

Idejni projekt lokalne ceste

Matas, Antea

Undergraduate thesis / Završni rad

2021

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UNIVERSITY OF SPLIT



**SVEUČILIŠTE U SPLITU
FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE**

ZAVRŠNI RAD

ANTEA MATAS

Split, 2021.

**SVEUČILIŠTE U SPLITU
FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I
GEODEZIJE**

IDEJNI PROJEKT LOKALNE CESTE

Završni rad

Split, 2021.

SVEUČILIŠTE U SPLITU

FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE

Split, Matice hrvatske 15

STUDIJ: **PREDDIPLOMSKI STUDIJ GRAĐEVINARSTVA**

KANDIDAT: **Antea Matas**

MATIČNI BROJ (JMBAG) : **83223366**

KATEDRA: **Katedra za prometnice**

PREDMET: **Ceste**

ZADATAK ZA ZAVRŠNI RAD

Tema: **Idejni projekt lokalne ceste**

Opis zadatka: Uz pomoć programa za projektiranje cesta AutoCAD Civil 3D potrebno je izraditi idejni projekt ceste na geodetskoj podlozi koja je korištena za izradu programa u okviru kolegija Ceste. Trasa se treba položiti od točke A do točke B koristeći podatke iz programskog zadatka.

Zadatak treba sadržavati:

1. Kopiju programskog zadatka
2. Tehnički opis s prikazom korištenja programa Civil 3D
3. Građevinsku situaciju u mjerilu 1:1000
4. Uzdužni presjek u mjerilu 1:1000/100
5. Karakteristične poprečne presjeke u mjerilu 1:200
6. Obradu na računalu
7. Računalne ispise koordinatnih točaka osi
8. Proračun količina zemljanih radova
9. Proračun količine radova po presjecima

U Splitu, rujan 2021.

Voditelj Završnog rada:

Prof. dr. sc. Dražen Cvitanić

Idejni projekt lokalne ceste

Sažetak:

Idejni projekt lokalne ceste izrađen je između točaka A i B postavljenih na geodetskoj podlozi prema programskom zadatku kolegija Ceste. Pri izradi projekta služimo se računalnim programom AutoCAD Civil 3D. Odabrana projektna brzina za ovu kategoriju ceste je 40 km/h. Cesta je projektirana na brdovitom terenu i za prosječni godišnji dnevni promet od 950 vozila/dan. Idejni projekt izrađen je prema Pravilniku o osnovnim uvjetima za projektiranje cesta.

Ključne riječi:

Idejni projekt, lokalna cesta, projektna brzina, os ceste, niveleta, poprečni presjek

Conceptual project of local road

Abstract:

The conceptual project of the local road was made between points A and B placed on a geodetic basis according to the task of the course Roads. Conceptual project is made using the computer program AutoCAD Civil 3D. The selected design speed is 40 km/h. The road is designed on hilly terrain and for an average annual daily traffic of 950 vehicles/day.

The conceptual design was made according to the Ordinance on the basic conditions for road design.

Keywords:

Conceptual project, local road, design speed, the road axis, profile, cross-section

SADRŽAJ

1. Programski zadatak	1.
2. Tehnički opis	2.
2.1 Općenito.....	2.
2.2 Horizontalni elementi.....	2.
2.3 Vertikalni elementi.....	2.
2.4 Poprečni presjek.....	2.
2.5 Kolnička konstrukcija.....	2.
2.6 Odvodnja ceste	3.
2.7 Oprema ceste	3.
3. Grafički prilozi	4.
3.1 Situacija M 1:1000.....	4.
3.2 Uzdužni presjek M 1:1000/100	6.
3.3 Normalni poprečni presjek M 1:50	8.
3.4 Karakteristični poprečni presjeci M 1:50.....	10.
4. Tablica ukupnog volumena zemljanih radova	26.
5. Obrada na računalu	30.
6. Izlazni podaci iz programa	32.
6.1 Koordinatni račun glavnih točaka osi.....	32.
6.2 Koordinatni račun detaljnih točaka osi	52.
6.3 Račun kota kolnika	54.
6.4 Vertikalni tok trase	64.
7. Literatura.....	66.

1. PROGRAMSKI ZADATAK

Katedra za prometnice

Studij: Preddiplomski

Nastavni predmet: CESTE

Student/ica: *Antea Natas*

ZADATAK

Treba izraditi idejni projekt dionice cešte između točaka A i B naznačenih na priloženoj geodetskoj podlozi u mjerilu 1:1000.

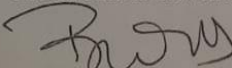
Zadano je:

- PGDP - prosječni godišnji dnevni promet: **950 voz/dan**
- vrsta terena: **brdoviti**.

Idejni projekt treba sadržavati:

1. Tehnički opis
2. Proračun horizontalne geometrije
3. Proračun proširenja kolnika u krivini
4. Proračun vertikalne geometrije i kota nivelete
5. Proračun vitoperenja kolnika
6. Građevinska situacija MJ. 1:1000
7. Uzdužni presjek MJ. 1:1000/100
8. Normalni poprečni presjek MJ. 1:50
9. Karakteristični poprečni presjeci MJ. 1:100
10. Predmjer radova
11. Aproximativni troškovnik

Predmetna nastavnica:


izv.prof.dr.sc. Deana Breški, dipl.ing.grad.

2. TEHNIČKI OPIS

2.1 Općenito

Na priloženoj geodetskoj podlozi u mjerilu 1:1000 izrađen je idejni projekt ceste na dionici od točke A, koja se nalazi na 258 metara nadmorske visine, do točke B koja se nalazi na 241 metra nadmorske visine. Cesta je projektirana na prosječni godišnji dnevni promet od 950 vozila na dan i pripada

cestama 5. kategorije na brdovitom terenu. Predviđena projektna brzina za ovu kategoriju ceste je $V_p = 40$ km/h.

2.2 Horizontalni elementi

Za određenu kategoriju ceste prema pravilniku, minimalni radijus krivine je 45 m, a prijelaznice 30 m.

Duljina trase iznosi 366 m, a sastoji se od dva pravca i tri krivine. Prva krivina ima radijus $R = 60$ m i duljinu prijelaznice $L = 40$ m. Druga krivina je radijusa $R = 45$ m i duljine prijelaznice $L = 30$ m. Trećoj je radijus $R = 70$ m, a duljina prijelaznice $L = 30$ m. Svaka krivina je konstruirana pomoću dvije prijelazne krivine oblika klotoide i jednog kružnog luka.

2.3 Vertikalni elementi

Maksimalni dozvoljeni nagib nivelete je 12%, a minimalni radijus krivine 300 m.

U programu se tok sastoji od dva pravca i jedne krivine. Nagib prvog pravca je 4.55%, a drugog 3.71%. Tangenta krivine je dužine 69.82 m, a radijus krivine 8393.66 m.

2.4 Poprečni presjek

Cesta 5. kategorije ima dva kolnička traka svaki širine 3 m, betonski rubni trak širine 0.2 m, bankine širine 1.0 m i nagiba 4%. Cesta se dijelom nalazi u zasjeku, dijelom u nasipu, a dijelom u usjeku. Na usjecima se izvode rigoli za odvodnju vode i drenaža koja je postavljena u glinenu posteljicu. Nagibi usjeka su 2:1, a nasipa 1:1,5.

2.5 Kolnička konstrukcija

Projektom je predviđena kolnička konstrukcija sa sljedećim slojevima:

- Habajući sloj AC 11 surf (BIT50/70) AG4 M4 u debljini 4 cm
- Nosivi sloj AC 22 base (BIT50/70) AG6 M2 u debljini 6 cm
- Mehanički zbijeni nosivi sloj debljine 25 cm

2.6 Odvodnja

Odvodnja kolnika predviđa se otvorenim sustavom odvodnje prihvaćanjem vode u zasjeku i usjeku u betonske rigole te kontroliranim ispuštanjem vode u teren direktno.

2.7 Oprema ceste

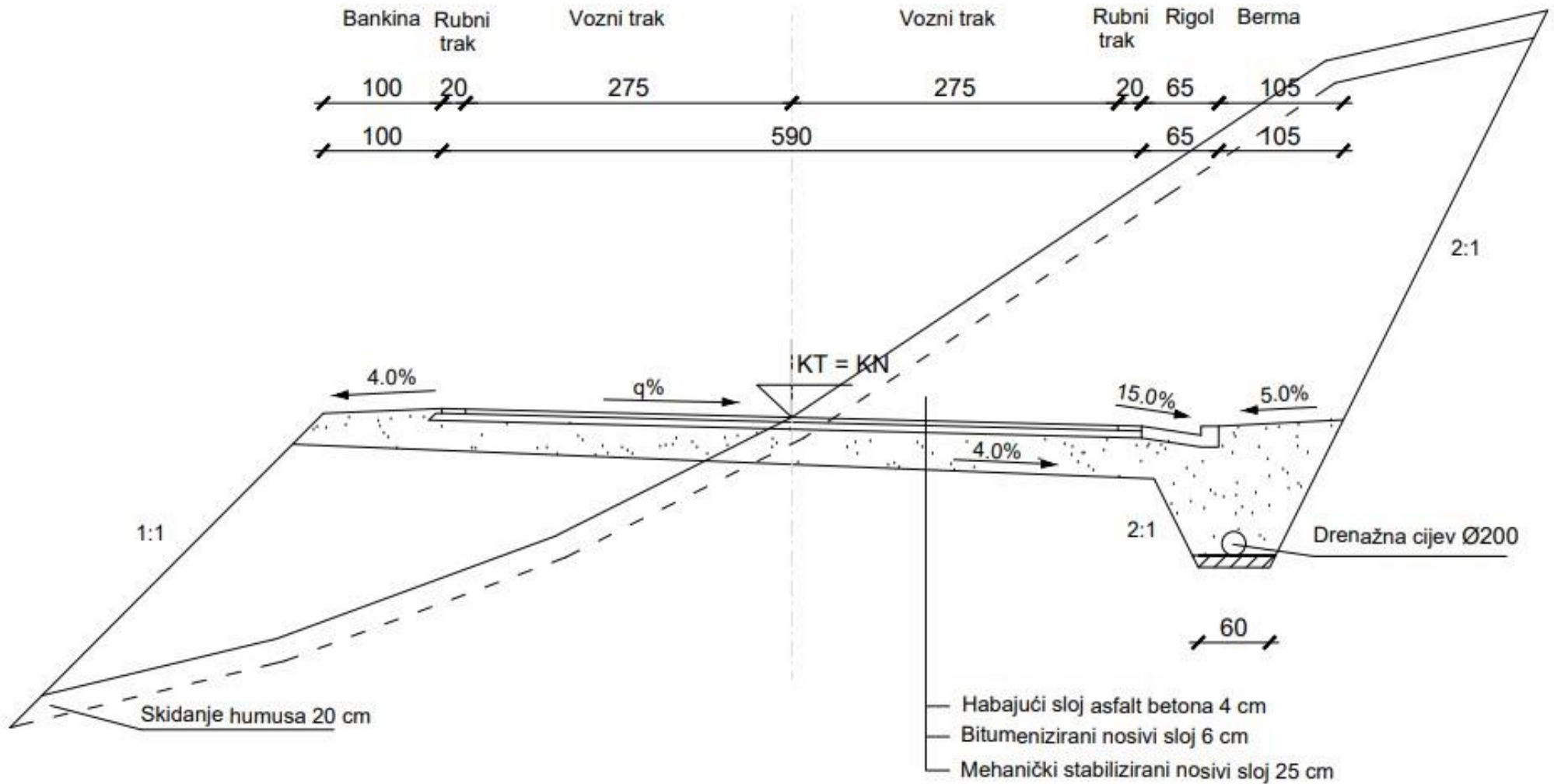
Idejnim rješenjem je predviđena horizontalna signalizacija koja se sastoji od jedne pune razdjelne crte širine 10 cm koja se postavlja u osi prometnice i punih rubnih crta širine 10 cm koje se postavljaju na svaki od rubnih trakova. Na nasip se postavlja jednostrana zaštitna čelična ograda.

3. GRAFIČKI PRILOZI
3.1 Situacija M 1:1000

3.2 Uzdužni presjek M 1:1000/100

3.3 Normalni poprečni presjek M 1:50

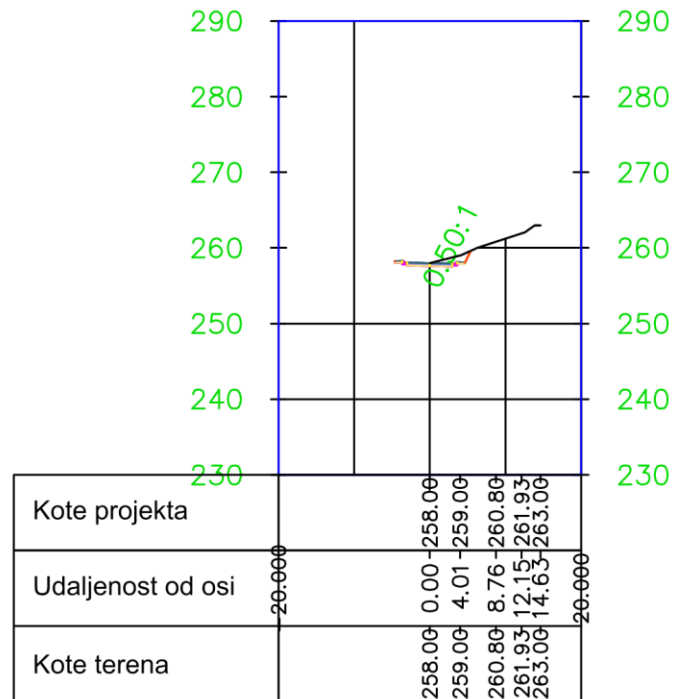
NORMALNI POPREČNI PRESJEK M 1:50



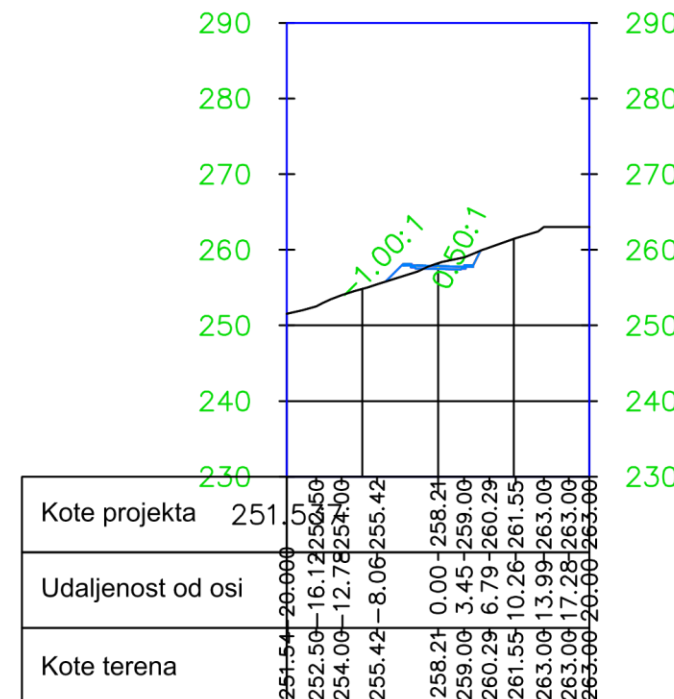
3.4 Karakteristični poprečni presjeci M 1:200

KARAKTERISTIČNI POPREČNI PRESJECI M 1:100

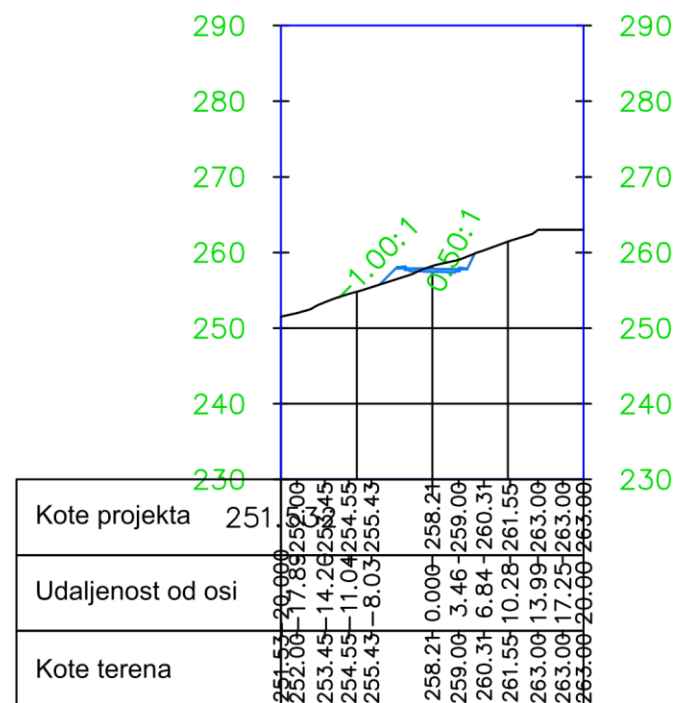
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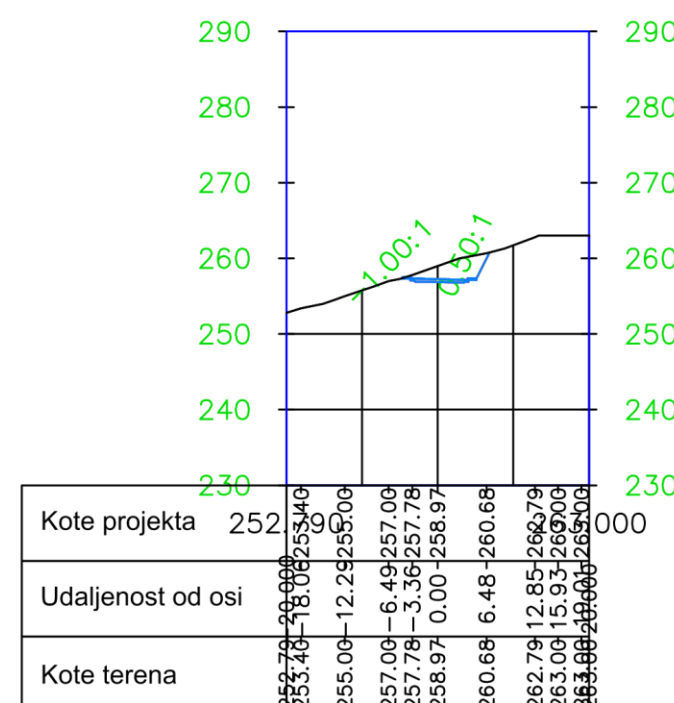
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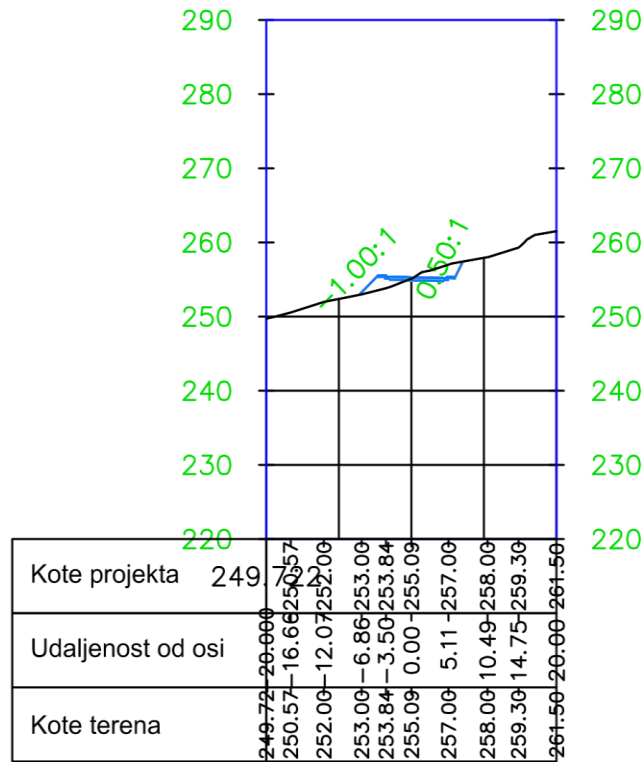
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SADRŽAJ: KARAK.POPREČNI PRESJECI MJERILO: M 1 : 100

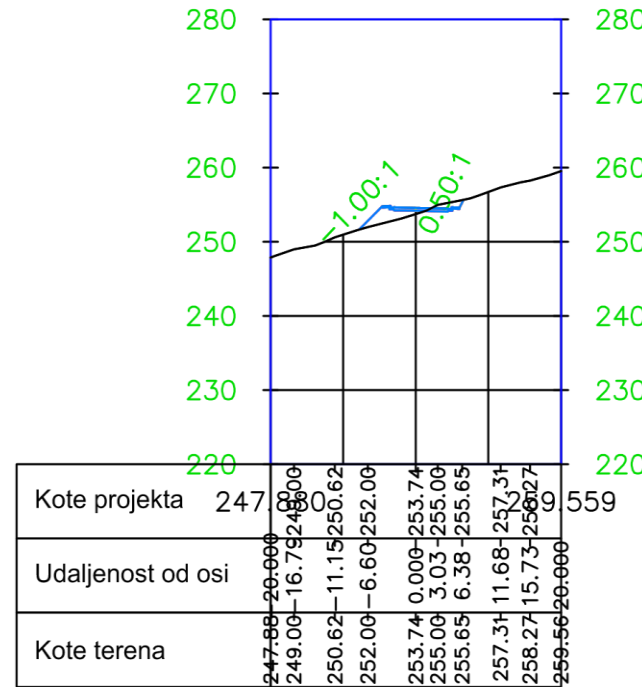
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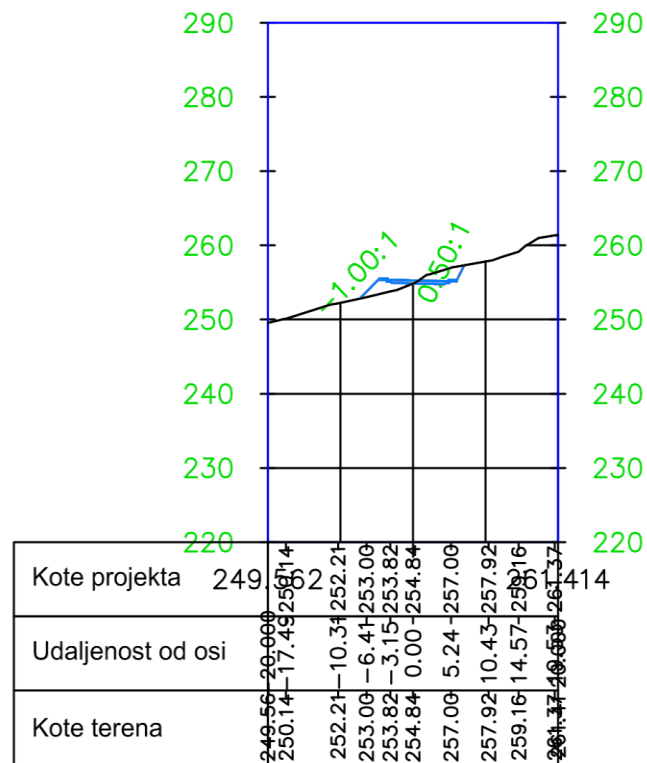
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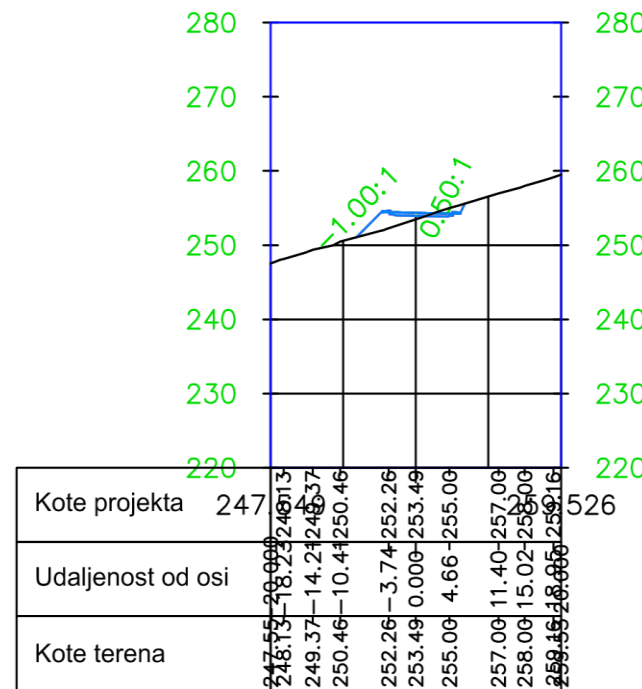
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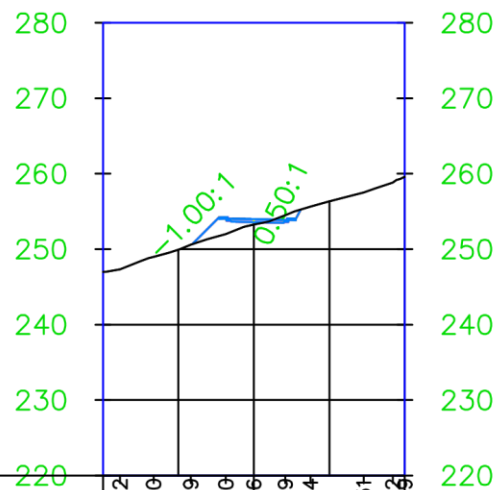
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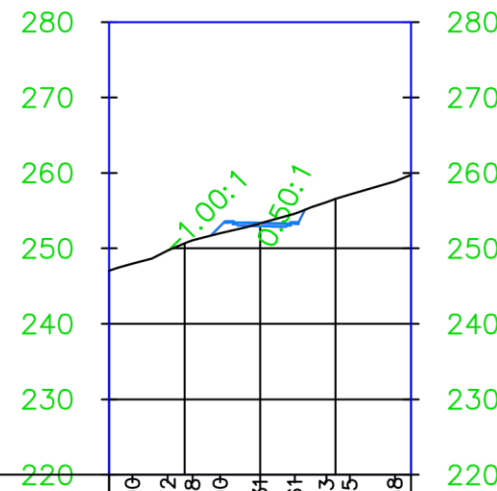
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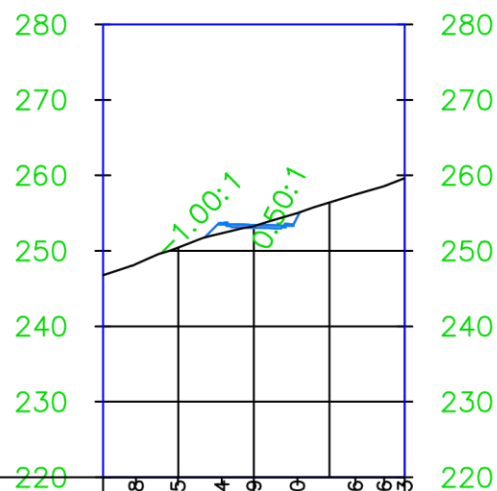
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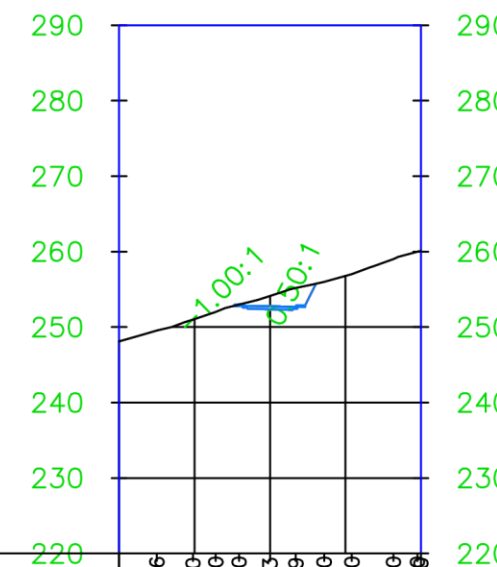
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Udaljenost od osi	0.00	16.92	12.24	8.96	5.29	0.00	4.58	8.80	11.88	17.87
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0+100.00



Kote projekta	246.77	248.28	250.45	252.34	253.29	255.00	257.46	258.56	259.63
Udaljenost od osi	0.00	15.63	10.05	4.26	0.00	5.78	13.45	17.26	20.00
Kote terena	246.77	248.28	250.45	252.34	253.29	255.00	257.46	258.56	259.63

0+115.30



Kote projekta	248.10	249.56	251.00	252.00	253.00	254.13	255.19	256.00	257.00	259.00
Udaljenost od osi	0.00	14.98	10.28	7.18	4.09	0.00	3.43	7.18	10.86	16.37
Kote terena	248.10	249.56	251.00	252.00	253.00	254.13	255.19	256.00	257.00	259.00



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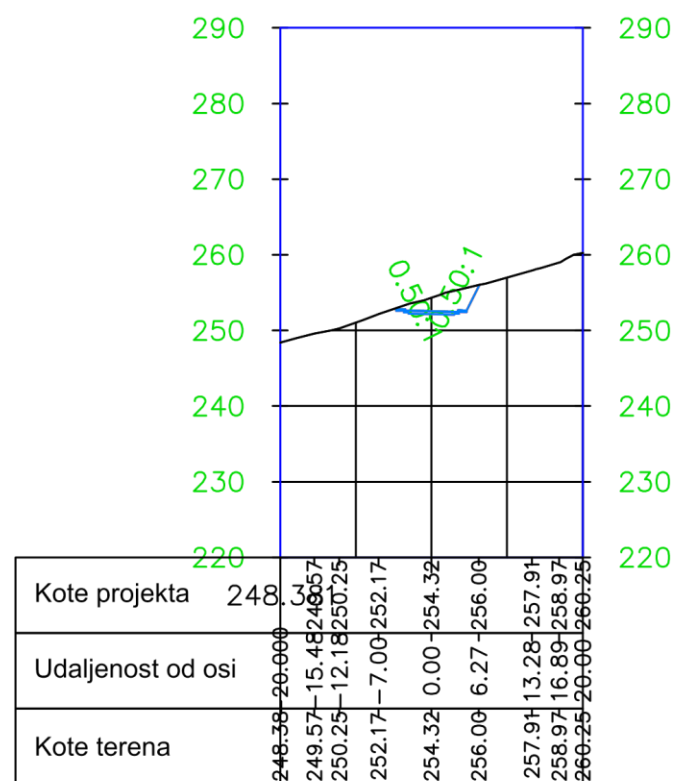
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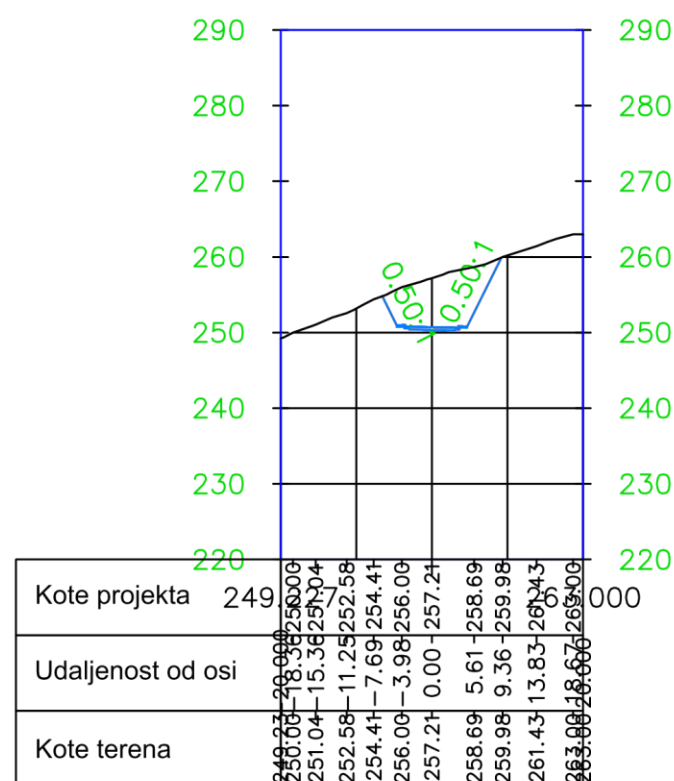
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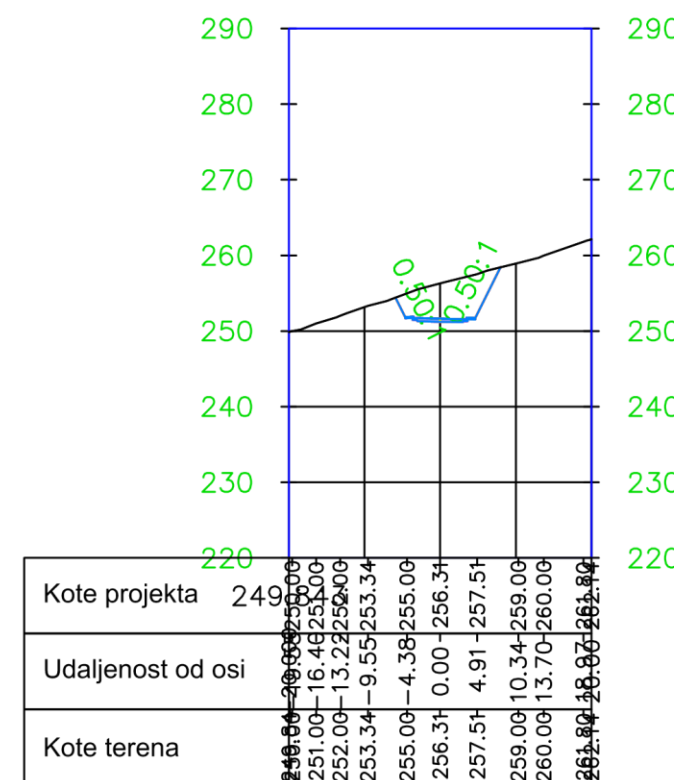
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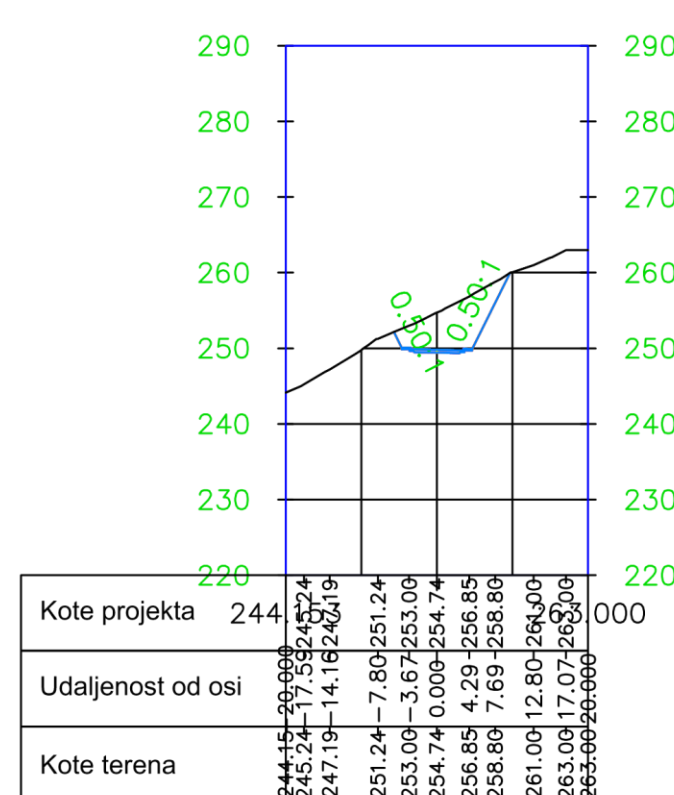
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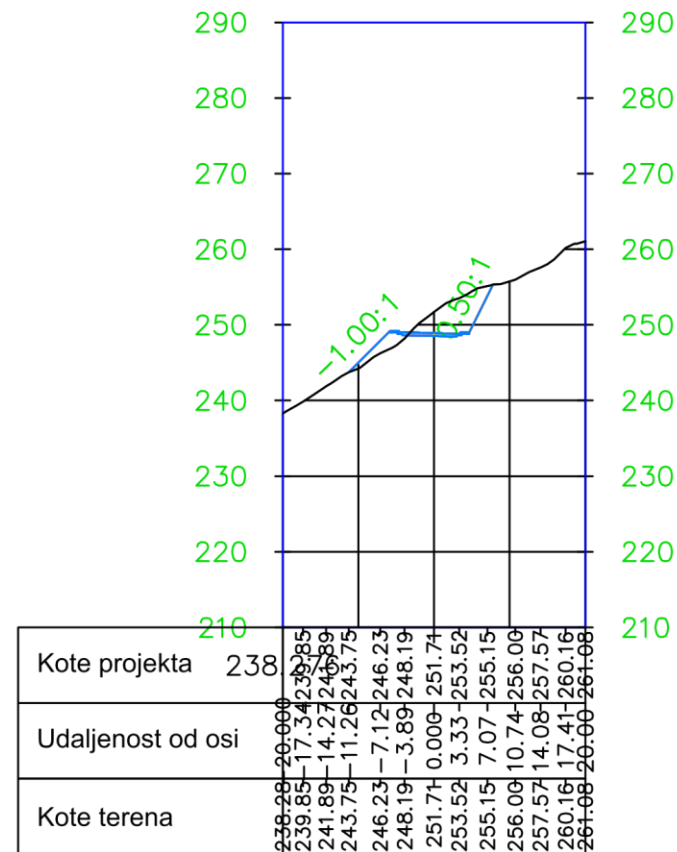
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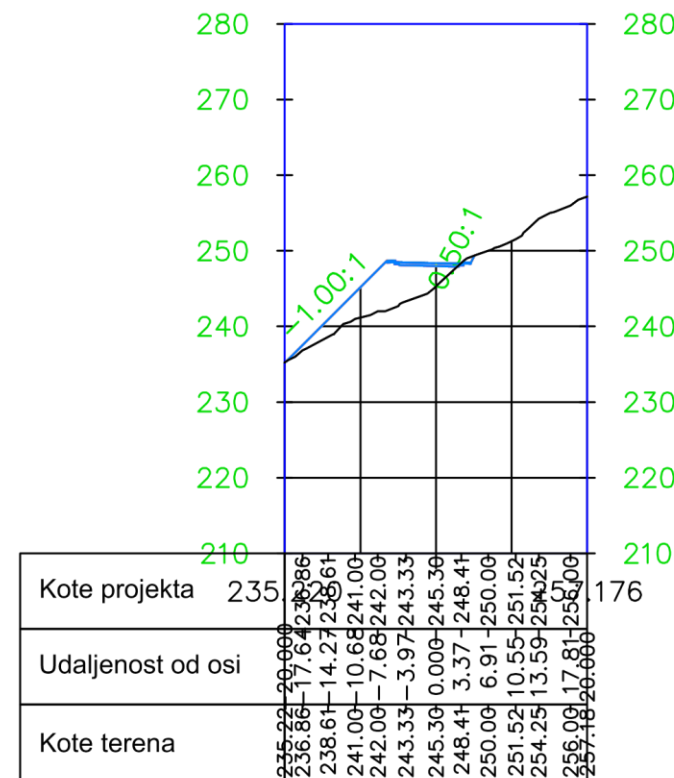
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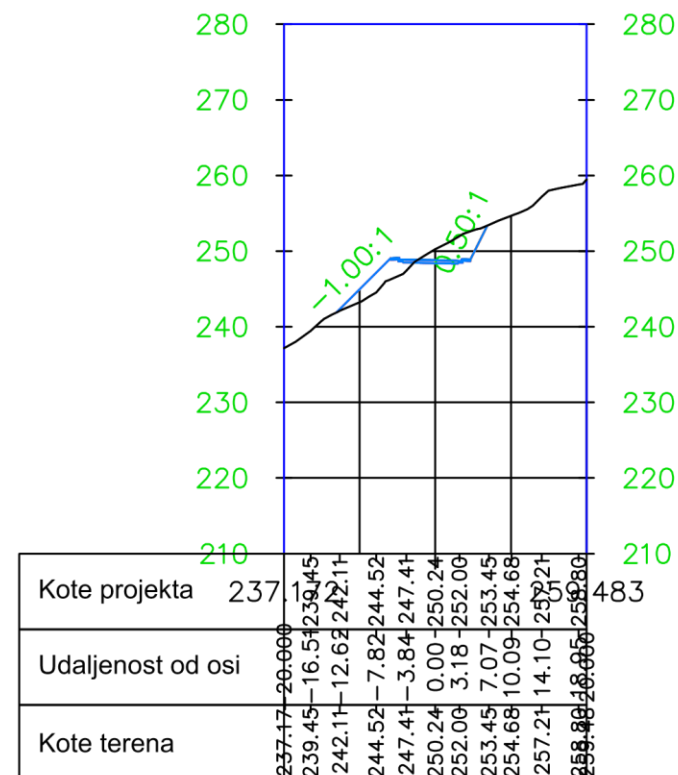
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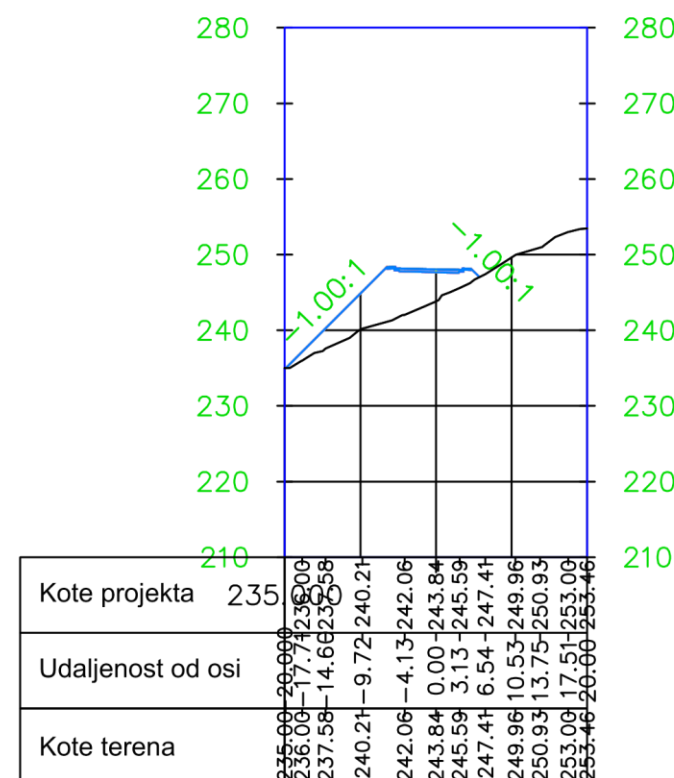
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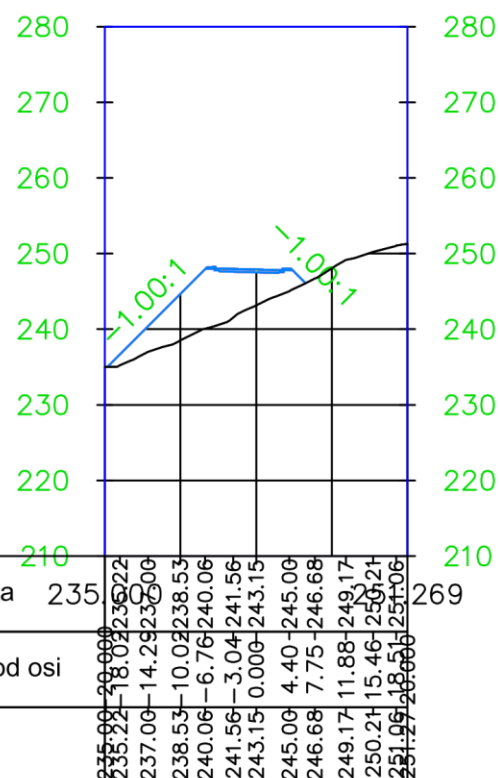
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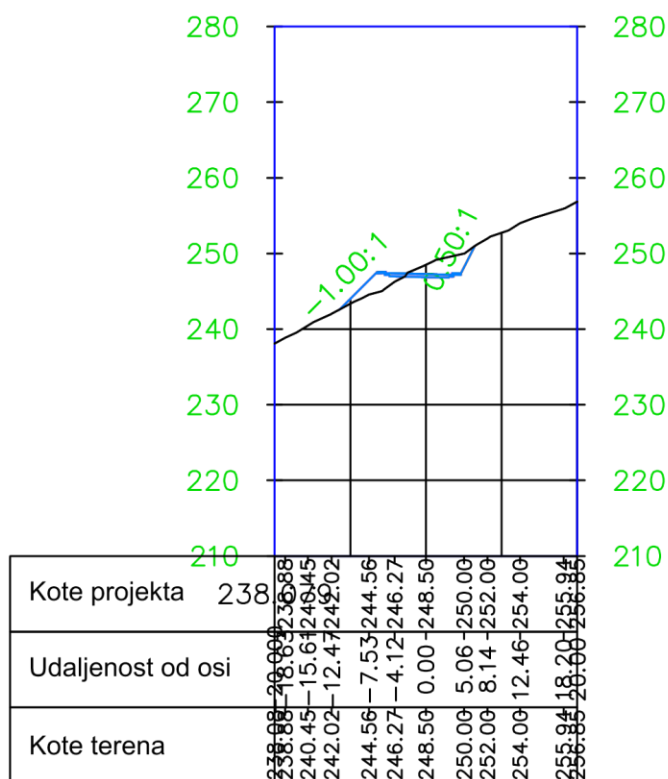
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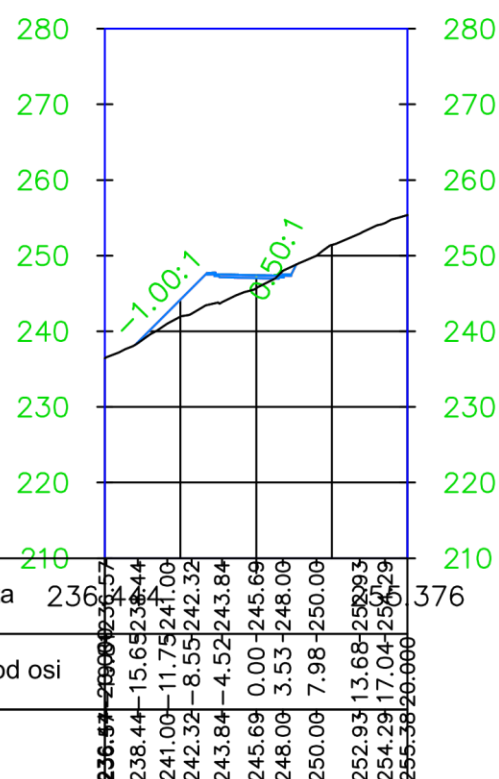
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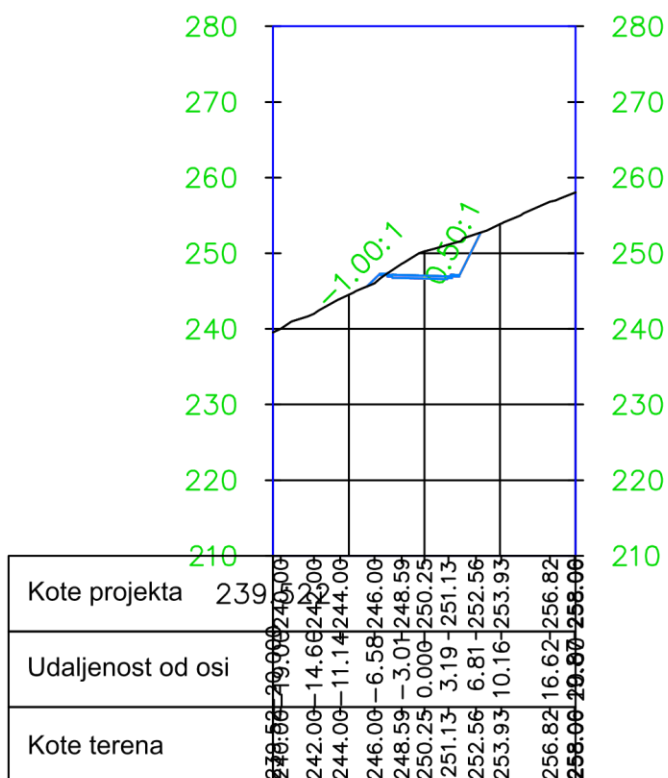
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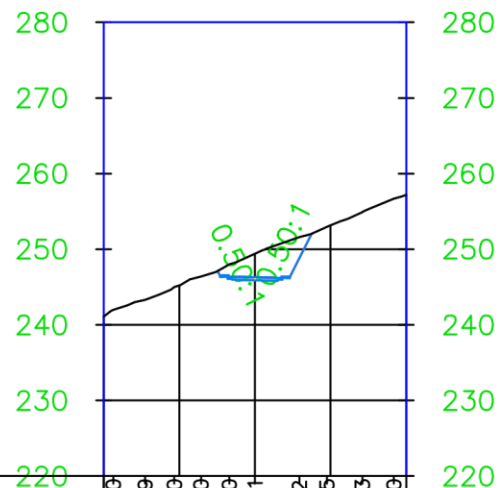
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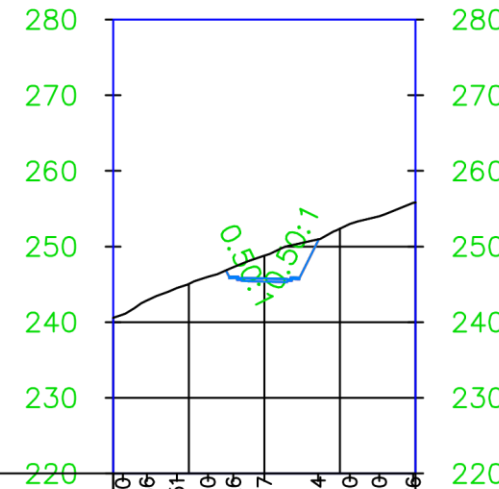
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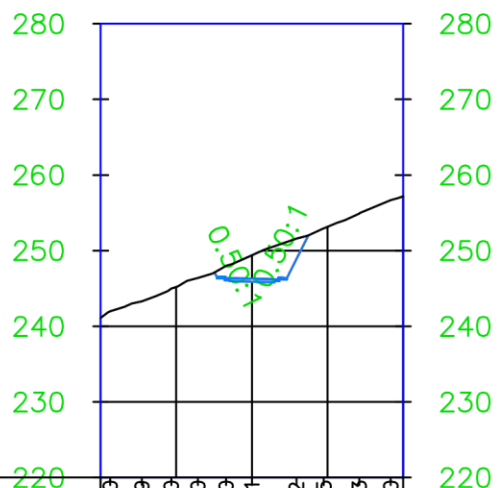
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Udaljenost od osi	-18.99	-18.99	-14.54	-10.66	-7.14	-3.41	0.00	5.88	9.52	14.20	18.37	22.66	26.00		
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0+280.00



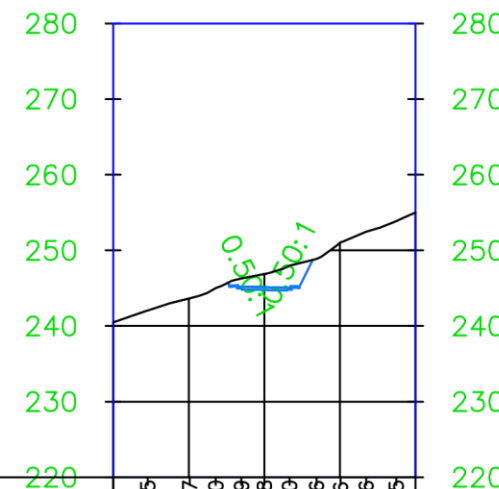
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Kote terena	242.86	244.51	246.00	247.26	248.77	250.94	253.00	254.00	255.00					

0+265.93



Kote projekta	241.00	242.00	243.00	244.00	245.00	246.00	247.00	248.00	249.41	251.62	252.95	254.93	256.70	257.20	195
Udaljenost od osi	-18.99	-18.99	-14.54	-10.66	-7.14	-3.41	0.00	5.88	9.52	14.20	18.37	22.66	26.00		
Kote terena	242.00	243.29	245.00	246.40	248.00	249.41	251.62	252.95	254.93	256.70	257.20				

0+297.00



Kote projekta	240.50	242.05	243.67	245.00	246.29	246.88	248.00	248.86	251.06	252.46	253.85	255.00	20.000	001
Udaljenost od osi	-18.99	-15.48	-11.57	-7.46	-4.09	0.000	7.11	11.30	15.19	18.85	22.00	25.57		
Kote terena	242.86	244.51	246.00	247.26	248.77	250.94	253.00	254.00	255.00					



SVEUČILIŠTE U SPLITU,
FAKULTET GRAĐEVINARSTVA
ARHITEKTURE I GEODEZIJE
2100 SPLIT, MATICE HRVATSKE
15

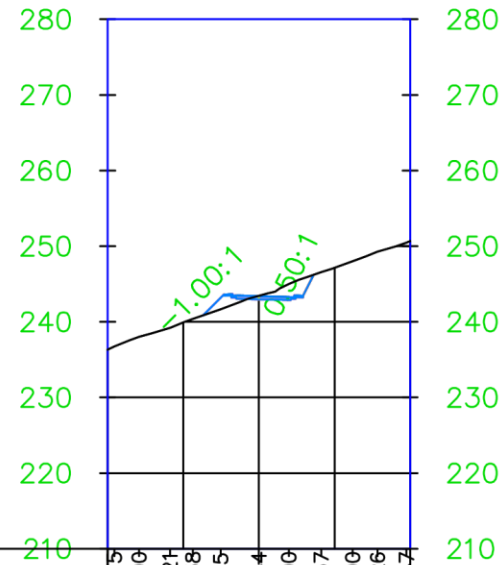
ZAVRŠNI RAD - CESTE

IDEJNI PROJEKT LOKALNE CESTE

IZRADILA:	ANTEA MATAS	MENTOR:	Prof.dr.sc. Dražen Cvitanić
SADRŽAJ:	KARAK.POPREČNI PRESJECI	MJERILO:	M 1 : 200
DATUM:	01.09.2021.	PRILOG:	3

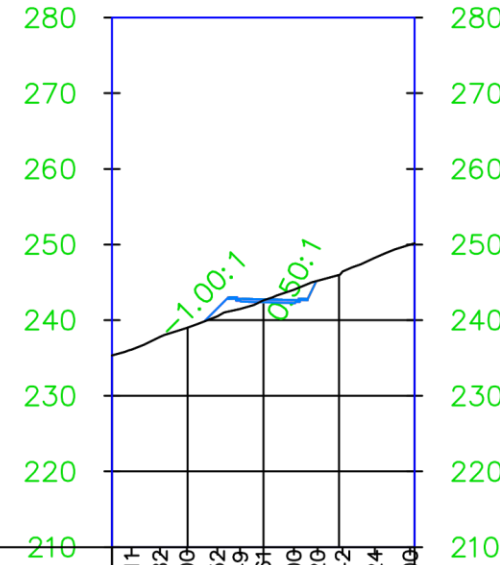
KARAKTERISTIČNI POPREČNI PRESJECI M 1:100

0+344.13



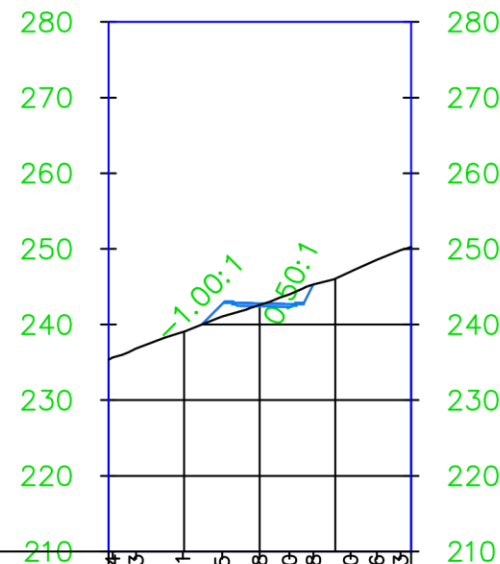
Kote projekta	236	236.75	236.99	236.75	236.00	235.00	236.86
Udaljenost od osi		0.00	1.00	2.00	3.00	4.00	5.00
Kote terena		236.75	236.99	236.75	236.00	235.00	236.86

0+361.25



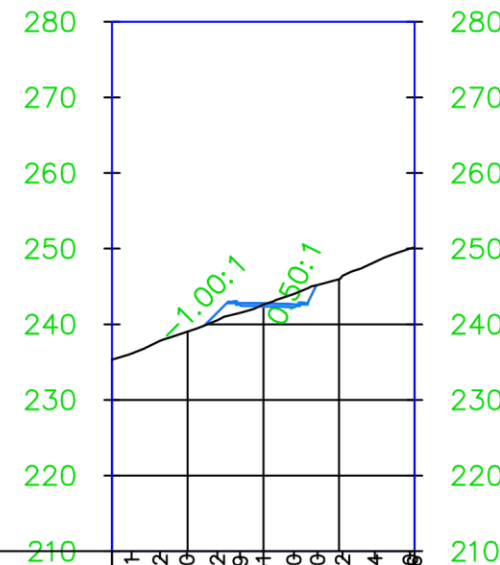
Kote projekta	235	235.32	20.00	236.11	237.82	239.00	240.52	241.49	242.61	244.00	245.20	246.42	248.24	250.00
Udaljenost od osi		0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
Kote terena		235.32	20.00	236.11	237.82	239.00	240.52	241.49	242.61	244.00	245.20	246.42	248.24	250.00

0+360.00



Kote projekta	235	235.77	20.00	236.56	238.27	239.01	241.05	242.58	244.00	245.28	247.00	248.56	249.83	250.00
Udaljenost od osi		0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
Kote terena		235.77	20.00	236.56	238.27	239.01	241.05	242.58	244.00	245.28	247.00	248.56	249.83	250.00

0+361.25



Kote projekta	235	235.32	20.00	236.11	237.82	239.00	240.52	241.49	242.61	244.00	245.20	246.42	248.24	250.00
Udaljenost od osi		0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00	11.00	12.00
Kote terena		235.32	20.00	236.11	237.82	239.00	240.52	241.49	242.61	244.00	245.20	246.42	248.24	250.00



SVEUČILIŠTE U SPLITU,
FAKULTET GRAĐEVINARSTVA
ARHITEKTURE I GEODEZIJE
2100 SPLIT, MATICE HRVATSKE

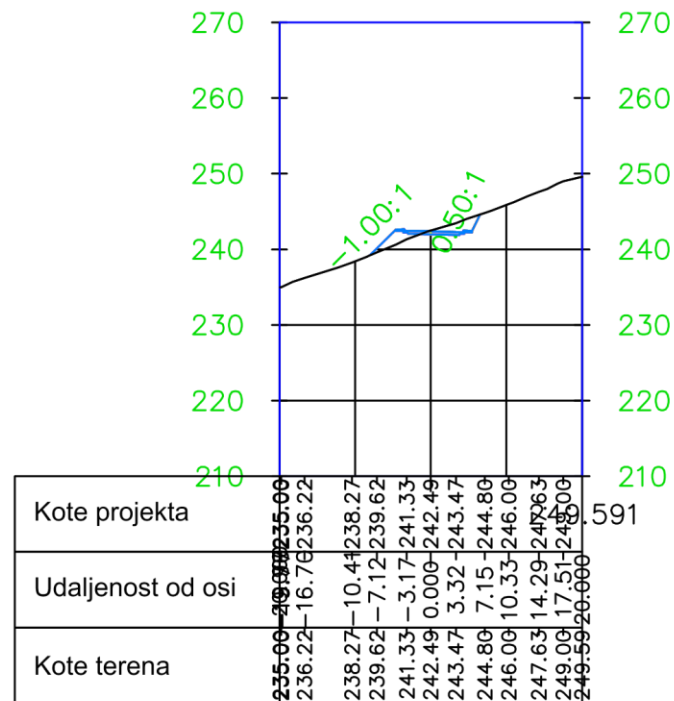
ZAVRŠNI RAD - CESTE

IDEJNI PROJEKT LOKALNE CESTE

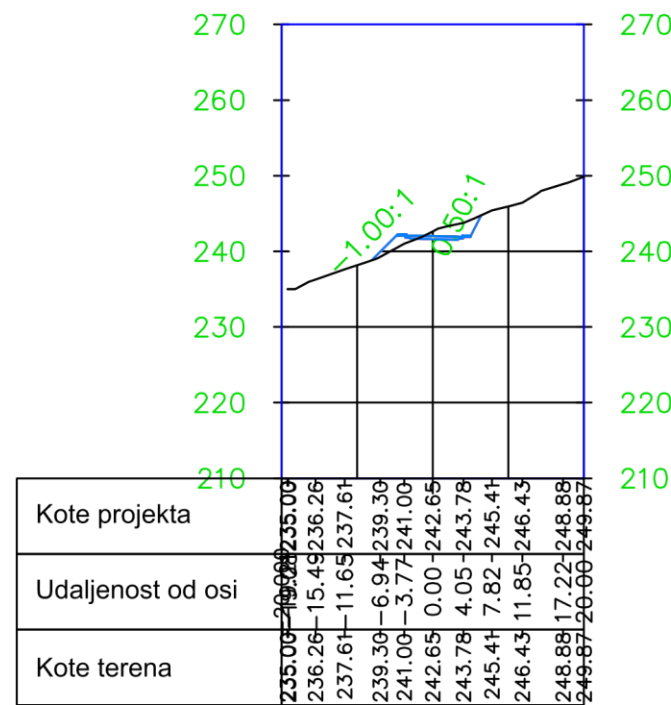
IZRADILA:	ANTEA MATAS	MENTOR:	Prof.dr.sc. Dražen Cvitanić
SADRŽAJ:	KARAK.POPREČNI PRESJECI	MJERILO:	M 1 : 200
DATUM:	01.09.2021.	PRILOG:	3

KARAKTERISTIČNI POPREČNI PRESJECI M 1:100

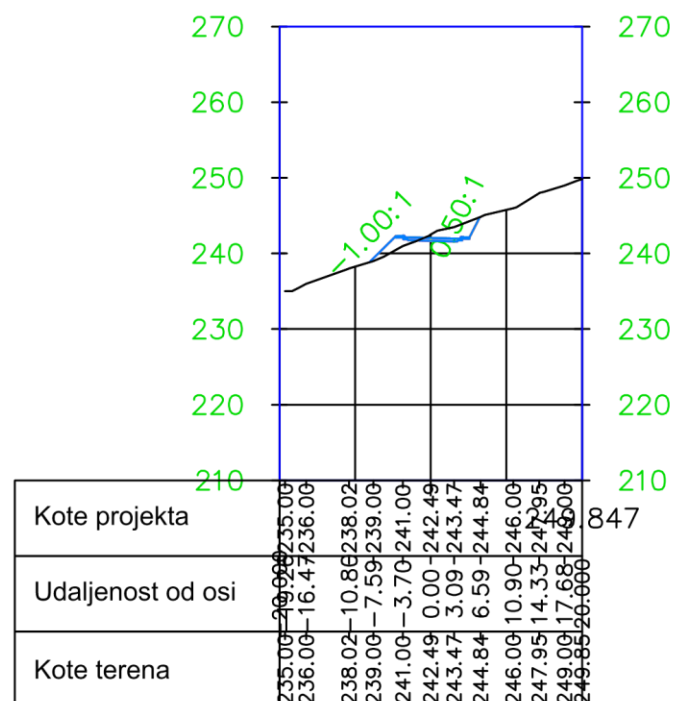
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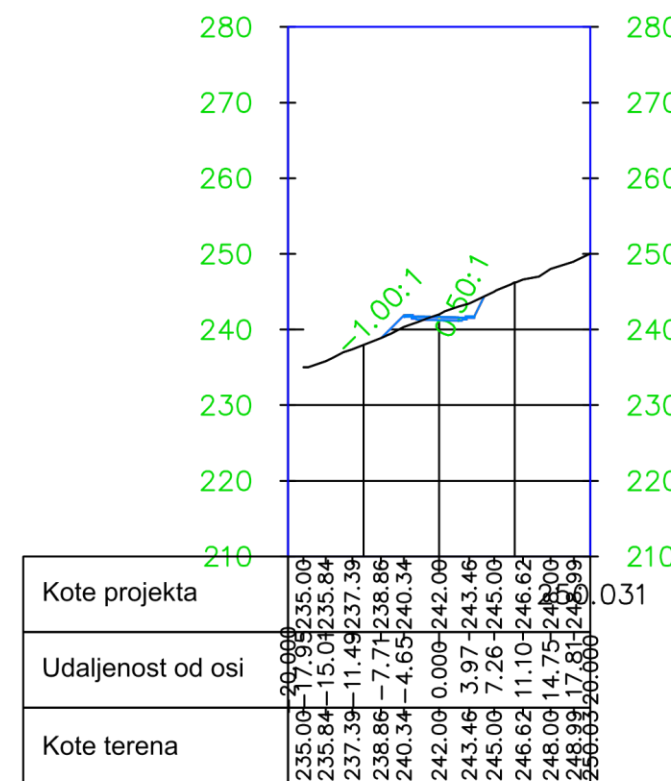
0+381.25



0+380.00



0+391.25



SVEUČILIŠTE U SPLITU,
FAKULTET GRAĐEVINARSTVA
ARHITEKTURE I GEODEZIJE
2100 SPLIT, MATICE HRVATSKE

ZAVRŠNI RAD - CESTE

IDEJNI PROJEKT LOKALNE CESTE

IZRADILA:	ANTEA MATAS	MENTOR:	Prof.dr.sc. Dražen Cvitanić
SADRŽAJ:	KARAK.POPREČNI PRESJECI	MJERILO:	M 1 : 200
DATUM:	01.09.2021.	PRILOG:	3

4. TABLICA UKUPNOG VOLUMENA ZEMLJANIH RADOVA

Tablica 1. Ukupni volumen zemljanih radova

Station	Cut Area (Sq.m.)	Cut Volume (Cu.m.)	Reusable Volume (Cu.m.)	Fill Area (Sq.m.)	Fill Volume (Cu.m.)	Cum. Cut Vol. (Cu.m.)	Cum. Reusable Vol. (Cu.m.)	Cum. Fill Vol. (Cu.m.)	Cum. Net Vol. (Cu.m.)
0+000.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0+003.216	7.47	12.02	12.02	3.88	6.24	12.02	12.02	6.24	5.78
0+003.250	7.51	0.25	0.25	3.86	0.13	12.27	12.27	6.37	5.90
0+016.550	22.94	201.25	201.25	0.00	26.01	213.53	213.53	32.39	181.14
0+020.000	23.02	78.18	78.18	0.00	0.02	291.71	291.71	32.40	259.30
0+029.883	24.11	227.86	227.86	0.01	0.08	519.56	519.56	32.48	487.08
0+040.000	27.96	254.40	254.40	0.04	0.26	773.96	773.96	32.74	741.22
0+043.216	23.98	79.82	79.82	0.14	0.30	853.78	853.78	33.05	820.74
0+059.256	9.65	255.69	255.69	6.35	55.73	1109.48	1109.48	88.78	1020.70
0+060.000	9.04	6.95	6.95	7.27	5.07	1116.43	1116.43	93.85	1022.59
0+075.296	4.19	94.27	94.27	9.77	138.81	1210.70	1210.70	232.66	978.04
0+080.000	3.87	17.66	17.66	11.42	52.89	1228.36	1228.36	285.55	942.81
0+088.629	3.00	27.98	27.98	10.01	97.28	1256.34	1256.34	382.83	873.51
0+100.000	5.88	48.91	48.91	3.44	79.25	1305.25	1305.25	462.08	843.17
0+101.962	6.08	11.74	11.74	3.45	6.76	1316.98	1316.98	468.84	848.14
0+115.296	17.59	156.88	156.88	0.01	23.36	1473.86	1473.86	492.20	981.66
0+115.300	17.60	0.08	0.08	0.01	0.00	1473.94	1473.94	492.20	981.74
0+120.000	22.03	93.13	93.13	0.00	0.03	1567.07	1567.07	492.23	1074.83
0+140.000	57.44	794.69	794.69	0.00	0.00	2361.76	2361.76	492.23	1869.52
0+160.000	84.31	1417.47	1417.47	0.00	0.00	3779.22	3779.22	492.23	3286.99
0+180.000	67.77	1520.79	1520.79	0.00	0.00	5300.02	5300.02	492.23	4807.78
0+182.746	63.03	179.61	179.61	0.00	0.00	5479.63	5479.63	492.23	4987.39
0+182.750	63.03	0.23	0.23	0.00	0.00	5479.85	5479.85	492.23	4987.62
0+185.096	62.58	147.33	147.33	0.00	0.00	5627.18	5627.18	492.23	5134.94
0+191.746	41.45	349.21	349.21	0.13	0.43	5976.38	5976.38	492.66	5483.72

0+192.746	37.83	39.64	39.64	0.06	0.10	6016.03	6016.03	492.76	5523.27
0+200.000	35.66	273.76	273.76	9.37	31.81	6289.79	6289.79	524.56	5765.22
0+202.746	20.90	80.51	80.51	16.80	32.32	6370.30	6370.30	556.88	5813.42
0+212.746	1.10	115.63	115.63	70.38	377.93	6485.92	6485.92	934.81	5551.11
0+220.000	0.00	4.37	4.37	93.74	506.33	6490.30	6490.30	1441.15	5049.15
0+224.337	0.00	0.00	0.00	114.08	387.10	6490.30	6490.30	1828.24	4662.05
0+235.928	1.87	11.80	11.80	37.35	754.80	6502.10	6502.10	2583.04	3919.06
0+240.000	16.02	38.26	38.26	10.67	84.66	6540.36	6540.36	2667.70	3872.65
0+245.928	36.72	161.34	161.34	0.92	30.33	6701.70	6701.70	2698.03	4003.67
0+254.916	37.31	339.10	339.10	0.00	3.82	7040.79	7040.79	2701.85	4338.94
0+255.928	37.06	37.61	37.61	0.00	0.00	7078.40	7078.40	2701.85	4376.55
0+256.928	37.28	37.17	37.17	0.00	0.00	7115.57	7115.57	2701.85	4413.72
0+260.000	38.94	117.09	117.09	0.00	0.00	7232.67	7232.67	2701.85	4530.82
0+265.928	38.23	228.72	228.72	0.00	0.00	7461.39	7461.39	2701.85	4759.54
0+265.930	38.23	0.09	0.09	0.00	0.00	7461.48	7461.48	2701.85	4759.63
0+280.000	37.08	529.79	529.79	0.00	0.00	7991.26	7991.26	2701.85	5289.41
0+296.999	22.72	508.26	508.26	0.00	0.00	8499.52	8499.52	2701.85	5797.68
0+297.000	22.72	0.01	0.01	0.00	0.00	8499.54	8499.54	2701.85	5797.69
0+300.000	22.17	67.34	67.34	0.00	0.00	8566.88	8566.88	2701.85	5865.02
0+306.999	24.10	160.78	160.78	0.28	0.99	8727.65	8727.65	2702.85	6024.81
0+316.999	27.36	252.67	252.67	0.00	1.49	8980.32	8980.32	2704.33	6275.99
0+320.000	24.65	75.98	75.98	0.35	0.57	9056.30	9056.30	2704.90	6351.40
0+326.999	15.36	134.67	134.67	1.71	7.61	9190.97	9190.97	2712.51	6478.46
0+326.999	15.36	0.00	0.00	1.71	0.00	9190.97	9190.97	2712.51	6478.46
0+340.000	11.85	167.99	167.99	4.43	42.55	9358.96	9358.96	2755.07	6603.89
0+344.127	10.71	44.04	44.04	5.10	20.98	9403.00	9403.00	2776.04	6626.96
0+360.000	8.44	143.32	143.32	6.15	95.01	9546.32	9546.32	2871.06	6675.26

0+361.254	8.67	10.12	10.12	6.48	8.42	9556.44	9556.44	2879.47	6676.96
0+361.254	8.67	0.00	0.00	6.48	0.00	9556.44	9556.44	2879.47	6676.96
0+371.254	8.46	81.90	81.90	6.14	66.54	9638.34	9638.34	2946.01	6692.32
0+380.000	10.88	82.55	82.55	5.63	53.35	9720.89	9720.89	2999.36	6721.52
0+381.254	11.41	13.98	13.98	4.98	6.66	9734.86	9734.86	3006.02	6728.84
0+391.250	9.72	104.92	104.92	4.11	46.01	9839.79	9839.79	3052.03	6787.75
0+391.254	9.73	0.04	0.04	4.11	0.02	9839.83	9839.83	3052.05	6787.78
0+400.000	12.45	96.97	96.97	1.83	25.95	9936.80	9936.80	3078.00	6858.80
0+408.602	8.09	88.36	88.36	6.98	37.89	10025.16	10025.16	3115.90	6909.27

5. OBRADA NA RAČUNALU

5. OBRADA NA RAČUNALU

Za izradu idejnog projekta lokalne ceste korišten je AutoCAD Civil 3D koji znatno olakšava i ubrzava izradu programskog zadatka.

Kao geodetsku podlogu upotrijebljena je već postojeća podloga koju je potrebno skenirati i dodatno prilagoditi mjerilu. Zatim se pomoću podloge iscrtavaju slojnice koristeći se naredbom `polyline` i definira se nadmorska visina pojedine slojnice. Postupkom triangulacije se na tim linijama dobije trodimenzionalni model terena.

Dalje definiramo koordinate točaka tangenti te ih iscrtavamo na terenu. Na sjecištima tangenti definiramo kružne lukove i prijelazne krivine te na taj način definiramo horizontalni tok ceste.

Sljedeći korak je izrada dijagrama vitoperenja pomoću naredbe `edit superelevation`. Zbog američkih standarda vitoperenja koji se razlikuju od europskih potrebno je provesti dodatne korekcije na području prijelaznica.

Slijedi izrada vertikalnog toka trase koja obuhvaća izradu terena i ucrtavanje tangenti nivelete. Niveleta treba postaviti tako da se zadovolje geometrijski i sigurnosni elementi te odvodnja.

Dalje je potrebno definirati poprečni presjek ceste kojim su definirani: poprečni nagib i širina kolnika te pokosi usjeka i nasipa.

Pomoću definiranog poprečnog presjeka, vertikalnog i horizontalnog toka trase izrađuje se koridor.

On omogućuje uvid u poprečne presjeke u svim karakterističnim i zadanim točkama osi ceste.

Koristeći naredbu `report manager` izrađujemo računalne ispise glavnih točaka osi ceste, detaljne točke osi ceste, kote kolnika te vertikalnog toka trase.

6. IZLAZNI PODACI IZ PROGRAMA

6.1 Koordinatni račun glavnih točaka

Tablica 2. Koordinatni račun glavnih točaka

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	-214.349	-945.646
End:	0+03.216	-211.608	-943.964

Tangent Data

Parameter	Value	Parameter	Value
Length:	3.216	Course:	N 31° 31' 53.3062" E

Spiral Point Data

Description	Station	Northing	Easting
TS:	0+03.216	-211.608	-943.964
SPI:		-188.744	-929.936
SC:	0+43.216	-180.196	-919.518

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	40.000	L Tan:	26.824
Radius:	60.000	S Tan:	13.476
Theta:	19° 05' 54.9354"	P:	1.107
X:	39.558	K:	19.926
Y:	4.409	A:	48.990
Chord:	39.803	Course:	N 37° 53' 30.0023" E

Curve Point Data

Description	Station	Northing	Easting
SC:	0+43.216	-180.196	-919.518
RP:		-226.580	-881.458
CS:	0+75.296	-167.276	-890.572

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	30° 38' 00.2030"	Type:	RIGHT
Radius:	60.000		
Length:	32.079	Tangent:	16.433
Mid-Ord:	2.131	External:	2.210
Chord:	31.698	Course:	N 65° 56' 48.3431" E

Spiral Point Data

Description	Station	Northing	Easting
CS:	0+75.296	-167.276	-890.572
SPI:		-165.229	-877.252
ST:	1+15.296	-170.054	-850.866

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	40.000	L Tan:	26.824
Radius:	60.000	S Tan:	13.476
Theta:	19° 05' 54.9354"	P:	1.107
X:	39.558	K:	19.926
Y:	4.409	A:	48.990
Chord:	39.803	Course:	S 85° 59' 53.3161" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	1+15.296	-170.054	-850.866
End:	1+82.746	-182.186	-784.515

Tangent Data

Parameter	Value	Parameter	Value
Length:	67.451	Course:	S 79° 38' 16.6200" E

Spiral Point Data

Description	Station	Northing	Easting
TS:	1+82.746	-182.186	-784.515
SPI:		-185.805	-764.726
SC:	2+12.746	-184.270	-754.736

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	30.000	L Tan:	20.118
Radius:	45.000	S Tan:	10.107
Theta:	19° 05' 54.9354"	P:	0.830
X:	29.668	K:	14.945
Y:	3.307	A:	36.742
Chord:	29.852	Course:	S 85° 59' 53.3161" E

Curve Point Data

Description	Station	Northing	Easting
SC:	2+12.746	-184.270	-754.736
RP:		-139.792	-761.571
CS:	2+35.928	-175.130	-733.711

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	29° 30' 55.1688"	Type:	LEFT
Radius:	45.000		
Length:	23.181	Tangent:	11.854
Mid-Ord:	1.484	External:	1.535
Chord:	22.926	Course:	N 66° 30' 20.8602" E

Spiral Point Data

Description	Station	Northing	Easting
CS:	2+35.928	-175.130	-733.711
SPI:		-168.873	-725.774
ST:	2+65.928	-151.934	-714.920

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	30.000	L Tan:	20.118
Radius:	45.000	S Tan:	10.107
Theta:	19° 05' 54.9354"	P:	0.830
X:	29.668	K:	14.945
Y:	3.307	A:	36.742
Chord:	29.852	Course:	N 39° 00' 35.0365" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	2+65.928	-151.934	-714.920
End:	2+96.999	-125.772	-698.157

Tangent Data

Parameter	Value	Parameter	Value
Length:	31.072	Course:	N 32° 38' 58.3404" E

Spiral Point Data

Description	Station	Northing	Easting
TS:	2+96.999	-125.772	-698.157
SPI:		-108.892	-687.341
SC:	3+26.999	-101.781	-680.248

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	30.000	L Tan:	20.048

Radius:	70.000	S Tan:	10.044
Theta:	12° 16' 39.6013"	P:	0.535
X:	29.863	K:	14.977
Y:	2.136	A:	45.826
Chord:	29.939	Course:	N 36° 44' 25.8073" E

Curve Point Data

Description	Station	Northing	Easting
SC:	3+26.999	-101.781	-680.248
RP:		-151.215	-630.688
CS:	3+61.254	-84.286	-651.194

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	28° 02' 17.2556"	Type:	RIGHT
Radius:	70.000		
Length:	34.255	Tangent:	17.478
Mid-Ord:	2.085	External:	2.149
Chord:	33.914	Course:	N 58° 56' 46.5696" E

Spiral Point Data

Description	Station	Northing	Easting
CS:	3+61.254	-84.286	-651.194
SPI:		-81.344	-641.591
ST:	3+91.254	-79.681	-621.612

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	30.000	L Tan:	20.048
Radius:	70.000	S Tan:	10.044
Theta:	12° 16' 39.6013"	P:	0.535

X: 29.863 K: 14.977
 Y: 2.136 A: 45.826
 Chord: 29.939 Course: N 81° 09' 07.3318" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	3+91.254	-79.681	-621.612
End:	4+08.602	-78.243	-604.324

Tangent Data

Parameter	Value	Parameter	Value
Length:	17.348	Course:	N 85° 14' 34.7987" E

Alignment: os 1 (1)-Left-3.000

Description:

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	-212.780	-948.203
End:	0+03.216	-210.039	-946.521

Tangent Data

Parameter	Value	Parameter	Value
Length:	3.216	Course:	N 31° 31' 53.3062" E

Spiral Point Data

Description	Station	Northing	Easting
TS:	0+03.216	-210.039	-946.521
SPI:		-186.745	-932.229
SC:	0+44.216	-177.877	-921.421

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	41.000	L Tan:	27.486
Radius:	63.000	S Tan:	13.806
Theta:	18° 38' 37.9131"	P:	1.108
X:	40.568	K:	20.428
Y:	4.414	A:	50.823
Chord:	40.797	Course:	N 37° 58' 09.9710" E

Curve Point Data

Description	Station	Northing	Easting
SC:	0+44.216	-177.877	-921.421
RP:		-226.580	-881.458
CS:	0+77.899	-164.311	-891.028

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	30° 38' 00.2030"	Type:	RIGHT
Radius:	63.000		
Length:	33.683	Tangent:	17.255
Mid-Ord:	2.238	External:	2.320
Chord:	33.283	Course:	N 65° 56' 48.3431" E

Spiral Point Data

Description	Station	Northing	Easting
CS:	0+77.899	-164.311	-891.028
SPI:		-162.188	-877.209
ST:	1+18.899	-167.103	-850.327

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
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Length:	41.000	L Tan:	27.486
Radius:	63.000	S Tan:	13.806
Theta:	18° 38' 37.9131"	P:	1.108
X:	40.568	K:	20.428
Y:	4.414	A:	50.823
Chord:	40.797	Course:	S 86° 04' 33.2848" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	1+18.899	-167.103	-850.327
End:	1+86.350	-179.235	-783.976

Tangent Data

Parameter	Value	Parameter	Value
Length:	67.451	Course:	S 79° 38' 16.6200" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	1+86.350	-179.235	-783.976
End:	1+96.243	-180.277	-774.138

Tangent Data

Parameter	Value	Parameter	Value
Length:	9.893	Course:	S 83° 57' 10.2754" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	1+96.243	-180.277	-774.138
End:	2+05.817	-180.561	-764.568

Tangent Data

Parameter	Value	Parameter	Value
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Length: 9.574

Course: S 88° 18' 01.1213" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	2+05.817	-180.561	-764.568
End:	2+14.977	-179.456	-755.476

Tangent Data

Parameter	Value	Parameter	Value
Length:	9.160	Course:	N 83° 04' 11.4099" E

Curve Point Data

Description	Station	Northing	Easting
PC:	2+14.977	-179.456	-755.476
RP:		-139.792	-761.571
PT:	2+35.649	-171.306	-736.726

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	29° 30' 55.1688"	Type:	LEFT
Radius:	40.130		
Length:	20.673	Tangent:	10.571
Mid-Ord:	1.324	External:	1.369
Chord:	20.445	Course:	N 66° 30' 20.8602" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	2+35.649	-171.306	-736.726
End:	2+44.809	-165.411	-729.715

Tangent Data

Parameter	Value	Parameter	Value
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Length: 9.160 Course: N 49° 56' 30.3105" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	2+44.809	-165.411	-729.715
End:	2+54.383	-158.220	-723.395

Tangent Data

Parameter	Value	Parameter	Value
Length:	9.574	Course:	N 41° 18' 42.8417" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	2+54.383	-158.220	-723.395
End:	2+64.275	-150.315	-717.446

Tangent Data

Parameter	Value	Parameter	Value
Length:	9.893	Course:	N 36° 57' 51.9958" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	2+64.275	-150.315	-717.446
End:	2+95.347	-124.154	-700.683

Tangent Data

Parameter	Value	Parameter	Value
Length:	31.072	Course:	N 32° 38' 58.3404" E

Spiral Point Data

Description	Station	Northing	Easting
TS:	2+95.347	-124.154	-700.683

SPI: -107.002 -689.693
 SC: 3+25.990 -99.662 -682.372

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	30.643	L Tan:	20.476
Radius:	73.000	S Tan:	10.257
Theta:	12° 01' 31.3904"	P:	0.535
X:	30.508	K:	15.299
Y:	2.137	A:	47.296
Chord:	30.580	Course:	N 36° 47' 00.4600" E

Curve Point Data

Description	Station	Northing	Easting
SC:	3+25.990	-99.662	-682.372
RP:		-151.215	-630.688
CS:	3+61.713	-81.418	-652.073

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	28° 02' 17.2556"	Type:	RIGHT
Radius:	73.000		
Length:	35.723	Tangent:	18.227
Mid-Ord:	2.174	External:	2.241
Chord:	35.368	Course:	N 58° 56' 46.5696" E

Spiral Point Data

Description	Station	Northing	Easting
CS:	3+61.713	-81.418	-652.073
SPI:		-78.381	-642.161
ST:	3+92.356	-76.691	-621.860

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	30.643	L Tan:	20.476
Radius:	73.000	S Tan:	10.257
Theta:	12° 01' 31.3904"	P:	0.535
X:	30.508	K:	15.299
Y:	2.137	A:	47.296
Chord:	30.580	Course:	N 81° 06' 32.6791" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	3+92.356	-76.691	-621.860
End:	4+09.703	-75.253	-604.572

Tangent Data

Parameter	Value	Parameter	Value
Length:	17.348	Course:	N 85° 14' 34.7987" E

Alignment: os 1 (1)-Right-3.000

Description:

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	-215.918	-943.089
End:	0+03.216	-213.176	-941.407

Tangent Data

Parameter	Value	Parameter	Value
Length:	3.216	Course:	N 31° 31' 53.3062" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+03.216	-213.176	-941.407
End:	0+16.434	-202.252	-933.966

Tangent Data

Parameter	Value	Parameter	Value
Length:	13.218	Course:	N 34° 15' 30.5398" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+16.434	-202.252	-933.966
End:	0+29.355	-192.145	-925.916

Tangent Data

Parameter	Value	Parameter	Value
Length:	12.921	Course:	N 38° 32' 17.5171" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+29.355	-192.145	-925.916
End:	0+41.905	-183.598	-916.727

Tangent Data

Parameter	Value	Parameter	Value
Length:	12.549	Course:	N 47° 04' 16.4467" E

Curve Point Data

Description	Station	Northing	Easting
PC:	0+41.905	-183.598	-916.727
RP:		-226.580	-881.458
PT:	0+71.631	-171.625	-889.904

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	30° 38' 00.2030"	Type:	RIGHT
Radius:	55.600		
Length:	29.727	Tangent:	15.228
Mid-Ord:	1.975	External:	2.048
Chord:	29.374	Course:	N 65° 56' 48.3431" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+71.631	-171.625	-889.904
End:	0+84.181	-170.493	-877.406

Tangent Data

Parameter	Value	Parameter	Value
Length:	12.549	Course:	N 84° 49' 20.2395" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+84.181	-170.493	-877.406
End:	0+97.102	-171.249	-864.507

Tangent Data

Parameter	Value	Parameter	Value
Length:	12.921	Course:	S 86° 38' 40.8309" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+97.102	-171.249	-864.507
End:	1+10.320	-173.005	-851.406

Tangent Data

Parameter	Value	Parameter	Value
Length:	13.218	Course:	S 82° 21' 53.8535" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	1+10.320	-173.005	-851.406
End:	1+77.771	-185.137	-785.055

Tangent Data

Parameter	Value	Parameter	Value
Length:	67.451	Course:	S 79° 38' 16.6200" E

Spiral Point Data

Description	Station	Northing	Easting
TS:	1+77.771	-185.137	-785.055
SPI:		-188.847	-764.769
SC:	2+08.771	-187.235	-754.280

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	31.000	L Tan:	20.781
Radius:	48.000	S Tan:	10.437
Theta:	18° 30' 06.3437"	P:	0.831
X:	30.678	K:	15.446
Y:	3.312	A:	38.575
Chord:	30.846	Course:	S 86° 06' 03.6007" E

Curve Point Data

Description	Station	Northing	Easting
SC:	2+08.771	-187.235	-754.280
RP:		-139.792	-761.571

CS: 2+33.497 -177.486 -731.853

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	29° 30' 55.1688"	Type:	LEFT
Radius:	48.000		
Length:	24.727	Tangent:	12.644
Mid-Ord:	1.583	External:	1.637
Chord:	24.454	Course:	N 66° 30' 20.8602" E

Spiral Point Data

Description	Station	Northing	Easting
CS:	2+33.497	-177.486	-731.853
SPI:		-170.916	-723.520
ST:	2+64.497	-153.552	-712.394

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	31.000	L Tan:	20.781
Radius:	48.000	S Tan:	10.437
Theta:	18° 30' 06.3437"	P:	0.831
X:	30.678	K:	15.446
Y:	3.312	A:	38.575
Chord:	30.846	Course:	N 39° 06' 45.3212" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	2+64.497	-153.552	-712.394
End:	2+95.569	-127.391	-695.631

Tangent Data

Parameter	Value	Parameter	Value
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Length: 31.072 Course: N 32° 38' 58.3404" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	2+95.569	-127.391	-695.631
End:	3+05.499	-119.297	-689.877

Tangent Data

Parameter	Value	Parameter	Value
Length:	9.930	Course:	N 35° 24' 39.4012" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	3+05.499	-119.297	-689.877
End:	3+15.246	-111.635	-683.853

Tangent Data

Parameter	Value	Parameter	Value
Length:	9.747	Course:	N 38° 10' 37.1783" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	3+15.246	-111.635	-683.853
End:	3+24.771	-104.747	-677.274

Tangent Data

Parameter	Value	Parameter	Value
Length:	9.525	Course:	N 43° 40' 49.8985" E

Curve Point Data

Description	Station	Northing	Easting
PC:	3+24.771	-104.747	-677.274

RP: -151.215 -630.688
 PT: 3+56.971 -88.302 -649.964

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	28° 02' 17.2556"	Type:	RIGHT
Radius:	65.800		
Length:	32.200	Tangent:	16.429
Mid-Ord:	1.960	External:	2.020
Chord:	31.879	Course:	N 58° 56' 46.5696" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	3+56.971	-88.302	-649.964
End:	3+66.496	-85.710	-640.798

Tangent Data

Parameter	Value	Parameter	Value
Length:	9.525	Course:	N 74° 12' 43.2406" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	3+66.496	-85.710	-640.798
End:	3+76.243	-83.970	-631.208

Tangent Data

Parameter	Value	Parameter	Value
Length:	9.747	Course:	N 79° 42' 55.9608" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	3+76.243	-83.970	-631.208

End: 3+86.173 -82.671 -621.363

Tangent Data

Parameter	Value	Parameter	Value
Length:	9.930	Course:	N 82° 28' 53.7379" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	3+86.173	-82.671	-621.363
End:	4+03.521	-81.232	-604.075

Tangent Data

Parameter	Value	Parameter	Value
Length:	17.348	Course:	N 85° 14' 34.7987" E

6.2 Koordinatni račun detaljnih točaka osi

Tablica 3. Koordinatni račun detaljnih točaka osi

Station	Northing	Easting	Tangential Direction
0+000.00	-214.3490m	-945.6457m	N31° 31' 53"E
0+020.00	-197.4785m	-934.9096m	N34° 53' 38"E
0+040.00	-182.3003m	-921.9501m	N47° 40' 56"E
0+060.00	-171.4911m	-905.2323m	N66° 39' 26"E
0+080.00	-166.7376m	-885.8995m	N85° 29' 30"E
0+100.00	-167.5481m	-865.9534m	S82° 25' 50"E
0+120.00	-170.9004m	-846.2384m	S79° 38' 17"E
0+140.00	-174.4977m	-826.5646m	S79° 38' 17"E
0+160.00	-178.0951m	-806.8908m	S79° 38' 17"E
0+180.00	-181.6924m	-787.2170m	S79° 38' 17"E
0+200.00	-184.6628m	-767.4498m	S85° 57' 18"E
0+220.00	-182.5962m	-747.6862m	N72° 01' 40"E
0+240.00	-172.4740m	-730.6256m	N46° 54' 54"E
0+260.00	-156.9111m	-718.1399m	N33° 23' 43"E
0+280.00	-140.0853m	-707.3283m	N32° 38' 58"E
0+300.00	-123.2467m	-696.5365m	N32° 46' 21"E
0+320.00	-106.9570m	-684.9558m	N39° 51' 59"E
0+340.00	-93.4790m	-670.2672m	N55° 34' 06"E
0+360.00	-84.6643m	-652.3902m	N71° 56' 19"E
0+380.00	-80.7271m	-632.8169m	N83° 30' 54"E
0+400.00	-78.9559m	-612.8962m	N85° 14' 35"E

6.3 Račun kota kolnika

Tablica 4. Račun kota kolnika

CHAINAGE 0+000.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-949.6021	-211.9215	258.2330	-4.642m	Hinge_Cut
2	-949.6012	-211.9220	258.0330	-4.641m	EPS_Sub
3	-948.7497	-212.4445	258.2730	-3.642m	Back_Curb
4	-948.6219	-212.5229	258.2730	-3.492m	Top_Curb
5	-948.5863	-212.5447	258.0480	-3.450m	Flowline_Gutter
6	-948.2028	-212.7801	258.0750	-3.000m	ETW
7	-948.2028	-212.7801	257.6750	-3.000m	ETW_SubBase
8	-943.0887	-215.9179	257.5250	3.000m	ETW_SubBase
9	-943.0887	-215.9179	257.9250	3.000m	Flange
10	-942.7051	-216.1532	257.8980	3.450m	Flowline_Gutter
11	-942.6696	-216.1750	258.1230	3.492m	Top_Curb
12	-942.5417	-216.2535	258.1230	3.642m	Back_Curb
13	-941.6902	-216.7759	257.8830	4.641m	EPS_Sub
14	-941.6894	-216.7764	258.0830	4.642m	EPS
15	-941.0360	-217.1773	259.6160	5.408m	Daylight

CHAINAGE 0+020.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-938.7945	-194.7690	257.2290	-4.736m	Daylight
2	-938.7167	-194.8233	257.3239	-4.642m	Hinge
3	-938.7159	-194.8238	257.1239	-4.641m	EPS_Sub
4	-937.8965	-195.3953	257.3639	-3.642m	Back_Curb
5	-937.7734	-195.4811	257.3639	-3.492m	Top_Curb
6	-937.7392	-195.5050	257.1389	-3.450m	Flowline_Gutter
7	-937.3701	-195.7624	257.1659	-3.000m	ETW
8	-937.3701	-195.7624	256.7659	-3.000m	ETW_SubBase
9	-931.8588	-199.6063	256.9979	3.720m	Flange
10	-931.8588	-199.6063	256.5979	3.720m	ETW_SubBase
11	-931.4897	-199.8637	256.9709	4.170m	Flowline_Gutter
12	-931.4555	-199.8876	257.1959	4.211m	Top_Curb
13	-931.3324	-199.9734	257.1959	4.361m	Back_Curb
14	-930.5131	-200.5449	256.9559	5.360m	EPS_Sub
15	-930.5122	-200.5455	257.1559	5.361m	Hinge_Cut
16	-928.9929	-201.6051	260.8605	7.214m	Daylight

CHAINAGE 0+040.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-925.3089	-178.6113	256.0678	-4.989m	Daylight
2	-925.0753	-178.8679	256.4148	-4.642m	Hinge
3	-925.0746	-178.8686	256.2148	-4.641m	EPS_Sub
4	-924.4020	-179.6073	256.4548	-3.642m	Back_Curb

5	-924.3011	-179.7182	256.4548	-3.492m	Top_Curb
6	-924.2730	-179.7491	256.2298	-3.450m	Flowline_Gutter
7	-923.9700	-180.0818	256.2568	-3.000m	ETW
8	-923.9700	-180.0818	255.8568	-3.000m	ETW_SubBase
9	-918.9154	-185.6334	256.0691	4.508m	Flange
10	-918.9154	-185.6334	255.6691	4.508m	ETW_SubBase
11	-918.6124	-185.9661	256.0421	4.958m	Flowline_Gutter
12	-918.5843	-185.9969	256.2671	4.999m	Top_Curb
13	-918.4833	-186.1078	256.2671	5.149m	Back_Curb
14	-917.8108	-186.8465	256.0271	6.148m	EPS_Sub
15	-917.8101	-186.8473	256.2271	6.149m	Hinge_Cut
16	-916.5834	-188.1946	259.8713	7.971m	Daylight

CHAINAGE 0+060.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-908.1386	-164.7564	252.8123	-7.335m	Daylight
2	-907.0714	-167.2293	255.5057	-4.642m	Hinge
3	-907.0710	-167.2303	255.3057	-4.641m	EPS_Sub
4	-906.6752	-168.1475	255.5457	-3.642m	Back_Curb
5	-906.6158	-168.2852	255.5457	-3.492m	Top_Curb
6	-906.5993	-168.3235	255.3207	-3.450m	Flowline_Gutter
7	-906.4210	-168.7367	255.3477	-3.000m	ETW
8	-906.4210	-168.7367	254.9477	-3.000m	ETW_SubBase
9	-903.4889	-175.5310	255.1627	4.400m	Flange
10	-903.4889	-175.5310	254.7627	4.400m	ETW_SubBase
11	-903.3106	-175.9442	255.1357	4.850m	Flowline_Gutter
12	-903.2940	-175.9825	255.3607	4.892m	Top_Curb
13	-903.2346	-176.1202	255.3607	5.042m	Back_Curb
14	-902.8388	-177.0374	255.1207	6.041m	EPS_Sub
15	-902.8384	-177.0383	255.3207	6.042m	Hinge_Cut
16	-902.4415	-177.9580	257.3240	7.043m	Daylight

CHAINAGE 0+080.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-886.5436	-158.5688	251.0435	-8.194m	Daylight
2	-886.2643	-162.1110	254.5966	-4.641m	Hinge
3	-886.2642	-162.1120	254.3966	-4.640m	EPS_Sub
4	-886.1857	-163.1079	254.6366	-3.641m	Back_Curb
5	-886.1739	-163.2574	254.6366	-3.491m	Top_Curb
6	-886.1706	-163.2990	254.4116	-3.449m	Flowline_Gutter
7	-886.1353	-163.7476	254.4386	-2.999m	ETW
8	-886.1353	-163.7476	254.0386	-2.999m	ETW_SubBase
9	-885.5453	-171.2304	254.2510	4.507m	Flange
10	-885.5453	-171.2304	253.8510	4.507m	ETW_SubBase
11	-885.5099	-171.6790	254.2240	4.957m	Flowline_Gutter
12	-885.5066	-171.7206	254.4490	4.998m	Top_Curb
13	-885.4948	-171.8701	254.4490	5.148m	Back_Curb
14	-885.4163	-172.8660	254.2090	6.147m	EPS_Sub

15	-885.4162	-172.8670	254.4090	6.148m	Hinge_Cut
16	-885.3685	-173.4717	255.6221	6.755m	Daylight

CHAINAGE 0+100.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-865.0911	-161.0594	251.7836	-6.546m	Daylight
2	-865.3419	-162.9467	253.6875	-4.642m	Hinge
3	-865.3420	-162.9477	253.4875	-4.641m	EPS_Sub
4	-865.4736	-163.9380	253.7275	-3.642m	Back_Curb
5	-865.4934	-164.0867	253.7275	-3.492m	Top_Curb
6	-865.4989	-164.1281	253.5025	-3.450m	Flowline_Gutter
7	-865.5582	-164.5741	253.5295	-3.000m	ETW
8	-865.5582	-164.5741	253.1295	-3.000m	ETW_SubBase
9	-866.4302	-171.1363	253.3641	3.620m	Flange
10	-866.4302	-171.1363	252.9641	3.620m	ETW_SubBase
11	-866.4895	-171.5824	253.3371	4.070m	Flowline_Gutter
12	-866.4950	-171.6237	253.5621	4.111m	Top_Curb
13	-866.5147	-171.7724	253.5621	4.261m	Back_Curb
14	-866.6463	-172.7627	253.3221	5.260m	EPS_Sub
15	-866.6464	-172.7637	253.5221	5.261m	Hinge_Cut
16	-866.7505	-173.5466	255.1016	6.051m	Daylight

CHAINAGE 0+120.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-845.3902	-166.2616	252.9264	-4.716m	Daylight
2	-845.4035	-166.3344	252.7785	-4.642m	EPS
3	-845.4037	-166.3354	252.5785	-4.641m	EPS_Sub
4	-845.5834	-167.3181	252.8185	-3.642m	Back_Curb
5	-845.6104	-167.4656	252.8185	-3.492m	Top_Curb
6	-845.6179	-167.5066	252.5935	-3.450m	Flowline_Gutter
7	-845.6988	-167.9493	252.6205	-3.000m	ETW
8	-845.6988	-167.9493	252.2205	-3.000m	ETW_SubBase
9	-846.7780	-173.8514	252.0705	3.000m	ETW_SubBase
10	-846.7780	-173.8514	252.4705	3.000m	ETW
11	-846.8590	-174.2941	252.4435	3.450m	Flowline_Gutter
12	-846.8665	-174.3351	252.6685	3.492m	Top_Curb
13	-846.8935	-174.4827	252.6685	3.642m	Back_Curb
14	-847.0731	-175.4654	252.4285	4.641m	EPS_Sub
15	-847.0733	-175.4664	252.6285	4.642m	Hinge_Cut
16	-847.3779	-177.1321	256.0151	6.335m	Daylight

CHAINAGE 0+140.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-825.5011	-168.6813	254.4117	-5.913m	Daylight
2	-825.7297	-169.9317	251.8694	-4.642m	EPS
3	-825.7299	-169.9327	251.6694	-4.641m	EPS_Sub
4	-825.9096	-170.9154	251.9094	-3.642m	Back_Curb
5	-825.9366	-171.0630	251.9094	-3.492m	Top_Curb
6	-825.9441	-171.1040	251.6844	-3.450m	Flowline_Gutter

7	-826.0250	-171.5466	251.7114	-3.000m	ETW
8	-826.0250	-171.5466	251.3114	-3.000m	ETW_SubBase
9	-827.1042	-177.4488	251.1614	3.000m	ETW_SubBase
10	-827.1042	-177.4488	251.5614	3.000m	ETW
11	-827.1852	-177.8915	251.5344	3.450m	Flowline_Gutter
12	-827.1927	-177.9325	251.7594	3.492m	Top_Curb
13	-827.2196	-178.0800	251.7594	3.642m	Back_Curb
14	-827.3993	-179.0627	251.5194	4.641m	EPS_Sub
15	-827.3995	-179.0637	251.7194	4.642m	Hinge_Cut
16	-828.0035	-182.3669	258.4353	8.000m	Daylight

CHAINAGE 0+160.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-805.7091	-171.6322	254.8169	-6.570m	Daylight
2	-806.0559	-173.5291	250.9603	-4.642m	EPS
3	-806.0561	-173.5301	250.7603	-4.641m	EPS_Sub
4	-806.2358	-174.5128	251.0003	-3.642m	Back_Curb
5	-806.2628	-174.6603	251.0003	-3.492m	Top_Curb
6	-806.2703	-174.7013	250.7753	-3.450m	Flowline_Gutter
7	-806.3512	-175.1440	250.8023	-3.000m	ETW
8	-806.3512	-175.1440	250.4023	-3.000m	ETW_SubBase
9	-807.4304	-181.0461	250.2523	3.000m	ETW_SubBase
10	-807.4304	-181.0461	250.6523	3.000m	ETW
11	-807.5113	-181.4888	250.6253	3.450m	Flowline_Gutter
12	-807.5188	-181.5298	250.8503	3.492m	Top_Curb
13	-807.5458	-181.6774	250.8503	3.642m	Back_Curb
14	-807.7255	-182.6601	250.6103	4.641m	EPS_Sub
15	-807.7257	-182.6611	250.8103	4.642m	Hinge_Cut
16	-808.5444	-187.1388	259.9142	9.194m	Daylight

CHAINAGE 0+180.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-786.1926	-176.0900	252.1585	-5.695m	Daylight
2	-786.3821	-177.1264	250.0512	-4.642m	EPS
3	-786.3823	-177.1274	249.8512	-4.641m	EPS_Sub
4	-786.5620	-178.1101	250.0912	-3.642m	Back_Curb
5	-786.5889	-178.2577	250.0912	-3.492m	Top_Curb
6	-786.5964	-178.2987	249.8662	-3.450m	Flowline_Gutter
7	-786.6774	-178.7414	249.8932	-3.000m	ETW
8	-786.6774	-178.7414	249.4932	-3.000m	ETW_SubBase
9	-787.7566	-184.6435	249.3432	3.000m	ETW_SubBase
10	-787.7566	-184.6435	249.7432	3.000m	ETW
11	-787.8375	-185.0862	249.7162	3.450m	Flowline_Gutter
12	-787.8450	-185.1272	249.9412	3.492m	Top_Curb
13	-787.8720	-185.2747	249.9412	3.642m	Back_Curb
14	-788.0517	-186.2574	249.7012	4.641m	EPS_Sub
15	-788.0519	-186.2584	249.9012	4.642m	Hinge_Cut
16	-788.9551	-191.1980	259.9441	9.663m	Daylight

CHAINAGE 0+200.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-766.6541	-173.4100	243.7344	-11.281m	Daylight
2	-767.0386	-178.8471	249.1851	-5.830m	Hinge
3	-767.0386	-178.8481	248.9851	-5.829m	EPS_Sub
4	-767.1091	-179.8446	249.2251	-4.830m	Back_Curb
5	-767.1197	-179.9943	249.2251	-4.680m	Top_Curb
6	-767.1226	-180.0358	249.0001	-4.639m	Flowline_Gutter
7	-767.1544	-180.4847	249.0271	-4.189m	ETW
8	-767.1544	-180.4847	248.6271	-4.189m	ETW_SubBase
9	-767.6615	-187.6554	248.8474	3.000m	Flange
10	-767.6615	-187.6554	248.4474	3.000m	ETW_SubBase
11	-767.6932	-188.1043	248.8204	3.450m	Flowline_Gutter
12	-767.6961	-188.1459	249.0454	3.492m	Top_Curb
13	-767.7067	-188.2956	249.0454	3.642m	Back_Curb
14	-767.7772	-189.2921	248.8054	4.641m	EPS_Sub
15	-767.7773	-189.2931	249.0054	4.642m	Hinge_Cut
16	-767.9999	-192.4410	255.3169	7.798m	Daylight

CHAINAGE 0+220.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-753.8154	-163.7012	235.0000	-19.864m	Daylight
2	-749.6954	-176.4022	248.3525	-6.512m	Hinge
3	-749.6951	-176.4032	248.1525	-6.511m	EPS_Sub
4	-749.3869	-177.3534	248.3925	-5.512m	Back_Curb
5	-749.3406	-177.4961	248.3925	-5.362m	Top_Curb
6	-749.3277	-177.5358	248.1675	-5.320m	Flowline_Gutter
7	-749.1889	-177.9638	247.7945	-4.870m	ETW_SubBase
8	-749.1889	-177.9638	248.1945	-4.870m	Flange
9	-746.7606	-185.4498	247.9978	3.000m	Flange
10	-746.7606	-185.4498	247.5978	3.000m	ETW_SubBase
11	-746.6217	-185.8779	247.9708	3.450m	Flowline_Gutter
12	-746.6088	-185.9175	248.1958	3.492m	Top_Curb
13	-746.5626	-186.0602	248.1958	3.642m	Back_Curb
14	-746.2543	-187.0105	247.9558	4.641m	EPS_Sub
15	-746.2540	-187.0114	248.1558	4.642m	EPS
16	-745.9055	-188.0857	247.0263	5.771m	Daylight

CHAINAGE 0+240.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-738.4540	-164.1040	242.5578	-11.460m	Daylight
2	-735.0441	-167.7498	247.5496	-6.468m	Hinge
3	-735.0434	-167.7505	247.3496	-6.467m	EPS_Sub
4	-734.3610	-168.4802	247.5896	-5.468m	Back_Curb
5	-734.2585	-168.5897	247.5896	-5.318m	Top_Curb
6	-734.2301	-168.6202	247.3646	-5.277m	Flowline_Gutter
7	-733.9227	-168.9488	247.3916	-4.827m	ETW
8	-733.9227	-168.9488	246.9916	-4.827m	ETW_SubBase

9	-728.5767	-174.6646	247.1960	2.999m	Flange
10	-728.5767	-174.6646	246.7960	2.999m	ETW_SubBase
11	-728.2694	-174.9933	247.1690	3.449m	Flowline_Gutter
12	-728.2409	-175.0237	247.3940	3.491m	Top_Curb
13	-728.1384	-175.1333	247.3940	3.641m	Back_Curb
14	-727.4560	-175.8629	247.1540	4.640m	EPS_Sub
15	-727.4553	-175.8636	247.3540	4.641m	Hinge_Cut
16	-726.2260	-177.1780	250.9533	6.441m	Daylight

CHAINAGE 0+260.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-722.6534	-153.9355	247.4508	-5.406m	Daylight
2	-722.3646	-154.1259	246.7589	-5.060m	EPS
3	-722.3637	-154.1264	246.5589	-5.059m	EPS_Sub
4	-721.5297	-154.6763	246.7989	-4.060m	Back_Curb
5	-721.4044	-154.7589	246.7989	-3.910m	Top_Curb
6	-721.3696	-154.7818	246.5739	-3.868m	Flowline_Gutter
7	-720.9939	-155.0295	246.6009	-3.418m	ETW
8	-720.9939	-155.0295	246.2009	-3.418m	ETW_SubBase
9	-715.6352	-158.5623	246.0404	3.000m	ETW_SubBase
10	-715.6352	-158.5623	246.4404	3.000m	ETW
11	-715.2595	-158.8100	246.4134	3.450m	Flowline_Gutter
12	-715.2247	-158.8329	246.6384	3.492m	Top_Curb
13	-715.0994	-158.9155	246.6384	3.642m	Back_Curb
14	-714.2654	-159.4654	246.3984	4.641m	EPS_Sub
15	-714.2645	-159.4659	246.5984	4.642m	Hinge_Cut
16	-711.7433	-161.1280	252.6380	7.662m	Daylight

CHAINAGE 0+280.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-711.5898	-137.3547	246.8452	-5.061m	Daylight
2	-711.2365	-137.5811	246.0061	-4.642m	EPS
3	-711.2357	-137.5816	245.8061	-4.641m	EPS_Sub
4	-710.3945	-138.1206	246.0461	-3.642m	Back_Curb
5	-710.2682	-138.2015	246.0461	-3.492m	Top_Curb
6	-710.2331	-138.2240	245.8211	-3.450m	Flowline_Gutter
7	-709.8542	-138.4668	245.8481	-3.000m	ETW
8	-709.8542	-138.4668	245.4481	-3.000m	ETW_SubBase
9	-704.8023	-141.7038	245.2981	3.000m	ETW_SubBase
10	-704.8023	-141.7038	245.6981	3.000m	ETW
11	-704.4234	-141.9466	245.6711	3.450m	Flowline_Gutter
12	-704.3883	-141.9691	245.8961	3.492m	Top_Curb
13	-704.2620	-142.0500	245.8961	3.642m	Back_Curb
14	-703.4209	-142.5889	245.6561	4.641m	EPS_Sub
15	-703.4200	-142.5895	245.8561	4.642m	Hinge_Cut
16	-701.2717	-143.9660	250.9590	7.193m	Daylight

CHAINAGE 0+300.00

POINT	X	Y	Z	OFFSET	STRING CUT
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1	-700.5098	-120.6888	245.1789	-4.726m	Daylight
2	-700.4385	-120.7347	245.2638	-4.641m	Hinge
3	-700.4376	-120.7353	245.0638	-4.640m	EPS_Sub
4	-699.5976	-121.2760	245.3038	-3.641m	Back_Curb
5	-699.4715	-121.3572	245.3038	-3.491m	Top_Curb
6	-699.4364	-121.3798	245.0788	-3.449m	Flowline_Gutter
7	-699.0581	-121.6234	245.1058	-2.999m	ETW
8	-699.0581	-121.6234	244.7058	-2.999m	ETW_SubBase
9	-693.8944	-124.9476	244.9522	3.142m	Flange
10	-693.8944	-124.9476	244.5522	3.142m	ETW_SubBase
11	-693.5160	-125.1912	244.9252	3.592m	Flowline_Gutter
12	-693.4810	-125.2138	245.1502	3.634m	Top_Curb
13	-693.3548	-125.2950	245.1502	3.784m	Back_Curb
14	-692.5148	-125.8358	244.9102	4.783m	EPS_Sub
15	-692.5140	-125.8363	245.1102	4.784m	Hinge_Cut
16	-690.7228	-126.9894	249.3708	6.914m	Daylight

CHAINAGE 0+320.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-689.1191	-103.4801	243.7392	-5.424m	Daylight
2	-688.5186	-103.9815	244.5215	-4.642m	Hinge
3	-688.5178	-103.9822	244.3215	-4.641m	EPS_Sub
4	-687.7510	-104.6225	244.5615	-3.642m	Back_Curb
5	-687.6359	-104.7187	244.5615	-3.492m	Top_Curb
6	-687.6039	-104.7454	244.3365	-3.450m	Flowline_Gutter
7	-687.2585	-105.0339	244.3635	-3.000m	ETW
8	-687.2585	-105.0339	243.9635	-3.000m	ETW_SubBase
9	-681.8568	-109.5451	244.1875	4.038m	Flange
10	-681.8568	-109.5451	243.7875	4.038m	ETW_SubBase
11	-681.5114	-109.8335	244.1605	4.488m	Flowline_Gutter
12	-681.4794	-109.8602	244.3855	4.529m	Top_Curb
13	-681.3642	-109.9564	244.3855	4.679m	Back_Curb
14	-680.5975	-110.5968	244.1455	5.678m	EPS_Sub
15	-680.5967	-110.5974	244.3455	5.679m	Hinge_Cut
16	-678.9616	-111.9629	248.6062	7.810m	Daylight

CHAINAGE 0+340.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-674.3572	-87.5128	241.1875	-7.233m	Daylight
2	-672.8917	-89.6505	243.7792	-4.642m	Hinge
3	-672.8912	-89.6513	243.5792	-4.641m	EPS_Sub
4	-672.3263	-90.4753	243.8192	-3.642m	Back_Curb
5	-672.2415	-90.5990	243.8192	-3.492m	Top_Curb
6	-672.2179	-90.6334	243.5942	-3.450m	Flowline_Gutter
7	-671.9635	-91.0045	243.6212	-3.000m	ETW
8	-671.9635	-91.0045	243.2212	-3.000m	ETW_SubBase
9	-667.8925	-96.9431	243.4412	4.200m	Flange
10	-667.8925	-96.9431	243.0412	4.200m	ETW_SubBase

11	-667.6380	-97.3143	243.4142	4.650m	Flowline_Gutter
12	-667.6144	-97.3487	243.6392	4.692m	Top_Curb
13	-667.5296	-97.4724	243.6392	4.842m	Back_Curb
14	-666.9648	-98.2964	243.3992	5.841m	EPS_Sub
15	-666.9642	-98.2972	243.5992	5.842m	Hinge_Cut
16	-666.1552	-99.4773	246.4608	7.272m	Daylight

CHAINAGE 0+360.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-654.7709	-77.3639	239.9997	-7.679m	Daylight
2	-653.8293	-80.2513	243.0369	-4.642m	Hinge
3	-653.8290	-80.2523	242.8369	-4.641m	EPS_Sub
4	-653.5192	-81.2021	243.0769	-3.642m	Back_Curb
5	-653.4727	-81.3447	243.0769	-3.492m	Top_Curb
6	-653.4598	-81.3843	242.8519	-3.450m	Flowline_Gutter
7	-653.3203	-81.8122	242.8789	-3.000m	ETW
8	-653.3203	-81.8122	242.4789	-3.000m	ETW_SubBase
9	-651.0880	-88.6574	242.6989	4.200m	Flange
10	-651.0880	-88.6574	242.2989	4.200m	ETW_SubBase
11	-650.9485	-89.0852	242.6719	4.650m	Flowline_Gutter
12	-650.9356	-89.1248	242.8969	4.692m	Top_Curb
13	-650.8891	-89.2675	242.8969	4.842m	Back_Curb
14	-650.5794	-90.2172	242.6569	5.841m	EPS_Sub
15	-650.5790	-90.2182	242.8569	5.842m	Hinge_Cut
16	-650.2063	-91.3611	245.2612	7.044m	Daylight

CHAINAGE 0+380.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-633.7304	-72.6900	238.8474	-8.089m	Daylight
2	-633.3411	-76.1151	242.2946	-4.642m	Hinge
3	-633.3410	-76.1161	242.0946	-4.641m	EPS_Sub
4	-633.2282	-77.1087	242.3346	-3.642m	Back_Curb
5	-633.2112	-77.2577	242.3346	-3.492m	Top_Curb
6	-633.2065	-77.2991	242.1096	-3.450m	Flowline_Gutter
7	-633.1557	-77.7463	242.1366	-3.000m	ETW
8	-633.1557	-77.7463	241.7366	-3.000m	ETW_SubBase
9	-632.4232	-84.1907	241.9744	3.486m	Flange
10	-632.4232	-84.1907	241.5744	3.486m	ETW_SubBase
11	-632.3723	-84.6378	241.9474	3.936m	Flowline_Gutter
12	-632.3676	-84.6792	242.1724	3.978m	Top_Curb
13	-632.3507	-84.8283	242.1724	4.128m	Back_Curb
14	-632.2379	-85.8209	241.9324	5.127m	EPS_Sub
15	-632.2377	-85.8219	242.1324	5.128m	Hinge_Cut
16	-632.0878	-87.1412	244.7880	6.455m	Daylight

CHAINAGE 0+400.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-613.4342	-72.4901	239.7058	-6.488m	Daylight
2	-613.2811	-74.3302	241.5523	-4.642m	Hinge

3	-613.2810	-74.3312	241.3523	-4.641m	EPS_Sub
4	-613.1982	-75.3267	241.5923	-3.642m	Back_Curb
5	-613.1857	-75.4762	241.5923	-3.492m	Top_Curb
6	-613.1823	-75.5178	241.3673	-3.450m	Flowline_Gutter
7	-613.1449	-75.9662	241.3943	-3.000m	ETW
8	-613.1449	-75.9662	240.9943	-3.000m	ETW_SubBase
9	-612.6474	-81.9455	241.2443	3.000m	Flange
10	-612.6474	-81.9455	240.8443	3.000m	ETW_SubBase
11	-612.6100	-82.3940	241.2173	3.450m	Flowline_Gutter
12	-612.6066	-82.4355	241.4423	3.492m	Top_Curb
13	-612.5941	-82.5850	241.4423	3.642m	Back_Curb
14	-612.5113	-83.5806	241.2023	4.641m	EPS_Sub
15	-612.5112	-83.5816	241.4023	4.642m	Hinge_Cut
16	-612.3729	-85.2432	244.7370	6.309m	Daylight

6.4 Vertikalni tok trase

Tablica 5. Vertikalni tok trase

PVI	Station	Grade Out	Curve Length
0.00	0+000.00	-4.55%	
1.00	0+220.00	-3.71%	69.820m
Vertical Curve Information:(sag curve) <hr/> PVC Station: 0+185.10 Elevation: 249.587m PVI Station: 0+220.00 Elevation: 248.000m PVT Station: 0+254.92 Elevation: 246.704m Low Point: 0+254.92 Elevation: 246.704m Grade in: -4.55% Grade out: -3.71% Change: 0.83% K: Curve Length: 69.820m Headlight Distance:			
2.00	0+408.60		

7. Literatura

1. Prof. dr. sc. Željko Korlaet, "Uvod u projektiranje i građenje cesta", Građevinski Fakultet Sveučilišta u Zagrebu, Zagreb, 1995.
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