

# Idejni projekt dionice ceste

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Šerić, Josipa

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

# **ZAVRŠNI RAD**

**Josipa Šerić**

**Split, 2020**

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

**IDEJNI PROJEKT DIONICE CESTE**

**Završni rad**

**Split, 2020**

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

Split, Matice hrvatske 15

**STUDIJ: PREDDIPLOMSKI STRUČNI STUDIJ GRAĐEVINARSTVA**

**KANDIDAT: JOSIPA ŠERIĆ**

**BROJ INDEKSA: 1765**

**KATEDRA: Katedra za prometnice**

**PREDMET: CESTE**

**ZADATAK ZA ZAVRŠNI RAD**

**Tema:** Idejni projekt dionice ceste

**Opis zadatka:** U programu CIVIL 3D 2020 Metric potrebno je izraditi idejni projekt dionice ceste između točaka A i B naznačenih na geodetskoj podlozi koja je korištena za izradu programskog zadatka iz kolgija Ceste.

**Idejni projekt treba sadržavati:**

1. Kopiju programskog zadatka
2. Tehnički opis
3. Građevinsku situaciju M 1:1000
4. Uzdužni presjek M 1:1000/100
5. Normalni poprečni presjek M 1:50
6. Karakteristične poprečne presjeke M 1:200
7. Računalne ispise koordinatnih točaka osi
8. Proračun količina zemljanih radova
9. Proračun količina radova po presjecima

U Splitu, travanj 2020

Voditelj Završnog rada:  
**Izv.prof.dr.sc. Deana Breški**

## IDEJNI PROJEKT DIONICE CESTE

### ***Sažetak:***

Uz pomoć geodetske podloge korištene za izradu programskog zadatka iz kolegija Ceste u programu CIVIL 3D 2020 Metric izrađen je teren na kojem je projektirana dionica ceste između točaka A i B naznačenih na podlozi. Cesta je projektirana za prosječni godišnji dnevni promet (PGDP) od 950 vozila/dan te za vrstu terena brdoviti. Projektna brzina za ovu kategoriju ceste je  $v_p=40$  km/h.

### ***Ključne riječi:***

*Idejni projekt, teren, dionica ceste, projektna brzina, os ceste, uzdužni presjek, poprečni presjek, niveleta, kolnik, prijelaznica, krivina*

## CONCEPTUAL PROJECT OF A LOCAL ROAD

### ***Abstract:***

With the help of a geodetic basis used in the creation of a task from the course “Roads“, a terrain is constructed using software Civil 3D 2020 Metric. On that terrain a local road section is designed between points A and B indicated on the basis. The road is designed for an annual average daily traffic (AADT) of 950 vehicles per day, for the hilly type of terrain. The project speed for this category of road is  $v_p = 40$  km / h.

### ***Keywords:***

*conceptual project, terrain, road section, project speed, road axis, longitudinal section, cross section, profile, pavement, transition, curve*

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## 1. Kopija programskog zadatka

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FAKULTET GRAĐEVINARSTVA, ARHITEKTURE  
I GEODEZIJE

Split, ak.god. 2017/2018.

Katedra za prometnice

Studij: Stručni

Nastavni predmet: CESTE

Student: .....*Josipa Šerić*.....

## 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. Aproksimativni troškovnik

Predmetna asistentica:

mag.ing.aedif. Daniela Dumanić



## 2. Tehnički opis

## 2.1. OPĆENITO

Na geodetskoj podlozi u mjerilu 1:1000 izrađen je idejni projekt ceste na dionici od točke A koja se nalazi na 230 metara nadmorske visine do točke B koja se nalazi na 215 metara nadmorske visine. Trasa ceste se nalazi na brdovitom terenu te njena duljina iznosi 356,94 m. Proteže se u smjeru zapad istok. Na prostorno vođenje prometnice utječu topografske karakteristike terena.

Temeljem «Pravilnika o osnovnim uvjetima kojima javne ceste izvan naselja i njihovi elementi moraju udovoljavati sa stajališta sigurnosti prometa», definirani su projektni elementi trase i elementi poprečnog profila. U tablici 1.2, koja je sastavni dio Pravilnika, dani su elementi za definiciju kategorije prometnice.

Tabl. 1.2

| Kategorija ceste | Društ. gospod. značenje (1.1.1.) | Vrsta prometa (1.1.2.)        | Veličina prometa (1.1.3.) | Zadaća povezivanja (1.1.4.)      | Srednja duljina putovanja (km) |
|------------------|----------------------------------|-------------------------------|---------------------------|----------------------------------|--------------------------------|
| AC               | Državna                          | Prom. mot. vozila             | >14000                    | Međudržavno i državno            | >100                           |
| 1. kat.          | Državna                          | Prom. mot. vozila             | >12000                    | Međudržavno i državno-regionalno | 50-100                         |
| 2. kat.          | Državna                          | Prom. mot. v. mješoviti prom. | 7000-12000                | Državno i županijsko             | 20-50                          |
| 3. kat.          | Državna; županijska              | Mješoviti promet              | 3000-7000                 | Međuopćinsko                     | 5-50                           |
| 4. kat.          | Županijska; lokalna              | Mješoviti promet              | 1000-3000                 | Općinsko                         | 5-20                           |
| 5. kat.          | Lokalna                          | Mješoviti promet              | <1000                     | Općinsko-lokalno                 | <5                             |

Predmetna cesta je lokalnog značaja s PGDP-om od 950 voz/dan što je svrstava u 5. kategoriju.

Prema tablici 1.3.1 iz Pravilnika, ceste 5. kategorije projektiraju se za projektne brzine 40-60 km/h ovisno o terenskim ograničenjima.

Tabl. 1.3.1. Projektne brzine i najveći nagibi nivelete

| PROMETNO -TEHNIČKO<br>RAZVRSTAVANJE |                  | PROJEKTNNA BRZINA $V_p$ (km/h) / NAGIB $s_{max}$ (%) |          |          |         |         |         |         |                         |
|-------------------------------------|------------------|--|----------|----------|---------|---------|---------|---------|-------------------------|
| KAT.                                | Razina<br>usluge | 120  | 100      | 90       | 80      | 70      | 60      | 50      | 40                      |
|                                     |                  | a.   | b.       | c.       | d.      | e.      | f.      | g.      | h.                      |
| AC                                  | C/D              | $\geq 120/4^\circ$                                   | 100/5*   | 90/5.5** | 80/6*** |         |         |         |                         |
| 1. kat.                             | D                |  | 100/5.5° | 90/5.5*  | 80/6**  | 70/7*** |         |         |                         |
| 2. kat.                             | D                |  | 100/5.5° | 90/5.5*  | 80/6*   | 70/7**  | 60/8*** |         |                         |
| 3. kat.                             | E                |  |          |          | 80/7°   | 70/7*   | 60/8**  | 50/9*** |                         |
| 4. kat.                             | E                |  |          |          |         | 70/8°   | 60/9*   | 50/10** | 40/11***                |
| 5. kat.                             | E                |  |          |          |         |         | 60/10°  | 50/11*  | 40/12**<br>40(30)/12*** |

|         |     |                      |    |
|---------|-----|----------------------|----|
| OZNAKE: | °   | BEZ OGRANIČENJA      | BO |
|         | *   | UMJERENA OGRANIČENJA | UO |
|         | **  | ZNATNA OGRANIČENJA   | ZO |
|         | *** | VELIKA OGRANIČENJA   | VO |

Za predmetnu prometnicu, obzirom da se radi o brdovitom terenu sa znatnim ograničenjima, prema navedenoj tablici, projektna brzina je 40 km/h i max. uzdužni nagib je 12%.

Iz odabrane projektne brzine proizlaze i projektne elementi horizontalne i vertikalne geometrije trase:

- minimalni radijus horizontalne krivine  $R= 45$  m
- minimalna duljina klotoidne prelazne krivine  $L= 30$  m
- maksimalni uzdužni nagib  $i= 12$  %
- minimalni polumjer konkavnog zaobljenja nivelete (za 0%)  $R=249$  m

## 2.2. HORIZONTALNI ELEMENTI

Trasa se sastoji od tri pravca i dvije krivine. Prva krivina ima radijus  $R= 65$  m i duljinu prijelaznice  $L= 40$  m. Druga krivina ima radijus  $R= 45$  m i duljinu prijelaznice  $L= 30$  m. Svaka krivina je konstruirana pomoću dvije prijelazne krivine oblika klotoida i jednog kružnog luka. Proširenje kružnog luka za promet teretnih vozila s priključkom u prvoj krivini iznosi 0,65 m, a u drugoj 0,93 m.

## 2.3. VERTIKALNI ELEMENTI

Maksimalni nagib nivelete je 12%, a minimalni radijus krivine 249 m.

U programu se tok sastoji od dva pravca i jedne krivine.

Nagib prvog pravca iznosi 3,76%, a drugog 4,55 %.

Tangenta krivine je dužine 110,76 m, a radijus krivine 14000 m.

## 2.4. POPREČNI PRESJEK

Cesta ima dva prometna traka čija širina iznosi 2,75 m, širina rubnog traka iznosi 0,20 m. U usjecima se izvode i rigoli za odvodnju vode širine 0,65 m i drenaža koja je postavljena u glinenu posteljicu. U nasipu se izvodi bankina širine 1,0 m i nagiba 4%, a u usjeku berma širine 0,5 m, nagiba 4%. Cesta se većim dijelom nalazi u zasjeku, a dijelom u usjeku i nasipu. Poprečni nagib u pravcima iznosi 2,5%, nagib u prvoj krivini iznosi 5,5% dok u drugoj krivini iznosi 7%. Nagibi usjeka su 2:1, a nasipa 1:1,5.

## 2.5. KOLNIČKA KONSTRUKCIJA

Projektom je predviđena sljedeća kolnička konstrukcija:

- Habajući asfaltni sloj AC11 surf (BIT 50/70) AG4 M4 - debljine 4 cm
- Bitumenizirani nosivi sloj AC22 base (BIT 50/70) AG6 M2 - debljine 6 cm
- Na dnu mehanički nosivi zbijeni sloj debljine 30 cm

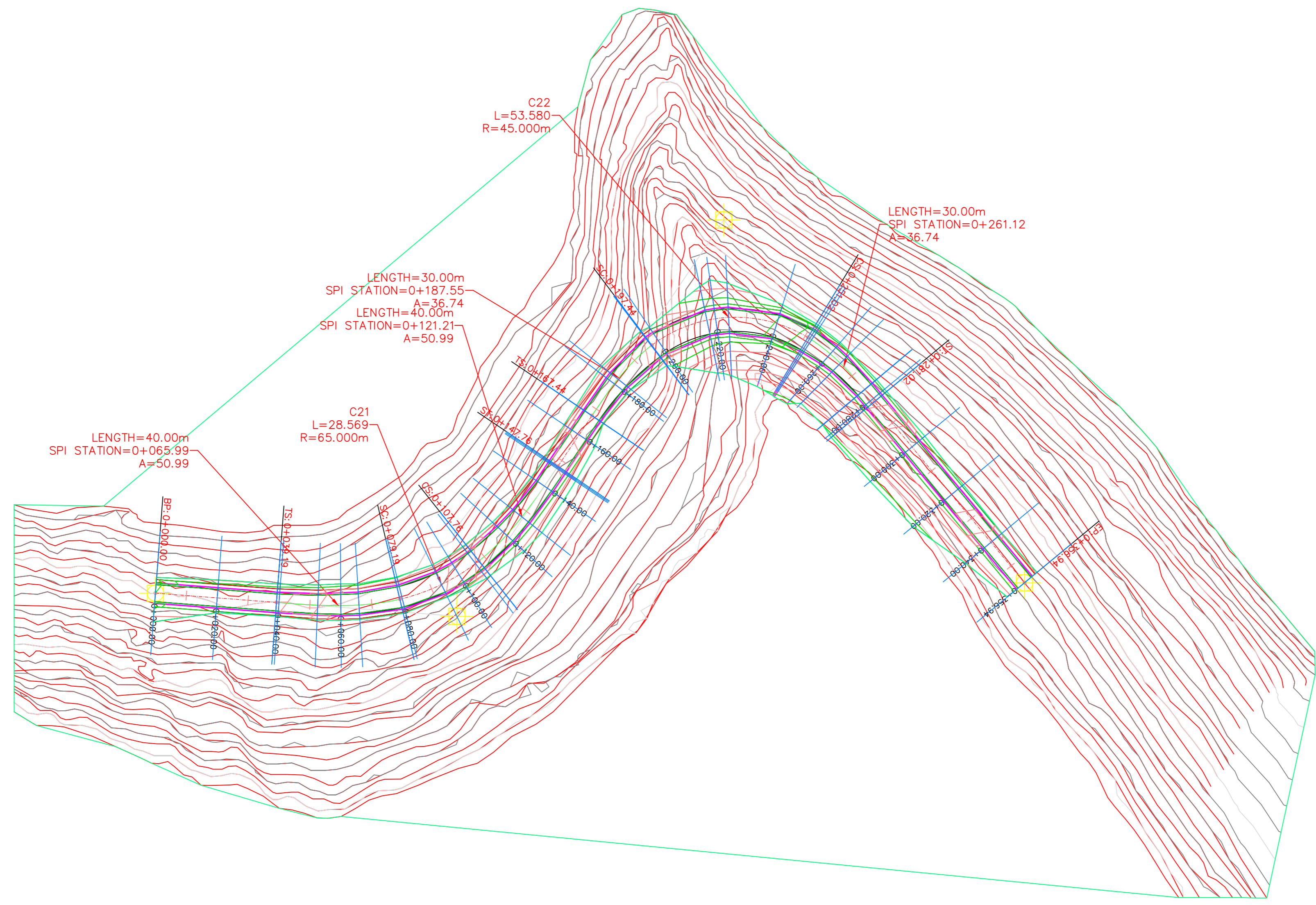
## 2.6. ODVODNJA

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

## 2.7. OPREMA CESTE

Idejnim projektom predviđena je 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 bankinama nasipa visine  $h > 3,00$  m je predviđeno postavljanje jednostrane zaštitne ograde.

### 3. Građevinska situacija M 1:1000

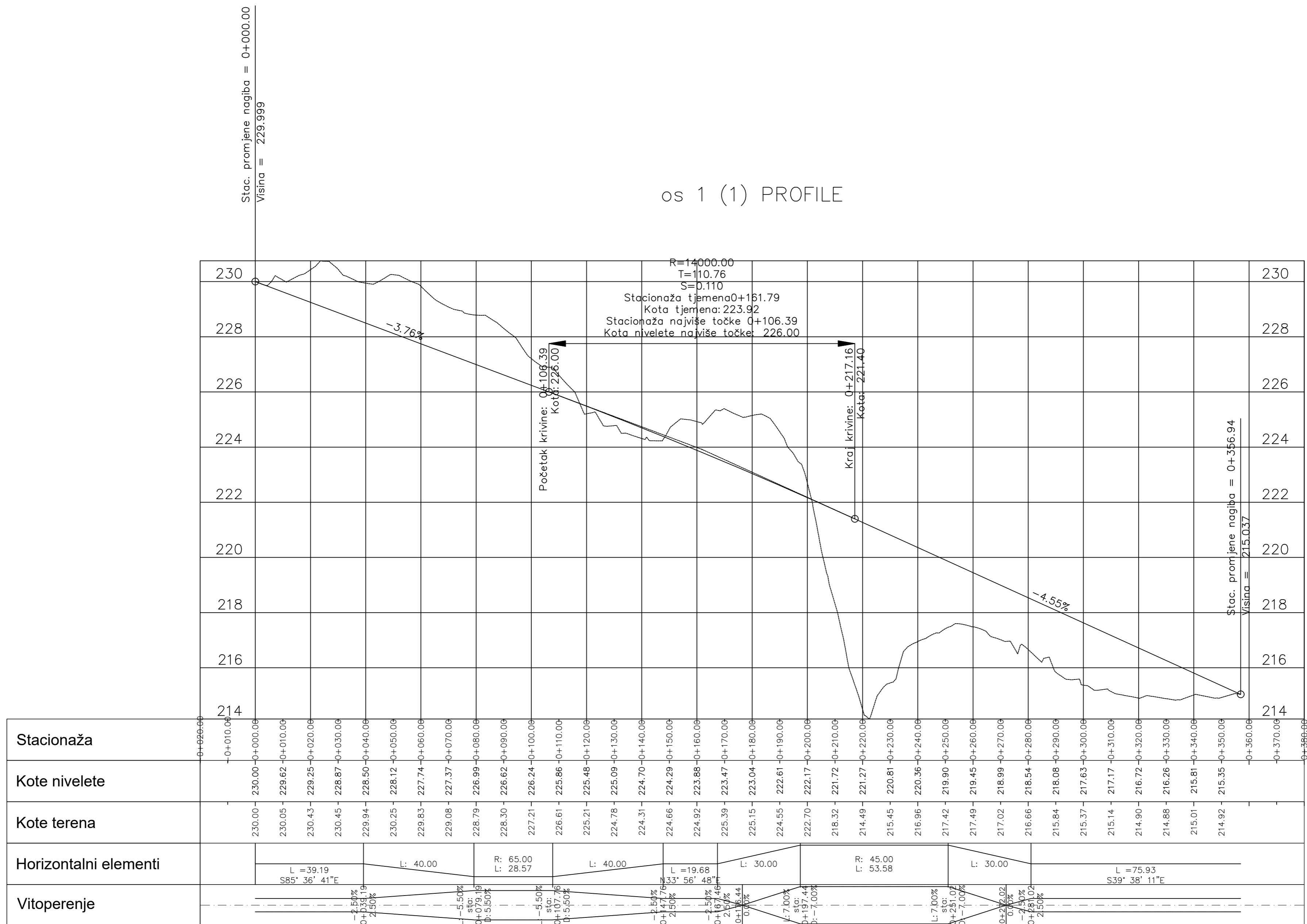


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|                    |                              |
|--------------------|------------------------------|
| <b>ZAVRŠNI RAD</b> |                              |
| TEMA               | IDEJNI PROJEKT DIONICE CESTE |
| STUDENT            | Josipa Šerić                 |
| SADRŽAJ            | Situacija                    |
| MJERILO            | 1:1000                       |
| DATUM              | travanj 2020                 |

#### 4. Uzdužni presjek M 1:1000/100

os 1 (1) PROFILE



| Stacionaža | Kote nivelete | Kote terena | Horizontalni elementi     | Vitoperenje |
|------------|---------------|-------------|---------------------------|-------------|
| 0+000.00   | 230.00        | 230.00      |                           |             |
| 0+010.00   | 229.62        | 230.05      | L: 39.19<br>S85° 36' 41"E | -2.50%      |
| 0+020.00   | 228.87        | 230.43      | L: 40.00                  | -2.50%      |
| 0+030.00   | 228.50        | 230.45      |                           | -2.50%      |
| 0+040.00   | 228.12        | 229.94      |                           | -2.50%      |
| 0+050.00   | 227.74        | 230.25      |                           | -2.50%      |
| 0+060.00   | 227.37        | 229.83      |                           | -2.50%      |
| 0+070.00   | 226.99        | 229.08      |                           | -2.50%      |
| 0+080.00   | 226.62        | 228.79      |                           | -2.50%      |
| 0+090.00   | 226.24        | 228.30      |                           | -2.50%      |
| 0+100.00   | 225.86        | 227.21      | R: 65.00<br>L: 28.57      | -2.50%      |
| 0+110.00   | 225.48        | 226.61      | L: 40.00                  | -2.50%      |
| 0+120.00   | 225.09        | 225.21      |                           | -2.50%      |
| 0+130.00   | 224.70        | 224.78      |                           | -2.50%      |
| 0+140.00   | 224.29        | 224.31      | L: 19.68<br>S33° 56' 48"E | -2.50%      |
| 0+150.00   | 223.88        | 224.66      | L: 30.00                  | -2.50%      |
| 0+160.00   | 223.47        | 224.92      |                           | -2.50%      |
| 0+170.00   | 223.04        | 225.39      |                           | -2.50%      |
| 0+180.00   | 222.61        | 225.15      |                           | -2.50%      |
| 0+190.00   | 222.17        | 224.55      |                           | -2.50%      |
| 0+200.00   | 221.72        | 222.70      | R: 45.00<br>L: 53.58      | -2.50%      |
| 0+210.00   | 221.27        | 218.32      | L: 30.00                  | -2.50%      |
| 0+220.00   | 220.81        | 214.49      |                           | -2.50%      |
| 0+230.00   | 220.36        | 215.45      |                           | -2.50%      |
| 0+240.00   | 219.90        | 216.96      |                           | -2.50%      |
| 0+250.00   | 219.45        | 217.42      |                           | -2.50%      |
| 0+260.00   | 218.99        | 217.49      |                           | -2.50%      |
| 0+270.00   | 218.54        | 217.02      |                           | -2.50%      |
| 0+280.00   | 218.08        | 216.66      |                           | -2.50%      |
| 0+290.00   | 217.63        | 215.84      |                           | -2.50%      |
| 0+300.00   | 217.17        | 215.37      |                           | -2.50%      |
| 0+310.00   | 216.72        | 215.14      |                           | -2.50%      |
| 0+320.00   | 216.26        | 214.90      | L: 75.93<br>S39° 38' 11"E | -2.50%      |
| 0+330.00   | 215.81        | 214.88      |                           | -2.50%      |
| 0+340.00   | 215.35        | 215.01      |                           | -2.50%      |
| 0+350.00   | 214.92        | 214.92      |                           | -2.50%      |
| 0+360.00   | 214.50        | 214.92      |                           | -2.50%      |
| 0+370.00   | 214.08        | 214.92      |                           | -2.50%      |
| 0+380.00   | 213.66        | 214.92      |                           | -2.50%      |

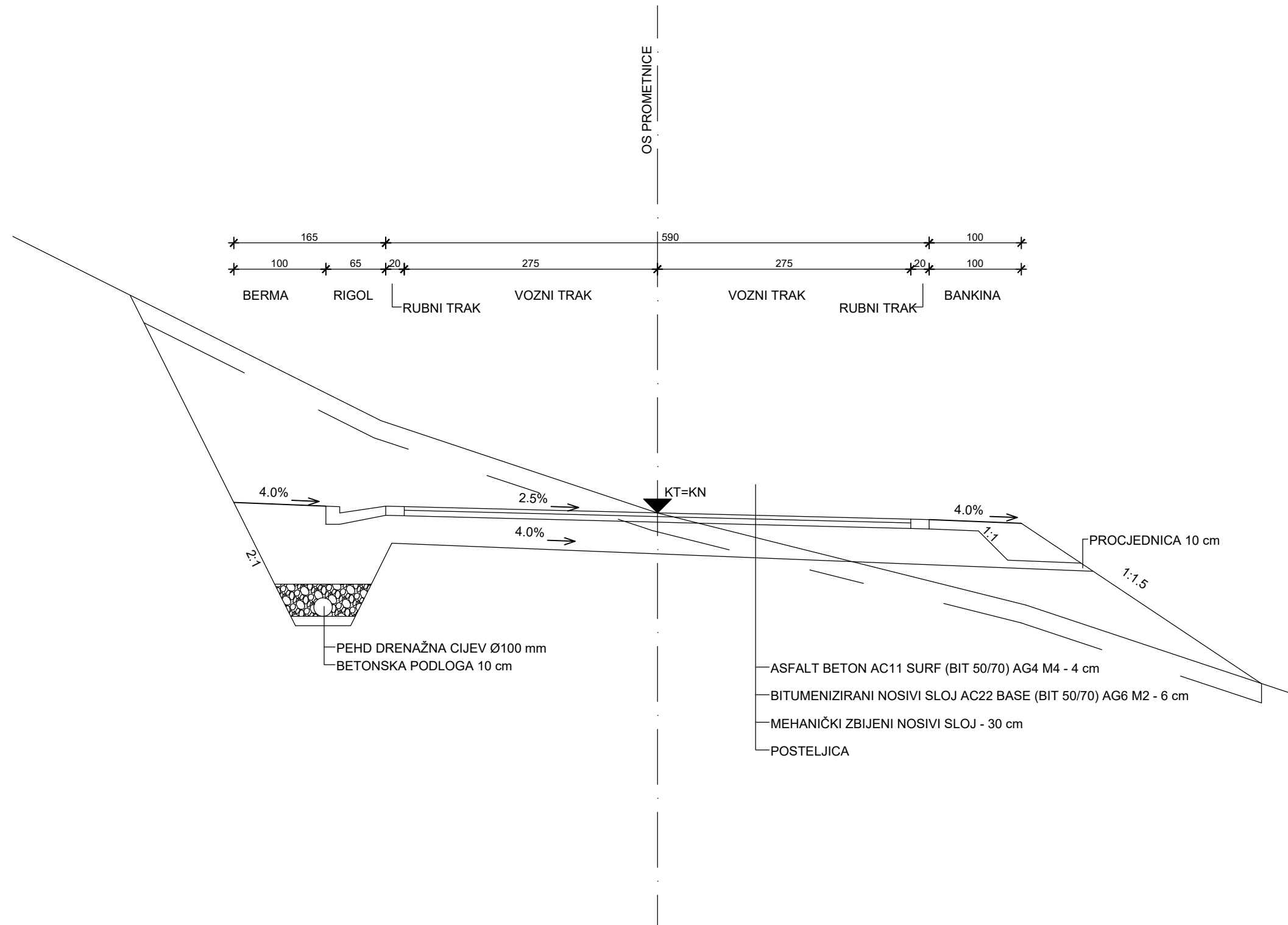
  
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| ZAVRŠNI RAD |                              |
|-------------|------------------------------|
| TEMA        | IDEJNI PROJEKT DIONICE CESTE |
| STUDENT     | Josipa Šerić                 |
| SADRŽAJ     | Uzdružni presjek             |
| MJERILO     | 1:1000                       |
| DATUM       | travanj 2020                 |




## 5. Normalni poprečni presjek M 1:50

# Normalni poprečni presjek M 1:50



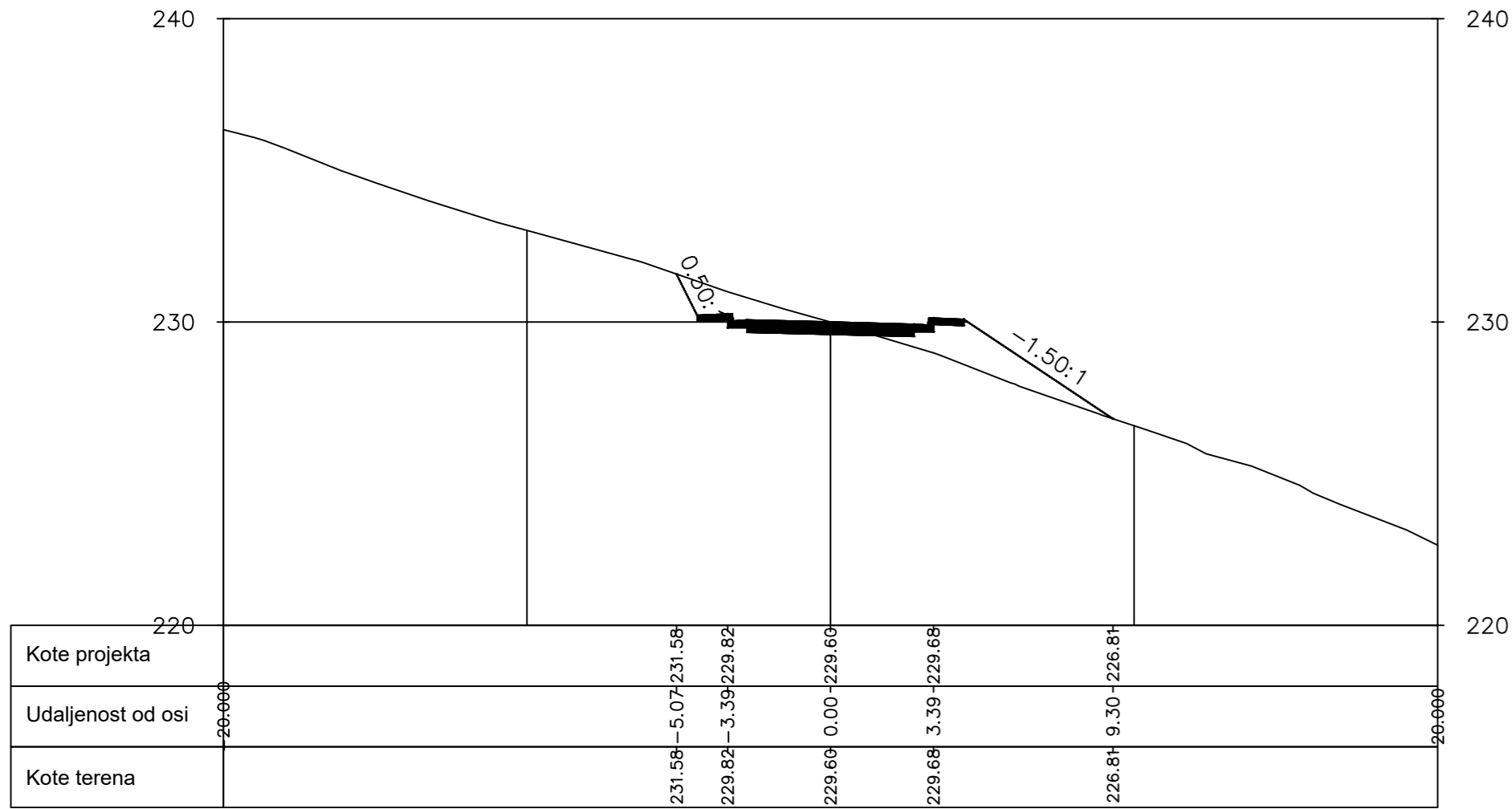
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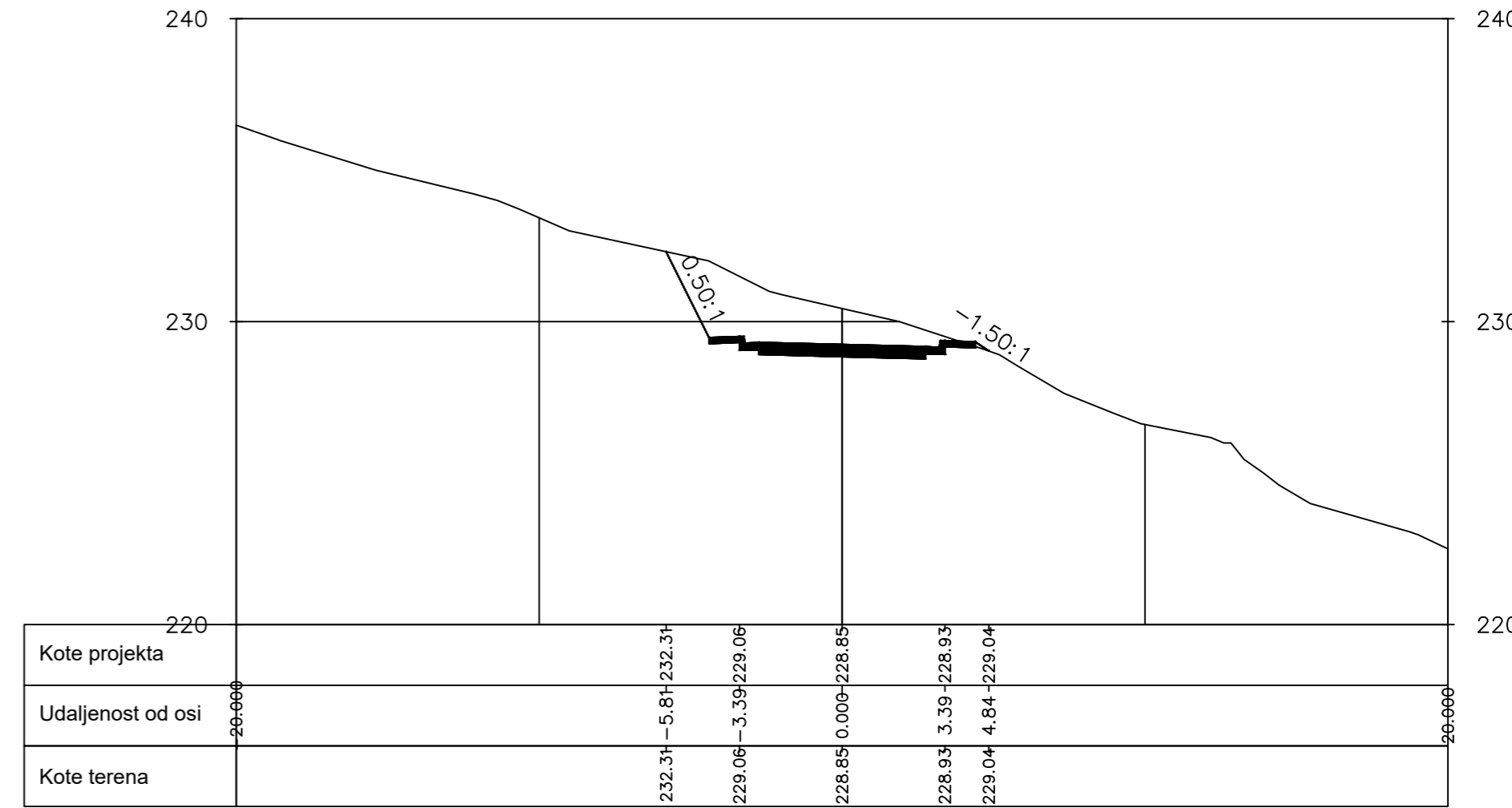
|  |                    |   |                           |         |      |  |       |
|--|--------------------|---|---------------------------|---------|------|--|-------|
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|  | TEMA               | IDEJNI PROJEKT DIONICE CESTE  |                           |         |      |  |       |
|  | STUDENT            | Josipa Šerić  |                           |         |      |  |       |
|  | SADRŽAJ            | <table border="1" style="width: 100%;"> <tr> <td>Normalni poprečni presjek</td> <td>MJERILO</td> <td style="text-align: center;">1:50</td> </tr> <tr> <td></td> <td>DATUM</td> <td style="text-align: center;">travanj 2020</td> </tr> </table> | Normalni poprečni presjek | MJERILO | 1:50 |  | DATUM |
| Normalni poprečni presjek  | MJERILO            | 1:50  |                           |         |      |  |       |
|  | DATUM              | travanj 2020  |                           |         |      |  |       |

## 6. Karakteristični poprečni presjeci M 1:200

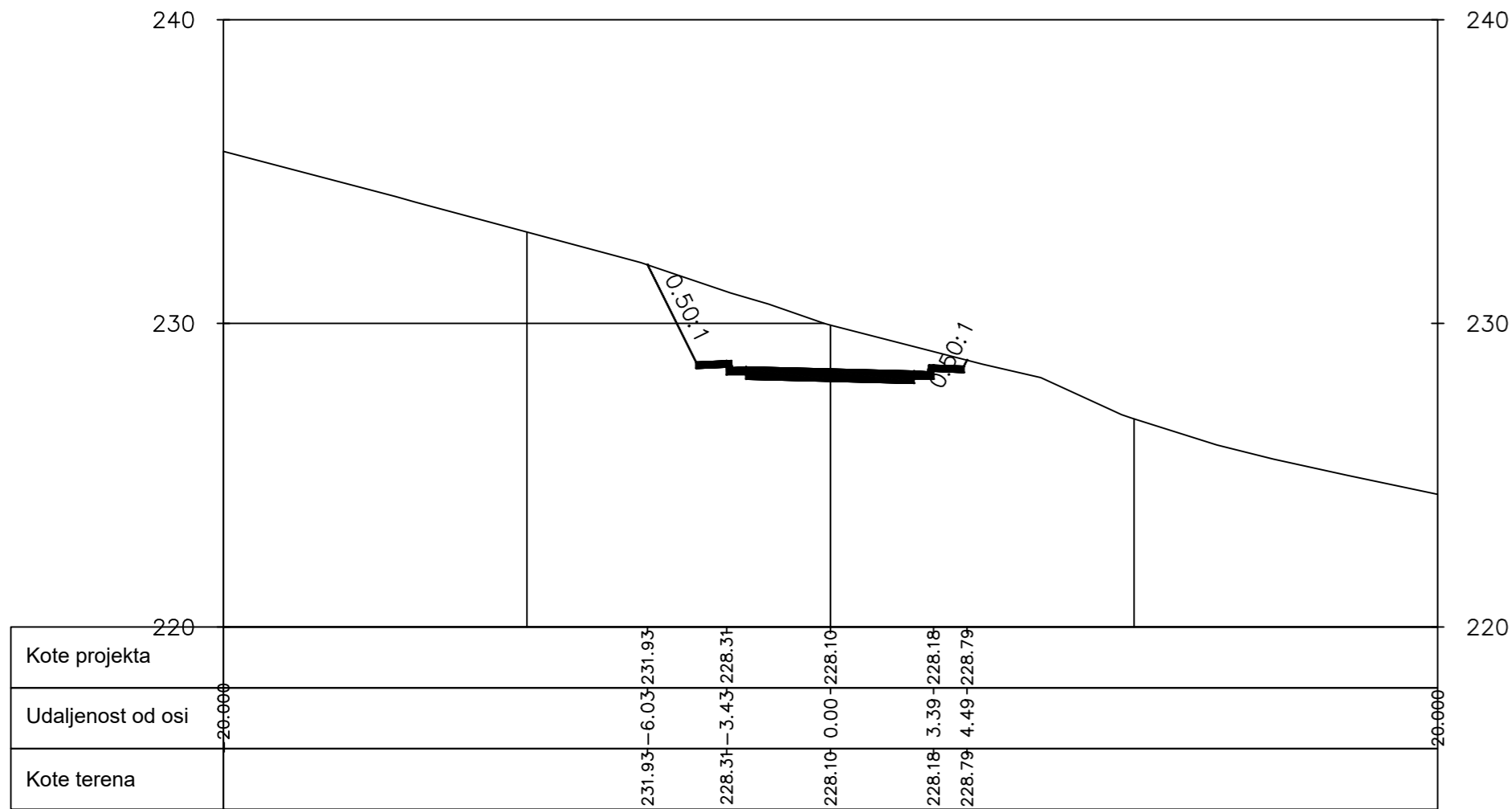
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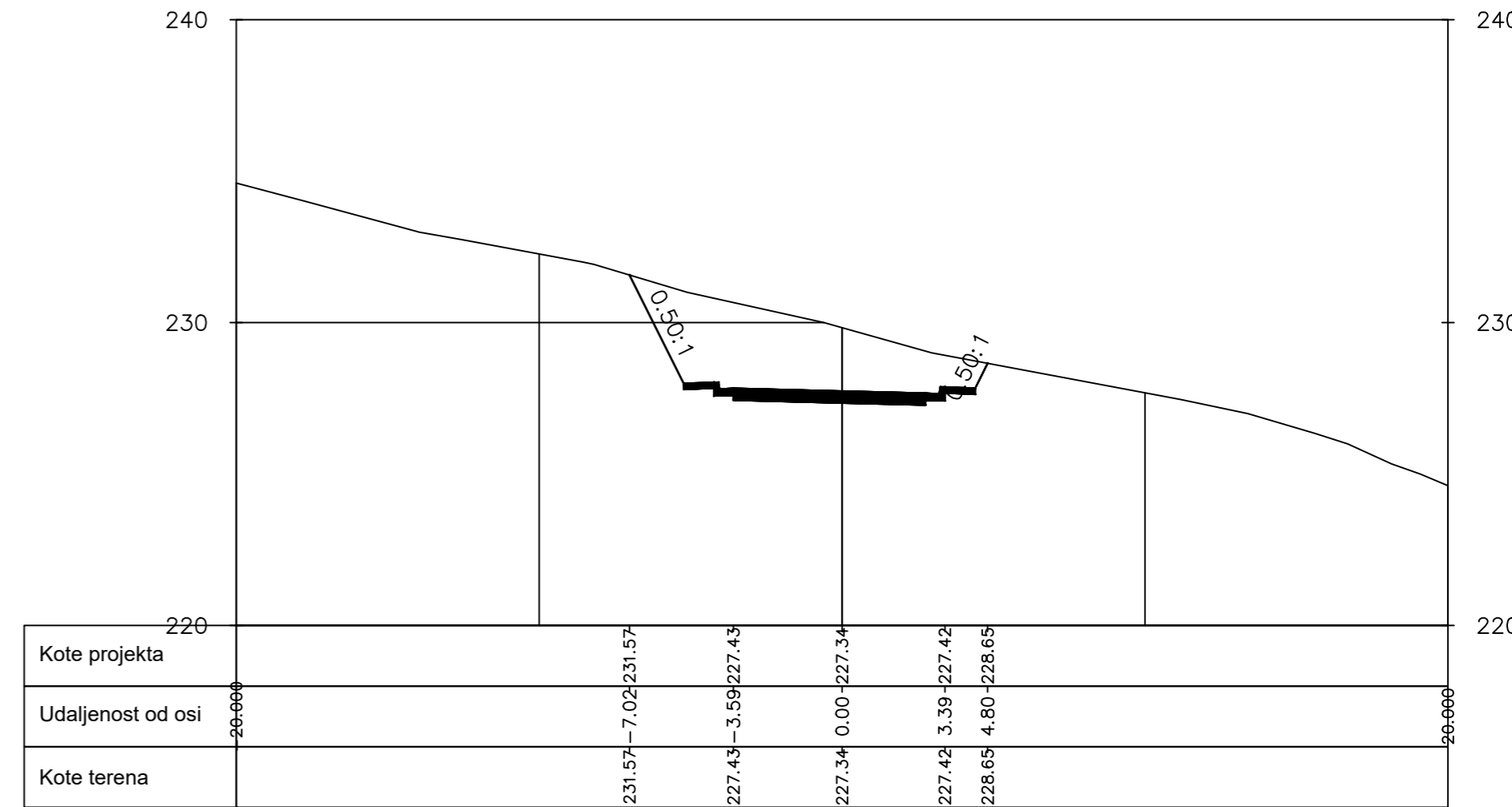
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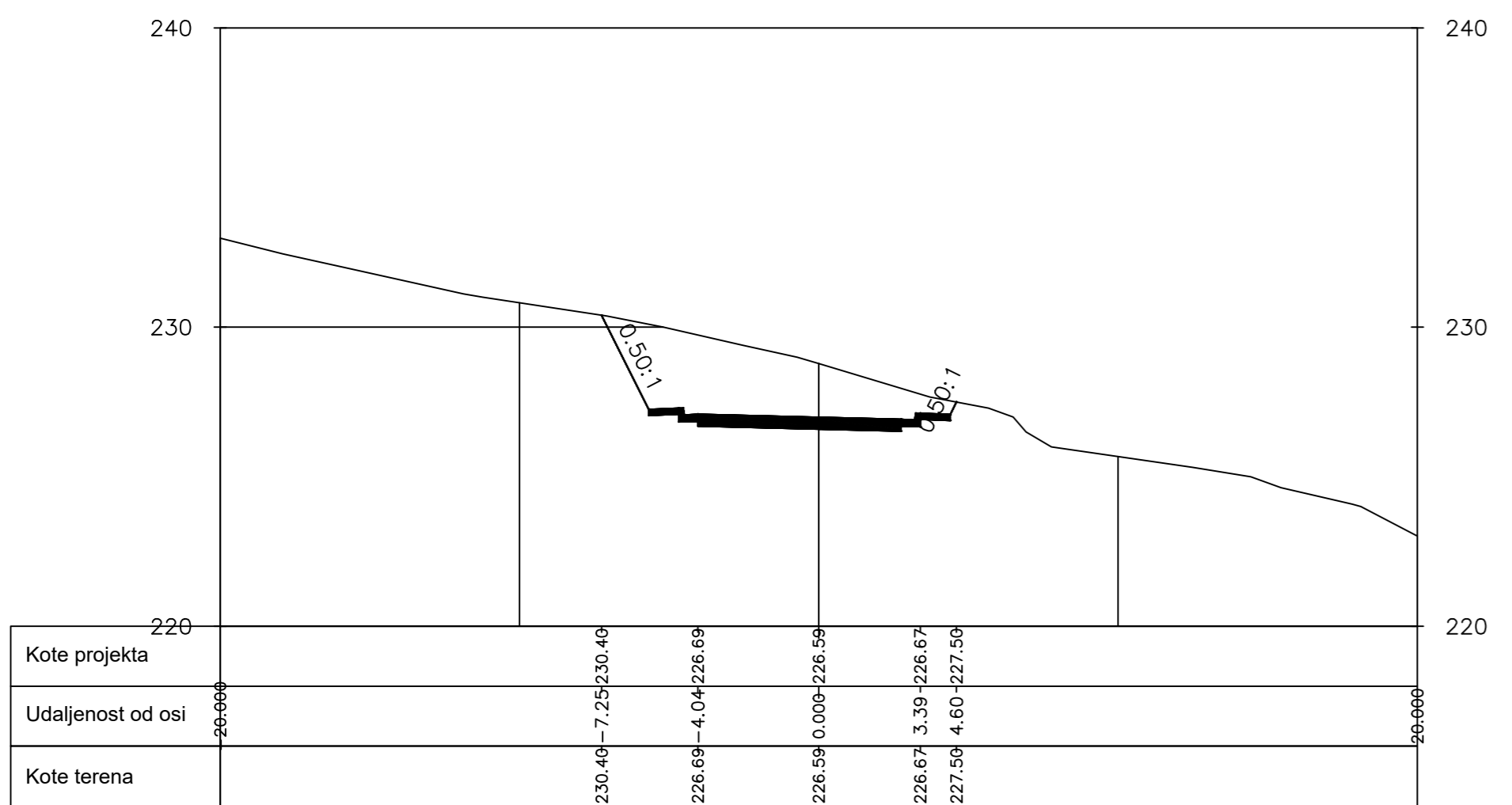
TEMA IDEJNI PROJEKT DIONICE CESTE

STUDENT Josipa Šerić

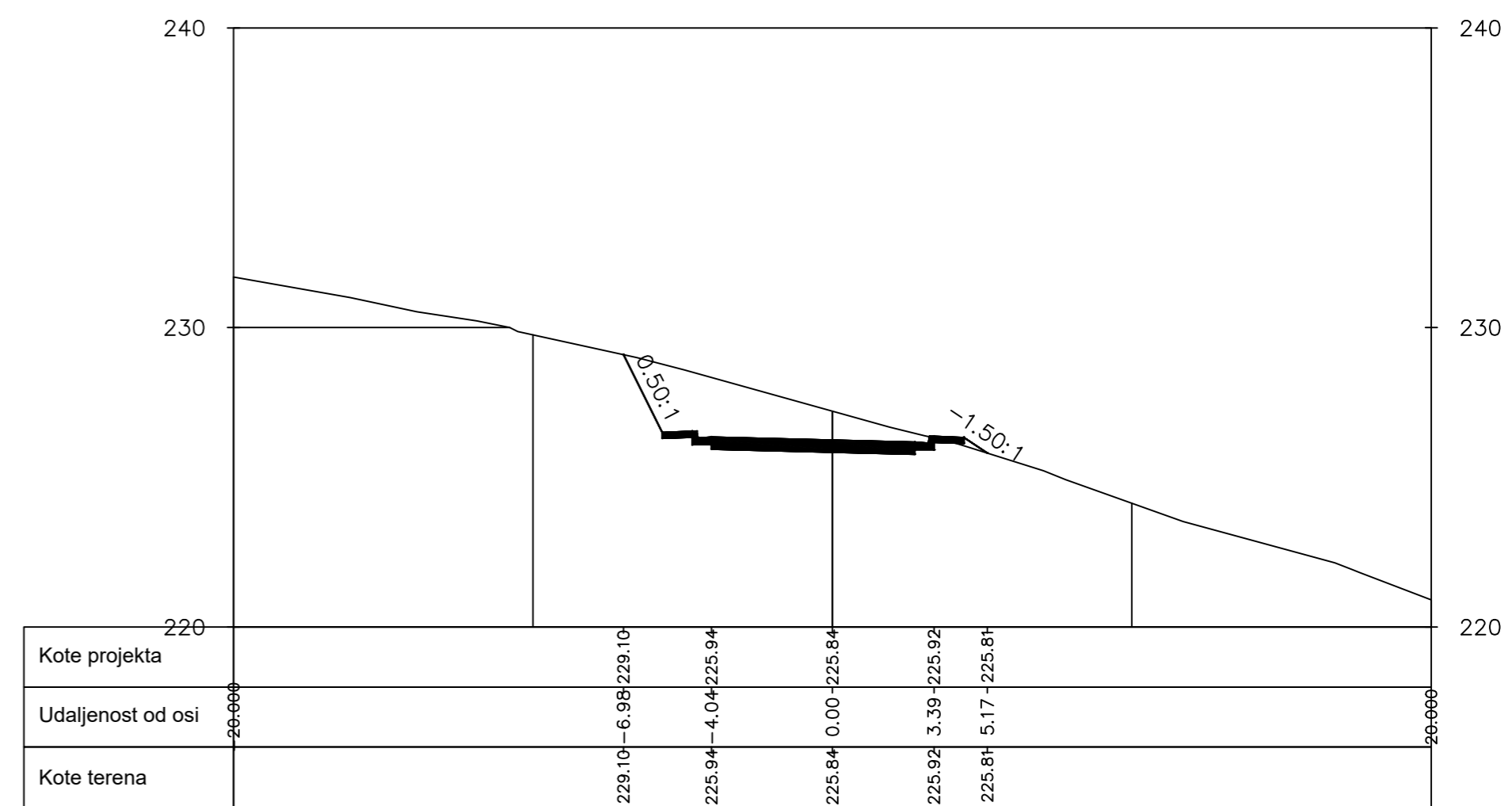
SADRŽAJ Karakteristični poprečni presjeci

MJERILO 1:200  
DATUM travanj 2020

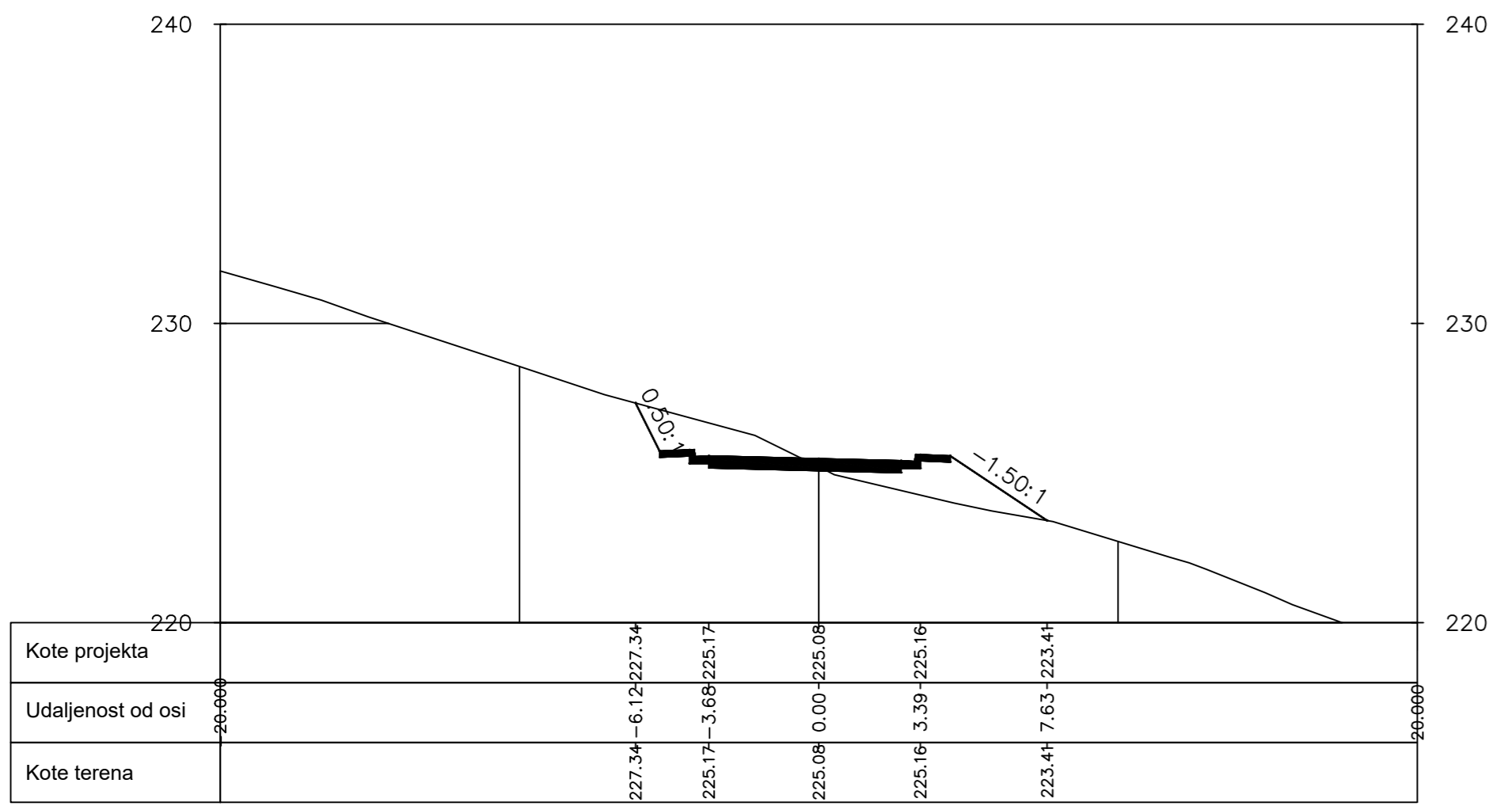
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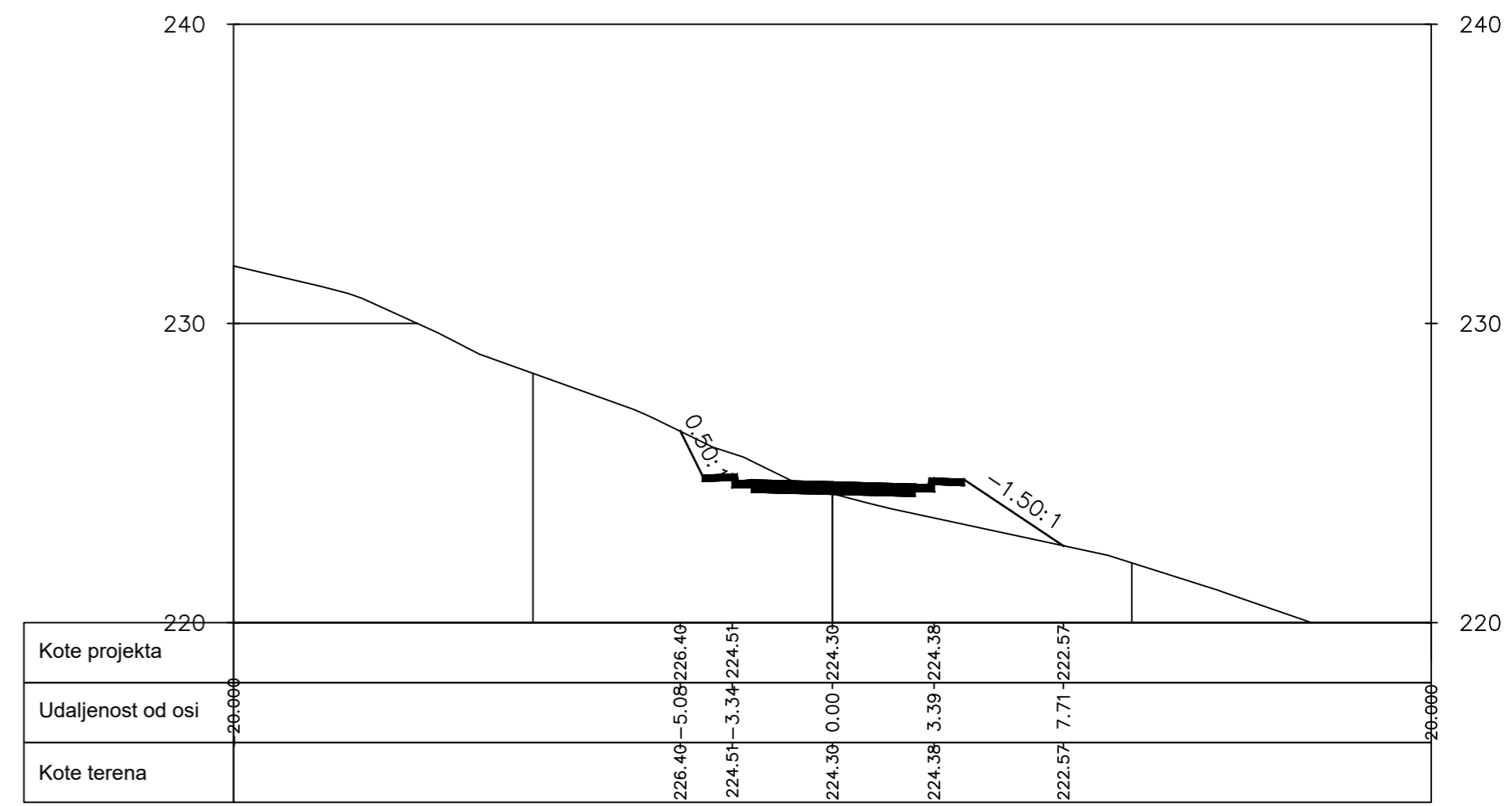
0+100.00



0+120.00



0+140.00



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21000 SPLIT, MATICE HRVATSKE 15

ZAVRŠNI RAD

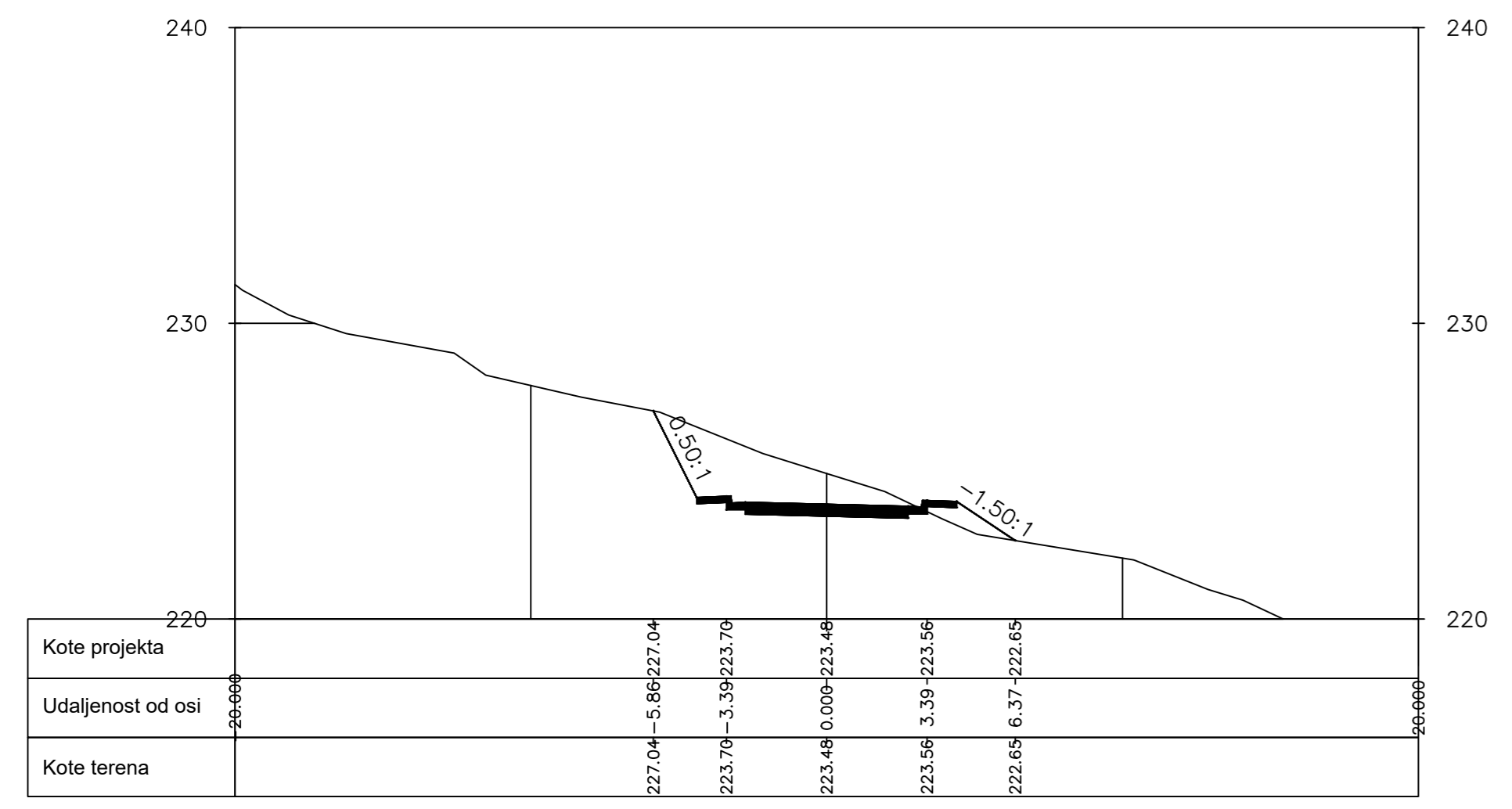
TEMA IDEJNI PROJEKT DIONICE CESTE

STUDENT Josipa Šerić

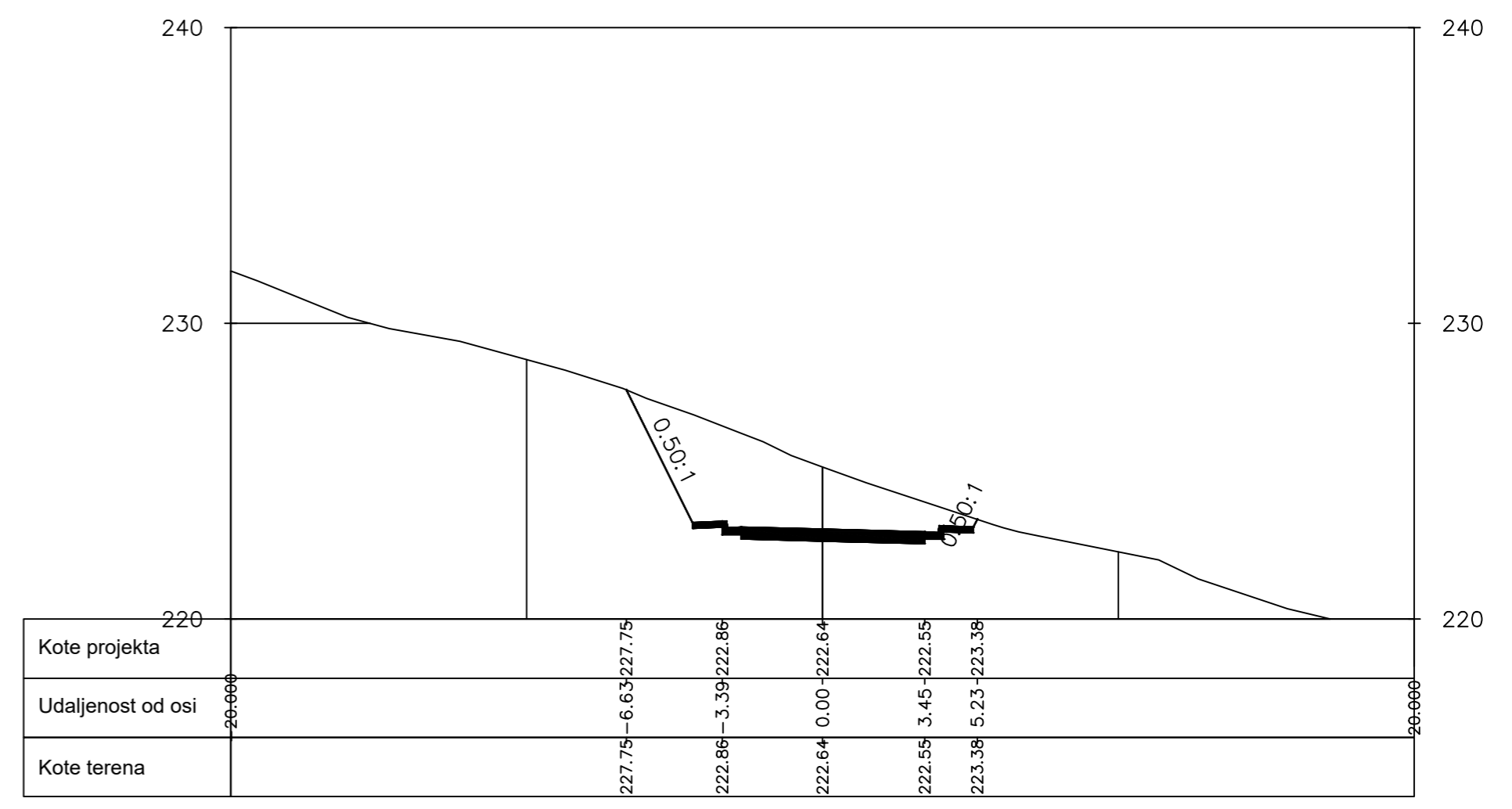
SADRŽAJ Karakteristični poprečni presjeci

MJERILO 1:200  
DATUM travanj 2020

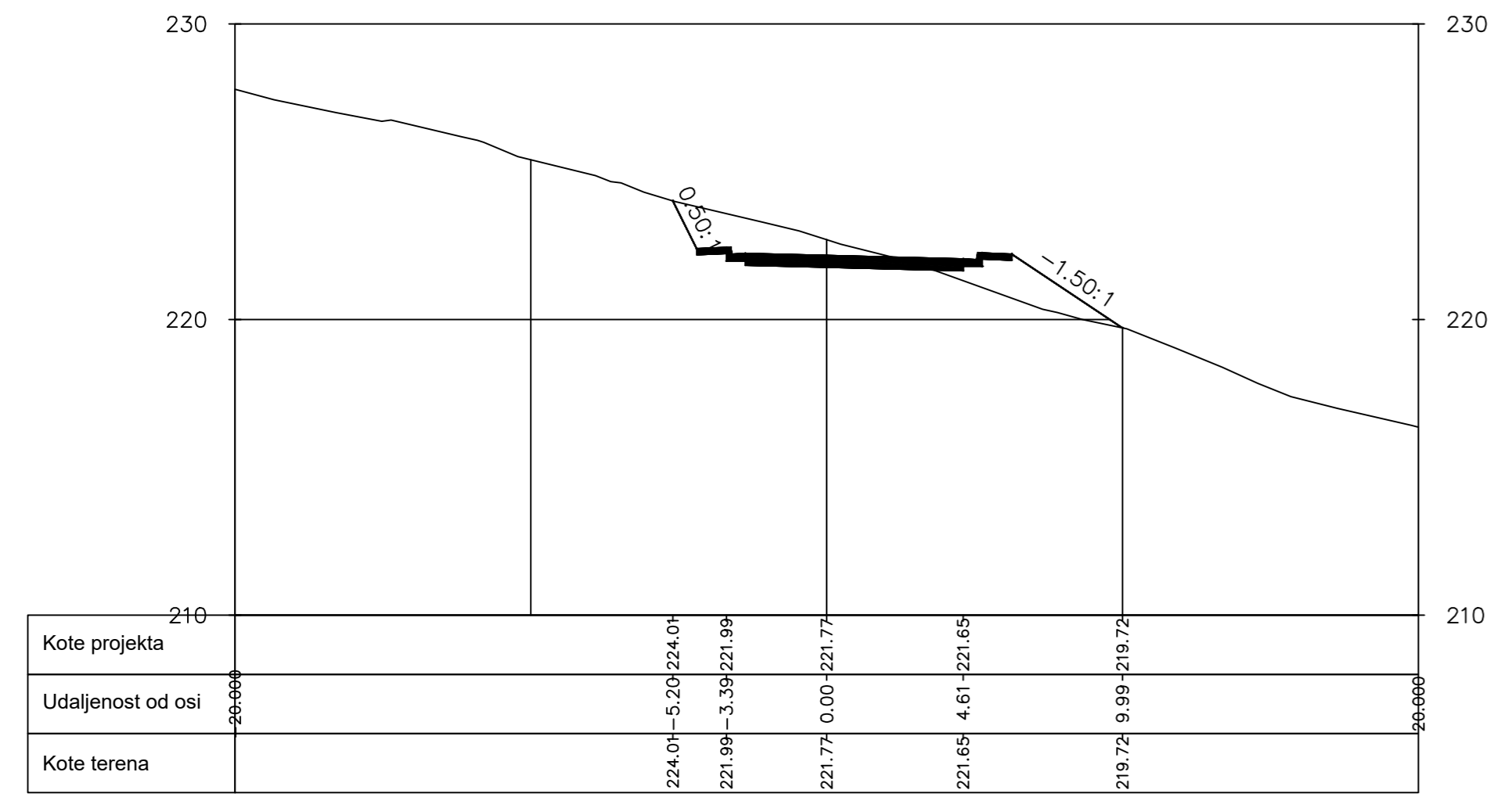
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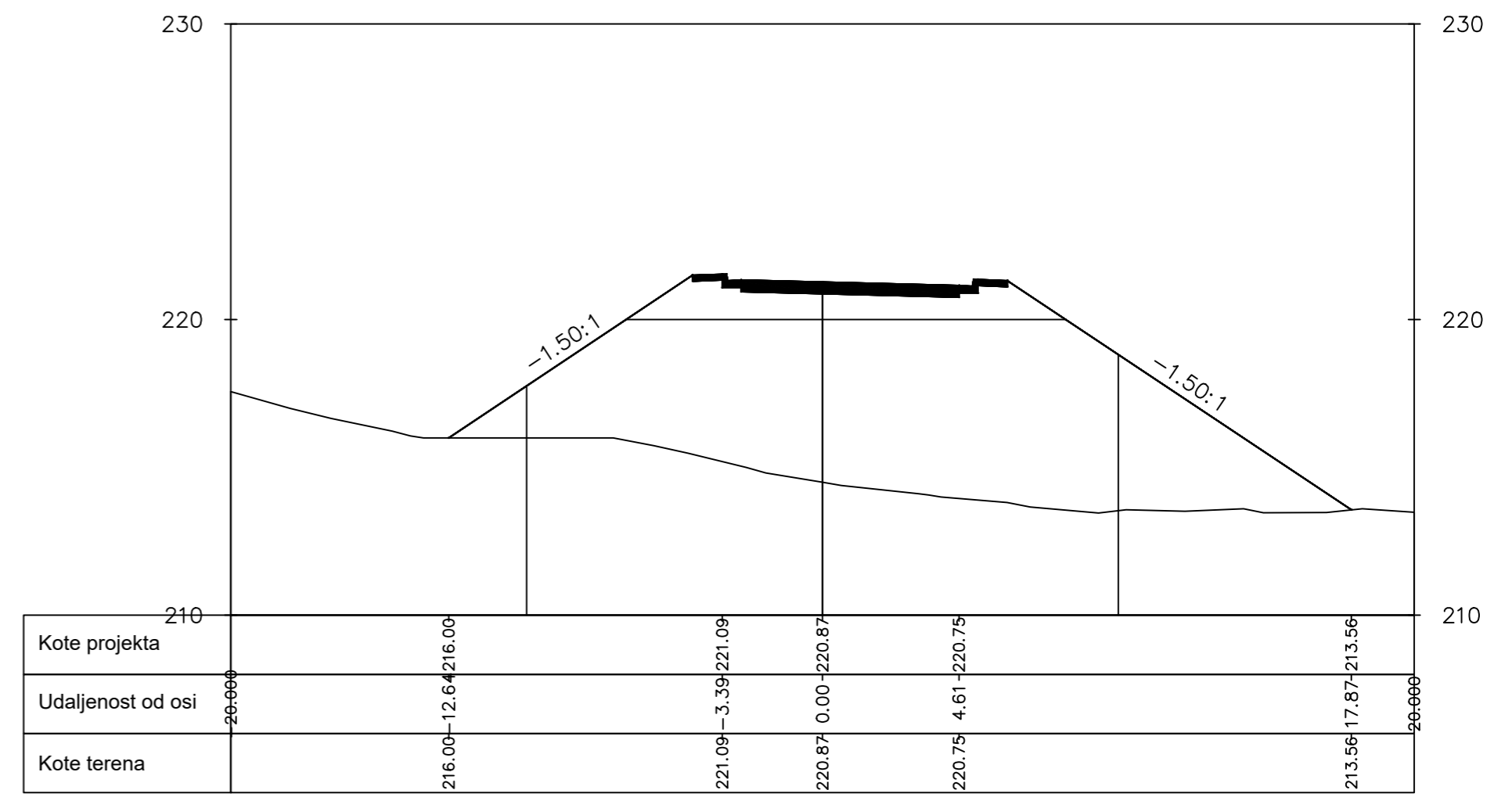
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0+200.00



0+220.00



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 FAKULTET GRAĐEVINARSTVA,  
 ARHITEKTURE I GEODEZIJE  
 21000 SPLIT, MATICE HRVATSKE 15

ZAVRŠNI RAD

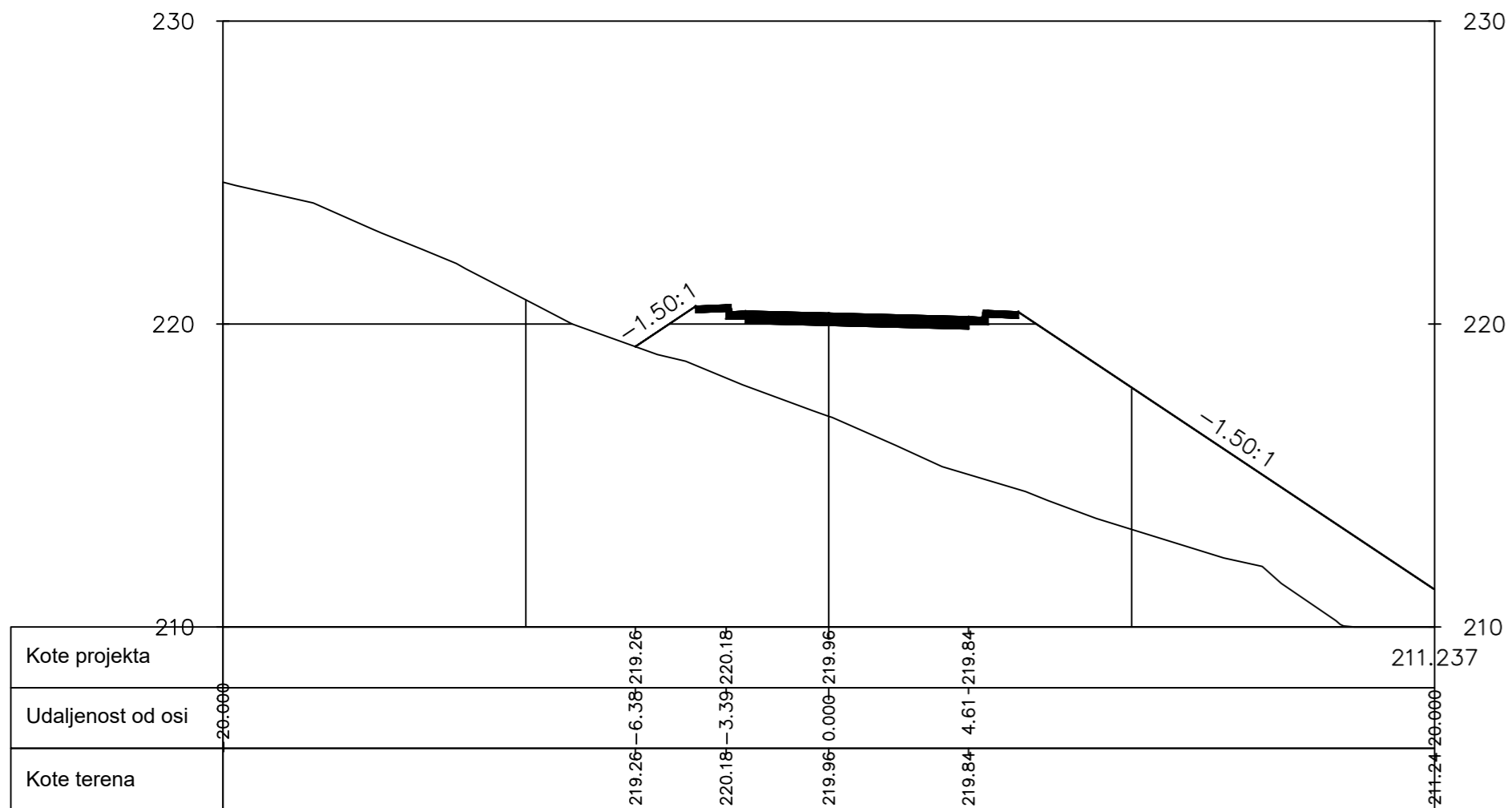
TEMA IDEJNI PROJEKT DIONICE CESTE

STUDENT Josipa Šerić

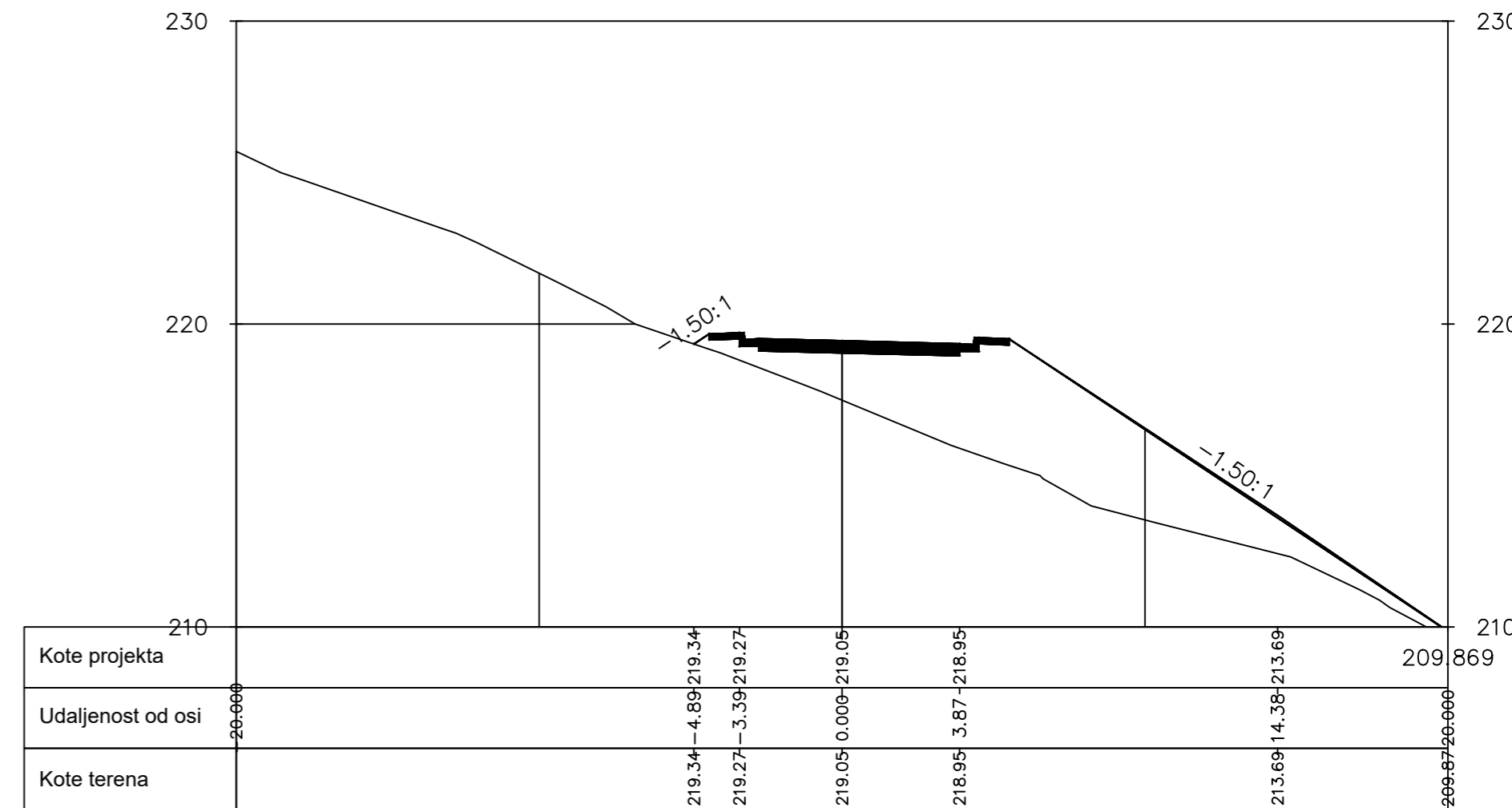
SADRŽAJ Karakteristični poprečni presjeci

MJERILO 1:200  
 DATUM travanj 2020

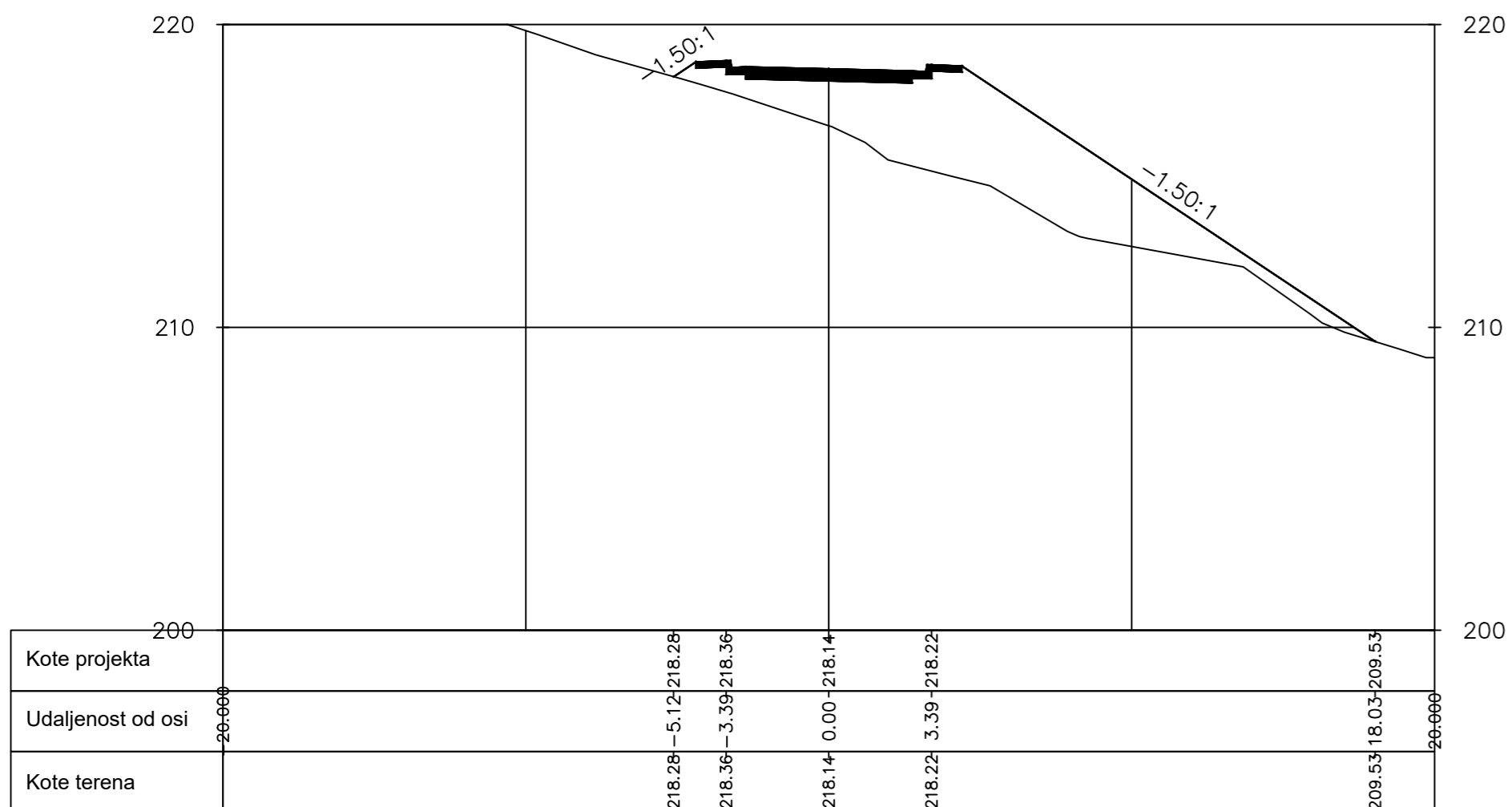
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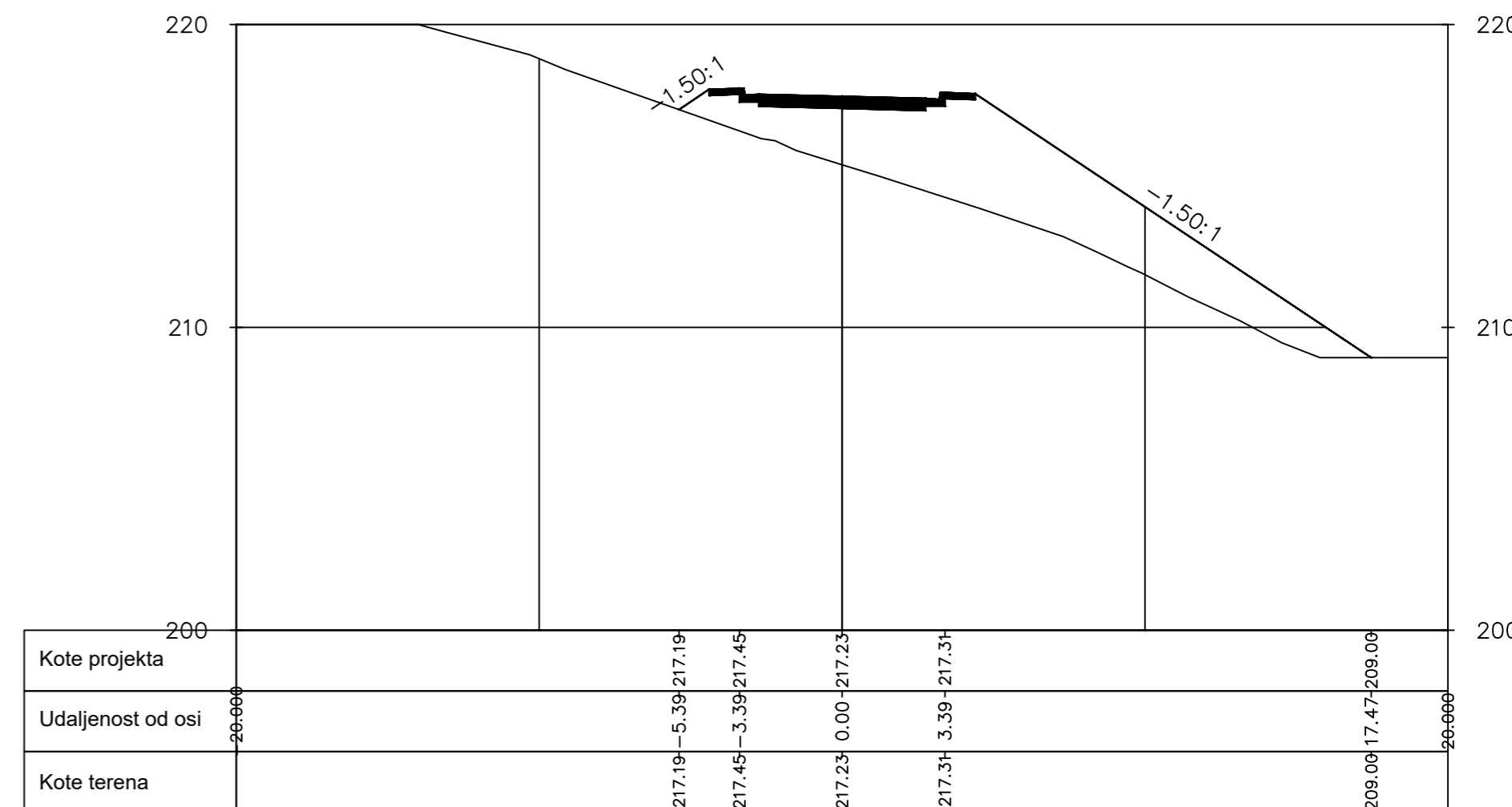
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0+300.00



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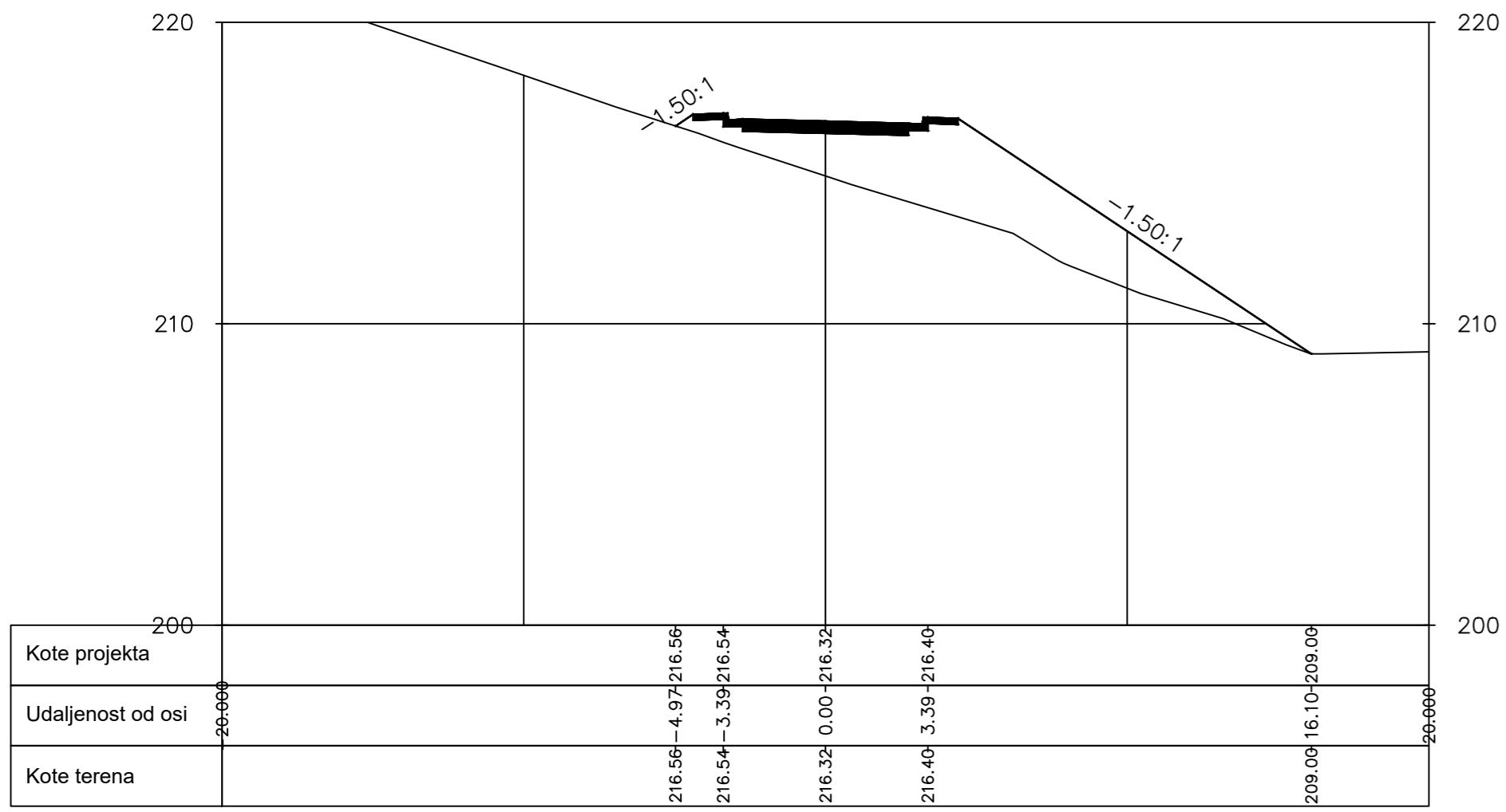


SVEUČILIŠTE U SPLITU  
 FAKULTET GRAĐEVINARSTVA,  
 ARHITEKTURE I GEODEZIJE  
 21000 SPLIT, MATICE HRVATSKE 15

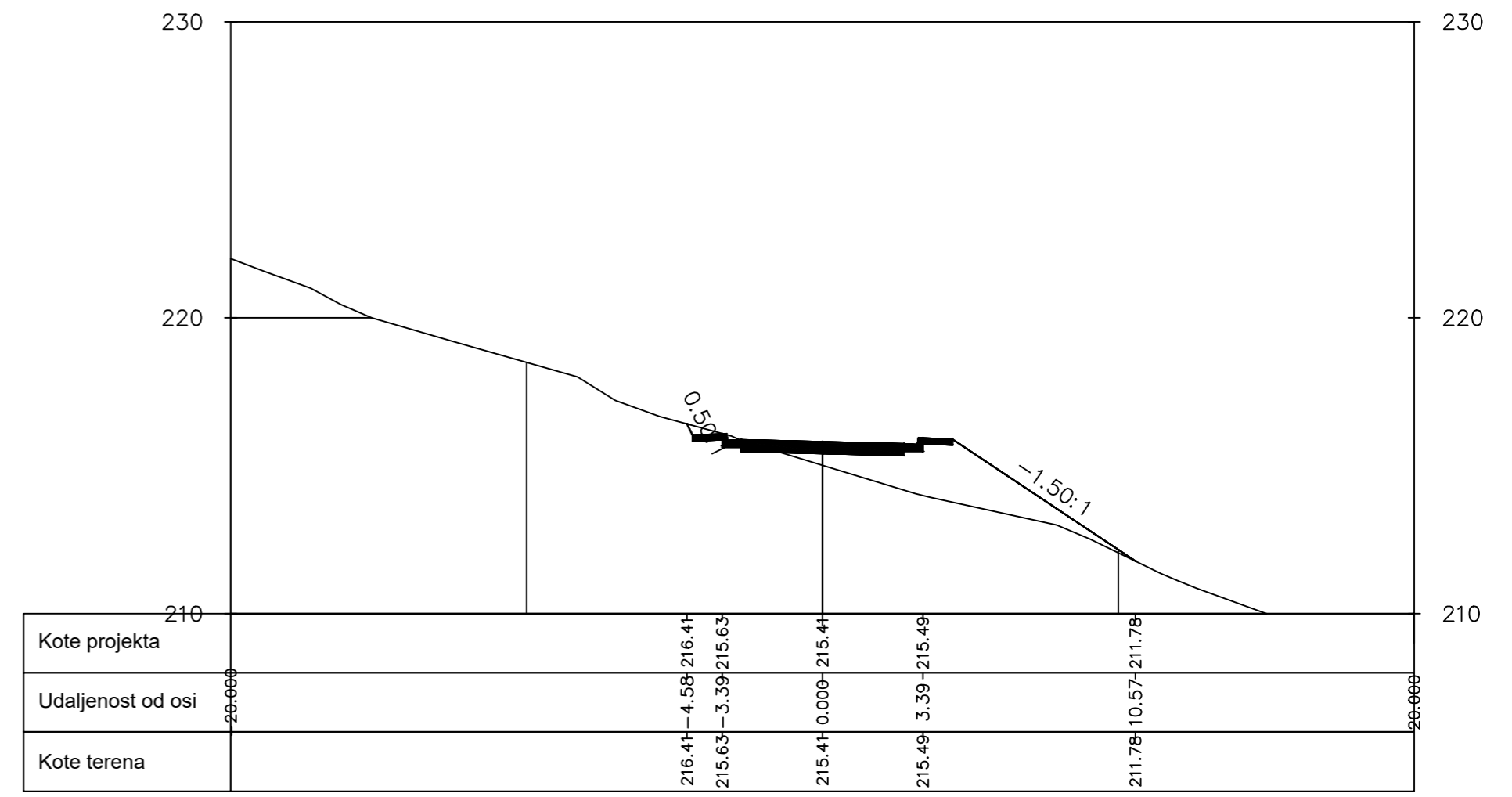
ZAVRŠNI RAD

|         |                                   |                    |
|---------|-----------------------------------|--------------------|
| TEMA    | IDEJNI PROJEKT DIONICE CESTE      |                    |
| STUDENT | Josipa Šerić                      |                    |
| SADRŽAJ | Karakteristični poprečni presjeci | MJERILO 1:200      |
|         |                                   | DATUM travanj 2020 |

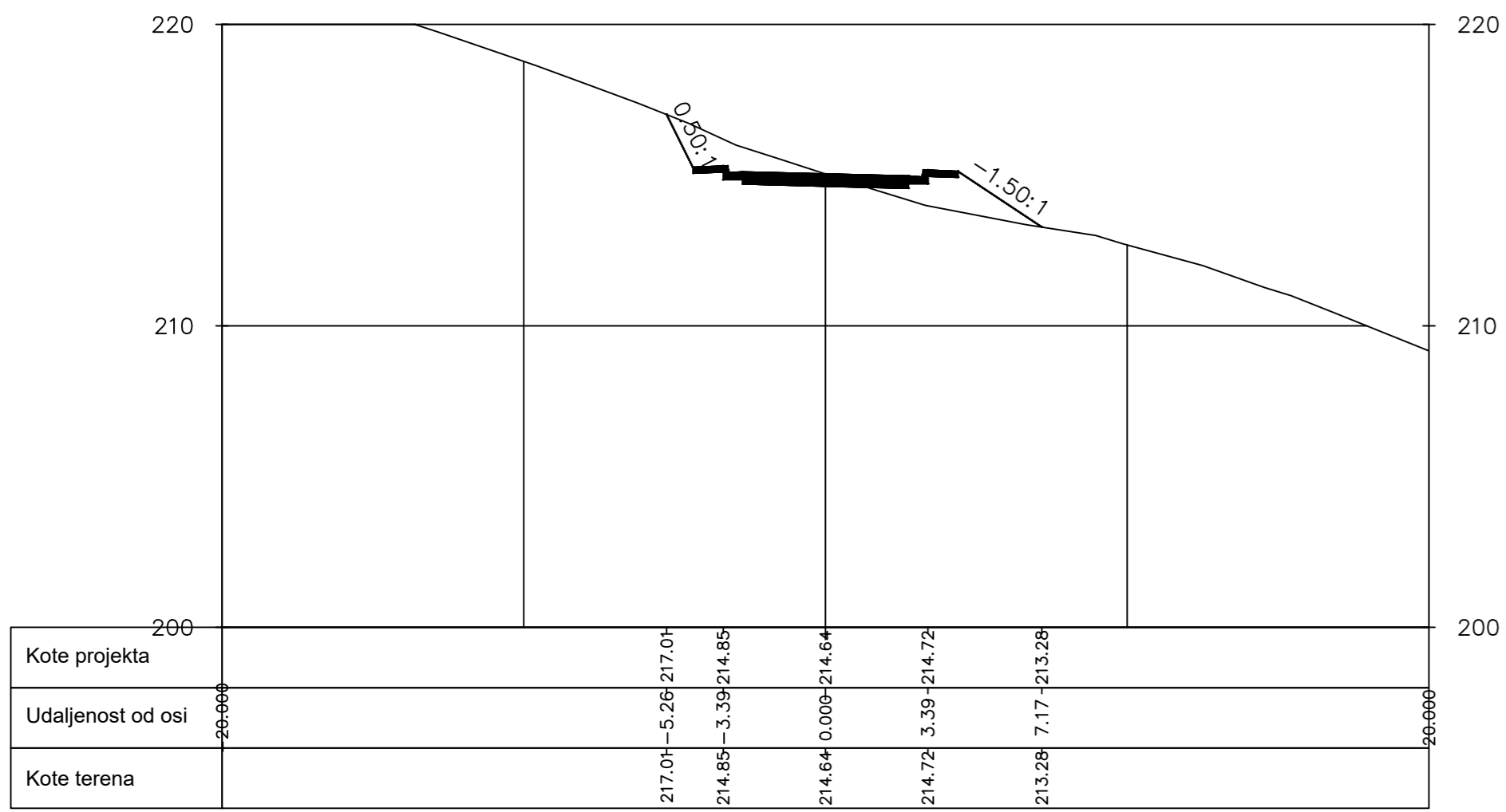
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0+340.00




0+356.94



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|  |                    |                                   |
|--|--------------------|-----------------------------------|
|  <p>SVEUČILIŠTE U SPLITU<br/>FAKULTET GRAĐEVINARSTVA,<br/>ARHITEKTURE I GEODEZIJE<br/>21000 SPLIT, MATICE HRVATSKE 15</p> | <b>ZAVRŠNI RAD</b> |                                   |
|  | TEMA               | IDEJNI PROJEKT DIONICE CESTE      |
|  | STUDENT            | Josipa Šerić                      |
|  | SADRŽAJ            | Karakteristični poprečni presjeci |
|  | MJERILO            | 1:200                             |
|  | DATUM              | travanj 2020                      |



## 7. Obrada na računalu

Za izradu projektnog zadatka korišten je softver za projektiranje cesta Autodesk Autocad Civil 3D. Postupak projektiranja trasa na računalu vrlo je sličan sa postupkom pri ručnoj izradi, ali je mnogo brži i jednostavniji.

Prvi korak pri izradi idejnog projekta ceste na računalu je umetanje skeniranog terena u AutoCAD te njegovo skaliranje u pravo mjerilo na kojem će se postaviti dionica ceste. Zatim smo iscrtavali slojnice terena pomoću polilinija i svakoj slojnici zadali njezinu nadmorsku visinu. Od konstruiranih slojnica radi se 3D model terena na način da se svakoj slojnici pridruži niz točaka koje kasnije formiraju prostorni prikaz terena.

Sljedeće je ubacivanje tangenti, postavljanje prijelaznih krivina te kružnih lukova kako bi mogli dobiti horizontalne elemente ceste.

Nakon toga slijedi izračun dijagrama vitoperenja kao i izrada uzdužnog presjeka ceste. Prilikom izrade niveletu postavljamo tako da se riješe geometrijski i sigurnosni elementi i odvodnja te između tangenti nivelete interpoliramo odgovarajuću vertikalnu kružnu krivinu.

Sljedeći korak je definiranje poprečnih profila trase. Poprečnim presjekom definirani su:

- Poprečni nagib
- Širina kolnika
- Pokosi nasipa
- Pokosi usjeka

Zatim definiramo 3D model terena (koridor) pomoću definirane osi trase, nivelete i poprečnog presjeka. Time smo dobili poprečne presjeke u svim zadanim i karakterističnim točkama osi ceste.

Za zadnji korak radimo ispis točaka osi naše ceste i računamo ukupnu količinu radova na temelju naših presjeka.

## 8. Računalni ispis točaka osi

## 8.1. Koordinatni račun glavnih točaka osi

### Alignment Station and Curve Report

**Client:** Client  
Company

**Project Name:** C:\Users\User\AppData\Local\Temp\ZR  
jš\_1\_18315\_ba6d8ec5.sv\$

**Project Description:**

**Report Date:** 9/4/2020 6:03:19 PM

**Prepared by:**  
Preparer

**Alignment:** os\_1\_(1)

**Description:**

#### Tangent Data

| Description | PT Station | Northing   | Easting    |
|-------------|------------|------------|------------|
| Start:      | 0+00.000   | -65537.596 | 233619.586 |
| End:        | 0+39.189   | -65540.595 | 233658.660 |

#### Tangent Data

| Parameter | Value  | Parameter | Value                |
|-----------|--------|-----------|----------------------|
| Length:   | 39.189 | Course:   | S 85° 36' 40.8089" E |

#### Spiral Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| TS:         | 0+39.189 | -65540.595 | 233658.660 |
| SPI:        |          | -65542.646 | 233685.382 |
| SC:         | 0+79.189 | -65539.564 | 233698.479 |

#### Spiral Curve Data: clothoid

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Length:   | 40.000           | L Tan:    | 26.800               |
| Radius:   | 65.000           | S Tan:    | 13.455               |
| Theta:    | 17° 37' 46.0942" | P:        | 1.022                |
| X:        | 39.623           | K:        | 19.937               |
| Y:        | 4.075            | A:        | 50.990               |
| Chord:    | 39.832           | Course:   | N 88° 31' 00.8209" E |

#### Curve Point Data

| Description | Station | Northing | Easting |
|-------------|---------|----------|---------|
|-------------|---------|----------|---------|

|     |          |            |            |
|-----|----------|------------|------------|
| SC: | 0+79.189 | -65539.564 | 233698.479 |
| RP: |          | -65476.292 | 233683.591 |
| CS: | 1+07.758 | -65527.216 | 233723.987 |

Circular Curve Data

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Delta:    | 25° 10' 58.7807" | Type:     | LEFT                 |
| Radius:   | 65.000           |           |                      |
| Length:   | 28.569           | Tangent:  | 14.519               |
| Mid-Ord:  | 1.563            | External: | 1.602                |
| Chord:    | 28.340           | Course:   | N 64° 10' 03.7065" E |

Spiral Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| CS:         | 1+07.758 | -65527.216 | 233723.987 |
| SPI:        |          | -65518.854 | 233734.528 |
| ST:         | 1+47.758 | -65496.622 | 233749.493 |

Spiral Curve Data: clothoid

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Length:   | 40.000           | L Tan:    | 26.800               |
| Radius:   | 65.000           | S Tan:    | 13.455               |
| Theta:    | 17° 37' 46.0942" | P:        | 1.022                |
| X:        | 39.623           | K:        | 19.937               |
| Y:        | 4.075            | A:        | 50.990               |
| Chord:    | 39.832           | Course:   | N 39° 49' 06.5921" E |

Tangent Data

| Description | PT Station | Northing   | Easting    |
|-------------|------------|------------|------------|
| Start:      | 1+47.758   | -65496.622 | 233749.493 |
| End:        | 1+67.436   | -65480.298 | 233760.482 |

Tangent Data

| Parameter | Value  | Parameter | Value                |
|-----------|--------|-----------|----------------------|
| Length:   | 19.678 | Course:   | N 33° 56' 48.2219" E |

Spiral Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| TS:         | 1+67.436 | -65480.298 | 233760.482 |
| SPI:        |          | -65463.609 | 233771.716 |
| SC:         | 1+97.436 | -65457.533 | 233779.793 |

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 40° 18' 24.9180" E |

Curve Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| SC:         | 1+97.436 | -65457.533 | 233779.793 |
| RP:         |          | -65493.493 | 233806.846 |
| CS:         | 2+51.016 | -65455.028 | 233830.201 |

Circular Curve Data

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Delta:    | 68° 13' 11.2118" | Type:     | RIGHT                |
| Radius:   | 45.000           |           |                      |
| Length:   | 53.580           | Tangent:  | 30.479               |
| Mid-Ord:  | 7.742            | External: | 9.350                |
| Chord:    | 50.470           | Course:   | N 87° 09' 18.7632" E |

Spiral Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| CS:         | 2+51.016 | -65455.028 | 233830.201 |
| SPI:        |          | -65460.273 | 233838.840 |
| ST:         | 2+81.016 | -65475.766 | 233851.673 |

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 45° 59' 47.3915" E |

Tangent Data

| Description | PT Station | Northing   | Easting    |
|-------------|------------|------------|------------|
| Start:      | 2+81.016   | -65475.766 | 233851.673 |
| End:        | 3+56.943   | -65534.239 | 233900.109 |

Tangent Data

| Parameter | Value  | Parameter | Value                |
|-----------|--------|-----------|----------------------|
| Length:   | 75.928 | Course:   | S 39° 38' 10.6954" E |

**Alignment: os 1 (1)-Left-2.750****Description:**Tangent Data

| Description | PT Station | Northing   | Easting    |
|-------------|------------|------------|------------|
| Start:      | 0+00.000   | -65534.854 | 233619.797 |
| End:        | 0+39.189   | -65537.853 | 233658.871 |

Tangent Data

| Parameter | Value  | Parameter | Value                |
|-----------|--------|-----------|----------------------|
| Length:   | 39.189 | Course:   | S 85° 36' 40.8089" E |

Tangent Data

| Description | PT Station | Northing   | Easting    |
|-------------|------------|------------|------------|
| Start:      | 0+39.189   | -65537.853 | 233658.871 |
| End:        | 0+52.425   | -65538.287 | 233672.099 |

Tangent Data

| Parameter | Value  | Parameter | Value                |
|-----------|--------|-----------|----------------------|
| Length:   | 13.236 | Course:   | S 88° 07' 23.5276" E |

Tangent Data

| Description | PT Station | Northing   | Easting    |
|-------------|------------|------------|------------|
| Start:      | 0+52.425   | -65538.287 | 233672.099 |
| End:        | 0+65.409   | -65537.818 | 233685.075 |

Tangent Data

| Parameter | Value  | Parameter | Value                |
|-----------|--------|-----------|----------------------|
| Length:   | 12.984 | Course:   | N 87° 55' 53.5821" E |

Tangent Data

| Description | PT Station | Northing   | Easting    |
|-------------|------------|------------|------------|
| Start:      | 0+65.409   | -65537.818 | 233685.075 |
| End:        | 0+78.077   | -65535.632 | 233697.553 |

Tangent Data

| Parameter | Value  | Parameter | Value                |
|-----------|--------|-----------|----------------------|
| Length:   | 12.669 | Course:   | N 80° 03' 42.4033" E |

Curve Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| PC:         | 0+78.077 | -65535.632 | 233697.553 |
| RP:         |          | -65476.292 | 233683.591 |
| PCC:        | 1+04.871 | -65524.050 | 233721.476 |

Circular Curve Data

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Delta:    | 25° 10' 58.7807" | Type:     | LEFT                 |
| Radius:   | 60.960           |           |                      |
| Length:   | 26.794           | Tangent:  | 13.617               |
| Mid-Ord:  | 1.466            | External: | 1.502                |
| Chord:    | 26.578           | Course:   | N 64° 10' 03.7065" E |

Curve Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| PCC:        | 1+04.871 | -65524.050 | 233721.476 |
| RP:         |          | -65517.783 | 233716.504 |
| PCC:        | 1+04.891 | -65524.038 | 233721.492 |

Circular Curve Data

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Delta:    | 00° 08' 44.9197" | Type:     | LEFT                 |
| Radius:   | 8.000            |           |                      |
| Length:   | 0.020            | Tangent:  | 0.010                |
| Mid-Ord:  | 0.000            | External: | 0.000                |
| Chord:    | 0.020            | Course:   | N 51° 30' 11.8564" E |

Curve Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| PCC:        | 1+04.891 | -65524.038 | 233721.492 |
| RP:         |          | -65435.412 | 233650.820 |
| PCC:        | 1+43.025 | -65495.741 | 233746.786 |

Circular Curve Data

| Parameter | Value            | Parameter | Value  |
|-----------|------------------|-----------|--------|
| Delta:    | 19° 16' 29.7751" | Type:     | LEFT   |
| Radius:   | 113.354          |           |        |
| Length:   | 38.133           | Tangent:  | 19.249 |



Mid-Ord: 1.600 External: 1.623  
 Chord: 37.954 Course: N 41° 47' 34.5089" E

Curve Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| PCC:        | 1+43.025 | -65495.741 | 233746.786 |
| RP:         |          | -65509.046 | 233767.951 |
| PT:         | 1+43.806 | -65495.086 | 233747.212 |

Circular Curve Data

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Delta:    | 01° 47' 28.6005" | Type:     | RIGHT                |
| Radius:   | 25.000           |           |                      |
| Length:   | 0.782            | Tangent:  | 0.391                |
| Mid-Ord:  | 0.003            | External: | 0.003                |
| Chord:    | 0.782            | Course:   | N 33° 03' 03.9217" E |

Tangent Data

| Description | PT Station | Northing   | Easting    |
|-------------|------------|------------|------------|
| Start:      | 1+43.806   | -65495.086 | 233747.212 |
| End:        | 1+63.484   | -65478.762 | 233758.201 |

Tangent Data

| Parameter | Value  | Parameter | Value                |
|-----------|--------|-----------|----------------------|
| Length:   | 19.678 | Course:   | N 33° 56' 48.2219" E |

Spiral Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| TS:         | 1+63.484 | -65478.762 | 233758.201 |
| SPI:        |          | -65461.689 | 233769.693 |
| SC:         | 1+94.401 | -65455.335 | 233778.139 |

Spiral Curve Data: clothoid

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Length:   | 30.917           | L Tan:    | 20.725               |
| Radius:   | 47.750           | S Tan:    | 10.410               |
| Theta:    | 18° 32' 55.0813" | P:        | 0.831                |
| X:        | 30.594           | K:        | 15.404               |
| Y:        | 3.311            | A:        | 38.422               |
| Chord:    | 30.763           | Course:   | N 40° 24' 05.2595" E |

Curve Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| SC:         | 1+94.401 | -65455.335 | 233778.139 |
| RP:         |          | -65493.493 | 233806.846 |
| CS:         | 2+51.255 | -65452.677 | 233831.628 |

Circular Curve Data

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Delta:    | 68° 13' 11.2118" | Type:     | RIGHT                |
| Radius:   | 47.750           |           |                      |
| Length:   | 56.854           | Tangent:  | 32.341               |
| Mid-Ord:  | 8.215            | External: | 9.922                |
| Chord:    | 53.555           | Course:   | N 87° 09' 18.7632" E |

Spiral Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| CS:         | 2+51.255 | -65452.677 | 233831.628 |
| SPI:        |          | -65458.163 | 233840.663 |
| ST:         | 2+82.171 | -65474.012 | 233853.791 |

Spiral Curve Data: clothoid

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Length:   | 30.917           | L Tan:    | 20.725               |
| Radius:   | 47.750           | S Tan:    | 10.410               |
| Theta:    | 18° 32' 55.0813" | P:        | 0.831                |
| X:        | 30.594           | K:        | 15.404               |
| Y:        | 3.311            | A:        | 38.422               |
| Chord:    | 30.763           | Course:   | S 46° 05' 27.7330" E |

Tangent Data

| Description | PT Station | Northing   | Easting    |
|-------------|------------|------------|------------|
| Start:      | 2+82.171   | -65474.012 | 233853.791 |
| End:        | 3+58.099   | -65532.485 | 233902.226 |

Tangent Data

| Parameter | Value  | Parameter | Value                |
|-----------|--------|-----------|----------------------|
| Length:   | 75.928 | Course:   | S 39° 38' 10.6954" E |

**Alignment: os 1 (1)-Right-2.750**

**Description:**

Tangent Data

| Description | PT Station | Northing   | Easting    |
|-------------|------------|------------|------------|
| Start:      | 0+00.000   | -65540.338 | 233619.376 |
| End:        | 0+39.189   | -65543.337 | 233658.450 |

Tangent Data

| Parameter | Value  | Parameter | Value                |
|-----------|--------|-----------|----------------------|
| Length:   | 39.189 | Course:   | S 85° 36' 40.8089" E |

Spiral Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| TS:         | 0+39.189 | -65543.337 | 233658.450 |
| SPI:        |          | -65545.421 | 233685.596 |
| SC:         | 0+80.035 | -65542.241 | 233699.109 |

Spiral Curve Data: clothoid

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Length:   | 40.846           | L Tan:    | 27.362               |
| Radius:   | 67.750           | S Tan:    | 13.734               |
| Theta:    | 17° 16' 18.0370" | P:        | 1.023                |
| X:        | 40.477           | K:        | 20.361               |
| Y:        | 4.078            | A:        | 52.605               |
| Chord:    | 40.674           | Course:   | N 88° 27' 21.3797" E |

Curve Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| SC:         | 0+80.035 | -65542.241 | 233699.109 |
| RP:         |          | -65476.292 | 233683.591 |
| CS:         | 1+09.813 | -65529.370 | 233725.696 |

Circular Curve Data

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Delta:    | 25° 10' 58.7807" | Type:     | LEFT                 |
| Radius:   | 67.750           |           |                      |
| Length:   | 29.778           | Tangent:  | 15.133               |
| Mid-Ord:  | 1.629            | External: | 1.670                |
| Chord:    | 29.539           | Course:   | N 64° 10' 03.7065" E |

Spiral Point Data

| Description | Station | Northing | Easting |
|-------------|---------|----------|---------|
|-------------|---------|----------|---------|

|      |          |            |            |
|------|----------|------------|------------|
| CS:  | 1+09.813 | -65529.370 | 233725.696 |
| SPI: |          | -65520.743 | 233736.571 |
| ST:  | 1+50.659 | -65498.157 | 233751.775 |

Spiral Curve Data: clothoid

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Length:   | 40.846           | L Tan:    | 27.362               |
| Radius:   | 67.750           | S Tan:    | 13.734               |
| Theta:    | 17° 16' 18.0370" | P:        | 1.023                |
| X:        | 40.477           | K:        | 20.361               |
| Y:        | 4.078            | A:        | 52.605               |
| Chord:    | 40.674           | Course:   | N 39° 52' 46.0333" E |

Tangent Data

| Description | PT Station | Northing   | Easting    |
|-------------|------------|------------|------------|
| Start:      | 1+50.659   | -65498.157 | 233751.775 |
| End:        | 1+70.337   | -65481.833 | 233762.763 |

Tangent Data

| Parameter | Value  | Parameter | Value                |
|-----------|--------|-----------|----------------------|
| Length:   | 19.678 | Course:   | N 33° 56' 48.2219" E |

Curve Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| PC:         | 1+70.337 | -65481.833 | 233762.763 |
| RP:         |          | -65486.301 | 233769.400 |
| PCC:        | 1+70.362 | -65481.813 | 233762.777 |

Circular Curve Data

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Delta:    | 00° 10' 40.8857" | Type:     | RIGHT                |
| Radius:   | 8.000            |           |                      |
| Length:   | 0.025            | Tangent:  | 0.012                |
| Mid-Ord:  | 0.000            | External: | 0.000                |
| Chord:    | 0.025            | Course:   | N 34° 02' 08.6649" E |

Curve Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| PCC:        | 1+70.362 | -65481.813 | 233762.777 |
| RP:         |          | -65529.219 | 233832.730 |
| PCC:        | 1+98.879 | -65461.325 | 233782.419 |

Circular Curve Data

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Delta:    | 19° 20' 08.3115" | Type:     | RIGHT                |
| Radius:   | 84.503           |           |                      |
| Length:   | 28.517           | Tangent:  | 14.396               |
| Mid-Ord:  | 1.200            | External: | 1.217                |
| Chord:    | 28.382           | Course:   | N 43° 47' 33.2634" E |

Curve Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| PCC:        | 1+98.879 | -65461.325 | 233782.419 |
| RP:         |          | -65441.239 | 233767.535 |
| PCC:        | 1+99.060 | -65461.217 | 233782.564 |

Circular Curve Data

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Delta:    | 00° 24' 54.2618" | Type:     | LEFT                 |
| Radius:   | 25.000           |           |                      |
| Length:   | 0.181            | Tangent:  | 0.091                |
| Mid-Ord:  | 0.000            | External: | 0.000                |
| Chord:    | 0.181            | Course:   | N 53° 15' 10.2882" E |

Curve Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| PCC:        | 1+99.060 | -65461.217 | 233782.564 |
| RP:         |          | -65493.493 | 233806.846 |
| PCC:        | 2+47.151 | -65458.968 | 233827.808 |

Circular Curve Data

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Delta:    | 68° 13' 11.2118" | Type:     | RIGHT                |
| Radius:   | 40.390           |           |                      |
| Length:   | 48.091           | Tangent:  | 27.356               |
| Mid-Ord:  | 6.949            | External: | 8.392                |
| Chord:    | 45.300           | Course:   | N 87° 09' 18.7632" E |

Curve Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| PCC:        | 2+47.151 | -65458.968 | 233827.808 |
| RP:         |          | -65437.599 | 233840.783 |
| PCC:        | 2+48.423 | -65459.600 | 233828.912 |

Circular Curve Data

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Delta:    | 02° 54' 52.7469" | Type:     | LEFT                 |
| Radius:   | 25.000           |           |                      |
| Length:   | 1.272            | Tangent:  | 0.636                |
| Mid-Ord:  | 0.008            | External: | 0.008                |
| Chord:    | 1.272            | Course:   | S 60° 11' 32.0043" E |

Curve Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| PCC:        | 2+48.423 | -65459.600 | 233828.912 |
| RP:         |          | -65513.424 | 233799.870 |
| PCC:        | 2+70.937 | -65473.658 | 233846.335 |

Circular Curve Data

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Delta:    | 21° 05' 31.4460" | Type:     | RIGHT                |
| Radius:   | 61.159           |           |                      |
| Length:   | 22.514           | Tangent:  | 11.386               |
| Mid-Ord:  | 1.033            | External: | 1.051                |
| Chord:    | 22.387           | Course:   | S 51° 06' 12.6547" E |

Curve Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| PCC:        | 2+70.937 | -65473.658 | 233846.335 |
| RP:         |          | -65478.859 | 233840.257 |
| CS:         | 2+70.991 | -65473.699 | 233846.371 |

Circular Curve Data

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Delta:    | 00° 23' 29.4757" | Type:     | RIGHT                |
| Radius:   | 8.000            |           |                      |
| Length:   | 0.055            | Tangent:  | 0.027                |
| Mid-Ord:  | 0.000            | External: | 0.000                |
| Chord:    | 0.055            | Course:   | S 40° 21' 42.1938" E |

Spiral Point Data

| Description | Station  | Northing   | Easting    |
|-------------|----------|------------|------------|
| CS:         | 2+70.991 | -65473.699 | 233846.371 |
| SPI:        |          | -65474.963 | 233847.437 |
| ST:         | 2+75.966 | -65477.520 | 233849.556 |

Spiral Curve Data: clothoid

| Parameter | Value            | Parameter | Value                |
|-----------|------------------|-----------|----------------------|
| Length:   | 4.974            | L Tan:    | 3.316                |
| Radius:   | 267.254          | S Tan:    | 1.658                |
| Theta:    | 00° 31' 59.6268" | P:        | 0.004                |
| X:        | 4.974            | K:        | 2.487                |
| Y:        | 0.015            | A:        | 36.462               |
| Chord:    | 4.974            | Course:   | S 39° 48' 45.6661" E |

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Tangent Data

| Description | PT Station | Northing   | Easting    |
|-------------|------------|------------|------------|
| Start:      | 2+75.966   | -65477.520 | 233849.556 |
| End:        | 3+51.894   | -65535.993 | 233897.991 |

Tangent Data

| Parameter | Value  | Parameter | Value                |
|-----------|--------|-----------|----------------------|
| Length:   | 75.928 | Course:   | S 39° 38' 10.6954" E |

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## 8.2. Koordinatni račun detaljnih točaka osi

Alignment Name: os 1 (1)

Description:

Station Range: Start: 0+000.00, End: 0+356.94

Station Increment: 20.00

| Station  | Northing      | Easting       | Tangential Direction |
|----------|---------------|---------------|----------------------|
| 0+000.00 | -65,537.5964m | 233,619.5862m | S85° 36' 41"E        |
| 0+020.00 | -65,539.1268m | 233,639.5275m | S85° 36' 41"E        |
| 0+040.00 | -65,540.6572m | 233,659.4689m | S85° 37' 07"E        |
| 0+060.00 | -65,541.6108m | 233,679.4401m | N89° 37' 00"E        |
| 0+080.00 | -65,539.3736m | 233,699.2671m | N76° 02' 39"E        |
| 0+100.00 | -65,531.6632m | 233,717.6357m | N58° 24' 53"E        |
| 0+120.00 | -65,518.8335m | 233,732.8911m | N42° 26' 12"E        |
| 0+140.00 | -65,503.0405m | 233,745.1363m | N34° 36' 36"E        |
| 0+160.00 | -65,486.4662m | 233,756.3295m | N33° 56' 48"E        |
| 0+180.00 | -65,470.0153m | 233,767.6986m | N37° 17' 48"E        |
| 0+200.00 | -65,456.0504m | 233,781.8845m | N56° 18' 36"E        |
| 0+220.00 | -65,448.9556m | 233,800.4080m | N81° 46' 29"E        |
| 0+240.00 | -65,450.5144m | 233,820.1825m | S72° 45' 37"E        |
| 0+260.00 | -65,460.3547m | 233,837.4223m | S49° 00' 31"E        |
| 0+280.00 | -65,474.9842m | 233,851.0254m | S39° 39' 29"E        |
| 0+300.00 | -65,490.3863m | 233,863.7838m | S39° 38' 11"E        |
| 0+320.00 | -65,505.7885m | 233,876.5420m | S39° 38' 11"E        |
| 0+340.00 | -65,521.1907m | 233,889.3002m | S39° 38' 11"E        |
| 0+356.94 | -65,534.2363m | 233,900.1065m | S39° 38' 11"E        |



### 8.3. Račun kota kolnika

Corridor Name: koridor0123

Description:

Base Alignment Name: os 1 (1)

Station Range: Start: 0+000.00, End: 0+356.94

CHAINAGE 0+000.00

| POINT | X            | Y            | Z        | OFFSET  | STRING CUT      |
|-------|--------------|--------------|----------|---------|-----------------|
| 1     | 233,619.9741 | -65,532.5420 | 231.5811 | -5.069m | Daylight        |
| 2     | 233,619.9222 | -65,533.2176 | 230.2260 | -4.392m | Ditch_Out       |
| 3     | 233,619.9222 | -65,533.2186 | 230.0260 | -4.391m | EPS_Sub         |
| 4     | 233,619.8457 | -65,534.2146 | 230.2660 | -3.392m | Back_Curb       |
| 5     | 233,619.8342 | -65,534.3642 | 230.2660 | -3.242m | Top_Curb        |
| 6     | 233,619.8311 | -65,534.4058 | 230.0410 | -3.200m | Flowline_Gutter |
| 7     | 233,619.7966 | -65,534.8545 | 229.6680 | -2.750m | ETW_SubBase     |
| 8     | 233,619.7966 | -65,534.8545 | 230.0680 | -2.750m | Flange          |
| 9     | 233,619.3757 | -65,540.3383 | 229.9305 | 2.750m  | Flange          |
| 10    | 233,619.3757 | -65,540.3383 | 229.5305 | 2.750m  | ETW_SubBase     |
| 11    | 233,619.3413 | -65,540.7870 | 229.9035 | 3.200m  | Flowline_Gutter |
| 12    | 233,619.3381 | -65,540.8286 | 230.1285 | 3.242m  | Top_Curb        |
| 13    | 233,619.3266 | -65,540.9782 | 230.1285 | 3.392m  | Back_Curb       |
| 14    | 233,619.2502 | -65,541.9742 | 229.8885 | 4.391m  | EPS_Sub         |
| 15    | 233,619.2501 | -65,541.9752 | 230.0885 | 4.392m  | Hinge           |
| 16    | 233,618.8743 | -65,546.8716 | 226.8146 | 9.302m  | Daylight        |

CHAINAGE 0+020.00

| POINT | X            | Y            | Z        | OFFSET  | STRING CUT      |
|-------|--------------|--------------|----------|---------|-----------------|
| 1     | 233,639.9720 | -65,533.3353 | 232.3081 | -5.809m | Daylight        |
| 2     | 233,639.8636 | -65,534.7480 | 229.4744 | -4.392m | Ditch_Out       |
| 3     | 233,639.8635 | -65,534.7490 | 229.2744 | -4.391m | EPS_Sub         |
| 4     | 233,639.7871 | -65,535.7451 | 229.5144 | -3.392m | Back_Curb       |
| 5     | 233,639.7756 | -65,535.8946 | 229.5144 | -3.242m | Top_Curb        |
| 6     | 233,639.7724 | -65,535.9362 | 229.2894 | -3.200m | Flowline_Gutter |
| 7     | 233,639.7380 | -65,536.3849 | 228.9164 | -2.750m | ETW_SubBase     |
| 8     | 233,639.7380 | -65,536.3849 | 229.3164 | -2.750m | Flange          |
| 9     | 233,639.3171 | -65,541.8688 | 229.1789 | 2.750m  | Flange          |
| 10    | 233,639.3171 | -65,541.8688 | 228.7789 | 2.750m  | ETW_SubBase     |
| 11    | 233,639.2827 | -65,542.3175 | 229.1519 | 3.200m  | Flowline_Gutter |

|    |              |              |          |        |           |
|----|--------------|--------------|----------|--------|-----------|
| 12 | 233,639.2795 | -65,542.3590 | 229.3769 | 3.242m | Top_Curb  |
| 13 | 233,639.2680 | -65,542.5086 | 229.3769 | 3.392m | Back_Curb |
| 14 | 233,639.1916 | -65,543.5047 | 229.1369 | 4.391m | EPS_Sub   |
| 15 | 233,639.1915 | -65,543.5057 | 229.3369 | 4.392m | Hinge     |
| 16 | 233,639.1569 | -65,543.9557 | 229.0359 | 4.843m | Daylight  |

## CHAINAGE 0+040.00

| <b>POINT</b> | <b>X</b>     | <b>Y</b>     | <b>Z</b> | <b>OFFSET</b> | <b>STRING CUT</b> |
|--------------|--------------|--------------|----------|---------------|-------------------|
| 1            | 233,659.9295 | -65,534.6453 | 231.9283 | -6.030m       | Daylight          |
| 2            | 233,659.8071 | -65,536.2429 | 228.7237 | -4.427m       | EPS               |
| 3            | 233,659.8070 | -65,536.2439 | 228.5237 | -4.426m       | EPS_Sub           |
| 4            | 233,659.7307 | -65,537.2400 | 228.7637 | -3.427m       | Back_Curb         |
| 5            | 233,659.7193 | -65,537.3896 | 228.7637 | -3.277m       | Top_Curb          |
| 6            | 233,659.7161 | -65,537.4312 | 228.5387 | -3.236m       | Flowline_Gutter   |
| 7            | 233,659.6817 | -65,537.8798 | 228.5657 | -2.786m       | ETW               |
| 8            | 233,659.6817 | -65,537.8798 | 228.1657 | -2.786m       | ETW_SubBase       |
| 9            | 233,659.2588 | -65,543.3990 | 228.0273 | 2.750m        | ETW_SubBase       |
| 10           | 233,659.2588 | -65,543.3990 | 228.4273 | 2.750m        | ETW               |
| 11           | 233,659.2245 | -65,543.8477 | 228.4003 | 3.200m        | Flowline_Gutter   |
| 12           | 233,659.2213 | -65,543.8892 | 228.6253 | 3.241m        | Top_Curb          |
| 13           | 233,659.2098 | -65,544.0388 | 228.6253 | 3.391m        | Back_Curb         |
| 14           | 233,659.1335 | -65,545.0349 | 228.3853 | 4.390m        | EPS_Sub           |
| 15           | 233,659.1334 | -65,545.0359 | 228.5853 | 4.391m        | Hinge_Cut         |
| 16           | 233,659.1256 | -65,545.1384 | 228.7909 | 4.494m        | Daylight          |

## CHAINAGE 0+060.00

| <b>POINT</b> | <b>X</b>     | <b>Y</b>     | <b>Z</b> | <b>OFFSET</b> | <b>STRING CUT</b> |
|--------------|--------------|--------------|----------|---------------|-------------------|
| 1            | 233,679.3931 | -65,534.5914 | 231.5710 | -7.020m       | Daylight          |
| 2            | 233,679.4051 | -65,536.3808 | 227.9921 | -5.230m       | EPS               |
| 3            | 233,679.4051 | -65,536.3818 | 227.7921 | -5.229m       | EPS_Sub           |
| 4            | 233,679.4117 | -65,537.3808 | 228.0321 | -4.230m       | Back_Curb         |
| 5            | 233,679.4128 | -65,537.5308 | 228.0321 | -4.080m       | Top_Curb          |
| 6            | 233,679.4130 | -65,537.5725 | 227.8071 | -4.038m       | Flowline_Gutter   |
| 7            | 233,679.4160 | -65,538.0225 | 227.8341 | -3.588m       | ETW               |
| 8            | 233,679.4160 | -65,538.0225 | 227.4341 | -3.588m       | ETW_SubBase       |
| 9            | 233,679.4585 | -65,544.3609 | 227.2757 | 2.750m        | ETW_SubBase       |
| 10           | 233,679.4585 | -65,544.3609 | 227.6757 | 2.750m        | ETW               |
| 11           | 233,679.4615 | -65,544.8109 | 227.6487 | 3.200m        | Flowline_Gutter   |
| 12           | 233,679.4618 | -65,544.8526 | 227.8737 | 3.242m        | Top_Curb          |

|    |              |              |          |        |           |
|----|--------------|--------------|----------|--------|-----------|
| 13 | 233,679.4628 | -65,545.0026 | 227.8737 | 3.392m | Back_Curb |
| 14 | 233,679.4694 | -65,546.0016 | 227.6337 | 4.391m | EPS_Sub   |
| 15 | 233,679.4694 | -65,546.0026 | 227.8337 | 4.392m | Hinge_Cut |
| 16 | 233,679.4722 | -65,546.4131 | 228.6547 | 4.802m | Daylight  |

## CHAINAGE 0+080.00

| <b>POINT</b> | <b>X</b>     | <b>Y</b>     | <b>Z</b> | <b>OFFSET</b> | <b>STRING CUT</b> |
|--------------|--------------|--------------|----------|---------------|-------------------|
| 1            | 233,697.5177 | -65,532.3337 | 230.3964 | -7.254m       | Daylight          |
| 2            | 233,697.8969 | -65,533.8596 | 227.2518 | -5.682m       | EPS               |
| 3            | 233,697.8971 | -65,533.8605 | 227.0518 | -5.681m       | EPS_Sub           |
| 4            | 233,698.1380 | -65,534.8301 | 227.2918 | -4.682m       | Back_Curb         |
| 5            | 233,698.1742 | -65,534.9756 | 227.2918 | -4.532m       | Top_Curb          |
| 6            | 233,698.1843 | -65,535.0161 | 227.0668 | -4.490m       | Flowline_Gutter   |
| 7            | 233,698.2928 | -65,535.4528 | 227.0938 | -4.040m       | ETW               |
| 8            | 233,698.2928 | -65,535.4528 | 226.6938 | -4.040m       | ETW_SubBase       |
| 9            | 233,699.9304 | -65,542.0424 | 226.5241 | 2.750m        | ETW_SubBase       |
| 10           | 233,699.9304 | -65,542.0424 | 226.9241 | 2.750m        | ETW               |
| 11           | 233,700.0389 | -65,542.4791 | 226.8971 | 3.200m        | Flowline_Gutter   |
| 12           | 233,700.0489 | -65,542.5196 | 227.1221 | 3.242m        | Top_Curb          |
| 13           | 233,700.0851 | -65,542.6651 | 227.1221 | 3.392m        | Back_Curb         |
| 14           | 233,700.3261 | -65,543.6347 | 226.8821 | 4.391m        | EPS_Sub           |
| 15           | 233,700.3263 | -65,543.6356 | 227.0821 | 4.392m        | Hinge_Cut         |
| 16           | 233,700.3765 | -65,543.8377 | 227.4985 | 4.600m        | Daylight          |

## CHAINAGE 0+100.00

| <b>POINT</b> | <b>X</b>     | <b>Y</b>     | <b>Z</b> | <b>OFFSET</b> | <b>STRING CUT</b> |
|--------------|--------------|--------------|----------|---------------|-------------------|
| 1            | 233,713.9790 | -65,525.7159 | 229.1000 | -6.982m       | Daylight          |
| 2            | 233,714.6598 | -65,526.8232 | 226.5002 | -5.682m       | Ditch_Out         |
| 3            | 233,714.6604 | -65,526.8241 | 226.3002 | -5.681m       | EPS_Sub           |
| 4            | 233,715.1836 | -65,527.6751 | 226.5402 | -4.682m       | Back_Curb         |
| 5            | 233,715.2622 | -65,527.8029 | 226.5402 | -4.532m       | Top_Curb          |
| 6            | 233,715.2840 | -65,527.8384 | 226.3152 | -4.490m       | Flowline_Gutter   |
| 7            | 233,715.5197 | -65,528.2217 | 225.9422 | -4.040m       | ETW_SubBase       |
| 8            | 233,715.5197 | -65,528.2217 | 226.3422 | -4.040m       | Flange            |
| 9            | 233,719.0761 | -65,534.0059 | 226.1725 | 2.750m        | Flange            |
| 10           | 233,719.0761 | -65,534.0059 | 225.7725 | 2.750m        | ETW_SubBase       |
| 11           | 233,719.3118 | -65,534.3892 | 226.1455 | 3.200m        | Flowline_Gutter   |
| 12           | 233,719.3336 | -65,534.4247 | 226.3705 | 3.242m        | Top_Curb          |
| 13           | 233,719.4122 | -65,534.5525 | 226.3705 | 3.392m        | Back_Curb         |

|    |              |              |          |        |          |
|----|--------------|--------------|----------|--------|----------|
| 14 | 233,719.9354 | -65,535.4035 | 226.1305 | 4.391m | EPS_Sub  |
| 15 | 233,719.9359 | -65,535.4044 | 226.3305 | 4.392m | Hinge    |
| 16 | 233,720.3451 | -65,536.0698 | 225.8097 | 5.173m | Daylight |

## CHAINAGE 0+120.00

| <b>POINT</b> | <b>X</b>     | <b>Y</b>     | <b>Z</b> | <b>OFFSET</b> | <b>STRING CUT</b> |
|--------------|--------------|--------------|----------|---------------|-------------------|
| 1            | 233,728.3730 | -65,514.7026 | 227.3401 | -6.122m       | Daylight          |
| 2            | 233,728.9660 | -65,515.2449 | 225.7329 | -5.318m       | Ditch_Out         |
| 3            | 233,728.9668 | -65,515.2456 | 225.5329 | -5.317m       | EPS_Sub           |
| 4            | 233,729.7041 | -65,515.9197 | 225.7729 | -4.318m       | Back_Curb         |
| 5            | 233,729.8148 | -65,516.0209 | 225.7729 | -4.168m       | Top_Curb          |
| 6            | 233,729.8455 | -65,516.0490 | 225.5479 | -4.127m       | Flowline_Gutter   |
| 7            | 233,730.1776 | -65,516.3527 | 225.1749 | -3.677m       | ETW_SubBase       |
| 8            | 233,730.1776 | -65,516.3527 | 225.5749 | -3.677m       | Flange            |
| 9            | 233,734.9202 | -65,520.6888 | 225.4142 | 2.749m        | Flange            |
| 10           | 233,734.9202 | -65,520.6888 | 225.0142 | 2.749m        | ETW_SubBase       |
| 11           | 233,735.2523 | -65,520.9924 | 225.3872 | 3.199m        | Flowline_Gutter   |
| 12           | 233,735.2831 | -65,521.0206 | 225.6122 | 3.241m        | Top_Curb          |
| 13           | 233,735.3938 | -65,521.1218 | 225.6122 | 3.391m        | Back_Curb         |
| 14           | 233,736.1311 | -65,521.7959 | 225.3722 | 4.390m        | EPS_Sub           |
| 15           | 233,736.1318 | -65,521.7965 | 225.5722 | 4.391m        | Hinge             |
| 16           | 233,738.5230 | -65,523.9827 | 223.4123 | 7.631m        | Daylight          |

## CHAINAGE 0+140.00

| <b>POINT</b> | <b>X</b>     | <b>Y</b>     | <b>Z</b> | <b>OFFSET</b> | <b>STRING CUT</b> |
|--------------|--------------|--------------|----------|---------------|-------------------|
| 1            | 233,740.9513 | -65,500.1524 | 226.4021 | -5.085m       | Daylight          |
| 2            | 233,741.5598 | -65,500.5724 | 224.9232 | -4.345m       | Ditch_Out         |
| 3            | 233,741.5607 | -65,500.5729 | 224.7232 | -4.344m       | EPS_Sub           |
| 4            | 233,742.3829 | -65,501.1404 | 224.9632 | -3.345m       | Back_Curb         |
| 5            | 233,742.5063 | -65,501.2255 | 224.9632 | -3.195m       | Top_Curb          |
| 6            | 233,742.5407 | -65,501.2492 | 224.7382 | -3.154m       | Flowline_Gutter   |
| 7            | 233,742.9110 | -65,501.5048 | 224.3652 | -2.704m       | ETW_SubBase       |
| 8            | 233,742.9110 | -65,501.5048 | 224.7652 | -2.704m       | Flange            |
| 9            | 233,747.3996 | -65,504.6025 | 224.6288 | 2.750m        | Flange            |
| 10           | 233,747.3996 | -65,504.6025 | 224.2288 | 2.750m        | ETW_SubBase       |
| 11           | 233,747.7700 | -65,504.8580 | 224.6018 | 3.200m        | Flowline_Gutter   |
| 12           | 233,747.8043 | -65,504.8817 | 224.8268 | 3.242m        | Top_Curb          |
| 13           | 233,747.9278 | -65,504.9669 | 224.8268 | 3.392m        | Back_Curb         |
| 14           | 233,748.7500 | -65,505.5343 | 224.5868 | 4.391m        | EPS_Sub           |

|    |              |              |          |        |          |
|----|--------------|--------------|----------|--------|----------|
| 15 | 233,748.7508 | -65,505.5349 | 224.7868 | 4.392m | Hinge    |
| 16 | 233,751.4857 | -65,507.4223 | 222.5715 | 7.715m | Daylight |

## CHAINAGE 0+160.00

| <b>POINT</b> | <b>X</b>     | <b>Y</b>     | <b>Z</b> | <b>OFFSET</b> | <b>STRING CUT</b> |
|--------------|--------------|--------------|----------|---------------|-------------------|
| 1            | 233,751.4705 | -65,483.1953 | 227.0416 | -5.857m       | Daylight          |
| 2            | 233,752.6863 | -65,484.0137 | 224.1103 | -4.392m       | Ditch_Out         |
| 3            | 233,752.6871 | -65,484.0143 | 223.9103 | -4.391m       | EPS_Sub           |
| 4            | 233,753.5159 | -65,484.5722 | 224.1503 | -3.392m       | Back_Curb         |
| 5            | 233,753.6403 | -65,484.6559 | 224.1503 | -3.242m       | Top_Curb          |
| 6            | 233,753.6749 | -65,484.6792 | 223.9253 | -3.200m       | Flowline_Gutter   |
| 7            | 233,754.0482 | -65,484.9305 | 223.5523 | -2.750m       | ETW_SubBase       |
| 8            | 233,754.0482 | -65,484.9305 | 223.9523 | -2.750m       | Flange            |
| 9            | 233,758.6108 | -65,488.0018 | 223.8148 | 2.750m        | Flange            |
| 10           | 233,758.6108 | -65,488.0018 | 223.4148 | 2.750m        | ETW_SubBase       |
| 11           | 233,758.9841 | -65,488.2531 | 223.7878 | 3.200m        | Flowline_Gutter   |
| 12           | 233,759.0187 | -65,488.2764 | 224.0128 | 3.242m        | Top_Curb          |
| 13           | 233,759.1431 | -65,488.3601 | 224.0128 | 3.392m        | Back_Curb         |
| 14           | 233,759.9718 | -65,488.9180 | 223.7728 | 4.391m        | EPS_Sub           |
| 15           | 233,759.9727 | -65,488.9186 | 223.9728 | 4.392m        | Hinge             |
| 16           | 233,761.6138 | -65,490.0233 | 222.6539 | 6.370m        | Daylight          |

## CHAINAGE 0+180.00

| <b>POINT</b> | <b>X</b>     | <b>Y</b>     | <b>Z</b> | <b>OFFSET</b> | <b>STRING CUT</b> |
|--------------|--------------|--------------|----------|---------------|-------------------|
| 1            | 233,762.4213 | -65,465.9955 | 227.7522 | -6.634m       | Daylight          |
| 2            | 233,764.2050 | -65,467.3542 | 223.2676 | -4.392m       | EPS               |
| 3            | 233,764.2058 | -65,467.3548 | 223.0676 | -4.391m       | EPS_Sub           |
| 4            | 233,765.0006 | -65,467.9602 | 223.3076 | -3.392m       | Back_Curb         |
| 5            | 233,765.1199 | -65,468.0511 | 223.3076 | -3.242m       | Top_Curb          |
| 6            | 233,765.1531 | -65,468.0763 | 223.0826 | -3.200m       | Flowline_Gutter   |
| 7            | 233,765.5110 | -65,468.3490 | 223.1096 | -2.750m       | ETW               |
| 8            | 233,765.5110 | -65,468.3490 | 222.7096 | -2.750m       | ETW_SubBase       |
| 9            | 233,770.4469 | -65,472.1086 | 222.5545 | 3.455m        | ETW_SubBase       |
| 10           | 233,770.4469 | -65,472.1086 | 222.9545 | 3.455m        | ETW               |
| 11           | 233,770.8049 | -65,472.3813 | 222.9275 | 3.905m        | Flowline_Gutter   |
| 12           | 233,770.8380 | -65,472.4066 | 223.1525 | 3.946m        | Top_Curb          |
| 13           | 233,770.9574 | -65,472.4975 | 223.1525 | 4.096m        | Back_Curb         |
| 14           | 233,771.7521 | -65,473.1028 | 222.9125 | 5.095m        | EPS_Sub           |
| 15           | 233,771.7529 | -65,473.1034 | 223.1125 | 5.096m        | Hinge_Cut         |

|    |              |              |          |        |          |
|----|--------------|--------------|----------|--------|----------|
| 16 | 233,771.8573 | -65,473.1830 | 223.3750 | 5.228m | Daylight |
|----|--------------|--------------|----------|--------|----------|

## CHAINAGE 0+200.00

| POINT | X            | Y            | Z        | OFFSET  | STRING CUT      |
|-------|--------------|--------------|----------|---------|-----------------|
| 1     | 233,778.9994 | -65,451.7229 | 224.0149 | -5.201m | Daylight        |
| 2     | 233,779.4484 | -65,452.3963 | 222.3963 | -4.392m | Ditch_Out       |
| 3     | 233,779.4489 | -65,452.3971 | 222.1963 | -4.391m | EPS_Sub         |
| 4     | 233,780.0031 | -65,453.2284 | 222.4363 | -3.392m | Back_Curb       |
| 5     | 233,780.0863 | -65,453.3532 | 222.4363 | -3.242m | Top_Curb        |
| 6     | 233,780.1094 | -65,453.3879 | 222.2113 | -3.200m | Flowline_Gutter |
| 7     | 233,780.3590 | -65,453.7623 | 221.8383 | -2.750m | ETW_SubBase     |
| 8     | 233,780.3590 | -65,453.7623 | 222.2383 | -2.750m | Flange          |
| 9     | 233,784.4416 | -65,459.8862 | 222.0543 | 4.610m  | Flange          |
| 10    | 233,784.4416 | -65,459.8862 | 221.6543 | 4.610m  | ETW_SubBase     |
| 11    | 233,784.6912 | -65,460.2606 | 222.0273 | 5.060m  | Flowline_Gutter |
| 12    | 233,784.7144 | -65,460.2953 | 222.2523 | 5.102m  | Top_Curb        |
| 13    | 233,784.7976 | -65,460.4201 | 222.2523 | 5.252m  | Back_Curb       |
| 14    | 233,785.3517 | -65,461.2513 | 222.0123 | 6.251m  | EPS_Sub         |
| 15    | 233,785.3523 | -65,461.2522 | 222.2123 | 6.252m  | Hinge           |
| 16    | 233,787.4286 | -65,464.3667 | 219.7168 | 9.995m  | Daylight        |

## CHAINAGE 0+220.00

| POINT | X            | Y            | Z        | OFFSET   | STRING CUT      |
|-------|--------------|--------------|----------|----------|-----------------|
| 1     | 233,798.6002 | -65,436.4491 | 216.0000 | -12.637m | Daylight        |
| 2     | 233,799.7797 | -65,444.6091 | 221.4966 | -4.392m  | Hinge           |
| 3     | 233,799.7799 | -65,444.6101 | 221.2966 | -4.391m  | EPS_Sub         |
| 4     | 233,799.9228 | -65,445.5988 | 221.5366 | -3.392m  | Back_Curb       |
| 5     | 233,799.9443 | -65,445.7473 | 221.5366 | -3.242m  | Top_Curb        |
| 6     | 233,799.9502 | -65,445.7886 | 221.3116 | -3.200m  | Flowline_Gutter |
| 7     | 233,800.0146 | -65,446.2339 | 220.9386 | -2.750m  | ETW_SubBase     |
| 8     | 233,800.0146 | -65,446.2339 | 221.3386 | -2.750m  | Flange          |
| 9     | 233,801.0675 | -65,453.5182 | 221.1546 | 4.610m   | Flange          |
| 10    | 233,801.0675 | -65,453.5182 | 220.7546 | 4.610m   | ETW_SubBase     |
| 11    | 233,801.1319 | -65,453.9636 | 221.1276 | 5.060m   | Flowline_Gutter |
| 12    | 233,801.1379 | -65,454.0049 | 221.3526 | 5.102m   | Top_Curb        |
| 13    | 233,801.1594 | -65,454.1533 | 221.3526 | 5.252m   | Back_Curb       |
| 14    | 233,801.3023 | -65,455.1420 | 221.1126 | 6.251m   | EPS_Sub         |
| 15    | 233,801.3024 | -65,455.1430 | 221.3126 | 6.252m   | EPS             |
| 16    | 233,802.9652 | -65,466.6462 | 213.5641 | 17.874m  | Daylight        |

## CHAINAGE 0+240.00

| <b>POINT</b> | <b>X</b>     | <b>Y</b>     | <b>Z</b> | <b>OFFSET</b> | <b>STRING CUT</b> |
|--------------|--------------|--------------|----------|---------------|-------------------|
| 1            | 233,822.0741 | -65,444.4187 | 219.2591 | -6.383m       | Daylight          |
| 2            | 233,821.4840 | -65,446.3200 | 220.5863 | -4.392m       | Hinge             |
| 3            | 233,821.4837 | -65,446.3210 | 220.3863 | -4.391m       | EPS_Sub           |
| 4            | 233,821.1877 | -65,447.2751 | 220.6263 | -3.392m       | Back_Curb         |
| 5            | 233,821.1432 | -65,447.4184 | 220.6263 | -3.242m       | Top_Curb          |
| 6            | 233,821.1309 | -65,447.4582 | 220.4013 | -3.200m       | Flowline_Gutter   |
| 7            | 233,820.9975 | -65,447.8880 | 220.0283 | -2.750m       | ETW_SubBase       |
| 8            | 233,820.9975 | -65,447.8880 | 220.4283 | -2.750m       | Flange            |
| 9            | 233,818.8162 | -65,454.9173 | 220.2443 | 4.610m        | Flange            |
| 10           | 233,818.8162 | -65,454.9173 | 219.8443 | 4.610m        | ETW_SubBase       |
| 11           | 233,818.6829 | -65,455.3471 | 220.2173 | 5.060m        | Flowline_Gutter   |
| 12           | 233,818.6705 | -65,455.3869 | 220.4423 | 5.102m        | Top_Curb          |
| 13           | 233,818.6260 | -65,455.5302 | 220.4423 | 5.252m        | Back_Curb         |
| 14           | 233,818.3300 | -65,456.4843 | 220.2023 | 6.251m        | EPS_Sub           |
| 15           | 233,818.3297 | -65,456.4853 | 220.4023 | 6.252m        | EPS               |
| 16           | 233,813.8582 | -65,470.8951 | 210.3439 | 21.339m       | Daylight          |

## CHAINAGE 0+260.00

| <b>POINT</b> | <b>X</b>     | <b>Y</b>     | <b>Z</b> | <b>OFFSET</b> | <b>STRING CUT</b> |
|--------------|--------------|--------------|----------|---------------|-------------------|
| 1            | 233,840.6306 | -65,456.6630 | 219.3430 | -4.891m       | Daylight          |
| 2            | 233,840.3029 | -65,457.0401 | 219.6761 | -4.391m       | Hinge             |
| 3            | 233,840.3022 | -65,457.0408 | 219.4761 | -4.390m       | EPS_Sub           |
| 4            | 233,839.6469 | -65,457.7949 | 219.7161 | -3.391m       | Back_Curb         |
| 5            | 233,839.5485 | -65,457.9081 | 219.7161 | -3.241m       | Top_Curb          |
| 6            | 233,839.5212 | -65,457.9396 | 219.4911 | -3.200m       | Flowline_Gutter   |
| 7            | 233,839.2260 | -65,458.2793 | 219.1181 | -2.750m       | ETW_SubBase       |
| 8            | 233,839.2260 | -65,458.2793 | 219.5181 | -2.750m       | Flange            |
| 9            | 233,834.8815 | -65,463.2785 | 219.3525 | 3.874m        | Flange            |
| 10           | 233,834.8815 | -65,463.2785 | 218.9525 | 3.874m        | ETW_SubBase       |
| 11           | 233,834.5863 | -65,463.6182 | 219.3255 | 4.324m        | Flowline_Gutter   |
| 12           | 233,834.5590 | -65,463.6496 | 219.5505 | 4.365m        | Top_Curb          |
| 13           | 233,834.4606 | -65,463.7629 | 219.5505 | 4.515m        | Back_Curb         |
| 14           | 233,833.8053 | -65,464.5169 | 219.3105 | 5.514m        | EPS_Sub           |
| 15           | 233,833.8046 | -65,464.5177 | 219.5105 | 5.515m        | EPS               |
| 16           | 233,823.4632 | -65,476.4177 | 209.0000 | 21.281m       | Daylight          |

## CHAINAGE 0+280.00

| <b>POINT</b> | <b>X</b>     | <b>Y</b>     | <b>Z</b> | <b>OFFSET</b> | <b>STRING CUT</b> |
|--------------|--------------|--------------|----------|---------------|-------------------|
| 1            | 233,854.9699 | -65,471.7142 | 218.2775 | -5.124m       | Daylight          |
| 2            | 233,854.4061 | -65,472.1817 | 218.7658 | -4.391m       | Hinge             |
| 3            | 233,854.4053 | -65,472.1823 | 218.5658 | -4.390m       | EPS_Sub           |
| 4            | 233,853.6362 | -65,472.8199 | 218.8058 | -3.391m       | Back_Curb         |
| 5            | 233,853.5207 | -65,472.9156 | 218.8058 | -3.241m       | Top_Curb          |
| 6            | 233,853.4886 | -65,472.9422 | 218.5808 | -3.200m       | Flowline_Gutter   |
| 7            | 233,853.1422 | -65,473.2294 | 218.2078 | -2.750m       | ETW_SubBase       |
| 8            | 233,853.1422 | -65,473.2294 | 218.6078 | -2.750m       | Flange            |
| 9            | 233,848.9083 | -65,476.7393 | 218.4703 | 2.750m        | Flange            |
| 10           | 233,848.9083 | -65,476.7393 | 218.0703 | 2.750m        | ETW_SubBase       |
| 11           | 233,848.5618 | -65,477.0264 | 218.4433 | 3.200m        | Flowline_Gutter   |
| 12           | 233,848.5297 | -65,477.0531 | 218.6683 | 3.242m        | Top_Curb          |
| 13           | 233,848.4143 | -65,477.1488 | 218.6683 | 3.392m        | Back_Curb         |
| 14           | 233,847.6452 | -65,477.7864 | 218.4283 | 4.391m        | EPS_Sub           |
| 15           | 233,847.6444 | -65,477.7870 | 218.6283 | 4.392m        | EPS               |
| 16           | 233,837.1434 | -65,486.4922 | 209.5350 | 18.032m       | Daylight          |

## CHAINAGE 0+300.00

| <b>POINT</b> | <b>X</b>     | <b>Y</b>     | <b>Z</b> | <b>OFFSET</b> | <b>STRING CUT</b> |
|--------------|--------------|--------------|----------|---------------|-------------------|
| 1            | 233,867.9322 | -65,486.9500 | 217.1921 | -5.387m       | Daylight          |
| 2            | 233,867.1658 | -65,487.5848 | 217.8556 | -4.392m       | Hinge             |
| 3            | 233,867.1651 | -65,487.5854 | 217.6556 | -4.391m       | EPS_Sub           |
| 4            | 233,866.3957 | -65,488.2227 | 217.8956 | -3.392m       | Back_Curb         |
| 5            | 233,866.2802 | -65,488.3184 | 217.8956 | -3.242m       | Top_Curb          |
| 6            | 233,866.2481 | -65,488.3450 | 217.6706 | -3.200m       | Flowline_Gutter   |
| 7            | 233,865.9016 | -65,488.6320 | 217.2976 | -2.750m       | ETW_SubBase       |
| 8            | 233,865.9016 | -65,488.6320 | 217.6976 | -2.750m       | Flange            |
| 9            | 233,861.6660 | -65,492.1405 | 217.5601 | 2.750m        | Flange            |
| 10           | 233,861.6660 | -65,492.1405 | 217.1601 | 2.750m        | ETW_SubBase       |
| 11           | 233,861.3194 | -65,492.4276 | 217.5331 | 3.200m        | Flowline_Gutter   |
| 12           | 233,861.2873 | -65,492.4542 | 217.7581 | 3.242m        | Top_Curb          |
| 13           | 233,861.1718 | -65,492.5499 | 217.7581 | 3.392m        | Back_Curb         |
| 14           | 233,860.4024 | -65,493.1872 | 217.5181 | 4.391m        | EPS_Sub           |
| 15           | 233,860.4017 | -65,493.1878 | 217.7181 | 4.392m        | EPS               |
| 16           | 233,850.3309 | -65,501.5298 | 209.0000 | 17.469m       | Daylight          |



## CHAINAGE 0+320.00

| <b>POINT</b> | <b>X</b>     | <b>Y</b>     | <b>Z</b> | <b>OFFSET</b> | <b>STRING CUT</b> |
|--------------|--------------|--------------|----------|---------------|-------------------|
| 1            | 233,880.3723 | -65,502.6156 | 216.5573 | -4.974m       | Daylight          |
| 2            | 233,879.9241 | -65,502.9870 | 216.9453 | -4.392m       | Hinge             |
| 3            | 233,879.9233 | -65,502.9876 | 216.7453 | -4.391m       | EPS_Sub           |
| 4            | 233,879.1540 | -65,503.6249 | 216.9853 | -3.392m       | Back_Curb         |
| 5            | 233,879.0385 | -65,503.7206 | 216.9853 | -3.242m       | Top_Curb          |
| 6            | 233,879.0063 | -65,503.7472 | 216.7603 | -3.200m       | Flowline_Gutter   |
| 7            | 233,878.6598 | -65,504.0342 | 216.3873 | -2.750m       | ETW_SubBase       |
| 8            | 233,878.6598 | -65,504.0342 | 216.7873 | -2.750m       | Flange            |
| 9            | 233,874.4242 | -65,507.5427 | 216.6498 | 2.750m        | Flange            |
| 10           | 233,874.4242 | -65,507.5427 | 216.2498 | 2.750m        | ETW_SubBase       |
| 11           | 233,874.0776 | -65,507.8298 | 216.6228 | 3.200m        | Flowline_Gutter   |
| 12           | 233,874.0455 | -65,507.8564 | 216.8478 | 3.242m        | Top_Curb          |
| 13           | 233,873.9300 | -65,507.9521 | 216.8478 | 3.392m        | Back_Curb         |
| 14           | 233,873.1607 | -65,508.5894 | 216.6078 | 4.391m        | EPS_Sub           |
| 15           | 233,873.1599 | -65,508.5900 | 216.8078 | 4.392m        | EPS               |
| 16           | 233,864.1406 | -65,516.0610 | 209.0000 | 16.103m       | Daylight          |

## CHAINAGE 0+340.00

| <b>POINT</b> | <b>X</b>     | <b>Y</b>     | <b>Z</b> | <b>OFFSET</b> | <b>STRING CUT</b> |
|--------------|--------------|--------------|----------|---------------|-------------------|
| 1            | 233,892.8265 | -65,518.2697 | 216.4096 | -4.579m       | Daylight          |
| 2            | 233,892.6823 | -65,518.3891 | 216.0351 | -4.392m       | Ditch_Out         |
| 3            | 233,892.6816 | -65,518.3898 | 215.8351 | -4.391m       | EPS_Sub           |
| 4            | 233,891.9122 | -65,519.0270 | 216.0751 | -3.392m       | Back_Curb         |
| 5            | 233,891.7967 | -65,519.1227 | 216.0751 | -3.242m       | Top_Curb          |
| 6            | 233,891.7646 | -65,519.1493 | 215.8501 | -3.200m       | Flowline_Gutter   |
| 7            | 233,891.4180 | -65,519.4364 | 215.4771 | -2.750m       | ETW_SubBase       |
| 8            | 233,891.4180 | -65,519.4364 | 215.8771 | -2.750m       | Flange            |
| 9            | 233,887.1824 | -65,522.9449 | 215.7396 | 2.750m        | Flange            |
| 10           | 233,887.1824 | -65,522.9449 | 215.3396 | 2.750m        | ETW_SubBase       |
| 11           | 233,886.8359 | -65,523.2320 | 215.7126 | 3.200m        | Flowline_Gutter   |
| 12           | 233,886.8038 | -65,523.2586 | 215.9376 | 3.242m        | Top_Curb          |
| 13           | 233,886.6883 | -65,523.3543 | 215.9376 | 3.392m        | Back_Curb         |
| 14           | 233,885.9189 | -65,523.9915 | 215.6976 | 4.391m        | EPS_Sub           |
| 15           | 233,885.9181 | -65,523.9922 | 215.8976 | 4.392m        | Hinge             |
| 16           | 233,881.1569 | -65,527.9361 | 211.7758 | 10.574m       | Daylight          |

### 8.4. Vertikalni tok trase

Vertical Alignment: Layout (3)

Description:

Station Range: Start: 0+000.00, End: 0+356.94

| PVI                                      | Station  | Grade Out          | Curve Length |
|--|----------|--------------------|--------------|
| 0.00                                     | 0+000.00 | -3.76%             |              |
| 1.00                                     | 0+161.79 | -4.55%             | 110.764m     |
| Vertical Curve Information:(crest curve) |          |                    |              |
| PVC Station:                             | 0+106.39 | Elevation:         | 226.001m     |
| PVI Station:                             | 0+161.79 | Elevation:         | 223.919m     |
| PVT Station:                             | 0+217.16 | Elevation:         | 221.399m     |
| High Point:                              | 0+106.39 | Elevation:         | 226.001m     |
| Grade in:                                | -3.76%   | Grade out:         | -4.55%       |
| Change:                                  | 0.79%    | K:                 |              |
| Curve Length:                            | 110.764m |                    |              |
| Passing Distance:                        |          | Stopping Distance: |              |

## 9. Proračun količina zemljanih radova za troškovnik

### Cut/Fill Report

**Generated:** 2020-09-04 18:27:09  
**By user:** User  
**Drawing:** C:\Users\User\Desktop\C:\Users\User\Desktop\ZR.jš.dwg

#### Volume Summary

| Name     | Type | Cut Factor | Fill Factor | 2d Area<br>(sq.m) | Cut<br>(Cu. M.) | Fill<br>(Cu. M.) | Net<br>(Cu. M.) |
|----------|------|------------|-------------|-------------------|-----------------|------------------|-----------------|
| Surface3 | fill | 1.000      | 1.000       | 5718.33           | 3296.97         | 7724.82          | 4427.85<Fill>   |

#### Totals

|       |  |  |  | 2d Area<br>(sq.m) | Cut<br>(Cu. M.) | Fill<br>(Cu. M.) | Net<br>(Cu. M.) |
|-------|--|--|--|-------------------|-----------------|------------------|-----------------|
| Total |  |  |  | 5718.33           | 3296.97         | 7724.82          | 4427.85<Fill>   |

\* Value adjusted by cut or fill factor other than 1.0

## 10. Proračun količine radova po presjecima

## Volume Report

**Project:** C:\Users\User\AppData\Local\Temp\ZR jš\_1\_18315\_ba6d8ec5.sv\$

Alignment: os 1 (1)

Sample Line Group: SL Collection - 6

Start Sta: 0+000.000

End Sta: 0+356.943

| <b>Station</b> | <b>Cut Area<br/>(Sq.m.)</b> | <b>Cut Volume<br/>(Cu.m.)</b> | <b>Reusable Volume<br/>(Cu.m.)</b> | <b>Fill Area<br/>(Sq.m.)</b> | <b>Fill Volume<br/>(Cu.m.)</b> | <b>Cum. Cut Vol.<br/>(Cu.m.)</b> | <b>Cum. Reusable Vol.<br/>(Cu.m.)</b> | <b>Cum. Fill Vol.<br/>(Cu.m.)</b> | <b>Cum. Net Vol.<br/>(Cu.m.)</b> |
|----------------|-----------------------------|-------------------------------|------------------------------------|------------------------------|--------------------------------|----------------------------------|---------------------------------------|-----------------------------------|----------------------------------|
| 0+000.000      | 4.58                        | 0.00                          | 0.00                               | 5.50                         | 0.00                           | 0.00                             | 0.00                                  | 0.00                              | 0.00                             |
| 0+020.000      | 15.04                       | 196.21                        | 196.21                             | 0.03                         | 55.33                          | 196.21                           | 196.21                                | 55.33                             | 140.87                           |
| 0+039.189      | 17.78                       | 314.97                        | 314.97                             | 0.00                         | 0.32                           | 511.17                           | 511.17                                | 55.65                             | 455.52                           |
| 0+039.190      | 17.79                       | 0.02                          | 0.02                               | 0.00                         | 0.00                           | 511.19                           | 511.19                                | 55.65                             | 455.54                           |
| 0+040.000      | 18.22                       | 14.58                         | 14.58                              | 0.00                         | 0.00                           | 525.78                           | 525.78                                | 55.65                             | 470.13                           |
| 0+052.522      | 26.15                       | 277.85                        | 277.85                             | 0.00                         | 0.00                           | 803.62                           | 803.62                                | 55.65                             | 747.97                           |
| 0+060.000      | 26.38                       | 196.41                        | 196.41                             | 0.00                         | 0.00                           | 1000.04                          | 1000.04                               | 55.65                             | 944.38                           |
| 0+065.855      | 23.43                       | 145.83                        | 145.83                             | 0.00                         | 0.00                           | 1145.87                          | 1145.87                               | 55.65                             | 1090.22                          |
| 0+079.189      | 24.05                       | 316.58                        | 316.58                             | 0.00                         | 0.00                           | 1462.45                          | 1462.45                               | 55.65                             | 1406.80                          |
| 0+079.190      | 24.05                       | 0.03                          | 0.03                               | 0.00                         | 0.00                           | 1462.48                          | 1462.48                               | 55.65                             | 1406.83                          |
| 0+080.000      | 24.25                       | 19.56                         | 19.56                              | 0.00                         | 0.00                           | 1482.04                          | 1482.04                               | 55.65                             | 1426.39                          |
| 0+093.473      | 21.14                       | 305.75                        | 305.75                             | 0.00                         | 0.00                           | 1787.79                          | 1787.79                               | 55.65                             | 1732.14                          |
| 0+100.000      | 16.07                       | 121.42                        | 121.42                             | 0.12                         | 0.39                           | 1909.21                          | 1909.21                               | 56.04                             | 1853.17                          |
| 0+106.394      | 14.65                       | 98.20                         | 98.20                              | 0.59                         | 2.26                           | 2007.41                          | 2007.41                               | 58.30                             | 1949.11                          |
| 0+107.758      | 14.48                       | 19.86                         | 19.86                              | 0.59                         | 0.80                           | 2027.27                          | 2027.27                               | 59.10                             | 1968.17                          |
| 0+107.760      | 14.48                       | 0.03                          | 0.03                               | 0.59                         | 0.00                           | 2027.30                          | 2027.30                               | 59.10                             | 1968.20                          |

|           |       |        |        |        |         |         |         |         |          |
|-----------|-------|--------|--------|--------|---------|---------|---------|---------|----------|
| 0+107.769 | 14.47 | 0.13   | 0.13   | 0.59   | 0.00    | 2027.43 | 2027.43 | 59.11   | 1968.32  |
| 0+107.780 | 14.47 | 0.16   | 0.16   | 0.59   | 0.00    | 2027.58 | 2027.58 | 59.11   | 1968.47  |
| 0+120.000 | 6.29  | 126.81 | 126.81 | 5.13   | 34.98   | 2154.40 | 2154.40 | 94.09   | 2060.31  |
| 0+127.697 | 3.71  | 38.48  | 38.48  | 6.43   | 44.48   | 2192.88 | 2192.88 | 138.57  | 2054.31  |
| 0+140.000 | 3.40  | 43.75  | 43.75  | 5.04   | 70.56   | 2236.64 | 2236.64 | 209.13  | 2027.51  |
| 0+146.976 | 4.07  | 26.06  | 26.06  | 3.36   | 29.33   | 2262.69 | 2262.69 | 238.45  | 2024.24  |
| 0+147.367 | 4.40  | 1.66   | 1.66   | 3.30   | 1.30    | 2264.35 | 2264.35 | 239.76  | 2024.59  |
| 0+147.758 | 4.74  | 1.79   | 1.79   | 3.24   | 1.28    | 2266.13 | 2266.13 | 241.03  | 2025.10  |
| 0+147.760 | 4.74  | 0.00   | 0.00   | 3.24   | 0.00    | 2266.14 | 2266.14 | 241.04  | 2025.10  |
| 0+160.000 | 13.63 | 112.43 | 112.43 | 1.31   | 27.85   | 2378.58 | 2378.58 | 268.89  | 2109.68  |
| 0+167.436 | 18.73 | 120.29 | 120.29 | 0.00   | 4.87    | 2498.87 | 2498.87 | 273.77  | 2225.10  |
| 0+167.437 | 18.73 | 0.02   | 0.02   | 0.00   | 0.00    | 2498.89 | 2498.89 | 273.77  | 2225.12  |
| 0+167.448 | 18.74 | 0.21   | 0.21   | 0.00   | 0.00    | 2499.10 | 2499.10 | 273.77  | 2225.33  |
| 0+167.461 | 18.75 | 0.24   | 0.24   | 0.00   | 0.00    | 2499.34 | 2499.34 | 273.77  | 2225.57  |
| 0+180.000 | 26.41 | 283.13 | 283.13 | 0.00   | 0.00    | 2782.47 | 2782.47 | 273.77  | 2508.70  |
| 0+181.939 | 27.42 | 52.19  | 52.19  | 0.00   | 0.00    | 2834.66 | 2834.66 | 273.77  | 2560.89  |
| 0+197.234 | 15.54 | 328.54 | 328.54 | 1.21   | 9.25    | 3163.20 | 3163.20 | 283.02  | 2880.17  |
| 0+197.335 | 15.37 | 1.56   | 1.56   | 1.29   | 0.13    | 3164.75 | 3164.75 | 283.15  | 2881.61  |
| 0+197.436 | 15.21 | 1.54   | 1.54   | 1.38   | 0.13    | 3166.30 | 3166.30 | 283.28  | 2883.01  |
| 0+200.000 | 8.32  | 30.17  | 30.17  | 4.68   | 7.77    | 3196.46 | 3196.46 | 291.05  | 2905.41  |
| 0+217.158 | 0.00  | 71.42  | 71.42  | 117.15 | 1045.20 | 3267.88 | 3267.88 | 1336.25 | 1931.63  |
| 0+220.000 | 0.00  | 0.00   | 0.00   | 137.63 | 362.04  | 3267.88 | 3267.88 | 1698.29 | 1569.59  |
| 0+224.226 | 0.00  | 0.00   | 0.00   | 140.92 | 588.54  | 3267.88 | 3267.88 | 2286.83 | 981.05   |
| 0+240.000 | 0.00  | 0.00   | 0.00   | 91.02  | 1829.37 | 3267.88 | 3267.88 | 4116.20 | -848.31  |
| 0+251.016 | 0.00  | 0.00   | 0.00   | 65.61  | 862.66  | 3267.88 | 3267.88 | 4978.86 | -1710.97 |
| 0+251.723 | 0.00  | 0.00   | 0.00   | 64.69  | 46.07   | 3267.88 | 3267.88 | 5024.93 | -1757.05 |

|           |      |       |       |       |        |         |         |         |          |
|-----------|------|-------|-------|-------|--------|---------|---------|---------|----------|
| 0+252.427 | 0.00 | 0.00  | 0.00  | 63.46 | 45.10  | 3267.88 | 3267.88 | 5070.03 | -1802.14 |
| 0+260.000 | 0.00 | 0.00  | 0.00  | 48.39 | 423.53 | 3267.88 | 3267.88 | 5493.55 | -2225.67 |
| 0+264.445 | 0.00 | 0.00  | 0.00  | 41.43 | 199.63 | 3267.88 | 3267.88 | 5693.18 | -2425.30 |
| 0+275.960 | 0.00 | 0.00  | 0.00  | 36.07 | 446.25 | 3267.88 | 3267.88 | 6139.43 | -2871.55 |
| 0+275.988 | 0.00 | 0.00  | 0.00  | 36.09 | 0.99   | 3267.88 | 3267.88 | 6140.42 | -2872.54 |
| 0+276.016 | 0.00 | 0.00  | 0.00  | 36.11 | 1.00   | 3267.88 | 3267.88 | 6141.42 | -2873.54 |
| 0+280.000 | 0.00 | 0.00  | 0.00  | 39.47 | 150.57 | 3267.88 | 3267.88 | 6292.00 | -3024.11 |
| 0+281.014 | 0.00 | 0.00  | 0.00  | 39.01 | 39.78  | 3267.88 | 3267.88 | 6331.77 | -3063.89 |
| 0+281.016 | 0.00 | 0.00  | 0.00  | 39.00 | 0.07   | 3267.88 | 3267.88 | 6331.85 | -3063.96 |
| 0+300.000 | 0.00 | 0.00  | 0.00  | 44.82 | 795.64 | 3267.88 | 3267.88 | 7127.49 | -3859.61 |
| 0+320.000 | 0.00 | 0.00  | 0.00  | 33.08 | 778.95 | 3267.88 | 3267.88 | 7906.44 | -4638.56 |
| 0+340.000 | 0.88 | 8.78  | 8.78  | 10.57 | 436.48 | 3276.66 | 3276.66 | 8342.92 | -5066.25 |
| 0+356.943 | 5.22 | 51.69 | 51.69 | 3.62  | 120.23 | 3328.35 | 3328.35 | 8463.15 | -5134.79 |

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