

STATIČNI RAČUN

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Vhodni podatki - Konstrukcija

Schema nivojev

Naziv	z [m]	h [m]
nad 2.nad	9.87	5.47
nad pritličjem	4.40	4.50

Naziv	z [m]	h [m]
nad kletjo	-0.10	3.00
temelji	-3.10	

Tabele materialov

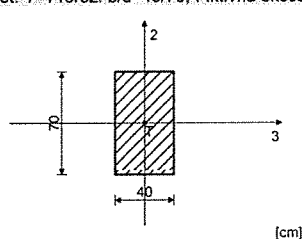
No	Naziv materiala	E[kN/m ²]	μ	γ [kN/m ³]	α [1/C]	Em[kN/m ²]	μ_m
1	Beton MB 30	3.150e+7	0.20	25.00	1.000e-5	3.150e+7	0.20
2	Beton MB 20	2.850e+7	0.20	25.00	1.000e-5	2.850e+7	0.20

Seti plošč

No	d[m]	e[m]	Material	Tip preračuna	Ortotropija	E2[kN/m ²]	G[kN/m ²]	α
<1>	0.200	0.100	1	Tanka plošča	Izotropna			
<2>	0.120	0.060	1	Tanka plošča	Izotropna			
<3>	0.300	0.150	2	Tanka plošča	Izotropna			
<4>	0.300	0.150	1	Debela plošča	Izotropna			

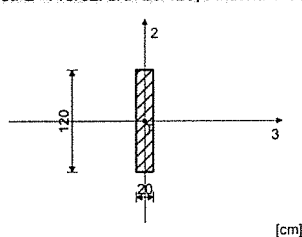
Seti gred

Set: 1 Prerez: b/d=40/70, Fiktivna ekscentričnost



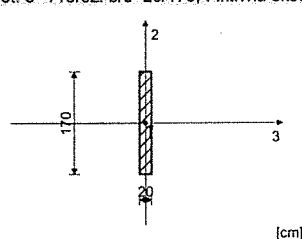
Mat.	A1	A2	A3	I1	I2	I3
2 - Beton MB 20	2.800e-1	2.333e-1	2.333e-1	9.605e-3	3.733e-3	1.143e-2

Set: 2 Prerez: b/d=20/120, Fiktivna ekscentričnost



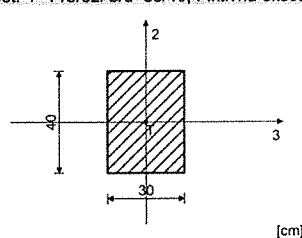
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	2.400e-1	2.000e-1	2.000e-1	2.864e-3	8.000e-4	2.880e-2

Set: 3 Prerez: b/d=20/170, Fiktivna ekscentričnost



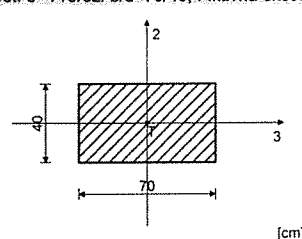
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	3.400e-1	2.833e-1	2.833e-1	4.197e-3	1.133e-3	8.188e-2

Set: 4 Prerez: b/d=30/40, Fiktivna ekscentričnost



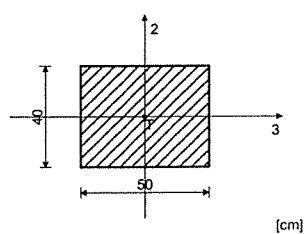
Mat.	A1	A2	A3	I1	I2	I3
2 - Beton MB 20	1.200e-1	1.000e-1	1.000e-1	1.944e-3	9.000e-4	1.600e-3

Set: 5 Prerez: b/d=70/40, Fiktivna ekscentričnost



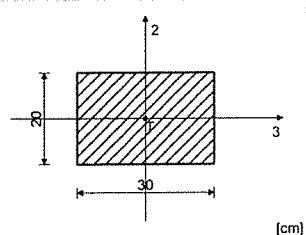
Mat.	A1	A2	A3	I1	I2	I3
2 - Beton MB 20	2.800e-1	2.333e-1	2.333e-1	9.605e-3	1.143e-2	3.733e-3

Set: 6 Prerez: b/d=50/40, Fiktivna ekscentričnost

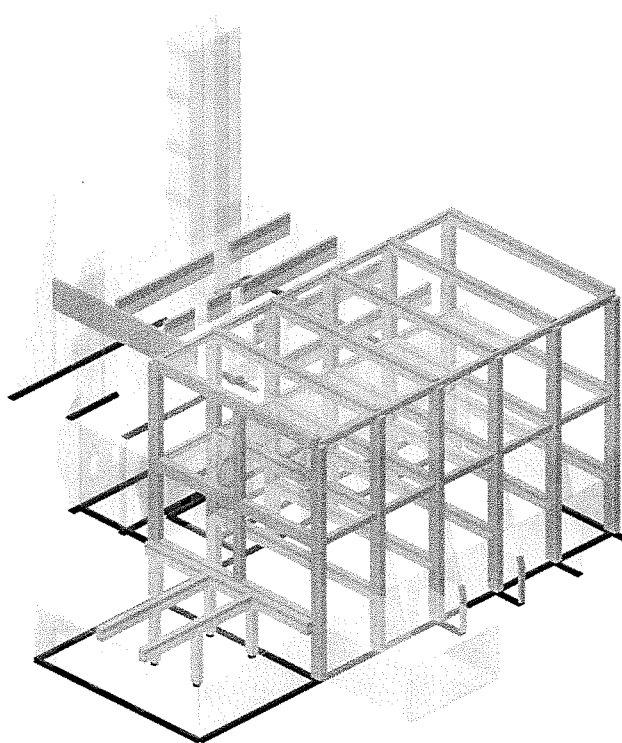


Mat.	A1	A2	A3	I1	I2	I3
2 - Beton MB 20	2.000e-1	1.667e-1	1.667e-1	5.474e-3	4.167e-3	2.667e-3

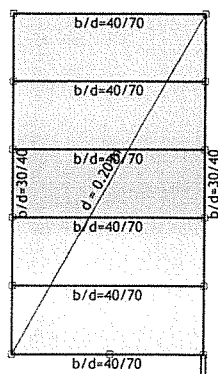
Set: 7 Prerez: b/d=30/20, Fiktivna ekscentričnost



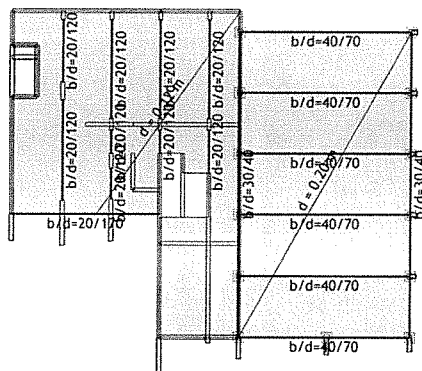
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton MB 30	6.000e-2	5.000e-2	5.000e-2	4.695e-4	4.500e-4	2.000e-4



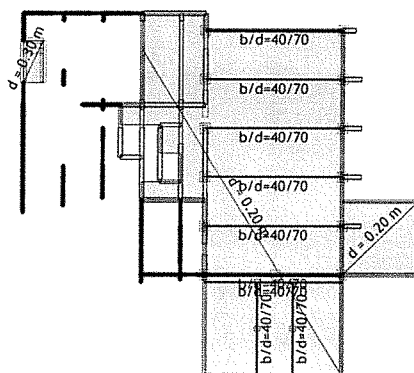
Izometrija



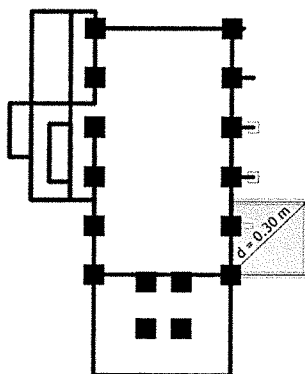
Nivo: nad 2.nad [9.87 m]



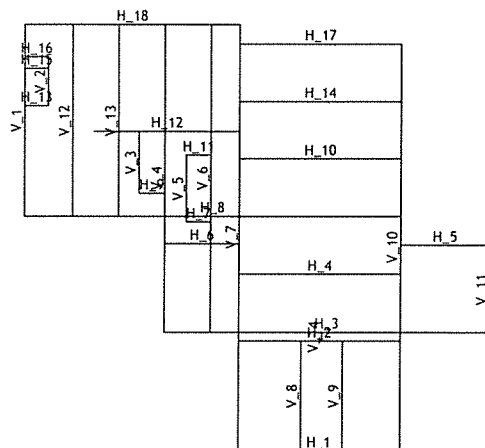
Nivo: nad pritličjem [4.40 m]



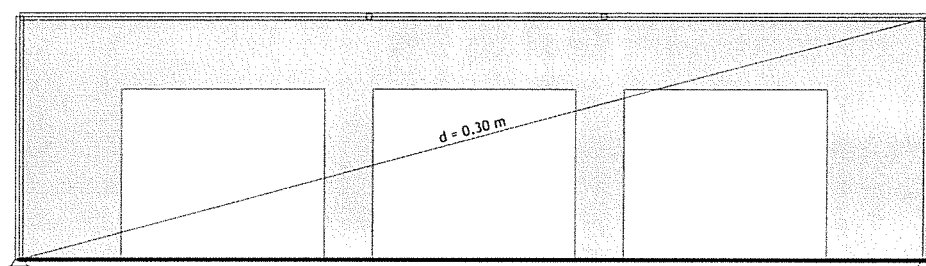
Nivo: nad kletjo [-0.10 m]



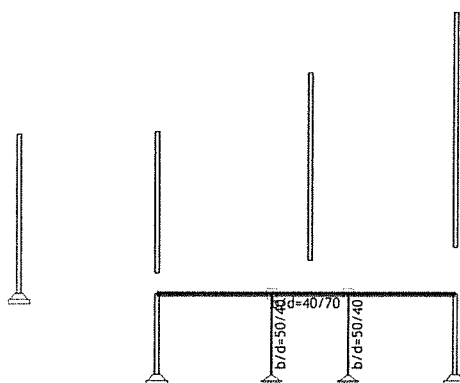
Nivo: temelji [-3.10 m]



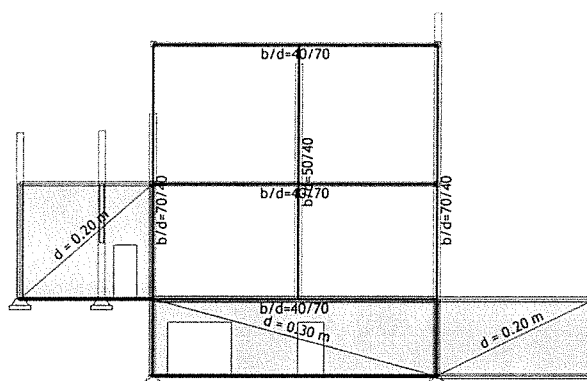
Dispozicija okvirjev



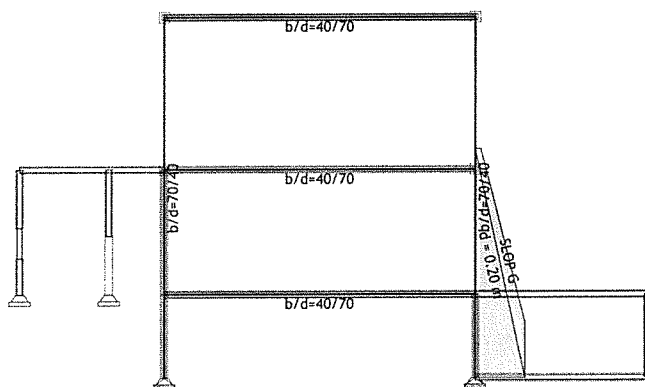
Okvir: H_1



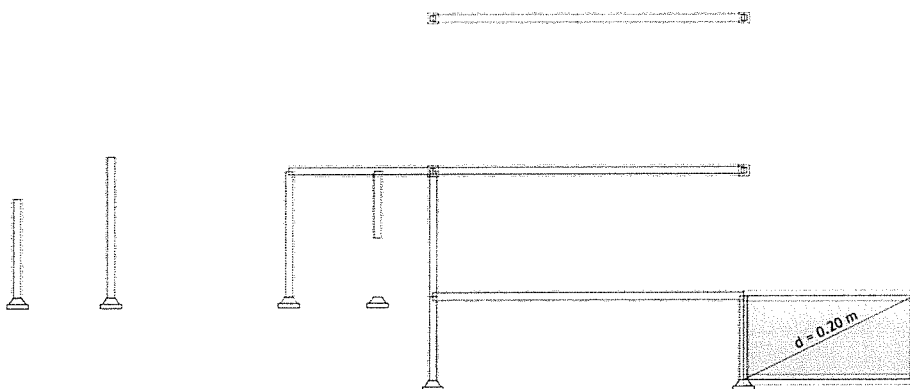
Okvir: H_2



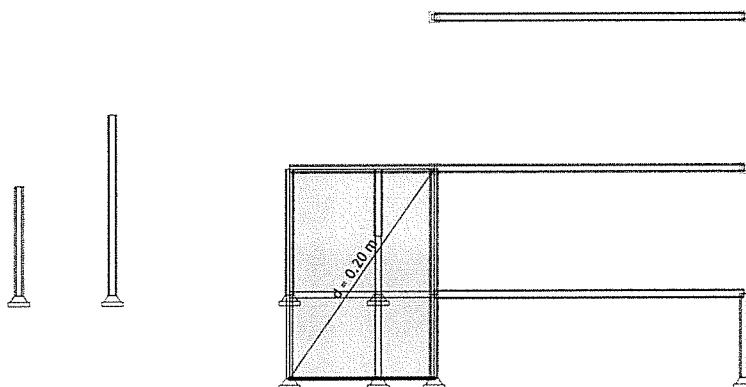
Okvir: H_3



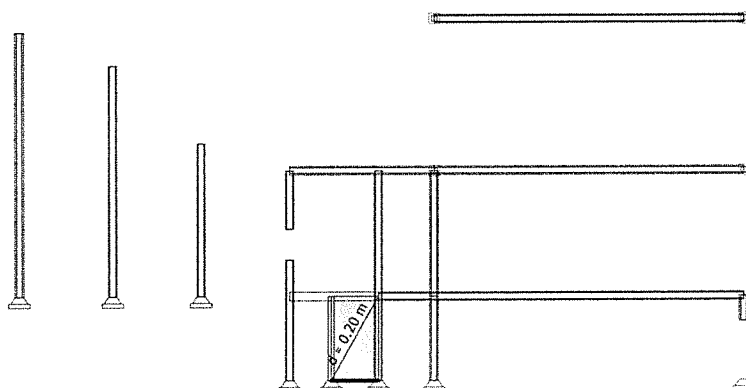
Okvir: H_4



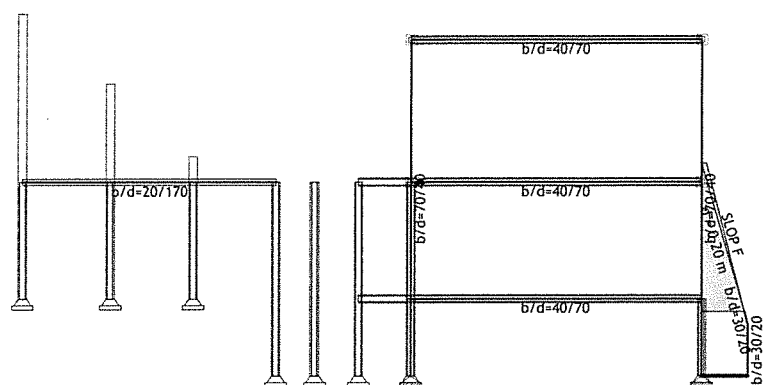
Okvir: H_5



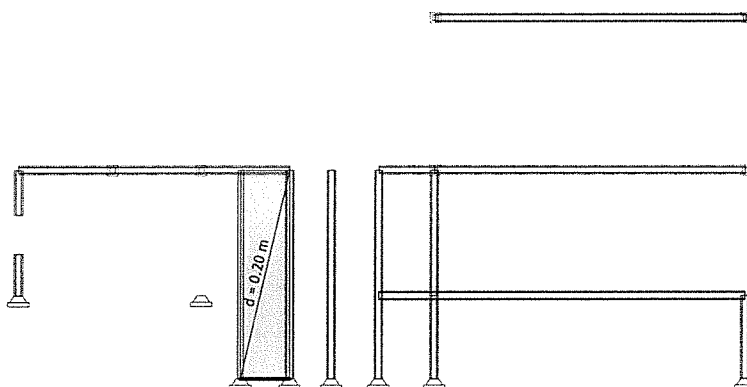
Okvir: H_6



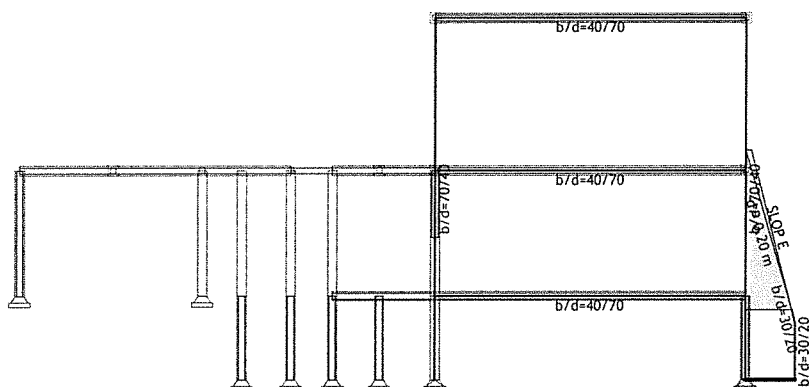
Okvir: H_7



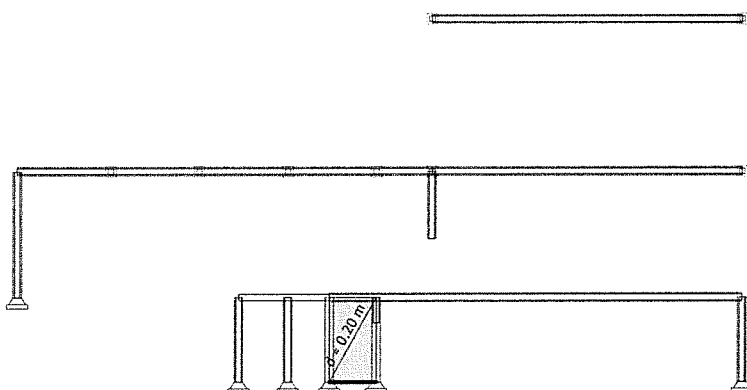
Okvir: H_8



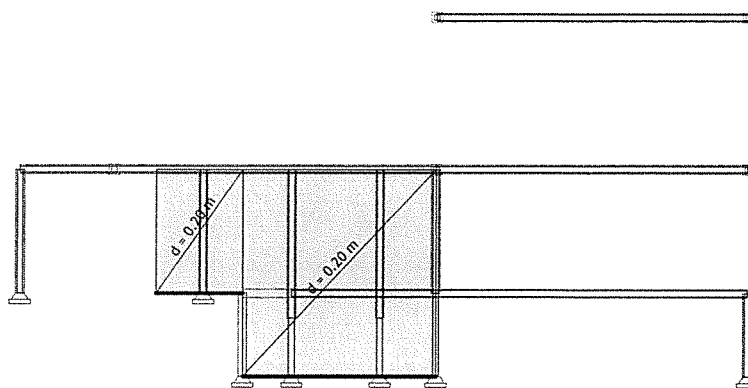
Okvir: H_9



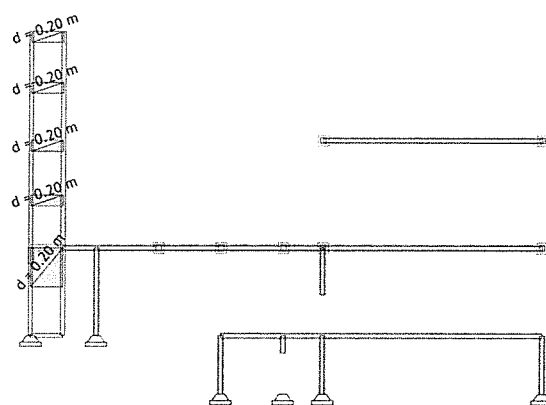
Okvir: H_10



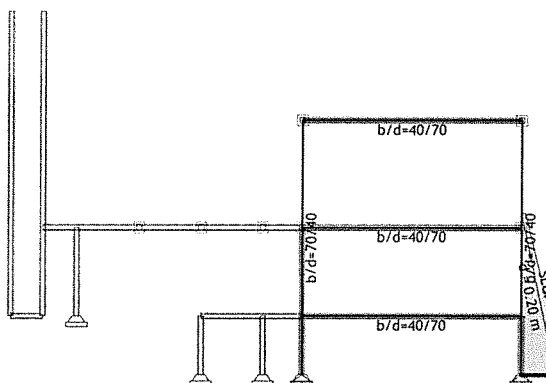
Okvir: H_11



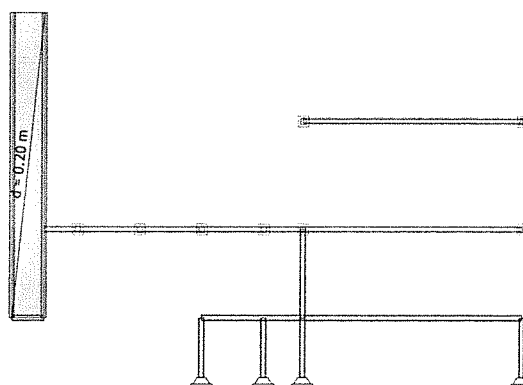
Okvir: H_12



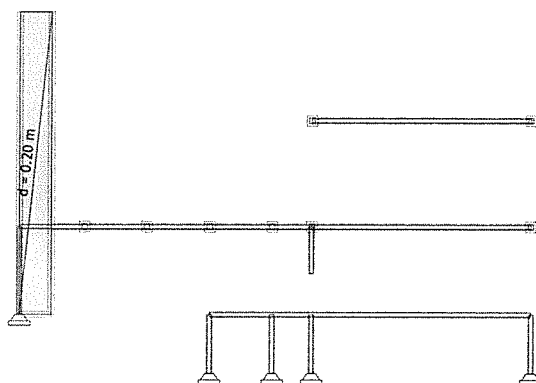
Okvir: H_13



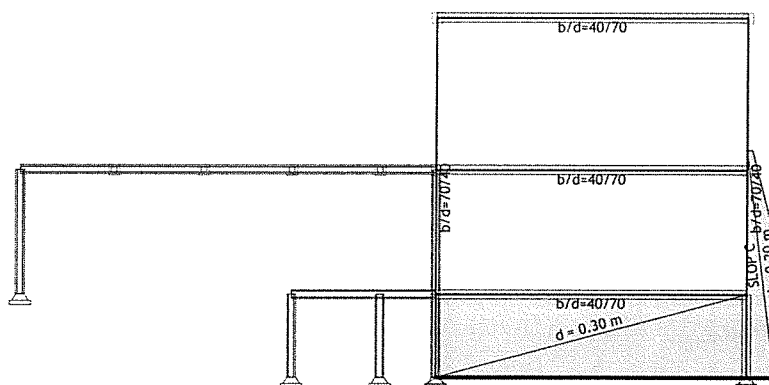
Okvir: H_14



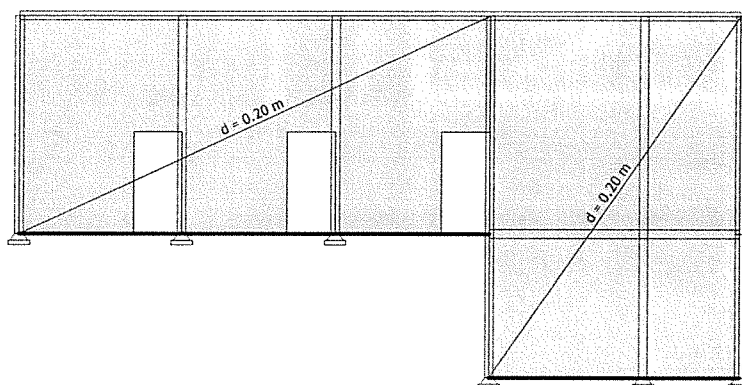
Okvir: H_15



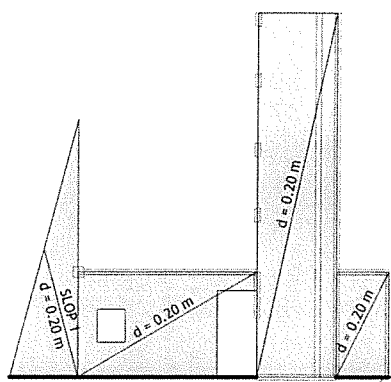
Okvir: H_16



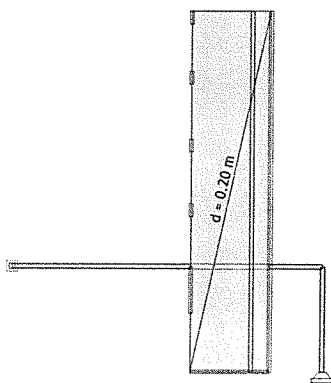
Okvir: H_17



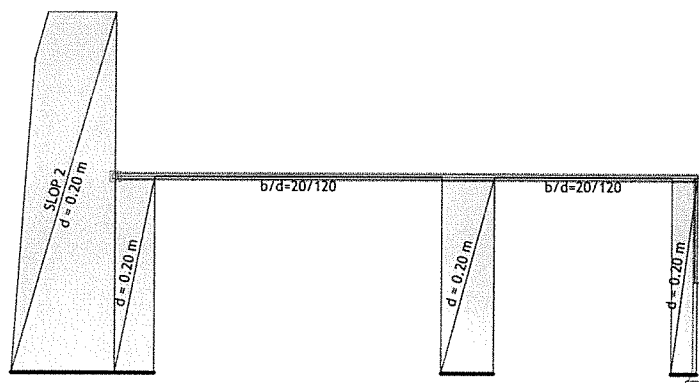
Okvir: H_18



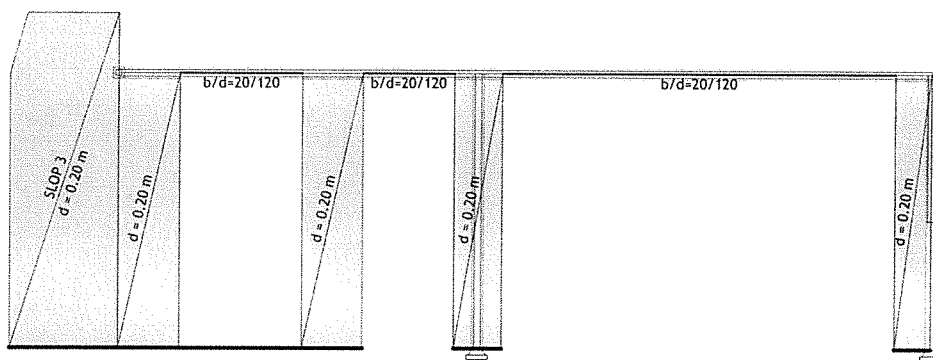
Okvir: V_1



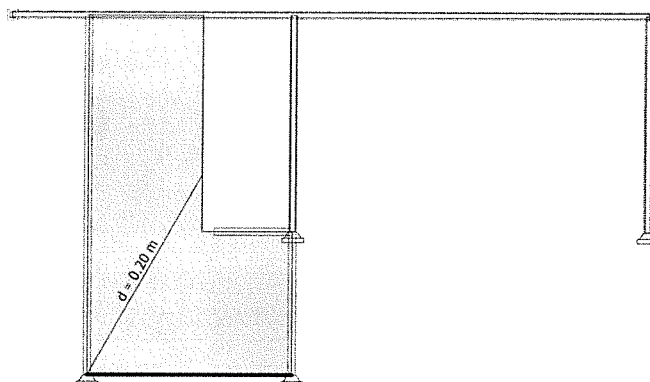
Okvir: V_2



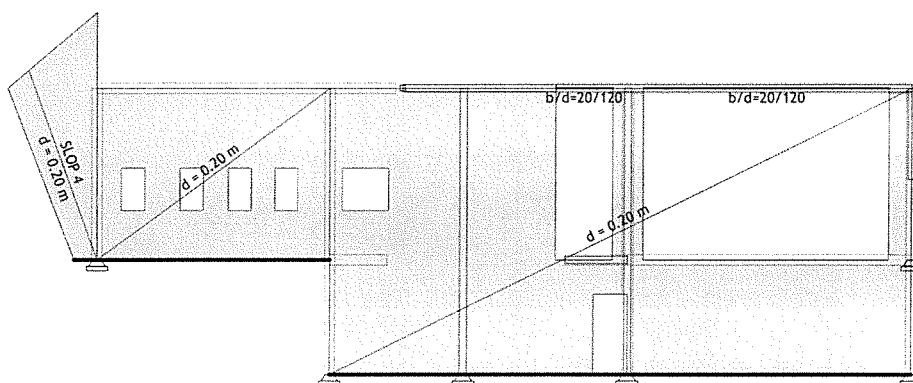
Okvir: V_12



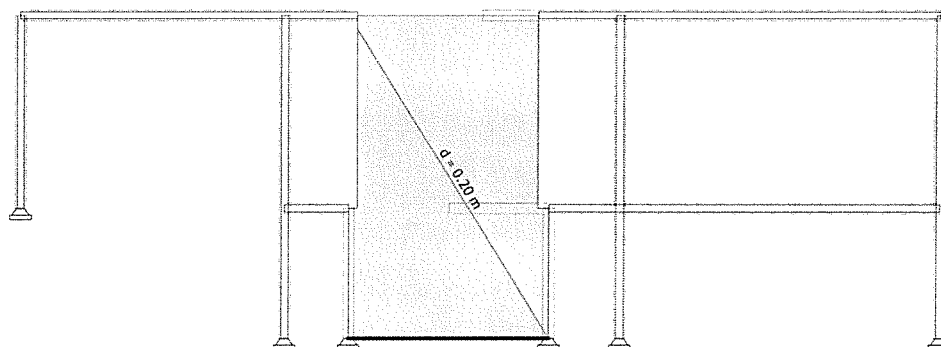
Okvir: V_13



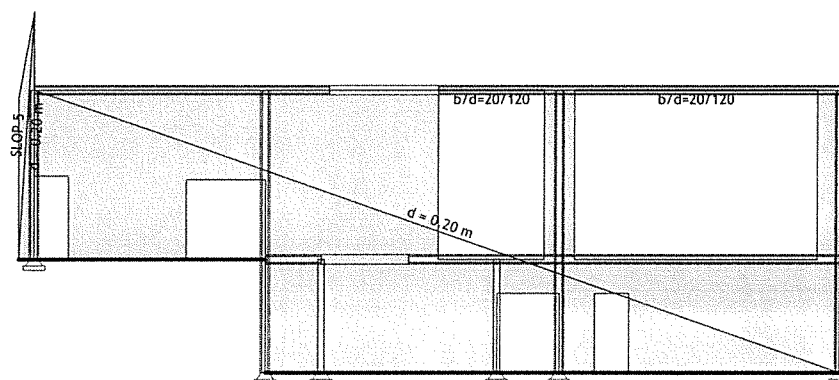
Okvir: V_3



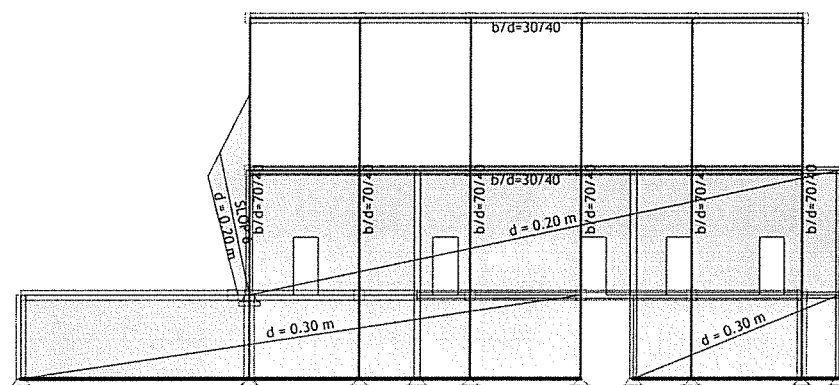
Okvir: V_4



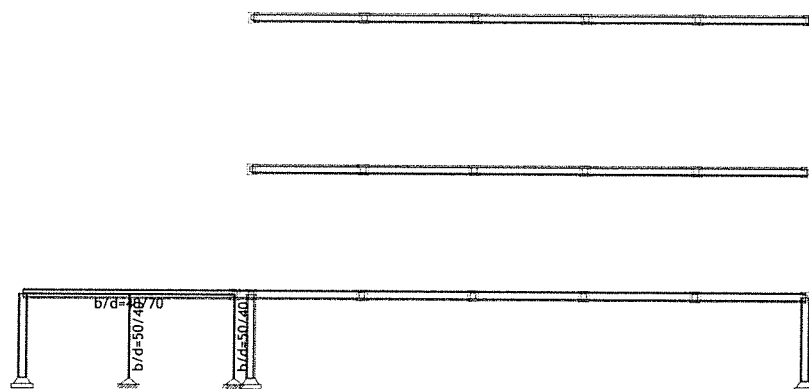
Okvir: V_5



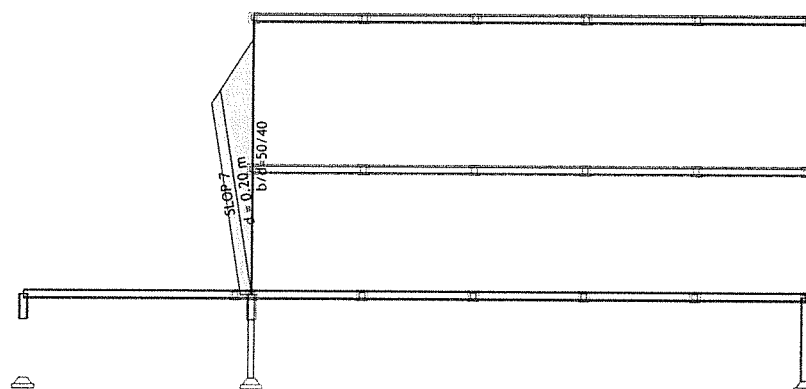
Okvir: V_6



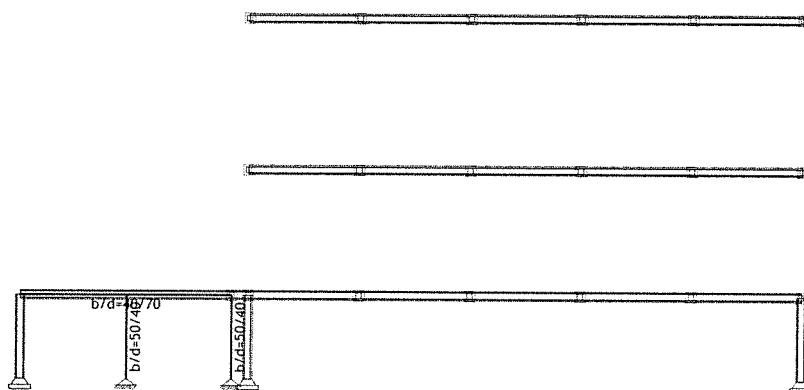
Okvir: V_7



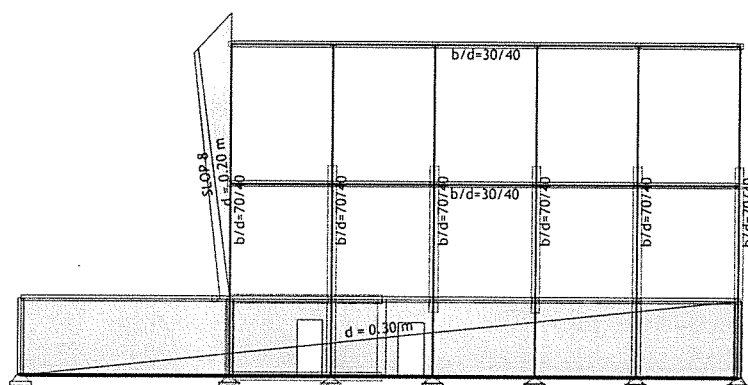
Okvir: V_8



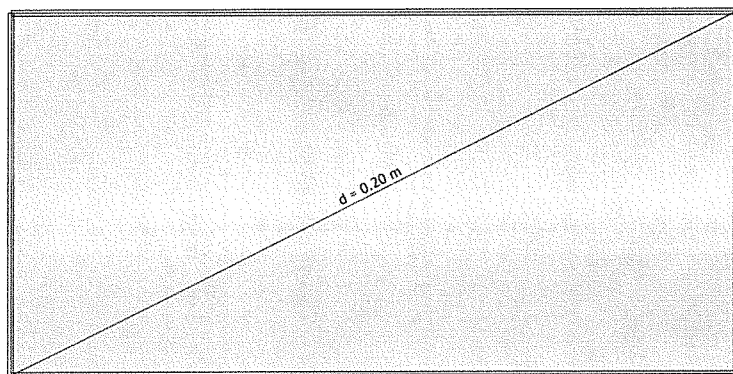
Okvir: V_14



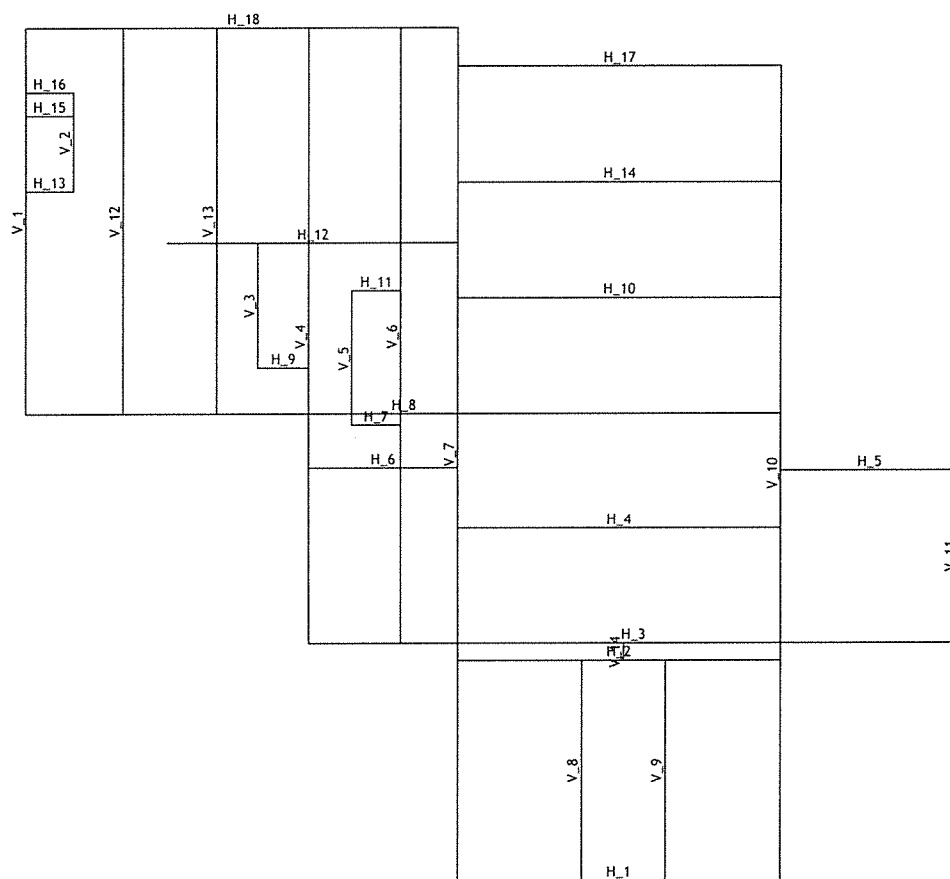
Okvir: V_9



Okvir: V_10



Okvir: V_11



Dispozicija okvirjev

Vhodni podatki - Obtežba

Lista obtežnih primerov

No	Naziv	pX [kN]	pY [kN]	pZ [kN]
1	stalna (g)	0.00	0.00	-25500.88
2	koristna	0.00	0.00	-6466.93
3	Sx			
4	Sy			
5	Komb.: 1.35xI+1.5xII	0.00	0.00	-44126.58
6	Komb.: I+1.5xII	0.00	0.00	-35201.27
7	Komb.: I+0.3xII+IV			
8	Komb.: I+0.3xII-1xIV			

No	Naziv	pX [kN]	pY [kN]	pZ [kN]
9	Komb.: I+0.3xII-1xIII			
10	Komb.: I+0.3xII+III			
11	Komb.: I-1xIV			
12	Komb.: I-1xIII			
13	Komb.: I+IV			
14	Komb.: I+III			
15	Komb.: 1.35xI	0.00	0.00	-34426.19
16	Komb.: I	0.00	0.00	-25500.88

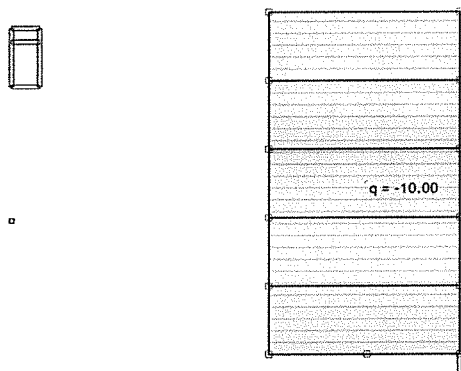
OBTEŽBE:

plošče: stalna obtežba $g = 2.50 \text{ kN/m}^2$

koristna: $q = 3.00 \text{ kN/m}^2$, $q = 4.00 \text{ kN/m}^2$ (POZ 001)

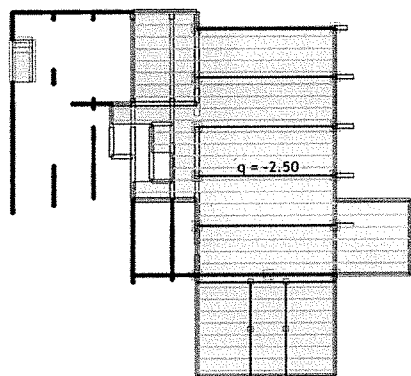
Konstrukcija (ab plošče, opečno zidovje) ter koristna obtežba (sneg + koristna) nad pritličjem (novi del) in 2.nadstropjem (stari del) upoštevana kot dodatna obtežba.

Obt. 1: stalna (g)



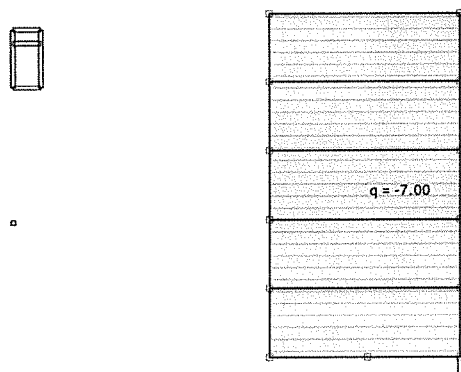
Nivo: nad 2.nad [9.87 m]

Obt. 1: stalna (g)



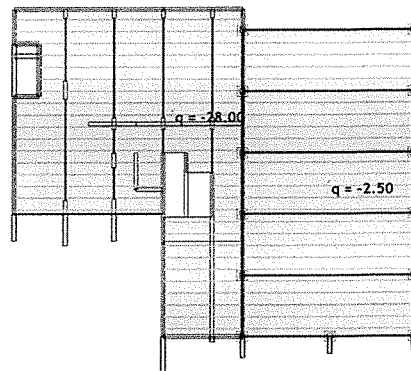
Nivo: nad kletjo [-0.10 m]

Obt. 2: koristna



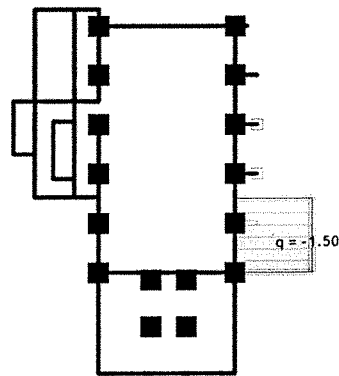
Nivo: nad 2.nad [9.87 m]

Obt. 1: stalna (g)



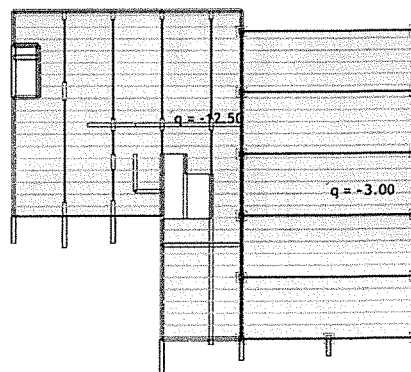
Nivo: nad pritličjem [4.40 m]

Obt. 1: stalna (g)



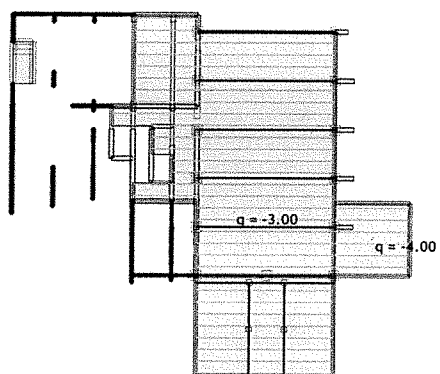
Nivo: temelji [-3.10 m]

Obt. 2: koristna



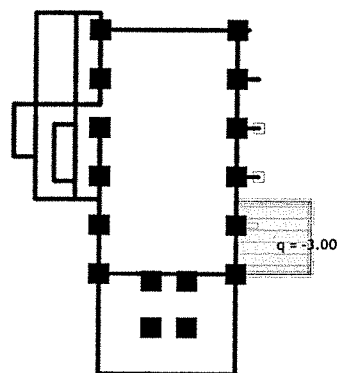
Nivo: nad pritličjem [4.40 m]

Obt. 2: koristna



Nivo: nad kletjo [-0.10 m]

Obt. 2: koristna



Nivo: temelji [-3.10 m]

Modalna analiza

Napredne opcije seizmičnega preračuna:

Mase grupirane v nivojih izbranih etaž
Preprečeno nihanje v Z smeri

Faktorji obtežb za preračun mas

No	Naziv	Koeficient
1	stalna (g)	1.00
2	koristna	0.50

Razporeditev mas po višini objekta

Nivo	Z [m]	X [m]	Y [m]	Masa [T]	T/m2
nad 2.nad	9.87	18.98	10.53	553.64	2.47
nad pritličjem	4.40	11.17	12.01	1371.78	3.06
nad kletjo	-0.10	18.61	7.86	1004.66	2.34
Skupno:	3.89	15.20	10.31	2930.09	

Položaj centra togosti po višini objekta

Nivo	Z [m]	X [m]	Y [m]
nad 2.nad	9.87	1.62	15.87
nad pritličjem	4.40	13.73	16.67
nad kletjo	-0.10	22.42	5.65

Ekscentriciteta po višini objekta

Nivo	Z [m]	eox [m]	eoy [m]
nad 2.nad	9.87	17.36	5.35
nad pritličjem	4.40	2.56	4.65
nad kletjo	-0.10	3.81	2.21

Nihajne dobe konstrukcije

No	T [s]	f [Hz]
1	0.4577	2.1848
2	0.3814	2.6221
3	0.3138	3.1871
4	0.1318	7.5868

No	T [s]	f [Hz]
5	0.0781	12.8089
6	0.0734	13.6190

No	T [s]	f [Hz]
7	0.0689	14.5076
8	0.0626	15.9764
9	0.0575	17.3782

Seizmični preračun

Seizmični preračun: EC8 SLO

Kategorija tal: B
 Kategorija pomena: III ($\gamma=1.2$)
 Razmerje a_g/g : 0.20
 Faktor obnašanja: 2.5
 Koeficient dušenja: 0.05
 S: 1
 Tb: 0.15
 Tc: 0.4
 Td: 2

Faktorji smeri potresa:

Naziv	Kx	Ky	Kz
Sx	1.000	0.300	0.000
Sy	0.300	1.000	0.000

Sx

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]
nad 2.nad	9.87	1.78	330.14	-0.00	1220.3	3.85	-0.00	45.82	-11.95	-0.00
nad pritičjem	4.40	-0.02	12.24	0.00	68.12	-3.54	0.00	2.11	4.76	0.00
nad kletjo	-0.10	-0.13	0.20	0.00	-0.66	0.14	0.00	-0.15	0.06	0.00
temelji	-3.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$\Sigma=$	1.63	342.58	-0.00	1287.8	0.46	-0.00	47.78	-7.14	-0.00

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]
nad 2.nad	9.87	161.41	3.73	0.01	-15.04	-116.32	0.00	-61.04	145.89	0.00
nad pritičjem	4.40	149.58	-1.22	-0.00	433.49	-312.60	-0.00	1532.0	896.41	-0.00
nad kletjo	-0.10	7.06	-0.55	-0.00	26.19	-7.27	-0.00	85.49	34.21	-0.00
temelji	-3.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$\Sigma=$	318.05	1.96	0.00	444.65	-436.19	0.00	1556.5	1076.5	0.00

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]
nad 2.nad	9.87	-1.17	-19.58	0.00	-2.65	11.21	-0.01	3.48	7.94	-0.00
nad pritičjem	4.40	11.18	168.75	-0.00	245.26	3.16	0.00	16.40	-54.64	0.00
nad kletjo	-0.10	-0.50	12.89	-0.00	20.06	0.08	0.00	1.82	-2.55	0.00
temelji	-3.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$\Sigma=$	9.51	162.06	0.00	262.67	14.45	-0.01	21.70	-49.25	-0.00

Nivo	Z [m]	Vsi toni		
		Px [kN]	Py [kN]	Pz [kN]
nad 2.nad	9.87	1352.9	354.92	-0.00
nad pritičjem	4.40	2458.1	713.32	0.00
nad kletjo	-0.10	139.18	37.22	0.00
temelji	-3.10	0.00	0.00	0.00
	$\Sigma=$	3950.2	1105.5	-0.00

Sy

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]
nad 2.nad	9.87	5.86	1084.8	-0.00	366.49	1.16	-0.00	7.22	-1.88	-0.00
nad pritičjem	4.40	-0.06	40.21	0.00	20.46	-1.06	0.00	0.33	0.75	0.00
nad kletjo	-0.10	-0.44	0.66	0.00	-0.20	0.04	0.00	-0.02	0.01	0.00
temelji	-3.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$\Sigma=$	5.36	1125.7	-0.00	386.74	0.14	-0.00	7.53	-1.13	-0.00

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]
nad 2.nad	9.87	49.33	1.14	0.00	14.51	112.24	-0.00	-50.13	119.81	0.00
nad pritičjem	4.40	45.71	-0.37	-0.00	-418.30	301.64	0.00	1258.2	736.17	-0.00
nad kletjo	-0.10	2.16	-0.17	-0.00	-25.27	7.02	0.00	70.21	28.10	-0.00
temelji	-3.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$\Sigma=$	97.20	0.60	0.00	-429.06	420.90	-0.00	1278.2	884.07	0.00

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]
nad 2.nad	9.87	-3.31	-55.55	0.00	-0.93	3.92	-0.00	-21.49	-48.99	0.00
nad pritičjem	4.40	31.72	478.71	-0.00	85.66	1.10	0.00	-101.22	337.16	-0.00
nad kletjo	-0.10	-1.42	36.57	-0.00	7.01	0.03	0.00	-11.21	15.74	-0.00
temelji	-3.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	$\Sigma=$	26.99	459.74	0.00	91.74	5.05	-0.00	-133.91	303.91	0.00

Nivo	Z [m]	Vsi toni		
		Px [kN]	Py [kN]	Pz [kN]
nad 2.nad	9.87	367.56	1216.7	0.00
nad pritičjem	4.40	922.45	1894.3	-0.00
nad kletjo	-0.10	40.82	88.01	-0.00
temelji	-3.10	0.00	0.00	0.00
	$\Sigma=$	1330.8	3199.0	0.00

Faktorji participacije - relativno sodelovanje

Ton \ Naziv	1. Sx	2. Sy
1	0.024	0.313
2	0.301	0.032
3	0.011	0.000
4	0.074	0.008
5	0.073	0.081
6	0.439	0.352
7	0.014	0.130
8	0.062	0.009
9	0.002	0.073

Faktorji participacije - angažiranje mase

Ton	UX (%)	UY (%)	UZ (%)	ΣUX (%)	ΣUY (%)	ΣUZ (%)
1	0.00	18.65	0.00	0.00	18.65	0.00
2	18.67	0.00	0.00	18.67	18.65	0.00
3	0.73	0.02	0.00	19.40	18.67	0.00
4	4.80	0.00	0.00	24.19	18.67	0.00
5	10.87	10.46	0.00	35.07	29.13	0.00

6	22.52	10.77	0.00	57.59	39.91	0.00
7	0.03	7.99	0.00	57.62	47.90	0.00
8	4.65	0.01	0.00	62.27	47.91	0.00
9	1.24	6.39	0.00	63.51	54.30	0.00

Technical drawing of a building facade showing a cross-section. The drawing includes elevation markers and a section line.

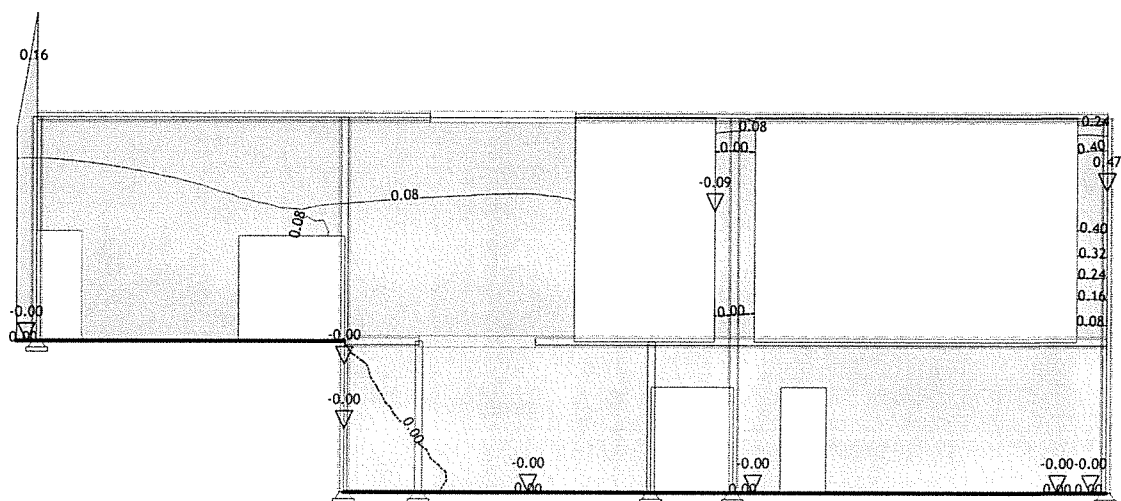
Key elevation markers (from top to bottom):

- 2.34
- 1.96
- 1.47
- 0.78
- 0.39
- 0.00
- 0.60
- 0.00
- 0.00

The drawing shows a sloped roof on the left and a flat roof on the right. A section line is indicated by a dashed line with a triangle at the end.

Radimpex - www.radimpex.rs

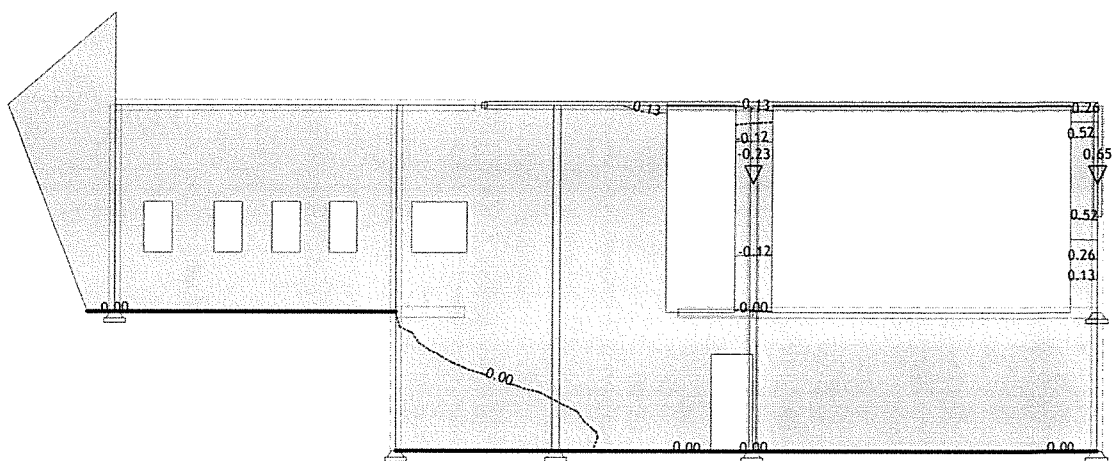
Obt. 7: I+0.3xII+IV



Okvir: V_6

Vplivi v plošči: max $Y_p = 0.47$ / min $Y_p = -0.09$ m / 1000

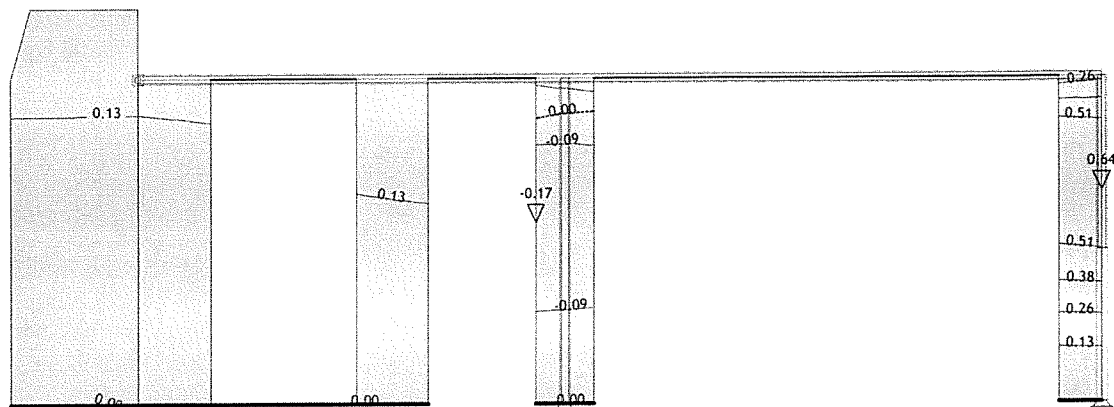
Obt. 7: I+0.3xII+IV



Okvir: V_4

Vplivi v plošči: max $Y_p = 0.65$ / min $Y_p = -0.23$ m / 1000

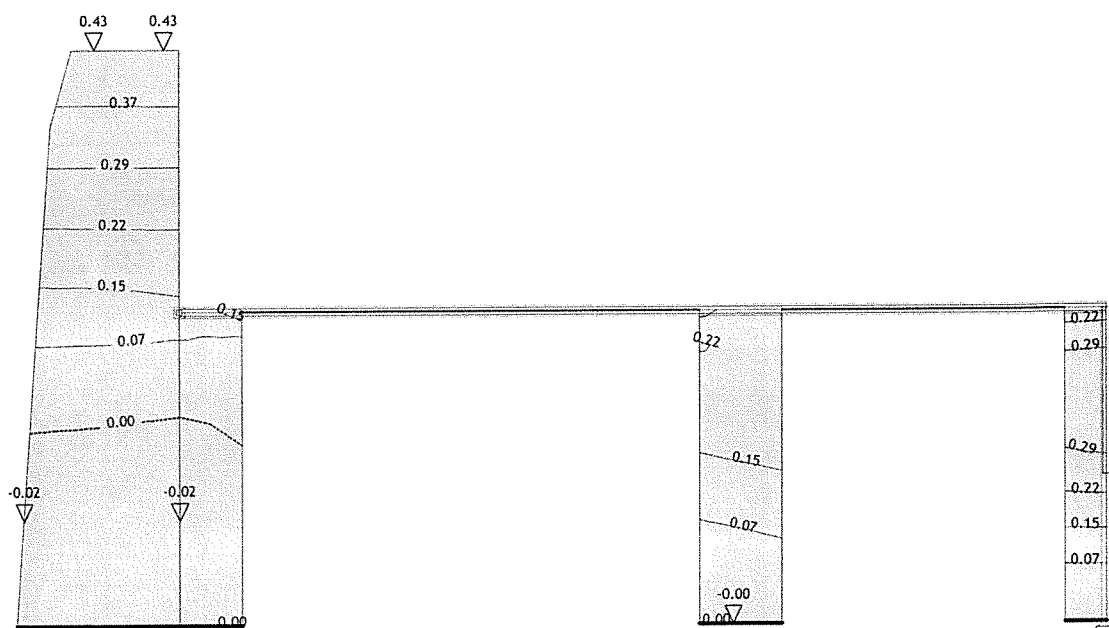
Obt. 7: I+0.3xII+IV



Okvir: V_13

Vplivi v plošči: max Yp= 0.64 / min Yp= -0.17 m / 1000

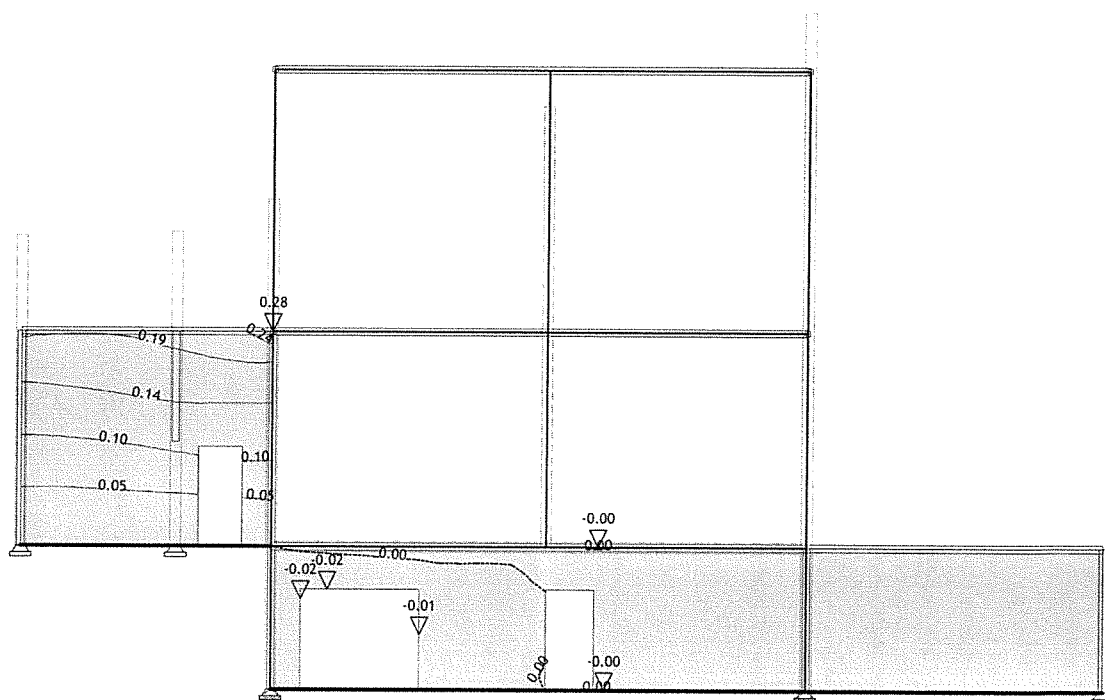
Obt. 7: I+0.3xII+IV



Okvir: V_12

Vplivi v plošči: max Yp= 0.43 / min Yp= -0.02 m / 1000

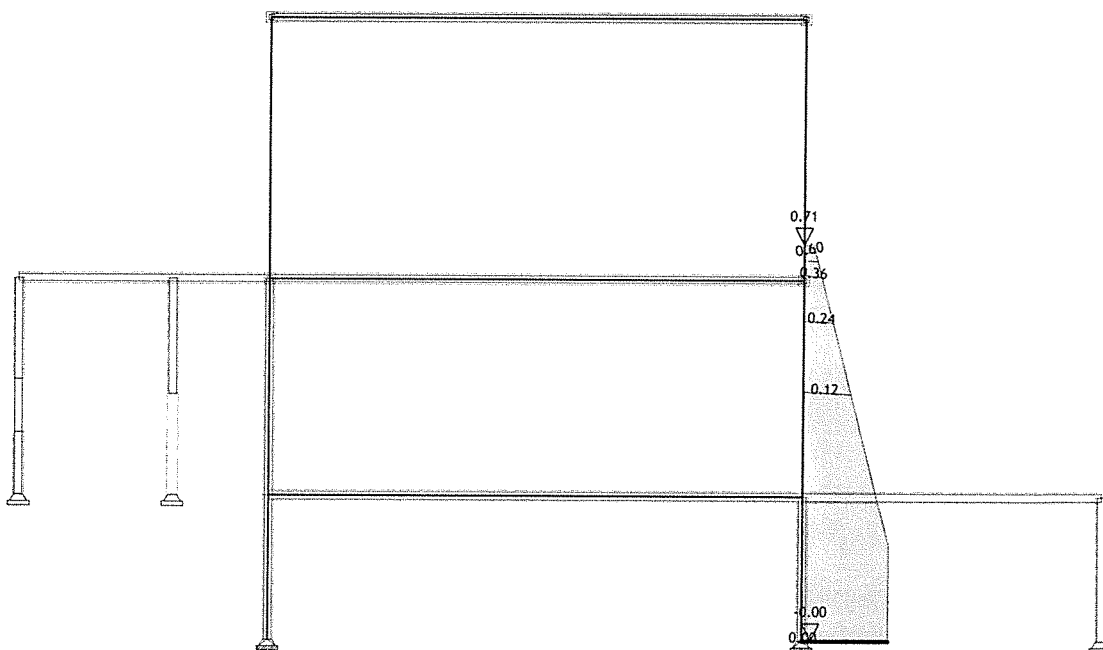
Obt. 10: I+0.3xII+III



Okvir: H_3

Vplivi v plošči: max $X_p = 0.28$ / min $X_p = -0.02$ m / 1000

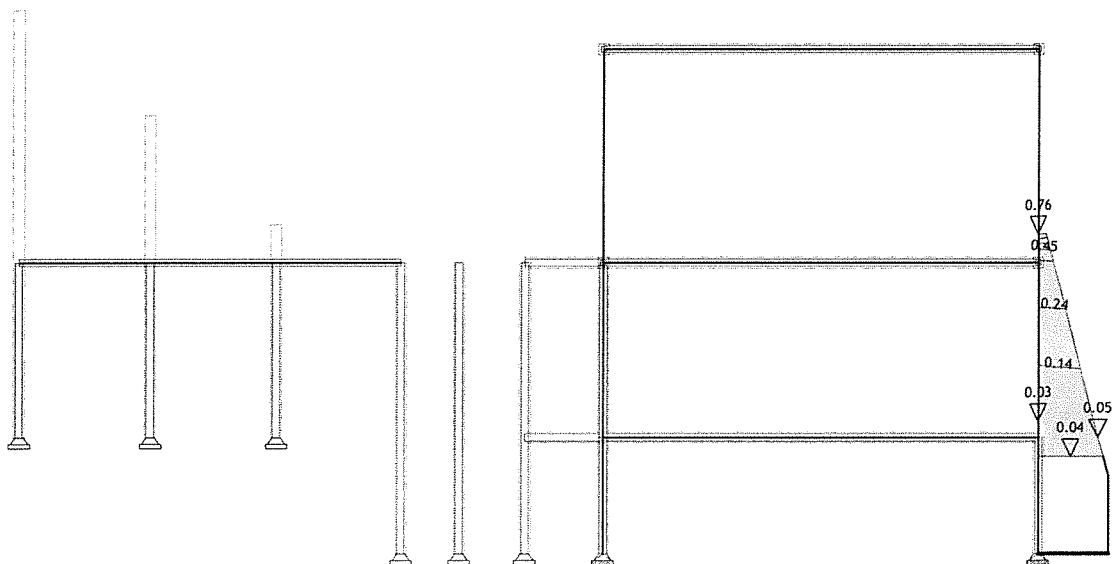
Obt. 10: I+0.3xII+III



Okvir: H_4

Vplivi v plošči: max $X_p = 0.71$ / min $X_p = -0.00$ m / 1000

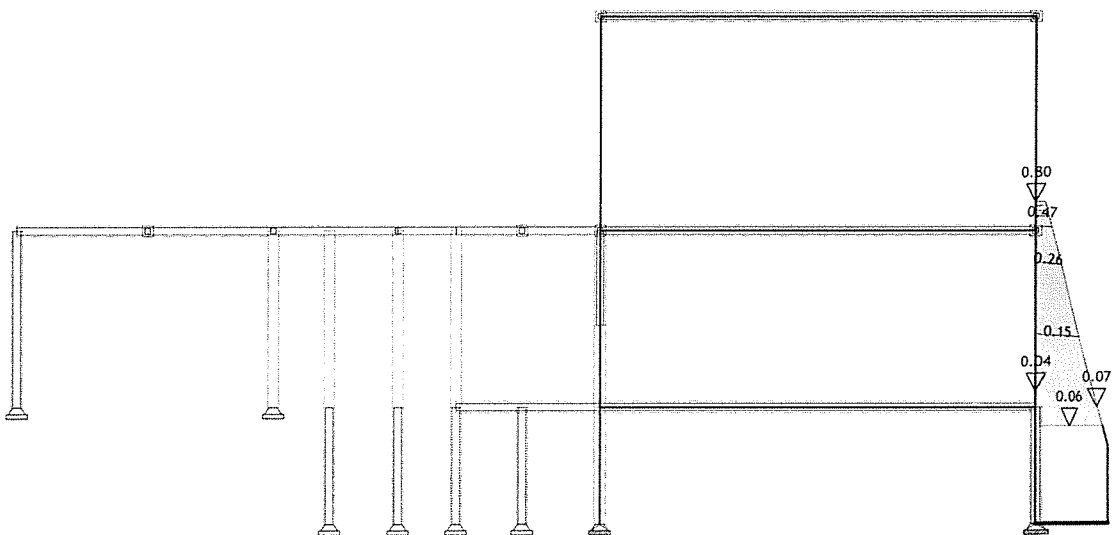
Obt. 10: I+0.3xII+III



Okvir: H_8

Vplivi v plošči: max $X_p = 0.76$ / min $X_p = 0.03$ m / 1000

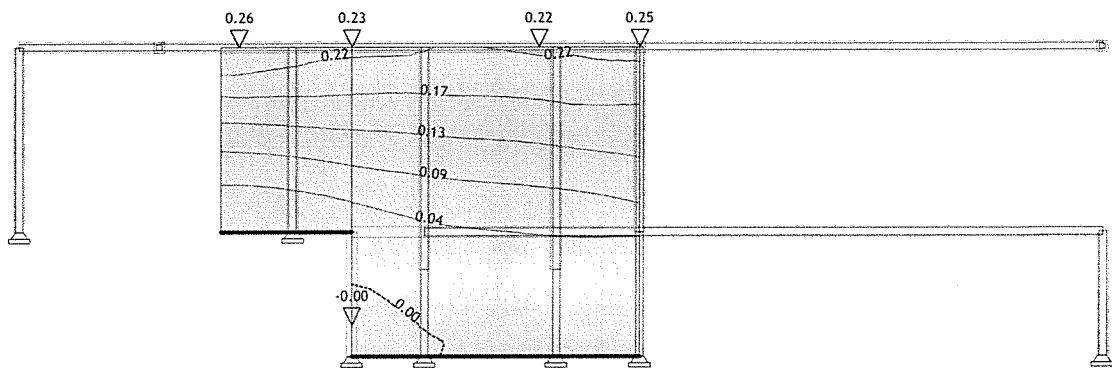
Obt. 10: I+0.3xII+III



Okvir: H_10

Vplivi v plošči: max $X_p = 0.80$ / min $X_p = 0.04$ m / 1000

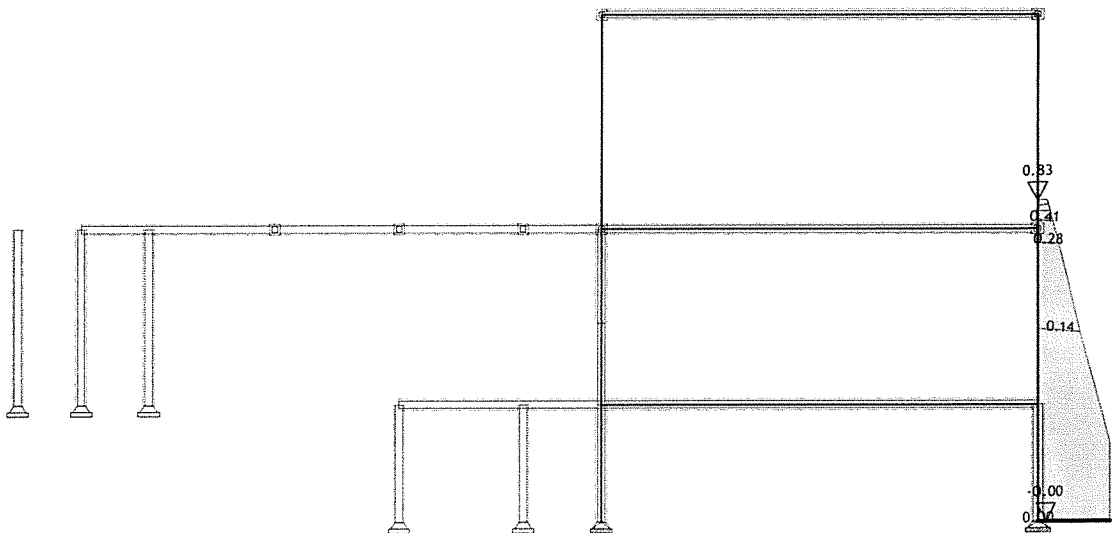
Obt. 10: I+0.3xII+III



Okvir: H_12

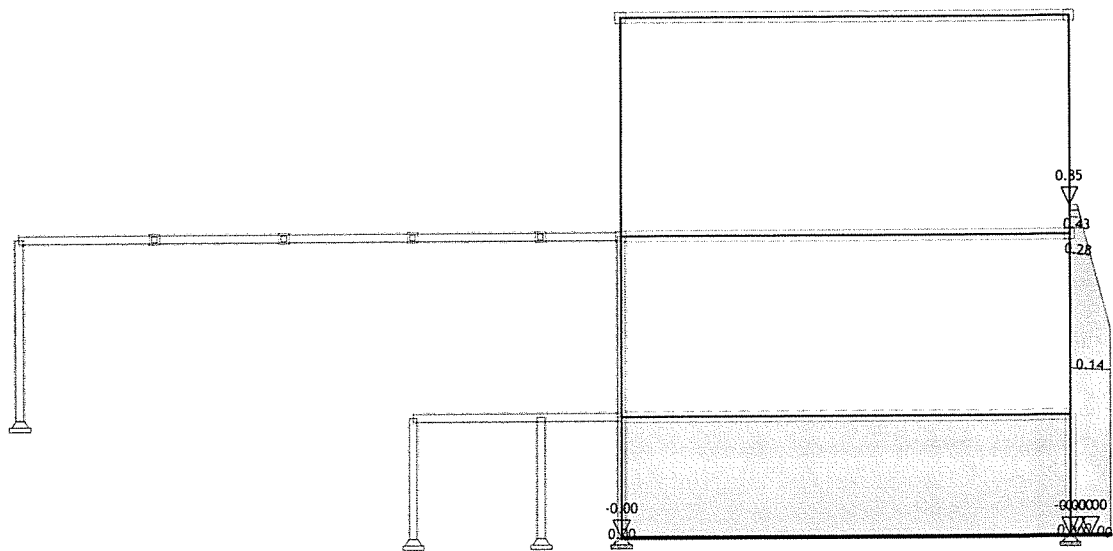
Vplivi v plošči: max $X_p = 0.26$ / min $X_p = -0.00$ m / 1000

Obt. 10: I+0.3xII+III

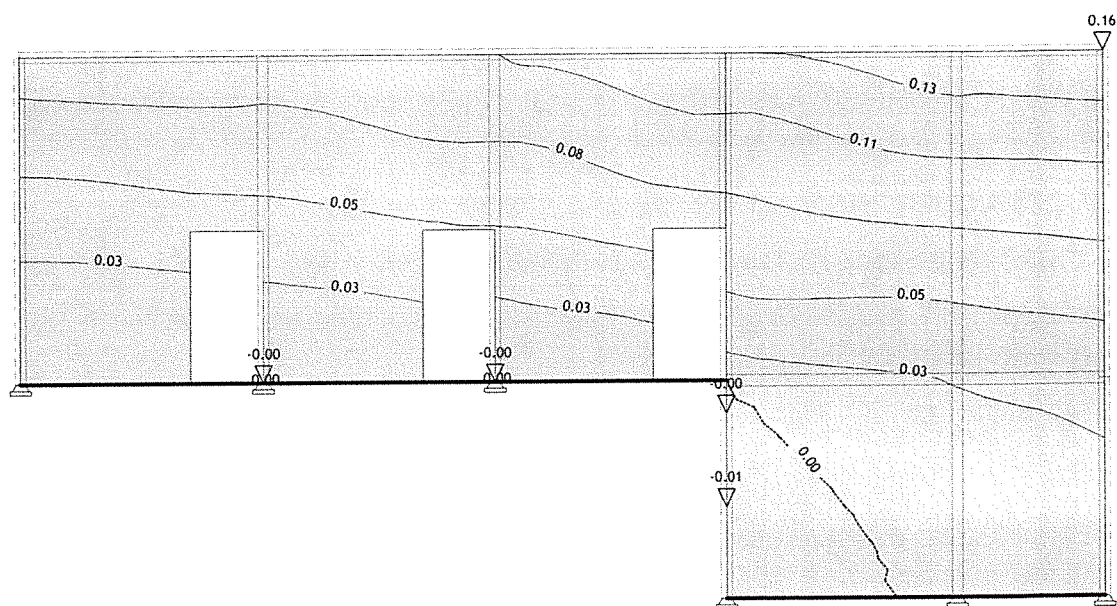


Okvir: H_14

Vplivi v plošči: max $X_p = 0.83$ / min $X_p = -0.00$ m / 1000

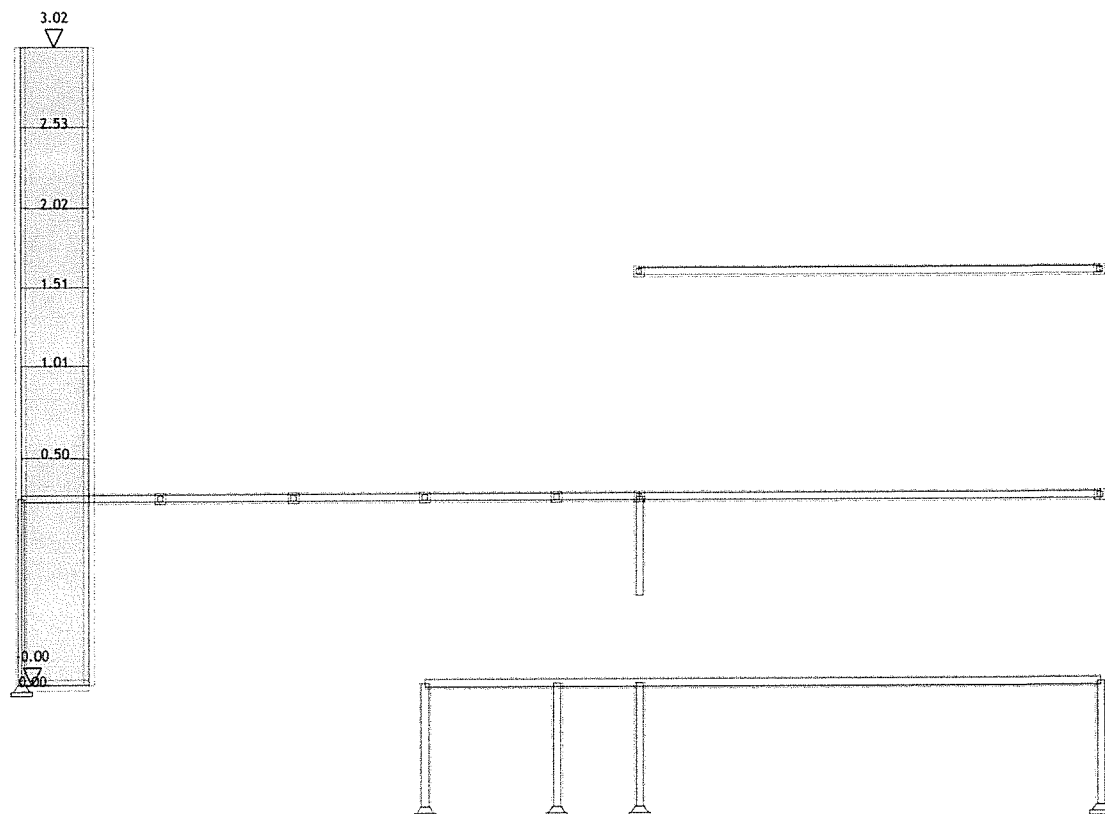


Obt. 10: $I + 0.3 \times II + III$



Radimpex - www.radimpex.rs

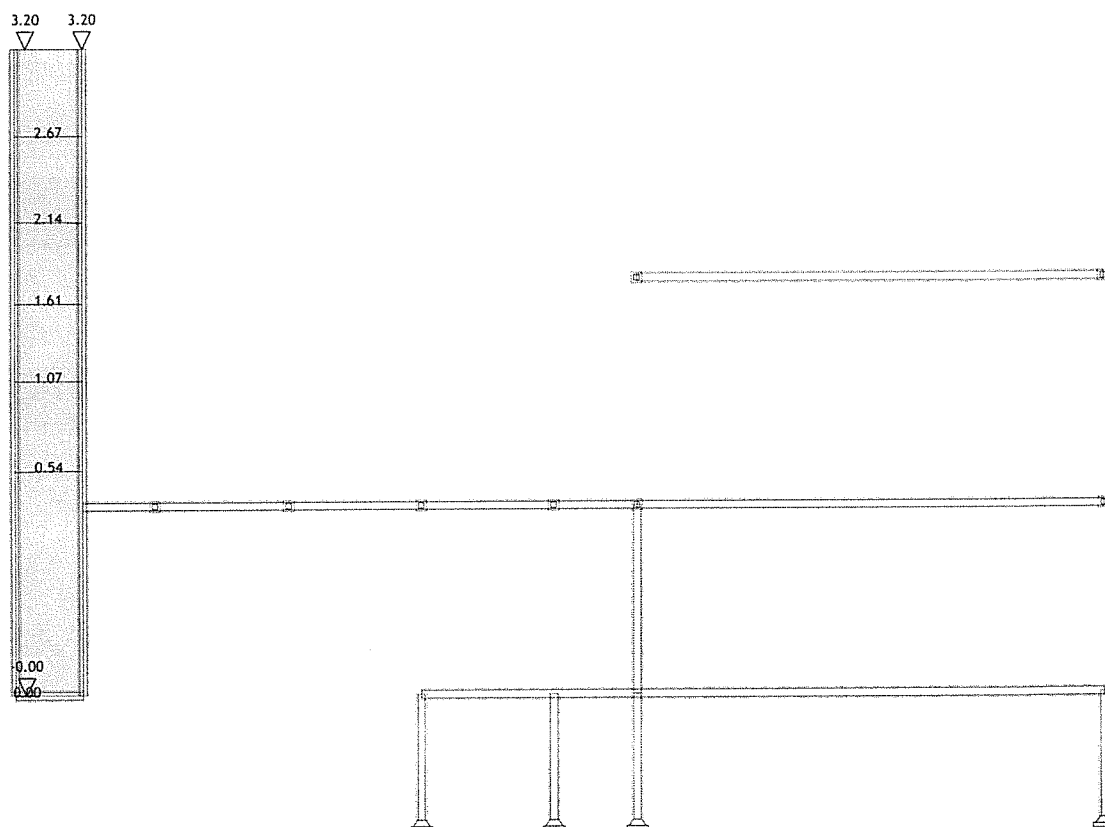
Obt. 10: I+0.3xII+III



Okvir: H_16

Vplivi v plošči: max $X_p = 3.02$ / min $X_p = -0.00$ m / 1000

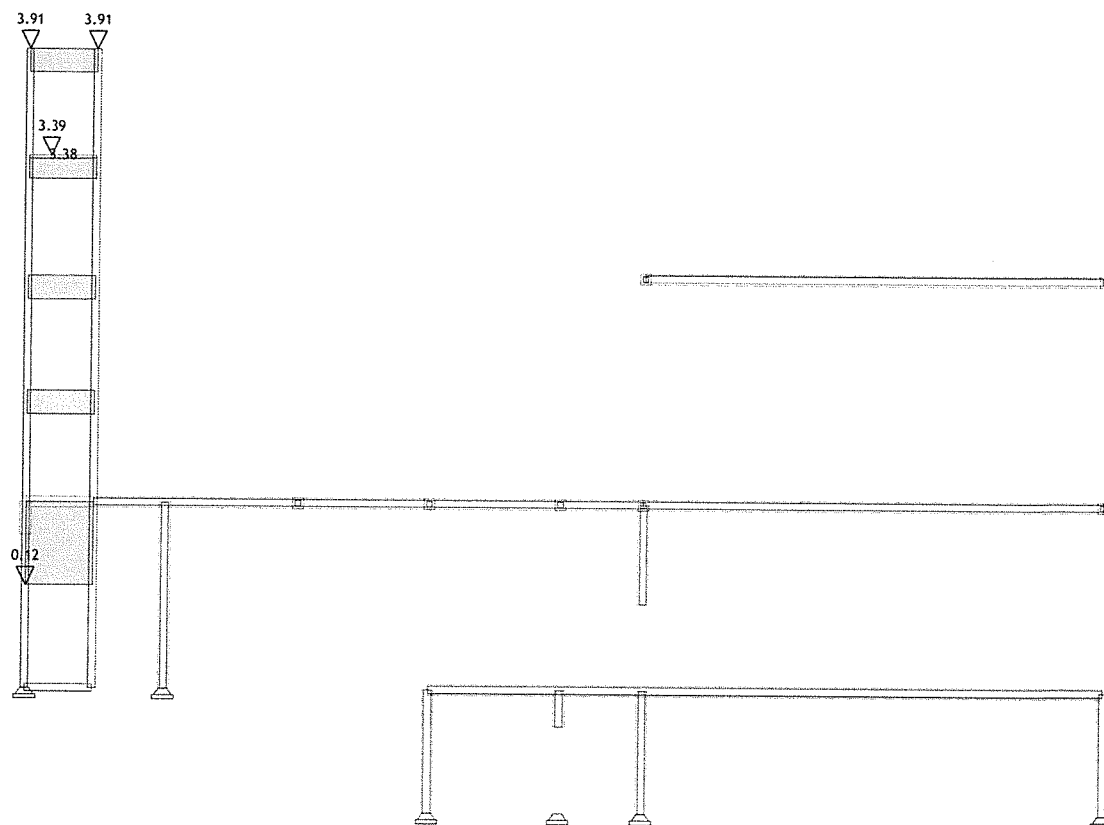
Obt. 10: I+0.3xII+III



Okvir: H_15

Vplivi v plošči: max $X_p = 3.20$ / min $X_p = -0.00$ m / 1000

Obt. 10: I+0.3xII+III

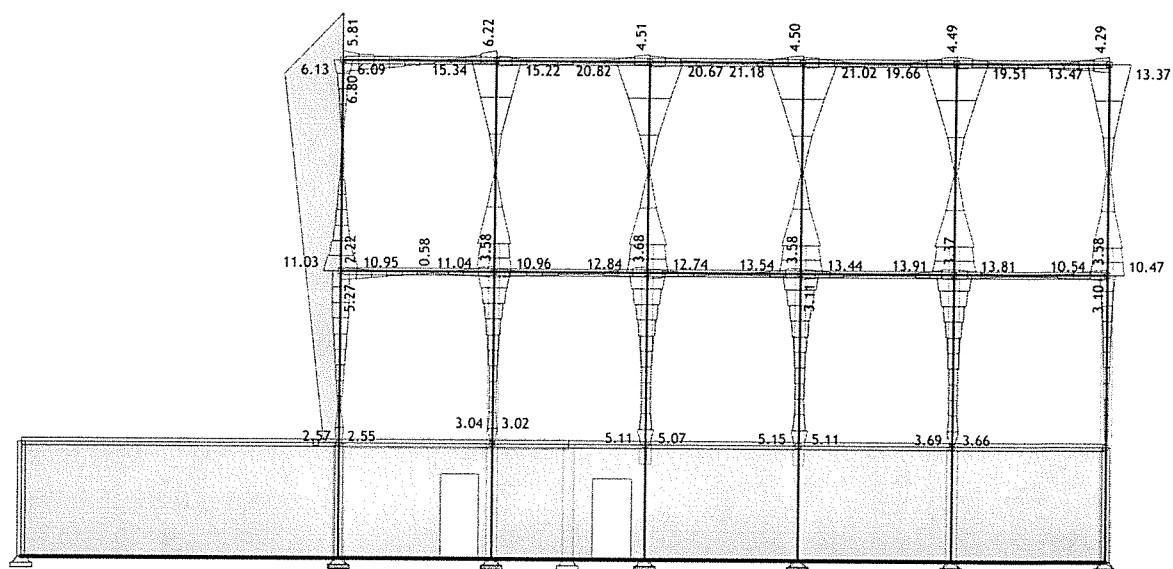


Okvir: H_13

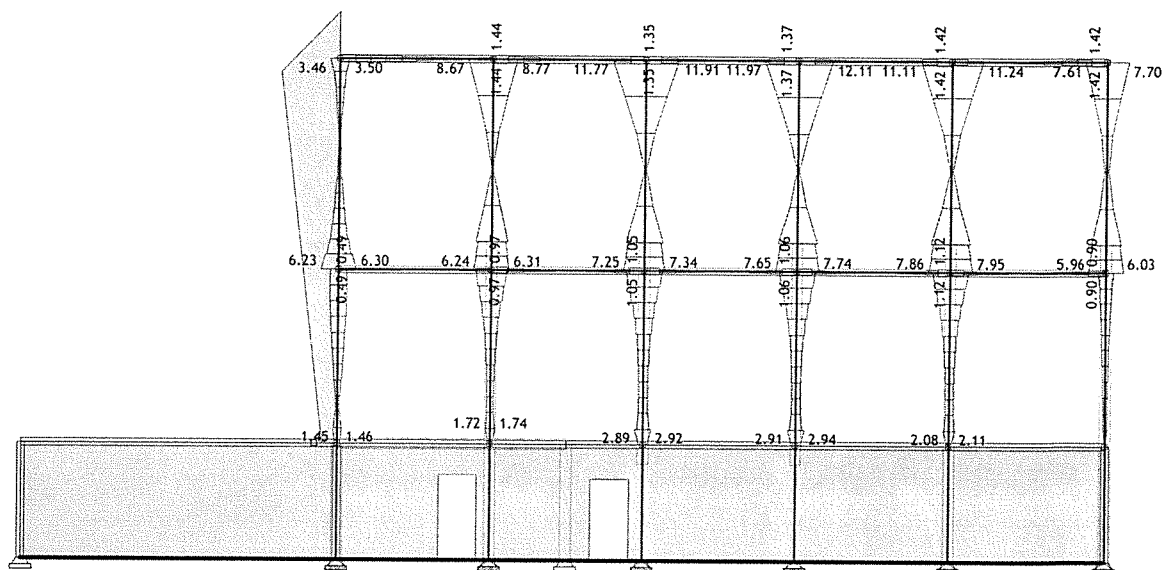
Vplivi v plošči: max $X_p = 3.91$ / min $X_p = 0.12$ m / 1000

Radimpex - www.radimpex.rs

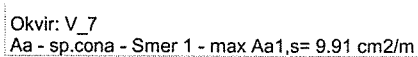
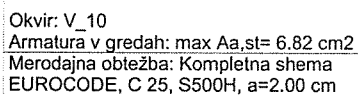
Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H



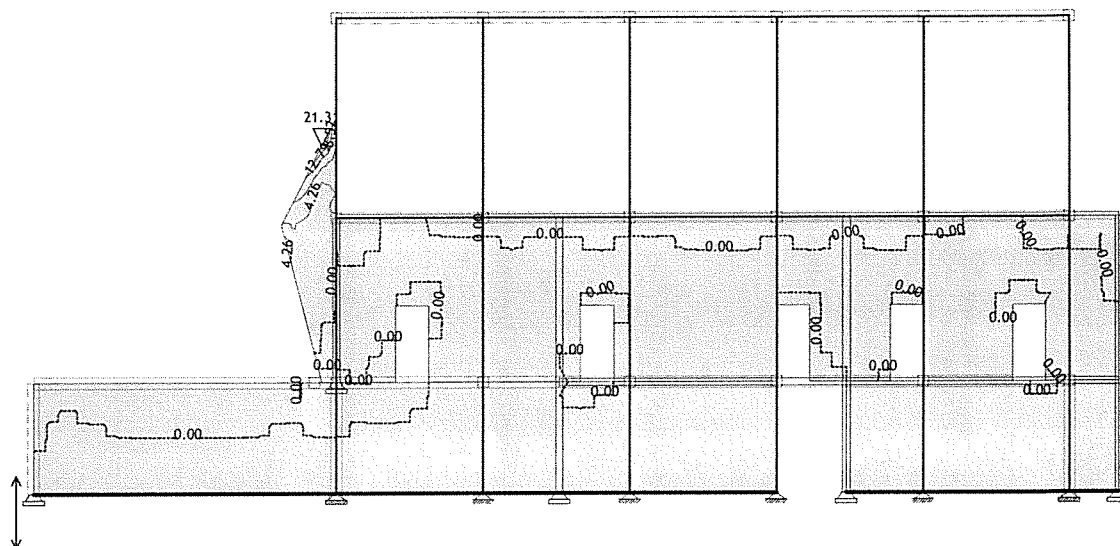
Okvir: V_10
Armatura v gredah: max $A_{a2}/A_{a1} = 21.18 \text{ cm}^2$
Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H



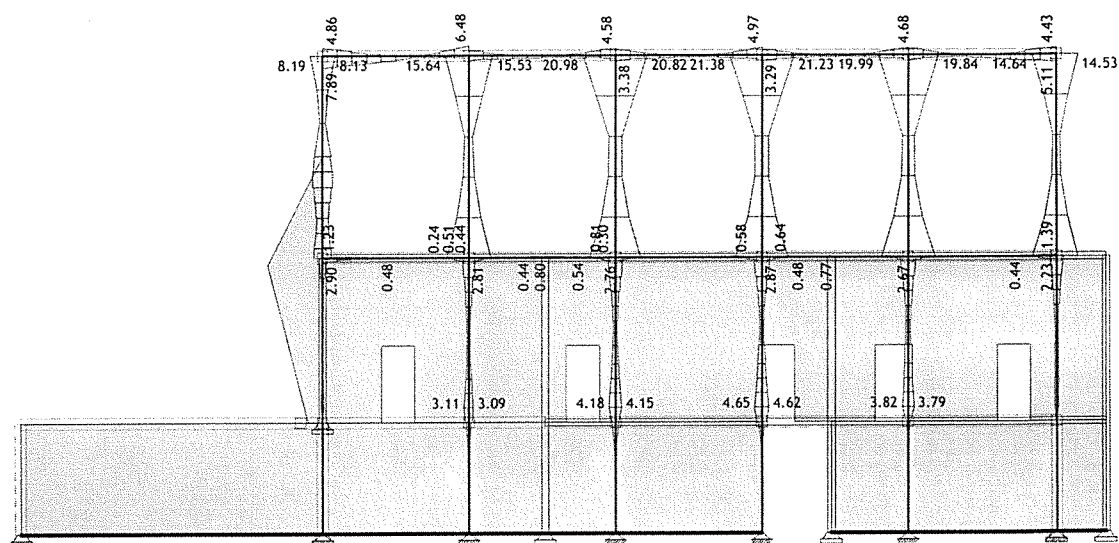
Okvir: V_10
Armatura v gredah: max $A_{a3}/A_{a4} = 12.11 \text{ cm}^2$



Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm

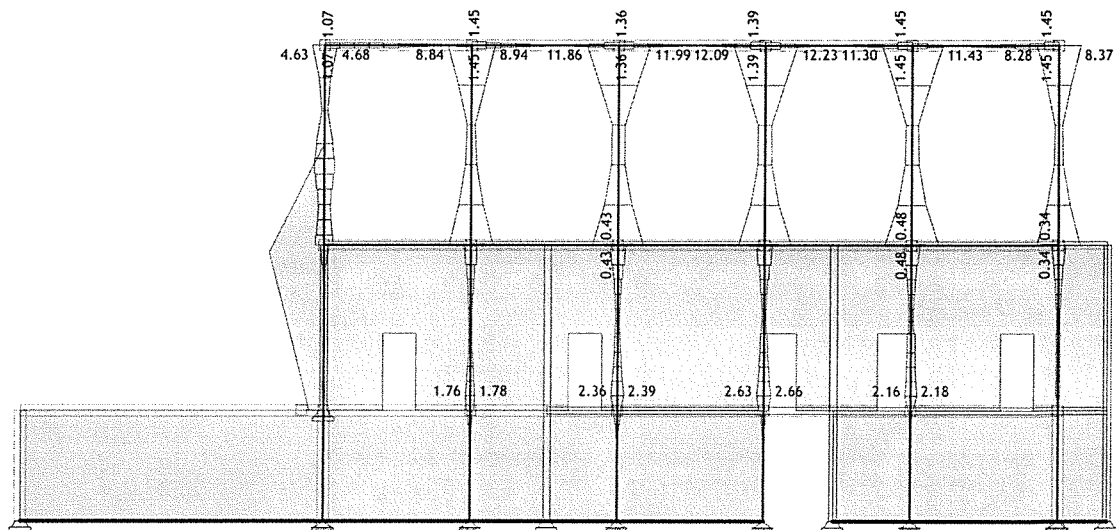


Okvir: V_7
Aa - sp.cona - Smer 2 - max Aa2,s= 21.31 cm²/m
Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H

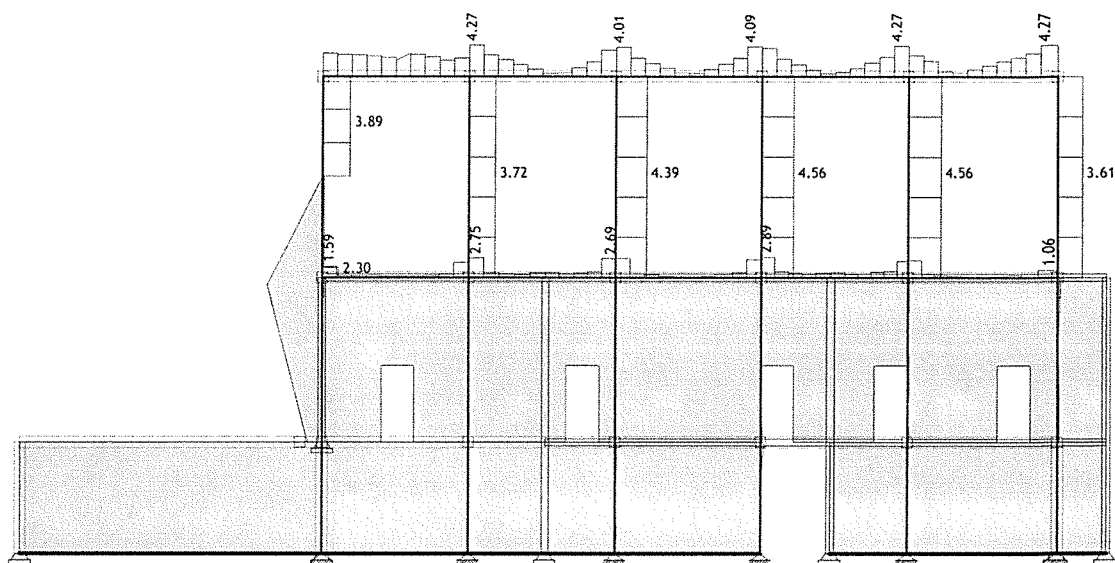


Okvir: V_7
Armatura v gredah: max Aa2/Aa1= 21.38 cm²

Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H

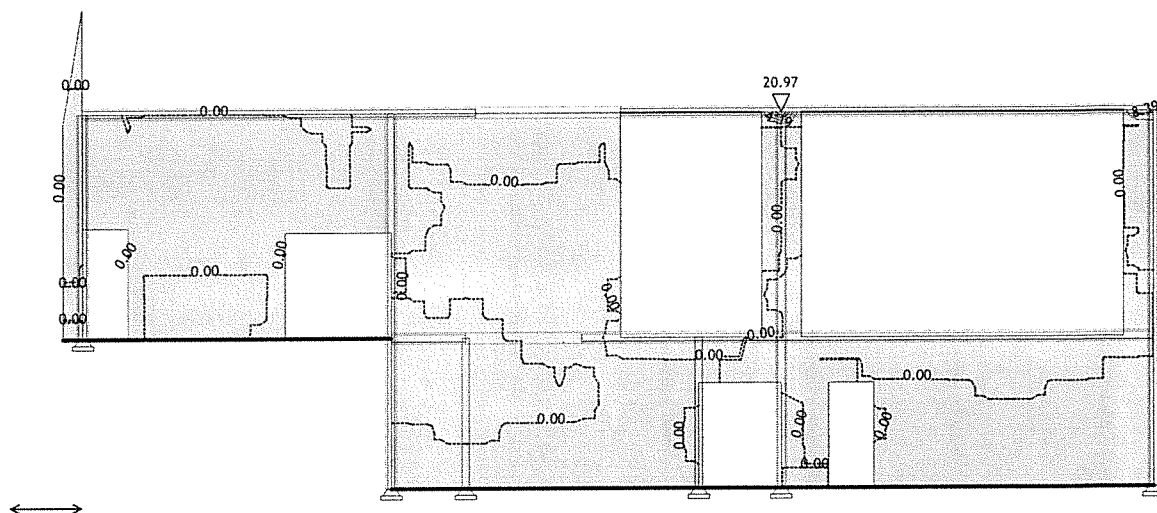


Okvir: V_7
Armatura v gredah: max $A_{a3}/A_{a4} = 12.23 \text{ cm}^2$
Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H



Okvir: V_7
Armatura v gredah: max $A_{a,st} = 4.56 \text{ cm}^2$

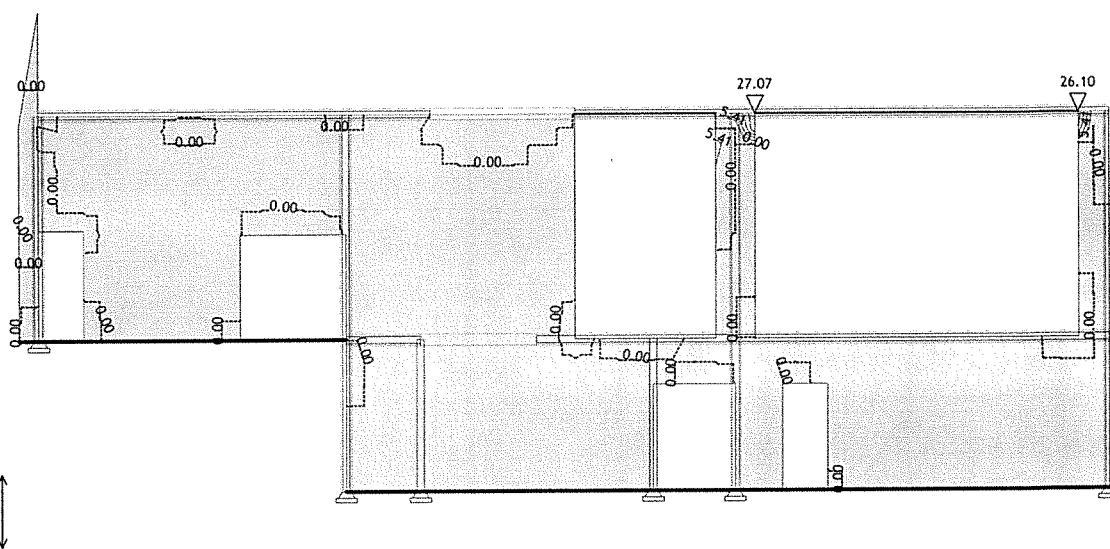
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: V_6

Aa - sp.cona - Smer 1 - max Aa1,s= 20.97 cm²/m

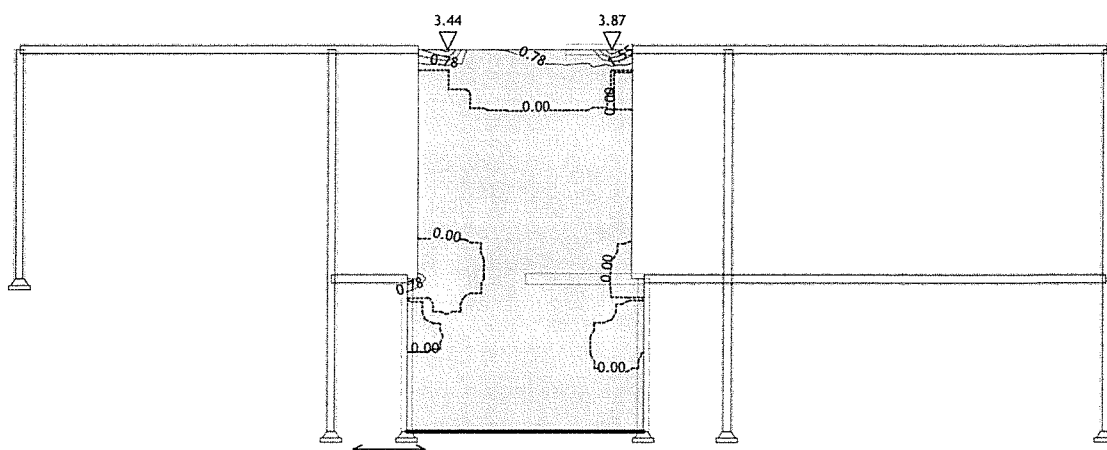
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: V_6

Aa - sp.cona - Smer 2 - max Aa2,s= 27.07 cm²/m

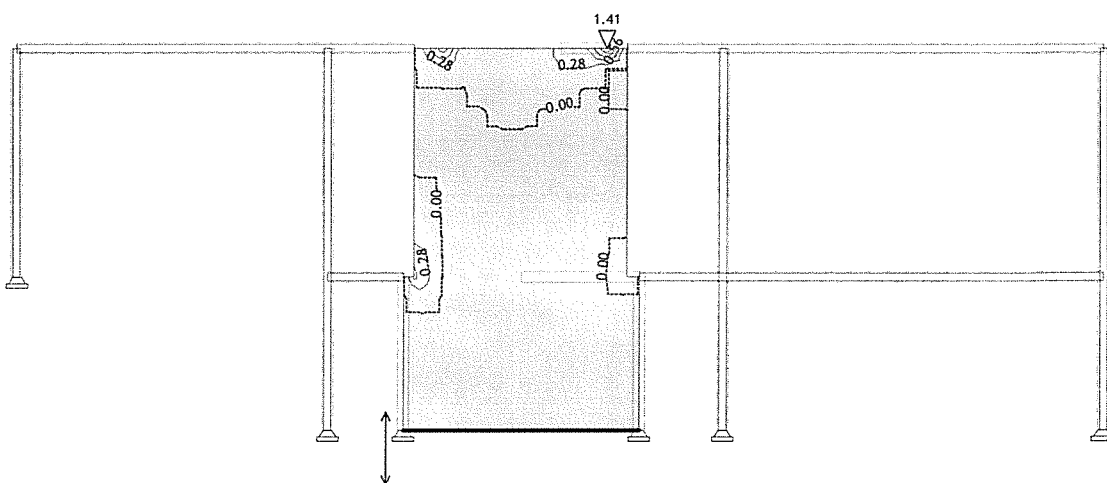
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: V_5

Aa - sp.cona - Smer 1 - max Aa1,s= 3.87 cm²/m

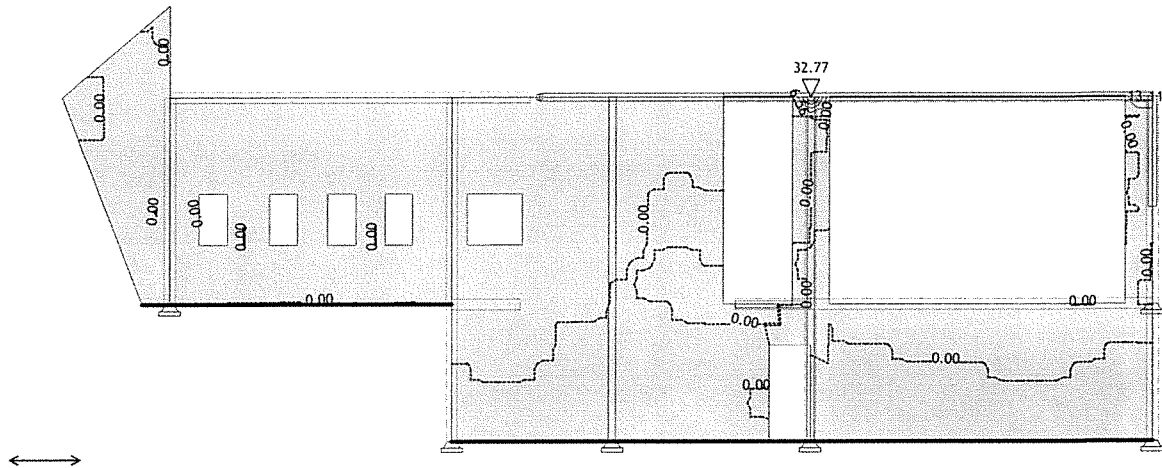
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



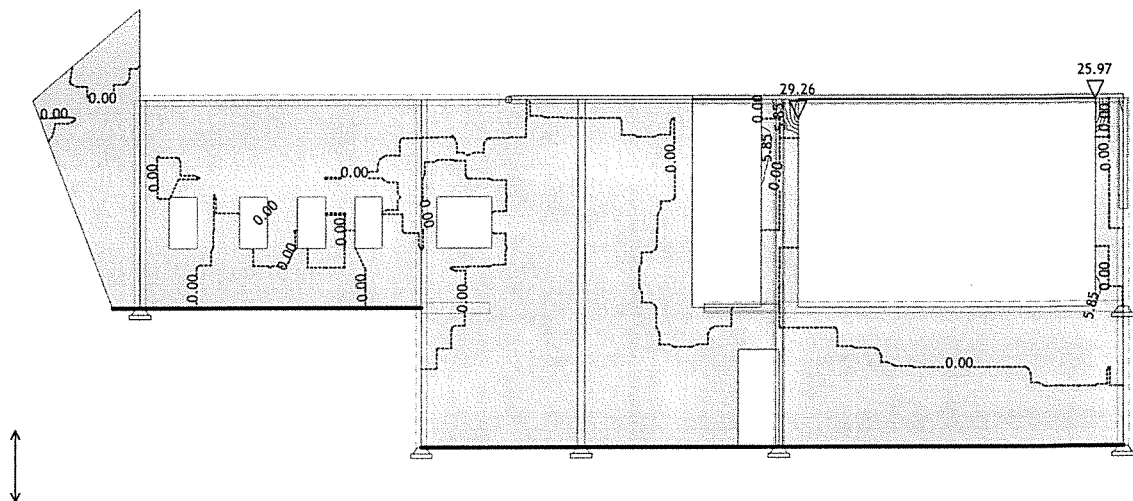
Okvir: V_5

Aa - sp.cona - Smer 2 - max Aa2,s= 1.41 cm²/m

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm

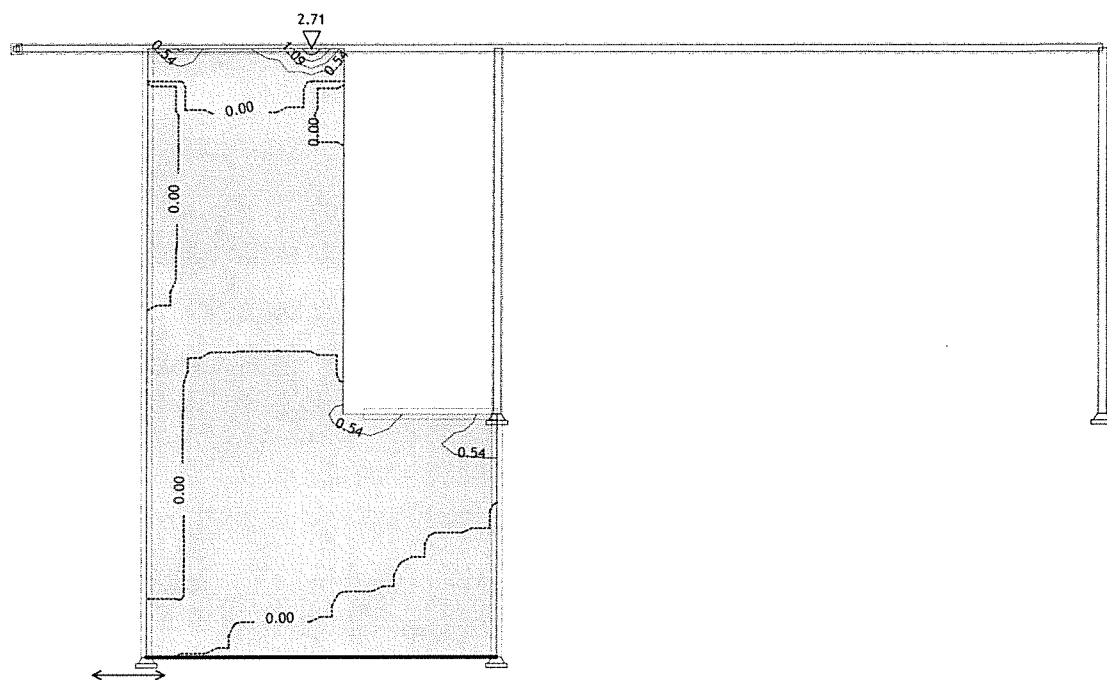


Okvir: V_4
Aa - sp.cona - Smer 1 - max Aa1,s= 32.77 cm²/m
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: V_4
Aa - sp.cona - Smer 2 - max Aa2,s= 29.26 cm²/m

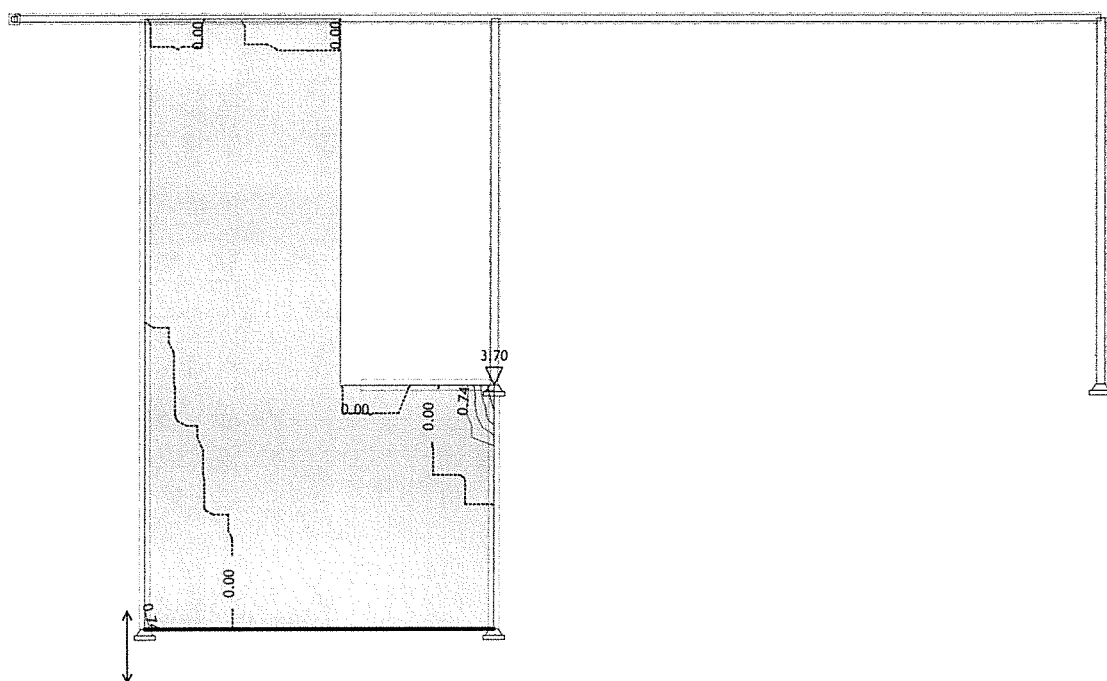
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: V_3

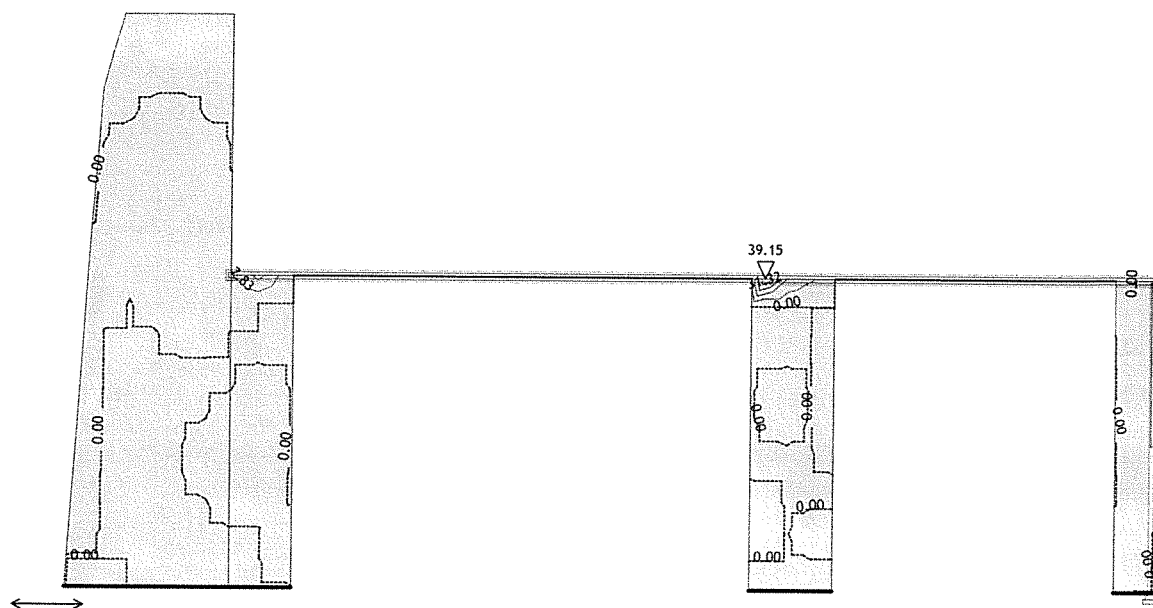
Aa - sp.cona - Smer 1 - max Aa1,s= 2.71 cm²/m

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm

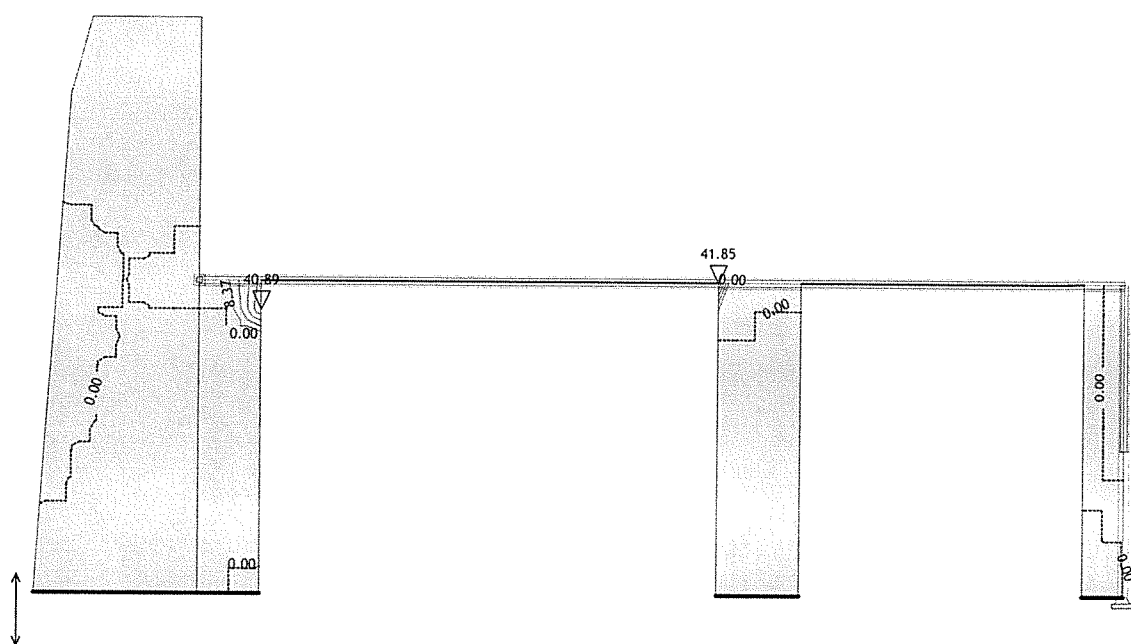


Okvir: V_3

Aa - sp.cona - Smer 2 - max Aa2,s= 3.70 cm²/m

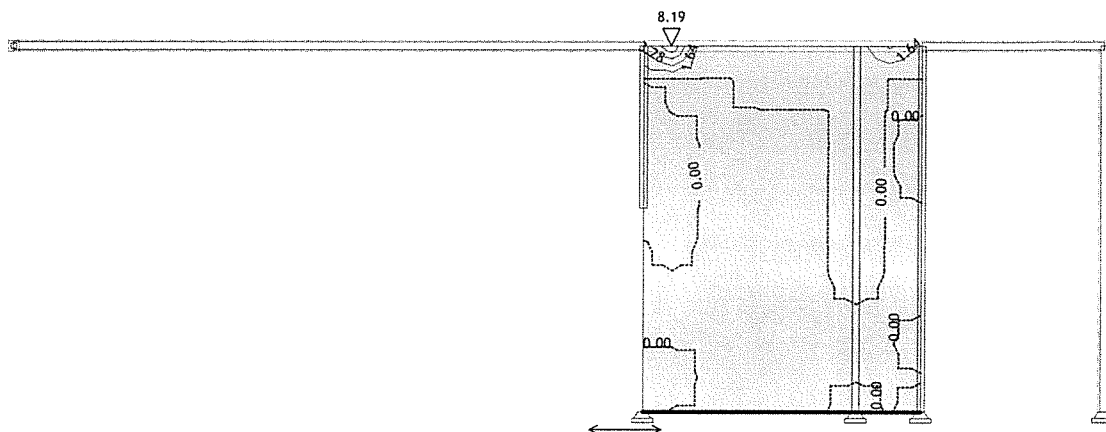


Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Aa - sp.cona - Smer 2 - max Aa_{2,s} = 41.85 cm²/m

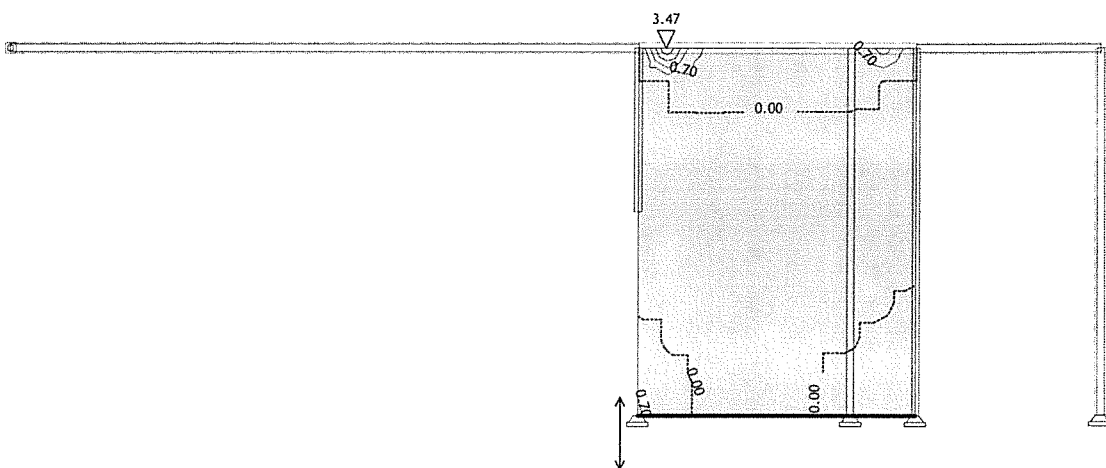
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: V_2

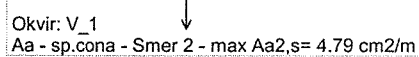
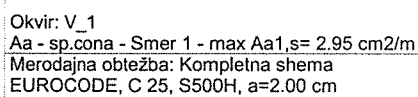
Aa - sp.cona - Smer 1 - max Aa1,s= 8.19 cm²/m

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm

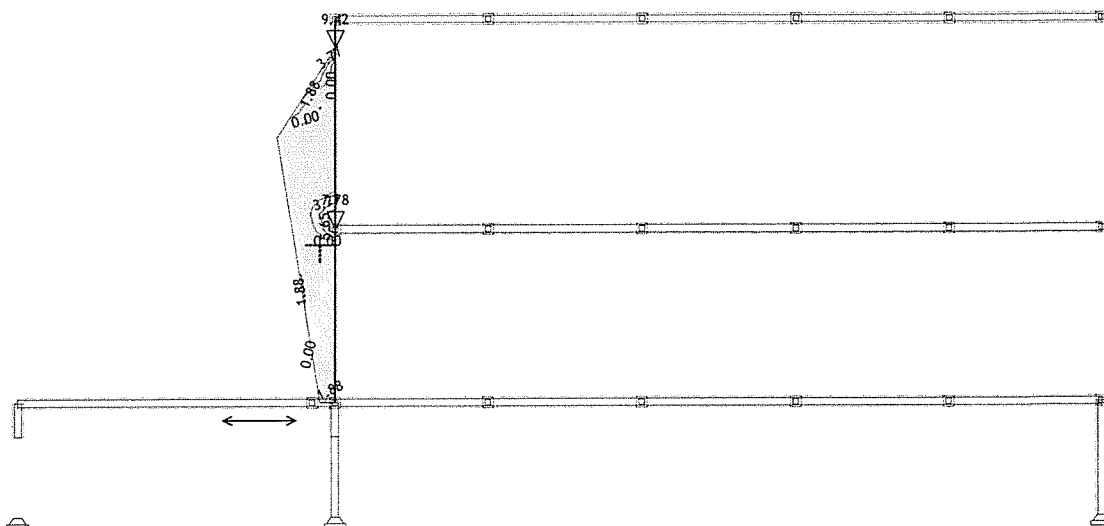


Okvir: V_2

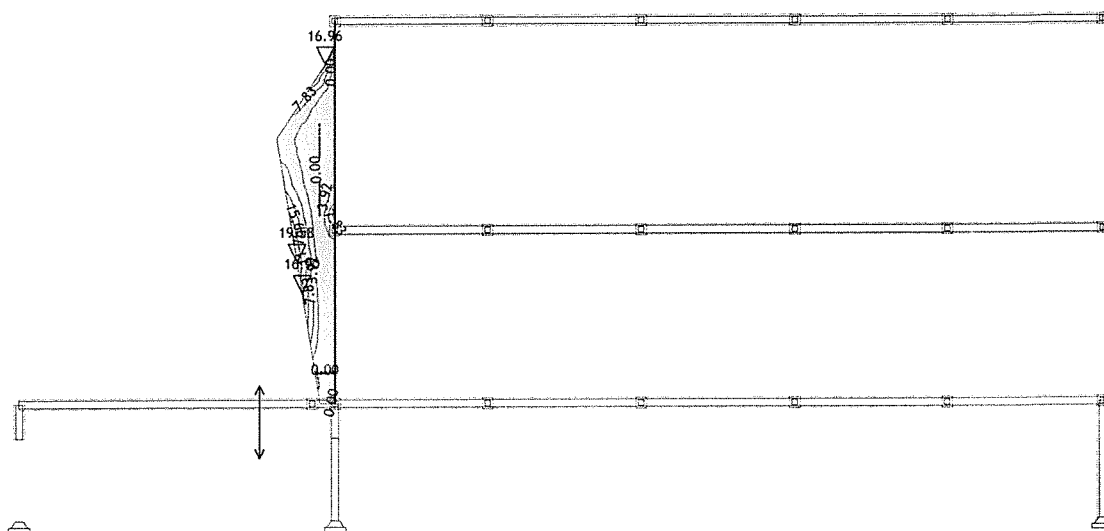
Aa - sp.cona - Smer 2 - max Aa2,s= 3.47 cm²/m



Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm

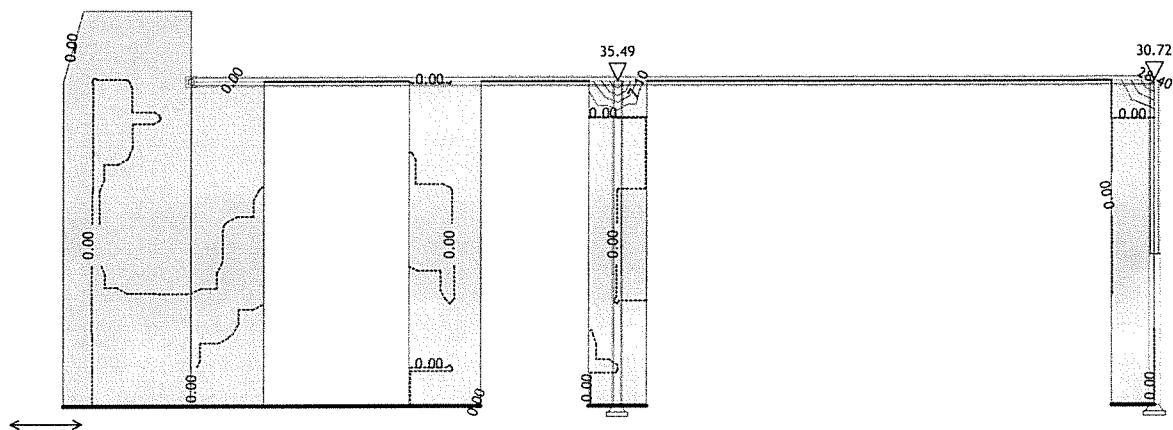


Okvir: V_14
Aa - sp.cona - Smer 1 - max Aa1,s= 9.42 cm²/m
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: V_14
Aa - sp.cona - Smer 2 - max Aa2,s= 19.58 cm²/m

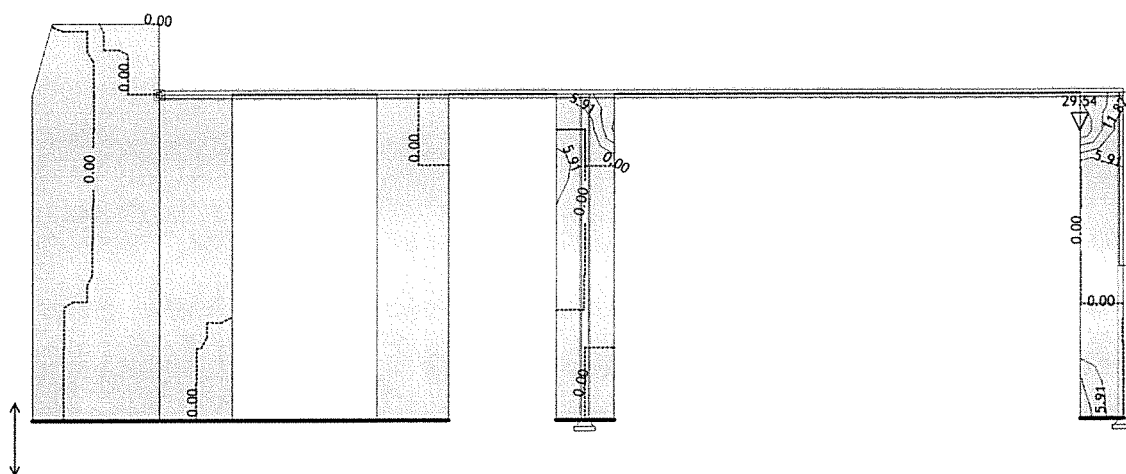
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: V_13

Aa - sp.cona - Smer 1 - max Aa1,s= 35.49 cm2/m

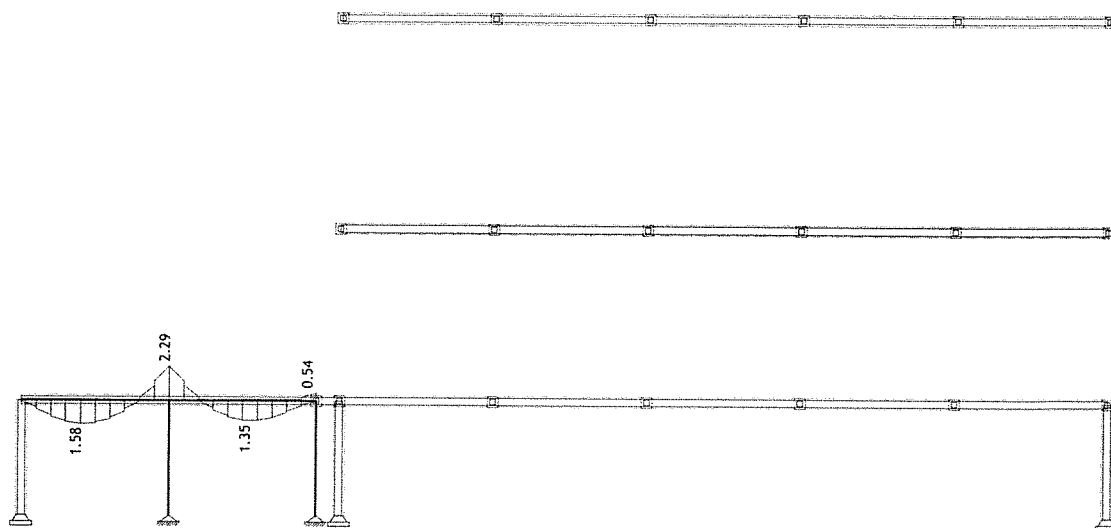
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: V_13

Aa - sp.cona - Smer 2 - max Aa2,s= 29.54 cm2/m

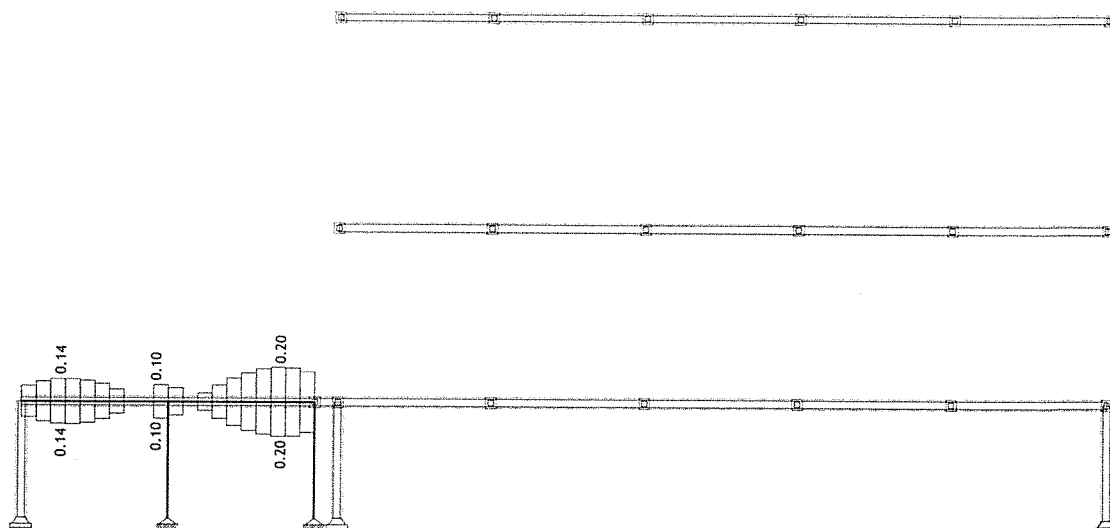
Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H



Okvir: V_9

Armatura v gredah: max $A_{a2}/A_{a1} = 2.29 \text{ cm}^2$

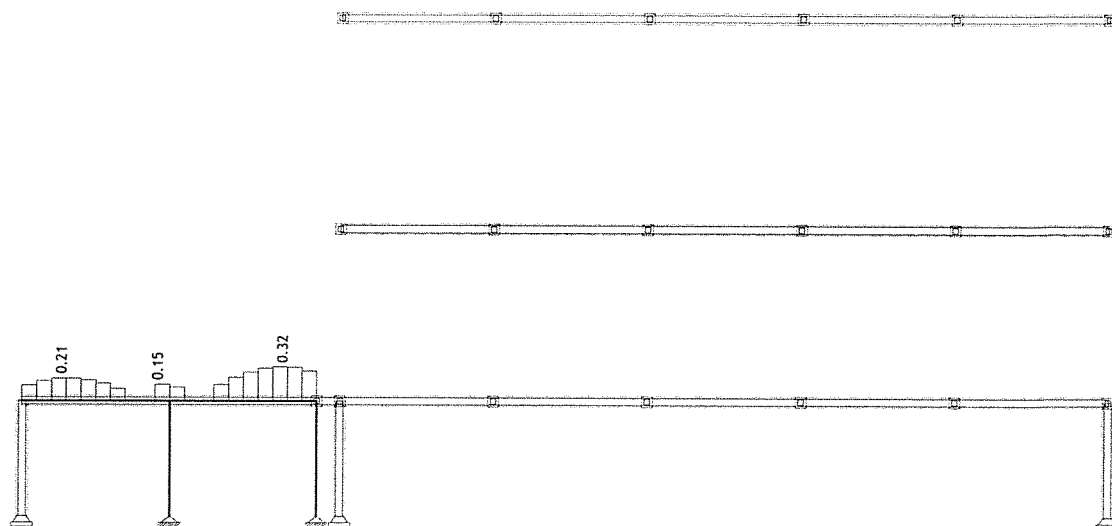
Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H



Okvir: V_9

Armatura v gredah: max $A_{a3}/A_{a4} = 0.20 \text{ cm}^2$

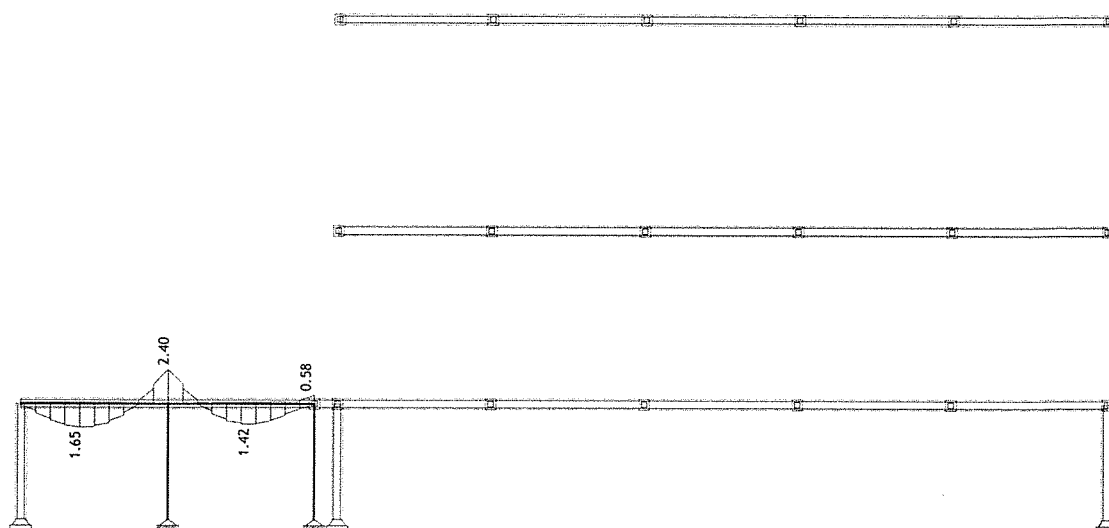
Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H



Okvir: V_9

Armatura v gredah: max $A_{a,st} = 0.32 \text{ cm}^2$

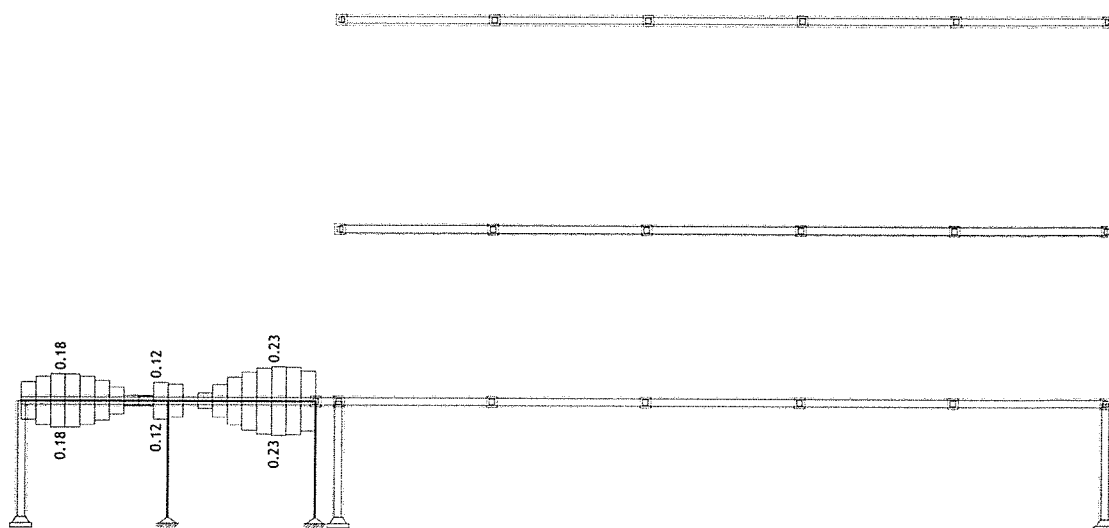
Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H



Okvir: V_8

Armatura v gredah: max $A_{a2}/A_{a1} = 2.40 \text{ cm}^2$

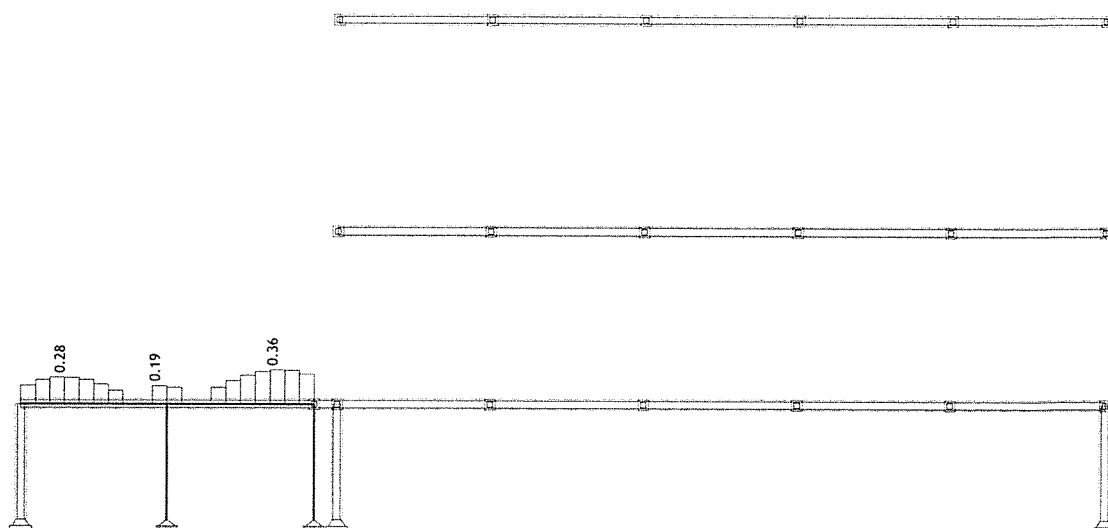
Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H



Okvir: V_8

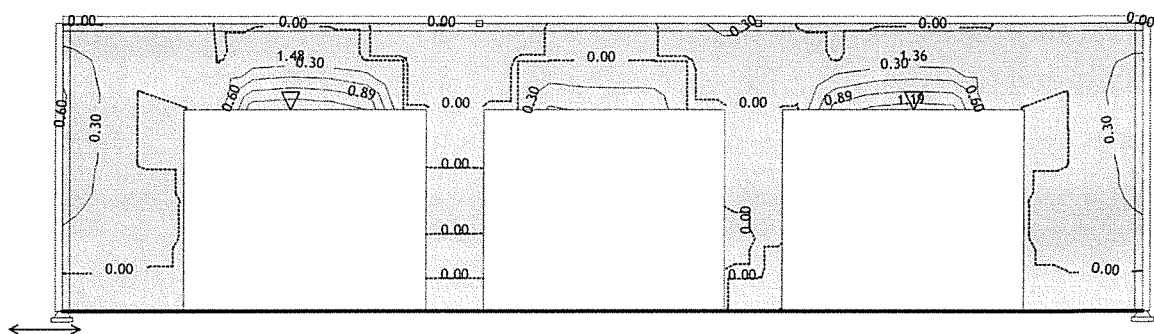
Armatura v gredah: max $A_{a3}/A_{a4} = 0.23 \text{ cm}^2$

Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H

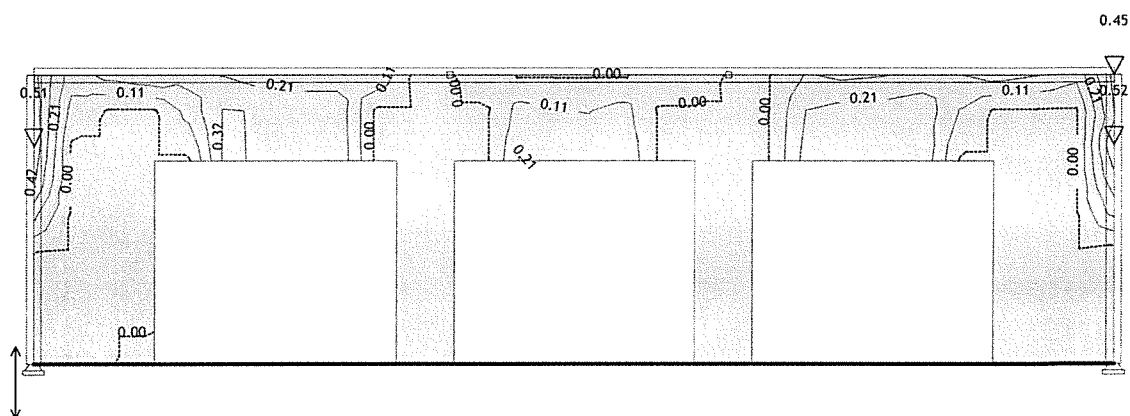


Okvir: V_8

Armatura v gredah: max $A_{a, st} = 0.36 \text{ cm}^2$

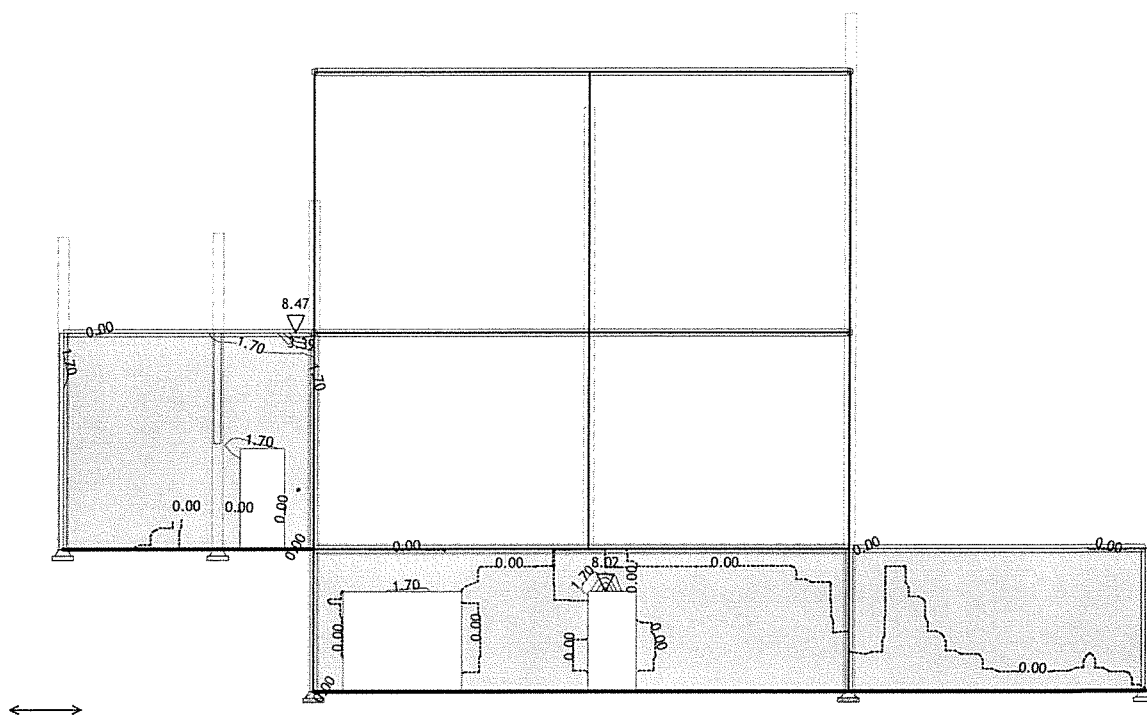


Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H, a=2.00 cm

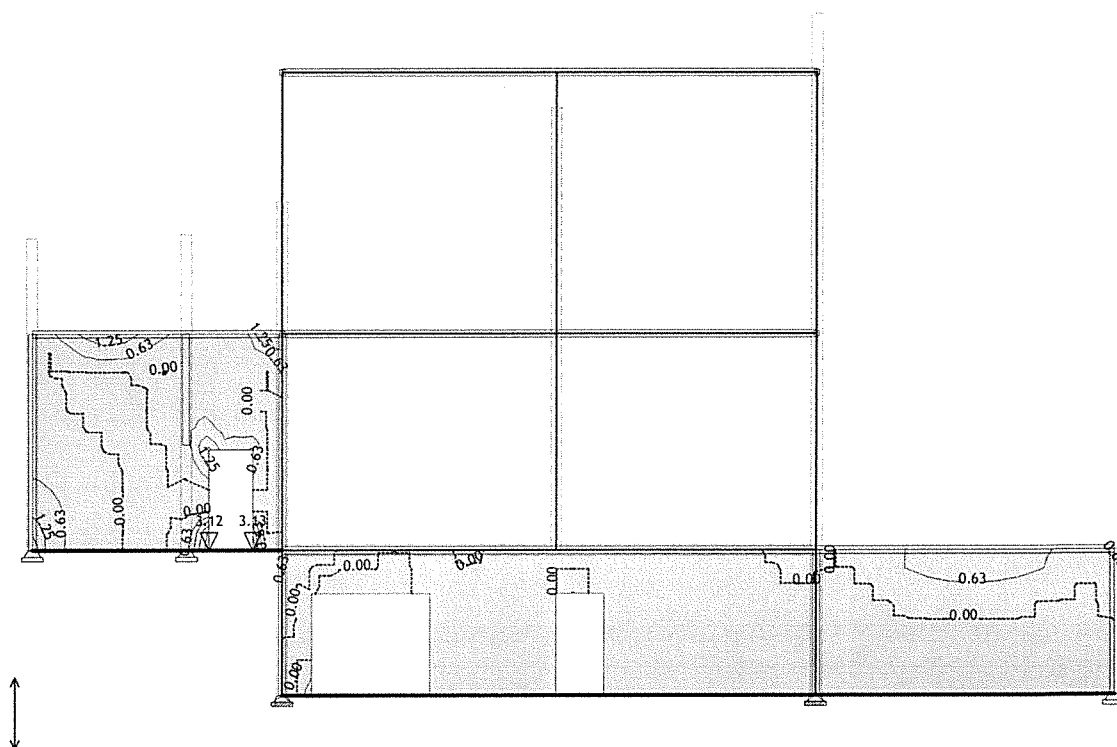


Aa - sp.cona - Smer 2 - max Aa_{2,s} = 0.52 cm²/m

Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H, a=2.00 cm

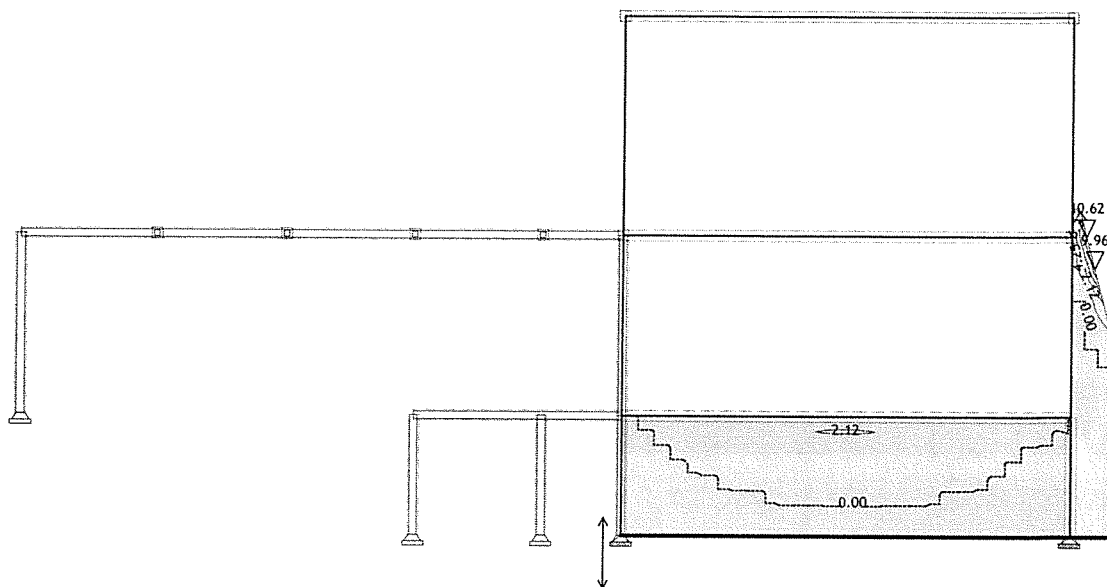


Okvir: H_3
Aa - sp.cona - Smer 1 - max Aa1,s= 8.47 cm²/m
Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H, a=2.00 cm



Okvir: H_3
Aa - sp.cona - Smer 2 - max Aa2,s= 3.13 cm²/m

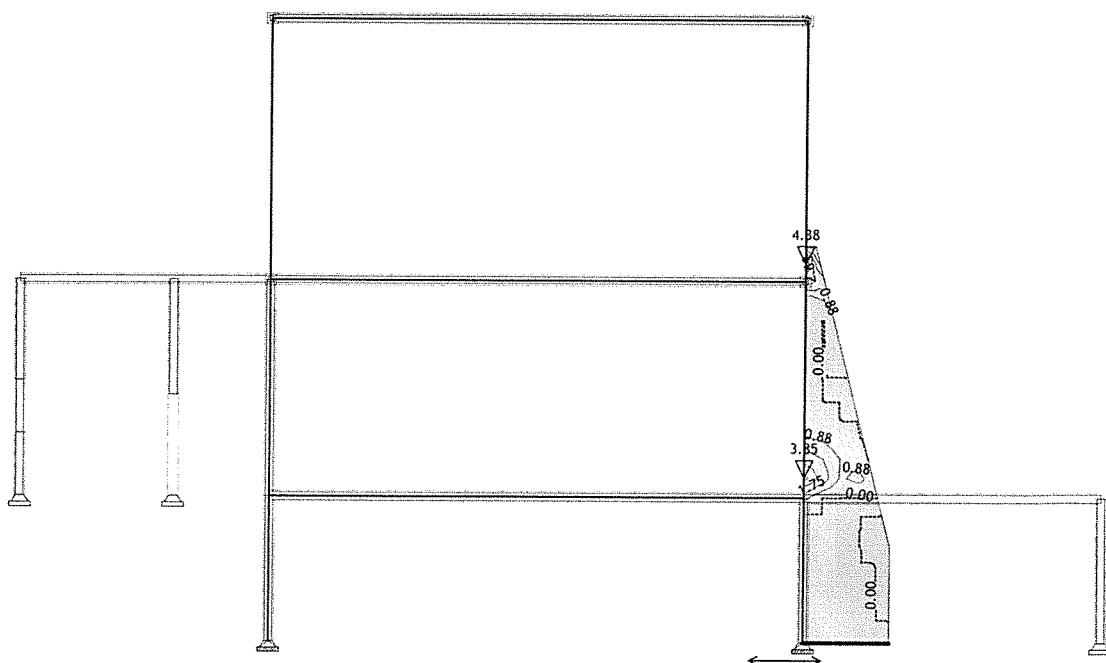
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_17

Aa - sp.cona - Smer 2 - max Aa2,s= 10.62 cm²/m

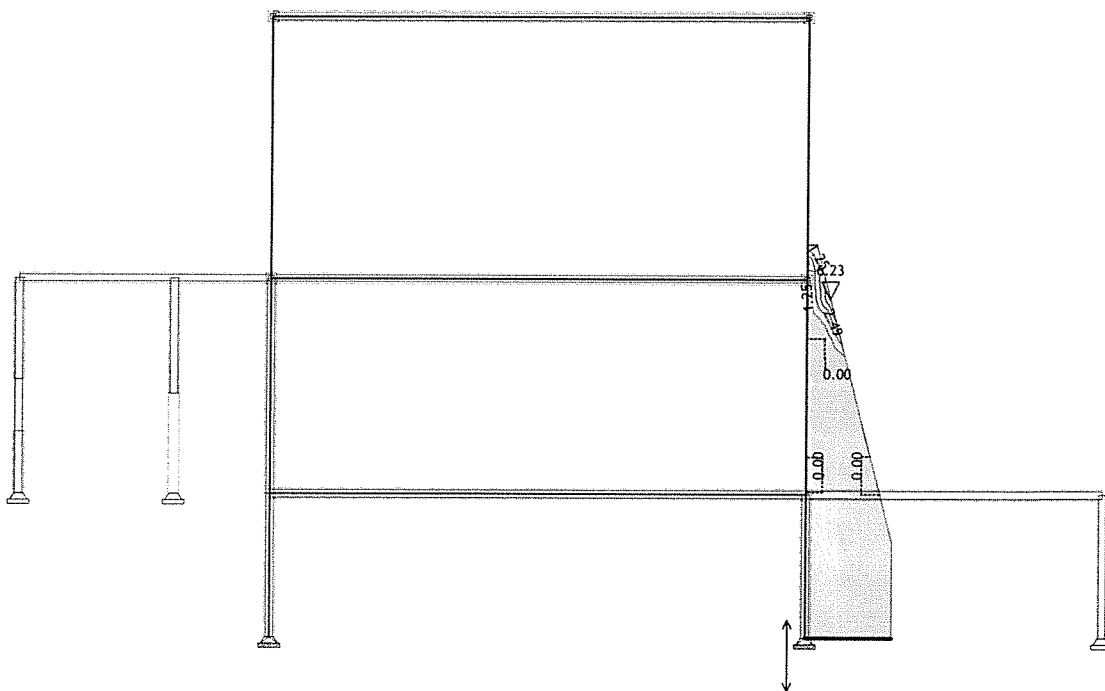
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_4

Aa - sp.cona - Smer 1 - max Aa1,s= 4.38 cm²/m

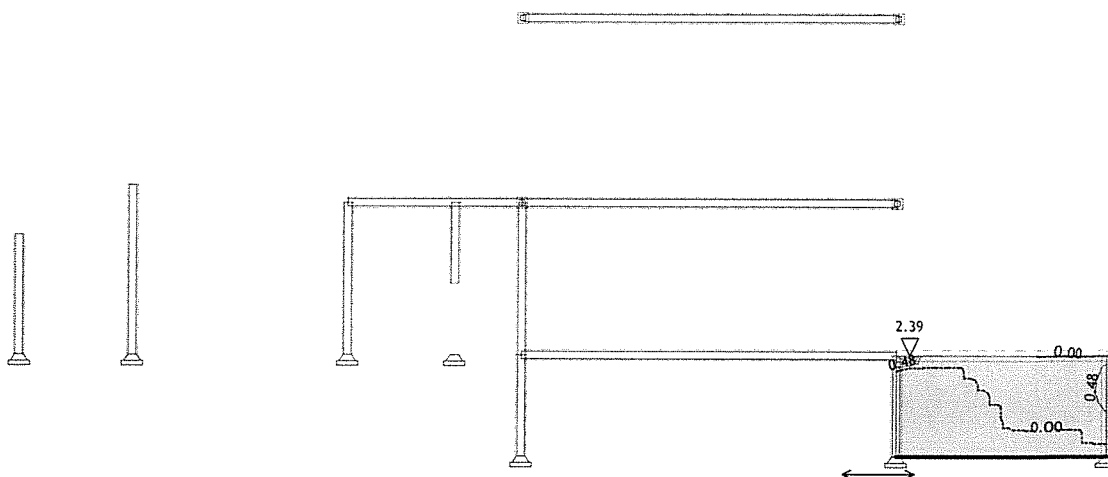
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_4

Aa - sp.cona - Smer 2 - max Aa2,s= 6.23 cm²/m

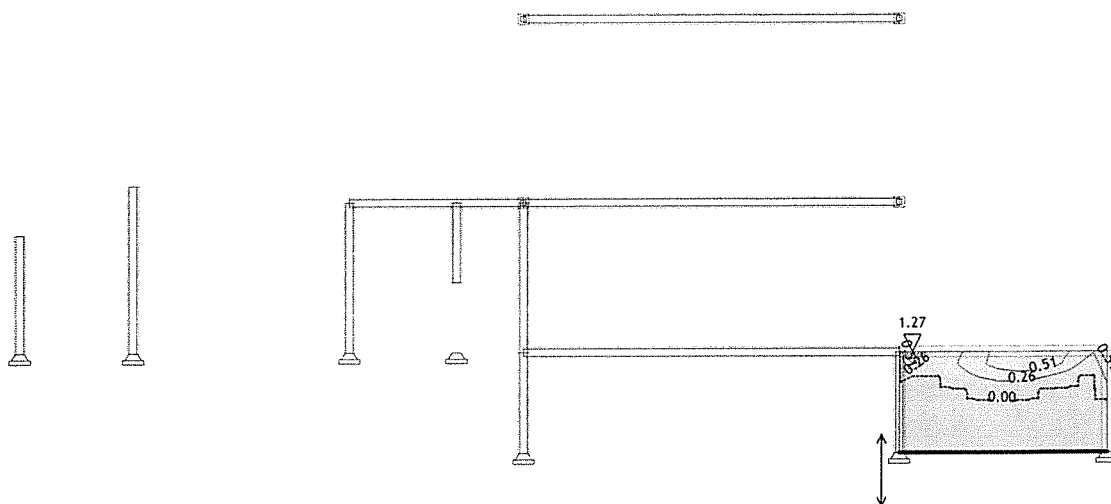
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



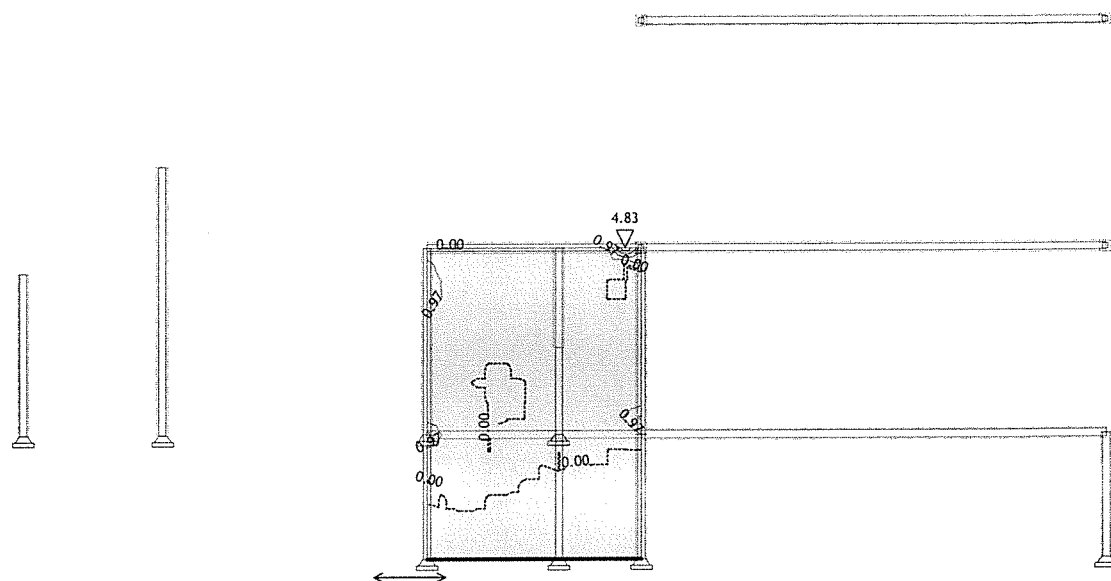
Okvir: H_5

Aa - sp.cona - Smer 1 - max Aa1,s= 2.39 cm²/m

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm

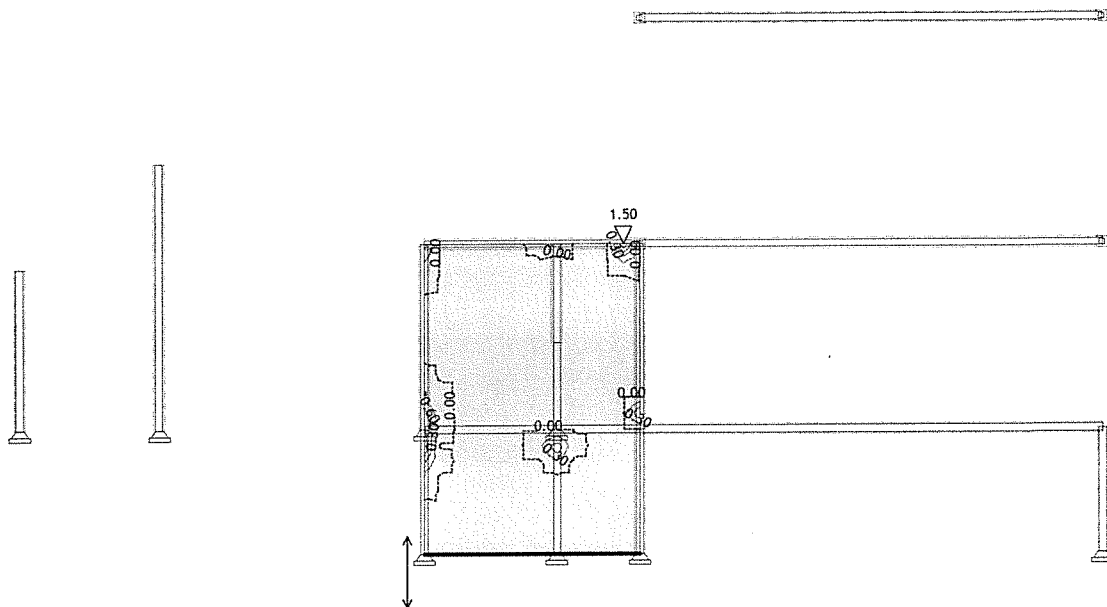


Okvir: H_5
Aa - sp.cona - Smer 2 - max Aa2,s= 1.27 cm²/m
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm

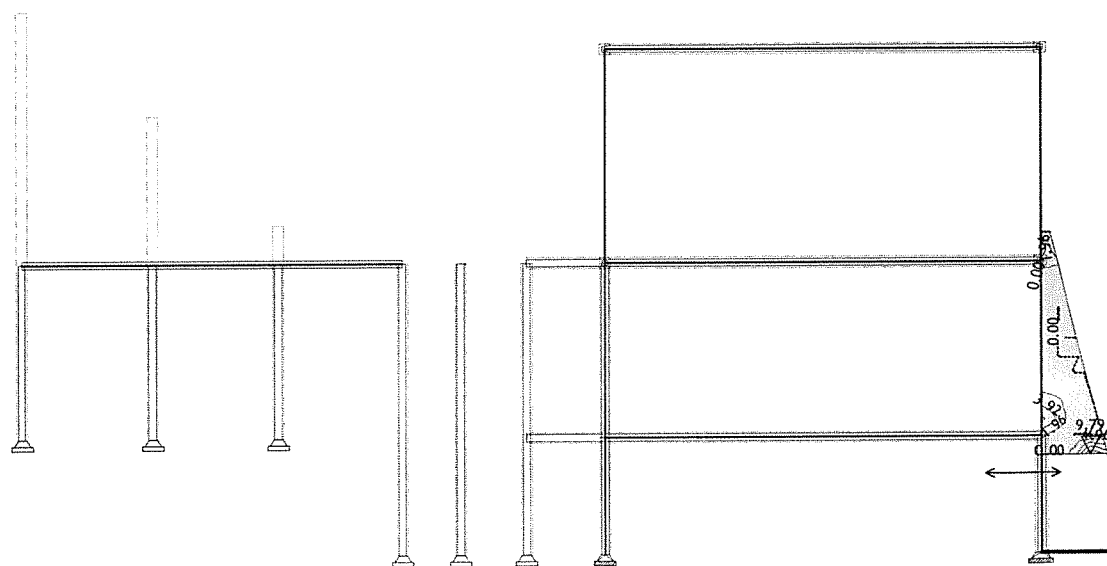


Okvir: H_6
Aa - sp.cona - Smer 1 - max Aa1,s= 4.83 cm²/m

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm

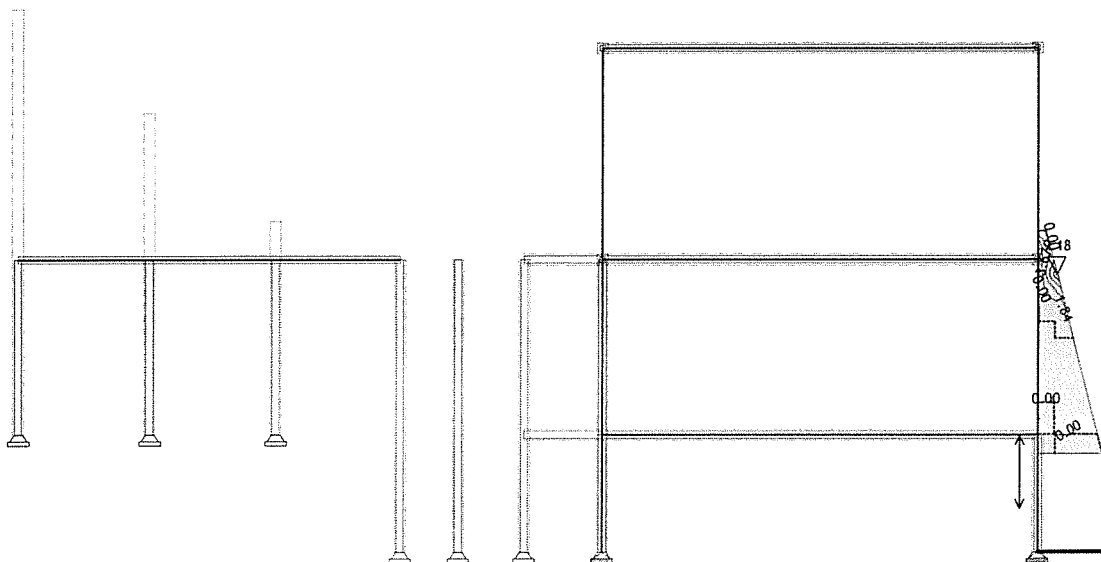


Okvir: H_6
Aa - sp.cona - Smer 2 - max Aa2,s= 1.50 cm²/m
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_8
Aa - sp.cona - Smer 1 - max Aa1,s= 9.79 cm²/m

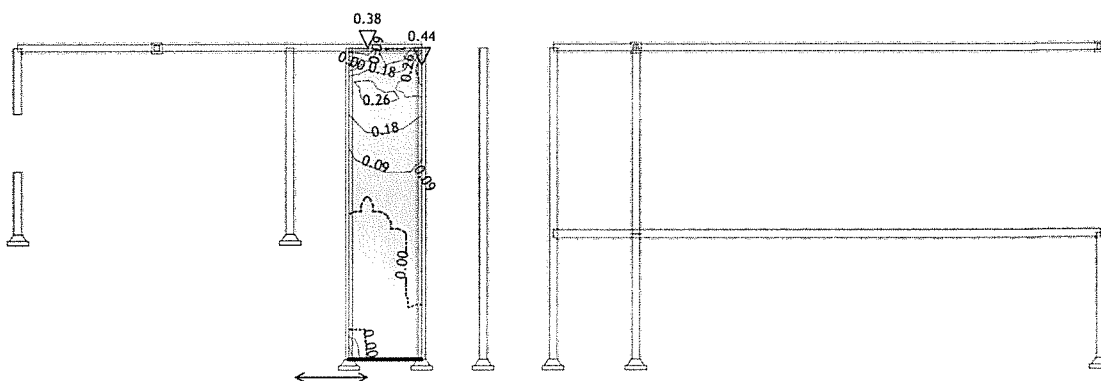
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_8

Aa - sp.cona - Smer 2 - max Aa2,s= 9.18 cm²/m

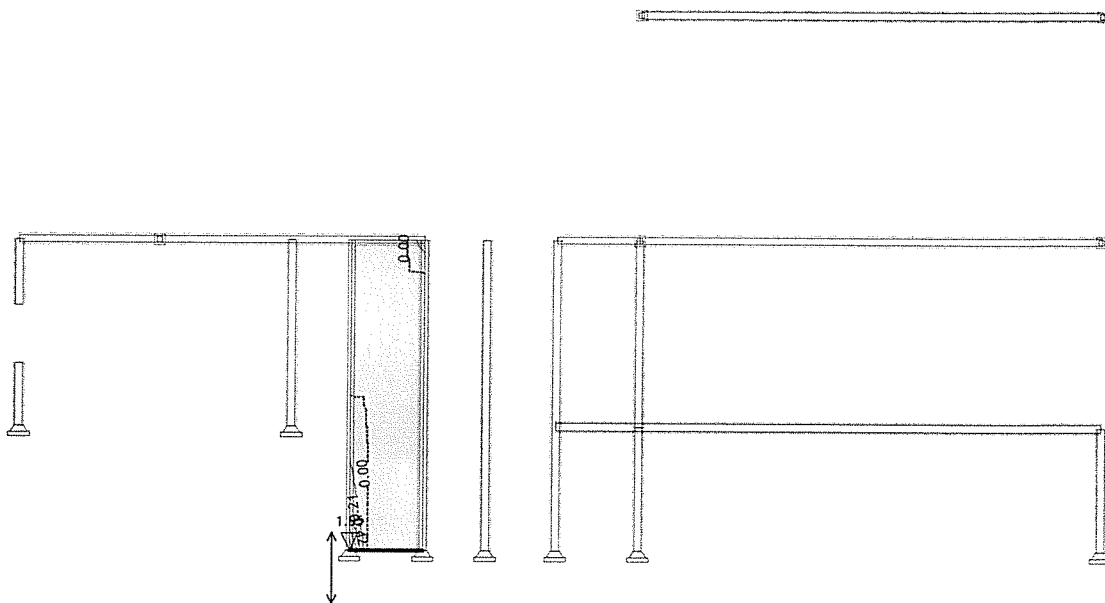
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_9

Aa - sp.cona - Smer 1 - max Aa1,s= 0.44 cm²/m

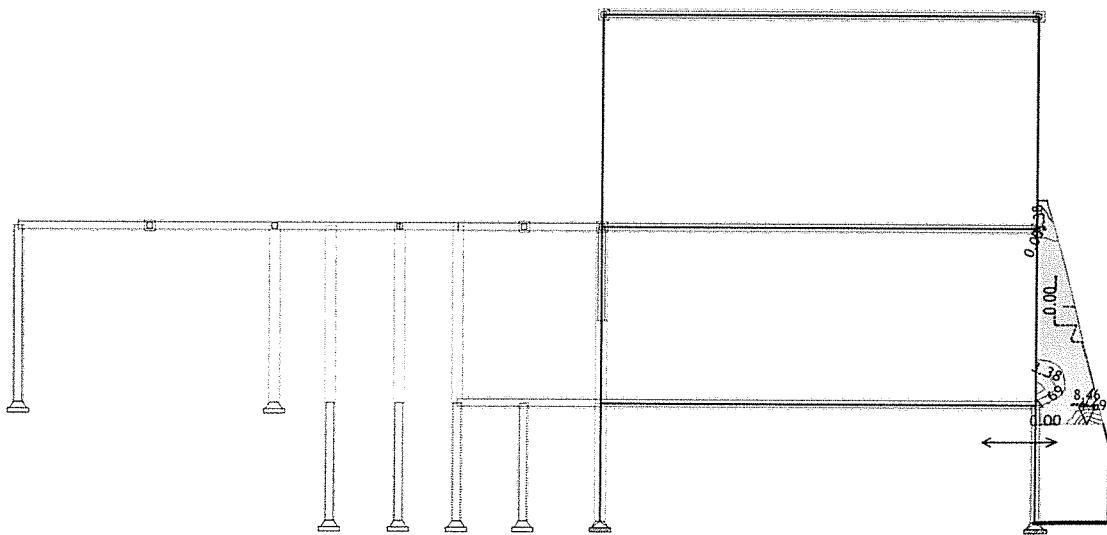
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_9

Aa - sp.cona - Smer 2 - max Aa2,s= 1.05 cm²/m

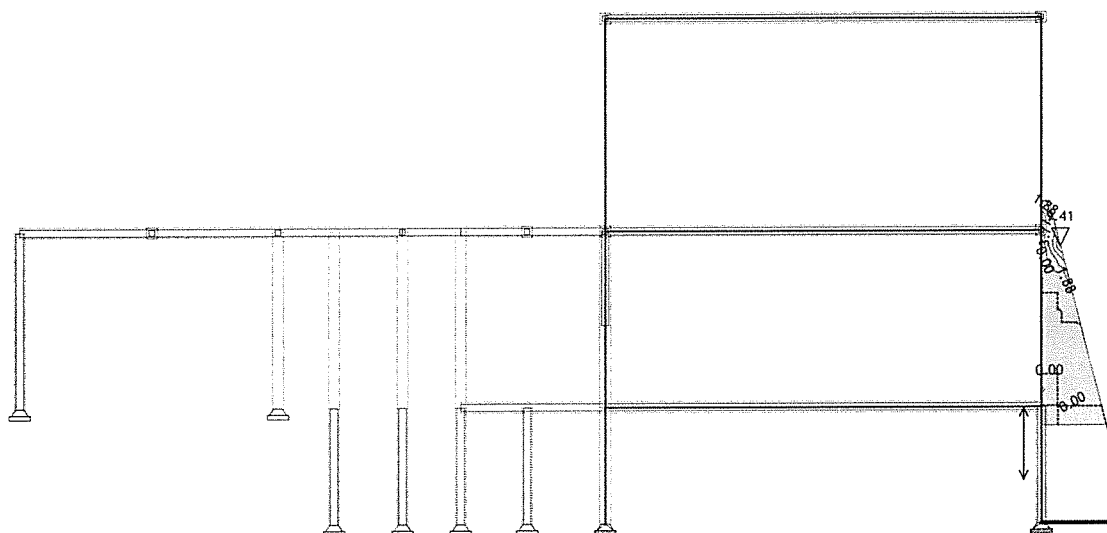
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



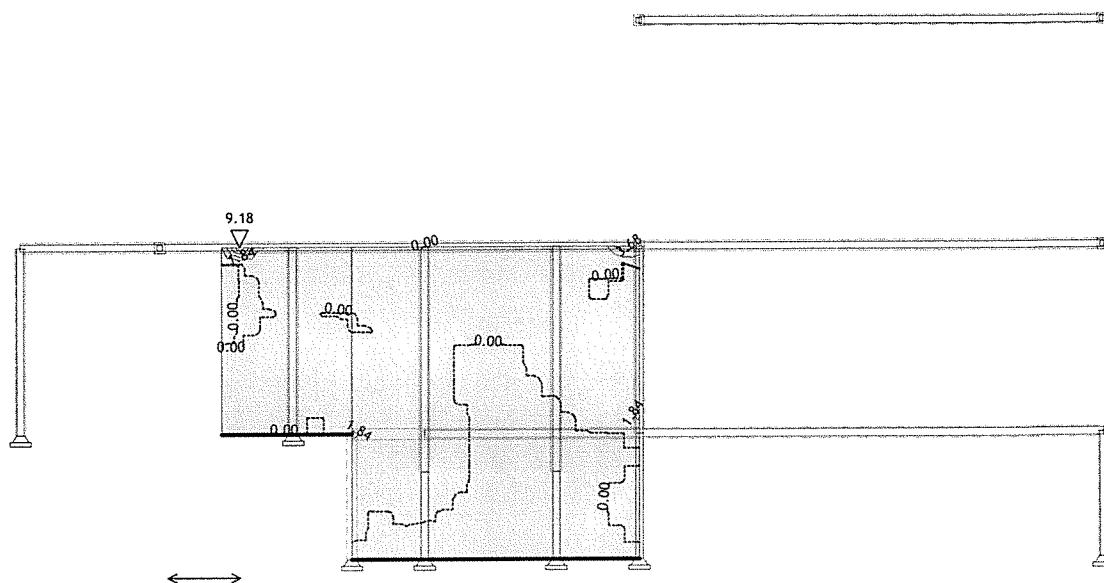
Okvir: H_10

Aa - sp.cona - Smer 1 - max Aa1,s= 8.46 cm²/m

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm

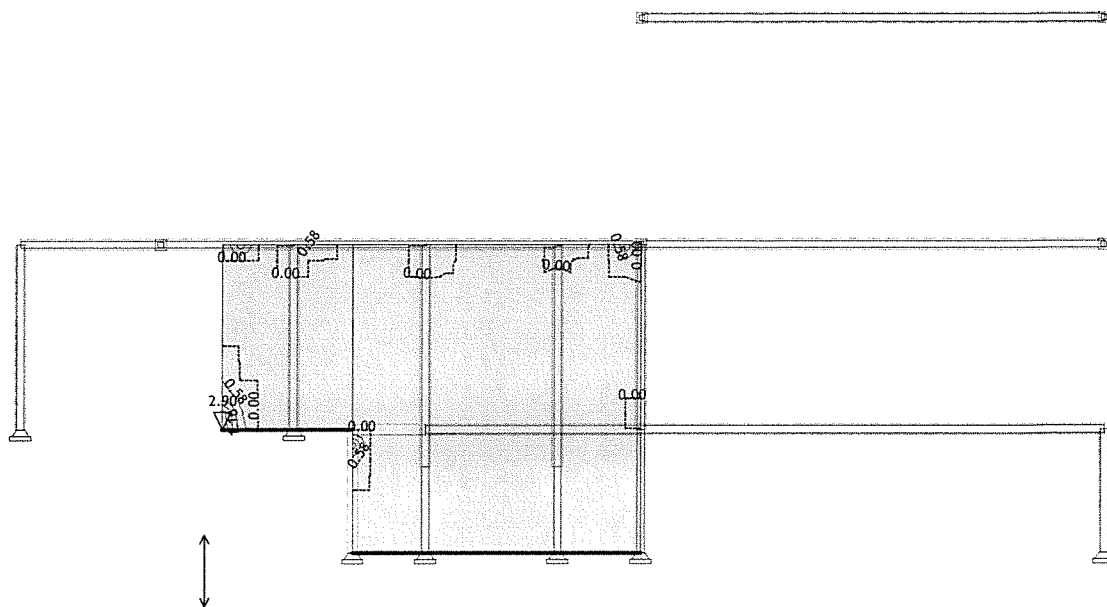


Okvir: H_10
Aa - sp.cona - Smer 2 - max Aa2,s= 9.41 cm²/m
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_12
Aa - sp.cona - Smer 1 - max Aa1,s= 9.18 cm²/m

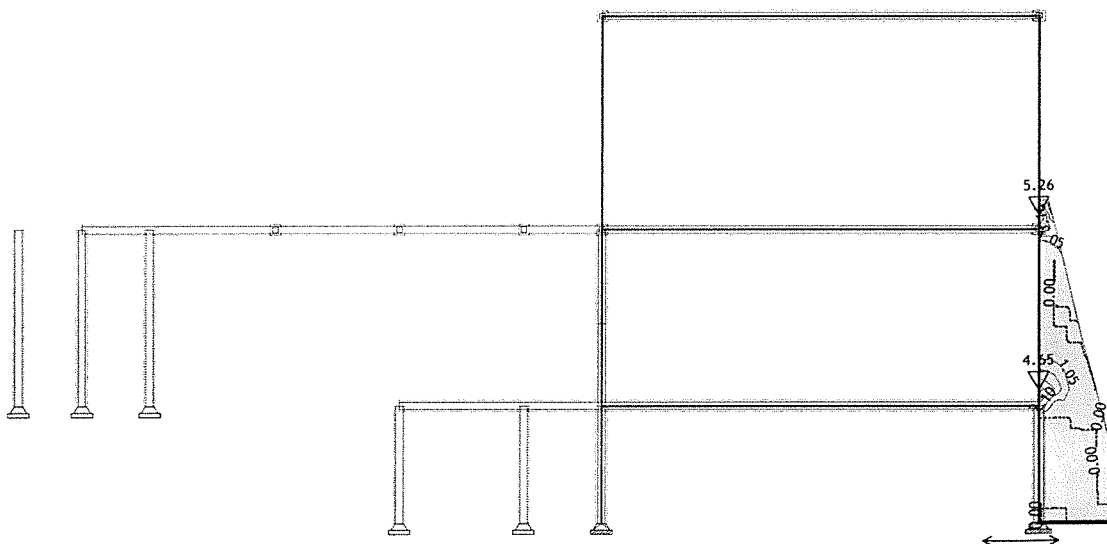
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_12

Aa - sp.cona - Smer 2 - max Aa2,s= 2.90 cm²/m

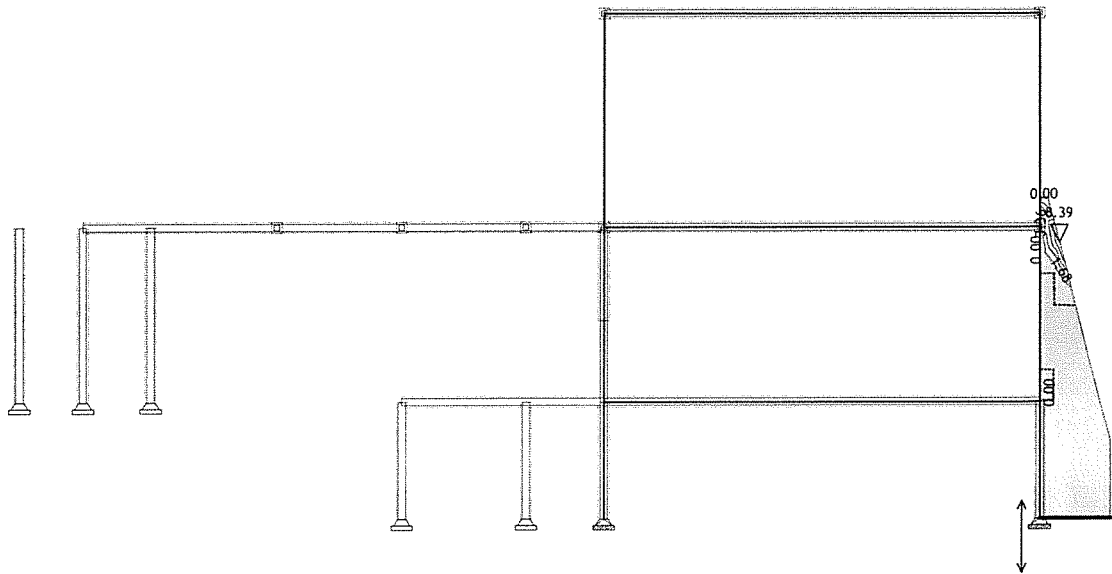
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



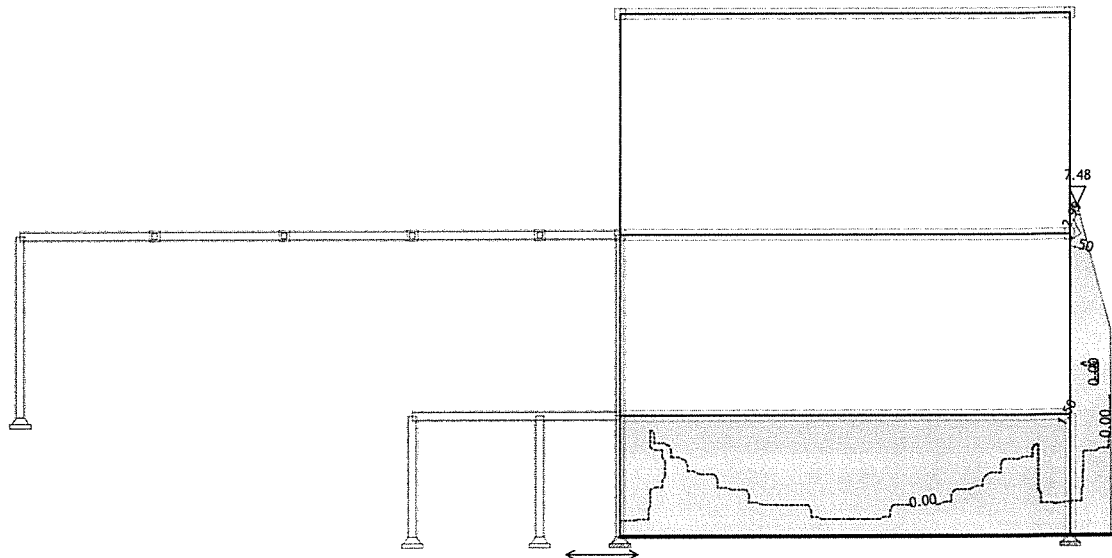
Okvir: H_14

Aa - sp.cona - Smer 1 - max Aa1,s= 5.26 cm²/m

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm

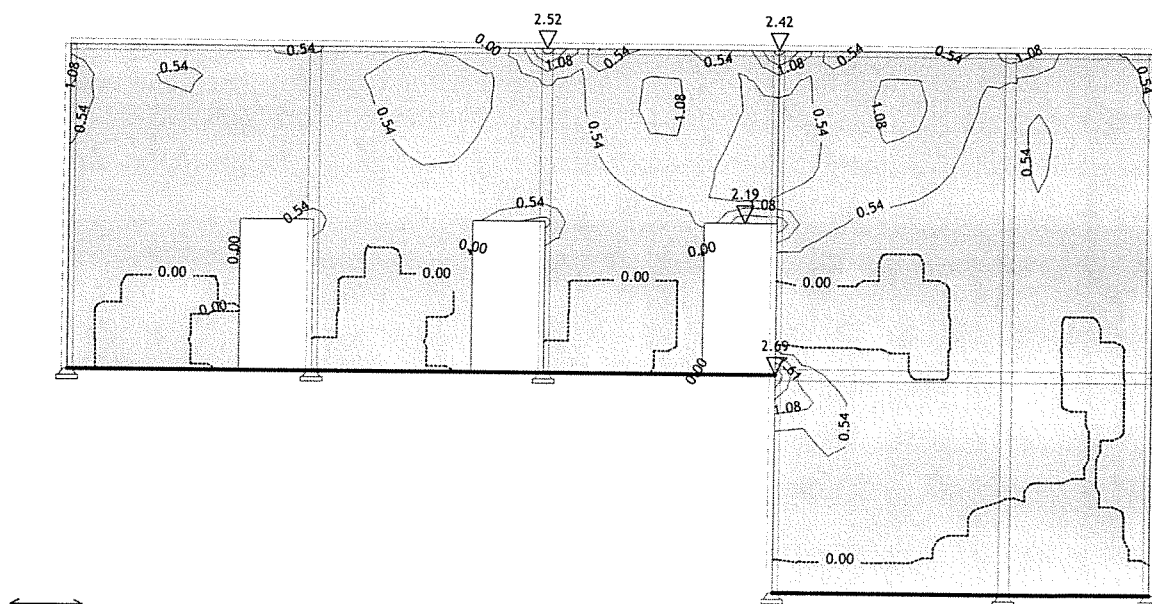


Okvir: H_14
Aa - sp.cona - Smer 2 - max Aa2,s= 8.39 cm²/m
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_17
Aa - sp.cona - Smer 1 - max Aa1,s= 7.48 cm²/m

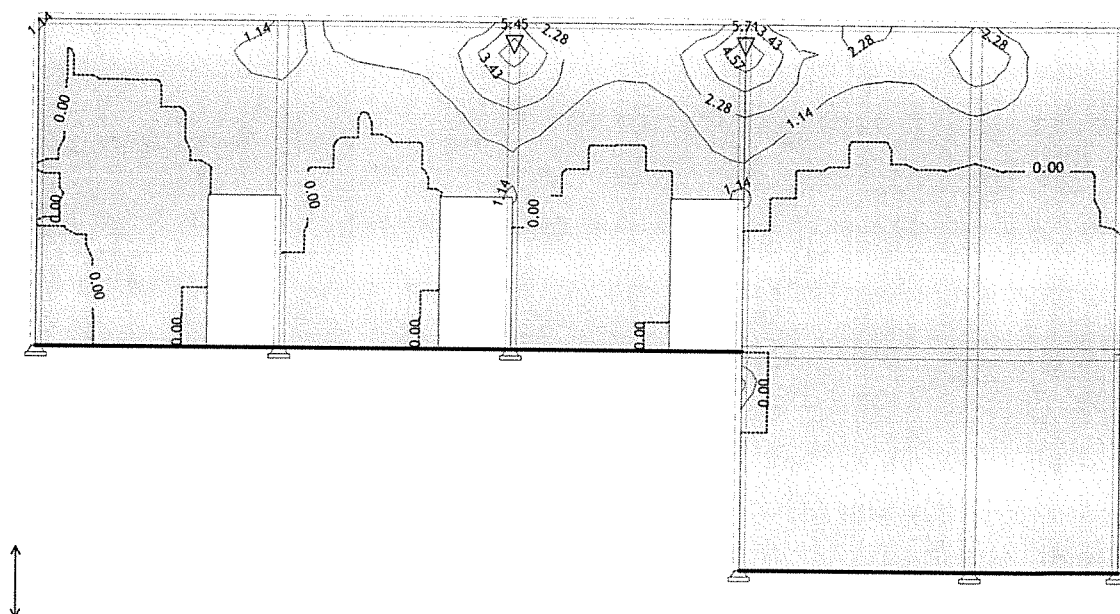
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_18

Aa - sp.cona - Smer 1 - max Aa1,s= 2.69 cm²/m

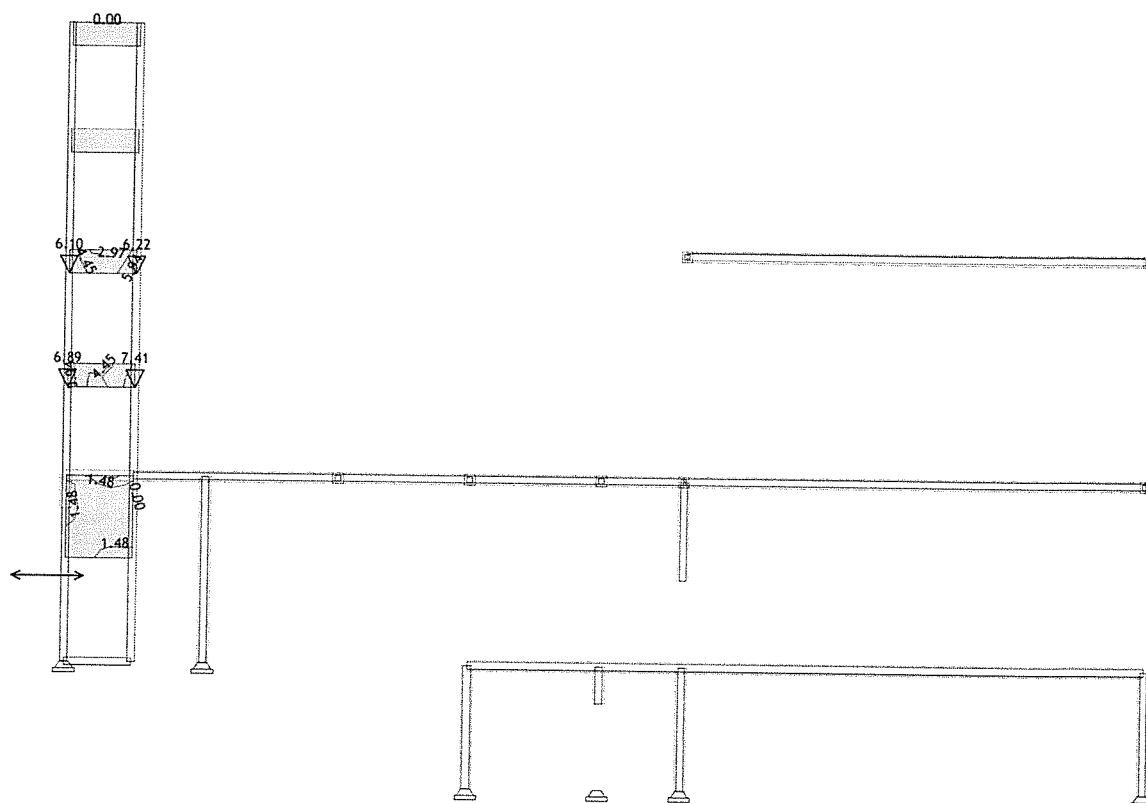
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_18

Aa - sp.cona - Smer 2 - max Aa2,s= 5.71 cm²/m

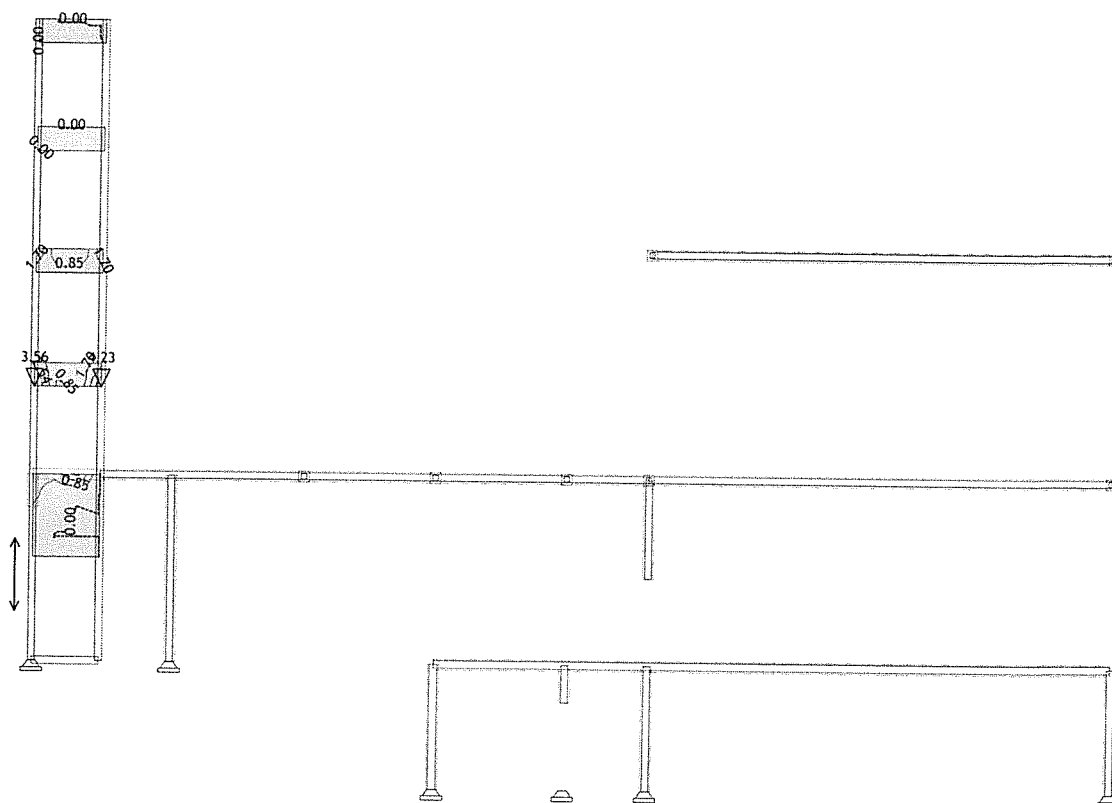
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_13

Aa - sp.cona - Smer 1 - max Aa1,s= 7.41 cm²/m

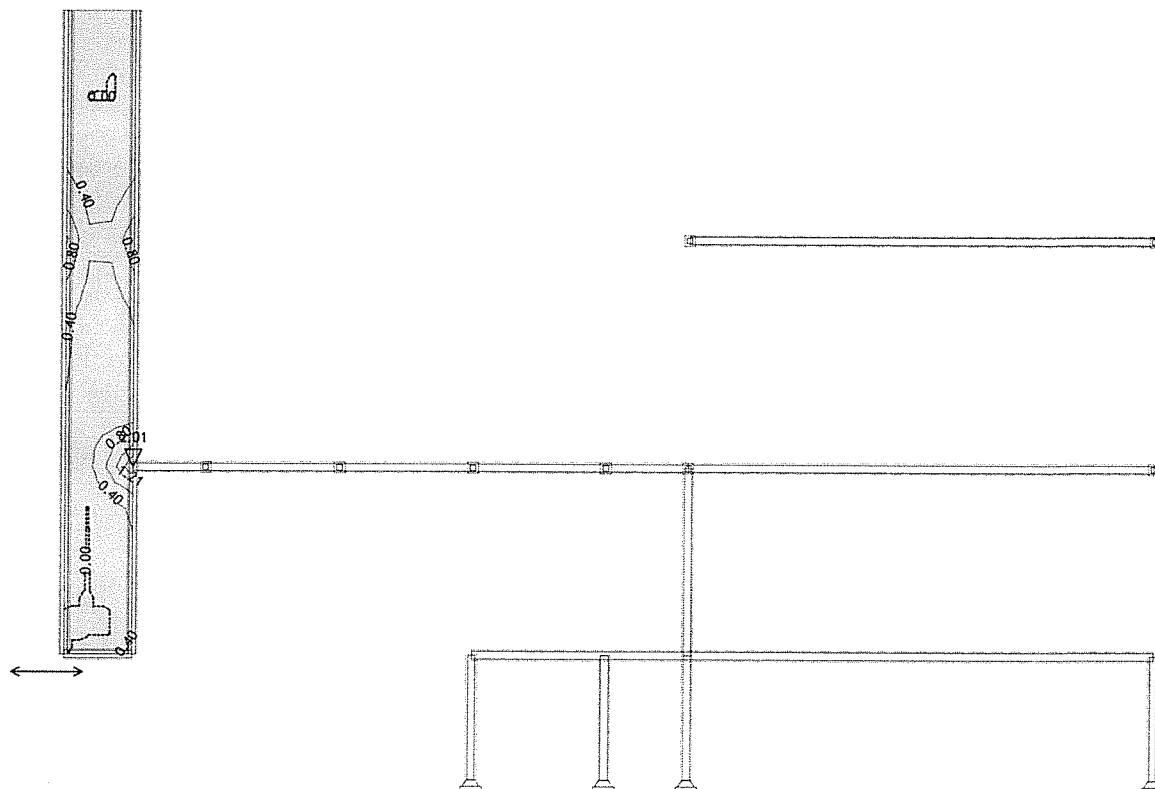
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_13

Aa - sp.cona - Smer 2 - max Aa2,s= 4.23 cm²/m

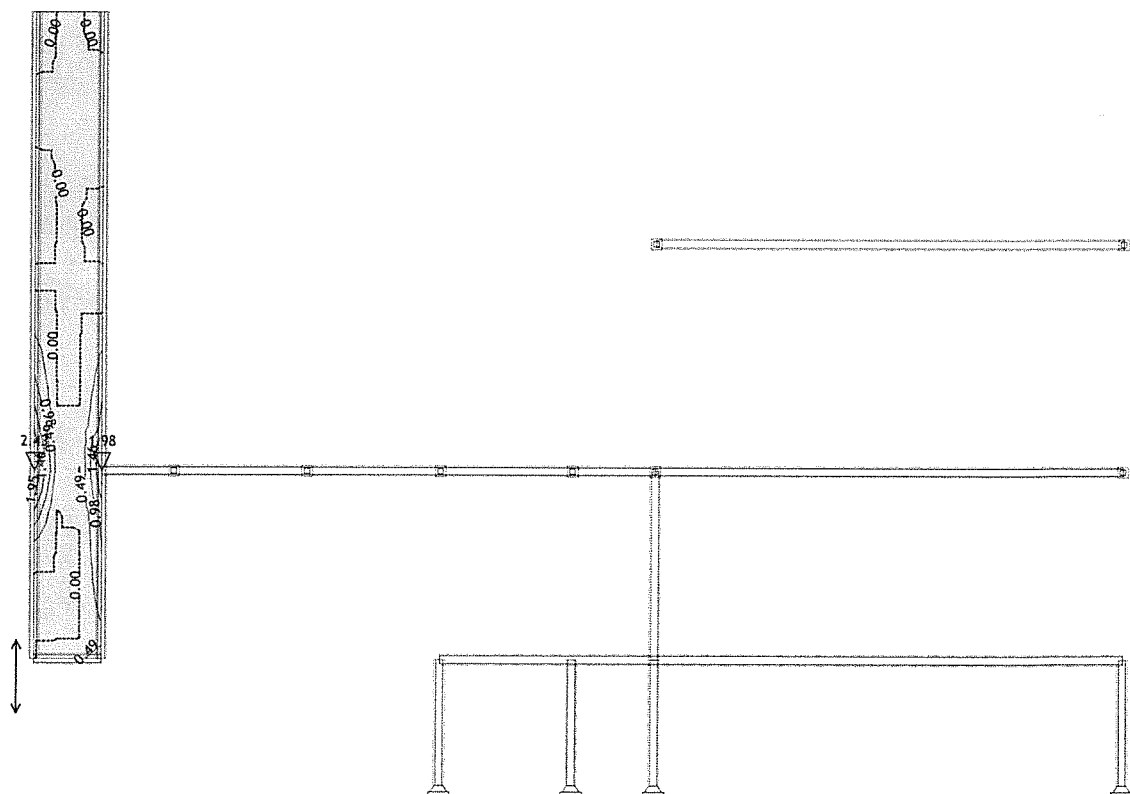
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_15

Aa - sp.cona - Smer 1 - max Aa1,s= 2.01 cm²/m

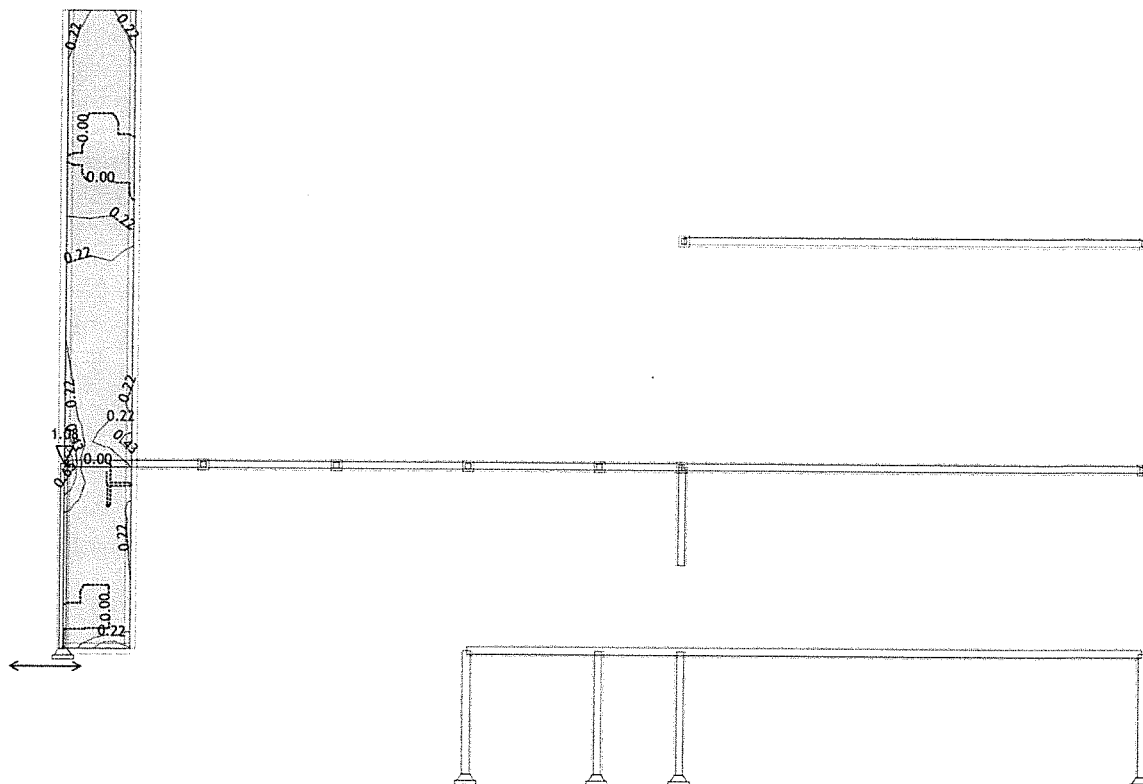
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_15

Aa - sp.cona - Smer 2 - max Aa2,s= 2.43 cm²/m

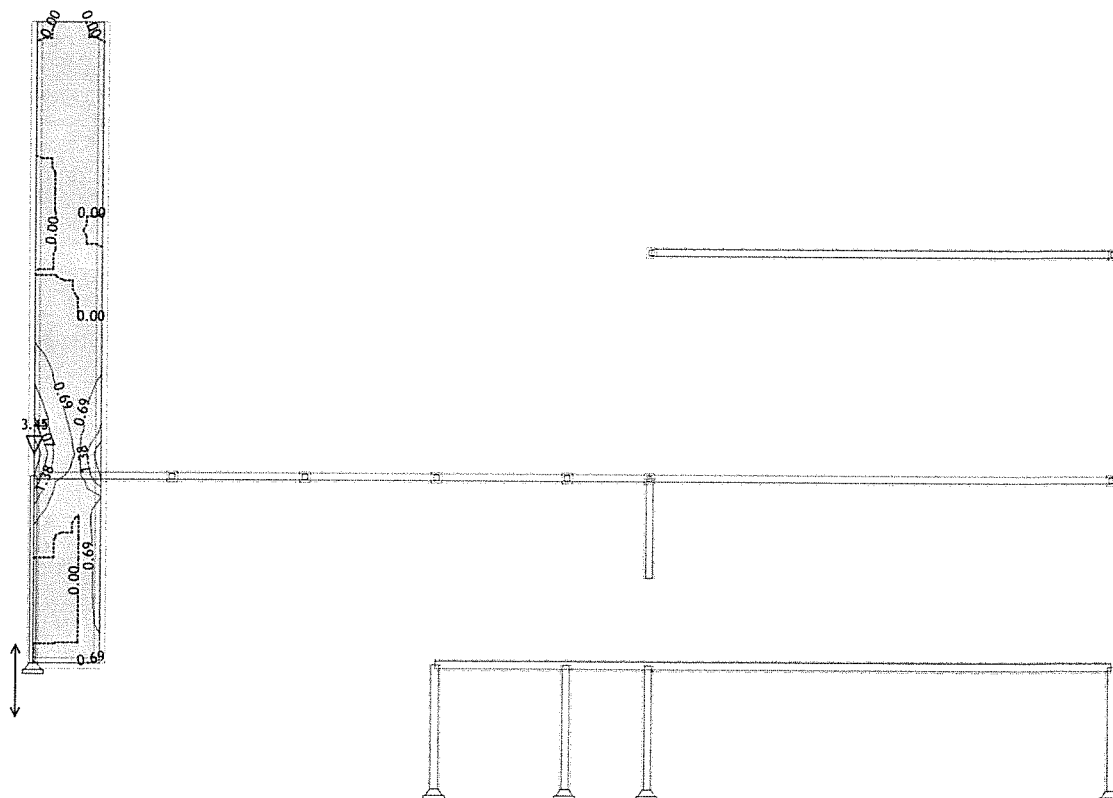
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_16

Aa - sp.cona - Smer 1 - max Aa1,s= 1.08 cm2/m

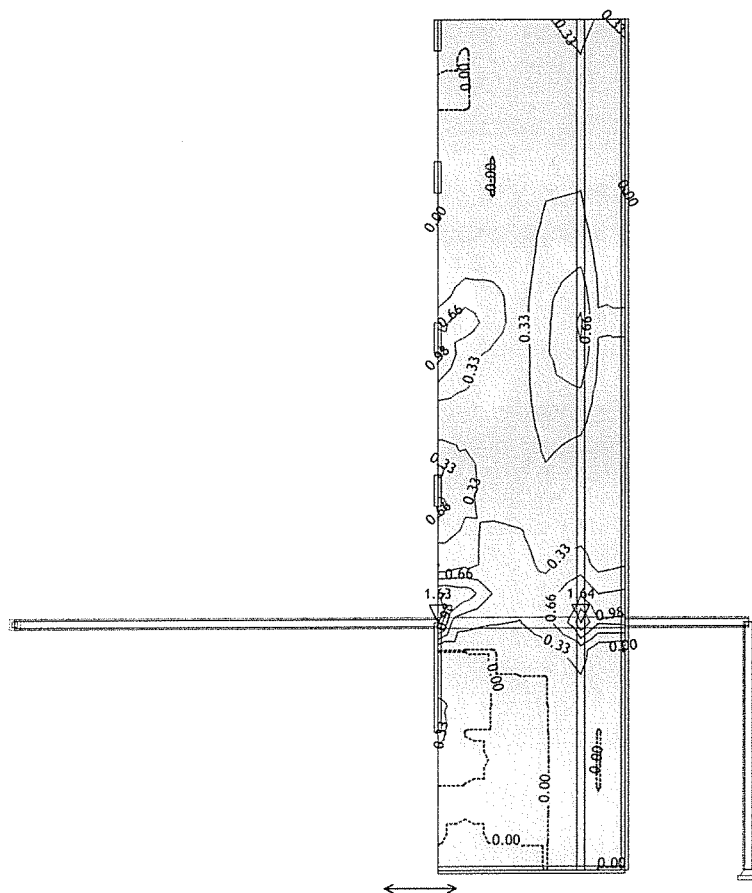
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Okvir: H_16

Aa - sp.cona - Smer 2 - max Aa2,s= 3.45 cm2/m

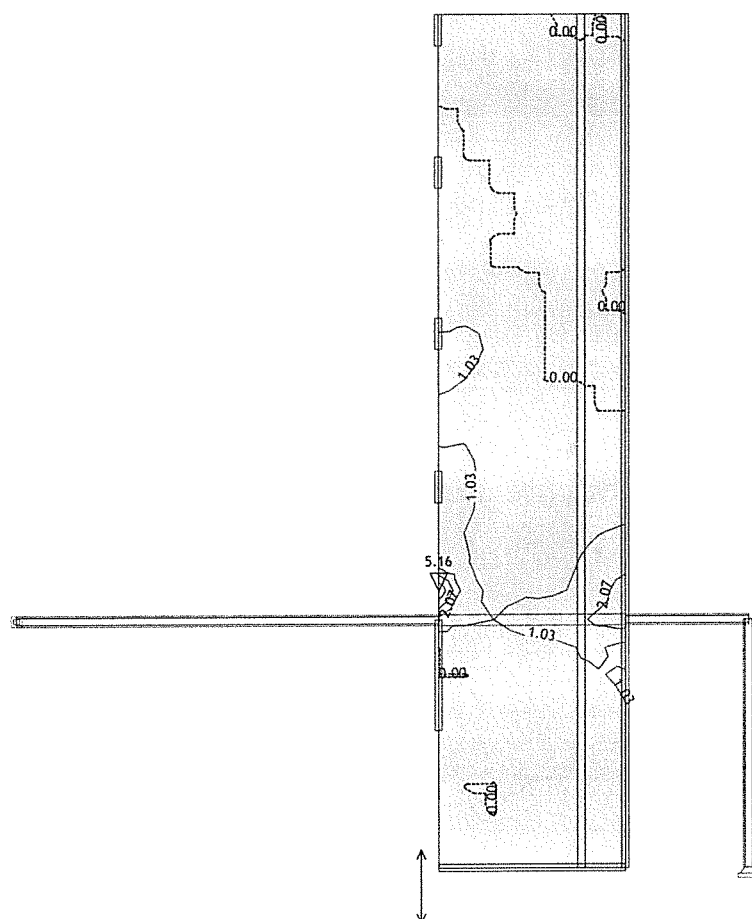
**Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm**



Okvir: V_2

Aa - sp.cona - Smer 1 - max Aa1,s= 1.64 cm2/m

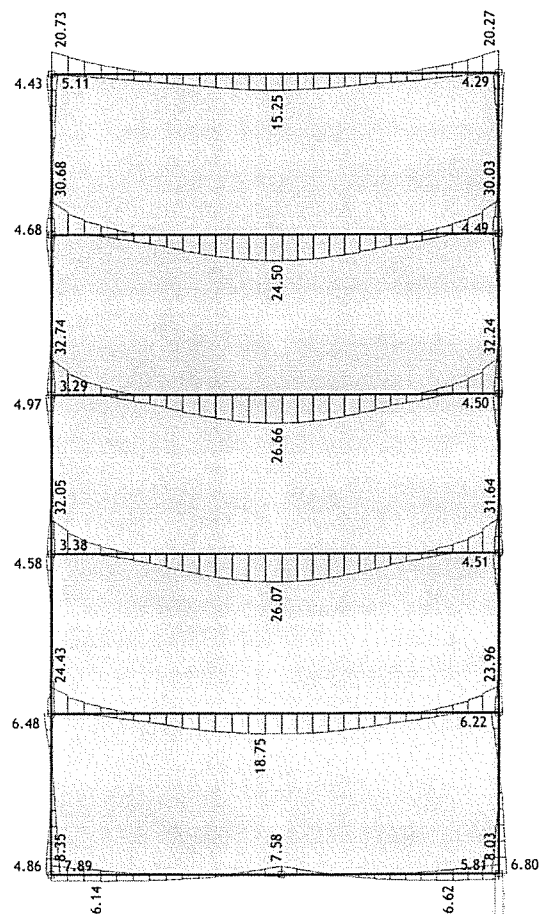
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



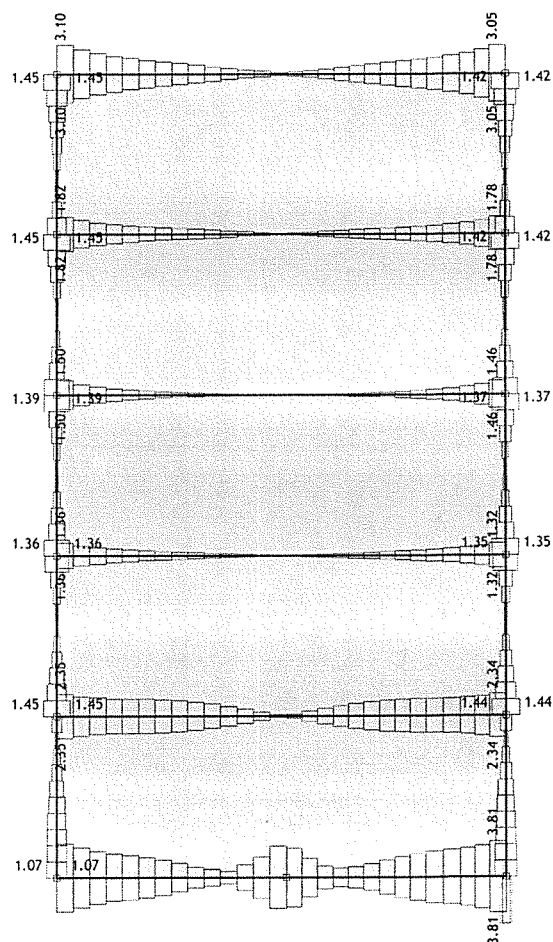
Okvir: V_2

Aa - sp.cona - Smer 2 - max Aa2,s= 5.16 cm2/m

Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H

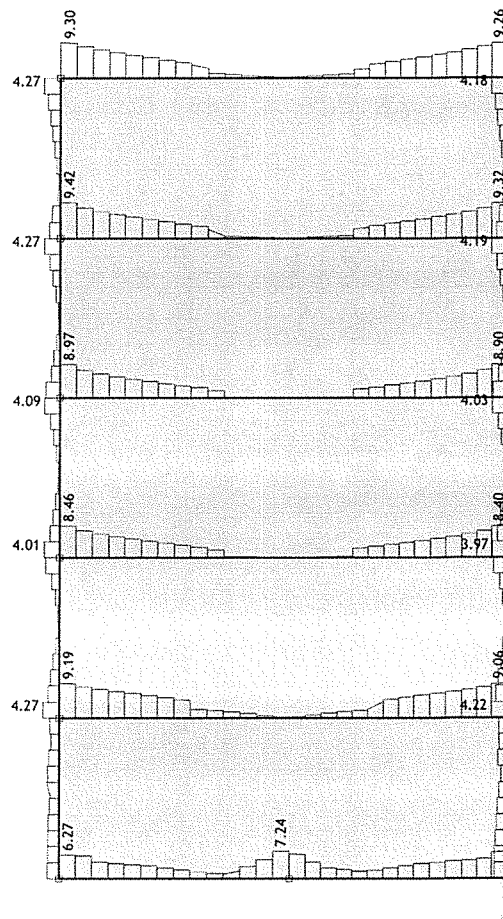


Nivo: nad 2.nad [9.87 m]
Armatura v gredah: max $Aa2/Aa1 = 32.74 \text{ cm}^2$
Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H

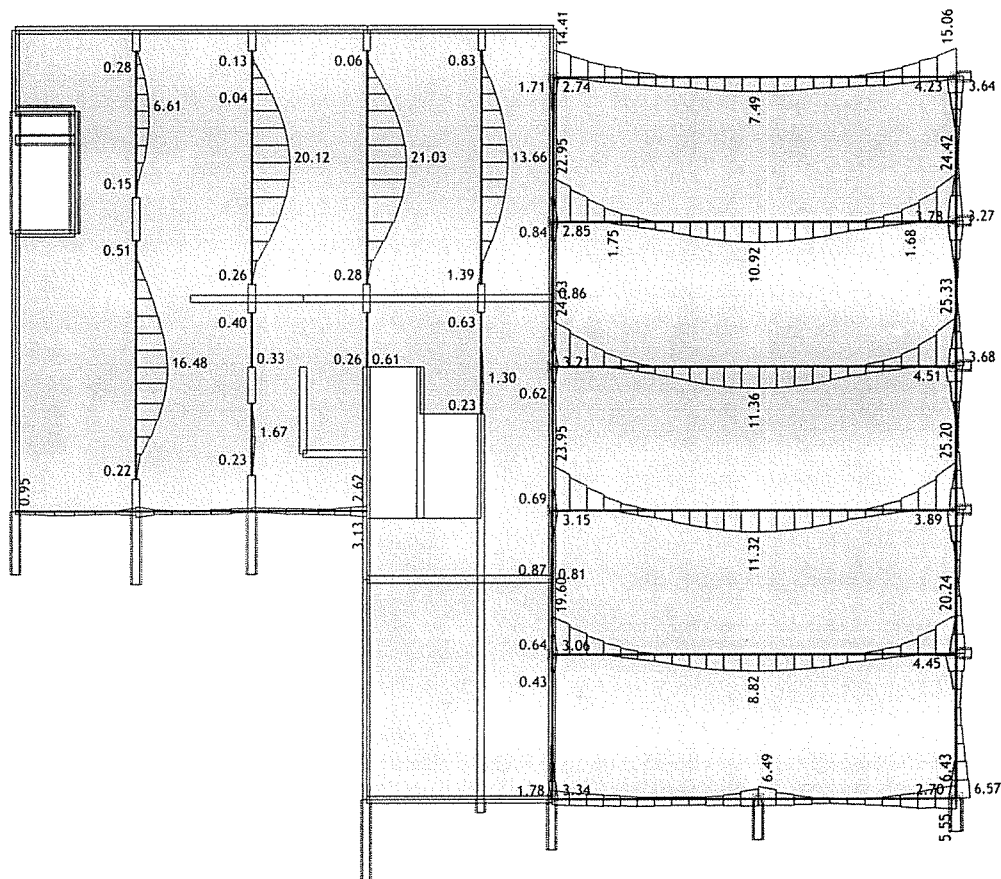


Nivo: nad 2.nad [9.87 m]
Armatura v gredah: max $Aa3/Aa4 = 3.81 \text{ cm}^2$

Merodajna obležba: Kompletna shema
EUROCODE, C 20, S500H

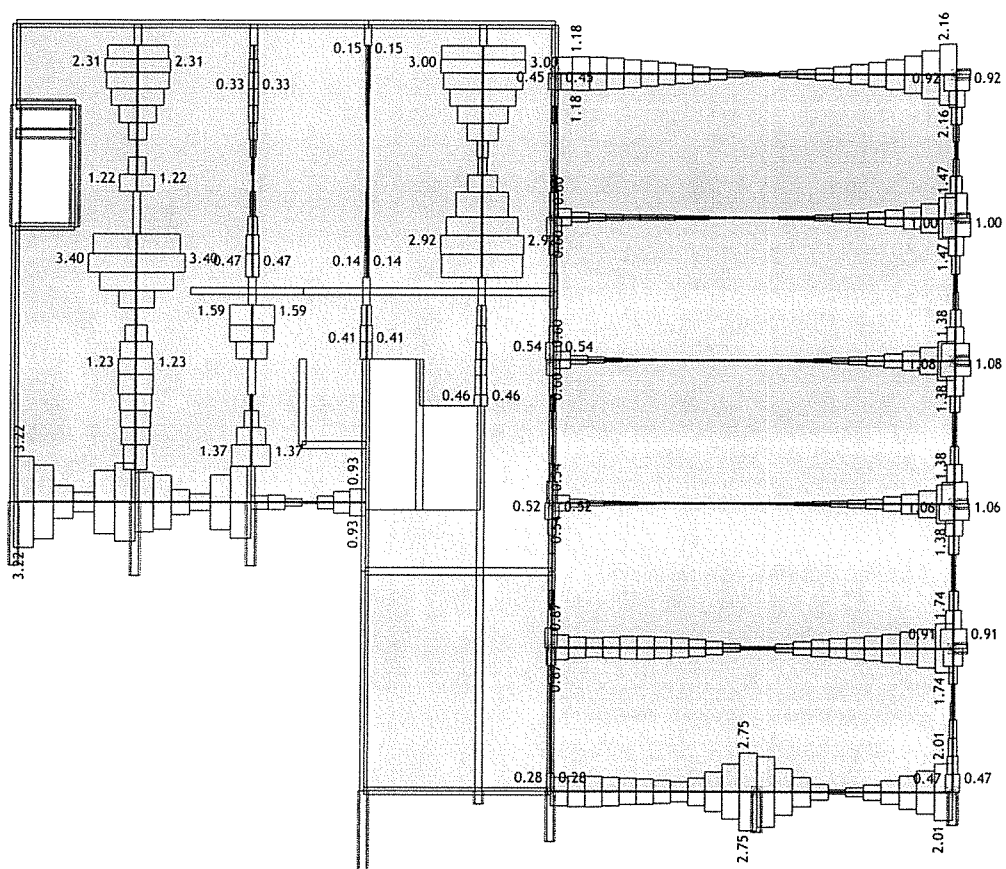


Nivo: nad 2.nad [9.87 m]
Armatura v gredah: max Aa,st= 9.42 cm²
Merodajna obležba: Kompletna shema
EUROCODE, S500H

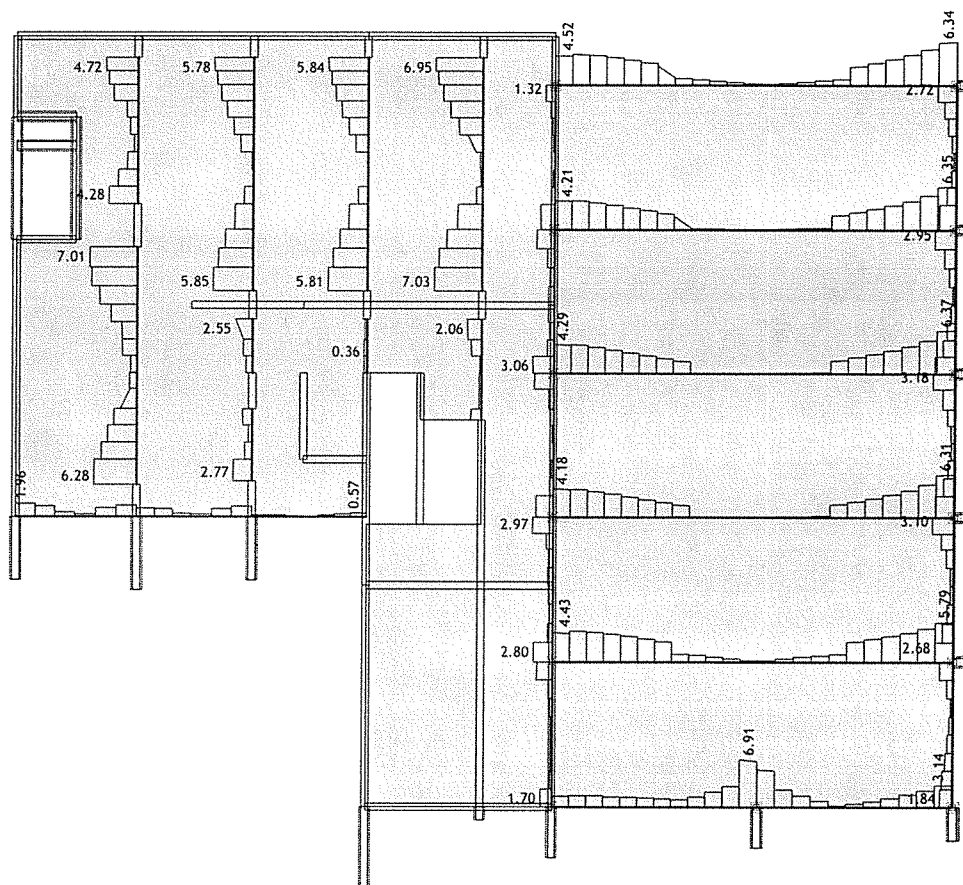


Nivo: nad pritličjem [4.40 m]
Armatura v gredah: max Aa2/Aa1= 25.33 cm²

Merodajna obtežba: Kompletna shema EUROCODE, S500H

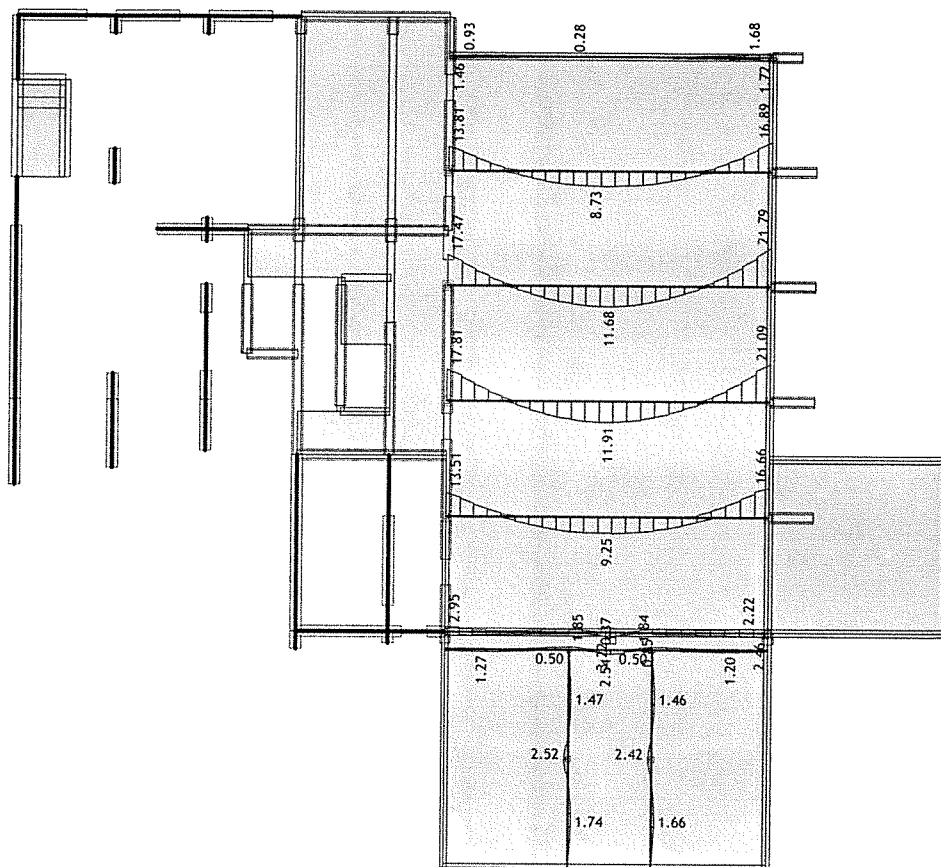


Nivo: nad pritličjem [4.40 m]
Armatura v gredah: max Aa3/Aa4= 3.40 cm²
Merodajna obtežba: Kompletna shema
EUROCODE, S500H

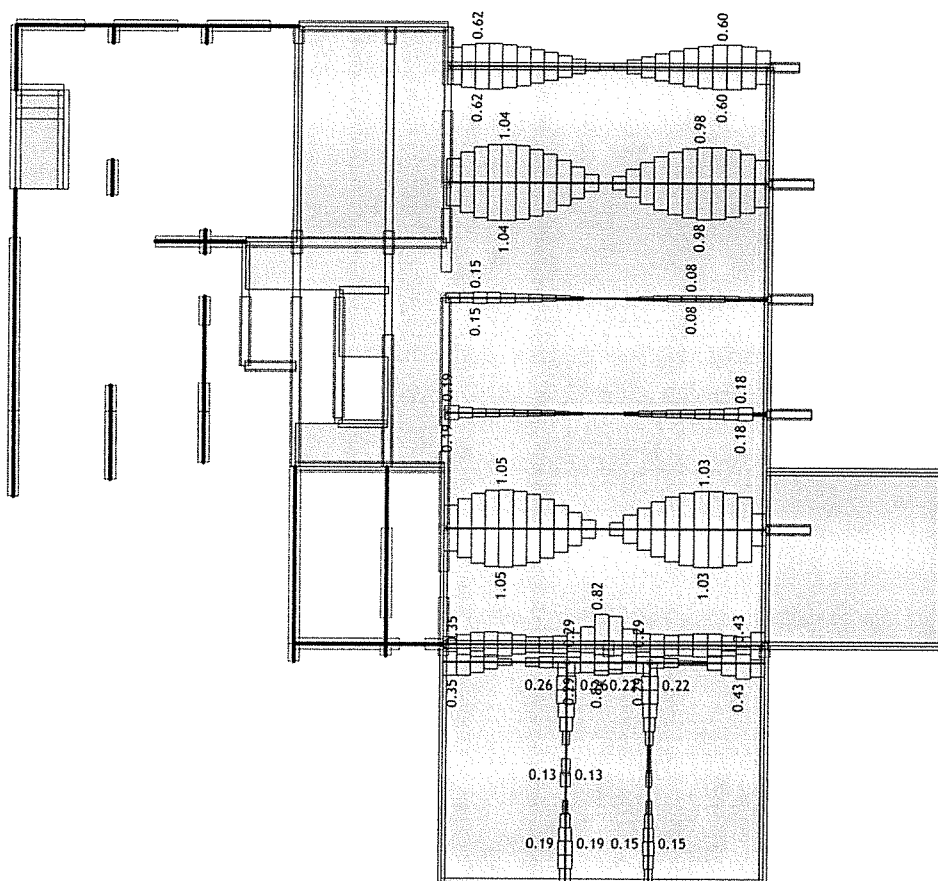


Nivo: nad pritličjem [4.40 m]
 Armatura v gredah: max Aa,st= 7.03 cm²

Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H

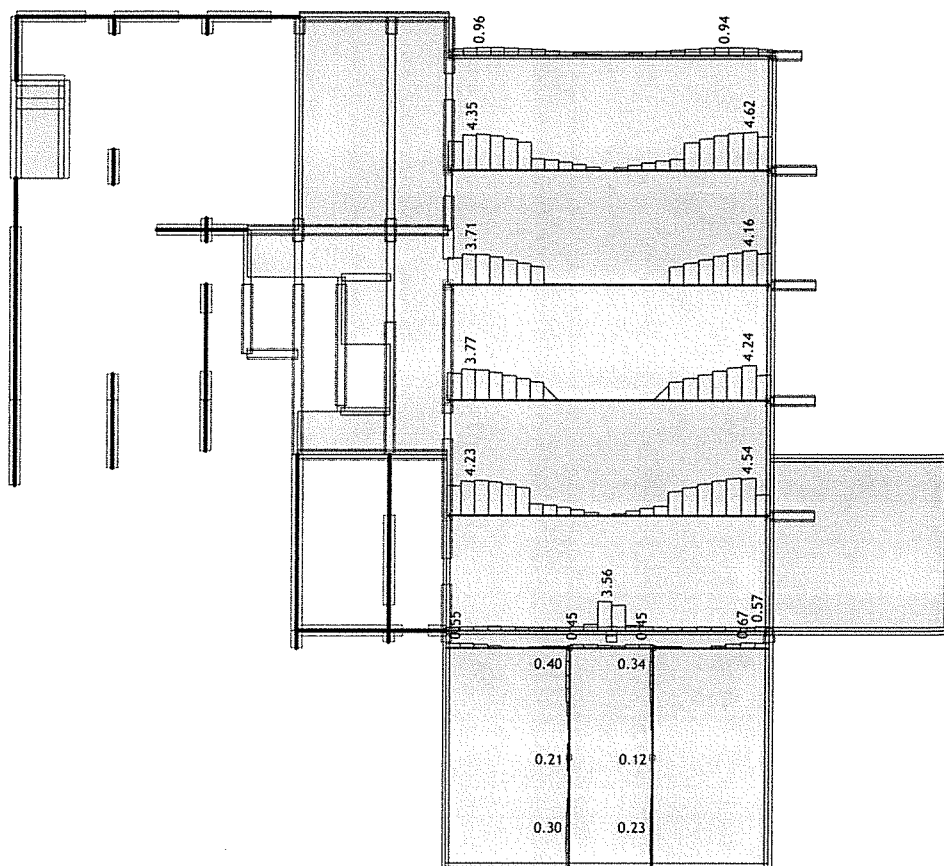


Nivo: nad kletjo [-0.10 m]
Armatura v gredah: max $A_{a2}/A_{a1} = 21.79 \text{ cm}^2$
Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H



Nivo: nad kletjo [-0.10 m]
Armatura v gredah: max $A_{a3}/A_{a4} = 1.05 \text{ cm}^2$

Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H

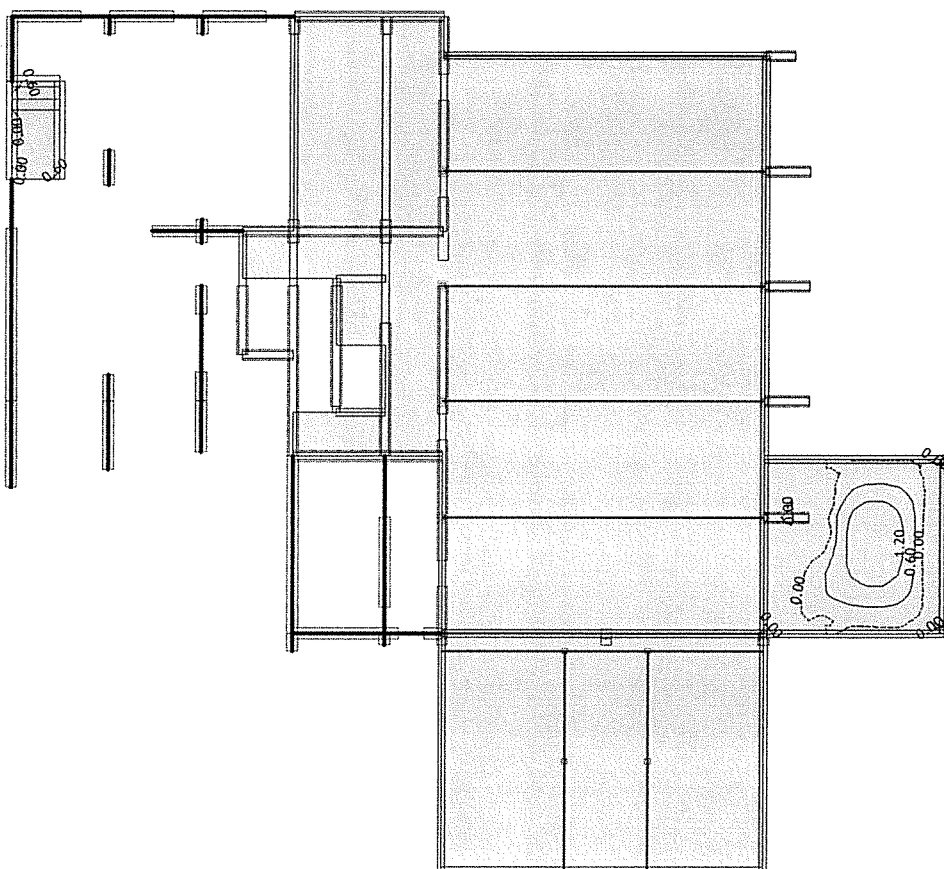


Nivo: nad kletjo [-0.10 m]

Armatura v gredah: max Aa, st= 4.62 cm²

Merodajna obtežba: Kompletna shema

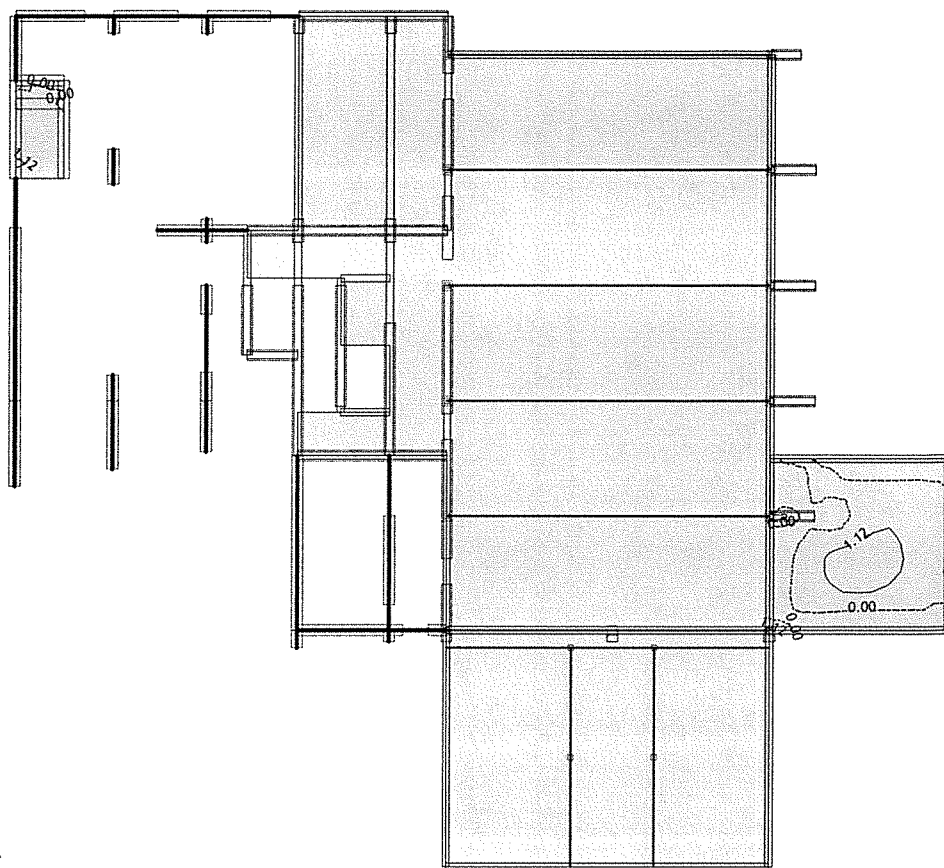
EUROCODE, C 20, S500H, a=2.00 cm



Nivo: nad kletjo [-0.10 m]

Aa - sp.cona - Smer 1 - max Aa1,s= 1.78 cm²/m

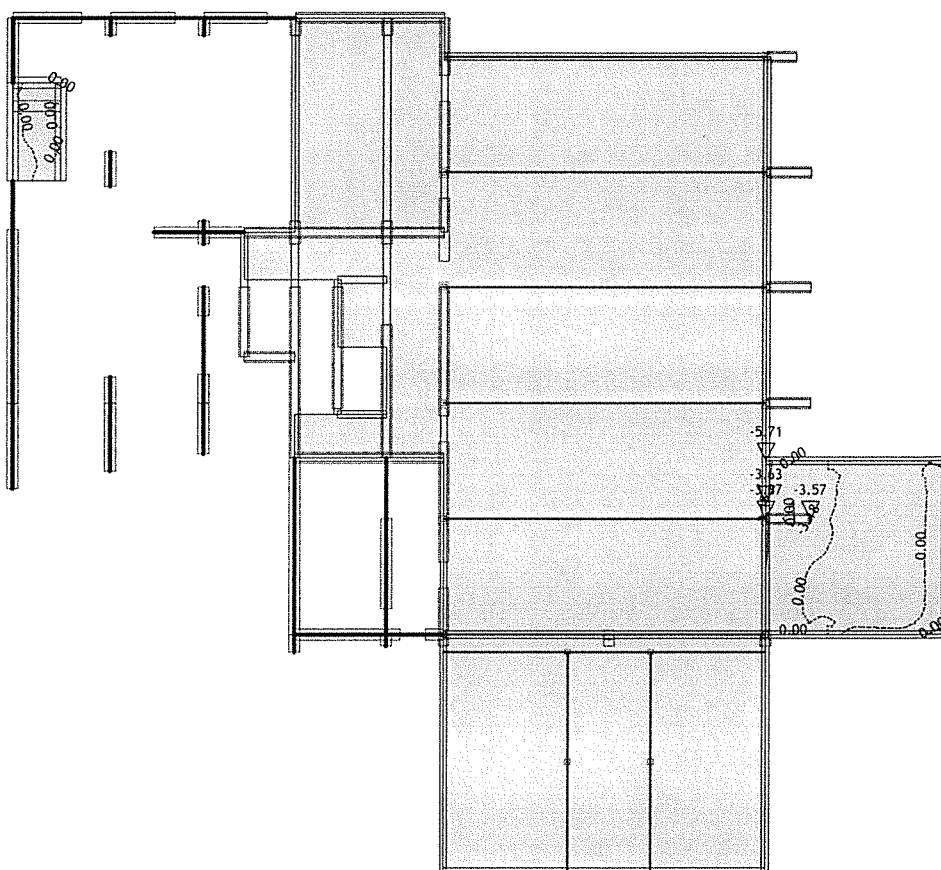
Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H, a=2.00 cm



Nivo: nad kletjo [-0.10 m]

Aa - sp.cona - Smer 2 - max Aa2,s= 2.02 cm²/m

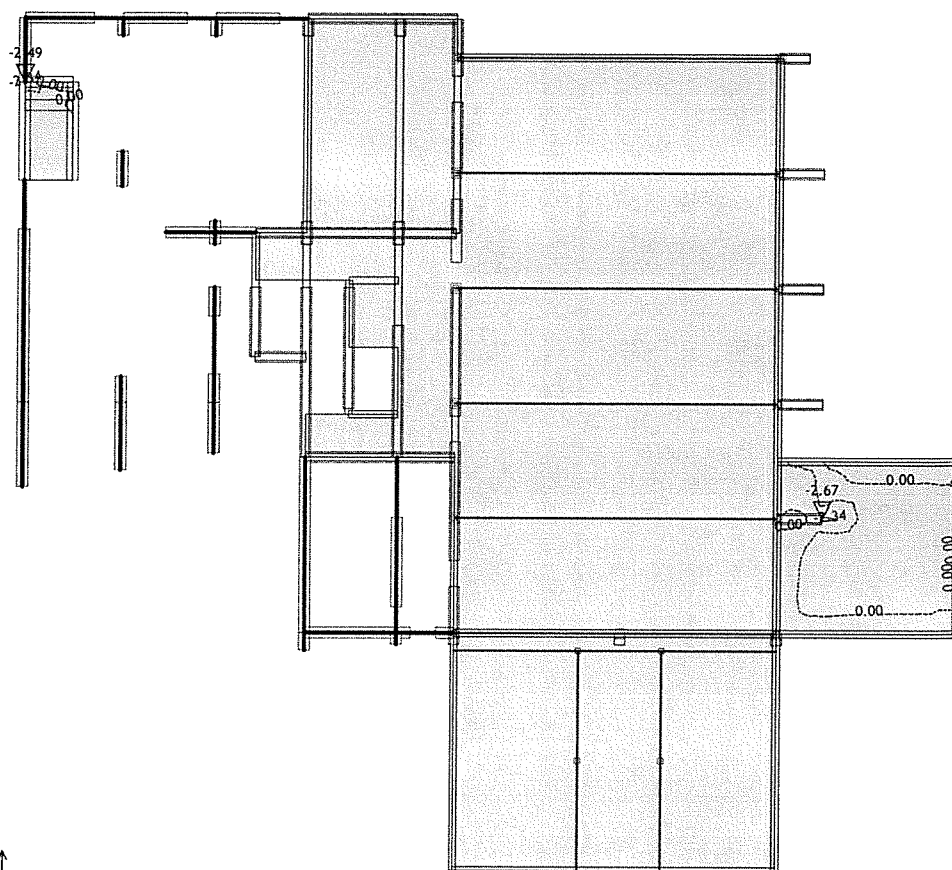
Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H, a=2.00 cm



Nivo: nad kletjo [-0.10 m]

Aa - zg.cona - Smer 1 - max Aa1,z= -5.71 cm²/m

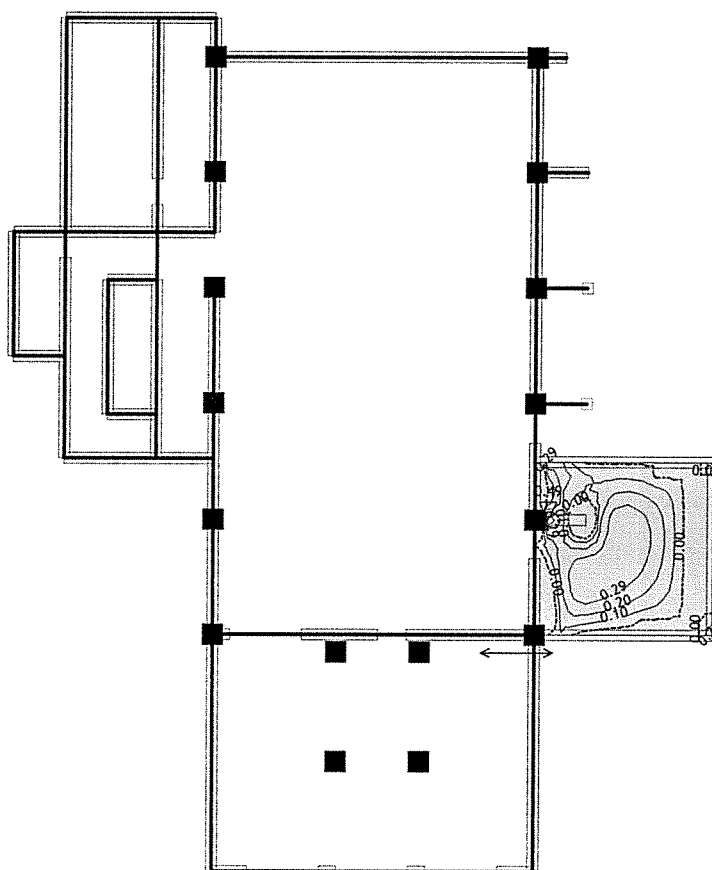
Merodajna obtežba: Kompletna shema
EUROCODE, C 20, S500H, a=2.00 cm



Nivo: nad kletjo [-0.10 m]

Aa - zg.cona - Smer 2 - max Aa_{2,z} = -2.67 cm²/m

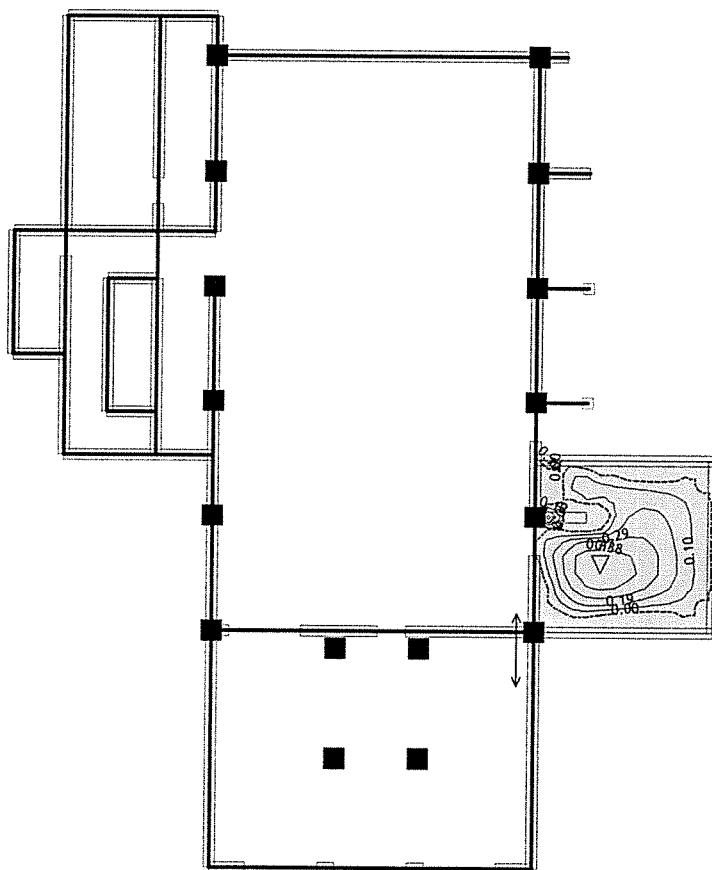
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Nivo: temelji [-3.10 m]

Aa - sp.cona - Smer 1 - max Aa1,s= 0.49 cm²/m

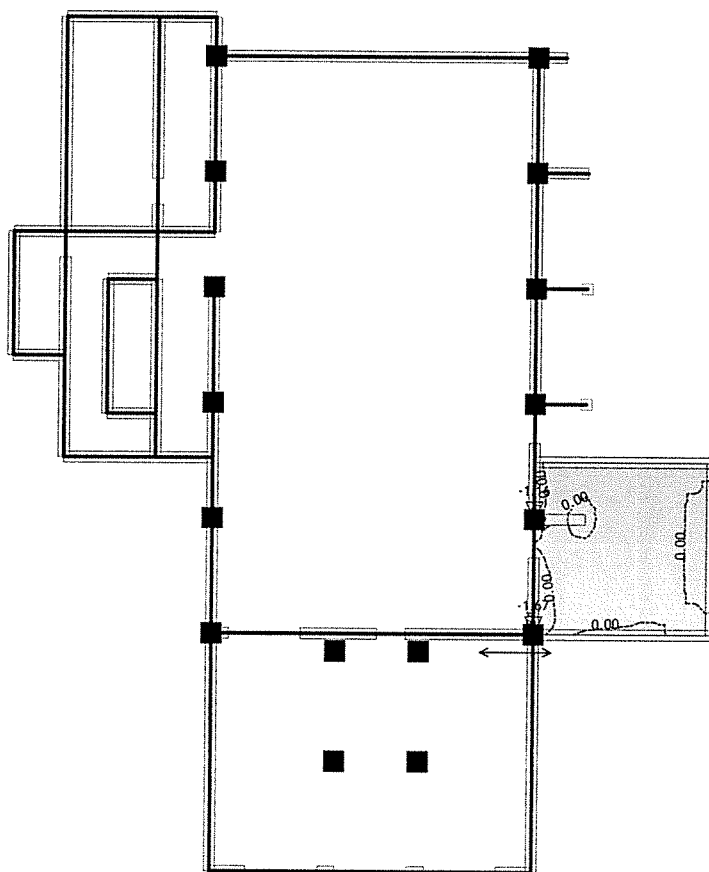
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Nivo: temelji [-3.10 m]

Aa - sp.cona - Smer 2 - max Aa2,s= 0.47 cm²/m

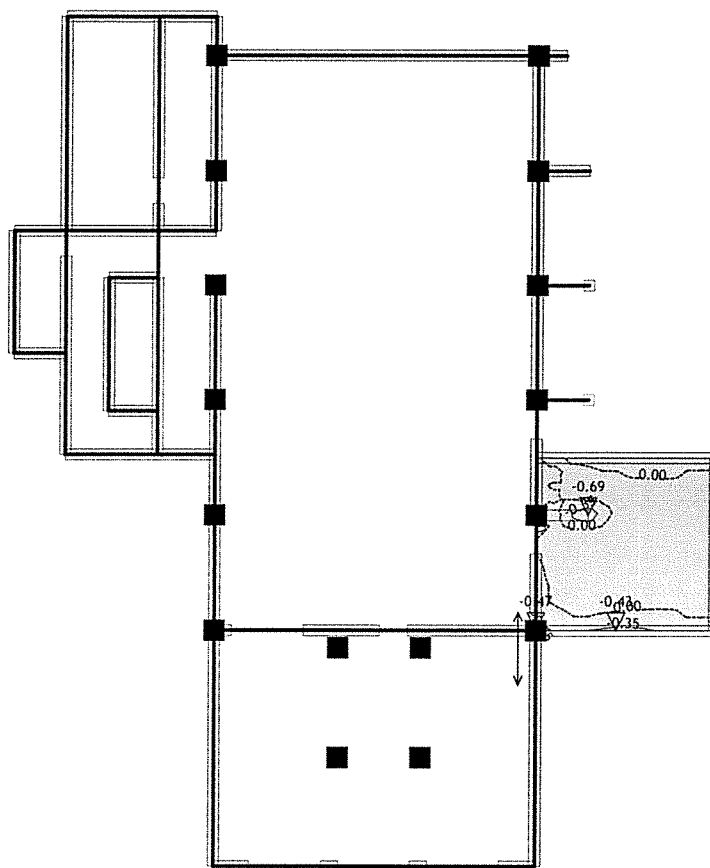
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Nivo: temelji [-3.10 m]

Aa - zg.cona - Smer 1 - max Aa1,z= -1.67 cm²/m

Merodajna optežba: Kompletna shema
EUROCODE, C 25, S500H, a=2.00 cm



Nivo: temelji [-3.10 m]

Aa - zg.cona - Smer 2 - max Aa2,z= -0.69 cm²/m

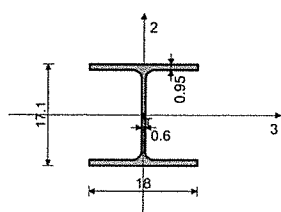
Poz 501, 502 (jeklen okvir)

Tabele materialov

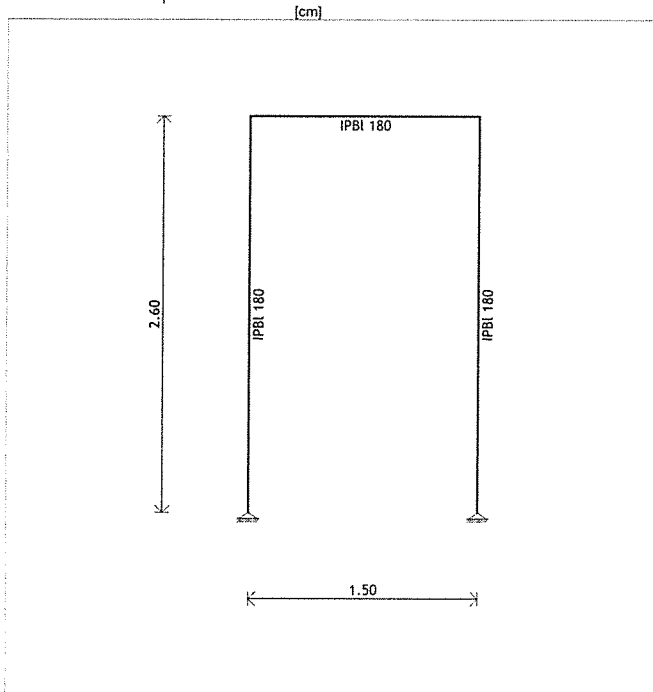
No	Naziv materiala	E[kN/m ²]	μ	γ [kN/m ³]	α [1/C]	Em[kN/m ²]	μ m
1	Jeklo	2.100e+8	0.30	78.50	1.000e-5	2.100e+8	0.30

Seti gred

Set: 1 Prerez: IPBI 180, Fiktivna ekscentričnost



Mat.	A1	A2	A3	I1	I2	I3
1 - Jeklo	4.530e-3	1.452e-3	3.078e-3	1.490e-7	9.250e-6	2.510e-5



Lista obtežnih primerov

No	Naziv	pX [kN]	pY [kN]	pZ [kN]
1	stalna (g)	0.00	0.00	-31.18
2	koristna	0.00	0.00	-4.80
3	sneg	0.00	0.00	-29.46
4	Komb.: 1.35xI+1.05xII+ +1.5xIII	0.00	0.00	-91.33
5	Komb.: 1.35xI+ +1.5xII+0.75xIII	0.00	0.00	-71.39
6	Komb.: I+1.05xII+1.5xIII	0.00	0.00	-80.41

No	Naziv	pX [kN]	pY [kN]	pZ [kN]
7	Komb.: I+1.5xII+0.75xIII	0.00	0.00	-60.48
8	Komb.: 1.35xI+1.5xIII	0.00	0.00	-86.29
9	Komb.: 1.35xI+1.5xII	0.00	0.00	-49.30
10	Komb.: I+1.5xII	0.00	0.00	-38.38
11	Komb.: I+1.5xIII	0.00	0.00	-75.37
12	Komb.: 1.35xI	0.00	0.00	-42.10
13	Komb.: I	0.00	0.00	-31.18

stalna:

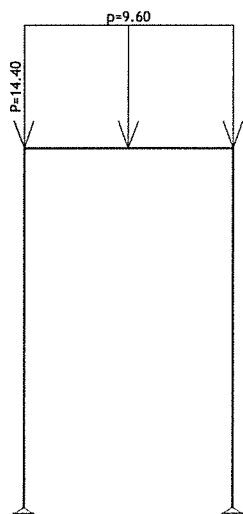
$$g = 0.12 \times 25 \times 3.2 = 9.6 \text{ kN/m'} \text{ (od plošče)}$$

$$\text{koristna: } q = 1.00 \times 3.2 = 3.2 \text{ kN/m'}$$

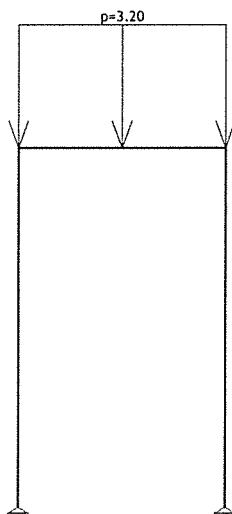
$$\text{sneg: } sk = 2.577 \times (1 + (509/728)^2) = 3.836$$

$$s = 3.836 \times 0.8 = 3.07 \text{ kN/m'}$$

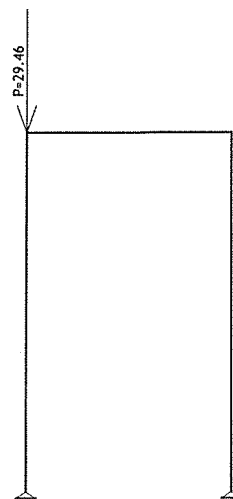
Obt. 1: stalna (g)



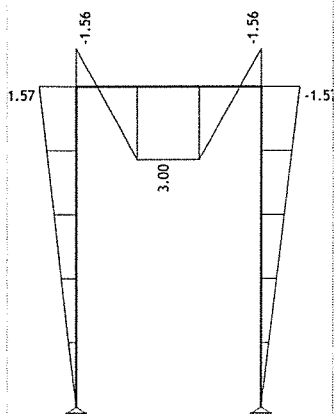
Obt. 2: koristna



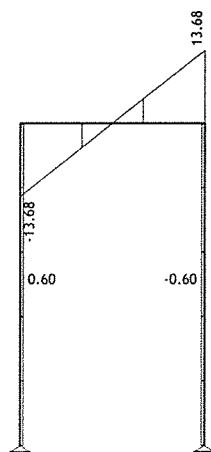
Obt. 3: sneg



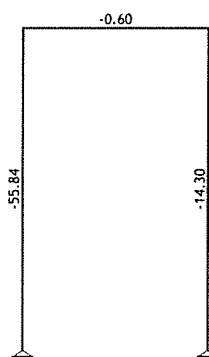
Obt. 5: 1.35xI+1.5xII+0.75xIII



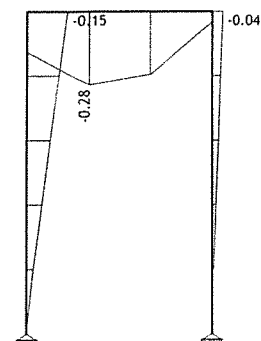
Obt. 5: 1.35xI+1.5xII+0.75xIII



Obt. 5: 1.35xI+1.5xII+0.75xIII



Obt. 5: 1.35xI+1.5xII+0.75xIII

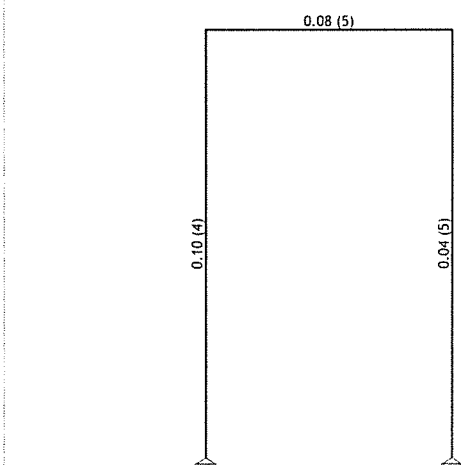


Vplivi v gredi: max M3= 3.00 / min...

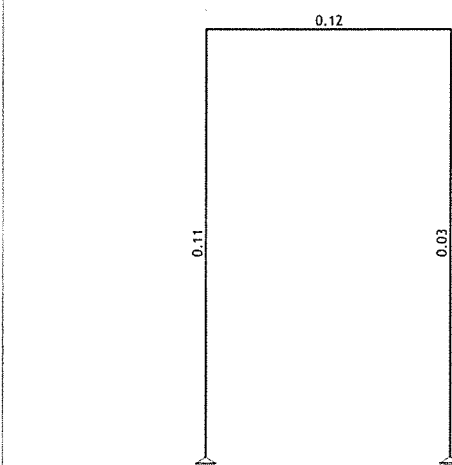
Vplivi v gredi: max T2= 13.68 / min...

Vplivi v gredi: max N1= -0.60 / min...

Vplivi v gredi: max Zp= -0.00 / min...



Kontrola napetosti



Kontrola stabilnosti

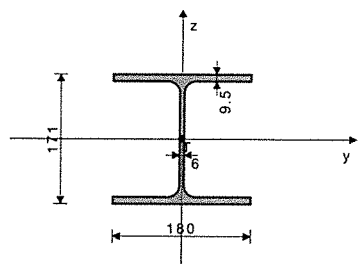
Kontrola napetosti - EUROCODE 3 (EN 1993-1-1:2005)

Opis	LC	σ [kN/cm ²]	τ [kN/cm ²]	σ_u [kN/cm ²]	Opis	LC	σ [kN/cm ²]	τ [kN/cm ²]	σ_u [kN/cm ²]
Set 1: IPBI 180					(3 - 4)	5	0.976	0.942	1.712
(3 - 1)	4	2.148	0.038	2.149	(4 - 2)	5	0.807	0.042	0.810
	5	1.724	0.042	1.725					

PALICA 4-3

PREČNI PREREZ: IPBI 180 [S 235]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIJSKE KARAKTERISTIKE prereza



($f_y = 23.5$ kN/cm², $f_u = 36.0$ kN/cm²)

Ax = 45.300 cm²
Ay = 30.780 cm²
Az = 14.520 cm²
Ix = 14.900 cm⁴
Iy = 2510.0 cm⁴
Iz = 925.00 cm⁴
Wy = 293.57 cm³
Wz = 102.78 cm³
Wy,pl = 321.86 cm³
Wz,pl = 153.90 cm³
 $\gamma_{M0} = 1.100$
 $\gamma_{M1} = 1.100$
 $\gamma_{M2} = 1.250$
A_{net}/A = 0.900

[mm]

FAKTORJI IZKORIŠČENOSTI PO KOMBINACIJAH OBTEŽB

5. $\gamma = 0.12$ 9. $\gamma = 0.12$ 4. $\gamma = 0.11$
7. $\gamma = 0.10$ 10. $\gamma = 0.10$ 8. $\gamma = 0.09$
12. $\gamma = 0.09$ 6. $\gamma = 0.09$ 11. $\gamma = 0.07$
13. $\gamma = 0.07$

PALICA IZPOSTAVLJENA PRITISKU IN UPOGIBU
(obtežni primer 5, na 64.3 cm od začetka palice)

Računska osna sila $N_{Ed} = -0.603$ kN
Prečna sila v z smeri $V_{Ed,z} = -1.954$ kN
Upogibni moment okoli y osi $M_{Ed,y} = 2.991$ kNm
Sistemska dolžina palice $L = 150.00$ cm

5.5 KLASIFIKACIJA PREČNIH PREREZOV
Razred prereza 1

6.2 NOSILNOST PREČNIH PREREZOV

6.2.4 Tlak

Računska nosilnost na tlak $N_{c,Rd} = 967.77$ kN
Pogoj 6.9: $N_{Ed} \leq N_{c,Rd}$ (0.60 $\leq$ 967.77)

6.2.5 Upogib y-y

Plastični odpornostni moment $W_{y,pl} = 321.86$ cm³
Računska nosilnost na upogib $M_{c,Rd} = 68.761$ kNm
Pogoj 6.12: $M_{Ed,y} \leq M_{c,Rd,y}$ (2.99 $\leq$ 68.76)

6.2.6 Strig

Računska strižna nosilnost $V_{pl,Rd,z} = 112.49$ kN
Računska strižna nosilnost $V_{c,Rd,z} = 112.49$ kN
Pogoj 6.17: $V_{Ed,z} \leq V_{c,Rd,z}$ (1.95 $\leq$ 112.49)

6.2.10 Upogib z osno in prečno silo

Ni potrebno zmanjšanje upogibne nosilnosti
Pogoj: $V_{Ed,z} \leq 50\% V_{pl,Rd,z}$

6.2.9 Upogib in osna sila

Razmerje $N_{Ed} / N_{pl,Rd} = 0.001$
Pogoj 6.41: (0.00 $\leq$ 1)

6.3 NOSILNOST ELEMENTA NA UKLON

6.3.1.1 Nosilnost na uklon

Uklonska dolžina y-y $l_y = 150.00$ cm
Relativna vitkost y-y $\lambda_y = 0.215$
Uklonska krivulja za os y-y: B $\alpha = 0.340$

Elastična kritična sila $N_{cr,y} = 23121$ kN
Koeficient nepopolnosti $\chi_y = 0.995$
Računska uklonska nosilnost $N_{b,Rd,y} = 962.77$ kN
Pogoj 6.46: $N_{Ed} \leq N_{b,Rd,y}$ (0.60 $\leq$ 962.77)

Uklonska dolžina z-z $l_z = 150.00$ cm
Relativna vitkost z-z $\lambda_z = 0.353$
Uklonska krivulja za os z-z: C $\alpha = 0.490$
Koeficient nepopolnosti $\chi_z = 0.922$
Računska uklonska nosilnost $N_{b,Rd,z} = 891.97$ kN
Pogoj 6.46: $N_{Ed} \leq N_{b,Rd,z}$ (0.60 $\leq$ 891.97)

6.3.2.1 Nosilnost na bočno-torzijski uklon

Koeficient $C1 = 1.285$
Koeficient $C2 = 1.562$
Koeficient $C3 = 0.753$
Koef. ukl. dolžine za uklon $k = 1.000$
Koef. ukl. dolžine za vbočenje $k_w = 1.000$
Koordinata $z_g = 0.000$ cm
Koordinata $z_j = 0.000$ cm
Razmak med bočnimi podporami $L = 150.00$ cm
Sektorski vztrajnostni moment $I_w = 60211$ cm⁶
Krit. moment bočne zvrnitve $M_{cr} = 974.52$ kNm
Ustrezni odpornostni moment $W_y = 321.86$ cm³
Koeficient imperf. $\alpha_{LT} = 0.210$
Brezdimenz. vitkost $\lambda_{LT} = 0.279$
Koeficient zmanjšanja $\chi_{LT} = 0.982$
Računska uklonska nosilnost $M_{b,Rd} = 67.554$ kNm
Kontrola bočne zvrnitve ni potrebna: $\lambda_{LT} \leq 0.4$

6.3.3. Elementi konstantnega prečnega prereza obremenjeni z upogibom in osnim tlakom

Preračun koeficienta interakcije je izvršen z alternativno metodo št. 2 (Aneks B)

Koeficient oblike momenta $C_{my} = 0.924$
Koeficient oblike momenta $C_{mz} = 1.000$
Koeficient oblike momenta $C_{mLT} = 0.924$
Koeficient interakcije $k_{yy} = 0.924$
Koeficient interakcije $k_{yz} = 0.600$
Koeficient interakcije $k_{zy} = 0.554$
Koeficient interakcije $k_{zz} = 1.000$

Koeficient nepopolnosti

$N_{Ed} / (\chi_y N_{Rk} / \gamma_{M1}) = 0.001$
 $k_{yy} * (M_{yEd} + \Delta M_{yEd}) / \dots = 0.041$
Pogoj 6.61: (0.04 $\leq$ 1)

Koeficient nepopolnosti

$N_{Ed} / (\chi_z N_{Rk} / \gamma_{M1}) = 0.001$
 $k_{zy} * (M_{yEd} + \Delta M_{yEd}) / \dots = 0.025$
Pogoj 6.62: (0.03 $\leq$ 1)

KONTROLA STRIŽNE NOSILNOSTI
(obtežni primer 5, začetek palice)

Računska osna sila $N_{Ed} = -0.603$ kN
Prečna sila v z smeri $V_{Ed,z} = -13.680$ kN
Upogibni moment okoli y osi $M_{Ed,y} = -1.569$ kNm
Sistemska dolžina palice $L = 150.00$ cm

6.2 NOSILNOST PREČNIH PREREZOV

6.2.6 Strig

Računska strižna nosilnost $V_{pl,Rd,z} = 112.49$ kN
Računska strižna nosilnost $V_{c,Rd,z} = 112.49$ kN
Pogoj 6.17: $V_{Ed,z} \leq V_{c,Rd,z}$ (13.68 $\leq$ 112.49)

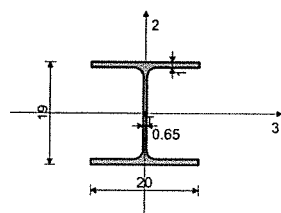
Poz 401 (jeklen okvir)

Tabele materialov

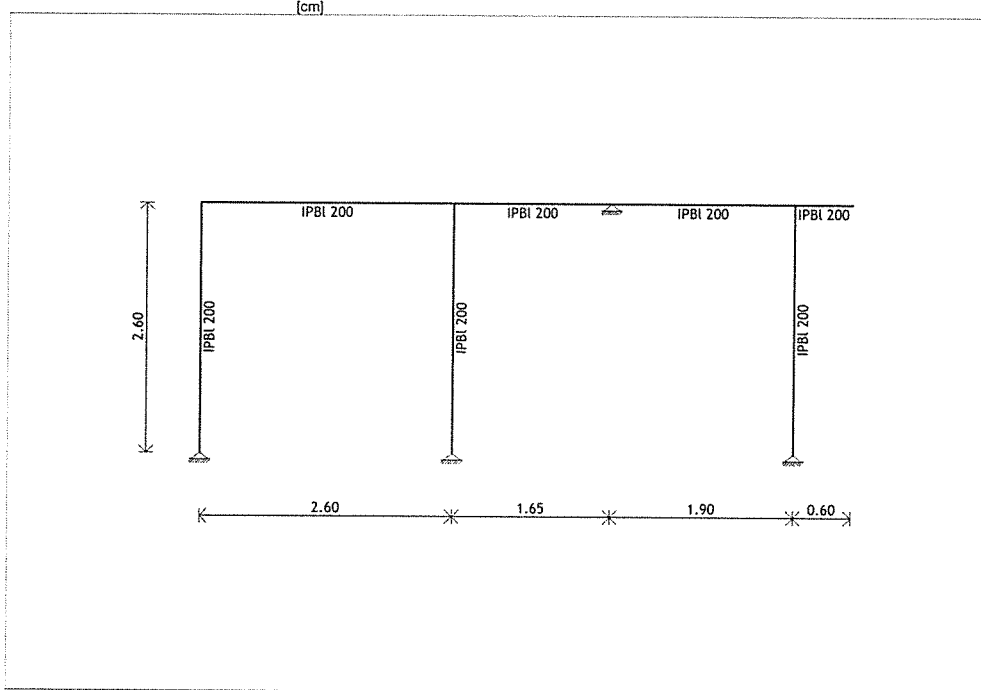
No	Naziv materiala	E[kN/m ²]	μ	γ [kN/m ³]	α [1/C]	Em[kN/m ²]	μ_m
1	Jeklo	2.100e+8	0.30	78.50	1.000e-5	2.100e+8	0.30

Seti gred

Set: 1 Prerez: IPBI 200, Fiktivna ekscentričnost



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



Lista obtežnih primerov

No	Naziv	pX [kN]	pY [kN]	pZ [kN]
1	stalna (g)	0.00	0.00	-172.32
2	koristna	0.00	0.00	-32.40
3	sneg	0.00	0.00	-114.20
4	Komb.: 1.35xI+1.05xII+1.5xIII	0.00	0.00	-437.96
5	Komb.: 1.35xI+1.5xII+0.75xIII	0.00	0.00	-366.89
6	Komb.: I+1.05xII+1.5xIII	0.00	0.00	-377.64

No	Naziv	pX [kN]	pY [kN]	pZ [kN]
7	Komb.: I+1.5xII+0.75xIII	0.00	0.00	-306.57
8	Komb.: 1.35xI+1.5xIII	0.00	0.00	-403.94
9	Komb.: 1.35xI+1.5xII	0.00	0.00	-281.24
10	Komb.: I+1.5xII	0.00	0.00	-220.92
11	Komb.: I+1.5xIII	0.00	0.00	-343.62
12	Komb.: 1.35xI	0.00	0.00	-232.64
13	Komb.: I	0.00	0.00	-172.32

stalna:

$$g = 0.20 \times 25 \times 3.2 = 16.00 \text{ kN/m'} \text{ (od plošče)}$$

$$G_{str} = 3.5 \times 3.1 \times 1.5 = 16.27 \text{ kN (od strehe)}$$

$$G_s = 0.2 \times 0.2 \times 1.2 \times 25 = 1.20 \text{ kN (od stebra)}$$

$$G = 17.47 \text{ kN}$$

$$G_{str} = 2.50 \times 3.1 \times 1.5 = 11.26 \text{ kN (od strehe-na robovih okvirja)}$$

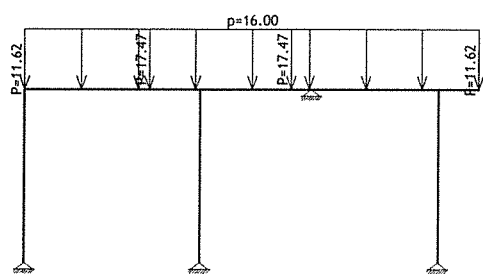
$$\text{koristna: } q = 1.50 \times 3.20 = 4.80 \text{ kN/m'}$$

sneg:

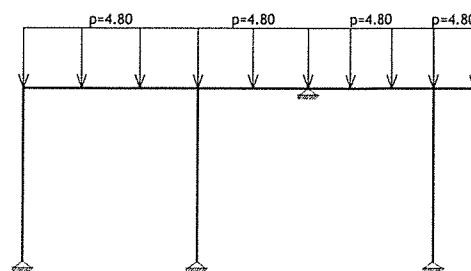
$$S_1 = 3.50 \times 3.10 \times 3.07 = 33.31 \text{ kN}$$

$$S_2 = 2.50 \times 3.10 \times 3.07 = 23.79 \text{ kN}$$

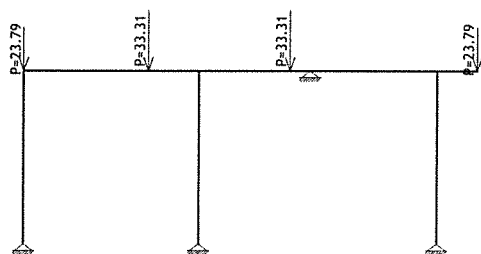
Obt. 1: stalna (g)



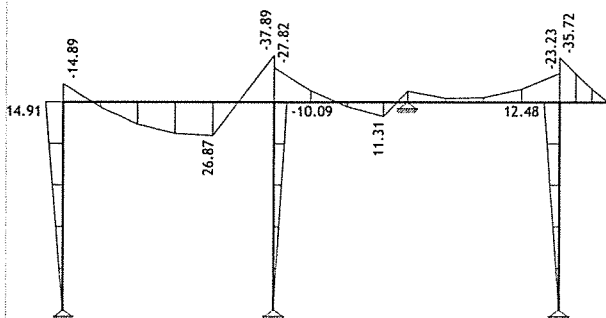
Obt. 2: korisna



Obt. 3: sneg

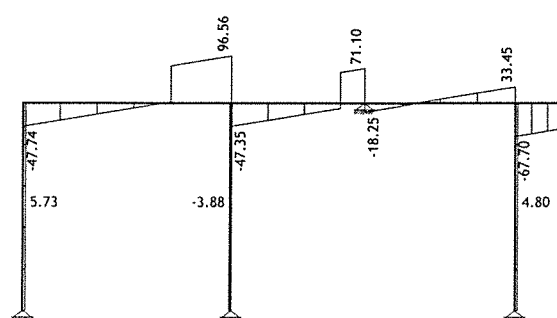


Obt. 4: 1.35xI+1.05xII+1.5xIII

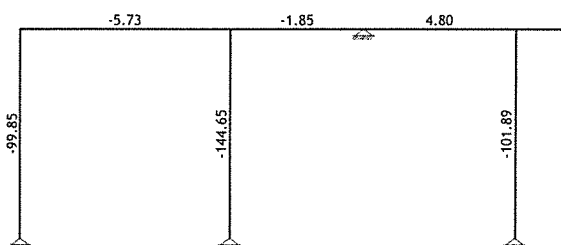


Vplivi v gredi: max M3= 26.87 / min M3= -37.89 kNm
Obt. 4: 1.35xI+1.05xII+1.5xIII

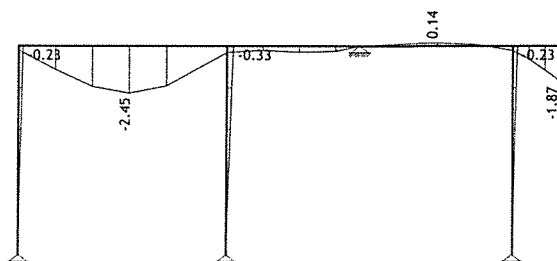
Obt. 4: 1.35xI+1.05xII+1.5xIII



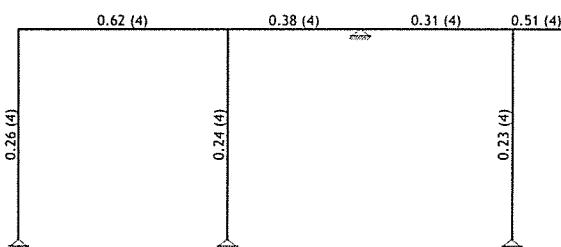
Vplivi v gredi: max T2= 96.56 / min T2= -67.70 kN
Obt. 4: 1.35xI+1.05xII+1.5xIII



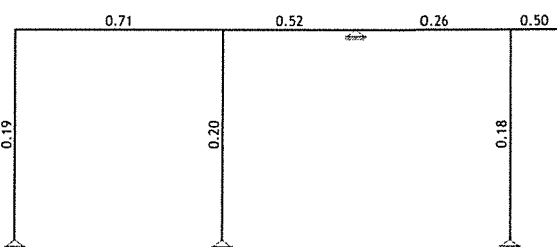
Vplivi v gredi: max N1= 4.80 / min N1= -145.39 kN



Vplivi v gredi: max Zp= 0.14 / min Zp= -2.45 m / 1000



Kontrola napetosti



Kontrola stabilnosti

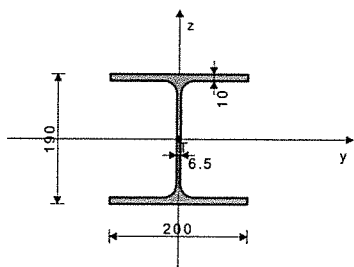
Kontrola napetosti - EUROCODE 3 (EN 1993-1-1:2005)

Opis	LC	σ [kN/cm ²]	τ [kN/cm ²]	σ_u [kN/cm ²]
Set 1: IPBI 200				
(2 - 4)	4	9.354	5.349	13.166
(7 - 8)	4	8.712	3.751	10.868
(4 - 6)	4	6.821	3.939	8.196
(6 - 7)	4	5.758	1.853	6.592

PALICA 4-2

PREČNI PREREZ: IPBI 200 [S 235]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIJSKE KARAKTERISTIKE preseza



($f_y = 23.5$ kN/cm², $f_u = 36.0$ kN/cm²)

$A_x =$	53.800 cm ²
$A_y =$	35.750 cm ²
$A_z =$	18.050 cm ²
$I_x =$	21.100 cm ⁴
$I_y =$	3690.0 cm ⁴
$I_z =$	1340.0 cm ⁴
$W_y =$	388.42 cm ³
$W_z =$	134.00 cm ³
$W_{y,pl} =$	420.70 cm ³
$W_{z,pl} =$	200.00 cm ³
$\gamma_{M0} =$	1.100
$\gamma_{M1} =$	1.100
$\gamma_{M2} =$	1.250
$A_{net}/A =$	0.900

[mm]

FAKTORJI IZKORIŠČENOSTI PO KOMBINACIJAH OBTEŽB

4. $\gamma = 0.71$	8. $\gamma = 0.66$	6. $\gamma = 0.61$
5. $\gamma = 0.58$	11. $\gamma = 0.56$	7. $\gamma = 0.49$
9. $\gamma = 0.44$	12. $\gamma = 0.36$	10. $\gamma = 0.34$
13. $\gamma = 0.27$		

PALICA IZPOSTAVLJENA PRITISKU IN UPOGIBU
(obtežni primer 4, konec palice)

Računska osna sila	$N_{Ed} =$	-5.733 kN
Prečna sila v z smeri	$V_{Ed,z} =$	96.555 kN
Upogibni moment okoli y osi	$M_{Ed,y} =$	-37.913 kNm
Sistemska dolžina palice	$L =$	260.00 cm

5.5 KLASIFIKACIJA PREČNIH PREREZOV

Razred preseza 1

6.2 NOSILNOST PREČNIH PREREZOV

6.2.4 Tlak

Računska nosilnost na tlak

Pogoj 6.9: $N_{Ed} \leq N_{c,Rd}$ ($5.73 \leq 1149.36$)

$$N_{c,Rd} = 1149.4 \text{ kN}$$

6.2.5 Upogib y-y

Plastični odpornostni moment

Računska nosilnost na upogib

Pogoj 6.12: $M_{Ed,y} \leq M_{c,Rd,y}$ ($37.91 \leq 89.88$)

$$M_{c,Rd} = 89.876 \text{ kNm}$$

6.2.6 Strig

Računska strižna nosilnost

Računska strižna nosilnost

Pogoj 6.17: $V_{Ed,z} \leq V_{c,Rd,z}$ ($96.56 \leq 136.29$)

$$V_{c,Rd,z} = 136.29 \text{ kN}$$

6.2.10 Upogib z osno in prečno silo

Koefficient zmanjšanja

Zmanjšana meja plastičnosti

Zmanjšana plast.upogibna nosilnost

$$M_{v,Rd,y} = 74.258 \text{ kNm}$$

6.2.9 Upogib in osna sila

Razmerje $N_{Ed} / N_{pl,Rd}$

$$0.005$$

Opis	LC	σ [kN/cm ²]	τ [kN/cm ²]	σ_u [kN/cm ²]
(2 - 1)	4	5.478	0.318	5.505
(4 - 3)	4	5.135	0.215	5.149
(7 - 5)	4	4.923	0.266	4.945
	8	4.837	0.271	4.860

Zmanjšana plast.upogibna nosilnost

Koefficient

Razmerje ($M_{y,Ed} / M_{N,y,Rd}$) ^{α} Pogoj 6.41: ($0.26 \leq 1$)

$$M_{N,y,Rd} = 74.258 \text{ kNm}$$

$$\alpha = 2.000$$

$$0.261$$

6.3 NOSILNOST ELEMENTA NA UKLON

6.3.1.1 Nosilnost na uklon

Uklonska dolžina y-y

Relativna vitkost y-y

Uklonska krivulja za os y-y: B

Elastična kritična sila

Koefficient nepopolnosti

Računska uklonska nosilnost

Pogoj 6.46: $N_{Ed} \leq N_{b,Rd,y}$ ($5.73 \leq 1093.50$)

$$I_{y,y} = 260.00 \text{ cm}$$

$$\lambda_{y,y} = 0.334$$

$$\alpha = 0.340$$

$$N_{cr,y} = 11314 \text{ kN}$$

$$\chi_{y,y} = 0.951$$

$$N_{b,Rd,y} = 1093.5 \text{ kN}$$

Uklonska dolžina z-z

Relativna vitkost z-z

Uklonska krivulja za os z-z: C

Koefficient nepopolnosti

Računska uklonska nosilnost

Pogoj 6.46: $N_{Ed} \leq N_{b,Rd,z}$ ($5.73 \leq 933.14$)

$$I_{z,z} = 260.00 \text{ cm}$$

$$\lambda_{z,z} = 0.555$$

$$\alpha = 0.490$$

$$\chi_{z,z} = 0.812$$

$$N_{b,Rd,z} = 933.14 \text{ kN}$$

6.3.2.1 Nosilnost na bočno-torzijski uklon

Koefficient

Koefficient

Koefficient

Koeff. ukl.dolžine za uklon

Koeff. ukl.dolžine za vbočenje

Koordinata

Koordinata

Razmak med bočnimi podporami

Sektorski vztrajnostni moment

Krit.moment bočne zvrnitve

Ustrezni odpornostni moment

Koefficient imperf.

Brezdimenz.vitkost

Koefficient zmanjšanja

Računska uklonska nosilnost

Pogoj 5.48: $M_{Ed,y} \leq M_{b,Rd}$ ($37.91 \leq 85.35$)

$$C1 = 1.285$$

$$C2 = 1.562$$

$$C3 = 0.753$$

$$k = 1.000$$

$$k_w = 1.000$$

$$z_g = 0.000 \text{ cm}$$

$$z_j = 0.000 \text{ cm}$$

$$L = 260.00 \text{ cm}$$

$$I_w = 1.08e+5 \text{ cm}^6$$

$$M_{cr} = 583.31 \text{ kNm}$$

$$W_y = 420.70 \text{ cm}^3$$

$$\alpha_L T = 0.210$$

$$\lambda_{LT} = 0.412$$

$$\chi_{LT} = 0.950$$

$$M_{b,Rd} = 85.354 \text{ kNm}$$

6.3.3. Elementi konstantnega prečnega preseza obremenjeni z

upogibom in osnim tlakom

Preračun koefficienta interakcije je izvršen z alternativno

metodo št.2 (Aneks B)

Koefficient oblike momenta

Koefficient oblike momenta

Koefficient oblike momenta

Koefficient interakcije

Koefficient interakcije

Koefficient interakcije

Koefficient interakcije

$$C_{my} = 0.667$$

$$C_{mz} = 1.000$$

$$C_{mLT} = 0.667$$

$$k_{yy} = 0.667$$

$$k_{yz} = 0.602$$

$$k_{zy} = 0.400$$

$$k_{zz} = 1.003$$

Koefficient nepopolnosti

 $N_{Ed} / (\chi_y N_{Rk} / \gamma_{M1})$ $k_{yy} * (M_{y,Ed} + \Delta M_{y,Ed}) / \dots$ Pogoj 6.61: ($0.30 \leq 1$)

$$\chi_y = 0.951$$

$$0.005$$

$$0.296$$

Koefficient nepopolnosti

 $N_{Ed} / (\chi_z N_{Rk} / \gamma_{M1})$ $k_{zy} * (M_{y,Ed} + \Delta M_{y,Ed}) / \dots$ Pogoj 6.62: ($0.18 \leq 1$)

$$\chi_z = 0.812$$

$$0.006$$

$$0.178$$

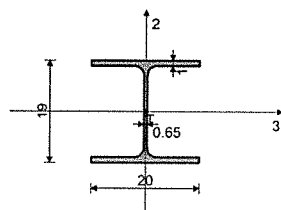
Poz 402 (jeklen okvir)

Tabele materialov

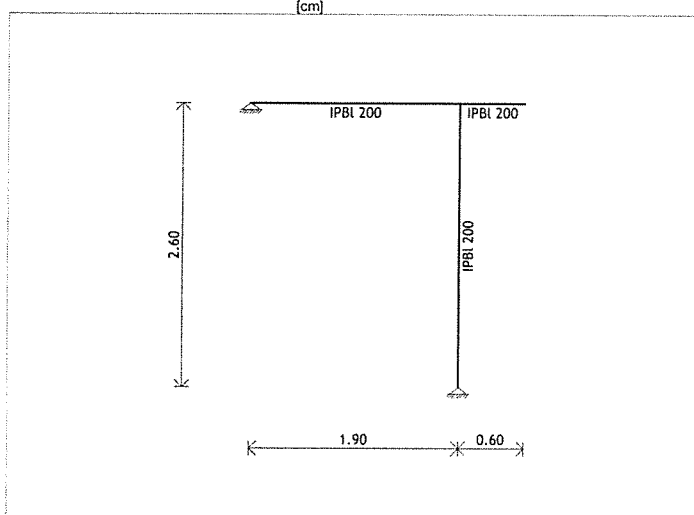
No	Naziv materiala	E[kN/m ²]	μ	γ [kN/m ³]	α [1/C]	Em[kN/m ²]	μ
1	Jeklo	2.100e+8	0.30	78.50	1.000e-5	2.100e+8	0.30

Seti gred

Set: 1 Prerez: IPBI 200, Fiktivna ekscentričnost



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



Lista obtežnih primerov

No	Naziv	pX [kN]	pY [kN]	pZ [kN]
1	stalna (g)	0.00	0.00	-32.52
2	koristna	0.00	0.00	-5.62
3	sneg	0.00	0.00	-23.79
4	Komb.: 1.35xI+1.05xII+1.5xIII	0.00	0.00	-85.50
5	Komb.: 1.35xI+1.5xII+0.75xIII	0.00	0.00	-70.19
6	Komb.: I+1.05xII+1.5xIII	0.00	0.00	-74.12

No	Naziv	pX [kN]	pY [kN]	pZ [kN]
7	Komb.: I+1.5xII+0.75xIII	0.00	0.00	-58.80
8	Komb.: 1.35xI+1.5xIII	0.00	0.00	-79.59
9	Komb.: 1.35xI+1.5xII	0.00	0.00	-52.34
10	Komb.: I+1.5xII	0.00	0.00	-40.96
11	Komb.: I+1.5xIII	0.00	0.00	-68.21
12	Komb.: 1.35xI	0.00	0.00	-43.91
13	Komb.: I	0.00	0.00	-32.52

stalna:

$$g = 0.20 \times 25 \times 1.50 = 7.50 \text{ kN/m' (od plošče)}$$

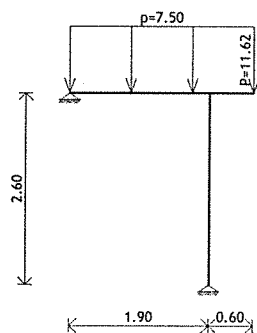
$$G_{str} = 2.50 \times 3.1 \times 1.5 = 11.26 \text{ kN (od strehe-na robovih okvirja)}$$

$$\text{koristna: } q = 1.50 \times 1.50 = 2.25 \text{ kN/m'}$$

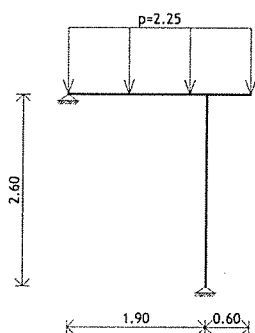
sneg:

$$S = 2.50 \times 3.10 \times 3.07 = 23.79 \text{ kN}$$

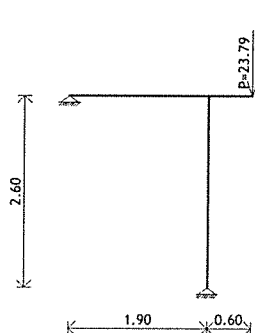
Obl. 1: stalna (g)

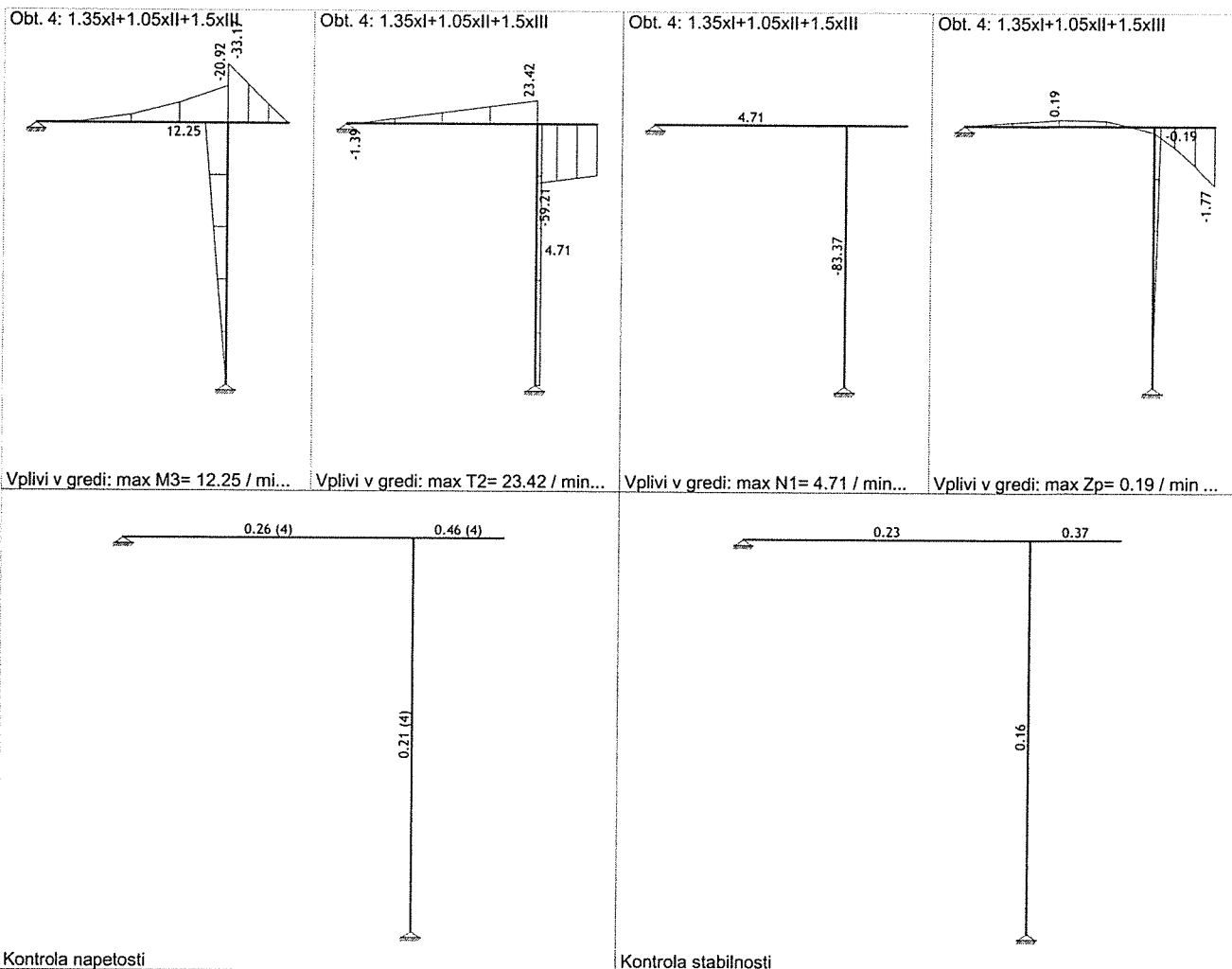


Obl. 2: koristna



Obl. 3: снег





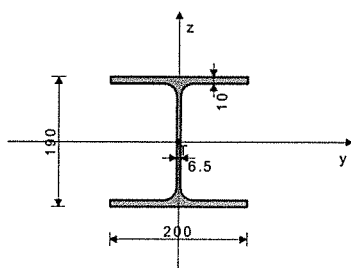
Kontrola napetosti - EUROCODE 3 (EN 1993-1-1:2005)

Opis	LC	σ [kN/cm ²]	τ [kN/cm ²]	σ_u [kN/cm ²]
Set 1: IPBI 200				
(3 - 4)	4	8.091	3.280	9.887
(2 - 3)	4	5.191	1.297	5.657

PALICA 4-3

PREČNI PREREZ: IPBI 200 [S 235]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIJSKE KARAKTERISTIKE prereza



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

[mm]

$A_x =$	53.800 cm ²
$A_y =$	35.750 cm ²
$A_z =$	18.050 cm ²
$I_x =$	21.100 cm ⁴
$I_y =$	3690.0 cm ⁴
$I_z =$	1340.0 cm ⁴
$W_y =$	388.42 cm ³
$W_z =$	134.00 cm ³
$W_{y,pl} =$	420.70 cm ³
$W_{z,pl} =$	200.00 cm ³
$\gamma_{M0} =$	1.100
$\gamma_{M1} =$	1.100
$\gamma_{M2} =$	1.250
$A_{net}/A =$	0.900

FAKTORJI IZKORIŠČENOSTI PO KOMBINACIJAH OBTEŽB

4. $\gamma=0.37$	8. $\gamma=0.36$	6. $\gamma=0.34$
11. $\gamma=0.33$	5. $\gamma=0.25$	7. $\gamma=0.22$
9. $\gamma=0.13$	12. $\gamma=0.13$	10. $\gamma=0.10$
13. $\gamma=0.09$		

PALICA IZPOSTAVLJENA UPOGIBU
(obtežni primer 4, začetek palice)

Prečna sila v z smeri	$V_{Ed,z} =$	-59.207 kN
Upogibni moment okoli y osi	$M_{Ed,y} =$	-33.174 kNm
Sistemska dolžina palice	$L =$	60.000 cm

5.5 KLASIFIKACIJA PREČNIH PREREZOV

Opis	LC	σ [kN/cm ²]	τ [kN/cm ²]	σ_u [kN/cm ²]
(3 - 1)	4	4.523	0.261	4.546
	8	4.505	0.266	4.528

Razred prereza 1

6.2 NOSILNOST PREČNIH PREREZOV

6.2.5 Upogib y-y

Plastični odpornostni moment

$W_{y,pl} = 420.70 \text{ cm}^3$

Računska nosilnost na upogib

$M_{c,Rd} = 89.876 \text{ kNm}$

Pogoj 6.12: $M_{Ed,y} \leq M_{c,Rd,y}$ (33.17 ≤ 89.88)

6.2.6 Strig

Računska strižna nosilnost

$V_{pl,Rd,z} = 222.63 \text{ kN}$

Računska strižna nosilnost

$V_{c,Rd,z} = 222.63 \text{ kN}$

Pogoj 6.17: $V_{Ed,z} \leq V_{c,Rd,z}$ (59.21 ≤ 222.63)

6.2.8 Upogib in strig

Ni potrebno zmanjšanje upogibne nosilnosti

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

6.3 NOSILNOST ELEMENTA NA UKLON

6.3.2.1 Nosilnost na bočno-torzijski uklon

Koeficient

$C1 = 1.879$

Koeficient

$C2 = 0.000$

Koeficient

$C3 = 0.939$

Koef. ukl. dolžine za uklon

$k = 1.000$

Koef. ukl. dolžine za vbočenje

$kw = 1.000$

Koordinata

$z_g = 0.000 \text{ cm}$

Koordinata

$z_j = 0.000 \text{ cm}$

Razmak med bočnimi podporami

$L = 60.000 \text{ cm}$

Sektorski vztrajnostni moment

$I_w = 1.08e+5 \text{ cm}^6$

Krit. moment bočne zvrtilve

$M_{cr} = 13191 \text{ kNm}$

Ustrezni odpornostni moment

$W_y = 420.70 \text{ cm}^3$

Koeficient imperf.

$\alpha_L = 0.210$

Brezdimenz. vitkost

$\lambda_{LT} = 0.087$

Koeficient zmanjšanja

$\chi_{LT} = 1.000$

Računska uklonska nosilnost

$M_{b,Rd} = 89.876 \text{ kNm}$

Kontrola bočne zvrtilve ni potrebna: $\lambda_{LT} \leq 0.4$

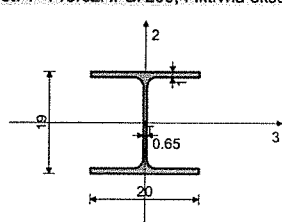
Poz 403 (jeklen okvir)

Tabele materialov

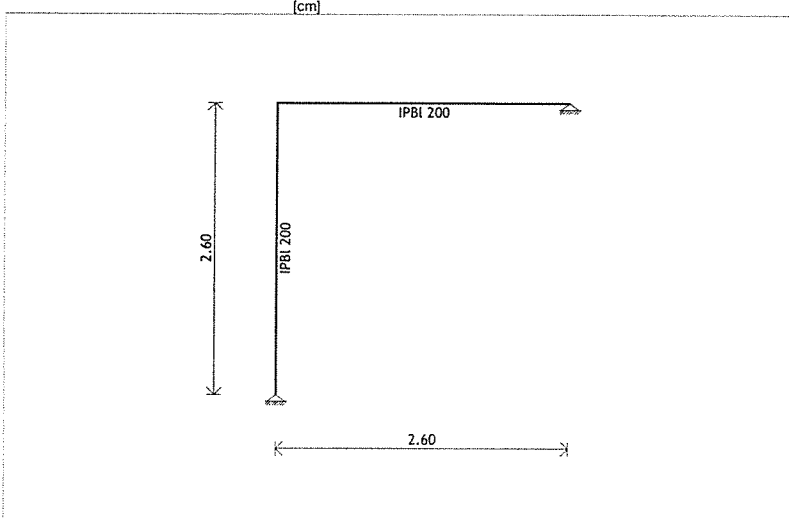
No	Naziv materiala	E[kN/m ²]	μ	γ [kN/m ³]	α [1/C]	Em[kN/m ²]	μ m
1	Jeklo	2.100e+8	0.30	78.50	1.000e-5	2.100e+8	0.30

Seti gred

Set: 1 Prerez: IPBI 200, Fiktivna ekscentričnost



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



Lista obtežnih primerov

No	Naziv	pX [kN]	pY [kN]	pZ [kN]
1	stalna (g)	0.00	0.00	-55.42
2	koristna	0.00	0.00	-12.48
3	sneg	0.00	0.00	-23.79
4	Komb.: 1.35xI+1.05xII+1.5xIII	0.00	0.00	-123.60
5	Komb.: 1.35xI+1.5xII+0.75xIII	0.00	0.00	-111.37
6	Komb.: I+1.05xII+1.5xIII	0.00	0.00	-104.21

No	Naziv	pX [kN]	pY [kN]	pZ [kN]
7	Komb.: I+1.5xII+0.75xIII	0.00	0.00	-91.98
8	Komb.: 1.35xI+1.5xIII	0.00	0.00	-110.50
9	Komb.: 1.35xI+1.5xII	0.00	0.00	-93.53
10	Komb.: I+1.5xII	0.00	0.00	-74.14
11	Komb.: I+1.5xIII	0.00	0.00	-91.10
12	Komb.: 1.35xI	0.00	0.00	-74.81
13	Komb.: I	0.00	0.00	-55.42

stalna:

$$g = 0.20 \times 25 \times 3.2 = 16.00 \text{ kN/m' (od plošče)}$$

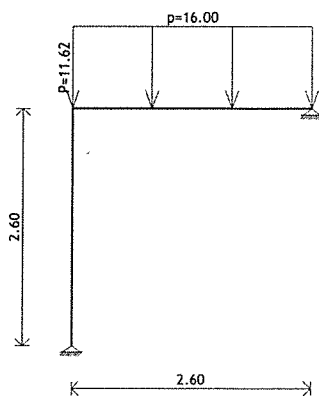
$$G_{str} = 2.50 \times 3.1 \times 1.5 = 11.26 \text{ kN (od strehe)}$$

$$\text{koristna: } q = 1.50 \times 3.20 = 4.80 \text{ kN/m'}$$

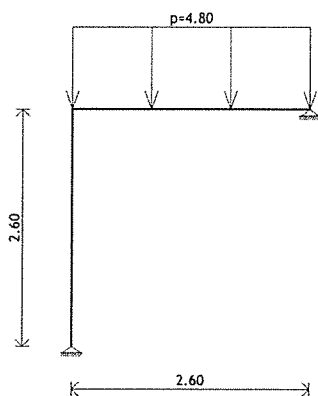
sneg:

$$S = 2.50 \times 3.10 \times 3.07 = 23.79 \text{ kN}$$

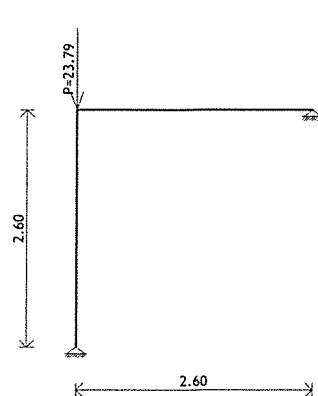
Obt. 1: stalna (g)



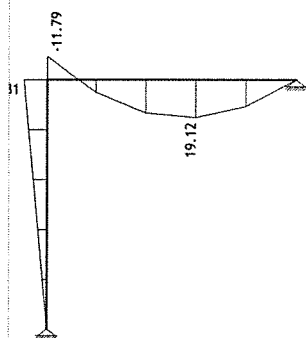
Obt. 2: korisna



Obt. 3: sneg

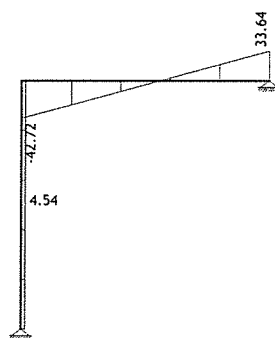


Obt. 5: 1.35xI+1.5xII+0.75xIII



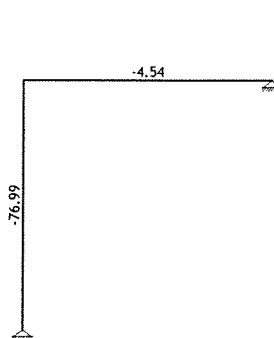
Vplivi v gredi: max M3= 19.12 / min...

Obt. 5: 1.35xI+1.5xII+0.75xIII



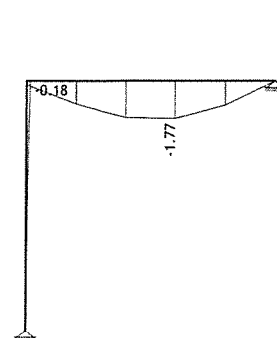
Vplivi v gredi: max T2= 33.64 / min...

Obt. 5: 1.35xI+1.5xII+0.75xIII

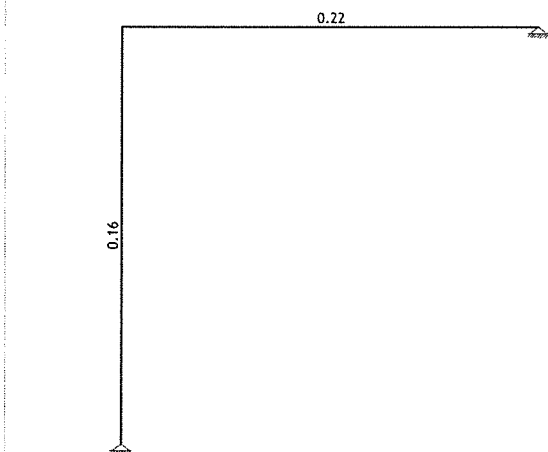


Vplivi v gredi: max N1= -4.54 / min...

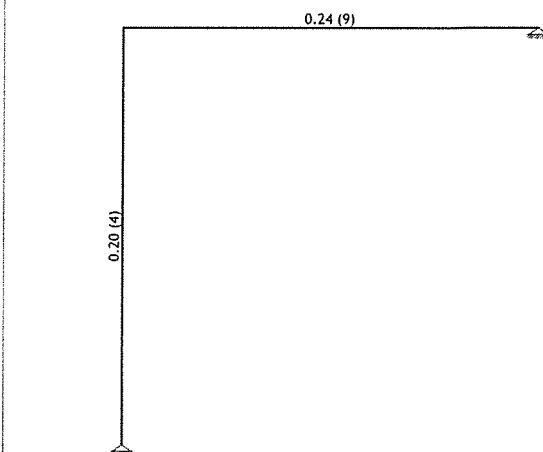
Obt. 5: 1.35xI+1.5xII+0.75xIII



Vplivi v gredi: max Zp= -0.00 / min...



Kontrola stabilnosti



Kontrola napetosti

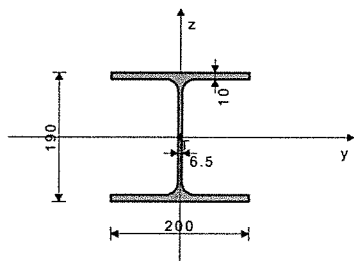
Kontrola napetosti - EUROCODE 3 (EN 1993-1-1:2005)

Opis	LC	σ [kN/cm ²]	τ [kN/cm ²]	σ_u [kN/cm ²]
Set 1: IPBI 200				
(2 - 3)	5	4.639	2.367	5.059
	9	4.633	2.368	5.071

PALICA 3-2

PREČNI PREREZ: IPBI 200 [S 235]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIJSKE KARAKTERISTIKE prereza



($f_y = 23.5$ kN/cm², $f_u = 36.0$ kN/cm²)

$A_x =$	53.800 cm ²
$A_y =$	35.750 cm ²
$A_z =$	18.050 cm ²
$I_x =$	21.100 cm ⁴
$I_y =$	3690.0 cm ⁴
$I_z =$	1340.0 cm ⁴
$W_y =$	388.42 cm ³
$W_z =$	134.00 cm ³
$W_{y,pl} =$	420.70 cm ³
$W_{z,pl} =$	200.00 cm ³
$\gamma_{M0} =$	1.100
$\gamma_{M1} =$	1.100
$\gamma_{M2} =$	1.250
$A_{net}/A =$	0.900

[mm]

FAKTORJI IZKORIŠČENOSTI PO KOMBINACIJAH OBEŽB

5. $\gamma = 0.22$	9. $\gamma = 0.22$	4. $\gamma = 0.20$
7. $\gamma = 0.17$	10. $\gamma = 0.17$	8. $\gamma = 0.17$
12. $\gamma = 0.16$	6. $\gamma = 0.16$	11. $\gamma = 0.12$
13. $\gamma = 0.12$		

PALICA IZPOSTAVLJENA PRITISKU IN UPOGIBU
(obtežni primer 5, na 160.0 cm od začetka palice)

Računska osna sila	$N_{Ed} =$	-4.541 kN
Prečna sila v z smeri	$V_{Ed,z} =$	4.270 kN
Upogibni moment okoli y osi	$M_{Ed,y} =$	18.673 kNm
Sistemska dolžina palice	$L =$	260.00 cm

5.5 KLASIFIKACIJA PREČNIH PREREZOV
Razred prereza 1

6.2 NOSILNOST PREČNIH PREREZOV

6.2.4 Tlak

Računska nosilnost na tlak

Pogoj 6.9: $N_{Ed} \leq N_{c,Rd}$ (4.54 $\leq$ 1149.36) $N_{c,Rd} = 1149.4$ kN

6.2.5 Upogib y-y

Plastični odpornostni moment

Računska nosilnost na upogib

Pogoj 6.12: $M_{Ed,y} \leq M_{c,Rd,y}$ (18.67 $\leq$ 89.88) $W_{y,pl} = 420.70$ cm³ $M_{c,Rd} = 89.876$ kNm

6.2.6 Strig

Računska strižna nosilnost

Računska strižna nosilnost

Pogoj 6.17: $V_{Ed,z} \leq V_{c,Rd,z}$ (4.27 $\leq$ 222.63) $V_{pl,Rd,z} = 222.63$ kN $V_{c,Rd,z} = 222.63$ kN

6.2.10 Upogib z osno in prečno silo

Ni potrebno zmanjšanje upogibne nosilnosti

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

6.2.9 Upogib in osna sila

Razmerje $N_{Ed} / N_{pl,Rd}$

Zmanjšana plast.upogibna nosilnost

Koeficient

Razmerje $(M_{y,Ed} / M_{N,y,Rd})^\alpha$ Pogoj 6.41: (0.04 $\leq$ 1) $M_{N,y,Rd} = 89.876$ kNm $\alpha = 2.000$ $\alpha = 0.043$

6.3 NOSILNOST ELEMENTA NA UKLON

6.3.1.1 Nosilnost na uklon

Uklonska dolžina y-y

 $l_y = 260.00$ cm

Opis	LC	σ [kN/cm ²]	τ [kN/cm ²]	σ_u [kN/cm ²]
(2 - 1)	4	4.339	0.231	4.357
	9	3.983	0.253	4.007

Relativna vitkost y-y

 $\lambda_y = 0.334$

Uklonska krivulja za os y-y: B

 $\alpha = 0.340$

Elastična kritična sila

 $N_{cr,y} = 11314$ kN

Koeficient nepopolnosti

 $\chi_y = 0.951$

Računska uklonska nosilnost

 $N_{b,Rd,y} = 1093.5$ kNPogoj 6.46: $N_{Ed} \leq N_{b,Rd,y}$ (4.54 $\leq$ 1093.50)

Uklonska dolžina z-z

 $l_z = 260.00$ cm

Relativna vitkost z-z

 $\lambda_z = 0.555$

Uklonska krivulja za os z-z: C

 $\alpha = 0.490$

Koeficient nepopolnosti

 $\chi_z = 0.812$

Računska uklonska nosilnost

 $N_{b,Rd,z} = 933.14$ kNPogoj 6.46: $N_{Ed} \leq N_{b,Rd,z}$ (4.54 $\leq$ 933.14)

6.3.2.1 Nosilnost na bočno-torzijski uklon

Koeficient

 $C1 = 1.285$

Koeficient

 $C2 = 1.562$

Koeficient

 $C3 = 0.753$

Koef. ukl.dolžine za uklon

 $k = 1.000$

Koef. ukl.dolžine za vbočenje

 $k_w = 1.000$

Koordinata

 $z_g = 0.000$ cm

Koordinata

 $z_j = 0.000$ cm

Razmak med bočnimi podporami

 $L = 260.00$ cm

Sektorski vztrajnostni moment

 $I_w = 1.08e+5$ cm⁶

Krit.moment bočne zvrnitve

 $M_{cr} = 583.31$ kNm

Ustrezni odpornostni moment

 $W_y = 420.70$ cm³

Koeficient imperf.

 $\alpha_{LT} = 0.210$

Brezdimenz.vitkost

 $\lambda_{LT} = 0.412$

Koeficient zmanjšanja

 $\chi_{LT} = 0.950$

Računska uklonska nosilnost

 $M_{b,Rd} = 85.354$ kNmPogoj 5.48: $M_{Ed,y} \leq M_{b,Rd}$ (18.67 $\leq$ 85.35)

6.3.3. Elementi konstantnega prečnega prereza obremenjeni z upogibom in osnim tlakom

Preračun koeficienta interakcije je izvršen z alternativno metodo št.2 (Aneks B)

Koeficient oblike momenta

 $C_{my} = 0.900$

Koeficient oblike momenta

 $C_{mz} = 1.000$

Koeficient oblike momenta

 $C_{mLT} = 0.900$

Koeficient interakcije

 $k_{yy} = 0.901$

Koeficient interakcije

 $k_{yz} = 0.601$

Koeficient interakcije

 $k_{zy} = 0.540$

Koeficient interakcije

 $k_{zz} = 1.002$

Koeficient nepopolnosti

 $\chi_y = 0.951$ $N_{Ed} / (\chi_y N_{Rk} / \gamma_{M1})$

0.004

 $k_{yy} * (M_{y,Ed} + \Delta M_{y,Ed}) / \dots$

0.197

Pogoj 6.61: (0.20 $\leq$ 1)

Koeficient nepopolnosti

 $\chi_z = 0.812$ $N_{Ed} / (\chi_z N_{Rk} / \gamma_{M1})$

0.005

 $k_{zy} * (M_{y,Ed} + \Delta M_{y,Ed}) / \dots$

0.118

Pogoj 6.62: (0.12 $\leq$ 1)

KONTROLA STRIŽNE NOSILNOSTI

(obtežni primer 9, začetek palice)

Računska osna sila

 $N_{Ed} = -4.568$ kN

Prečna sila v z smeri

 $V_{Ed,z} = -42.749$ kN

Upogibni moment okoli y osi

 $M_{Ed,y} = -11.876$ kNm

Sistemska dolžina palice

 $L = 260.00$ cm

6.2 NOSILNOST PREČNIH PREREZOV

6.2.6 Strig

Računska strižna nosilnost

 $V_{pl,Rd,z} = 222.63$ kN

Računska strižna nosilnost

 $V_{c,Rd,z} = 222.63$ kNPogoj 6.17: $V_{Ed,z} \leq V_{c,Rd,z}$ (42.75 $\leq$ 222.63)

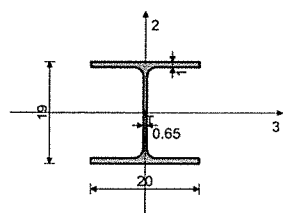
Poz 404 (jeklen okvir)

Tabele materialov

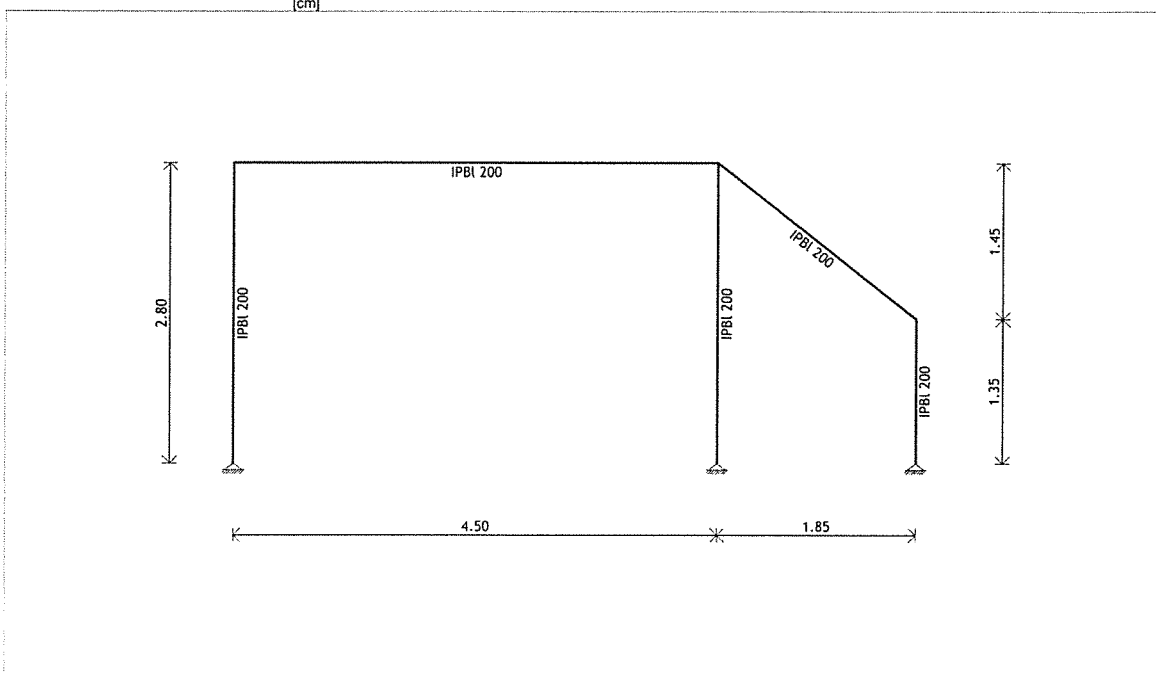
No	Naziv materiala	E[kN/m ²]	μ	γ [kN/m ³]	α [1/C]	Em[kN/m ²]	μ m
1	Jeklo	2.100e+8	0.30	78.50	1.000e-5	2.100e+8	0.30

Seti gred

Set: 1 Prerez: IPB1 200, Fiktivna ekscentričnost



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



Lista obtežnih primerov

No	Naziv	pX [kN]	pY [kN]	pZ [kN]
1	stalna (g)	0.00	0.00	-89.37
2	koristna	0.00	0.00	-54.30
3	Komb.: 1.35xI+1.5xII	0.00	0.00	-202.10
4	Komb.: I+1.5xII	0.00	0.00	-170.82

No	Naziv	pX [kN]	pY [kN]	pZ [kN]
5	Komb.: 1.35xI	0.00	0.00	-120.65
6	Komb.: I	0.00	0.00	-89.37
7	Komb.: I+II	0.00	0.00	-143.67

stalna:

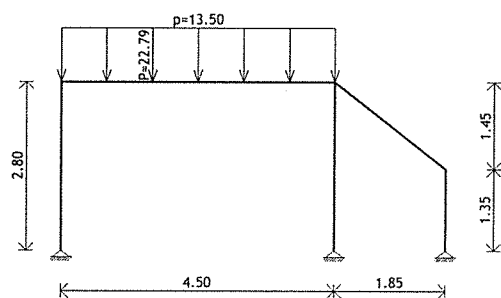
$$g = 0.20 \times 25 \times 2.7 = 13.50 \text{ kN/m' (od plošče)}$$

$$G_{str} = 2.70 \times 2.00 = 5.40$$

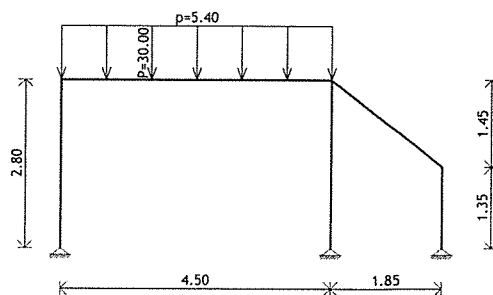
$$\text{koristna: } q = 1.50 \times 3.20 = 4.80 \text{ kN/m'}$$

+ točkovna obtežba od okvirja 502

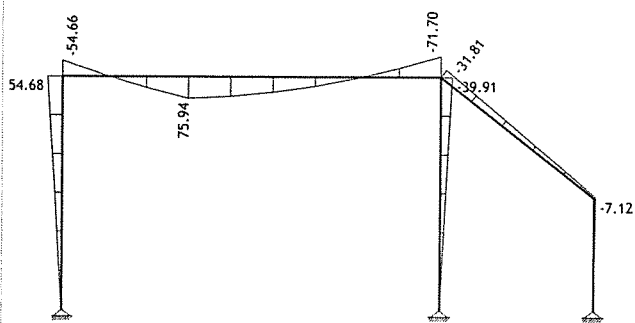
Obt. 1: stalna (g)



Obt. 2: koristna

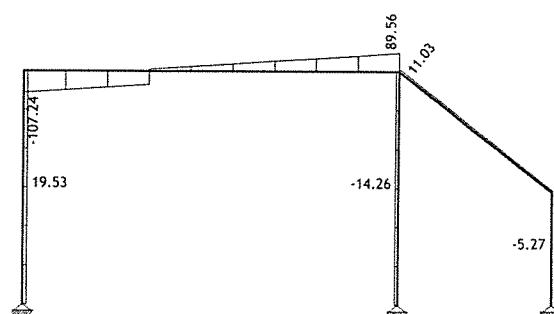


Obt. 3: 1.35xI+1.5xII

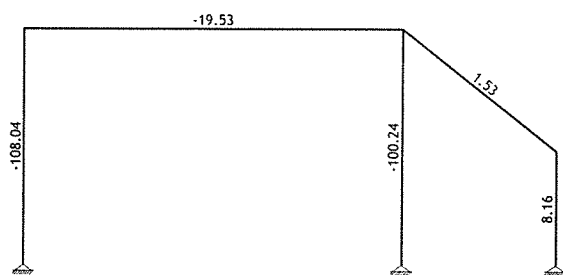


Vplivi v gredi: max M3= 75.94 / min M3= -71.70 kNm
Obt. 3: 1.35xI+1.5xII

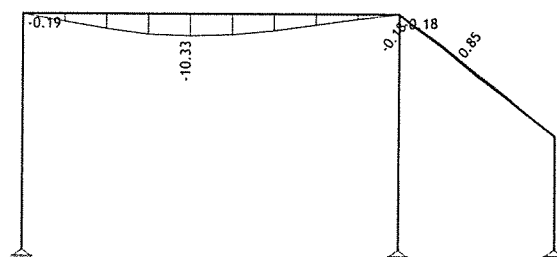
Obt. 3: 1.35xI+1.5xII



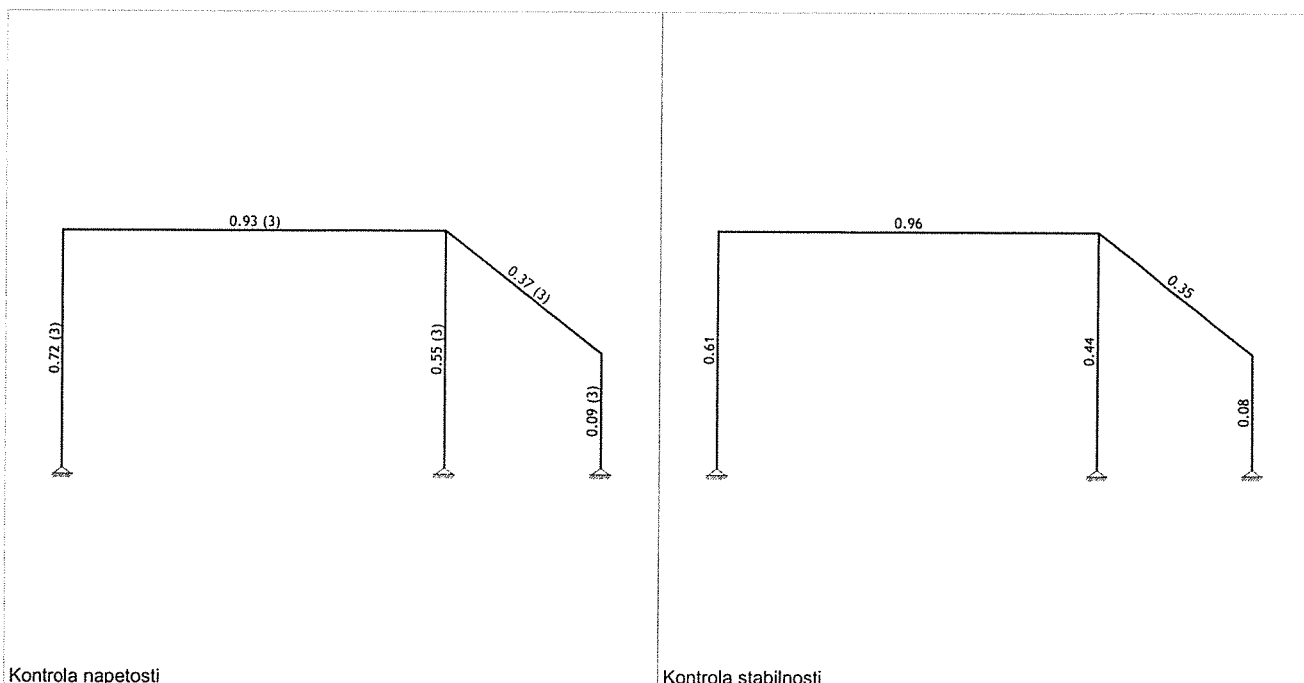
Vplivi v gredi: max T2= 89.56 / min T2= -107.24 kN
Obt. 7: I+II



Vplivi v gredi: max N1= 8.54 / min N1= -108.83 kN



Vplivi v gredi: max Zp= 0.85 / min Zp= -10.33 m / 1000



Kontrola napetosti

Kontrola stabilnosti

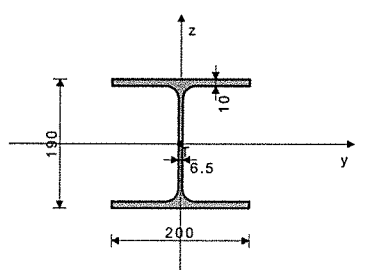
Kontrola napetosti - EUROCODE 3 (EN 1993-1-1:2005)

Opis	LC	σ [kN/cm ²]	τ [kN/cm ²]	σ_u [kN/cm ²]	Opis	LC	σ [kN/cm ²]	τ [kN/cm ²]	σ_u [kN/cm ²]
Set 1: IPBI 200					(5 - 3)	3	11.584	0.790	11.664
(2 - 5)	3	18.880	5.941	19.941	(6 - 5)	3	7.795	0.611	7.866
(2 - 1)	3	15.329	1.082	15.444	(6 - 4)	3	1.895	0.292	1.961

PALICA 5-2

PREČNI PREREZ: IPBI 200 [S 235]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIJSKE KARAKTERISTIKE prereza

(fy = 23.5 kN/cm², fu = 36.0 kN/cm²)

Ax =	53.800 cm ²
Ay =	35.750 cm ²
Az =	18.050 cm ²
Ix =	21.100 cm ⁴
Iy =	3690.0 cm ⁴
Iz =	1340.0 cm ⁴
Wy =	388.42 cm ³
Wz =	134.00 cm ³
Wy,pl =	420.70 cm ³
Wz,pl =	200.00 cm ³
γM0 =	1.100
γM1 =	1.100
γM2 =	1.250
Anet/A =	0.900

[mm]

Razmerje $N_{Ed} / N_{pl,Rd}$

Zmanjšana plast.upogibna nosilnost

Koefficient

Razmerje $(M_{y,Ed} / M_{N,y,Rd})^\alpha$ Pogoj 6.41: $(0.71 \leq 1)$

$N_{y,Rd} =$	89.876 kNm
$\alpha =$	2.000
	0.714

6.3 NOSILNOST ELEMENTA NA UKLON

6.3.1.1 Nosilnost na uklon

Uklonska dolžina y-y

Relativna vitkost y-y

Uklonska krivulja za os y-y: B

Elastična kritična sila

Koefficient nepopolnosti

Računska uklonska nosilnost

Pogoj 6.46: $N_{Ed} \leq N_{b,Rd,y}$ (19.53 $\leq$ 974.27)

$I_{y,y} =$	450.00 cm
$\lambda_{y,y} =$	0.579
$\alpha =$	0.340
$N_{cr,y} =$	3776.8 kN
$\chi_{y,y} =$	0.848
$N_{b,Rd,y} =$	974.27 kN

Uklonska dolžina z-z

Relativna vitkost z-z

Uklonska krivulja za os z-z: C

Koefficient nepopolnosti

Računska uklonska nosilnost

Pogoj 6.46: $N_{Ed} \leq N_{b,Rd,z}$ (19.53 $\leq$ 647.56)

$I_{z,z} =$	450.00 cm
$\lambda_{z,z} =$	0.960
$\alpha =$	0.490
$\chi_{z,z} =$	0.563
$N_{b,Rd,z} =$	647.56 kN

FAKTORJI IZKORIŠČENOSTI PO KOMBINACIJAH OBTEŽB

3. $\gamma = 0.96$	4. $\gamma = 0.83$	5. $\gamma = 0.53$
6. $\gamma = 0.39$		

PALICA IZPOSTAVLJENA PRITISKU IN UPOGIBU
(obtežni primer 3, na 150.0 cm od začetka palice)

Računska osna sila	$N_{Ed} =$	-19.528 kN
Prečna sila v z smeri	$V_{Ed,z} =$	8.872 kN
Upogibni moment okoli y osi	$M_{Ed,y} =$	75.920 kNm
Sistemska dolžina palice	$L =$	450.00 cm

5.5 KLASIFIKACIJA PREČNIH PREREZOV
Razred prereza 1

6.2 NOSILNOST PREČNIH PREREZOV

6.2.4 Tlak

Računska nosilnost na tlak

Pogoj 6.9: $N_{Ed} \leq N_{c,Rd}$ (19.53 $\leq$ 1149.36) $N_{c,Rd} =$ 1149.4 kN

6.2.5 Upogib y-y

Plastični odpornostni moment

Računska nosilnost na upogib

Pogoj 6.12: $M_{Ed,y} \leq M_{c,Rd,y}$ (75.92 $\leq$ 89.88) $W_{y,pl} =$ 420.70 cm³ $M_{c,Rd} =$ 89.876 kNm

6.2.6 Strig

Računska strižna nosilnost

Računska strižna nosilnost

Pogoj 6.17: $V_{Ed,z} \leq V_{c,Rd,z}$ (8.87 $\leq$ 222.63) $V_{pl,Rd,z} =$ 222.63 kN $V_{c,Rd,z} =$ 222.63 kN

6.2.10 Upogib z osno in prečno silo

Ni potrebno zmanjšanje upogibne nosilnosti

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

6.2.9 Upogib in osna sila

6.3.2.1 Nosilnost na bočno-torzijski uklon

Koefficient

Koefficient

Koefficient

Koeff. ukl. dolžine za uklon

Koeff. ukl. dolžine za vbočenje

Koordinata

Koordinata

Razmak med bočnimi podporami

Sektorski vztrajnostni moment

Krit.moment bočne zvrnitve

Ustrezni odpornostni moment

Koefficient imperf.

Brezdimenz.vitkost

Koefficient zmanjšanja

Računska uklonska nosilnost

Pogoj 5.48: $M_{Ed,y} \leq M_{b,Rd}$ (75.92 $\leq$ 79.08)

$C1 =$	1.285
$C2 =$	1.562
$C3 =$	0.753
$k =$	1.000
$kw =$	1.000
$z_g =$	0.000 cm
$z_j =$	0.000 cm
$L =$	450.00 cm
$I_w =$	1.08e+5 cm ⁶
$M_{cr} =$	252.25 kNm
$W_{y,y} =$	420.70 cm ³
$\alpha_{LT} =$	0.210
$\lambda_{LT} =$	0.626
$\chi_{LT} =$	0.880
$M_{b,Rd} =$	79.077 kNm

6.3.3. Elementi konstantnega prečnega prereza obremenjeni z upogibom in osnim tlakom

Preračun koefficienta interakcije je izvršen z alternativno

metodo št.2 (Aneks B)

Koefficient oblike momenta

Koefficient oblike momenta

Koefficient oblike momenta

Koefficient interakcije

Koefficient interakcije

Koefficient interakcije

Koefficient interakcije

$C_{my} =$	0.903
$C_{mz} =$	1.000
$C_{mLT} =$	0.903
$k_{yy} =$	0.910
$k_{yz} =$	0.624
$k_{zy} =$	0.546
$k_{zz} =$	1.040

Koefficient nepopolnosti

 $N_{Ed} / (\chi_y N_{Rk} / \gamma_{M1})$ $k_{yy} * (M_{y,Ed} + \Delta M_{y,Ed}) / \dots$ Pogoj 6.61: $(0.89 \leq 1)$

$\chi_y =$	0.848
	0.020
	0.873

Koefficient nepopolnosti

 $\chi_z =$ 0.563

$N_{Ed} / (\chi_z N_{Rk} / \gamma M1)$	0.030	Upogibni moment okoli y osi	$M_{Ed,y} =$	-54.678 kNm
$k_{zy} * (M_{yEd} + \Delta M_{yEd}) / \dots$	0.524	Sistemska dolžina palice	$L =$	450.00 cm
Pogoj 6.62: $(0.55 \leq 1)$				
6.2 NOSILNOST PREČNIH PREREZOV				
6.2.6 Strig				
Računska strižna nosilnost			$V_{pl,Rd,z} =$	222.63 kN
Računska strižna nosilnost			$V_{c,Rd,z} =$	222.63 kN
Pogoj 6.17: $V_{Ed,z} \leq V_{c,Rd,z}$ ($107.24 \leq 222.63$)				
KONTROLA STRIŽNE NOSILNOSTI				
(obtežni primer 3, začetek palice)				
Računska osna sila	$N_{Ed} =$	-19.528 kN		
Prečna sila v z smeri	$V_{Ed,z} =$	-107.24 kN		

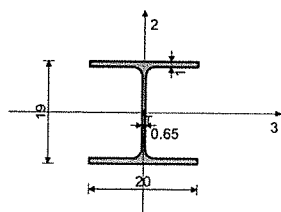
Poz 201 (jeklen okvir)

Tabele materialov

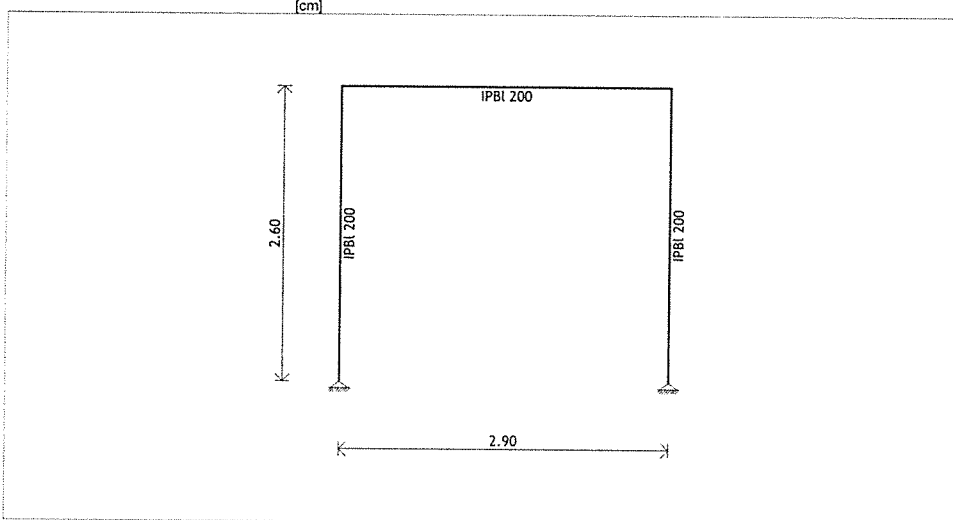
No	Naziv materiala	E[kN/m ²]	μ	γ [kN/m ³]	α [1/C]	Em[kN/m ²]	μ m
1	Jeklo	2.100e+8	0.30	78.50	1.000e-5	2.100e+8	0.30

Seti gred

Set: 1 Prerez: IPB1 200, Fiktivna ekscentričnost



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



Lista obtežnih primerov

No	Naziv	pX [kN]	pY [kN]	pZ [kN]
1	stalna (g)	0.00	0.00	-78.82
2	koristna	0.00	0.00	-30.16
3	Komb.: 1.35xI+1.5xII	0.00	0.00	-151.65

No	Naziv	pX [kN]	pY [kN]	pZ [kN]
4	Komb.: I+1.5xII	0.00	0.00	-124.06
5	Komb.: 1.35xI	0.00	0.00	-106.41
6	Komb.: I	0.00	0.00	-78.82

stalna:

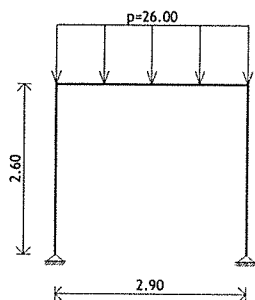
$$g = 0.12 \times 25 \times 2.6 = 7.8 \times 2 = 15.60 \text{ kN/m'} \text{ (od plošče)}$$

$$g = 0.20 \times 20 \times 2.6 = 10.40 \text{ (od zidu)}$$

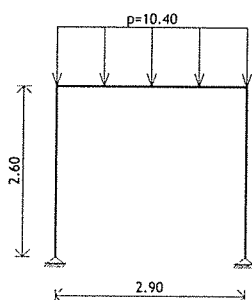
koristna:

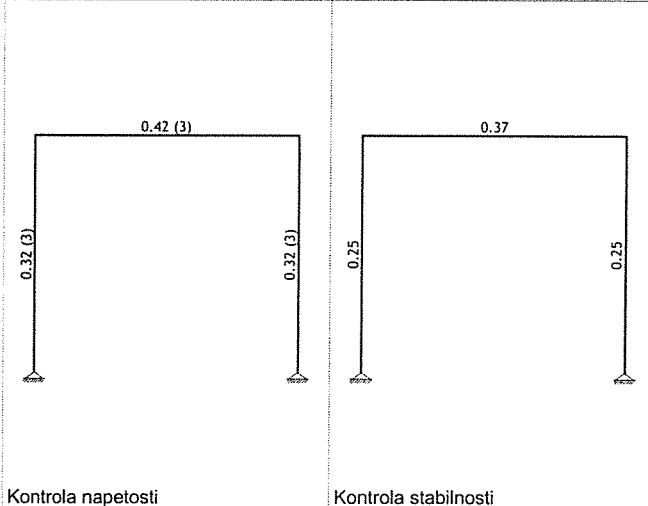
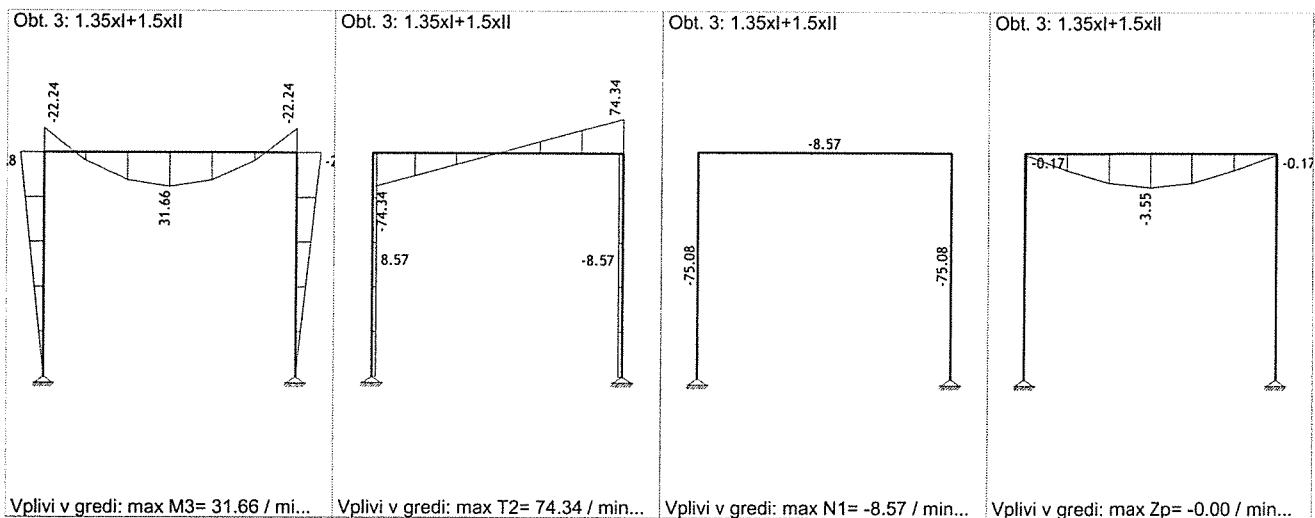
$$q = 2.00 \times 2.6 = 5.20 \times 2 = 10.40 \text{ kN/m'}$$

Obt. 1: stalna (g)



Obt. 2: koristna





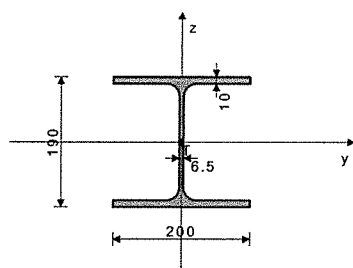
Kontrola napetosti - EUROCODE 3 (EN 1993-1-1:2005)

Opis	LC	σ [kN/cm ²]	τ [kN/cm ²]	σ_u [kN/cm ²]
Set 1: IPBI 200 (2 - 4)	3	7.871	4.119	9.065

PALICA 4-2

PREČNI PREREZ: IPBI 200 [S 235]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIJSKE KARAKTERISTIKE prereza



($f_y = 23.5$ kN/cm², $f_u = 36.0$ kN/cm²)

$A_x =$	53.800 cm ²
$A_y =$	35.750 cm ²
$A_z =$	18.050 cm ²
$I_x =$	21.100 cm ⁴
$I_y =$	3690.0 cm ⁴
$I_z =$	1340.0 cm ⁴
$W_y =$	388.42 cm ³
$W_z =$	134.00 cm ³
$W_{y,pl} =$	420.70 cm ³
$W_{z,pl} =$	200.00 cm ³
$\gamma_{M0} =$	1.100
$\gamma_{M1} =$	1.100
$\gamma_{M2} =$	1.250
$A_{net}/A =$	0.900

[mm]

FAKTORJI IZKORIŠČENOSTI PO KOMBINACIJAH OBTEŽB

3. $\gamma = 0.37$	4. $\gamma = 0.31$	5. $\gamma = 0.26$
6. $\gamma = 0.19$		

PALICA IZPOSTAVLJENA PRITISKU IN UPOGIBU (obtežni primer 3, na 145.0 cm od začetka palice)

Računska osna sila	$N_{Ed} =$	-8.568 kN
Upogibni moment okoli y osi	$M_{Ed,y} =$	31.620 kNm
Sistemska dolžina palice	$L =$	290.00 cm

5.5 KLASIFIKACIJA PREČNIH PREREZOV

Razred prereza 1

6.2 NOSILNOST PREČNIH PREREZOV

6.2.4 Tlak

Računska nosilnost na tlak

Pogoj 6.9: $N_{Ed} \leq N_{c,Rd}$ (8.57 <= 1149.36)

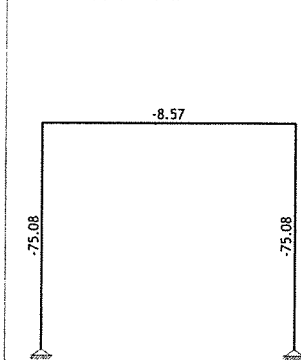
$N_{c,Rd} =$ 1149.4 kN

6.2.5 Upogib y-y

Plastični odpornostni moment

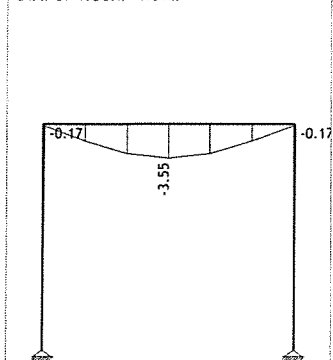
$W_{y,pl} =$ 420.70 cm³

Obt. 3: 1.35xl+1.5xll



Vplivi v gredi: max N1= -8.57 / min...

Obt. 3: 1.35xl+1.5xll



Vplivi v gredi: max Zp= -0.00 / min...

Opis	LC	σ [kN/cm ²]	τ [kN/cm ²]	σ_u [kN/cm ²]
(2 - 1)	3	6.815	0.475	6.865
(4 - 3)	3	6.815	0.475	6.865

Računska nosilnost na upogib

Pogoj 6.12: $M_{Ed,y} \leq M_{c,Rd,y}$ (31.62 <= 89.88)

$M_{c,Rd} =$ 89.876 kNm

6.2.9 Upogib in osna sila

Razmerje $N_{Ed} / N_{pl,Rd}$

Zmanjšana plast.upogibna nosilnost

Koeficient

Razmerje ($M_{y,Ed} / M_{N,y,Rd}$) ^{α}

Pogoj 6.41: (0.12 <= 1)

$M_{N,y,Rd} =$	0.007
$\alpha =$	2.000
	0.124

6.3 NOSILNOST ELEMENTA NA UKLON

6.3.1.1 Nosilnost na uklon

Uklonska dolžina y-y

Relativna vrtkost y-y

Uklonska krivulja za os y-y: B

Elastična kritična sila

Koeficient nepopolnosti

Računska uklonska nosilnost

Pogoj 6.46: $N_{Ed} \leq N_{b,Rd,y}$ (8.57 <= 1076.61)

$I_{y,z} =$	290.00 cm
$\lambda_{y,z} =$	0.373
$\alpha =$	0.340
$N_{cr,y} =$	9093.9 kN
$\chi_{y,z} =$	0.937
$N_{b,Rd,y} =$	1076.6 kN

Uklonska dolžina z-z

Relativna vrtkost z-z

Uklonska krivulja za os z-z: C

Koeficient nepopolnosti

Računska uklonska nosilnost

Pogoj 6.46: $N_{Ed} \leq N_{b,Rd,z}$ (8.57 <= 889.86)

$I_{y,z} =$	290.00 cm
$\lambda_{y,z} =$	0.619
$\alpha =$	0.490
$\chi_{y,z} =$	0.774
$N_{b,Rd,z} =$	889.86 kN

6.3.2.1 Nosilnost na bočno-torzijski uklon

Koeficient

Koeficient

Koeficient

Koef.ukl.dolžine za uklon

Koef.ukl.dolžine za vbočenje

Koordinata

Koordinata

Razmak med bočnimi podporami

Sektorski vztrajnostni moment

Krit.moment bočne zvrtilne

Ustrezni odpornostni moment

Koeficient imperf.

Brezdimenz.vitkost

Koeficient zmanjšanja

Računska uklonska nosilnost

Pogoj 5.48: $M_{Ed,y} \leq M_{b,Rd}$ (31.62 <= 84.40)

$C1 =$	1.285
$C2 =$	1.562
$C3 =$	0.753
$k =$	1.000
$k_w =$	1.000
$z_g =$	0.000 cm
$z_j =$	0.000 cm
$L =$	290.00 cm
$I_w =$	1.08e+5 cm ⁶
$M_{cr} =$	487.92 kNm
$W_{y,z} =$	420.70 cm ³
$\alpha_L =$	0.210
$\lambda_{LT} =$	0.450
$\chi_{LT} =$	0.939
$M_{b,Rd} =$	84.401 kNm

6.3.3. Elementi konstantnega prečnega prereza obremenjeni z upogibom in osnim tlakom

Preračun koeficienta interakcije je izvršen z alternativno metodo št.2 (Aneks B)

Koeficient oblike momenta	$C_{my} =$	0.915
Koeficient oblike momenta	$C_{mz} =$	1.000
Koeficient oblike momenta	$C_{mLT} =$	0.915
Koeficient interakcije	$k_{yy} =$	0.916
Koeficient interakcije	$k_{yz} =$	0.604
Koeficient interakcije	$k_{zy} =$	0.550
Koeficient interakcije	$k_{zz} =$	1.006

Koeficient nepopolnosti	$\chi_y =$	0.937
$N_{Ed} / (\chi_y N_{Rk} / \gamma M1)$		0.008
$k_{yy} * (M_{yEd} + \Delta M_{yEd}) / \dots$		0.343

Pogoj 6.61: $(0.35 \leq 1)$

Koeficient nepopolnosti	$\chi_z =$	0.774
$N_{Ed} / (\chi_z N_{Rk} / \gamma M1)$		0.010

$$k_{zy} * (M_{yEd} + \Delta M_{yEd}) / \dots$$

Pogoj 6.62: $(0.22 \leq 1)$

0.206

KONTROLA STRIŽNE NOSILNOSTI (obtežni primer 3, začetek palice)

Računska osna sila	$N_{Ed} =$	-8.568 kN
Prečna sila v z smeri	$V_{Ed,z} =$	-74.342 kN
Upogibni moment okoli y osi	$M_{Ed,y} =$	-22.278 kNm
Sistemska dolžina palice	$L =$	290.00 cm

6.2 NOSILNOST PREČNIH PREREZOV

6.2.6 Strig

Računska strižna nosilnost	$V_{pl,Rd,z} =$	222.63 kN
Računska strižna nosilnost	$V_{c,Rd,z} =$	222.63 kN

Pogoj 6.17: $V_{Ed,z} \leq V_{c,Rd,z} (74.34 \leq 222.63)$

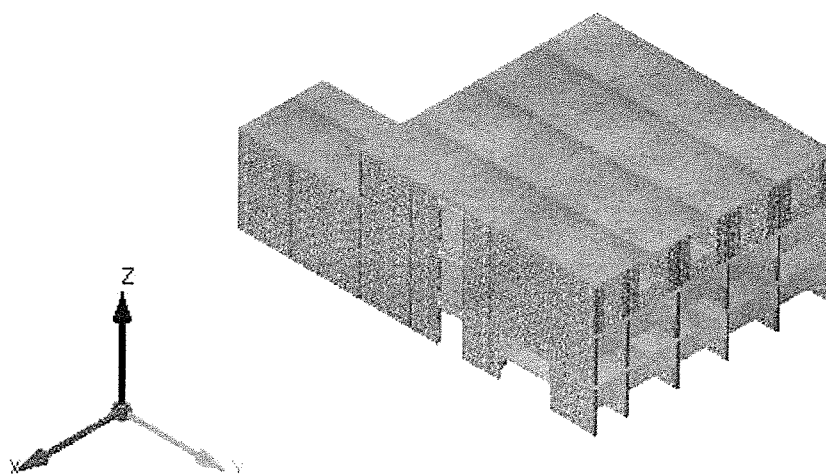
POZ O1-On, ojačitve okoli novih odprtín za vrata v AB stenah:

Obojestranska ojačitev okoli novih odprtín z karbonskimi lamelami S512.

POZ P1 - Pn, AB preklade nad novimi odprtínami za vrata v zidanih stenah:

Zadošča: $\pm 3\phi 14$, str. $\phi 8/15$ cm

POROČILO ANALIZE PUSHOVER



Analiza	Mejno stanje	DLS ncilj [mm]	DLS kapacit eta [mm]	ULS cilj x 1,50 [mm]:	ULS kapacit eta [mm]	Varnos tni faktor DLS [%]	Varnos tni faktor ULS [%]	Faktor dodatne nosilnos ti	Max napaka [%]
X+, exc. pos, tri	Pogoji izpolnjeni	4,841	14,537	14,522	14,537	66,702	0,105	2,508	0,342
Y+, exc. pos, tri	Pogoji izpolnjeni	0,586	1,873	1,758	1,873	68,711	6,133	21,144	0,377

2.0 Parametri analize

Standard objekta: Slovenia

Kategorja pomembnosti za stavbe: III

Gamma M	2,200
Gamma C	1,500
Gamma S	1,150
Analza PushoverGamma_Gp	1,000
StatikaGamma_Gs	1,350
Analiza Pushover Phi_L	0,800
Analiza PushoverPsi_2L	0,300
StatikaGamma_QL	1,500
Analiza PushoverPhi_S	1,000
Analiza Pushover Psi_2S	0,000
StatikaGamma_Qs	1,500
StatikaPsi_0,S	0,500

(si90bojestranski pomik nadstropja:

Material	Pomik zaradi upogiba	Pomik zaradi striga
Zidovje	0,00800	0,00400
Armirano zidovje	0,00800	0,00400
Armirani beton	0,0110	0,0110

Omejitev poškodb:	0,00500
Koeficient razpok:	0,500
Faktor pomembnosti(Gamma_I):	1,000
Uporabiti srednje vrednosti(PushOver)	Da
P_d	1,500
P_F	0,800
Ekscentričnost obtežbe[%]:	5,000

3.0 Potresni parametri

Tip tal:: B

Tip spektra: 1

Razmerje viskoznega dušenja konstrukcije: 5,000

Projektni pospešek tal: 0,200g

Faktor tal (S):: 1,200

Perioda B: 0,150

Perioda C: 0,500

Perioda D: 2,000

Dinamični amplif. factor beta0: 2,500

4.0 Obtežba stropa

Ime	Stalna obtežba[kN/m ²]	Trajnaobtežba [kN/m ²]	Analiza PushoverGamma_Gp	StatikaGamma_Gs
Etaža 0,000 - 2,800	3,000	2,500	1,000	1,350
Etaža 2,800 - 5,600	3,000	2,500	1,000	1,350
Etaža 5,600 - 8,400	3,000	9,000	1,000	1,350

Ime	Spremenljiva obtežba[kN/m ²]	Analiza Pushover Phi_L	Analiza PushoverPsi_2L	StatikaGamma_QL
Etaža 0,000 - 2,800	2,000	0,800	0,300	1,500
Etaža 2,800 - 5,600	2,000	0,800	0,300	1,500
Etaža 5,600 - 8,400	2,000	0,800	0,300	1,500

Ime	Obtežba zaradi snega[kN/m ²]	Analiza PushoverPhi_S	Analiza PushoverPsi_2S	StatikaGamma_Qs	StatikaPsi_0,S
Etaža 0,000 - 2,800	0,000	1,000	0,000	1,500	0,500
Etaža 2,800 -	0,000	1,000	0,000	1,500	0,500

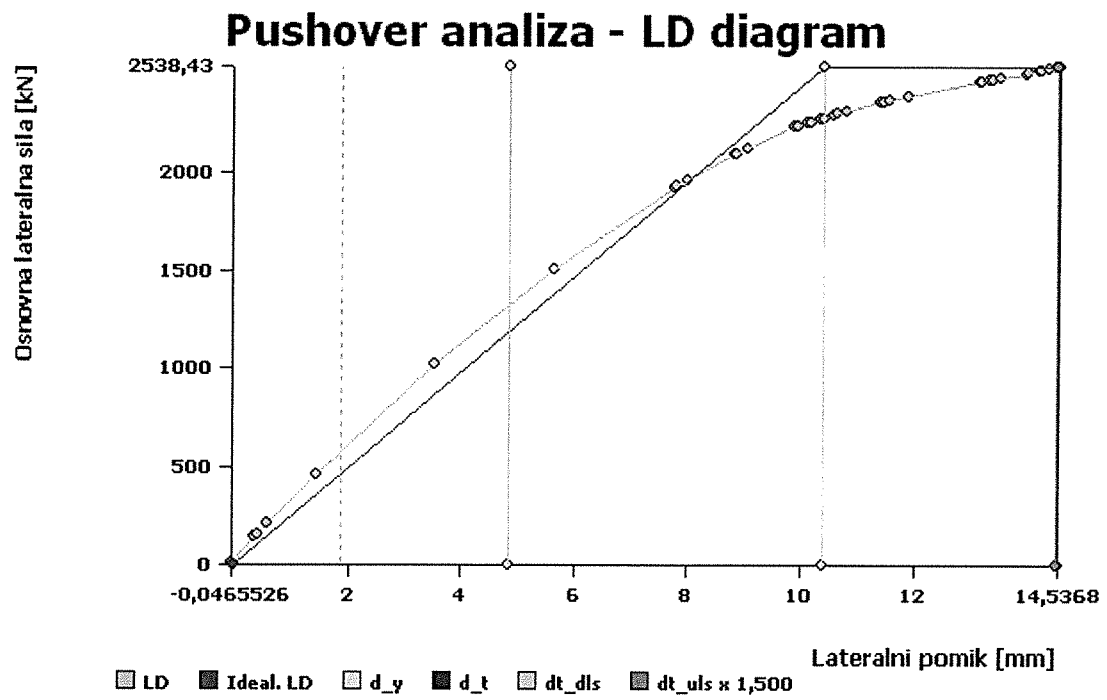
5,600					
Etaža 5,600 - 8,400	0,000	1,000	0,000	1,500	0,500

5.0 Rezultati

5.1 Analiza X+, exc. pos, tri

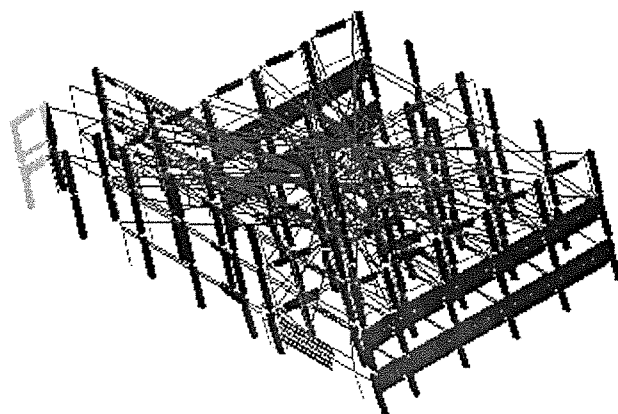
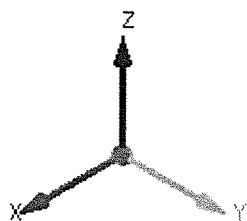
Povzetek

DLS cilj [mm]: = dt_dls	4,841
DLS kapaciteta [mm]	14,537
ULS cilj x 1,50 [mm] = dt_uls x 1,50:	14,522
ULS kapaciteta [mm] = d_t	14,537
Varnostni faktor DLS [%]	66,702
Varnostni faktor ULS [%]	0,105
Max napaka [%]	0,575
Nadstropje	1
RShift	0,00179
Dls kriterij	3,003
RShift kriterij	0,357
Uls kriterij	1,001
Dls korak Id	38
Uls korak Id	38
Obdobje T norm.	0,288
Max referenčni pospešek tal [m/s ²]	1,962
Duktilnost	1,774
Faktor dodatne nosilnosti	2,508
Elastic displacement [mm] = d_y	10,399

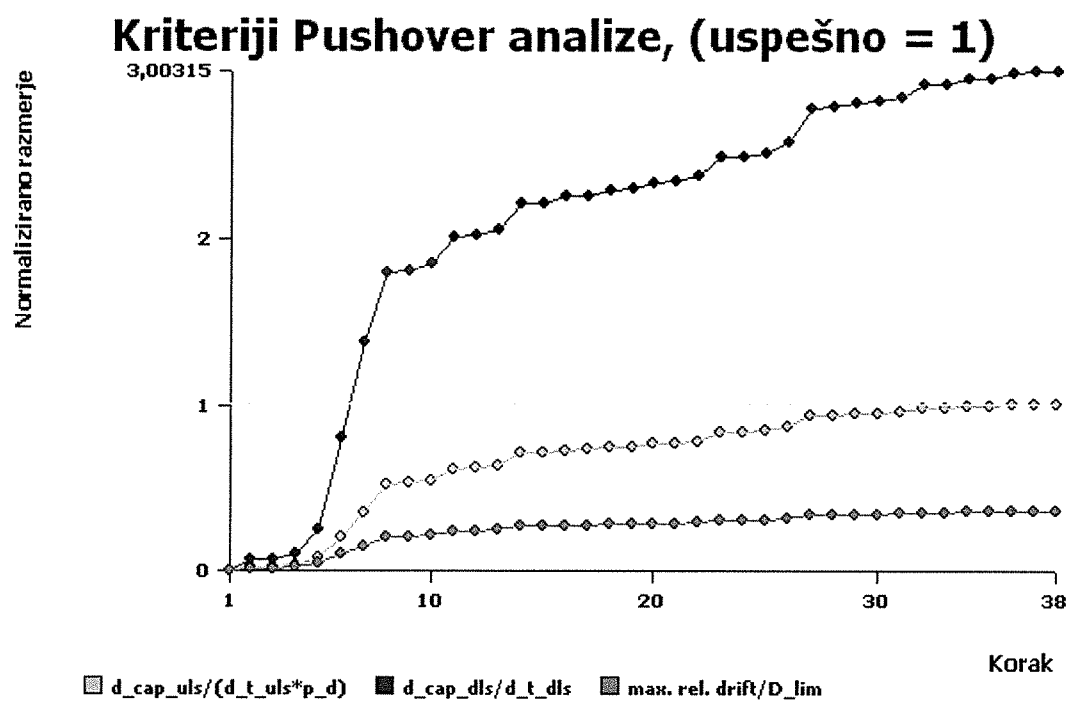


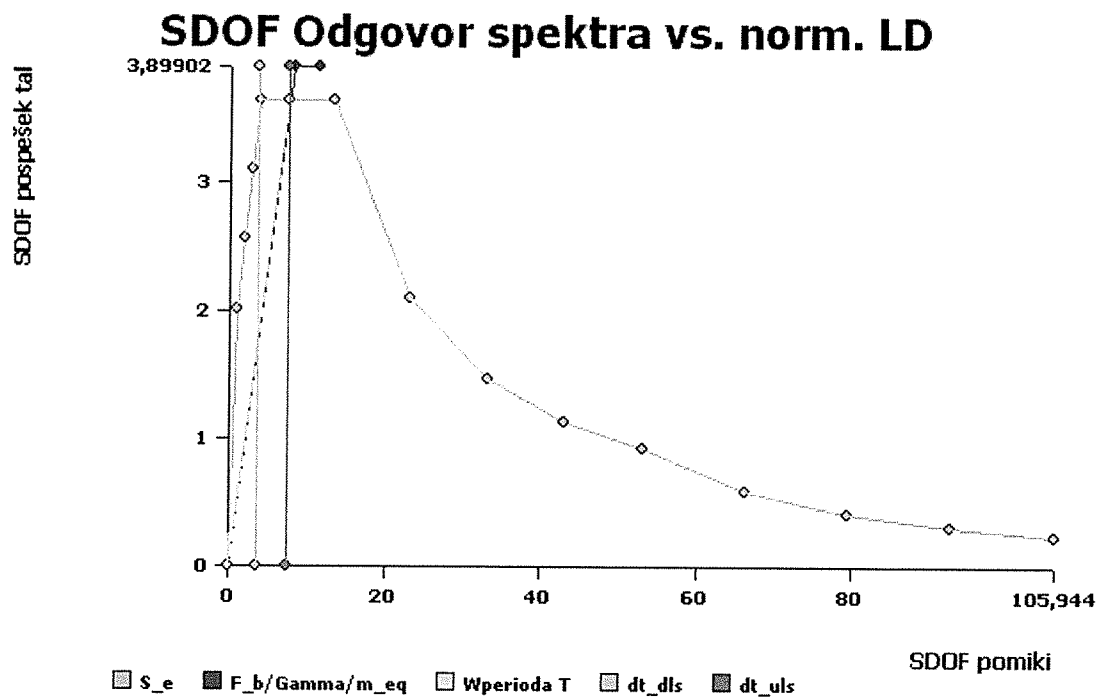
CF stopnja poškodbe [0-1]

1,0000
0,8750
0,7500
0,6250
0,5000
0,3750
0,2500
0,1250
0,0000



CF poškodba na zadnjem koraku, deformacija





(si)GAMMA_FACTOR_D:	1,269
(si)GAMMA_FACTOR_F:	1,269
(si)MASS_NORM:	513,064
(si)MASS:	824,379
(si)ETA_FACTOR:	1,000

Vertikalna obremenitev / kontrola reakcij:

Skupna obremenitev = $F_{z,sum}$: 8278,535

Skupne reakcije $F_z = R_{z,sum}$: 9105,10260

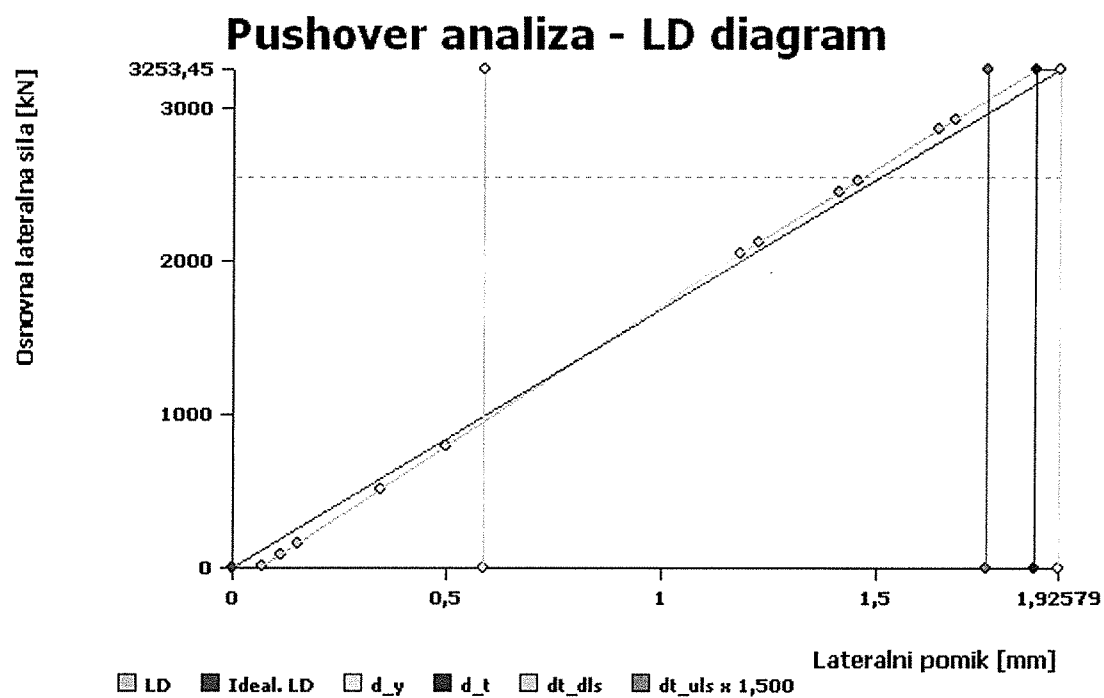
Vertikalno ravnovesje kontrola na ULS cilju:

$|F_{z,sum} - R_{z,sum}| = 826,6 \text{ kN (10 \%)}$

5.2 Analiza Y+, exc. pos, tri

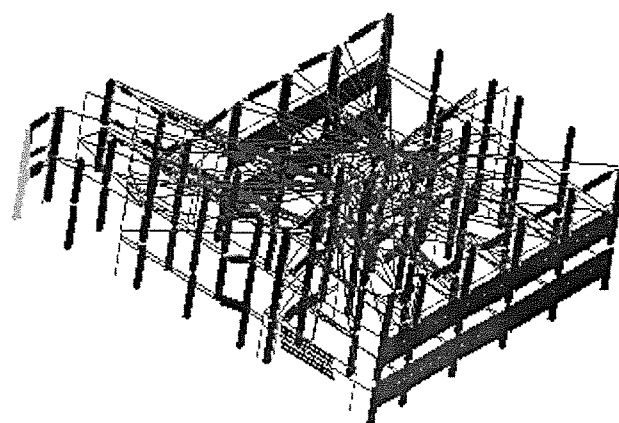
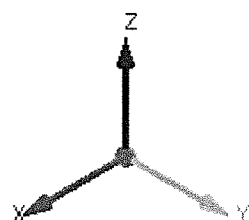
Povzetek

DLS cilj [mm]: = dt_dls	0,586
DLS kapaciteta [mm]	1,873
ULS cilj x 1,50 [mm] = dt_uls x 1,50:	1,758
ULS kapaciteta [mm] = d_t	1,873
Varnostni faktor DLS [%]	68,711
Varnostni faktor ULS [%]	6,133
Max napaka [%]	0,797
Nadstropje	3
RShift	0,000251
Dls kriterij	3,196
RShift kriterij	0,0501
Uls kriterij	1,065
Dls korak Id	12
Uls korak Id	12
Obdobje T norm.	0,109
Max referenčni pospešek tal [m/s ²]	1,289
Duktilnost	1,234
Faktor dodatne nosilnosti	21,144
Elastic displacement [mm] = d_y	1,926

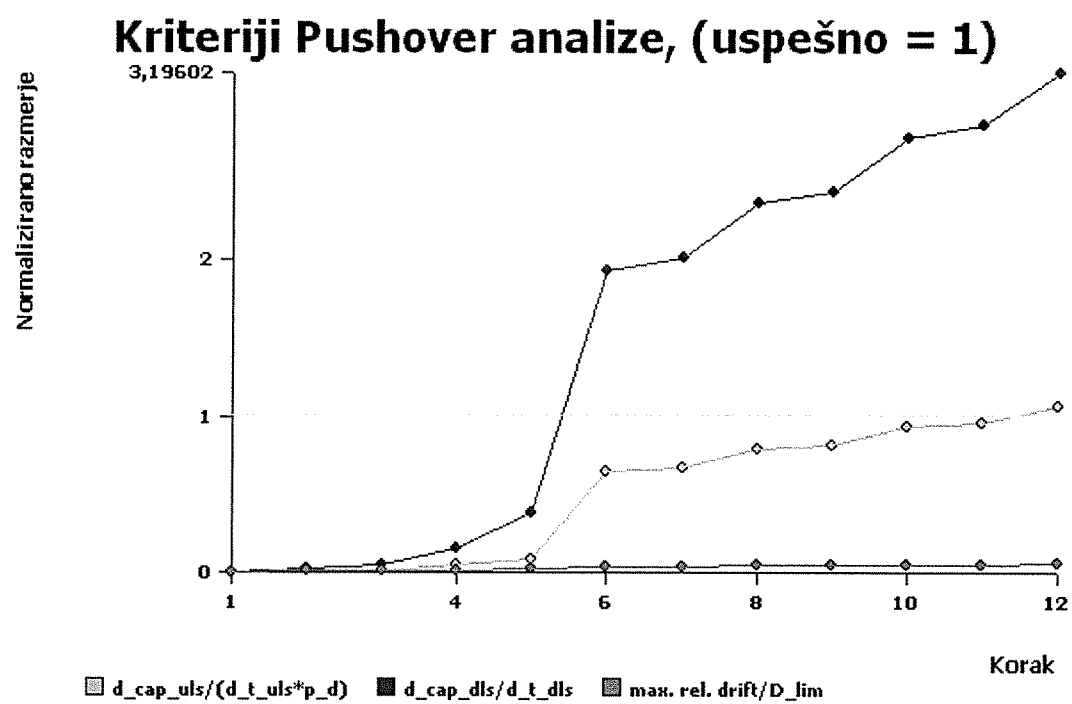


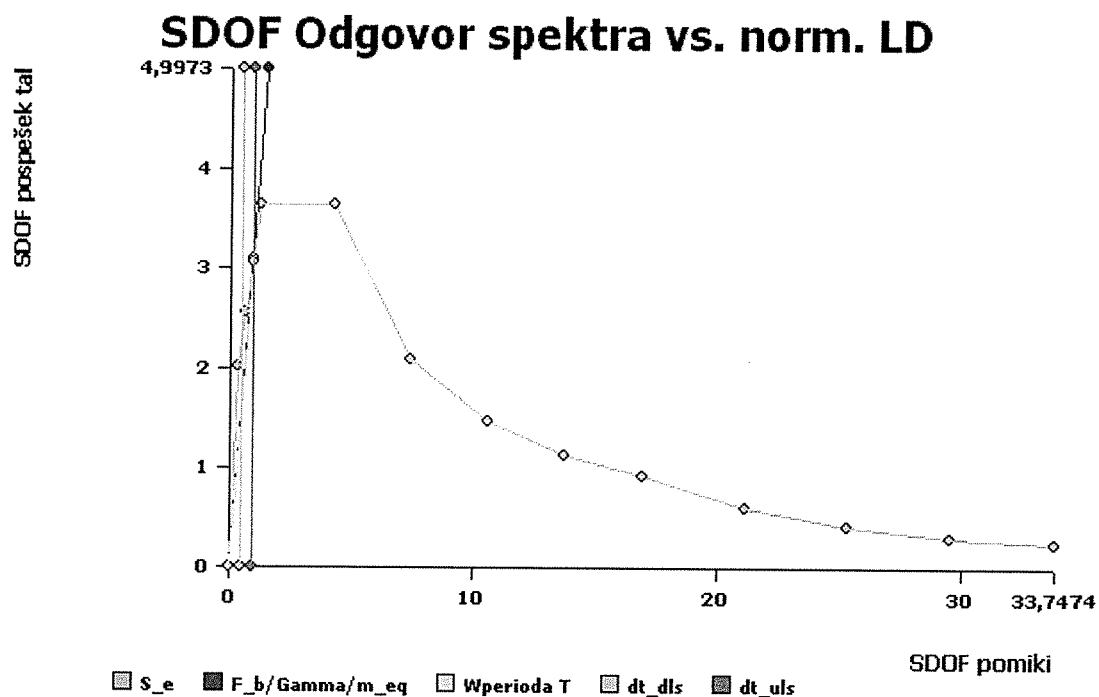
CF stopnja poškodbe [0-1]

1,0000
0,8750
0,7500
0,6250
0,5000
0,3750
0,2500
0,1250
0,0000



CF poškodba na zadnjem koraku, deformacija





(si)GAMMA_FACTOR_D:	1,269
(si)GAMMA_FACTOR_F:	1,269
(si)MASS_NORM:	513,064
(si)MASS:	824,379
(si)ETA_FACTOR:	1,000

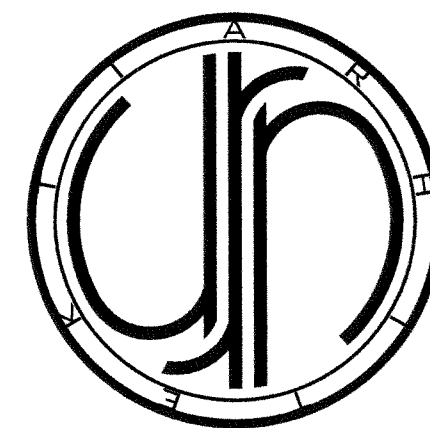
Vertikalna obremenitev / kontrola reakcij:

Skupna obremenitev = $F_{z,sum}$: 8278,535

Skupne reakcije $F_z = R_{z,sum}$: 8454,27483

Vertikalno ravnovesje kontrola na ULS cilju:

$|F_{z,sum} - R_{z,sum}| = 175,7 \text{ kN (2,1 \%)}$



POZICIJSKA RISBA KLET

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ARMATURA: S 400, S 500

INVESTITOR:
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GREGORČIČEVA 20, 1000 LJUBLJANA

OBJEKT:
DOM BOHINJ
Ribčev laz 63

VRSTA PROJEKTA/NAČRTA:
PGD, NAČRT GRADBENIH KONSTRUKCIJ

ODGOVORNI PROJEKTANT:
SLAVKO ZALAR, U.D.I.G., G-0731

ODGOVORNI VODJA PROJEKTA:
MAG. BRUNO URH, U.D.I.A., ZAPS 0100 A

ŠT. PROJEKTA:
150/2010/D

VSEBINA RISBE:
POZICIJSKA RISBA

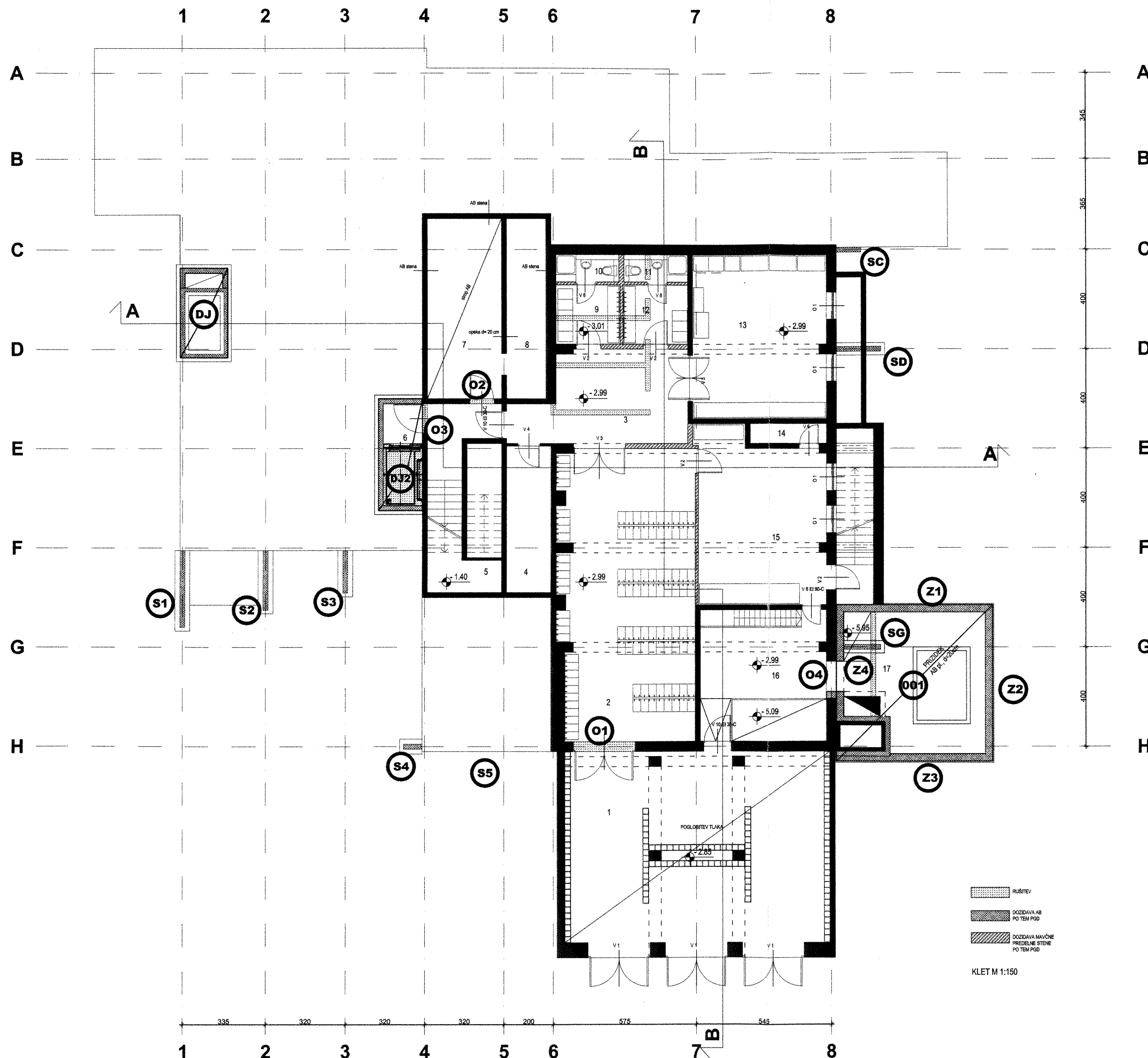
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1

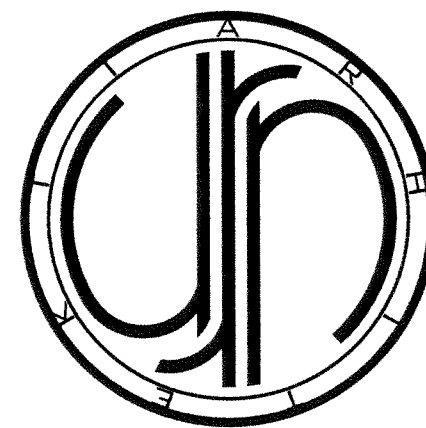
MERILO:

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DATUM:

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POZICIJSKA RISBA PRITLIČJE

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OBJEKT:
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ODGOVORNI PROJEKTANT:
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ODGOVORNI VODJA PROJEKTA:
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ŠT. PROJEKTA:
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VSEBINA RISBE:
POZICIJSKA RISBA

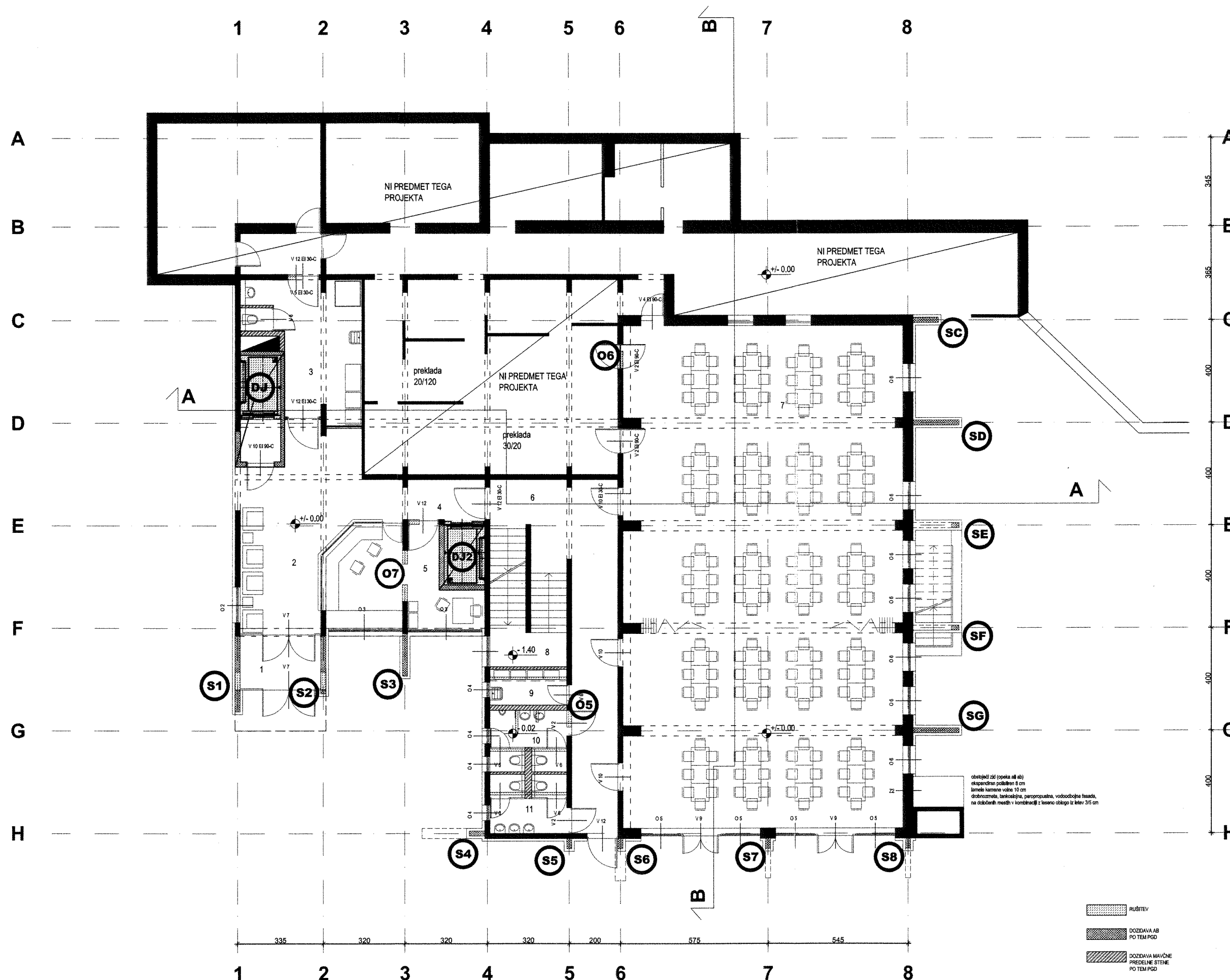
ŠT. RISBE:
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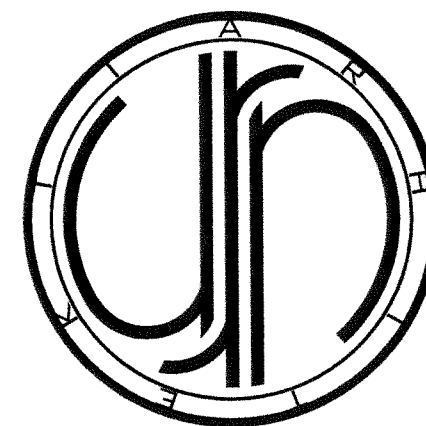
MERILO:

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DATUM:

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POZICIJSKA RISBA
1.NADSTROPJE

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OBJEKT:
DOM BOHINJ
Ribčev laz 63

VRSTA PROJEKTA/NAČRTA:
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ODGOVORNI PROJEKTANT:
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ODGOVORNI VODJA PROJEKTA:
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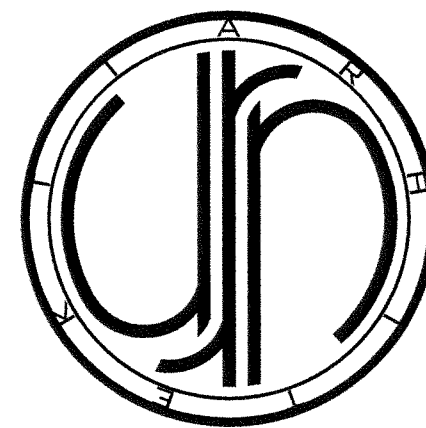
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150/2010/D

VSEBINA RISBE:
POZICIJSKA RISBA

ŠT. RISBE:
3

MERILO:
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POZICIJSKA RISBA
2.NADSTROPJE

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ARMATURA: S 400, S 500

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OBJEKT:
DOM BOHINJ
Ribčev laz 63

VRSTA PROJEKTA/NAČRTA:
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ODGOVORNI PROJEKTANT:
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ODGOVORNI VODJA PROJEKTA:
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ŠT. PROJEKTA:
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VSEBINA RISBE:
POZICIJSKA RISBA

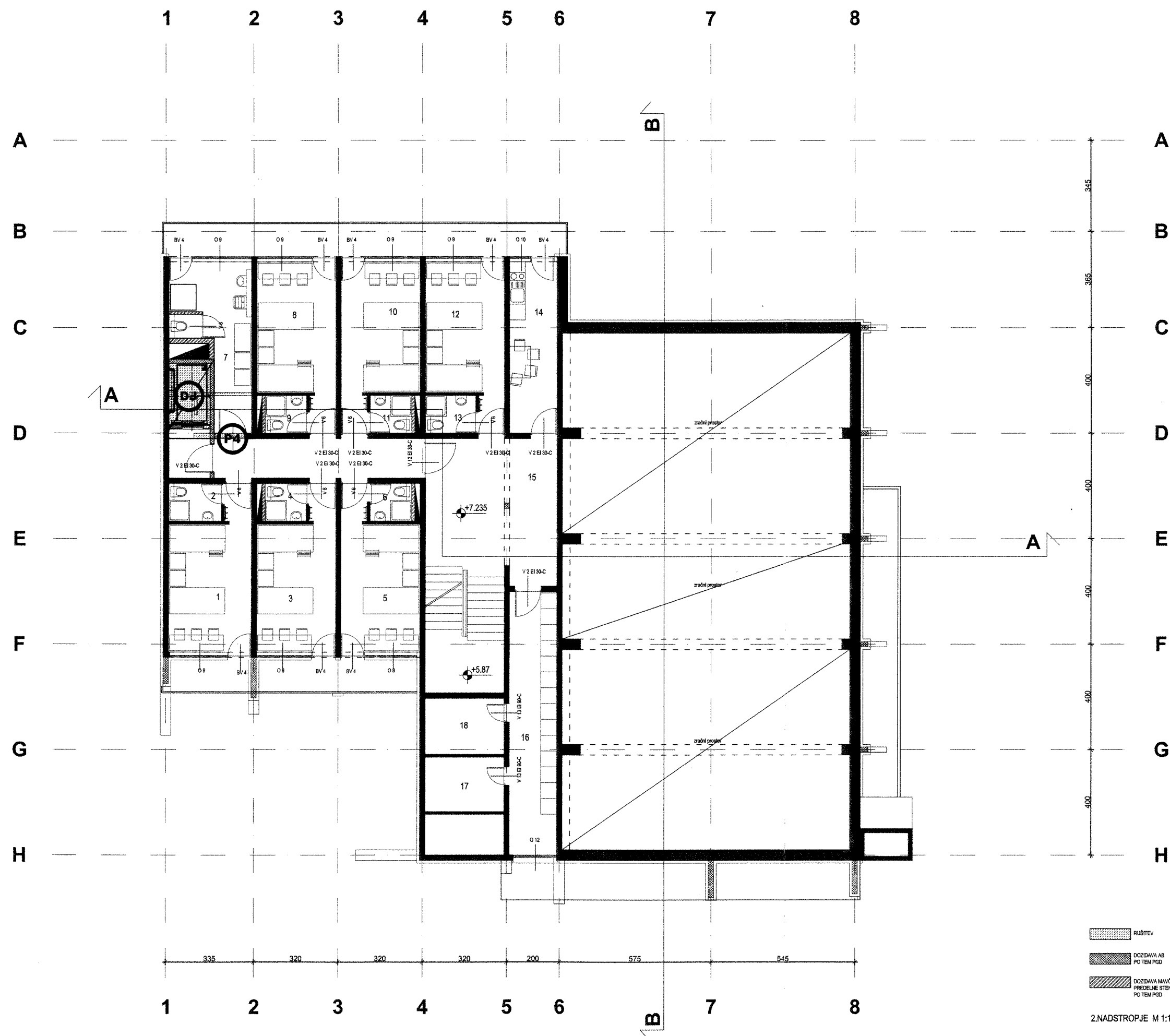
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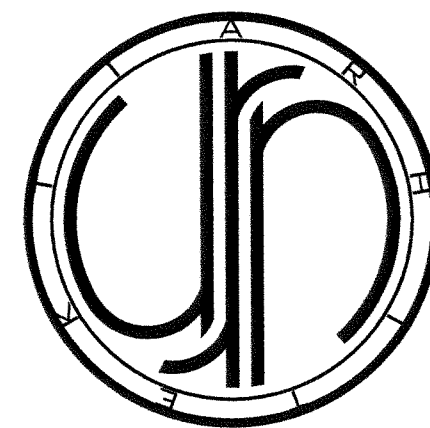
MERILO:

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DATUM:

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POZICIJSKA RISBA
3.NADSTROPJE

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ARMATURA: S 400, S 500

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OBJEKT:
DOM BOHINJ
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VRSTA PROJEKTA/NAČRTA:
PGD, NAČRT GRADBENIH KONSTRUKCIJ

ODGOVORNI PROJEKTANT:
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ODGOVORNI VODJA PROJEKTA:
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ŠT. PROJEKTA:
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VSEBINA RISBE:
POZICIJSKA RISBA

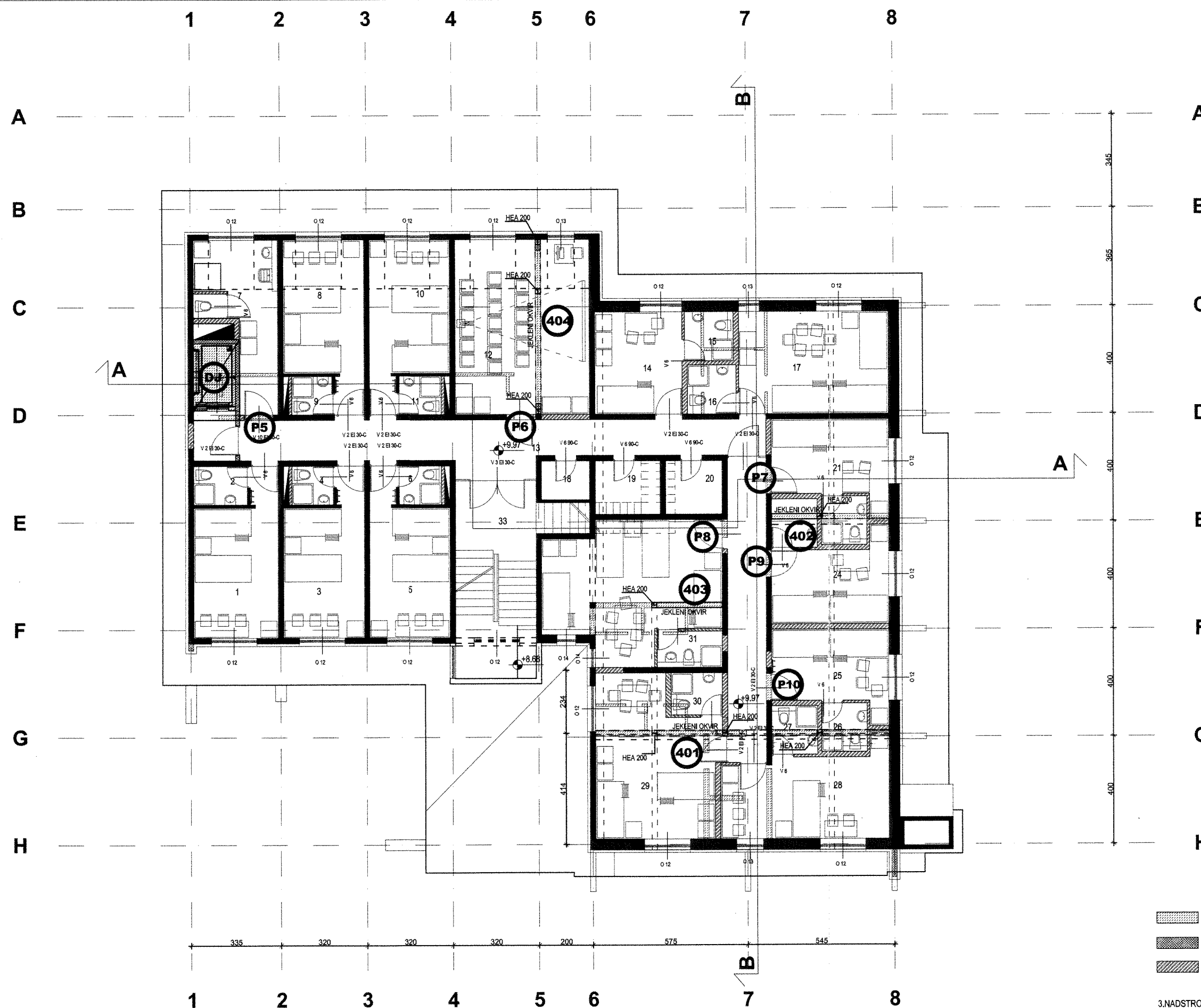
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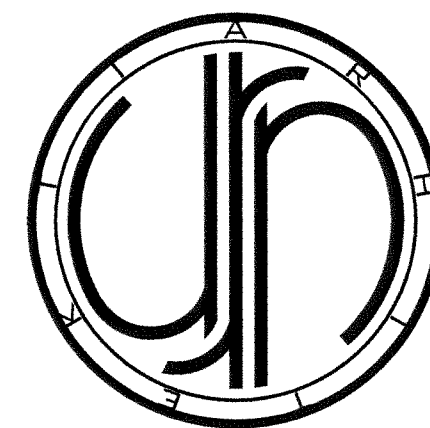
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DATUM:

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POZICIJSKA RISBA MANSARDA

BETON: C 20/25, C 25/30
ARMATURA: S 400, S 500

INVESTITOR:
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GREGORČIČEVA 20, 1000 LJUBLJANA

OBJEKT:
DOM BOHINJ
Ribčev laz 63

VRSTA PROJEKTA/NAČRTA:
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ODGOVORNI PROJEKTANT:
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ODGOVORNI VODJA PROJEKTA:
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ŠT. PROJEKTA:
150/2010/D

VSEBINA RISBE:
POZICIJSKA RISBA

ŠT. RISBE:
6

MERILO:

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DATUM:

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