

Idejni projekt lokalne ceste

Čondić-Galiničić, Zvonimir Nediljko

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UNIVERSITY OF SPLIT



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

ZAVRŠNI RAD

Zvonimir Nediljko Čondić-Galiničić

Split, 2019

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

Idejni projekt lokalne ceste

Završni rad

Split, 2019

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

Split, Matice hrvatske 15

STUDIJ: **PREDDIPLOMSKI SVEUČILIŠNI STUDIJ GRAĐEVINARSTVA**

KANDIDAT: Zvonimir Nediljko Čondić-Galiničić

BROJ INDEKSA: 4531

KATEDRA: **Katedra za prometnice**

PREDMET: Ceste

ZADATAK ZA ZAVRŠNI RAD

Tema: Idejni projekt lokalne ceste

Opis zadatka: Uz pomoć programa za projektiranje cesta Autodesk AutoCAD Civil 3D potrebno je projektirati cestu na geodetskoj podlozi koja je korištena kao podloga za izradu programa u kolegiju Ceste. Svi korišteni podaci su isti oni koje smo koristili za izradu programa.

U Splitu, lipanj 2019.

Voditelj Završnog rada:

prof. dr. sc. Dražen Cvitanić

Idejni projekt lokalne ceste

Sažetak:

Uz pomoć programa za projektiranje cesta AutoCAD Civil 3D izrađen je idejni projekt lokalne ceste na geodetskoj podlozi prema zadatku iz kolegija Ceste. Cesta je projektirana za godišnji dnevni promet (PGDP) od 950 vozila na dan, na brdovitom terenu. Projektna brzina ceste iznosi 30km/h. Idejni projekt je izrađen prema Pravilniku o osnovnim uvjetima za projektiranje ceste sa elementima koji zadovoljavaju važeće propise, kao i sigurnosne i estetske kriterije.

Ključne riječi:

idejni projekt, lokalna cesta, geodetska podloga, projektna brzina, os ceste, duljina prijelazne krivine, radijus krivine, niveleta, poprečni presjek, uzdužni presjek

Preliminary design of local road

Abstract:

A preliminary design of local road, on a geodetic basis according to the task from course „Roads“, is made using software for designing roads, AutoCAD Civil 3D. The road is designed for the annual average daily traffic (AADT) of 950 vehicles per day, on the hilly terrain. Design speed for the road is 30 km/h. Preliminary design of local road was created according to the Regulations on the basic conditions for the design of public roads with the elements that meet the applicable rules, as well as safety and aesthetic criteria.

Keywords:

preliminary design, local road, geodetic basis, design speed, the road axis, the length of transition curve, the radius of curvature, vertical alignment, cross-section, longitudinal section

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1. KOPIJA PROGRAMSKOG ZADATKA

Katedra za prometnice

Studij: Preddiplomski

Nastavni predmet: CESTE

Student/ica: Zvonimir Nediljko Čondić-Galiničić

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: **brdoviti**.

Idejni projekt treba sadržavati:

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

Predmetna nastavnica:


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

1. TEHNIČKI OPIS

a) OPĆENITO

Na priloženoj geodetskoj podlozi u mjerilu 1:1000 izrađen je idejni projekt ceste na dionici od točke A koja se nalazi na 239 metra nadmorske visine, do točke B koja se nalazi na 218 metra nadmorske visine.

Cesta je projektirana za prosječni godišnji dnevni promet od 950 vozila/dan i to na brdovitom terenu. Sastoji se od 2 krivine, različitog radijusa te 3 pravca.

Predviđena projektna brzina za ovu kategoriju ceste je $v_p=30\text{km/h}$

b) HORIZONTALNI ELEMENTI

Za određenu kategoriju prema pravilniku, minimalni radijus krivine je 45m, a prijelaznice 30m. Trasa konstruirane ceste ima dužinu od 396,18 m, a sastoji se od tri pravca i dvije krivine. Krivina s početkom na stacionaži 0+097.81 m ima radijus $R=70\text{m}$ i duljinu prijelaznice $L=40\text{m}$. Krivina s početkom na stacionaži 0+245.90 m ima radijus $R=30\text{m}$ i duljinu prijelazne krivine $L=30\text{m}$. Prvi pravac počinje na stacionaži 0+000,00 m s krajem u stacionaži 0+057,31 m te njegova duljina iznosi 57,31 m, drugi pravac počinje na stacionaži 0+197,10 s krajem u stacionaži 0+215,90 te njegova duljina iznosi 18,80 m, treći počinje na stacionaži 0+308,75 s krajem u stacionaži 0+396,18 i njegova duljina iznosi 87,43 m

Svaka krivina je konstruirana pomoću dvije prijelazne krivine oblika klotoide i jednog kružnog luka.

Proširenje kružnog luka za promet teretnih vozila s priključkom u prvoj krivini iznosi 1,20 m, u drugoj 2,80m.

c) VERTIKALNI ELEMENTI

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

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

Nagib prvog pravca je 3.18 % , a drugog 7,92 %.

Tangenta krivine je dužine 94,27 m , a radijus konveksne krivine 2000 m.

d) POPREČNI PRESJEK

Cesta ove kategorije ima dva kolnička traka širine svakog po 2,75m, betonski rubni trak širine 0,20m te bankine dužine 1m i nagiba 4% . Cesta se dijelom nalazi u zasjeku, a dijelom u usjeku. Na usjecima se izvode rigoli za odvodnju vode i drenaža koja je postavljena u glinenu posteljicu.

Nagibi usjeka su 2:1 , a nasipa 1:1,5 .

e) KOLNIČKA KONSTRUKCIJA

Projektom je predviđena kolnička konstrukcija sa sljedećim slojevima:

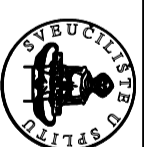
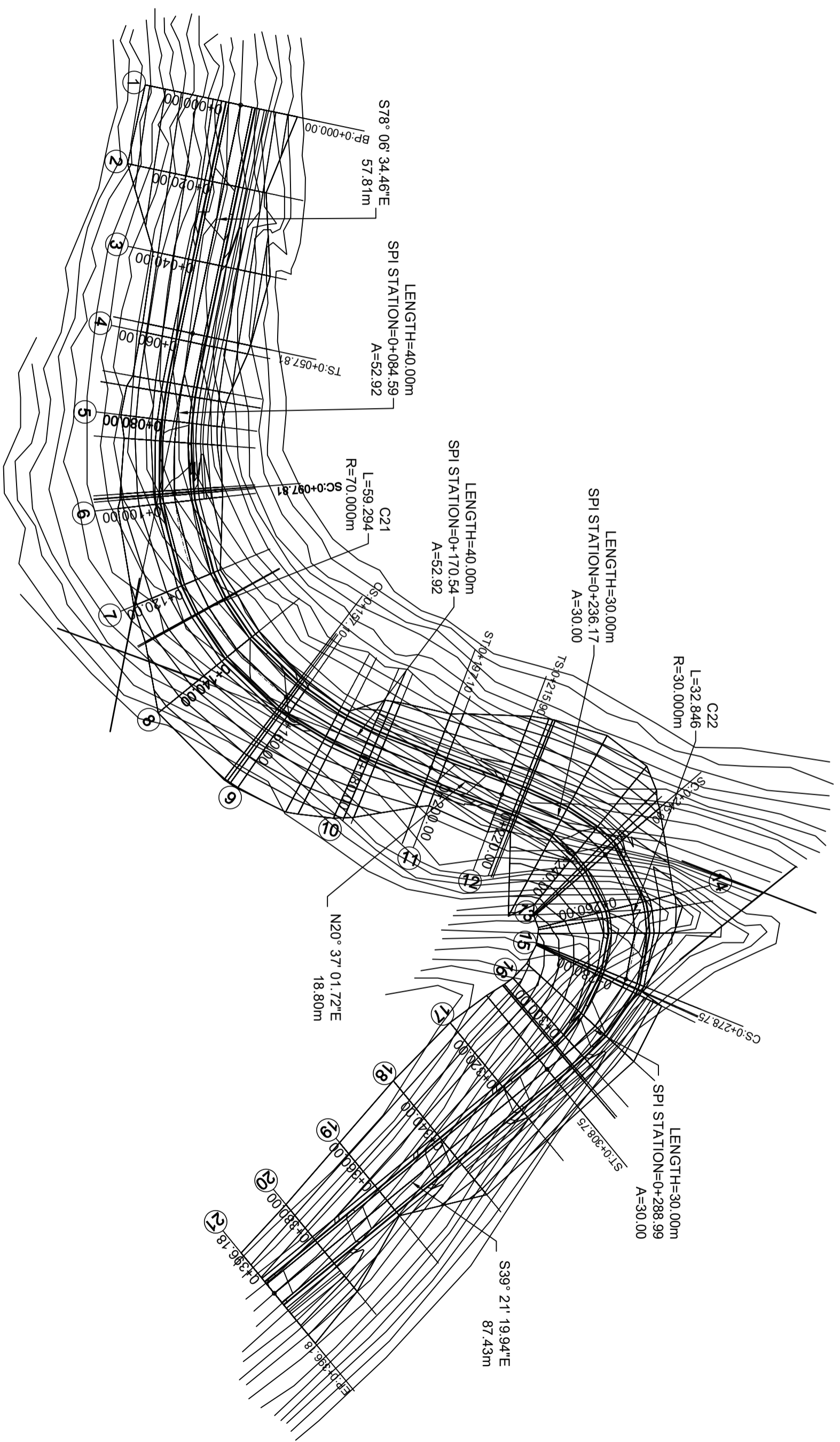
- habajući sloj AC11 surf (BIT 50/70) AG4 M3 u debljini 4cm
- bitumenizirajući sloj AC22 base (BIT 50/70) AG6 M2 u debljini 6cm
- mehanički zbijeni nosivi sloj debljine 30 cm.

f) 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. GRAĐEVINSKA SITUACIJA

M 1:1000



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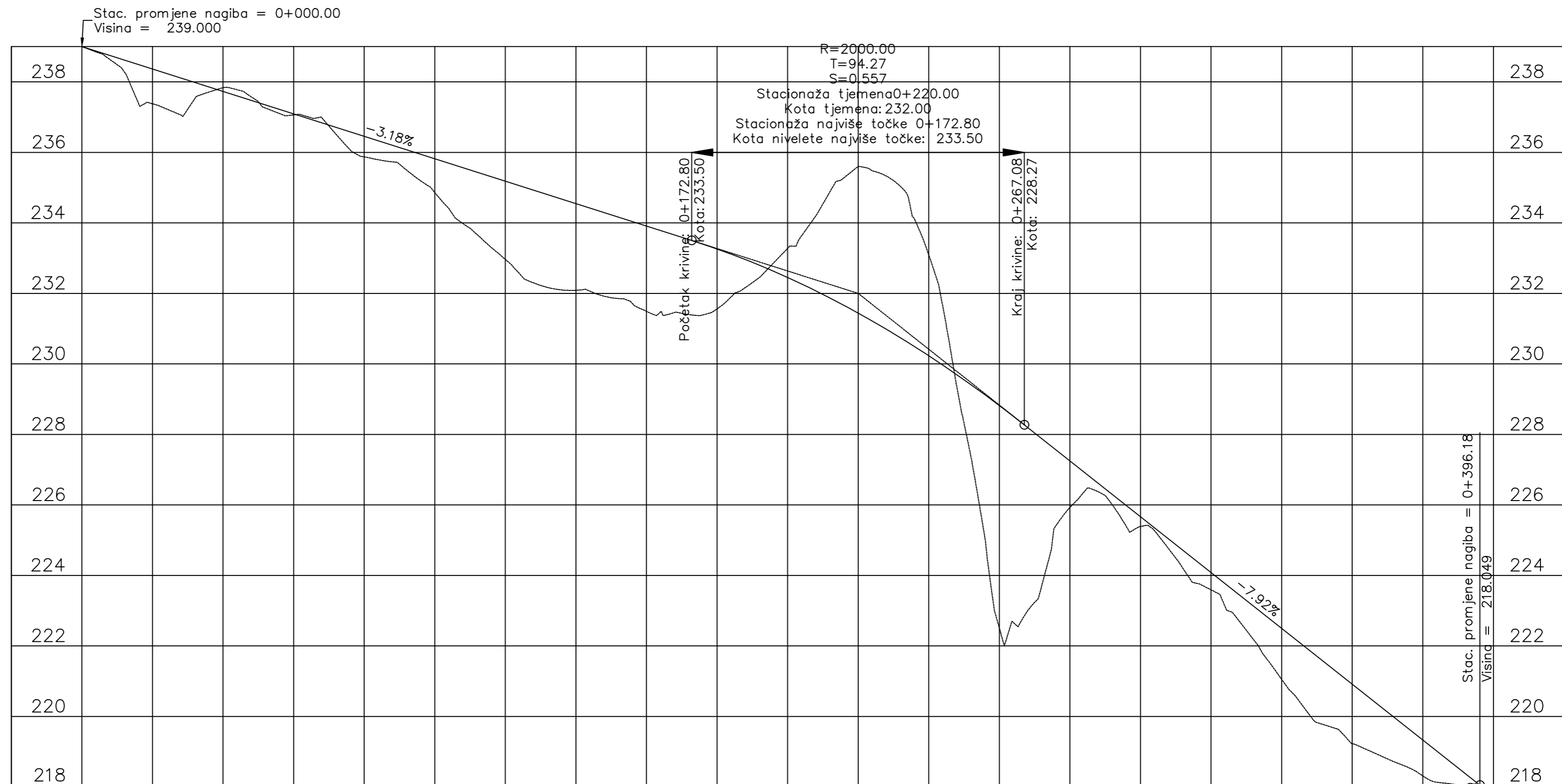
Završni rad

| | | |
|---------|---|--------------|
| TEMA | IDEJNI PROJEKT LOKALNE CESTE | |
| STUDENT | Zvonimir Nediljko Čondić-Galinčić, 4531 | |
| SADRŽAJ | Situacija | MAŠTERILO |
| DATAUM | lipanj 2019. | BROJ PRILOGA |
| | | 1 |


3. UZDUŽNI PRESJEK

M 1:1000 / M 1:100

OS 1 PROFILE



| | |
|-----------------------|--|
| Stacionaža | -0+010.00- 0+000.00- 0+010.00- 0+020.00- 0+030.00- 0+040.00- 0+050.00- 0+060.00- 0+070.00- 0+080.00- 0+090.00- 0+100.00- 0+110.00- 0+120.00- 0+130.00- 0+140.00- 0+150.00- 0+160.00- 0+170.00- 0+180.00- 0+190.00- 0+200.00- 0+210.00- 0+220.00- 0+230.00- 0+240.00- 0+250.00- 0+260.00- 0+270.00- 0+280.00- 0+290.00- 0+300.00- 0+310.00- 0+320.00- 0+330.00- 0+340.00- 0+350.00- 0+360.00- 0+370.00- 0+380.00- 0+390.00- 0+400.00- 0+410.00- |
| Kote nivelete | 239.00 238.68 238.36 238.05 237.73 237.41 237.09 236.77 236.45 236.14 235.82 235.50 235.18 234.86 234.55 234.23 233.91 233.59 233.26 232.88 232.45 231.97 231.44 230.86 230.23 229.55 228.82 228.04 227.25 226.46 225.67 224.87 224.08 223.29 222.50 221.71 220.91 220.12 219.33 218.54 218.06 |
| Kote terena | 239.00 238.49 237.38 237.23 237.84 237.44 237.06 236.75 235.87 235.67 234.86 233.85 232.96 232.23 232.09 231.88 231.49 231.43 231.56 231.31 233.28 234.54 235.60 235.20 233.09 228.31 222.51 223.24 225.93 226.26 225.39 224.49 223.59 222.44 221.05 219.83 219.23 218.80 218.31 218.06 |
| Horizontalni elementi | L = 57.81 S78° 06' 34"E L: 40.00 R: 70.00 L: 59.29 L: 40.00 L = 18.80 N20° 37' 02"E L: 30.00 R: 30.00 L: 32.85 L: 30.00 L = 87.43 S39° 21' 20"E |
| Vertikani elementi | G = -3.18% L = 172.80 R = 2000.00m L = 94.27m G = -7.92% L = 129.10 |
| Vitoperenje | 2.50% 0+057.81- -2.50% 0+070.81 0.00% L: 3.40% 0+097.41- -3.40% L: 3.40% 0+157.10 D: 3.40% 0+184.10 0.00% 2.50% 0+197.10- -2.50% 2.50% 0+221.44- -2.50% L: 6.20% 0+245.90 D: 6.20% L: 6.20% 0+278.75- -6.20% 2.50% 0+303.21- -2.50% |



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Završni rad

TEMA: IDEJNI PROJEKT LOKALNE CESTE

STUDENT: Zvonimir Nediljko Čondić-Galiničić, 4531

SADRŽAJ: Uzdužni presjek

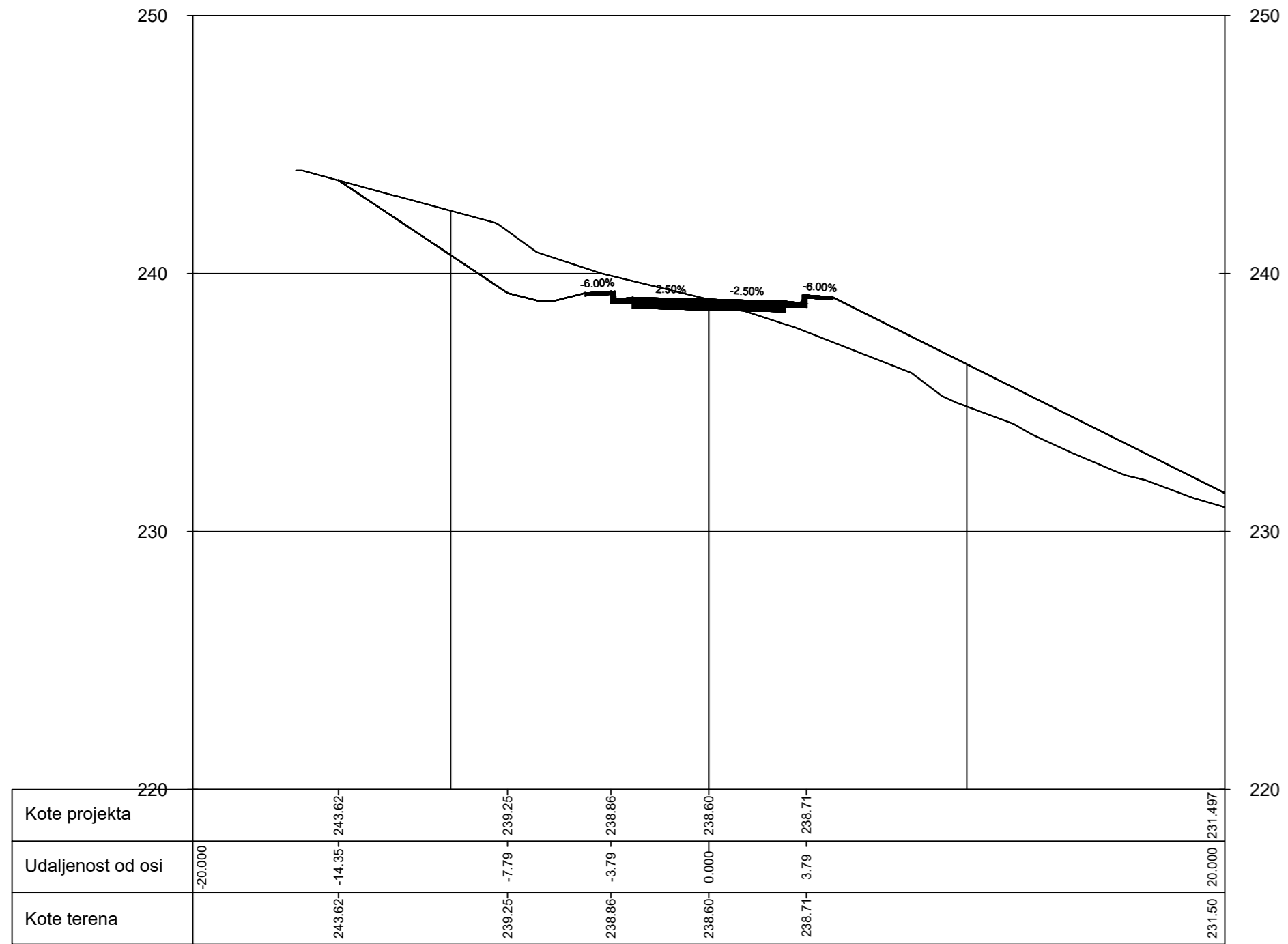
DATUM: lipanj 2019.

MJERILO: 1:1000/1:100

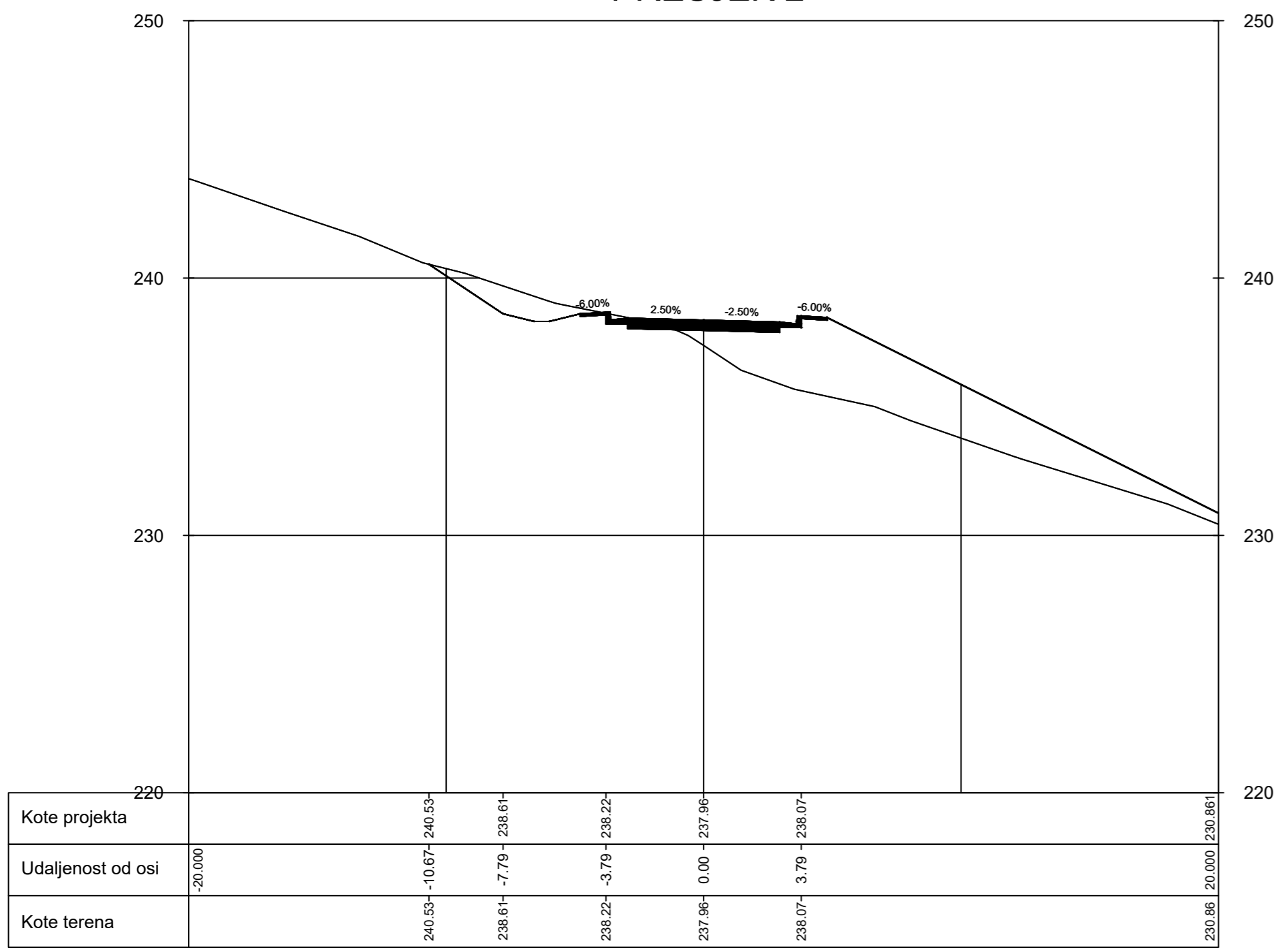
BROJ PRILOGA: 1

**4. KARAKTERISTIČNI POPREČNI
PRESJECI
M 1:100**

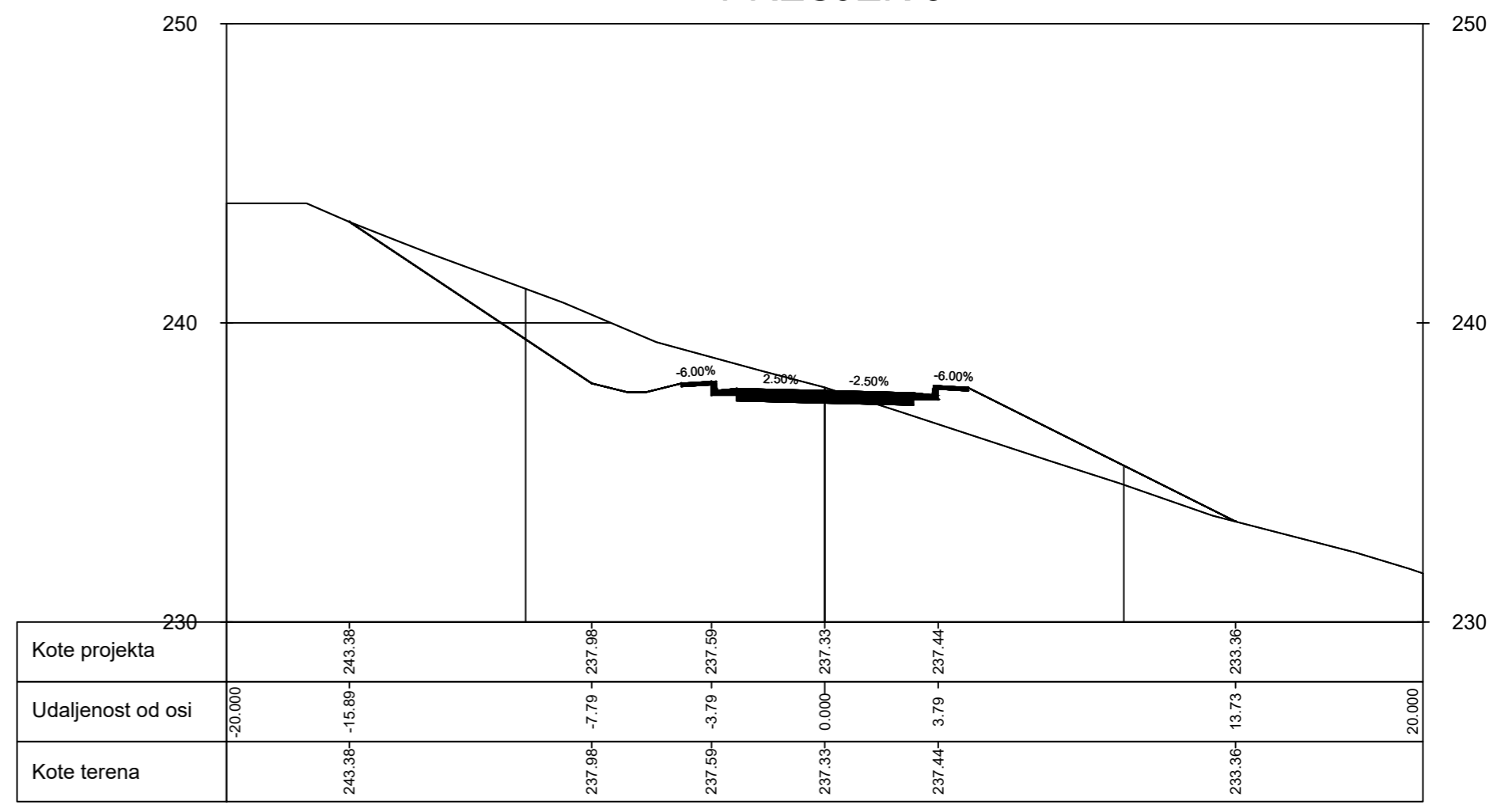
0+000.00
PRESJEK 1



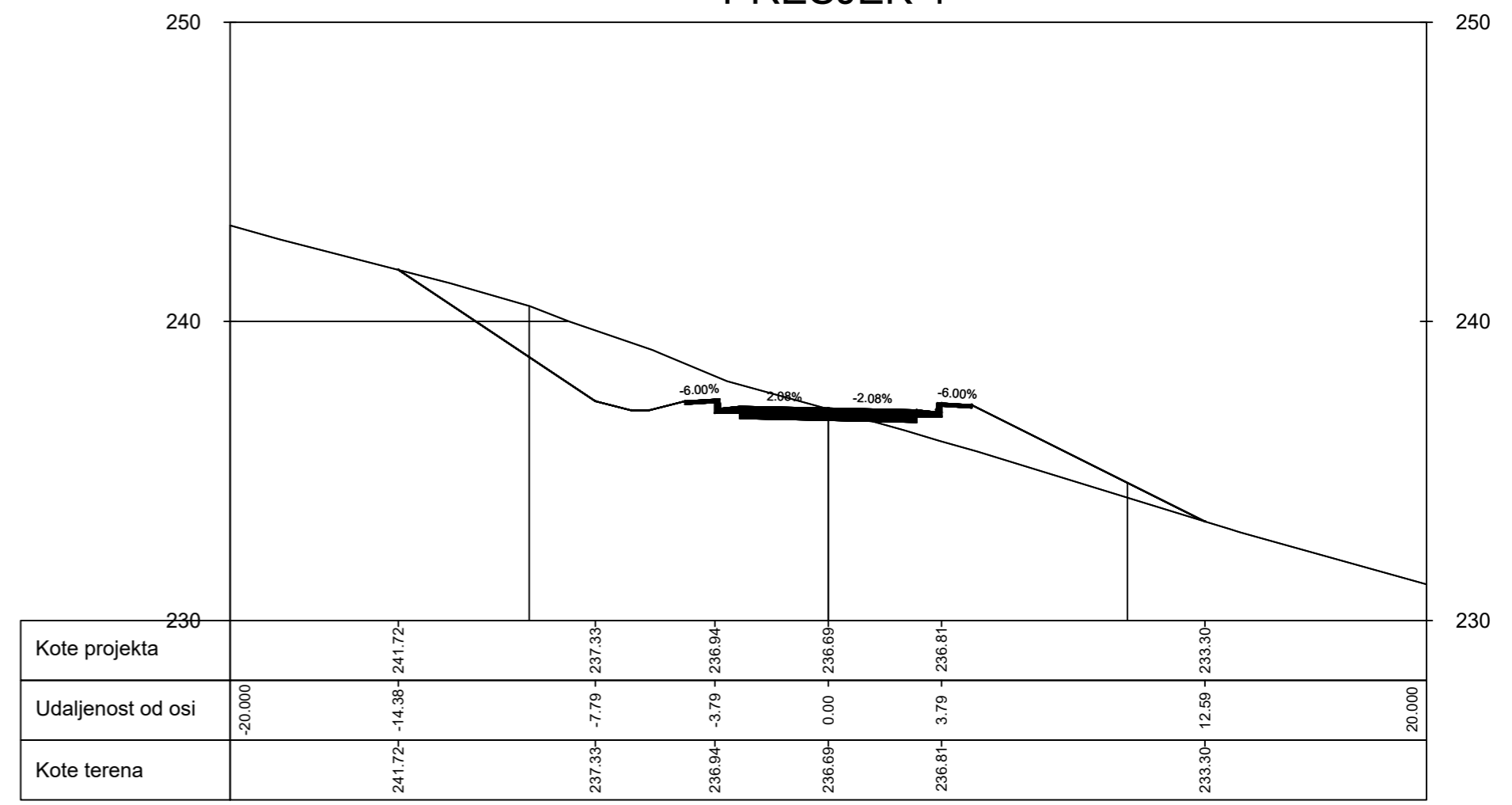
0+020.00
PRESJEK 2



0+040.00
PRESJEK 3

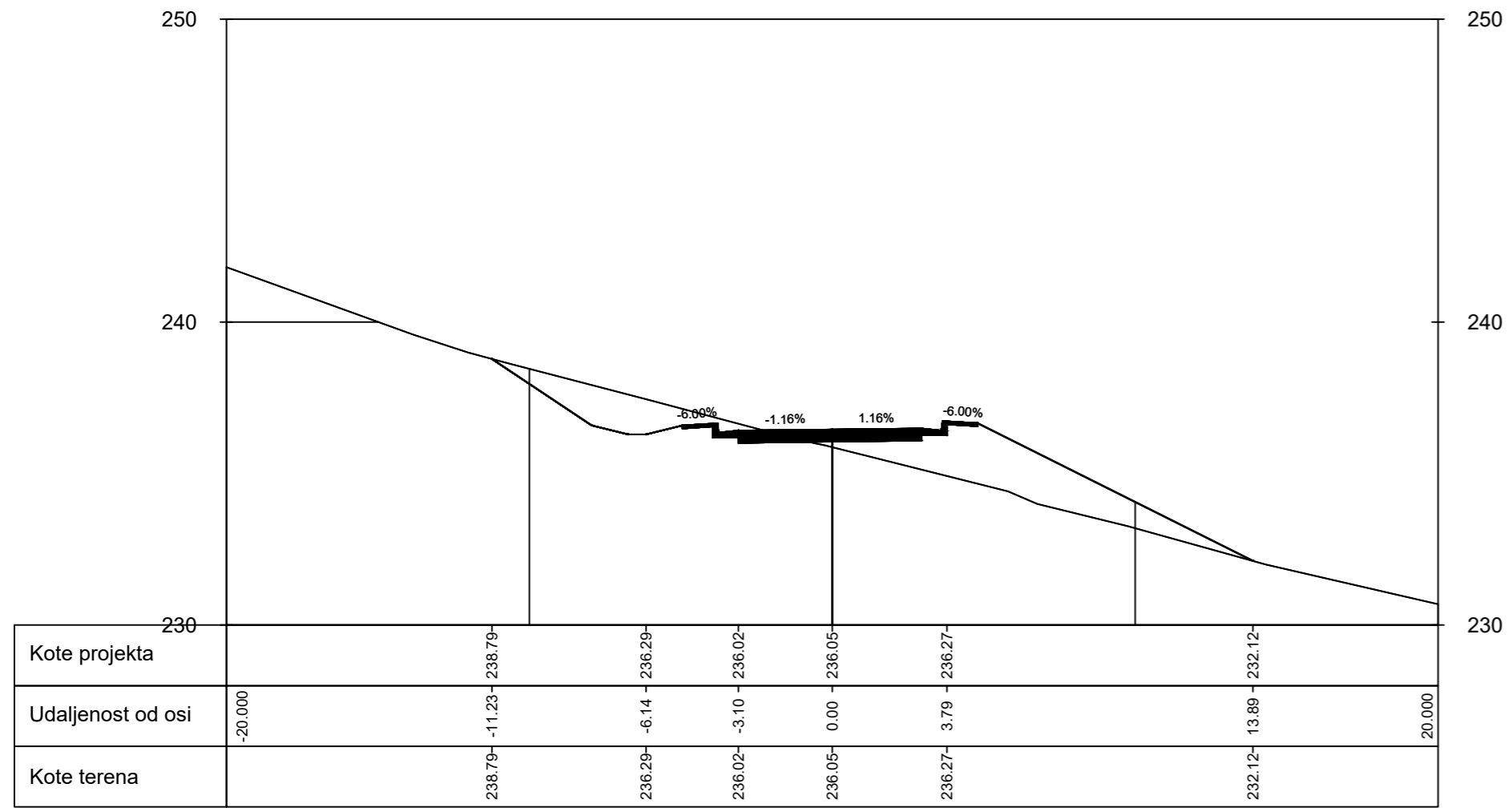


0+060.00
PRESJEK 4



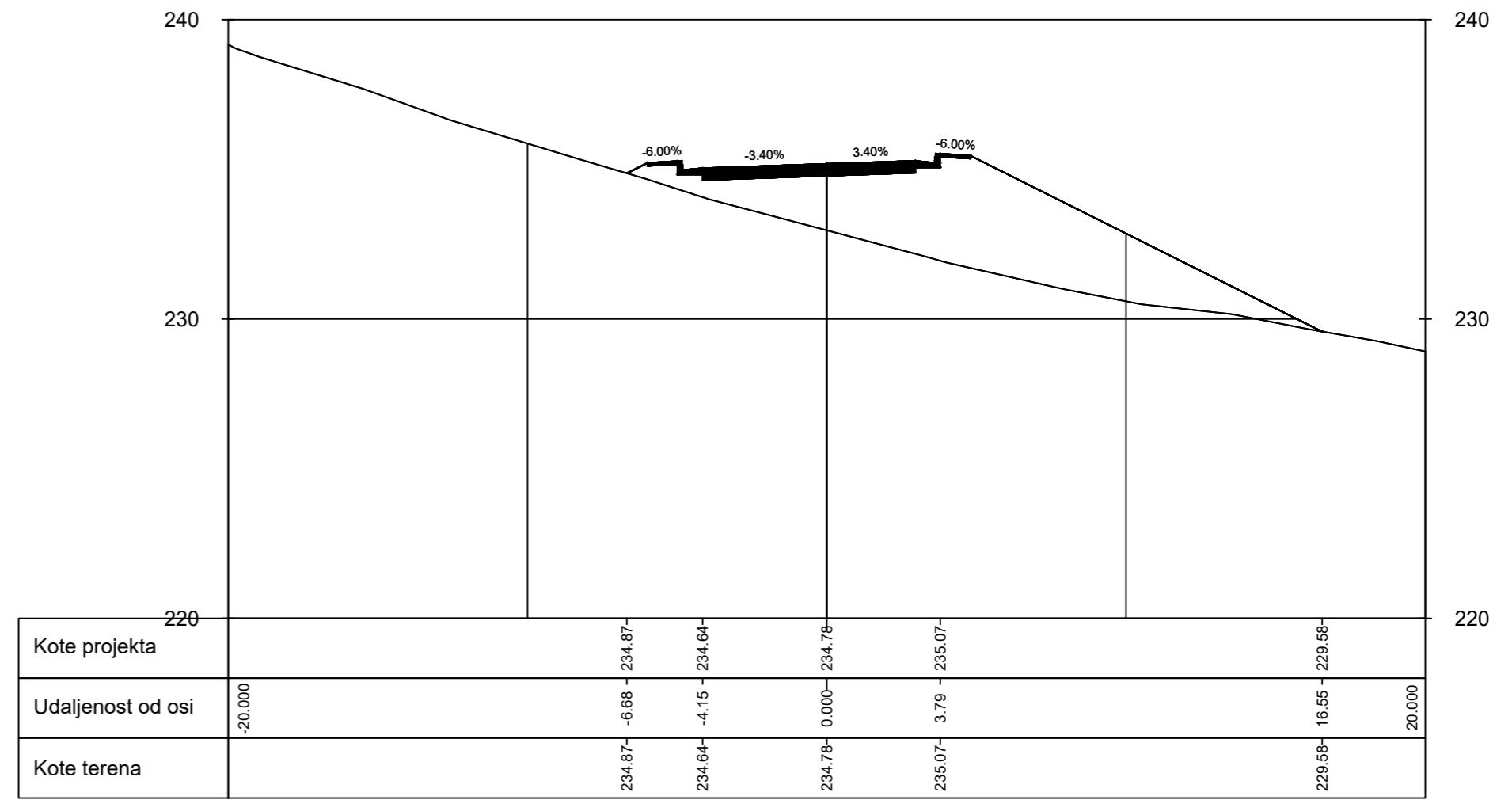
0+080.00

PRESJEK 5



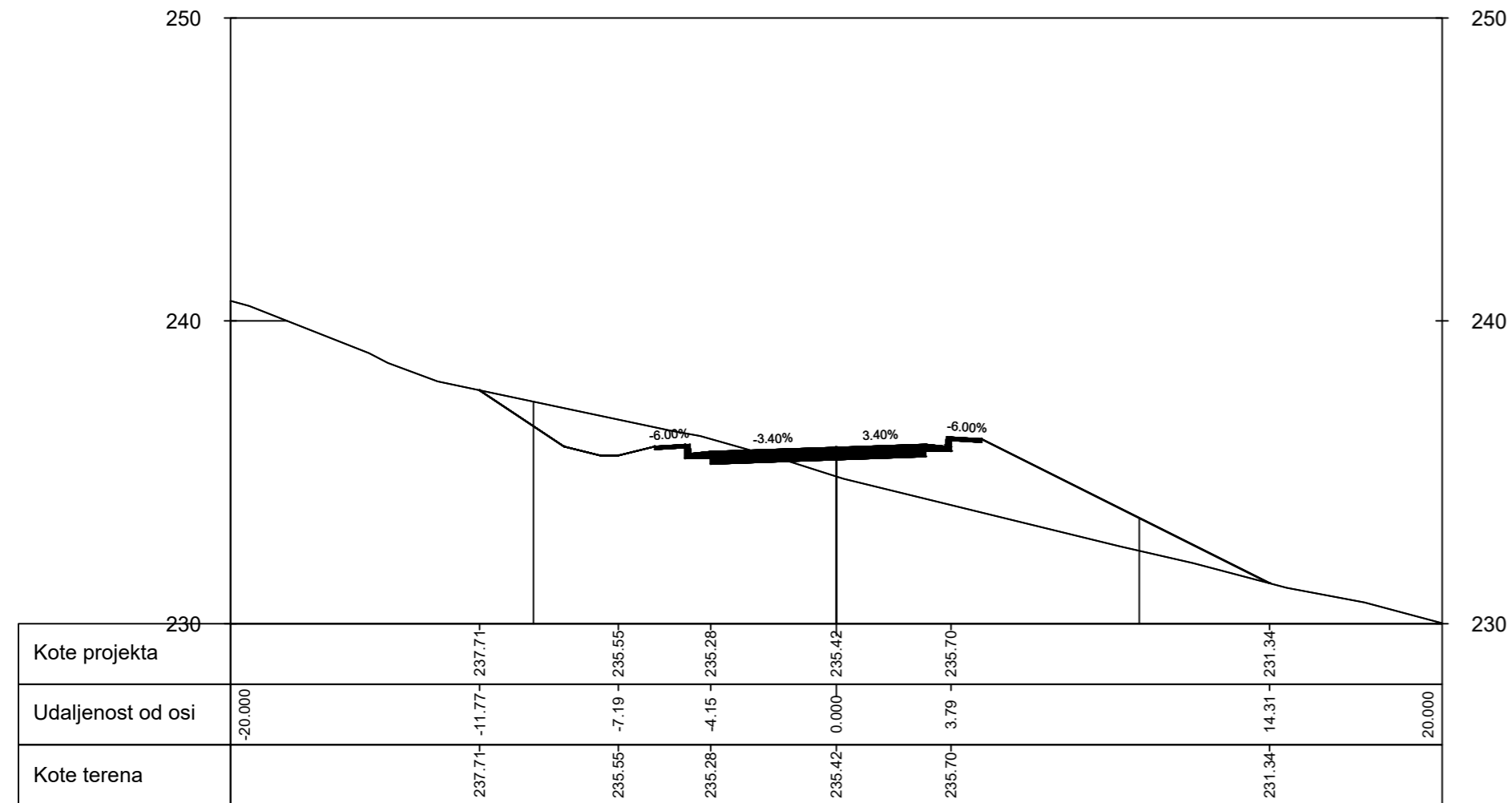
0+120.00

PRESJEK 7



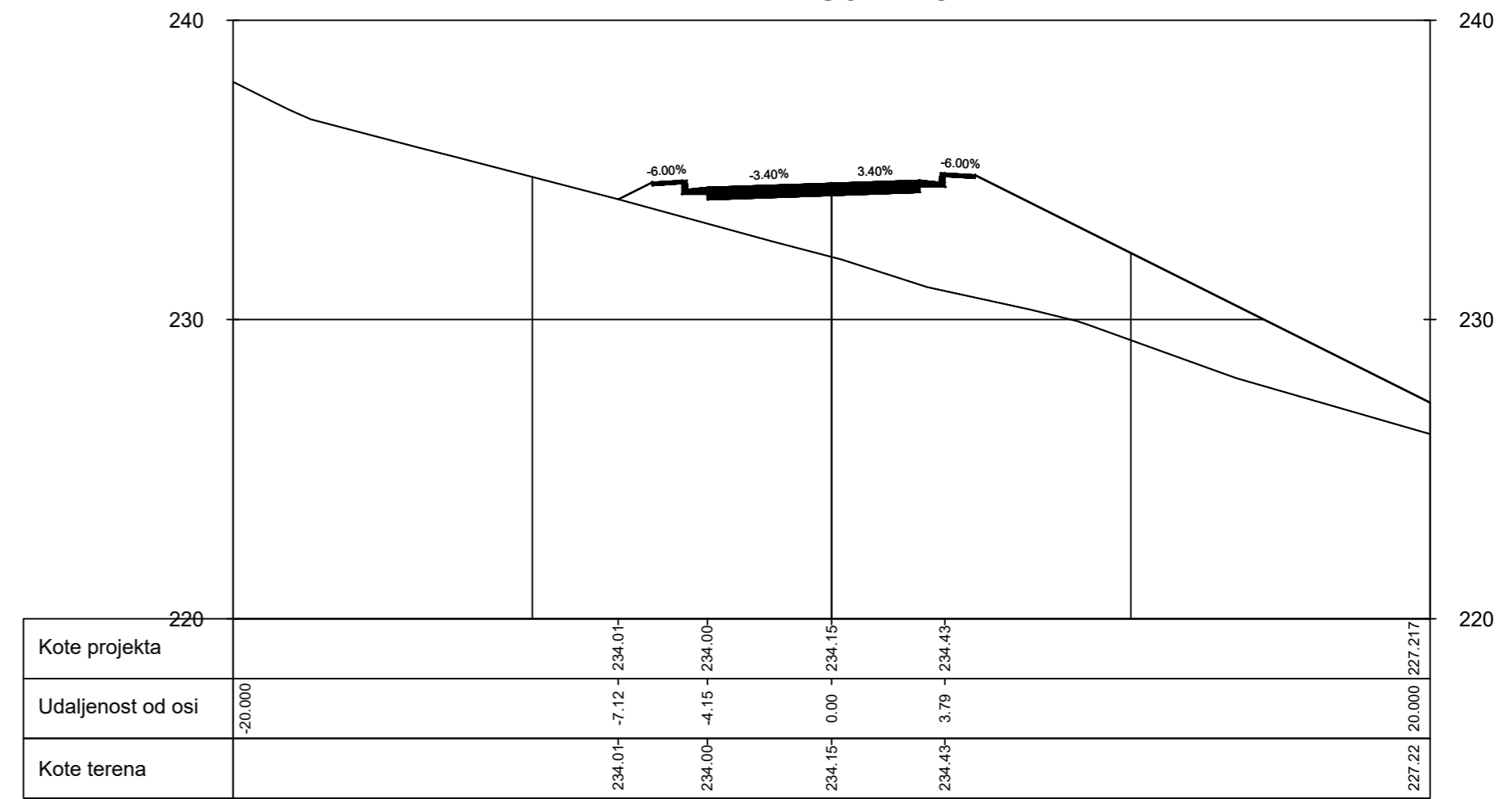
0+100.00

PRESJEK 6



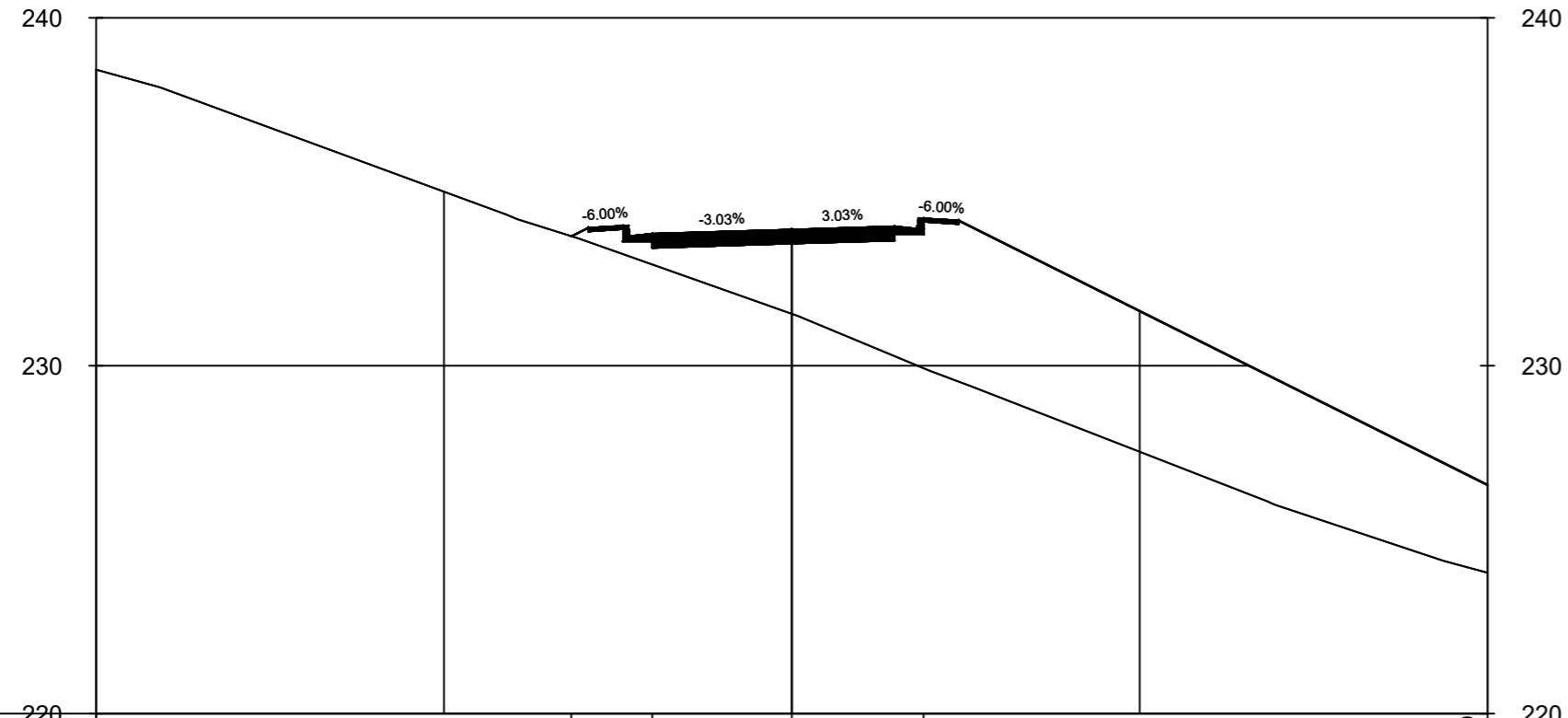
0+140.00

PRESJEK 8



0+160.00

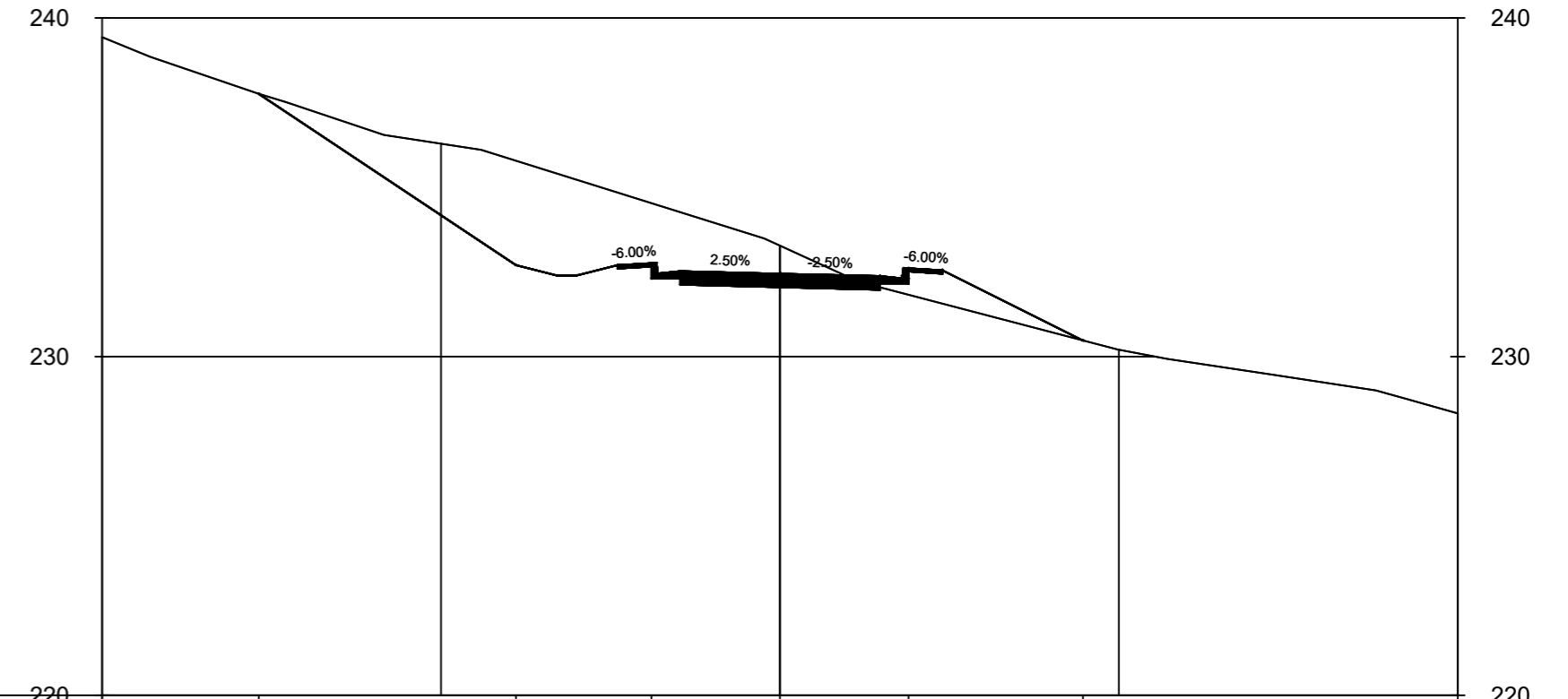
PRESJEK 9



| | | | | | | | | | | | |
|-------------------|---------|--|--------|--|--------|--|--------|--|--------|--------|---------|
| Kote projekta | | | 233.72 | | 233.51 | | 233.78 | | 226.57 | 20.000 | 226.570 |
| Udaljenost od osi | -20.000 | | -6.34 | | 0.00 | | 3.79 | | | | |
| Kote terena | | | 233.72 | | 233.51 | | 233.78 | | | | 226.57 |

0+200.00

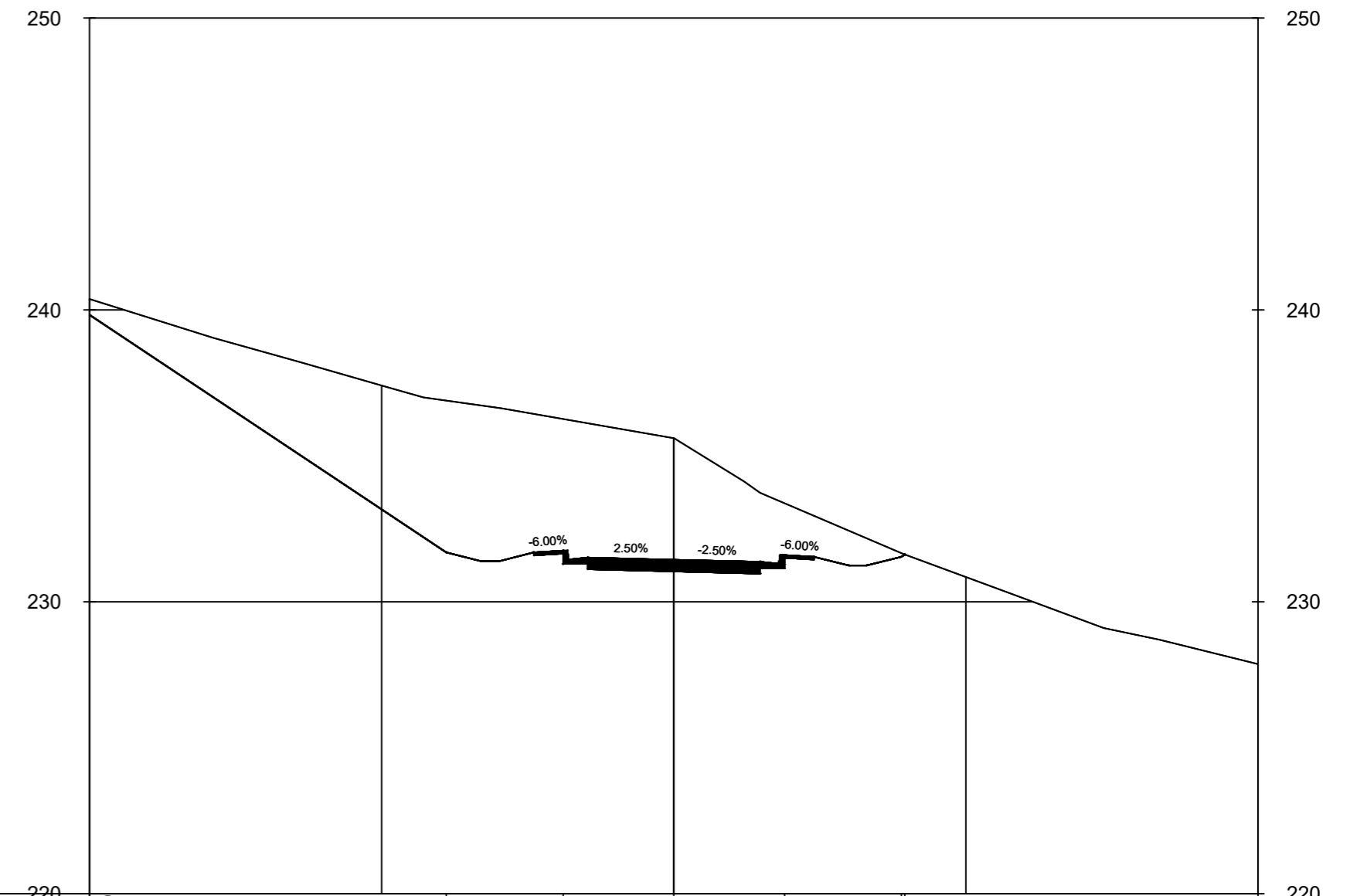
PRESJEK 11



| | | | | | | | | | | | | | |
|-------------------|---------|--|--------|--|--------|--|--------|--|--------|--|--------|--------|--------|
| Kote projekta | | | | | | | | | | | | | |
| Udaljenost od osi | -20.000 | | -15.38 | | -7.79 | | -3.79 | | 0.00 | | 3.79 | 8.94 | 20.000 |
| Kote terena | | | 237.76 | | 232.70 | | 232.31 | | 232.05 | | 232.16 | 230.48 | |

0+220.00

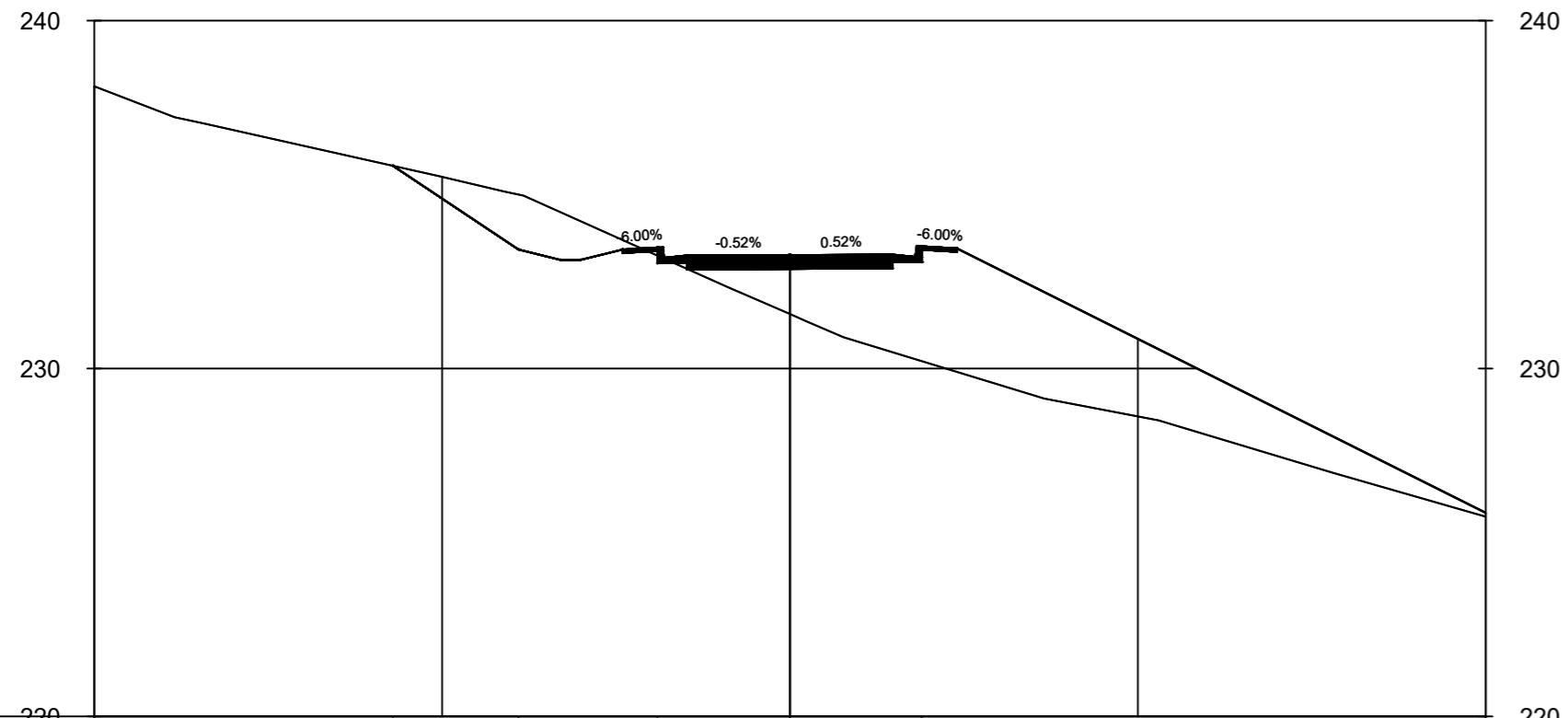
PRESJEK 12



| | | | | | | | | | | | | |
|-------------------|---------|--|--------|--|--------|--|--------|--|--------|--|--------|--------|
| Kote projekta | | | | | | | | | | | | |
| Udaljenost od osi | -20.000 | | | | | | | | | | | 20.000 |
| Kote terena | 239.83 | | 231.69 | | 231.30 | | 231.04 | | 231.15 | | 231.54 | 231.62 |

0+180.00

PRESJEK 10



| | | | | | | | | | | | | |
|-------------------|---------|--|--------|--|--------|--|--------|--|--------|--|--------|---------|
| Kote projekta | | | | | | | | | | | | |
| Udaljenost od osi | -20.000 | | | | | | | | | | | 20.000 |
| Kote terena | | | 235.82 | | 233.42 | | 233.03 | | 232.86 | | 233.06 | 225.846 |

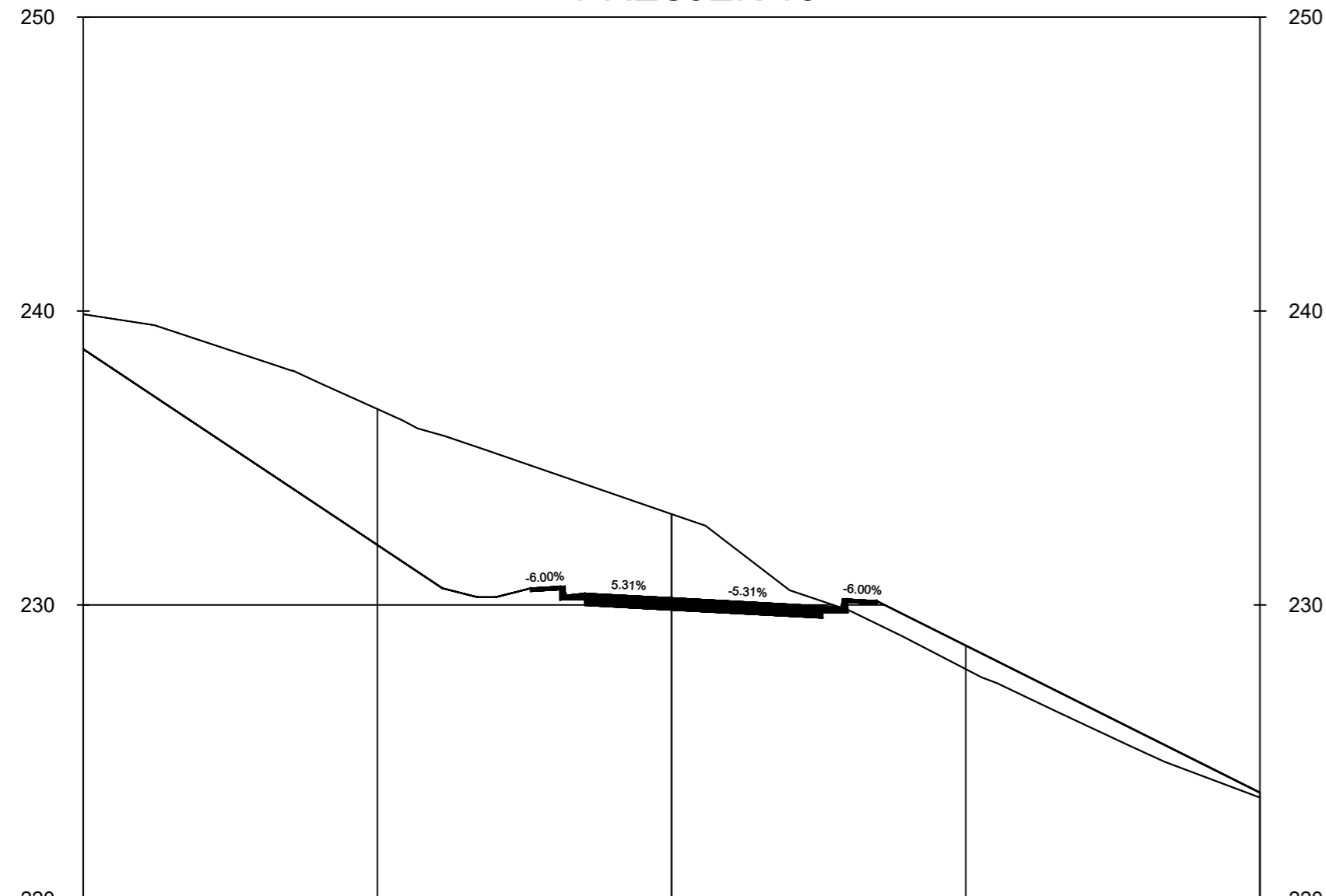


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| | |
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| Završni rad | |
| TEMA | IDEJNI PROJEKT LOKALNE CESTE |
| STUDENT | Zvonimir Nediljko Čondić-Galiničić, 4531 |
| SADRŽAJ | Poprečni presjeci |
| DATUM | lipanj 2019. |
| MJERILO | 1:200 |
| BROJ PRILOGA | 1 |

0+240.00

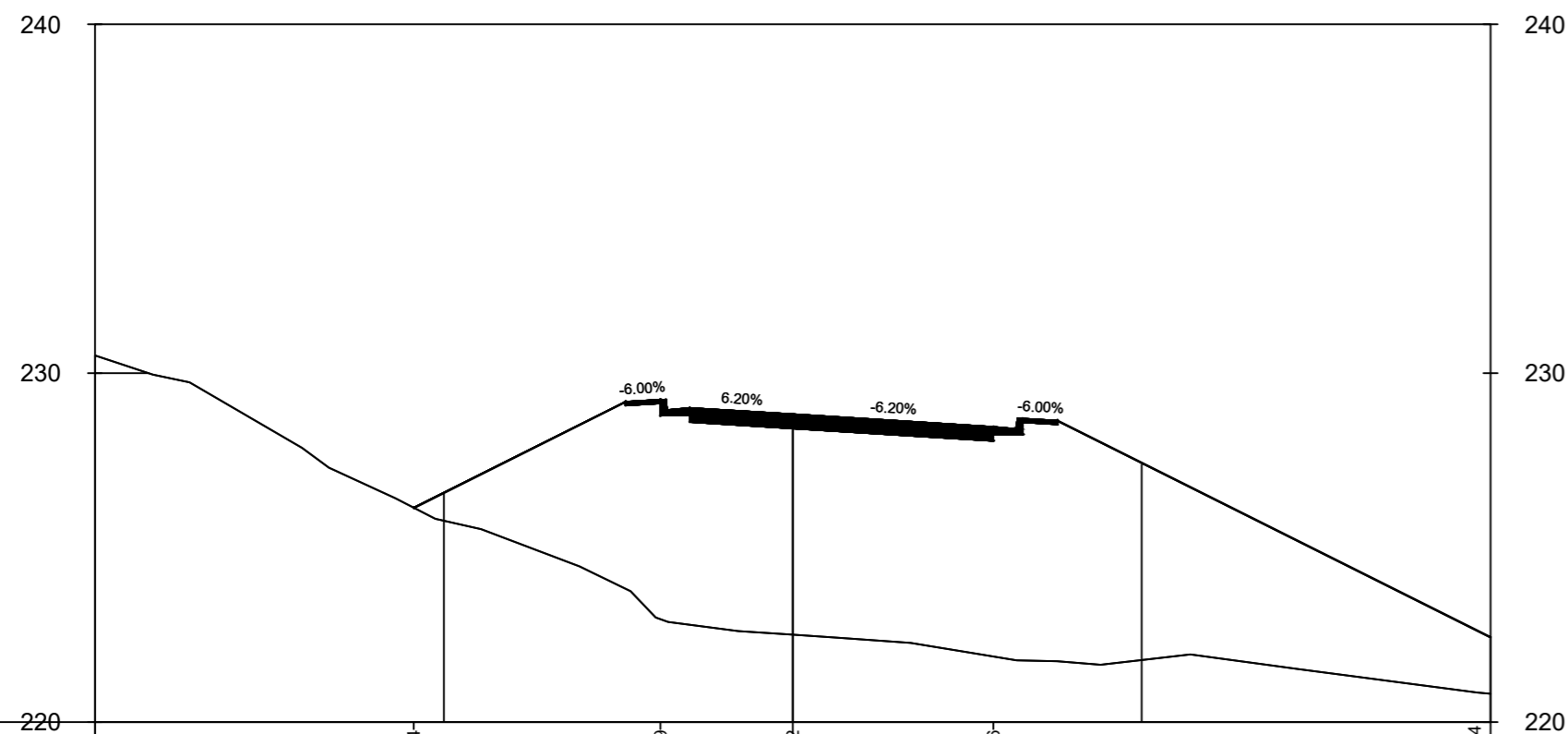
PRESJEK 13



| | | | | | | | |
|-------------------|---------|--------|--------|--------|--------|--------|---------|
| Kote projekta | 220 | 238.70 | 230.56 | 230.17 | 229.83 | 229.56 | 223.62 |
| Udaljenost od osi | -20.000 | -7.79 | -3.79 | 0.000 | 5.12 | 20.000 | 223.617 |
| Kote terena | 238.70 | 230.56 | 230.17 | 229.83 | 229.56 | 223.62 | 223.617 |

0+260.00

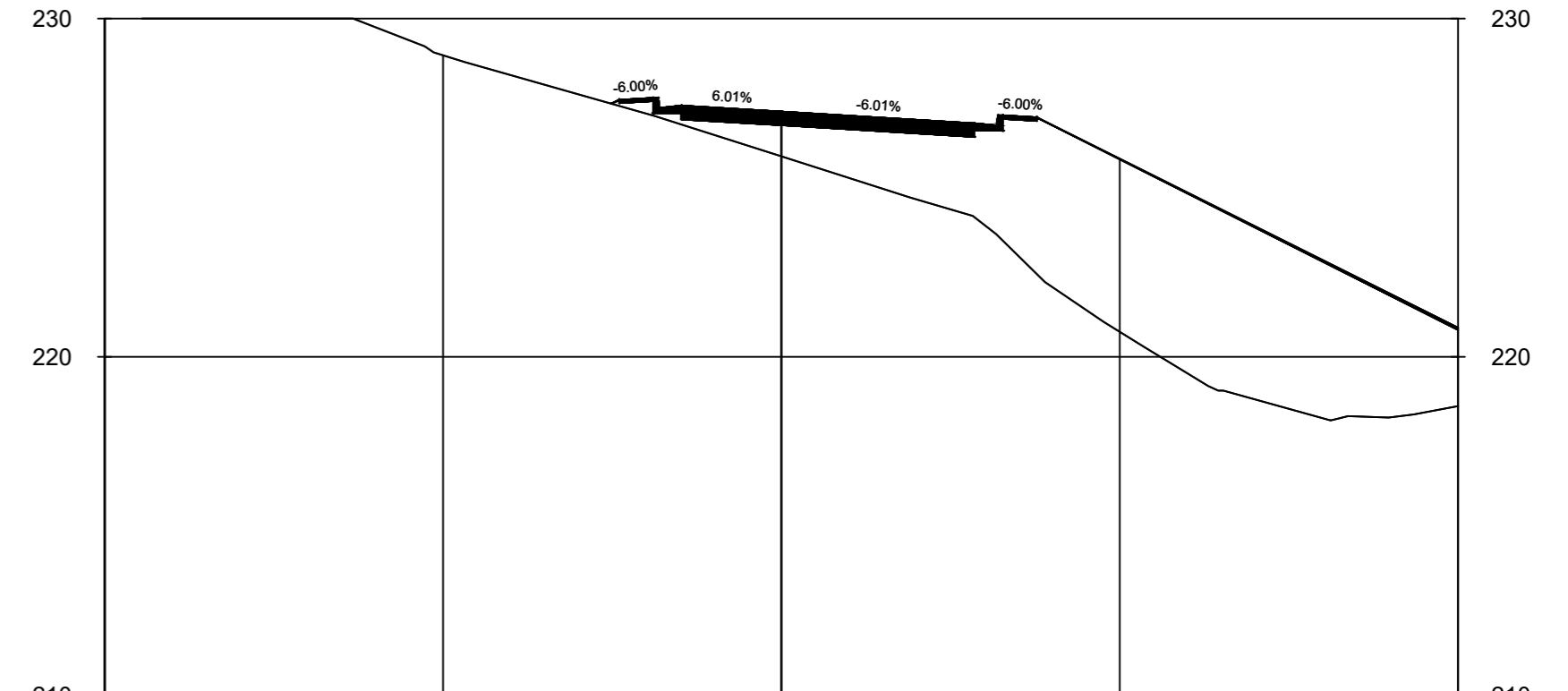
PRESJEK 14



| | | | | | | |
|-------------------|---------|--------|--------|--------|--------|---------|
| Kote projekta | 220 | 226.14 | 228.79 | 228.42 | 228.06 | 222.434 |
| Udaljenost od osi | -20.000 | -10.86 | -3.79 | 0.000 | 5.75 | 20.000 |
| Kote terena | 226.14 | 228.79 | 228.42 | 228.06 | 222.43 | 222.434 |

0+280.00

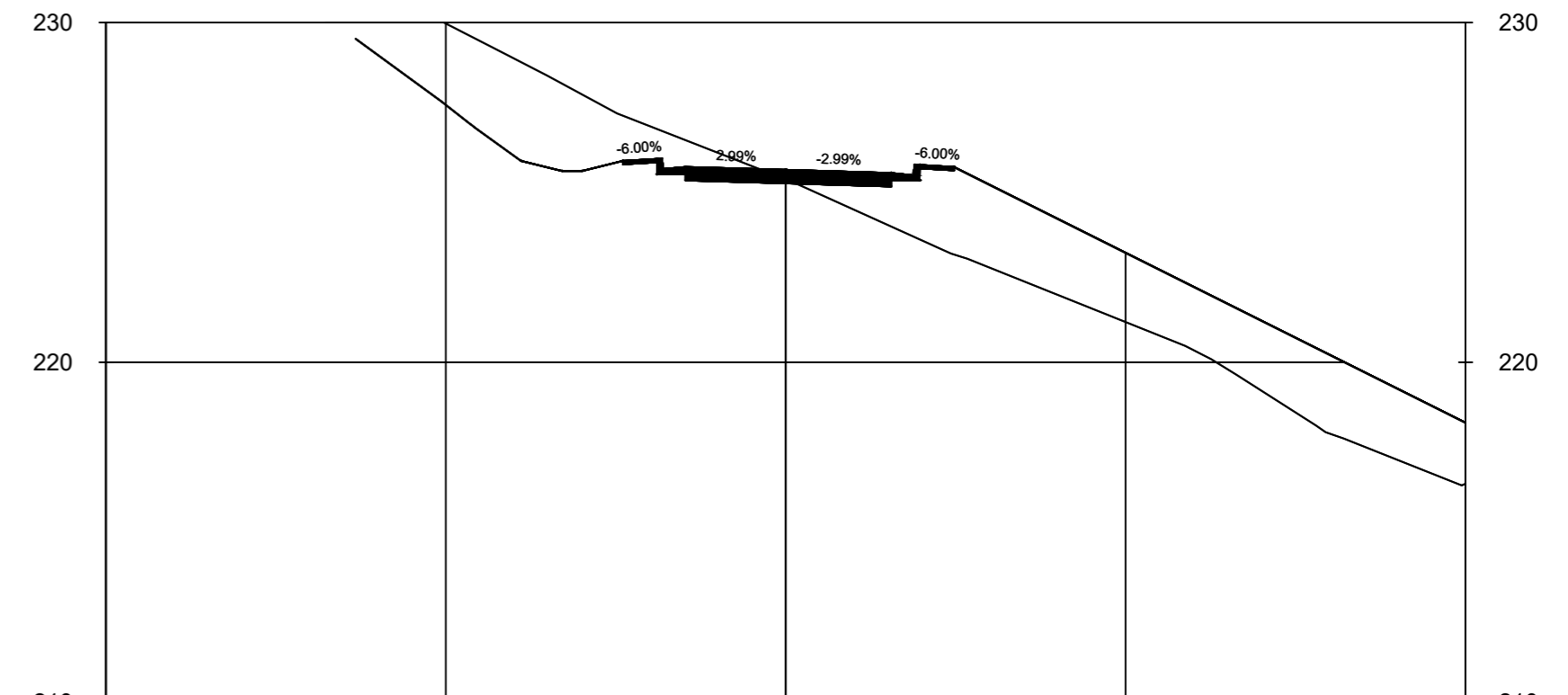
PRESJEK 15



| | | | | | | | |
|-------------------|---------|--------|--------|--------|--------|--------|--------|
| Kote projekta | 210 | 227.49 | 227.21 | 226.85 | 226.51 | 224.05 | 220.80 |
| Udaljenost od osi | -20.000 | -5.02 | -3.79 | 0.00 | 5.71 | 13.56 | 20.00 |
| Kote terena | 227.49 | 227.21 | 226.85 | 226.51 | 224.05 | 220.80 | 220.80 |

0+300.00

PRESJEK 16



| | | | | | | | |
|-------------------|---------|--------|--------|--------|--------|--------|--------|
| Kote projekta | 210 | 229.52 | 225.93 | 225.54 | 225.27 | 225.17 | 218.22 |
| Udaljenost od osi | -20.000 | -12.65 | -7.79 | -3.79 | 0.00 | 3.10 | 20.00 |
| Kote terena | 229.52 | 225.93 | 225.54 | 225.27 | 225.17 | 218.22 | 218.22 |



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Završni rad

TEMA IDEJNI PROJEKT LOKALNE CESTE

STUDENT Zvonimir Nediljko Čondić-Galiničić, 4531

SADRŽAJ Poprečni presjeci

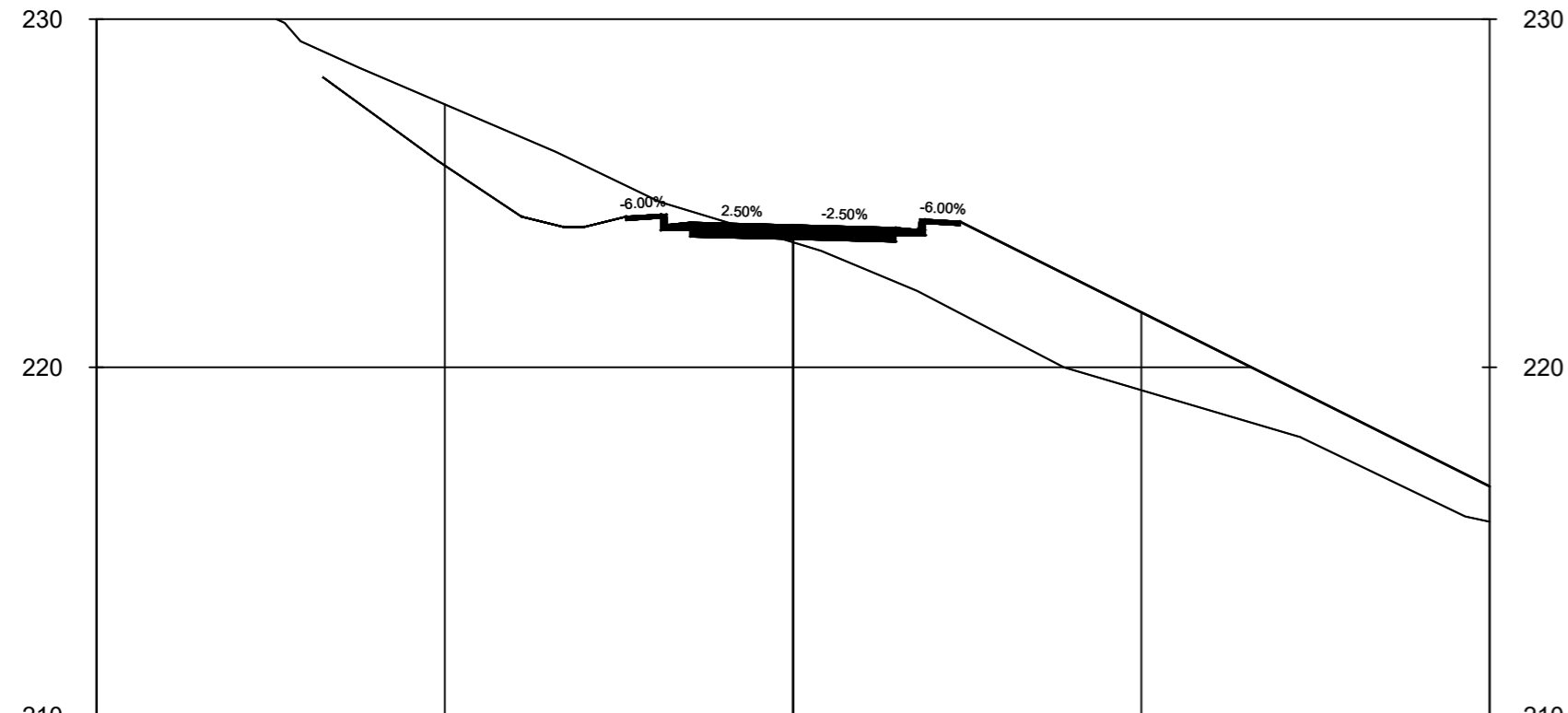
DATUM lipanj 2019.

MJERILO 1:200

BROJ PRILOGA 1

0+320.00

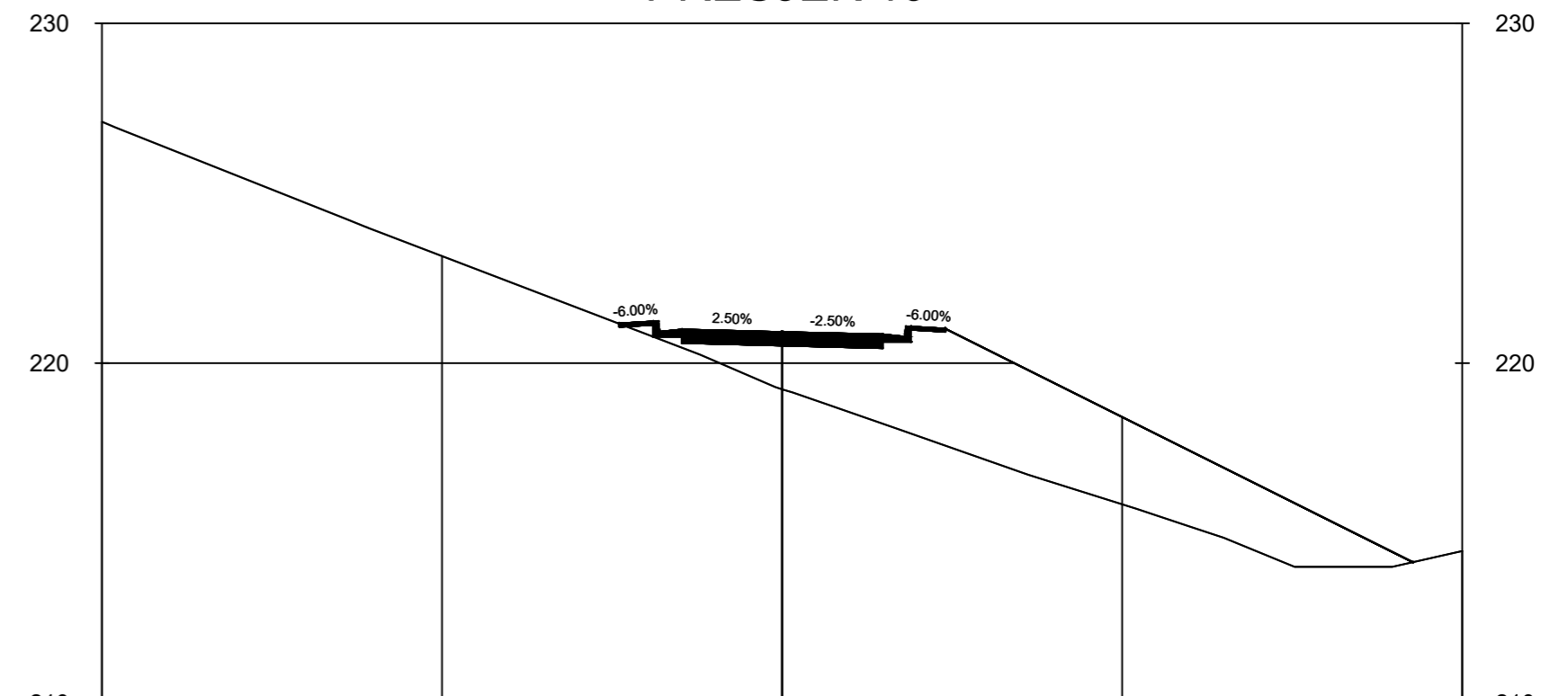
PRESJEK 17



| | | | | | | | |
|-------------------|---------|--------|--------|--------|--------|--------|--------|
| Kote projekta | -20.000 | 228.35 | 224.33 | 223.94 | 223.68 | 223.79 | 216.58 |
| Udaljenost od osi | -20.000 | -13.52 | -7.79 | -3.79 | 0.000 | 3.79 | 20.000 |
| Kote terena | | 228.35 | 224.33 | 223.94 | 223.68 | 223.79 | 216.58 |

0+360.00

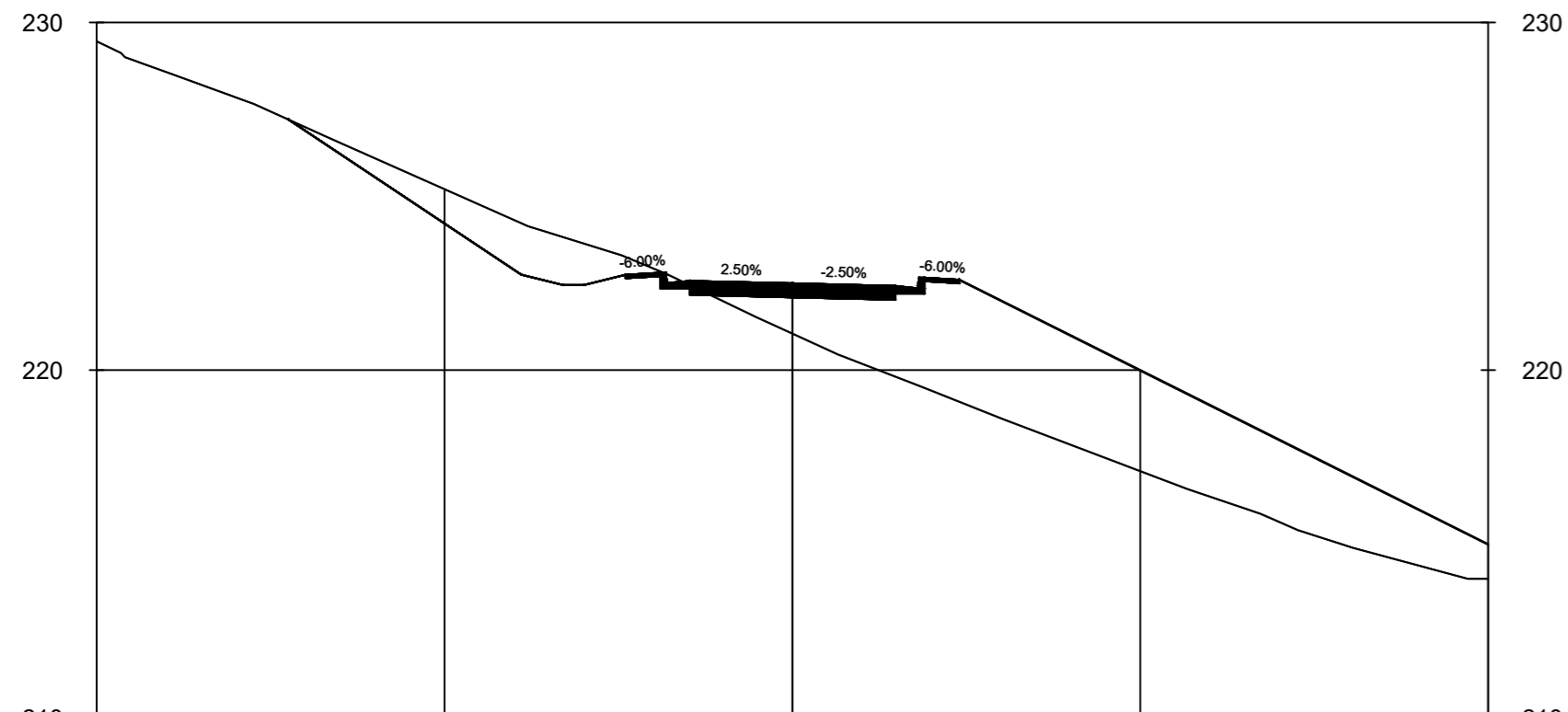
PRESJEK 19



| | | | | | | |
|-------------------|---------|--------|--------|--------|--------|--------|
| Kote projekta | -20.000 | 221.16 | 220.77 | 220.51 | 220.63 | 214.14 |
| Udaljenost od osi | -20.000 | -4.80 | -3.79 | 0.000 | 3.79 | 18.55 |
| Kote terena | | 221.16 | 220.77 | 220.51 | 220.63 | 214.14 |

0+340.00

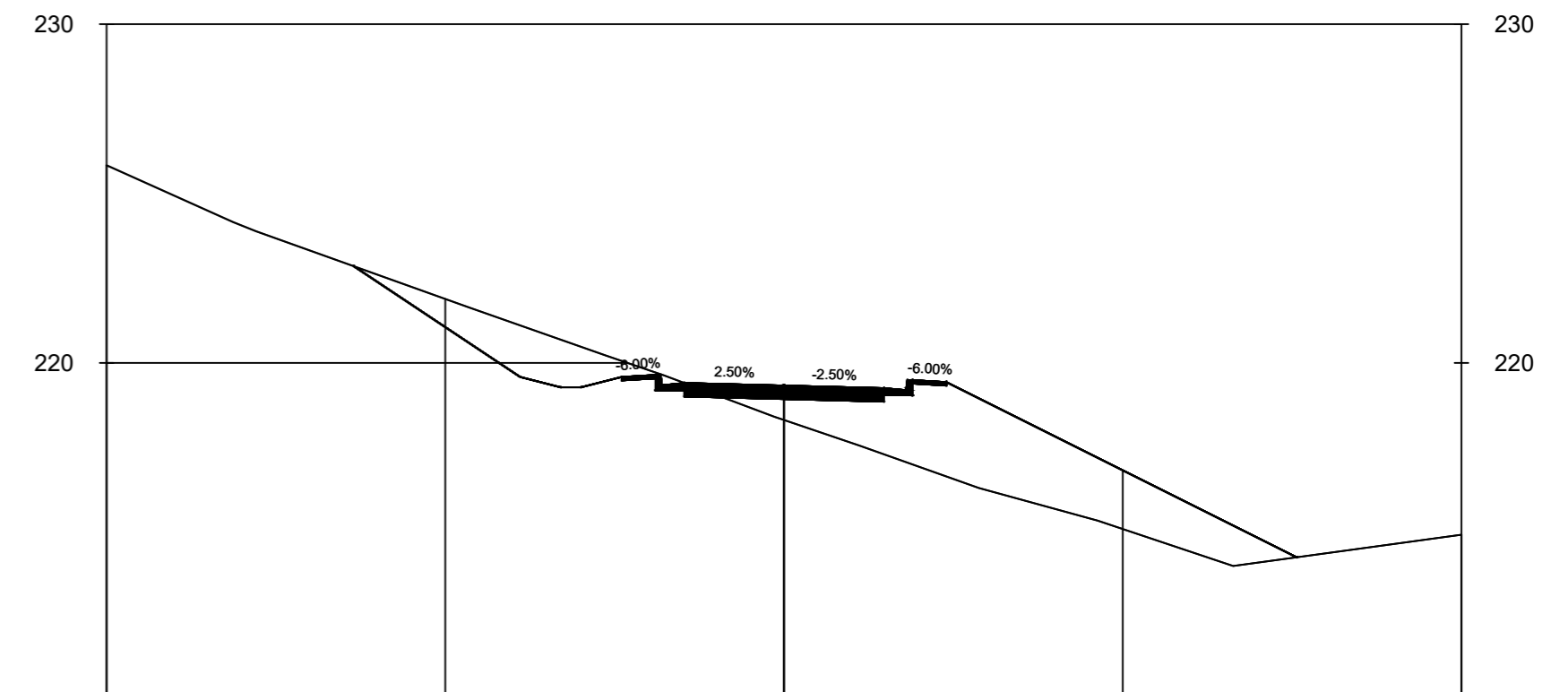
PRESJEK 18



| | | | | | | | |
|-------------------|---------|--------|--------|--------|--------|--------|--------|
| Kote projekta | -20.000 | 227.22 | 222.75 | 222.36 | 222.10 | 222.21 | 214.99 |
| Udaljenost od osi | -20.000 | -14.50 | -7.79 | -3.79 | 0.000 | 3.79 | 20.000 |
| Kote terena | | 227.22 | 222.75 | 222.36 | 222.10 | 222.21 | 214.99 |

0+380.00

PRESJEK 20



| | | | | | | | |
|-------------------|---------|--------|--------|--------|--------|--------|--------|
| Kote projekta | -20.000 | 222.85 | 219.58 | 219.19 | 218.93 | 219.04 | 214.26 |
| Udaljenost od osi | -20.000 | -12.70 | -7.79 | -3.79 | 0.000 | 3.79 | 15.14 |
| Kote terena | | 222.85 | 219.58 | 219.19 | 218.93 | 219.04 | 214.26 |



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

Završni rad

TEMA IDEJNI PROJEKT LOKALNE CESTE

STUDENT Zvonimir Nediljko Čondić-Galiničić, 4531

SADRŽAJ Poprečni presjeci

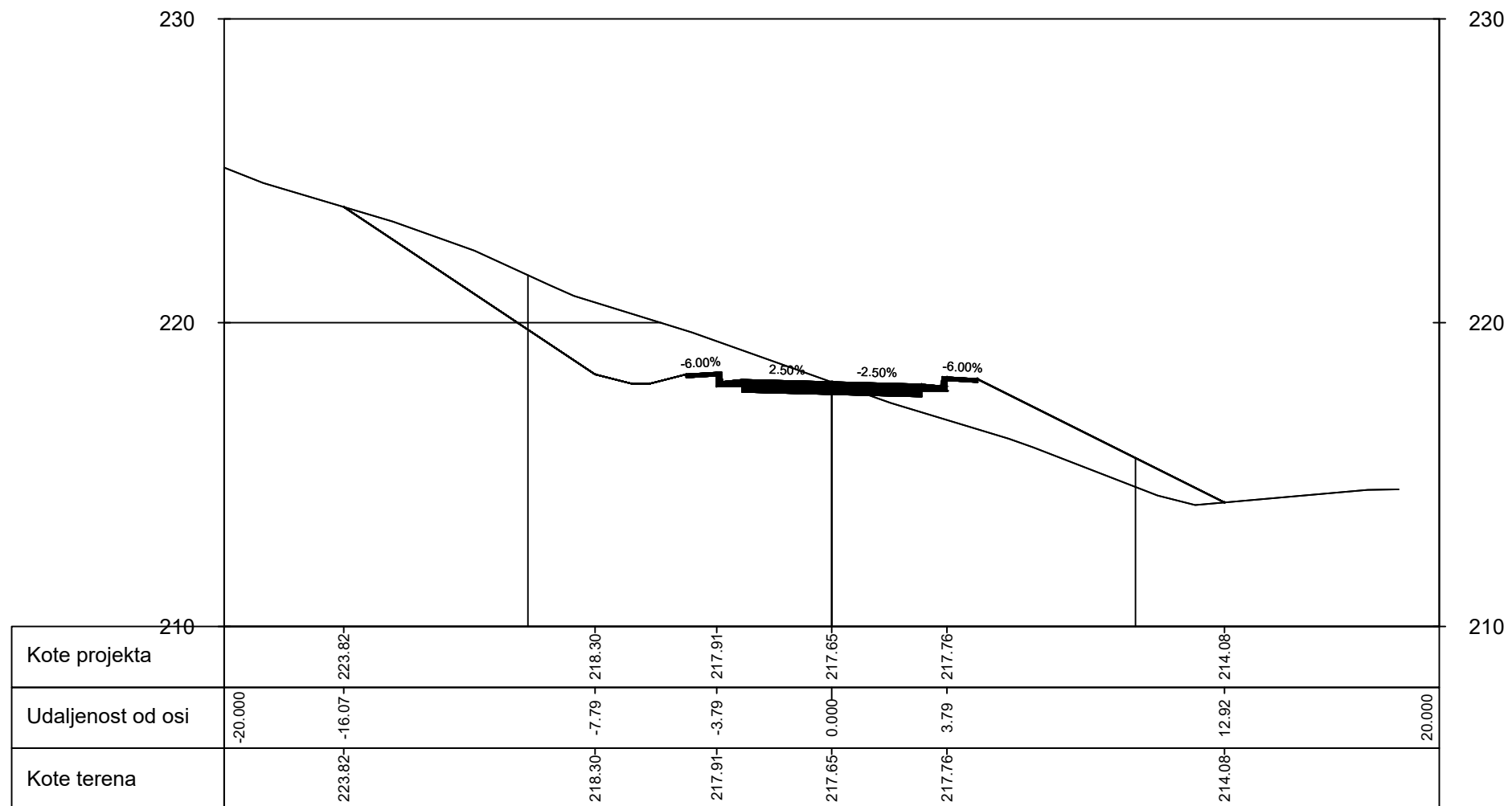
DATUM lipanj 2019.

MJERILO 1:200

BRJ PRILOGA

0+396.18

PRESJEK 21



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

Završni rad

| | | | |
|---------|--|--------------|-------|
| TEMA | IDEJNI PROJEKT LOKALNE CESTE | | |
| STUDENT | Zvonimir Nediljko Čondić-Galiničić, 4531 | | |
| SADRŽAJ | Poprečni presjeci | MJERILO | 1:200 |
| DATUM | lipanj 2019. | BROJ PRILOGA | 1 |

5. OBRADA NA RAČUNALU

Obrada na računalu

Prilikom izrade završnog rada korišteno je računalo uz pomoć softvera Autodesk Autocad Civil 3D.

Prvi korak izrade zadatka je definiranje podloge odnosno terena na kojem će se postaviti dionica ceste. Potrebno je iscrtati slojnice terena pomoću polilinija te definirati odgovarajuće visine (elevation) u programu. Od konstruiranih slojnica je potrebno napraviti 3D model terena na način da se svakoj slojnici pridruži niz točaka koje kasnije formiraju prostorni prikaz terena. Nakon toga se u program ubacuju tangente, postavljamo prijelazne krivine i kružne lukove te tako rješavamo horizontalnu geometriju. Idući korak je izračun dijagrama vitoperenja te rješavanje vertikalne geometrije. Niveleta se postavlja tako da se u konačnici riješe geometrijski, sigurnosni elementi i odvodnja. Između tangenti interpolira se odgovarajuća kružna krivina.

Nakon toga radimo 3D model terena (koridor) i definiramo poprečni presjek. U poprečnom presjeku su definirani svi njegovi elementi; poprečni nagib, dimenzije slivnika, bankine, usjeka i nasipa.

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

6. RAČUNALNI ISPIS TOČAKA OSI

6.1. Koordinatni račun glavnih točaka osi

Alignment Station and Curve Report**Client:** Client
Company**Project Name:** C:\Users\zncg9\OneDrive\Desktop\završni rad\
korak8.dwg**Project Description:****Report Date:** 7.6.2019. 20:46:22**Prepared by:** Preparer**Alignment: OS_1****Description:**

| <u>Tangent Data</u> | | | |
|------------------------------------|------------------|-----------|----------------------|
| Description | PT Station | Northing | Easting |
| Start: | 0+00.000 | 9510.600 | -12745.842 |
| End: | 0+57.807 | 9498.689 | -12689.275 |
| <u>Tangent Data</u> | | | |
| Parameter | Value | Parameter | Value |
| Length: | 57.807 | Course: | S 78° 06' 34.4610" E |
| <u>Spiral Point Data</u> | | | |
| Description | Station | Northing | Easting |
| TS: | 0+57.807 | 9498.689 | -12689.275 |
| SPI: | | 9493.171 | -12663.068 |
| SC: | 0+97.807 | 9494.221 | -12649.671 |
| <u>Spiral Curve Data: clothoid</u> | | | |
| Parameter | Value | Parameter | Value |
| Length: | 40.000 | L Tan: | 26.782 |
| Radius: | 70.000 | S Tan: | 13.438 |
| Theta: | 16° 22' 12.8018" | P: | 0.950 |
| X: | 39.675 | K: | 19.946 |
| Y: | 3.787 | A: | 52.915 |
| Chord: | 39.855 | Course: | S 83° 33' 45.1258" E |
| <u>Curve Point Data</u> | | | |
| Description | Station | Northing | Easting |
| SC: | 0+97.807 | 9494.221 | -12649.671 |
| RP: | | 9564.007 | -12655.138 |
| CS: | 1+57.101 | 9521.892 | -12599.225 |
| <u>Circular Curve Data</u> | | | |
| Parameter | Value | Parameter | Value |
| Delta: | 48° 31' 58.2120" | Type: | LEFT |
| Radius: | 70.000 | | |
| Length: | 59.294 | Tangent: | 31.557 |
| Mid-Ord: | 6.185 | External: | 6.784 |
| Chord: | 57.537 | Course: | N 61° 15' 13.6312" E |
| <u>Spiral Point Data</u> | | | |

| Description | Station | Northing | Easting |
|-------------|----------|----------|------------|
| CS: | 1+57.101 | 9521.892 | -12599.225 |
| SPI: | | 9532.626 | -12591.140 |
| ST: | 1+97.101 | 9557.692 | -12581.709 |

Spiral Curve Data: clothoid

| Parameter | Value | Parameter | Value |
|-----------|------------------|-----------|----------------------|
| Length: | 40.000 | L Tan: | 26.782 |
| Radius: | 70.000 | S Tan: | 13.438 |
| Theta: | 16° 22' 12.8018" | P: | 0.950 |
| X: | 39.675 | K: | 19.946 |
| Y: | 3.787 | A: | 52.915 |
| Chord: | 39.855 | Course: | N 26° 04' 12.3882" E |

Tangent Data

| Description | PT Station | Northing | Easting |
|-------------|------------|----------|------------|
| Start: | 1+97.101 | 9557.692 | -12581.709 |
| End: | 2+15.899 | 9575.286 | -12575.090 |

Tangent Data

| Parameter | Value | Parameter | Value |
|-----------|--------|-----------|----------------------|
| Length: | 18.798 | Course: | N 20° 37' 01.7234" E |

Spiral Point Data

| Description | Station | Northing | Easting |
|-------------|----------|----------|------------|
| TS: | 2+15.899 | 9575.286 | -12575.090 |
| SPI: | | 9594.256 | -12567.953 |
| SC: | 2+45.899 | 9600.941 | -12560.191 |

Spiral Curve Data: clothoid

| Parameter | Value | Parameter | Value |
|-----------|------------------|-----------|----------------------|
| Length: | 30.000 | L Tan: | 20.268 |
| Radius: | 30.000 | S Tan: | 10.244 |
| Theta: | 28° 38' 52.4031" | P: | 1.239 |
| X: | 29.259 | K: | 14.876 |
| Y: | 4.911 | A: | 30.000 |
| Chord: | 29.668 | Course: | N 30° 08' 45.9911" E |

Curve Point Data

| Description | Station | Northing | Easting |
|-------------|----------|----------|------------|
| SC: | 2+45.899 | 9600.941 | -12560.191 |
| RP: | | 9578.209 | -12540.614 |
| CS: | 2+78.745 | 9606.025 | -12529.378 |

Circular Curve Data

| Parameter | Value | Parameter | Value |
|-----------|------------------|-----------|----------------------|
| Delta: | 62° 43' 53.5293" | Type: | RIGHT |
| Radius: | 30.000 | | |
| Length: | 32.846 | Tangent: | 18.287 |
| Mid-Ord: | 4.384 | External: | 5.134 |
| Chord: | 31.230 | Course: | N 80° 37' 50.8912" E |

Spiral Point Data

| Description | Station | Northing | Easting |
|-------------|----------|----------|------------|
| CS: | 2+78.745 | 9606.025 | -12529.378 |
| SPI: | | 9602.188 | -12519.879 |
| ST: | 3+08.745 | 9586.516 | -12507.026 |

Spiral Curve Data: clothoid

| Parameter | Value | Parameter | Value |
|-----------|------------------|-----------|----------------------|
| Length: | 30.000 | L Tan: | 20.268 |
| Radius: | 30.000 | S Tan: | 10.244 |
| Theta: | 28° 38' 52.4031" | P: | 1.239 |
| X: | 29.259 | K: | 14.876 |
| Y: | 4.911 | A: | 30.000 |
| Chord: | 29.668 | Course: | S 48° 53' 04.2088" E |

Tangent Data

| Description | PT Station | Northing | Easting |
|-------------|------------|----------|------------|
| Start: | 3+08.745 | 9586.516 | -12507.026 |
| End: | 3+96.176 | 9518.913 | -12451.584 |

Tangent Data

| Parameter | Value | Parameter | Value |
|-----------|-------|-----------|-------|
|-----------|-------|-----------|-------|

6.2. Koordinatni račun detaljnih točaka osi

Client:

Client

Client Company

Address 1

Date: 7.6.2019. 20:46:56

Prepared by:

Preparer

Your Company Name

123 Main Street

Alignment Name: OS 1

Description:

Station Range: Start: 0+000.00, End: 39+618.00

Station Increment: 20.00

| Station | Northing | Easting | Tangential Direction |
|----------|-------------|---------------|----------------------|
| 0+000.00 | 9,510.5997m | -12,745.8415m | S78° 06' 34"E |
| 0+020.00 | 9,506.4788m | -12,726.2706m | S78° 06' 34"E |
| 0+040.00 | 9,502.3580m | -12,706.6998m | S78° 06' 34"E |
| 0+060.00 | 9,498.2378m | -12,687.1288m | S78° 09' 32"E |

| | | | |
|----------|-------------|---------------|---------------|
| 0+080.00 | 9,494.7562m | -12,667.4408m | S83° 08' 55"E |
| 0+100.00 | 9,494.4260m | -12,647.4878m | N83° 43' 32"E |
| 0+120.00 | 9,499.4030m | -12,628.1872m | N67° 21' 19"E |
| 0+140.00 | 9,509.6180m | -12,611.0717m | N50° 59' 06"E |
| 0+160.00 | 9,524.2419m | -12,597.5279m | N34° 42' 03"E |
| 0+180.00 | 9,541.7951m | -12,588.0081m | N23° 36' 34"E |
| 0+200.00 | 9,560.4051m | -12,580.6888m | N20° 37' 02"E |
| 0+220.00 | 9,579.1196m | -12,573.6344m | N21° 09' 09"E |
| 0+240.00 | 9,596.7034m | -12,564.2834m | N39° 06' 23"E |
| 0+260.00 | 9,607.3426m | -12,547.7722m | N76° 11' 45"E |
| 0+280.00 | 9,605.5314m | -12,528.2241m | S65° 39' 25"E |
| 0+300.00 | 9,593.1984m | -12,512.6664m | S41° 47' 24"E |
| 0+320.00 | 9,577.8137m | -12,499.8891m | S39° 21' 20"E |
| 0+340.00 | 9,562.3492m | -12,487.2065m | S39° 21' 20"E |
| 0+360.00 | 9,546.8846m | -12,474.5238m | S39° 21' 20"E |
| 0+380.00 | 9,531.4201m | -12,461.8412m | S39° 21' 20"E |

6.3. Račun kota kolnika

Client:

Client

Client Company

Address 1

Date: 7.6.2019. 20:51:30

Prepared by:

Preparer

Your Company Name

123 Main Street

Corridor Name: koridor

Description:

Base Alignment Name: OS 1

Station Range: Start: 0+000.00, End: 0+396.18

CHAINAGE 0+000.00

| POINT | X | Y | Z | OFFSET | STRING CUT |
|-------|--------------|------------|----------|----------|------------|
| 1 | -12,742.8856 | 9,524.6380 | 243.6184 | -14.346m | Daylight |
| 2 | -12,744.2361 | 9,518.2242 | 239.2488 | -7.792m | Hinge_Cut |
| 3 | -12,744.4834 | 9,517.0499 | 238.9488 | -6.592m | Ditch_Out |
| 4 | -12,744.6070 | 9,516.4628 | 238.9488 | -5.992m | Ditch_In |
| 5 | -12,744.8542 | 9,515.2885 | 239.2488 | -4.792m | EPS |
| 6 | -12,744.8544 | 9,515.2876 | 239.1488 | -4.791m | EPS_Sub |
| 7 | -12,745.0603 | 9,514.3100 | 239.3088 | -3.792m | Back_Curb |
| 8 | -12,745.0912 | 9,514.1632 | 239.3088 | -3.642m | Top_Curb |

| | | | | | |
|----|--------------|------------|----------|---------|-----------------|
| 9 | -12,745.0998 | 9,514.1224 | 239.0088 | -3.600m | Flowline_Gutter |
| 10 | -12,745.2337 | 9,513.4864 | 239.0338 | -2.950m | ETW_Pave1 |
| 11 | -12,745.2337 | 9,513.4864 | 239.0738 | -2.950m | ETW |
| 12 | -12,745.2337 | 9,513.4864 | 238.6738 | -2.950m | ETW_Sub |
| 13 | -12,745.2337 | 9,513.4864 | 238.9738 | -2.950m | ETW_Pave2 |
| 14 | -12,745.8415 | 9,510.5997 | 238.6000 | 0.000m | Crown_Sub |
| 15 | -12,745.8415 | 9,510.5997 | 239.0000 | 0.000m | Crown |
| 16 | -12,745.8415 | 9,510.5997 | 238.9000 | 0.000m | Crown_Pave2 |
| 17 | -12,745.8415 | 9,510.5997 | 238.9600 | 0.000m | Crown_Pave1 |
| 18 | -12,746.4493 | 9,507.7130 | 238.9263 | 2.950m | Flange |
| 19 | -12,746.4493 | 9,507.7130 | 238.5262 | 2.950m | ETW_Sub |
| 20 | -12,746.4493 | 9,507.7130 | 238.8263 | 2.950m | ETW_Pave2 |
| 21 | -12,746.4493 | 9,507.7130 | 238.8863 | 2.950m | ETW_Pave1 |
| 22 | -12,746.5833 | 9,507.0769 | 238.8613 | 3.600m | Flowline_Gutter |
| 23 | -12,746.5918 | 9,507.0361 | 239.1613 | 3.642m | Top_Curb |
| 24 | -12,746.6228 | 9,506.8893 | 239.1613 | 3.792m | Back_Curb |
| 25 | -12,746.8286 | 9,505.9117 | 239.0012 | 4.791m | EPS_Sub |
| 26 | -12,746.8288 | 9,505.9108 | 239.1013 | 4.792m | Hinge |
| 27 | -12,750.8158 | 9,486.9752 | 229.4259 | 24.142m | Daylight |

CHAINAGE 0+025.00

CHAINAGE 0+050.00

CHAINAGE 0+075.00

CHAINAGE 0+100.00

| POINT | X | Y | Z | OFFSET | STRING CUT |
|--------------|--------------|------------|----------|---------------|-------------------|
| 1 | -12,648.7745 | 9,506.1281 | 237.7061 | -11.773m | Daylight |
| 2 | -12,648.4706 | 9,503.3638 | 235.8521 | -8.992m | Hinge_Cut |
| 3 | -12,648.3394 | 9,502.1710 | 235.5521 | -7.792m | Ditch_Out |
| 4 | -12,648.2738 | 9,501.5746 | 235.5521 | -7.192m | Ditch_In |
| 5 | -12,648.1427 | 9,500.3818 | 235.8521 | -5.992m | EPS |
| 6 | -12,648.1426 | 9,500.3808 | 235.7521 | -5.991m | EPS_Sub |
| 7 | -12,648.0334 | 9,499.3878 | 235.9121 | -4.992m | Back_Curb |
| 8 | -12,648.0170 | 9,499.2387 | 235.9121 | -4.842m | Top_Curb |
| 9 | -12,648.0124 | 9,499.1972 | 235.6121 | -4.800m | Flowline_Gutter |
| 10 | -12,647.9414 | 9,498.5511 | 235.6371 | -4.150m | ETW_Pave1 |
| 11 | -12,647.9414 | 9,498.5511 | 235.6771 | -4.150m | ETW |
| 12 | -12,647.9414 | 9,498.5511 | 235.2771 | -4.150m | ETW_Sub |
| 13 | -12,647.9414 | 9,498.5511 | 235.5771 | -4.150m | ETW_Pave2 |
| 14 | -12,647.4878 | 9,494.4260 | 235.4182 | 0.000m | Crown_Sub |
| 15 | -12,647.4878 | 9,494.4260 | 235.8182 | 0.000m | Crown |
| 16 | -12,647.4878 | 9,494.4260 | 235.7182 | 0.000m | Crown_Pave2 |
| 17 | -12,647.4878 | 9,494.4260 | 235.7782 | 0.000m | Crown_Pave1 |
| 18 | -12,647.1654 | 9,491.4937 | 235.9185 | 2.950m | Flange |

| | | | | | |
|----|--------------|------------|----------|---------|-----------------|
| 19 | -12,647.1654 | 9,491.4937 | 235.5185 | 2.950m | ETW_Sub |
| 20 | -12,647.1654 | 9,491.4937 | 235.8185 | 2.950m | ETW_Pave2 |
| 21 | -12,647.1654 | 9,491.4937 | 235.8785 | 2.950m | ETW_Pave1 |
| 22 | -12,647.0944 | 9,490.8475 | 235.8535 | 3.600m | Flowline_Gutter |
| 23 | -12,647.0898 | 9,490.8061 | 236.1535 | 3.642m | Top_Curb |
| 24 | -12,647.0734 | 9,490.6570 | 236.1535 | 3.792m | Back_Curb |
| 25 | -12,646.9642 | 9,489.6640 | 235.9935 | 4.791m | EPS_Sub |
| 26 | -12,646.9641 | 9,489.6630 | 236.0935 | 4.792m | Hinge |
| 27 | -12,645.9242 | 9,480.2048 | 231.3359 | 14.307m | Daylight |

CHAINAGE 0+125.00

CHAINAGE 0+150.00

CHAINAGE 0+175.00

CHAINAGE 0+200.00

| POINT | X | Y | Z | OFFSET | STRING CUT |
|--------------|--------------|------------|----------|---------------|-------------------|
| 1 | -12,595.0840 | 9,565.8208 | 237.7588 | -15.380m | Daylight |
| 2 | -12,587.9814 | 9,563.1487 | 232.6998 | -7.792m | Hinge_Cut |
| 3 | -12,586.8583 | 9,562.7261 | 232.3998 | -6.592m | Ditch_Out |
| 4 | -12,586.2967 | 9,562.5149 | 232.3998 | -5.992m | Ditch_In |
| 5 | -12,585.1736 | 9,562.0923 | 232.6998 | -4.792m | EPS |
| 6 | -12,585.1726 | 9,562.0920 | 232.5998 | -4.791m | EPS_Sub |
| 7 | -12,584.2376 | 9,561.7402 | 232.7598 | -3.792m | Back_Curb |
| 8 | -12,584.0972 | 9,561.6874 | 232.7598 | -3.642m | Top_Curb |
| 9 | -12,584.0582 | 9,561.6727 | 232.4598 | -3.600m | Flowline_Gutter |
| 10 | -12,583.4498 | 9,561.4438 | 232.4848 | -2.950m | ETW_Pave1 |
| 11 | -12,583.4498 | 9,561.4438 | 232.5248 | -2.950m | ETW |
| 12 | -12,583.4498 | 9,561.4438 | 232.1248 | -2.950m | ETW_Sub |
| 13 | -12,583.4498 | 9,561.4438 | 232.4248 | -2.950m | ETW_Pave2 |
| 14 | -12,580.6888 | 9,560.4051 | 232.0510 | 0.000m | Crown_Sub |
| 15 | -12,580.6888 | 9,560.4051 | 232.4510 | 0.000m | Crown |
| 16 | -12,580.6888 | 9,560.4051 | 232.3510 | 0.000m | Crown_Pave2 |
| 17 | -12,580.6888 | 9,560.4051 | 232.4110 | 0.000m | Crown_Pave1 |
| 18 | -12,577.9277 | 9,559.3663 | 232.3773 | 2.950m | Flange |
| 19 | -12,577.9277 | 9,559.3663 | 231.9773 | 2.950m | ETW_Sub |
| 20 | -12,577.9277 | 9,559.3663 | 232.2773 | 2.950m | ETW_Pave2 |
| 21 | -12,577.9277 | 9,559.3663 | 232.3373 | 2.950m | ETW_Pave1 |
| 22 | -12,577.3193 | 9,559.1374 | 232.3123 | 3.600m | Flowline_Gutter |
| 23 | -12,577.2803 | 9,559.1227 | 232.6123 | 3.642m | Top_Curb |
| 24 | -12,577.1399 | 9,559.0699 | 232.6123 | 3.792m | Back_Curb |
| 25 | -12,576.2049 | 9,558.7181 | 232.4523 | 4.791m | EPS_Sub |
| 26 | -12,576.2039 | 9,558.7178 | 232.5523 | 4.792m | Hinge |
| 27 | -12,572.3233 | 9,557.2578 | 230.4792 | 8.938m | Daylight |

CHAINAGE 0+225.00

CHAINAGE 0+250.00

CHAINAGE 0+275.00

CHAINAGE 0+300.00

| POINT | X | Y | Z | OFFSET | STRING CUT |
|--------------|--------------|------------|----------|---------------|-------------------|
| 1 | -12,506.8579 | 9,598.3900 | 225.9281 | -7.790m | Hinge_Cut |
| 2 | -12,507.7526 | 9,597.5903 | 225.6281 | -6.590m | Ditch_Out |
| 3 | -12,508.2000 | 9,597.1905 | 225.6281 | -5.990m | Ditch_In |
| 4 | -12,509.0947 | 9,596.3908 | 225.9281 | -4.790m | EPS |
| 5 | -12,509.0954 | 9,596.3902 | 225.8281 | -4.789m | EPS_Sub |
| 6 | -12,509.8403 | 9,595.7244 | 225.9881 | -3.790m | Back_Curb |
| 7 | -12,509.9521 | 9,595.6245 | 225.9881 | -3.640m | Top_Curb |
| 8 | -12,509.9832 | 9,595.5967 | 225.6881 | -3.599m | Flowline_Gutter |
| 9 | -12,510.4678 | 9,595.1635 | 225.3531 | -2.949m | ETW_Sub |
| 10 | -12,510.4678 | 9,595.1635 | 225.7531 | -2.949m | ETW |
| 11 | -12,510.4678 | 9,595.1635 | 225.6531 | -2.949m | ETW_Pave2 |
| 12 | -12,510.4678 | 9,595.1635 | 225.7131 | -2.949m | ETW_Pave1 |
| 13 | -12,512.6664 | 9,593.1984 | 225.6651 | 0.000m | Crown |
| 14 | -12,512.6664 | 9,593.1984 | 225.5651 | 0.000m | Crown_Pave2 |
| 15 | -12,512.6664 | 9,593.1984 | 225.6251 | 0.000m | Crown_Pave1 |
| 16 | -12,512.6664 | 9,593.1984 | 225.2651 | 0.000m | Crown_Sub |
| 17 | -12,514.9768 | 9,591.1335 | 225.5726 | 3.099m | Flange |
| 18 | -12,514.9768 | 9,591.1335 | 225.4726 | 3.099m | ETW_Pave2 |
| 19 | -12,514.9768 | 9,591.1335 | 225.1726 | 3.099m | ETW_Sub |
| 20 | -12,514.9768 | 9,591.1335 | 225.5326 | 3.099m | ETW_Pave1 |
| 21 | -12,515.4614 | 9,590.7003 | 225.5076 | 3.749m | Flowline_Gutter |
| 22 | -12,515.4925 | 9,590.6725 | 225.8076 | 3.790m | Top_Curb |
| 23 | -12,515.6044 | 9,590.5726 | 225.8076 | 3.940m | Back_Curb |
| 24 | -12,516.3492 | 9,589.9068 | 225.6476 | 4.939m | EPS_Sub |
| 25 | -12,516.3499 | 9,589.9062 | 225.7476 | 4.940m | Hinge |
| 26 | -12,529.6479 | 9,578.0206 | 216.8299 | 22.776m | Daylight |

CHAINAGE 0+325.00

CHAINAGE 0+350.00

CHAINAGE 0+375.00

6.4. Vertikalni tok trase

Client:

Client

Client Company

Address 1

Date: 7.6.2019. 20:53:21

Prepared by:

Preparer

Your Company Name

123 Main Street

Vertical Alignment: niveleta

Description:

Station Range: Start: 0+000.00, End: 39+618.00

| PVI | Station | Grade Out | Curve Length |
|---|----------|-----------|--------------|
| 0.00 | 0+000.00 | -3.18% | |
| 1.00 | 0+220.00 | -7.92% | 94.275m |
| <u>Vertical Curve Information:(crest curve)</u> ----- PVC Station: 0+172.80 Elevation: 233.502m PVI Station: 0+220.00 Elevation: 232.000m PVT Station: 0+267.08 Elevation: 228.272m High Point: 0+172.80 Elevation: 233.502m Grade in: -3.18% Grade out: -7.92% Change: 4.74% K: Curve Length: 94.275m Passing Distance: Stopping Distance: | | | |
| 2.00 | 0+396.18 | | |

7. PRORAČUN KOLIČINE ZEMLJANIH RADOVA ZA TROŠKOVNIK

Proračun količina zemljanih radova za troškovnik

Cut/Fill Report

Generated: 2019-06-09 19:58:14
 By user: zncg9
 Drawing: C:\Users\zncg9\OneDrive\Desktop\završni rad\C:\Users\zncg9\OneDrive\Desktop\završni rad\korak8.dwg

| Volume Summary | | | | | | | |
|----------------|------|------------|-------------|----------------|--------------|---------------|---------------|
| Name | Type | Cut Factor | Fill Factor | 2d Area (sq.m) | Cut (Cu. M.) | Fill (Cu. M.) | Net (Cu. M.) |
| Surface3 | full | 1.000 | 1.000 | 12232.13 | 7218.28 | 13965.81 | 6747.54<Fill> |
| Totals | | | | | | | |
| | | | | 2d Area (sq.m) | Cut (Cu. M.) | Fill (Cu. M.) | Net (Cu. M.) |
| Total | | | | 12232.13 | 7218.28 | 13965.81 | 6747.54<Fill> |

* Value adjusted by cut or fill factor other than 1.0

8. PRORAČUN KOLIČINE RADOVA PO PRESJECIMA

TABLICA UKUPNOG VOLUMENA ZEMLJANIH RADOVA

TABLICA UKUPNOG VOLUMENA

| Stacionaža | Površina nasipa | Površina usjeka | Volumen nasipa | Volumen usjeka | Kumulativni volumen nasipa | Kumulativni volumen usjeka |
|------------|-----------------|-----------------|----------------|----------------|----------------------------|----------------------------|
| 0+000.00 | 23.09 | 17.71 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0+020.00 | 34.41 | 4.90 | 575.00 | 226.10 | 575.00 | 226.10 |
| 0+040.00 | 9.11 | 19.90 | 435.15 | 248.01 | 1010.15 | 474.11 |
| 0+057.81 | 8.16 | 18.06 | 153.68 | 337.96 | 1163.83 | 812.07 |
| 0+057.81 | 8.16 | 18.06 | 0.02 | 0.05 | 1163.85 | 812.12 |
| 0+060.00 | 8.03 | 18.87 | 17.72 | 40.44 | 1181.57 | 852.56 |
| 0+070.81 | 9.80 | 10.88 | 98.00 | 157.84 | 1279.57 | 1010.41 |
| 0+073.31 | 12.29 | 8.46 | 27.60 | 24.18 | 1307.17 | 1034.58 |
| 0+073.32 | 12.30 | 8.46 | 0.12 | 0.08 | 1307.29 | 1034.66 |
| 0+073.33 | 12.31 | 8.45 | 0.12 | 0.08 | 1307.41 | 1034.74 |
| 0+080.00 | 13.89 | 7.21 | 91.20 | 50.07 | 1398.61 | 1084.81 |
| 0+085.08 | 11.28 | 7.85 | 67.36 | 36.04 | 1465.97 | 1120.85 |
| 0+097.07 | 15.14 | 8.51 | 169.37 | 90.17 | 1635.34 | 1211.02 |
| 0+097.69 | 15.53 | 8.33 | 9.46 | 5.20 | 1644.81 | 1216.22 |
| 0+097.81 | 15.60 | 8.29 | 1.84 | 0.98 | 1646.65 | 1217.20 |
| 0+098.31 | 15.90 | 8.09 | 7.87 | 4.09 | 1654.52 | 1221.29 |
| 0+100.00 | 18.42 | 7.44 | 31.49 | 11.81 | 1686.02 | 1233.10 |
| 0+120.00 | 41.96 | 0.00 | 650.52 | 66.78 | 2336.54 | 1299.89 |
| 0+127.45 | 47.86 | 0.00 | 357.89 | 0.00 | 2694.43 | 1299.89 |
| 0+127.70 | 47.80 | 0.00 | 11.96 | 0.00 | 2706.38 | 1299.89 |
| 0+140.00 | 60.86 | 0.00 | 725.44 | 0.00 | 3431.82 | 1299.89 |
| 0+157.10 | 76.05 | 0.00 | 1307.45 | 0.00 | 4739.27 | 1299.89 |
| 0+157.74 | 76.47 | 0.00 | 48.57 | 0.00 | 4787.84 | 1299.89 |
| 0+158.37 | 76.88 | 0.00 | 48.70 | 0.00 | 4836.55 | 1299.89 |
| 0+160.00 | 77.86 | 0.00 | 140.99 | 0.00 | 4977.54 | 1299.89 |
| 0+170.35 | 58.41 | 0.00 | 775.41 | 0.02 | 5752.95 | 1299.91 |
| 0+172.80 | 53.50 | 0.00 | 147.31 | 0.01 | 5900.25 | 1299.91 |
| 0+180.00 | 40.11 | 6.40 | 356.34 | 21.73 | 6256.59 | 1321.64 |
| 0+182.10 | 35.57 | 8.13 | 79.39 | 15.24 | 6335.98 | 1336.88 |
| 0+182.10 | 35.56 | 8.13 | 0.06 | 0.01 | 6336.04 | 1336.89 |
| 0+182.10 | 35.56 | 8.13 | 0.05 | 0.01 | 6336.10 | 1336.90 |
| 0+184.10 | 31.13 | 9.55 | 66.69 | 17.68 | 6402.78 | 1354.58 |
| 0+197.10 | 7.49 | 25.01 | 254.92 | 221.20 | 6657.70 | 1575.78 |

| Stacionaža | Površina nasipa | Površina usjeka | Volumen nasipa | Volumen usjeka | Kumulativni volumen nasipa | Kumulativni volumen usjeka |
|------------|-----------------|-----------------|----------------|----------------|----------------------------|----------------------------|
| 0+197.10 | 7.49 | 25.01 | 0.01 | 0.03 | 6657.71 | 1575.81 |
| 0+200.00 | 3.03 | 30.09 | 15.24 | 79.86 | 6672.95 | 1655.67 |
| 0+215.90 | 0.36 | 78.51 | 26.93 | 863.30 | 6699.87 | 2518.97 |
| 0+220.00 | 0.00 | 89.76 | 0.74 | 345.03 | 6700.61 | 2864.00 |
| 0+220.90 | 0.00 | 92.68 | 0.00 | 82.00 | 6700.61 | 2946.00 |
| 0+220.91 | 0.00 | 92.71 | 0.00 | 0.75 | 6700.61 | 2946.75 |
| 0+220.92 | 0.00 | 92.73 | 0.00 | 0.75 | 6700.61 | 2947.51 |
| 0+221.44 | 0.00 | 94.03 | 0.00 | 48.73 | 6700.61 | 2996.23 |
| 0+231.86 | 3.34 | 104.18 | 15.25 | 1110.14 | 6715.86 | 4106.38 |
| 0+240.00 | 8.73 | 85.72 | 36.31 | 897.03 | 6752.17 | 5003.41 |
| 0+243.67 | 20.11 | 57.90 | 34.54 | 321.70 | 6786.71 | 5325.12 |
| 0+244.78 | 24.07 | 50.29 | 15.24 | 73.60 | 6801.95 | 5398.72 |
| 0+245.90 | 28.66 | 42.85 | 18.23 | 64.96 | 6820.18 | 5463.68 |
| 0+245.90 | 28.66 | 42.85 | 0.01 | 0.02 | 6820.19 | 5463.70 |
| 0+260.00 | 140.78 | 0.00 | 967.31 | 377.88 | 7787.50 | 5841.58 |
| 0+262.32 | 152.70 | 0.00 | 291.70 | 0.00 | 8079.20 | 5841.58 |
| 0+267.08 | 139.44 | 0.00 | 579.56 | 0.00 | 8658.76 | 5841.58 |
| 0+278.75 | 79.79 | 0.00 | 956.42 | 0.00 | 9615.18 | 5841.58 |
| 0+278.75 | 79.79 | 0.00 | 0.04 | 0.00 | 9615.22 | 5841.58 |
| 0+279.83 | 75.40 | 0.00 | 54.26 | 0.00 | 9669.48 | 5841.58 |
| 0+280.00 | 74.80 | 0.00 | 13.14 | 0.00 | 9682.61 | 5841.58 |
| 0+280.89 | 71.59 | 3.02 | 42.12 | 1.66 | 9724.73 | 5843.23 |
| 0+292.73 | 42.69 | 18.85 | 485.15 | 152.58 | 10209.88 | 5995.81 |
| 0+300.00 | 37.30 | 20.76 | 244.56 | 158.45 | 10454.44 | 6154.26 |
| 0+303.21 | 34.36 | 22.34 | 104.94 | 73.06 | 10559.38 | 6227.32 |
| 0+303.68 | 34.45 | 22.38 | 16.35 | 10.62 | 10575.73 | 6237.95 |
| 0+303.71 | 34.45 | 22.38 | 1.08 | 0.70 | 10576.81 | 6238.65 |
| 0+303.75 | 34.46 | 22.38 | 1.09 | 0.71 | 10577.90 | 6239.35 |
| 0+308.75 | 35.90 | 22.31 | 175.88 | 111.73 | 10753.78 | 6351.09 |
| 0+320.00 | 33.51 | 16.41 | 390.56 | 217.91 | 11144.34 | 6569.00 |
| 0+340.00 | 49.59 | 9.13 | 831.01 | 255.41 | 11975.35 | 6824.41 |
| 0+360.00 | 43.15 | 0.01 | 927.45 | 91.43 | 12902.80 | 6915.84 |
| 0+380.00 | 25.59 | 8.20 | 687.41 | 82.06 | 13590.21 | 6997.90 |
| 0+396.18 | 11.00 | 22.17 | 295.91 | 245.59 | 13886.12 | 7243.49 |

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