STATIČNI RAČUN Vsebina

PRIZIDAVA POZ P1

Shema nivojev

Naziv	z [m]	h [m]
nad 2.nadstropjem	9.00	2.65
nad 1.nadstropjem	6.35	2.95

Naziv	z [m]	h [m]
nad pritličjem	3.40	3.40
temelj	0.00	

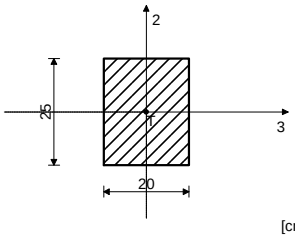
Tabele materialov

No	Naziv materiala	E[kN/m2]	μ	γ[kN/m3]	αt[1/C]	Em[kN/m2]	μm
1	Beton C 25	2.583e+7	0.20	25.00	1.000e-5	2.583e+7	0.20
2	Jeklo	2.100e+8	0.30	78.50	1.000e-5	2.100e+8	0.30
3	Beton MB 30	3.150e+7	0.20	25.00	1.000e-5	3.150e+7	0.20

Seti gred

Set: 1 Prerez: b/d=20/25, Fiktivna ekscentričnost

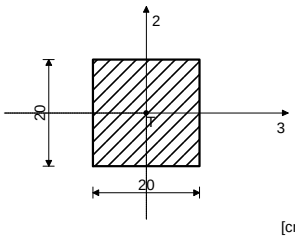
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton C 25	5.000e-2	4.167e-2	4.167e-2	3.421e-4	1.667e-4	2.604e-4



[cm]

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

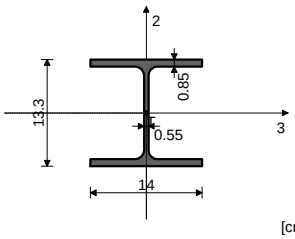
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton C 25	4.000e-2	3.333e-2	3.333e-2	2.253e-4	1.333e-4	1.333e-4



[cm]

Set: 3 Prerez: IPBl 140, Fiktivna ekscentričnost

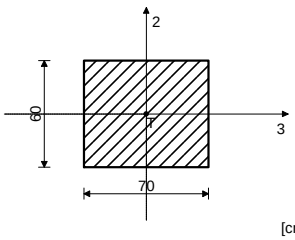
Mat.	A1	A2	A3	I1	I2	I3
2 - Jeklo	3.140e-3	1.011e-3	2.129e-3	8.160e-8	3.890e-6	1.030e-5



[cm]

Set: 4 Prerez: b/d=70/60, Fiktivna ekscentričnost

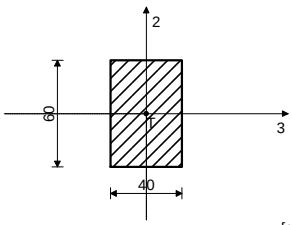
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton C 25	4.200e-1	3.500e-1	3.500e-1	2.441e-2	1.715e-2	1.260e-2



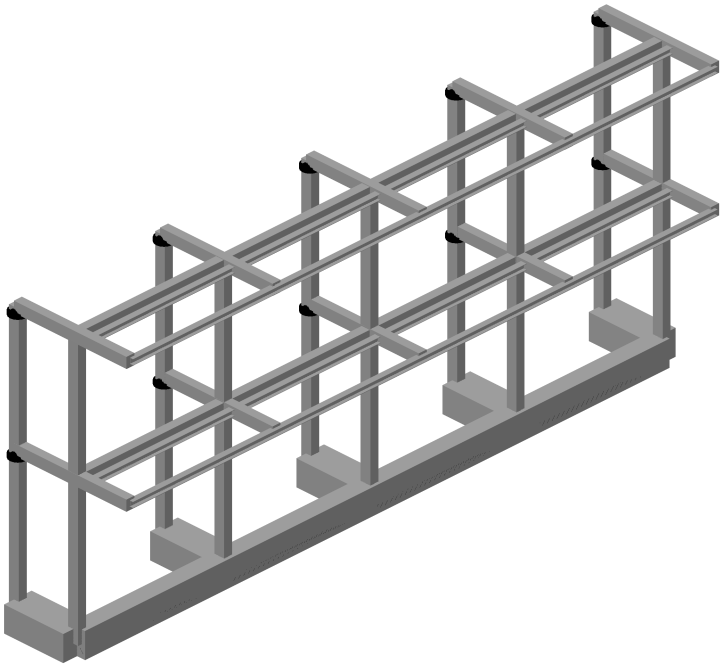
[cm]

Set: 5 Prerez: b/d=40/60, Fiktivna ekscentričnost

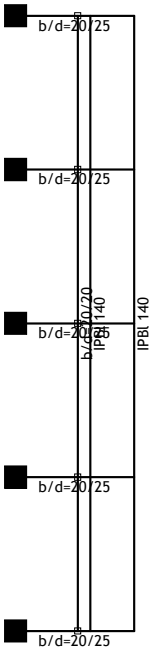
Mat.	A1	A2	A3	I1	I2	I3
3 - Beton MB 30	2.400e-1	2.000e-1	2.000e-1	7.512e-3	3.200e-3	7.200e-3



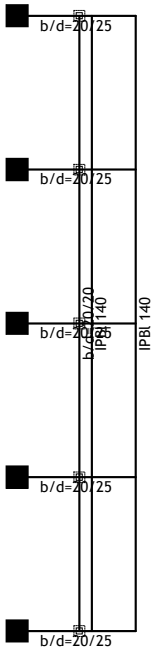
[cm]



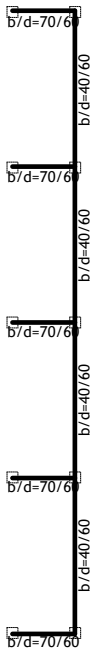
Izometrija



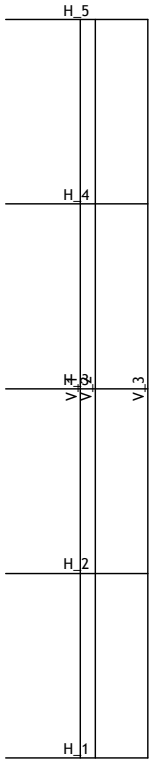
Nivo: nad 1.nadstropjem [6.35 m]



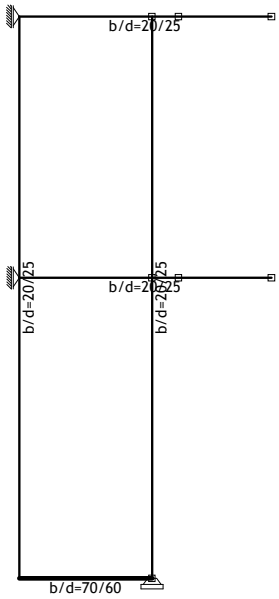
Nivo: nad pritličjem [3.40 m]



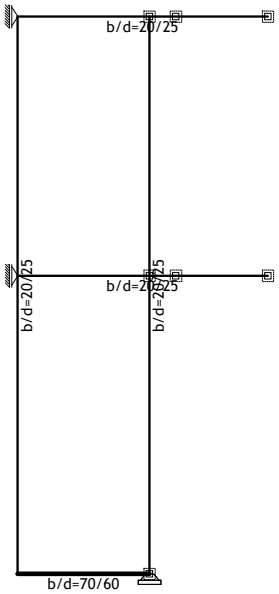
Nivo: temelj [0.00 m]



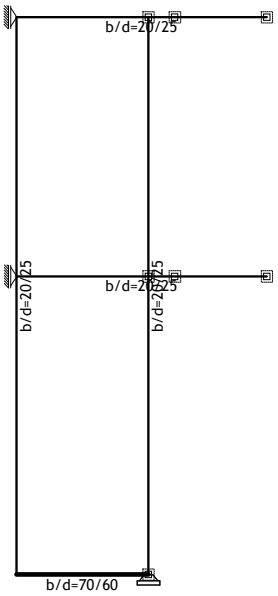
Dispozicija okvirjev



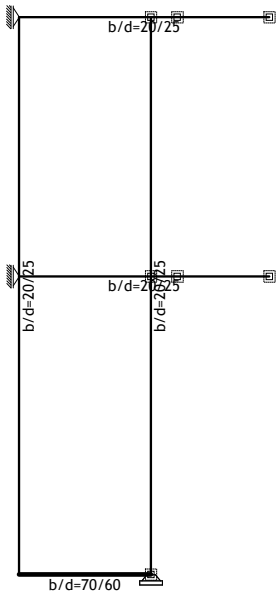
Okvir: H_1



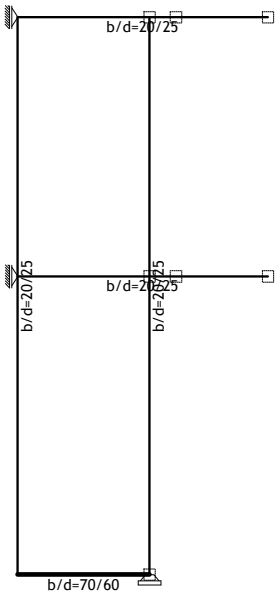
Okvir: H_2



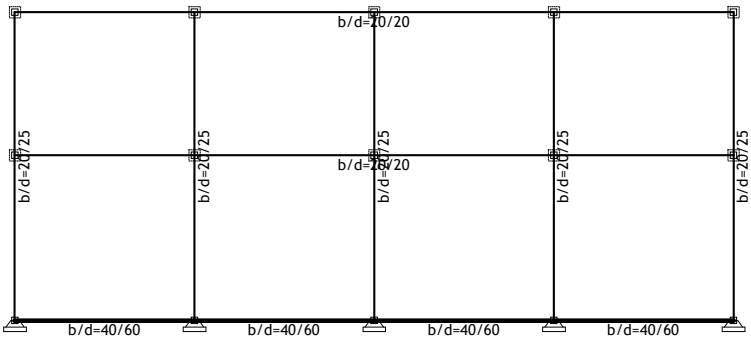
Okvir: H_3



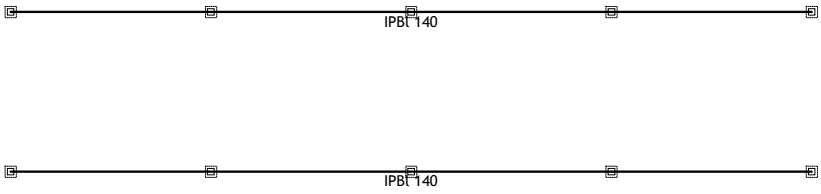
Okvir: H_4



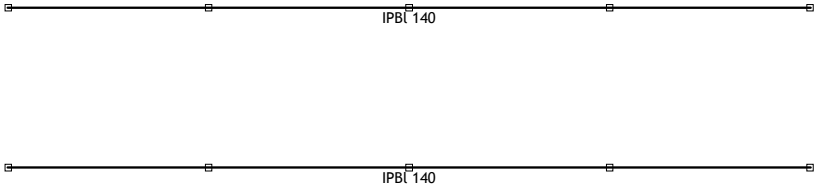
Okvir: H_5



Okvir: V_1



Okvir: V_2

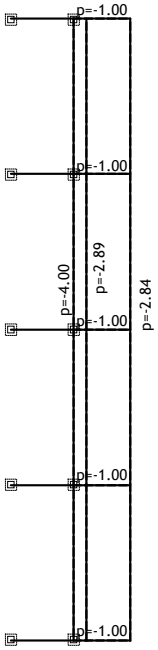


Okvir: V_3

Lista obtežnih primerov

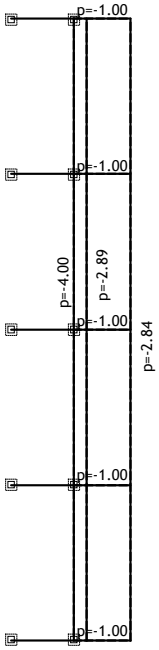
No	Naziv	pX [kN]	pY [kN]	pZ [kN]
1	stalna (g)	0.00	0.00	-762.99
2	koristna	0.00	0.00	-216.45
3	Komb.: 1.35xI+1.5xII	0.00	0.00	-1354.72
4	Komb.: I+1.5xII	0.00	0.00	-1087.67
5	Komb.: 1.35xI	0.00	0.00	-1030.04
6	Komb.: I	0.00	0.00	-762.99

Obt. 1: stalna (g)



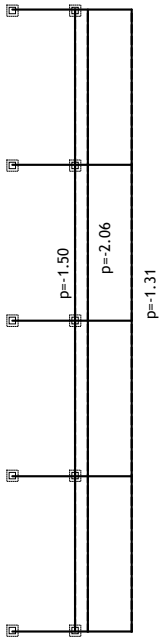
Nivo: nad 1.nadstropjem [6.35 m]

Obt. 1: stalna (g)



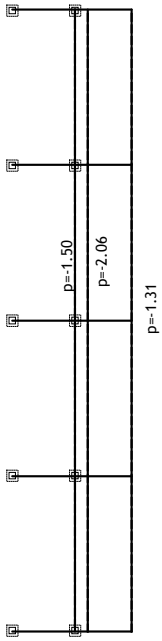
Nivo: nad pritličjem [3.40 m]

Obt. 2: koristna



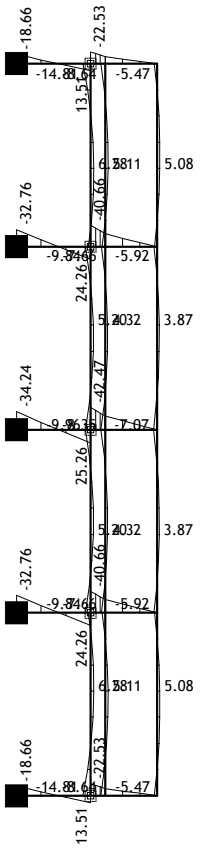
Nivo: nad 1.nadstropjem [6.35 m]

Obt. 2: koristna



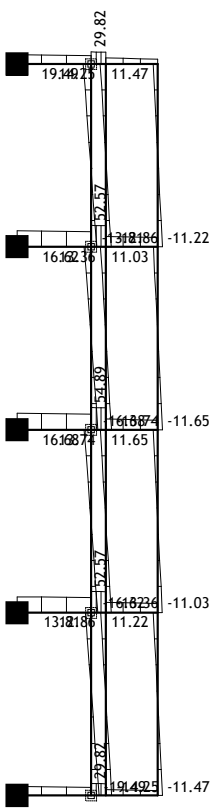
Nivo: nad pritličjem [3.40 m]

Obt. 3: 1.35xI+1.5xII



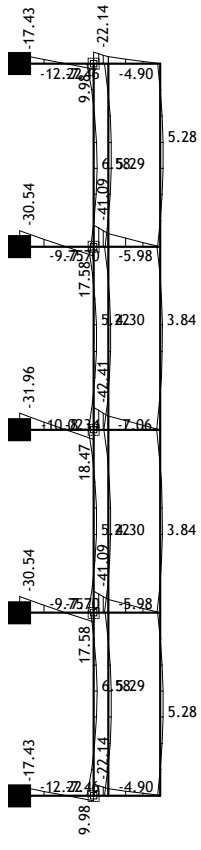
Nivo: nad 1.nadstropjem [6.35 m]
Vplivi v gredi: max M3= 25.26 / min M3= -42.47...

Obt. 3: 1.35xI+1.5xII



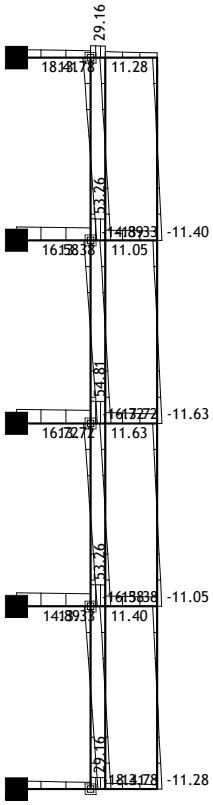
Nivo: nad 1.nadstropjem [6.35 m]
Vplivi v gredi: max T2= 54.89 / min T2= -19.49 kN

Obt. 3: 1.35xI+1.5xII



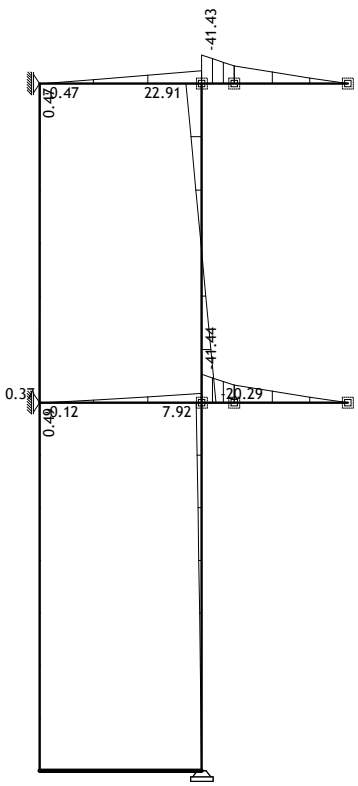
Nivo: nad pritličjem [3.40 m]
Vplivi v gredi: max M3= 18.47 / min M3= -42.41...

Obt. 3: 1.35xI+1.5xII



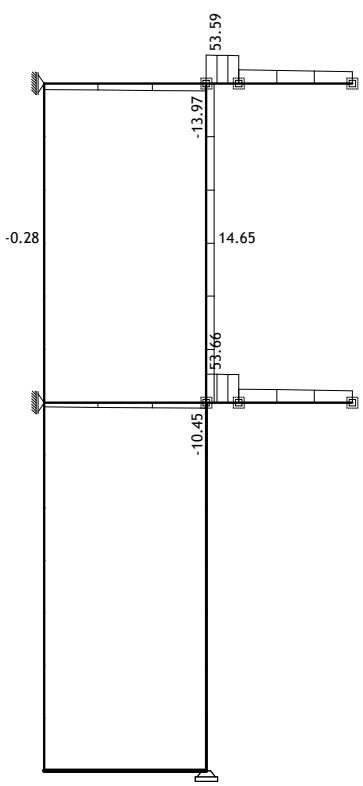
Nivo: nad pritličjem [3.40 m]
Vplivi v gredi: max T2= 54.81 / min T2= -18.41 kN

Obt. 3: 1.35xI+1.5xII



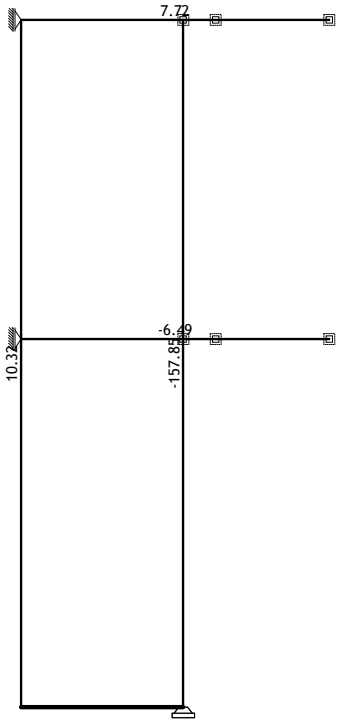
Okvir: H_3
Vplivi v gredi: max M3= 22.91 / min M3= -41.44...

Obt. 3: 1.35xI+1.5xII



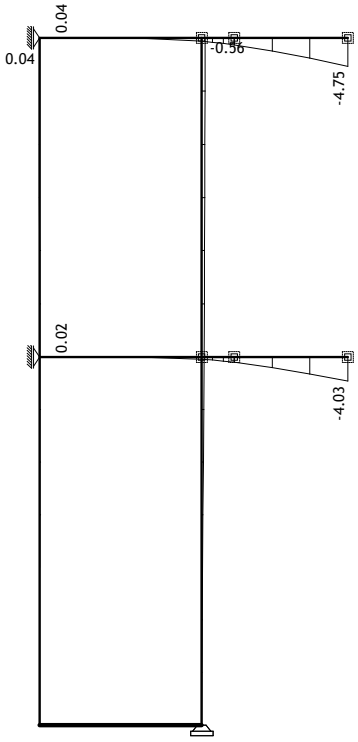
Okvir: H_3
Vplivi v gredi: max T2= 53.66 / min T2= -13.97 kN

Obt. 3: 1.35xI+1.5xII



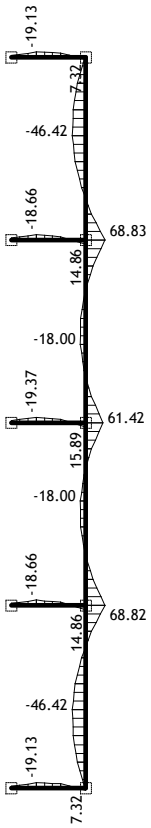
Okvir: H_3
Vplivi v gredi: max N1= 14.66 / min N1= -208.3...

Obt. 7: I+II



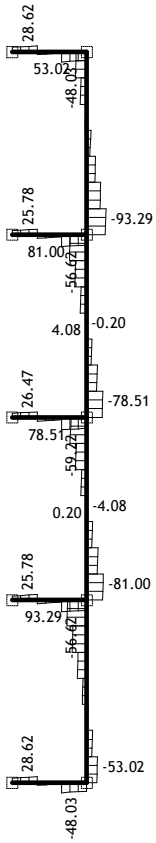
Okvir: H_3
Vplivi v gredi: max Zp= 0.04 / min Zp= -4.75 m /...

Obt. 3: 1.35xI+1.5xII



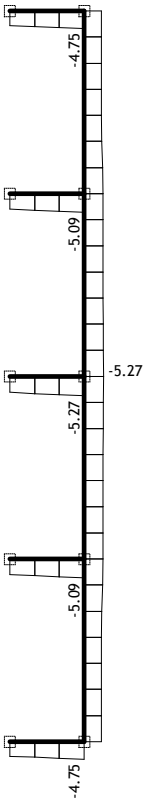
Nivo: temelj [0.00 m]
Vplivi v gredi: max M3= 68.83 / min M3= -46.42...

Obt. 3: 1.35xI+1.5xII



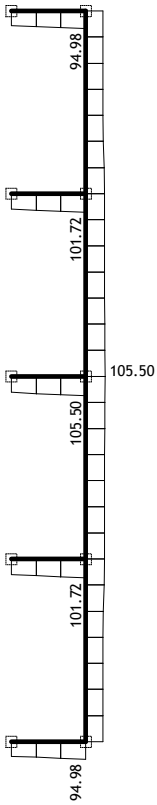
Nivo: temelj [0.00 m]
Vplivi v gredi: max T2= 93.29 / min T2= -93.29 kN

Obt. 7: I+II



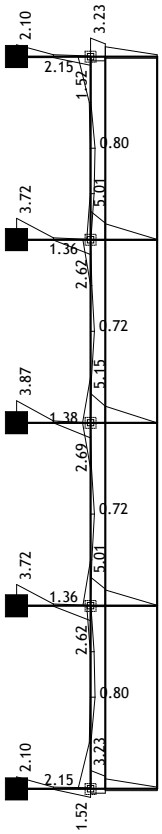
Nivo: temelj [0.00 m]
Vplivi v lin. podpori: max s,tal= -3.97 / min s,tal= ...

Obt. 7: I+II



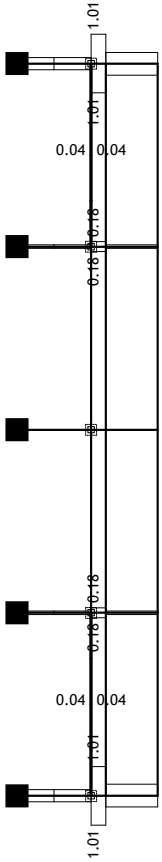
Nivo: temelj [0.00 m]
Vplivi v lin. podpori: max σ,tal= 105.50 / min σ,ta...

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



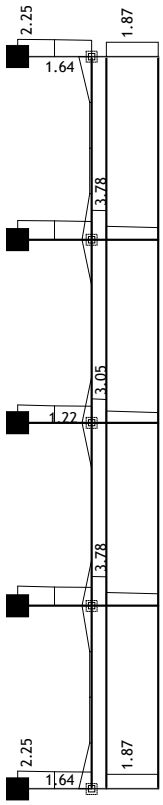
Nivo: nad 1.nadstropjem [6.35 m]
Armatura v gredah: max Aa2/Aa1= 5.15 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



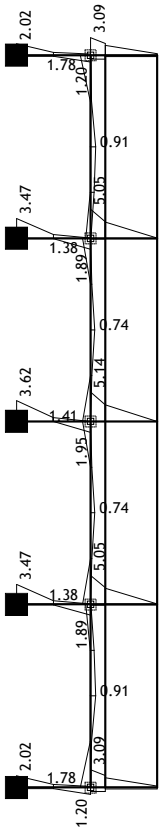
Nivo: nad 1.nadstropjem [6.35 m]
Armatura v gredah: max Aa3/Aa4= 1.01 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



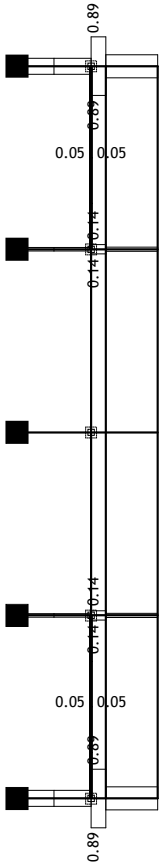
Nivo: nad 1.nadstropjem [6.35 m]
Armatura v gredah: max Aa,st= 3.78 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



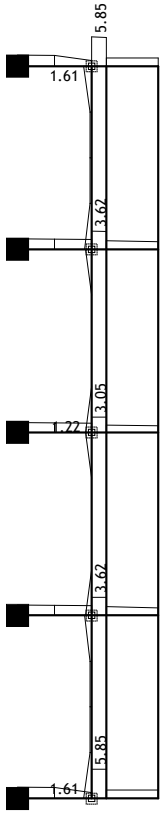
Nivo: nad pritličjem [3.40 m]
Armatura v gredah: max Aa2/Aa1= 5.14 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



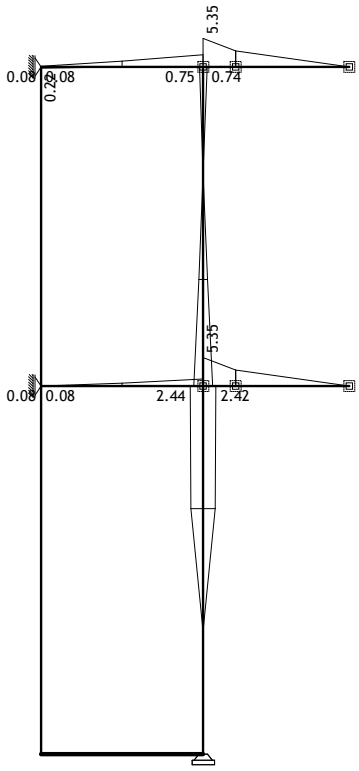
Nivo: nad pritličjem [3.40 m]
Armatura v gredah: max Aa3/Aa4= 0.89 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



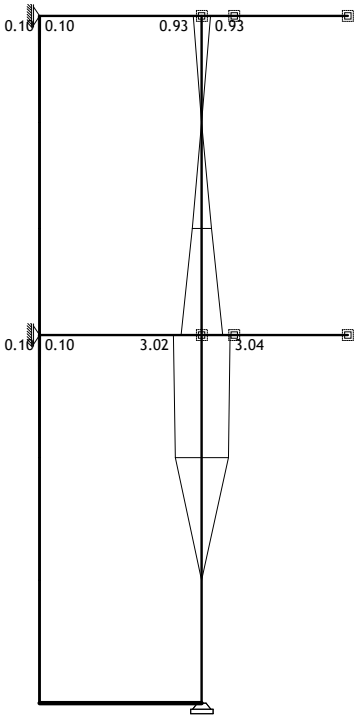
Nivo: nad pritličjem [3.40 m]
Armatura v gredah: max Aa,st= 5.85 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



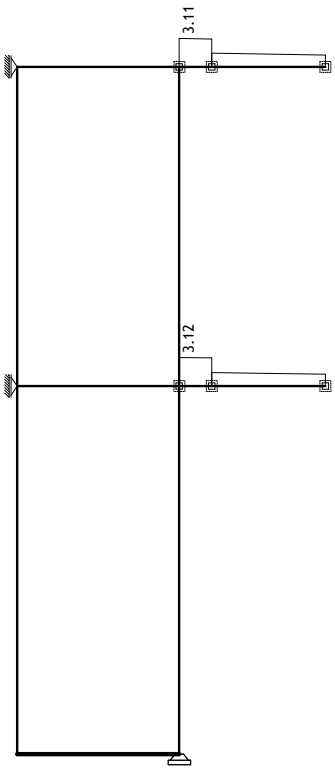
Okvir: H_3
Armatura v gredah: max Aa2/Aa1= 5.35 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



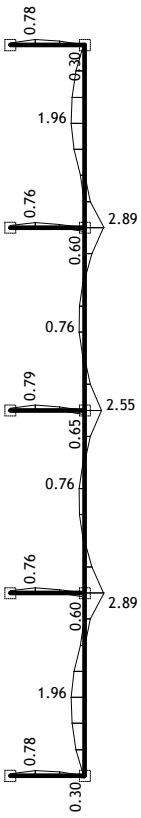
Okvir: H_3
Armatura v gredah: max Aa3/Aa4= 3.04 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



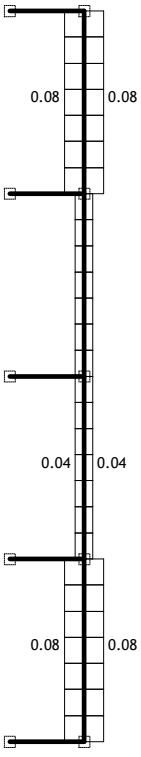
Okvir: H_3
Armatura v gredah: max Aa,st= 3.12 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



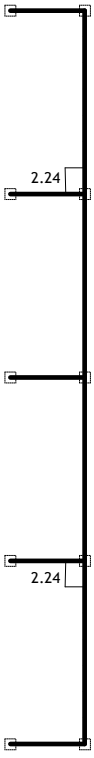
Nivo: temelj [0.00 m]
Armatura v gredah: max Aa2/Aa1= 2.89 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H

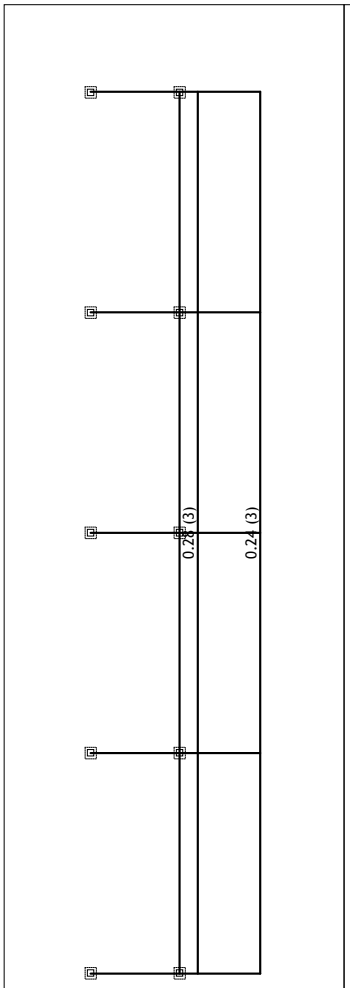


Nivo: temelj [0.00 m]
Armatura v gredah: max Aa3/Aa4= 0.08 cm2

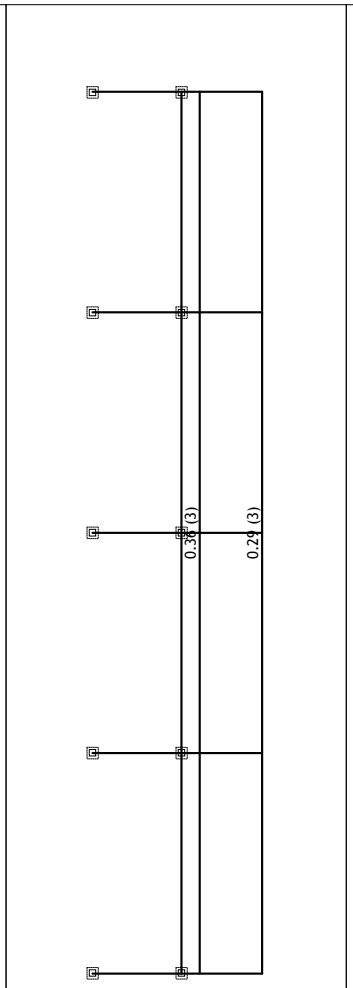
Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



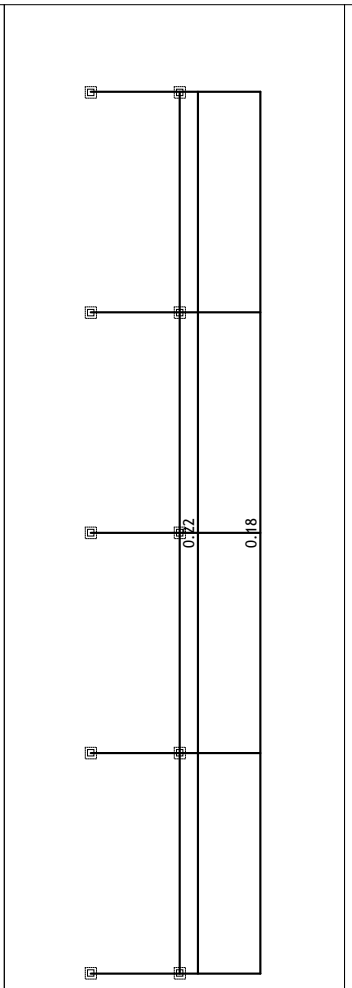
Nivo: temelj [0.00 m]
Armatura v gredah: max Aa,st= 2.24 cm2



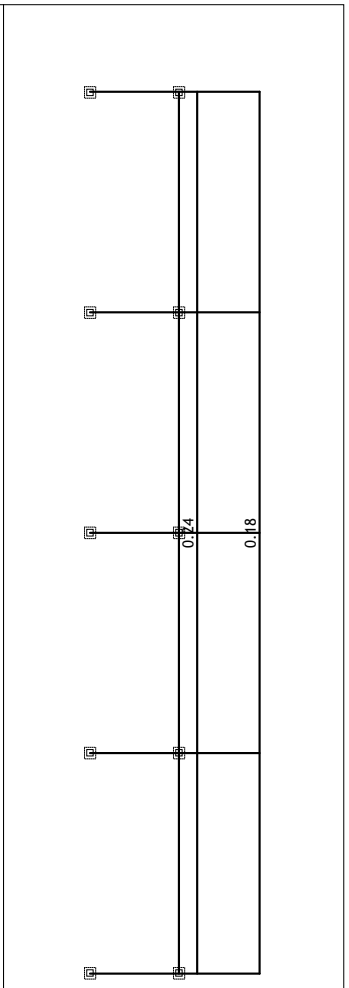
Nivo: nad pritličjem [3.40 m]
Kontrola napetosti



Nivo: nad 1.nadstropjem [6.35 m]
Kontrola napetosti



Nivo: nad pritličjem [3.40 m]
Kontrola stabilnosti



Nivo: nad 1.nadstropjem [6.35 m]
Kontrola stabilnosti

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

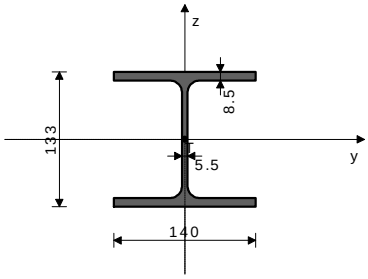
Opis	LC	σ [kN/cm2]	τ [kN/cm2]	σu [kN/cm2]
Set 3: IPBl 140				
(34 - 80)	3	**7.841**	**1.204**	**8.113**
(29 - 79)	3	**7.721**	**1.391**	**8.087**
(18 - 74)	3	**7.163**	**1.445**	**7.588**

Opis	LC	σ [kN/cm2]	τ [kN/cm2]	σu [kN/cm2]
(24 - 77)	3	**5.942**	**1.194**	**6.292**
(11 - 66)	3	**5.559**	**1.384**	**6.037**
(12 - 69)	3	**4.662**	**1.150**	**5.070**

PALICA 79-29

PREČNI PREREZ: IPBl 140 [S 235]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIJSKE KARAKTERISTIKE prereza



[mm]

Ax =	31.400 cm2
Ay =	21.293 cm2
Az =	10.107 cm2
Ix =	8.160 cm4
Iy =	1030.0 cm4
Iz =	389.00 cm4
Wy =	154.89 cm3
Wz =	55.571 cm3
Wy,pl =	173.32 cm3
Wz,pl =	83.300 cm3
γM0 =	1.100
γM1 =	1.100
γM2 =	1.250
Anet/A =	0.900

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

FAKTORJI IZKORIŠČENOSTI PO KOMBINACIJAH OBTEŽB
3. γ=0.56 4. γ=0.48 5. γ=0.32
6. γ=0.24

PALICA IZPOSTAVLJENA PRITISKU IN UPOGIBU
(obtežni primer 3, začetek palice)

Računska osna sila	N_{Ed} =	-1.968 kN
Prečna sila v y smeri	$V_{Ed,y}$ =	1.053 kN
Prečna sila v z smeri	$V_{Ed,z}$ =	-13.563 kN
Upogibni moment okoli y osi	$M_{Ed,y}$ =	-6.807 kNm
Upogibni moment okoli z osi	$M_{Ed,z}$ =	1.911 kNm
Sistemska dolžina palice	L =	1480.0 cm

5.5 KLASIFIKACIJA PREČNIH PREREZOV
Razred prereza 1

6.2 NOSILNOST PREČNIH PREREZOV
6.2.4 Tlak

Računska nosilnost na tlak $N_{c,Rd}$ = 670.82 kN
Pogoj 6.9: N_{Ed} <= $N_{c,Rd}$ (1.97 <= 670.82)

6.2.5 Upogib y-y
Plastični odpornostni moment $W_{y,pl}$ = 173.32 cm3
Računska nosilnost na upogib $M_{c,Rd}$ = 37.028 kNm
Pogoj 6.12: $M_{Ed,y}$ <= $M_{c,Rd,y}$ (6.81 <= 37.03)

6.2.5 Upogib z-z
Plastični odpornostni moment $W_{z,pl}$ = 83.300 cm3
Računska nosilnost na upogib $M_{c,Rd}$ = 17.796 kNm
Pogoj 6.12: $M_{Ed,z}$ <= $M_{c,Rd,z}$ (1.91 <= 17.80)

6.2.6 Strig
Računska strižna nosilnost $V_{pl,Rd,z}$ = 124.67 kN
Računska strižna nosilnost $V_{c,Rd,z}$ = 124.67 kN
Pogoj 6.17: $V_{Ed,z}$ <= $V_{c,Rd,z}$ (13.56 <= 124.67)

Računska strižna nosilnost $V_{pl,Rd,y}$ = 262.63 kN
Računska strižna nosilnost $V_{c,Rd,y}$ = 262.63 kN
Pogoj 6.17: $V_{Ed,y}$ <= $V_{c,Rd,y}$ (1.05 <= 262.63)

6.2.10 Upogib z osno in prečno silo
Ni potrebno zmanjšanje upogibne nosilnosti
Pogoj: $V_{Ed,z}$ <= 50%$V_{pl,Rd,z}$; $V_{Ed,y}$ <= 50%$V_{pl,Rd,y}$

6.2.9 Upogib in osna sila
Razmerje N_{Ed} / $N_{pl,Rd}$ 0.003
Zmanjšana plast.upogibna nosilnost $M_{N,y,Rd}$ = 37.028 kNm
Koeficient α = 2.000
Razmerje ($M_{y,Ed}$ / $M_{N,y,Rd}$)^α 0.034
Zmanjšana plast.upogibna nosilnost $M_{N,z,Rd}$ = 17.796 kNm
Koeficient β = 1.000
Razmerje ($M_{z,Ed}$ / $M_{N,z,Rd}$)^β 0.107
Pogoj 6.41: (0.14 <= 1)

6.3 NOSILNOST ELEMENTA NA UKLON
6.3.1.1 Nosilnost na uklon
Uklonska dolžina y-y l,y = 1480.0 cm
Relativna vitkost y-y λ_y = 2.752
Uklonska krivulja za os y-y: B α = 0.340
Elastična kritična sila N_{cr},y = 97.461 kN

Koeficient nepopolnosti	χ,y =	0.117
Računska uklonska nosilnost	$N_{b,Rd,y}$ =	78.425 kN

Pogoj 6.46: N_{Ed} <= $N_{b,Rd,y}$ (1.97 <= 78.43)

Uklonska dolžina z-z	l,z =	1480.0 cm
Relativna vitkost z-z	λ_z =	4.477
Uklonska krivulja za os z-z: C	α =	0.490
Koeficient nepopolnosti	χ,z =	0.045
Računska uklonska nosilnost	$N_{b.Rd,z}$ =	30.160 kN

Pogoj 6.46: N_{Ed} <= $N_{b,Rd,z}$ (1.97 <= 30.16)

6.3.2.1 Nosilnost na bočno-torzijski uklon

Koeficient	C1 =	1.132
Koeficient	C2 =	0.459
Koeficient	C3 =	0.525
Koef.ukl.dolžine za uklon	k =	1.000
Koef.ukl.dolžine za vbočenje	kw =	1.000
Koordinata	zg =	0.000 cm
Koordinata	zj =	0.000 cm
Razmak med bočnimi podporami	L =	1480.0 cm
Sektorski vztrajnostni moment	Iw =	15064 cm6
Krit.moment bočne zvrnitve	Mcr =	17.821 kNm
Ustrezni odpornostni moment	W_y =	173.32 cm3
Koeficient imperf.	αLT =	0.210
Brezdimenz.vitkost	λLT_ =	1.512
Koeficient zmanjšanja	χLT =	0.367
Računska uklonska nosilnost	$M_{b,Rd}$ =	13.608 kNm

Pogoj 5.48: $M_{Ed,y}$ <= $M_{b,Rd}$ (6.81 <= 13.61)

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} =	0.991
Koeficient oblike momenta	C_{mz} =	0.443
Koeficient oblike momenta	C_{mLT} =	0.991
Koeficient interakcije	k_{yy} =	1.011
Koeficient interakcije	k_{yz} =	0.290
Koeficient interakcije	k_{zy} =	0.607
Koeficient interakcije	k_{zz} =	0.483

Koeficient nepopolnosti	χ_y =	0.117
N_{Ed} / (χ_y N_{Rk} / γM1)		0.025
kyy * (M_{yEd} + ΔM_{yEd}) / ...		0.506
kyz * (M_{zEd} + ΔM_{zEd}) / ...		0.031

Pogoj 6.61: (0.56 <= 1)

Koeficient nepopolnosti	χ_z =	0.045
N_{Ed} / (χ_z N_{Rk} / γM1)		0.065
kzy * (M_{yEd} + ΔM_{yEd}) / ...		0.304
kzz * (M_{zEd} + ΔM_{zEd}) / ...		0.052

Pogoj 6.62: (0.42 <= 1)

KONTROLA STRIŽNE NOSILNOSTI
(obtežni primer 3, na 740.0 cm od začetka palice)

Računska osna sila	N_{Ed} =	3.570 kN
Prečna sila v y smeri	$V_{Ed,y}$ =	0.394 kN
Prečna sila v z smeri	$V_{Ed,z}$ =	13.714 kN
Upogibni moment okoli y osi	$M_{Ed,y}$ =	-8.212 kNm
Upogibni moment okoli z osi	$M_{Ed,z}$ =	-0.819 kNm
Sistemska dolžina palice	L =	1480.0 cm

6.2 NOSILNOST PREČNIH PREREZOV
6.2.6 Strig

Računska strižna nosilnost	$V_{pl,Rd,z}$ =	78.693 kN
Računska strižna nosilnost	$V_{c,Rd,z}$ =	78.693 kN

Pogoj 6.17: $V_{Ed,z}$ <= $V_{c,Rd,z}$ (13.71 <= 78.69)

Računska strižna nosilnost	$V_{pl,Rd,y}$ =	265.16 kN
Računska strižna nosilnost	$V_{c,Rd,y}$ =	265.16 kN

Pogoj 6.17: $V_{Ed,y}$ <= $V_{c,Rd,y}$ (0.39 <= 265.16)

PRIZIDAVA POZ P2, P2´

Shema nivojev

Naziv	z [m]	h [m]
nad 2.nadstropjem	9.00	2.65
nad 1.nadstropjem	6.35	2.95

Naziv	z [m]	h [m]
nad pritličjem	3.40	3.40
temelj	0.00	

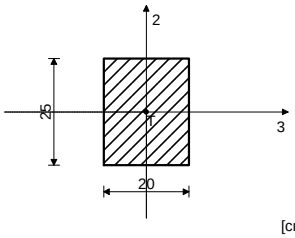
Tabele materialov

No	Naziv materiala	E[kN/m2]	μ	γ[kN/m3]	αt[1/C]	Em[kN/m2]	μm
1	Beton C 25	2.583e+7	0.20	25.00	1.000e-5	2.583e+7	0.20
2	Jeklo	2.100e+8	0.30	78.50	1.000e-5	2.100e+8	0.30
3	Beton MB 30	3.150e+7	0.20	25.00	1.000e-5	3.150e+7	0.20

Seti gred

Set: 1 Prerez: b/d=20/25, Fiktivna ekscentričnost

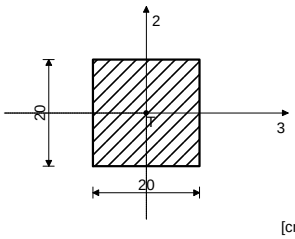
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton C 25	5.000e-2	4.167e-2	4.167e-2	3.421e-4	1.667e-4	2.604e-4



[cm]

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

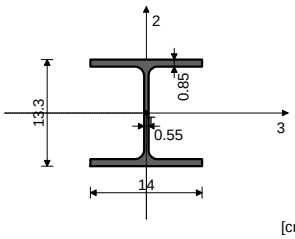
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton C 25	4.000e-2	3.333e-2	3.333e-2	2.253e-4	1.333e-4	1.333e-4



[cm]

Set: 3 Prerez: IPBl 140, Fiktivna ekscentričnost

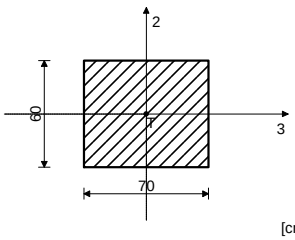
Mat.	A1	A2	A3	I1	I2	I3
2 - Jeklo	3.140e-3	1.011e-3	2.129e-3	8.160e-8	3.890e-6	1.030e-5



[cm]

Set: 4 Prerez: b/d=70/60, Fiktivna ekscentričnost

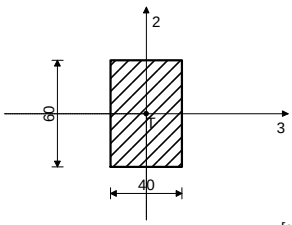
Mat.	A1	A2	A3	I1	I2	I3
1 - Beton C 25	4.200e-1	3.500e-1	3.500e-1	2.441e-2	1.715e-2	1.260e-2



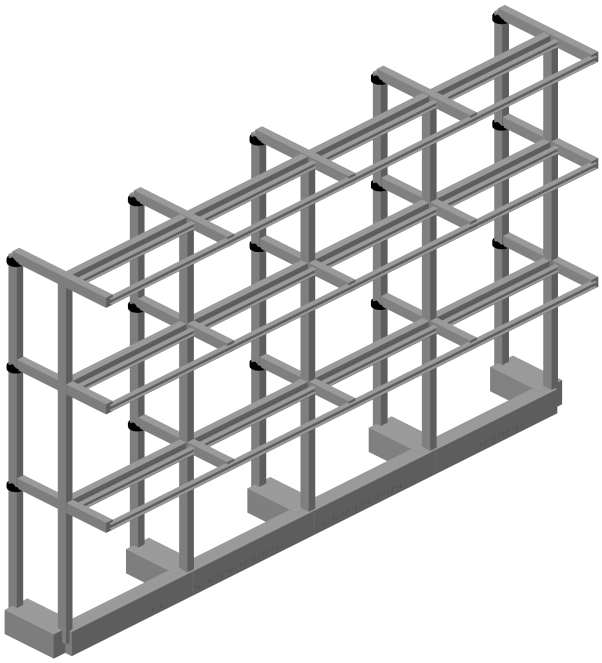
[cm]

Set: 5 Prerez: b/d=40/60, Fiktivna ekscentričnost

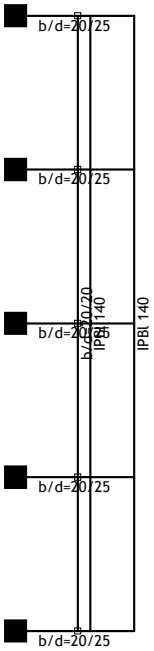
Mat.	A1	A2	A3	I1	I2	I3
3 - Beton MB 30	2.400e-1	2.000e-1	2.000e-1	7.512e-3	3.200e-3	7.200e-3



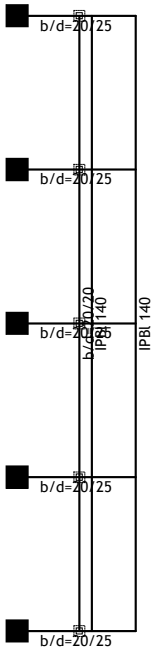
[cm]



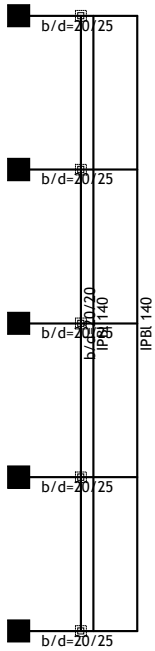
Izometrija



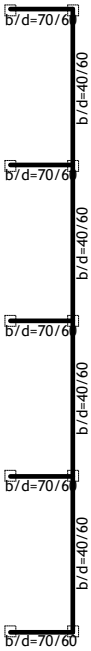
Nivo: nad 2.nadstropjem [9.00 m]



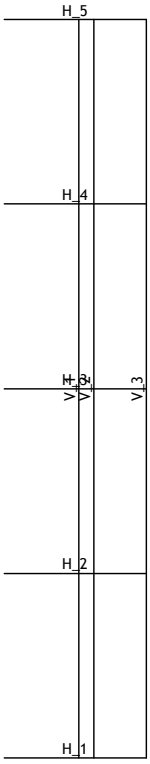
Nivo: nad 1.nadstropjem [6.35 m]



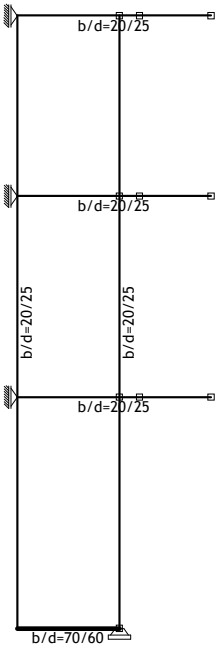
Nivo: nad pritličjem [3.40 m]



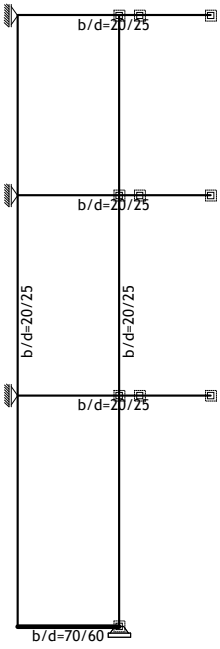
Nivo: temelj [0.00 m]



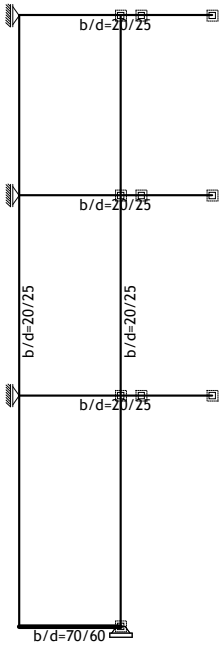
Dispozicija okvirjev



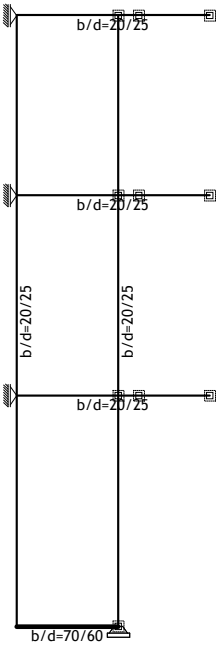
Okvir: H_1



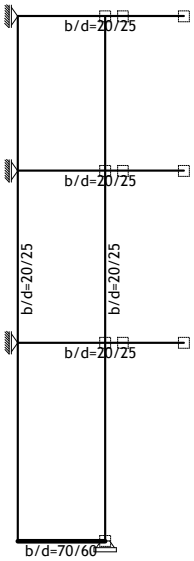
Okvir: H_2



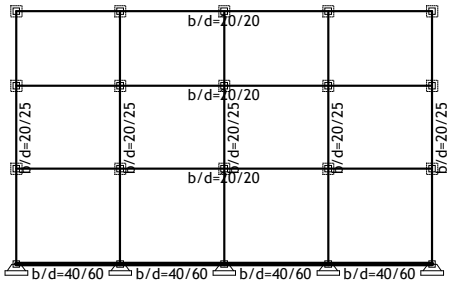
Okvir: H_3



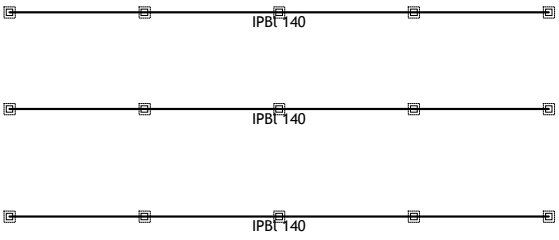
Okvir: H_4



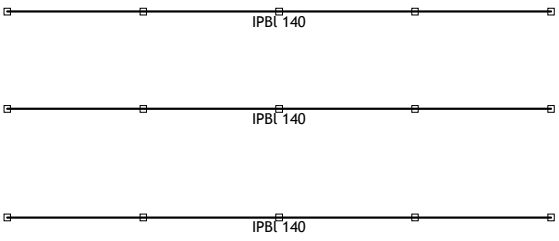
Okvir: H_5



Okvir: V_1



Okvir: V_2

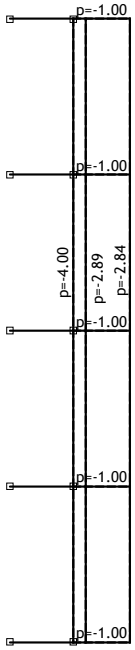


Okvir: V_3

Lista obtežnih primerov

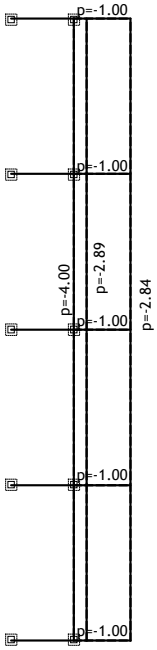
No	Naziv	pX [kN]	pY [kN]	pZ [kN]
1	stalna (g)	0.00	0.00	-762.99
2	koristna	0.00	0.00	-216.45
3	Komb.: 1.35xI+1.5xII	0.00	0.00	-1354.72
4	Komb.: I+1.5xII	0.00	0.00	-1087.67
5	Komb.: 1.35xI	0.00	0.00	-1030.04
6	Komb.: I	0.00	0.00	-762.99

Obt. 1: stalna (g)



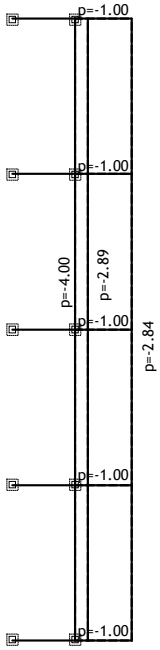
Nivo: nad 2.nadstropjem [9.00 m]

Obt. 1: stalna (g)



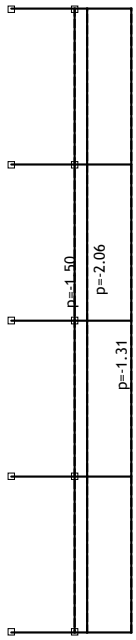
Nivo: nad 1.nadstropjem [6.35 m]

Obt. 1: stalna (g)



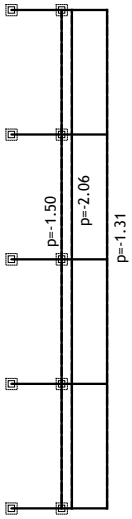
Nivo: nad pritličjem [3.40 m]

Obt. 2: koristna



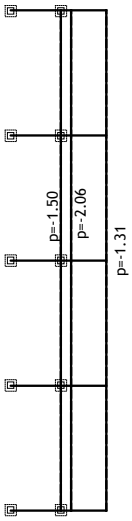
Nivo: nad 2.nadstropjem [9.00 m]

Obt. 2: koristna



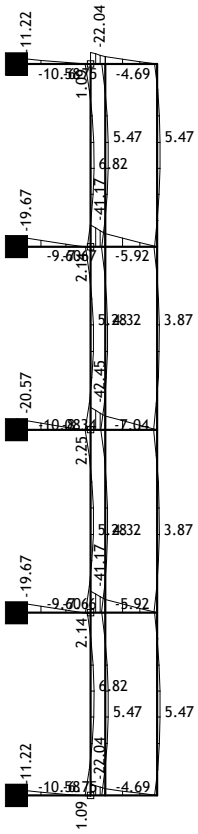
Nivo: nad 1.nadstropjem [6.35 m]

Obt. 2: koristna



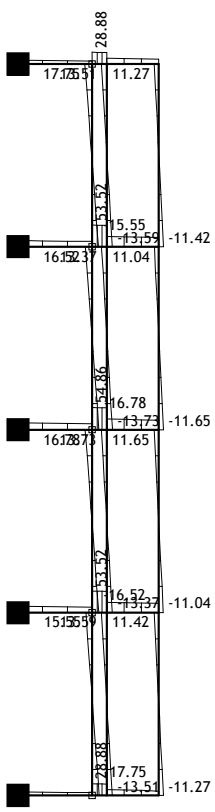
Nivo: nad pritličjem [3.40 m]

Obt. 3: 1.35xI+1.5xII



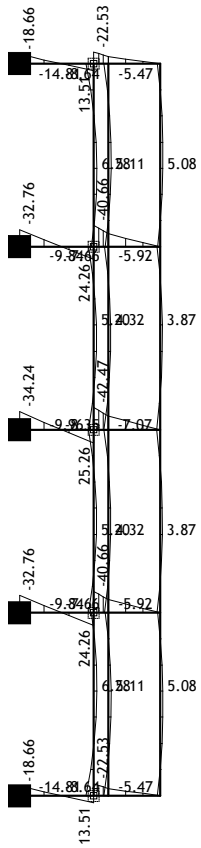
Nivo: nad 2.nadstropjem [9.00 m]
Vplivi v gredi: max M3= 6.82 / min M3= -42.45...

Obt. 3: 1.35xI+1.5xII



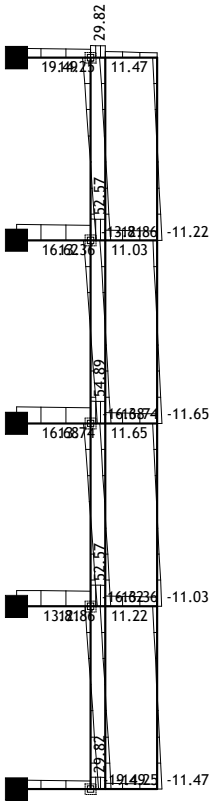
Nivo: nad 2.nadstropjem [9.00 m]
Vplivi v gredi: max T2= 54.86 / min T2= -17.75 kN

Obt. 3: 1.35xI+1.5xII



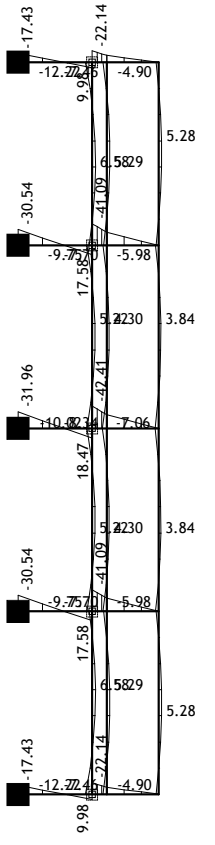
Nivo: nad 1.nadstropjem [6.35 m]
Vplivi v gredi: max M3= 25.26 / min M3= -42.47...

Obt. 3: 1.35xI+1.5xII



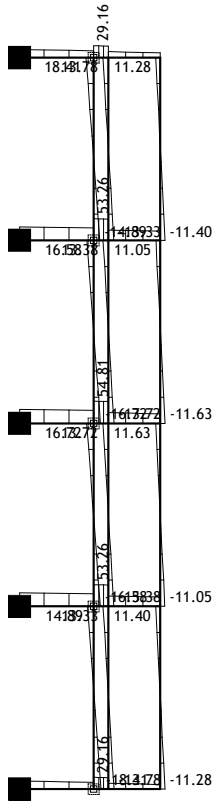
Nivo: nad 1.nadstropjem [6.35 m]
Vplivi v gredi: max T2= 54.89 / min T2= -19.49 kN

Obt. 3: 1.35xI+1.5xII



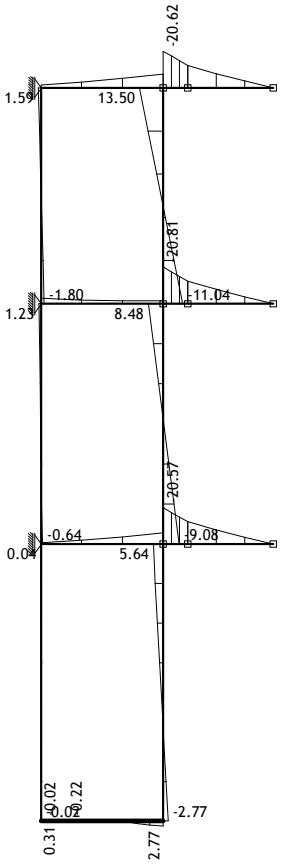
Nivo: nad pritličjem [3.40 m]
Vplivi v gredi: max M3= 18.47 / min M3= -42.41...

Obt. 3: 1.35xI+1.5xII



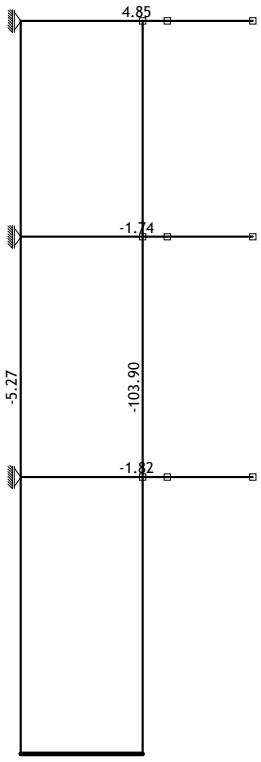
Nivo: nad pritličjem [3.40 m]
Vplivi v gredi: max T2= 54.81 / min T2= -18.41 kN

Obt. 3: 1.35xI+1.5xII



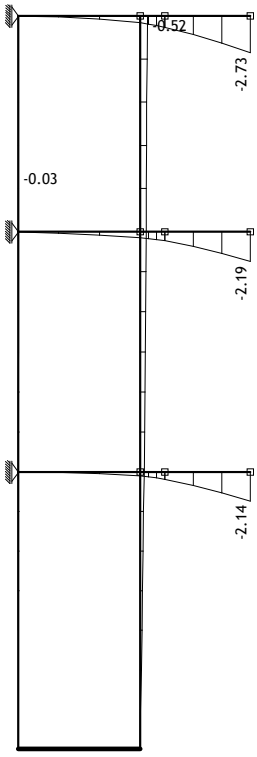
Okvir: H_1
Vplivi v gredi: max M3= 13.50 / min M3= -20.81...

Obt. 3: 1.35xI+1.5xII



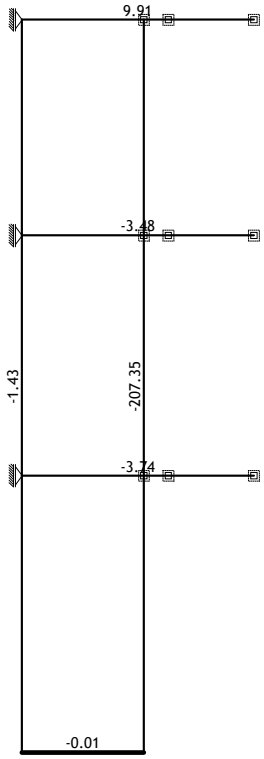
Okvir: H_1
Vplivi v gredi: max N1= 9.22 / min N1= -153.88 kN

Obt. 7: I+II



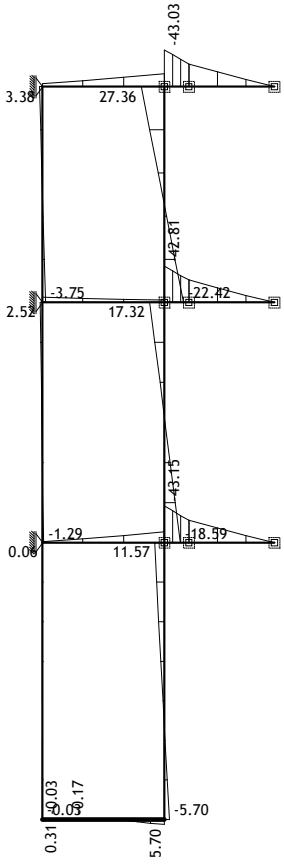
Okvir: H_1
Vplivi v gredi: max Zp= -0.00 / min Zp= -2.73 m ...

Obt. 3: 1.35xI+1.5xII



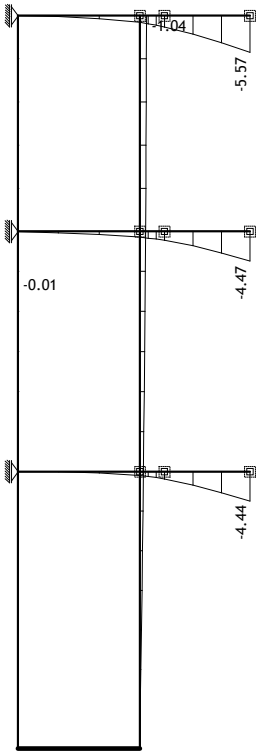
Okvir: H_2
Vplivi v gredi: max N1= 18.82 / min N1= -302.7...

Obt. 3: 1.35xI+1.5xII



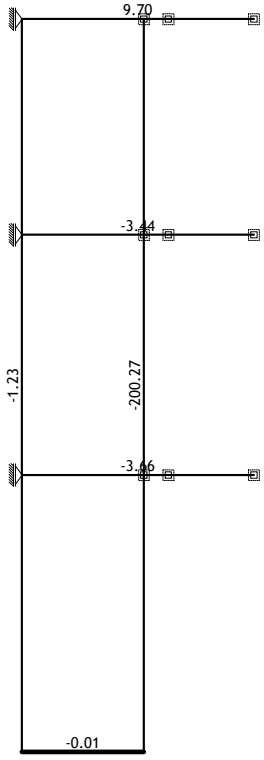
Okvir: H_2
Vplivi v gredi: max M3= 27.36 / min M3= -43.15...

Obt. 7: I+II



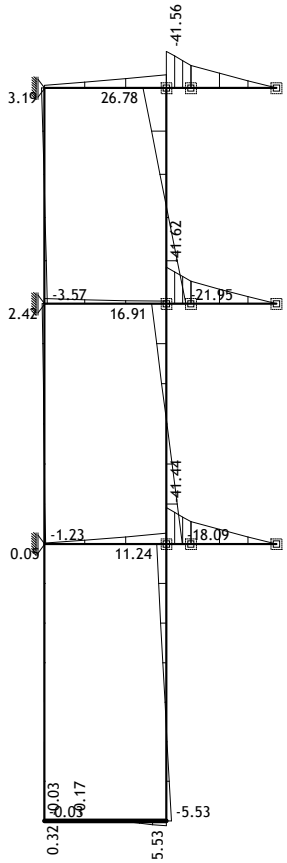
Okvir: H_2
Vplivi v gredi: max Zp= -0.00 / min Zp= -5.57 m ...

Obt. 3: 1.35xI+1.5xII



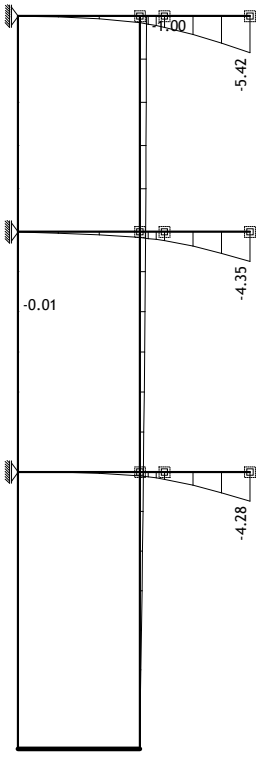
Okvir: H_3
Vplivi v gredi: max N1= 18.41 / min N1= -292.5...

Obt. 3: 1.35xI+1.5xII



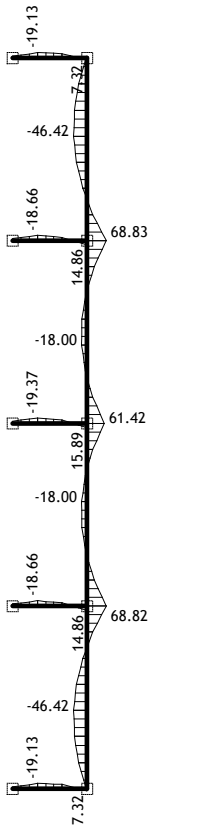
Okvir: H_3
Vplivi v gredi: max M3= 26.78 / min M3= -41.62...

Obt. 7: I+II



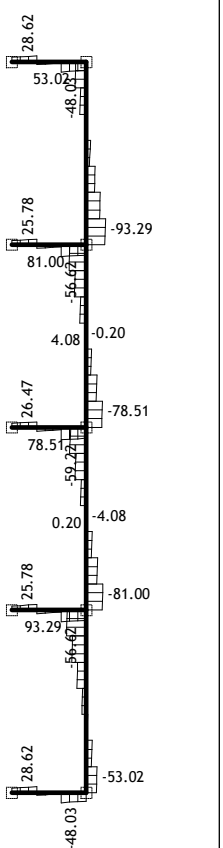
Okvir: H_3
Vplivi v gredi: max Zp= -0.00 / min Zp= -5.42 m ...

Obt. 3: 1.35xI+1.5xII



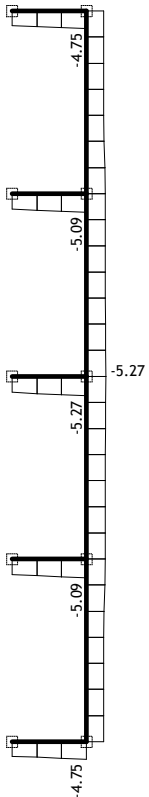
Nivo: temelj [0.00 m]
Vplivi v gredi: max M3= 68.83 / mi...

Obt. 3: 1.35xI+1.5xII



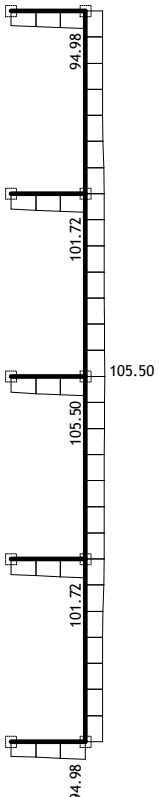
Nivo: temelj [0.00 m]
Vplivi v gredi: max T2= 93.29 / min...

Obt. 7: I+II



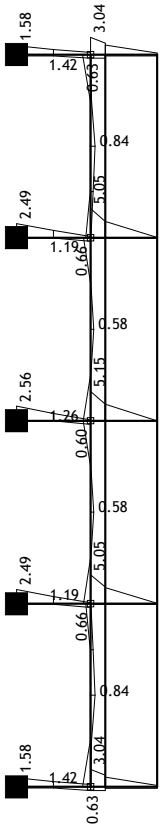
Nivo: temelj [0.00 m]
Vplivi v lin. podpori: max s,tal= -3.97...

Obt. 7: I+II



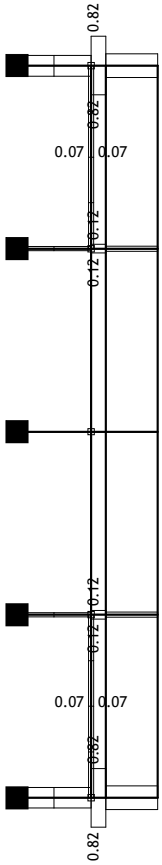
Nivo: temelj [0.00 m]
Vplivi v lin. podpori: max σ,tal= 105...

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



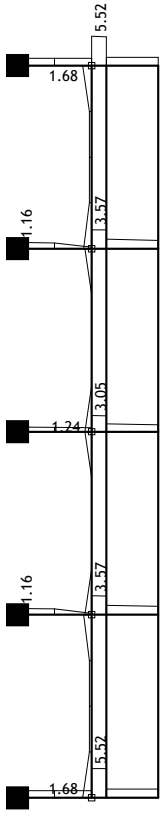
Nivo: nad 2.nadstropjem [9.00 m]
Armatura v gredah: max Aa2/Aa1= 5.15 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



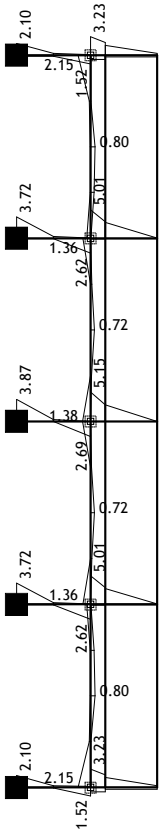
Nivo: nad 2.nadstropjem [9.00 m]
Armatura v gredah: max Aa3/Aa4= 0.82 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



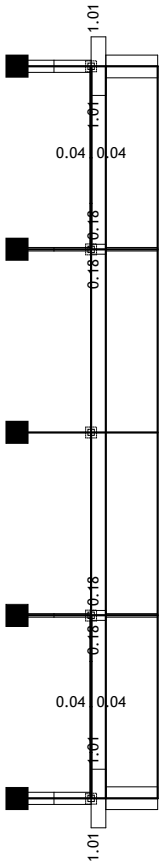
Nivo: nad 2.nadstropjem [9.00 m]
Armatura v gredah: max Aa,st= 5.52 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



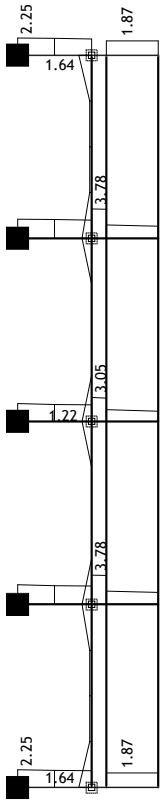
Nivo: nad 1.nadstropjem [6.35 m]
Armatura v gredah: max Aa2/Aa1= 5.15 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



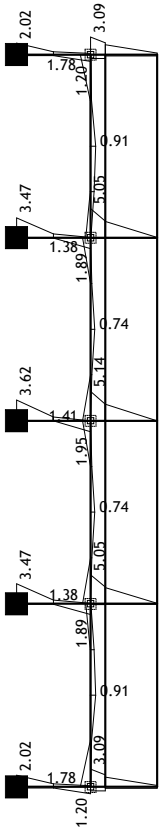
Nivo: nad 1.nadstropjem [6.35 m]
Armatura v gredah: max Aa3/Aa4= 1.01 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



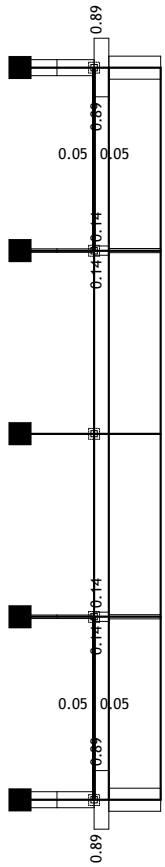
Nivo: nad 1.nadstropjem [6.35 m]
Armatura v gredah: max Aa,st= 3.78 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



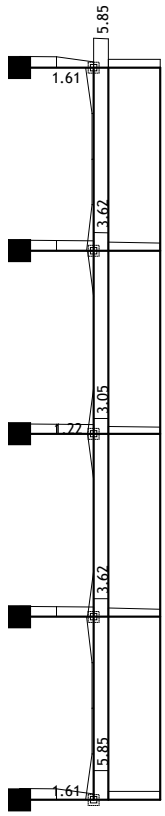
Nivo: nad pritličjem [3.40 m]
Armatura v gredah: max Aa2/Aa1= 5.14 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



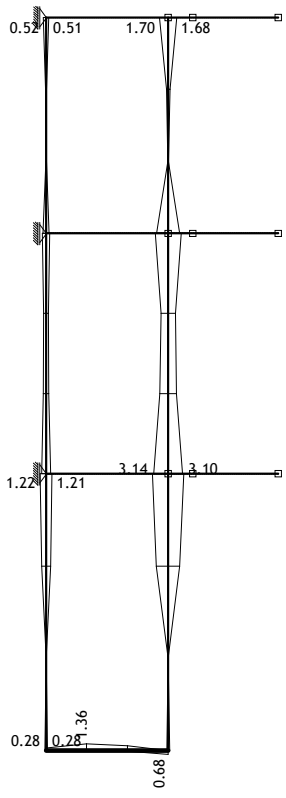
Nivo: nad pritličjem [3.40 m]
Armatura v gredah: max Aa3/Aa4= 0.89 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



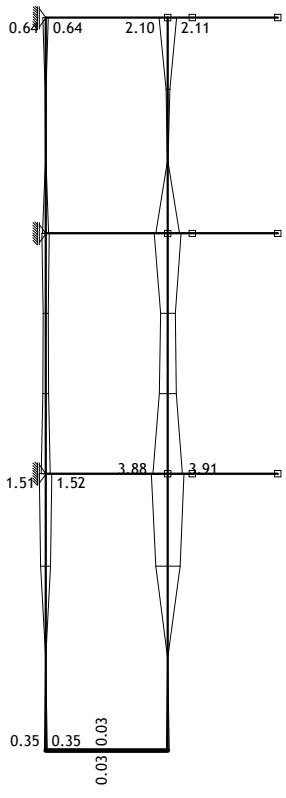
Nivo: nad pritličjem [3.40 m]
Armatura v gredah: max Aa,st= 5.85 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



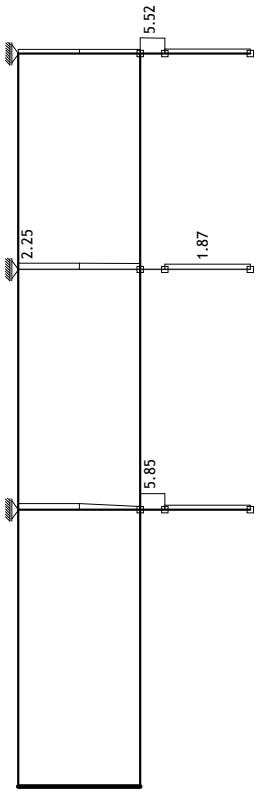
Okvir: H_1
Armatura v gredah: max Aa2/Aa1= 3.23 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



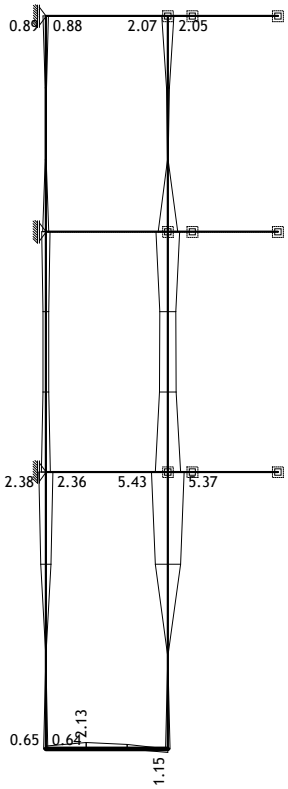
Okvir: H_1
Armatura v gredah: max Aa3/Aa4= 3.91 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



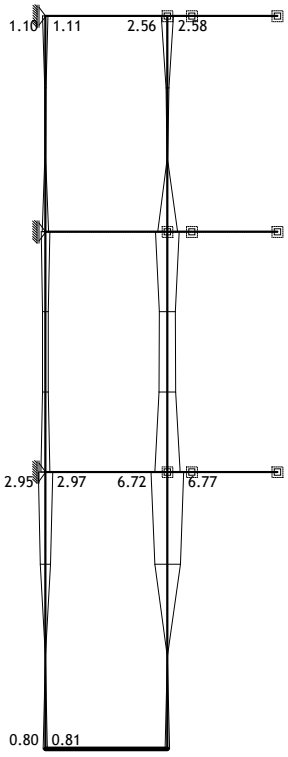
Okvir: H_1
Armatura v gredah: max Aa,st= 5.85 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



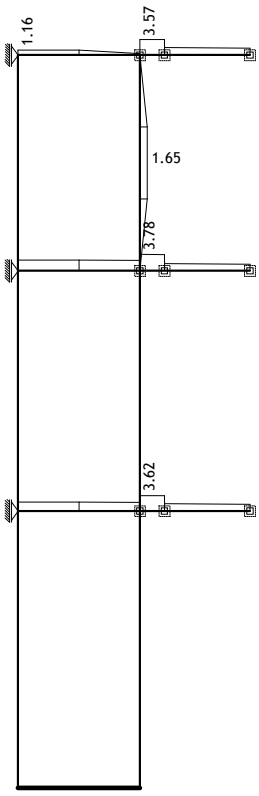
Okvir: H_2
Armatura v gredah: max Aa2/Aa1= 5.43 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



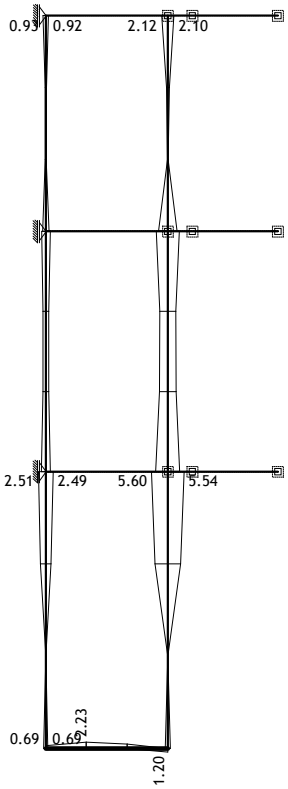
Okvir: H_2
Armatura v gredah: max Aa3/Aa4= 6.77 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



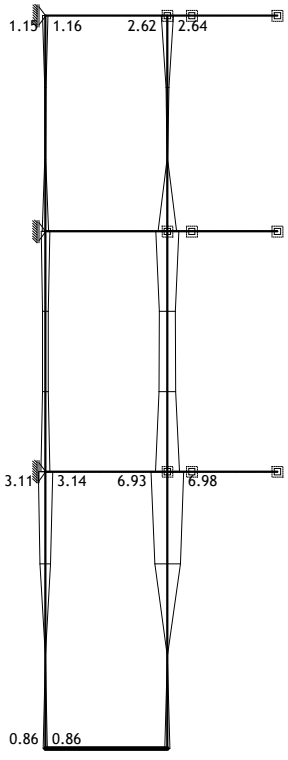
Okvir: H_2
Armatura v gredah: max Aa,st= 3.78 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



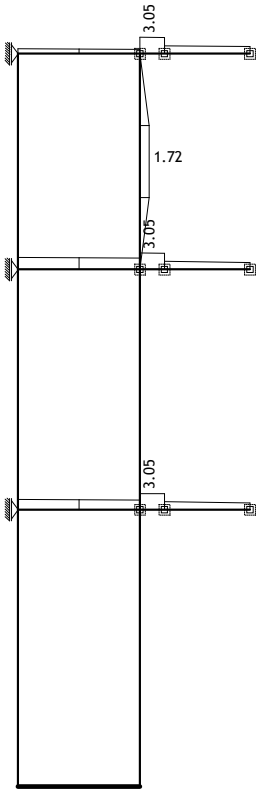
Okvir: H_3
Armatura v gredah: max Aa2/Aa1= 5.60 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



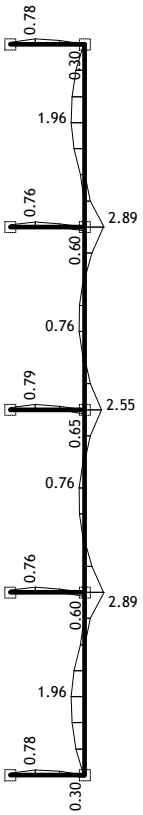
Okvir: H_3
Armatura v gredah: max Aa3/Aa4= 6.98 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



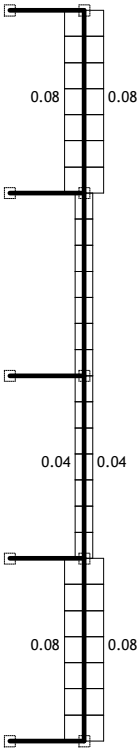
Okvir: H_3
Armatura v gredah: max Aa,st= 3.05 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



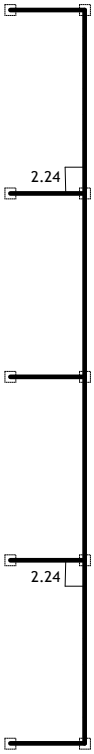
Nivo: temelj [0.00 m]
Armatura v gredah: max Aa2/Aa1= 2.89 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H



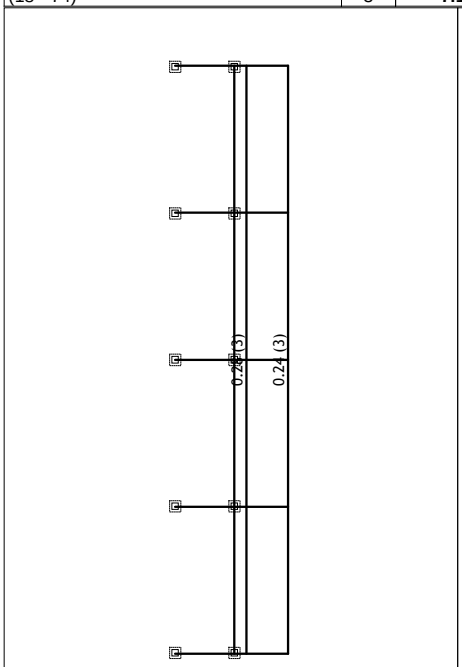
Nivo: temelj [0.00 m]
Armatura v gredah: max Aa3/Aa4= 0.08 cm2

Merodajna obtežba: Kompletna shema
EUROCODE, C 25, S500H

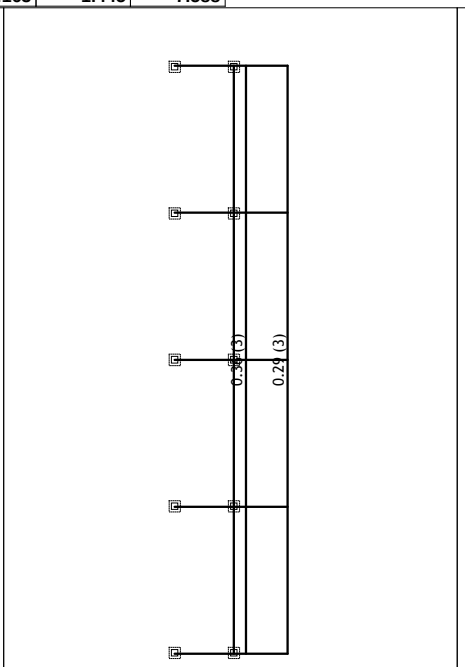


Nivo: temelj [0.00 m]
Armatura v gredah: max Aa,st= 2.24 cm2

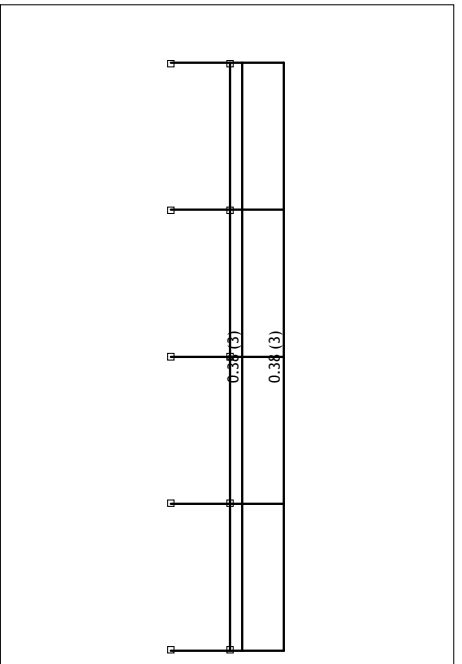
Kontrola napetosti - EUROCODE 3 (EN 1993-1-1:2005)									
Opis	LC	σ [kN/cm2]	τ [kN/cm2]	σu [kN/cm2]	Opis	LC	σ [kN/cm2]	τ [kN/cm2]	σu [kN/cm2]
Set 3: IPBl 140					(24 - 77)	3	**5.942**	**1.194**	**6.292**
(34 - 80)	3	**7.841**	**1.204**	**8.113**	(11 - 66)	3	**5.559**	**1.384**	**6.037**
(29 - 79)	3	**7.721**	**1.391**	**8.087**	(12 - 69)	3	**4.662**	**1.150**	**5.070**
(18 - 74)	3	**7.163**	**1.445**	**7.588**					



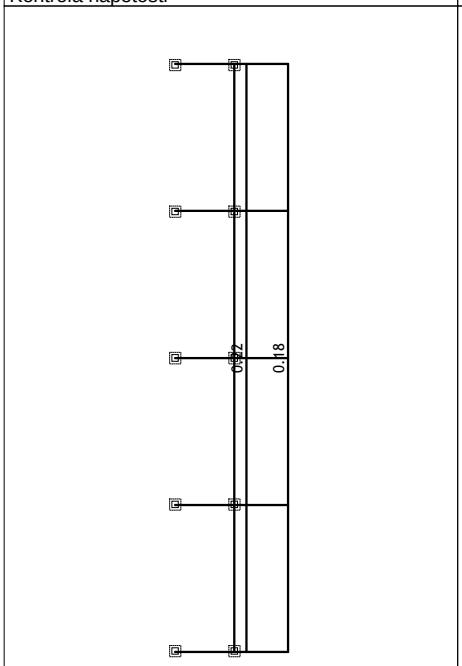
Nivo: nad pritličjem [3.40 m]
Kontrola napetosti



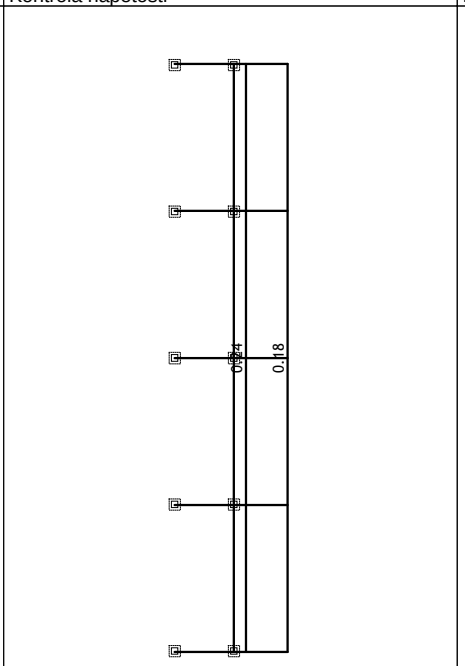
Nivo: nad 1.nadstropjem [6.35 m]
Kontrola napetosti



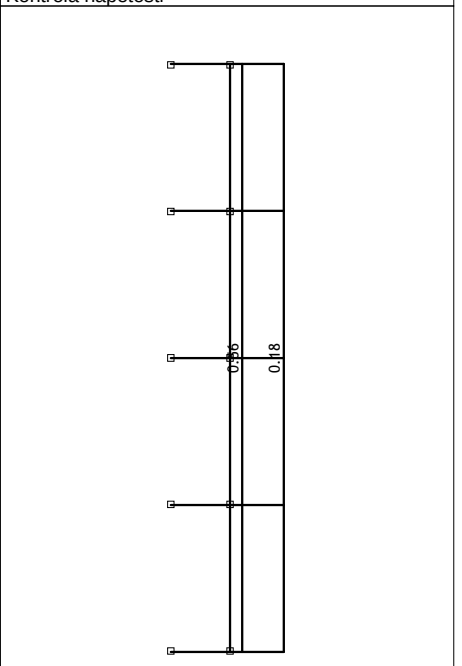
Nivo: nad 2.nadstropjem [9.00 m]
Kontrola napetosti



Nivo: nad pritličjem [3.40 m]
Kontrola stabilnosti



Nivo: nad 1.nadstropjem [6.35 m]
Kontrola stabilnosti

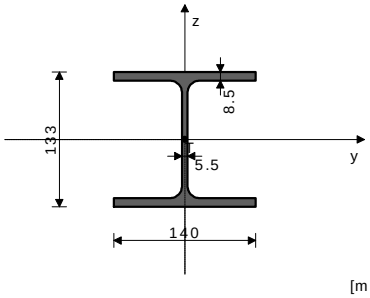


Nivo: nad 2.nadstropjem [9.00 m]
Kontrola stabilnosti

PALICA 79-29

PREČNI PREREZ: IPBl 140 [S 235]
EUROCODE 3 (EN 1993-1-1:2005)

GEOMETRIJSKE KARAKTERISTIKE prereza



[mm]

Ax =	31.400 cm2
Ay =	21.293 cm2
Az =	10.107 cm2
Ix =	8.160 cm4
Iy =	1030.0 cm4
Iz =	389.00 cm4
Wy =	154.89 cm3
Wz =	55.571 cm3
Wy,pl =	173.32 cm3
Wz,pl =	83.300 cm3
γM0 =	1.100
γM1 =	1.100
γM2 =	1.250
Anet/A =	0.900

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

FAKTORJI IZKORIŠČENOSTI PO KOMBINACIJAH OBTEŽB

3. γ=0.56 4. γ=0.48 5. γ=0.32
6. γ=0.24

PALICA IZPOSTAVLJENA PRITISKU IN UPOGIBU
(obtežni primer 3, začetek palice)

Računska osna sila	N_{Ed} =	-1.968 kN
Prečna sila v y smeri	$V_{Ed,y}$ =	1.053 kN
Prečna sila v z smeri	$V_{Ed,z}$ =	-13.563 kN
Upogibni moment okoli y osi	$M_{Ed,y}$ =	-6.807 kNm
Upogibni moment okoli z osi	$M_{Ed,z}$ =	1.911 kNm
Sistemska dolžina palice	L =	1480.0 cm

5.5 KLASIFIKACIJA PREČNIH PREREZOV
Razred prereza 1

6.2 NOSILNOST PREČNIH PREREZOV
6.2.4 Tlak
Računska nosilnost na tlak $N_{c,Rd}$ = 670.82 kN
Pogoj 6.9: N_{Ed} <= $N_{c,Rd}$ (1.97 <= 670.82)

6.2.5 Upogib y-y
Plastični odpornostni moment $W_{y,pl}$ = 173.32 cm3
Računska nosilnost na upogib $M_{c,Rd}$ = 37.028 kNm
Pogoj 6.12: $M_{Ed,y}$ <= $M_{c,Rd,y}$ (6.81 <= 37.03)

6.2.5 Upogib z-z
Plastični odpornostni moment $W_{z,pl}$ = 83.300 cm3
Računska nosilnost na upogib $M_{c,Rd}$ = 17.796 kNm
Pogoj 6.12: $M_{Ed,z}$ <= $M_{c,Rd,z}$ (1.91 <= 17.80)

6.2.6 Strig
Računska strižna nosilnost $V_{pl,Rd,z}$ = 124.67 kN
Računska strižna nosilnost $V_{c,Rd,z}$ = 124.67 kN
Pogoj 6.17: $V_{Ed,z}$ <= $V_{c,Rd,z}$ (13.56 <= 124.67)

Računska strižna nosilnost $V_{pl,Rd,y}$ = 262.63 kN
Računska strižna nosilnost $V_{c,Rd,y}$ = 262.63 kN
Pogoj 6.17: $V_{Ed,y}$ <= $V_{c,Rd,y}$ (1.05 <= 262.63)

6.2.10 Upogib z osno in prečno silo
Ni potrebno zmanjšanje upogibne nosilnosti
Pogoj: $V_{Ed,z}$ <= 50%$V_{pl,Rd,z}$; $V_{Ed,y}$ <= 50%$V_{pl,Rd,y}$

6.2.9 Upogib in osna sila
Razmerje N_{Ed} / $N_{pl,Rd}$ 0.003
Zmanjšana plast.upogibna nosilnost $M_{N,y,Rd}$ = 37.028 kNm
Koeficient α = 2.000
Razmerje ($M_{y,Ed}$ / $M_{N,y,Rd}$)^α 0.034
Zmanjšana plast.upogibna nosilnost $M_{N,z,Rd}$ = 17.796 kNm
Koeficient β = 1.000
Razmerje ($M_{z,Ed}$ / $M_{N,z,Rd}$)^β 0.107
Pogoj 6.41: (0.14 <= 1)

6.3 NOSILNOST ELEMENTA NA UKLON
6.3.1.1 Nosilnost na uklon
Uklonska dolžina y-y l,y = 1480.0 cm
Relativna vitkost y-y λ_y = 2.752
Uklonska krivulja za os y-y: B α = 0.340
Elastična kritična sila N_{cr},y = 97.461 kN
Koeficient nepopolnosti χ,y = 0.117
Računska uklonska nosilnost $N_{b,Rd,y}$ = 78.425 kN
Pogoj 6.46: N_{Ed} <= $N_{b,Rd,y}$ (1.97 <= 78.43)

Uklonska dolžina z-z l,z = 1480.0 cm
Relativna vitkost z-z λ_z = 4.477
Uklonska krivulja za os z-z: C α = 0.490
Koeficient nepopolnosti χ,z = 0.045
Računska uklonska nosilnost $N_{b,Rd,z}$ = 30.160 kN
Pogoj 6.46: N_{Ed} <= $N_{b,Rd,z}$ (1.97 <= 30.16)

6.3.2.1 Nosilnost na bočno-torzijski uklon
Koeficient C1 = 1.132
Koeficient C2 = 0.459
Koeficient C3 = 0.525
Koef.ukl.dolžine za uklon k = 1.000
Koef.ukl.dolžine za vbočenje kw = 1.000
Koordinata zg = 0.000 cm
Koordinata zj = 0.000 cm
Razmak med bočnimi podporami L = 1480.0 cm

Sektorski vztrajnostni moment Iw = 15064 cm6
Krit.moment bočne zvrnitve Mcr = 17.821 kNm
Ustrezni odpornostni moment W_y = 173.32 cm3
Koeficient imperf. αLT = 0.210
Brezdimenz.vitkost λLT_ = 1.512
Koeficient zmanjšanja χLT = 0.367
Računska uklonska nosilnost $M_{b,Rd}$ = 13.608 kNm
Pogoj 5.48: $M_{Ed,y}$ <= $M_{b,Rd}$ (6.81 <= 13.61)

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} = 0.991
Koeficient oblike momenta C_{mz} = 0.443
Koeficient oblike momenta C_{mLT} = 0.991
Koeficient interakcije k_{yy} = 1.011
Koeficient interakcije k_{yz} = 0.290
Koeficient interakcije k_{zy} = 0.607
Koeficient interakcije k_{zz} = 0.483

Koeficient nepopolnosti χ_y = 0.117
N_{Ed} / (χ_y N_{Rk} / γM1) 0.025
kyy * (M_{yEd} + ΔM_{yEd}) / ... 0.506
kyz * (M_{zEd} + ΔM_{zEd}) / ... 0.031
Pogoj 6.61: (0.56 <= 1)

Koeficient nepopolnosti χ_z = 0.045
N_{Ed} / (χ_z N_{Rk} / γM1) 0.065
kzy * (M_{yEd} + ΔM_{yEd}) / ... 0.304
kzz * (M_{zEd} + ΔM_{zEd}) / ... 0.052
Pogoj 6.62: (0.42 <= 1)

KONTROLA STRIŽNE NOSILNOSTI
(obtežni primer 3, na 740.0 cm od začetka palice)

Računska osna sila N_{Ed} = 3.570 kN
Prečna sila v y smeri $V_{Ed,y}$ = 0.394 kN
Prečna sila v z smeri $V_{Ed,z}$ = 13.714 kN
Upogibni moment okoli y osi $M_{Ed,y}$ = -8.212 kNm
Upogibni moment okoli z osi $M_{Ed,z}$ = -0.819 kNm
Sistemska dolžina palice L = 1480.0 cm

6.2 NOSILNOST PREČNIH PREREZOV
6.2.6 Strig
Računska strižna nosilnost $V_{pl,Rd,z}$ = 78.693 kN
Računska strižna nosilnost $V_{c,Rd,z}$ = 78.693 kN
Pogoj 6.17: $V_{Ed,z}$ <= $V_{c,Rd,z}$ (13.71 <= 78.69)

Računska strižna nosilnost $V_{pl,Rd,y}$ = 265.16 kN
Računska strižna nosilnost $V_{c,Rd,y}$ = 265.16 kN
Pogoj 6.17: $V_{Ed,y}$ <= $V_{c,Rd,y}$ (0.39 <= 265.16)