Idejni projekt ceste

Vučko, Hrvoje

Undergraduate thesis / Završni rad

2016

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SVEUČILIŠTE U SPLITU
FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE

ZAVRŠNI RAD

Hrvoje Vučko

Split, 2015./2016.

SVEUČILIŠTE U SPLITU
FAKULTET GRAĐEVINARSTVA, ARHITEKTURE I GEODEZIJE

IDEJNI PROJEKT CESTE

Završni rad

Split, 2015./2016.

Sažetak:

Priložen je idejni projekt ceste 5.kategorije na geodetskoj podlozi u mjerilu 1:1000, izrađene u programu AutoCad Civil 3D Metric.

Ključne riječi:

Idejni projekt ceste

Abstract:

Attached is a preliminary design of the road 5.category on the geodetic surveying in scale 1:1000, made in AutoCad CIVIL 3D Metric.

Keywords:

The preliminary design of the road

SADRŽAJ:

1. Tehnički opis
2. Situacija
3. Vitoperenje
4. Uzdužni presjek
5. Karakteristični poprečni presjeci

PRILOZI:

Prilog 1- Horizontalni tok trase
Prilog 2- Koordinatni račun detaljnih točaka osi
Prilog 3- Račun kota kolnika
Prilog 4- Vertikalni tok trase

TEHNIČKI OPIS

1)OPĆENITO

-Izrađen je idejni projekt ceste na priloženoj geodetskoj podlozi. Cesta je 5. kategorije s PGDP-om koji iznosi 950 vozila na dan. Projektna brzina zadane trase iznosi 40km/h, dok predviđena duljina trase iznosi 278.14 metara.

2)HORIZONTALNI ELEMENTI

-Za projektnu brzinu od 40 km/h minimalni dozvoljen radijus iznosi 45 m, a minimalno dozvoljena duljina prijelaznice iznosi 30 m.
-Projektirana trasa ima dvije krivine. U prvoj krivini radijus iznosi 90 m, a prijelazna krivina iznosi 30 m. U drugoj krivini radijus iznosi 45 m, a duljina prijelazne krivine iznosi 30 m.

3)VERTIKALNI ELEMENTI

-Za cestu 5. kategorije i projektne brzine 40 km/h, maksimalni dozvoljeni nagib nivelete iznosi 12%, minimalni radijus konveksne vertikalne krivine iznosi 300 m , konkavne vertikalne krivine iznosi 200 m.
Primijenjen je konkavni radijus od 5000m.
-Niveleta se sastoji od dvije tangente s ubačenim vertikalnim kružnim lukom. Prva tangenta ima nagib od 6,84%, a drugi nagib je predviđen u padu od 3,52%.

4)POPREČNI PRESJEK

-Poprečni presjek se sastoji od dva prometna traka širine 3,00m. Predviđeni poprečni nagib kolnika u pravcu iznosi 2.5%, a maksimalni predviđeni poprečni nagib u krivini iznosi 7%. Ugrađen je betonski rubni trak širine 20 cm, jednakog poprečnog nagiba kao i prometni trak. Bankina i berma su širine 1 m, poprečni nagib bankine iznosi 4%, a poprečni nagib berme iznosi 5%. Trasa se velikim dijelom svoje dužine nalazi u zasjeku, a tek malim dijelom u nasipu. Nagib pokosa usjeka iznosi 1:1, a nagib pokosa nasipa iznosi 1:1.5.

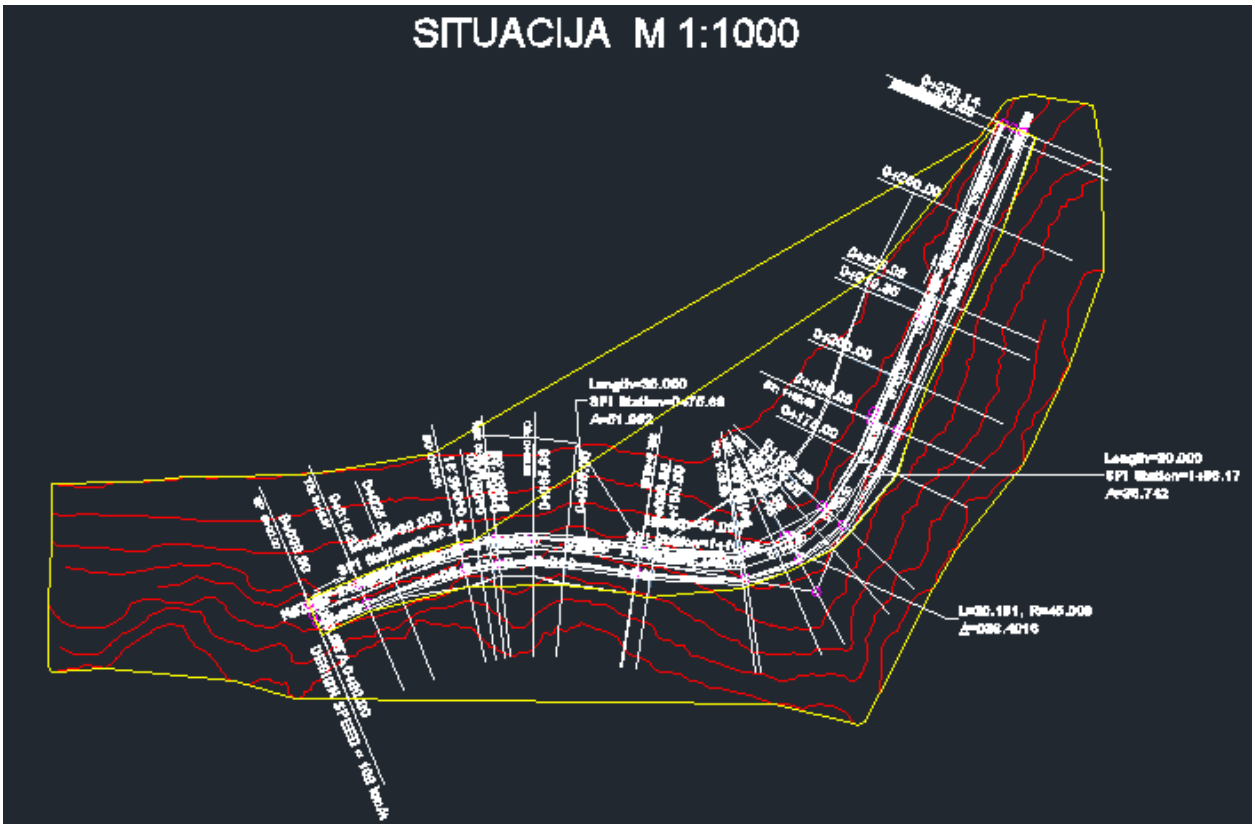
5)KOLNIČKA KONSTRUKCIJA

-Projektom je predviđena sljedeća kolnička konstrukcija:
-habajući sloj (asfalt-beton) AB 11
-bitumenizirani nosivi sloj BNS 22
-mehanički zbijeni nosivi sloj 30 cm

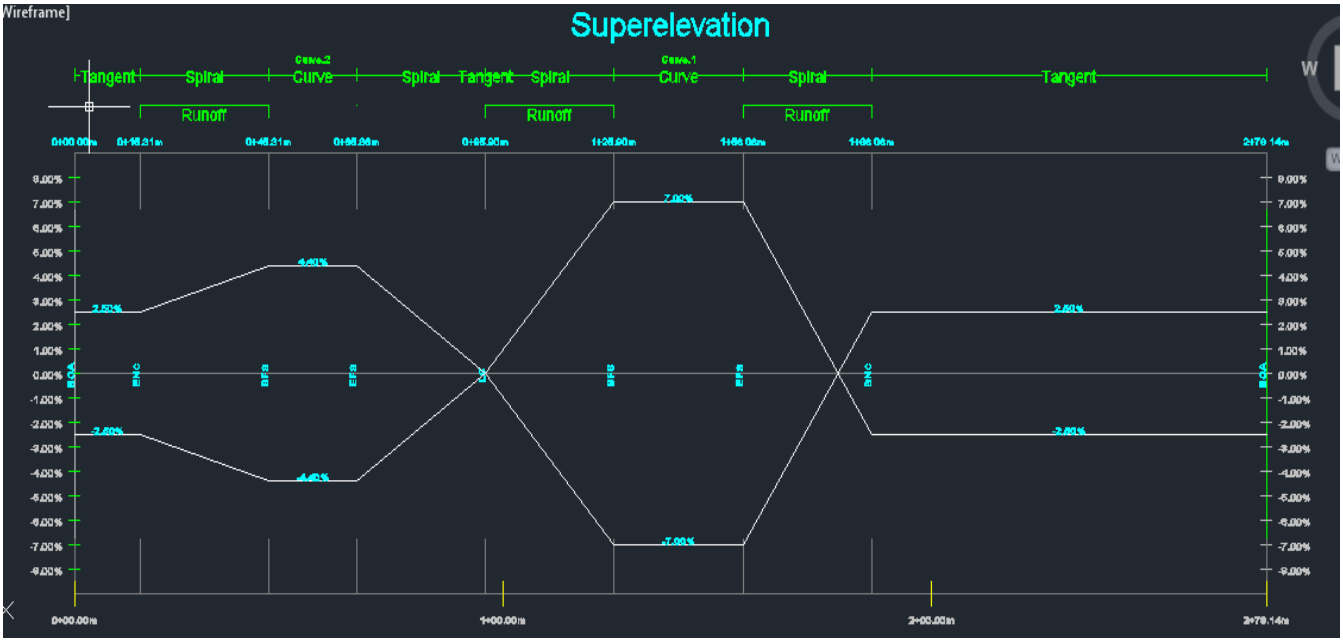
6)ODVODNJA

-Odvodnja kolnika predviđa se otvorenim sustavom odvodnje prihvaćanjem kolničkih i pribrežnih voda u zasjeku i usjeku u betonske rigole, te dalje kontroliranom odvodnjom preko drenažnih cijevi direktno u teren.

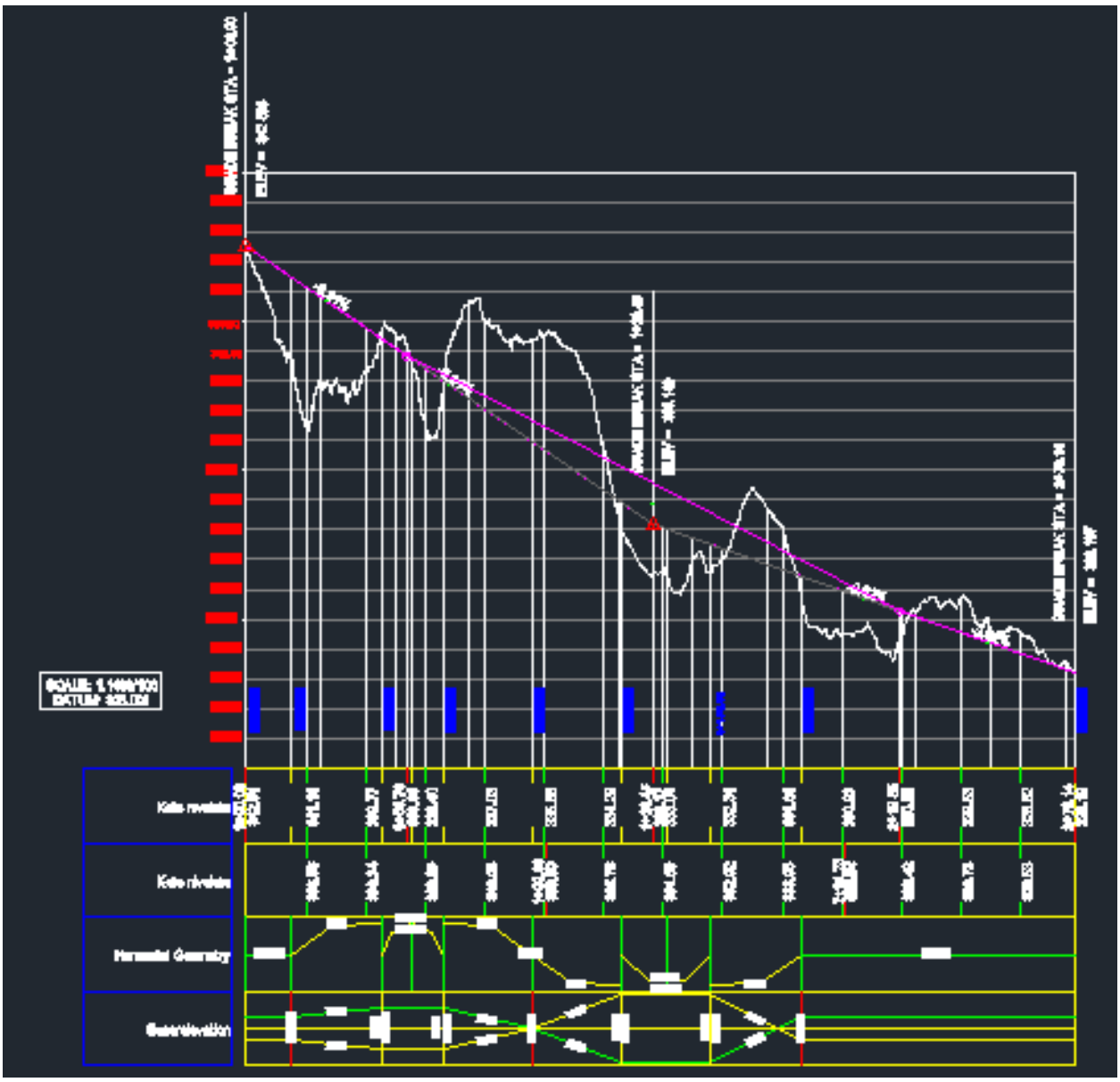
SITUACIJA



VITOPERENJE

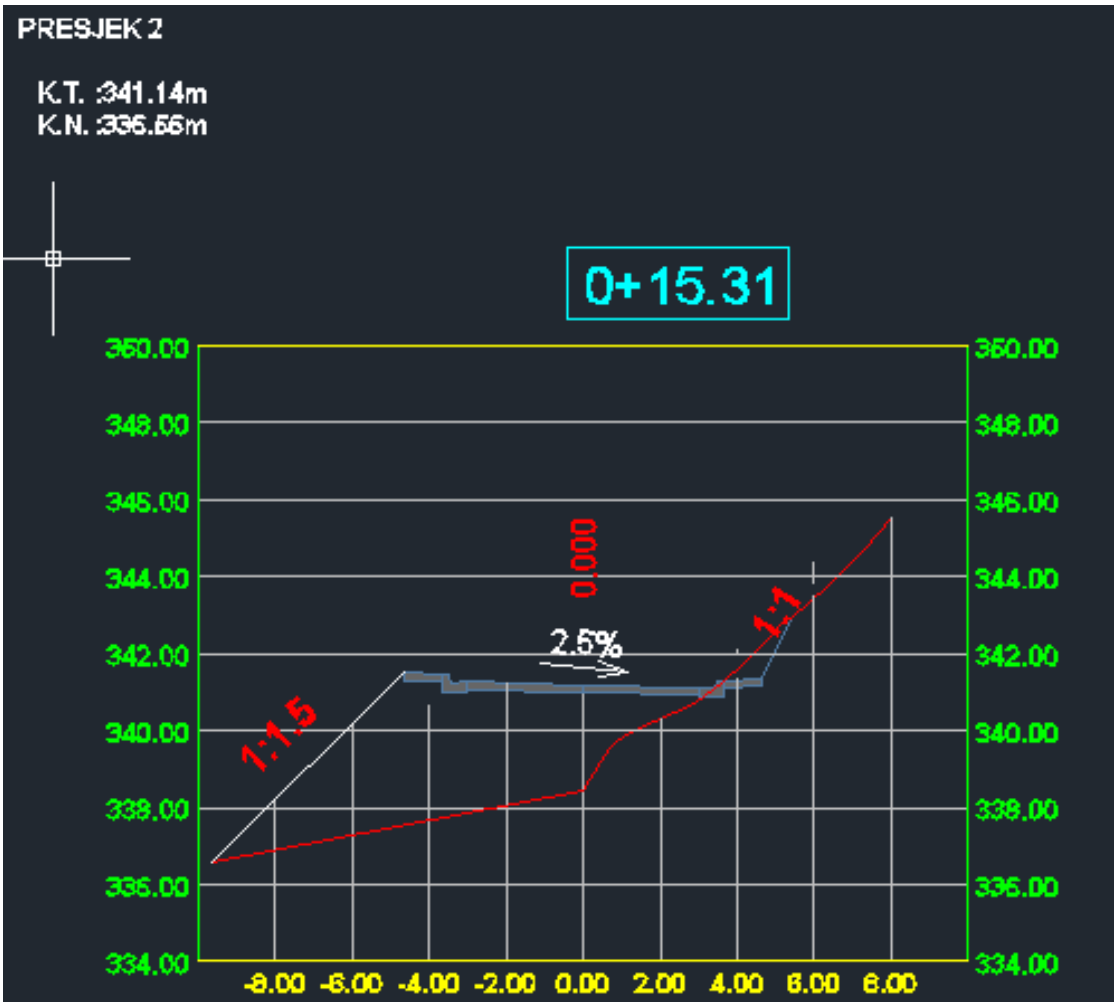


UZDUŽNI PRESJEK

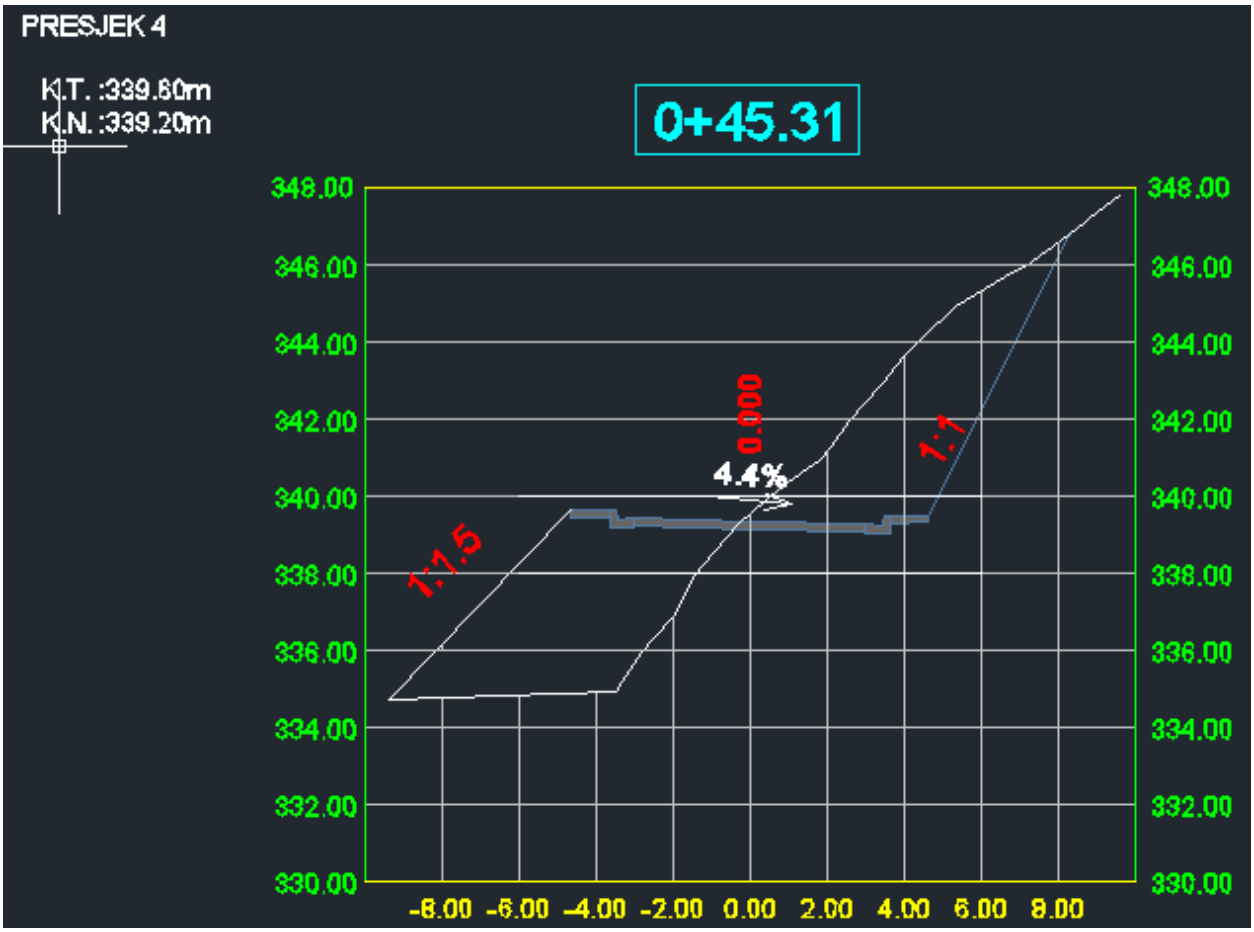


KARAKTERISTIČNI POPREČNI PRESJECI

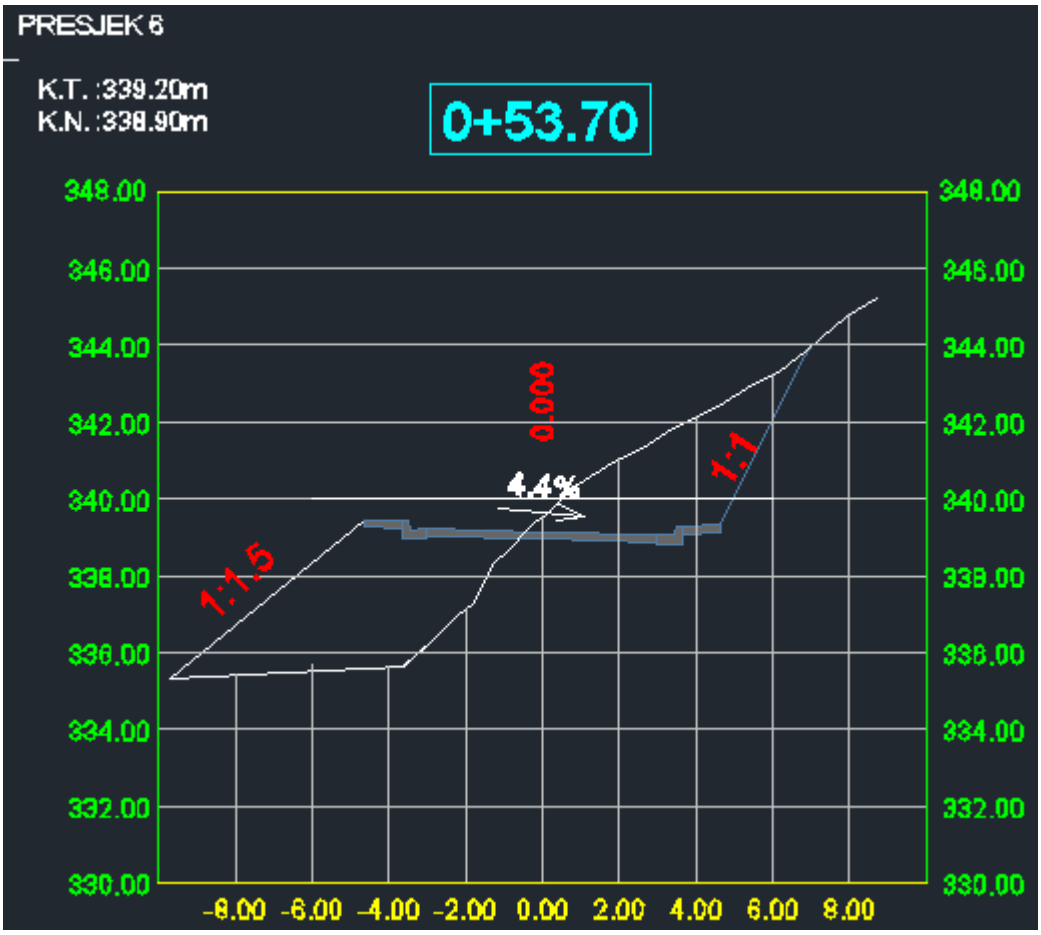


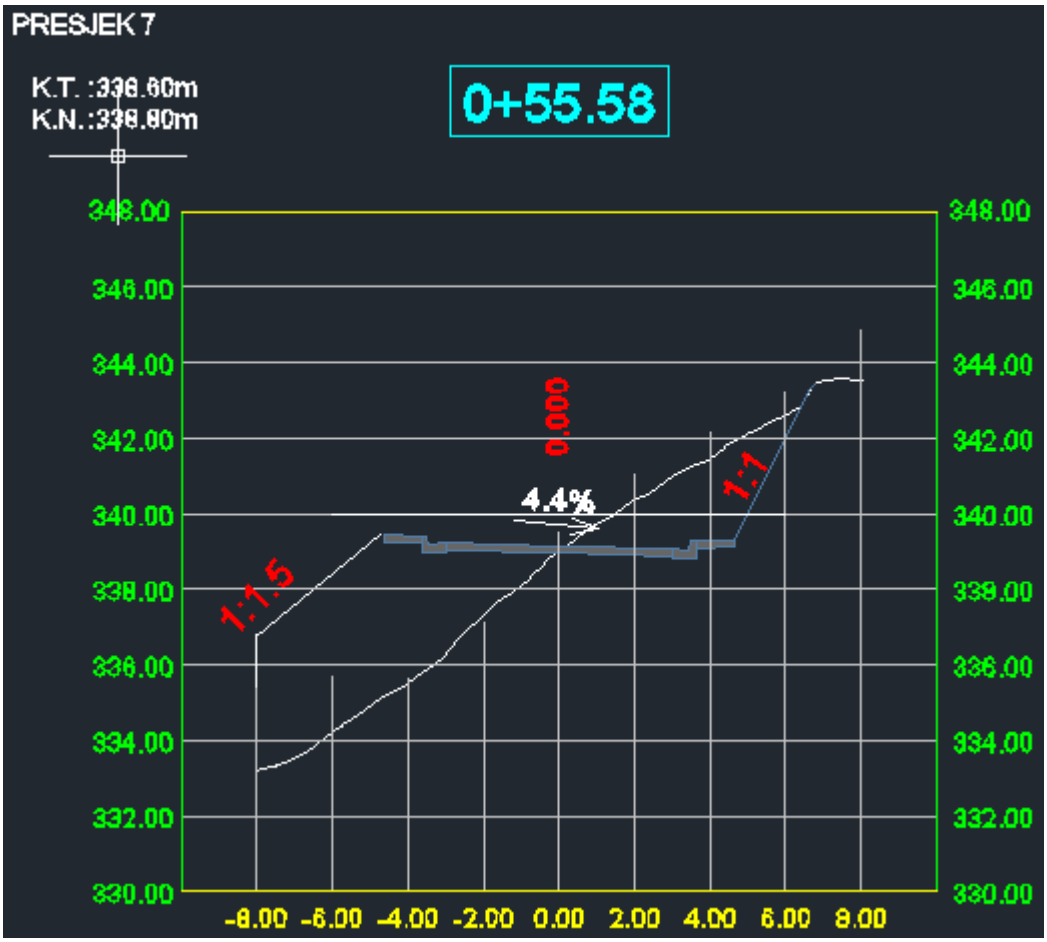

PRESJEK 2
K.T. :341.14m
K.N. :336.66m
0+15.31
350.00
348.00
346.00
344.00
342.00
340.00
338.00
336.00
334.00
0.000
2.5%
1:1.5
1:1
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00

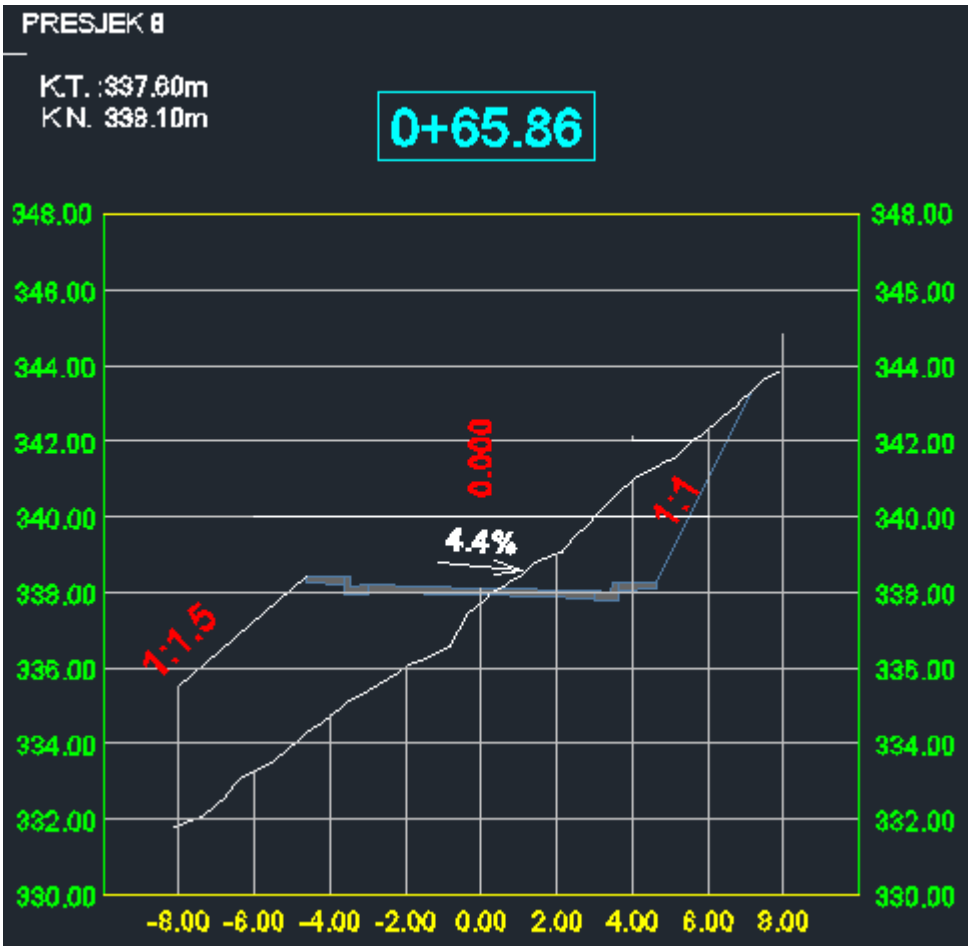

PRESJEK 3
K.T.:336.00m
K.N.:340.60m
0+25.00
350.00
348.00
346.00
344.00
342.00
340.00
338.00
336.00
334.00
0.000
3.2
1:1.5
1:1
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00

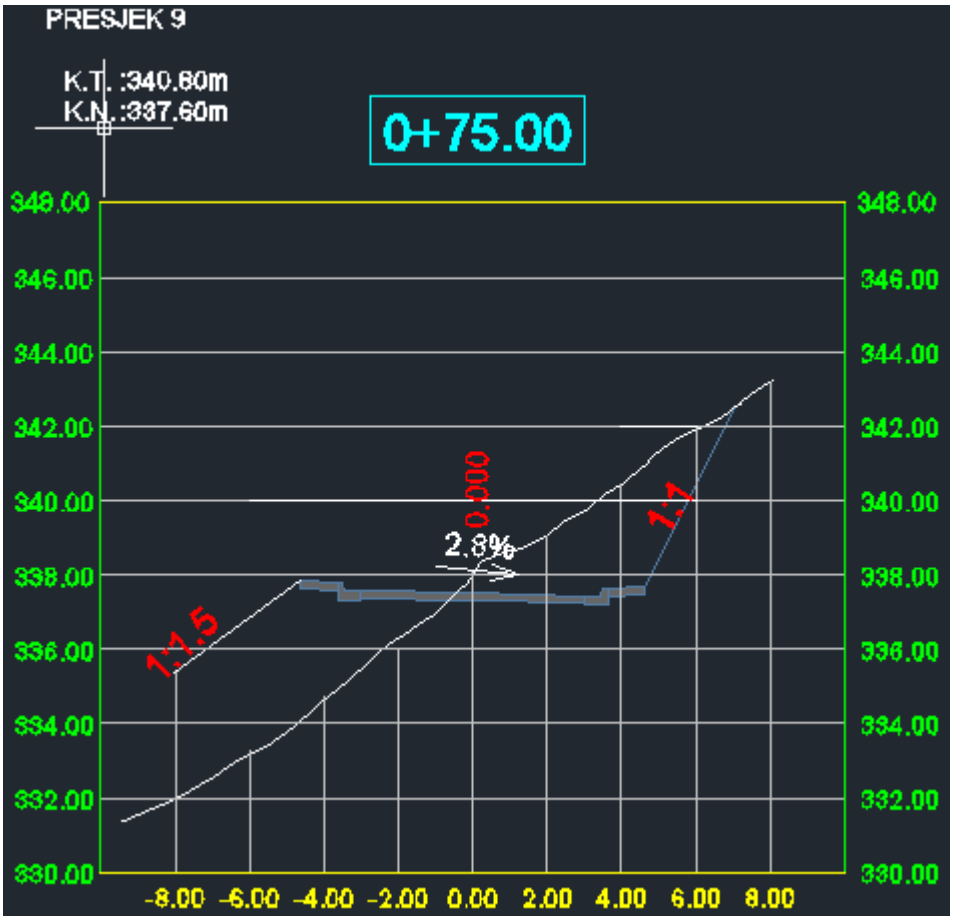

PRESJEK 4
K.T. :339.60m
K.N. :339.20m
0+45.31
348.00
346.00
344.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00
0.000
4.4%
1:1.5
1:1

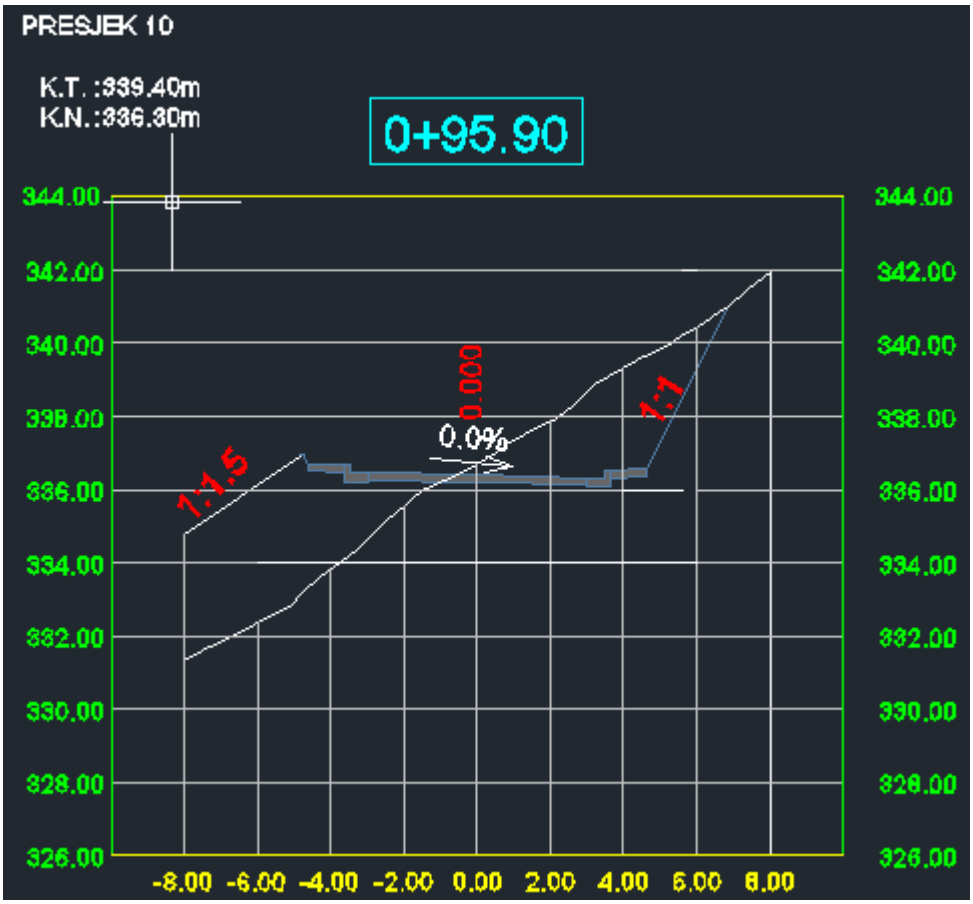

PRESJEK 5
K.T.:339.70m
K.N.:339.10m
0+50.00
348.00
346.00
344.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00
0.00
4.4%
1:1.5
1:1

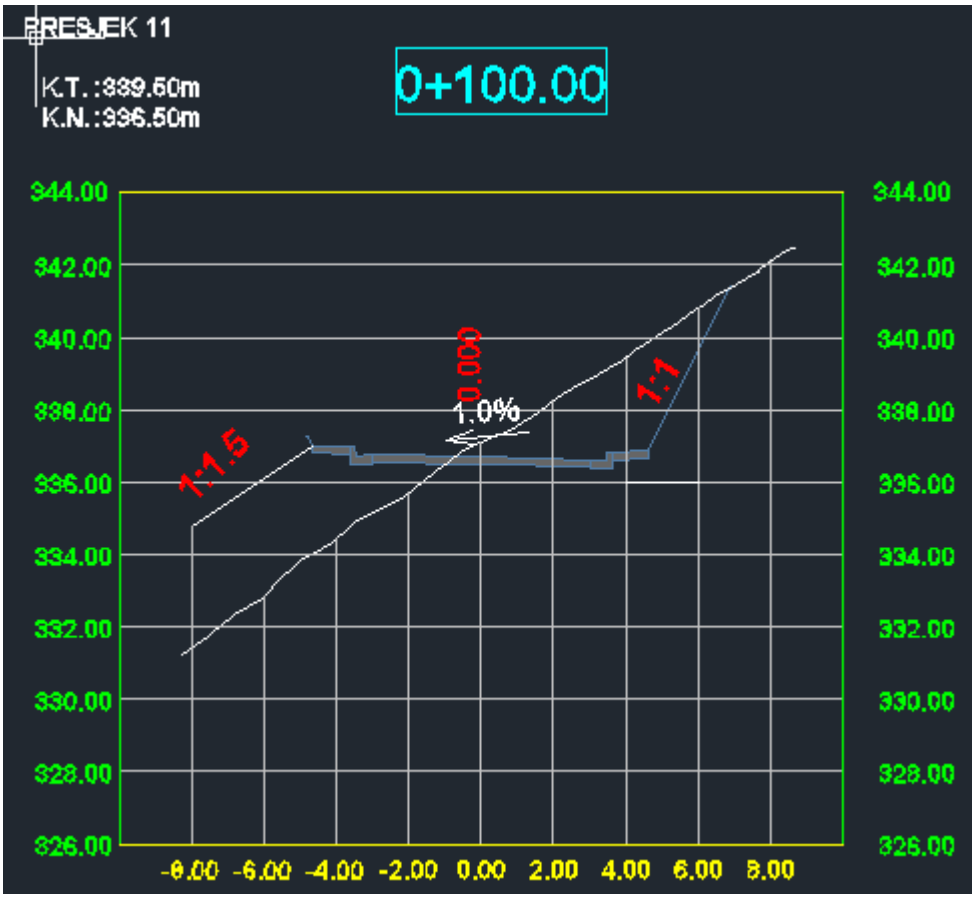

PRESJEK 6
K.T. :339.20m
K.N. :338.90m
0+53.70
348.00
346.00
344.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
0.000
4.4%
1:1.5
1:1
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00


PRESJEK 7
K.T. :338.60m
K.N.:338.80m
0+55.58
348.00
346.00
344.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
0.000
4.4%
1:1.5
1:1
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00

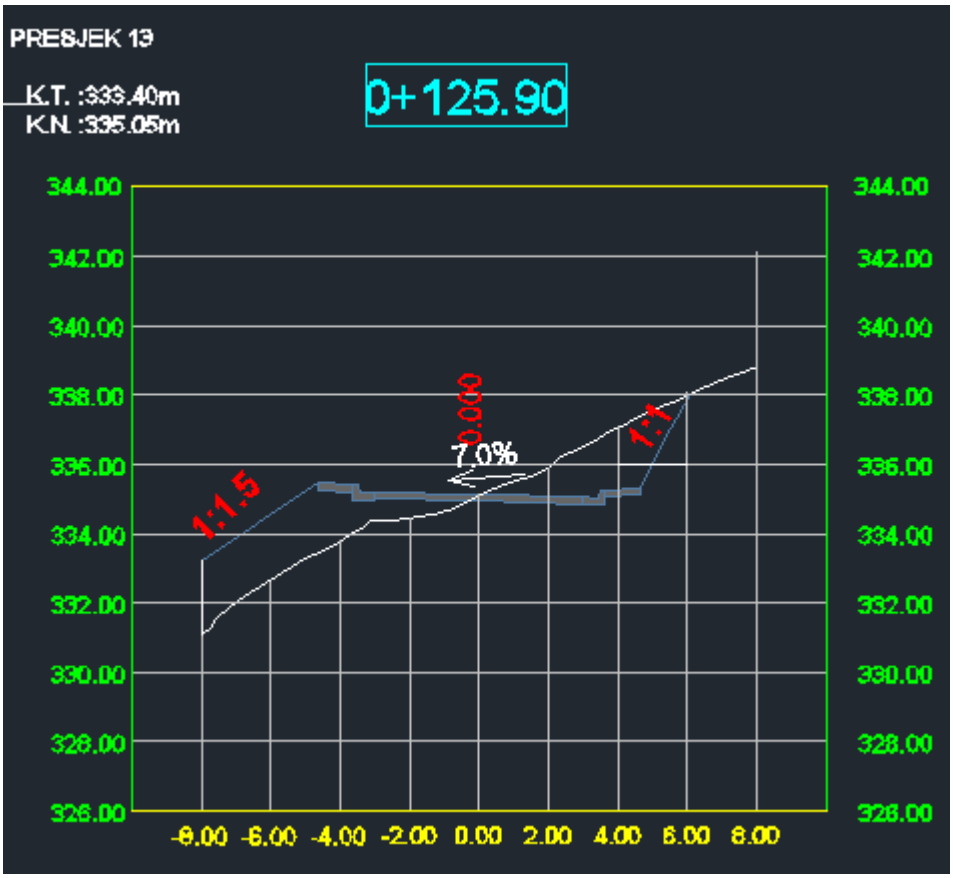

PRESJEK 8
K.T. :337.60m
K.N. 338.10m
0+65.86
348.00
346.00
344.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
0.000
4.4%
1:1.5
1:1
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00

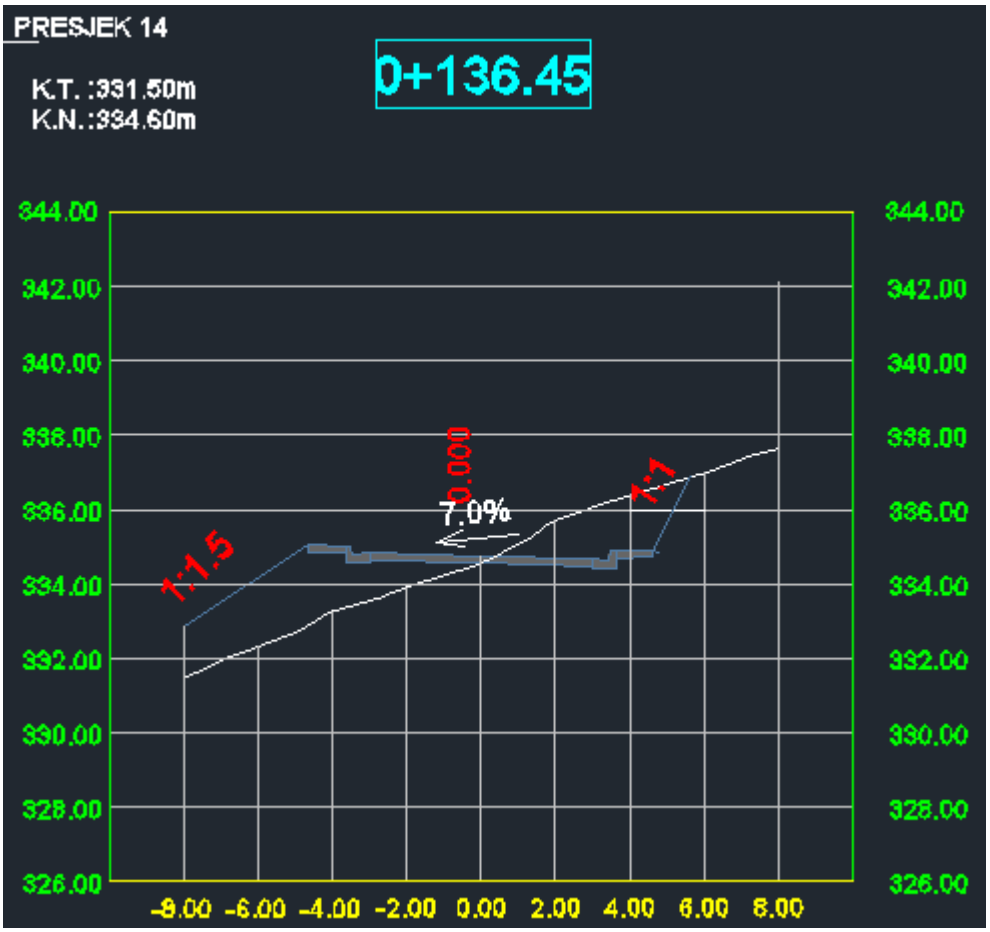

PRESJEK 9
K.T. :340.60m
K.N. :337.60m
0+75.00
348.00
346.00
344.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00
2.8%
0.000
1:1.5
1:1

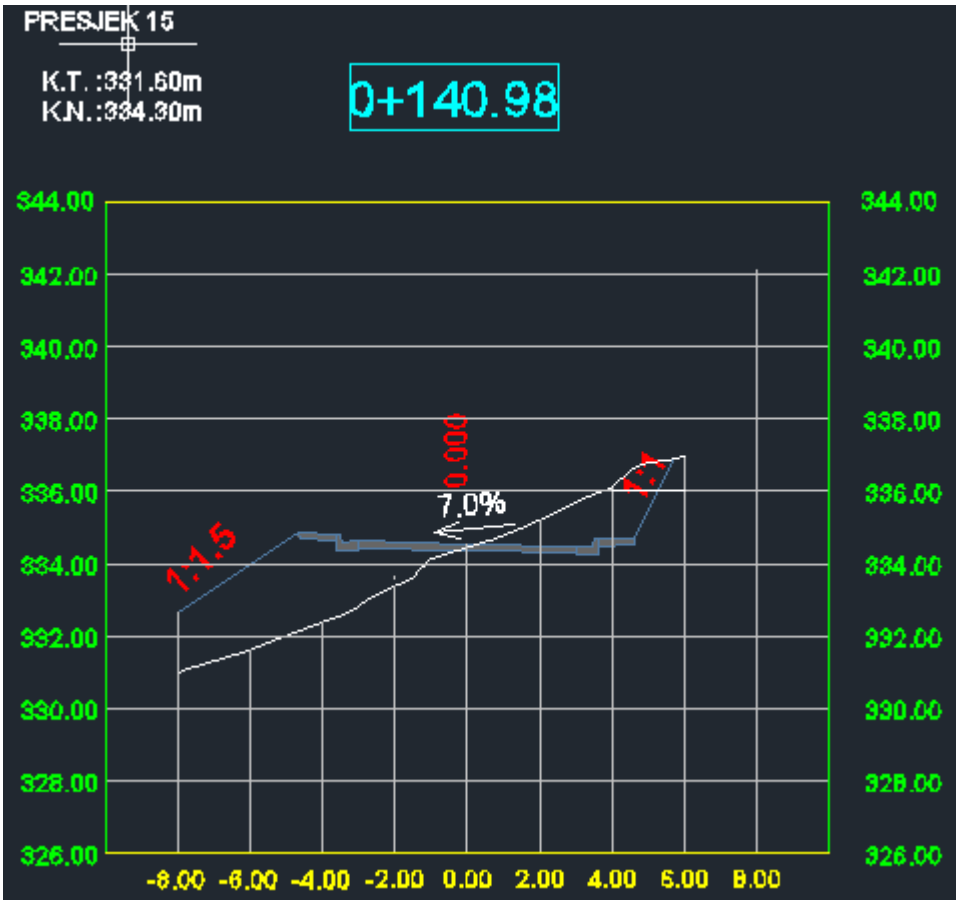

PRESJEK 10
K.T. :339.40m
K.N.:336.30m
0+95.90
344.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
328.00
326.00
0.000
0.0%
1:1.5
1:1
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00

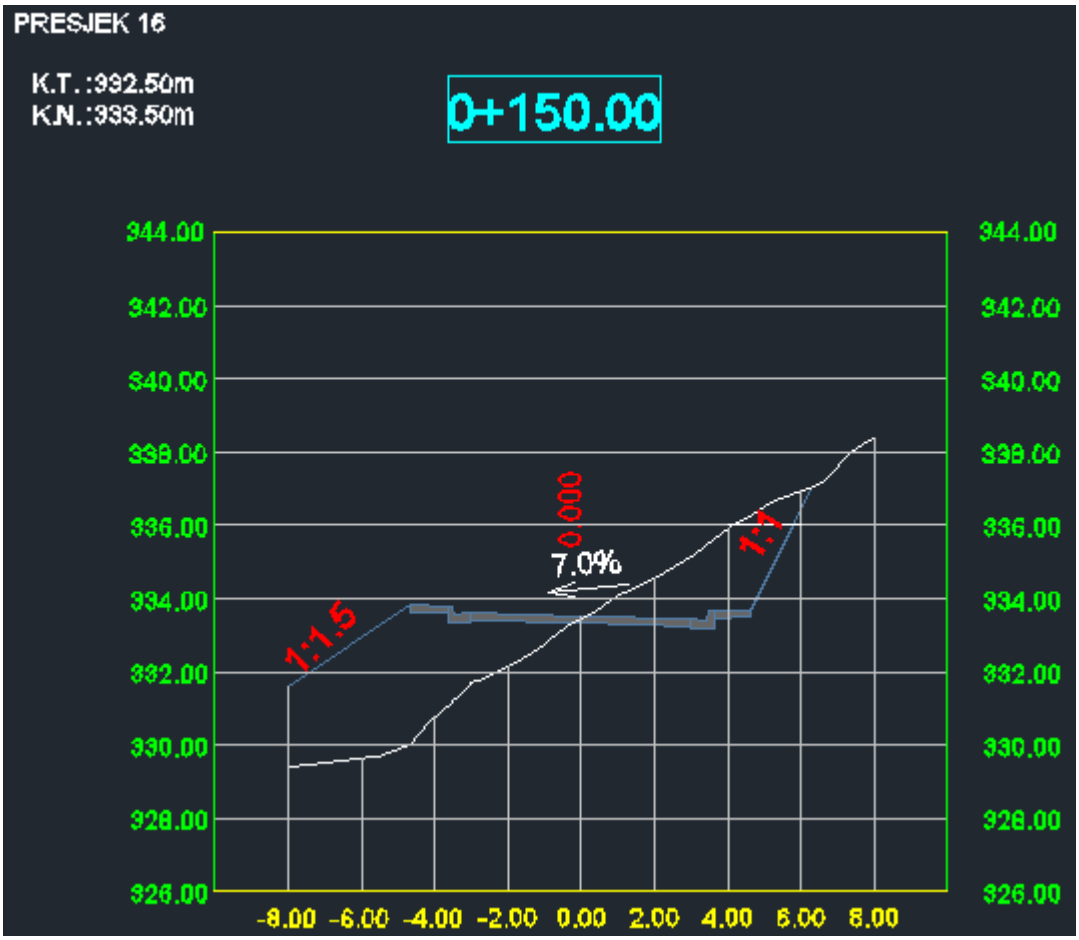

PRESJEK 11
K.T.:339.60m
K.N.:396.50m
0+100.00
344.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
328.00
326.00
0.000
1.0%
1:1.5
1:1
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00

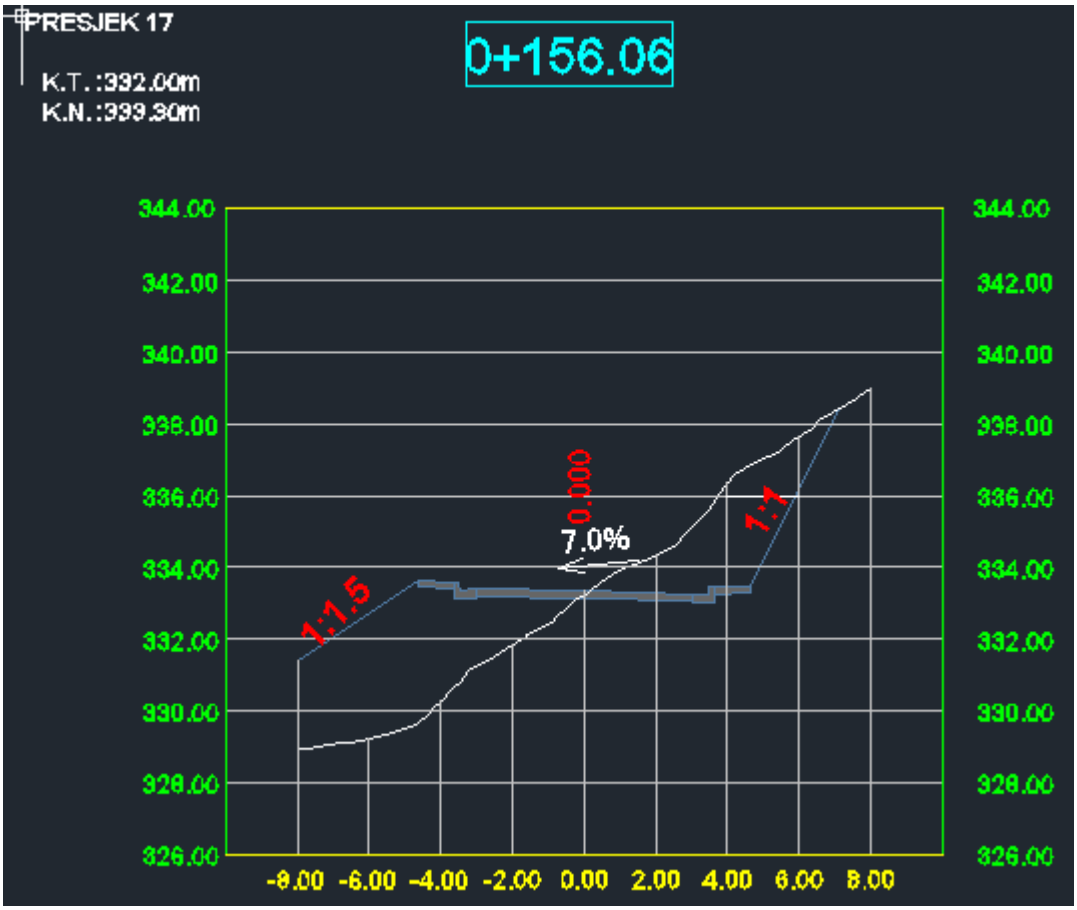

PRESJEK 12
K.T.:333.50m
K.N.:335.10m
0+125.00
344.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
328.00
326.00
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00
0.000
6.9%
1:1.5
1:1


PRESJEK 13
K.T. :339.40m
K.N. :335.05m
0+125.90
344.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
328.00
326.00
0.00
7.0%
1:1.5
1:1
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00

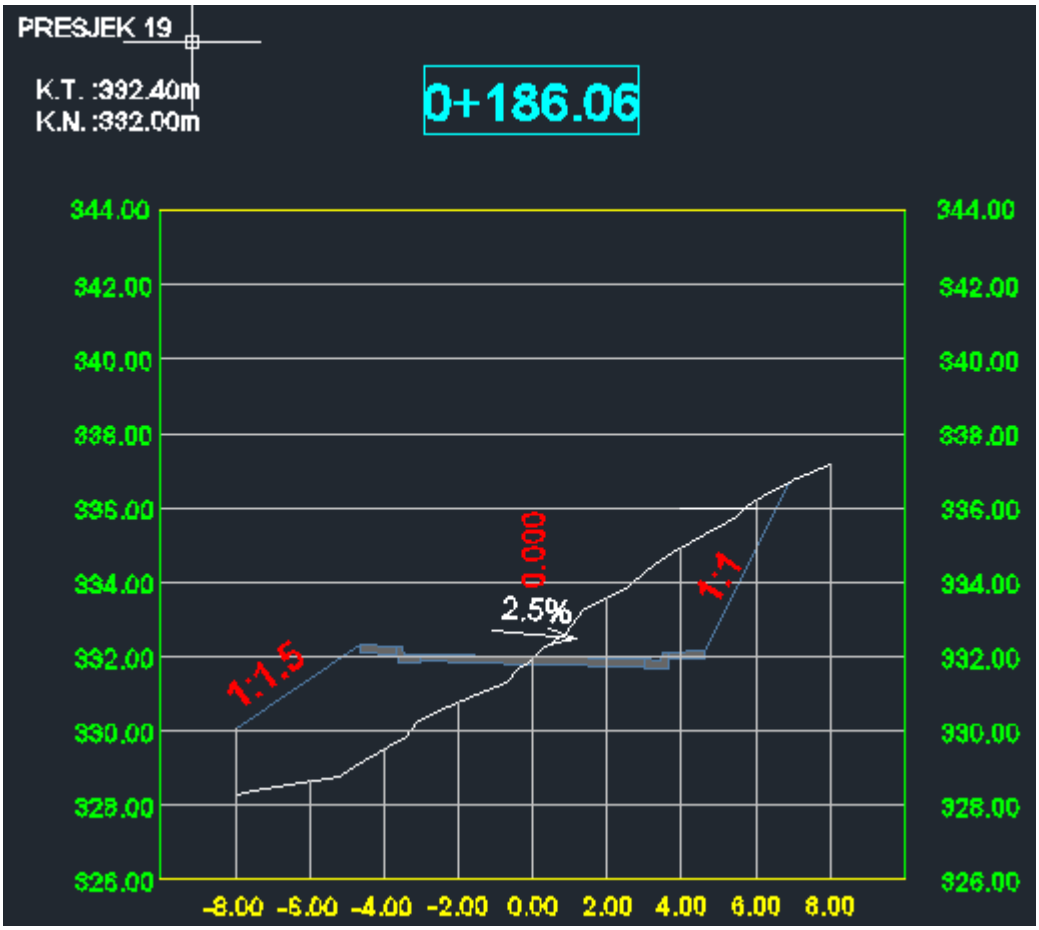

PRESJEK 14
0+136.45
K.T. :331.50m
K.N.:334.60m
344.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
328.00
326.00
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00
1:1.5
7.0%
1:1


PRESJEK 15
K.T. :331.60m
K.N.:334.30m
0+140.98
344.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
328.00
326.00
0.000
7.0%
1:1.5
1:1
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00

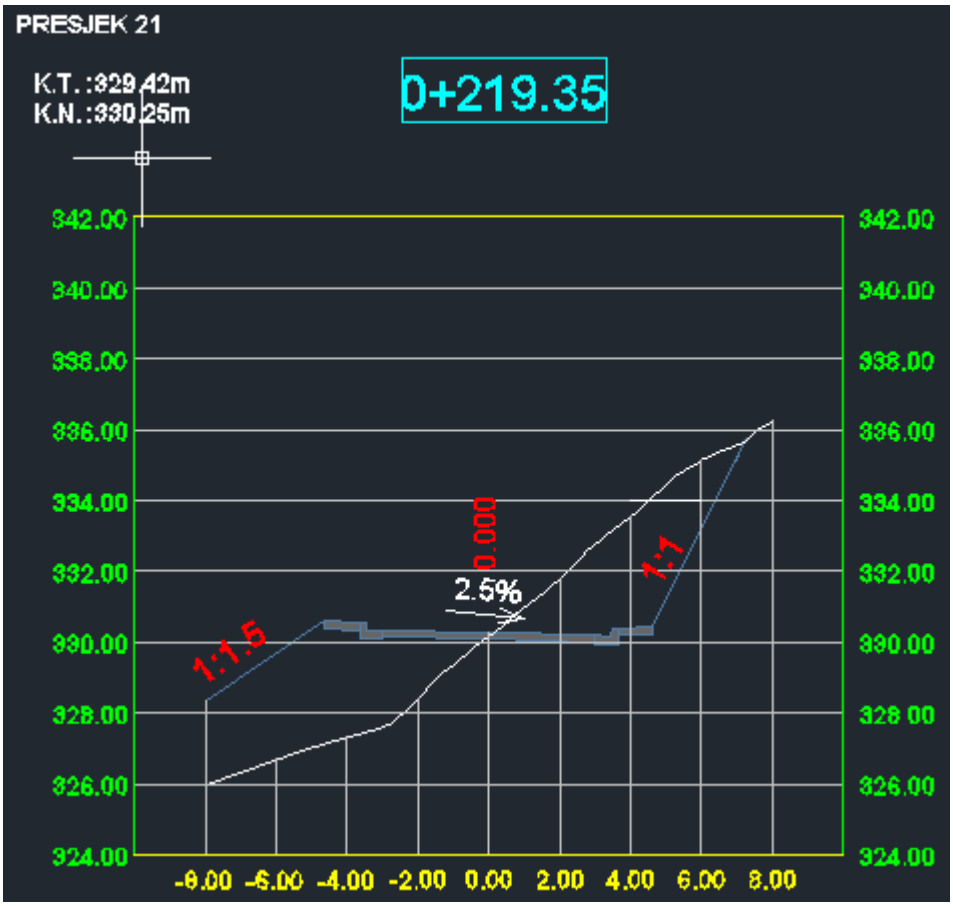

PRESJEK 16
K.T.:332.50m
K.N.:333.50m
0+150.00
344.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
328.00
326.00
0.000
7.0%
1:1.5
1:1
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00

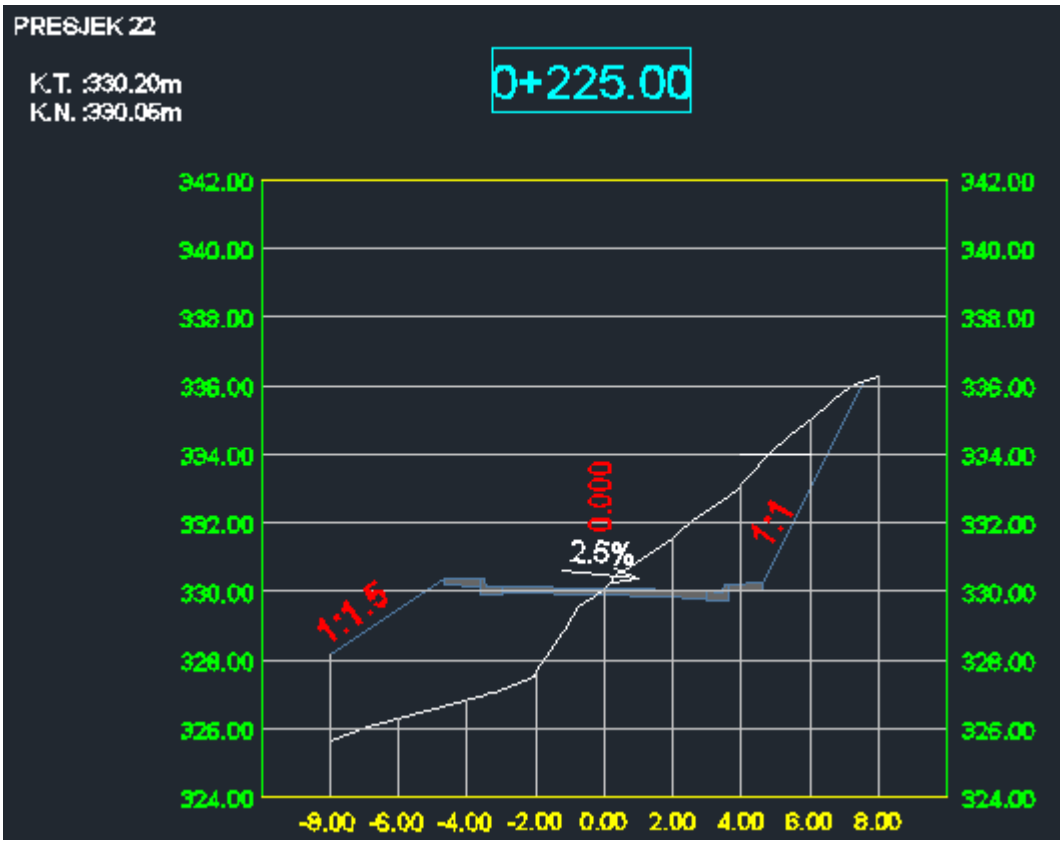

PRESJEK 17
K.T.:332.00m
K.N.:339.30m
0+156.06
344.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
328.00
326.00
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00
0.000
7.0%
1:1.5
1:1

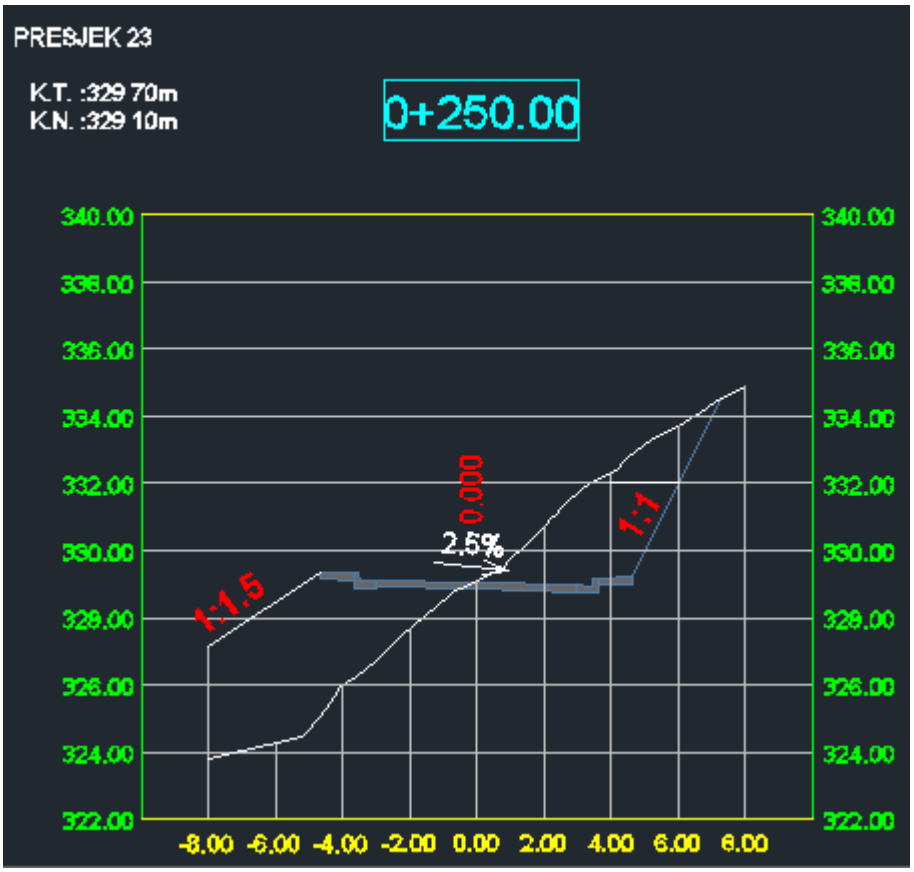

PRESJEK 18
K.T. :333.70m
K.N. :332.70m
0+175.00
344.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
328.00
326.00
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00
0.000
1.8%
1:1.5
1:1

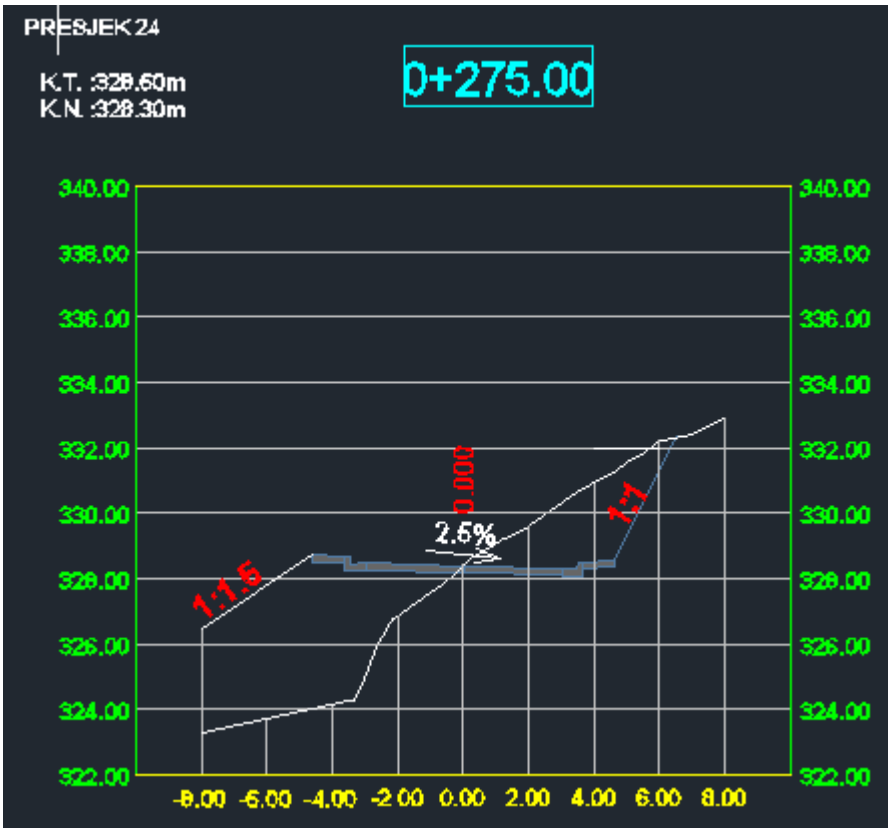

PRESJEK 19
K.T. :332.40m
K.N. :332.00m
0+186.06
344.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
328.00
326.00
0.000
2.5%
1:1.5
1:1
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00

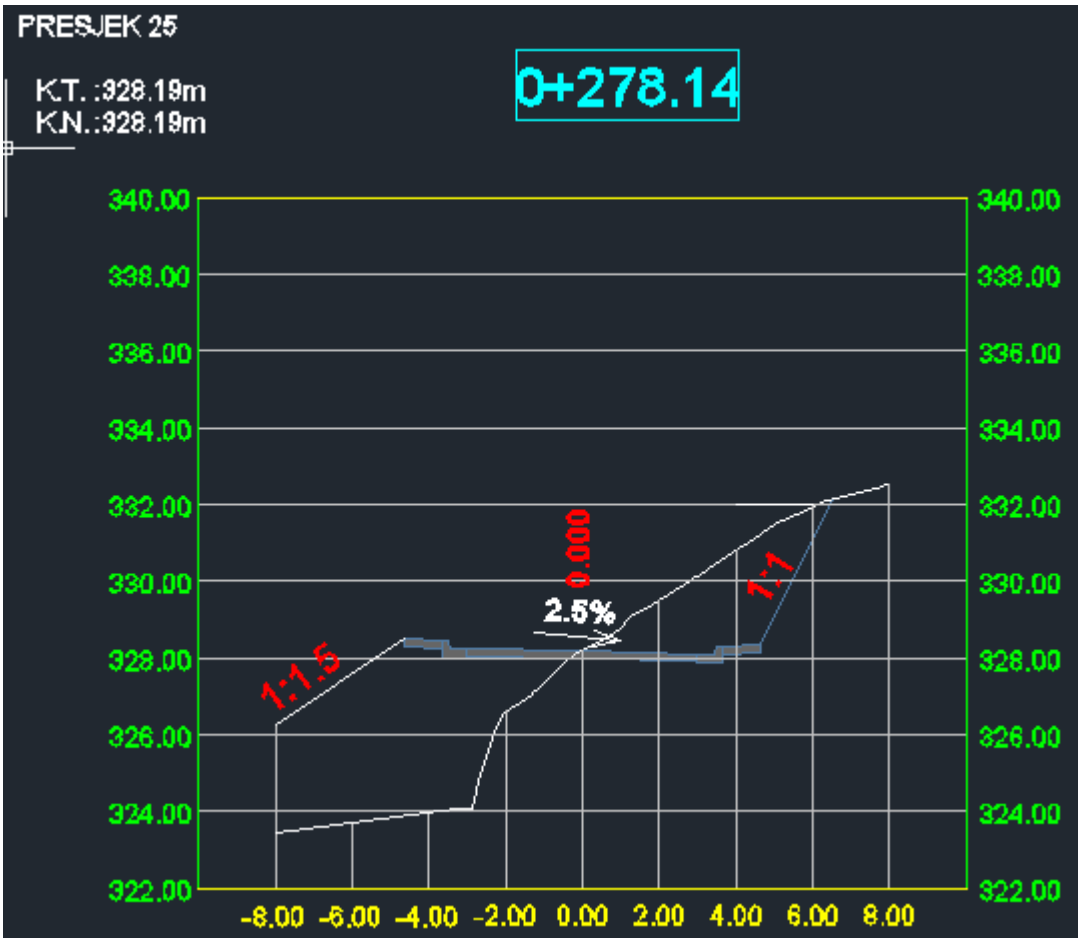

PRESJEK 20
K.T.:329.40m
K.N.:331.20m
0+200.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
328.00
326.00
324.00
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00
0.000
2.5%
1:1.5
1:1


PRESJEK 21
K.T.:329.42m
K.N.:330.25m
0+219.35
342.00
340.00
338.00
336.00
334.00
332.00
330.00
328.00
326.00
324.00
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00
0.000
2.5%
1:1.5
1:1


PRESJEK 22
K.T. :330.20m
K.N. :330.05m
0+225.00
342.00
340.00
338.00
336.00
334.00
332.00
330.00
328.00
326.00
324.00
0.000
2.5%
1:1.5
1:1
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00


PRESJEK 23
K.T. :329 70m
K.N. :329 10m
0+250.00
340.00
336.00
336.00
334.00
332.00
330.00
329.00
326.00
324.00
322.00
0.000
2.5%
1:1.5
1:1
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 6.00


PRESJEK 24
K.T. 328.60m
K.N. 328.30m
0+275.00
340.00
338.00
336.00
334.00
332.00
330.00
328.00
326.00
324.00
322.00
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00
0.000
2.5%
1:1.5
1:1


PRESJEK 25
K.T. :328.19m
K.N.:328.19m
0+278.14
340.00
338.00
336.00
334.00
332.00
330.00
328.00
326.00
324.00
322.00
-8.00 -6.00 -4.00 -2.00 0.00 2.00 4.00 6.00 8.00
0.000
2.5%
1:1.5
1:1

PRILOG 1- HORIZONTALNI TOK TRASE

Alignment: OS_1
Description:

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	100.989	126.922
End:	0+15.310	106.858	141.061

Tangent Data

Parameter	Value	Parameter	Value
Length:	15.310	Course:	N 67° 27' 24.4902" E

Spiral Point Data

Description	Station	Northing	Easting
TS:	0+15.310	106.858	141.061
SPI:		114.537	159.560
SC:	0+45.310	116.791	169.330

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	30.000	L Tan:	20.029
Radius:	90.000	S Tan:	10.027
Theta:	09° 32' 57.4677"	P:	0.416
X:	29.917	K:	14.986
Y:	1.663	A:	51.962
Chord:	29.963	Course:	N 70° 38' 20.9496" E

Curve Point Data

Description	Station	Northing	Easting
SC:	0+45.310	116.791	169.330
RP:		29.096	189.566
CS:	0+65.857	119.096	189.702

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	13° 04' 50.1464"	Type:	RIGHT
Radius:	90.000		
Length:	20.547	Tangent:	10.318

Mid-Ord:	0.586	External:	0.590
Chord:	20.502	Course:	N 83° 32' 47.0311" E

Spiral Point Data

Description	Station	Northing	Easting
CS:	0+65.857	119.096	189.702
SPI:		119.081	199.729
ST:	0+95.857	115.728	219.475

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	30.000	L Tan:	20.029
Radius:	90.000	S Tan:	10.027
Theta:	09° 32' 57.4677"	P:	0.416
X:	29.917	K:	14.986
Y:	1.663	A:	51.962
Chord:	29.963	Course:	S 83° 32' 46.8874" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+95.857	115.728	219.475
End:	0+95.902	115.720	219.520

Tangent Data

Parameter	Value	Parameter	Value
Length:	0.045	Course:	S 80° 21' 50.4280" E

Spiral Point Data

Description	Station	Northing	Easting
TS:	0+95.902	115.720	219.520
SPI:		112.353	239.354
SC:	1+25.902	114.015	249.323

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 86° 43' 27.1241" E

Curve Point Data

Description	Station	Northing	Easting
SC:	1+25.902	114.015	249.323

RP:		158.402	241.925
CS:	1+56.062	128.212	275.295

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	38° 24' 05.9106"	Type:	LEFT
Radius:	45.000		
Length:	30.161	Tangent:	15.671
Mid-Ord:	2.503	External:	2.651
Chord:	29.599	Course:	N 61° 20' 11.6813" E

Spiral Point Data

Description	Station	Northing	Easting
CS:	1+56.062	128.212	275.295
SPI:		135.707	282.076
ST:	1+86.062	154.220	289.949

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 29° 23' 50.4866" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	1+86.062	154.220	289.949
End:	2+78.136	238.951	325.979

Tangent Data

Parameter	Value	Parameter	Value
Length:	92.073	Course:	N 23° 02' 13.7905" E

Alignment: OS 1-Left-3.000
Description:

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	103.759	125.771
End:	0+15.310	109.629	139.911

Tangent Data

Parameter	Value	Parameter	Value

Length:	15.310	Course:	N 67° 27' 24.4902" E

Spiral Point Data

Description	Station	Northing	Easting
TS:	0+15.310	109.629	139.911
SPI:		117.404	158.641
SC:	0+45.810	119.714	168.655

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	30.500	L Tan:	20.362
Radius:	93.000	S Tan:	10.193
Theta:	09° 23' 42.9924"	P:	0.416
X:	30.418	K:	15.236
Y:	1.664	A:	53.259
Chord:	30.462	Course:	N 70° 39' 54.9169" E

Curve Point Data

Description	Station	Northing	Easting
SC:	0+45.810	119.714	168.655
RP:		29.096	189.566
PT:	0+65.402	122.084	188.067

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	12° 04' 14.0503"	Type:	RIGHT
Radius:	93.000		
Length:	19.592	Tangent:	9.833
Mid-Ord:	0.515	External:	0.518
Chord:	19.556	Course:	N 83° 02' 28.9831" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+65.402	122.084	188.067
End:	0+80.875	122.132	203.540

Tangent Data

Parameter	Value	Parameter	Value
Length:	15.473	Course:	N 89° 49' 17.7516" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+80.875	122.132	203.540
End:	0+96.117	120.791	218.723

Tangent Data

Parameter	Value	Parameter	Value
Length:	15.243	Course:	S 84° 57' 10.3613" E

Spiral Point Data

Description	Station	Northing	Easting
TS:	0+96.117	120.791	218.723
SPI:		120.702	219.246
ST:	0+97.706	120.525	220.290

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	1.589	L Tan:	1.059
Radius:	1706.609	S Tan:	0.530
Theta:	00° 01' 36.0178"	P:	0.000
X:	1.589	K:	0.794
Y:	0.000	A:	52.073
Chord:	1.589	Course:	S 80° 22' 22.5025" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+97.706	120.525	220.290
End:	0+97.751	120.518	220.334

Tangent Data

Parameter	Value	Parameter	Value
Length:	0.045	Course:	S 80° 21' 50.4280" E

Spiral Point Data

Description	Station	Northing	Easting
TS:	0+97.751	120.518	220.334
SPI:		117.287	239.361
SC:	1+26.129	118.814	248.523

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	28.378	L Tan:	19.044
Radius:	40.134	S Tan:	9.573
Theta:	20° 15' 22.9914"	P:	0.832
X:	28.025	K:	14.130
Y:	3.315	A:	33.748
Chord:	28.240	Course:	S 86° 32' 31.1038" E

Curve Point Data

Description	Station	Northing	Easting
SC:	1+26.129	118.814	248.523

RP:		158.402	241.925
CS:	1+53.028	131.477	271.687

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	38° 24' 05.9106"	Type:	LEFT
Radius:	40.134		
Length:	26.899	Tangent:	13.977
Mid-Ord:	2.233	External:	2.364
Chord:	26.399	Course:	N 61° 20' 11.6813" E

Spiral Point Data

Description	Station	Northing	Easting
CS:	1+53.028	131.477	271.687
SPI:		138.365	277.918
ST:	1+81.406	156.125	285.471

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	28.378	L Tan:	19.044
Radius:	40.134	S Tan:	9.573
Theta:	20° 15' 22.9914"	P:	0.832
X:	28.025	K:	14.130
Y:	3.315	A:	33.748
Chord:	28.240	Course:	N 29° 12' 54.4663" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	1+81.406	156.125	285.471
End:	1+83.734	158.267	286.381

Tangent Data

Parameter	Value	Parameter	Value
Length:	2.328	Course:	N 23° 02' 13.7905" E

Curve Point Data

Description	Station	Northing	Easting
PC:	1+83.734	158.267	286.381
RP:		140.657	327.793
PT:	1+86.768	161.016	287.662

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	03° 51' 44.1215"	Type:	RIGHT
Radius:	45.000		
Length:	3.033	Tangent:	1.517

Mid-Ord:	0.026	External:	0.026
Chord:	3.033	Course:	N 24° 58' 05.8513" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	1+86.768	161.016	287.662
End:	2+12.110	183.617	299.127

Tangent Data

Parameter	Value	Parameter	Value
Length:	25.342	Course:	N 26° 53' 57.9120" E

Curve Point Data

Description	Station	Northing	Easting
PC:	2+12.110	183.617	299.127
RP:		194.927	276.832
PT:	2+13.795	185.144	299.839

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	03° 51' 44.1215"	Type:	LEFT
Radius:	25.000		
Length:	1.685	Tangent:	0.843
Mid-Ord:	0.014	External:	0.014
Chord:	1.685	Course:	N 24° 58' 05.8513" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	2+13.795	185.144	299.839
End:	2+73.541	240.125	323.219

Tangent Data

Parameter	Value	Parameter	Value
Length:	59.746	Course:	N 23° 02' 13.7905" E

Alignment: OS 1-Right-3.000
Description:

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+00.000	98.218	128.072
End:	0+15.310	104.087	142.211

Tangent Data

Parameter	Value	Parameter	Value
Length:	15.310	Course:	N 67° 27' 24.4902" E

Spiral Point Data

Description	Station	Northing	Easting
TS:	0+15.310	104.087	142.211
SPI:		111.670	160.479
SC:	0+44.810	113.868	170.004

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	29.500	L Tan:	19.696
Radius:	87.000	S Tan:	9.860
Theta:	09° 42' 50.1827"	P:	0.416
X:	29.415	K:	14.736
Y:	1.664	A:	50.661
Chord:	29.464	Course:	N 70° 36' 43.7979" E

Curve Point Data

Description	Station	Northing	Easting
SC:	0+44.810	113.868	170.004
RP:		29.096	189.566
CS:	0+64.672	116.096	189.698

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	13° 04' 50.1464"	Type:	RIGHT
Radius:	87.000		
Length:	19.862	Tangent:	9.974
Mid-Ord:	0.566	External:	0.570
Chord:	19.819	Course:	N 83° 32' 47.0311" E

Spiral Point Data

Description	Station	Northing	Easting
CS:	0+64.672	116.096	189.698
SPI:		116.081	199.474
ST:	0+94.172	112.770	218.973

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	29.500	L Tan:	19.696
Radius:	87.000	S Tan:	9.860
Theta:	09° 42' 50.1827"	P:	0.416
X:	29.415	K:	14.736
Y:	1.664	A:	50.661
Chord:	29.464	Course:	S 83° 31' 09.7357" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	0+94.172	112.770	218.973
End:	0+94.217	112.763	219.018

Tangent Data

Parameter	Value	Parameter	Value
Length:	0.045	Course:	S 80° 21' 50.4280" E

Spiral Point Data

Description	Station	Northing	Easting
TS:	0+94.217	112.763	219.018
SPI:		109.311	239.349
SC:	1+25.217	111.055	249.817

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value
Length:	31.000	L Tan:	20.781
Radius:	48.000	S Tan:	10.437
Theta:	18° 30' 06.3437"	P:	0.831
X:	30.678	K:	15.446
Y:	3.312	A:	38.575
Chord:	30.846	Course:	S 86° 49' 37.4088" E

Curve Point Data

Description	Station	Northing	Easting
SC:	1+25.217	111.055	249.817
RP:		158.402	241.925
CS:	1+57.388	126.200	277.520

Circular Curve Data

Parameter	Value	Parameter	Value
Delta:	38° 24' 05.9106"	Type:	LEFT
Radius:	48.000		
Length:	32.171	Tangent:	16.716
Mid-Ord:	2.670	External:	2.827
Chord:	31.572	Course:	N 61° 20' 11.6813" E

Spiral Point Data

Description	Station	Northing	Easting
CS:	1+57.388	126.200	277.520
SPI:		134.069	284.639
ST:	1+88.388	153.046	292.709

Spiral Curve Data: clothoid

Parameter	Value	Parameter	Value

Length:	31.000	L Tan:	20.781
Radius:	48.000	S Tan:	10.437
Theta:	18° 30' 06.3437"	P:	0.831
X:	30.678	K:	15.446
Y:	3.312	A:	38.575
Chord:	30.846	Course:	N 29° 30' 00.7713" E

Tangent Data

Description	PT Station	Northing	Easting
Start:	1+88.388	153.046	292.709
End:	2+80.462	237.777	328.740

Tangent Data

Parameter	Value	Parameter	Value
Length:	92.073	Course:	N 23° 02' 13.7905" E

PRILOG 2- KOORDINATNI RAČUN DETALJNIH TOČAKA OSI

Alignment Name: OS 1
Description:
Station Range: Start: 0+00.00, End: 278+14.00
Station Increment: 20.00

Station	Northing	Easting	Tangential Direction
0+00.00	100.9887m	126.9215m	N67° 27' 24.49"E
0+20.00	108.6504m	145.3958m	N67° 41' 24.82"E
0+40.00	115.4545m	164.1920m	N73° 55' 30.11"E
0+60.00	118.9141m	183.8496m	N86° 21' 29.89"E
0+80.00	118.1389m	203.8048m	S83° 01' 54.35"E
1+00.00	115.0427m	223.5618m	S80° 43' 13.53"E
1+20.00	113.4029m	243.4568m	N87° 18' 45.37"E
1+40.00	118.4552m	262.6432m	N62° 35' 12.98"E
1+60.00	131.2393m	277.8118m	N37° 27' 04.25"E
1+80.00	148.6524m	287.5509m	N23° 49' 01.42"E
2+00.00	167.0466m	295.4027m	N23° 02' 13.79"E
2+20.00	185.4516m	303.2293m	N23° 02' 13.79"E
2+40.00	203.8567m	311.0559m	N23° 02' 13.79"E
2+60.00	222.2617m	318.8824m	N23° 02' 13.79"E

Alignment Name: OS 1-Left-3.000
Description:
Station Range: Start: 0+00.00, End: 273+54.00
Station Increment: 20.00

Station	Northing	Easting	Tangential Direction
0+00.00	103.7595m	125.7714m	N67° 27' 24.49"E
0+20.00	111.3965m	144.1854m	N67° 40' 57.50"E
0+40.00	118.2213m	162.9620m	N73° 42' 52.91"E
0+60.00	121.8399m	182.6717m	N85° 44' 54.88"E
0+80.00	122.1292m	202.6654m	N89° 49' 17.75"E
1+00.00	120.1231m	222.6685m	S80° 29' 02.19"E
1+20.00	118.2415m	242.7009m	N87° 53' 47.25"E
1+40.00	123.3905m	261.5445m	N60° 44' 07.03"E
1+60.00	136.7428m	275.7727m	N33° 54' 16.45"E
1+80.00	154.7602m	284.8900m	N23° 05' 02.67"E
2+00.00	172.8168m	293.6484m	N26° 53' 57.91"E
2+20.00	190.8540m	302.2666m	N23° 02' 13.79"E
2+40.00	209.2590m	310.0932m	N23° 02' 13.79"E
2+60.00	227.6640m	317.9197m	N23° 02' 13.79"E

Alignment Name: OS 1-Right-3.000
Description:
Station Range: Start: 0+00.00, End: 280+46.00
Station Increment: 20.00

Station	Northing	Easting	Tangential Direction
0+00.00	98.2179m	128.0717m	N67° 27' 24.49"E
0+20.00	105.9050m	146.6078m	N67° 41' 53.55"E
0+40.00	112.6837m	165.4139m	N74° 08' 46.14"E
0+60.00	115.9774m	185.0282m	N87° 00' 36.28"E
0+80.00	114.9830m	204.8500m	S82° 34' 04.03"E
1+00.00	111.8416m	224.5734m	S81° 01' 43.25"E
1+20.00	110.4553m	244.4958m	N86° 25' 28.38"E
1+40.00	115.6753m	263.7978m	N62° 53' 28.70"E
1+60.00	128.2418m	279.2687m	N39° 03' 11.05"E
1+80.00	145.5355m	289.4426m	N24° 26' 07.76"E
2+00.00	163.7323m	297.2533m	N23° 02' 13.79"E
2+20.00	182.1373m	305.0799m	N23° 02' 13.79"E
2+40.00	200.5423m	312.9065m	N23° 02' 13.79"E
2+60.00	218.9474m	320.7330m	N23° 02' 13.79"E
2+80.00	237.3524m	328.5596m	N23° 02' 13.79"E

PRILOG 3- RAČUN KOTA KOLNIKA

Base Alignment Name: OS 1
Station Range: Start: 0+00.00, End: 2+78.14

CHAINAGE 0+00.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	113.6520	132.9560	322.8387	-34.612m	Before_Rounding
2	125.1420	105.2757	342.8189	-4.642m	EPS
3	125.1424	105.2748	342.6189	-4.641m	EPS_Sub
4	125.5254	104.3521	342.7789	-3.642m	Back_Curb
5	125.5829	104.2136	342.7789	-3.492m	Top_Curb
6	125.5989	104.1751	342.5539	-3.450m	Flowline_Gutter
7	125.7714	103.7595	342.5809	-3.000m	ETW
8	125.7714	103.7595	342.3809	-3.000m	ETW_SubBase
9	128.0717	98.2179	342.2309	3.000m	ETW_SubBase
10	128.0717	98.2179	342.4309	3.000m	Flange
11	128.2442	97.8023	342.4039	3.450m	Flowline_Gutter
12	128.2602	97.7638	342.6289	3.492m	Top_Curb
13	128.3177	97.6252	342.6289	3.642m	Back_Curb
14	128.7007	96.7026	342.4689	4.641m	EPS_Sub
15	128.7011	96.7016	342.6689	4.642m	Hinge_Cut
16	129.4059	95.0036	346.3458	6.480m	Before_Rounding
17	129.4680	94.8540	346.5377	6.642m	Daylight

CHAINAGE 0+25.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	148.3278	114.8385	341.1081	-4.642m	EPS
2	148.3282	114.8376	340.9081	-4.641m	EPS_Sub
3	148.6951	113.9084	341.0681	-3.642m	Back_Curb
4	148.7502	113.7689	341.0681	-3.492m	Top_Curb
5	148.7655	113.7301	340.8431	-3.450m	Flowline_Gutter
6	148.9308	113.3115	340.6701	-3.000m	ETW_SubBase
7	148.9308	113.3115	340.8701	-3.000m	Flange
8	151.1343	107.7308	340.7201	3.000m	ETW
9	151.1343	107.7308	340.5201	3.000m	ETW_SubBase
10	151.2996	107.3123	340.6931	3.450m	Flowline_Gutter
11	151.3149	107.2735	340.9181	3.492m	Top_Curb
12	151.3700	107.1340	340.9181	3.642m	Back_Curb
13	151.7369	106.2048	340.7581	4.641m	EPS_Sub
14	151.7373	106.2039	340.9581	4.642m	Ditch_Out
15	151.9512	105.6620	342.1233	5.224m	Before_Rounding
16	152.0321	105.4573	342.2176	5.444m	Daylight

CHAINAGE 0+50.00

POINT	X	Y	Z	OFFSET	STRING CUT

1	173.1189	122.2974	339.3974	-4.642m	EPS
2	173.1191	122.2965	339.1974	-4.641m	EPS_Sub
3	173.2927	121.3127	339.3574	-3.642m	Back_Curb
4	173.3188	121.1649	339.3574	-3.492m	Top_Curb
5	173.3260	121.1239	339.1324	-3.450m	Flowline_Gutter
6	173.4042	120.6807	338.9594	-3.000m	ETW_SubBase
7	173.4042	120.6807	339.1594	-3.000m	Flange
8	174.4469	114.7720	339.0094	3.000m	ETW
9	174.4469	114.7720	338.8094	3.000m	ETW_SubBase
10	174.5251	114.3289	338.9824	3.450m	Flowline_Gutter
11	174.5324	114.2878	339.2074	3.492m	Top_Curb
12	174.5585	114.1401	339.2074	3.642m	Back_Curb
13	174.7321	113.1563	339.0474	4.641m	EPS_Sub
14	174.7322	113.1553	339.2474	4.642m	Ditch_Out
15	175.2953	109.9645	345.7275	7.882m	Before_Rounding
16	175.3341	109.7447	345.8556	8.105m	Daylight

CHAINAGE 0+75.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	201.5607	149.7170	320.0000	-31.172m	Before_Rounding
2	199.2390	123.2888	337.6866	-4.642m	EPS
3	199.2389	123.2878	337.4866	-4.641m	EPS_Sub
4	199.1515	122.2926	337.6466	-3.642m	Back_Curb
5	199.1384	122.1432	337.6466	-3.492m	Top_Curb
6	199.1347	122.1017	337.4216	-3.450m	Flowline_Gutter
7	199.0953	121.6534	337.4486	-3.000m	ETW
8	199.0953	121.6534	337.2486	-3.000m	ETW_SubBase
9	198.5702	115.6764	337.0986	3.000m	ETW_SubBase
10	198.5702	115.6764	337.2986	3.000m	Flange
11	198.5309	115.2281	337.2716	3.450m	Flowline_Gutter
12	198.5272	115.1866	337.4966	3.492m	Top_Curb
13	198.5141	115.0372	337.4966	3.642m	Back_Curb
14	198.4267	114.0420	337.3366	4.641m	EPS_Sub
15	198.4266	114.0410	337.5366	4.642m	Hinge_Cut
16	198.0355	109.5895	346.4741	9.110m	Before_Rounding
17	198.0178	109.3881	346.6285	9.313m	Daylight

CHAINAGE 1+00.00

POINT	X	Y	Z	OFFSET	STRING CUT	
1	224.3412	119.8129	336.2349	-4.833m	Daylight	
2	224.3334	119.7650	336.2623	-4.785m	Before_Rounding	
3	224.3103	119.6237	335.9759	-4.642m	Ditch_Out	
4	224.3101	119.6227	335.7759	-4.641m	EPS_Sub	
5	224.1491	118.6368	335.9359	-3.642m	Back_Curb	
6	224.1249	118.4887	335.9359	-3.492m	Top_Curb	
7	224.1181	118.4476	335.7109	-3.450m	Flowline_Gutter	
8	224.0456	118.0035	335.7379	-3.000m	ETW	
9	224.0456	118.0035	335.5379	-3.000m	ETW_SubBase	
10	223.0781	112.0820	335.5879	3.000m	ETW	
11	223.0781	112.0820	335.3879	3.000m	ETW_SubBase	
12	223.0055	111.6379	335.5609	3.450m	Flowline_Gutter	
13	222.9988	111.5967	335.7859	3.492m	Top_Curb	
14	222.9746	111.4487	335.7859	3.642m	Back_Curb	
15	222.8135	110.4628	335.6259	4.641m	EPS_Sub	
16	222.8133	110.4618	335.8259	4.642m	Hinge_Cut	
17	222.0568	105.8314	345.2095	9.333m	Before_Rounding	
18	222.0214	105.6146	345.3426	9.553m	Daylight	

CHAINAGE 1+25.00

POINT	X	Y	Z	OFFSET	STRING CUT	
1	245.5379	133.6398	324.1490	-19.976m	Daylight	
2	245.5736	133.3964	324.2067	-19.729m	Before_Rounding	
3	247.7598	118.4678	334.2652	-4.642m	EPS	
4	247.7600	118.4668	334.0652	-4.641m	EPS_Sub	
5	247.9047	117.4784	334.2252	-3.642m	Back_Curb	
6	247.9265	117.3300	334.2252	-3.492m	Top_Curb	
7	247.9325	117.2887	334.0002	-3.450m	Flowline_Gutter	
8	247.9977	116.8434	334.0272	-3.000m	ETW	
9	247.9977	116.8434	333.8272	-3.000m	ETW_SubBase	
10	248.8671	110.9068	333.6772	3.000m	ETW_SubBase	
11	248.8671	110.9068	333.8772	3.000m	Flange	
12	248.9324	110.4615	333.8502	3.450m	Flowline_Gutter	
13	248.9384	110.4203	334.0752	3.492m	Top_Curb	
14	248.9601	110.2718	334.0752	3.642m	Back_Curb	
15	249.1049	109.2834	333.9152	4.641m	EPS_Sub	
16	249.1050	109.2824	334.1152	4.642m	Hinge_Cut	
17	249.2583	108.2358	336.2307	5.699m	Before_Rounding	
18	249.2939	107.9925	336.3225	5.945m	Daylight	

CHAINAGE 1+50.00

POINT	X	Y	Z	OFFSET	STRING CUT	
1	259.2513	137.8598	324.1295	-18.126m	Daylight	
2	259.4112	137.6703	324.1806	-17.879m	Before_Rounding	
3	267.9454	127.5519	333.0051	-4.642m	EPS	
4	267.9460	127.5512	332.8051	-4.641m	EPS_Sub	
5	268.5901	126.7875	332.9651	-3.642m	Back_Curb	
6	268.6868	126.6729	332.9651	-3.492m	Top_Curb	
7	268.7137	126.6410	332.7401	-3.450m	Flowline_Gutter	
8	269.0038	126.2970	332.7671	-3.000m	ETW	
9	269.0038	126.2970	332.5671	-3.000m	ETW_SubBase	
10	272.8722	121.7105	332.4171	3.000m	ETW_SubBase	
11	272.8722	121.7105	332.6171	3.000m	Flange	
12	273.1623	121.3665	332.5901	3.450m	Flowline_Gutter	
13	273.1892	121.3347	332.8151	3.492m	Top_Curb	
14	273.2859	121.2200	332.8151	3.642m	Back_Curb	
15	273.9300	120.4564	332.6551	4.641m	EPS_Sub	
16	273.9307	120.4556	332.8551	4.642m	Hinge_Cut	
17	274.7249	119.5140	335.3188	5.874m	Before_Rounding	
18	274.8677	119.3446	335.4493	6.095m	Daylight	

CHAINAGE 1+75.00

POINT	X	Y	Z	OFFSET	STRING CUT	
1	268.9222	152.0467	323.0344	-18.351m	Daylight	
2	269.0344	151.9928	323.0698	-18.226m	Before_Rounding	
3	281.2818	146.1159	332.1261	-4.642m	EPS	
4	281.2827	146.1155	331.9261	-4.641m	EPS_Sub	
5	282.1834	145.6833	332.0861	-3.642m	Back_Curb	
6	282.3186	145.6184	332.0861	-3.492m	Top_Curb	
7	282.3562	145.6003	331.8611	-3.450m	Flowline_Gutter	
8	282.7619	145.4057	331.8881	-3.000m	ETW	
9	282.7619	145.4057	331.6881	-3.000m	ETW_SubBase	
10	288.1714	142.8099	331.5381	3.000m	ETW_SubBase	
11	288.1714	142.8099	331.7381	3.000m	Flange	
12	288.5771	142.6153	331.7111	3.450m	Flowline_Gutter	
13	288.6147	142.5972	331.9361	3.492m	Top_Curb	
14	288.7499	142.5323	331.9361	3.642m	Back_Curb	
15	289.6506	142.1001	331.7761	4.641m	EPS_Sub	

16	289.6515	142.0997	331.9761	4.642m	Hinge_Cut
17	292.6215	140.6745	338.5646	7.936m	Before_Rounding
18	292.7421	140.6167	338.6526	8.070m	Daylight

CHAINAGE 2+00.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	277.0584	174.8473	321.1562	-19.934m	Daylight
2	277.2843	174.7513	321.2158	-19.689m	Before_Rounding
3	291.1312	168.8630	331.2470	-4.642m	EPS
4	291.1321	168.8626	331.0470	-4.641m	EPS_Sub
5	292.0515	168.4717	331.2070	-3.642m	Back_Curb
6	292.1895	168.4130	331.2070	-3.492m	Top_Curb
7	292.2279	168.3967	330.9820	-3.450m	Flowline_Gutter
8	292.6420	168.2206	331.0090	-3.000m	ETW
9	292.6420	168.2206	330.8090	-3.000m	ETW_SubBase
10	298.1635	165.8726	330.6590	3.000m	ETW_SubBase
11	298.1635	165.8726	330.8590	3.000m	Flange
12	298.5776	165.6965	330.8320	3.450m	Flowline_Gutter
13	298.6160	165.6802	331.0570	3.492m	Top_Curb
14	298.7540	165.6215	331.0570	3.642m	Back_Curb
15	299.6734	165.2306	330.8970	4.641m	EPS_Sub
16	299.6743	165.2302	331.0970	4.642m	Hinge_Cut
17	300.9284	164.6969	333.8225	6.004m	Before_Rounding
18	301.1343	164.6093	333.9499	6.228m	Daylight

CHAINAGE 2+25.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	286.3658	198.0560	320.0000	-20.451m	Daylight
2	286.6027	197.9552	320.0000	-20.194m	Before_Rounding
3	300.9144	191.8693	330.3679	-4.642m	EPS
4	300.9153	191.8689	330.1679	-4.641m	EPS_Sub
5	301.8347	191.4780	330.3279	-3.642m	Back_Curb
6	301.9727	191.4193	330.3279	-3.492m	Top_Curb
7	302.0111	191.4030	330.1029	-3.450m	Flowline_Gutter
8	302.4252	191.2269	330.1299	-3.000m	ETW
9	302.4252	191.2269	329.9299	-3.000m	ETW_SubBase
10	307.9467	188.8789	329.7799	3.000m	ETW_SubBase
11	307.9467	188.8789	329.9799	3.000m	Flange

12	308.3608	188.7028	329.9529	3.450m	Flowline_Gutter
13	308.3992	188.6865	330.1779	3.492m	Top_Curb
14	308.5372	188.6278	330.1779	3.642m	Back_Curb
15	309.4566	188.2368	330.0179	4.641m	EPS_Sub
16	309.4575	188.2365	330.2179	4.642m	Hinge_Cut
17	311.9629	187.1710	335.6631	7.364m	Before_Rounding
18	312.1006	187.1125	335.7652	7.514m	Daylight

CHAINAGE 2+50.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	297.5994	220.4455	320.0000	-18.875m	Before_Rounding
2	310.6976	214.8756	329.4889	-4.642m	EPS
3	310.6985	214.8752	329.2889	-4.641m	EPS_Sub
4	311.6179	214.4843	329.4489	-3.642m	Back_Curb
5	311.7559	214.4256	329.4489	-3.492m	Top_Curb
6	311.7943	214.4092	329.2239	-3.450m	Flowline_Gutter
7	312.2084	214.2331	329.2509	-3.000m	ETW
8	312.2084	214.2331	329.0509	-3.000m	ETW_SubBase
9	317.7299	211.8852	328.9009	3.000m	ETW_SubBase
10	317.7299	211.8852	329.1009	3.000m	Flange
11	318.1440	211.7091	329.0739	3.450m	Flowline_Gutter
12	318.1824	211.6928	329.2989	3.492m	Top_Curb
13	318.3204	211.6341	329.2989	3.642m	Back_Curb
14	319.2398	211.2431	329.1389	4.641m	EPS_Sub
15	319.2407	211.2427	329.3389	4.642m	Hinge_Cut
16	322.5767	209.8241	336.5891	8.267m	Before_Rounding
17	322.7583	209.7469	336.7487	8.464m	Daylight

CHAINAGE 2+75.00

POINT	X	Y	Z	OFFSET	STRING CUT
1	320.4808	237.8819	328.6098	-4.642m	EPS
2	320.4817	237.8815	328.4098	-4.641m	EPS_Sub
3	321.4011	237.4905	328.5698	-3.642m	Back_Curb
4	321.5391	237.4318	328.5698	-3.492m	Top_Curb
5	321.5775	237.4155	328.3448	-3.450m	Flowline_Gutter
6	321.9916	237.2394	328.1718	-3.000m	ETW_SubBase
7	321.9916	237.2394	328.3718	-3.000m	Flange

8	327.5131	234.8915	328.2218	3.000m	ETW
9	327.5131	234.8915	328.0218	3.000m	ETW_SubBase
10	327.9272	234.7154	328.1948	3.450m	Flowline_Gutter
11	327.9656	234.6990	328.4198	3.492m	Top_Curb
12	328.1036	234.6403	328.4198	3.642m	Back_Curb
13	329.0230	234.2494	328.2598	4.641m	EPS_Sub
14	329.0239	234.2490	328.4598	4.642m	Ditch_Out
15	331.0172	233.4014	332.7920	6.808m	Before_Rounding
16	331.2249	233.3130	332.9167	7.033m	Daylight

PRILOG 4- VERTIKALNI TOK TRASE

Station Range: Start: 0+00.00, End: 278+14.00

PVI	Station	Grade Out	Curve Length
0.00	0+00.00	-6.84%	
1.00	1+36.45	-3.52%	165.65m

Vertical Curve Information:(sag curve)
PVC Station: 0+53.70 Elevation: 338.85m
PVI Station: 1+36.45 Elevation: 333.20m
PVT Station: 2+19.35 Elevation: 330.25m
Low Point: 2+19.35 Elevation: 330.25m
Grade in: -6.84% Grade out: -3.52%
Change: 3.32% K:
Curve Length: 165.65m
Headlight Distance:
2.00 2+78.14