Idejni projekt lokalne ceste

Čondić-Galiničić, Zvonimir Nediljko

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SVEUČILIŠTE U SPLITU
FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE

ZAVRŠNI RAD

Zvonimir Nediljko Čondić-Galiničić

Split, 2019

SVEUČILIŠTE U SPLITU
FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE

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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

SVEUČILIŠTE U SPLITU
FAKULTET GRAĐEVINARSTVA, ARHITEKTURE
I GEODEZIJE

Split, ak.god. 2018/2019.

Katedra za prometnice

Studij: Preddiplomski

Nastavni predmet: CESTE

Student/ica: Zvonimir Nediljko Čondić-Galinčić

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=30km/h

b) HORIZONTALNI ELEMENTI

Za određenu kategoriju prema pravilniku, minimalni radijus krivine je 45m, a prijelaznice 30m.Trasa konsturirane ceste ima dužinu od 396,18 m, a sastoji se od tri pravaca i dvije krivine.Krivina s početkom na stacionaži 0+097.81 m ima radijus R= 70m i duljinu prijelaznice L=40 m. Krivina s početkom na stacionaži 0+245.90 m ima radijus R= 30 m i duljinu prijelazne krivine L=30 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 pravaca 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 .

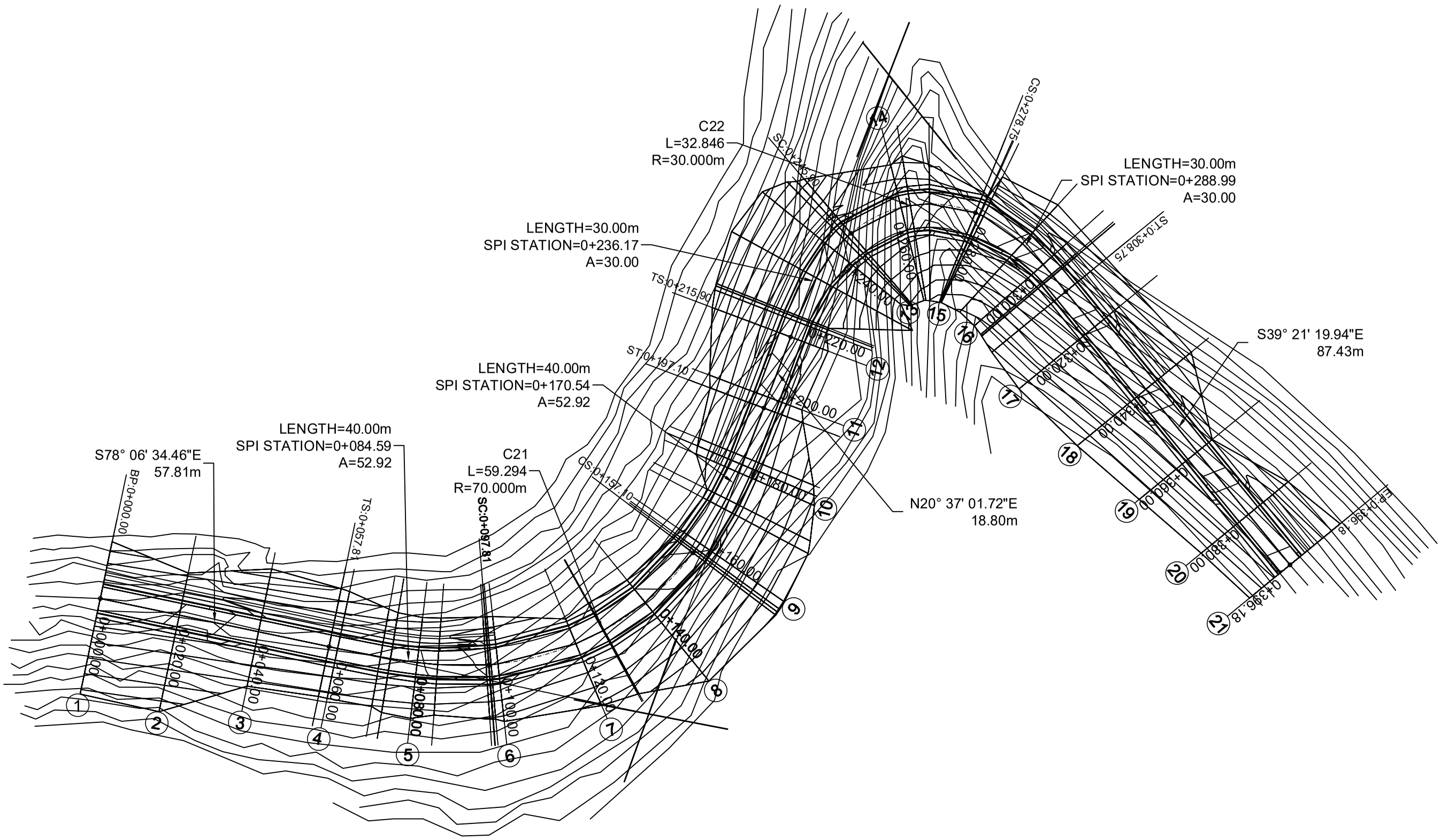
e) KOLNIČKA KONSTRUKCIJA

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.

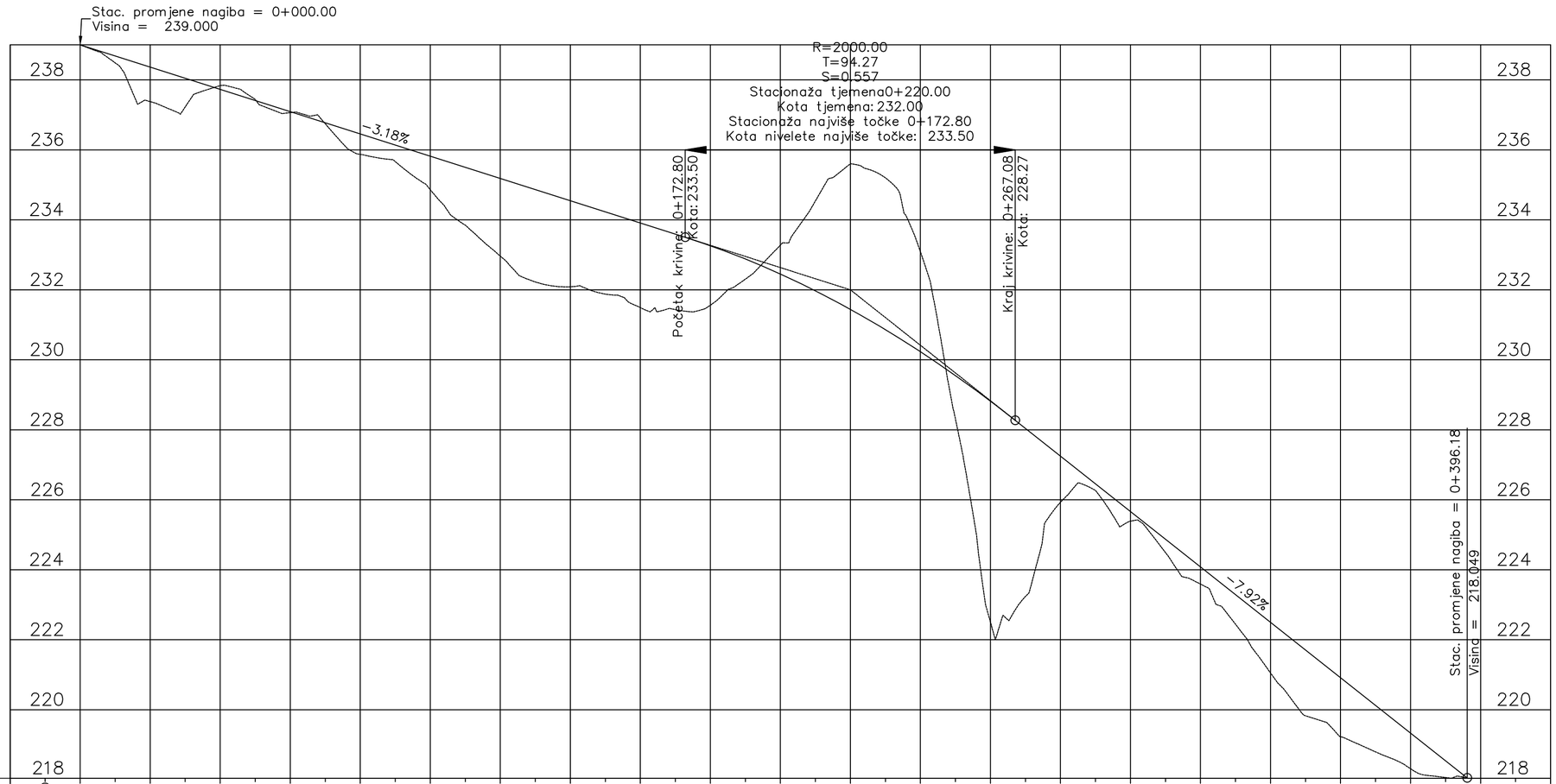
2. GRAĐEVINSKA SITUACIJA
M 1:1000



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: Situacija	MJERILO: 1:1000
	DATUM: lipanj 2019.	BROJ PRILOGA: 1

3. UZDUŽNI PRESJEK
M 1:1000 / M 1:100

OS 1 PROFILE


Stac. promjene nagiba = 0+000.00
Visina = 239.000
R=2000.00
T=94.27
S=0.557
Stacionaža tjemena0+220.00
Kota tjemena: 232.00
Stacionaža najviše točke 0+172.80
Kota nivelete najviše točke: 233.50
-3.18%
Početak krivine: 0+172.80
Kota: 233.50
Kraj krivine: 0+267.08
Kota: 228.27
-7.92%
Stac. promjene nagiba = 0+396.18
Visina = 218.049
238
236
234
232
230
228
226
224
222
220
218

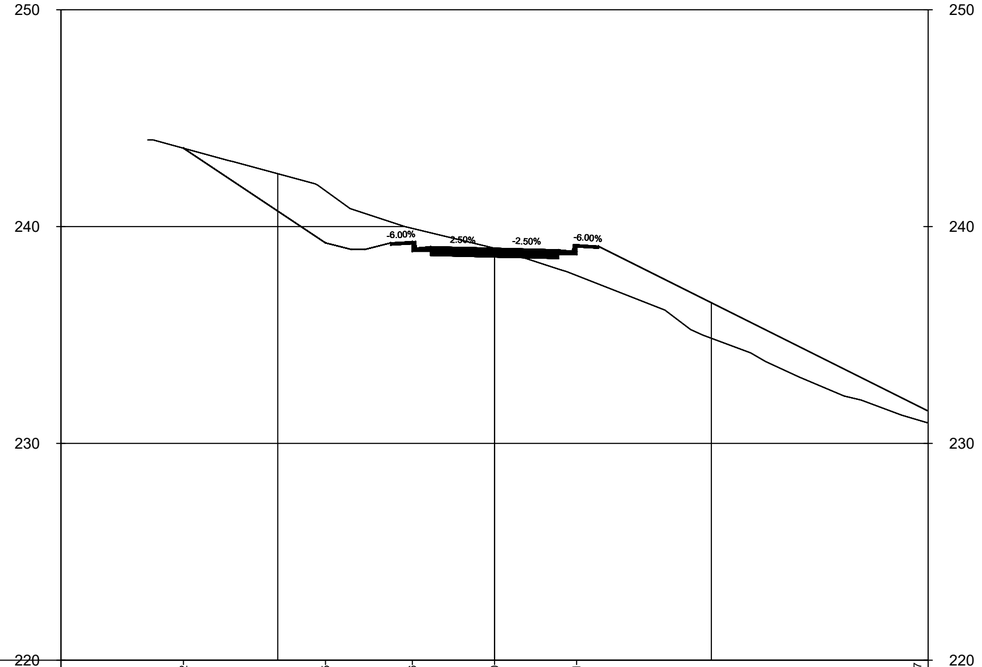
| | | |

4. KARAKTERISTIČNI POPREČNI PRESJECI

M 1:100

0+000.00

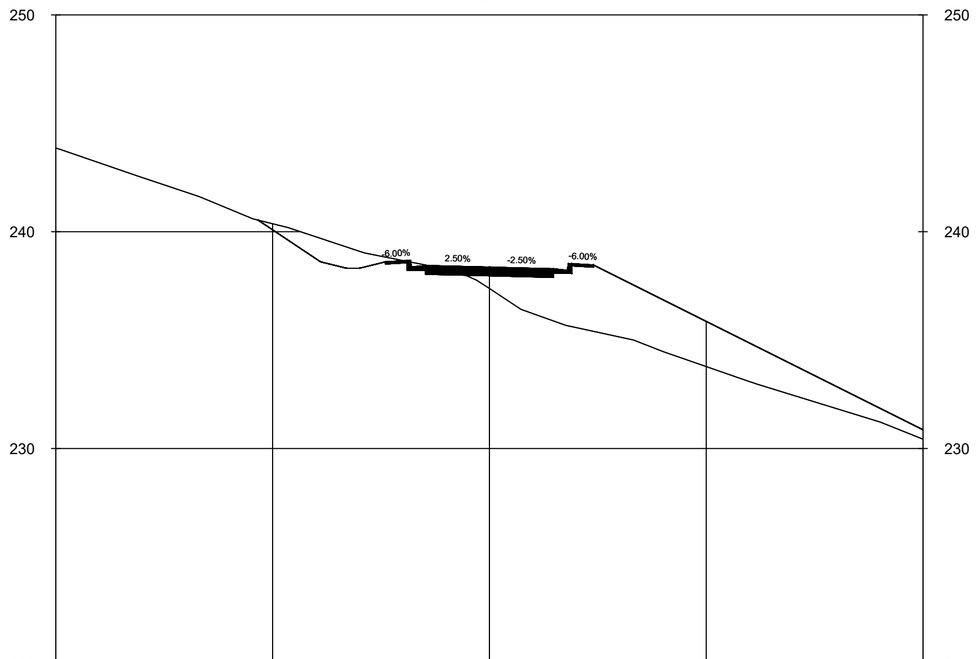
PRESJEK 1



Kote projekta		243.62	239.25	238.86	238.60	238.71	231.497
Udaljenost od osi	-20.000	-14.35	-7.79	-3.79	0.000	3.79	20.000
Kote terena		243.62	239.25	238.86	238.60	238.71	231.50

0+020.00

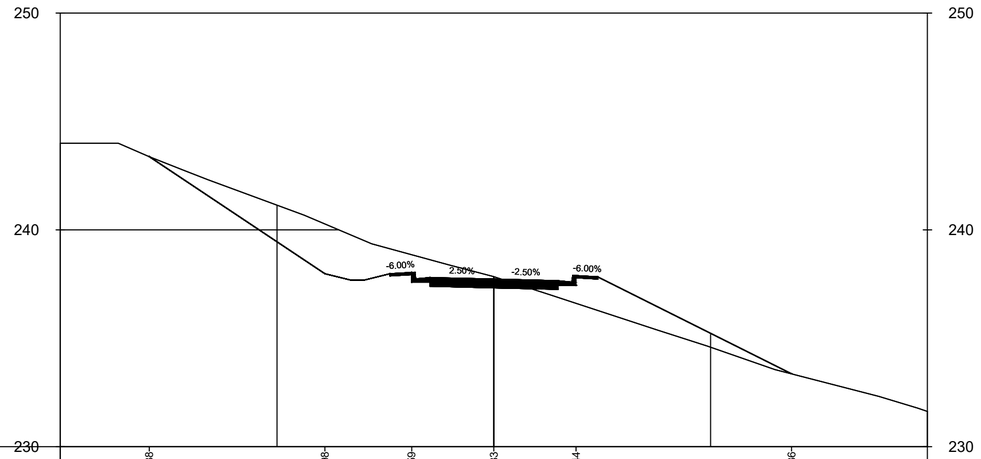
PRESJEK 2



Kote projekta		240.53	238.61	238.22	237.96	238.07	230.861
Udaljenost od osi	-20.000	-10.67	-7.79	-3.79	0.00	3.79	20.000
Kote terena		240.53	238.61	238.22	237.96	238.07	230.86

0+040.00

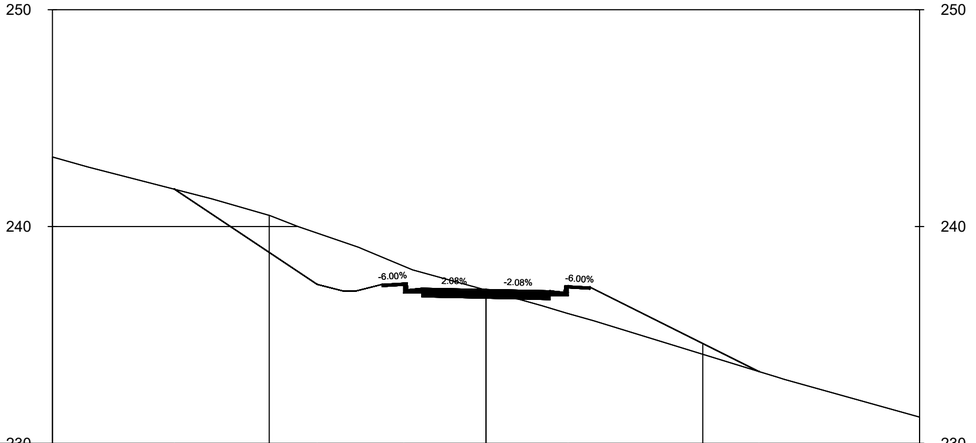
PRESJEK 3



Kote projekta		243.38	237.98	237.59	237.33	237.44	233.36
Udaljenost od osi	-20.000	-15.89	-7.79	-3.79	0.000	3.79	13.73	20.000
Kote terena		243.38	237.98	237.59	237.33	237.44	233.36

0+060.00

PRESJEK 4



Kote projekta		241.72	237.33	236.94	236.69	236.81	233.30
Udaljenost od osi	-20.000	-14.38	-7.79	-3.79	0.00	3.79	12.59	20.000
Kote terena		241.72	237.33	236.94	236.69	236.81	233.30

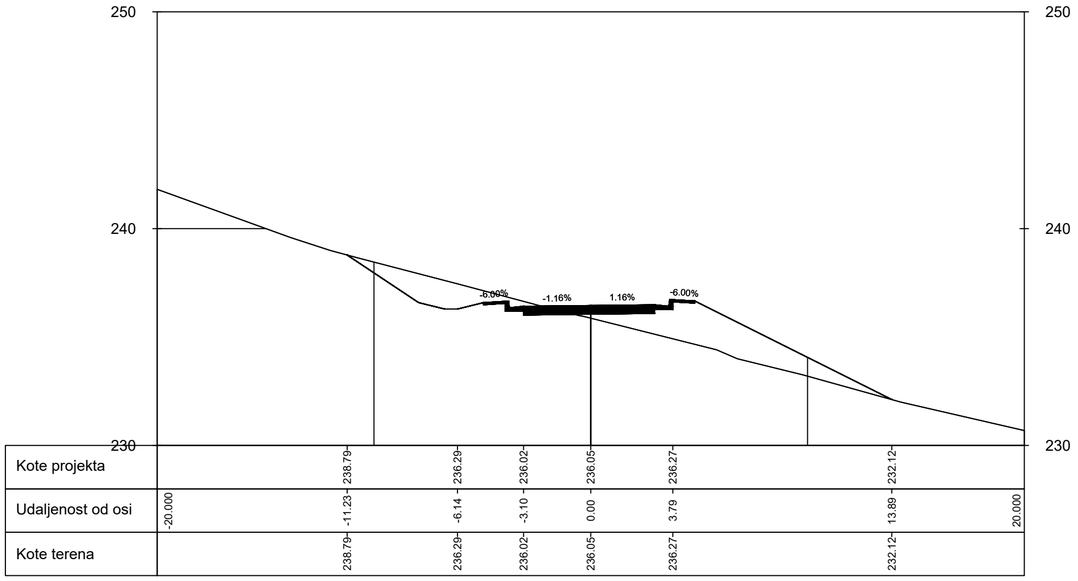
SVEUČILIŠTE U SPLITU
FAKULTET GRAĐEVINARSTVA
ARHITEKTURE I GEODEZIJE
21000 SPLIT, MATICE HRVATSKE 15

Završni rad

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

0+080.00

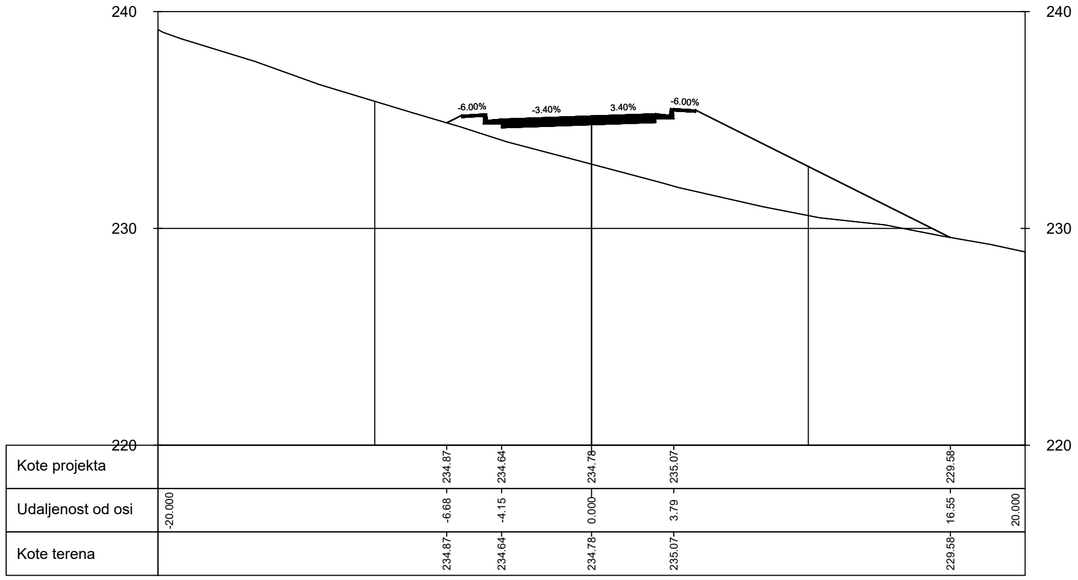
PRESJEK 5



Kote projekta	238.79	236.29	236.02	236.05	236.27	232.12		
Udaljenost od osi	-20.000	-11.23	-6.14	-3.10	0.00	3.79	13.89	20.000
Kote terena	238.79	236.29	236.02	236.05	236.27	232.12		

0+120.00

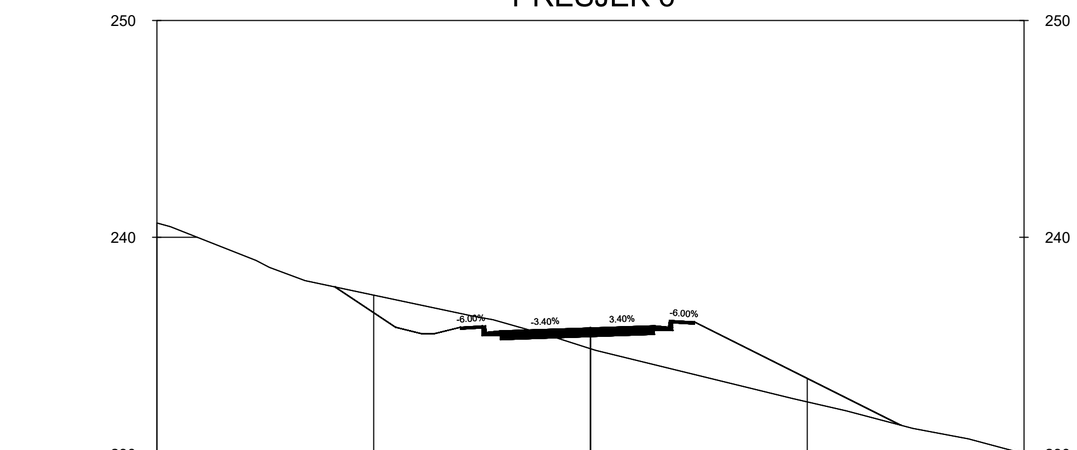
PRESJEK 7



Kote projekta	234.87	234.64	234.78	235.07	229.58		
Udaljenost od osi	-20.000	-6.68	-4.15	0.000	3.79	16.55	20.000
Kote terena	234.87	234.64	234.78	235.07	229.58		

0+100.00

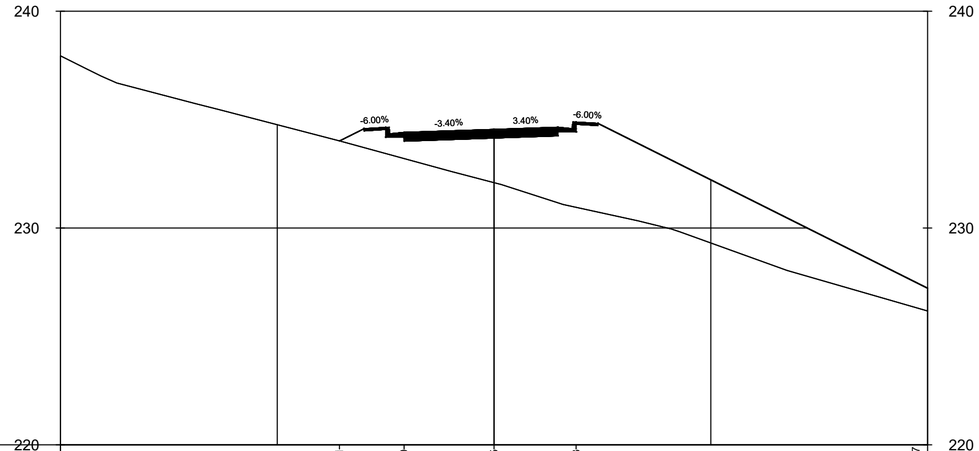
PRESJEK 6



Kote projekta	237.71	235.55	235.28	235.42	235.70	231.34	
Udaljenost od osi	-20.000	-11.77	-7.19	-4.15	0.000	3.79	14.31	20.000
Kote terena	237.71	235.55	235.28	235.42	235.70	231.34		

0+140.00

PRESJEK 8



Kote projekta	234.01	234.00	234.15	234.43	227.217		
Udaljenost od osi	-20.000	-7.12	-4.15	0.00	3.79	20.000	20.000
Kote terena	234.01	234.00	234.15	234.43	227.22		

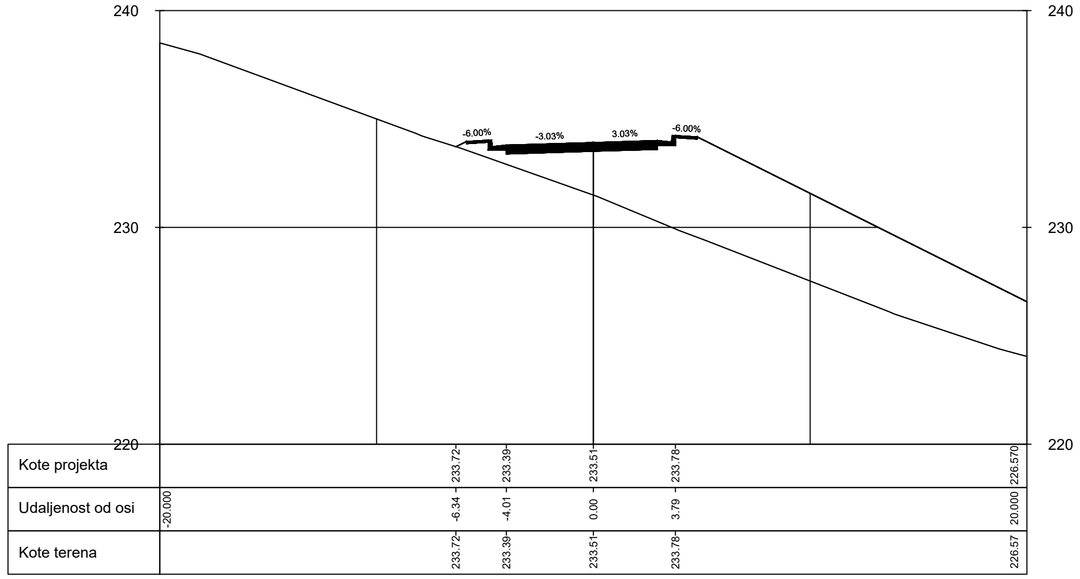
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21000 SPLIT, MATICE HRVATSKE 15

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STUDENT	Zvonimir Nediljko Čondić-Galiničić, 4531
SADRŽAJ	Poprečni presjeci
MJERILO	1:200
BROJ PRILOGA	1
DATUM	lipanj 2019.

0+160.00

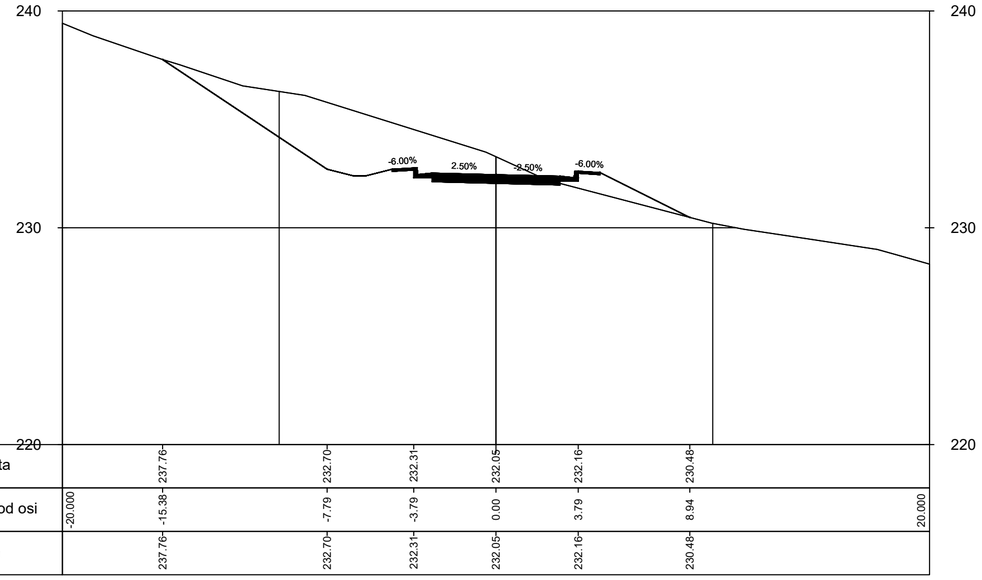
PRESJEK 9



Kote projekta		233.72	233.39	233.51	233.78	226.570
Udaljenost od osi	-20.000	-6.34	-4.01	0.00	3.79	20.000
Kote terena		233.72	233.39	233.51	233.78	226.57

0+200.00

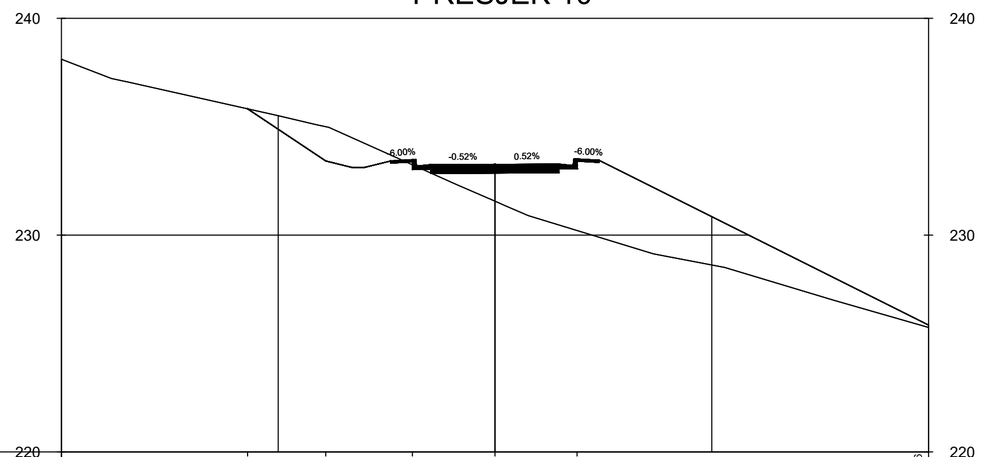
PRESJEK 11



Kote projekta		237.76	232.70	232.31	232.05	232.16	230.48	
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+180.00

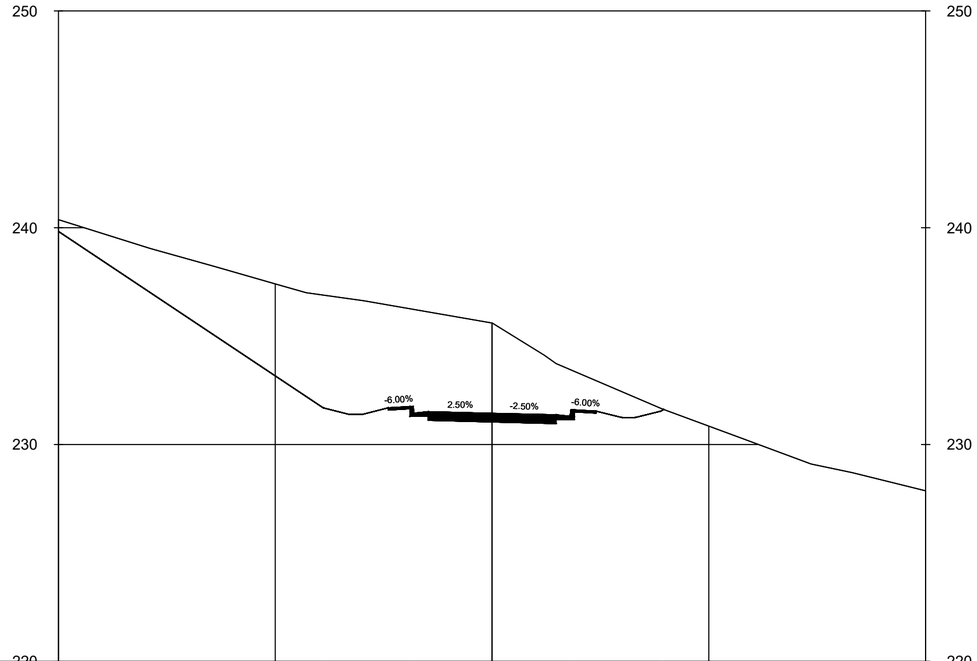
PRESJEK 10



Kote projekta		235.82	233.42	233.03	232.86	233.06	225.846
Udaljenost od osi	-20.000	-11.41	-7.81	-3.81	0.000	3.79	20.000
Kote terena		235.82	233.42	233.03	232.86	233.06	225.85

0+220.00

PRESJEK 12



Kote projekta	239.830	231.69	231.30	231.04	231.15	231.54	231.625	
Udaljenost od osi	-20.000	-7.79	-3.79	0.000	3.79	7.79	7.91	20.000
Kote terena	239.83	231.69	231.30	231.04	231.15	231.54	231.62	

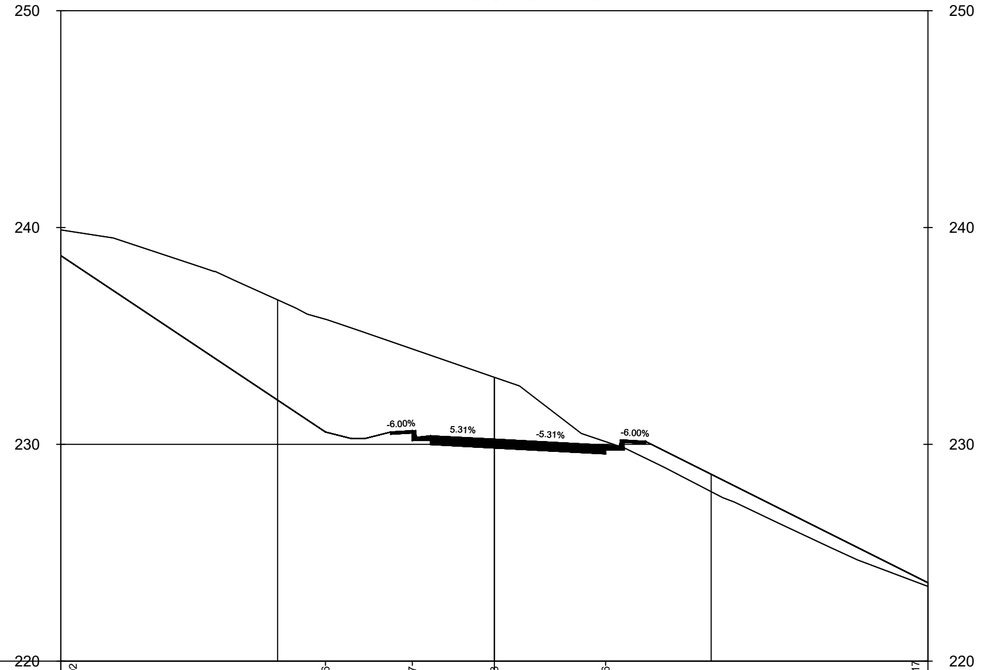
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SADRŽAJ	Poprečni presjeci
MJERILO	1:200
BROJ PRILOGA	1
DATUM	lipanj 2019.

0+240.00

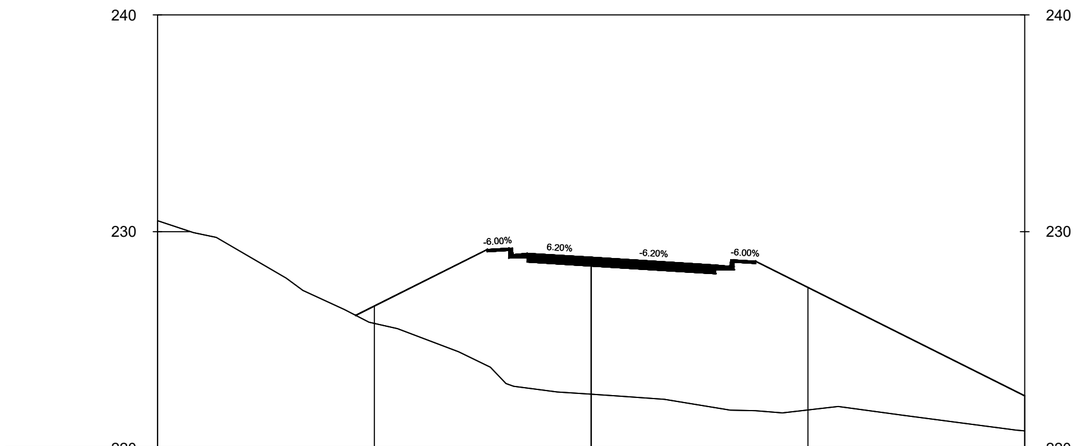
PRESJEK 13



Kote projekta	238.702	230.56	230.17	229.83	229.56	223.617
Udaljenost od osi	-20.000	-7.79	-3.79	0.000	5.12	20.000
Kote terena	238.70	230.56	230.17	229.83	229.56	223.62

0+260.00

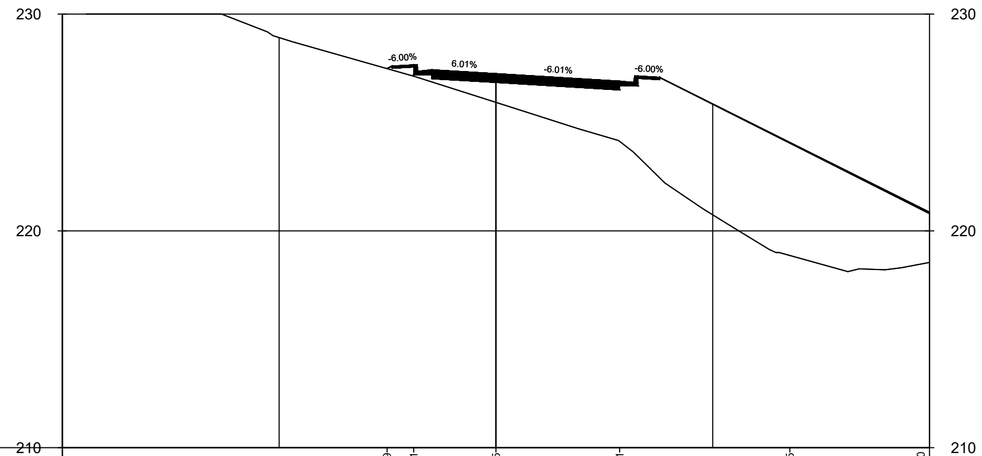
PRESJEK 14



Kote projekta	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	

0+280.00

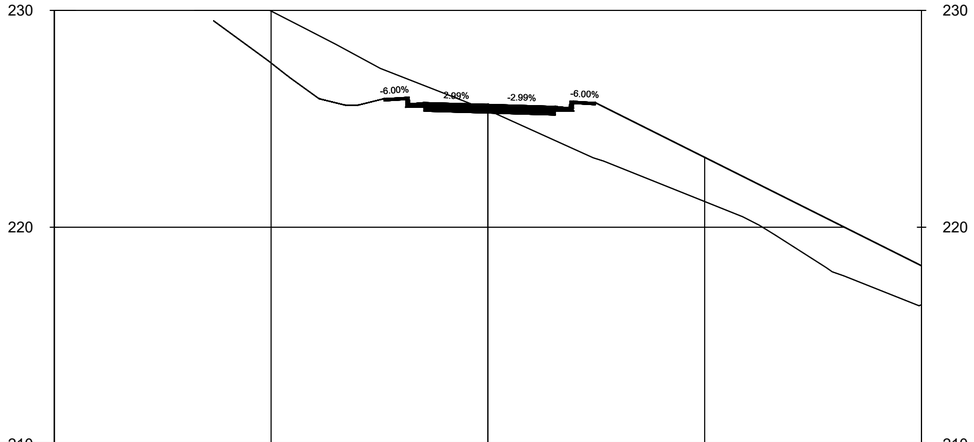
PRESJEK 15



Kote projekta		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

0+300.00

PRESJEK 16



Kote projekta		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

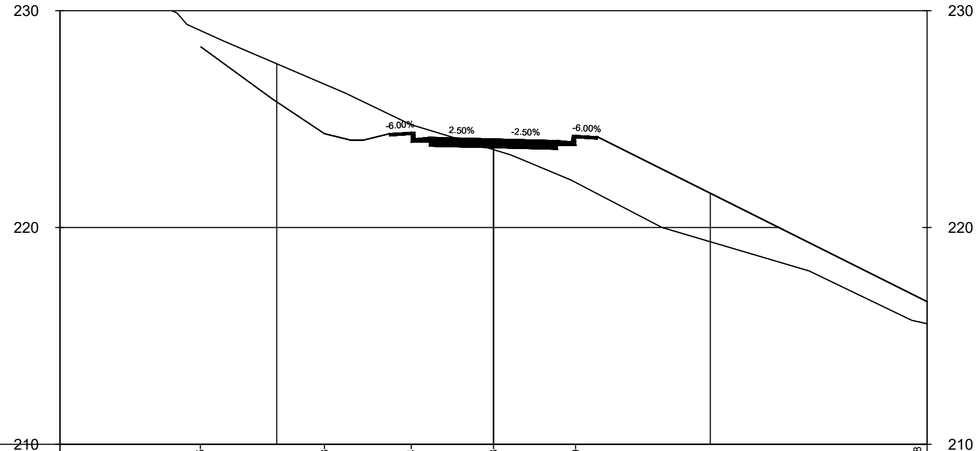
SVEUČILIŠTE U SPLITU
FAKULTET GRAĐEVINARSTVA ARHITEKTURE I GEODEZIJE
21000 SPLIT, MATICE HRVATSKE 15

Završni rad

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

0+320.00

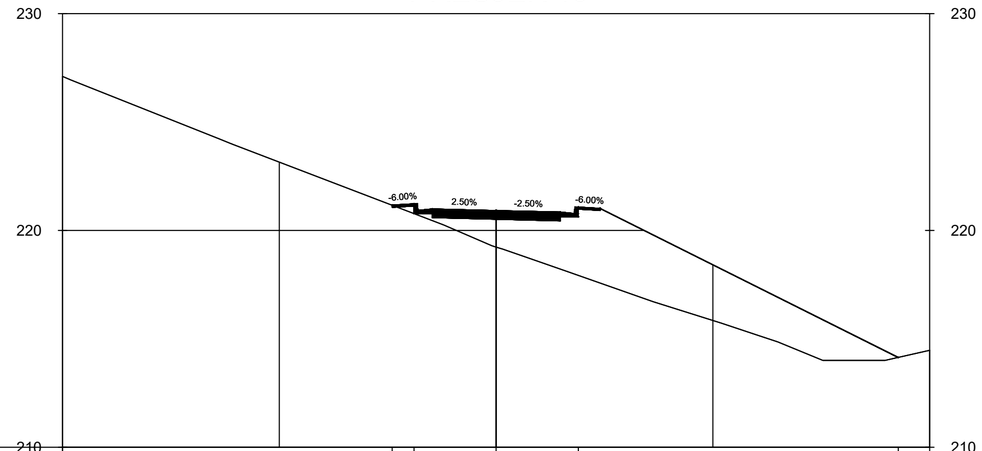
PRESJEK 17



Kote projekta	228.35	224.33	223.94	223.68	223.79		216.578
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

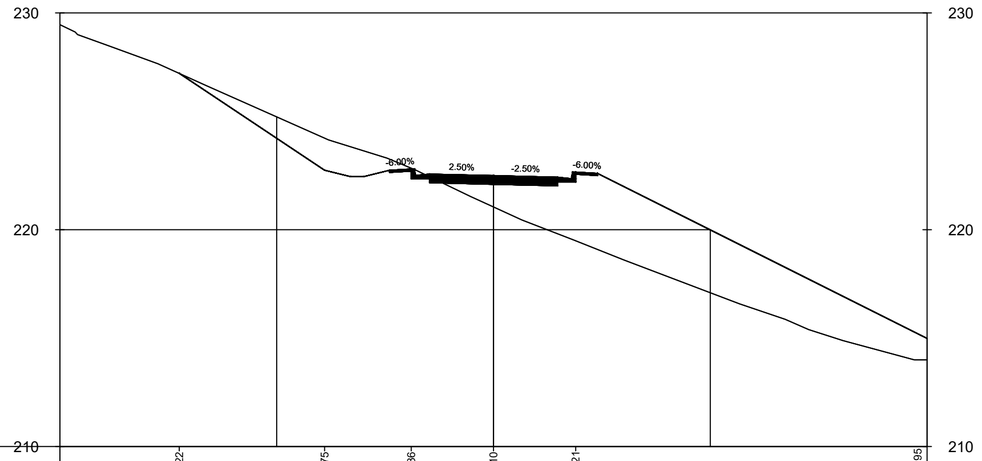
PRESJEK 19



Kote projekta	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	20.000
Kote terena	221.16	220.77	220.51	220.63		214.14	

0+340.00

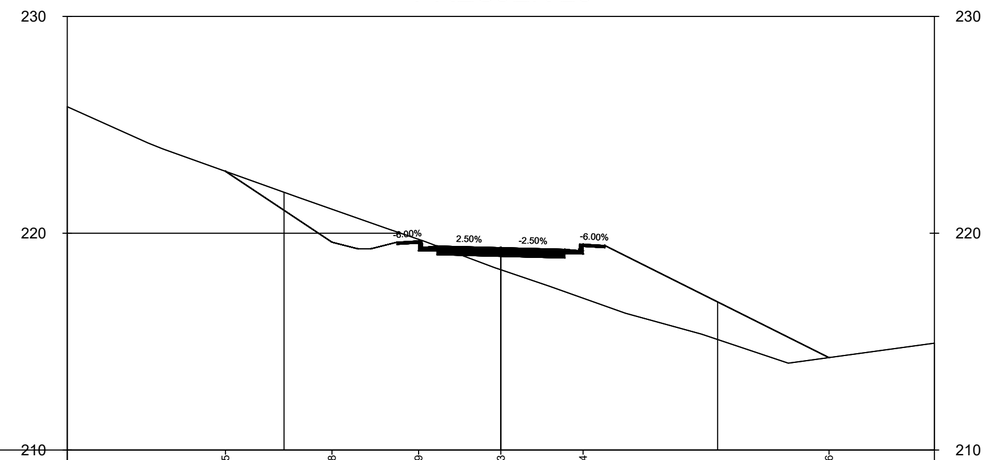
PRESJEK 18



Kote projekta	227.22	222.75	222.36	222.10	222.21		214.995
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	222.85	219.58	219.19	218.93	219.04		214.26	
Udaljenost od osi	-20.000	-12.70	-7.79	-3.79	0.00	3.79	15.14	20.000
Kote terena	222.85	219.58	219.19	218.93	219.04		214.26	

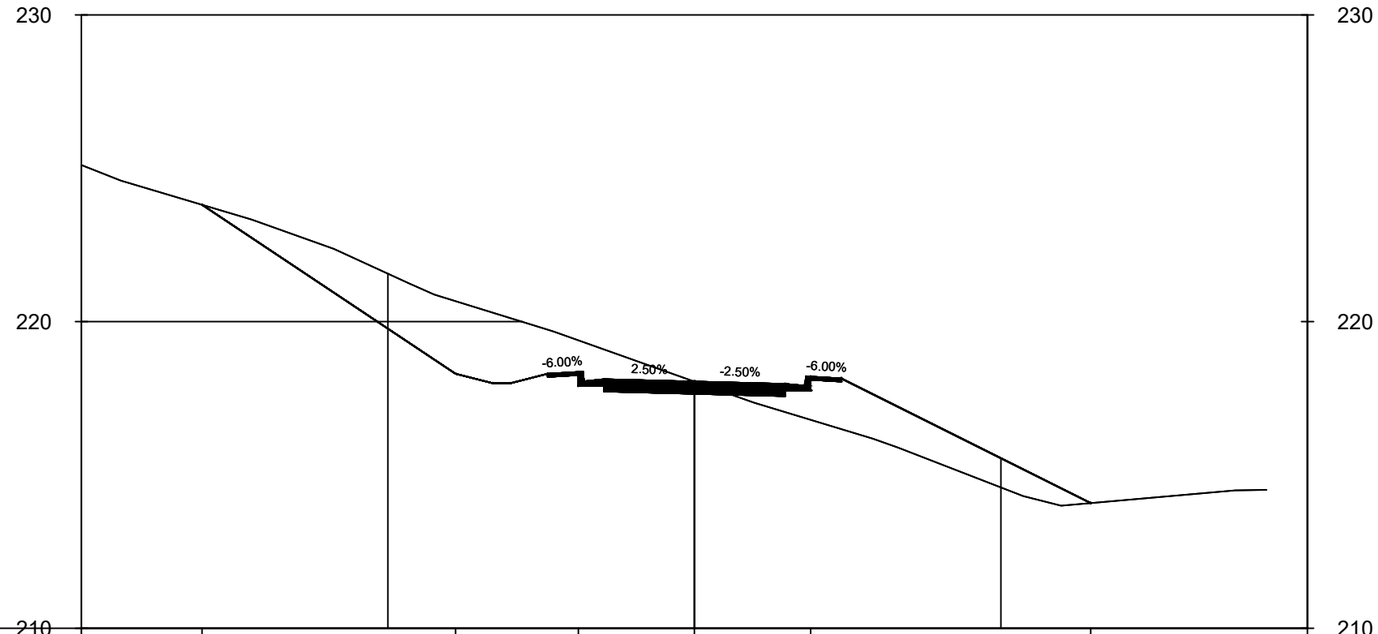
SVEUČILIŠTE U SPLITU
FAKULTET GRAĐEVINARSTVA ARHITEKTURE I GEODEZIJE
21000 SPLIT, MATICE HRVATSKE 15

Završni rad

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

0+396.18

PRESJEK 21



Kote projekta		223.82		218.30	217.91	217.65	217.76	214.08
Udaljenost od osi	-20.000	-16.07		-7.79	-3.79	0.000	3.79	12.92	20.000
Kote terena		223.82		218.30	217.91	217.65	217.76	214.08	

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

BROJ PRILOGA: 1

DATUM: lipanj 2019.

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 riješavamo horizontalnu geometriju.Idući korak je izračun dijagrama vitoperenja te riješavanje 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:

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	9510.600	-12745.842
End:	0+57.807	9498.689	-12689.275

Tangent Data

Parameter	Value	Parameter	Value
Length:	57.807	Course:	S 78° 06' 34.4610" E

Spiral Point Data

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

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:	S 83° 33' 45.1258" E

Curve Point Data

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

Circular Curve Data

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

Spiral Point Data

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

Prepared by:
Preparer
Your Company Name
123 Main Street

Date: 7.6.2019. 20:46:56

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:	**Prepared by:**
Client	Preparer
Client Company	Your Company Name
Address 1	123 Main Street

Date: 7.6.2019. 20:51:30

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

Prepared by:
Preparer
Your Company Name
123 Main Street

Date: 7.6.2019. 20:53:21

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
	Vertical Curve Information:(crest curve) 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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