



Ministry of Forests, Lands and
Natural Resource Operations

Omenica Region

Prince George Resource District

Chuchinka-Colbourne FSR

Roadway Widening and Upgrade

Geometric Alignment

Km 31 to Km 33.6

Page 1 of 71

Stations: 30+919.50 to 31+071.55

ROAD DESIGN SPECIFICATIONS

Design Speed: 30 km/h
Avg. Stab. Road Width: 6.0m
Fav. Grade Max. 10%
Adv. Grade Max 10%

Section Scale 1:250

Project Location Coordinates

Latitude: 51-15-03
Longitude: -119-53-14
Elevation: 610m
Datum: NAD83
UTM Combined Scale Factor:
n/a

Notes:

- Ground model data obtained by Lidar Survey method by McElhanney Survey Consulting Ltd. Oct. 2013
-30km/h Speed Limit through the Canyon, remainder designed to minimum 60km/h.

Survey Control Stations

Point Name	Northing	Easting	Elevation	Description

Plan Legend (all may not be applicable)

L-line Location

Road Edges

Clearing Limits

Culverts

GPS Base Station

Old Iron Bar found (tied)

Old Pipe Post found (tie)

Survey Control Points tie

Benchmark

Edge of Wetland

Existing Road Edges

Breakline

Powerline

Draw

Test Pit

Stream

Tension Crack

Timberline

Cut / Fill limits

Powerpole

Finished Road Surface

Profile Subgrade

Cut / Fill limits

Original Ground

1st Stratum

2nd Stratum (Rock)

Ditch Invert Right

Ditch Invert Left

EARTH WORK VOLUMES (Bank cubic meters)

L-Stn m.	Strip V. Cu. m.	SG Cut V. Cu. m.	SG Fill V. Cu. m.	B/W Vol. Cu. m.	Srf1 Fill V. Cu. m.
30+919.50					
31+000.00	94.8	117.9	76.0		208.3
31+200.00	269.4	263.6	265.7		548.1
Pg. Tot.	364.2	381.5	341.6		756.4
Cum. Tot.	364.2	381.5	341.6		756.4

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cnt
31+035.97	600	21.00	10.50	10.50	89.00000	Minor Crossing

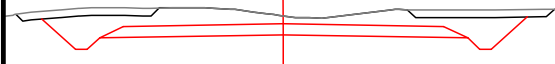
SOIL TYPES

OB - Overburden
OR - Organics
SL - Silt
FS - Fine Sand & Silt
SA - Sand
SG - Sand & Gravel
CG - Sand & Course Gravel
SC - Sand/Cobbles/Gravel
GR - Gravel
BO - Boulders
FR - Fractured Rock (Talus)
RR - Riprable Rock
SR - Solid Rock

ROAD TEMPLATES

TP = Taper template
TO = Turnout Template
8M = 8.0m wide finished running surface
8WS = 8m wide finished running surface with retaining wall

Surfacing depth = 0.3m
Ditch Slopes = 1.5:1 Ditch Depth = 0.3 Width = 0.3
F Slope = Final Slope Left or Right



Prepared by:


Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

DRAFT
FOR REVIEW
PURPOSES ONLY

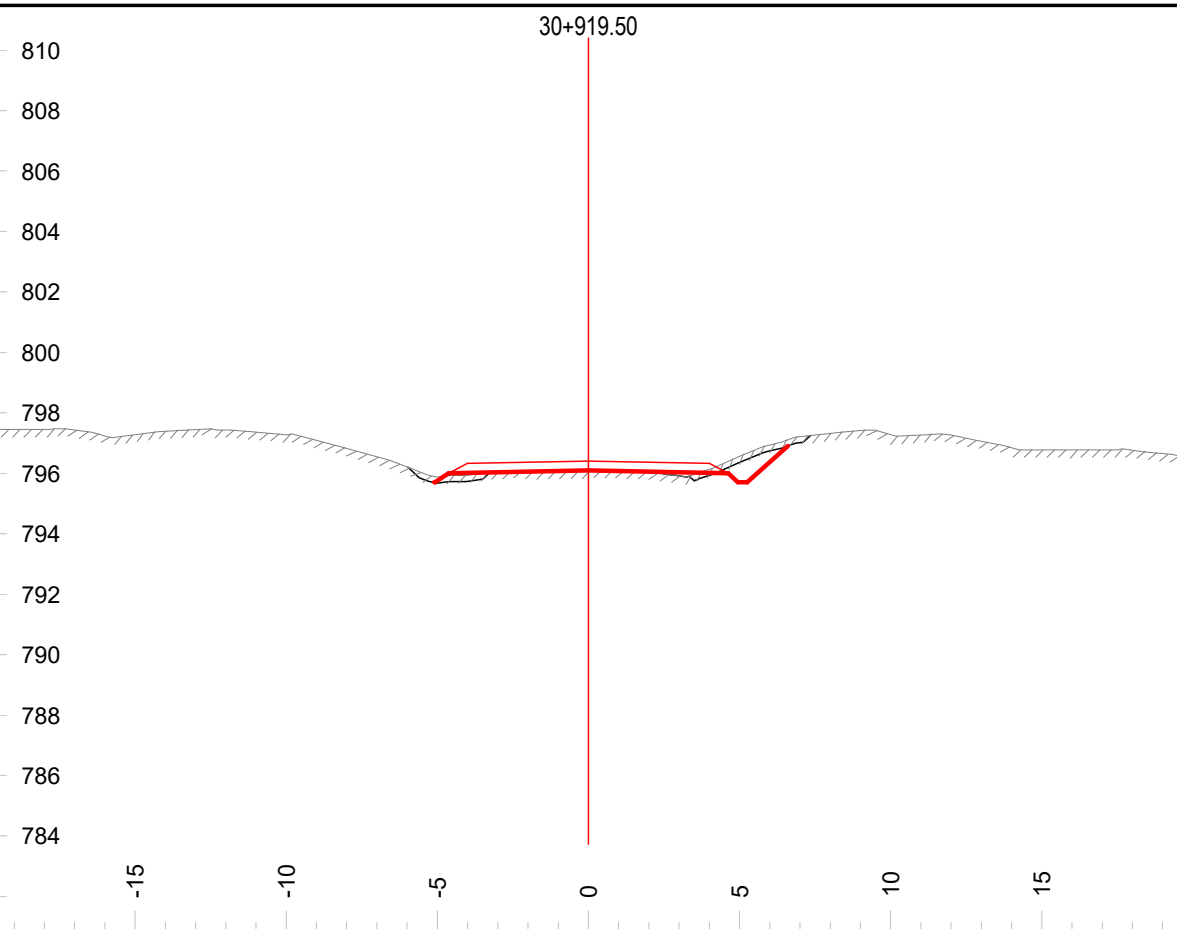
Dwg Num: 110-022-003

Survey By: see Notes above
Design By: Edward Folk, P.Eng.
Approved By:

Plot Date:16/06/29

Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-

30+919.50

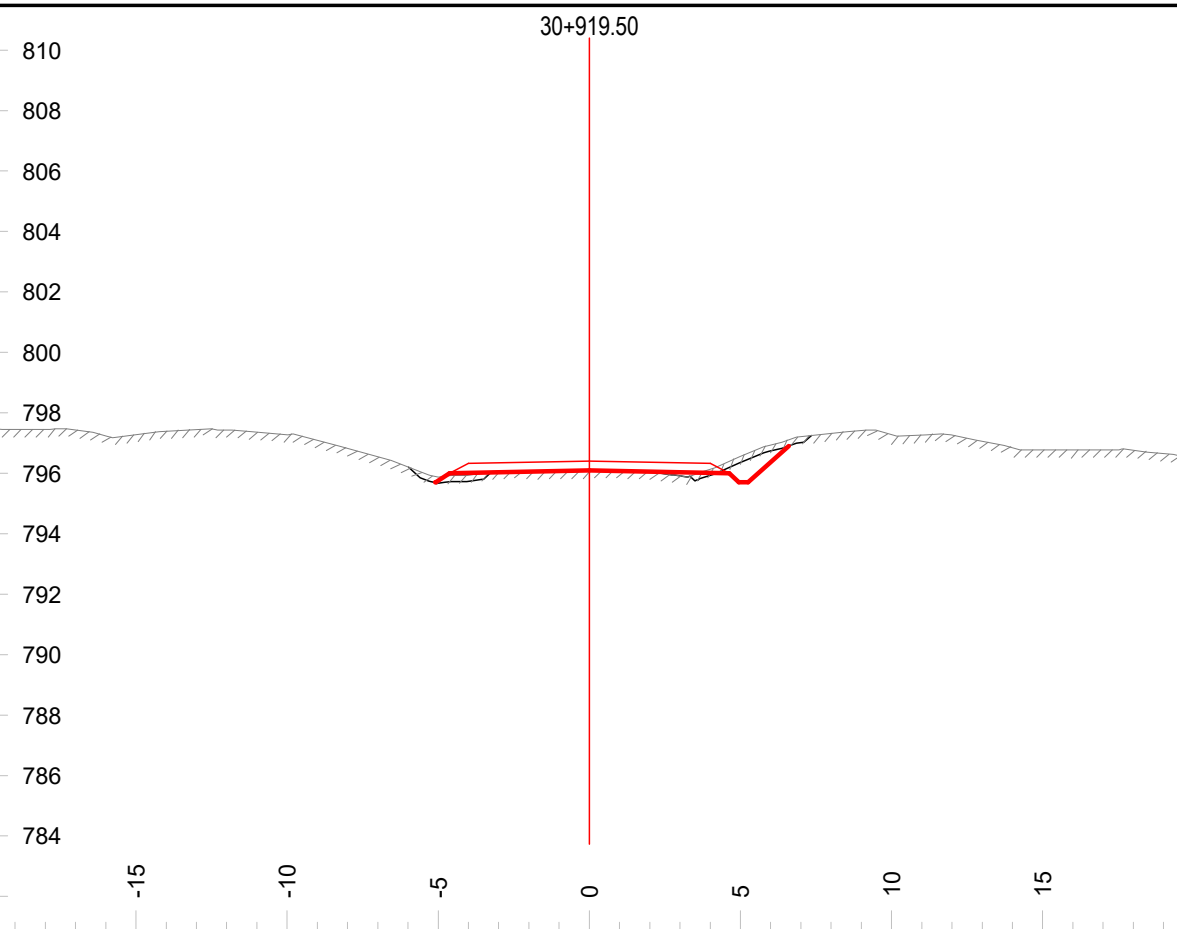


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8M Rd. Wd. L: 4.63 CL Elev: 796.11 Rd. Wd. R: 4.63 Grd.Lst: n/a
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.01 F Slope R: 1.11:1 Grd.Nxt.: 0.0%

30+919.50

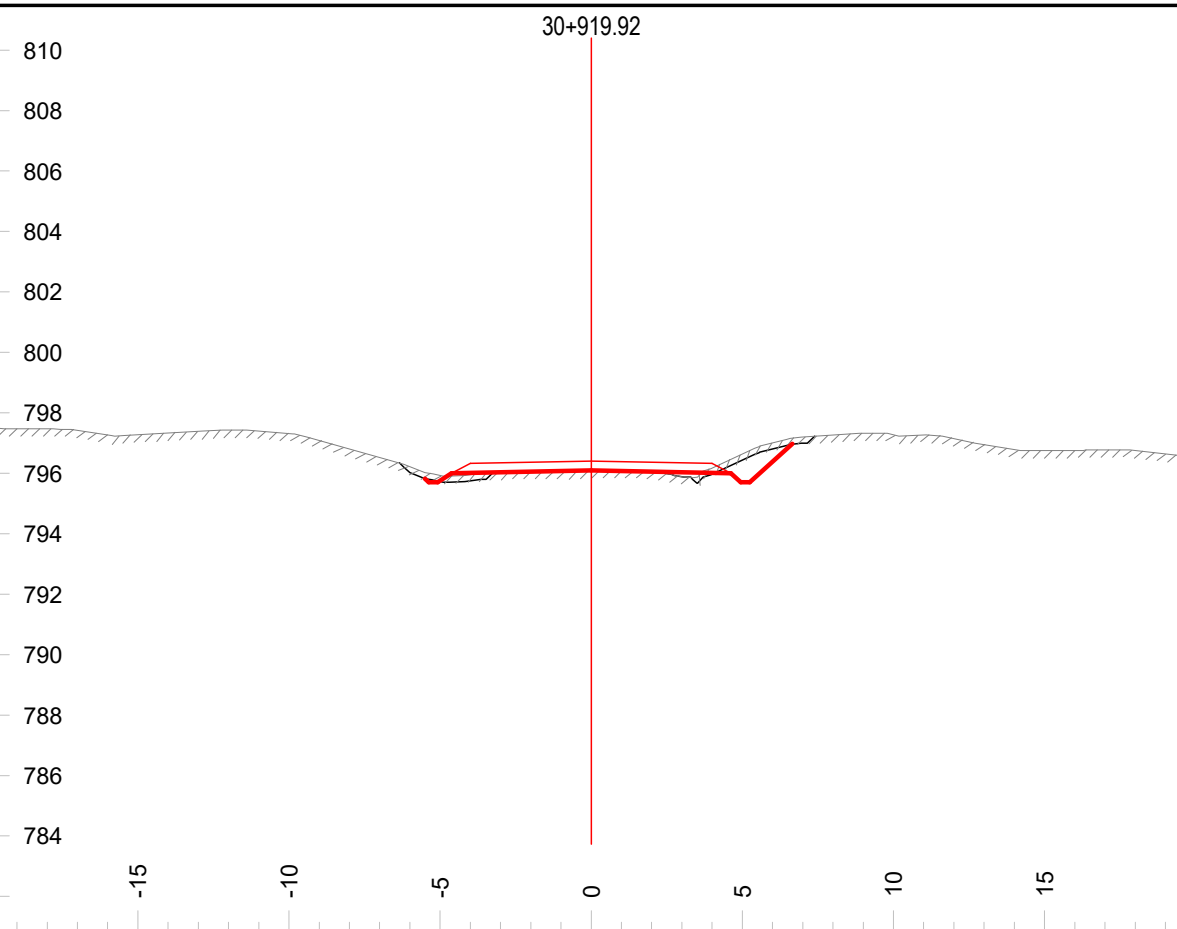


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8M Rd. Wd. L: 4.63 CL Elev: 796.11 Rd. Wd. R: 4.63 Grd.Lst: n/a
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.01 F Slope R: 1.11:1 Grd.Nxt.: 0.0%

30+919.92

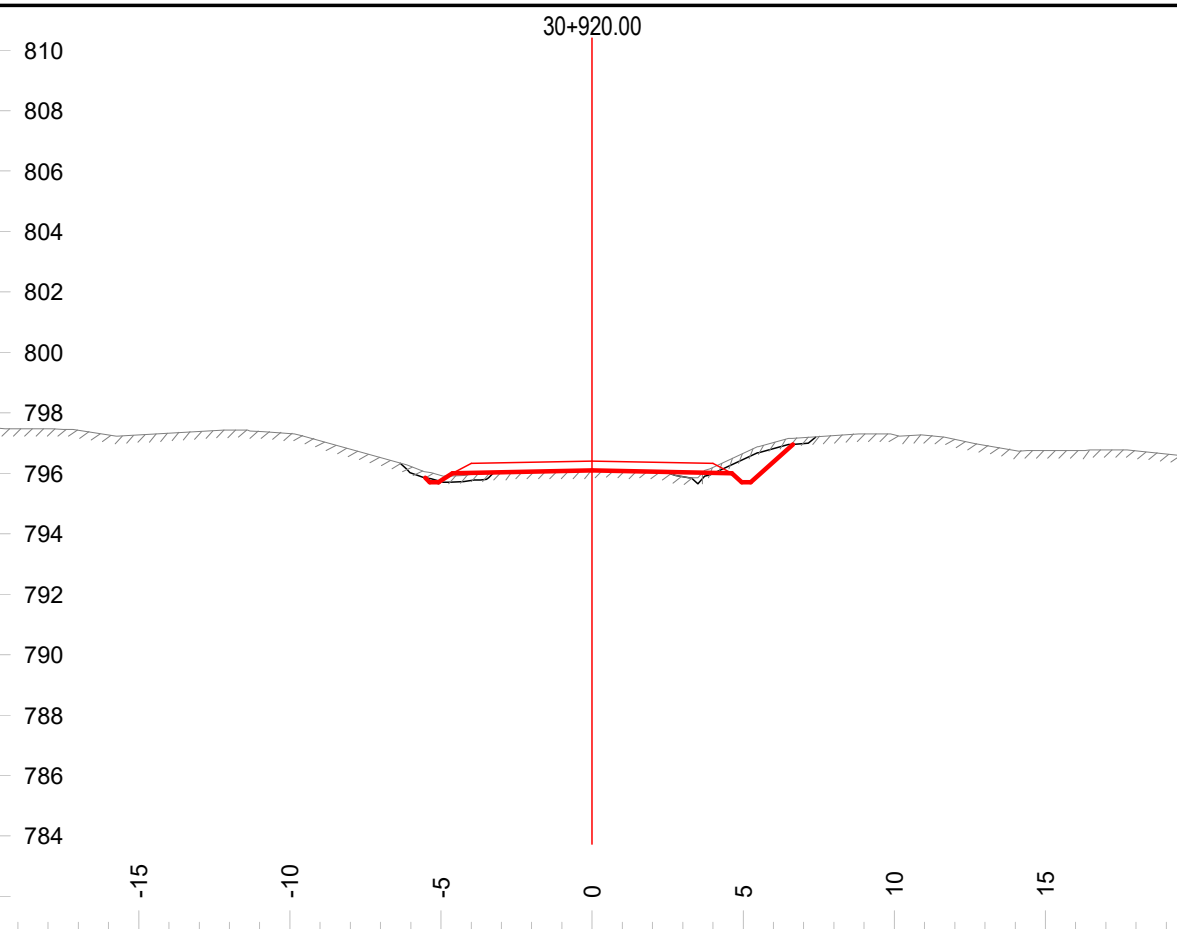


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8M Rd. Wd. L: 4.63 CL Elev: 796.10 Rd. Wd. R: 4.63 Grd.Lst: -0.1%
Cul Length: F Slope L: 1.11:1 Cut Dp: -0.01 F Slope R: 1.11:1 Grd.Nxt.: -0.1%

30+920.00

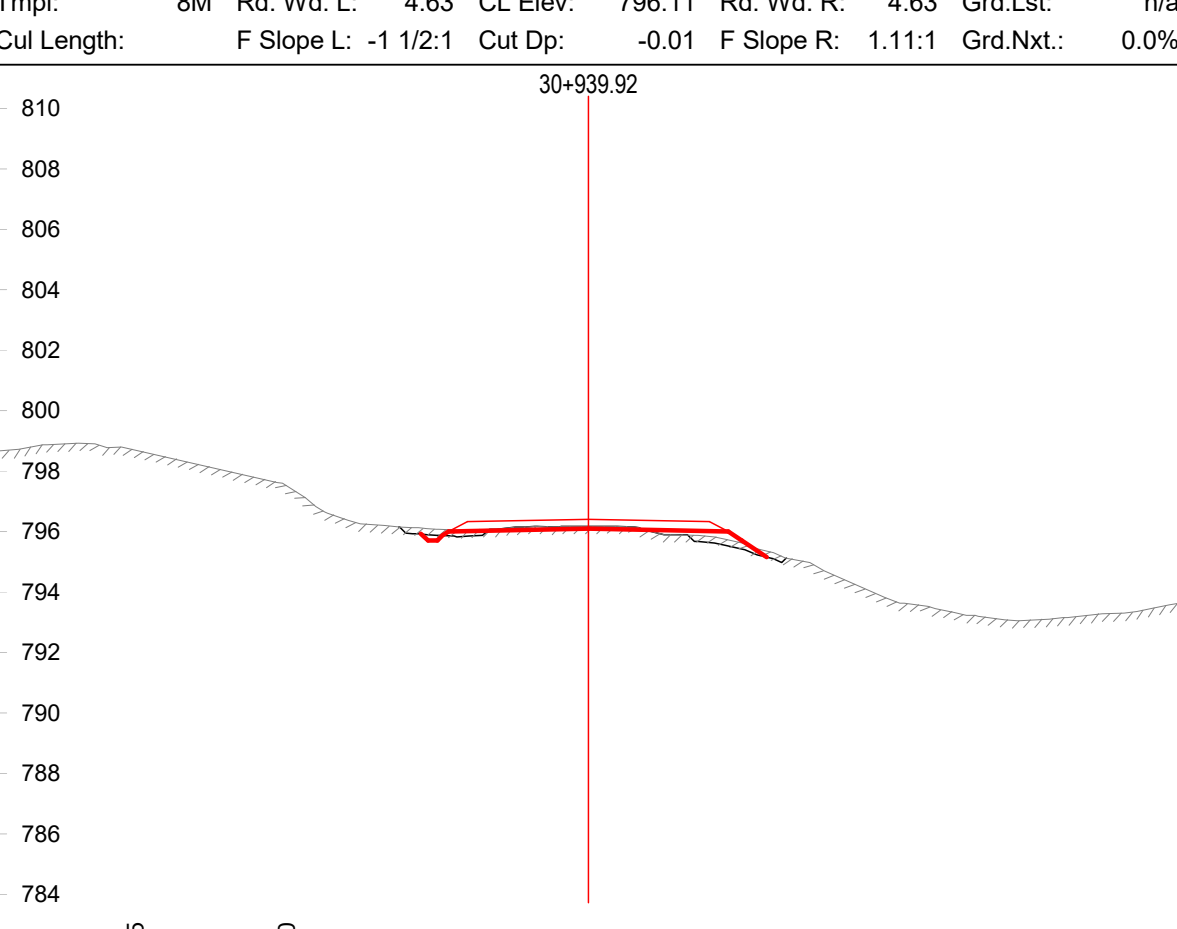


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8M Rd. Wd. L: 4.63 CL Elev: 796.10 Rd. Wd. R: 4.63 Grd.Lst: -0.1%
Cul Length: F Slope L: 1.11:1 Cut Dp: -0.01 F Slope R: 1.11:1 Grd.Nxt.: -0.1%

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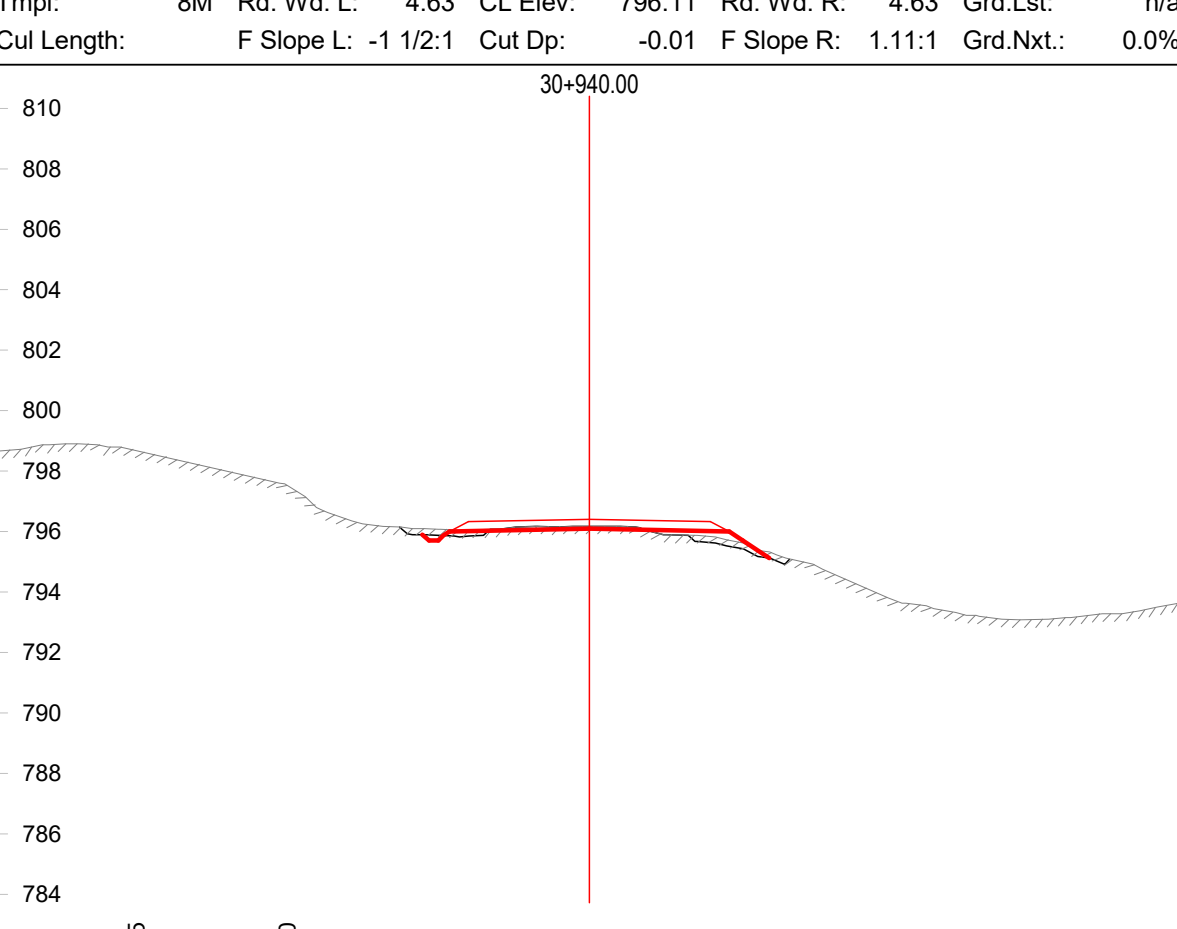


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8M Rd. Wd. L: 4.63 CL Elev: 796.09 Rd. Wd. R: 4.63 Grd.Lst: -0.1%
Cul Length: F Slope L: 1.11:1 Cut Dp: 0.08 F Slope R: -1 1/2:1 Grd.Nxt.: -0.1%

30+940.00

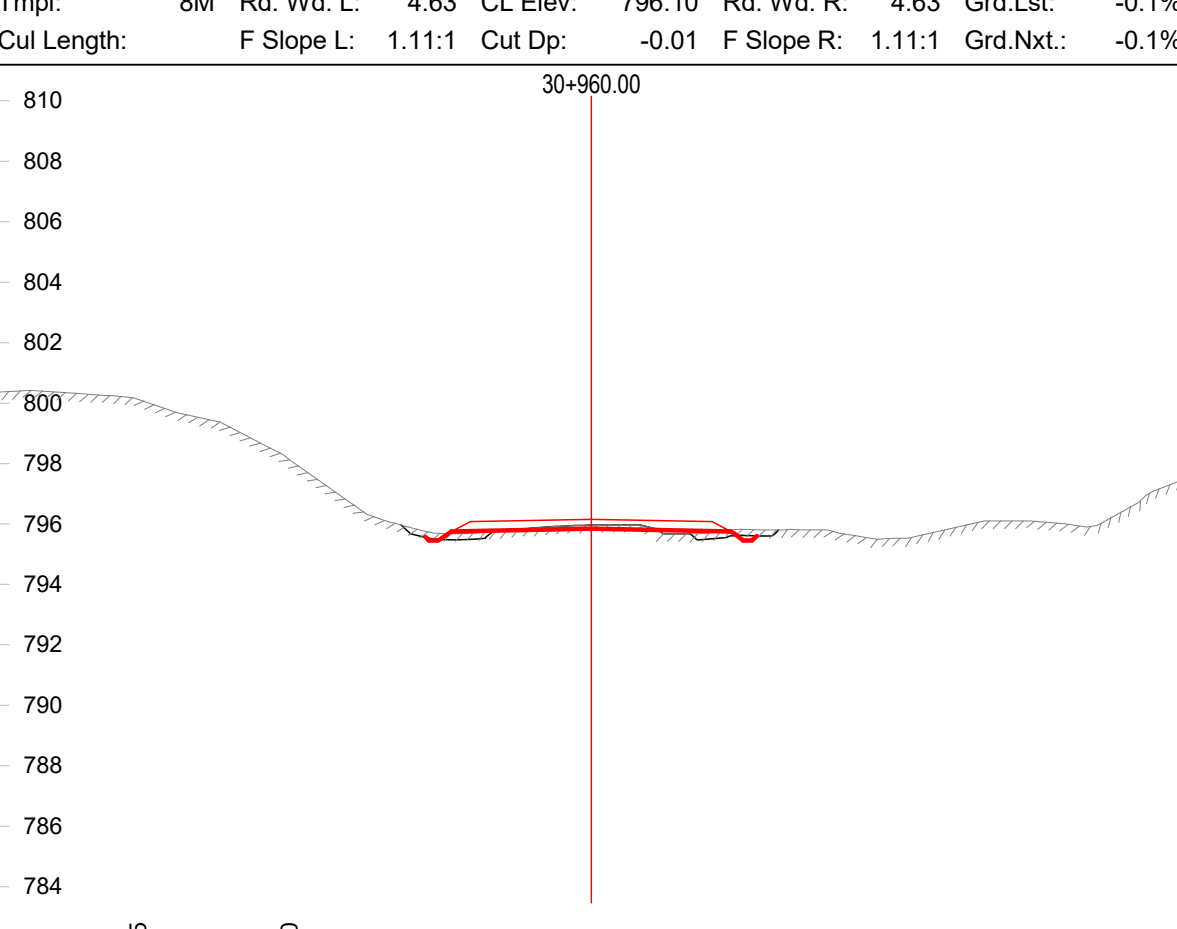


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8M Rd. Wd. L: 4.63 CL Elev: 796.09 Rd. Wd. R: 4.63 Grd.Lst: -0.1%
Cul Length: F Slope L: 1.11:1 Cut Dp: 0.08 F Slope R: -1 1/2:1 Grd.Nxt.: -0.1%

30+960.00

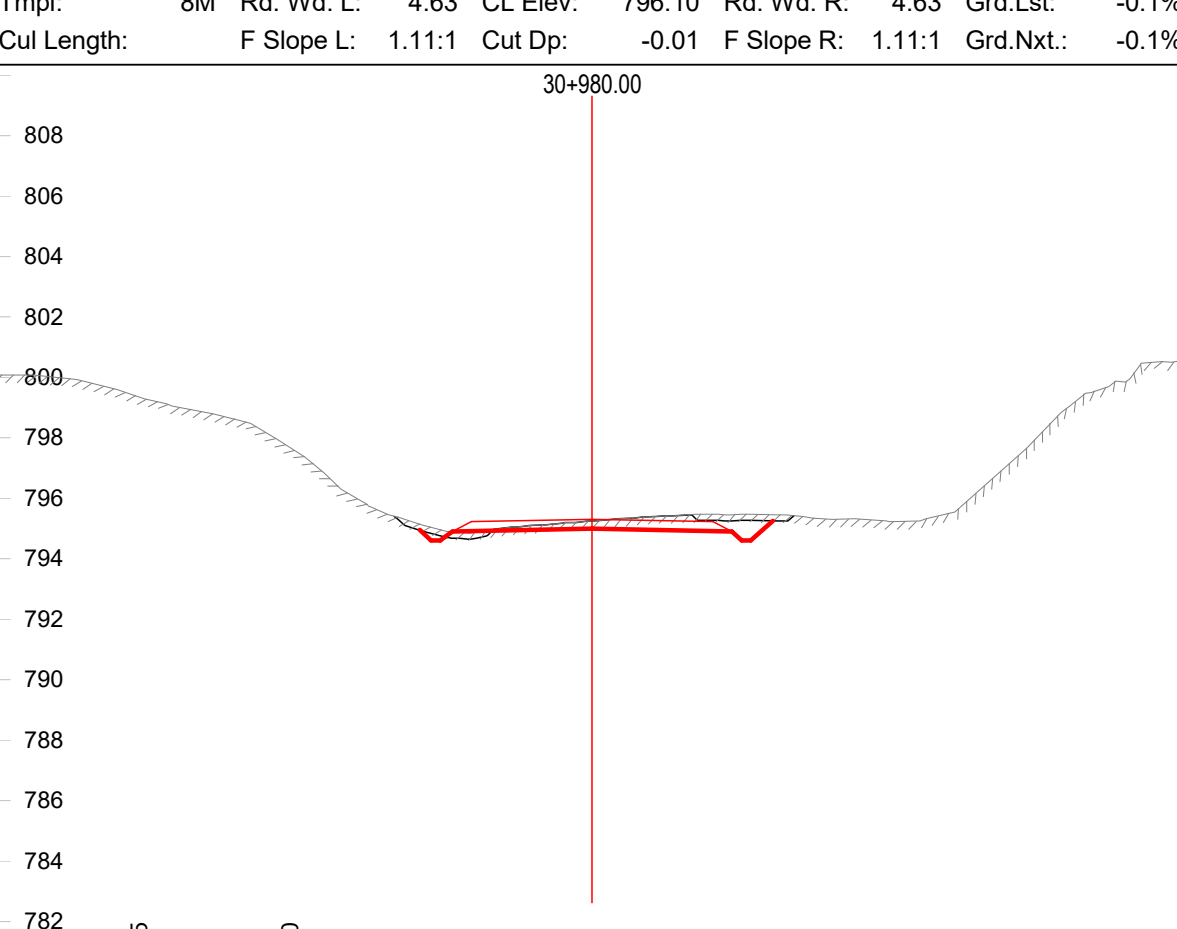


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8M Rd. Wd. L: 4.63 CL Elev: 795.84 Rd. Wd. R: 4.63 Grd.Lst: -2.7%
Cul Length: F Slope L: 1.11:1 Cut Dp: 0.12 F Slope R: 1.11:1 Grd.Nxt.: -2.7%

30+980.00

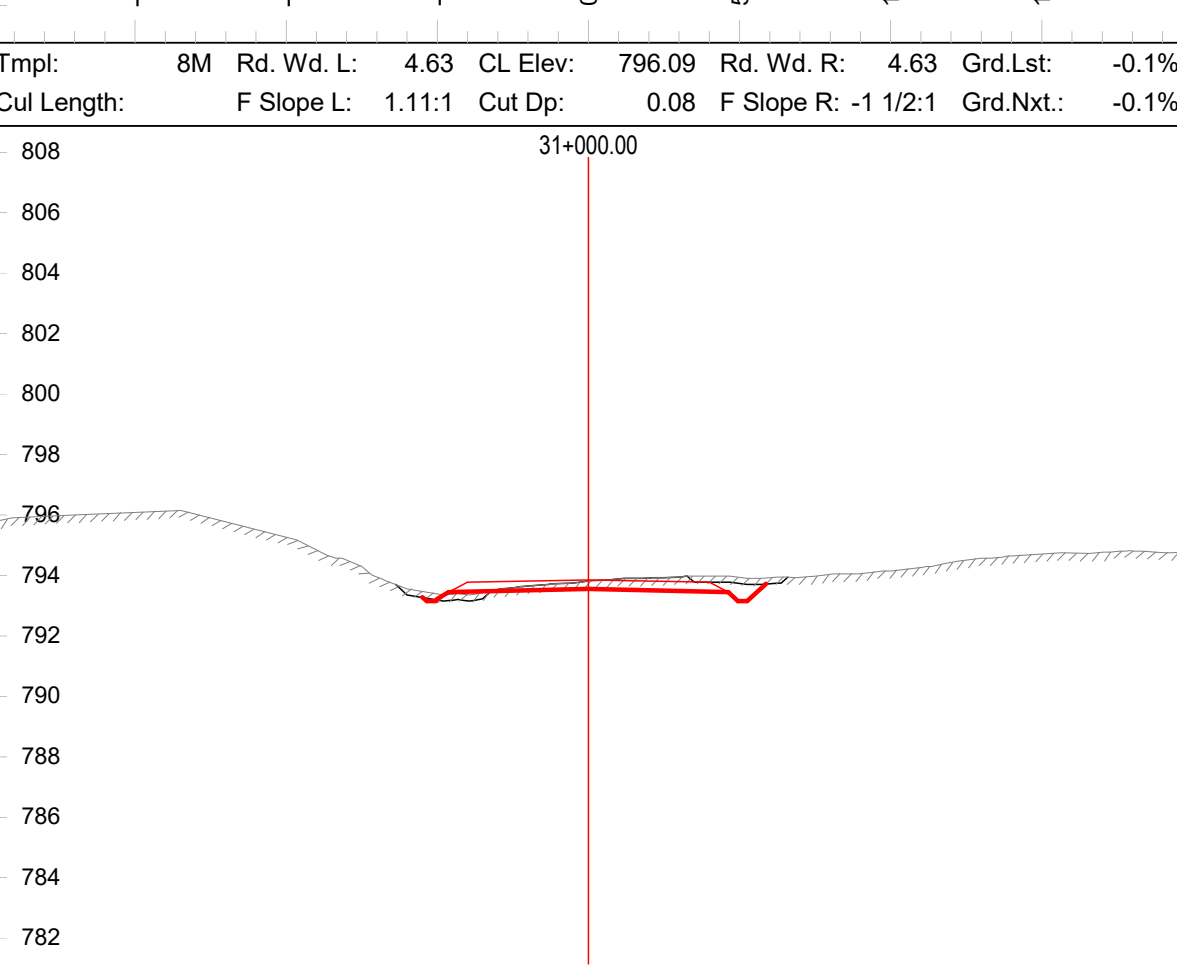


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8M Rd. Wd. L: 4.63 CL Elev: 794.99 Rd. Wd. R: 4.63 Grd.Lst: -5.8%
Cul Length: F Slope L: 1.11:1 Cut Dp: 0.26 F Slope R: 1.11:1 Grd.Nxt.: -5.8%

31+000.00

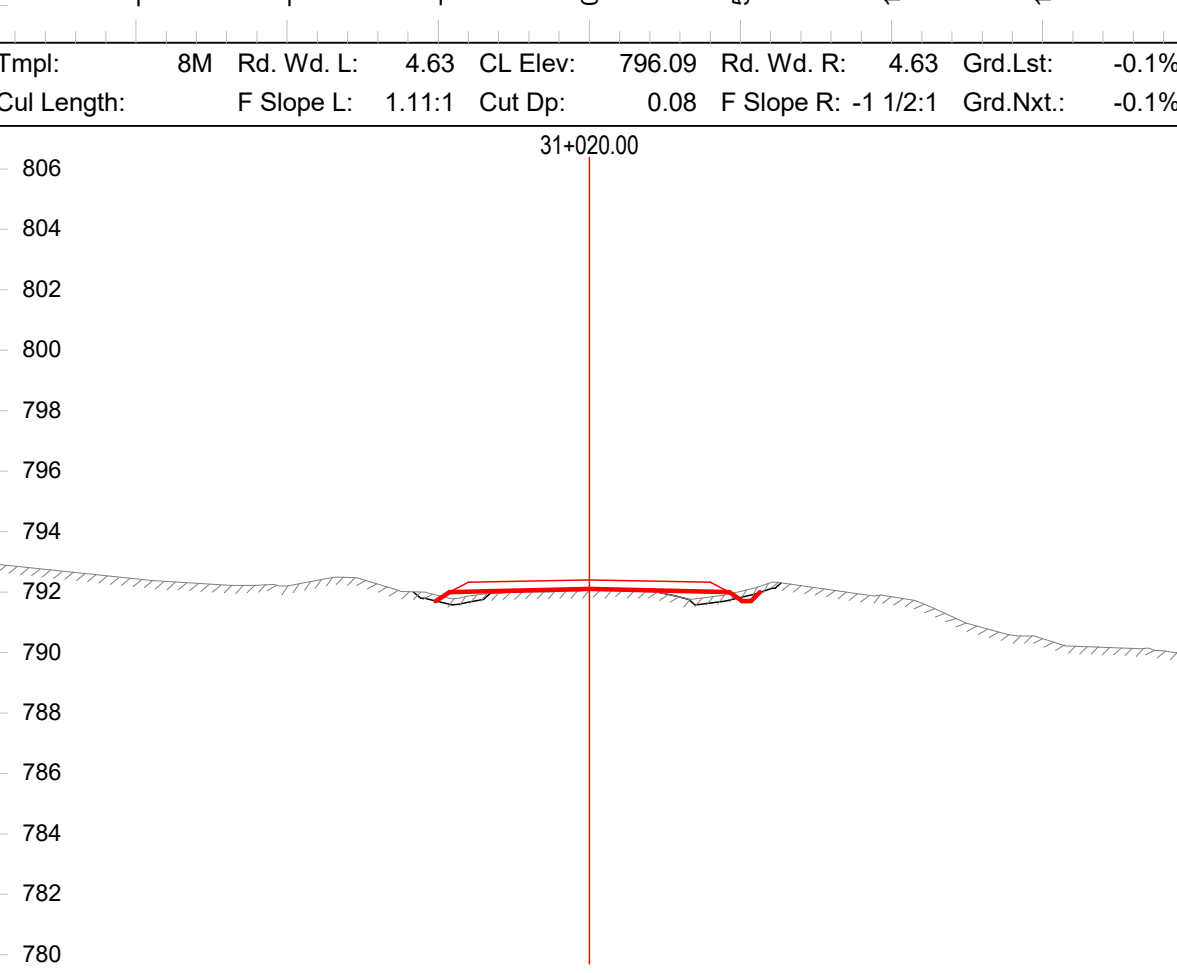


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8M Rd. Wd. L: 4.63 CL Elev: 793.55 Rd. Wd. R: 4.63 Grd.Lst: -8.0%
Cul Length: F Slope L: 1.11:1 Cut Dp: 0.26 F Slope R: 1.11:1 Grd.Nxt.: -8.0%

31+020.00

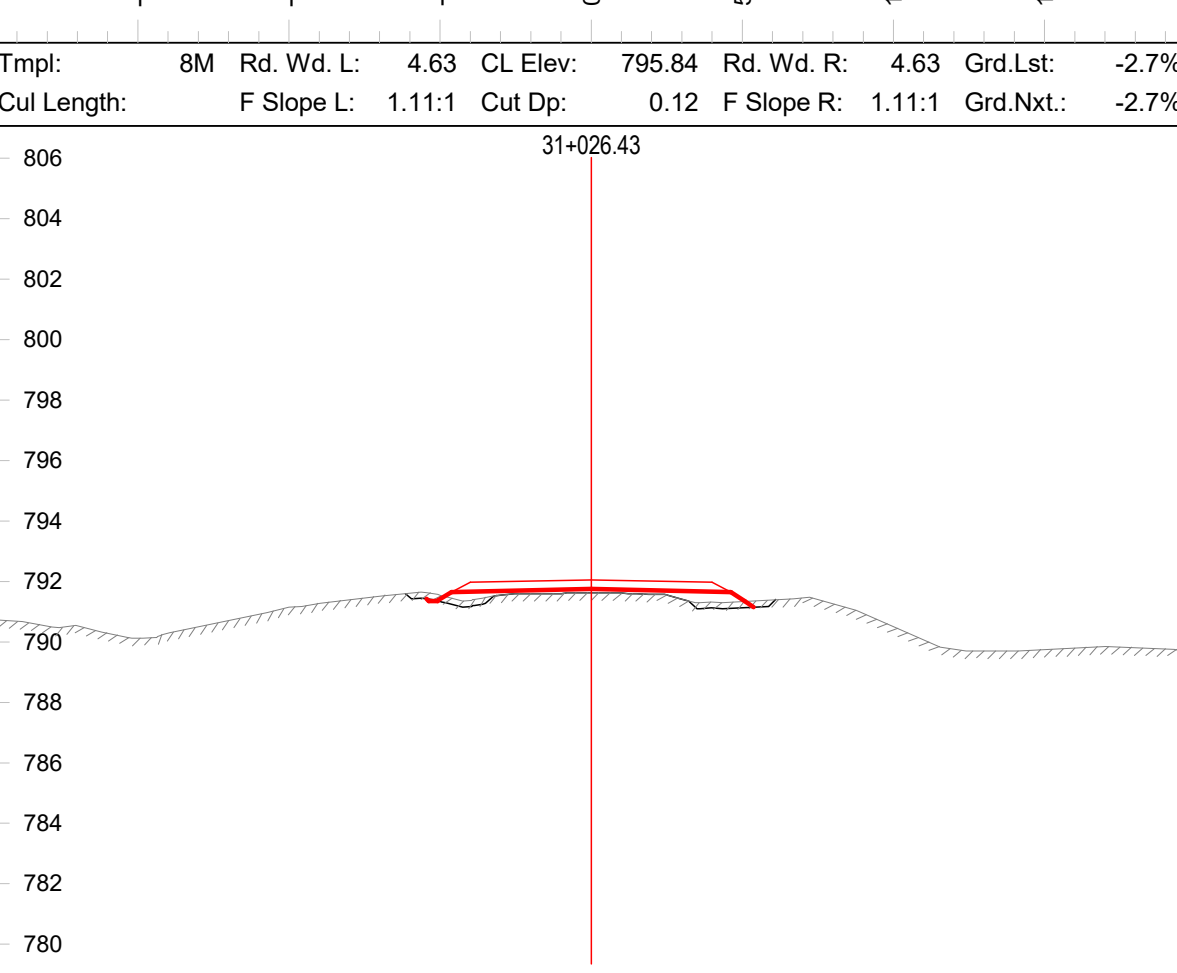


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8M Rd. Wd. L: 4.63 CL Elev: 792.10 Rd. Wd. R: 4.63 Grd.Lst: -5.8%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.03 F Slope R: 1.11:1 Grd.Nxt.: -5.8%

31+026.43

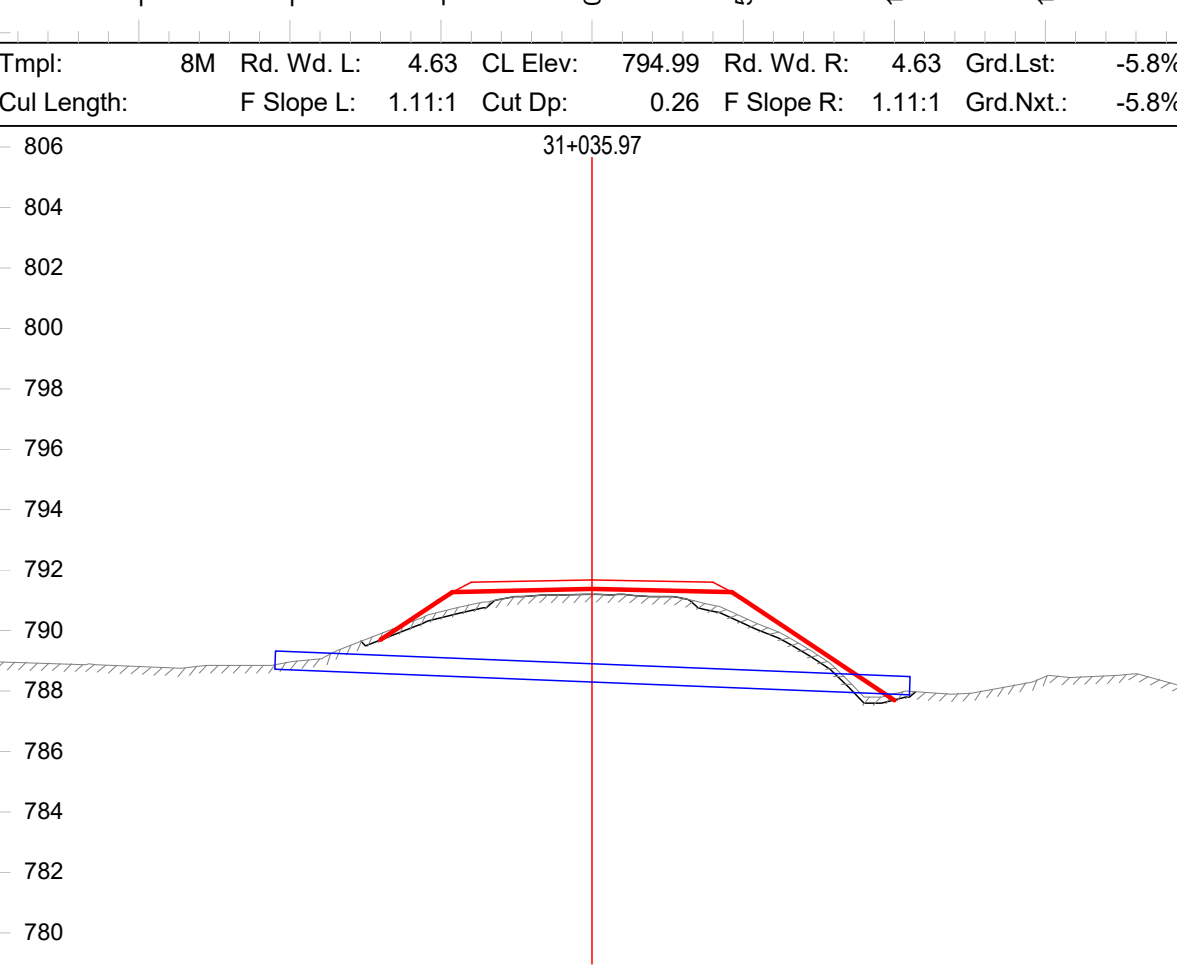


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8M Rd. Wd. L: 4.63 CL Elev: 791.76 Rd. Wd. R: 4.63 Grd.Lst: -4.8%
Cul Length: F Slope L: 1.11:1 Cut Dp: -0.12 F Slope R: -1 1/2:1 Grd.Nxt.: -4.8%

31+035.97

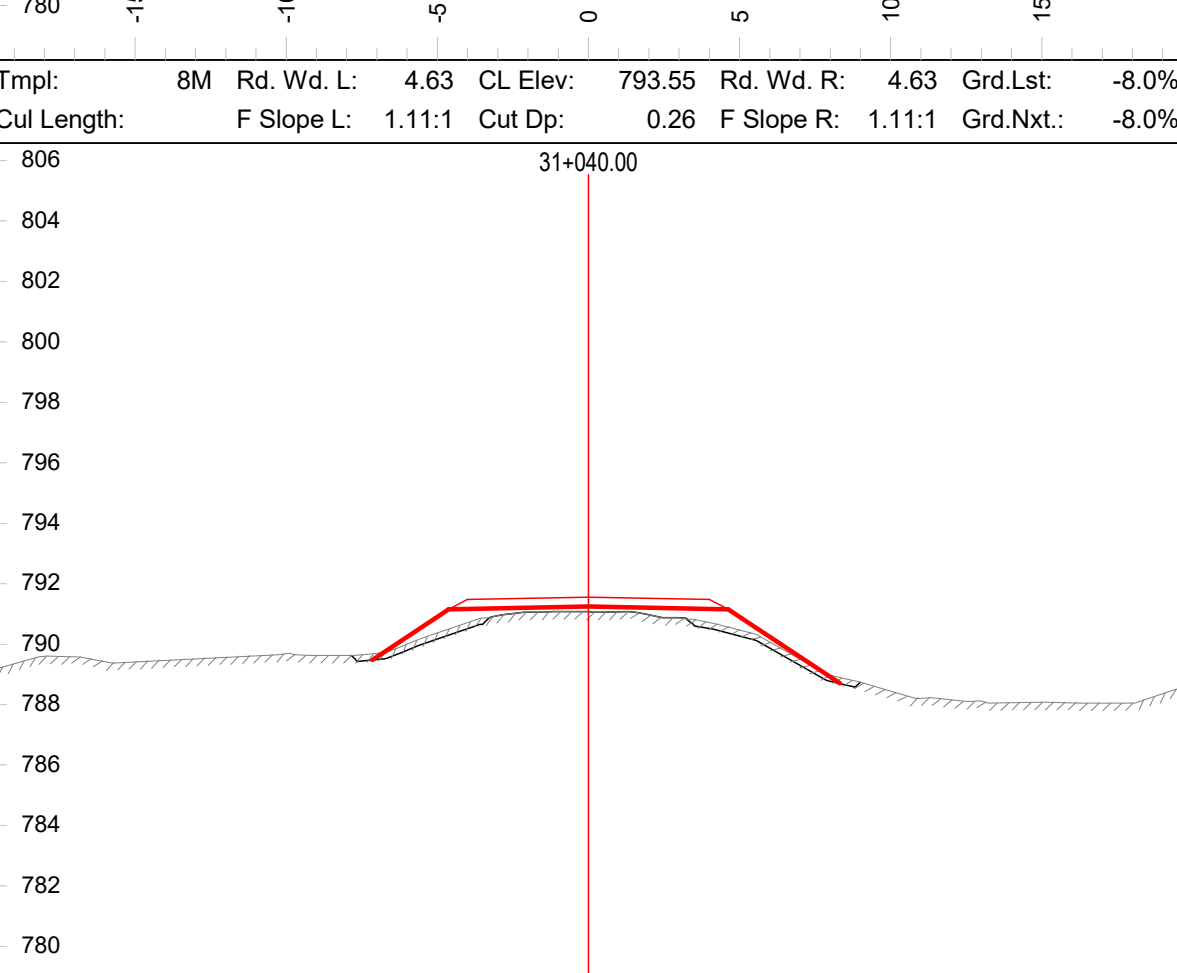


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8M Rd. Wd. L: 4.63 CL Elev: 791.36 Rd. Wd. R: 4.63 Grd.Lst: -3.4%
Cul Length: 21.00 F Slope L: -1 1/2:1 Cut Dp: -0.18 F Slope R: -1 1/2:1 Grd.Nxt.: -3.4%

31+040.00

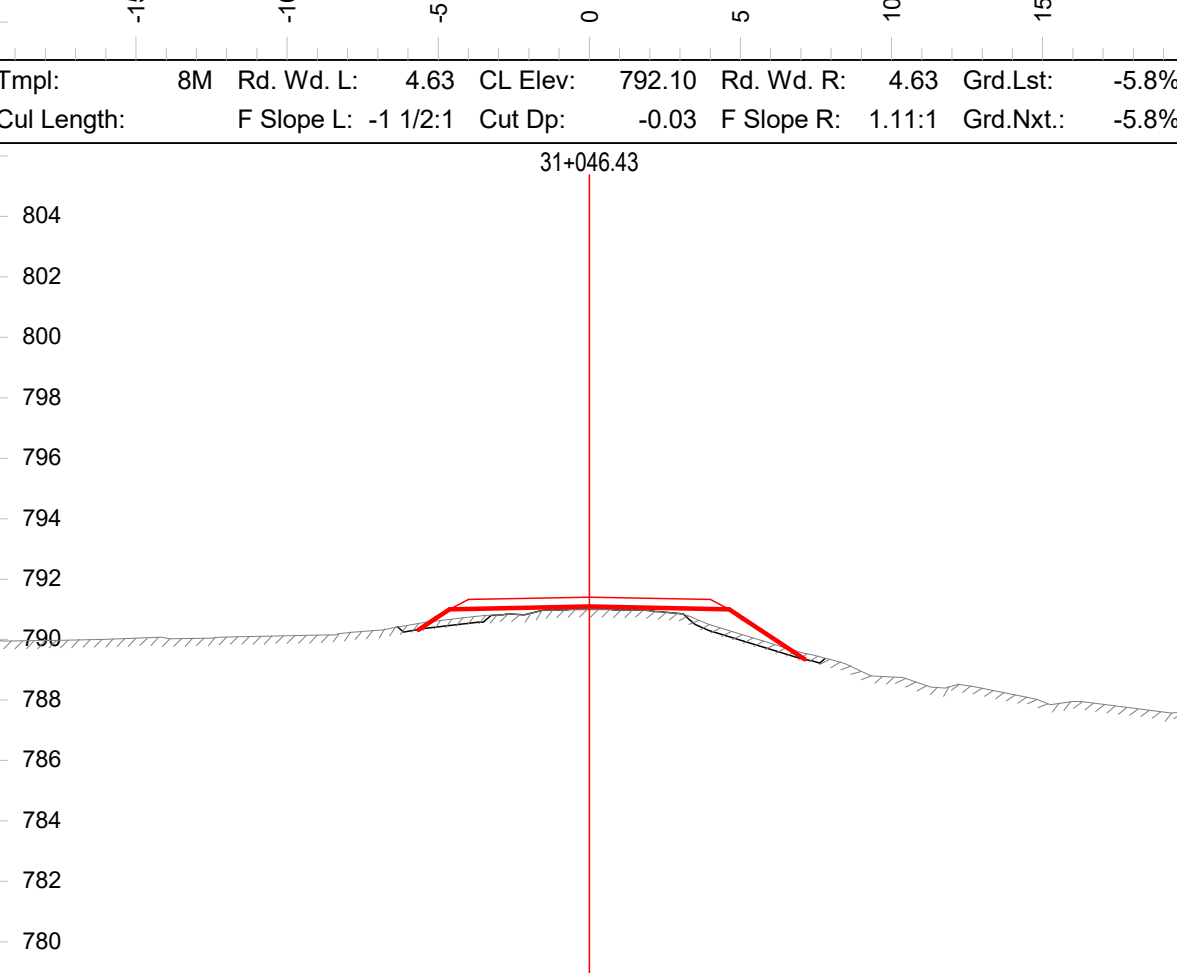


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8M Rd. Wd. L: 4.63 CL Elev: 791.24 Rd. Wd. R: 4.63 Grd.Lst: -2.8%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.19 F Slope R: -1 1/2:1 Grd.Nxt.: -2.8%

31+046.43

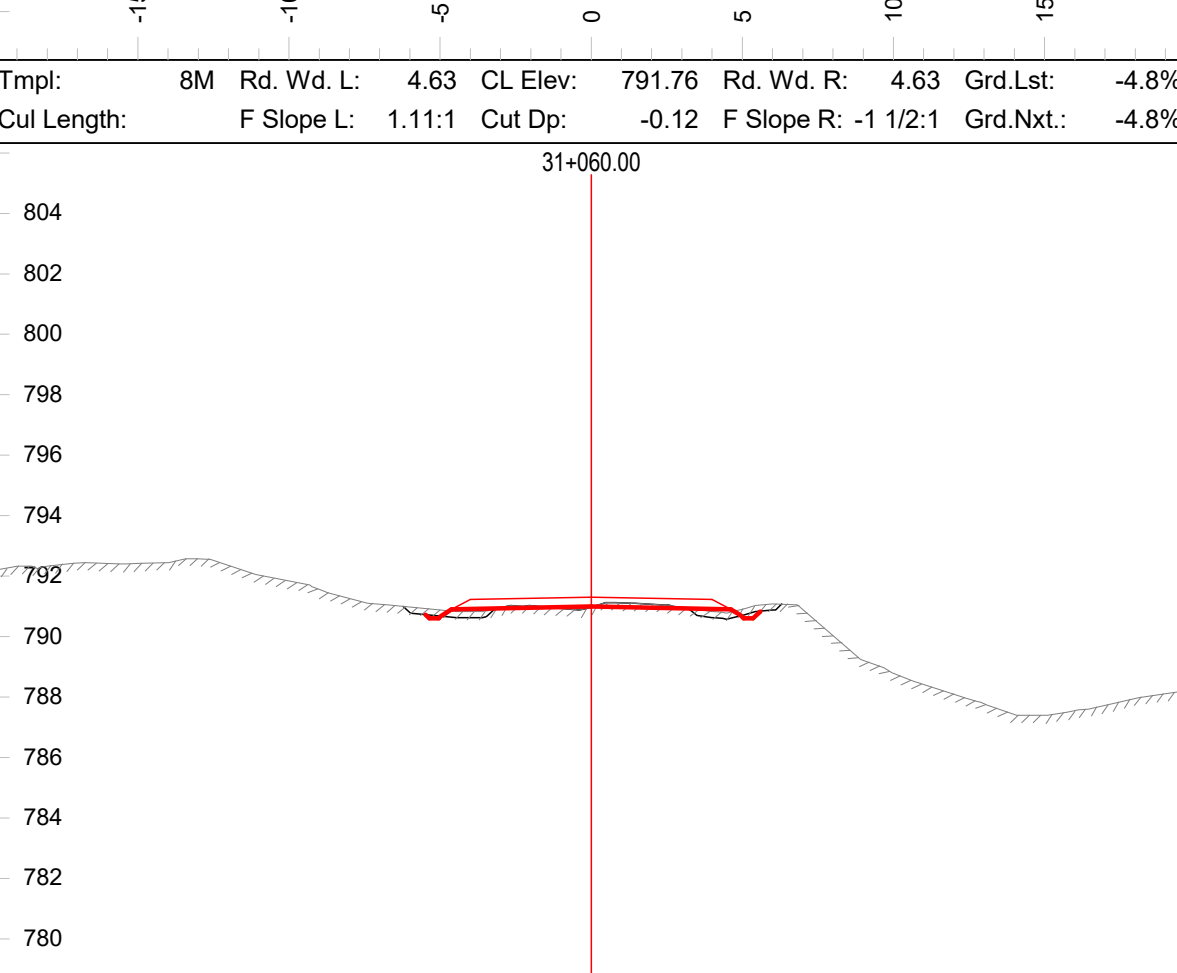


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8M Rd. Wd. L: 4.63 CL Elev: 791.10 Rd. Wd. R: 4.63 Grd.Lst: -1.8%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.11 F Slope R: -1 1/2:1 Grd.Nxt.: -1.8%

31+060.00

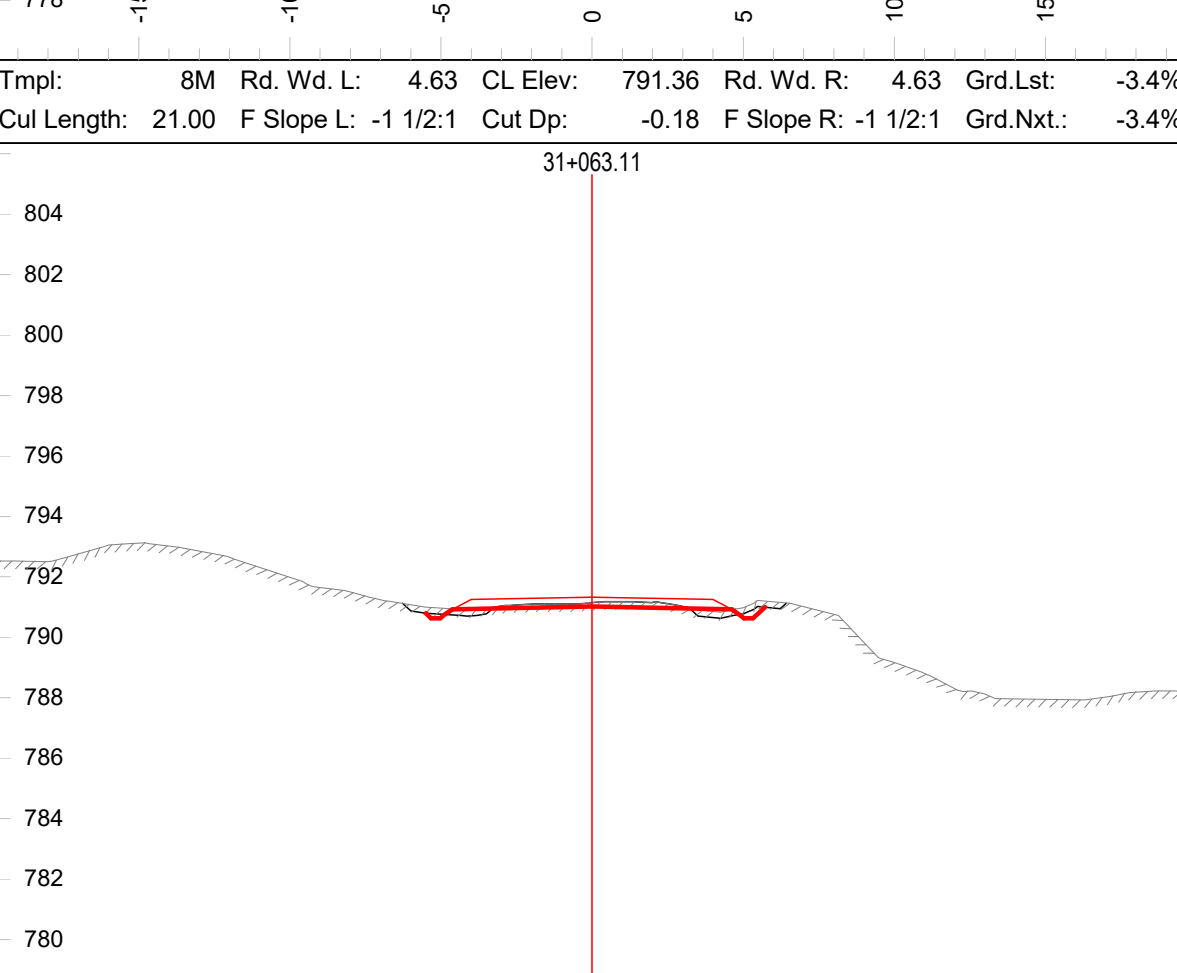


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8M Rd. Wd. L: 4.63 CL Elev: 791.00 Rd. Wd. R: 4.63 Grd.Lst: 0.3%
Cul Length: F Slope L: 1.11:1 Cut Dp: -0.02 F Slope R: 1.11:1 Grd.Nxt.: 0.3%

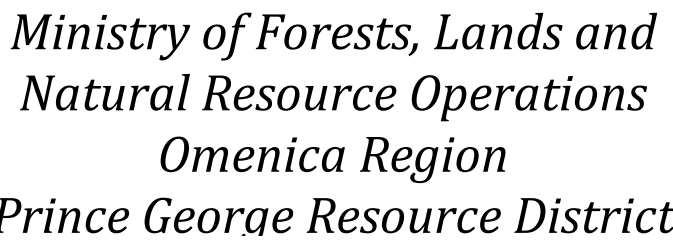
31+063.11



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8M Rd. Wd. L: 4.63 CL Elev: 791.01 Rd. Wd. R: 4.63 Grd.Lst: 0.8%
Cul Length: F Slope L: 1.11:1 Cut Dp: 0.12 F Slope R: 1.11:1 Grd.Nxt.: 0.8%



Page 2 of 71 Stations: 31+071.55 to 31+229.17

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CULVERT TABLE						
L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt

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Tmpl:	8M	Rd. Wd. L:	4.63	CL Elev:	791.40	Rd. Wd. R:	4.63	Grd.Lst:	-0.9%
Cul Length:		F Slope L:	-1 1/2:1	Cut Dp:	-0.09	F Slope R:	-1 1/2:1	Grd.Nxt.:	-0.9%



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Roadway Widening and Upgrade

Geometric Alignment

Km 31 to Km 33.6

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Stations: 31+229.17 to 31+382.22

ROAD DESIGN SPECIFICATIONS

Design Speed: 30 km/h
Avg. Stab. Road Width: 6.0m
Fav. Grade Max. 10%
Adv. Grade Max. 10%

Section Scale 1:250

Project Location Coordinates

Latitude: 51-15-03
Longitude: -119-53-14
Elevation: 610m
Datum: NAD83
UTM Combined Scale Factor:
n/a

Notes:

- Ground model data obtained by Lidar Survey method by McElhanney Survey Consulting Ltd. Oct. 2013
-30km/h Speed Limit through the Canyon, remainder designed to minimum 60km/h.

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Point Name	Northing	Easting	Elevation	Description

Plan Legend (all may not be applicable)

L-line Location

Road Edges

Cleaning Limits

Culverts

GPS Base Station

Old Iron Bar found (tied)

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Survey Control Points tie

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Edge of Wetland

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Breakline

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Draw

Test Pit

Stream

Tension Crack

Timberline

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Cut / Fill limits

Original Ground

1st Stratum

2nd Stratum (Rock)

Ditch Invert Right

Ditch Invert Left

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L-Stn m.	Strip V. Cu. m.	SG Cut V. Cu. m.	SG Fill V. Cu. m.	B/W Vol. Cu. m.	Srf1 Fill V. Cu. m.
31+400.00					
Pg. Tot.	0.0	0.0	0.0		0.0
Cum. Tot.	623.4	946.9	509.5		1301.1

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt
31+238.33	600	13.00	7.00	6.00	90.00000	xdrain

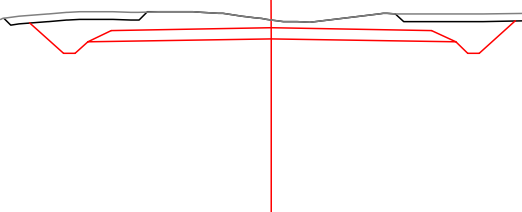
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OR - Organics
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FS - Fine Sand & Silt
SA - Sand
SG - Sand & Gravel
CG - Sand & Course Gravel
SC - Sand/Cobbles/Gravel
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TP = Taper template
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8WS = 8m wide finished running surface with retaining wall

Surfacing depth = 0.3m
Ditch Slopes = 1.5:1 Ditch Depth = 0.3 Width = 0.3
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Prepared by:



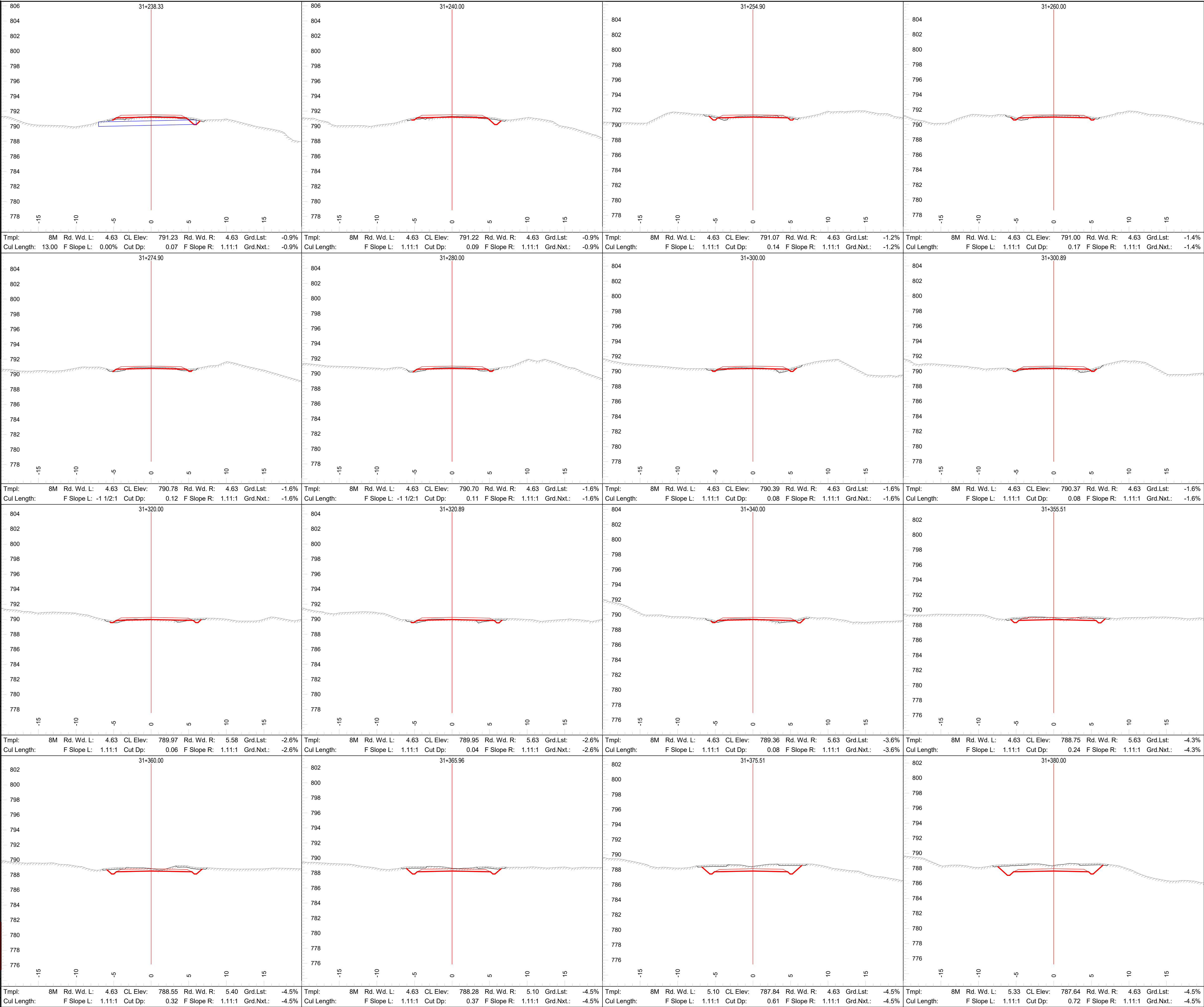
Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

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FOR REVIEW
PURPOSES ONLY

Dwg Num: 110-022-003

Survey By: see Notes above
Design By: Edward Folk, P.Eng.
Approved By:

Plot Date:16/06/29 Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-





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Prince George Resource District

Chuchinka-Colbourne FSR

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Geometric Alignment

Km 31 to Km 33.6

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Stations: 31+382.22 to 31+471.09

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Adv. Grade Max 10%

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1st Stratum

2nd Stratum (Rock)

Ditch Invert Right

Ditch Invert Left

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31+400.00 31+600.00	296.7	1125.2	246.0	-1310.0	561.8
Pg. Tot.	296.7	1125.2	246.0		561.8
Cum. Tot.	920.1	2072.0	755.5		1862.9

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt
31+384.43	600	13.00	6.50	6.50	85.00000	xdrain

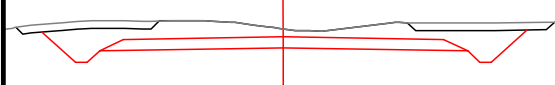
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Prepared by:



Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

DRAFT
FOR REVIEW
PURPOSES ONLY

Dwg Num: 110-022-003

Survey By: see Notes above
Design By: Edward Folk, P.Eng.
Approved By:

Plot Date:16/06/29

Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-

<div><div><div>31+384.43</div><div>802 800 798 796 794 792 790 788 786 784 782 780 778 776 774</div></div><div><div>Tmpl: 8M Rd. Wd. L: 5.55 CL Elev: 787.44 Rd. Wd. R: 4.63 Grd.Lst: -4.5% Cul Length: 13.00 F Slope L: 1.11:1 Cut Dp: 0.76 F Slope R: 1.11:1 Grd.Nxt: -4.5%</div></div></div>	<div><div><div>31+385.96</div><div>802 800 798 796 794 792 790 788 786 784 782 780 778 776 774</div></div><div><div>Tmpl: 8M Rd. Wd. L: 5.63 CL Elev: 787.37 Rd. Wd. R: 4.63 Grd.Lst: -4.5% Cul Length: F Slope L: 1.11:1 Cut Dp: 0.96 F Slope R: 1.11:1 Grd.Nxt: -4.5%</div></div></div>	<div><div><div>31+389.00</div><div>802 800 798 796 794 792 790 788 786 784 782 780 778 776 774</div></div><div><div>Tmpl: 8M<->TP Rd. Wd. L: 5.63 CL Elev: 787.23 Rd. Wd. R: 4.63 Grd.Lst: -4.5% Cul Length: F Slope L: 1.11:1 Cut Dp: 0.96 F Slope R: 1.11:1 Grd.Nxt: -4.5%</div></div></div>	<div><div><div>31+400.00</div><div>800 798 796 794 792 790 788 786 784 782 780 778 776 774</div></div><div><div>Tmpl: 8M<->TP Rd. Wd. L: 5.63 CL Elev: 786.73 Rd. Wd. R: 6.70 Grd.Lst: -4.5% Cul Length: F Slope L: 1.11:1 Cut Dp: 0.94 F Slope R: 1.11:1 Grd.Nxt: -4.5%</div></div></div>
<div><div><div>31+404.00</div><div>800 798 796 794 792 790 788 786 784 782 780 778 776 774</div></div><div><div>Tmpl: 8M<->TO Rd. Wd. L: 5.63 CL Elev: 786.55 Rd. Wd. R: 7.46 Grd.Lst: -4.5% Cul Length: F Slope L: 1.11:1 Cut Dp: 0.93 F Slope R: 1.11:1 Grd.Nxt: -4.5%</div></div></div>	<div><div><div>31+419.30</div><div>800 798 796 794 792 790 788 786 784 782 780 778 776 774</div></div><div><div>Tmpl: TP Rd. Wd. L: 5.63 CL Elev: 785.87 Rd. Wd. R: 7.46 Grd.Lst: -4.2% Cul Length: F Slope L: 1.11:1 Cut Dp: 1.16 F Slope R: 1.11:1 Grd.Nxt: -4.2%</div></div></div>	<div><div><div>31+420.00</div><div>800 798 796 794 792 790 788 786 784 782 780 778 776 774</div></div><div><div>Tmpl: TP Rd. Wd. L: 5.65 CL Elev: 785.84 Rd. Wd. R: 7.42 Grd.Lst: -4.2% Cul Length: F Slope L: 1.11:1 Cut Dp: 1.16 F Slope R: 1.11:1 Grd.Nxt: -4.2%</div></div></div>	<div><div><div>31+440.00</div><div>798 796 794 792 790 788 786 784 782 780 778 776 774 772</div></div><div><div>Tmpl: TP Rd. Wd. L: 6.29 CL Elev: 785.04 Rd. Wd. R: 6.23 Grd.Lst: -4.0% Cul Length: F Slope L: 1.11:1 Cut Dp: 0.90 F Slope R: 1.11:1 Grd.Nxt: -4.0%</div></div></div>
<div><div><div>31+444.08</div><div>798 796 794 792 790 788 786 784 782 780 778 776 774 772</div></div><div><div>Tmpl: TP Rd. Wd. L: 6.42 CL Elev: 784.87 Rd. Wd. R: 5.99 Grd.Lst: -4.0% Cul Length: F Slope L: 1.11:1 Cut Dp: 0.76 F Slope R: 1.11:1 Grd.Nxt: -4.0%</div></div></div>	<div><div><div>31+450.40</div><div>798 796 794 792 790 788 786 784 782 780 778 776 774 772</div></div><div><div>Tmpl: 10F Rd. Wd. L: 6.31 CL Elev: 784.62 Rd. Wd. R: 5.63 Grd.Lst: -4.0% Cul Length: F Slope L: 1.11:1 Cut Dp: 0.46 F Slope R: 1.11:1 Grd.Nxt: -4.0%</div></div></div>	<div><div><div>31+451.40</div><div>798 796 794 792 790 788 786 784 782 780 778 776 774 772</div></div><div><div>Tmpl: TP Rd. Wd. L: 6.26 CL Elev: 784.58 Rd. Wd. R: 5.63 Grd.Lst: -4.0% Cul Length: F Slope L: 1.11:1 Cut Dp: 0.43 F Slope R: 1.11:1 Grd.Nxt: -4.0%</div></div></div>	<div><div><div>31+460.00</div><div>798 796 794 792 790 788 786 784 782 780 778 776 774 772</div></div><div><div>Tmpl: TP Rd. Wd. L: 5.83 CL Elev: 784.24 Rd. Wd. R: 5.63 Grd.Lst: -4.0% Cul Length: F Slope L: 1/2:1 Cut Dp: 0.03 F Slope R: 1/2:1 Grd.Nxt: -4.0%</div></div></div>
<div><div><div>31+462.90</div><div>798 796 794 792 790 788 786 784 782 780 778 776 774 772</div></div><div><div>Tmpl: 10F Rd. Wd. L: 5.68 CL Elev: 784.12 Rd. Wd. R: 5.63 Grd.Lst: -4.0% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.06 F Slope R: 1/2:1 Grd.Nxt: -4.0%</div></div></div>	<div><div><div>31+463.00</div><div>798 796 794 792 790 788 786 784 782 780 778 776 774 772</div></div><div><div>Tmpl: 10F Rd. Wd. L: 5.68 CL Elev: 784.12 Rd. Wd. R: 5.63 Grd.Lst: -4.0% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.06 F Slope R: 1/2:1 Grd.Nxt: -4.0%</div></div></div>	<div><div><div>31+463.20</div><div>798 796 794 792 790 788 786 784 782 780 778 776 774 772</div></div><div><div>Tmpl: BR Rd. Wd. L: 0.00 CL Elev: 784.11 Rd. Wd. R: 0.00 Grd.Lst: -4.0% Cul Length: F Slope L: *** Cut Dp: -0.09 F Slope R: *** Grd.Nxt: -4.0%</div></div></div>	<div><div><div>31+464.08</div><div>798 796 794 792 790 788 786 784 782 780 778 776 774 772</div></div><div><div>Tmpl: BR Rd. Wd. L: 0.00 CL Elev: 784.07 Rd. Wd. R: 0.00 Grd.Lst: -4.0% Cul Length: F Slope L: *** Cut Dp: -0.10 F Slope R: *** Grd.Nxt: -4.0%</div></div></div>



Ministry of Forests, Lands and
Natural Resource Operations

Omenica Region

Prince George Resource District

Chuchinka-Colbourne FSR

Roadway Widening and Upgrade

Geometric Alignment

Km 31 to Km 33.6

Page 5 of 71

Stations: 31+471.09 to 31+543.29

ROAD DESIGN SPECIFICATIONS

Design Speed: 30 km/h
Avg. Stab. Road Width: 6.0m
Fav. Grade Max. 10%
Adv. Grade Max 10%

Section Scale 1:250

Project Location Coordinates

Latitude: 51-15-03
Longitude: -119-53-14
Elevation: 610m
Datum: NAD83
UTM Combined Scale Factor:
n/a

Notes:

- Ground model data obtained by Lidar Survey method by McElhanney Survey Consulting Ltd. Oct. 2013
-30km/h Speed Limit through the Canyon, remainder designed to minimum 60km/h.

Survey Control Stations

Point Name	Northing	Easting	Elevation	Description

Plan Legend (all may not be applicable)

L-line Location

Road Edges

Clearing Limits

Culverts

GPS Base Station

Old Iron Bar found (tied)

Old Pipe Post found (tie)

Survey Control Points tie

Benchmark

Edge of Wetland

Existing Road Edges

Breakline

Powerline

Draw

Test Pit

Stream

Tension Crack

Timberline

Cut / Fill limits

Powerpole

Finished Road Surface

Profile Subgrade

Cut / Fill limits

Original Ground

1st Stratum

2nd Stratum (Rock)

Ditch Invert Right

Ditch Invert Left

EARTH WORK VOLUMES (Bank cubic meters)

L-Stn m.	Strip V. Cu. m.	SG Cut V. Cu. m.	SG Fill V. Cu. m.	B/W Vol. Cu. m.	Srf1 Fill V. Cu. m.
31+600.00					
Pg. Tot.	0.0	0.0	0.0		0.0
Cum. Tot.	920.1	2072.0	755.5		1862.9

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt

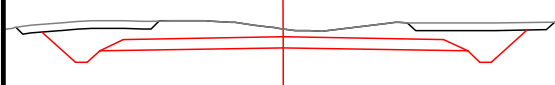
SOIL TYPES

OB - Overburden
OR - Organics
SL - Silt
FS - Fine Sand & Silt
SA - Sand
SG - Sand & Gravel
CG - Sand & Course Gravel
SC - Sand/Cobbles/Gravel
GR - Gravel
BO - Boulders
FR - Fractured Rock (Talus)
RR - Ripplable Rock
SR - Solid Rock

ROAD TEMPLATES

TP = Taper template
TO = Turnout Template
8M = 8.0m wide finished running surface
8WS = 8m wide finished running surface with retaining wall

Surfacing depth = 0.3m
Ditch Slopes = 1.5:1 Ditch Depth = 0.3 Width = 0.3
F Slope = Final Slope Left or Right



Prepared by:



Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

DRAFT
FOR REVIEW
PURPOSES ONLY

Dwg Num: 110-022-003

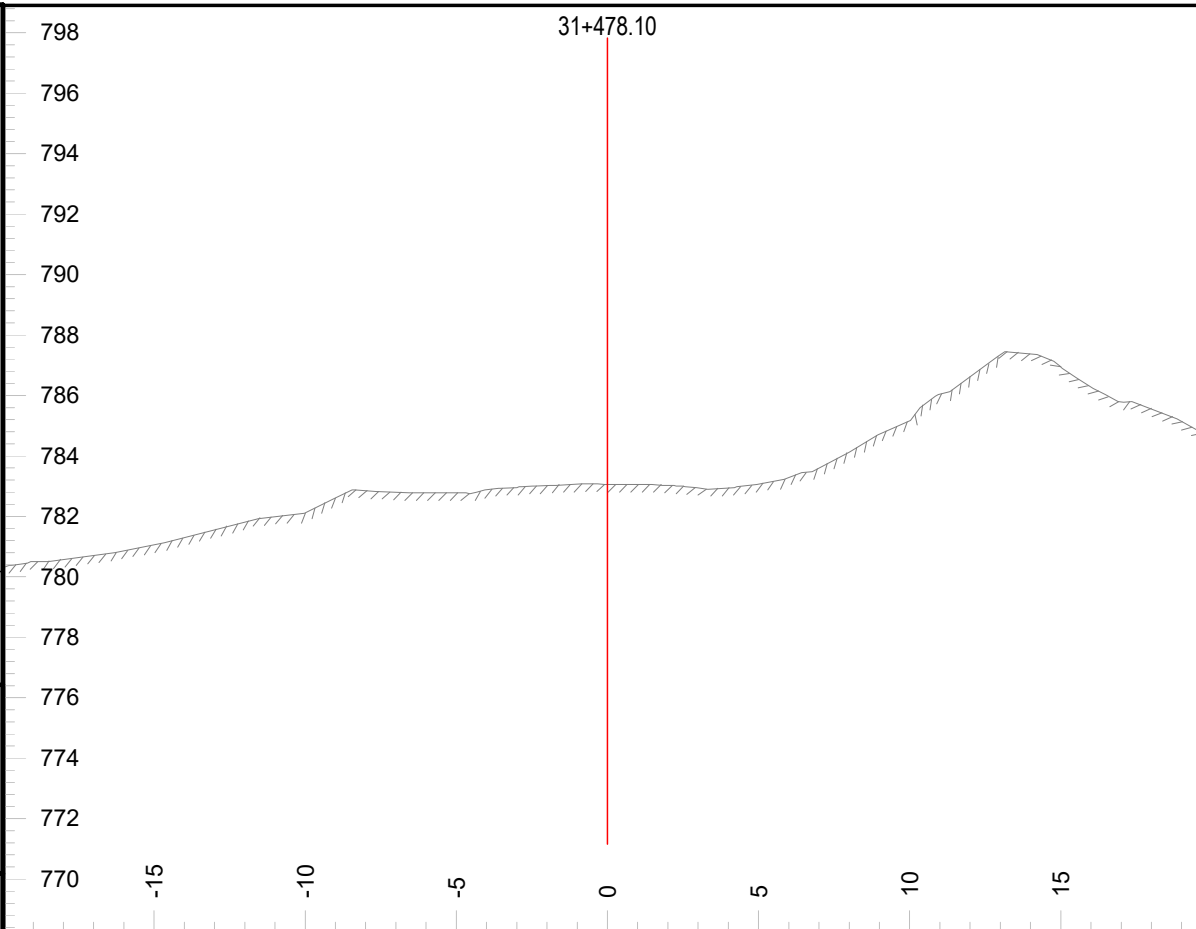
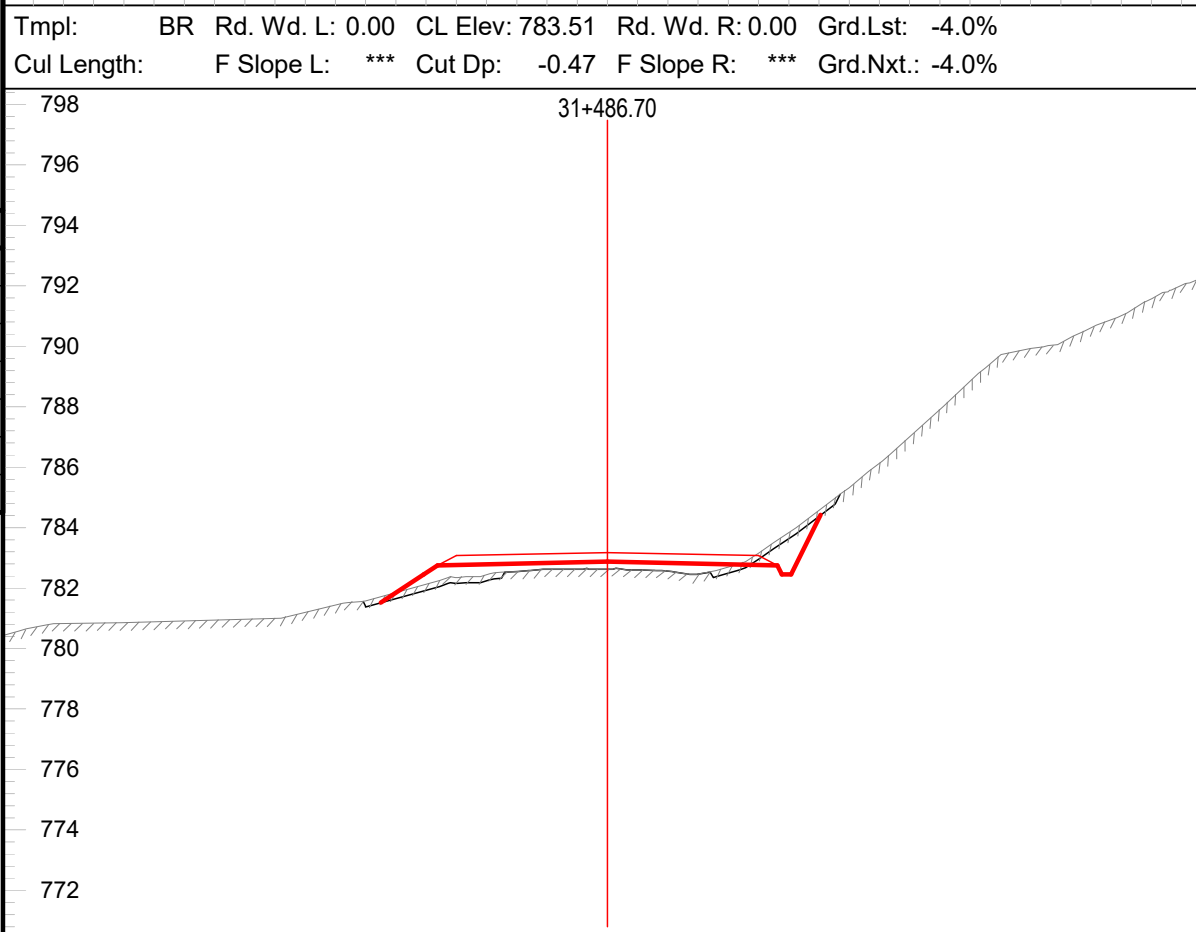
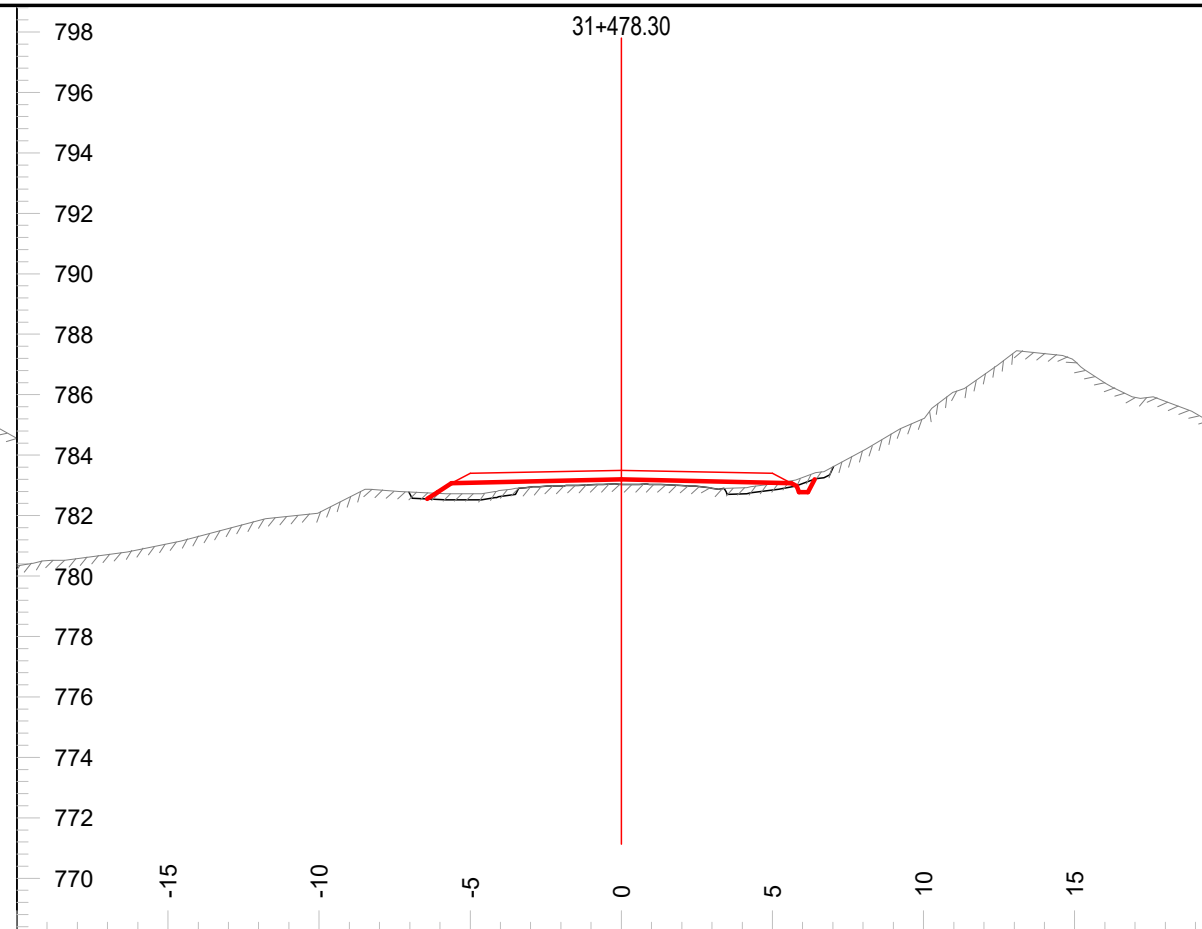
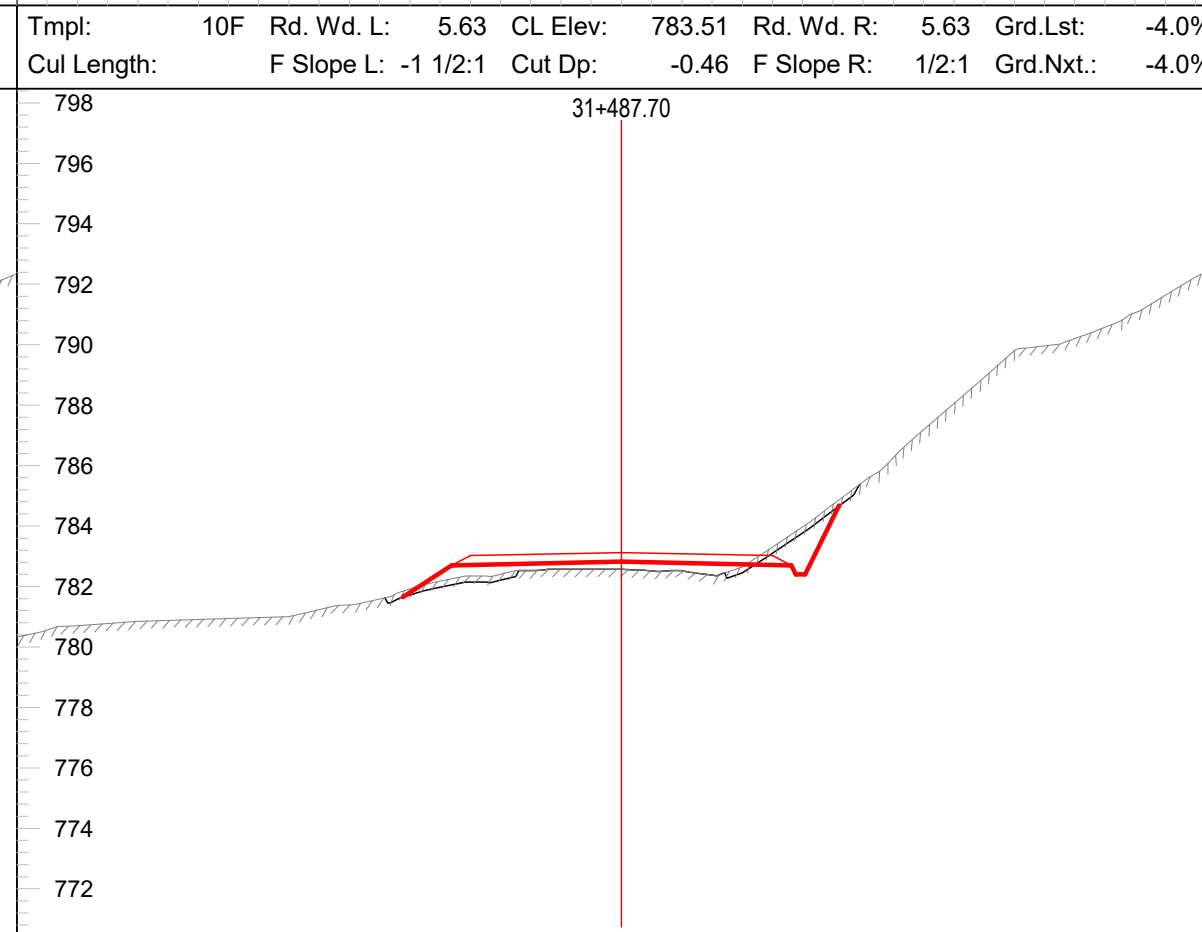
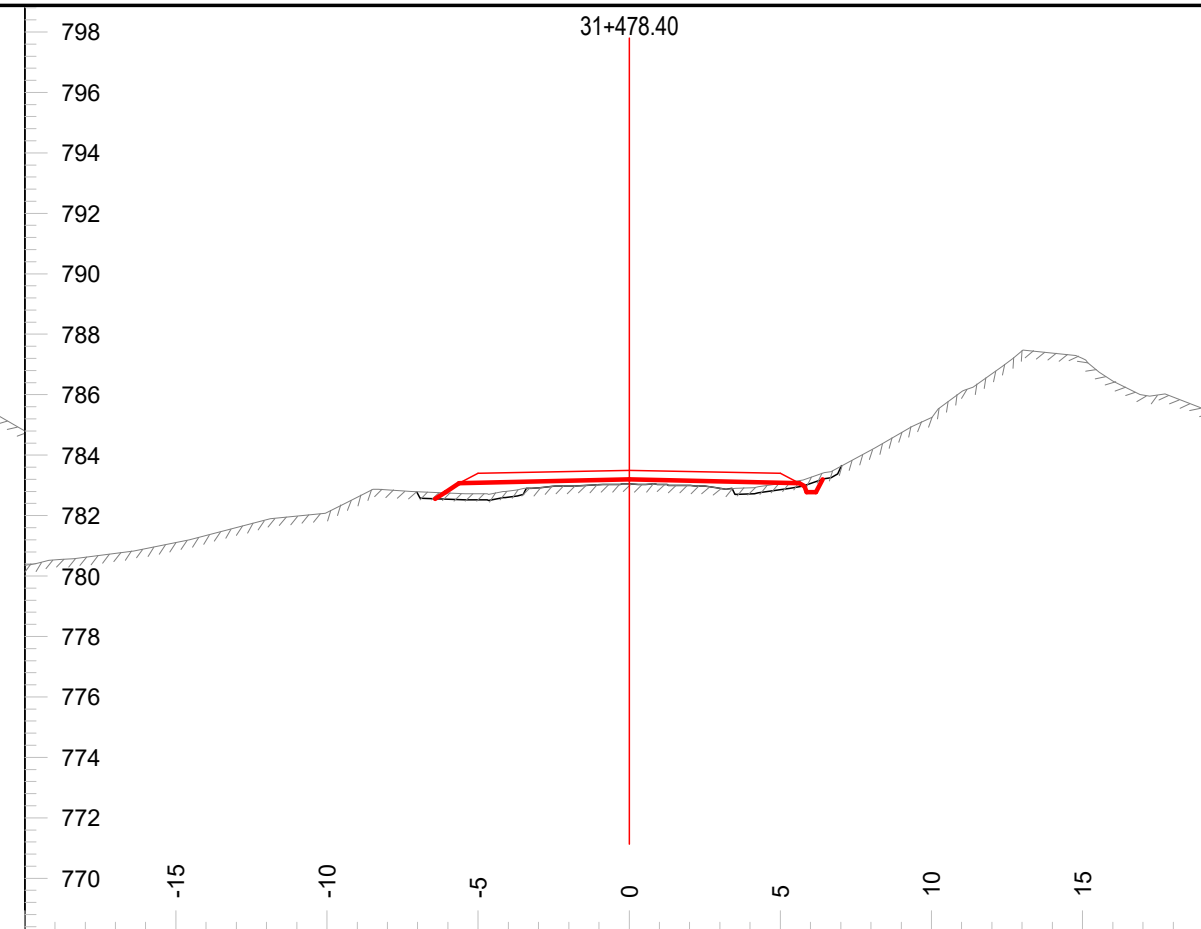
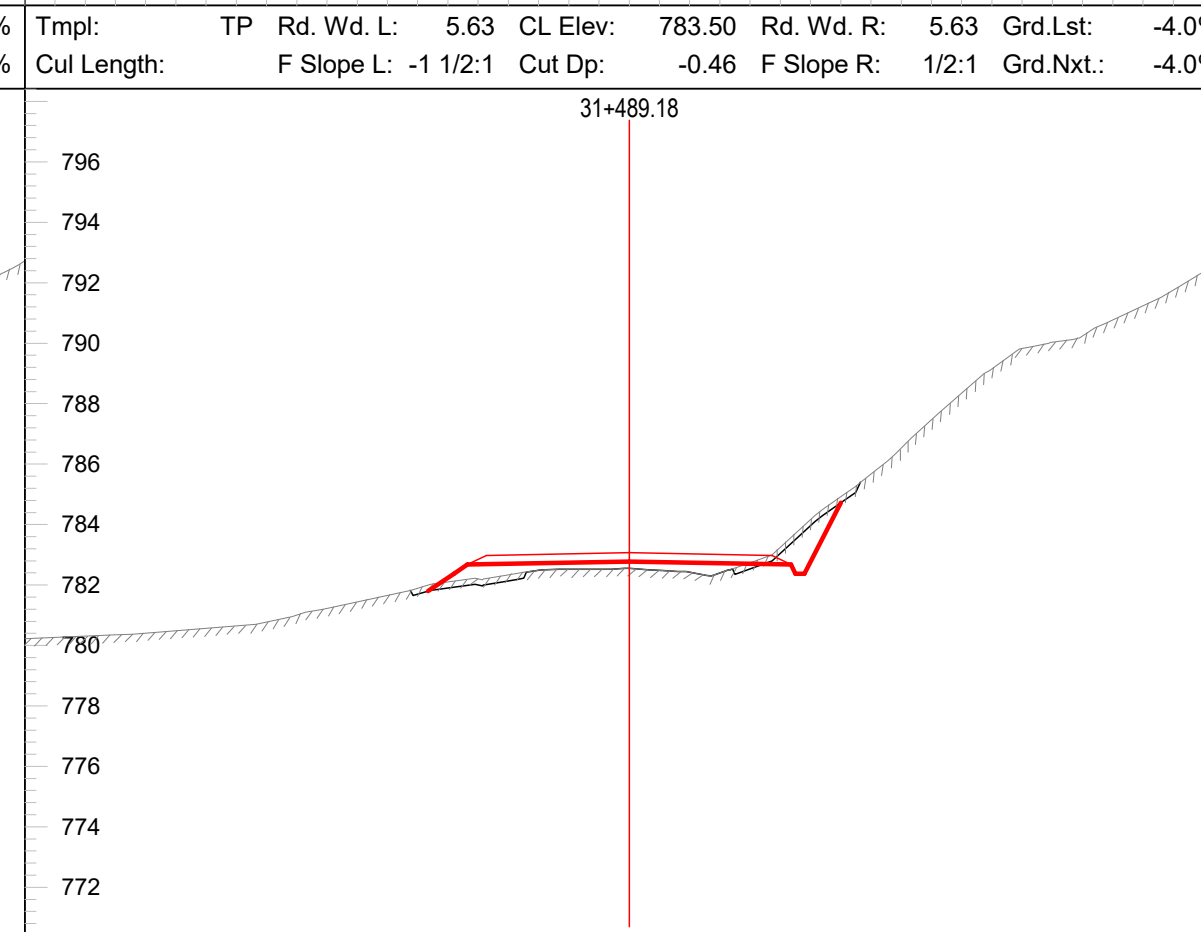
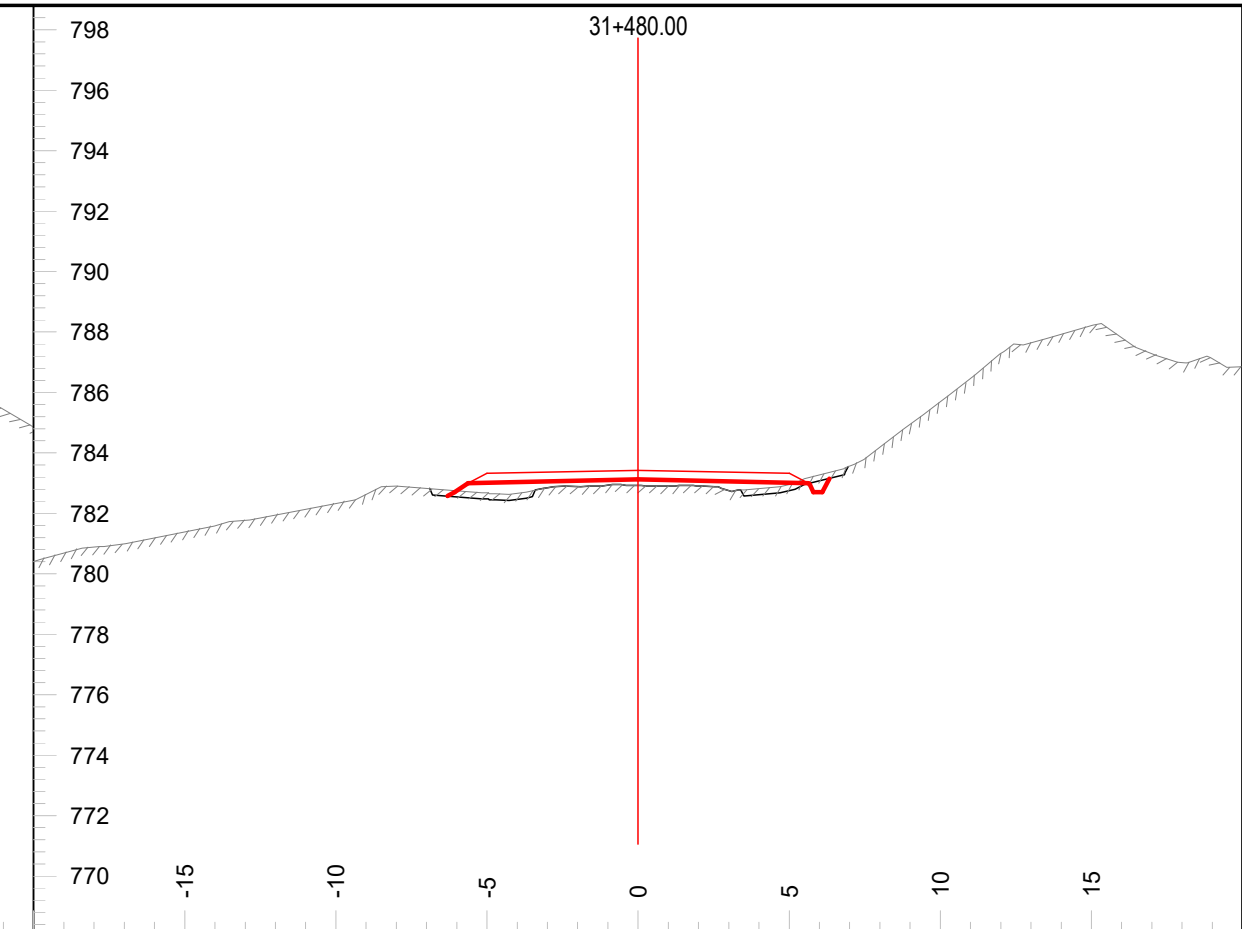
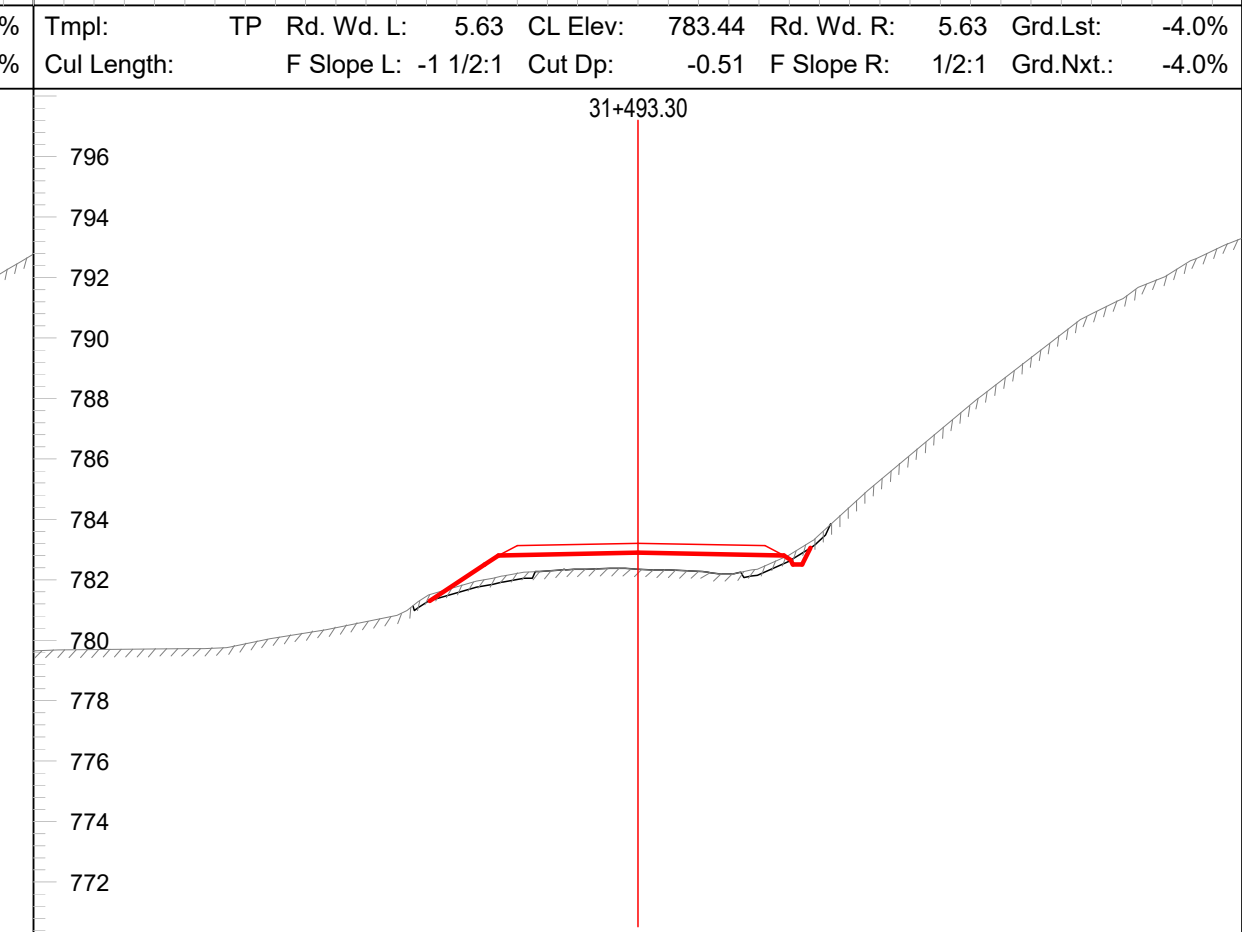
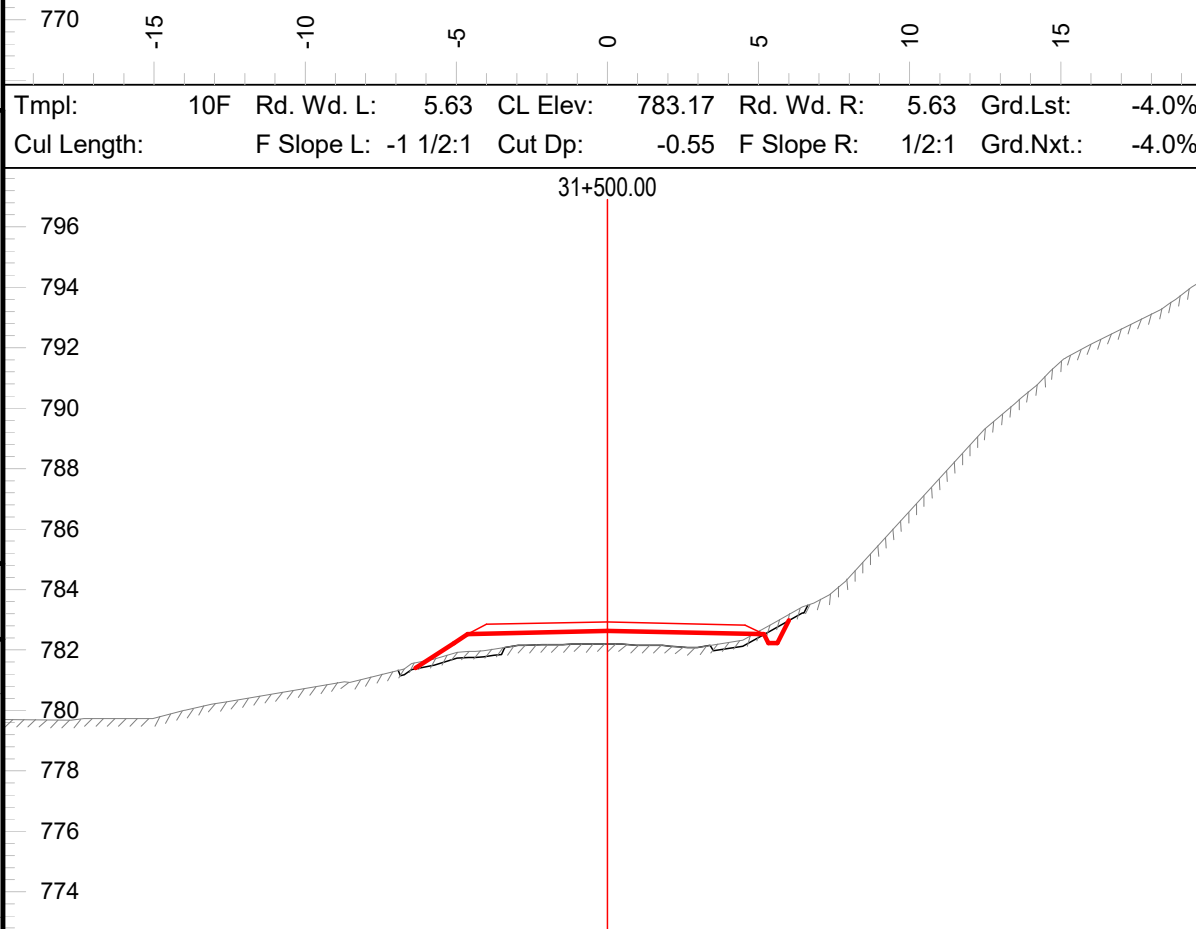
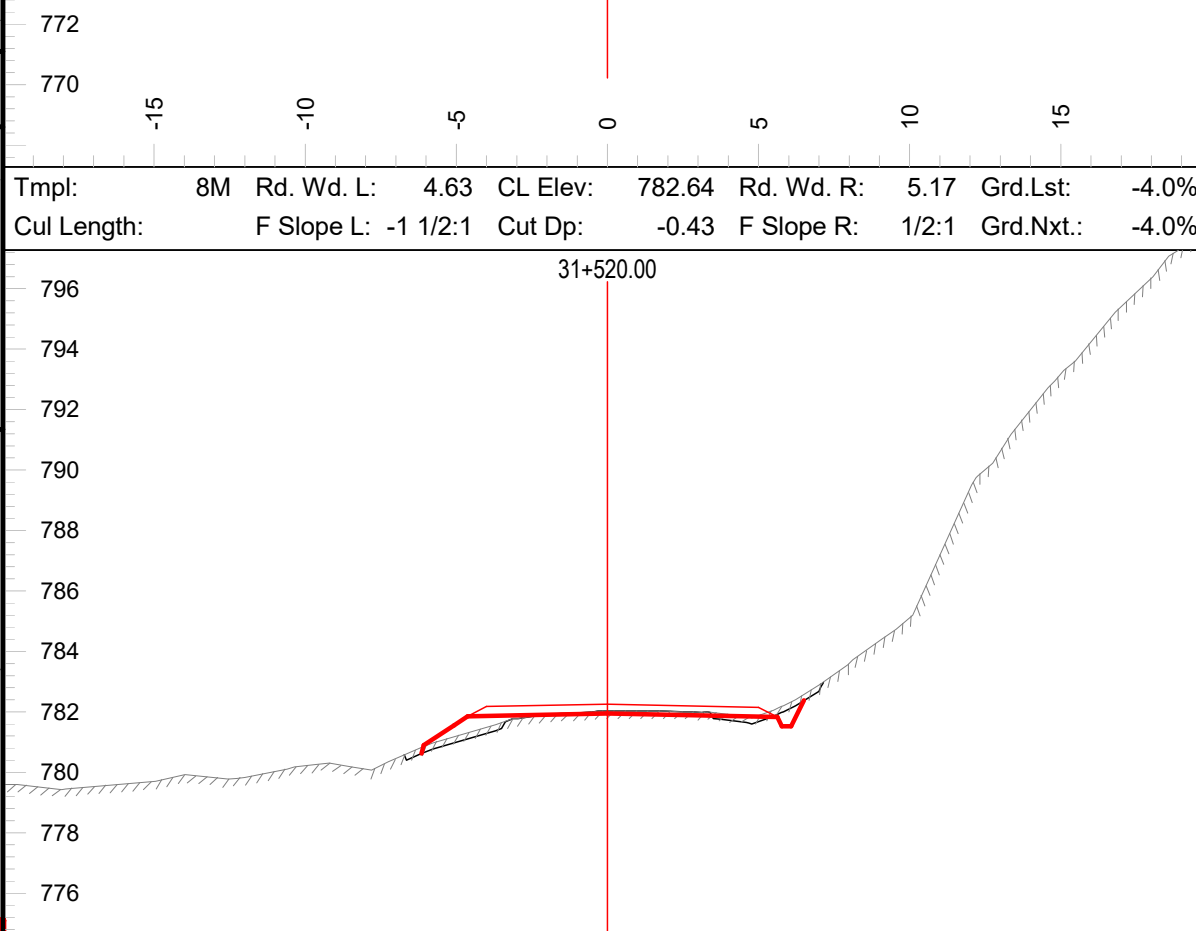
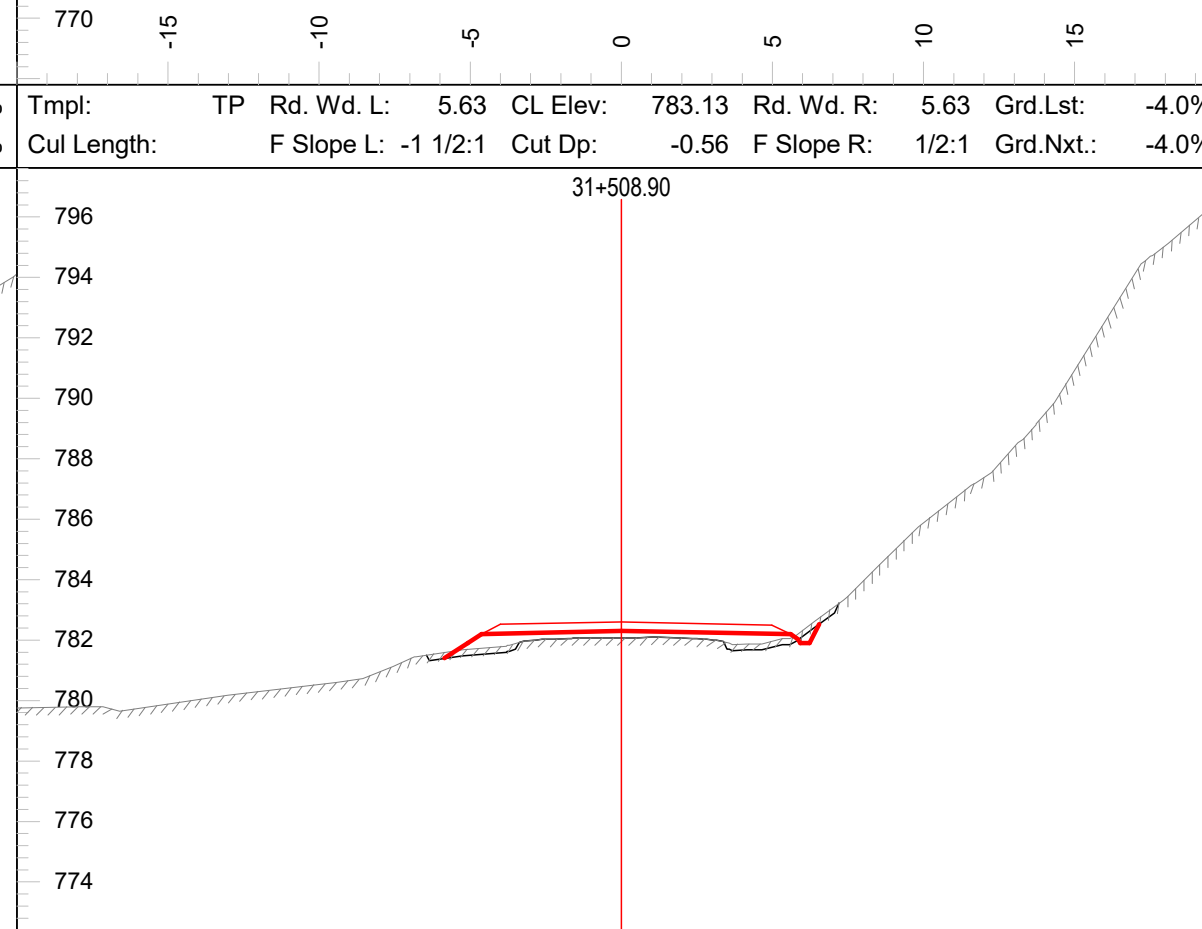
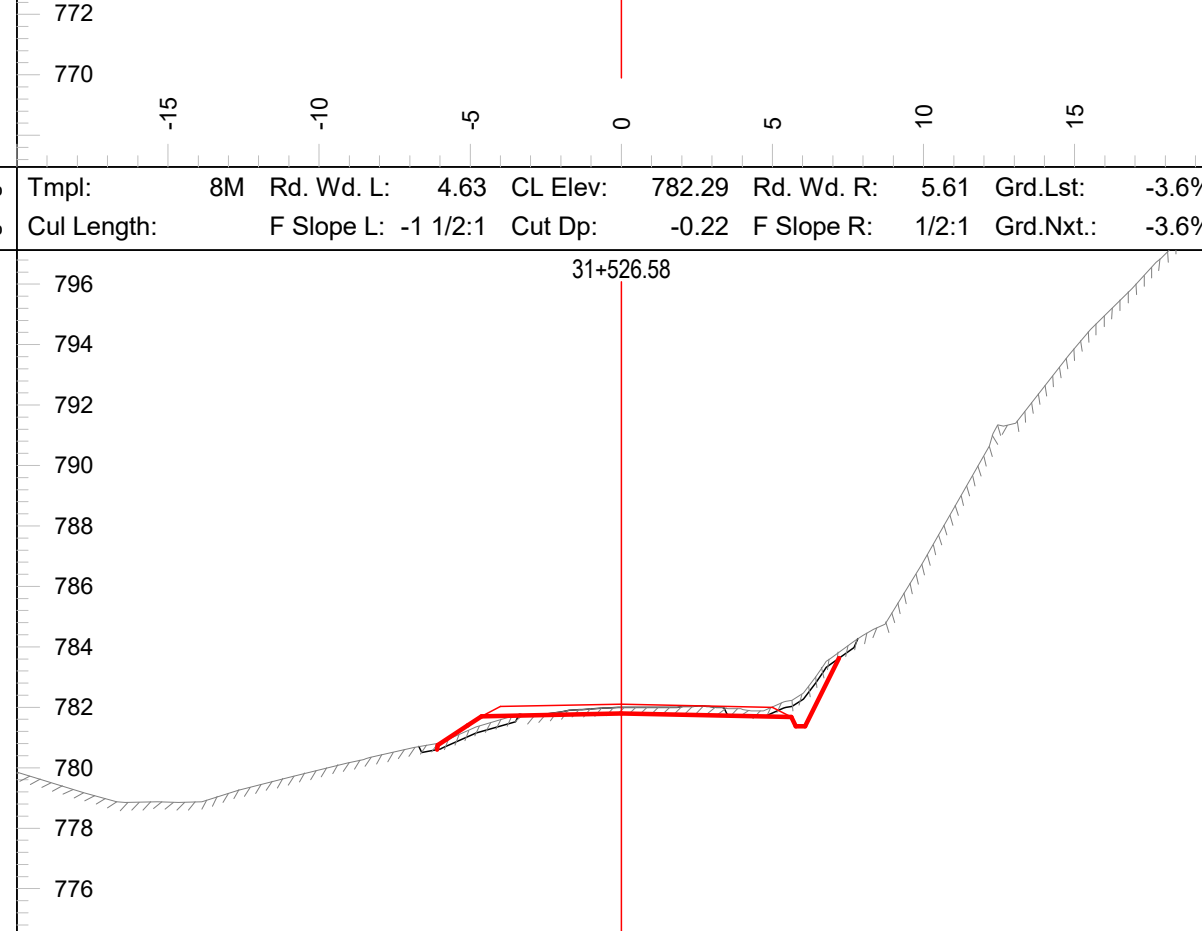
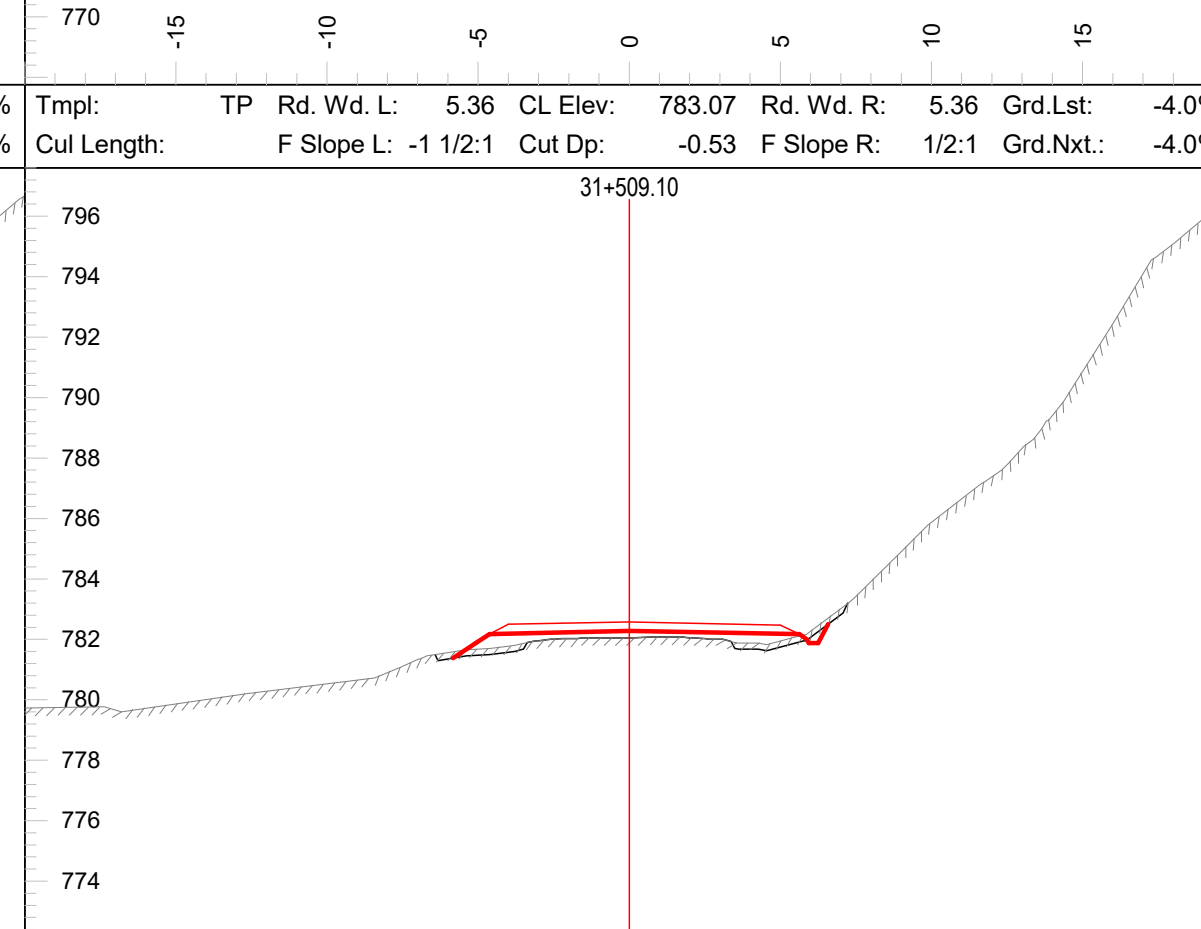
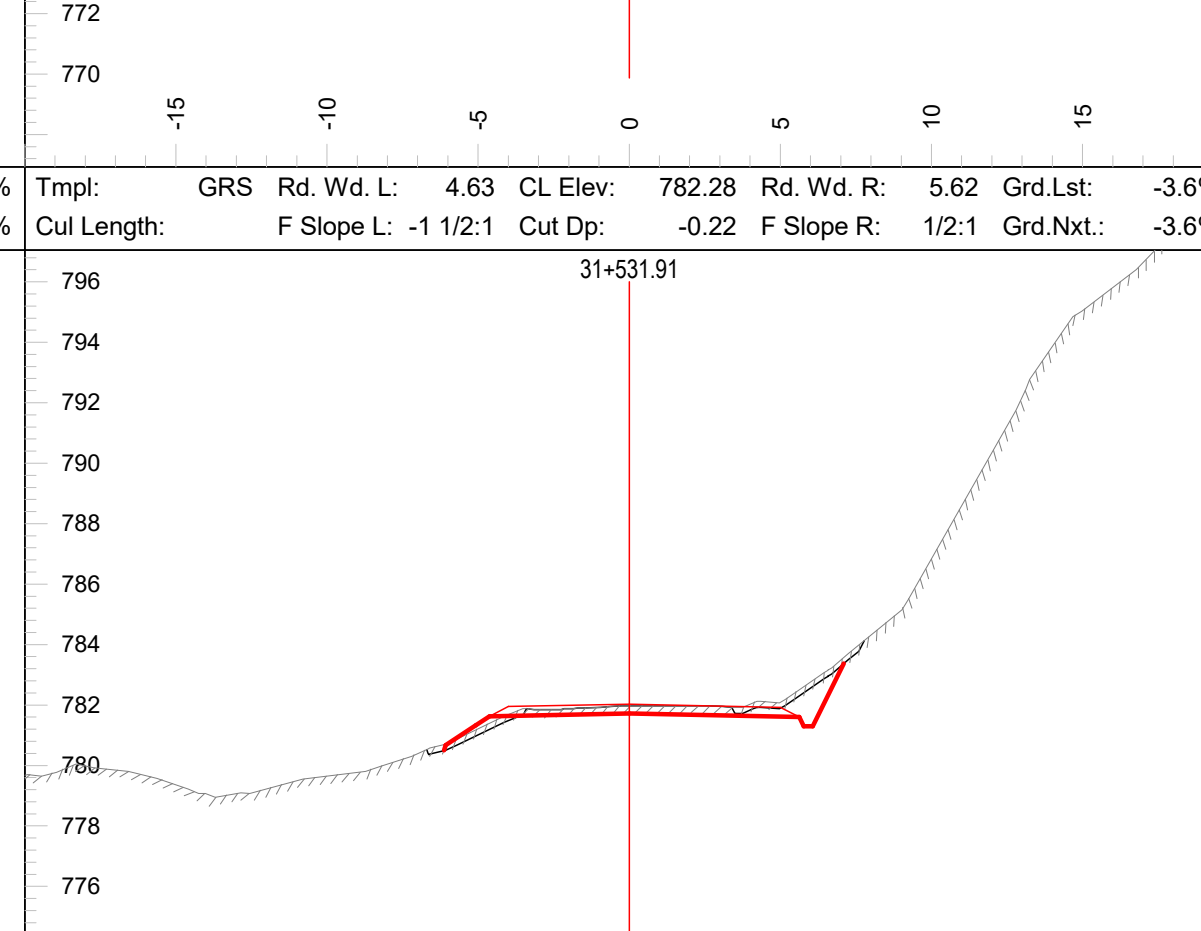
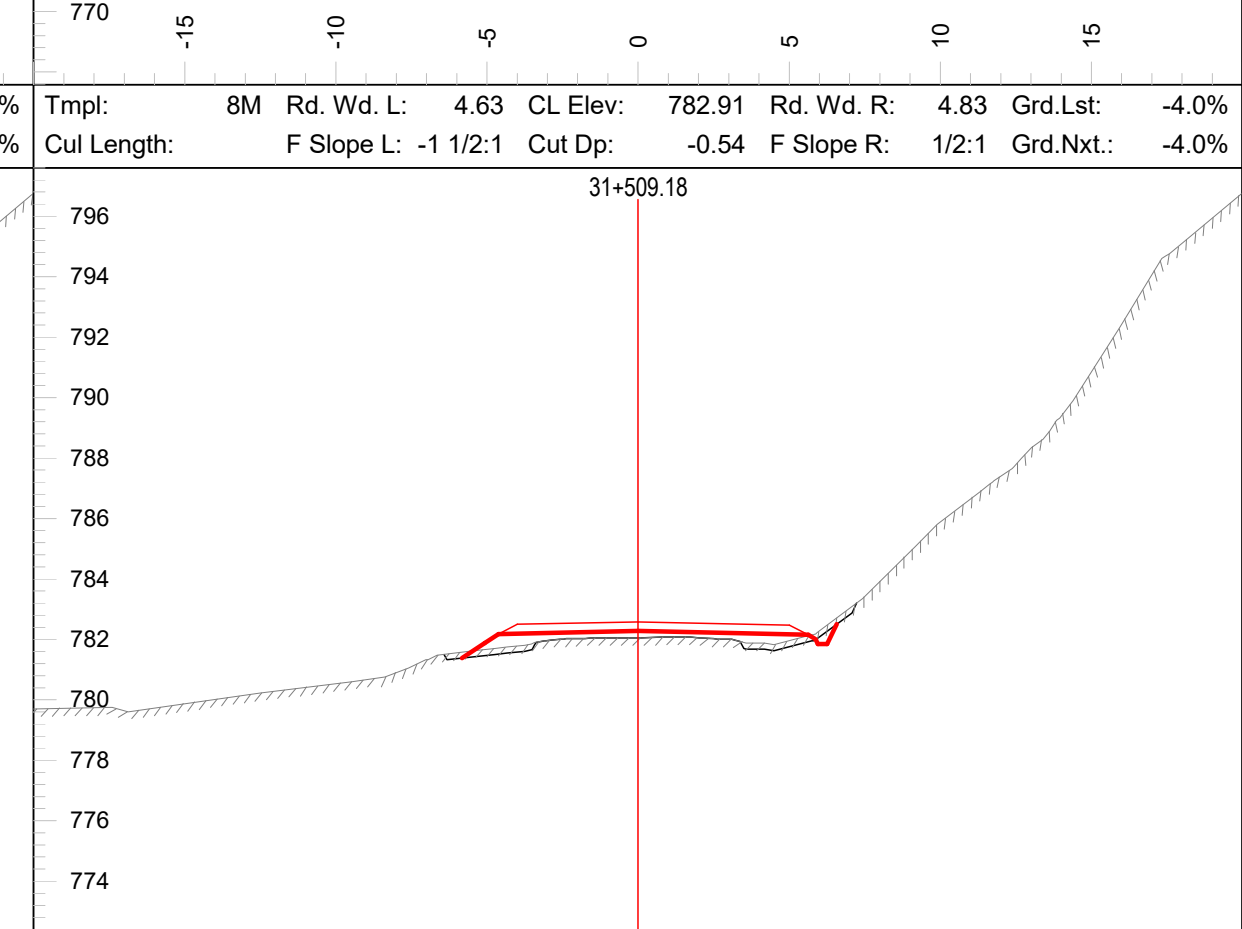
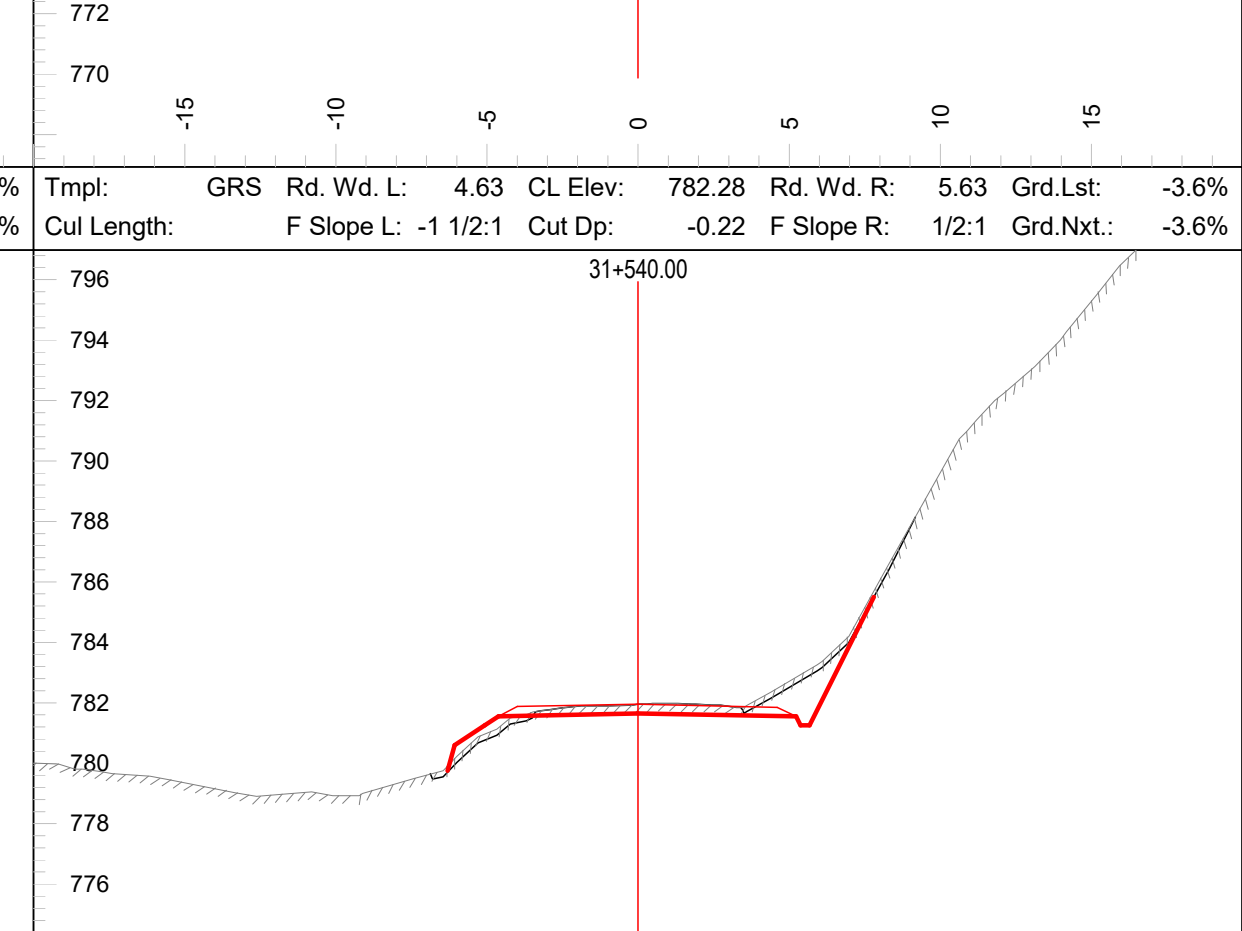
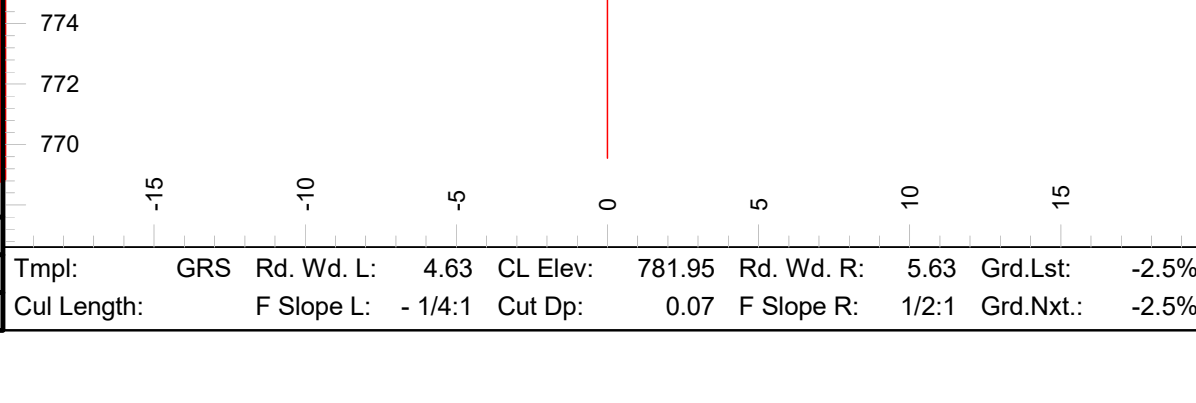
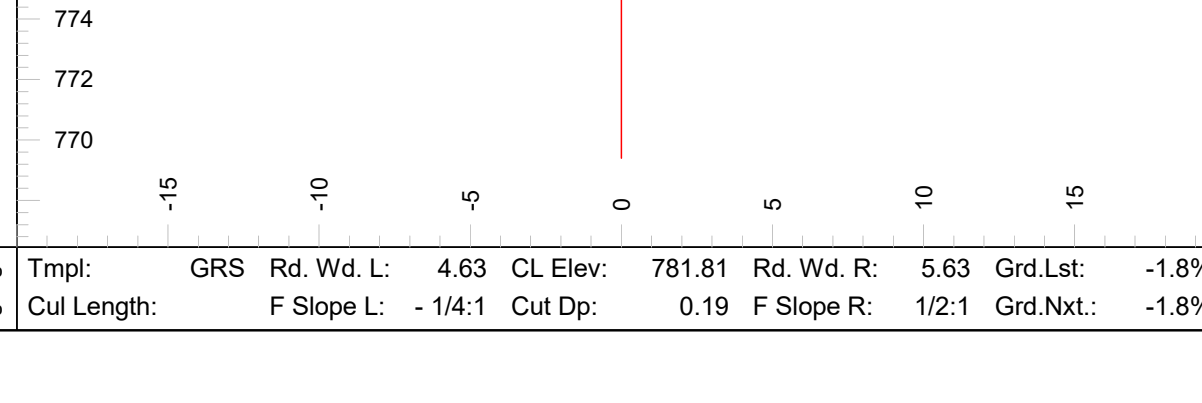
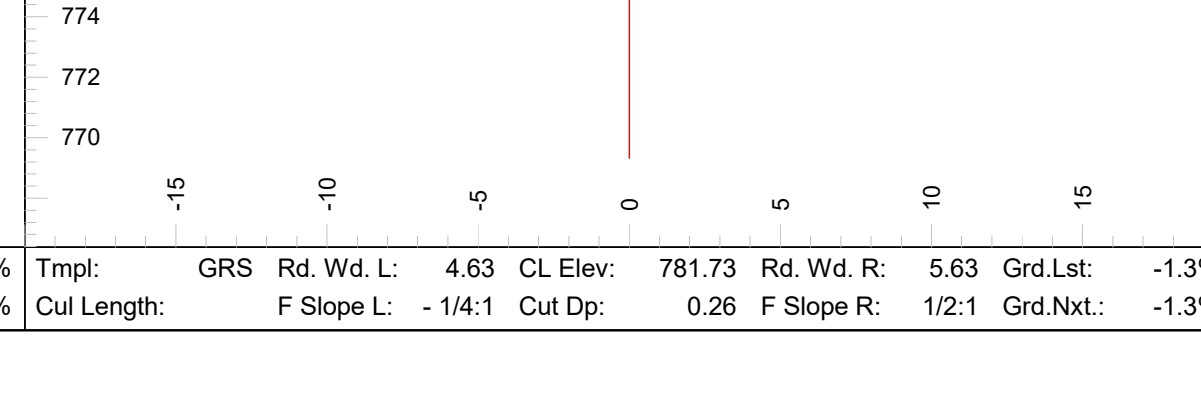
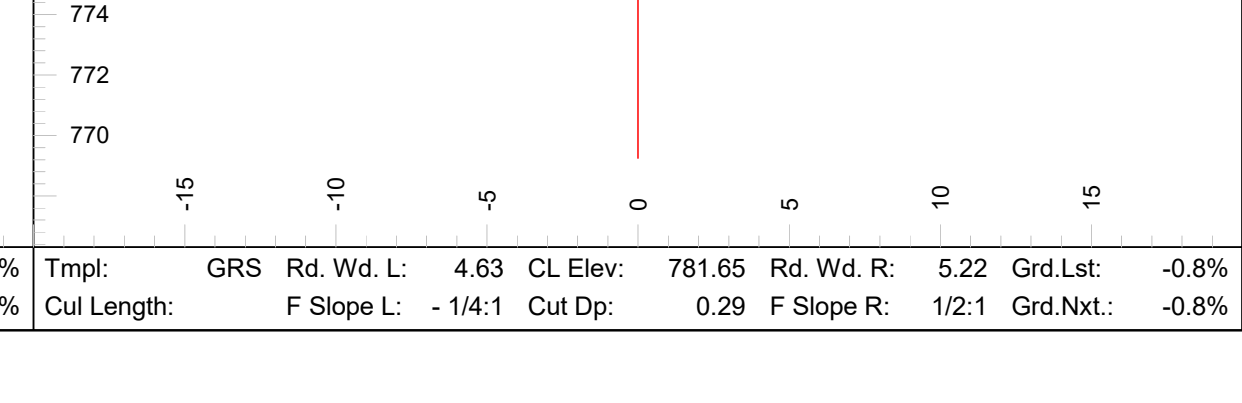
Survey By: see Notes above

Design By: Edward Folk, P.Eng.

Approved By:

Plot Date:16/06/29

Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-

<div><div>31+478.10</div></div> <div><div>Tmpl: BR Rd. Wd. L: 0.00 CL Elev: 783.51 Rd. Wd. R: 0.00 Grd.Lst: -4.0% Cul Length: F Slope L: *** Cut Dp: -0.47 F Slope R: *** Grd.Nxt.: -4.0%</div></div>	<div><div>31+478.30</div></div> <div><div>Tmpl: 10F Rd. Wd. L: 5.63 CL Elev: 783.51 Rd. Wd. R: 5.63 Grd.Lst: -4.0% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.46 F Slope R: 1/2:1 Grd.Nxt.: -4.0%</div></div>	<div><div>31+478.40</div></div> <div><div>Tmpl: TP Rd. Wd. L: 5.63 CL Elev: 783.50 Rd. Wd. R: 5.63 Grd.Lst: -4.0% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.46 F Slope R: 1/2:1 Grd.Nxt.: -4.0%</div></div>	<div><div>31+480.00</div></div> <div><div>Tmpl: TP Rd. Wd. L: 5.63 CL Elev: 783.44 Rd. Wd. R: 5.63 Grd.Lst: -4.0% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.51 F Slope R: 1/2:1 Grd.Nxt.: -4.0%</div></div>
<div><div>31+486.70</div></div> <div><div>Tmpl: 10F Rd. Wd. L: 5.63 CL Elev: 783.17 Rd. Wd. R: 5.63 Grd.Lst: -4.0% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.55 F Slope R: 1/2:1 Grd.Nxt.: -4.0%</div></div>	<div><div>31+487.70</div></div> <div><div>Tmpl: TP Rd. Wd. L: 5.63 CL Elev: 783.13 Rd. Wd. R: 5.63 Grd.Lst: -4.0% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.56 F Slope R: 1/2:1 Grd.Nxt.: -4.0%</div></div>	<div><div>31+489.18</div></div> <div><div>Tmpl: TP Rd. Wd. L: 5.36 CL Elev: 783.07 Rd. Wd. R: 5.36 Grd.Lst: -4.0% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.53 F Slope R: 1/2:1 Grd.Nxt.: -4.0%</div></div>	<div><div>31+493.30</div></div> <div><div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 782.91 Rd. Wd. R: 4.63 Grd.Lst: -4.0% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.54 F Slope R: 1/2:1 Grd.Nxt.: -4.0%</div></div>
<div><div>31+500.00</div></div> <div><div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 782.64 Rd. Wd. R: 5.17 Grd.Lst: -4.0% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.43 F Slope R: 1/2:1 Grd.Nxt.: -4.0%</div></div>	<div><div>31+508.90</div></div> <div><div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 782.29 Rd. Wd. R: 5.61 Grd.Lst: -3.6% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.22 F Slope R: 1/2:1 Grd.Nxt.: -3.6%</div></div>	<div><div>31+509.10</div></div> <div><div>Tmpl: GRS Rd. Wd. L: 4.63 CL Elev: 782.28 Rd. Wd. R: 5.62 Grd.Lst: -3.6% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.22 F Slope R: 1/2:1 Grd.Nxt.: -3.6%</div></div>	<div><div>31+509.18</div></div> <div><div>Tmpl: GRS Rd. Wd. L: 4.63 CL Elev: 782.28 Rd. Wd. R: 5.63 Grd.Lst: -3.6% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.22 F Slope R: 1/2:1 Grd.Nxt.: -3.6%</div></div>
<div><div>31+520.00</div></div> <div><div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 781.95 Rd. Wd. R: 5.63 Grd.Lst: -2.5% Cul Length: F Slope L: -1/4:1 Cut Dp: 0.07 F Slope R: 1/2:1 Grd.Nxt.: -2.5%</div></div>	<div><div>31+526.58</div></div> <div><div>Tmpl: GRS Rd. Wd. L: 4.63 CL Elev: 781.81 Rd. Wd. R: 5.63 Grd.Lst: -1.8% Cul Length: F Slope L: -1/4:1 Cut Dp: 0.19 F Slope R: 1/2:1 Grd.Nxt.: -1.8%</div></div>	<div><div>31+531.91</div></div> <div><div>Tmpl: GRS Rd. Wd. L: 4.63 CL Elev: 781.73 Rd. Wd. R: 5.63 Grd.Lst: -1.3% Cul Length: F Slope L: -1/4:1 Cut Dp: 0.26 F Slope R: 1/2:1 Grd.Nxt.: -1.3%</div></div>	<div><div>31+540.00</div></div> <div><div>Tmpl: GRS Rd. Wd. L: 4.63 CL Elev: 781.65 Rd. Wd. R: 5.22 Grd.Lst: -0.8% Cul Length: F Slope L: -1/4:1 Cut Dp: 0.29 F Slope R: 1/2:1 Grd.Nxt.: -0.8%</div></div>



Ministry of Forests, Lands and
Natural Resource Operations

Omenica Region

Prince George Resource District

Chuchinka-Colbourne FSR

Roadway Widening and Upgrade

Geometric Alignment

Km 31 to Km 33.6

Page 6 of 71

Stations: 31+543.29 to 31+640.35

ROAD DESIGN SPECIFICATIONS

Design Speed: 30 km/h
Avg. Stab. Road Width: 6.0m
Fav. Grade Max. 10%
Adv. Grade Max 10%

Section Scale 1:250

Project Location Coordinates

Latitude: 51-15-03
Longitude: -119-53-14
Elevation: 610m
Datum: NAD83
UTM Combined Scale Factor:
n/a

Notes:

- Ground model data obtained by Lidar Survey method by McElhanney Survey Consulting Ltd. Oct. 2013
-30km/h Speed Limit through the Canyon, remainder designed to minimum 60km/h.

Survey Control Stations

Point Name	Northing	Easting	Elevation	Description

Plan Legend (all may not be applicable)

L-line Location

Road Edges

Clearing Limits

Culverts

GPS Base Station

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Survey Control Points tie

Benchmark

Edge of Wetland

Existing Road Edges

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Powerline

Draw

Test Pit

Stream

Tension Crack

Timberline

Cut / Fill limits

Powerpole

Finished Road Surface

Profile Subgrade

Cut / Fill limits

Original Ground

1st Stratum

2nd Stratum (Rock)

Ditch Invert Right

Ditch Invert Left

EARTH WORK VOLUMES (Bank cubic meters)

L-Stn m.	Strip V. Cu. m.	SG Cut V. Cu. m.	SG Fill V. Cu. m.	B/W Vol. Cu. m.	Srf1 Fill V. Cu. m.
31+600.00 31+800.00	306.5	729.9	513.5		570.4
Pg. Tot.	306.5	729.9	513.5		570.4
Cum. Tot.	1226.7	2801.9	1269.0		2433.3

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt
31+620.00	600	11.00	6.00	5.00	90.00000	xdrain

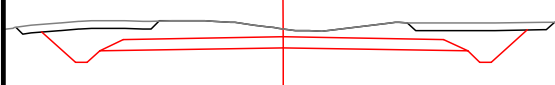
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OB - Overburden
OR - Organics
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FS - Fine Sand & Silt
SA - Sand
SG - Sand & Gravel
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SC - Sand/Cobbles/Gravel
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BO - Boulders
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TP = Taper template
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8M = 8.0m wide finished running surface
8WS = 8m wide finished running surface with retaining wall

Surfacing depth = 0.3m
Ditch Slopes = 1.5:1 Ditch Depth = 0.3 Width = 0.3
F Slope = Final Slope Left or Right



Prepared by:



Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

DRAFT
FOR REVIEW
PURPOSES ONLY

Dwg Num: 110-022-003

Survey By: see Notes above

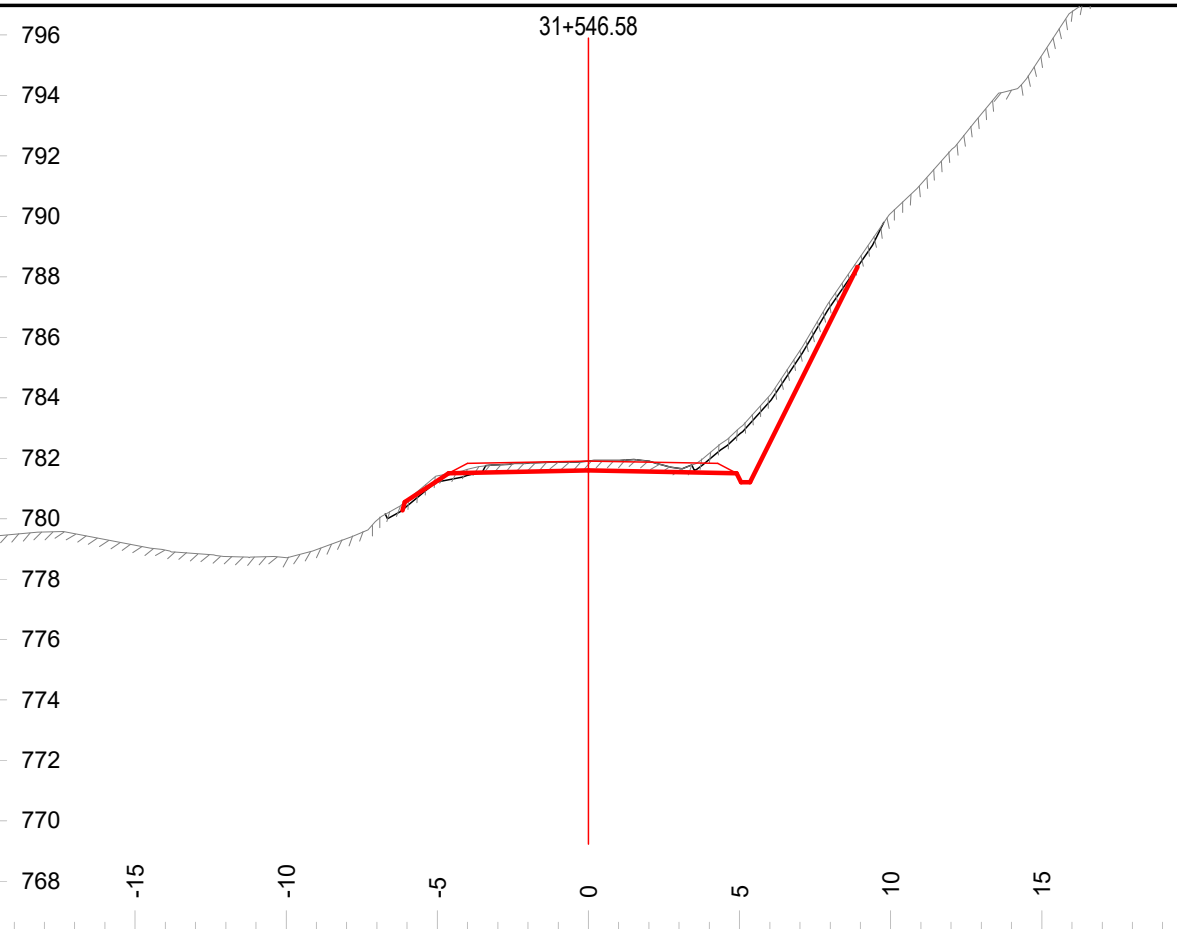
Design By: Edward Folk, P.Eng.

Approved By:

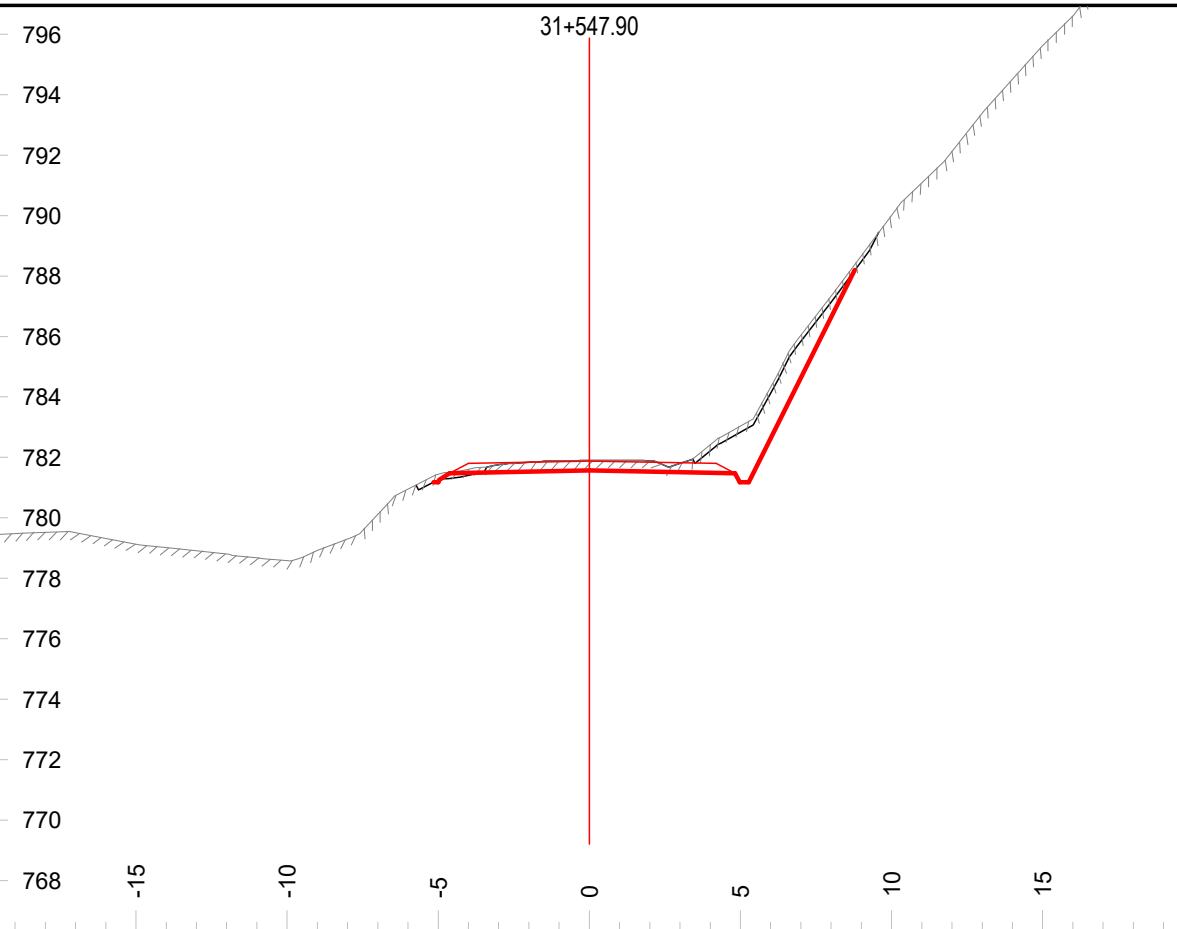
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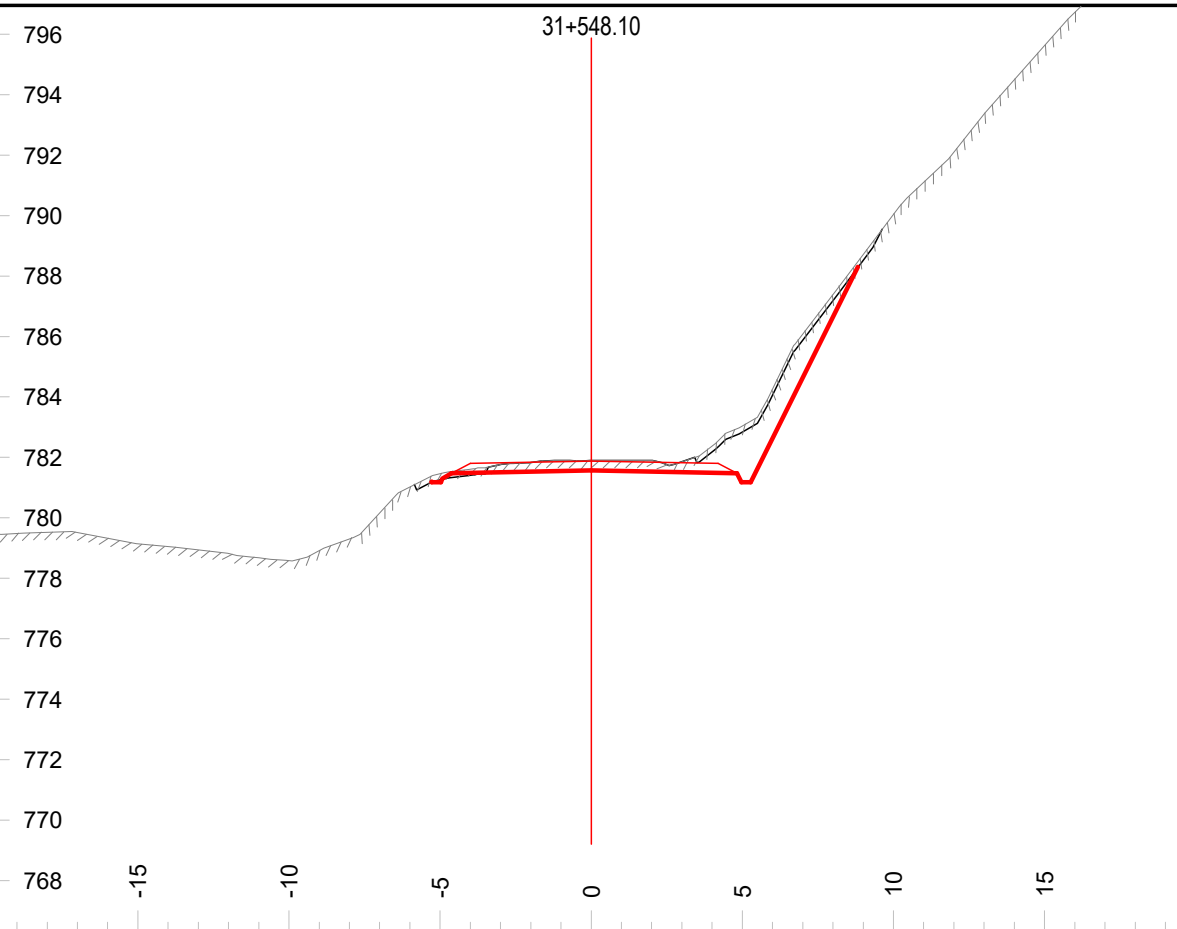
31+546.58



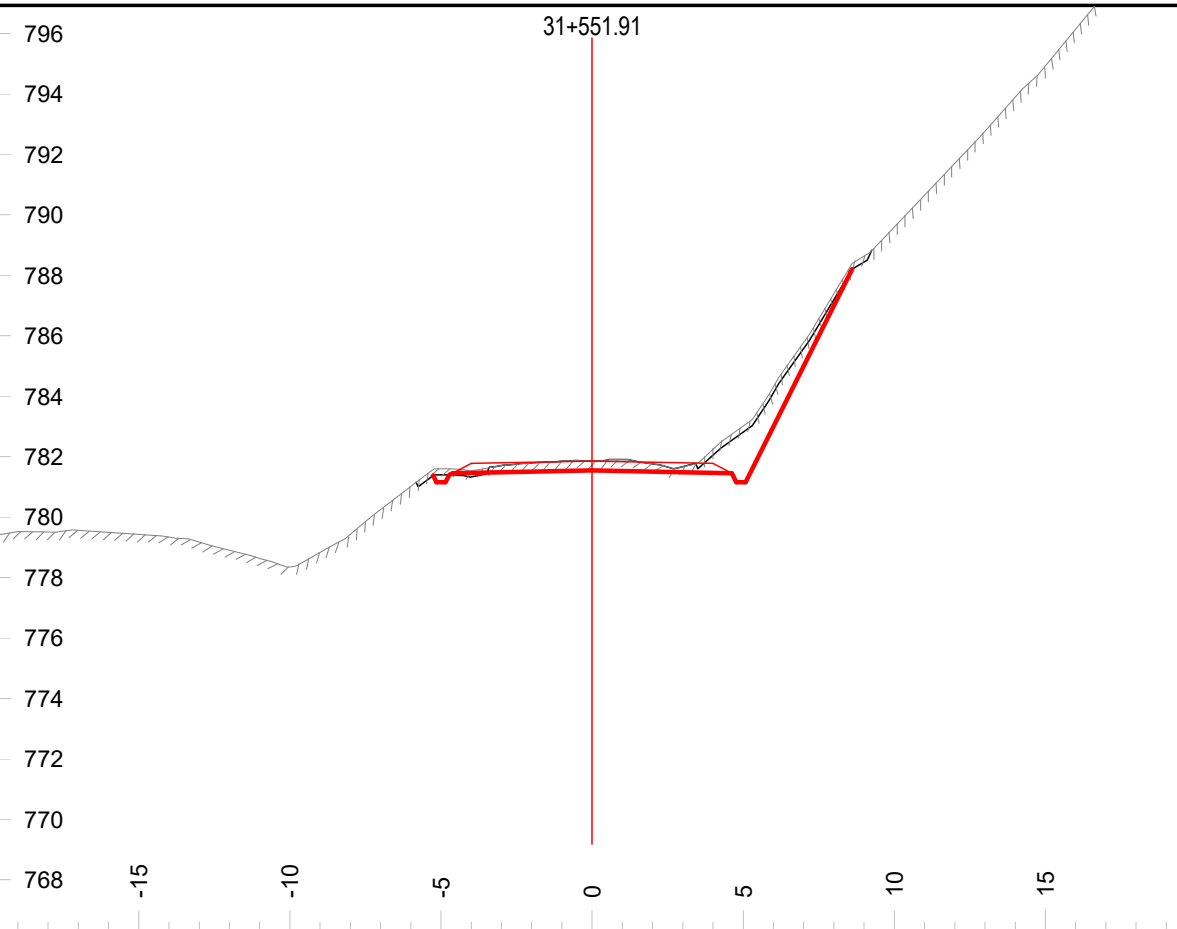
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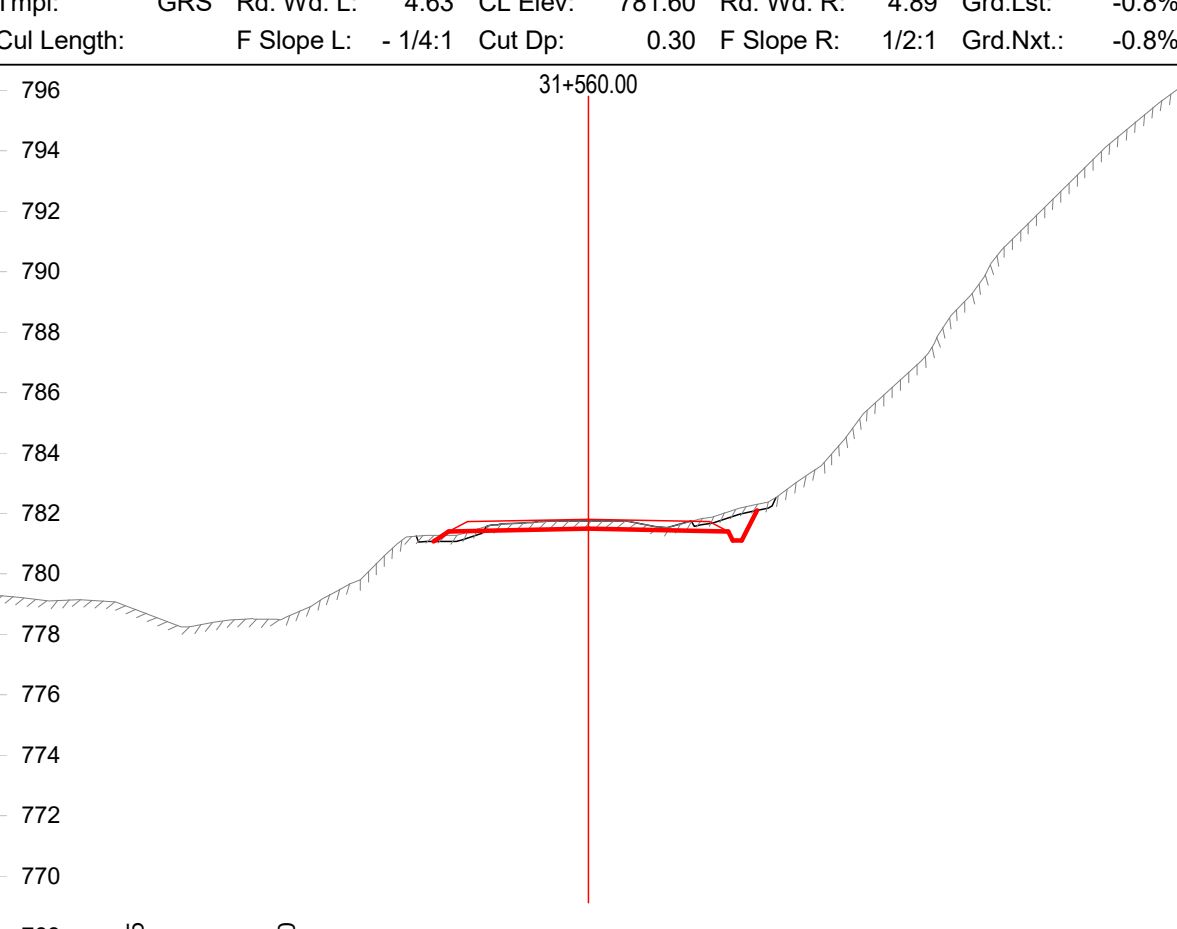
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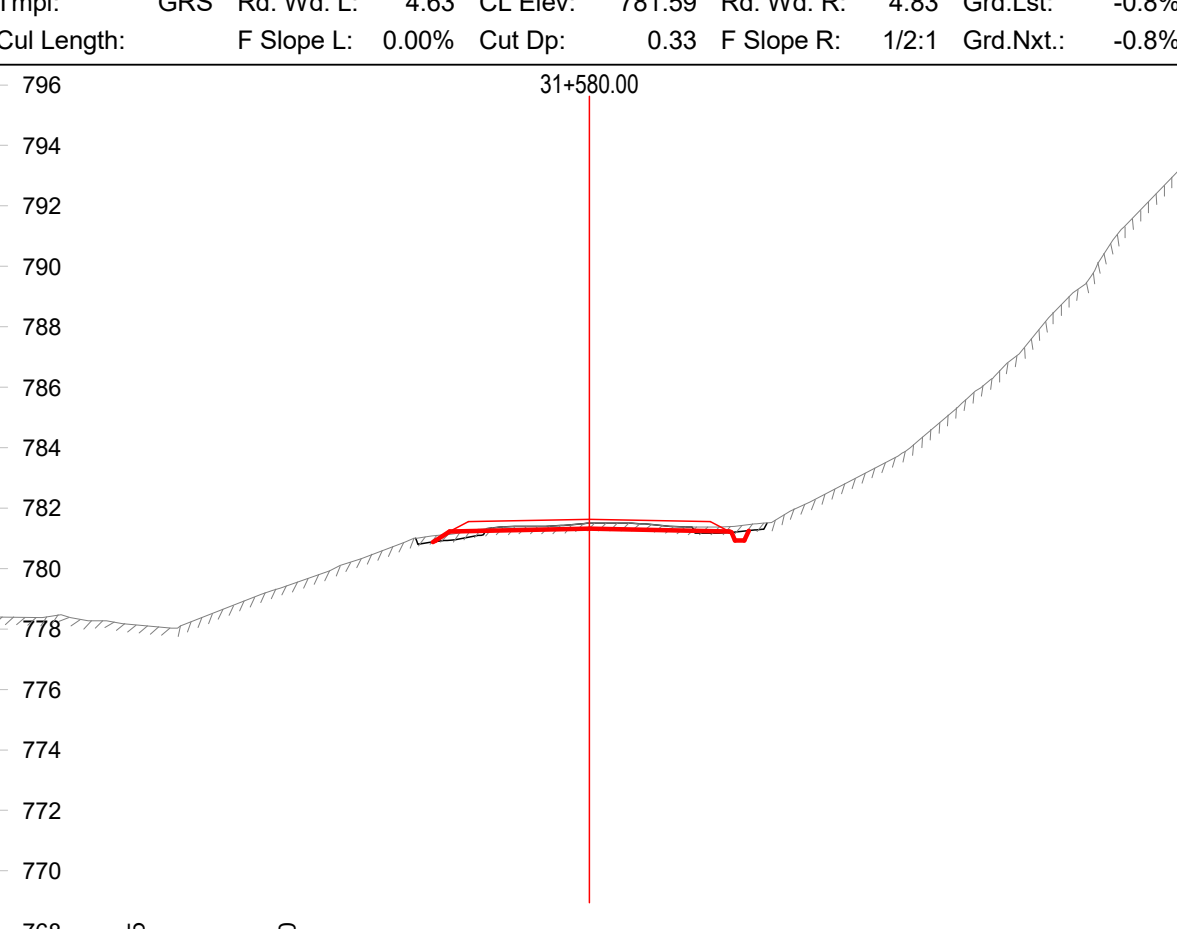
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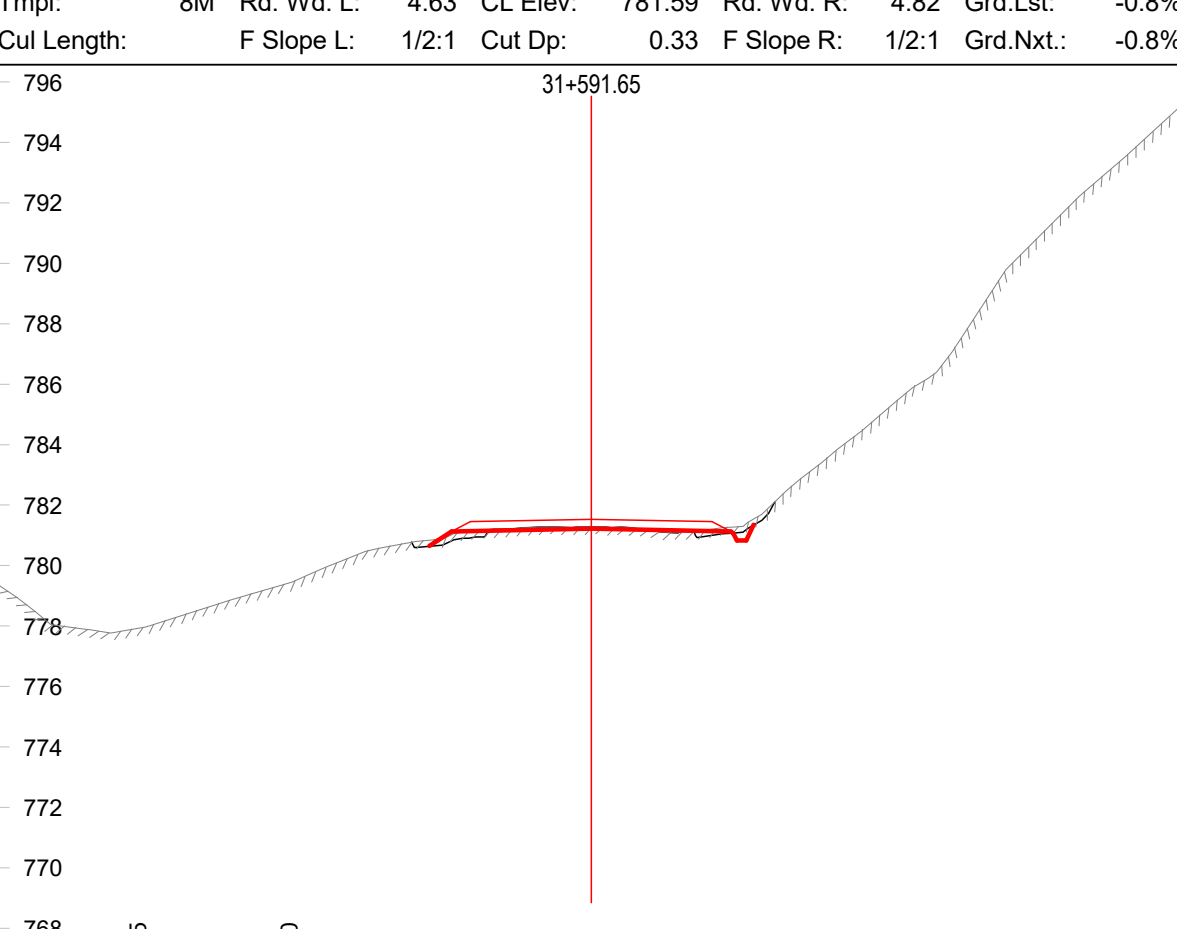
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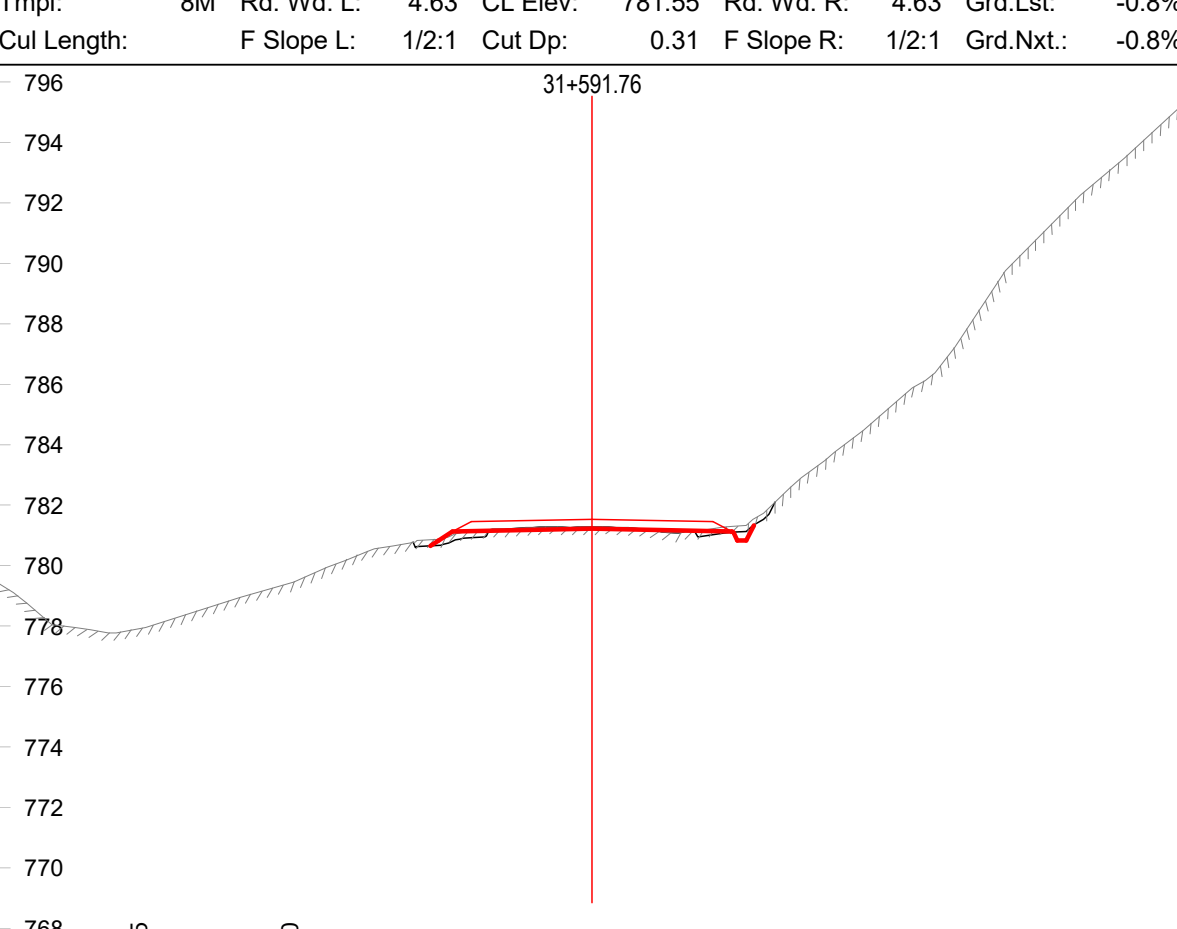
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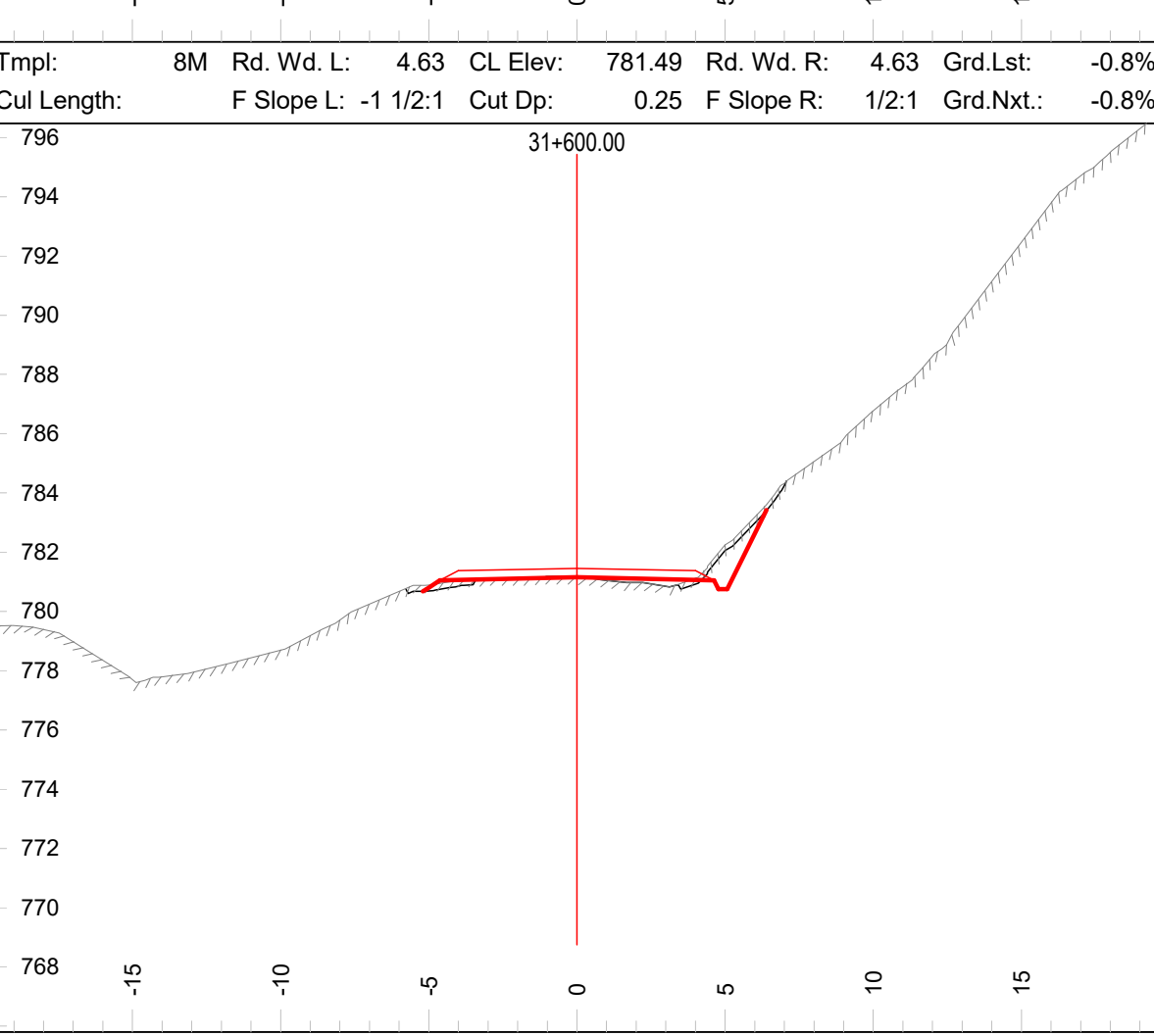
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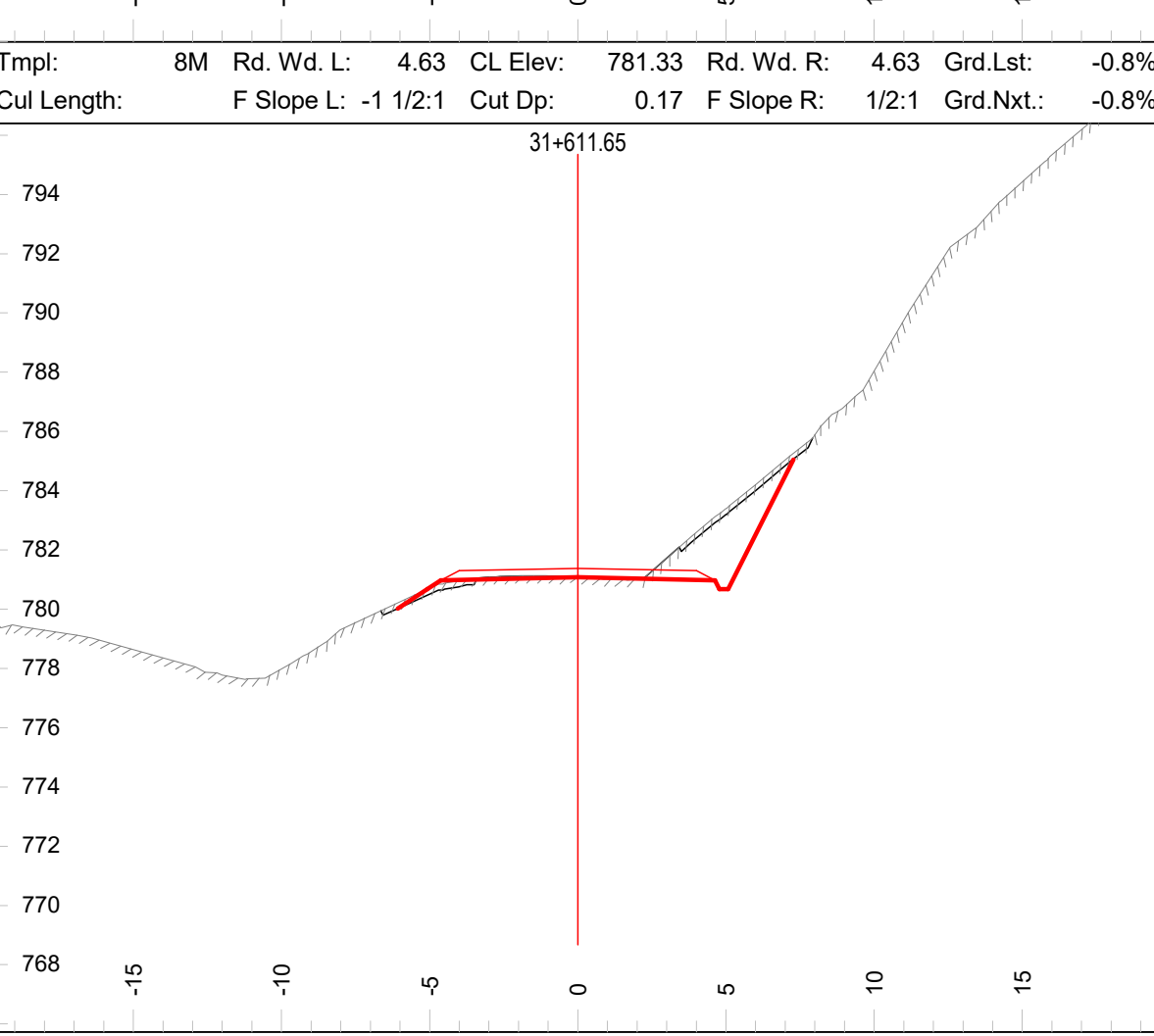
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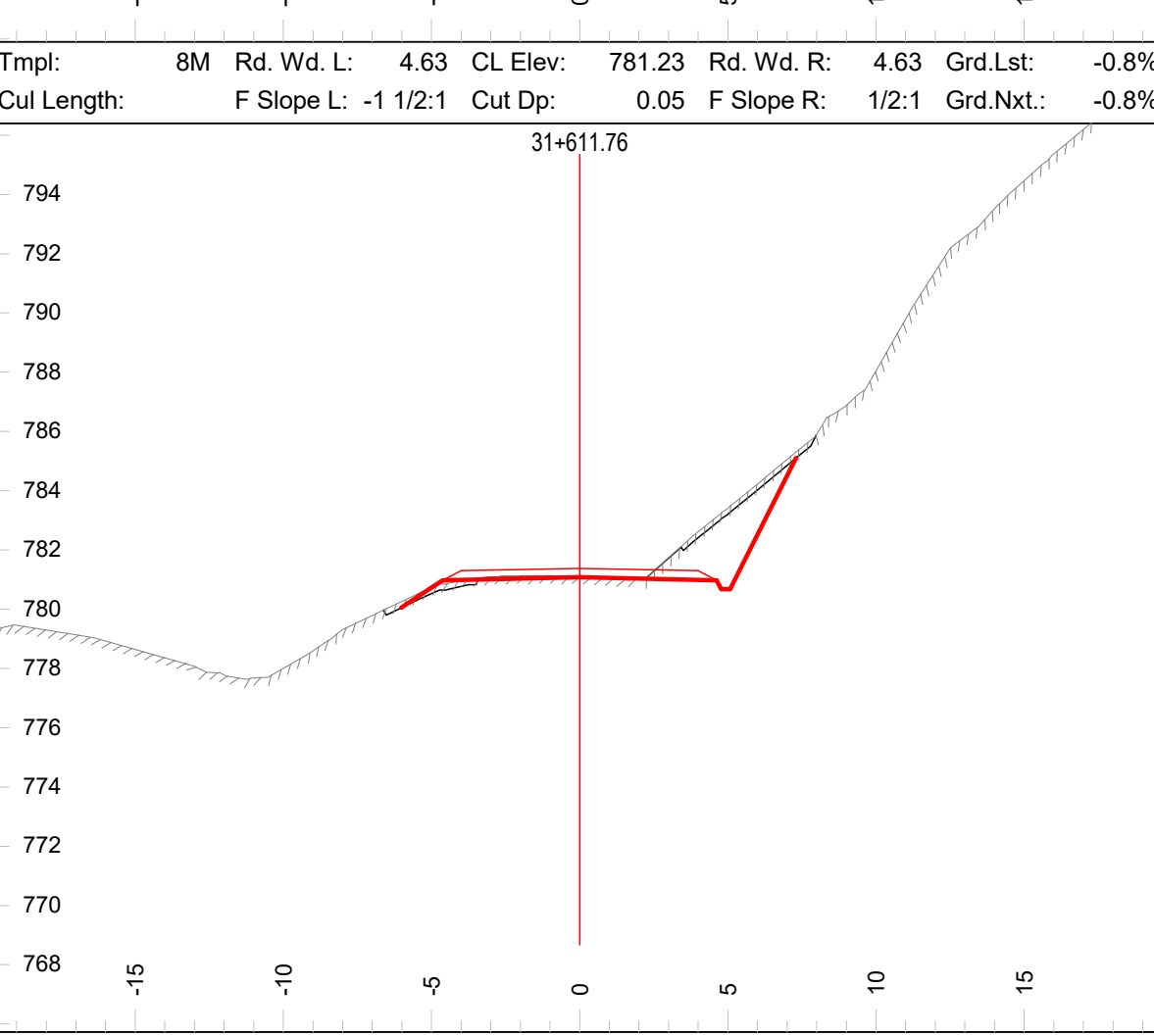
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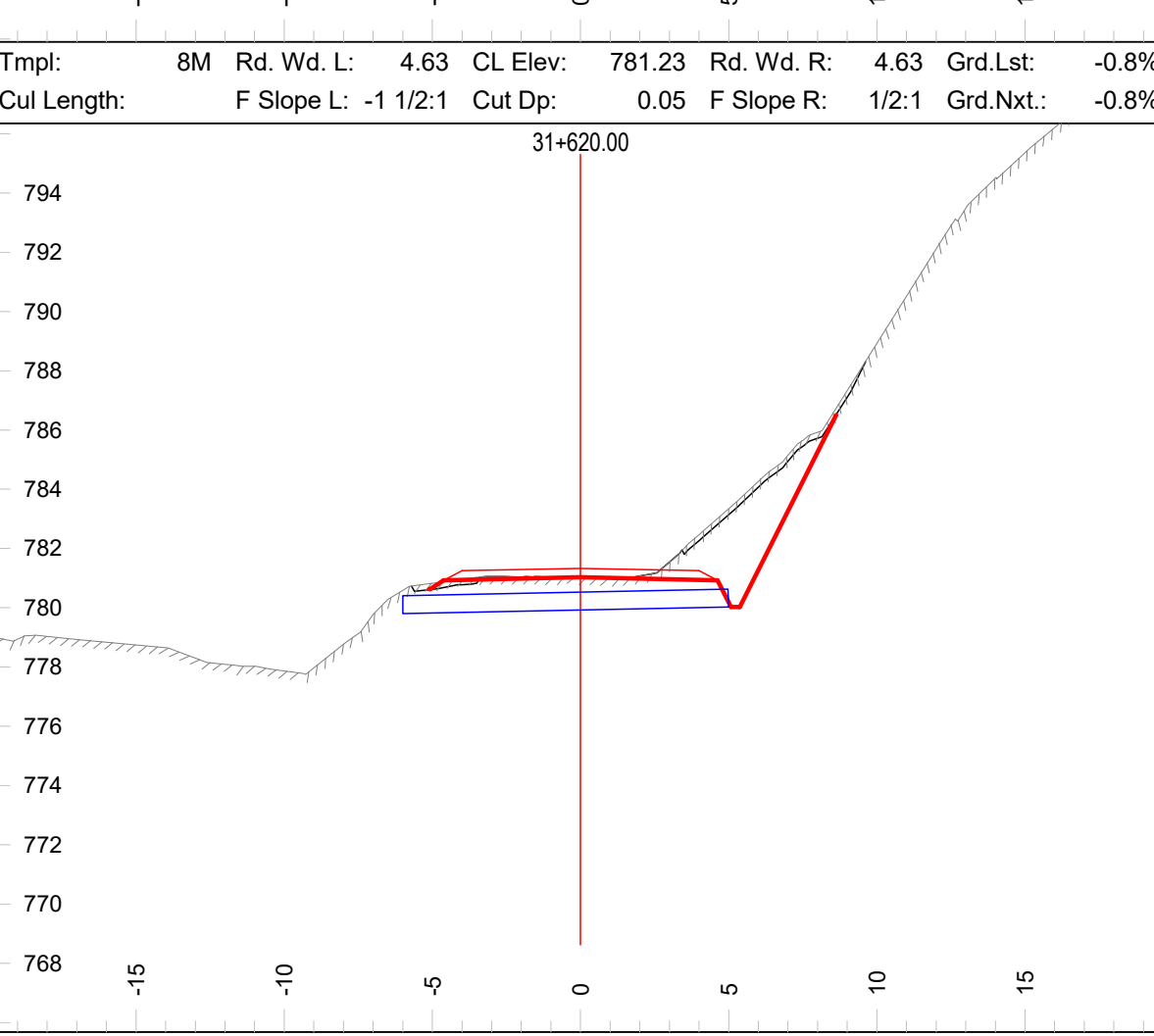
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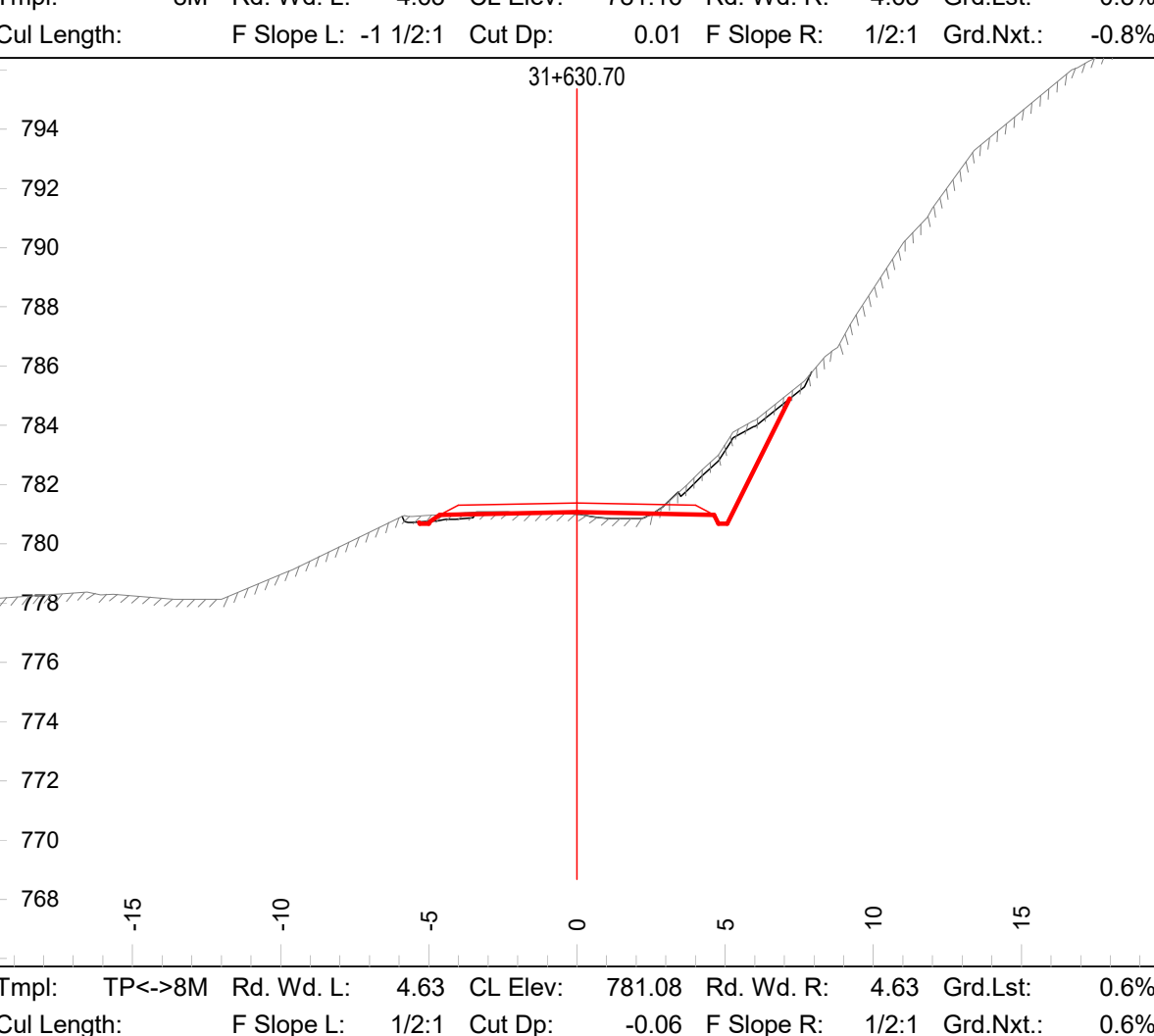
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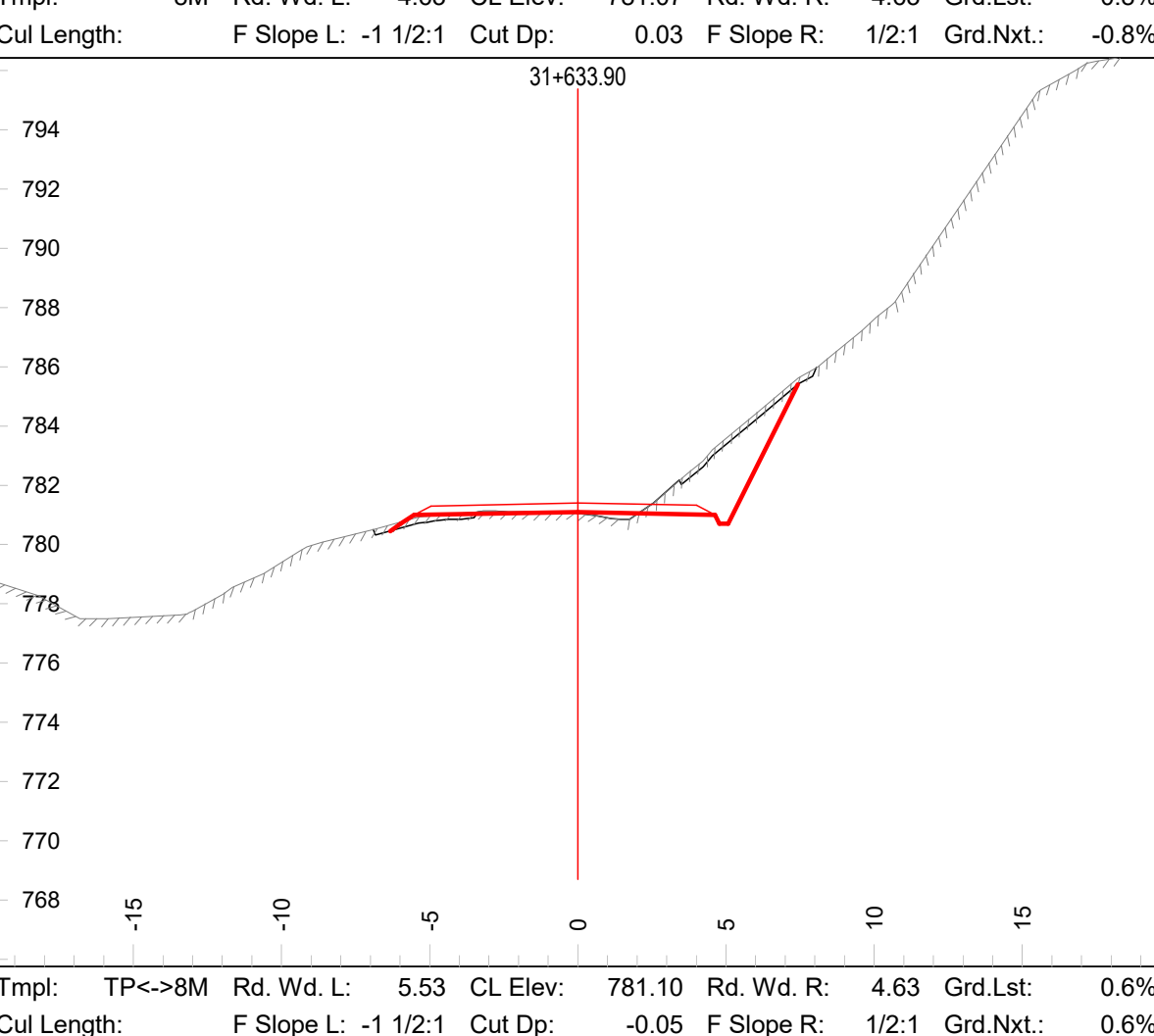
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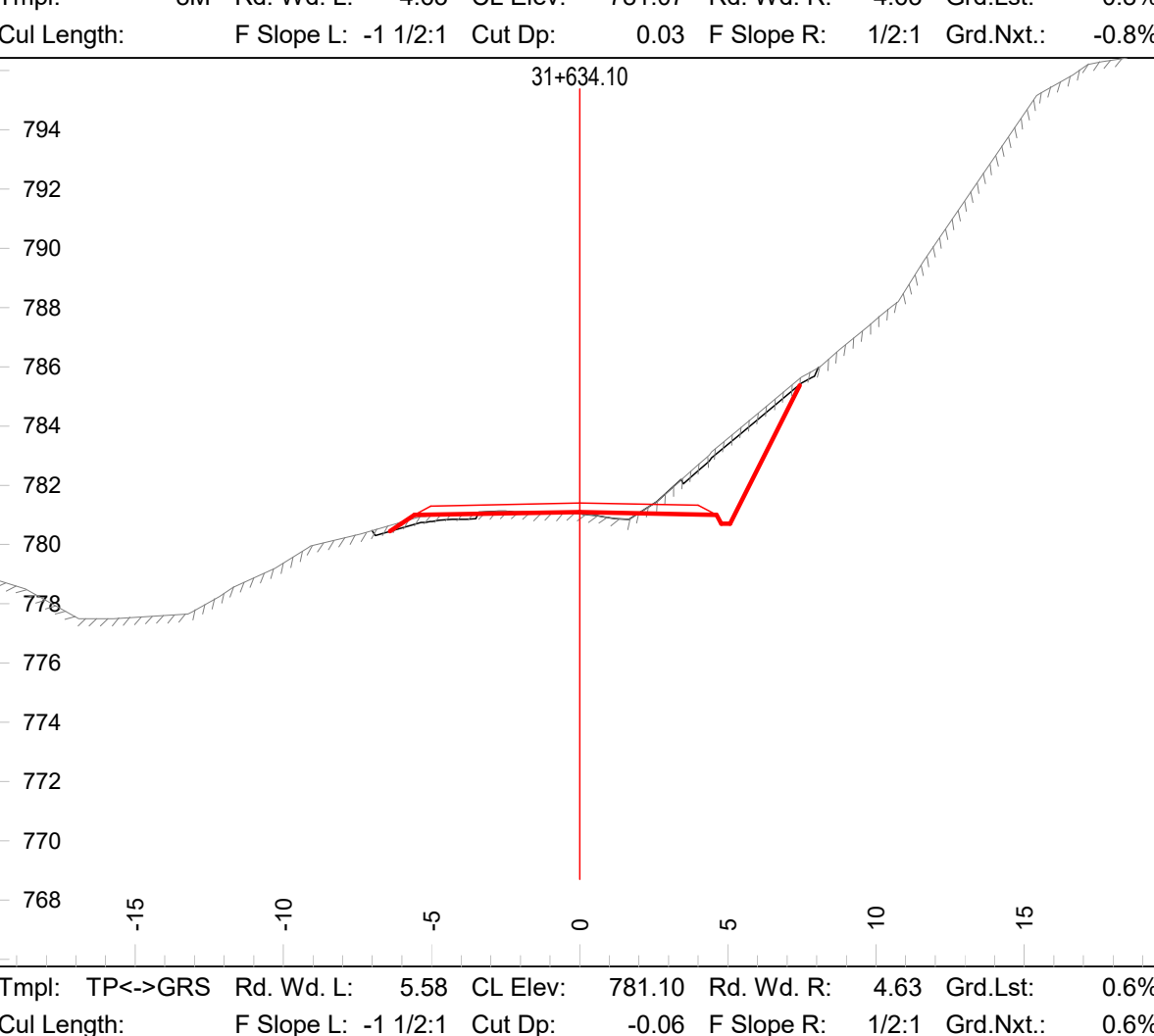
31+630.70



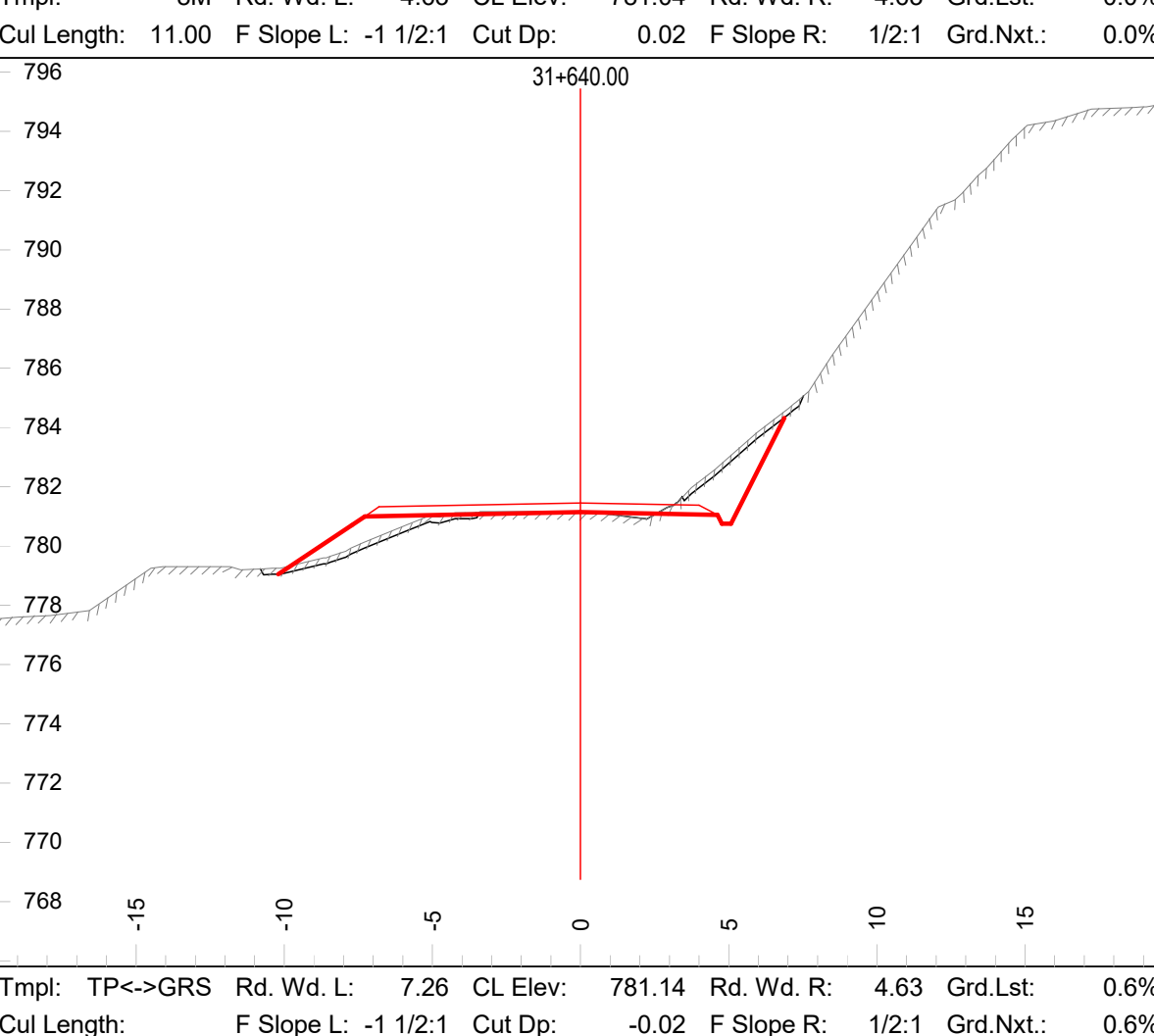
31+633.90



31+634.10



31+640.00



31+546.58

Temp: GRS Rd. Wd. L: 4.63 CL Elev: 781.60 Rd. Wd. R: 4.89 Grd.Lst: -0.8%
Cul Length: F Slope L: -1/4:1 Cut Dp: 0.30 F Slope R: 1/2:1 Grd.Nxt: -0.8%

31+547.90

Temp: GRS Rd. Wd. L: 4.63 CL Elev: 781.59 Rd. Wd. R: 4.83 Grd.Lst: -0.8%
Cul Length: F Slope L: 0.00% Cut Dp: 0.33 F Slope R: 1/2:1 Grd.Nxt: -0.8%

31+548.10

Temp: 8M Rd. Wd. L: 4.63 CL Elev: 781.59 Rd. Wd. R: 4.82 Grd.Lst: -0.8%
Cul Length: F Slope L: 1/2:1 Cut Dp: 0.33 F Slope R: 1/2:1 Grd.Nxt: -0.8%

31+551.91

Temp: 8M Rd. Wd. L: 4.63 CL Elev: 781.55 Rd. Wd. R: 4.63 Grd.Lst: -0.8%
Cul Length: F Slope L: 1/2:1 Cut Dp: 0.31 F Slope R: 1/2:1 Grd.Nxt: -0.8%

31+560.00

Temp: 8M Rd. Wd. L: 4.63 CL Elev: 781.49 Rd. Wd. R: 4.63 Grd.Lst: -0.8%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.25 F Slope R: 1/2:1 Grd.Nxt: -0.8%

31+580.00

Temp: 8M Rd. Wd. L: 4.63 CL Elev: 781.33 Rd. Wd. R: 4.63 Grd.Lst: -0.8%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.17 F Slope R: 1/2:1 Grd.Nxt: -0.8%

31+591.65

Temp: 8M Rd. Wd. L: 4.63 CL Elev: 781.23 Rd. Wd. R: 4.63 Grd.Lst: -0.8%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.05 F Slope R: 1/2:1 Grd.Nxt: -0.8%

31+591.76

Temp: 8M Rd. Wd. L: 4.63 CL Elev: 781.23 Rd. Wd. R: 4.63 Grd.Lst: -0.8%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.05 F Slope R: 1/2:1 Grd.Nxt: -0.8%

31+600.00

Temp: 8M Rd. Wd. L: 4.63 CL Elev: 781.16 Rd. Wd. R: 4.63 Grd.Lst: -0.8%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.01 F Slope R: 1/2:1 Grd.Nxt: -0.8%

31+611.65

Temp: 8M Rd. Wd. L: 4.63 CL Elev: 781.07 Rd. Wd. R: 4.63 Grd.Lst: -0.8%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.03 F Slope R: 1/2:1 Grd.Nxt: -0.8%

31+611.76

Temp: 8M Rd. Wd. L: 4.63 CL Elev: 781.07 Rd. Wd. R: 4.63 Grd.Lst: -0.8%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.03 F Slope R: 1/2:1 Grd.Nxt: -0.8%

31+620.00

Temp: 8M Rd. Wd. L: 4.63 CL Elev: 781.04 Rd. Wd. R: 4.63 Grd.Lst: 0.0%
Cul Length: 11.00 F Slope L: -1 1/2:1 Cut Dp: 0.02 F Slope R: 1/2:1 Grd.Nxt: 0.0%

31+630.70

Temp: TP<->8M Rd. Wd. L: 4.63 CL Elev: 781.10 Rd. Wd. R: 4.63 Grd.Lst: 0.6%
Cul Length: F Slope L: 1/2:1 Cut Dp: -0.06 F Slope R: 1/2:1 Grd.Nxt: 0.6%

31+633.90

Temp: TP<->8M Rd. Wd. L: 5.63 CL Elev: 781.10 Rd. Wd. R: 4.63 Grd.Lst: 0.6%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.05 F Slope R: 1/2:1 Grd.Nxt: 0.8%

31+634.10

Temp: TP<->GRS Rd. Wd. L: 5.58 CL Elev: 781.10 Rd. Wd. R: 4.63 Grd.Lst: 0.6%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.06 F Slope R: 1/2:1 Grd.Nxt: 0.6%

31+640.00

Temp: TP<->GRS Rd. Wd. L: 7.26 CL Elev: 781.14 Rd. Wd. R: 4.63 Grd.Lst: 0.6%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.02 F Slope R: 1/2:1 Grd.Nxt: 0.6%



Ministry of Forests, Lands and
Natural Resource Operations

Omenica Region

Prince George Resource District

Chuchinka-Colbourne FSR

Roadway Widening and Upgrade

Geometric Alignment

Km 31 to Km 33.6

Page 8 of 71

Stations: 31+779.35 to 31+911.66

ROAD DESIGN SPECIFICATIONS

Design Speed: 30 km/h
Avg. Stab. Road Width: 6.0m
Fav. Grade Max. 10%
Adv. Grade Max 10%

Section Scale 1:250

Project Location Coordinates

Latitude: 51-15-03
Longitude: -119-53-14
Elevation: 610m
Datum: NAD83
UTM Combined Scale Factor:
n/a

Notes:

- Ground model data obtained by Lidar Survey method by McElhanney Survey Consulting Ltd. Oct. 2013
-30km/h Speed Limit through the Canyon, remainder designed to minimum 60km/h.

Survey Control Stations

Point Name	Northing	Easting	Elevation	Description

Plan Legend (all may not be applicable)

L-line Location

Road Edges

Cleaning Limits

Culverts

GPS Base Station

Old Iron Bar found (tied)

Old Pipe Post found (tie)

Survey Control Points tie

Benchmark

Edge of Wetland

Existing Road Edges

Breakline

Powerline

Draw

Test Pit

Stream

Tension Crack

Timberline

Cut / Fill limits

Powerpole

Finished Road Surface

Profile Subgrade

Cut / Fill limits

Original Ground

1st Stratum

2nd Stratum (Rock)

Ditch Invert Right

Ditch Invert Left

EARTH WORK VOLUMES (Bank cubic meters)

L-Stn m.	Strip V. Cu. m.	SG Cut V. Cu. m.	SG Fill V. Cu. m.	B/W Vol. Cu. m.	Srf1 Fill V. Cu. m.
31+800.00					
32+000.00	253.3	649.4	448.5	-400.0	549.6
Pg. Tot.	253.3	649.4	448.5		549.6
Cum. Tot.	1479.9	3451.3	1717.5		2982.9

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt
31+903.32	600	12.00	6.50	5.50	92.00000	xdrain

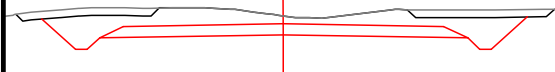
SOIL TYPES

OB - Overburden
OR - Organics
SL - Silt
FS - Fine Sand & Silt
SA - Sand
SG - Sand & Gravel
CG - Sand & Course Gravel
SC - Sand/Cobbles/Gravel
GR - Gravel
BO - Boulders
FR - Fractured Rock (Talus)
RR - Riprapable Rock
SR - Solid Rock

ROAD TEMPLATES

TP = Taper template
TO = Turnout Template
8M = 8.0m wide finished running surface
8WS = 8m wide finished running surface with retaining wall

Surfacing depth = 0.3m
Ditch Slopes = 1.5:1 Ditch Depth = 0.3 Width = 0.3
F Slope = Final Slope Left or Right



Prepared by:



Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

DRAFT
FOR REVIEW
PURPOSES ONLY

Dwg Num: 110-022-003

Survey By: see Notes above
Design By: Edward Folk, P.Eng.
Approved By:

Plot Date:16/06/29

Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-

31+780.00



31+780.00

31+784.60



31+784.60

31+798.69



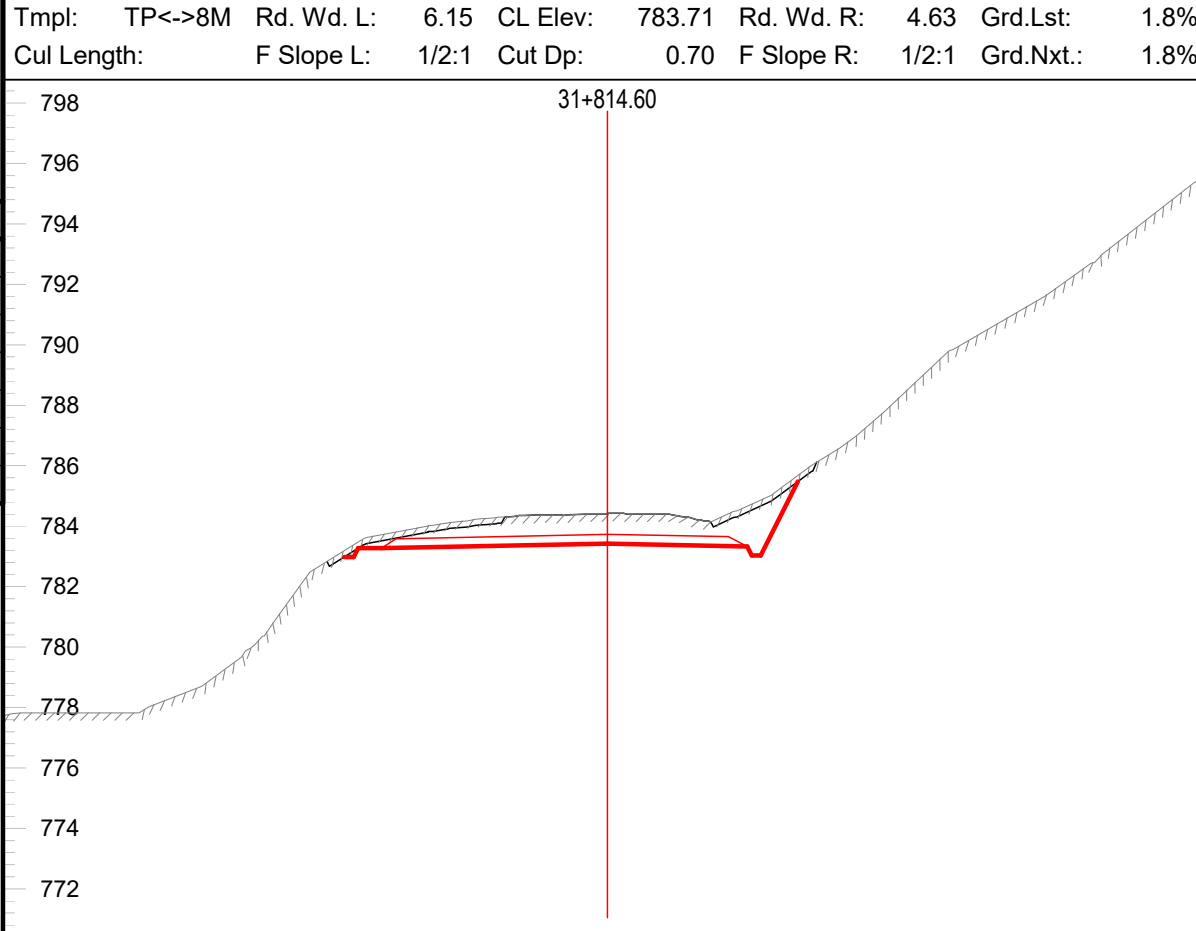
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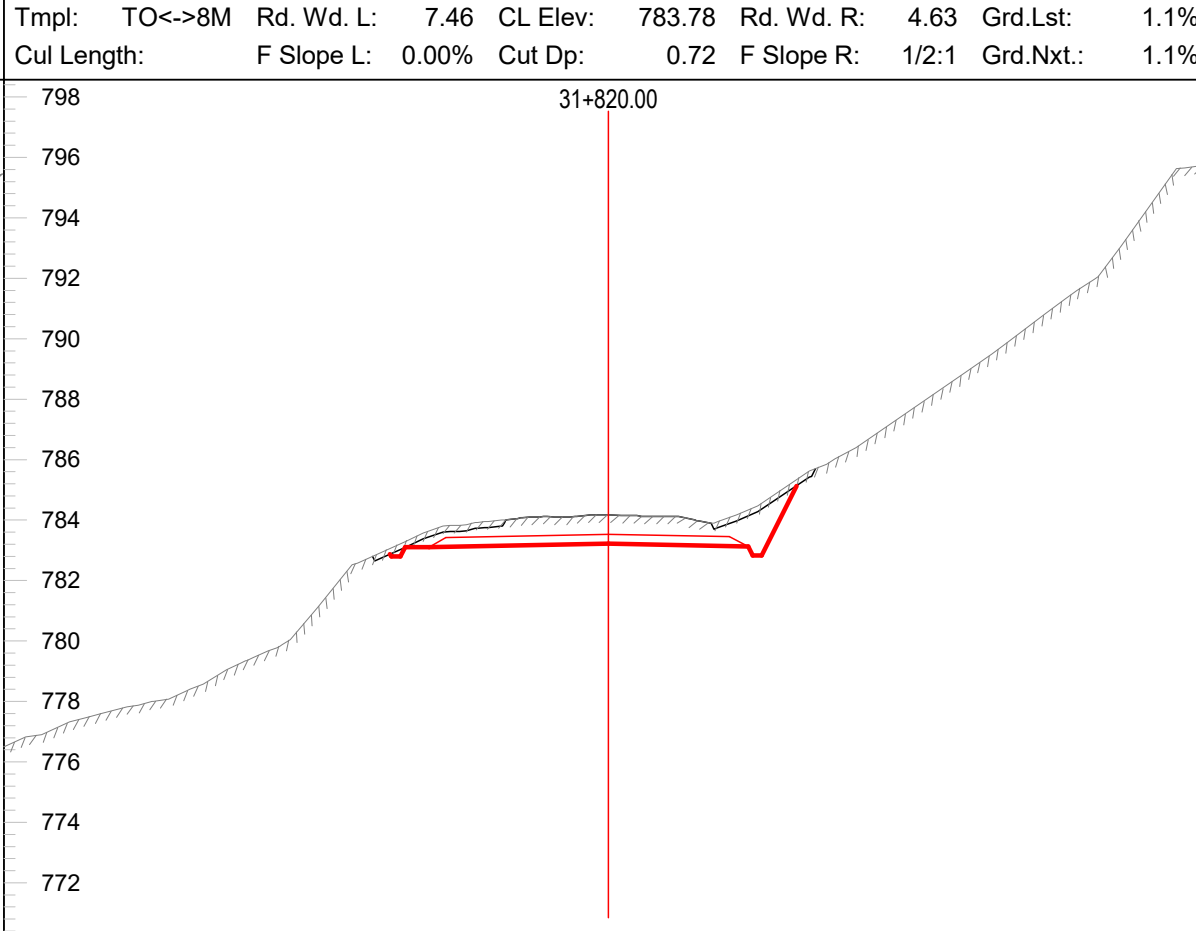
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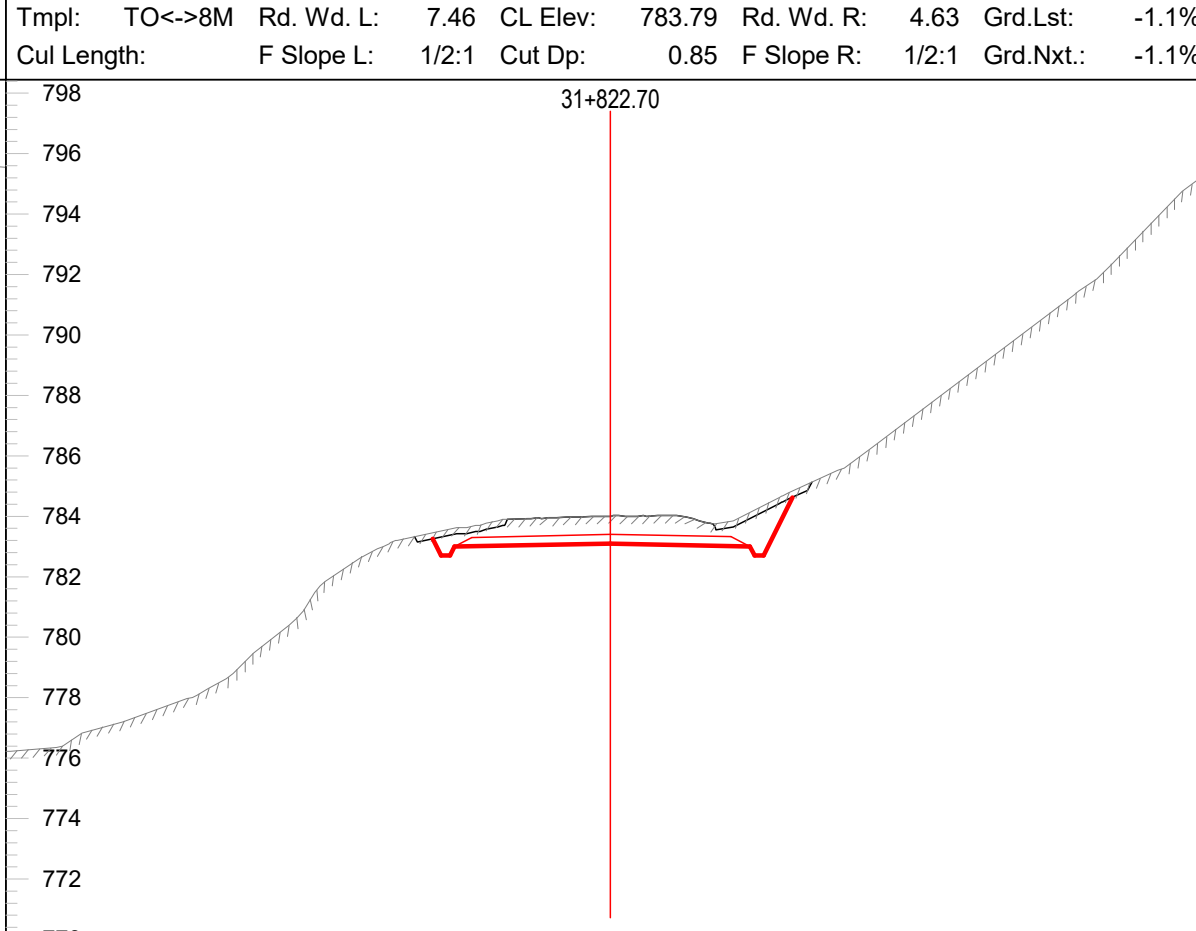
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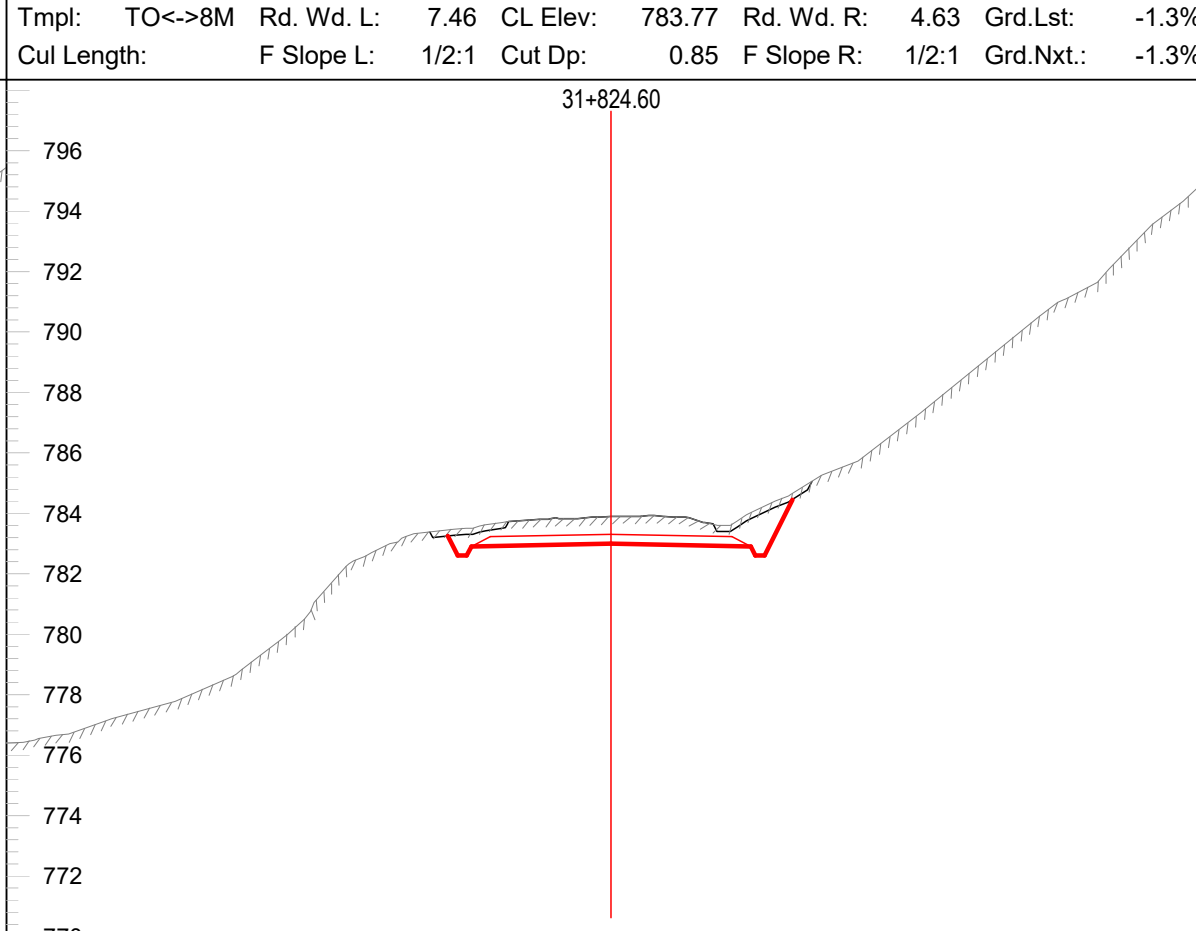
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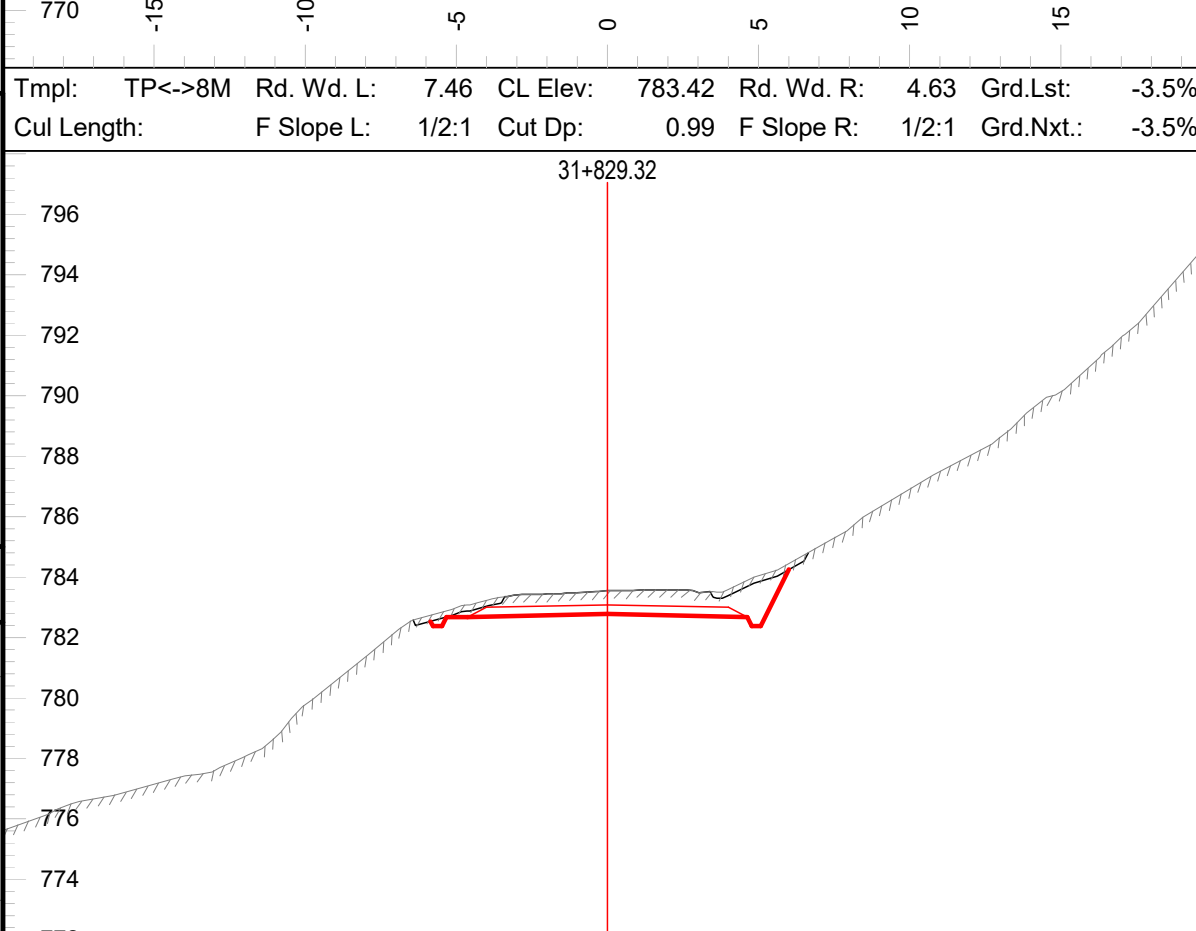
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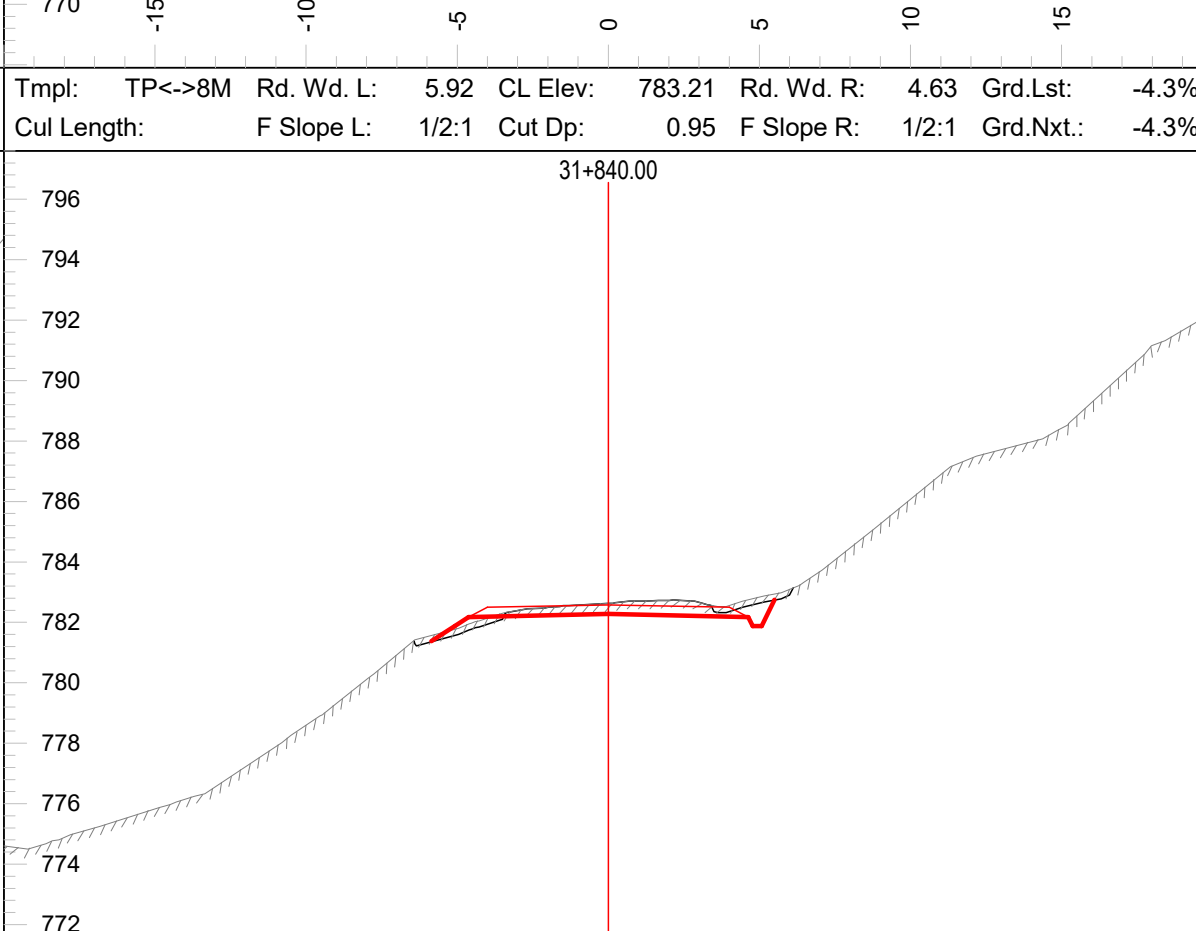
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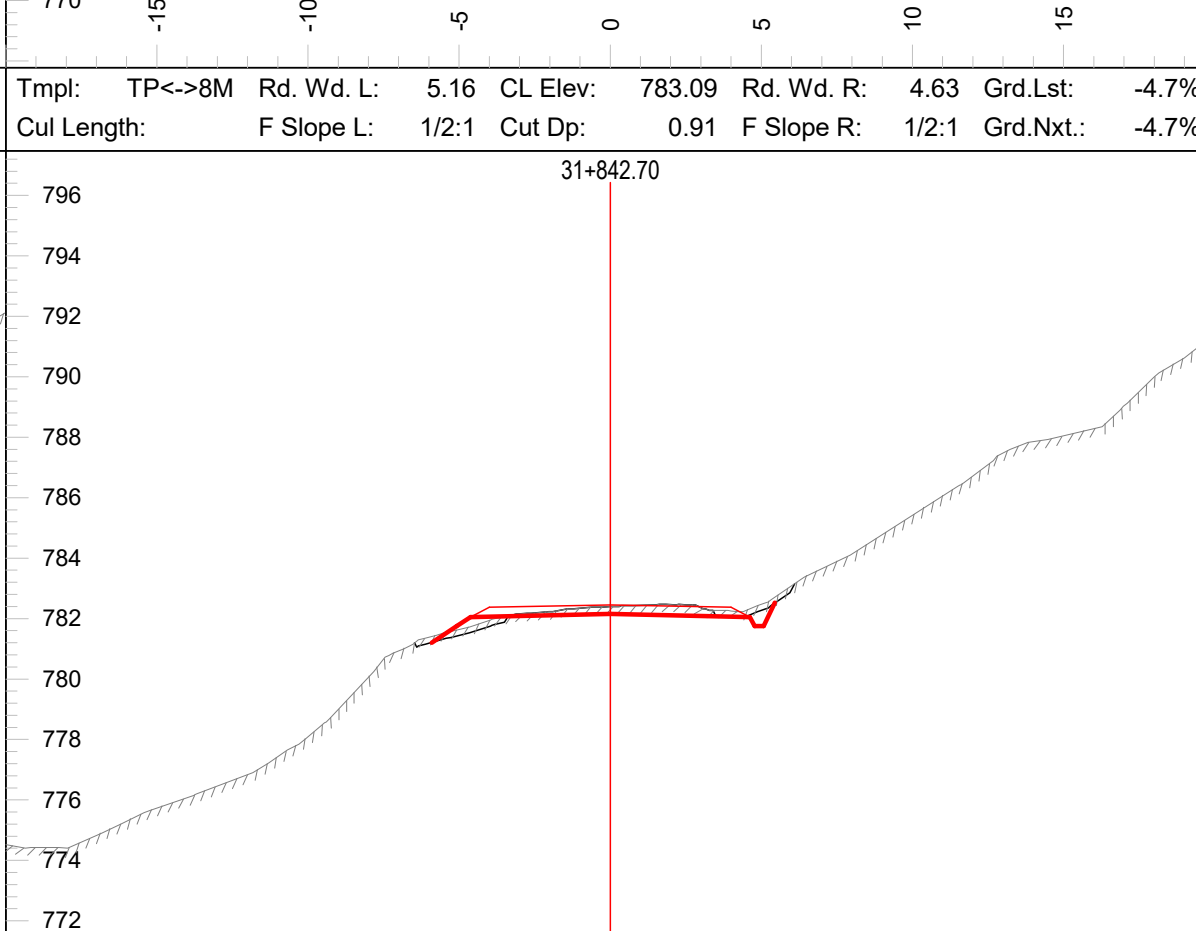
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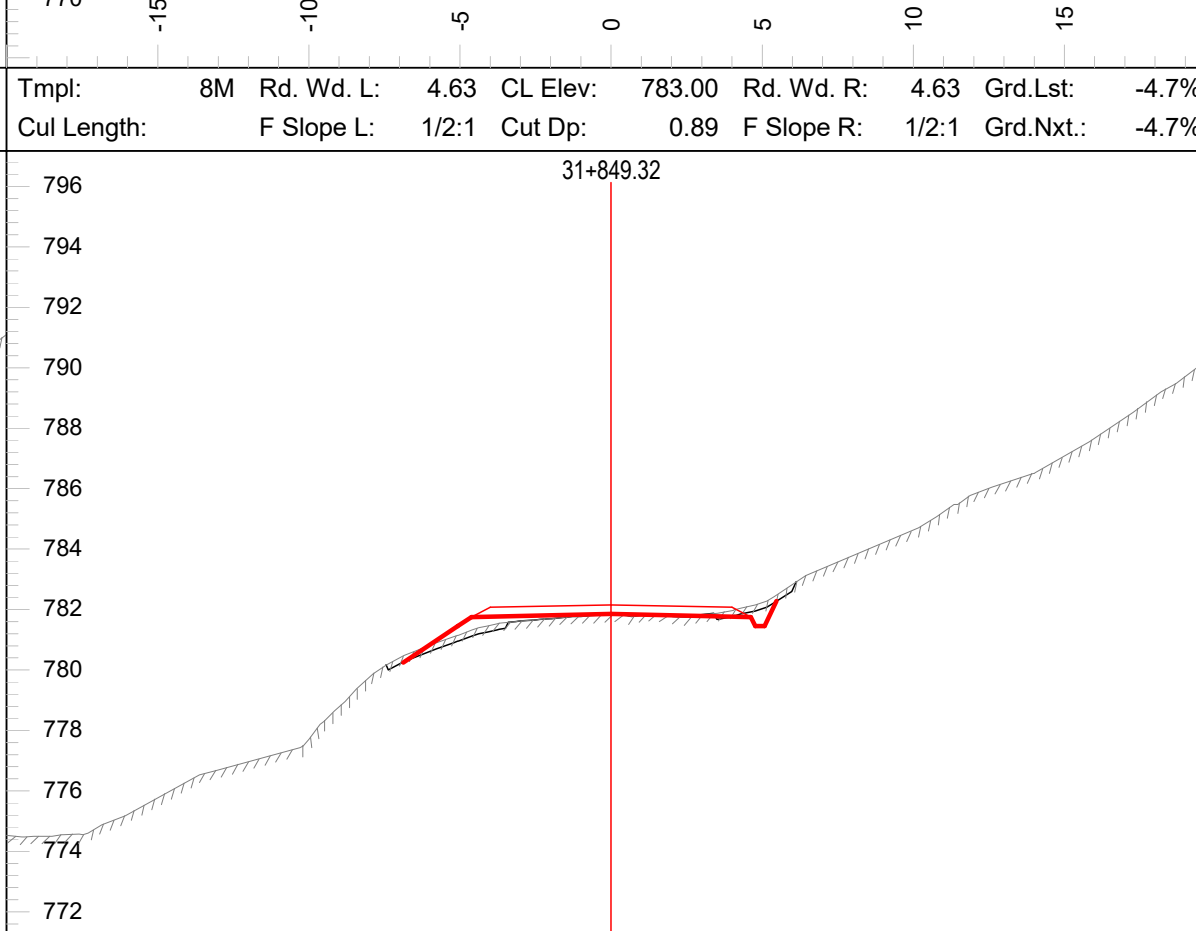
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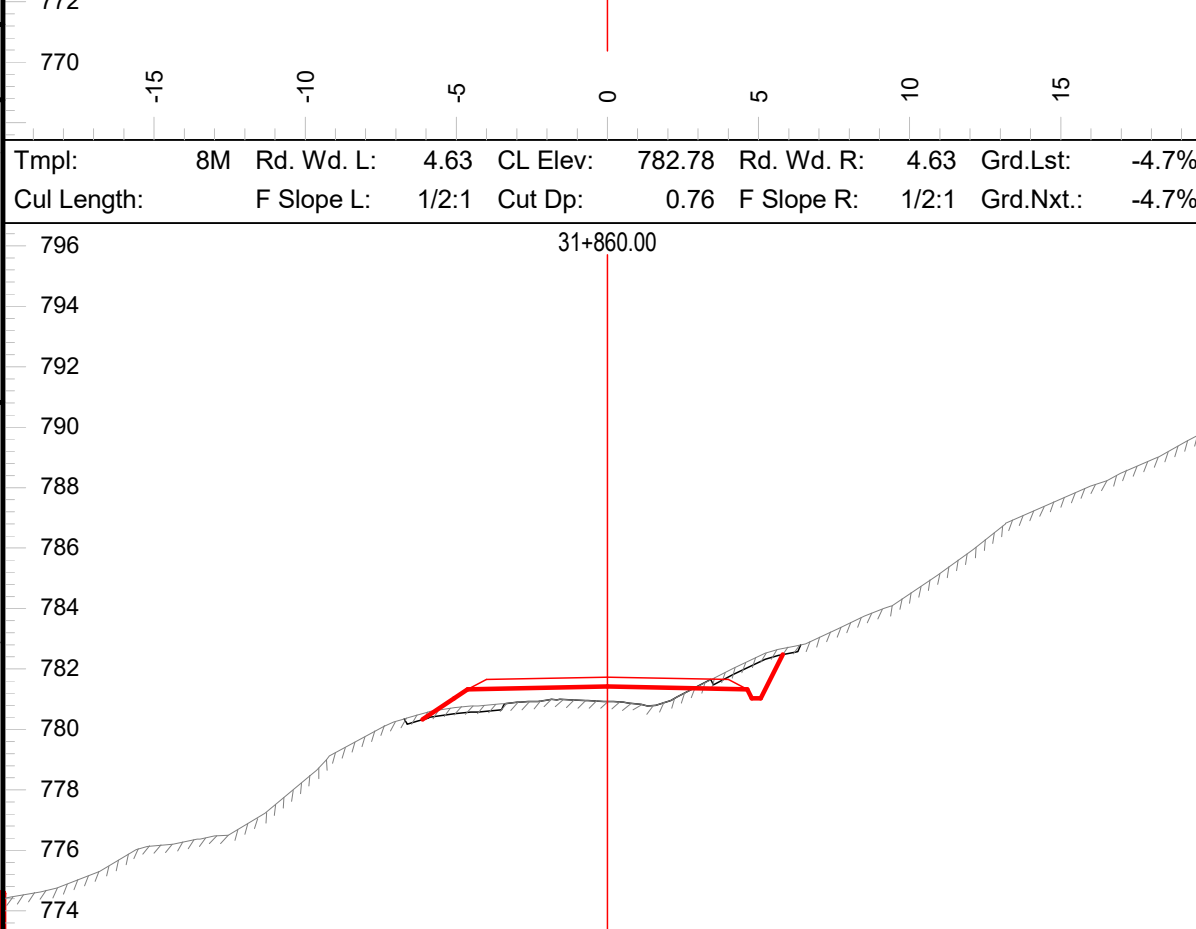
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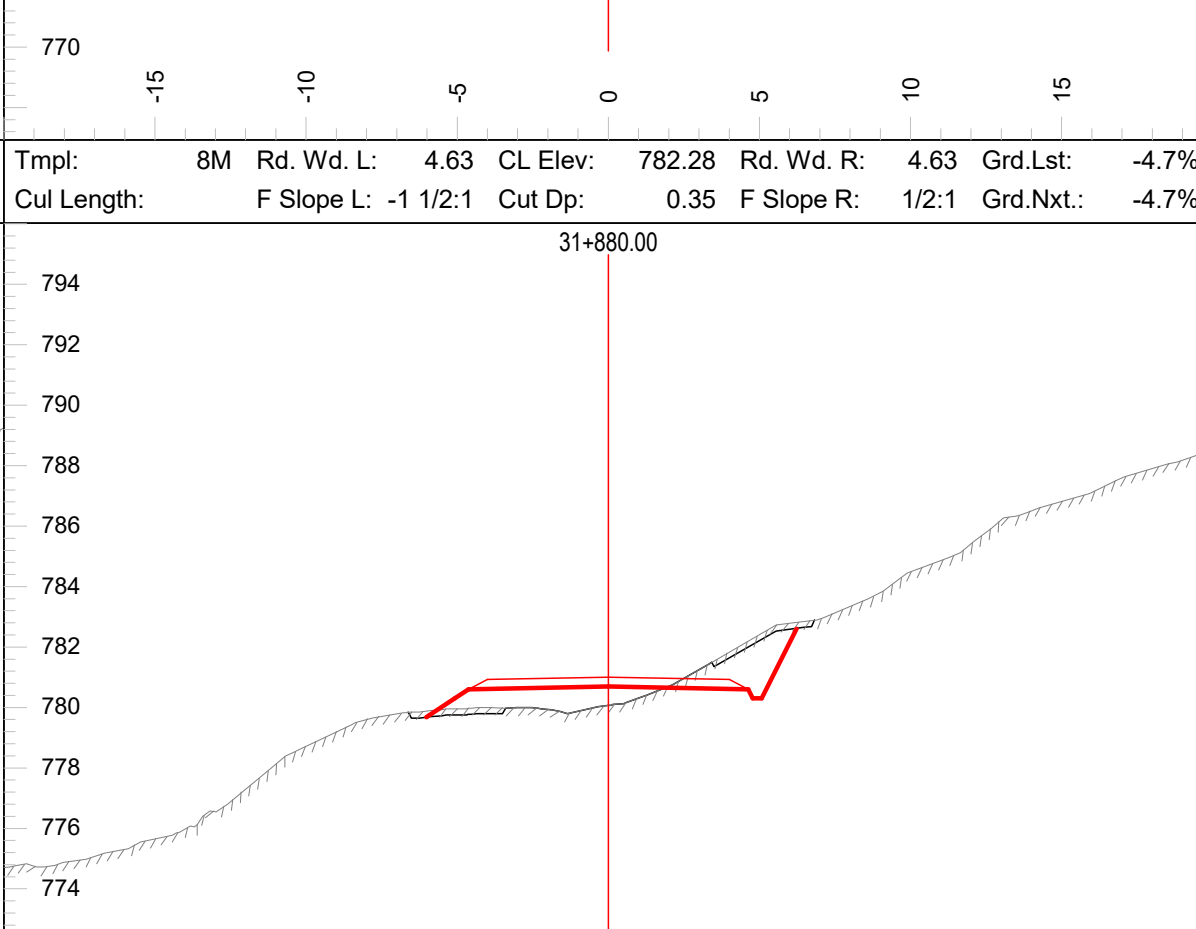
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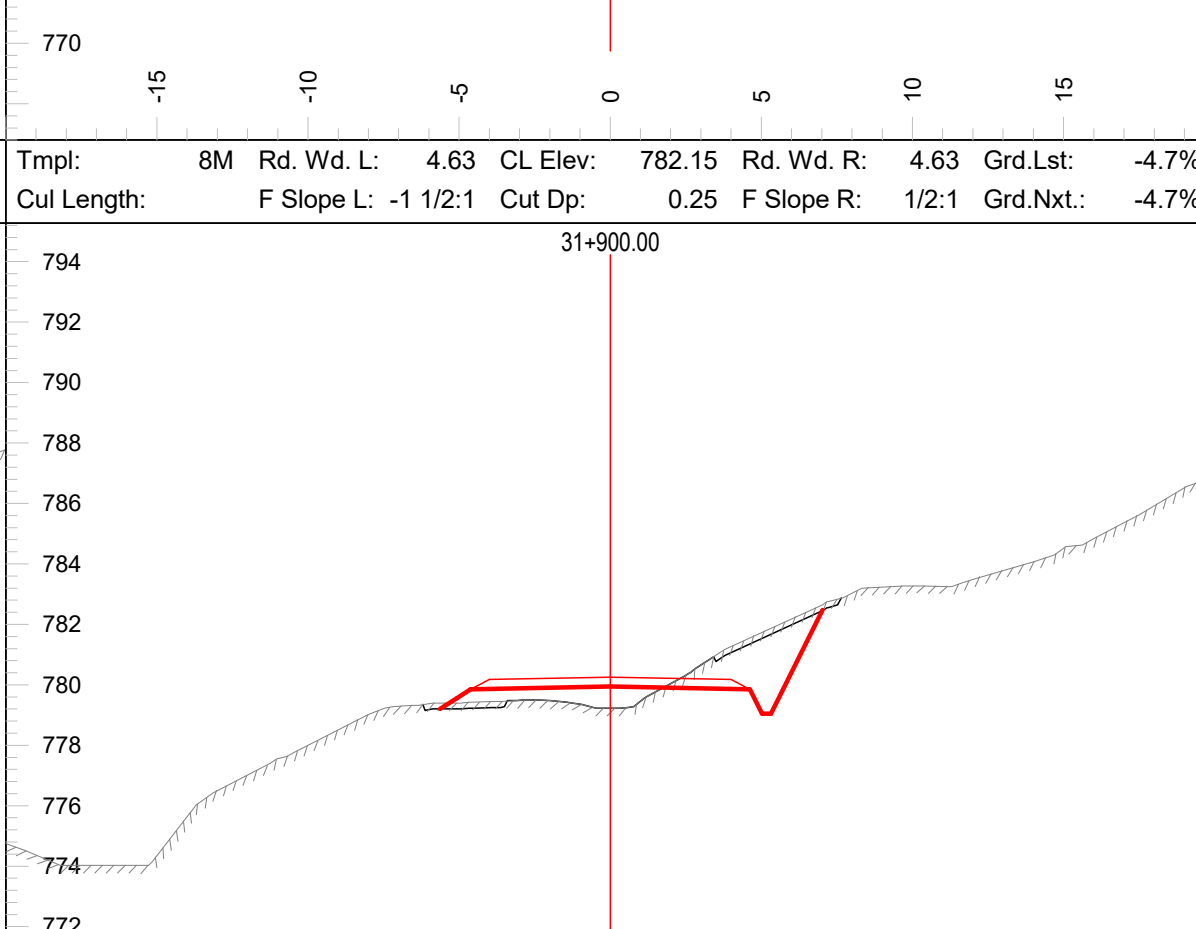
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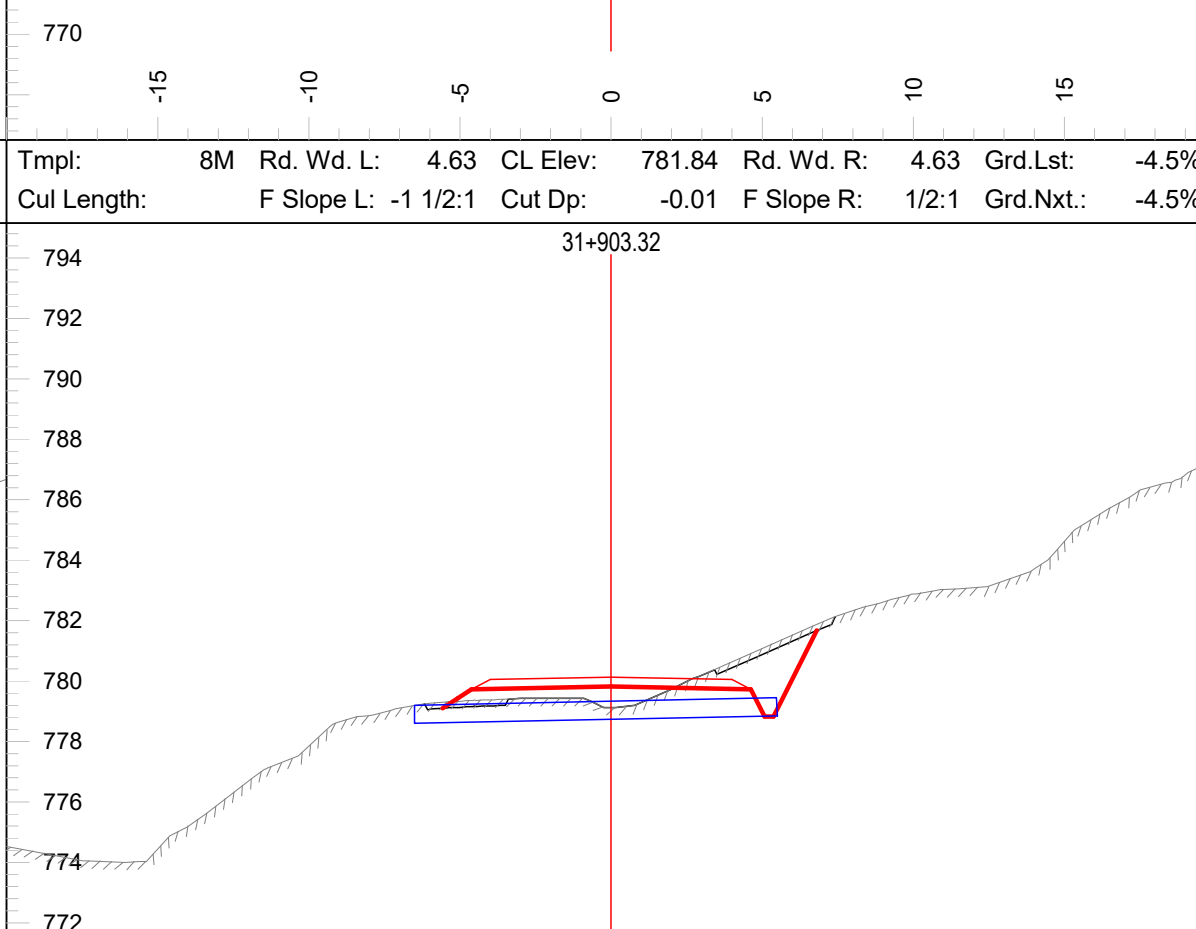
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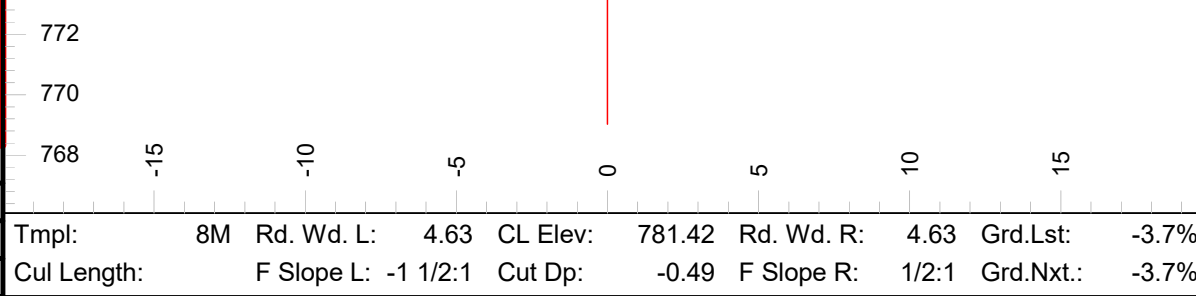
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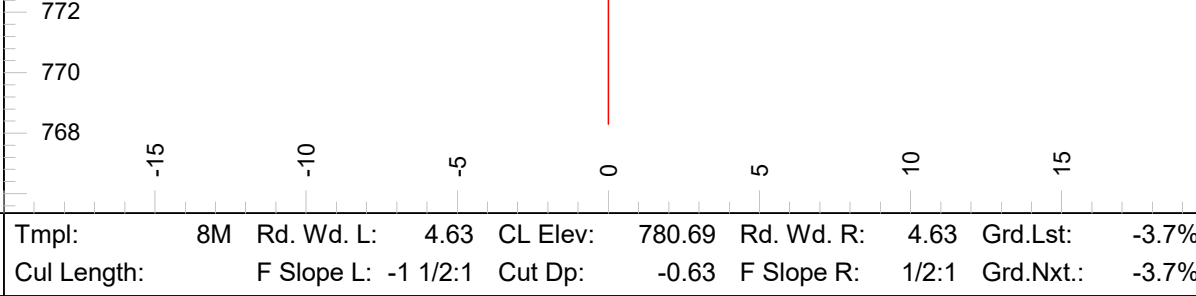
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31+911.66



31+911.66

31+911.66



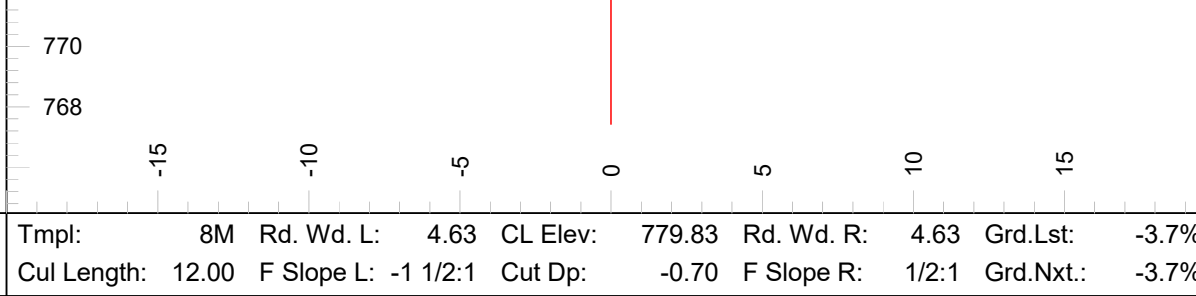
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31+911.66

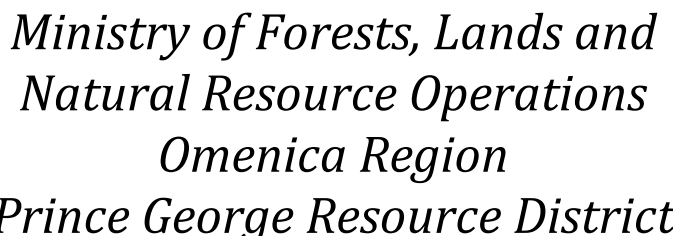


31+911.66

31+911.66



31+911.66



Page 9 of 71 Stations: 31+911.66 to 32+036.49

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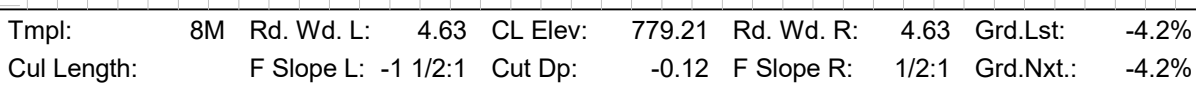
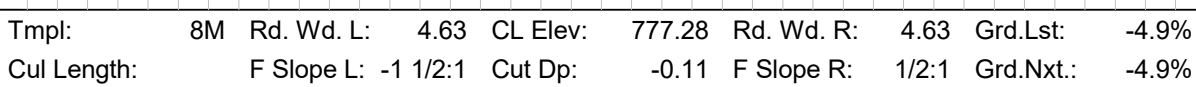
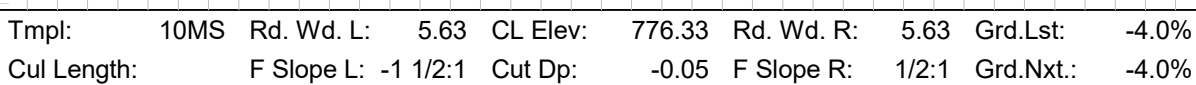
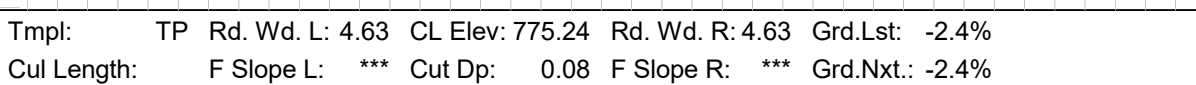
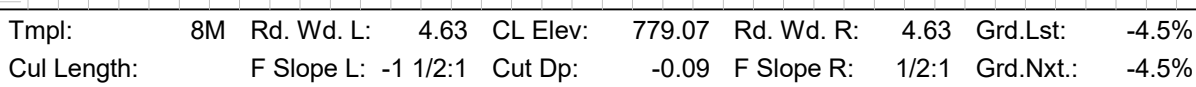
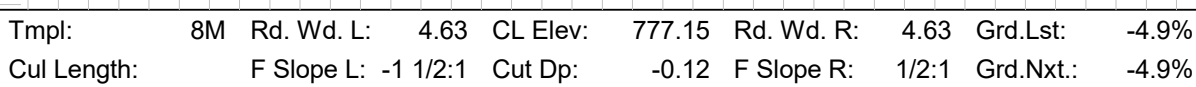
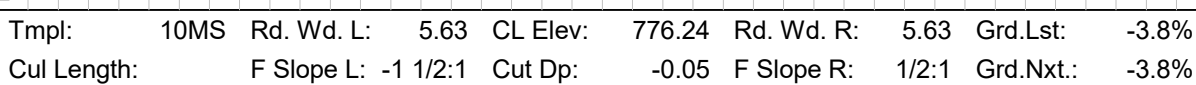
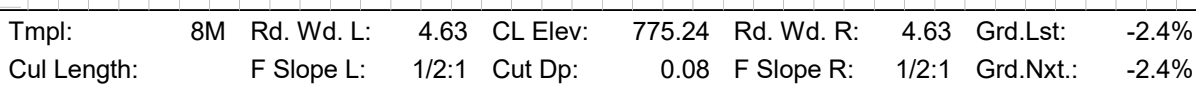
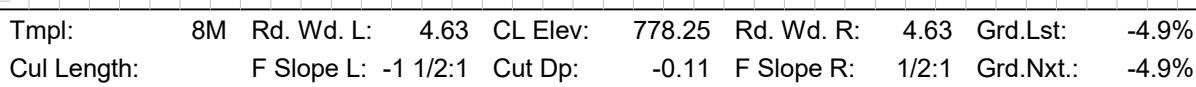
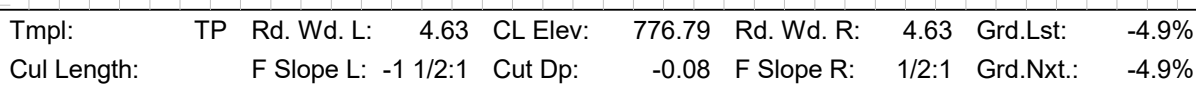
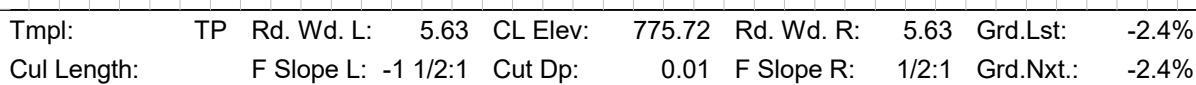
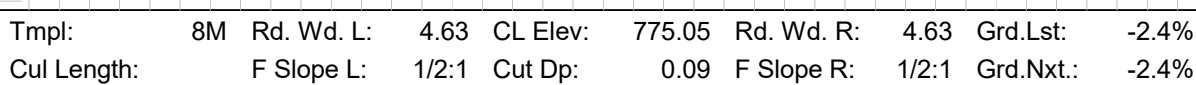
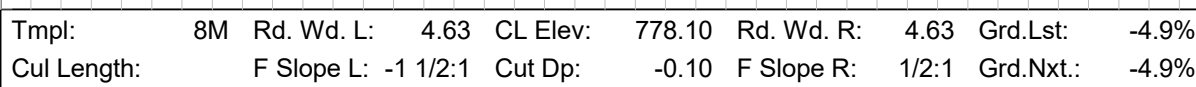
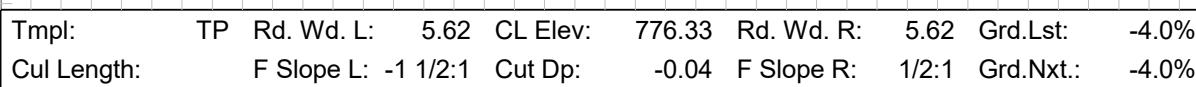
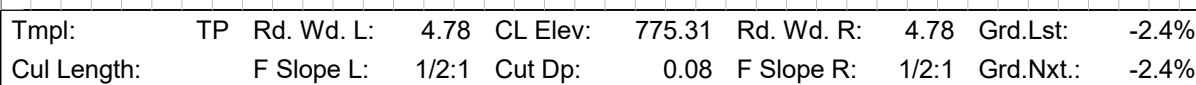
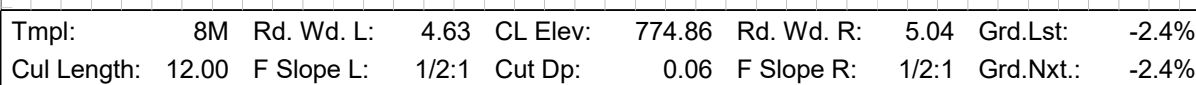
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CULVERT TABLE							
L-Strn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt	
32+036.09	600	12.00	6.50	5.50	82.00000	xdrain	

Prepared by:  Celtic Engineering Ltd. DESIGN & CONSTRUCTION	DRAFT FOR REVIEW PURPOSES ONLY
---	---

Survey By: see Notes above
Design By: Edward Folk, P.Eng.
Approved By:

Plot Date: 16/06/29	Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-
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Ministry of Forests, Lands and
Natural Resource Operations

Omenica Region

Prince George Resource District

Chuchinka-Colbourne FSR

Roadway Widening and Upgrade

Geometric Alignment

Km 31 to Km 33.6

Page 10 of 71

Stations: 32+036.49 to 32+149.06

ROAD DESIGN SPECIFICATIONS

Design Speed: 30 km/h
Avg. Stab. Road Width: 6.0m
Fav. Grade Max. 10%
Adv. Grade Max 10%

Section Scale 1:250

Project Location Coordinates

Latitude: 51-15-03
Longitude: -119-53-14
Elevation: 610m
Datum: NAD83
UTM Combined Scale Factor:
n/a

Notes:

- Ground model data obtained by Lidar Survey method by McElhanney Survey Consulting Ltd. Oct. 2013
-30km/h Speed Limit through the Canyon, remainder designed to minimum 60km/h.

Survey Control Stations

Point Name	Northing	Easting	Elevation	Description

Plan Legend (all may not be applicable)

L-line Location

Road Edges

Clearing Limits

Culverts

GPS Base Station

Old Iron Bar found (tied)

Old Pipe Post found (tie)

Survey Control Points tie

Benchmark

Edge of Wetland

Existing Road Edges

Breakline

Powerline

Draw

Test Pit

Stream

Tension Crack

Timberline

Cut / Fill limits

Powerpole

Finished Road Surface

Profile Subgrade

Cut / Fill limits

Original Ground

1st Stratum

2nd Stratum (Rock)

Ditch Invert Right

Ditch Invert Left

EARTH WORK VOLUMES (Bank cubic meters)

L-Stn m.	Strip V. Cu. m.	SG Cut V. Cu. m.	SG Fill V. Cu. m.	B/W Vol. Cu. m.	Srf1 Fill V. Cu. m.
32+200.00					
Pg. Tot.	0.0	0.0	0.0		0.0
Cum. Tot.	1767.2	4068.0	2305.9		3564.8

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cnt

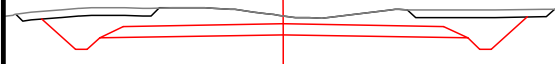
SOIL TYPES

OB - Overburden
OR - Organics
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FS - Fine Sand & Silt
SA - Sand
SG - Sand & Gravel
CG - Sand & Course Gravel
SC - Sand/Cobbles/Gravel
GR - Gravel
BO - Boulders
FR - Fractured Rock (Talus)
RR - Riprapable Rock
SR - Solid Rock

ROAD TEMPLATES

TP = Taper template
TO = Turnout Template
8M = 8.0m wide finished running surface
8WS = 8m wide finished running surface with retaining wall

Surfacing depth = 0.3m
Ditch Slopes = 1.5:1 Ditch Depth = 0.3 Width = 0.3
F Slope = Final Slope Left or Right



Prepared by:



Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

DRAFT
FOR REVIEW
PURPOSES ONLY

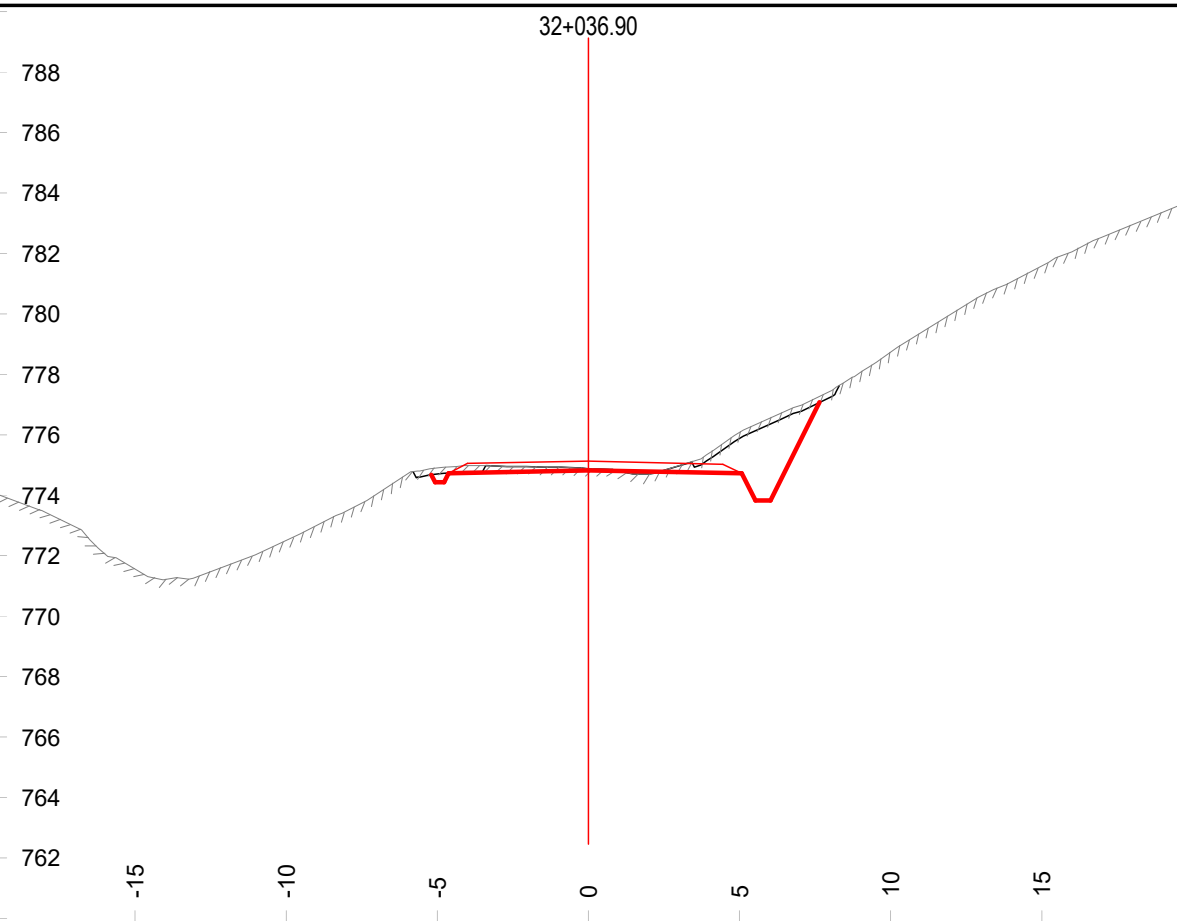
Dwg Num: 110-022-003

Survey By: see Notes above
Design By: Edward Folk, P.Eng.
Approved By:

Plot Date:16/06/29

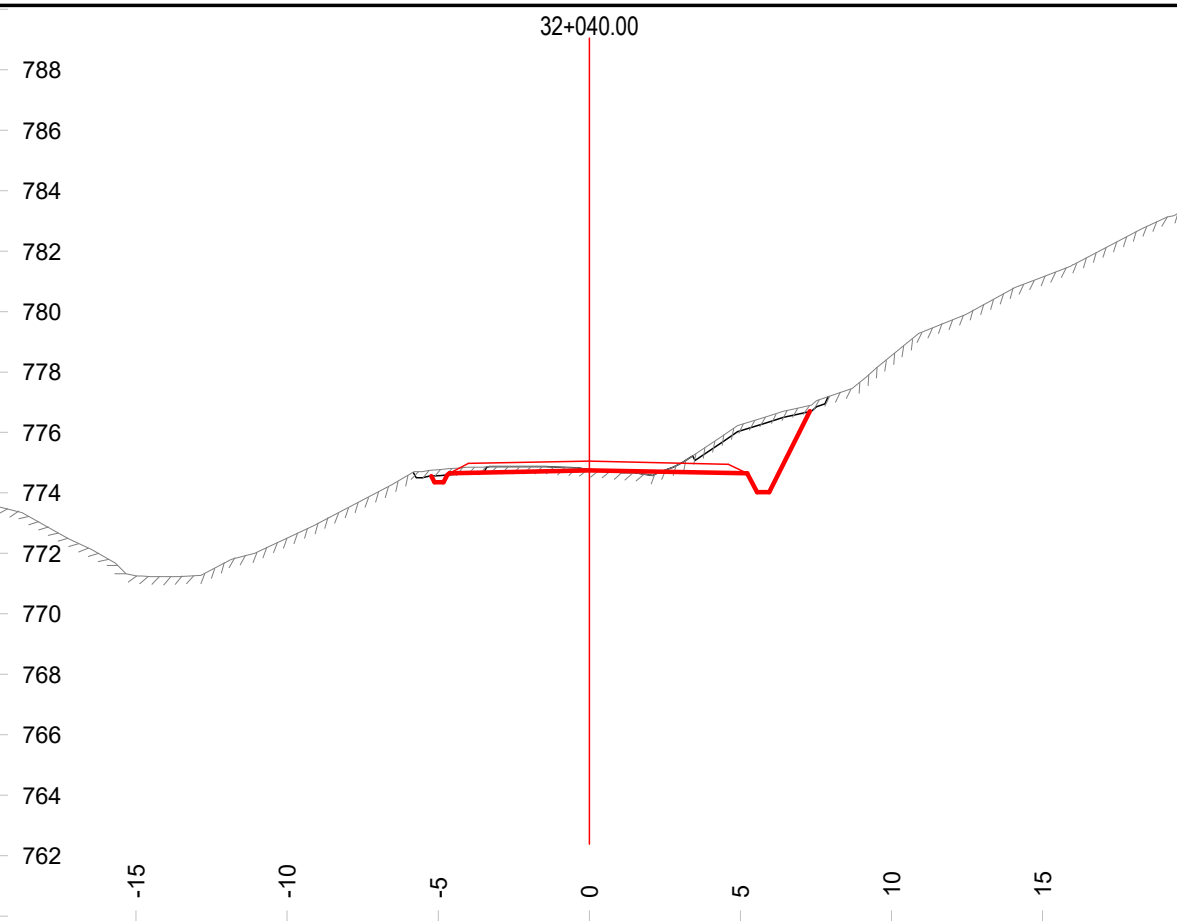
Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-

32+036.90



Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 774.84 Rd. Wd. R: 5.08 Grd.Lst: -2.4%
Cul Length: F Slope L: 1/2:1 Cut Dp: 0.06 F Slope R: 1/2:1 Grd.Nxt.: -2.4%

32+040.00



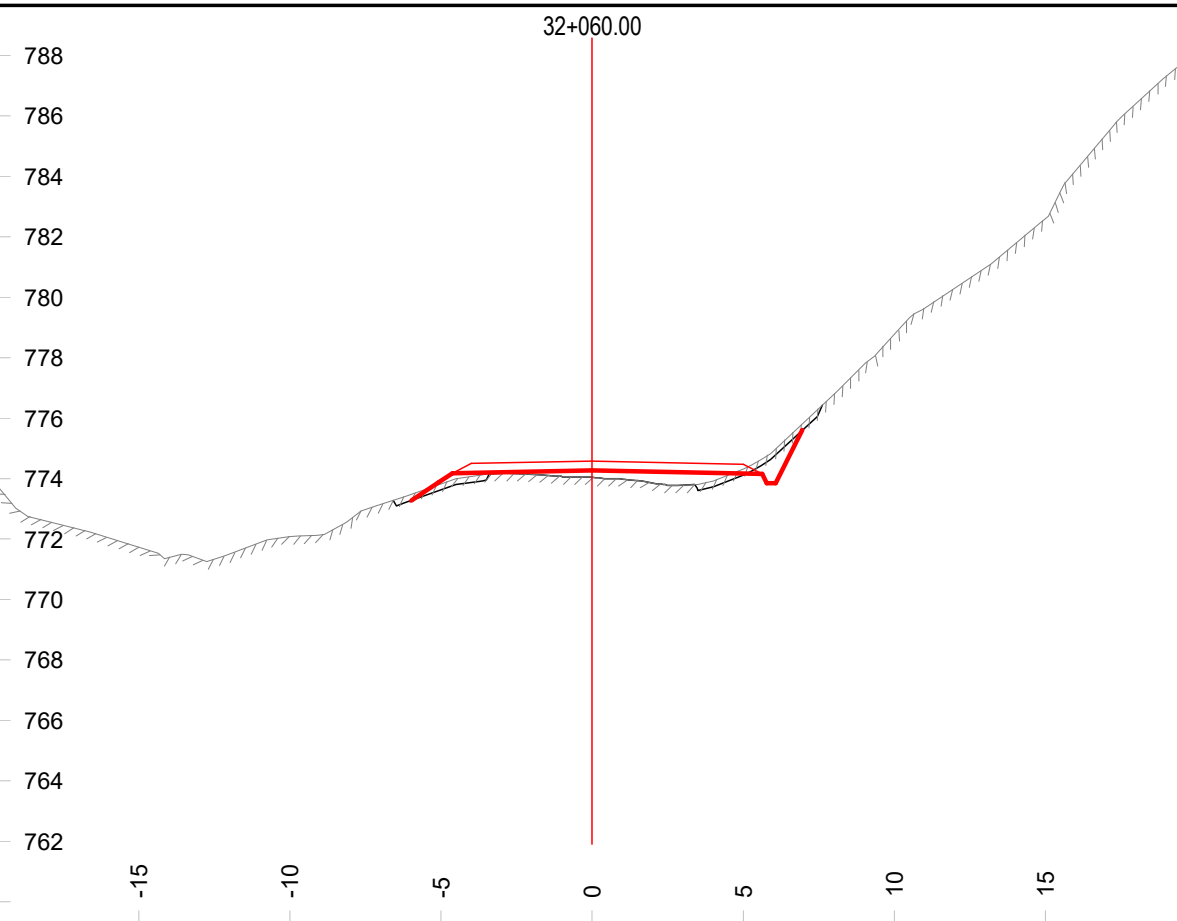
Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 774.76 Rd. Wd. R: 5.23 Grd.Lst: -2.4%
Cul Length: F Slope L: 1/2:1 Cut Dp: 0.02 F Slope R: 1/2:1 Grd.Nxt.: -2.4%

32+047.84



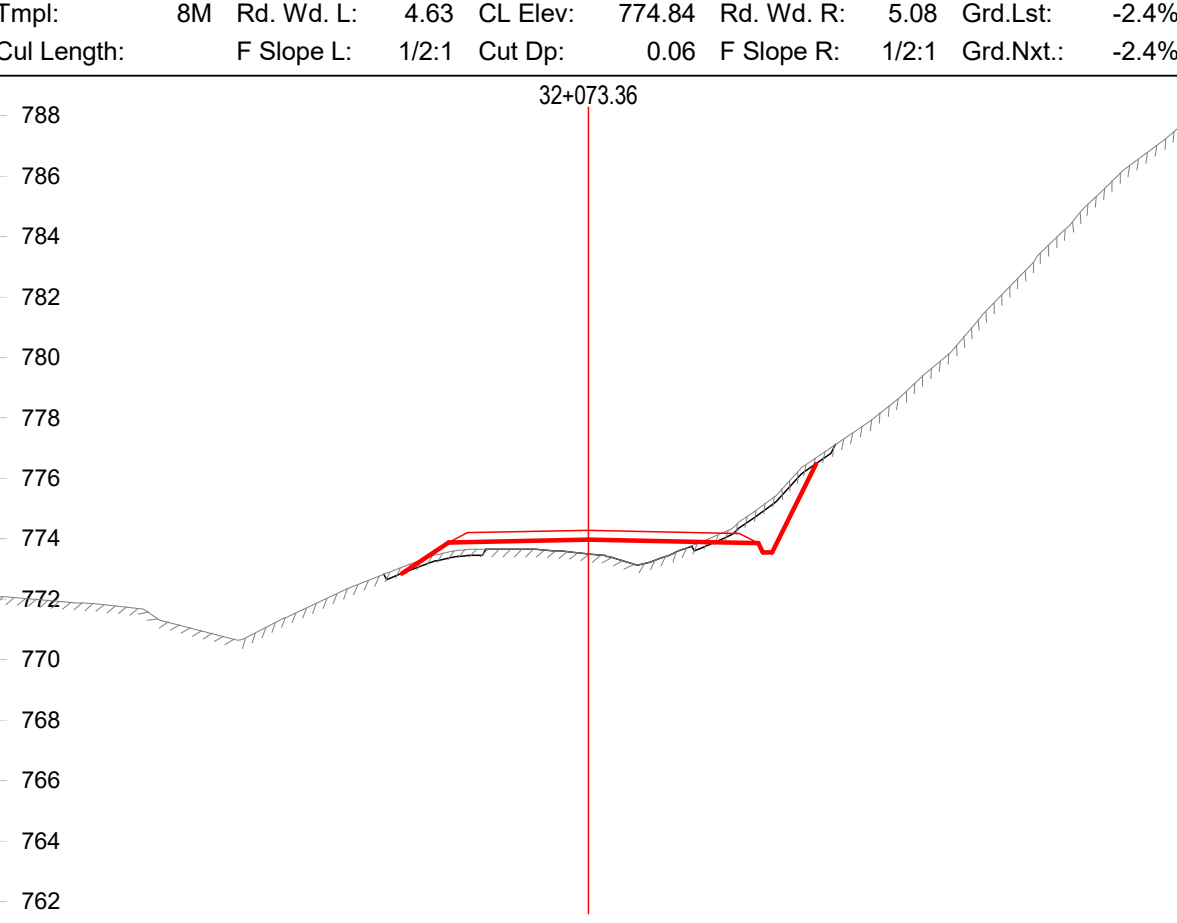
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32+060.00



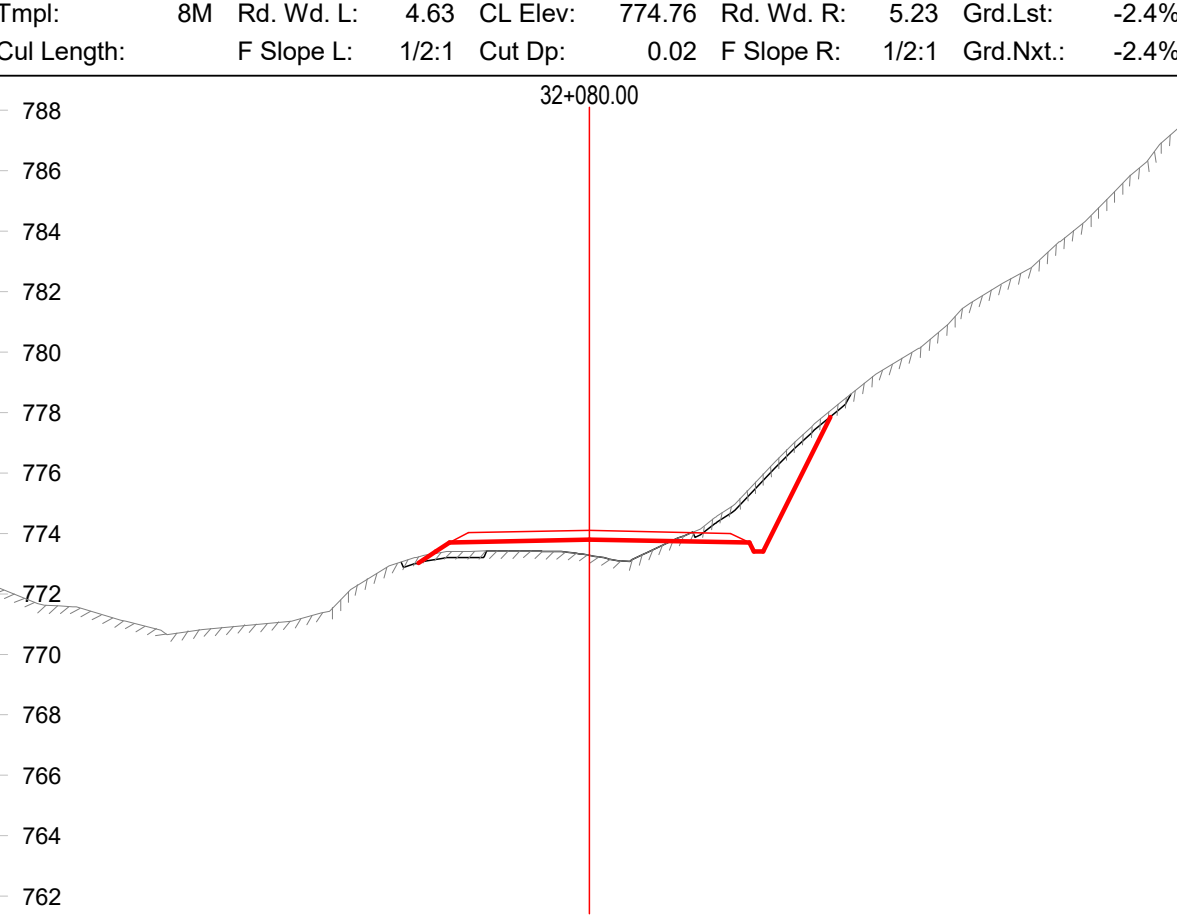
Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 774.28 Rd. Wd. R: 5.63 Grd.Lst: -2.4%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.23 F Slope R: 1/2:1 Grd.Nxt.: -2.4%

32+073.36



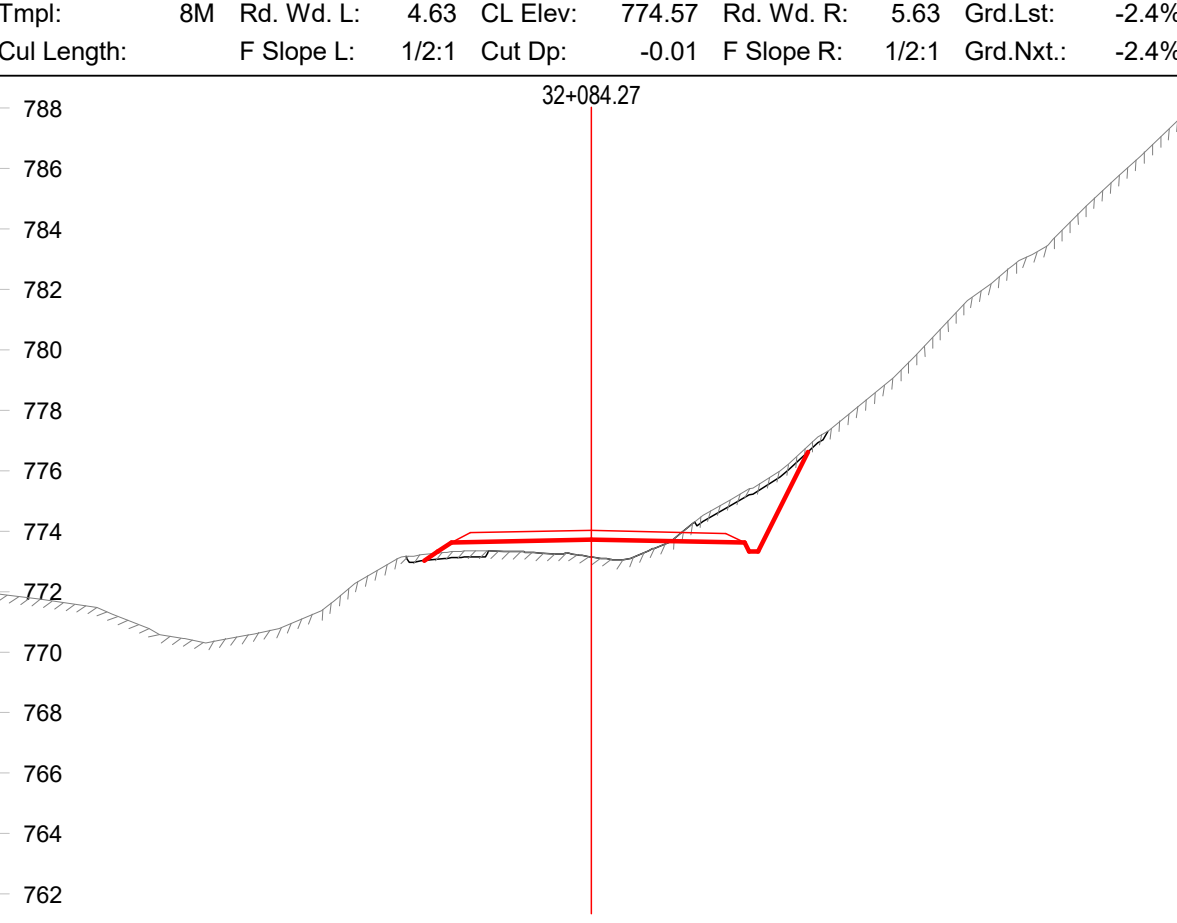
Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 773.96 Rd. Wd. R: 5.63 Grd.Lst: -2.4%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.48 F Slope R: 1/2:1 Grd.Nxt.: -2.4%

32+080.00



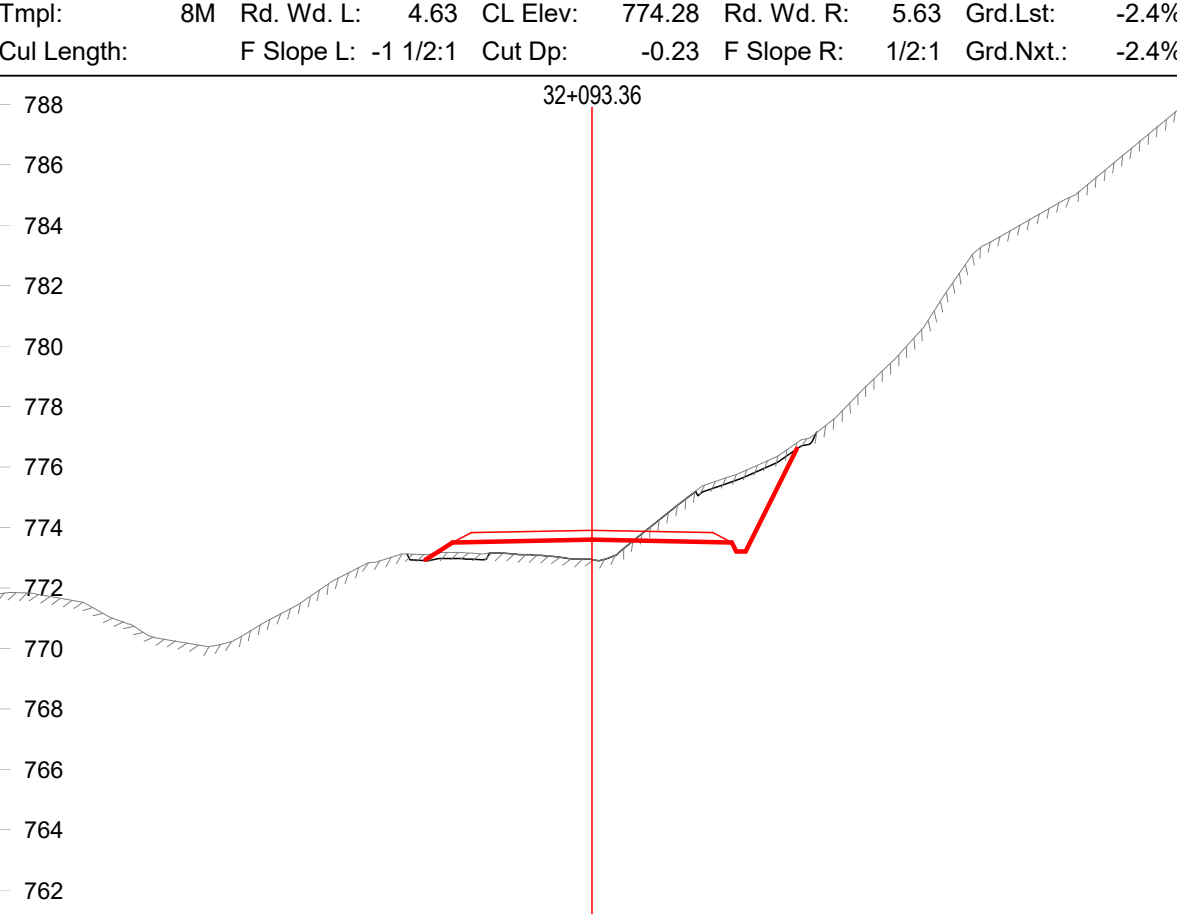
Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 773.81 Rd. Wd. R: 5.29 Grd.Lst: -2.1%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.52 F Slope R: 1/2:1 Grd.Nxt.: -2.1%

32+084.27



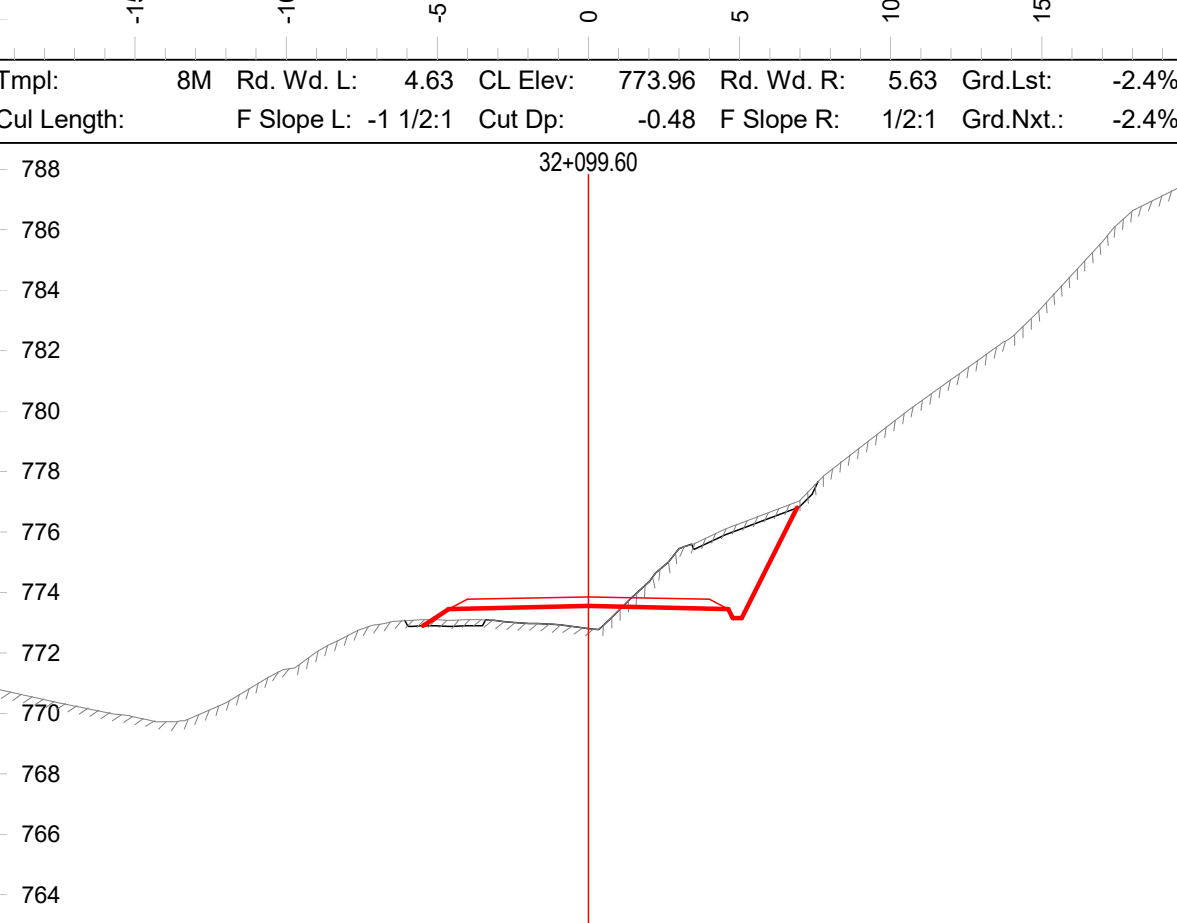
Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 773.73 Rd. Wd. R: 5.08 Grd.Lst: -1.7%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.58 F Slope R: 1/2:1 Grd.Nxt.: -1.7%

32+093.36



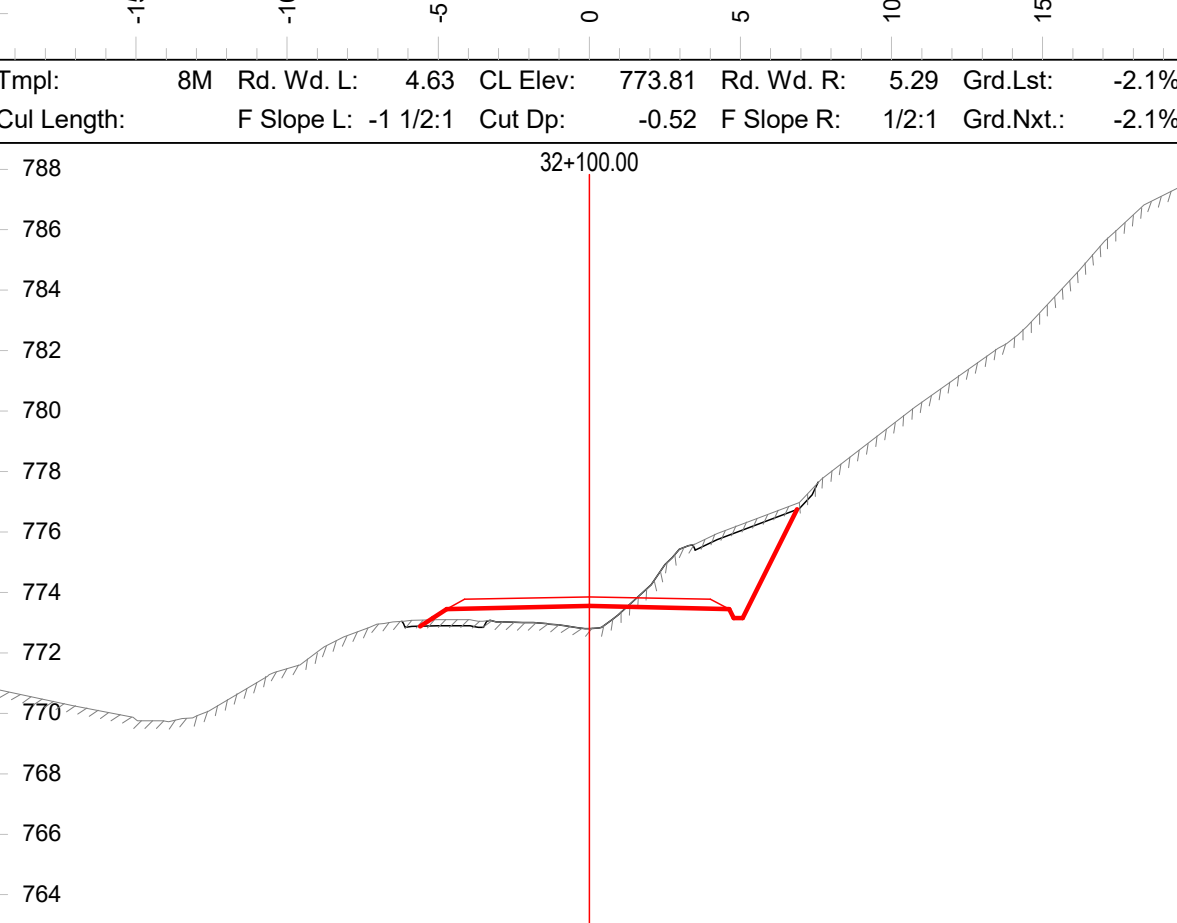
Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 773.61 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.67 F Slope R: 1/2:1 Grd.Nxt.: -0.9%

32+099.60



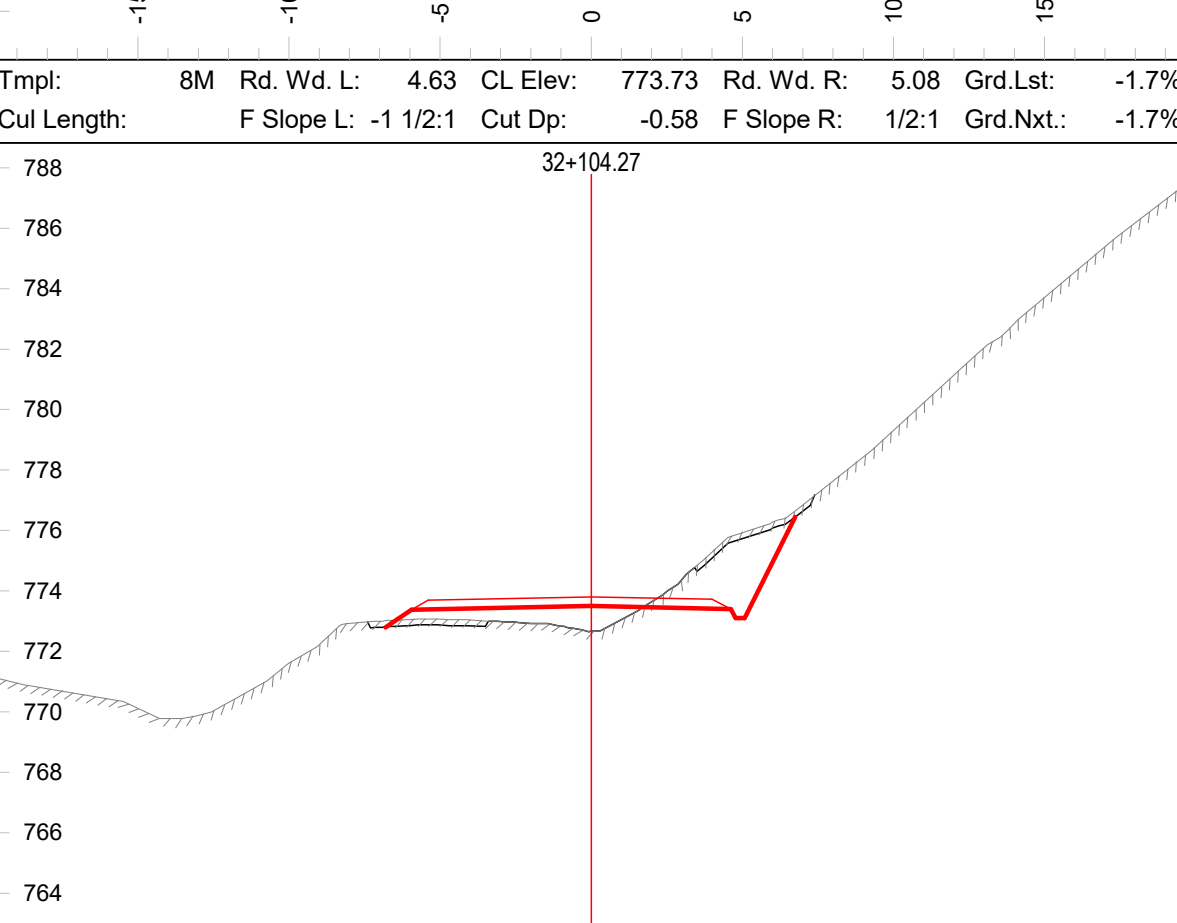
Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 773.55 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.74 F Slope R: 1/2:1 Grd.Nxt.: -0.9%

32+100.00



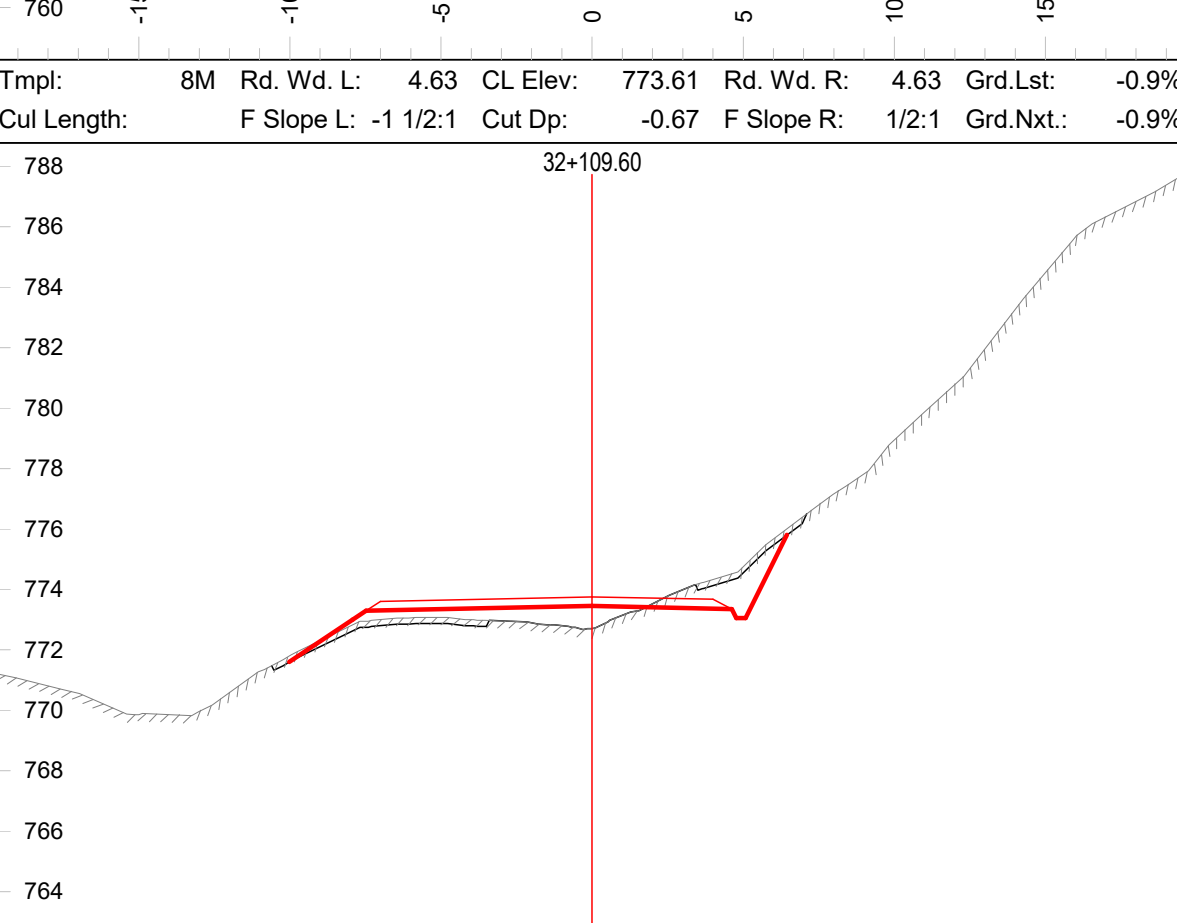
Tmpl: 8M Rd. Wd. L: 4.74 CL Elev: 773.55 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.74 F Slope R: 1/2:1 Grd.Nxt.: -0.9%

32+104.27



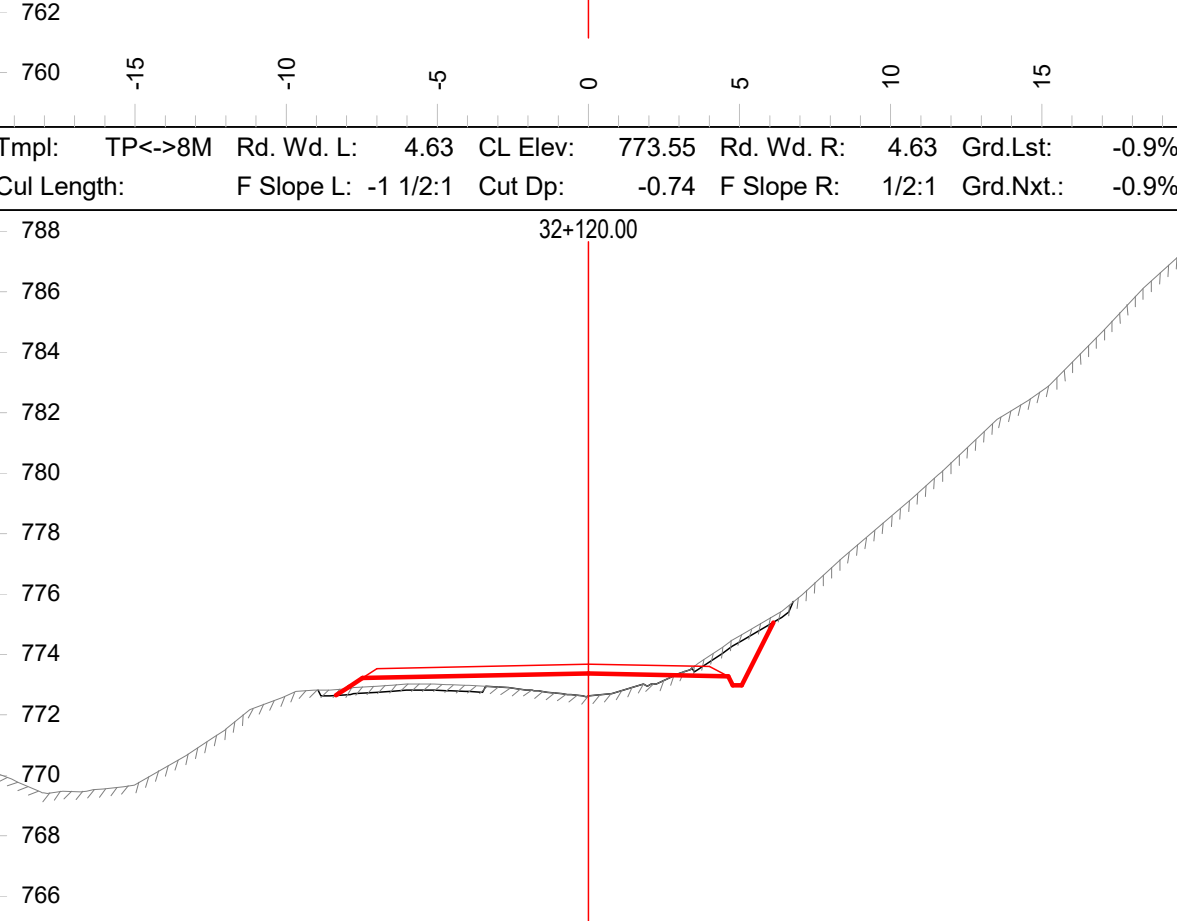
Tmpl: 8M Rd. Wd. L: 5.94 CL Elev: 773.51 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.84 F Slope R: 1/2:1 Grd.Nxt.: -0.9%

32+109.60



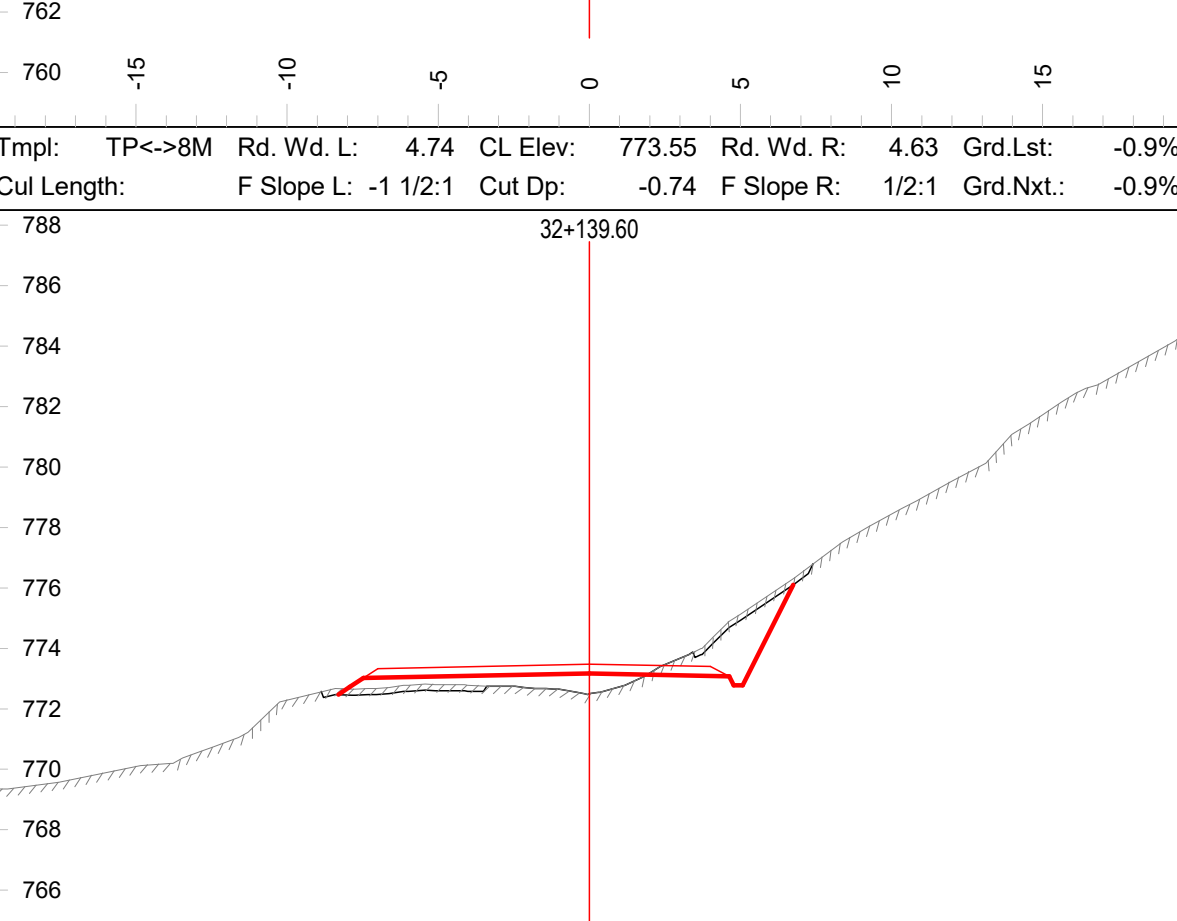
Tmpl: 8M Rd. Wd. L: 7.46 CL Elev: 773.46 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.75 F Slope R: 1/2:1 Grd.Nxt.: -0.9%

32+120.00



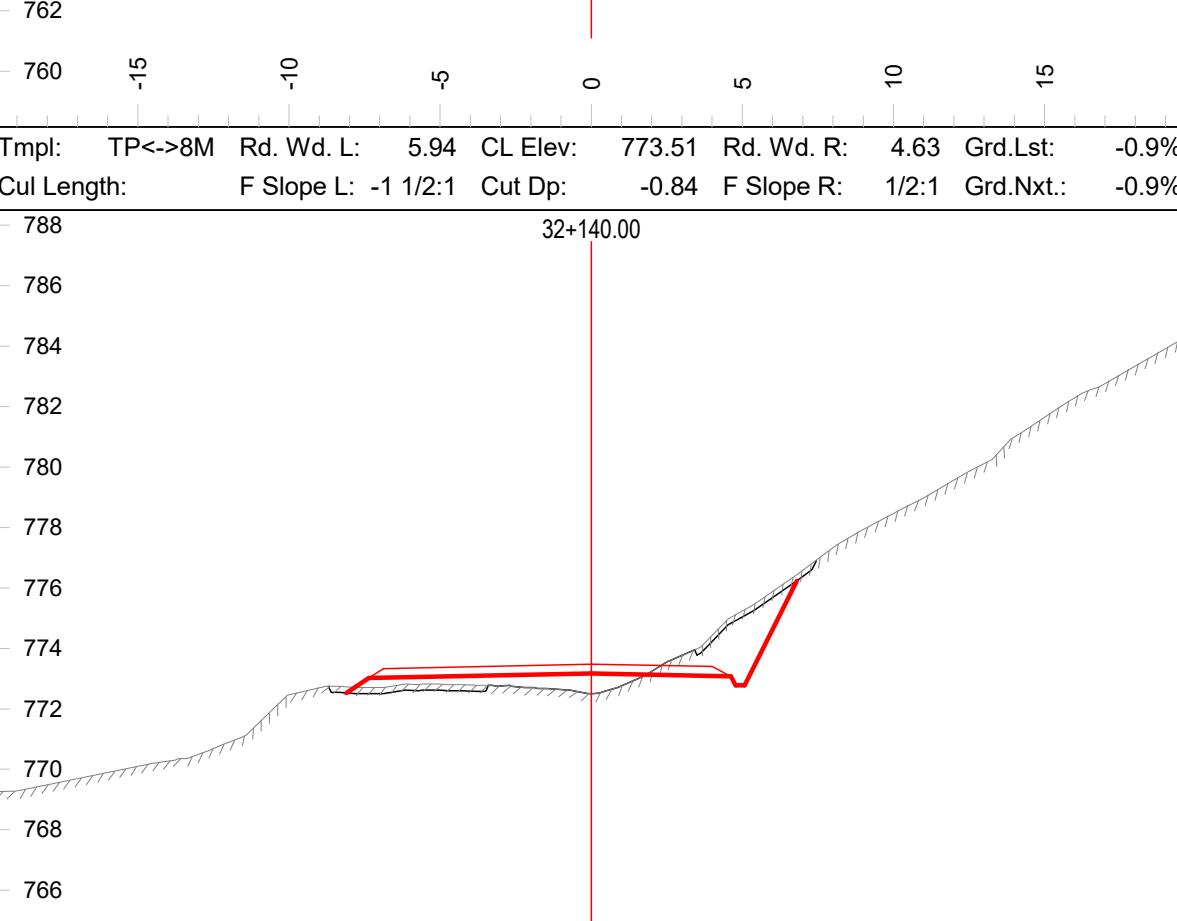
Tmpl: 8M Rd. Wd. L: 7.46 CL Elev: 773.37 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.76 F Slope R: 1/2:1 Grd.Nxt.: -0.9%

32+139.60



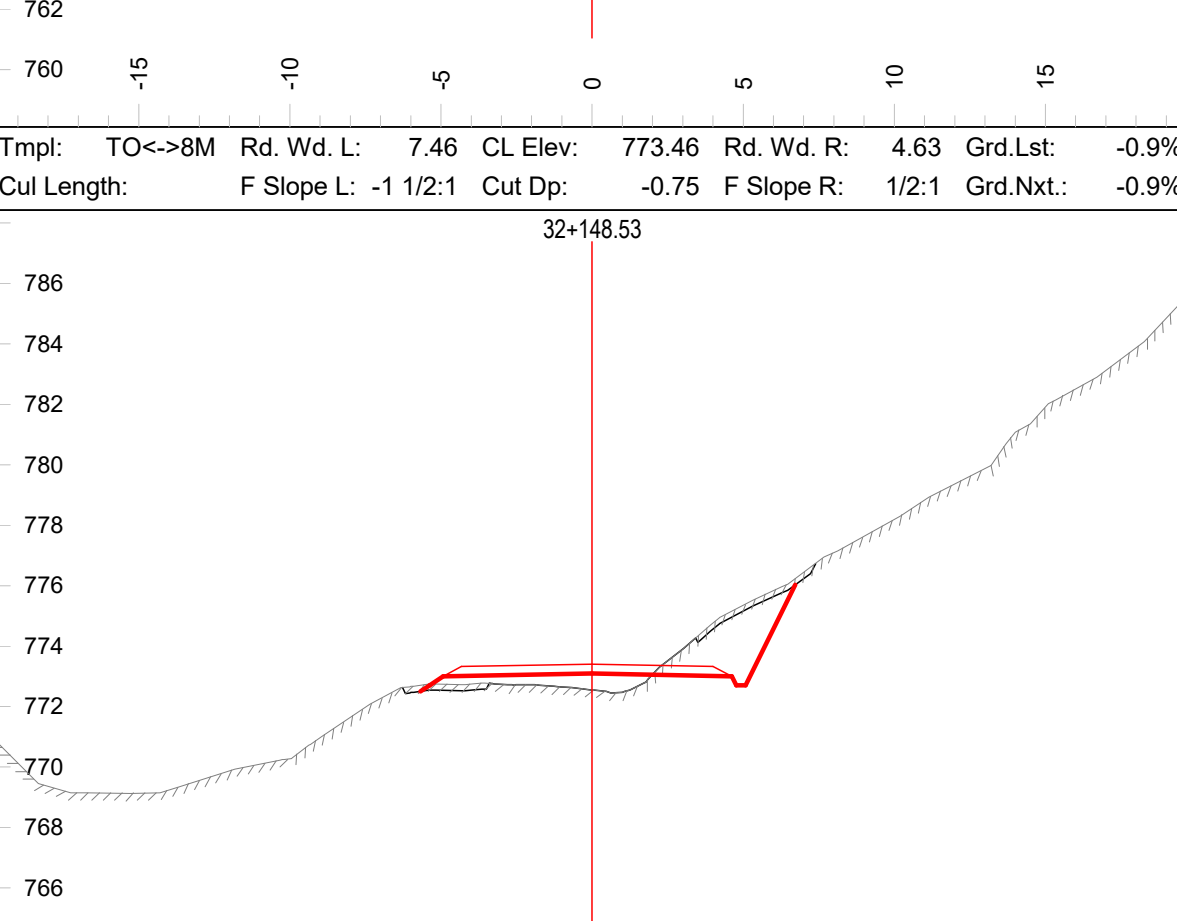
Tmpl: 8M Rd. Wd. L: 7.46 CL Elev: 773.19 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.68 F Slope R: 1/2:1 Grd.Nxt.: -0.9%

32+140.00



Tmpl: 8M Rd. Wd. L: 7.35 CL Elev: 773.18 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.67 F Slope R: 1/2:1 Grd.Nxt.: -0.9%

32+148.53



Tmpl: 8M Rd. Wd. L: 4.93 CL Elev: 773.10 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.54 F Slope R: 1/2:1 Grd.Nxt.: -0.9%



Ministry of Forests, Lands and
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Omenica Region

Prince George Resource District

Chuchinka-Colbourne FSR

Roadway Widening and Upgrade

Geometric Alignment

Km 31 to Km 33.6

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Stations: 32+149.06 to 32+248.21

ROAD DESIGN SPECIFICATIONS

Design Speed: 30 km/h
Avg. Stab. Road Width: 6.0m
Fav. Grade Max. 10%
Adv. Grade Max 10%

Section Scale 1:250

Project Location Coordinates

Latitude: 51-15-03
Longitude: -119-53-14
Elevation: 610m
Datum: NAD83
UTM Combined Scale Factor:
n/a

Notes:

- Ground model data obtained by Lidar Survey method by McElhanney Survey Consulting Ltd. Oct. 2013
-30km/h Speed Limit through the Canyon, remainder designed to minimum 60km/h.

Survey Control Stations

Point Name	Northing	Easting	Elevation	Description

Plan Legend (all may not be applicable)

L-line Location

Road Edges

Cleaning Limits

Culverts

GPS Base Station

Old Iron Bar found (tied)

Old Pipe Post found (tie)

Survey Control Points tie

Benchmark

Edge of Wetland

Existing Road Edges

Breakline

Powerline

Draw

Test Pit

Stream

Tension Crack

Timberline

Cut / Fill limits

Powerpole

Finished Road Surface

Profile Subgrade

Cut / Fill limits

Original Ground

1st Stratum

2nd Stratum (Rock)

Ditch Invert Right

Ditch Invert Left

EARTH WORK VOLUMES (Bank cubic meters)

L-Stn m.	Strip V. Cu. m.	SG Cut V. Cu. m.	SG Fill V. Cu. m.	B/W Vol. Cu. m.	Srf1 Fill V. Cu. m.
32+200.00 32+400.00	273.9	763.0	187.1	-470.0	550.8
Pg. Tot.	273.9	763.0	187.1		550.8
Cum. Tot.	2041.1	4830.9	2493.1		4115.5

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt
32+206.43	600	11.50	6.50	5.00	90.00000	xdrain

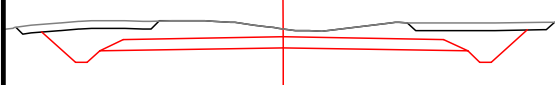
SOIL TYPES

OB - Overburden
OR - Organics
SL - Silt
FS - Fine Sand & Silt
SA - Sand
SG - Sand & Gravel
CG - Sand & Course Gravel
SC - Sand/Cobbles/Gravel
GR - Gravel
BO - Boulders
FR - Fractured Rock (Talus)
RR - Riprapable Rock
SR - Solid Rock

ROAD TEMPLATES

TP = Taper template
TO = Turnout Template
8M = 8.0m wide finished running surface
8WS = 8m wide finished running surface with retaining wall

Surfacing depth = 0.3m
Ditch Slopes = 1.5:1 Ditch Depth = 0.3 Width = 0.3
F Slope = Final Slope Left or Right



Prepared by:



Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

DRAFT
FOR REVIEW
PURPOSES ONLY

Dwg Num: 110-022-003

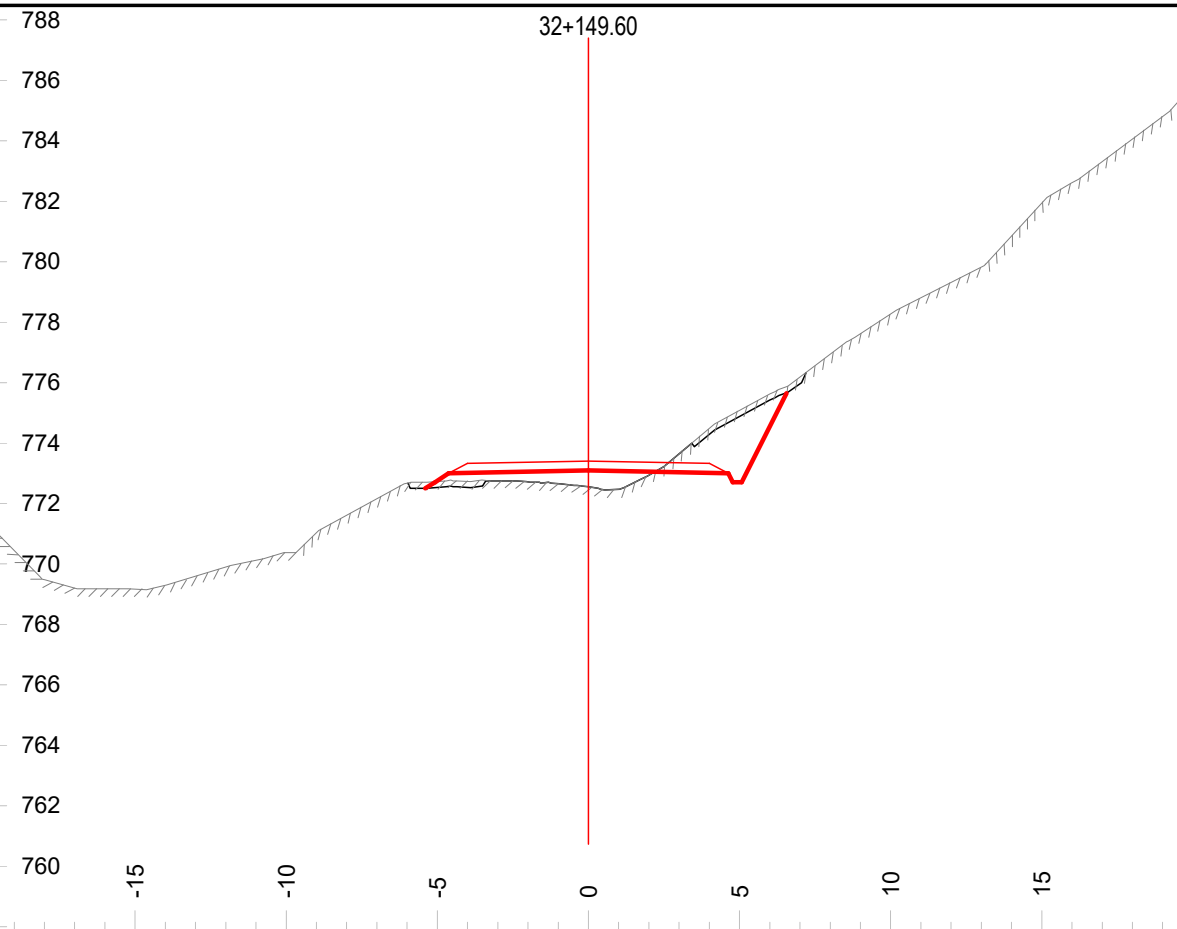
Survey By: see Notes above
Design By: Edward Folk, P.Eng.
Approved By:

Plot Date:16/06/29

Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-

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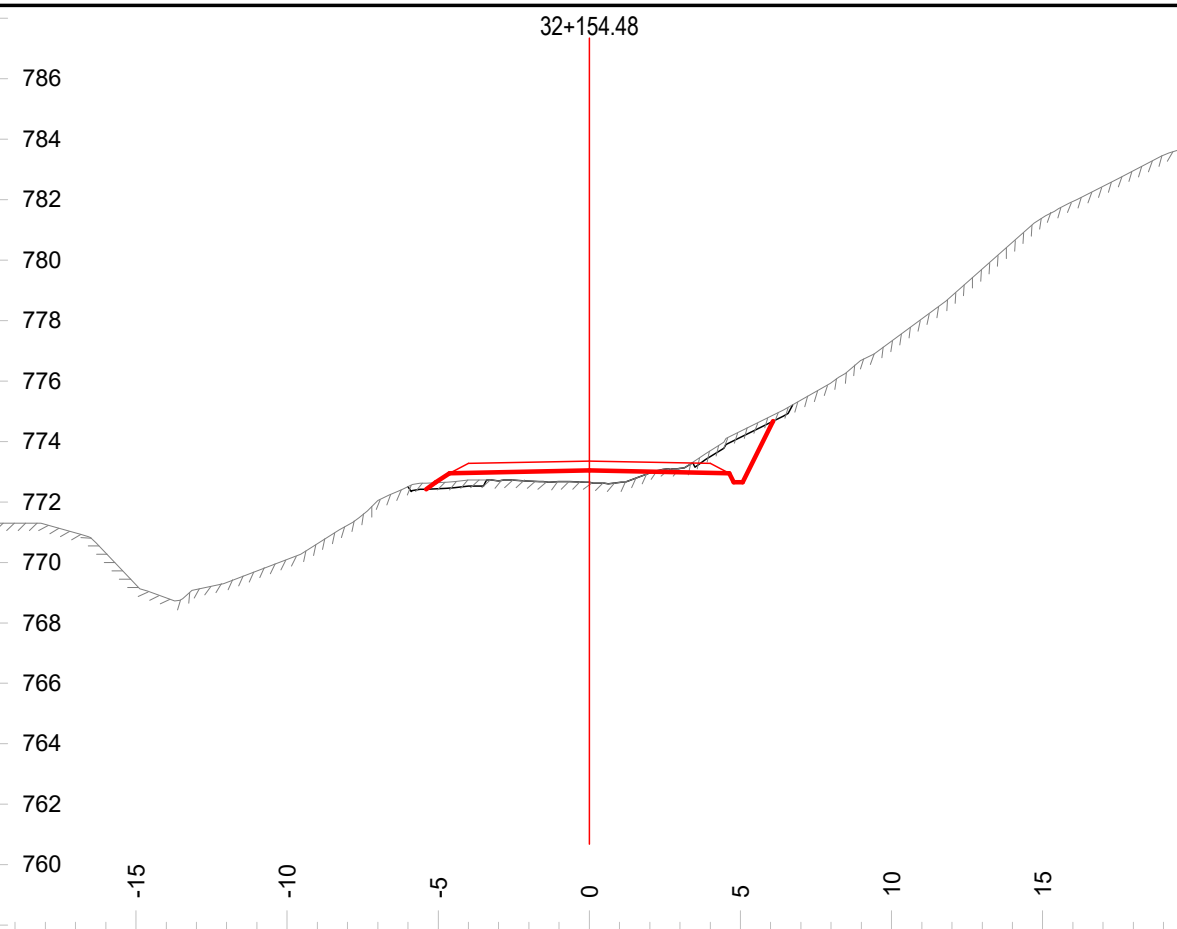
32+149.60



Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 773.09 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.56 F Slope R: 1/2:1 Grd.Nxt.: -0.9%

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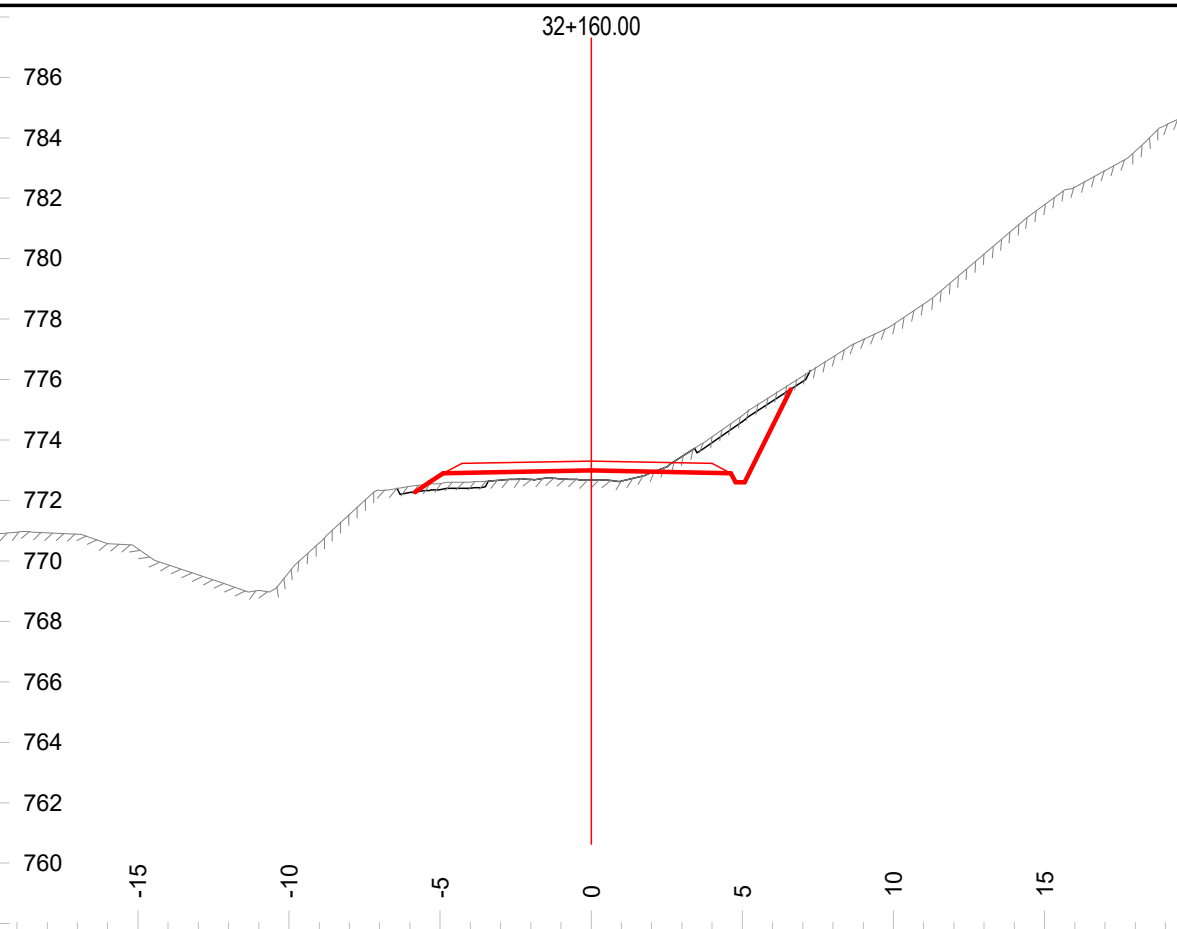
32+154.48



Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 773.05 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.41 F Slope R: 1/2:1 Grd.Nxt.: -0.9%

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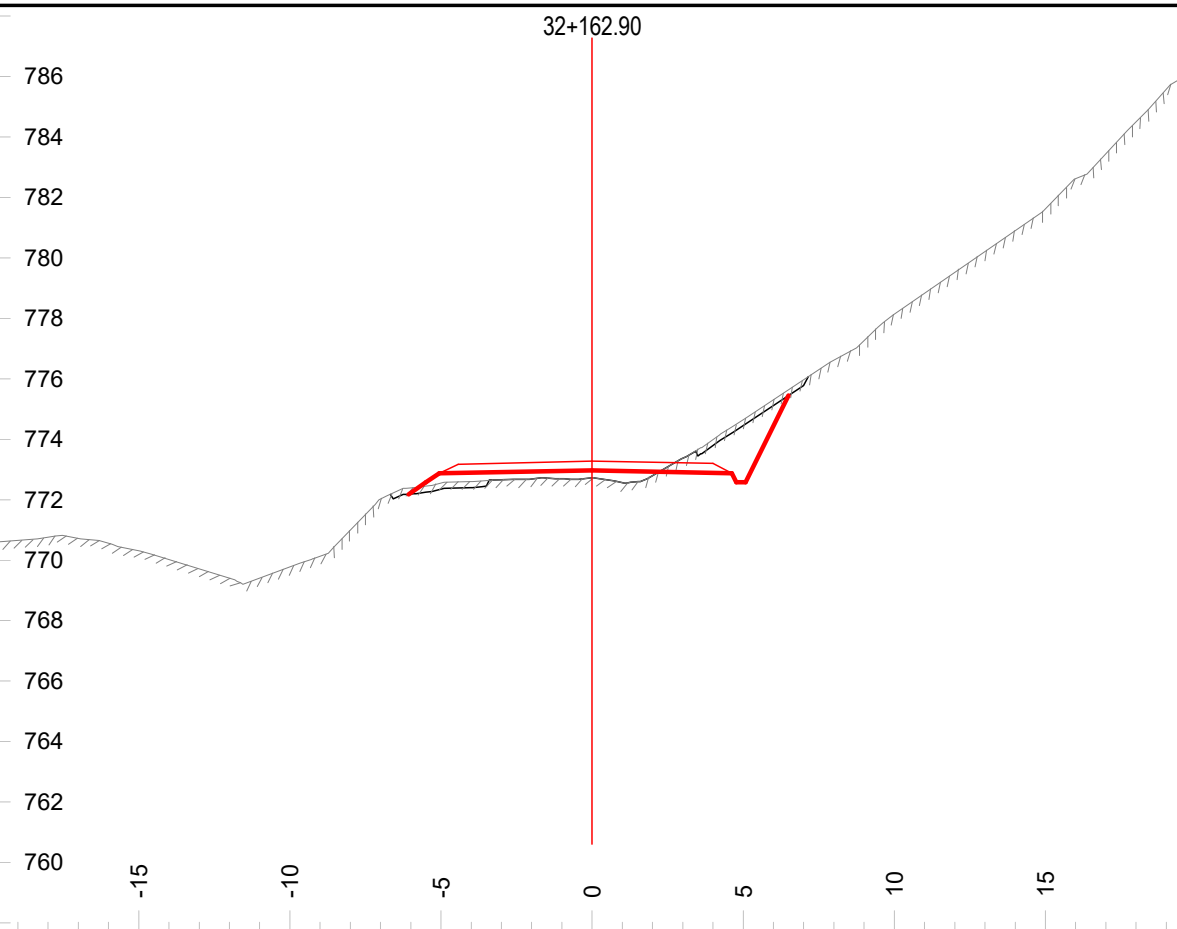
32+160.00



Tmpl: 8M Rd. Wd. L: 4.90 CL Elev: 773.00 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.34 F Slope R: 1/2:1 Grd.Nxt.: -0.9%

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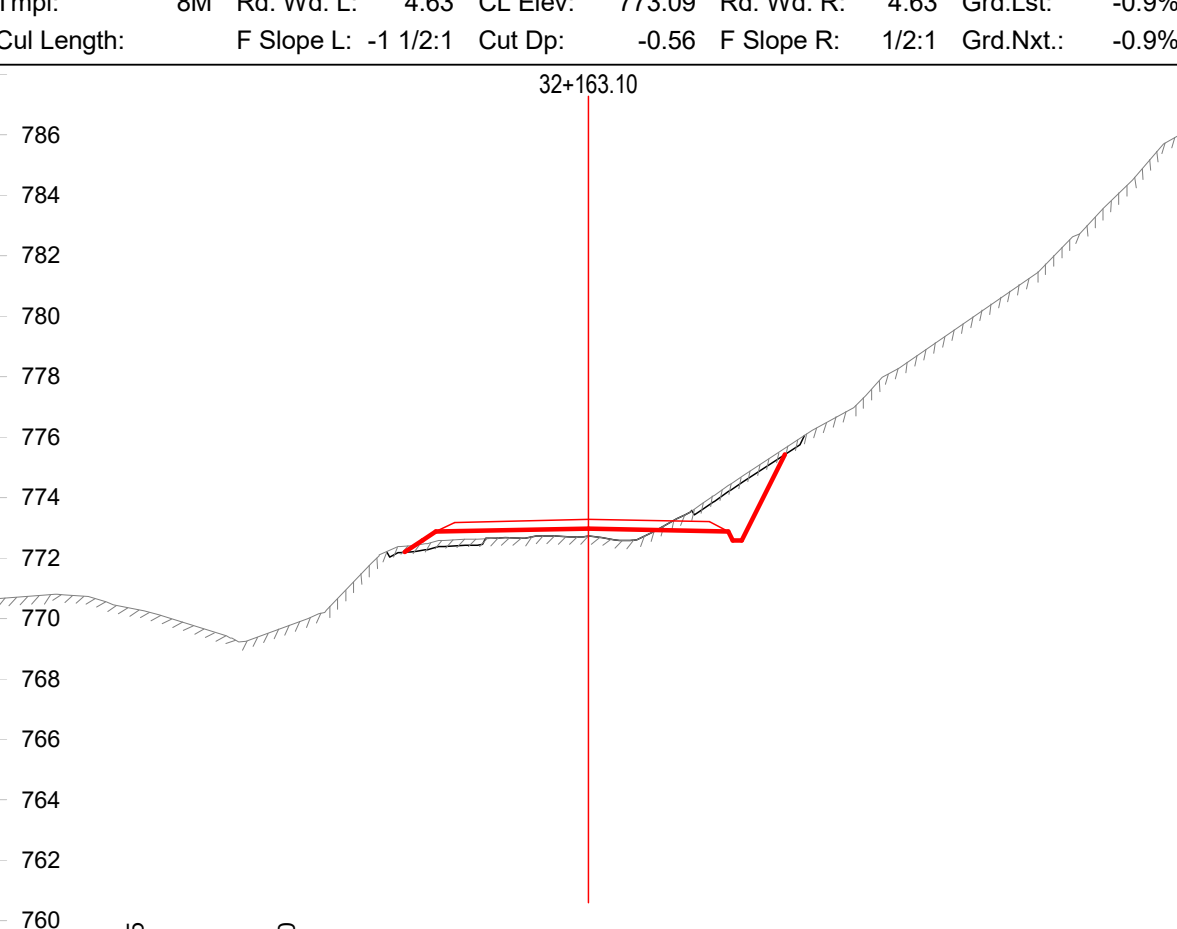
32+162.90



Tmpl: 8M Rd. Wd. L: 5.05 CL Elev: 772.97 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.26 F Slope R: 1/2:1 Grd.Nxt.: -0.9%

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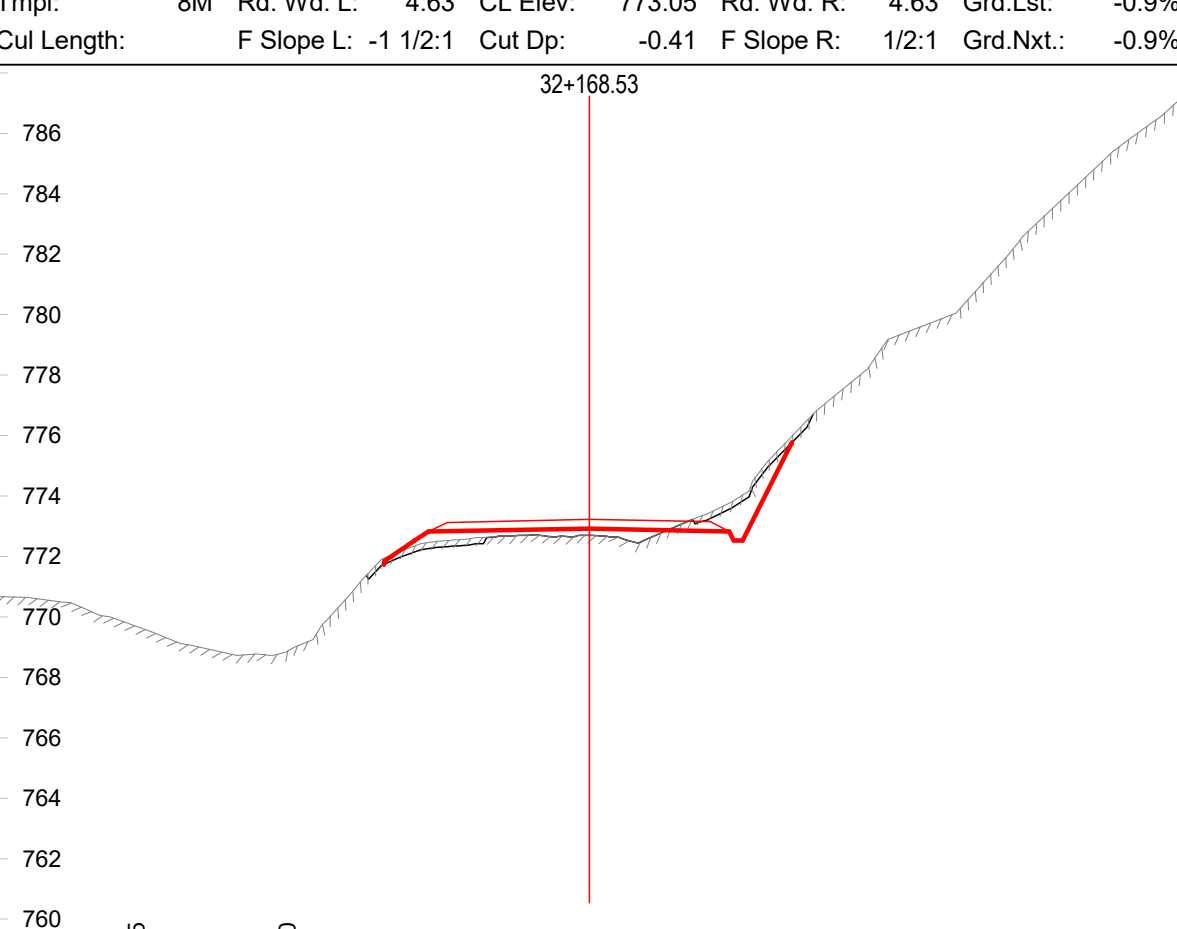
32+163.10



Tmpl: 8WL2 Rd. Wd. L: 5.06 CL Elev: 772.97 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.26 F Slope R: 1/2:1 Grd.Nxt.: -0.9%

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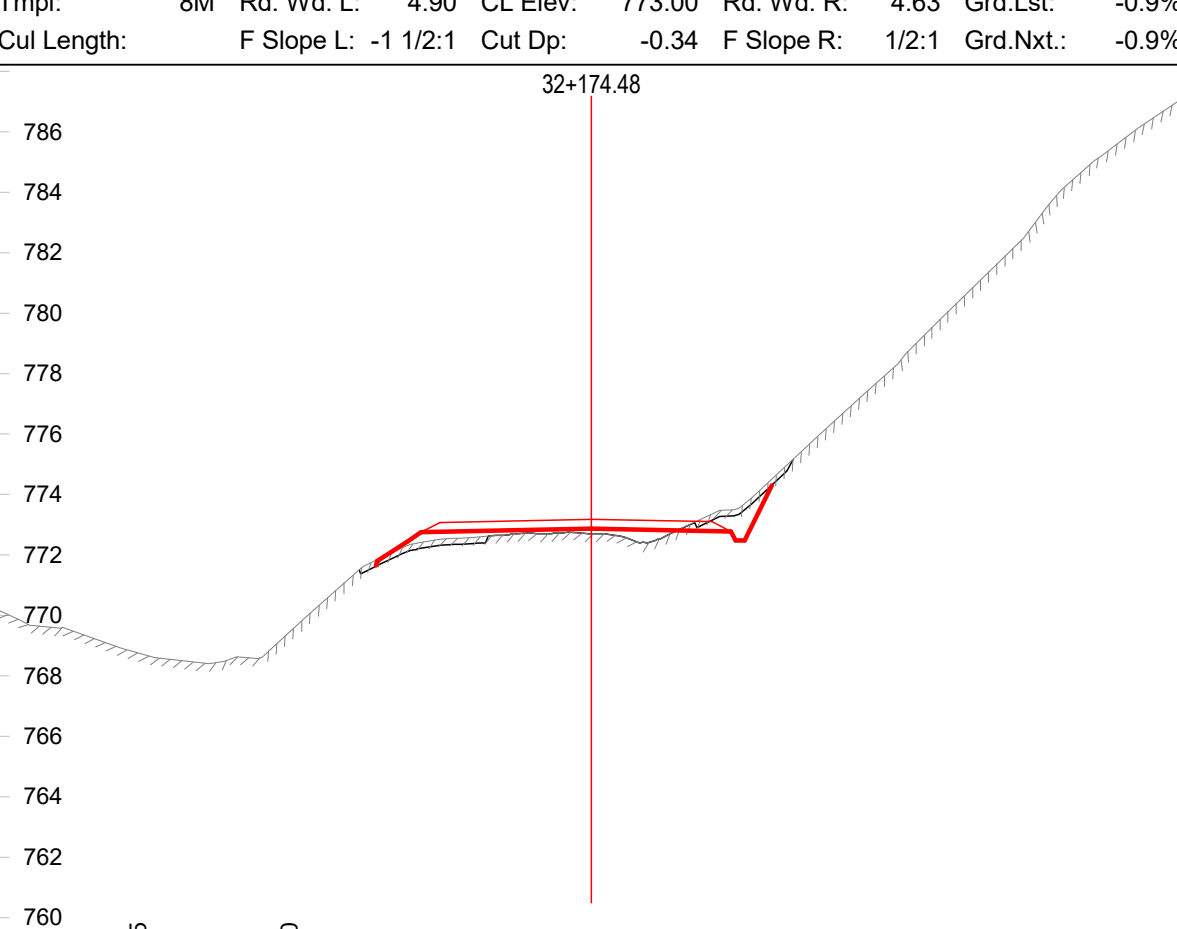
32+168.53



Tmpl: 8WL2 Rd. Wd. L: 5.33 CL Elev: 772.92 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/4:1 Cut Dp: -0.23 F Slope R: 1/2:1 Grd.Nxt.: -0.9%

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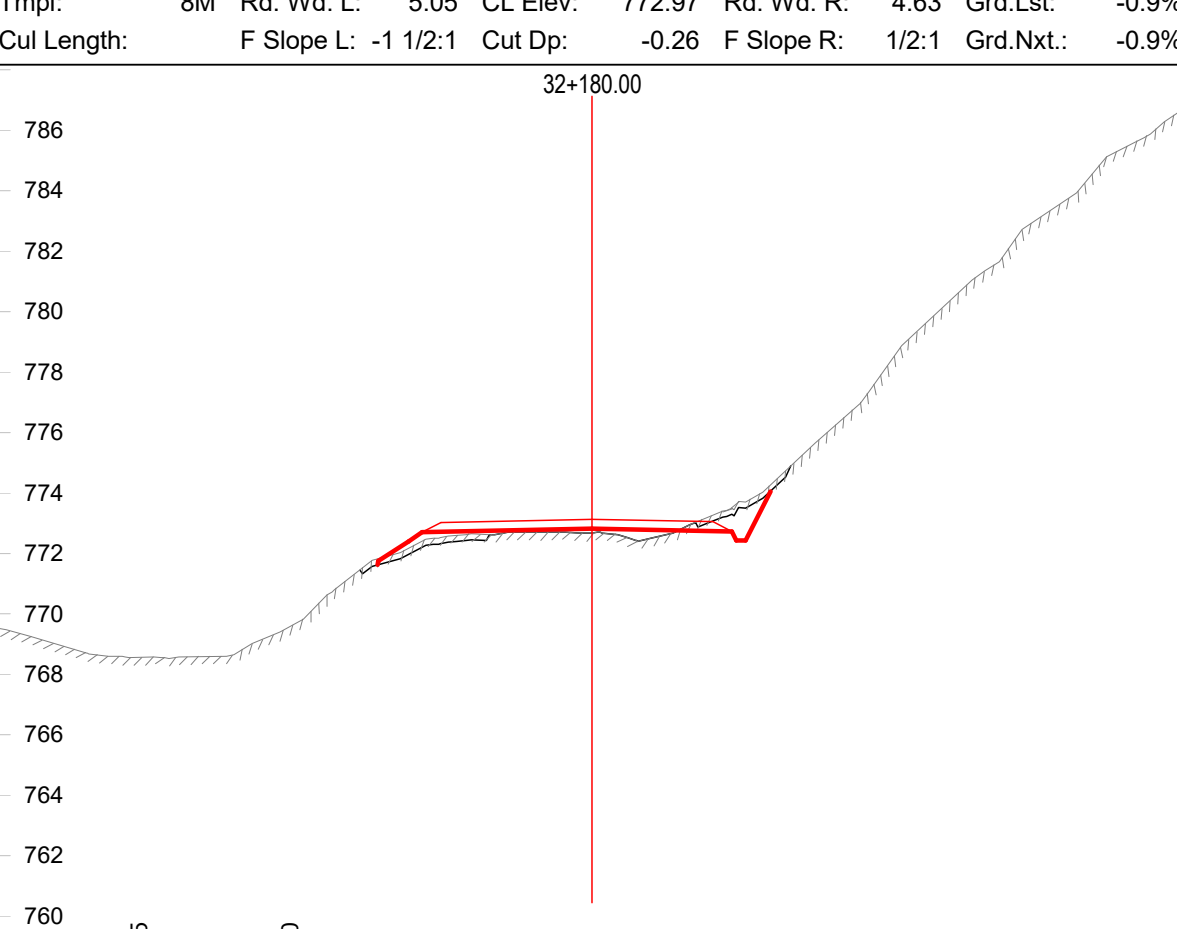
32+174.48



Tmpl: 8WL2 Rd. Wd. L: 5.63 CL Elev: 772.87 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/4:1 Cut Dp: -0.17 F Slope R: 1/2:1 Grd.Nxt.: -0.9%

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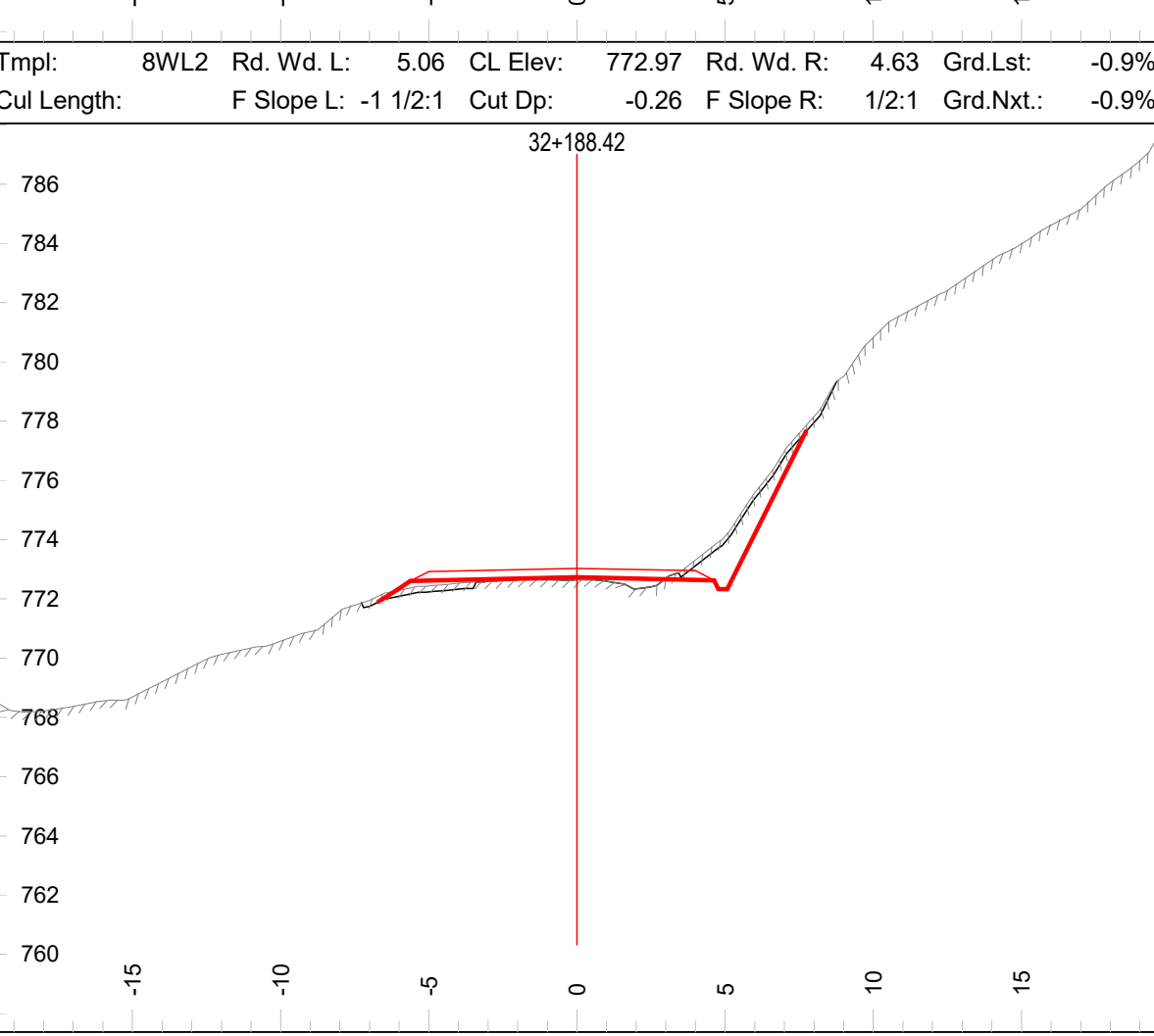
32+180.00



Tmpl: 8WL2 Rd. Wd. L: 5.63 CL Elev: 772.81 Rd. Wd. R: 4.63 Grd.Lst: -0.9%
Cul Length: F Slope L: -1 1/4:1 Cut Dp: -0.15 F Slope R: 1/2:1 Grd.Nxt.: -0.9%

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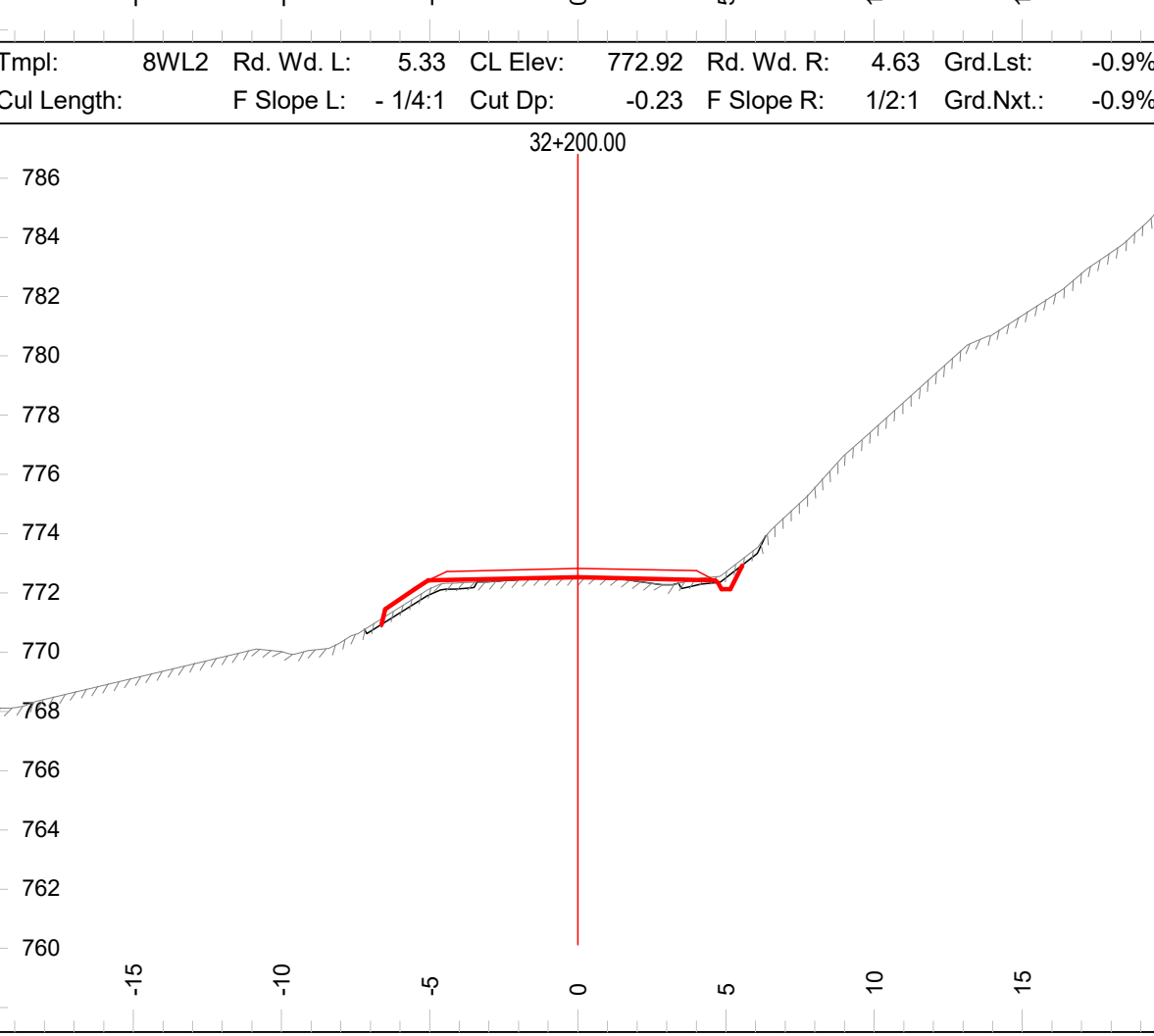
32+188.42



Tmpl: 8WL2 Rd. Wd. L: 5.06 CL Elev: 772.73 Rd. Wd. R: 4.63 Grd.Lst: -1.3%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.08 F Slope R: 1/2:1 Grd.Nxt.: -1.3%

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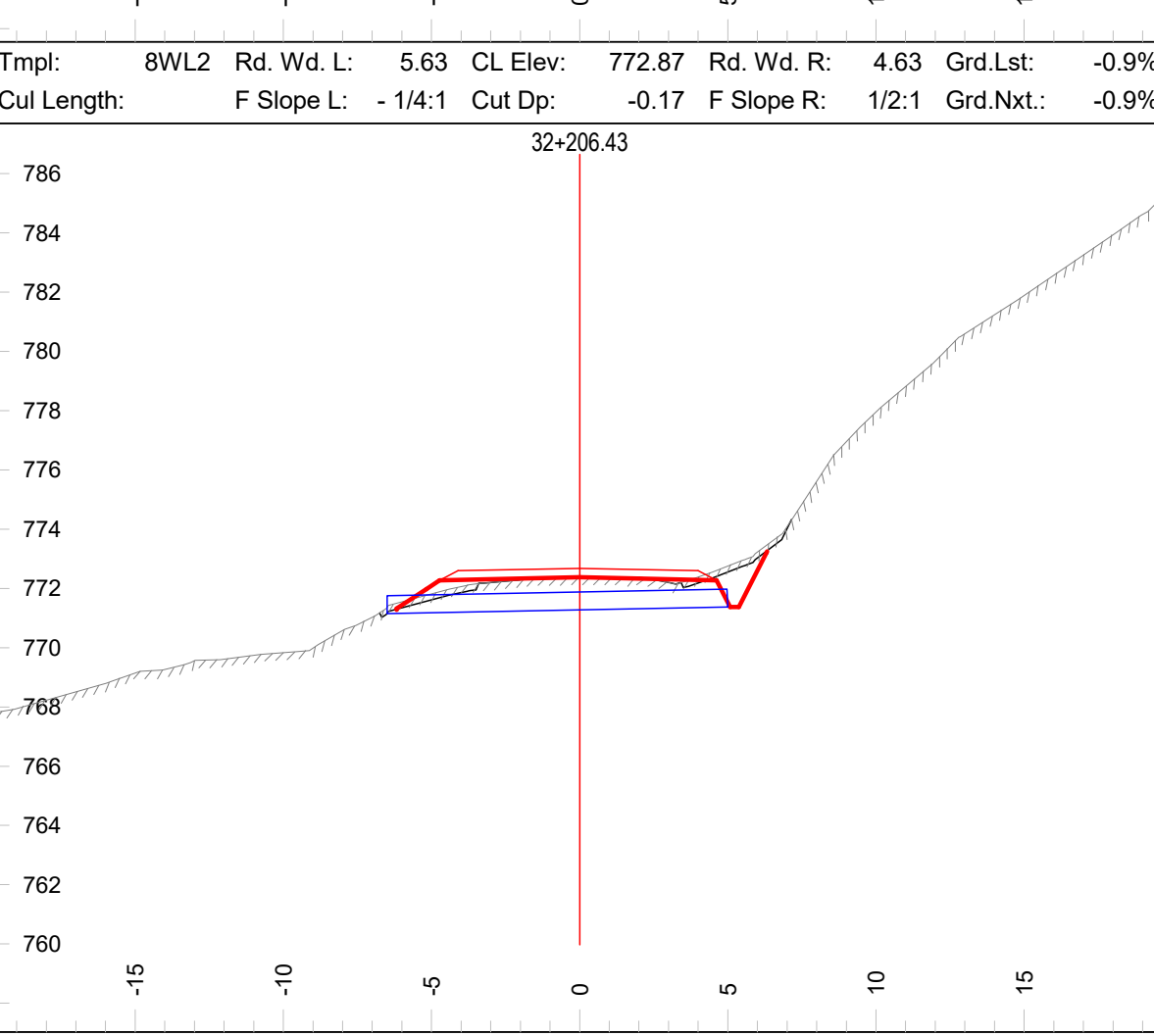
32+200.00



Tmpl: 8WL2 Rd. Wd. L: 5.05 CL Elev: 772.52 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: -1 1/4:1 Cut Dp: 0.00 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

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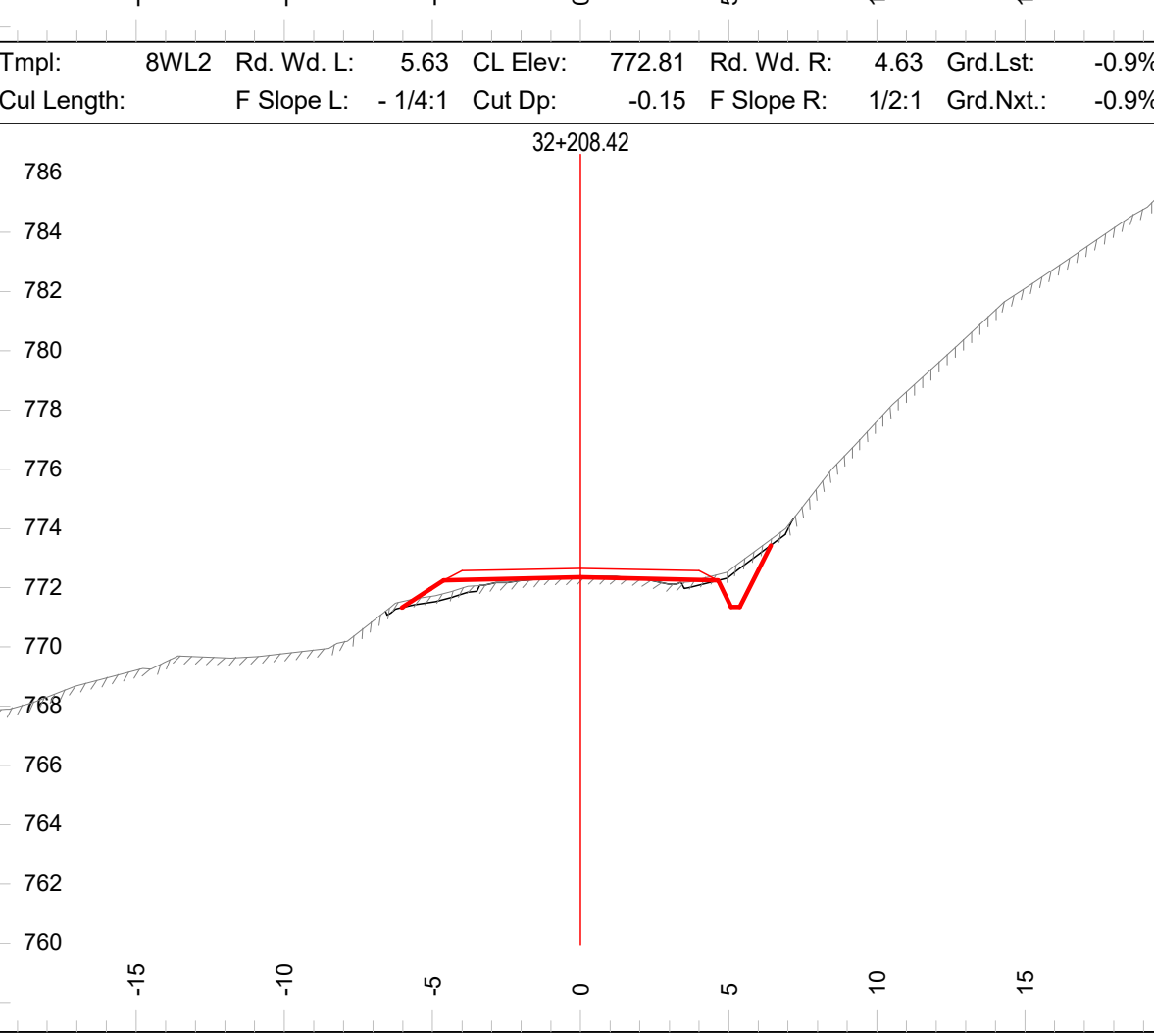
32+206.43



Tmpl: 8WL2 Rd. Wd. L: 4.72 CL Elev: 772.39 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: 11.50 F Slope L: -1 1/4:1 Cut Dp: 0.00 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

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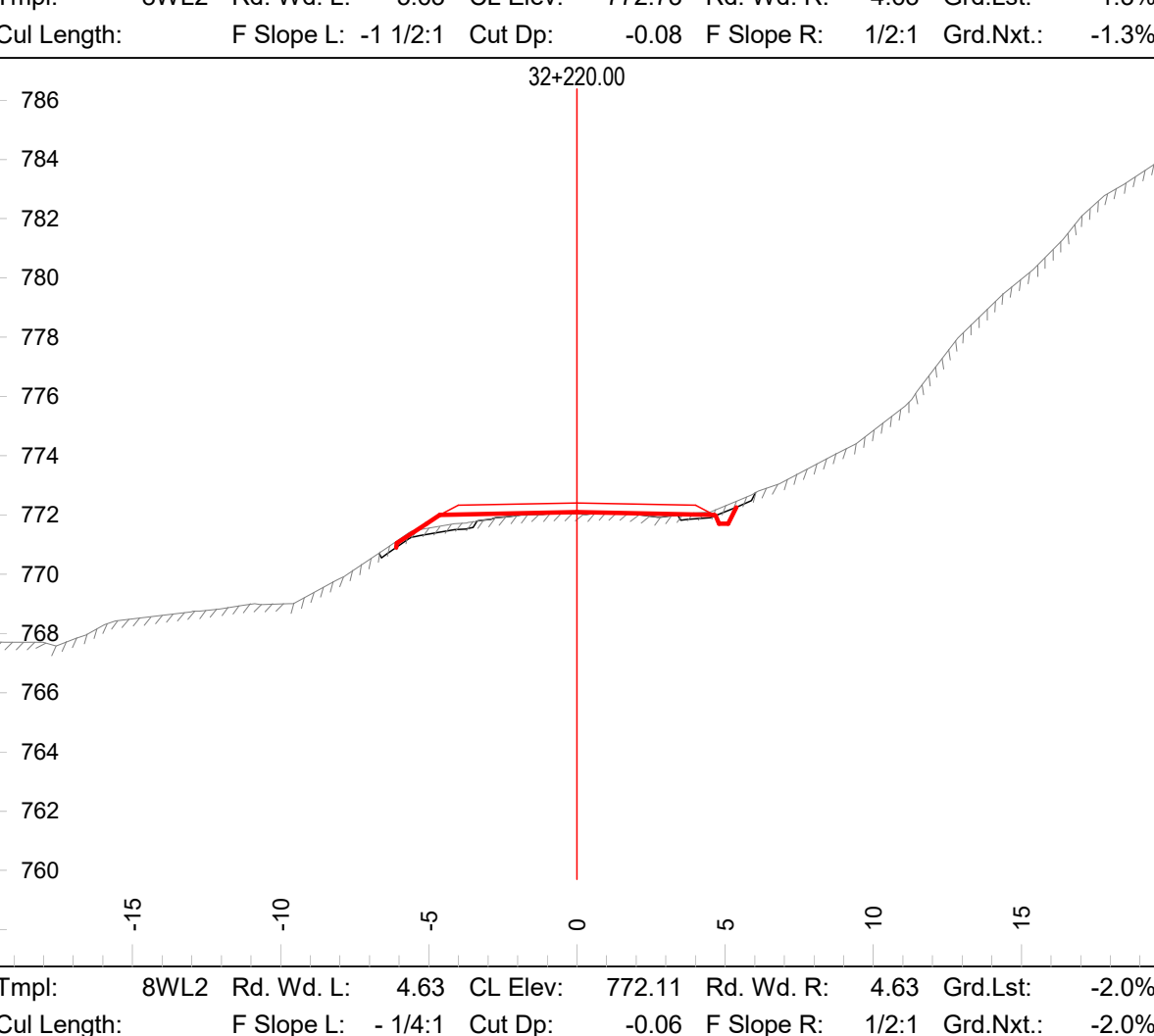
32+208.42



Tmpl: 8WL2 Rd. Wd. L: 4.63 CL Elev: 772.35 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.02 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

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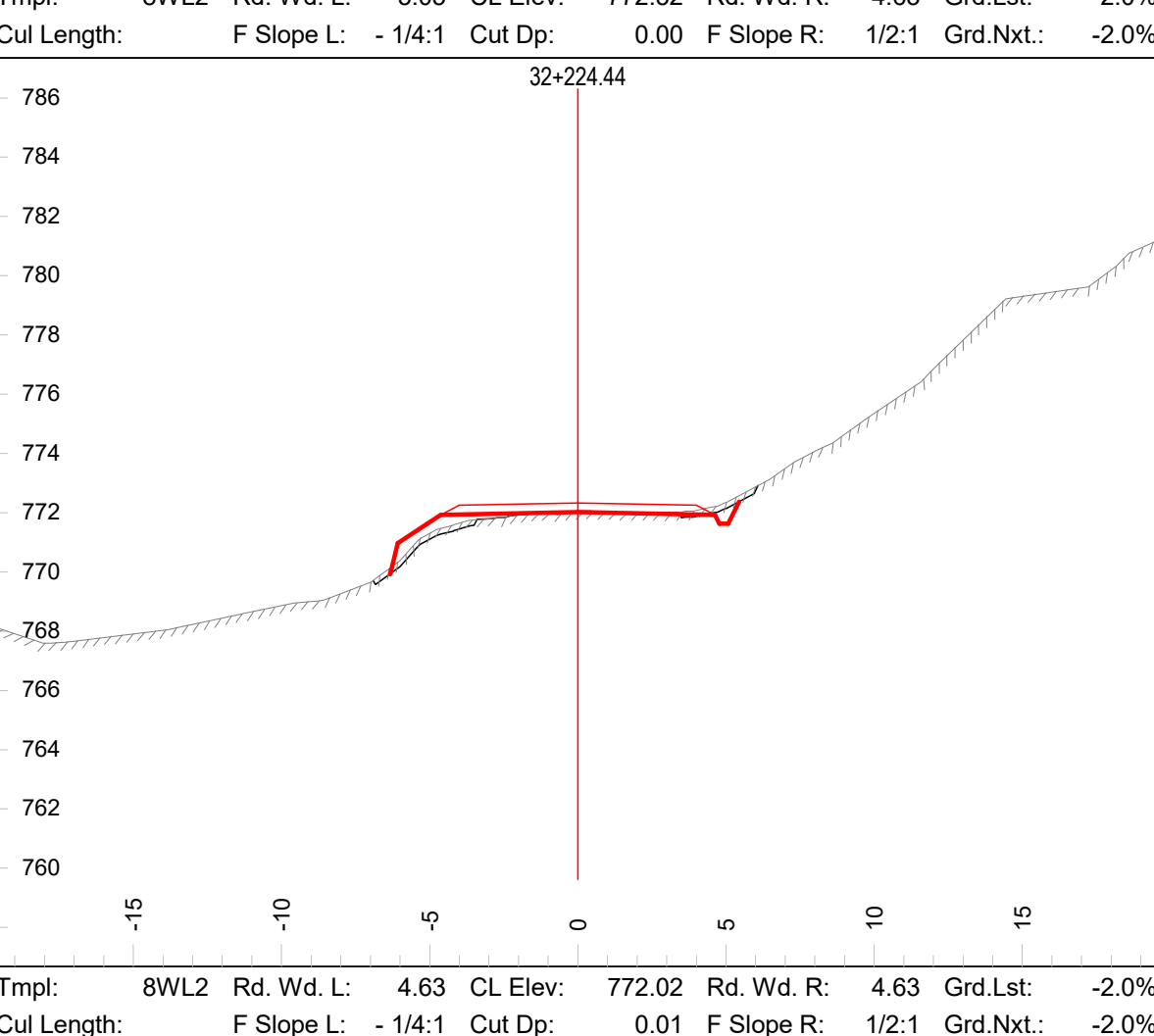
32+220.00



Tmpl: 8WL2 Rd. Wd. L: 4.63 CL Elev: 772.11 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: -1 1/4:1 Cut Dp: -0.06 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

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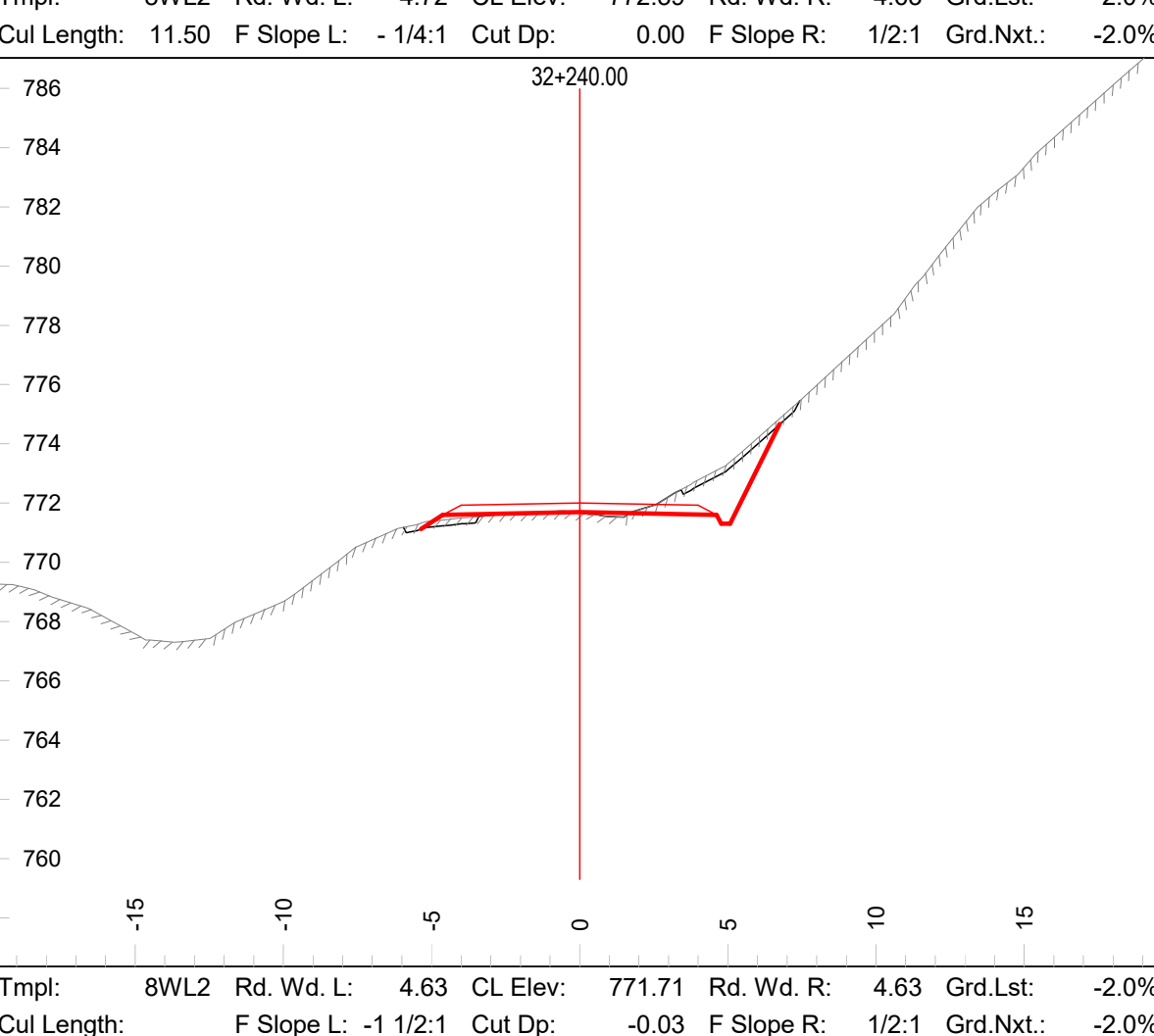
32+224.44



Tmpl: 8WL2 Rd. Wd. L: 4.63 CL Elev: 772.02 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: -1 1/4:1 Cut Dp: 0.01 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

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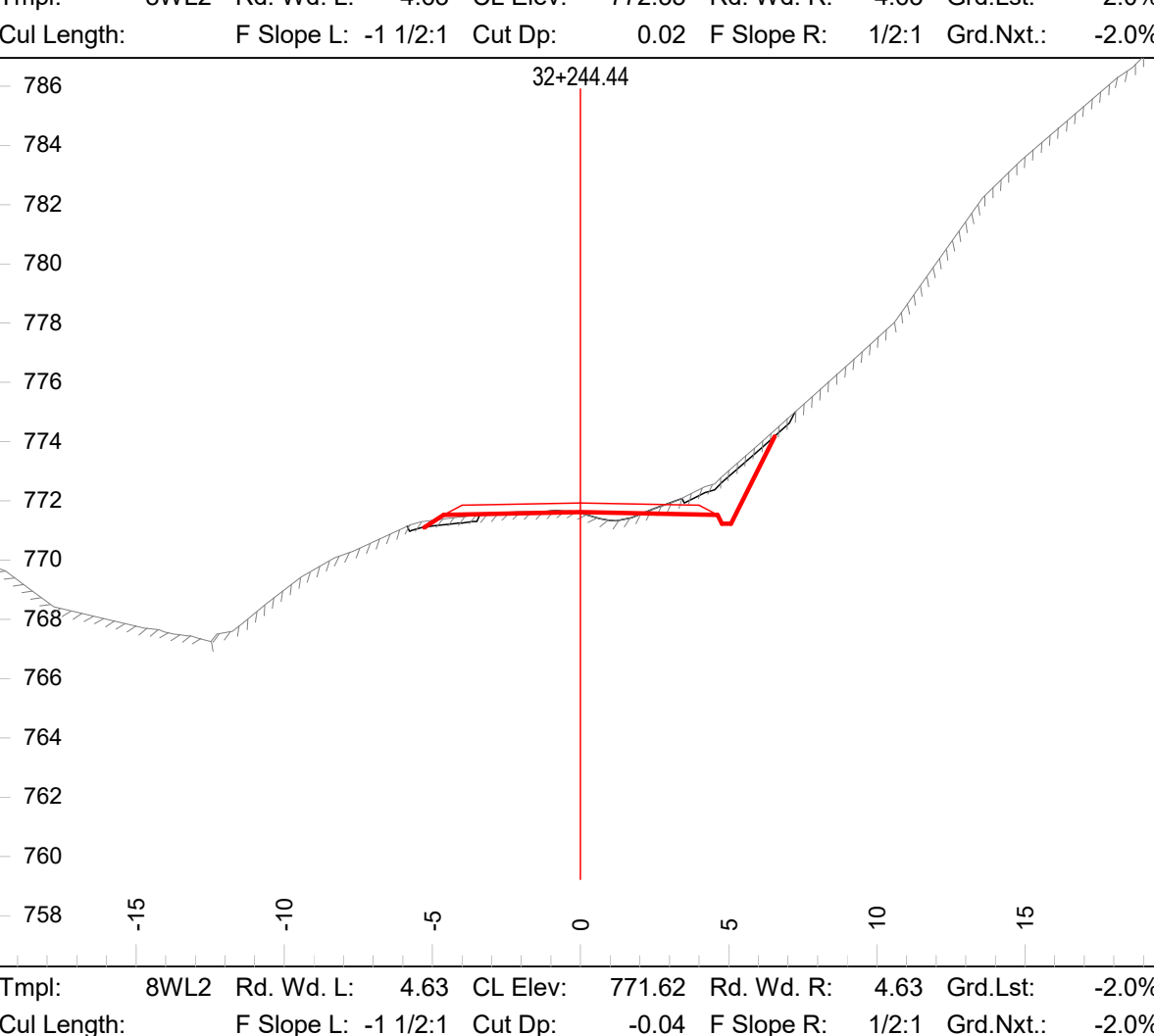
32+240.00



Tmpl: 8WL2 Rd. Wd. L: 4.63 CL Elev: 771.71 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.03 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

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32+244.44



Tmpl: 8WL2 Rd. Wd. L: 4.63 CL Elev: 771.62 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.04 F Slope R: 1/2:1 Grd.Nxt.: -2.0%



Ministry of Forests, Lands and
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Roadway Widening and Upgrade

Geometric Alignment

Km 31 to Km 33.6

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Stations: 32+248.21 to 32+353.24

ROAD DESIGN SPECIFICATIONS

Design Speed: 30 km/h
Avg. Stab. Road Width: 6.0m
Fav. Grade Max. 10%
Adv. Grade Max 10%

Section Scale 1:250

Project Location Coordinates

Latitude: 51-15-03
Longitude: -119-53-14
Elevation: 610m
Datum: NAD83
UTM Combined Scale Factor:
n/a

Notes:

- Ground model data obtained by Lidar Survey method by McElhanney Survey Consulting Ltd. Oct. 2013
-30km/h Speed Limit through the Canyon, remainder designed to minimum 60km/h.

Survey Control Stations

Point Name	Northing	Easting	Elevation	Description

Plan Legend (all may not be applicable)

 L-line Location

 Road Edges

 Clearing Limits

 Culverts

 GPS Base Station

 Old Iron Bar found (tied)

 Old Pipe Post found (tie)

 Survey Control Points tie

 Benchmark

 Edge of Wetland

 Existing Road Edges

 Breakline

 Powerline

 Draw

 Test Pit

 Stream

 Tension Crack

 Timberline

 Cut / Fill limits

 Powerpole

 Finished Road Surface

 Profile Subgrade

 Cut / Fill limits

 Original Ground

 1st Stratum

 2nd Stratum (Rock)

 Ditch Invert Right

 Ditch Invert Left

EARTH WORK VOLUMES (Bank cubic meters)

L-Stn m.	Strip V. Cu. m.	SG Cut V. Cu. m.	SG Fill V. Cu. m.	B/W Vol. Cu. m.	Srf1 Fill V. Cu. m.
32+400.00					
Pg. Tot.	0.0	0.0	0.0		0.0
Cum. Tot.	2041.1	4830.9	2493.1		4115.5

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt

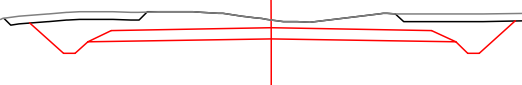
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Surfacing depth = 0.3m
Ditch Slopes = 1.5:1 Ditch Depth = 0.3 Width = 0.3
F Slope = Final Slope Left or Right



Prepared by:
 Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

DRAFT
FOR REVIEW
PURPOSES ONLY

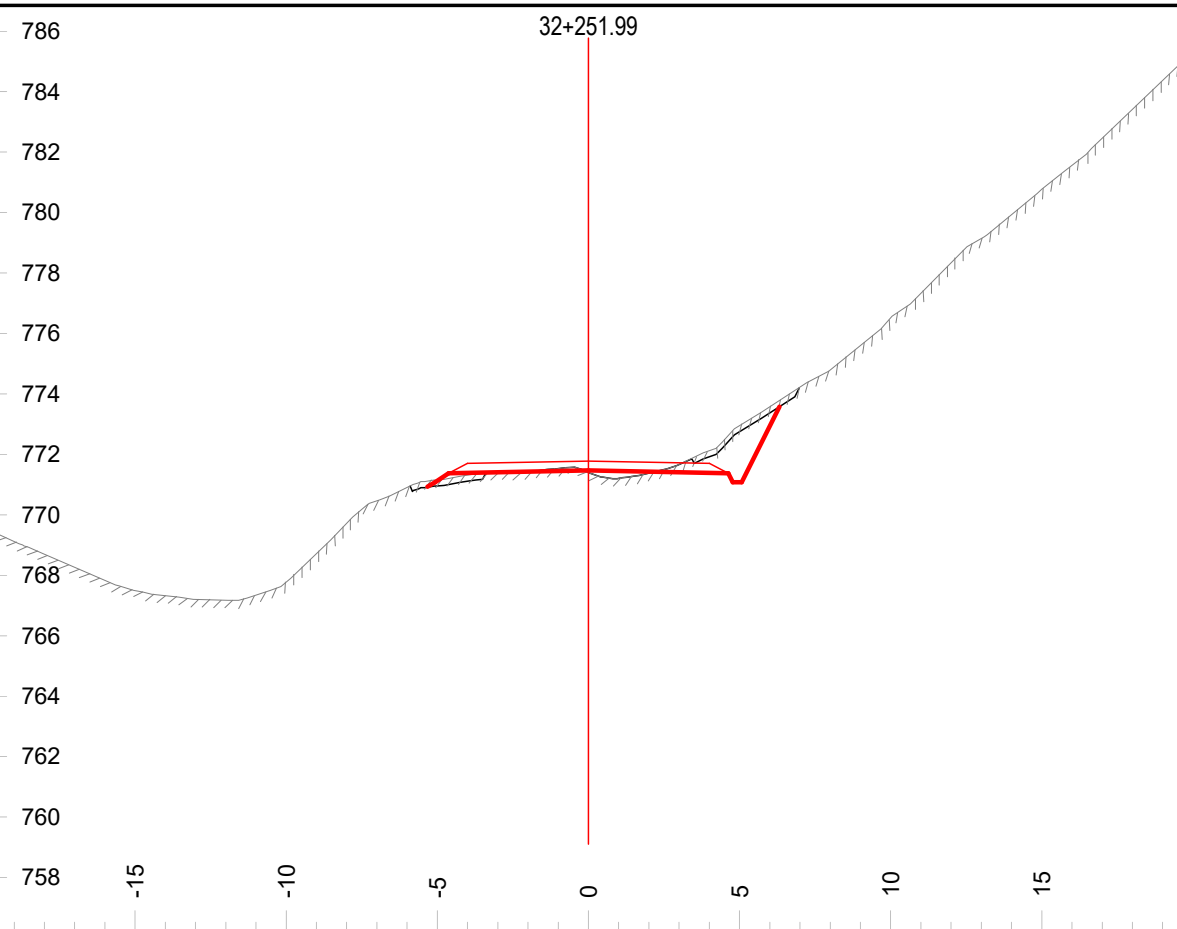
Dwg Num: 110-022-003

Survey By: see Notes above
Design By: Edward Folk, P.Eng.
Approved By:

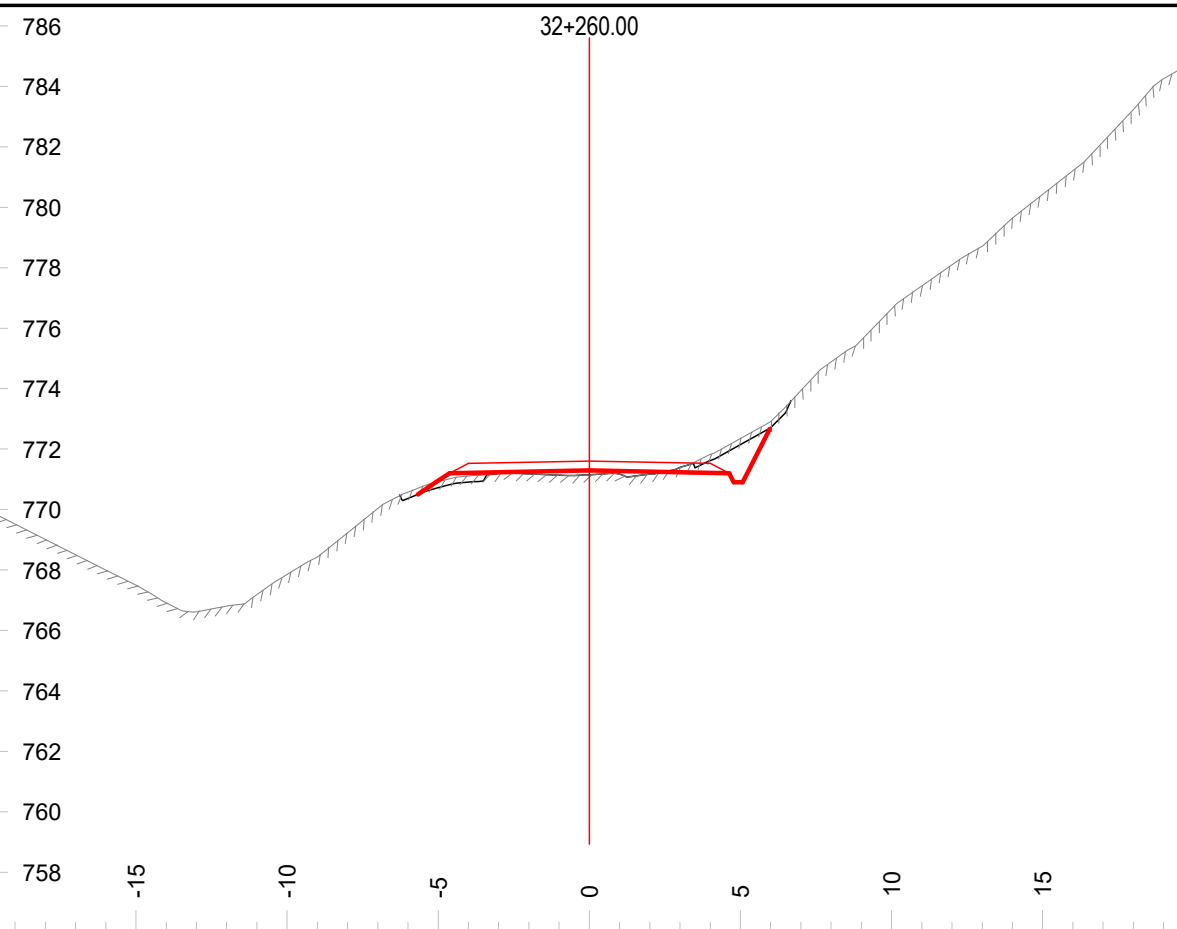
Plot Date:16/06/29

Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-

32+251.99



32+260.00



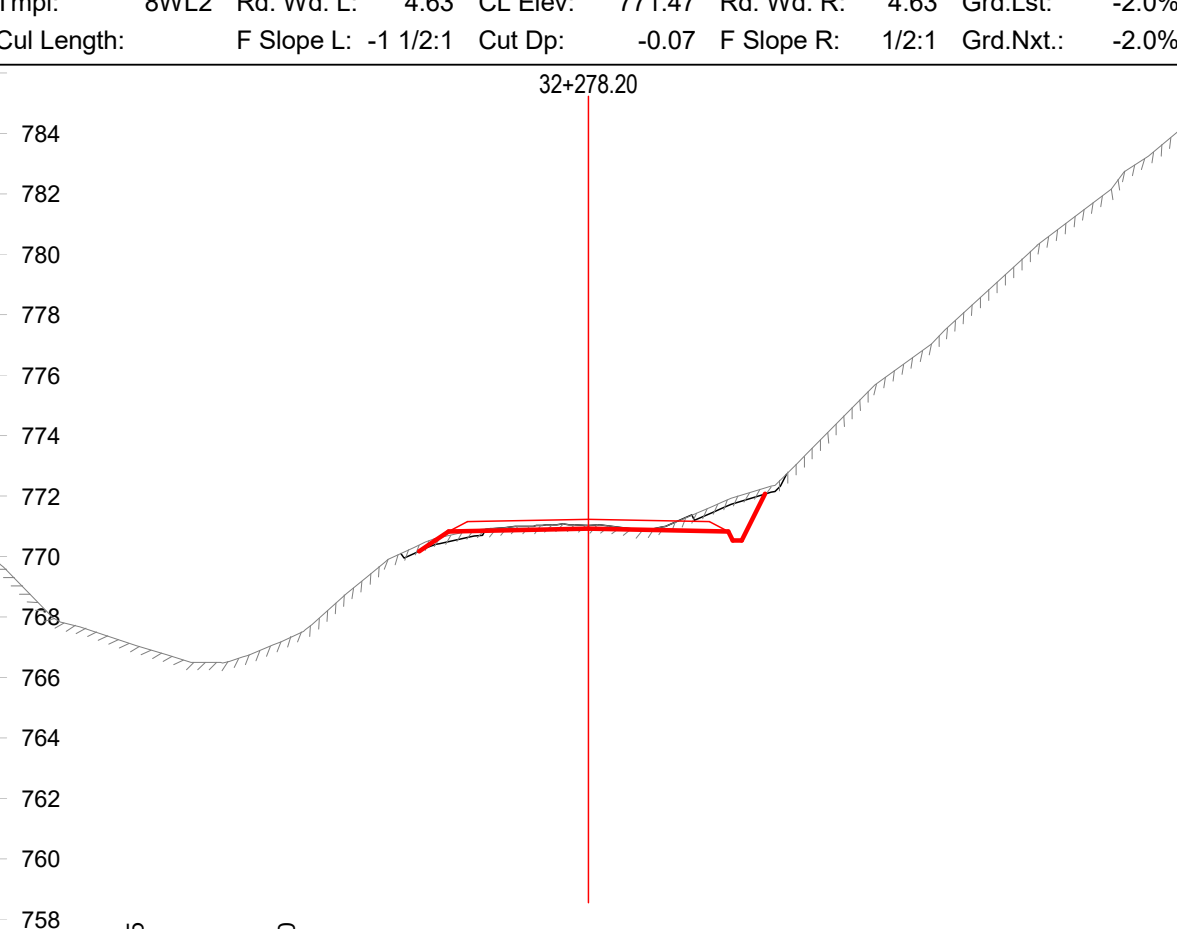
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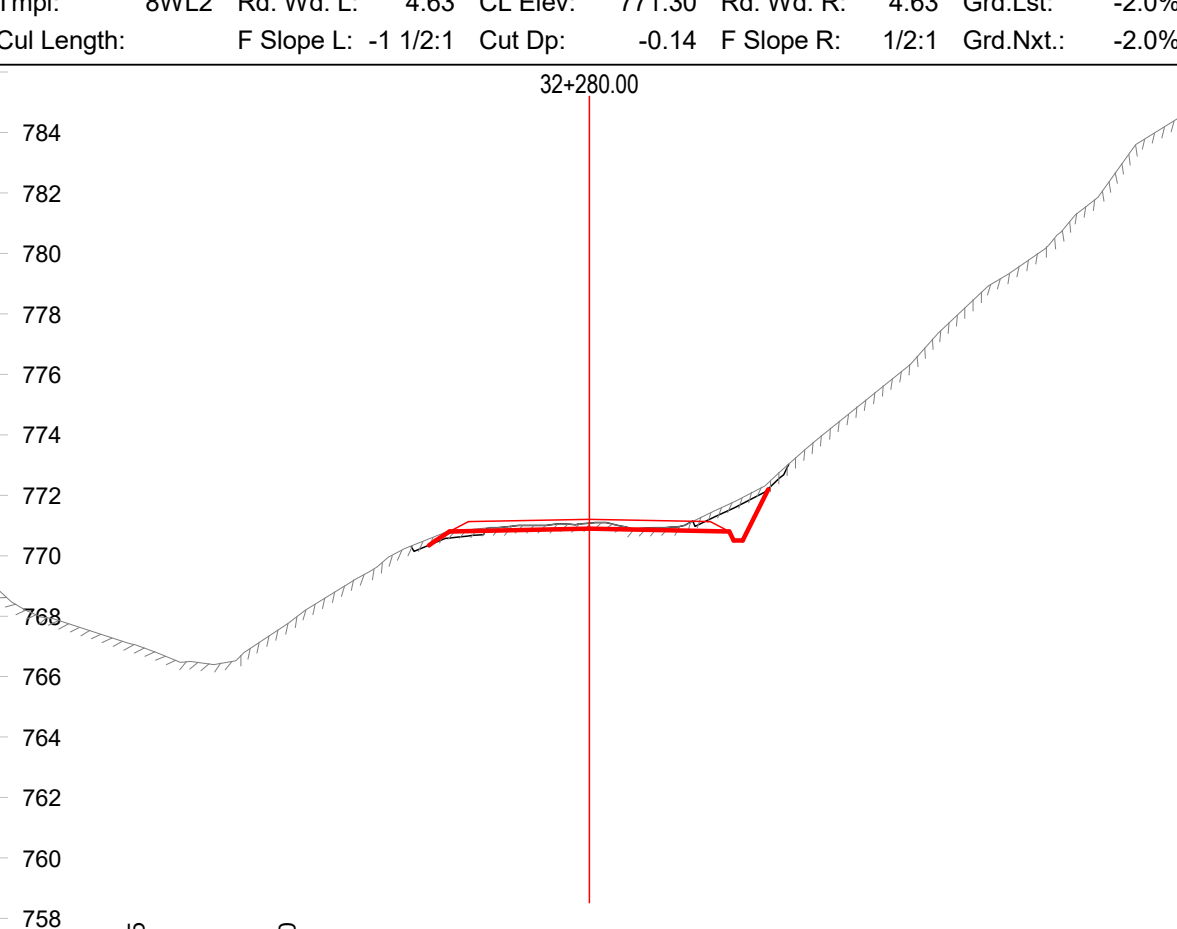
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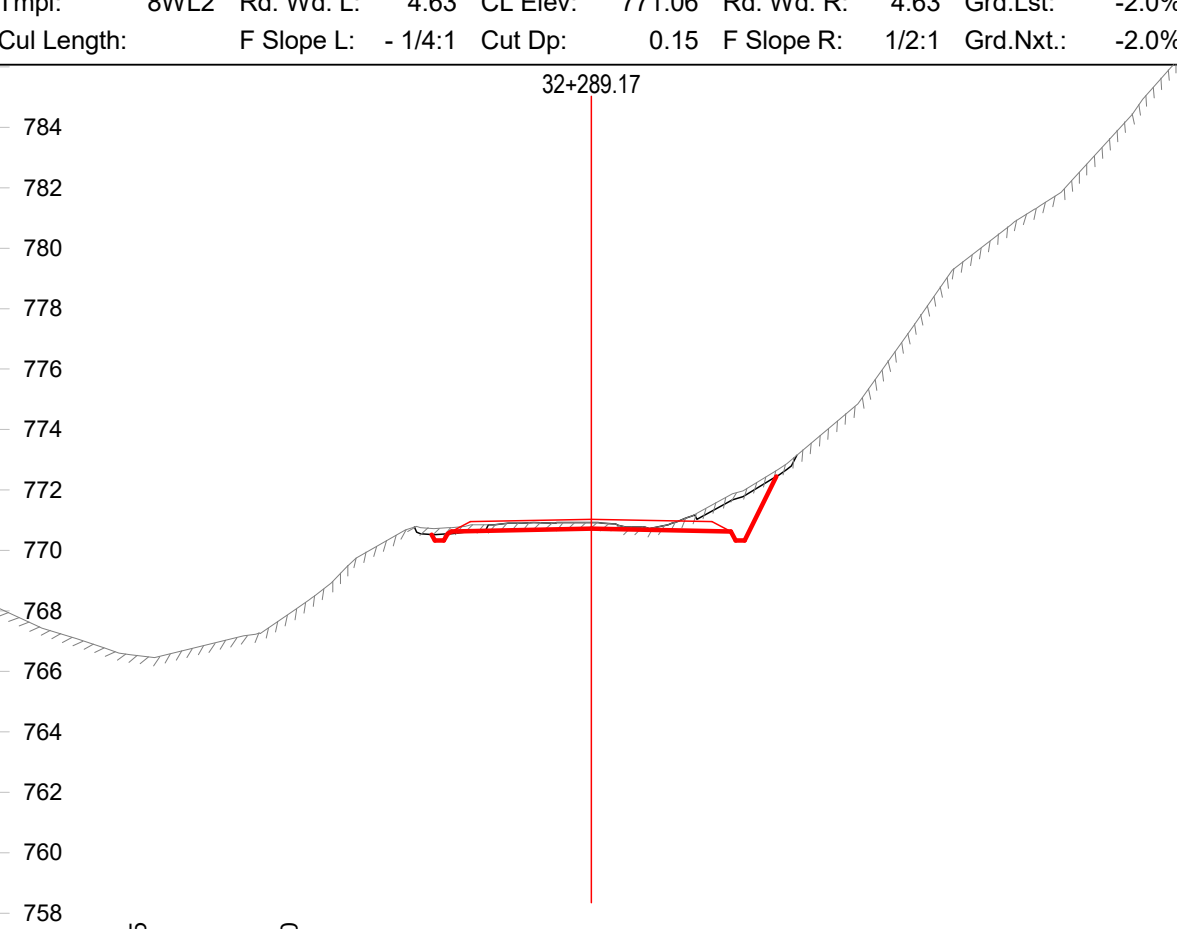
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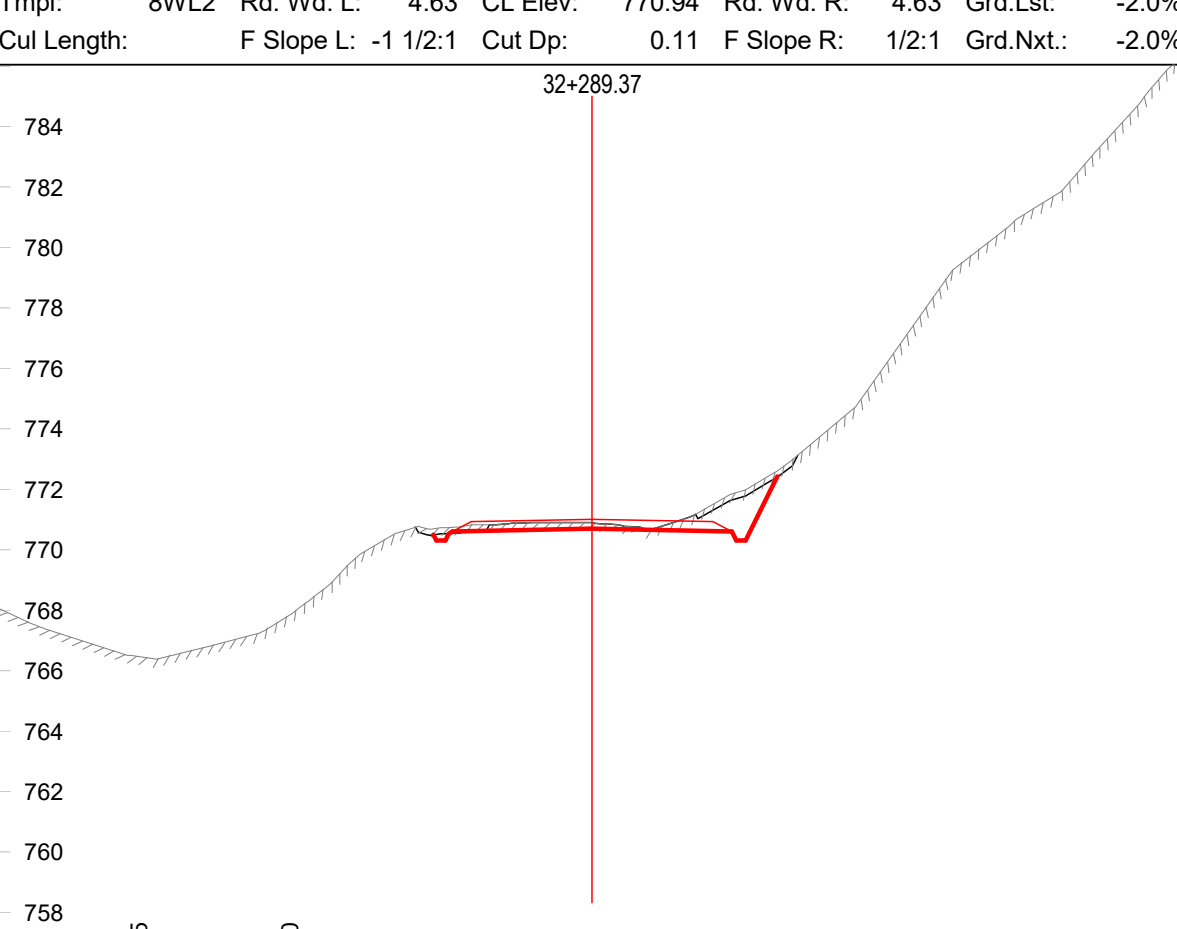
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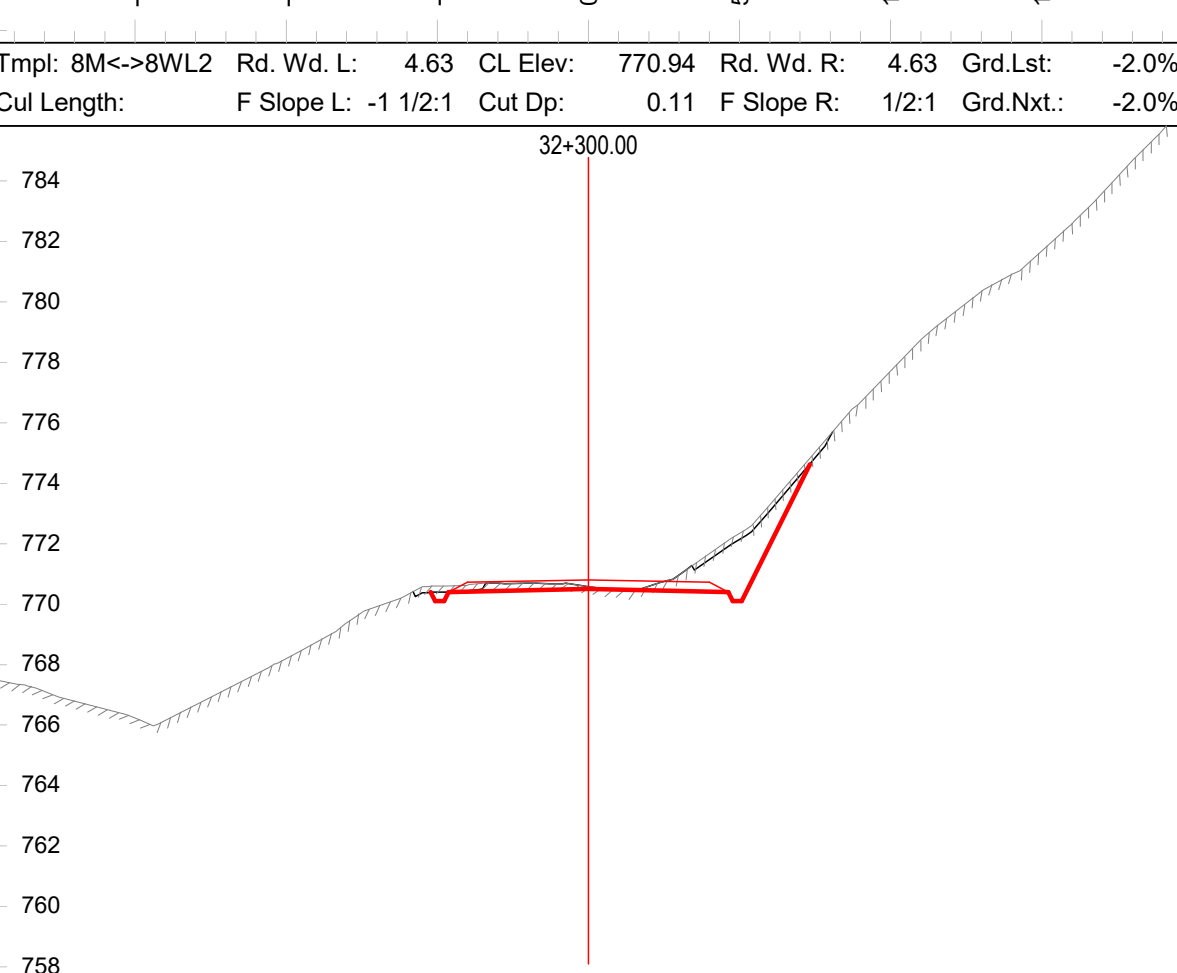
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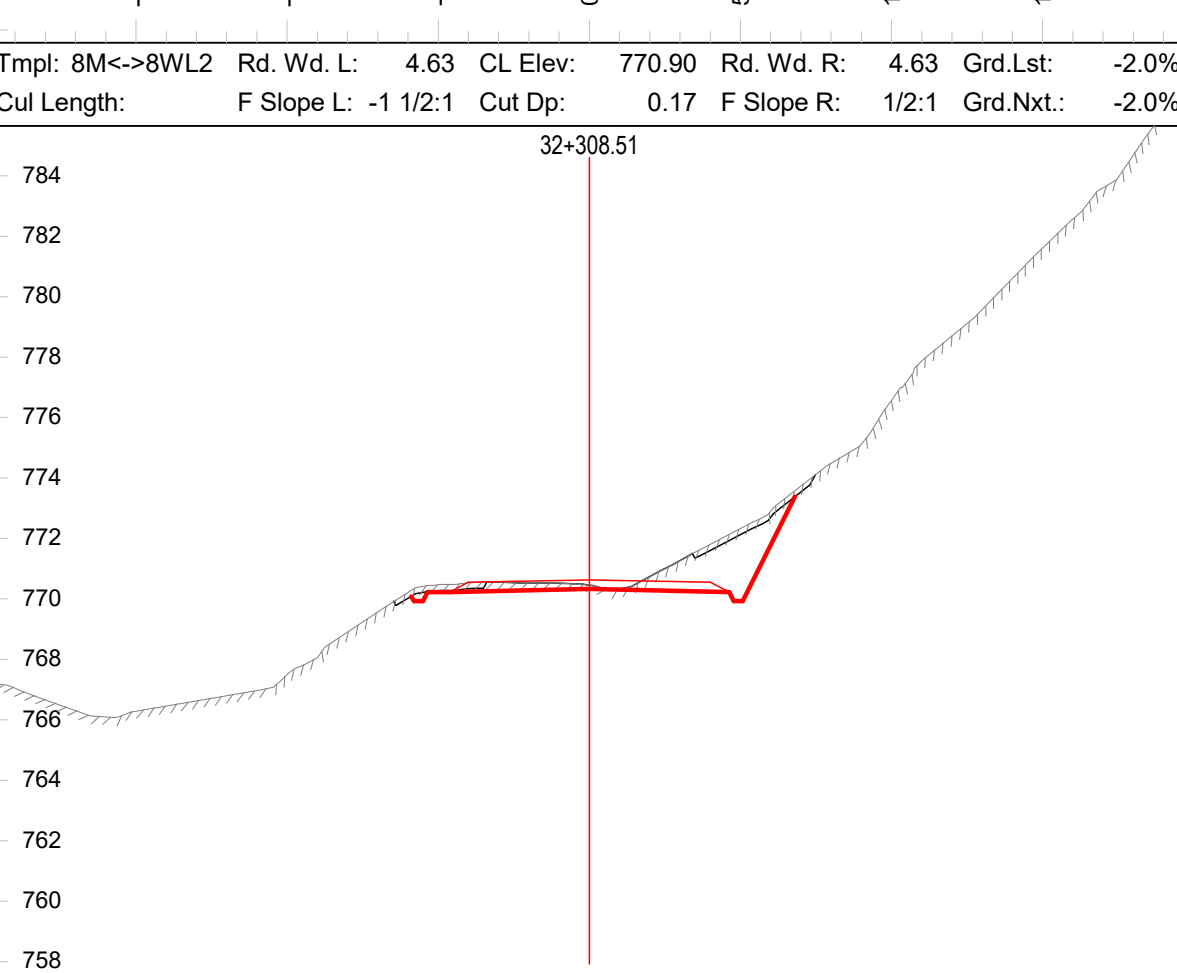
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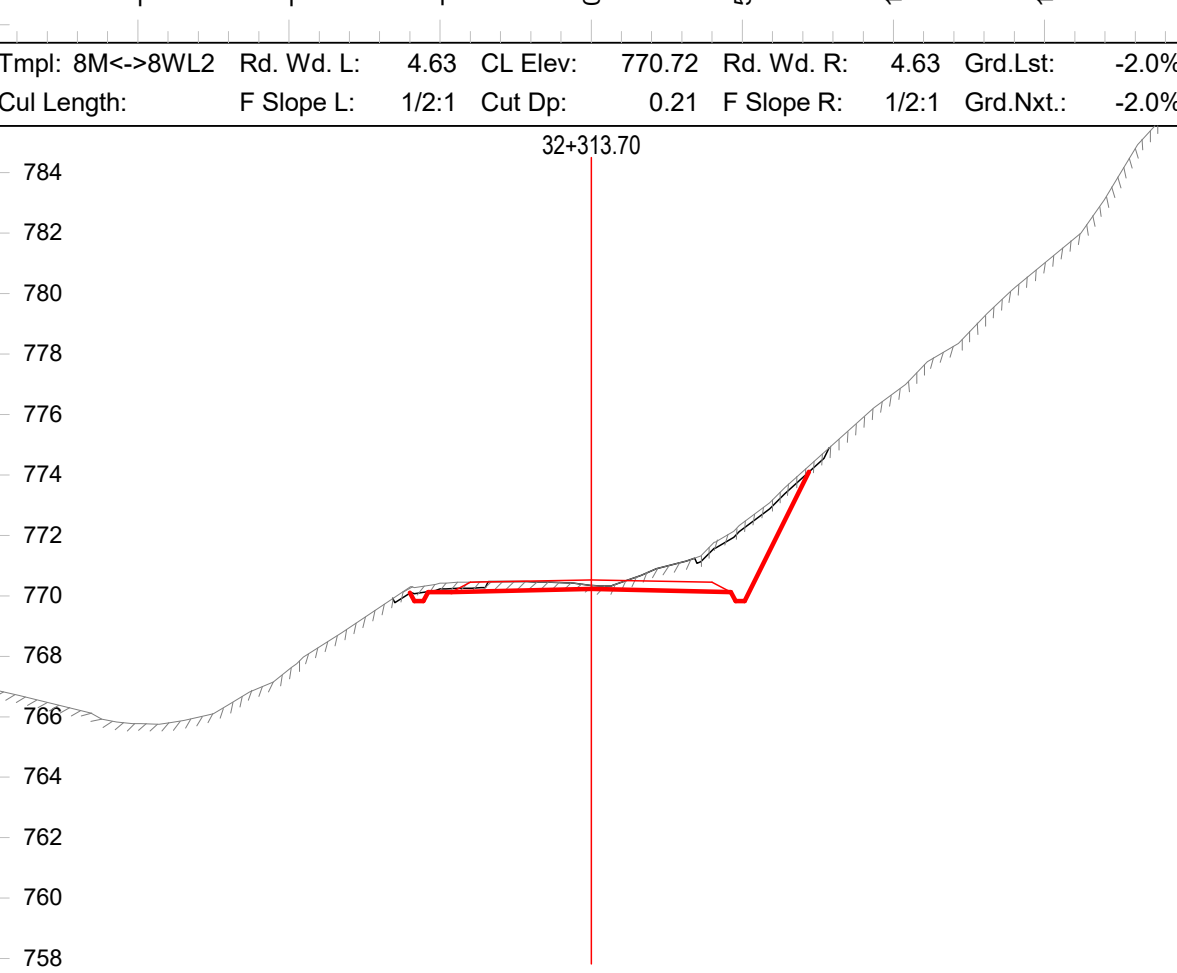
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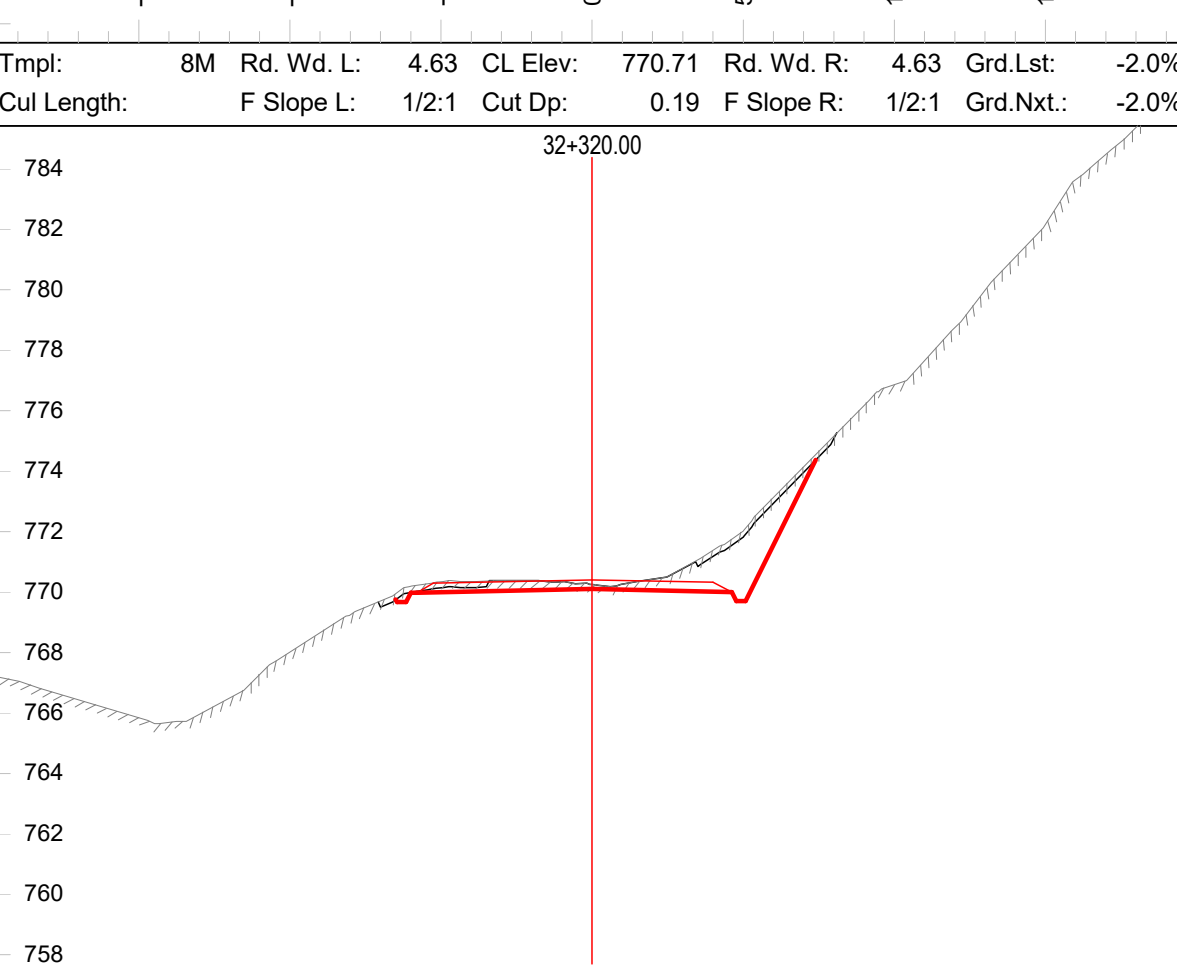
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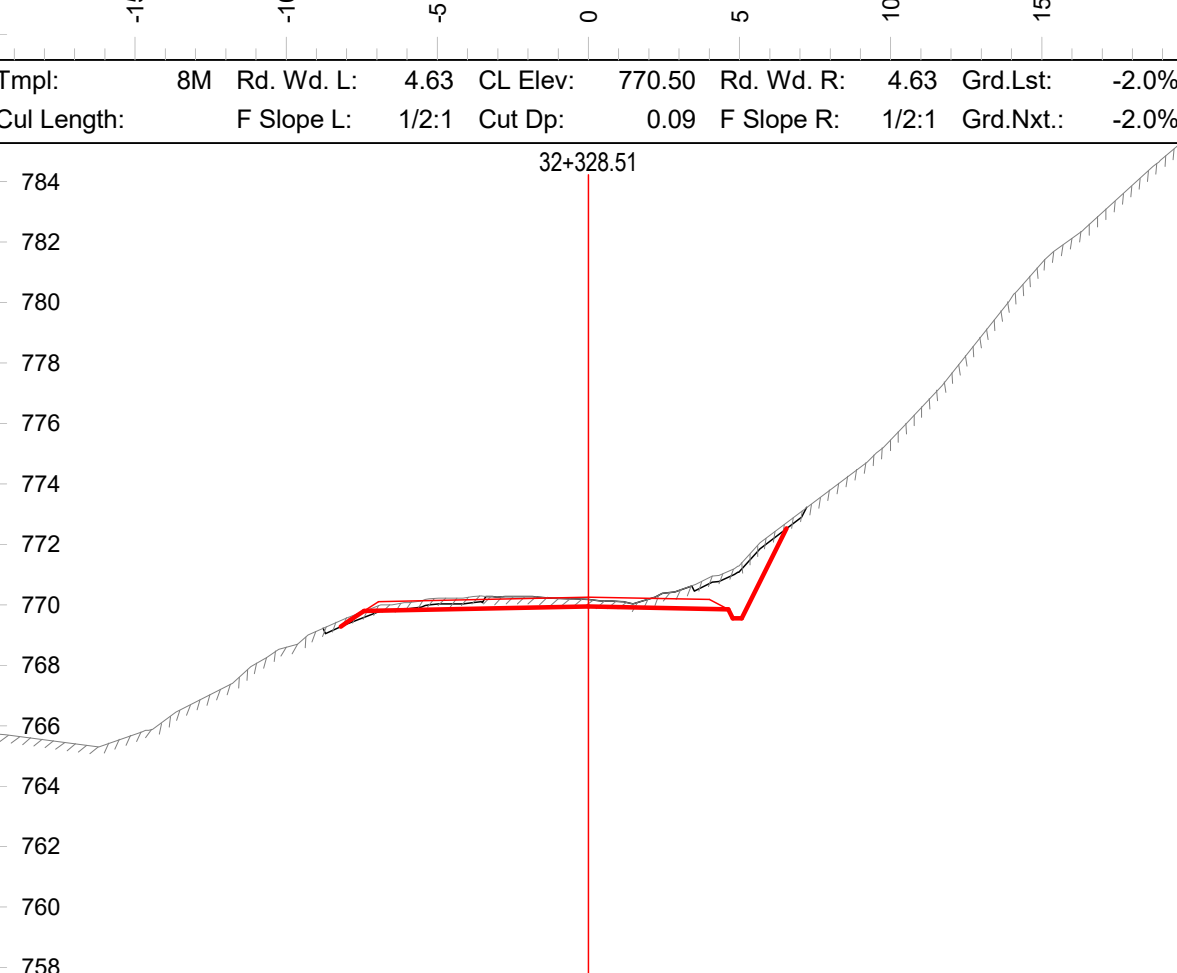
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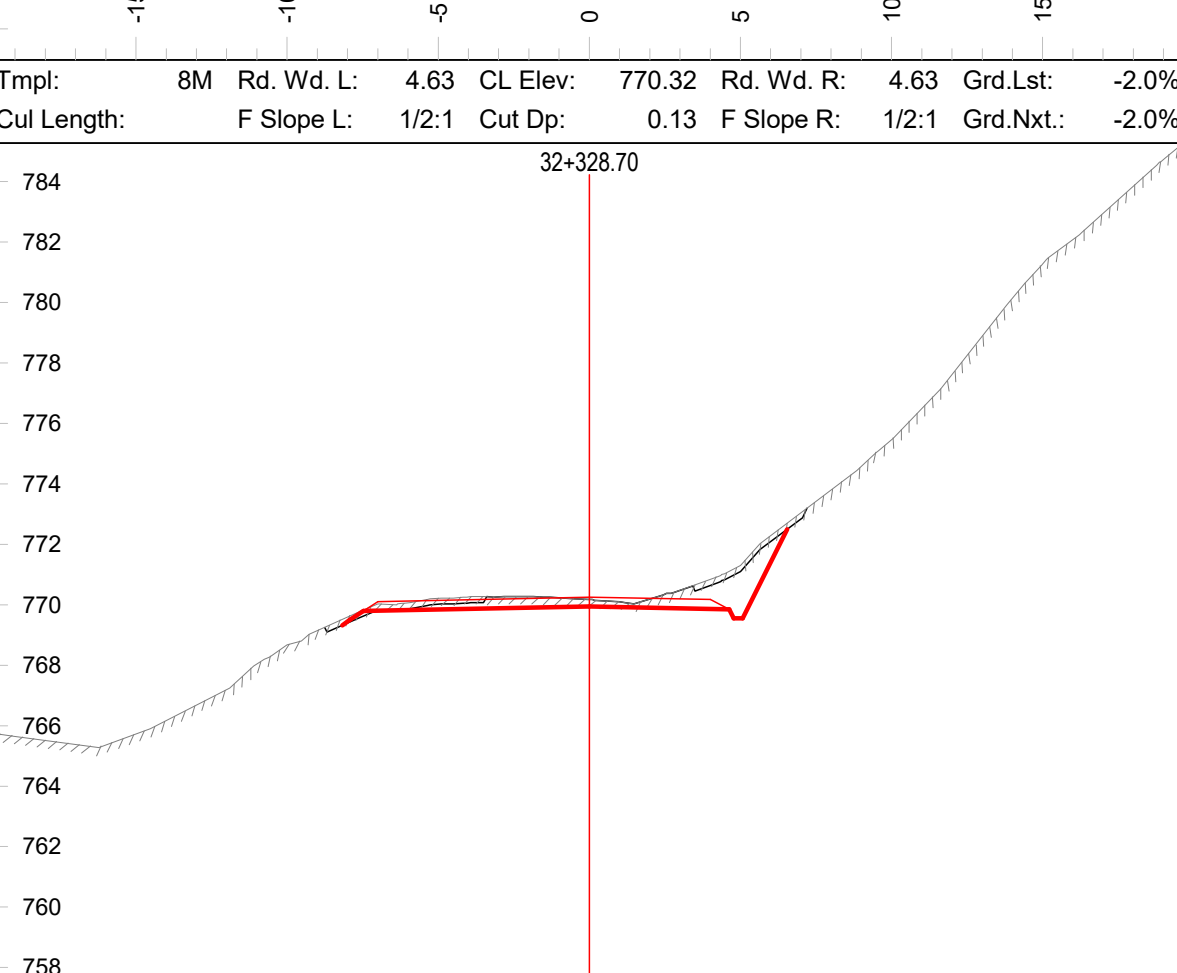
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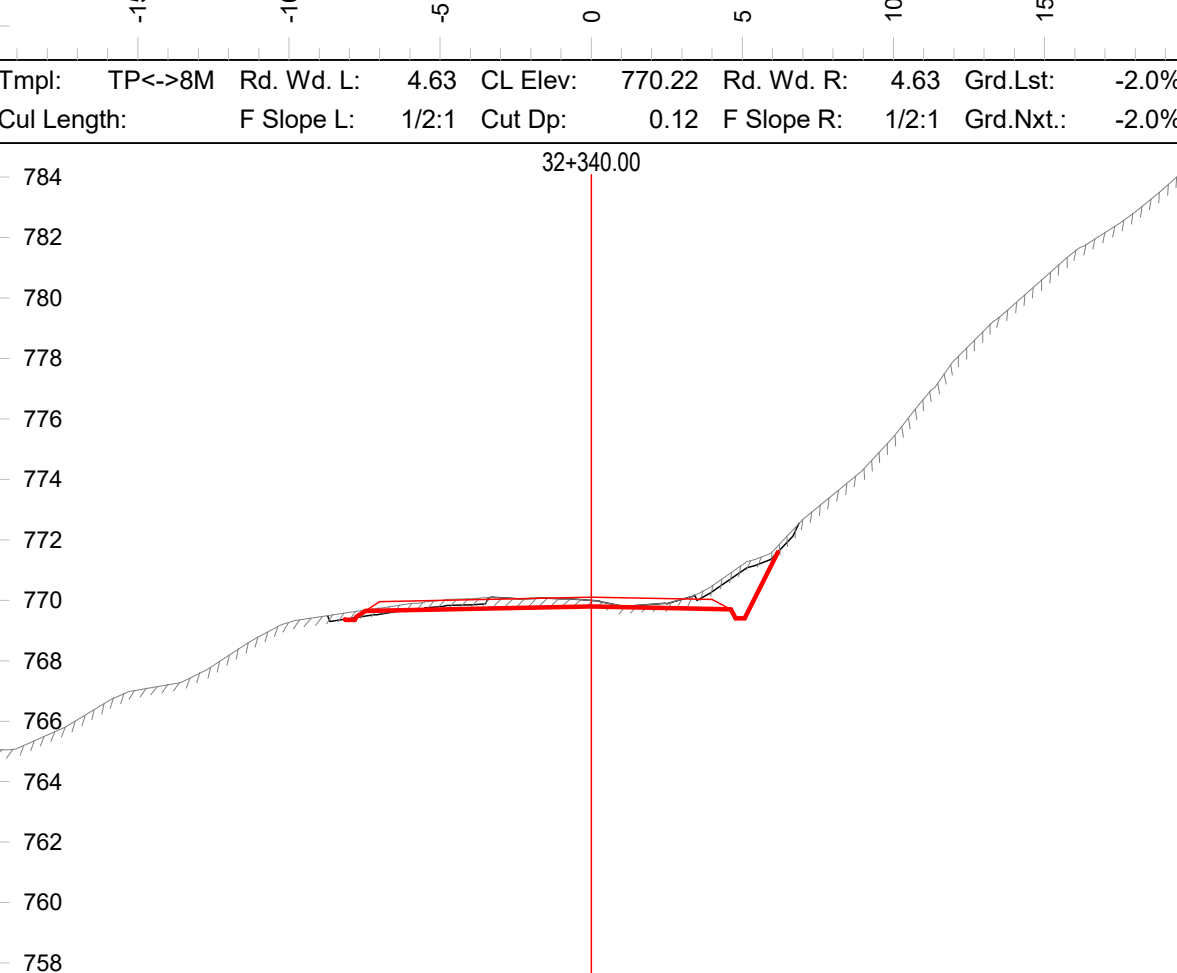
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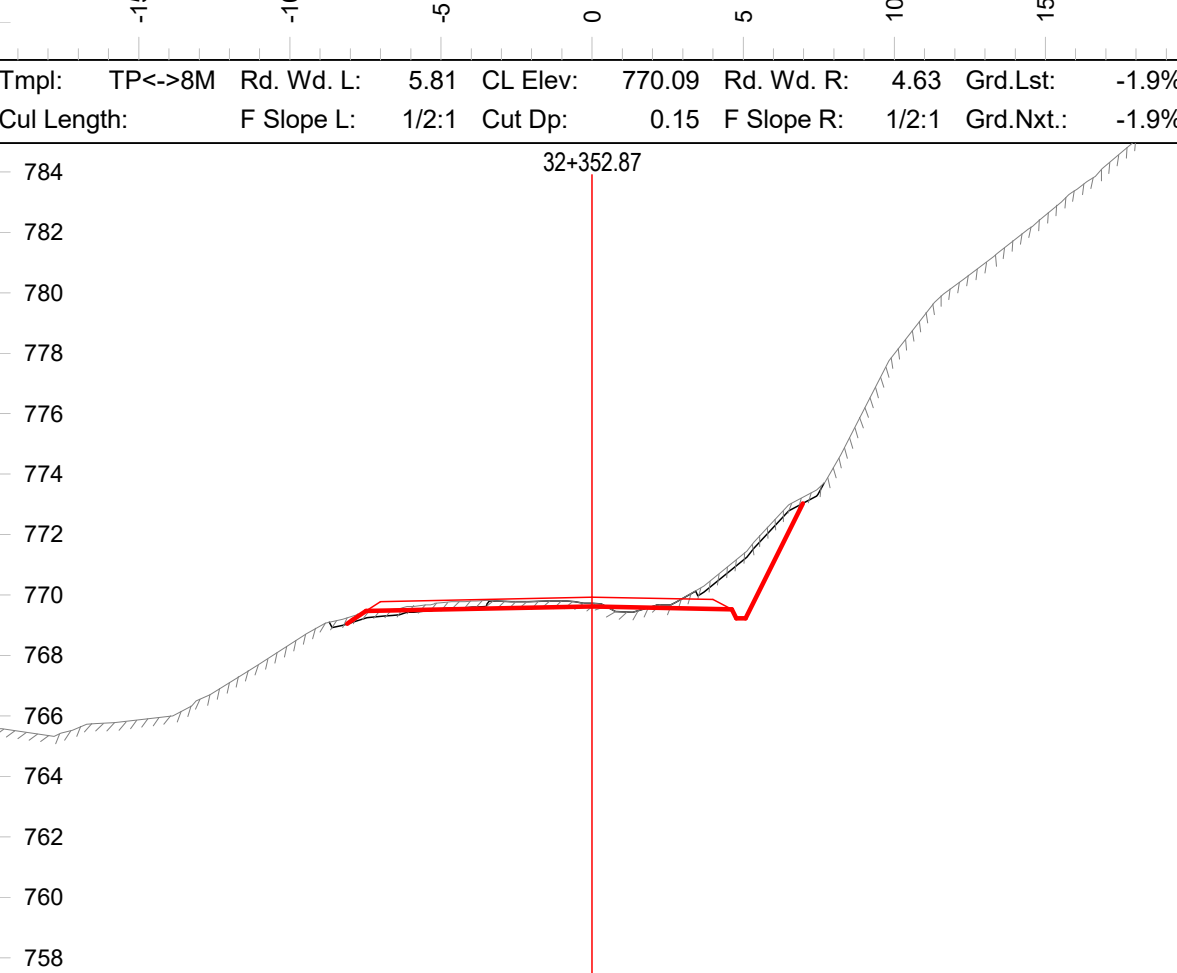
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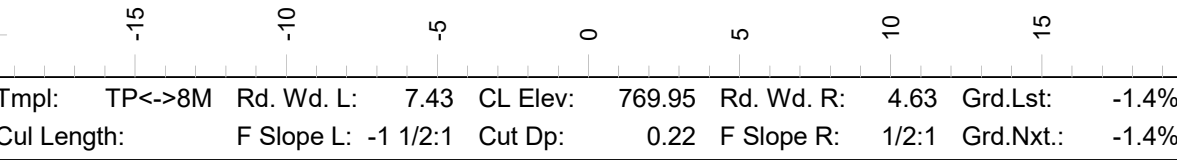
32+340.00



32+352.87



32+353.24



32+251.99

TMpl: 8WL2 Rd. Wd. L: 4.63 CL Elev: 771.47 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.07 F Slope R: 1/2:1 Grd.Nxt: -2.0%

32+260.00

TMpl: 8WL2 Rd. Wd. L: 4.63 CL Elev: 771.30 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.14 F Slope R: 1/2:1 Grd.Nxt: -2.0%

32+271.99

TMpl: 8WL2 Rd. Wd. L: 4.63 CL Elev: 771.06 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: -1 1/4:1 Cut Dp: 0.15 F Slope R: 1/2:1 Grd.Nxt: -2.0%

32+278.00

TMpl: 8WL2 Rd. Wd. L: 4.63 CL Elev: 770.94 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.11 F Slope R: 1/2:1 Grd.Nxt: -2.0%

32+278.20

TMpl: 8M<->8WL2 Rd. Wd. L: 4.63 CL Elev: 770.94 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.11 F Slope R: 1/2:1 Grd.Nxt: -2.0%

32+280.00

TMpl: 8M<->8WL2 Rd. Wd. L: 4.63 CL Elev: 770.90 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.17 F Slope R: 1/2:1 Grd.Nxt: -2.0%

32+289.17

TMpl: 8M<->8WL2 Rd. Wd. L: 4.63 CL Elev: 770.72 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: 1/2:1 Cut Dp: 0.21 F Slope R: 1/2:1 Grd.Nxt: -2.0%

32+289.37

TMpl: 8M Rd. Wd. L: 4.63 CL Elev: 770.71 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: 1/2:1 Cut Dp: 0.19 F Slope R: 1/2:1 Grd.Nxt: -2.0%

32+300.00

TMpl: 8M Rd. Wd. L: 4.63 CL Elev: 770.50 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: 1/2:1 Cut Dp: 0.09 F Slope R: 1/2:1 Grd.Nxt: -2.0%

32+308.51

TMpl: 8M Rd. Wd. L: 4.63 CL Elev: 770.32 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: 1/2:1 Cut Dp: 0.13 F Slope R: 1/2:1 Grd.Nxt: -2.0%

32+313.70

TMpl: TP<->8M Rd. Wd. L: 4.63 CL Elev: 770.22 Rd. Wd. R: 4.63 Grd.Lst: -2.0%
Cul Length: F Slope L: 1/2:1 Cut Dp: 0.12 F Slope R: 1/2:1 Grd.Nxt: -2.0%

32+320.00

TMpl: TP<->8M Rd. Wd. L: 5.81 CL Elev: 770.09 Rd. Wd. R: 4.63 Grd.Lst: -1.9%
Cul Length: F Slope L: 1/2:1 Cut Dp: 0.15 F Slope R: 1/2:1 Grd.Nxt: -1.9%

32+328.51

TMpl: TP<->8M Rd. Wd. L: 7.43 CL Elev: 769.95 Rd. Wd. R: 4.63 Grd.Lst: -1.4%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.22 F Slope R: 1/2:1 Grd.Nxt: -1.4%

32+328.70

TMpl: TO<->8M Rd. Wd. L: 7.46 CL Elev: 769.95 Rd. Wd. R: 4.63 Grd.Lst: -1.4%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.22 F Slope R: 1/2:1 Grd.Nxt: -1.4%

32+340.00

TMpl: TO<->8M Rd. Wd. L: 7.46 CL Elev: 769.80 Rd. Wd. R: 4.63 Grd.Lst: -1.3%
Cul Length: F Slope L: 1/2:1 Cut Dp: 0.19 F Slope R: 1/2:1 Grd.Nxt: -1.3%

32+352.87

TMpl: TO<->8M Rd. Wd. L: 7.46 CL Elev: 769.63 Rd. Wd. R: 4.63 Grd.Lst: -1.3%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.09 F Slope R: 1/2:1 Grd.Nxt: -1.3%

32+353.24

TMpl: TP<->8M Rd. Wd. L: 7.43 CL Elev: 769.95 Rd. Wd. R: 4.63 Grd.Lst: -1.4%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.22 F Slope R: 1/2:1 Grd.Nxt: -1.4%



Ministry of Forests, Lands and
Natural Resource Operations
Omenica Region
Prince George Resource District

Chuchinka-Colbourne FSR
Roadway Widening and Upgrade
Geometric Alignment
Km 31 to Km 33.6

Page 13 of 71

Stations: 32+353.24 to 32+433.00

ROAD DESIGN SPECIFICATIONS

Design Speed: 30 km/h
Avg. Stab. Road Width: 6.0m
Fav. Grade Max. 10%
Adv. Grade Max 10%

Section Scale 1:250

Project Location Coordinates

Latitude: 51-15-03
Longitude: -119-53-14
Elevation: 610m
Datum: NAD83
UTM Combined Scale Factor:
n/a

Notes:

- Ground model data obtained by Lidar Survey method by McElhanney Survey Consulting Ltd. Oct. 2013
-30km/h Speed Limit through the Canyon, remainder designed to minimum 60km/h.

Survey Control Stations

Point Name	Northing	Easting	Elevation	Description

Plan Legend (all may not be applicable)

L-line Location

Road Edges

Cleaning Limits

Culverts

GPS Base Station

Old Iron Bar found (tied)

Old Pipe Post found (tie)

Survey Control Points tie

Benchmark

Edge of Wetland

Existing Road Edges

Breakline

Powerline

Draw

Test Pit

Stream

Tension Crack

Timberline

Cut / Fill limits

Powerpole

Finished Road Surface

Profile Subgrade

Cut / Fill limits

Original Ground

1st Stratum

2nd Stratum (Rock)

Ditch Invert Right

Ditch Invert Left

EARTH WORK VOLUMES (Bank cubic meters)

L-Stn m.	Strip V. Cu. m.	SG Cut V. Cu. m.	SG Fill V. Cu. m.	B/W Vol. Cu. m.	Srf1 Fill V. Cu. m.
32+400.00 32+600.00	312.3	1295.5	488.5		553.8
Pg. Tot.	312.3	1295.5	488.5		553.8
Cum. Tot.	2353.4	6126.4	2981.5		4669.4

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt
32+396.26	600	12.00	6.50	5.50	90.00000	xdrain

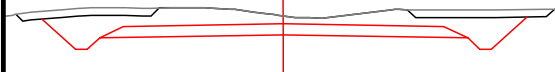
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Prepared by:



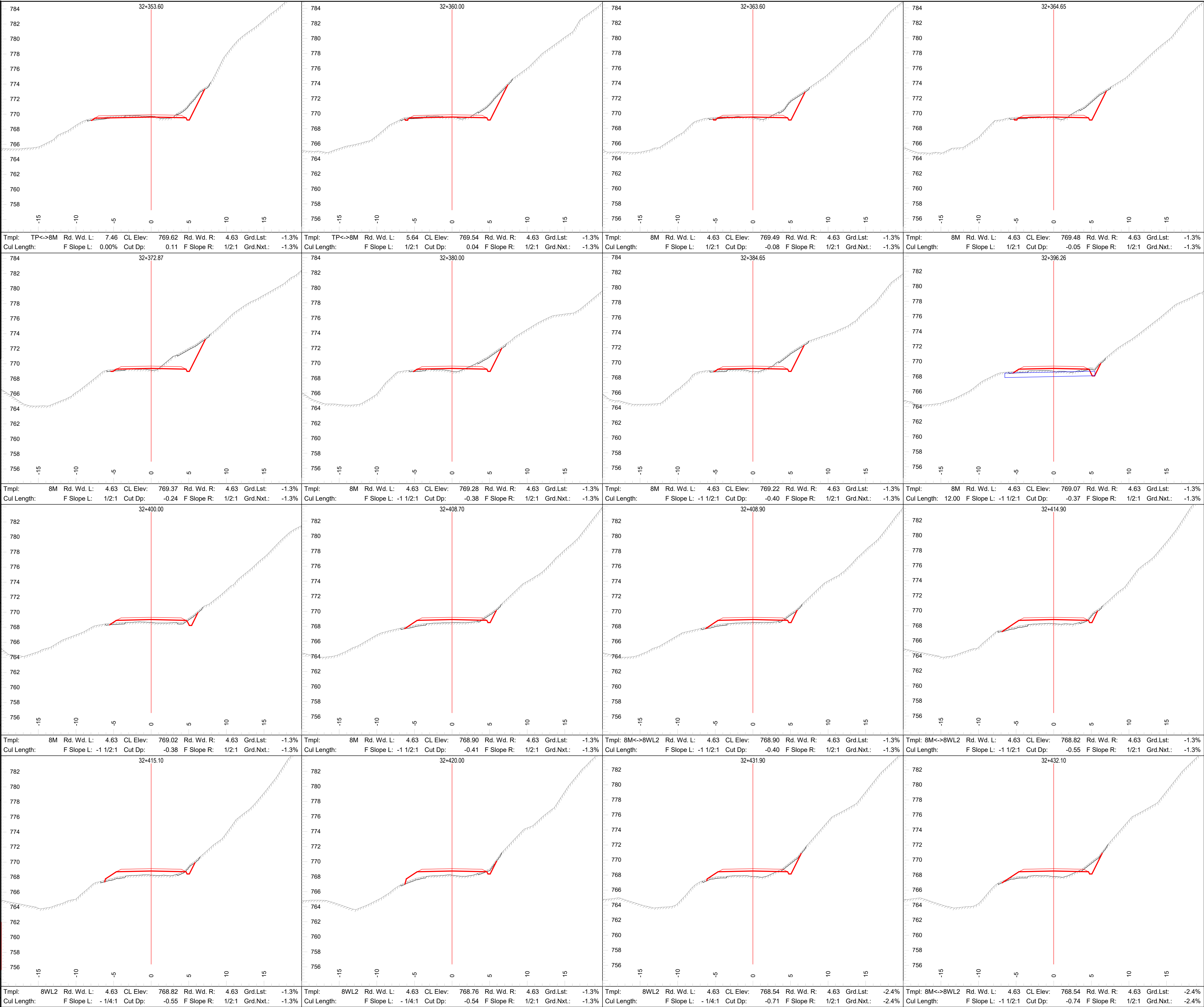
Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

DRAFT
FOR REVIEW
PURPOSES ONLY

Dwg Num: 110-022-003

Survey By: see Notes above
Design By: Edward Folk, P.Eng.
Approved By:

Plot Date:16/06/29 Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-





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Page 14 of 71

Stations: 32+433.00 to 32+533.75

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Tension Crack

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32+600.00					
Pg. Tot.	0.0	0.0	0.0		0.0
Cum. Tot.	2353.4	6126.4	2981.5		4669.4

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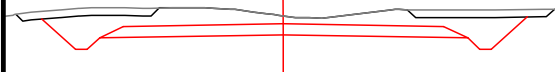
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Prepared by:



Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

DRAFT
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PURPOSES ONLY

Dwg Num: 110-022-003

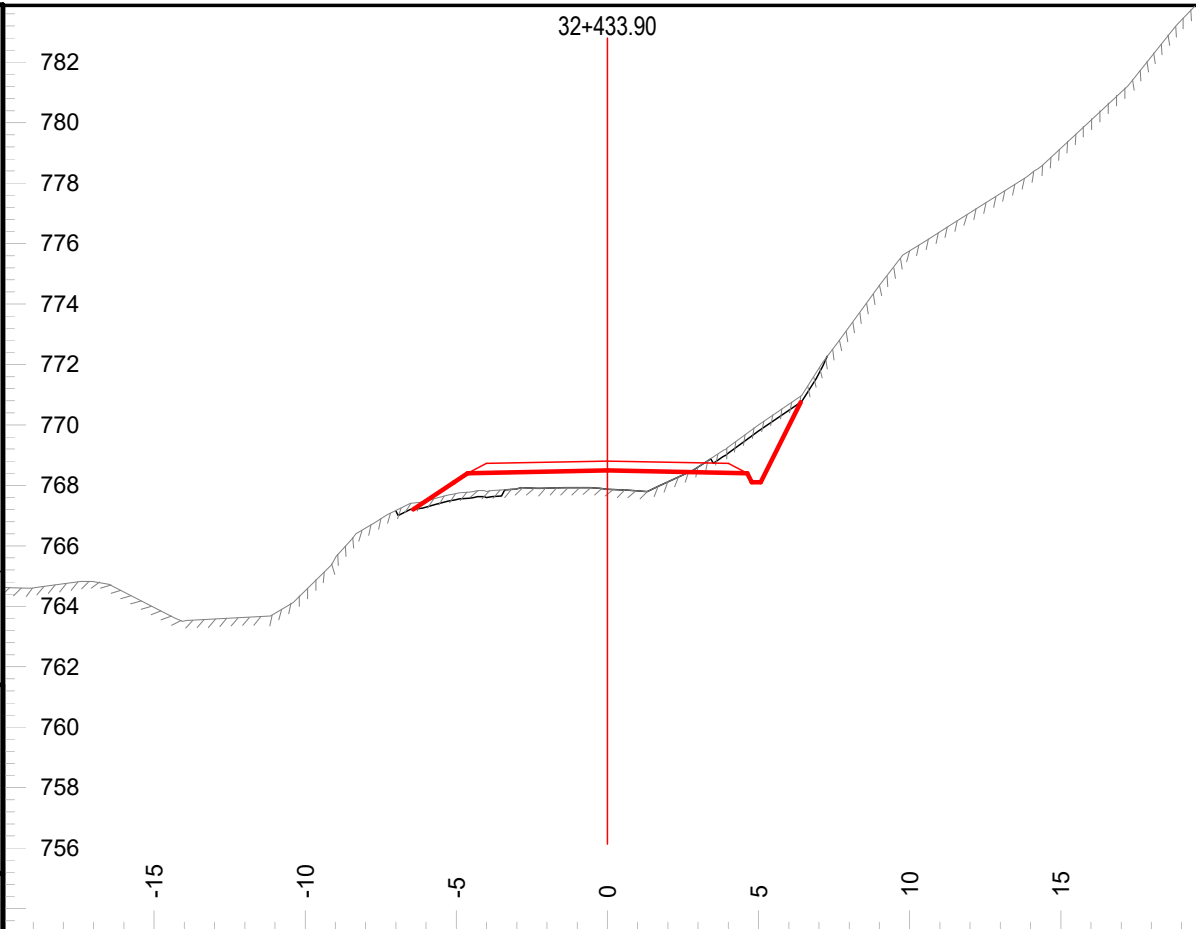
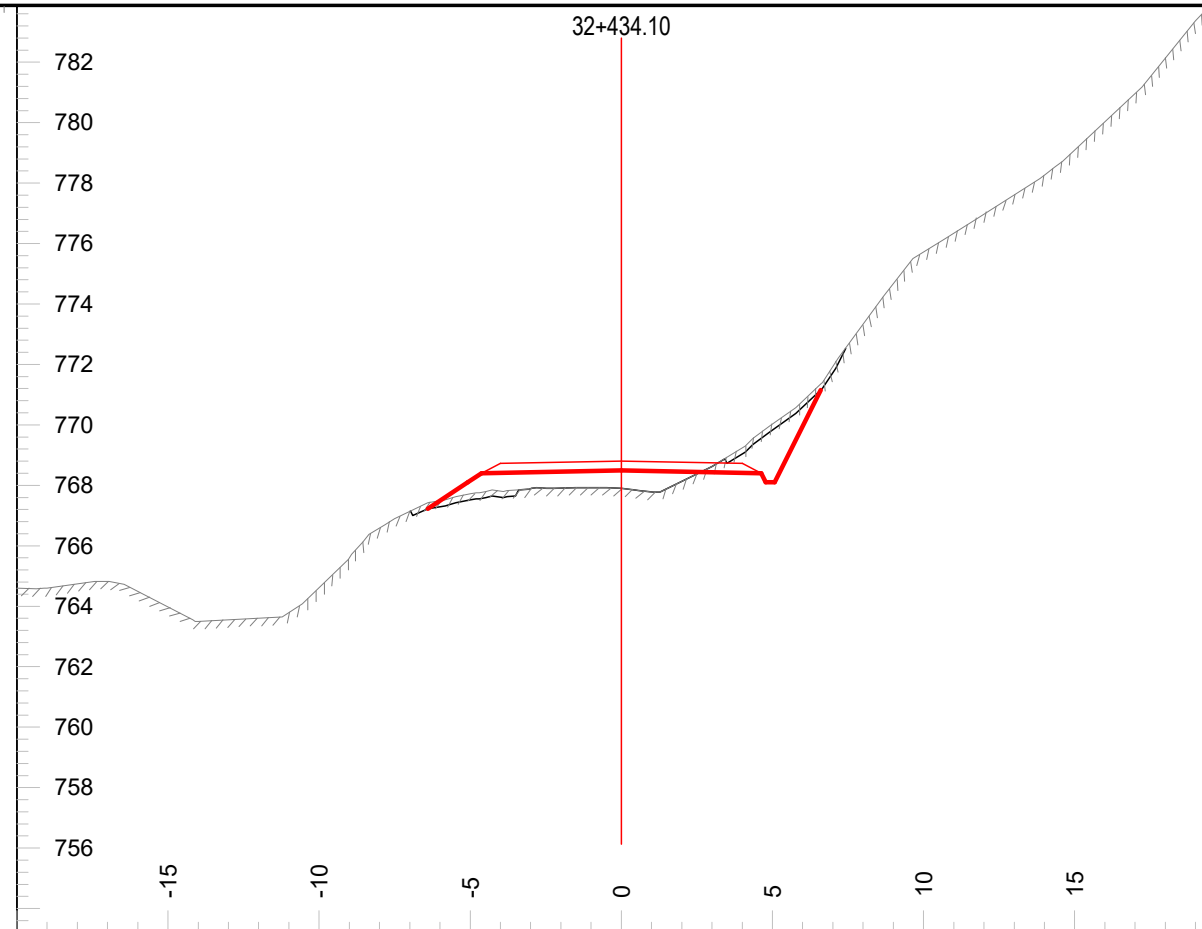
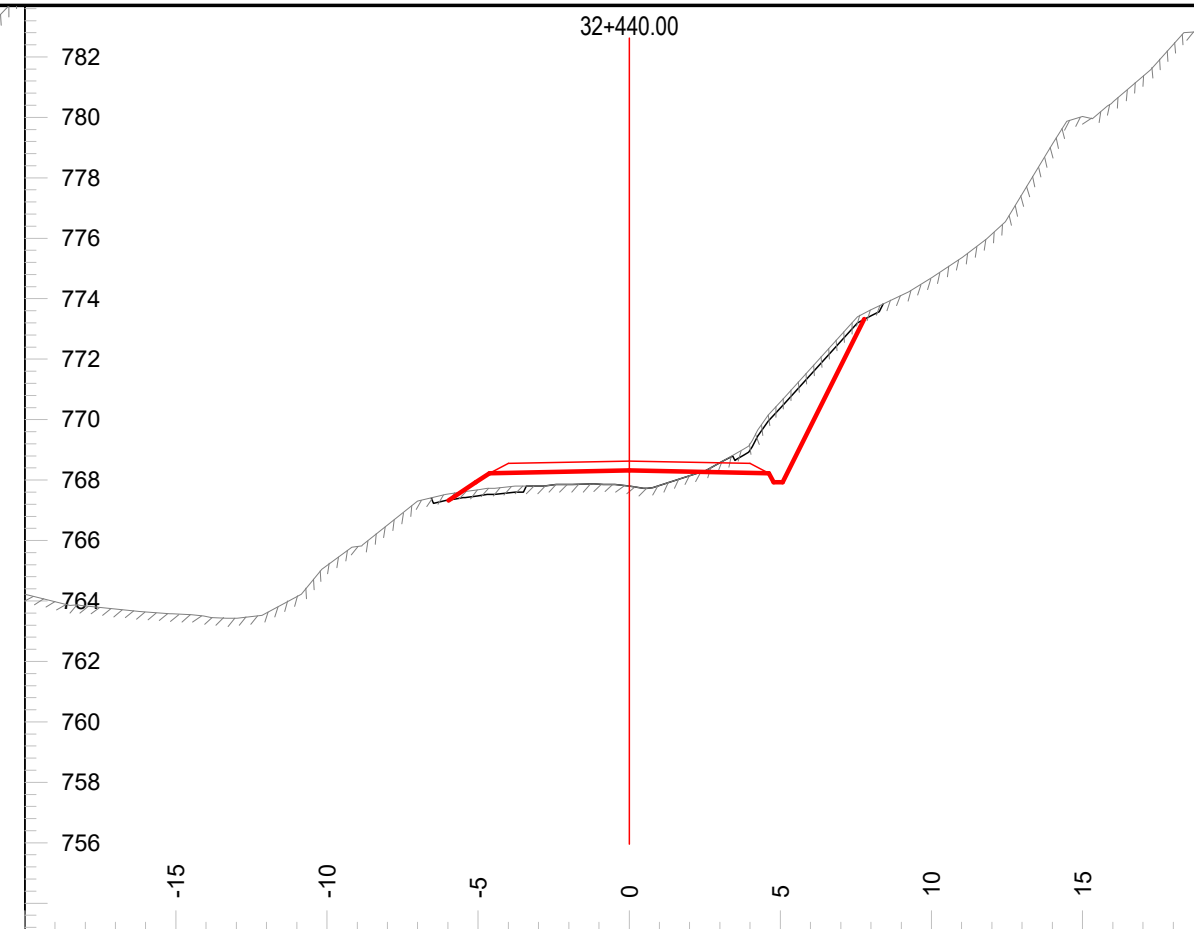
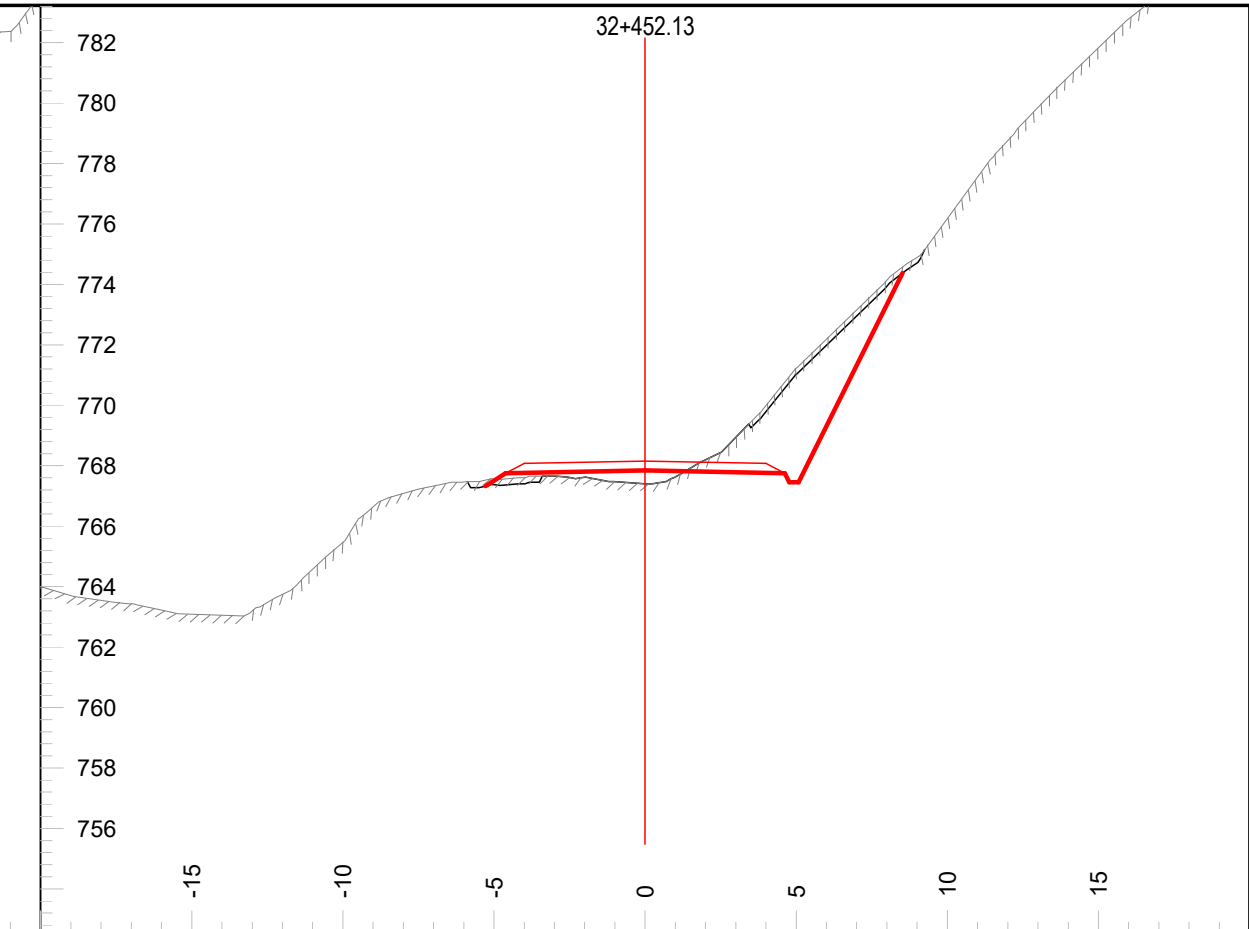
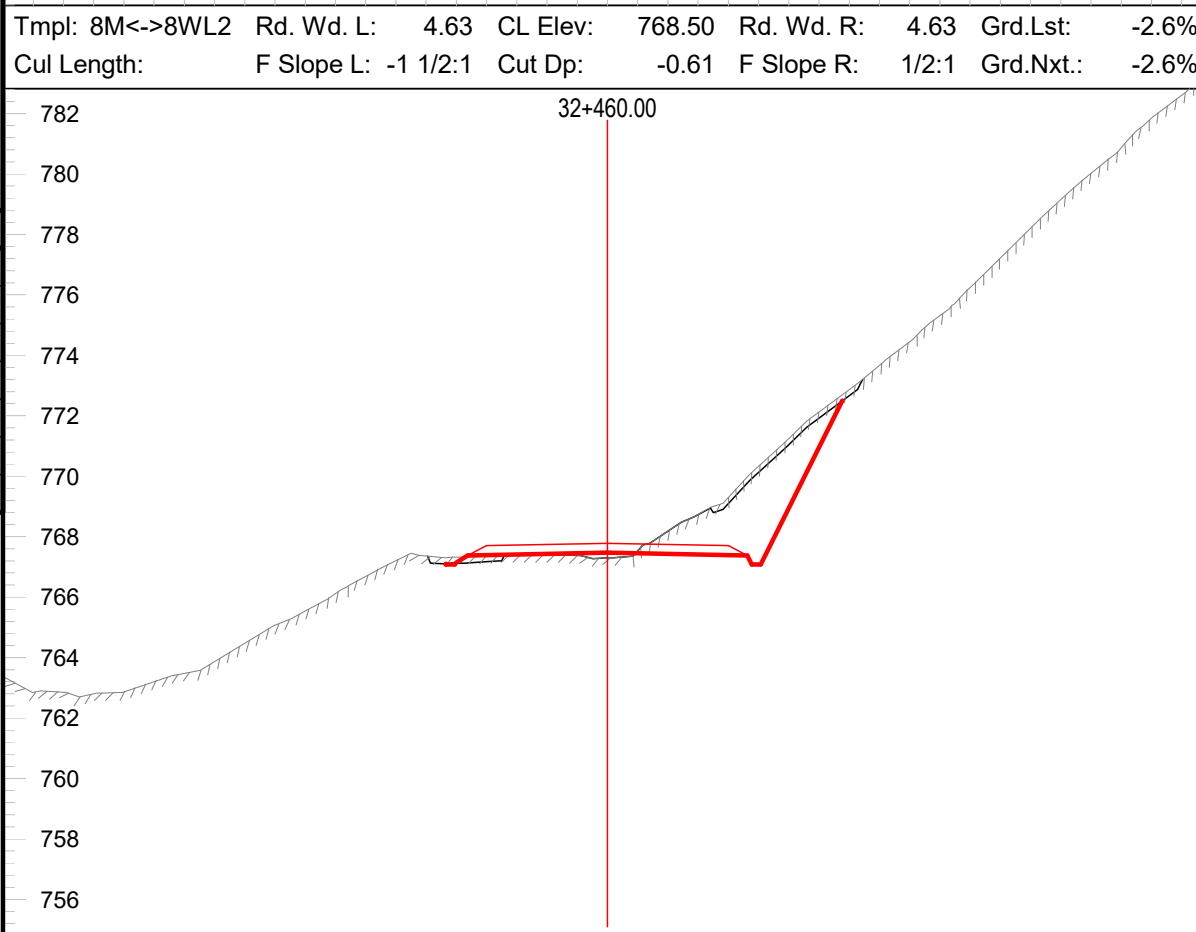
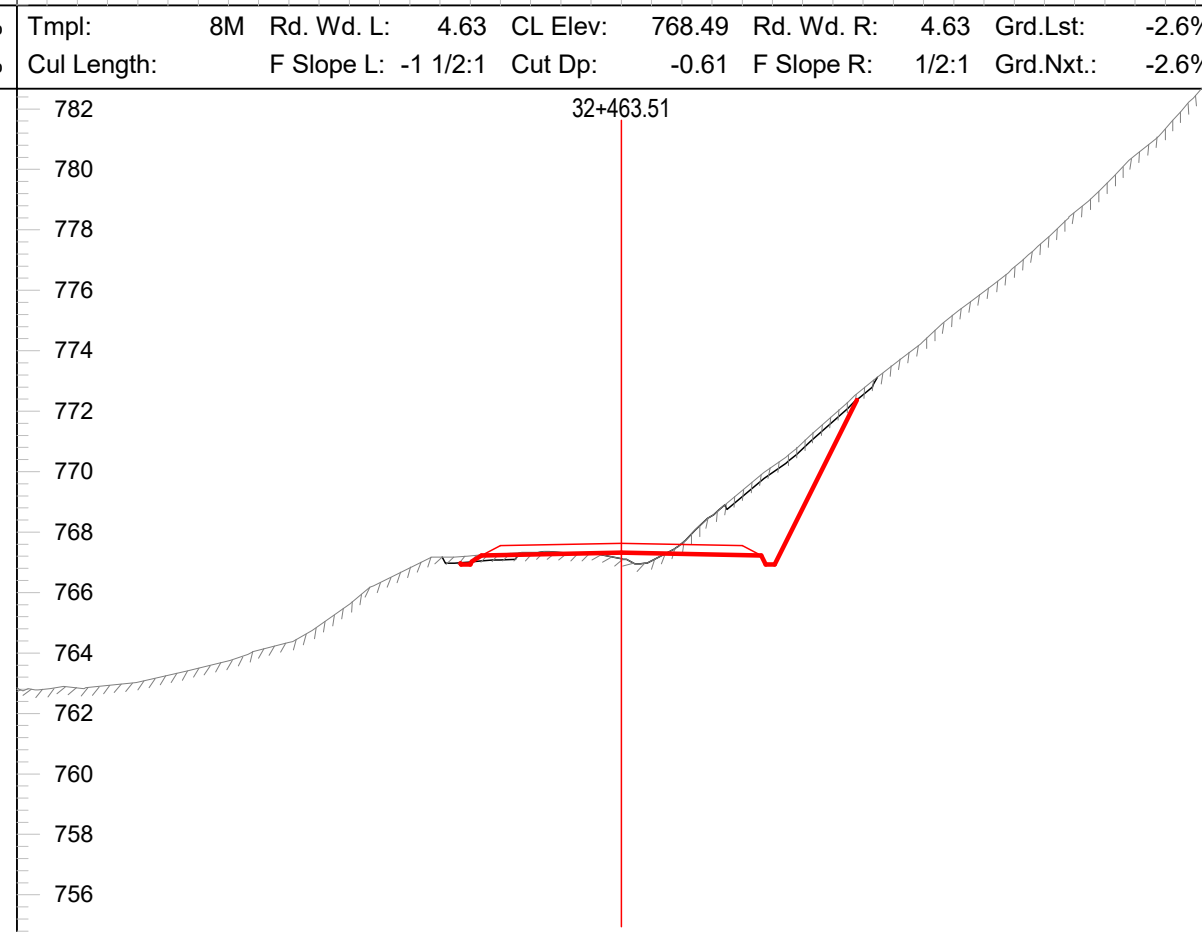
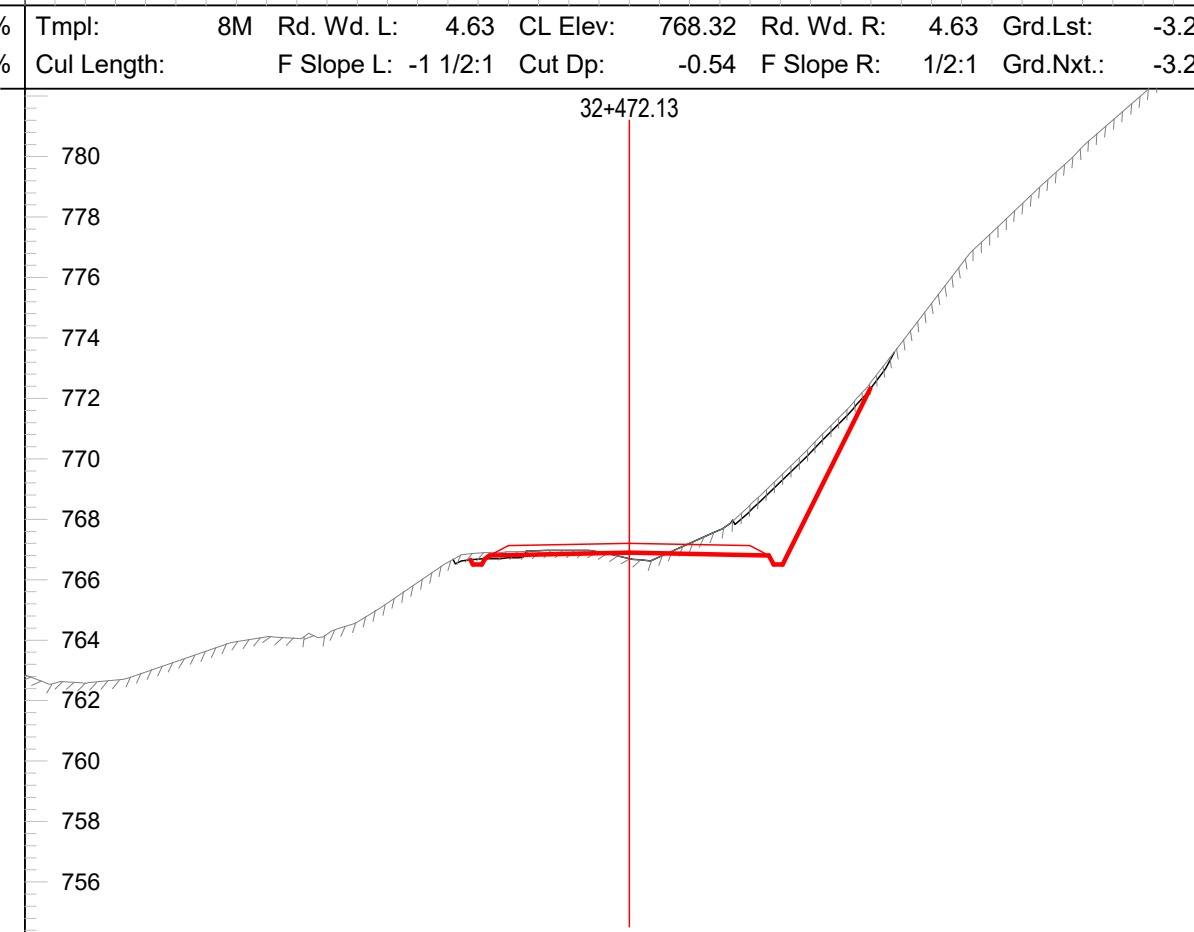
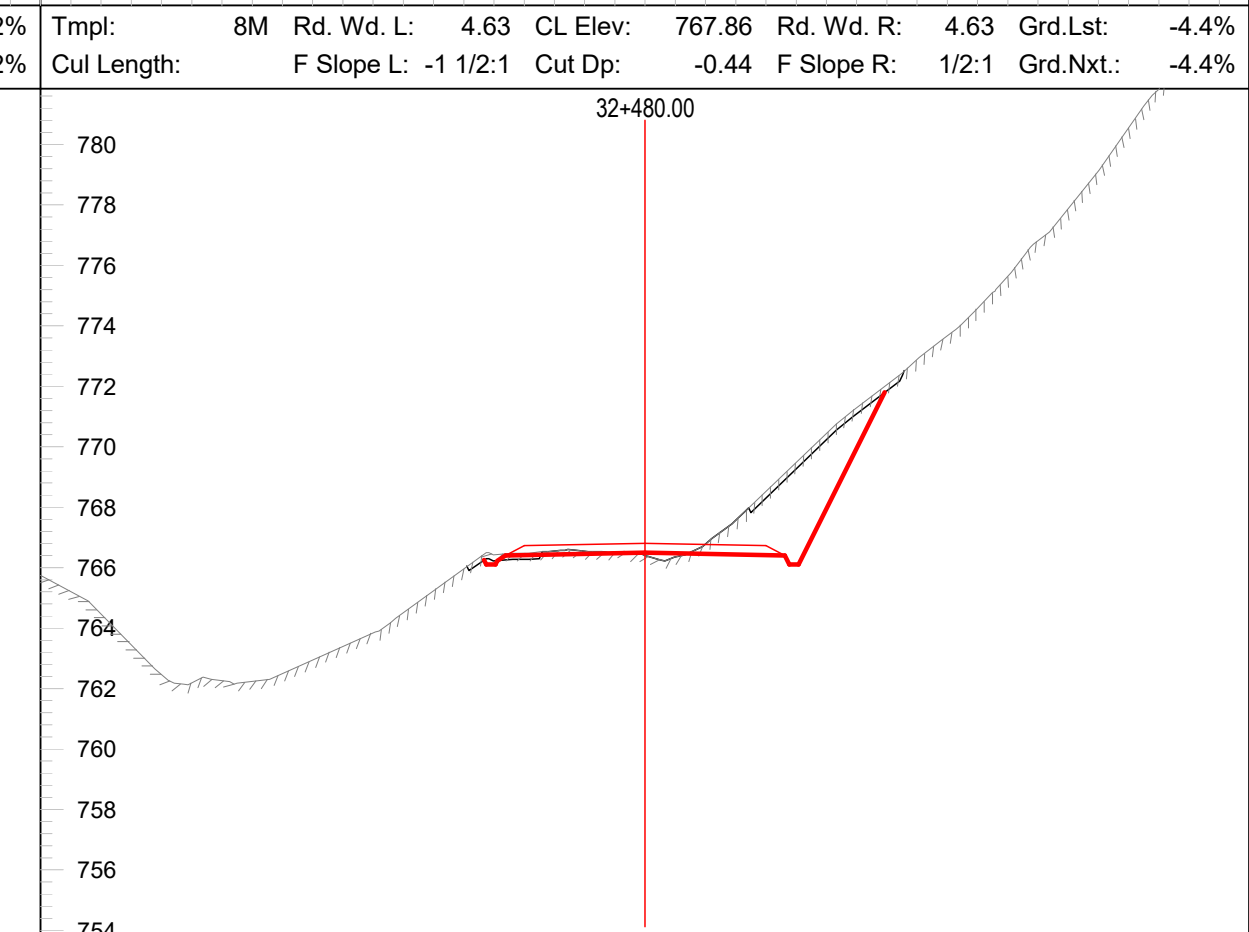
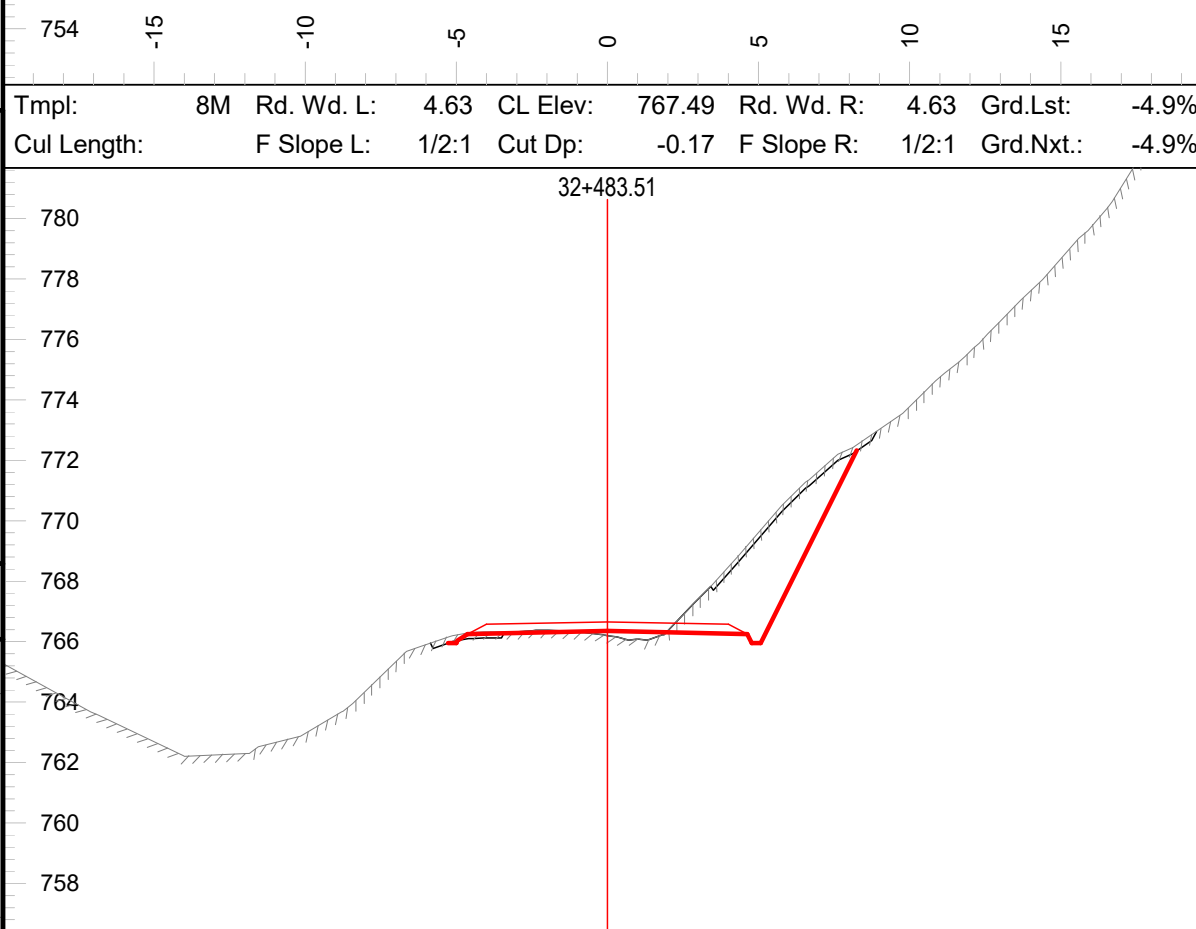
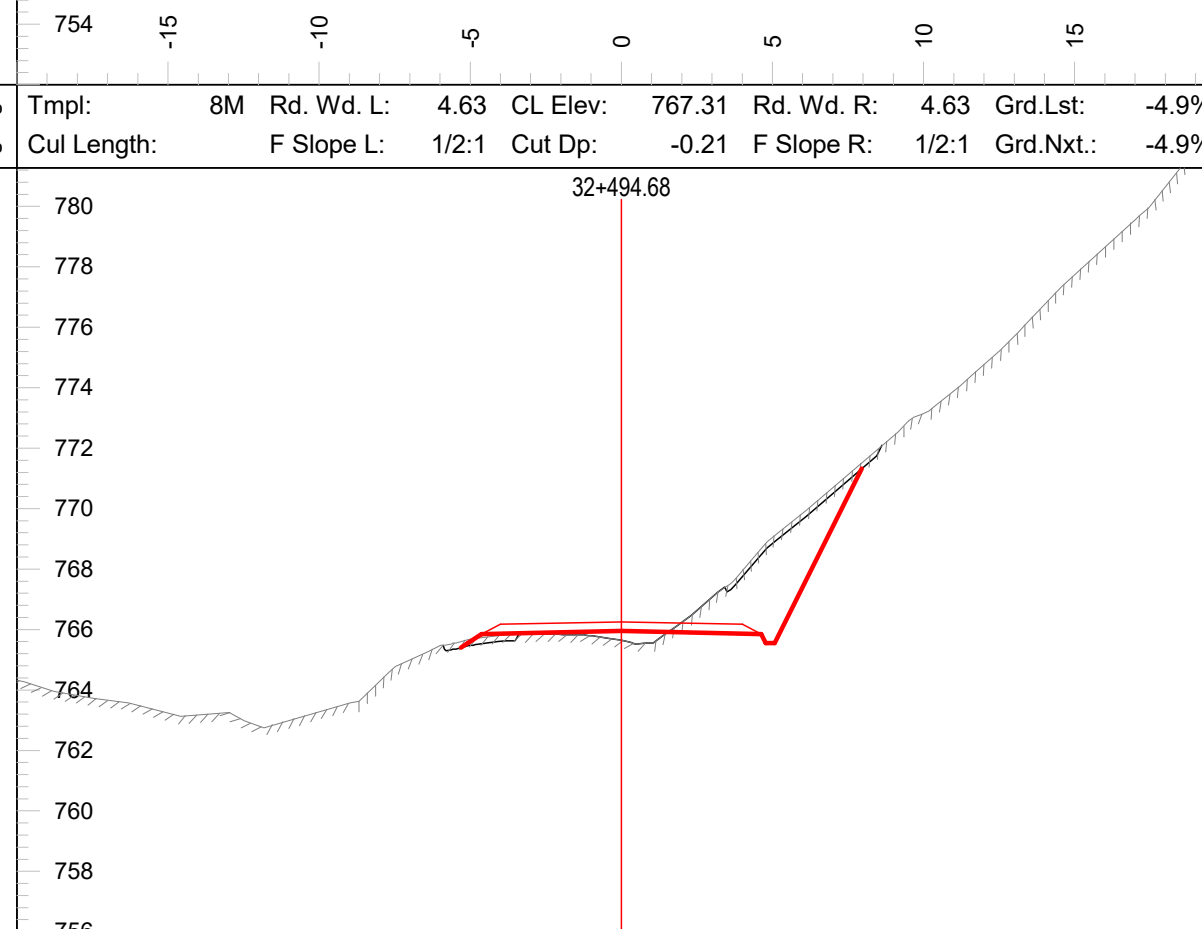
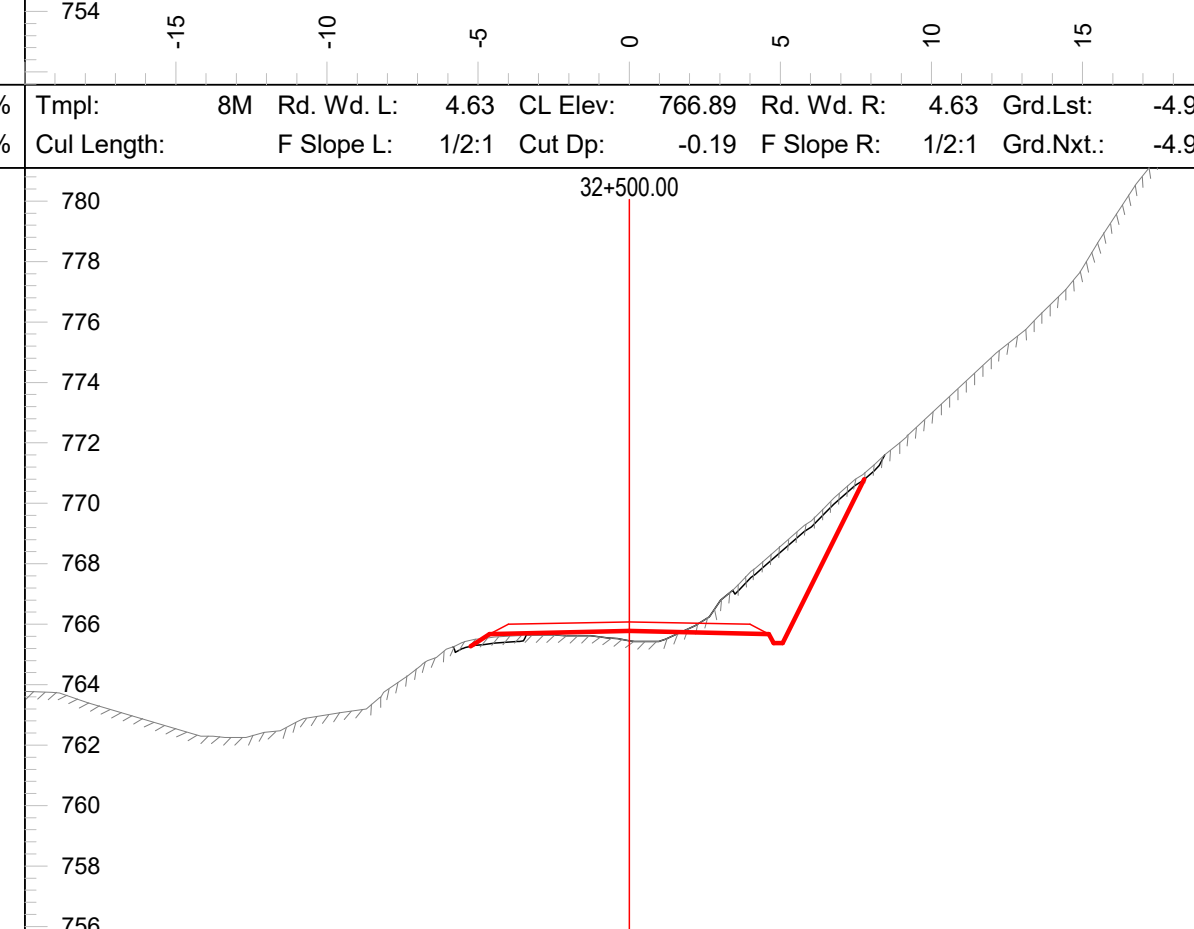
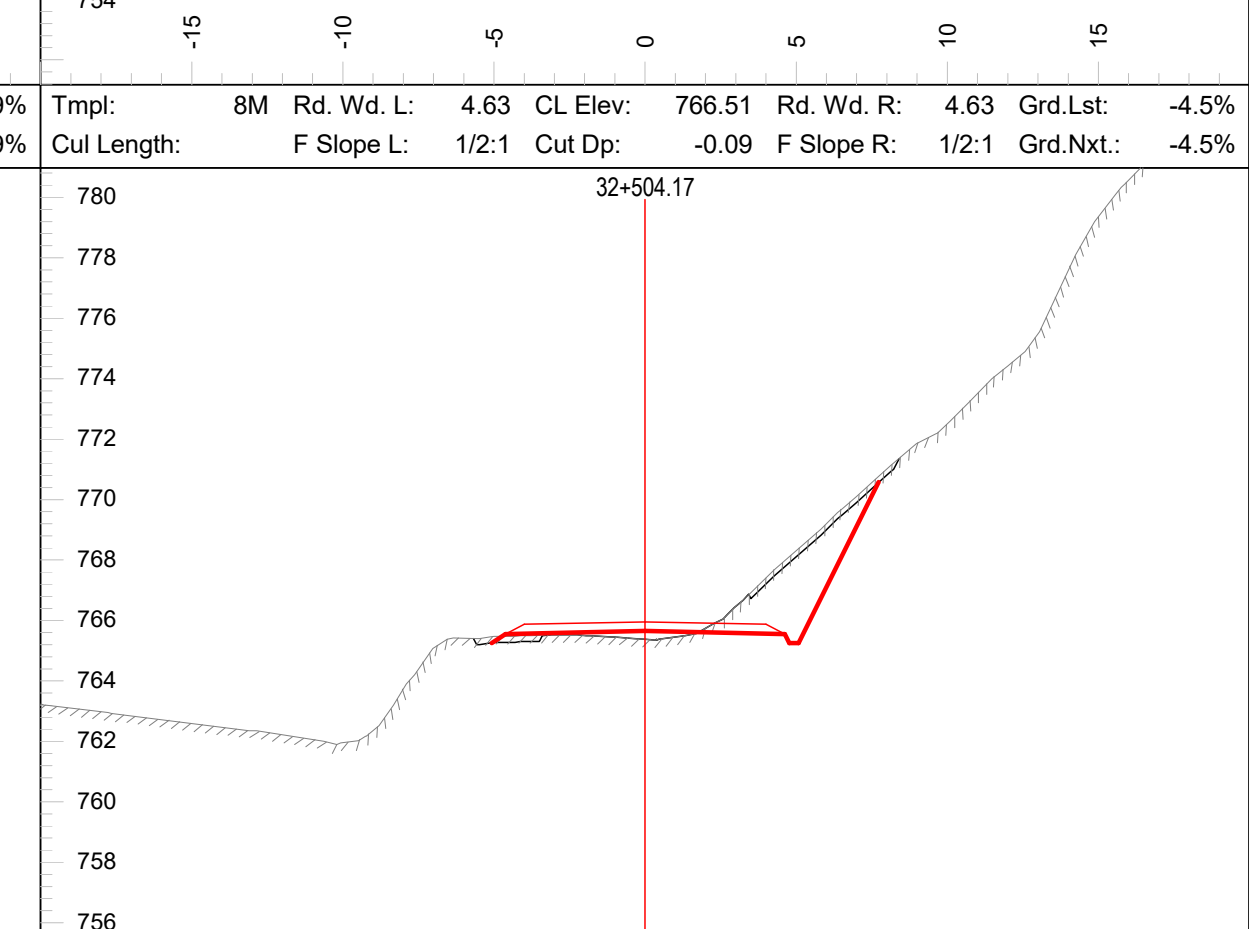
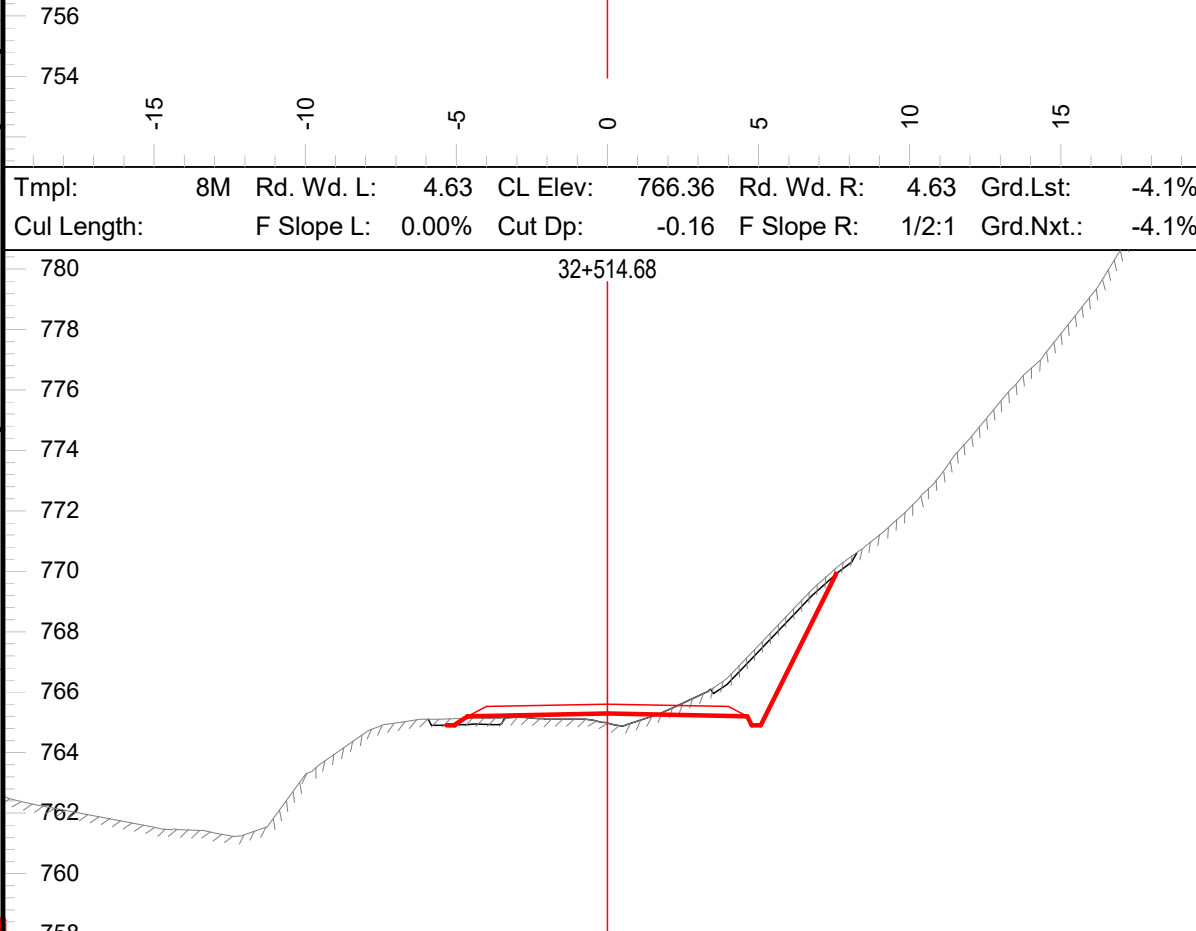
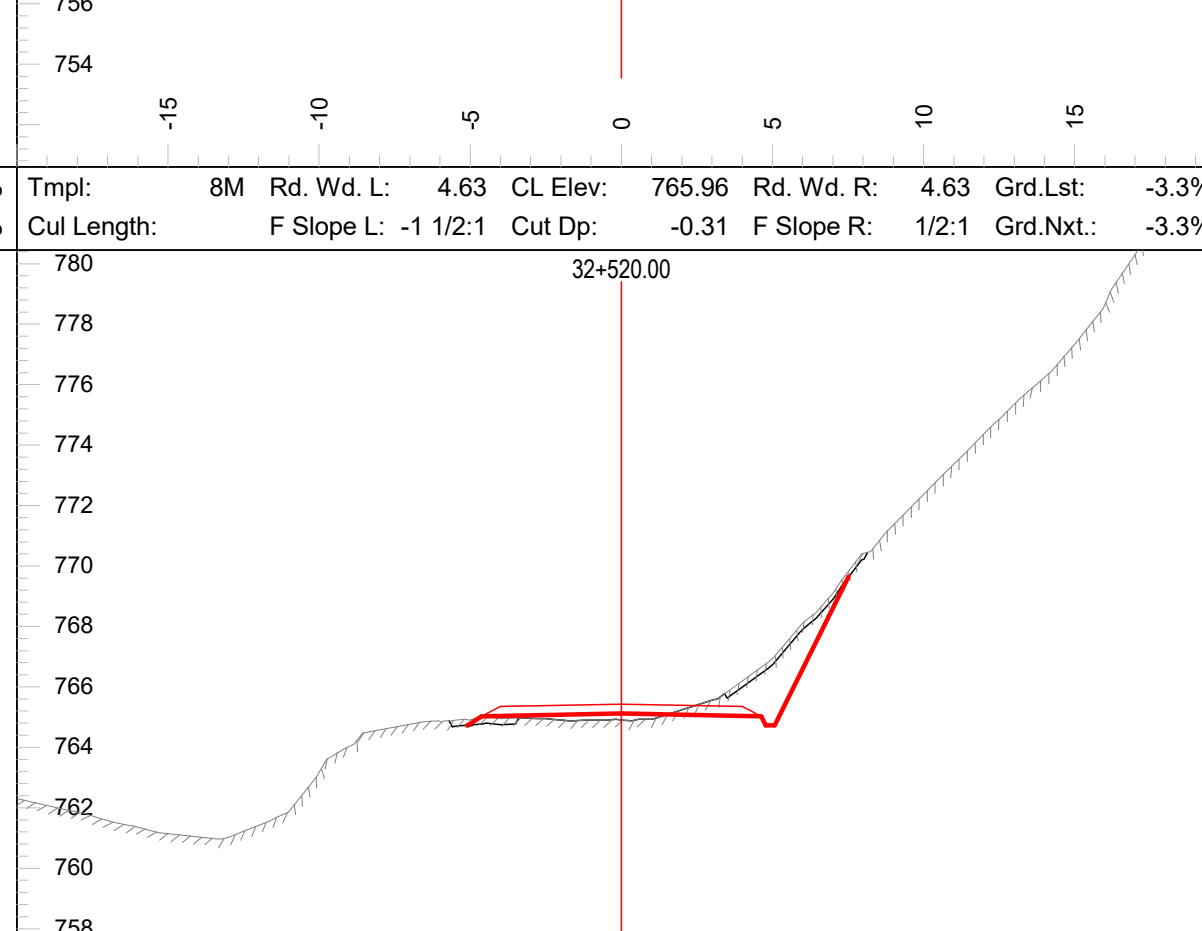
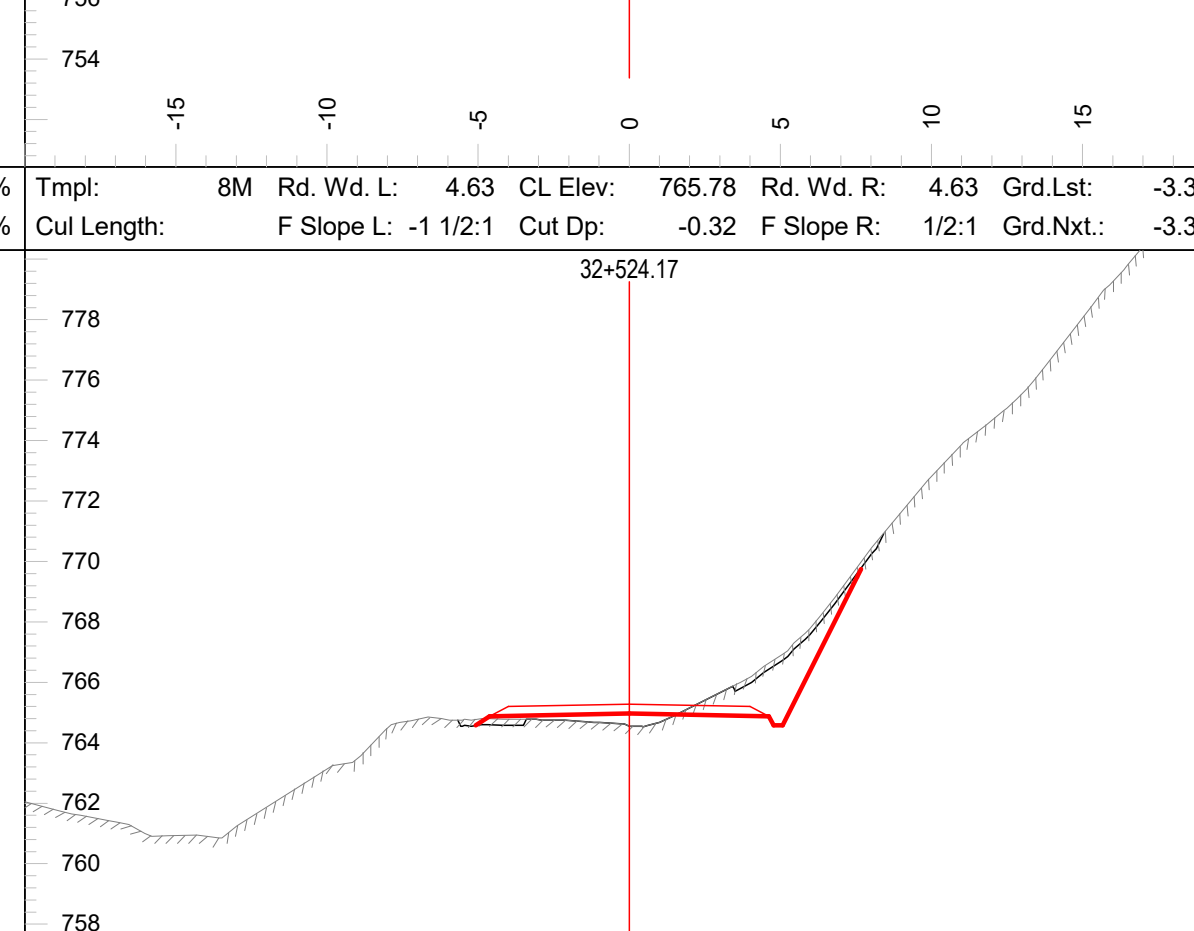
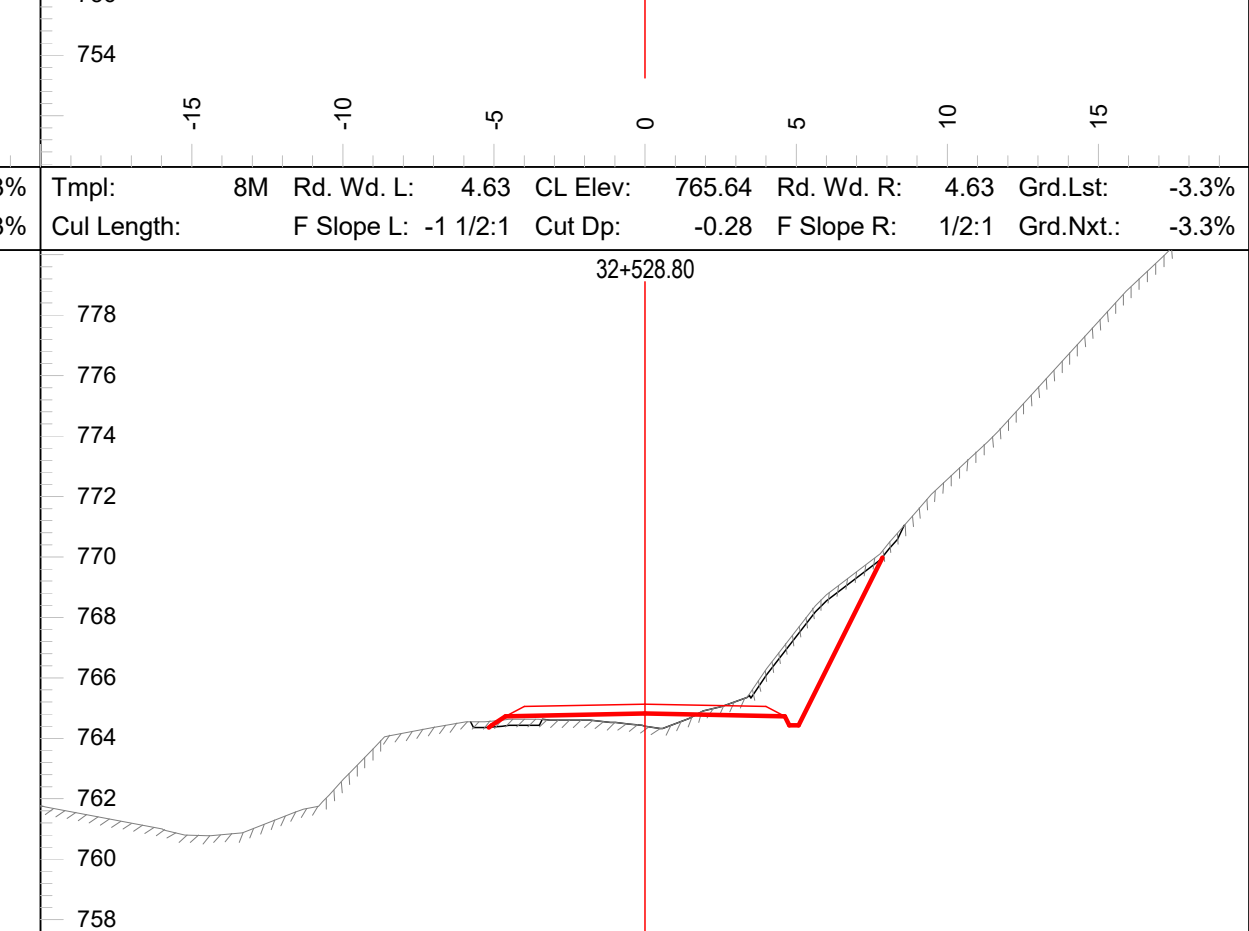
Survey By: see Notes above

Design By: Edward Folk, P.Eng.

Approved By:

Plot Date:16/06/29

Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-

 <div>Tmpl: 8M<->8WL2 Rd. Wd. L: 4.63 CL Elev: 768.50 Rd. Wd. R: 4.63 Grd.Lst: -2.6% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.61 F Slope R: 1/2:1 Grd.Nxt.: -2.6%</div>	 <div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 768.49 Rd. Wd. R: 4.63 Grd.Lst: -2.6% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.61 F Slope R: 1/2:1 Grd.Nxt.: -2.6%</div>	 <div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 768.32 Rd. Wd. R: 4.63 Grd.Lst: -3.2% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.54 F Slope R: 1/2:1 Grd.Nxt.: -3.2%</div>	 <div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 767.86 Rd. Wd. R: 4.63 Grd.Lst: -4.4% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.44 F Slope R: 1/2:1 Grd.Nxt.: -4.4%</div>
 <div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 767.49 Rd. Wd. R: 4.63 Grd.Lst: -4.9% Cul Length: F Slope L: 1/2:1 Cut Dp: -0.17 F Slope R: 1/2:1 Grd.Nxt.: -4.9%</div>	 <div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 767.31 Rd. Wd. R: 4.63 Grd.Lst: -4.9% Cul Length: F Slope L: 1/2:1 Cut Dp: -0.21 F Slope R: 1/2:1 Grd.Nxt.: -4.9%</div>	 <div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 766.89 Rd. Wd. R: 4.63 Grd.Lst: -4.9% Cul Length: F Slope L: 1/2:1 Cut Dp: -0.19 F Slope R: 1/2:1 Grd.Nxt.: -4.9%</div>	 <div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 766.51 Rd. Wd. R: 4.63 Grd.Lst: -4.5% Cul Length: F Slope L: 1/2:1 Cut Dp: -0.09 F Slope R: 1/2:1 Grd.Nxt.: -4.5%</div>
 <div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 766.36 Rd. Wd. R: 4.63 Grd.Lst: -4.1% Cul Length: F Slope L: 0.00% Cut Dp: -0.16 F Slope R: 1/2:1 Grd.Nxt.: -4.1%</div>	 <div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 765.96 Rd. Wd. R: 4.63 Grd.Lst: -3.3% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.31 F Slope R: 1/2:1 Grd.Nxt.: -3.3%</div>	 <div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 765.78 Rd. Wd. R: 4.63 Grd.Lst: -3.3% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.32 F Slope R: 1/2:1 Grd.Nxt.: -3.3%</div>	 <div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 765.64 Rd. Wd. R: 4.63 Grd.Lst: -3.3% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.28 F Slope R: 1/2:1 Grd.Nxt.: -3.3%</div>
 <div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 765.29 Rd. Wd. R: 4.63 Grd.Lst: -3.3% Cul Length: F Slope L: 0.00% Cut Dp: -0.33 F Slope R: 1/2:1 Grd.Nxt.: -3.3%</div>	 <div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 765.11 Rd. Wd. R: 4.63 Grd.Lst: -3.3% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.21 F Slope R: 1/2:1 Grd.Nxt.: -3.3%</div>	 <div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 764.97 Rd. Wd. R: 4.63 Grd.Lst: -3.3% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.42 F Slope R: 1/2:1 Grd.Nxt.: -3.3%</div>	 <div>Tmpl: TP<->8M Rd. Wd. L: 4.63 CL Elev: 764.82 Rd. Wd. R: 4.63 Grd.Lst: -3.3% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.42 F Slope R: 1/2:1 Grd.Nxt.: -3.3%</div>



Ministry of Forests, Lands and
Natural Resource Operations

Omenica Region

Prince George Resource District

Chuchinka-Colbourne FSR

Roadway Widening and Upgrade

Geometric Alignment

Km 31 to Km 33.6

Page 15 of 71

Stations: 32+533.75 to 32+649.67

ROAD DESIGN SPECIFICATIONS

Design Speed: 30 km/h
Avg. Stab. Road Width: 6.0m
Fav. Grade Max. 10%
Adv. Grade Max 10%

Section Scale 1:250

Project Location Coordinates

Latitude: 51-15-03
Longitude: -119-53-14
Elevation: 610m
Datum: NAD83
UTM Combined Scale Factor:
n/a

Notes:

- Ground model data obtained by Lidar Survey method by McElhanney Survey Consulting Ltd. Oct. 2013
-30km/h Speed Limit through the Canyon, remainder designed to minimum 60km/h.

Survey Control Stations

Point Name	Northing	Easting	Elevation	Description

Plan Legend (all may not be applicable)

L-line Location

Road Edges

Cleaning Limits

Culverts

GPS Base Station

Old Iron Bar found (tied)

Old Pipe Post found (tie)

Survey Control Points tie

Benchmark

Edge of Wetland

Existing Road Edges

Breakline

Powerline

Draw

Test Pit

Stream

Tension Crack

Timberline

Cut / Fill limits

Powerpole

Finished Road Surface

Profile Subgrade

Cut / Fill limits

Original Ground

1st Stratum

2nd Stratum (Rock)

Ditch Invert Right

Ditch Invert Left

EARTH WORK VOLUMES (Bank cubic meters)

L-Stn m.	Strip V. Cu. m.	SG Cut V. Cu. m.	SG Fill V. Cu. m.	B/W Vol. Cu. m.	Srf1 Fill V. Cu. m.
32+600.00					
32+800.00	284.3	1017.7	49.5	-1400.0	553.7
Pg. Tot.	284.3	1017.7	49.5		553.7
Cum. Tot.	2637.7	7144.1	3031.1		5223.1

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt
32+580.00	600	11.00	6.00	5.00	90.00000	xdrain

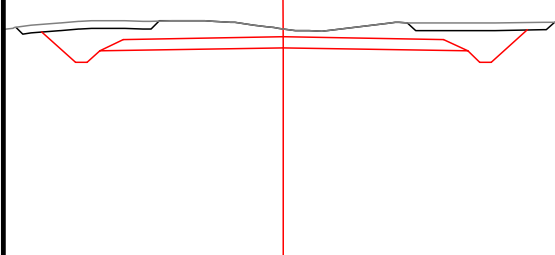
SOIL TYPES

OB - Overburden
OR - Organics
SL - Silt
FS - Fine Sand & Silt
SA - Sand
SG - Sand & Gravel
CG - Sand & Course Gravel
SC - Sand/Cobbles/Gravel
GR - Gravel
BO - Boulders
FR - Fractured Rock (Talus)
RR - Riprapable Rock
SR - Solid Rock

ROAD TEMPLATES

TP = Taper template
TO = Turnout Template
8M = 8.0m wide finished running surface
8WS = 8m wide finished running surface with retaining wall

Surfacing depth = 0.3m
Ditch Slopes = 1.5:1 Ditch Depth = 0.3 Width = 0.3
F Slope = Final Slope Left or Right



Prepared by:



Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

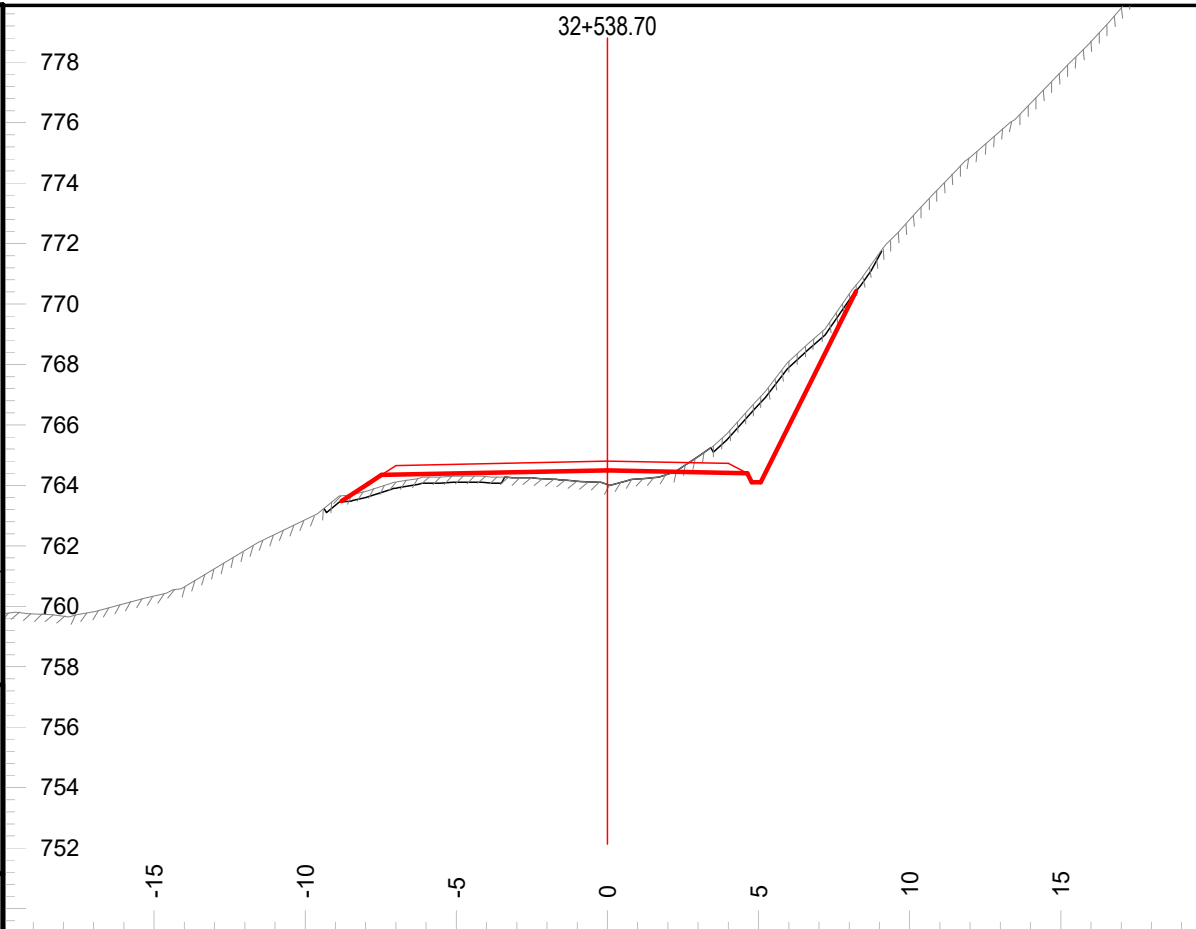
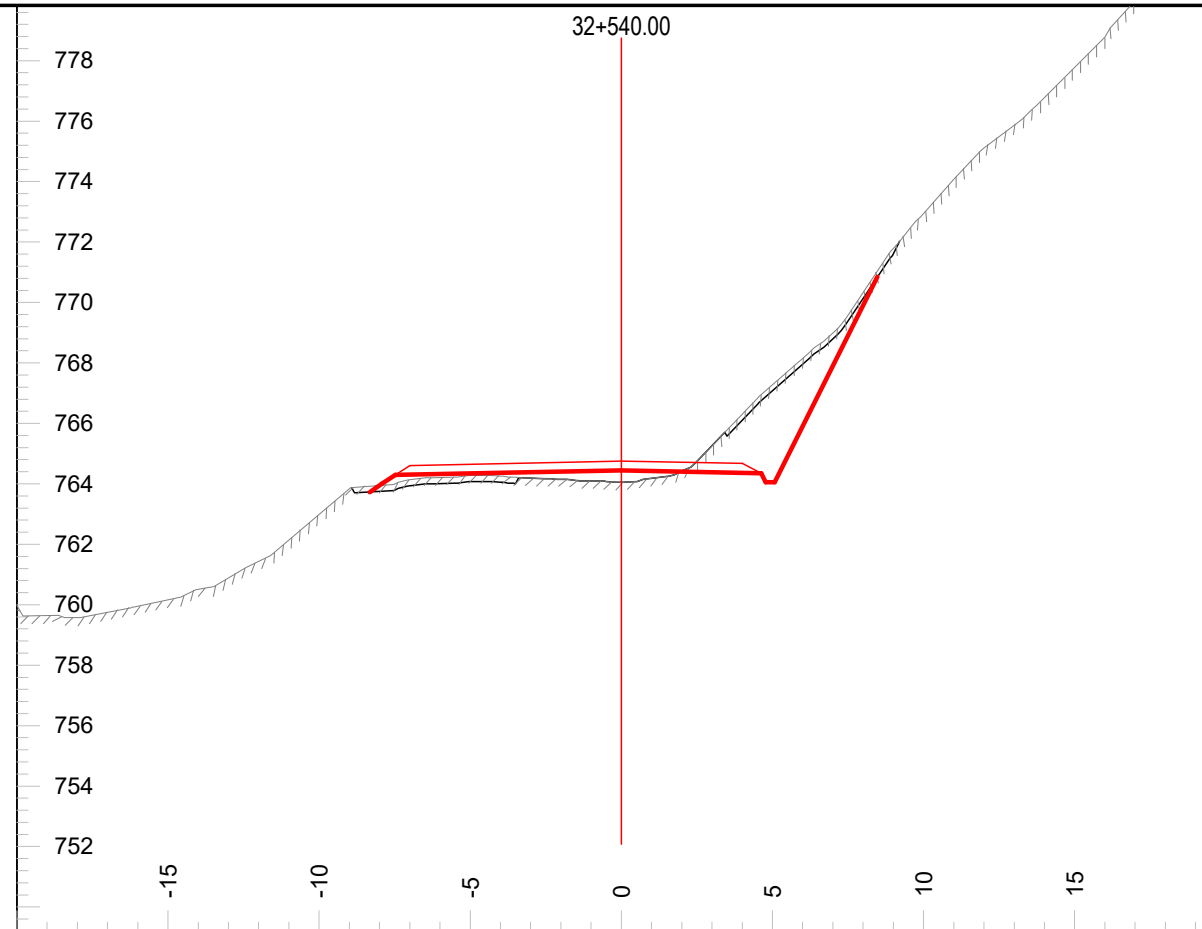
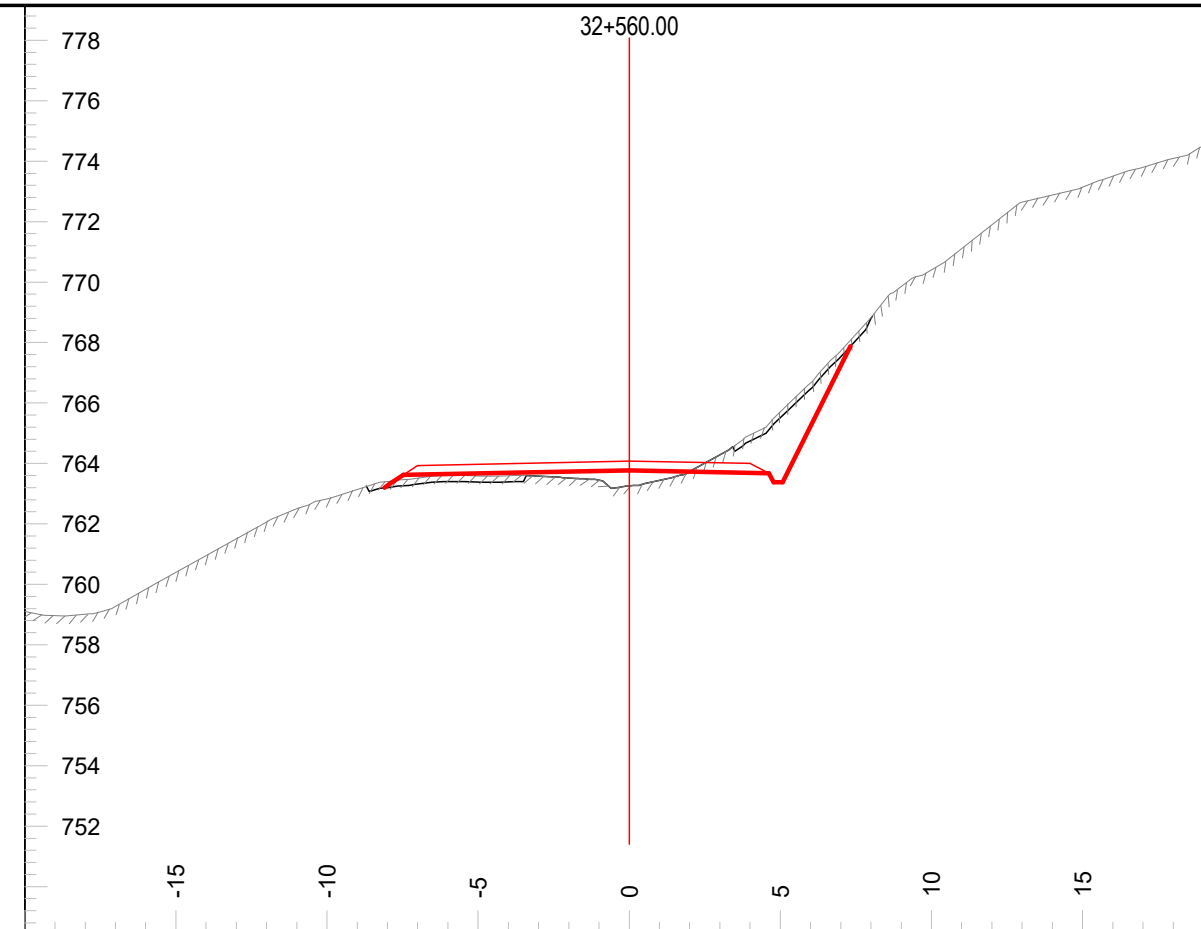
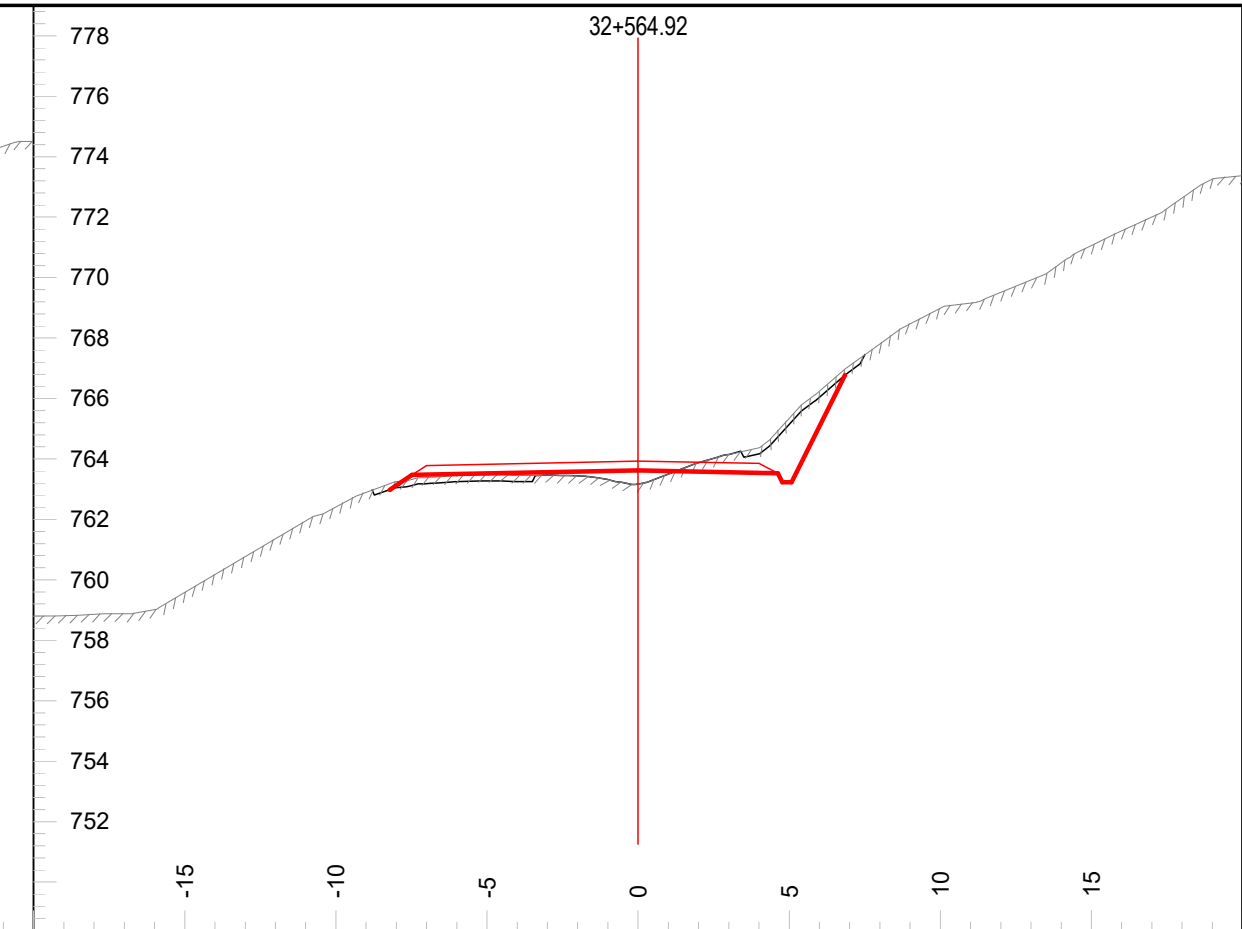
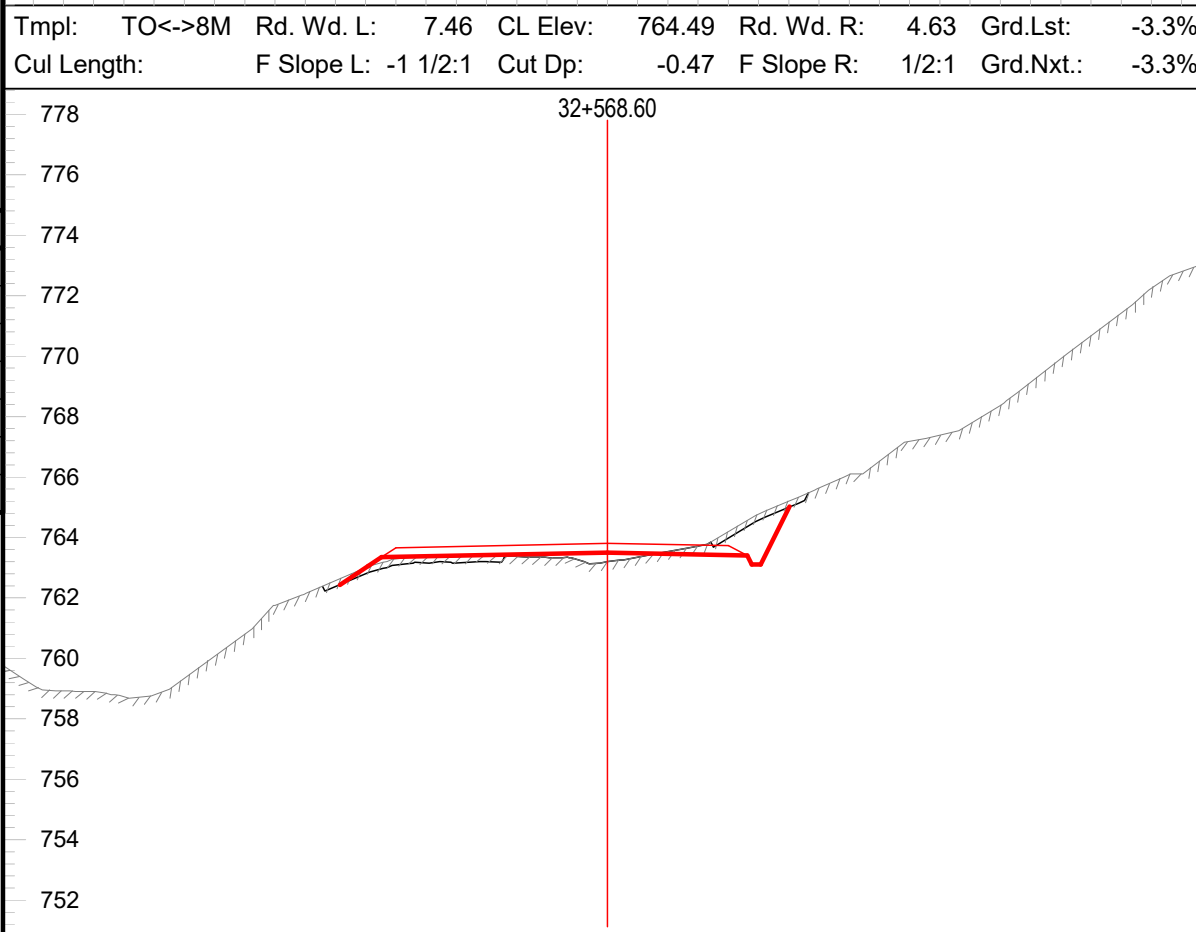
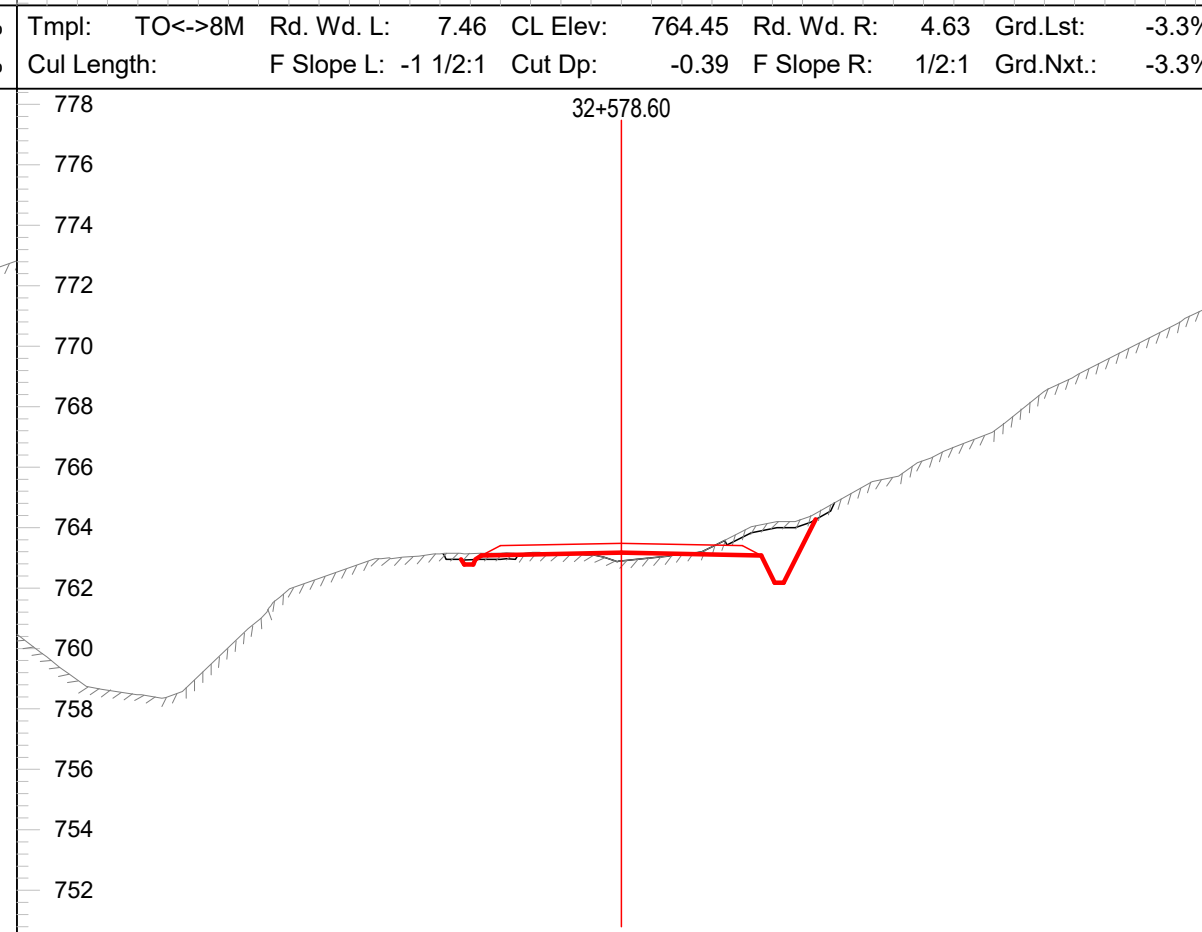
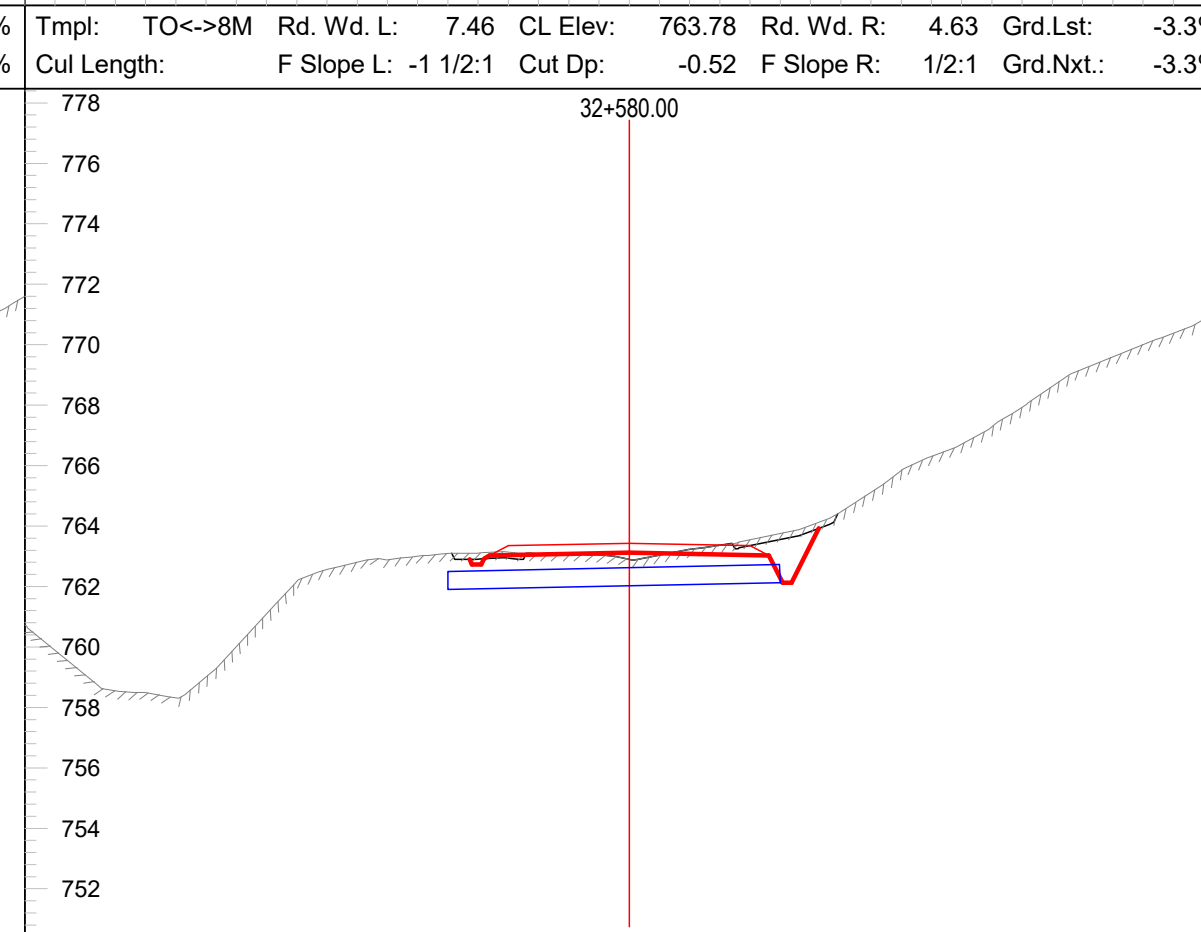
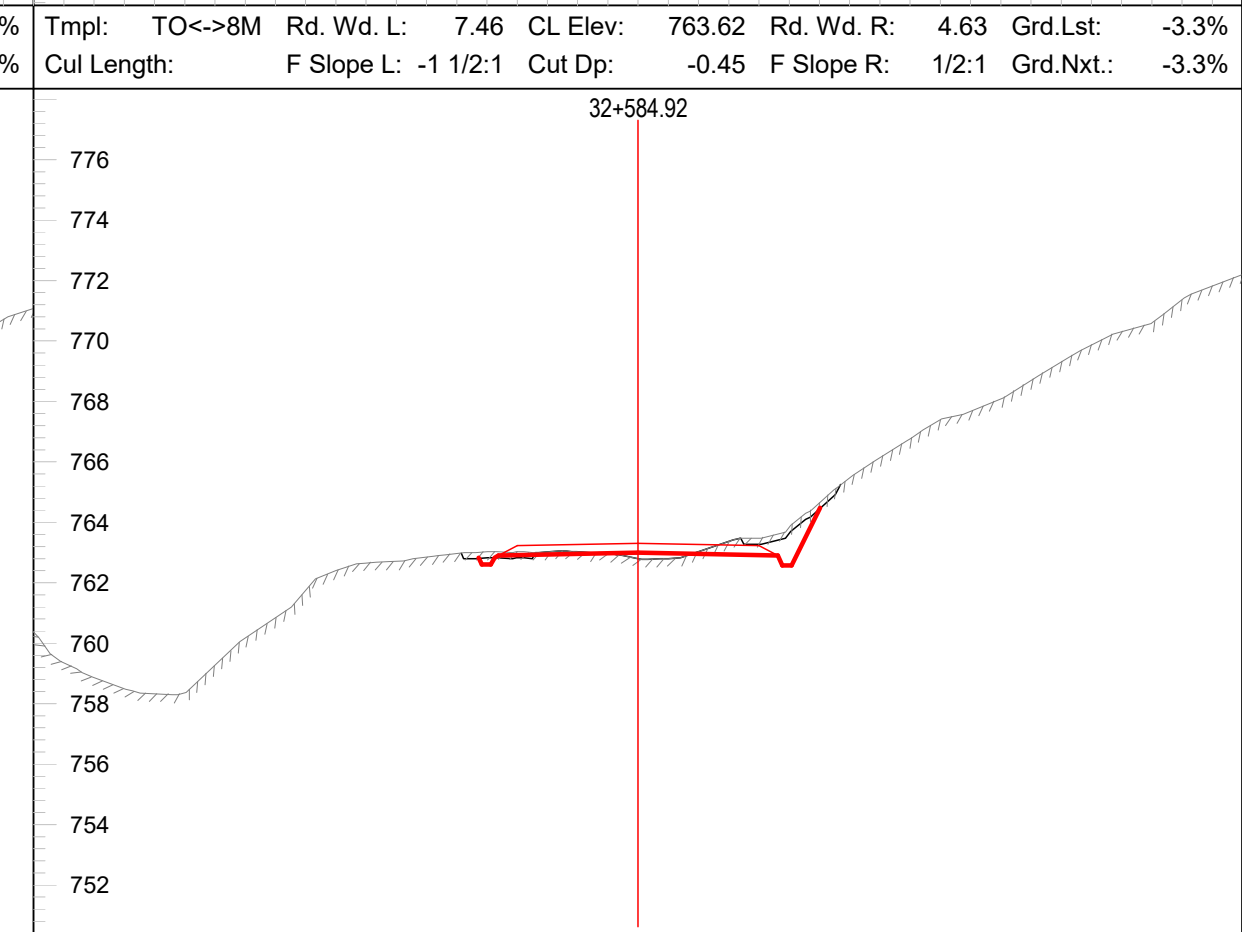
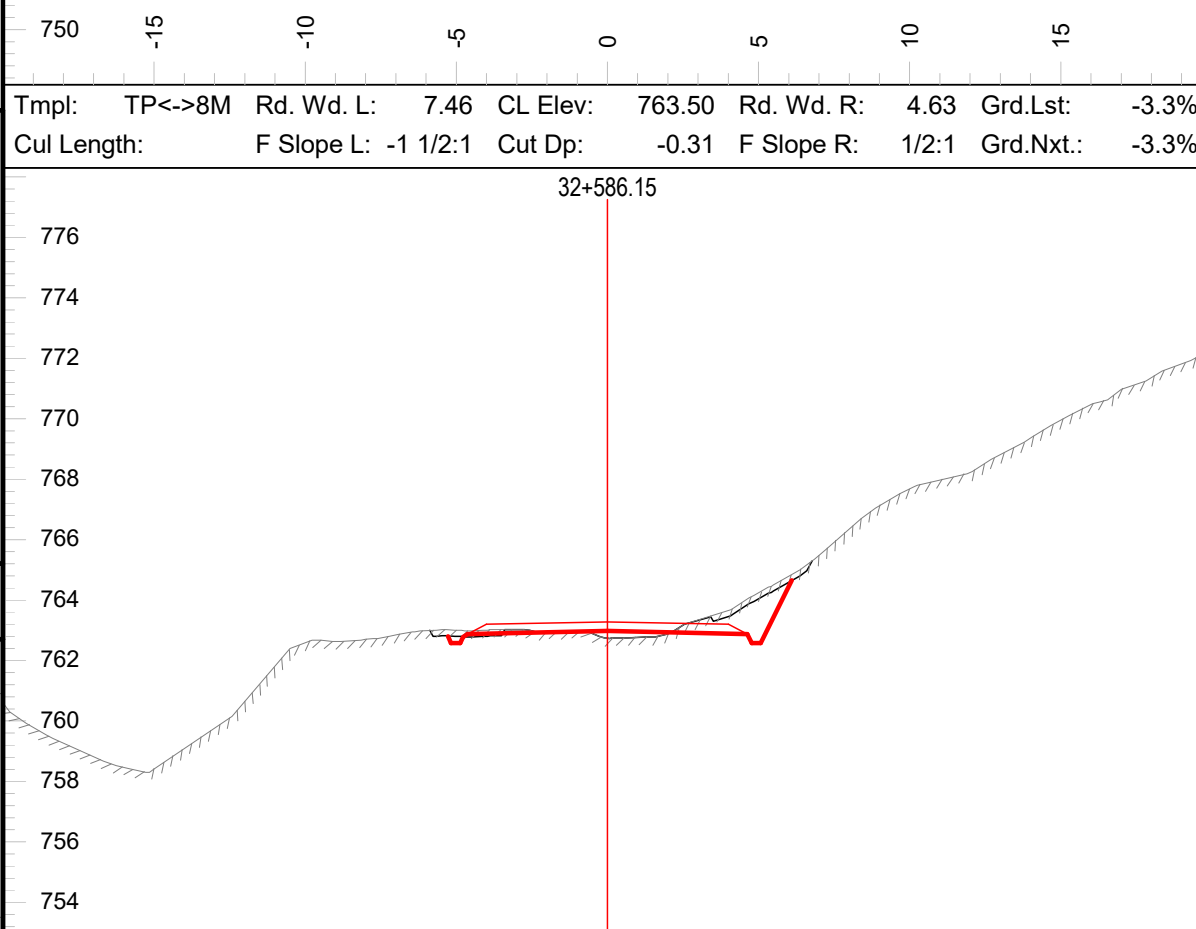
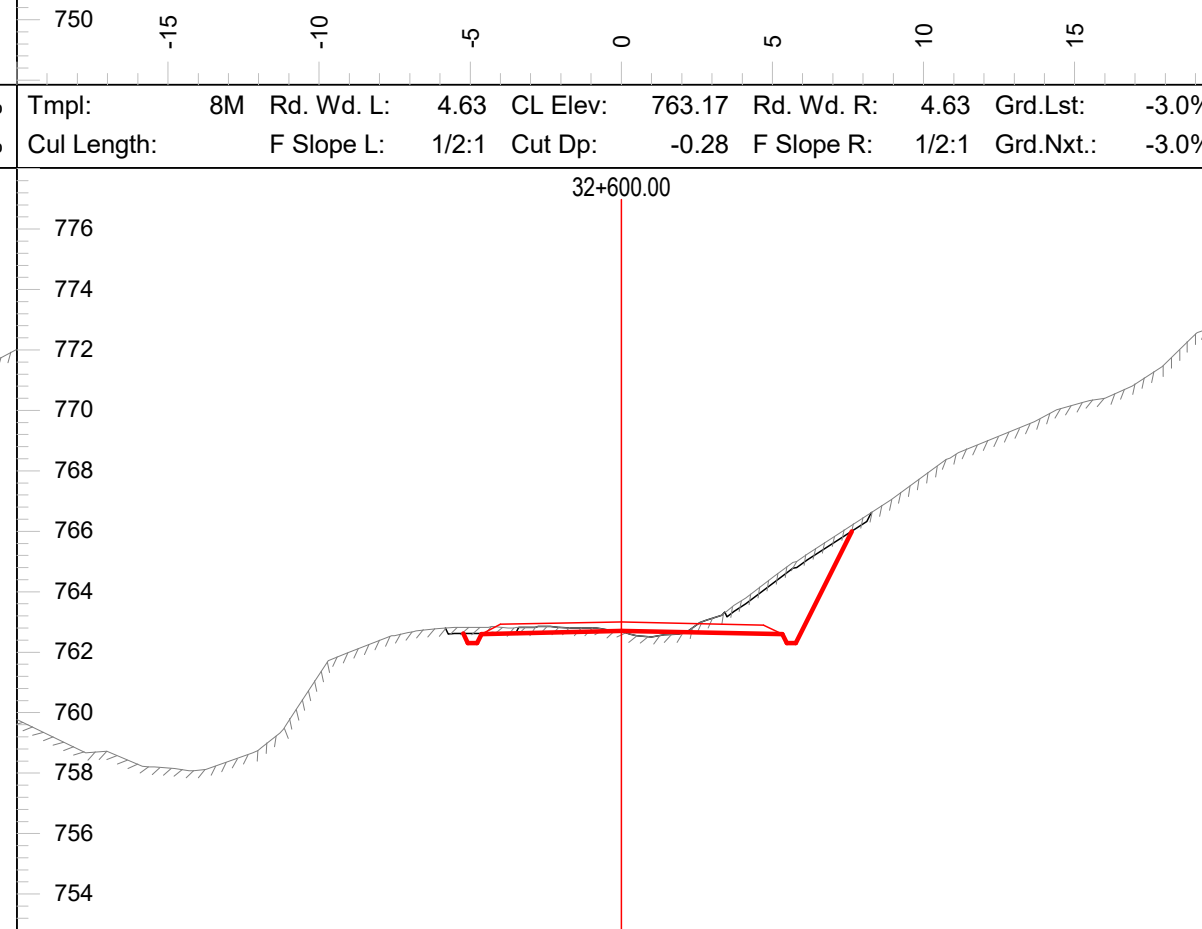
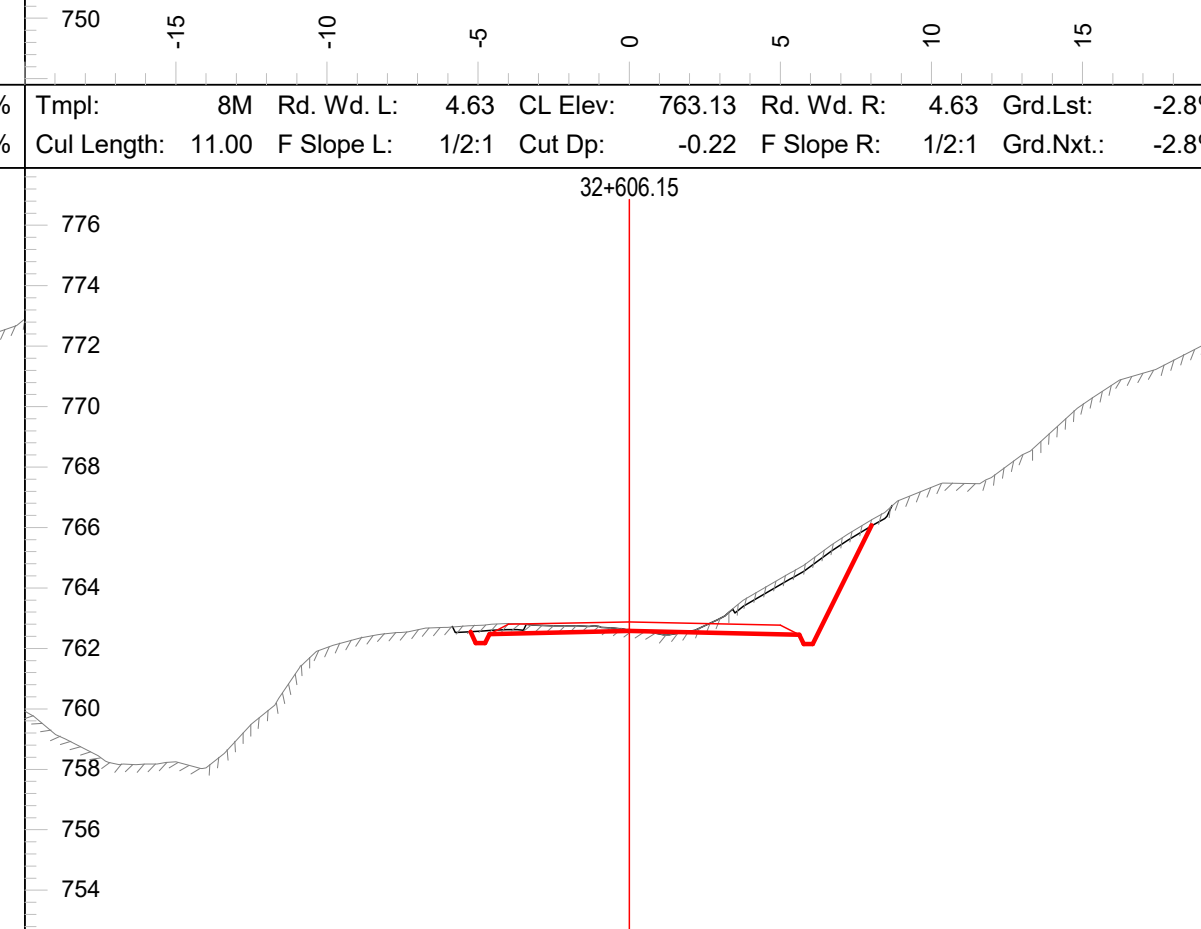
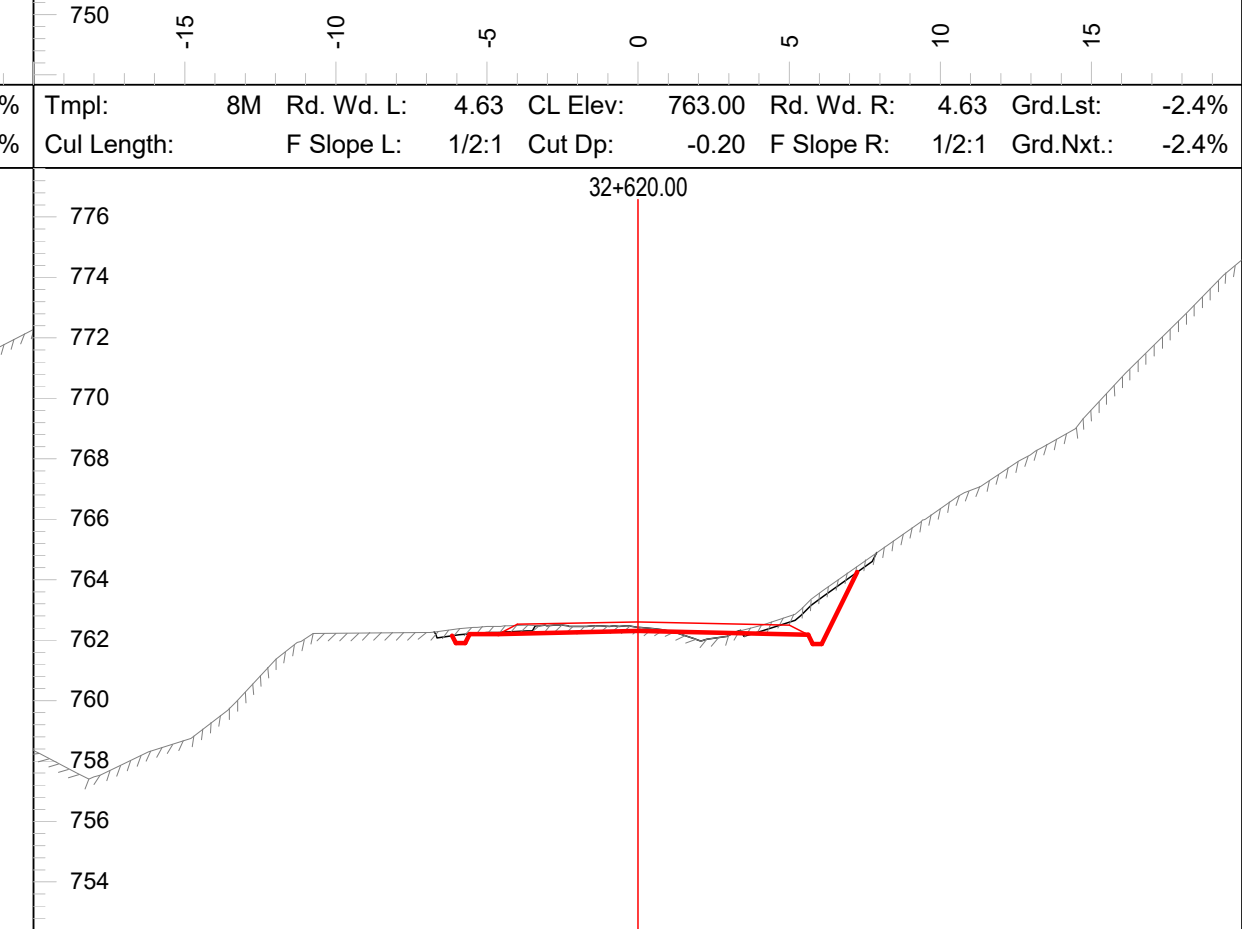
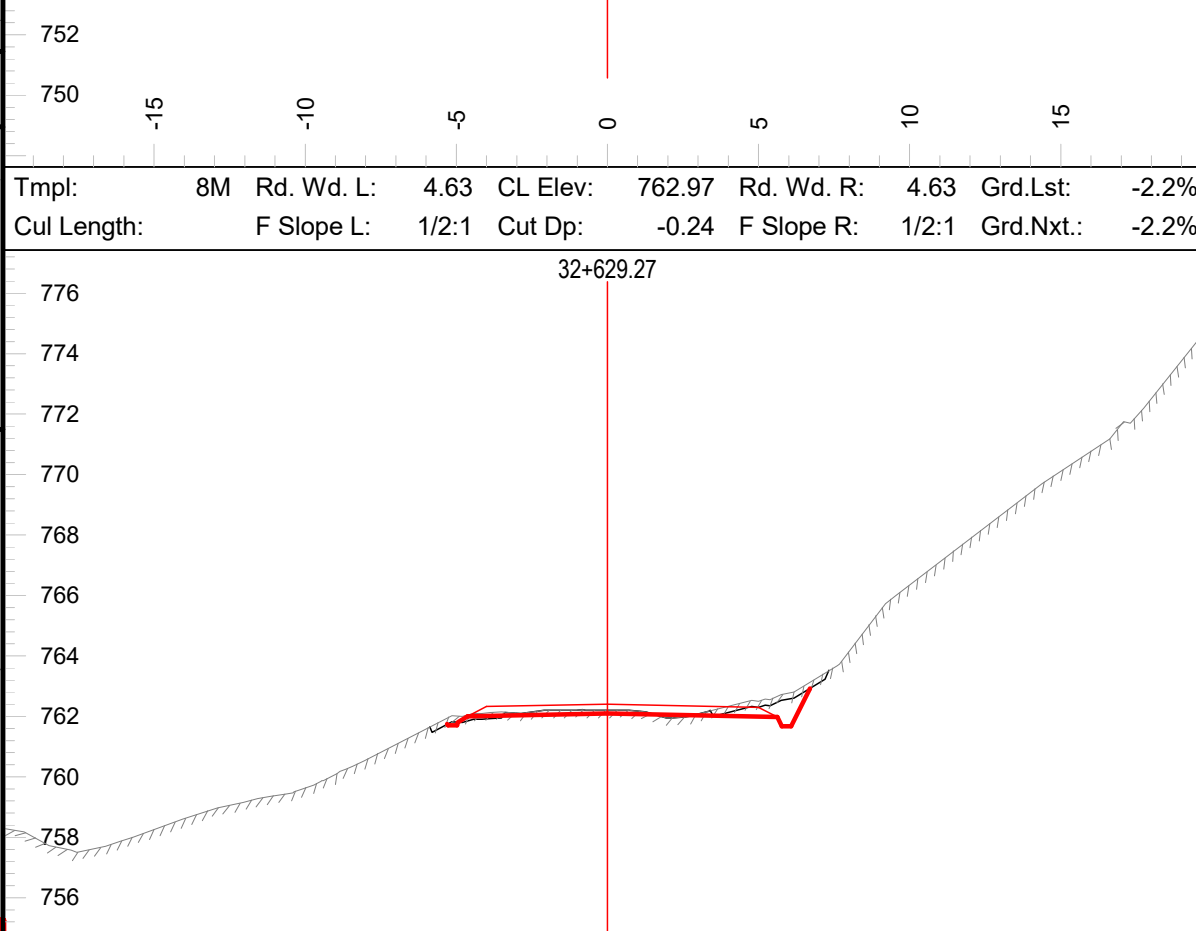
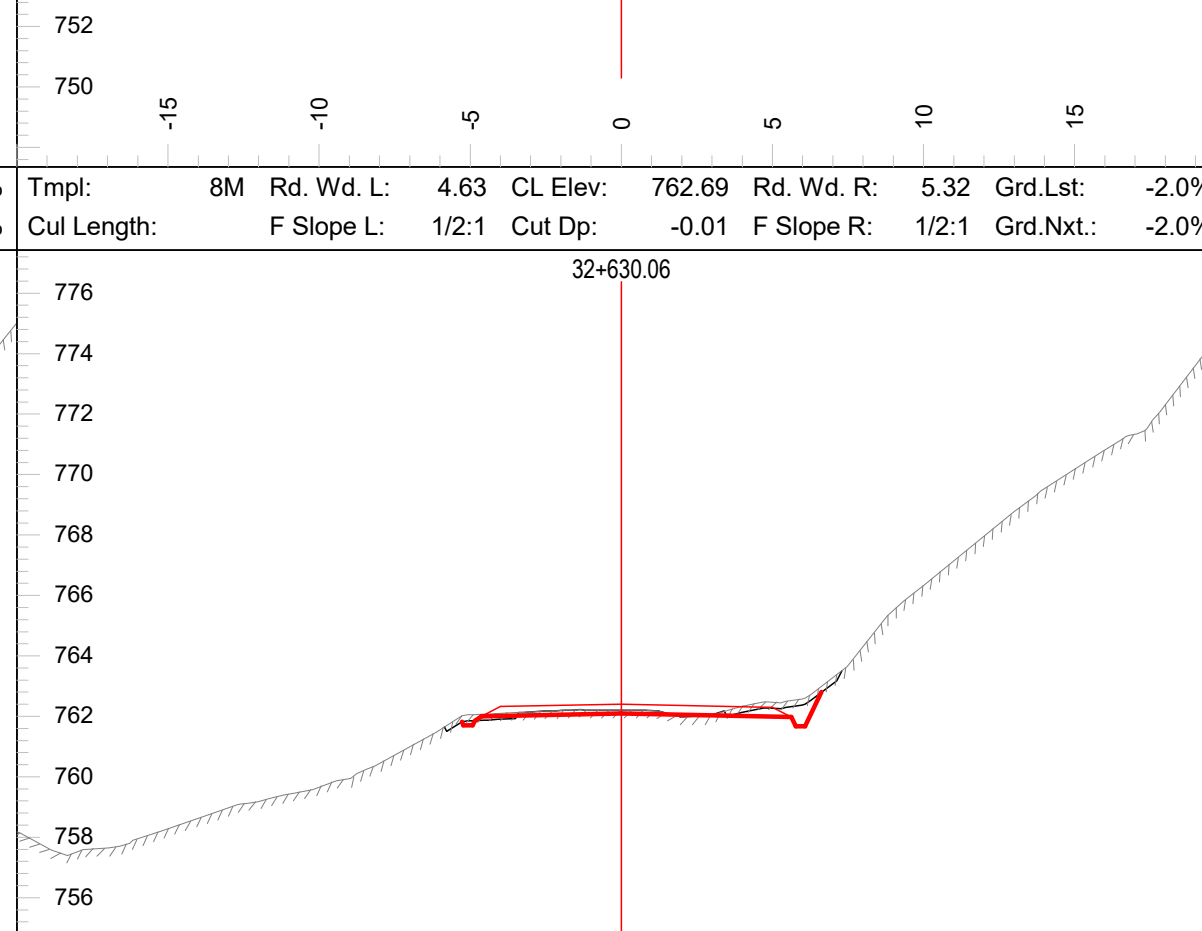
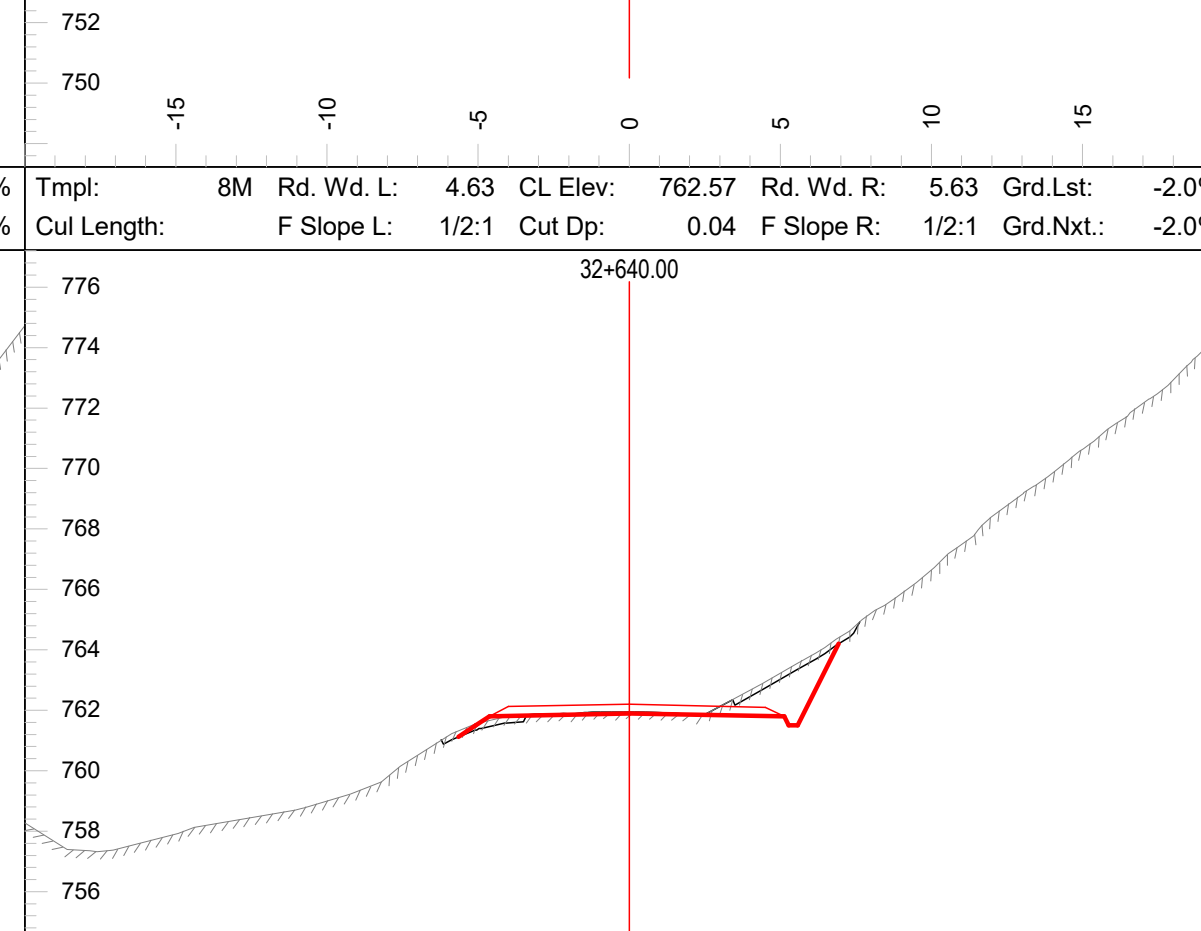
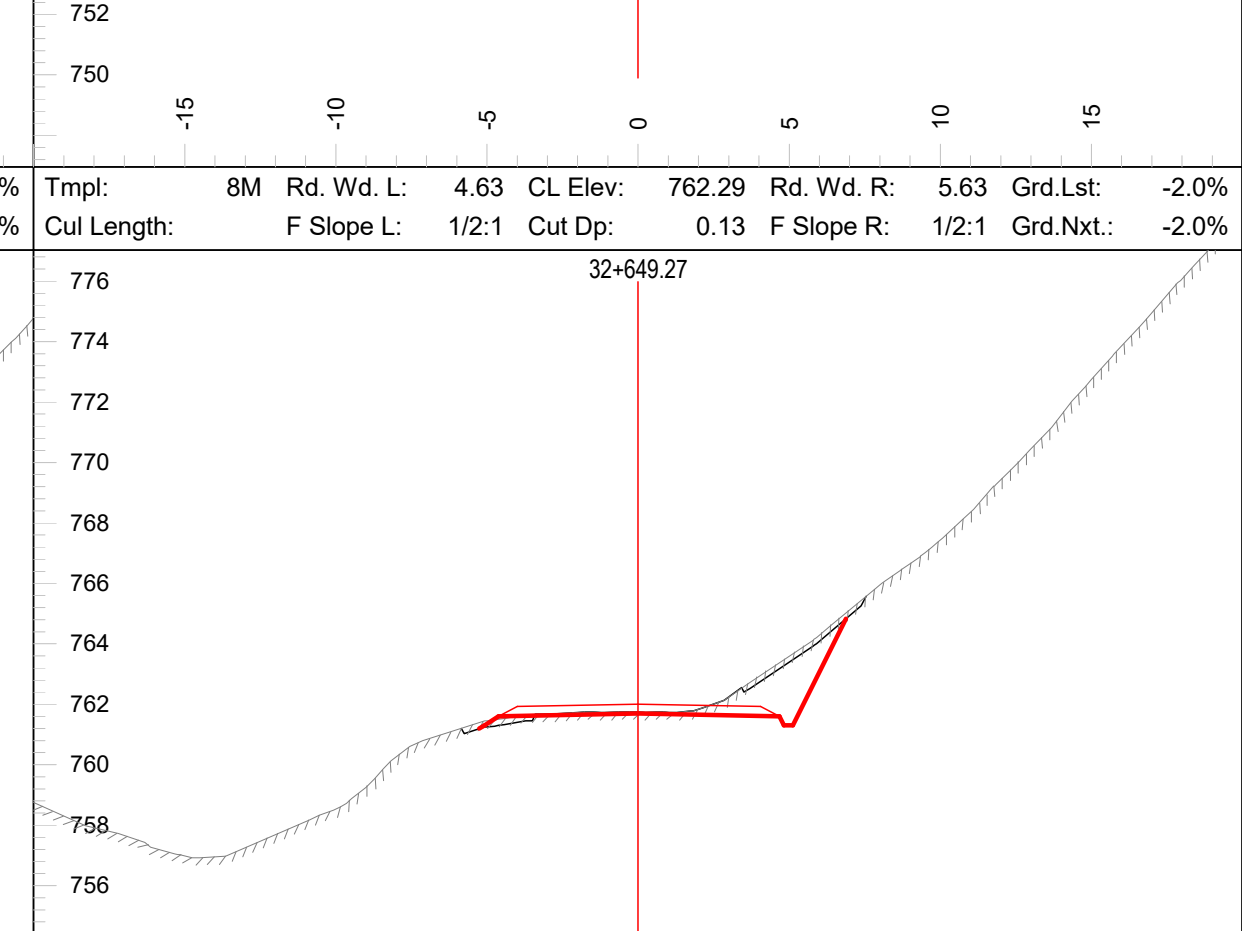
DRAFT
FOR REVIEW
PURPOSES ONLY

Dwg Num: 110-022-003

Survey By: see Notes above
Design By: Edward Folk, P.Eng.
Approved By:

Plot Date:16/06/29

Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-

 <div><div>32+538.70</div><div>Tmpl: TO<->8M Rd. Wd. L: 7.46 CL Elev: 764.49 Rd. Wd. R: 4.63 Grd.Lst: -3.3% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.47 F Slope R: 1/2:1 Grd.Nxt: -3.3%</div></div>	 <div><div>32+540.00</div><div>Tmpl: TO<->8M Rd. Wd. L: 7.46 CL Elev: 764.45 Rd. Wd. R: 4.63 Grd.Lst: -3.3% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.39 F Slope R: 1/2:1 Grd.Nxt: -3.3%</div></div>	 <div><div>32+540.00</div><div>Tmpl: TO<->8M Rd. Wd. L: 7.46 CL Elev: 763.78 Rd. Wd. R: 4.63 Grd.Lst: -3.3% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.52 F Slope R: 1/2:1 Grd.Nxt: -3.3%</div></div>	 <div><div>32+544.92</div><div>Tmpl: TO<->8M Rd. Wd. L: 7.46 CL Elev: 763.62 Rd. Wd. R: 4.63 Grd.Lst: -3.3% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.45 F Slope R: 1/2:1 Grd.Nxt: -3.3%</div></div>
 <div><div>32+568.60</div><div>Tmpl: TP<->8M Rd. Wd. L: 7.46 CL Elev: 763.50 Rd. Wd. R: 4.63 Grd.Lst: -3.3% Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.31 F Slope R: 1/2:1 Grd.Nxt: -3.3%</div></div>	 <div><div>32+578.60</div><div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 763.17 Rd. Wd. R: 4.63 Grd.Lst: -3.0% Cul Length: F Slope L: 1/2:1 Cut Dp: -0.28 F Slope R: 1/2:1 Grd.Nxt: -3.0%</div></div>	 <div><div>32+580.00</div><div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 763.13 Rd. Wd. R: 4.63 Grd.Lst: -2.8% Cul Length: 11.00 F Slope L: 1/2:1 Cut Dp: -0.22 F Slope R: 1/2:1 Grd.Nxt: -2.8%</div></div>	 <div><div>32+584.92</div><div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 763.00 Rd. Wd. R: 4.63 Grd.Lst: -2.4% Cul Length: F Slope L: 1/2:1 Cut Dp: -0.20 F Slope R: 1/2:1 Grd.Nxt: -2.4%</div></div>
 <div><div>32+588.15</div><div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 762.97 Rd. Wd. R: 4.63 Grd.Lst: -2.2% Cul Length: F Slope L: 1/2:1 Cut Dp: -0.24 F Slope R: 1/2:1 Grd.Nxt: -2.2%</div></div>	 <div><div>32+600.00</div><div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 762.69 Rd. Wd. R: 5.32 Grd.Lst: -2.0% Cul Length: F Slope L: 1/2:1 Cut Dp: -0.01 F Slope R: 1/2:1 Grd.Nxt: -2.0%</div></div>	 <div><div>32+606.15</div><div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 762.57 Rd. Wd. R: 5.63 Grd.Lst: -2.0% Cul Length: F Slope L: 1/2:1 Cut Dp: 0.04 F Slope R: 1/2:1 Grd.Nxt: -2.0%</div></div>	 <div><div>32+620.00</div><div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 762.29 Rd. Wd. R: 5.63 Grd.Lst: -2.0% Cul Length: F Slope L: 1/2:1 Cut Dp: 0.13 F Slope R: 1/2:1 Grd.Nxt: -2.0%</div></div>
 <div><div>32+629.27</div><div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 762.10 Rd. Wd. R: 5.63 Grd.Lst: -2.0% Cul Length: F Slope L: 1/2:1 Cut Dp: 0.10 F Slope R: 1/2:1 Grd.Nxt: -2.0%</div></div>	 <div><div>32+630.06</div><div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 762.09 Rd. Wd. R: 5.63 Grd.Lst: -2.0% Cul Length: F Slope L: 1/2:1 Cut Dp: 0.09 F Slope R: 1/2:1 Grd.Nxt: -2.0%</div></div>	 <div><div>32+640.00</div><div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 761.89 Rd. Wd. R: 5.13 Grd.Lst: -2.0% Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.05 F Slope R: 1/2:1 Grd.Nxt: -2.0%</div></div>	 <div><div>32+649.27</div><div>Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 761.70 Rd. Wd. R: 4.66 Grd.Lst: -2.0% Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.04 F Slope R: 1/2:1 Grd.Nxt: -2.0%</div></div>



Ministry of Forests, Lands and
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Prince George Resource District

Chuchinka-Colbourne FSR

Roadway Widening and Upgrade

Geometric Alignment

Km 31 to Km 33.6

Page 16 of 71

Stations: 32+649.67 to 32+782.00

ROAD DESIGN SPECIFICATIONS

Design Speed: 30 km/h
Avg. Stab. Road Width: 6.0m
Fav. Grade Max. 10%
Adv. Grade Max 10%

Section Scale 1:250

Project Location Coordinates

Latitude: 51-15-03
Longitude: -119-53-14
Elevation: 610m
Datum: NAD83
UTM Combined Scale Factor:
n/a

Notes:
- Ground model data obtained by Lidar Survey method by McElhanney Survey Consulting Ltd. Oct. 2013
-30km/h Speed Limit through the Canyon, remainder designed to minimum 60km/h.

Survey Control Stations

Point Name	Northing	Easting	Elevation	Description

Plan Legend (all may not be applicable)

L-line Location

Road Edges

Cleaning Limits

Culverts

GPS Base Station

Old Iron Bar found (tied)

Old Pipe Post found (tie)

Survey Control Points tie

Benchmark

Edge of Wetland

Existing Road Edges

Breakline

Powerline

Draw

Test Pit

Stream

Tension Crack

Timberline

Cut / Fill limits

Powerpole

Finished Road Surface

Profile Subgrade

Cut / Fill limits

Original Ground

1st Stratum

2nd Stratum (Rock)

Ditch Invert Right

Ditch Invert Left

EARTH WORK VOLUMES (Bank cubic meters)

L-Stn m.	Strip V. Cu. m.	SG Cut V. Cu. m.	SG Fill V. Cu. m.	B/W Vol. Cu. m.	Srf1 Fill V. Cu. m.
32+800.00					
Pg. Tot.	0.0	0.0	0.0		0.0
Cum. Tot.	2637.7	7144.1	3031.1		5223.1

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt
32+706.14	600	12.00	7.00	5.00	90.00000	xdrain

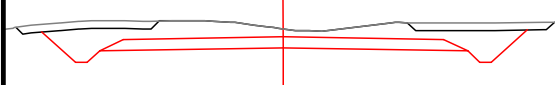
SOIL TYPES

OB - Overburden
OR - Organics
SL - Silt
FS - Fine Sand & Silt
SA - Sand
SG - Sand & Gravel
CG - Sand & Course Gravel
SC - Sand/Cobbles/Gravel
GR - Gravel
BO - Boulders
FR - Fractured Rock (Talus)
RR - Ripplable Rock
SR - Solid Rock

ROAD TEMPLATES

TP = Taper template
TO = Turnout Template
8M = 8.0m wide finished running surface
8WS = 8m wide finished running surface with retaining wall

Surfacing depth = 0.3m
Ditch Slopes = 1.5:1 Ditch Depth = 0.3 Width = 0.3
F Slope = Final Slope Left or Right



Prepared by:



Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

DRAFT
FOR REVIEW
PURPOSES ONLY

Dwg Num: 110-022-003

Survey By: see Notes above

Design By: Edward Folk, P.Eng.

Approved By:

Plot Date:16/06/29

Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-

776

774

772

770

768

766

764

762

760

758

756

754

752

750

32+650.06

-15

-10

5

0

5

10

15

Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 761.69 Rd. Wd. R: 4.63 Grd.Lst: -2.0%

Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.03 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

776

774

772

770

768

766

764

762

760

758

756

754

752

750

32+660.00

-15

-10

5

0

5

10

15

Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 761.49 Rd. Wd. R: 4.63 Grd.Lst: -2.0%

Cul Length: F Slope L: 1/2:1 Cut Dp: 0.05 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

774

772

770

768

766

764

762

760

758

756

754

752

750

32+680.00

-15

-10

5

0

5

10

15

Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 761.08 Rd. Wd. R: 4.63 Grd.Lst: -2.0%

Cul Length: F Slope L: 1/2:1 Cut Dp: 0.00 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

774

772

770

768

766

764

762

760

758

756

754

752

750

32+700.00

-15

-10

5

0

5

10

15

Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 760.68 Rd. Wd. R: 4.63 Grd.Lst: -2.0%

Cul Length: F Slope L: 1/2:1 Cut Dp: -0.08 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

774

772

770

768

766

764

762

760

758

756

754

752

750

32+706.14

-15

-10

5

0

5

10

15

Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 760.56 Rd. Wd. R: 4.63 Grd.Lst: -2.0%

Cul Length: 12.00 F Slope L: 1/2:1 Cut Dp: -0.07 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

774

772

770

768

766

764

762

760

758

756

754

752

750

32+720.00

-15

-10

5

0

5

10

15

Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 760.28 Rd. Wd. R: 4.63 Grd.Lst: -2.0%

Cul Length: F Slope L: 1/2:1 Cut Dp: -0.02 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

774

772

770

768

766

764

762

760

758

756

754

752

750

32+727.05

-15

-10

5

0

5

10

15

Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 760.14 Rd. Wd. R: 4.63 Grd.Lst: -2.0%

Cul Length: F Slope L: 1/2:1 Cut Dp: 0.01 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

774

772

770

768

766

764

762

760

758

756

754

752

750

32+732.89

-15

-10

5

0

5

10

15

Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 760.02 Rd. Wd. R: 4.63 Grd.Lst: -2.0%

Cul Length: F Slope L: 1/2:1 Cut Dp: 0.08 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

774

772

770

768

766

764

762

760

758

756

754

752

750

32+740.00

-15

-10

5

0

5

10

15

Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 759.88 Rd. Wd. R: 4.63 Grd.Lst: -2.0%

Cul Length: F Slope L: 1/2:1 Cut Dp: 0.17 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

774

772

770

768

766

764

762

760

758

756

754

752

750

32+742.00

-15

-10

5

0

5

10

15

Tmpl: TP<->8M Rd. Wd. L: 4.63 CL Elev: 759.83 Rd. Wd. R: 4.63 Grd.Lst: -2.0%

Cul Length: F Slope L: 1/2:1 Cut Dp: 0.14 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

774

772

770

768

766

764

762

760

758

756

754

752

750

32+747.05

-15

-10

5

0

5

10

15

Tmpl: TP<->8M Rd. Wd. L: 5.64 CL Elev: 759.73 Rd. Wd. R: 4.63 Grd.Lst: -2.0%

Cul Length: F Slope L: 1/2:1 Cut Dp: 0.23 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

774

772

770

768

766

764

762

760

758

756

754

752

750

32+752.89

-15

-10

5

0

5

10

15

Tmpl: TP<->8M Rd. Wd. L: 6.83 CL Elev: 759.62 Rd. Wd. R: 4.63 Grd.Lst: -2.0%

Cul Length: F Slope L: 1/2:1 Cut Dp: 0.26 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

774

772

770

768

766

764

762

760

758

756

754

752

750

32+756.00

-15

-10

5

0

5

10

15

Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 759.55 Rd. Wd. R: 4.63 Grd.Lst: -2.0%

Cul Length: F Slope L: 1/2:1 Cut Dp: 0.26 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

774

772

770

768

766

764

762

760

758

756

754

752

750

32+760.00

-15

-10

5

0

5

10

15

Tmpl: TO<->8M Rd. Wd. L: 7.46 CL Elev: 759.47 Rd. Wd. R: 4.63 Grd.Lst: -2.0%

Cul Length: F Slope L: 1/2:1 Cut Dp: 0.20 F Slope R: 1/2:1 Grd.Nxt.: -2.0%

774

772

770

768

766

764

762

760

758

756

754

752

750

32+770.00

-15

-10

5

0

5

10

15

Tmpl: TP<->8M Rd. Wd. L: 7.46 CL Elev: 759.27 Rd. Wd. R: 4.63 Grd.Lst: -2.3%

Cul Length: F Slope L: 1/2:1 Cut Dp: 0.11 F Slope R: 1/2:1 Grd.Nxt.: -2.3%

772

770

768

766

764

762

760

758

756

754

752

750

748

32+780.00

-15

-10

5

0

5

10

15

Tmpl: TP<->8M Rd. Wd. L: 5.43 CL Elev: 759.00 Rd. Wd. R: 4.63 Grd.Lst: -2.7%

Cul Length: F Slope L: 1/2:1 Cut Dp: 0.08 F Slope R: 1/2:1 Grd.Nxt.: -2.7%



Ministry of Forests, Lands and
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Prince George Resource District

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Roadway Widening and Upgrade
Geometric Alignment
Km 31 to Km 33.6

Page 17 of 71

Stations: 32+782.00 to 32+942.60

ROAD DESIGN SPECIFICATIONS

Design Speed: 30 km/h
Avg. Stab. Road Width: 6.0m
Fav. Grade Max. 10%
Adv. Grade Max 10%

Section Scale 1:250

Project Location Coordinates

Latitude: 51-15-03
Longitude: -119-53-14
Elevation: 610m
Datum: NAD83
UTM Combined Scale Factor:
n/a

Notes:

- Ground model data obtained by Lidar Survey method by McElhanney Survey Consulting Ltd. Oct. 2013
-30km/h Speed Limit through the Canyon, remainder designed to minimum 60km/h.

Survey Control Stations

Point Name	Northing	Easting	Elevation	Description

Plan Legend (all may not be applicable)

L-line Location

Road Edges

Clearing Limits

Culverts

GPS Base Station

Old Iron Bar found (tied)

Old Pipe Post found (tie)

Survey Control Points tie

Benchmark

Edge of Wetland

Existing Road Edges

Breakline

Powerline

Draw

Test Pit

Stream

Tension Crack

Timberline

Cut / Fill limits

Powerpole

Finished Road Surface

Profile Subgrade

Cut / Fill limits

Original Ground

1st Stratum

2nd Stratum (Rock)

Ditch Invert Right

Ditch Invert Left

EARTH WORK VOLUMES (Bank cubic meters)

L-Stn m.	Strip V. Cu. m.	SG Cut V. Cu. m.	SG Fill V. Cu. m.	B/W Vol. Cu. m.	Srf1 Fill V. Cu. m.
32+800.00 33+000.00	250.2	941.3	113.1	-1315.0	517.5
Pg. Tot.	250.2	941.3	113.1		517.5
Cum. Tot.	2887.9	8085.4	3144.2		5740.6

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt
32+853.80 32+922.63	600 600	11.00 13.00	6.00 7.50	5.00 5.50	90.00000 110.00000	

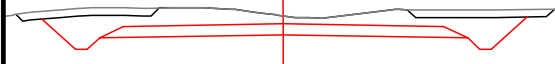
SOIL TYPES

OB - Overburden
OR - Organics
SL - Silt
FS - Fine Sand & Silt
SA - Sand
SG - Sand & Gravel
CG - Sand & Course Gravel
SC - Sand/Cobbles/Gravel
GR - Gravel
BO - Boulders
FR - Fractured Rock (Talus)
RR - Riprapable Rock
SR - Solid Rock

ROAD TEMPLATES

TP = Taper template
TO = Turnout Template
8M = 8.0m wide finished running surface
8WS = 8m wide finished running surface with retaining wall

Surfacing depth = 0.3m
Ditch Slopes = 1.5:1 Ditch Depth = 0.3 Width = 0.3
F Slope = Final Slope Left or Right



Prepared by:


Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

DRAFT
FOR REVIEW
PURPOSES ONLY

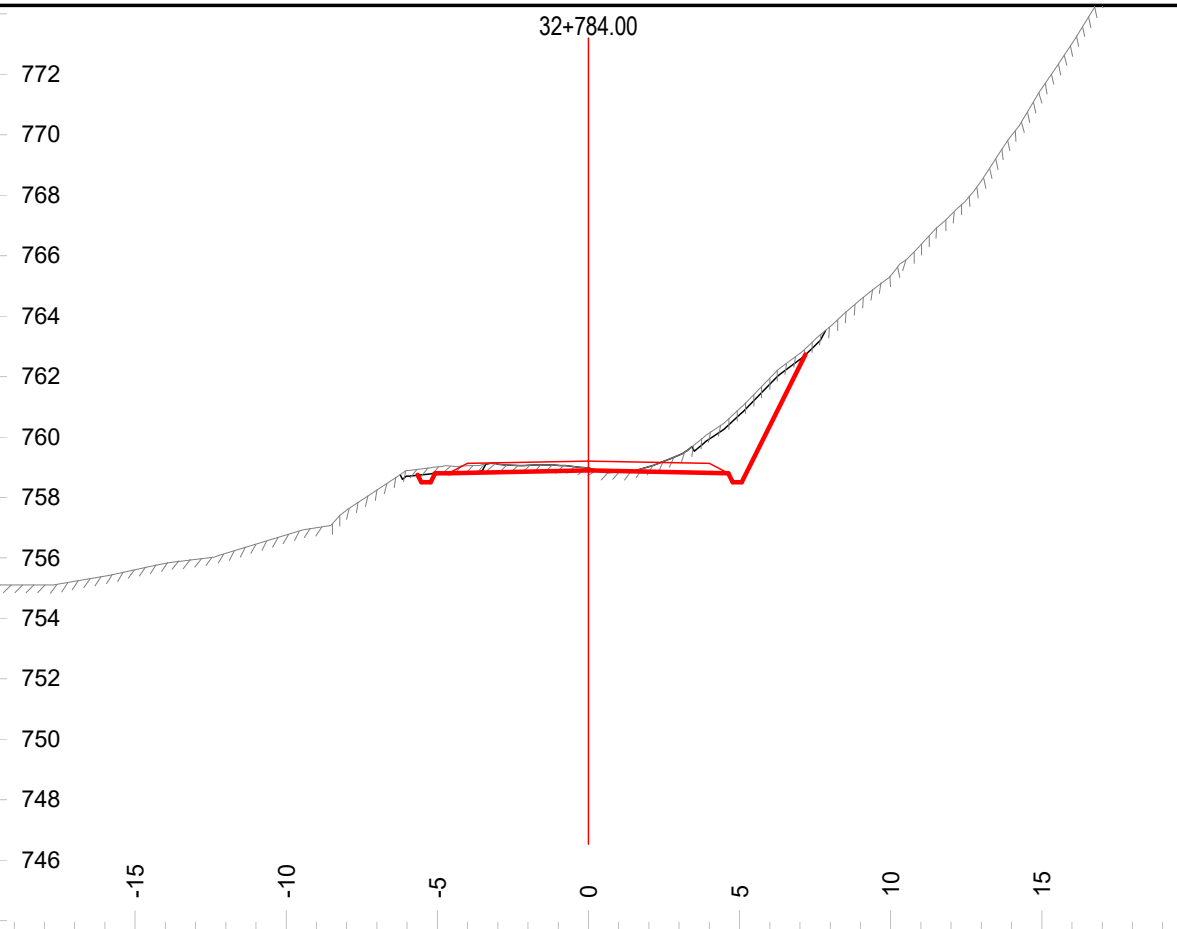
Dwg Num: 110-022-003

Survey By: see Notes above
Design By: Edward Folk, P.Eng.
Approved By:

Plot Date:16/06/29

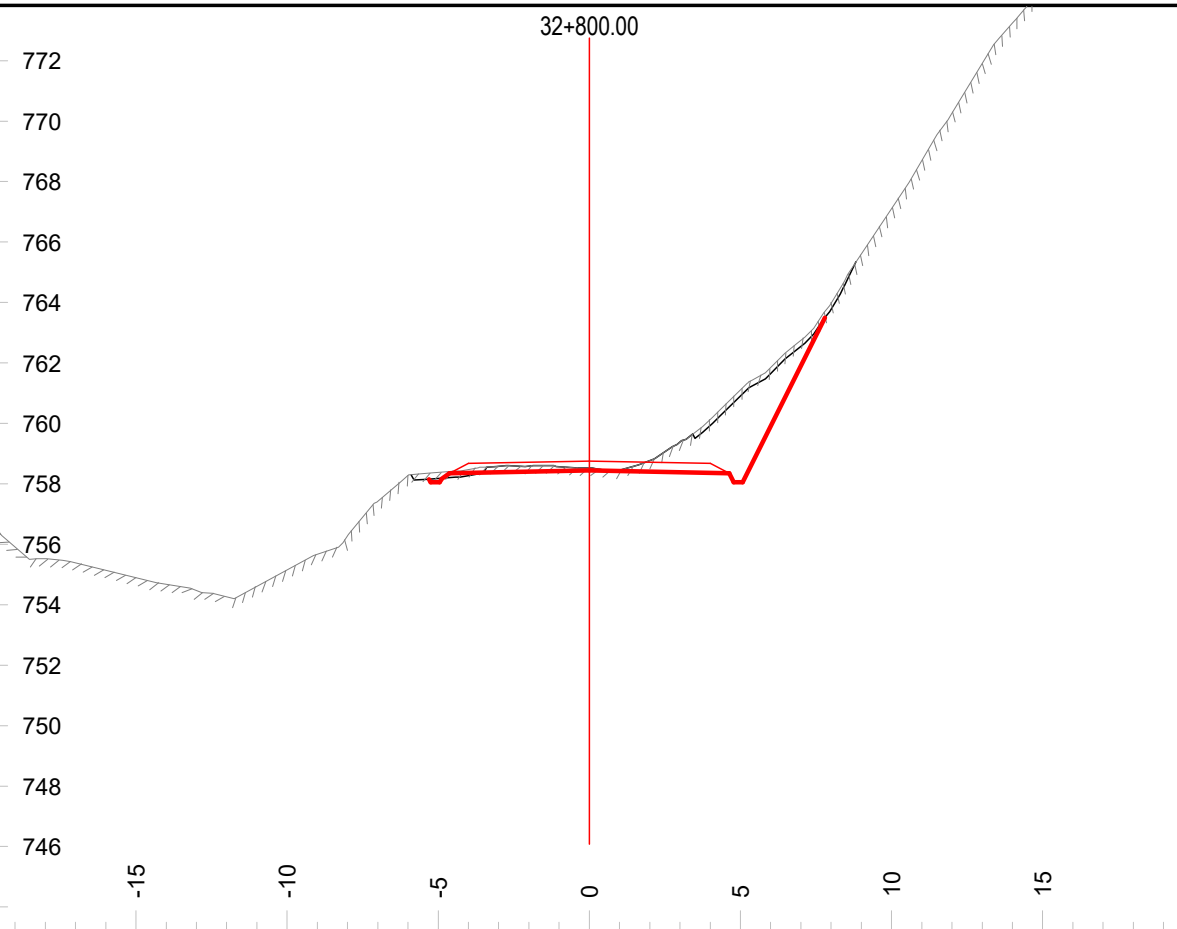
Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-

32+784.00



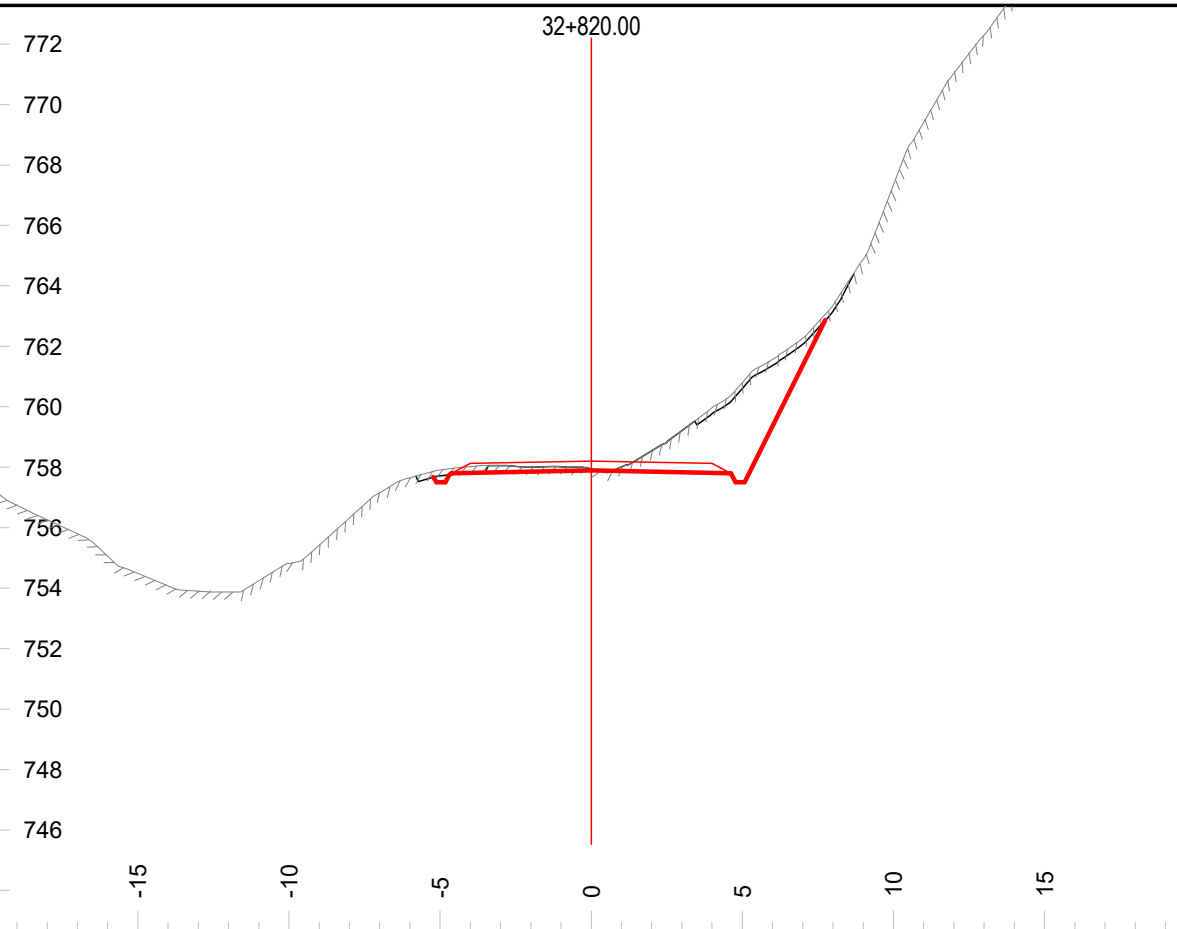
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Cul Length: F Slope L: 1/2:1 Cut Dp: 0.07 F Slope R: 1/2:1 Grd.Nxt.: -2.7%

32+800.00



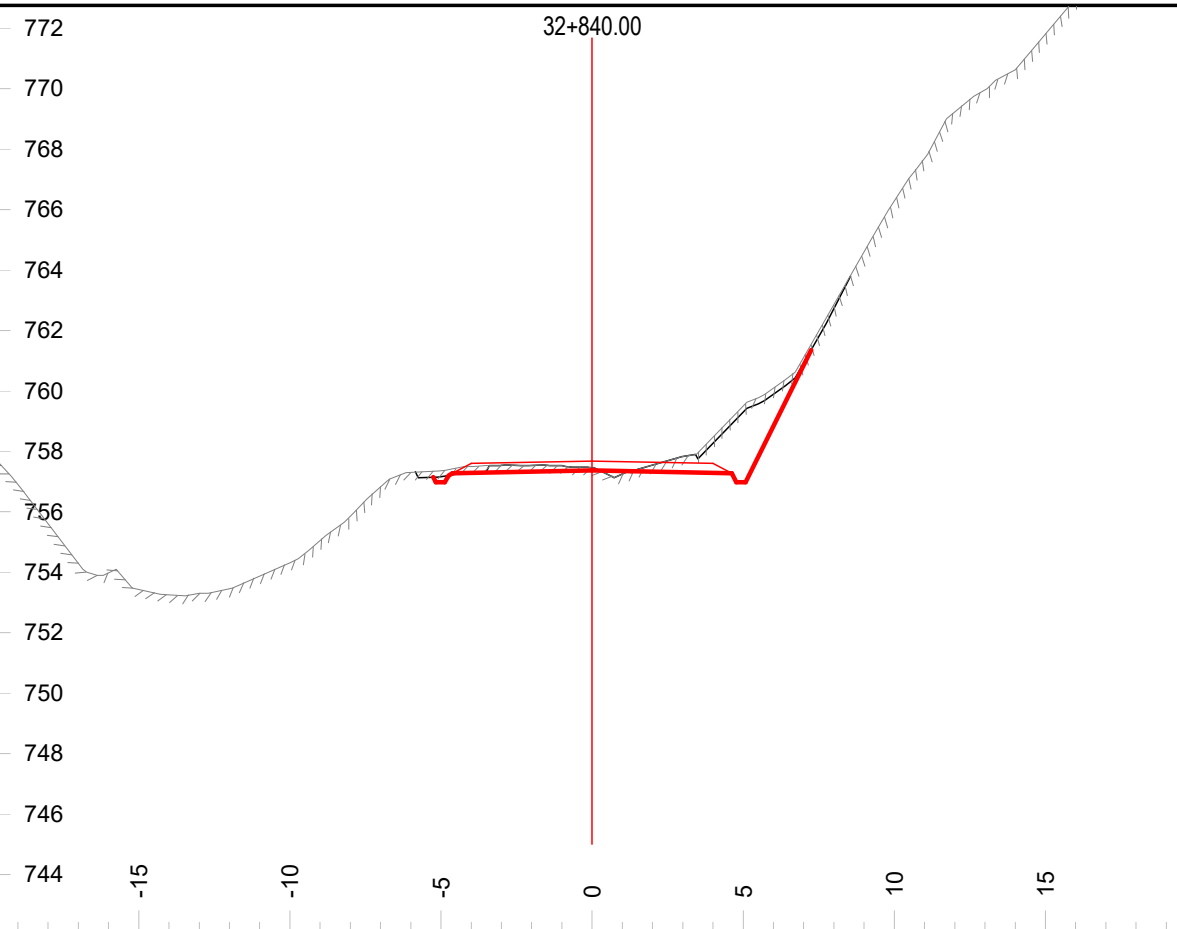
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Cul Length: F Slope L: 1/2:1 Cut Dp: 0.08 F Slope R: 1/2:1 Grd.Nxt.: -2.7%

32+820.00



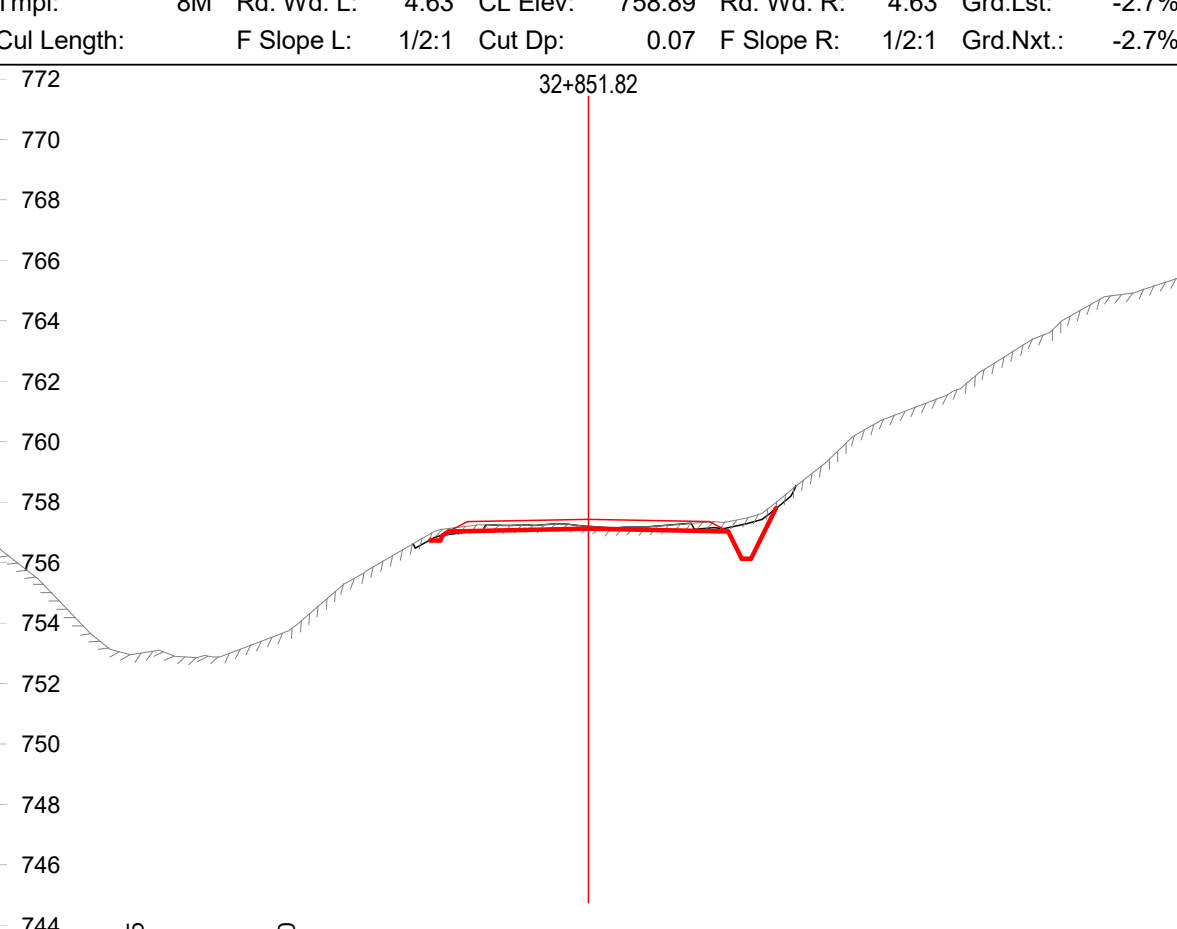
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32+840.00



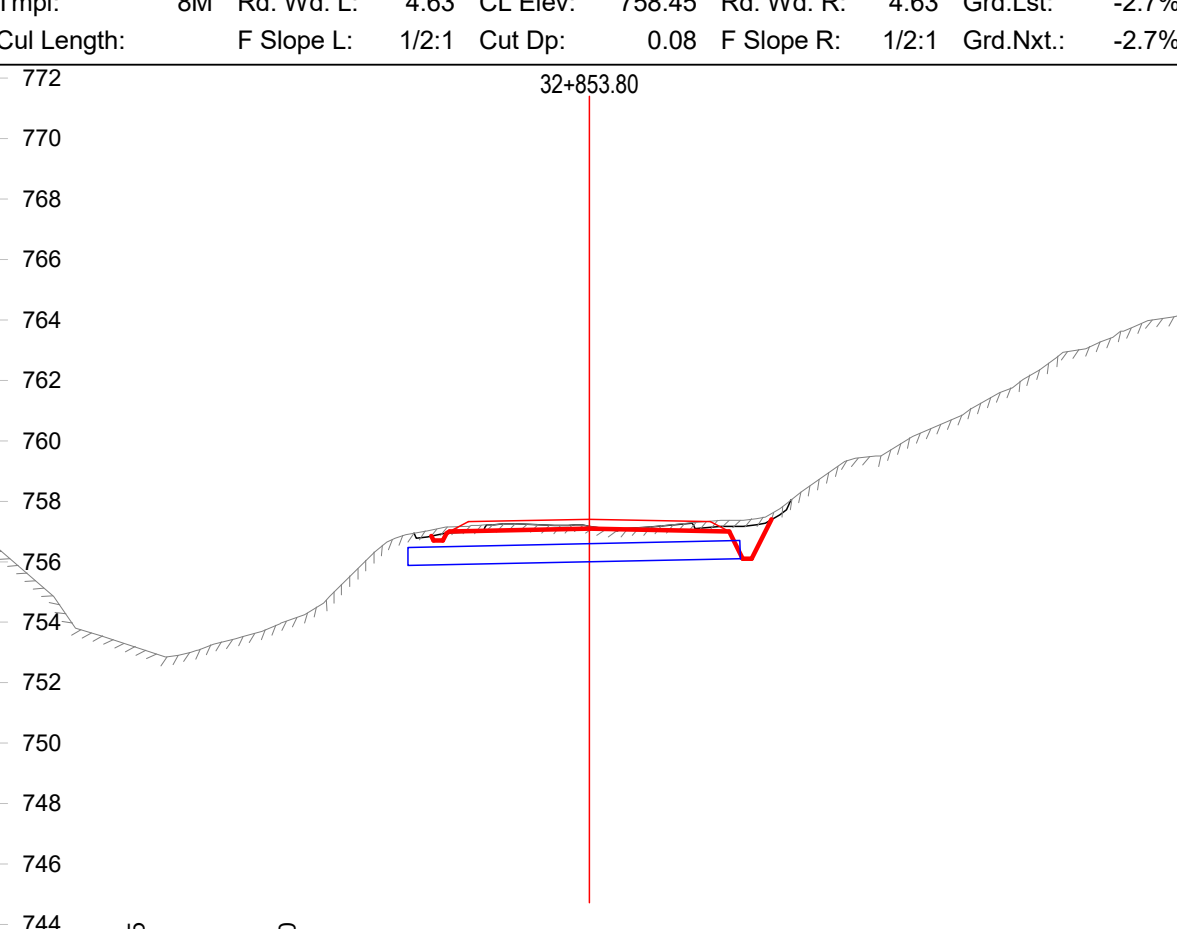
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Cul Length: F Slope L: 1/2:1 Cut Dp: 0.08 F Slope R: 1/2:1 Grd.Nxt.: -2.4%

32+851.82



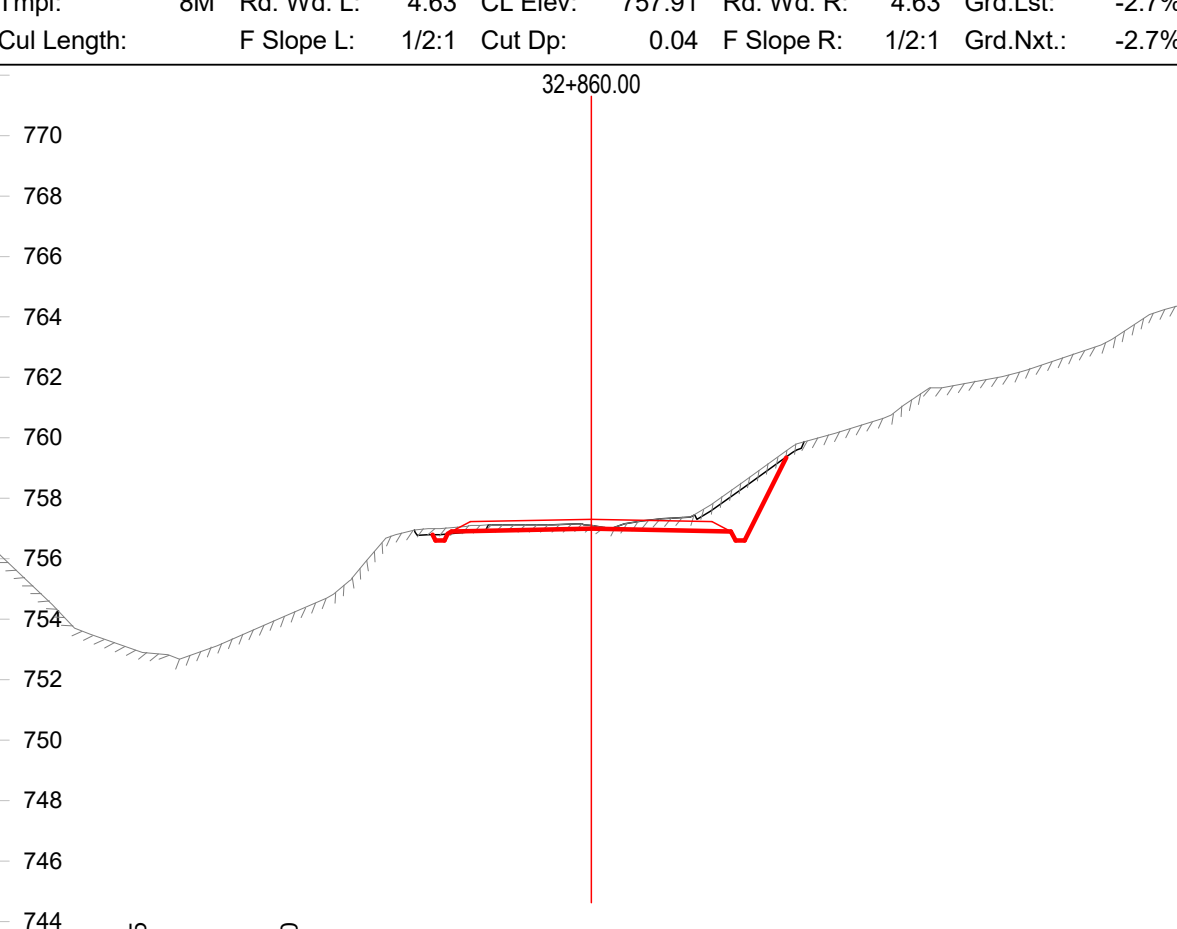
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Cul Length: F Slope L: 1/2:1 Cut Dp: 0.07 F Slope R: 1/2:1 Grd.Nxt.: -1.8%

32+853.80



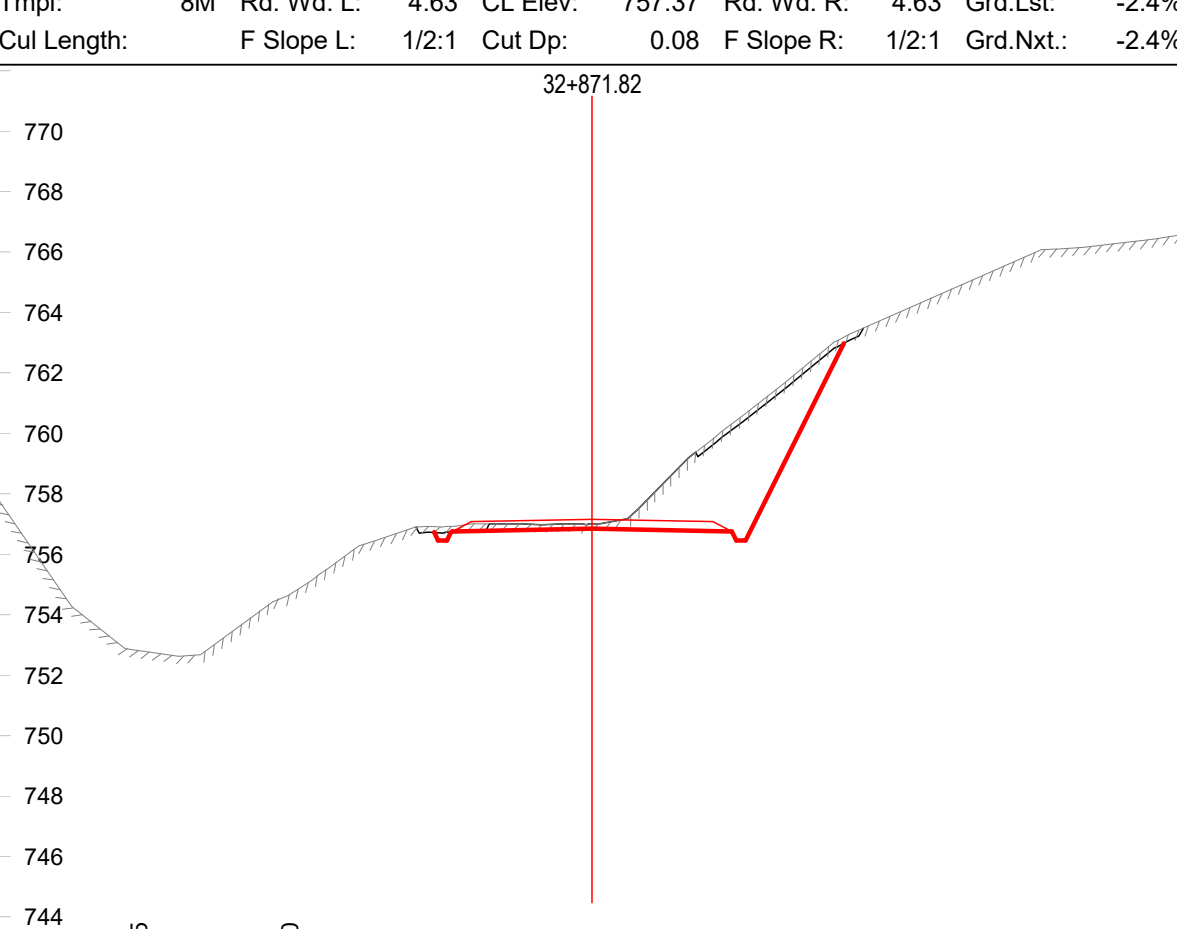
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Cul Length: 11.00 F Slope L: 1/2:1 Cut Dp: 0.08 F Slope R: 1/2:1 Grd.Nxt.: -1.7%

32+860.00



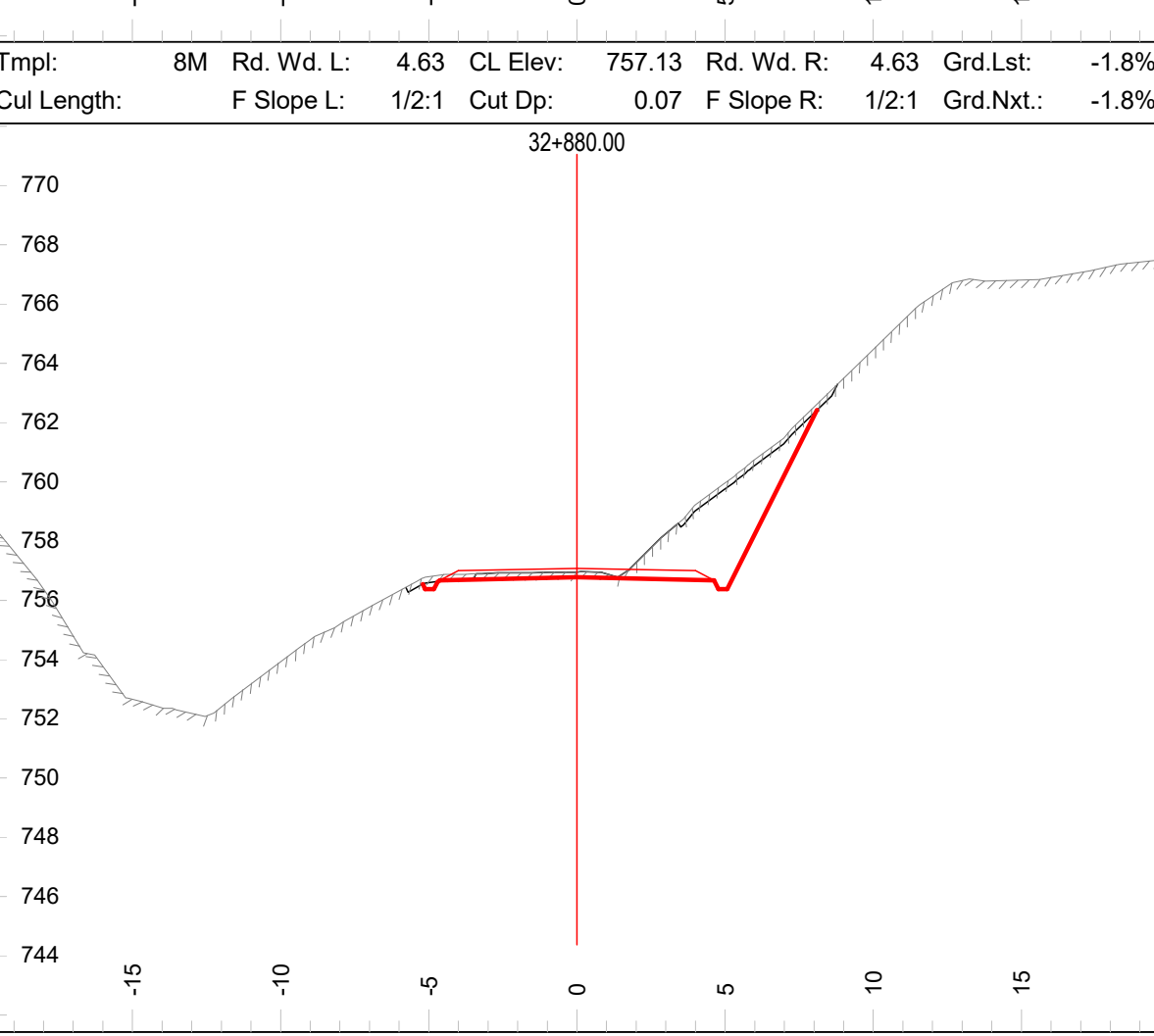
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Cul Length: F Slope L: 1/2:1 Cut Dp: 0.10 F Slope R: 1/2:1 Grd.Nxt.: -1.4%

32+871.82



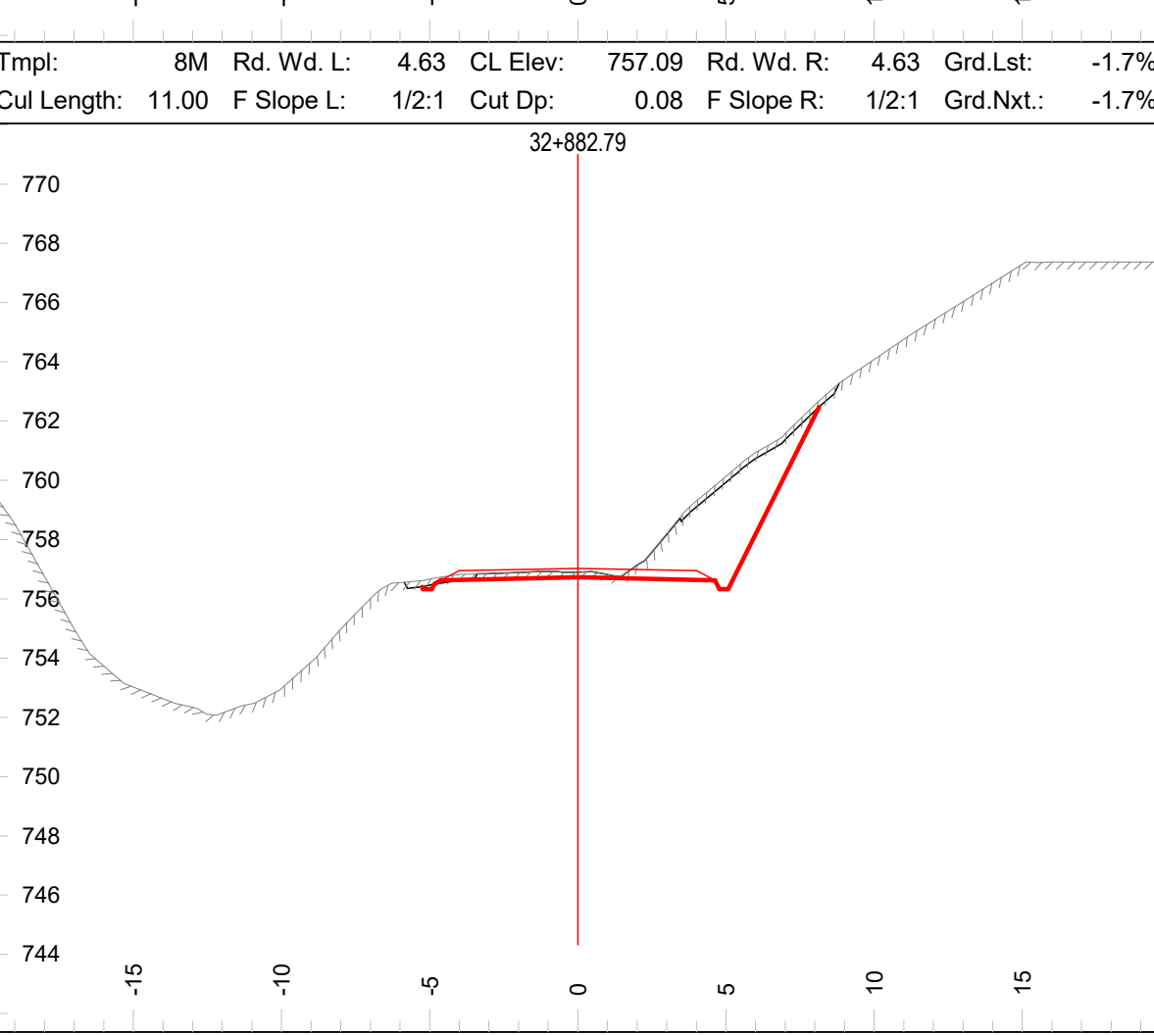
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32+880.00



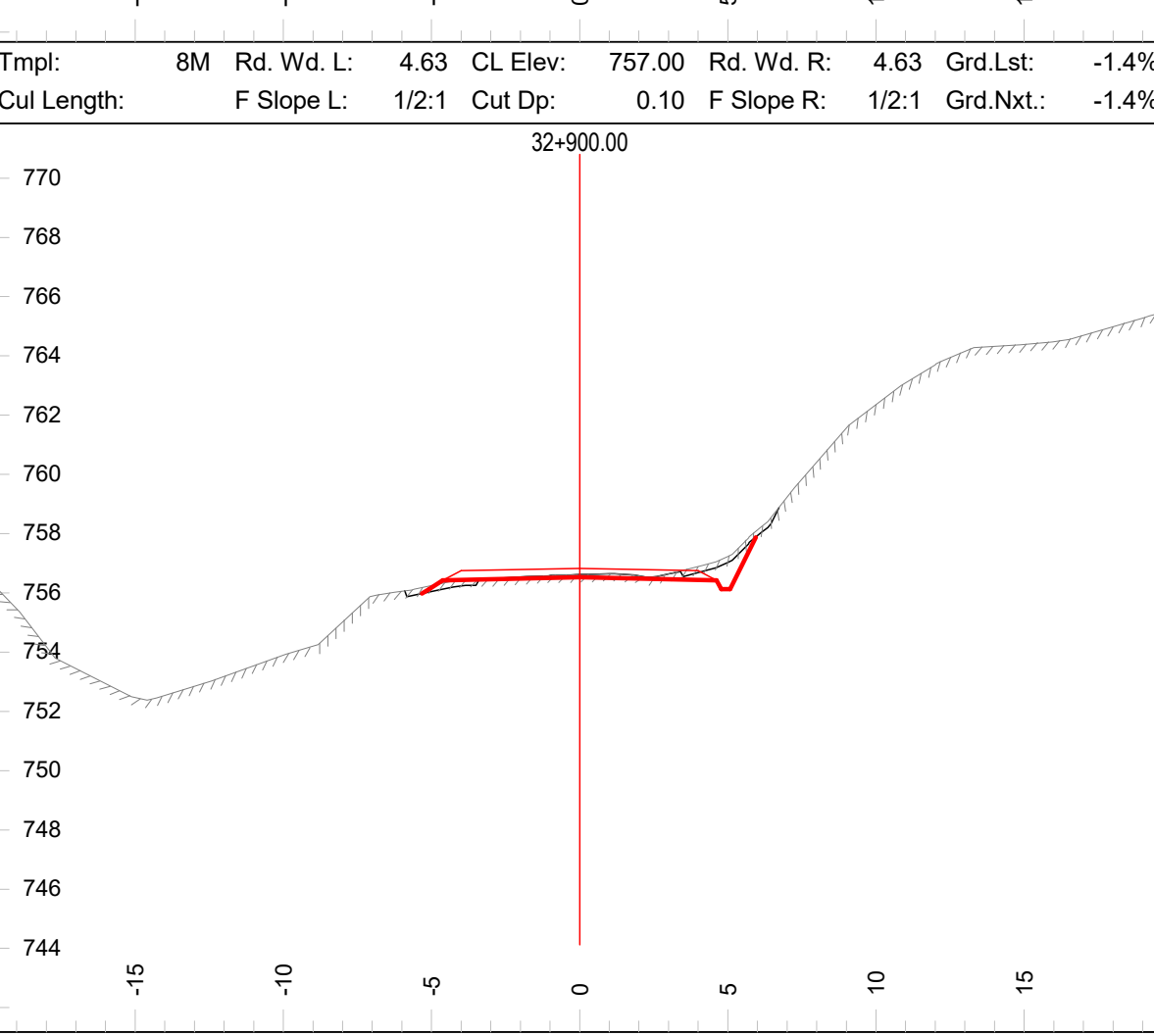
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32+882.79



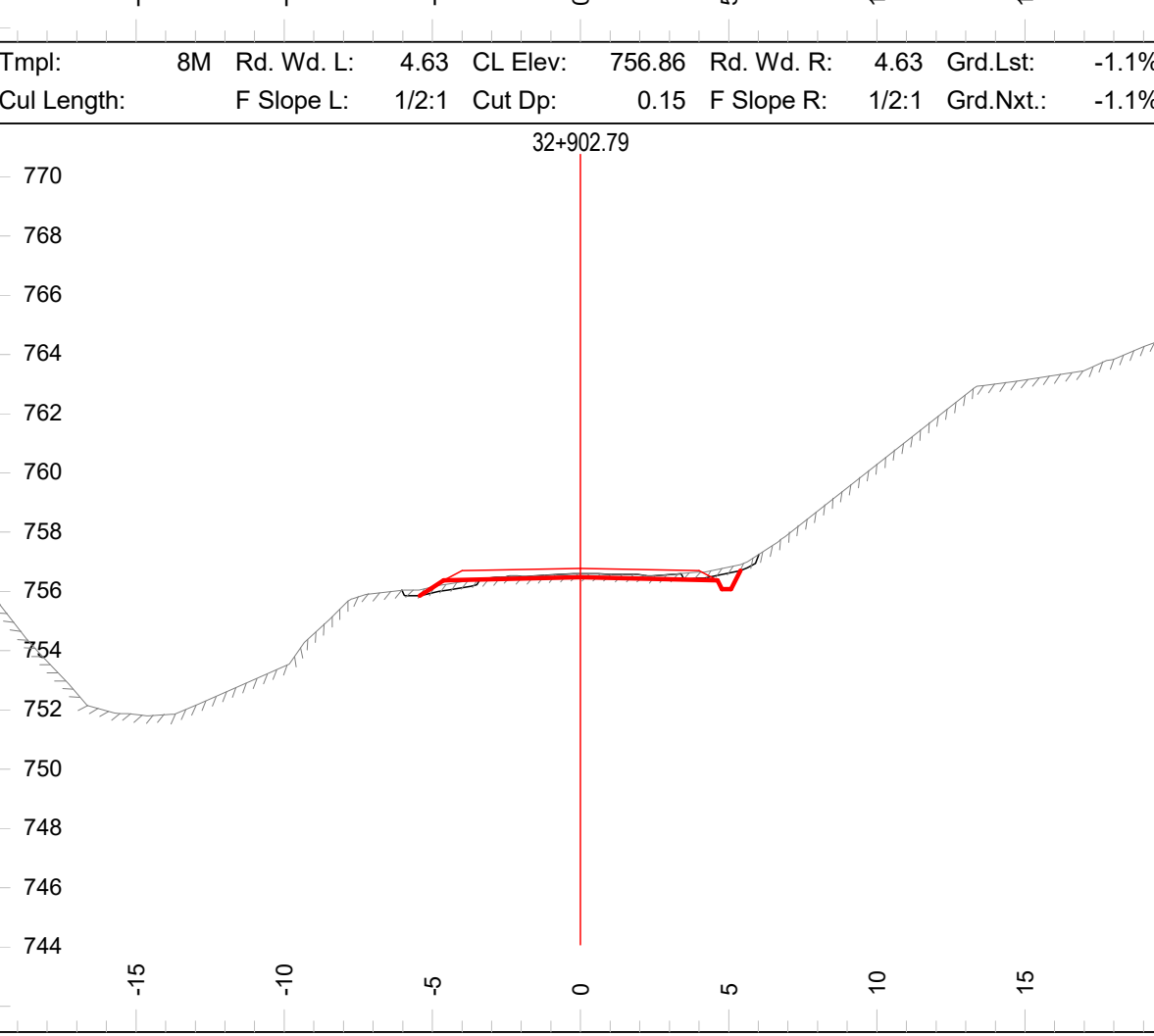
Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 756.73 Rd. Wd. R: 4.63 Grd.Lst: -1.1%
Cul Length: F Slope L: 1/2:1 Cut Dp: 0.18 F Slope R: 1/2:1 Grd.Nxt.: -1.1%

32+900.00



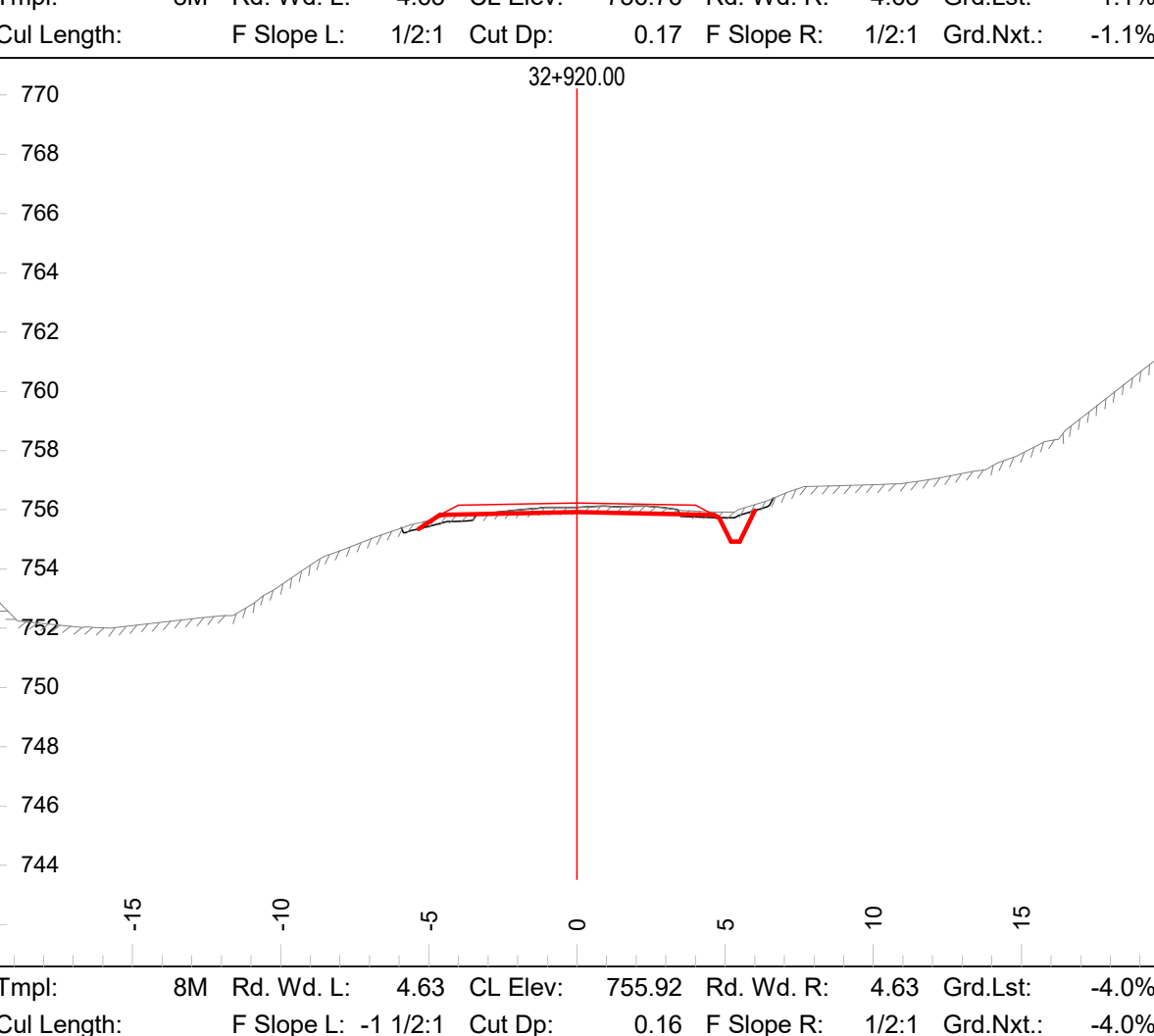
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Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.10 F Slope R: 1/2:1 Grd.Nxt.: -1.8%

32+902.79



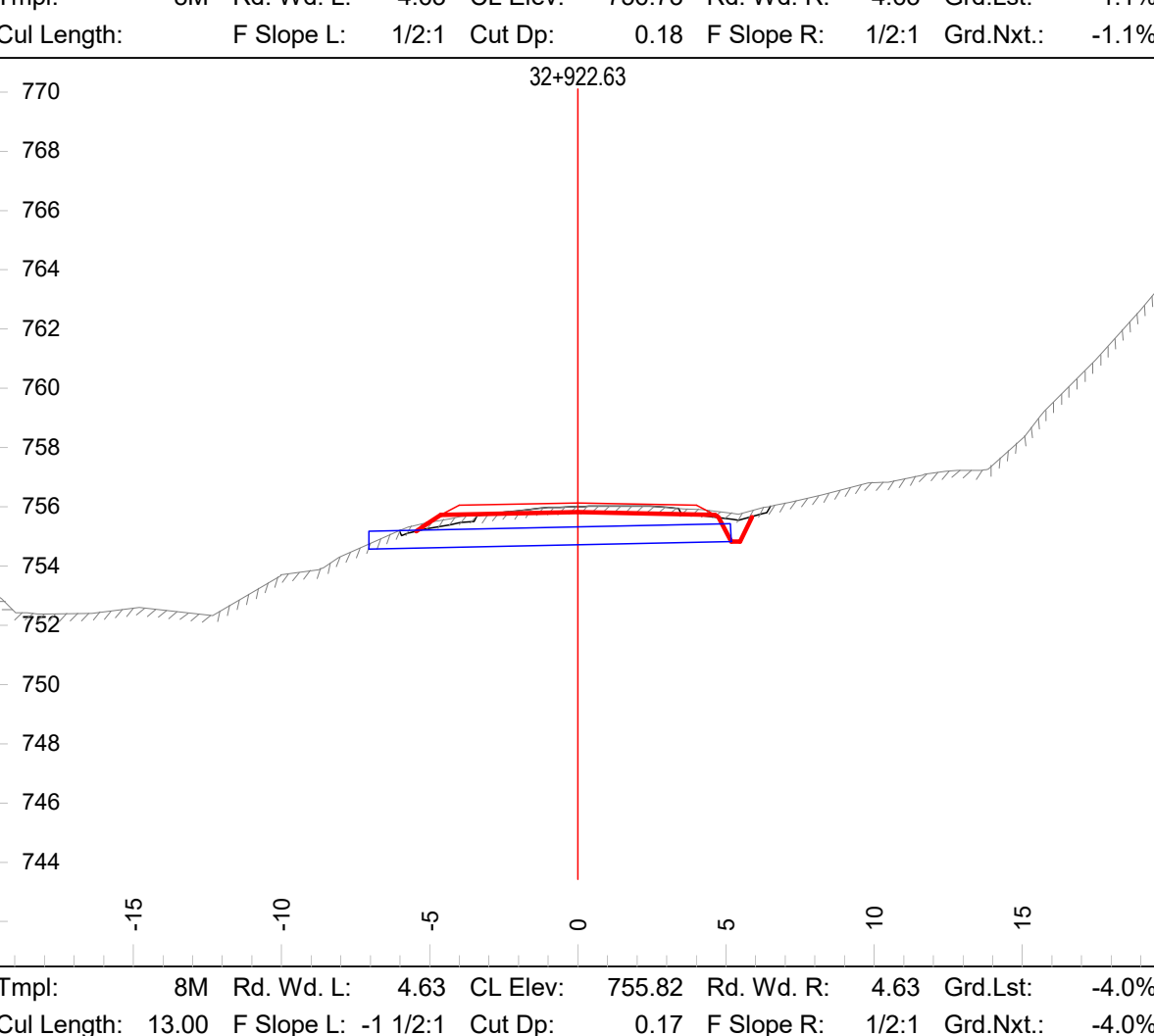
Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 756.47 Rd. Wd. R: 4.63 Grd.Lst: -2.1%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.13 F Slope R: 1/2:1 Grd.Nxt.: -2.1%

32+920.00



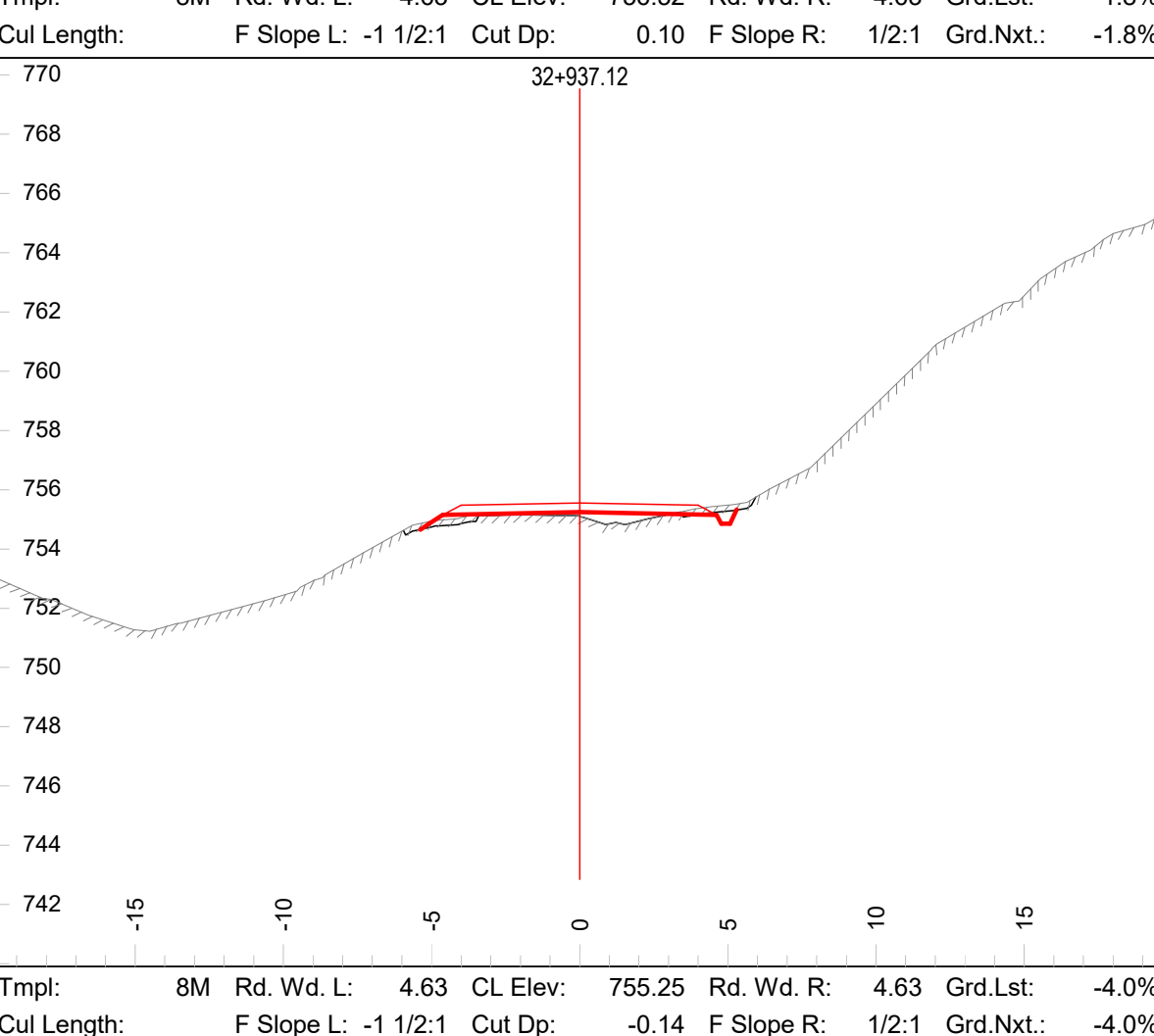
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Cul Length: F Slope L: -1 1/2:1 Cut Dp: 0.16 F Slope R: 1/2:1 Grd.Nxt.: -4.0%

32+922.63



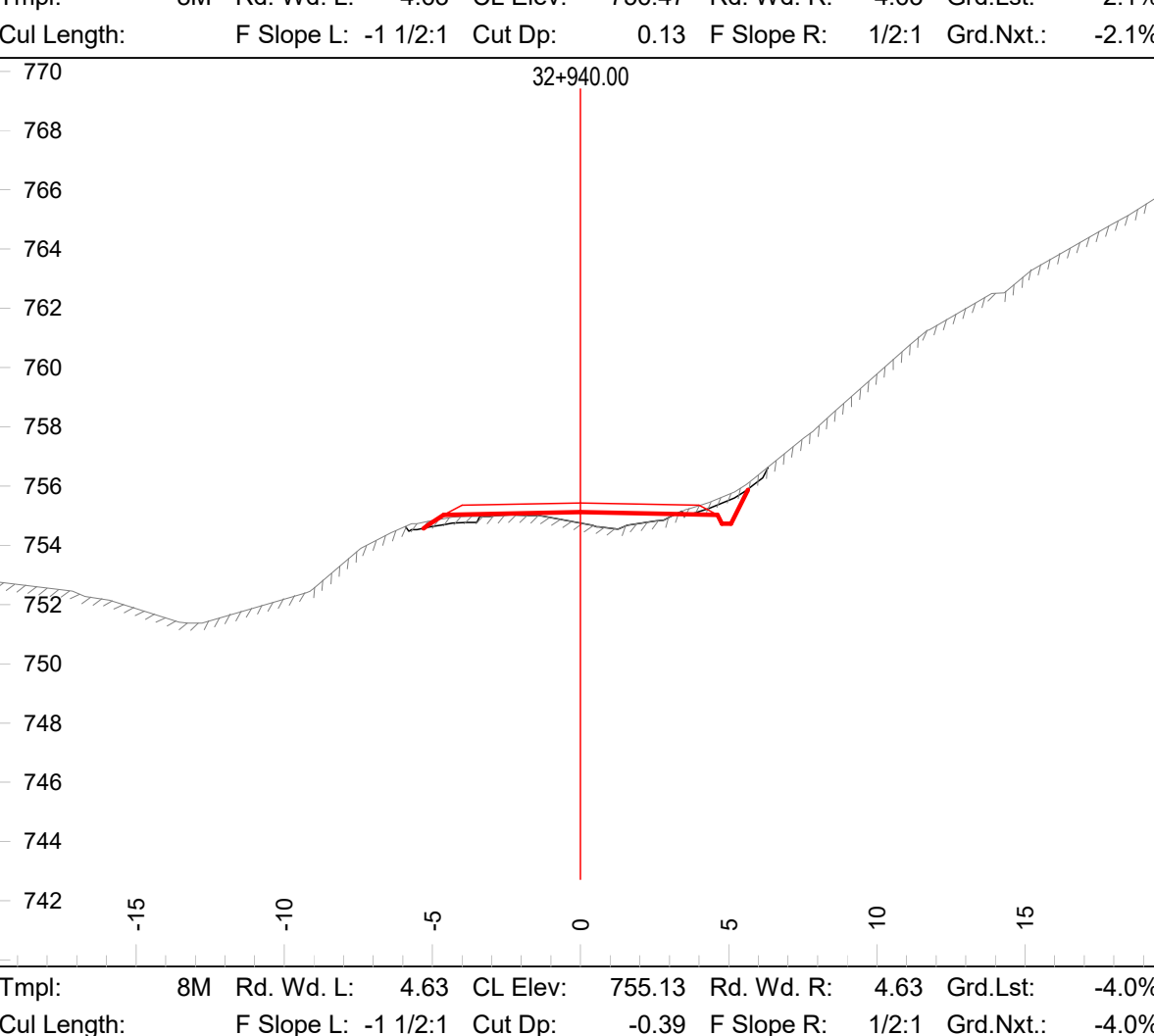
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Cul Length: 13.00 F Slope L: -1 1/2:1 Cut Dp: 0.17 F Slope R: 1/2:1 Grd.Nxt.: -4.0%

32+937.12



Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 755.25 Rd. Wd. R: 4.63 Grd.Lst: -4.0%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.14 F Slope R: 1/2:1 Grd.Nxt.: -4.0%

32+940.00



Tmpl: 8M Rd. Wd. L: 4.63 CL Elev: 755.13 Rd. Wd. R: 4.63 Grd.Lst: -4.0%
Cul Length: F Slope L: -1 1/2:1 Cut Dp: -0.39 F Slope R: 1/2:1 Grd.Nxt.: -4.0%



Ministry of Forests, Lands and
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Prince George Resource District

Chuchinka-Colbourne FSR
Roadway Widening and Upgrade
Geometric Alignment
Km 31 to Km 33.6

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Stations: 32+942.60 to 33+063.97

ROAD DESIGN SPECIFICATIONS

Design Speed: 30 km/h
Avg. Stab. Road Width: 6.0m
Fav. Grade Max. 10%
Adv. Grade Max 10%

Section Scale 1:250

Project Location Coordinates

Latitude: 51-15-03
Longitude: -119-53-14
Elevation: 610m
Datum: NAD83
UTM Combined Scale Factor:
n/a

Notes:

- Ground model data obtained by Lidar Survey method by McElhanney Survey Consulting Ltd. Oct. 2013
-30km/h Speed Limit through the Canyon, remainder designed to minimum 60km/h.

Survey Control Stations

Point Name	Northing	Easting	Elevation	Description

Plan Legend (all may not be applicable)

L-line Location

Road Edges

Clearing Limits

Culverts

GPS Base Station

Old Iron Bar found (tied)

Old Pipe Post found (tie)

Survey Control Points tie

Benchmark

Edge of Wetland

Existing Road Edges

Breakline

Powerline

Draw

Test Pit

Stream

Tension Crack

Timberline

Cut / Fill limits

Powerpole

Finished Road Surface

Profile Subgrade

Cut / Fill limits

Original Ground

1st Stratum

2nd Stratum (Rock)

Ditch Invert Right

Ditch Invert Left

EARTH WORK VOLUMES (Bank cubic meters)

L-Stn m.	Strip V. Cu. m.	SG Cut V. Cu. m.	SG Fill V. Cu. m.	B/W Vol. Cu. m.	Srf1 Fill V. Cu. m.
33+000.00 33+200.00	216.1	357.9	261.8		517.5
Pg. Tot.	216.1	357.9	261.8		517.5
Cum. Tot.	3104.0	8443.3	3406.0		6258.1

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt

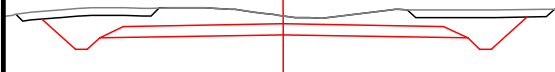
SOIL TYPES

OB - Overburden
OR - Organics
SL - Silt
FS - Fine Sand & Silt
SA - Sand
SG - Sand & Gravel
CG - Sand & Course Gravel
SC - Sand/Cobbles/Gravel
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FR - Fractured Rock (Talus)
RR - Riprapable Rock
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ROAD TEMPLATES

TP = Taper template
TO = Turnout Template
8M = 8.0m wide finished running surface
8WS = 8m wide finished running surface with retaining wall

Surfacing depth = 0.3m
Ditch Slopes = 1.5:1 Ditch Depth = 0.3 Width = 0.3
F Slope = Final Slope Left or Right



Prepared by:
Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

DRAFT
FOR REVIEW
PURPOSES ONLY

Dwg Num: 110-022-003

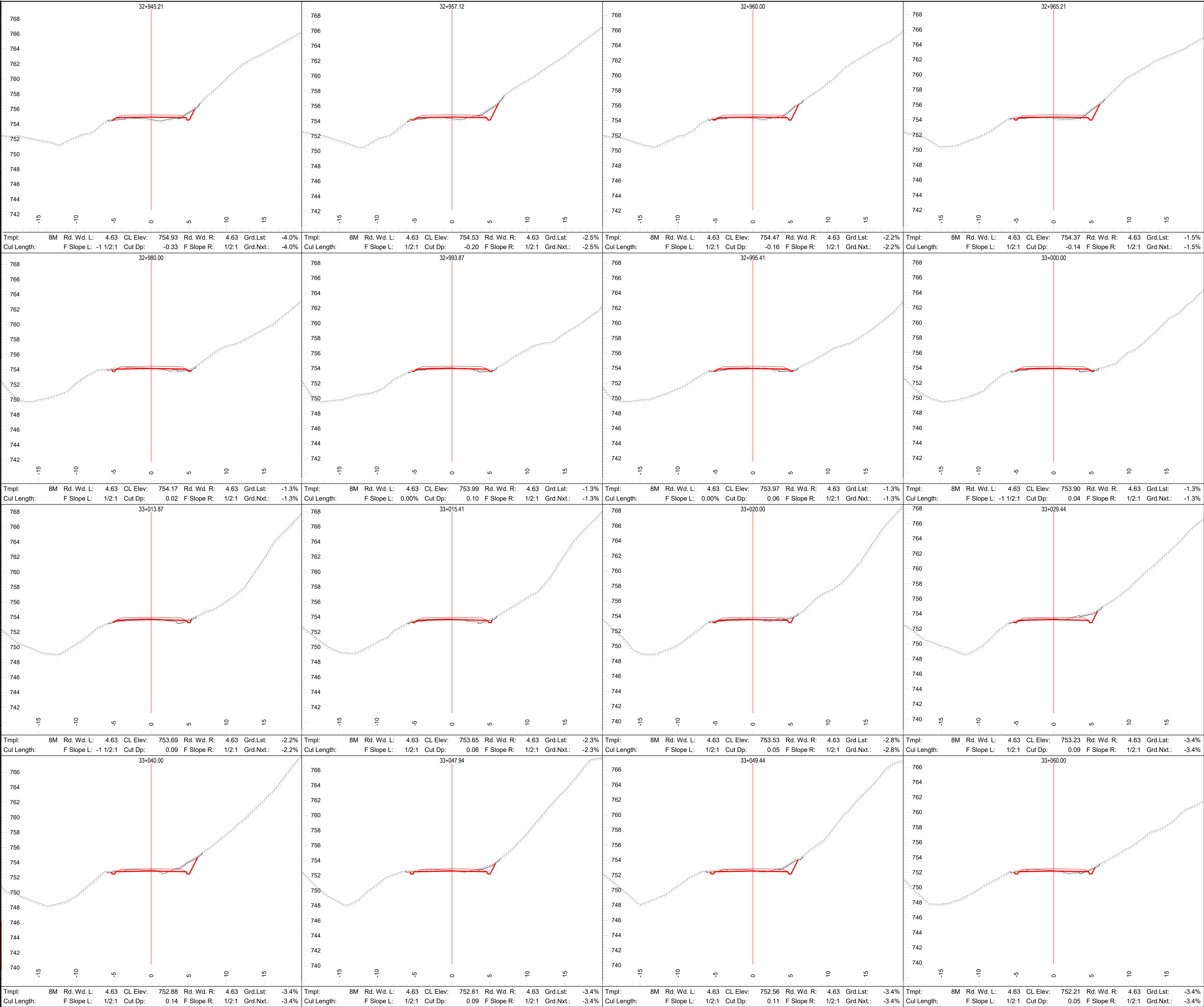
Survey By: see Notes above

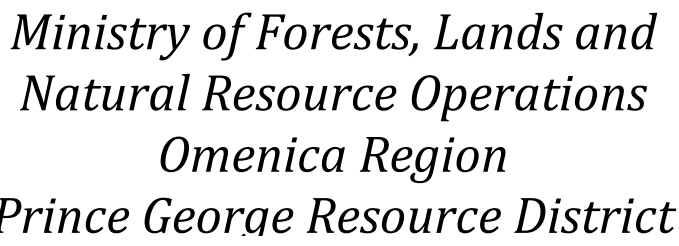
Design By: Edward Folk, P.Eng.

Approved By:

Plot Date:16/06/29

Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-





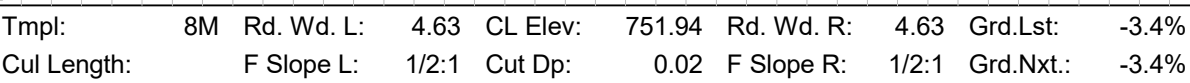
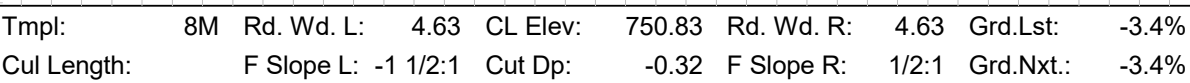
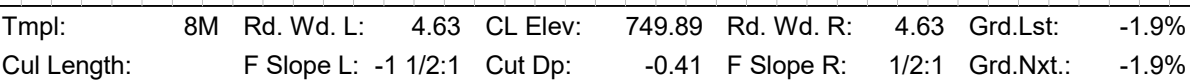
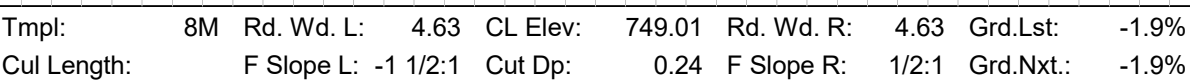
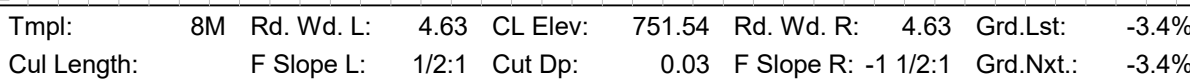
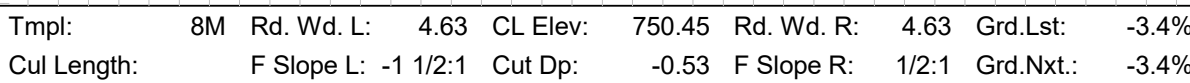
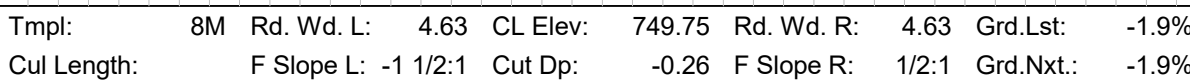
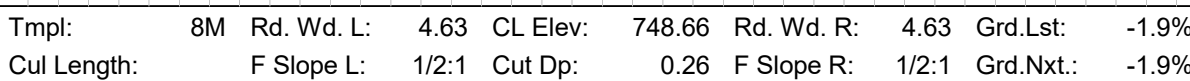
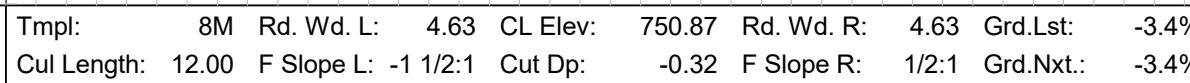
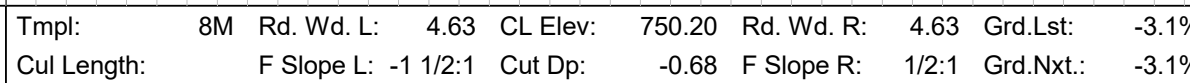
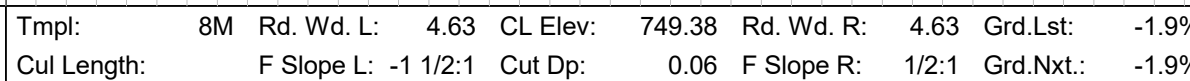
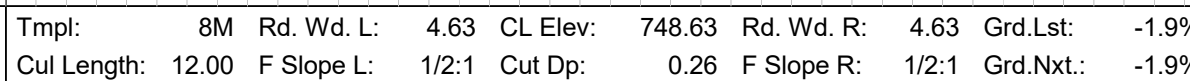
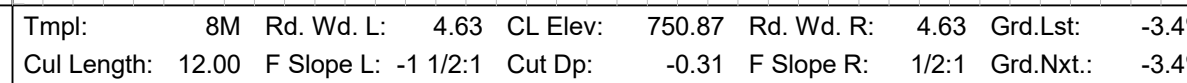
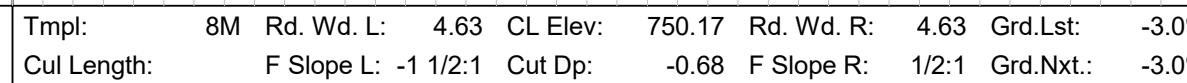
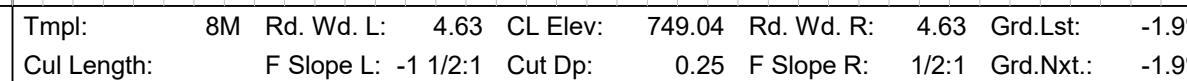
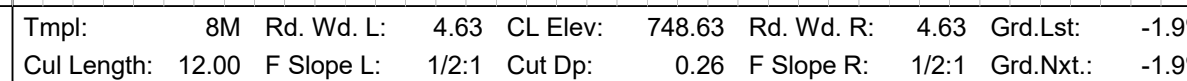
Page 19 of 71 Stations: 33+063.97 to 33+210.07

[illegible]

CULVERT TABLE						
L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt
33+100.10	600	12.00	6.50	5.50	91.00000	
33+200.14	600	12.00	6.50	5.50	90.00000	xdrain

Prepared by:  Celtic Engineering Ltd. DESIGN & CONSTRUCTION	DRAFT FOR REVIEW PURPOSES ONLY
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Plot Date: 16/06/29 Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-





Ministry of Forests, Lands and
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Omenica Region

Prince George Resource District

Chuchinka-Colbourne FSR

Roadway Widening and Upgrade

Geometric Alignment

Km 31 to Km 33.6

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Stations: 33+210.07 to 33+316.55

ROAD DESIGN SPECIFICATIONS

Design Speed: 30 km/h
Avg. Stab. Road Width: 6.0m
Fav. Grade Max. 10%
Adv. Grade Max 10%

Section Scale 1:250

Project Location Coordinates

Latitude: 51-15-03
Longitude: -119-53-14
Elevation: 610m
Datum: NAD83
UTM Combined Scale Factor:
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Notes:

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Point Name	Northing	Easting	Elevation	Description

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Survey Control Points tie

Benchmark

Edge of Wetland

Existing Road Edges

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Tension Crack

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Cut / Fill limits

Powerpole

Finished Road Surface

Profile Subgrade

Cut / Fill limits

Original Ground

1st Stratum

2nd Stratum (Rock)

Ditch Invert Right

Ditch Invert Left

EARTH WORK VOLUMES (Bank cubic meters)

L-Stn m.	Strip V. Cu. m.	SG Cut V. Cu. m.	SG Fill V. Cu. m.	B/W Vol. Cu. m.	Srf1 Fill V. Cu. m.
33+400.00					
Pg. Tot.	0.0	0.0	0.0		0.0
Cum. Tot.	3490.2	10500.7	5361.3		6792.7

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt

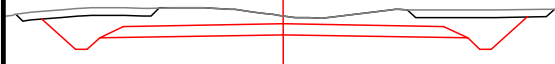
SOIL TYPES

OB - Overburden
OR - Organics
SL - Silt
FS - Fine Sand & Silt
SA - Sand
SG - Sand & Gravel
CG - Sand & Course Gravel
SC - Sand/Cobbles/Gravel
GR - Gravel
BO - Boulders
FR - Fractured Rock (Talus)
RR - Riprapable Rock
SR - Solid Rock

ROAD TEMPLATES

TP = Taper template
TO = Turnout Template
8M = 8.0m wide finished running surface
8WS = 8m wide finished running surface with retaining wall

Surfacing depth = 0.3m
Ditch Slopes = 1.5:1 Ditch Depth = 0.3 Width = 0.3
F Slope = Final Slope Left or Right



Prepared by:



Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

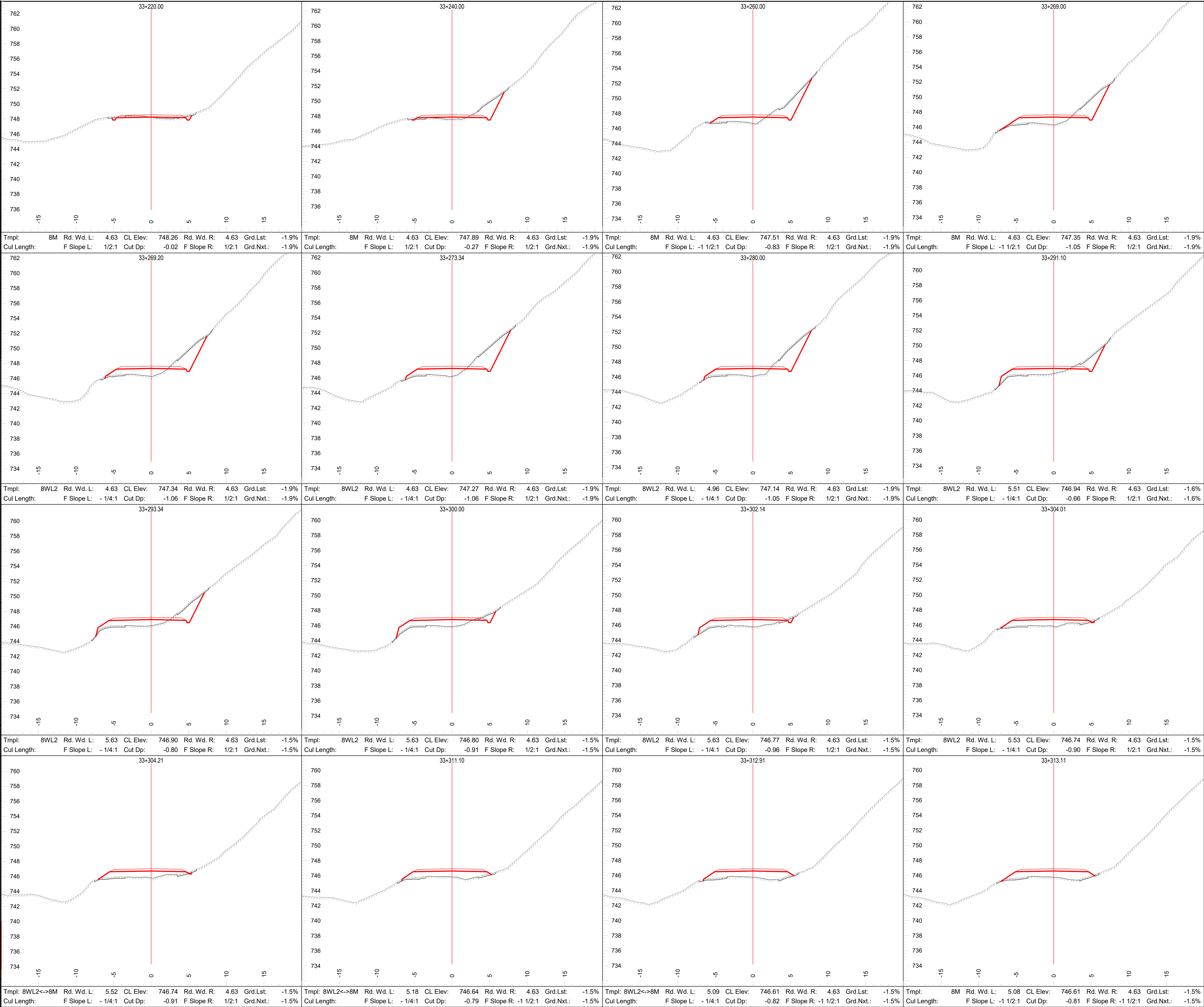
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PURPOSES ONLY

Dwg Num: 110-022-003

Survey By: see Notes above
Design By: Edward Folk, P.Eng.
Approved By:

Plot Date:16/06/29

Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-





Ministry of Forests, Lands and
Natural Resource Operations
Omenica Region
Prince George Resource District

Chuchinka-Colbourne FSR
Roadway Widening and Upgrade
Geometric Alignment
Km 31 to Km 33.6

Page 21 of 71 Stations: 33+316.55 to 33+414.36

ROAD DESIGN SPECIFICATIONS

Design Speed: 30 km/h
Avg. Stab. Road Width: 6.0m
Fav. Grade Max. 10%
Adv. Grade Max 10%

Section Scale 1:250

Project Location Coordinates

Latitude: 51-15-03
Longitude: -119-53-14
Elevation: 610m
Datum: NAD83
UTM Combined Scale Factor:
n/a

Notes:
- Ground model data obtained by Lidar Survey method by McElhanney Survey Consulting Ltd. Oct. 2013
-30km/h Speed Limit through the Canyon, remainder designed to minimum 60km/h.

Survey Control Stations

Point Name	Northing	Easting	Elevation	Description

Plan Legend (all may not be applicable)

L-line Location

Road Edges

Cleaning Limits

Culverts

GPS Base Station

Old Iron Bar found (tied)

Old Pipe Post found (tie)

Survey Control Points tie

Benchmark

Edge of Wetland

Existing Road Edges

Breakline

Powerline

Draw

Test Pit

Stream

Tension Crack

Timberline

Cut / Fill limits

Powerpole

Finished Road Surface

Profile Subgrade

Cut / Fill limits

Original Ground

1st Stratum

2nd Stratum (Rock)

Ditch Invert Right

Ditch Invert Left

EARTH WORK VOLUMES (Bank cubic meters)

L-Stn m.	Strip V. Cu. m.	SG Cut V. Cu. m.	SG Fill V. Cu. m.	B/W Vol. Cu. m.	Srf1 Fill V. Cu. m.
33+400.00 33+600.00	666.4	3247.7	1649.3	-1700.0	669.8
Pg. Tot.	666.4	3247.7	1649.3		669.8
Cum. Tot.	4156.6	13748.4	7010.6		7462.4

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt
33+328.19	600	12.44	6.34	6.10	90.00000	xdrain

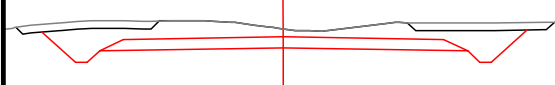
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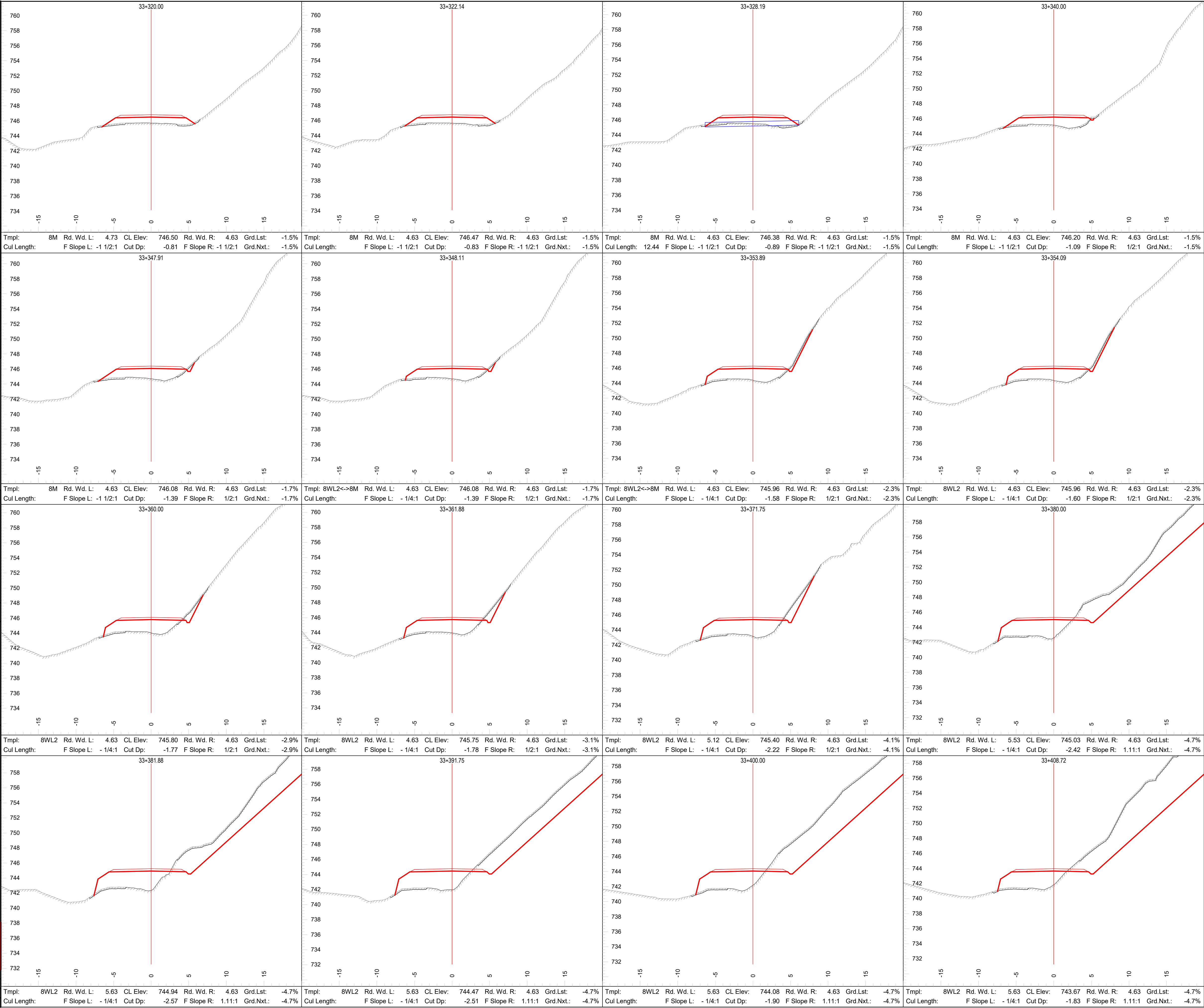
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Design File Name: Colbourne FSR Road upgrade\110-022-003- Road Design\Design File\Road Eng\Chuchinka-





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Omenica Region
Prince George Resource District

Chuchinka-Colbourne FSR
Roadway Widening and Upgrade
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Km 31 to Km 33.6

Page 22 of 71

Stations: 33+414.36 to 33+516.00

ROAD DESIGN SPECIFICATIONS

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33+600.00					
Pg. Tot.	0.0	0.0	0.0		0.0
Cum. Tot.	4156.6	13748.4	7010.6		7462.4

CULVERT TABLE

L-Stn m.	Cul DIA mm.	Cul Len m.	Cul Len L m.	Cul Len R m.	Cul Skew deg.	Cul Cmt
33+456.20	600	13.00	7.00	6.00	93.00000	xdrain

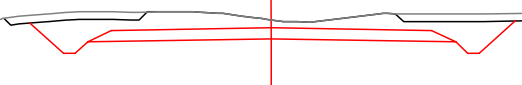
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