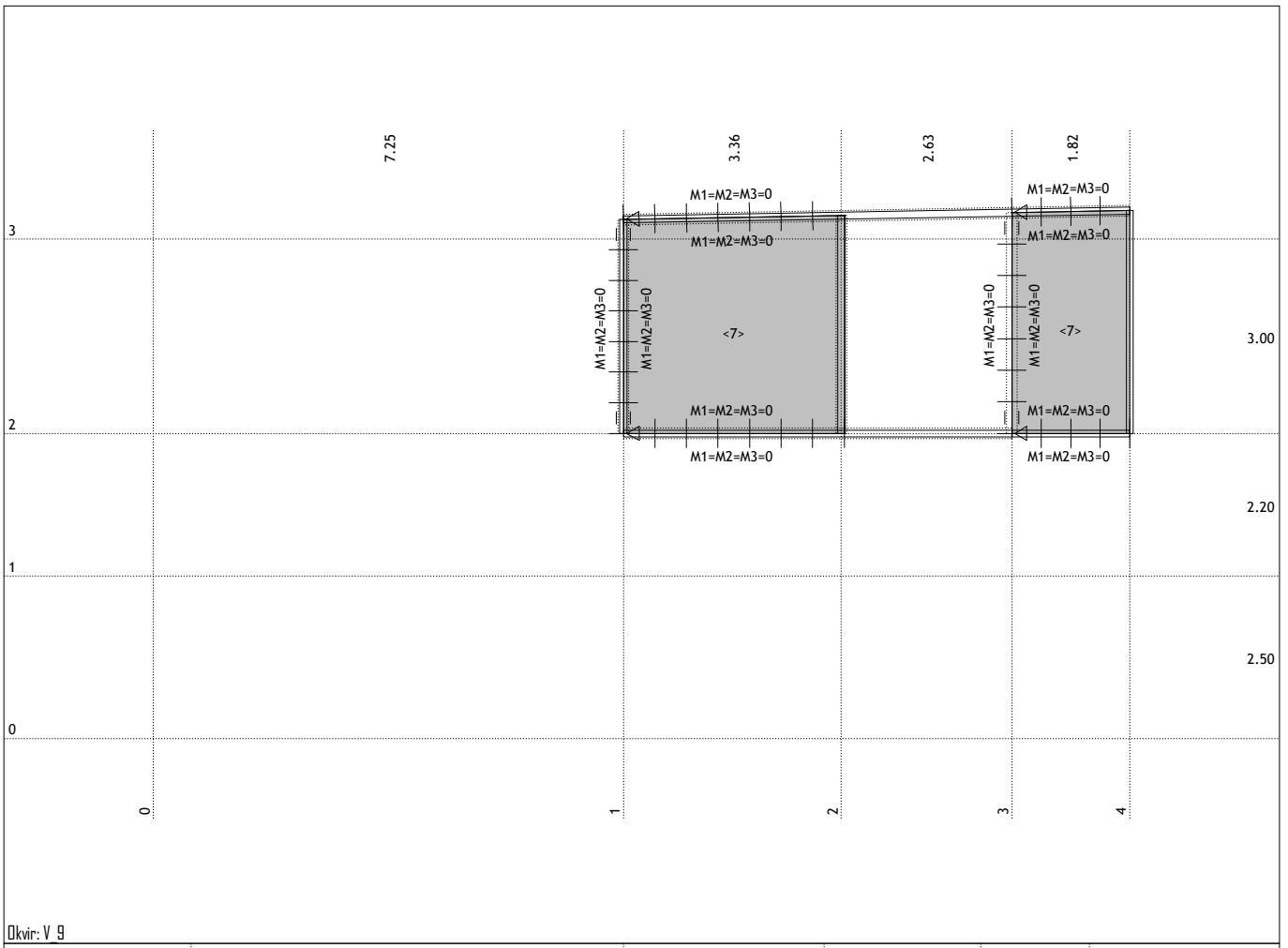
Okvir: H 8



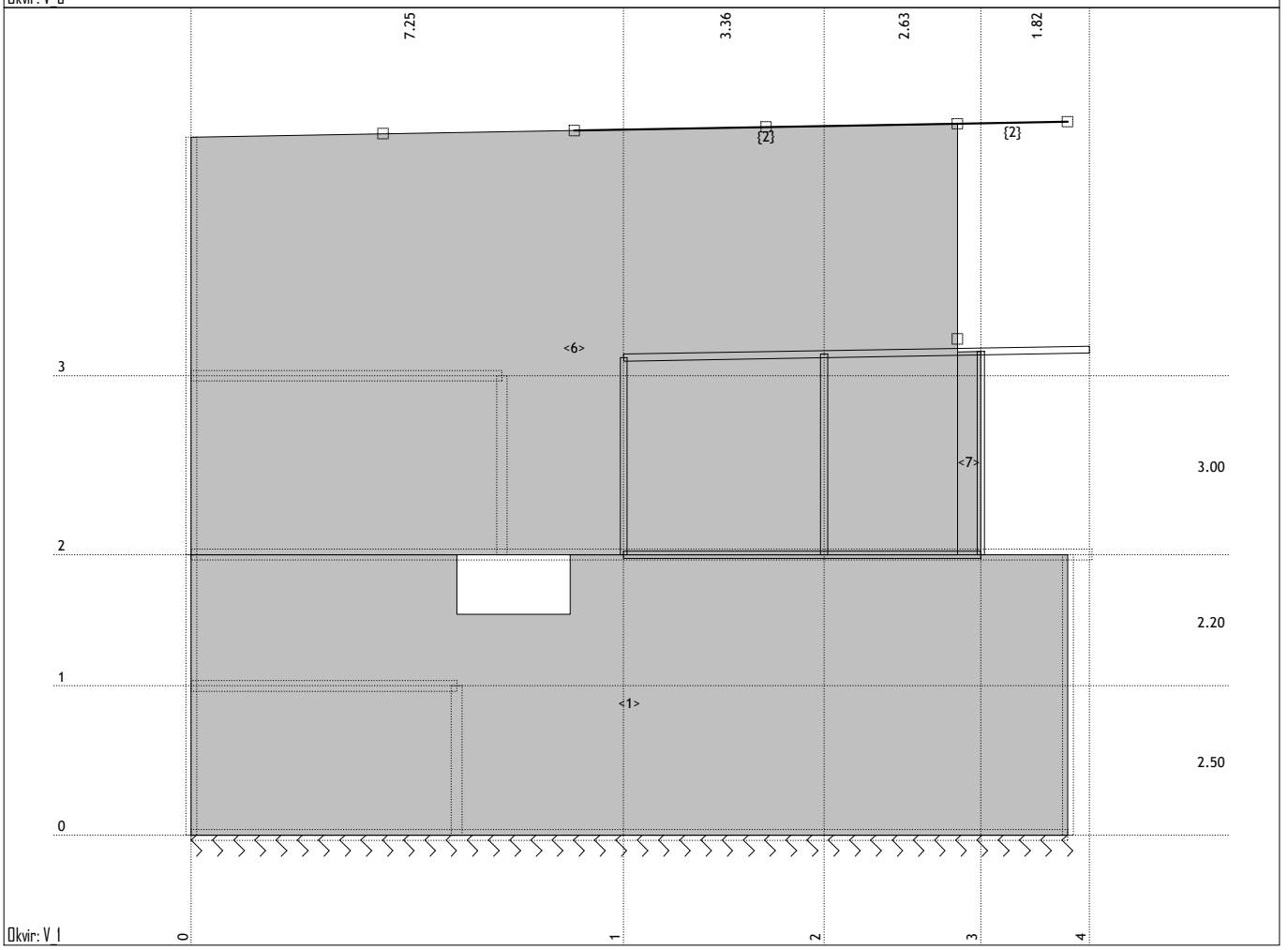
Okvir: V 8



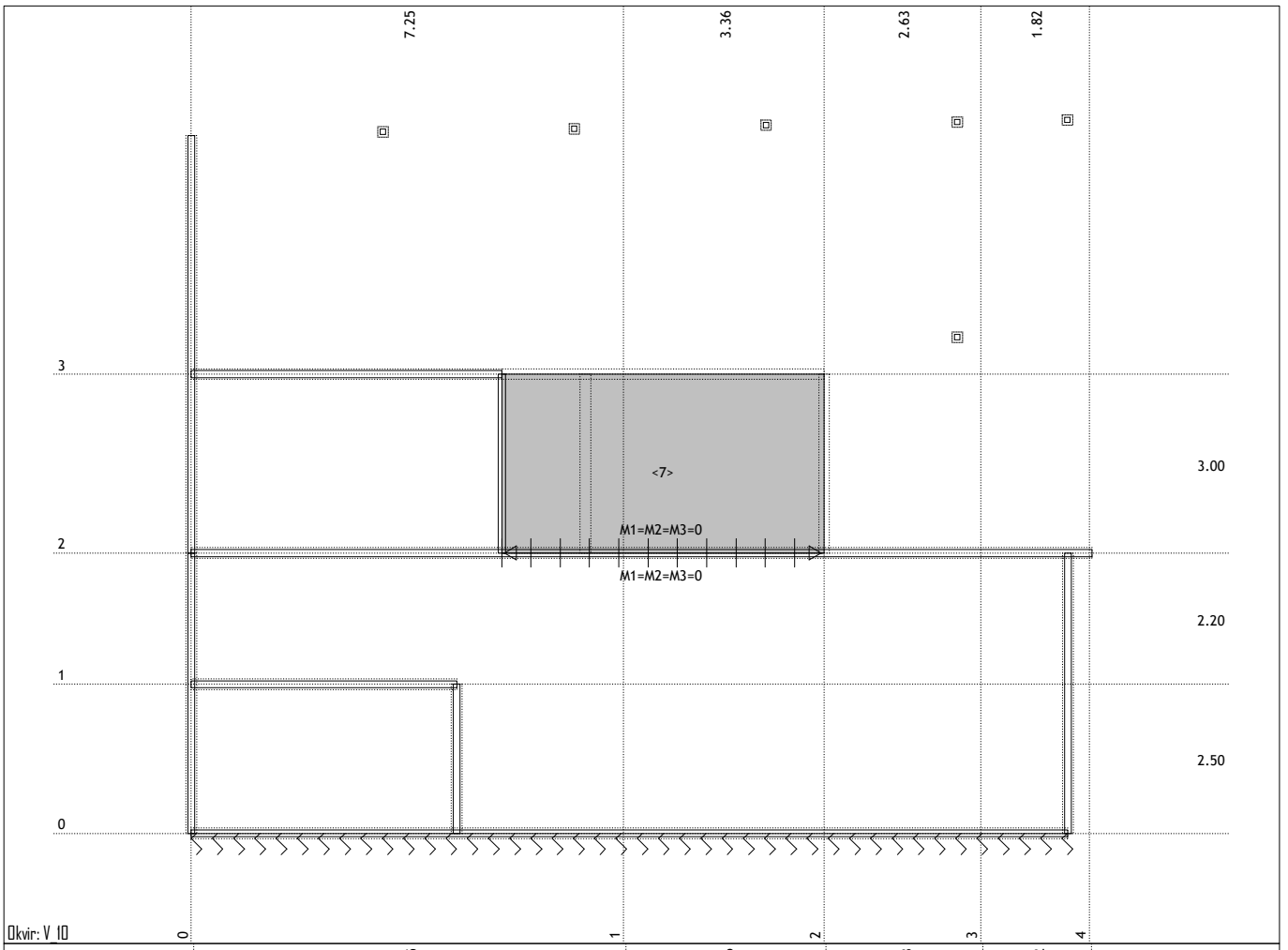
Okvir: V 7

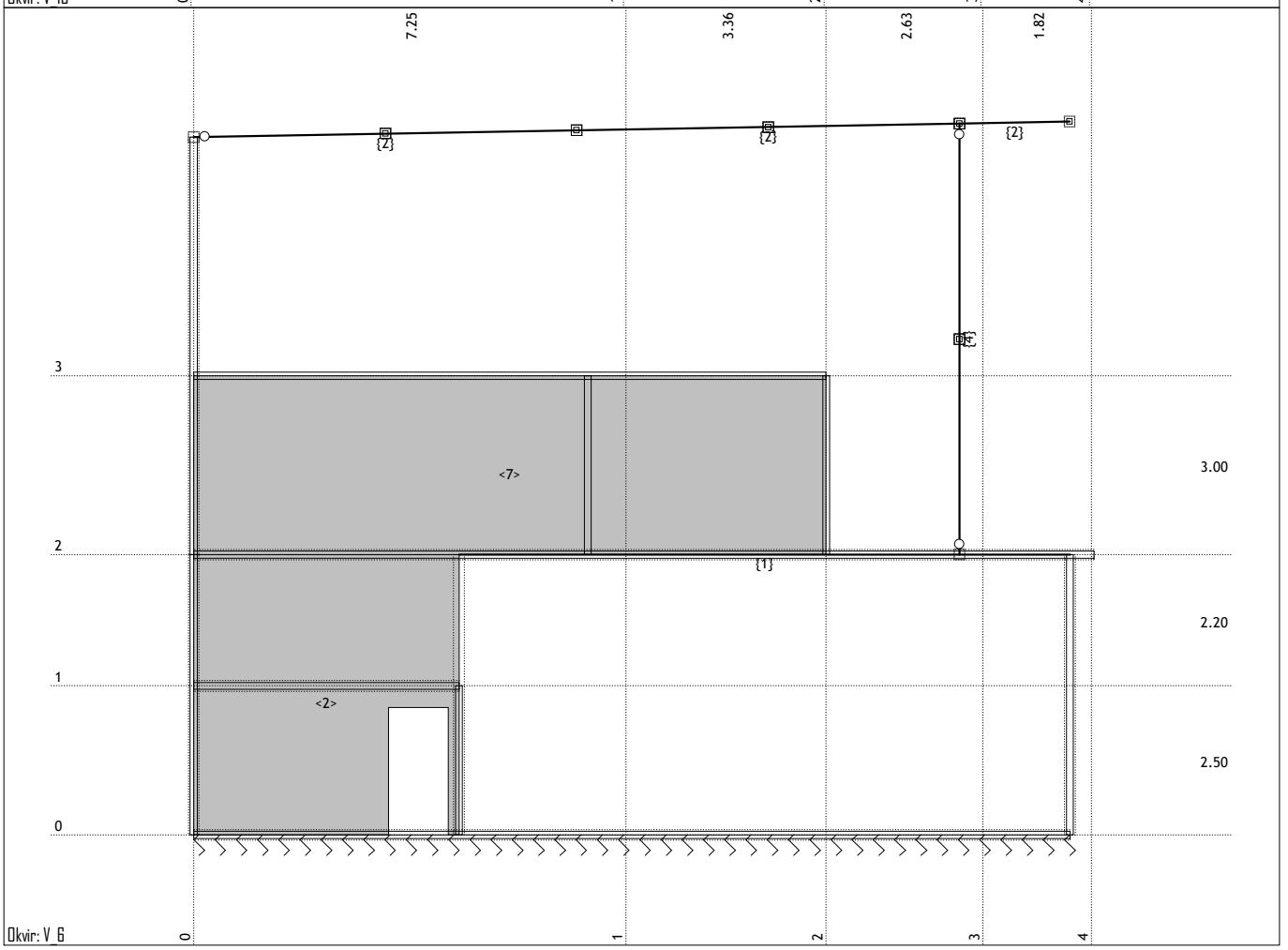


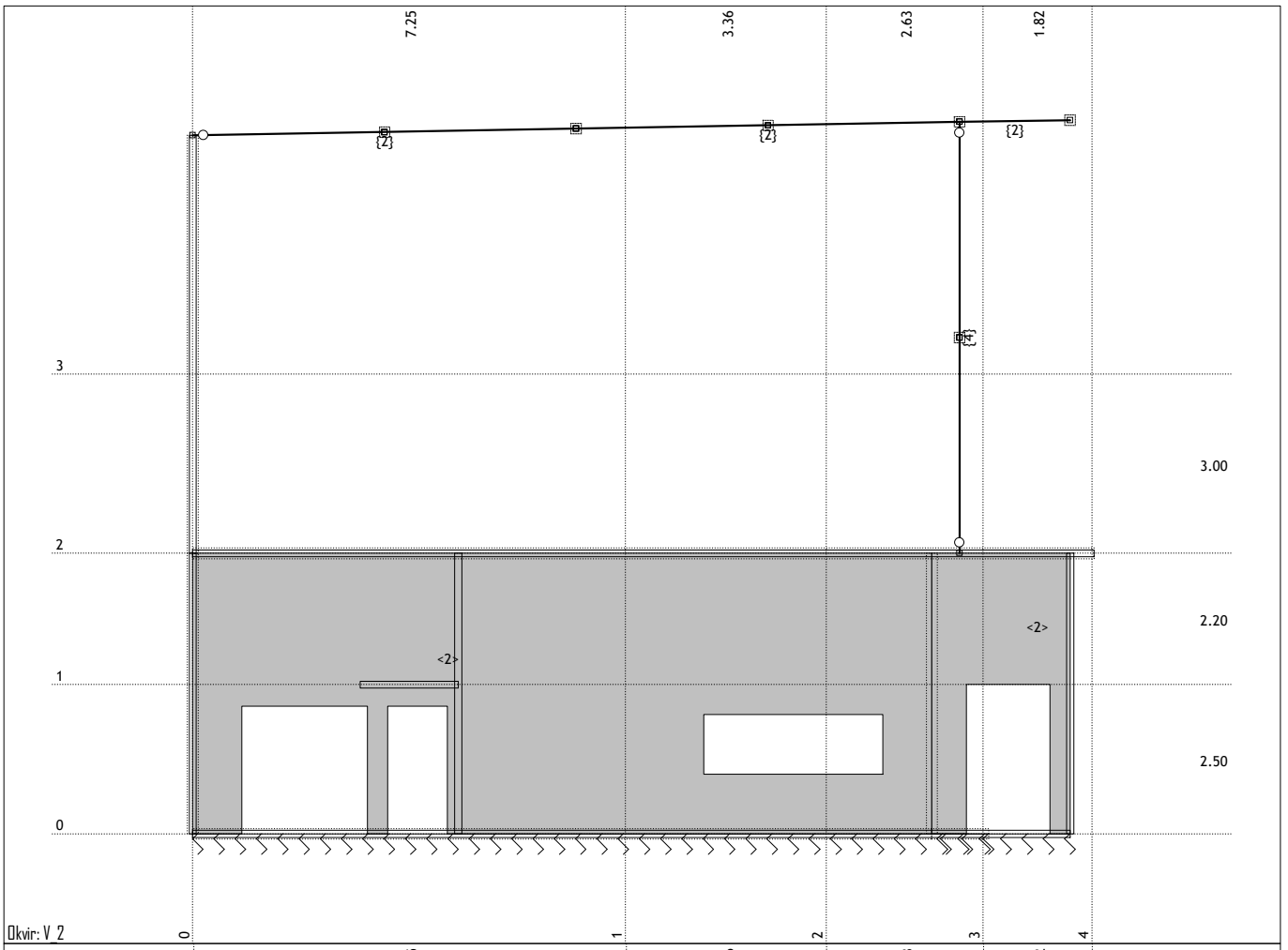
Okvir: V 9

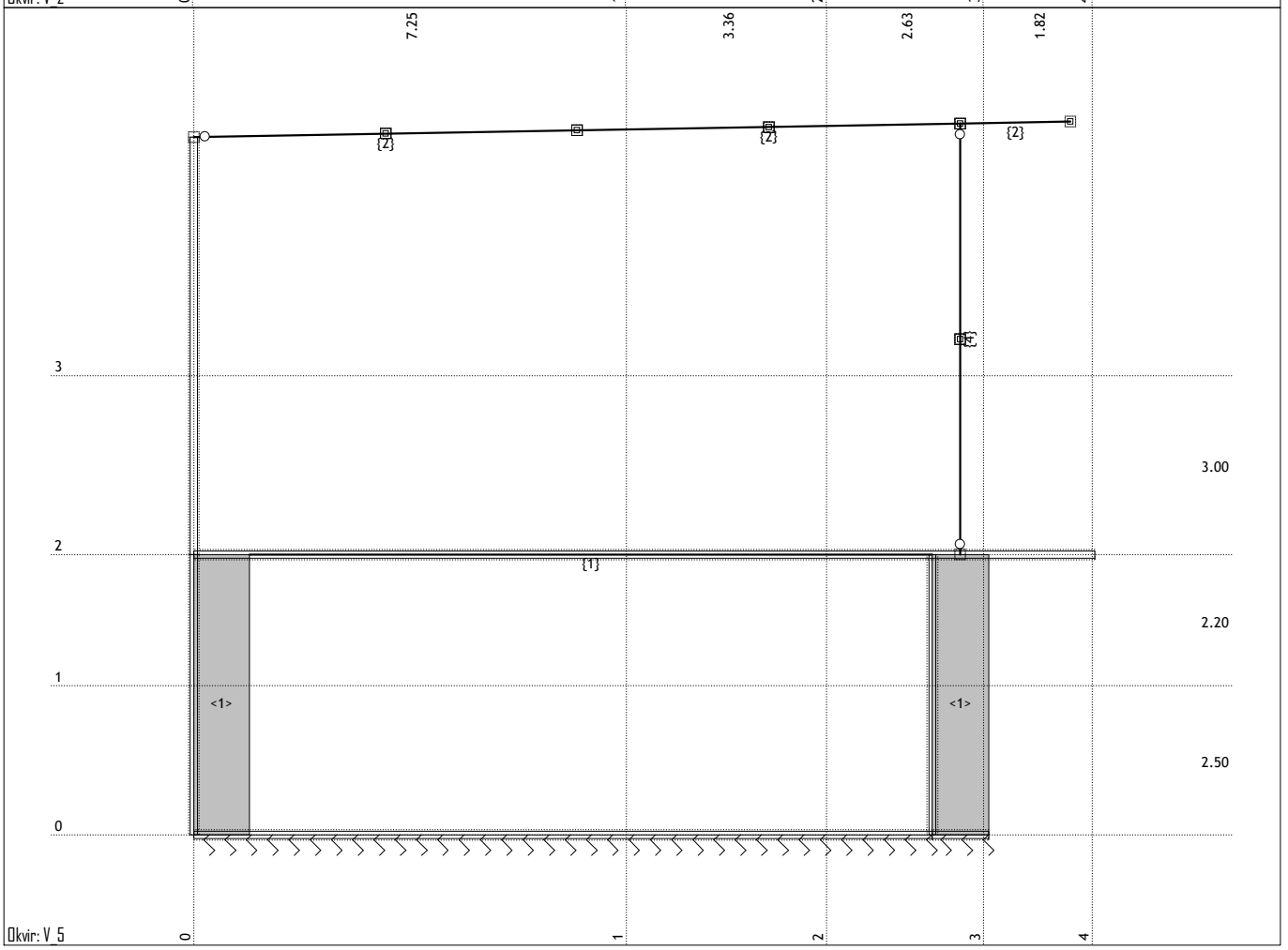


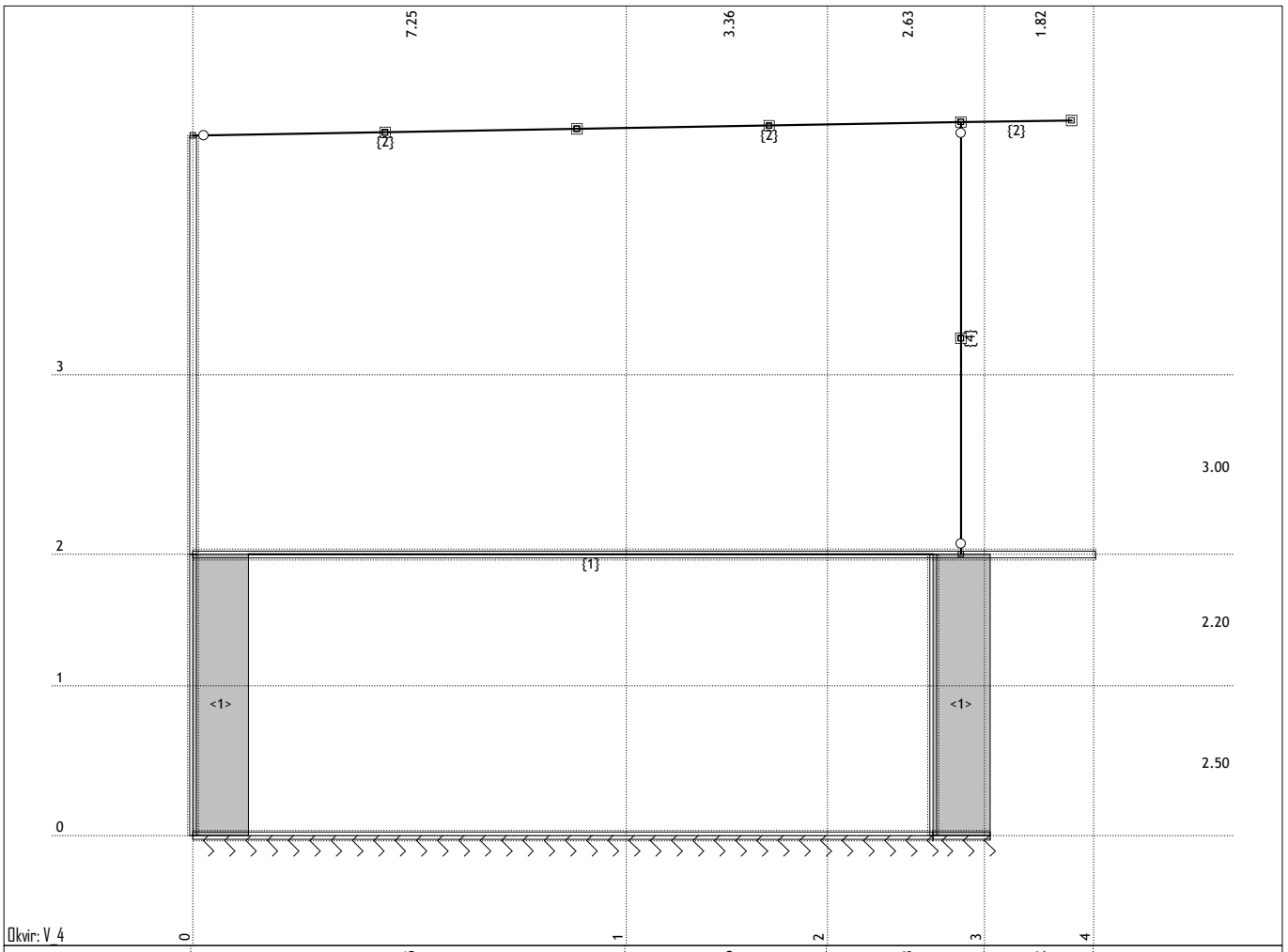
Okvir: V 1

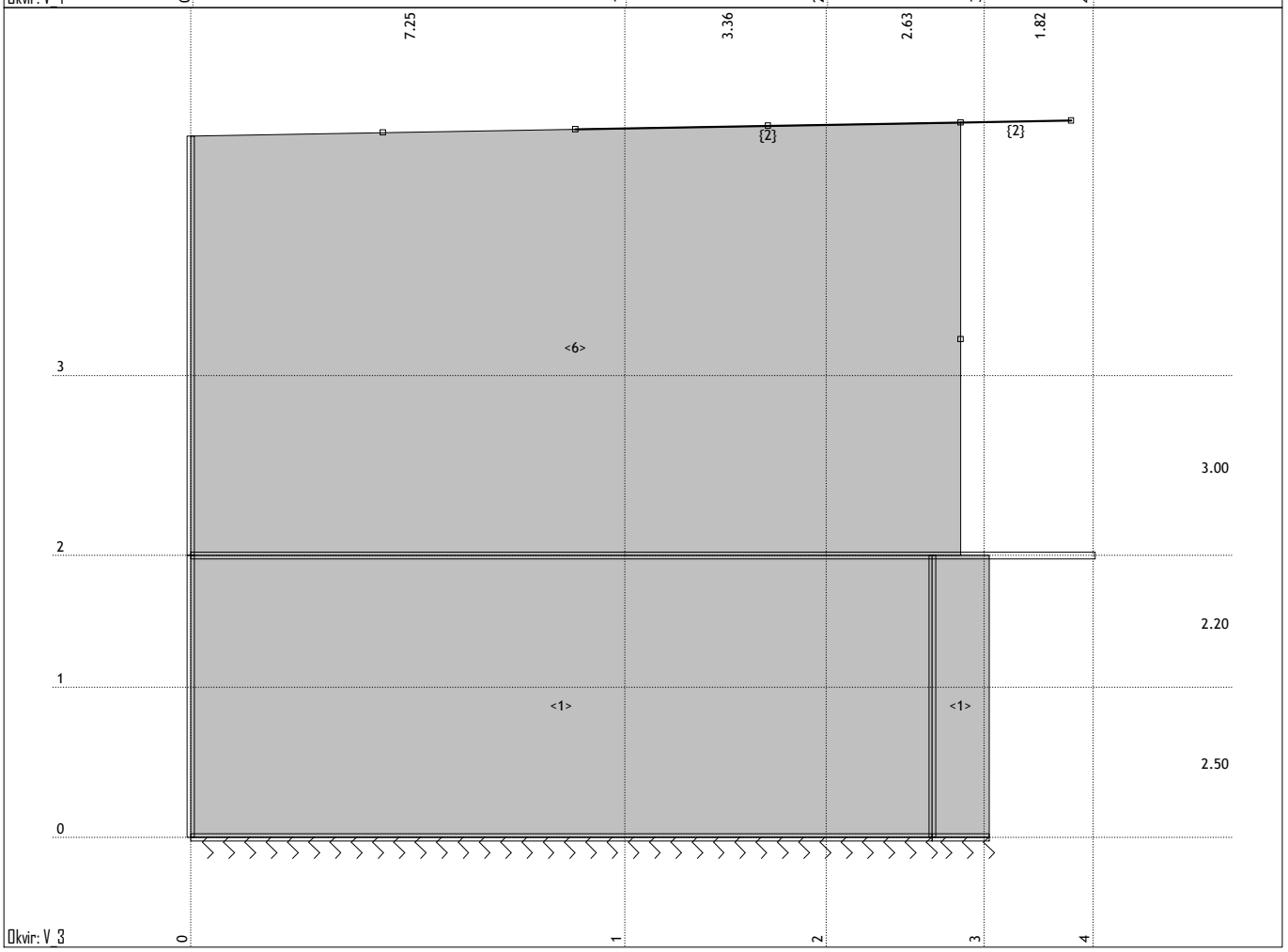

7.25
3.36
2.63
1.82
3
2
1
0
3.00
2.20
2.50
<7>
M1=M2=M3=0
M1=M2=M3=0
Okvir: V 10
0
1
2
3
4

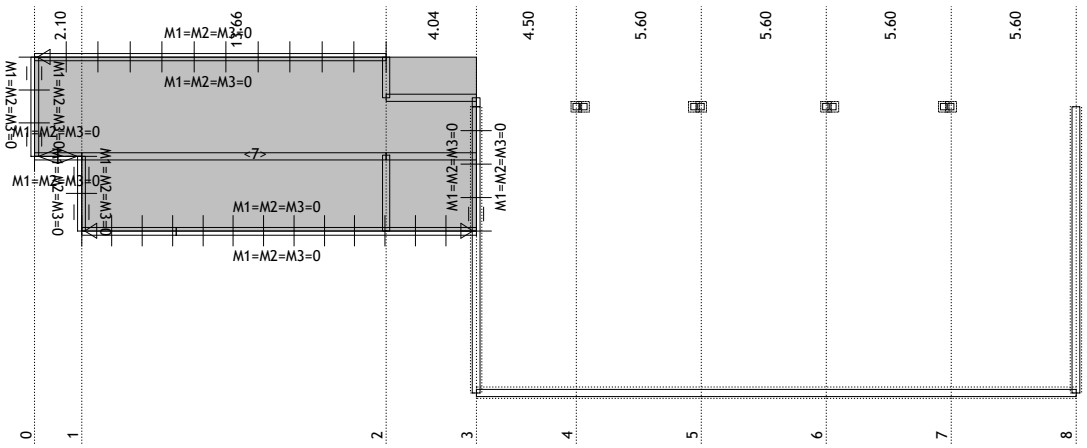

7.25
3.36
2.63
1.82
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{2}
{2}
{4}
3
2
1
0
3.00
2.20
2.50
<7>
{1}
<2>
Okvir: V 6
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1
2
3
4


7.25
3.36
2.63
1.82
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{4}
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3.00
2.20
2.50
0
1
2
3
4
Okvir: V_2

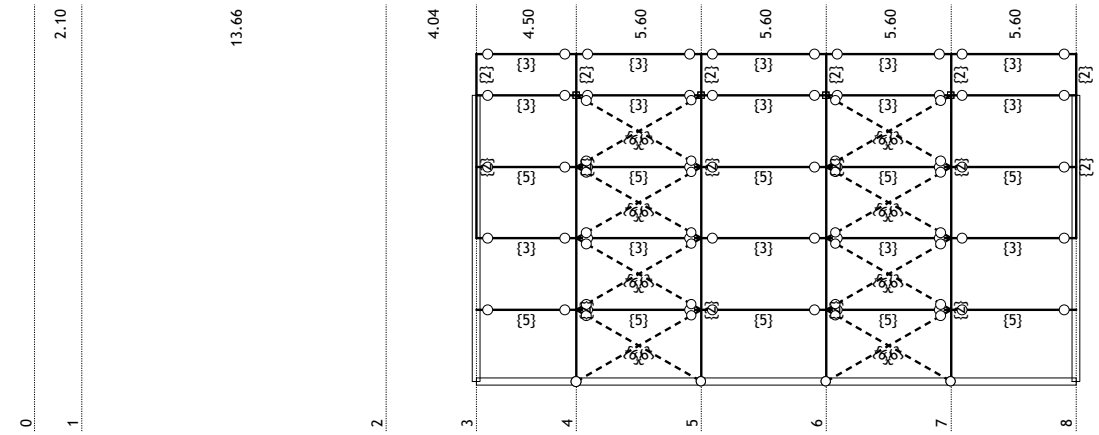

7.25
3.36
2.63
1.82
{2}
{4}
{1}
<1>
3.00
2.20
2.50
0
1
2
3
4
Okvir: V_5


7.25
3.36
2.63
1.82
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0
1
2
3
4
Okvir: V_4

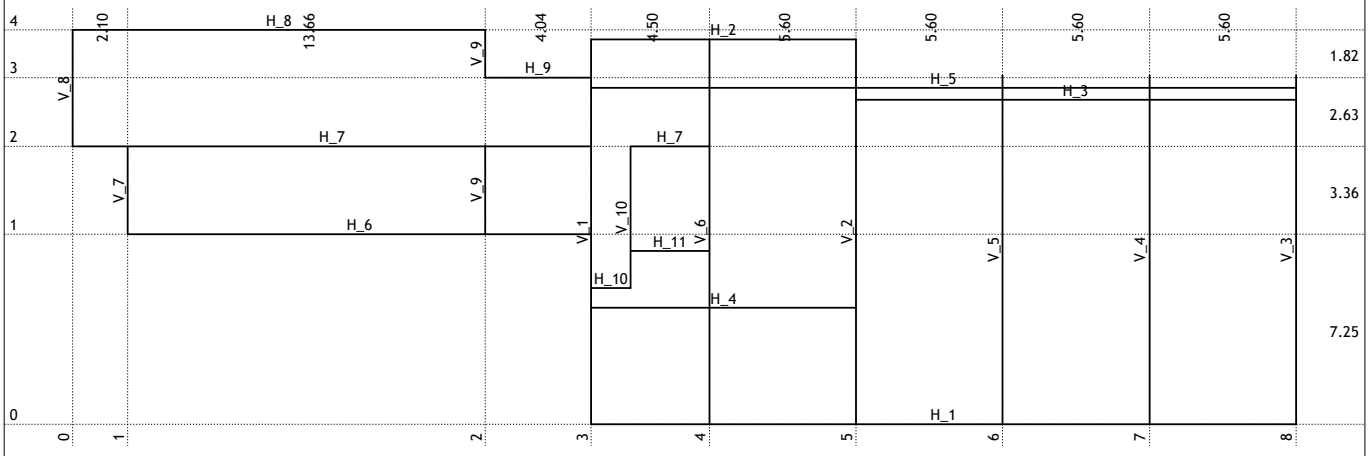

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2
3
4
Okvir: V_3



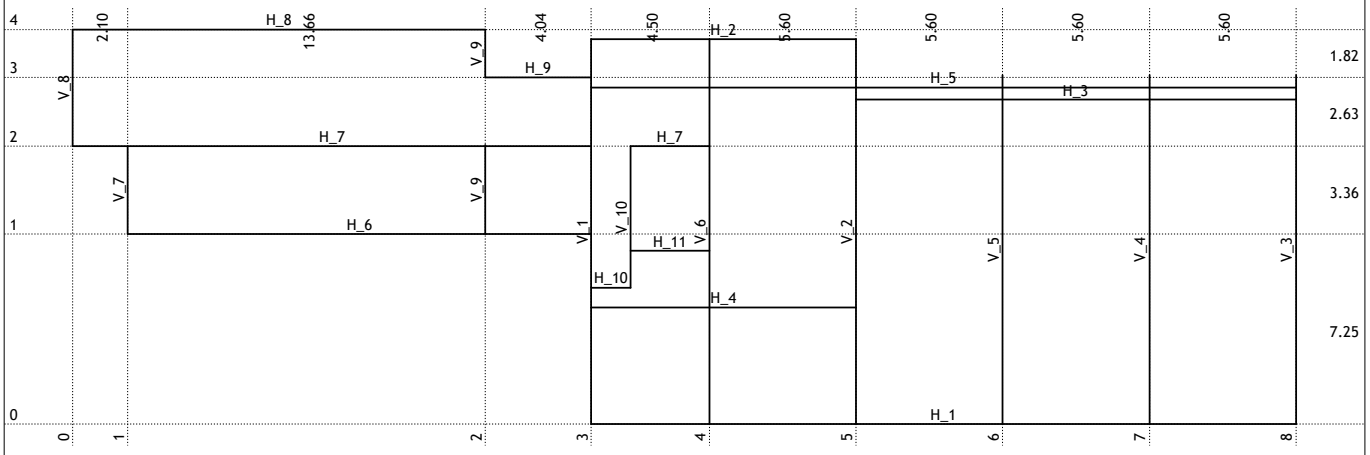
Pogled: streha aneksa



Pogled: streha



Dispozicija okvirjev



Dispozicija okvirjev

Vhodni podatki - Obtežba

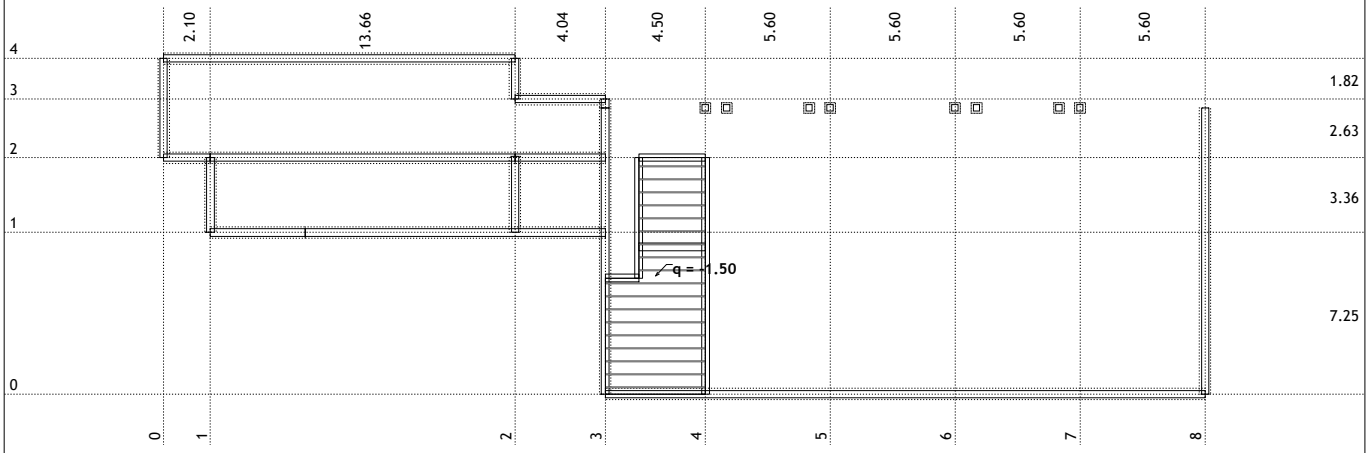
Lista obtežnih primerov

LC	Naziv
1	lastna in stalna (g)
2	sneg
3	koristna 1
4	koristna 2
5	koristna 3
6	veter preČno
7	veter vzdolžno

LC	Naziv
8	potres x
9	potres y
10	Komb.: 1.35xI+1.5xII+1.05xIII
11	Komb.: 1.35xI+1.5xII+1.05xIV
12	Komb.: 1.35xI+1.5xII+1.05xV
13	Komb.: 1.35xI+1.5xVII
14	Komb.: I+II

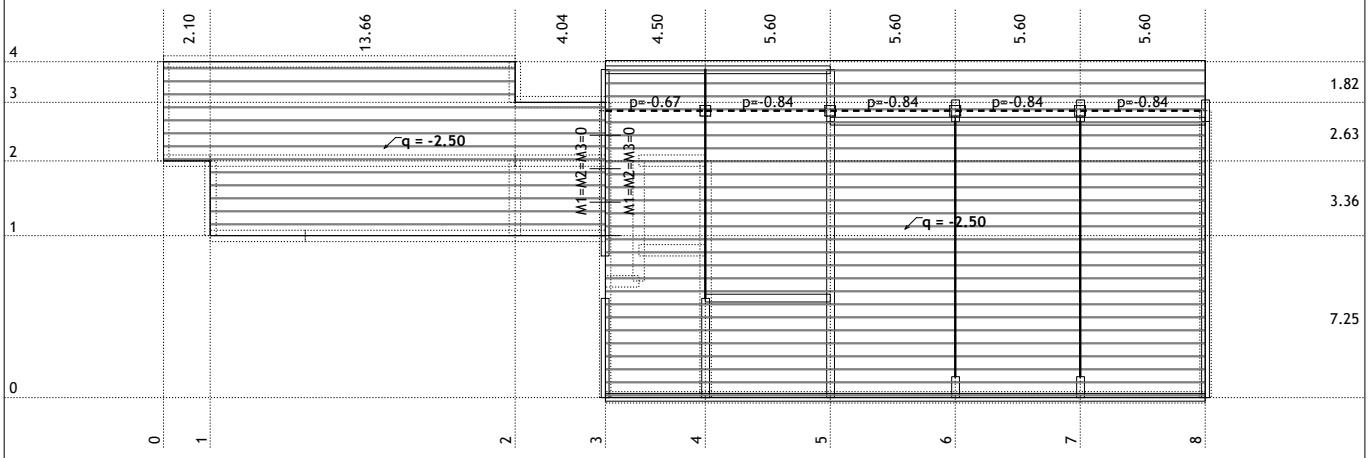
LC	Naziv
15	Komb.: I+III
16	Komb.: I+IV
17	Komb.: I+V
18	Komb.: I+VI
19	Komb.: I+VII

Obt. 1: lastna in stalna (g)



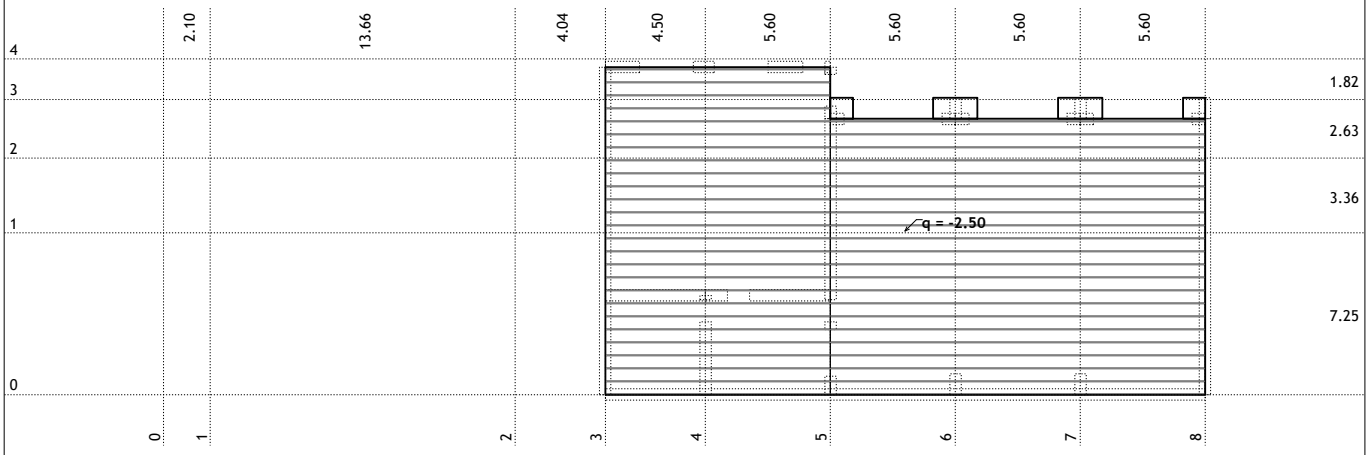
Nivo: podest nadstropja [7.70 m]

Obt. 1: lastna in stalna (g)



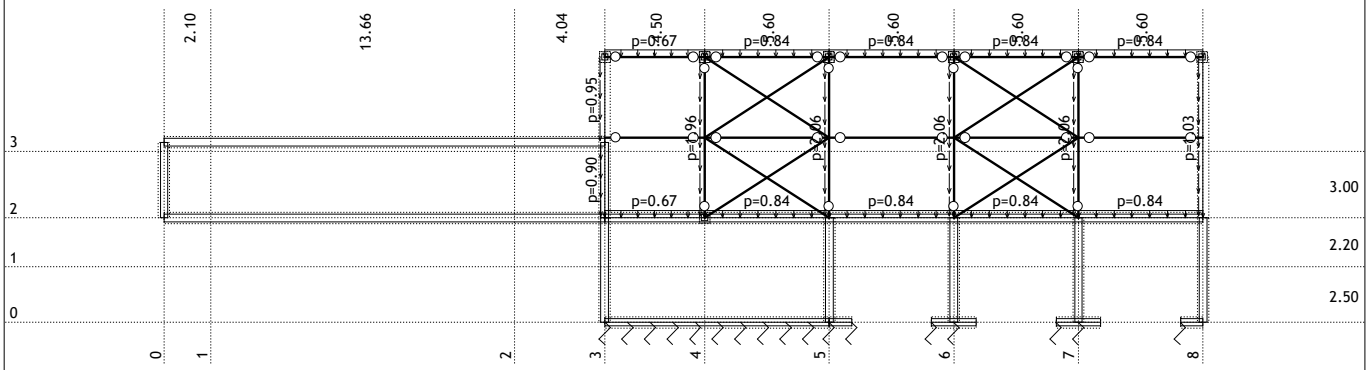
Nivo: etažna/temeljna plošča [4.70 m]

Obt. 1: lastna in stalna (g)



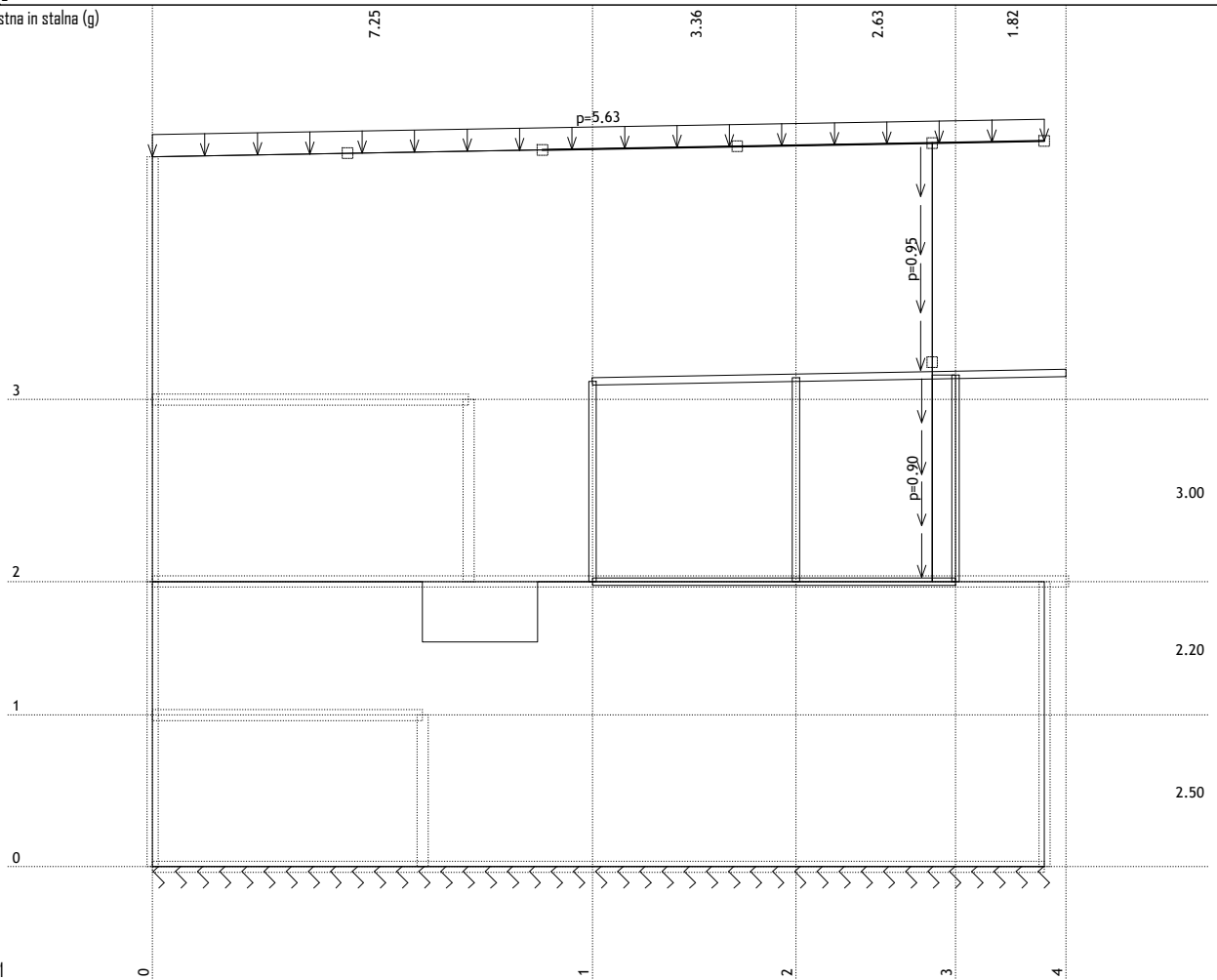
Nivo: [0.00 m]

Obt. 1: lastna in stalna (g)

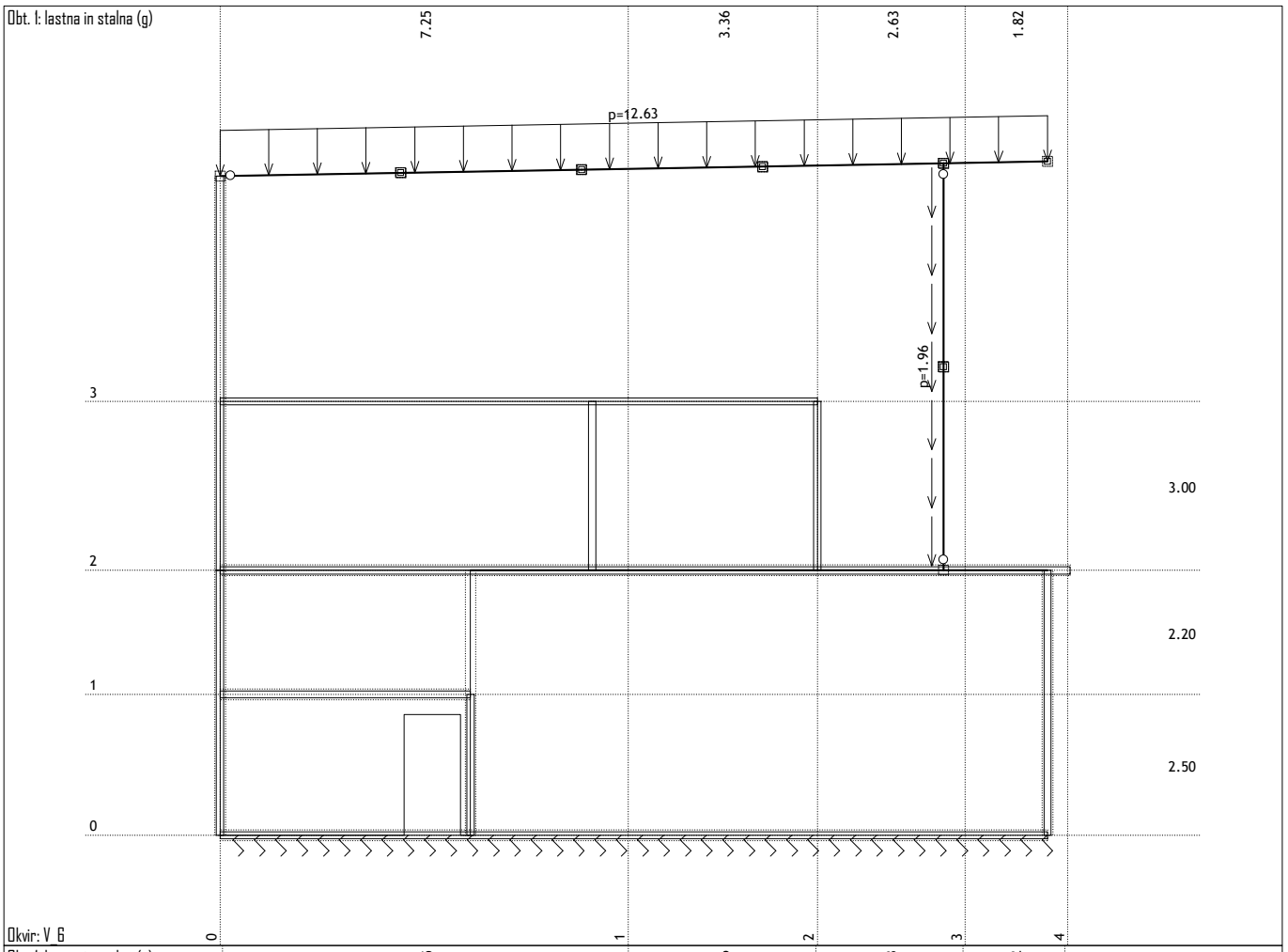


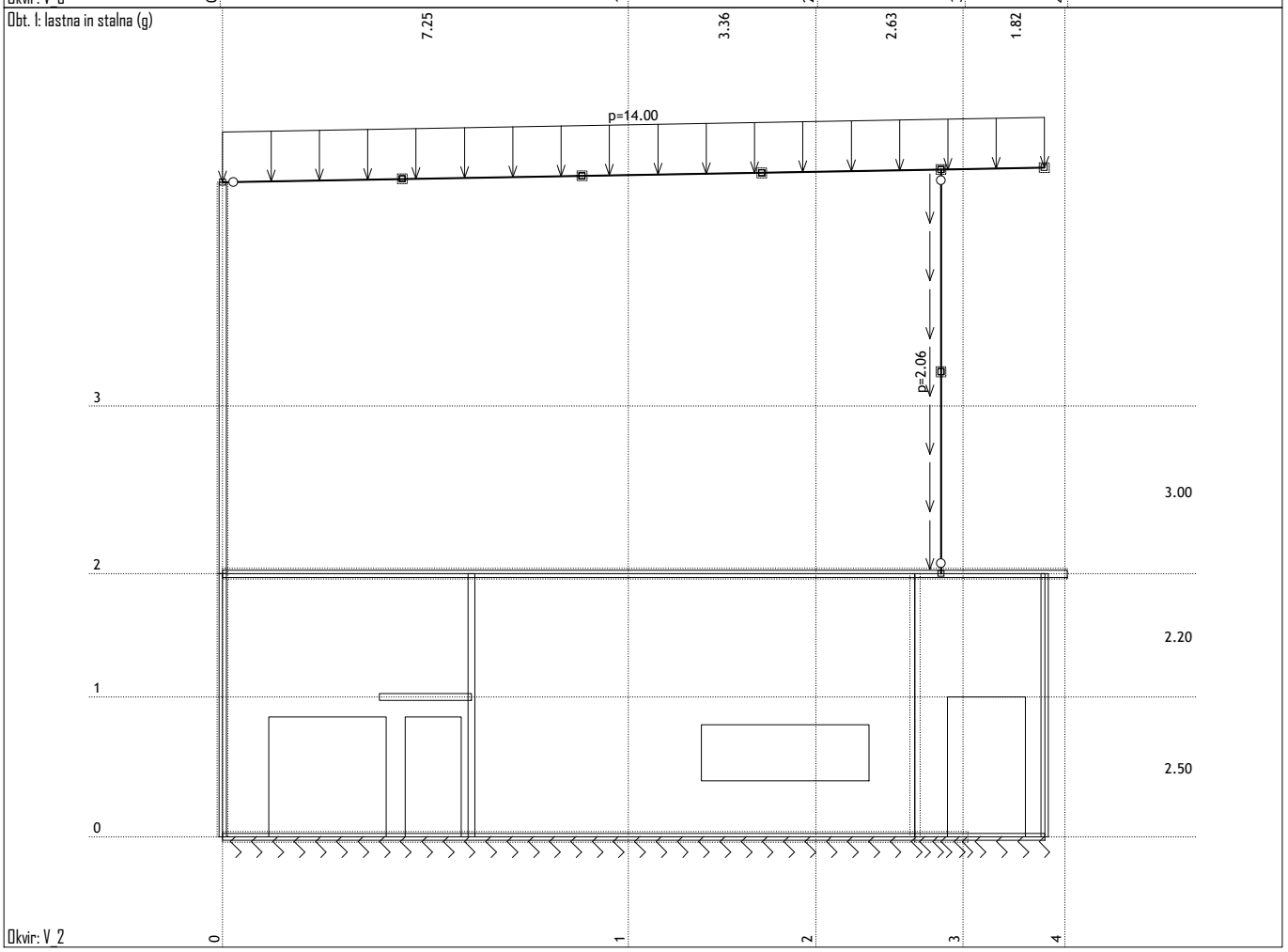
Okvir: H 5

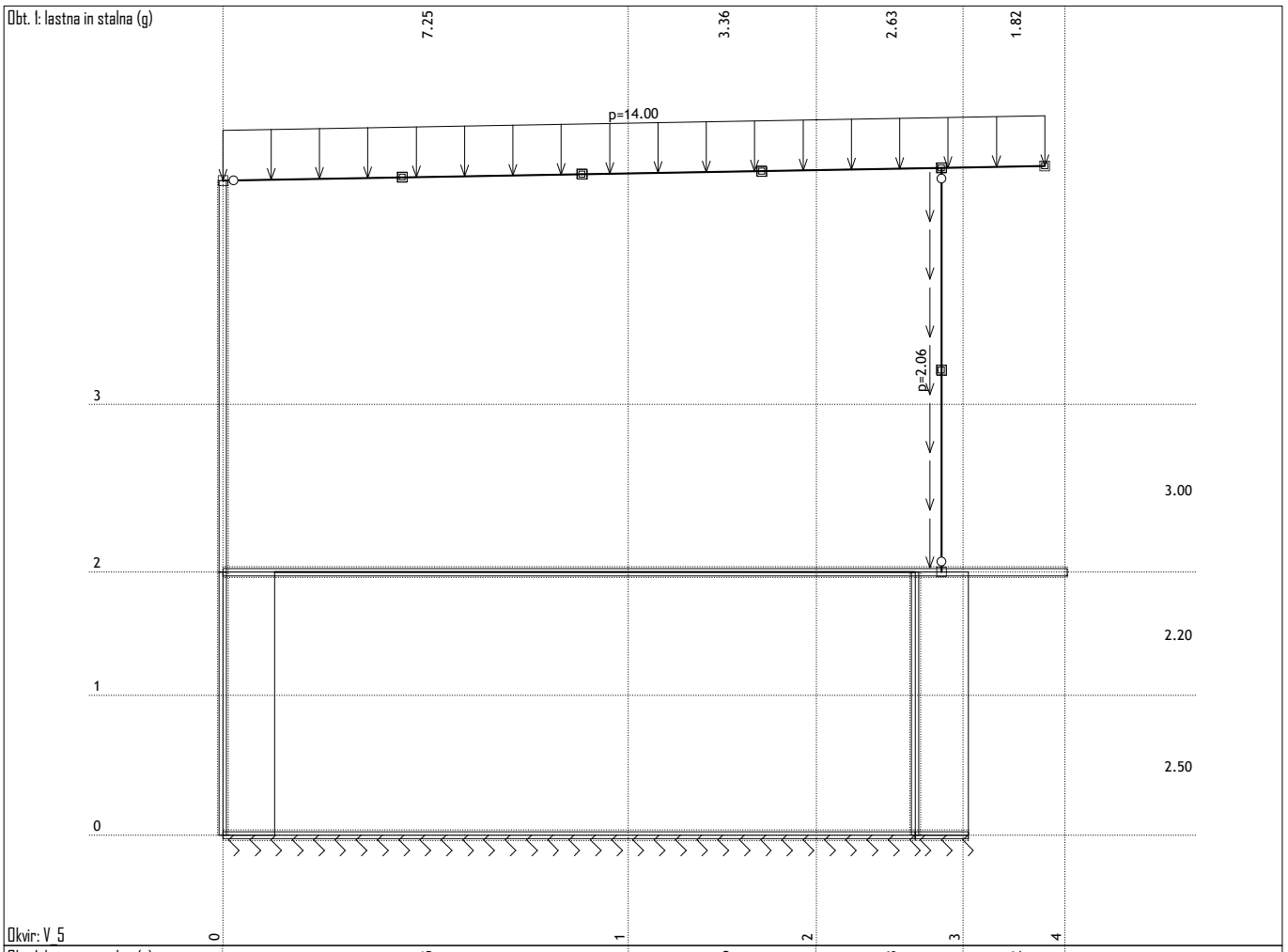
Obt. 1: lastna in stalna (g)

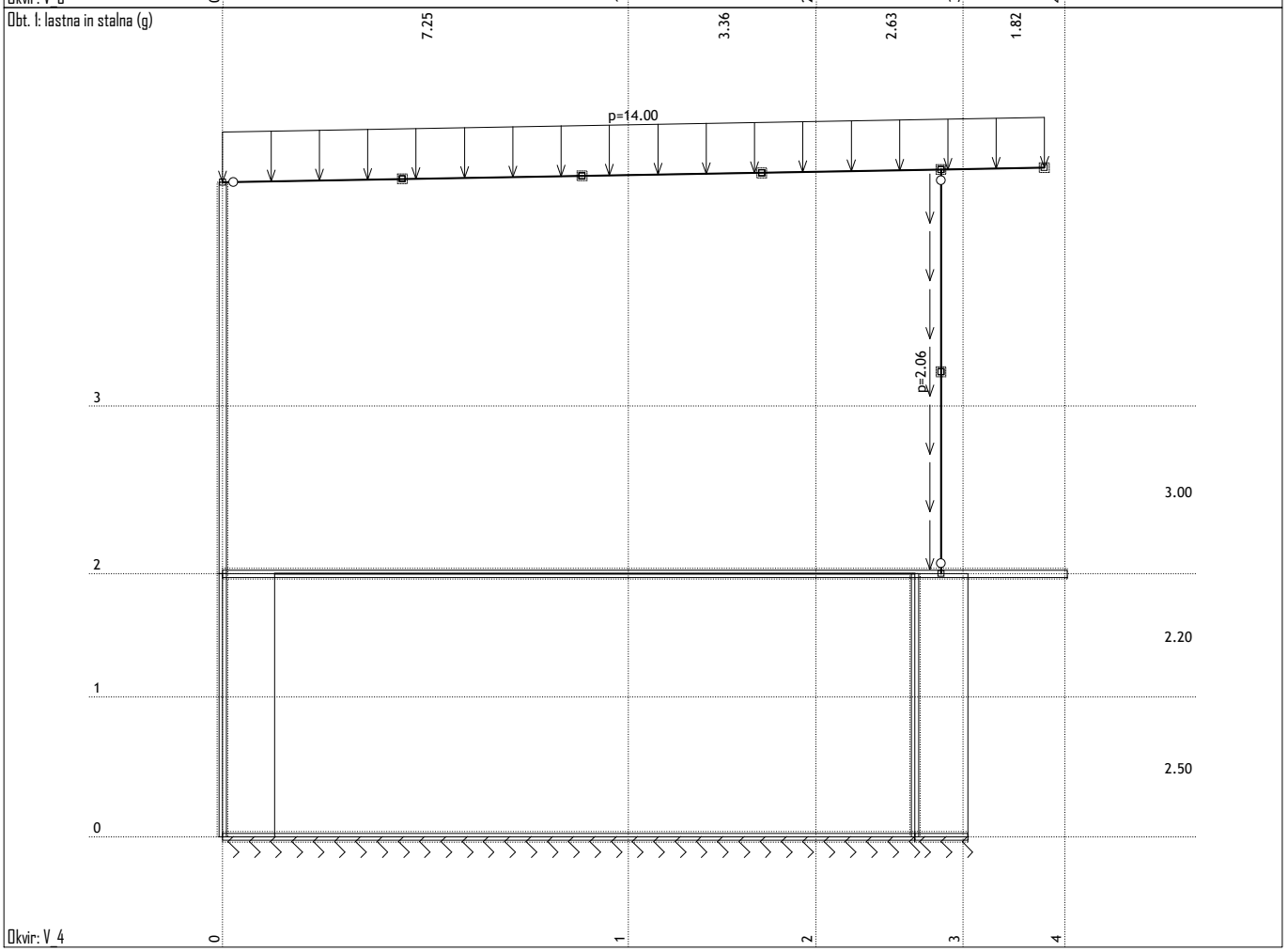


Okvir: V 1

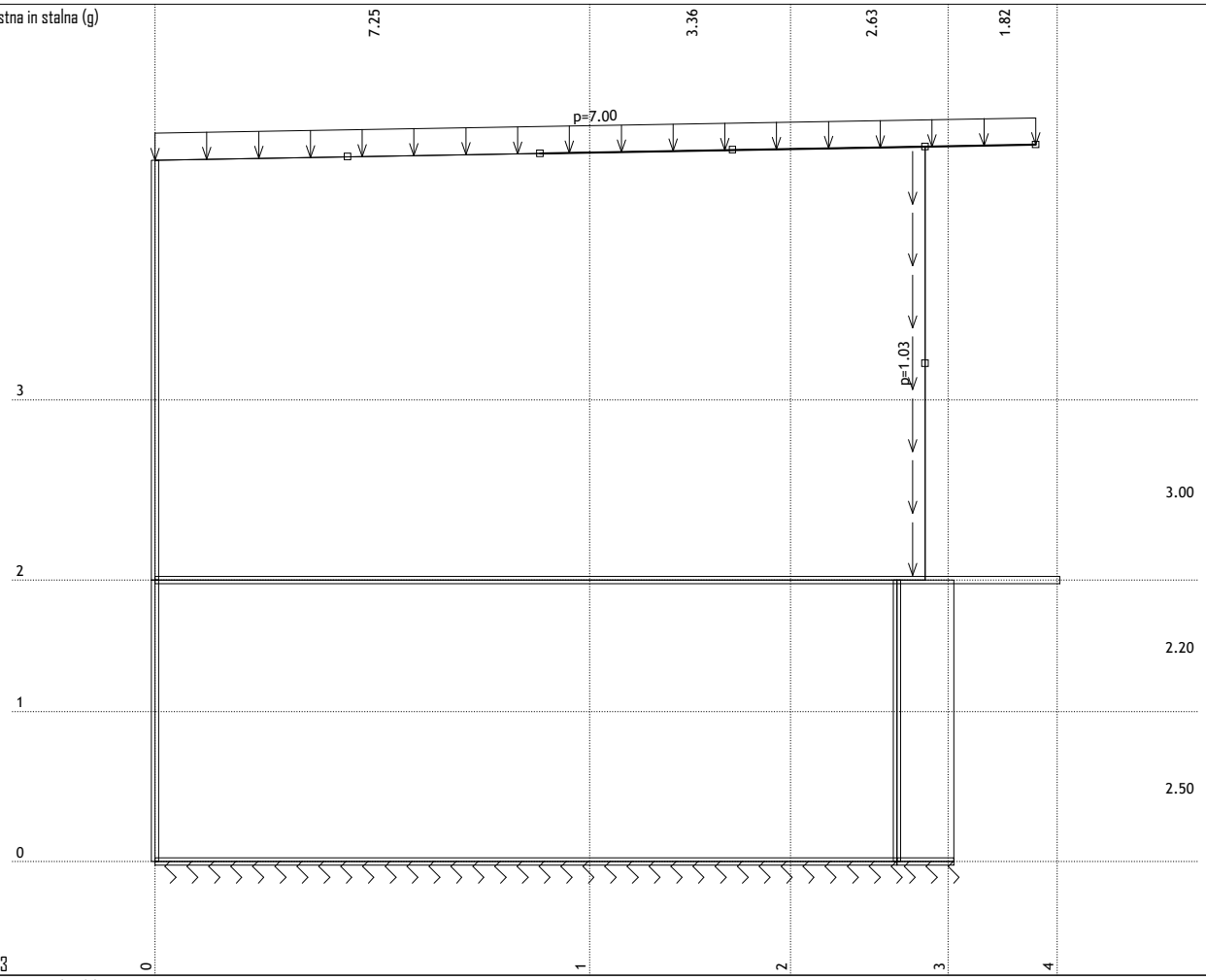

Obt. 1: lastna in stalna (g)
7.25
3.36
2.63
1.82
p=12.63
p=1.96
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V 6


Obt. 1: lastna in stalna (g)
7.25
3.36
2.63
1.82
p=14.00
p=2.06
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V 2


Obt. 1: lastna in stalna (g)
7.25
3.36
2.63
1.82
p=14.00
p=2.06
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V 5

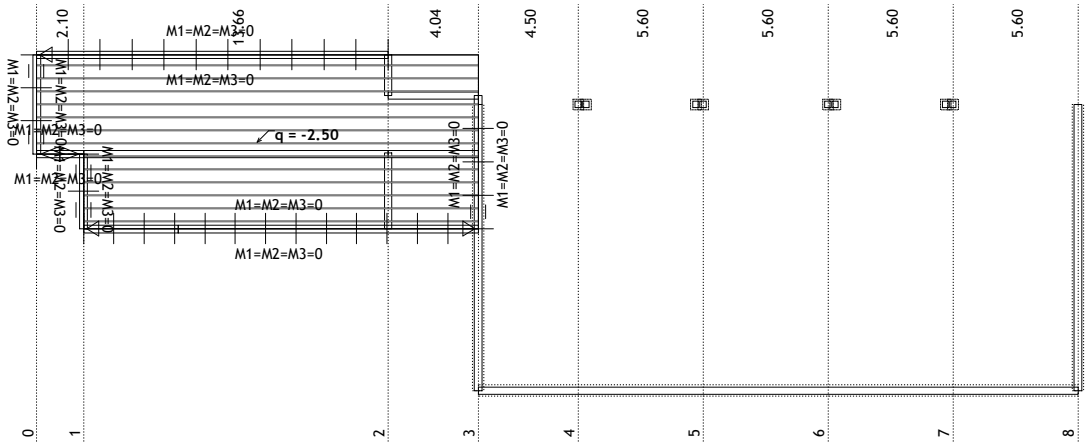

Obt. 1: lastna in stalna (g)
7.25
3.36
2.63
1.82
p=14.00
p=2.06
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V 4

Obt. I: lastna in stalna (g)

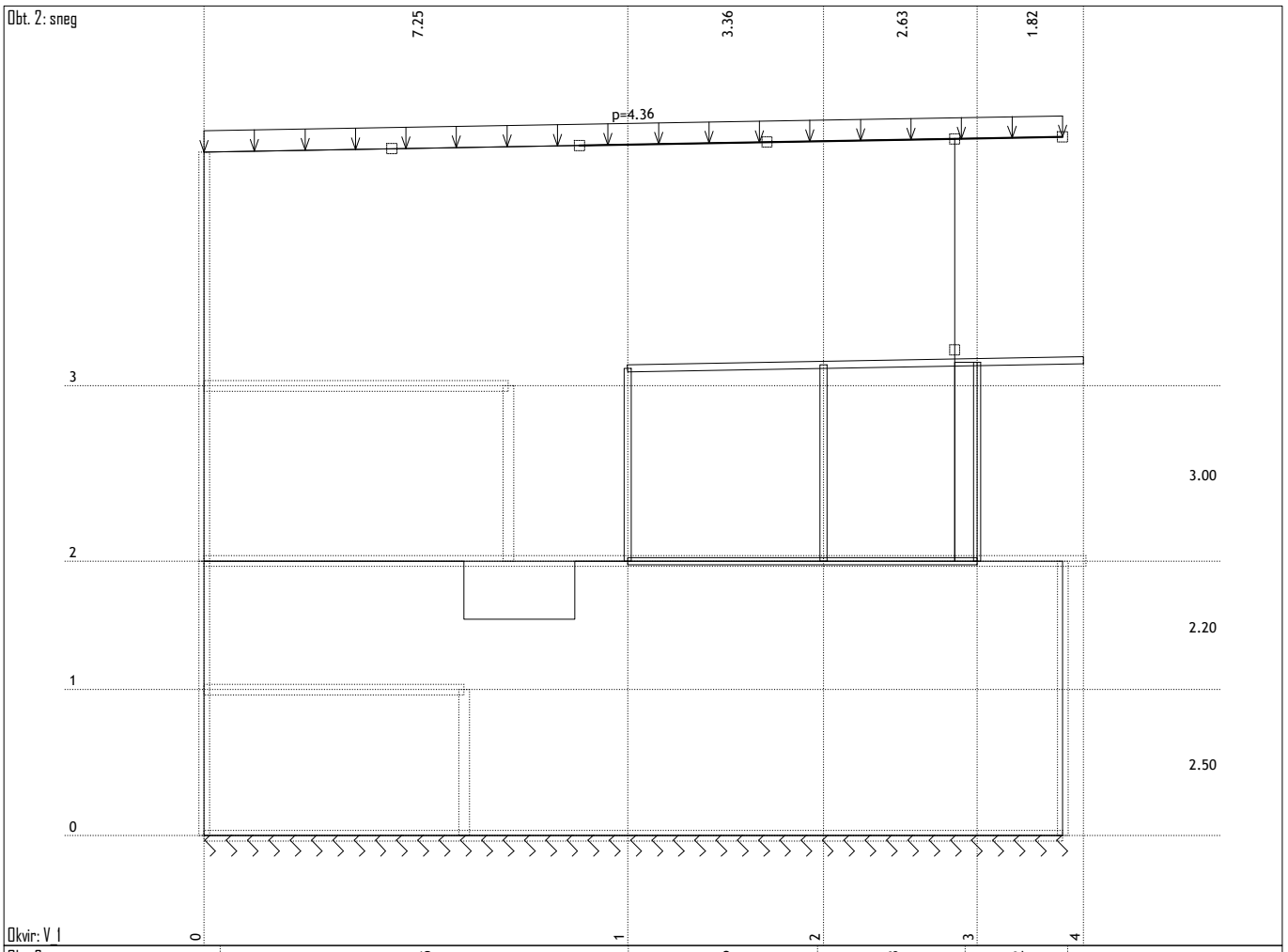


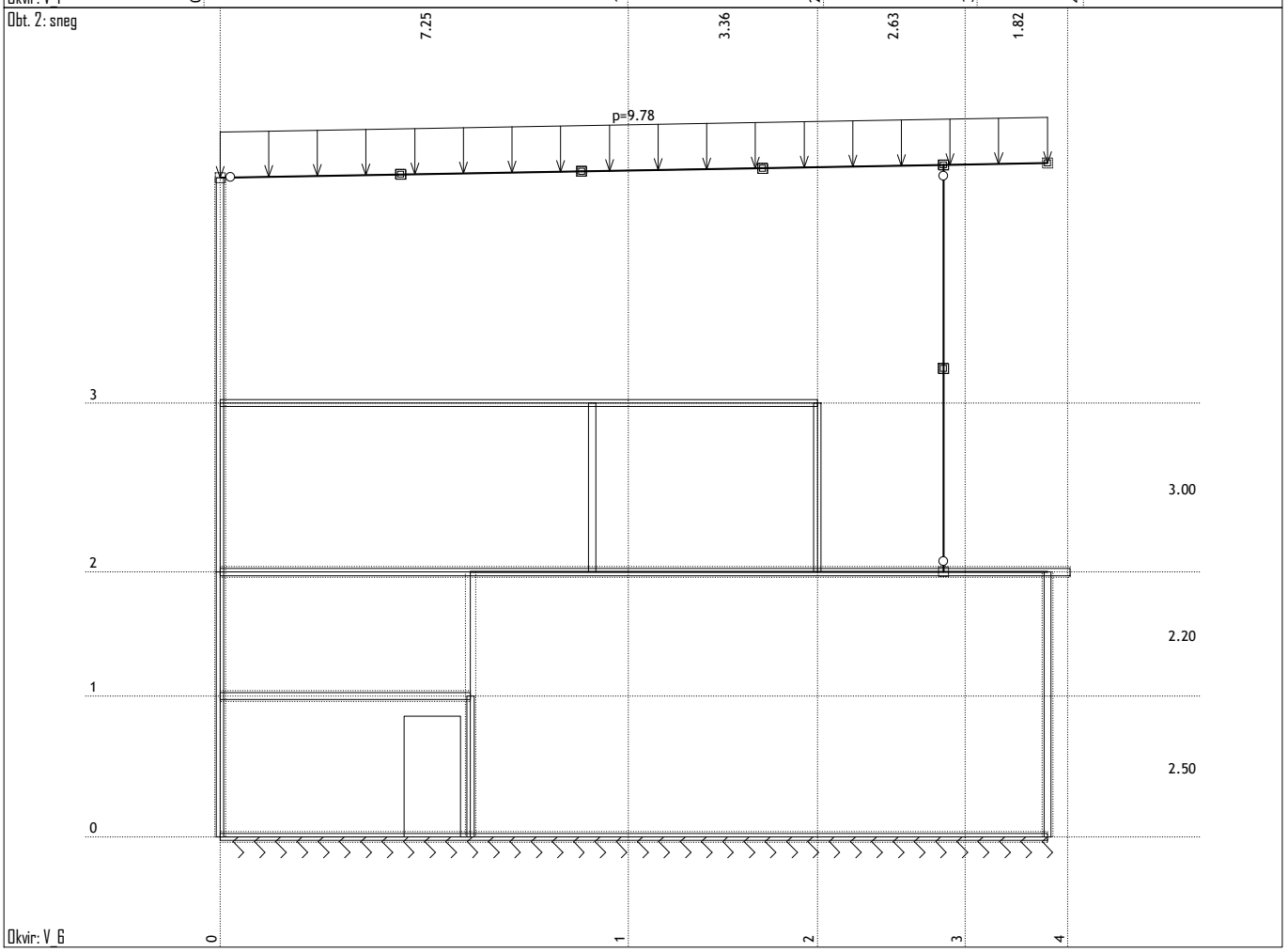
Okvir: V 3

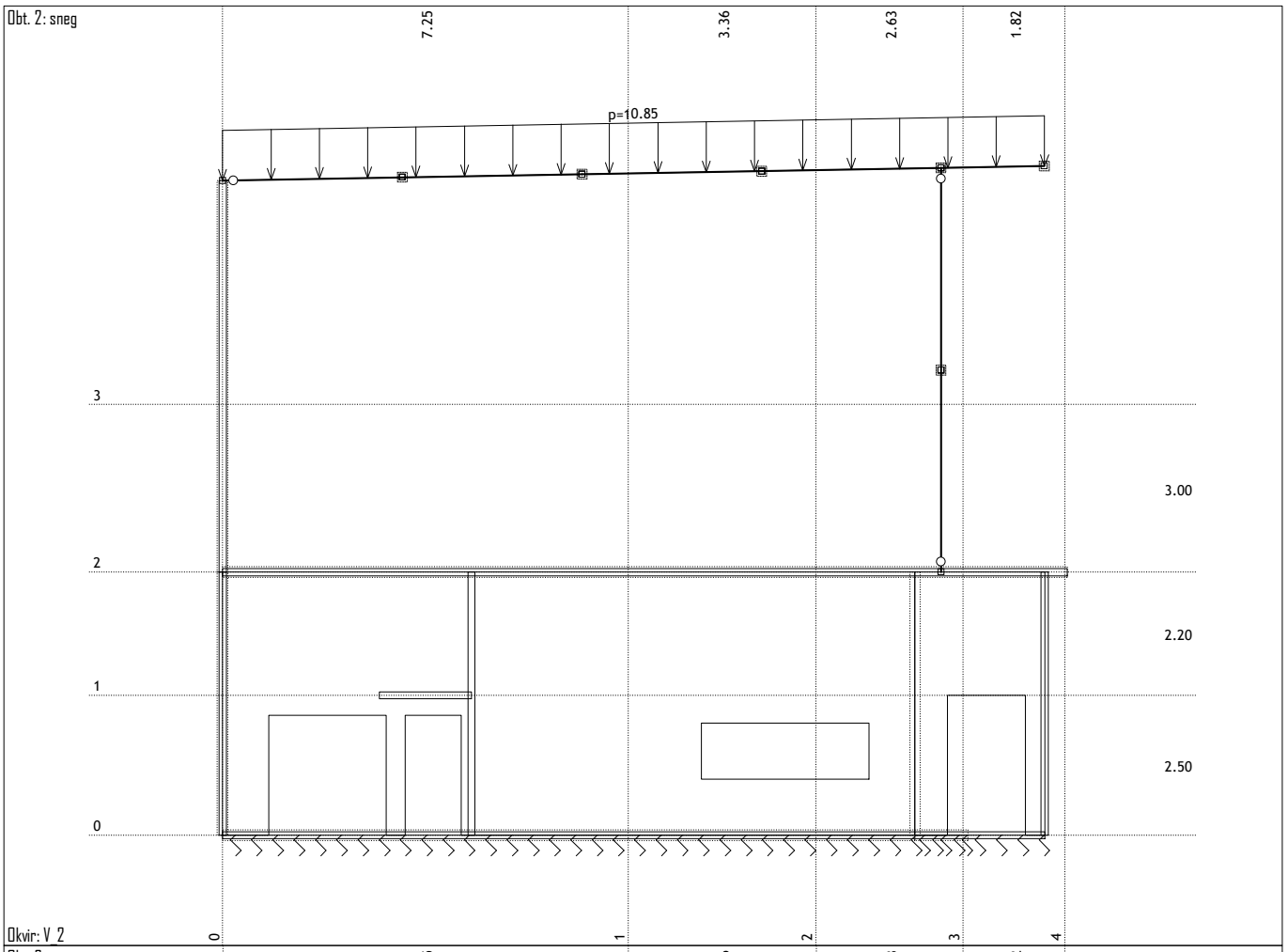
Obt. I: lastna in stalna (g)

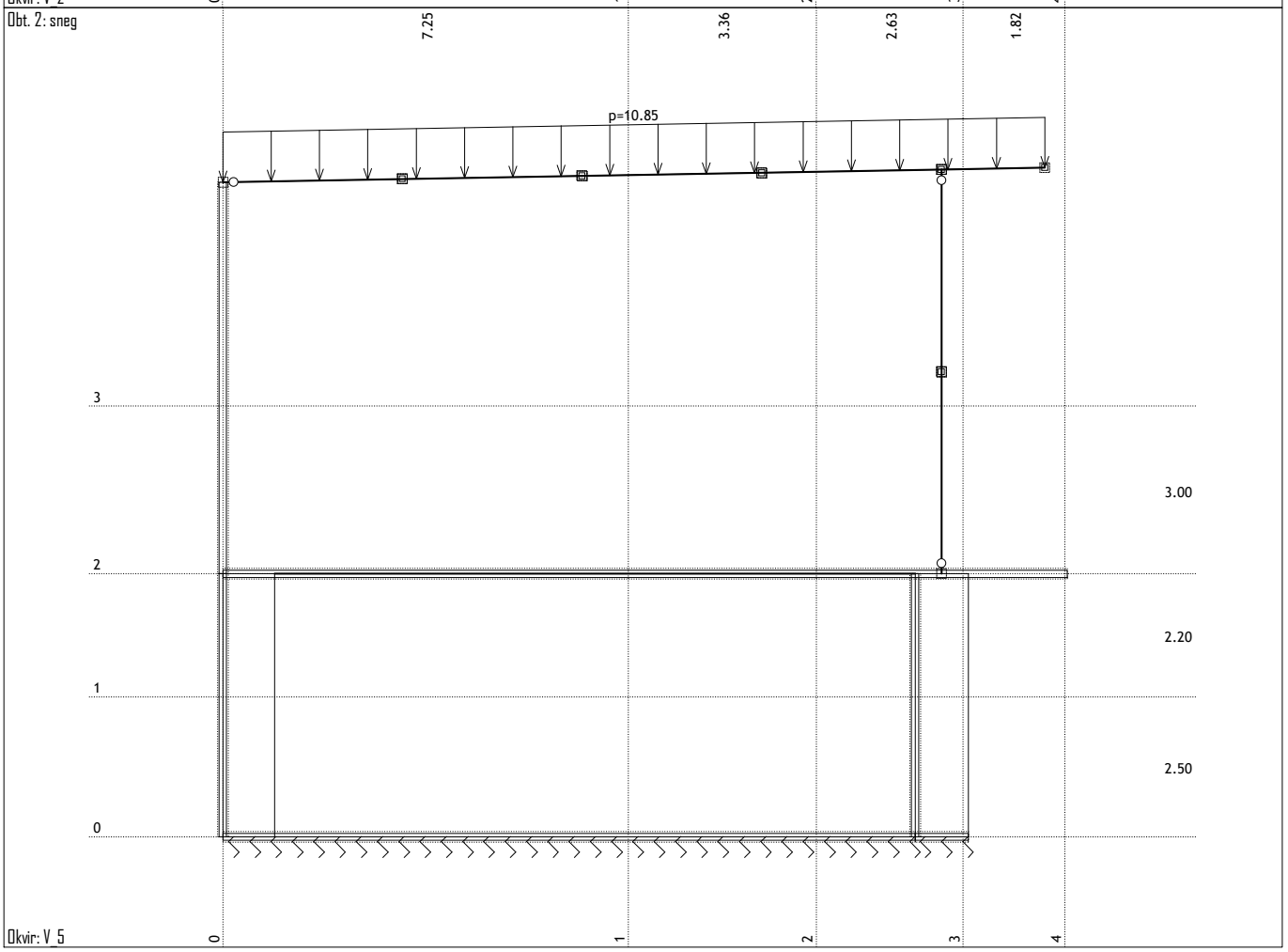


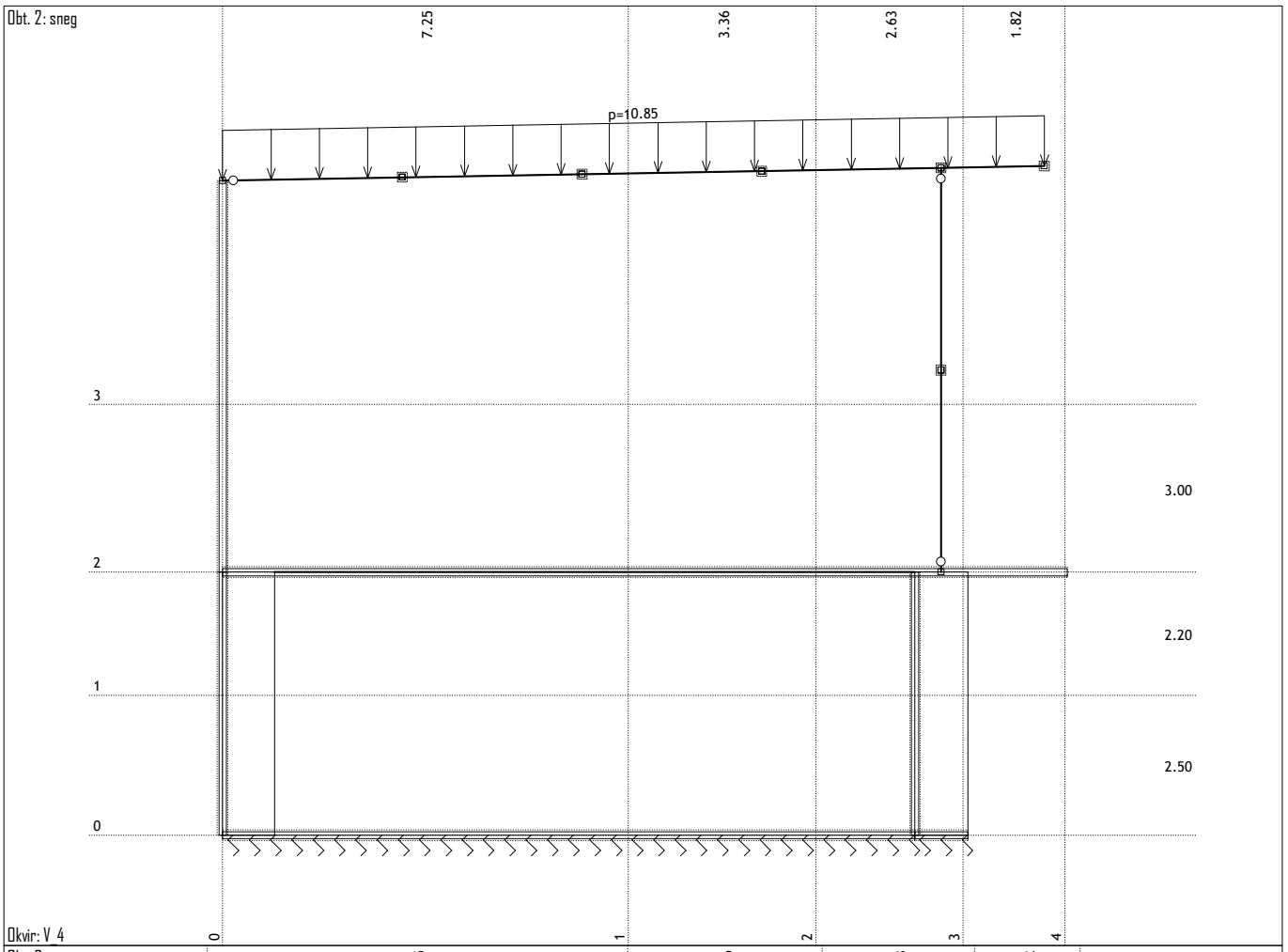
Pogled: streha aneksa

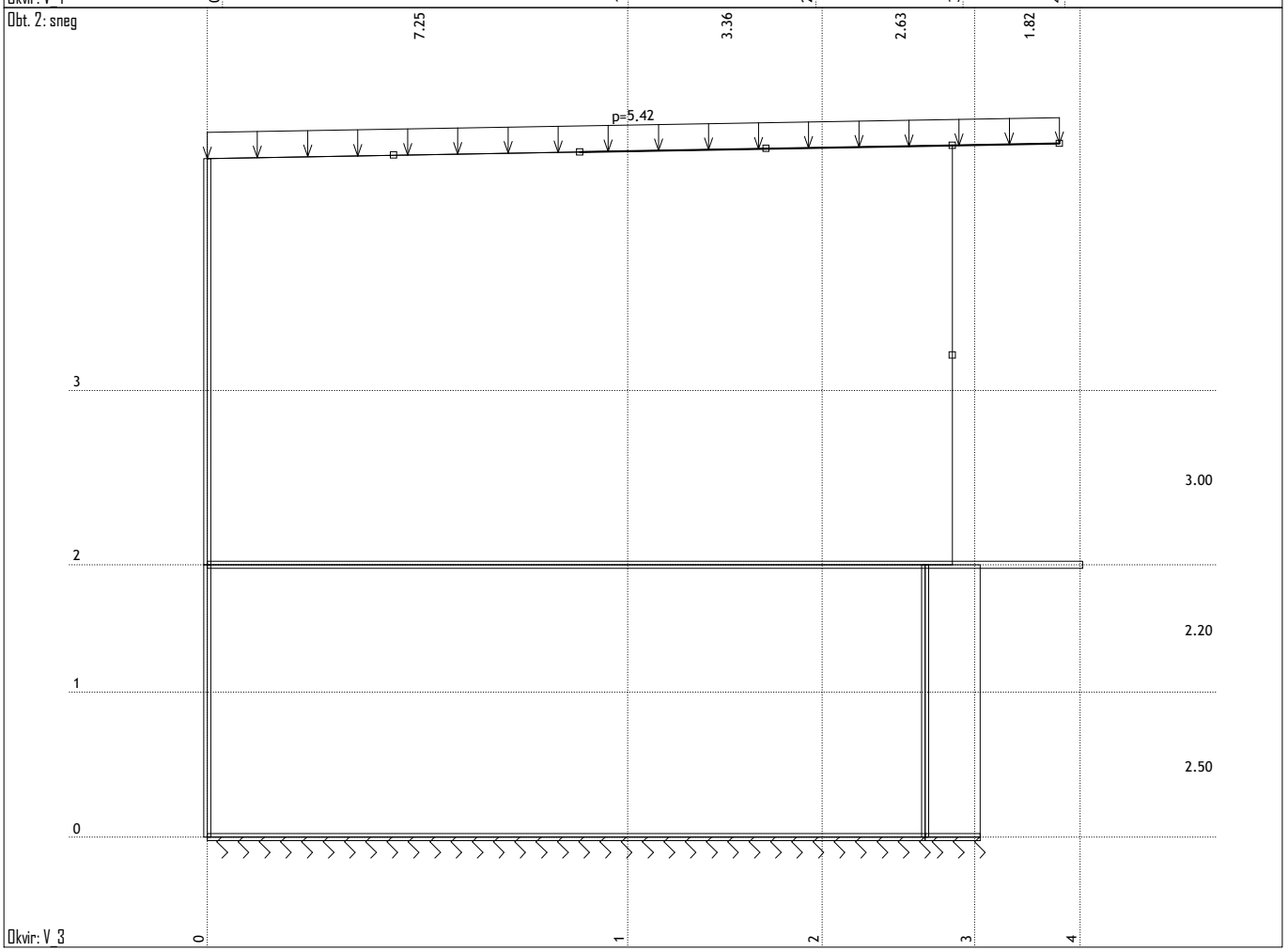

Obt. 2: sneg
7.25
3.36
2.63
1.82
p=4.36
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V_1


Obt. 2: sneg
7.25
3.36
2.63
1.82
p=9.78
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V_6

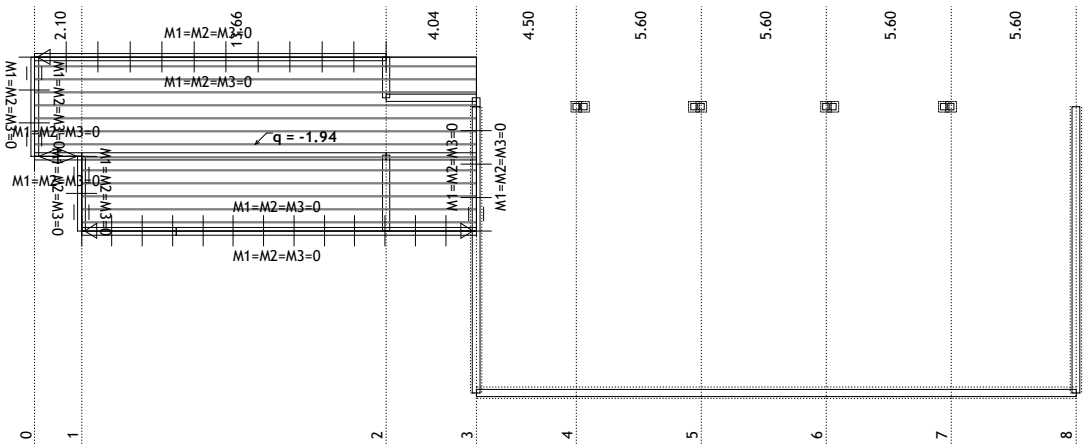

Obt. 2: sneg
7.25
3.36
2.63
1.82
p=10.85
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V_2


Obt. 2: sneg
7.25
3.36
2.63
1.82
p=10.85
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V_5


Obt. 2: sneg
7.25
3.36
2.63
1.82
p=10.85
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V_4

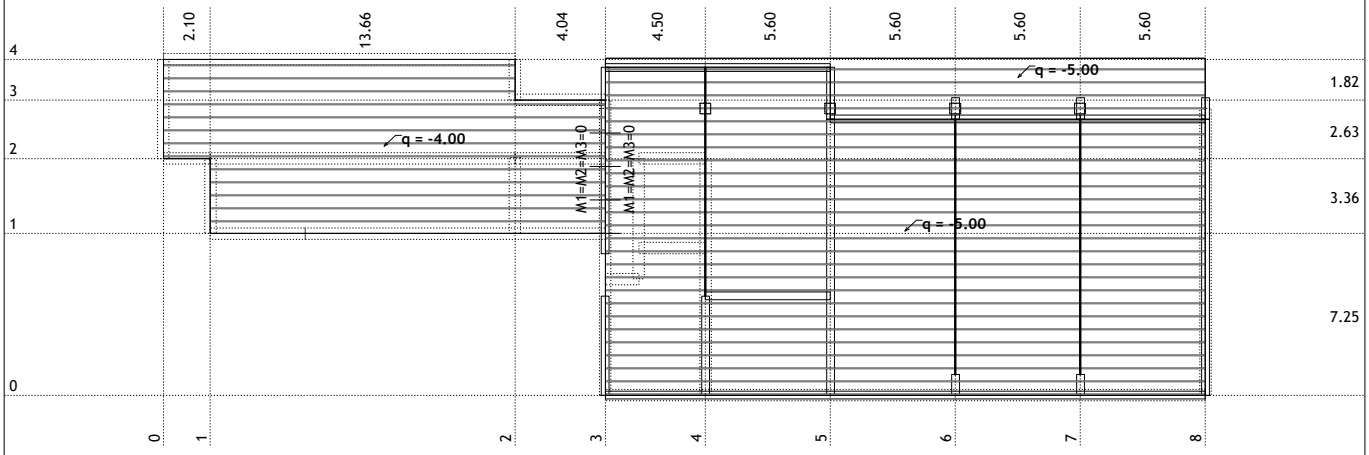

Obt. 2: sneg
7.25
3.36
2.63
1.82
p=5.42
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V_3

Obt. 2: sneg



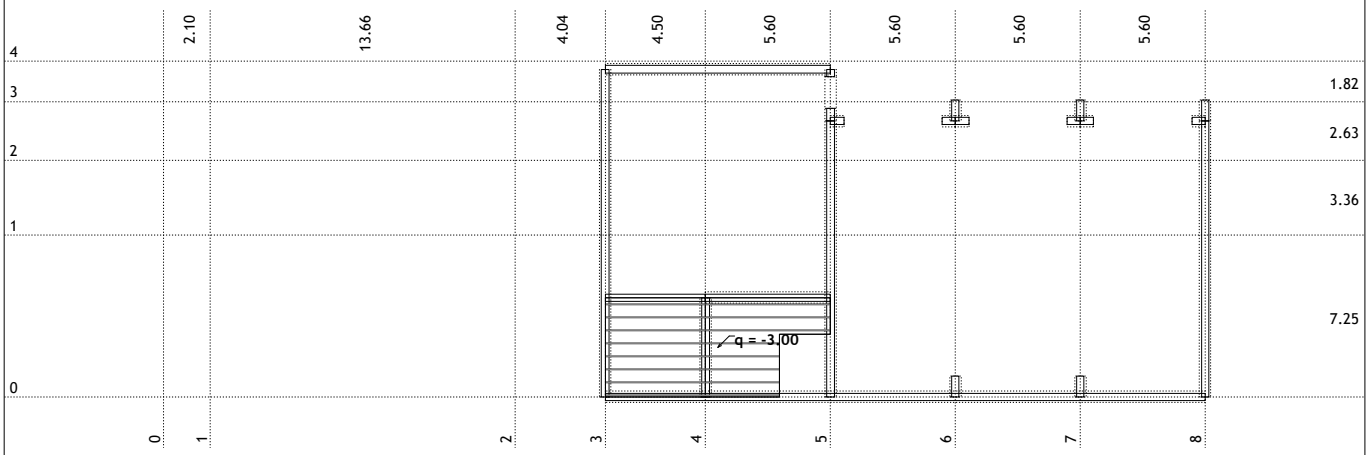
Pogled: streha aneksa

Obt. 3: koristna I



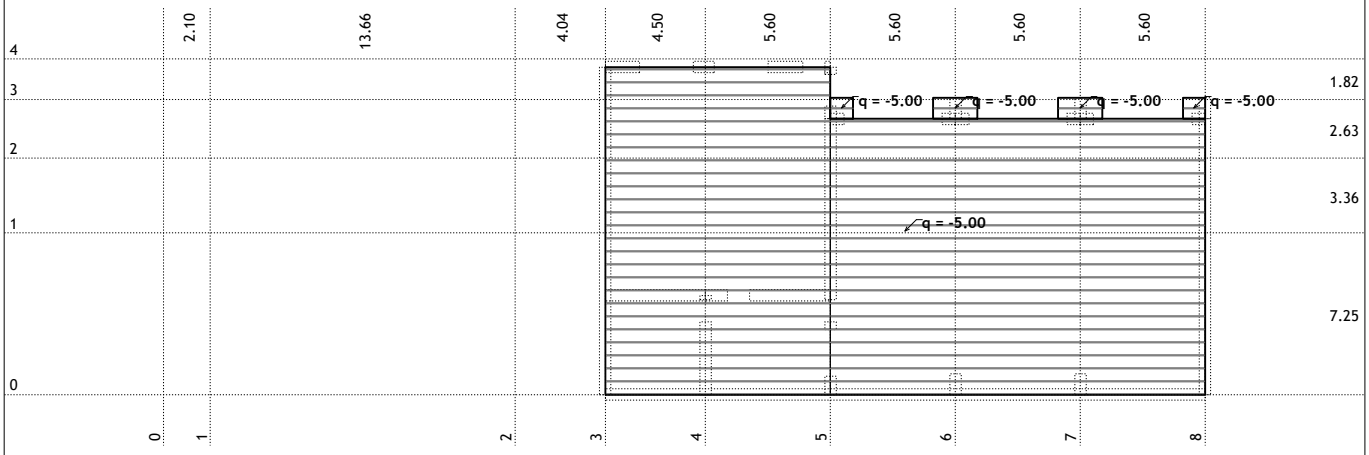
Nivo: etažna/temeljna plošča [4.70 m]

Obt. 3: koristna I



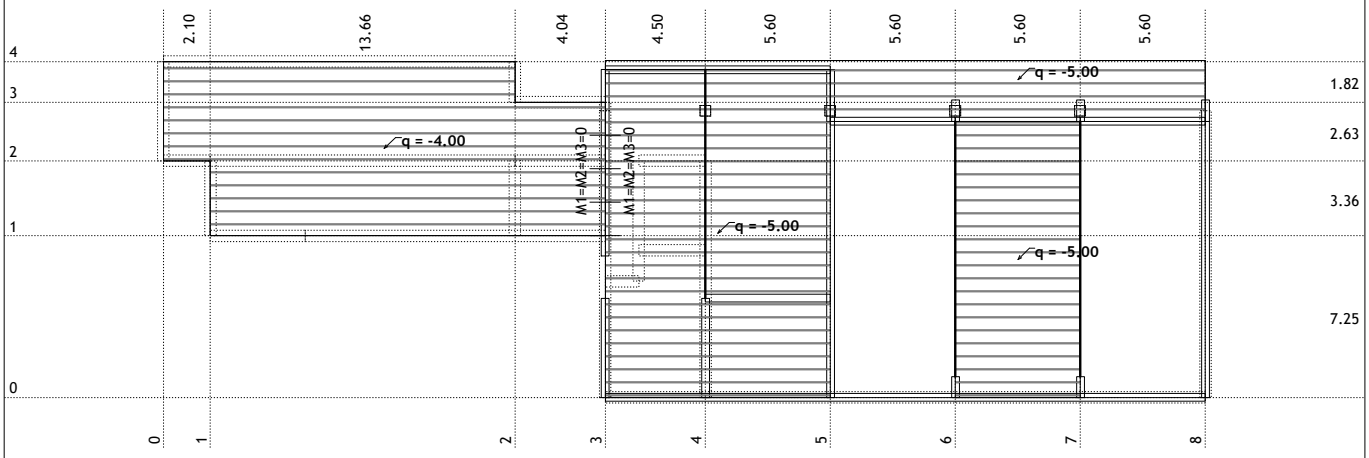
Nivo: podest [2.50 m]

Obt. 3: koristna I



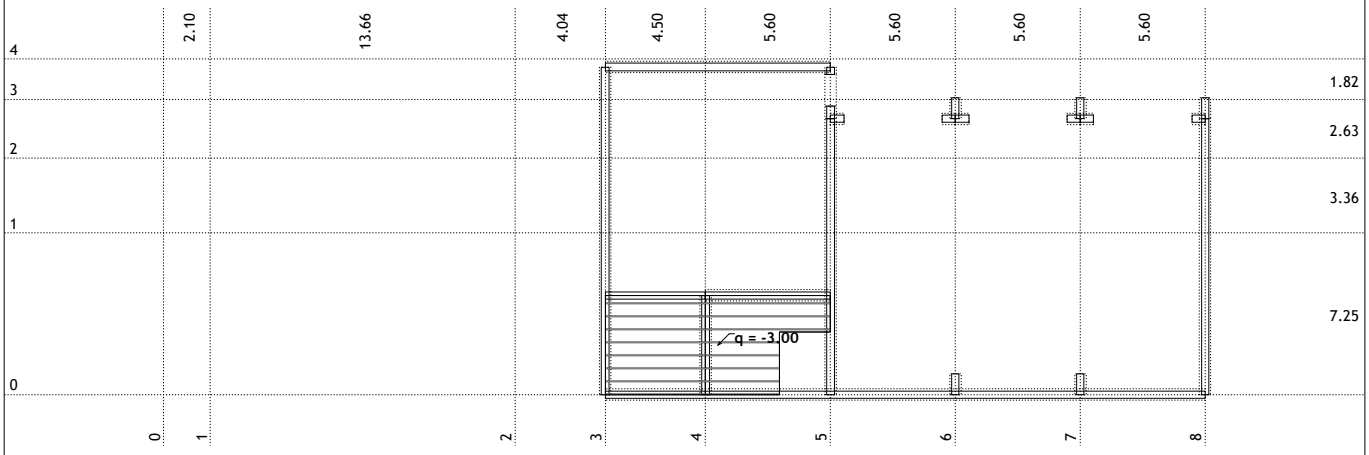
Nivo: [0.00 m]

Obt. 4: koristna 2



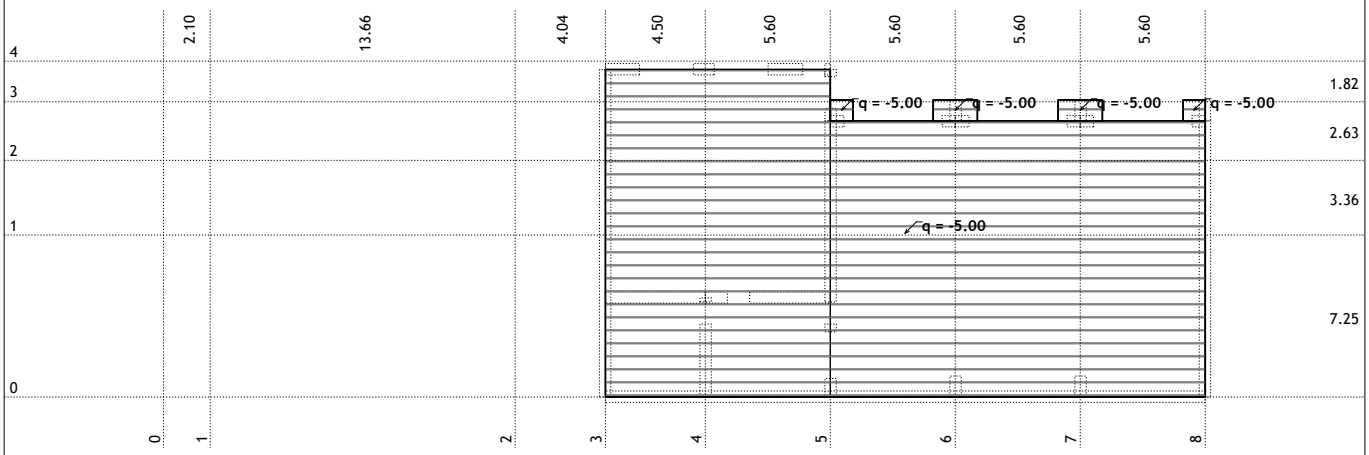
Nivo: etažna/temeljna plošča [4.70 m]

Obt. 4: koristna 2



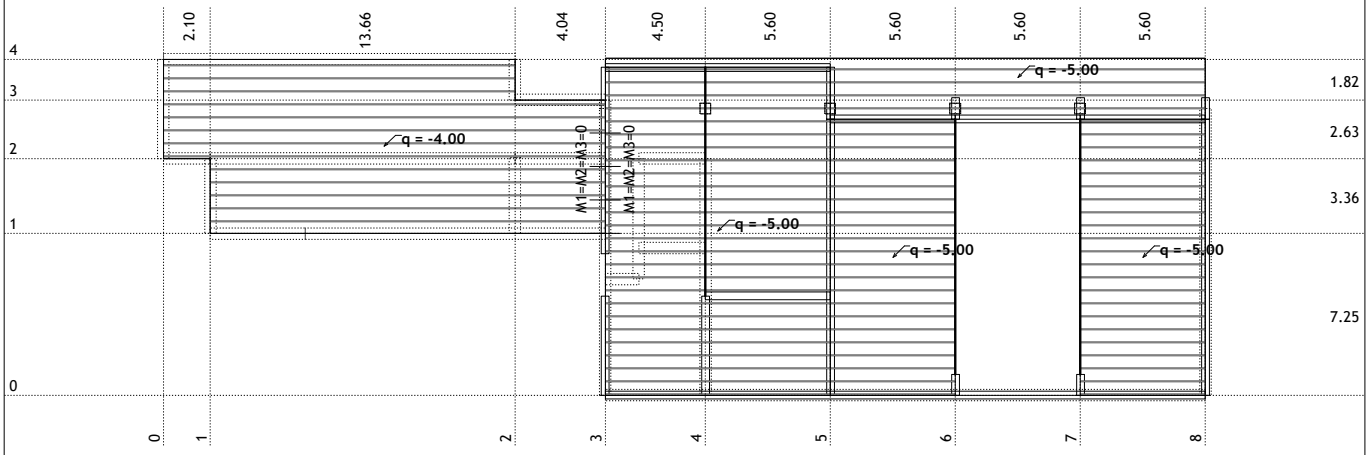
Nivo: podest [2.50 m]

Obt. 4: koristna 2



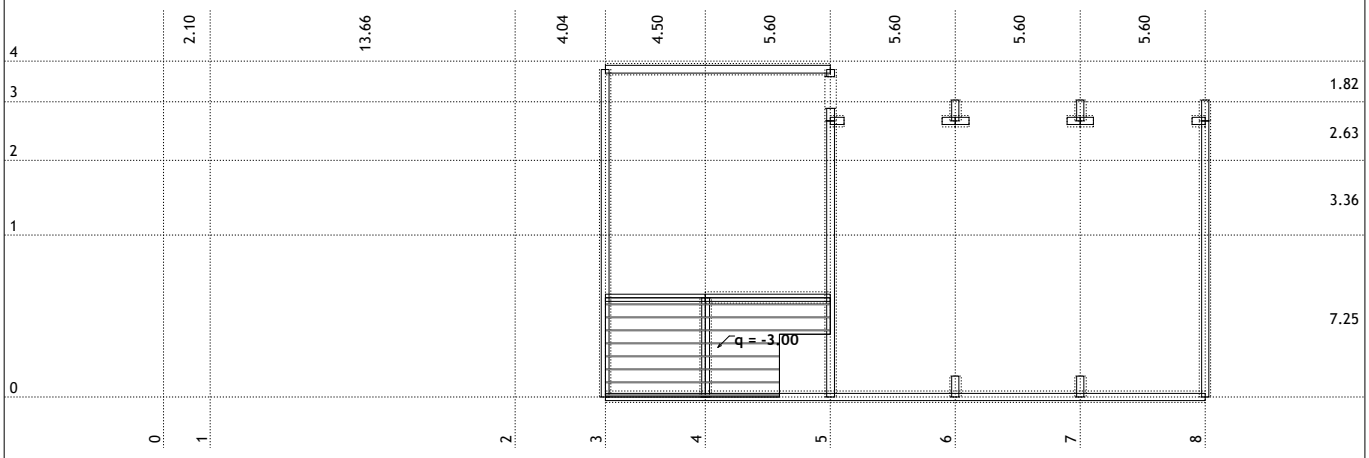
Nivo: [0.00 m]

Obt. 5: koristna 3



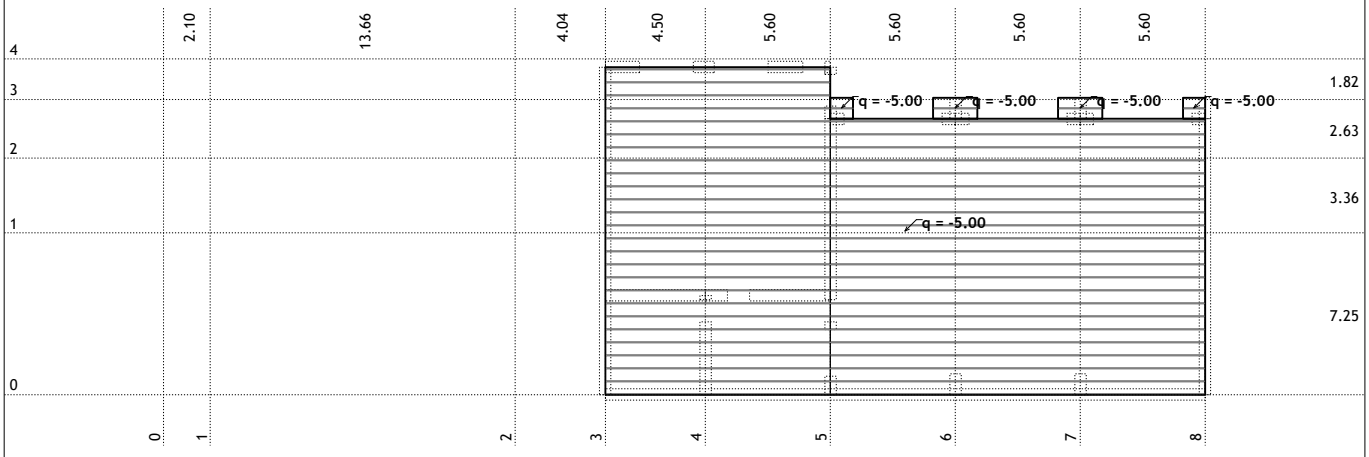
Nivo: etažna/temeljna plošča [4.70 m]

Obt. 5: koristna 3



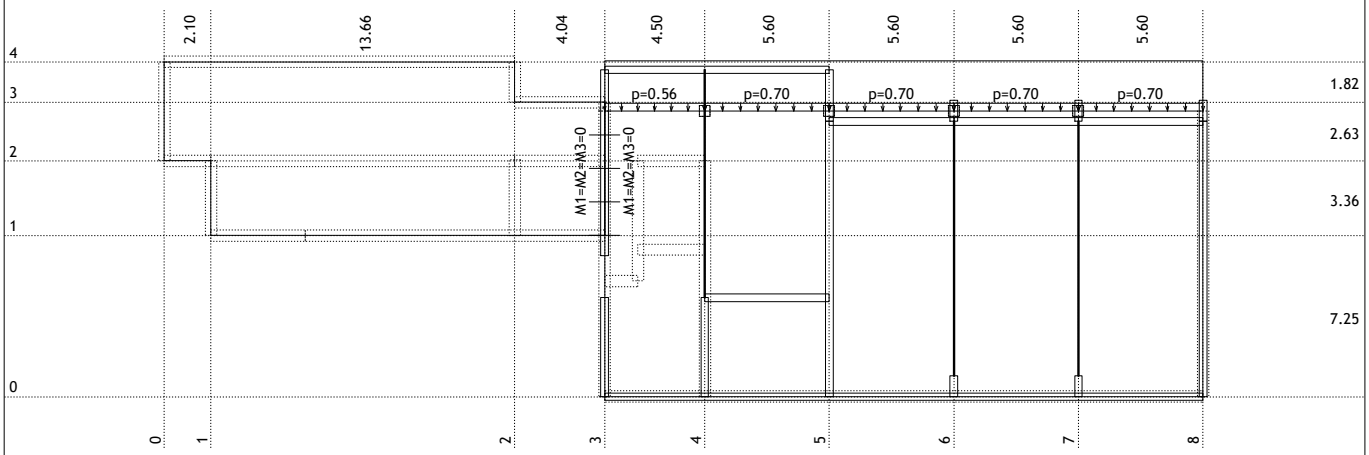
Nivo: podest [2.50 m]

Obt. 5: koristna 3



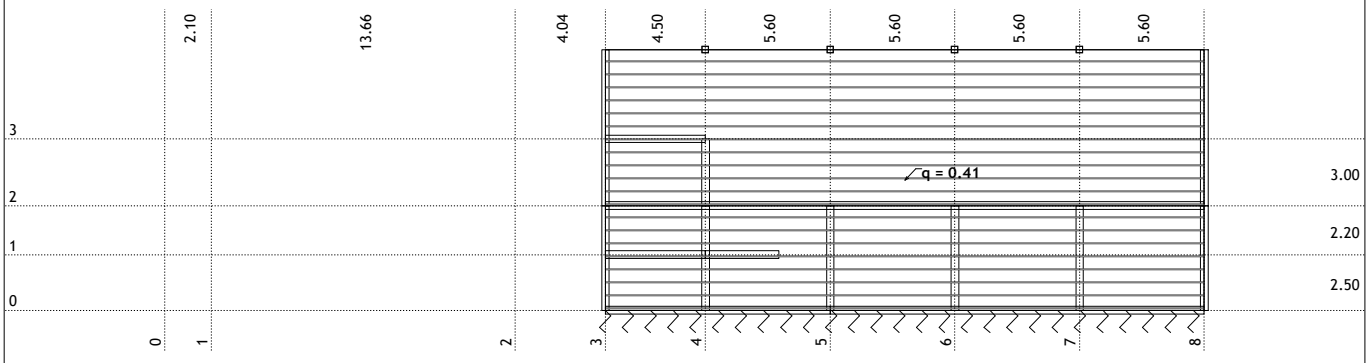
Nivo: [0.00 m]

Obt. 6: veter prečno



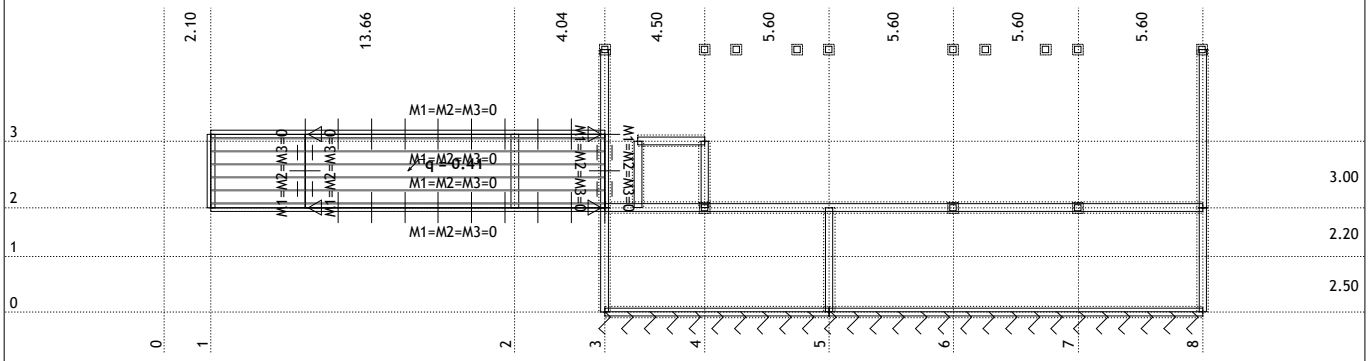
Nivo: etažna/temeljna plošča [4.70 m]

Obt. 6: veter prečno



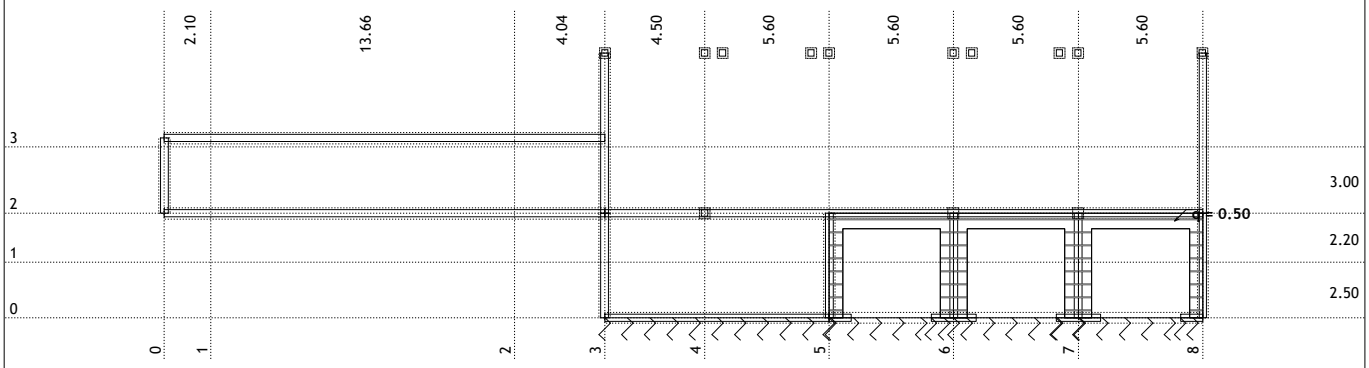
Okvir: H_1

Obt. 6: veter prečno



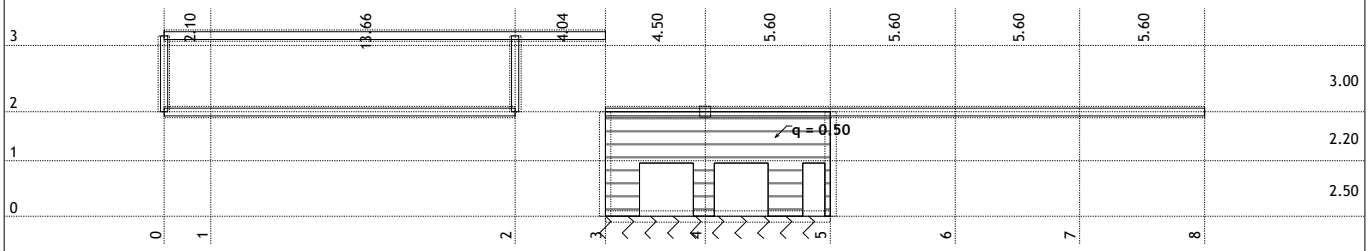
Okvir: H 6

Obt. 6: veter prečno



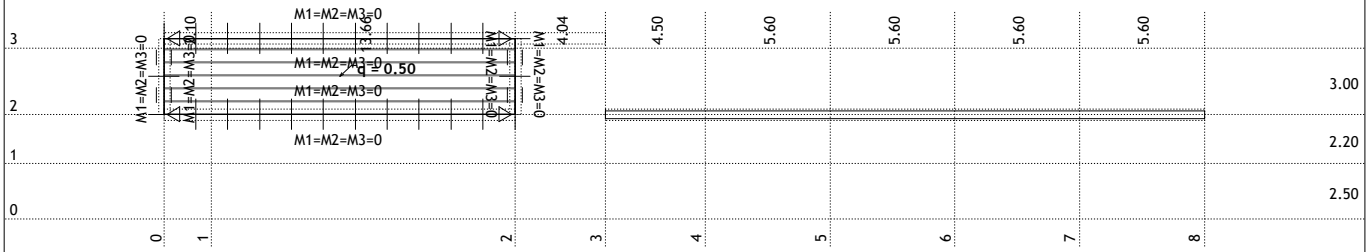
Okvir: H 3

Obt. 6: veter prečno

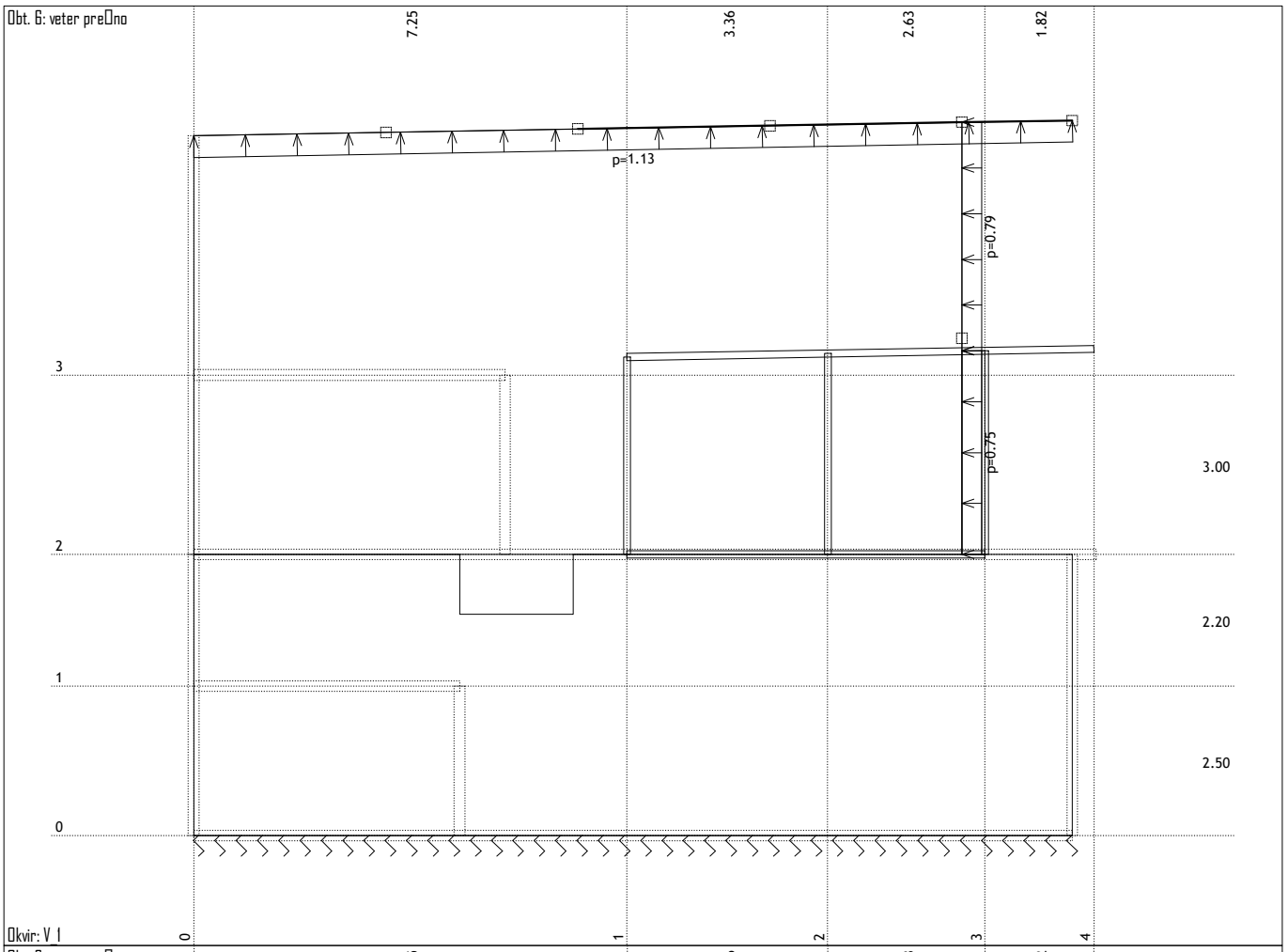


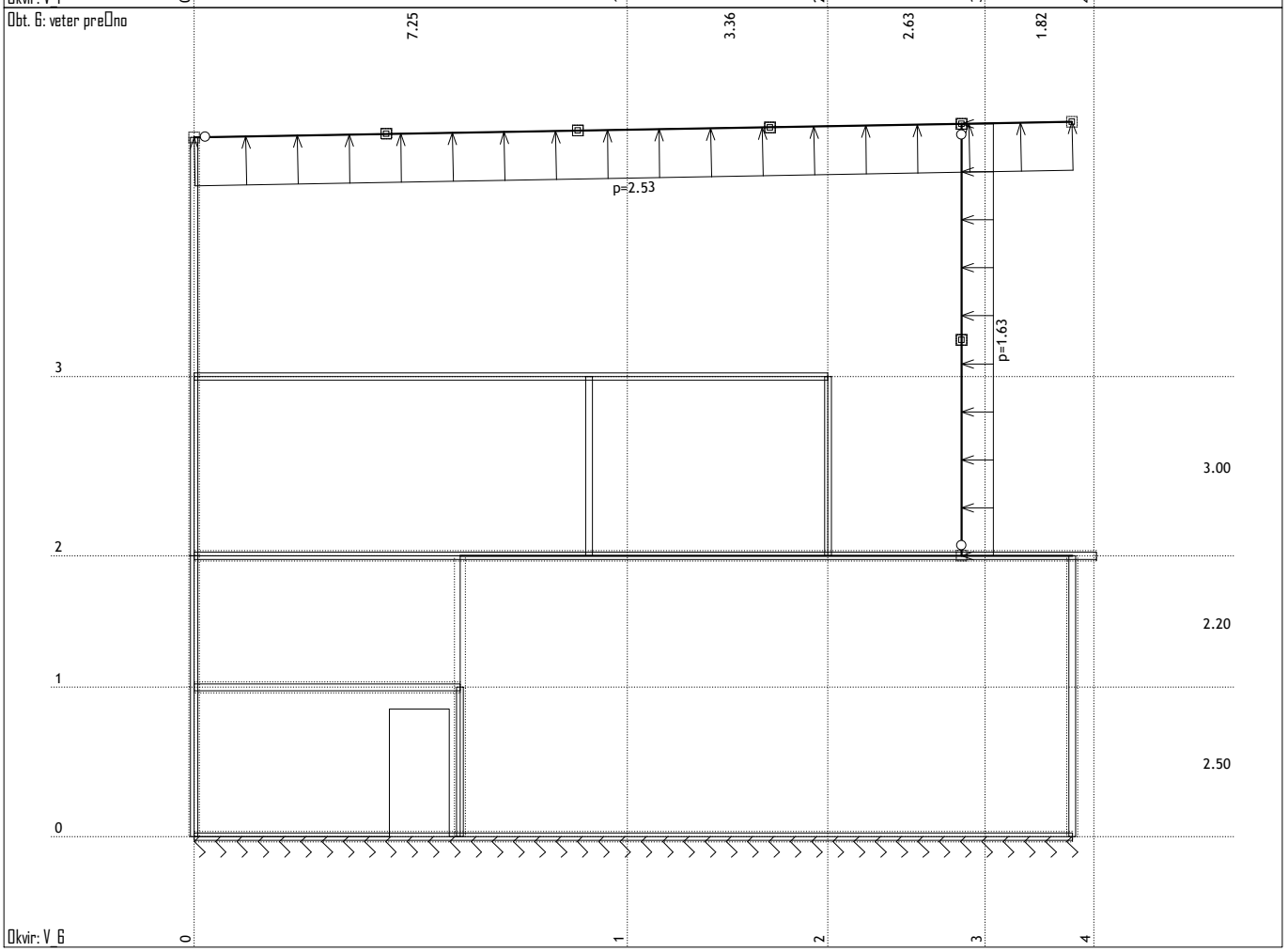
Okvir: H_2

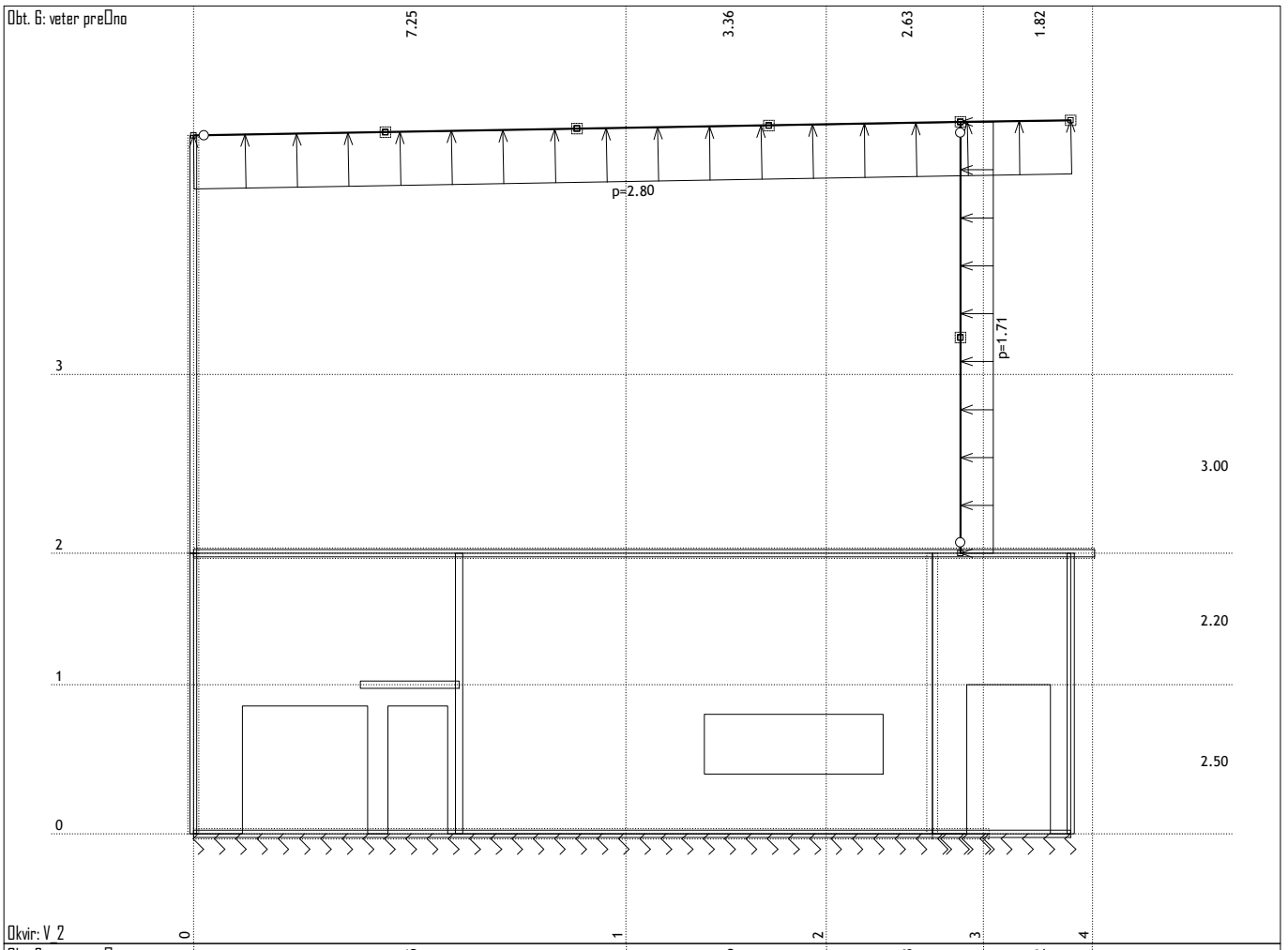
Obt. 6: veter prečno

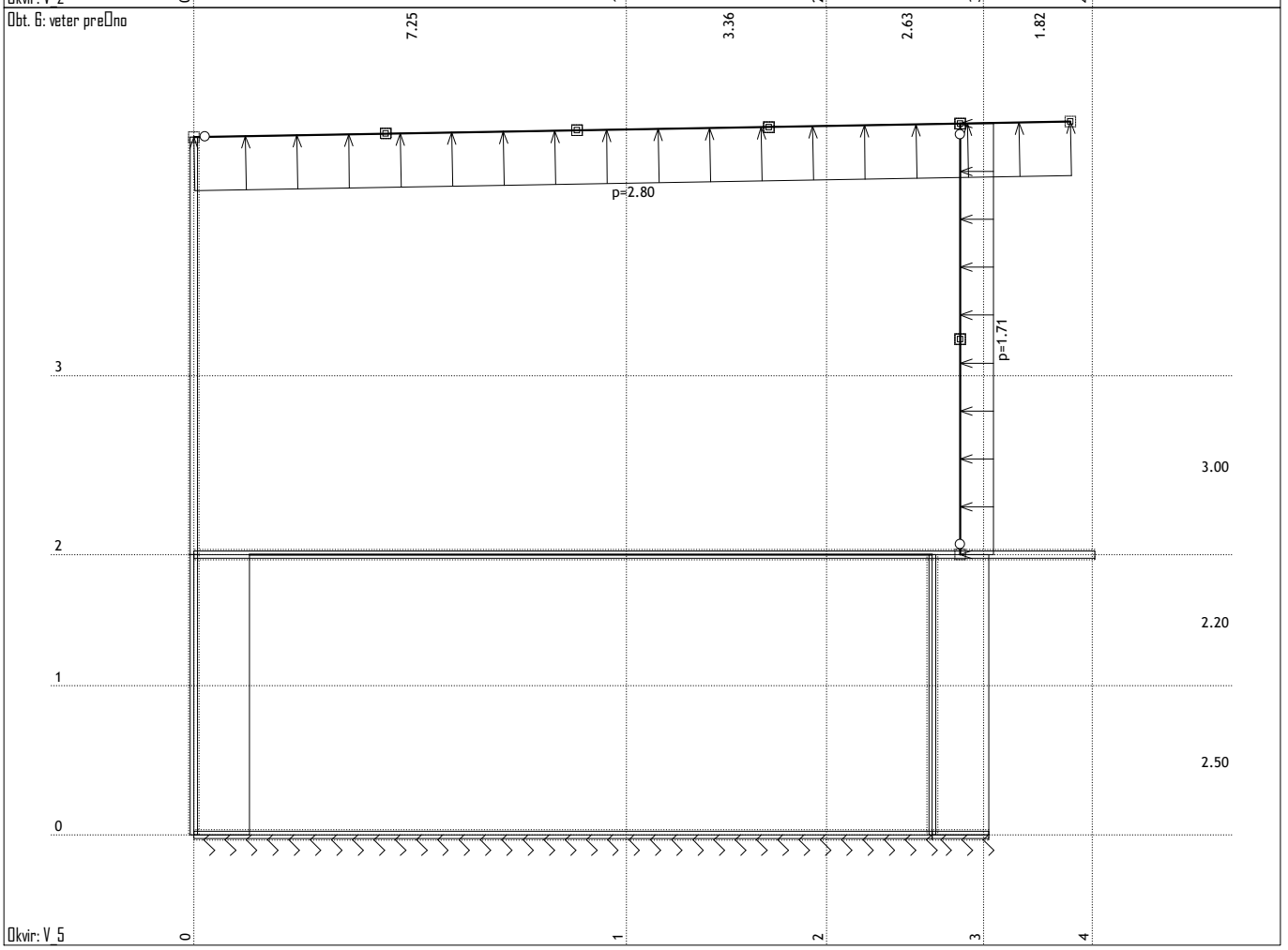


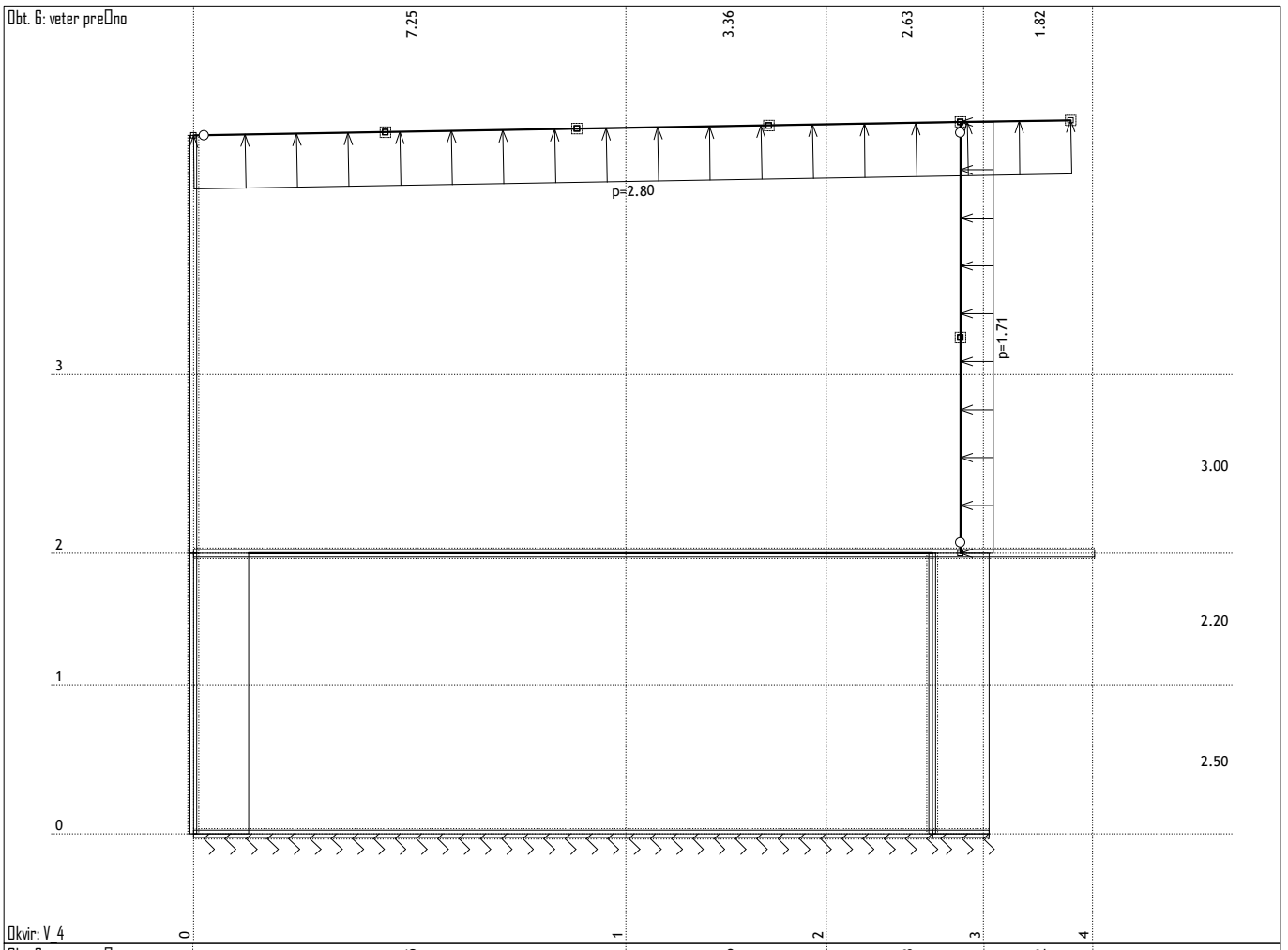
Okvir: H_8

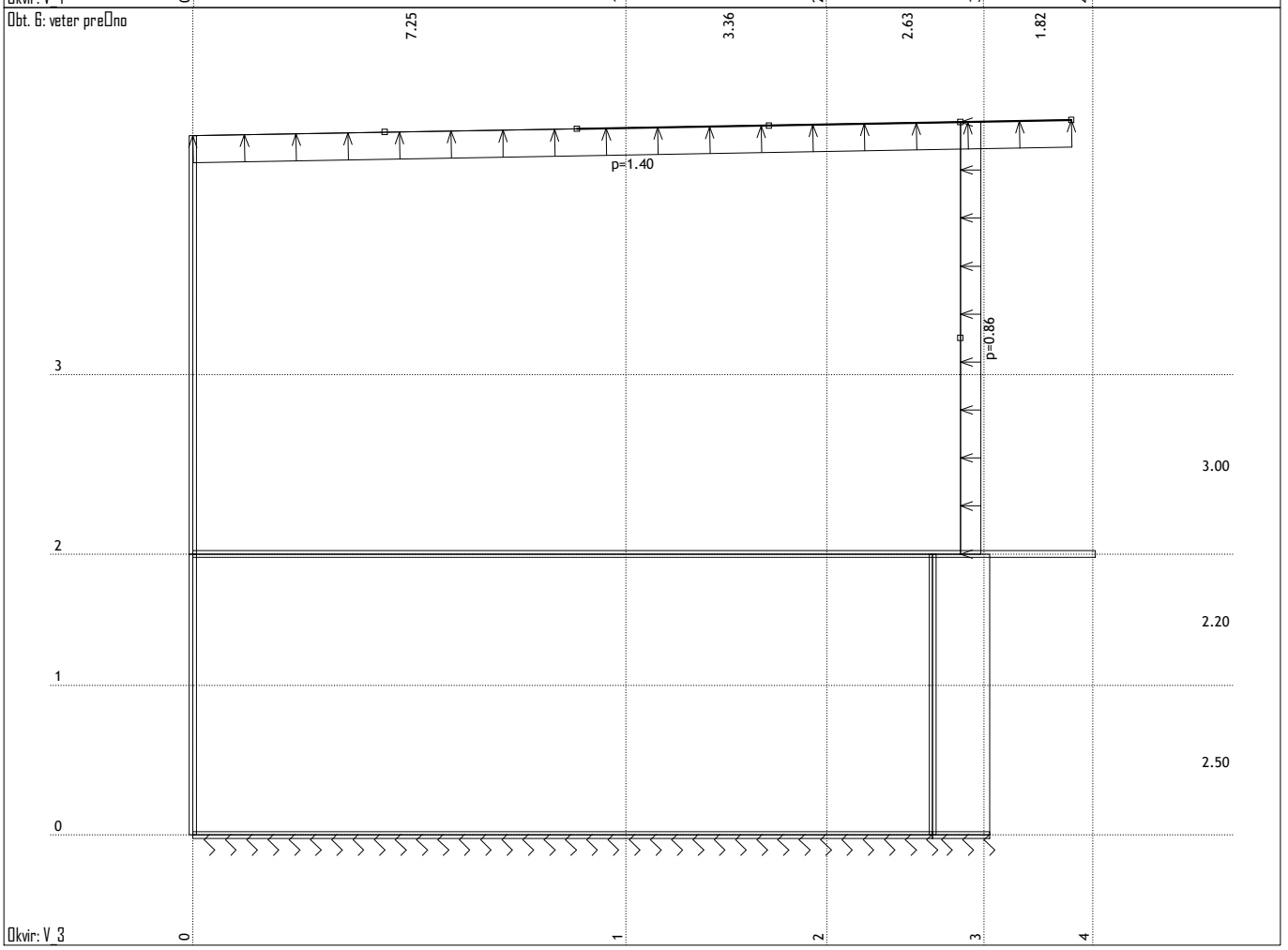

Obt. 6: veter prečno
7.25
3.36
2.63
1.82
p=1.13
p=0.79
p=0.75
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V_1


Obt. 6: veter prečno
7.25
3.36
2.63
1.82
p=2.53
p=1.63
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V_6

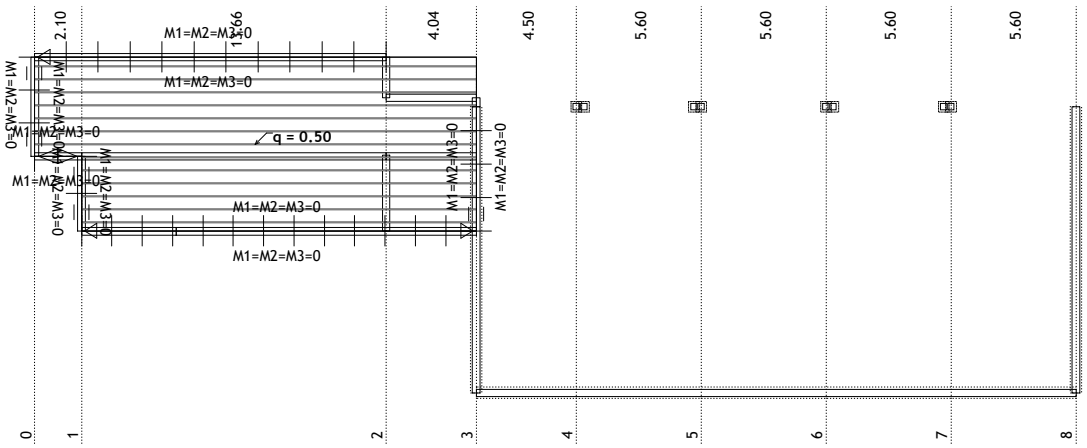

Obt. 6: veter prečno
7.25
3.36
2.63
1.82
p=2.80
p=1.71
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V_2


Obt. 6: veter prečno
7.25
3.36
2.63
1.82
p=2.80
p=1.71
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V_5


Obt. 6: veter prečno
7.25
3.36
2.63
1.82
p=2.80
p=1.71
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V_4

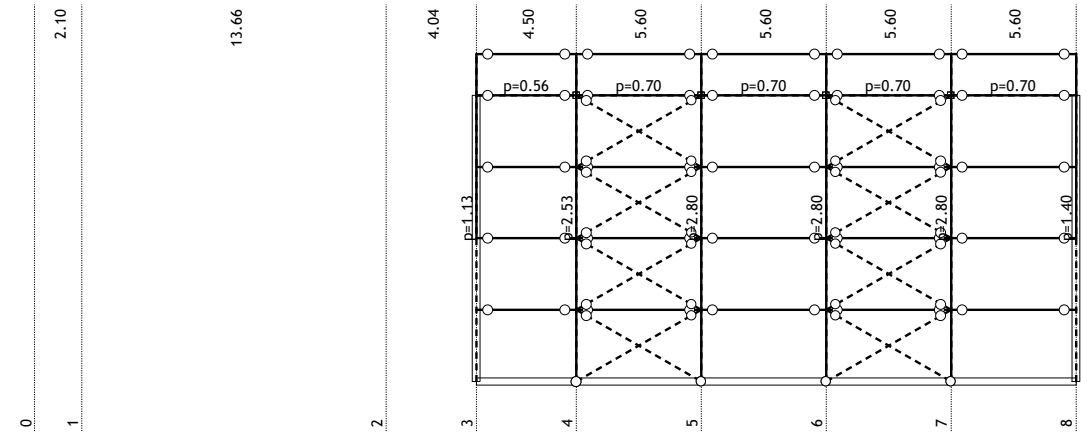

Obt. 6: veter prečno
7.25
3.36
2.63
1.82
p=1.40
p=0.86
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V_3

Obt. 6: veter prečno

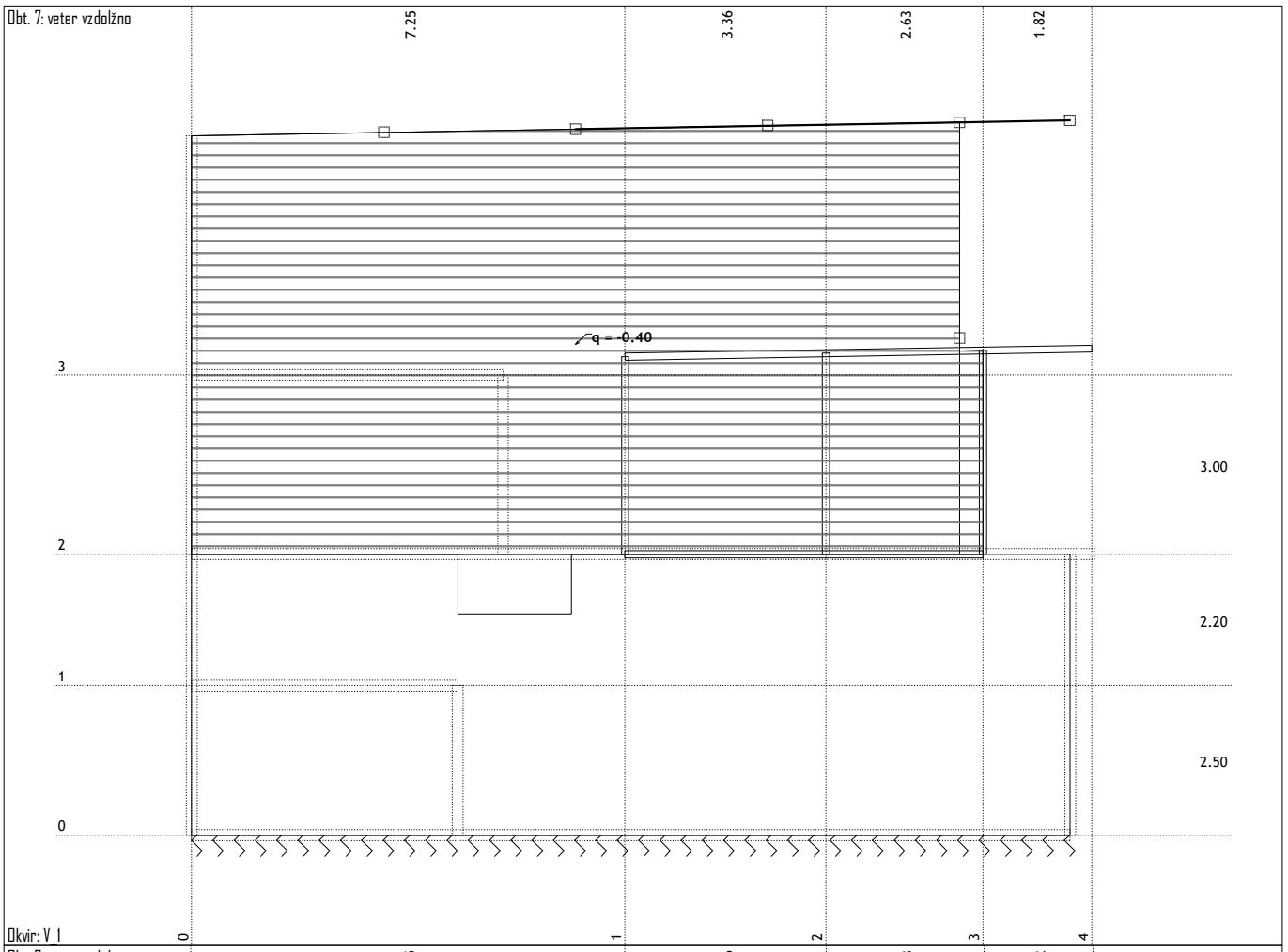


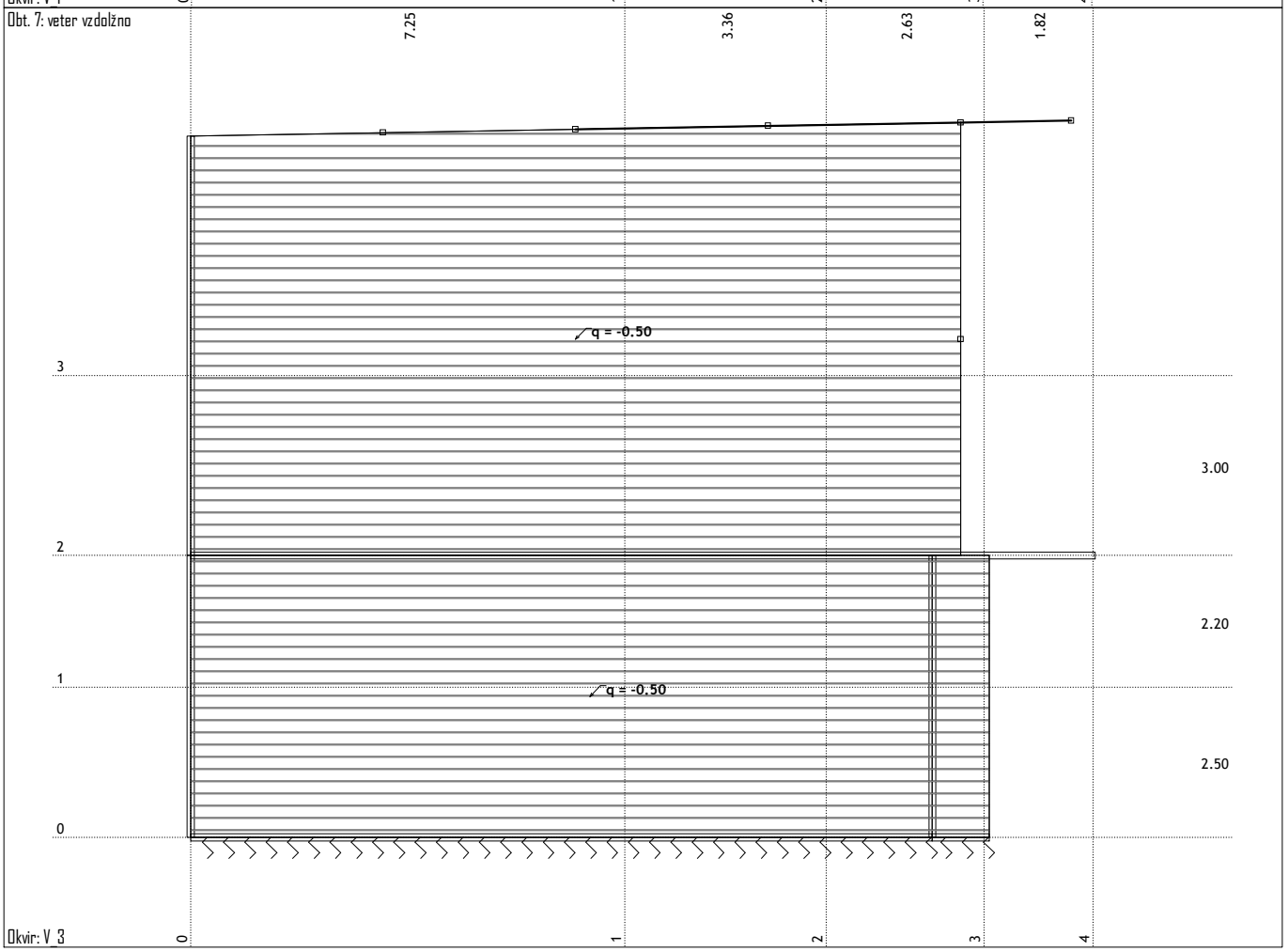
Pogled: streha aneksa

Obt. 6: veter prečno



Pogled: streha


Obt. 7: veter vzdolžno
7.25
3.36
2.63
1.82
q = -0.40
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V_1


Obt. 7: veter vzdolžno
7.25
3.36
2.63
1.82
q = -0.50
q = -0.50
3
2
1
0
3.00
2.20
2.50
0
1
2
3
4
Okvir: V_3

Modalna analiza

Faktorji obtežb za preračun mas

No	Naziv	Koeficient
1	lastna in stalna (g)	1.00
2	sneg	0.00
3	koristna 1	1.00
4	koristna 2	1.00
5	koristna 3	1.00
6	veter prečno	0.00
7	veter vzdolžno	0.00

Razporeditev mas po višini objekta

Nivo	Z [m]	X [m]	Y [m]	Masa [T]	T/m²
podest nadstropja	7.70	5.91	8.22	253.84	6.40
etažna/temeljna plošča	4.70	6.94	8.38	1215.94	2.23
podest	2.50	9.02	4.71	191.10	4.96
	0.00	13.35	6.58	1093.16	3.02
Skupno:	2.96	9.54	7.40	2754.05	

Položaj centra togosti po višini objekta (približna metoda)

Nivo	Z [m]	X [m]	Y [m]
podest nadstropja	7.70	10.36	2.98
etažna/temeljna plošča	4.70	14.37	1.41
podest	2.50	10.02	0.66
	0.00	10.04	0.03

Ekscentriciteta po višini objekta (približna metoda)

Nivo	Z [m]	eox [m]	eoy [m]
podest nadstropja	7.70	4.46	5.23
etažna/temeljna plošča	4.70	7.43	6.97
podest	2.50	1.00	4.05
	0.00	3.31	6.55

Nihajne dobe konstrukcije

No	T [s]	f [Hz]
1	1.2372	0.8083
2	0.9564	1.0455
3	0.6505	1.5374
4	0.4186	2.3891
5	0.2793	3.5801
6	0.2717	3.6810
7	0.2645	3.7801
8	0.2591	3.8594
9	0.2572	3.8875
10	0.2499	4.0010
11	0.2377	4.2069
12	0.1914	5.2239
13	0.1796	5.5694
14	0.1730	5.7794
15	0.1662	6.0158
16	0.1587	6.3019
17	0.1546	6.4683
18	0.1470	6.8042
19	0.1391	7.1903
20	0.1342	7.4496

Seizmični prerač: EC8 (EN 1998) SLO	
Kategorija tal:	A
Kategorija pomena:	II (=1.0)
Razmerje agR/g:	0.225
Koeficient dušenja:	0

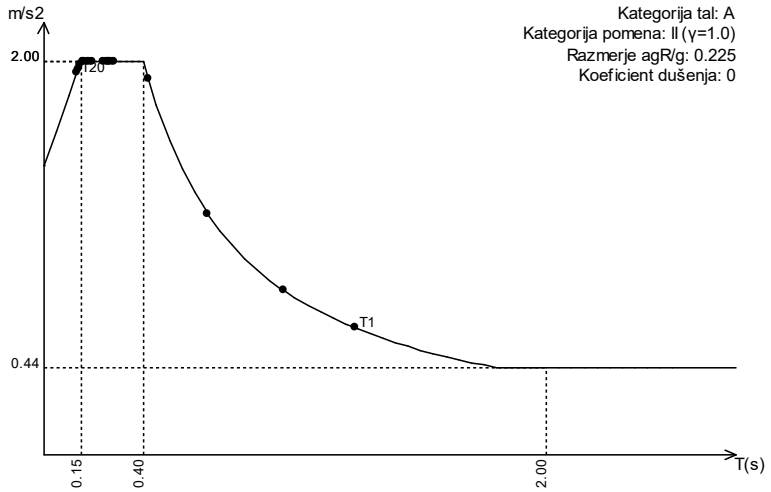
Faktorji smeri potresa:

Obtežni primer	Kot [°]	k	k+90°	kz	Faktor .
potres x	0	1.000	0.300	0.000	3.900
potres y	90	0.300	1.000	0.000	3.900

Tip spektra

Obtežni primer	S	Tb	Tc	Td	avg/ag
potres x	1.000	0.150	0.400	2.000	1.000
potres y	1.000	0.150	0.400	2.000	1.000

Projektni spekter



S=1.00, Tb=0.15, Tc=0.40, Td=2.00

Razporeditev potresnih sil po višini objekta - 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]
podest nadstropja	7.70	2.26	-0.62	4.53	0.17	28.63	0.25	0.26	14.66	0.05
etažna/temeljna plošča	4.70	0.63	-0.70	17.98	-0.06	2.67	0.55	1.29	4.95	-0.06
podest	2.50	0.05	-0.03	0.09	0.01	0.23	0.10	0.04	0.42	0.18
	0.00	0.03	-0.02	0.15	0.00	0.44	0.05	0.03	0.57	0.07
	Σ=	2.97	-1.37	22.76	0.13	31.97	0.95	1.62	20.60	0.24

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]
podest nadstropja	7.70	46.04	98.74	0.33	147.57	-36.92	-123.75	61.47	-17.19	149.29
etažna/temeljna plošča	4.70	140.55	486.27	-15.81	448.56	-262.47	-111.16	187.26	-124.77	108.69
podest	2.50	3.17	28.25	9.63	41.73	-27.60	-0.33	17.36	-13.41	15.19
	0.00	11.65	41.02	1.95	117.48	-63.13	-59.76	52.01	-31.97	47.51
	Σ=	201.41	654.28	-3.90	755.34	-390.11	-295.00	318.10	-187.34	320.68

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]
podest nadstropja	7.70	1.03	-1.71	0.74	33.41	7.03	-15.73	106.72	22.53	56.85
etažna/temeljna plošča	4.70	5.11	-14.25	6.74	69.00	72.45	-71.33	282.11	235.43	-178.09
podest	2.50	0.26	-1.73	-0.46	8.85	10.22	4.15	34.35	33.59	27.46
	0.00	1.25	-3.96	1.08	25.15	21.59	-17.82	97.05	71.24	-20.43
	Σ=	7.66	-21.65	8.10	136.41	111.29	-100.74	520.22	362.79	-114.21

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]
podest nadstropja	7.70	20.55	-0.14	-21.89	142.71	4.17	-39.86	21.30	-6.67	-12.92
etažna/temeljna plošča	4.70	74.35	6.34	-132.35	423.30	75.53	584.14	321.31	-48.51	-208.34
podest	2.50	8.09	1.56	-4.91	46.90	17.62	60.70	29.68	10.20	-35.07
	0.00	24.97	2.20	-40.14	166.50	29.91	166.72	175.21	-25.86	-110.09
	Σ=	127.96	9.96	-199.30	779.42	127.23	771.70	547.51	-70.84	-366.42

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]
podest nadstropja	7.70	14.22	-2.04	-11.83	-14.52	1.34	3.04	-23.27	-0.39	-0.07
etažna/temeljna plošča	4.70	14.63	-31.88	-102.41	13.96	13.78	25.51	27.08	-9.26	-7.75
podest	2.50	2.27	-3.88	-23.35	0.66	3.90	5.26	3.19	-2.44	0.95
	0.00	17.73	-23.09	-83.64	-0.16	12.02	23.35	6.09	-8.57	-7.41
	Σ=	48.84	-60.88	-221.23	-0.06	31.04	57.17	13.09	-20.66	-14.29

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]
podest nadstropja	7.70	24.37	12.13	-2.84	23.28	1.67	-4.06	-2.07	0.02	-0.03
etažna/temeljna plošča	4.70	16.05	144.20	-10.76	202.92	-117.49	9.44	1.78	2.66	0.60
podest	2.50	20.08	6.02	-19.17	53.79	-47.66	-1.70	-0.15	1.02	-0.70
	0.00	64.50	164.02	-39.55	287.70	-135.87	21.06	-0.77	3.91	-1.19
	Σ=	125.00	326.38	-72.32	567.70	-299.35	24.74	-1.21	7.61	-1.32

Nivo	Z [m]	Ton 19			Ton 20		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
podest nadstropja	7.70	-24.65	-29.01	-5.85	-40.11	-0.94	2.02
etažna/temeljna plošča	4.70	97.11	294.75	-19.35	256.33	-0.65	55.95
podest	2.50	14.72	74.89	-48.05	55.50	4.86	-4.11
	0.00	132.97	526.37	-140.24	509.65	-5.36	157.08
	Σ=	220.15	866.99	-213.50	781.38	-2.10	210.94

Razporeditev potresnih sil po višini objekta - 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]
podest nadstropja	7.70	-2.98	0.82	-5.99	0.17	27.89	0.25	0.15	8.57	0.03
etažna/temeljna plošča	4.70	-0.83	0.92	-23.75	-0.05	2.60	0.54	0.75	2.89	-0.04
podest	2.50	-0.06	0.04	-0.12	0.01	0.23	0.10	0.03	0.25	0.11
	0.00	-0.04	0.02	-0.20	0.00	0.43	0.05	0.02	0.34	0.04
	Σ=	-3.92	1.80	-30.05	0.12	31.14	0.93	0.95	12.04	0.14

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]
podest nadstropja	7.70	-0.59	-1.27	-0.00	-201.69	50.46	169.13	-87.86	24.57	-213.37
etažna/temeljna plošča	4.70	-1.81	-6.27	0.20	-613.05	358.72	151.92	-267.62	178.32	-155.33
podest	2.50	-0.04	-0.36	-0.12	-57.03	37.72	0.45	-24.82	19.16	-21.71
	0.00	-0.15	-0.53	-0.03	-160.56	86.27	81.68	-74.33	45.69	-67.90
	Σ=	-2.60	-8.44	0.05	-1032.33	533.17	403.18	-454.63	267.74	-458.31

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]
podest nadstropja	7.70	-12.55	20.80	-9.01	-20.27	-4.27	9.55	-69.79	-14.74	-37.18
etažna/temeljna plošča	4.70	-62.24	173.46	-81.99	-41.87	-43.96	43.28	-184.49	-153.96	116.47
podest	2.50	-3.20	21.06	5.61	-5.37	-6.20	-2.52	-22.46	-21.97	-17.96
	0.00	-15.22	48.18	-13.18	-15.26	-13.10	10.81	-63.47	-46.59	13.36
	Σ=	-93.20	263.51	-98.56	-82.77	-67.52	61.13	-340.21	-237.26	74.69

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]
podest nadstropja	7.70	-19.62	0.13	20.89	-129.39	-3.78	36.14	-23.02	7.21	13.96
etažna/temeljna plošča	4.70	-70.96	-6.05	126.31	-383.78	-68.48	-529.60	-347.27	52.43	225.17
podest	2.50	-7.72	-1.49	4.69	-42.52	-15.97	-55.03	-32.08	-11.02	37.90
	0.00	-23.83	-2.10	38.31	-150.96	-27.12	-151.15	-189.36	27.95	118.98
	Σ=	-122.12	-9.51	190.20	-706.65	-115.35	-699.65	-591.73	76.56	396.02

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]
podest nadstropja	7.70	-31.20	4.47	25.97	-14.71	1.36	3.08	65.12	1.08	0.20
etažna/temeljna plošča	4.70	-32.11	69.96	224.74	14.14	13.96	25.85	-75.79	25.91	21.70
podest	2.50	-4.97	8.51	51.24	0.67	3.95	5.33	-8.92	6.84	-2.66
	0.00	-38.92	50.68	183.56	-0.16	12.18	23.67	-17.05	23.99	20.74
	Σ=	-107.20	133.62	485.51	-0.06	31.45	57.93	-36.63	57.82	39.99

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]
podest nadstropja	7.70	-2.96	-1.47	0.34	-32.04	-2.30	5.58	-6.79	0.07	-0.11
etažna/temeljna plošča	4.70	-1.95	-17.53	1.31	-279.18	161.64	-12.99	5.81	8.69	1.96
podest	2.50	-2.44	-0.73	2.33	-74.01	65.58	2.34	-0.48	3.35	-2.28
	0.00	-7.84	-19.93	4.81	-395.83	186.93	-28.97	-2.53	12.81	-3.91
	Σ=	-15.19	-39.67	8.79	-781.06	411.85	-34.04	-3.98	24.92	-4.34

Nivo	Z [m]	Ton 19			Ton 20		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
podest nadstropja	7.70	-2.05	-2.41	-0.49	40.17	0.94	-2.02
etažna/temeljna plošča	4.70	8.08	24.52	-1.61	-256.75	0.65	-56.04
podest	2.50	1.22	6.23	-4.00	-55.59	-4.86	4.12
	0.00	11.06	43.78	-11.66	-510.47	5.37	-157.34
	Σ=	18.31	72.11	-17.76	-782.63	2.10	-211.28

Faktorji participacije - relativno sodelovanje

Ton \ Naziv	1. potres x	2. potres y
1	0.000	0.001
2	0.002	0.002
3	0.001	0.000
4	0.071	0.000
5	0.114	0.214
6	0.047	0.096
7	0.000	0.031
8	0.030	0.011
9	0.112	0.048
10	0.023	0.021
11	0.146	0.121
12	0.094	0.110
13	0.005	0.026
14	0.002	0.002
15	0.001	0.010
16	0.040	0.001
17	0.085	0.162
18	0.000	0.002
19	0.086	0.001
20	0.139	0.141

Faktorji participacije - angažiranje mase			
Ton	U [□=0°]	U [□=90°]	U [Z]
1	0.19	0.04	11.37
2	0.00	4.57	0.00
3	0.01	1.61	0.00
4	1.94	20.45	0.00
5	16.23	4.33	2.47
6	7.01	2.43	7.13
7	0.92	7.32	1.02

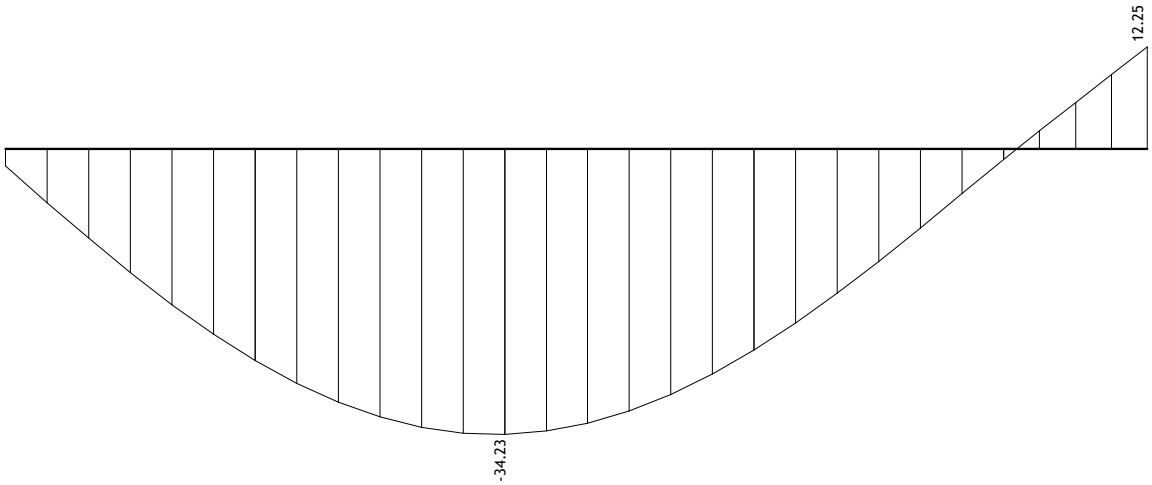
Ton	U [□=0°]	U [□=90°]	U [Z]
8	1.99	1.32	1.09
9	7.81	3.80	0.38
10	2.27	0.01	5.51
11	13.49	0.36	13.22
12	10.34	0.17	4.63
13	1.42	2.20	29.05
14	0.00	1.89	6.41

Ton	U [□=0°]	U [□=90°]	U [Z]
15	0.45	1.12	0.54
16	1.27	8.67	0.43
17	12.24	3.40	0.02
18	0.03	0.99	0.03
19	1.87	28.97	1.76
20	14.60	0.00	1.06
□U (%)	94.07	93.66	86.12

Statični preračun

Obt. 14: I+II

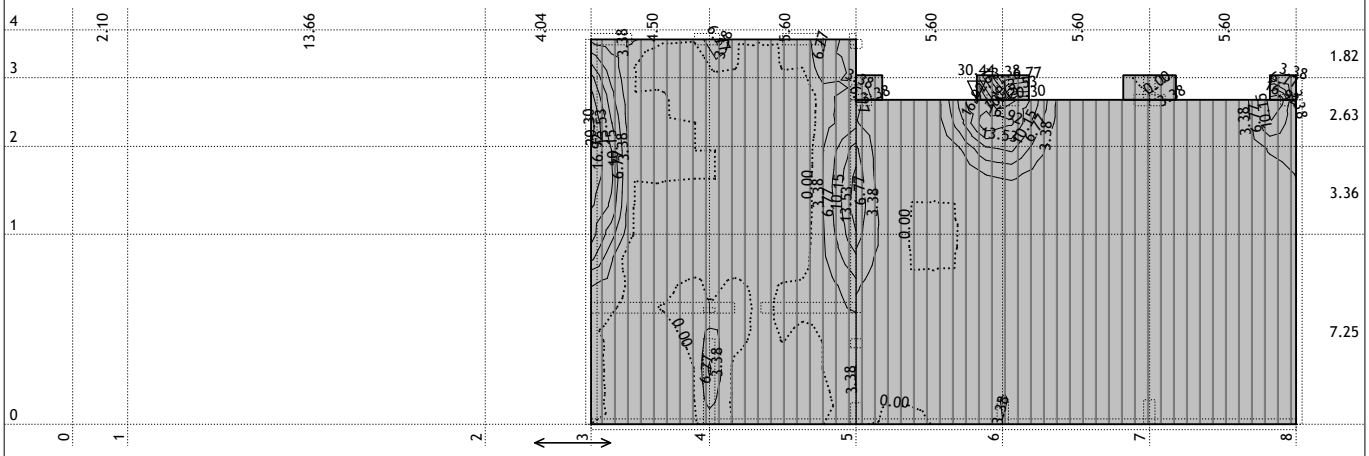
Zp



Vplivi v gredi: (7503-7833-7992-8007)
Zp [m/1000]

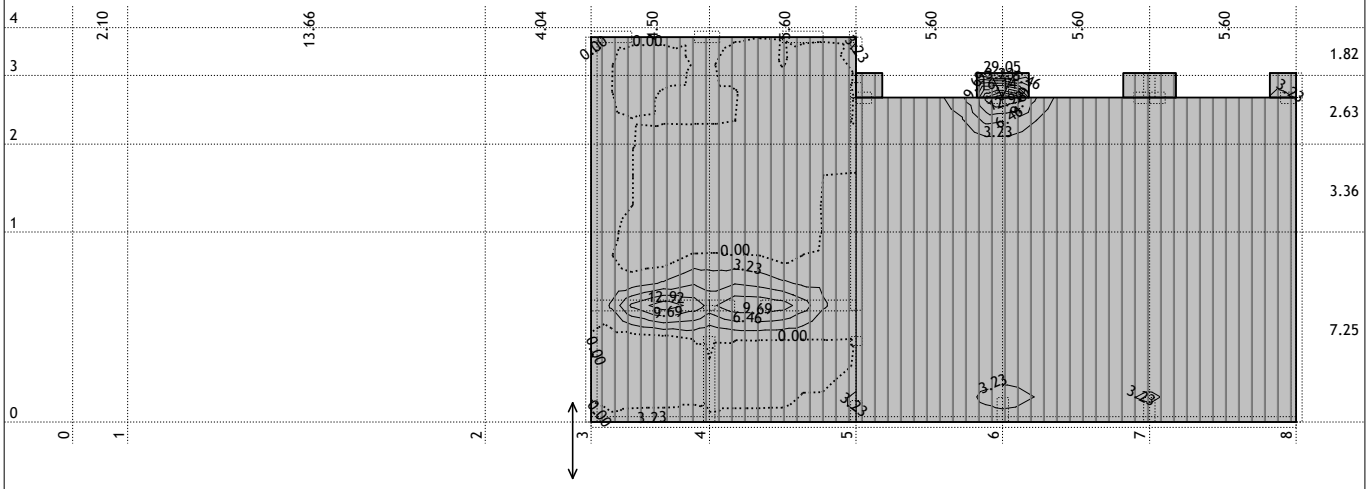
Dimenzioniranje (beton)

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm



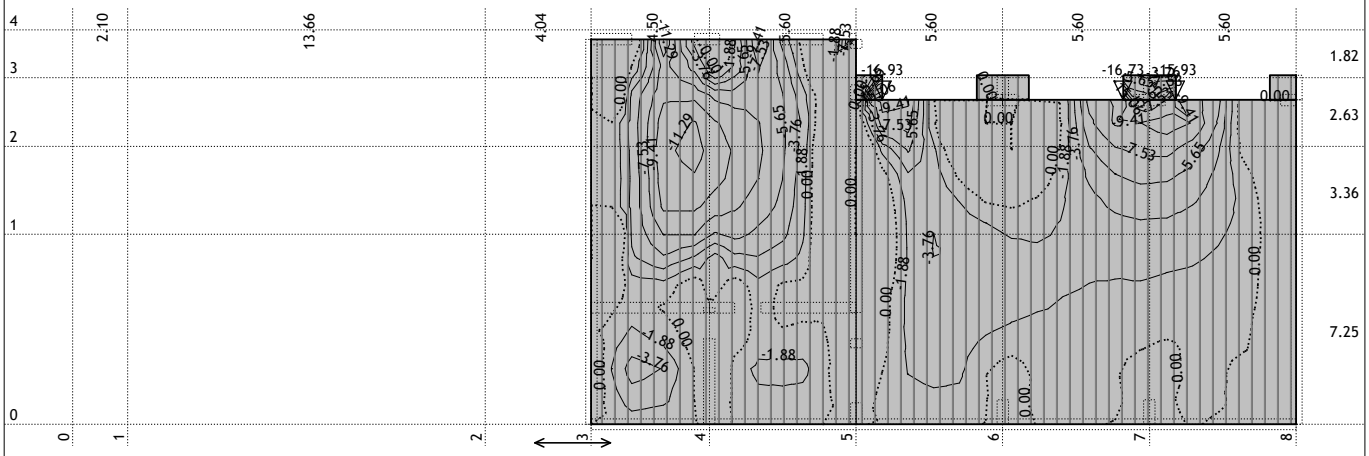
Nivo: [0.00 m]
Aa - sp.cona - Smer 1 - max Aa1,s= 30.44 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm



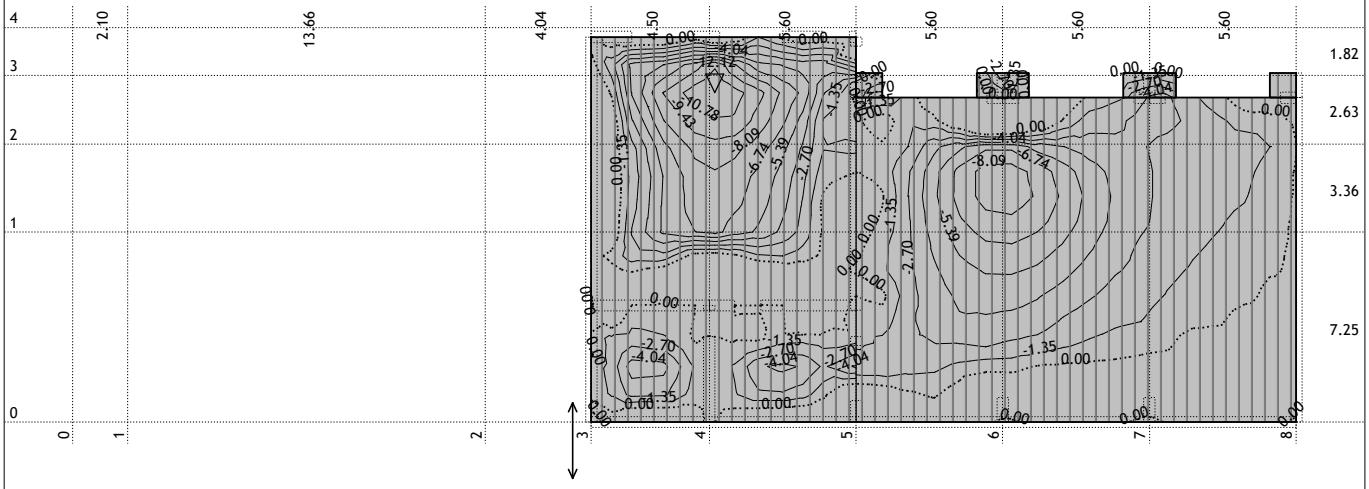
Nivo: [0.00 m]
Aa - sp.cona - Smer 2 - max Aa2,s= 29.05 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm



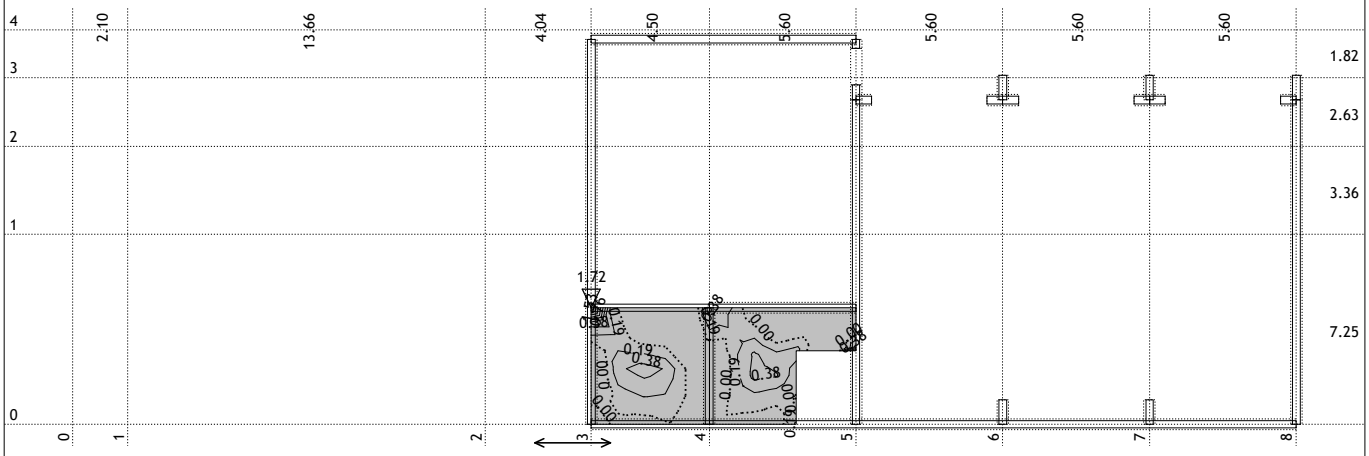
Nivo: [0.00 m]
Aa - zg.cona - Smer 1 - max Aa1,z= -16.93 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm



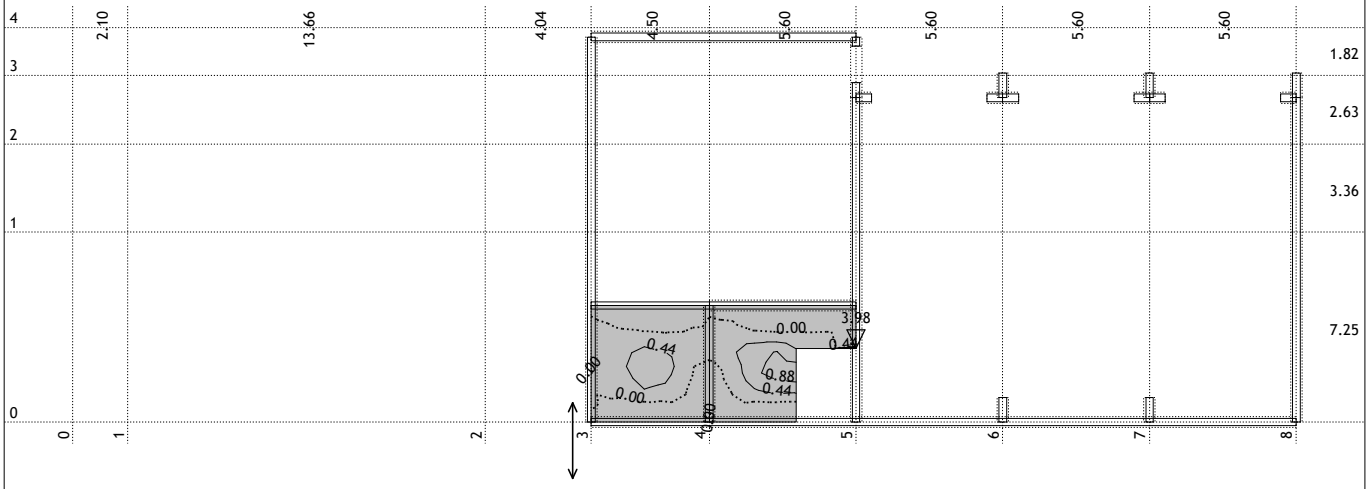
Nivo: [0.00 m]
Aa - zg.cona - Smer 2 - max Aa2,z= -12.12 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm



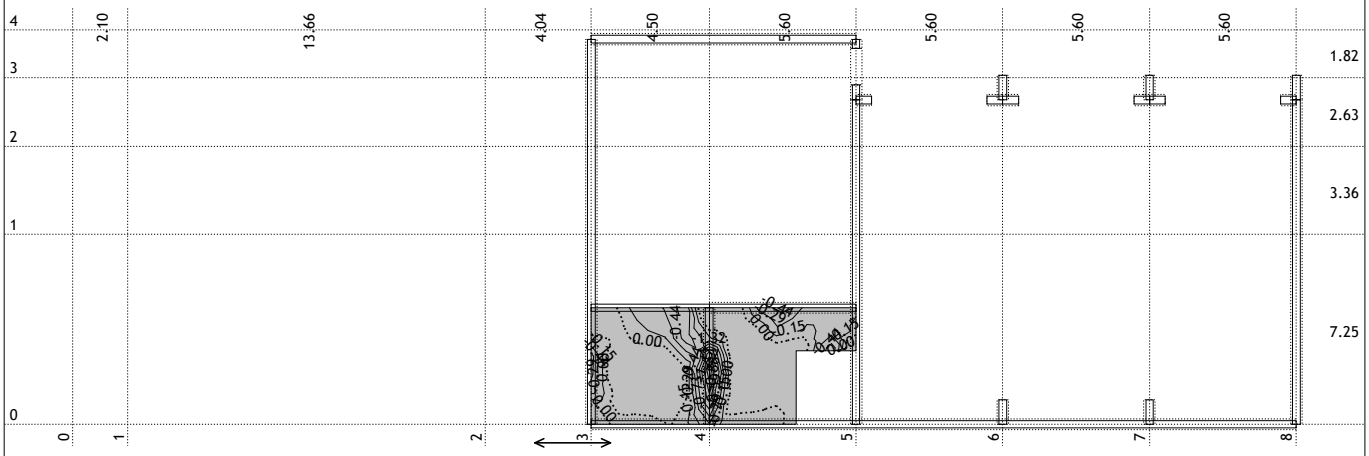
Nivo: podest [2.50 m]
Aa - sp.cona - Smer 1 - max Aa1,s= 1.72 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm



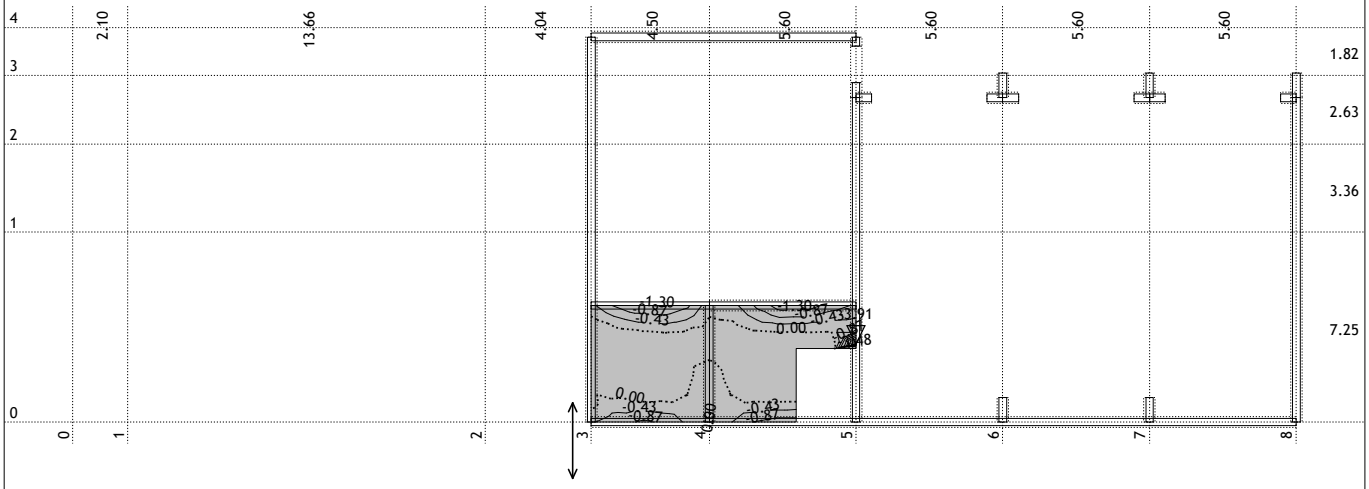
Nivo: podest [2.50 m]
Aa - sp.cona - Smer 2 - max Aa2,s= 3.98 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm



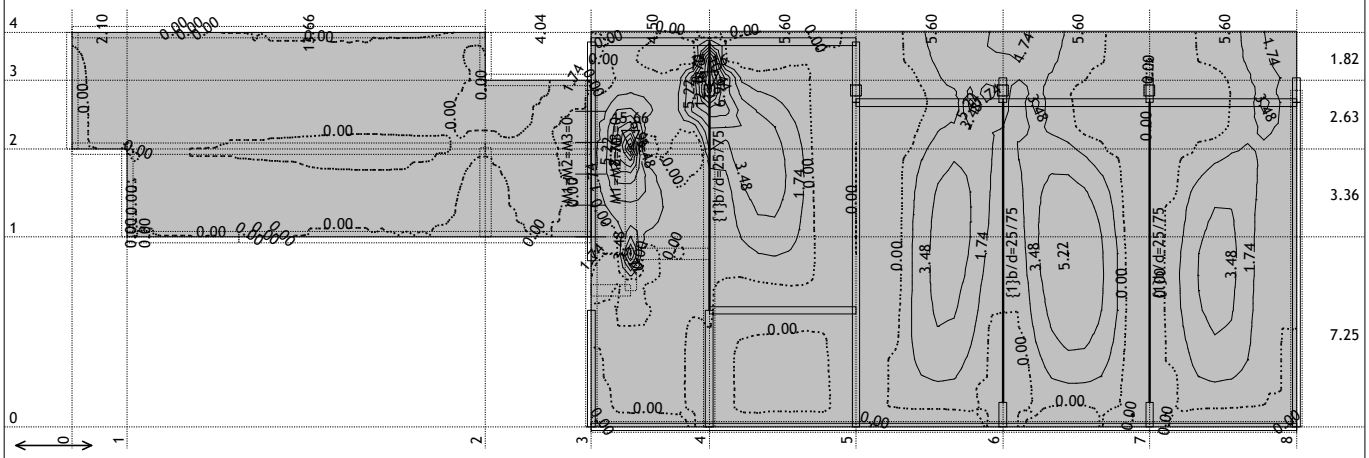
Nivo: podest [2.50 m]
Aa - zg.cona - Smer 1 - max Aa1,z= -1.32 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm



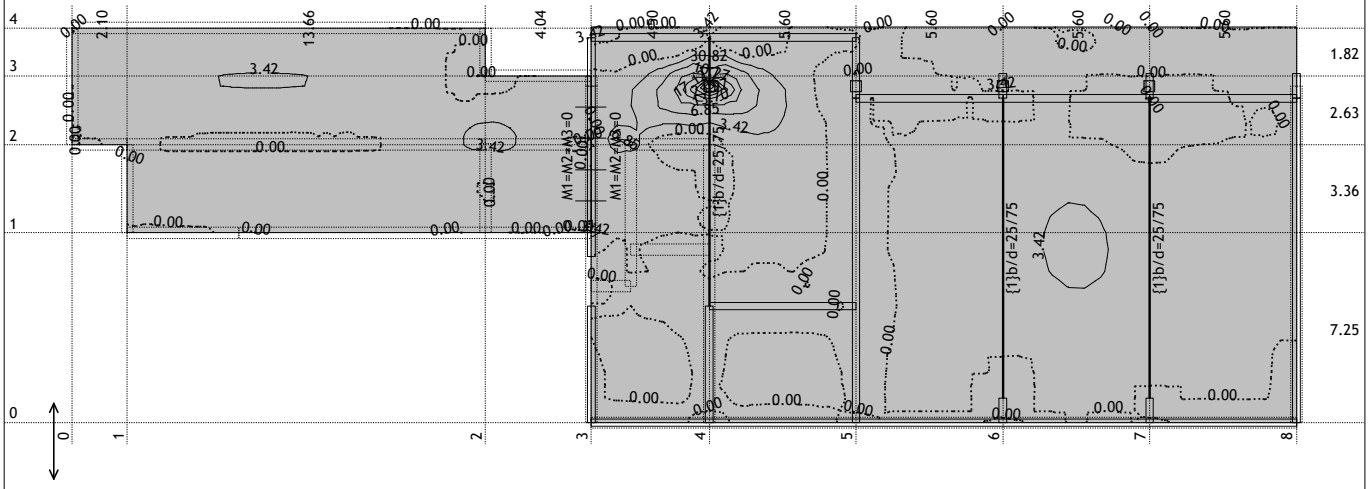
Nivo: podest [2.50 m]
Aa - zg.cona - Smer 2 - max Aa2,z= -3.91 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm



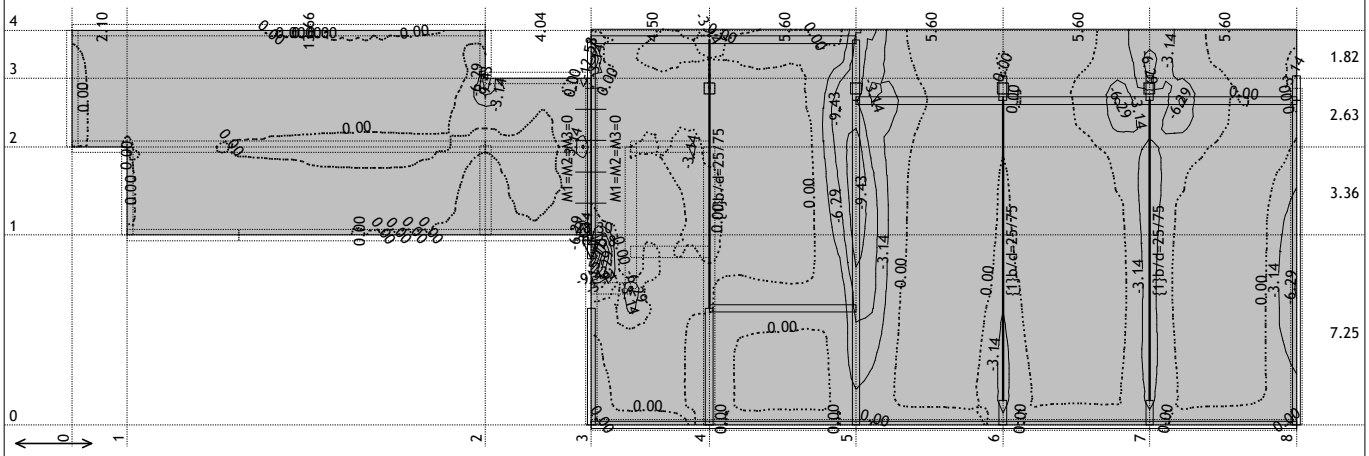
Nivo: etažna/temeljna plošča [4.70 m]
Aa - sp.cona - Smer 1 - max Aa1,s= 15.66 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm



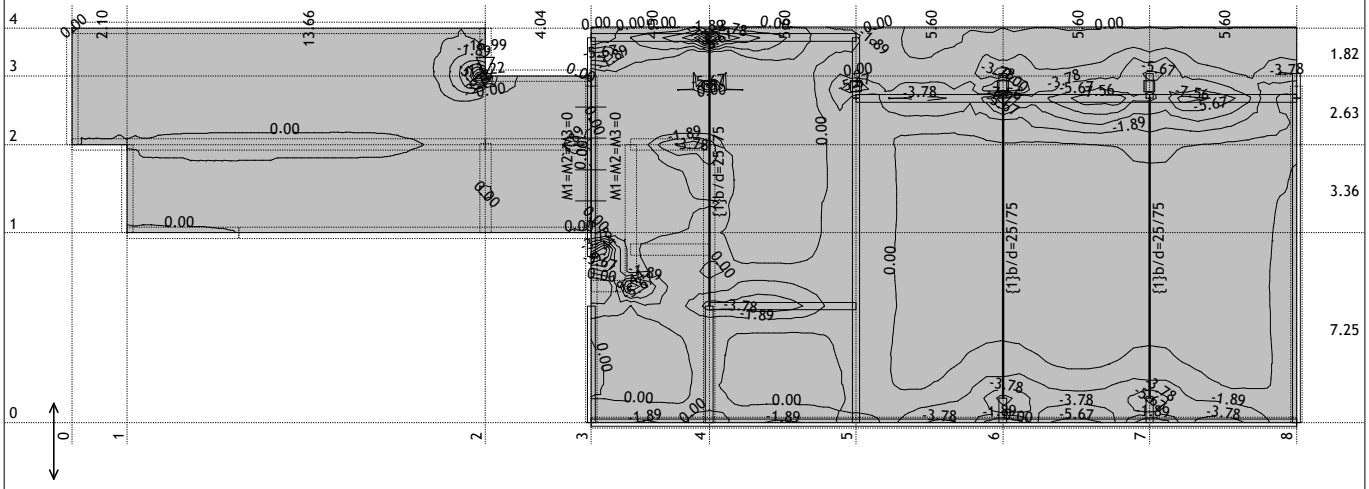
Nivo: etažna/temeljna plošča [4.70 m]
Aa - sp.cona - Smer 2 - max Aa2,s= 30.82 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm

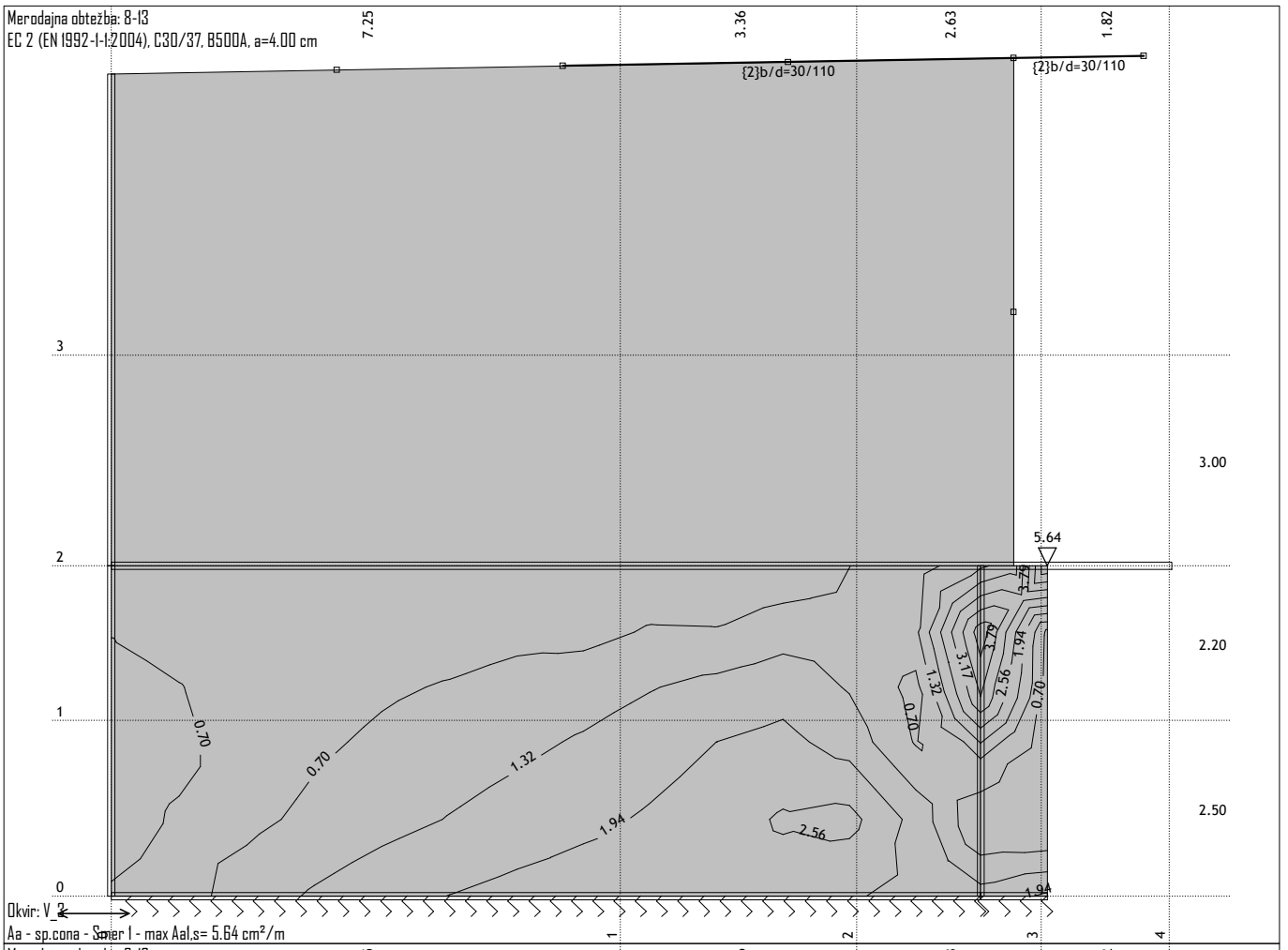


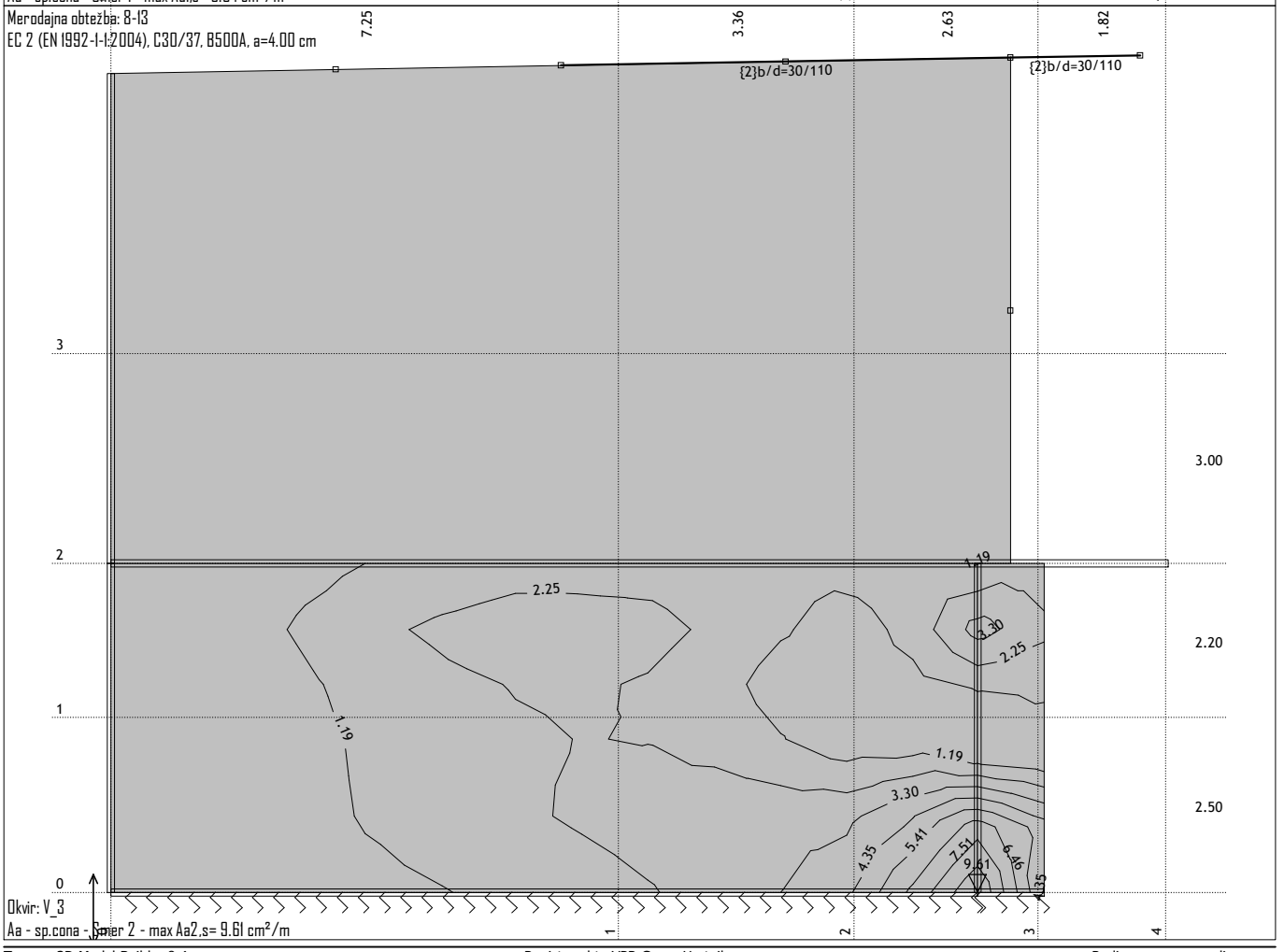
Nivo: etažna/temeljna plošča [4.70 m]
Aa - zg.cona - Smer 1 - max Aa1,z= -28.30 cm²/m

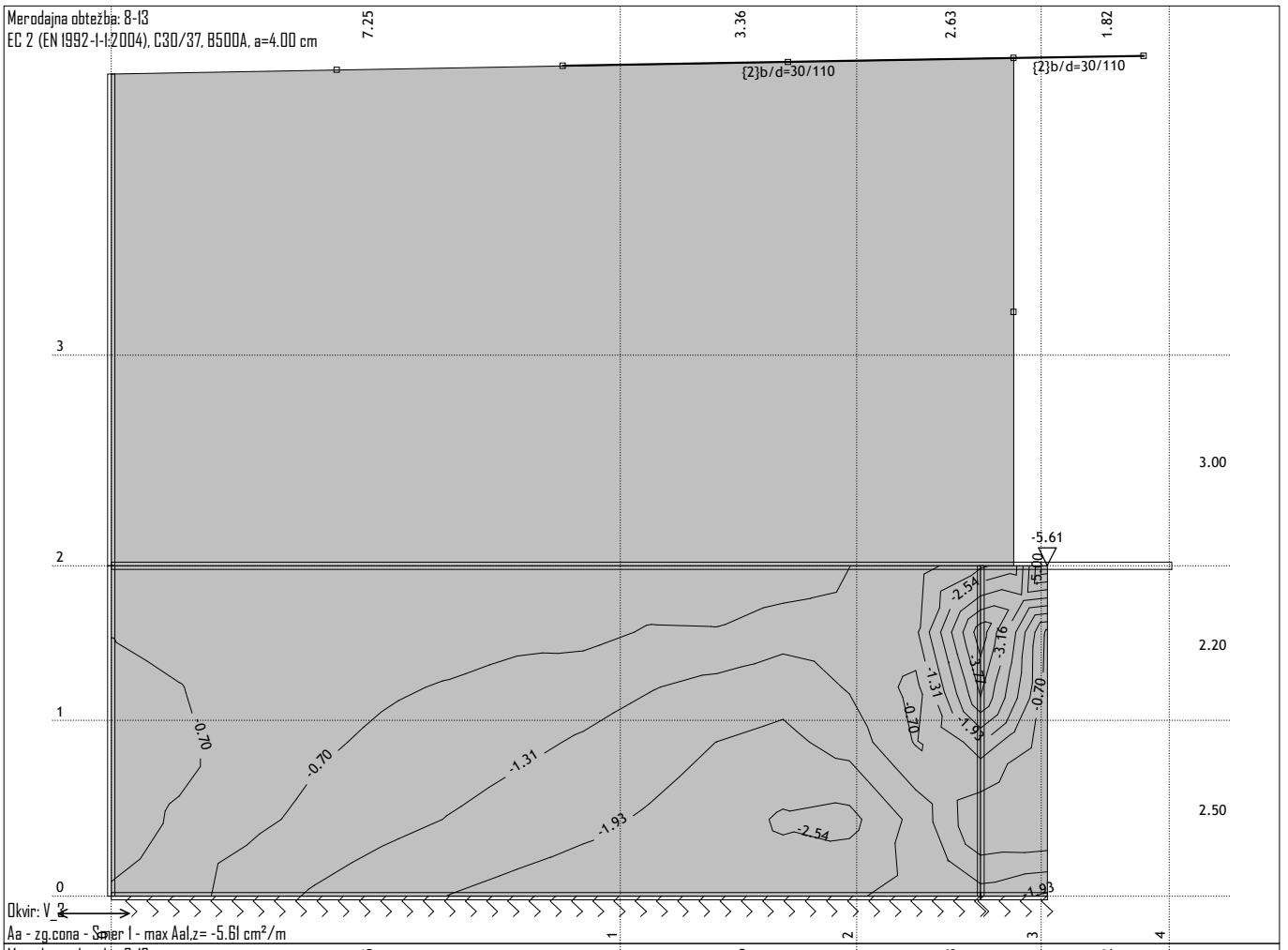
Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm

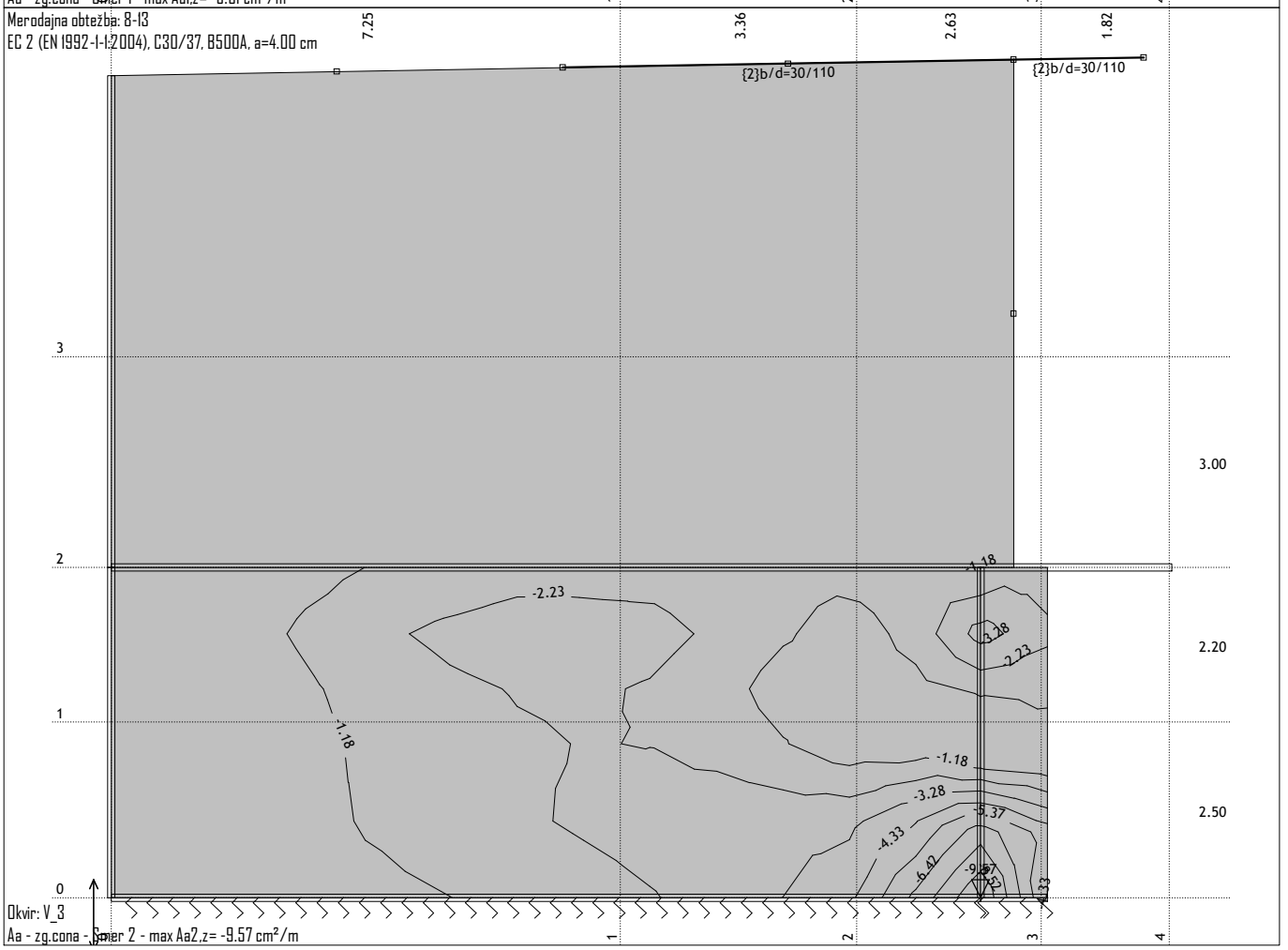


Nivo: etažna/temeljna plošča [4.70 m]
Aa - zg.cona - Smer 2 - max Aa2,z= -16.99 cm²/m

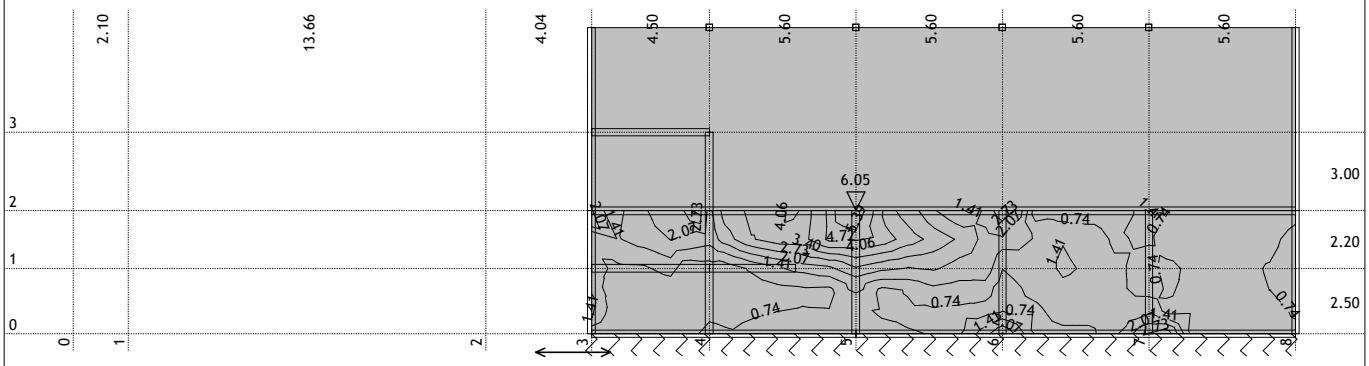

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm
7.25
3.36
2.63
1.82
{2}b/d=30/110
{2}b/d=30/110
3.00
2.20
2.50
5.64
0.70
1.32
1.94
2.56
3.79
3.17
Okvir: V_2
Aa - sp.cona - Smer 1 - max Aa1,s= 5.64 cm²/m


Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm
7.25
3.36
2.63
1.82
{2}b/d=30/110
{2}b/d=30/110
3.00
2.20
2.50
2.25
1.19
3.30
5.41
4.35
7.51
9.61
Okvir: V_3
Aa - sp.cona - Smer 2 - max Aa2,s= 9.61 cm²/m


Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm
7.25
3.36
2.63
1.82
{2}b/d=30/110
{2}b/d=30/110
3.00
2.20
2.50
-5.61
-2.54
-3.16
-1.31
-0.70
-1.93
-2.54
-1.93
Okvir: V_2
Aa - zg.cona - Smer 1 - max Aa1,z= -5.61 cm²/m

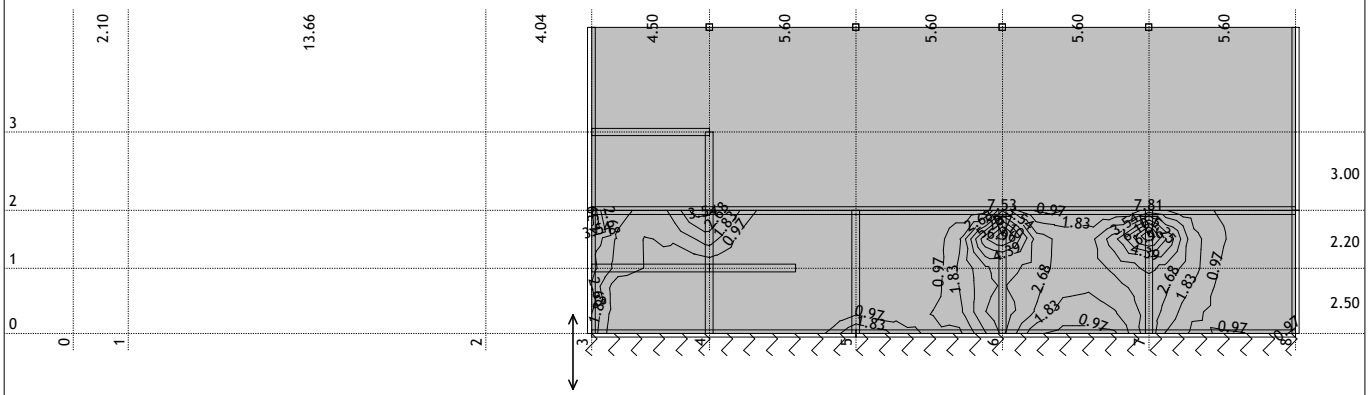

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm
7.25
3.36
2.63
1.82
{2}b/d=30/110
{2}b/d=30/110
3.00
2.20
2.50
-1.18
-2.23
-3.48
-2.23
-1.18
-1.18
-3.28
-5.37
-4.33
-6.42
-9.57
-9.33
Okvir: V_3
Aa - zg.cona - Smer 2 - max Aa2,z= -9.57 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm



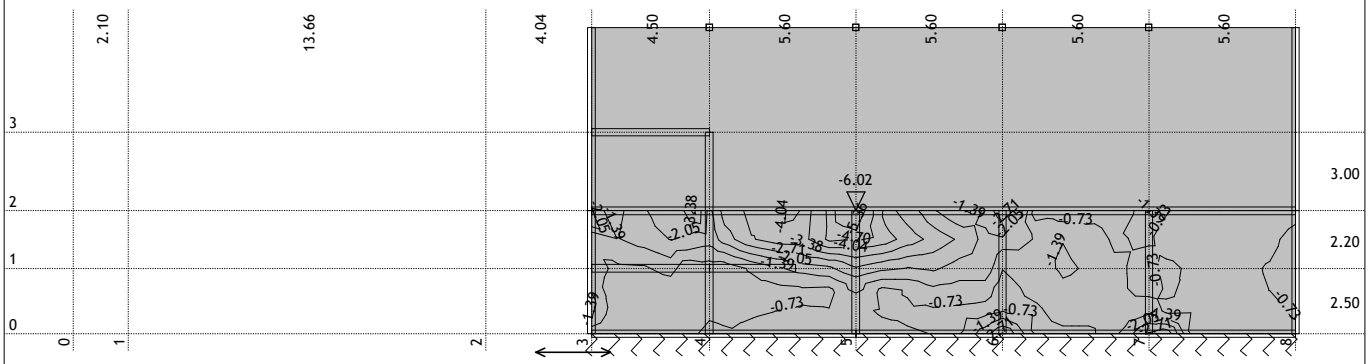
Okvir: H_1
Aa - sp.cona - Smer 1 - max Aa1,s= 6.05 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm



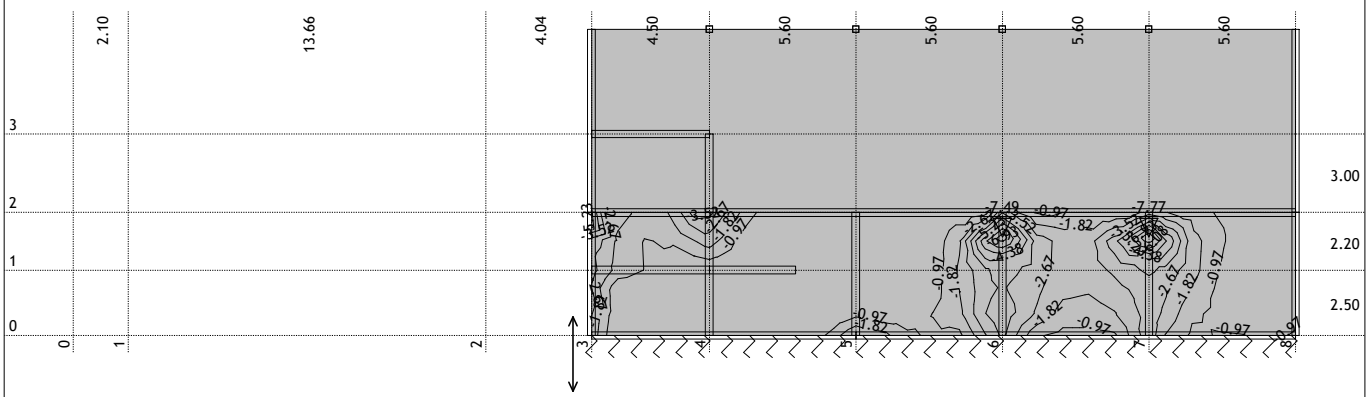
Okvir: H_1
Aa - sp.cona - Smer 2 - max Aa2,s= 7.81 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm

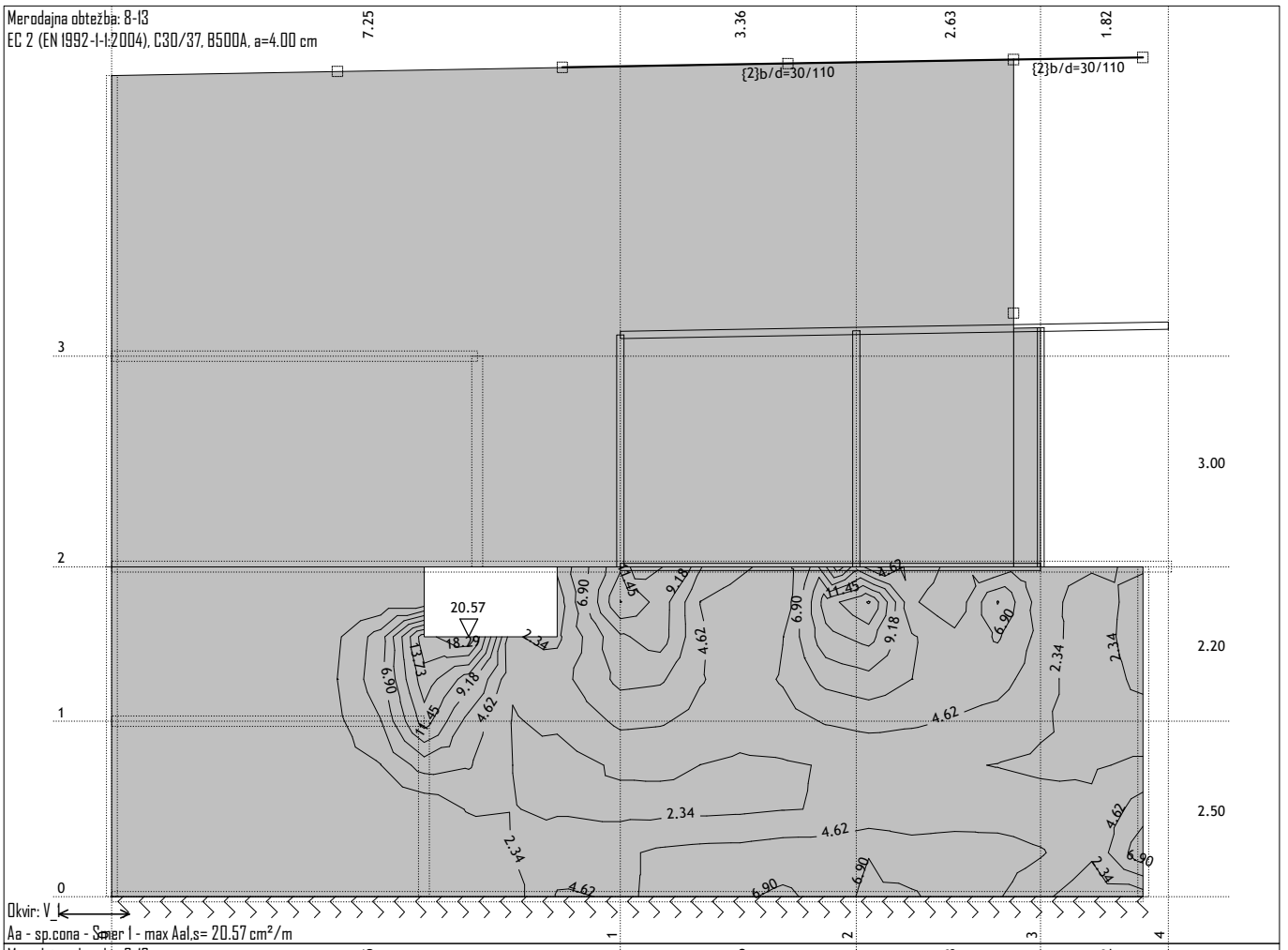


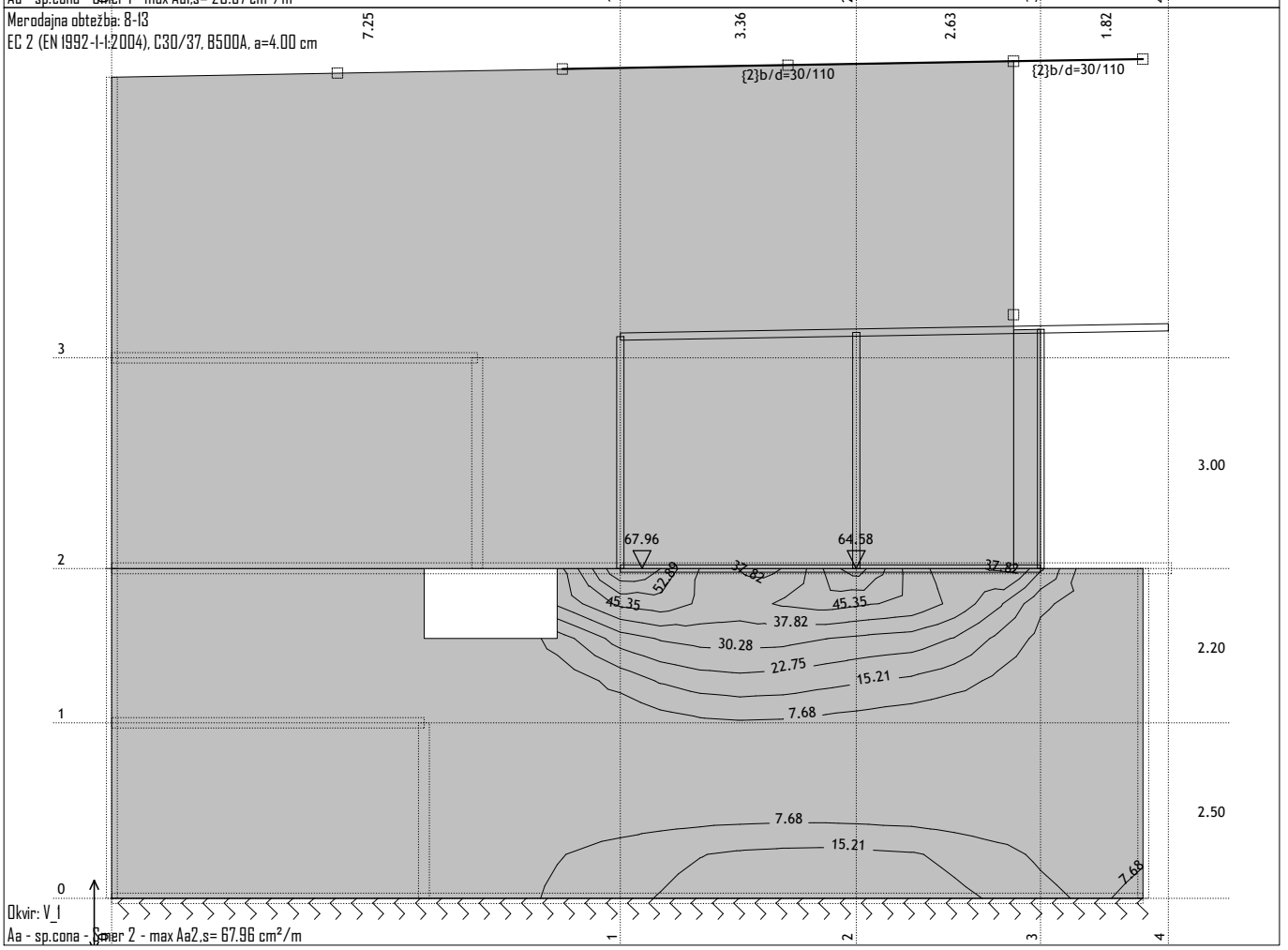
Okvir: H_1
Aa - zg.cona - Smer 1 - max Aa1,z= -6.02 cm²/m

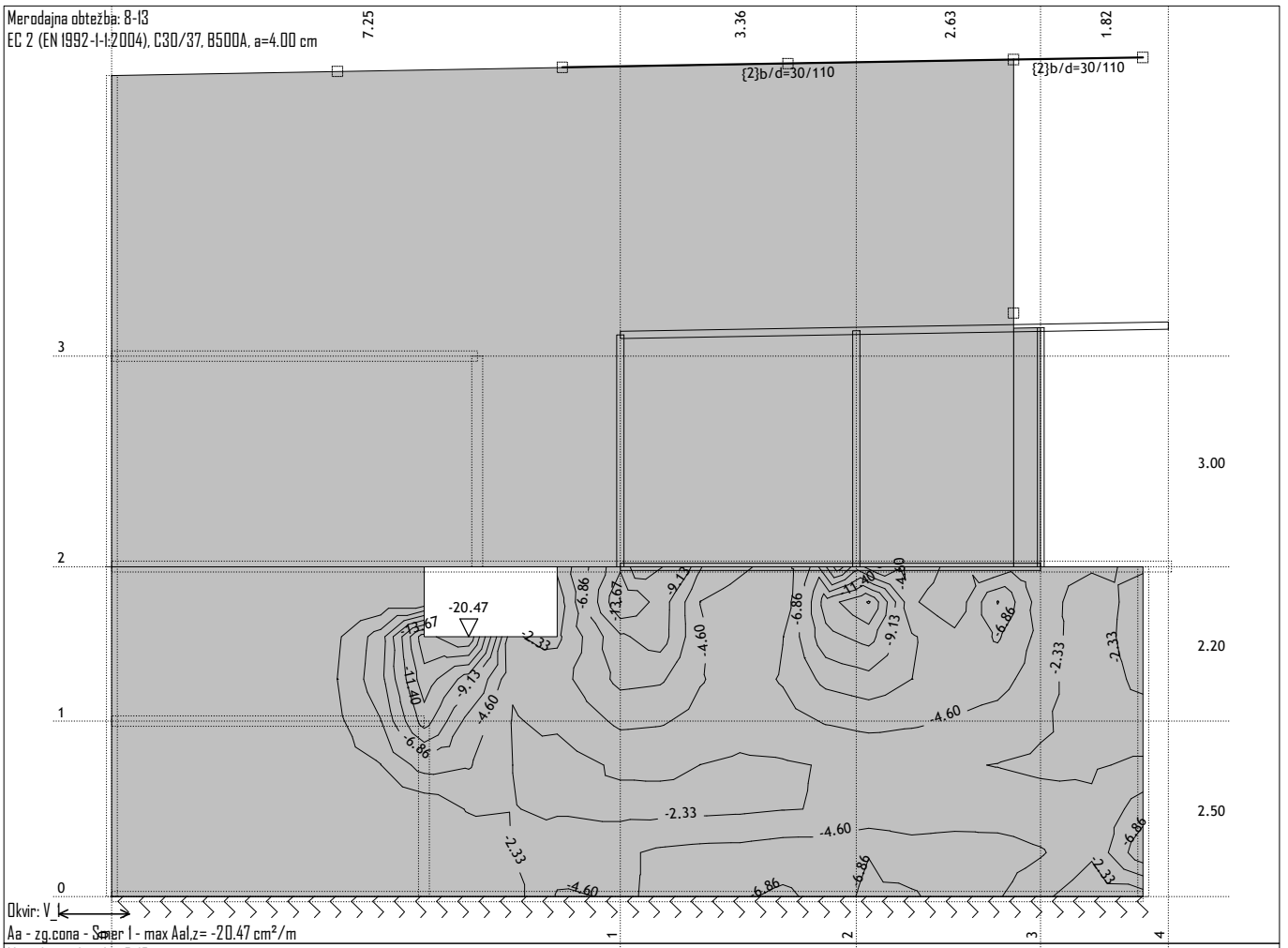
Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm

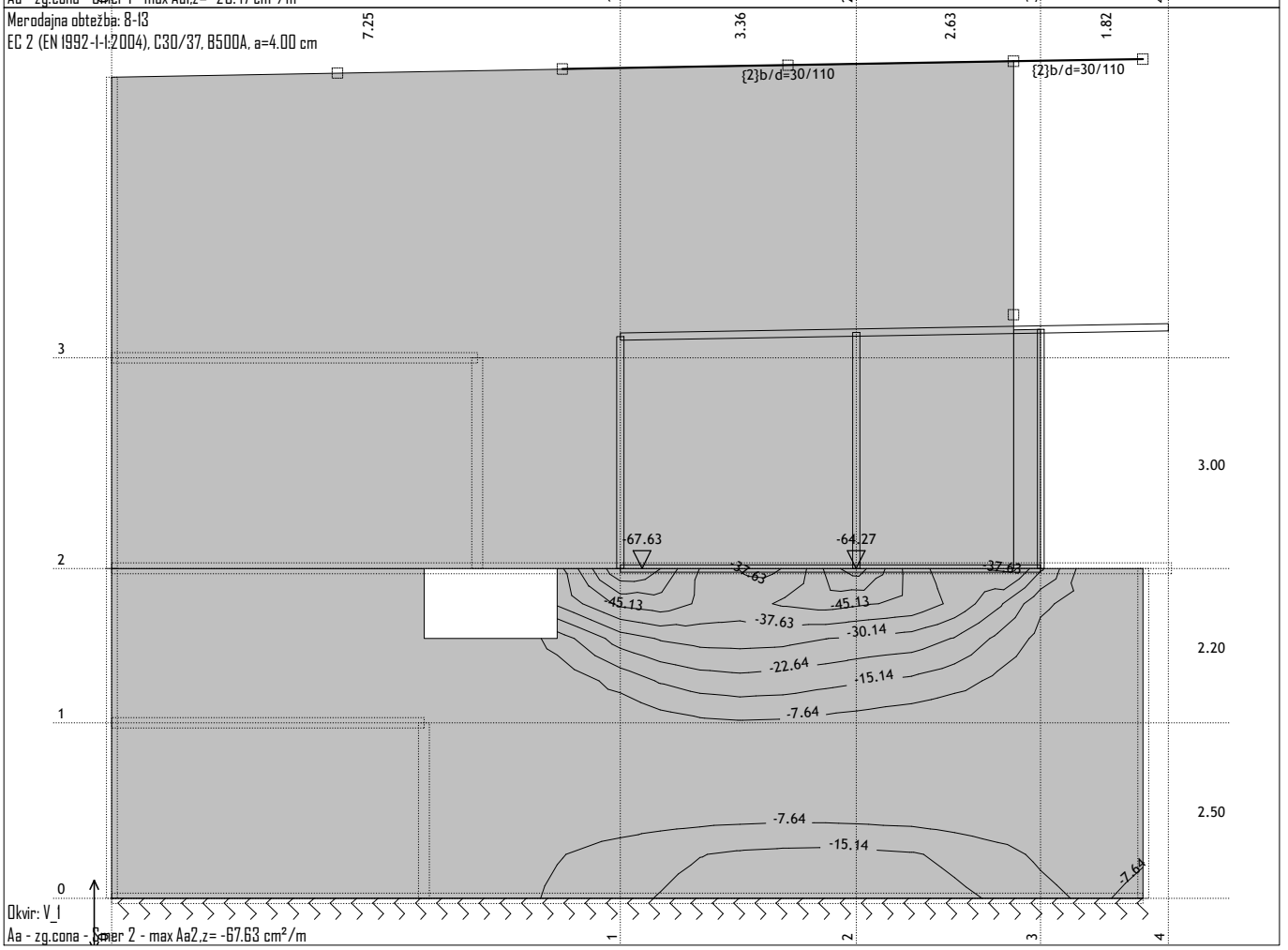


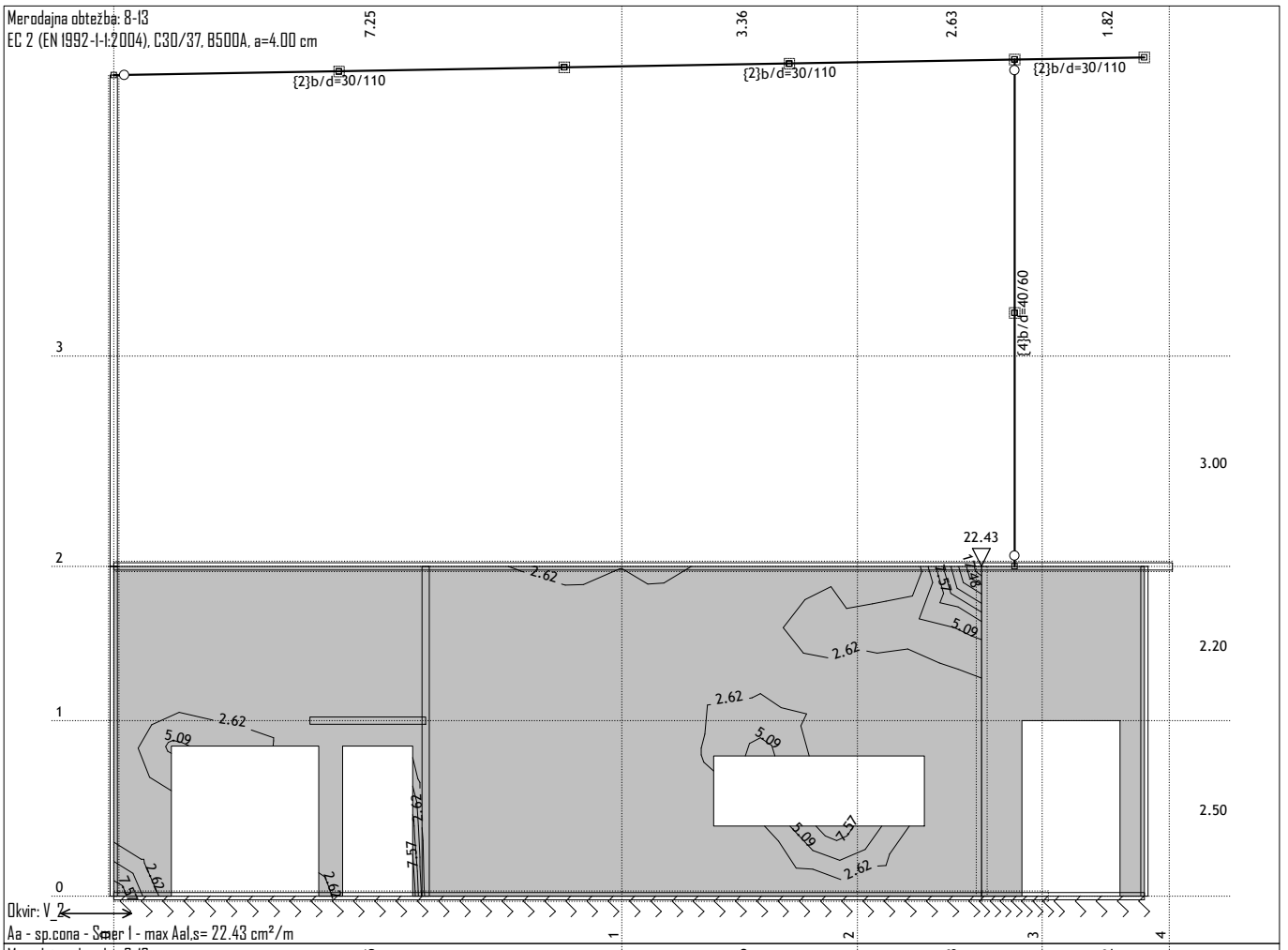
Okvir: H_1
Aa - zg.cona - Smer 2 - max Aa2,z= -7.77 cm²/m

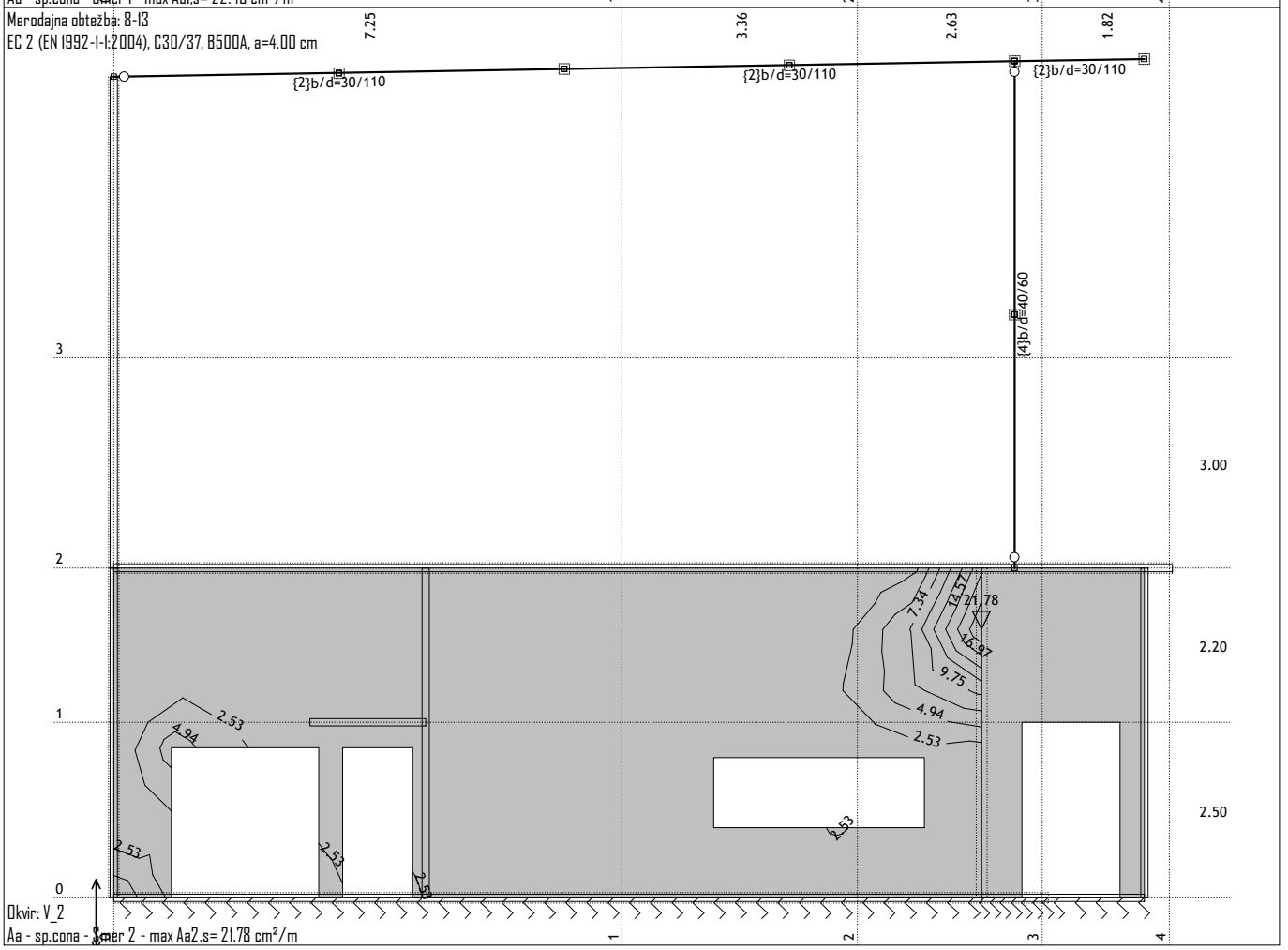

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm
7.25
3.36
2.63
1.82
{2}b/d=30/110
{2}b/d=30/110
3.00
2.20
2.50
20.57
18.29
13.73
11.45
9.18
6.90
4.62
2.34
Okvir: V_I
Aa - sp.cona - Smer 1 - max Aa1,s= 20.57 cm²/m

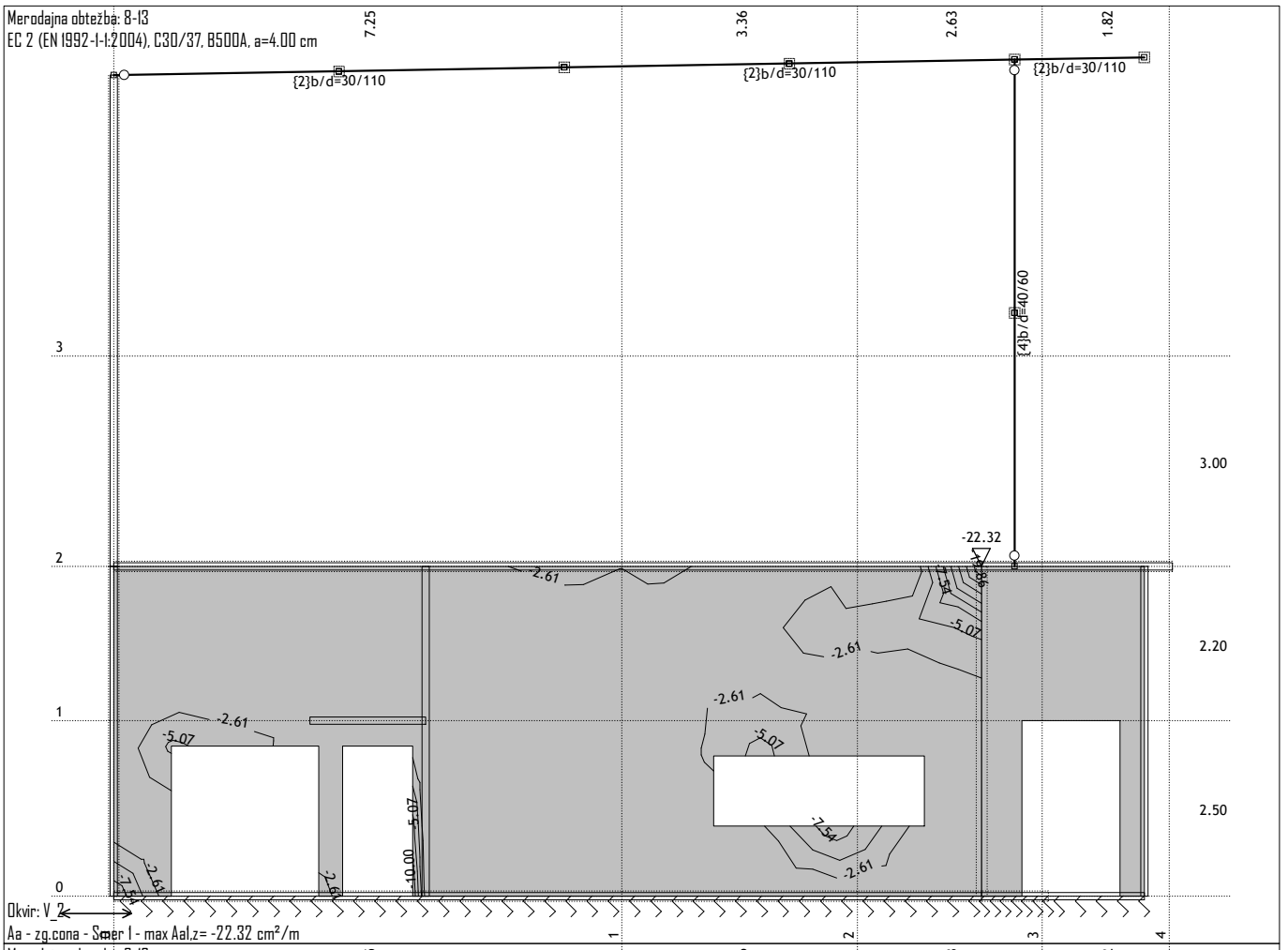

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm
7.25
3.36
2.63
1.82
{2}b/d=30/110
{2}b/d=30/110
3.00
2.20
2.50
67.96
64.58
52.80
45.35
37.82
30.28
22.75
15.21
7.68
Okvir: V_I
Aa - sp.cona - Smer 2 - max Aa2,s= 67.96 cm²/m

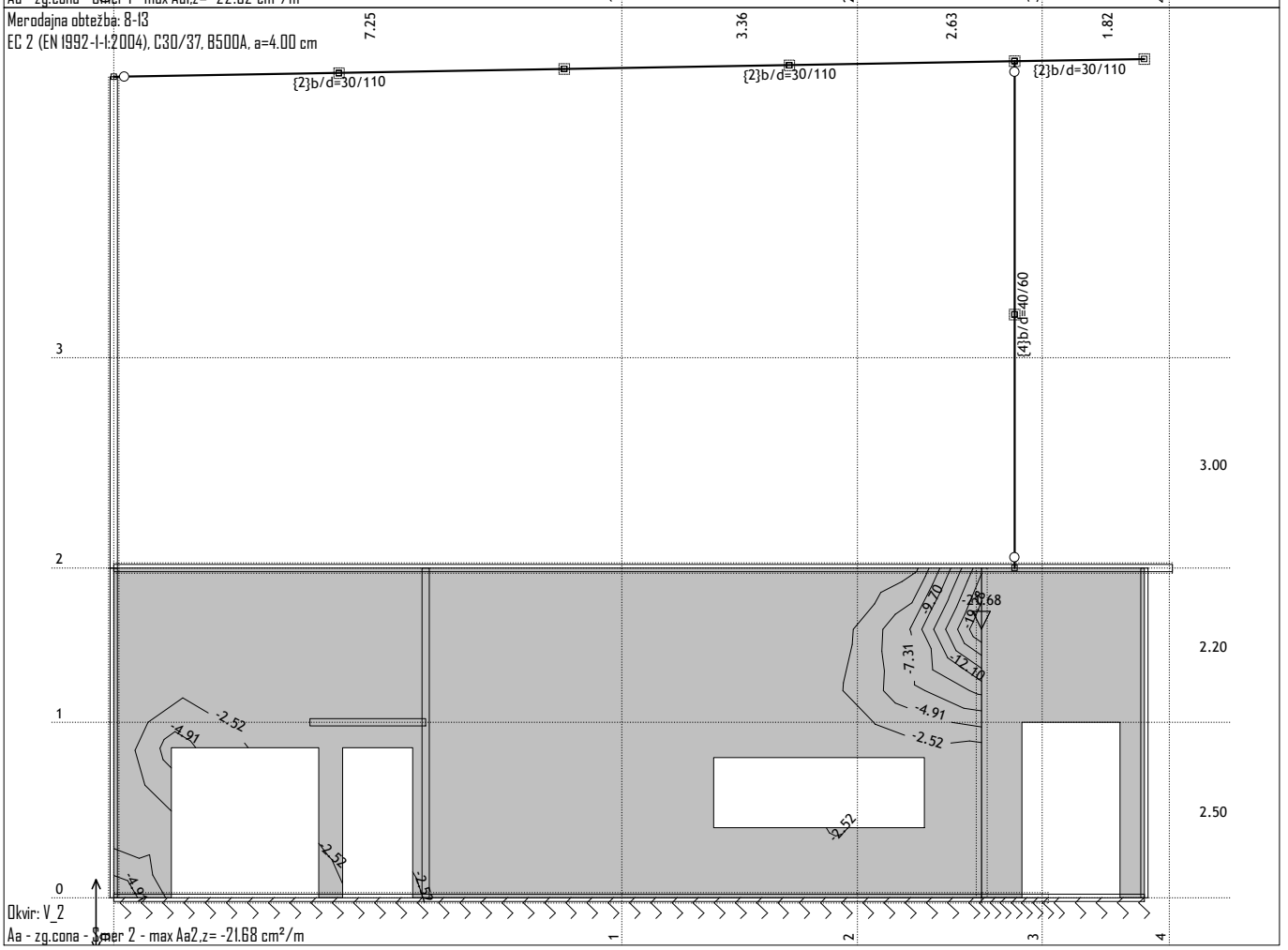

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm
7.25
3.36
2.63
1.82
{2}b/d=30/110
{2}b/d=30/110
3.00
2.20
2.50
-20.47
-13.67
-11.40
-9.13
-6.86
-4.60
-2.33
Okvir: V_I
Aa - zg.cona - Smer 1 - max Aa1,z= -20.47 cm²/m


Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm
7.25
3.36
2.63
1.82
{2}b/d=30/110
{2}b/d=30/110
3.00
2.20
2.50
-67.63
-64.27
-45.13
-37.63
-30.14
-22.64
-15.14
-7.64
Okvir: V_I
Aa - zg.cona - Smer 2 - max Aa2,z= -67.63 cm²/m

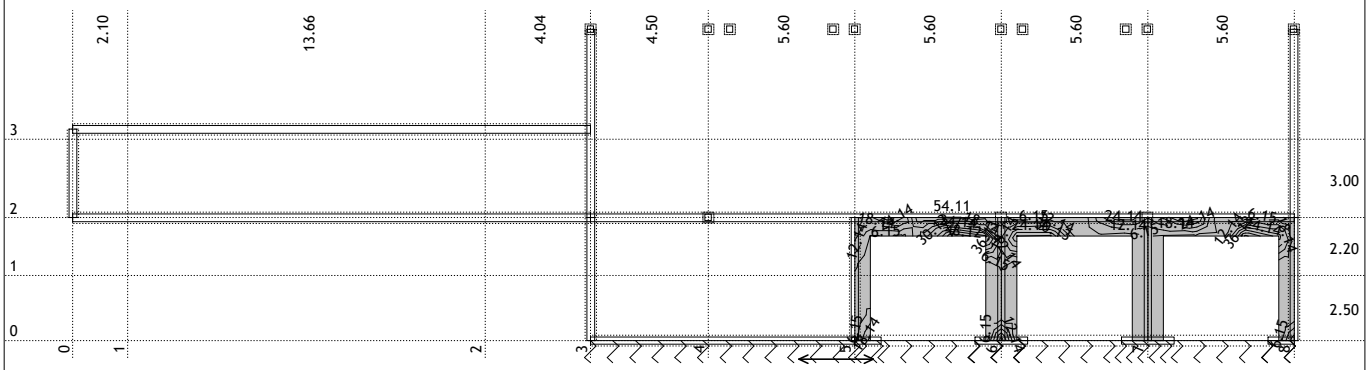

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm
7.25
3.36
2.63
1.82
{2}b/d=30/110
{2}b/d=30/110
{2}b/d=30/110
{4}b/d=40/60
22.43
3.00
2.20
2.50
2.62
5.09
7.57
Okvir: V_2
Aa - sp.cona - Smer 1 - max Aa1,s= 22.43 cm²/m


Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm
7.25
3.36
2.63
1.82
{2}b/d=30/110
{2}b/d=30/110
{2}b/d=30/110
{4}b/d=40/60
21.78
3.00
2.20
2.50
2.53
4.94
7.34
9.75
Okvir: V_2
Aa - sp.cona - Smer 2 - max Aa2,s= 21.78 cm²/m


Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm
7.25
3.36
2.63
1.82
{2}b/d=30/110
{2}b/d=30/110
{2}b/d=30/110
{4}b/d=40/60
3.00
2.20
2.50
-22.32
-2.61
-5.07
-7.54
-10.00
Okvir: V_2
Aa - zg.cona - Smer 1 - max Aa1,z= -22.32 cm²/m

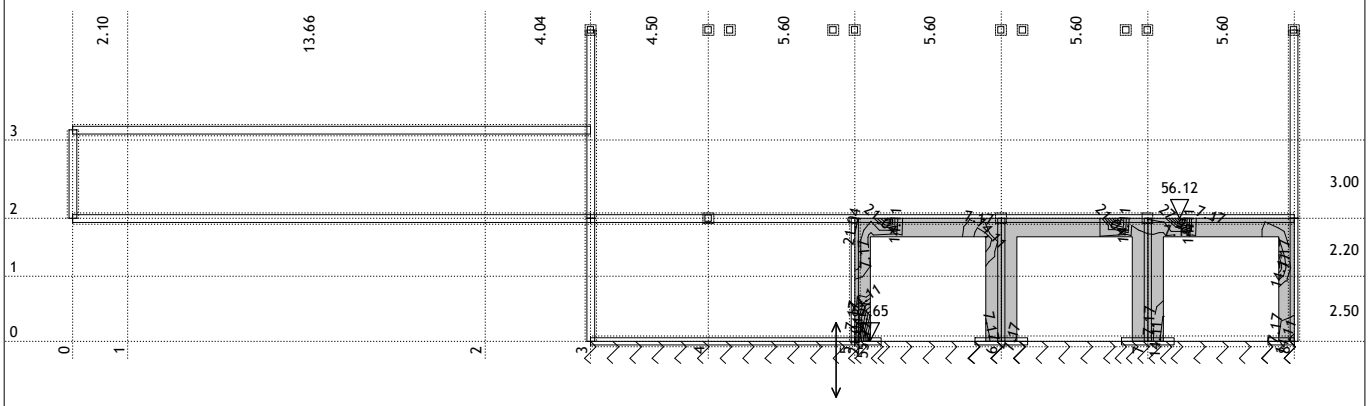

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm
7.25
3.36
2.63
1.82
{2}b/d=30/110
{2}b/d=30/110
{2}b/d=30/110
{4}b/d=40/60
3.00
2.20
2.50
-21.68
-2.52
-4.91
-7.31
-9.70
-12.10
Okvir: V_2
Aa - zg.cona - Smer 2 - max Aa2,z= -21.68 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm



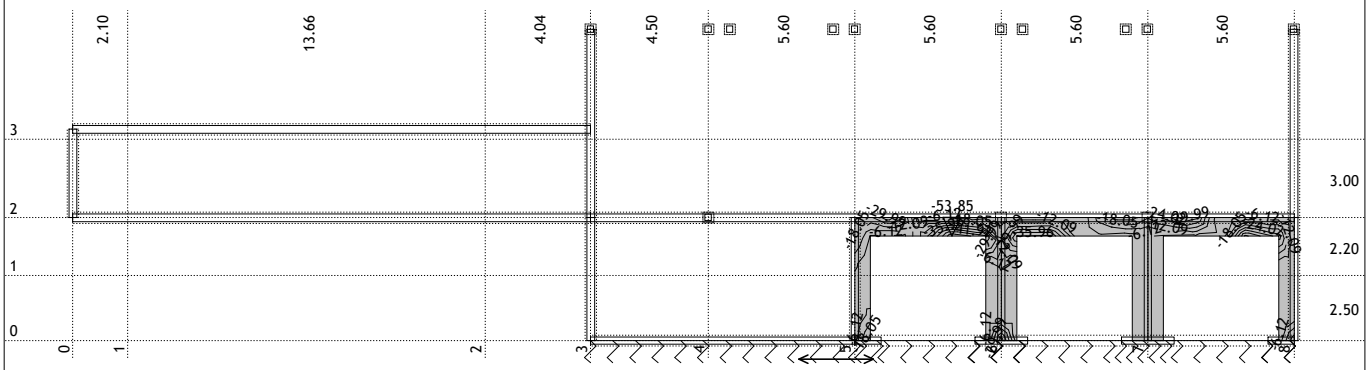
Okvir: H_3
Aa - sp.cona - Smer 1 - max Aal,s= 54.11 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm



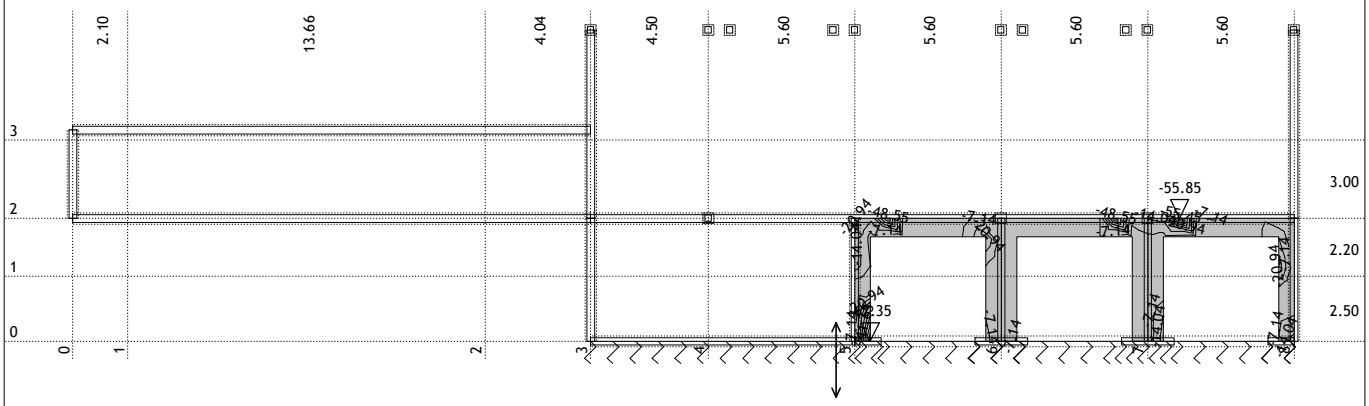
Okvir: H_3
Aa - sp.cona - Smer 2 - max Aa2,s= 62.65 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm



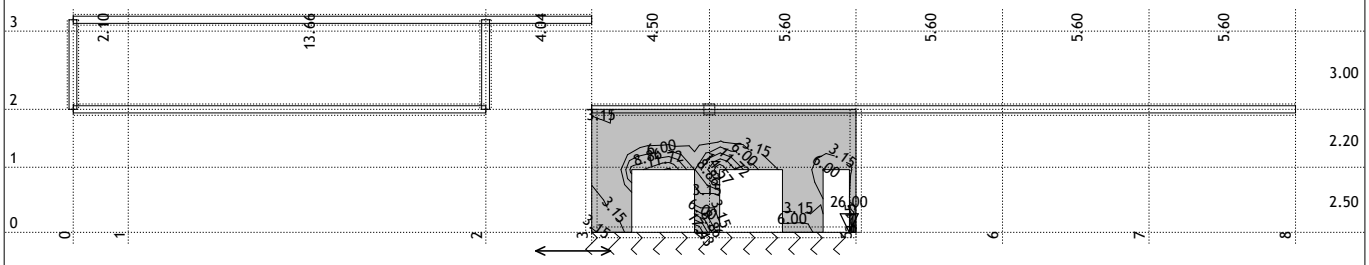
Okvir: H_3
Aa - zg.cona - Smer 1 - max Aal,z= -53.85 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C30/37, B500A, a=4.00 cm



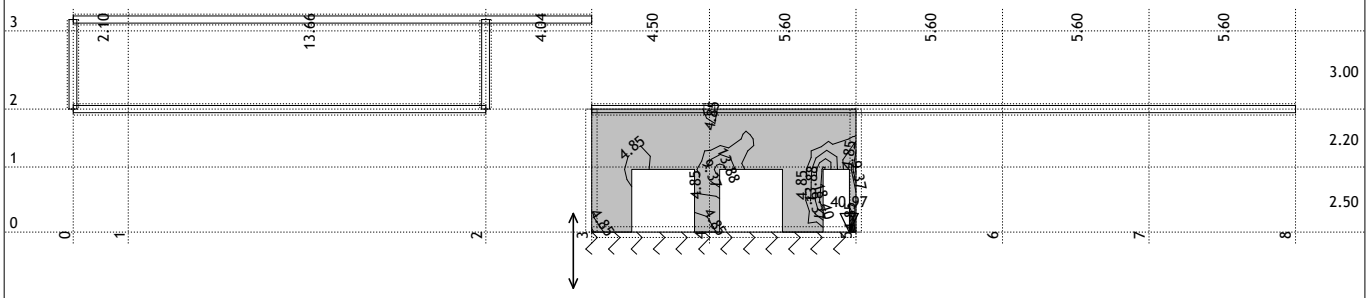
Okvir: H_3
Aa - zg.cona - Smer 2 - max Aa2,z= -62.35 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C25/30, B500A, a=2.00 cm



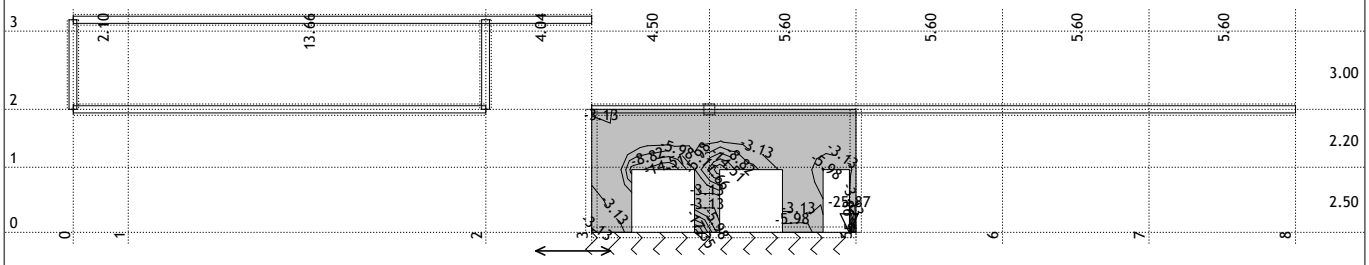
Okvir: H_2
Aa - sp.cona - Smer 1 - max Aa1,s= 26.00 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C25/30, B500A, a=2.00 cm



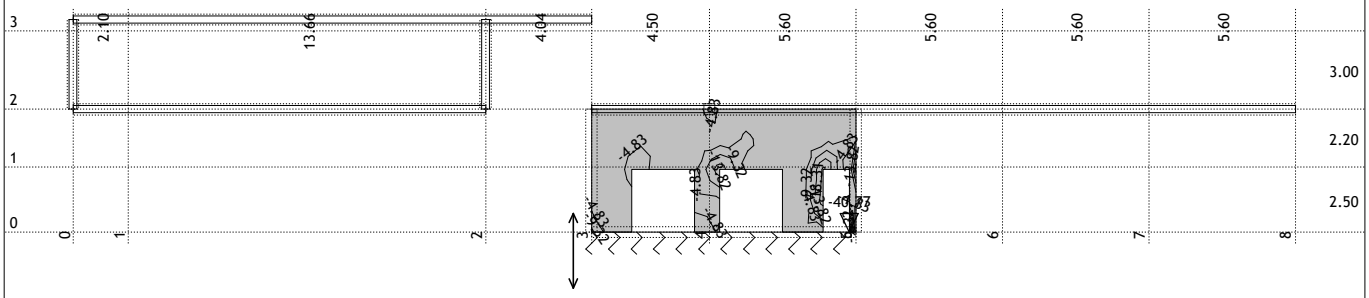
Okvir: H_2
Aa - sp.cona - Smer 2 - max Aa2,s= 40.97 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C25/30, B500A, a=2.00 cm



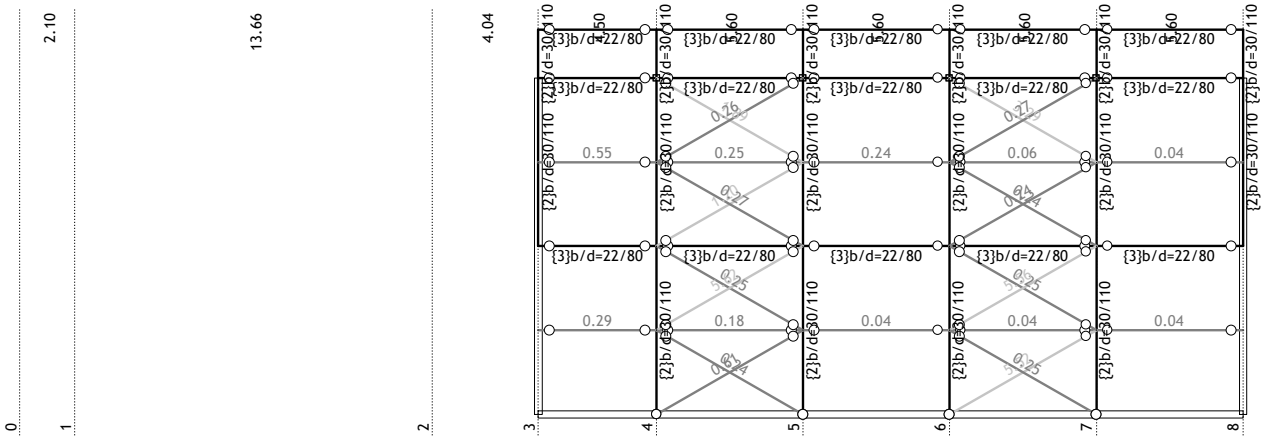
Okvir: H_2
Aa - zg.cona - Smer 1 - max Aal,z= -25.87 cm²/m

Merodajna obtežba: 8-13
EC 2 (EN 1992-1-1:2004), C25/30, B500A, a=2.00 cm



Okvir: H_2
Aa - zg.cona - Smer 2 - max Aa2,z= -40.77 cm²/m

Dimenzioniranje (jeklo)

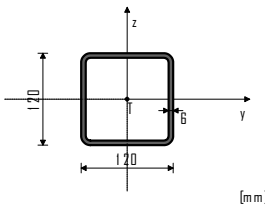


Pogled: streha
Kontrola stabilnosti

PALICA 7016-6612

PREČNI PREREZ: HOP [] 120x120x6 [S 235] [Set: 5]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIJSKE KARAKTERISTIKE prereza



[mm]

Ax =	26.430 cm2
Ay =	13.215 cm2
Az =	13.215 cm2
Ix =	910.28 cm4
Iy =	562.14 cm4
Iz =	562.14 cm4
Wy =	93.690 cm3
Wz =	93.690 cm3
Wy,pl =	117.07 cm3
Wz,pl =	117.07 cm3
γM0 =	1.000
γM1 =	1.000
γM2 =	1.250
Anet/A =	0.900

(fy = 23.5 kN/cm2, fu = 36.0 kN/cm2)

FAKTORJI IZKORIŠČENOSTI PO KOMBINACIJAH OBTEŽB

10. □=0.55	11. □=0.55	12. □=0.55
13. □=0.42	15. □=0.38	16. □=0.38
17. □=0.38	14. □=0.34	19. □=0.31
		18. □=0.30

PALICA IZPOSTAVLJENA CENTRIČNEMU NATEGU
(obtežni primer 11, začetek palice)

Računska osna sila	N_{Ed} =	340.21 kN
Prečna sila v z smeri	$V_{Ed,z}$ =	-0.630 kN
Moment torzije	M_t =	1.011 kNm
Sistemska dolžina palice	L =	450.00 cm

5.5 KLASIFIKACIJA PREČNIH PREREZOV
Razred prereza 1

6.2 NOSILNOST PREČNIH PREREZOV
6.2.3 Nateg

Plast.računska nosilnost bruto prereza	$N_{pl,Rd}$ =	621.11 kN
Mejna računska nosilnost neto prereza	$N_{u,Rd}$ =	616.56 kN
Računska nos. na nateg	$N_{t,Rd}$ =	616.56 kN

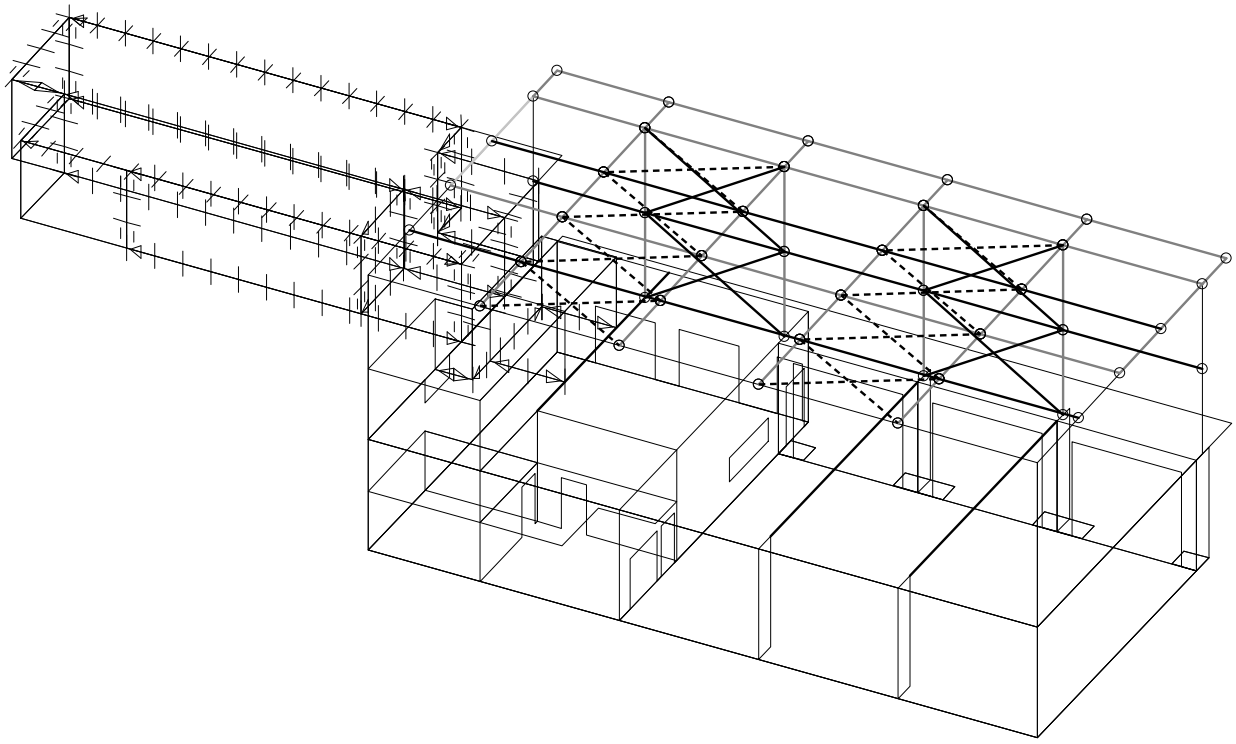
Pogoj 6.5: N_{Ed} <= $N_{t,Rd}$ (340.21 <= 616.56)

6.2.6 Strig

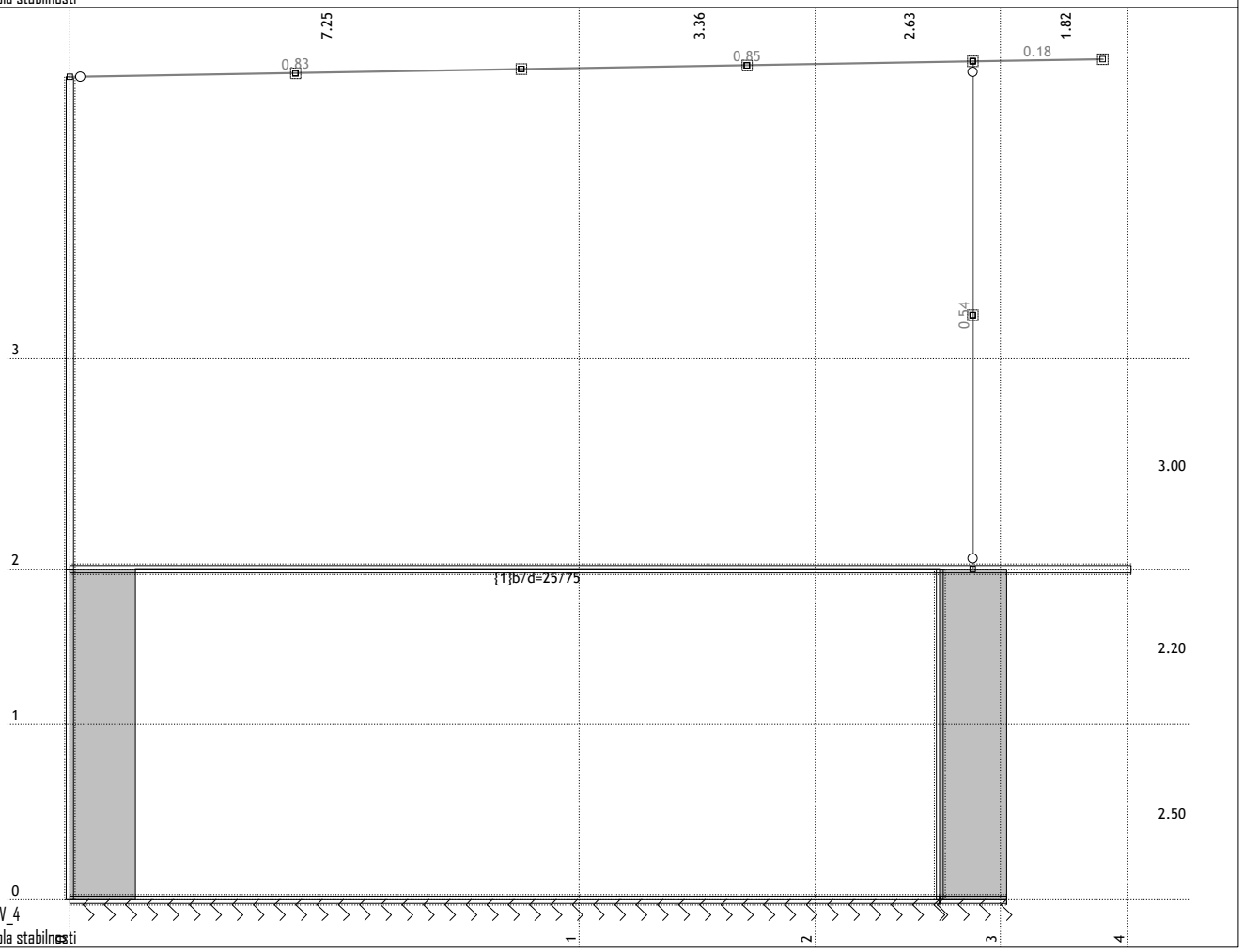
Računska strižna nosilnost	$V_{pl,Rd,z}$ =	179.30 kN
Računska strižna nosilnost	$V_{c,Rd,z}$ =	179.30 kN

Pogoj 6.17: $V_{Ed,z}$ <= $V_{c,Rd,z}$ (0.63 <= 179.30)

Dimenzioniranje (les)



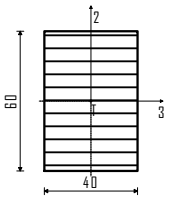
Izometrija
Kontrola stabilnosti



Okvir: V_4
Kontrola stabilnosti

PALICA 7992-7807

Lepljen lameliran les - GL28h
v smeri zgornjega roba palice
Debelina lamele 3.00 cm
Eksploatacijski razred 2
EUROCODE (EN 1995-1-1)



[cm]

FAKTORJI IZKORIŠČENOSTI PO KOMBINACIJAH OBTEŽB

10. □=0.54	11. □=0.54	12. □=0.54
13. □=0.42	16. □=0.40	17. □=0.40
15. □=0.40	14. □=0.32	18. □=0.32
19. □=0.31		

KONTROLA NORMALNIH NAPETOSTI
(obtežni primer 11, na 361.2 cm od začetka palice)

Računska osna sila	Ned =	1313.8 kN
Prečna sila v smeri osi 2	V2ed =	1.256 kN
Prečna sila v smeri osi 3	V3ed =	8.951 kN
Moment torzije	Med =	13.164 kNm
Upogibni moment okoli osi 2	M2ed =	32.333 kNm
Upogibni moment okoli osi 3	M3ed =	-4.535 kNm

KONTROLA NAPETOSTI - NATEG IN UPOGIB
Vrsta obtežbe: osnovno - srednjetrajno

Korekcijski koeficient	Kmod =	0.800
Parcialni koef. za karakteristike materiala	□m =	1.250
Dodatek za elemente z malimi dimenzijami - os 2	Kh_2 =	1.041
Dodatek za elemente z malimi dimenzijami - os 3	Kh_3 =	1.000
Dodatek za elemente z malimi dimenzijami - nateg	Kh_t =	1.041
Karakteristična natezna trdnost	ft,0,k =	19.500 MPa
Računska natezna trdnost	ft,0,d =	12.996 MPa
Faktor oblik (za pravokotni prerez)	km =	0.700
Karakteristična upogibna trdnost	fm,k =	28.000 MPa
Računska upogibna trdnost - os 2	fm,2,d =	18.662 MPa
Računska upogibna trdnost - os 3	fm,3,d =	17.920 MPa
Normalna natezna napetost	□t,0,d =	5.474 MPa
Odpornostni moment	W2 =	16000 cm3
Normalna upogibna napetost okoli osi 2	□m2,d =	2.021 MPa

□m2,d <= fm,2,d (2.021 <= 18.662)

Izkoriščenost prereza je 10.8%

Odpornostni moment	W3 =	24000 cm3
Normalna upogibna napetost okoli osi 3	□m3,d =	0.189 MPa

□m3,d <= fm,3,d (0.189 <= 17.920)

Izkoriščenost prereza je 1.1%

□t,0,d / ft,0,d + km x (□m3,d / fm,3,d) + □m2,d / fm,2,d <= 1
(0.537 <= 1)

Izkoriščenost prereza je 53.7%

□t,0,d / ft,0,d + □m3,d / fm,3,d + km x (□m2,d / fm,2,d) <= 1
(0.508 <= 1)

Izkoriščenost prereza je 50.8%

KONTROLA STRIŽNIH NAPETOSTI
(obtežni primer 11, začetek palice)

Prečna sila v smeri osi 2	V2ed =	-0.515 kN
Prečna sila v smeri osi 3	V3ed =	-6.904 kN
Moment torzije	Med =	15.399 kNm

KONTROLA NAPETOSTI - STRIG
Vrsta obtežbe: osnovno - srednjetrajno

Korekcijski koeficient	Kmod =	0.800
Parcialni koef. za karakteristike materiala	□m =	1.250
Karakteristična strižna napetost	fv,k =	3.200 MPa
Računska strižna trdnost	fv,d =	2.048 MPa
Površina prečnega prereza	A =	2400.0 cm2
Dejanska strižna napetost(os 2)	□2,d =	0.003 MPa
Dejanska strižna napetost(os 3)	□3,d =	0.043 MPa
Superpozicija vplivov prečne sile		
(2)	□2,d / fv,d =	0.002
(3)	□3,d / fv,d =	0.021

(2)^2 + (3)^2 <= 1 (0.000 <= 1)

Izkoriščenost prereza je 0.0%

KONTROLA NAPETOSTI - TORZIJA

Karakteristična strižna trdnost	fv,k =	3.200 MPa
Računska strižna trdnost	fv,d =	2.048 MPa
Koeficient	k_{shape} =	1.225
Torzijski odpornostni moment	Wt =	22176 cm3
Dejanska strižna napetost	□tor,d =	0.694 MPa

□tor,d <= k_{shape} x fv,d (0.694 <= 2.509)

Izkoriščenost prereza je 27.7%

Superpozicija vplivov prečne sile in torzijskega momenta

(1)	□tor,d/(k_{shape} x fv,d) =	0.277
(2)	□2,d / fv,d =	0.002
(3)	□3,d / fv,d =	0.021

(1) + (2)^2 + (3)^2 <= 1 (0.277 <= 1)

Izkoriščenost prereza je 27.7%

DOKAZ STABILNOSTI ELEMENTA
(obtežni primer 18, na 361.2 cm od začetka palice)

Računska osna sila	Ned =	24.308 kN
Prečna sila v smeri osi 2	V2ed =	-0.294 kN
Prečna sila v smeri osi 3	V3ed =	-3.768 kN
Moment torzije	Med =	7.987 kNm
Upogibni moment okoli osi 2	M2ed =	13.610 kNm
Upogibni moment okoli osi 3	M3ed =	10.124 kNm

DOKAZ BOČNE STABILNOSTI
Vrsta obtežbe: osnovno - srednjetrajno

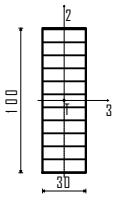
Korekcijski koeficient	Kmod =	0.800
Parcialni koef. za karakteristike materiala	□m =	1.250
Razmak pridržanih točk pravokotno na smer osi 2	lef =	722.43 cm
5% fraktil modula E paralelno z vlakni	E0.05 =	10200 MPa
5% fraktil strižnega modula G	G0.05 =	520.00 MPa
Torzijski vztrajnostni moment	Itor =	7.45e+5 cm4
Vztrajnostni moment	I2 =	3.20e+5 cm4
Odpornostni moment	W3 =	24000 cm3
Kritična napetost uklona	□m,crit =	203.73 MPa
Relativna vitkost za uklon	□rel =	0.371
Koeficient	k_krit =	1.000
Normalna upogibna napetost okoli osi 3	□m3,d =	0.422 MPa

□m,3,d <= k_krit x fm,3,d (0.422 <= 17.920)

Izkoriščenost prereza je 2.4%

PALICA 7833-7992

Lepljen lameliran les - GL28h
v smeri zgornjega roba palice
Debelina lamele 3.00 cm
Eksploatacijski razred 2
EUROCODE (EN 1995-1-1)



[cm]

FAKTORJI IZKORIŠČENOSTI PO KOMBINACIJAH OBTEŽB

10. □=0.85	11. □=0.85	12. □=0.85
14. □=0.60	13. □=0.50	15. □=0.37
16. □=0.37	17. □=0.37	19. □=0.37
18. □=0.31		

KONTROLA NORMALNIH NAPETOSTI
(obtežni primer 10, začetek palice)

Računska osna sila	Ned =	-84.611 kN
Prečna sila v smeri osi 2	V2ed =	14.148 kN
Prečna sila v smeri osi 3	V3ed =	0.687 kN
Moment torzije	Med =	-4.006 kNm
Upogibni moment okoli osi 2	M2ed =	-3.998 kNm
Upogibni moment okoli osi 3	M3ed =	-740.94 kNm

KONTROLA NAPETOSTI - TLAK IN UPOGIB
Vrsta obtežbe: osnovno - srednjetrajno

Korekcijski koeficient	Kmod =	0.800
Parcialni koef. za karakteristike materiala	γm =	1.250
Dodatek za elemente z malimi dimenzijami - os 2		
	Kh_2 =	1.072
Dodatek za elemente z malimi dimenzijami - os 3		
	Kh_3 =	1.000
Faktor oblik (za pravokotni prerez)	km =	0.700
Karakteristična tlačna trdnost	fc,0,k =	26.500 MPa
Računska tlačna trdnost	fc,0,d =	16.960 MPa
Karakteristična upogibna trdnost	fm,k =	28.000 MPa
Računska upogibna trdnost - os 2	fm,2,d =	19.206 MPa
Računska upogibna trdnost - os 3	fm,3,d =	17.920 MPa
Relativna vitkost	λrel,2 =	1.204
Relativna vitkost	λrel,3 =	0.361
Normalne tlačne napetosti	σc,0,d =	0.282 MPa
Odpornostni moment	W2 =	15000 cm3
Normalna upogibna napetost okoli osi 2	σm2,d =	0.267 MPa

σm2,d <= fm,2,d (0.267 <= 19.206)
Izkoriščenost prereza je 1.4%

Odpornostni moment	W3 =	50000 cm3
Normalna upogibna napetost okoli osi 3	σm3,d =	14.819 MPa

σm3,d <= fm,3,d (14.819 <= 17.920)
Izkoriščenost prereza je 82.7%

TLAK IN UPOGIB - VELIKA VITKOST

Začetna imperfekcija	εc =	0.100
Koeficient	k3 =	0.568
Koeficient	k2 =	1.270
Koeficient	kc,3 =	0.993
Koeficient	kc,2 =	0.597

(σc,0,d / (kc_2 x fc,0,d)) + km x (σm3,d / fm,3,d) +
+ σm2,d / fm,2,d <= 1 (0.621 <= 1)
Izkoriščenost prereza je 62.1%

(σc,0,d / (kc_3 x fc,0,d)) + σm3,d / fm,3,d +
+ km x (σm2,d / fm,2,d) <= 1 (0.853 <= 1)
Izkoriščenost prereza je 85.3%

KONTROLA STRIŽNIH NAPETOSTI
(obtežni primer 12, konec palice)

Prečna sila v smeri osi 2	V2ed =	256.05 kN
Prečna sila v smeri osi 3	V3ed =	-4.112 kN
Moment torzije	Med =	-3.969 kNm

KONTROLA NAPETOSTI - STRIG
Vrsta obtežbe: osnovno - srednjetrajno

Korekcijski koeficient	Kmod =	0.800
Parcialni koef. za karakteristike materiala	γm =	1.250
Karakteristična strižna napetost	fv,k =	3.200 MPa
Računska strižna trdnost	fv,d =	2.048 MPa
Površina prečnega prereza	A =	3000.0 cm2
Dejanska strižna napetost(os 2)	τ2,d =	1.280 MPa
Dejanska strižna napetost(os 3)	τ3,d =	0.021 MPa
Superpozicija vplivov prečne sile		
(2)	τ2,d / fv,d =	0.625
(3)	τ3,d / fv,d =	0.010

(2)^2 + (3)^2 <= 1 (0.397 <= 1)
Izkoriščenost prereza je 39.7%

KONTROLA NAPETOSTI - TORZIJA

Karakteristična strižna trdnost	fv,k =	3.200 MPa
Računska strižna trdnost	fv,d =	2.048 MPa
Koeficient	k_{shape} =	1.500
Torzijski odpornostni moment	Wt =	24480 cm3
Dejanska strižna napetost	τtor,d =	0.162 MPa

τtor,d <= k_{shape} x fv,d (0.162 <= 3.072)
Izkoriščenost prereza je 5.3%

Superpozicija vplivov prečne sile in torzijskega momenta

(1)	τtor,d/(k_{shape} x fv,d) =	0.053
(2)	τ2,d / fv,d =	0.625
(3)	τ3,d / fv,d =	0.010

(1) + (2)^2 + (3)^2 <= 1 (0.444 <= 1)
Izkoriščenost prereza je 44.4%

DOKAZ STABILNOSTI ELEMENTA
(obtežni primer 11, začetek palice)

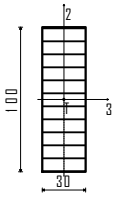
Računska osna sila	Ned =	-84.537 kN
Prečna sila v smeri osi 2	V2ed =	14.145 kN
Prečna sila v smeri osi 3	V3ed =	0.692 kN
Moment torzije	Med =	-3.999 kNm
Upogibni moment okoli osi 2	M2ed =	-3.981 kNm
Upogibni moment okoli osi 3	M3ed =	-740.95 kNm

DOKAZ BOČNE STABILNOSTI
Vrsta obtežbe: osnovno - srednjetrajno

Korekcijski koeficient	Kmod =	0.800
Parcialni koef. za karakteristike materiala	γm =	1.250
Razmak pridržanih točk pravokotno na smer osi 2		
	lef =	642.60 cm
5% fraktil modula E paralelno z vlakni	E0.05 =	10200 MPa
5% fraktil strižnega modula G	G0.05 =	520.00 MPa
Torzijski vztrajnostni moment	Itor =	7.33e+5 cm4
Vztrajnostni moment	I2 =	2.25e+5 cm4
Odpornostni moment	W3 =	50000 cm3
Kritična napetost uklona	σm,crit =	91.444 MPa
Relativna vitkost za uklon	λrel =	0.553
Koeficient	k_krit =	1.000
Normalna upogibna napetost okoli osi 3	σm3,d =	14.819 MPa

σm,3,d <= k_krit x fm,3,d (14.819 <= 17.920)
Izkoriščenost prereza je 82.7%

PALICA 7992-8007
Lepljen lameliran les - GL28h
v smeri zgornjega roba palice
Debelina lamele 3.00 cm
Eksploatacijski razred 2
EUROCODE (EN 1995-1-1)



[cm]

FAKTORJI IZKORIŠČENOSTI PO KOMBINACIJAH OBTEŽB

10. η=0.18	11. η=0.18	12. η=0.18
14. η=0.13	13. η=0.11	15. η=0.08
16. η=0.08	17. η=0.08	19. η=0.08
18. η=0.07		

KONTROLA NORMALNIH NAPETOSTI
(obtežni primer 11, začetek palice)

Računska osna sila	Ned =	-1.316 kN
Prečna sila v smeri osi 2	V2ed =	-75.381 kN
Prečna sila v smeri osi 3	V3ed =	9.474 kN
Upogibni moment okoli osi 2	M2ed =	17.508 kNm
Upogibni moment okoli osi 3	M3ed =	97.064 kNm

KONTROLA NAPETOSTI - TLAK IN UPOGIB
Vrsta obtežbe: osnovno - srednjetrajno

Korekcijski koeficient	Kmod =	0.800
Parcialni koef. za karakteristike materiala	γm =	1.250
Dodatek za elemente z malimi dimenzijami - os 2		
	Kh_2 =	1.072
Dodatek za elemente z malimi dimenzijami - os 3		
	Kh_3 =	1.000
Faktor oblik (za pravokotni prerez)	km =	0.700
Karakteristična tlačna trdnost	fc,0,k =	26.500 MPa
Računska tlačna trdnost	fc,0,d =	16.960 MPa
Karakteristična upogibna trdnost	fm,k =	28.000 MPa
Računska upogibna trdnost - os 2	fm,2,d =	19.206 MPa
Računska upogibna trdnost - os 3	fm,3,d =	17.920 MPa
Relativna vitkost	λrel,2 =	0.346
Relativna vitkost	λrel,3 =	0.104
Normalne tlačne napetosti	σc,0,d =	0.004 MPa
Odpornostni moment	W2 =	15000 cm3
Normalna upogibna napetost okoli osi 2	σm2,d =	1.167 MPa

σm2,d <= fm,2,d (1.167 <= 19.206)
Izkoriščenost prereza je 6.1%

Odpornostni moment	W3 =	50000 cm3
Normalna upogibna napetost okoli osi 3	σm3,d =	1.941 MPa

σm3,d <= fm,3,d (1.941 <= 17.920)

Izkoriščenost prereza je 10.8%

TLAK IN UPOGIB - VELIKA VITKOST

Začetna imperfekcija	εc =	0.100
Koeficient	k3 =	0.496
Koeficient	k2 =	0.562
Koeficient	kc,3 =	1.020
Koeficient	kc,2 =	0.995

(σc,0,d / (kc_2 x fc,0,d)) + km x (σm3,d / fm,3,d) +
+ σm2,d / fm,2,d <= 1 (0.137 <= 1)

Izkoriščenost prereza je 13.7%

(σc,0,d / (kc_3 x fc,0,d)) + σm3,d / fm,3,d +
+ km x (σm2,d / fm,2,d) <= 1 (0.151 <= 1)

Izkoriščenost prereza je 15.1%

KONTROLA STRIŽNIH NAPETOSTI
(obtežni primer 10, zaščetek palice)

Prečna sila v smeri osi 2	V2ed =	-75.381 kN
Prečna sila v smeri osi 3	V3ed =	9.438 kN

KONTROLA NAPETOSTI - STRIG
Vrsta obtežbe: osnovno - srednjetrajno

Korekcijski koeficient	Kmod =	0.800
Parcialni koef. za karakteristike materiala	γm =	1.250
Karakteristična strižna napetost	fv,k =	3.200 MPa
Računska strižna trdnost	fv,d =	2.048 MPa
Površina prečnega prereza	A =	30000.0 cm2
Dejanska strižna napetost(os 2)	τ2,d =	0.377 MPa
Dejanska strižna napetost(os 3)	τ3,d =	0.047 MPa
Superpozicija vplivov prečne sile		
(2)	τ2,d / fv,d =	0.184
(3)	τ3,d / fv,d =	0.023

(2)^2 + (3)^2 <= 1 (0.038 <= 1)

Izkoriščenost prereza je 3.8%

DOKAZ STABILNOSTI ELEMENTA
(obtežni primer 12, zaščetek palice)

Računska osna sila	Ned =	-1.316 kN
Prečna sila v smeri osi 2	V2ed =	-75.381 kN
Prečna sila v smeri osi 3	V3ed =	9.458 kN
Upogibni moment okoli osi 2	M2ed =	17.479 kNm
Upogibni moment okoli osi 3	M3ed =	97.110 kNm

DOKAZ BOČNE STABILNOSTI
Vrsta obtežbe: osnovno - srednjetrajno

Korekcijski koeficient	Kmod =	0.800
Parcialni koef. za karakteristike materiala	γm =	1.250
Razmak pridržanih točk pravokotno na smer osi 2	lef =	184.80 cm
5% fraktil modula E paralelno z vlakni	E0.05 =	10200 MPa
5% fraktil strižnega modula G	G0.05 =	520.00 MPa
Torzijski vztrajnostni moment	Itor =	7.33e+5 cm4
Vztrajnostni moment	I2 =	2.25e+5 cm4
Odpornostni moment	W3 =	50000 cm3
Kritična napetost uklona	σm,crit =	317.97 MPa
Relativna vitkost za uklon	λrel =	0.297
Koeficient	k_krit =	1.000
Normalna upogibna napetost okoli osi 3	σm3,d =	1.942 MPa

σm,3,d <= k_krit x fm,3,d (1.942 <= 17.920)

Izkoriščenost prereza je 10.8%