

# Idejni projekt lokalne ceste

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Hodžić, Dino

Undergraduate thesis / Završni rad

2022

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UNIVERSITY OF SPLIT



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

# **ZAVRŠNI RAD**

**DINO HODZIC**

**Split, 2022.**

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

# **IDEJNI PROJEKT LOKALNE CESTE**

**Završni rad**

**Split, 2022.**

**SVEUČILIŠTE U SPLITU**

**FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE**

Split, Matice hrvatske 15

STUDIJ: **PREDDIPLOMSKI SVEUČILIŠNI STUDIJ  
GRAĐEVINARSTVA**

KANDIDAT: **Dino Hodžić**

BROJ ISKAZNICE: **0083224909**

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 2022.

Voditelj završnog rada:

Prof. dr. sc. Dražen Cvitanić

## **Idejni projekt lokalne ceste**

Sažetak: Idejni projekt lokalne ceste je izrađen na geodetskoj podlozi, prema zadatku iz kolegija Ceste, koristeći se programom AutoCAD Civil 3D. Cesta je projektirana za godišnji dnevni promet (PGDP) od 950 vozila na dan, na brdovitom terenu. Predviđena projektna brzina ceste je 40 km/h. Idejno rješenje izrađeno je prema Pravilniku i osnovnim uvjetima za projektiranje ceste s elementima koji zadovoljavaju važeće propise, kao i sigurnosne i estetske kriterije.

Ključne riječi:

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

## **Conceptual project of local road**

Abstract:

A conceptual project of local road, on a geodetic ground according to the task from course „Roads“, is made using software AutoCAD Civil 3D. The road is designed for the annual average daily traffic (AADT) of 950 vehicles per day, on the hilly terrain. The predicted project speed of the road is 40 miles per hour. Preliminary design of local road was created according to the Regulations on the basic conditions for the design of public roads with the elements that meet the applicable rules, as well as safety and aesthetic criteria.

Keywords:

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

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## **1. PROGRAMSKI ZADATAK**

Katedra za prometnice

Studij: Stručni

Nastavni predmet: CESTE

Student: ..... DINO HODŽIĆ .....

## ZADATAK

Treba izraditi idejni projekt dionice ceste 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: **brdovit**.

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. Troškovnik

Predmetna asistentica:

Daniela Dumanić, mag.ing.aedif.



## **2. TEHNIČKI OPIS**

### **Općenito**

Na priloženoj geodetskoj podlozi u mjerilu 1:1000 izrađen je idejni projekt ceste na dionici od točke A koja se nalazi na 216 metara nadmorske visine, do točke B koja se nalazi na 232 metara nadmorske visine. Cesta je projektirana za prosječni dnevni promet od 950 vozila na dan i to na brdovitom terenu (ceste je V. kategorije). Predviđena projektna brzina je 40 km/h.

### **Horizontalni elementi**

Za navedenu kategoriju prema pravilniku, minimalni radijus horizontalne krivine je 45 m, a prijelaznice 30 m. Trasa kontinuirane ceste ima dužinu od 396 m, a sastoji se od tri pravca i dvije krivine. Prva krivina ima radijus 50 m, a duljinu prijelaznice 40 m, a druga krivina također radijus 50 m, ali prijelaznicu od 30 m.

Svaka krivina je konstruirana pomoću dvije prijelaznice oblika klotoide i jednog kružnog luka. Proširenje kružnog luka za promet teretnih vozila s priključkom u prvoj i u drugoj krivini iznosi 1.68 m.

### **Vertikalni elementi**

Na temelju kategorije ceste najveći dopušteni nagib nivelete iznosi 12%, a najmanji dopušteni radijus vertikalne krivine 300 m. Tok trase se sastoji od tri pravca i dvije krivine. Nagib prvog pravca iznosi 4.96%, a drugog 3.21%. Tangenta krivine je dužine 8.721 m, a radijus konkavne krivine 500 m.

### **Poprečni presjek**

Projektirana cesta ima dva kolnička traka širine svakog po 3 m, betonski rubni trak širine 0.20 m i bankinu širine 1 m i nagiba 4%. Cesta se dijelom nalazi u zasjeku, a dijelom u usjeku i nasipu. Nagib pokosa nasipa iznosi 1:1, a usjeka 2:1. Na usjecima se izvode rigoli za odvodnju vode širine 0.65 m i drenaža koja je postavljena u glinenu posteljicu, a u nasipu se izvode potporni zidovi zbog konfiguracije terena.

### **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 30 cm

## **Odvodnja**

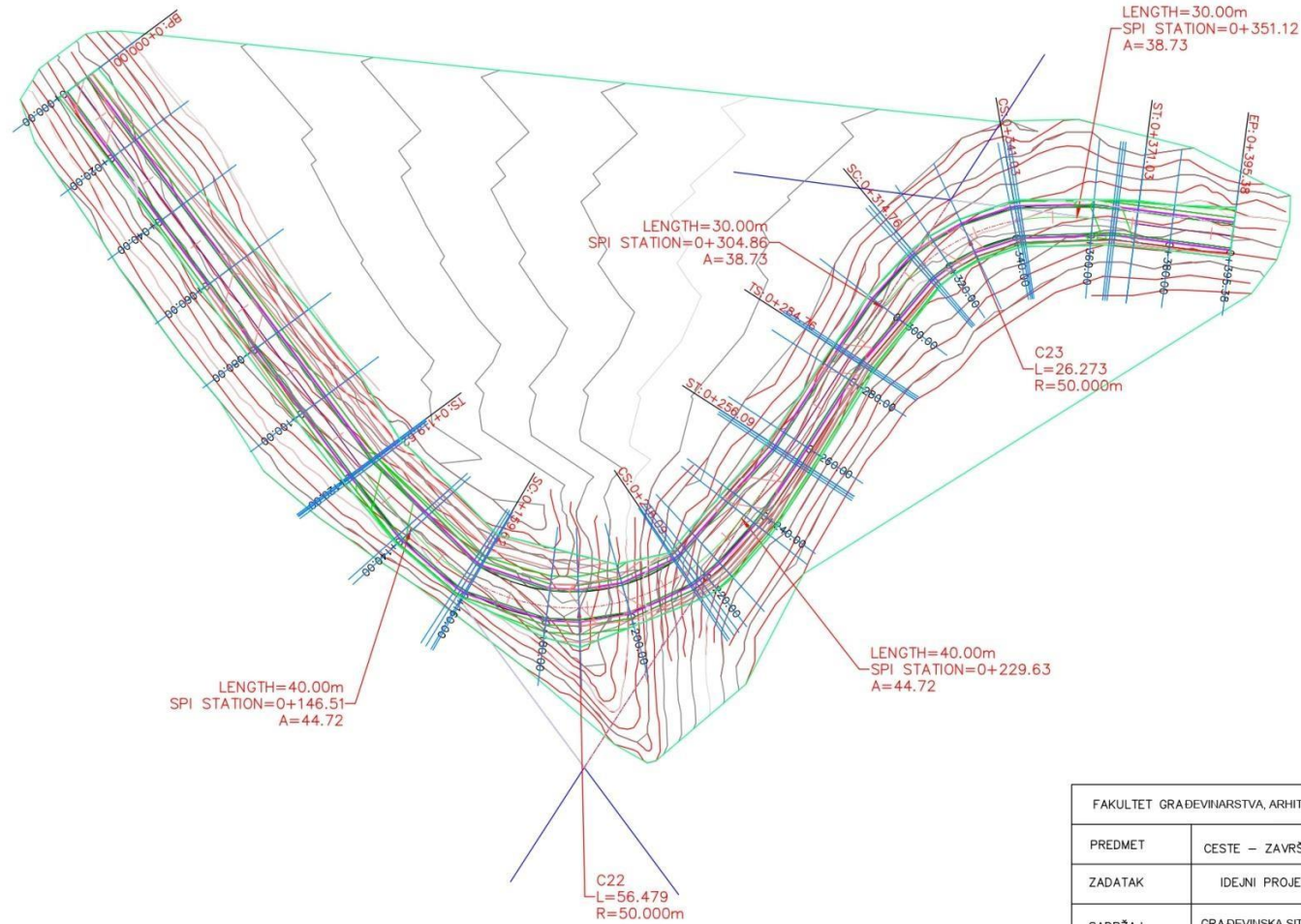
Odvodnja kolnika predviđa se otvorenim sustavom odvodnje prihvaćanjem kolničkih pribrežnih voda u zasjeku i usjeku u betonske rigole te kontroliranim ispuštanjem u teren direktno ili betonskim cijevnim propustima kroz trup kolnika.

## **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**

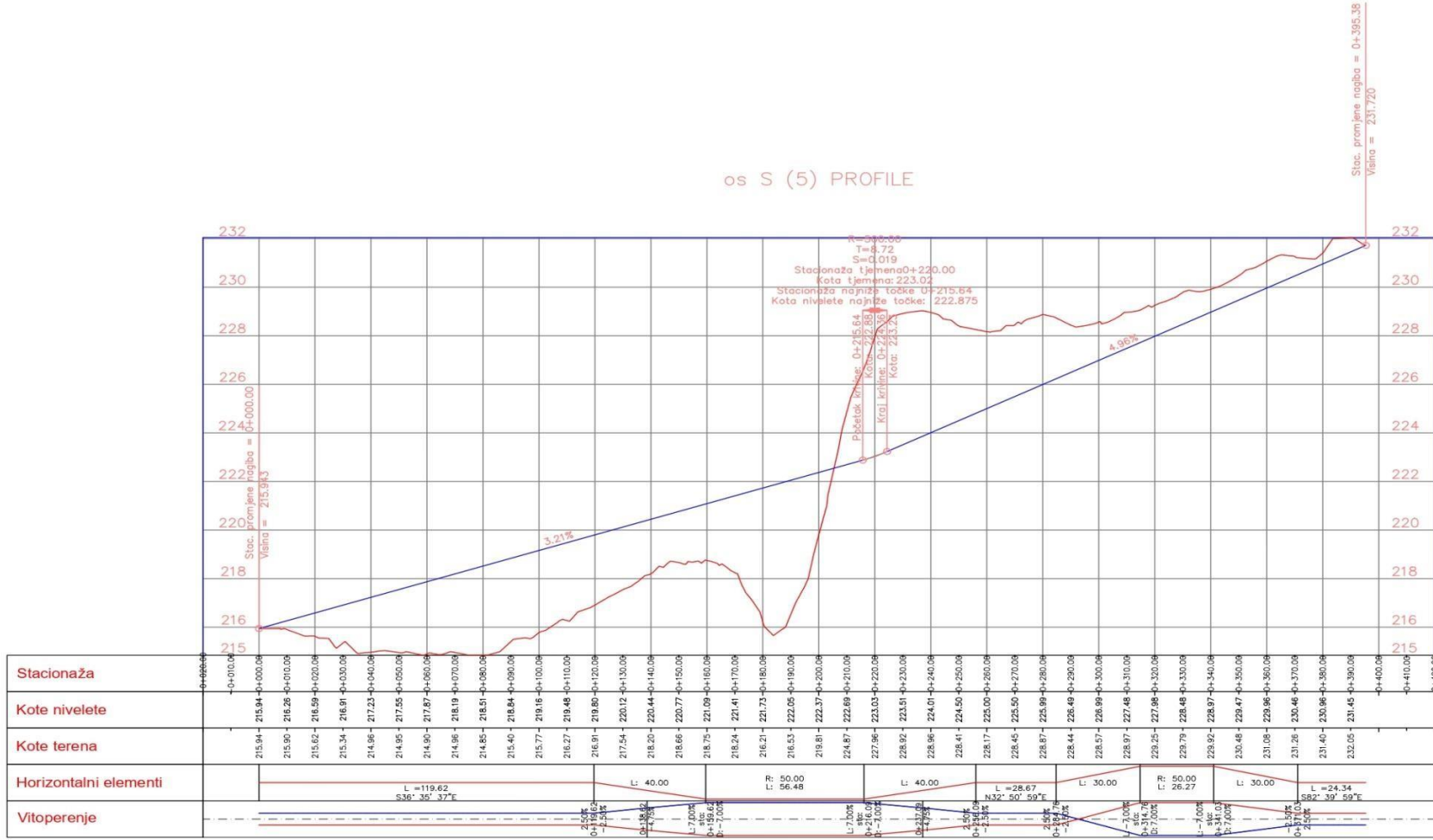
**Situacija M 1:1000**



FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE SPLIT		
PREDMET	CESTE – ZAVRŠNI RAD	GODINA 2021./2022.
ZADATAK	IDEJNI PROJEKT	
SADRŽAJ	GRAĐEVINSKA SITUACIJA	M 1:1000
STUDENT	DINO HODŽIĆ	

### **3.2 Uzdužni presjek M 1:1000/100**

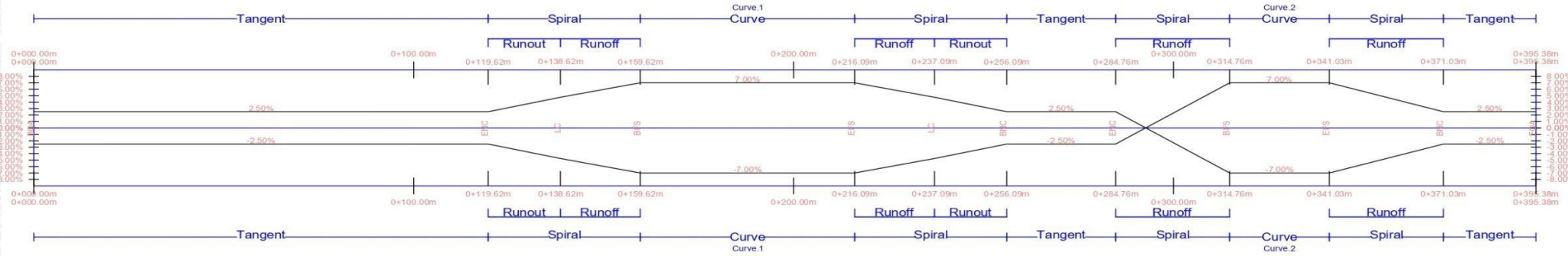
os S (5) PROFILE



Stac. promjene nagiba = 0+395.38  
Višina = 231.720

FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEOĐEZIJE SLJIT		
PREDMET	CESTE – ZAVRŠNI RAD	GODINA 2021./2022.
ZADATAK	IDEJNI PROJEKT	
SADRŽAJ	UZDUŽNI PRESJEK	M 1:1000
STUDENT	DINO HOĐIĆ	

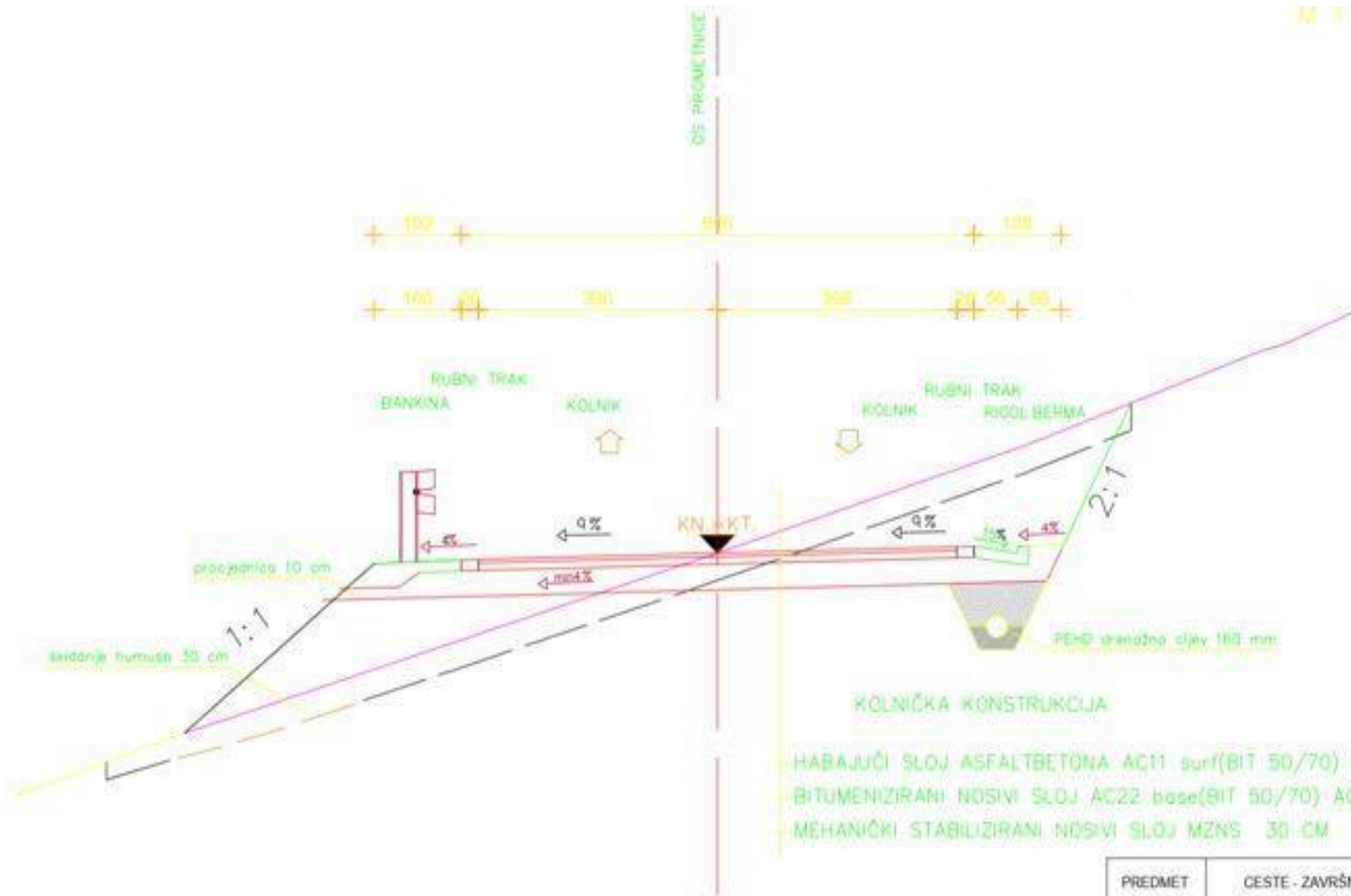
### Superelevation



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PREDMET	CESTE – ZAVRŠNI RAD	GODINA 2021./2022.
ZADATAK	IDEJNI PROJEKT	
SADRŽAJ	DIJAGRAM VITOPERENJA	M 1:1000
STUDENT	DINO HODŽIĆ	

### **3.3 Normalni poprečni presjek M 1:50**



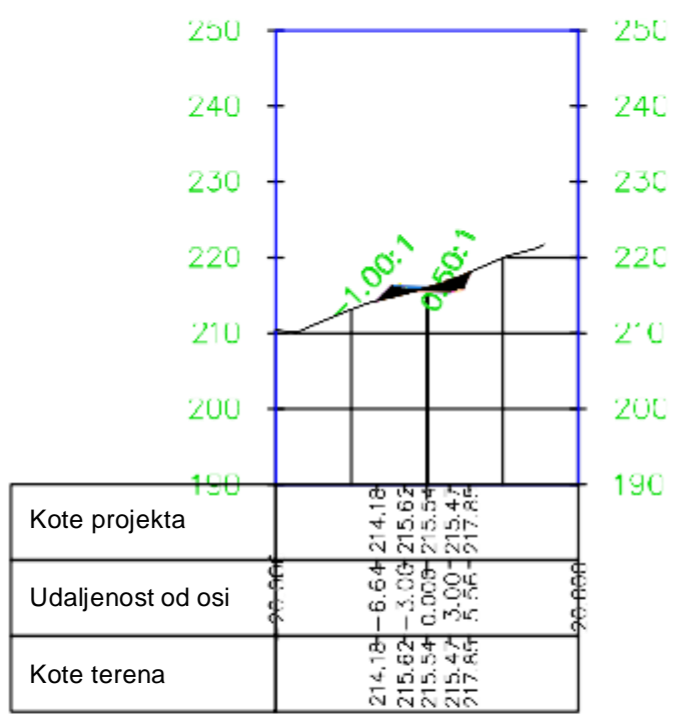


KOLNIČKA KONSTRUKCIJA  
 -HABAJUĆI SLOJ ASFALTBETONA AC11 surf(BIT 50/70) AG4 M4 4 CM  
 -BITUMENIZIRANI NOSIVI SLOJ AC22 base(BIT 50/70) AG6 M2 8 CM  
 -MEHANIČKI STABILIZIRANI NOSIVI SLOJ MZNS 30 CM

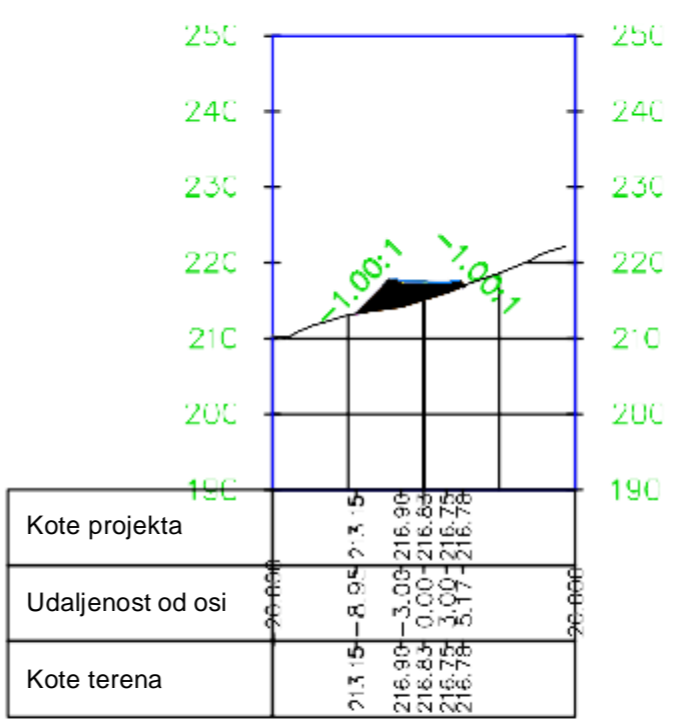
PREDMET	CESTE - ZAVRŠNI RAD	GODINA 2019./2020
PROGRAM	IDEJNI PROJEKT	
SADRŽAJ	NORMALNI POPREČNI PRESJEK	
STUDENT	DINO HODŽIĆ	M 1:50

### **3.4 Karakteristični poprečni presjeci M 1:200**

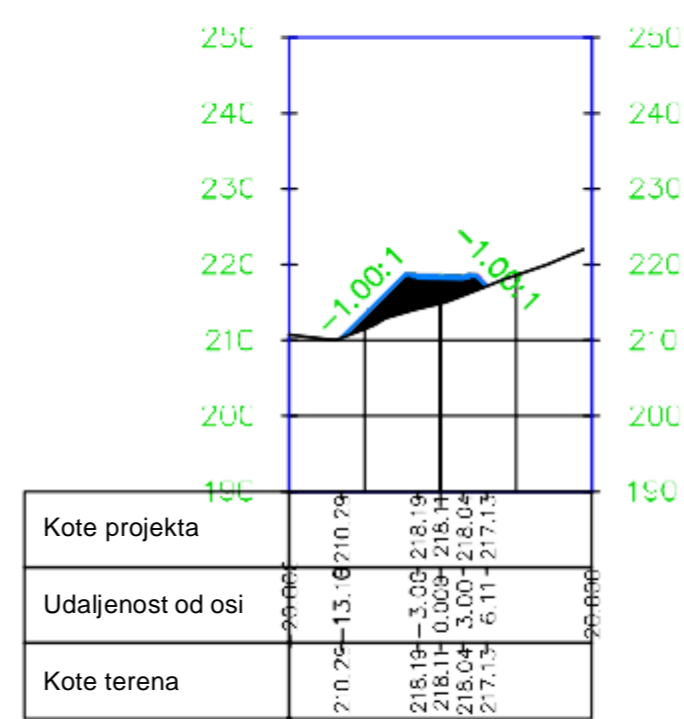
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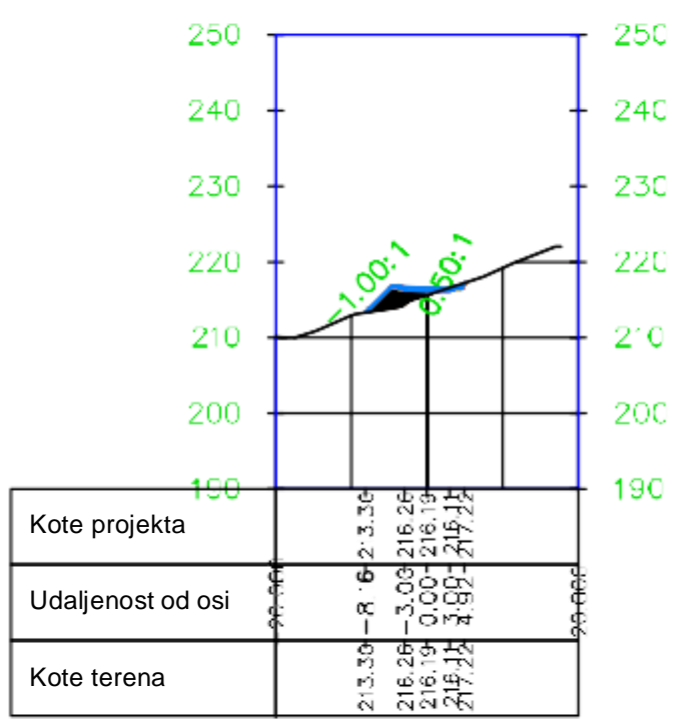
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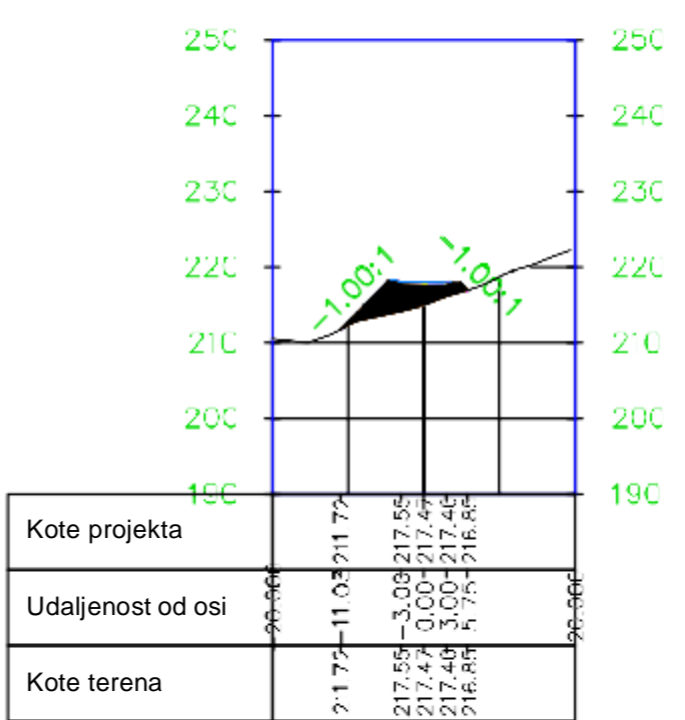
0+080.00



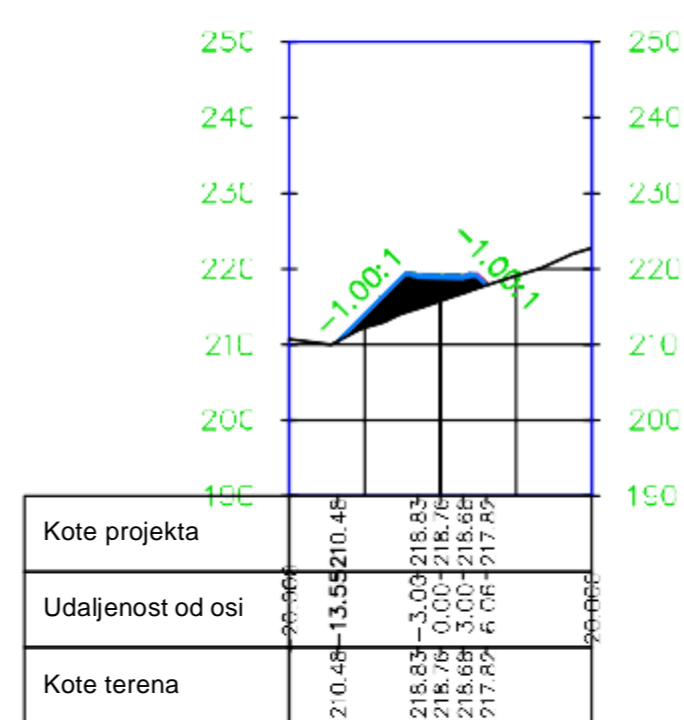
0+020.00



0+060.00

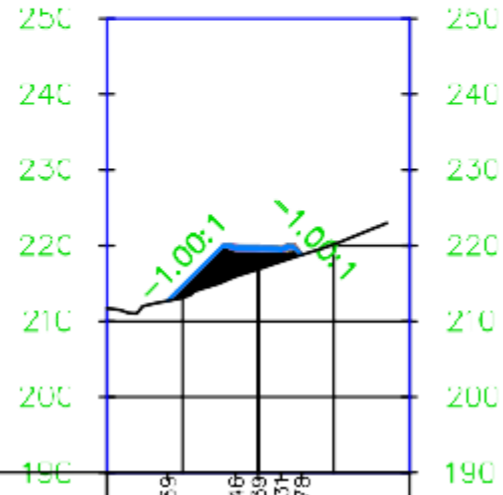


0+100.00



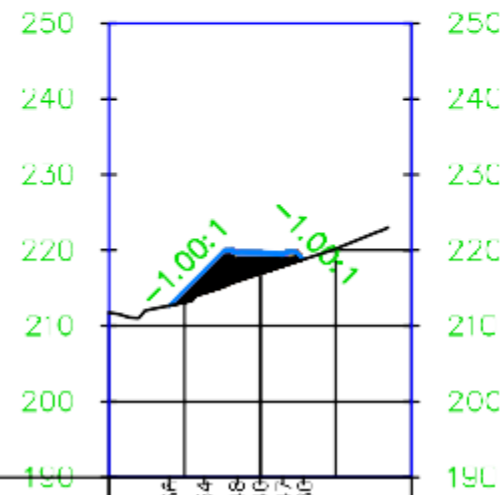
FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE SPLIT		
PREDMET	CESTE – ZAVRŠNI RAD	GODINA 2021./2022.
ZADATAK	IDEJNI PROJEKT	
SADRŽAJ	KARAKTERISTIČNI P.P.	M 1:200
STUDENT	DINO HODŽIĆ	

C+119.62



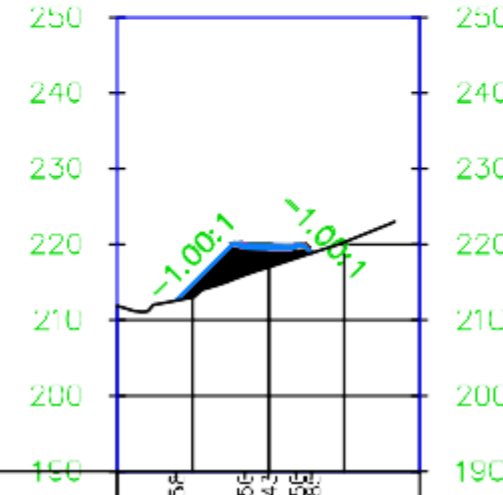
Kote projekta	20.00	212.59	219.46	219.39	219.31	218.78	20.00
Udaljenost od osi	0.00	-11.97	-3.00	0.00	3.00	5.75	0.00
Kote terena		212.59	219.46	219.39	219.31	218.78	

C+120.00



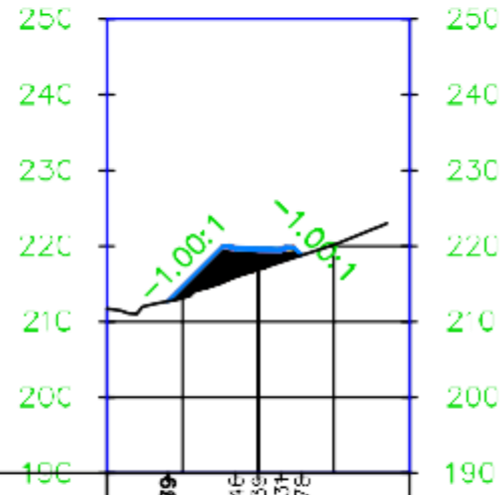
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Udaljenost od osi	0.00	-12.02	-7.35	-3.00	0.00	3.00	5.72	0.00
Kote terena		212.64	217.34	219.46	219.40	219.47	218.80	

C+120.83



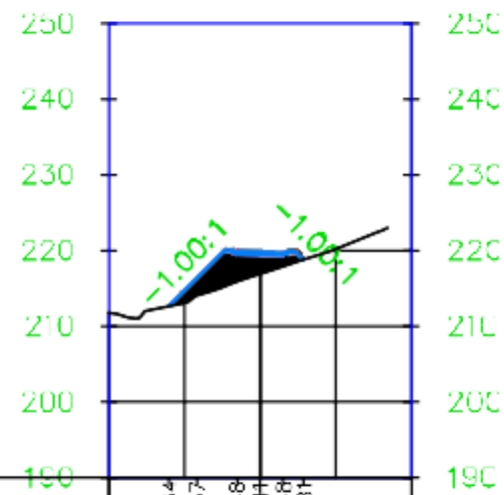
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Udaljenost od osi	0.00	-12.22	-3.09	0.00	3.54	5.75	0.00
Kote terena		212.58	219.50	219.43	218.88	218.88	

C+119.62



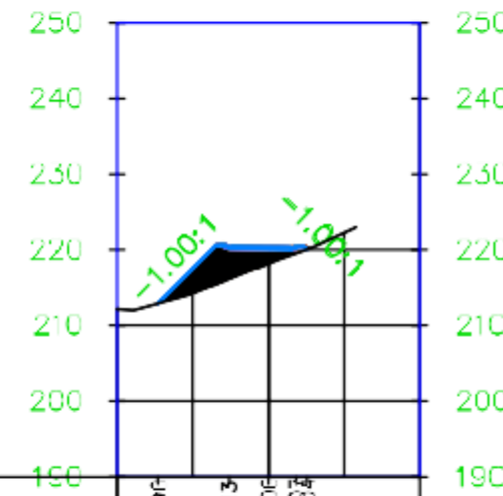
Kote projekta	20.00	212.89	219.46	219.39	219.31	218.78	20.00
Udaljenost od osi	0.00	-11.88	-3.00	0.00	3.00	5.75	0.00
Kote terena		212.89	219.46	219.39	219.31	218.78	

C+120.22



Kote projekta	20.00	212.64	216.37	219.46	219.40	219.48	218.81	20.00
Udaljenost od osi	0.00	-12.07	-8.31	-3.02	0.00	3.00	5.72	0.00
Kote terena		212.64	216.37	219.46	219.40	219.48	218.81	

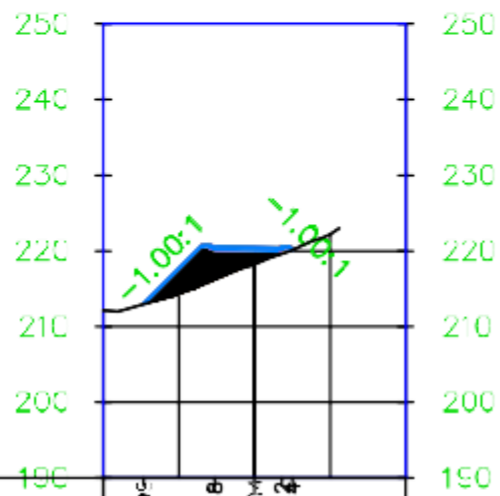
C+138.62



Kote projekta	20.00	212.90	220.13	220.06	220.06	220.06	20.00
Udaljenost od osi	0.00	-14.63	-5.20	0.00	0.00	0.00	0.00
Kote terena		212.90	220.13	220.06	220.06	220.06	

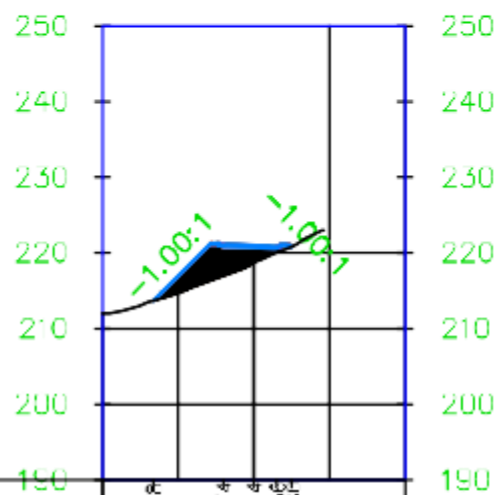
FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE SPLIT		
PREDMET	CESTE – ZAVRŠNI RAD	GODINA 2021./2022.
ZADATAK	IDEJNI PROJEKT	
SADRŽAJ	KARAKTERISTIČNI P.P.	M 1:200
STUDENT	DINO HODŽIĆ	

0+140.00



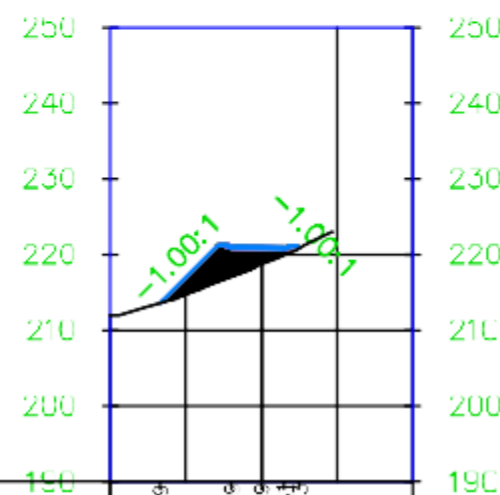
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Kote terena	212.95	220.18	220.04

0+158.54



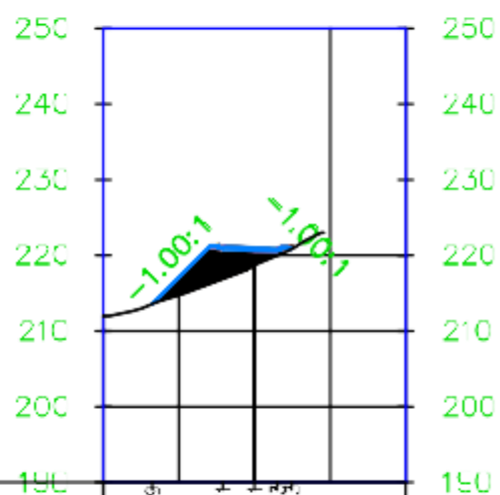
Kote projekta	213.65	13.37	213.65
Udaljenost od osi	20.00	13.37	20.00
Kote terena	213.65	220.74	220.64

C+160.00



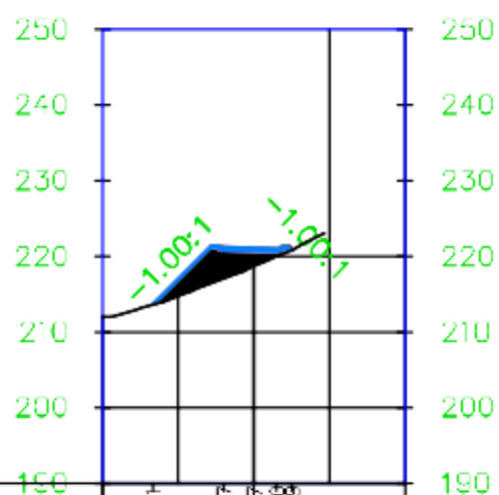
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Udaljenost od osi	20.00	13.39	20.00
Kote terena	213.59	220.79	220.69

0+157.48



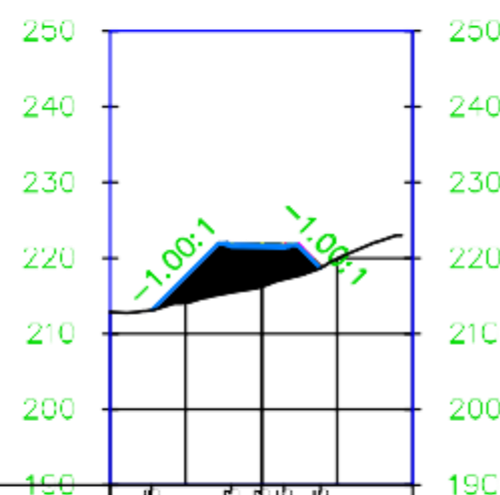
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Udaljenost od osi	20.00	13.53	20.00
Kote terena	213.59	220.74	220.64

0+159.62



Kote projekta	213.61	13.37	213.61
Udaljenost od osi	20.00	13.37	20.00
Kote terena	213.61	220.77	220.67

C+180.00



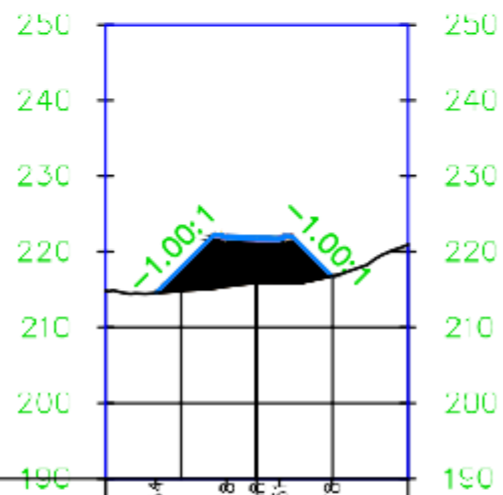
Kote projekta	213.08	14.54	213.08
Udaljenost od osi	20.00	14.54	20.00
Kote terena	213.08	221.43	221.33

FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE SPLIT		
PREDMET	CESTE – ZAVRŠNI RAD	GODINA 2021./2022.
ZADATAK	IDEJNI PROJEKT	
SADRŽAJ	KARAKTERISTIČNI P.P	M 1:200
STUDENT	DINO HODŽIĆ	

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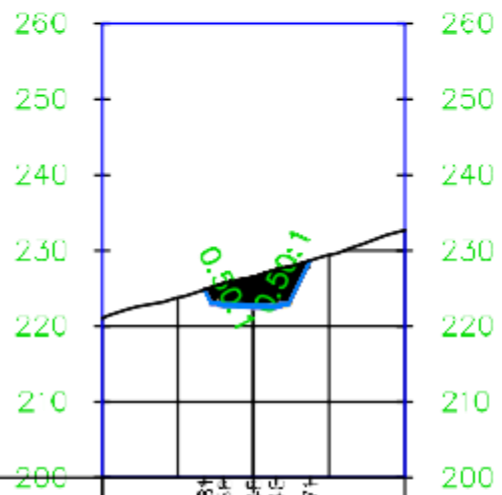
PRODUCED BY AN AUTODESK STUDENT VERSION

0+187.85



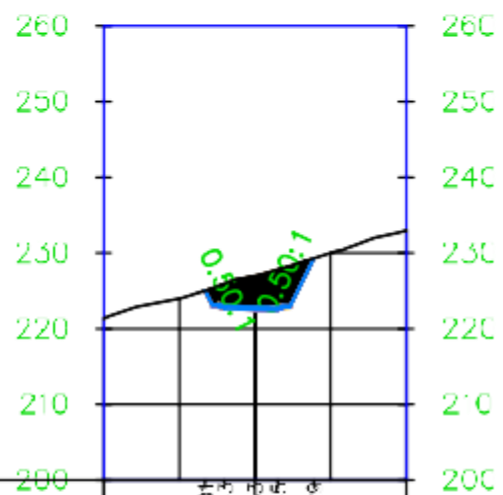
Kote projekta	214.54	214.54	221.68	221.54	216.78
Udaljenost od osi	13.34	0.00	0.00	3.00	9.92
Kote terena	214.54	221.68	221.54	216.78	

0+215.64



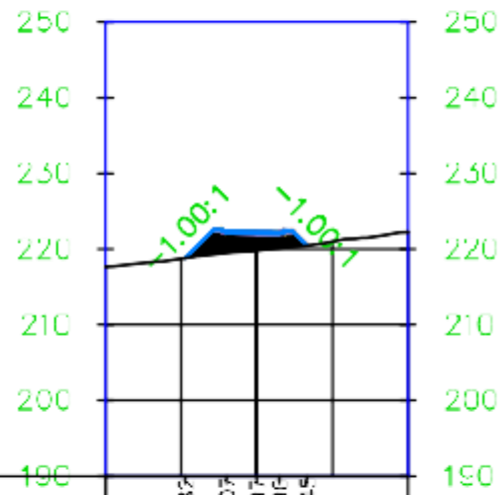
Kote projekta	224.81	224.81	222.45	222.45	228.74
Udaljenost od osi	6.48	4.00	0.00	3.00	7.52
Kote terena	224.81	222.45	222.45	228.74	

0+217.17



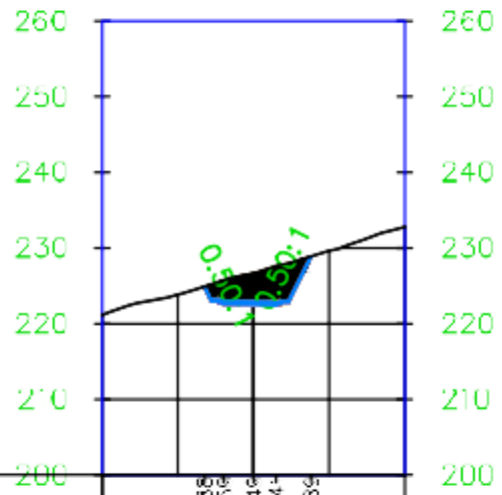
Kote projekta	225.04	225.04	222.55	222.55	229.29
Udaljenost od osi	6.60	4.05	0.00	3.00	7.78
Kote terena	225.04	222.55	222.55	229.29	

0+200.00



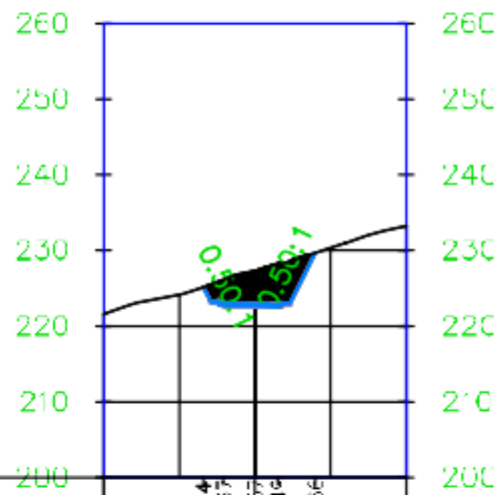
Kote projekta	218.82	218.82	222.07	221.91	220.45
Udaljenost od osi	9.45	0.00	0.00	3.00	6.65
Kote terena	218.82	222.07	221.91	220.45	

0+216.09



Kote projekta	224.58	224.58	222.45	222.45	228.89
Udaljenost od osi	6.51	4.00	0.00	3.00	7.60
Kote terena	224.58	222.45	222.45	228.89	

0+218.23

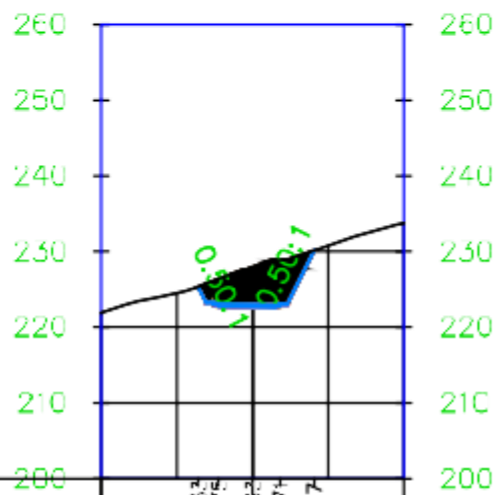


Kote projekta	225.14	225.14	222.57	222.57	229.66
Udaljenost od osi	6.80	4.20	0.00	3.00	7.95
Kote terena	225.14	222.57	222.57	229.66	

FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE SPLIT		
PREDMET	CESTE – ZAVRŠNI RAD	GODINA 2021./2022.
ZADATAK	IDEJNI PROJEKT	
SADRŽAJ	KARAKTERISTIČNI P.P	M 1:200
STUDENT	DINO HODŽIĆ	

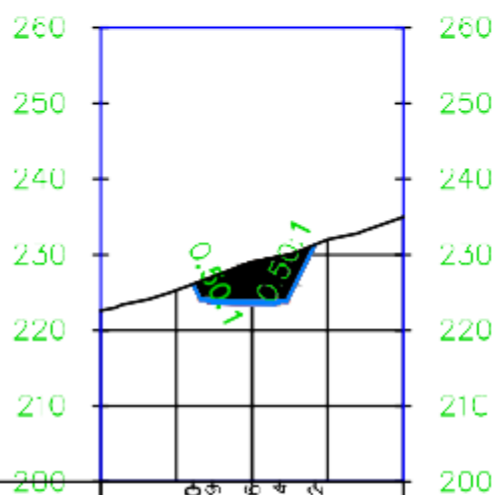


C+220.00



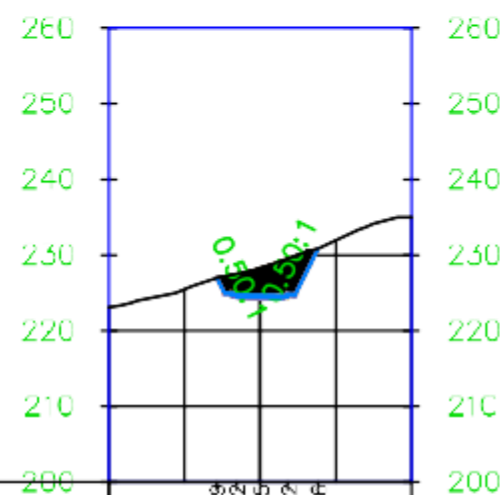
Kote projekta	225.33	225.33	225.33	225.33	225.33	225.33	225.33
Udaljenost od osi	-9.00	-7.17	0.00	7.17	9.00		
Kote terena	222.75	222.75	222.63	222.63	222.74	222.74	230.17

C+237.09



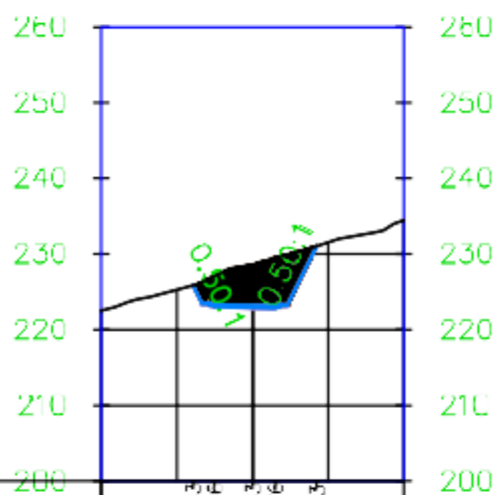
Kote projekta	226.10	226.10	226.10	226.10	226.10	226.10	226.10
Udaljenost od osi	-9.00	-7.81	0.00	7.81	9.00		
Kote terena	223.59	223.59	223.46	223.46	223.54	223.54	231.32

C+254.88



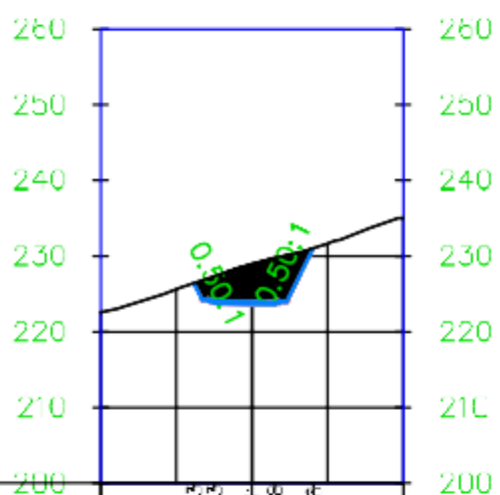
Kote projekta	226.99	226.99	226.99	226.99	226.99	226.99	226.99
Udaljenost od osi	-9.00	-5.74	0.00	5.74	9.00		
Kote terena	224.42	224.42	224.35	224.35	224.42	224.42	230.84

C+224.36



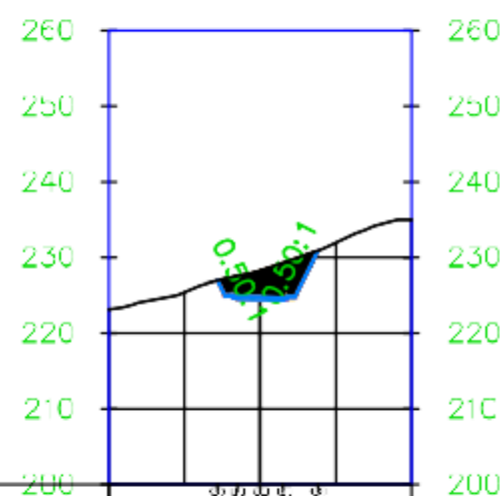
Kote projekta	225.83	225.83	225.83	225.83	225.83	225.83	225.83
Udaljenost od osi	-9.00	-7.86	0.00	7.86	9.00		
Kote terena	222.94	222.94	222.83	222.83	222.76	222.76	231.03

C+240.00



Kote projekta	225.43	225.43	225.43	225.43	225.43	225.43	225.43
Udaljenost od osi	-9.00	-7.70	0.00	7.70	9.00		
Kote terena	223.73	223.73	223.61	223.61	223.68	223.68	231.04

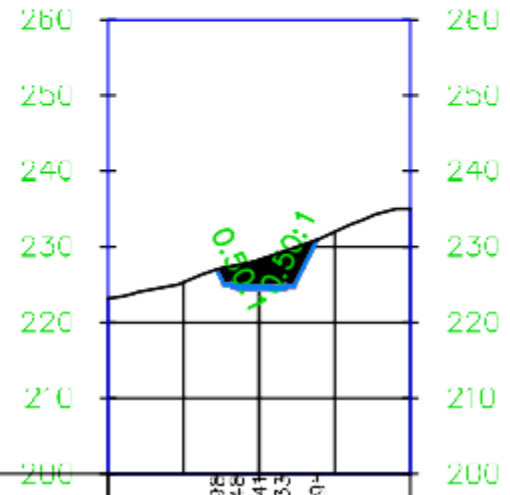
C+255.48



Kote projekta	226.99	226.99	226.99	226.99	226.99	226.99	226.99
Udaljenost od osi	-9.00	-5.66	0.00	5.66	9.00		
Kote terena	224.45	224.45	224.38	224.38	224.45	224.45	230.84

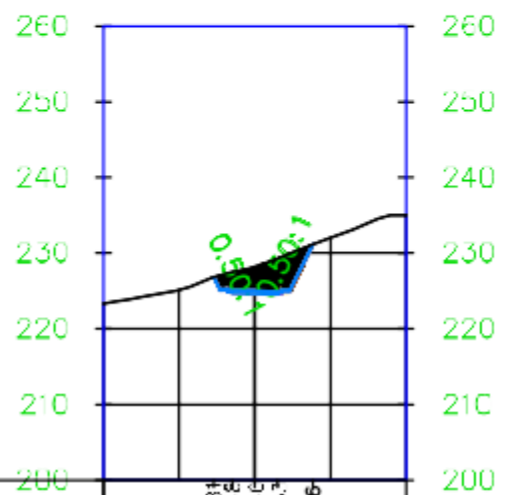
FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE SPLIT		
PREDMET	CESTE – ZAVRŠNI RAD	GODINA 2021./2022.
ZADATAK	IDEJNI PROJEKT	
SADRŽAJ	KARAKTERISTIČNI P.P	M 1:200
STUDENT	DINO HODŽIĆ	

0+256.09



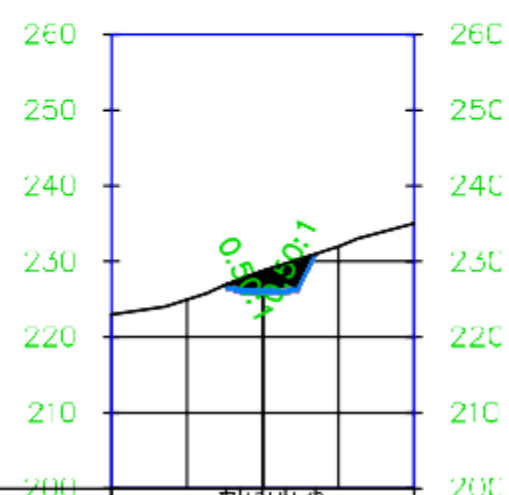
Kote projekta	26.000	226.98	224.48	224.41	224.33	230.91	26.000
Udaljenost od osi		-5.61	-3.00	0.00	3.00	7.65	
Kote terena		226.98	224.48	224.41	224.33	230.91	

C+260.00



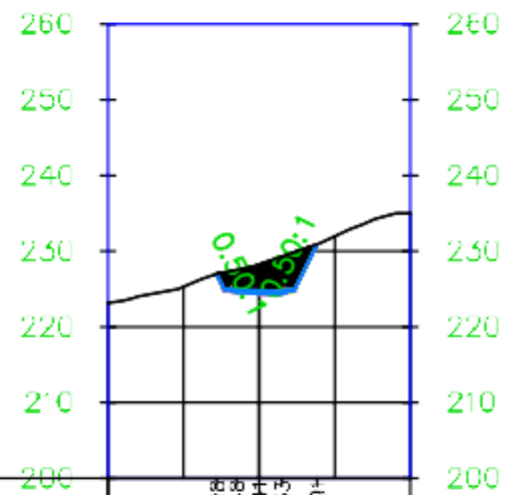
Kote projekta	26.000	226.81	224.68	224.60	224.53	231.16	26.000
Udaljenost od osi		-5.43	-3.00	0.00	3.00	7.65	
Kote terena		226.81	224.68	224.60	224.53	231.16	

0+284.76



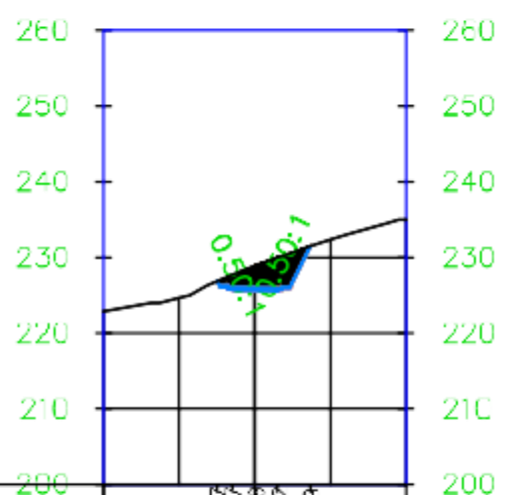
Kote projekta	26.000	226.98	225.83	225.75	230.96	26.000
Udaljenost od osi		-4.86	-3.00	3.00	6.96	
Kote terena		226.98	225.83	225.75	230.96	

0+256.09



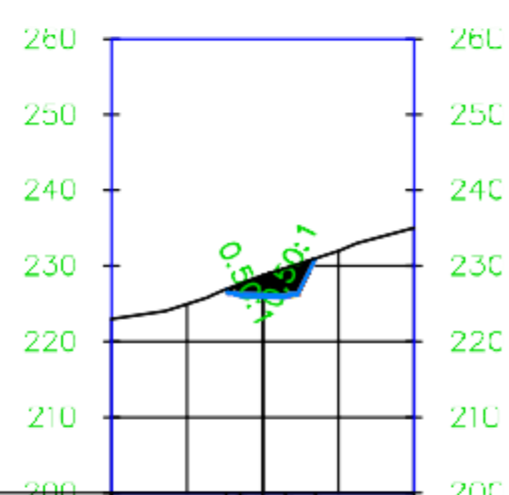
Kote projekta	26.000	226.98	224.48	224.41	224.33	230.91	26.000
Udaljenost od osi		-5.61	-3.00	0.00	3.00	7.65	
Kote terena		226.98	224.48	224.41	224.33	230.91	

C+280.00



Kote projekta	26.000	226.87	225.59	225.52	231.40	26.000
Udaljenost od osi		-4.86	-3.00	3.00	7.35	
Kote terena		226.87	225.59	225.52	231.40	

0+284.76

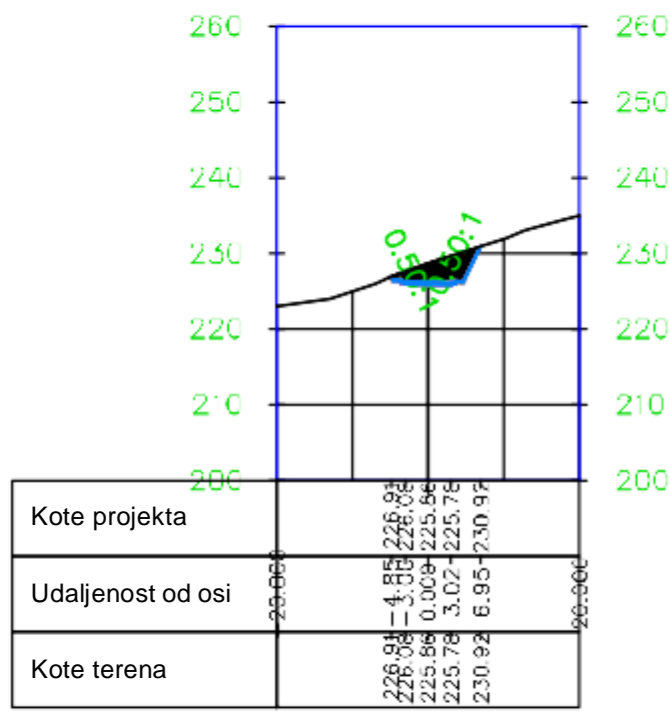


Kote projekta	26.000	226.98	225.83	225.75	230.96	26.000
Udaljenost od osi		-4.86	-3.00	3.00	6.96	
Kote terena		226.98	225.83	225.75	230.96	

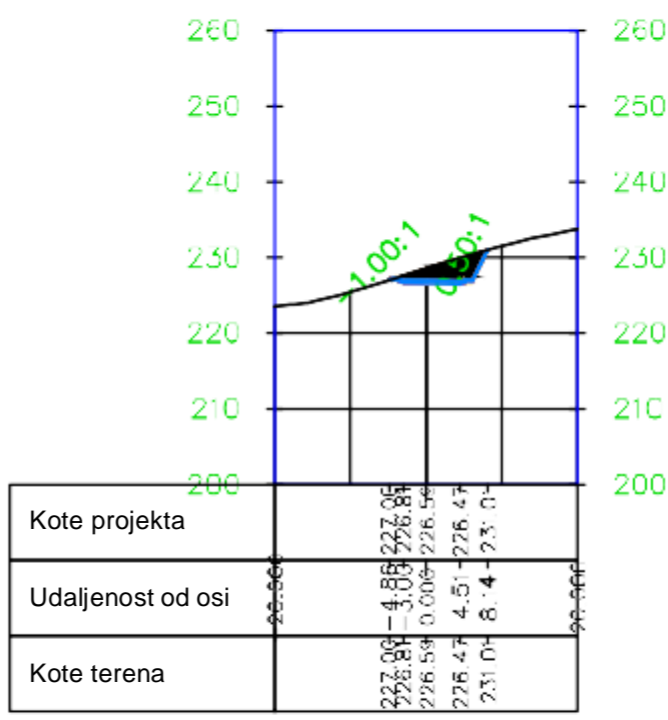
FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE SPLIT		
PREDMET	CESTE – ZAVRŠNI RAD	GODINA 2021./2022.
ZADATAK	IDEJNI PROJEKT	
SADRŽAJ	KARAKTERISTIČNI P.P	M 1:200
STUDENT	DINO HODŽIĆ	



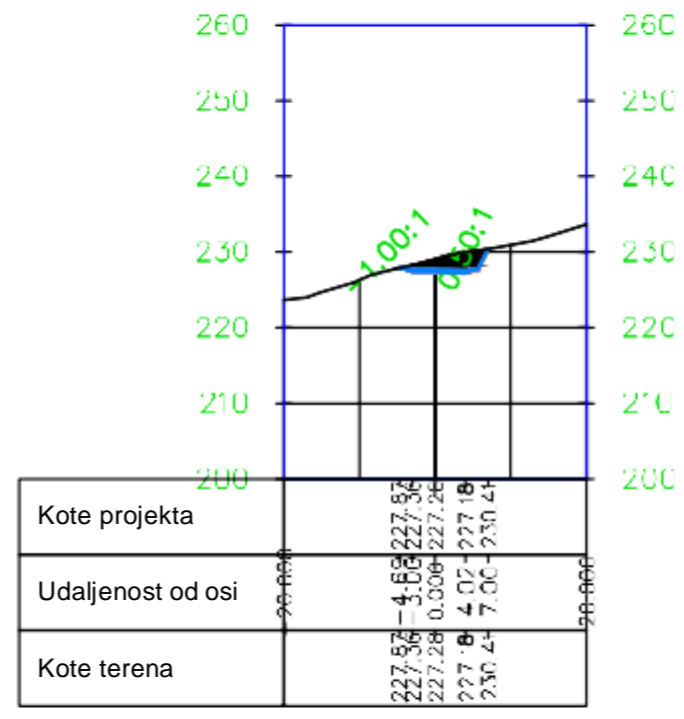
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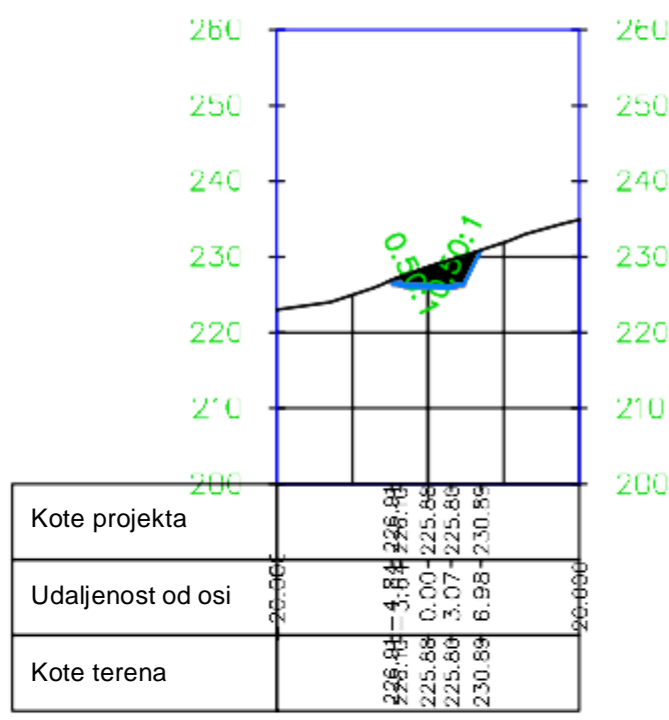
C+300.00



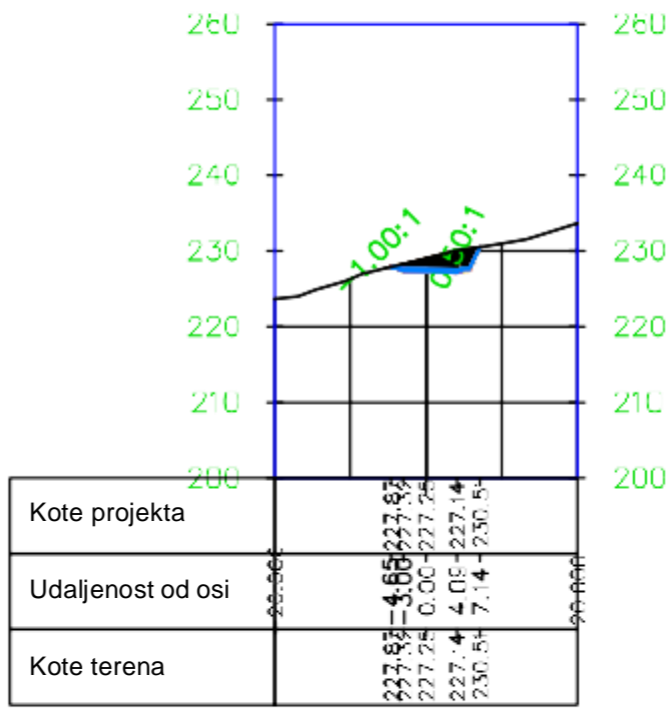
C+314.C3



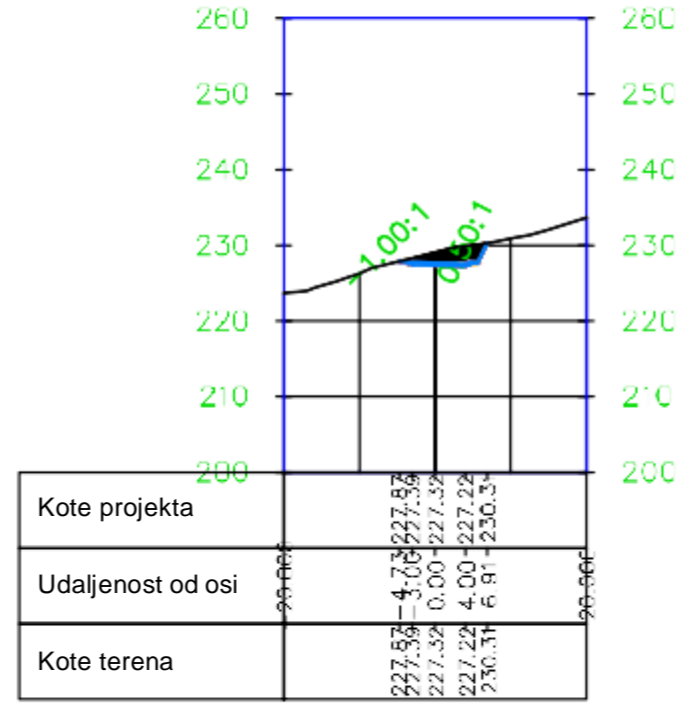
C+285.81



C+313.30

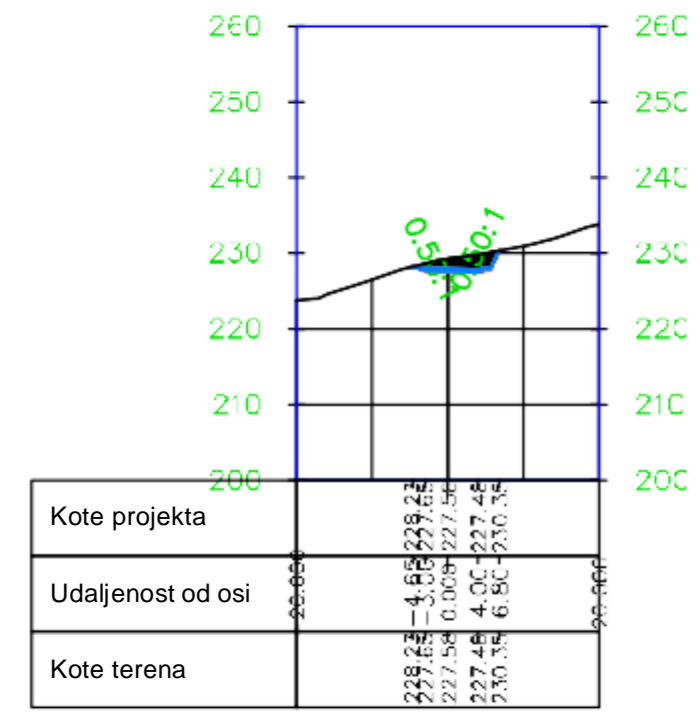


C+314.76

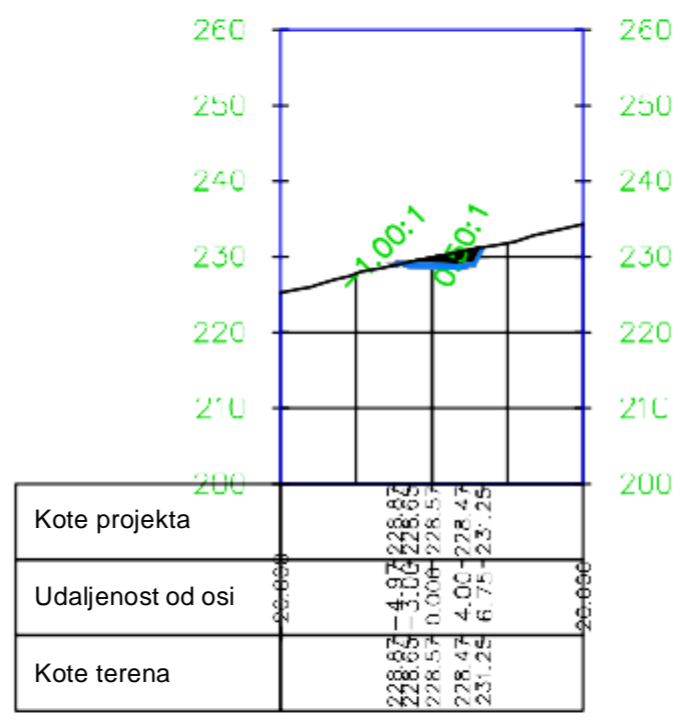


FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE SPLIT		
PREDMET	CESTE – ZAVRŠNI RAD	GODINA 2021./2022.
ZADATAK	IDEJNI PROJEKT	
SADRŽAJ	KARAKTERISTIČNI P.P	M 1:200
STUDENT	DINO HODŽIĆ	

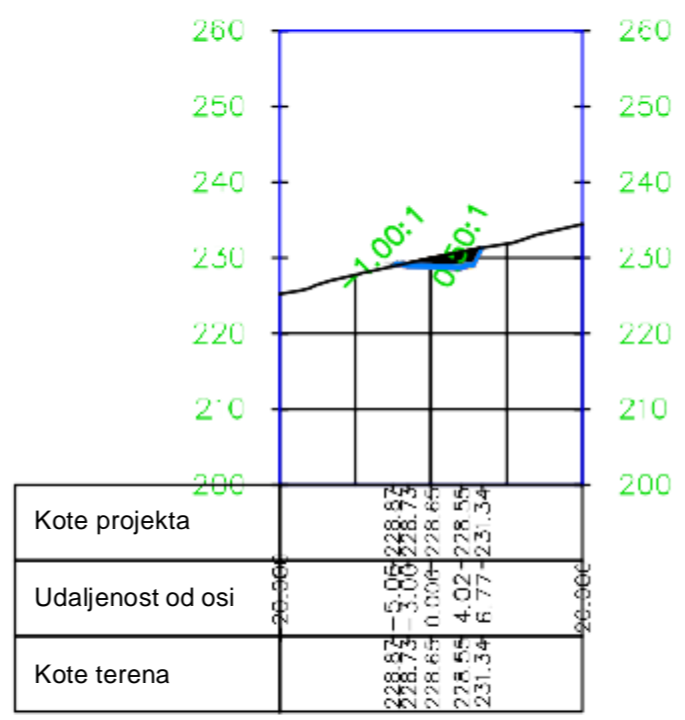
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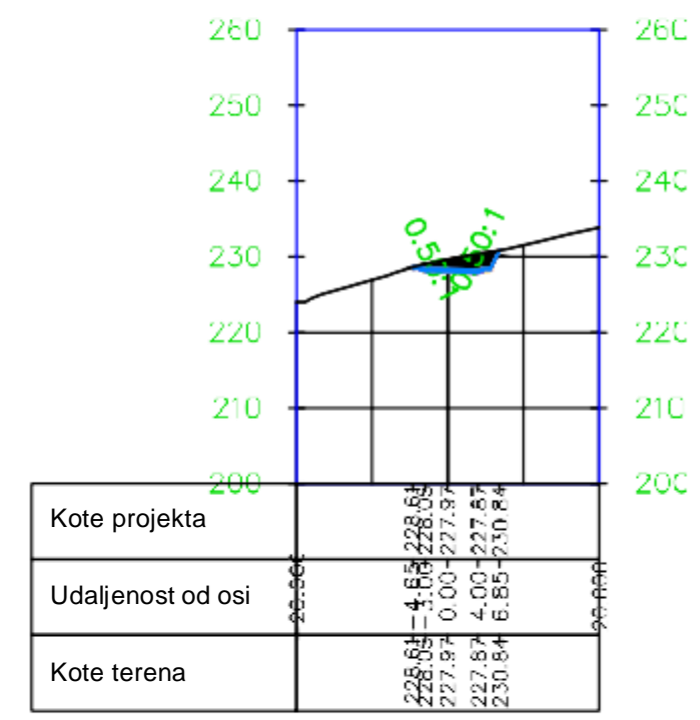
0+340.00



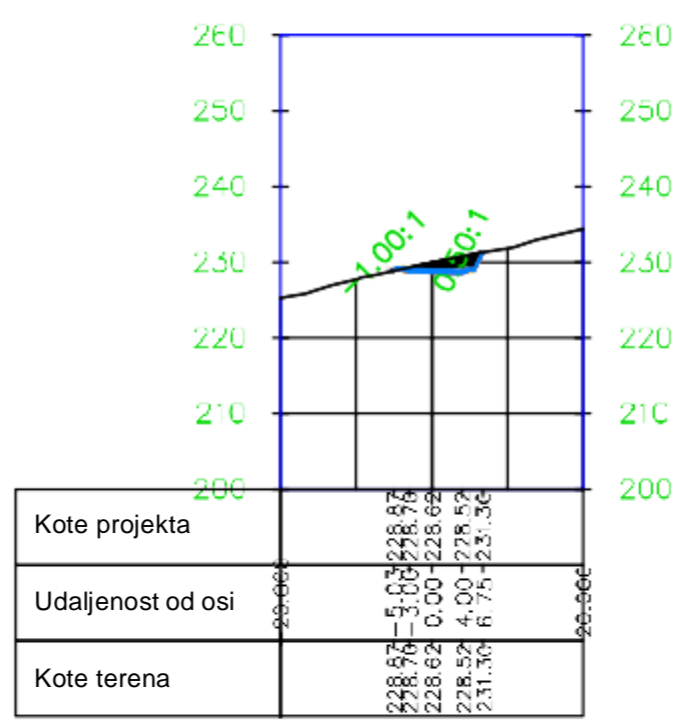
0+341.64



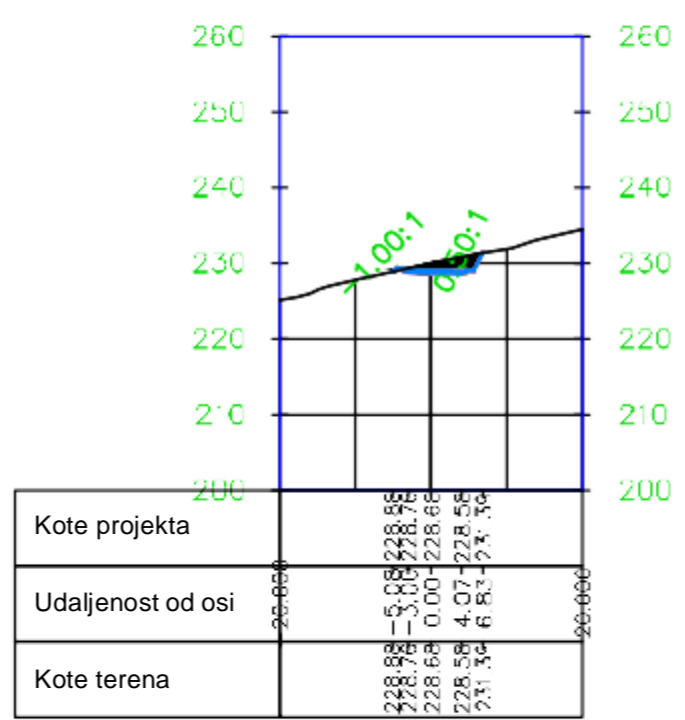
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0+341.03

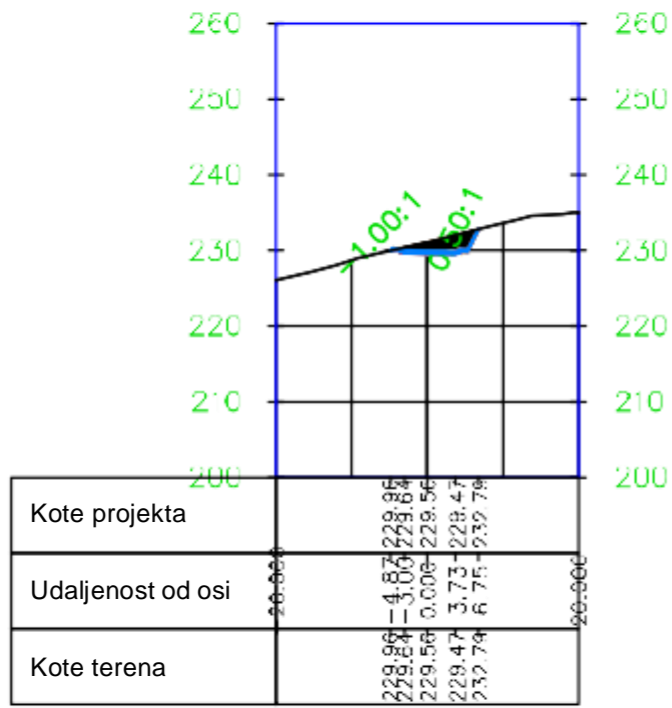


0+342.25

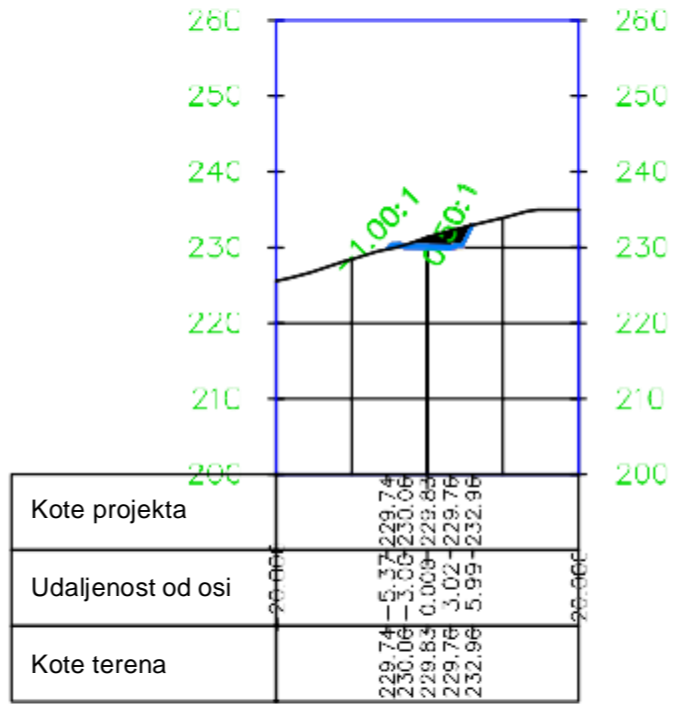


FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE SPLIT		
PREDMET	CESTE – ZAVRŠNI RAD	GODINA 2021./2022.
ZADATAK	IDEJNI PROJEKT	
SADRŽAJ	KARAKTERISTIČNI P.P	M 1:200
STUDENT	DINO HODŽIĆ	

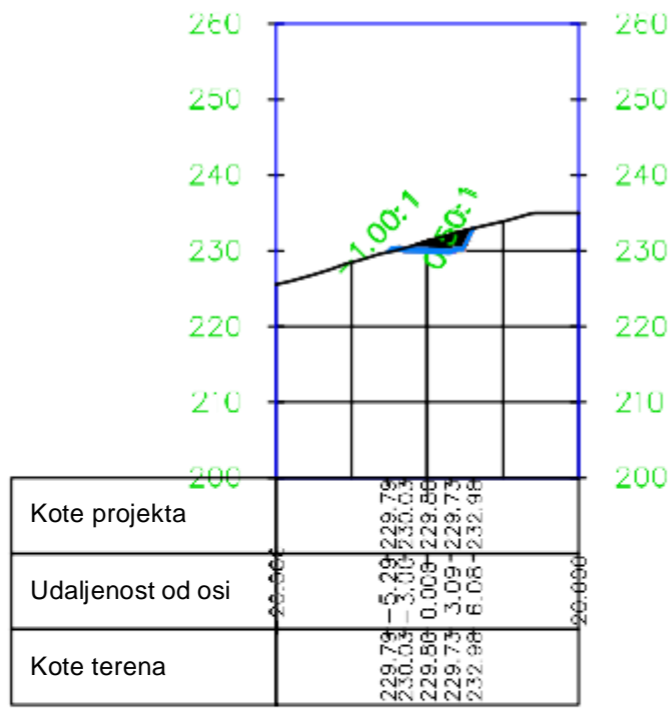
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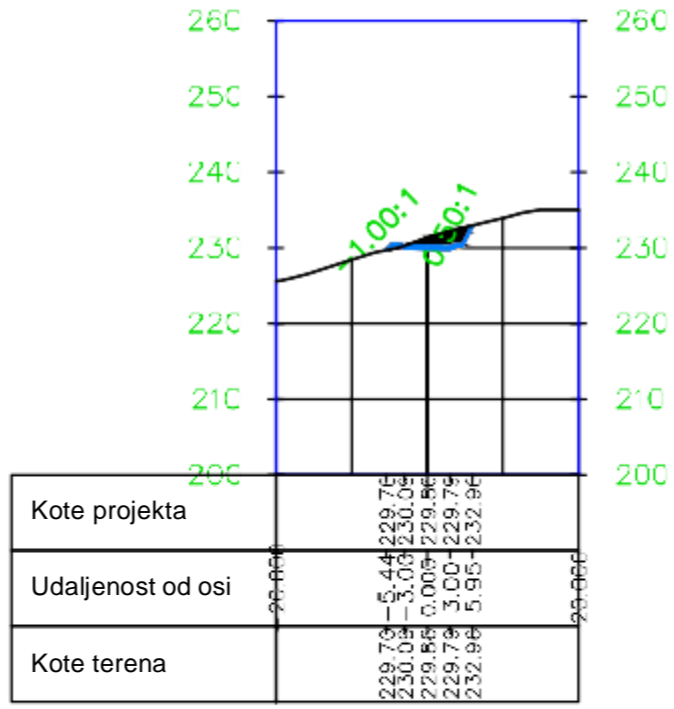
0+365.42



0+364.81

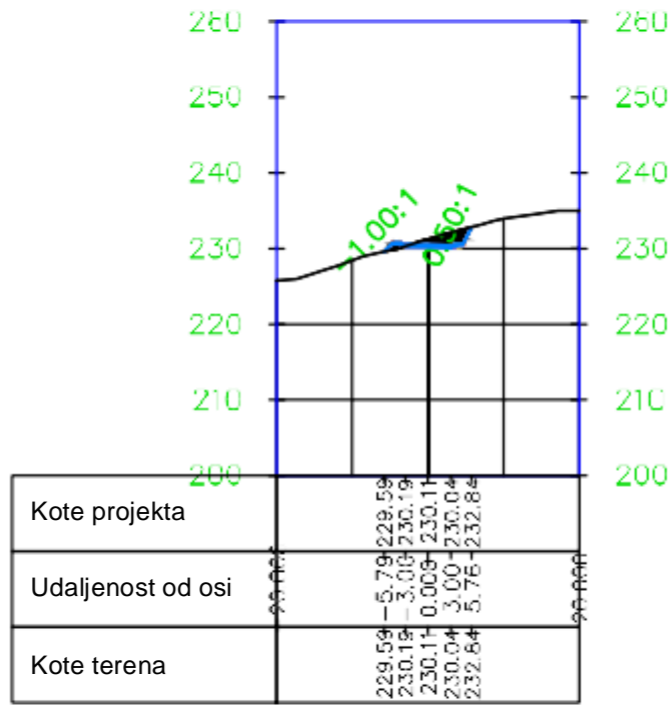


0+366.03

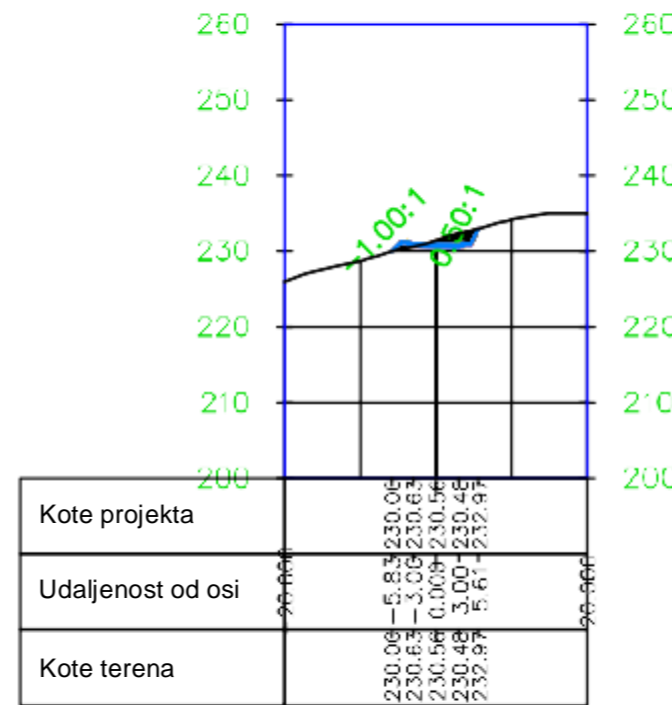


FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE SPLIT		
PREDMET	CESTE – ZAVRŠNI RAD	GODINA 2021./2022.
ZADATAK	IDEJNI PROJEKT	
SADRŽAJ	KARAKTERISTIČNI P.P	M 1:200
STUDENT	DINO HODŽIĆ	

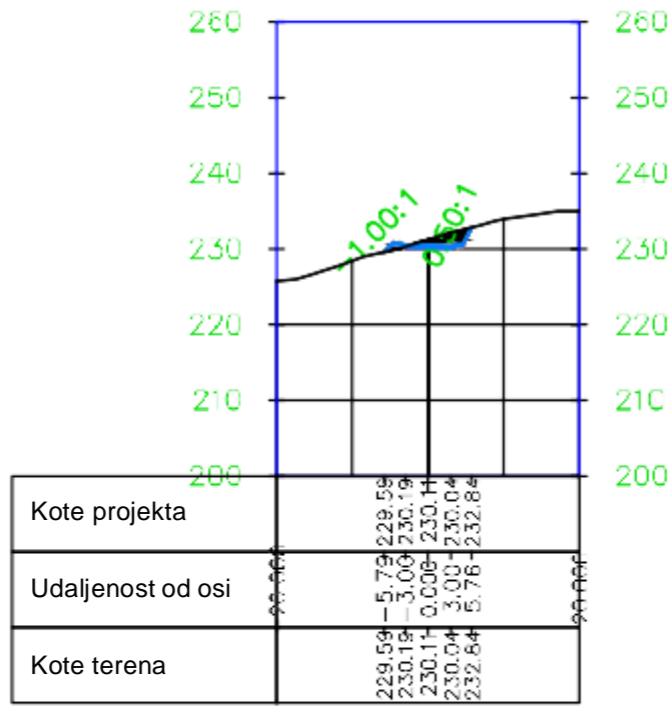
C+371.03



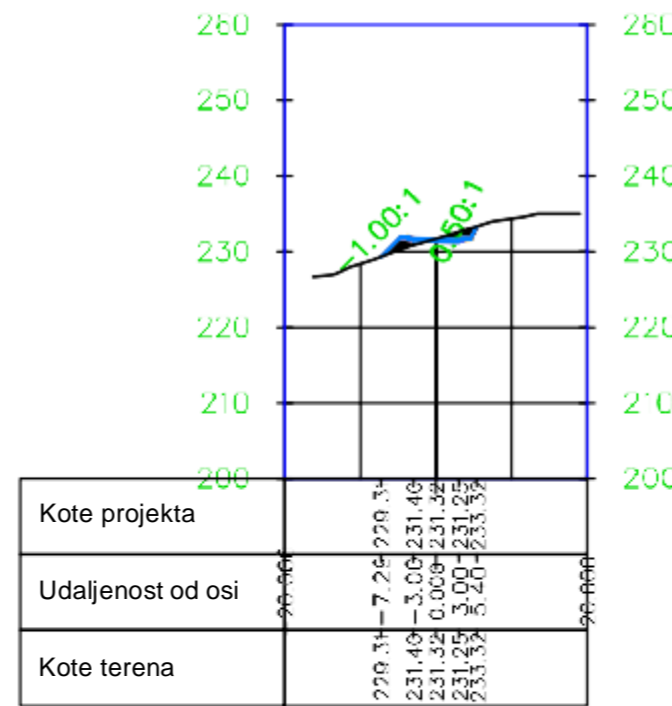
0+380.00



C+371.03



0+395.38



FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE SPLIT		
PREDMET	CESTE – ZAVRŠNI RAD	GODINA 2021./2022.
ZADATAK	IDEJNI PROJEKT	
SADRŽAJ	KARAKTERISTIČNI P.P.	M 1:200
STUDENT	DINO HODŽIĆ	

#### **4. TABLICA UKUPNOG VOLUMENA ZEMLJANIH RADOVA**

<b>Station</b>	<b>Cut Area (Sq.m.)</b>	<b>Cut Volume (Cu.m.)</b>	<b>Reusable Volume (Cu.m.)</b>	<b>Fill Area (Sq.m.)</b>	<b>Fill Volume (Cu.m.)</b>	<b>Cum. Cut Vol. (Cu.m.)</b>	<b>Cum. Reusable Vol. (Cu.m.)</b>	<b>Cum. Fill Vol. (Cu.m.)</b>	<b>Cum. Net Vol. (Cu.m.)</b>
0+000.000	5.83	0.00	0.00	3.76	0.00	0.00	0.00	0.00	0.00
0+020.000	1.15	69.81	69.81	13.06	168.19	69.81	69.81	168.19	-98.39
0+040.000	0.00	11.49	11.49	25.91	389.76	81.30	81.30	557.95	-476.66
0+060.000	0.00	0.00	0.00	37.28	631.93	81.30	81.30	1189.88	-1108.58
0+080.000	0.00	0.00	0.00	52.60	898.76	81.30	81.30	2088.64	-2007.35
0+100.000	0.00	0.00	0.00	51.94	1045.36	81.30	81.30	3134.00	-3052.70
0+119.615	0.00	0.00	0.00	43.15	932.60	81.30	81.30	4066.59	-3985.30
0+119.620	0.00	0.00	0.00	43.15	0.21	81.30	81.30	4066.81	-3985.51
0+120.000	0.00	0.00	0.00	43.07	16.38	81.30	81.30	4083.19	-4001.90
0+120.224	0.00	0.00	0.00	43.06	9.65	81.30	81.30	4092.84	-4011.54
0+120.830	0.00	0.00	0.00	43.09	26.10	81.30	81.30	4118.94	-4037.64
0+138.615	0.00	0.00	0.00	48.49	794.84	81.30	81.30	4913.78	-4832.48
0+140.000	0.00	0.00	0.00	48.12	66.90	81.30	81.30	4980.67	-4899.38
0+157.478	0.00	0.00	0.00	43.71	738.30	81.30	81.30	5718.98	-5637.68
0+158.541	0.00	0.00	0.00	43.11	41.67	81.30	81.30	5760.64	-5679.35
0+159.615	0.00	0.00	0.00	43.04	41.75	81.30	81.30	5802.39	-5721.10
0+160.000	0.00	0.00	0.00	43.17	16.59	81.30	81.30	5818.98	-5737.69
0+180.000	0.00	0.00	0.00	90.18	1237.01	81.30	81.30	7056.00	-6974.70
0+187.854	0.00	0.00	0.00	104.56	731.43	81.30	81.30	7787.42	-7706.13
0+200.000	0.00	0.00	0.00	31.81	802.86	81.30	81.30	8590.28	-8508.98



0+200.000	0.00	0.00	0.00	31.81	802.86	81.30	81.30	8590.28	-8508.98
0+215.638	48.33	384.18	384.18	0.00	240.30	465.48	465.48	8830.58	-8365.10
0+216.094	49.63	22.33	22.33	0.00	0.00	487.80	487.80	8830.58	-8342.78
0+217.168	53.11	56.10	56.10	0.00	0.00	543.91	543.91	8830.58	-8286.67
0+218.230	57.54	59.71	59.71	0.00	0.00	603.62	603.62	8830.58	-8226.96
0+220.000	64.66	109.68	109.68	0.00	0.00	713.29	713.29	8830.58	-8117.28
0+224.359	75.04	307.68	307.68	0.00	0.00	1020.98	1020.98	8830.58	-7809.60
0+237.094	68.09	917.46	917.46	0.00	0.00	1938.43	1938.43	8830.58	-6892.14
0+240.000	66.76	196.85	196.85	0.00	0.00	2135.28	2135.28	8830.58	-6695.30
0+254.879	45.62	839.03	839.03	0.00	0.00	2974.32	2974.32	8830.58	-5856.26
0+255.485	44.94	27.44	27.44	0.00	0.00	3001.75	3001.75	8830.58	-5828.83
0+256.090	44.33	27.01	27.01	0.00	0.00	3028.76	3028.76	8830.58	-5801.82
0+256.094	44.33	0.17	0.17	0.00	0.00	3028.93	3028.93	8830.58	-5801.65
0+260.000	41.53	167.68	167.68	0.00	0.00	3196.62	3196.62	8830.58	-5633.96
0+280.000	35.34	768.65	768.65	0.00	0.00	3965.27	3965.27	8830.58	-4865.31
0+284.760	30.21	156.01	156.01	0.00	0.00	4121.28	4121.28	8830.58	-4709.30
0+284.762	30.21	0.05	0.05	0.00	0.00	4121.33	4121.33	8830.58	-4709.25
0+285.285	29.69	15.67	15.67	0.00	0.00	4137.00	4137.00	8830.58	-4693.58
0+285.806	29.36	15.40	15.40	0.00	0.00	4152.40	4152.40	8830.58	-4678.18
0+300.000	26.56	392.04	392.04	0.02	0.13	4544.44	4544.44	8830.71	-4286.27
0+313.297	20.74	302.53	302.53	0.00	0.13	4846.96	4846.96	8830.84	-3983.88
0+314.027	19.91	14.84	14.84	0.00	0.00	4861.80	4861.80	8830.84	-3969.04
0+314.762	19.29	14.39	14.39	0.00	0.00	4876.19	4876.19	8830.84	-3954.65
0+320.000	17.68	92.97	92.97	0.00	0.00	4969.16	4969.16	8830.85	-3861.69
0+327.898	18.25	136.47	136.47	0.00	0.00	5105.63	5105.63	8830.85	-3725.22

0+340.000	15.15	193.67	193.67	0.05	0.34	5299.30	5299.30	8831.20	-3531.90
0+341.035	14.96	14.87	14.87	0.09	0.08	5314.17	5314.17	8831.27	-3517.10
0+341.643	14.91	9.09	9.09	0.11	0.06	5323.26	5323.26	8831.33	-3508.08
0+342.249	14.98	9.05	9.05	0.13	0.07	5332.31	5332.31	8831.41	-3499.10
0+360.000	17.06	275.79	275.79	0.02	1.46	5608.10	5608.10	8832.87	-3224.77
0+364.813	14.78	75.71	75.71	0.37	0.97	5683.80	5683.80	8833.84	-3150.04
0+365.423	14.29	8.86	8.86	0.48	0.26	5692.67	5692.67	8834.10	-3141.43
0+366.035	13.95	8.65	8.65	0.59	0.33	5701.32	5701.32	8834.43	-3133.11
0+371.030	11.09	62.54	62.54	1.21	4.50	5763.86	5763.86	8838.92	-3075.07
0+371.035	11.09	0.05	0.05	1.21	0.00	5763.91	5763.91	8838.93	-3075.02
0+380.000	8.94	89.77	89.77	1.29	11.22	5853.68	5853.68	8850.15	-2996.47
0+395.380	5.59	111.69	111.69	4.47	44.26	5965.37	5965.37	8894.41	-2929.05

## 5. OBRADA NA RAČUNALU

Za izradu idejnog projekta lokalne ceste korišten je AutoCAD Civil 3D koji znatno olakšava izradu programskog zadatka. U odnosu na ručno rješavanje, postupak na računalu je znatno brži i jednostavniji.

Prvi korak pri izradi idejnog rješenja je skeniranje geodetske podloge te slijedi iscrtavanje slojnica. Slojnice se iscrtavaju pomoću 3D poligonalnih linija te se postupkom triangulacije na tim linijama dobije trodimenzionalni model terena. Zatim definiramo koordinate točaka tangenti (dvije točke ta svaku tangentu) te ih definiramo na terenu. Na sjecištima tangenti definiramo kružne lukove i prijelazne krivine te na taj način definiramo horizontalni tok ceste.

Slijedi izrada uzdužnog presjeka ceste kojeg definira niveleta. Niveleta se postavlja tako da se zadovolje geometrijski i sigurnosni elementi te odvodnja. Između tangenti se ubacuje kružna krivina određenog radijusa.

Sljedeći korak je definiranje poprečnog profila prometnice. Poprečnim presjekom su definirani: poprečni nagib i širina kolnika te pokosi usjeka i nasipa.

Na temelju definiranih horizontalnih i vertikalnih elemenata te osi ceste, izrađujemo koridor. On omogućuje uvid u poprečne presjeke u svim karakterističnim i zadanim točkama osi ceste. Time smo definirali cijelu dionicu ceste.

Izlazni podaci su računalni ispisi koordinatnih točaka osi, točaka svakog poprečnog presjeka te količina zemljanih radova po presjeku.



## **6. IZLAZNI PODACI IZ PROGRAMA**

### **6.1 Koordinatni račun glavnih točaka**

# Your Company Name

123 Main Street

Suite #321

City, State 01234

## Alignment Station and Curve Report

Project Name: C:\Users\Korisnik\AppData\Local\Temp\ZAVRSNI  
RAD\_1\_21304\_972c6b72.sv\$

Report Date: 7.9.2022. 16:47:22

Client: Client  
Company

Project  
Description:

Prepared by:  
Preparer

Alignment: os\_S\_(5)

Description:

### Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	198.984	-189.415
End:	1+19.615	102.947	-118.108

### Tangent Data

Parameter	Value	Parameter	Value
Length:	119.615	Course:	S 36° 35' 37.4481" E

### Spiral Point Data

Description	Station	Northing	Easting
TS:	1+19.615	102.947	-118.108
SPI:		81.355	-102.076
SC:	1+59.615	74.485	-90.408

### Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	40.000	L Tan:	26.894
Radius:	50.000	S Tan:	13.540
Theta:	22° 55' 05.9225"	P:	1.326
X:	39.365	K:	19.894
Y:	5.273	A:	44.721
Chord:	39.716	Course:	S 44° 13' 22.0259" E

### Curve Point Data

Description	Station	Northing	Easting
SC:	1+59.615	74.485	-90.408
RP:		117.572	-65.040
CS:	2+16.094	76.233	-36.913

### Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	64° 43' 11.9667"	Type:	LEFT
Radius:	50.000		
Length:	56.479	Tangent:	31.682
Mid-Ord:	7.765	External:	9.192
Chord:	53.524	Course:	N 88° 07' 40.6461" E

### Spiral Point Data

Description	Station	Northing	Easting
CS:	2+16.094	76.233	-36.913
SPI:		83.850	-25.718
ST:	2+56.094	106.444	-11.130

### Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
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Length:	40.000	L Tan:	26.894
Radius:	50.000	S Tan:	13.540
Theta:	22° 55' 05.9225"	P:	1.326
X:	39.365	K:	19.894
Y:	5.273	A:	44.721
Chord:	39.716	Course:	N 40° 28' 43.3181" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	2+56.094	106.444	-11.130
End:	2+84.762	130.527	4.420

Tangent Data

Parameter	Value	Parameter	Value
Length:	28.668	Course:	N 32° 50' 58.7403" E

Spiral Point Data

Description	Station	Northing	Easting
TS:	2+84.762	130.527	4.420
SPI:		147.409	15.320
SC:	3+14.762	153.887	23.052

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	30.000	L Tan:	20.095
Radius:	50.000	S Tan:	10.087
Theta:	17° 11' 19.4419"	P:	0.748
X:	29.731	K:	14.955
Y:	2.981	A:	38.730
Chord:	29.880	Course:	N 38° 34' 29.4711" E

Curve Point Data

Description	Station	Northing	Easting
SC:	3+14.762	153.887	23.052
RP:		115.564	55.165
CS:	3+41.035	164.826	46.607

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	30° 06' 23.7031"	Type:	RIGHT
Radius:	50.000		
Length:	26.273	Tangent:	13.447
Mid-Ord:	1.716	External:	1.777
Chord:	25.972	Course:	N 65° 05' 30.0337" E

Spiral Point Data

Description	Station	Northing	Easting
CS:	3+41.035	164.826	46.607
SPI:		166.552	56.545
ST:	3+71.035	163.987	76.476

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	30.000	L Tan:	20.095
Radius:	50.000	S Tan:	10.087
Theta:	17° 11' 19.4419"	P:	0.748
X:	29.731	K:	14.955
Y:	2.981	A:	38.730
Chord:	29.880	Course:	S 88° 23' 29.4037" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	3+71.035	163.987	76.476
End:	3+95.380	160.880	100.622

Tangent Data

Parameter	Value	Parameter	Value
Length:	24.345	Course:	S 82° 39' 58.6729" E

**Alignment: os S (5)-Left-3.000****Description:**Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	200.772	-187.006
End:	1+19.615	104.735	-115.699

Tangent Data

Parameter	Value	Parameter	Value
Length:	119.615	Course:	S 36° 35' 37.4481" E

Curve Point Data

Description	Station	Northing	Easting
PC:	1+19.615	104.735	-115.699
RP:		109.504	-109.276
PT:	1+20.834	103.816	-114.901

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	08° 43' 37.8603"	Type:	LEFT
Radius:	8.000		
Length:	1.219	Tangent:	0.610
Mid-Ord:	0.023	External:	0.023
Chord:	1.217	Course:	S 40° 57' 26.3782" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	1+20.834	103.816	-114.901
End:	1+55.932	79.137	-89.945

Tangent Data

Parameter	Value	Parameter	Value
Length:	35.098	Course:	S 45° 19' 15.3084" E

Curve Point Data

Description	Station	Northing	Easting
PC:	1+55.932	79.137	-89.945
RP:		84.826	-84.320
PCC:	1+57.913	77.932	-88.379

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	14° 11' 28.0622"	Type:	LEFT
Radius:	8.000		
Length:	1.981	Tangent:	0.996
Mid-Ord:	0.061	External:	0.062
Chord:	1.976	Course:	S 52° 24' 59.3395" E

Curve Point Data

Description	Station	Northing	Easting
PCC:	1+57.913	77.932	-88.379
RP:		117.572	-65.040
PCC:	2+09.874	79.541	-39.163

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	64° 43' 11.9667"	Type:	LEFT
Radius:	46.000		
Length:	51.961	Tangent:	29.147
Mid-Ord:	7.144	External:	8.457
Chord:	49.242	Course:	N 88° 07' 40.6461" E

Curve Point Data

Description	Station	Northing	Easting
PCC:	2+09.874	79.541	-39.163
RP:		86.155	-43.663



PT: 2+11.855 80.846 -37.679

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	14° 11' 28.0622"	Type:	LEFT
Radius:	8.000		
Length:	1.981	Tangent:	0.996
Mid-Ord:	0.061	External:	0.062
Chord:	1.976	Course:	N 48° 40' 20.6317" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	2+11.855	80.846	-37.679
End:	2+46.953	107.101	-14.387

Tangent Data

Parameter	Value	Parameter	Value
Length:	35.098	Course:	N 41° 34' 36.6006" E

Curve Point Data

Description	Station	Northing	Easting
PC:	2+46.953	107.101	-14.387
RP:		112.410	-20.371
PT:	2+48.172	108.071	-13.651

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	08° 43' 37.8603"	Type:	LEFT
Radius:	8.000		
Length:	1.219	Tangent:	0.610
Mid-Ord:	0.023	External:	0.023
Chord:	1.217	Course:	N 37° 12' 47.6704" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	2+48.172	108.071	-13.651
End:	2+76.840	132.155	1.900

Tangent Data

Parameter	Value	Parameter	Value
Length:	28.668	Course:	N 32° 50' 58.7403" E

Spiral Point Data

Description	Station	Northing	Easting
TS:	2+76.840	132.155	1.900
SPI:		149.417	13.046
SC:	3+07.740	156.187	21.125

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	30.900	L Tan:	20.692
Radius:	53.000	S Tan:	10.384
Theta:	16° 42' 08.1369"	P:	0.748
X:	30.638	K:	15.406
Y:	2.984	A:	40.469
Chord:	30.776	Course:	N 38° 39' 30.2734" E

Curve Point Data

Description	Station	Northing	Easting
SC:	3+07.740	156.187	21.125
RP:		115.564	55.165
CS:	3+35.589	167.782	46.094

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	30° 06' 23.7031"	Type:	RIGHT
Radius:	53.000		
Length:	27.849	Tangent:	14.254
Mid-Ord:	1.819	External:	1.883
Chord:	27.530	Course:	N 65° 05' 30.0337" E

Spiral Point Data

Description	Station	Northing	Easting
CS:	3+35.589	167.782	46.094
SPI:		169.586	56.478
ST:	3+66.489	166.963	76.859

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	30.900	L Tan:	20.692
Radius:	53.000	S Tan:	10.384
Theta:	16° 42' 08.1369"	P:	0.748
X:	30.638	K:	15.406
Y:	2.984	A:	40.469
Chord:	30.776	Course:	S 88° 28' 30.2060" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	3+66.489	166.963	76.859
End:	3+90.834	163.855	101.005

Tangent Data

Parameter	Value	Parameter	Value
Length:	24.345	Course:	S 82° 39' 58.6729" E

**Alignment: os S (5)-Right-3.000**

**Description:**

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	197.195	-191.824
End:	1+19.615	101.159	-120.517

Tangent Data

Parameter	Value	Parameter	Value
Length:	119.615	Course:	S 36° 35' 37.4481" E

Spiral Point Data

Description	Station	Northing	Easting
TS:	1+19.615	101.159	-120.517
SPI:		79.078	-104.122
SC:	1+60.815	71.900	-91.930

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	41.200	L Tan:	27.687
Radius:	53.000	S Tan:	13.934
Theta:	22° 16' 10.8492"	P:	1.327
X:	40.582	K:	20.497
Y:	5.281	A:	46.729
Chord:	40.906	Course:	S 44° 20' 03.5284" E

Curve Point Data

Description	Station	Northing	Easting
SC:	1+60.815	71.900	-91.930
RP:		117.572	-65.040
CS:	2+20.683	73.753	-35.225

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	64° 43' 11.9667"	Type:	LEFT
Radius:	53.000		
Length:	59.868	Tangent:	33.583
Mid-Ord:	8.231	External:	9.744
Chord:	56.735	Course:	N 88° 07' 40.6461" E

Spiral Point Data

Description	Station	Northing	Easting
CS:	2+20.683	73.753	-35.225
SPI:		81.712	-23.528
ST:	2+61.883	104.816	-8.610

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	41.200	L Tan:	27.687
Radius:	53.000	S Tan:	13.934
Theta:	22° 16' 10.8492"	P:	1.327
X:	40.582	K:	20.497
Y:	5.281	A:	46.729
Chord:	40.906	Course:	N 40° 35' 24.8206" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	2+61.883	104.816	-8.610
End:	2+90.550	128.900	6.940

Tangent Data

Parameter	Value	Parameter	Value
Length:	28.668	Course:	N 32° 50' 58.7403" E

Curve Point Data

Description	Station	Northing	Easting
PC:	2+90.550	128.900	6.940
RP:		124.561	13.661
PT:	2+91.597	129.740	7.564

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	07° 29' 40.6609"	Type:	RIGHT
Radius:	8.000		
Length:	1.046	Tangent:	0.524
Mid-Ord:	0.017	External:	0.017
Chord:	1.046	Course:	N 36° 35' 49.0707" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	2+91.597	129.740	7.564
End:	3+18.007	149.869	24.661

Tangent Data

Parameter	Value	Parameter	Value
Length:	26.411	Course:	N 40° 20' 39.4012" E

Curve Point Data

Description	Station	Northing	Easting
PC:	3+18.007	149.869	24.661
RP:		144.690	30.759
PCC:	3+19.361	150.822	25.621

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	09° 41' 38.7810"	Type:	RIGHT
Radius:	8.000		
Length:	1.354	Tangent:	0.678
Mid-Ord:	0.029	External:	0.029
Chord:	1.352	Course:	N 45° 11' 28.7916" E

Curve Point Data

Description	Station	Northing	Easting
PCC:	3+19.361	150.822	25.621
RP:		115.564	55.165
PCC:	3+43.532	160.885	47.292

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	30° 06' 23.7031"	Type:	RIGHT
Radius:	46.000		



Radius:	40.000	Tangent:	12.372
Length:	24.171	External:	1.635
Mid-Ord:	1.579	Course:	N 65° 05' 30.0337" E
Chord:	23.894		

Curve Point Data

Description	Station	Northing	Easting
PCC:	3+43.532	160.885	47.292
RP:		153.003	48.661
PT:	3+44.653	160.999	48.406

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	08° 01' 38.9360"	Type:	RIGHT
Radius:	8.000		
Length:	1.121	Tangent:	0.561
Mid-Ord:	0.020	External:	0.020
Chord:	1.120	Course:	N 84° 09' 31.3532" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	3+44.653	160.999	48.406
End:	3+66.205	161.686	69.947

Tangent Data

Parameter	Value	Parameter	Value
Length:	21.552	Course:	N 88° 10' 20.8212" E

Curve Point Data

Description	Station	Northing	Easting
PC:	3+66.205	161.686	69.947
RP:		153.690	70.202
CS:	3+67.417	161.633	71.157

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	08° 41' 01.6850"	Type:	RIGHT
Radius:	8.000		
Length:	1.212	Tangent:	0.607
Mid-Ord:	0.023	External:	0.023
Chord:	1.211	Course:	S 87° 29' 08.3363" E

Spiral Point Data

Description	Station	Northing	Easting
CS:	3+67.417	161.633	71.157
SPI:		161.436	72.799
ST:	3+72.392	161.012	76.093

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	4.975	L Tan:	3.317
Radius:	297.005	S Tan:	1.658
Theta:	00° 28' 47.5017"	P:	0.003
X:	4.975	K:	2.487
Y:	0.014	A:	38.439
Chord:	4.975	Course:	S 82° 49' 30.1733" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	3+72.392	161.012	76.093
End:	3+96.737	157.904	100.239

Tangent Data

Parameter	Value	Parameter	Value
Length:	24.345	Course:	S 82° 39' 58.6729" E



## **6.1 Koordinatni račun detaljnih točaka osi**

Alignment Name: os S (5)

Description:

Station Range: Start: 0+000.00, End: 39+538.00

Station Increment: 20.00

Station	Northing	Easting	Tangential Direction
0+000.00	198.9838m	-189.4150m	S36° 35' 37"E
0+020.00	182.9262m	-177.4923m	S36° 35' 37"E
0+040.00	166.8685m	-165.5695m	S36° 35' 37"E
0+060.00	150.8109m	-153.6468m	S36° 35' 37"E
0+080.00	134.7532m	-141.7241m	S36° 35' 37"E
0+100.00	118.6955m	-129.8013m	S36° 35' 37"E
0+120.00	102.6379m	-117.8786m	S36° 35' 45"E
0+140.00	87.0184m	-105.4026m	S42° 32' 46"E
0+160.00	74.2909m	-90.0755m	S59° 57' 11"E
0+180.00	67.9583m	-71.2448m	S82° 52' 17"E
0+200.00	69.4584m	-51.4346m	N74° 12' 37"E
0+220.00	78.5507m	-33.7694m	N51° 30' 38"E
0+240.00	93.1172m	-20.1484m	N36° 33' 35"E
0+260.00	109.7251m	-9.0115m	N32° 50' 59"E
0+280.00	126.5270m	1.8372m	N32° 50' 59"E
0+300.00	143.1081m	13.0111m	N37° 17' 04"E
0+320.00	157.0356m	27.2352m	N56° 02' 27"E
0+340.00	164.6383m	45.5899m	N78° 57' 33"E
0+360.00	165.2475m	65.5141m	S84° 59' 31"E
0+380.00	162.8428m	85.3678m	S82° 39' 59"E

### **6.3 Račun kota kolnika**

Corridor Name: corridor7  
 Description:  
 Base Alignment Name: os S (5)  
 Station Range: Start: 0+000.00, End: 0+395.38

CHAINAGE 0+000.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-184.0829	202.9429	214.1764	-6.641m	Daylight
2	-185.6883	201.7509	216.1759	-4.642m	Hinge
3	-185.6891	201.7503	215.9759	-4.641m	EPS_Sub
4	-186.4912	201.1548	216.2159	-3.642m	Back_Curb
5	-186.6116	201.0653	216.2159	-3.492m	Top_Curb
6	-186.6451	201.0405	215.9909	-3.450m	Flowline_Gutter
7	-187.0064	200.7722	216.0179	-3.000m	ETW
8	-187.0064	200.7722	215.6179	-3.000m	ETW_SubBase
9	-191.8237	197.1954	215.8679	3.000m	Flange
10	-191.8237	197.1954	215.4679	3.000m	ETW_SubBase
11	-192.1850	196.9271	215.8409	3.450m	Flowline_Gutter
12	-192.2184	196.9023	216.0659	3.492m	Top_Curb
13	-192.3389	196.8129	216.0659	3.642m	Back_Curb
14	-193.1410	196.2173	215.8259	4.641m	EPS_Sub
15	-193.1418	196.2167	216.0259	4.642m	Hinge_Cut
16	-193.8760	195.6716	217.8549	5.556m	Daylight

CHAINAGE 0+020.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-170.9426	187.7893	213.3029	-8.158m	Daylight
2	-173.7655	185.6932	216.8189	-4.642m	Hinge
3	-173.7663	185.6927	216.6189	-4.641m	EPS_Sub
4	-174.5684	185.0971	216.8589	-3.642m	Back_Curb
5	-174.6889	185.0077	216.8589	-3.492m	Top_Curb
6	-174.7223	184.9828	216.6339	-3.450m	Flowline_Gutter
7	-175.0836	184.7146	216.6609	-3.000m	ETW
8	-175.0836	184.7146	216.2609	-3.000m	ETW_SubBase
9	-179.9009	181.1377	216.5109	3.000m	Flange
10	-179.9009	181.1377	216.1109	3.000m	ETW_SubBase
11	-180.2622	180.8695	216.4839	3.450m	Flowline_Gutter
12	-180.2957	180.8446	216.7089	3.492m	Top_Curb
13	-180.4161	180.7552	216.7089	3.642m	Back_Curb
14	-181.2182	180.1597	216.4689	4.641m	EPS_Sub
15	-181.2190	180.1591	216.6689	4.642m	Hinge_Cut
16	-181.4391	179.9957	217.2170	4.916m	Daylight

CHAINAGE 0+040.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-158.3828	172.2046	213.1523	-8.951m	Daylight
2	-161.8428	169.6356	217.4618	-4.642m	Hinge
3	-161.8436	169.6350	217.2618	-4.641m	EPS_Sub
4	-162.6457	169.0395	217.5018	-3.642m	Back_Curb
5	-162.7661	168.9500	217.5018	-3.492m	Top_Curb
6	-162.7996	168.9252	217.2768	-3.450m	Flowline_Gutter
7	-163.1609	168.6569	216.9038	-3.000m	ETW_SubBase
8	-163.1609	168.6569	217.3038	-3.000m	Flange
9	-167.9782	165.0801	217.1538	3.000m	Flange
10	-167.9782	165.0801	216.7538	3.000m	ETW_SubBase
11	-168.3395	164.8118	217.1268	3.450m	Flowline_Gutter
12	-168.3730	164.7870	217.3518	3.492m	Top_Curb
13	-168.4934	164.6976	217.3518	3.642m	Back_Curb
14	-169.2955	164.1020	217.1118	4.641m	EPS_Sub
15	-169.2963	164.1014	217.3118	4.642m	EPS
16	-169.7210	163.7860	216.7828	5.171m	Daylight

CHAINAGE 0+060.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-144.7903	157.3867	211.7156	-11.031m	Daylight
2	-149.9201	153.5779	218.1048	-4.642m	Hinge
3	-149.9209	153.5773	217.9048	-4.641m	EPS_Sub
4	-150.7229	152.9818	218.1448	-3.642m	Back_Curb
5	-150.8434	152.8924	218.1448	-3.492m	Top_Curb
6	-150.8769	152.8675	217.9198	-3.450m	Flowline_Gutter
7	-151.2381	152.5993	217.5468	-3.000m	ETW_SubBase
8	-151.2381	152.5993	217.9468	-3.000m	Flange
9	-156.0554	149.0224	217.7968	3.000m	Flange
10	-156.0554	149.0224	217.3968	3.000m	ETW_SubBase
11	-156.4167	148.7542	217.7698	3.450m	Flowline_Gutter
12	-156.4502	148.7293	217.9948	3.492m	Top_Curb
13	-156.5707	148.6399	217.9948	3.642m	Back_Curb
14	-157.3727	148.0444	217.7548	4.641m	EPS_Sub
15	-157.3735	148.0438	217.9548	4.642m	EPS
16	-158.2633	147.3831	216.8466	5.750m	Daylight

CHAINAGE 0+080.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-131.2062	142.5626	210.2893	-13.100m	Daylight
2	-137.9973	137.5203	218.7477	-4.642m	Hinge
3	-137.9981	137.5197	218.5477	-4.641m	EPS_Sub
4	-138.8002	136.9242	218.7877	-3.642m	Back_Curb
5	-138.9206	136.8347	218.7877	-3.492m	Top_Curb
6	-138.9541	136.8099	218.5627	-3.450m	Flowline_Gutter
7	-139.3154	136.5416	218.1897	-3.000m	ETW_SubBase
8	-139.3154	136.5416	218.5897	-3.000m	Flange
9	-144.1327	132.9648	218.4397	3.000m	Flange
10	-144.1327	132.9648	218.0397	3.000m	ETW_SubBase
11	-144.4940	132.6965	218.4127	3.450m	Flowline_Gutter
12	-144.5275	132.6717	218.6377	3.492m	Top_Curb
13	-144.6479	132.5822	218.6377	3.642m	Back_Curb
14	-145.4500	131.9867	218.3977	4.641m	EPS_Sub
15	-145.4508	131.9861	218.5977	4.642m	EPS
16	-146.6297	131.1107	217.1293	6.110m	Daylight

CHAINAGE 0+100.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-118.9187	126.7758	210.4779	-13.554m	Daylight
2	-126.0746	121.4626	219.3907	-4.642m	Hinge
3	-126.0754	121.4620	219.1907	-4.641m	EPS_Sub
4	-126.8775	120.8665	219.4307	-3.642m	Back_Curb
5	-126.9979	120.7771	219.4307	-3.492m	Top_Curb
6	-127.0314	120.7522	219.2057	-3.450m	Flowline_Gutter
7	-127.3927	120.4840	218.8327	-3.000m	ETW_SubBase
8	-127.3927	120.4840	219.2327	-3.000m	Flange
9	-132.2100	116.9071	219.0827	3.000m	Flange
10	-132.2100	116.9071	218.6827	3.000m	ETW_SubBase
11	-132.5713	116.6389	219.0557	3.450m	Flowline_Gutter
12	-132.6047	116.6140	219.2807	3.492m	Top_Curb
13	-132.7252	116.5246	219.2807	3.642m	Back_Curb
14	-133.5273	115.9291	219.0407	4.641m	EPS_Sub
15	-133.5281	115.9285	219.2407	4.642m	EPS
16	-134.6656	115.0838	217.8238	6.059m	Daylight

CHAINAGE 0+120.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-108.2244	109.8066	212.6601	-12.025m	Daylight
2	-114.1445	105.4106	220.0338	-4.651m	Hinge
3	-114.1453	105.4100	219.8338	-4.650m	EPS_Sub
4	-114.9474	104.8145	220.0738	-3.651m	Back_Curb
5	-115.0678	104.7251	220.0738	-3.501m	Top_Curb
6	-115.1013	104.7002	219.8488	-3.459m	Flowline_Gutter
7	-115.4626	104.4319	219.4758	-3.009m	ETW_SubBase
8	-115.4626	104.4319	219.8758	-3.009m	Flange
9	-120.2871	100.8494	219.7256	3.000m	Flange
10	-120.2871	100.8494	219.3256	3.000m	ETW_SubBase
11	-120.6484	100.5812	219.6986	3.450m	Flowline_Gutter
12	-120.6819	100.5563	219.9236	3.492m	Top_Curb
13	-120.8023	100.4669	219.9236	3.642m	Back_Curb
14	-121.6043	99.8713	219.6836	4.641m	EPS_Sub
15	-121.6052	99.8707	219.8836	4.642m	EPS
16	-122.4725	99.2267	218.8033	5.722m	Daylight

CHAINAGE 0+140.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-94.6034	96.9301	212.9881	-14.658m	Daylight
2	-100.3096	91.6928	220.7333	-6.913m	Hinge
3	-100.3103	91.6922	220.5333	-6.912m	EPS_Sub
4	-101.0463	91.0167	220.7733	-5.913m	Back_Curb
5	-101.1568	90.9152	220.7733	-5.763m	Top_Curb
6	-101.1875	90.8870	220.5483	-5.721m	Flowline_Gutter
7	-101.5191	90.5827	220.1753	-5.271m	ETW_SubBase
8	-101.5191	90.5827	220.5753	-5.271m	Flange
9	-107.6127	84.9900	220.3686	3.000m	Flange
10	-107.6127	84.9900	219.9686	3.000m	ETW_SubBase
11	-107.9442	84.6857	220.3416	3.450m	Flowline_Gutter
12	-107.9749	84.6575	220.5666	3.491m	Top_Curb
13	-108.0854	84.5561	220.5666	3.641m	Back_Curb
14	-108.8214	83.8806	220.3266	4.640m	EPS_Sub
15	-108.8222	83.8799	220.5266	4.641m	EPS
16	-109.1061	83.6193	220.1411	5.027m	Daylight



## CHAINAGE 0+160.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-83.3687	85.8855	213.5916	-13.395m	Daylight
2	-87.2506	79.1745	221.3445	-5.642m	Hinge
3	-87.2511	79.1736	221.1445	-5.641m	EPS_Sub
4	-87.7513	78.3089	221.3845	-4.642m	Back_Curb
5	-87.8264	78.1790	221.3845	-4.492m	Top_Curb
6	-87.8473	78.1429	221.1595	-4.450m	Flowline_Gutter
7	-88.0726	77.7534	220.7865	-4.000m	ETW_SubBase
8	-88.0726	77.7534	221.1865	-4.000m	Flange
9	-91.5776	71.6941	221.0115	3.000m	Flange
10	-91.5776	71.6941	220.6115	3.000m	ETW_SubBase
11	-91.8029	71.3046	220.9845	3.450m	Flowline_Gutter
12	-91.8238	71.2685	221.2095	3.492m	Top_Curb
13	-91.8989	71.1386	221.2095	3.642m	Back_Curb
14	-92.3991	70.2739	220.9695	4.641m	EPS_Sub
15	-92.3996	70.2730	221.1695	4.642m	EPS
16	-92.5699	69.9786	220.8295	4.982m	Daylight

## CHAINAGE 0+180.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-69.4400	82.3902	213.0848	-14.544m	Daylight
2	-70.5447	73.5563	221.9875	-5.642m	Hinge
3	-70.5449	73.5553	221.7875	-5.641m	EPS_Sub
4	-70.6688	72.5641	222.0275	-4.642m	Back_Curb
5	-70.6874	72.4152	222.0275	-4.492m	Top_Curb
6	-70.6926	72.3739	221.8025	-4.450m	Flowline_Gutter
7	-70.7485	71.9273	221.4295	-4.000m	ETW_SubBase
8	-70.7485	71.9273	221.8295	-4.000m	Flange
9	-71.6171	64.9814	221.6545	3.000m	Flange
10	-71.6171	64.9814	221.2545	3.000m	ETW_SubBase
11	-71.6730	64.5349	221.6275	3.450m	Flowline_Gutter
12	-71.6781	64.4935	221.8525	3.492m	Top_Curb
13	-71.6968	64.3447	221.8525	3.642m	Back_Curb
14	-71.8207	63.3534	221.6125	4.641m	EPS_Sub
15	-71.8208	63.3524	221.8125	4.642m	EPS
16	-72.2131	60.2161	218.6517	7.802m	Daylight



CHAINAGE 0+200.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-54.0059	78.5512	218.8228	-9.449m	Daylight
2	-52.9698	74.8873	222.6304	-5.642m	Hinge
3	-52.9695	74.8863	222.4304	-5.641m	EPS_Sub
4	-52.6977	73.9250	222.6704	-4.642m	Back_Curb
5	-52.6569	73.7807	222.6704	-4.492m	Top_Curb
6	-52.6455	73.7405	222.4454	-4.450m	Flowline_Gutter
7	-52.5231	73.3075	222.0724	-4.000m	ETW_SubBase
8	-52.5231	73.3075	222.4724	-4.000m	Flange
9	-50.6183	66.5717	222.2974	3.000m	Flange
10	-50.6183	66.5717	221.8974	3.000m	ETW_SubBase
11	-50.4958	66.1386	222.2704	3.450m	Flowline_Gutter
12	-50.4845	66.0985	222.4954	3.492m	Top_Curb
13	-50.4437	65.9542	222.4954	3.642m	Back_Curb
14	-50.1718	64.9929	222.2554	4.641m	EPS_Sub
15	-50.1716	64.9919	222.4554	4.642m	EPS
16	-49.6255	63.0607	220.4485	6.649m	Daylight

CHAINAGE 0+220.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-38.2309	84.1618	225.3288	-7.169m	Daylight
2	-37.6013	83.3699	223.3053	-6.157m	EPS
3	-37.6006	83.3691	223.1053	-6.156m	EPS_Sub
4	-36.9789	82.5871	223.3453	-5.157m	Back_Curb
5	-36.8855	82.4697	223.3453	-5.007m	Top_Curb
6	-36.8596	82.4371	223.1203	-4.965m	Flowline_Gutter
7	-36.5795	82.0849	223.1473	-4.515m	ETW
8	-36.5795	82.0849	222.7473	-4.515m	ETW_SubBase
9	-31.9025	76.2028	222.5594	3.000m	ETW_SubBase
10	-31.9025	76.2028	222.9594	3.000m	ETW
11	-31.6224	75.8506	222.9324	3.450m	Flowline_Gutter
12	-31.5964	75.8179	223.1574	3.491m	Top_Curb
13	-31.5031	75.7005	223.1574	3.641m	Back_Curb
14	-30.8813	74.9186	222.9174	4.640m	EPS_Sub
15	-30.8807	74.9178	223.1174	4.641m	Hinge_Cut
16	-28.6866	72.1584	230.1681	8.167m	Daylight

As-Placed Windows

CHAINAGE 0+240.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-26.3349	97.7050	226.4327	-7.702m	Daylight
2	-25.4747	97.0671	224.2908	-6.631m	EPS
3	-25.4739	97.0665	224.0908	-6.630m	EPS_Sub
4	-24.6715	96.4714	224.3308	-5.631m	Back_Curb
5	-24.5510	96.3820	224.3308	-5.481m	Top_Curb
6	-24.5175	96.3572	224.1058	-5.439m	Flowline_Gutter
7	-24.1560	96.0892	224.1328	-4.989m	ETW
8	-24.1560	96.0892	223.7328	-4.989m	ETW_SubBase
9	-17.7386	91.3302	223.5330	3.000m	ETW_SubBase
10	-17.7386	91.3302	223.9330	3.000m	ETW
11	-17.3772	91.0621	223.9060	3.450m	Flowline_Gutter
12	-17.3437	91.0373	224.1310	3.492m	Top_Curb
13	-17.2232	90.9480	224.1310	3.642m	Back_Curb
14	-16.4208	90.3529	223.8910	4.641m	EPS_Sub
15	-16.4200	90.3523	224.0910	4.642m	Hinge_Cut
16	-13.6224	88.2777	231.0568	8.125m	Daylight

CHAINAGE 0+260.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-13.5737	112.6708	226.8112	-5.430m	Daylight
2	-12.9110	112.2429	225.2337	-4.642m	EPS
3	-12.9102	112.2424	225.0337	-4.641m	EPS_Sub
4	-12.0709	111.7005	225.2737	-3.642m	Back_Curb
5	-11.9449	111.6191	225.2737	-3.492m	Top_Curb
6	-11.9099	111.5965	225.0487	-3.450m	Flowline_Gutter
7	-11.5318	111.3524	225.0757	-3.000m	ETW
8	-11.5318	111.3524	224.6757	-3.000m	ETW_SubBase
9	-6.4913	108.0978	224.5257	3.000m	ETW_SubBase
10	-6.4913	108.0978	224.9257	3.000m	ETW
11	-6.1132	107.8537	224.8987	3.450m	Flowline_Gutter
12	-6.0782	107.8310	225.1237	3.492m	Top_Curb
13	-5.9522	107.7497	225.1237	3.642m	Back_Curb
14	-5.1129	107.2078	224.8837	4.641m	EPS_Sub
15	-5.1121	107.2072	225.0837	4.642m	Hinge_Cut
16	-2.5591	105.5588	231.1615	7.681m	Daylight

CHAINAGE 0+280.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	-2.3329	129.2196	226.8706	-4.964m	Daylight
2	-2.0623	129.0448	226.2264	-4.642m	EPS
3	-2.0615	129.0443	226.0264	-4.641m	EPS_Sub
4	-1.2222	128.5024	226.2664	-3.642m	Back_Curb
5	-1.0962	128.4210	226.2664	-3.492m	Top_Curb
6	-1.0611	128.3984	226.0414	-3.450m	Flowline_Gutter
7	-0.6831	128.1543	226.0684	-3.000m	ETW
8	-0.6831	128.1543	225.6684	-3.000m	ETW_SubBase
9	4.3575	124.8997	225.5184	3.000m	ETW_SubBase
10	4.3575	124.8997	225.9184	3.000m	ETW
11	4.7355	124.6556	225.8914	3.450m	Flowline_Gutter
12	4.7706	124.6330	226.1164	3.492m	Top_Curb
13	4.8966	124.5516	226.1164	3.642m	Back_Curb
14	5.7358	124.0097	225.8764	4.641m	EPS_Sub
15	5.7367	124.0092	226.0764	4.642m	Hinge_Cut
16	8.0122	122.5399	231.4937	7.350m	Daylight

CHAINAGE 0+300.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	9.1410	146.0547	226.9964	-4.864m	Daylight
2	9.3181	145.9198	227.2190	-4.642m	Hinge
3	9.3189	145.9192	227.0190	-4.641m	EPS_Sub
4	10.1138	145.3140	227.2590	-3.642m	Back_Curb
5	10.2331	145.2232	227.2590	-3.492m	Top_Curb
6	10.2663	145.1979	227.0340	-3.450m	Flowline_Gutter
7	10.6243	144.9253	227.0610	-3.000m	ETW
8	10.6243	144.9253	226.6610	-3.000m	ETW_SubBase
9	16.5988	140.3765	226.8733	4.509m	Flange
10	16.5988	140.3765	226.4733	4.509m	ETW_SubBase
11	16.9568	140.1040	226.8463	4.959m	Flowline_Gutter
12	16.9900	140.0787	227.0713	5.001m	Top_Curb
13	17.1094	139.9878	227.0713	5.151m	Back_Curb
14	17.9042	139.3827	226.8313	6.150m	EPS_Sub
15	17.9050	139.3821	227.0313	6.151m	Hinge_Cut
16	19.4895	138.1757	231.0143	8.142m	Daylight

## CHAINAGE 0+320.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	24.6369	160.8937	228.2313	-4.651m	Daylight
2	24.6424	160.8856	228.2117	-4.642m	EPS
3	24.6429	160.8848	228.0117	-4.641m	EPS_Sub
4	25.2010	160.0562	228.2517	-3.642m	Back_Curb
5	25.2848	159.9317	228.2517	-3.492m	Top_Curb
6	25.3081	159.8972	228.0267	-3.450m	Flowline_Gutter
7	25.5594	159.5239	228.0537	-3.000m	ETW
8	25.5594	159.5239	227.6537	-3.000m	ETW_SubBase
9	29.4696	153.7179	227.4787	4.000m	ETW_SubBase
10	29.4696	153.7179	227.8787	4.000m	ETW
11	29.7210	153.3446	227.8517	4.450m	Flowline_Gutter
12	29.7443	153.3100	228.0767	4.492m	Top_Curb
13	29.8281	153.1856	228.0767	4.642m	Back_Curb
14	30.3861	152.3570	227.8367	5.641m	EPS_Sub
15	30.3867	152.3562	228.0367	5.642m	Hinge_Cut
16	31.0325	151.3972	230.3491	6.798m	Daylight

## CHAINAGE 0+340.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	44.6378	169.5181	228.8743	-4.972m	Daylight
2	44.7010	169.1941	229.2044	-4.642m	Hinge
3	44.7012	169.1931	229.0044	-4.641m	EPS_Sub
4	44.8925	168.2126	229.2444	-3.642m	Back_Curb
5	44.9212	168.0654	229.2444	-3.492m	Top_Curb
6	44.9292	168.0245	229.0194	-3.450m	Flowline_Gutter
7	45.0154	167.5828	229.0464	-3.000m	ETW
8	45.0154	167.5828	228.6464	-3.000m	ETW_SubBase
9	46.3559	160.7123	228.8714	4.000m	Flange
10	46.3559	160.7123	228.4714	4.000m	ETW_SubBase
11	46.4421	160.2707	228.8444	4.450m	Flowline_Gutter
12	46.4501	160.2297	229.0694	4.492m	Top_Curb
13	46.4788	160.0825	229.0694	4.642m	Back_Curb
14	46.6701	159.1020	228.8294	5.641m	EPS_Sub
15	46.6703	159.1010	229.0294	5.642m	Hinge_Cut
16	46.8827	158.0128	231.2469	6.750m	Daylight

CHAINAGE 0+360.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	65.9397	170.1034	229.9643	-4.875m	Daylight
2	65.9194	169.8716	230.1971	-4.642m	Hinge
3	65.9193	169.8706	229.9971	-4.641m	EPS_Sub
4	65.8321	168.8754	230.2371	-3.642m	Back_Curb
5	65.8190	168.7260	230.2371	-3.492m	Top_Curb
6	65.8153	168.6844	230.0121	-3.450m	Flowline_Gutter
7	65.7760	168.2362	230.0391	-3.000m	ETW
8	65.7760	168.2362	229.6391	-3.000m	ETW_SubBase
9	65.1888	161.5344	229.8709	3.727m	Flange
10	65.1888	161.5344	229.4709	3.727m	ETW_SubBase
11	65.1495	161.0862	229.8439	4.177m	Flowline_Gutter
12	65.1458	161.0446	230.0689	4.219m	Top_Curb
13	65.1327	160.8952	230.0689	4.369m	Back_Curb
14	65.0455	159.9000	229.8289	5.368m	EPS_Sub
15	65.0454	159.8990	230.0289	5.369m	Hinge_Cut
16	64.9250	158.5251	232.7873	6.748m	Daylight

CHAINAGE 0+380.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	86.1120	168.6251	230.0015	-5.830m	Daylight
2	85.9603	167.4465	231.1897	-4.642m	Hinge
3	85.9602	167.4455	230.9897	-4.641m	EPS_Sub
4	85.8326	166.4547	231.2297	-3.642m	Back_Curb
5	85.8135	166.3059	231.2297	-3.492m	Top_Curb
6	85.8082	166.2646	231.0047	-3.450m	Flowline_Gutter
7	85.7507	165.8183	231.0317	-3.000m	ETW
8	85.7507	165.8183	230.6317	-3.000m	ETW_SubBase
9	84.9848	159.8673	230.8817	3.000m	Flange
10	84.9848	159.8673	230.4817	3.000m	ETW_SubBase
11	84.9274	159.4210	230.8547	3.450m	Flowline_Gutter
12	84.9221	159.3797	231.0797	3.492m	Top_Curb
13	84.9029	159.2309	231.0797	3.642m	Back_Curb
14	84.7754	158.2401	230.8397	4.641m	EPS_Sub
15	84.7753	158.2391	231.0397	4.642m	Hinge_Cut
16	84.6522	157.2831	232.9675	5.606m	Daylight

Activate Windows  
Go to Settings to activate

## **6.4 Vertikalni tok trase**



Vertical Alignment: NIVELET

Description:

Station Range: Start: 0+000.00, End: 39+538.00

PVI	Station	Grade Out	Curve Length
0.00	0+000.00	3.21%	
1.00	0+220.00	4.96%	8.721m
Vertical Curve Information:(sag curve) <hr/> PVC Station: 0+215.64 Elevation: 222.875m PVI Station: 0+220.00 Elevation: 223.015m PVT Station: 0+224.36 Elevation: 223.232m Low Point: 0+215.64 Elevation: 222.875m Grade in: 3.21% Grade out: 4.96% Change: 1.75% K: Curve Length: 8.721m Headlight Distance:			
2.00	0+395.38		

## 7. LITERATURA

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