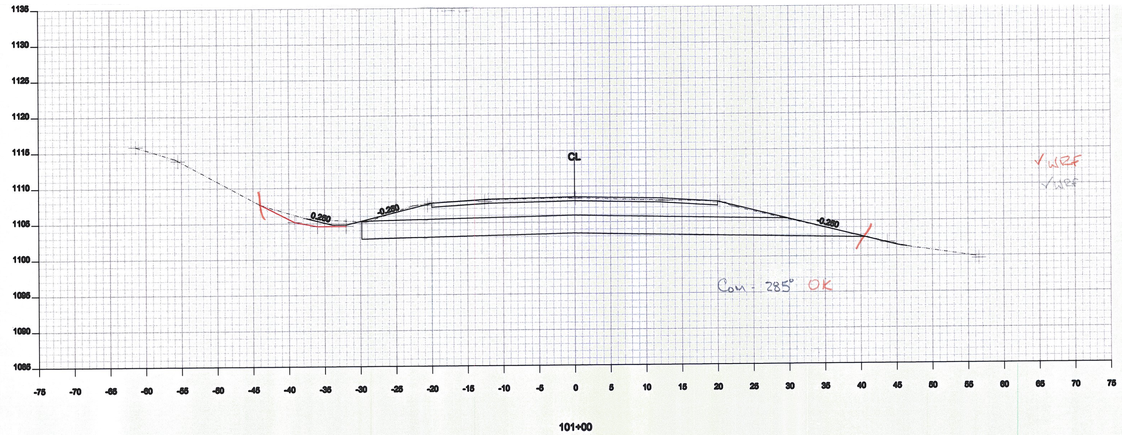
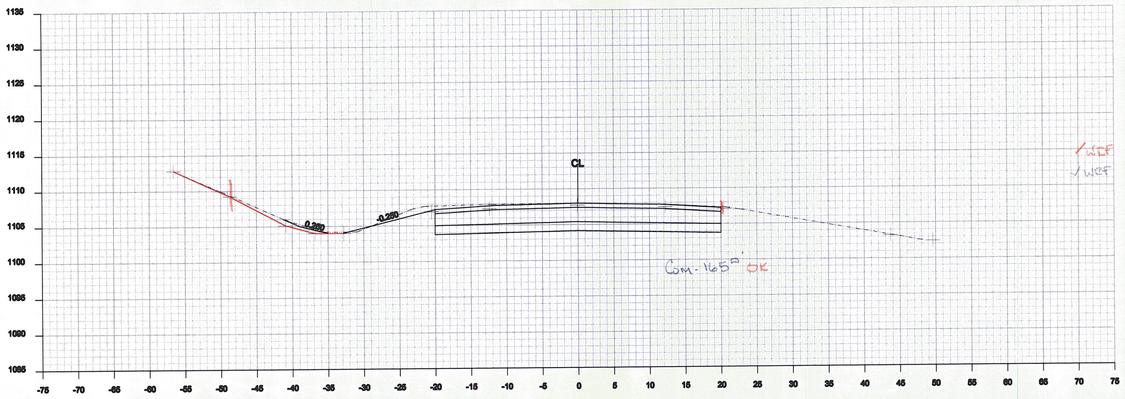
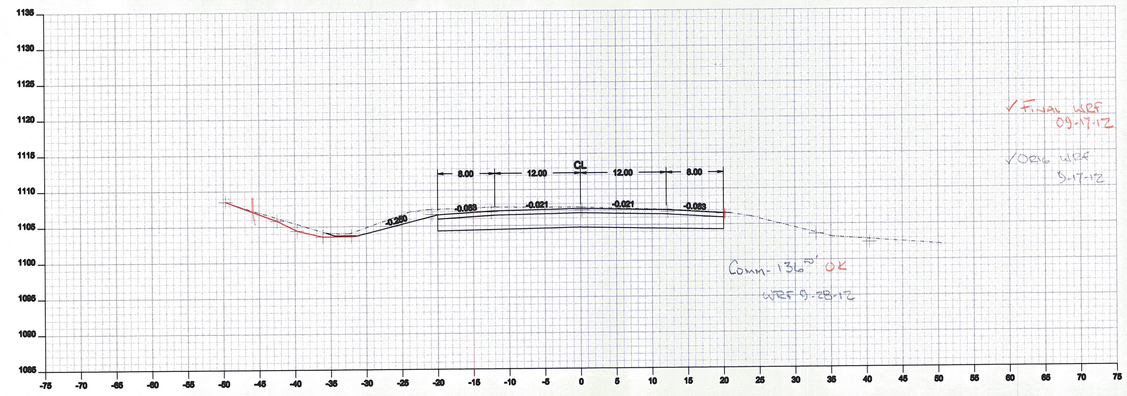


101+00

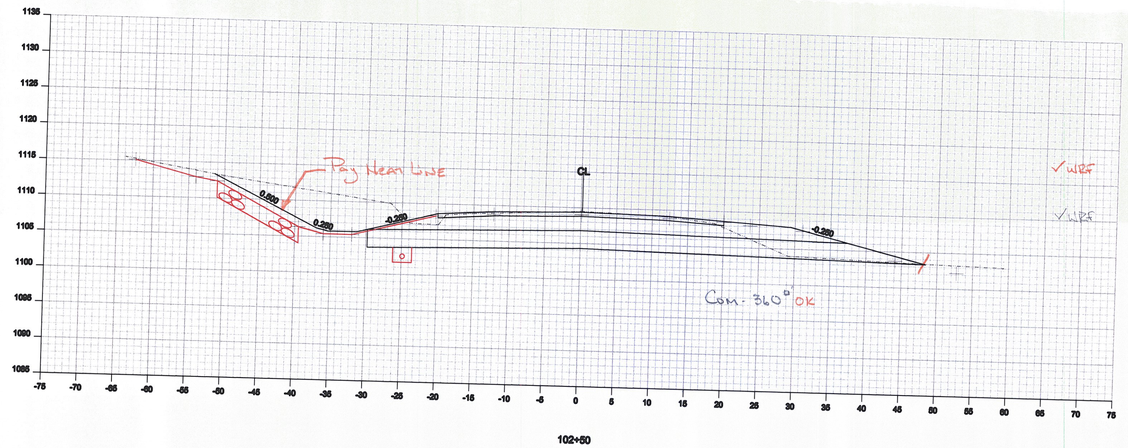


100+50

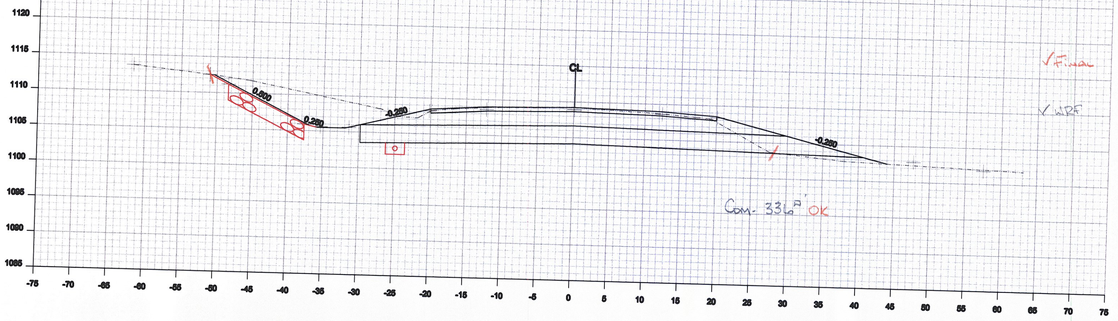


100+00

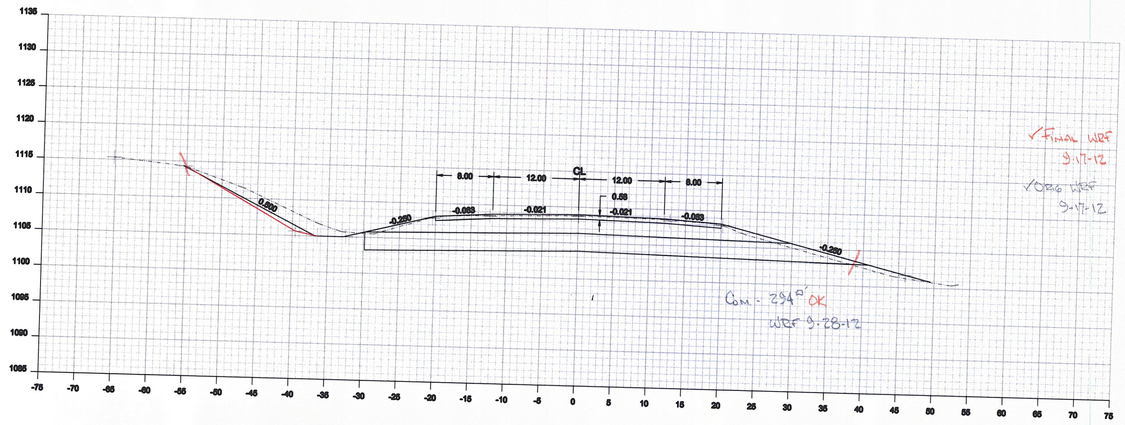
Drawing:	Cross Section 100+00 - 101+00
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-13-2011	Date:
Scale: 1 : 10	Sheet: of



102+50

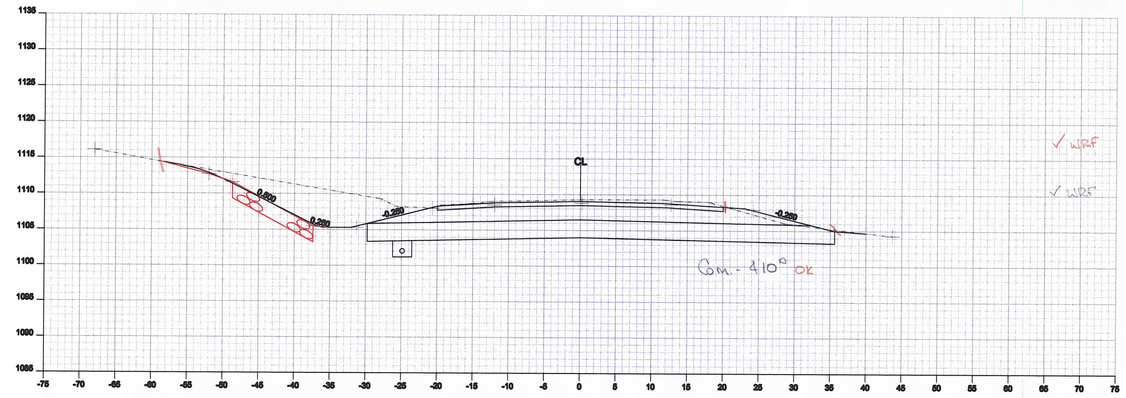


102+00

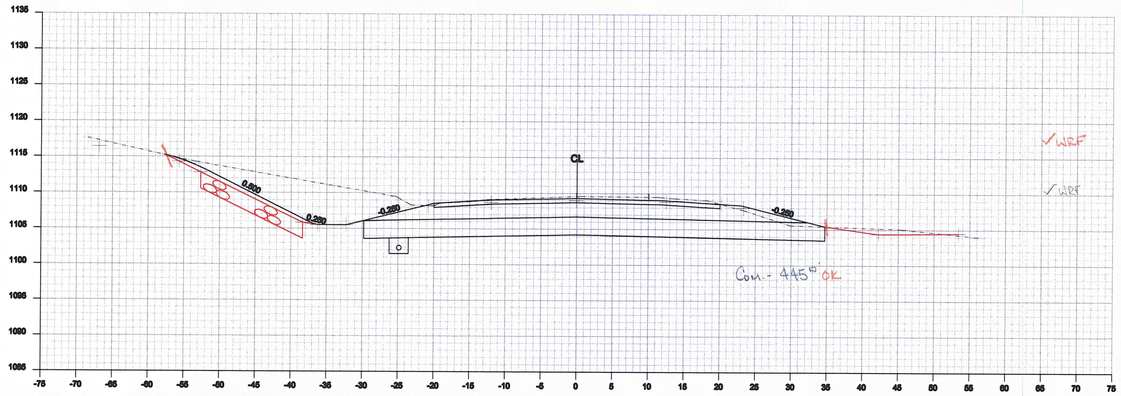


101+50

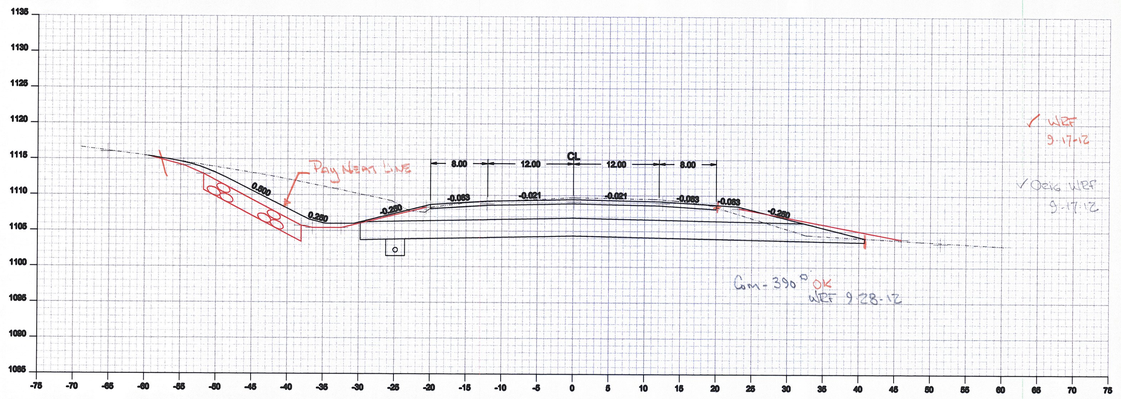
Drawing: Cross Section 101+50 - 102+50
Project: Cabot Danville
Drawn By: JMR
Date: 09-13-2012
Checked By:
Date:
Scale: 1 : 10
Sheet: of



104+00



103+50

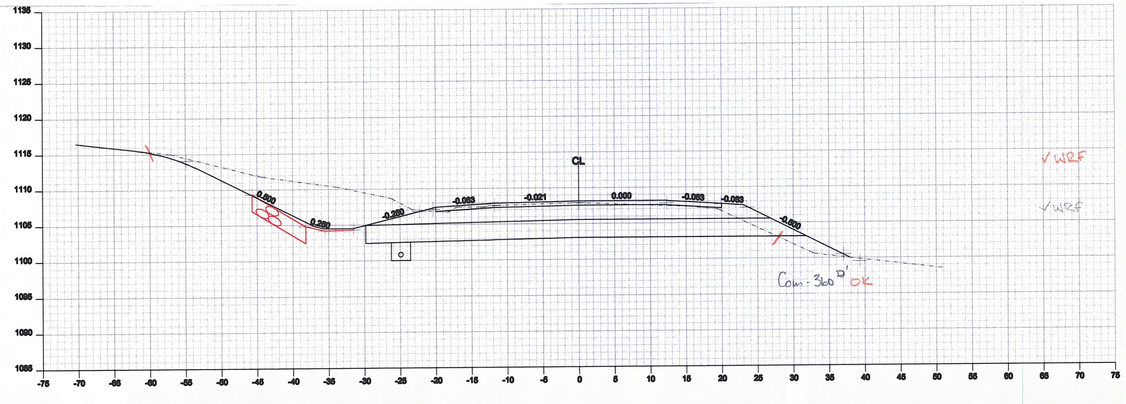


103+00

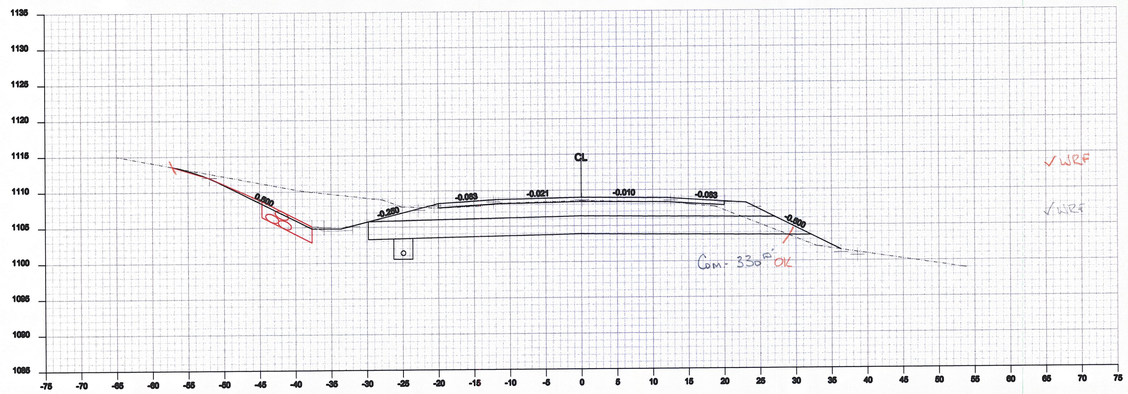
Drawing: Cross Section 103+00 - 104+00
Project: Cabot Danville

Drawn By: JMR | Checked By:
Date: 09-13-2012 | Date:

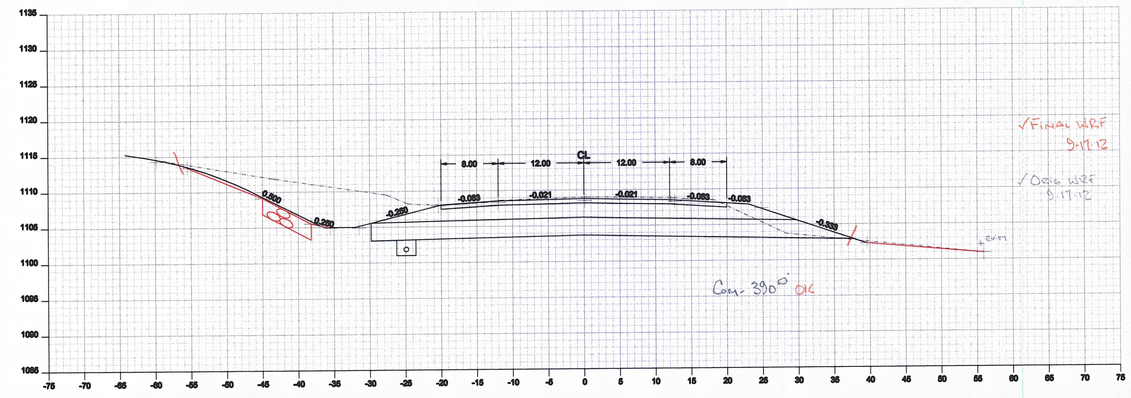
Scale: 1 : 10 | Sheet: of



105+50

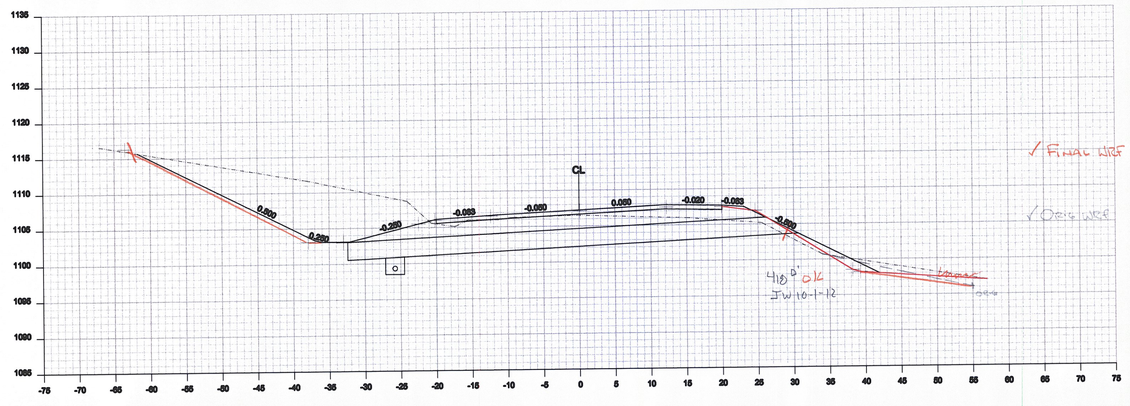


105+00

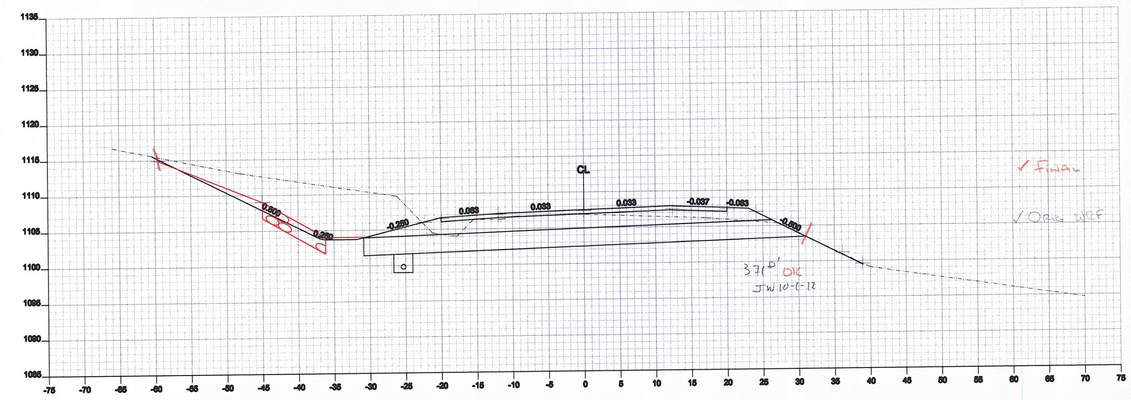


104+50

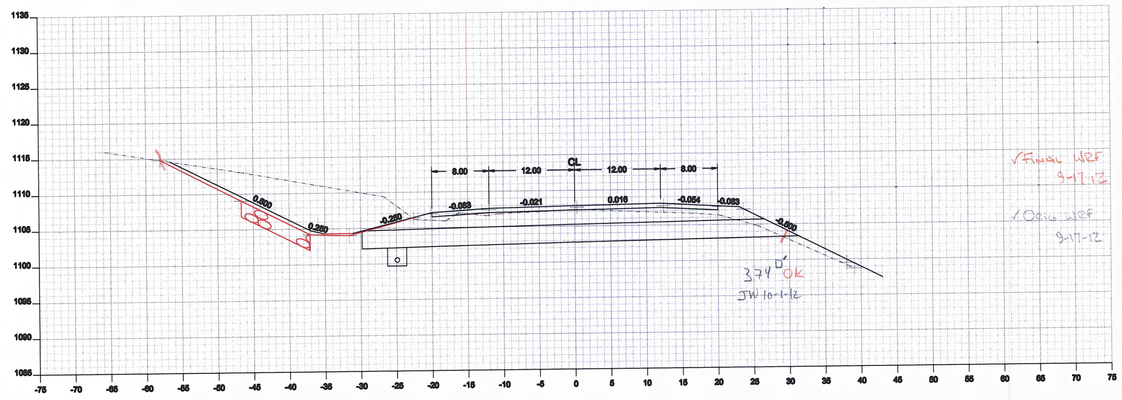
Drawing:	Cross Section 104+50 - 105+50		
Project:	Cabot Danville		
Drawn By:	JMR	Checked By:	
Date:	09-13-2012	Date:	
Scale:	1 : 10	Sheet:	of



107+00

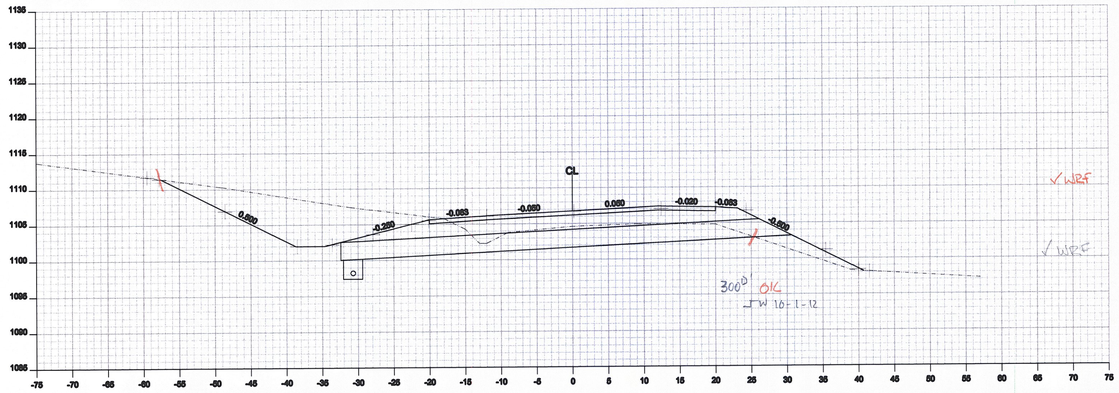


106+50

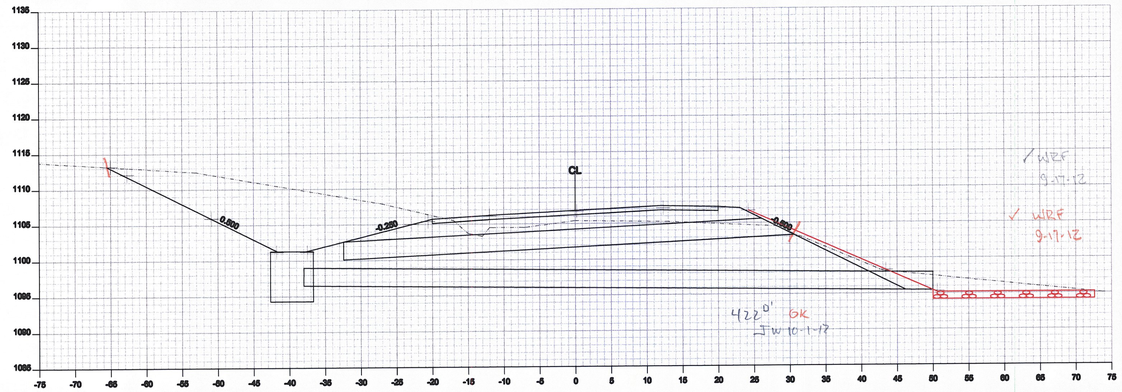


106+00

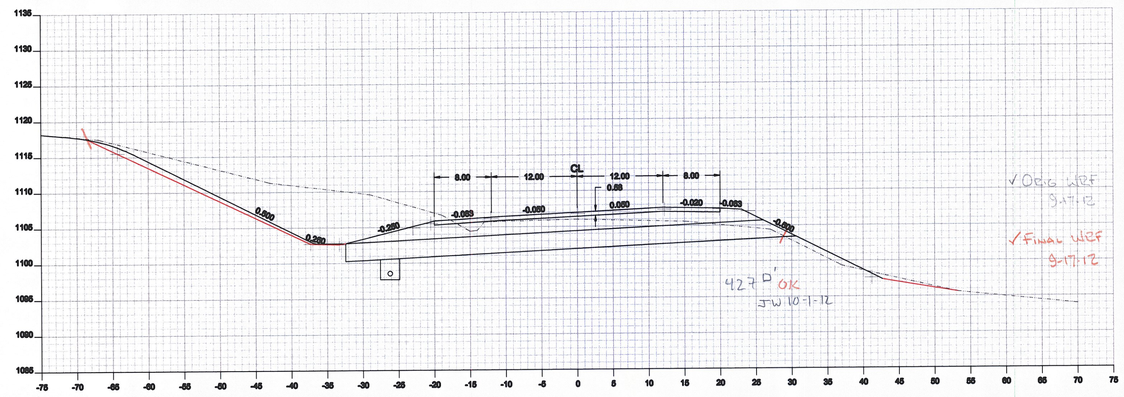
Drawing: Cross Section 106+00 - 107+00	
Project: Cabot Danville	
Drawn By: JMR	Checked By:
Date: 09-13-2012	Date:
Scale: 1 : 10	Sheet: of



108+50

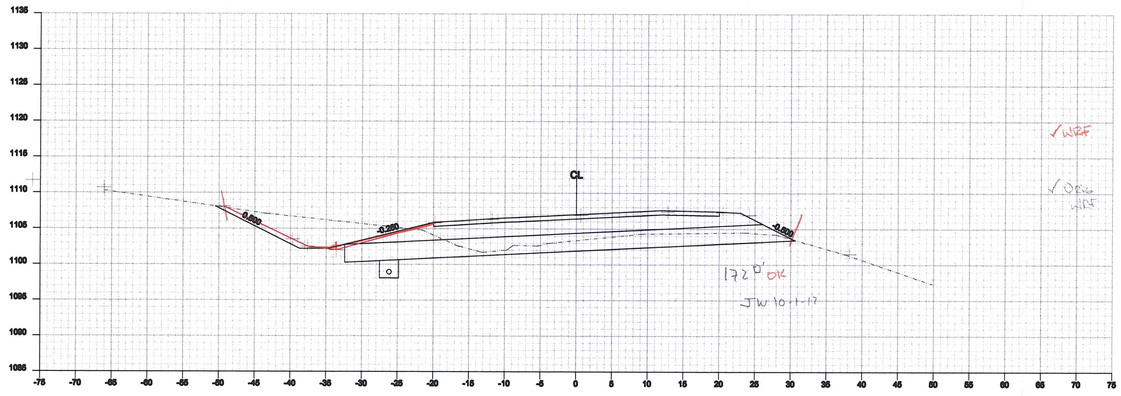


108+00

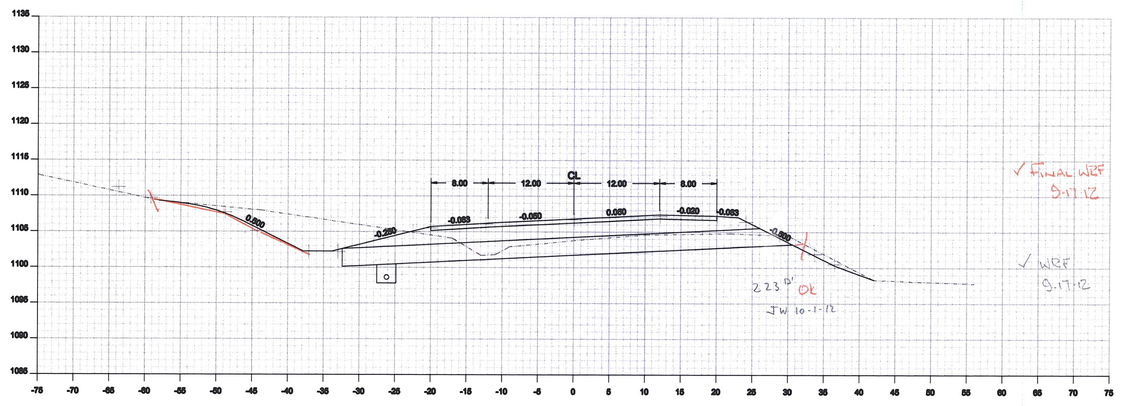


107+50

Drawing:	Cross Section 107+50 - 108+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 12-16-2011	Date:
Scale: 1 : 10	Sheet: of

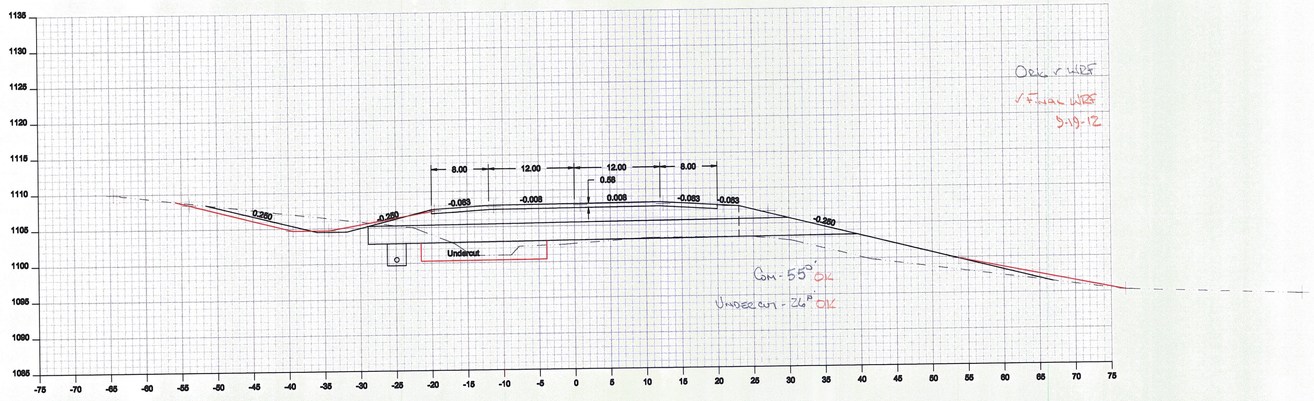


109+50

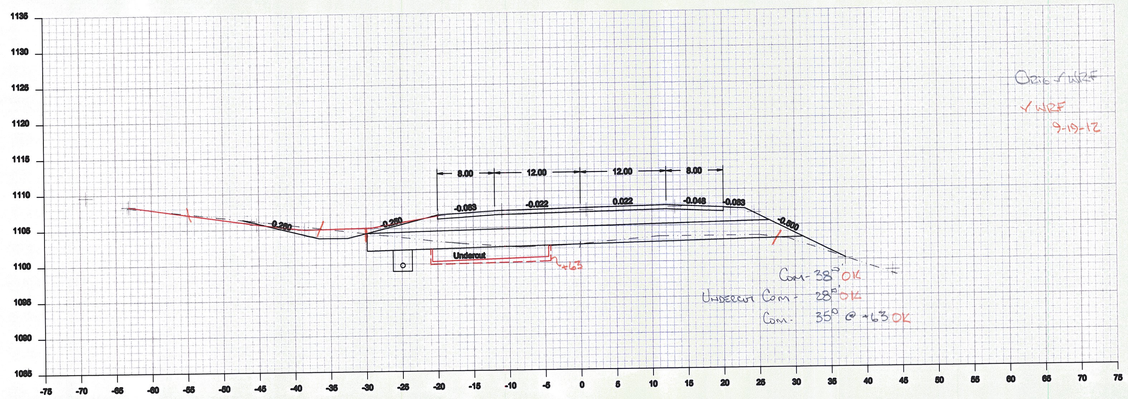


109+00

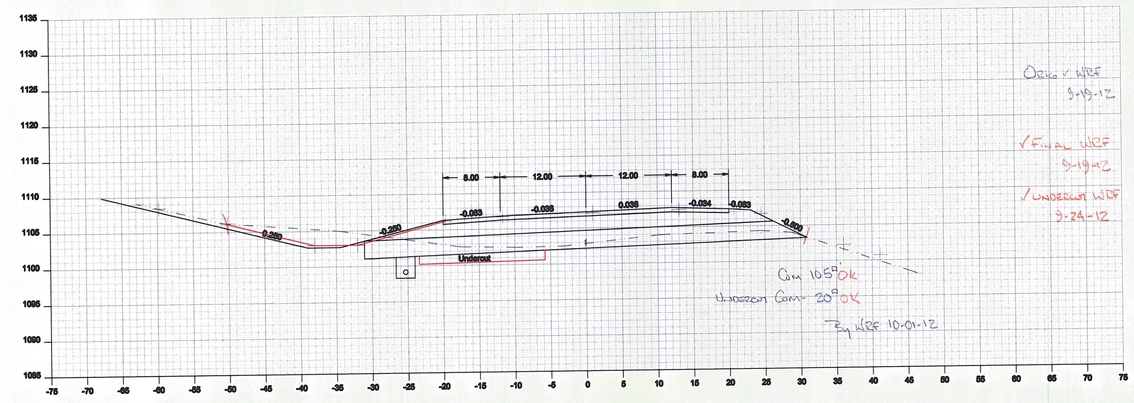
Drawing:	Cross Section 109+00 - 109+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 12-16-2011	Date:
Scale: 1 : 10	Sheet: of



111+00

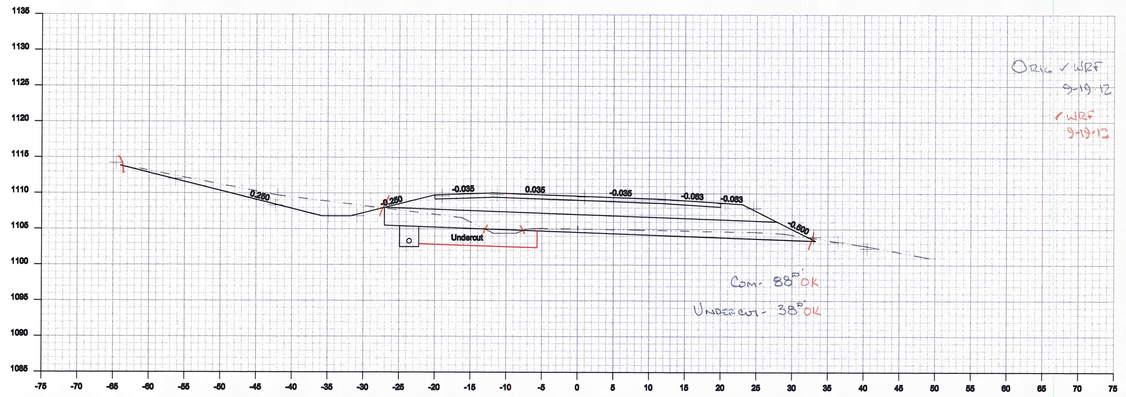


110+50

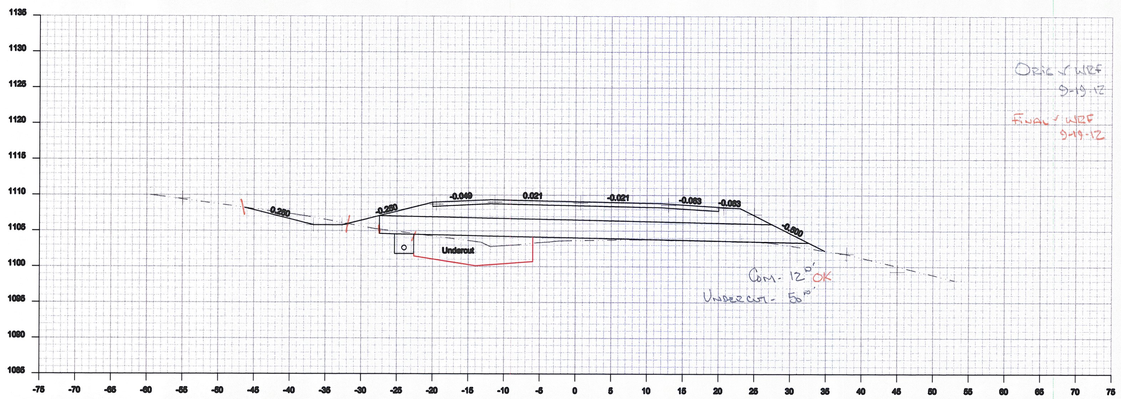


110+00

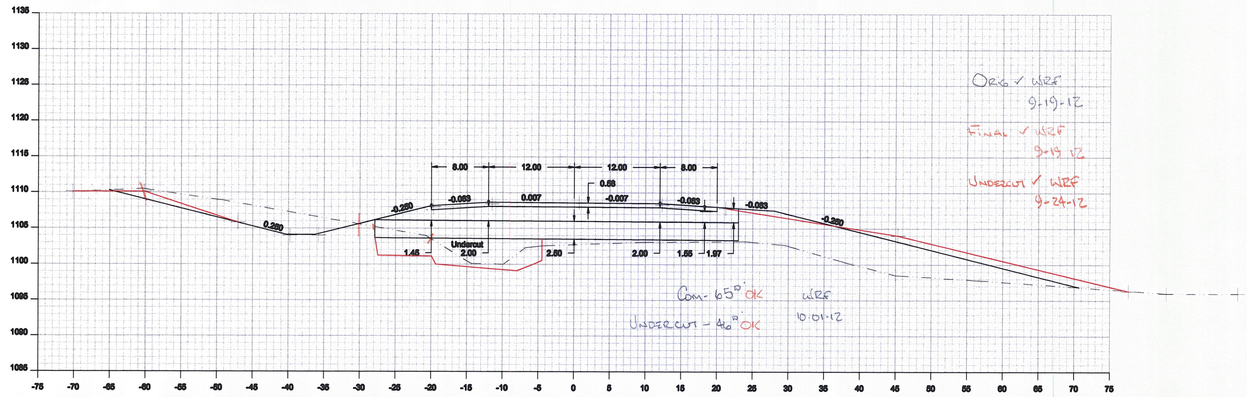
Drawing: Cross Section 110+00 - 111+00	
Project: Cabot Danville	
Drawn By: JMR	Checked By:
Date: 09-18-2012	Date:
Scale: 1 :10	Sheet: of



112+50

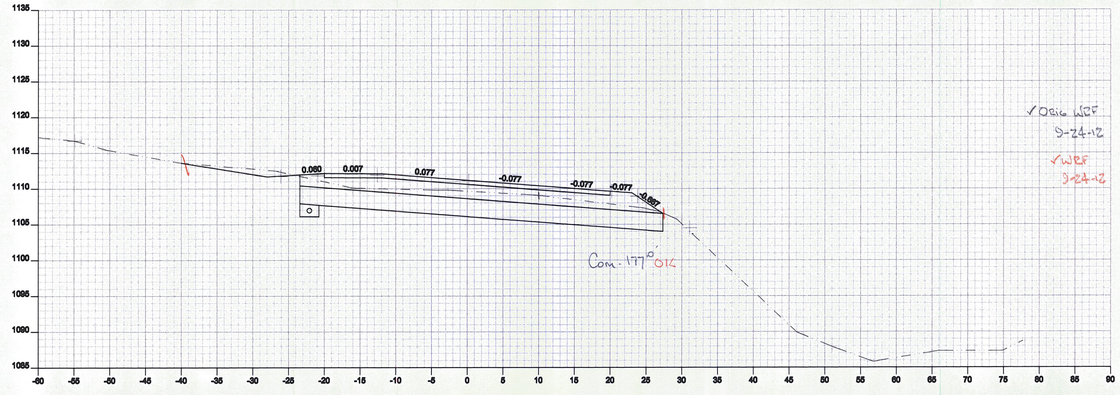


112+00

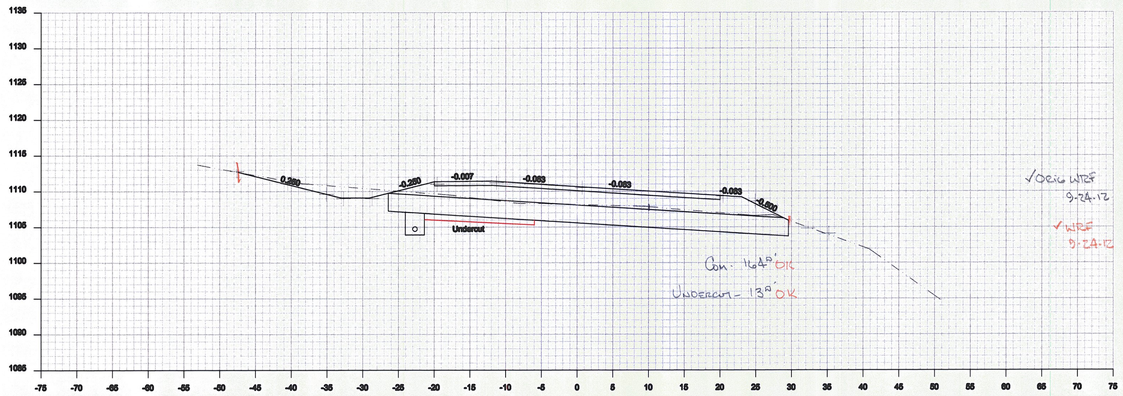


111+50

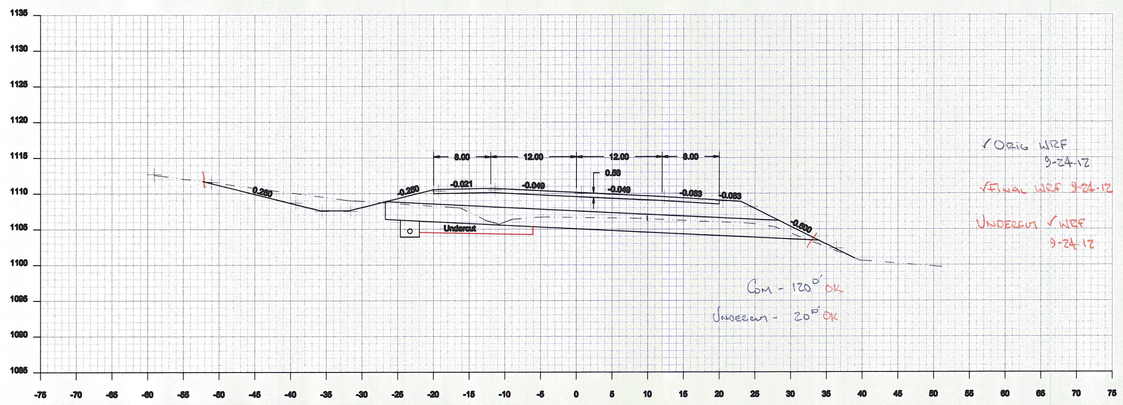
Drawing:	Cross Section 111+50 - 112+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-18-2012	Date:
Scale: 1:10	Sheet: of



114+00

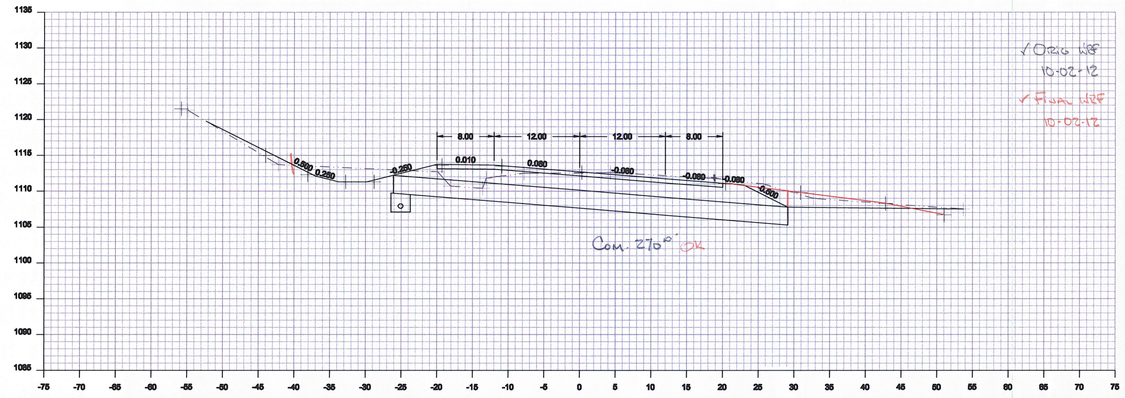


113+50

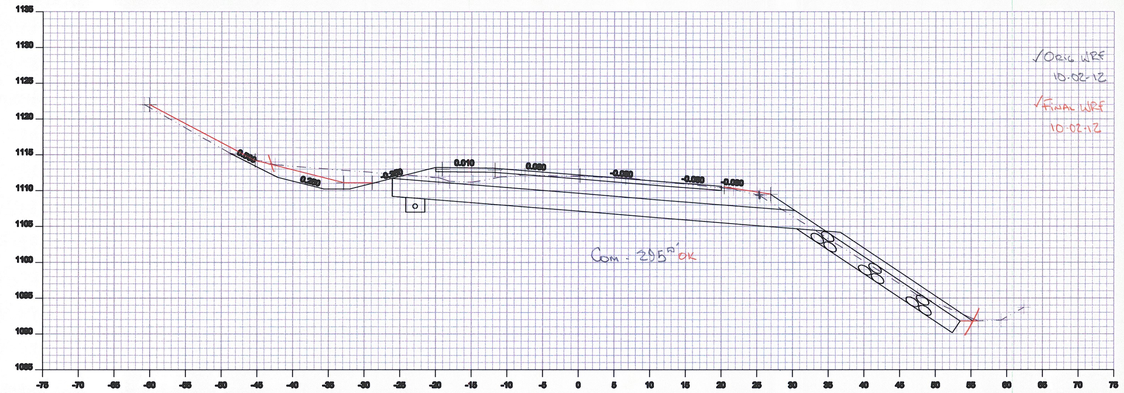


113+00

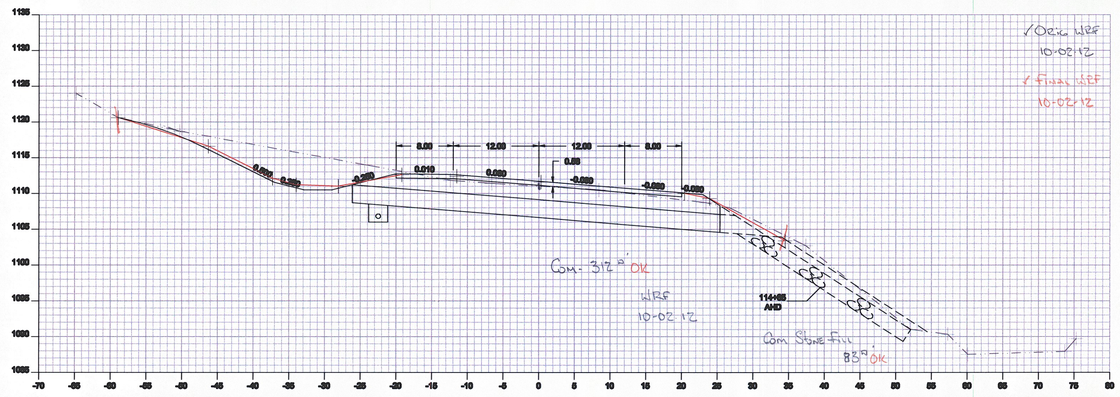
Drawing:	Cross Section 113+00 - 114+00
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-18-2012	Date:
Scale: 1 :10	Sheet: of



115+50

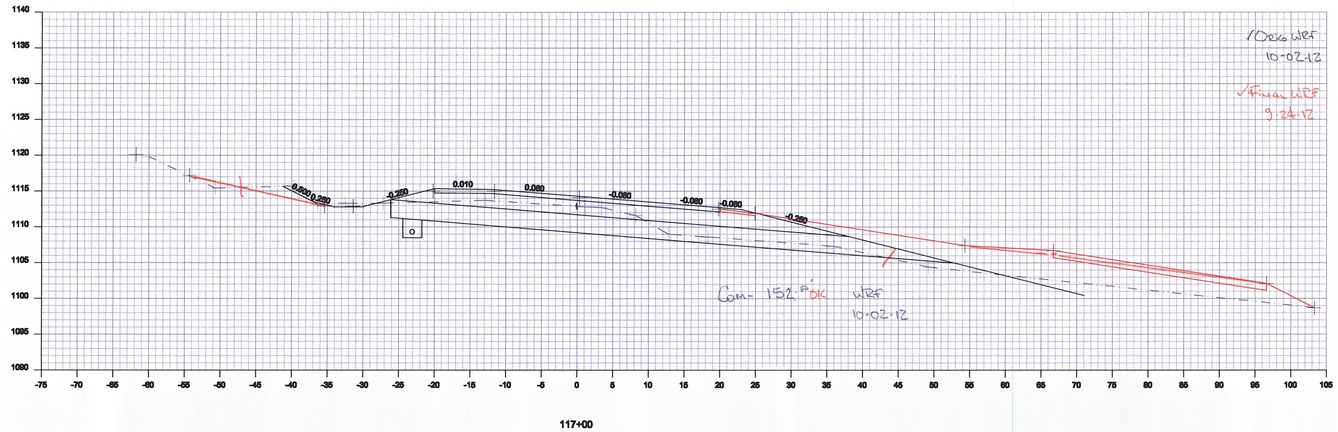


115+00

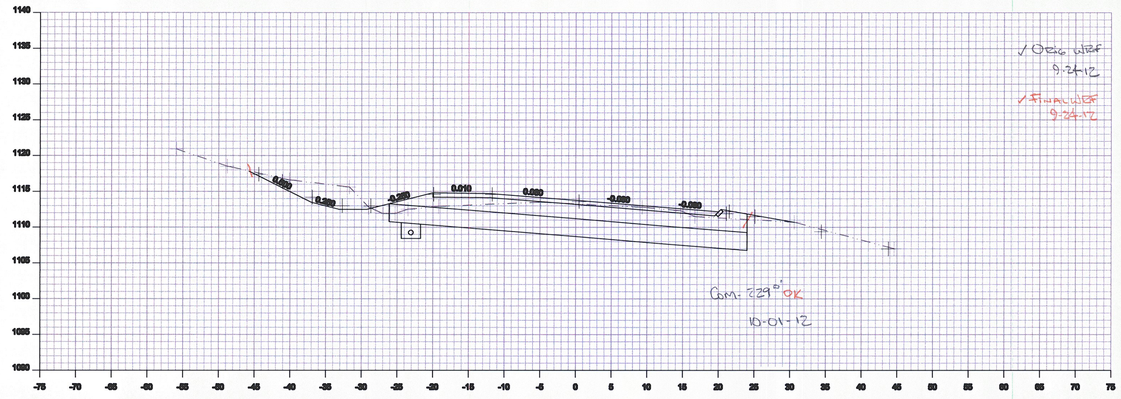


114+50

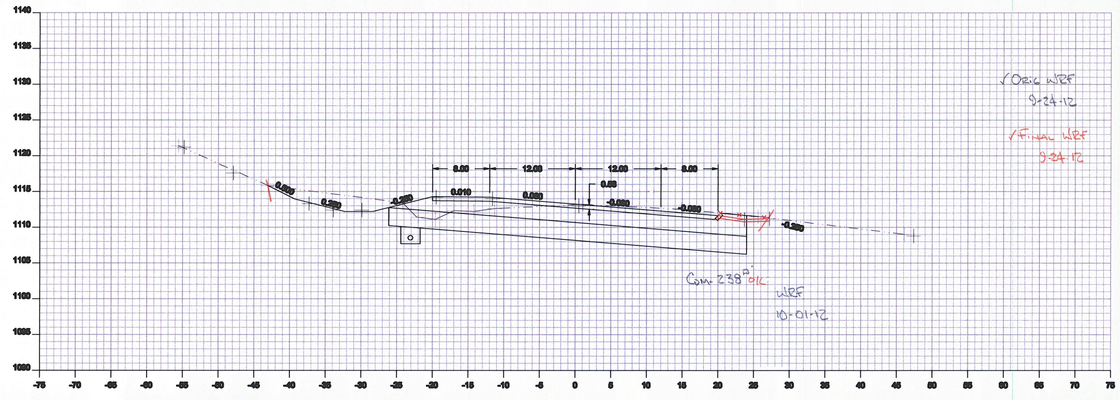
Drawing:	Cross Section 114+50 - 115+50		
Project:	Cabot Danville		
Drawn By:	JMR	Checked By:	
Date:	09-18-2012	Date:	
Scale:	1 :10	Sheet:	of



117+00

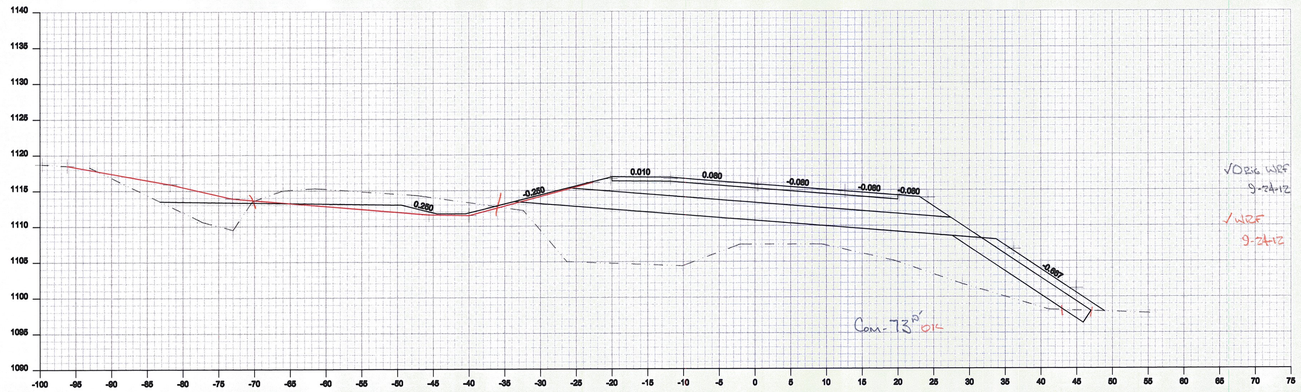


116+50

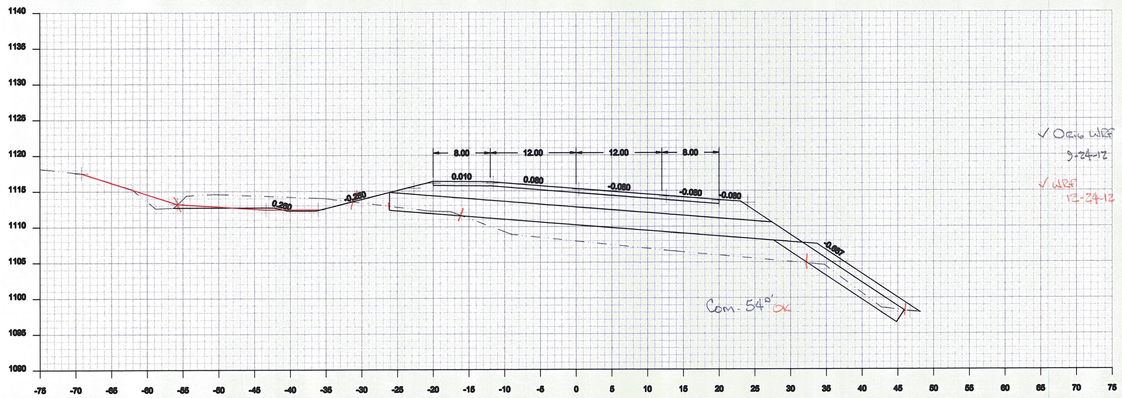


116+00

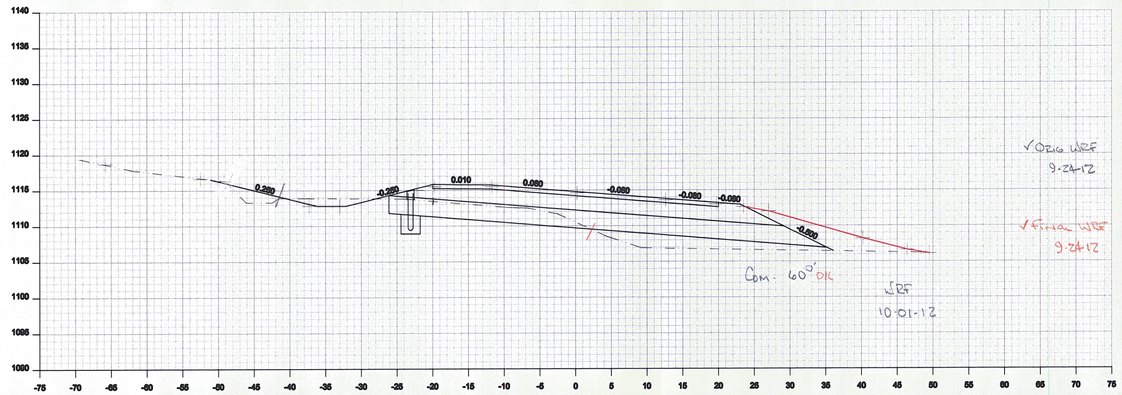
Drawing:	Cross Section 116+00 - 117+00		
Project:	Cabot Danville		
Drawn By:	JMR	Checked By:	
Date:	09-18-2012	Date:	
Scale:	1 :10	Sheet:	of



118+50

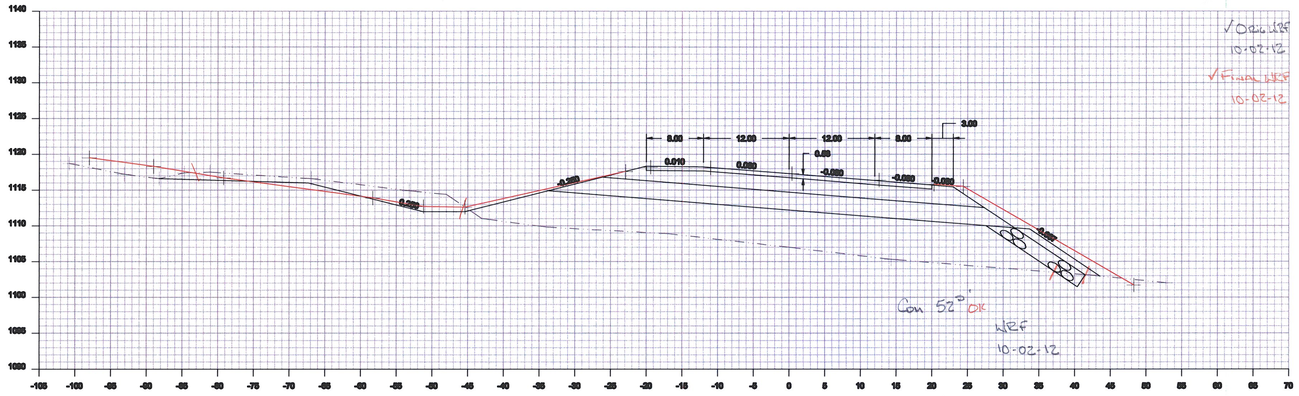


118+00

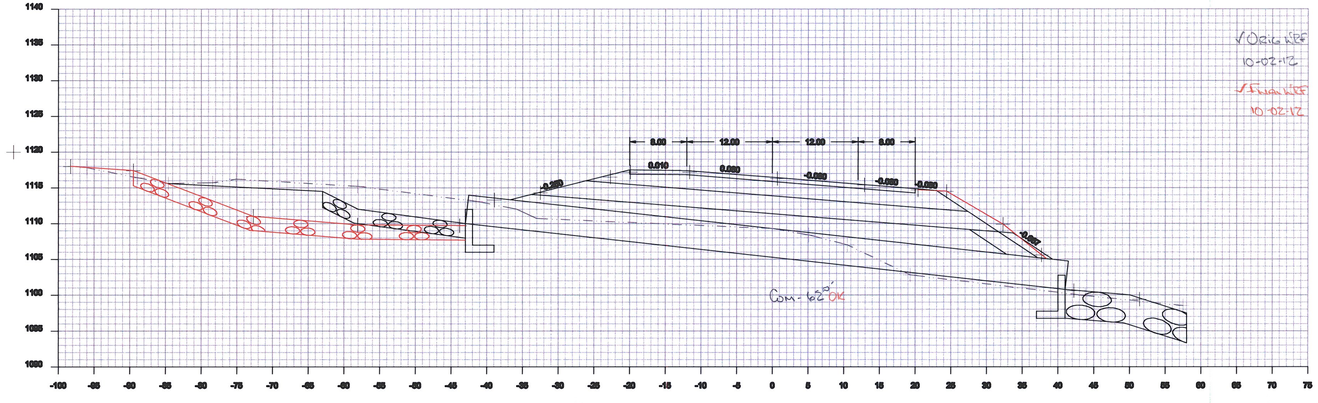


117+50

Drawing:	Cross Section 117+50 - 118+50
Project:	Cabot Denville
Drawn By: JMR	Checked By:
Date: 09-18-2012	Date:
Scale: 1:10	Sheet: of

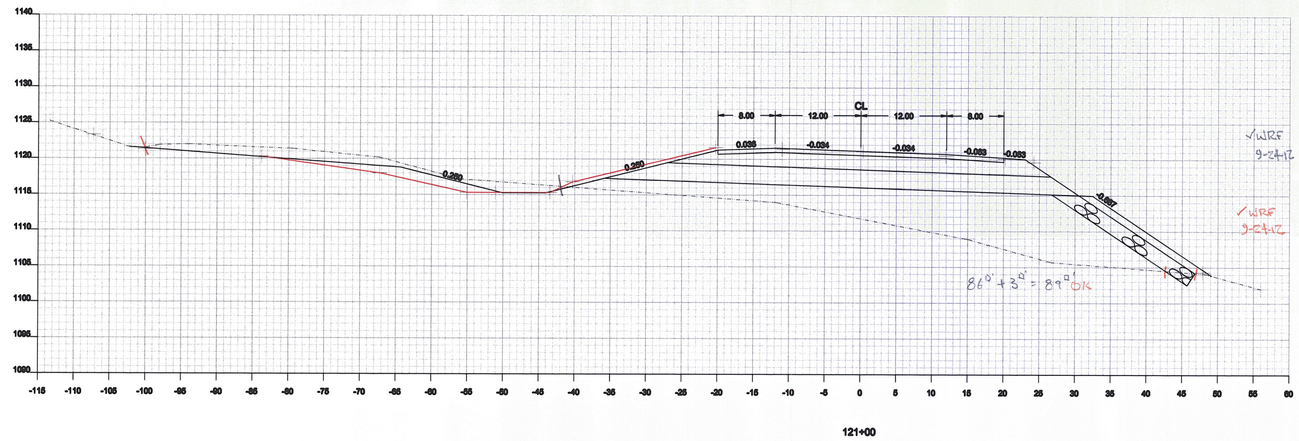


119+00

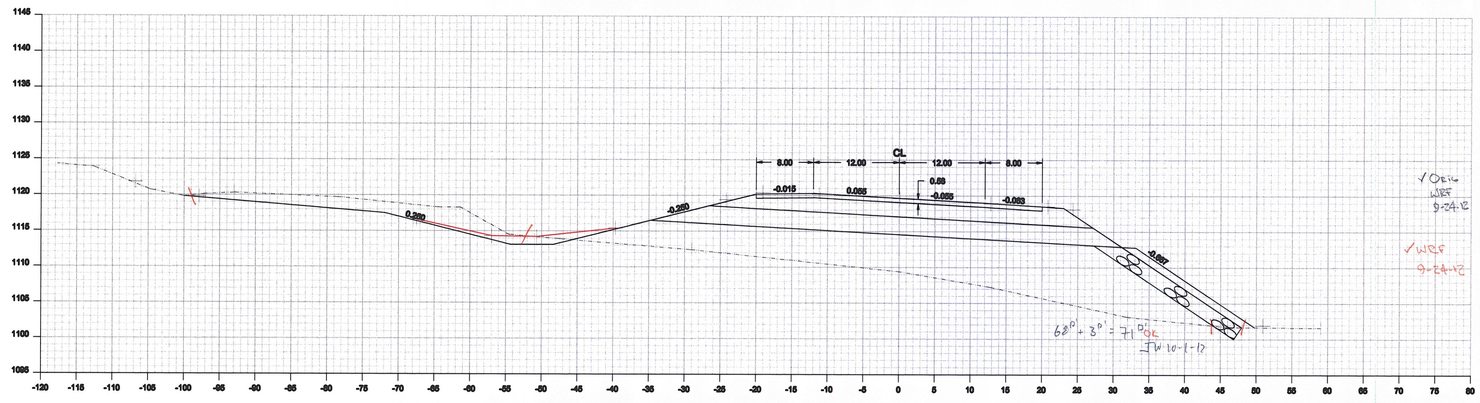


119+00

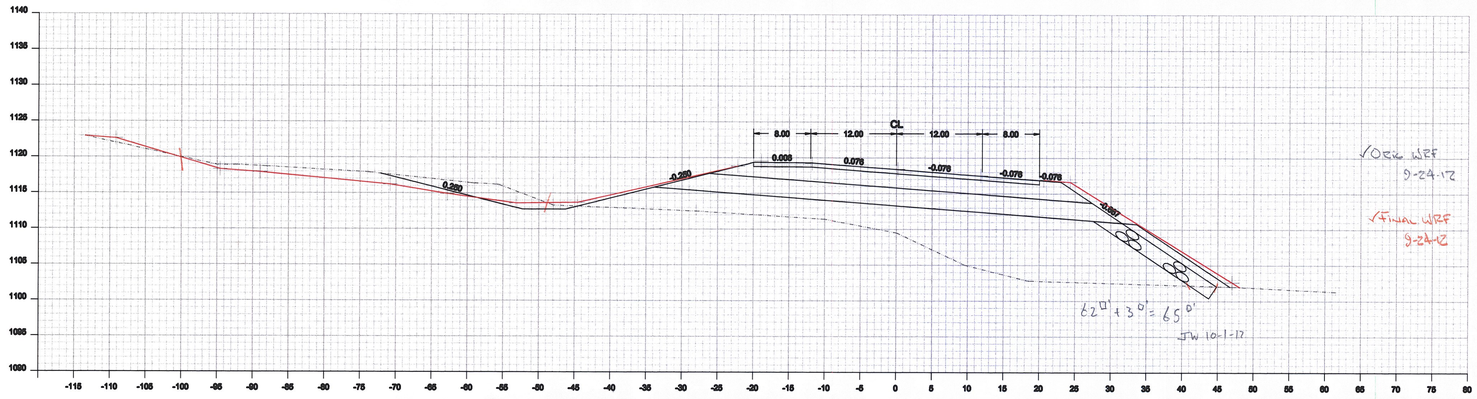
Drawing:	Cross Section 119+00 - 119+50		
Project:	Cabot Danville		
Drawn By:	JMR	Checked By:	
Date:	09-18-2012	Date:	
Scale:	1 :10	Sheet:	of



121+00

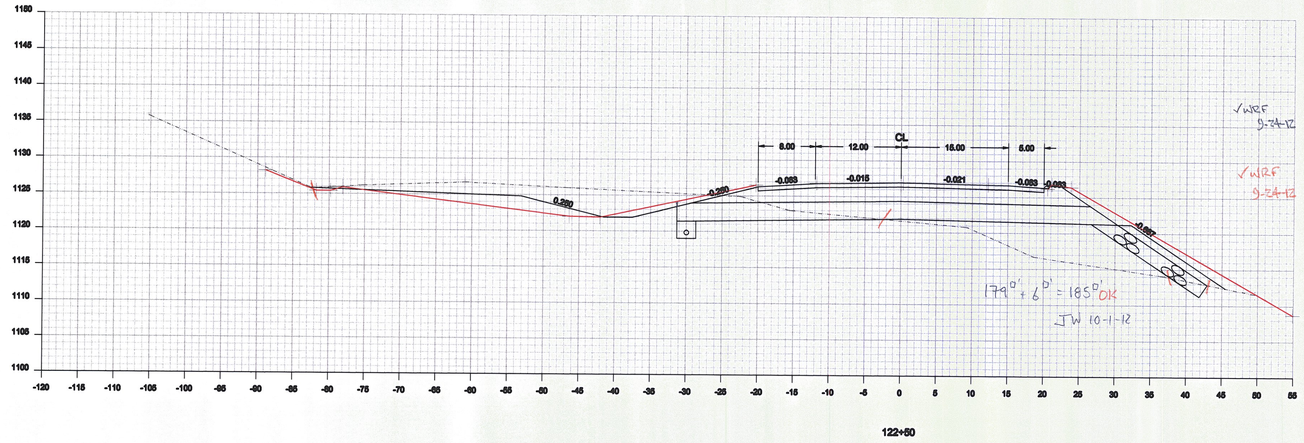


120+50

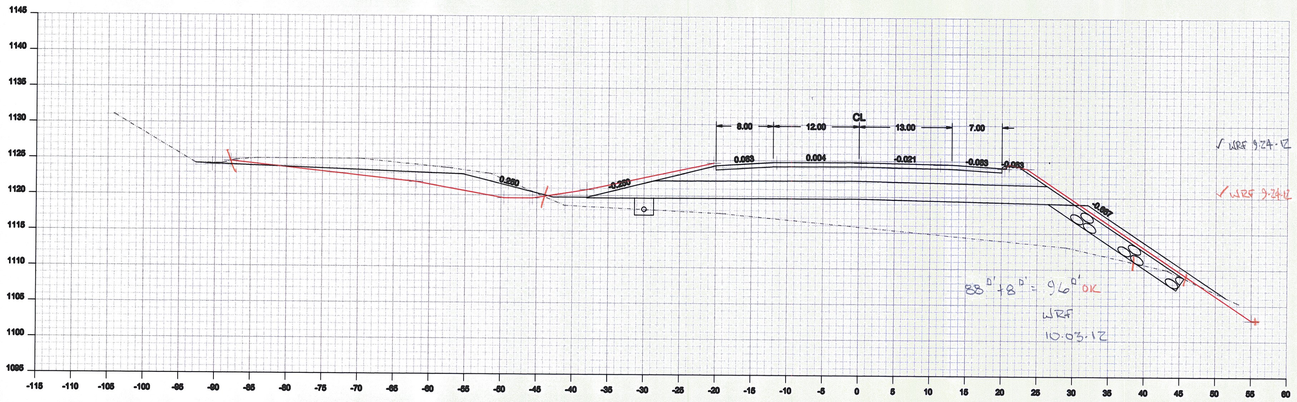


120+00

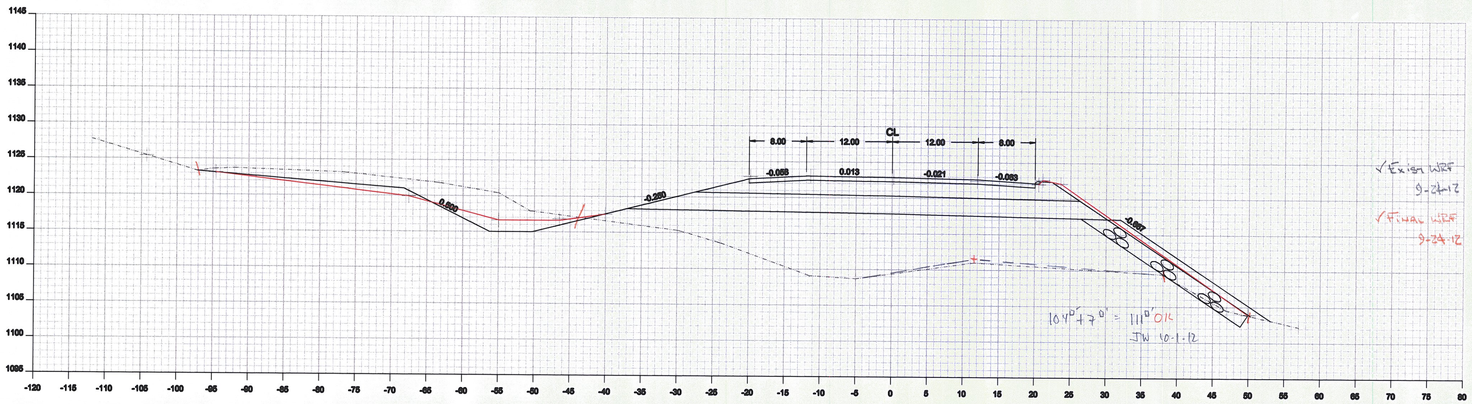
Drawing:	Section 120+00 - 121+00
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-19-2012	Date:
Scale: 1 : 10	Sheet: of



122+50

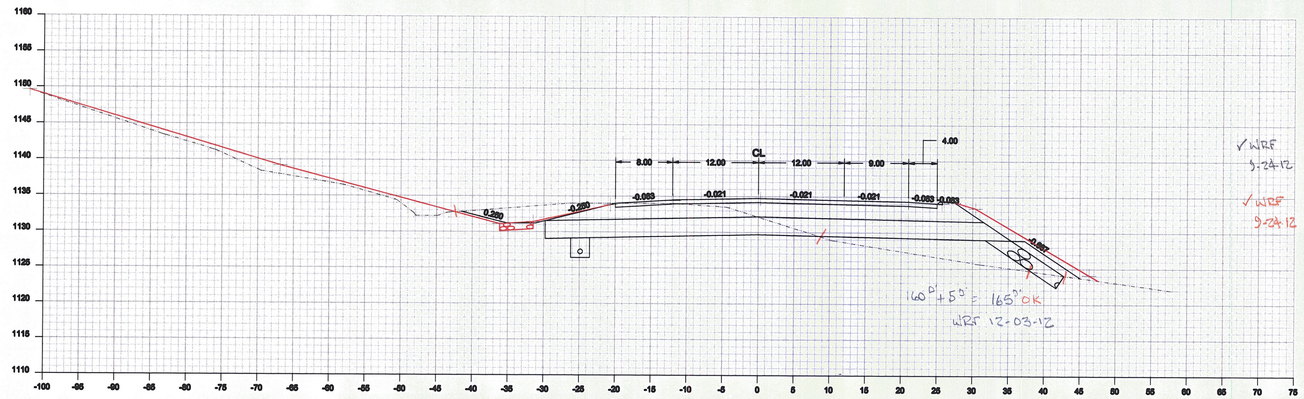


122+00

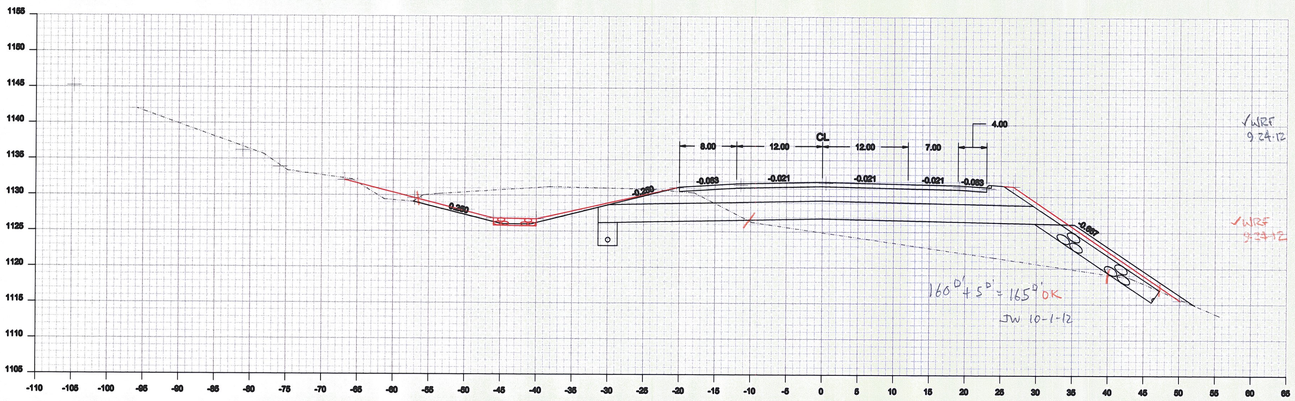


121+50

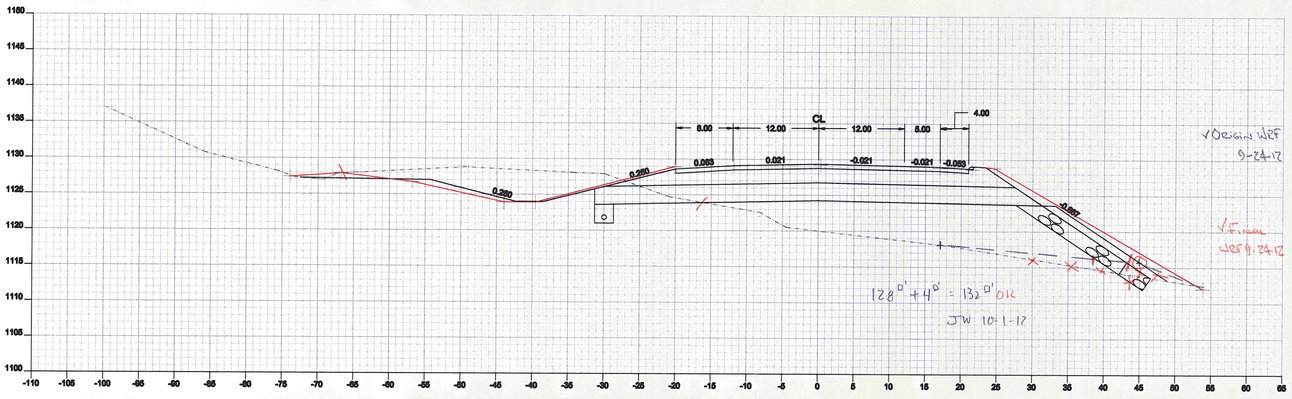
Drawing:	Section 121+50 - 122+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-19-2012	Date:
Scale: 1 : 10	Sheet: of



124+00

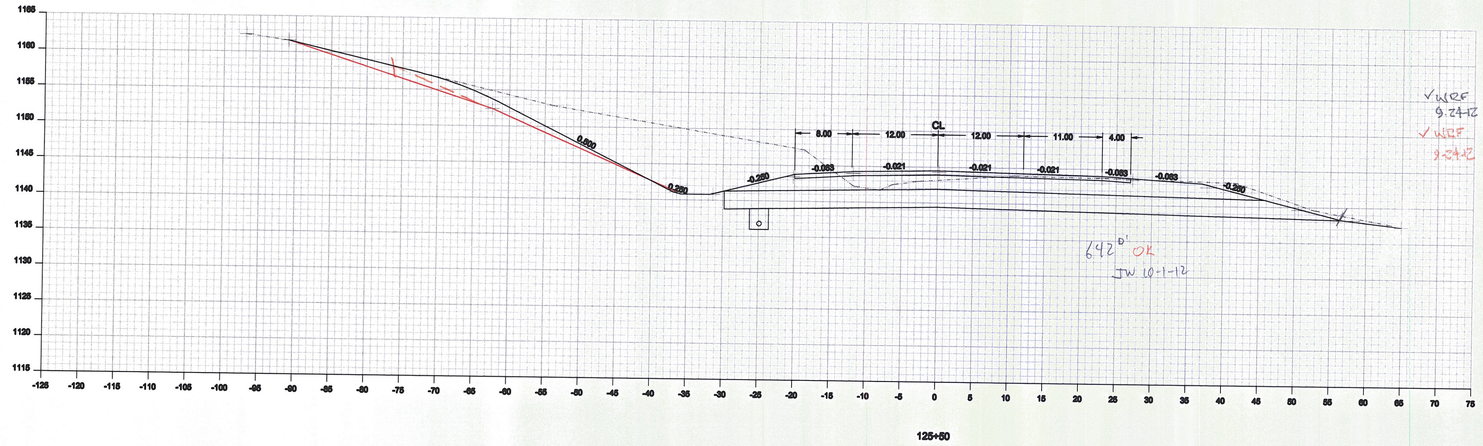


123+50



123+00

Drawing:	Section 123+00 - 124+00
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-19-2012	Date:
Scale: 1 : 10	Sheet: of

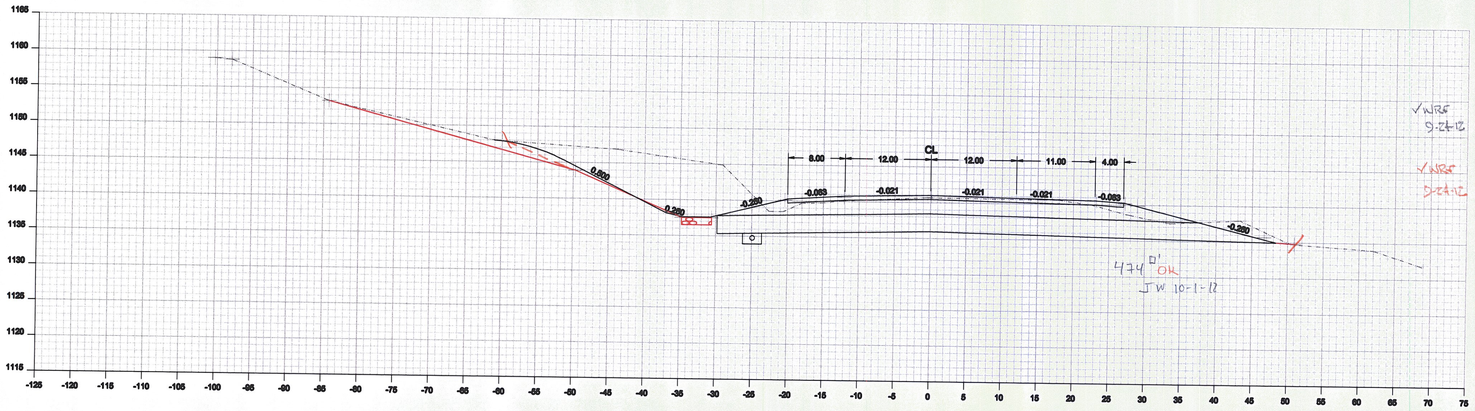


642' OK
JW 10-1-12

✓WRF 9-24-12

✓WRF 9-24-12

125+50

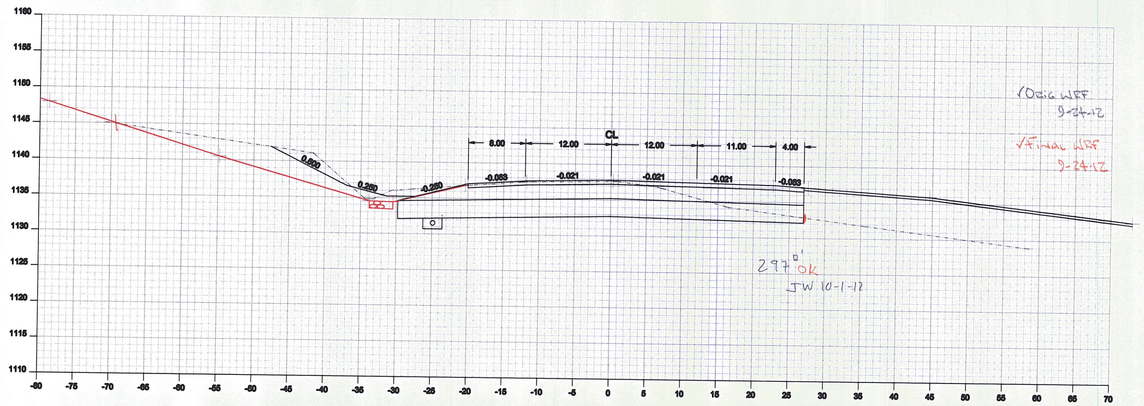


474' OK
JW 10-1-12

✓WRF 9-24-12

✓WRF 9-24-12

125+00



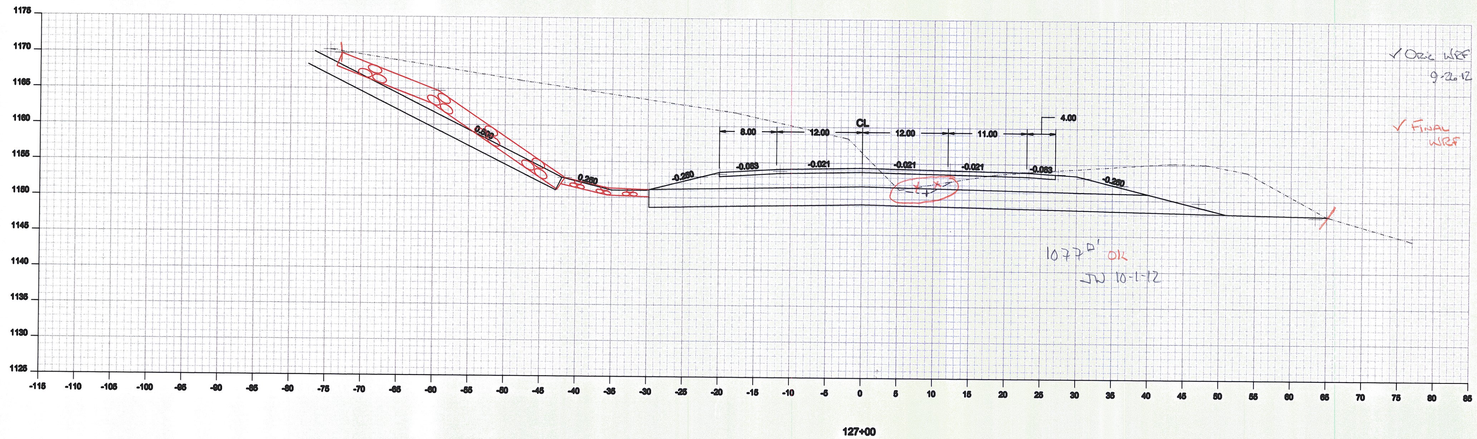
297' OK
JW 10-1-12

✓Orig WRF 9-24-12

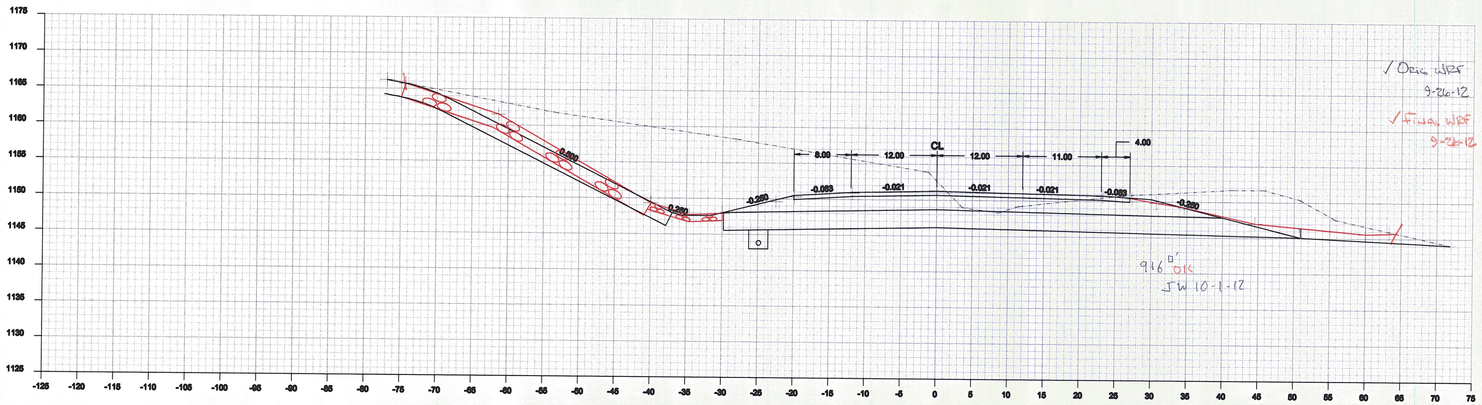
✓Final WRF 9-24-12

124+50

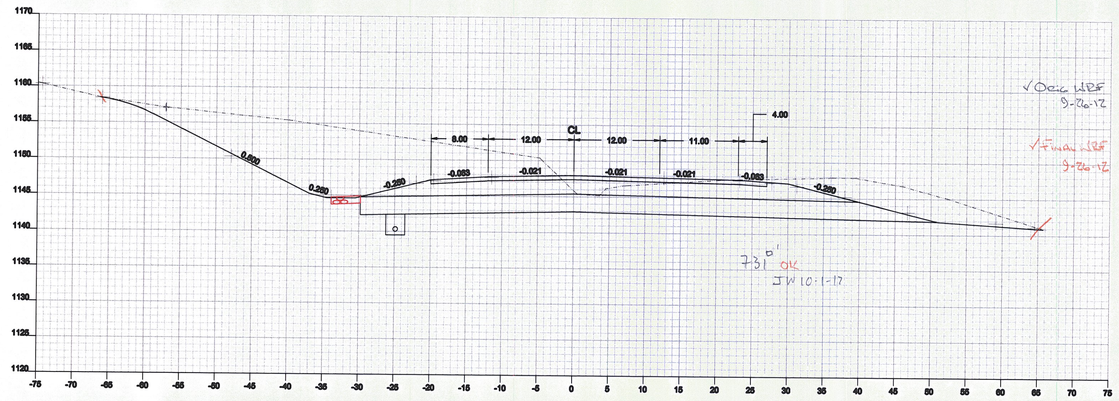
Drawing:	Section 124+50 - 125+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-19-2012	Date:
Scale: 1 : 10	Sheet: of



127+00

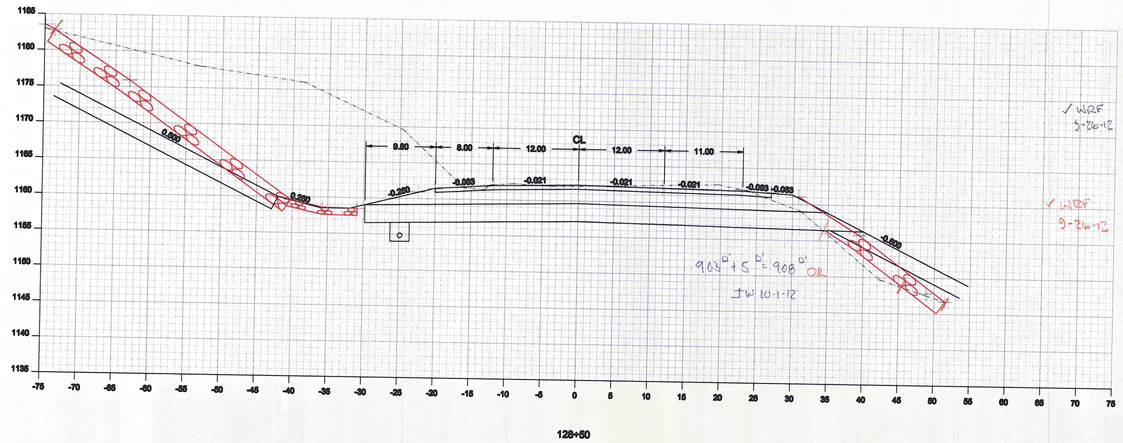


126+50

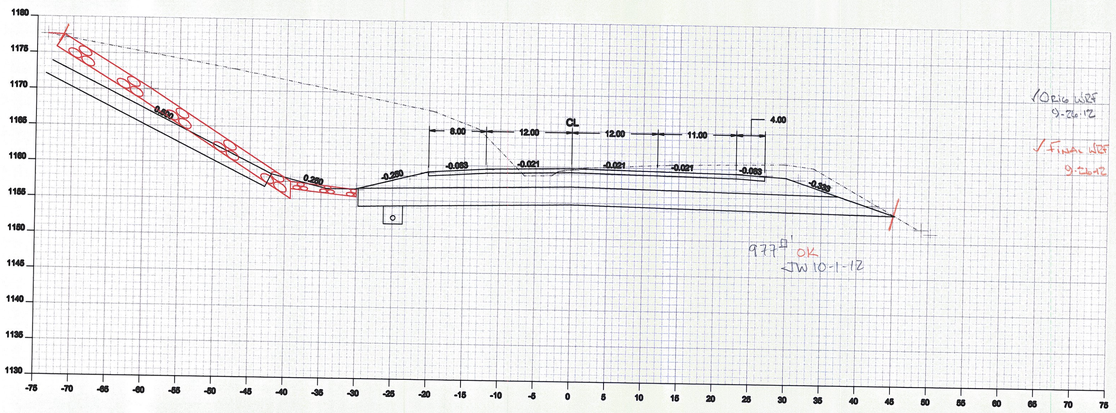


126+00

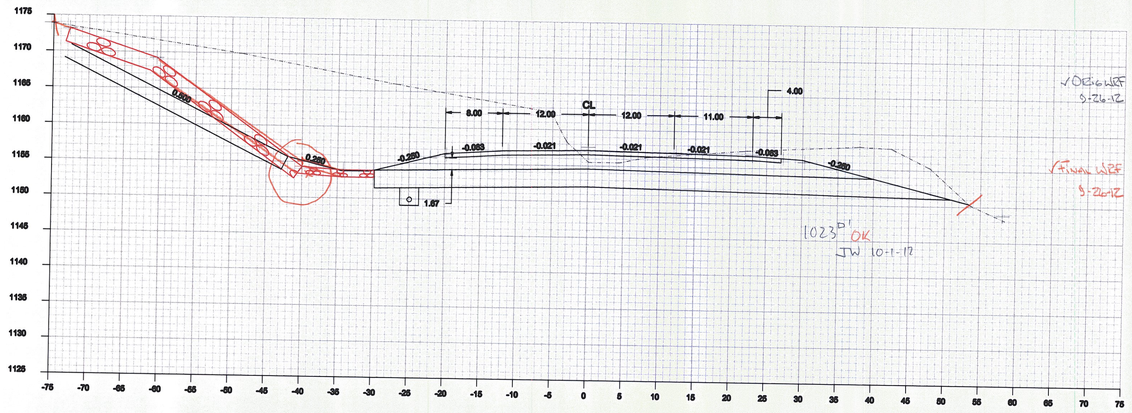
Drawing:	Section 126+00- 127+00
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-19-2012	Date:
Scale: 1 : 10	Sheet: of



128+50

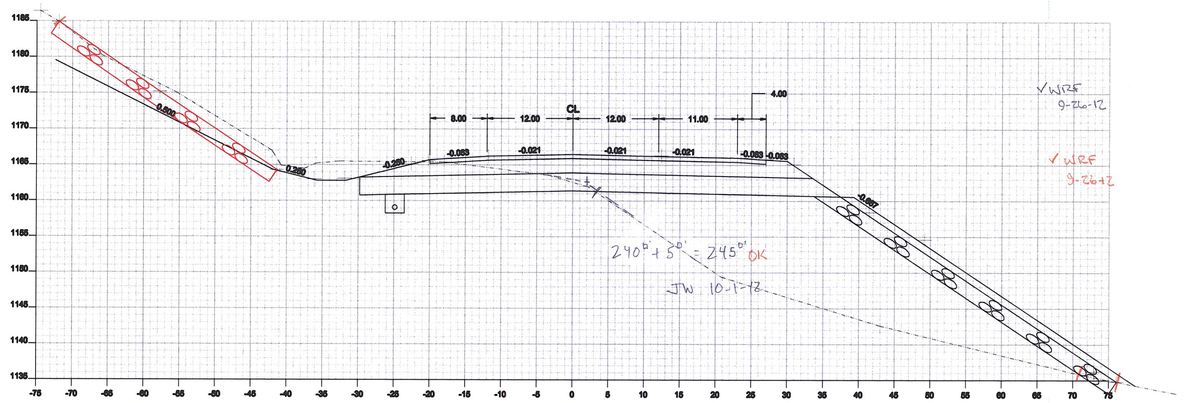


128+00

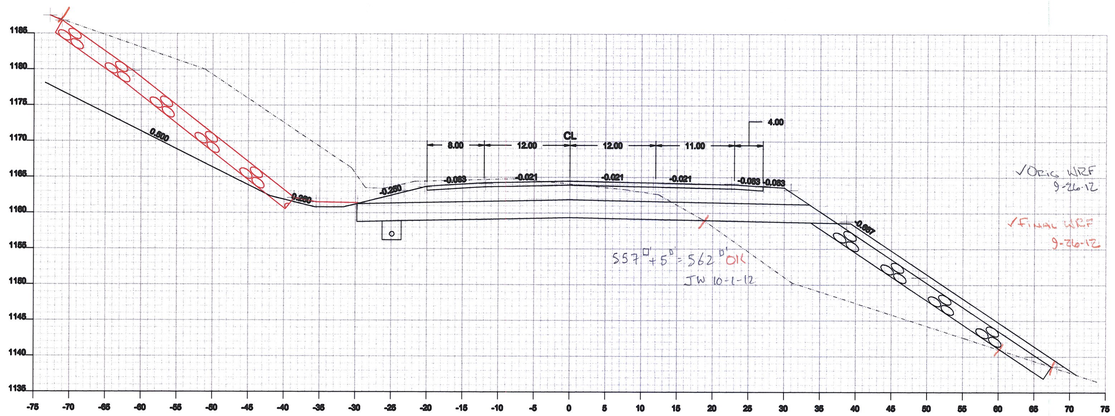


127+50

Drawing:	Section 127+50 - 128+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-19-2012	Date:
Scale: 1 : 10	Sheet: of

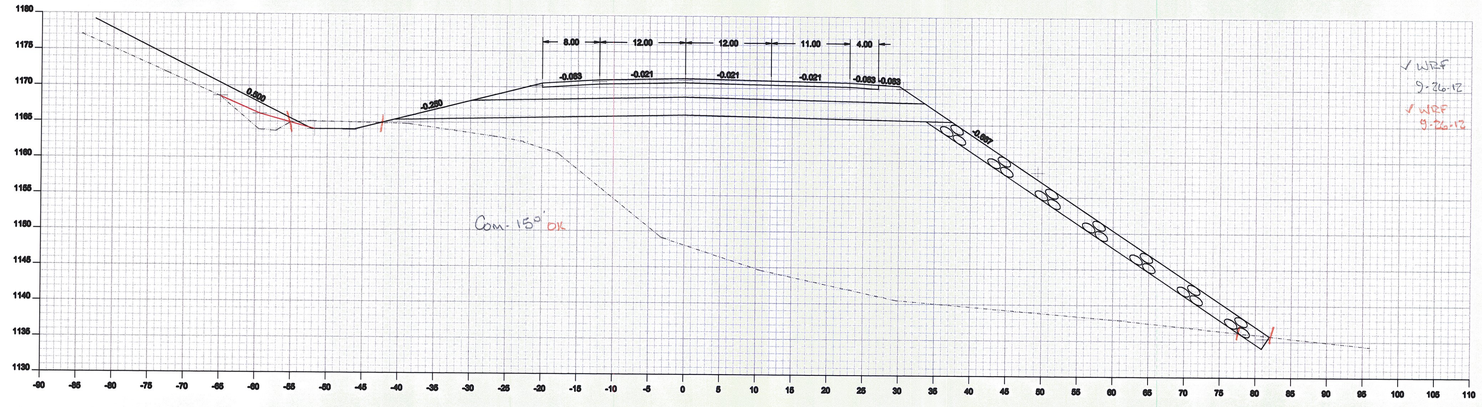


129+50

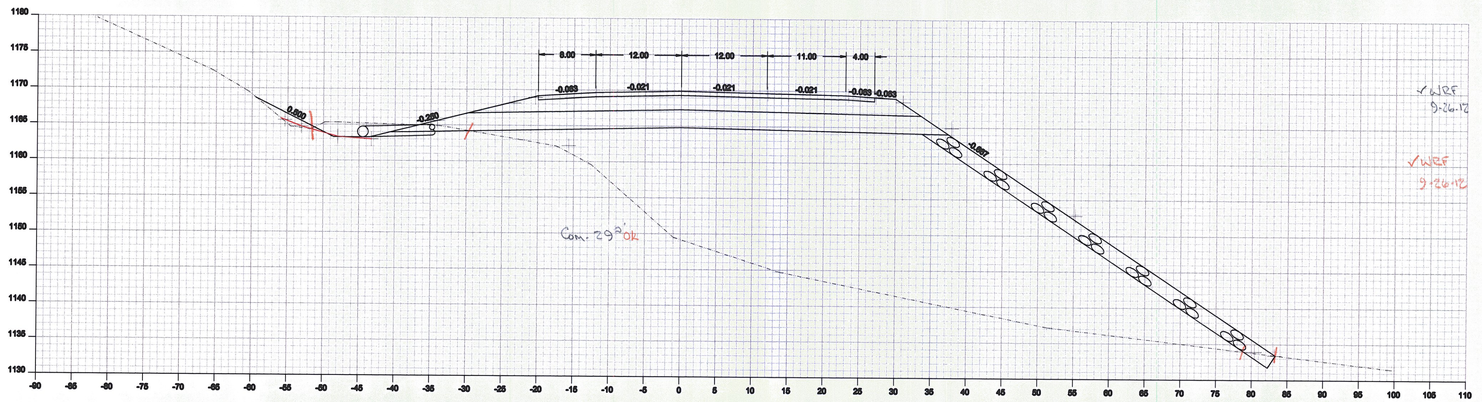


129+00

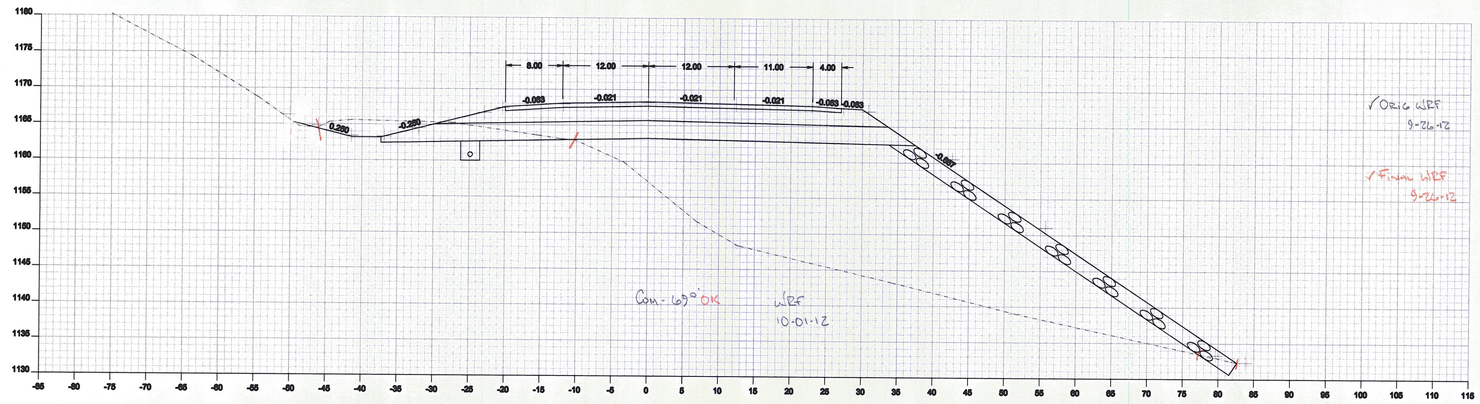
Drawing:	Section 129+00 - 129+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-19-2012	Date:
Scale: 1 : 10	Sheet: of



131+00

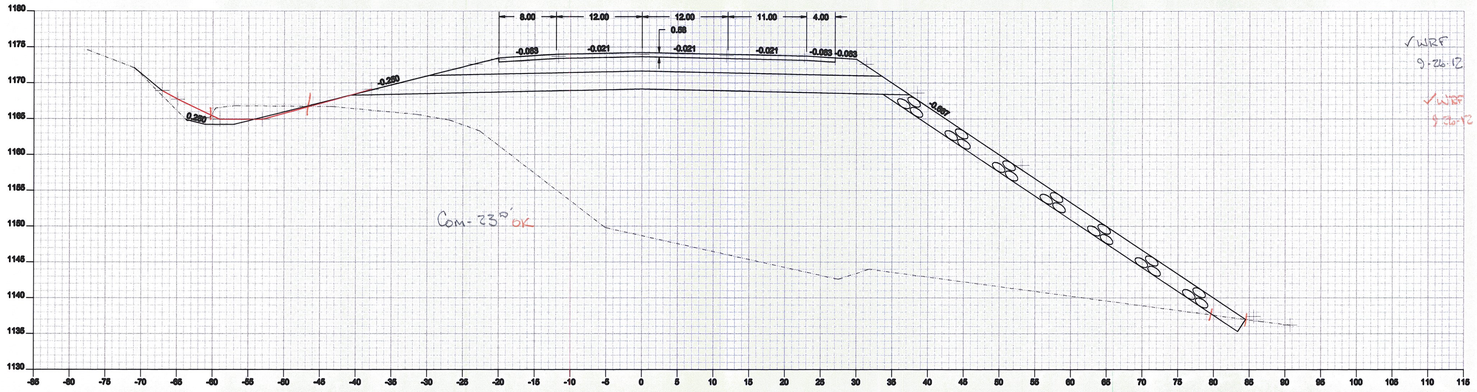


130+50

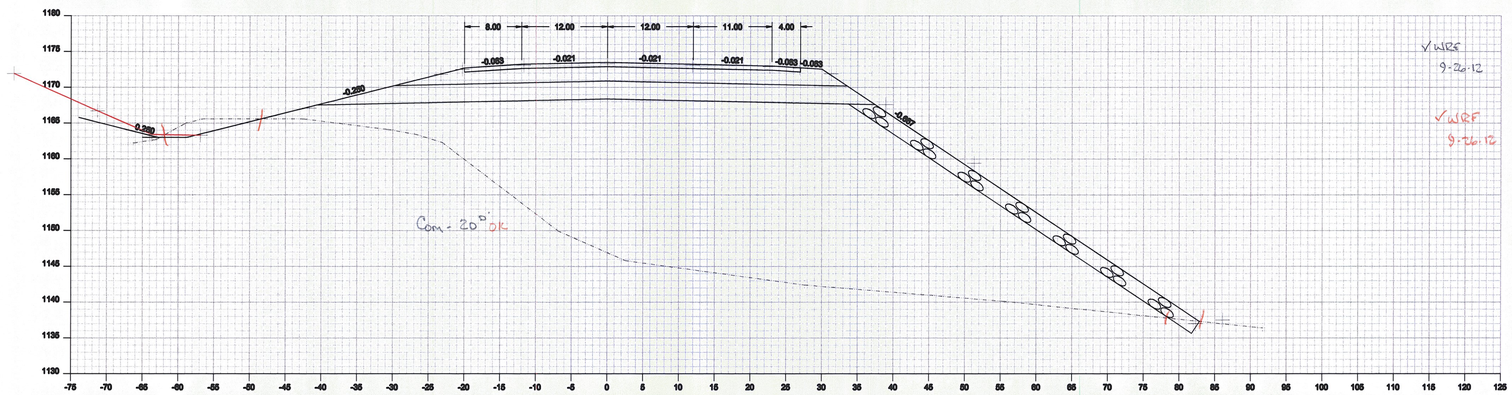


130+00

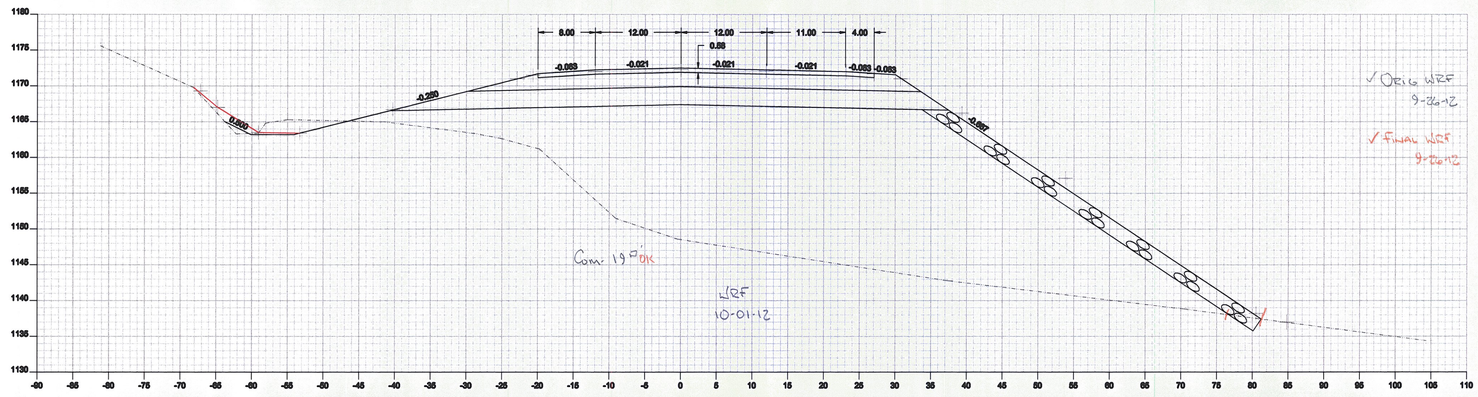
Drawing:	Cross Section 130+00 to 131+00
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 08-21-2012	Date:
Scale: 1 : 10	Sheet: of



132+50

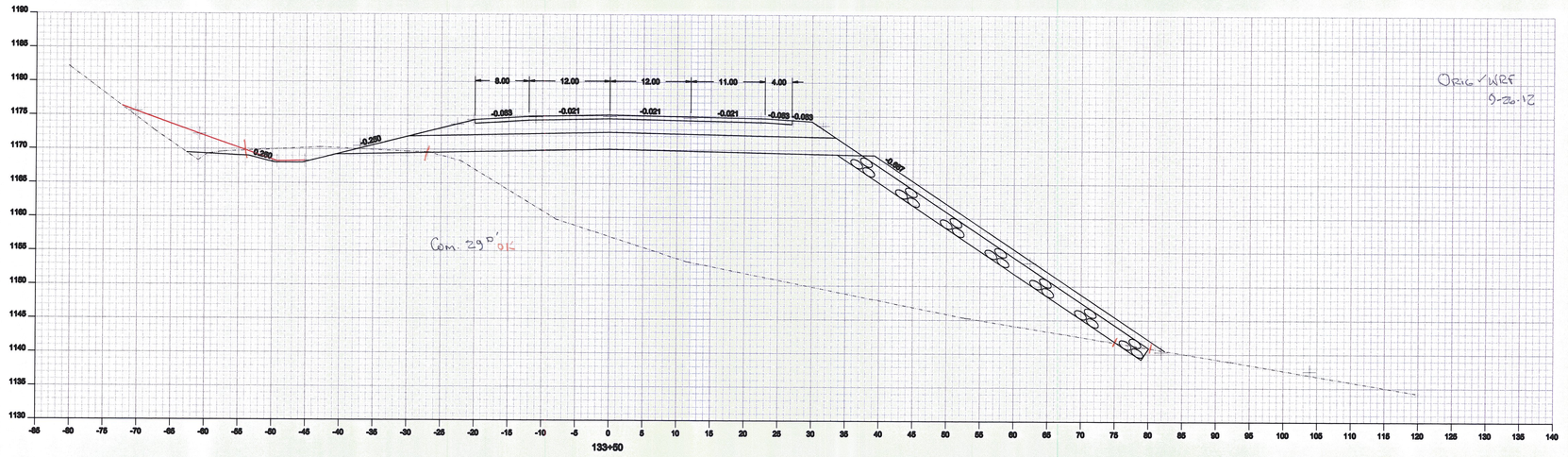


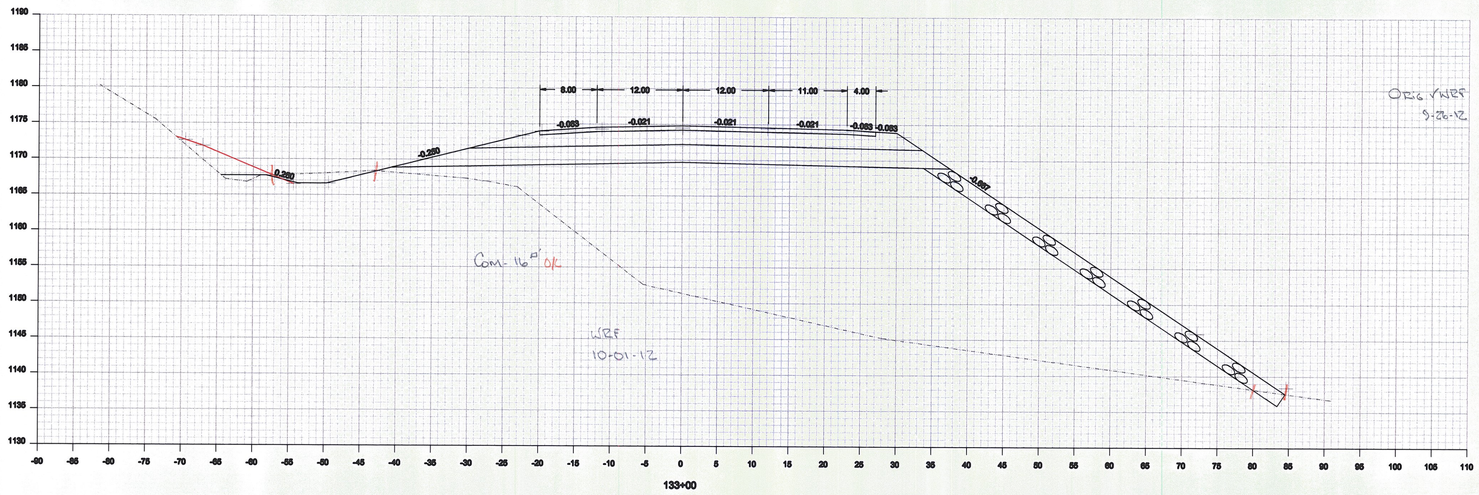
132+00



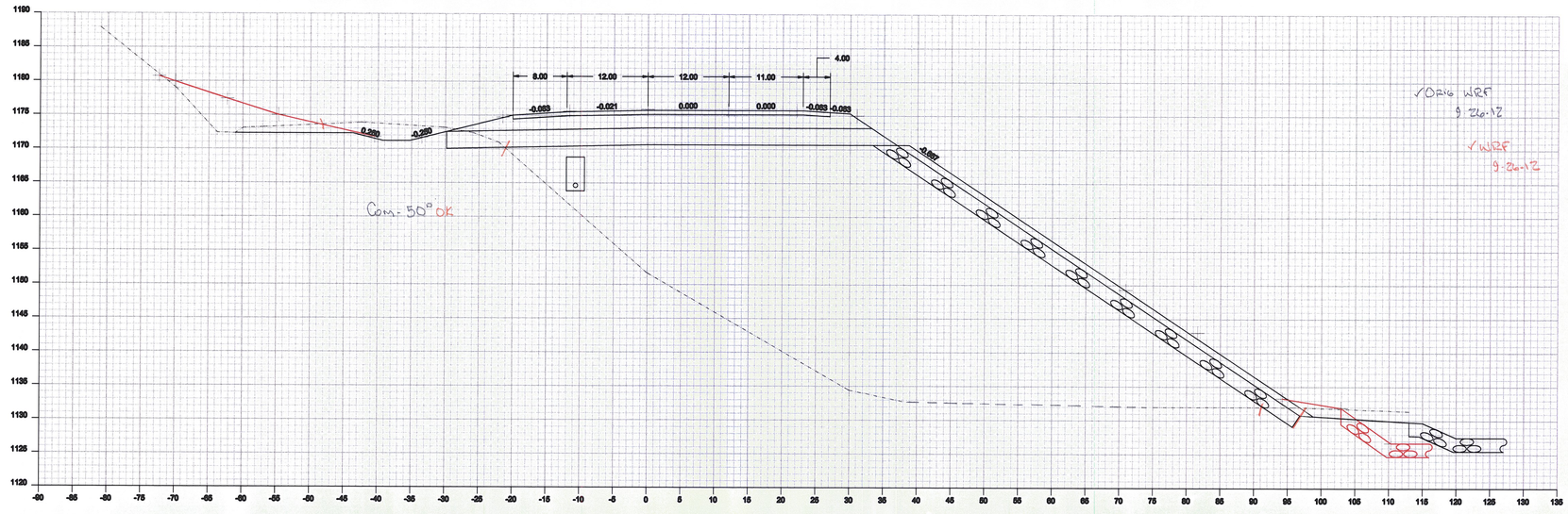
131+50

Drawing:	Cross Section 131+50 to 132+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-21-2012	Date:
Scale: 1 : 10	Sheet: of

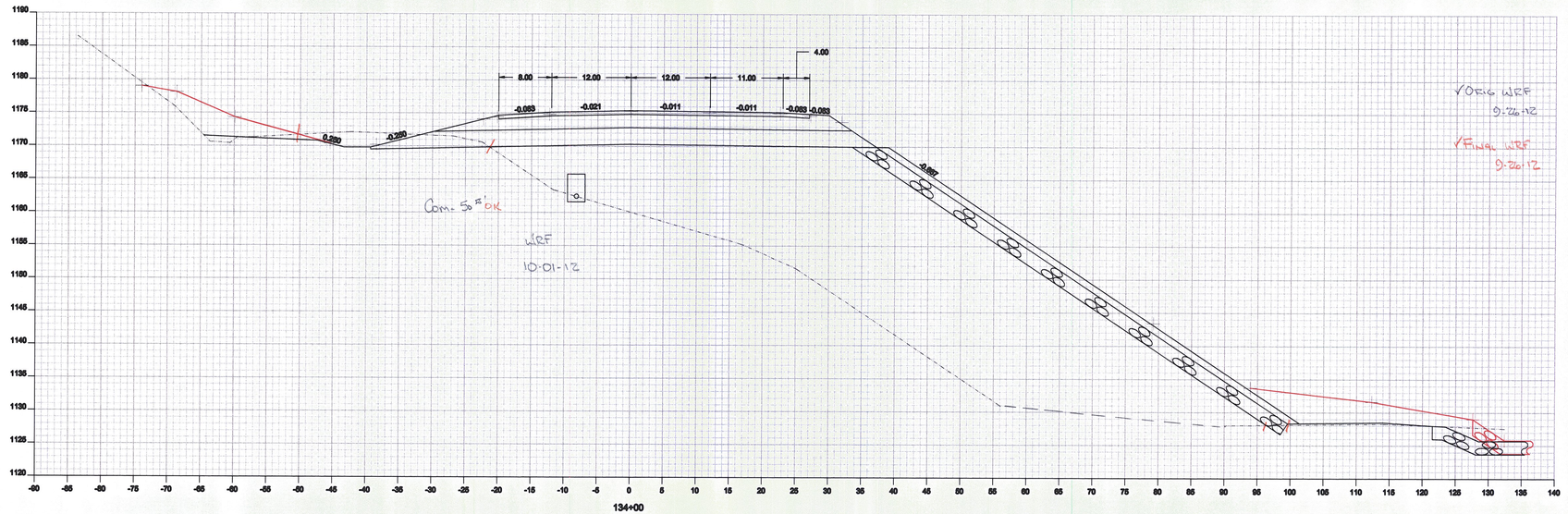




Drawing:	Cross Section 133+00 to 133+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-21-2012	Date:
Scale: 1 : 10	Sheet: of

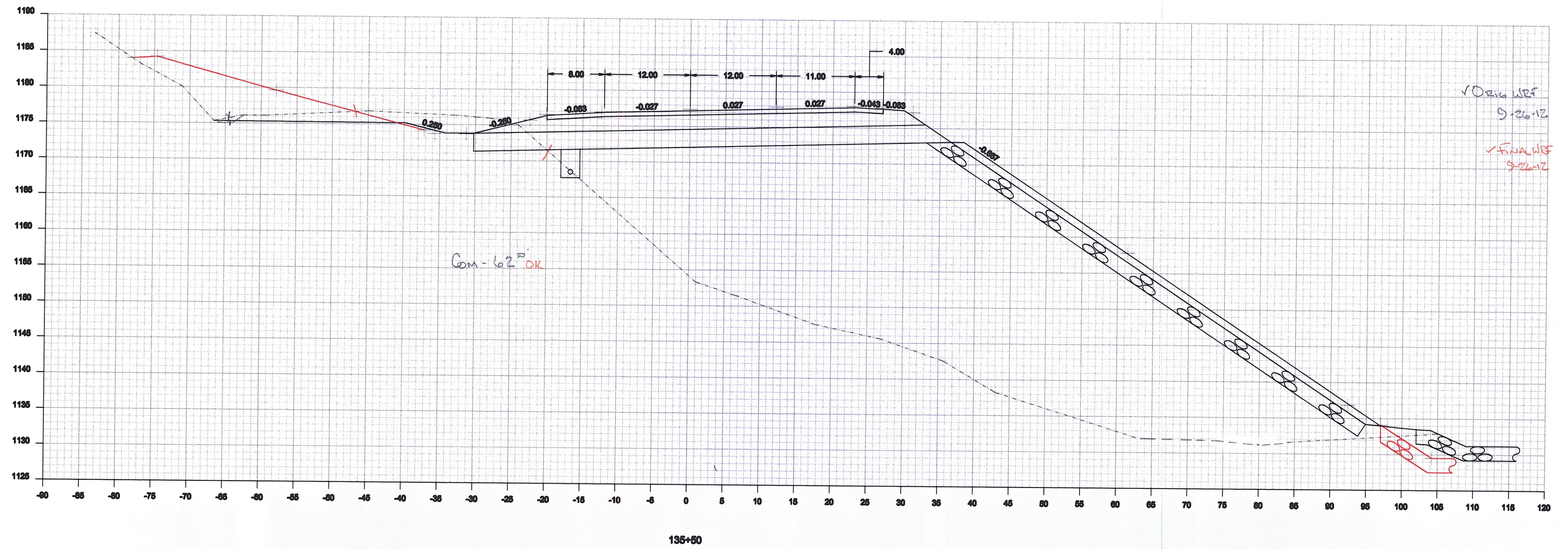


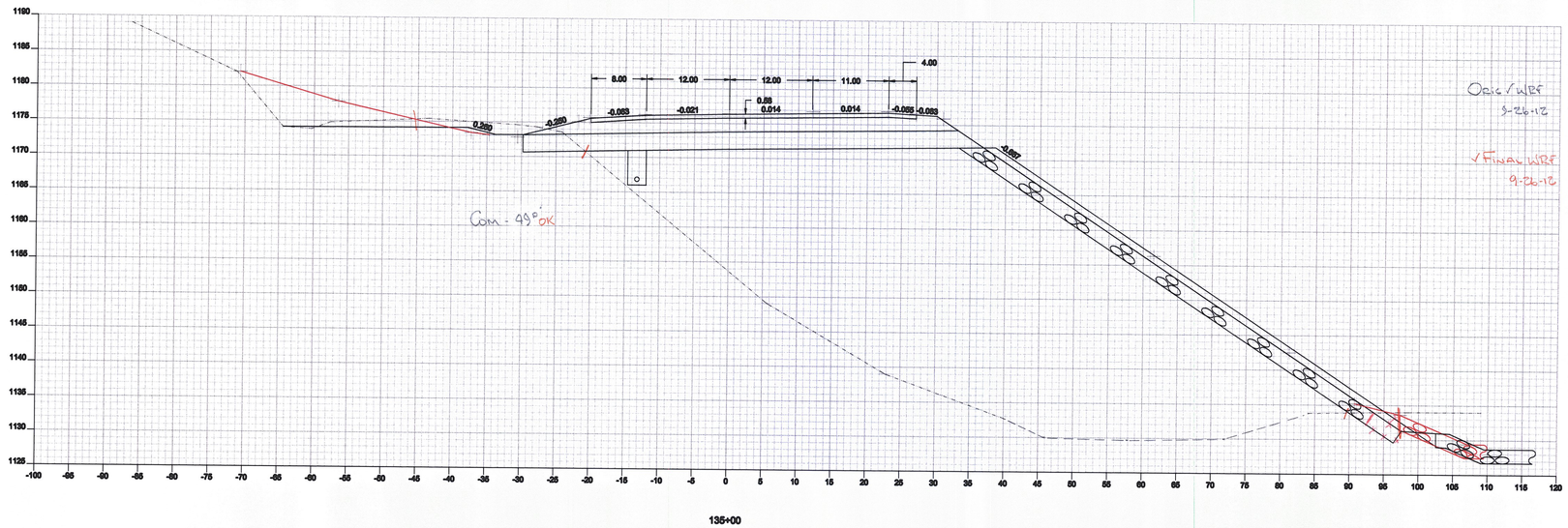
134+50



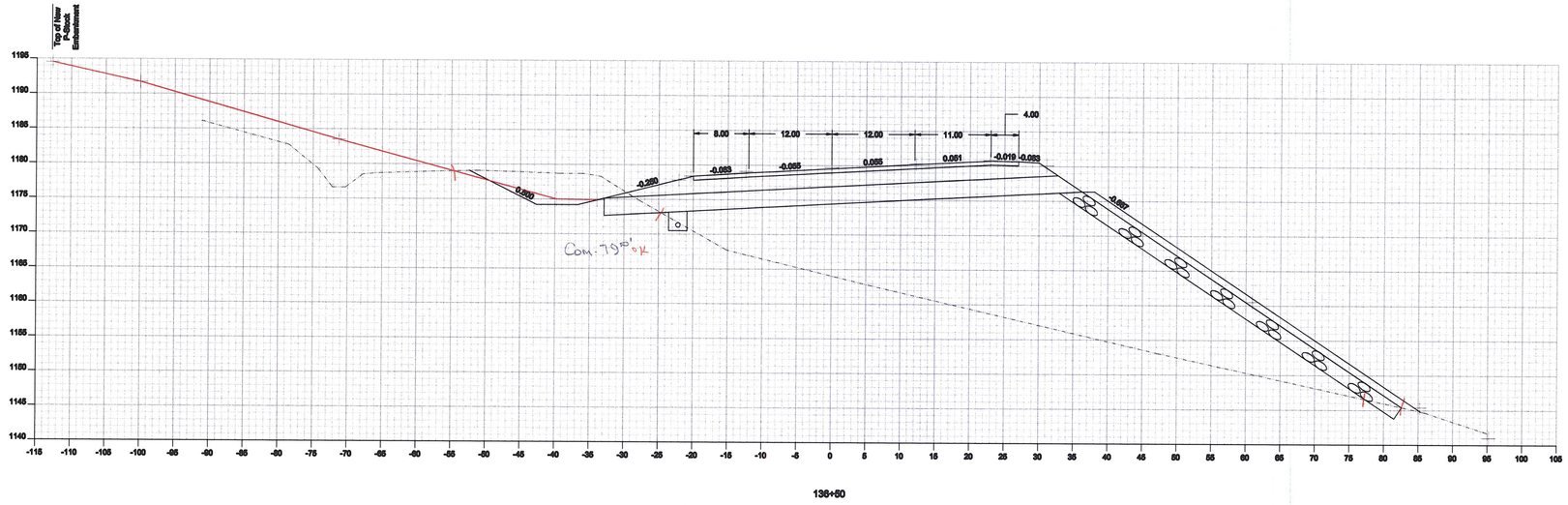
134+00

Drawing:	Cross Section 134+00 to 134+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-21-2012	Date:
Scale: 1 : 10	Sheet: of

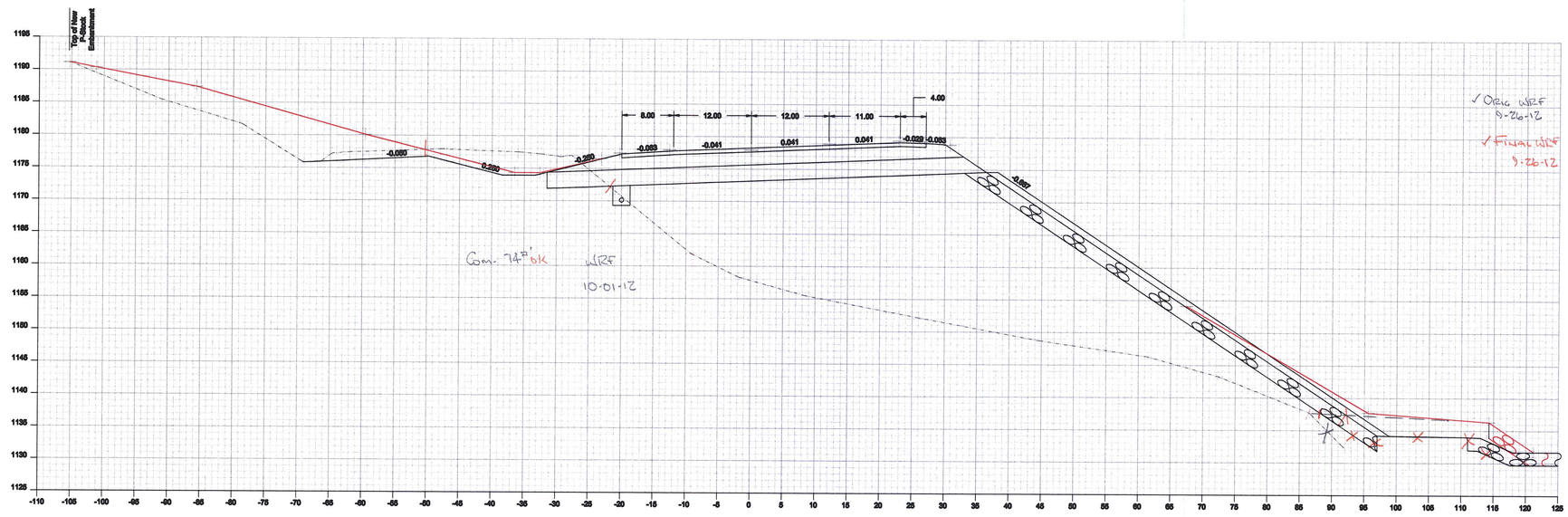




Drawing:	Cross Section 135+00 to 135+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-21-2012	Date:
Scale: 1 : 10	Sheet: of

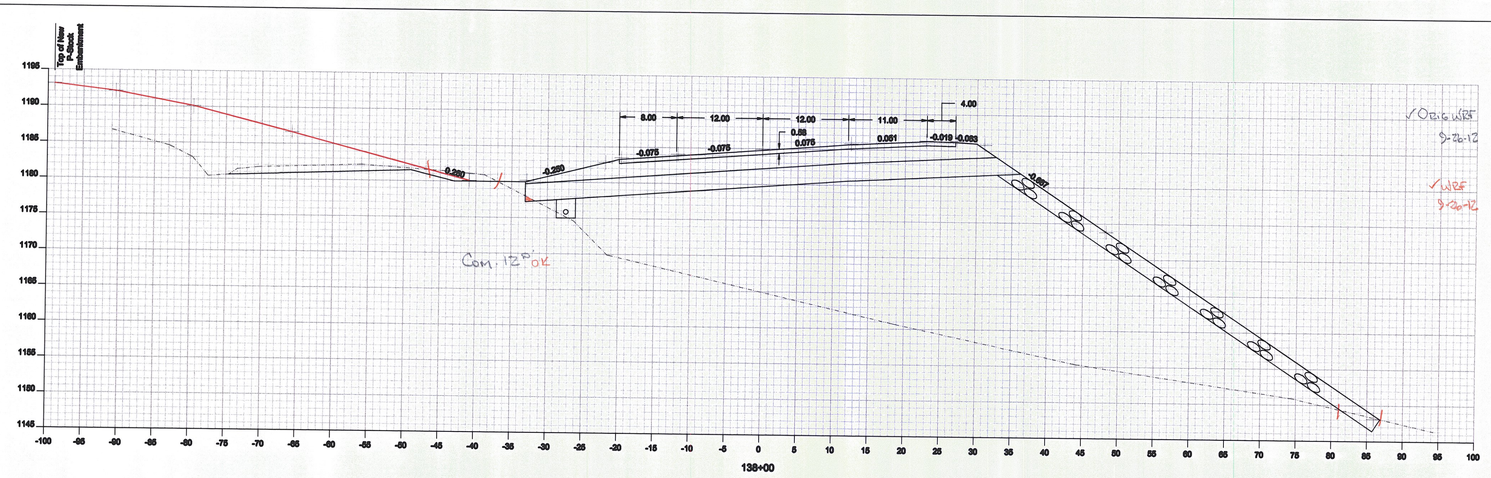


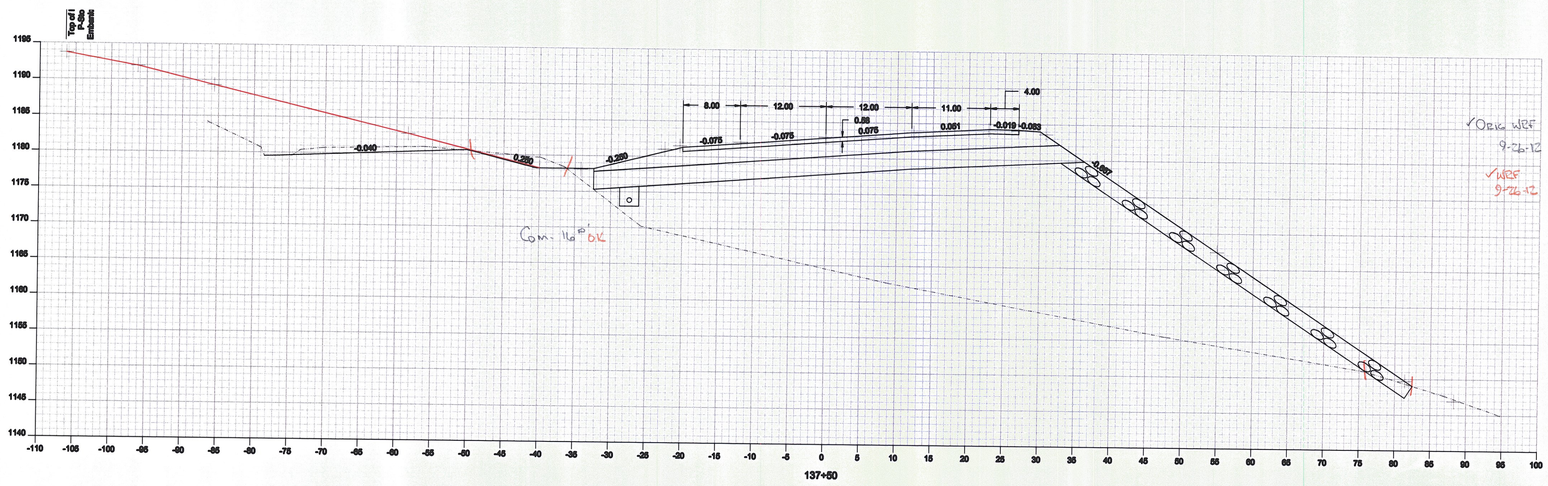
136+50

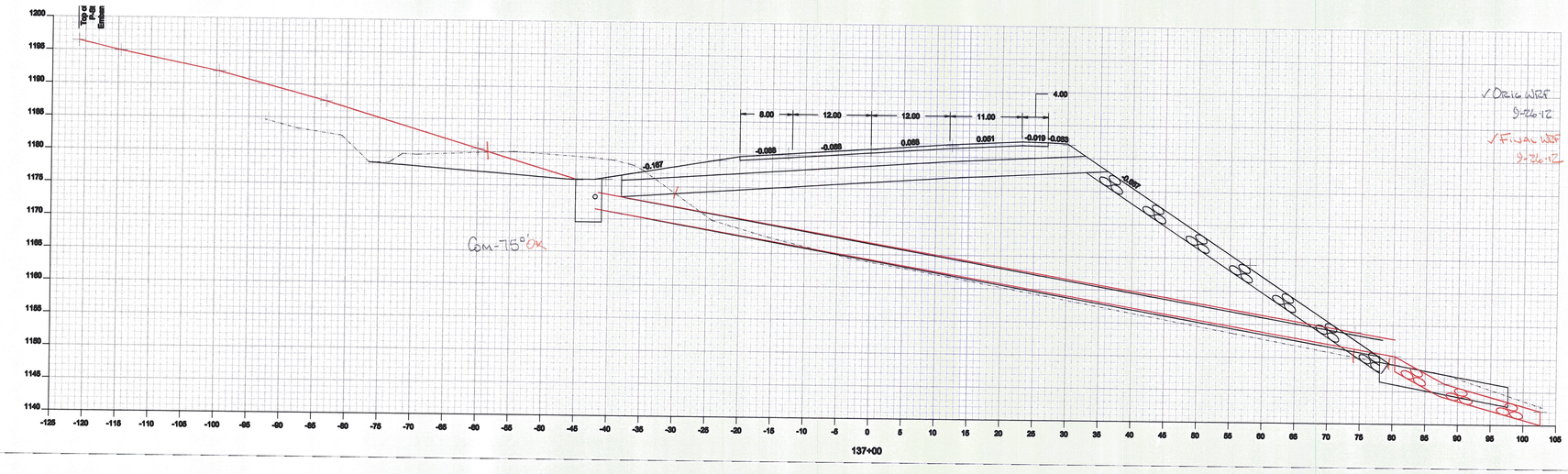


136+00

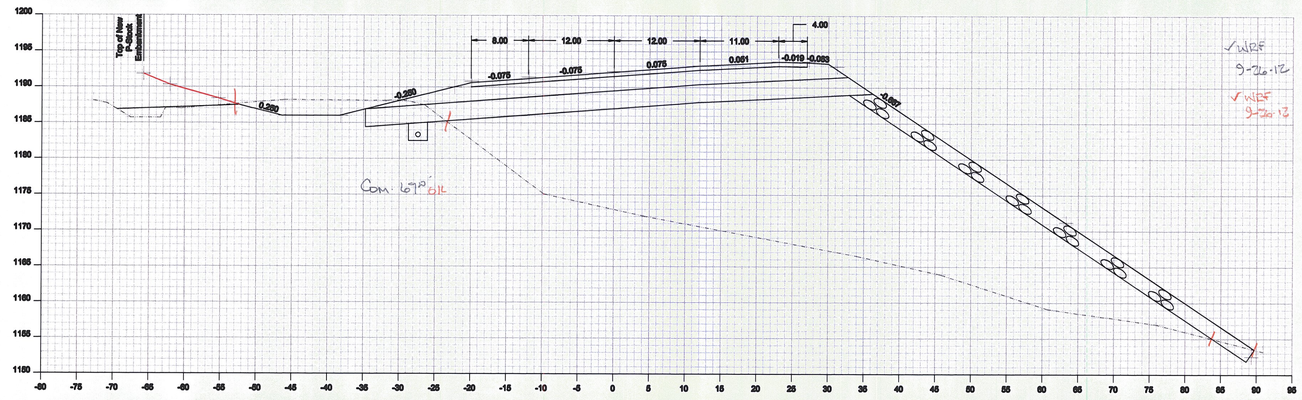
Drawing:	Cross Section 136+00 to 136+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-21-2012	Date:
Scale: 1 : 10	Sheet: of



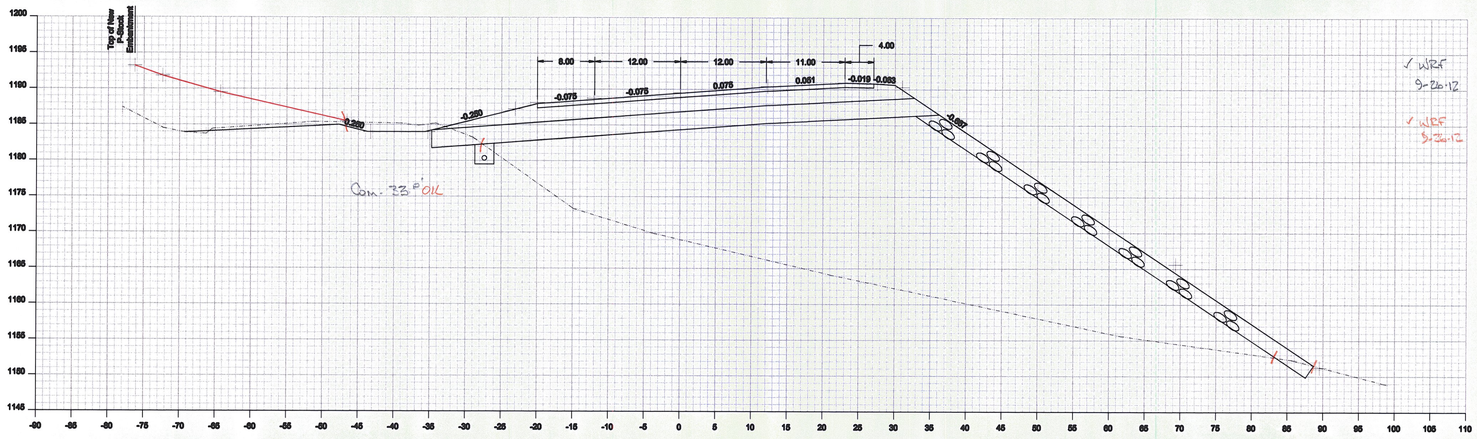




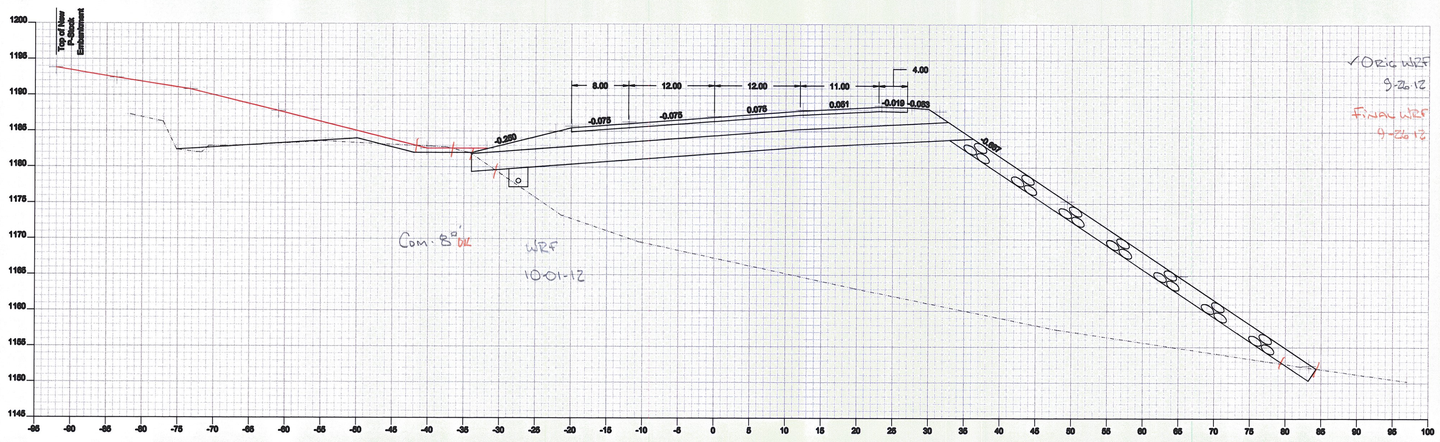
Drawing:	Cross Section 137+00 to 138+00
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-21-2012	Date:
Scale: 1 : 10	Sheet: of



139+50

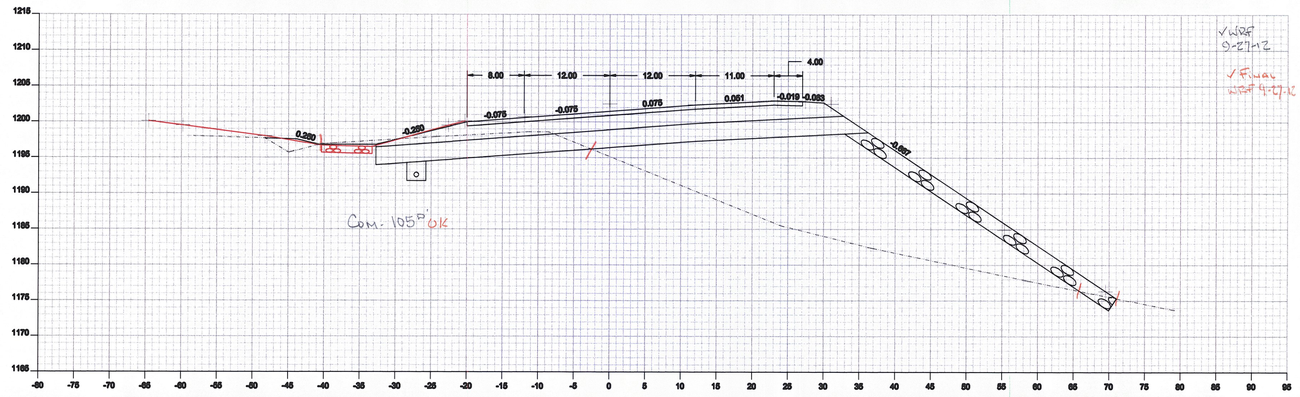


139+00



138+50

Drawing:	Cross Section 138+50 to 139+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-21-2012	Date:
Scale: 1 : 10	Sheet: of

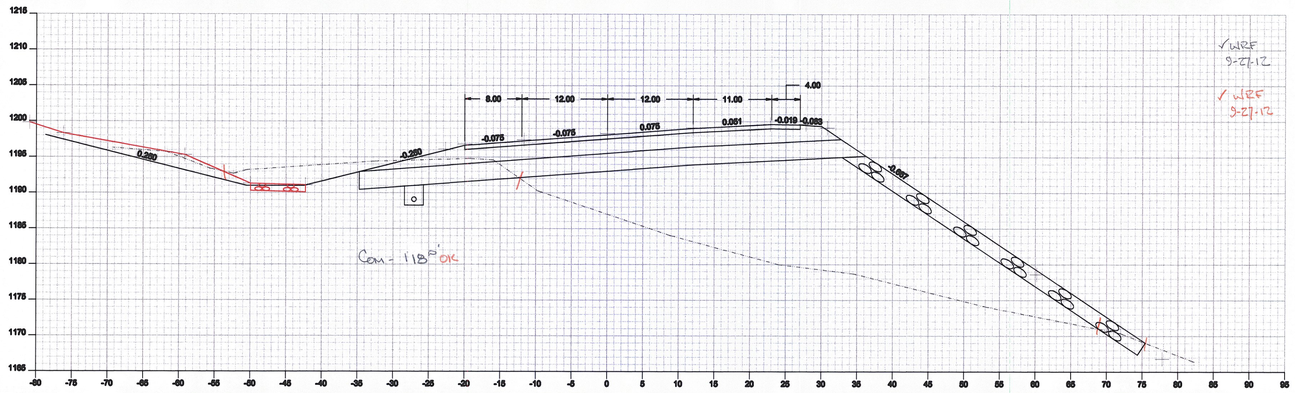


Com. 105° OK

✓ WRF 9-27-12

✓ Final WRF 9-27-12

141+00

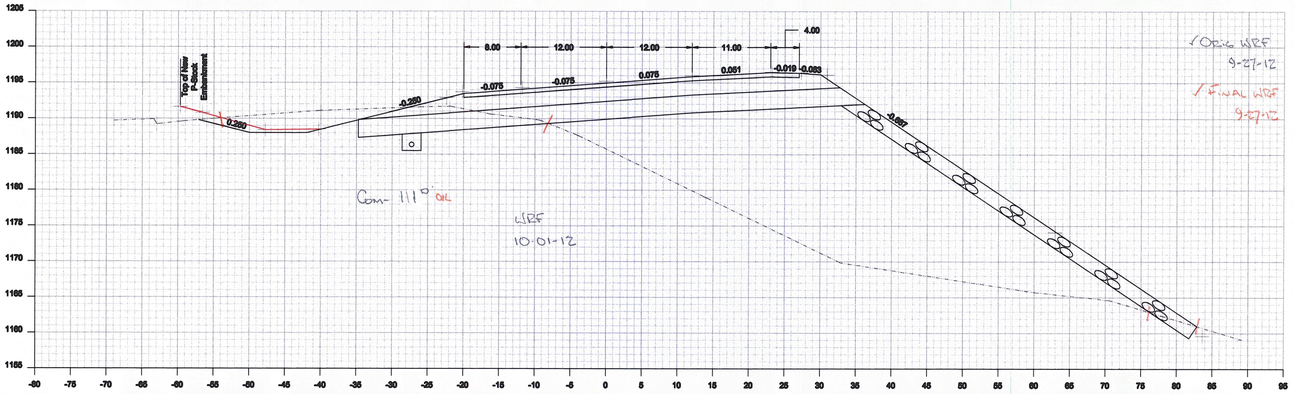


Com - 118° OK

✓ WRF 9-27-12

✓ WRF 9-27-12

140+50



Com - 111° OK

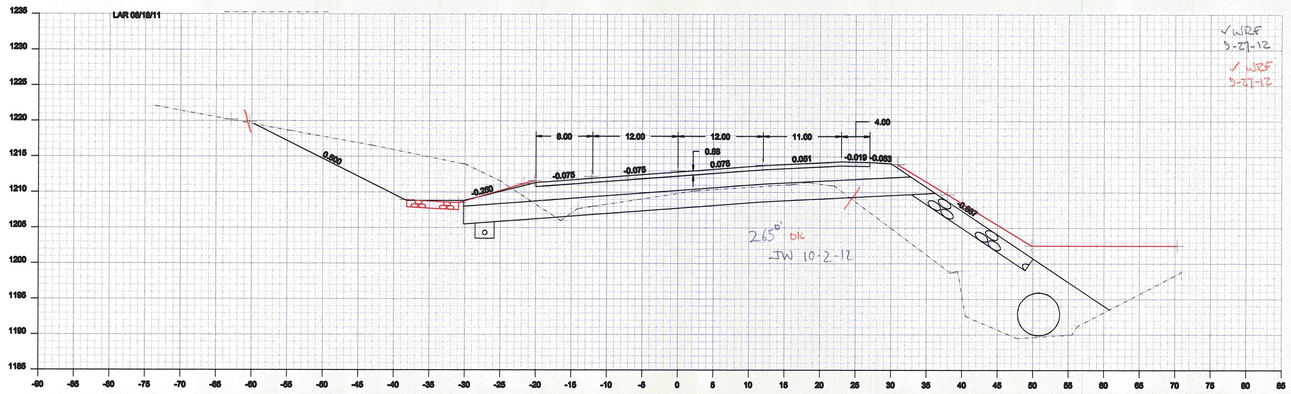
WRF 10-01-12

✓ Orig WRF 9-27-12

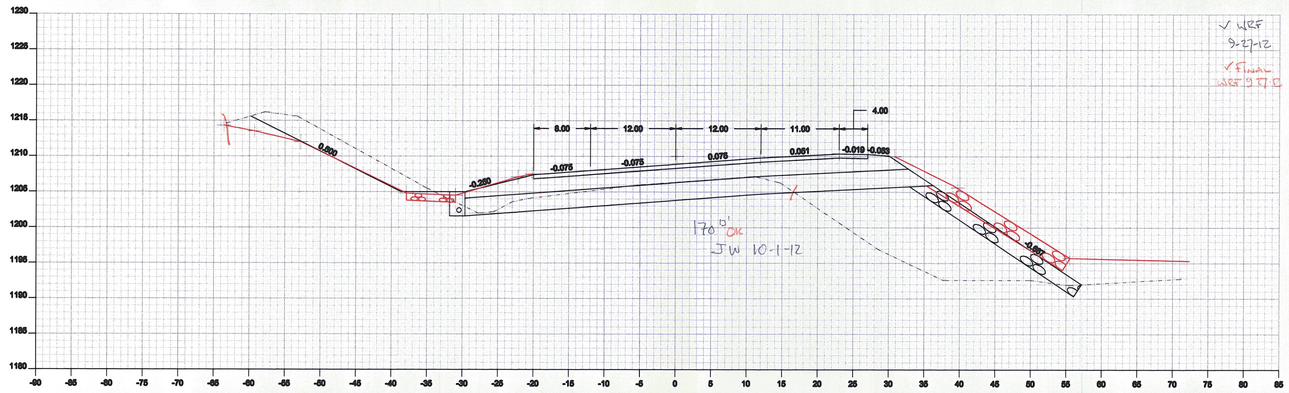
✓ Final WRF 9-27-12

140+00

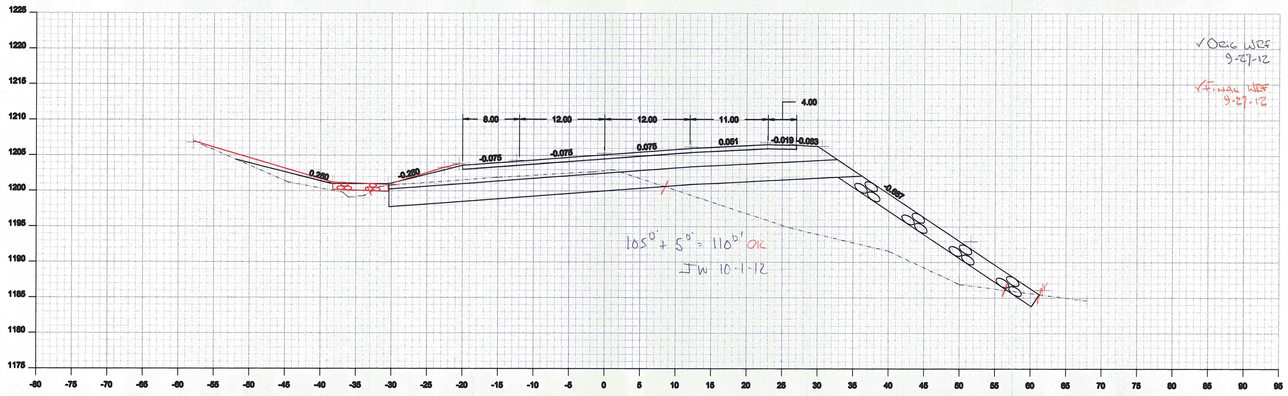
Drawing:	Cross Sections 140+00 - 141+00
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-24-2012	Date:
Scale: 1 : 10	Sheet: of



142+50

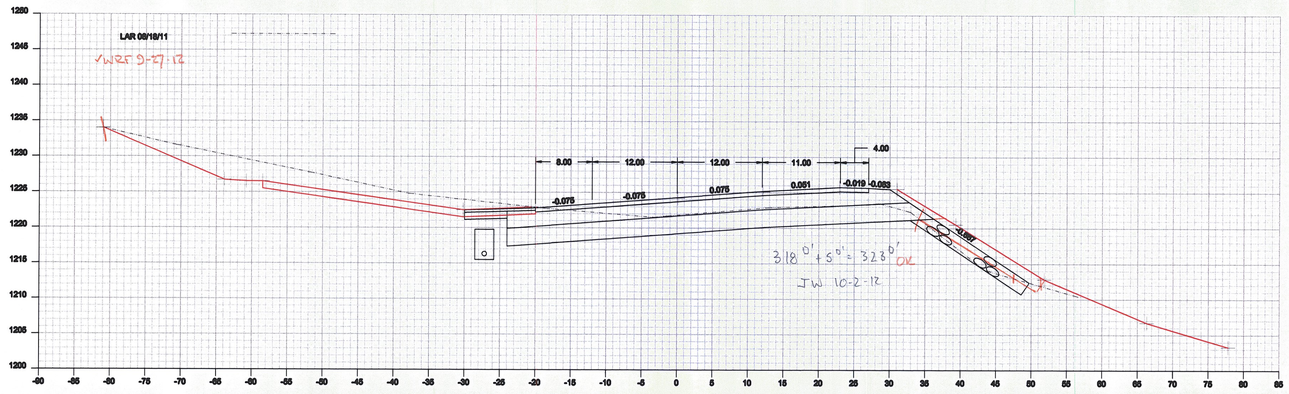


142+00

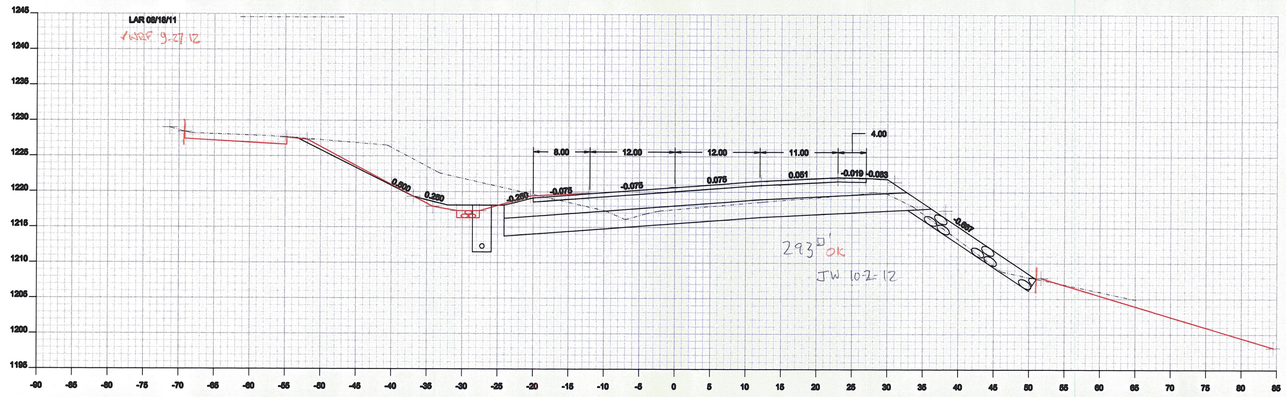


141+50

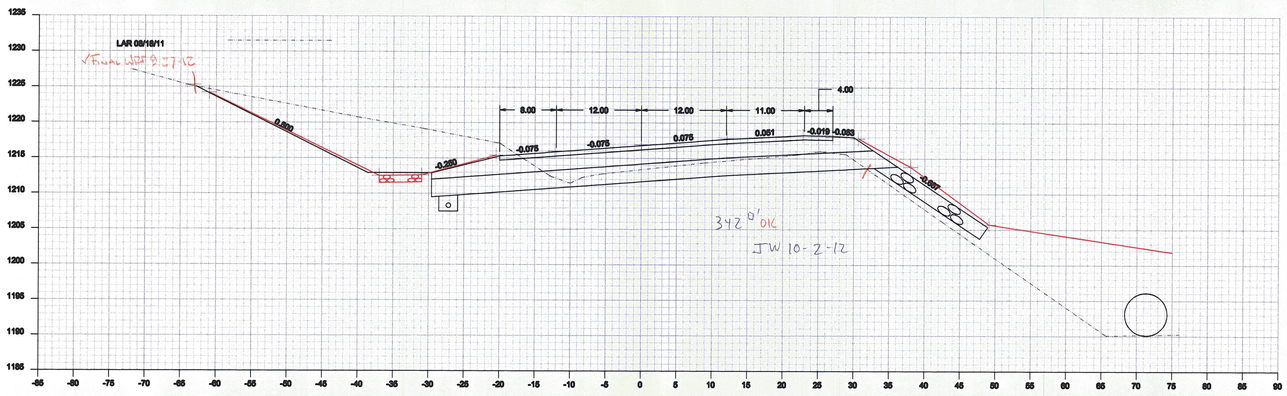
Drawing:	Cross Sections 141+50 - 142+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-24-2012	Date:
Scale: 1 : 10	Sheet: of



144+00

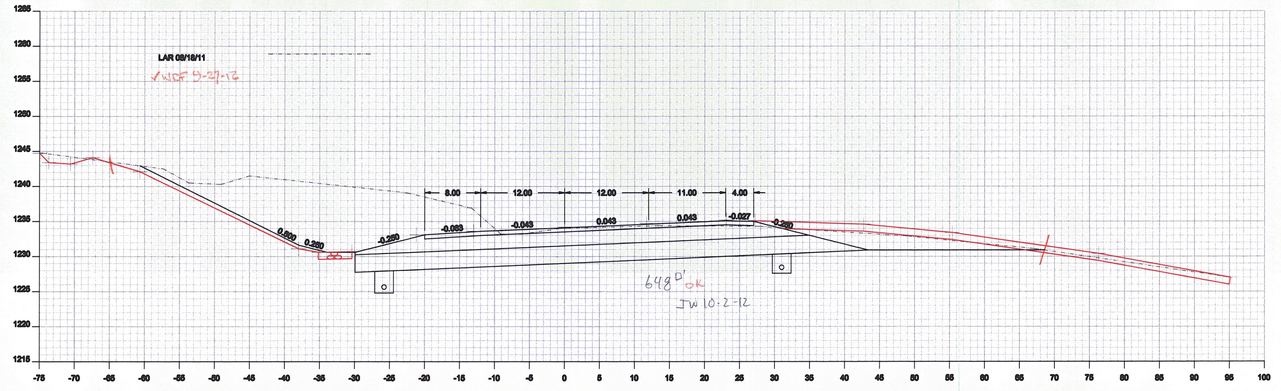


143+50

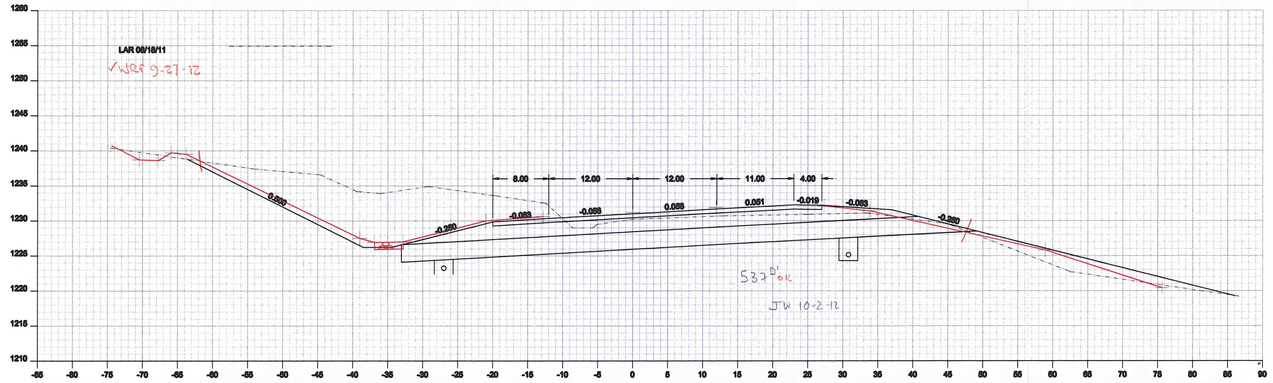


143+00

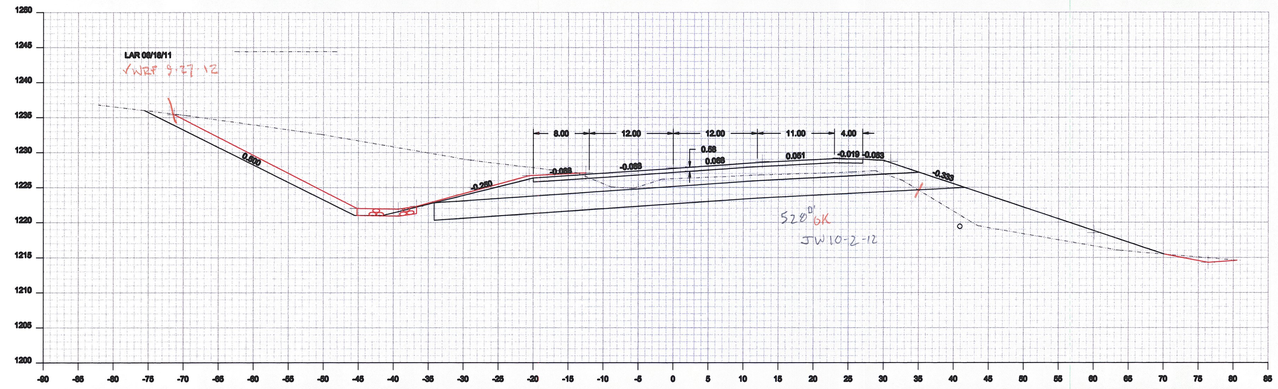
Drawing:	Cross Sections 143+00 - 144+00
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-24-2012	Date:
Scale: 1 : 10	Sheet: of



145+50

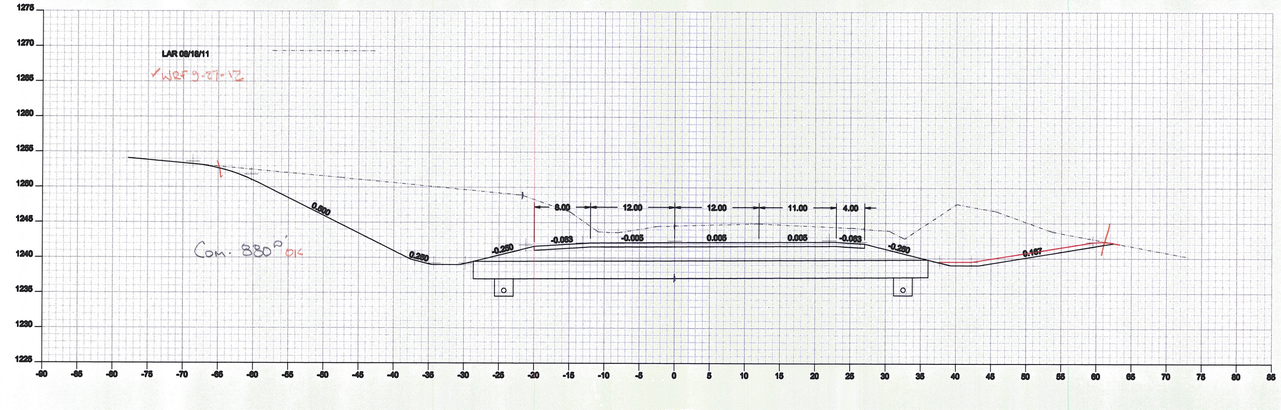


145+00

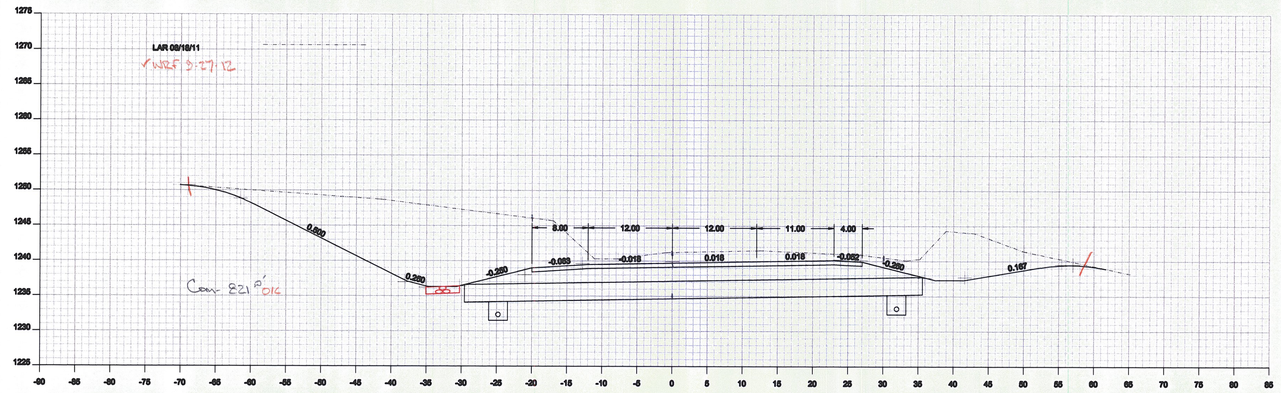


144+50

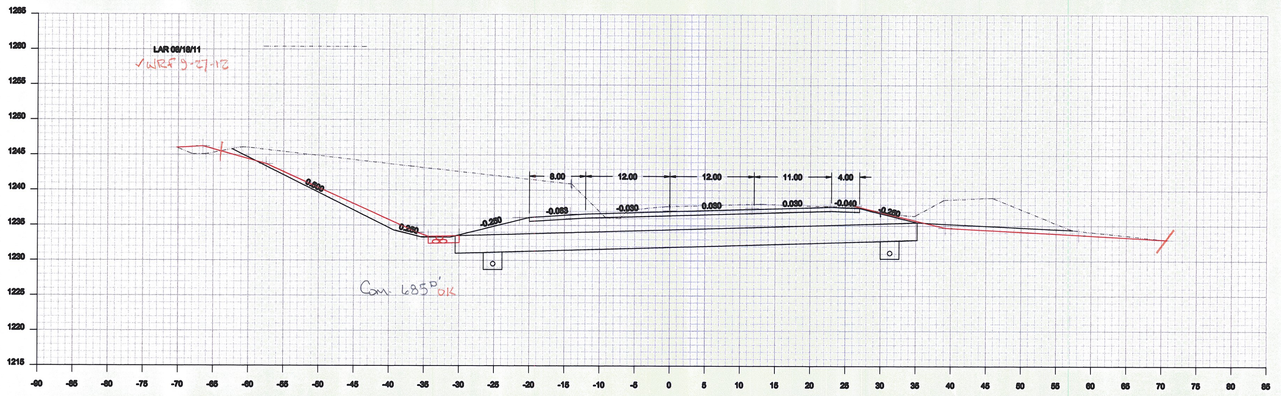
Drawing:	Cross Sections 144+50 - 145+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-24-2012	Date:
Scale: 1 : 10	Sheet: of



147+00



146+50



146+00

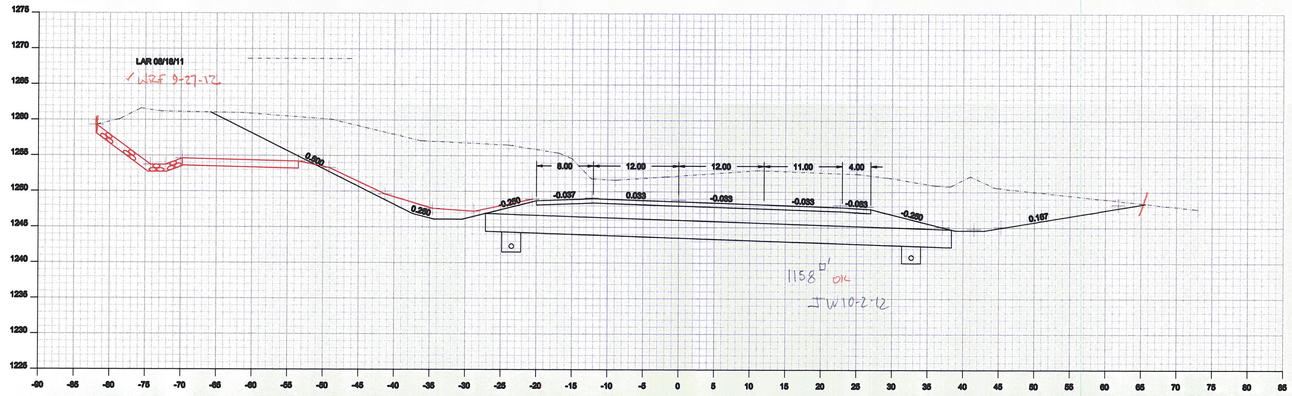
Drawing: Cross Sections 146+00 - 147+00
Project: Cabot Danville

Drawn By: JMR
Date: 09-24-2012

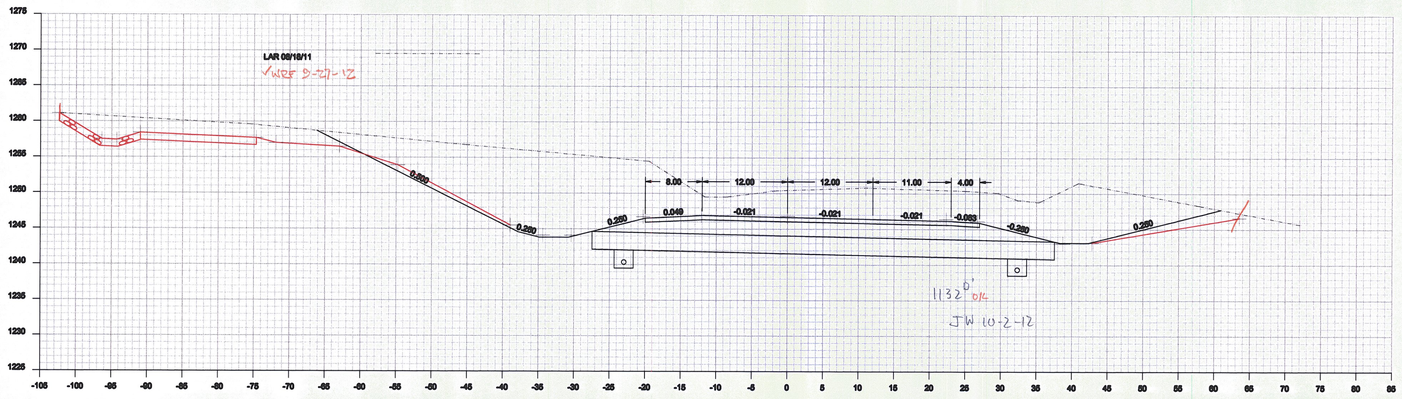
Checked By:
Date:

Scale: 1 : 10

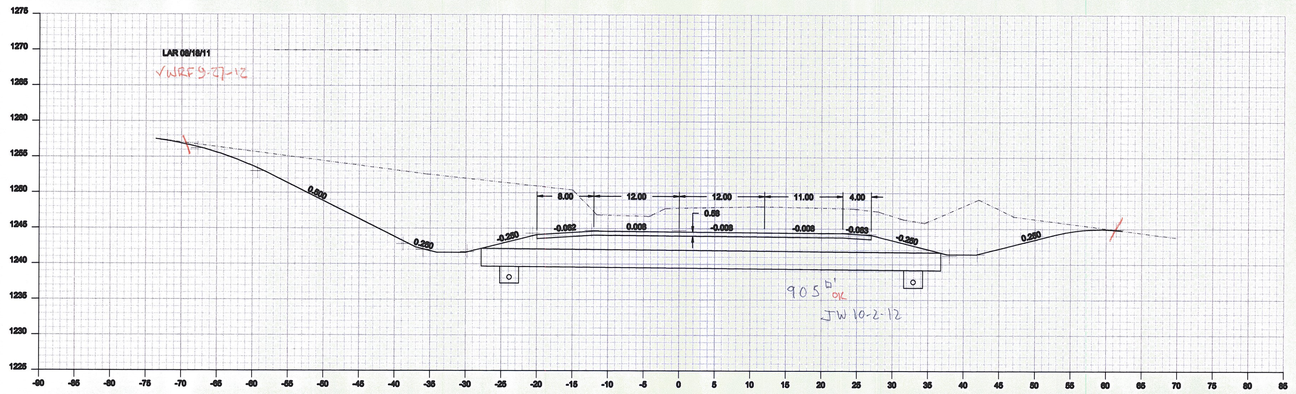
Sheet: of



148+50

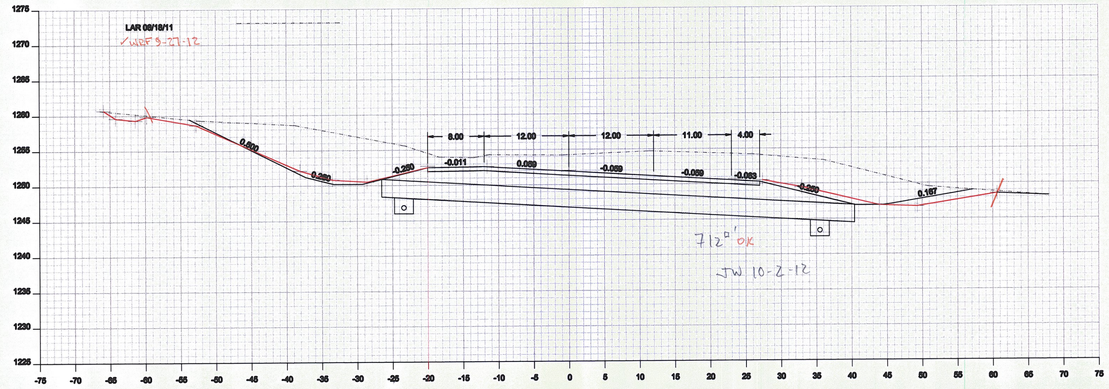


148+00

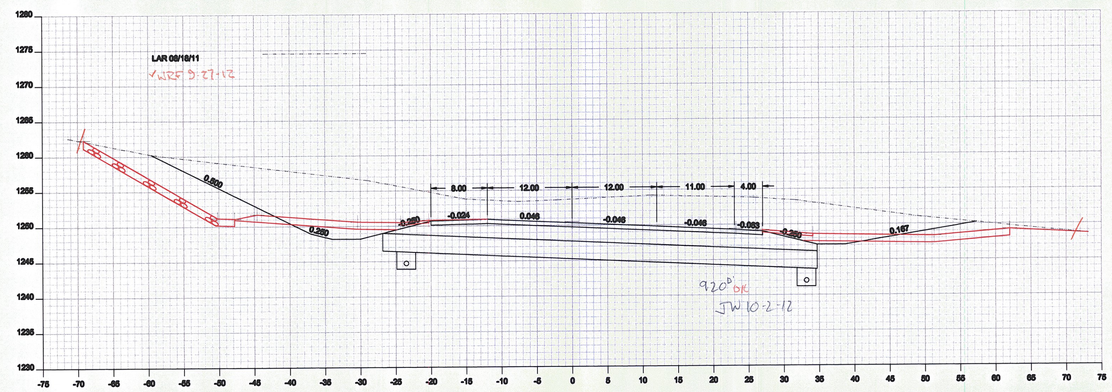


147+50

Drawing:	Cross Sections 147+50 - 148+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-24-2012	Date:
Scale: 1 : 10	Sheet: of

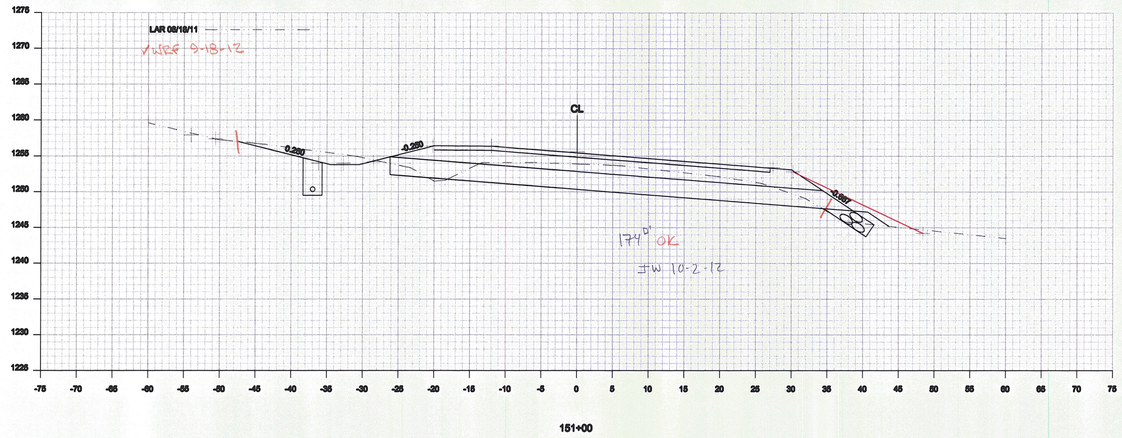


149+50

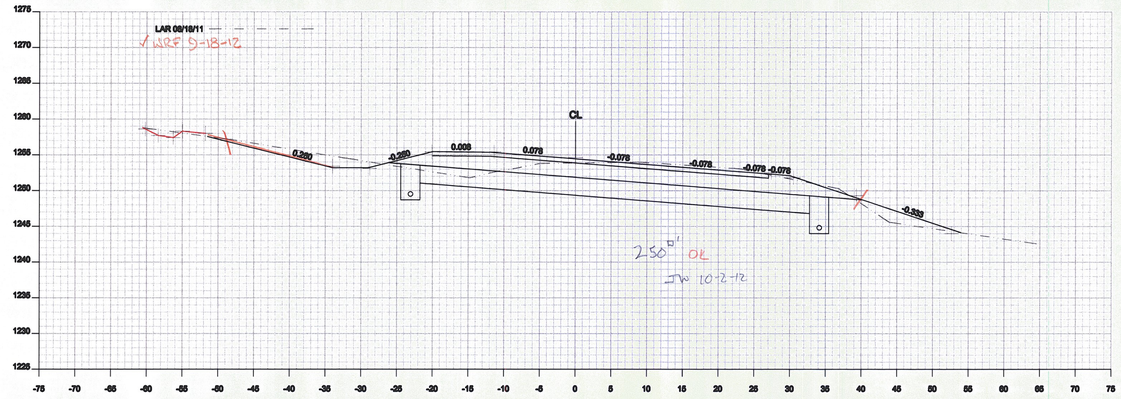


149+00

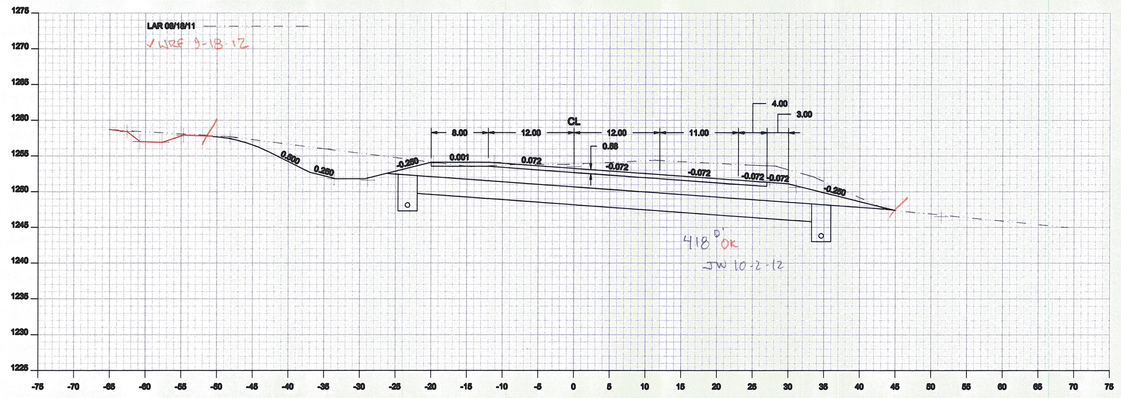
Drawing:	Cross Sections 149+00 - 149+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-24-2012	Date:
Scale: 1 : 10	Sheet: of



151+00

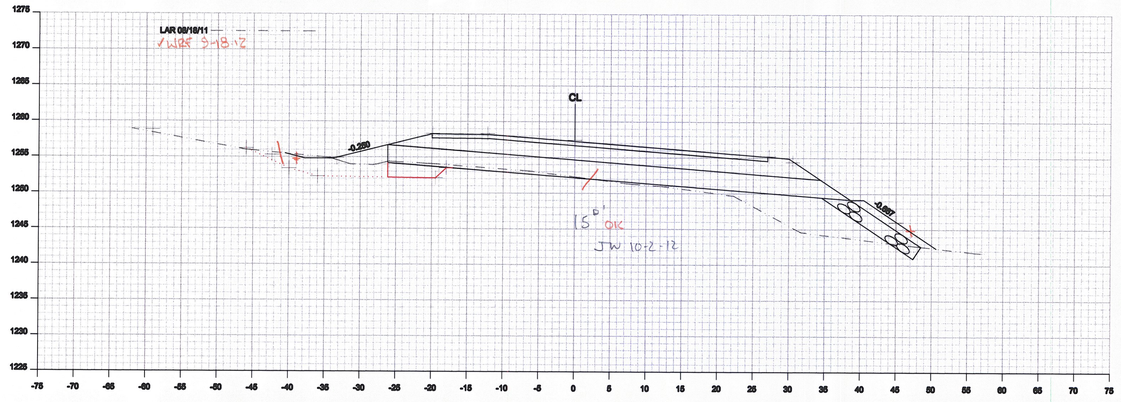


150+50

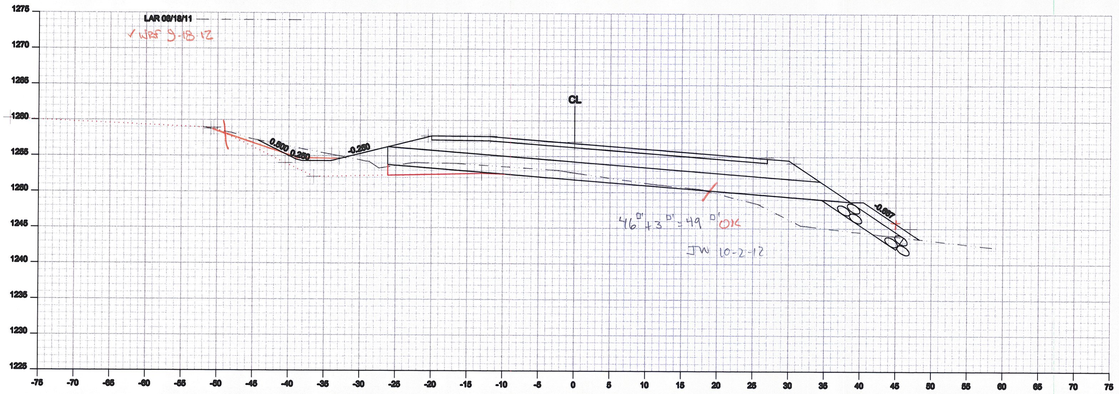


150+00

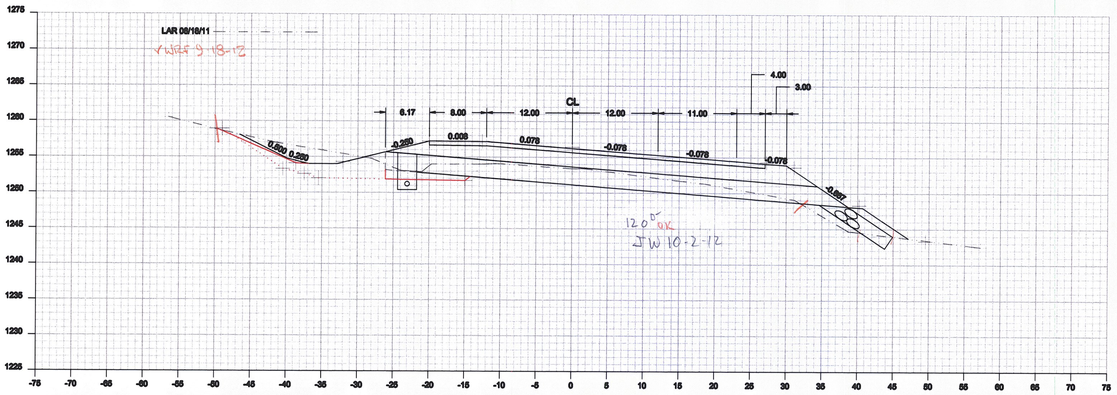
Drawing:	Cross Section 150+00 - 151+00
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 08-12-2012	Date:
Scale: 1 : 10	Sheet: of



152+50

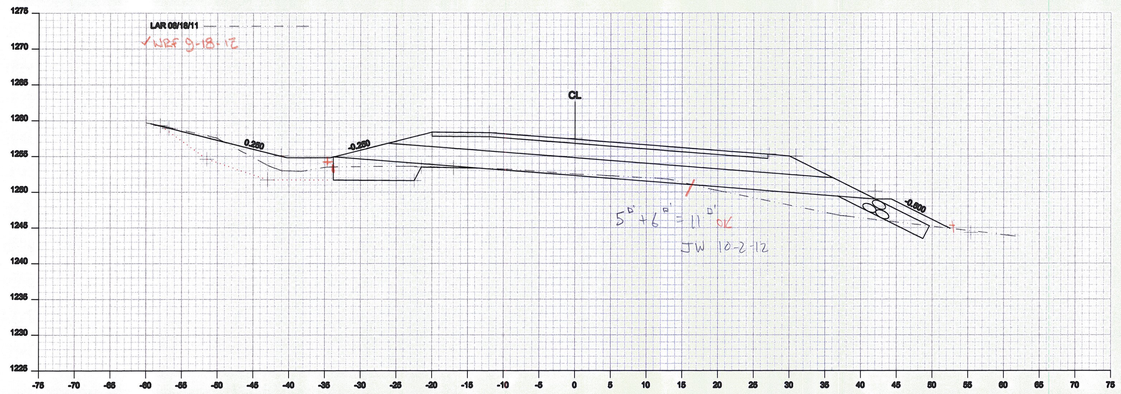


152+00

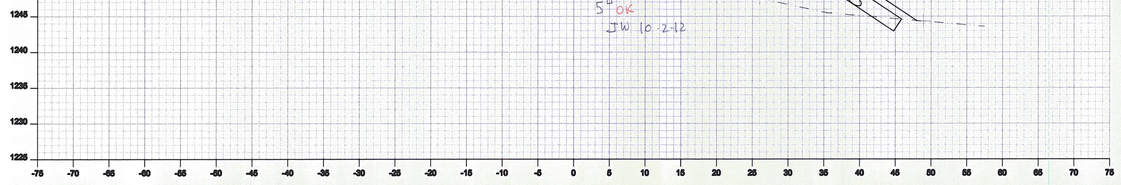


151+50

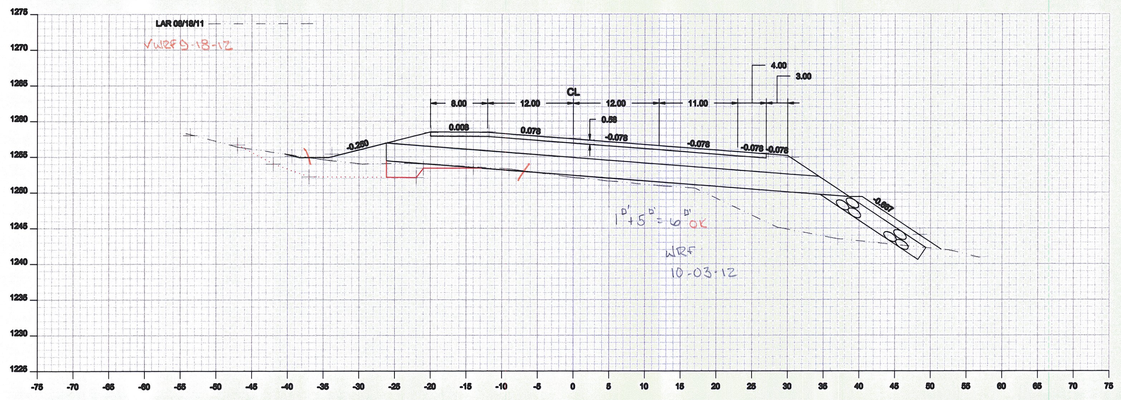
Drawing:	Cross Section 151+50 - 152+50		
Project:	Cabot Danville		
Drawn By:	JMR	Checked By:	
Date:	09-12-2012	Date:	
Scale:	1 : 10	Sheet:	of



154+00

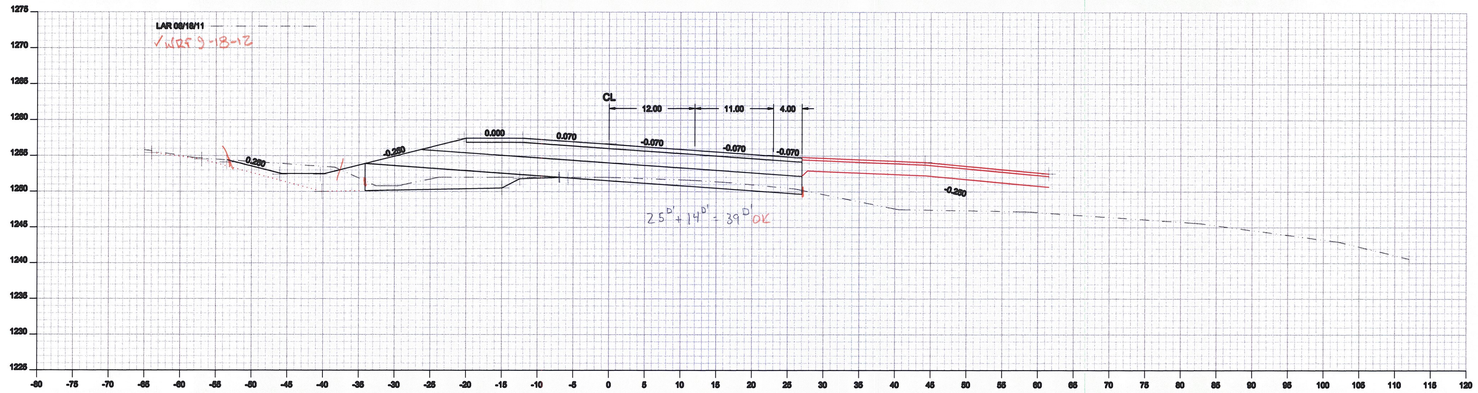


153+50

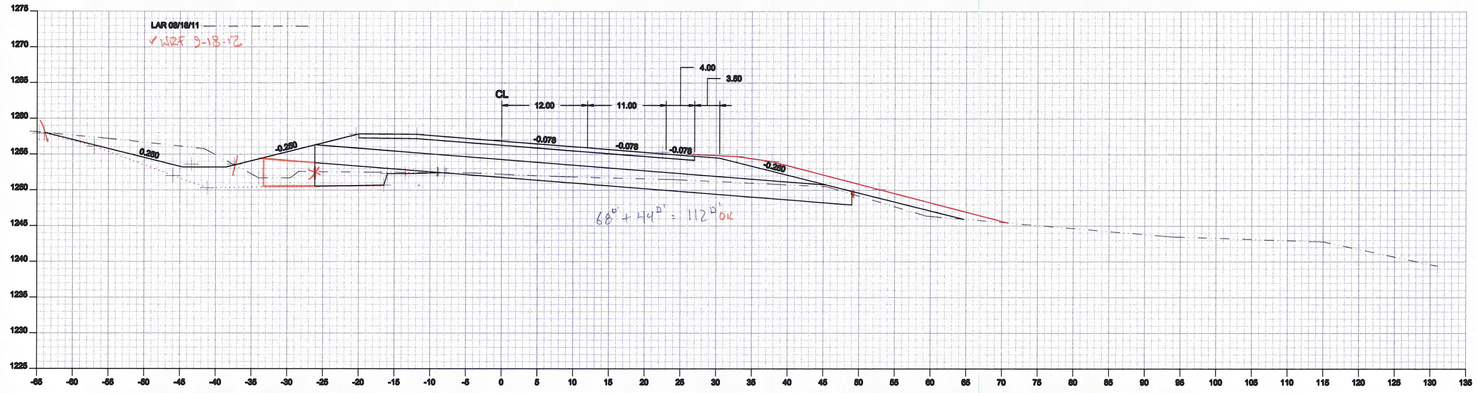


153+00

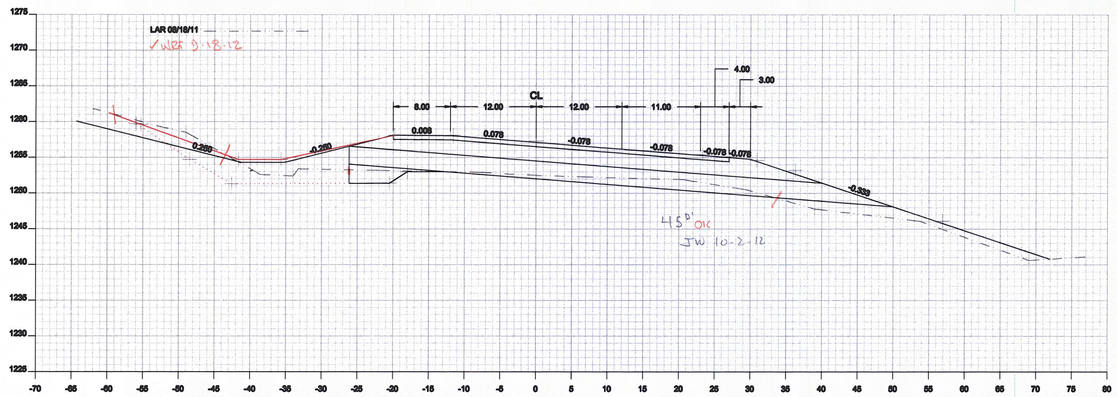
Drawing:	Cross Section 153+00 - 154+00
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-12-2012	Date:
Scale: 1 : 10	Sheet: of



155+50

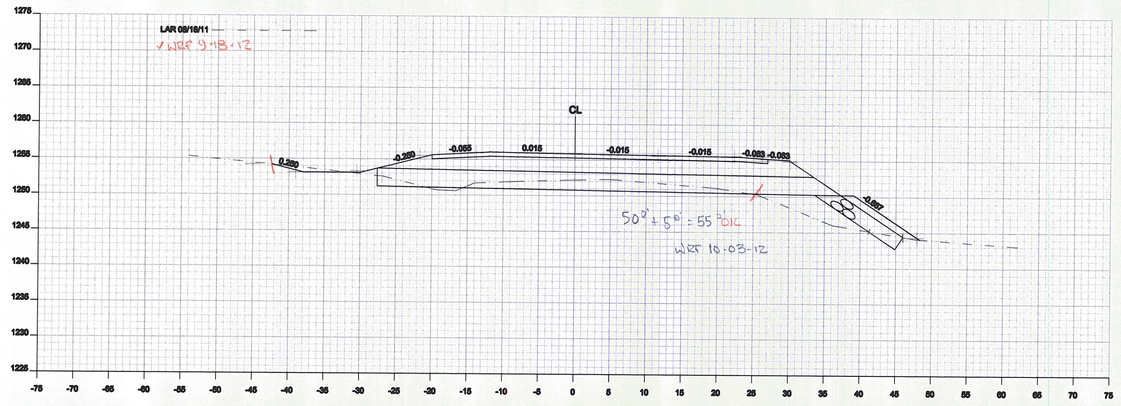


155+00

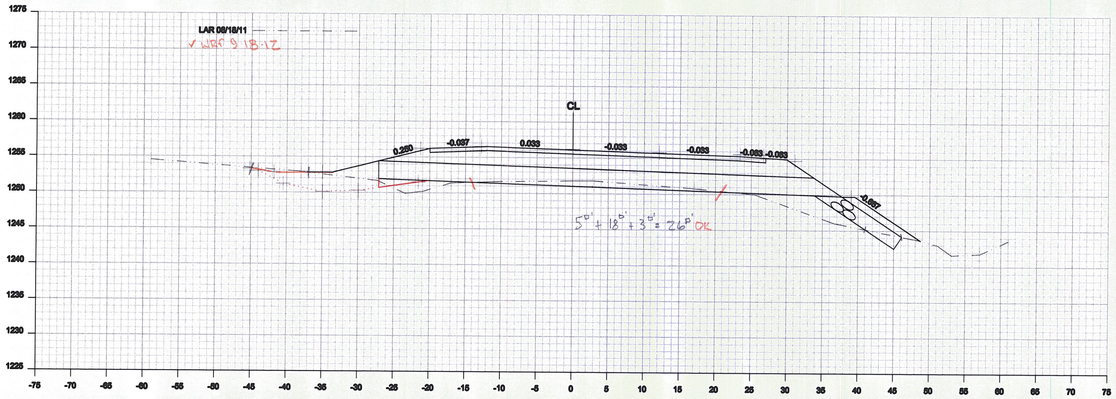


154+50

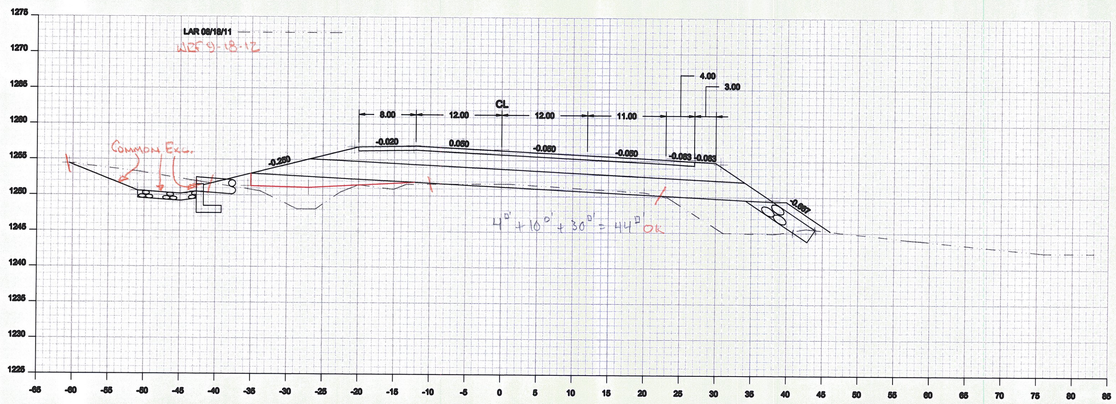
Drawing:	Cross Section 154+50 - 155+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-12-2012	Date:
Scale: 1 : 10	Sheet: of



157+00

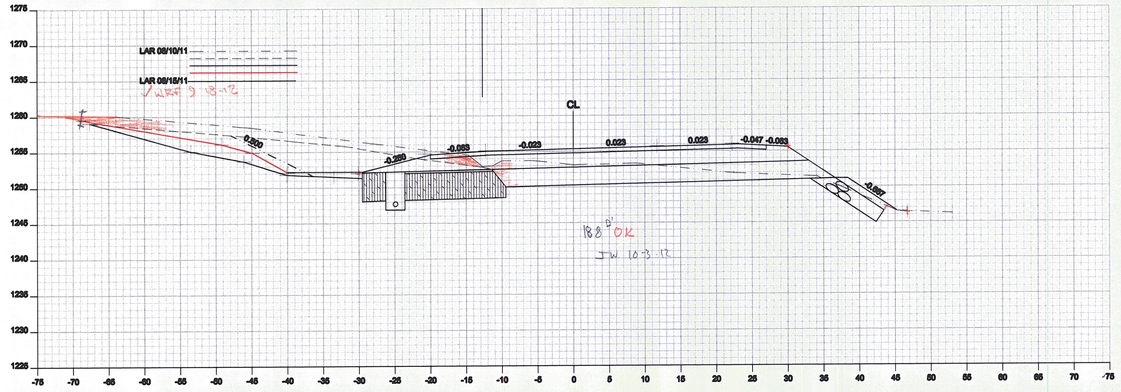


156+50

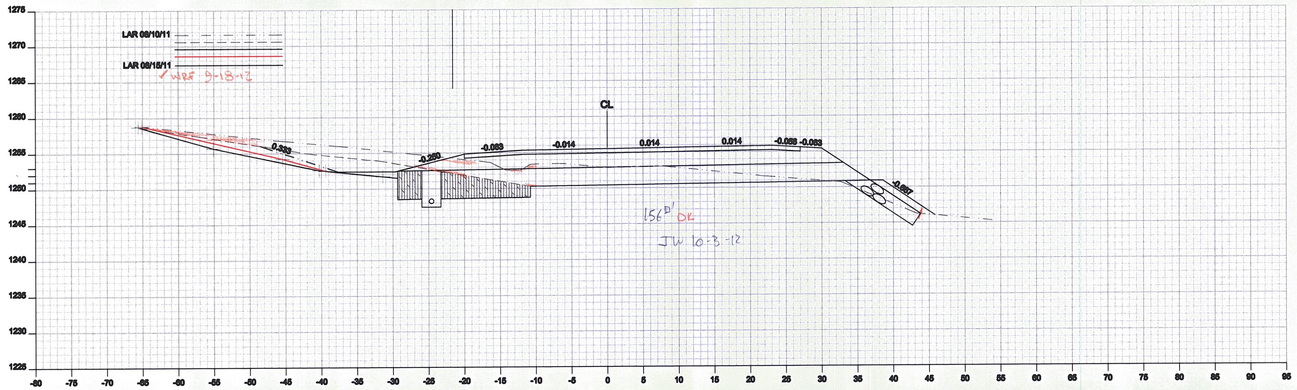


156+00

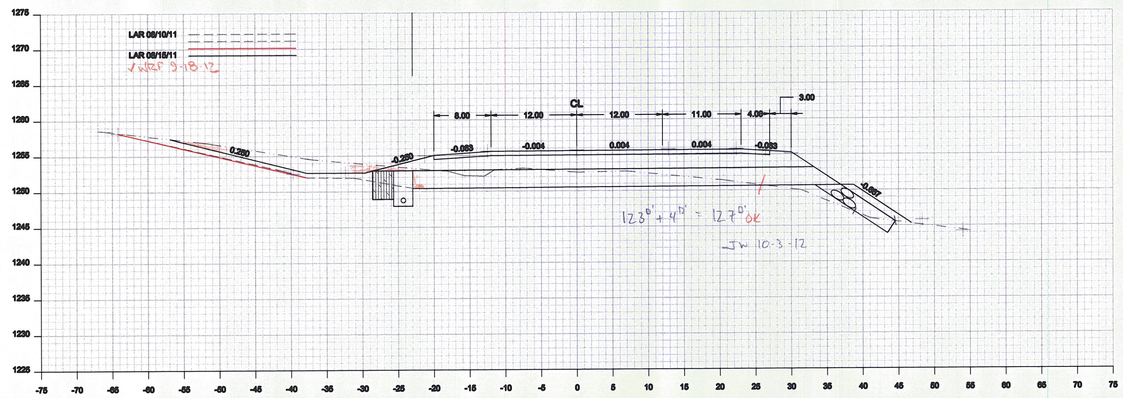
Drawing:	Cross Section 156+00 - 157+00
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 08-12-2012	Date:
Scale: 1 : 10	Sheet: of



158+00

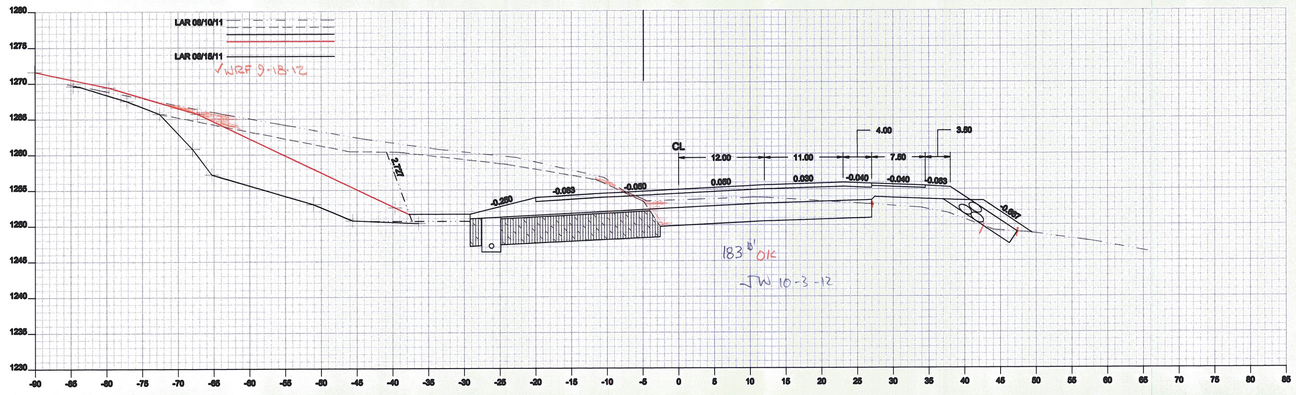


157+75

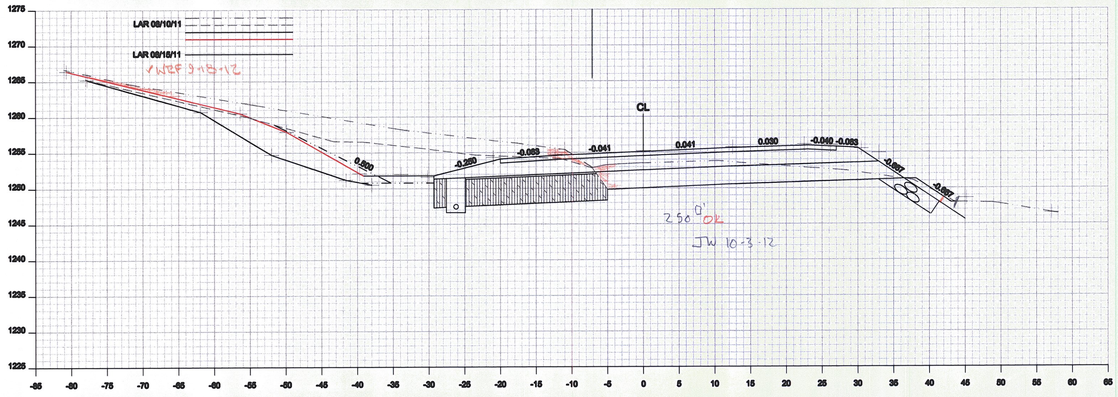


157+50

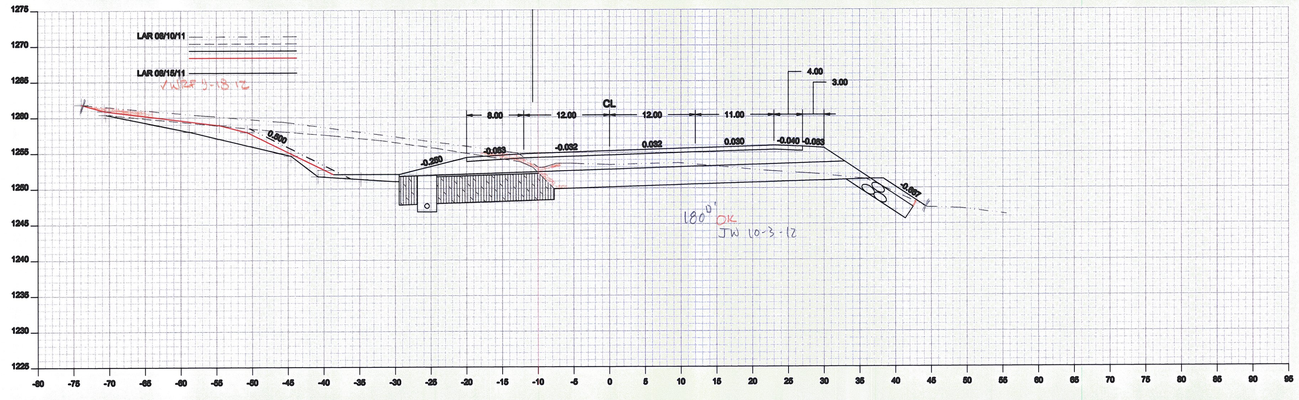
Drawing:	Cross Section 157+50 - 158+00
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-12-2012	Date:
Scale: 1 : 10	Sheet: of



158+75

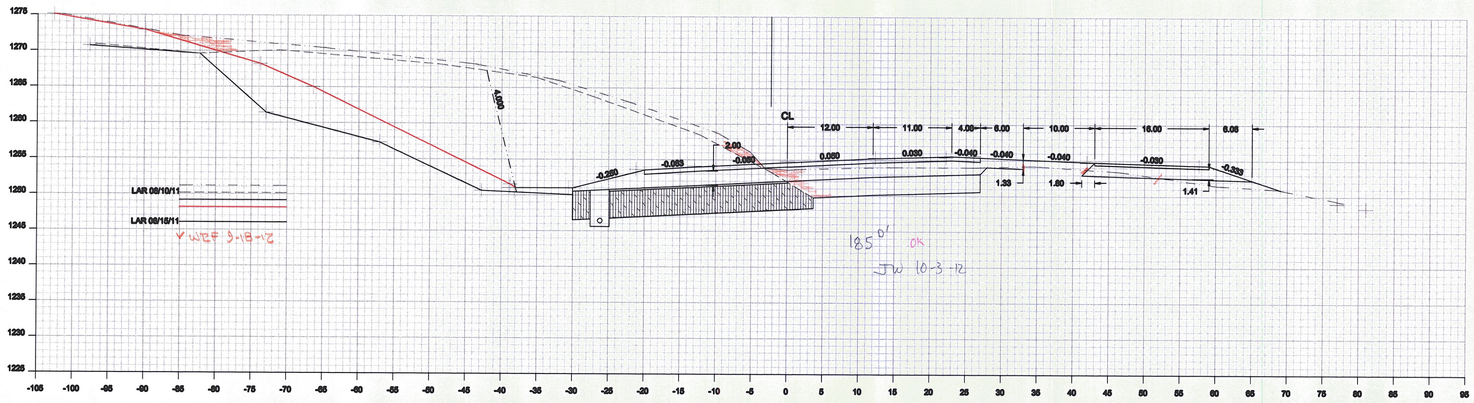


158+50

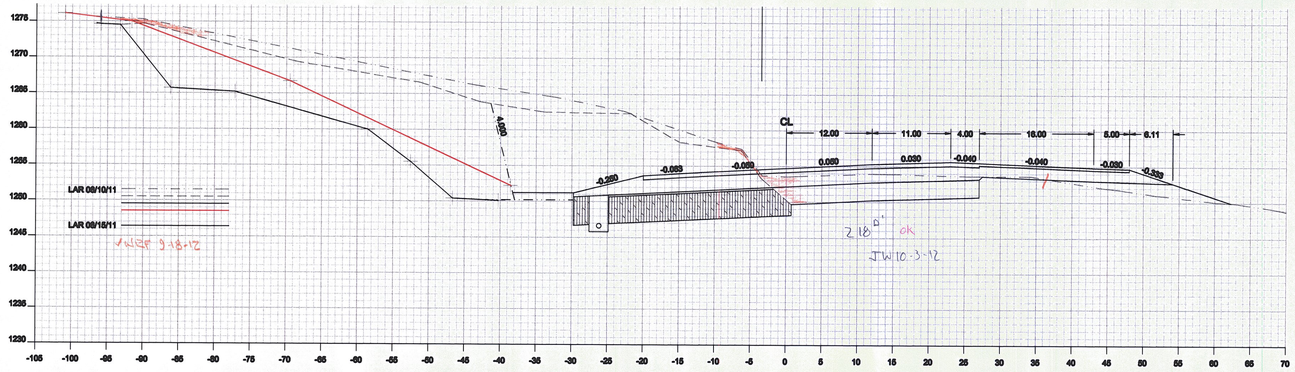


158+25

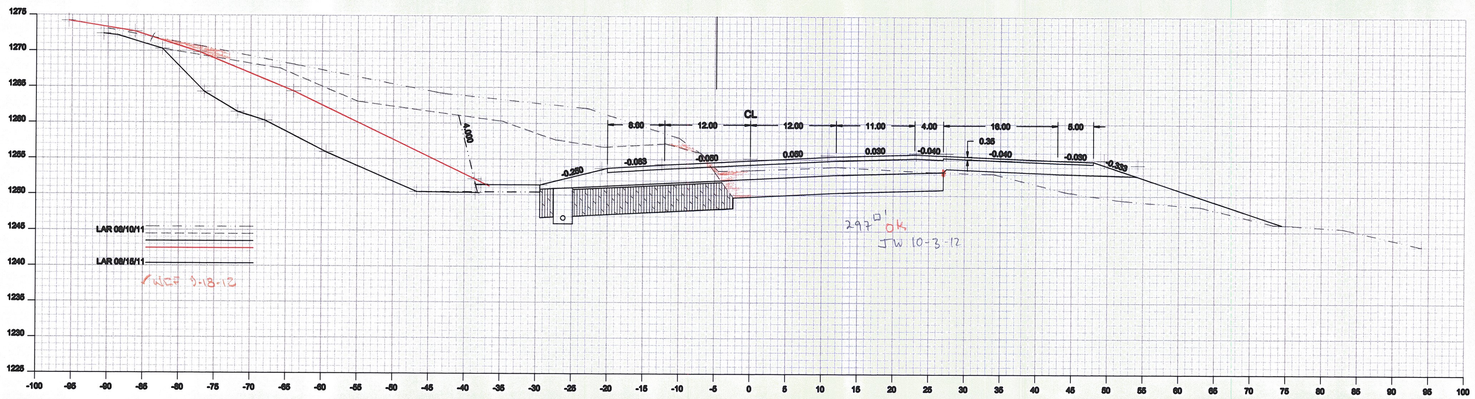
Drawing:	Cross Section 158+25 - 158+75
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-12-2012	Date:
Scale: 1 : 10	Sheet: of



159+50

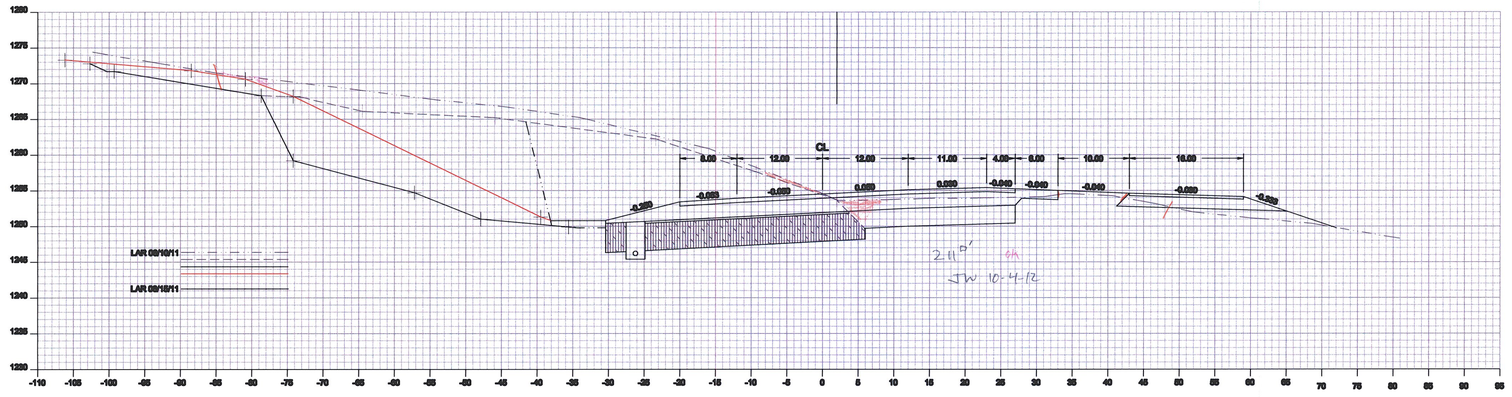


159+25



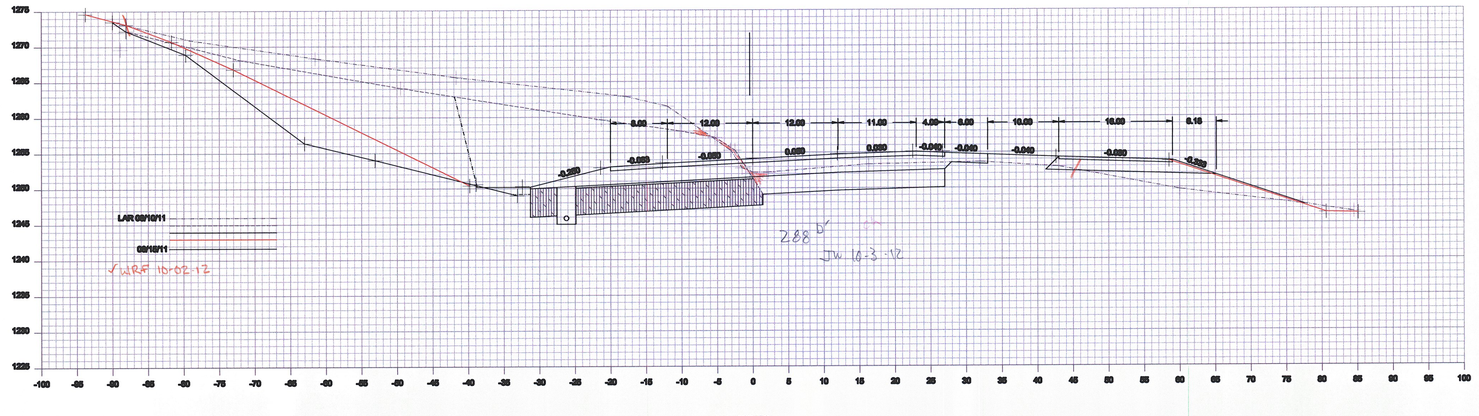
159+00

Drawing:	Cross Section 159+00 - 159+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-12-2012	Date:
Scale: 1 : 10	Sheet: of

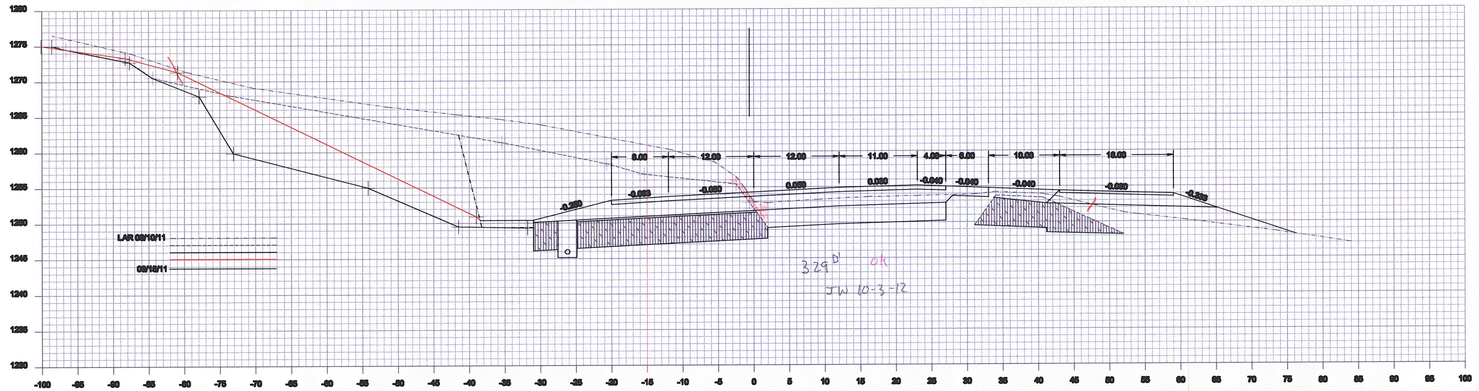


159+75

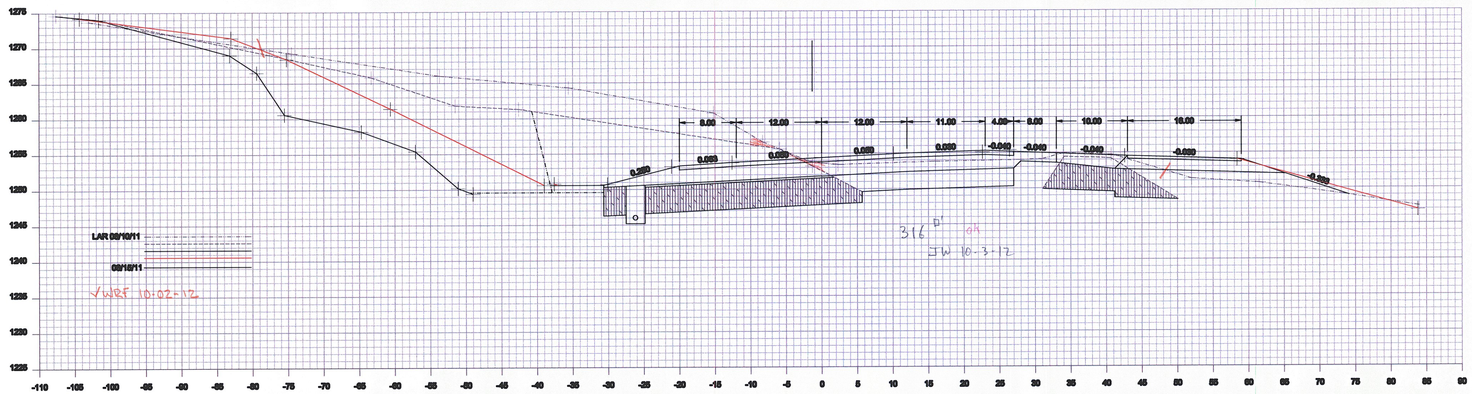
Drawing:	Cross Section 159+75		
Project:	Cabot Danville		
Drawn By:	JMR	Checked By:	
Date:	09-12-2012	Date:	
Scale:	1 : 10	Sheet:	of



160+50

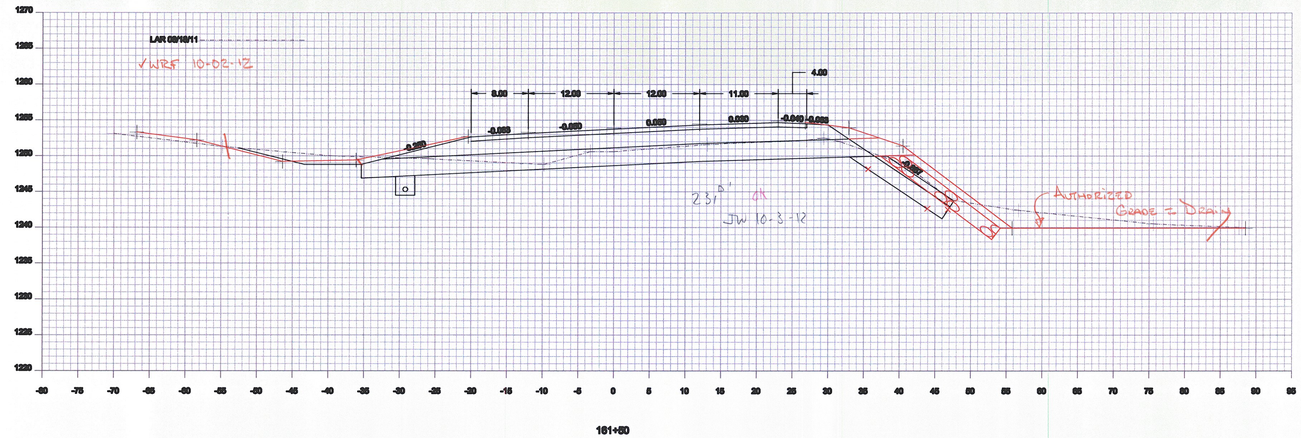


160+25

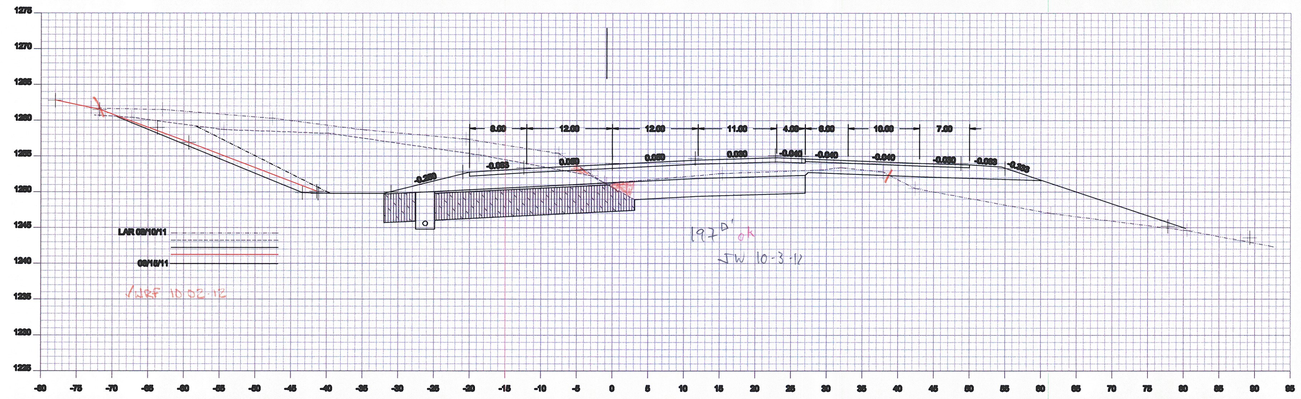


160+00

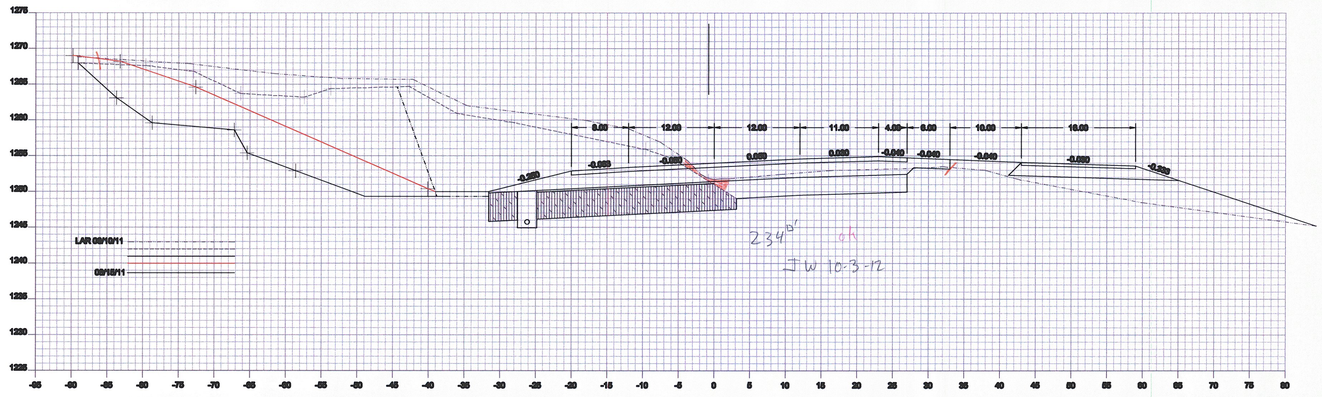
Drawing:	Cross Section 160+00 - 160+50		
Project:	Cabot Danville		
Drawn By:	JMR	Checked By:	
Date:	09-25-2012	Date:	
Scale:	1 : 10	Sheet:	of



161+50

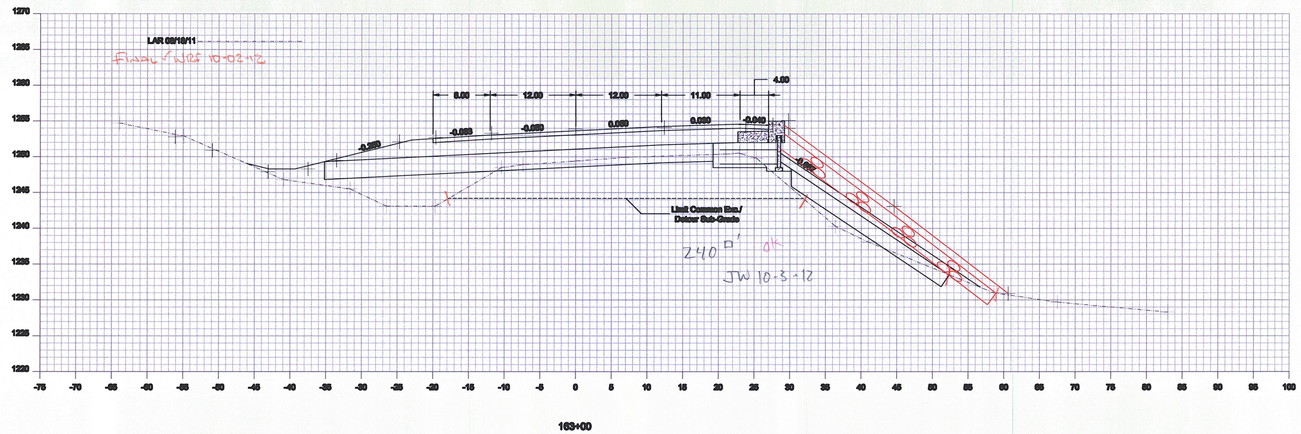


161+00

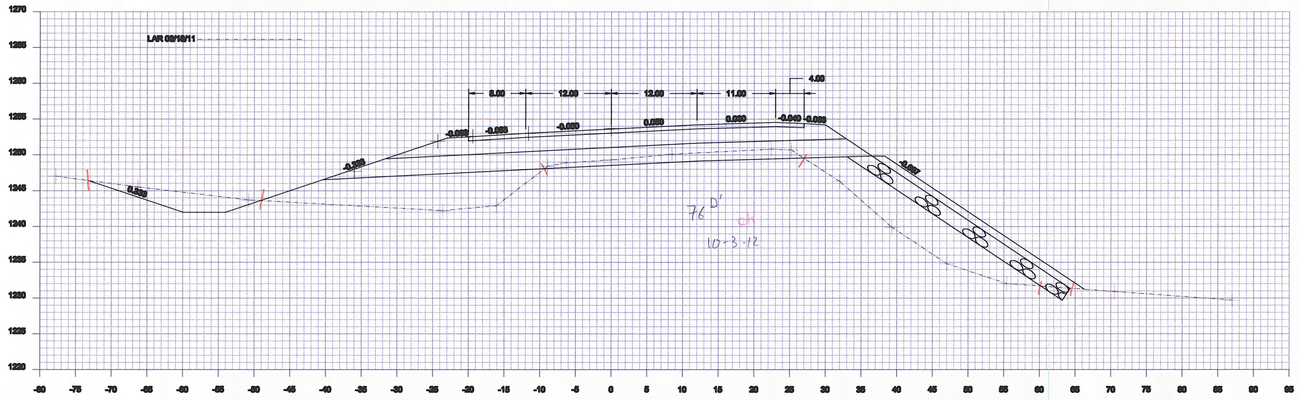


160+75

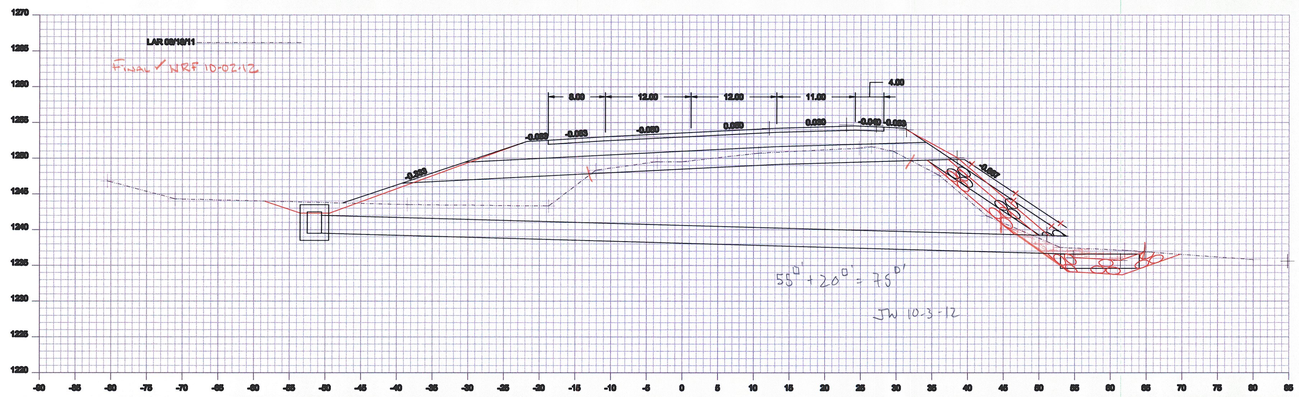
Drawing:	Cross Section 160+75 - 161+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-25-2012	Date:
Scale: 1 : 10	Sheet: of



163+00

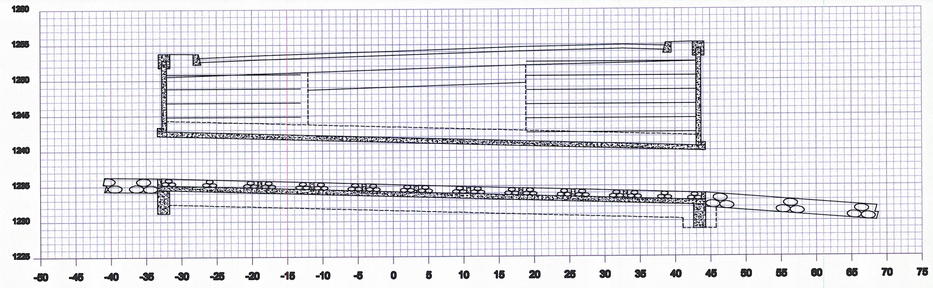


162+50

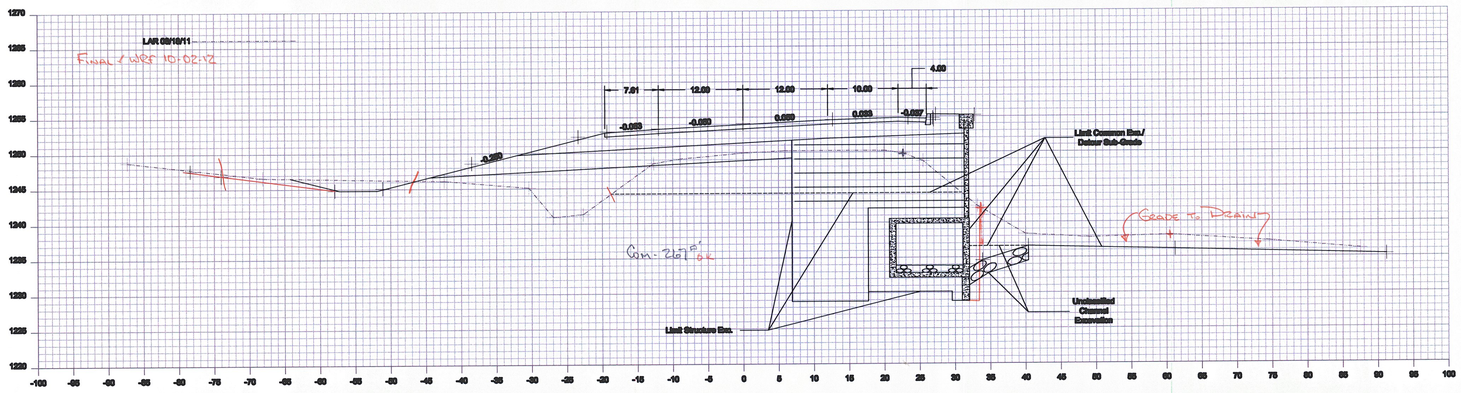


162+00

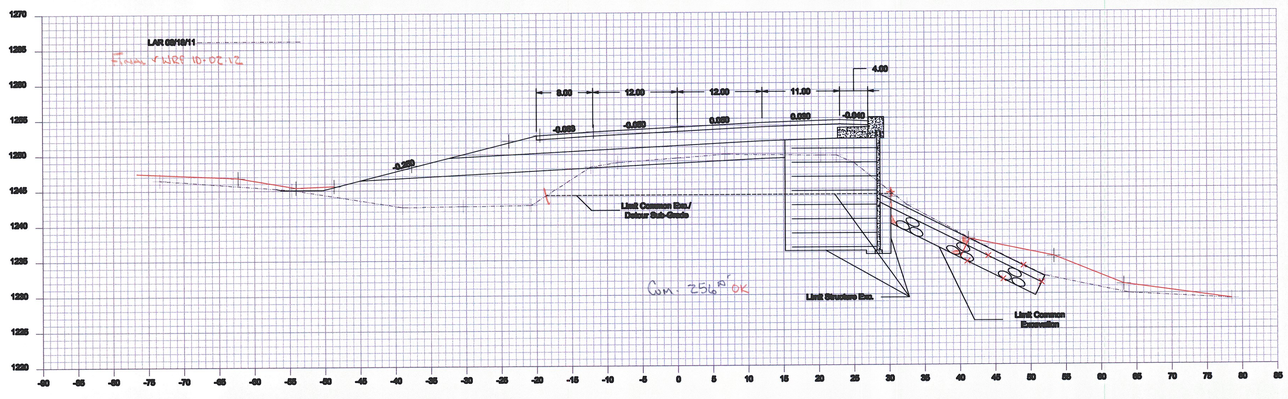
Drawing:	Cross Section 162+00 - 163+00		
Project:	Cabot Danville		
Drawn By:	JMR	Checked By:	
Date:	09-25-2012	Date:	
Scale:	1 : 10	Sheet:	of



164+28
Skewed

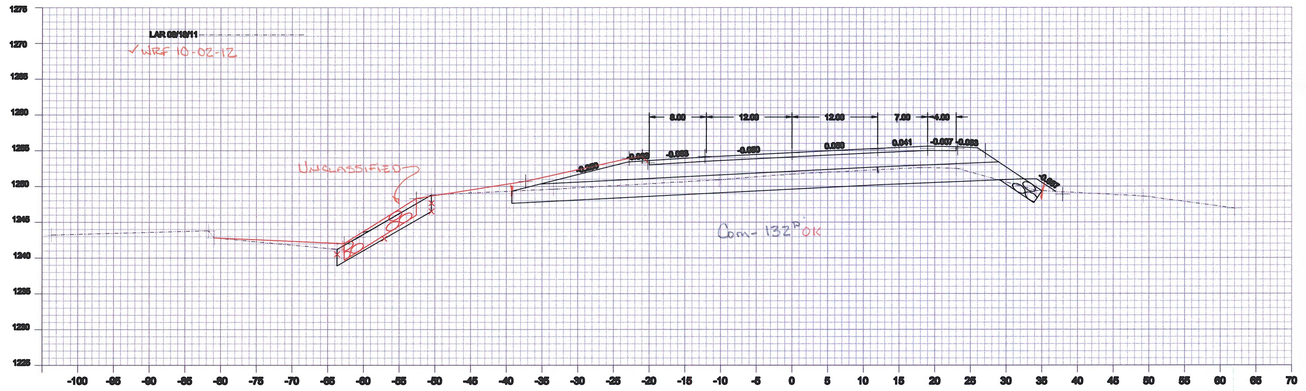


164+00

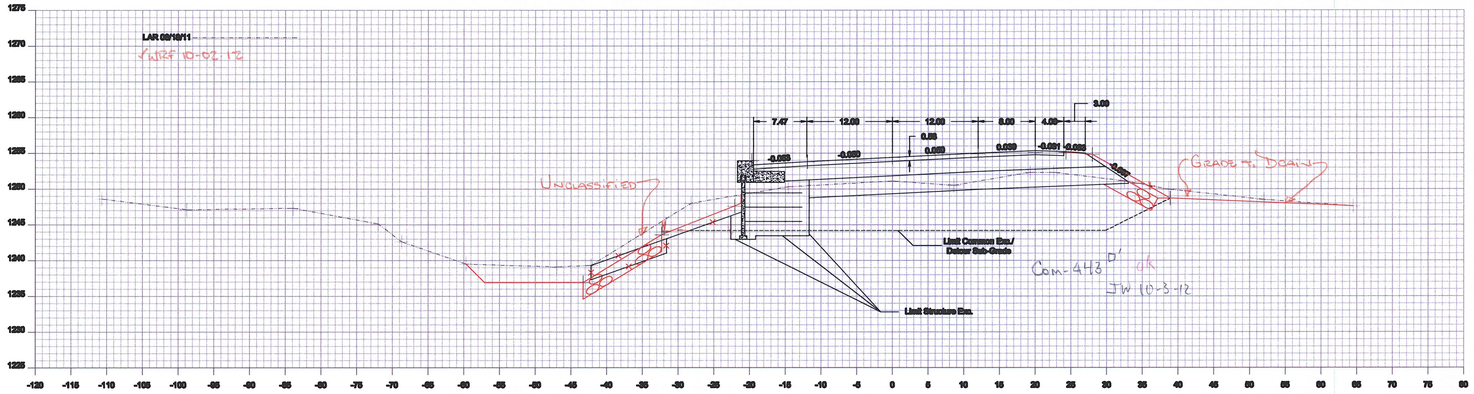


163+60

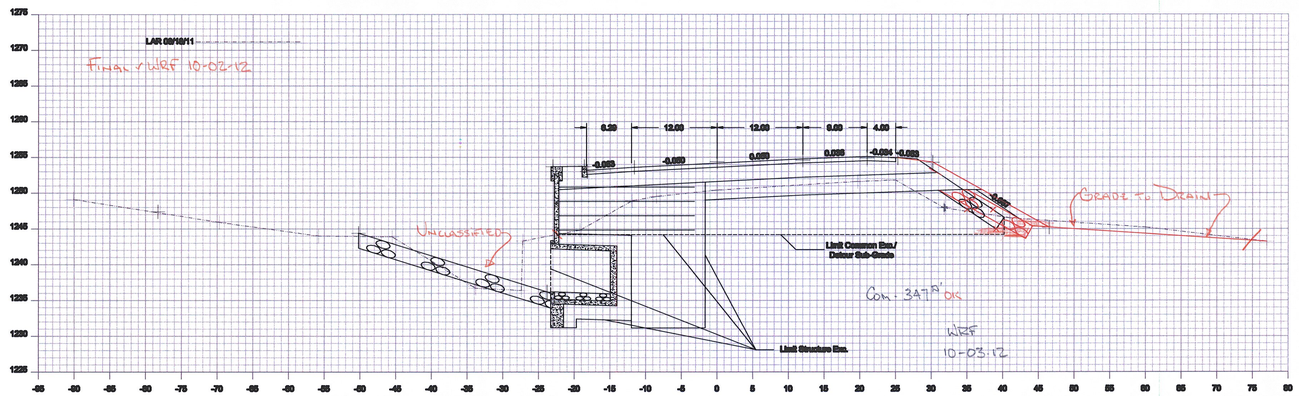
Drawing:	Cross Section 163+50 - 164+28
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-25-2012	Date:
Scale: 1 : 10	Sheet: of



165+50

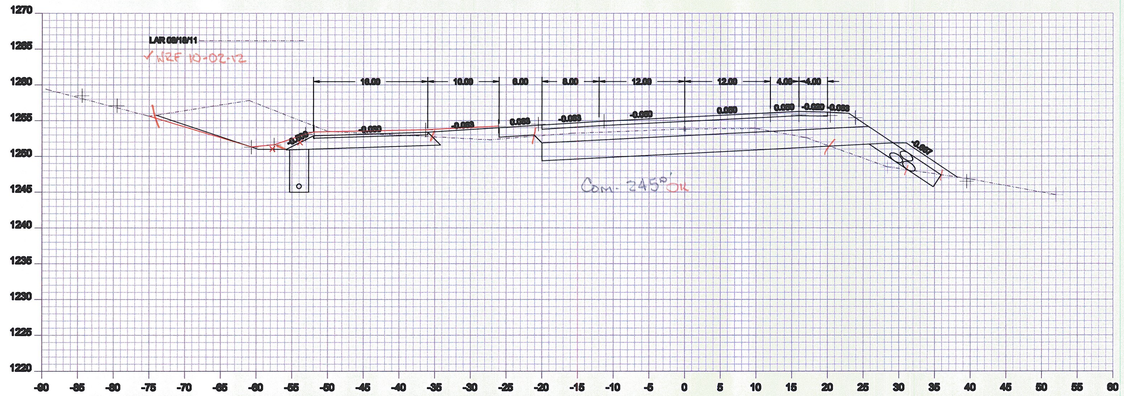


165+00

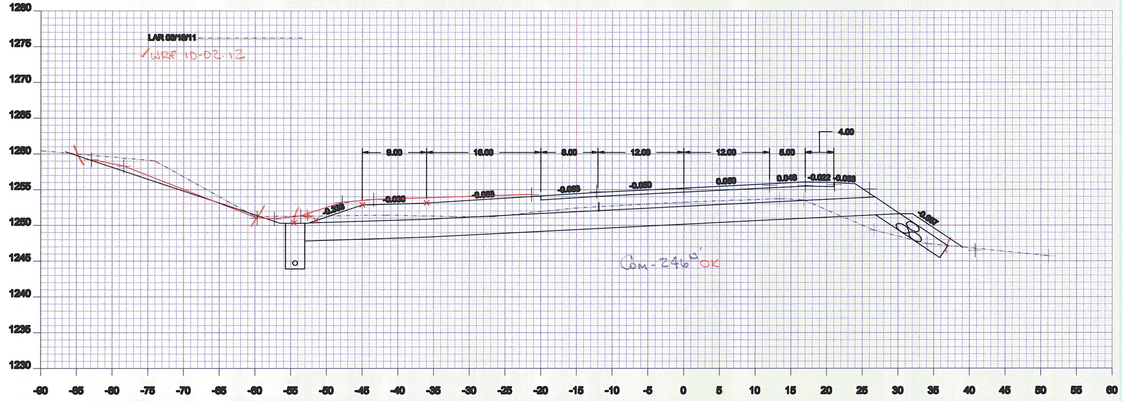


164+50

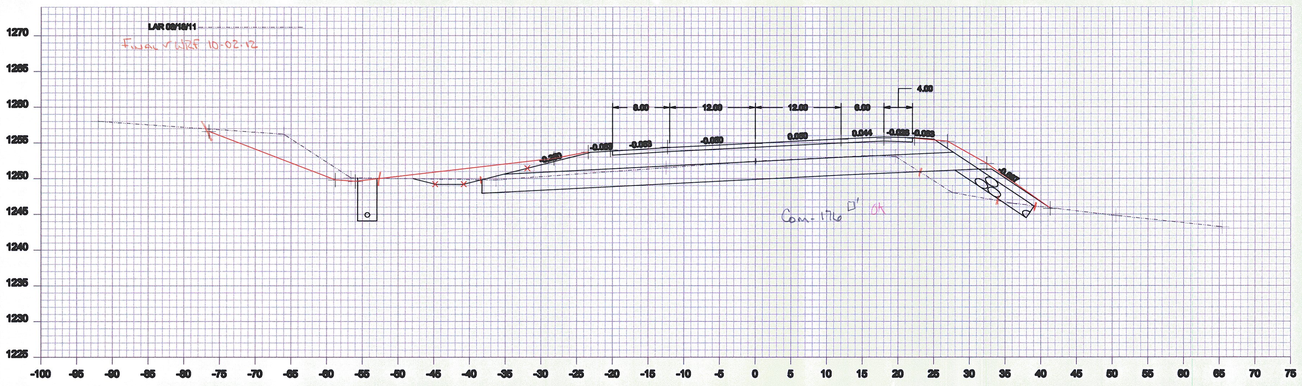
Drawing:	Cross Section 164+50 - 165+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-25-2012	Date:
Scale: 1 : 10	Sheet: of



167+00

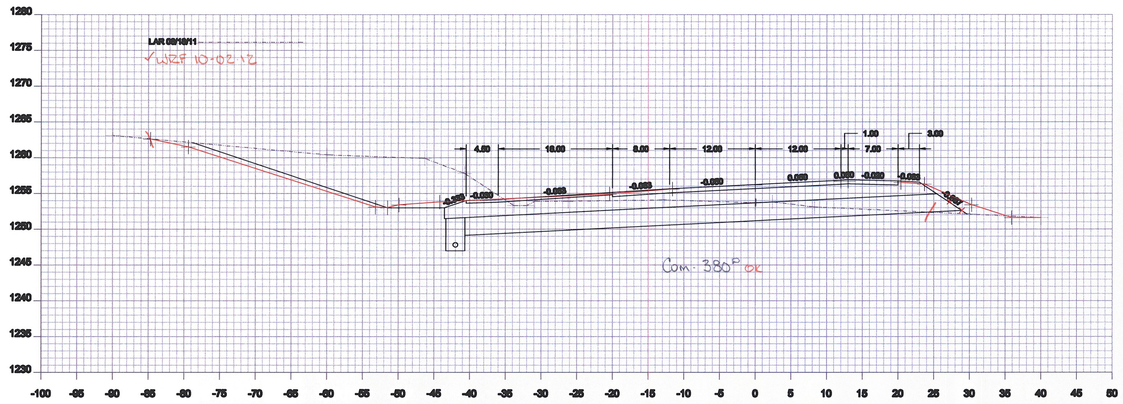


166+50

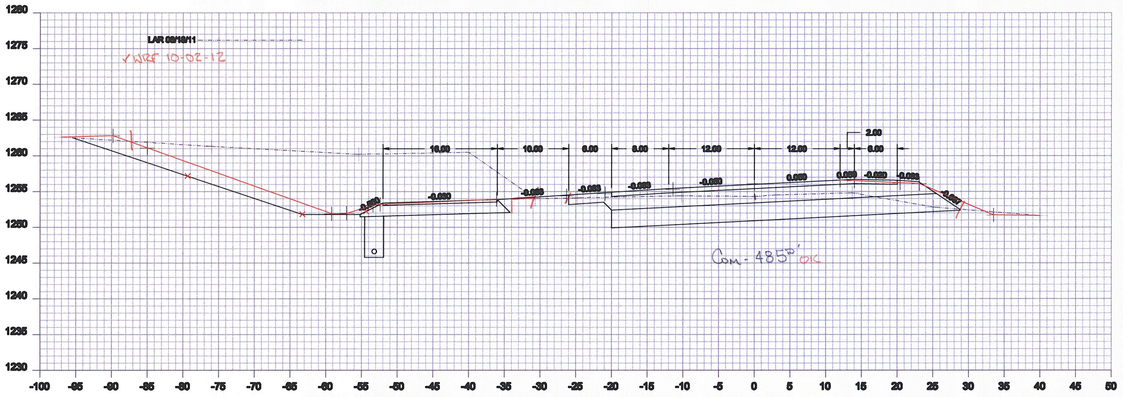


166+00

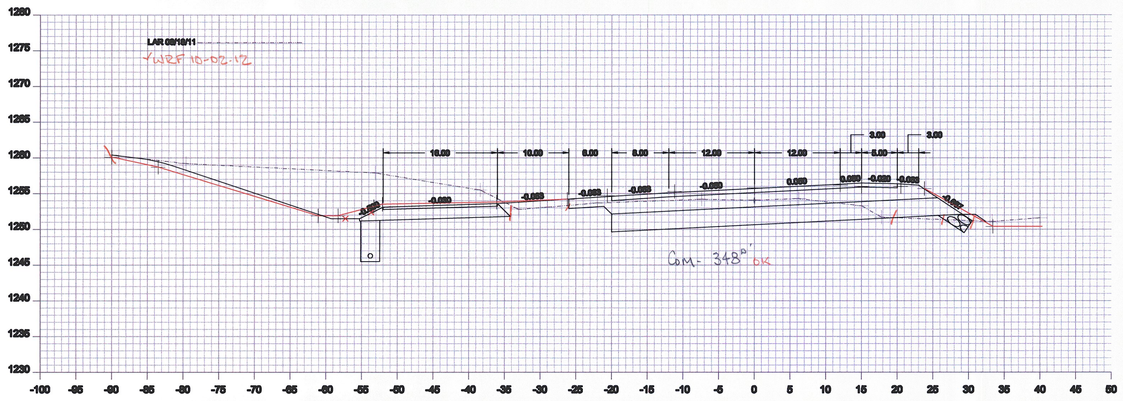
Drawing:	Cross Section 166+00 - 167+00
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-25-2012	Date:
Scale: 1 : 10	Sheet: of



168+50

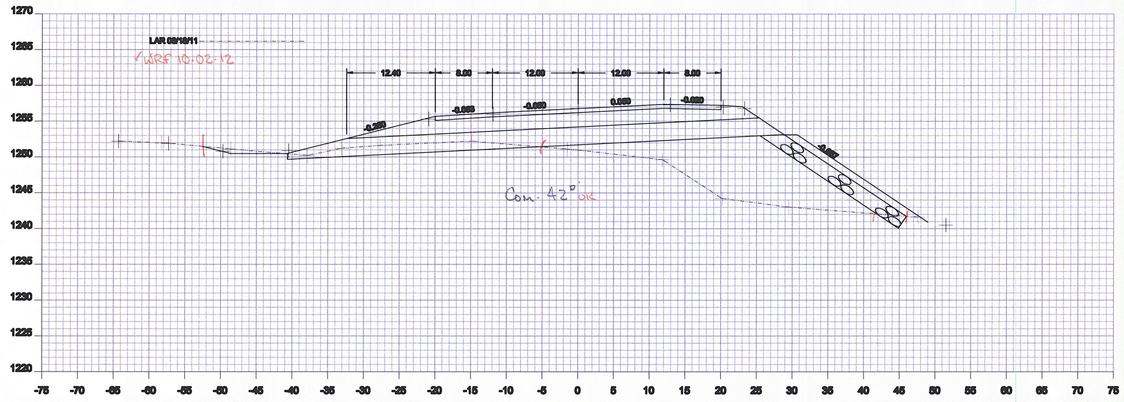


168+00

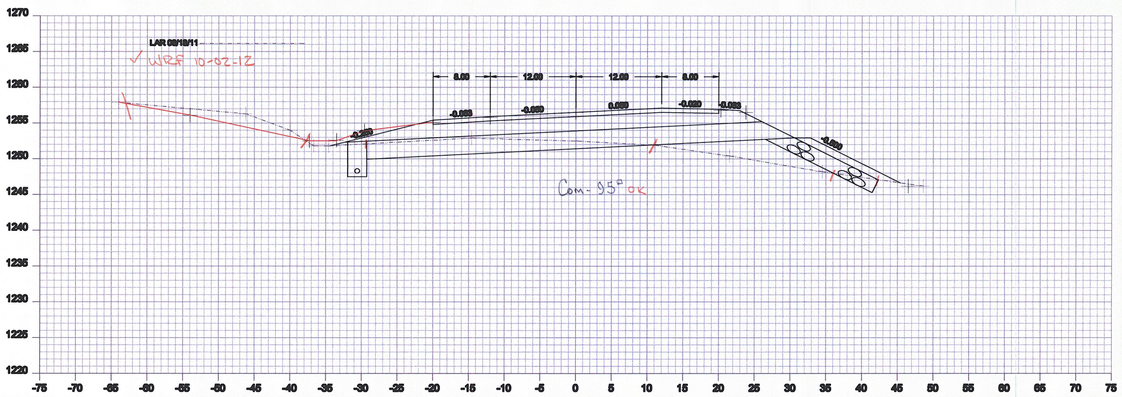


167+50

Drawing:	Cross Section 167+50 - 168+50		
Project:	Cabot Danville		
Drawn By:	JMR	Checked By:	
Date:	09-25-2012	Date:	
Scale:	1 : 10	Sheet:	of

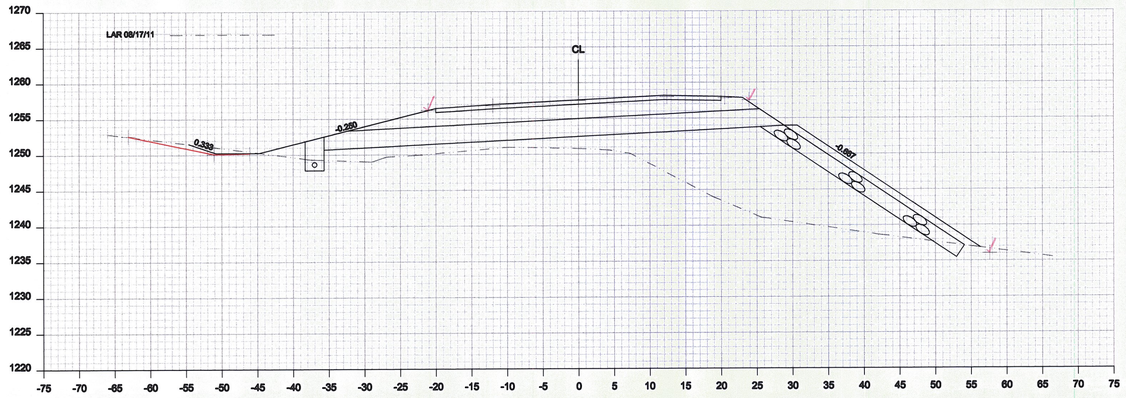


169+50

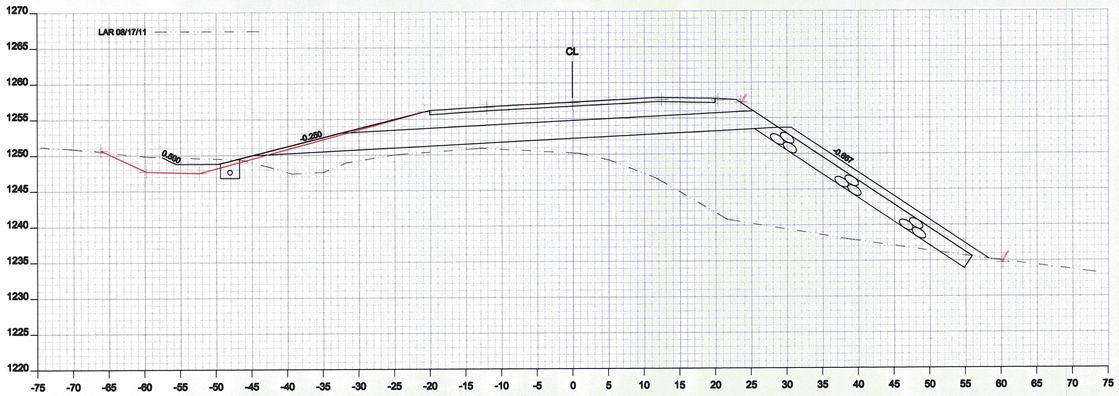


169+00

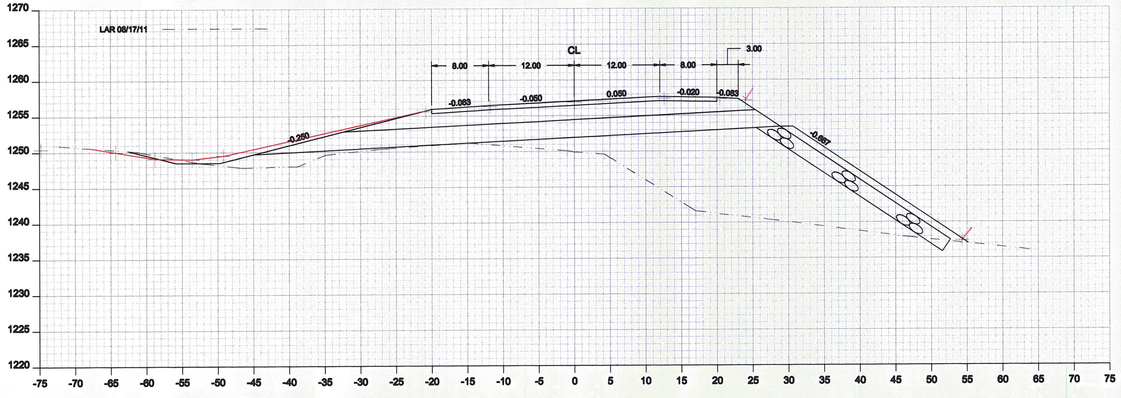
Drawing:	Cross Section 169+00 - 169+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 09-25-2012	Date:
Scale: 1 : 10	Sheet: of



171+00



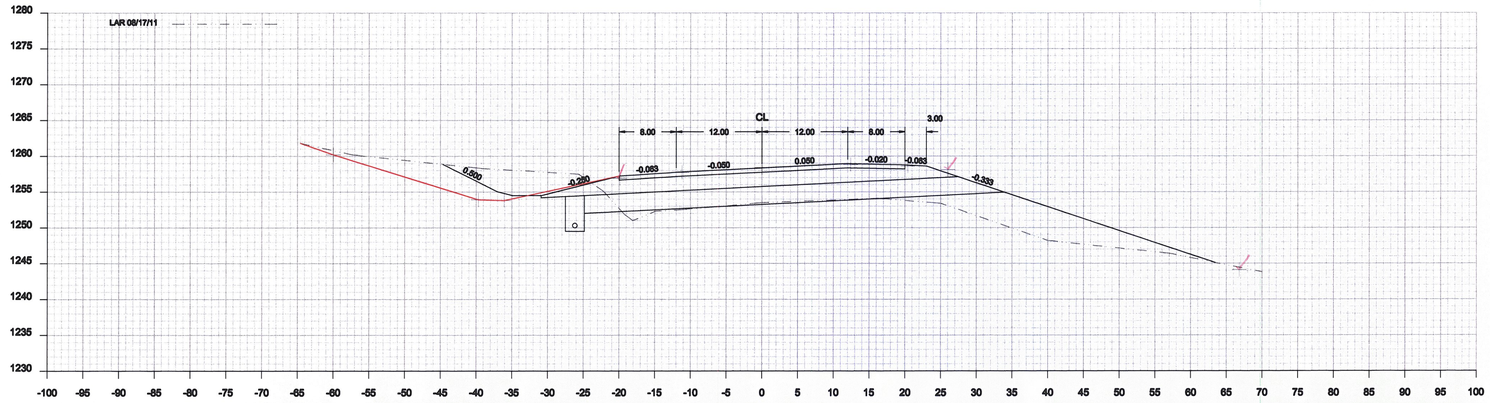
170+50



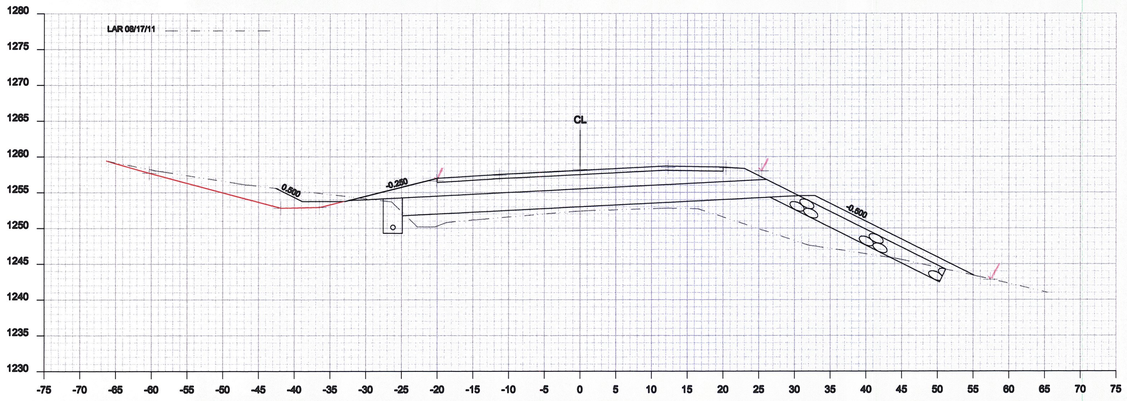
170+00

√ PLOT WRF 12-19-11
√ AREA WRF 12-21-11

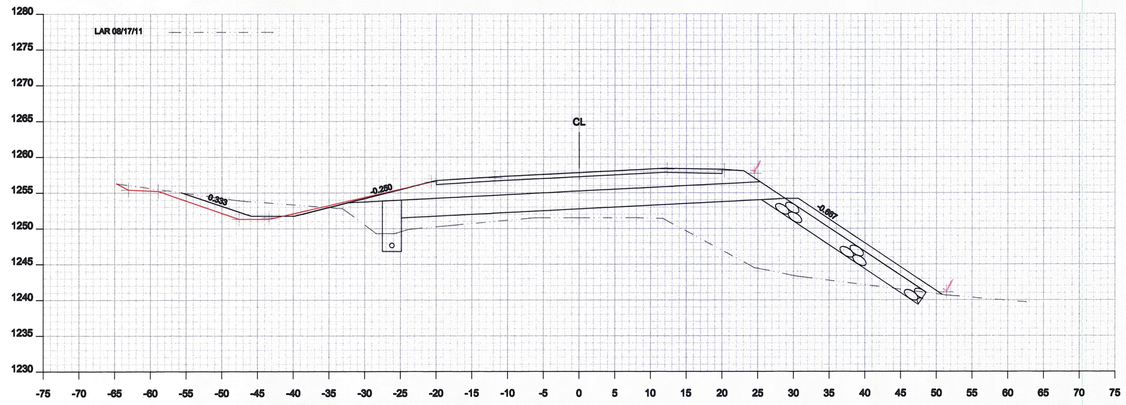
Drawing: Cross Section 170+00 - 171+00	
Project: Cabot Danville	
Drawn By: JMR	Checked By:
Date: 12-16-2011	Date:
Scale: 1 : 10	Sheet: of



172+50



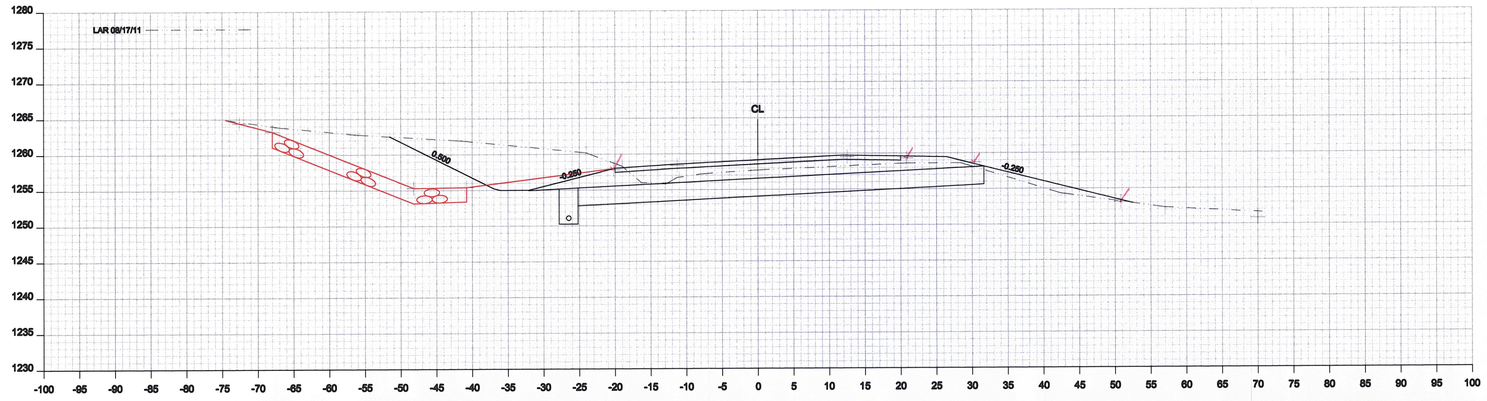
172+00



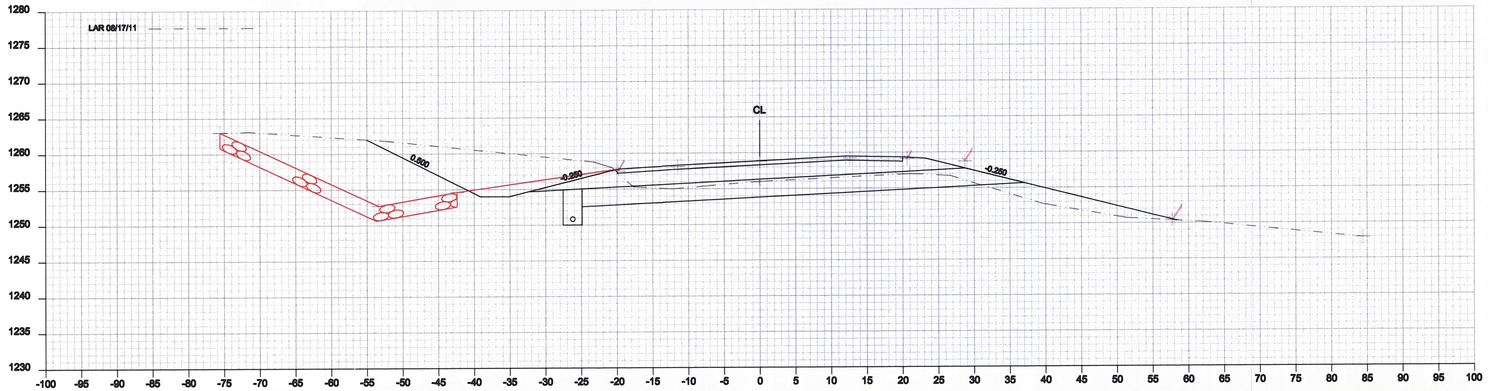
171+50

√Plot 12-19-11
√Area 12-21-11

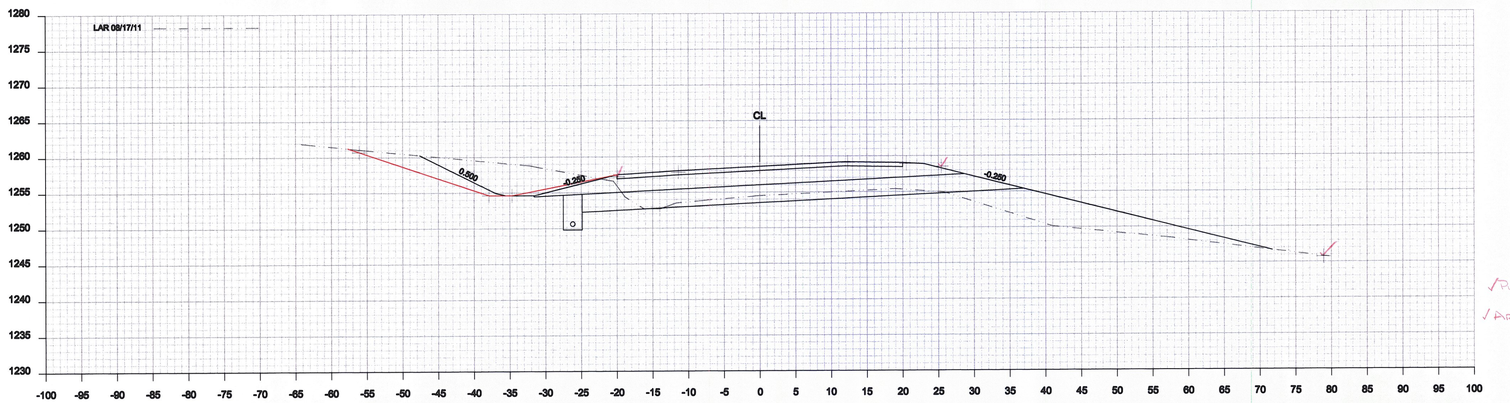
Drawing:	Cross Section 171+50 - 172+50
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 12-16-2011	Date:
Scale: 1 : 10	Sheet: of



174+00



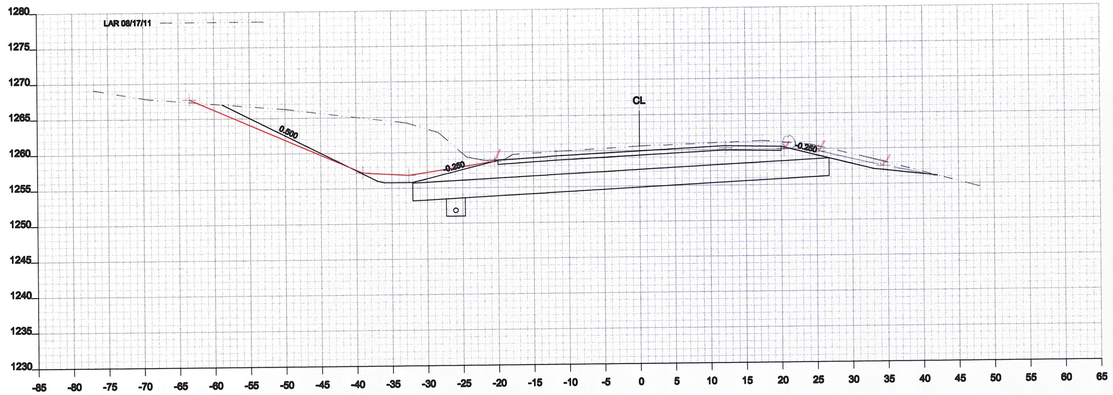
173+50



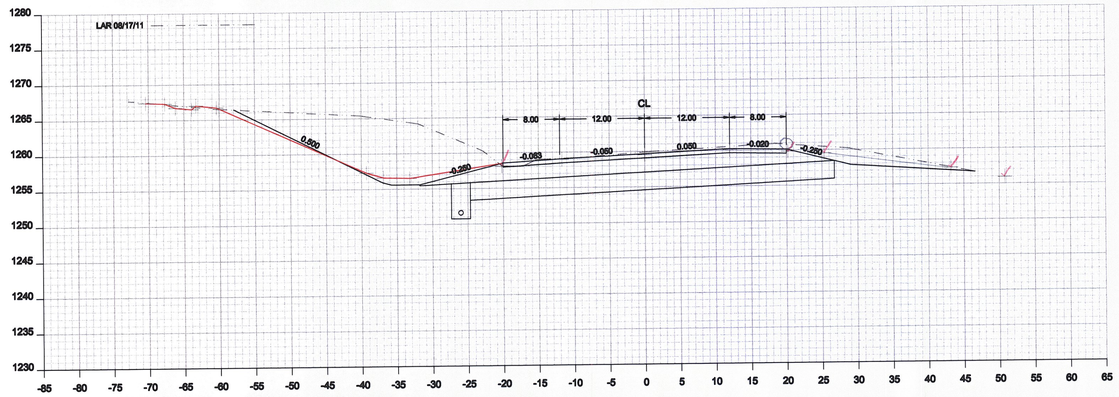
173+00

√Run 12-19-11
√Area 12-21-11

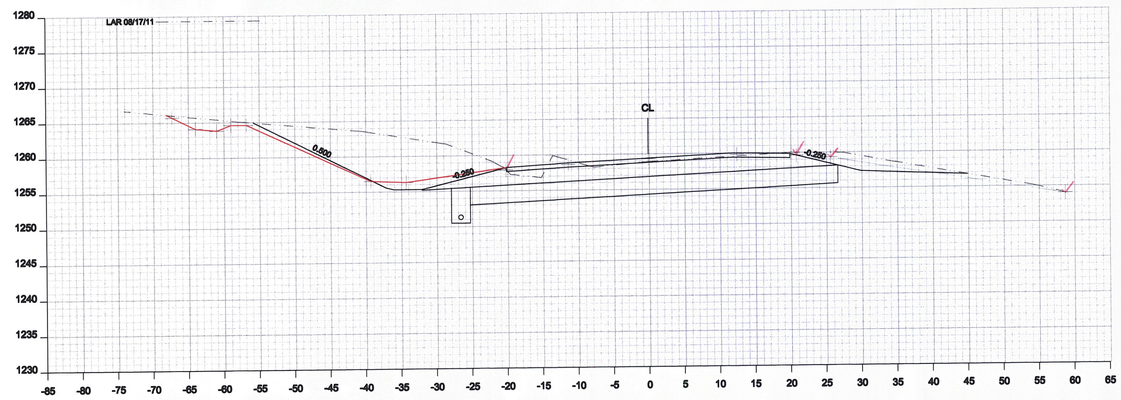
Drawing:	Cross Section 173+00 - 174+00
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 12-16-2011	Date:
Scale: 1 : 10	Sheet: of



175+50



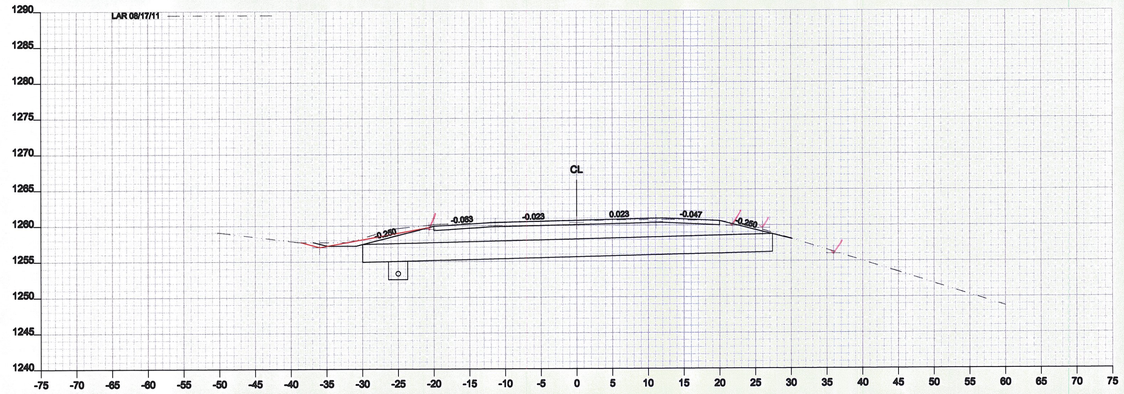
175+00



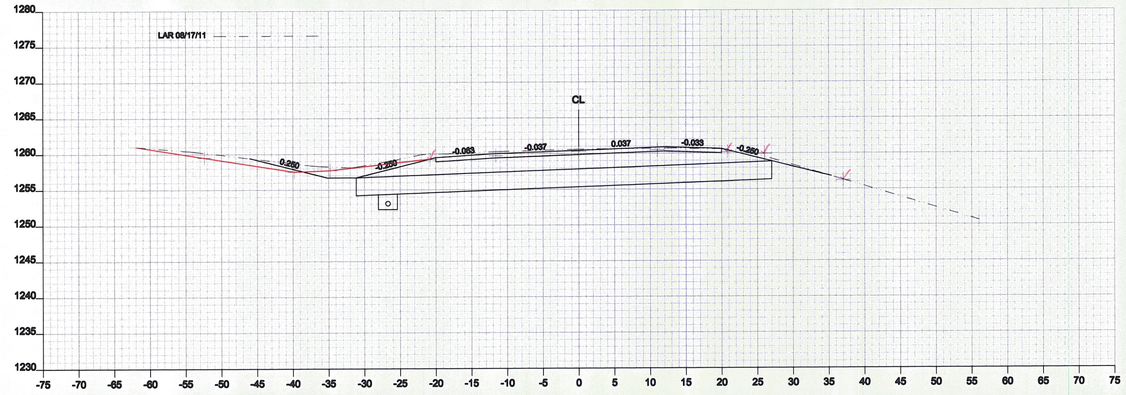
174+50

✓ Plot WRT 12-19-11
✓ Area WRT 12-21-11

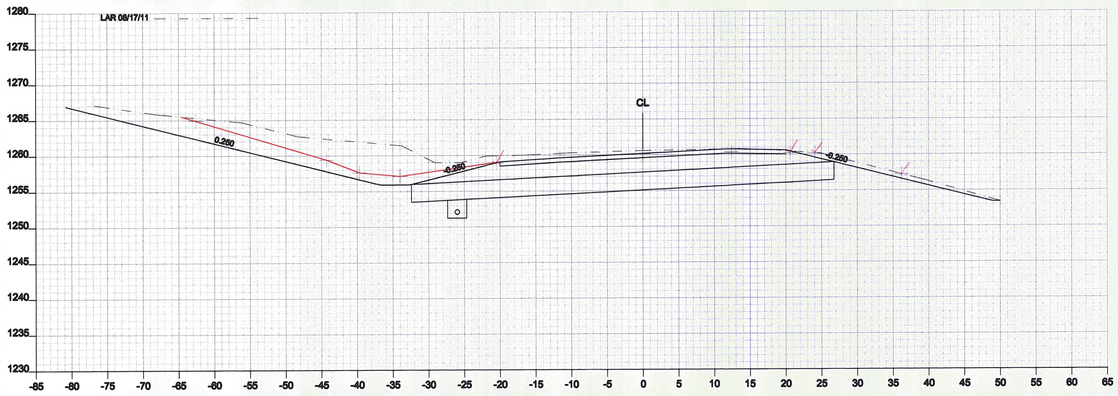
Drawing: Cross Section 174+50 - 175+50	
Project: Cabot Danville	
Drawn By: JMR	Checked By:
Date: 12-16-2011	Date:
Scale: 1 : 10	Sheet: of



177+00



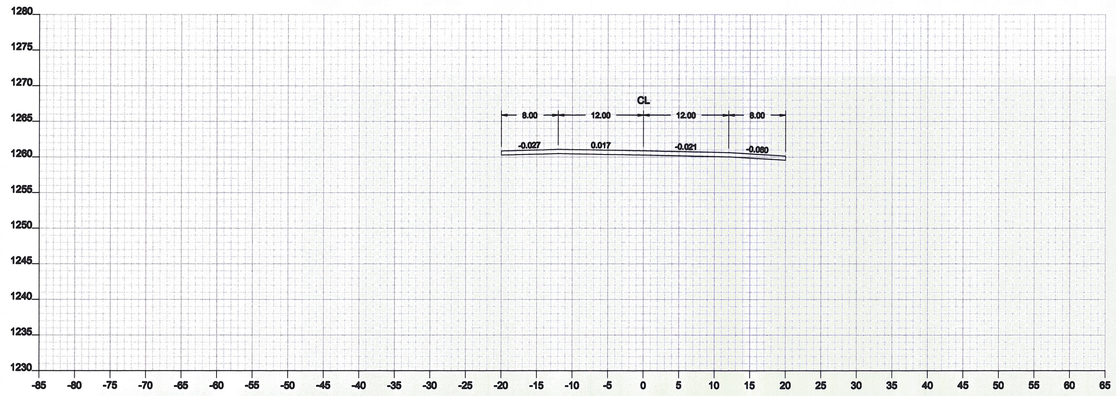
176+50



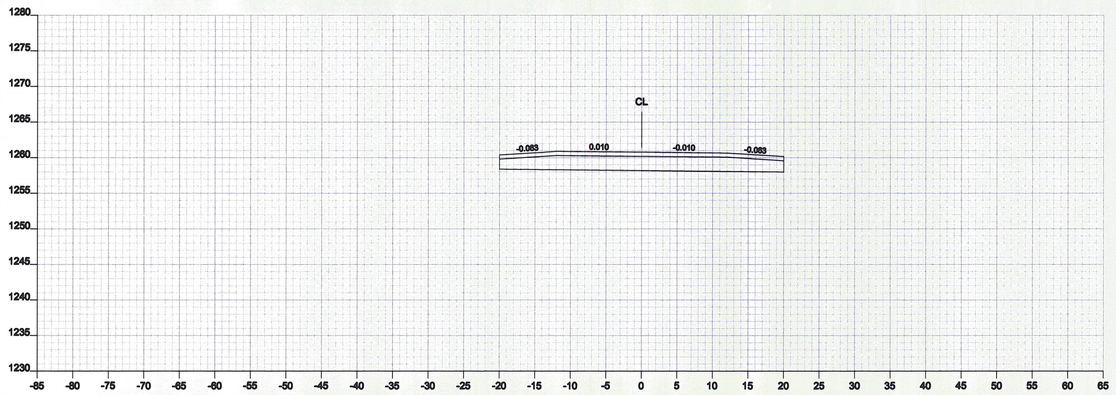
176+00

✓ Plot WRF 12-19-11
✓ Acen WRF 12-21-11

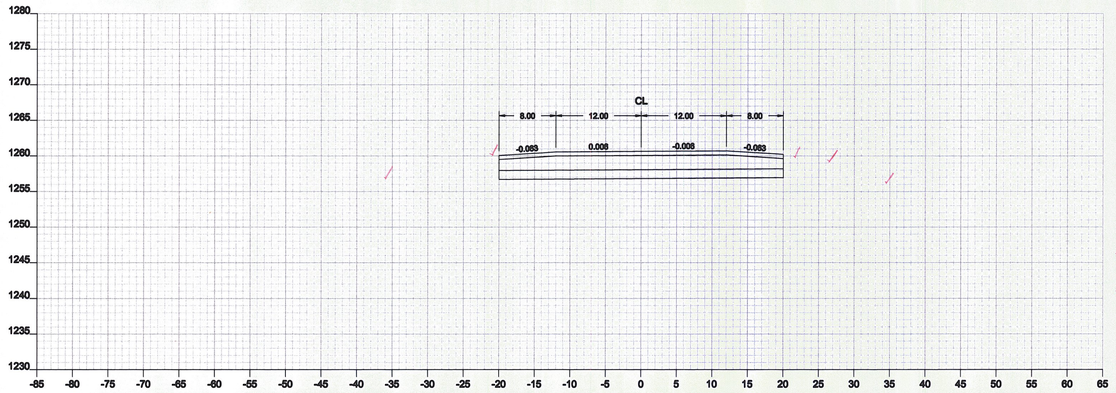
Drawing: Cross Section 176+00 - 177+00	
Project: Cabot Danville	
Drawn By: JMR	Checked By:
Date: 12-16-2011	Date:
Scale: 1 : 10	Sheet: of



178+50



178+00

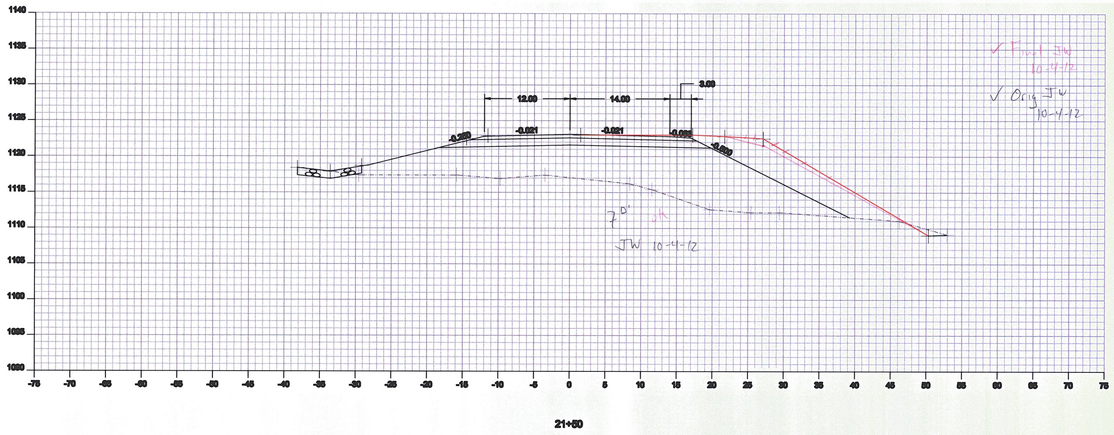


177+50

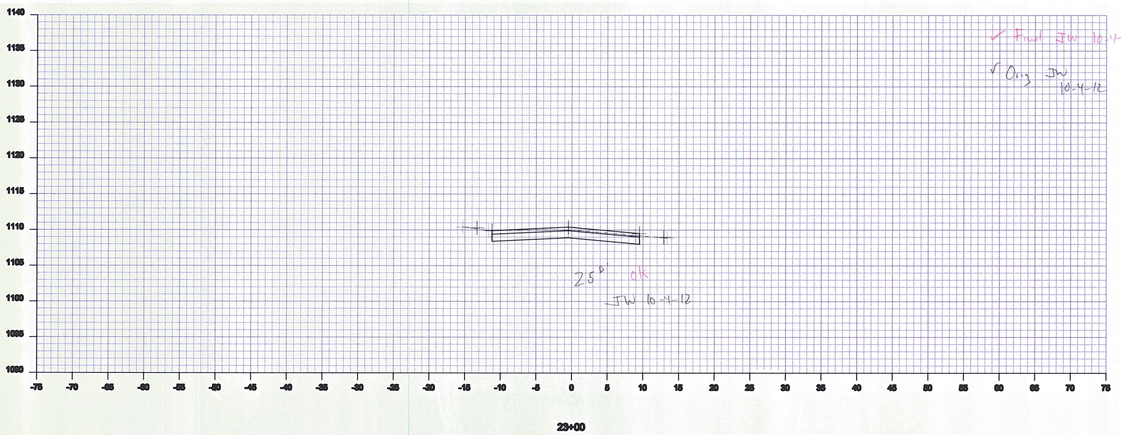
✓ Plot WRF 12-19-11

✓ Area WRF 12-21-11

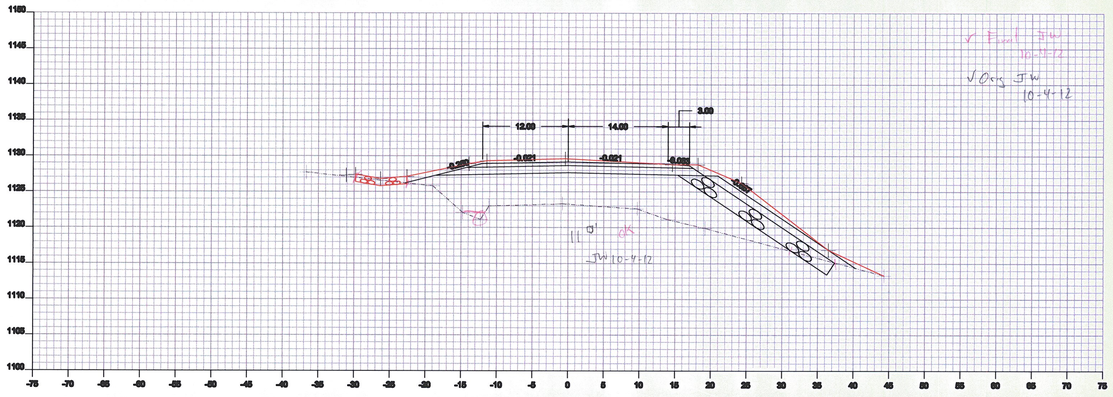
Drawing: Cross Section 177+50 - 178+50	
Project: Cabot Danville	
Drawn By: JMR	Checked By:
Date: 12-16-2011	Date:
Scale: 1 : 10	Sheet: of



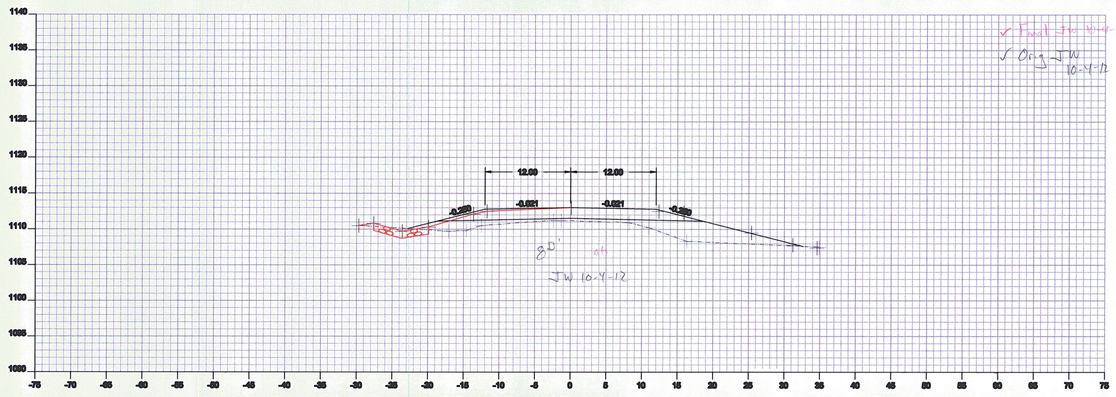
21+50



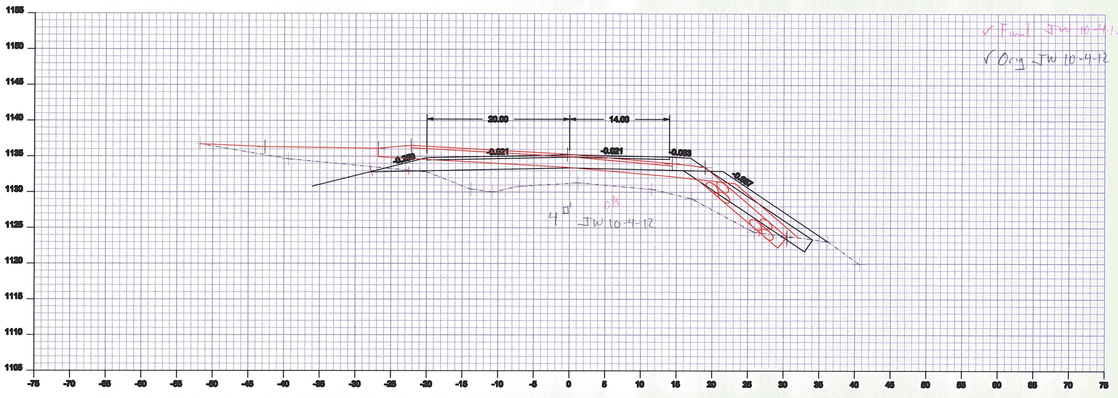
23+00



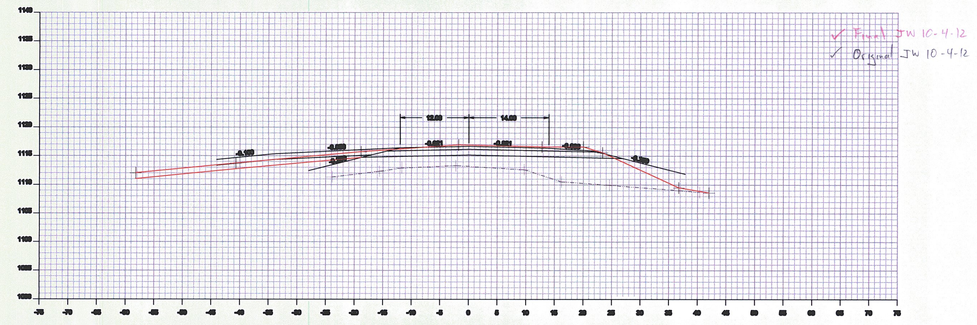
21+00



22+50

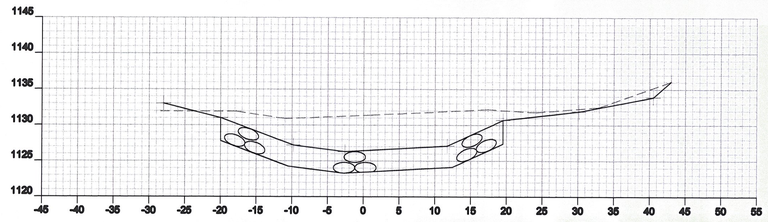


20+50



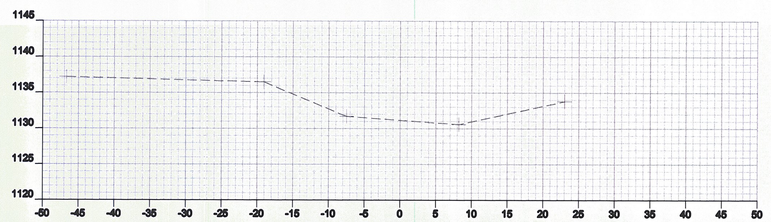
22+00

Drawing:	Cross Section 20+50 - 23+00
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 10-01-2012	Date:
Scale: 1 : 10	Sheet: of

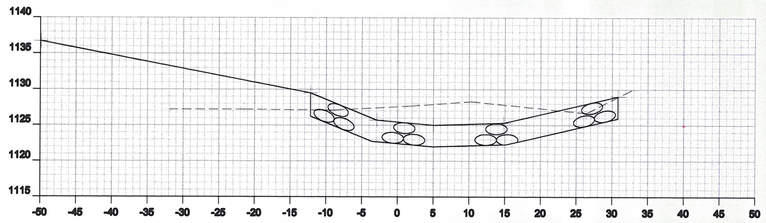


Orig ✓
Final ✓

2+50

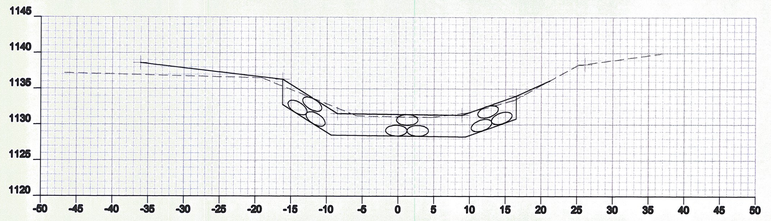


4+25



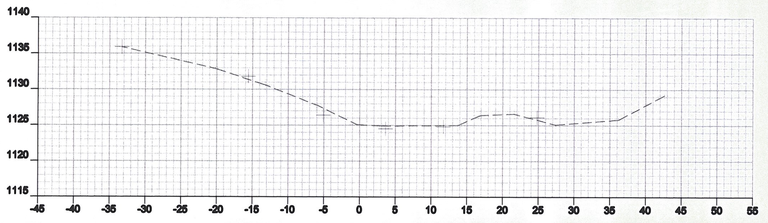
Orig ✓
Final ✓
WRF 5-10-12

2+00

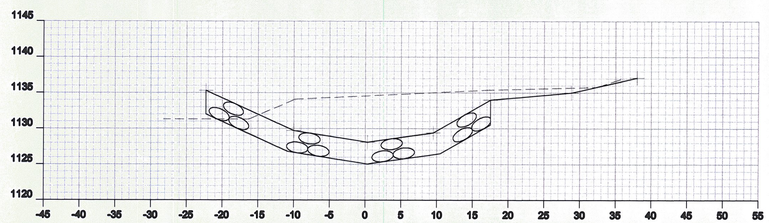


Orig ✓
Final ✓
WRF
05-10-12

4+00

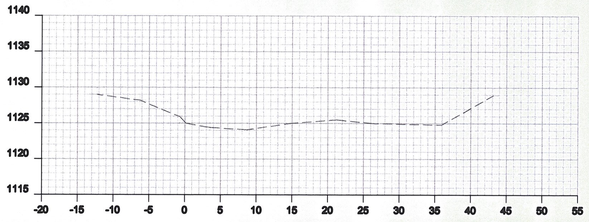


1+75

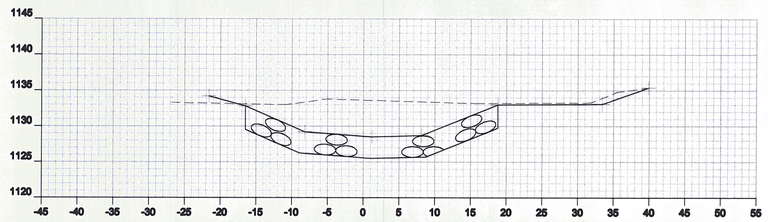


Orig ✓
Final ✓

3+50



1+50



✓ Orig
✓ Final

3+00

Drawing:	Channel Relocation
Project:	Cabot Danville
Drawn By: JMR	Checked By:
Date: 04-27-2012	Date:
Scale: 1:10	Sheet: of

PLATE 3-TYPE CROSS SECTION-HULL LINE
HIGHWAY SERVICE NO SHEET
PRINTED IN U.S.A.

Placed in Ditchline

1102.9 — 1103.3

1101+33.31 L.T. (40'L 18" CPEP)

1101+33+11.5' L.T.

1100

Ditchline

Pole

Inlet

Outlet

+57

+45

+03

99.00

Ditchline Grade

1105.80

1105+94

(5' Lined 60'-33 1/2")

Remove Exist 15" CGMP

1100

Tension Length = $\left(\frac{33'}{2}\times\frac{33.1}{12}\right)+\left(\frac{11'}{2}\times\frac{11.0}{12}\right)+\left(\frac{11'}{2}\times\frac{9.6}{12}\right)\times 4.25\div 360=2^{3}\times 1\frac{1}{2}+13.5^{\#}$ WRF 6-22-12

7-11-12

Pipe

Ditch

1103.0

1102.2

1100

+56

+03

Existing Outlet

1107.44

1106+67

58.5 + 3.0

T.E. = $\left(\frac{0.0+18.0}{2}\times 39\right)+\left(\frac{36+15}{2}\times 4\right)+6.5\times 4.25+28.6\times\frac{1}{12}=10.6^{SY}$

Remove Exist 15" CGMP

Say 11SY T.E.= 2.7 EA

WRF 6-21-12

7-18-12

1100

1101+67

T.E. = Dep

$\left(\frac{42.4+20.4}{2}\times 25\right)+\left(\frac{42.4+10.58}{2}\times 12\right)\times 4.25\div 28^{2}\times 1\frac{1}{2}=38.7^{SY}$

T.E. = Dep

$\left(\frac{42.4+20.4}{2}\times 25\right)+\left(\frac{42.4+10.58}{2}\times 12\right)\times 4.25\div 28^{2}\times 1\frac{1}{2}=38.7^{SY}$

Remove Exist 15" CGMP

#2 Bar, 6 Stirrups Spaced 6" Each End

#3 Bar, 2 Stirrups Spaced 6" Each End

7-13-12

Tension Length Conc. Apron (6-5)

CB: 5.0 + 3.0 + 0.5 = 8.5'

A: $4.9^{2}\times 3.14\div 4=6.8^{SF}\times 5=34^{SF}$

A: $1.5(\text{Apr Depth})\times 6.8^{SF}\times L.F.=\frac{132^{SF}}{477^{SF}}$

1100

Ditchline

Pipe

Inlet

Outlet

Ditchline Grade

1108+55

Remove Exist 15" CGMP & Provide 15" B Gasketed Pipe

Tension Length Pipe (30°)

(Over 5) $\left(\frac{30.0+18.0}{2}\times 39\right)+\left(\frac{18.0+15.0}{2}\times 4\right)+\left(\frac{15.0+10.0}{2}\times 59\right)\times 5.5\times 1.15=$

$\left(\frac{46.4+27.4}{2}\times 39\right)+\left(\frac{27.4+25.0}{2}\times 4\right)+\left(\frac{25.0+18.0}{2}\times 59\right)\times 5.5\times 1.15=$

$=\frac{464^{SF}}{2480^{SF}}=2957^{SF}\times\frac{1}{27}=109.5^{SY}$

109.5 SY = 16.2 EA = 110.7

WRF 6-13-12

7-18-12

JPD 07-12-12

Pipe

Ditch

1103.6

1102.2

1100

+56

+03

Existing Outlet

MEANDER - STONE FILL TYPE I

1100

Tension Length = $\left(\frac{30'}{2}\times 18.46^{3}\right)+\left(\frac{25'}{2}\times 18.25^{3}\right)+\left(\frac{18.0'}{2}\times 6\times 5\right)(1)=2741.5^{3}$

$2741.5\div 27=101.5^{CY}$

T.E. AT STONE FILL TYPE

7-19-12

WRF 7-19-12

Cabot Danville
FEGC F028-3(26) C/1
Drawing Sheet # 1

PLATE 3-FULL CROSS SECTION-FULL LINE
HIGHWAY, BRIDGE AND AIRFIELD

FINAL SURVEY
NOTE BOOK
PAGE
INITIALS
STARTED
FINISHED
ORIGINAL
NO.
PAGES CHECKED
BY
DATE

T.E. Pipe, CB, Headwall & Stone Fill

304.0+218.9+621.0+146.0+1567.4+2333.2+296.4+640 = 5540.9 ft³ x 1/27 = 205.2 cy WRF 6-20-12

Elev 1102.75

1100

Elev 1099.00

(111+65 (30° Lt) (Rebid)

T.E. CB (6.0 ft²)

0'-0" = 6.0 ft² x 5 ft = 304.0 ft³

Over 5' = 6.0 ft² x 24 ft x 1.5 = 216.0 ft³

T.E. - CB to NB (5.5 w)

0-5' [(5 x 17) + (85/12 x 17) + (41/12 x 2) x 5.5] = 621.0 ft³

Over 5' [(1.2 x 2.5) + (9/12 x 2.5 x 1.5) + (0.2 x 3.8) + (0.8/2 x 3.8 x 1.5) + (1.8 x 1.2) + (1.8/2 x 1.2 x 1.5)] x 5.5 x 1.5 = 182.6 ft³

WRF 6-20-12

T.E. 6'-5" Pipe M Right (Add 1 Extra Width)

[(16.8/12 x 215/12) + (13.8/12 x 215/12)] x 5.5 x 6.5 = 1557.4 ft³

Over 5' 146 223 262 168 7.7 3.5

[(6.0 x 1.5) + (11+22/12 x 1.5) + (28+26/12 x 1.5) + (28+23/12 x 1.5)] x 6.5 x 1.5 = 1233.2 ft³

239.5 x 6.5 x 1.5 = 2333.2 ft³

T.E. Headwall (6.5' Lang)

3.5 x 6.5 x 48/3 = 296.4 ft³

- Stone Fill - Type IV

8.0' x 40.0 w x 20.0 h = 640 ft³

(Concrete Headwall)

Conc. Pipe 6'-5" Dia

Plan: 9.5 x 6.5 x 0.5 = 30.8

Back: 9.5 x 1.5 x 1.0 = 14.2

Top Base: 4.5 x 4 x 4.3 = 163.4

208.4 ft³ / 27 = 7.7 cy

WRF 6-20-12

111 x 65 (Skewed 73° 52' Rt)

New 30" x 116' CMP w/ Prefab w/ Flared End Section

Stone Fill Bed Type IV 4 w x 10' L

Remove Exist 18" CSMP

111+65 (Skewed 73° 52' Rt)

New 42" x 26' PCCSP .109

Pipe 0'-5'

[(6.5/2 x 4.6 x 15) + (4.6/2 x 5.0 x 1) + (282.5/2 x 5.0 x 5.0) + (21.6/2 x 5.0 x 8) - (7.6/2 x 0.4 x 1.1 x 3.5)] x 6.5 = 2423.2 ft³

Over 5'

[(84.2/2 x 0.4 x 8) + (7.2/2 x 2.9 x 5.0)] x 6.5 x 1.5 = 880.2 ft³

Total = 356.8 + 1162.9 + 2423.2 + 880.2 + 307.8 + 423.3 = 4284.3 x 1/27 = 158.7 cy WRF 7-06-12

Plus Measured Trench Rock = 4 x 4 x 2 x 1/27 = 1.2 cy

159.9 cy

Pipe & Headwalls

Type I-S.F. = 12.0 cy

Type IV S.F. = 42.7 cy / 212.2 cy 7-10-12 WRF 7-09-12

Elev 1102.75

1100

Elev 1099.00

44 Rt

T.E. Pipe from Grey Section

1110

1100

1090

Reduced Width at T.E.

T.E. 7'-5"

Elev 1102.50

115+28 (Skewed 88° 29' Rt) (Plan)

New 42" x 26' PCCSP .109

3/Grade Adj. at Inlet & Outlet

Stone Fill Bed, Type IV 5' w x 20' L @ Outlet

Remove Exist. 24" RCP

88° 29' Rt

Existing Pipe Culvert

115+28 (Skewed 88° 29' Rt)

115+20 (Skewed 85° Lt)

Elev 1102.48

1110

1090

115+20 (Skewed 85° Lt) (Profile)

New 42" x 26' PCCSP .109

Stone Fill Bed Type IV 4 w x 10' L

Remove Exist 18" CSMP

Elev 1106.75

1'-6" Stone Fill Type IV

1' x 8' x 16' L = 32 x 1/27 = 1.2 cy

T.E. 7'-0"

1110

Type IV 8' x 20' x 1.5'

T.E. 27.5

[(6.2/2 x 4.1) + (5.5 x 5.0)] x 10.5 = 358.8 ft³

Over 5'

(6.8+19')/2 x 3.5 x 10.5 x 1.5 = 1168 ft³

115+23

41' Lt

1106.75

5' Undercut

1' Undercut

Elev 1102.75

Elev Pipe Invert

Elev Pipe Invert

115+11

5 1/2' Rt

1095.68

T.E. Outlet Head

7'w x 10.5' L x 5.0' H = 367.5 ft³

Over 5'

1'w x 10.5' L x 1.2 H x 1.5 = 132.3 ft³

Titanium Earth Stone Fill Type IV

[(5.0 x 18.5) + (2.5 x 11.2/2 x 5.0/2)] x 10 = 1037 ft³

Over 5'

[(5.5' x 1.2 Depth) + (10 x 9.0/2 x 1.0) + (2.5 x 1.2/2 x 1.0/2)] x 10 x 1.5 = 172.0 ft³

1/2 x (1037 + 172) = 427 cy WRF 7-09-12

115+26 (Skewed 88° 29' Lt) (Profile)

New 42" x 26' PCCSP .109

CABOT DANVILLE
FEGC F-028-3(26) C/I
DRAINAGE SHEET # 2

PLATE 3-FULL CROSS SECTION-HULL LINE
HIGHWAY LEGEND PID SHEET
NATIONAL PERMANENT
PRINTED IN U.S.A.

FINAL SURVEY
NOTE BOOK
PAGES CHECKED
STATUS
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DATE
BY
DESIGNED
DRAWN
TRACED
CHECKED
CHECKED BY

✓ Template
✓ Existing

Over 5' Neglect = HDWL
HDWL - T.E. = [(15.1+7.4)/2 x 1.5) + ((68.4+0.5)/2 x 34') + ((48.8+5.9)/2 x 32') + ((15.9+3.0)/2 x 15') + ((3.0+0.5)/2 x 30')] x 5 = 260.8 ft³
Pipe = 100% - [(3.3+5.6)/2 x 4) + ((45.5+15.2)/2 x 30') + ((30.5+8.5)/2 x 15') + (0.5+0.8)/2 x 8) + ((0.8+2.3)/2 x 12') + ((2.3+10.6)/2 x 6) + (0.5+2.0)/2 x 25') x 7] = 223.1 ft³
Over 5' = 100% - [(0.0+15.5)/2 x 5) + ((15.5+22.3)/2 x 30') + ((22.3+31.6)/2 x 15') x 7 x 1.5 = 128.8 ft³

HDWL T.E. = 100% = (5 x 7 x 5) = 280 ft³
T.E. = 150% = [(7.4+3.0)/2 x 5) + ((3.0+0.5)/2 x 30') x 5 x 1.5 = 154.8 ft³
Stone Fill & Other = [(5.7+4.8)/2 x 5) + ((4.8+1.5)/2 x 15') x 6 = 418.5 ft³
Over 5' Neglect
Total T.E. = 260.8 + 223.1 + 128.8 + 154.8 + 418.8 = 1186.3 x 1/27 = 43.9 cy
2295.0'
2295.0 + 2295.0 = 4590.0
4590.0 x 1/27 = 170.0 cy
SAY 170 cy
10/20/11
Under 12-02-11

Unclassified Channel
0+0 — 12.3' — 66.3' — 2238.3' — 12.6' — 30.2' — 2302.2' — 12.3' — 154.3 cy — Used 12-08-11 JPD 12-08-11

Unclassified Channel & Ditches 118+08

0+045		8.5	41.6	448
+10		10	63.8	1040
+20		10	64.2	1040
+30		10	102.1	832
+40		10	141.1	1225.6
+50		10	145.1	1451.0

Ave. x 1/27 = 170.6
Used 12-08-11 JPD 12-08-11

End Unclass Channel @ Sta. 50+00 - Same Price as Sta 46+60

Grade Headwalls & Inlets, Stone Fill Pad
Headwall - Under - 7'4" x 11' = 770
Pipe - [(60+48)/2 x 46) - (3'11" x 11')] x 11' = 533.7
Trans 11.5' - 3'4" x 11' = 59.4
Pipe - [(48+60)/2 x 3'4" x 46) - (3'4" x 11')] x 7' = 511.2
1903.3 ft³ x 1/27 = 35.1 cy Used 11-17-11

See 111/30 / 2011 EPR
For Type of Stone, Geotextile

Unclass
(12+0.5/2 x 4) + (5.3+5.5/2 x 4) = 42.2 sy
40+00
(12+0.5/2 x 4) + (7.8+5.7/2 x 8) + (5.7+4.2/2 x 8) = 145.1 sy
Unclass
(20.0+0.4/2 x 16) + (7.8+5.7/2 x 4) + (5.7+4.2/2 x 8) = 102.1 sy
30+00
Unclass
(22+5.3/2 x 4) + (5.3+5.5/2 x 4) + (0.5+0.8/2 x 8) = 44.2 sy
20+00
Unclass
(13.6+22/2 x 8) + (4.9+5.5/2 x 8) + (4.9+3.2/2 x 8) = 62.8 sy
10+00
Unclass
(20+35/2 x 4) + (3.4+5.8/2 x 16) + (5.8+3.0/2 x 8) = 41.6 sy
0+00 @ 1:1

Over 5' Neglect
Headwall 0-03 5'x7'x11'(6) = 385 ft³
Over 5' (10.5+10.4/2 x 3.0) + (32+20.4/2 x 4) x 11 x 1.5 = 344.8 ft³
Pipe = [(40+39/2 x 3) + (5.1+10.2/2 x 5) + (23+31/2 x 5)] x 7 = 296.1 ft³
10259 ft³ x 1/27 = 380 cy Used 11-17-11

Drain Under Pedestal
TE - Box 11-14-11 Work #8 CULVERT ROCK HAUL ITEM
Headwall 0-03 5'x7'x11'(6) = 385 ft³
Over 5' (10.5+10.4/2 x 3.0) + (32+20.4/2 x 4) x 11 x 1.5 = 344.8 ft³
Pipe = [(40+39/2 x 3) + (5.1+10.2/2 x 5) + (23+31/2 x 5)] x 7 = 296.1 ft³
10259 ft³ x 1/27 = 380 cy Used 11-17-11

Grade Headwalls & Inlets
Headwall - Under - 7'4" x 11' = 770
Pipe - [(60+48)/2 x 46) - (3'11" x 11')] x 11' = 533.7
Trans 11.5' - 3'4" x 11' = 59.4
Pipe - [(48+60)/2 x 3'4" x 46) - (3'4" x 11')] x 7' = 511.2
1903.3 ft³ x 1/27 = 35.1 cy Used 11-17-11

Summarized
Diesel & IDR Fuel Haul - TE - 86
- Asph. & Conc. Pipe & Haul - Grav. Backfill - 28
Grav. Borrow - 58
Haul - TE

Unclassified Channel
Headwall - Under - 7'4" x 11' = 770
Pipe - [(60+48)/2 x 46) - (3'11" x 11')] x 11' = 533.7
Trans 11.5' - 3'4" x 11' = 59.4
Pipe - [(48+60)/2 x 3'4" x 46) - (3'4" x 11')] x 7' = 511.2
1903.3 ft³ x 1/27 = 35.1 cy Used 11-17-11

Unclassified Ditches
(20+35/2 x 4) + (3.4+5.8/2 x 16) + (5.8+3.0/2 x 8) = 41.6 sy

Common Excavation
Begin Unclass Chan @ Sta 0+00 @ 1:1

Minus TE - Below Culvert Pipe - 12'x12' Culvert / 3'x3' Culvert / 39' Long
5' High x 8' Wide (5'-1.2'+1.5') x 39' Long = 1560 ft³
Minus Grade Box 5'x5'x3' = - 975 ft³
Minus TE - Outlet 12.3' x 3' x 3' Wide = - 111 ft³
Minus TE - Inlet (11+11/2) x 3' x 3' Wide = - 148.5 ft³
= 325.5 ft³ x 1/27 = 12.1 cy
TIR DIM HDR 12-01-11 (5+5) + 12' x 5' + 39' x 4 x 1/27 = 73.1 cy
Used 12-07-11 JPD 12-07-11

118+58 Lt
Exist 3'x2' Box Culvert (Remove)
- New Roadway Section for Reference -

Grade Headwalls & Inlets, Stone Fill Pad
Type II, 6'0"x16'1" Outlet / Type III, 12'x7'
Headwall - Under - 7'4" x 11' = 770
Pipe - [(60+48)/2 x 46) - (3'11" x 11')] x 11' = 533.7
Trans 11.5' - 3'4" x 11' = 59.4
Pipe - [(48+60)/2 x 3'4" x 46) - (3'4" x 11')] x 7' = 511.2
1903.3 ft³ x 1/27 = 35.1 cy Used 11-17-11

See 111/30 / 2011 EPR
For Type of Stone, Geotextile

Grade Headwalls & Inlets, Stone Fill Pad
Type II, 6'0"x16'1" Outlet / Type III, 12'x7'
Headwall - Under - 7'4" x 11' = 770
Pipe - [(60+48)/2 x 46) - (3'11" x 11')] x 11' = 533.7
Trans 11.5' - 3'4" x 11' = 59.4
Pipe - [(48+60)/2 x 3'4" x 46) - (3'4" x 11')] x 7' = 511.2
1903.3 ft³ x 1/27 = 35.1 cy Used 11-17-11

HDWL T.E. = 100% = (5 x 7 x 5) = 280 ft³
T.E. = 150% = [(7.4+3.0)/2 x 5) + ((3.0+0.5)/2 x 30') x 5 x 1.5 = 154.8 ft³
Stone Fill & Other = [(5.7+4.8)/2 x 5) + ((4.8+1.5)/2 x 15') x 6 = 418.5 ft³
Over 5' Neglect
Total T.E. = 260.8 + 223.1 + 128.8 + 154.8 + 418.8 = 1186.3 x 1/27 = 43.9 cy
2295.0'
2295.0 + 2295.0 = 4590.0
4590.0 x 1/27 = 170.0 cy
SAY 170 cy
10/20/11
Under 12-02-11

Grade Headwalls & Inlets, Stone Fill Pad
Type II, 6'0"x16'1" Outlet / Type III, 12'x7'
Headwall - Under - 7'4" x 11' = 770
Pipe - [(60+48)/2 x 46) - (3'11" x 11')] x 11' = 533.7
Trans 11.5' - 3'4" x 11' = 59.4
Pipe - [(48+60)/2 x 3'4" x 46) - (3'4" x 11')] x 7' = 511.2
1903.3 ft³ x 1/27 = 35.1 cy Used 11-17-11

Grade Headwalls & Inlets

PLATE 3-FULL CROSS SECTION-FULL LINE
HIGHWAY FEDERAL AID SHEET
MATERIAL WARRANTY
PRINTED IN U.S.A.

DESIGNED
DETAILED
TRACED
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QUANTITIES
STRUCTURE
DETAILS
QUANTITIES
CHECKED
DATE
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STATE
NO.
FIELD BOOK
PAGES
FIELD BOOK
PAGES
CHECKED
DATE
BY
STATE

1170.35
1168.00
1163.75
1170
Trench Earth
$\left(\frac{8.0+12.0}{2}\times 4\right)\left(\frac{11.0\times 11}{2}\right)+\left(12.0\times\frac{8.0\times 4}{2}\right)\times 4.5\times 6.75\times\frac{1}{27}=25.5\,cy$
Sta. 130+50 Lt - 130+75 Rt
New 18" RCP
S/PRECAST w/ Type B Grate & Inlet
Type B
7-10-12
7-12-12
Remove Old
Type B
7-11-12
9/15/2012
Sta. 126+24 Rt
Existing 18" RCP (Remove)
1170
1160
1150
1140
1130
1120
1110
1100
1090
1080
1070
1060
1050
1040
1030
1020
1010
1000
990
980
970
960
950
940
930
920
910
900
890
880
870
860
850
840
830
820
810
800
790
780
770
760
750
740
730
720
710
700
690
680
670
660
650
640
630
620
610
600
590
580
570
560
550
540
530
520
510
500
490
480
470
460
450
440
430
420
410
400
390
380
370
360
350
340
330
320
310
300
290
280
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
1180.95
1178.55
1180
1150
Trench Earth Catch Basin
0'-5' - $(4.4')^2\times 3.14\times 5.0 = 304\,cf$
Over 5' - $(4.4')^2\times 3.14\times 20\times 1.5 = 1824\,cf$
Trench Earth Last 18' of Pipe
0'-5' - $\left(\frac{6.0+18.0}{2}\times 18\right)+\left(\frac{6.0+18.0}{2}\times 20\times 18\right)\times 4.5\times\frac{1}{27}=335.5\,cy$
Over 5' - $\left(\frac{8.0+18.0}{2}\times 4\right)+\left(\frac{18.0+35}{2}\times 35\right)\times 4.5\times\frac{1}{27}=72.0\,cy$
Area $304+1824+335.5+72.0 = 8923\,cf/27 = 33.1\,sy$
Sta. 136+12 Lt - New Sheet
New 30" x 122' CPEP
Energie Dissipator & Outlet w/ Type IV 8'W x 30'L Stone Fill Pad
New PRECAST Type B Grates & Inlet
137+00
Inv. 1156.1
Stone Fill Type IV - $12'\times 30'\times 3.5'/27 = 30.1\,cy$ Fill w/ Hand Placed Stone
Geo. $16'\times 34'\times\frac{1}{9} = 60.4\,sy$
Geo. $5.5'\times 5.5'\times\frac{1}{9} = 3.4\,sy$
Total = 33.1 sy
Hand Placed 10/26/11
0'-5' Trench Earth Pipe - $\left(\frac{6.0+18.0}{2}\times 18\right)+\left(\frac{6.0+18.0}{2}\times 20\times 18\right)\times 4.5\times\frac{1}{27}=335.5\,cy$
Over 5' - $\left(\frac{8.0+18.0}{2}\times 4\right)+\left(\frac{18.0+35}{2}\times 35\right)\times 4.5\times\frac{1}{27}=72.0\,cy$
Concrete Encl. - Under Pipe - $(16\times 80\times\frac{3.5}{27})+(\frac{1}{2}\times 16\times 80\times\frac{1.5}{27})=495\,cf$
Up 1.25 - Pipe - $(6\times\frac{3.14}{4}\times 1.25^2)-(\frac{1}{2}\times\frac{3.14}{4}\times 1.25^2)=42.9\,cf-19.2\,cf=23.7\,cf$
Total = 519 cf
Hand Placed 10/26/11
34 cy x 1.15 = 39 cy USE 9-30-11
39 EC+
Hand 10/26/11
USE 10-20-11
1140
1130
1120
1110
1100
1090
1080
1070
1060
1050
1040
1030
1020
1010
1000
990
980
970
960
950
940
930
920
910
900
890
880
870
860
850
840
830
820
810
800
790
780
770
760
750
740
730
720
710
700
690
680
670
660
650
640
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470
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430
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390
380
370
360
350
340
330
320
310
300
290
280
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
1173.53
1160
1150
Sta. 130+50 Lt - 130+75 Rt
1149.55
1158.0
59'
Inv. 1158.0
2' Undercut
2' Undercut
(Under Exist. Culv. & Abandoned Retention Pond)
TE - 0'-5' (CB)
(AA) - $3.14\times 5.0 = 30\,cf$
Over 5' - $(4.4')^2\times 3.14\times 20\times 1.5 = 182\,cf$
TE - 0'-5' (Pipe)
$\left(\frac{6.0+18.0}{2}\times 18\right)+\left(\frac{6.0+18.0}{2}\times 20\times 18\right)\times 4.5\times\frac{1}{27}=335.5\,cy$
Over 5' - $\left(\frac{8.0+18.0}{2}\times 4\right)+\left(\frac{18.0+35}{2}\times 35\right)\times 4.5\times\frac{1}{27}=72.0\,cy$
$\left(\frac{20.0+18.0}{2}\times 4\right)+\left(\frac{18.0+28.0}{2}\times 35\right)+\left(\frac{28.0+28.0}{2}\times 55\right)+\left(\frac{28.0+38.0}{2}\times 55\right)+\left(\frac{38.0+38.0}{2}\times 16\right)+\left(\frac{38.0+28.0}{2}\times 6\right)+\left(\frac{28.0+28.0}{2}\times 6\right)+\left(\frac{28.0+20.0}{2}\times 5\right)\times 55\times\frac{1}{27}$
Volume = $304+82+1406+1678 = 3490\times\frac{1}{27} = 128.5\,cy$
= 130.1 cy (T.E. - Pipe Culvert) From IR IDR 6-30-12
108.4 cy say 108 cy USE 6-22-12
4 cy - Stone Fill Outlet
112 cy USE 6-22-12
7-11-12
New 30" x 140' CPEP
w/ 4 x 12' Type II Stone Fill Pad & Outlet
New PRECAST Type B Center & Inlet
1678" cf
1351 + 935
1140
1130
1120
1110
1100
1090
1080
1070
1060
1050
1040
1030
1020
1010
1000
990
980
970
960
950
940
930
920
910
900
890
880
870
860
850
840
830
820
810
800
790
780
770
760
750
740
730
720
710
700
690
680
670
660
650
640
630
620
610
600
590
580
570
560
550
540
530
520
510
500
490
480
470
460
450
440
430
420
410
400
390
380
370
360
350
340
330
320
310
300
290
280
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
1139.1
80
TE - 0'-5' for 6'x12' Pad
$6\times 12\times 1.5\,(\text{Max})\times\frac{1}{27} = 4\,cy$
USE 6-22-12
7-11-12

Cabot Danville
FECC F028-3(20) C1
Drainage Sheet #4

PLATE 3-FULL CROSS SECTION-FULL LINE

MINIMUM WARRANTY
PRINTED IN U.S.A.
HIGHWAY LEGEND AND SHEET

ORIGINAL SURVEY

NO. _____ BOOK _____ PAGE _____
PAGE CHECKED _____
STATION _____ TO _____
STATION _____ TO _____
BY _____
DATE _____

FINAL SURVEY

NO. _____ BOOK _____ PAGE _____
PAGE CHECKED _____
STATION _____ TO _____
STATION _____ TO _____
BY _____
DATE _____

148+50 (BUTT LN)

Added Stone Fill, Type 1 @ Outlet
Tie -12 LF 4"x11" Notch 1' Deep x 1'-2" Wide
6"x12"x11" Notch 1' Deep x 1'-2" Wide

Pavement Removed 4-19-12
Culvert Removed 4-19-12

LT - 14'x4"x55' = 80 SY
80 SY x 3.5 = 280 CY

LT Ditch Excavation
Ditch Depth = 2.5'
Ditch Width = 5'
Ditch Length = 24.5'
Ditch Volume = 153 CF

Pipe LT
Pipe Length = 45'
Pipe Diameter = 15"
Pipe Volume = 24.5' x 1.25 SF = 30.6 CF

Over Excavation
Over Excavation Depth = 5'
Over Excavation Width = 5'
Over Excavation Length = 45'
Over Excavation Volume = 1125 CF

Total Excavation = 153 + 30.6 + 1125 = 1308.6 CF
1308.6 CF / 27 = 48.5 CY

Ditch Excavation
Ditch Depth = 2.5'
Ditch Width = 5'
Ditch Length = 45'
Ditch Volume = 563 CF

Pipe LT
Pipe Length = 45'
Pipe Diameter = 15"
Pipe Volume = 45' x 1.25 SF = 56.3 CF

Over Excavation
Over Excavation Depth = 5'
Over Excavation Width = 5'
Over Excavation Length = 45'
Over Excavation Volume = 1125 CF

Total Excavation = 563 + 56.3 + 1125 = 1744.3 CF
1744.3 CF / 27 = 64.6

PLATE 3-FULL CROSS SECTION-FULL LINE
HIGHWAY, LEGEND AND SHEET

STAKED
ORIGINAL
DRAWN
NOTE BOOK
PAGE
VERIFIED
CHECKED
STATE
BY
DATE

1250

153+55

Trench Earth - (1.5x1) + (1.5+3.0/2 x 2) + (4.0+5.8/2 x 4) + (5.8+3.9/2 x 3) + (3.9+3.0/2 x 3) + (3.0+2.1/2 x 11) + (2.1+1.5/2 x 3) x .27 x 1/27 = 33.8 cy
Trench Rock - 18 RCP — Remove 5'2 L.F. x 2.29 = 150.28 x 1/27 = 5.6 cy
Remove Existing 18" RCP

1250.0

1250.94

1244.3

New 18"x30" PCCSP .064
Type A Grate & Inlet
Stone Fill Pad Type II
Remove Existing 18" RCP

Trench Earth - 0.5' Flow Line
Pipe - 16'-10.5" x 4.5' + 12'-1.5" x 3.5' + 12' x 2.5' = 130.4 sf x 1/27 = 4.8 cy
Trench Rock - 1/2 x 16'-10.5" x 4.5' + 12' x 3.5' + 12' x 2.5' = 360.4 sf x 1/27 = 13.3 cy
Grate & Inlet 12.0 x 2.0 x 2.5 = 60 cf
DI - (4.8 + 4.2/2 x 6) + (4.2 + 3.6/2 x 6) = 45 cf
Pipe - 16'-10.5" x 4.5' + 12'-1.5" x 3.5' + 12' x 2.5' = 360.4 sf x 1/27 = 13.3 cy
Trench Rock - 1/2 x 16'-10.5" x 4.5' + 12' x 3.5' + 12' x 2.5' = 551.4 sf x 1/27 = 20.4 cy
20.4 cy x 1.15 = 23.5 cy WRF 5-24-11

Remove Existing 18" RCP

T.E. Removal
DI - 7'-4" x 3.8 (ave) = 16.1 sf x 1/27 = 2.0 cy
Pipe 3 cy
28 cy WRF 8-25-11

T.E. - DI:
Top (12") + Bottom (8") = 20" = 1.67'
5.67' x 4.2' x 4' = 95.2 x 1/27 = 3.5 cy

WRF 8-25-11

14A - 18" RCP
Remove 18" RCP

T.E. - (6.5+5.0/2 x 19) + (5.0 x 9) + (5.0 x 3) + (5.0+2.5/2 x 3) + (2.5 x 2) x 4.5 = 684.7 sf
T.E. over 3' - (0.0+10.1/2 x 9) + (1.5+2.5/2 x 3) x 4.5 x 1.5 = 48.6 sf
684.7 + 48.6 = 730.3 x 1/27 = 27 cy
5.4 cy
21.6 cy WRF 8-25-11

T.E. - 18" RCP
Removed 50'11" x 2.29' x 1/27 = 5.35 cy
WRF 8-25-11

Total T.E. 3.2 cy + 5.4 cy = 8.6 cy
Total T.E. - 2.8 cy + 21.6 cy = 24.4 cy
WRF 8-25-11

Trench Earth - DI - 0.5' = 5' x 7' x 8.4' = 315 sf
Over 5' = (18.5+8.5/2 x 7 x 9) x 1.35 = 1561 sf

Gran. Backfill for Structures
Under Base DI 7' x 5' x 1' = 63 sf
Pipe - 5" Undercut - 36' x 5.5' x 0.5' = 104.5 sf
To Top Pipe - 20' x 5.5' x 2.5' = 275 sf - (12"/2 x 3.14 x 5.5' x 20') = 165 sf
63 sf + 104.5 sf + 165 sf = 330.5 x 1/27 = 12.2 cy
WRF 7-28-11

12" Undercut
Inlet 1239.5
Last 20' Backfill - to Top Culvert
162+00
Outlet 1236.6

NEW 30"-104" CPEP
w/1/4 x 6" Incoon DI - Inlet
Stone Fill Pad Type II - 4 x 6' - Outlet

Pipe - (4.5+4.5/2 x 24) + (4.5+5.5/2 x 12) + (5.5 x 59.3) + (5.5+0.8/2 x 10.5) = 464.4 sf
Over 5' - (0.0+4.5/2 x 6') + (4.5+4.8/2 x 12) + (4.8+5.5/2 x 40.5) + (5.5+5.5/2 x 4.8) + (5.5+5.0/2 x 6') = 326.1 x 1.5 = 490.3 sf
Excavation Stone Pad C162+00 - (2.7 x 8) + (2.7+3.0/2 x 8) x 8 = 344.8 sf
Total Trench Earth - (315 + 1561 + 464.4 + 490.4) x 5.5 = 3445 sf = 8186.7 x 1/27 = 303.2 cy
Trench Rock - 3.5
299.7 cy WRF 7-28-11
Trench Rock - 6'x4'x2.75 = 66
5'-6" x 1' = 3
26 sf x 1/27 = 3.5 cy

1250

LR 2/23/11
TEMPLATE OK
WRF 11/28/11

Stone Fill Type III - 8'x17'x2' x 1/27 = 10.1 cy WRF 7-29-11

1256.20

1250.3

T.E. - 12'x5'x2' x 1/27 = 15 cy
T.E. = 12'x11.2'x4' x 1/27 = 18 cy
Calc by LR
44.8' L.F.

1242.0

T.E. - 15'x9'x2' x 1/27 = 10.0 cy Calc by LR
T.E. - 17'x9'x2' x 1/27 = 10.0 cy
LR 2/16/11

156+00 L.F. - 156+56 R.F.
New 30" x 114 LF CPEP
w/Grate Headwall & Inlet
Type II Stone Fill Pad Outlet
Type I Stone Fill Pad Inlet

Trench Earth - Drop Inlet (DI)
0-5' - (5.0+5.0 x 11.5 x 18) x 9.5 = 2632
Over 5' - (0.0+5.0/2 x 5) x 9.5 x 6.5 = 309.2
302.4 sf WRF 8-18-11

Trench Earth - Pipe 0-5'
(1.8+4.5/2 x 3) + (1.5+0.0/2 x 6) + (0.0+3.2/2 x 2) + (3.2+3.8/2 x 1) + (3.8+4.2/2 x 1) + (4.2+5.0/2 x 21) + (5.0 x 19) + (5.0+3.8/2 x 11.5) + (3.8+3.3/2 x 15) + (1.5+4.0/2 x 3.8) x 55 = 18334 sf
Over 5' - (0.0+0.4/2 x 16) (3.4+0.0/2 x 3) x 5.5 x 1.5 = 31.4 sf

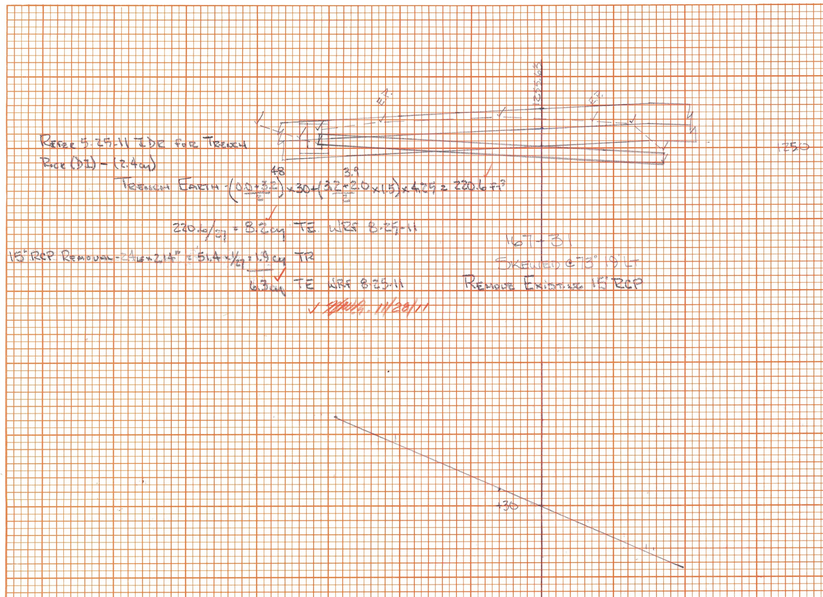
302.4 + 1833.4 + 31.4 x 1/27 = 80.3 cy WRF 8-18-11
Boulder @ Outlet = 8.6 cy
T.E. 71.7 cy

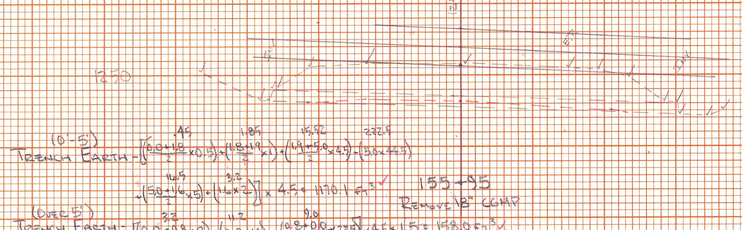
Boulder @ Outlet
11 x 7 x 3 x 1/27 = 8.6 cy FM by LR

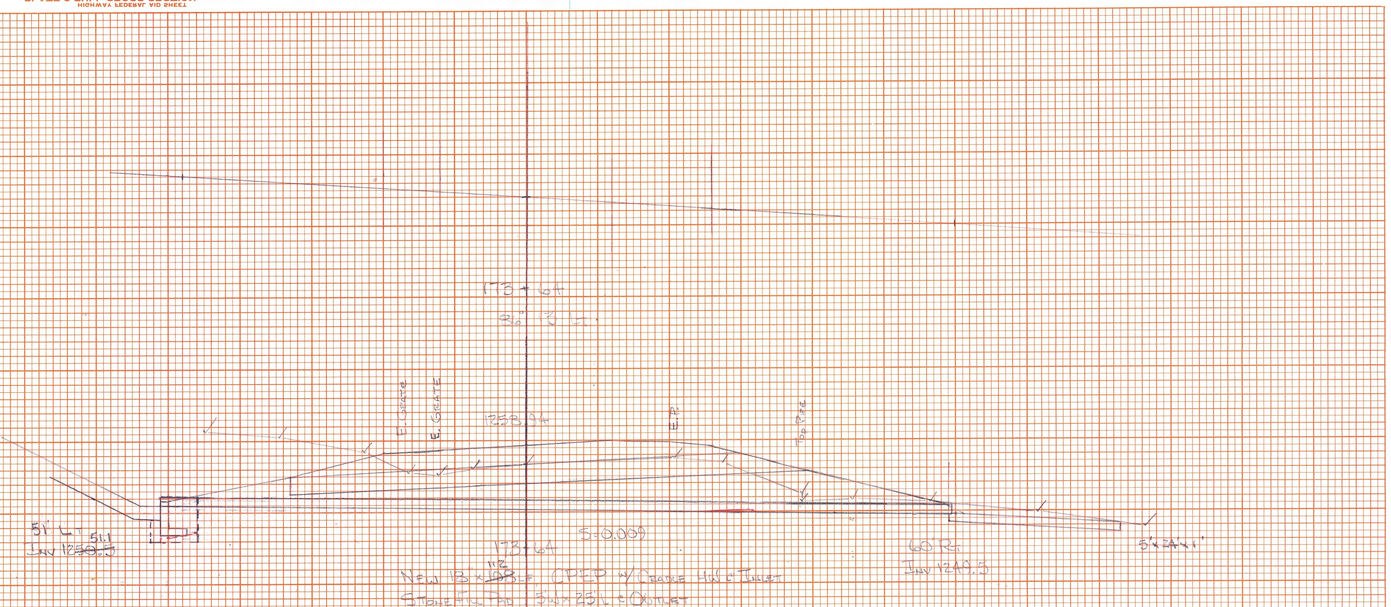
CABOT DANVILLE
FEGC F 028-3(24) C/1
DRAINAGE SHEET # 6

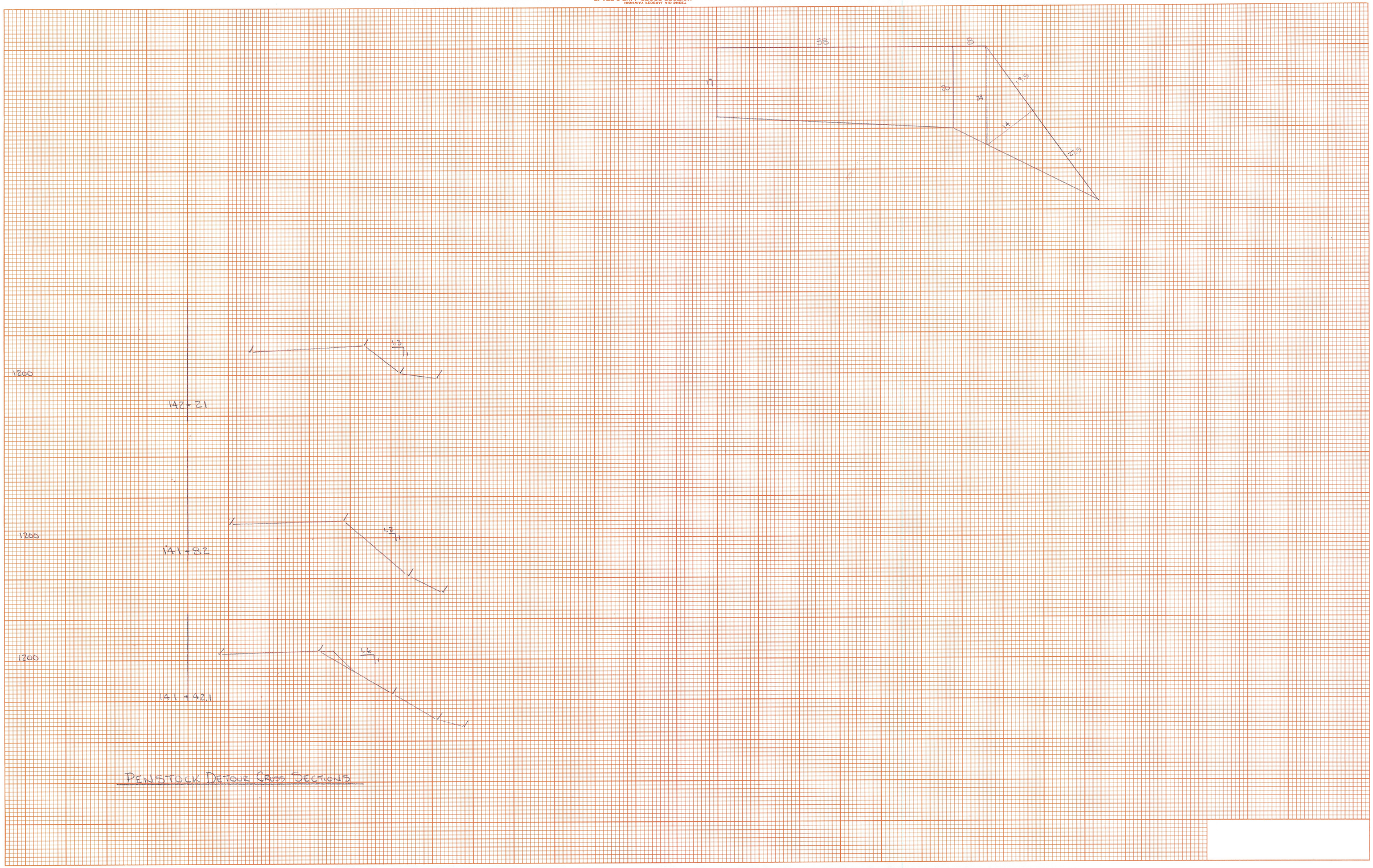
PLATE 3-LOAD CROSS SECTION-LOAD LINE
HIGHWAY LEGEND AID SHEET
NATIONAL NOMOGRAPH
PRINTED IN U.S.A.

DRAWN
TRACED
DESIGNED
QUANTITIES
CHECKED
APPROVED
DATE
NO.
BY
DATE
WORK BOOK
VERIFIED
VERIFIED CHECKED






15+13
15+61
Excelled 6" Lift
Remove Existing 15" RCP
15+64
5+0.09
66 LT
Inv 1240.5
New 18"x24" CMPEP w/ Concrete Hdwl & Toilet
Stone Fill Type 2 5'x25'x Outlet
Trench Earth: Q-5' (13+11/2x25)+(11+9/2x120)+(9+7/2x220)+(7+5/2x220)+(5+4/2x45)+(4+2.5/2x15) = 319 x 4.5 = 1435.5 x 1/27 = 53.2 cy
Over 5' (0.0+0.4/2x1) = 1.4x4.5 = 6.3/27 = 0.2x1.5 = 0.3 cy
Headwall 0-5' (5.0x5.0)+(2.8x1.0) = 28 x 6.3 x 1/27 = 6.5 cy
Over 5' (13+8/2x5) = 5.0 x 6.3 = 31.5 x 1/27 = 1.2 x 1.5 = 1.8 cy
Outlet Stone Fill - (26+21/2x125)+(21+17/2x119) = 47.2 x 5 = 236/27 = 8.7 cy
532+03+6.5+1.8+8.7 = 70.5 cy WEF 7-20-11
8/14/11
12.5
21.7
21.5
24.6
37.1
43
24
24
178
178
178



PENSTOCK DETOUR CROSS SECTIONS