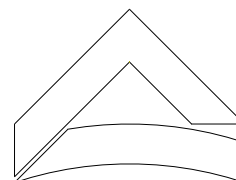


Ervin Presiček, s.p.

Cesta na Roglo 43, 3214 Zreče

tel.&fax: (03) 759-19-20 / GSM 041 734-414

G - PROJEKT
PROJEKTIRANJE GRADBENIH OBJEKTOV



Objekt: **Večnamenska športna dvorana Duplek**

Investitor: **Občina Duplek, Trg slovenske osamosvojitve 1
2241 Spodnji Duplek**

Št. projekta: **7-013017**

Št. načrta: **16/2018**

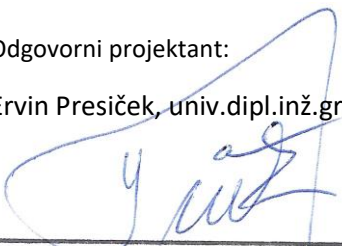
Vrsta proj. dok.: **PZI**

Datum: **Oktober 2018**

3/1 NAČRT GRADBENIH KONSTRUKCIJ - STATIČNI RAČUN

Odgovorni projektant:

Ervin Presiček, univ.dipl.inž.gradb.



ERVIN PRESIČEK
univ. dipl. inž. gradb.
IZS G-0755

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Dimenzioniranje (beton)	46
Dimenzioniranje (les)	72 - 75

Osnovni podatki o modelu

Datoteka: 18-16 Duplek - v4s.twp
Datum preračuna: 2.10.2018

Način preračuna: 3D model

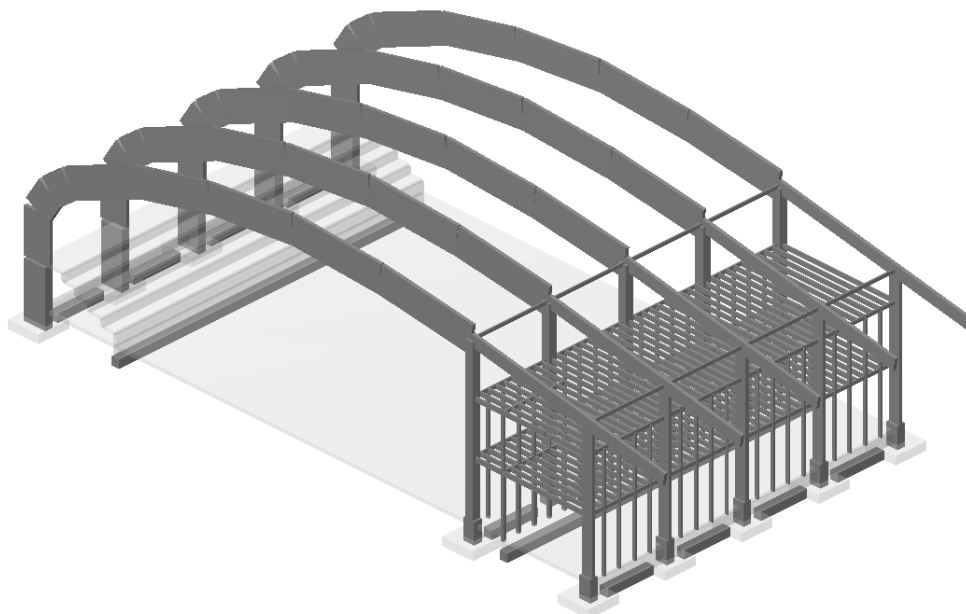
- Teorija I-ga reda Modalna analiza Stabilnost
 Teorija II-ga reda Seizmični preračun Faze gradnje
 Nelinearen preračun

Velikost modela

Število vozlišč: 12053
Število ploskovnih elementov: 11399
Število grednih elementov: 889
Število robnih elementov: 106644
Število osnovnih obtežnih primerov: 8
Število kombinacij obtežb: 12

Enote mer

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

Vhodni podatki - Konstrukcija

Izometrija

Shema nivojev

Naziv	z [m]	h [m]
-------	-------	-------

2.N	6.40	3.20
1.N	3.20	1.10
steber	2.10	0.45
T4	1.65	0.45
T3	1.20	0.45

T2	0.75	0.45
T1	0.30	0.30
teren	0.00	0.40
talna plošča	-0.40	0.85
temelji	-1.25	

Tabele materialov

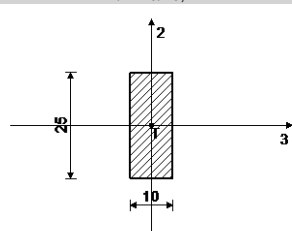
No	Naziv materiala	E[kN/m ²]	μ	γ [kN/m ³]	α [1/C]	Em[kN/m ²]	μ m
1	C 25/30	3.000e+7	0.20	25.00	1.000e-5	3.000e+7	0.20
2	C 25/30	3.050e+7	0.20	25.00	1.000e-5	3.050e+7	0.20
3	C 25/30	3.100e+7	0.20	25.00	1.000e-5	3.100e+7	0.20
4	Les-Iglavci-Masiven les	1.000e+7	0.20	9.00	1.000e-5	1.000e+7	0.20
5	Les-Iglavci-Lamelirani	1.100e+7	0.20	9.00	1.000e-5	1.100e+7	0.20

Seti plošč

No	d[m]	e[m]	Material	Tip preračuna	Ortotropija	E2[kN/m ²]	G[kN/m ²]	α
<1>	0.220	0.110	1	Tanka plošča	Izotropna			
<2>	0.500	0.250	1	Tanka plošča	Izotropna			
<3>	0.250	0.125	2	Tanka plošča	Izotropna			
<4>	0.200	0.100	2	Tanka plošča	Izotropna			
<5>	0.200	0.100	3	Tanka plošča	Izotropna			

Seti gred

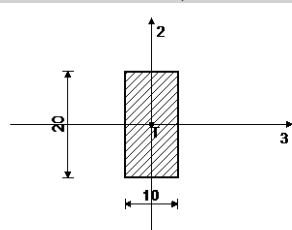
Set: 1 Prerez: b/d=10/25, Fiktivna ekscentričnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
4 - Les-Iglavci-M...	2.500e-2	2.083e-2	2.083e-2	6.238e-5	2.083e-5	1.302e-4

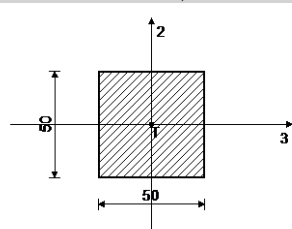
Set: 2 Prerez: b/d=10/20, Fiktivna ekscentričnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
4 - Les-Iglavci-M...	2.000e-2	1.667e-2	1.667e-2	4.578e-5	1.667e-5	6.667e-5

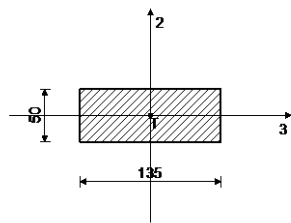
Set: 3 Prerez: b/d=50/50, Fiktivna ekscentričnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
1 - C 25/30	2.500e-1	2.083e-1	2.083e-1	8.802e-3	5.208e-3	5.208e-3

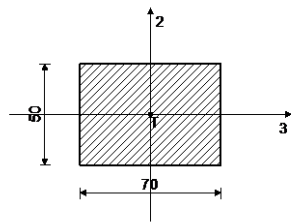
Set: 13 Prerez: b/d=135/50, Fiktivna ekscentričnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
1 - C 25	6.750e-1	5.625e-1	5.625e-1	4.315e-2	1.025e-1	1.406e-2

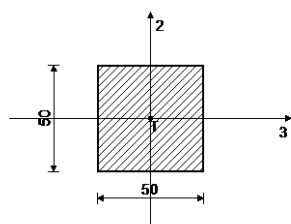
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[cm]

Mat.	A1	A2	A3	I1	I2	I3
1 - C 25	3.500e-1	2.917e-1	2.917e-1	1.633e-2	1.429e-2	7.292e-3

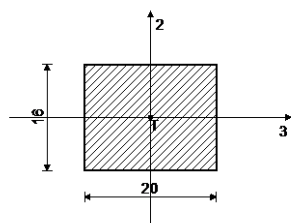
Set: 15 Prerez: b/d=50/50, Fiktivna ekscentričnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
1 - C 25	2.500e-1	2.083e-1	2.083e-1	8.802e-3	5.208e-3	5.208e-3

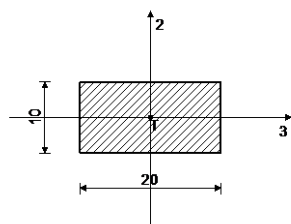
Set: 16 Prerez: b/d=20/16, Fiktivna ekscentričnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
4 - Les-Iglavci-M...	3.200e-2	2.667e-2	2.667e-2	1.401e-4	1.067e-4	6.827e-5

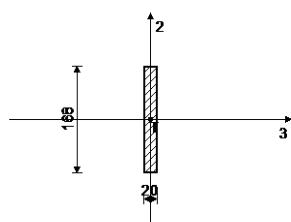
Set: 17 Prerez: b/d=20/10, Fiktivna ekscentričnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
4 - Les-Iglavci-M...	2.000e-2	1.667e-2	1.667e-2	4.578e-5	6.667e-5	1.667e-5

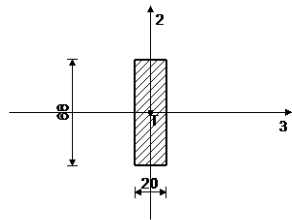
Set: 18 Prerez: b/d=20/168, Fiktivna ekscentričnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
5 - Les-Iglavci-L...	3.360e-1	2.800e-1	2.800e-1	4.144e-3	1.120e-3	7.903e-2

Set: 19 Prerez: b/d=20/68, Fiktivna ekscentričnost



[cm]

Mat.	A1	A2	A3	I1	I2	I3
5 - Les-Iglavci-L...	1.360e-1	1.133e-1	1.133e-1	1.478e-3	4.533e-4	5.241e-3

Seti površinskih podpor

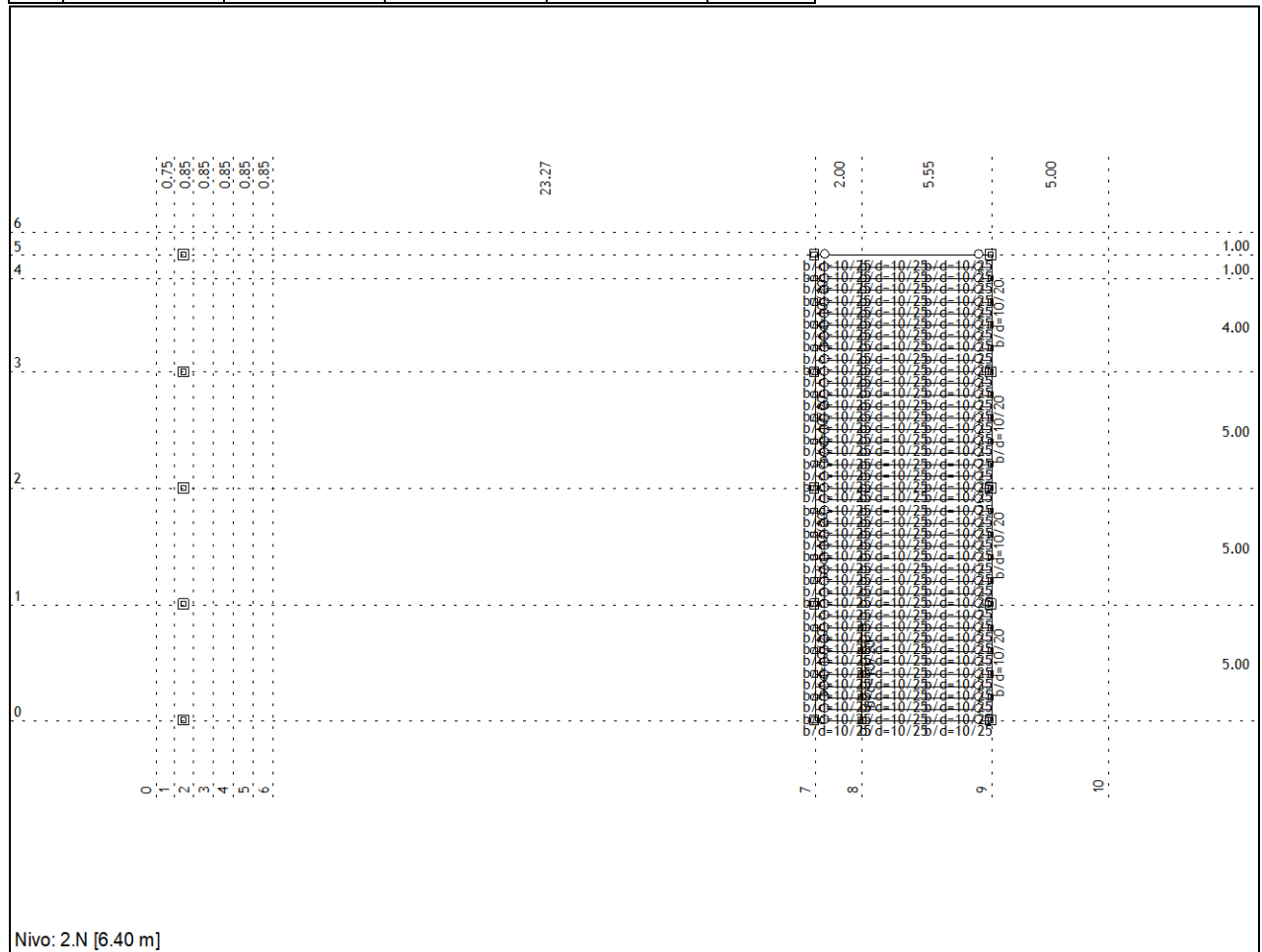
Set	K,R1	K,R2	K,R3
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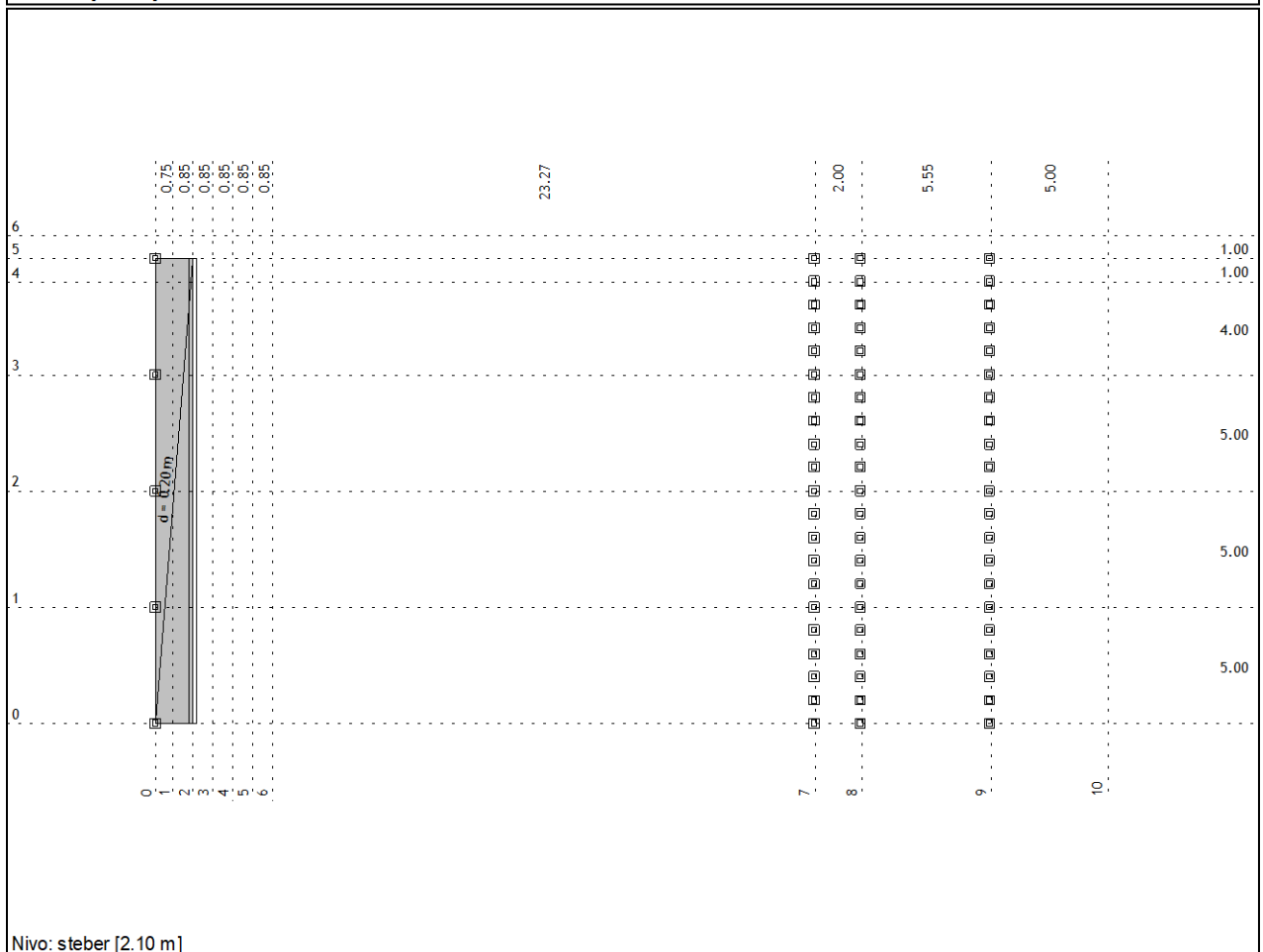
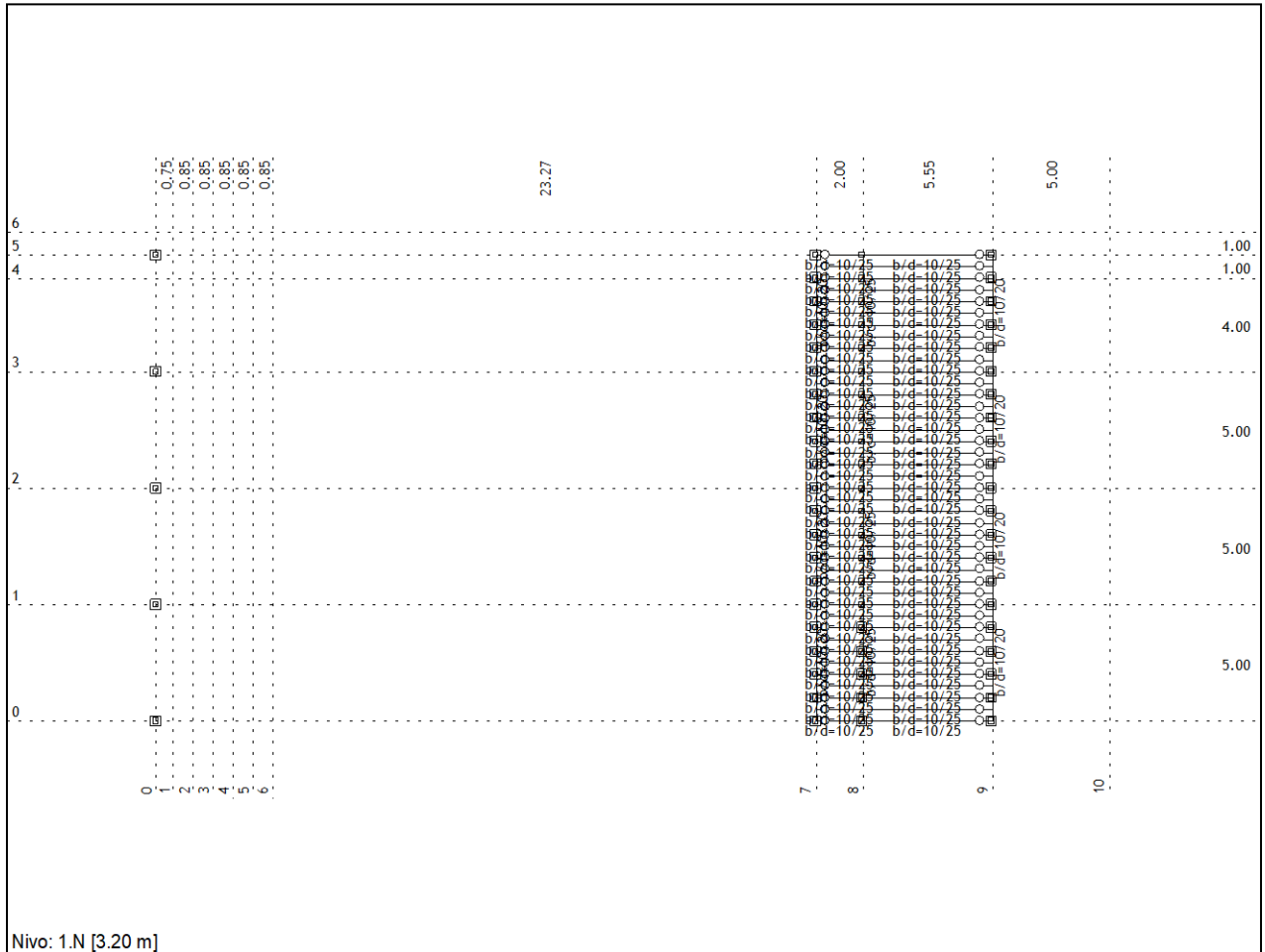
1	2.000e+4	2.000e+4	2.000e+4
2	1.000e+4	1.000e+4	1.000e+4

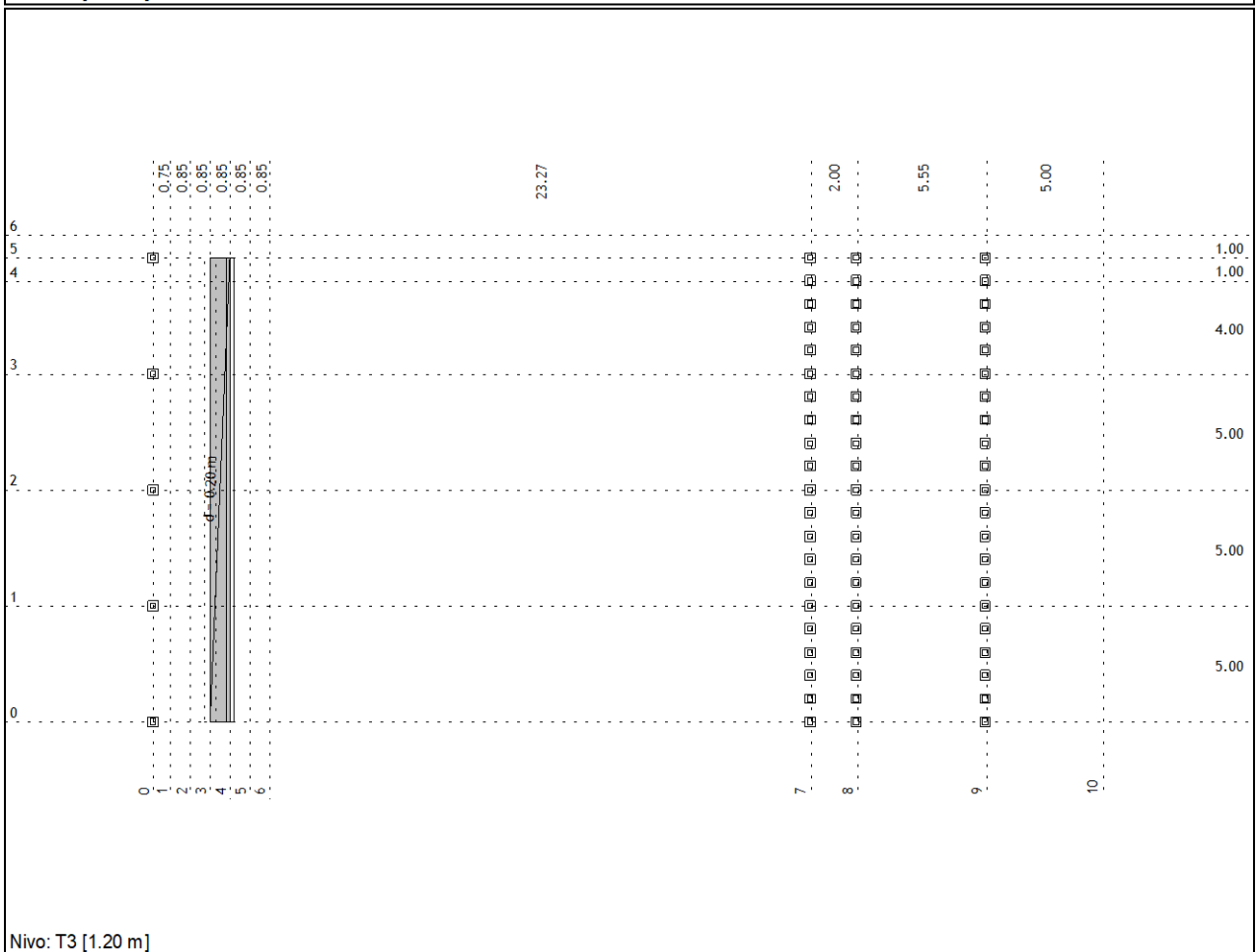
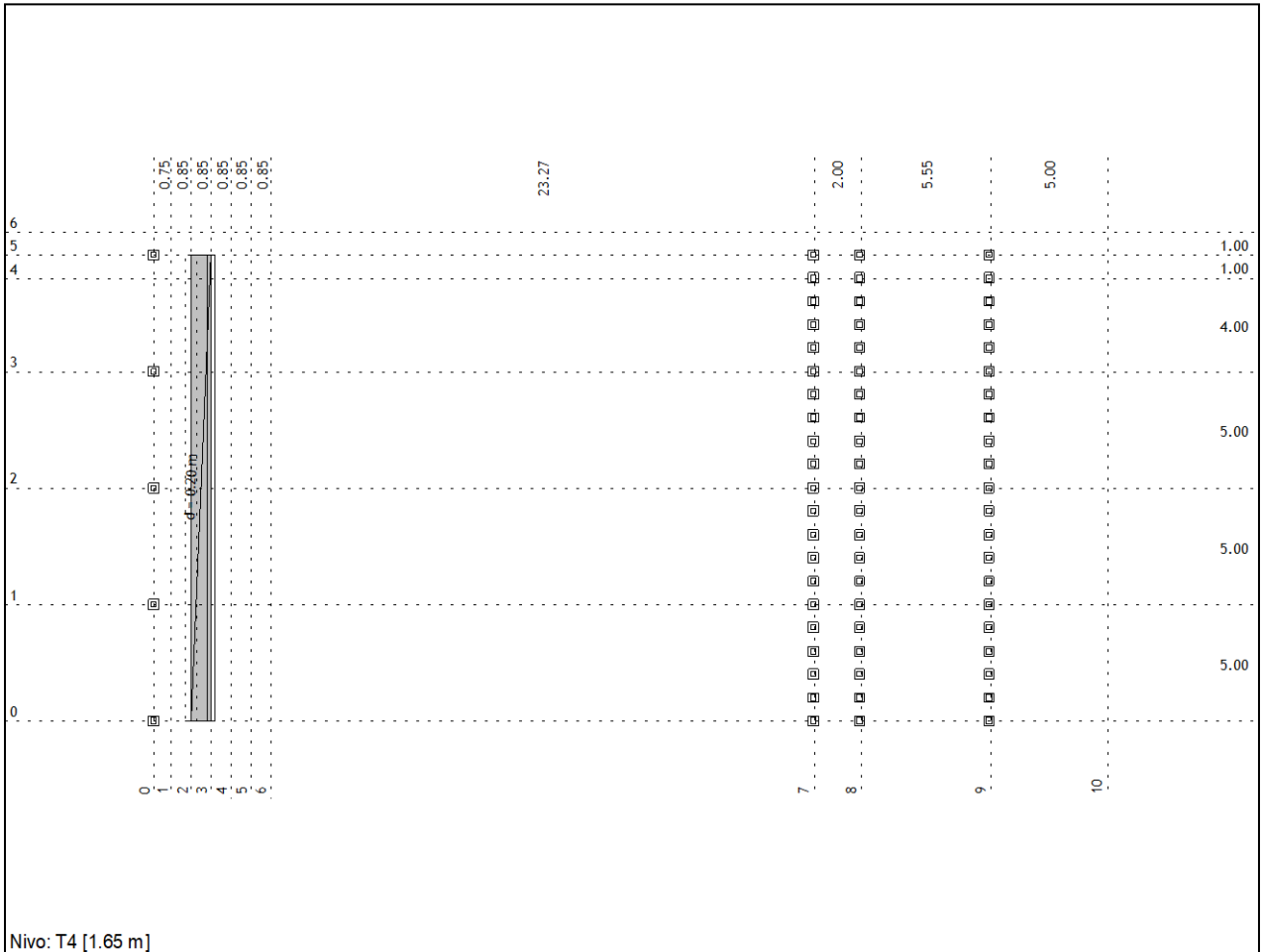
Seti linijskih podpor

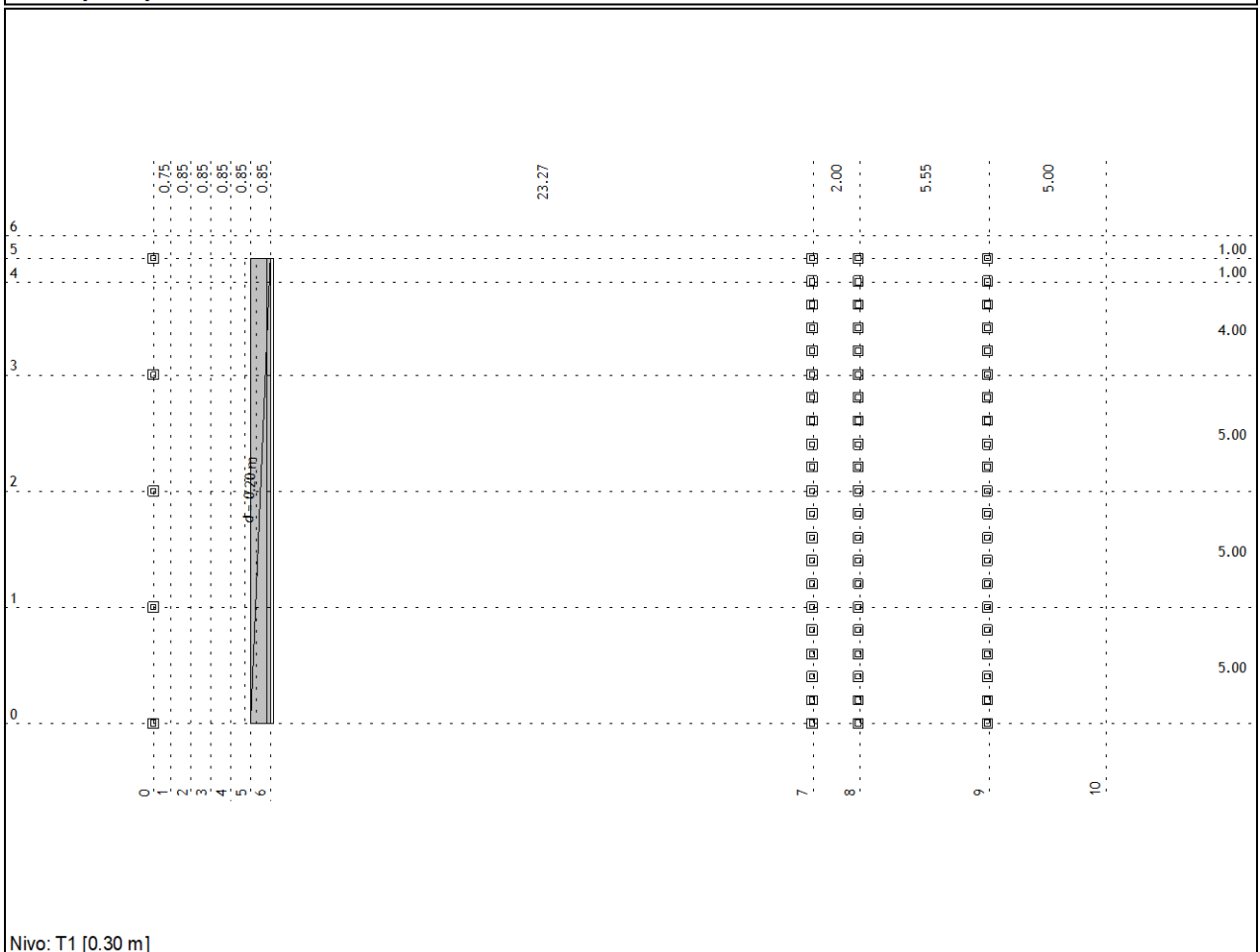
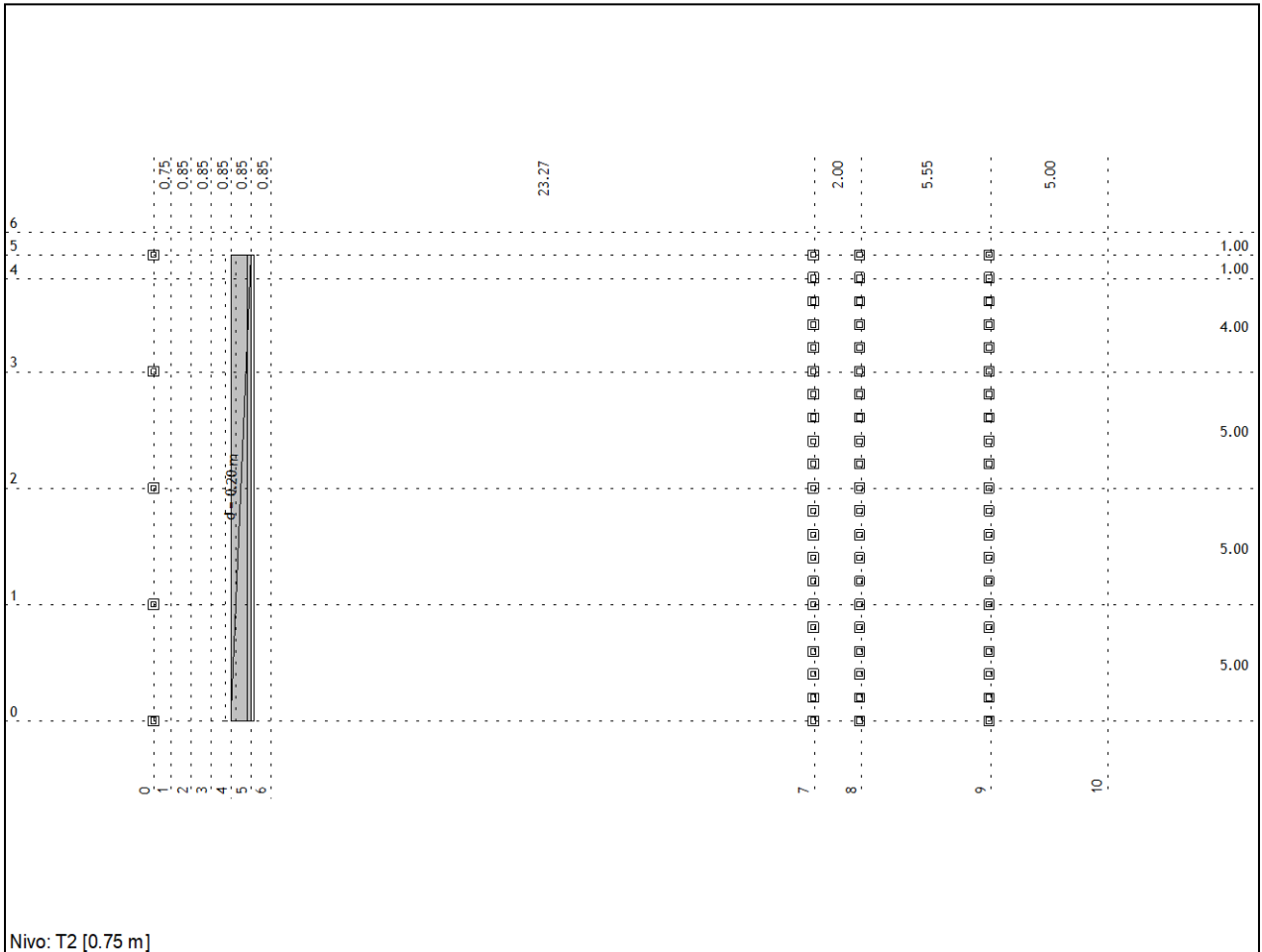
Set	K,R1	K,R2	K,R3	K,M1	Tla [m]
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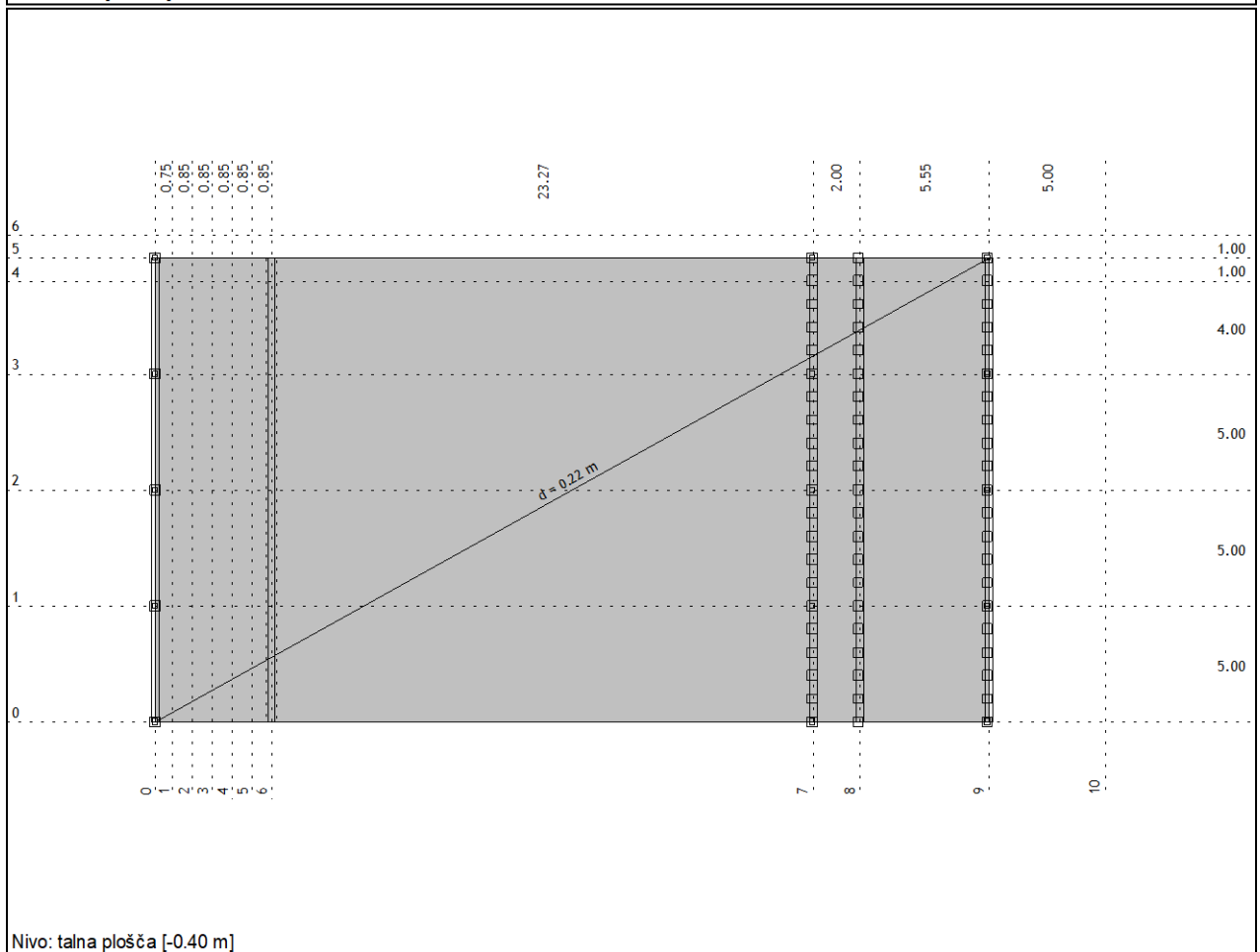
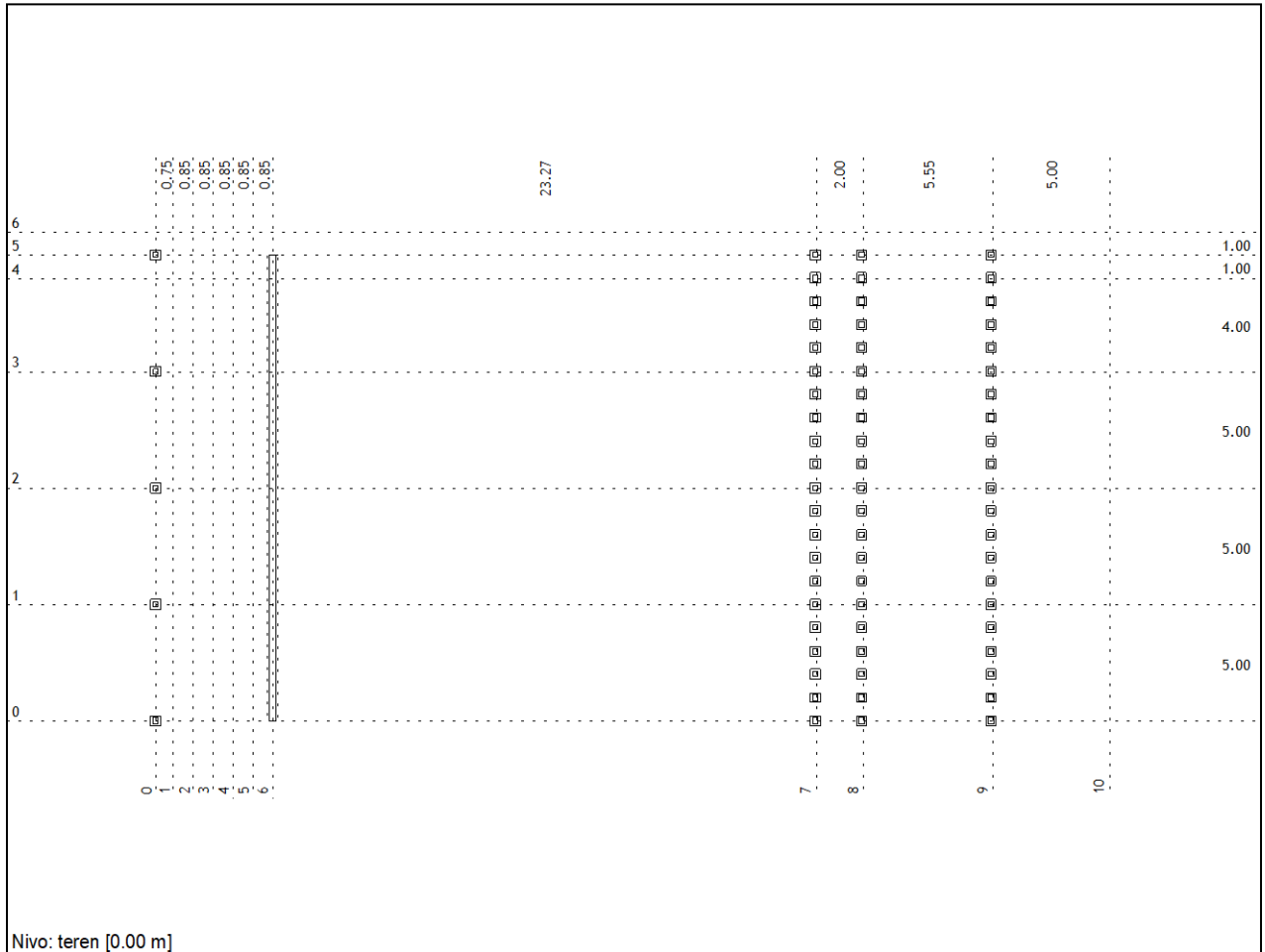
1	2.000e+4	2.000e+4	2.000e+4		0.500
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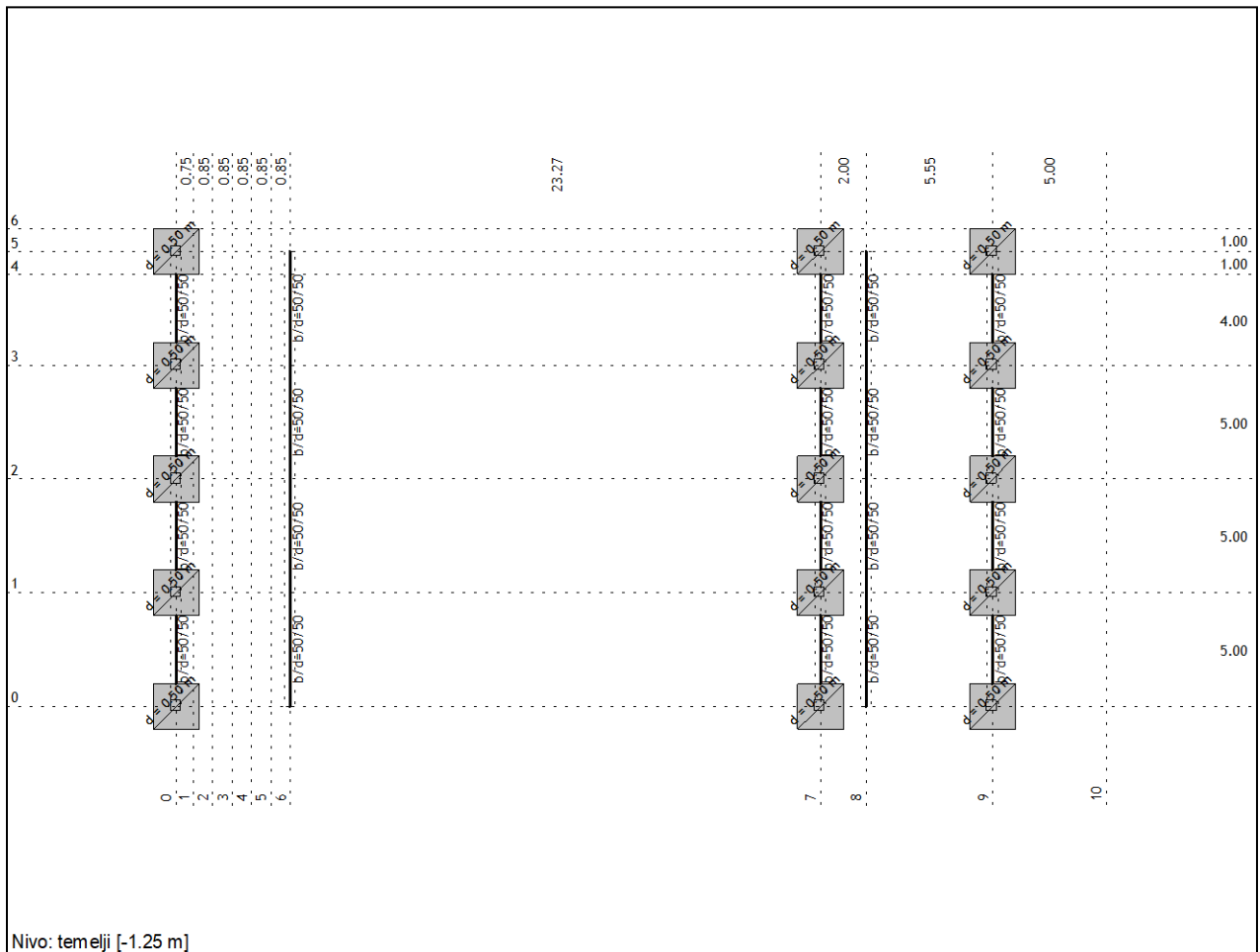




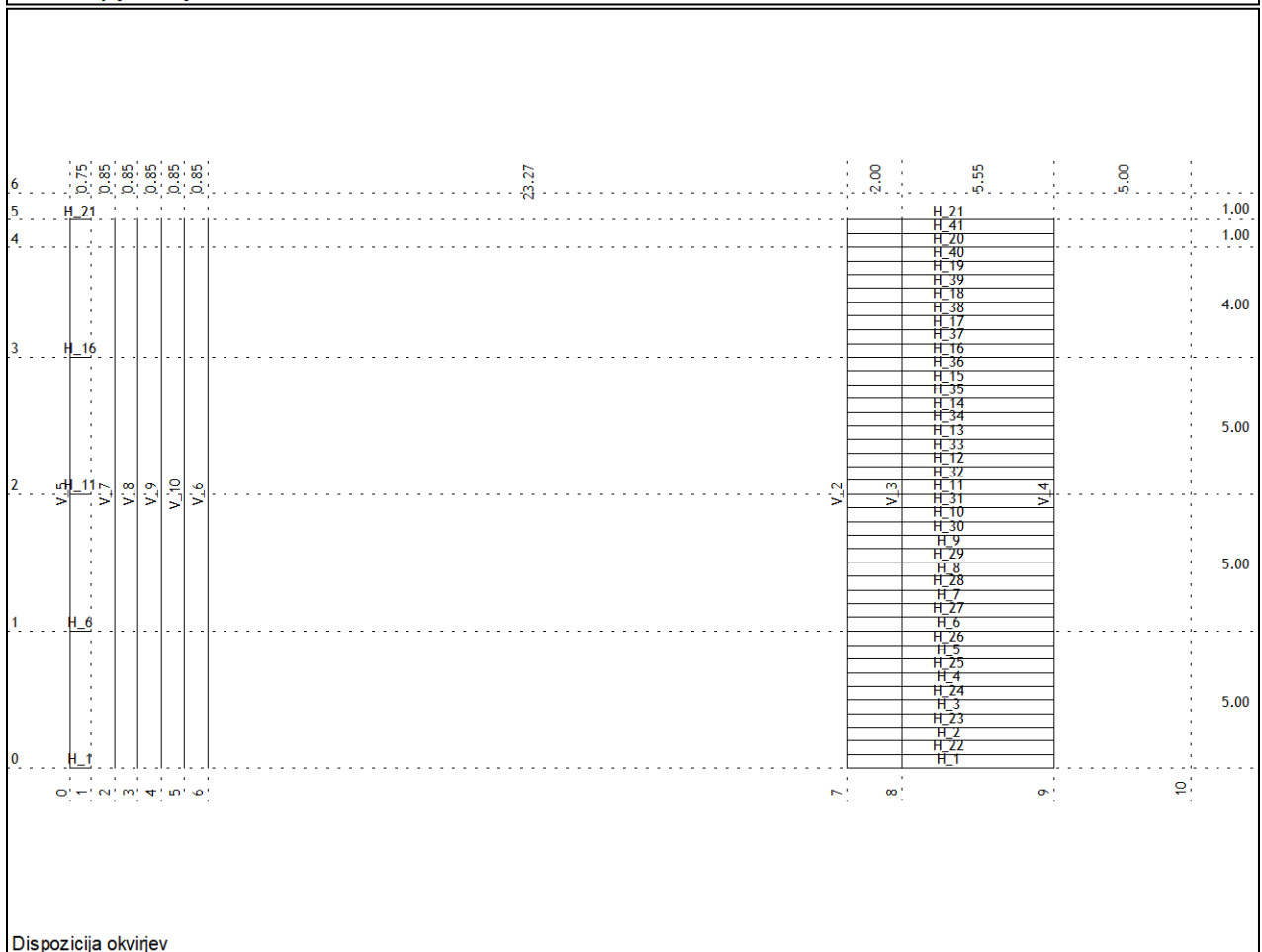




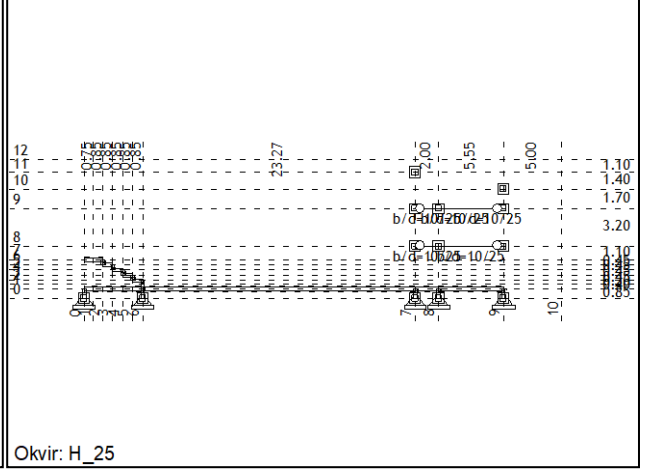
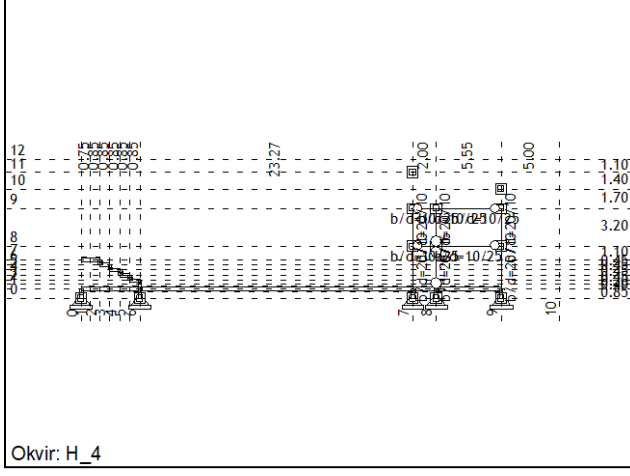
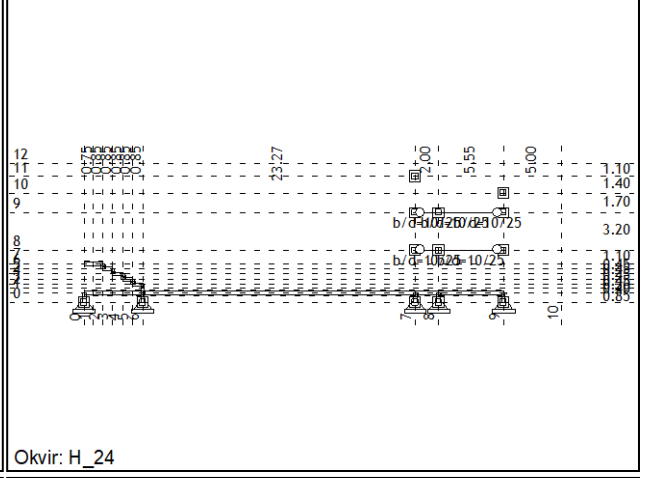
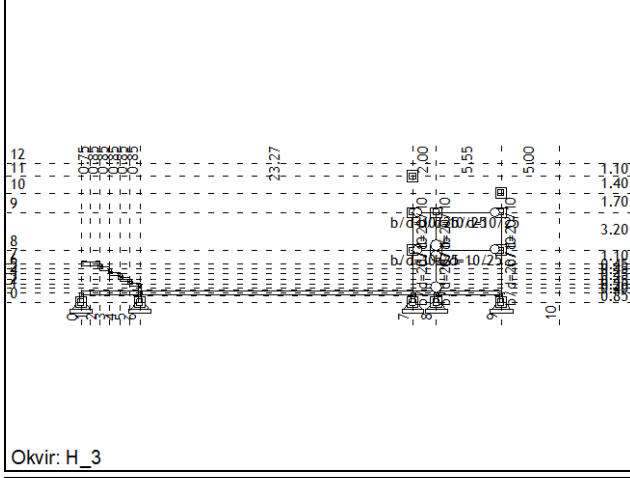
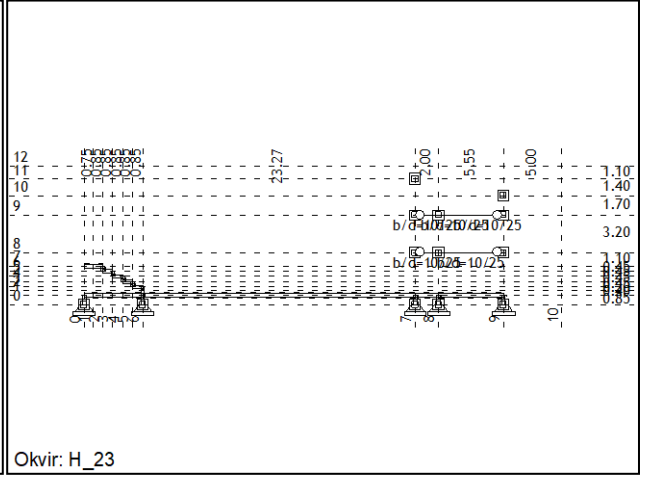
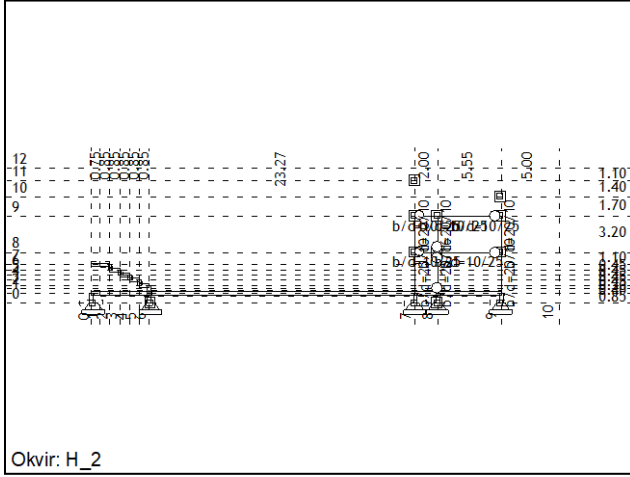
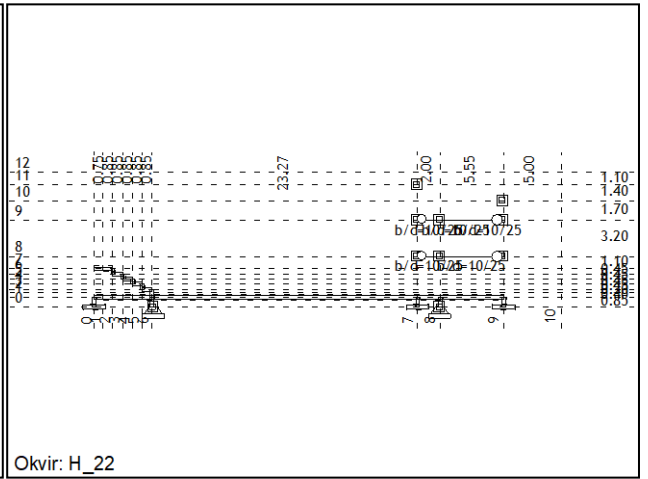
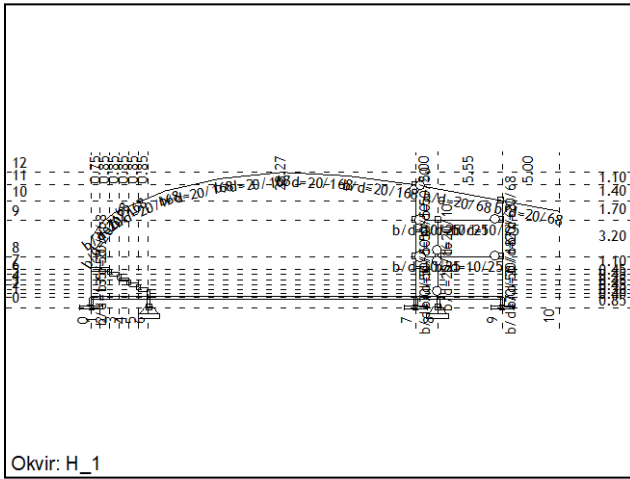


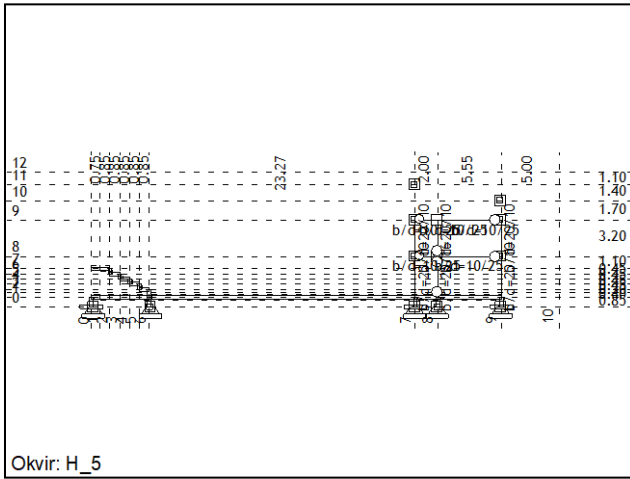


Nivo: temelji [-1.25 m]

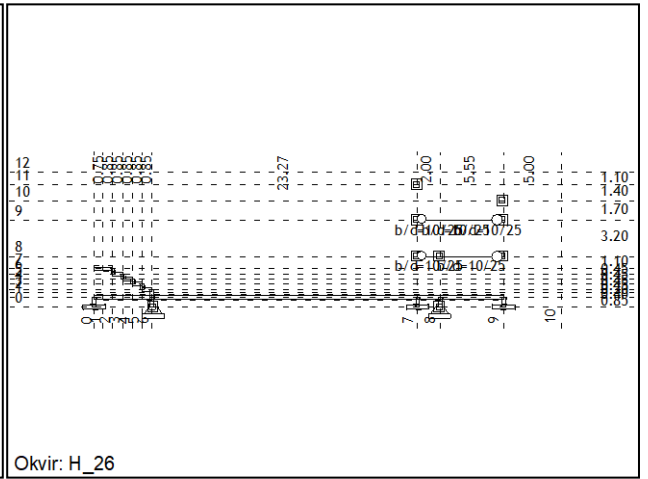


Dispozicija okvirjev

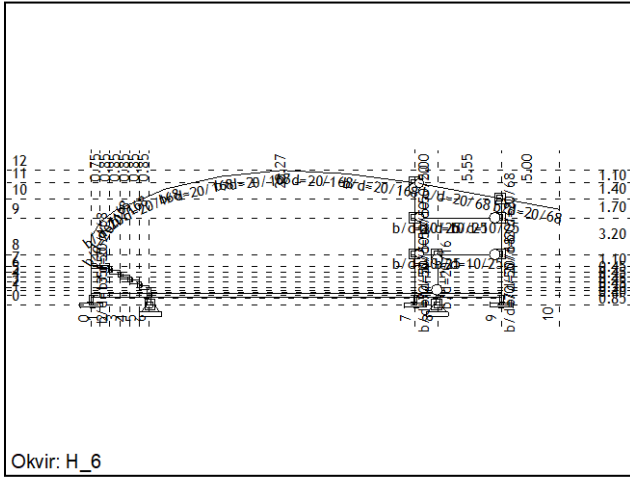




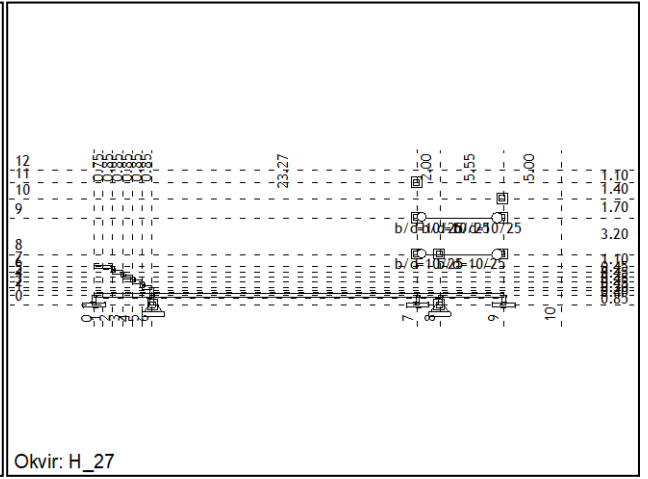
Okvir: H_5



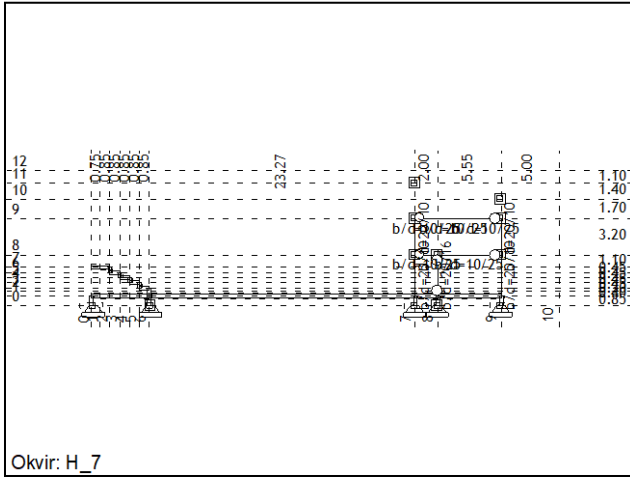
Okvir: H_26



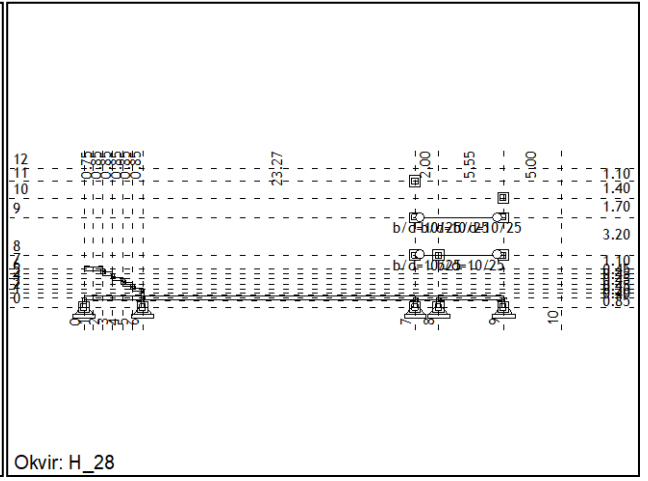
Okvir: H_6



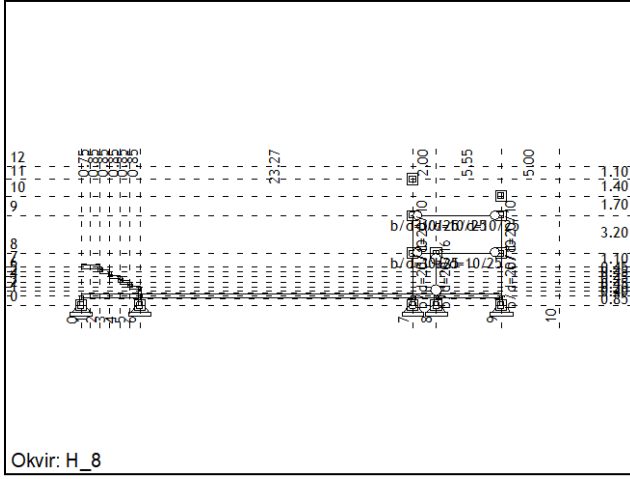
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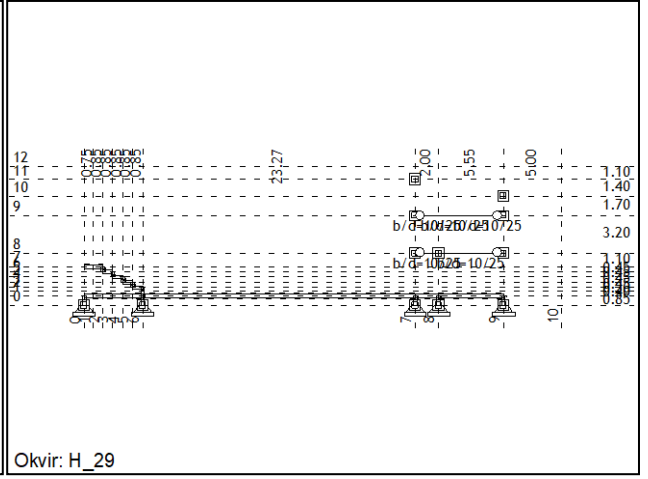
Okvir: H_7



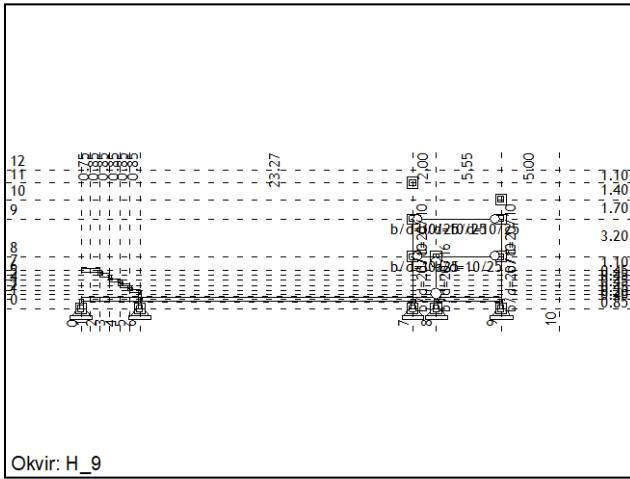
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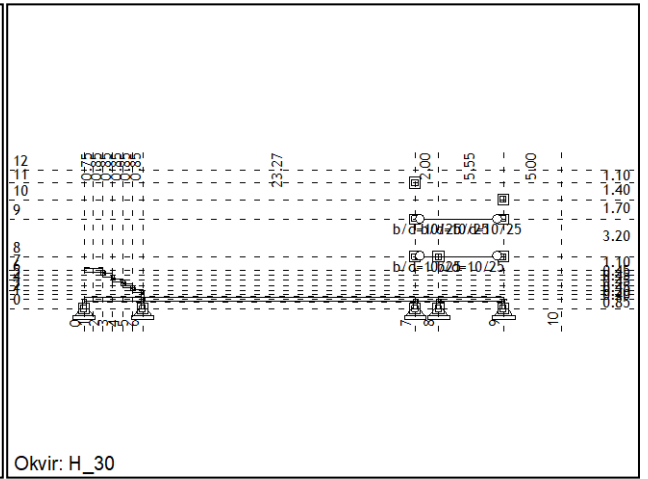
Okvir: H_8



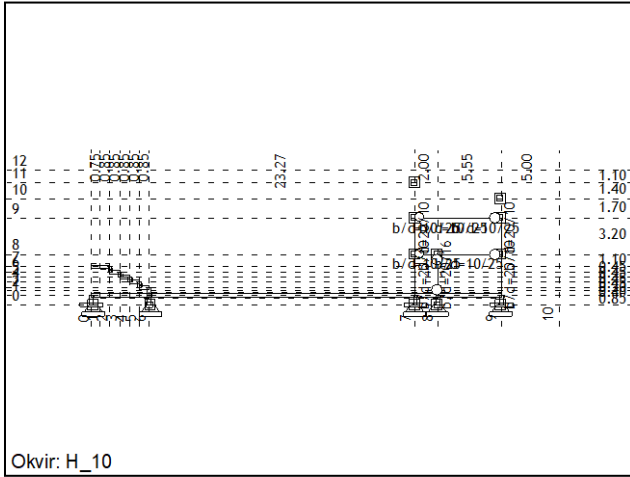
Okvir: H_29



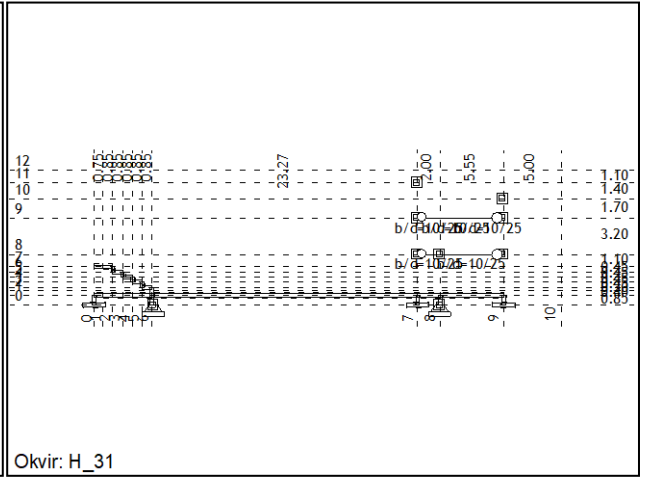
Okvir: H_9



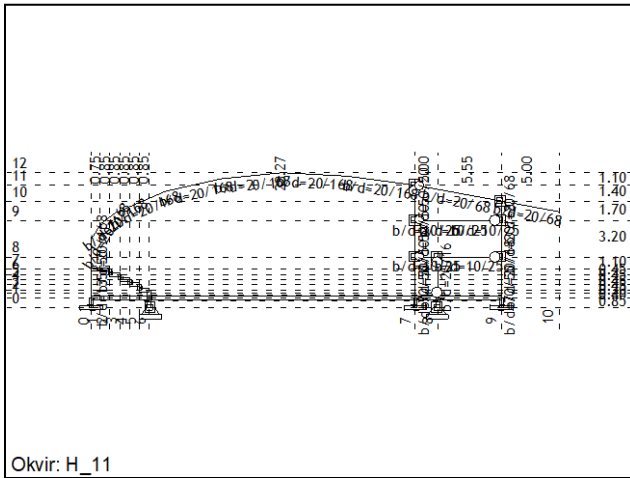
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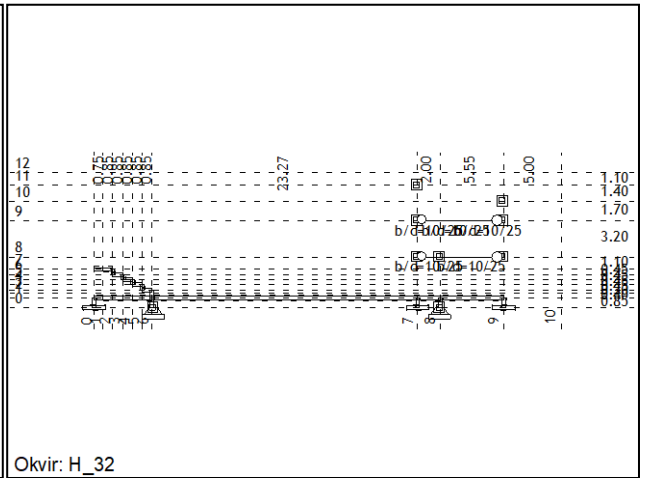
Okvir: H_10



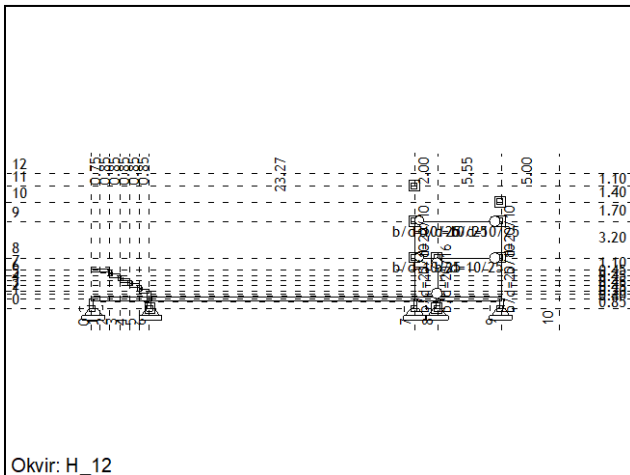
Okvir: H_31



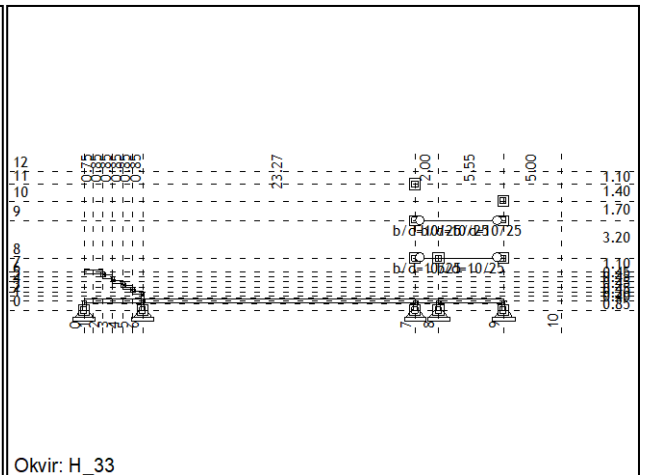
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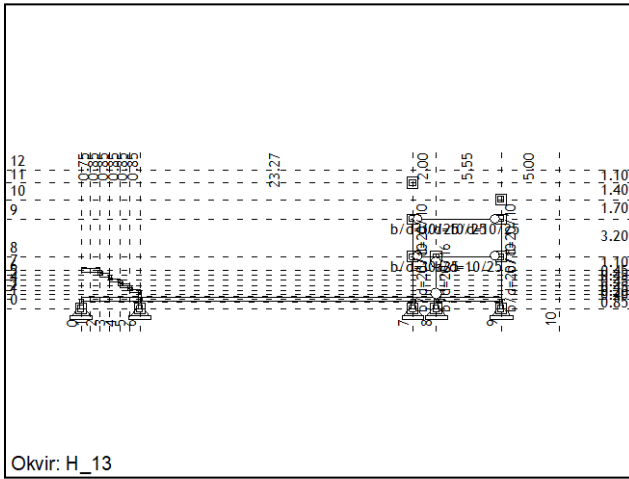
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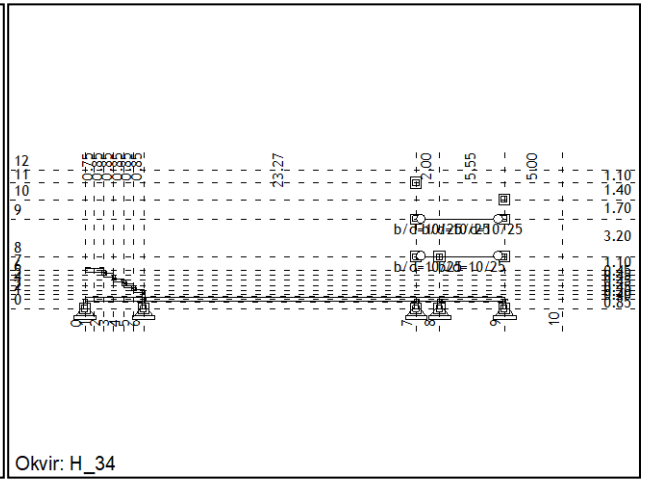
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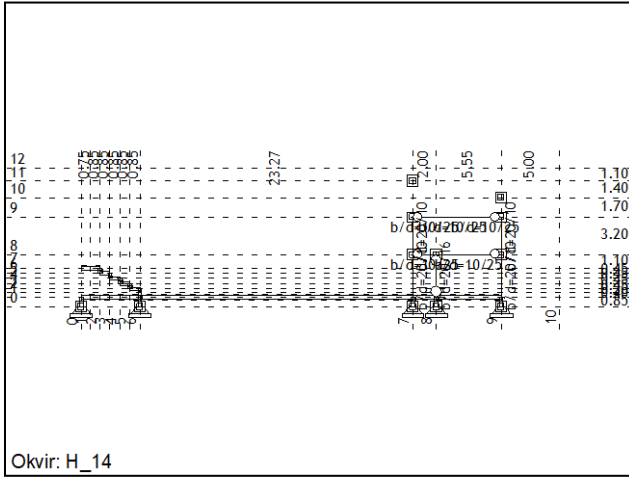
Okvir: H_33



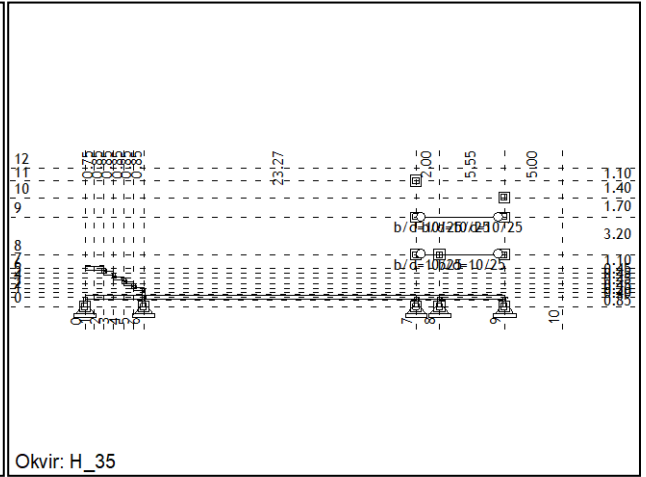
Okvir: H_13



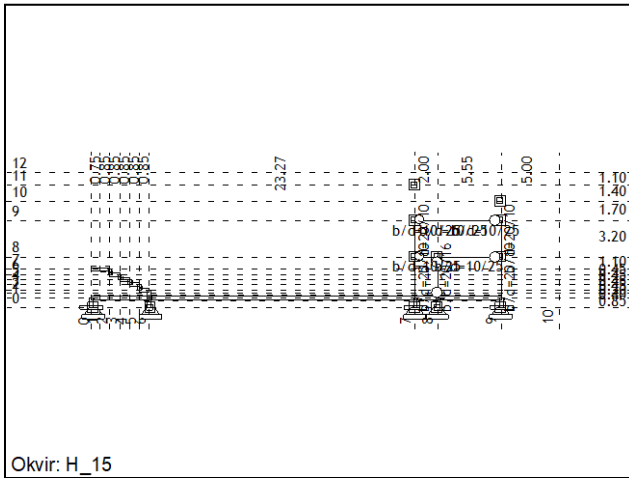
Okvir: H_34



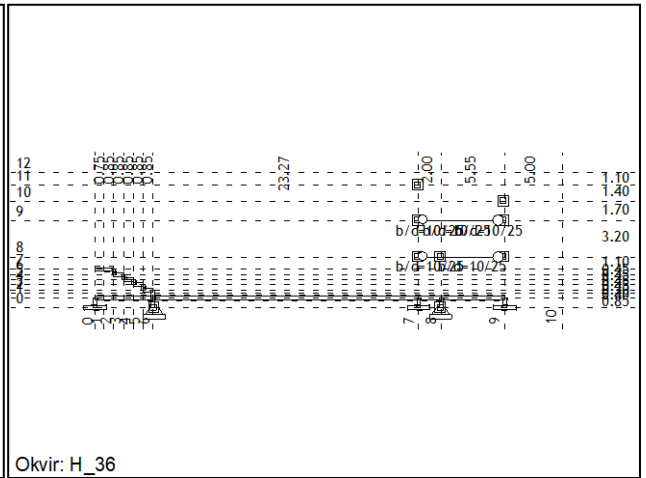
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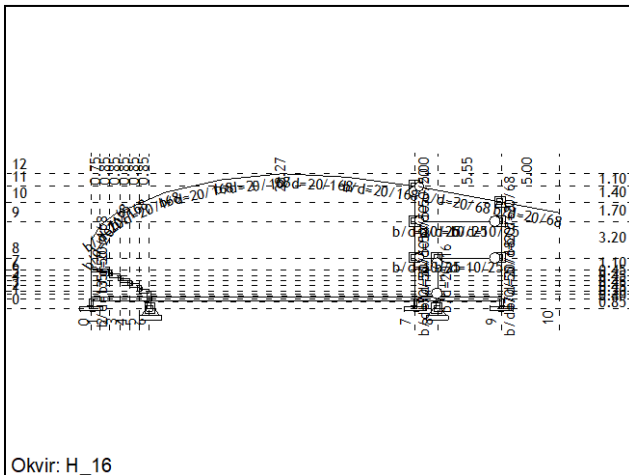
Okvir: H_35



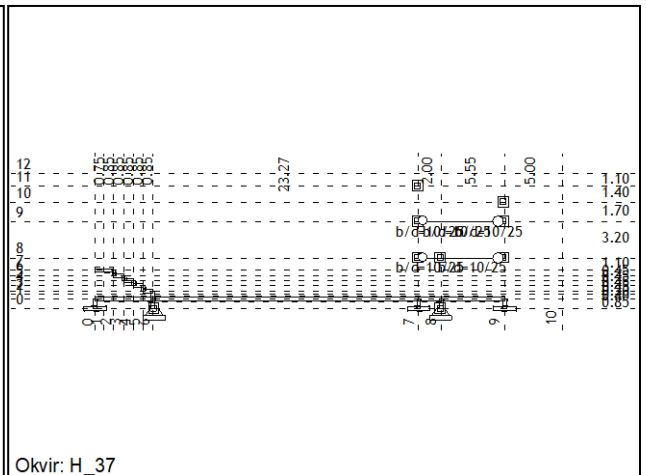
Okvir: H_15



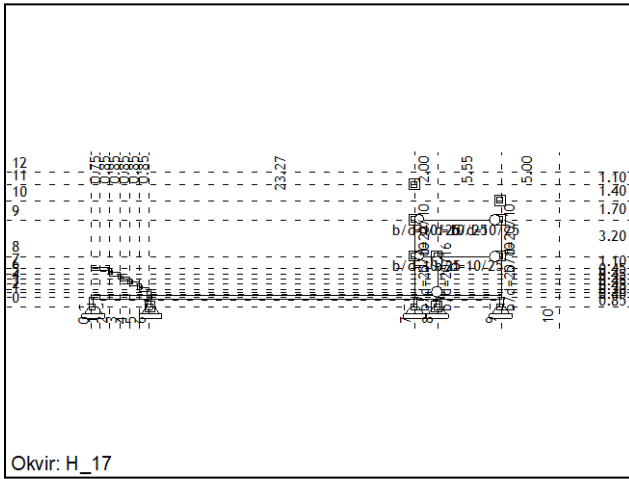
Okvir: H_36



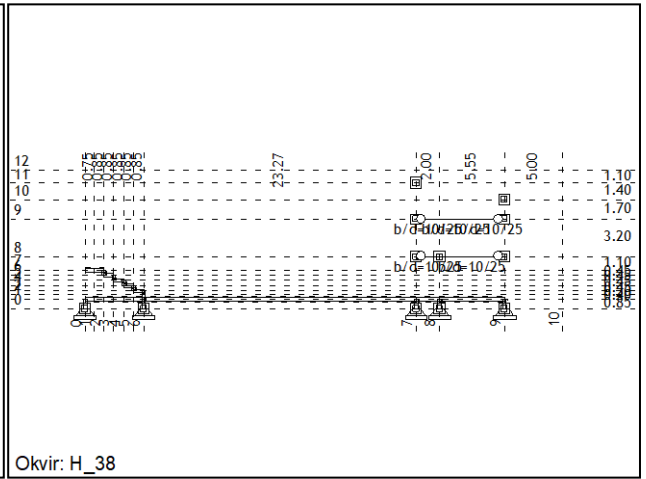
Okvir: H_16



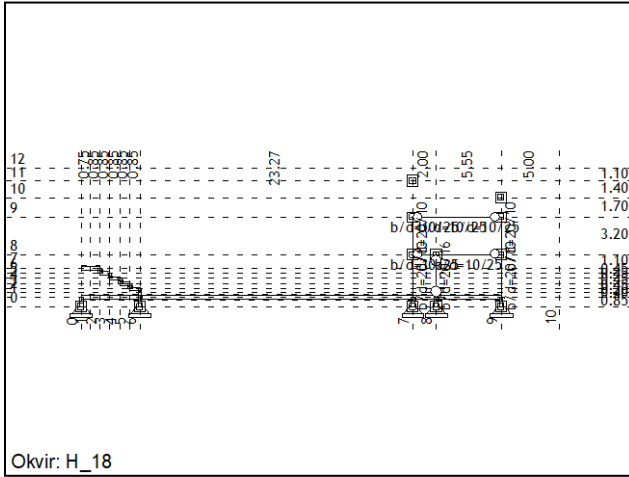
Okvir: H_37



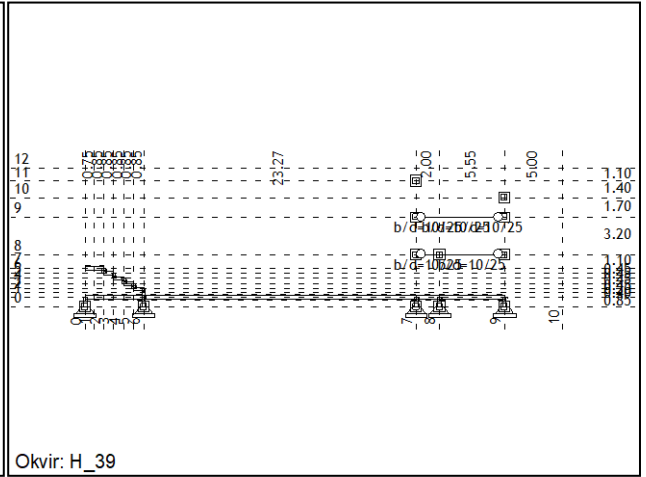
Okvir: H_17



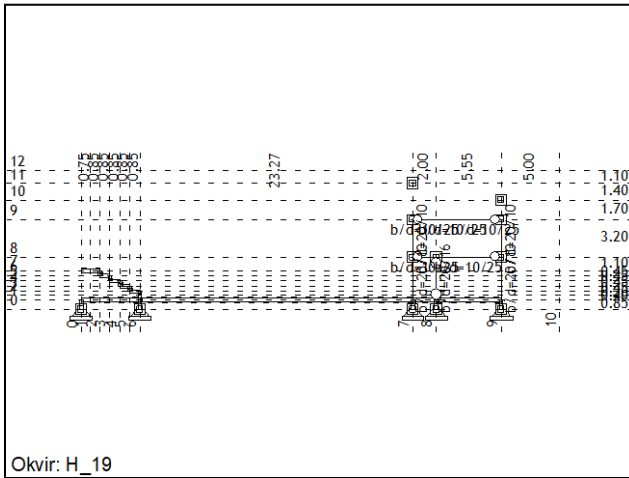
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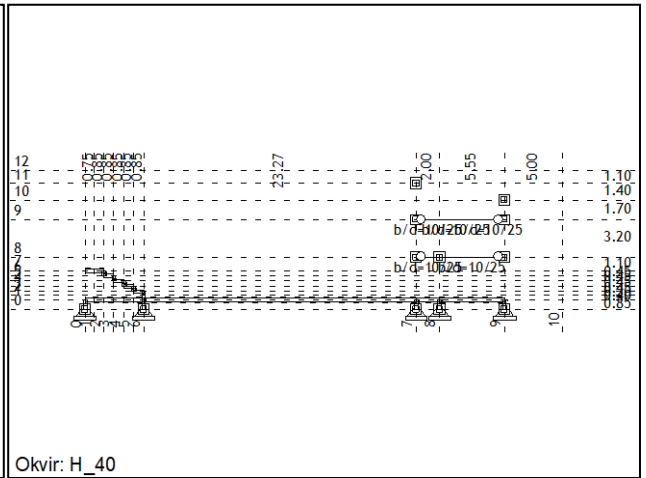
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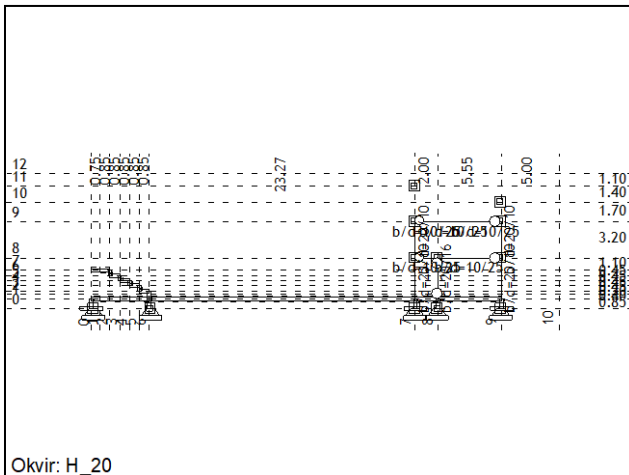
Okvir: H_39



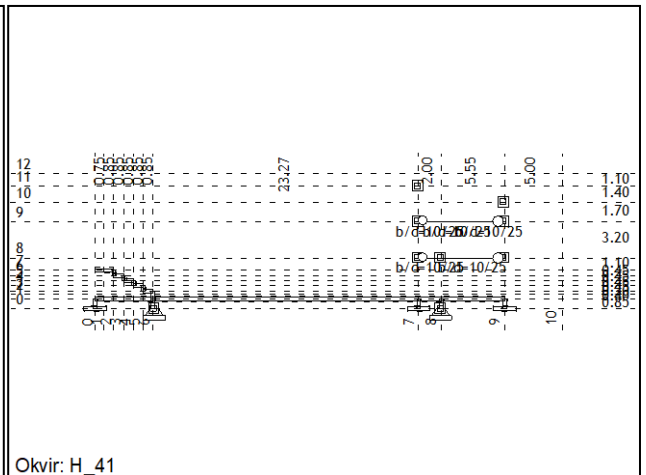
Okvir: H_19



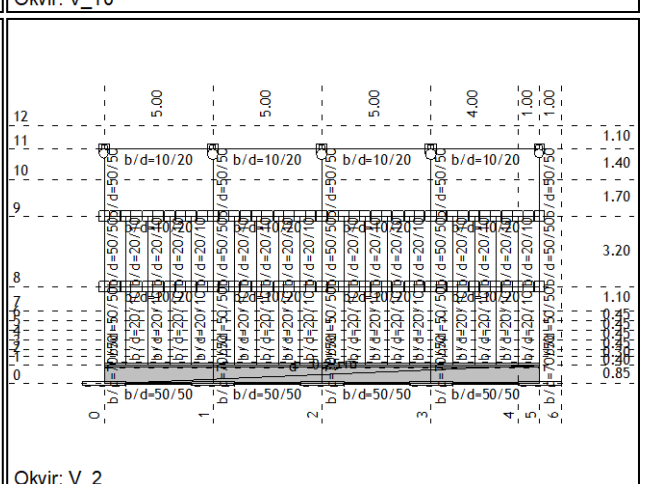
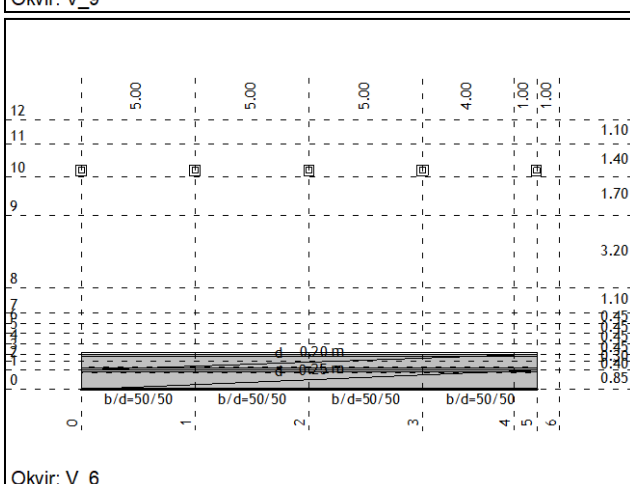
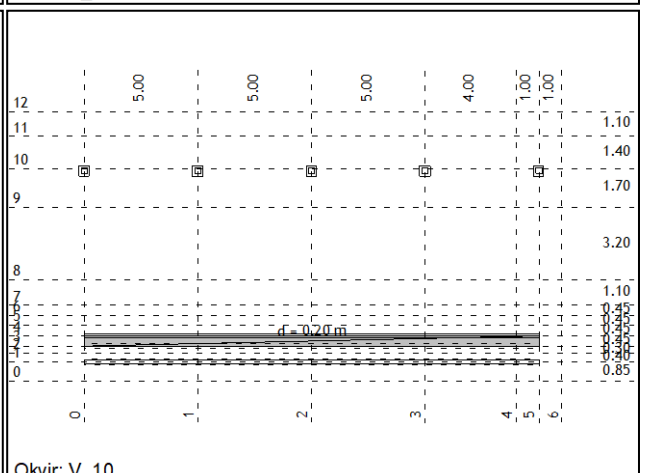
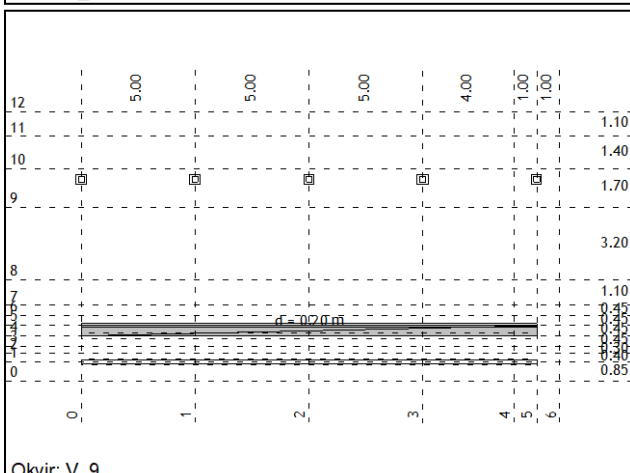
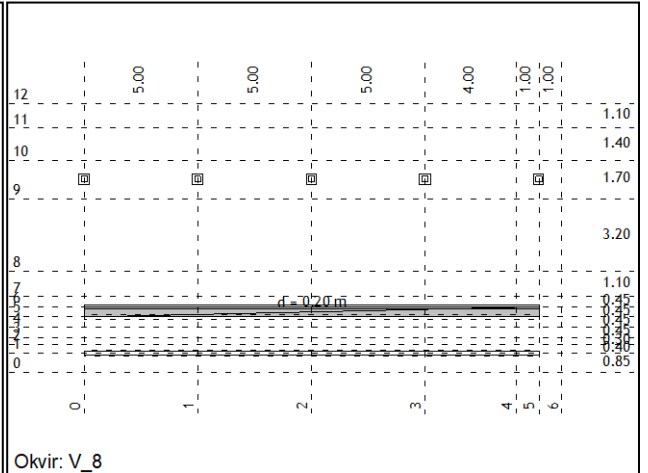
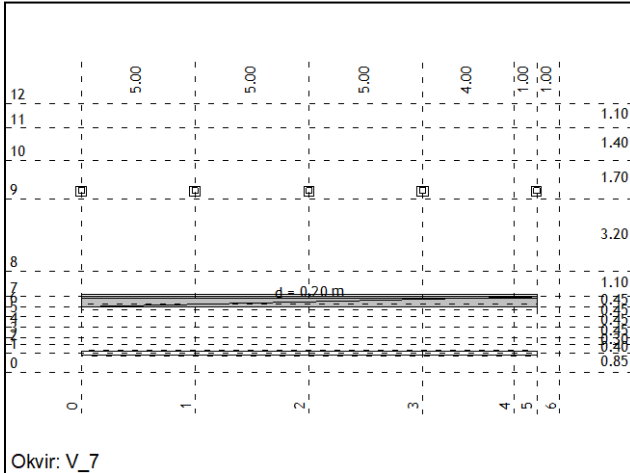
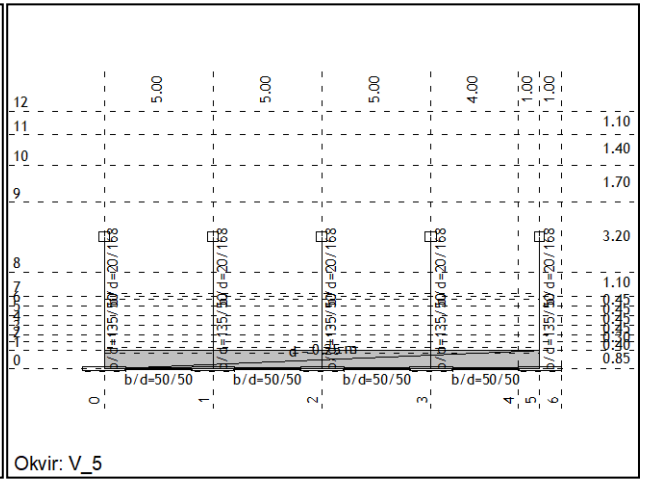
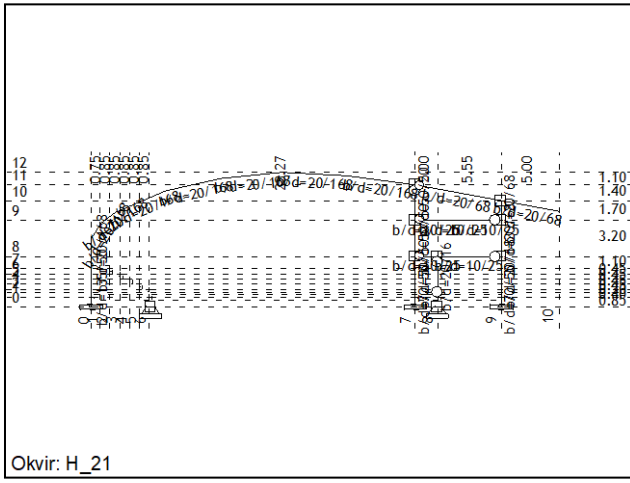
Okvir: H_40

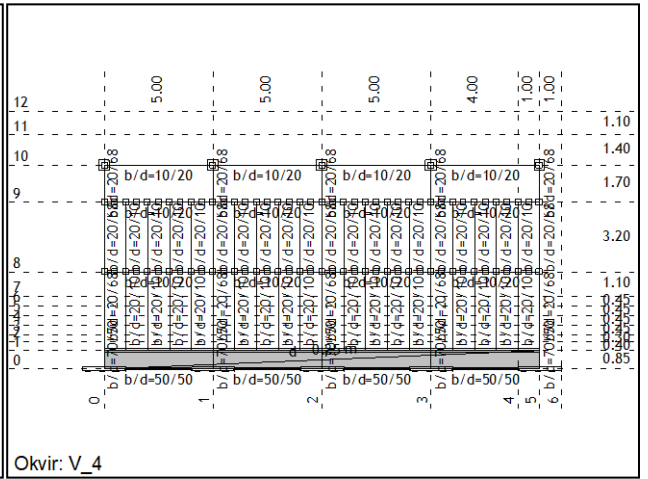
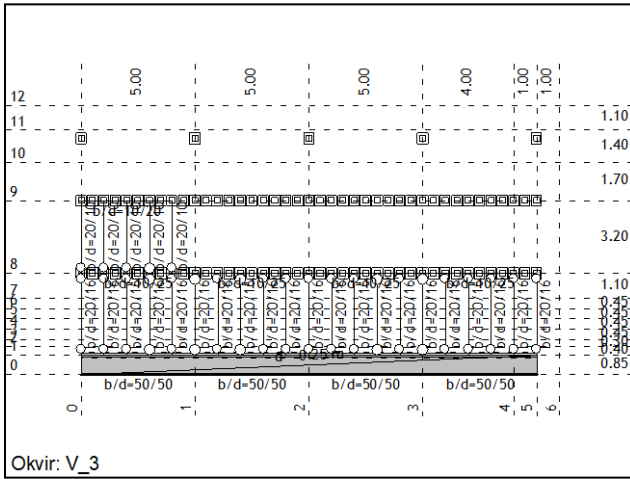


Okvir: H_20



Okvir: H_41

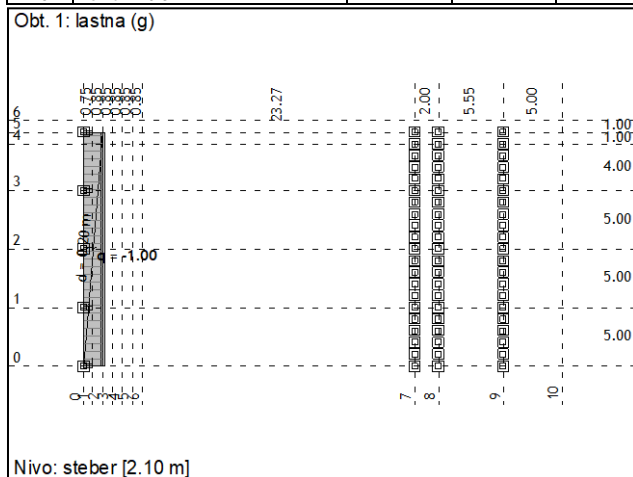




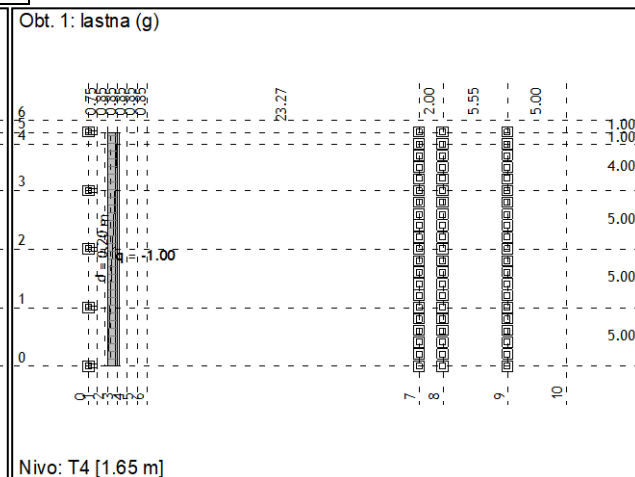
Vhodni podatki - Obtežba

Lista obtežnih primerov

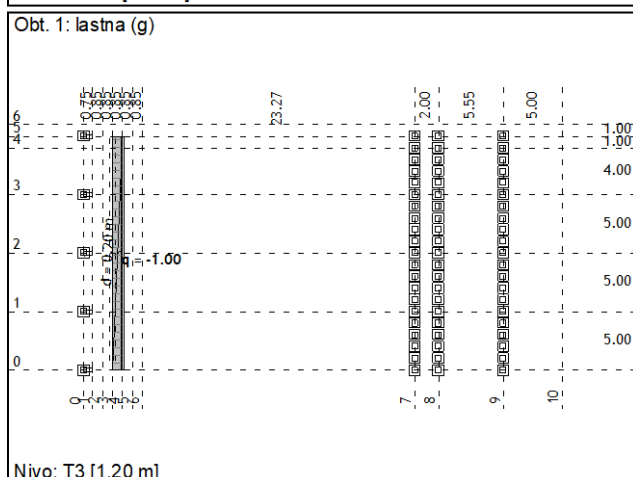
No	Naziv	pX [kN]	pY [kN]	pZ [kN]
1	lastna (g)	-0.00	0.00	-9835.23
2	koristna	-0.00	0.00	-5293.90
3	sneg	-0.00	0.00	-1329.98
4	veter X	639.35	0.00	-0.00
5	veter Y	11.86	0.00	-204.10
6	potres X			
7	potres Y			
8	potres XY			
9	Komb.: I	-0.00	0.00	-9835.23
10	Komb.: I+II	-0.00	0.00	-15129.13
11	Komb.: I+III	-0.00	0.00	-11165.21
12	Komb.: I+II+III	-0.00	0.00	-16459.11
13	Komb.: 1.35xI+0.9xIV	575.42	0.00	-15129.13
14	Komb.: I+II+III+0.9xIV	575.42	0.00	-16459.11
15	Komb.: 1.35xI+1.5xII+0.9xIII	-0.00	0.00	-22415.40
16	Komb.: 1.35xI+0.9xII+1.5xIII	-0.00	0.00	-20037.04
17	Komb.: 1.35xI+0.9xII+1.5xIV	959.03	0.00	-18042.07
18	Komb.: 1.35xI+0.9xII+1.5xIII+0.9xIV	575.42	0.00	-20037.04
19	Komb.: 1.35xI+0.9xII+0.75xIII+1.5xIV	959.03	0.00	-19039.56
20	Komb.: 0.9xI+0.9xII+1.5xV	17.80	0.00	-13922.37
21	Komb.: I+0.3xII+VI			
22	Komb.: I+0.3xII-1xVI			
23	Komb.: I+0.3xII+VII			
24	Komb.: I+0.3xII-1xVII			
25	Komb.: I+0.3xII+VIII			
26	Komb.: I+0.3xII-1xVIII			



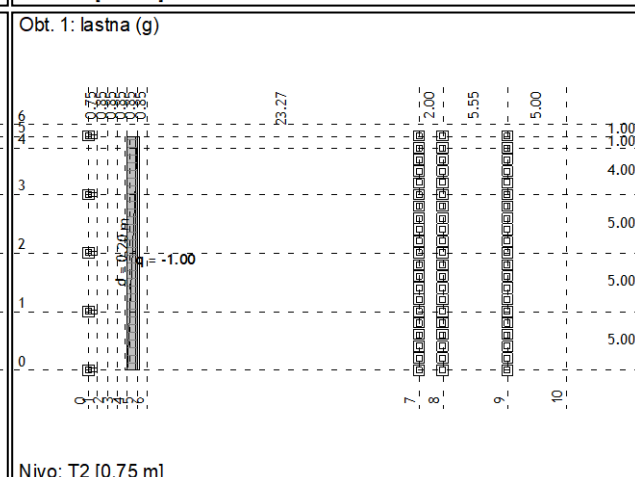
Nivo: steber [2.10 m]



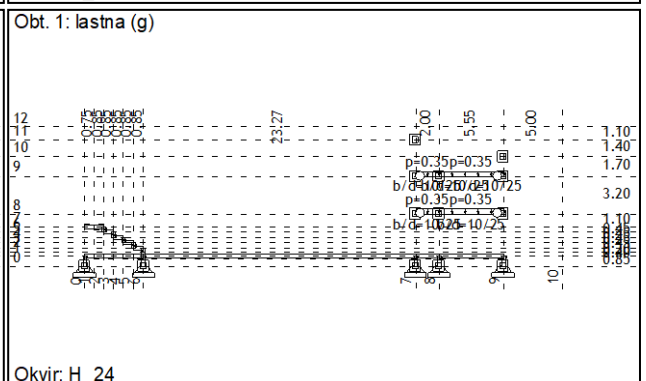
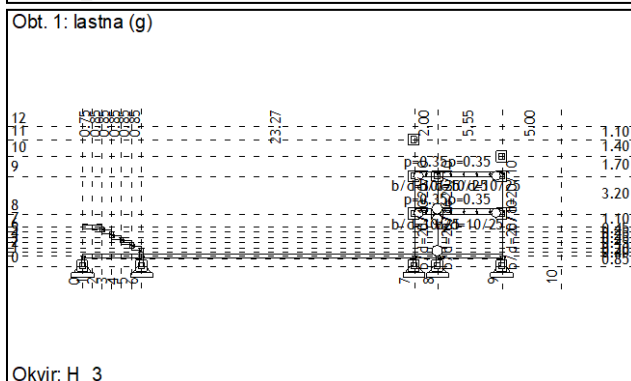
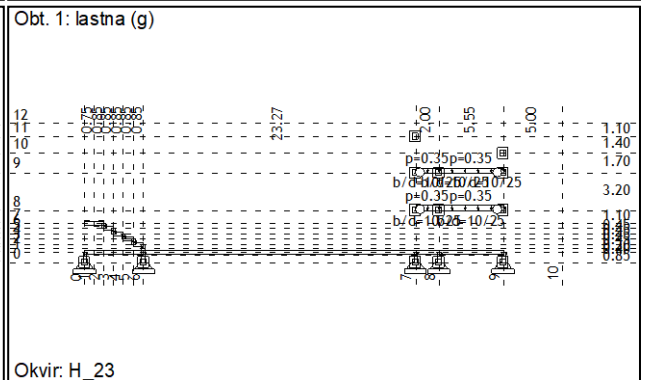
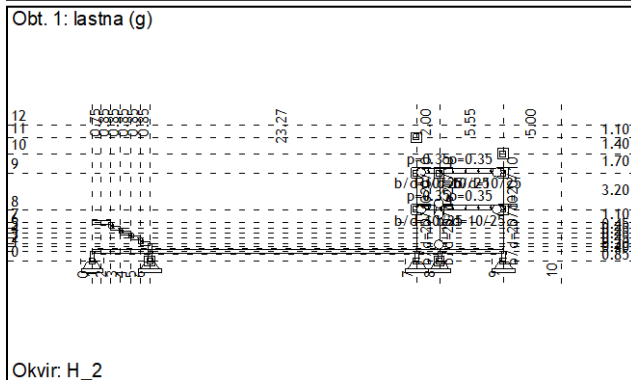
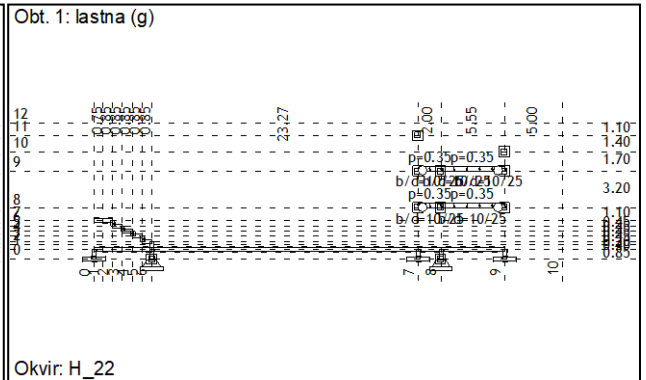
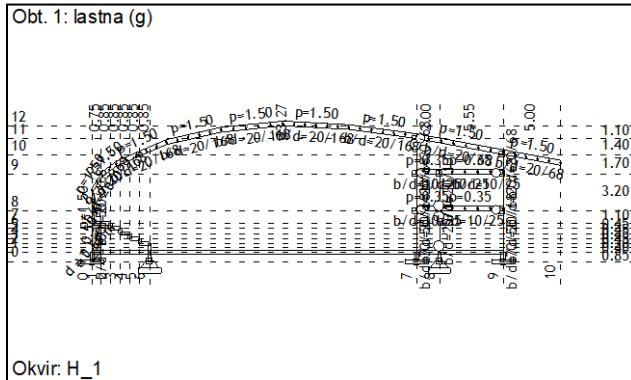
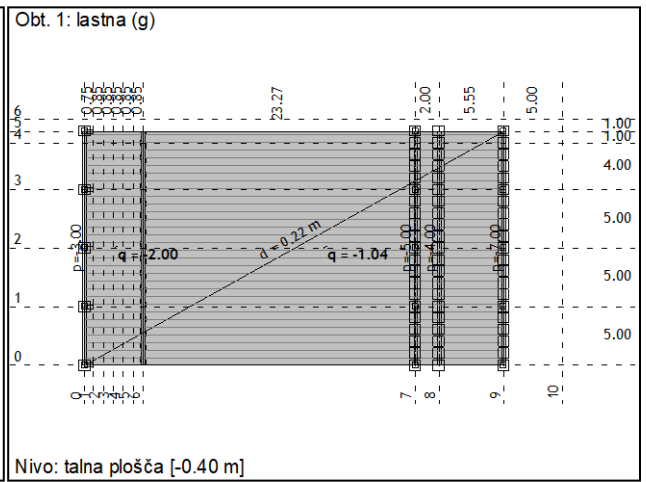
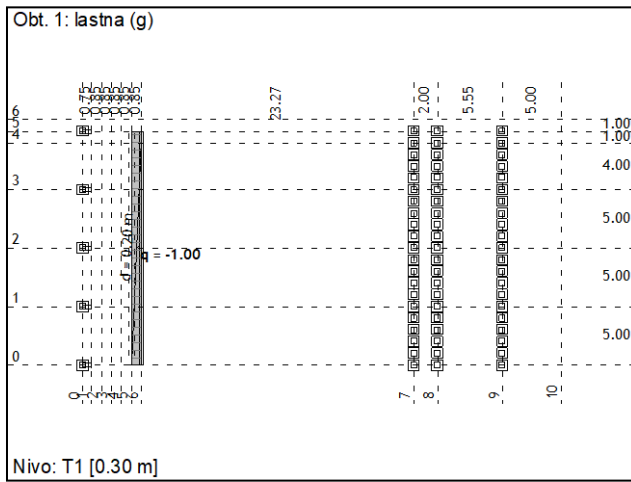
Nivo: T4 [1.65 m]

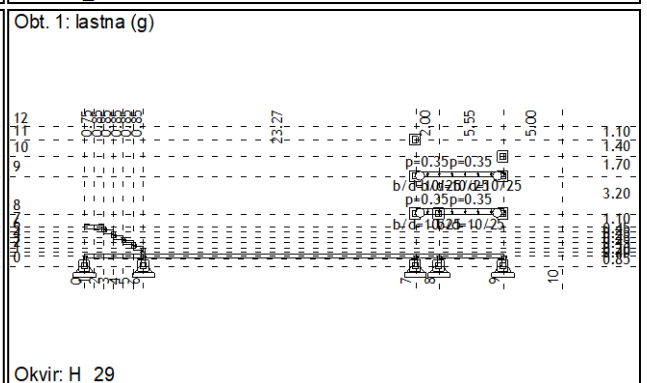
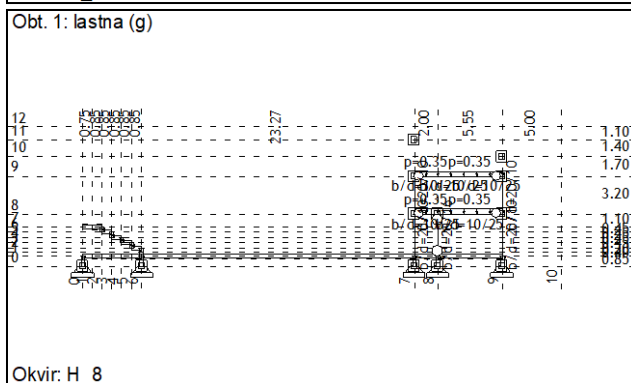
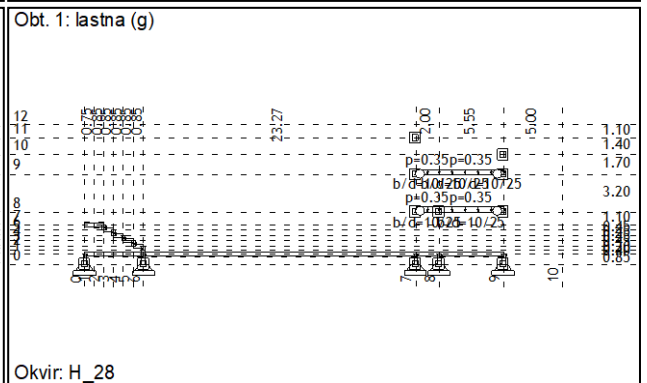
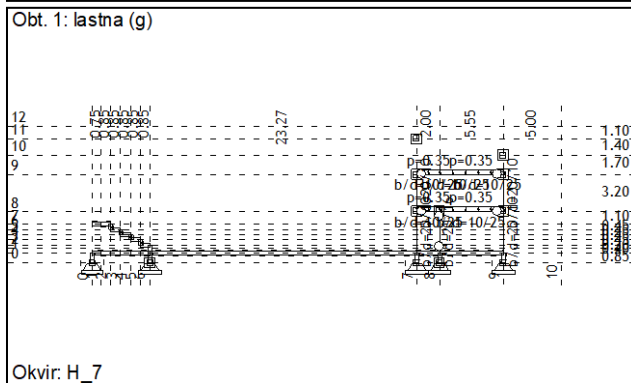
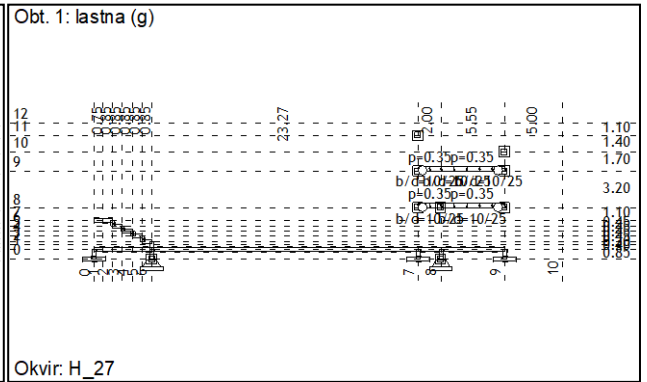
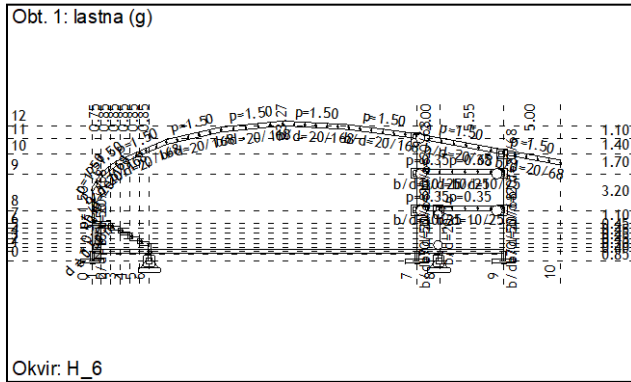
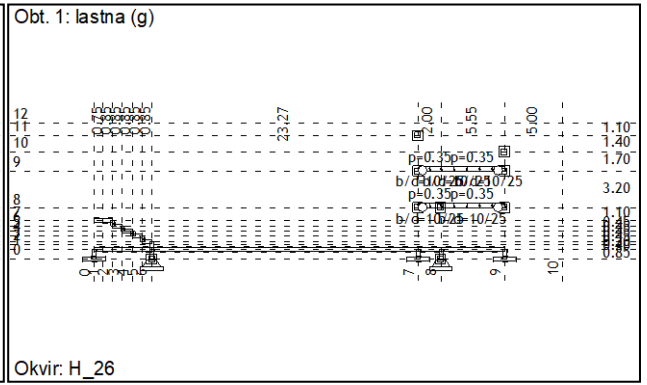
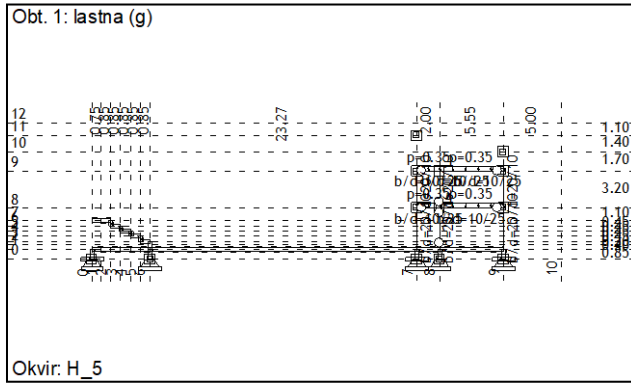
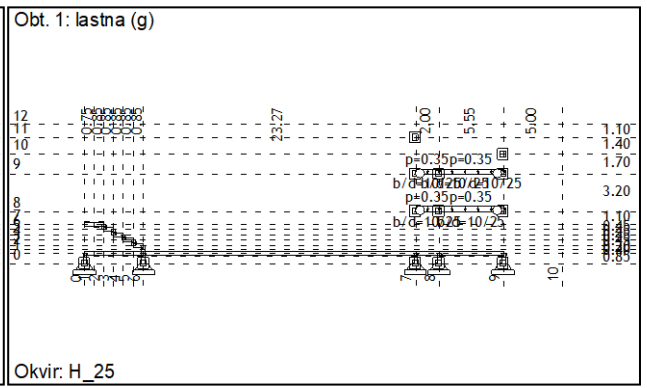
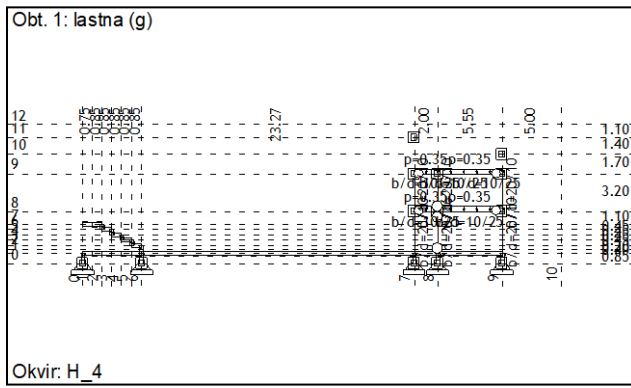


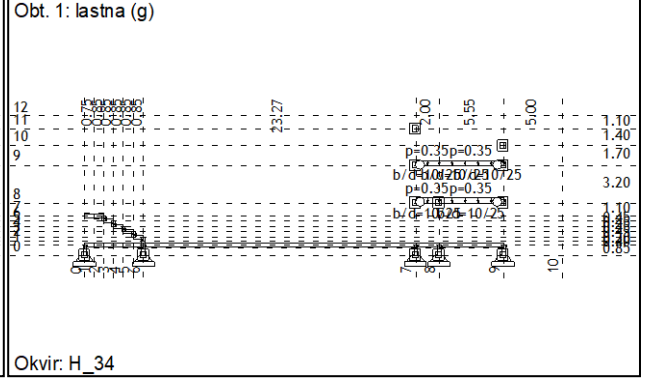
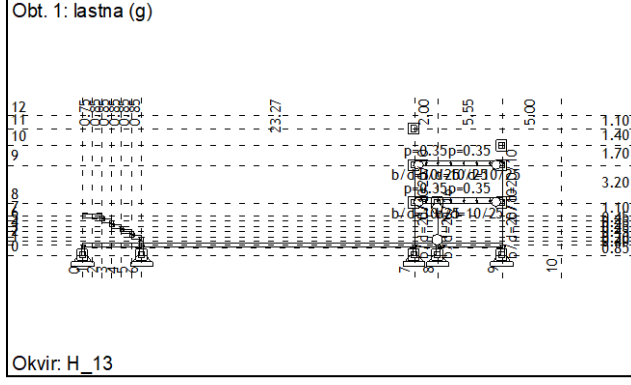
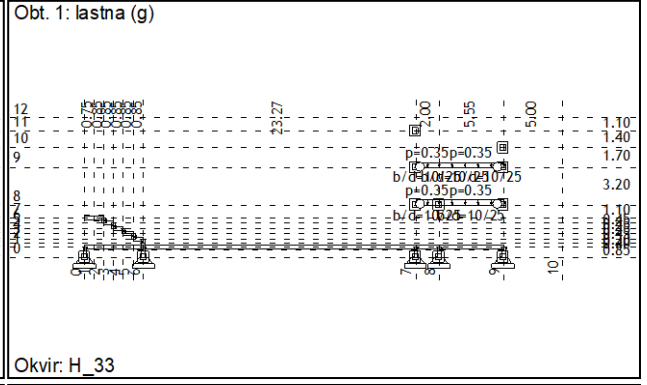
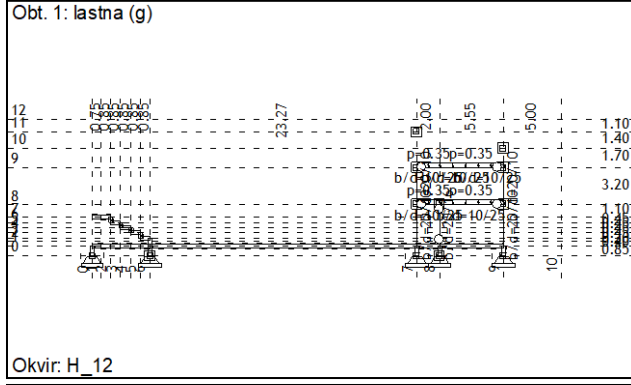
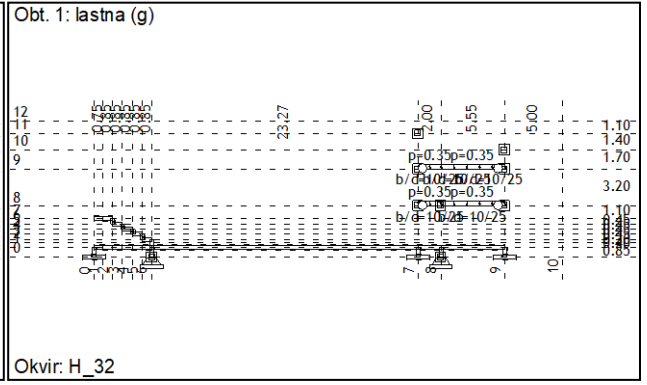
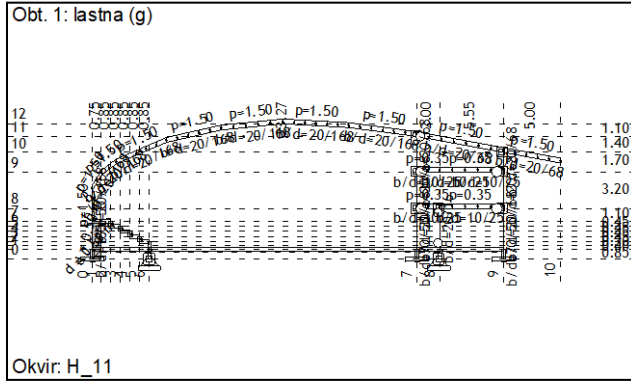
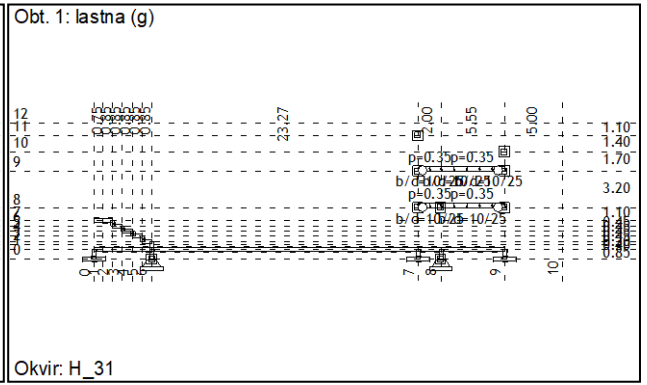
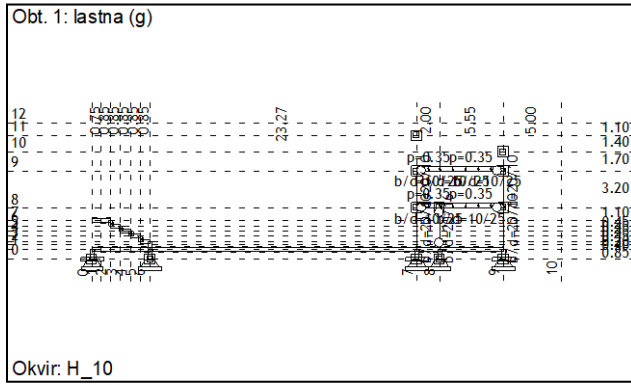
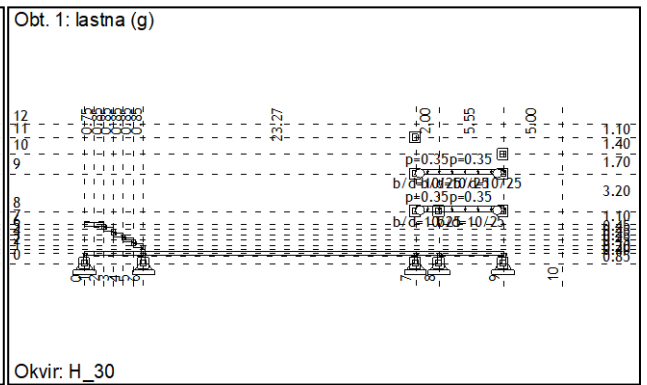
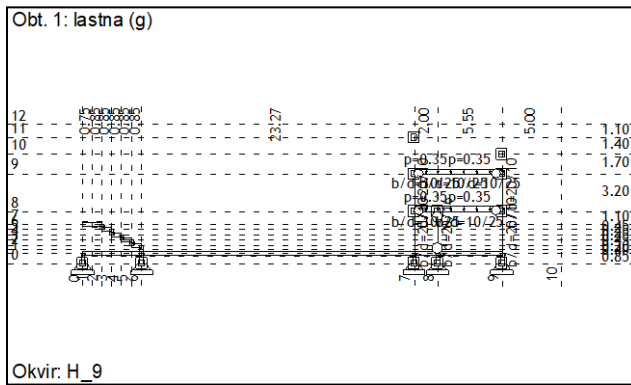
Nivo: T3 [1.20 m]

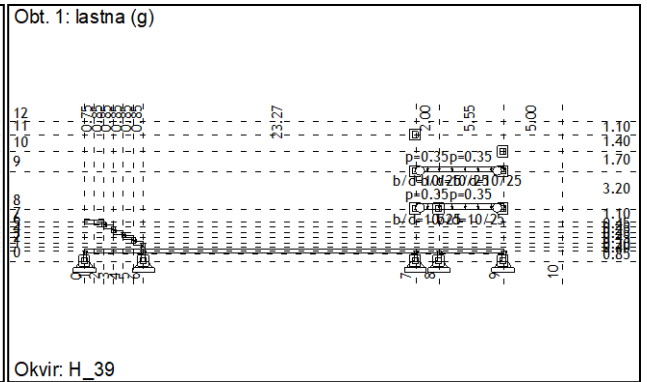
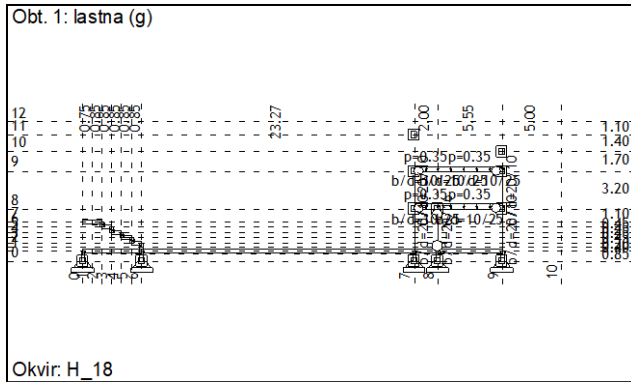
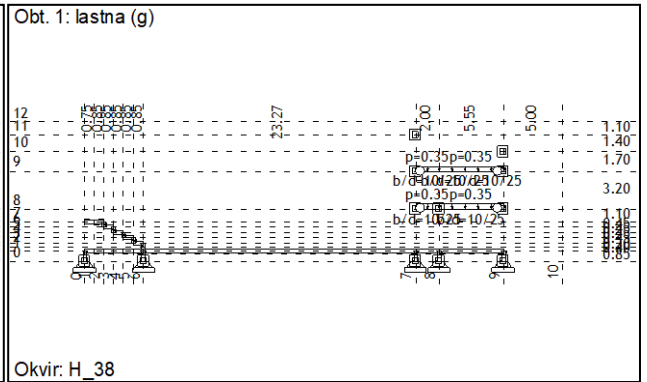
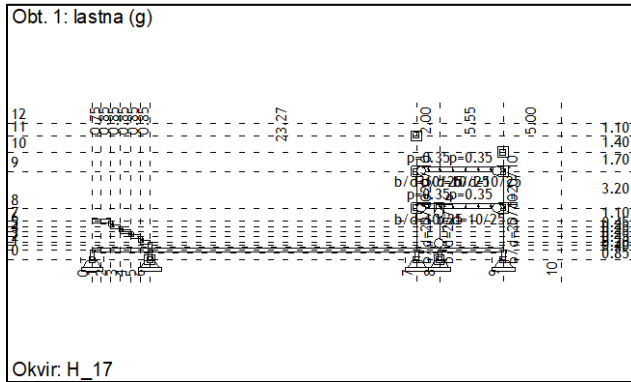
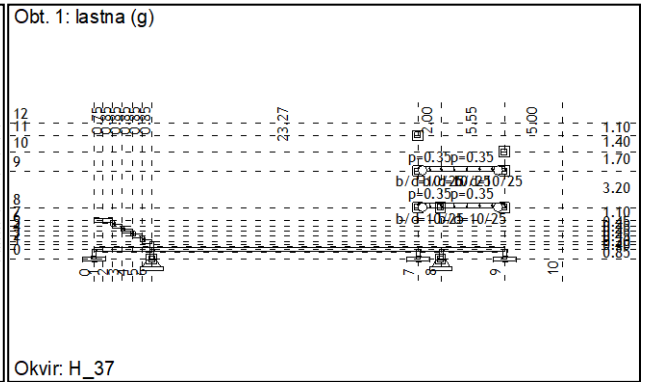
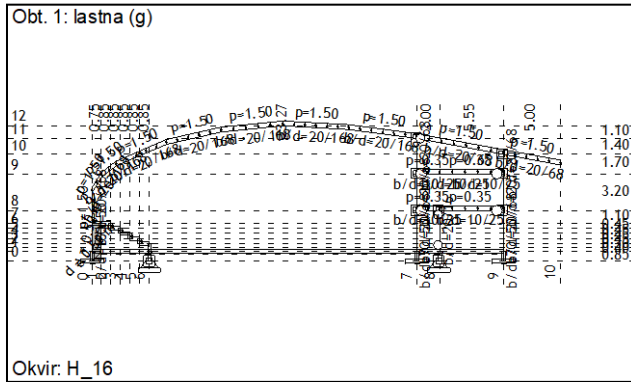
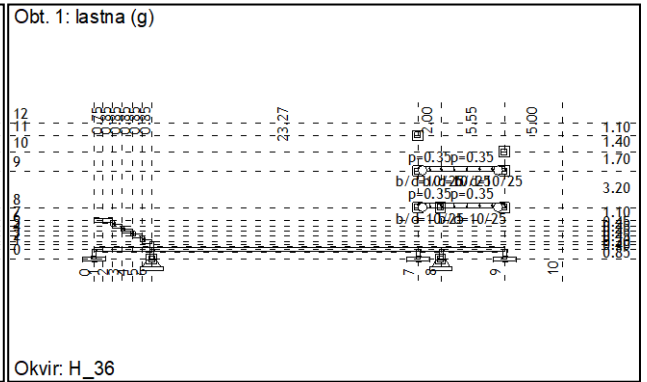
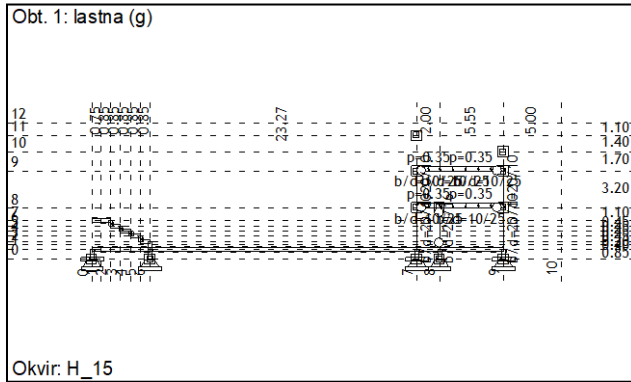
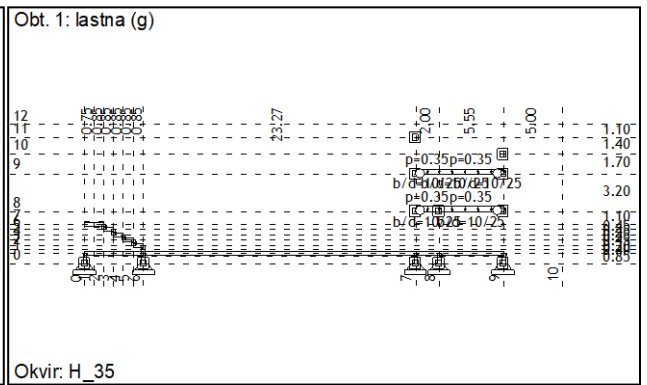
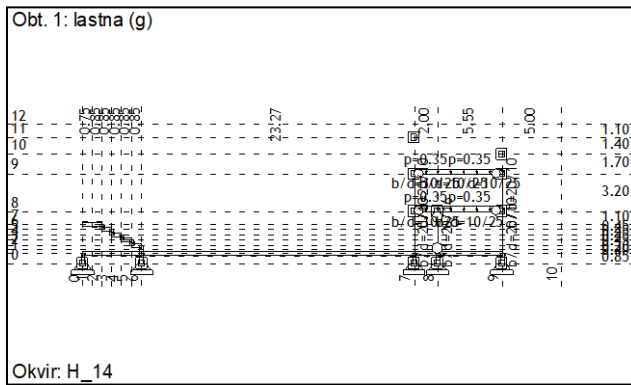


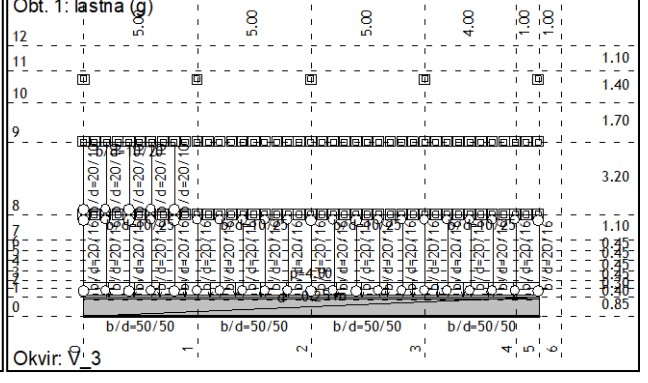
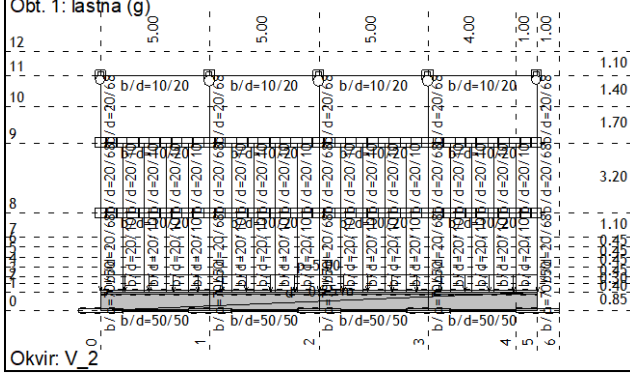
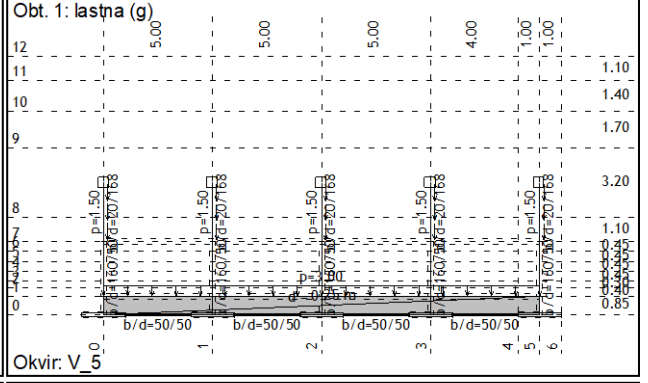
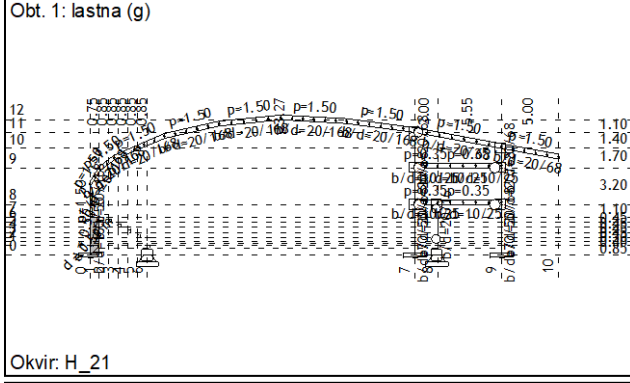
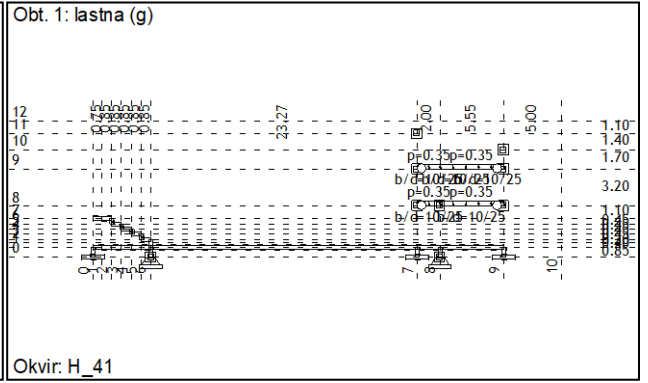
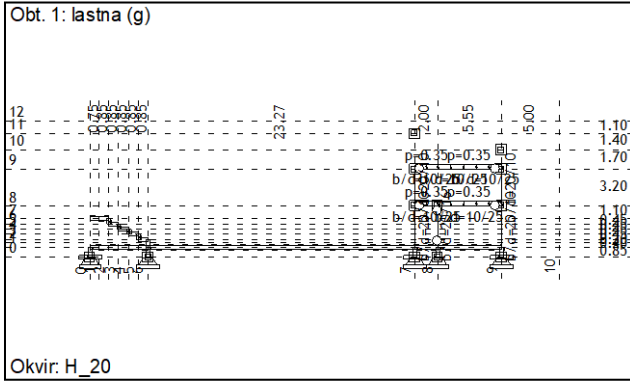
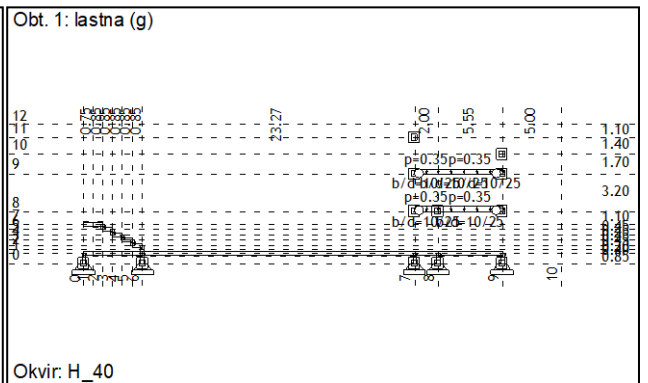
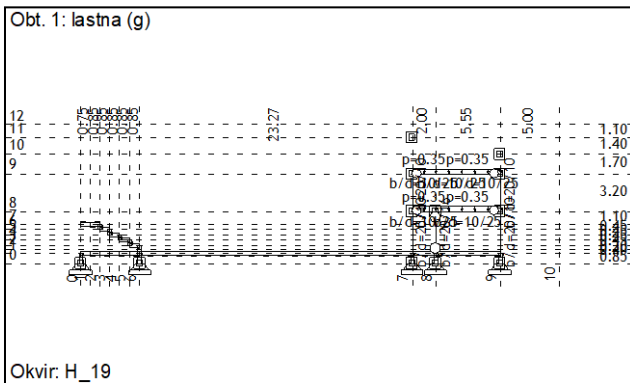
Nivo: T2 [0.75 m]

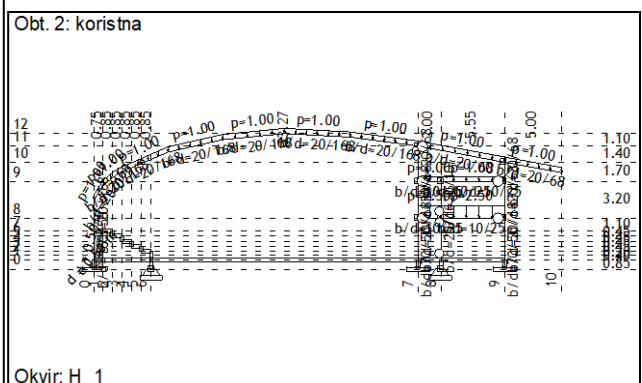
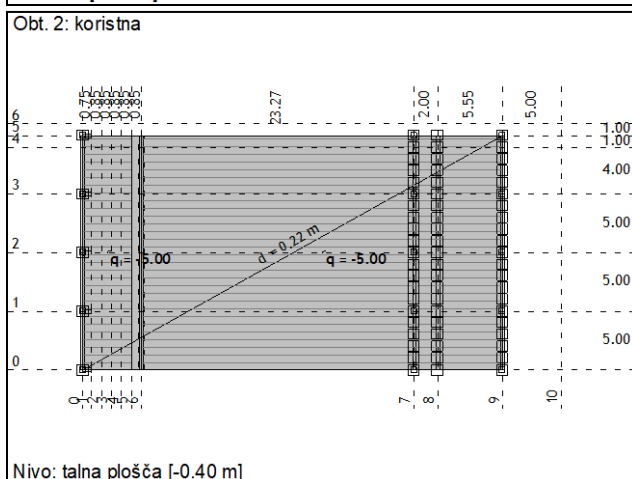
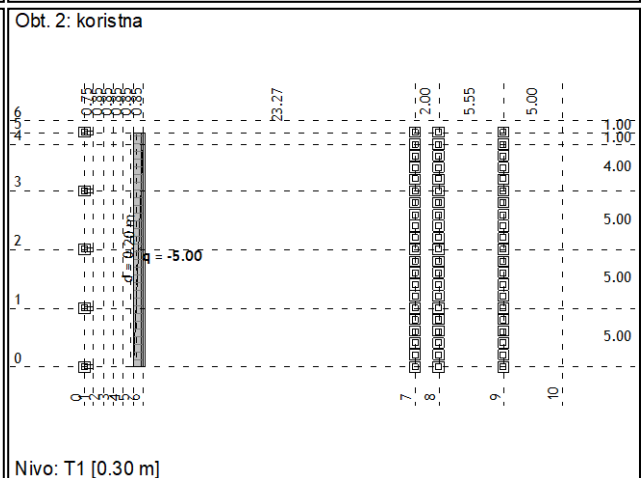
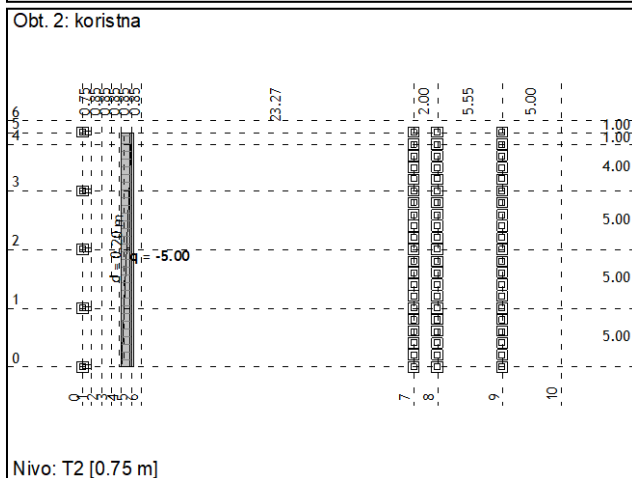
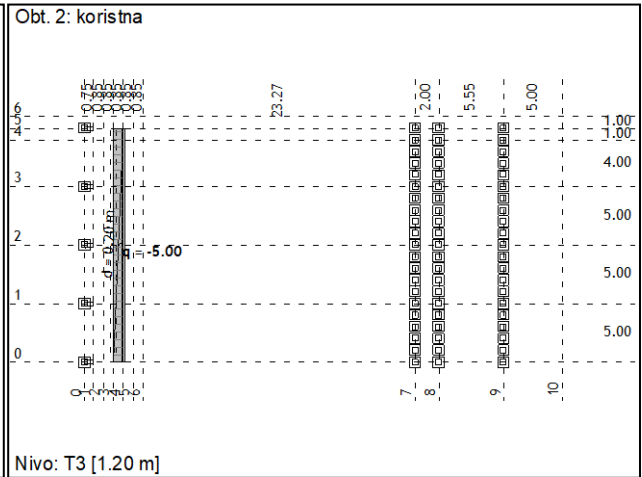
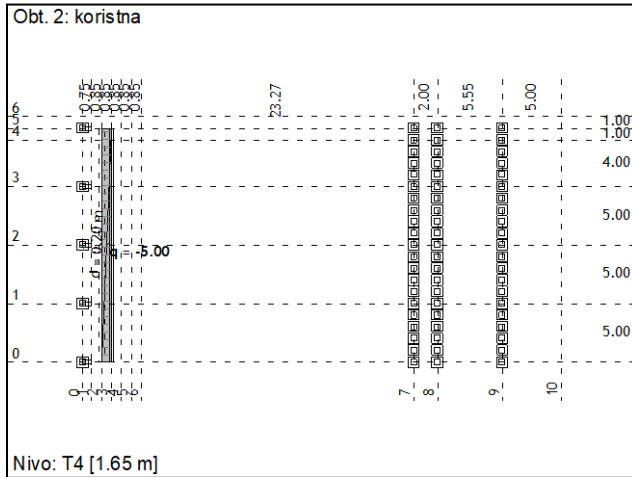
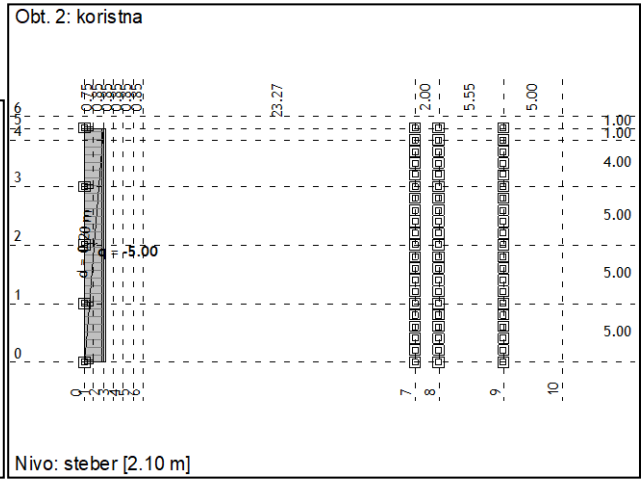
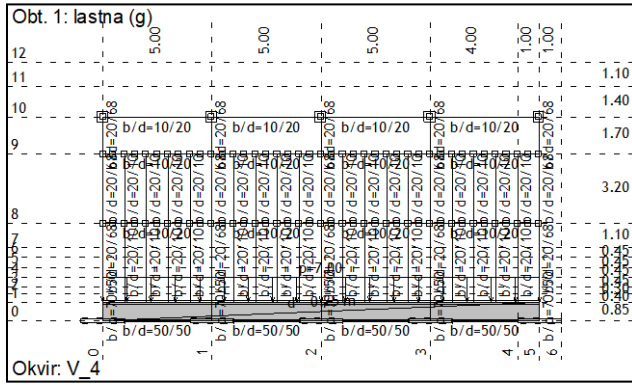


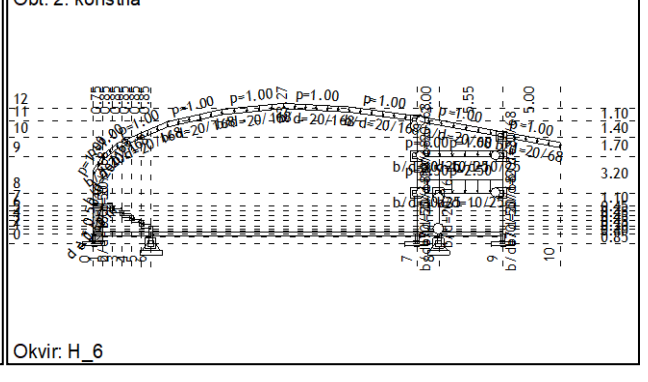
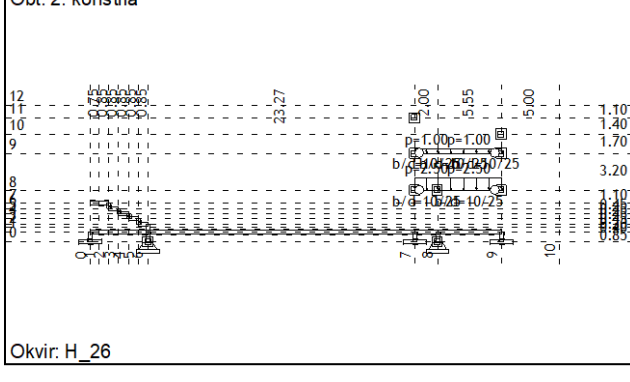
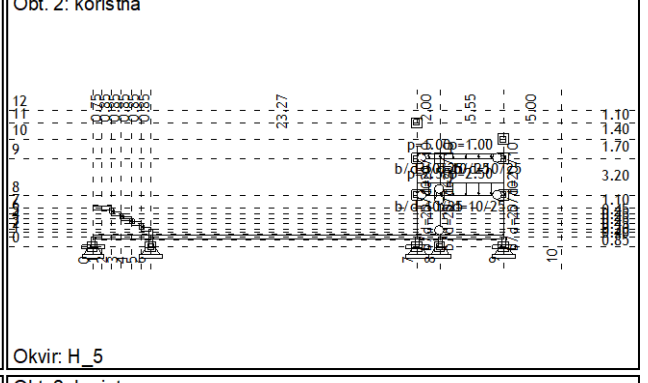
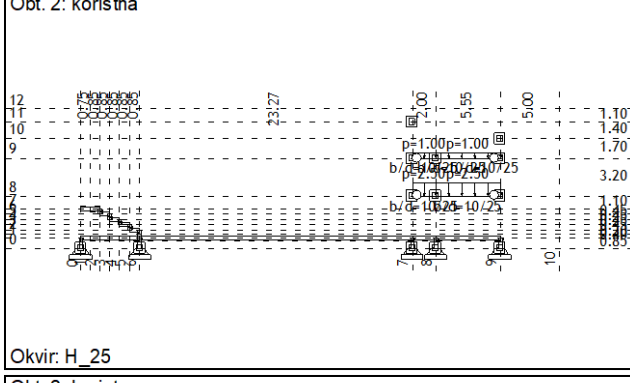
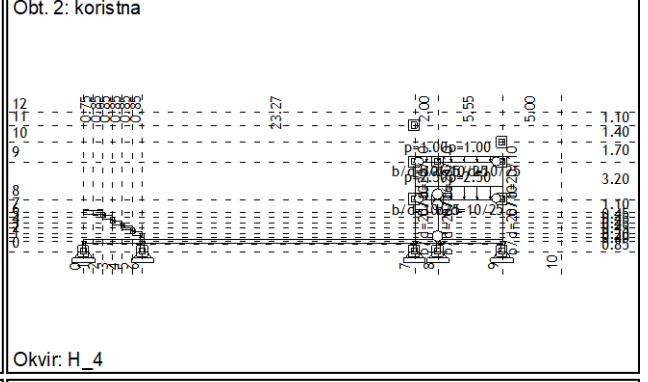
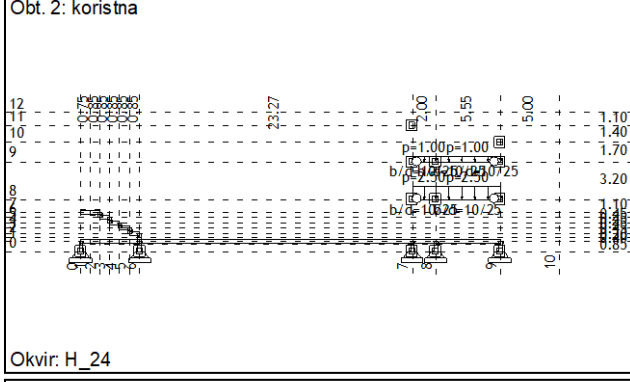
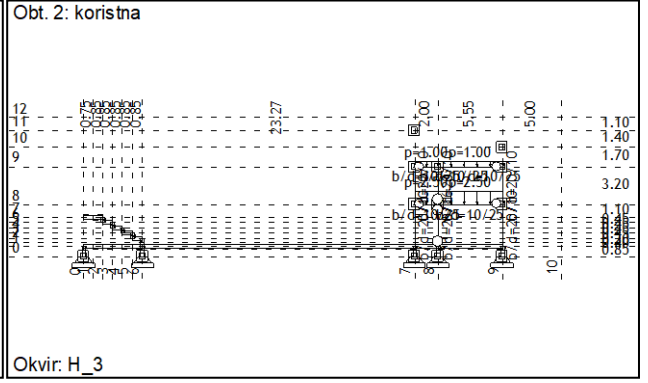
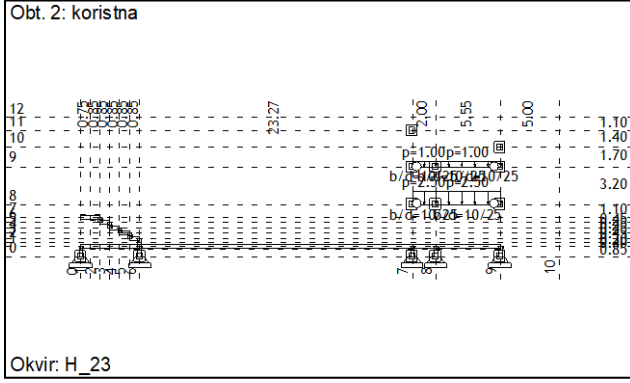
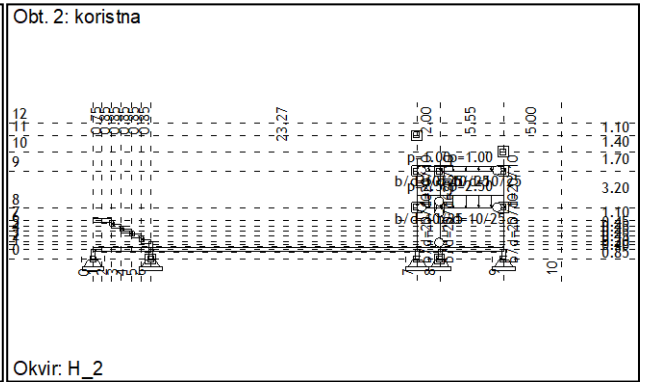
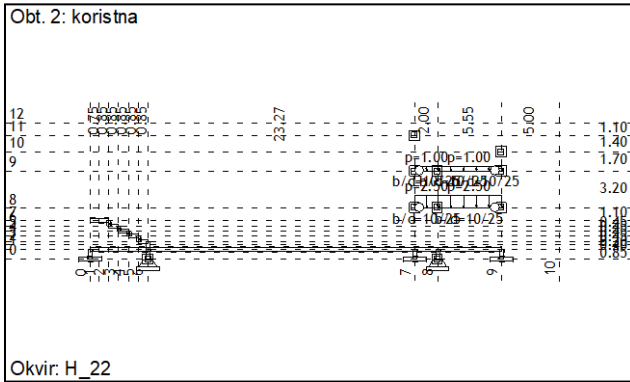


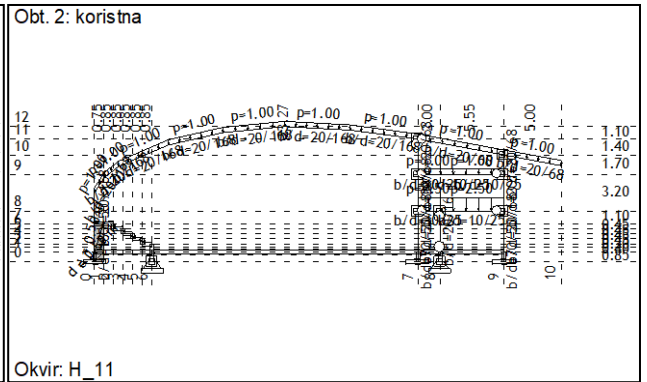
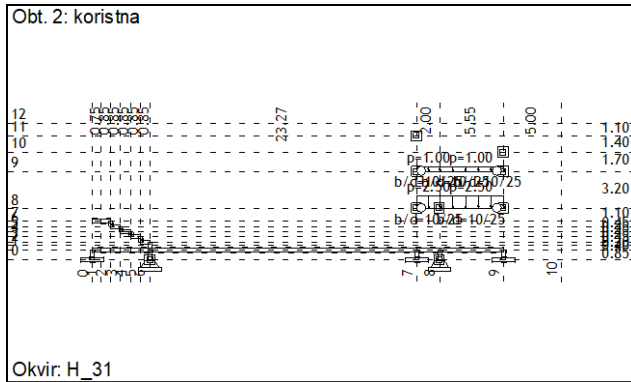
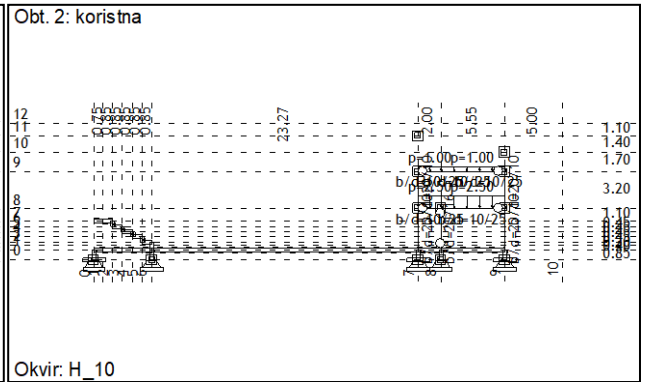
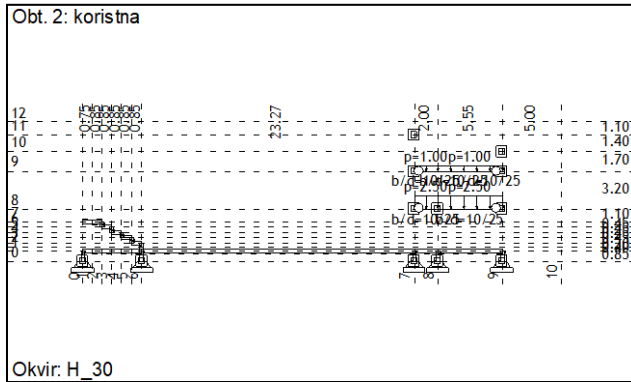
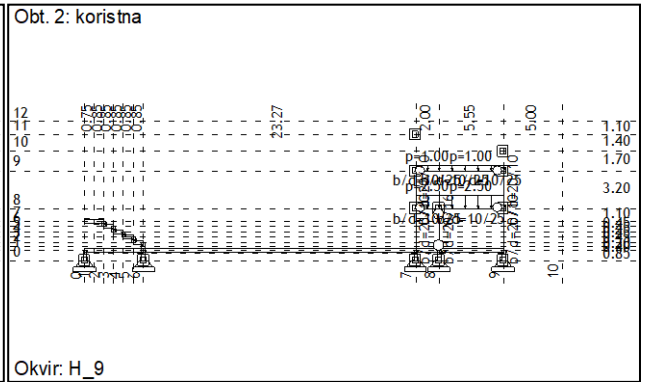
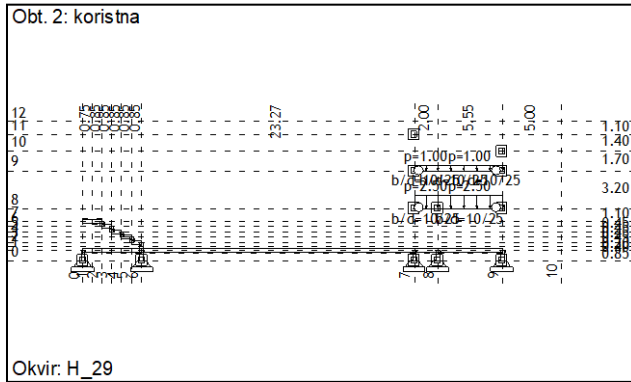
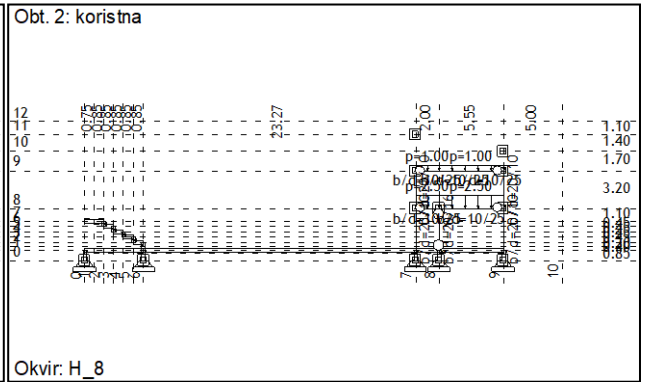
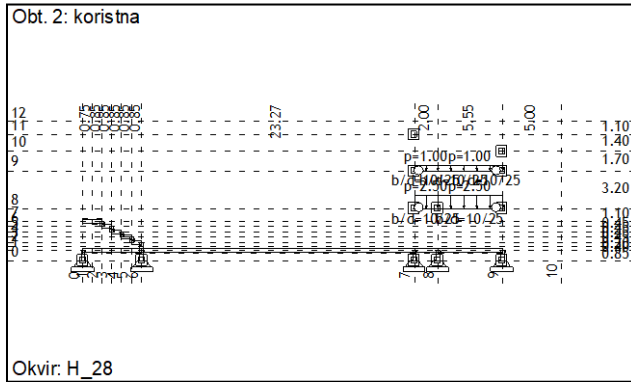
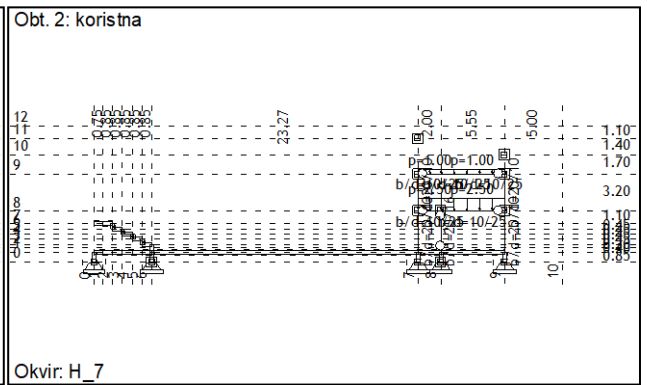
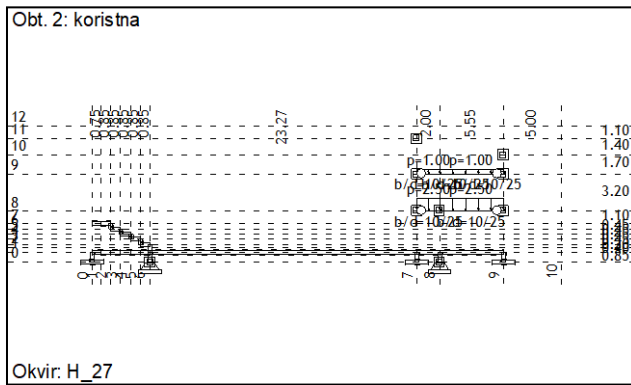


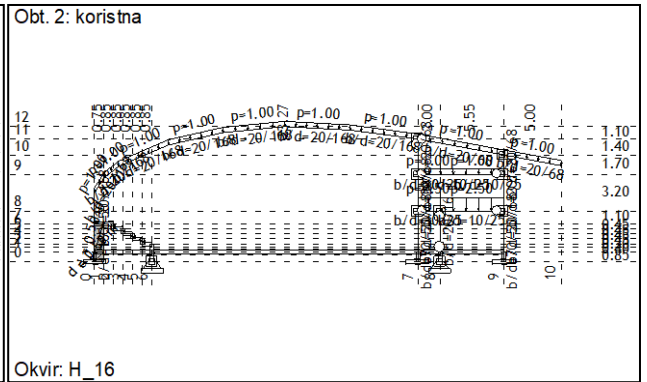
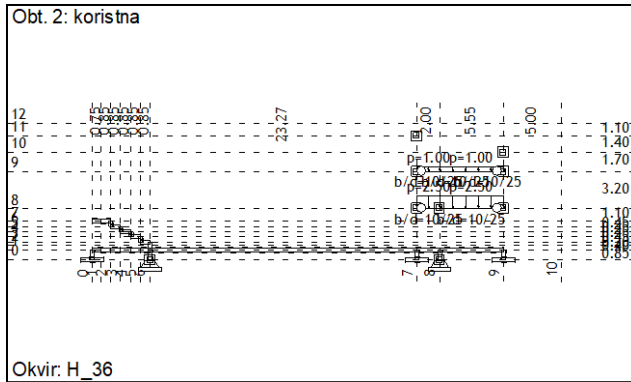
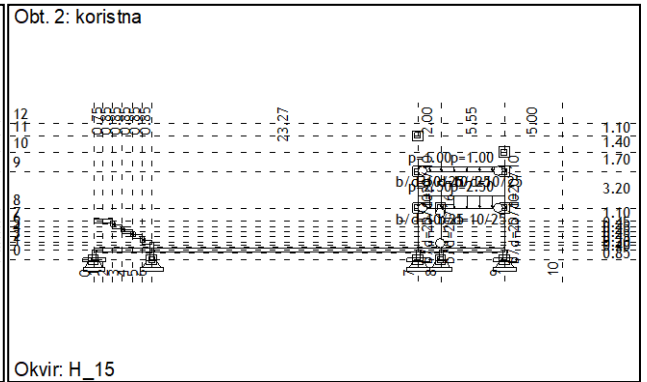
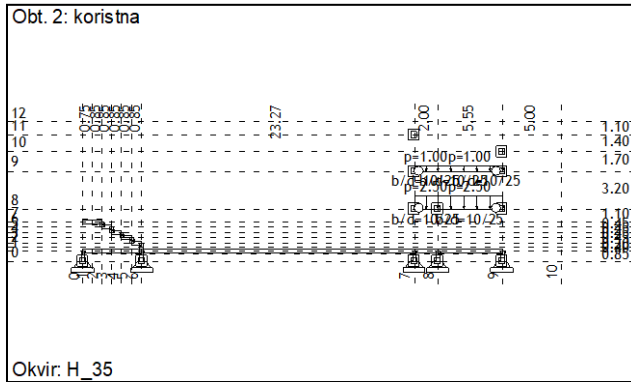
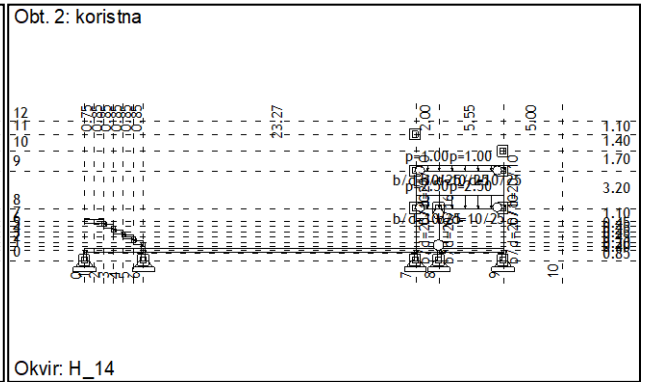
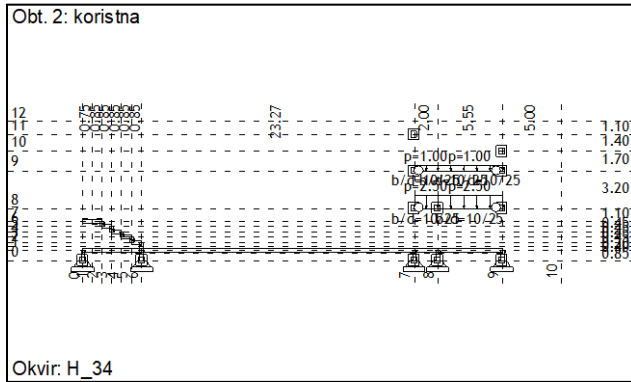
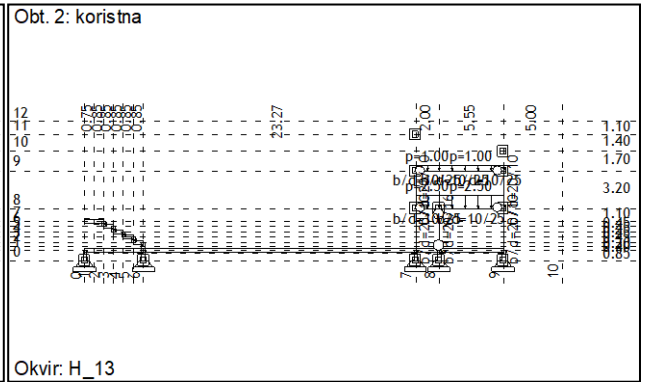
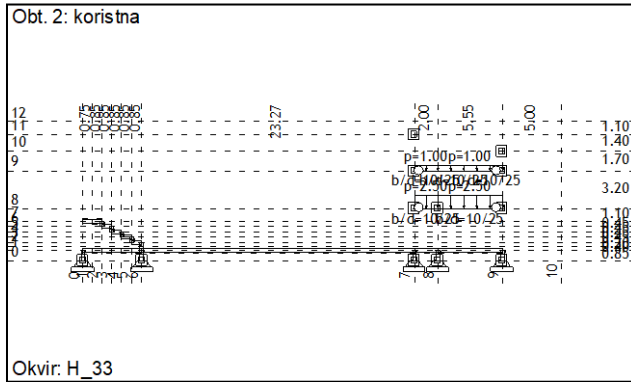
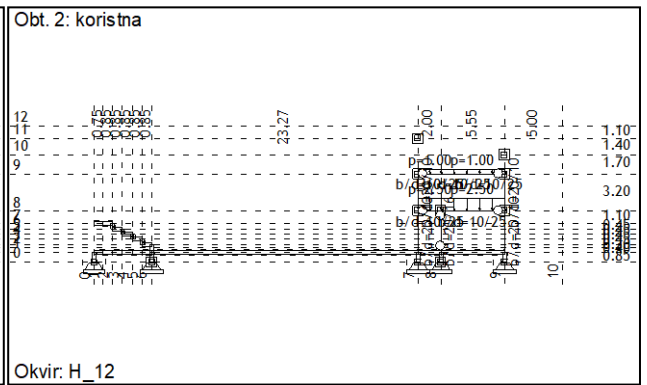
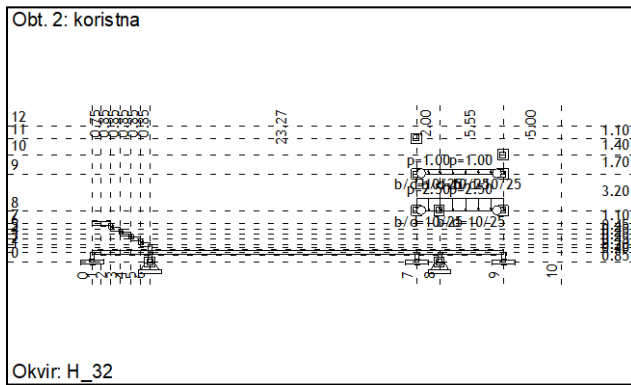


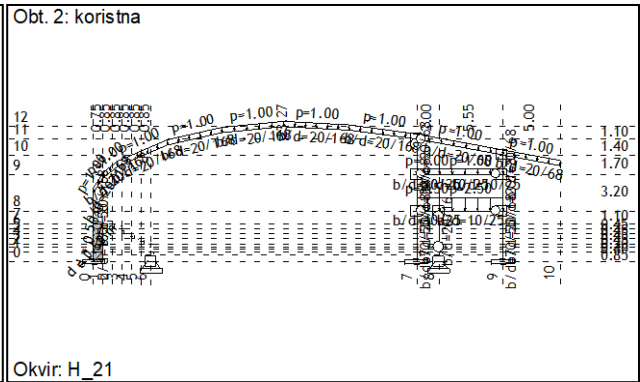
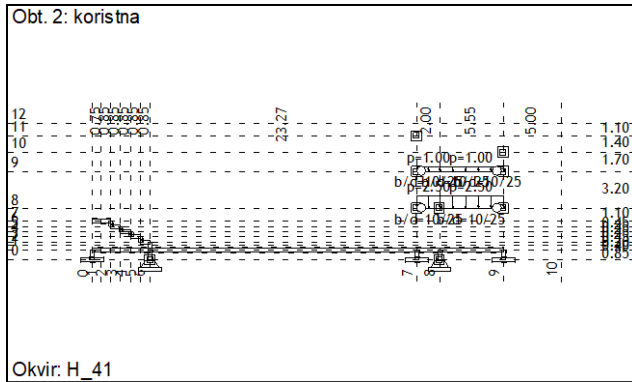
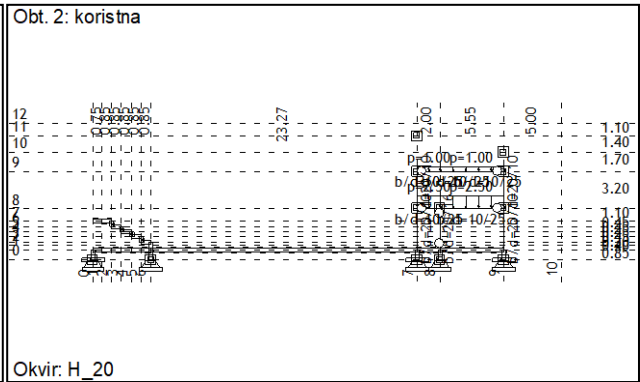
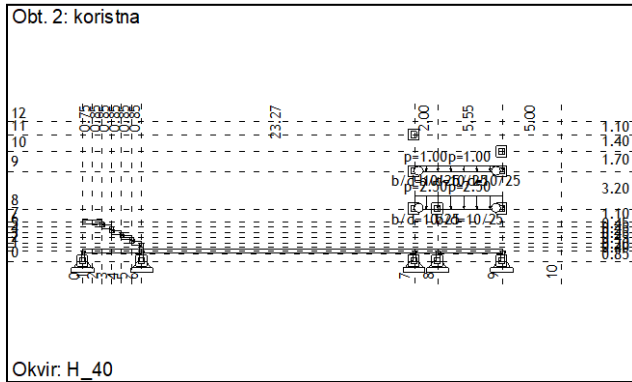
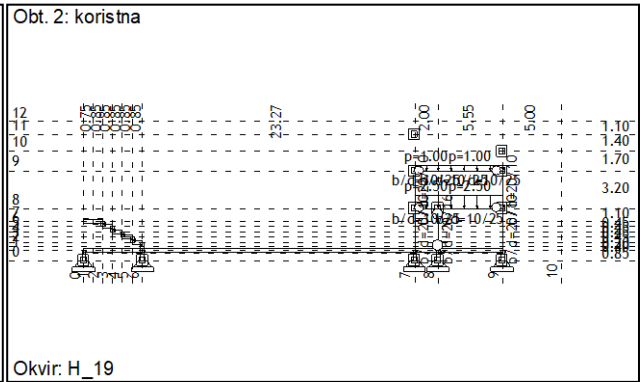
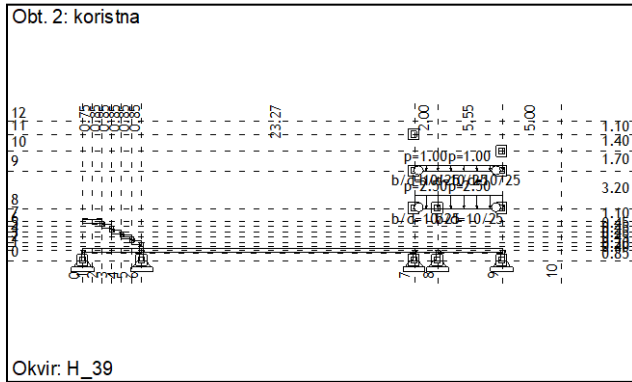
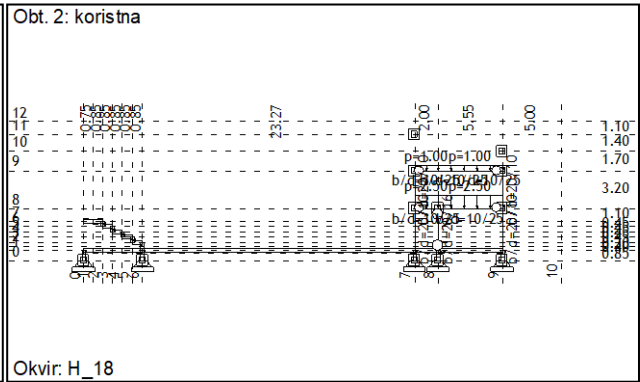
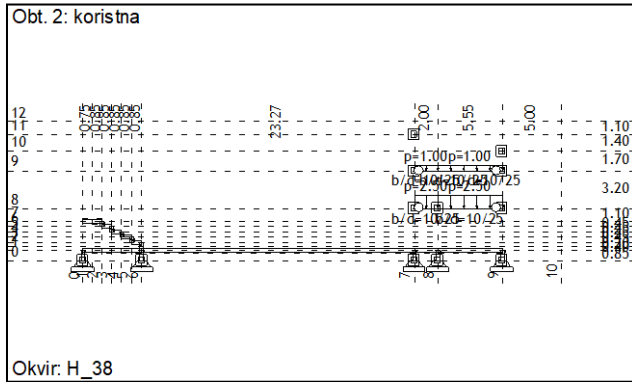
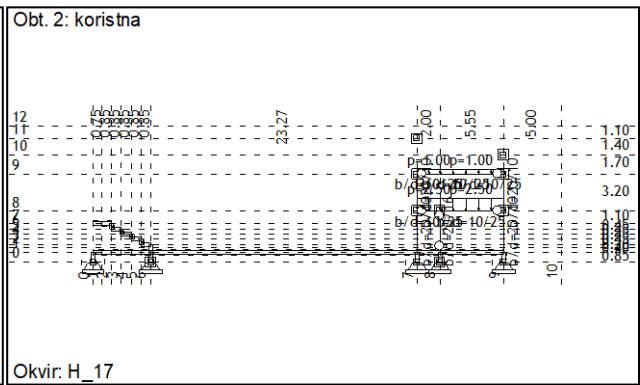
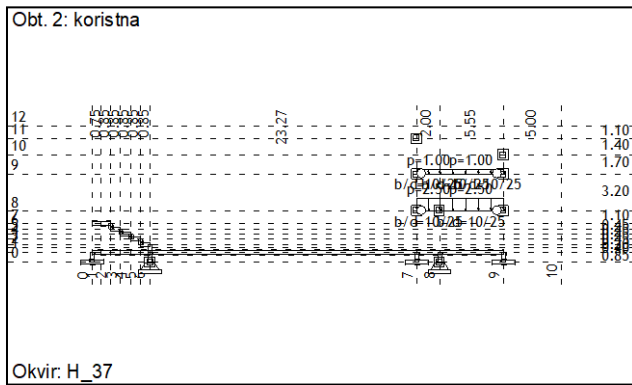


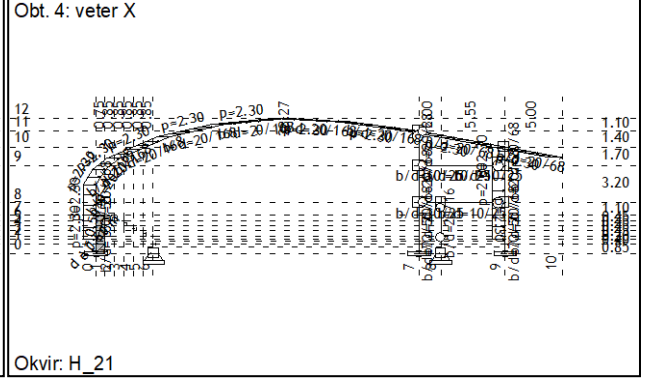
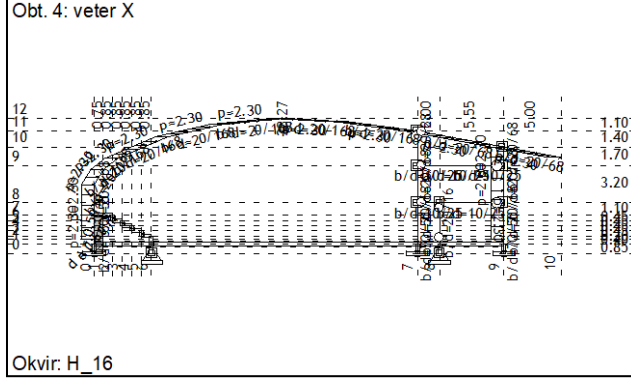
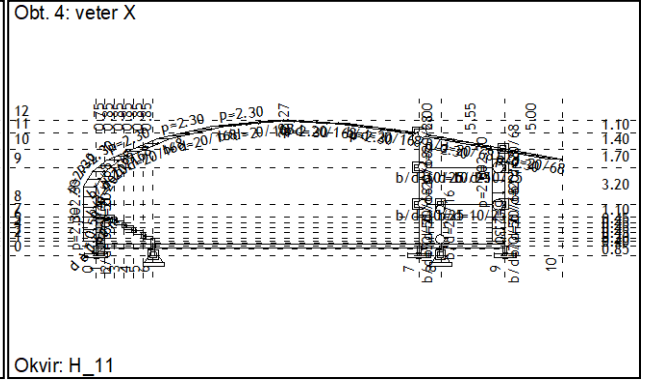
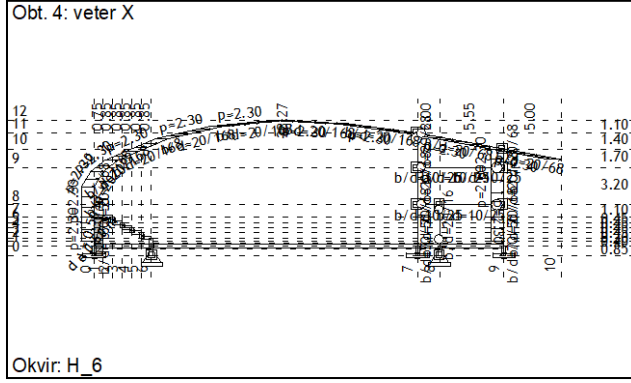
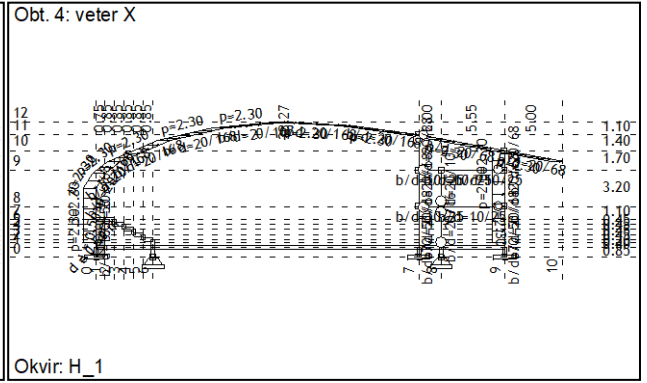
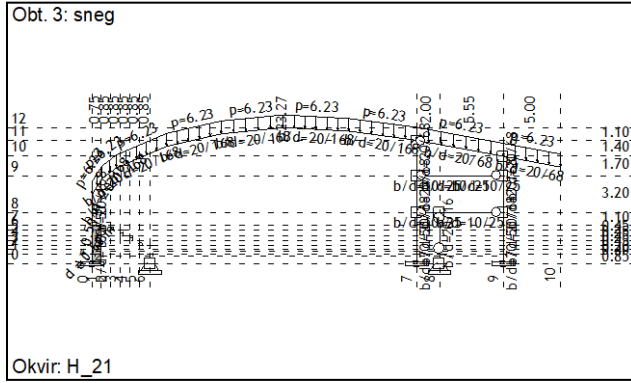
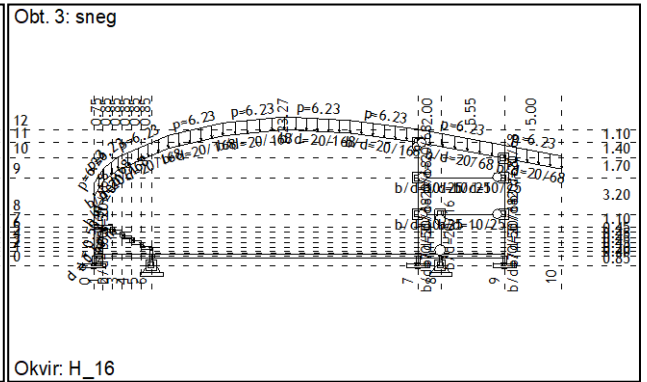
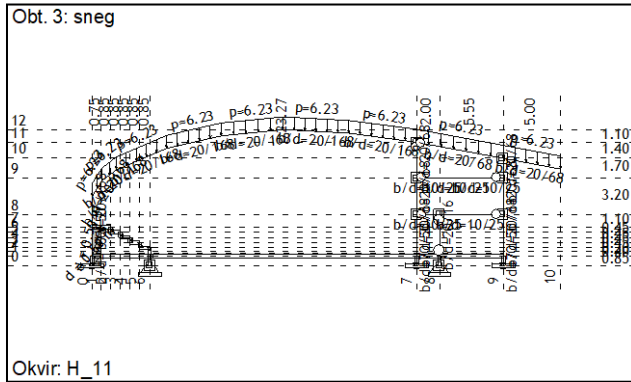
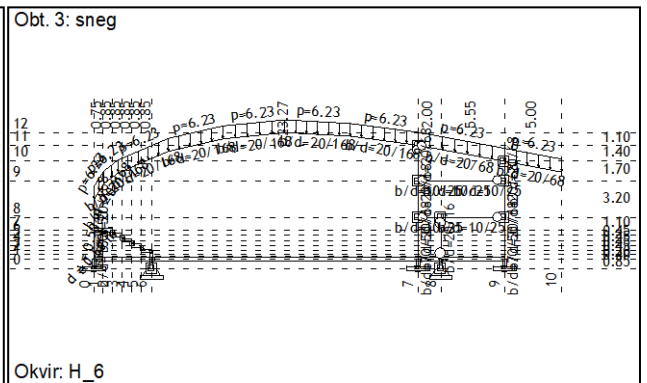
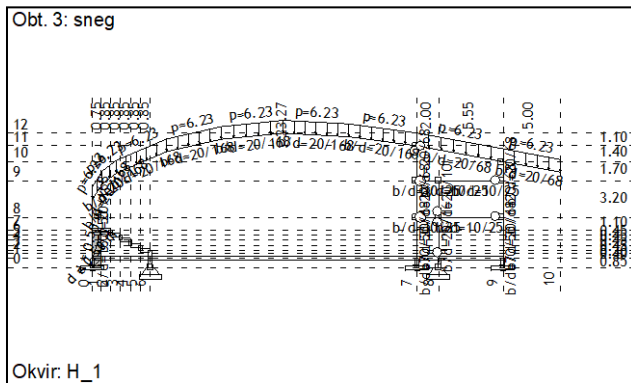


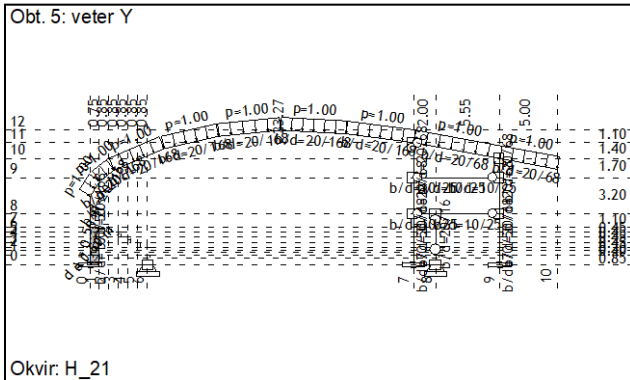
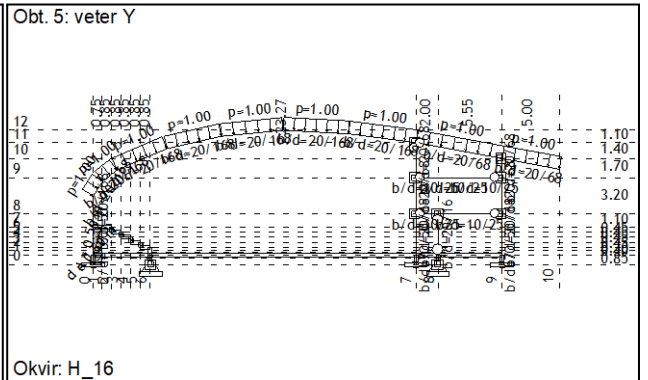
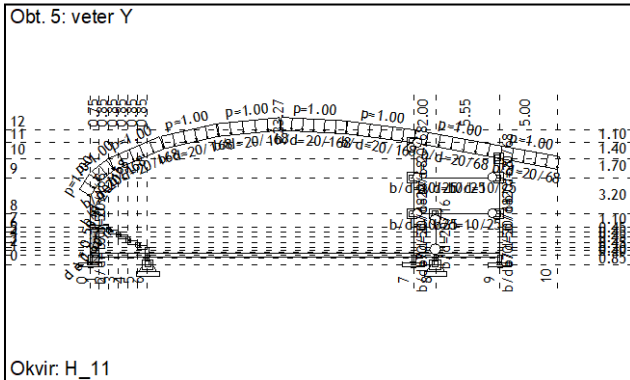
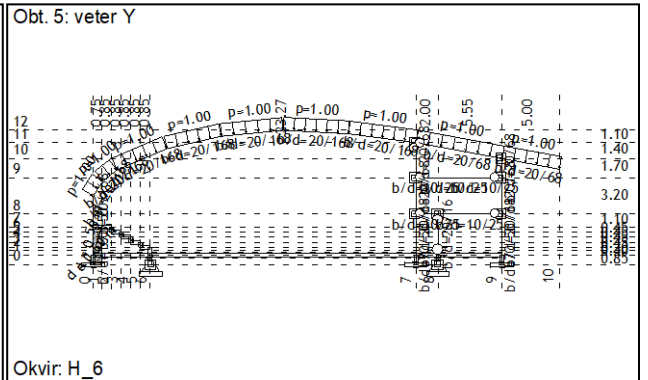
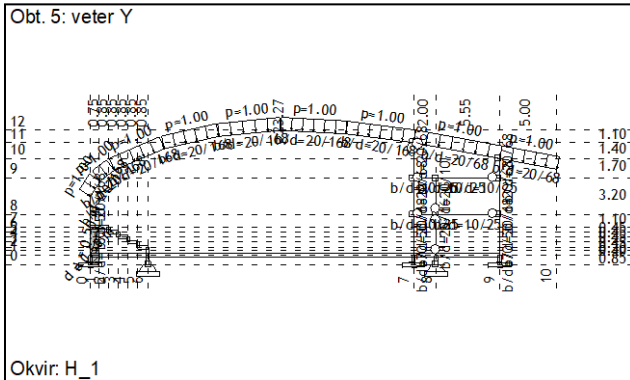












Modalna analiza

Faktorji obtežb za preračun mas

No	Naziv	Koeficient
1	lastna (g)	1.00
2	koristna	1.00
3	sneg	0.00
4	veter X	0.00
5	veter Y	0.00

Razporeditev mas po višini objekta

Nivo	Z [m]	X [m]	Y [m]	Masa [T]	T/m2
2.N	6.40	22.99	8.45	178.36	
1.N	3.20	31.37	8.45	116.38	
steber	2.10	0.62	8.46	52.06	1.63
T4	1.65	2.03	8.46	23.66	1.39
T3	1.20	2.89	8.46	23.66	1.39
T2	0.75	3.77	8.46	23.66	1.39
T1	0.30	4.59	8.46	23.15	1.36
teren	0.00	22.26	8.46	11.45	
talna plošča	-0.40	18.12	8.46	933.92	1.30
temelji	-1.25	20.28	8.46	159.45	2.66
Skupno:	0.74	18.44	8.46	1545.74	

Položaj centra togosti po višini objekta

Nivo	Z [m]	X [m]	Y [m]
2.N	6.40	26.58	8.46
1.N	3.20	26.55	8.46
steber	2.10	1.61	8.46
T4	1.65	2.03	8.46
T3	1.20	2.88	8.46
T2	0.75	3.73	8.46
T1	0.30	4.58	8.46
teren	0.00	5.01	8.46
talna plošča	-0.40	17.79	8.46
temelji	-1.25	19.87	8.46

Ekscentriciteta po višini objekta

Nivo	Z [m]	eox [m]	eoy [m]
2.N	6.40	3.59	0.01
1.N	3.20	4.82	0.01
steber	2.10	0.99	0.00
T4	1.65	0.00	0.00
T3	1.20	0.02	0.00
T2	0.75	0.04	0.00
T1	0.30	0.01	0.00
teren	0.00	17.26	0.00
talna plošča	-0.40	0.33	0.00
temelji	-1.25	0.41	0.00

Nihajne dobe konstrukcije

No	T [s]	f [Hz]
1	2.2278	0.4489
2	2.1974	0.4551
3	2.1874	0.4572
4	2.1741	0.4600
5	2.1678	0.4613
6	1.2661	0.7898
7	1.0472	0.9549
8	1.0462	0.9559
9	1.0459	0.9561
10	1.0458	0.9562

Seizmični preračun

Seizmični preračun: EC8 SLO

Kategorija tal: E
 Kategorija pomena: III ($\gamma=1.2$)
 Razmerje a_g/g : 0.15
 Faktor obnašanja: 2.4
 Koefficient dušenja: 0.05
 S: 1.4
 T_b: 0.15
 T_c: 0.5
 T_d: 2

Faktorji smeri potresa:

Naziv	K _x	K _y	K _z
potres X	1.000	0.300	0.000
potres Y	0.300	1.000	0.000
potres XY	0.600	0.810	0.000

potres X

Nivo	Z [m]	Ton 1			Ton 2			Ton 3		
		P _x [kN]	P _y [kN]	P _z [kN]	P _x [kN]	P _y [kN]	P _z [kN]	P _x [kN]	P _y [kN]	P _z [kN]
2.N	6.40	-0.00	10.27	0.00	0.00	0.00	-0.00	0.00	1.25	-0.00
1.N	3.20	-0.00	0.27	-0.00	0.00	0.00	0.00	0.00	0.03	0.00
steber	2.10	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00
T4	1.65	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00
T3	1.20	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00
T2	0.75	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00
T1	0.30	-0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	-0.00
teren	0.00	-0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	-0.00
talna plošča	-0.40	-0.00	0.01	0.00	0.00	0.00	-0.00	0.00	0.00	0.00
temelji	-1.25	0.00	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	0.00
	Σ=	-0.00	10.56	0.00	0.00	0.00	0.00	0.00	1.29	-0.00

Nivo	Z [m]	Ton 4			Ton 5			Ton 6		
		P _x [kN]	P _y [kN]	P _z [kN]	P _x [kN]	P _y [kN]	P _z [kN]	P _x [kN]	P _y [kN]	P _z [kN]
2.N	6.40	0.00	0.40	-0.00	0.00	0.00	0.00	-0.04	21.65	-0.00
1.N	3.20	0.00	0.01	0.00	0.00	0.00	0.00	-0.02	5.14	0.00
steber	2.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.00
T4	1.65	0.00	0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00
T3	1.20	0.00	0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00
T2	0.75	0.00	0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00
T1	0.30	0.00	0.00	-0.00	0.00	0.00	-0.00	-0.00	-0.00	0.00
teren	0.00	0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	-0.00
talna plošča	-0.40	0.00	0.00	-0.00	-0.00	0.00	-0.00	0.00	0.07	-0.00
temelji	-1.25	-0.00	0.00	0.00	0.00	0.00	0.00	-0.00	0.01	0.00
	Σ=	0.00	0.41	-0.00	0.00	0.00	0.00	-0.06	26.86	-0.00

Nivo	Z [m]	Ton 7			Ton 8			Ton 9		
		P _x [kN]	P _y [kN]	P _z [kN]	P _x [kN]	P _y [kN]	P _z [kN]	P _x [kN]	P _y [kN]	P _z [kN]
2.N	6.40	-0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00
1.N	3.20	0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	-0.00
steber	2.10	-0.00	-0.00	0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.00
T4	1.65	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
T3	1.20	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
T2	0.75	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
T1	0.30	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.00	0.00
teren	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00
talna plošča	-0.40	-0.00	0.00	-0.00	-0.00	0.00	-0.00	-0.00	0.00	-0.00
temelji	-1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Σ=	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	-0.00

Nivo	Z [m]	Ton 10			Vsi toni		
		P _x [kN]	P _y [kN]	P _z [kN]	P _x [kN]	P _y [kN]	P _z [kN]
2.N	6.40	-0.00	0.00	0.00	-0.04	33.57	-0.00
1.N	3.20	-0.00	0.00	0.00	-0.02	5.45	0.00
steber	2.10	-0.00	-0.00	-0.00	0.00	0.00	-0.00
T4	1.65	-0.00	-0.00	-0.00	-0.00	0.00	-0.00
T3	1.20	-0.00	-0.00	-0.00	-0.00	0.00	-0.00
T2	0.75	-0.00	-0.00	-0.00	-0.00	0.00	-0.00
T1	0.30	-0.00	-0.00	0.00	-0.00	0.00	0.00
teren	0.00	-0.00	0.00	0.00	0.00	0.00	-0.00
talna plošča	-0.40	-0.00	0.00	-0.00	0.00	0.08	-0.00
temelji	-1.25	0.00	0.00	0.00	-0.00	0.01	0.00
	Σ=	-0.00	0.00	0.00	-0.06	39.12	-0.00

potres Y

Nivo	Z [m]	Ton 1			Ton 2			Ton 3		
		P _x [kN]	P _y [kN]	P _z [kN]	P _x [kN]	P _y [kN]	P _z [kN]	P _x [kN]	P _y [kN]	P _z [kN]
2.N	6.40	-0.01	34.28	0.00	0.00	0.00	-0.00	0.01	4.14	-0.00
1.N	3.20	-0.00	0.89	-0.00	0.00	0.00	0.00	0.00	0.11	0.00
steber	2.10	-0.00	0.02	-0.00	0.00	0.00	0.00	0.00	0.00	0.00
T4	1.65	-0.00	0.01	-0.00	0.00	0.00	0.00	0.00	0.00	0.00
T3	1.20	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00
T2	0.75	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00
T1	0.30	-0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	-0.00
teren	0.00	-0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	-0.00
talna plošča	-0.40	-0.00	0.03	0.00	0.00	0.00	-0.00	0.00	0.00	0.00
temelji	-1.25	0.00	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	0.00
	Σ=	-0.01	35.23	0.00	0.00	0.00	0.00	0.01	4.26	-0.00

Nivo	Z [m]	Ton 4			Ton 5			Ton 6		
		P _x [kN]	P _y [kN]	P _z [kN]	P _x [kN]	P _y [kN]	P _z [kN]	P _x [kN]	P _y [kN]	P _z [kN]

2.N	6.40	0.00	1.34	-0.00	0.00	0.00	0.00	-0.13	72.65	-0.00
1.N	3.20	0.00	0.04	0.00	0.00	0.00	0.00	-0.07	17.25	0.00
steber	2.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	-0.00
T4	1.65	0.00	0.00	0.00	0.00	0.00	0.00	-0.00	-0.01	-0.00
T3	1.20	0.00	0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00
T2	0.75	0.00	0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00
T1	0.30	0.00	0.00	-0.00	0.00	0.00	-0.00	-0.00	-0.00	0.00
teren	0.00	0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.01	-0.00
talna plošča	-0.40	0.00	0.00	-0.00	-0.00	0.00	-0.00	0.00	0.23	-0.00
temelji	-1.25	-0.00	0.00	0.00	0.00	0.00	0.00	-0.00	0.03	0.00
$\Sigma=$		0.00	1.38	-0.00	0.00	0.00	0.00	-0.20	90.14	-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]
2.N	6.40	-0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	-0.00
1.N	3.20	0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	-0.00
steber	2.10	-0.00	-0.00	0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.00
T4	1.65	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
T3	1.20	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
T2	0.75	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
T1	0.30	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.00	0.00
teren	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00
talna plošča	-0.40	-0.00	0.00	-0.00	-0.00	0.00	-0.00	0.00	0.00	-0.00
temelji	-1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
$\Sigma=$		0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	-0.00

Nivo	Z [m]	Ton 10			Vsi toni		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
2.N	6.40	-0.00	0.00	0.00	-0.13	112.41	-0.00
1.N	3.20	-0.00	0.00	0.00	-0.07	18.29	0.00
steber	2.10	-0.00	-0.00	-0.00	0.00	0.00	-0.00
T4	1.65	-0.00	-0.00	-0.00	-0.00	0.00	-0.00
T3	1.20	-0.00	-0.00	-0.00	-0.00	0.00	-0.00
T2	0.75	-0.00	-0.00	-0.00	-0.00	0.00	-0.00
T1	0.30	-0.00	-0.00	0.00	-0.00	0.00	0.00
teren	0.00	-0.00	0.00	0.00	0.00	0.02	-0.00
talna plošča	-0.40	-0.00	0.00	-0.00	0.00	0.26	-0.00
temelji	-1.25	0.00	0.00	0.00	-0.00	0.04	0.00
$\Sigma=$		-0.00	0.00	0.00	-0.20	131.02	-0.00

potres XY

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]
2.N	6.40	-0.01	27.76	0.00	0.00	0.00	-0.00	0.00	3.36	-0.00
1.N	3.20	-0.00	0.72	-0.00	0.00	0.00	0.00	0.00	0.09	0.00
steber	2.10	-0.00	0.01	-0.00	0.00	0.00	0.00	0.00	0.00	0.00
T4	1.65	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00
T3	1.20	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00
T2	0.75	-0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.00	0.00
T1	0.30	-0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	-0.00
teren	0.00	-0.00	0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	-0.00
talna plošča	-0.40	-0.00	0.03	0.00	0.00	0.00	-0.00	0.00	0.00	0.00
temelji	-1.25	0.00	0.00	-0.00	0.00	0.00	-0.00	-0.00	0.00	0.00
$\Sigma=$		-0.01	28.54	0.00	0.00	0.00	0.00	0.01	3.46	-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]
2.N	6.40	0.00	1.08	-0.00	0.00	0.00	0.00	-0.10	58.79	-0.00
1.N	3.20	0.00	0.03	0.00	0.00	0.00	0.00	-0.06	13.96	0.00
steber	2.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.00
T4	1.65	0.00	0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00
T3	1.20	0.00	0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00
T2	0.75	0.00	0.00	0.00	0.00	0.00	0.00	-0.00	-0.00	-0.00
T1	0.30	0.00	0.00	-0.00	0.00	0.00	-0.00	-0.00	-0.00	0.00
teren	0.00	0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.01	-0.00
talna plošča	-0.40	0.00	0.00	-0.00	-0.00	0.00	-0.00	0.00	0.18	-0.00
temelji	-1.25	-0.00	0.00	0.00	0.00	0.00	0.00	-0.00	0.03	0.00
$\Sigma=$		0.00	1.12	-0.00	0.00	0.00	0.00	-0.16	72.94	-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]
2.N	6.40	-0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00
1.N	3.20	0.00	0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	-0.00
steber	2.10	-0.00	-0.00	0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.00
T4	1.65	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
T3	1.20	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
T2	0.75	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
T1	0.30	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	-0.00	-0.00	0.00
teren	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00
talna plošča	-0.40	-0.00	0.00	-0.00	-0.00	0.00	-0.00	-0.00	0.00	-0.00
temelji	-1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
$\Sigma=$		0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	-0.00

Nivo	Z [m]	Ton 10			Vsi toni		
		Px [kN]	Py [kN]	Pz [kN]	Px [kN]	Py [kN]	Pz [kN]
2.N	6.40	-0.00	0.00	0.00	-0.10	90.99	-0.00
1.N	3.20	-0.00	0.00	0.00	-0.06	14.80	0.00
steber	2.10	-0.00	-0.00	-0.00	0.00	0.00	-0.00
T4	1.65	-0.00	-0.00	-0.00	-0.00	0.00	-0.00
T3	1.20	-0.00	-0.00	-0.00	-0.00	0.00	-0.00
T2	0.75	-0.00	-0.00	-0.00	-0.00	0.00	-0.00
T1	0.30	-0.00	-0.00	0.00	-0.00	0.00	0.00
teren	0.00	-0.00	0.00	0.00	0.00	0.01	-0.00
talna plošča	-0.40	-0.00	0.00	-0.00	0.00	0.21	-0.00
temelji	-1.25	0.00	0.00	0.00	-0.00	0.03	0.00
$\Sigma=$		-0.00	0.00	0.00	-0.16	106.05	-0.00

Faktorji participacije - relativno sodelovanje

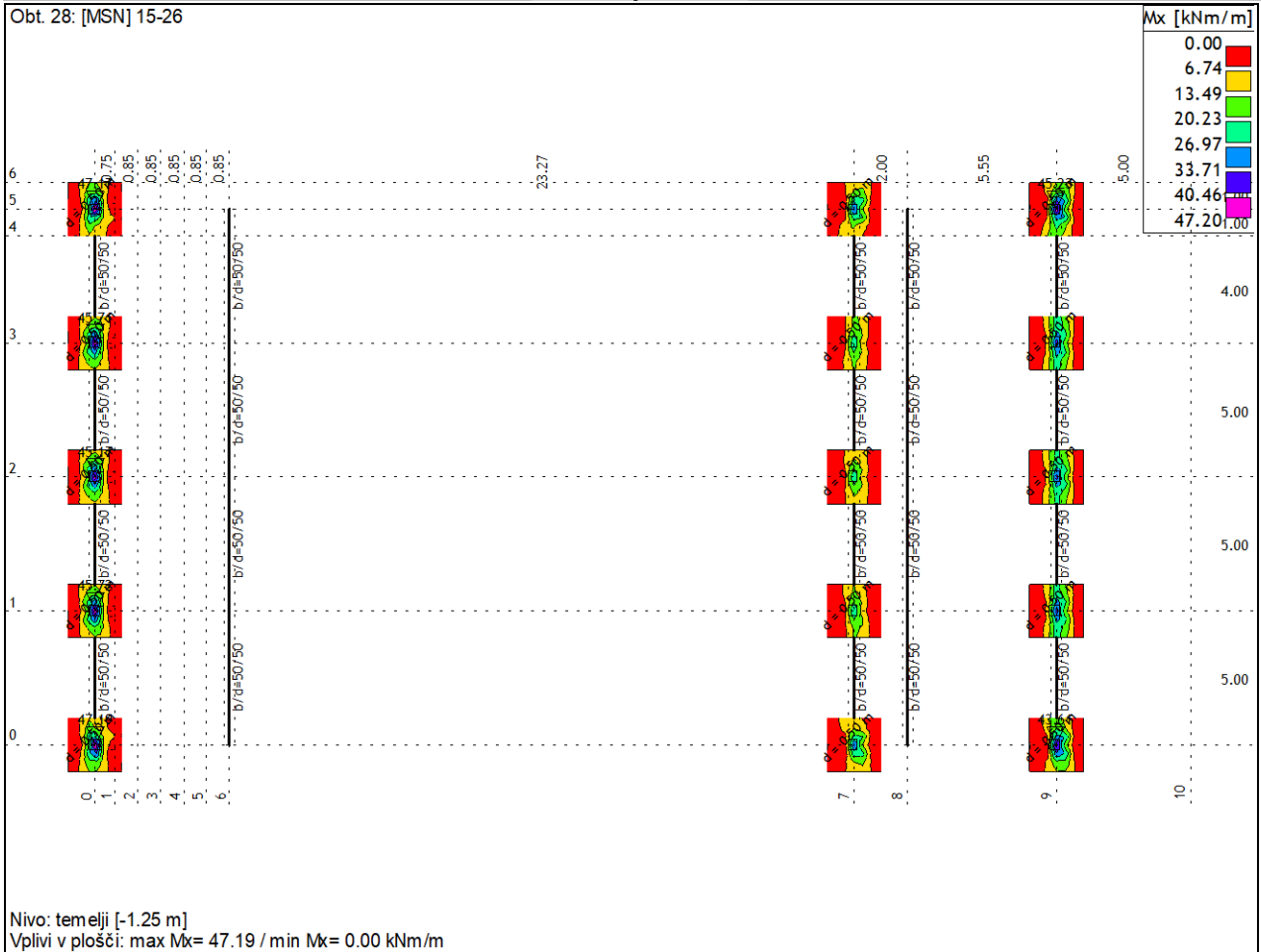
Ton \ Naziv	1. potres X	2. potres Y	3. potres XY
1	0.271	0.269	0.269
2	0.000	0.000	0.000
3	0.033	0.033	0.033
4	0.011	0.011	0.011
5	0.000	0.000	0.000
6	0.685	0.688	0.687
7	0.000	0.000	0.000
8	0.000	0.000	0.000
9	0.000	0.000	0.000
10	0.000	0.000	0.000

Faktorji participacije - angažiranje mase

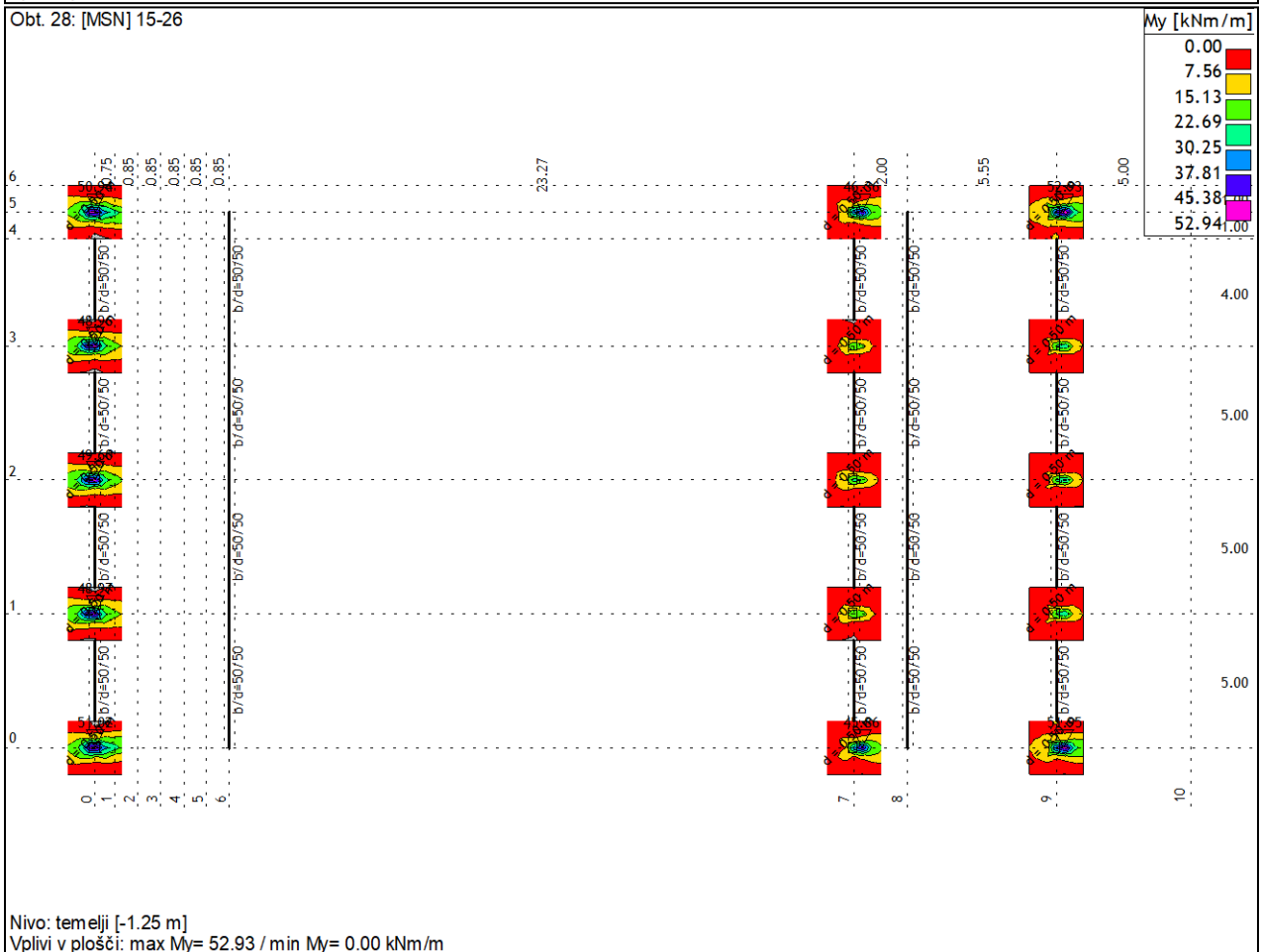
Ton	UX (%)	UY (%)	UZ (%)	ΣUX (%)	ΣUY (%)	ΣUZ (%)
1	0.00	4.40	0.00	0.00	4.40	0.00
2	0.00	0.00	0.00	0.00	4.40	0.00
3	0.00	0.51	0.00	0.00	4.91	0.00
4	0.00	0.16	0.00	0.00	5.07	0.00
5	0.00	0.00	0.00	0.00	5.07	0.00
6	0.00	5.74	0.00	0.00	10.81	0.00
7	0.00	0.00	0.00	0.00	10.81	0.00
8	0.00	0.00	0.00	0.00	10.81	0.00
9	0.00	0.00	0.00	0.00	10.81	0.00
10	0.00	0.00	0.00	0.00	10.81	0.00

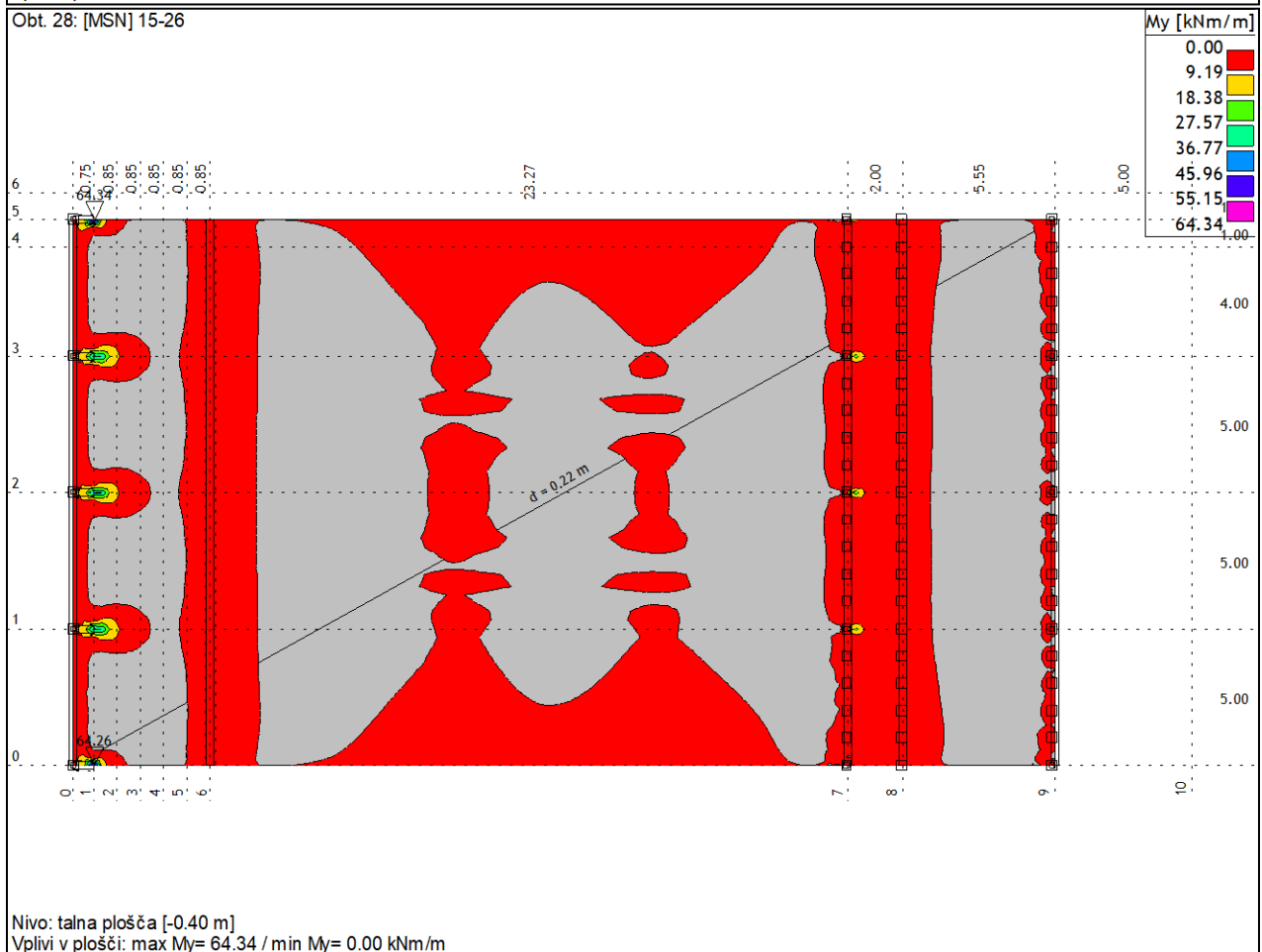
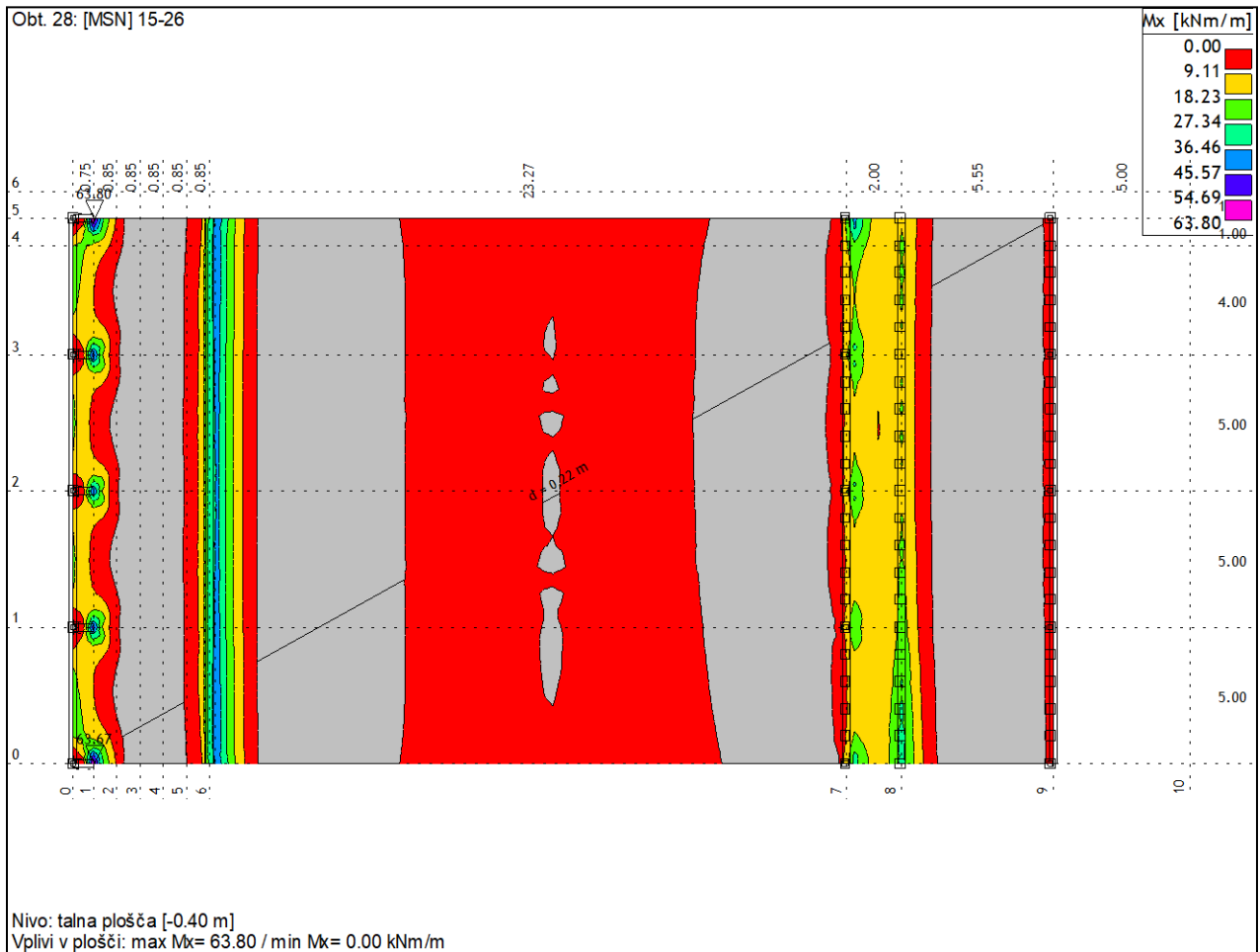
Statični preračun

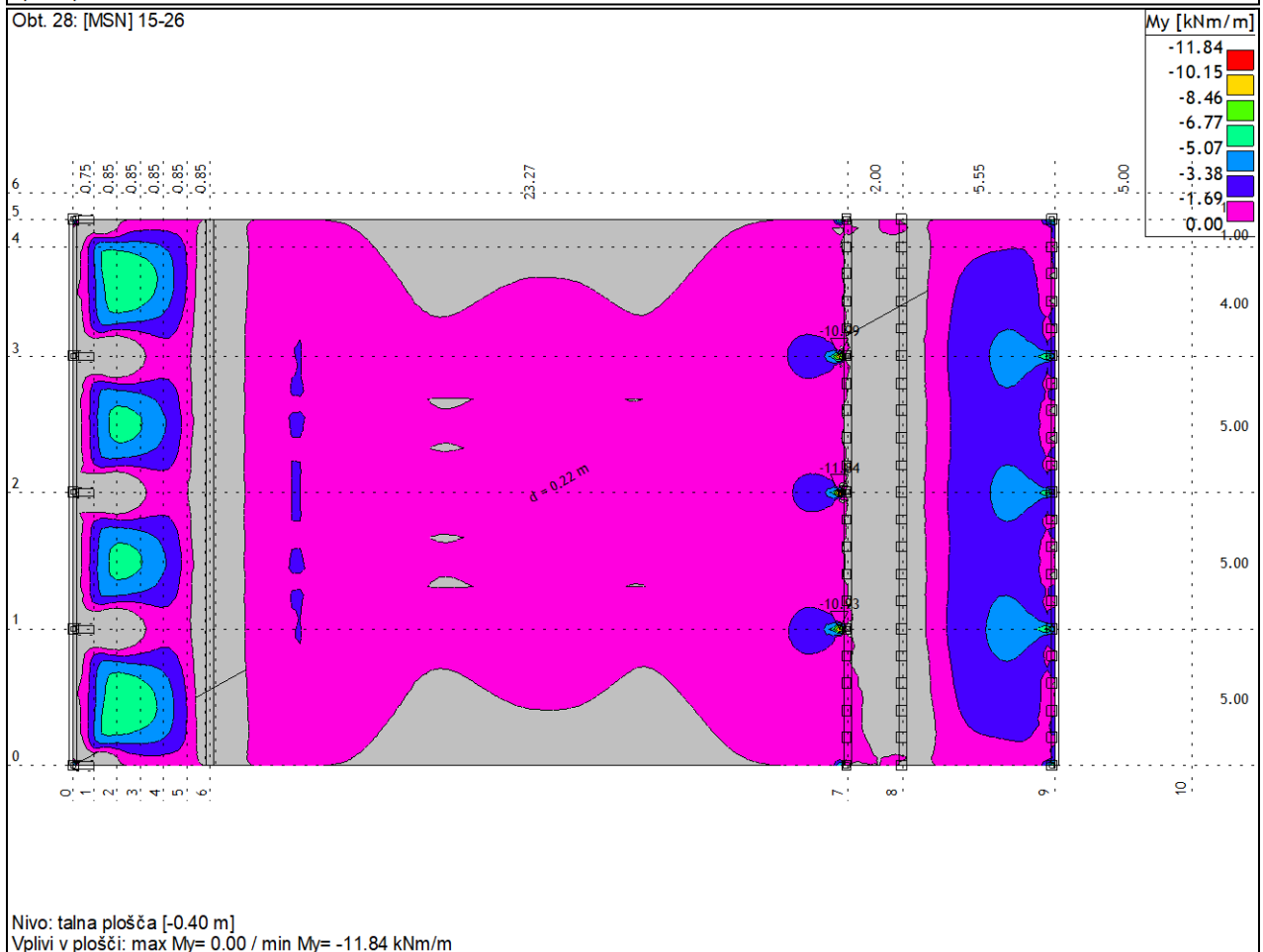
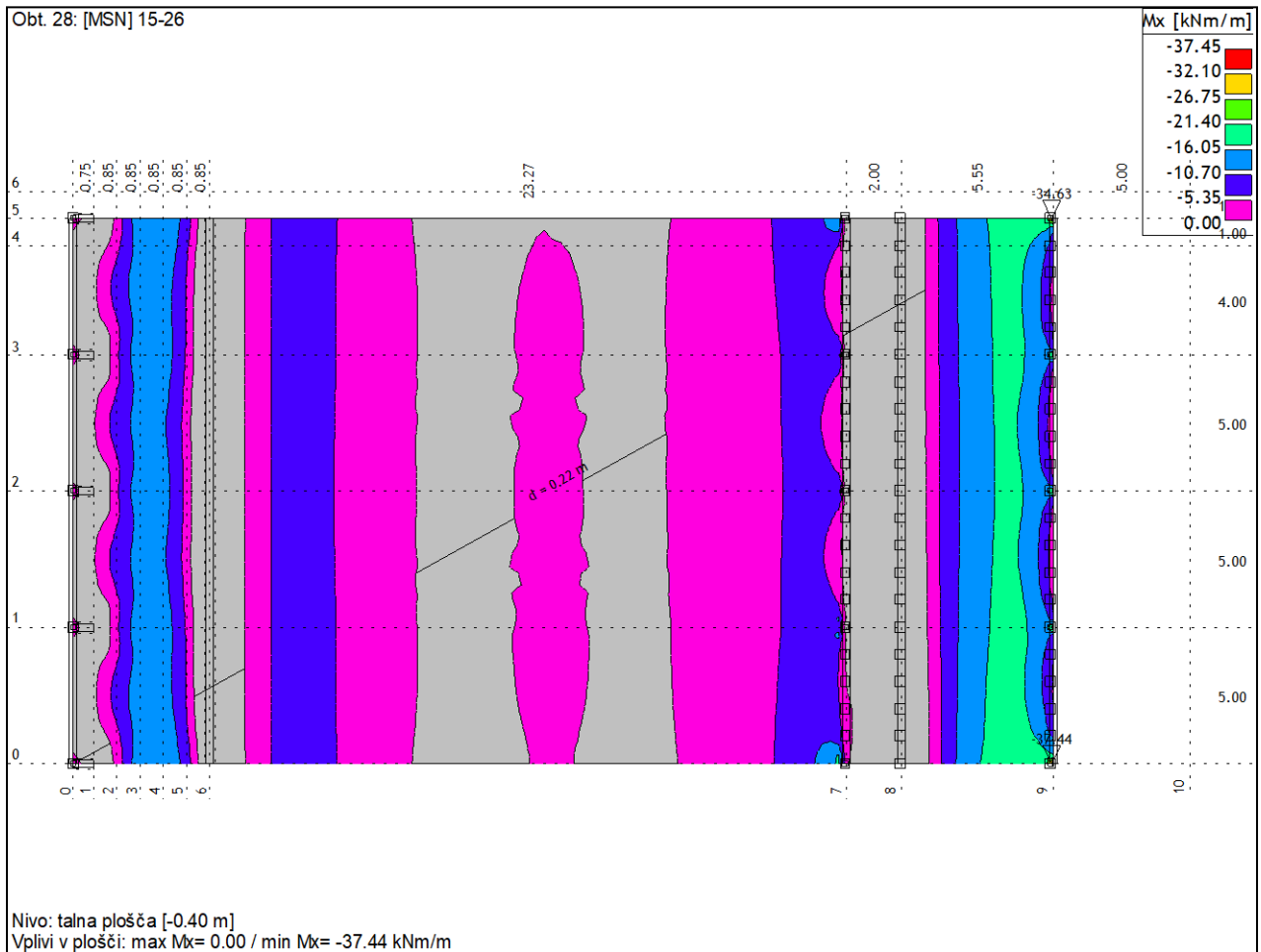
Obt. 28: [MSN] 15-26

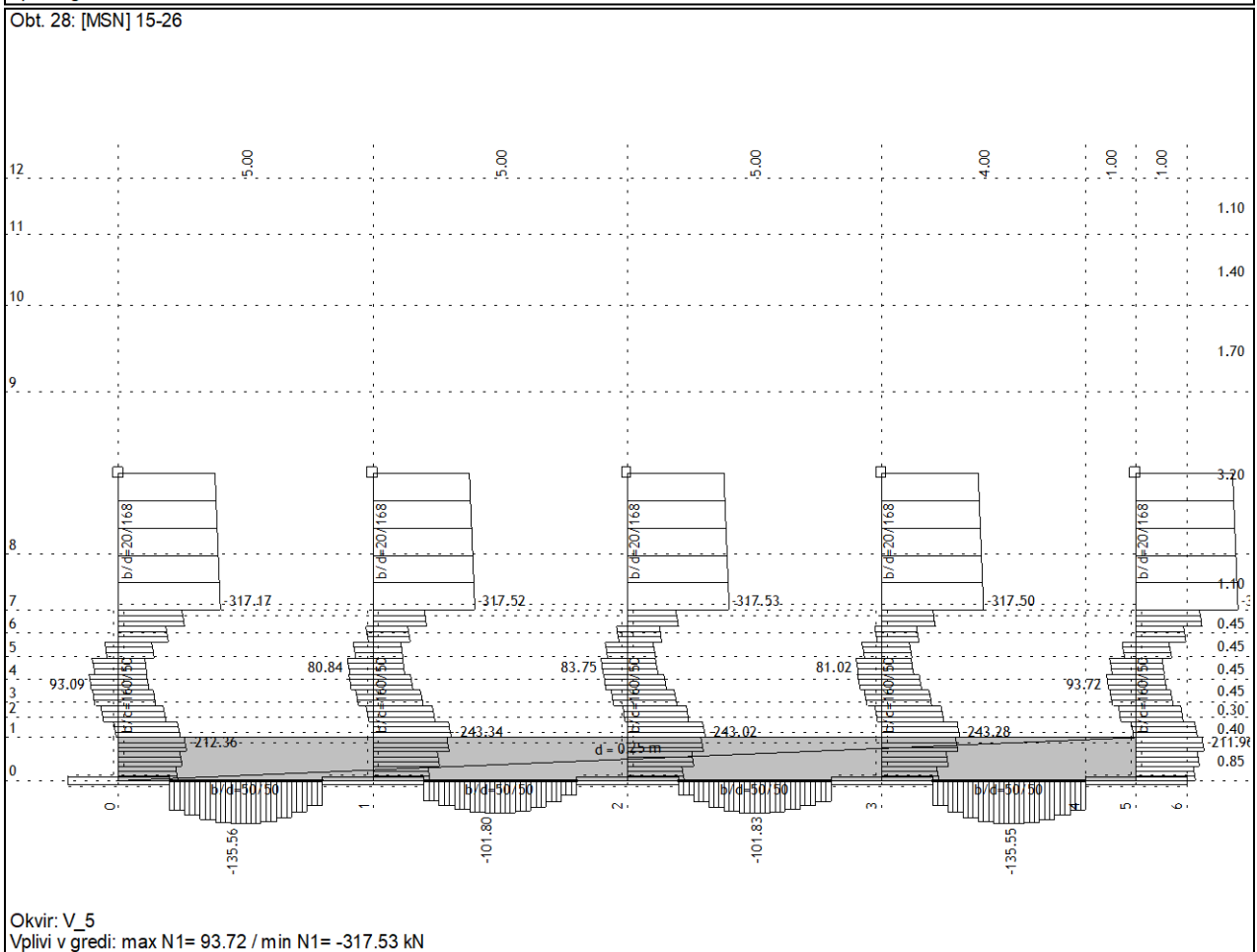
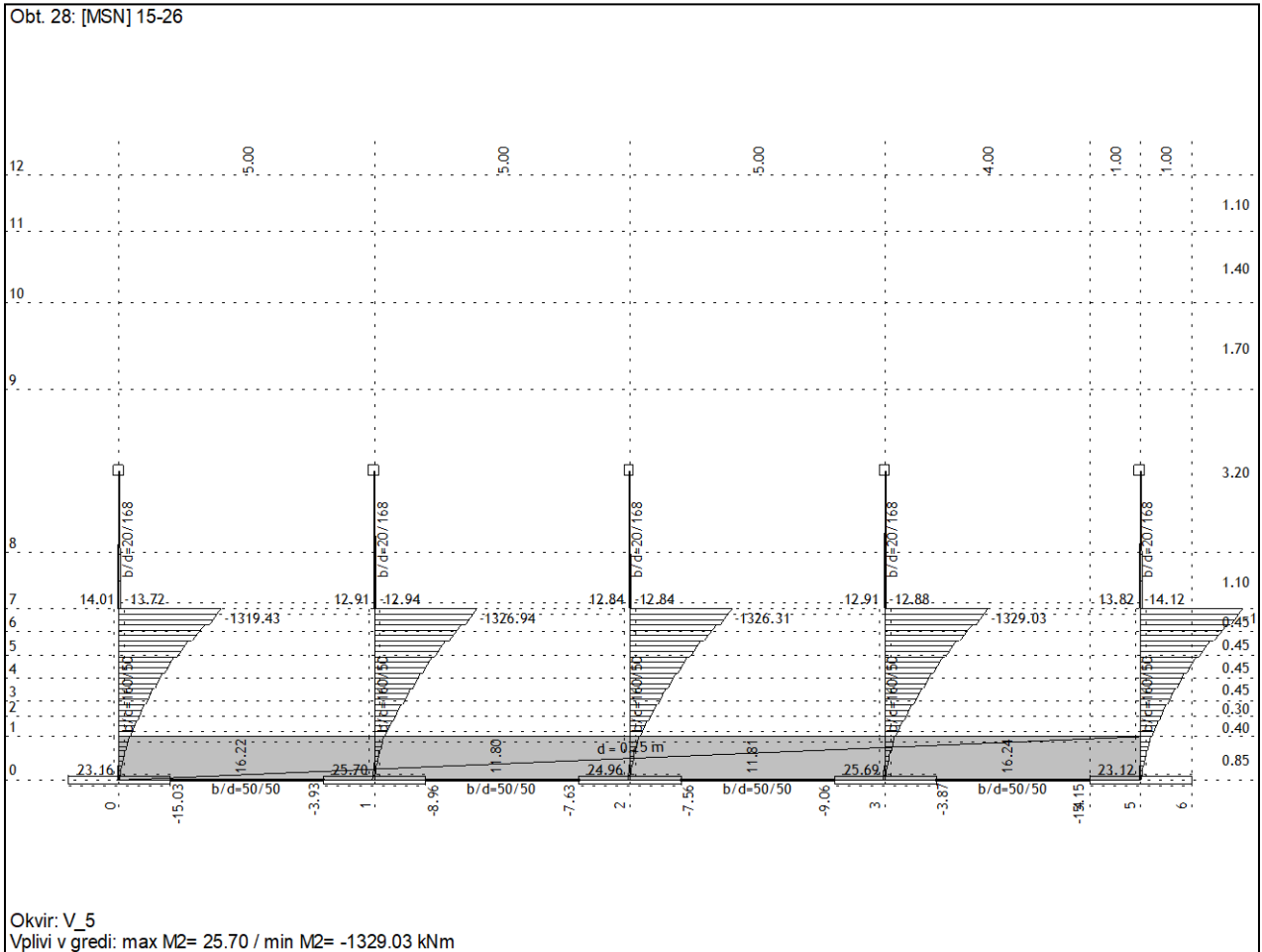


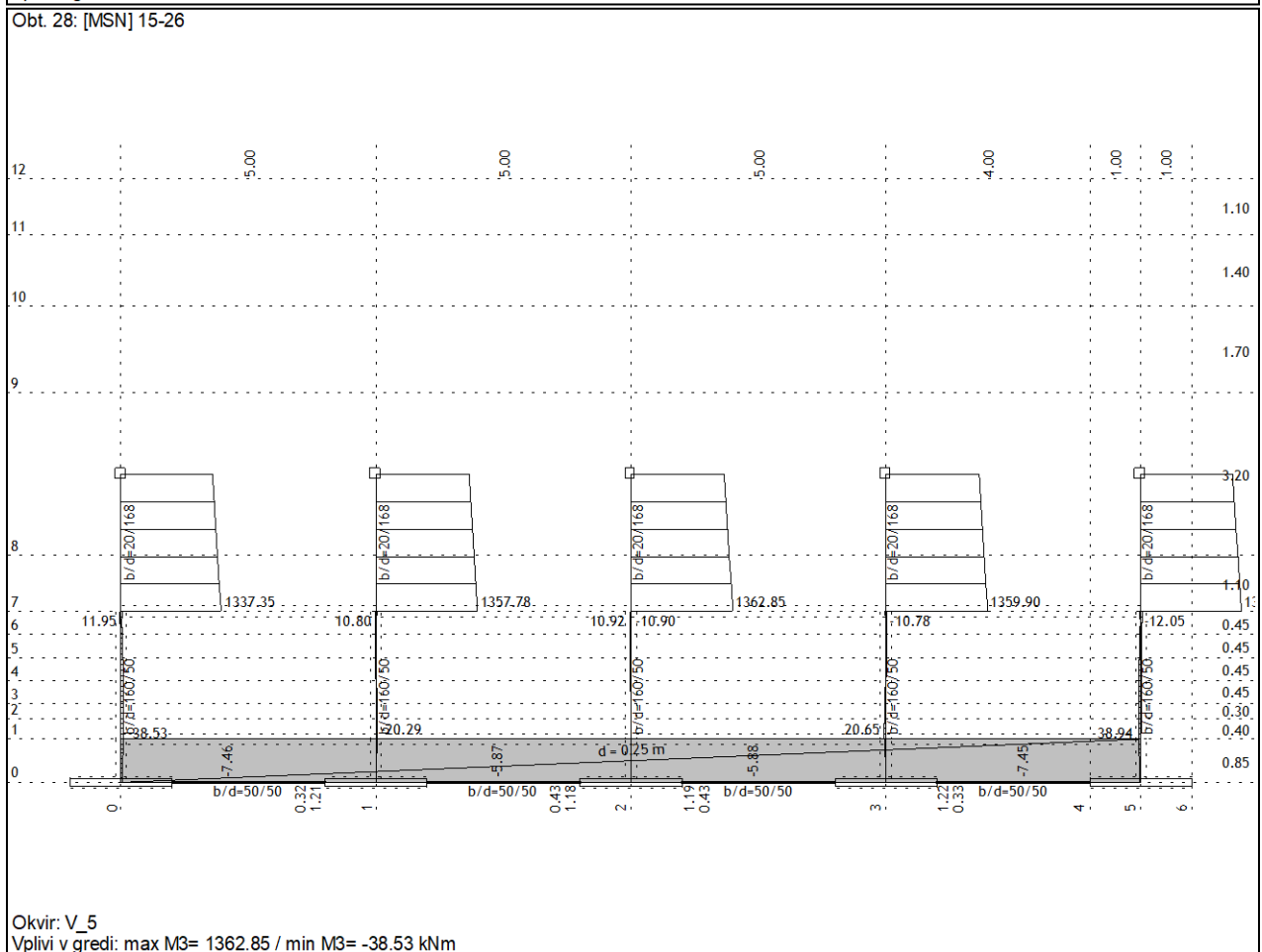
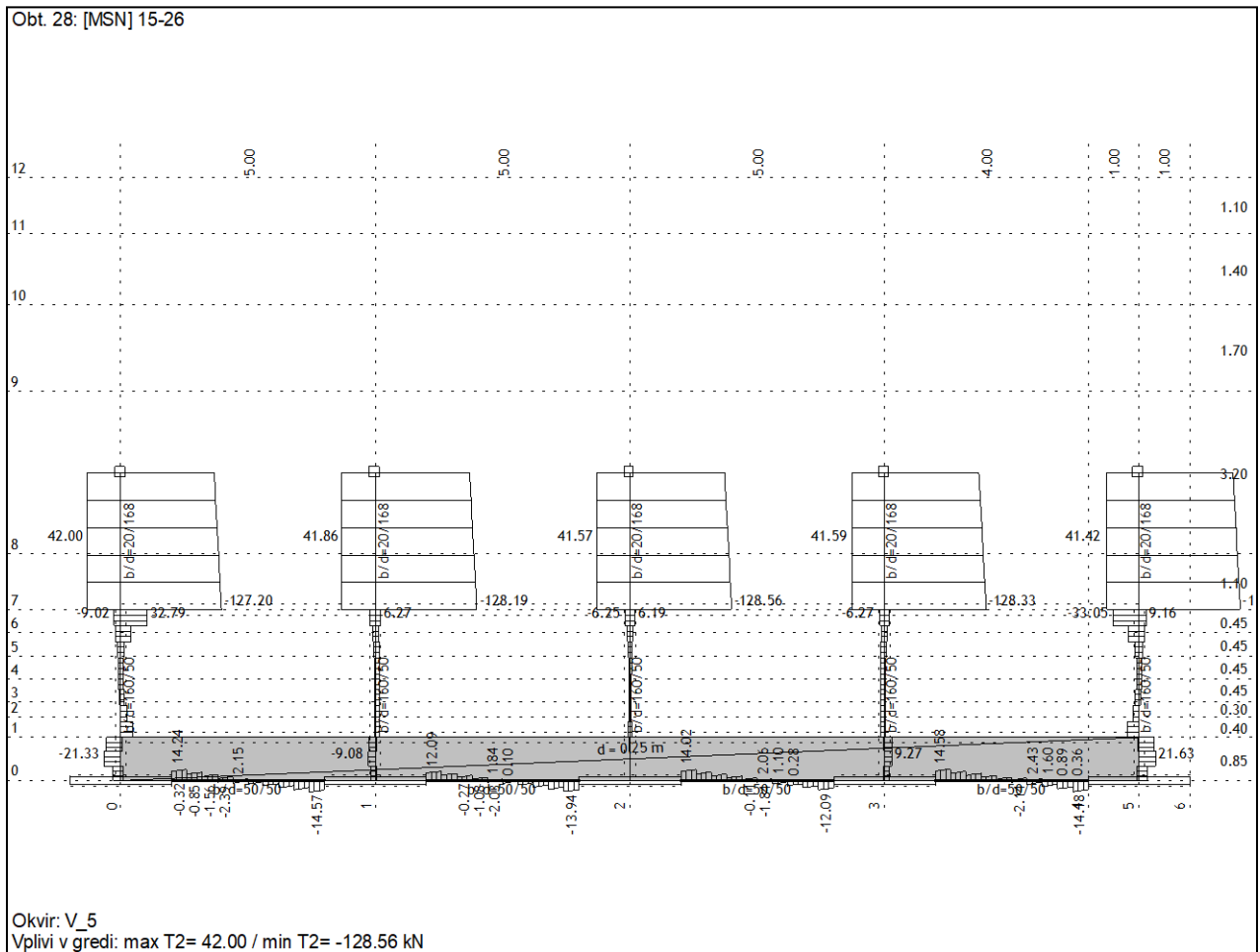
Obt. 28: [MSN] 15-26

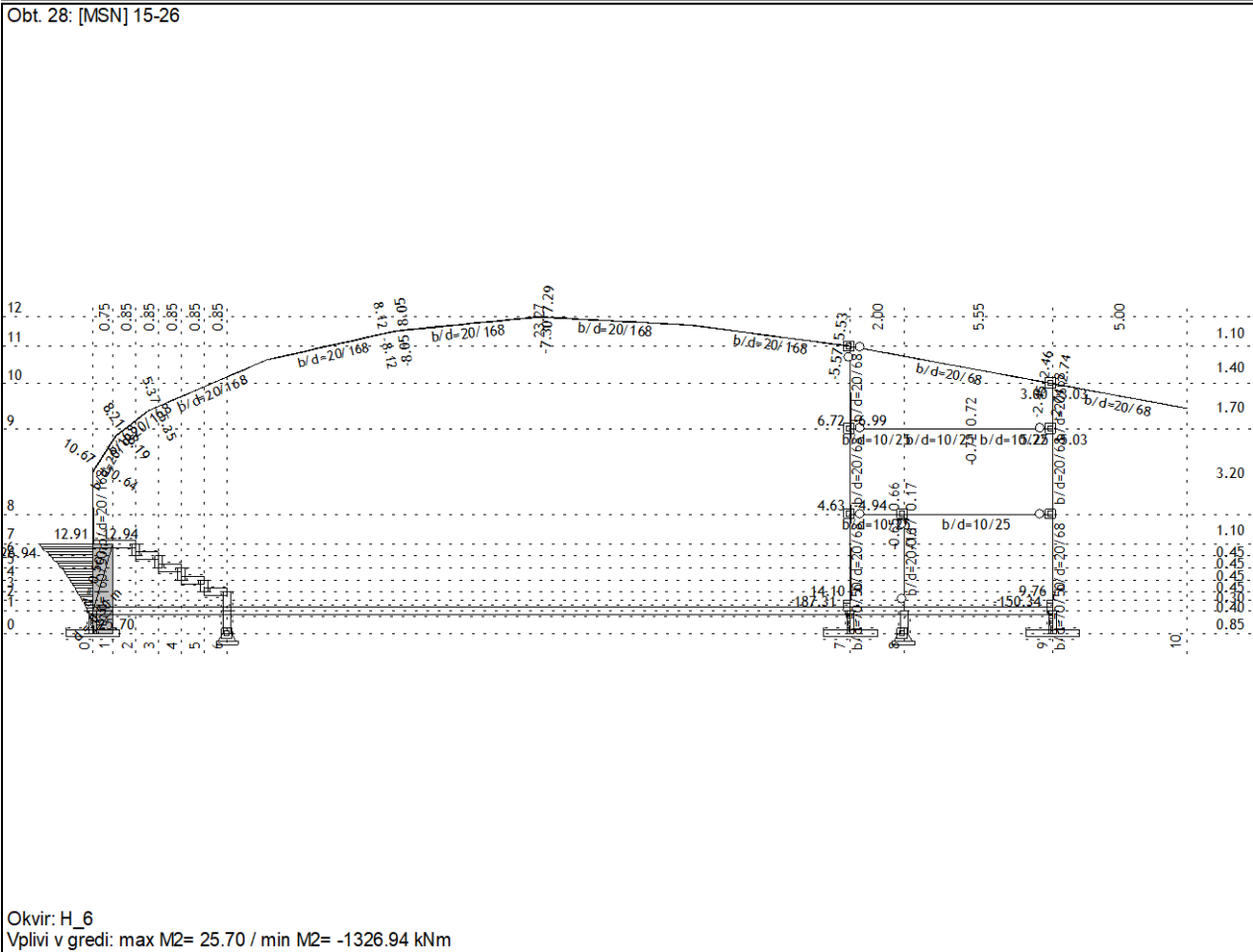
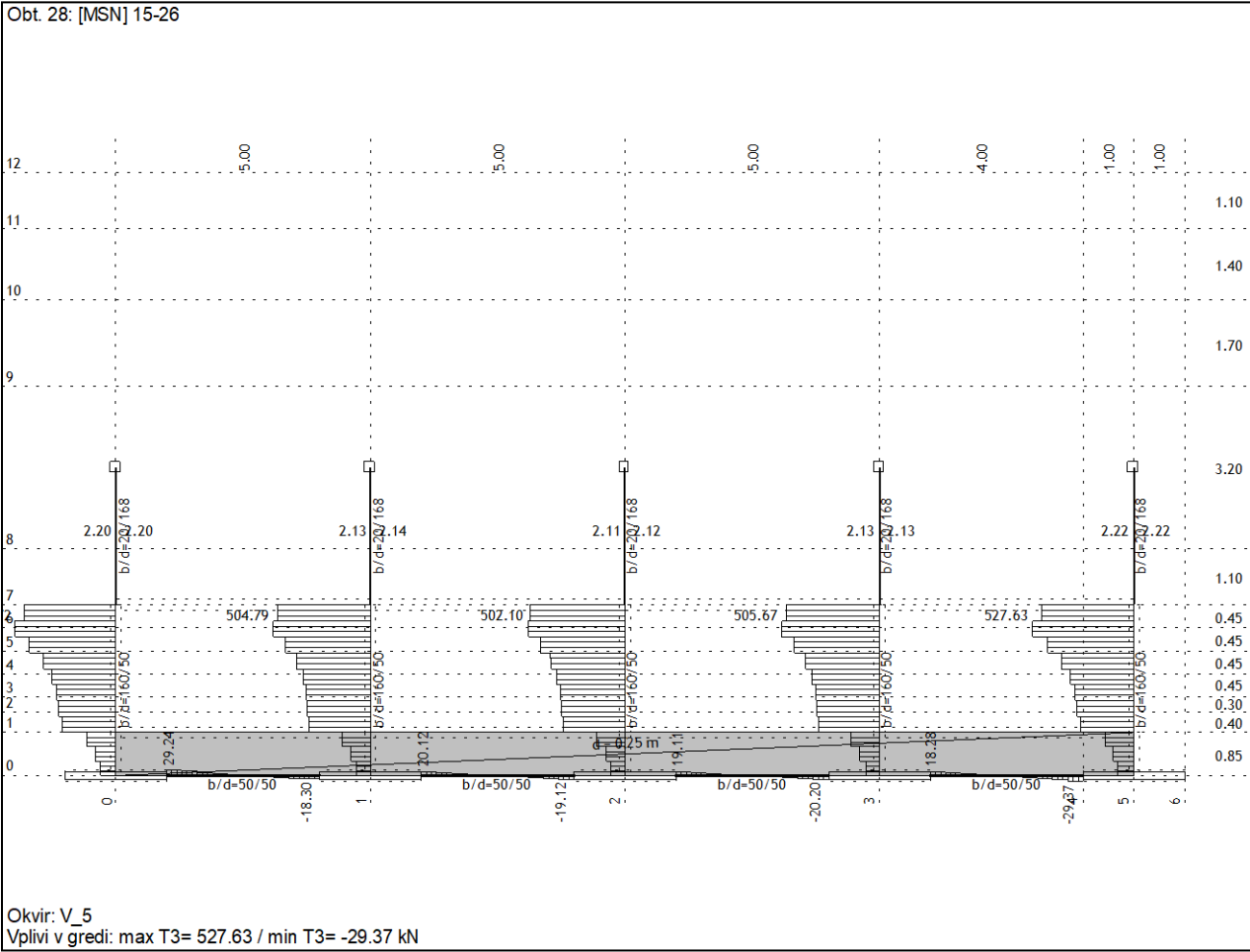


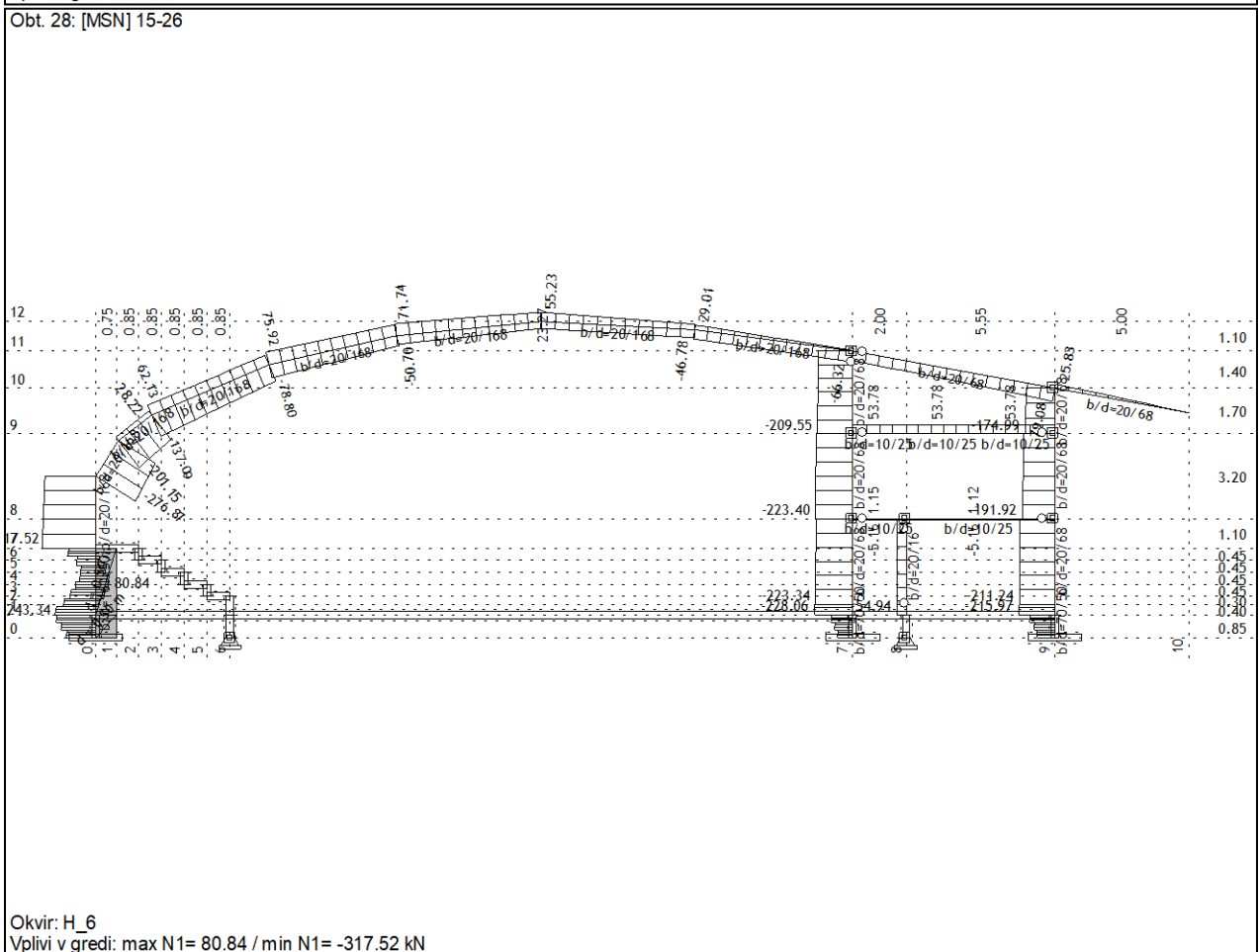
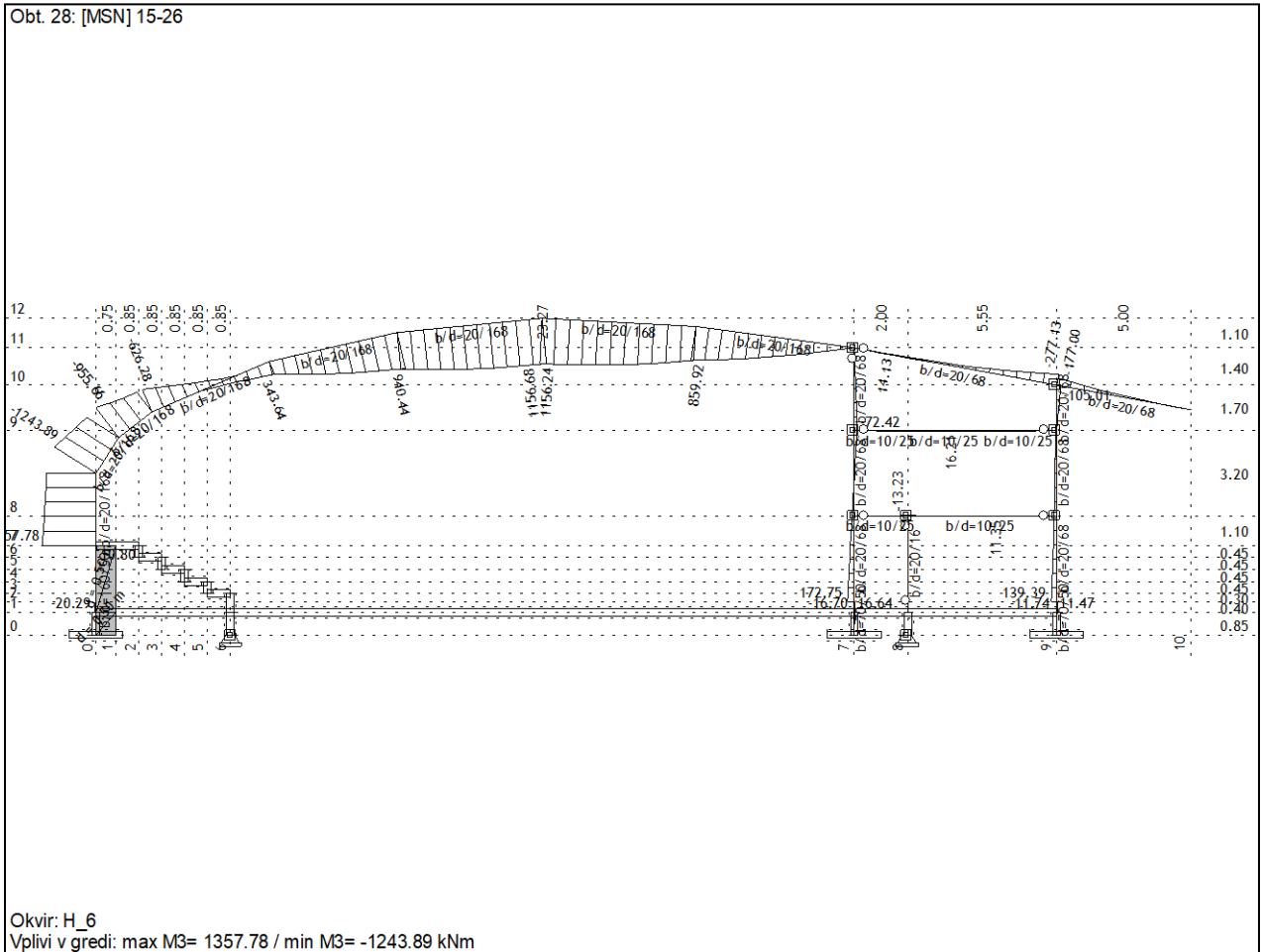


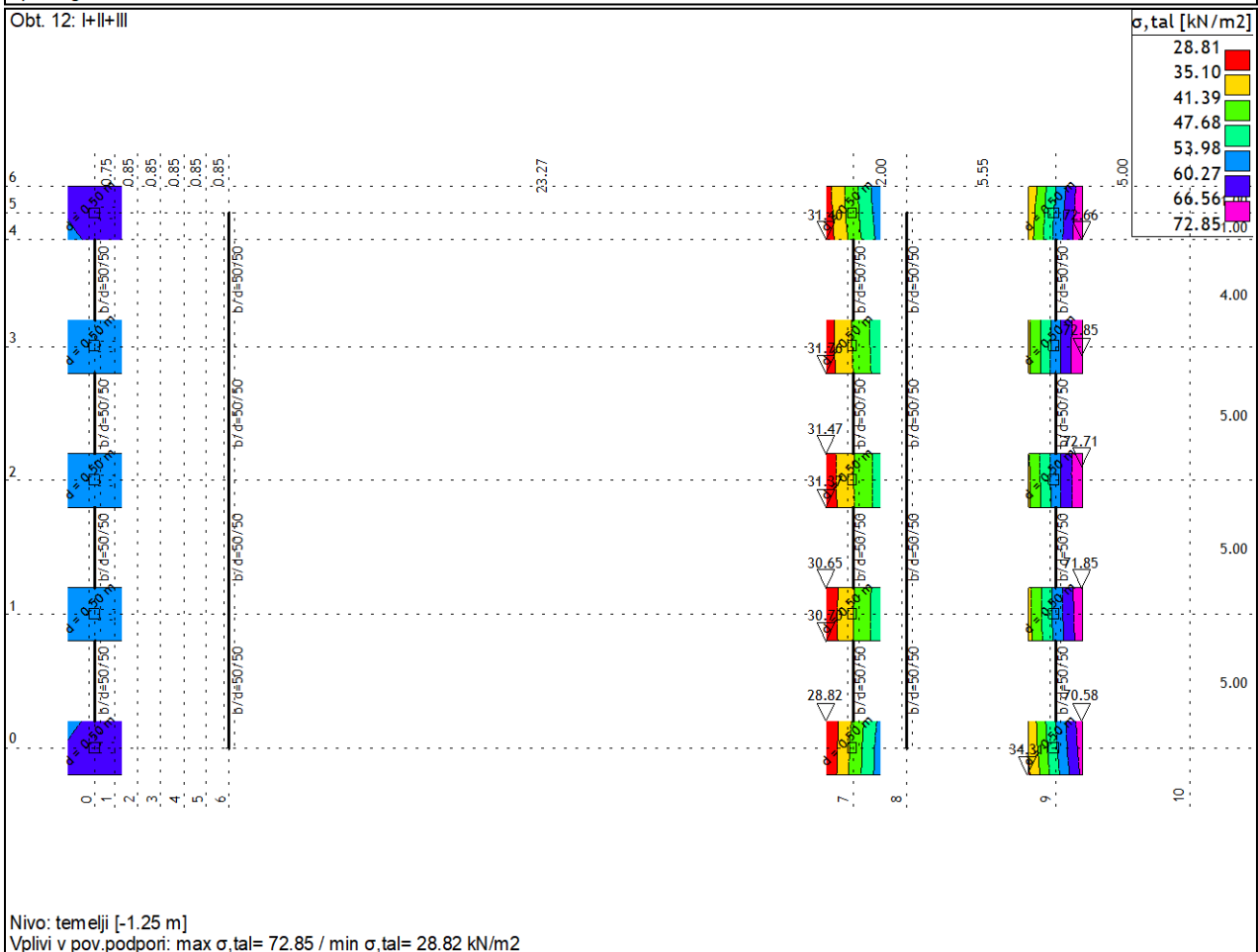
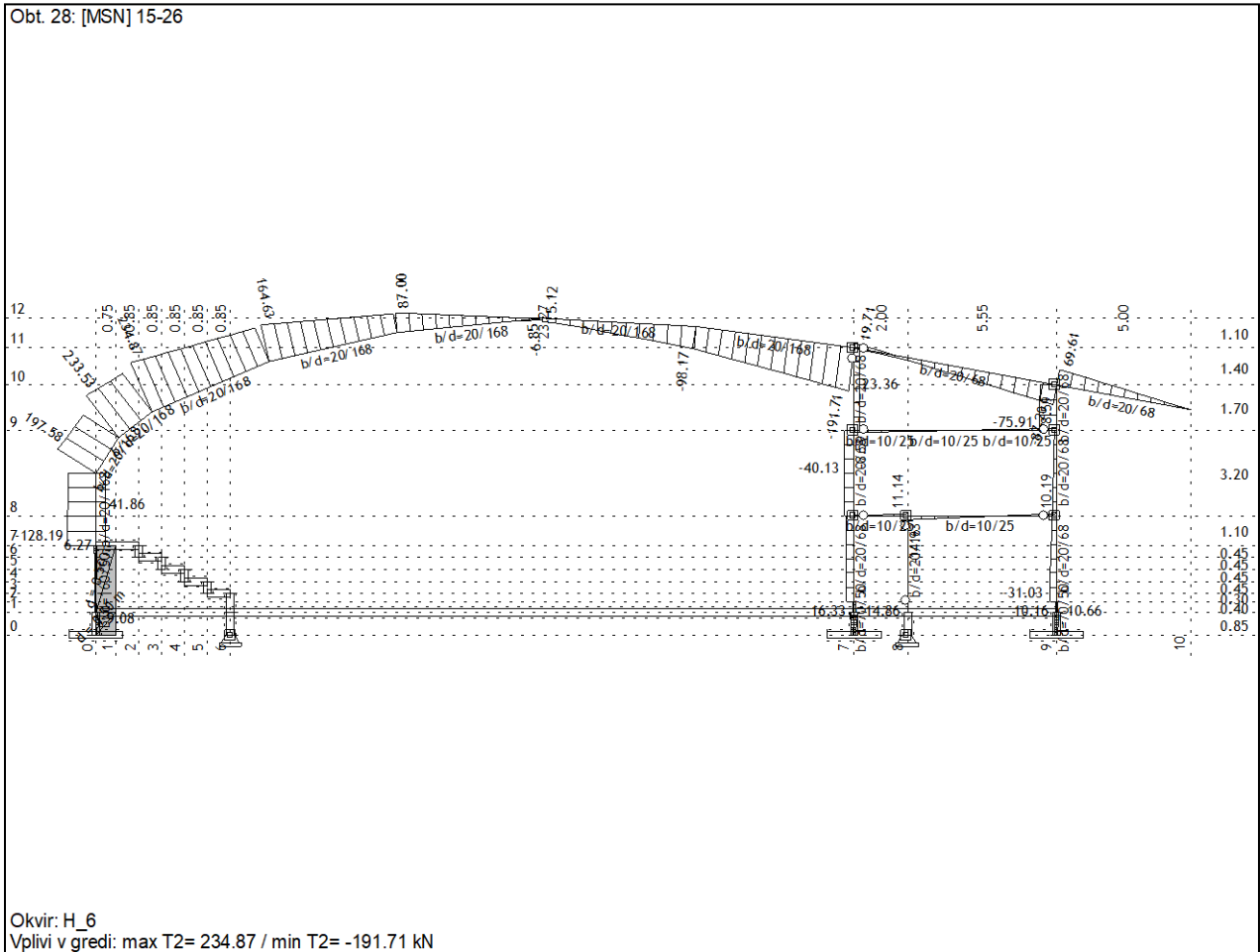


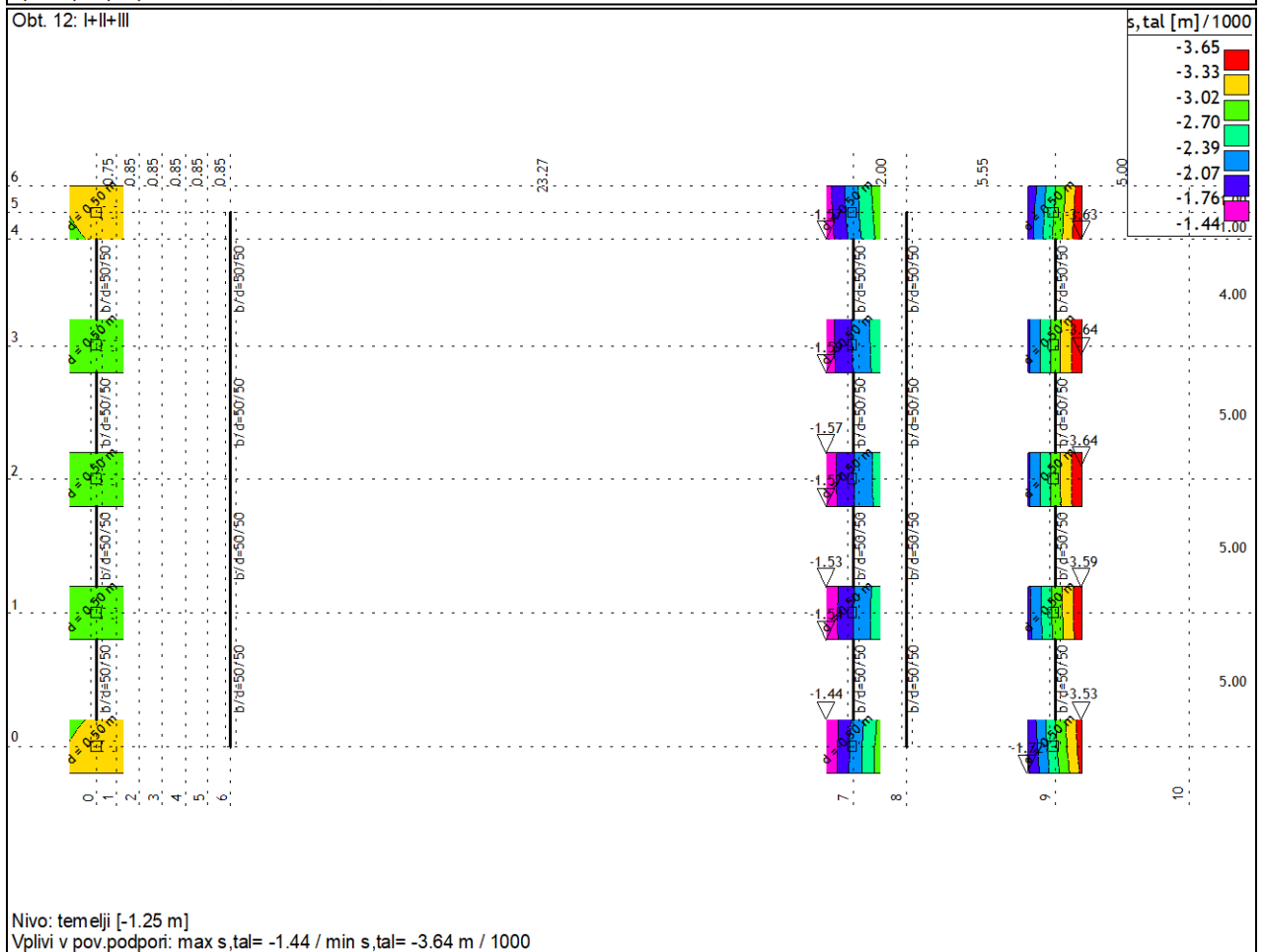
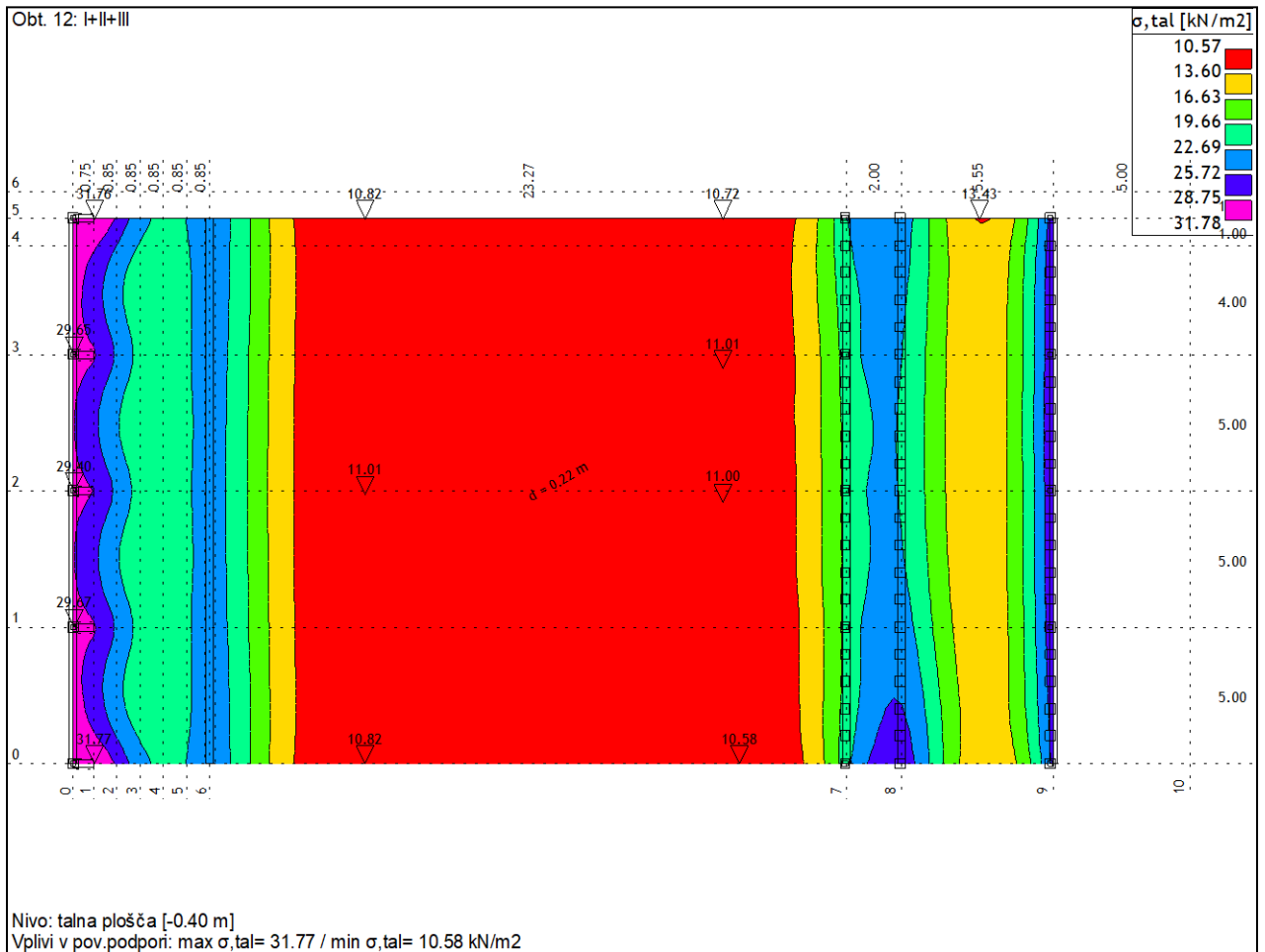


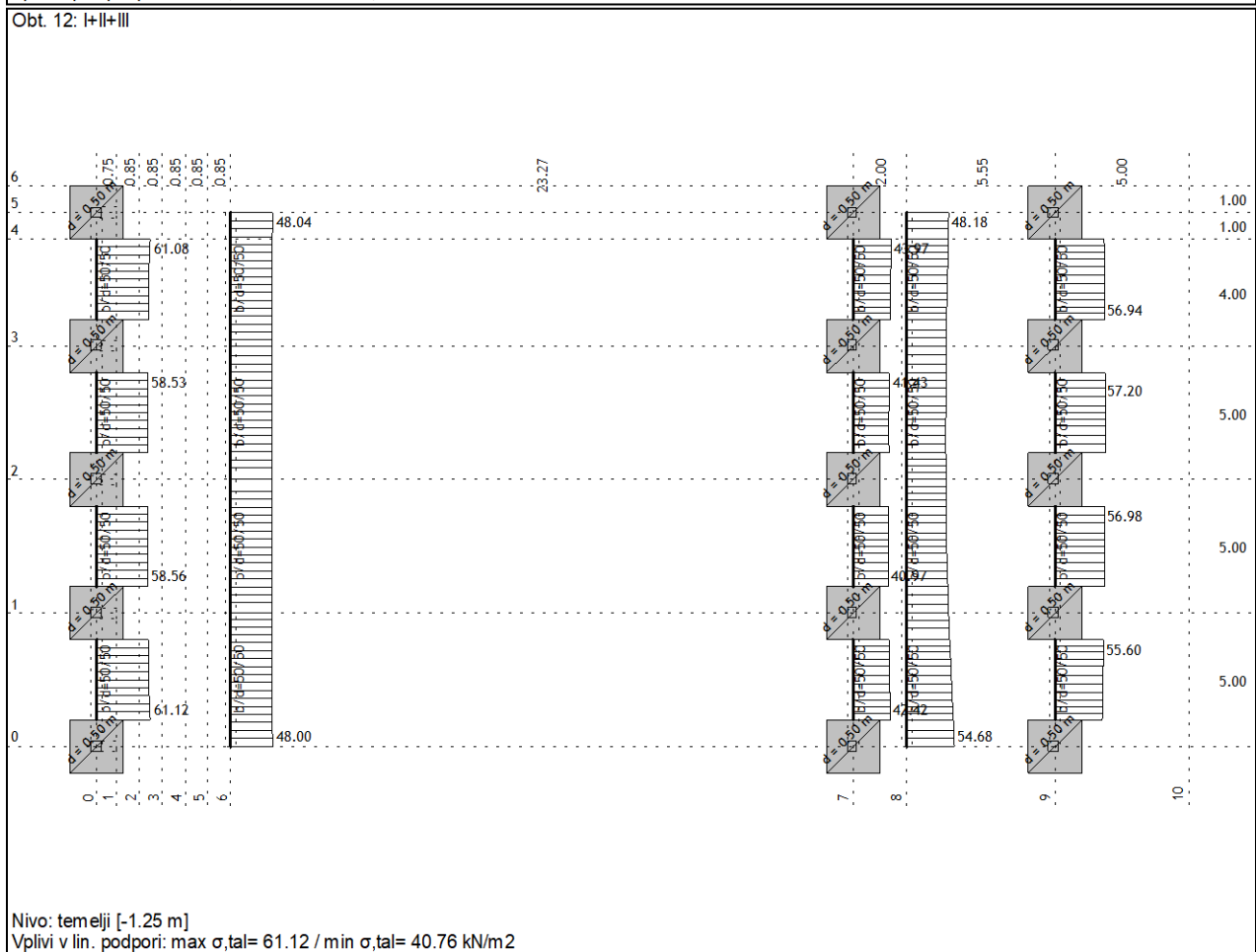
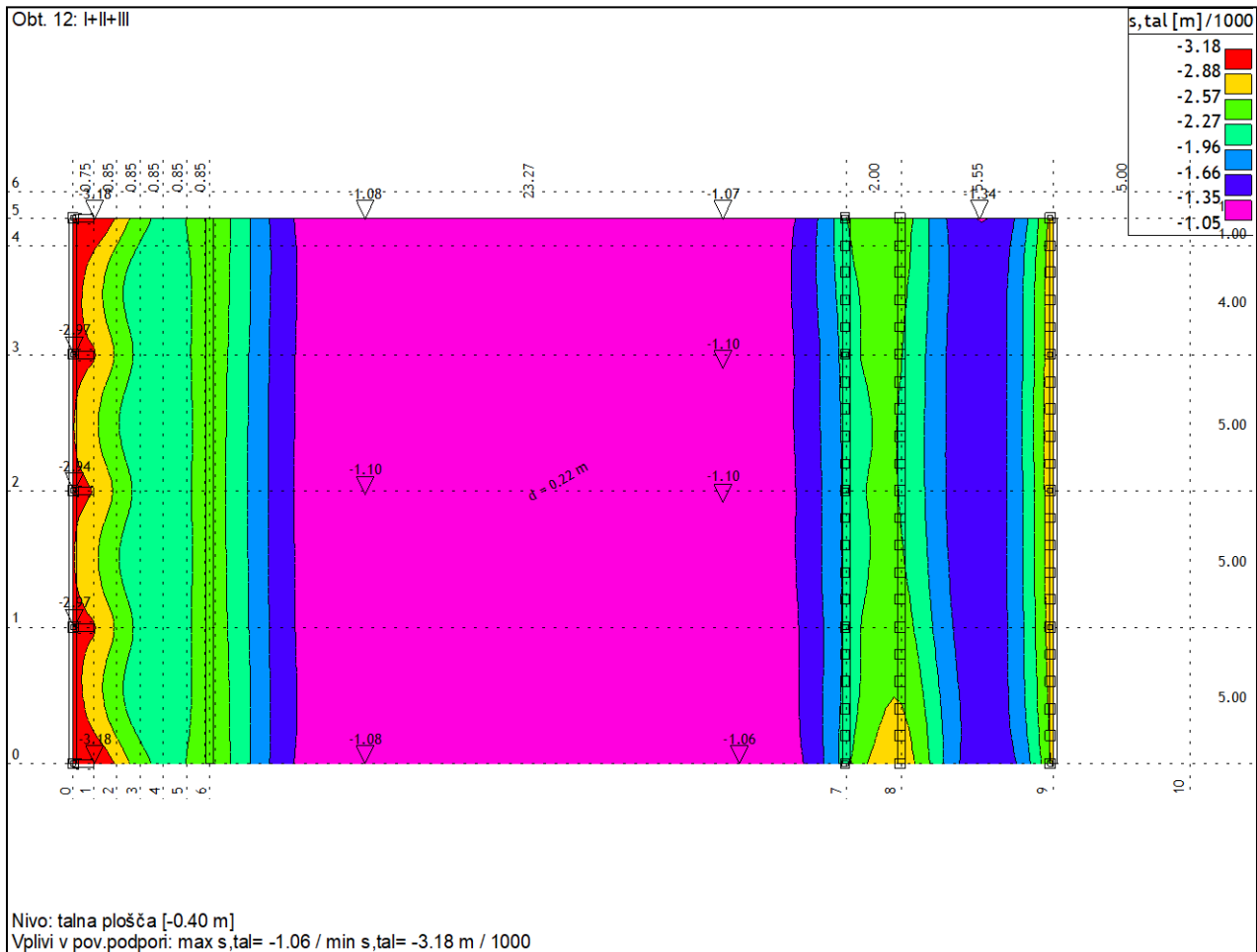


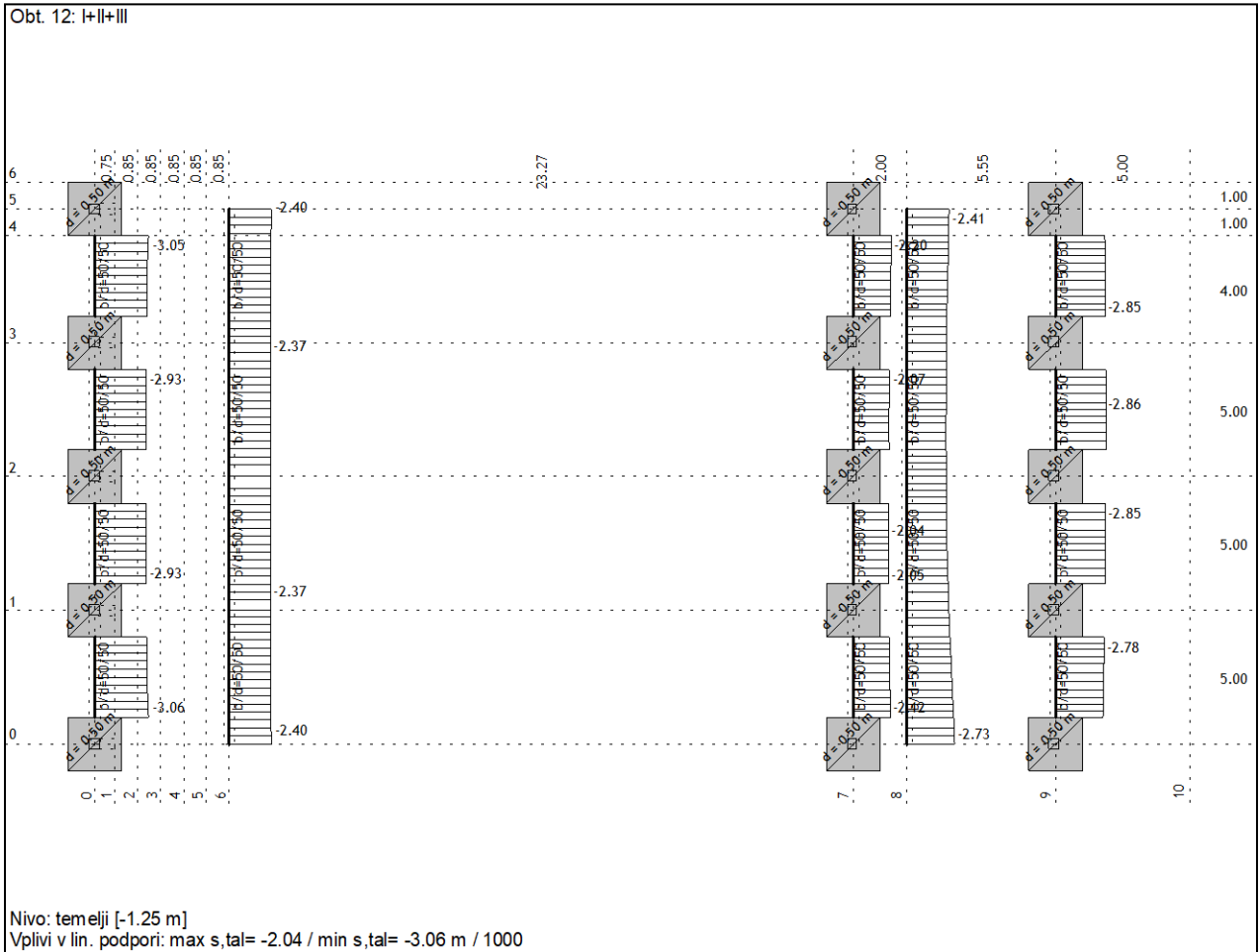












Dimenzioniranje (beton)**Merodajna obtežba - EC 2 (EN 1992-1-1:2004)**Obtežni primeri

- I lastna (g) - <Stalna>
- II koristna - <Koristna - A>
- III sneg - <Sneg - <= 1000 m>
- IV veter X - <Veter> (+/-)
- V veter Y - <Veter> (+/-)
- VI potres X - <Seizmična> (+/-)
- VII potres Y - <Seizmična> (+/-)
- VIII potres XY - <Seizmična> (+/-)

Ne kombiniraj z

- IV -> V
- V -> IV
- VI -> VII, VIII
- VII -> VI, VIII
- VIII -> VI, VII

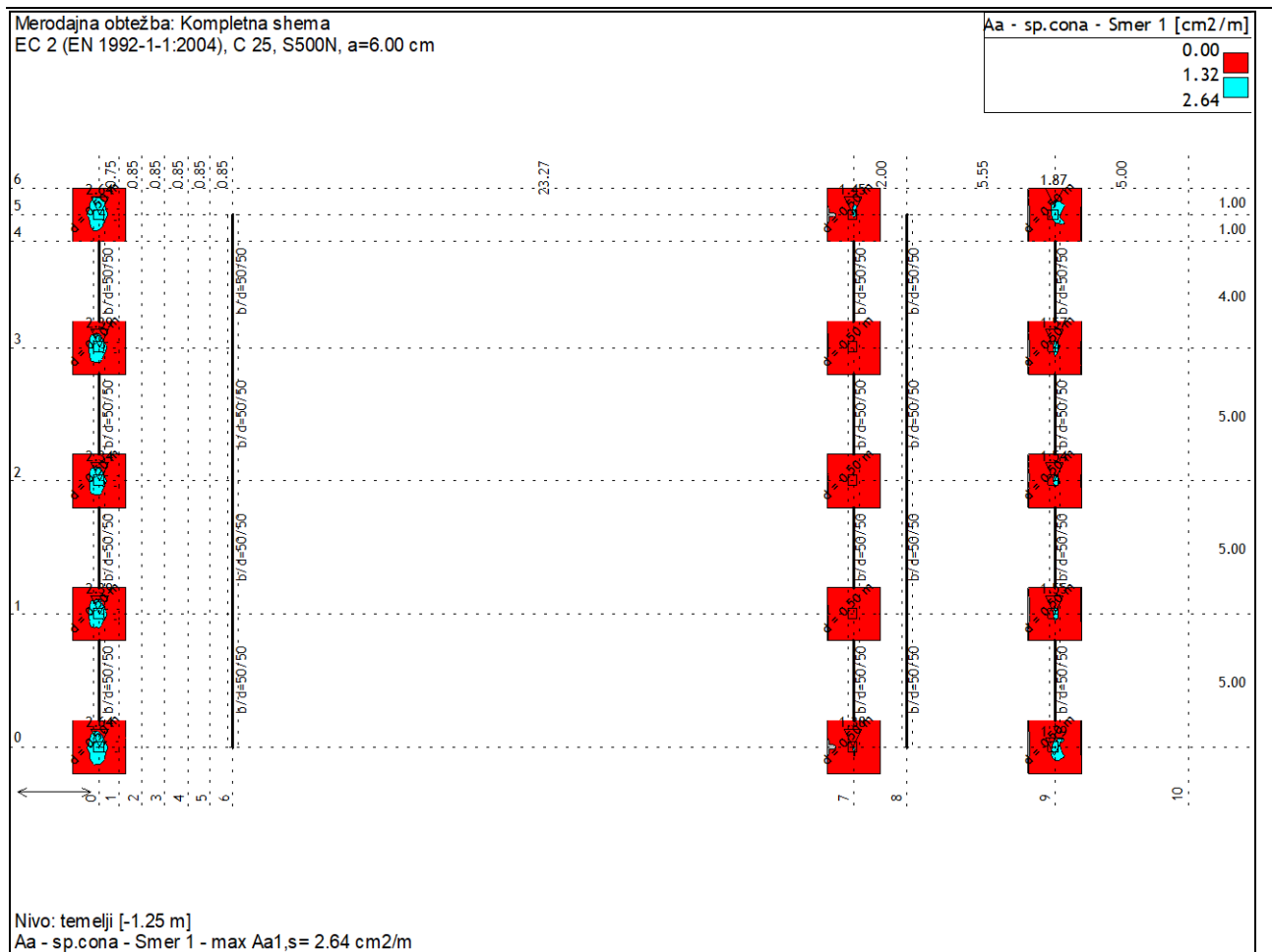
Materialni koeficienti varnosti

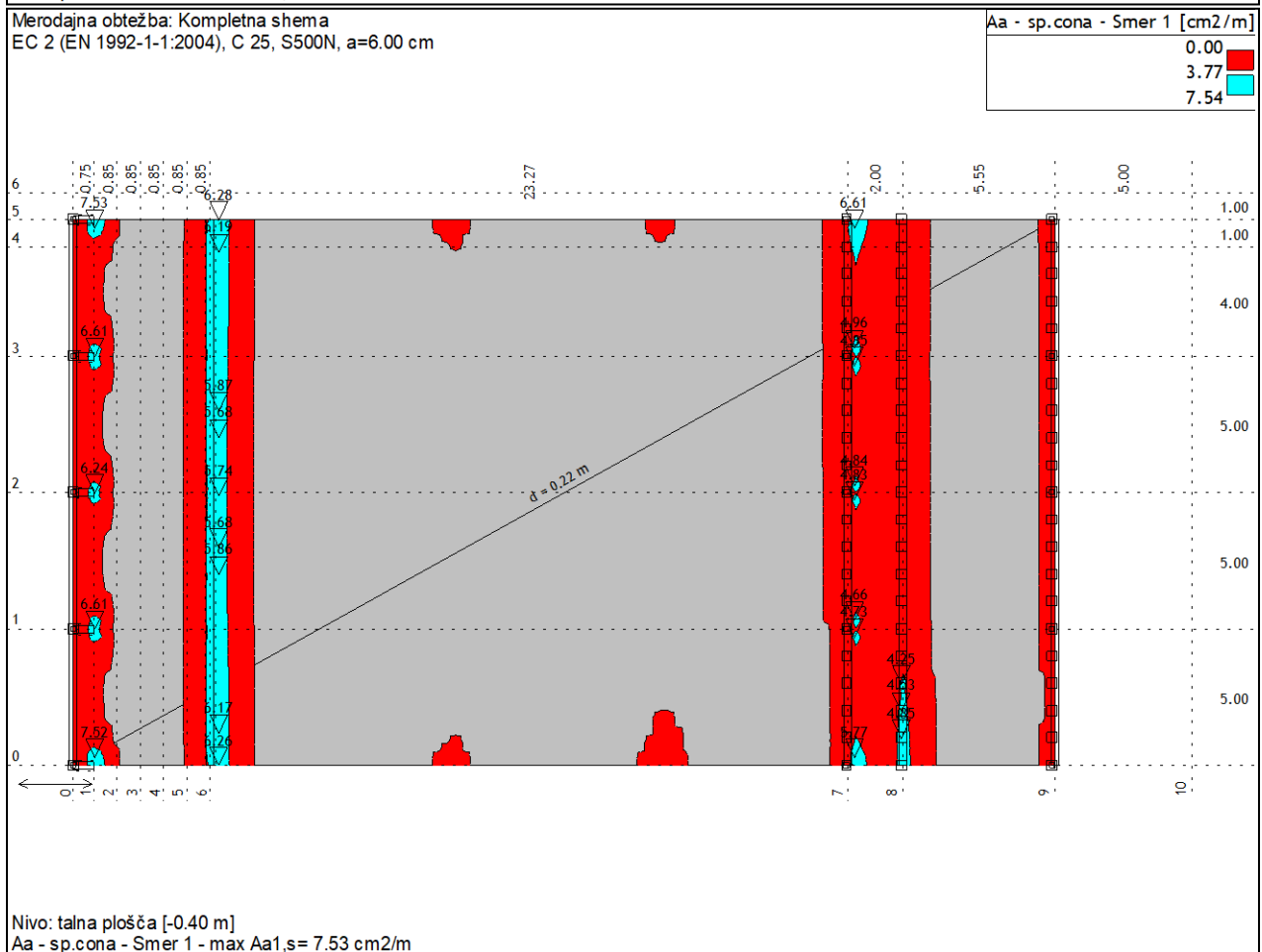
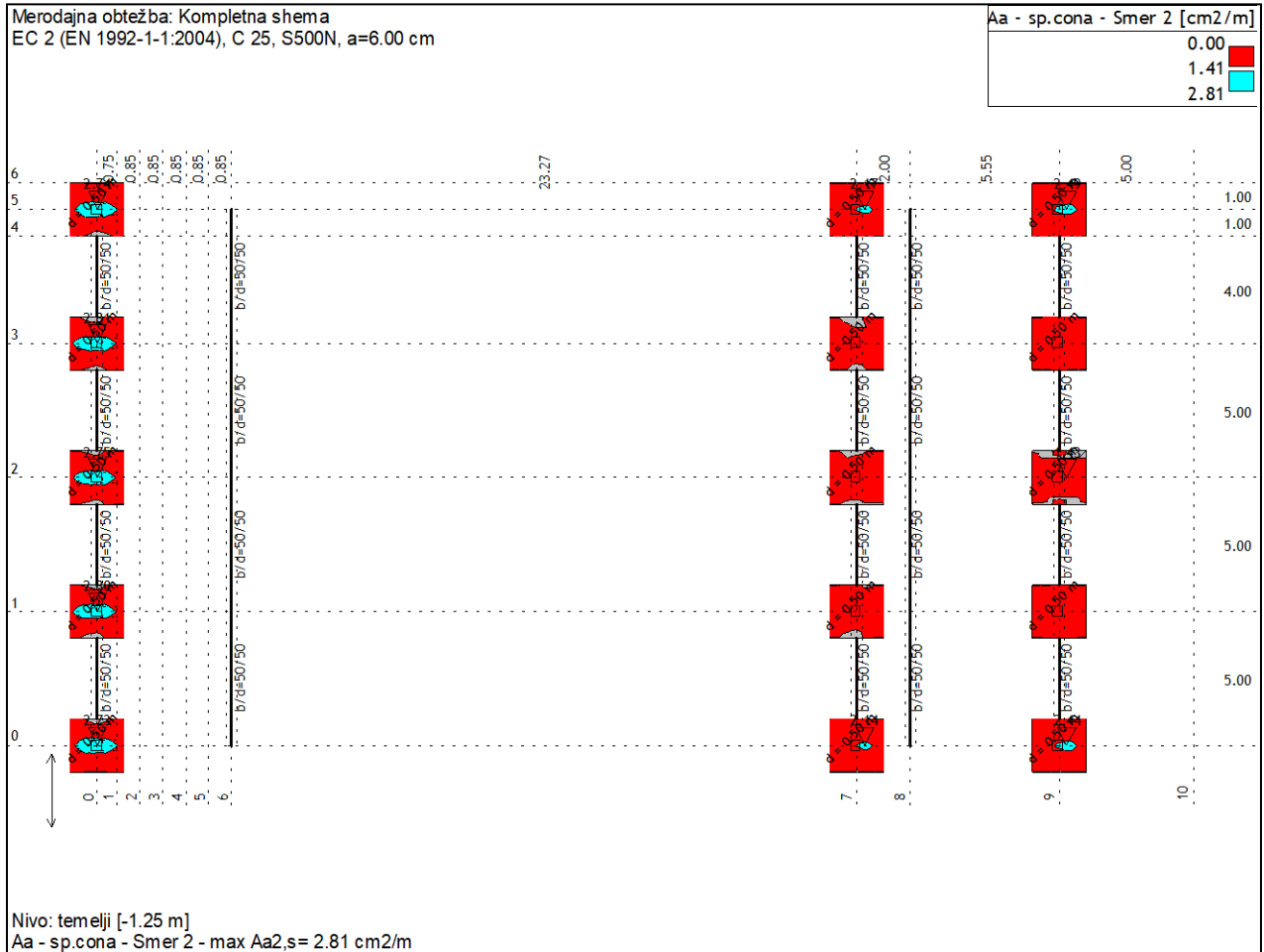
Stalne in prehodne kombinacije: $\gamma_C = 1.50$, $\gamma_S = 1.15$
 Nezgodne kombinacije: $\gamma_C = 1.20$, $\gamma_S = 1.00$

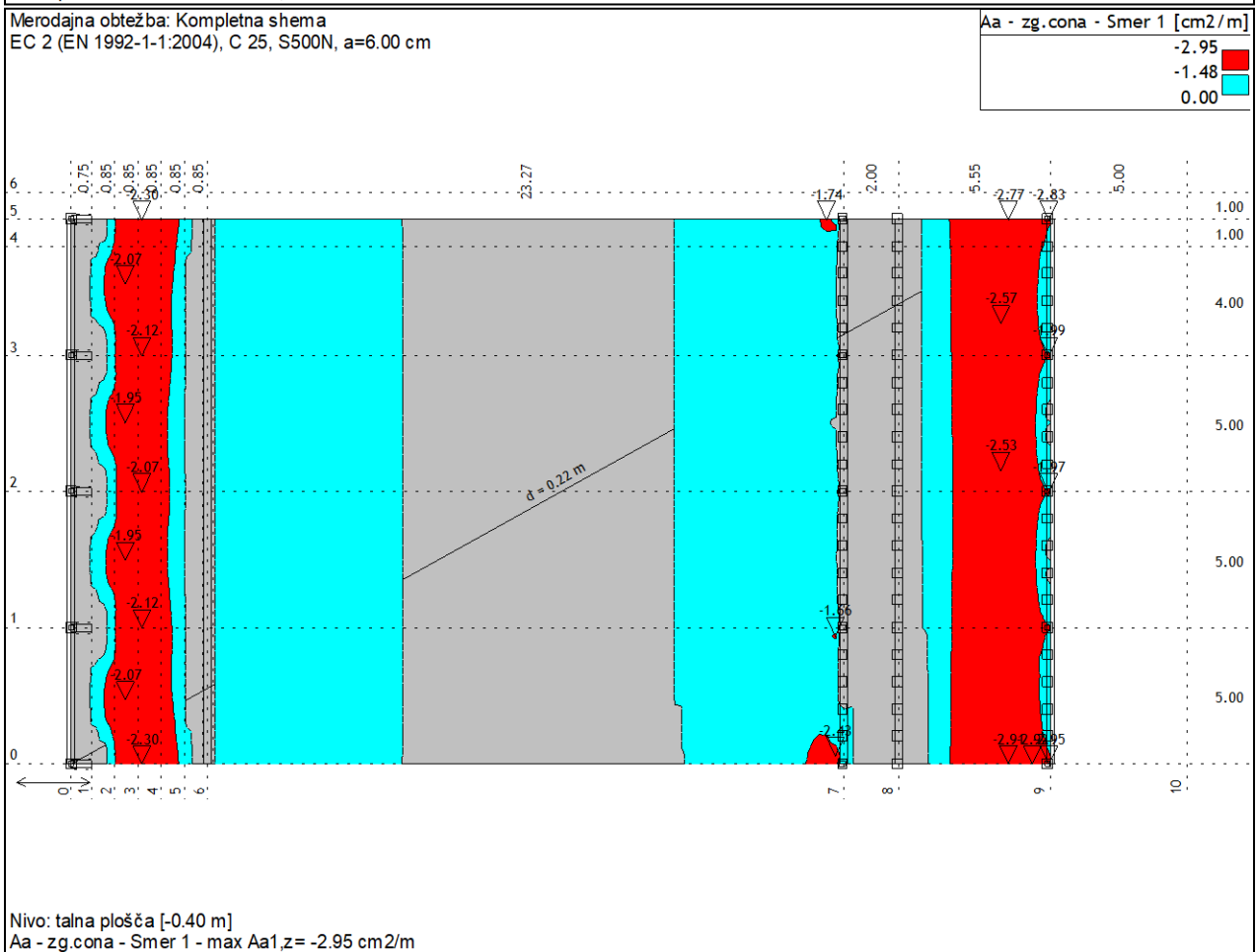
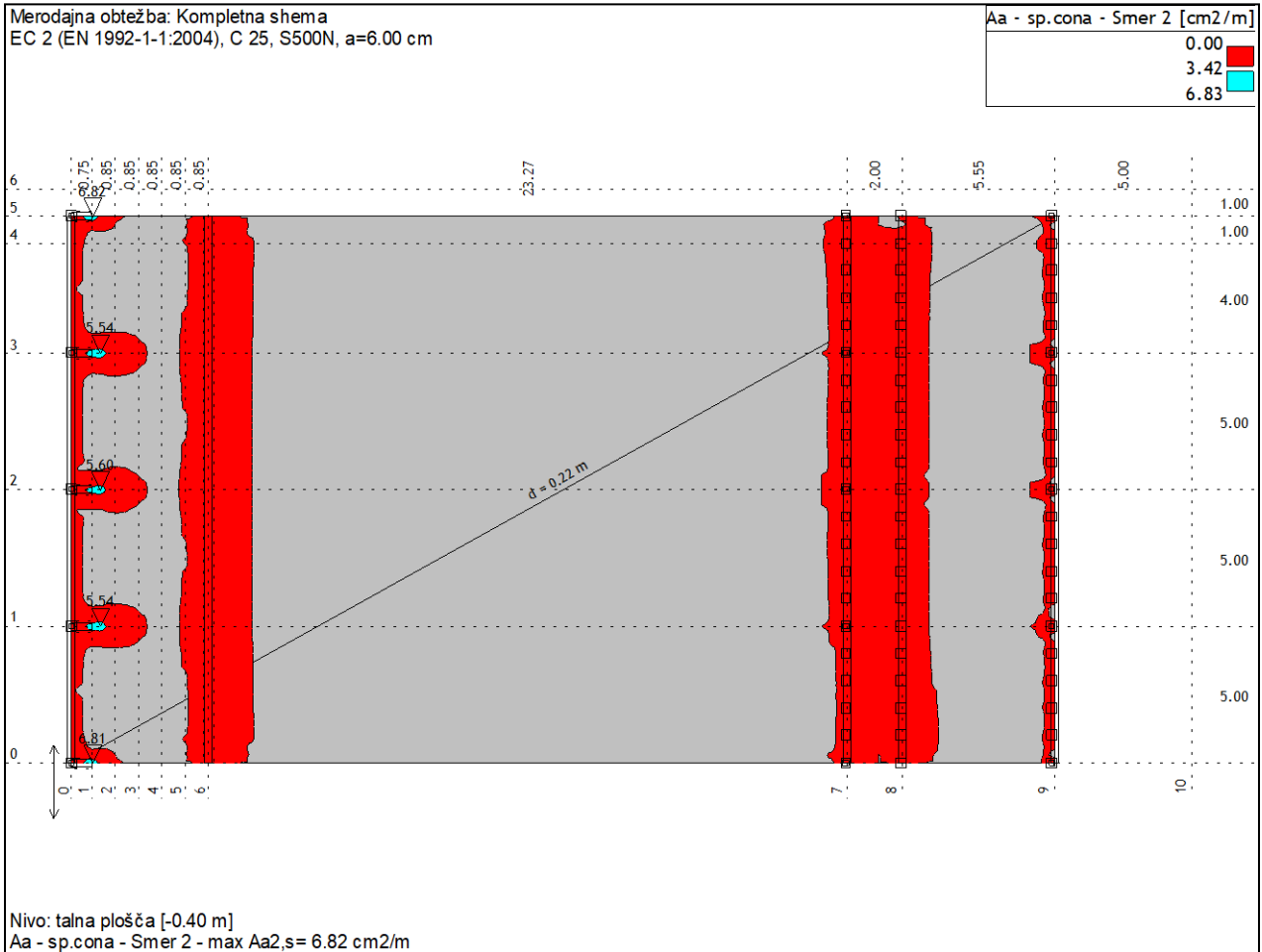
Kombinacije

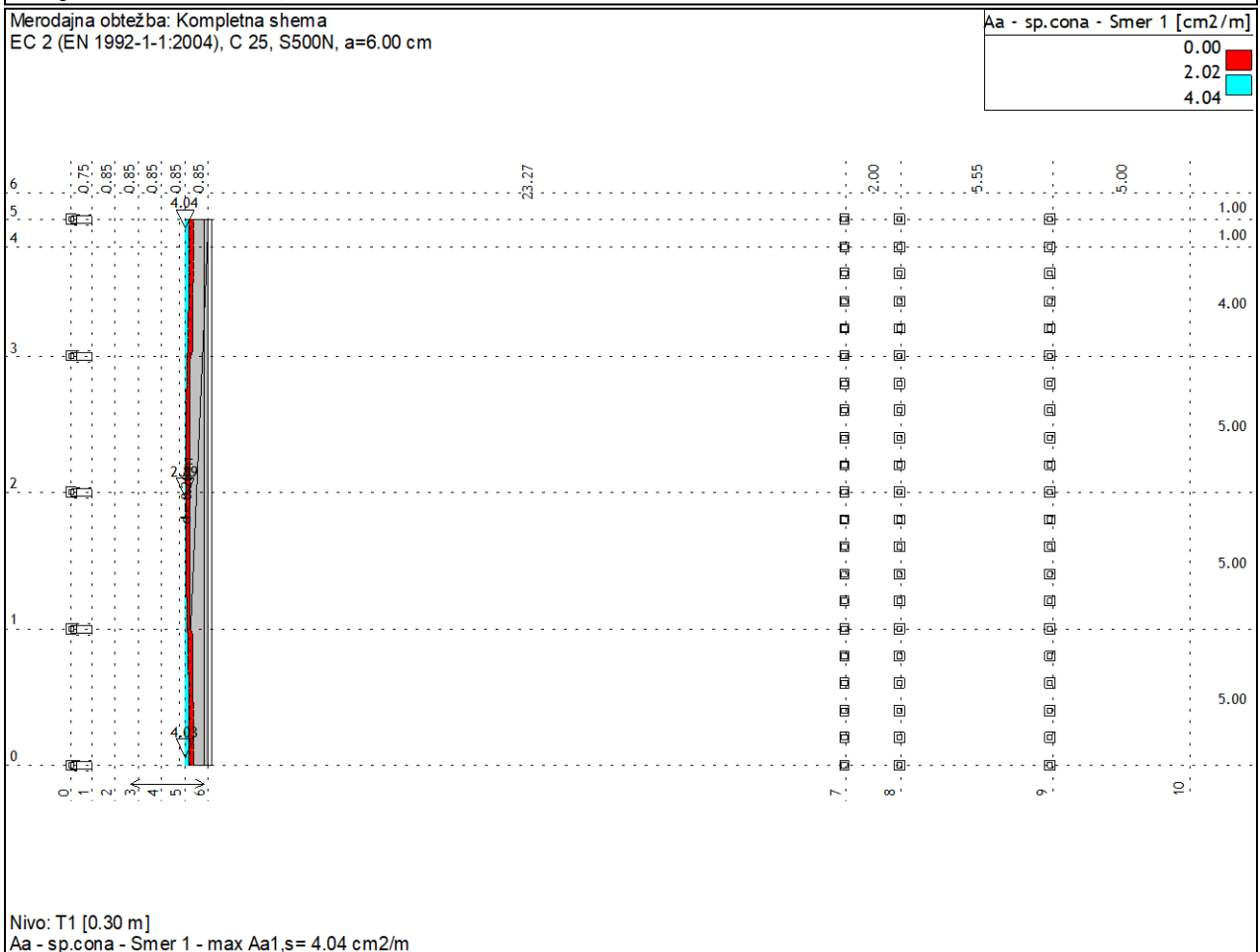
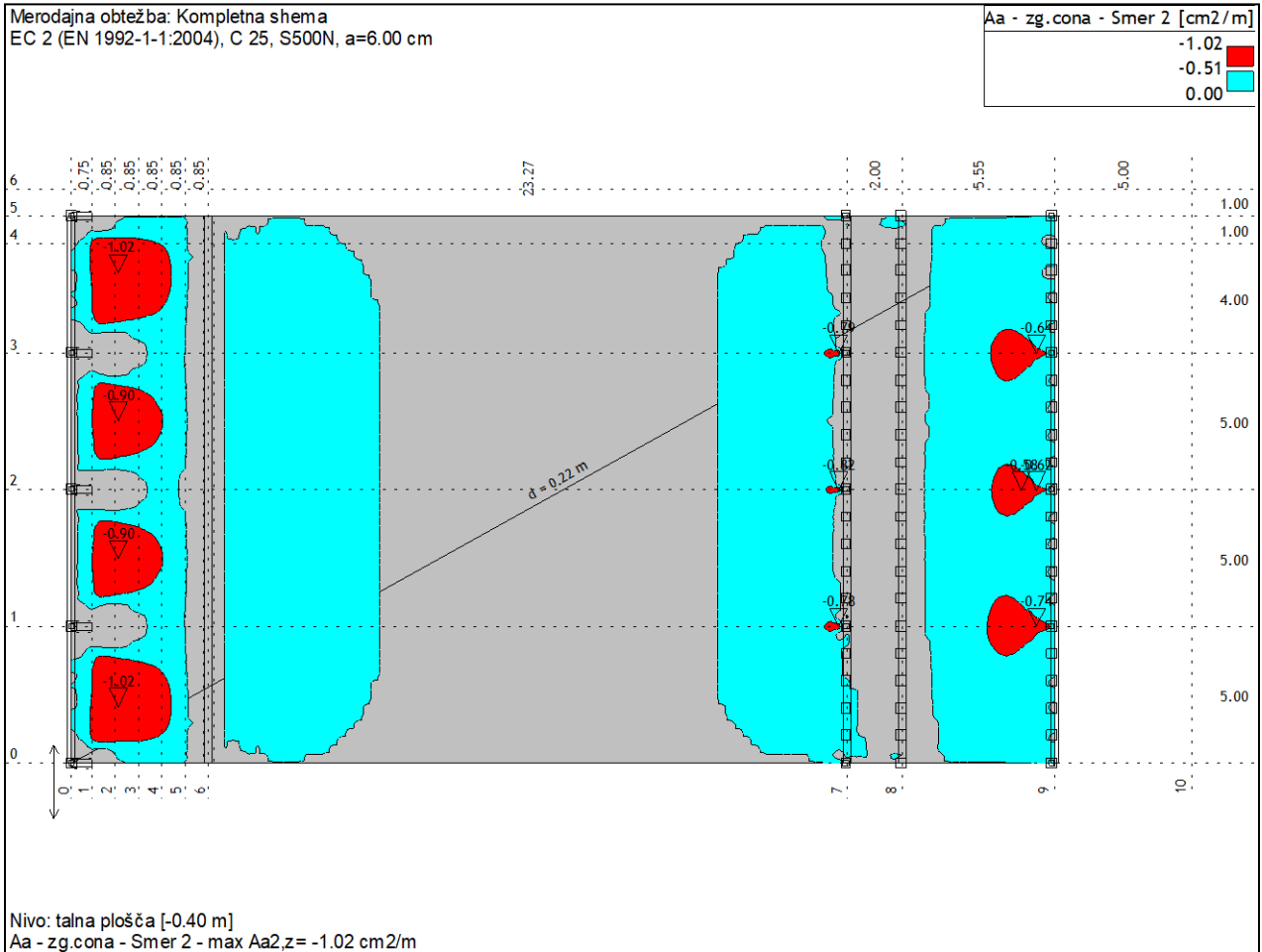
- 001. 1.35xI+1.50x0.70xII+1.50xIII-1.50x0.60xIV
- 002. 1.35xI+1.50x0.70xII+1.50xIII-1.50x0.60xV
- 003. 1.35xI+1.50x0.70xII+1.50xIII+1.50x0.60xV
- 004. 1.35xI+1.50x0.70xII+1.50xIII+1.50x0.60xIV
- 005. 1.35xI+1.50x0.70xII+1.50x0.50xIII-1.50xV
- 006. 1.35xI+1.50x0.70xII+1.50x0.50xIII+1.50xV
- 007. 1.35xI+1.50x0.70xII+1.50x0.50xIII-1.50xIV
- 008. 1.35xI+1.50x0.70xII+1.50x0.50xIII+1.50xIV
- 009. 1.35xI+1.50xII+1.50x0.50xIII+1.50x0.60xV
- 010. 1.35xI+1.50xII+1.50x0.50xIII+1.50x0.60xIV
- 011. 1.35xI+1.50xII+1.50x0.50xIII-1.50x0.60xV
- 012. 1.35xI+1.50xII+1.50x0.50xIII-1.50x0.60xIV
- 013. I+1.50x0.70xII+1.50xIII+1.50x0.60xIV
- 014. I+1.50x0.70xII+1.50xIII+1.50x0.60xV
- 015. I+1.50x0.70xII+1.50xIII-1.50x0.60xIV
- 016. I+1.50x0.70xII+1.50xIII-1.50x0.60xV
- 017. I+1.50x0.70xII+1.50x0.50xIII-1.50xV
- 018. I+1.50x0.70xII+1.50x0.50xIII+1.50xIV
- 019. I+1.50x0.70xII+1.50x0.50xIII+1.50xV
- 020. I+1.50x0.70xII+1.50x0.50xIII-1.50xIV
- 021. I+1.50xII+1.50x0.50xIII-1.50x0.60xIV
- 022. I+1.50xII+1.50x0.50xIII+1.50x0.60xV
- 023. I+1.50xII+1.50x0.50xIII-1.50x0.60xV
- 024. I+1.50xII+1.50x0.50xIII+1.50x0.60xIV
- 025. 1.35xI+1.50x0.70xII+1.50x0.50xIII-1.50x0.60xV
- 026. 1.35xI+1.50x0.70xII+1.50x0.50xIII+1.50x0.60xV
- 027. 1.35xI+1.50x0.70xII+1.50x0.50xIII-1.50x0.60xIV
- 028. 1.35xI+1.50x0.70xII+1.50x0.50xIII+1.50x0.60xIV
- 029. 1.35xI+1.50x0.70xII+1.50xV
- 030. 1.35xI+1.50x0.70xII-1.50xV
- 031. 1.35xI+1.50x0.70xII-1.50xIV
- 032. 1.35xI+1.50x0.70xII+1.50xIV
- 033. 1.35xI+1.50xII+1.50x0.60xIV
- 034. 1.35xI+1.50xII+1.50x0.60xV
- 035. 1.35xI+1.50xIII-1.50x0.60xIV
- 036. 1.35xI+1.50xII-1.50x0.60xIV
- 037. 1.35xI+1.50xIII+1.50x0.60xIV
- 038. 1.35xI+1.50xII-1.50x0.60xV
- 039. 1.35xI+1.50xIII-1.50x0.60xV
- 040. 1.35xI+1.50xIII+1.50x0.60xV
- 041. I+1.50x0.70xII+1.50x0.50xIII-1.50x0.60xV
- 042. I+1.50x0.70xII+1.50x0.50xIII+1.50x0.60xV
- 043. I+1.50x0.70xII+1.50x0.50xIII-1.50x0.60xIV
- 044. I+1.50x0.70xII+1.50x0.50xIII+1.50x0.60xIV
- 045. 1.35xI+1.50x0.50xIII+1.50xIV
- 046. 1.35xI+1.50x0.50xIII-1.50xIV
- 047. 1.35xI+1.50x0.50xIII+1.50xV
- 048. 1.35xI+1.50x0.50xIII-1.50xV
- 049. I+1.50x0.70xII-1.50xIV
- 050. I+1.50x0.70xII+1.50xV
- 051. I+1.50x0.70xII-1.50xV
- 052. I+1.50x0.70xII+1.50xIV
- 053. I+1.50xII-1.50x0.60xV
- 054. I+1.50xII-1.50x0.60xIV
- 055. I+1.50xII+1.50x0.60xV
- 056. I+1.50xIII+1.50x0.60xIV
- 057. I+1.50xIII-1.50x0.60xV
- 058. I+1.50xIII+1.50x0.60xV
- 059. I+1.50xIII-1.50x0.60xIV
- 060. I+1.50xII+1.50x0.60xIV
- 061. 1.35xI+1.50x0.70xII-1.50x0.60xV
- 062. 1.35xI+1.50x0.70xII-1.50x0.60xIV
- 063. 1.35xI+1.50x0.70xII+1.50x0.60xV
- 064. 1.35xI+1.50x0.70xII+1.50x0.60xIV
- 065. I+1.50x0.50xIII-1.50xV
- 066. I+1.50x0.50xIII+1.50xV
- 067. I+1.50x0.50xIII-1.50xIV
- 068. I+1.50x0.50xIII+1.50xIV
- 069. 1.35xI+1.50x0.50xIII+1.50x0.60xV
- 070. 1.35xI+1.50x0.50xIII-1.50x0.60xV
- 071. 1.35xI+1.50x0.50xIII-1.50x0.60xIV
- 072. 1.35xI+1.50x0.50xIII+1.50x0.60xIV
- 073. I+1.50x0.70xII-1.50x0.60xV
- 074. I+1.50x0.70xII-1.50x0.60xIV
- 075. I+1.50x0.70xII+1.50x0.60xIV

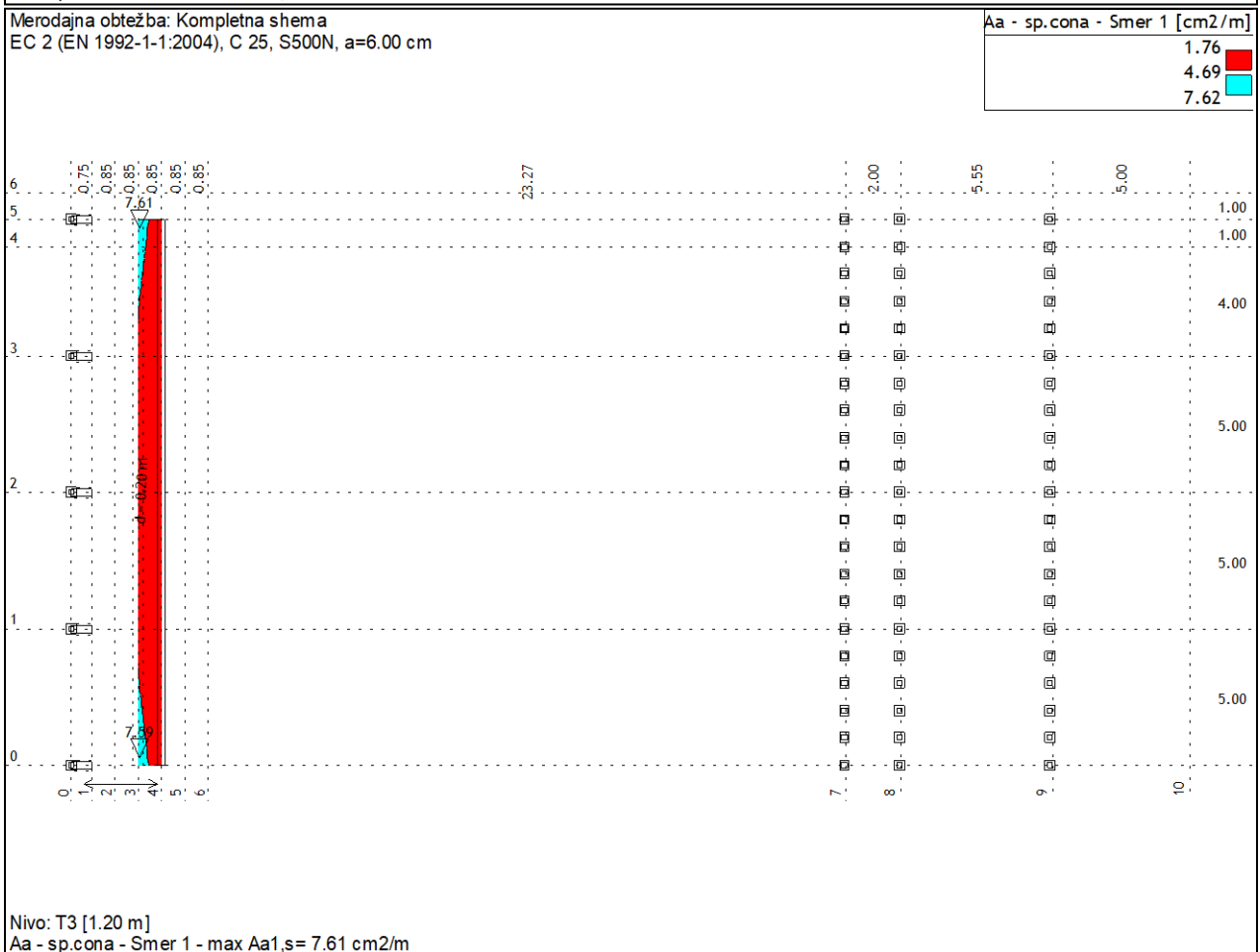
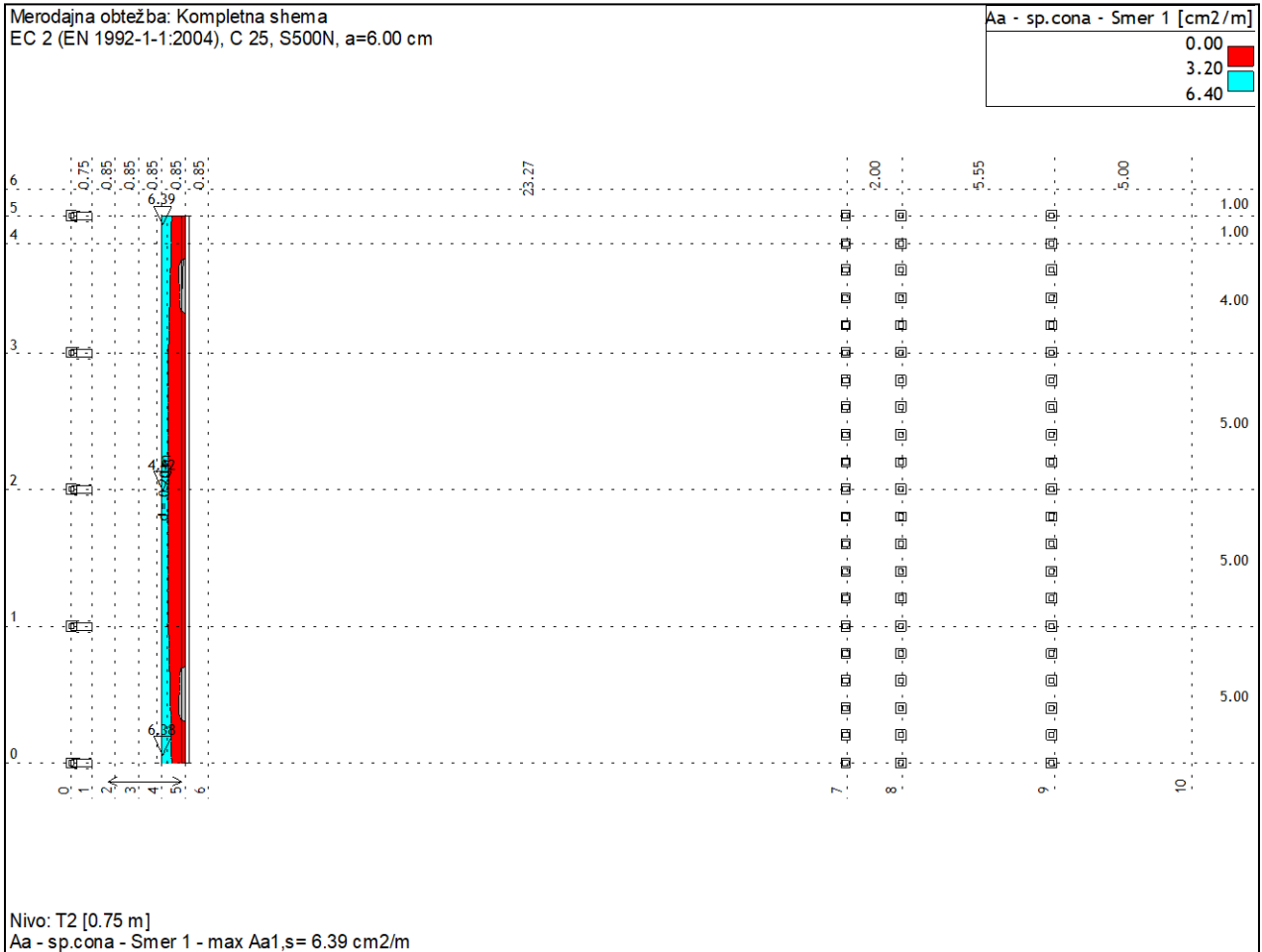
- 076. I+1.50×0.70×II+1.50×0.60×V
- 077. 1.35×I+1.50×IV
- 078. 1.35×I+1.50×V
- 079. 1.35×I-1.50×IV
- 080. 1.35×I-1.50×V
- 081. I+1.50×0.50×III-1.50×0.60×V
- 082. I+1.50×0.50×III+1.50×0.60×IV
- 083. I+1.50×0.50×III-1.50×0.60×IV
- 084. I+1.50×0.50×III+1.50×0.60×V
- 085. I+1.50×IV
- 086. I-1.50×V
- 087. I+1.50×V
- 088. I-1.50×IV
- 089. I+0.30×II+VII
- 090. I+0.30×II-VII
- 091. I+0.30×II+VIII
- 092. I+0.30×II-VIII
- 093. I+0.30×II+VI
- 094. I+0.30×II-VI
- 095. 1.35×I-1.50×0.60×IV
- 096. 1.35×I+1.50×0.60×IV
- 097. 1.35×I+1.50×0.60×V
- 098. 1.35×I-1.50×0.60×V
- 099. I-VII
- 100. I+VII
- 101. I-VIII
- 102. I+VIII
- 103. I-VI
- 104. I+VI
- 105. I-1.50×0.60×IV
- 106. I+1.50×0.60×IV
- 107. I-1.50×0.60×V
- 108. I+1.50×0.60×V
- 109. 1.35×I
- 110. I

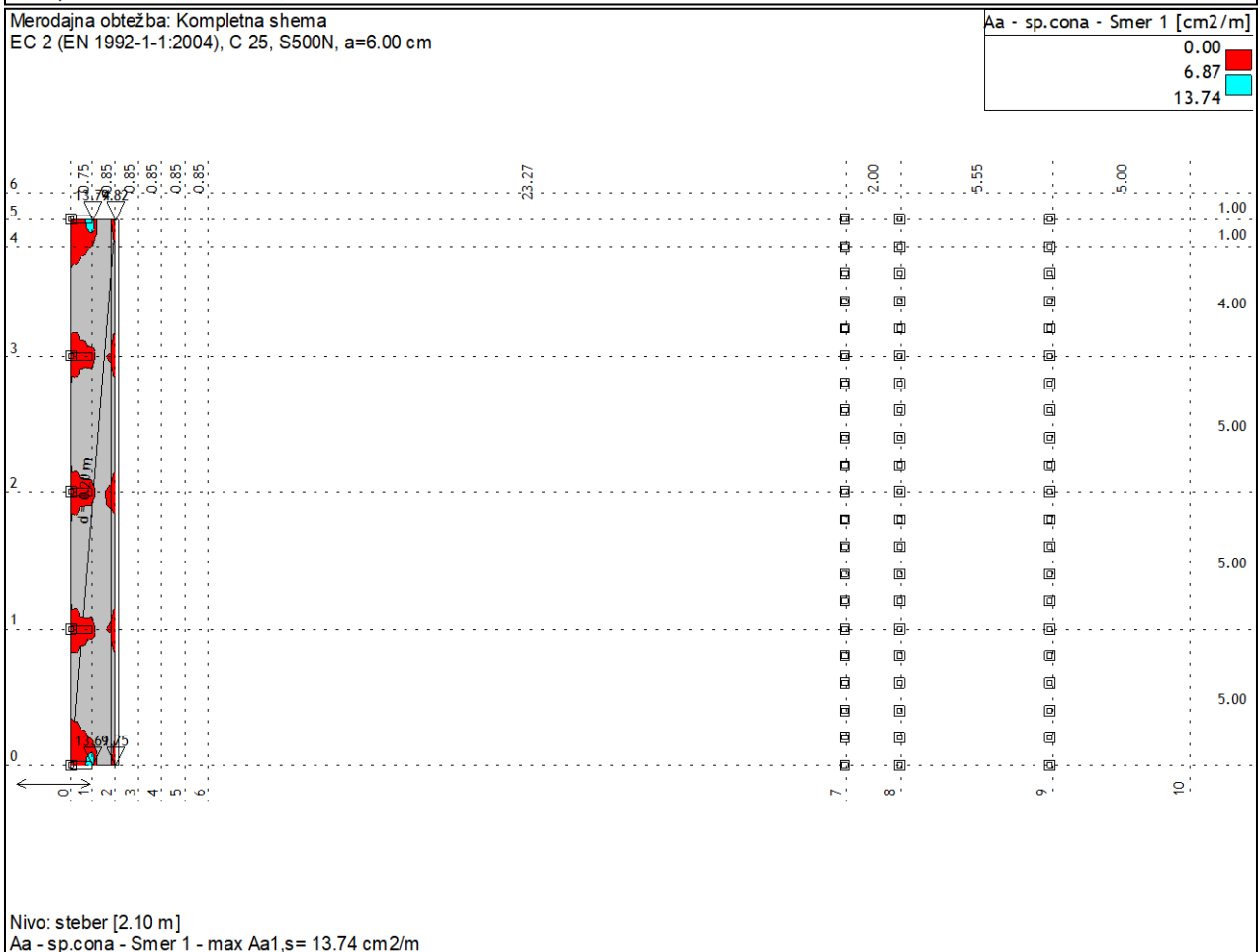
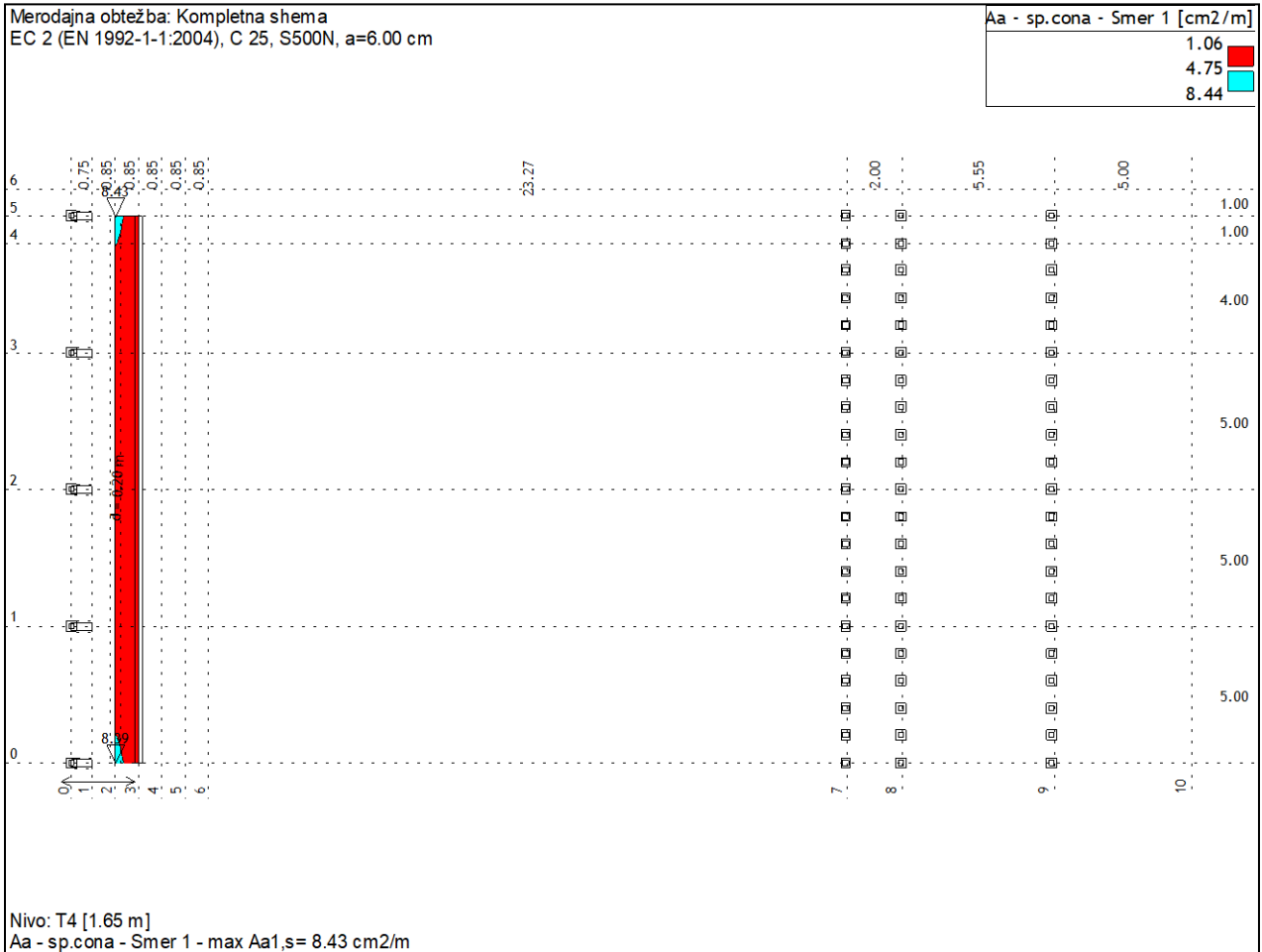


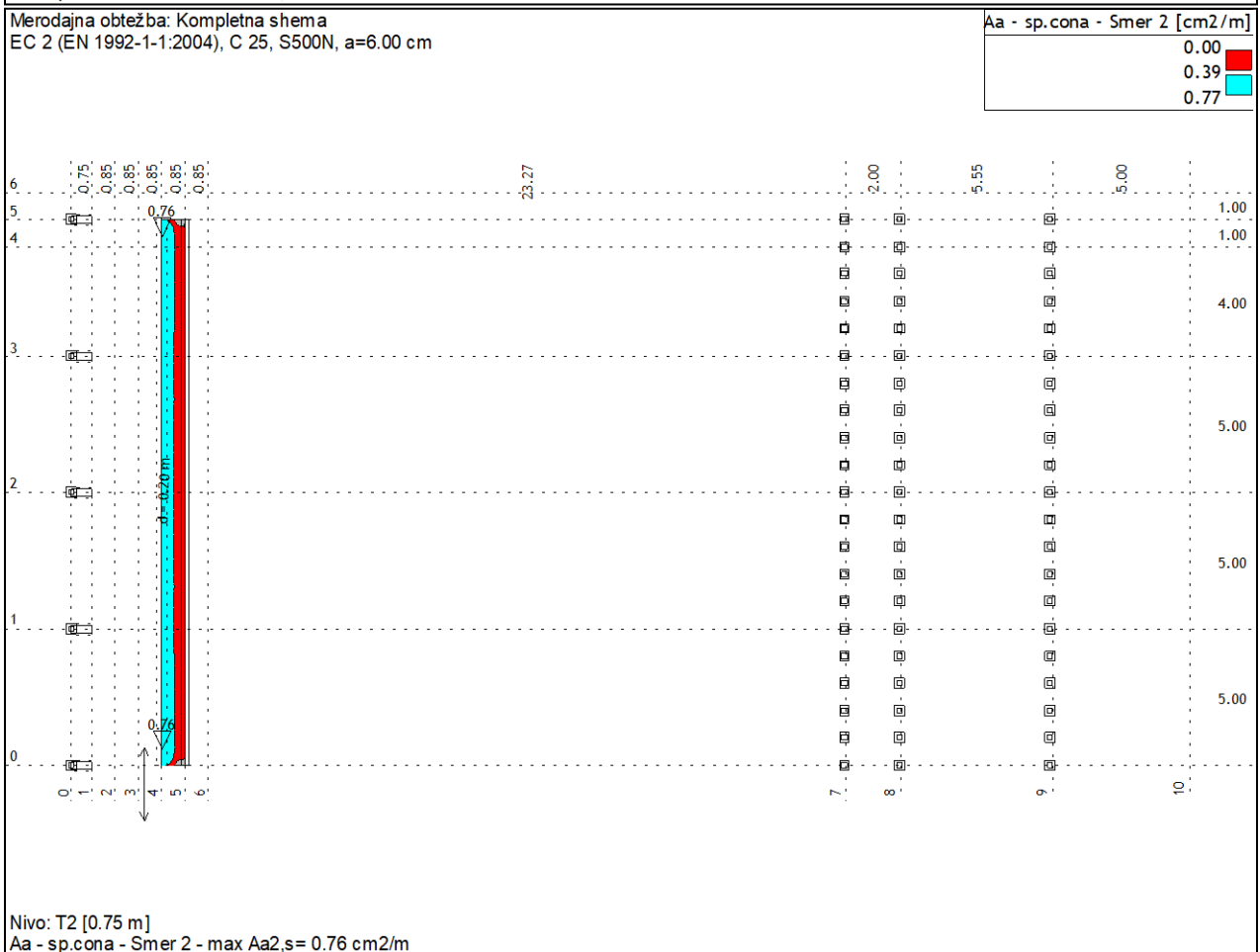
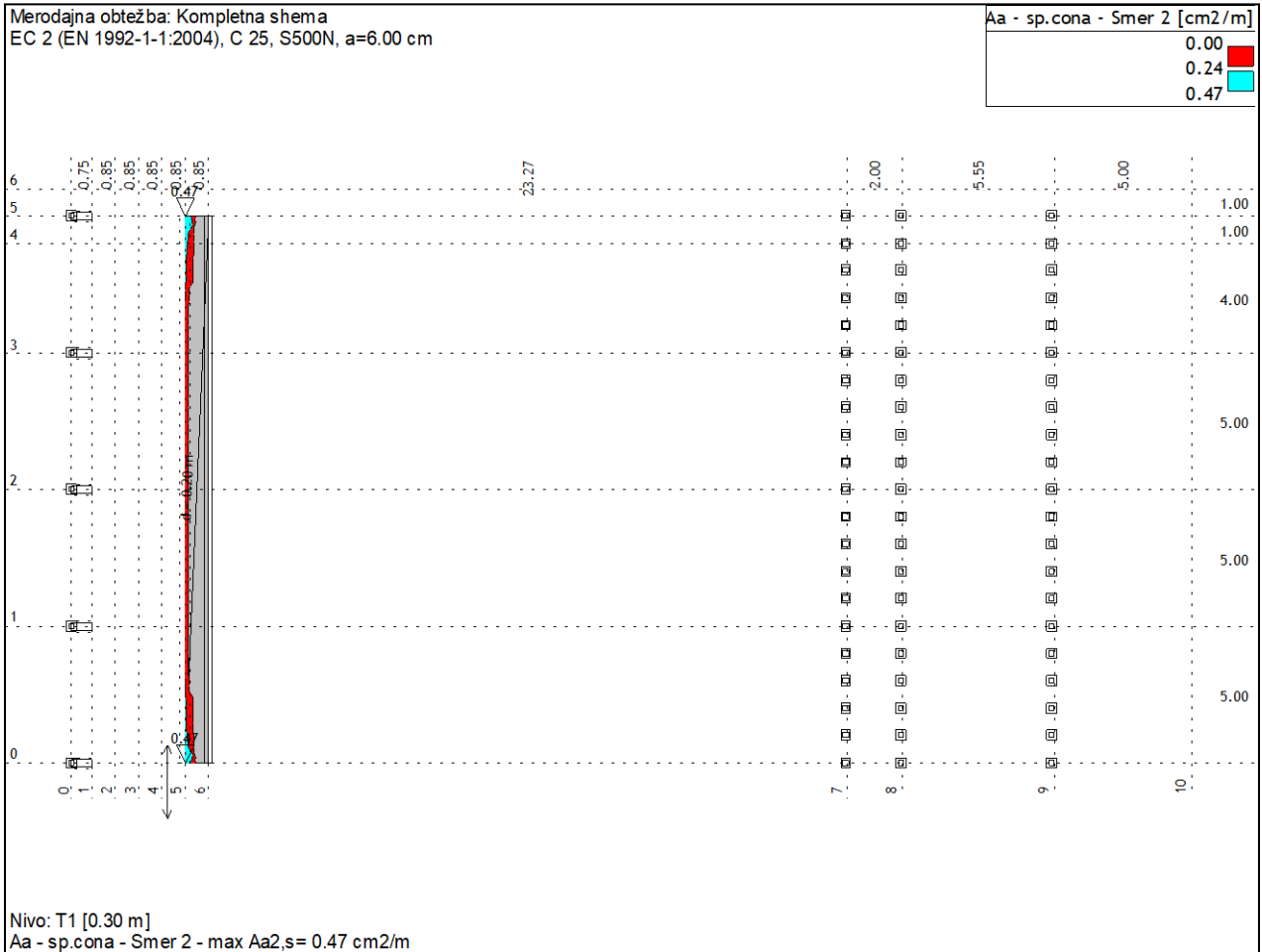


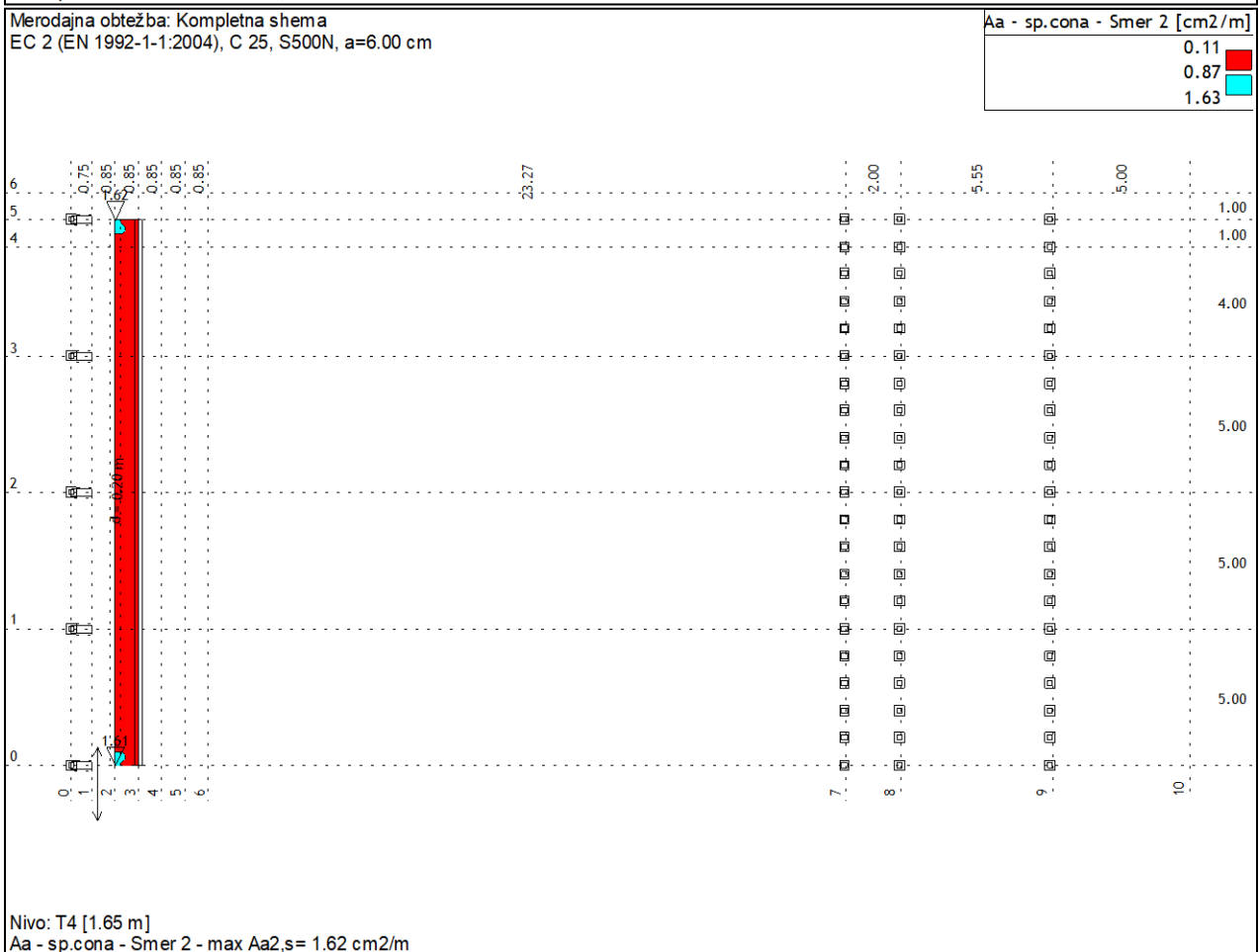
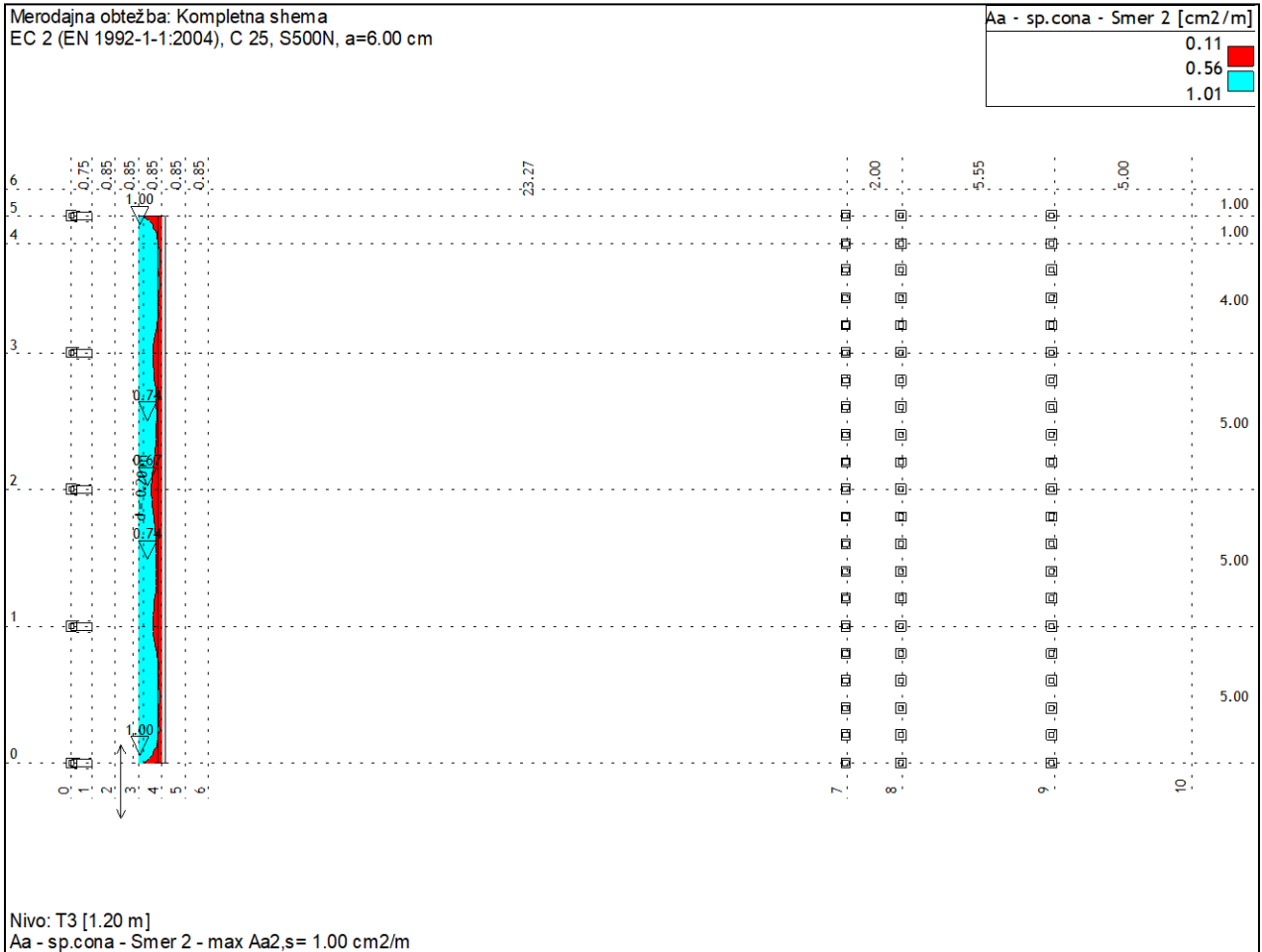


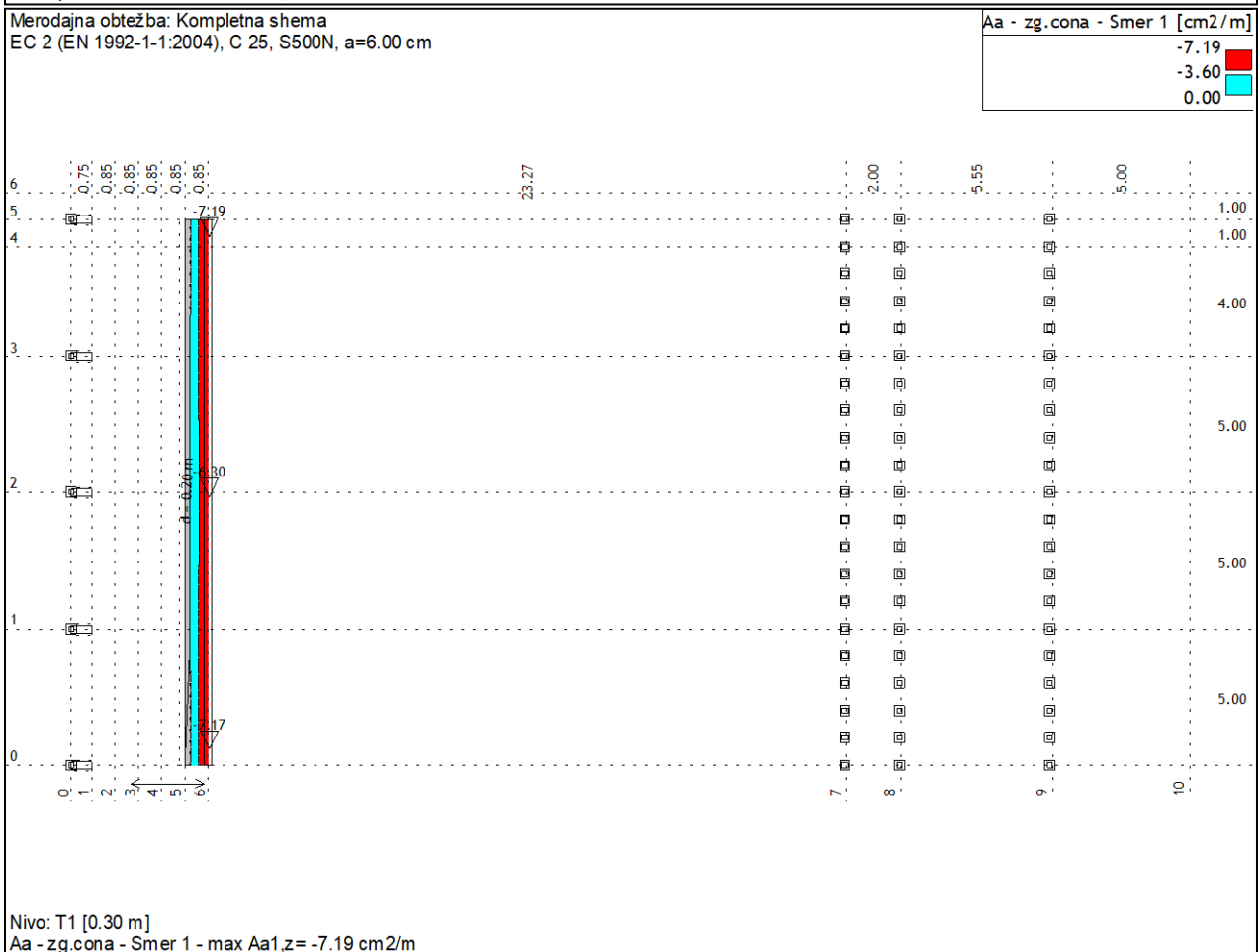
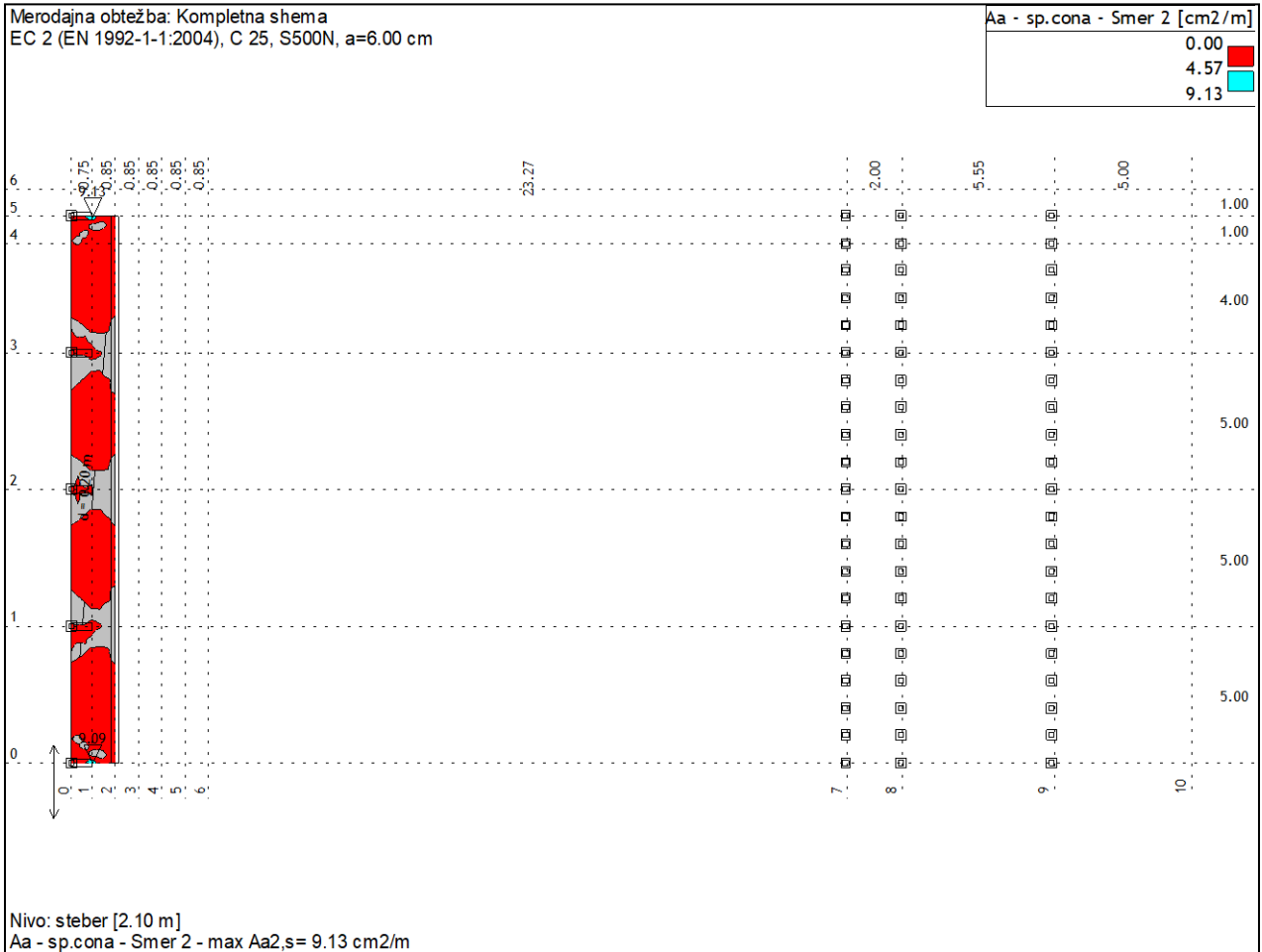


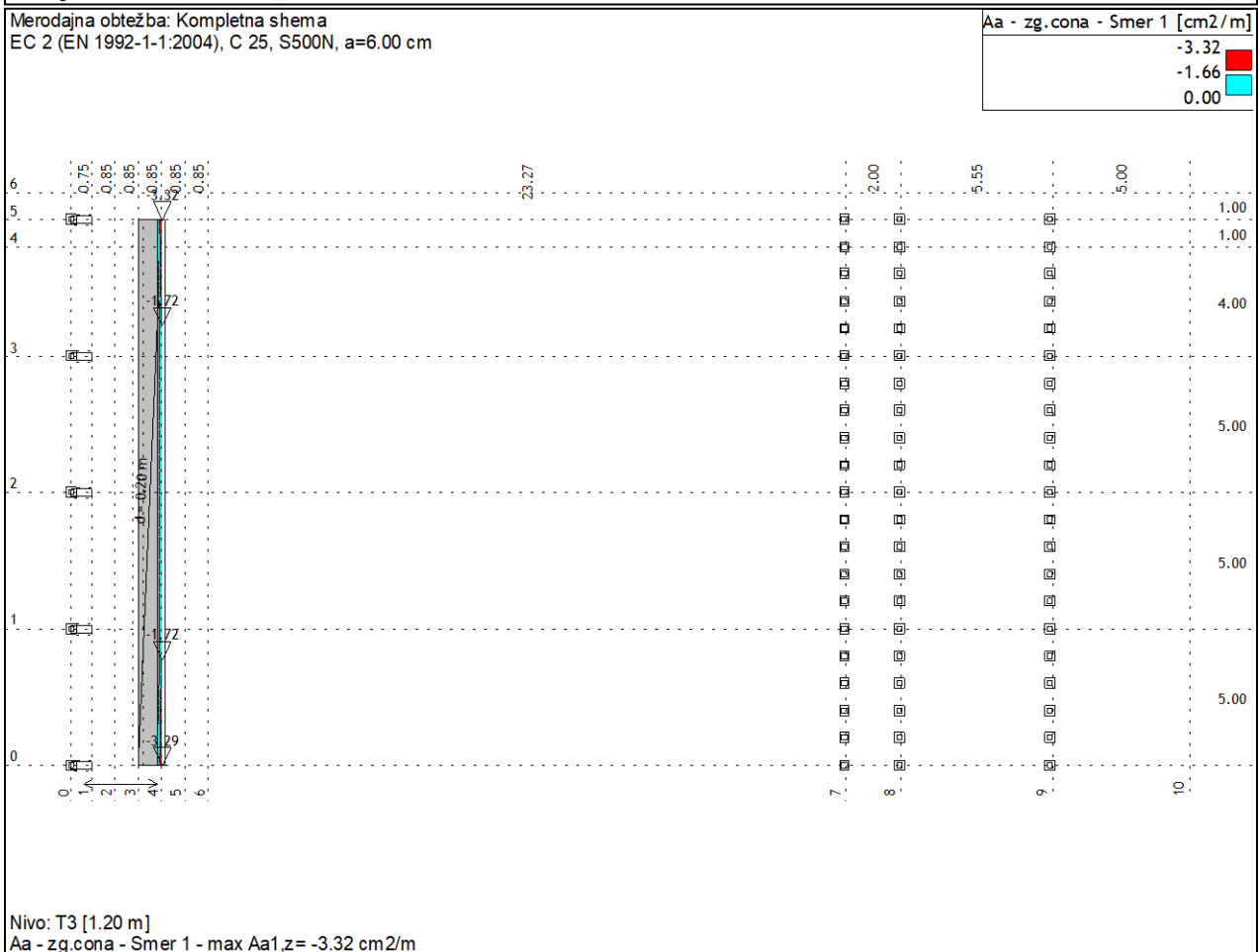
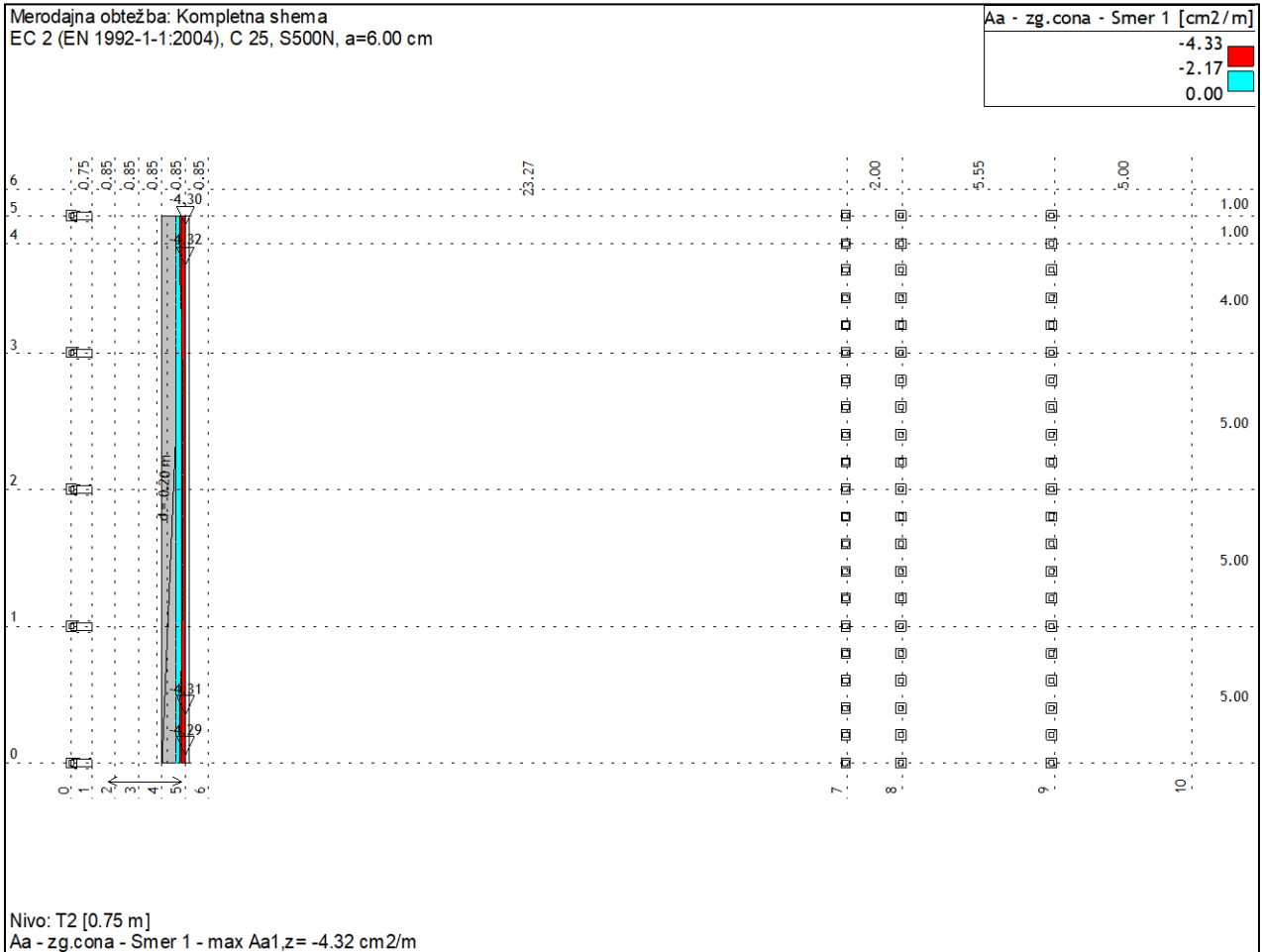


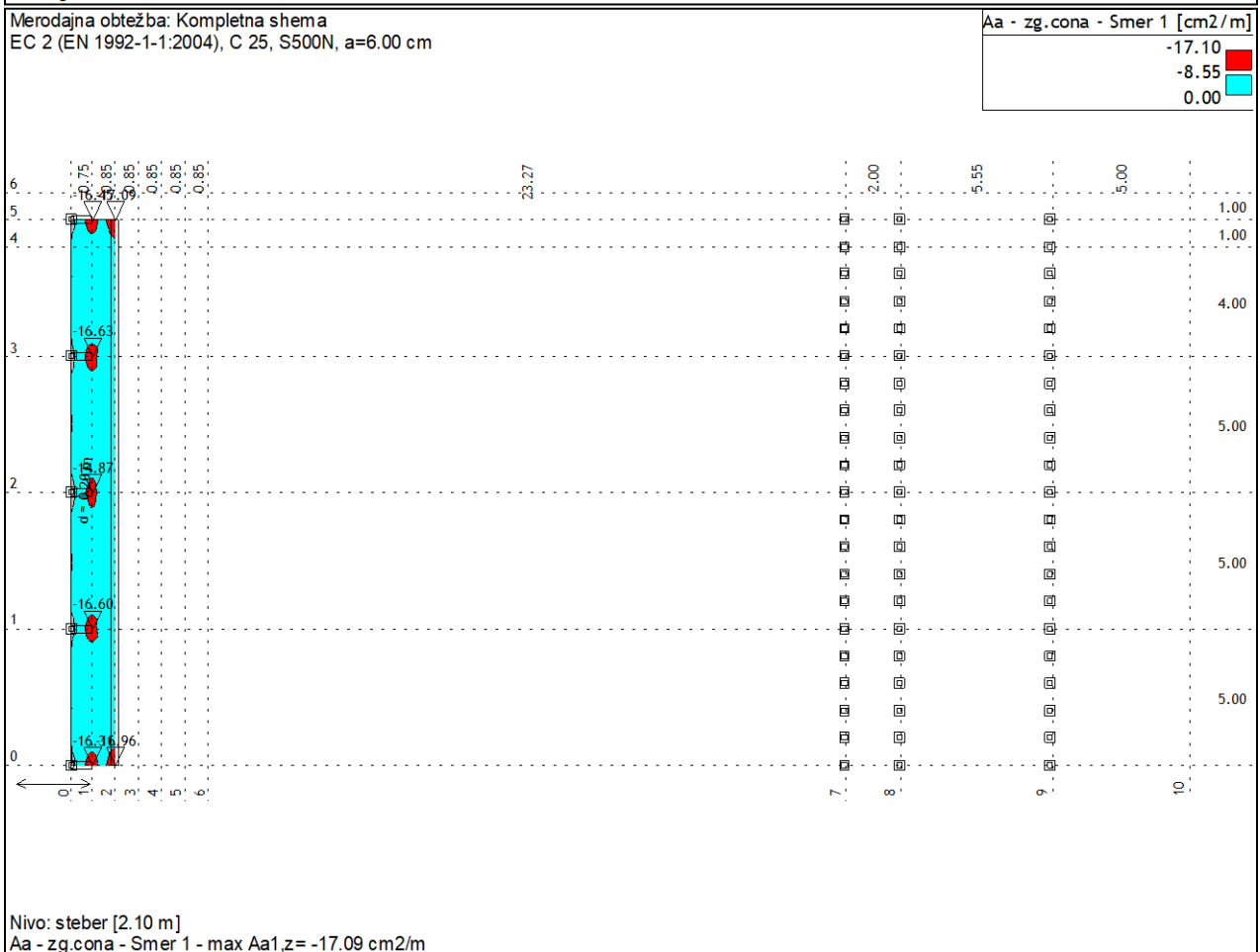
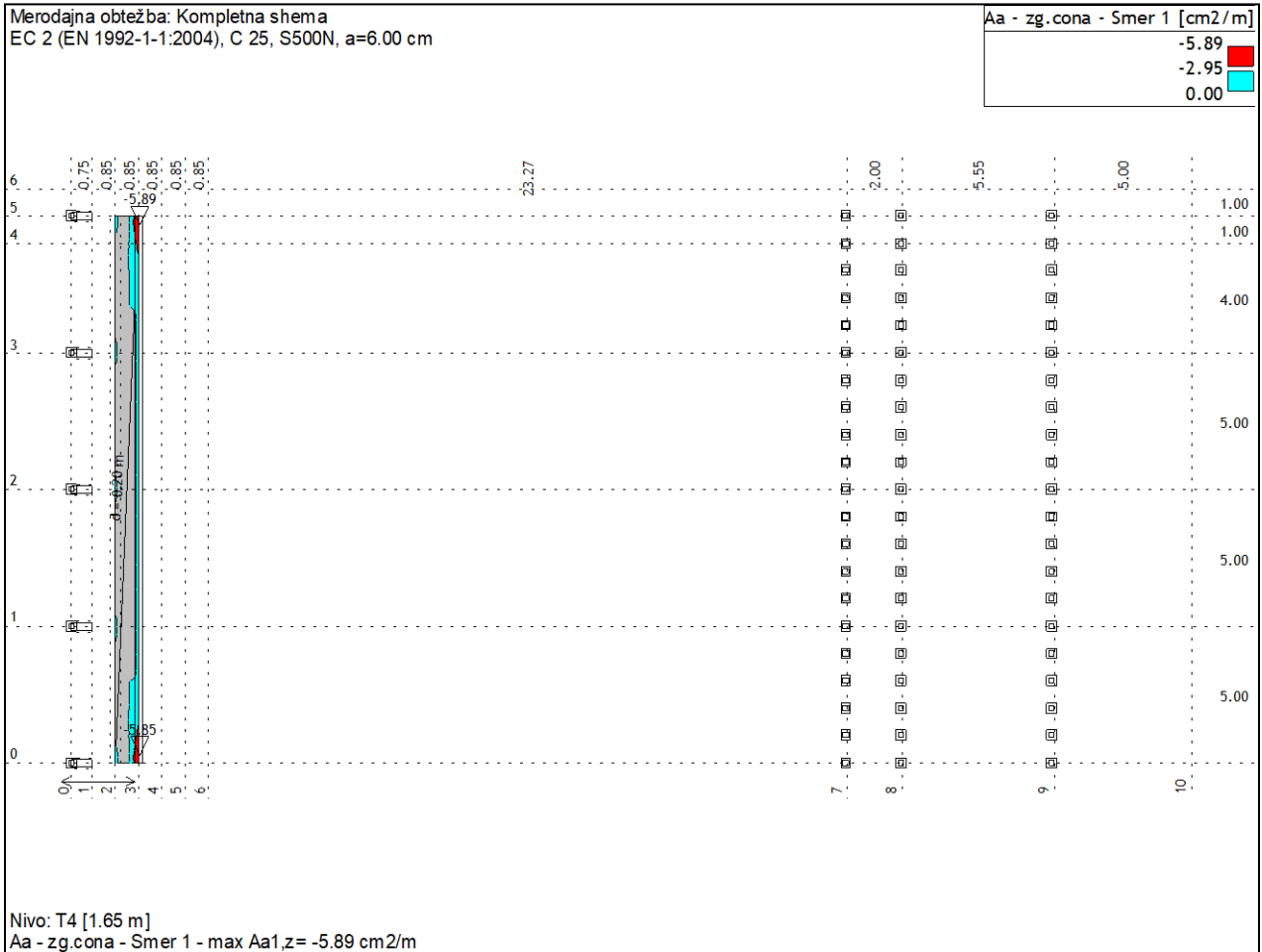


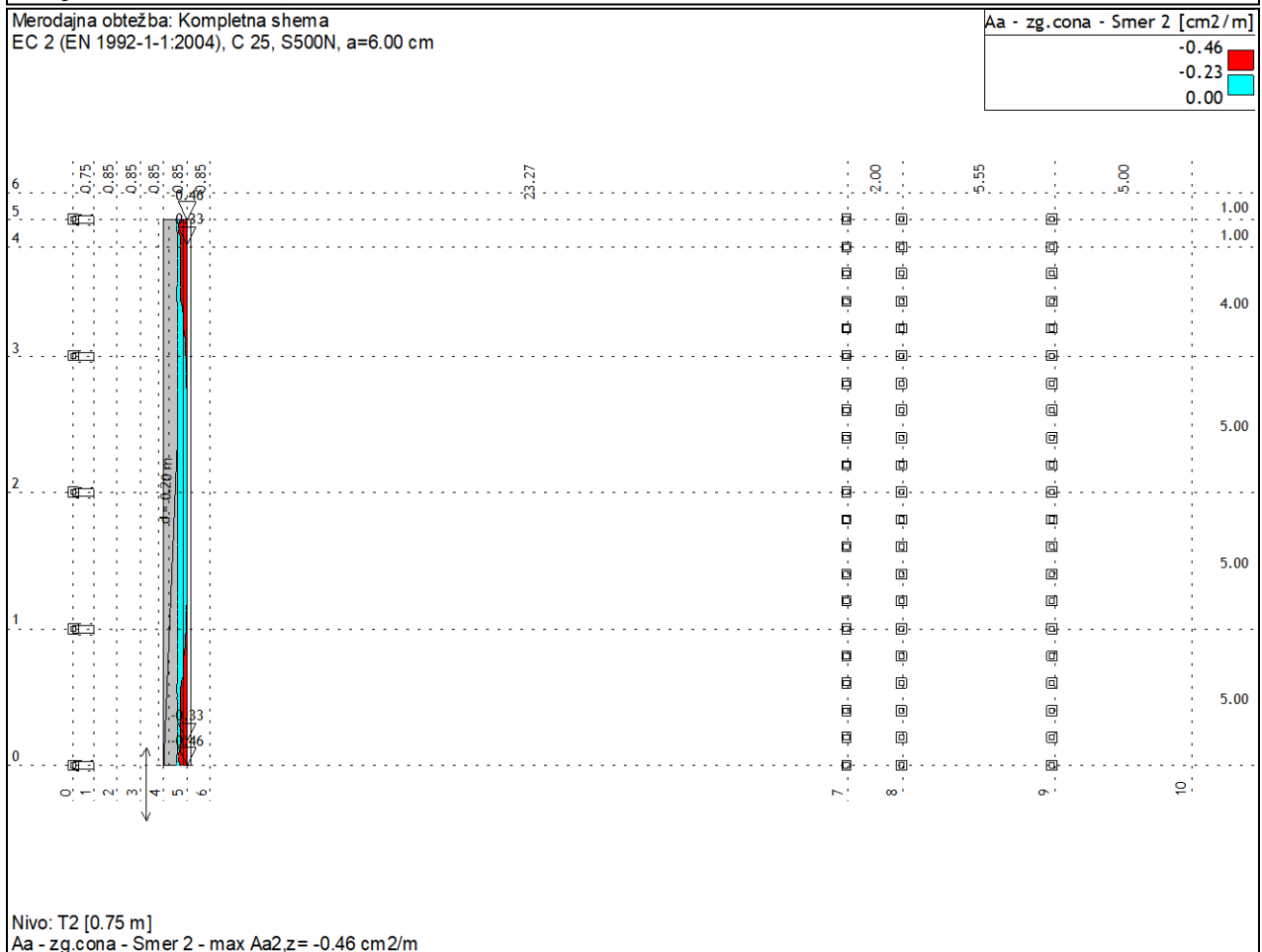
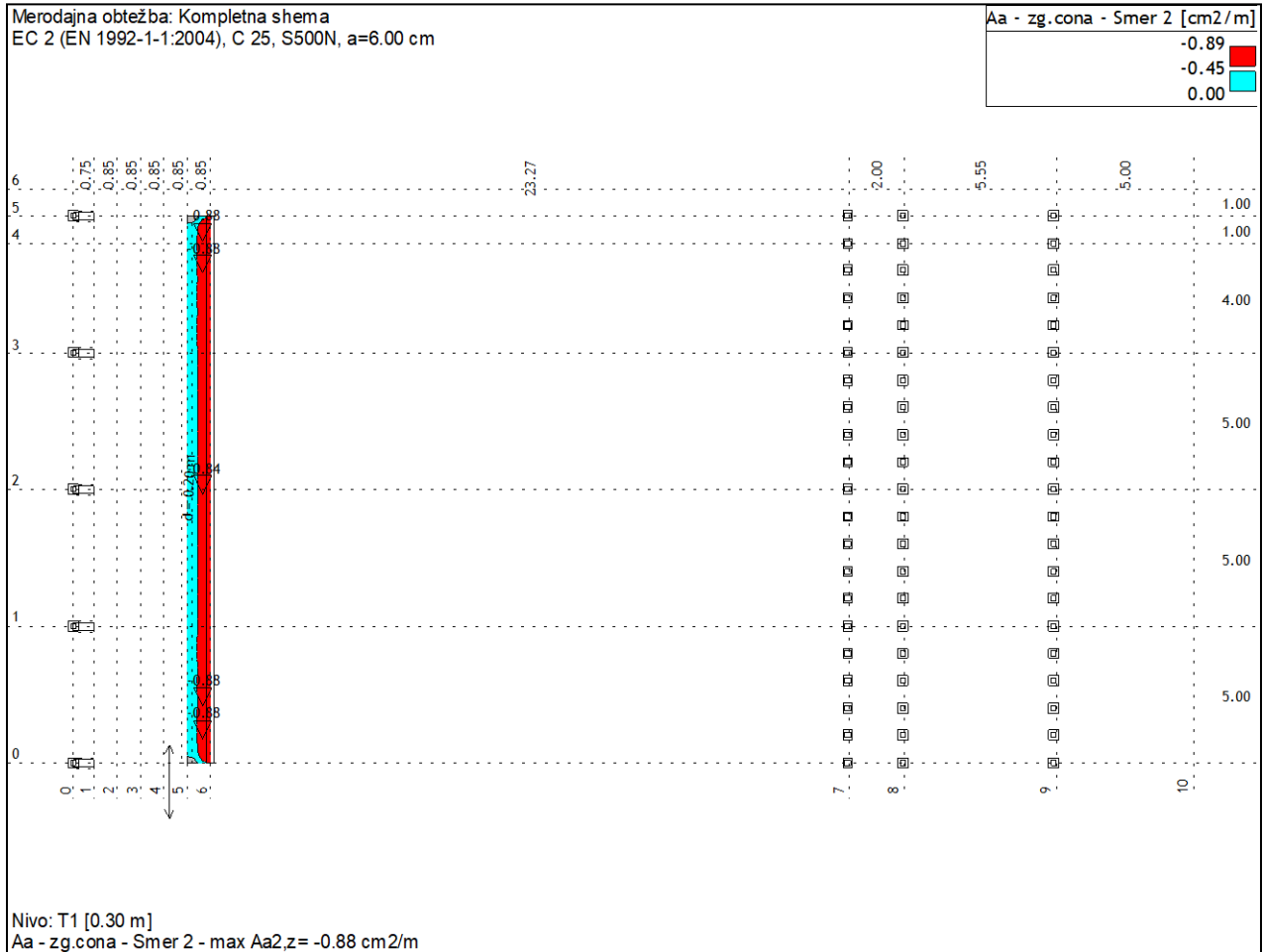








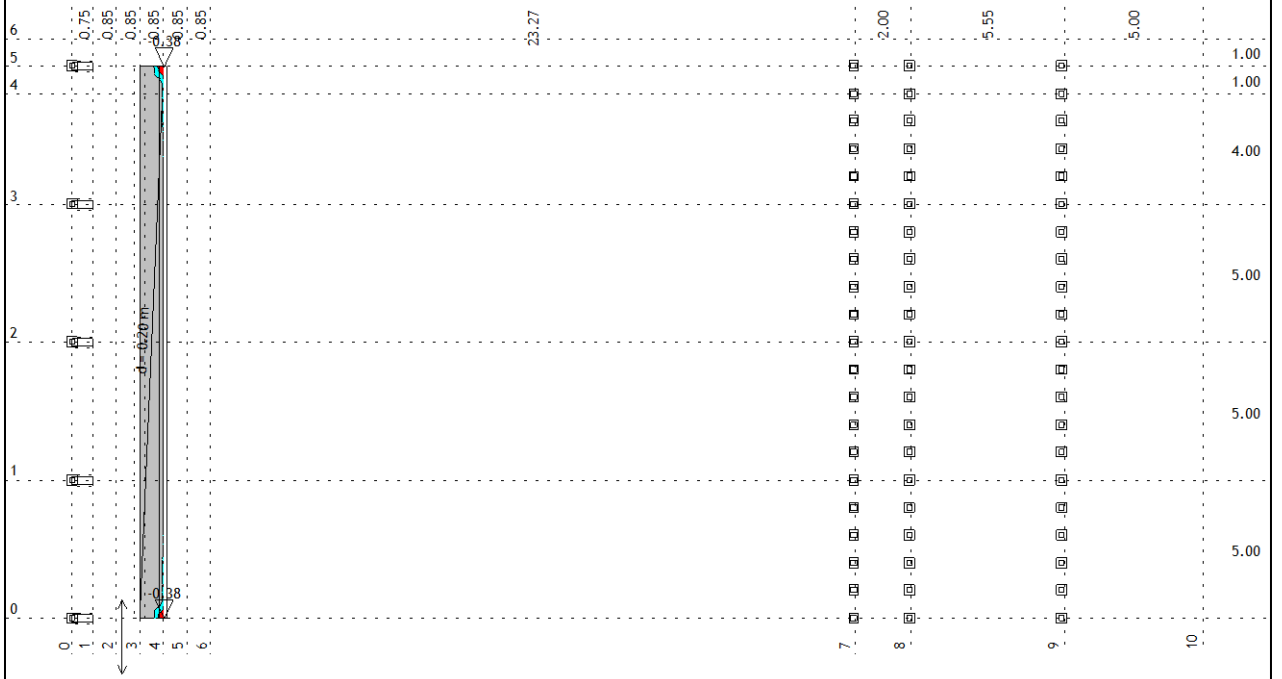




Merodajna obtežba: Kompletna shema
EC 2 (EN 1992-1-1:2004), C 25, S500N, a=6.00 cm

Aa - zg.cona - Smer 2 [cm²/m]

-0.39
-0.20
0.00

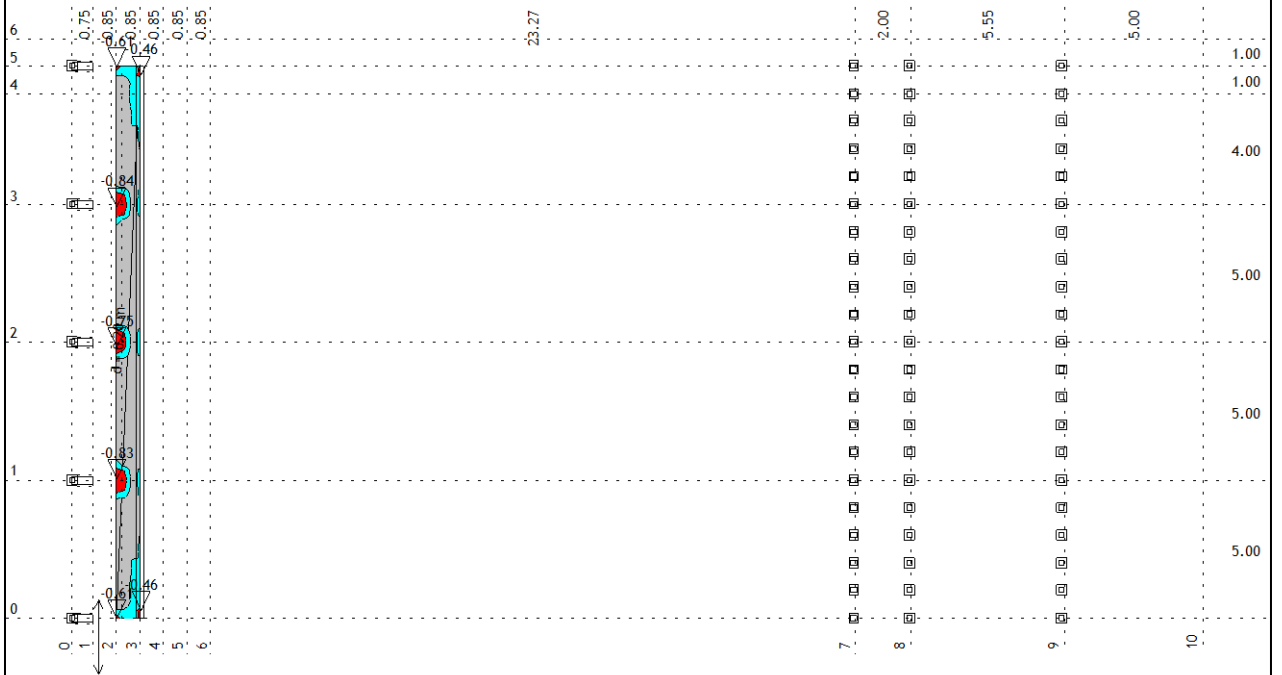


Nivo: T3 [1.20 m]
Aa - zg.cona - Smer 2 - max Aa_{2,z} = -0.38 cm²/m

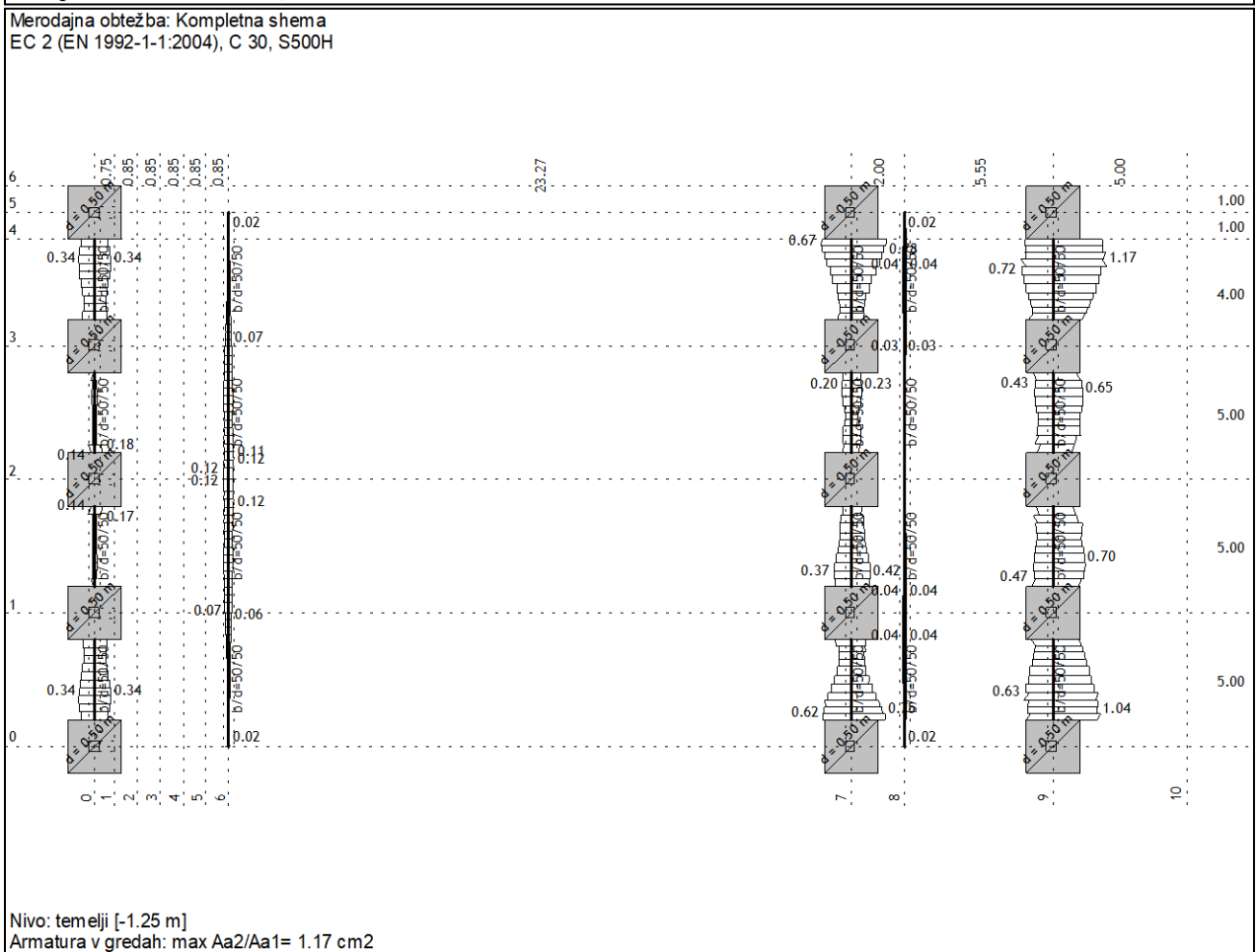
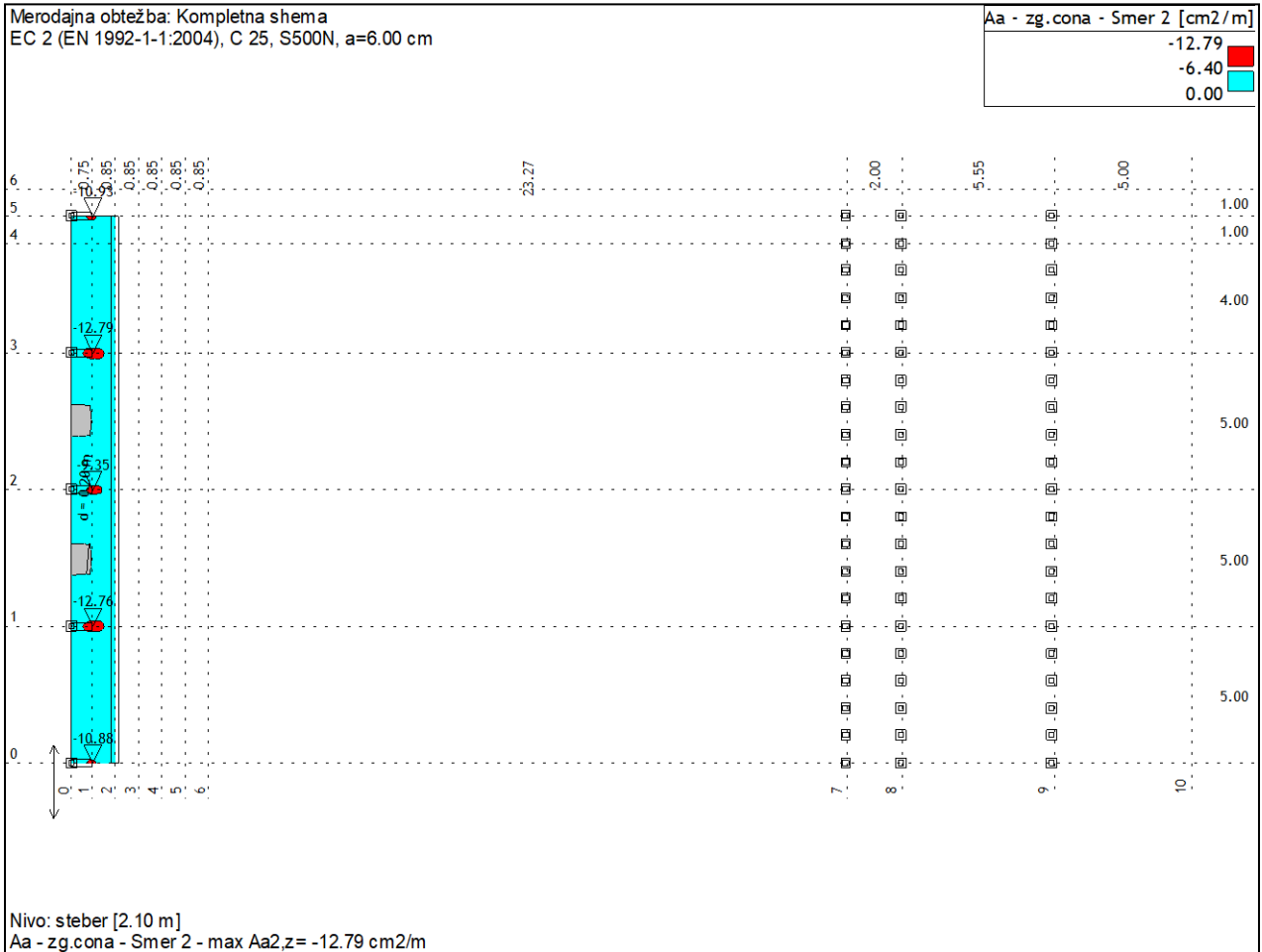
Merodajna obtežba: Kompletna shema
EC 2 (EN 1992-1-1:2004), C 25, S500N, a=6.00 cm

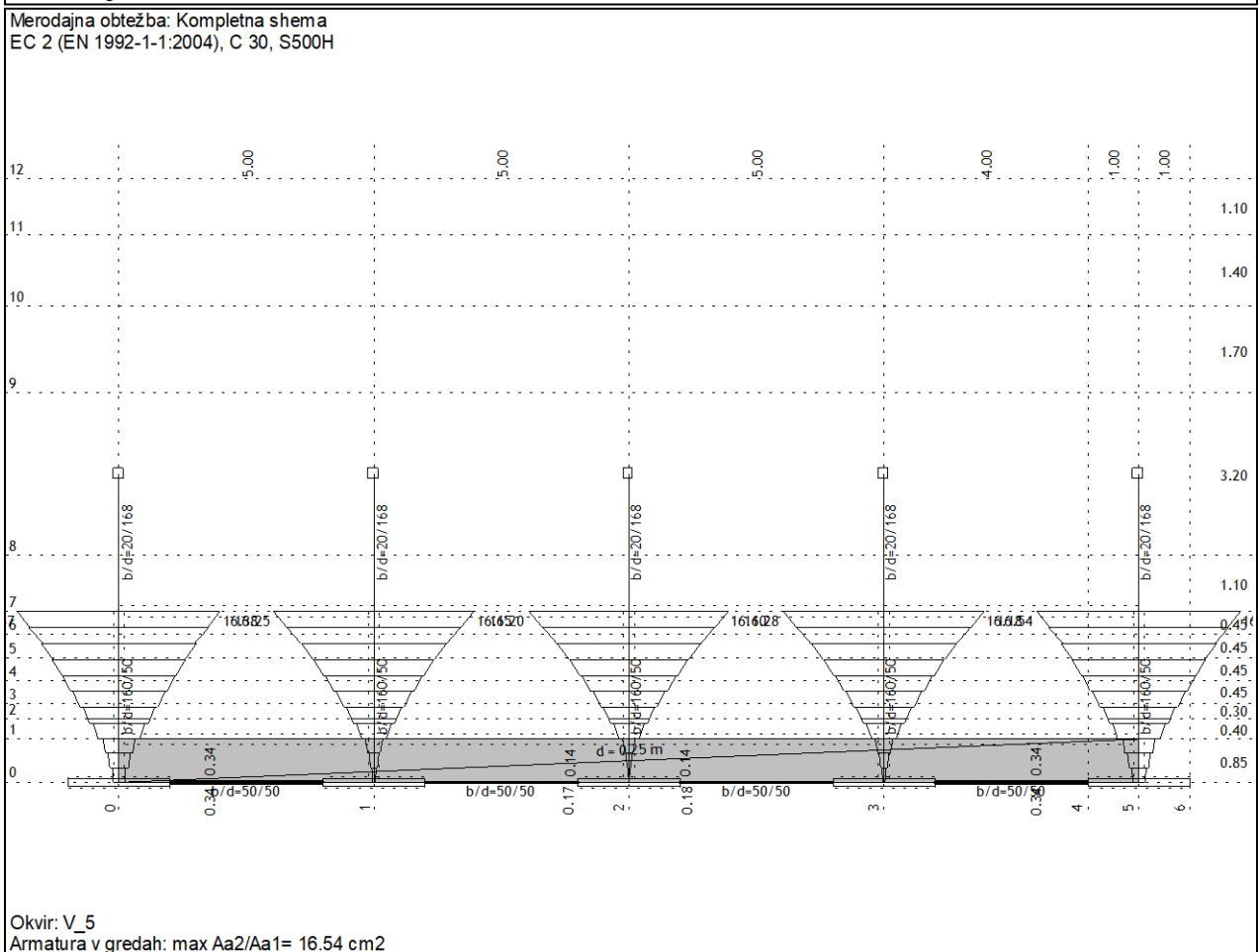
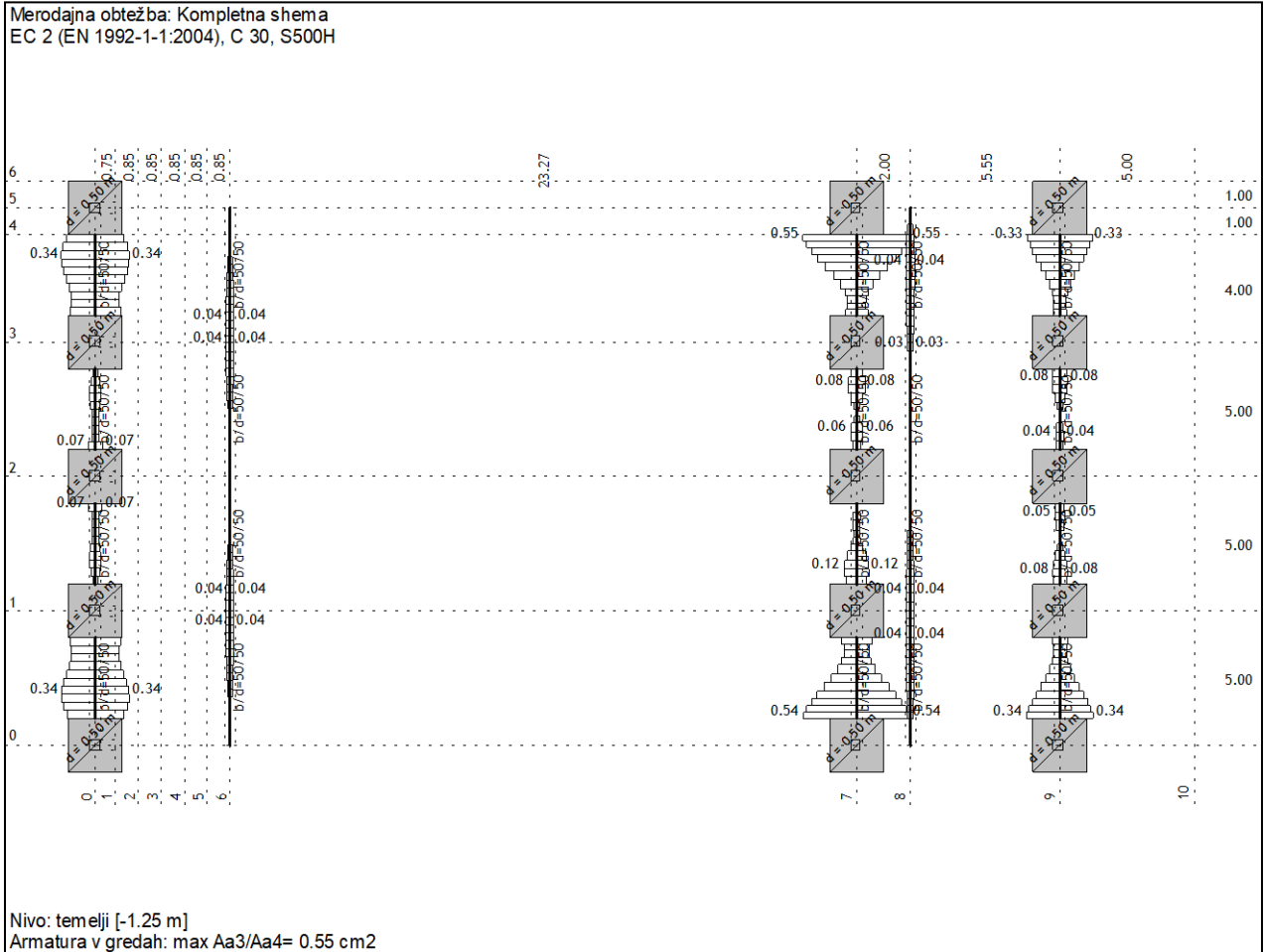
Aa - zg.cona - Smer 2 [cm²/m]

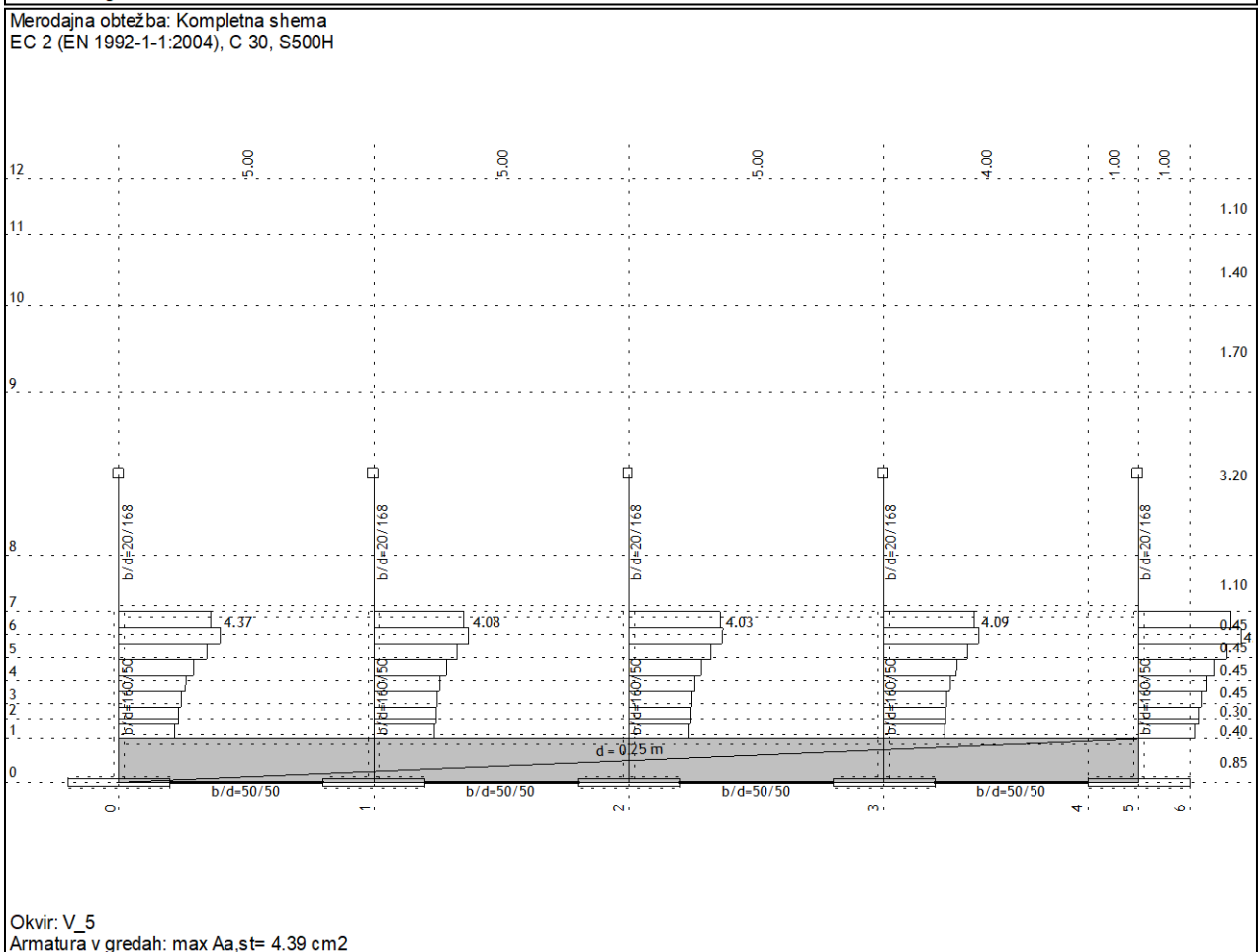
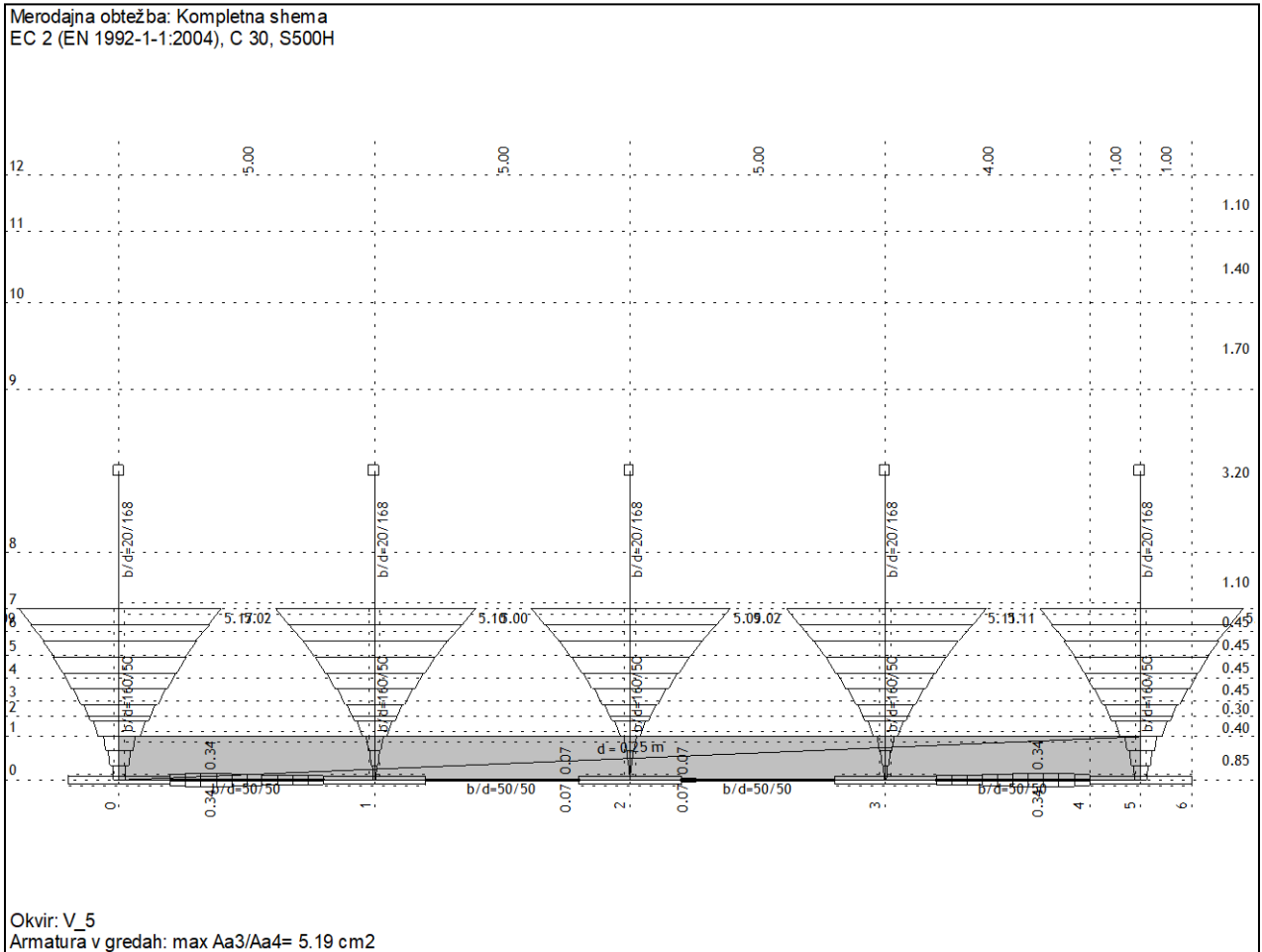
-0.84
-0.42
0.00

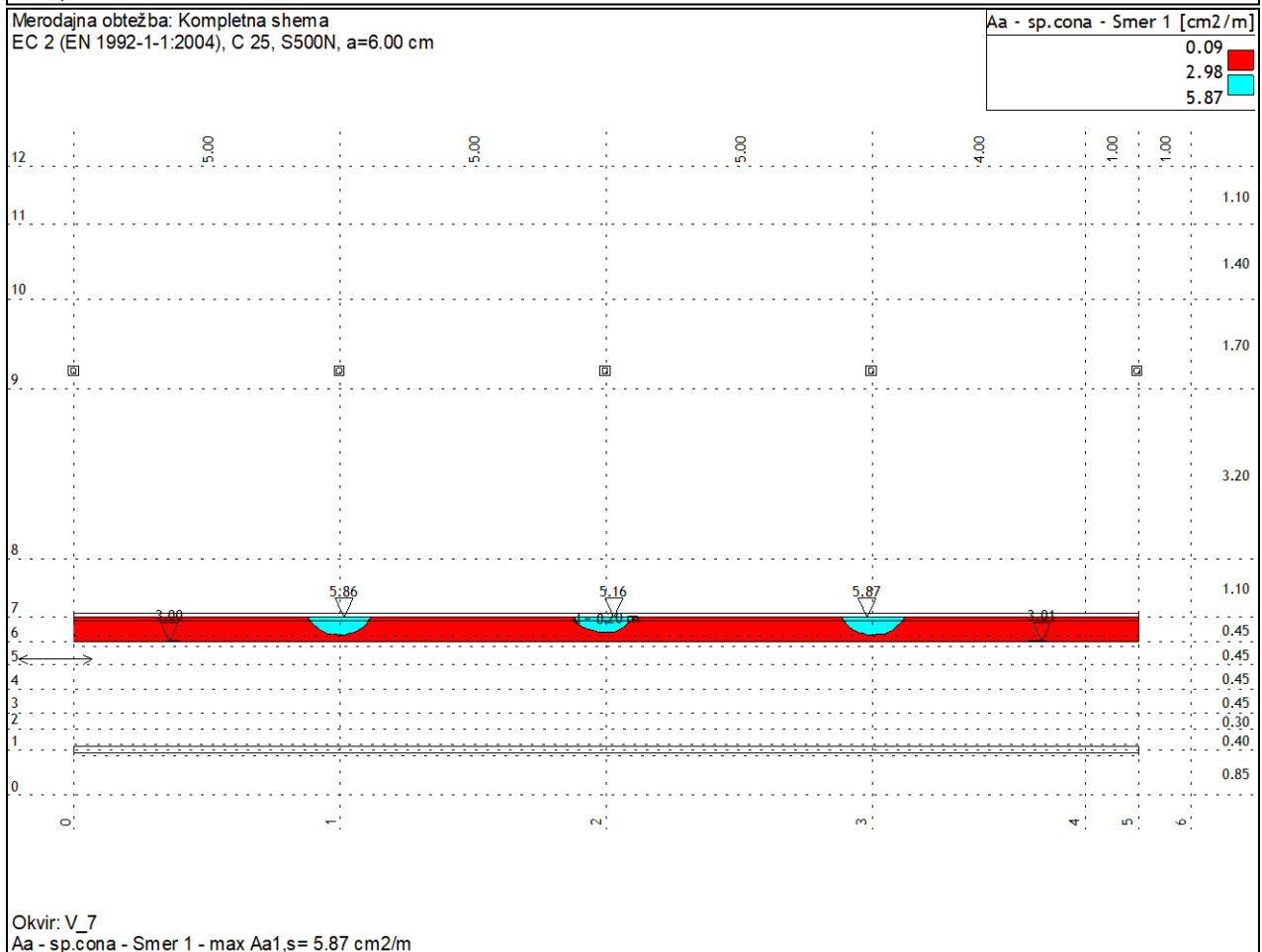
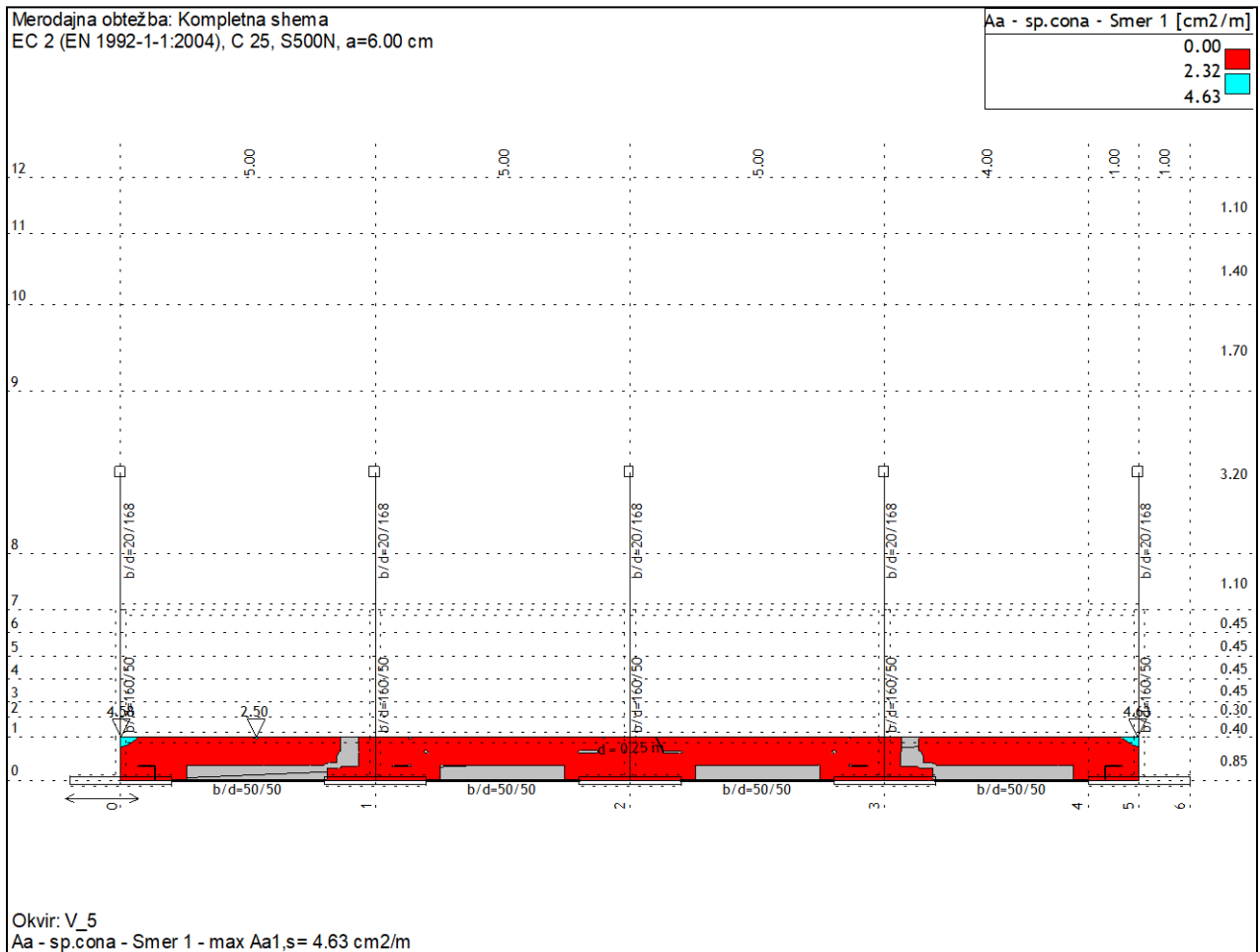


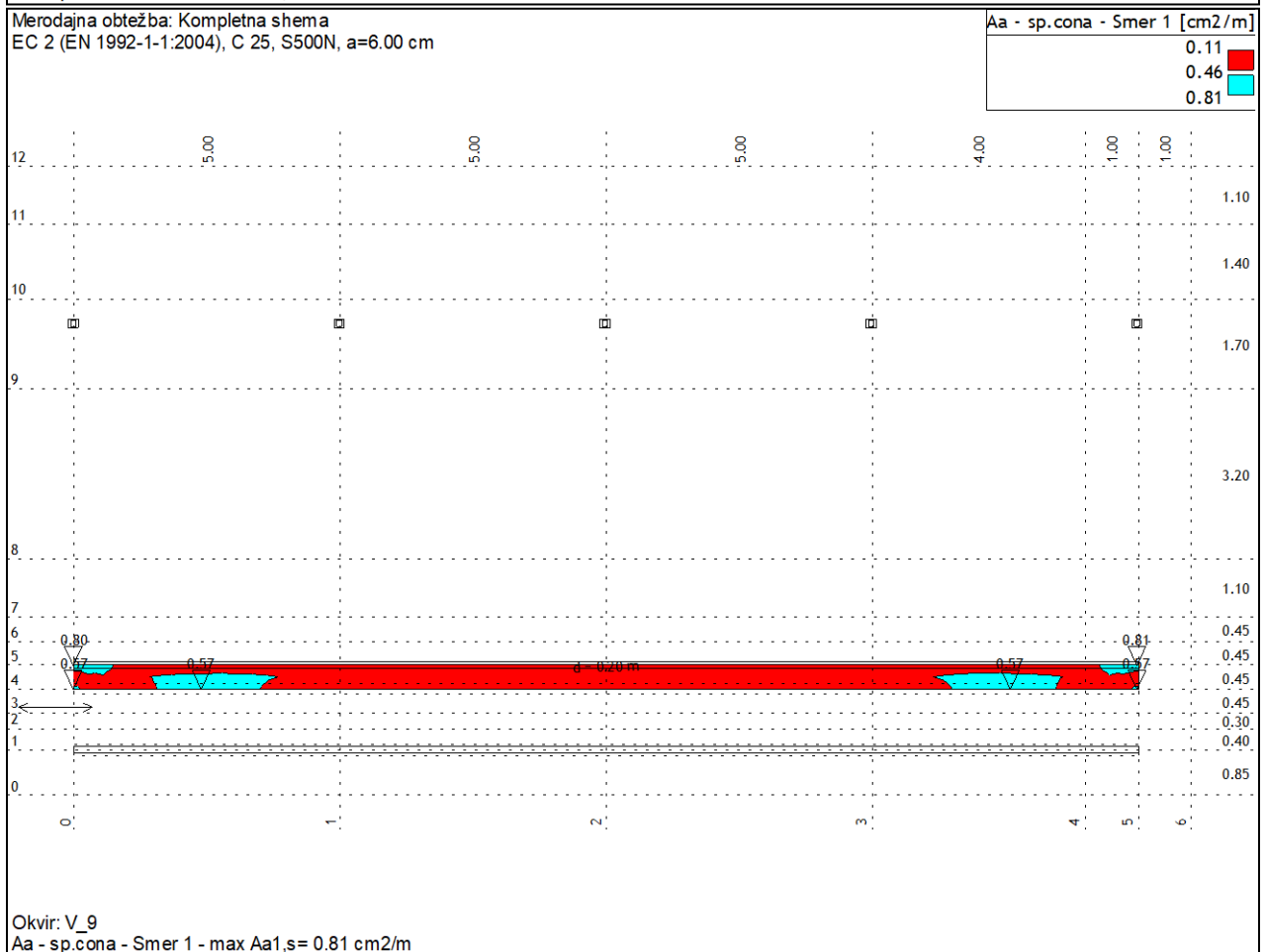
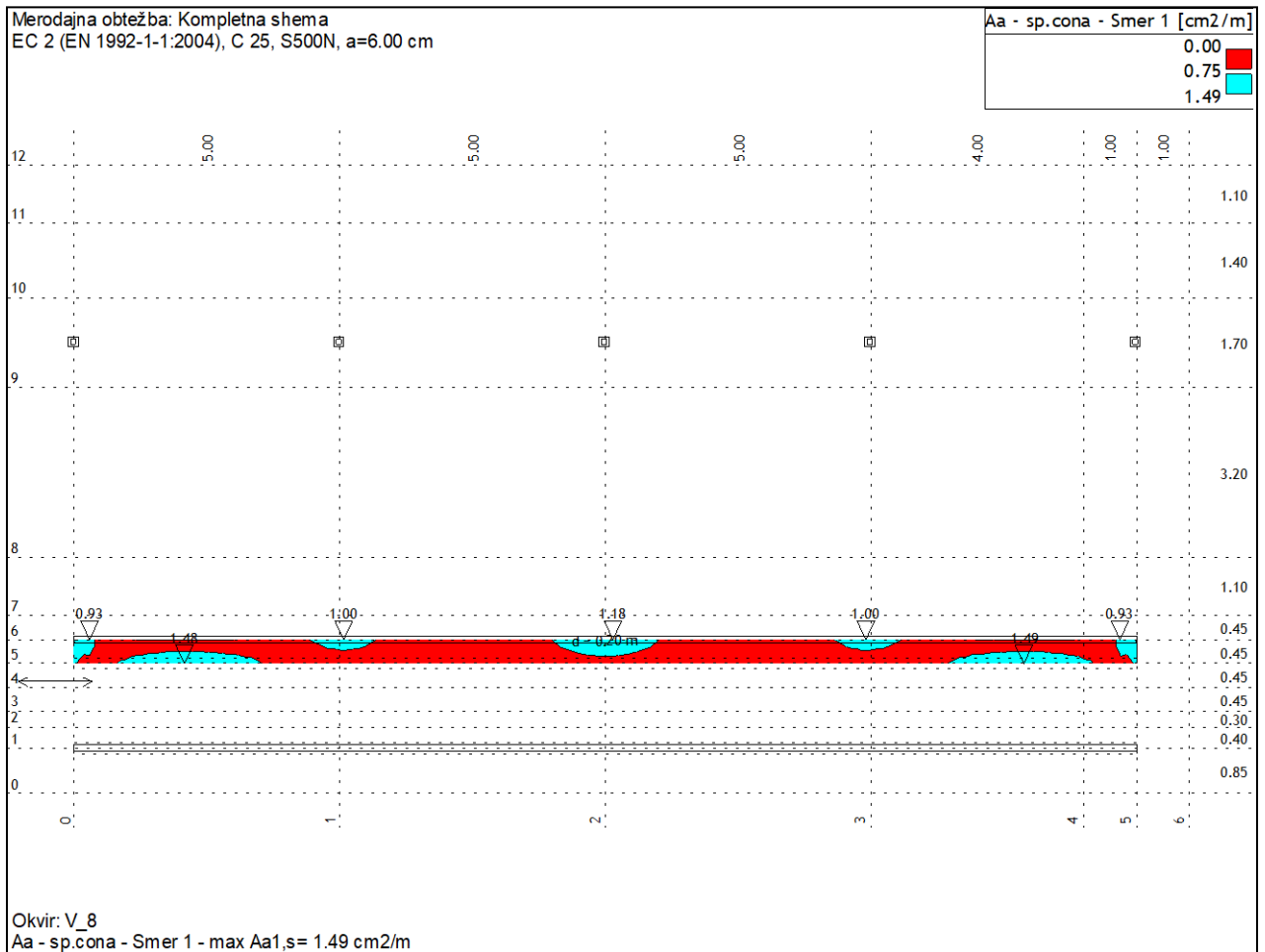
Nivo: T4 [1.65 m]
Aa - zg.cona - Smer 2 - max Aa_{2,z} = -0.84 cm²/m

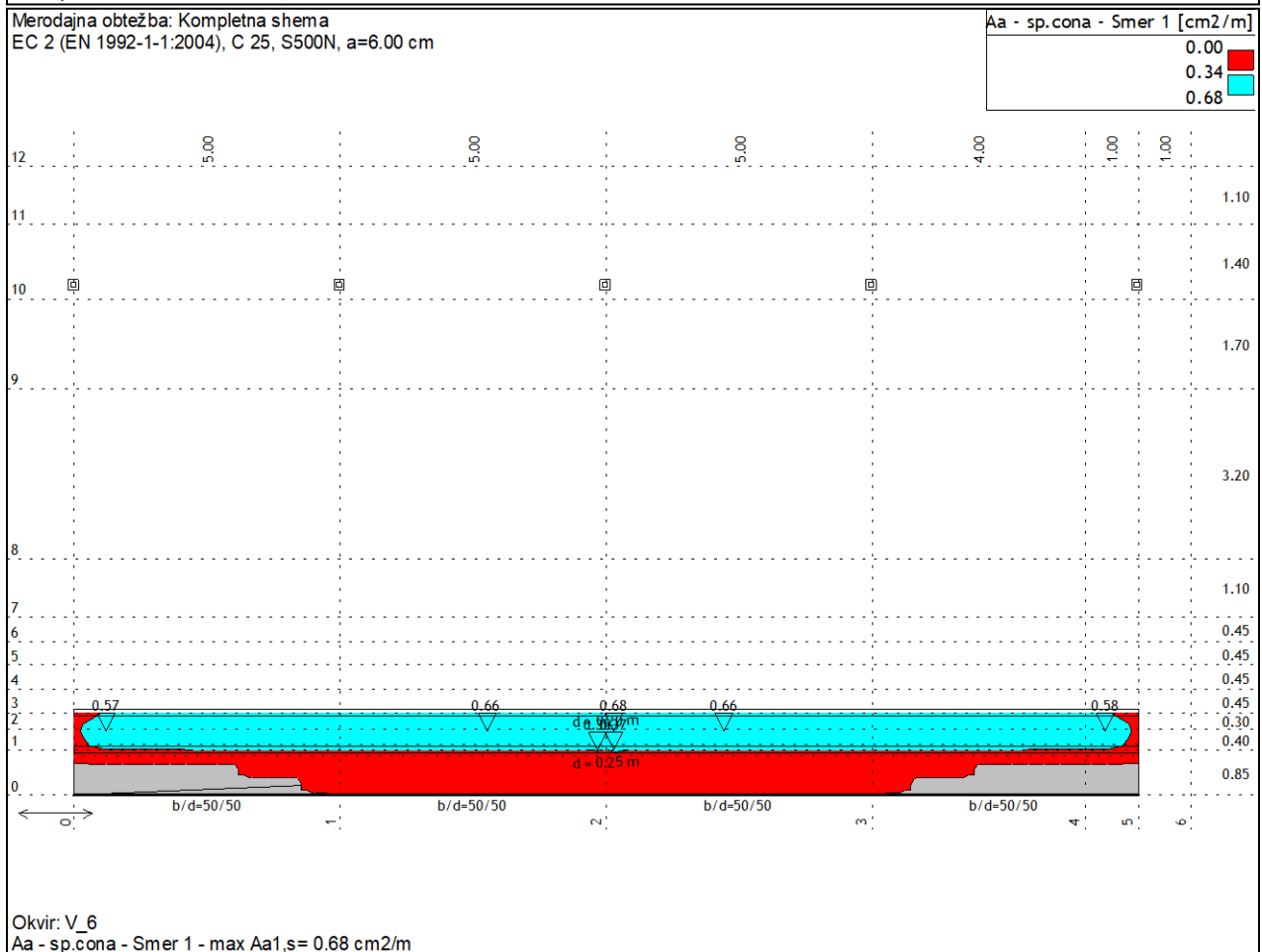
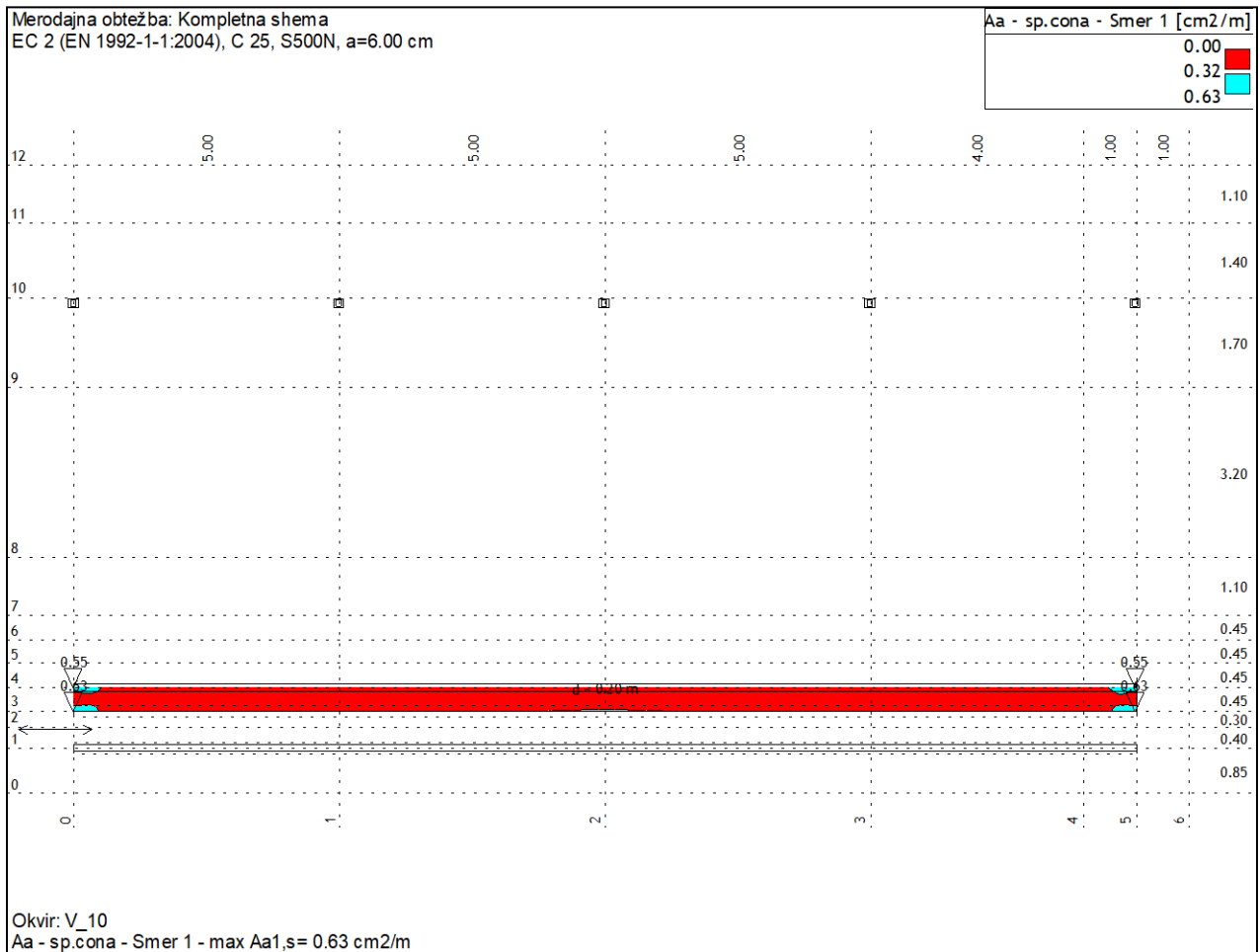


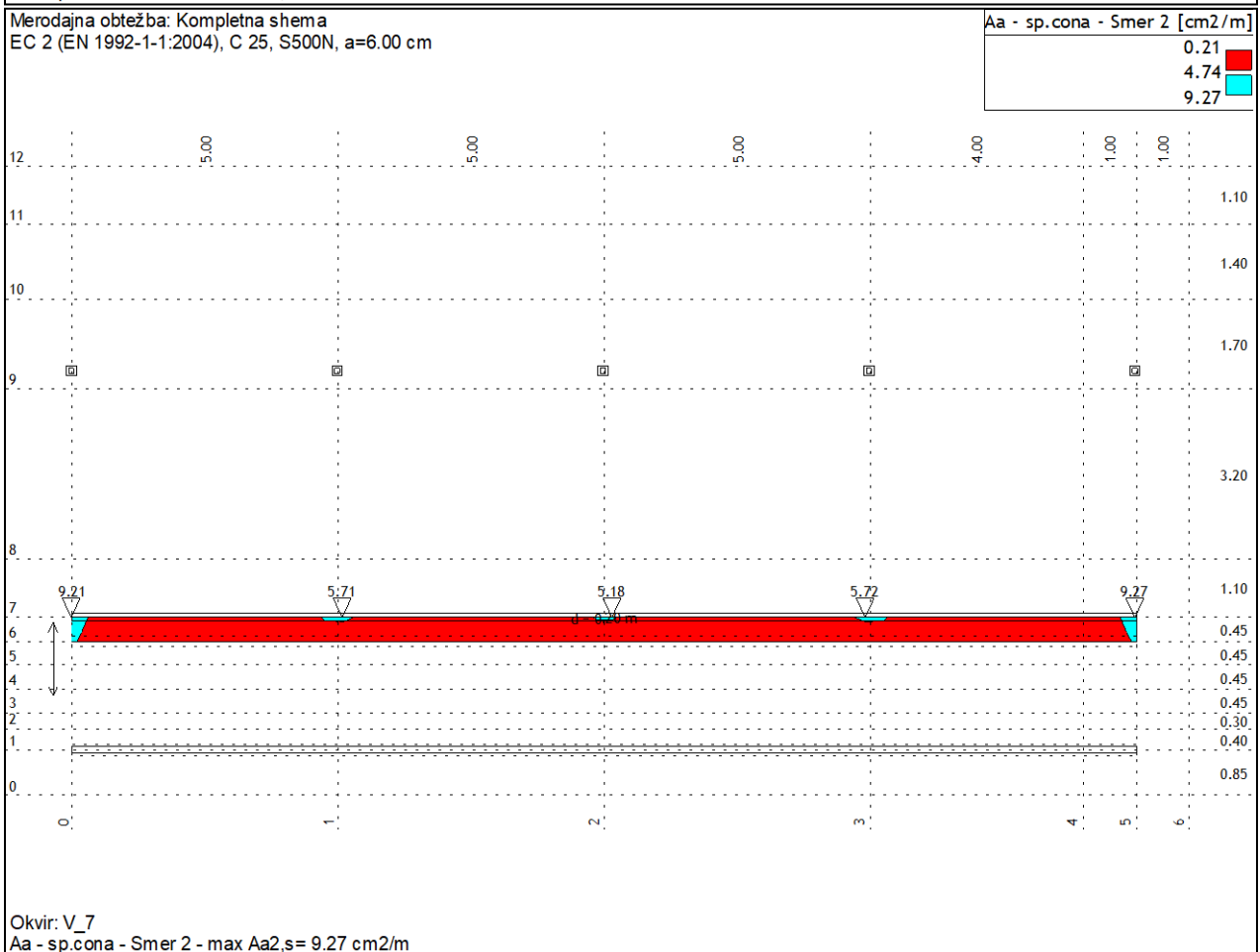
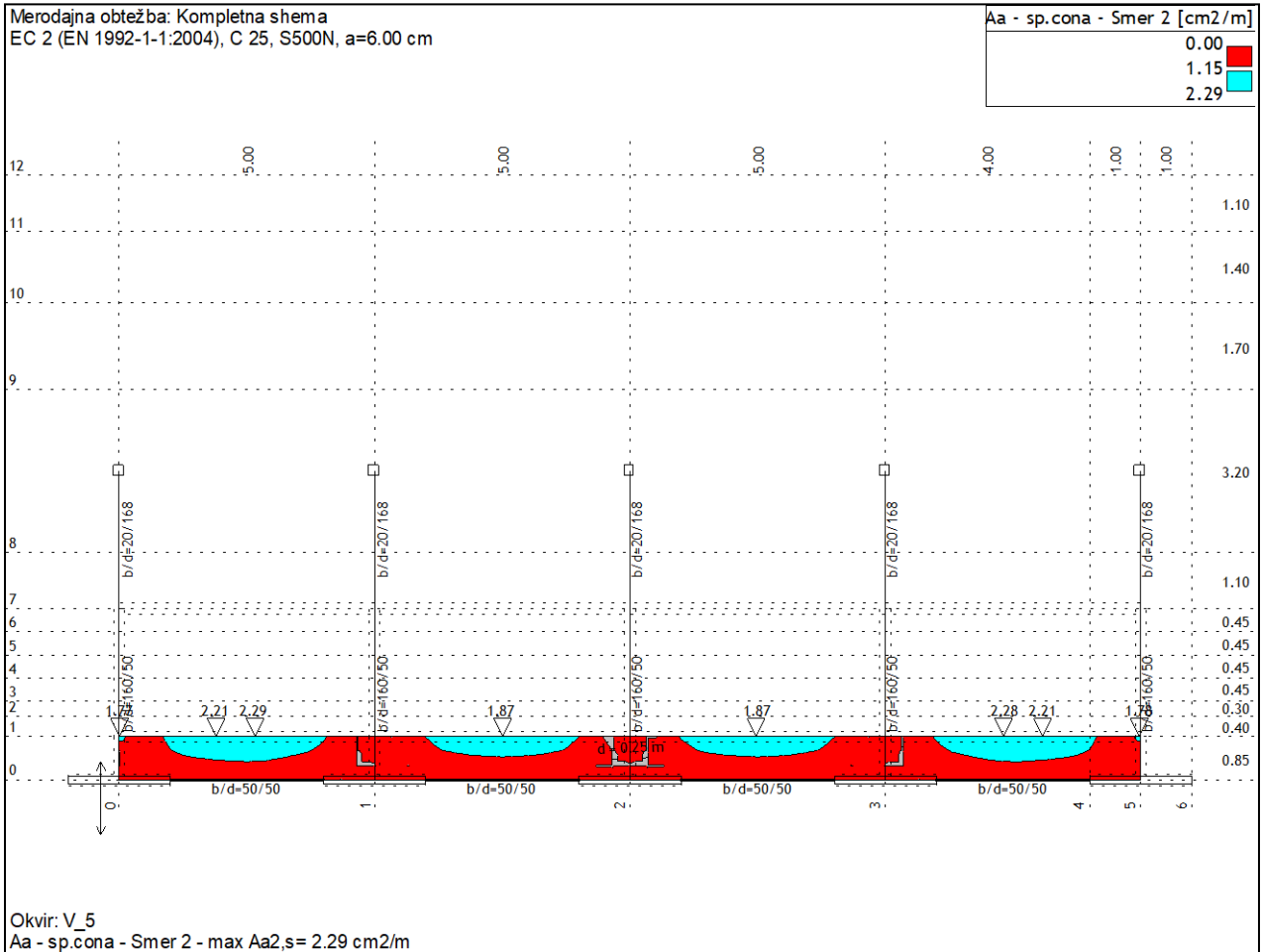


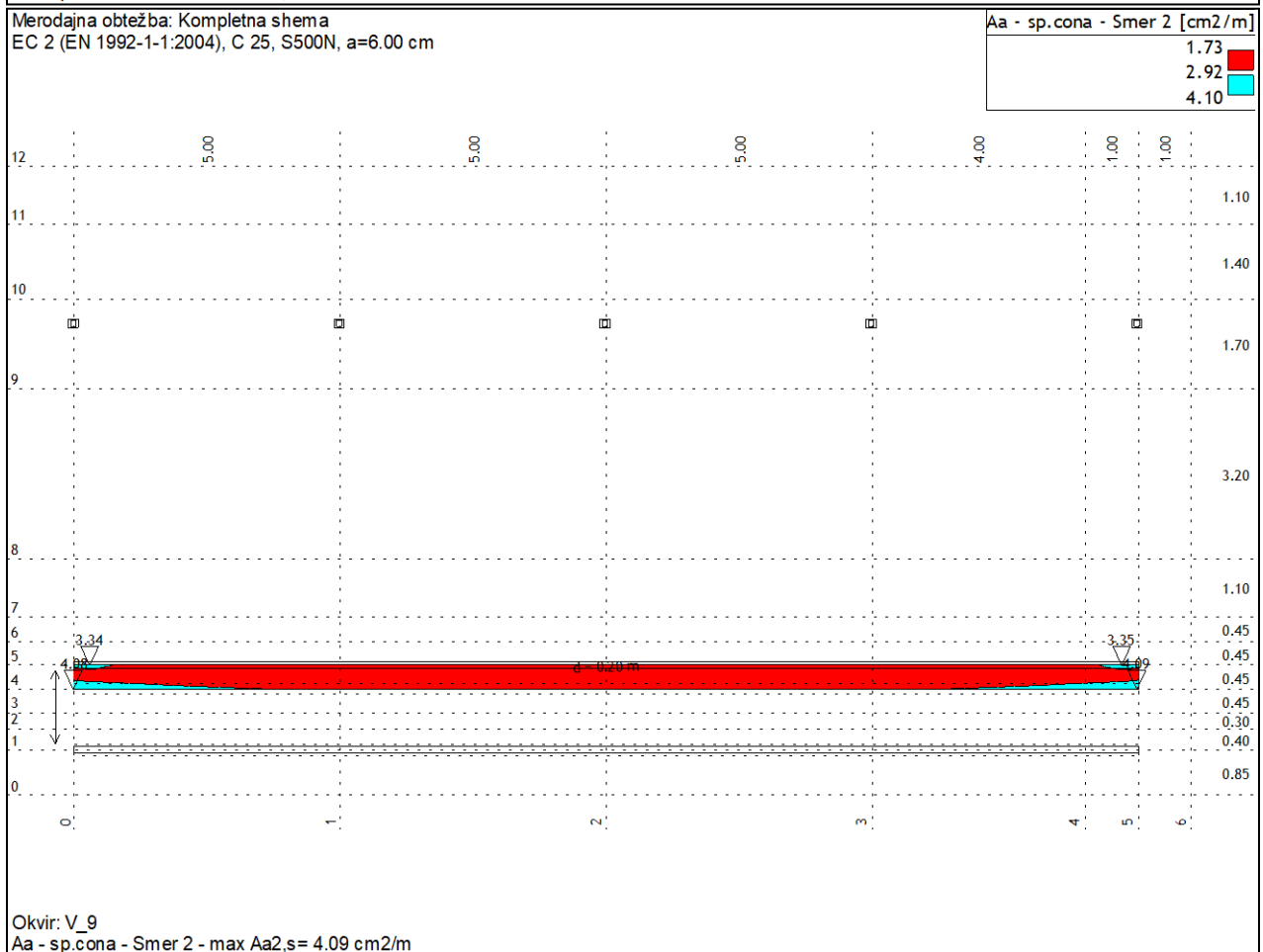
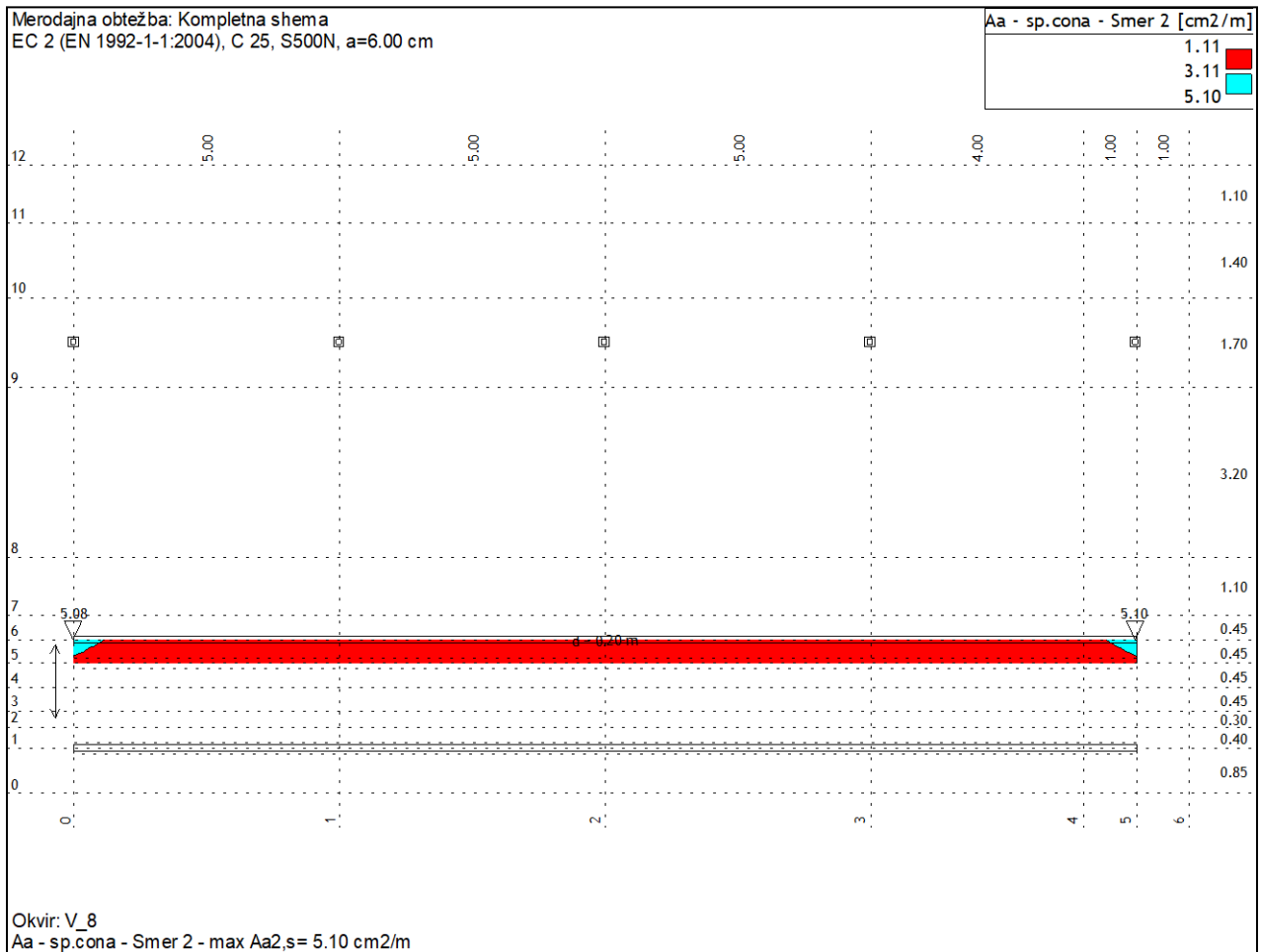


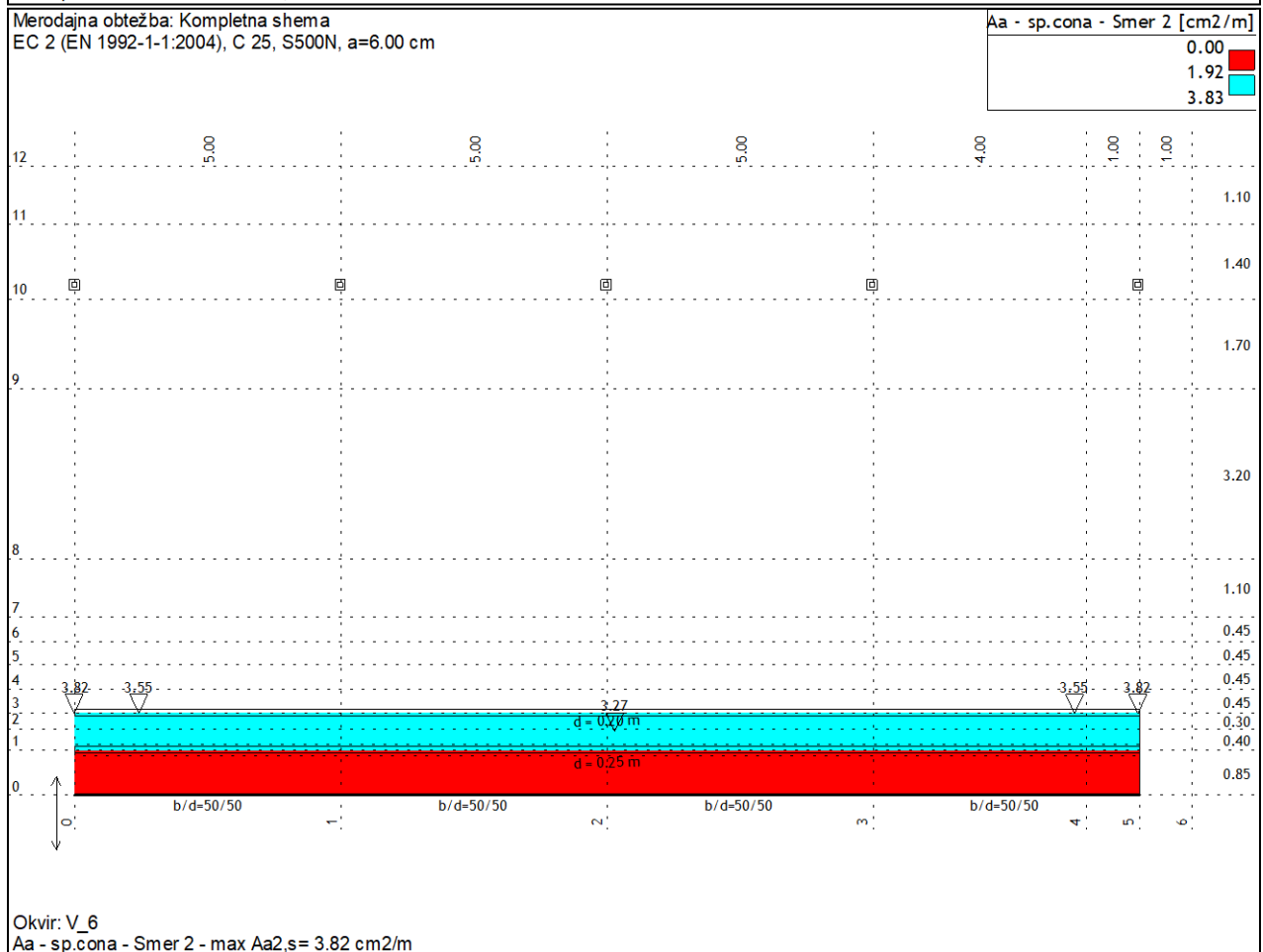
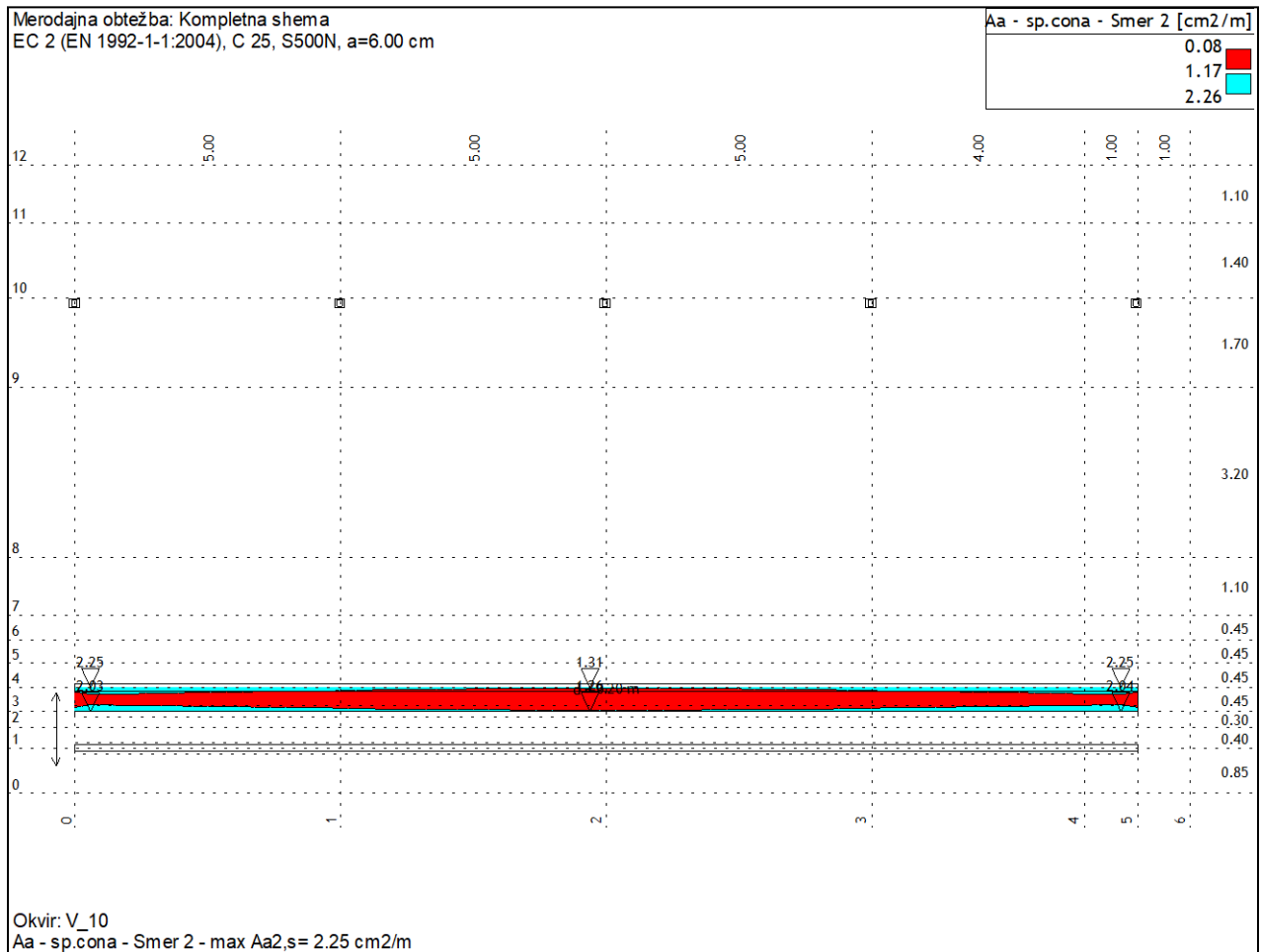




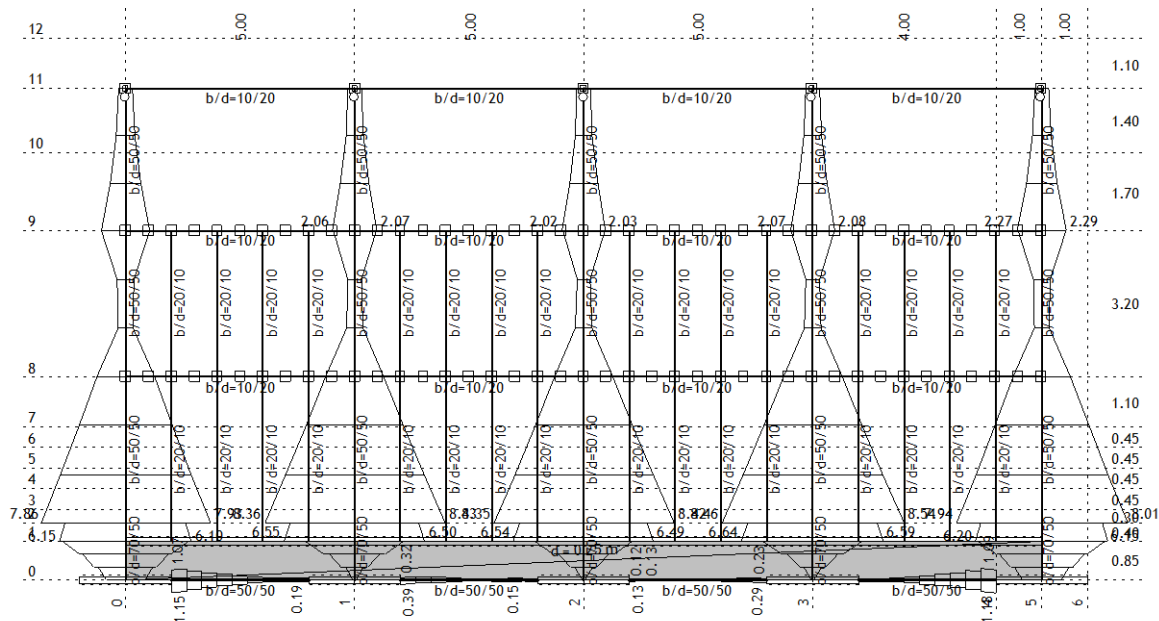






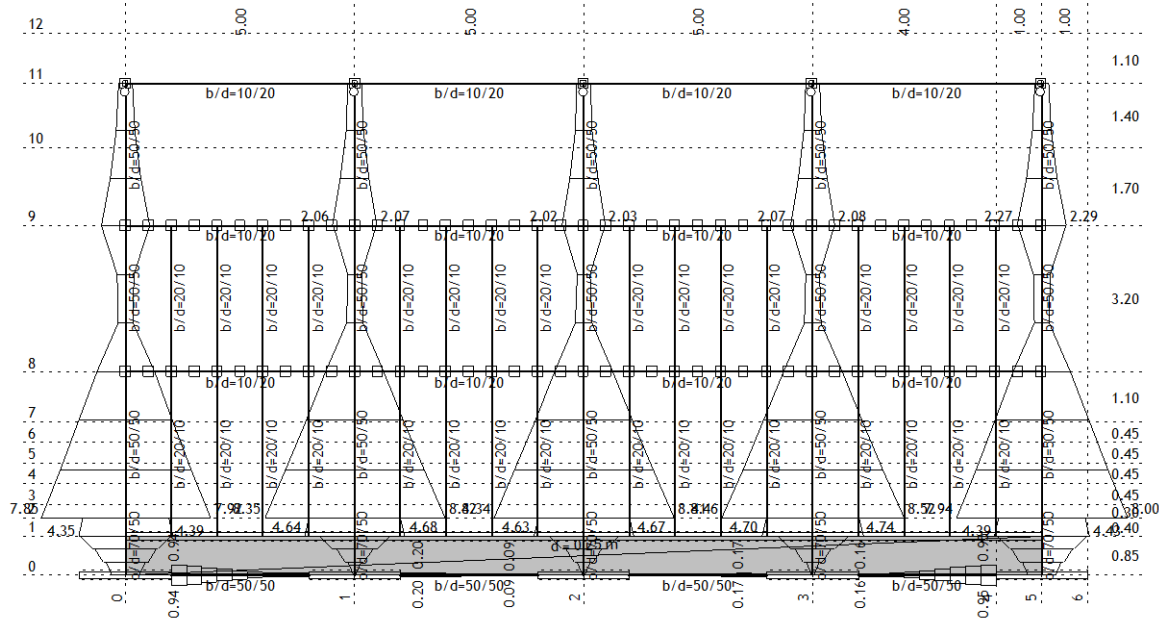


Merodajna obtežba: Kompletna shema
EC 2 (EN 1992-1-1:2004), C 30, S500H

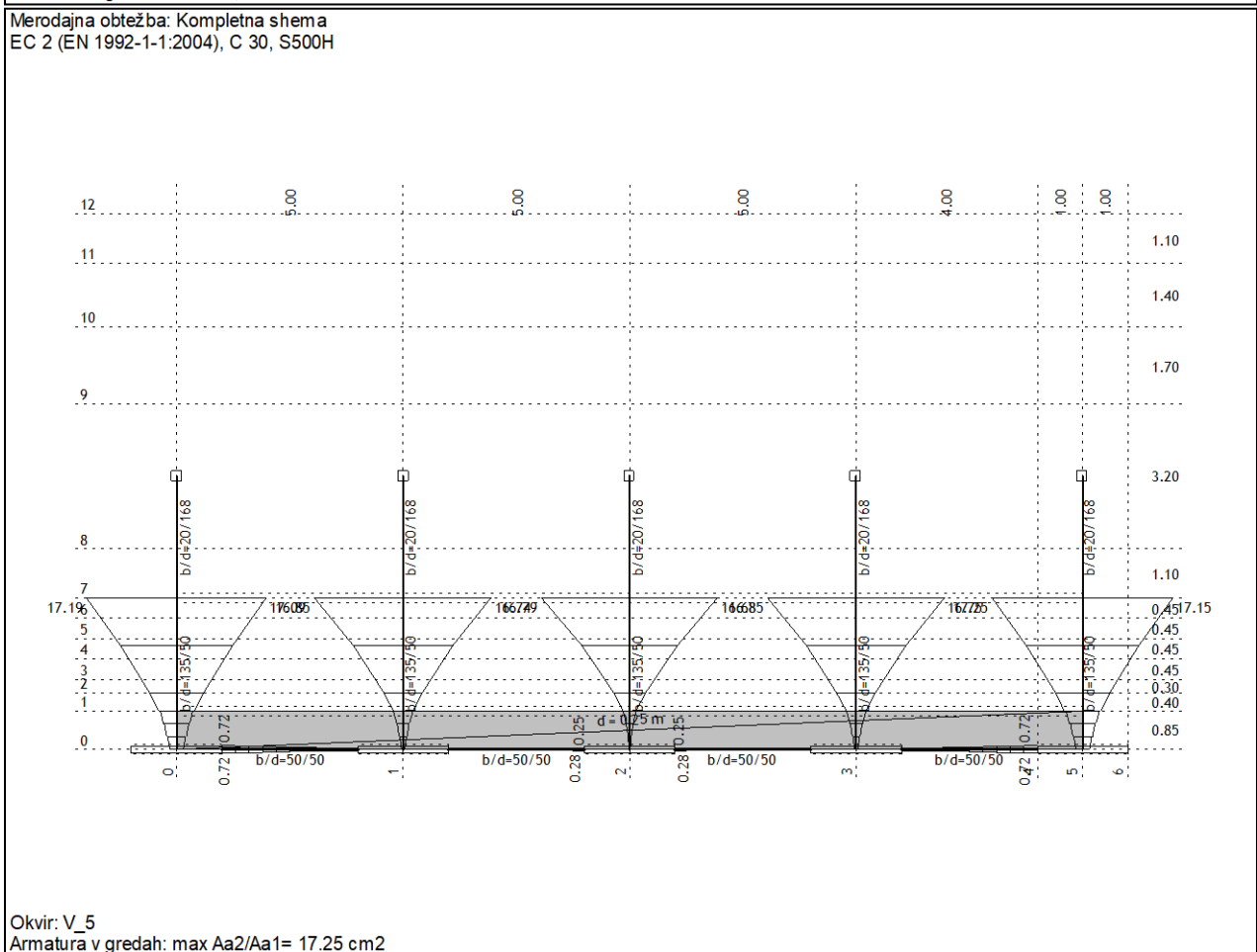
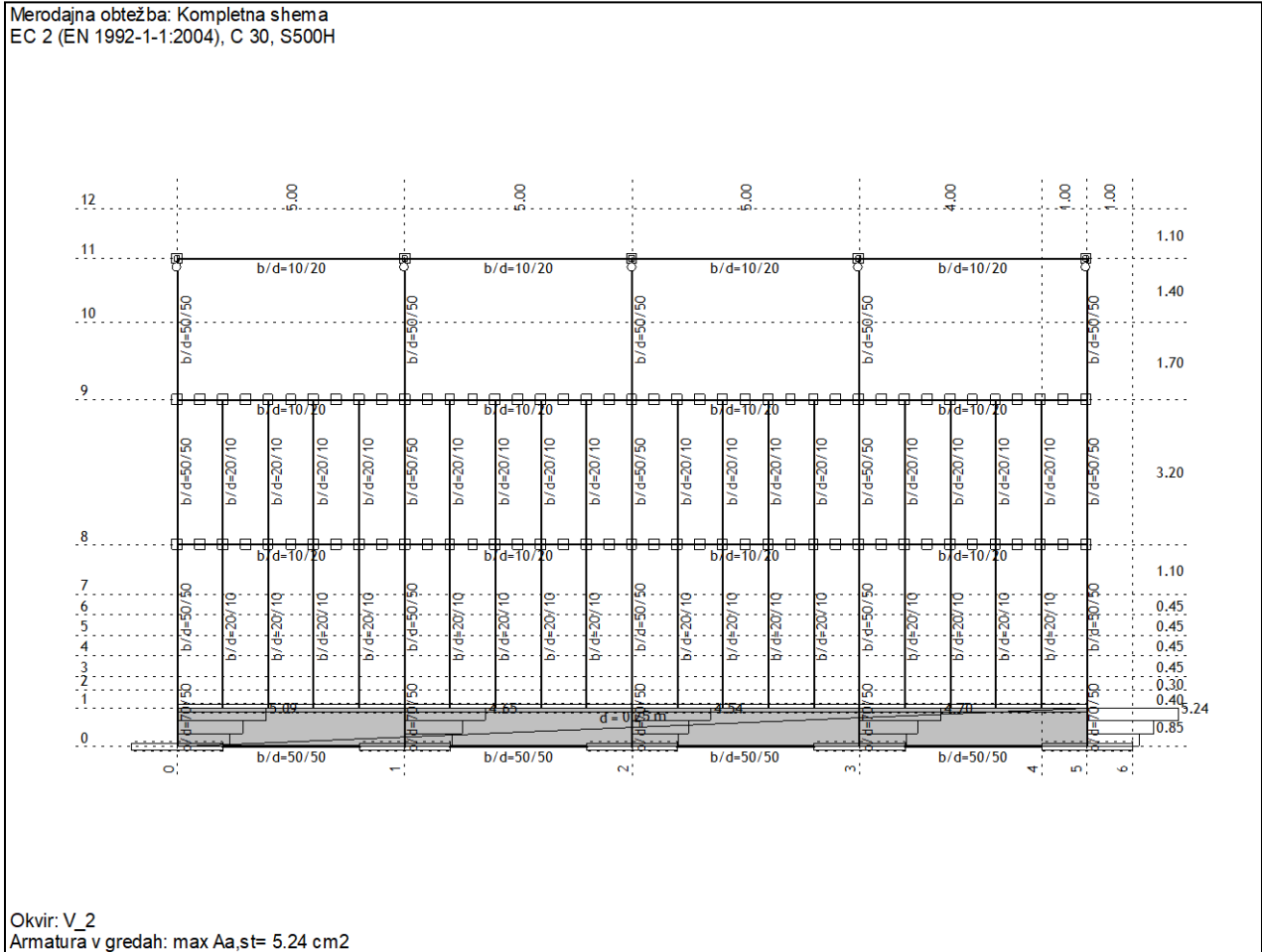


Okvir: V_2
Armatura v gredah: max Aa2/Aa1= 8.54 cm²

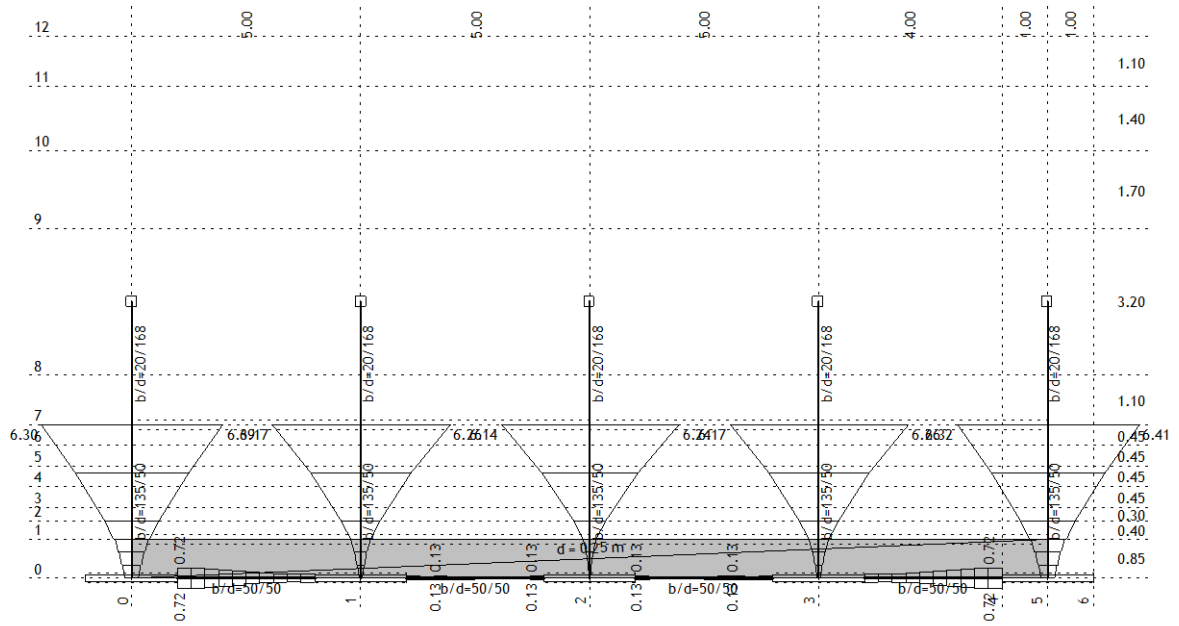
Merodajna obtežba: Kompletna shema
EC 2 (EN 1992-1-1:2004), C 30, S500H



Okvir: V_2
Armatura v gredah: max Aa3/Aa4= 8.52 cm²

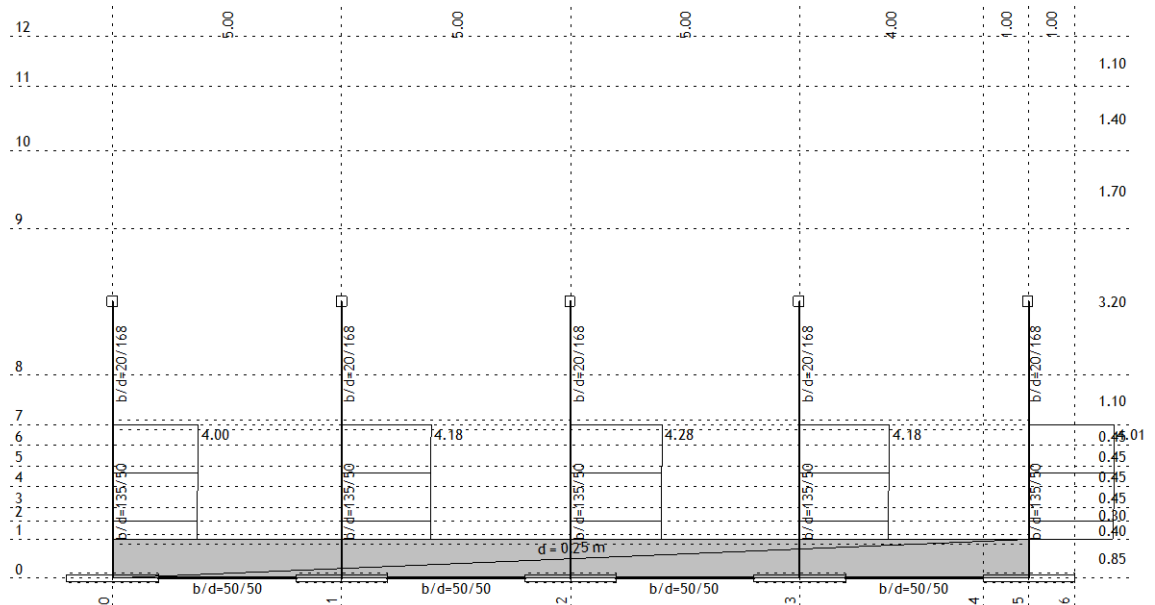


Merodajna obtežba: Kompletna shema
 EC 2 (EN 1992-1-1:2004), C 30, S500H



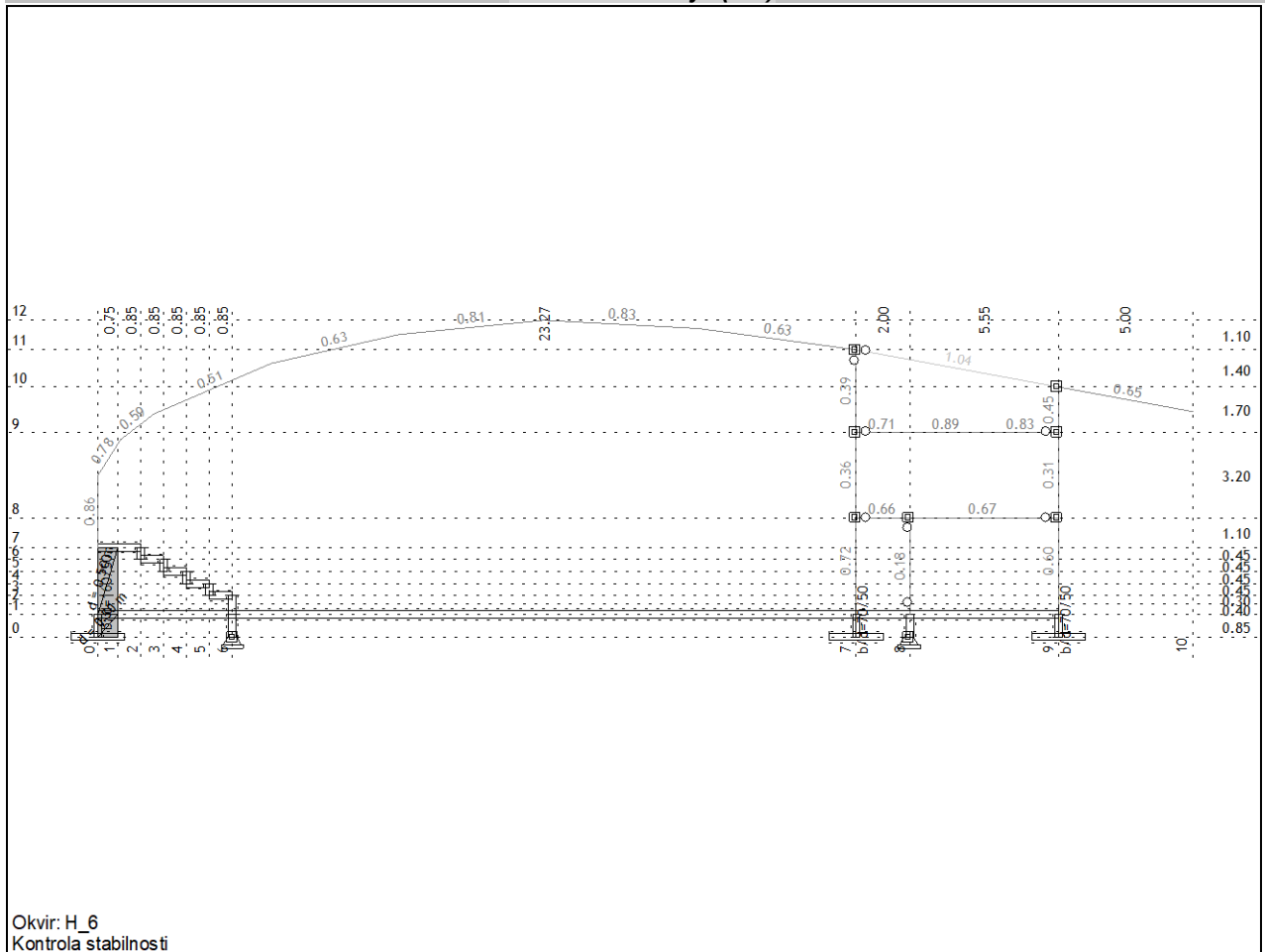
Okvir: V_5
 Armatura v gredah: max Aa3/Aa4= 6.41 cm²

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



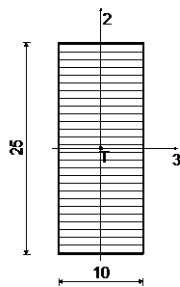
Okvir: V_5
 Armatura v gredah: max Aa,st= 4.28 cm²

Dimenzioniranje (les)



PALICA 9648-10918

Lepljen lameliran les - GL28h
v smeri zgornjega roba palice
Debelina lamele 2.00 cm
Eksploatacijski razred 1
EUROCODE



[cm]

FAKTORJI IZKORIŠČENOSTI PO KOMBINACIJAH OBEŽB

15. $\gamma=0.67$	16. $\gamma=0.46$	12. $\gamma=0.46$
14. $\gamma=0.45$	18. $\gamma=0.45$	10. $\gamma=0.45$
13. $\gamma=0.45$	19. $\gamma=0.45$	17. $\gamma=0.44$
20. $\gamma=0.41$	24. $\gamma=0.22$	23. $\gamma=0.21$
26. $\gamma=0.21$	25. $\gamma=0.20$	21. $\gamma=0.20$
22. $\gamma=0.20$	11. $\gamma=0.13$	9. $\gamma=0.09$

KONTROLA NORMALNIH IN STRIŽNIH NAPETOSTI
(obtežni primer 15, začetek palice)

Računska osna sila	N =	-4.421 kN
Prečna sila v smeri osi 2	T2 =	-14.929 kN
Upogibni moment okoli osi 3	M3 =	13.146 kNm

KONTROLA NAPETOSTI - TLAK IN UPOGIB

Vrsta obtežbe: @1@osnovno - srednjetrojno

Korekcijski koeficient

Parcialni koef. za karakteristike

materiala

Dodatek za elemente z malimi dimenzijami - os 2

Dodatek za elemente z malimi dimenzijami - os 3

Faktor oblik (za pravokotni prerez)

Karakteristična tlačna trdnost

Kmod =	0.800
γ_m =	1.250
Kh_2 =	1.100
Kh_3 =	1.091
km =	0.700
fc,0,k =	26.500 MPa

Računska tlačna trdnost	$f_{c,0,d}$	=	16.960 MPa
Karakteristična upogibna trdnost	$f_{m,k}$	=	28.000 MPa
Računska upogibna trdnost - os 2	$f_{m,2,d}$	=	19.712 MPa
Računska upogibna trdnost - os 3	$f_{m,3,d}$	=	19.560 MPa
Relativna vitkost	$\lambda_{rel,2}$	=	3.119
Relativna vitkost	$\lambda_{rel,3}$	=	3.119
Normalne tlačne napetosti	$\sigma_{c,0,d}$	=	0.177 MPa
Odpornostni moment	W_3	=	1041.7 cm ³
Normalna upogibna napetost okoli osi 3	$\sigma_{m,3,d}$	=	12.620 MPa

$$\sigma_{m,3,d} \leq f_{m,3,d} \quad (12.620 \leq 19.560)$$

Izkoriščenost prereza je 64.5%

TLAK IN UPOGIB - VELIKA VITKOST

Začetna imperfekcija	β_x	=	0.100
Koeficient	k_3	=	1.326
Koeficient	k_2	=	5.506
Koeficient	kc_3	=	0.564
Koeficient	kc_2	=	0.100

$$(\sigma_{c,0,d} / (kc_2 \times f_{c,0,d})) + k_m \times (\sigma_{m,3,d} / f_{m,3,d}) + \sigma_{m,2,d} / f_{m,2,d} \leq 1 \quad (0.556 \leq 1)$$

Izkoriščenost prereza je 55.6%

$$(\sigma_{c,0,d} / (kc_3 \times f_{c,0,d})) + \sigma_{m,3,d} / f_{m,3,d} + k_m \times (\sigma_{m,2,d} / f_{m,2,d}) \leq 1 \quad (0.664 \leq 1)$$

Izkoriščenost prereza je 66.4%

KONTROLA NAPETOSTI - STRIG

Vrsta obtežbe: @1@osnovno - srednjetravno			
Korekcijski koeficient	K_{mod}	=	0.800
Parcialni koef. za karakteristike materiala	γ_m	=	1.250
Karakteristična strižna napetost	$f_{v,k}$	=	3.200 MPa
Računska strižna trdnost	$f_{v,d}$	=	2.048 MPa
Površina prečnega prereza	A	=	250.00 cm ²
Dejanska strižna napetost(os 2)	$\tau_{2,d}$	=	0.896 MPa

$$\tau_{2,d} \leq f_{v,d} \quad (0.896 \leq 2.048)$$

Izkoriščenost prereza je 43.7%

DOKAZ BOČNE STABILNOSTI

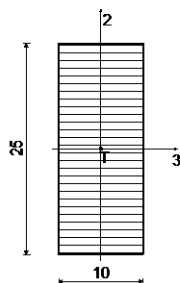
Vrsta obtežbe: @1@osnovno - srednjetravno			
Korekcijski koeficient	K_{mod}	=	0.800
Parcialni koef. za karakteristike materiala	γ_m	=	1.250
Razmak pridržanih točk pravokotno na smer osi 2	l_{ef}	=	555.00 cm
5% fraktil modula E paralelno z vlakni	$E_{0.05}$	=	10200 MPa
5% fraktil strižnega modula G	$G_{0.05}$	=	520.00 MPa
Torzijski vztrajnostni moment	I_{tor}	=	6225.1 cm ⁴
Vztrajnostni moment	I_2	=	2083.3 cm ⁴
Odpornostni moment	W_3	=	1041.7 cm ³
Kritična napetost uklona	$\sigma_{m,crit}$	=	45.069 MPa
Relativna vitkost za uklon	λ_{rel}	=	0.788
Koeficient	k_{krit}	=	0.969
Normalna upogibna napetost okoli osi 3	$\sigma_{m,3,d}$	=	12.620 MPa

$$\sigma_{m,3,d} \leq k_{krit} \times f_{m,3,d} \quad (12.620 \leq 18.950)$$

Izkoriščenost prereza je 66.6%

PALICA 10421-11004

Lepljen lameliran les - GL28h
v smeri zgornjega roba palice
Debelina lamele 2.00 cm
Eksploatacijski razred 1
EUROCODE



[cm]

FAKTORJI IZKORIŠČENOSTI PO KOMBINACIJAH OBTEŽB

15. $\gamma=0.89$	18. $\gamma=0.74$	19. $\gamma=0.73$
16. $\gamma=0.70$	17. $\gamma=0.69$	14. $\gamma=0.67$
12. $\gamma=0.63$	13. $\gamma=0.62$	10. $\gamma=0.59$
20. $\gamma=0.54$	23. $\gamma=0.40$	24. $\gamma=0.39$
25. $\gamma=0.38$	26. $\gamma=0.38$	21. $\gamma=0.35$
22. $\gamma=0.35$	11. $\gamma=0.28$	9. $\gamma=0.23$

KONTROLA NORMALNIH NAPETOSTI
 (obtežni primer 15, na 178.4 cm od začetka palice)

Računska osna sila	N =	32.405 kN
Prečna sila v smeri osi 2	T2 ≈	0.000 kN
Upogibni moment okoli osi 3	M3 =	-16.189 kNm

KONTROLA NAPETOSTI - NATEG IN UPOGIB

Vrsta obtežbe: @1@osnovno - srednjetrojno	Kmod =	0.800
Korekcijski koeficient	ym =	1.250
Parcialni koef. za karakteristike materiala		
Dodatek za elemente z malimi dimenzijami - os 2	Kh_2 =	1.100
Dodatek za elemente z malimi dimenzijami - os 3	Kh_3 =	1.091
Dodatek za elemente z malimi dimenzijami - nateg	Kh_t =	1.100
Karakteristična natezna trdnost	ft,0,k =	19.500 MPa
Računska natezna trdnost	ft,0,d =	13.728 MPa
Faktor oblik (za pravokotni prerez)	km =	0.700
Karakteristična upogibna trdnost	fm,k =	28.000 MPa
Računska upogibna trdnost - os 2	fm,2,d =	19.712 MPa
Računska upogibna trdnost - os 3	fm,3,d =	19.560 MPa
Normalna natezna napetost	σt,0,d =	1.296 MPa
Odpornostni moment	W3 =	1041.7 cm ³
Normalna upogibna napetost okoli osi 3	σm3,d =	15.542 MPa

$$\sigma_{m3,d} \leq f_{m,3,d} \quad (15.542 \leq 19.560)$$

Izkoriščenost prereza je 79.5%

$$\sigma_{t,0,d} / f_{t,0,d} + k_m \times (\sigma_{m3,d} / f_{m,3,d}) + \sigma_{m2,d} / f_{m,2,d} \leq 1$$

$$(0.651 \leq 1)$$

Izkoriščenost prereza je 65.1%

$$\sigma_{t,0,d} / f_{t,0,d} + \sigma_{m3,d} / f_{m,3,d} + k_m \times (\sigma_{m2,d} / f_{m,2,d}) \leq 1$$

$$(0.889 \leq 1)$$

Izkoriščenost prereza je 88.9%

DOKAZ BOČNE STABILNOSTI

Vrsta obtežbe: @1@osnovno - srednjetrojno	Kmod =	0.800
Korekcijski koeficient	ym =	1.250
Parcialni koef. za karakteristike materiala		
Razmak pridržanih točk pravokotno na smer osi 2	lef =	277.50 cm
5% fraktil modula E paralelno z vlakni	E0.05 =	10200 MPa
5% fraktil strižnega modula G	G0.05 =	520.00 MPa
Torzijski vztrajnostni moment	I _{tor} =	6225.1 cm ⁴
Vztrajnostni moment	I ₂ =	2083.3 cm ⁴
Odpornostni moment	W3 =	1041.7 cm ³
Kritična napetost uklona	σ _{m,crit} =	90.139 MPa
Relativna vitkost za uklon	λ _{rel} =	0.557
Koeficient	k _{krit} =	1.000
Normalna upogibna napetost okoli osi 3	σ _{m3,d} =	15.542 MPa

$$\sigma_{m,3,d} \leq k_{krit} \times f_{m,3,d} \quad (15.542 \leq 19.560)$$

Izkoriščenost prereza je 79.5%

KONTROLA STRIŽNIH NAPETOSTI

(obtežni primer 15, začetek palice)

Prečna sila v smeri osi 2	T2 =	-4.040 kN
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KONTROLA NAPETOSTI - STRIG

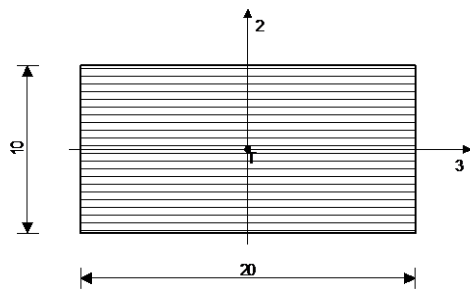
Vrsta obtežbe: @1@osnovno - srednjetrojno	Kmod =	0.800
Korekcijski koeficient	ym =	1.250
Parcialni koef. za karakteristike materiala		
Karakteristična strižna napetost	f _{v,k} =	3.200 MPa
Računska strižna trdnost	f _{v,d} =	2.048 MPa
Površina prečnega prereza	A =	250.00 cm ²
Dejanska strižna napetost(os 2)	τ _{2,d} =	0.242 MPa

$$\tau_{2,d} \leq f_{v,d} \quad (0.242 \leq 2.048)$$

Izkoriščenost prereza je 11.8%

PALICA 11119-10364

 Lepljen lameliran les - GL28h
 v smeri zgornjega roba palice
 Debelina lamele 2.00 cm
 Eksploatacijski razred 1
 EUROCODE



[cm]

FAKTORJI IZKORIŠČENOSTI PO KOMBINACIJAH OBTEŽB

15. $\gamma=0.51$	18. $\gamma=0.44$	16. $\gamma=0.42$
19. $\gamma=0.42$	14. $\gamma=0.40$	17. $\gamma=0.38$
12. $\gamma=0.37$	13. $\gamma=0.35$	24. $\gamma=0.34$
10. $\gamma=0.33$	26. $\gamma=0.31$	20. $\gamma=0.30$
22. $\gamma=0.23$	21. $\gamma=0.17$	11. $\gamma=0.16$
25. $\gamma=0.16$	23. $\gamma=0.15$	9. $\gamma=0.12$

KONTROLA NORMALNIH NAPETOSTI

(obtežni primer 15, konec palice)

Računska osna sila	N =	-37.235 kN
Prečna sila v smeri osi 2	T2 ≈	0.000 kN
Prečna sila v smeri osi 3	T3 ≈	0.000 kN
Upogibni moment okoli osi 2	M2 =	-0.764 kNm
Upogibni moment okoli osi 3	M3 ≈	0.000 kNm

KONTROLA NAPETOSTI - TLAK IN UPOGIB

Vrsta obtežbe: @1@osnovno - srednjetrojno

Korekcijski koeficient	Kmod =	0.800
Parcialni koef. za karakteristike materiala	γ_m =	1.250

Dodatek za elemente z malimi dimenzijami - os 2

Kh_2 = 1.100

Dodatek za elemente z malimi dimenzijami - os 3

Kh_3 = 1.100

Faktor oblik (za pravokotni prerez)

km = 0.700

Karakteristična tlačna trdnost

fc,0,k = 26.500 MPa

Računska tlačna trdnost

fc,0,d = 16.960 MPa

Karakteristična upogibna trdnost

fm,k = 28.000 MPa

Računska upogibna trdnost

fm,d = 19.712 MPa

Relativna vitkost

 $\lambda_{rel,2}$ = 1.012

Relativna vitkost

 $\lambda_{rel,3}$ = 1.012

Normalne tlačne napetosti

 $\sigma_{c,0,d}$ = 1.862 MPa

Odpornostni moment

W/2 = 666.67 cm³

Normalna upogibna napetost okoli osi 2

 $\sigma_{m2,d}$ = 1.145 MPa

$$\sigma_{m2,d} \leq fm,d \quad (1.145 \leq 19.712)$$

Izkoriščenost prereza je 5.8%

TLAK IN UPOGIB - VELIKA VITKOST

Začetna imperfekcija

 β_x = 0.100

Koeficient

k₃ = 2.633

Koeficient

k₂ = 1.047

Koeficient

kc,3 = 0.232

Koeficient

kc,2 = 0.759

$$(\sigma_{c,0,d} / (kc_2 \times fc_{0,d})) + km \times (\sigma_{m3,d} / fm,d) + \sigma_{m2,d} / fm,d \leq 1 \quad (0.203 \leq 1)$$

Izkoriščenost prereza je 20.3%

$$(\sigma_{c,0,d} / (kc_3 \times fc_{0,d})) + \sigma_{m3,d} / fm,d + km \times (\sigma_{m2,d} / fm,d) \leq 1 \quad (0.515 \leq 1)$$

Izkoriščenost prereza je 51.5%

KONTROLA STRIŽNIH NAPETOSTI

(obtežni primer 19, začetek palice)

Prečna sila v smeri osi 2	T2 ≈	0.000 kN
Prečna sila v smeri osi 3	T3 =	0.200 kN
Moment torzije	M1 =	0.014 kNm

KONTROLA NAPETOSTI - STRIG

Vrsta obtežbe: @1@osnovno - srednjetrojno

Korekcijski koeficient	Kmod =	0.800
Parcialni koef. za karakteristike materiala	γ_m =	1.250

Karakteristična strižna napetost

fv,k = 3.200 MPa

Računska strižna trdnost

fv,d = 2.048 MPa

Površina prečnega prereza

A = 200.00 cm²

Dejanska strižna napetost(os 3)

 $\tau_{3,d}$ = 0.015 MPa

$$\tau_{3,d} \leq fv,d \quad (0.015 \leq 2.048)$$

Izkoriščenost prereza je 0.7%

KONTROLA NAPETOSTI - TORZIJA

Karakteristična strižna trdnost

fv,k = 3.200 MPa

Računska strižna trdnost

fv,d = 2.048 MPa

Torzijski odpornostni moment

Wp2 = 392.70 cm³

Dejanska strižna napetost(os 2)

rtor,2,d = 0.034 MPa

$$\tau_{tor,2,d} \leq f_{v,d} \quad (0.034 \leq 2.048)$$

Izkoriščenost prereza je 1.7%

Torzijski odpornostni moment
Dejanska strižna napetost(os 3)

$$\begin{aligned} W_{p3} &= 522.29 \text{ cm}^3 \\ \tau_{tor,3,d} &= 0.026 \text{ MPa} \end{aligned}$$

$$\tau_{tor,3,d} \leq f_{v,d} \quad (0.026 \leq 2.048)$$

Izkoriščenost prereza je 1.3%

Superpozicija vplivov prečne sile in torzijskega momenta
(os 3)

$$\tau_{tor,2,d} + \tau_{3,d} \leq f_{v,d} \quad (0.049 \leq 2.048)$$

Izkoriščenost prereza je 2.4%

DOKAZ STABILNOSTI ELEMENTA
(obtežni primer 23, začetek palice)

Računska osna sila	N =	-5.046 kN
Prečna sila v smeri osi 2	T2 =	0.262 kN
Prečna sila v smeri osi 3	T3 =	0.000 kN
Upogibni moment okoli osi 2	M2 =	-0.145 kNm
Upogibni moment okoli osi 3	M3 =	-0.486 kNm

DOKAZ BOČNE STABILNOSTI

Vrsta obtežbe: @1@osnovno - srednjetrojno

Korekcijski koeficient	Kmod =	0.800
Parcialni koef. za karakteristike materiala	γm =	1.250

Razmak pridržanih točk pravokotno na smer osi 2

	l _{ef} =	360.00 cm
5% fraktil modula E paralelno z vlakni	E _{0.05} =	10200 MPa
5% fraktil strižnega modula G	G _{0.05} =	520.00 MPa
Torzijski vztrajnostni moment	I _{tor} =	4545.5 cm ⁴
Vztrajnostni moment	I ₂ =	6666.7 cm ⁴
Odpornostni moment	W ₃ =	333.33 cm ³
Kritična napetost uklona	σ _{m,crit} =	331.90 MPa
Relativna vitkost za uklon	λ _{rel} =	0.290
Koeficient	k _{krit} =	1.000
Normalna upogibna napetost okoli osi 3	σ _{m3,d} =	1.458 MPa

$$\sigma_{m,3,d} \leq k_{krit} \times f_{m,3,d} \quad (1.458 \leq 19.712)$$

Izkoriščenost prereza je 7.4%