

SWL DECEMBER 2013

ORDER OF SHEETS

Section No. 1	Title
Section No. 2	Typical Sections and Details (Includes erosion control)
Section No. 3	Estimate of Quantities
Section No. 3	Miscellaneous Quantities
Section No. 4	Right of Way Plat
Section No. 5	Plan and Profile
Section No. 6	Standard Detail Drawings
Section No. 7	Sign Plates
Section No. 8	Structure Plans
Section No. 9	Computer Earthwork Data
Section No. 9	Cross Sections

TOTAL SHEETS = 196

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED IMPROVEMENT

DODGE COUNTY SAFETY IMPROVEMENTS

(COUNTY COLLECTOR ROUTES)

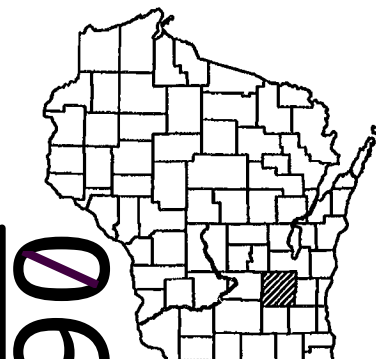
VARIOUS HIGHWAYS

DODGE COUNTY

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
6207-03-71	WISC 2013511	1

PROJECT ID: 6207-03-71

COUNTY: DODGE



DESIGN DESIGNATION

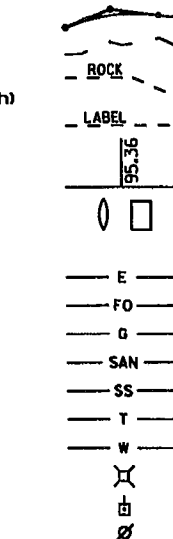
	CTH A	CTH O	CTH P
A.A.D.T.(2013)	2600 - 3500	740 - 1000	1300 - 2500
A.A.D.T.(2033)			
T(D.H.V.)			
D.D.	50/50	50/50	50/50
T.			
DESIGN SPEED	VARIES 40 MPH TO 60 MPH		
ESALS			

CONVENTIONAL SYMBOLS

PLAN	
CORPORATE LIMITS	////
PROPERTY LINE	----
LOT LINE	- - - -
LIMITED HIGHWAY EASEMENT	----
EXISTING RIGHT OF WAY	----
PROPOSED OR NEW R/W LINE	----
SLOPE INTERCEPT	- - - -
REFERENCE LINE	----
EXISTING CULVERT	----
PROPOSED CULVERT (Box or Pipe)	----
COMBUSTIBLE FLUIDS	CAUTION
MARSH AREA	----
WOODED OR SHRUB AREA	----

PROFILE

GRADE LINE	----
ORIGINAL GROUND	----
MARSH OR ROCK PROFILE (To be noted as such)	----
SPECIAL DITCH	----
GRADE ELEVATION	95.36
CULVERT (Profile View)	----
UTILITIES	----
ELECTRIC	----
FIBER OPTIC	----
GAS	----
SANITARY SEWER	----
STORM SEWER	----
TELEPHONE	----
WATER	----
UTILITY PEDESTAL	----
POWER POLE	----
TELEPHONE POLE	----



BEGIN CONSTRUCTION 6207-03-71
STA 50+00

BEGIN CONSTRUCTION CTH O
STA 236+90

BEGIN CONSTRUCTION CTH P
STA 71+90

END CONSTRUCTION CTH O
STA 735+00

LAYOUT
SCALE 0 2 MI. 4 MI.

TOTAL NET LENGTH OF CENTERLINE = 0.000 MI.

Coordinates on this plan are referenced to the Wisconsin County
Coordinate System (WCCS), Dodge County.

END CONSTRUCTION CTH P
STA 535+00

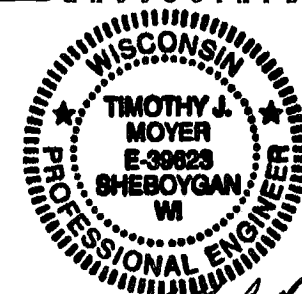
ACCEPTED FOR

County of Dodge

7-23-2013
DATE: DODGE COUNTY HIGHWAY COMMISSIONER

ORIGINAL PLANS PREPARED BY:

DONOHUE & ASSOCIATES



DATE: 7/22/13
(Signature)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

PREPARED BY

Surveyor	KUNKEL ENGINEERING
Designer	DONOHUE & ASSOCIATES, INC.
Management Consultant	KJOHNSON ENGINEERS INC.
C.O. Examiner	

APPROVED FOR THE DEPARTMENT

DATE: 8/21/13
(Management Consultant Signature)

E

GENERAL NOTES

THE LOCATIONS OF EXISTING AND PROPOSED UTILITY INSTALLATIONS AS SHOWN ON THE PLANS ARE APPROXIMATE. THERE MAY BE OTHER UTILITY INSTALLATIONS WITHIN THE PROJECT AREA THAT ARE NOT SHOWN.

WETLANDS ARE PRESENT WITHIN THE PROJECT LIMITS. THE APPROXIMATE LOCATIONS ARE SHOWN IN THE PLANS. CONSTRUCTION OPERATIONS SHALL NOT TAKE PLACE OUTSIDE THE SLOPE INTERCEPTS AND NO EXCAVATED MATERIAL MAY BE STOCKPILED WITHIN WETLAND AREAS.

REMOVALS

NO TREES OR SHRUBS ARE TO BE REMOVED WITHOUT APPROVAL OF THE ENGINEER.

EXISTING ENDWALLS CALLED FOR REMOVAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR EXCEPT FOR THE LOCATIONS NOTED IN THE SPECIAL PROVISIONS AND ON THE PLANS.

WOOD AT TREE REMOVAL LOCATIONS SHALL BECOME THE PROPERTY OF THE CONTRACTOR EXCEPT AT THE LOCATIONS NOTED IN THE SPECIAL PROVISIONS AND ON THE PLANS.

ALL HOLES OR OPENINGS BELOW SUBGRADE RESULTING FROM ABANDONMENT OR REMOVAL OF EXISTING STRUCTURES SHALL BE FILLED WITH BACKFILL GRANULAR. BACK GRANULAR MATERIAL IS INCIDENTAL TO THE REMOVAL ITEM.

EXCAVATION BELOW SUBGRADE (EBS) LOCATIONS ARE NOT SHOWN IN THE CROSS SECTIONS.

EXCAVATION BELOW SUBGRADE (EBS) IS NOT USED TO BALANCE YARDAGE. IF EBS IS REQUIRED, IT SHALL BE MEASURED AND PAID FOR AS EXCAVATION COMMON. EXACT LOCATIONS OF EBS WILL BE DETERMINED BY THE ENGINEER IN THE FIELD. REFER TO STANDARD SPECIFICATION SUBSECTION 2.5.3.13.

GRADING AND EROSION CONTROL

EROSION CONTROL FEATURES WILL BE DETERMINED BY THE EROSION CONTROL IMPLEMENTATION PLAN (ECIP). ALL EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL SUCH TIME AS THE ENGINEER DETERMINES THE MEASURE IS NO LONGER NECESSARY.

EROSION CONTROL DEVICES SHALL BE PLACED IN SEQUENCE WITH CONSTRUCTION OPERATIONS OR AS DETERMINED BY THE ENGINEER. THE EROSION CONTROL FEATURES AS SHOWN IN THE PLANS ARE AT SUGGESTED LOCATIONS. EXACT LOCATIONS WILL BE DETERMINED BY THE ENGINEER IN THE FIELD.

PLACE EROSION MAT ON ALL SLOPES GREATER THAN 3H:1V.

SALVAGE TOPSOIL, SEED, FERTILIZER, EMAT AND MULCH SHALL BE PLACED WITHIN 7 WORKING DAYS AFTER GRADING WORK IS COMPLETED. IF FINAL EROSION CONTROL ITEMS ARE NOT PLACED WITHIN 7 DAYS, SALVAGED TOPSOIL AND TEMPORARY SEEDING IS REQUIRED.

CULVERT PIPE

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO KEEP EXISTING DRAINAGE STRUCTURES FUNCTIONAL DURING EXCAVATION OPERATIONS TO PROVIDE TEMPORARY DRAINAGE.

INLET AND DISCHARGE ELEVATIONS FOR DRAINAGE STRUCTURES SHOWN ON THE PLAN MAY BE ADJUSTED BY THE ENGINEER TO FIT THE FIELD CONDITIONS.

WISDNR CONTACT

ERIC HEGGELUND
WISCONSIN DEPT OF NATURAL RESOURCES
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FITCHBURG, WI 53711
PH: (608) 275-3301
ERIC.HEGGELUND@WISCONSIN.GOV

DESIGN CONSULTANT

TIM MOYER
DONOHUE AND ASSOCIATES
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TMOYER@DONOHUE-ASSOCIATES.COM

DODGE COUNTY CONTACT

PETER THOMPSON
DODGE COUNTY HIGHWAY DEPARTMENT
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PH: (920) 386-3655
PTHOMPSON@CO.DODGE.WI.US

ORDER OF DETAIL SHEETS

- GENERAL NOTES
- TYPICAL SECTIONS
- CONSTRUCTION DETAILS
- PROJECT OVERVIEW
- DETAIL PROJECT OVERVIEW WITH AERIAL BACKGROUND (INCLUDES TREE REMOVAL LOCATIONS)
- DRIVEWAY AND CULVERT PIPE DETAILS CTH A
- DRIVEWAY CULVERT DETAILS CTH P
- BEAMGUARD DETAILS CTH A
- BEAMGUARD DETAILS CTH O
- BEAMGUARD DETAILS CTH P

UTILITIES

WALLY WELK
AT&T (COMMUNICATIONS - CTH A, CTH O, CTH P)
70 E DIVISION ST
FOND DU LAC, WI 54935
920-929-1016
WW5363@ATT.COM

PAUL WORTH
ALLIANT ENERGY (ELECTRIC - CTH A)
120 E MAPLE ST
BEAVER DAM, WI 53916
920-887-6030
PAULWORTH@ALLIANTENERGY.COM

TONY KLATT
CHARTER COMMUNICATIONS (COMMUNICATIONS - CTH A, CTH O, CTH P)
W7185 STH 49
WAUPUN, WI 53953
920-263-0062
TONY.KLATT@CHARTER.COM

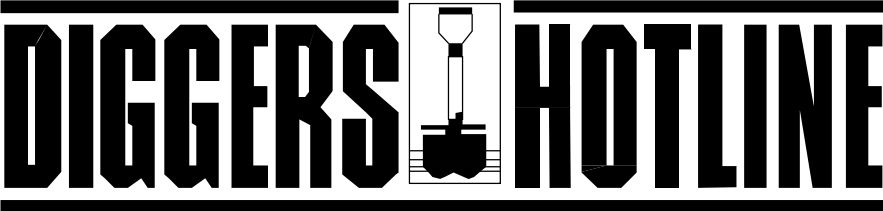
JASON HOGAN
ALLIANT ENERGY / WP&L (ELECTRIC - CTH O, CTH P)
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MADISON, WI 53718
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JASONHOGAN@ALLIANTENERGY.COM

RYAN OSNESS
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920-893-7455
RYAN.D.OSNESS@FTR.COM

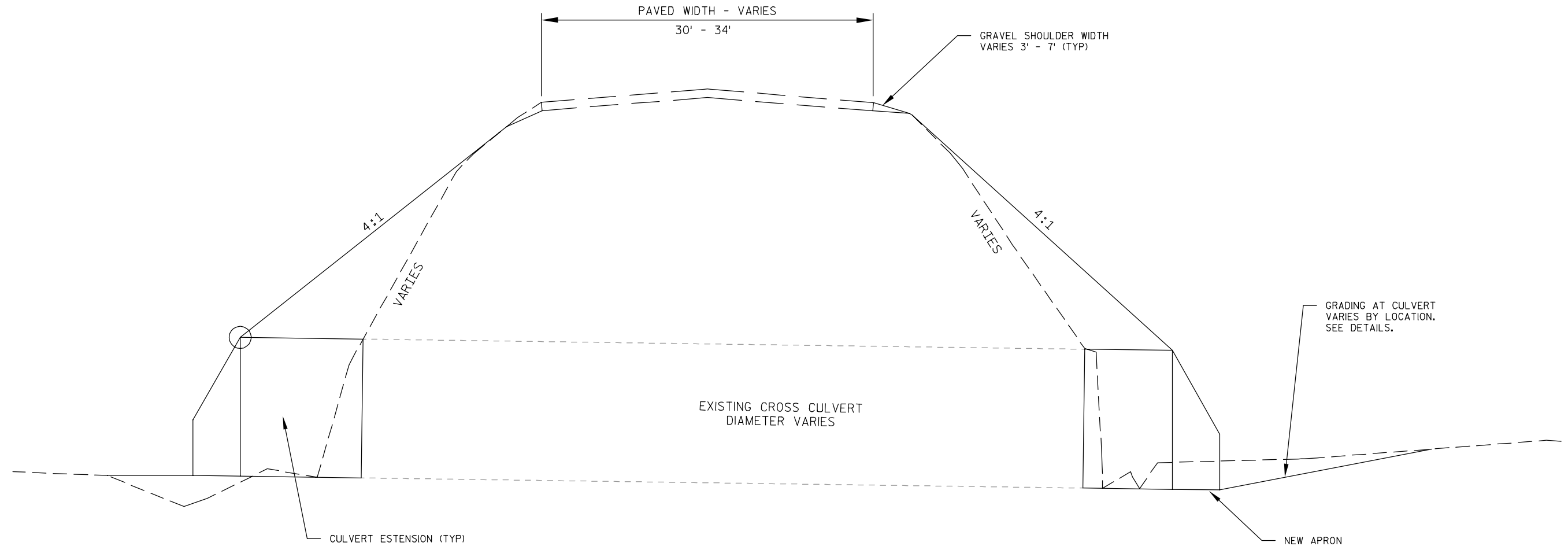
JENNIFER SWEENEY
KOCH PETROLEUM GROUP LP (GAS - CTH A)
PO BOX 64596
ROSEMOUNT, MN 55164
651-480-3936
JENNIFER.SWEENEY@KOCHPIPELINE.COM

DANIEL TIMM
WE ENERGIES (GAS - CTH A, CTH O, CTH P)
315 WILLIAM STREET
WATERTOWN, WI 53094
920-262-6888
DANIEL.TIMM@WE-ENERGIES.COM

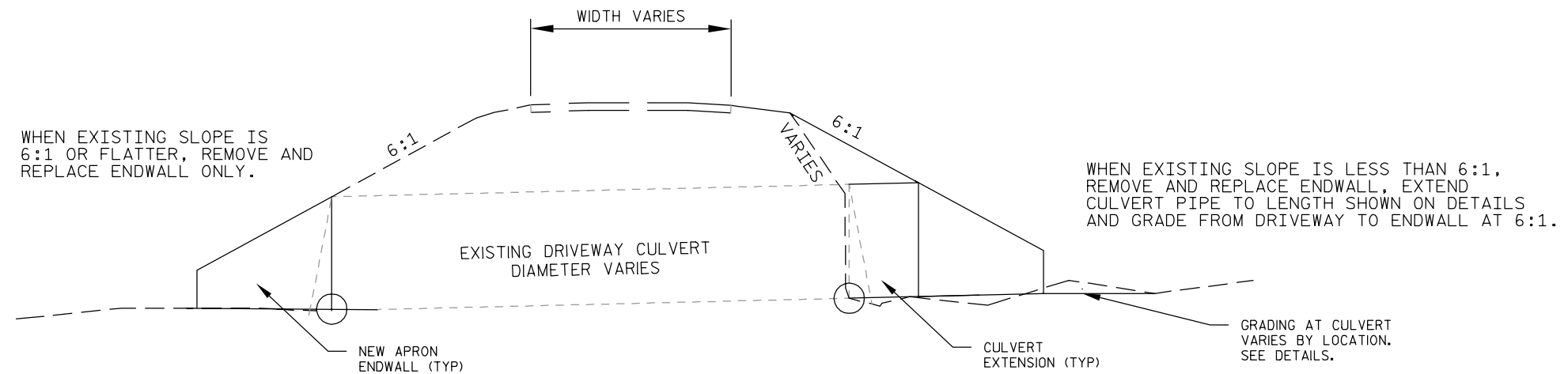
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245 SAND DRIVE
WEST BEND, WI 53095
(262) 338-7662
ALAN.SCHMIDT@WE-ENERGIES.COM



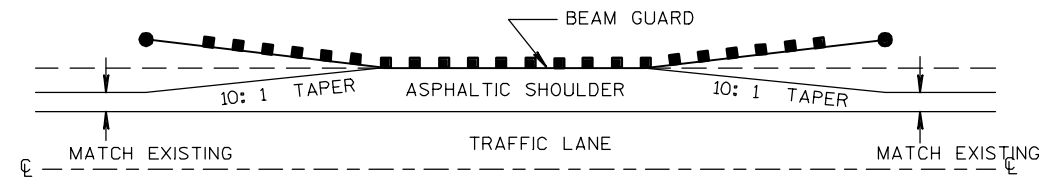
Call 811 3 Work Days Before You Dig
or Toll Free (800) 242-8511
Hearing Impaired TDD (800) 542-2289
www.DiggersHotline.com



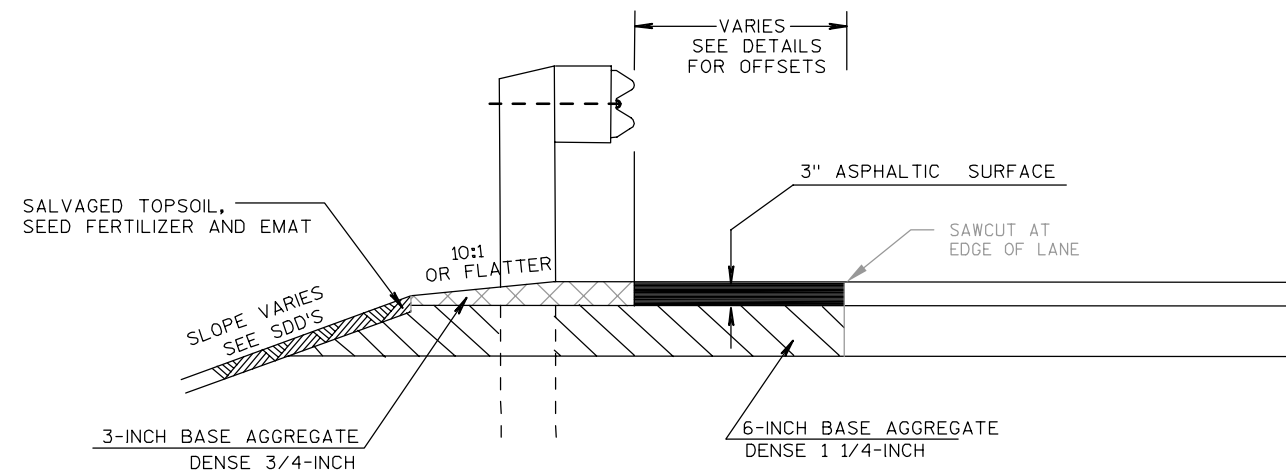
TYPICAL ROADWAY SECTION



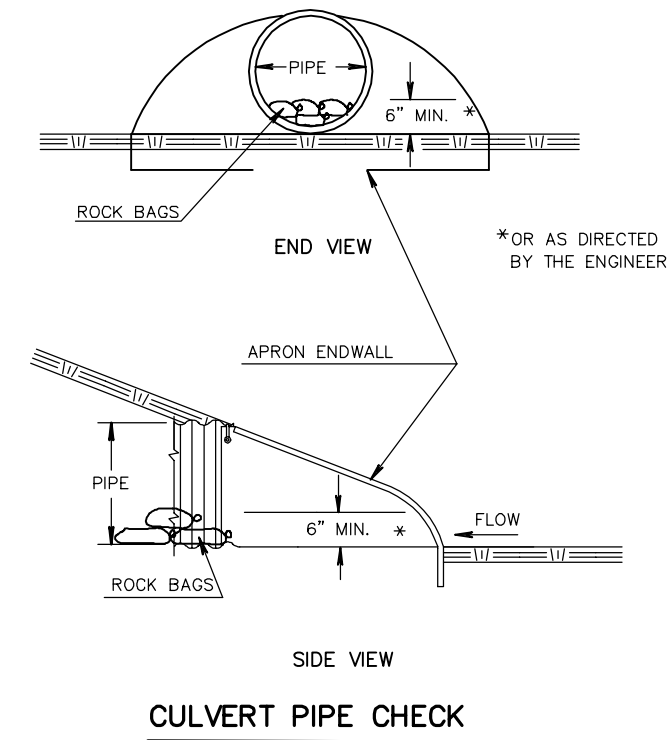
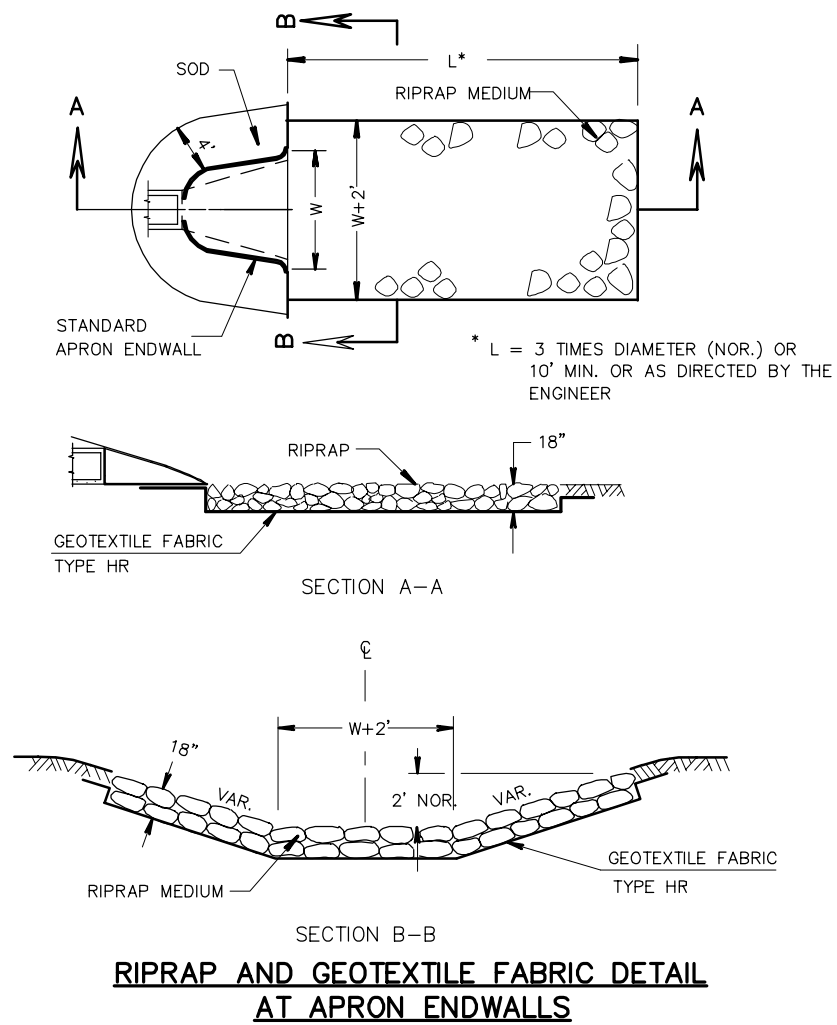
TYPICAL DRIVEWAY SECTION

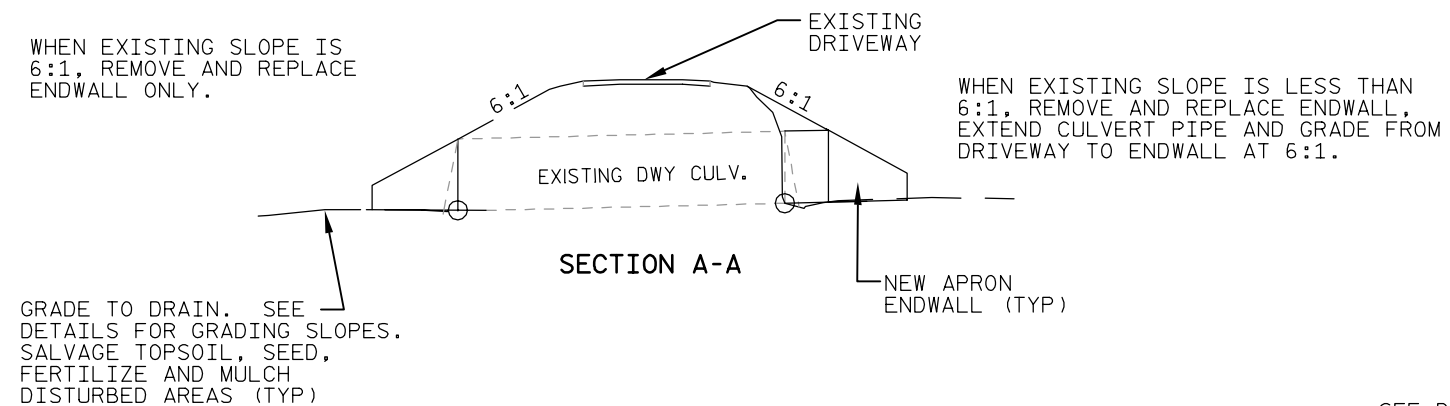
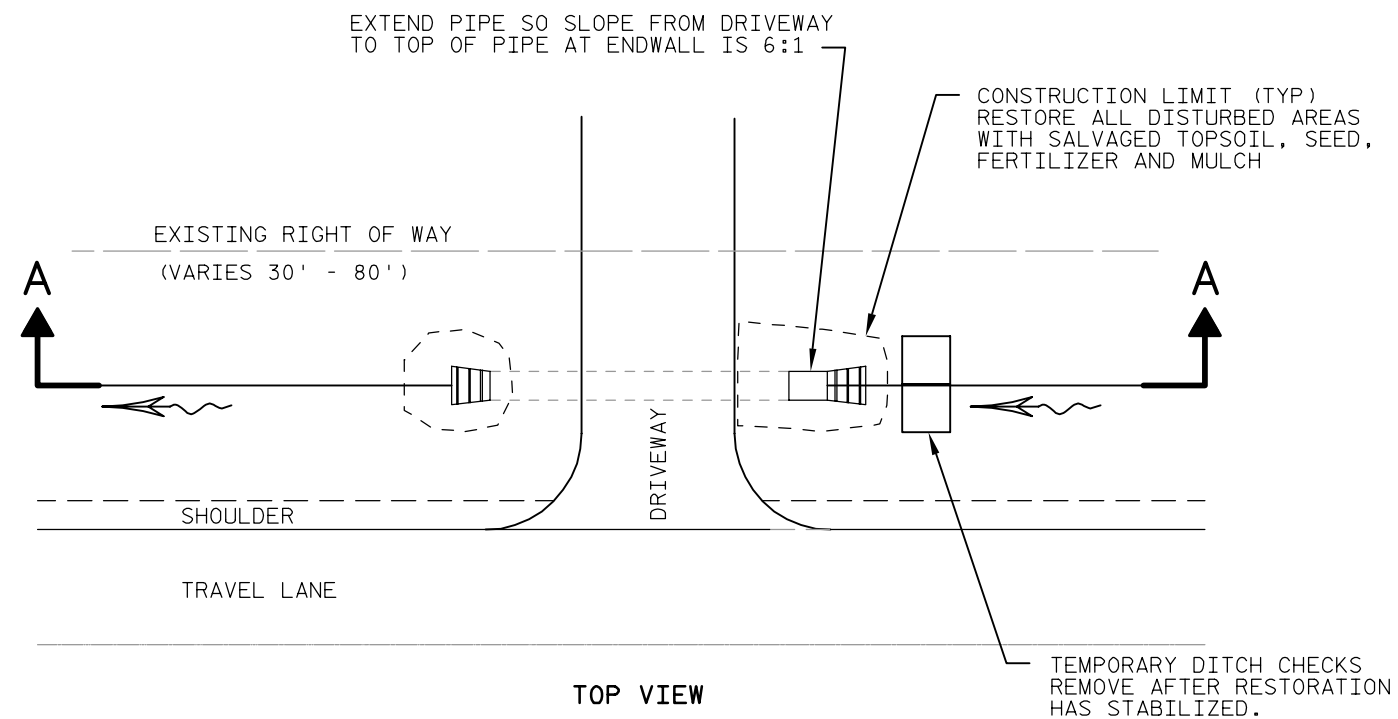


DETAIL FOR ASPHALTIC SHOULDER AT BEAM GUARD



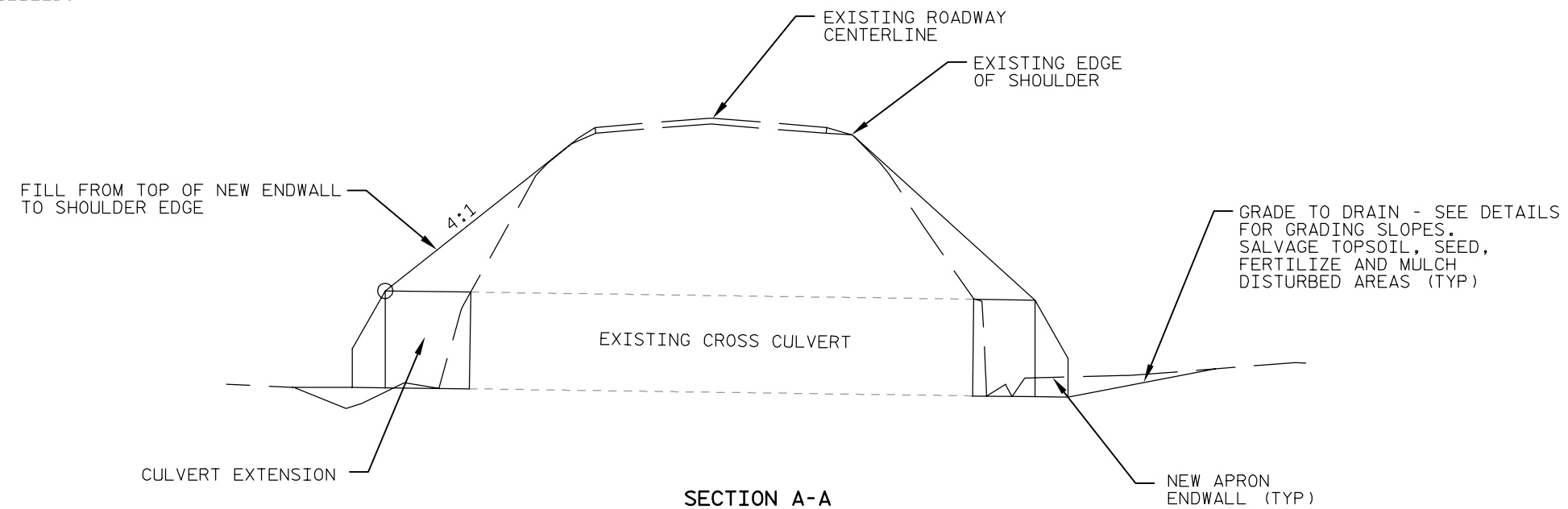
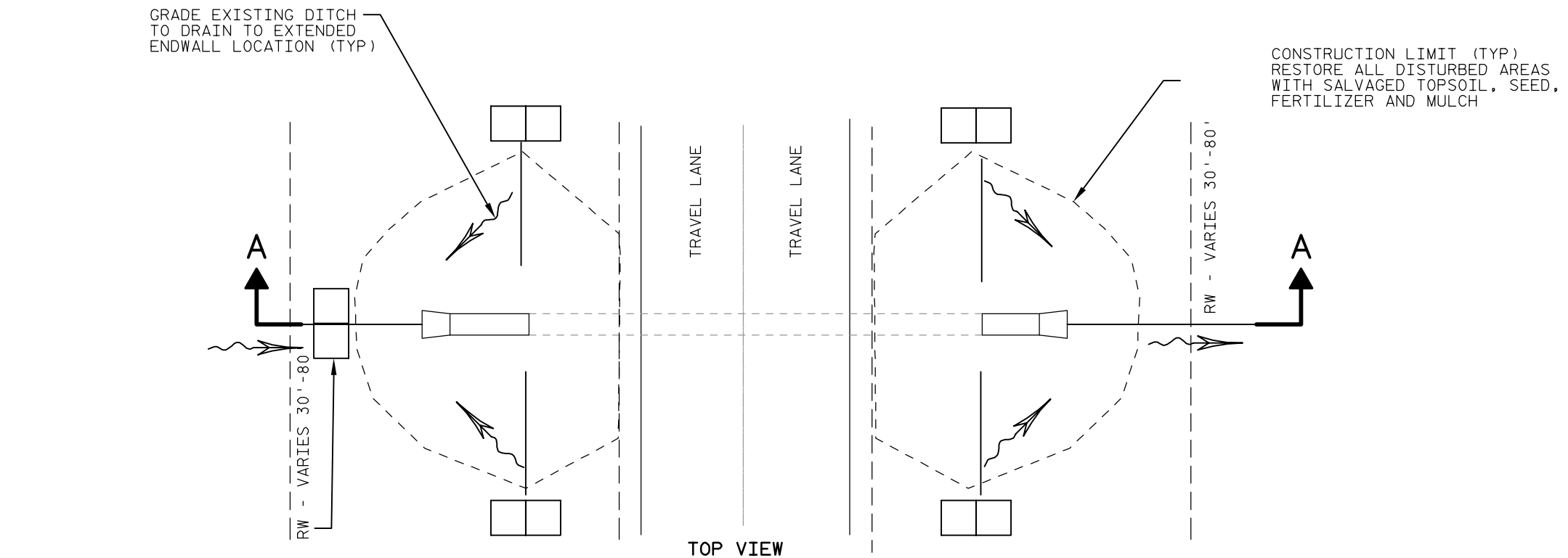
ASPHALTIC SHOULDER AT GUARD RAIL





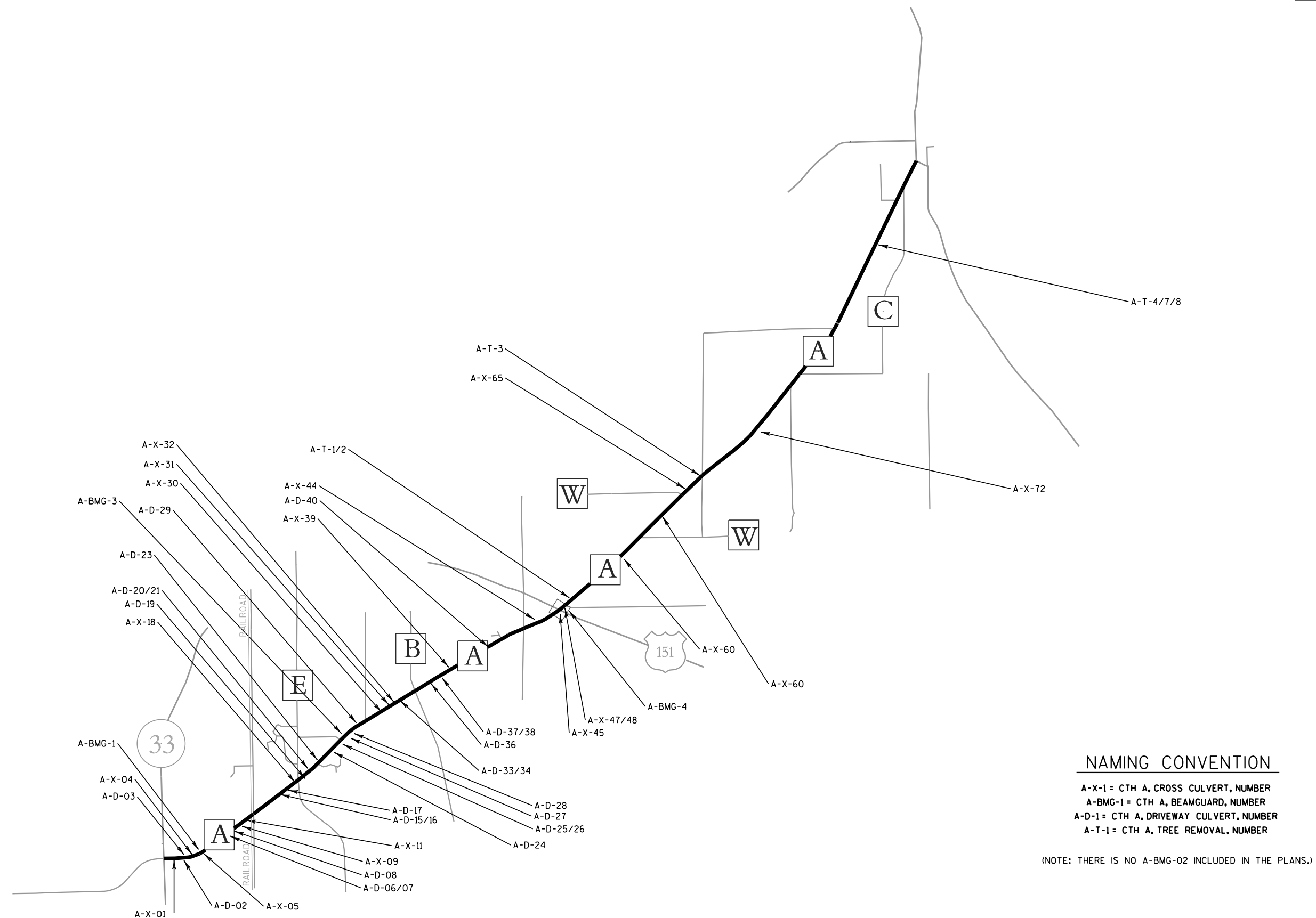
EROSION CONTROL AT DRIVEWAY CULVERTS

SEE DRIVEWAY CULVERT DETAILS
FOR LOCATIONS WHERE EROSION
MAT OR RIPRAP IS REQUIRED AT
THE ENDWALL LOCATIONS.



EROSION CONTROL AT CROSS CULVERT EXTENSIONS

SEE DRIVEWAY CULVERT DETAILS
FOR LOCATIONS WHERE EROSION
MAT OR RIPRAP IS REQUIRED AT
THE ENDWALL LOCATIONS.



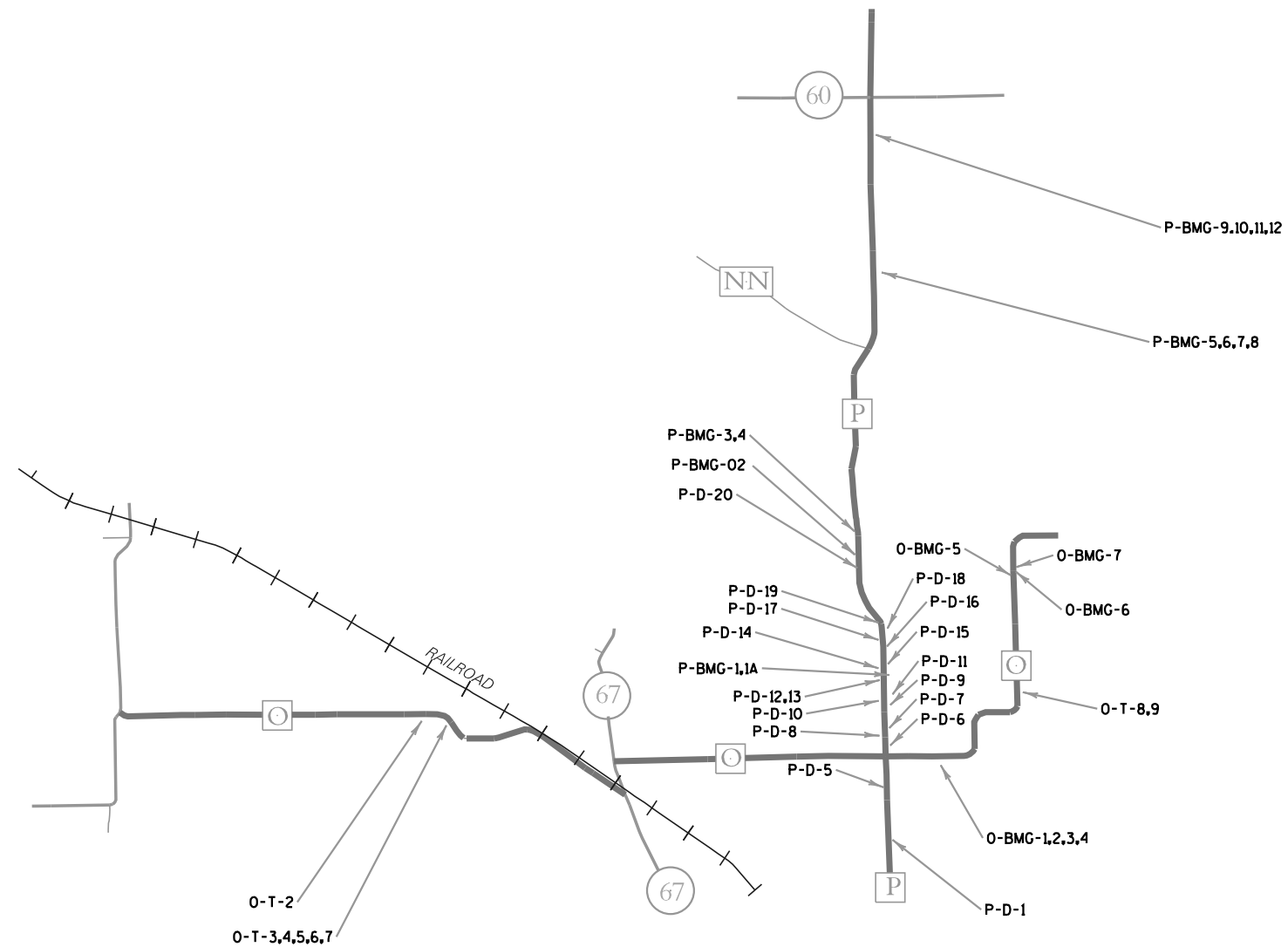
NAMING CONVENTION

A-X-1 = CTH A, CROSS CULVERT, NUMBER
A-BMG-1 = CTH A, BEAMGUARD, NUMBER
A-D-1 = CTH A, DRIVEWAY CULVERT, NUMBER
A-T-1 = CTH A, TREE REMOVAL, NUMBER

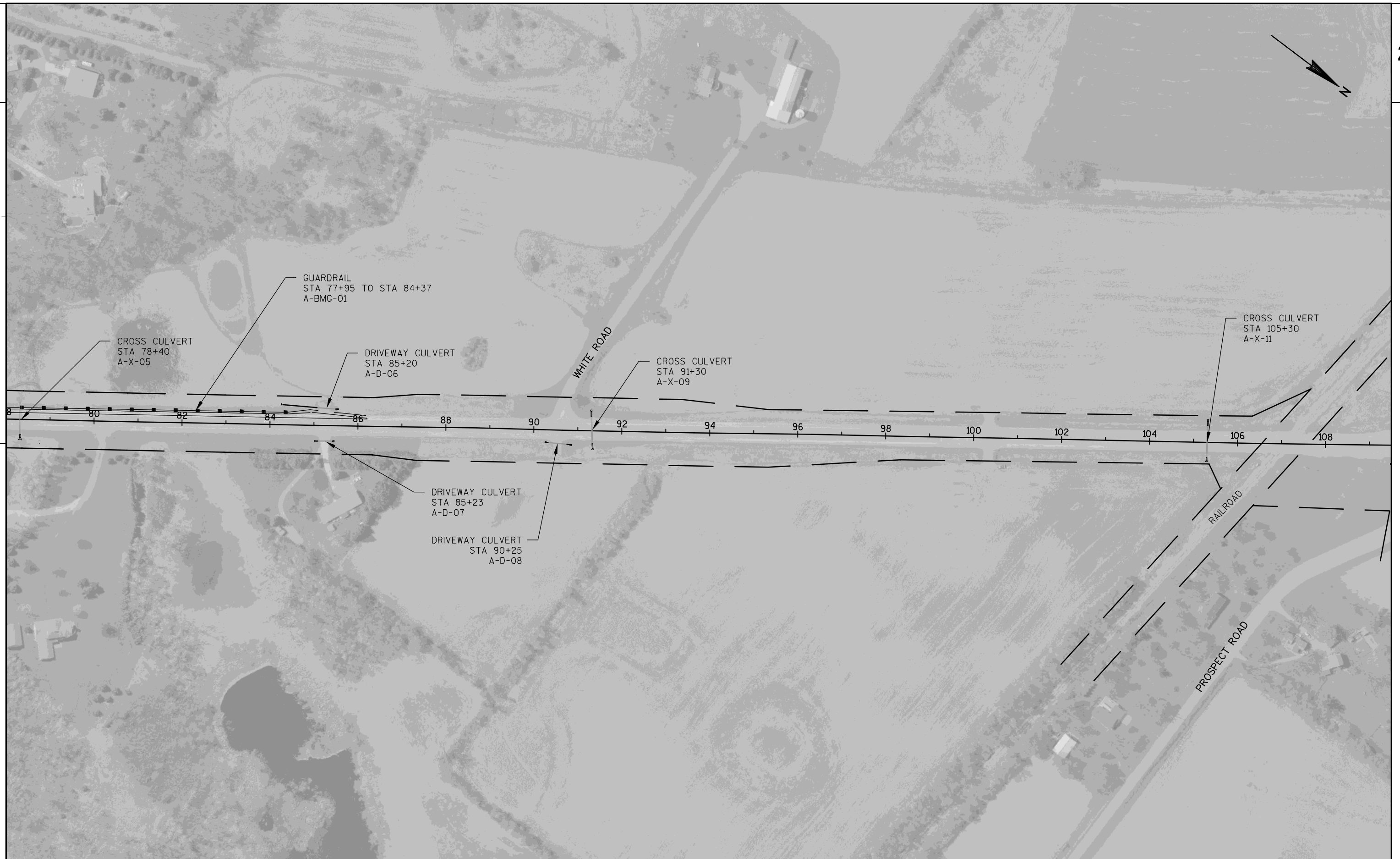
(NOTE: THERE IS NO A-BMG-02 INCLUDED IN THE PLANS.)

NAMING CONVENTION

P-D-1 = CTH P, DRIVEWAY CULVERT, NUMBER
O-T-1 = CTH O, TREE REMOVAL, NUMBER
O-BMG-1 = CTH O, BEAMGUARD, NUMBER
P-BMG-1 = CTH P, BEAMGUARD, NUMBER



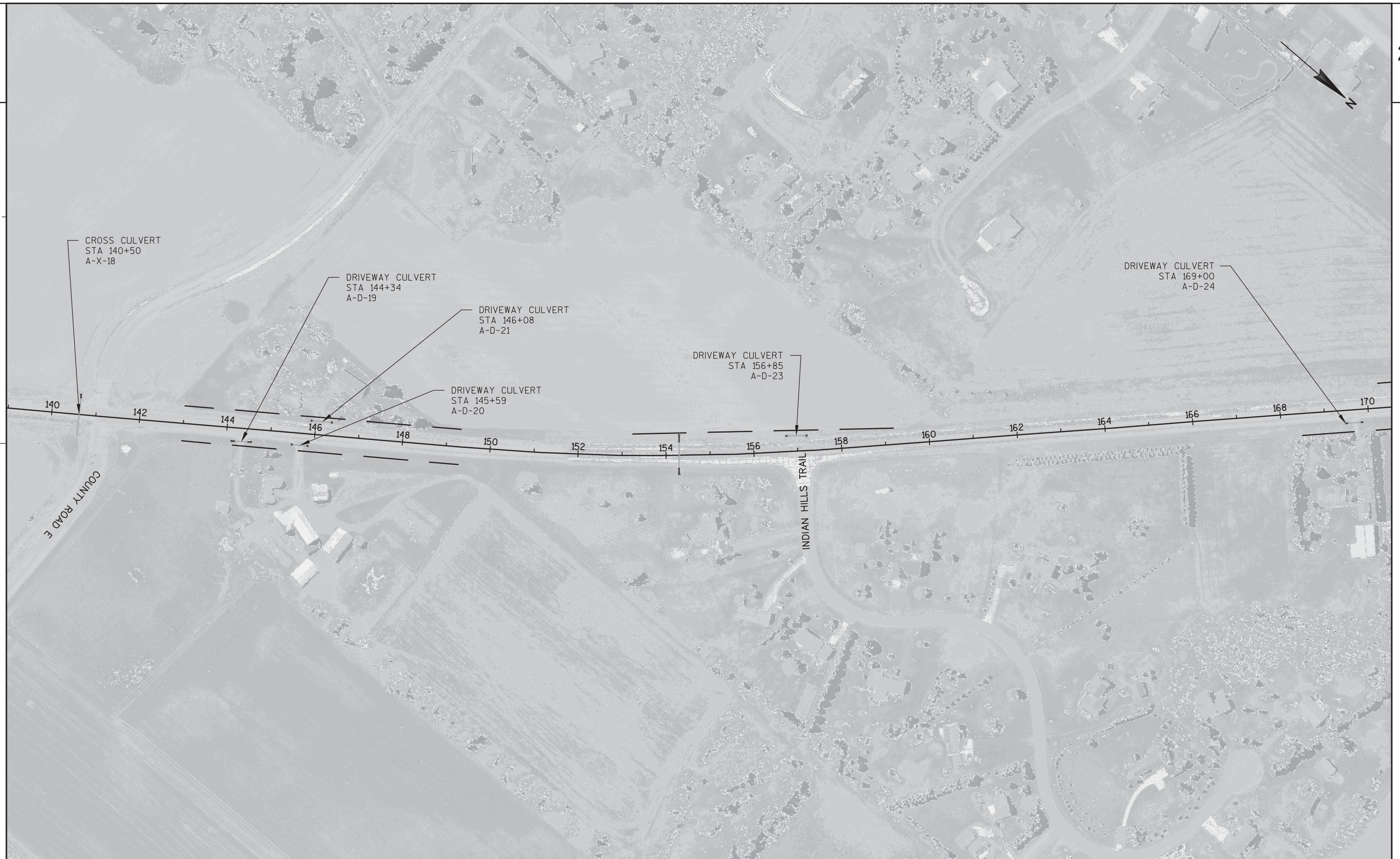






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PROJECT NO:6207-03-71	HWY:CTH A	COUNTY:DODGE	CTH A - STA 139+50 TO STA 170+00	SHEET 13	E
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2

2 |



PROJECT NO:6207-03-71	HWY:CTH A	COUNTY:DODGE	CTH A - STA 170+00 TO STA 200+50	SHEET 14	E
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PROJECT NO:6207-03-71

HWY:CTH A

COUNTY:DODGE

CTH A - STA 231+00 TO STA 261+50

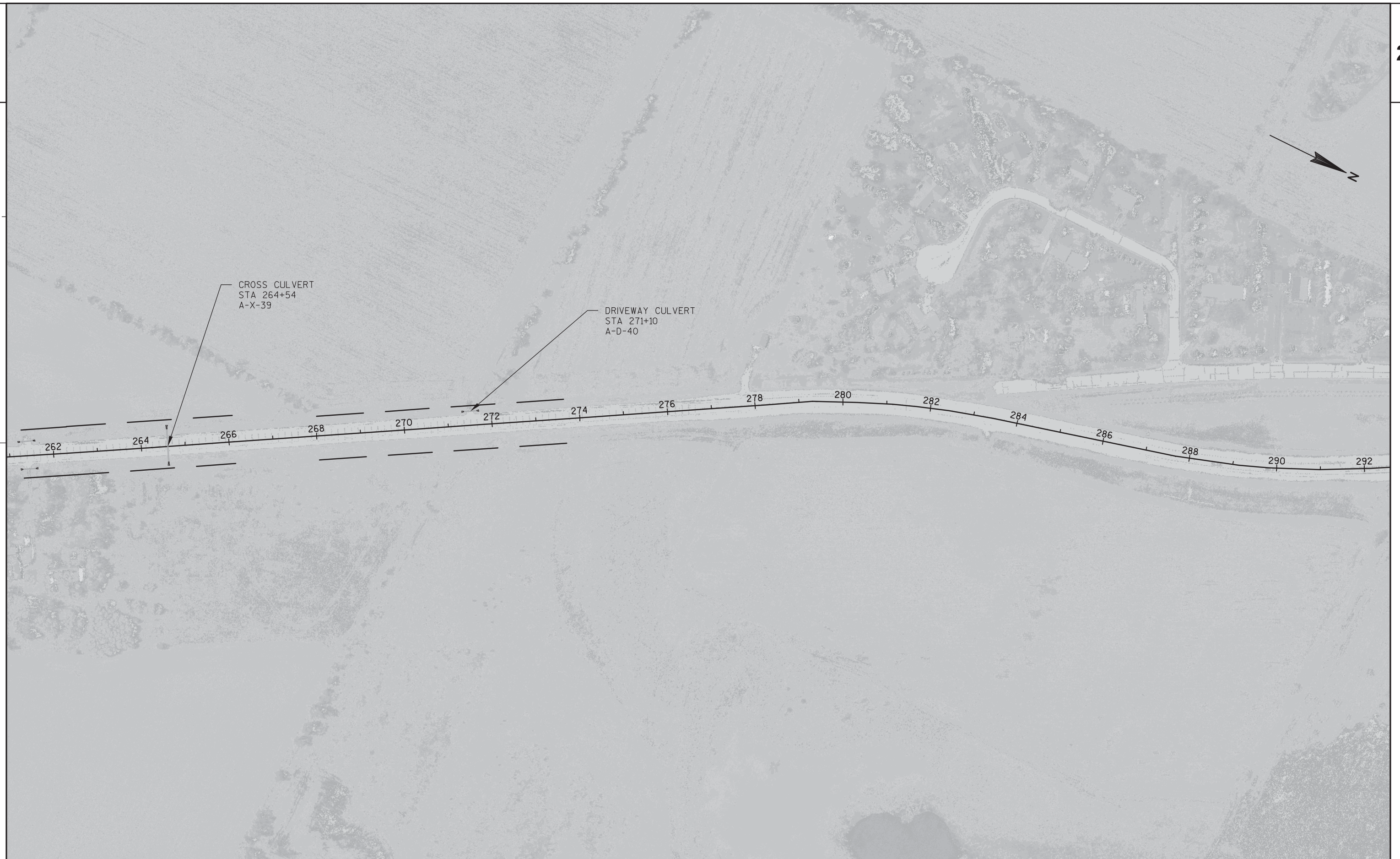
SHEET

16

E

2

2



PROJECT NO:6207-03-71	HWY:CTH A	COUNTY:DODGE	CTH A - STA 261+50 TO STA 292+00	SHEET 17	E
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PROJECT NO:6207-03-71

HWY:CTH A

COUNTY:DODGE

CTH A - STA 292+00 TO STA 322+50

SHEET

18

E

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WISDOT/CADDs SHEET 42





PROJECT NO:6207-03-71

HWY:CTH A

COUNTY:DODGE

CTH A - STA 353+00 TO STA 383+50

SHEET 20

E

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PLOT BY : MOYER, TIM

PLOT NAME : PLOT SCALE : \$\$\$.....plotscale.....\$\$ WISDOT/CADDs SHEET 42



2

2



PROJECT NO:6207-03-71	HWY:CTH A	COUNTY:DODGE	CHT A - STA 414+00 TO STA 444+50	SHEET 22	E
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PLOT NAME :

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WISDOT/CADDs SHEET 42



PROJECT NO:6207-03-71	HWY:CTH A	COUNTY:DODGE	CTH A - STA 444+50 TO STA 475+00	SHEET 23	E
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PROJECT NO:6207-03-71	HWY:CTH A	COUNTY:DODGE	CTH A - STA 505+50 TO STA 536+00	SHEET 25	E
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2

2



PROJECT NO:6207-03-71	HWY:CTH A	COUNTY:DODGE	CTH A - STA 536+00 TO STA 566+50	SHEET 26	E
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PROJECT NO:6207-03-71	HWY:CTH A	COUNTY:DODGE	CTH A - STA 566+50 TO STA 597+00	SHEET 27	E
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TREE REMOVAL
STA. 613+47, 615+48 AND 615+93
A-T-4, A-T-7 AND A-T-8



598 600 602 604 606 608 610 612 614 616 618 620 622 624 626 628

2

2



PROJECT NO:6207-03-71	HWY:CTH 0	COUNTY:DODGE	CTH 0 - STA 231+000 TO STA 261+50	SHEET 29	E
FILE NAME : L:\PROJECTS\12349\DWG\020202-PO.DWG		PLOT DATE : 12/29/2011 2:36 PM		PLOT BY : MOYER, TIM	
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WISDOT/CADDs SHEET 42					

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2



PROJECT NO:6207-03-71	HWY:CTH 0	COUNTY:DODGE	CTH 0 - STA 566+50 TO STA 597+00	SHEET 30	E
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PROJECT NO:6207-03-71	HWY:CTH 0	COUNTY:DODGE	CTH 0 - STA 658+00 TO STA 688+50	SHEET 31	E
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PROJECT NO:6207-03-71

HWY:CTH 0

COUNTY:DODGE

CTH 0 - STA 719+00 TO STA 749+50

SHEET 32

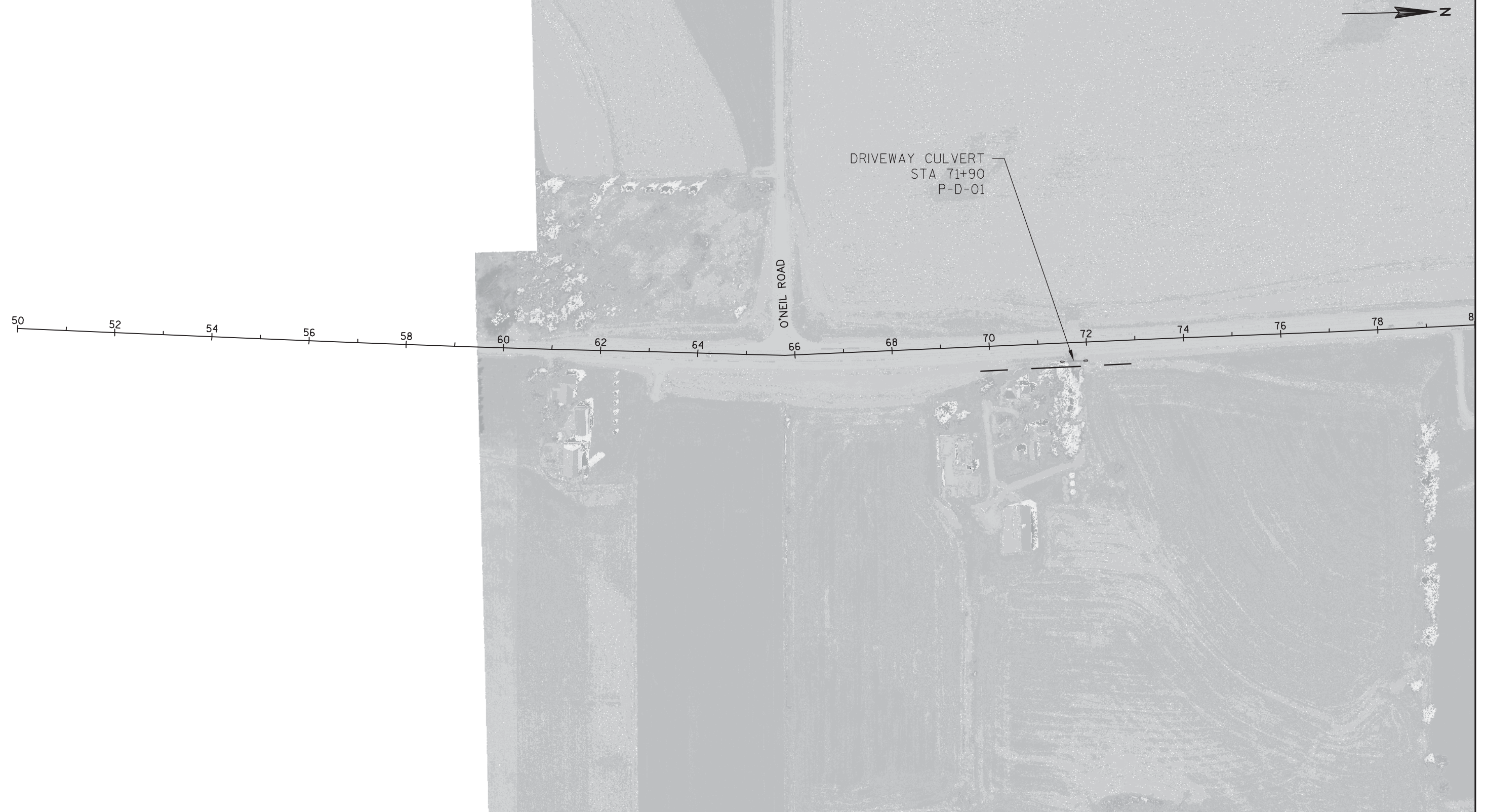
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PLOT BY : MOYER, TIM

PLOT NAME : PLOT SCALE : \$\$\$.....plotscale.....\$\$ WISDOT/CADDs SHEET 42



PROJECT NO:6207-03-71

HWY:CTH P

COUNTY:DODGE

CTH P - STA 50+00 TO STA 78+50

SHEET 33

E

FILE NAME : L:\PROJECTS\12349\DWG\020204_PO.DWG

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PLOT NAME : PLOT SCALE : \$\$\$.....plotscale.....\$\$ WISDOT/CADDs SHEET 42

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2



LINCOLN ROAD

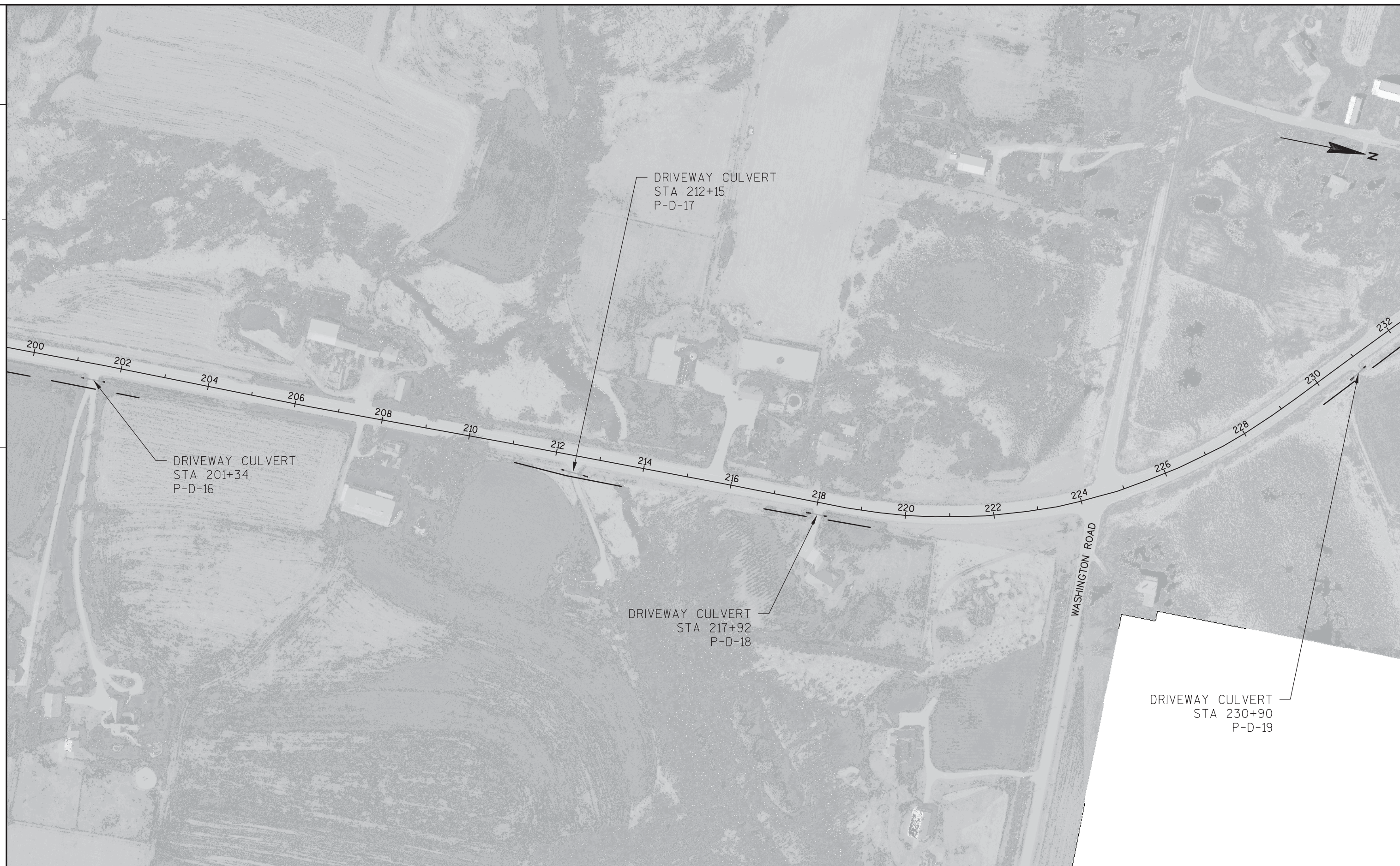
DRIVEWAY CULVERT
STA 135+10
P-D-05

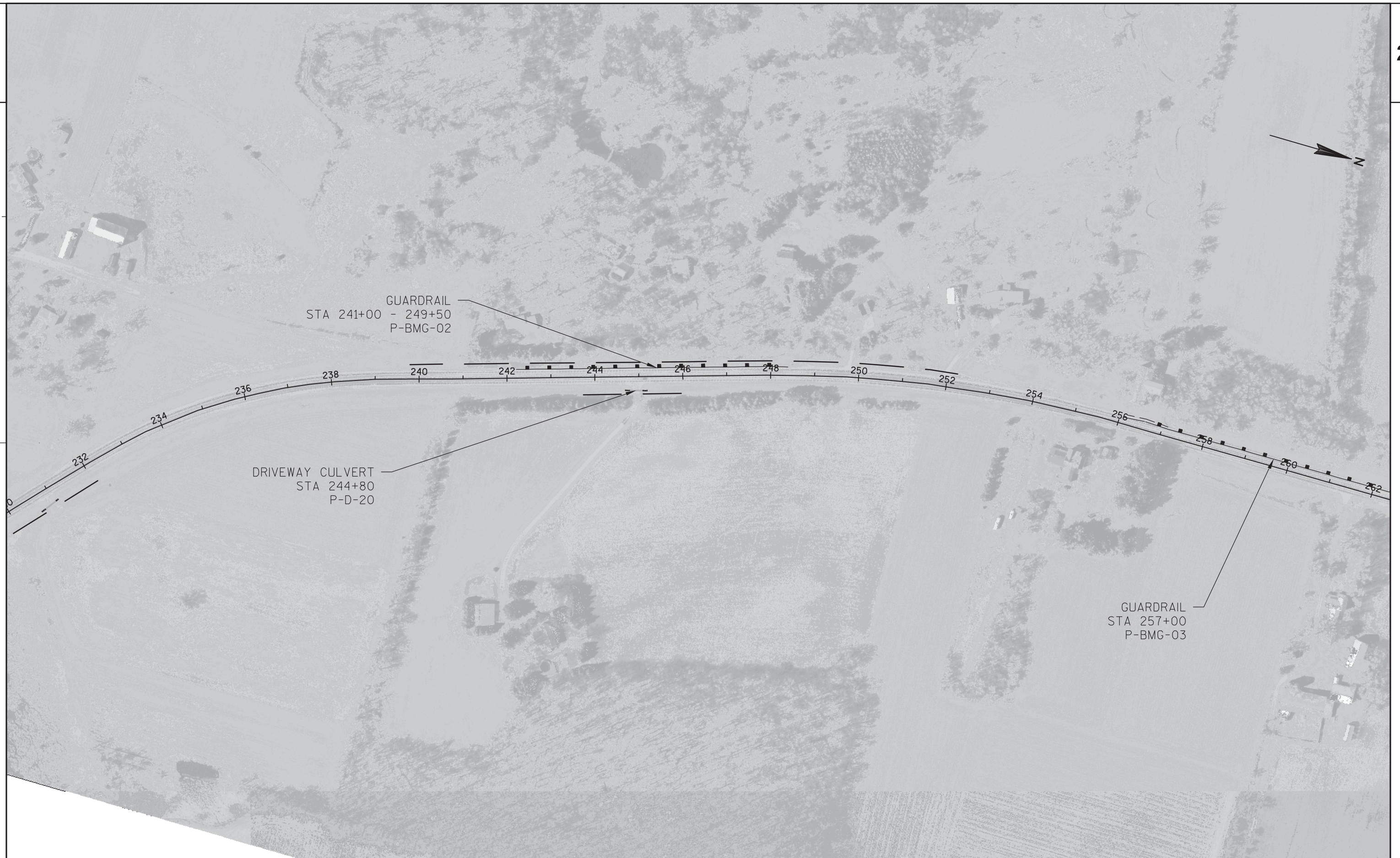
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110 112 114 116 118 120 122 124 126 128 130 132 134 136 138 140









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PROJECT NO:6207-03-71

HWY: CTH P

COUNTY:DODGE

CTH P - STA 261+50 TO STA 292+00

SHEET	40	E
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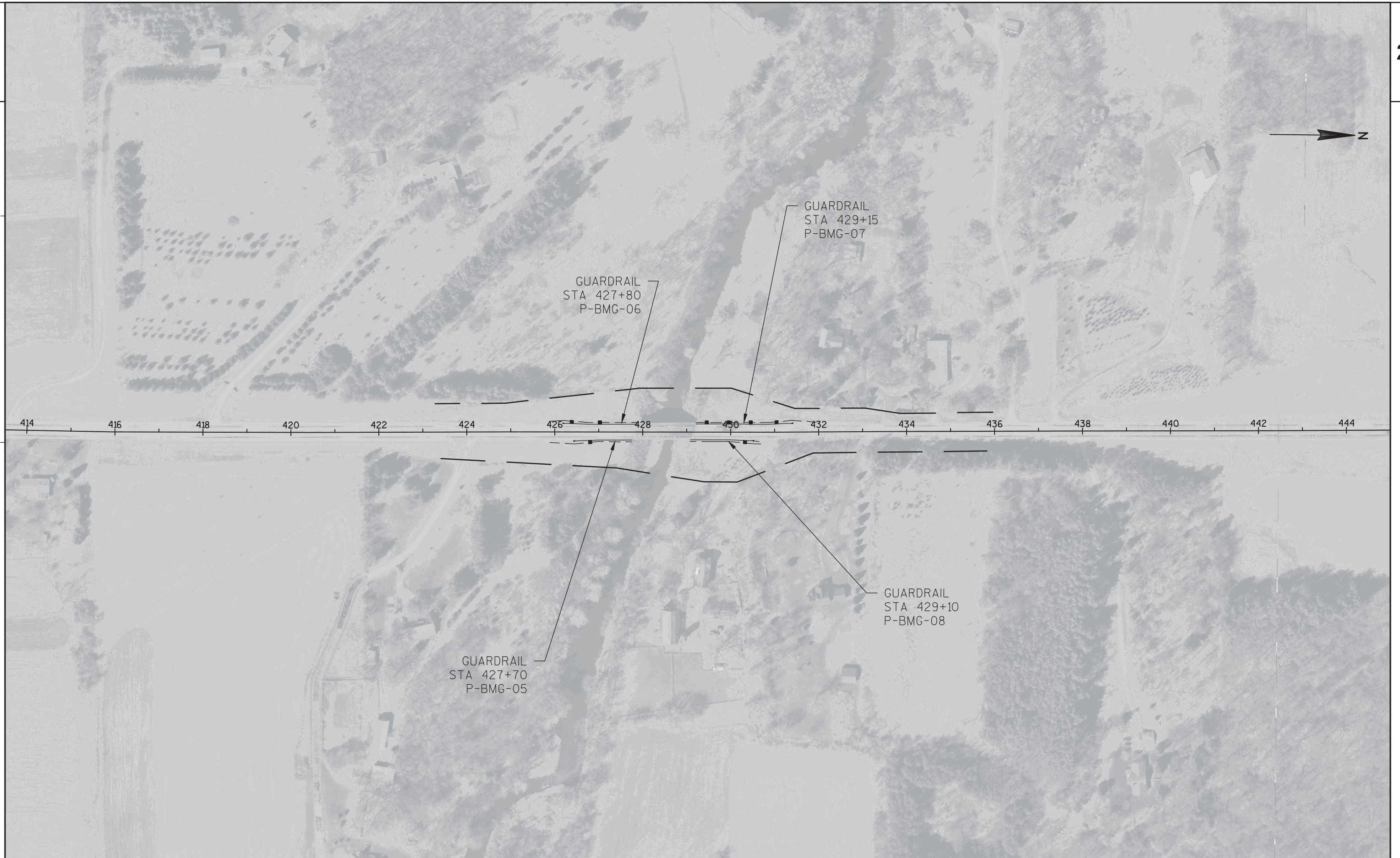
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PLOT BY : MOYER, TIM PLOT NAME : PLOT SCALE : \$\$.....plotscale.....\$\$

PLOT NAME : -----PLOT SCALE : \$\$.....plotscale.....\$\$ WISDOT/CADDs SHEET 42



2

2



PROJECT NO:6207-03-71

HWY: CTH P

COUNTY:DODGE

CTH P - STA 505+50 TO STA 536+00

SHEET	42	E
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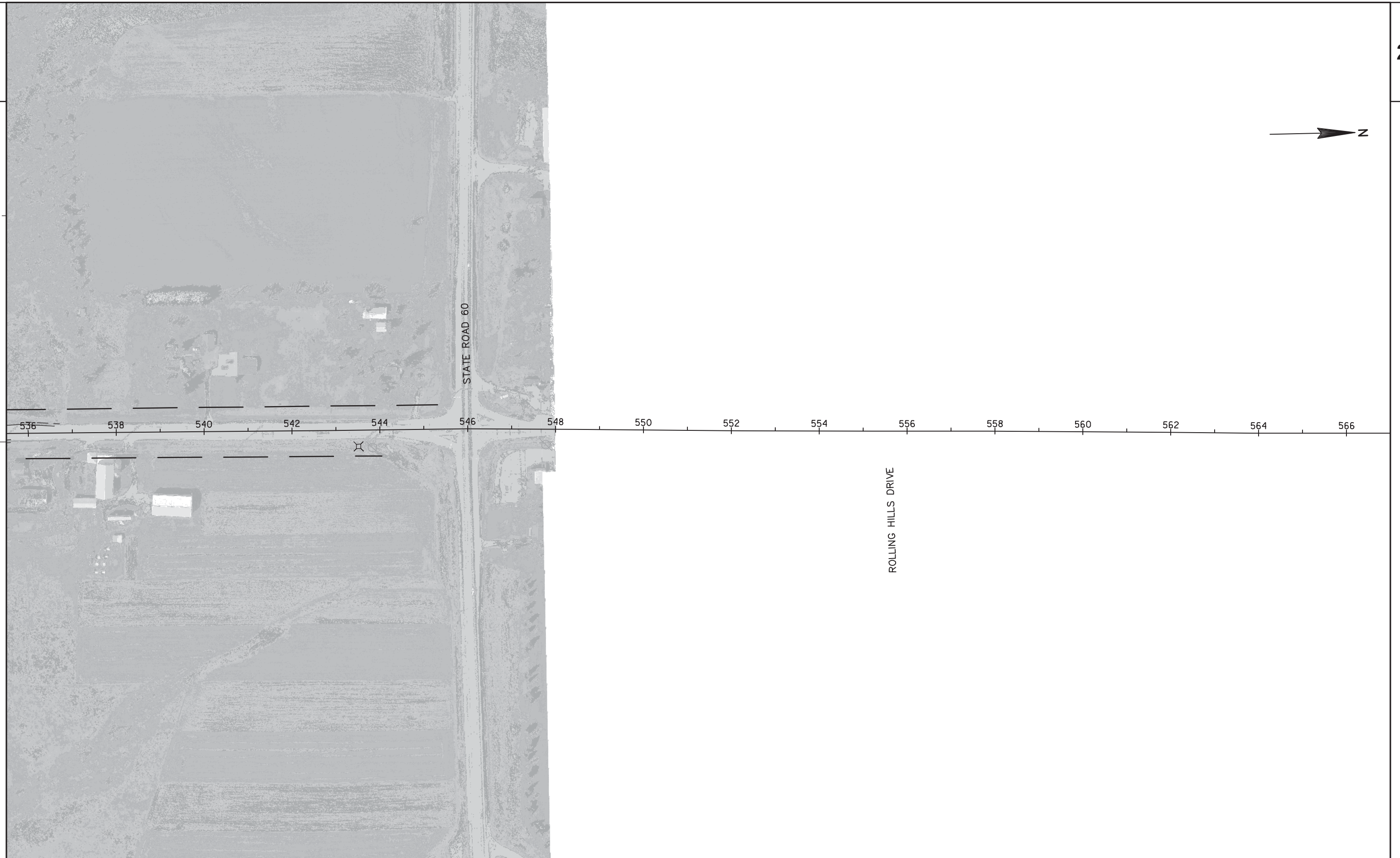
1. **Introduction**
 2. **Methodology**
 3. **Results**
 4. **Conclusion**

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PROJECT NO:6207-03-71

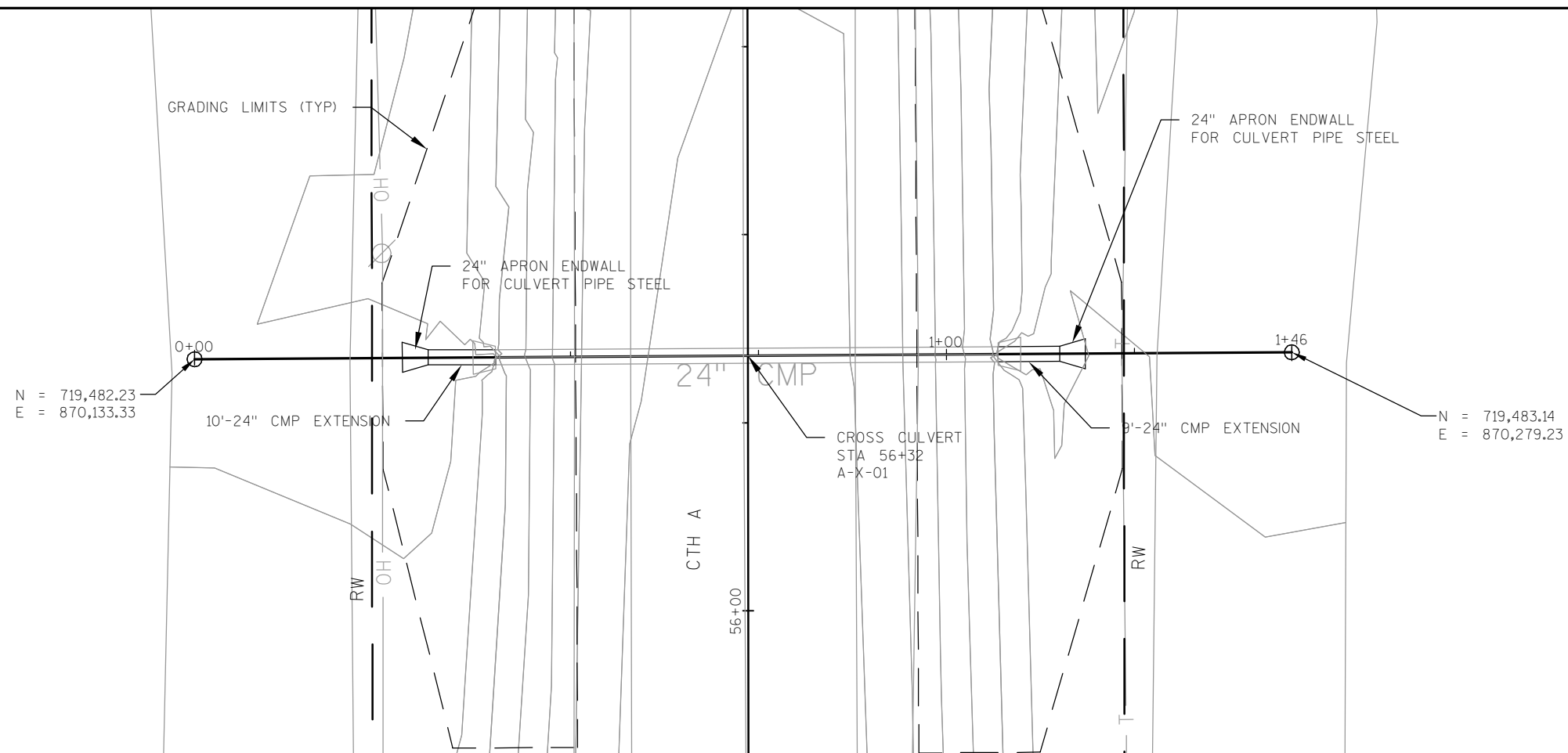
HWY:CTH P

COUNTY:DODGE

CTH P - STA 536+00 TO STA 566+50

SHEET 43

E



922

922

920

920

918

918

916

916

914

914

912

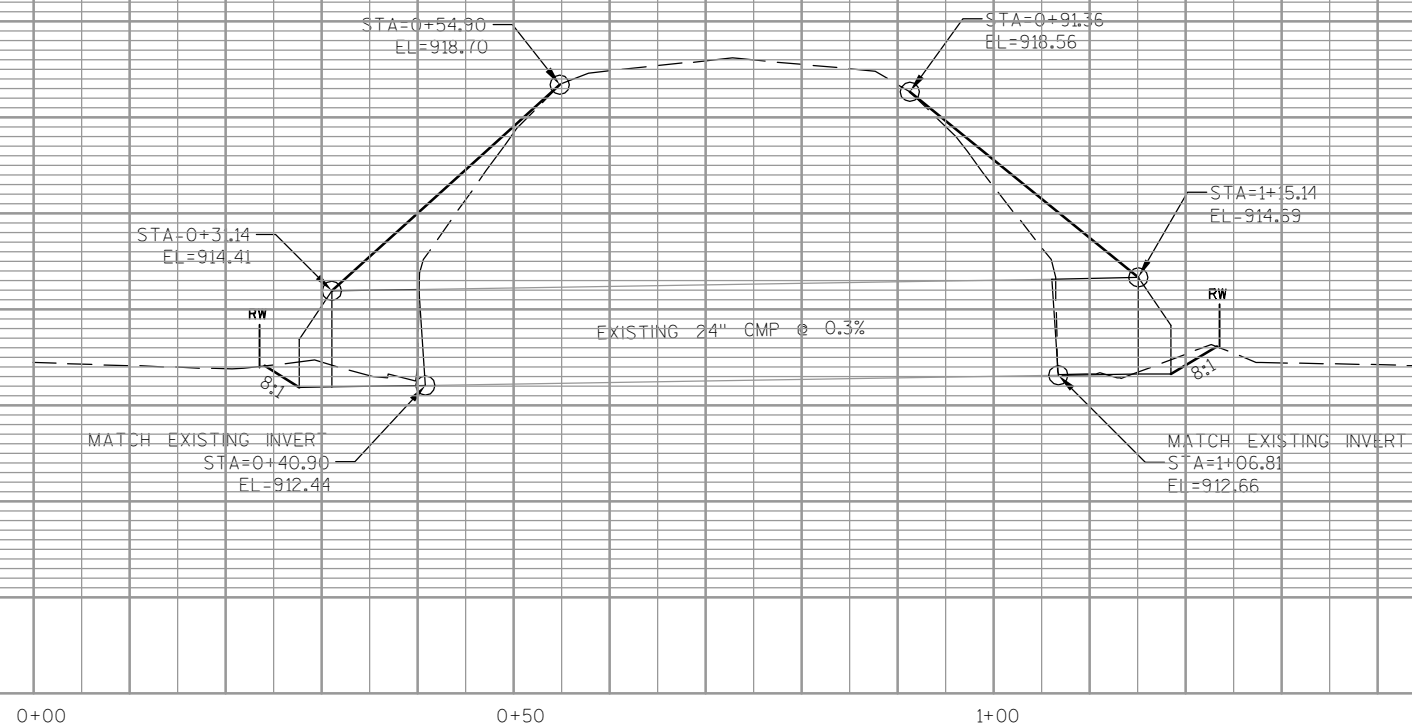
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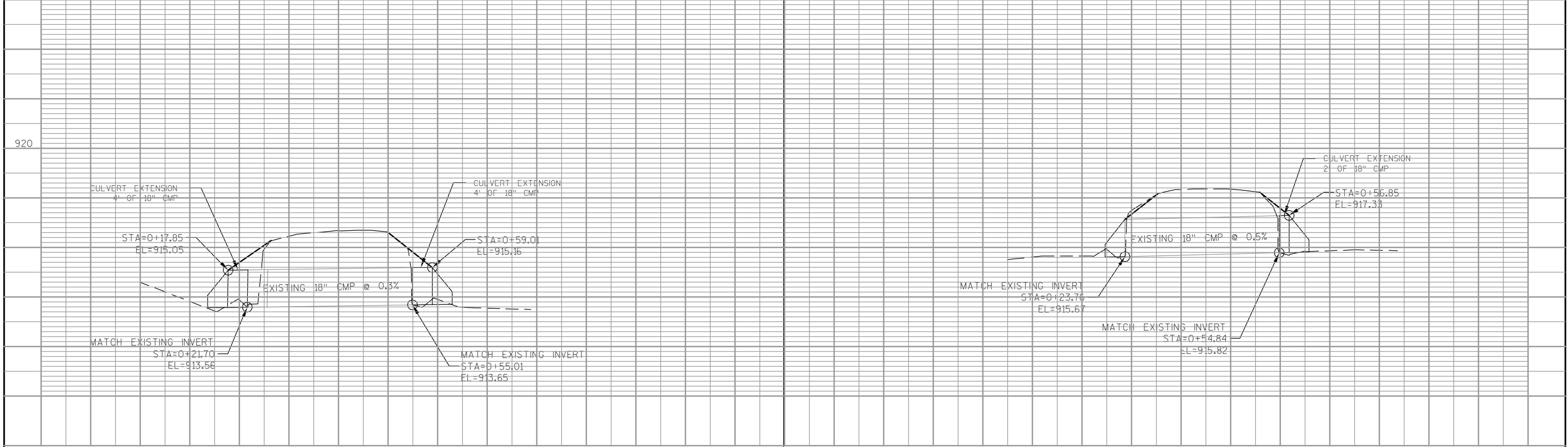
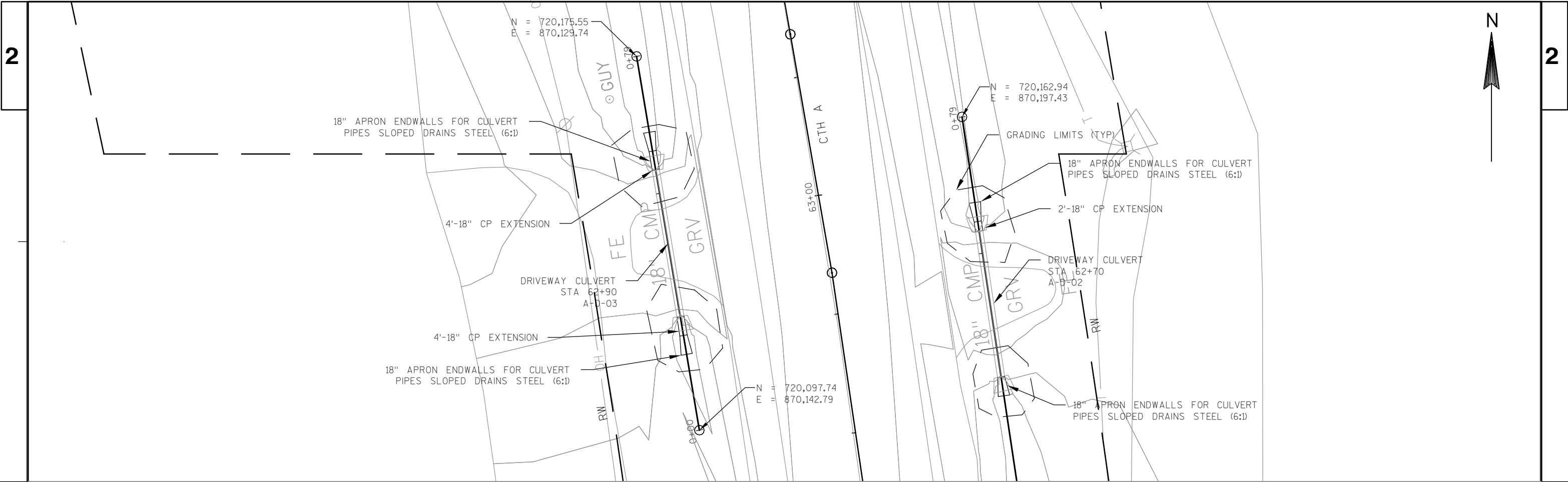
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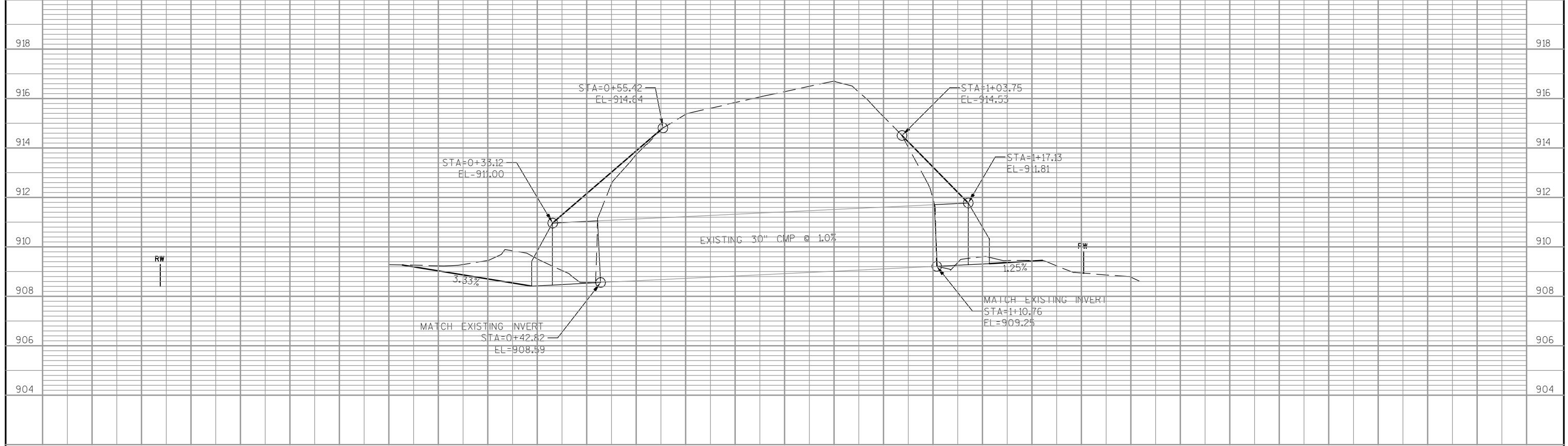
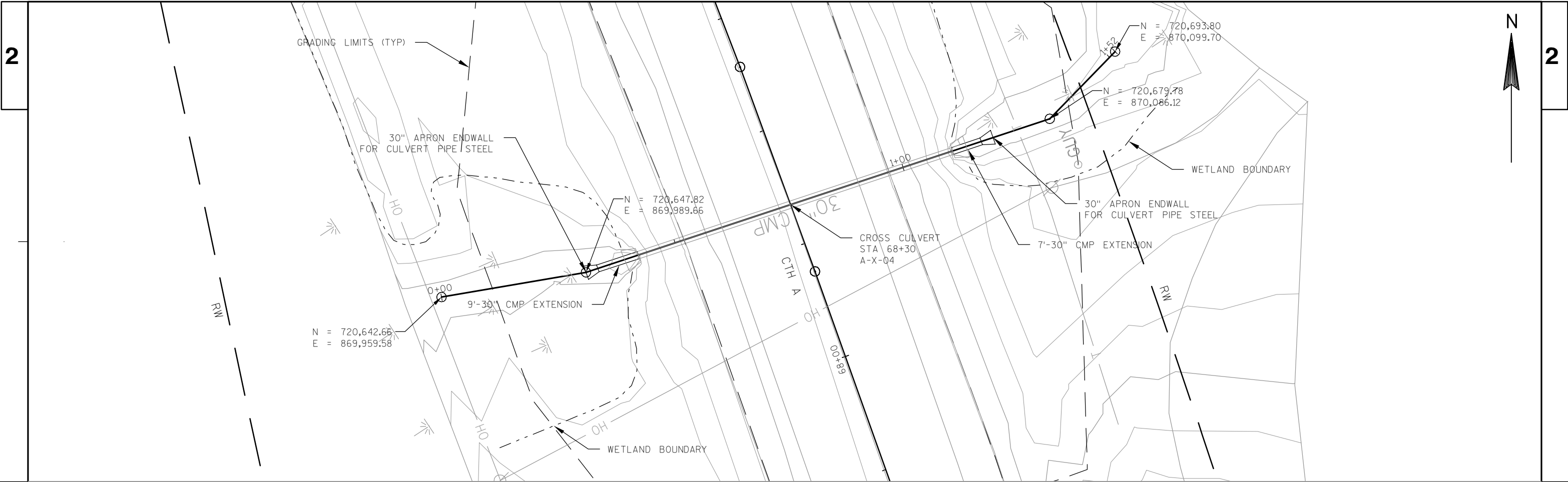
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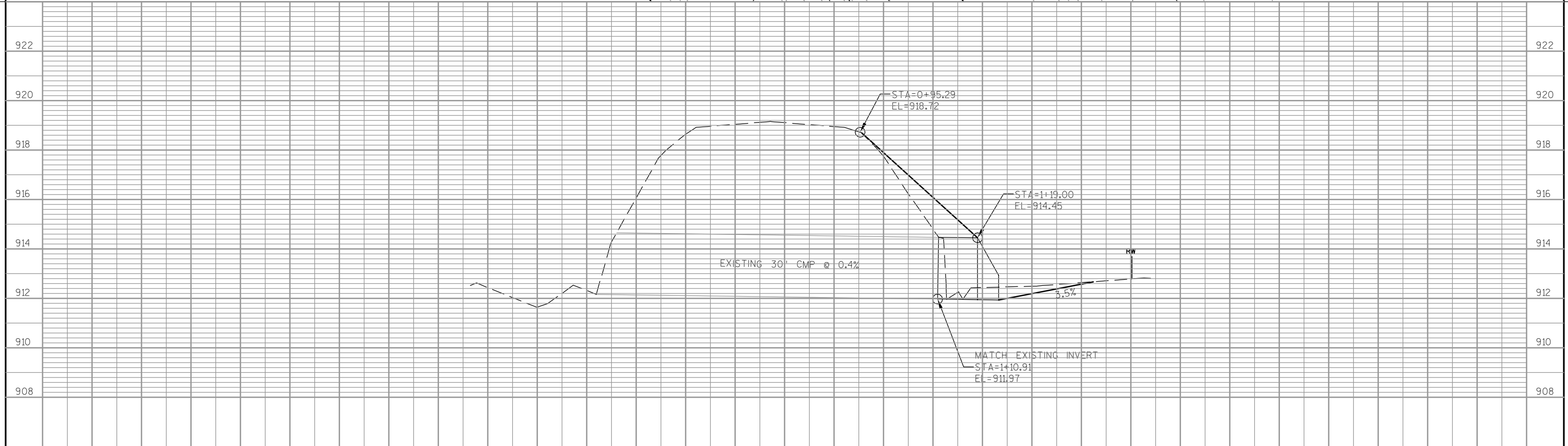
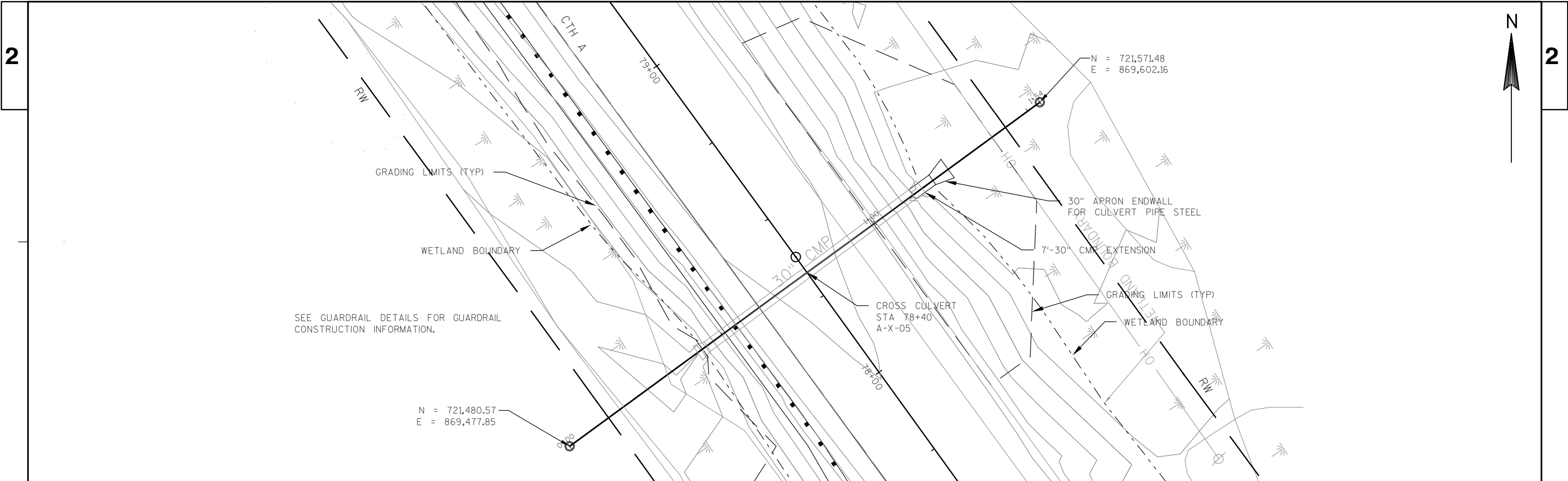
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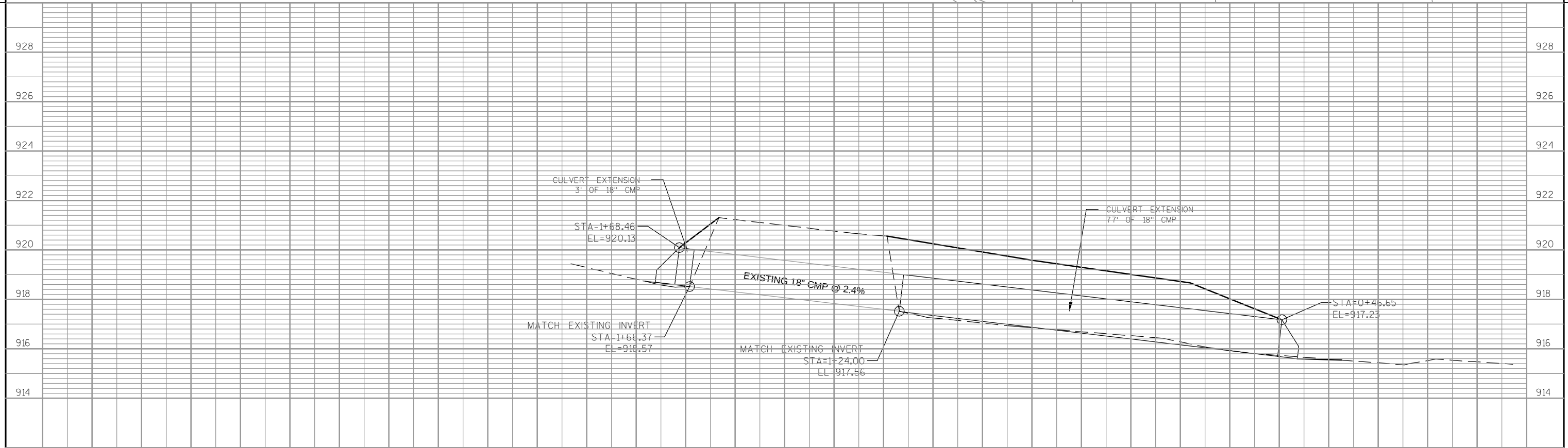
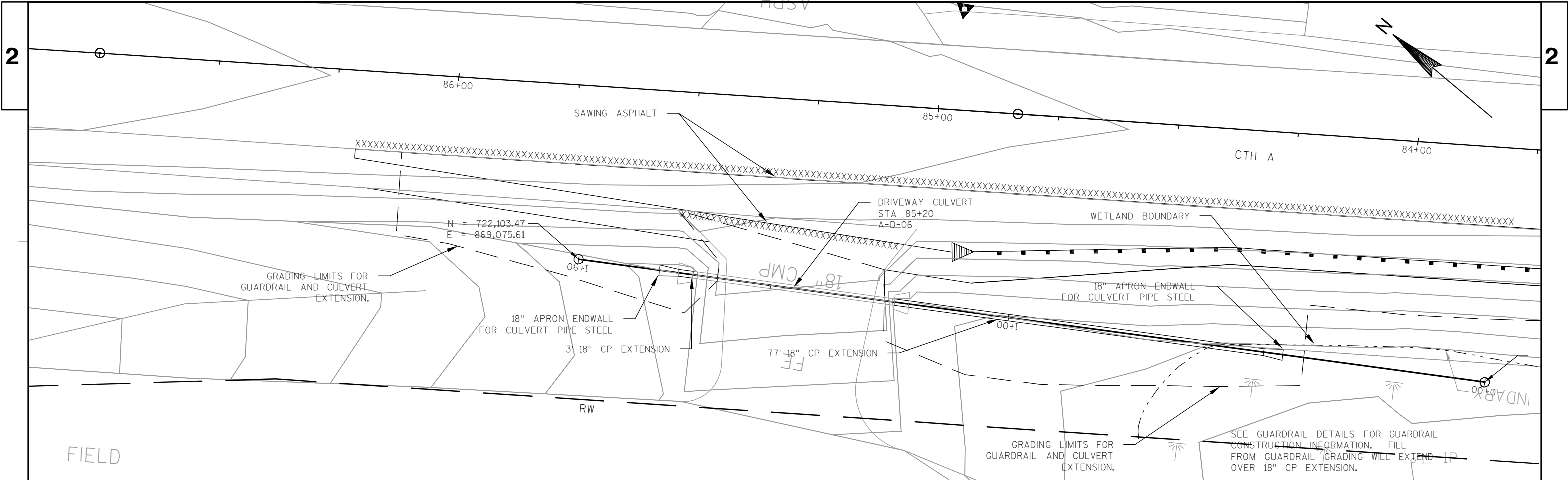
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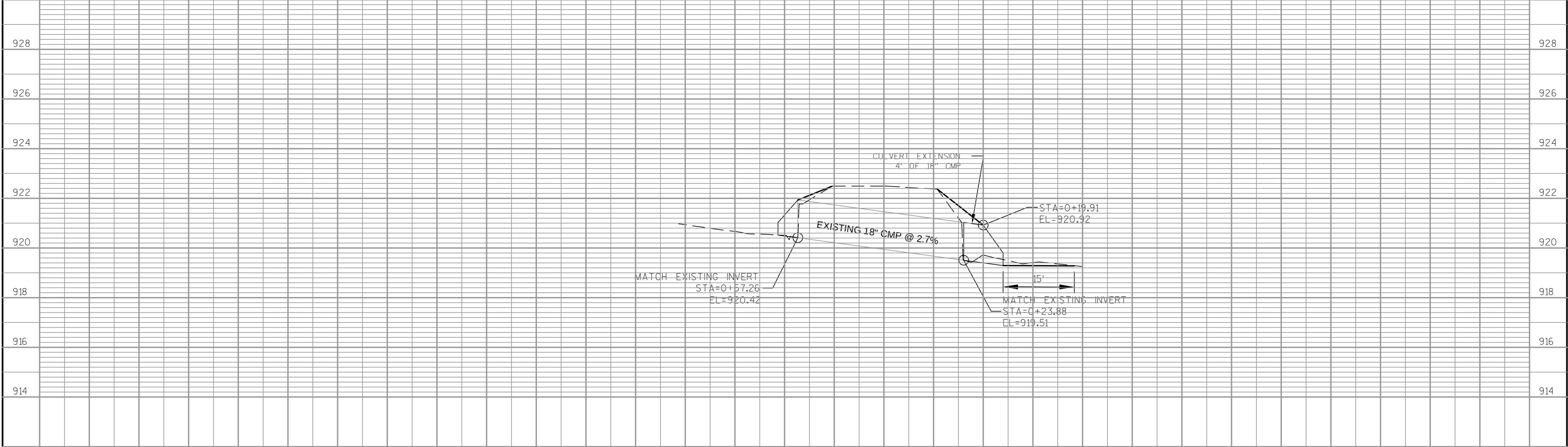
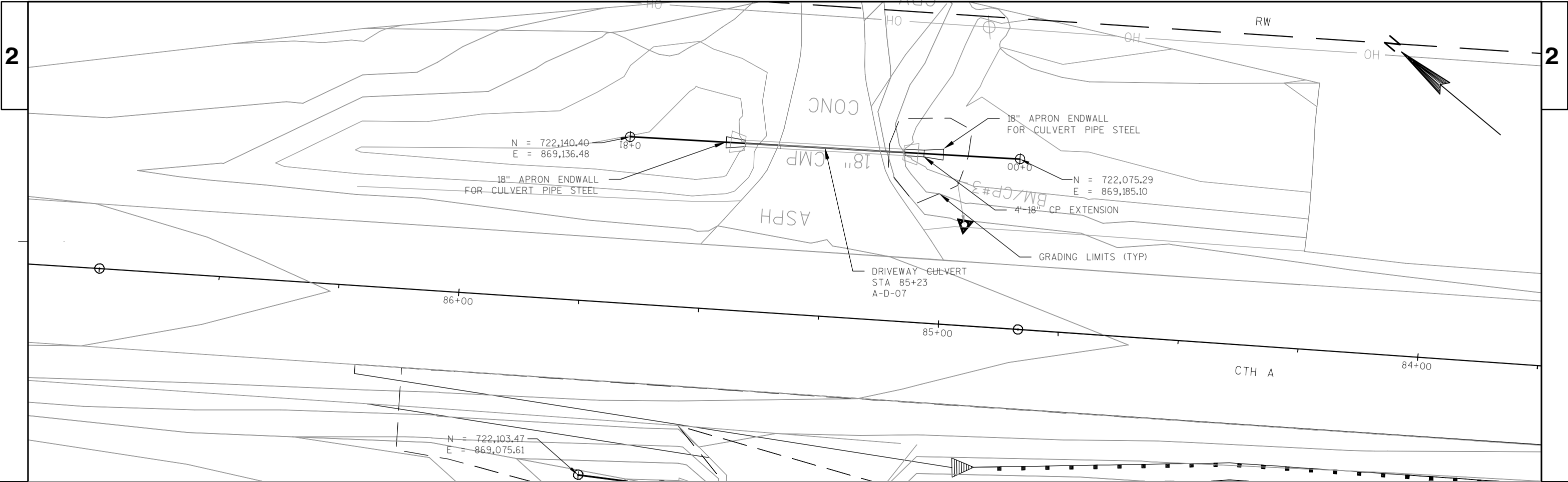


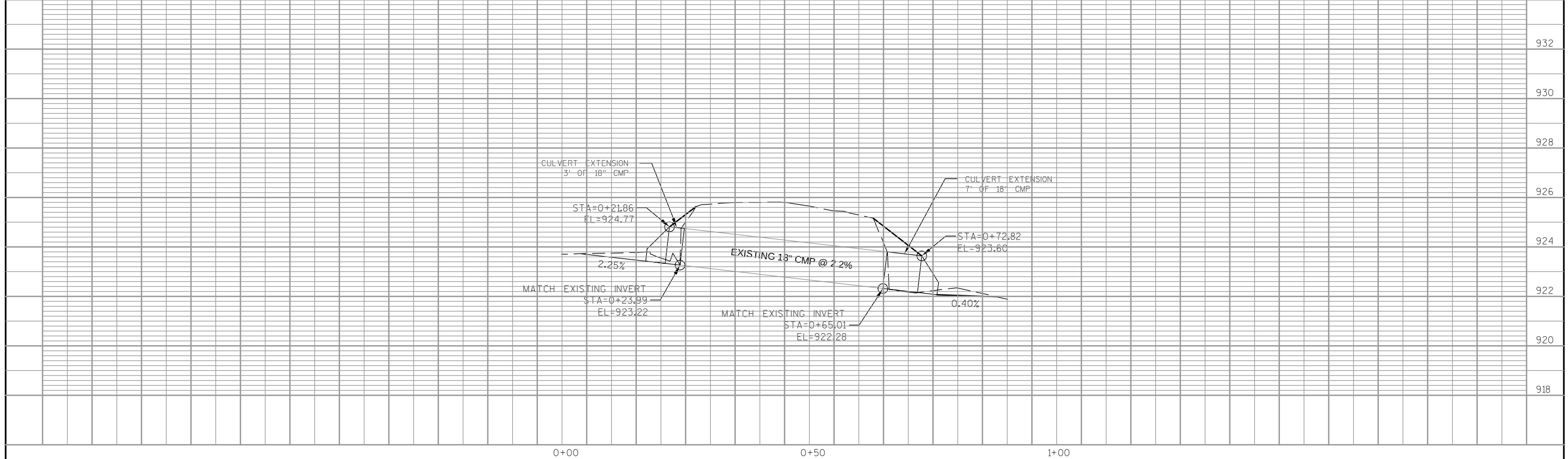
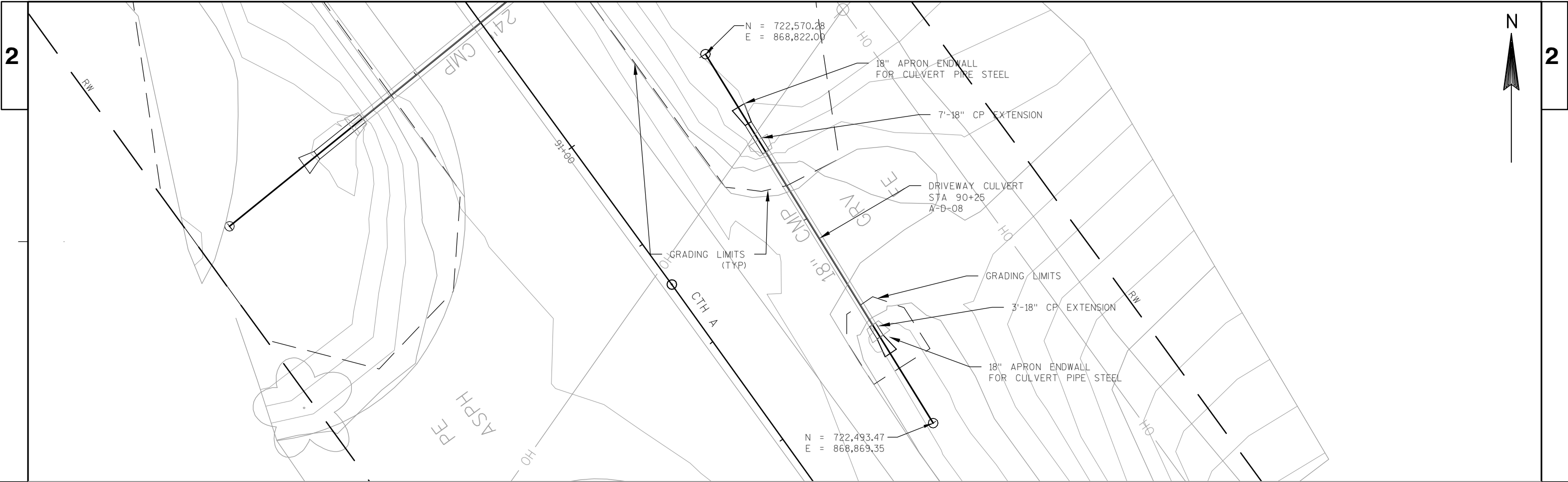


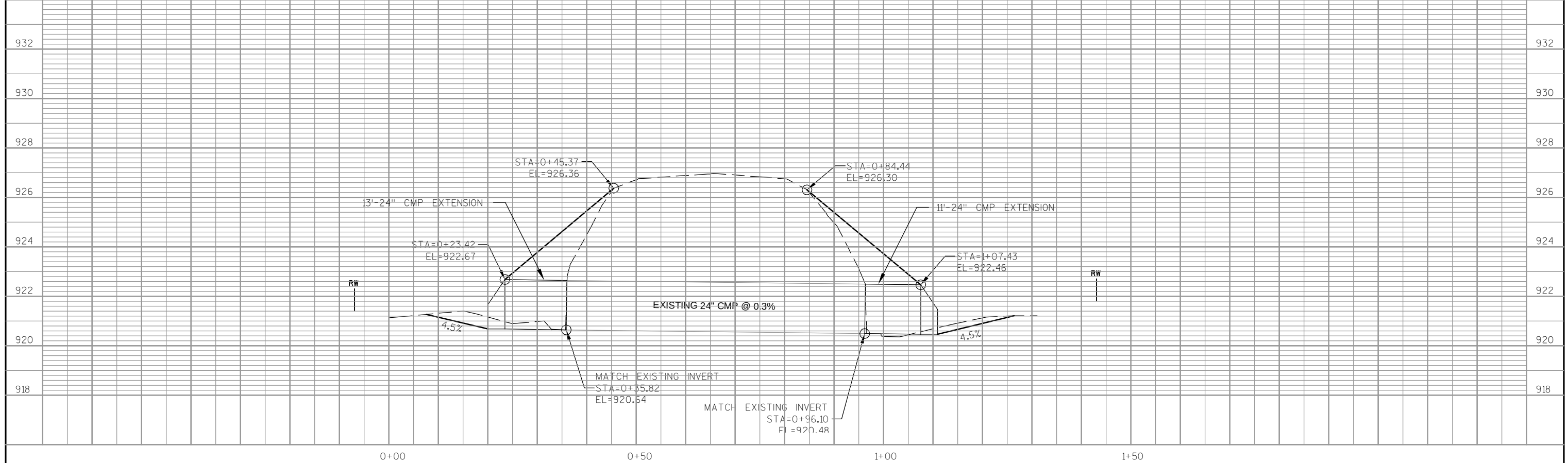
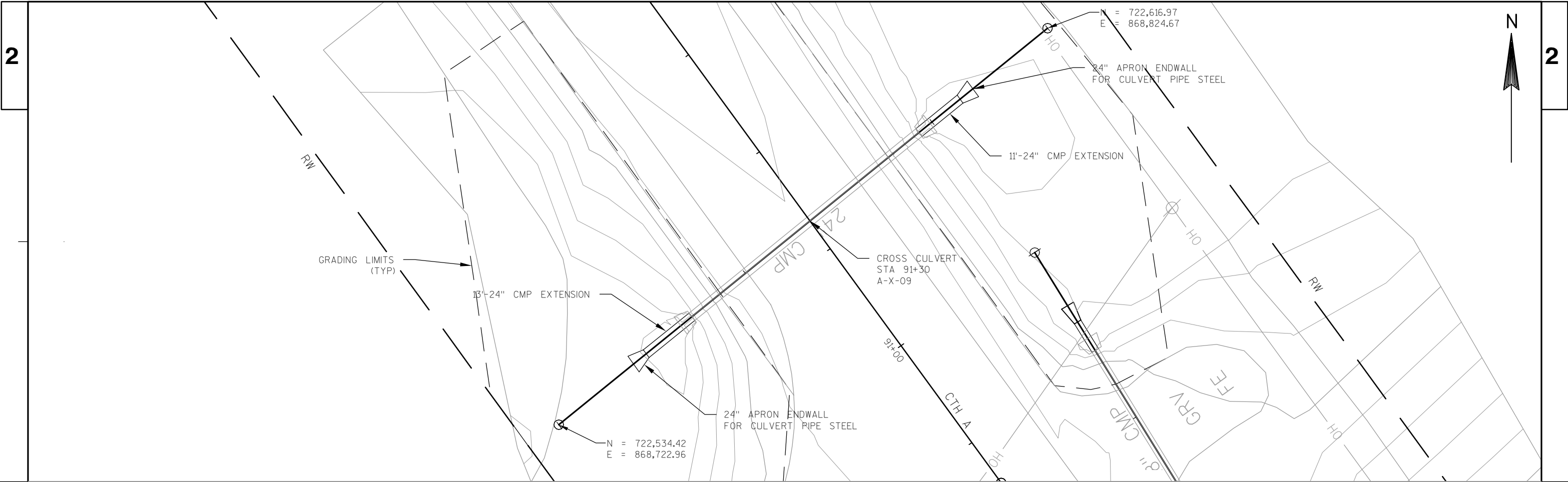


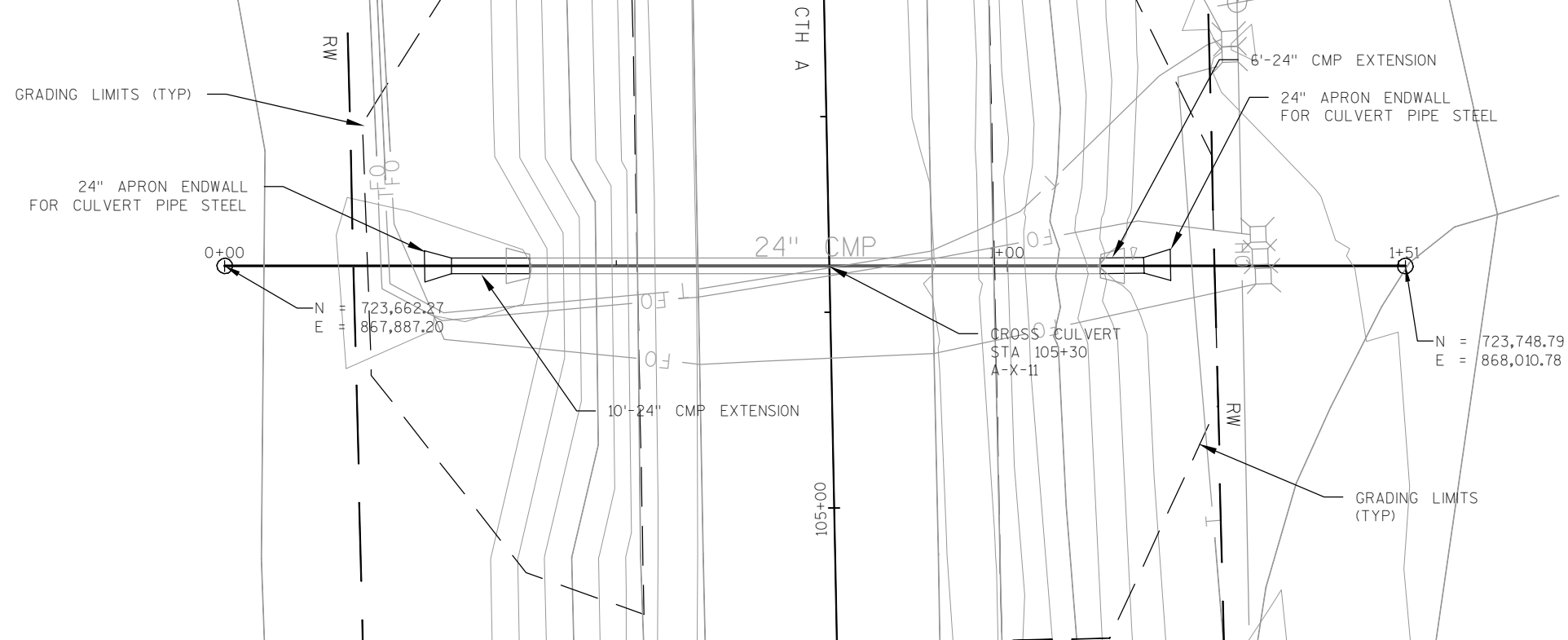




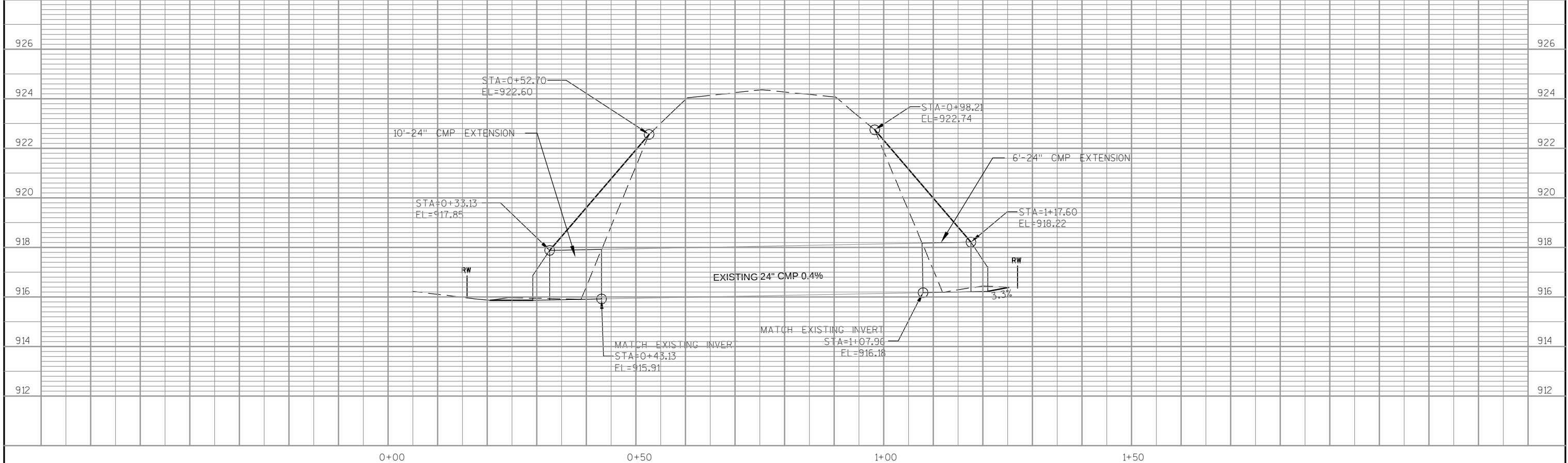


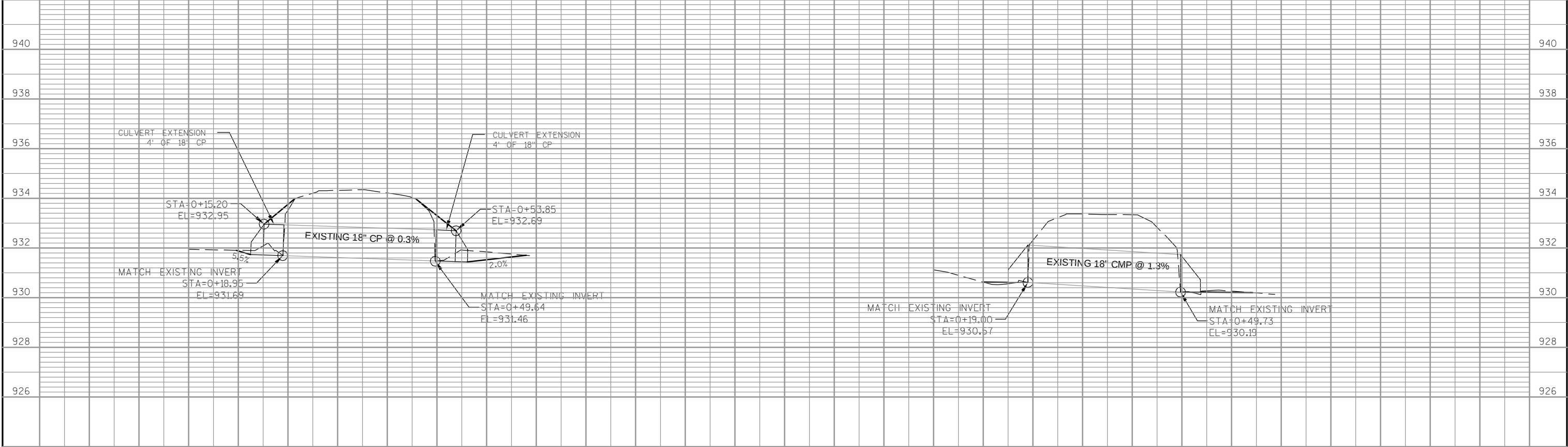
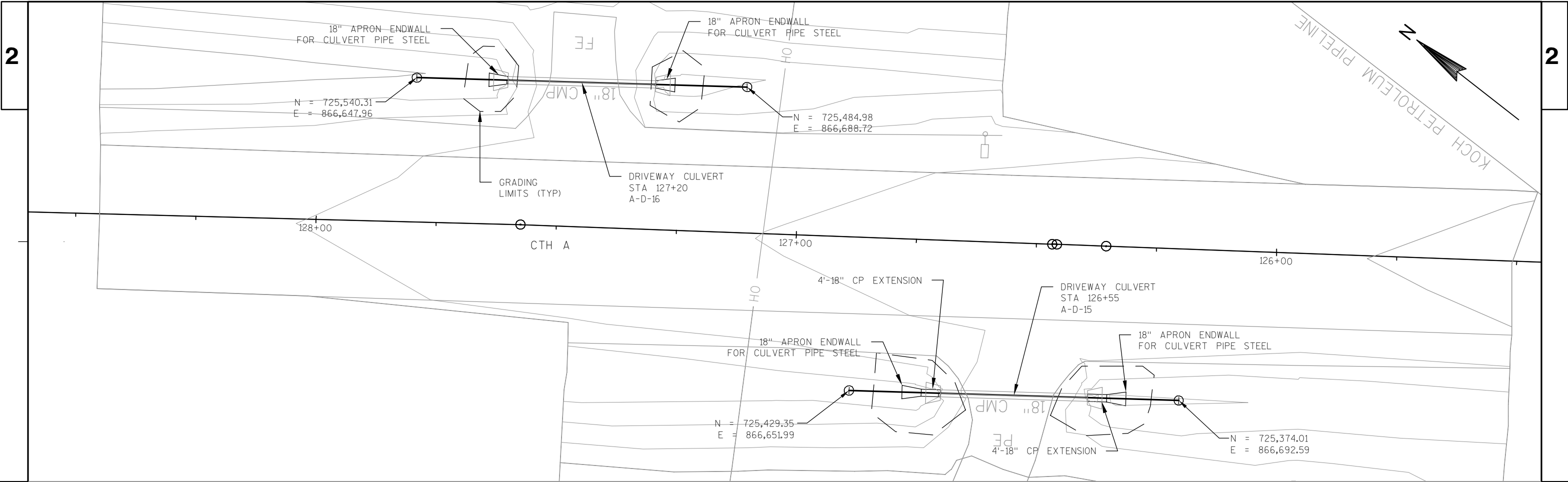


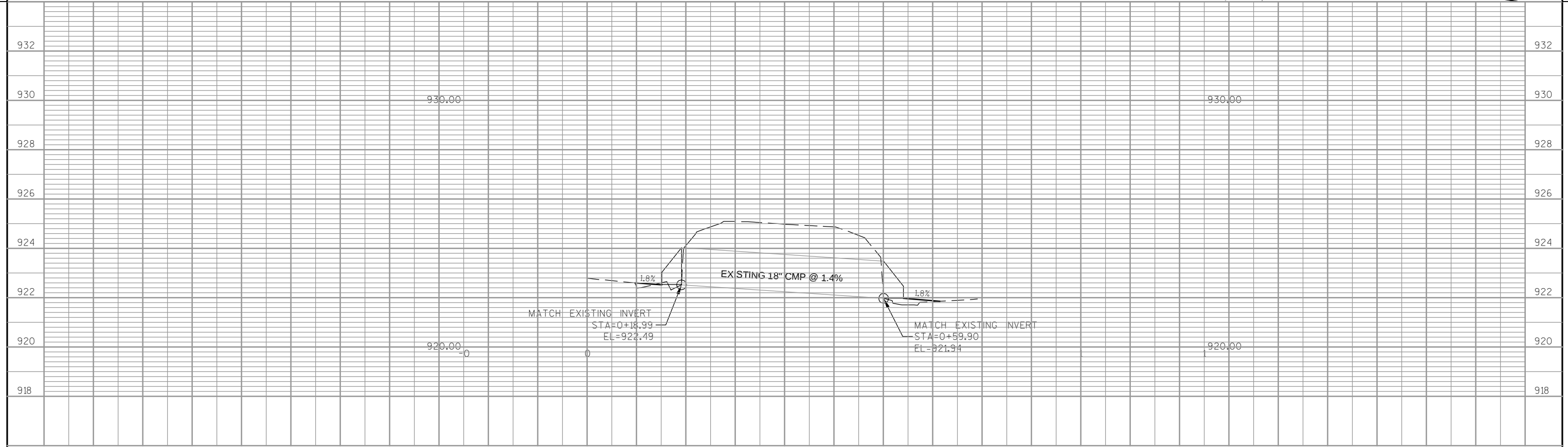
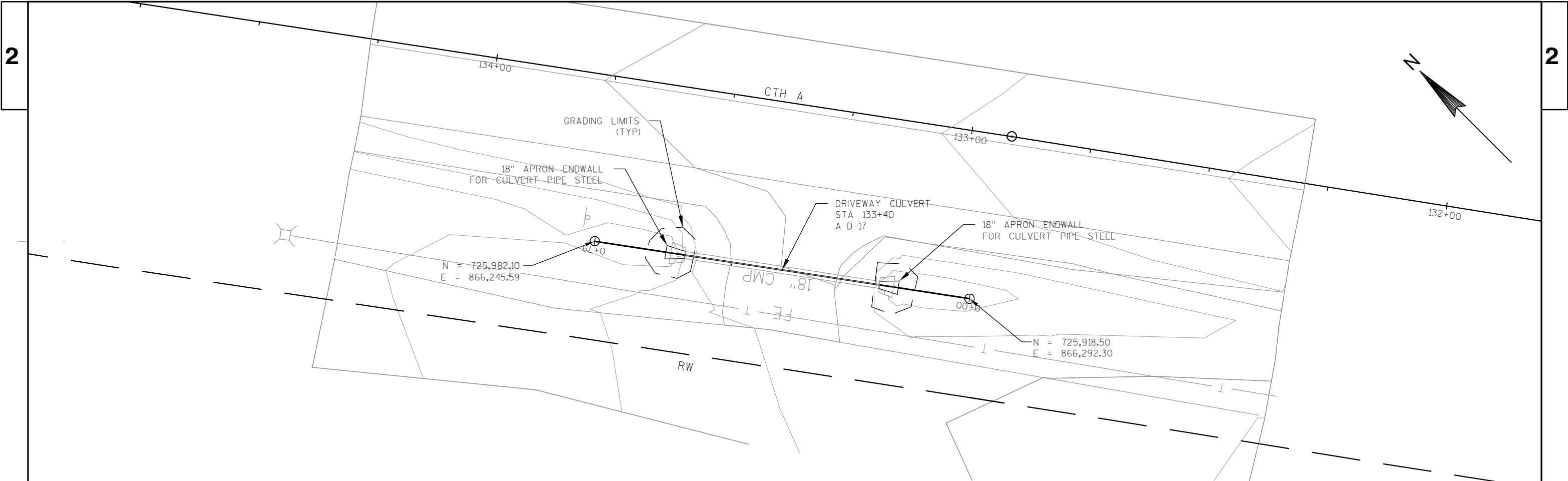




NOTE:
UTILITY LINE OPENING INCLUDED TO VERIFY
FACILITY LOCATIONS AND DEPTHS FOR
FIBER OPTIC AND COMMUNICATIONS LINES
AT A-X-11 LEFT AND RIGHT.





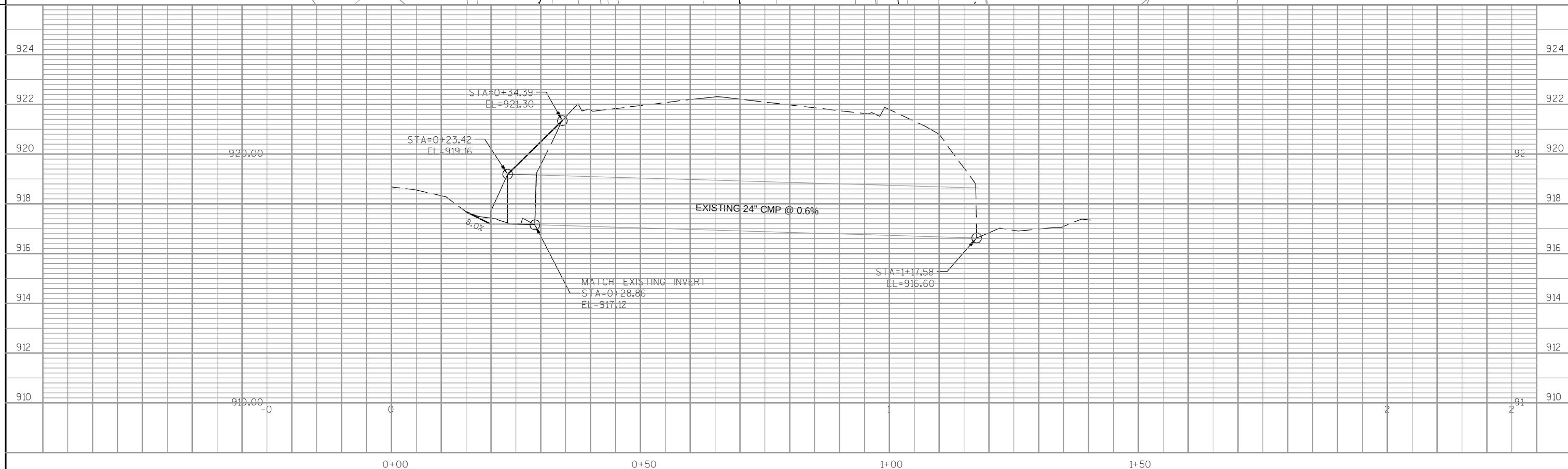
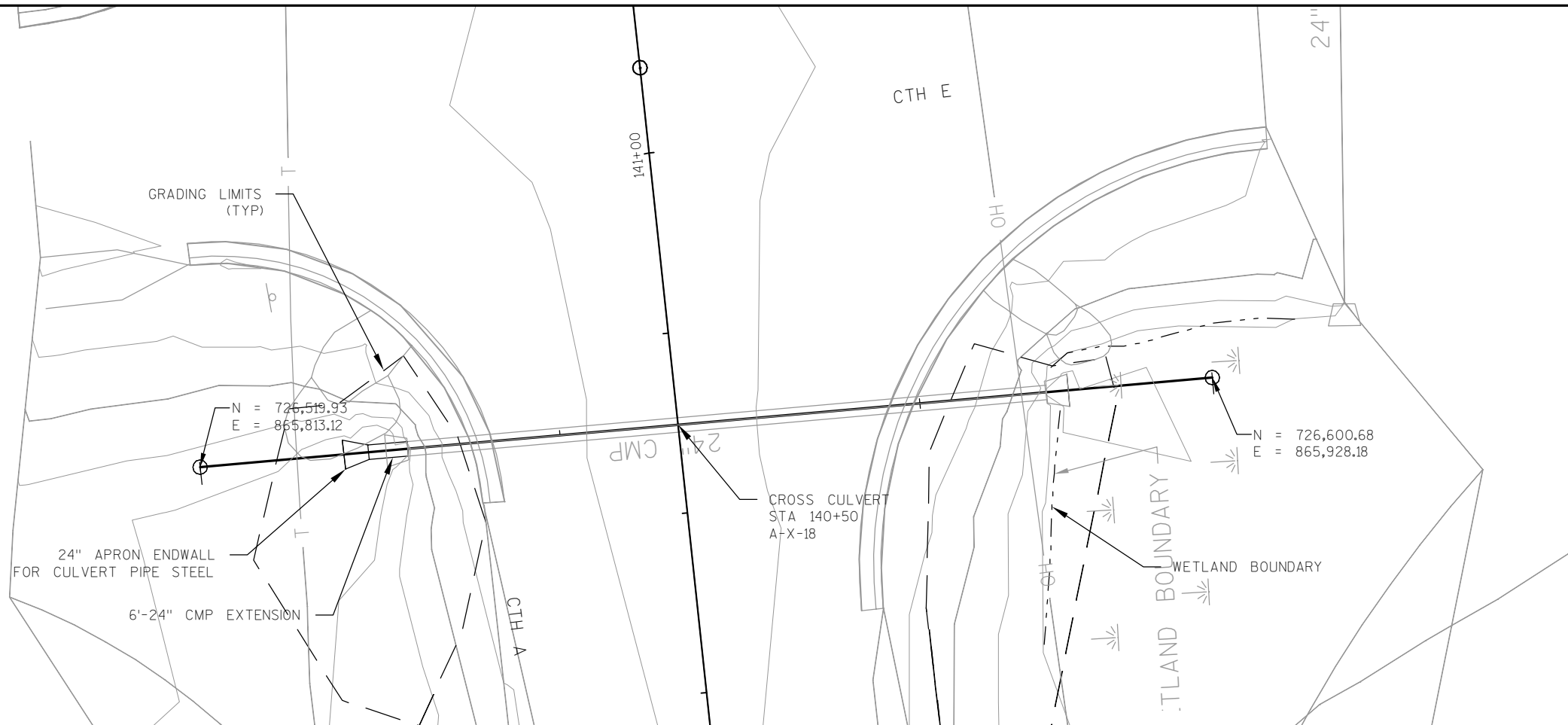


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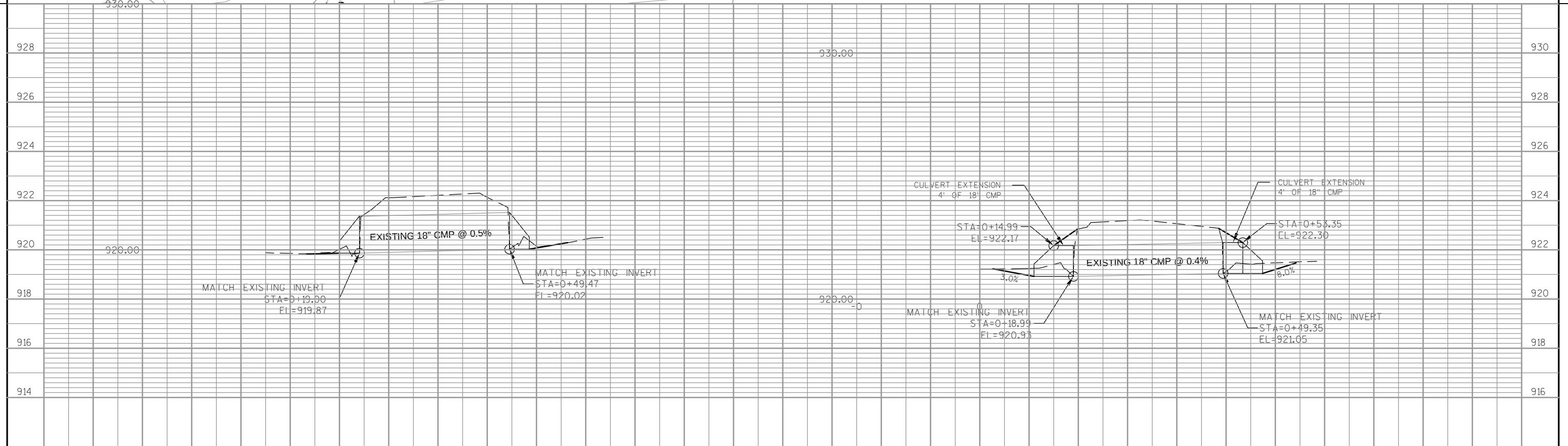
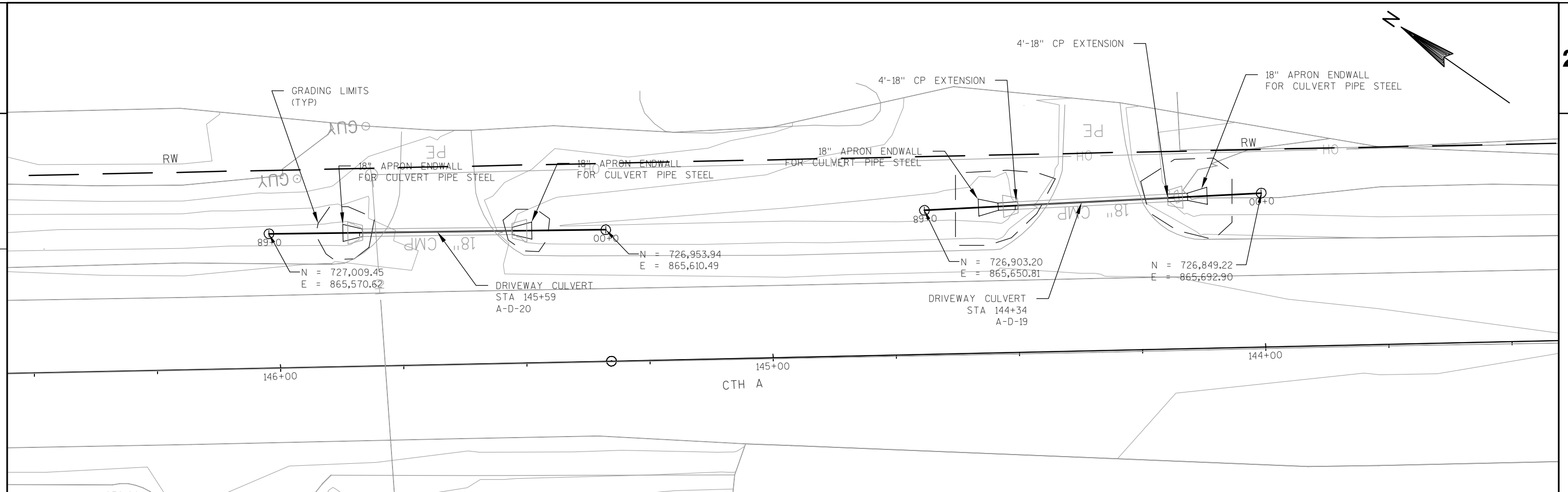
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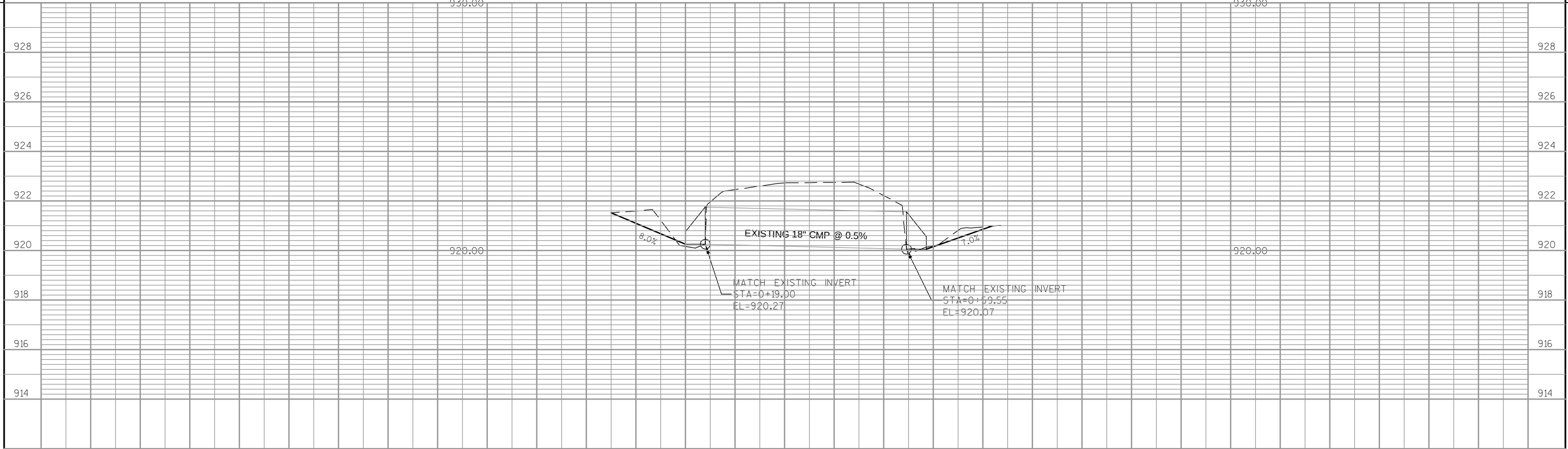
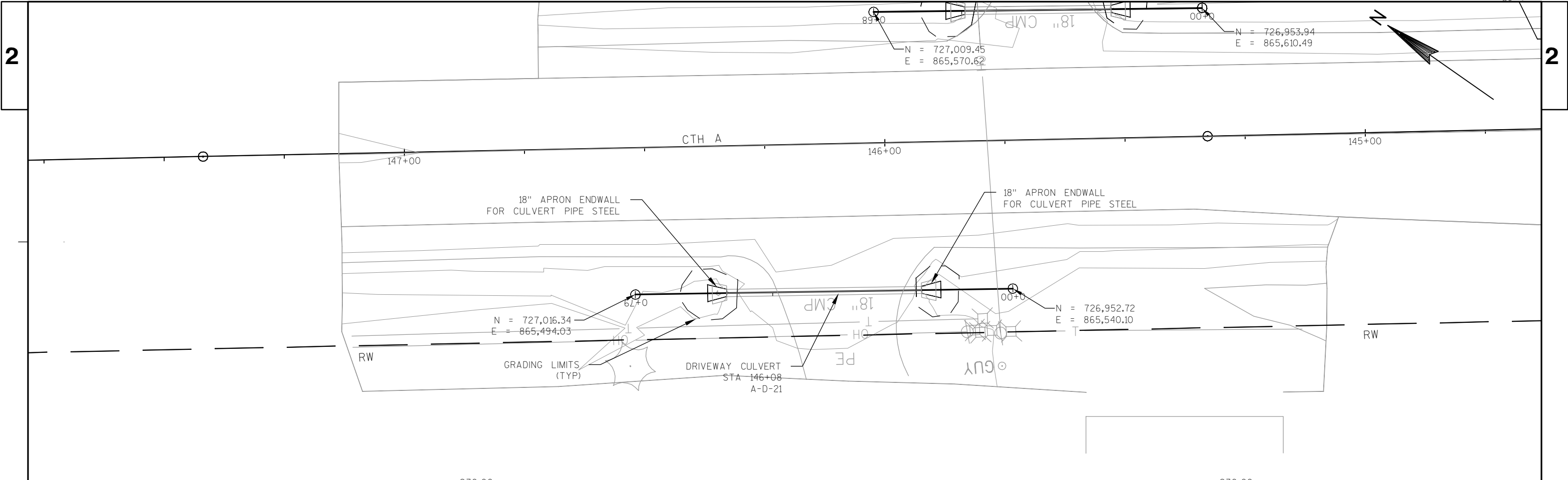
UTILITY LINE OPENING INCLUDED
TO VERIFY LOCATION AND DEPTH
OF TELEPHONE AT A-X-18.

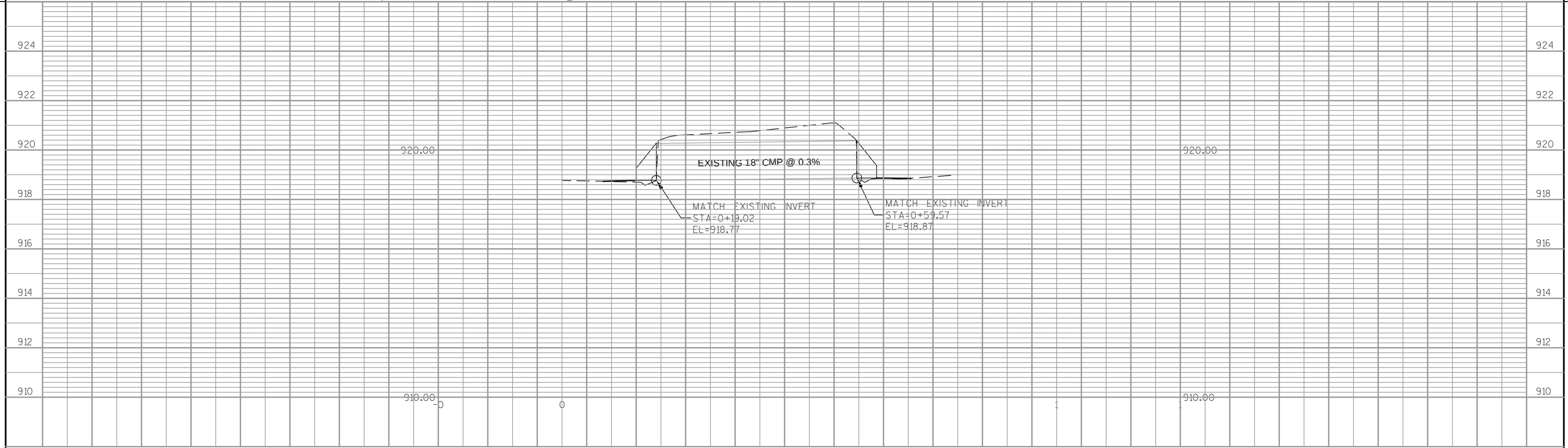
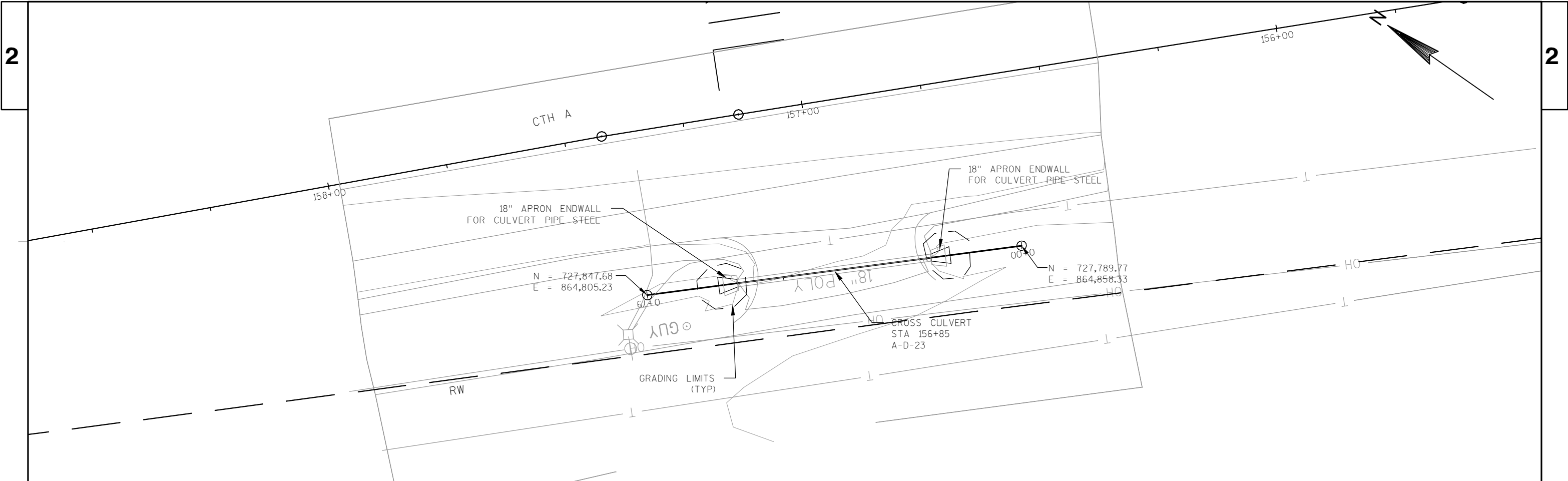


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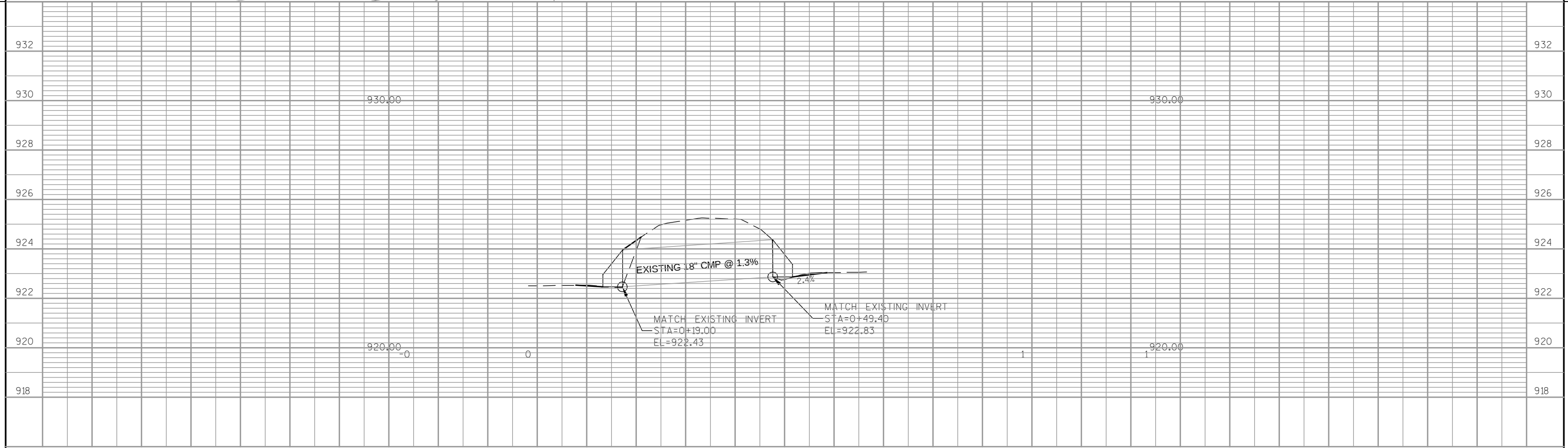
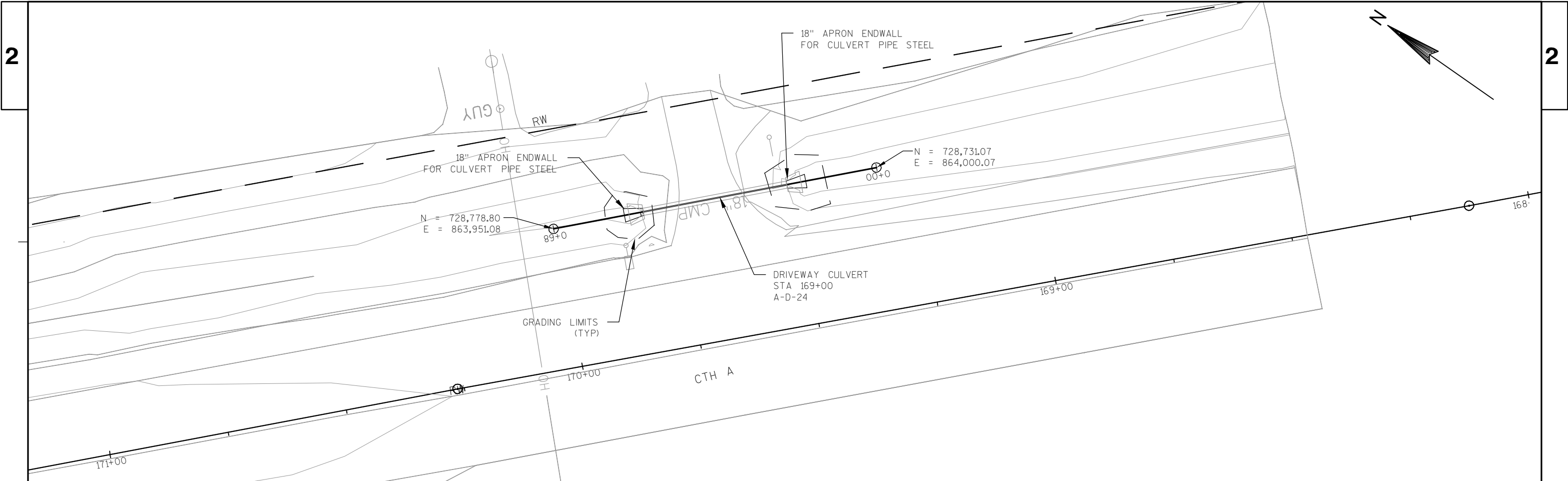
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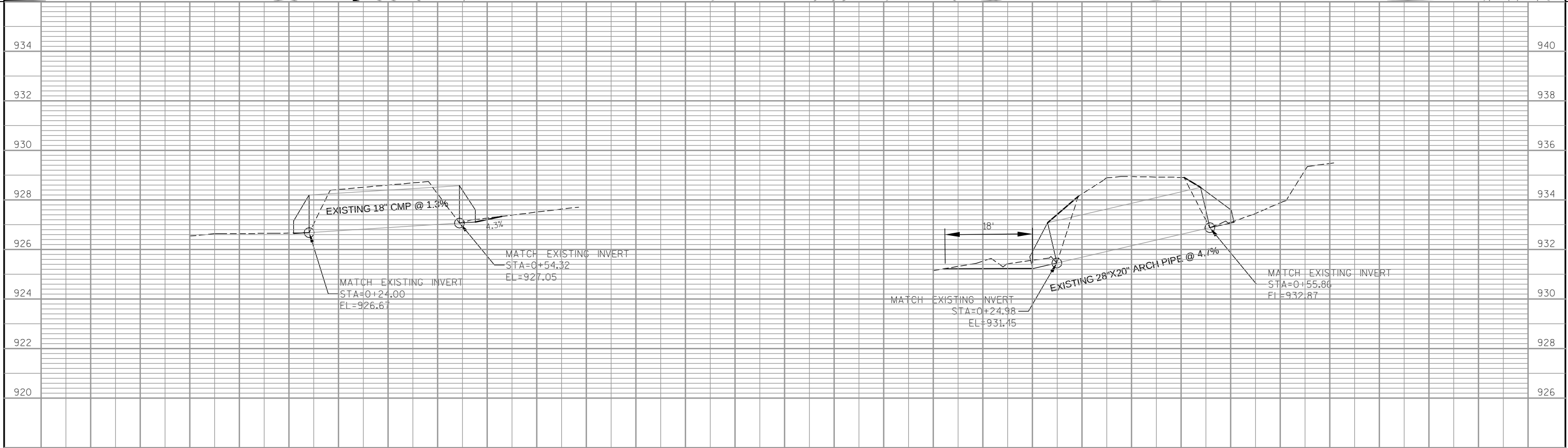
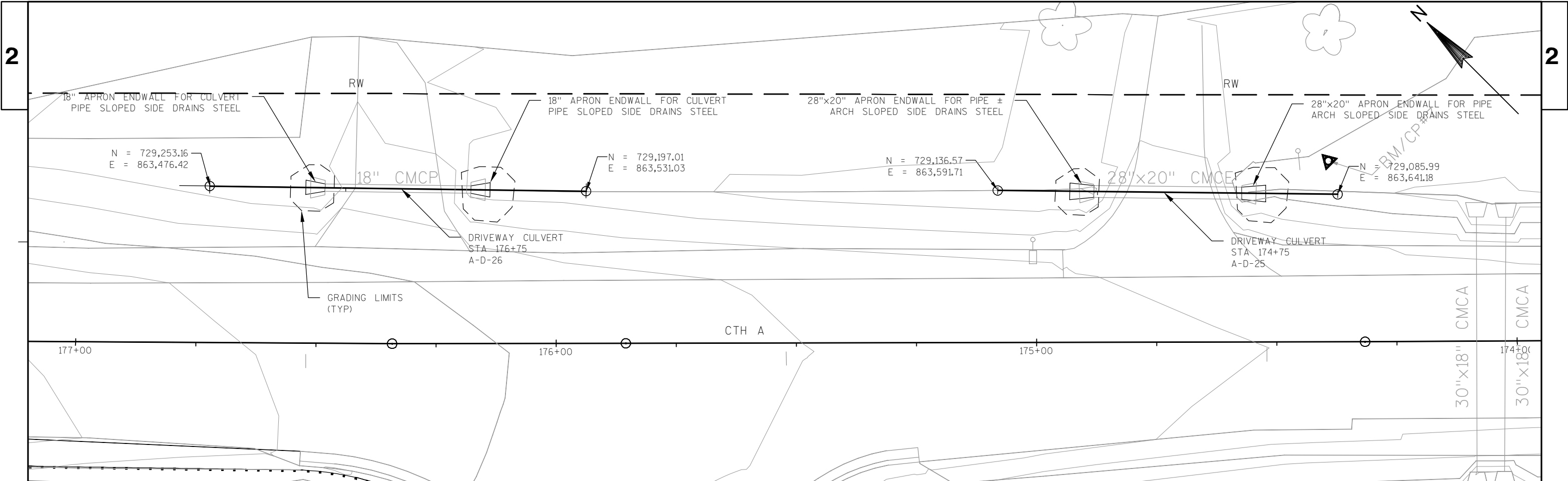


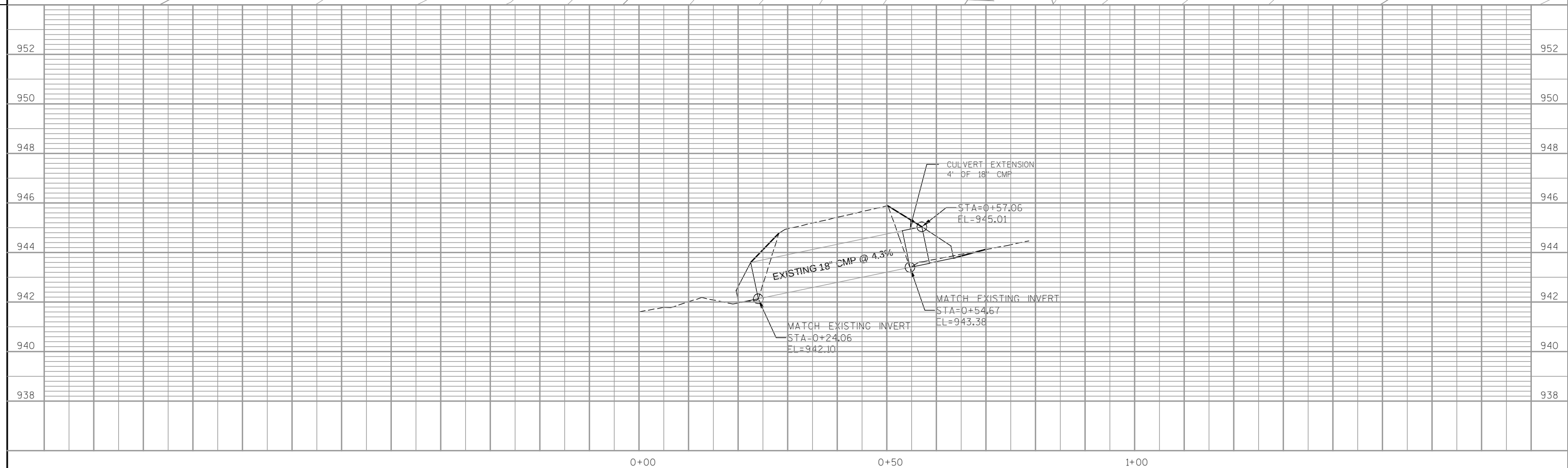
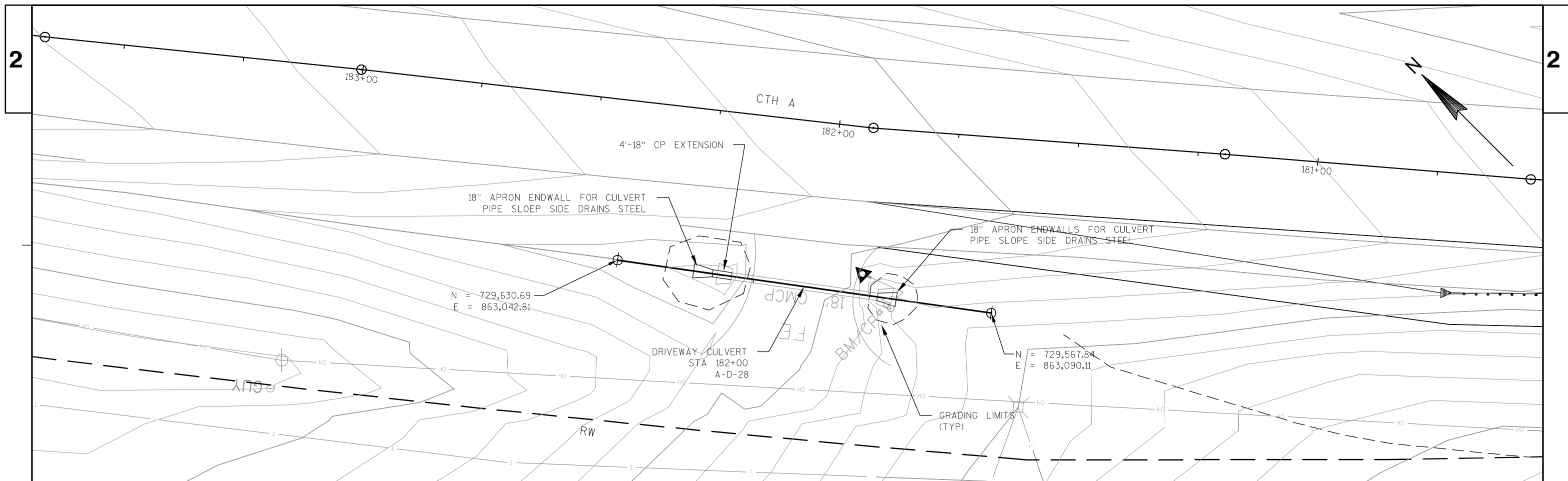


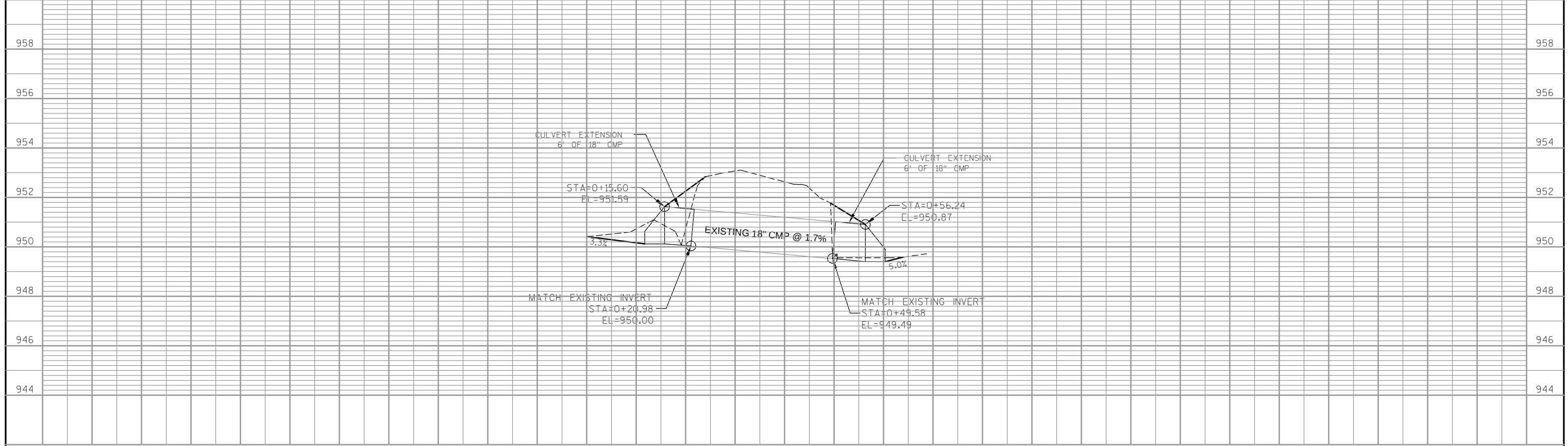
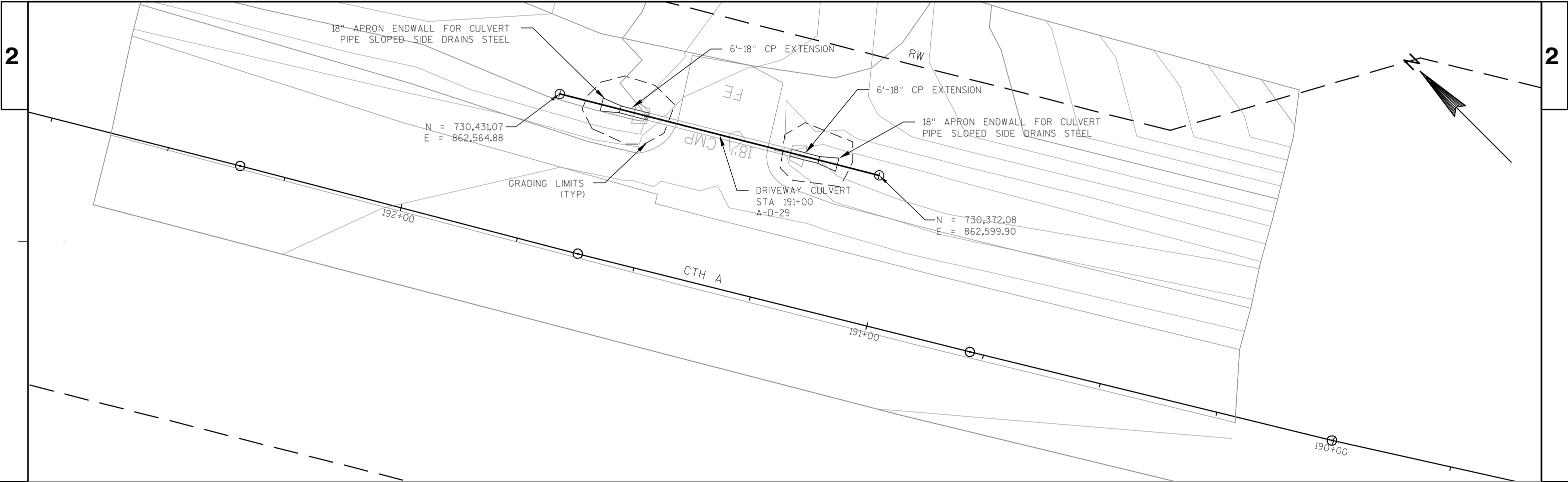


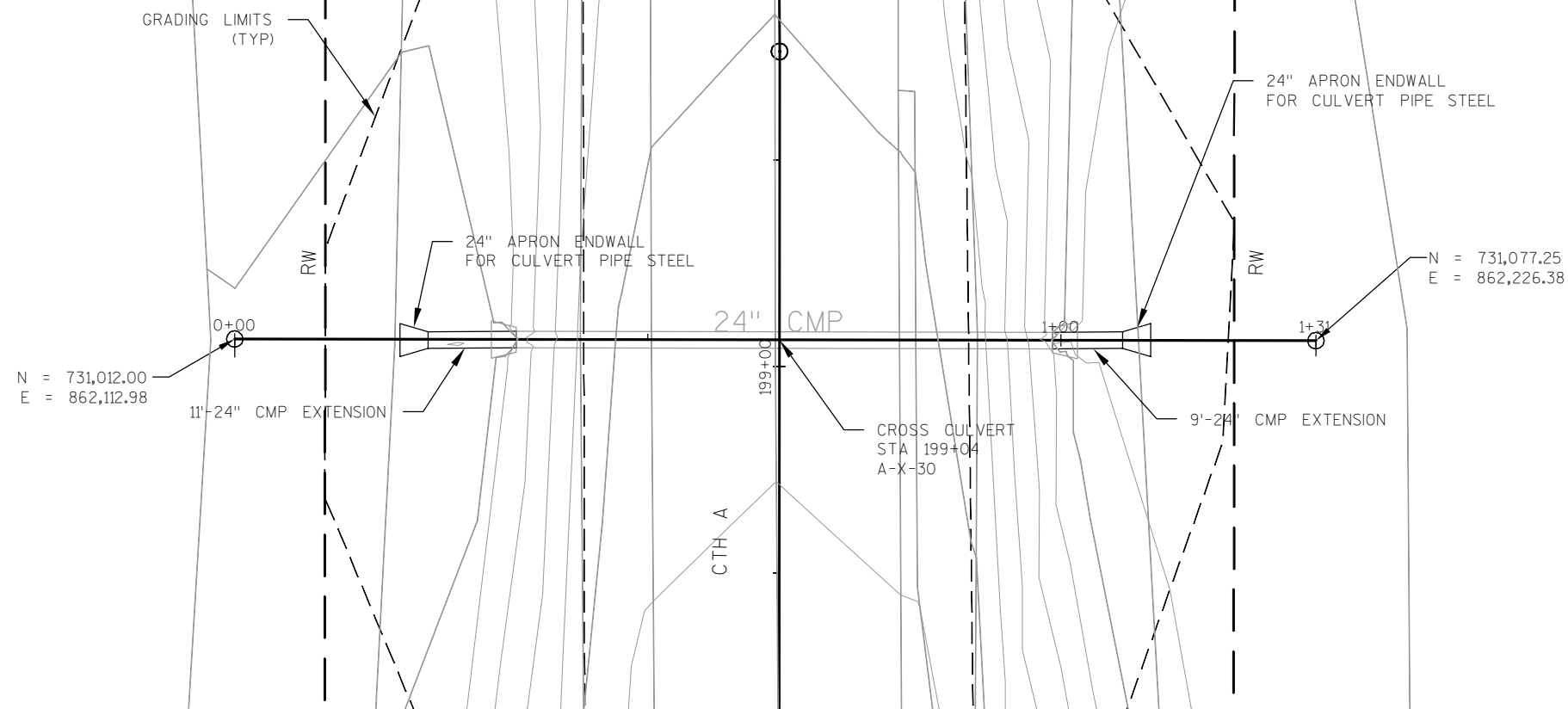
0+00		0+50		1+00	
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				PLOT NAME : -----	
				WISDOT/CADDs SHEET 41a	











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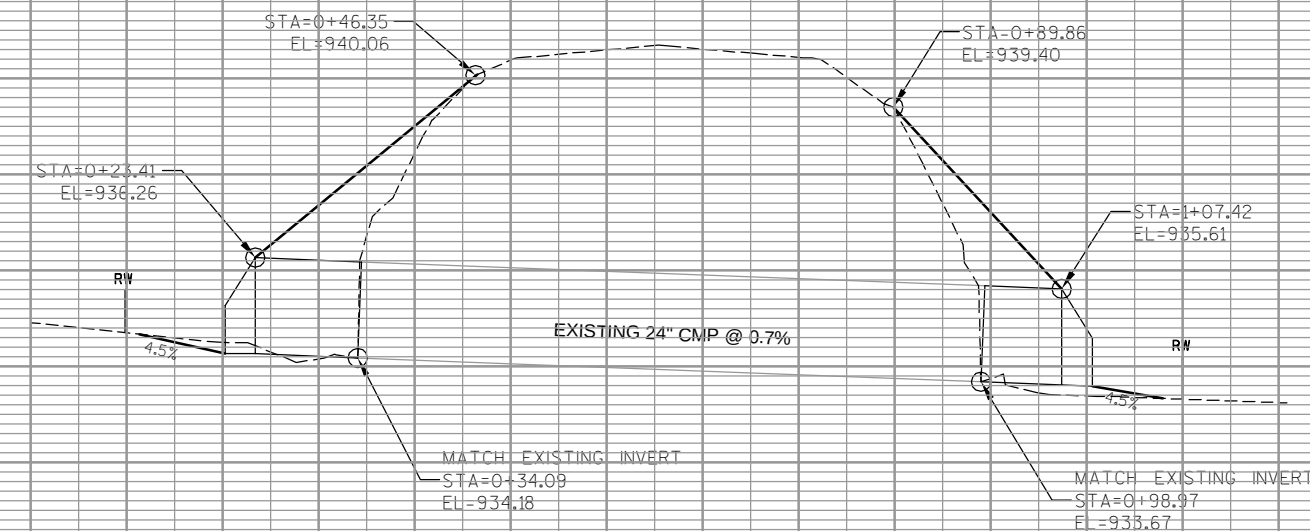
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0+00

0+50

1+00

1+50

PROJECT NO:6207-03-71

HWY: CTH A

COUNTY: DODGE

CULVERT DETAILS : STA 199+04

SHEET

64

E

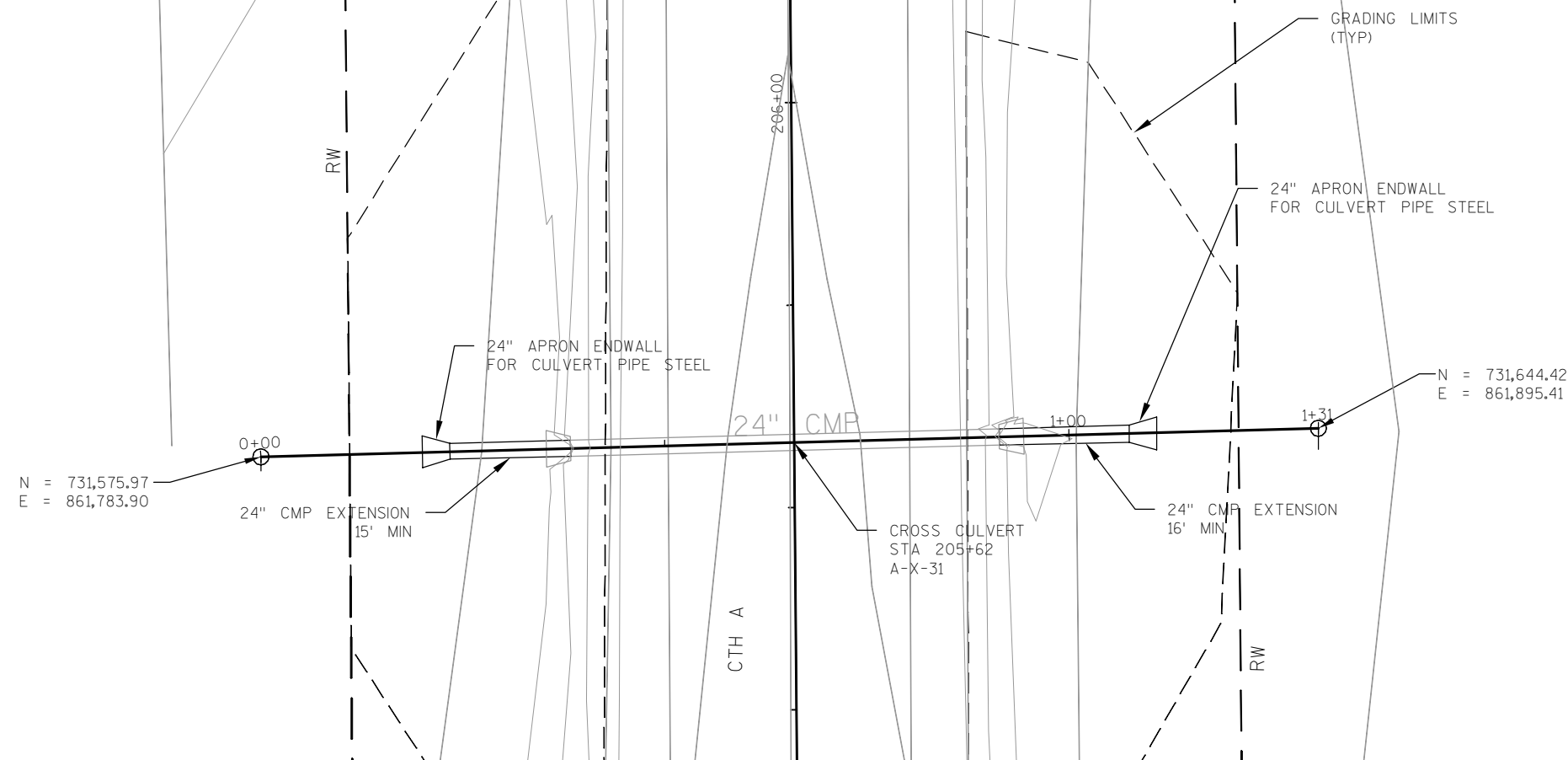
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PLOT DATE : 1/21/2013 10:40 AM

PLOT BY : MOYER, TIM

PLOT NAME : _____

WISDOT/CADDs SHEET 41a



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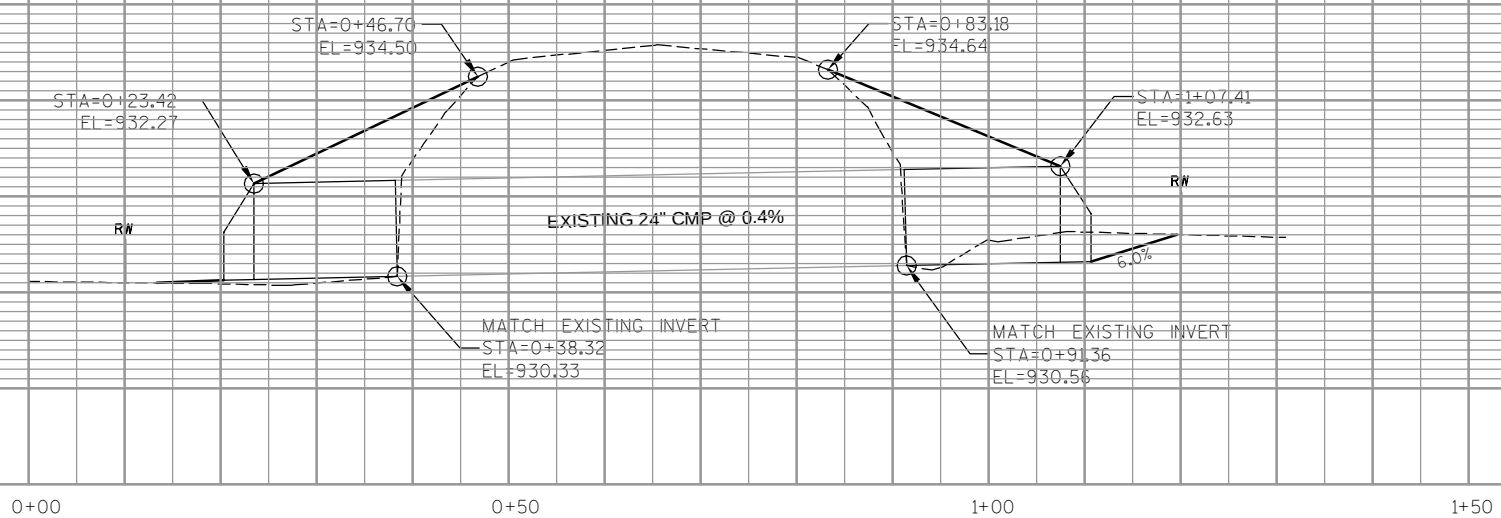
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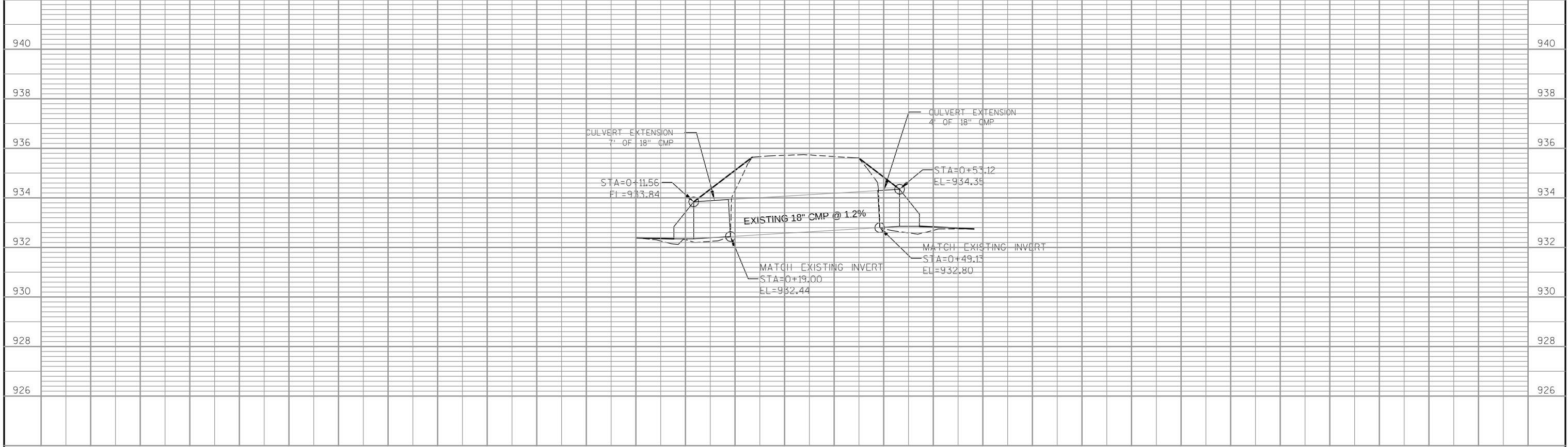
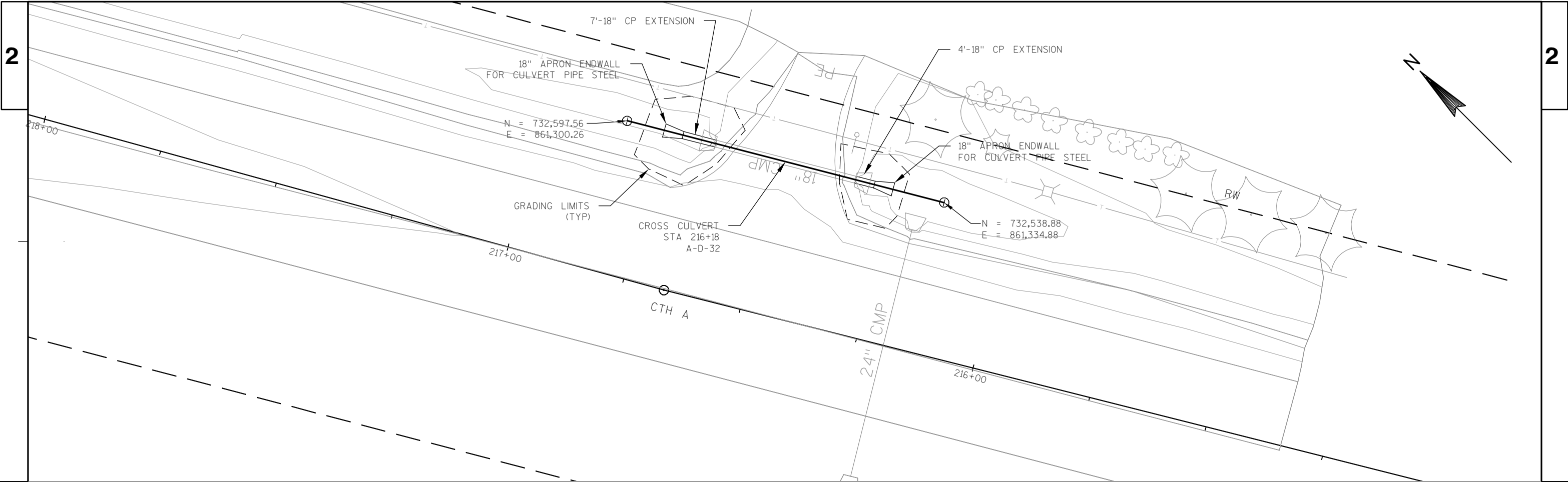


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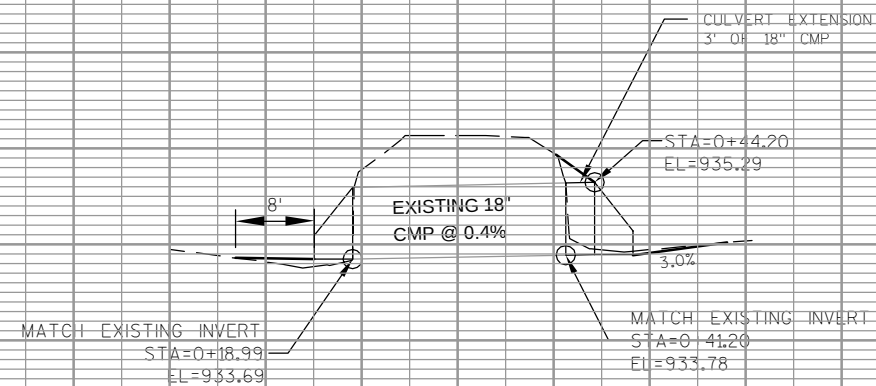
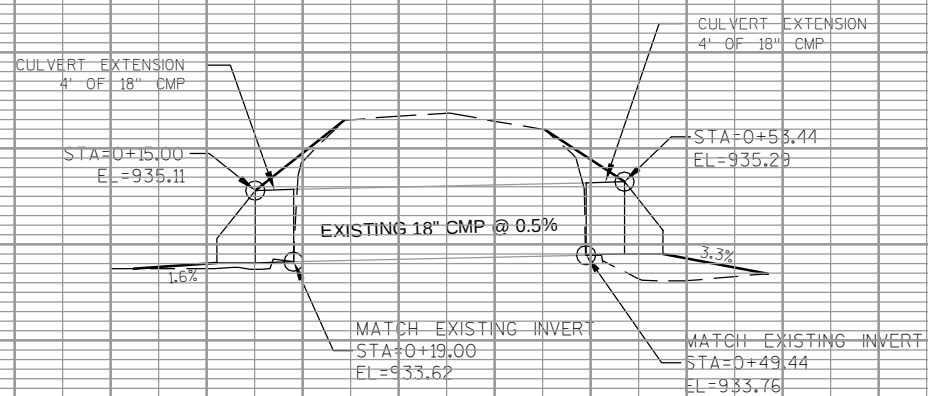
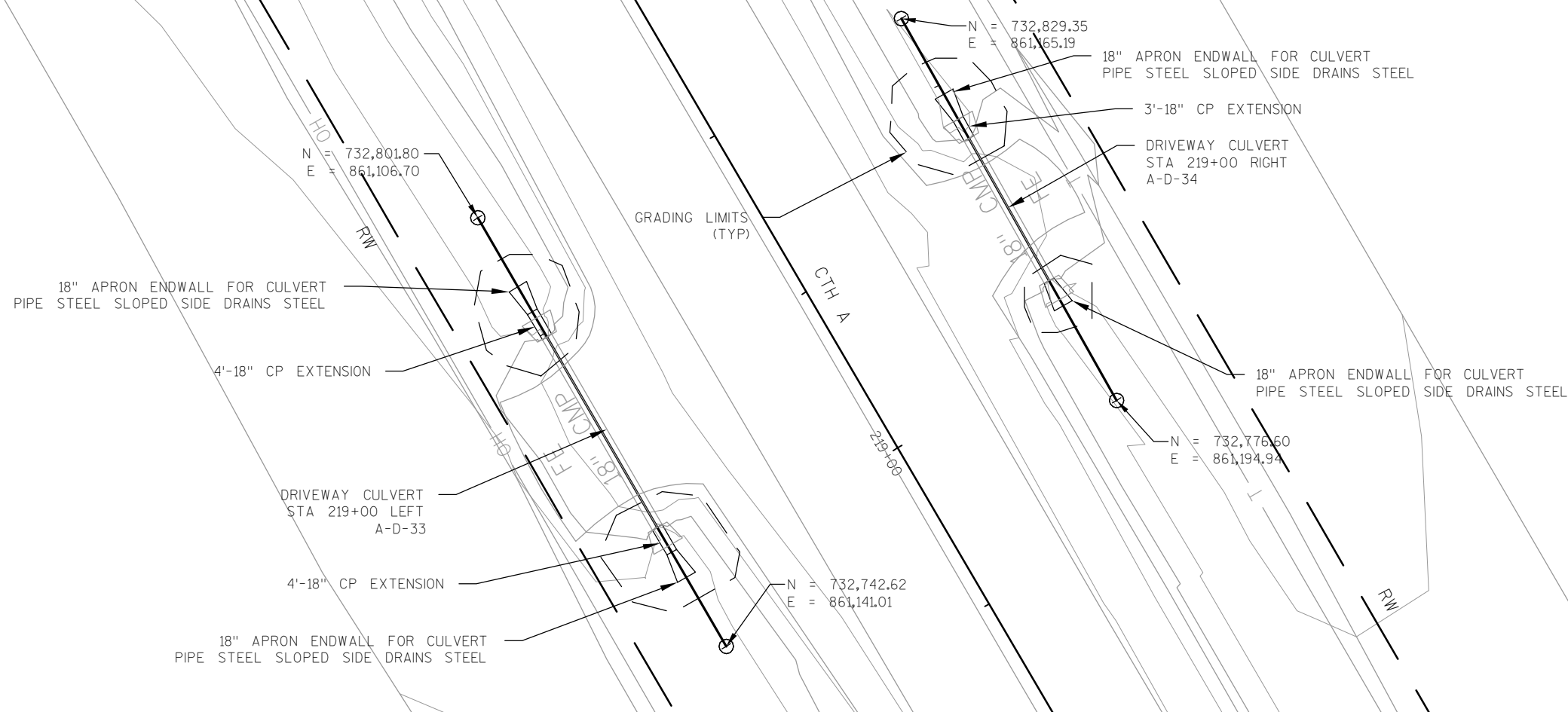
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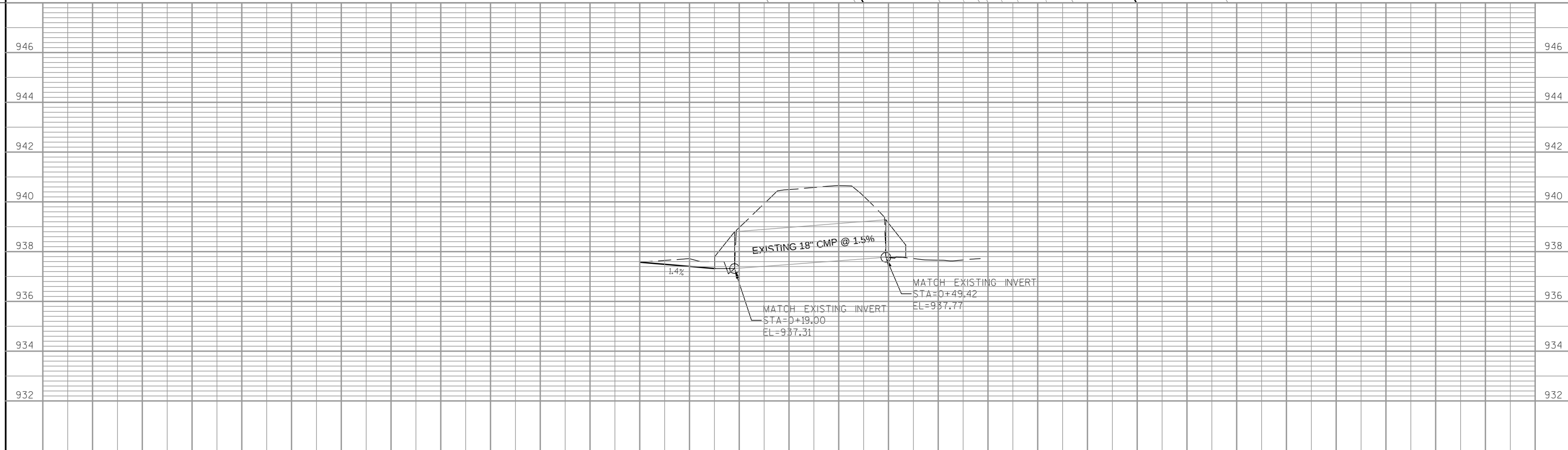
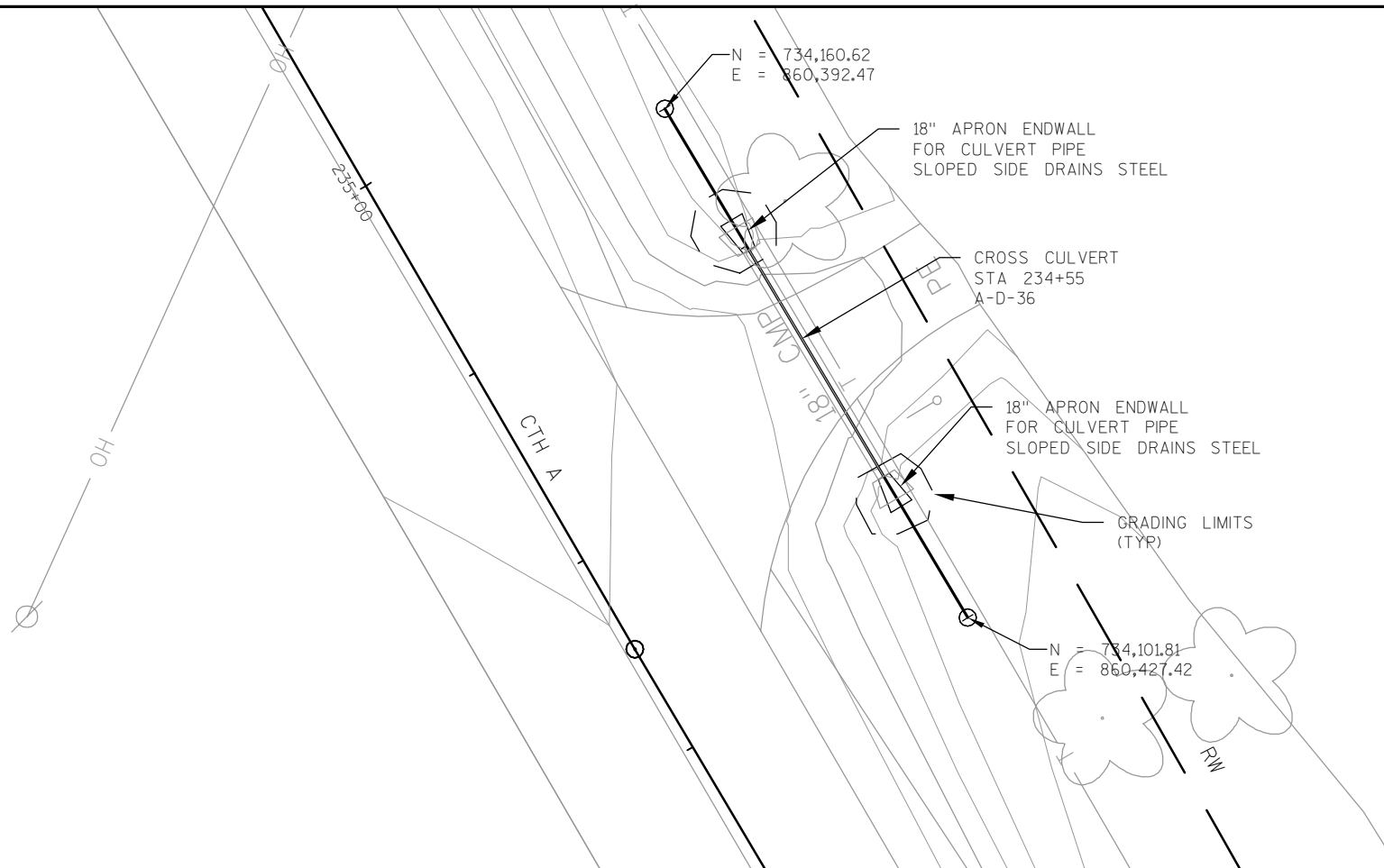


PROJECT NO:6207-03-71	HWY: CTH A	COUNTY: DODGE	CULVERT DETAILS : STA 216+18	SHEET 66	E
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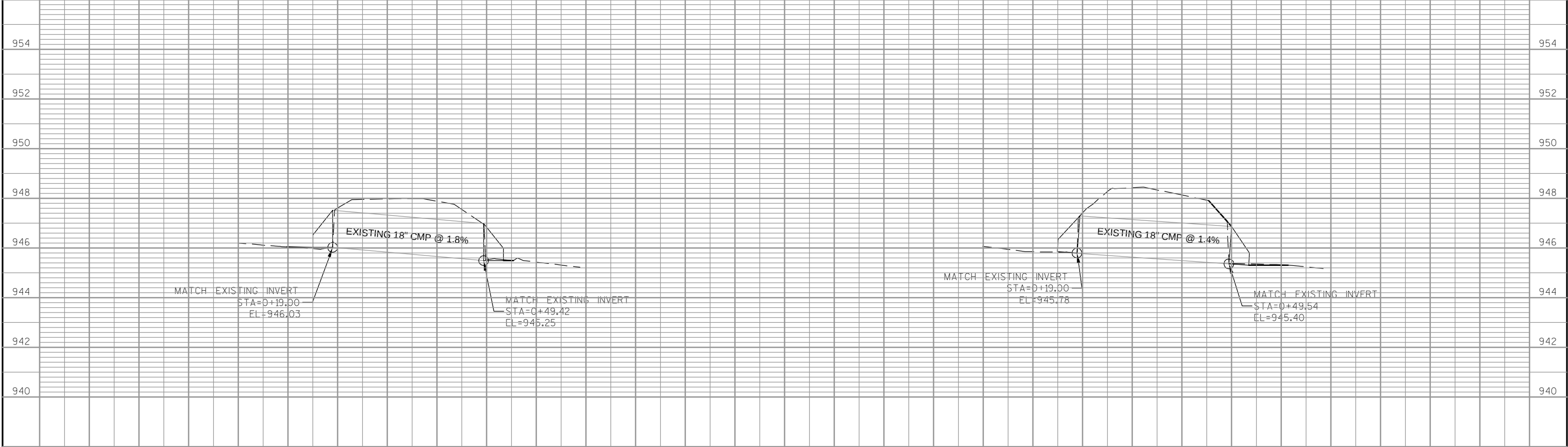
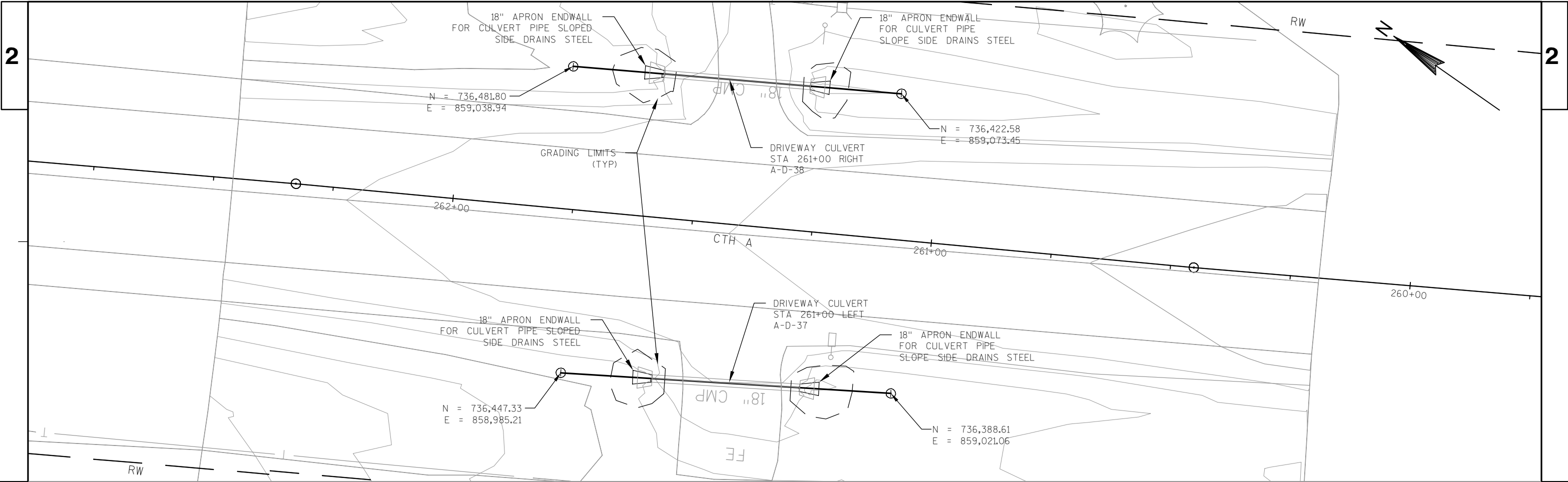


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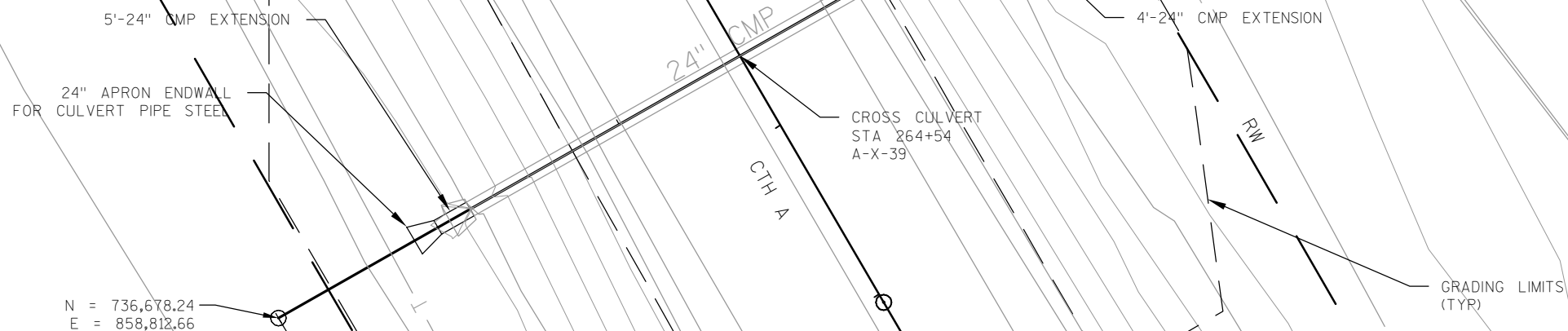


PROJECT NO:6207-03-71	HWY: CTH A	COUNTY: DODGE	CULVERT DETAILS : STA 234+55	SHEET 68	E
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**NOTE:**

UTILITY LINE OPENING INCLUDED
TO DETERMINE LOCATION AND DEPTH OF
TELEPHONE AT A-X-39 LEFT.



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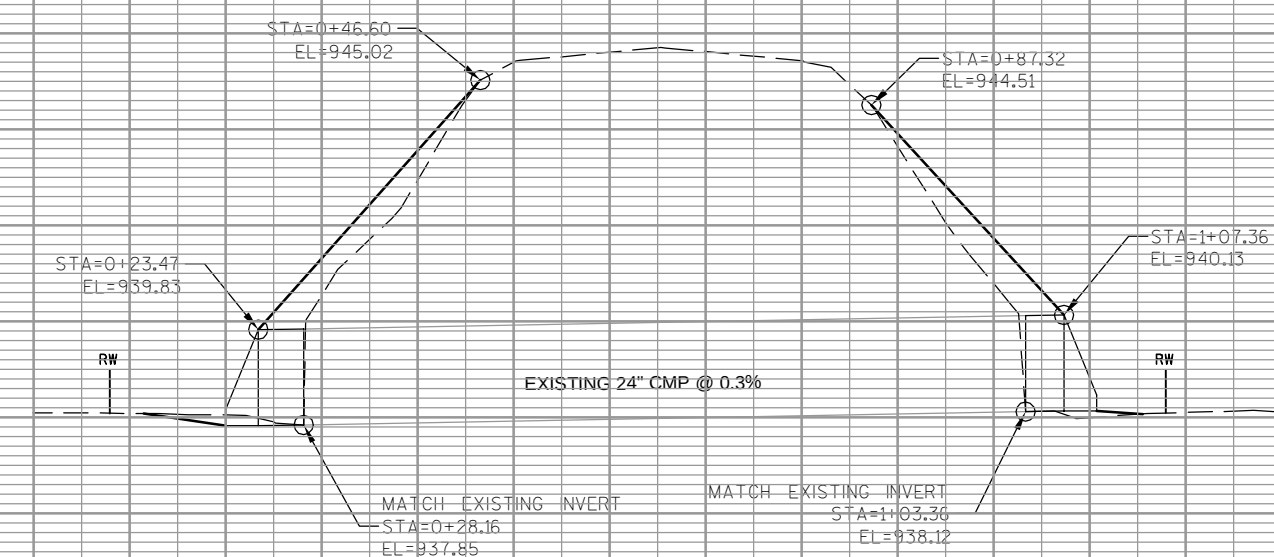
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0+00

0+50

1+00

1+50

PROJECT NO:6207-03-71

HWY: CTH A

COUNTY: DODGE

CULVERT DETAILS : STA 264+54

SHEET

70

E

FILE NAME : L:\PROJECTS\12349\DWG\021205_PD.DWG

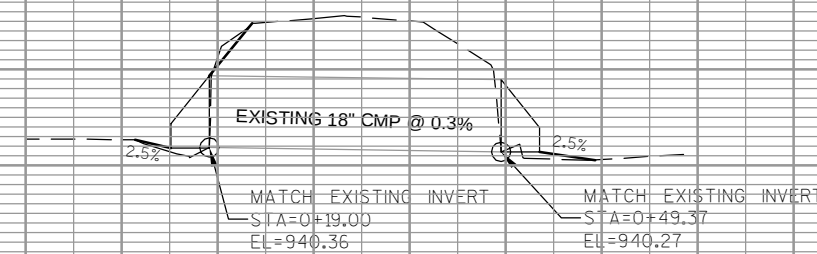
PLOT DATE : 1/21/2013 10:40 AM

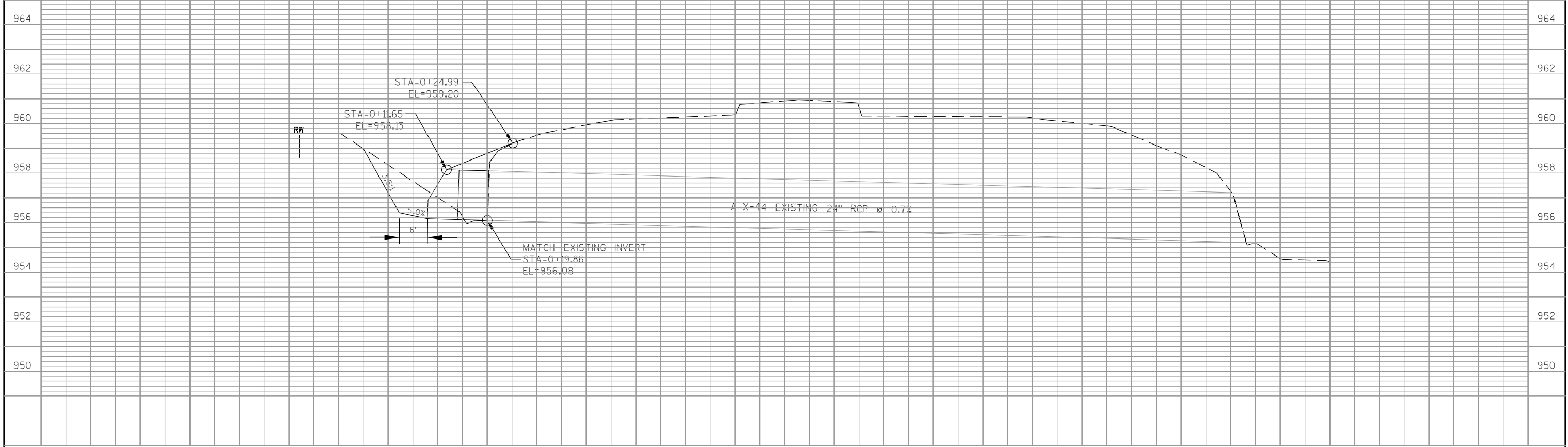
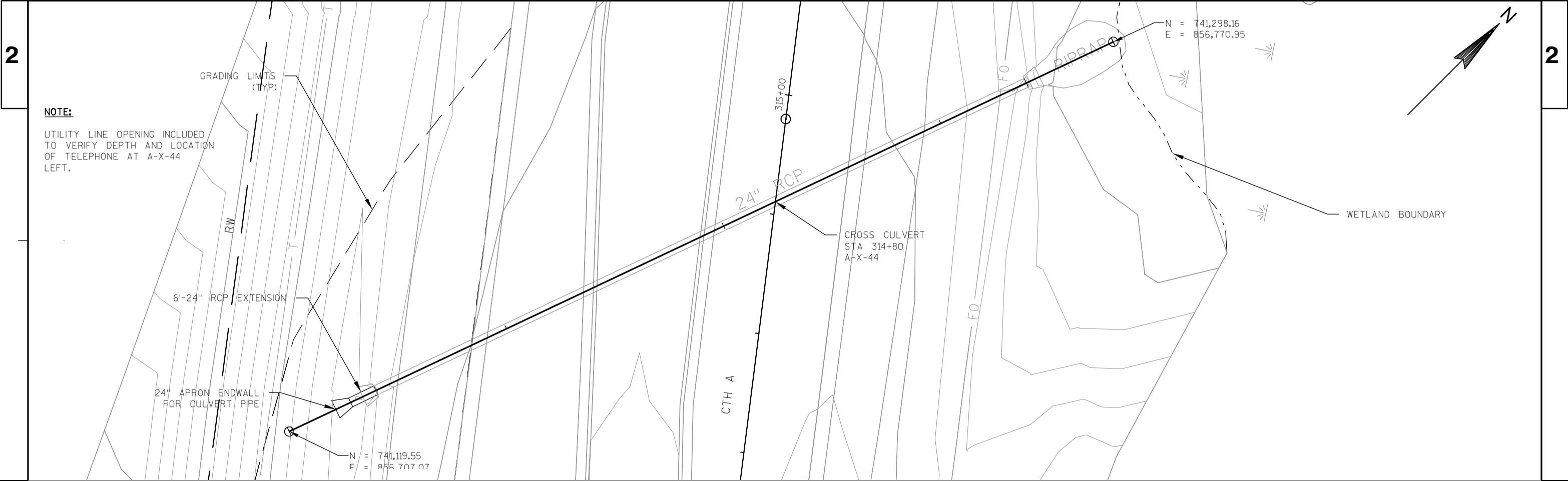
PLOT BY : MOYER, TIM

PLOT NAME : -----

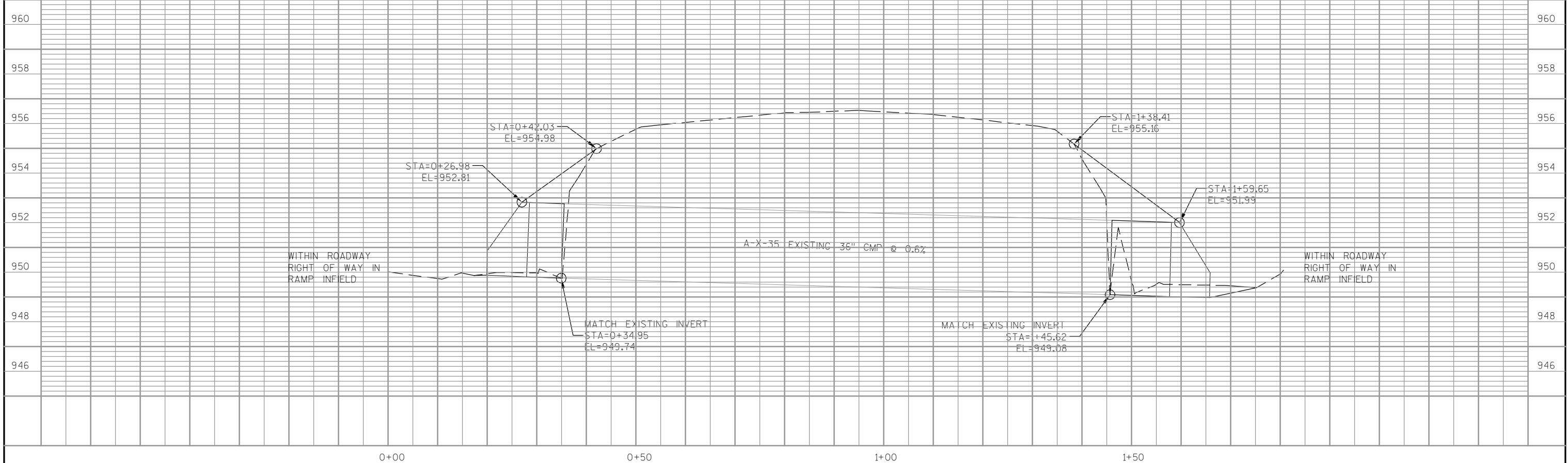
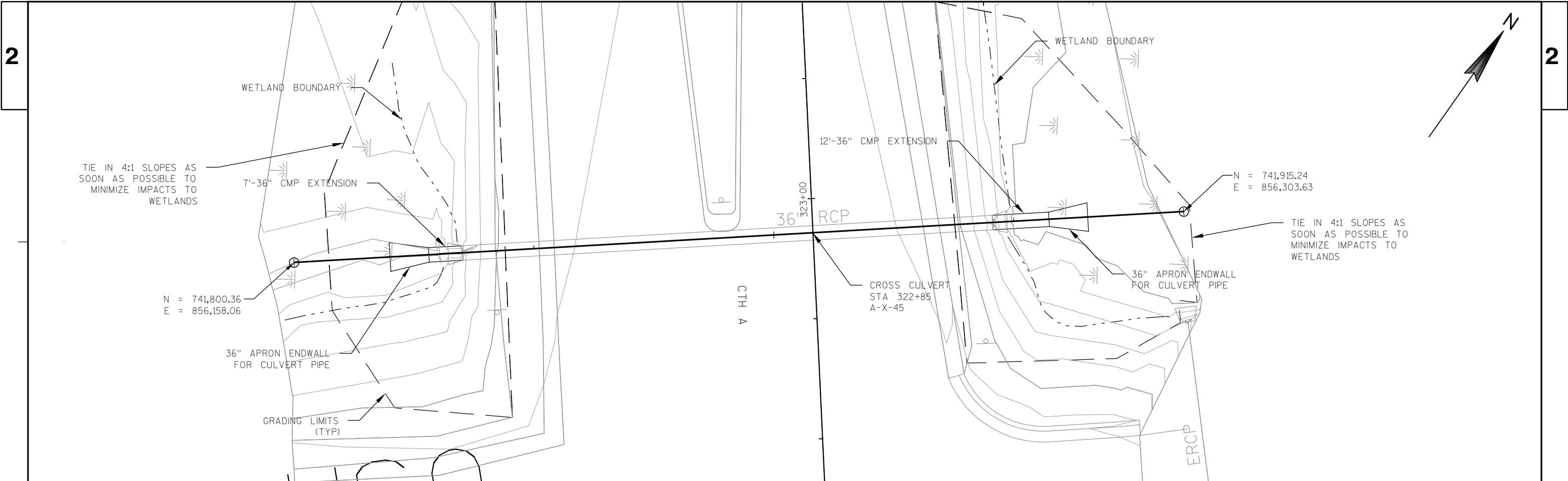
WISDOT/CADDs SHEET 41a

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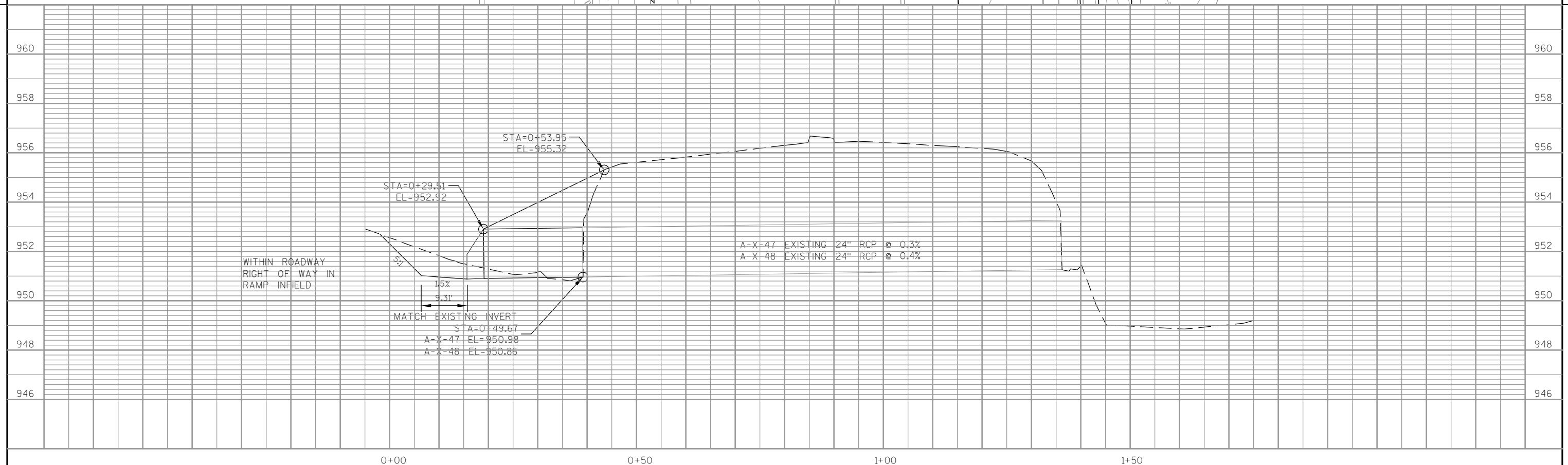
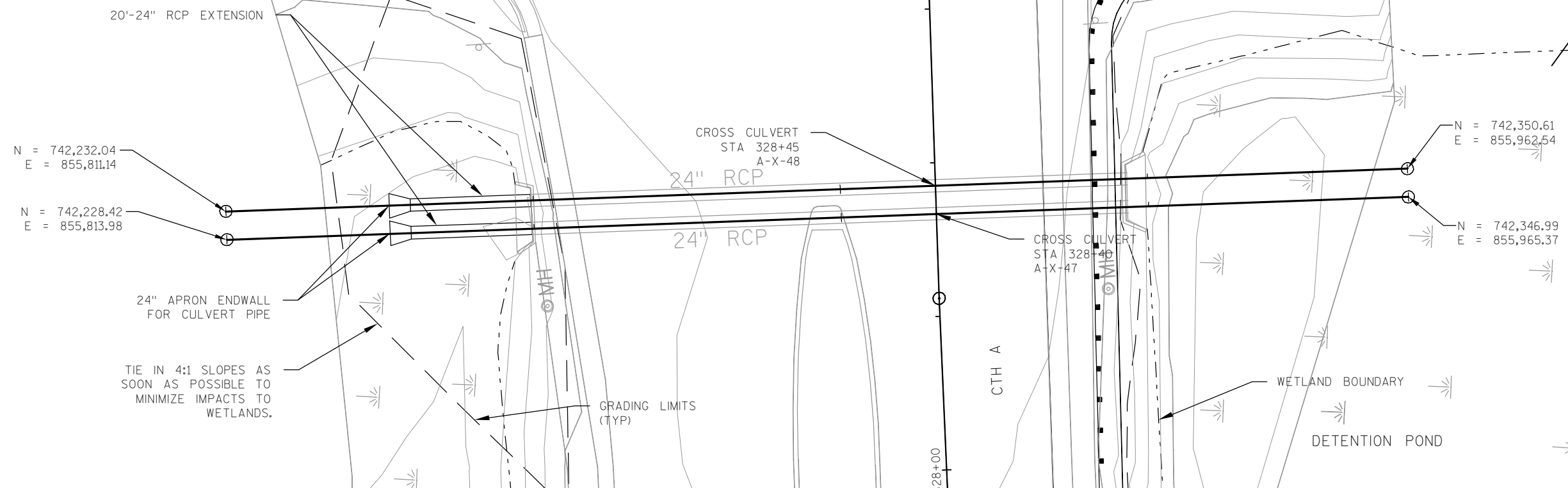


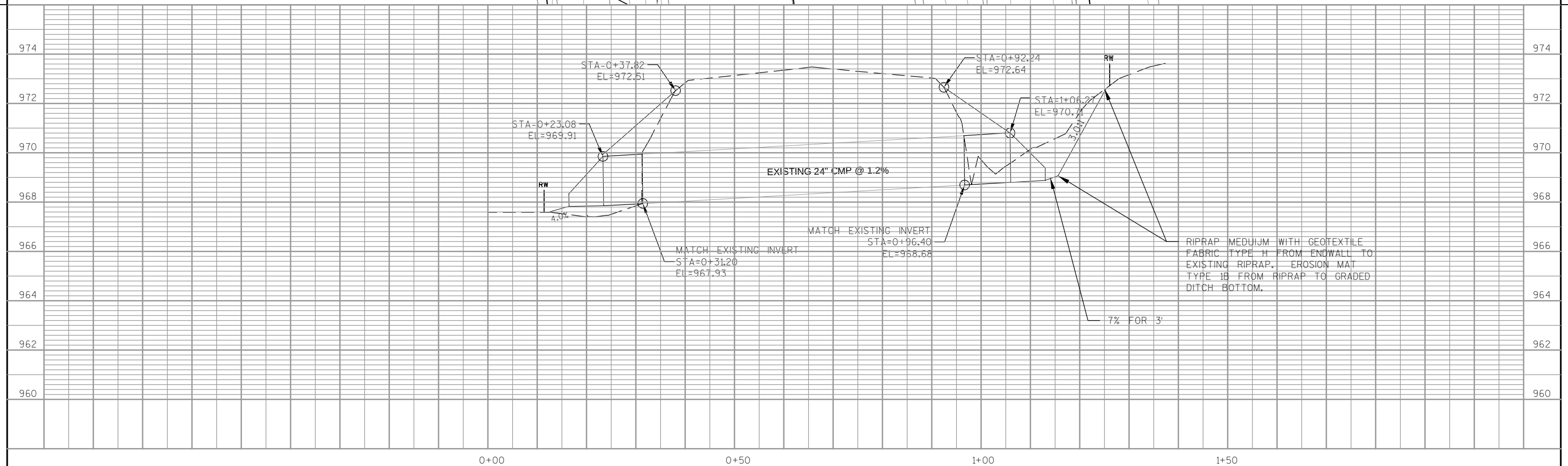
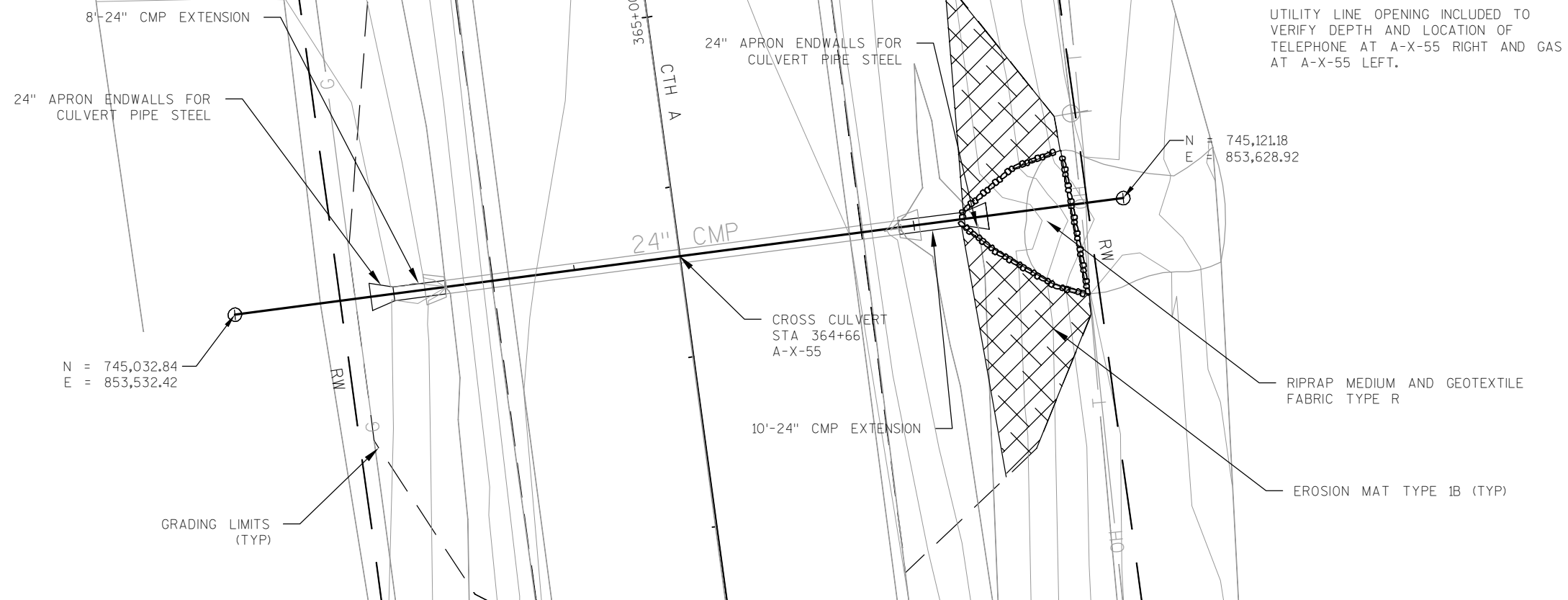
PROJECT NO:6207-03-71	HWY: CTH A	COUNTY: DODGE	CULVERT DETAILS : STA 314+80	SHEET 72	E
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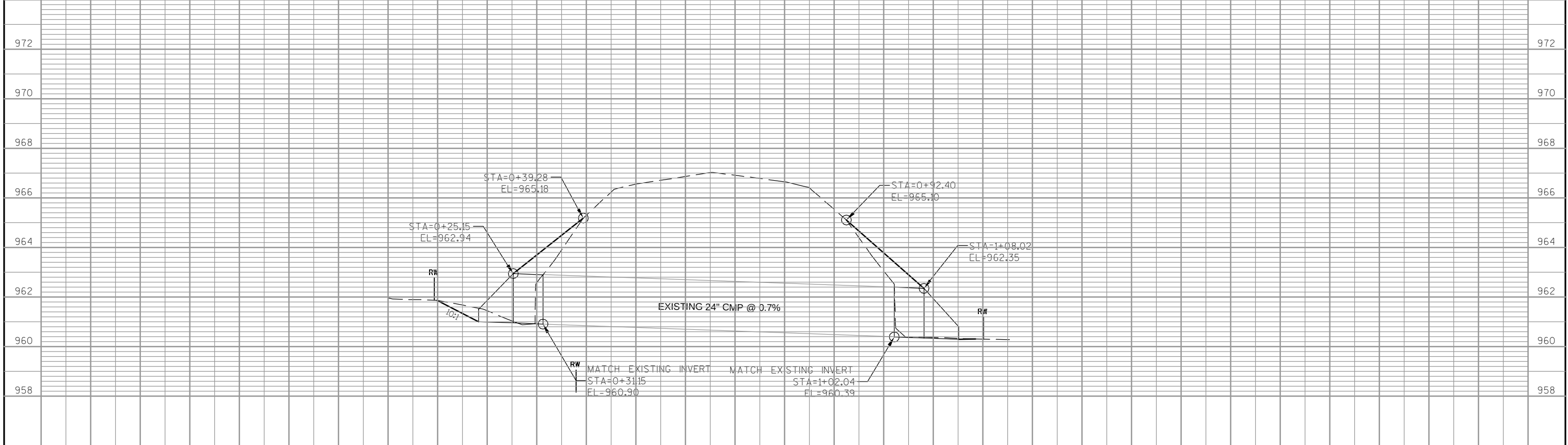
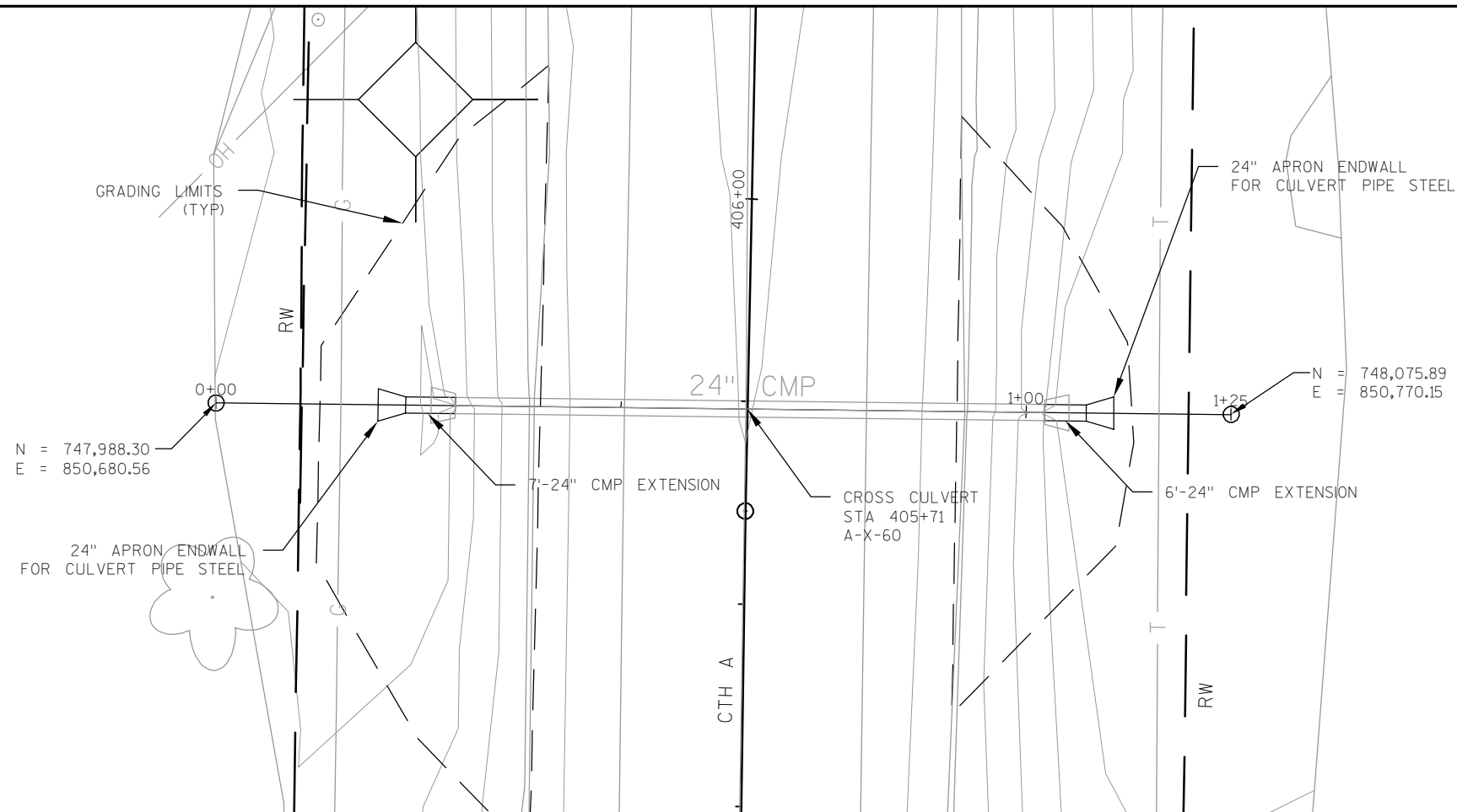


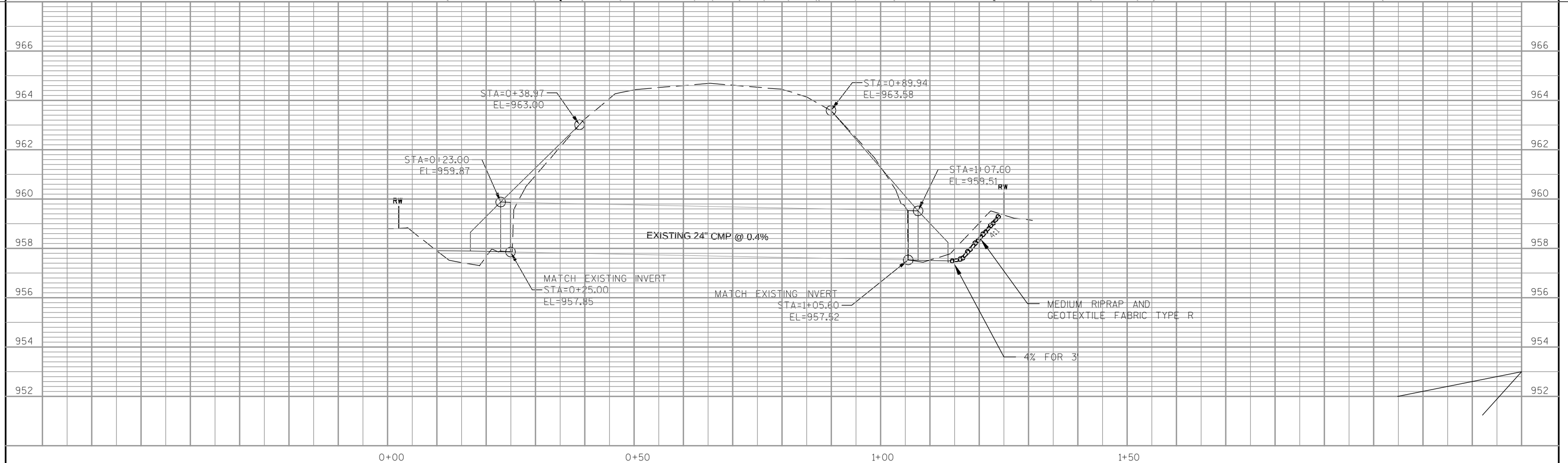
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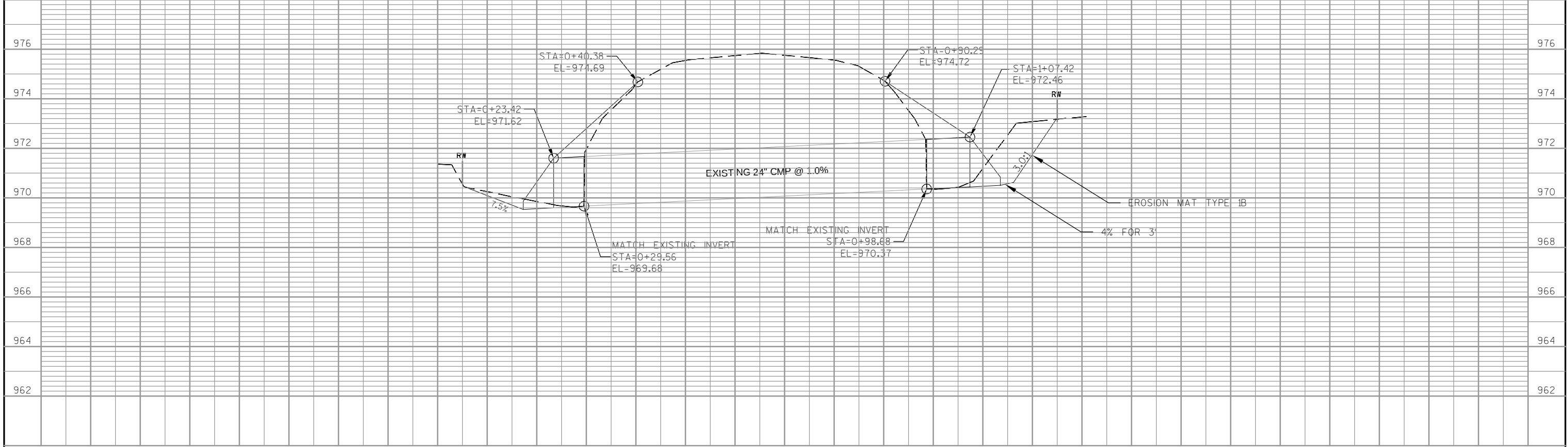
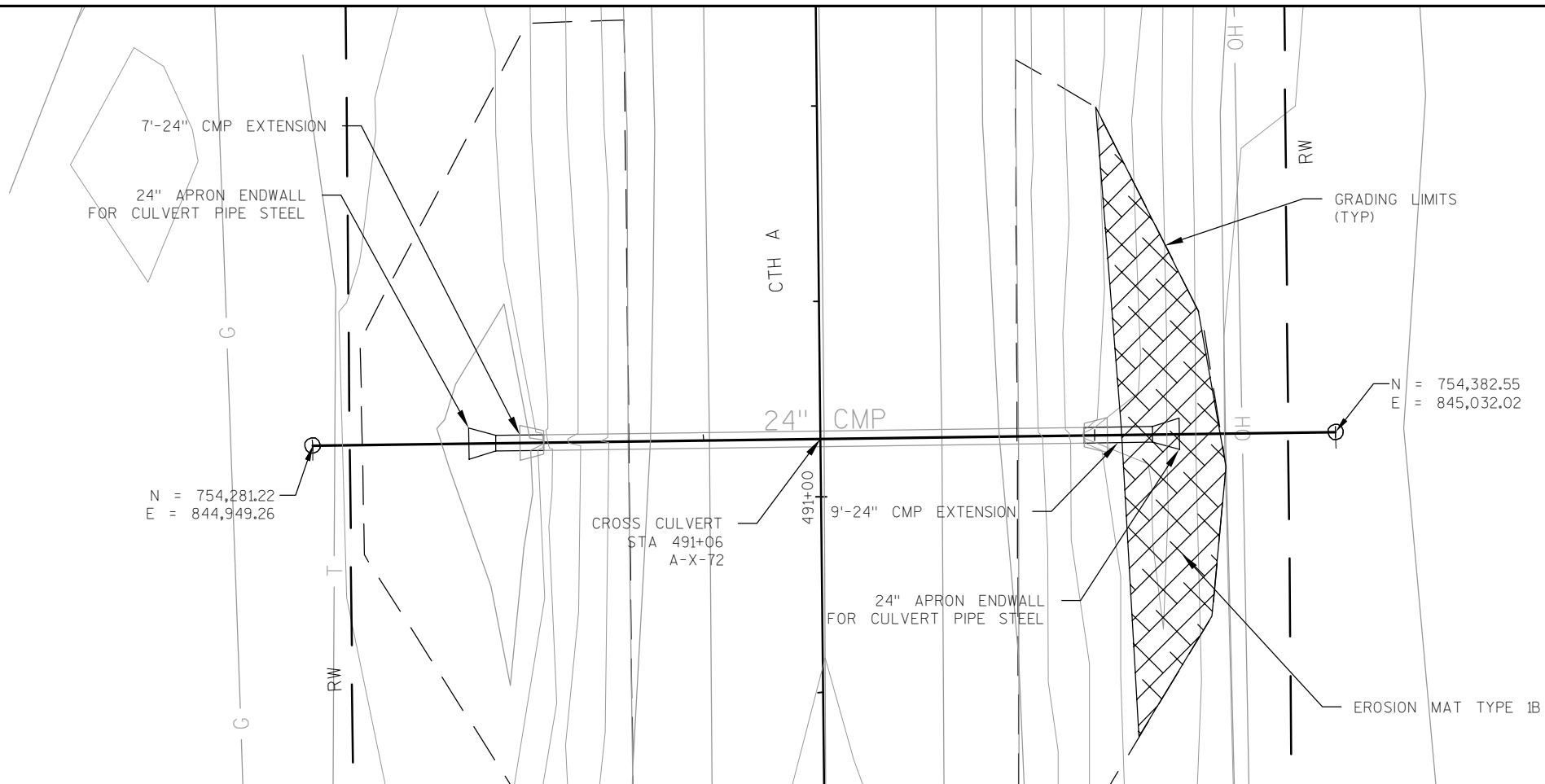


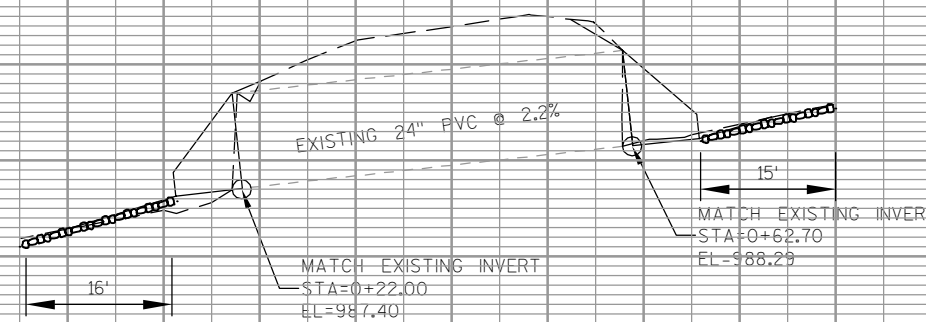
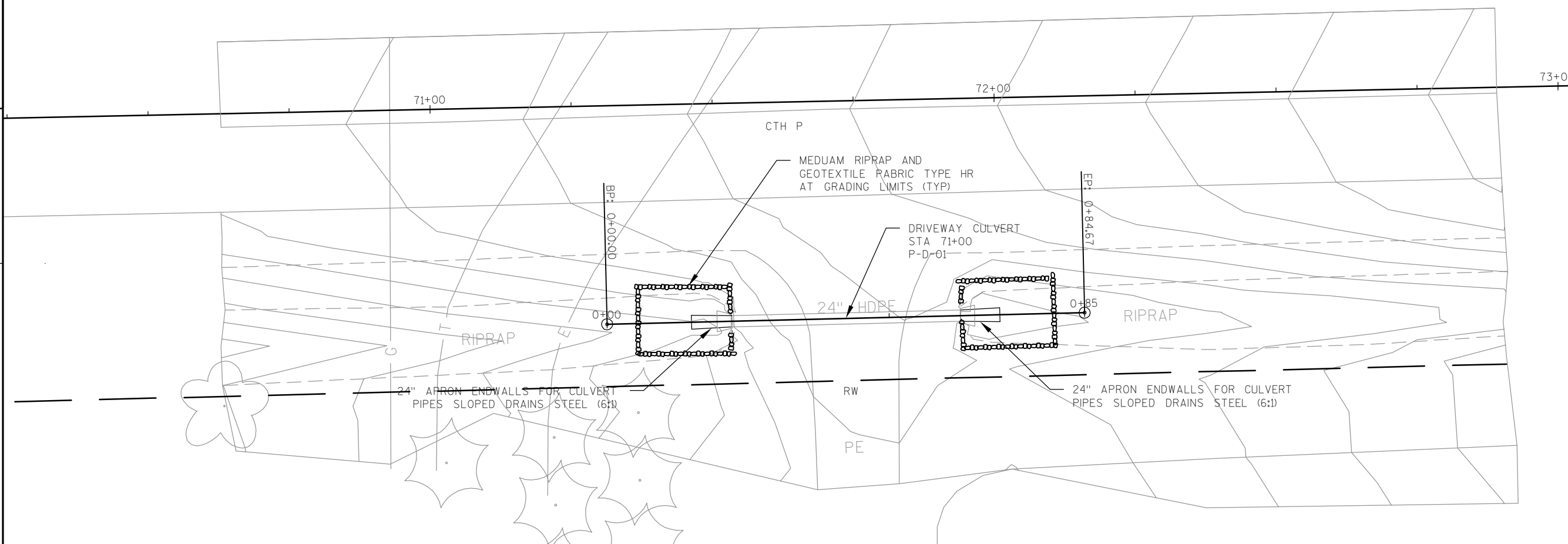


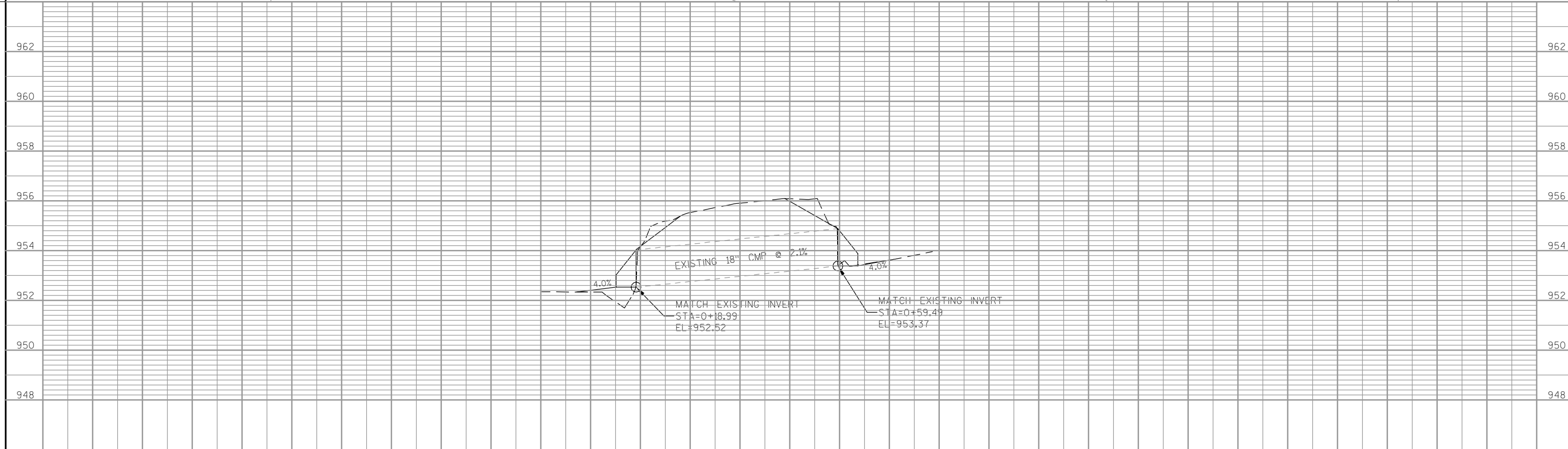
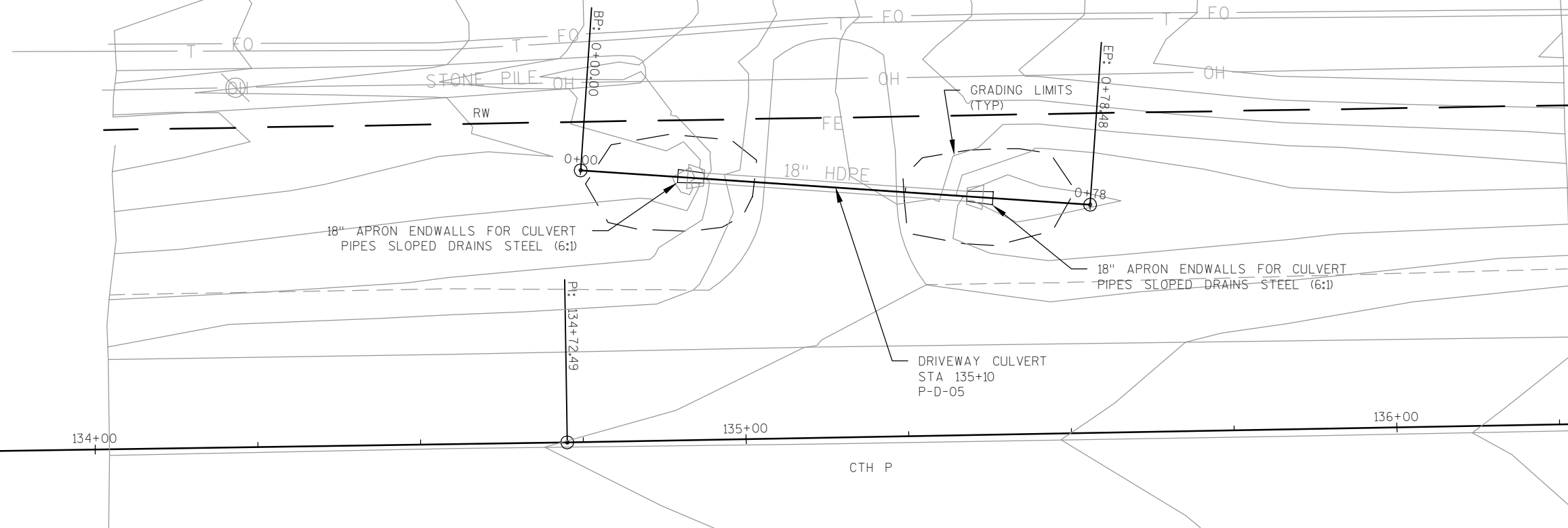


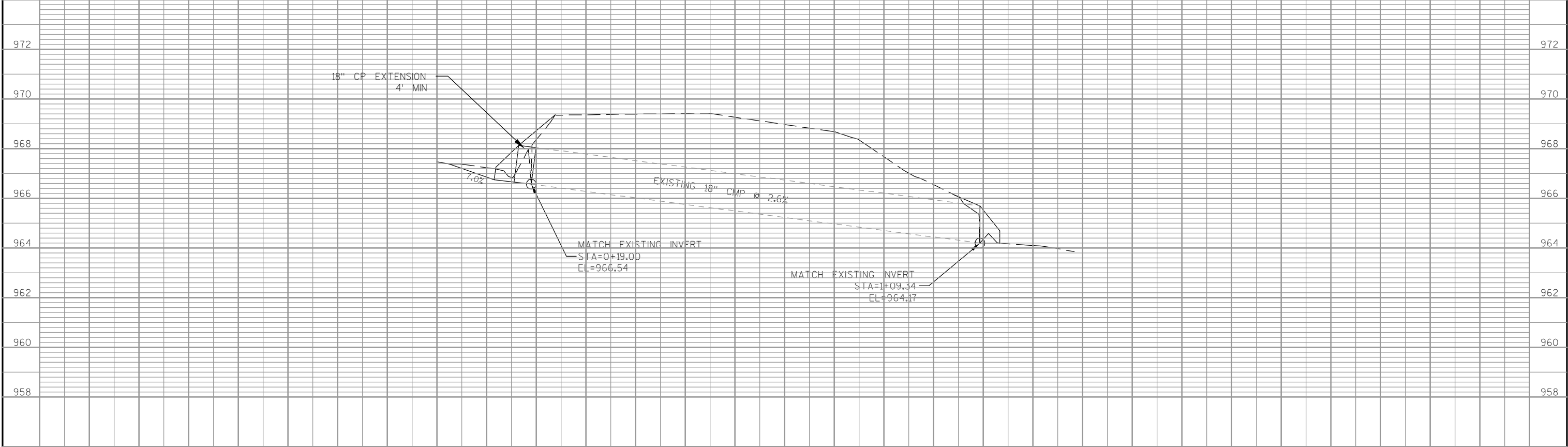
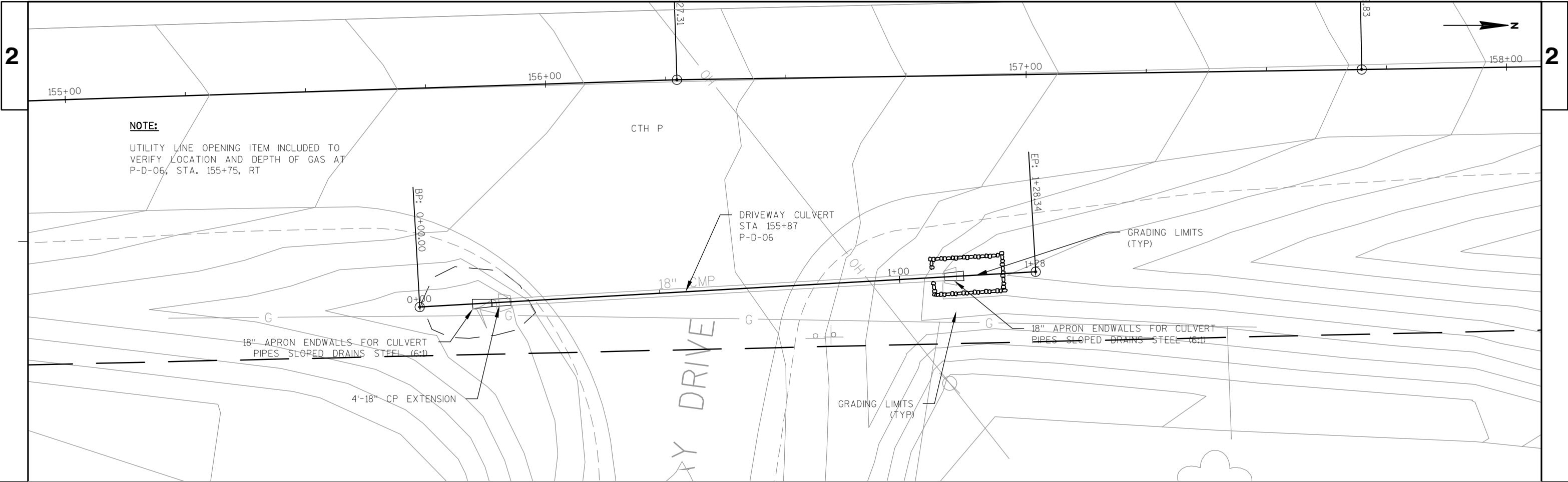
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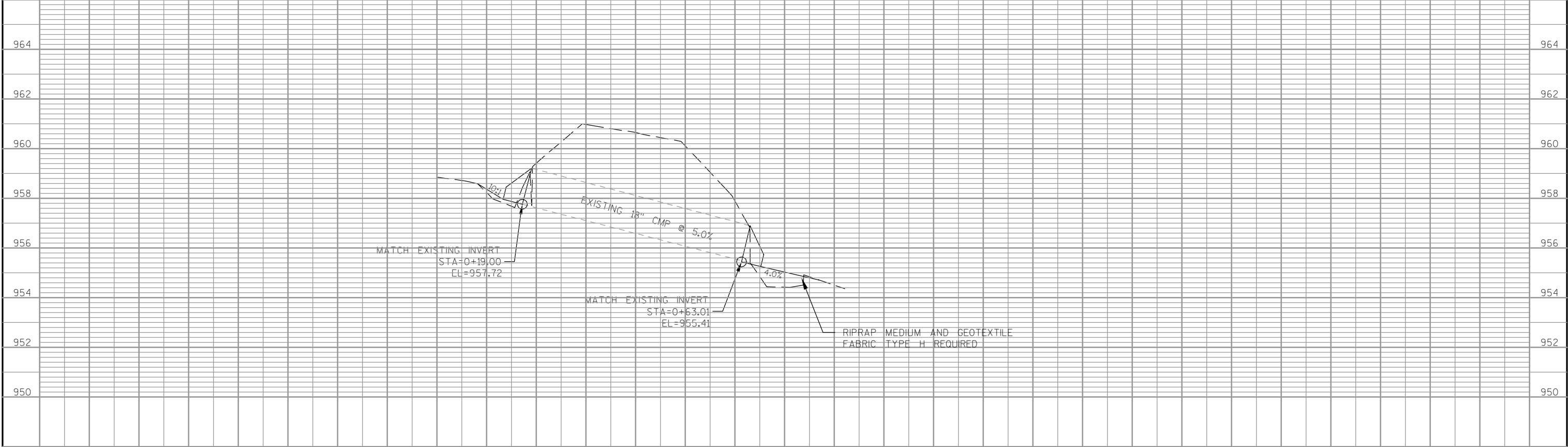
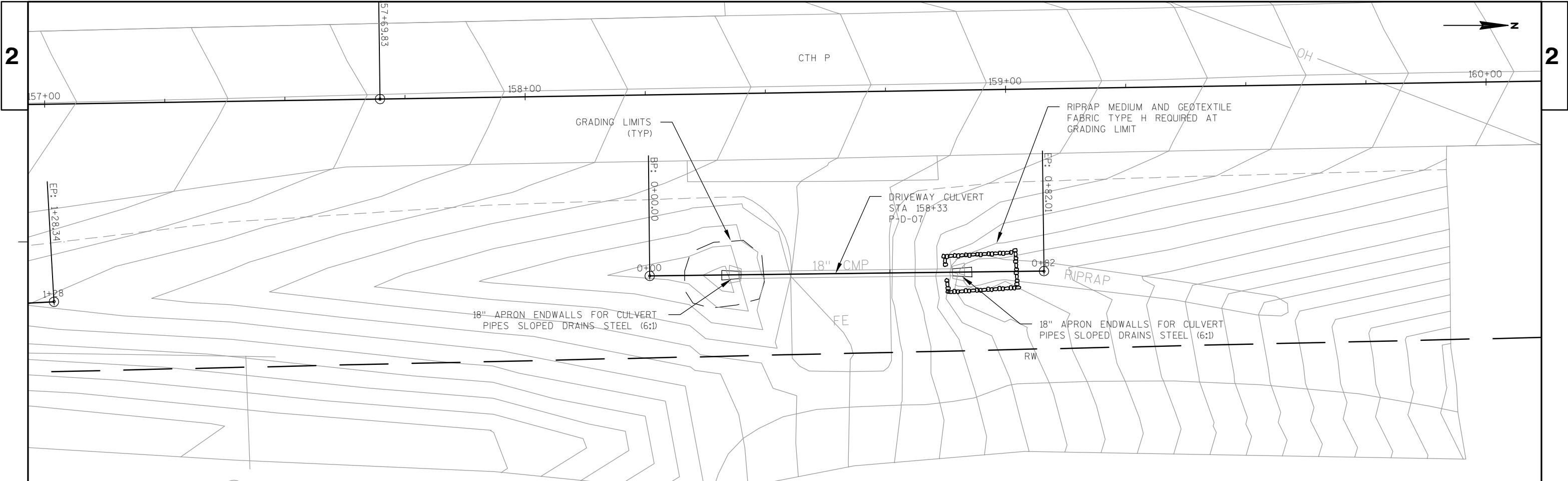
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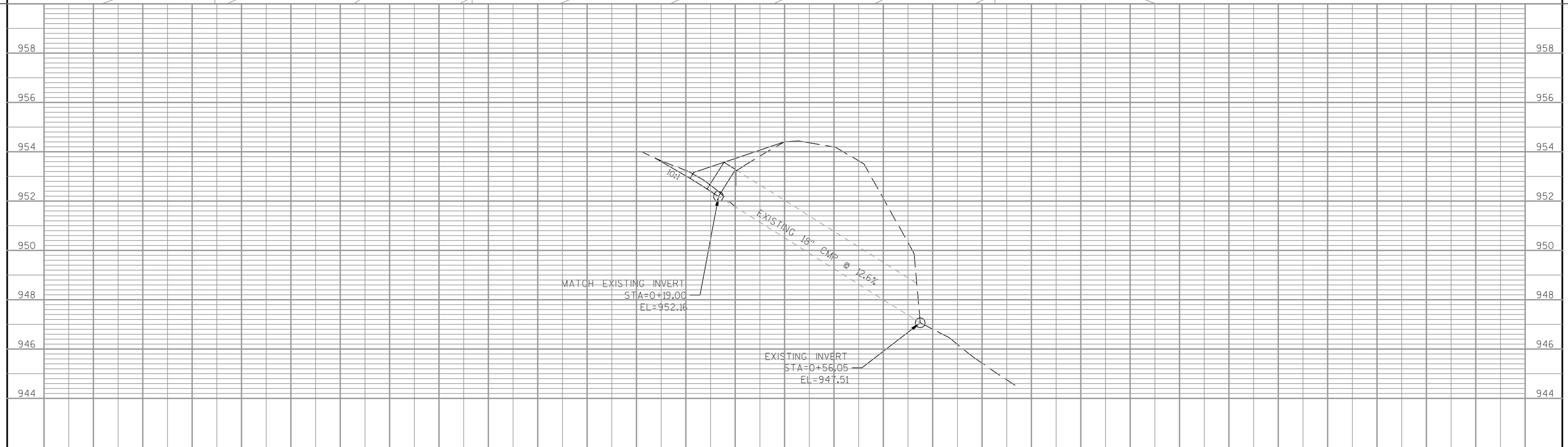


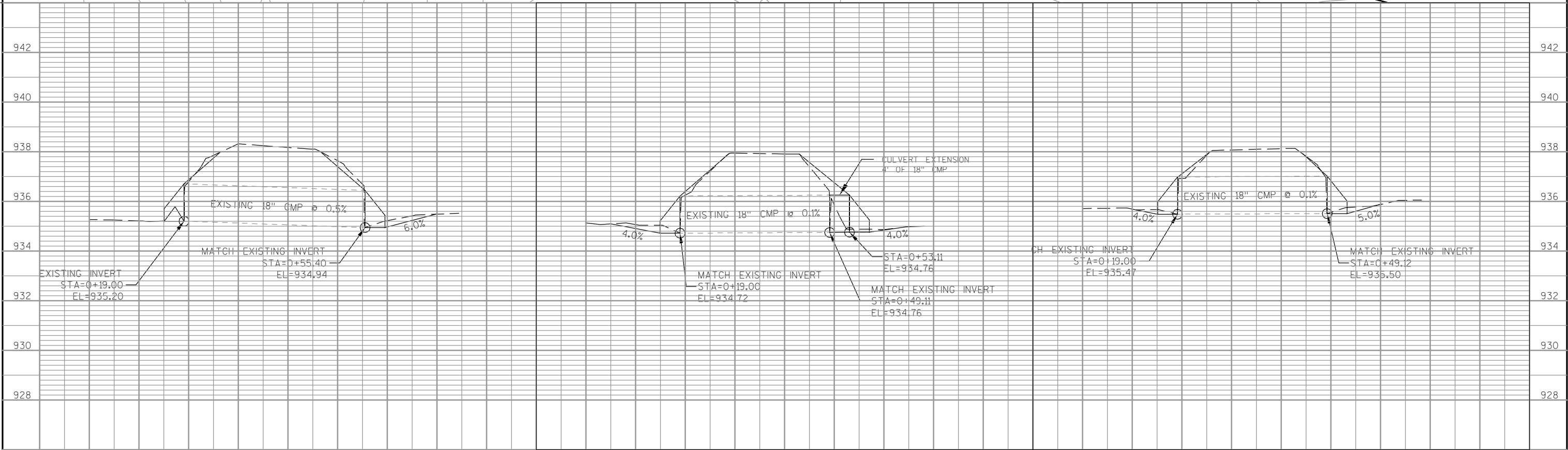
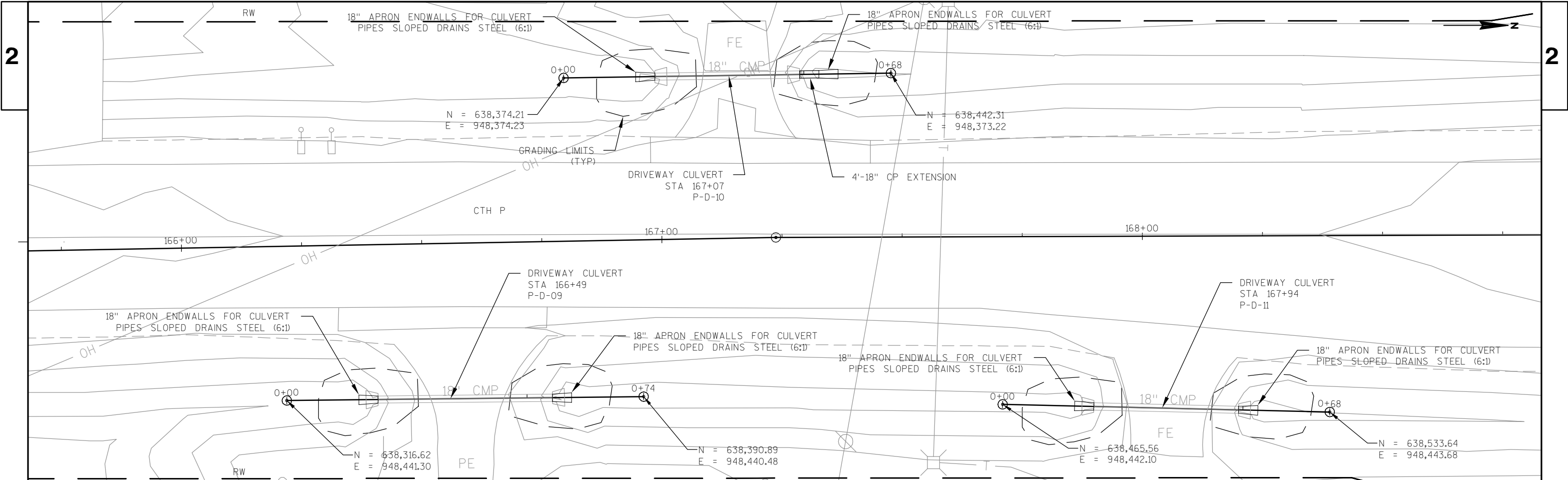


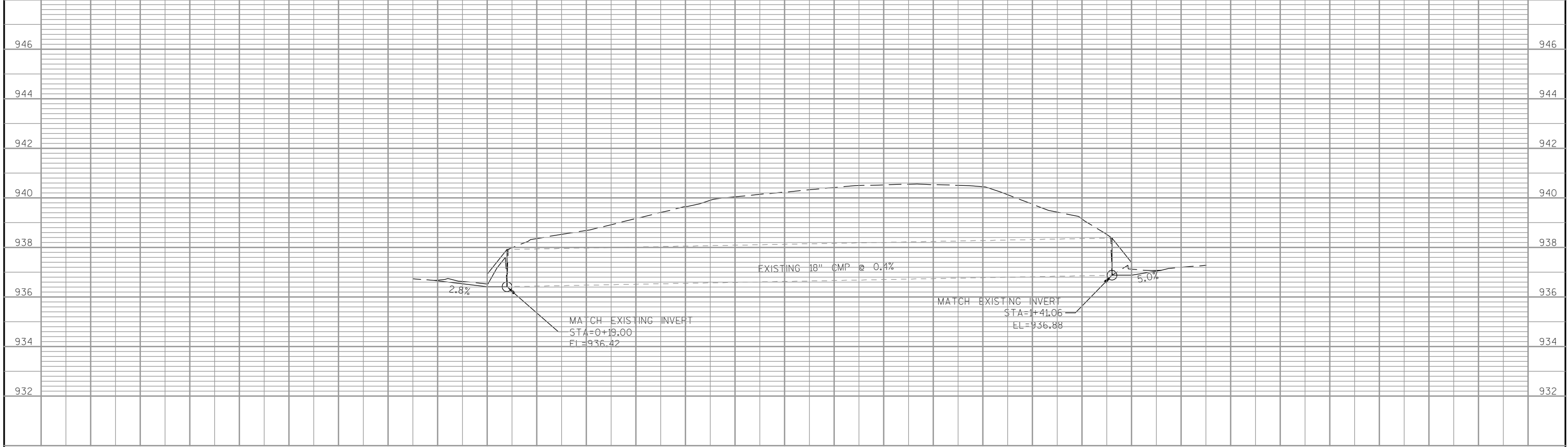
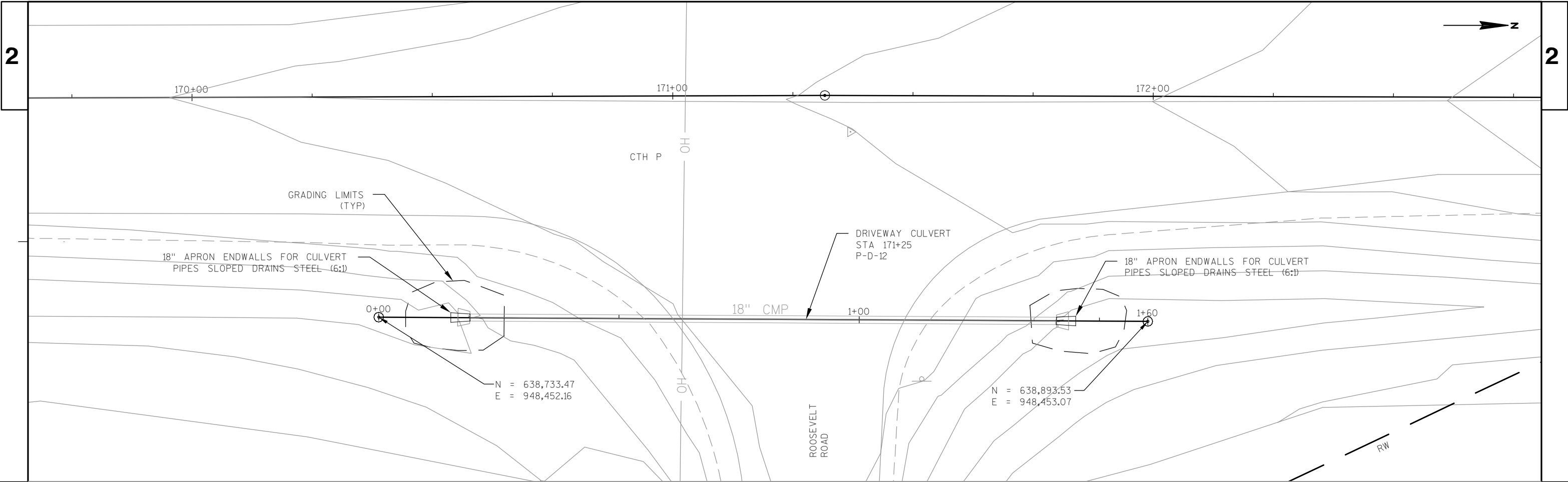


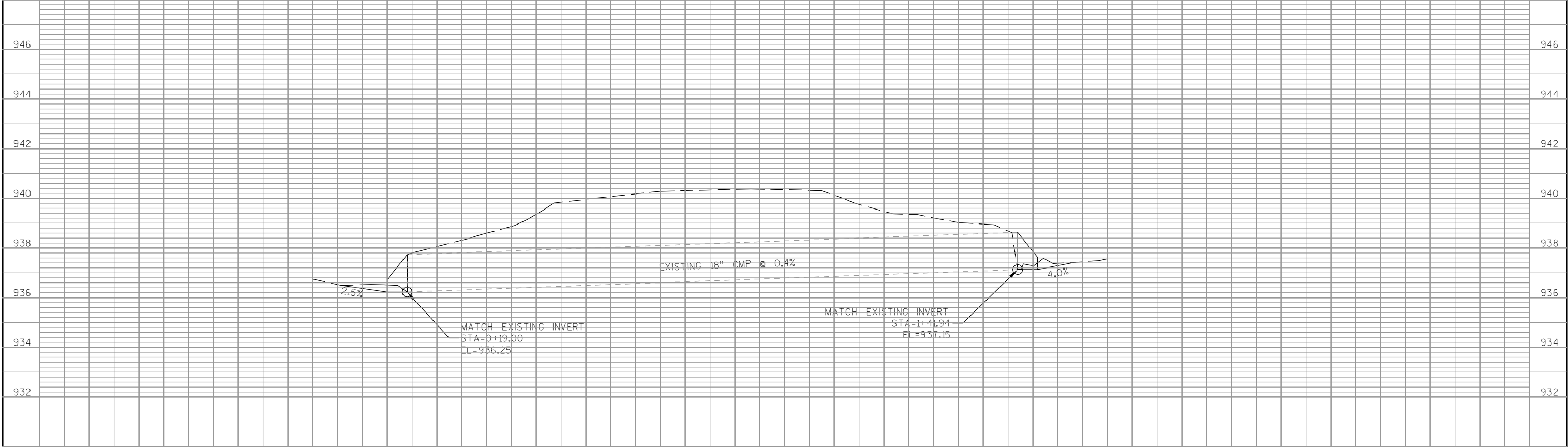
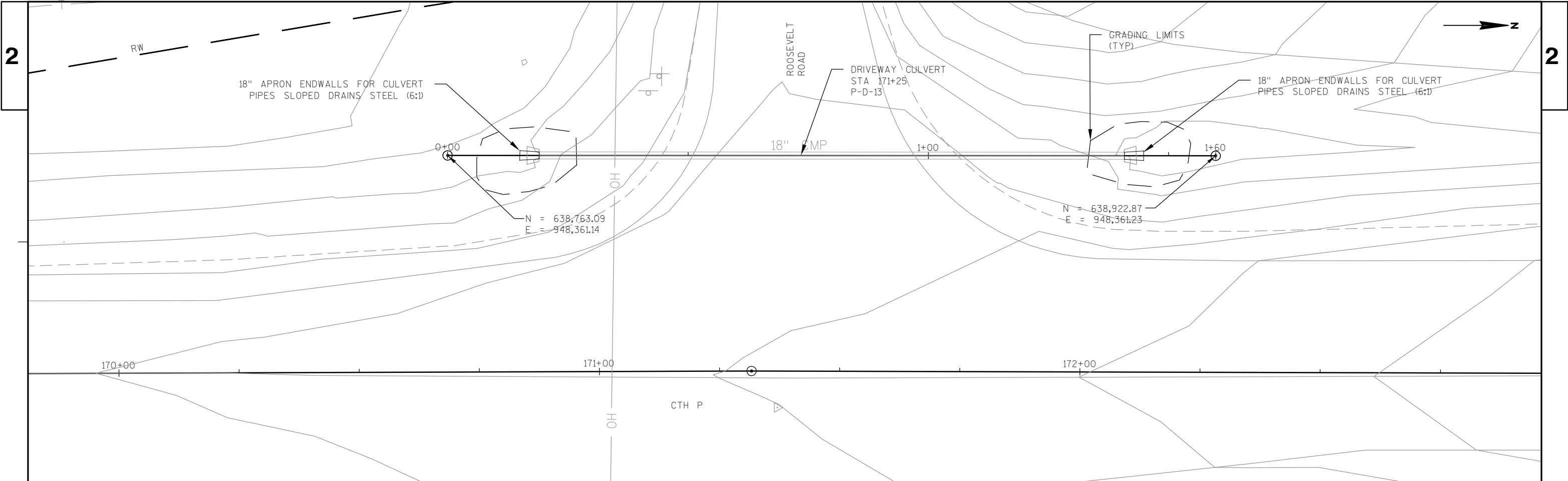


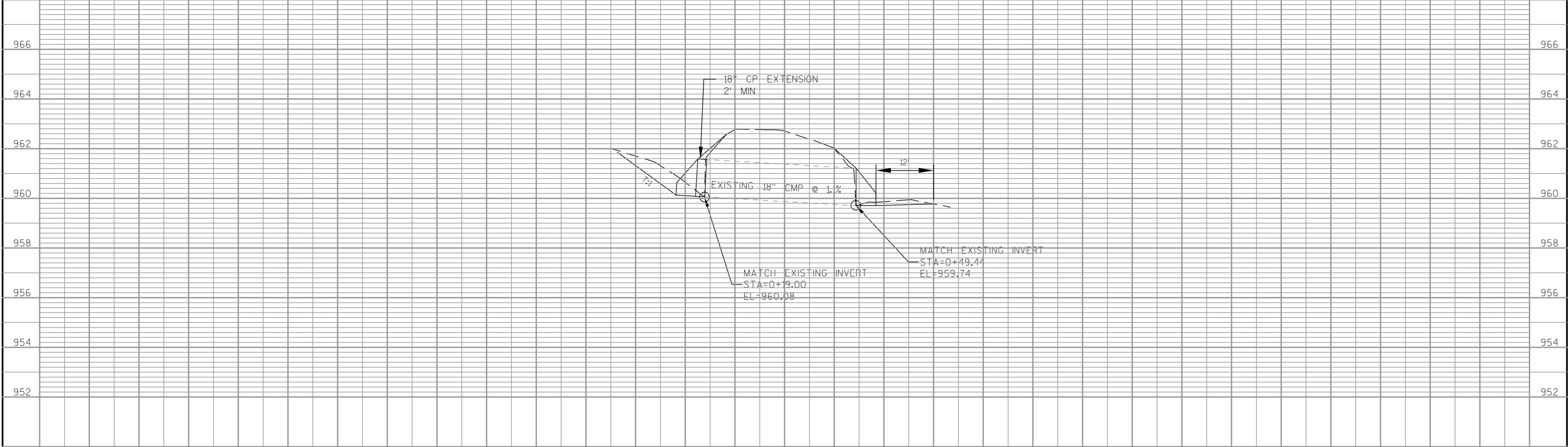
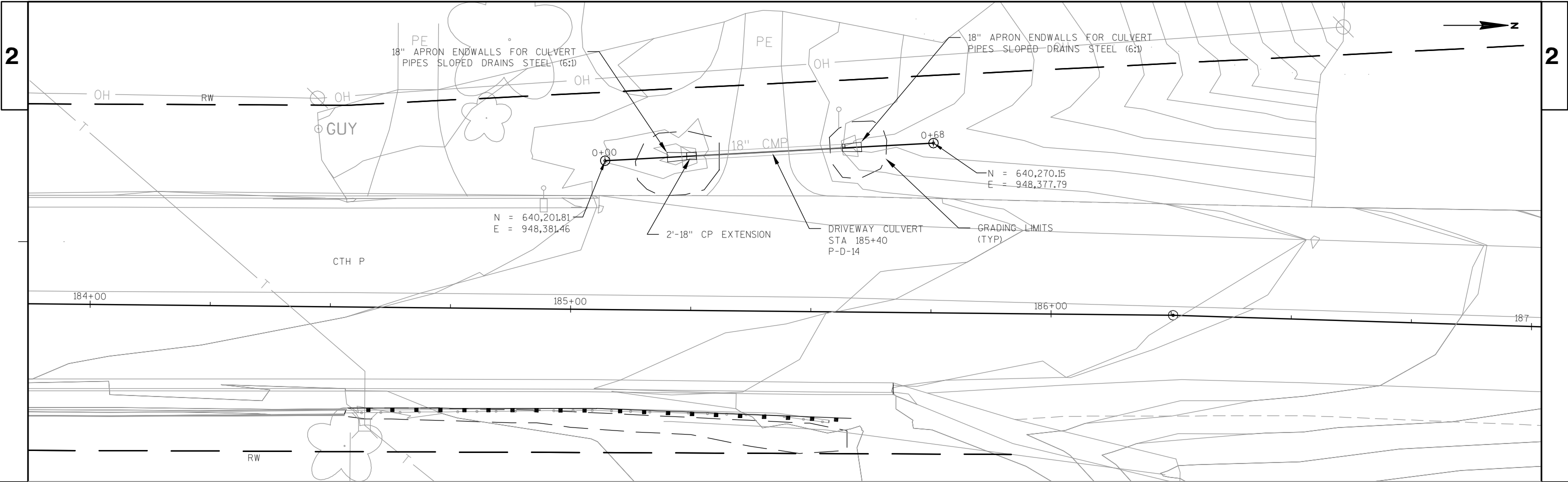
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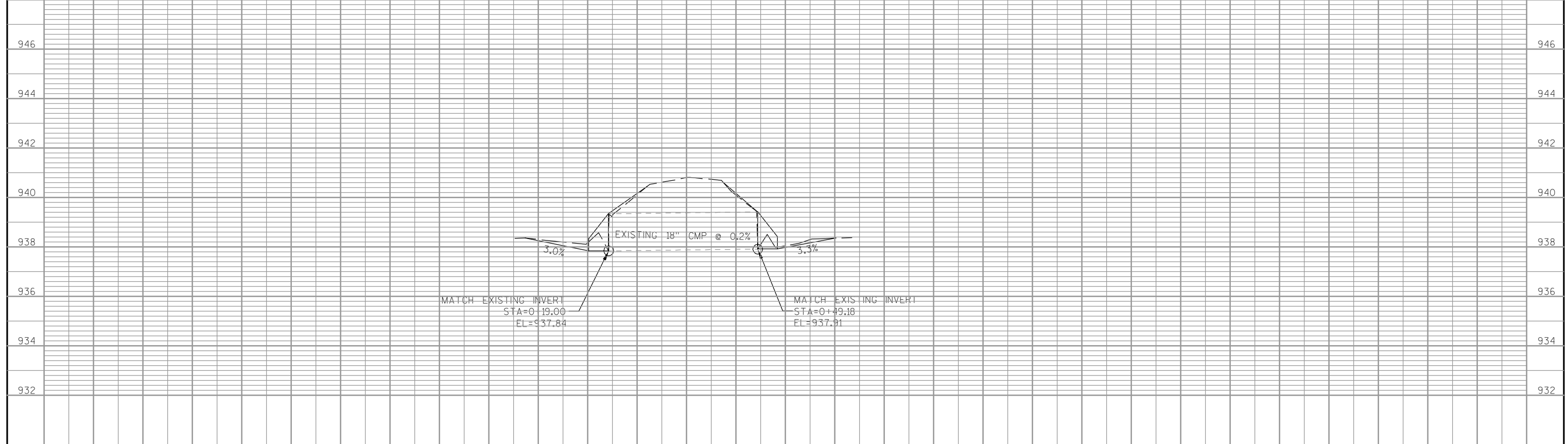


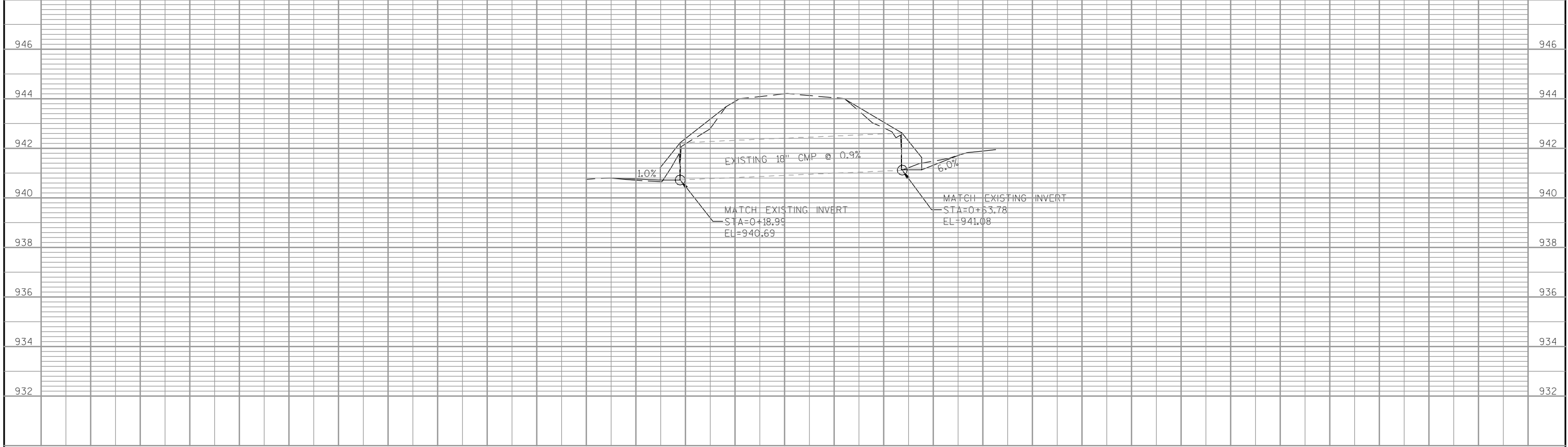
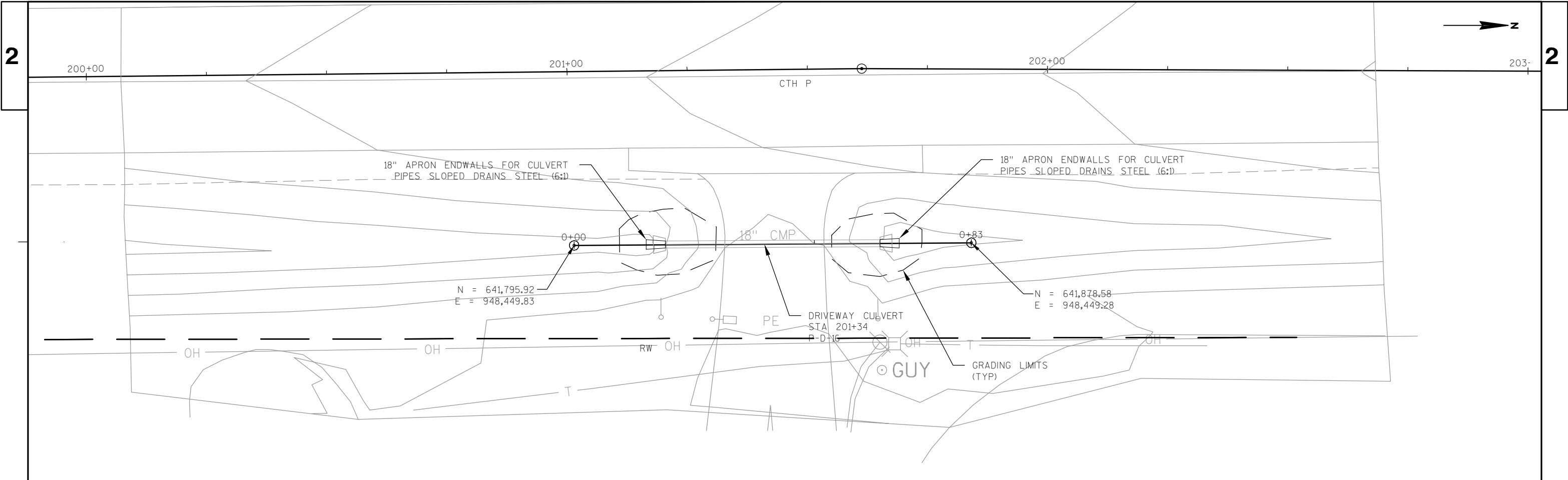


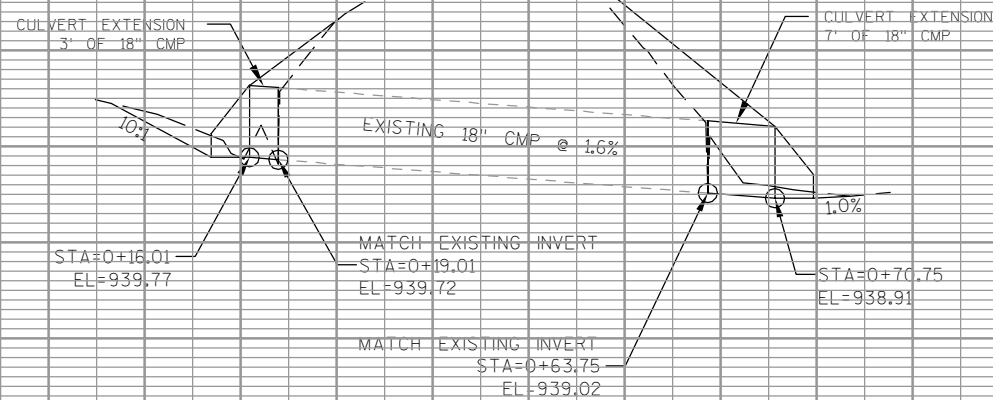
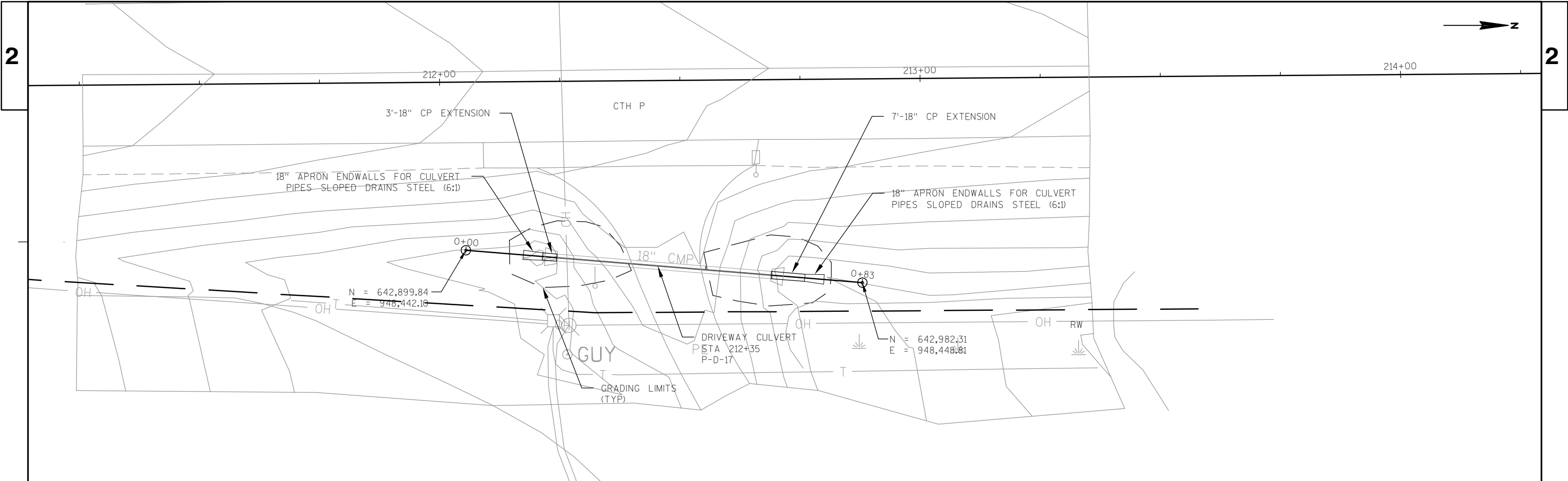


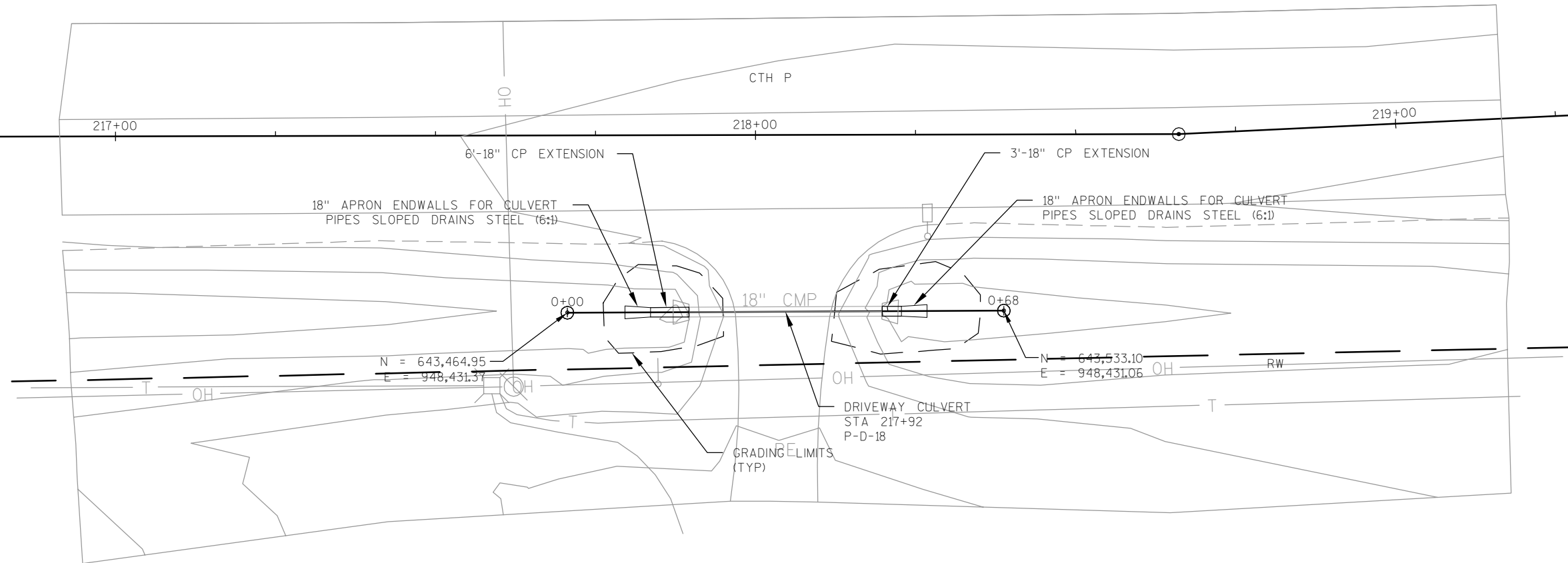


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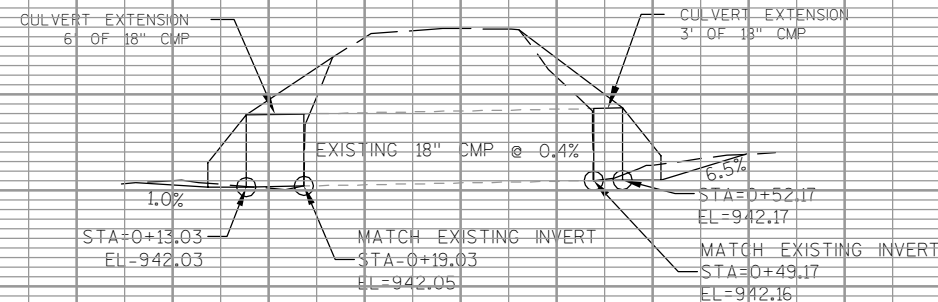
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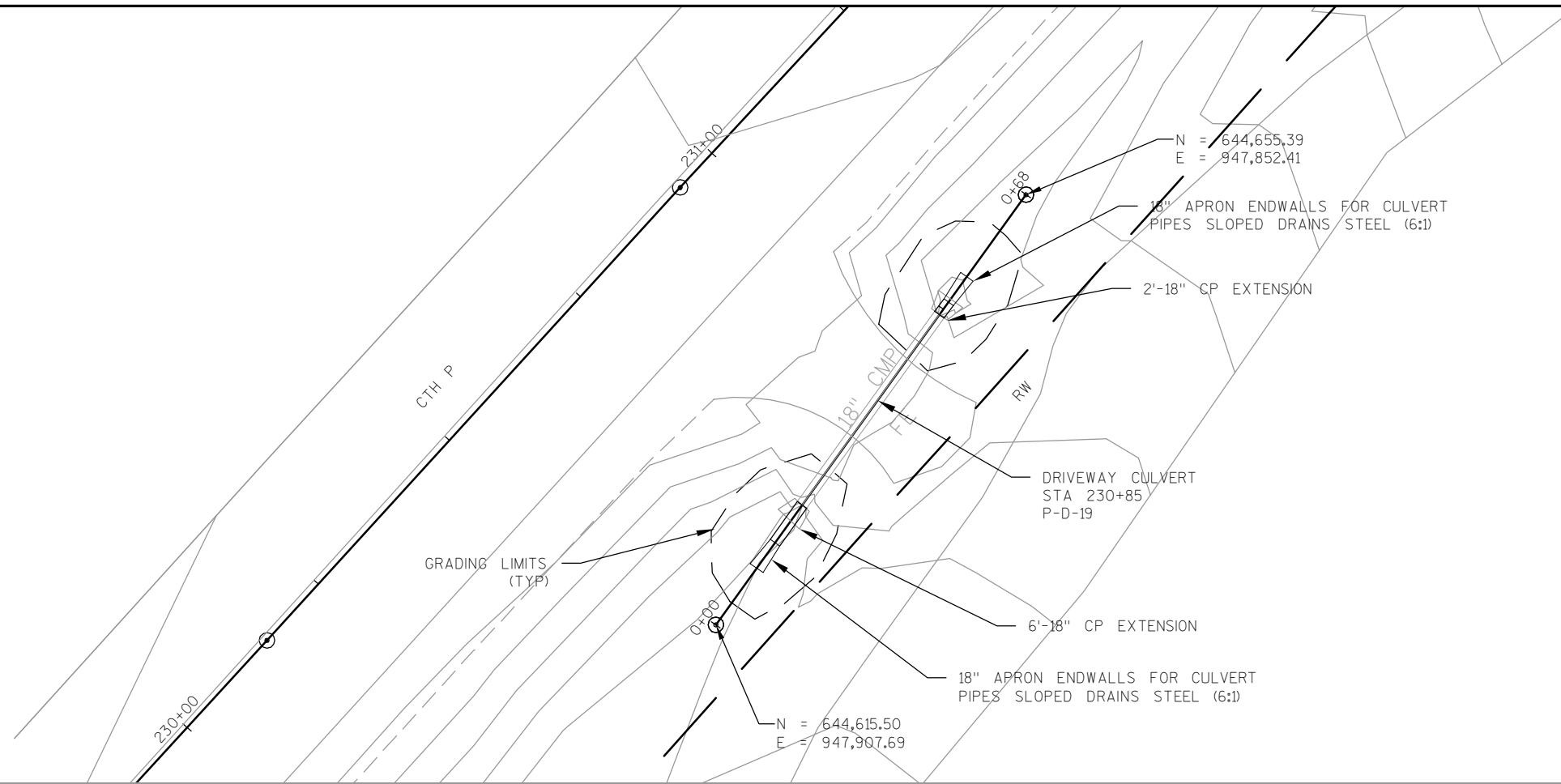
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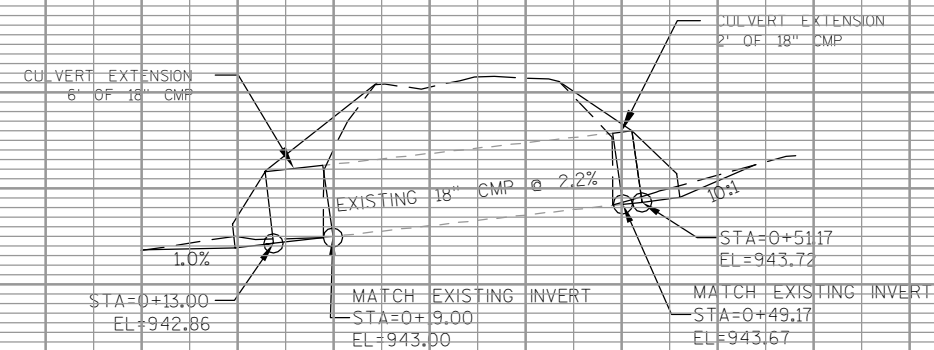
940

938

938

936

936



PROJECT NO:6207-03-71

HWY: CTH P

COUNTY: DODGE

CULVERT DETAILS : STA 230+85

SHEET .92

E

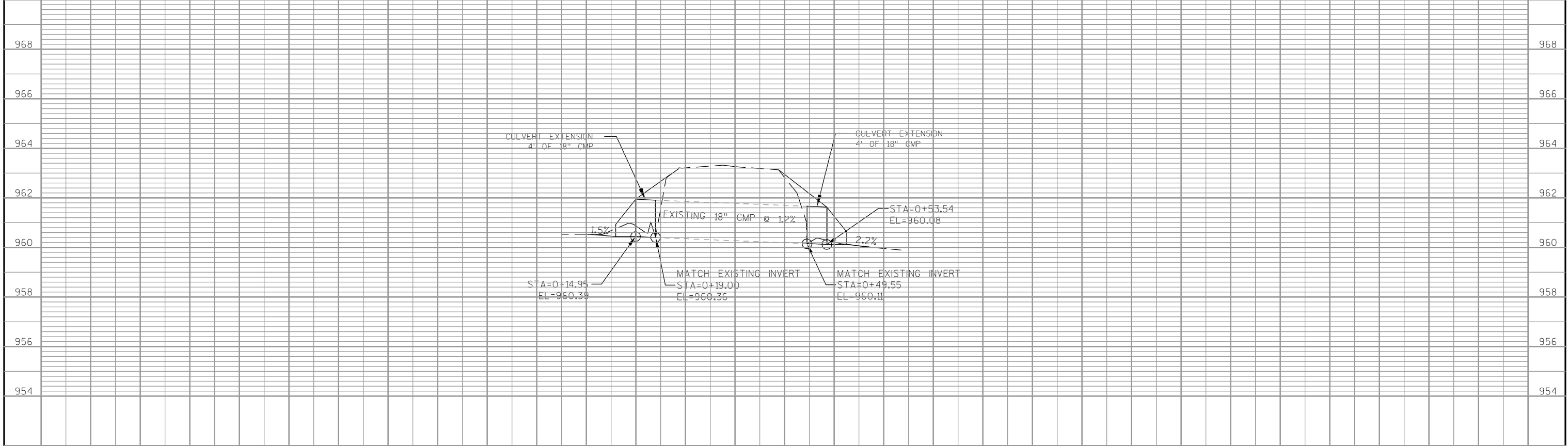
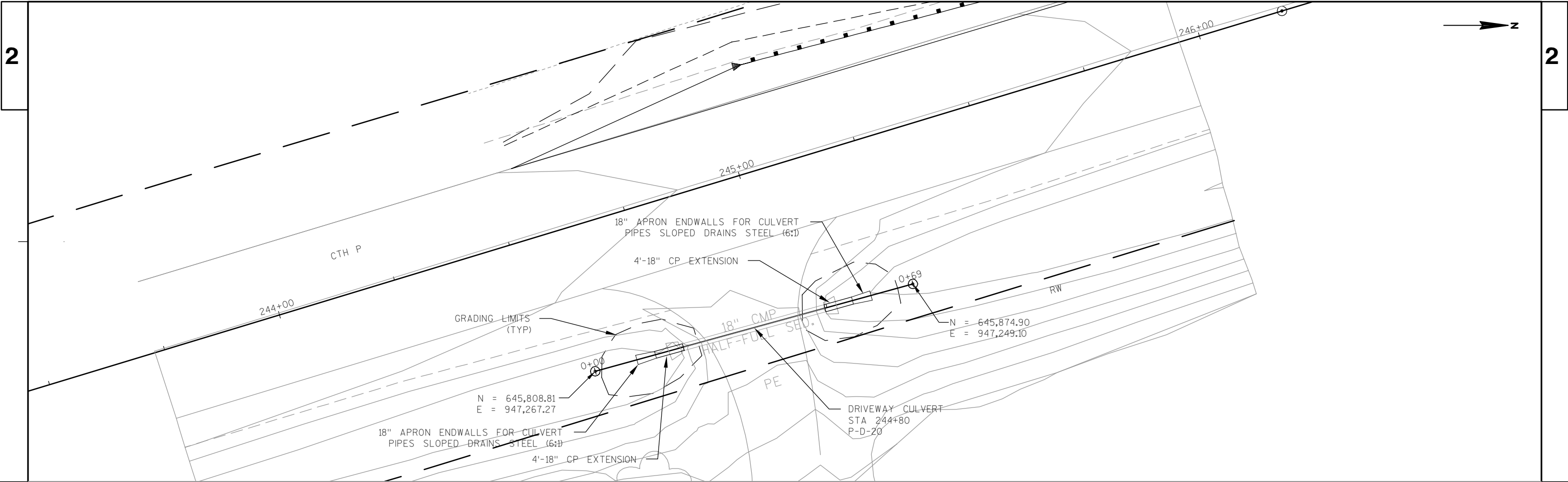
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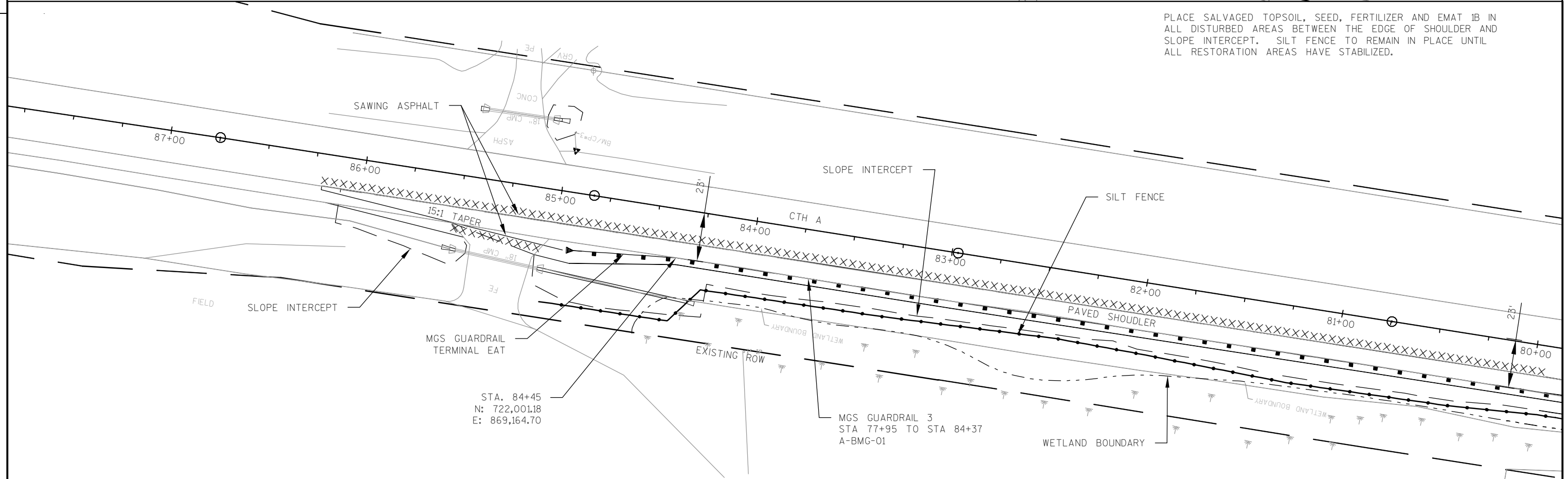
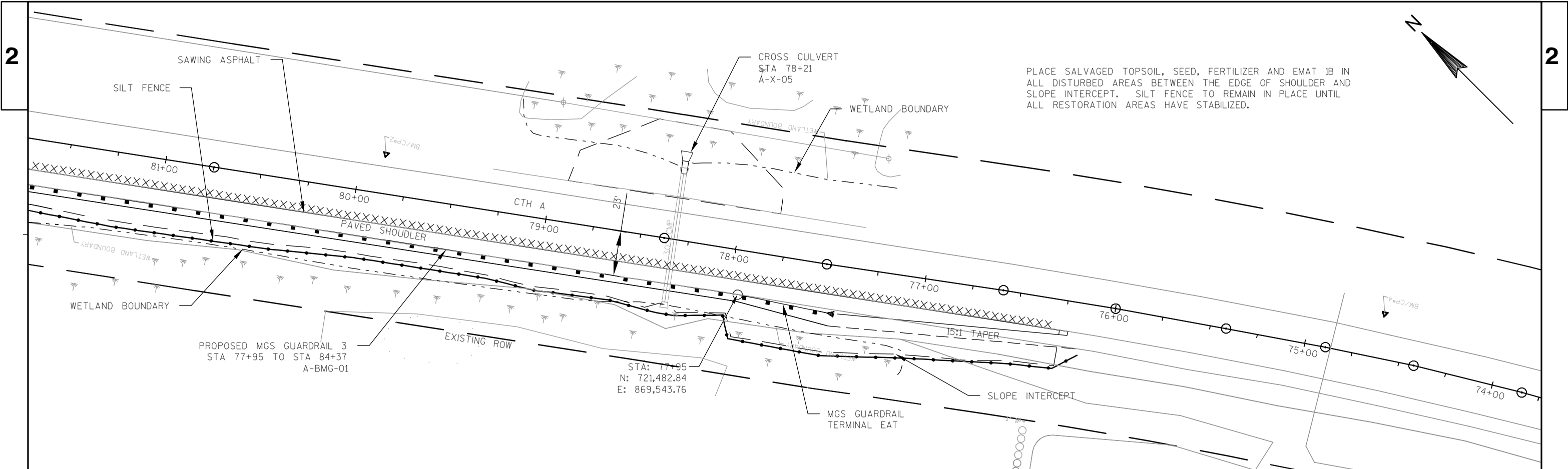
PLOT DATE : 3/7/2013 10:48 AM

PLOT BY : MOYER, TIM

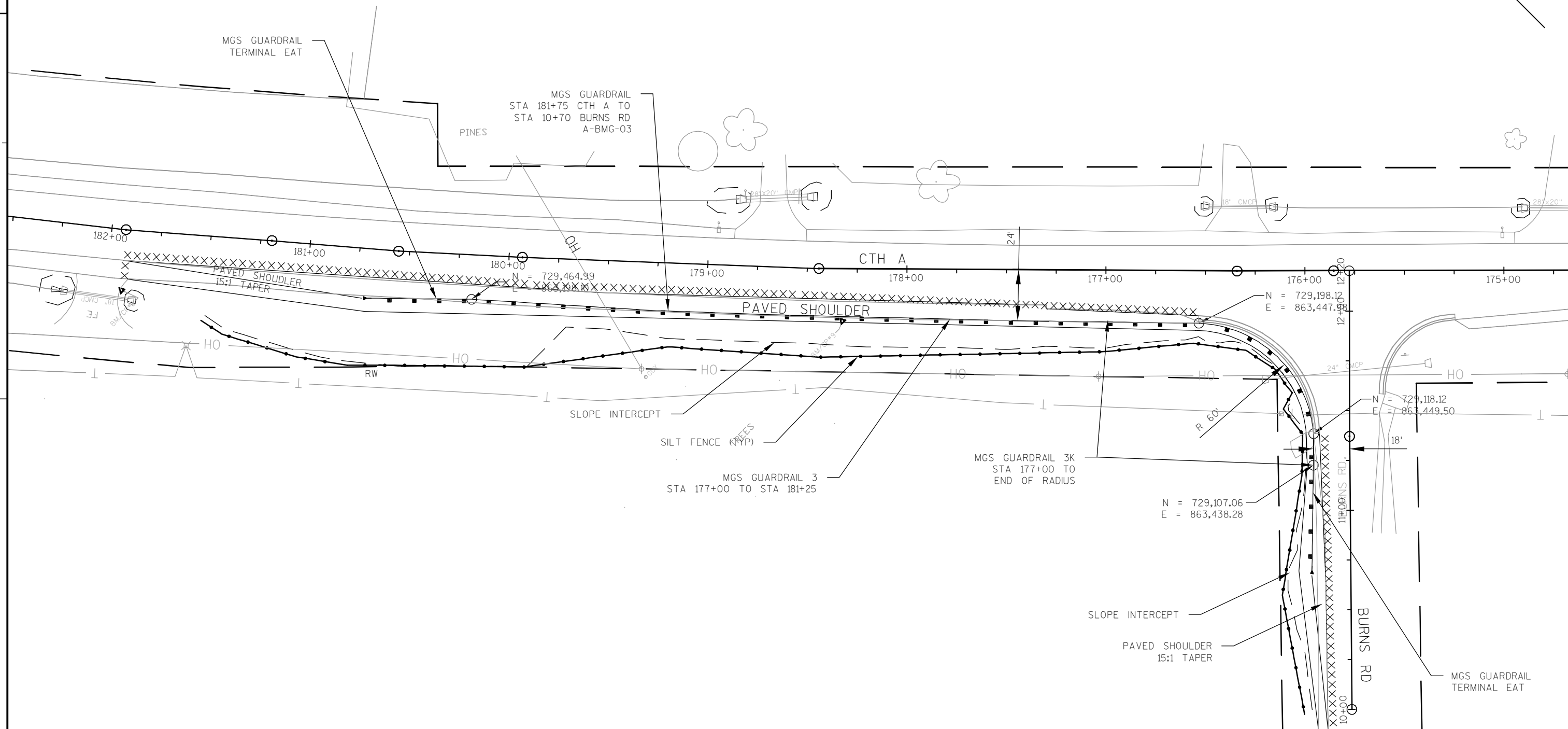
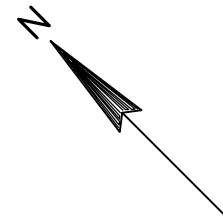
PLOT NAME : -----

WISDOT/CADDs SHEET 41a



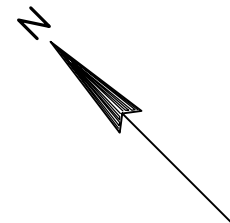


PLACE SALVAGED TOPSOIL, SEED, FERTILIZER AND EMAT 1B IN ALL DISTURBED AREAS BETWEEN THE EDGE OF SHOULDER AND SLOPE INTERCEPT. SILT FENCE TO REMAIN IN PLACE UNTIL ALL RESTORATION AREAS HAVE STABILIZED.



NOTE:

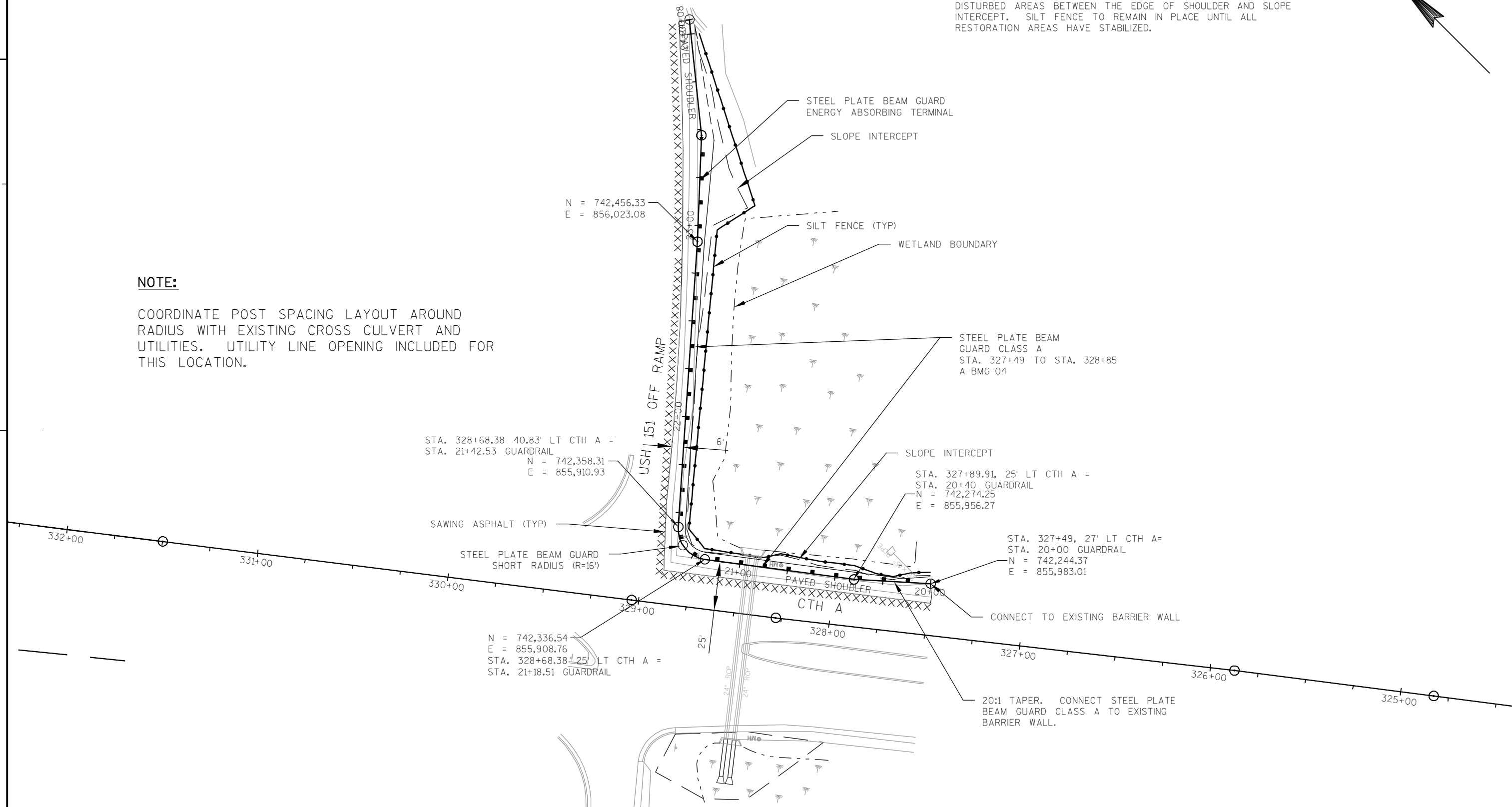
COORDINATE POST SPACING LAYOUT AROUND RADIUS WITH EXISTING CROSS CULVERT AND UTILITIES. UTILITY LINE OPENING INCLUDED FOR THIS LOCATION.

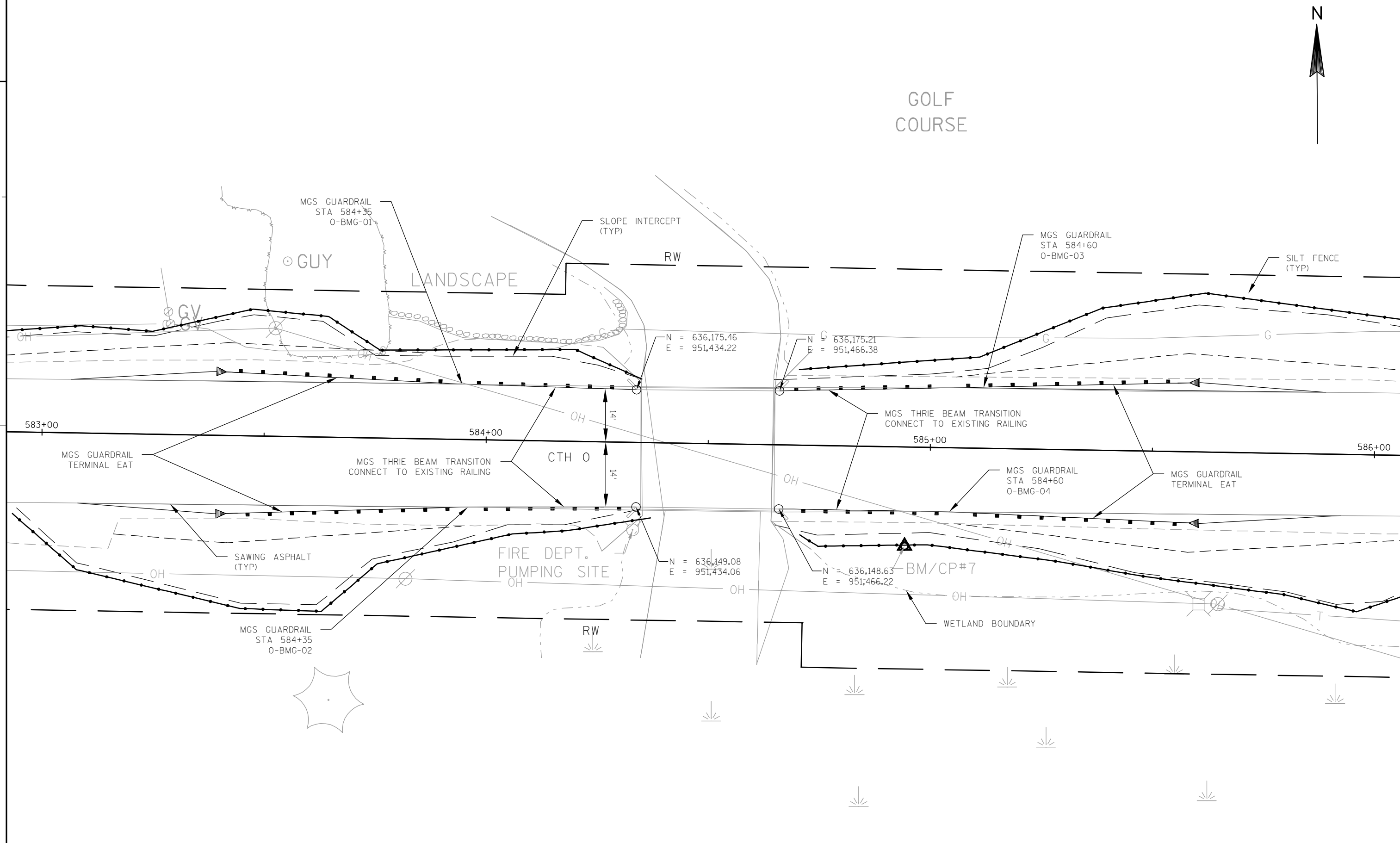


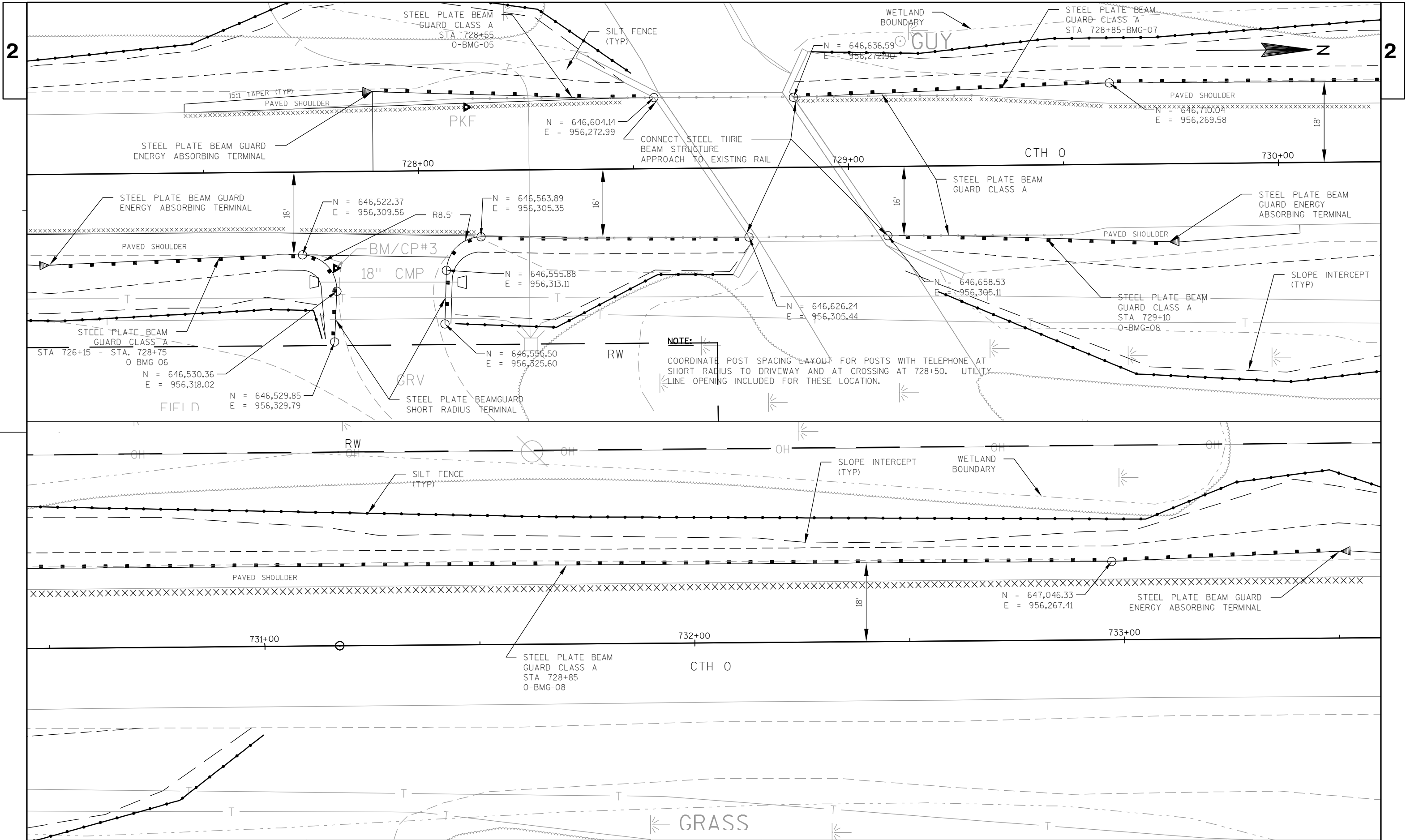
PLACE SALVAGED TOPSOIL, SEED, FERTILIZER AND MULCH IN ALL DISTURBED AREAS BETWEEN THE EDGE OF SHOULDER AND SLOPE INTERCEPT. SILT FENCE TO REMAIN IN PLACE UNTIL ALL RESTORATION AREAS HAVE STABILIZED.

NOTE:

COORDINATE POST SPACING LAYOUT AROUND RADIUS WITH EXISTING CROSS CULVERT AND UTILITIES. UTILITY LINE OPENING INCLUDED FOR THIS LOCATION.







PROJECT NO:6207-03-71

HWY: CTH 0

COUNTY: DODGE

BEAMGUARD DETAILS

SHEET

98

E

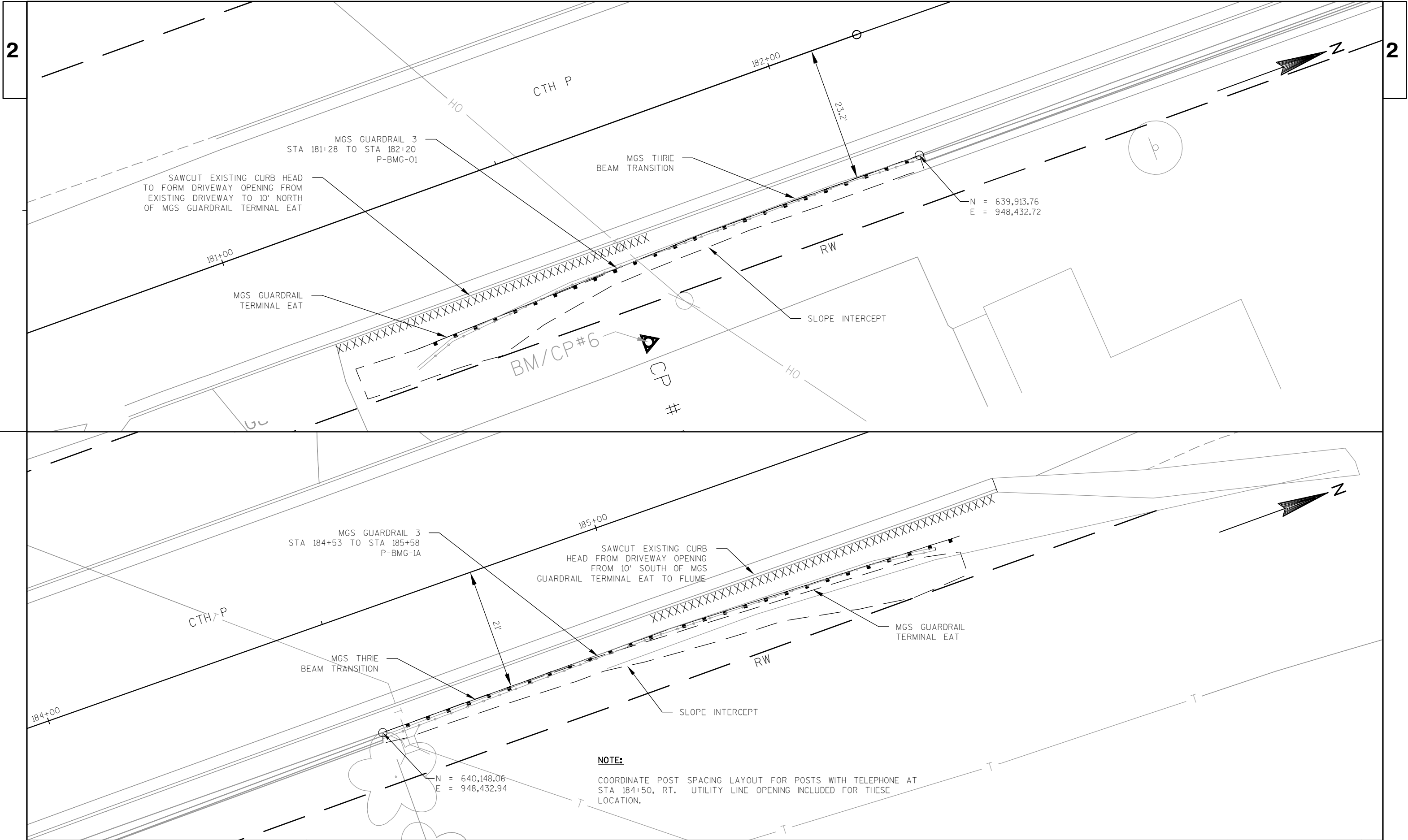
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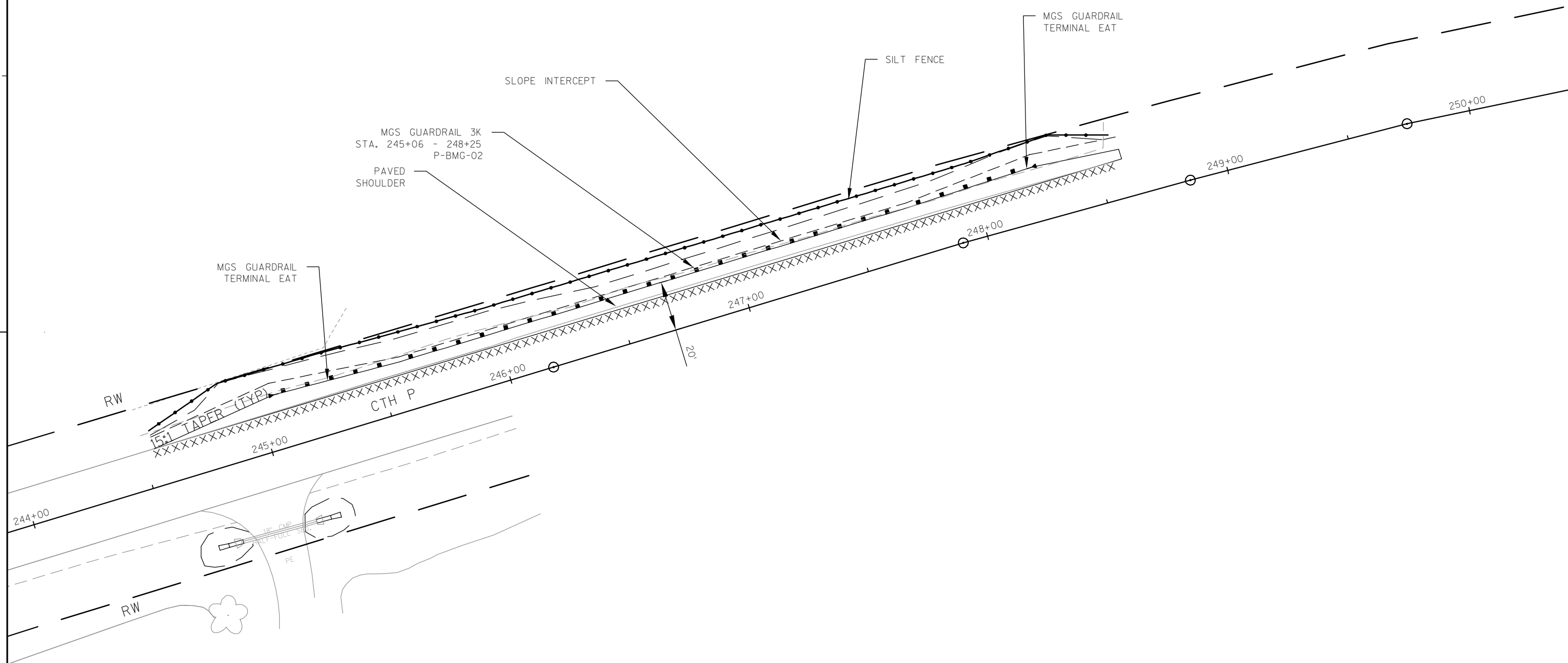
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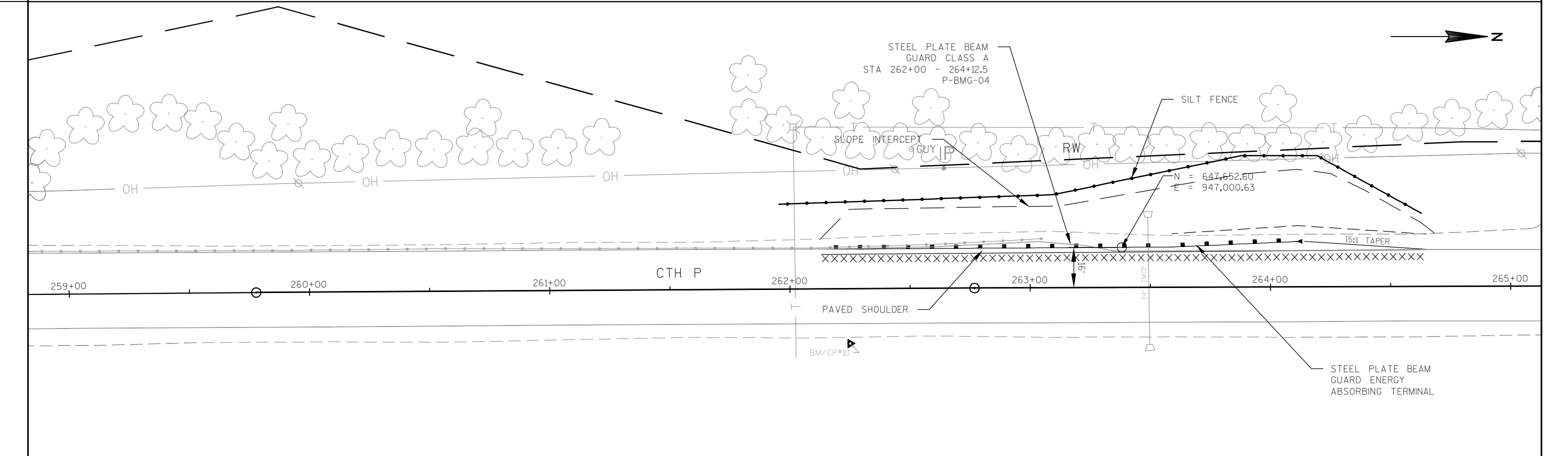
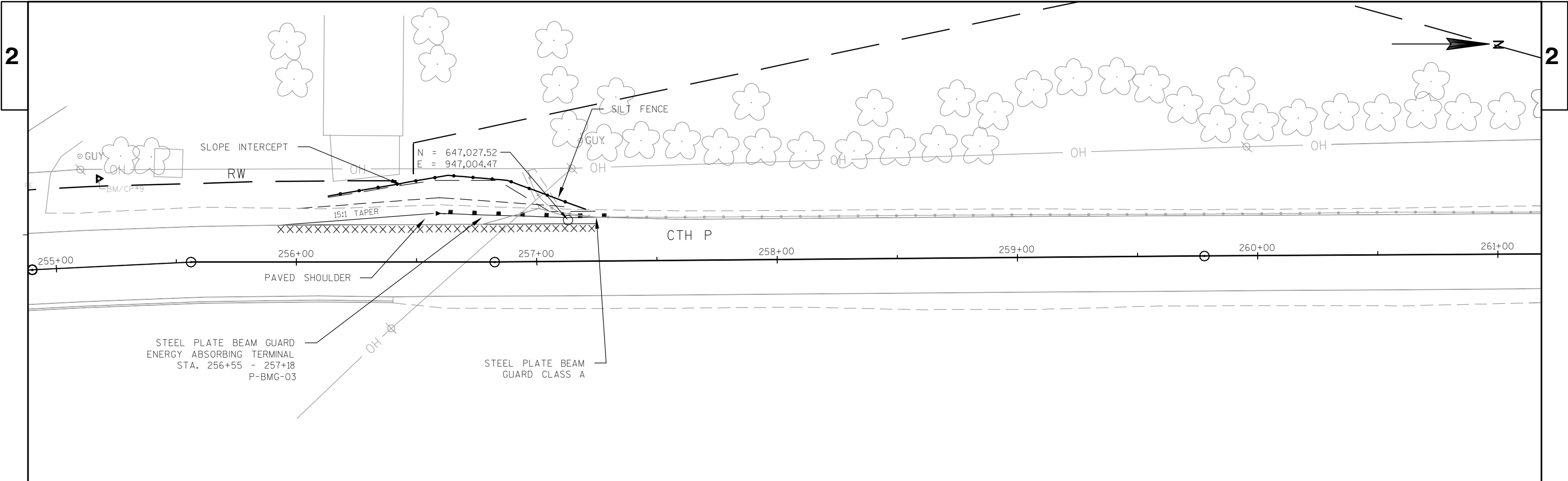
PLOT BY : MOYER, TIM

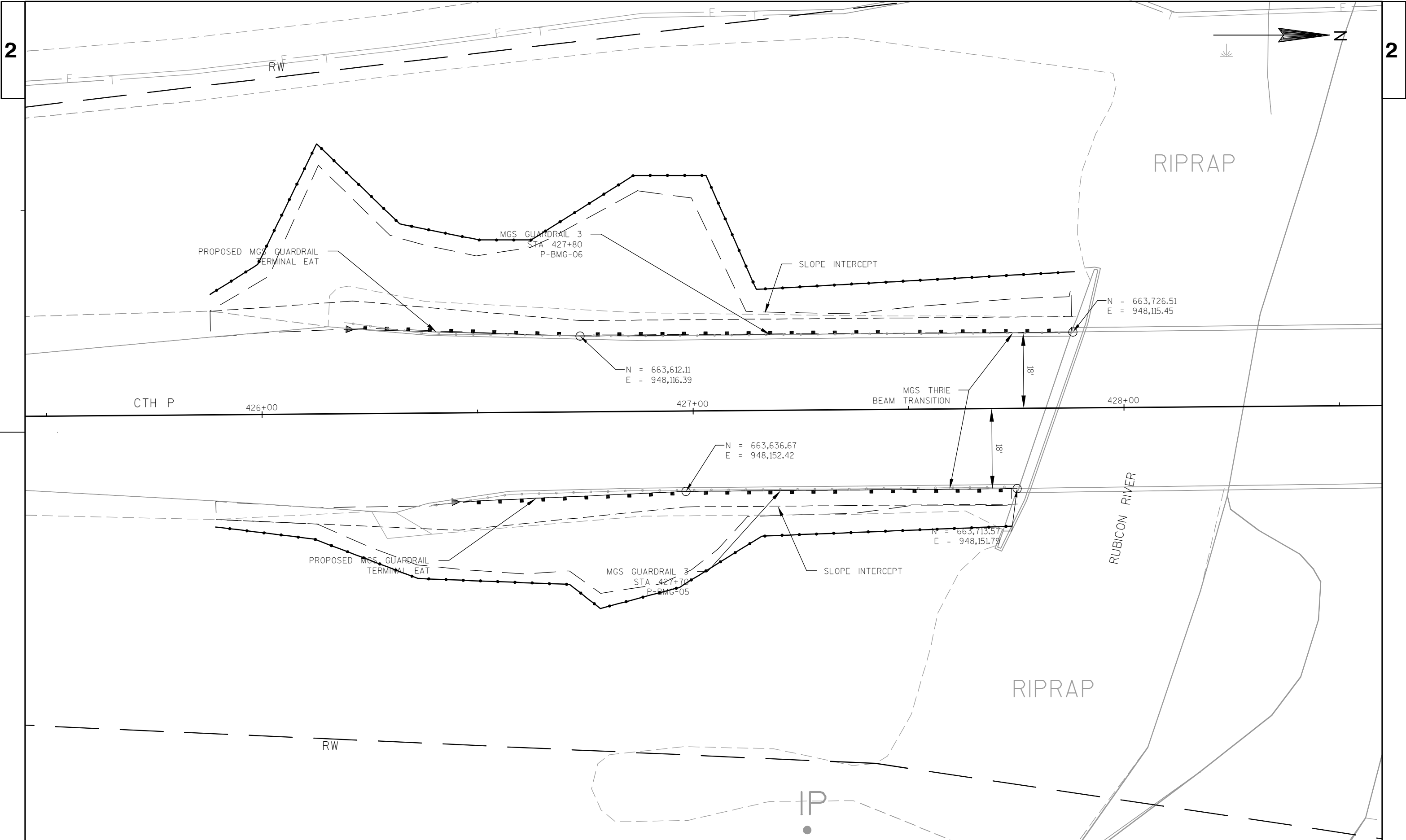
PLOT NAME : -----

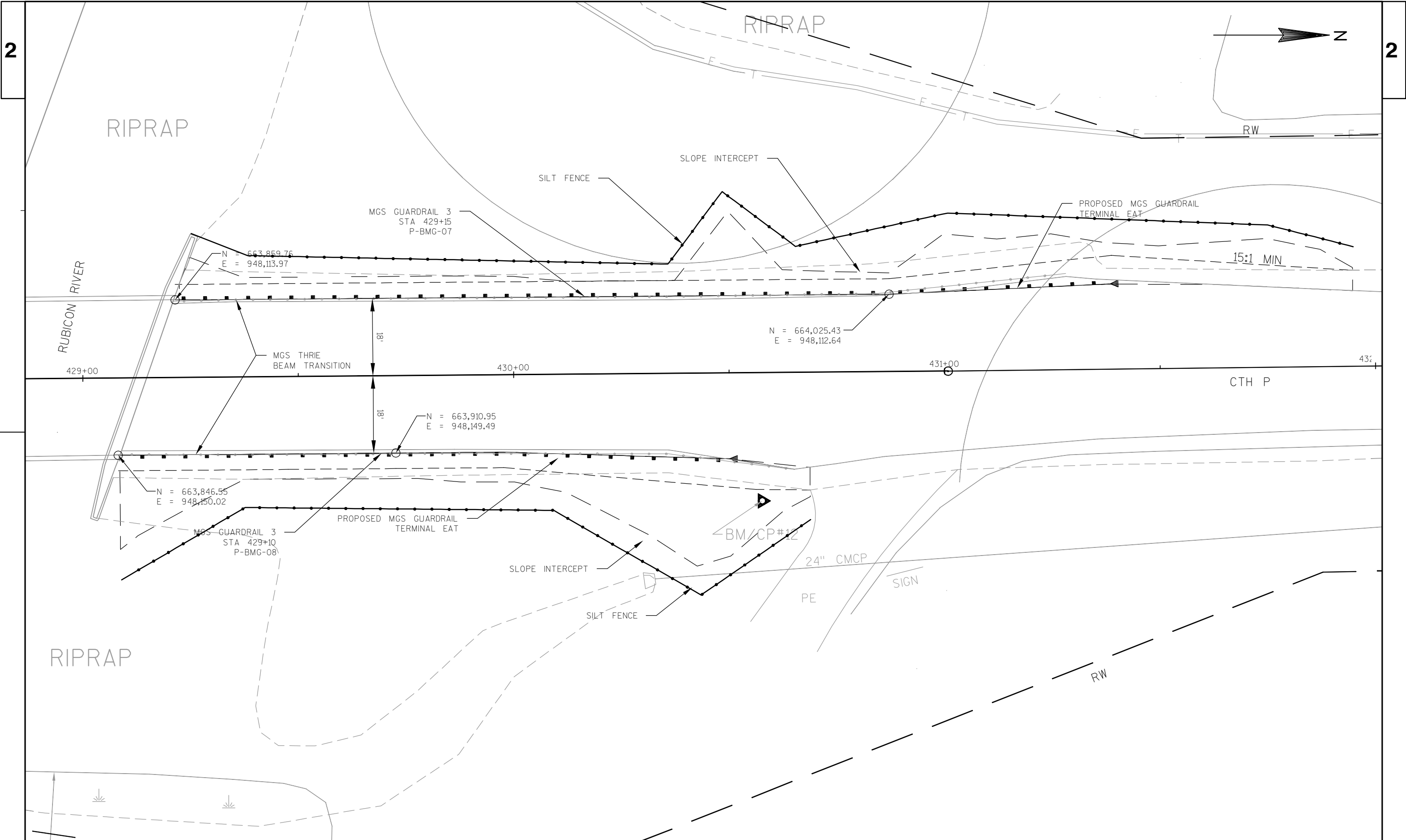
WISDOT/CADDs SHEET 42

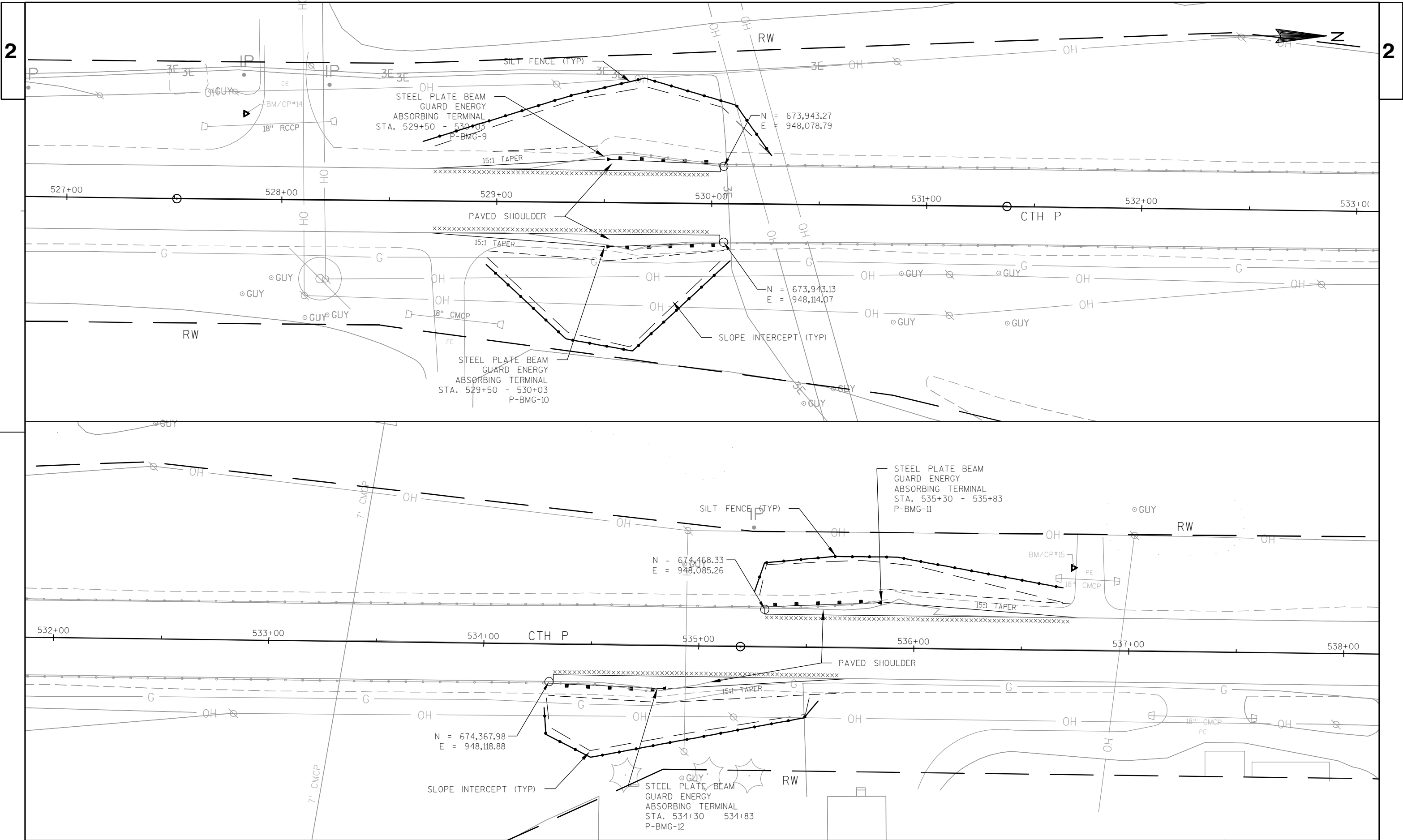












3

DATE 16OCT13		E S T I M A T E O F Q U A N T I T I E S			
LINE					6207-03-71
NUMBER	ITEM	ITEM DESCRIPTION	UNIT	TOTAL	QUANTITY
0010	201.0120	CLEARING	ID	483.000	483.000
0020	201.0220	GRUBBING	ID	483.000	483.000
0030	204.9060.S	REMOVING (ITEM DESCRIPTION) 01. ENDWALLS	EACH	112.000	112.000
0040	205.0100	EXCAVATION COMMON **P**	CY	405.000	405.000
0050	208.0100	BORROW **P**	CY	1,940.000	1,940.000
0060	211.0400	PREPARE FOUNDATION FOR ASPHALTIC SHOULDERS	STA	33.000	33.000
0070	213.0100	FINISHING ROADWAY (PROJECT) 01. 6207-03-71	EACH	1.000	1.000
0080	305.0110	BASE AGGREGATE DENSE 3/4-INCH	TON	355.000	355.000
0090	305.0120	BASE AGGREGATE DENSE 1 1/4-INCH	TON	445.000	445.000
0100	465.0105	ASPHALTIC SURFACE	TON	400.000	400.000
0110	520.0118	CULVERT PIPE CLASS III 18-INCH	LF	206.000	206.000
0120	520.0124	CULVERT PIPE CLASS III 24-INCH	LF	222.000	222.000
0130	520.0130	CULVERT PIPE CLASS III 30-INCH	LF	23.000	23.000
0140	520.0136	CULVERT PIPE CLASS III 36-INCH	LF	19.000	19.000
0150	520.1024	APRON ENDWALLS FOR CULVERT PIPE 24-INCH	EACH	24.000	24.000
0160	520.1030	APRON ENDWALLS FOR CULVERT PIPE 30-INCH	EACH	3.000	3.000
0170	520.8000	CONCRETE COLLARS FOR PIPE	EACH	61.000	61.000
0180	521.0336	APRON ENDWALLS FOR CULVERT PIPE SLOPED CROSS DRAINS STEEL 36-INCH 4 TO 1	EACH	2.000	2.000
0190	521.1518	APRON ENDWALLS FOR CULVERT PIPE SLOPED SIDE DRAINS STEEL 18-INCH 6 TO 1	EACH	75.000	75.000
0200	521.1524	APRON ENDWALLS FOR CULVERT PIPE SLOPED SIDE DRAINS STEEL 24-INCH 6 TO 1	EACH	4.000	4.000
0210	521.1728	APRON ENDWALLS FOR PIPE ARCH SLOPED SIDE DRAINS STEEL 28X20-INCH 6 TO 1	EACH	4.000	4.000
0220	606.0200	RIPRAP MEDIUM	CY	85.000	85.000
0230	614.0200	STEEL THRIE BEAM STRUCTURE APPROACH	LF	82.600	82.600
0240	614.0305	STEEL PLATE BEAM GUARD CLASS A	LF	625.000	625.000
0250	614.0345	STEEL PLATE BEAM GUARD SHORT RADIUS	LF	51.000	51.000
0260	614.0370	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL	EACH	12.000	12.000
0270	614.0390	STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL	EACH	2.000	2.000
0280	614.0515	GUARDRAIL STIFENED LHW	LF	257.500	257.500
0290	614.0920	SALVAGED RAIL	LF	835.000	835.000
0300	614.0925	SALVAGED GUARDRAIL END TREATMENTS	EACH	10.000	10.000
0310	614.2300	MGS GUARDRAIL 3	LF	1,287.500	1,287.500
0320	614.2330	MGS GUARDRAIL 3 K	LF	350.000	350.000
0330	614.2500	MGS THRIE BEAM TRANSITION	LF	395.000	395.000
0340	614.2610	MGS GUARDRAIL TERMINAL EAT	EACH	16.000	16.000
0350	619.1000	MOBILIZATION	EACH	1.000	1.000
0360	625.0500	SALVAGED TOPSOIL **P**	SY	12,015.000	12,015.000
0370	627.0200	MULCHING	SY	4,850.000	4,850.000
0380	628.1504	SILT FENCE	LF	5,065.000	5,065.000
0390	628.1520	SILT FENCE MAINTENANCE	LF	10,170.000	10,170.000
0400	628.1905	MOBILIZATIONS EROSION CONTROL	EACH	5.000	5.000
0410	628.1910	MOBILIZATIONS EMERGENCY EROSION CONTROL	EACH	2.000	2.000
0420	628.2004	EROSION MAT CLASS I TYPE B	SY	7,165.000	7,165.000
0430	628.7504	TEMPORARY DITCH CHECKS	LF	1,625.000	1,625.000
0440	628.7555	CULVERT PIPE CHECKS	EACH	148.000	148.000
0450	629.0210	FERTILIZER TYPE B	CWT	8.000	8.000
0460	630.0120	SEEDING MIXTURE NO. 20	LB	337.000	337.000
0470	633.5200	MARKERS CULVERT END	EACH	29.000	29.000

3

3

DATE 16OCT13			E S T I M A T E O F Q U A N T I T I E S		
LINE			6207-03-71		
NUMBER	ITEM	ITEM DESCRIPTION	UNIT	TOTAL	QUANTITY
0480	643.0100	TRAFFIC CONTROL (PROJECT) 01. 6207-03-71	EACH	1.000	1.000
0490	645.0120	GEOTEXTILE FABRIC TYPE HR	SY	160.000	160.000
0500	646.0106	PAVEMENT MARKING EPOXY 4-INCH	LF	3,905.000	3,905.000
0510	690.0150	SAWING ASPHALT	LF	3,925.000	3,925.000
0520	690.0250	SAWING CONCRETE	LF	150.000	150.000
0530	SPV.0060	SPECIAL 01. UTILITY LINE OPENING	EACH	19.000	19.000

3

CLEARING AND GRUBBING					
				ITEM NO. 201.0120	ITEM NO. 201.0220
SITE	STATION	LOCATION	ROADWAY	CLEARING ID	GRUBBING ID
A-T-1	335+05	59' LT	CTH A	36	36
A-T-2	335+60	62' LT	CTH A	36	36
A-T-3	437+40	30' RT	CTH A	36	36
A-T-4	613+47	38' RT	CTH A	24	24
A-T-7	615+48	36' RT	CTH A	42	42
A-T-8	615+93	35' RT	CTH A	42	42
O-T-2	236+91	36' LT	CTH O	48	48
O-T-3	237+98	36' LT	CTH O	21	21
O-T-4	238+45	35' LT	CTH O	42	42
O-T-5	238+82	34' LT	CTH O	48	48
O-T-6	239+13	33' LT	CTH O	42	42
O-T-7	239+50	32' LT	CTH O	42	42
O-T-8	669+63	28' LT	CTH O	12	12
O-T-9	670+00	29' LT	CTH O	12	12
TOTALS				483	483

EXCAVATION COMMON AND BORROW						
					ITEM NO. 205.0100	ITEM NO. 208.0100
SITE	ROADWAY	STATION		LOCATION/ DESCRIPTION	EXCAVATION COMMON CY	BORROW CY
		FROM	TO			
A-BMG-1	CTH A	77+95	84+37	LT	0	200
A-BMG-3	CTH A	176+05	180+00	LT	0	150
A-BMG-4	CTH A	326+80	329+00	RT	0	75
A-X-1	CTH A	56+32	---	X-CULVERT	30	80
A-D-2	CTH A	62+70	---	RT	2	8
A-D-3	CTH A	62+95	---	LT	1	4
A-X-4	CTH A	68+30	---	X-CULVERT	30	80
A-X-5	CTH A	78+40	---	X-CULVERT	15	50
A-D-6	CTH A	85+20	---	LT	---	3
A-D-7	CTH A	85+23	---	RT	1	3
A-D-8	CTH A	90+25	---	RT	1	4
A-X-9	CTH A	91+30	---	X-CULVERT	30	110
A-X-11	CTH A	105+30	---	X-CULVERT	30	120
A-D-15	CTH A	126+55	---	LT	2	6
A-D-16	CTH A	127+20	---	RT	---	---
A-D-17	CTH A	133+40	---	LT	---	2
A-X-18	CTH A	140+50	---	X-CULVERT	5	25
A-D-19	CTH A	144+34	---	RT	1	---
A-D-20	CTH A	145+59	---	RT	4	---
A-D-21	CTH A	146+08	---	LT	5	---
A-D-23	CTH A	156+85	---	LT	---	1
A-D-24	CTH A	169+00	---	RT	---	1
A-D-25	CTH A	174+75	---	RT	2	---
A-D-26	CTH A	176+75	---	RT	---	---
A-D-27	CTH A	178+73	---	RT	2	---
A-D-28	CTH A	182+00	---	LT	---	5
A-D-29	CTH A	191+00	---	RT	3	5
A-X-30	CTH A	199+04	---	X-CULVERT	5	120
A-X-31	CTH A	205+62	---	X-CULVERT	25	100
A-D-32	CTH A	216+18	---	RT	---	8
A-D-33	CTH A	219+00	---	LT	---	10
A-D-34	CTH A	219+00	---	RT	1	4
A-D-36	CTH A	235+55	---	RT	3	---
A-D-37	CTH A	261+00	---	LT	---	---
A-D-38	CTH A	261+00	---	RT	---	1
A-X-39	CTH A	264+54	---	X-CULVERT	5	95
A-D-40	CTH A	271+10	---	LT	1	---
A-X-44	CTH A	314+80	---	X-CULVERT	10	15
TABLE CONTINUED TO THE RIGHT						

EXCAVATION COMMON AND BORROW CONTINUED FROM THE LEFT						
					ITEM NO. 205.0100	ITEM NO. 208.0100
SITE	ROADWAY	STATION		LOCATION/ DESCRIPTION	EXCAVATION COMMON CY	BORROW CY
		FROM	TO			
A-X-45	CTH A	322+85	---	X-CULVERT	10	30
A-X-47,48	CTH A	328+40 328+45	---	X-CULVERT	10	60
A-D-49	CTH A	339+31	---	LT	---	---
A-X-55	CTH A	364+66	---	X-CULVERT	30	80
A-X-60	CTH A	405+71	---	X-CULVERT	15	65
A-X-65	CTH A	426+48	---	X-CULVERT	15	30
A-X-72	CTH A	491+06	---	X-CULVERT	75	15
O-BMG-1	CTH O	583+45	584+35	LT	0	15
O-BMG-2	CTH O	583+45	584+35	RT	0	15
O-BMG-3	CTH O	584+65	585+55	LT	0	15
O-BMG-4	CTH O	584+65	585+55	RT	0	15
O-BMG-5	CTH O	727+90	728+55	LT	0	10
O-BMG-6	CTH O	727+10	728+75	RT	0	10
O-BMG-7	CTH O	728+85	733+50	LT	0	50
O-BMG-8	CTH O	719+10	729+85	RT	0	10
P-D-1	CTH P	71+90	---	RT	1	4
P-D-5	CTH P	135+10	---	LT	3	---
P-D-6	CTH P	155+87	---	RT	2	---
P-D-7	CTH P	158+33	---	RT	---	---
P-D-8	CTH P	159+30	---	LT	1	3
P-D-9	CTH P	166+49	---	RT	5	---
P-D-10	CTH P	167+07	---	LT	2	4
P-D-11	CTH P	167+94	---	RT	2	---
P-D-12	CTH P	171+25	---	LT	---	---
P-D-13	CTH P	171+25	---	RT	3	---
P-D-14	CTH P	185+10	---	LT	5	---
P-D-15	CTH P	197+60	---	RT	2	---
P-D-16	CTH P	201+34	---	RT	1	3
P-D-17	CTH P	212+35	---	RT	3	8
P-D-18	CTH P	217+92	---	RT	2	5
P-D-19	CTH P	230+90	---	RT	2	5
P-D-20	CTH P	244+80	---	RT	2	3
P-BMG-1	CTH P	181+28	182+20	RT	0	10
P-BMG-1A	CTH P	184+53	185+58	RT	0	10
P-BMG-2	CTH P	245+06	248+25	LT	0	35
P-BMG-3	CTH P	256+50	257+15	LT	0	10
P-BMG-4	CTH P	252+00	253+50	LT	0	10
P-BMG-5	CTH P	426+40	427+70	RT	0	25
P-BMG-6	CTH P	426+12.5	427+80	LT	0	20
P-BMG-7	CTH P	429+15	431+45	LT	0	35
P-BMG-8	CTH P	429+10	430+52.5	RT	0	25
P-BMG-9	CTH P	529+50	530+03	LT	0	5
P-BMG-10	CTH P	529+50	530+03	RT	0	5
P-BMG-11	CTH P	535+30	535+83	LT	0	5
P-BMG-12	CTH P	534+30	534+83	RT	0	5
TOTALS					405	1940

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DRIVEWAY CULVERT EXTENSIONS AND ENDWALLS											
SITE ID		STATION	LOCATION	ITEM NO. 204.9060.S	SIZE	ITEM NO. 520.0118 CULVERT PIPE CLASS III 18-INCH EACH	ITEM NO. 520.8000 CONCRETE COLLARS FOR PIPE EACH	ITEM NO. 521.1518	ITEM NO. 521.1524	ITEM NO. 521.1728	
				REMOVING ENDWALLS EACH		APRON ENDWALLS FOR CULVERT PIPE SLOPED SIDE DRAINS STEEL (SIZE) 6:1					
						18-INCH EACH	24-INCH EACH	28X20-INCH EACH			
MINIMUM WALL THICKNESS - STEEL						0.064					
MINIMUM WALL THICKNESS - ALUMINUM						0.060					
A-D-02	62+70	RT	2	18	2	1	2	---	---		
A-D-03	62+95	LT	2	18	8	2	2	---	---		
A-D-06	85+20	LT	2	18	80	2	2	---	---		
A-D-07	85+23	RT	2	18	4	1	2	---	---		
A-D-08	90+25	RT	2	18	10	2	2	---	---		
A-D-15	126+55	RT	2	18	8	2	2	---	---		
A-D-16	127+20	RT	2	18	---	---	2	---	---		
A-D-17	133+40	LT	2	18	---	---	2	---	---		
A-D-19	144+34	RT	2	18	8	2	2	---	---		
A-D-20	145+59	RT	2	18	---	---	2	---	---		
A-D-21	146+08	LT	2	18	---	---	2	---	---		
A-D-23	156+85	LT	2	18	---	---	2	---	---		
A-D-24	169+00	RT	2	18	---	---	2	---	---		
A-D-25	174+75	RT	2	28X20	---	---	---	---	2		
A-D-26	176+75	RT	2	18	---	---	2	---	---		
A-D-27	178+73	RT	2	28X20	---	---	---	---	2		
A-D-28	182+00	LT	2	18	4	1	2	---	---		
A-D-29	191+00	RT	2	18	12	2	2	---	---		
A-D-32	216+18	RT	2	18	11	2	2	---	---		
A-D-33	219+00	LT	2	18	8	2	2	---	---		
A-D-34	219+00	RT	2	18	3	1	2	---	---		
A-D-36	234+55	RT	2	18	---	---	2	---	---		
A-D-37	261+00	LT	2	18	---	---	2	---	---		
A-D-38	261+00	RT	2	18	---	---	2	---	---		
A-D-40	271+10	LT	2	24	---	---	---	2	---		
P-D-1	71+00	RT	2	24"	---	---	---	2	---		
P-D-5	135+10	LT	2	18"	---	---	2	---	---		
P-D-6	155+87	RT	2	18"	4	1	2	---	---		
P-D-7	158+33	RT	2	18"	---	---	2	---	---		
P-D-8	159+30	LT	1	18"	3	1	1	---	---		
P-D-9	166+49	RT	2	18"	---	---	2	---	---		
P-D-10	167+07	LT	2	18"	4	1	2	---	---		
P-D-11	167+94	RT	2	18"	---	---	2	---	---		
P-D-12	171+25	RT	2	18"	---	---	2	---	---		
P-D-13	171+25	LT	2	18"	---	---	2	---	---		
P-D-14	185+40	LT	2	18"	2	1	2	---	---		
P-D-15	197+60	RT	2	18"	---	---	2	---	---		
P-D-16	201+34	RT	2	18"	---	---	2	---	---		
P-D-17	212+35	RT	2	18"	10	2	2	---	---		
P-D-18	217+92	RT	2	18"	9	2	2	---	---		
P-D-19	280+35	RT	2	18"	8	2	2	---	---		
P-D-20	244+80	RT	2	18"	8	2	2	---	---		
TOTALS				83 ✖	---	206	32 ✖	75	4	4	

✱ = ADDITIONAL QUANTITIES SHOWN UNDER THE CROSS CULVERT TABLE.

CROSS CULVERTS											
SITE ID	STATION	ITEM NO. 204.9060.S REMOVING ENDWALLS EACH	SIZE	ITEM NO. 520.0124	ITEM NO. 521.0130	ITEM NO. 521.0136	ITEM NO. 521.0336	ITEM NO. 520.1024	ITEM NO. 520.1030	ITEM NO. 520.8000	ITEM NO. 633.5200
				CULVERT PIPE CLASS III			APRON ENDWALLS FOR CULVERT PIPE SLOPED CROSS DRAINS STEEL 36-INCH 4 TO 1 EACH	APRON ENDWALLS FOR CULVERT PIPE		CONCRETE COLLARS FOR PIPE	MARKERS CULVERT END
				24-INCH LF	30-INCH LF	36-INCH LF	24-INCH EACH	30-INCH EACH	EACH	EACH	
				MINIMUM WALL THICKNESS - STEEL			0.064	0.079	0.079		
A-X-01	56+32	2	24	19	---	---	---	2	---	2	2
A-X-04	68+30	2	30	---	16	---	---	---	2	2	2
A-X-05	78+40	1	30	---	7	---	---	---	1	1	1
A-X-09	91+30	2	24	24	---	---	---	2	---	2	2
A-X-11	105+30	2	24	16	---	---	---	2	---	2	2
A-X-18	140+50	1	36	6	---	---	---	1	---	1	1
A-X-30	199+04	2	24	20	---	---	---	2	---	2	2
A-X-31	205+62	2	24	31	---	---	---	2	---	2	2
A-X-39	264+54	2	24	9	---	---	---	2	---	2	2
A-X-44	314+80	1	24	6	---	---	---	1	---	1	1
A-X-45	322+85	2	36	---	---	19	2	---	---	2	2
A-X-47	328+40	2	TWIN 24	40	---	---	---	2	---	2	2
A-X-48	328+45										
A-X-55	364+66	2	24	18	---	---	---	2	---	2	2
A-X-60	405+71	2	24	13	---	---	---	2	---	2	2
A-X-65	426+48	2	24	4	---	---	---	2	---	2	2
A-X-72	491+06	2	24	16	---	---	---	2	---	2	2
TOTALS		29 *	---	222	23	19	2	24	3	29 *	29

*= ADDITIONAL QUANTITIES SHOWN UNDER THE DRIVEWAY CULVERT TABLE.

GUARDRAIL LOCATIONS

SITE	STATION		LOCATION	ITEM NO. 211.0400	ITEM NO. 305.0110	ITEM NO. 305.0120	ITEM NO. 465.0105	ITEM NO. 614.0200	ITEM NO. 614.0305	ITEM NO. 614.0345	ITEM NO. 614.0370	ITEM NO. 614.0390	ITEM NO. 614.0920	ITEM NO. 614.0925	ITEM NO. 614.0515	ITEM NO. 614.2300	ITEM NO. 614.2330	ITEM. NO 614.2500	ITEM NO. 614.2610
	FROM	TO		PREPARATION OF FOUNDATION FOR ASPHALTIC SHOULDERS STA	BASE AGGREGATE DENSE 3/4-INCH TONS	BASE AGGREGATE DENSE 1 1/4-INCH TONS	ASPHALTIC SURFACE TONS	STEEL THRIE BEAM STRUCTURE APPROACH LF	STEEL PLATE BEAM GUARD CLASS A LF	STEEL PLATE BEAM GUARD SHORT RADIUS LF	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL EACH	STEEL PLATE BEAM GUARD SHORT RADIUS TERMNAL EACH	SALAGED RAIL LF	SALVAGED GUARDRAIL END TREATMENTS EACH	GUARDRAIL STIFFENED LHW LF	MGS GUARDAIL 3 LF	MGS GUARDRAIL 3K LF	MGS THRIE BEAM TRANSITION LF	MGS GUARDRAIL TERMINAL EAT EACH
A-BMG-1	77+95	84+45	LT	10	60	60	90	---	---	---	---	---	---	---	---	650	---	---	2
A-BMG-3	176+05	180+00	LT	4	40	40	60	---	---	---	---	---	---	---	---	325	137.5	---	2
A-BMG-4	326+80	329+00	RT, UP RAMP	5	35	35	55	---	---	25	1	---	---	---	257.5	---	---	---	---
O-BMG-1	583+42	584+35	LT	---	---	---	---	---	---	---	---	---	---	---	---	---	---	39.5	1
O-BMG-2	583+42	584+35	RT	---	---	---	---	---	---	---	---	---	---	---	---	---	---	39.5	1
O-BMG-3	584+60	585+53	LT	---	---	---	---	---	---	---	---	---	---	---	---	---	---	39.5	1
O-BMG-4	584+60	585+53	RT	---	---	---	---	---	---	---	---	---	---	---	---	---	---	39.5	1
O-BMG-5	727+90	728+55	LT	1	10	10	---	20.65	---	---	1	---	50	---	---	---	---	---	---
O-BMG-6	727+15	728+75	RT	1	20	30	15	20.65	62.5	26	2	2	50	---	---	---	---	---	---
O-BMG-7	728+85	733+50	LT	5	35	60	75	20.65	387.5	---	1	---	50	---	---	---	---	---	---
O-BMG-8	729+10	729+73	RT	1	10	10	15	20.65	---	---	1	---	50	---	---	---	---	---	---
P-BMG-1	181+28	182+20	RT	---	---	---	---	---	---	---	---	---	40	1	---	---	---	39.5	1
P-BMG-1A	184+53	185+58	RT	---	---	---	---	---	---	---	---	---	40	1	---	12.5	---	39.5	1
P-BMG-2	245+06	248+25	LT	4	40	40	60	---	---	---	---	---	---	---	---	---	212.5	---	2
P-BMG-3	256+55	257+18	LT	1	10	10	15	---	12.5	---	1	---	40	---	---	---	---	---	---
P-BMG-4	262+00	264+12.5	LT	1	10	10	15	---	162.5	---	1	---	60	---	---	---	---	---	---
P-BMG-5	426+40	427+70	RT	---	20	30	---	---	---	---	---	---	75	1	---	37.5	---	39.5	1
P-BMG-6	426+12.5	427+80	LT	---	20	30	---	---	---	---	---	---	115	1	---	75	---	39.5	1
P-BMG-7	429+15	431+45	LT	---	25	50	---	---	---	---	---	---	165	1	---	137.5	---	39.5	1
P-BMG-8	429+10	430+52.5	RT	---	20	30	---	---	---	---	---	---	100	1	---	50	---	39.5	1
P-BMG-9	529+50	530+03	LT	---	---	---	---	---	---	---	1	---	---	1	---	---	---	---	---
P-BMG-10	529+50	530+03	RT	---	---	---	---	---	---	---	1	---	---	1	---	---	---	---	---
P-BMG-11	535+30	535+83	LT	---	---	---	---	---	---	---	1	---	---	1	---	---	---	---	---
P-BMG-12	534+30	534+83	RT	---	---	---	---	---	---	---	1	---	---	1	---	---	---	---	---
TOTALS				33	355	445	400	82.6	625	51	12	2	835	10	257.5	1287.5	350	395	16

EROSION CONTROL ITEMS													
SITE	ROADWAY	STATION		LOCATION/ DESCRIPTION	ITEM NO. 625.0500	ITEM NO. 627.0200	ITEM NO. 628.1504	ITEM NO. 628.1520	ITEM NO. 628.2004 EROSION MAT CLASS I	ITEM NO. 628.7504	ITEM NO. 628.7555	ITEM NO. 629.0210	ITEM NO. 630.0120
		FROM	TO		SALVAGED TOPSOIL SY	MULCHING SY	SILT FENCE LF	SILT FENCE MAINTENANCE LF	TYPE B SY	TEMPORARY DITCH CHECKS LF	CULVERT PIPE CHECKS EACH	FERTILIZER TYPE B CWT	SEEDING MIXTURE NO. 20 LBS
A-BMG-1	CTH A	77+95	84+37	LT	1450	---	850	1700	1450	60	---	0.80	40
A-BMG-3	CTH A	176+05	180+00	LT	1000	---	750	1500	1000	60	---	0.55	28
A-BMG-4	CTH A	326+80	329+00	RT	425	---	400	800	425	40	---	0.23	11
A-T-1	CTH A	335+05	---	LT	15	15	---	---	---	---	---	0.06	0.3
A-T-2	CTH A	335+60	---	LT	15	15	---	---	---	---	---	0.06	0.3
A-T-3	CTH A	437+40	---	RT	15	15	---	---	---	---	---	0.06	0.3
A-T-4	CTH A	613+47	---	RT	15	15	---	---	---	---	---	0.06	0.3
A-T-7	CTH A	615+48	---	RT	15	15	---	---	---	---	---	0.06	0.3
A-T-8	CTH A	615+93	---	RT	15	15	---	---	---	---	---	0.06	0.3
A-X-1	CTH A	56+32	---	X-CULVERT	200	200	---	---	---	30	3	0.14	6
A-D-2	CTH A	62+70	---	RT	35	35	---	---	---	10	2	0.02	1
A-D-3	CTH A	62+95	---	LT	35	35	---	---	---	10	2	0.02	1
A-X-4	CTH A	68+30	---	X-CULVERT	200	200	---	---	---	30	5	0.14	6
A-X-5	CTH A	78+40	---	X-CULVERT	100	100	---	---	---	15	5	0.07	3
A-D-6	CTH A	85+20	---	RT	35	35	---	---	---	10	2	0.02	1
A-D-7	CTH A	85+23	---	LT	35	35	---	---	---	10	2	0.02	1
A-D-8	CTH A	90+25	---	RT	35	35	---	---	---	10	2	0.02	1
A-X-9	CTH A	91+30	---	X-CULVERT	200	200	---	---	---	30	3	0.14	6
A-X-11	CTH A	105+30	---	X-CULVERT	200	200	---	---	---	30	3	0.14	6
A-D-15	CTH A	126+55	---	LT	35	35	---	---	---	10	2	0.02	1
A-D-16	CTH A	127+20	---	RT	35	35	---	---	---	10	2	0.02	1
A-D-17	CTH A	133+40	---	LT	35	35	---	---	---	10	2	0.02	1
A-X-18	CTH A	140+50	---	X-CULVERT	75	75	---	---	---	15	7	0.04	3
A-D-19	CTH A	144+34	---	RT	35	35	---	---	---	10	2	0.02	1
A-D-20	CTH A	145+59	---	RT	35	35	---	---	---	10	2	0.02	1
A-D-21	CTH A	146+08	---	LT	35	35	---	---	---	10	2	0.02	1
A-D-23	CTH A	156+85	---	LT	35	35	---	---	---	10	2	0.02	1
A-D-24	CTH A	169+00	---	RT	35	35	---	---	---	10	2	0.02	1
A-D-25	CTH A	174+75	---	RT	35	35	---	---	---	10	3	0.02	1
A-D-26	CTH A	176+75	---	RT	35	35	---	---	---	10	2	0.02	1
A-D-27	CTH A	178+73	---	RT	35	35	---	---	---	10	3	0.02	1
A-D-28	CTH A	182+00	---	LT	35	35	---	---	---	10	2	0.02	1
A-D-29	CTH A	191+00	---	RT	35	35	---	---	---	10	2	0.02	1
A-X-30	CTH A	199+04	---	X-CULVERT	200	200	---	---	---	30	3	0.14	6
A-X-31	CTH A	205+62	---	X-CULVERT	200	200	---	---	---	30	3	0.14	6
A-D-32	CTH A	216+18	---	RT	35	35	---	---	---	10	2	0.02	1
A-D-33	CTH A	219+00	---	LT	35	35	---	---	---	10	2	0.02	1
A-D-34	CTH A	219+00	---	RT	35	35	---	---	---	10	2	0.02	1
A-D-36	CTH A	235+55	---	RT	35	35	---	---	---	10	2	0.02	1
A-D-37	CTH A	261+00	---	LT	35	35	---	---	---	10	2	0.02	1
A-D-38	CTH A	261+00	---	RT	35	35	---	---	---	10	2	0.02	1
A-X-39	CTH A	264+54	---	X-CULVERT	200	200	---	---	---	30	3	0.14	6
A-D-40	CTH A	271+10	---	LT	35	35	---	---	---	10	3	0.02	1
A-X-44	CTH A	314+80	---	X-CULVERT	100	100	---	---	---	15	3	0.07	3
A-X-45	CTH A	322+85	---	X-CULVERT	200	200	---	---	---	30	7	0.14	6
A-X-47,48	CTH A	328+40 328+45	---	X-CULVERT	100	100	---	---	---	15	3	0.07	3
A-X-55	CTH A	364+66	---	X-CULVERT	200	150	---	---	50	30	3	0.14	6
A-X-60	CTH A	405+71	---	X-CULVERT	200	200	---	---	---	30	3	0.14	6
A-X-65	CTH A	426+48	---	X-CULVERT	200	200	---	---	---	30	3	0.14	6
TABLE CONTINUED ON NEXT PAGE													

EROSION CONTROL ITEMS CONTINUED FROM PREVIOUS PAGE.													
SITE	ROADWAY	STATION		LOCATION/ DESCRIPTION	ITEM NO. 625.0500	ITEM NO. 627.0200	ITEM NO. 628.1504	ITEM NO. 628.1520	ITEM NO. 628.2004 EROSION MAT CLASS I TYPE B SY	ITEM NO. 628.7504	ITEM NO. 628.7555	ITEM NO. 629.0210	ITEM NO. 630.0120
		FROM	TO		SALVAGED TOPSOIL SY	MULCHING SY	SILT FENCE LF	SILT FENCE MAINTENANCE LF	TEMPORARY DITCH CHECKS LF	CULVERT PIPE CHECKS EACH	FERTILIZER TYPE B CWT	SEEDING MIXTURE NO. 20 LBS	
A-X-72	CTH A	491+06	---	X-CULVERT	200	150	---	---	50	30	3	0.14	6
O-BMG-1	CTH O	583+45	584+35	LT	175	---	150	300	175	30	---	0.09	5
O-BMG-2	CTH O	583+45	584+35	RT	200	---	150	300	200	30	---	0.11	5
O-BMG-3	CTH O	584+65	585+55	LT	250	---	175	350	250	40	---	0.14	7
O-BMG-4	CTH O	584+65	585+55	RT	250	---	175	350	250	40	---	0.14	7
O-BMG-5	CTH O	727+90	728+55	LT	175	---	130	260	175	40	---	0.09	5
O-BMG-6	CTH O	727+10	728+75	RT	300	---	250	500	300	40	---	0.16	8
O-BMG-7	CTH O	728+85	733+50	LT	600	---	500	1000	600	80	---	0.32	16
O-BMG-8	CTH O	719+10	729+85	RT	300	---	250	500	300	40	---	0.16	8
O-T-2	CTH O	236+91	---	LT	15	15	---	---	---	---	---	0.06	0.3
O-T-3	CTH O	237+98	---	LT	15	15	---	---	---	---	---	0.06	0.3
O-T-4	CTH O	238+45	---	LT	15	15	---	---	---	---	---	0.06	0.3
O-T-5	CTH O	238+82	---	LT	15	15	---	---	---	---	---	0.06	0.3
O-T-6	CTH O	239+13	---	LT	15	15	---	---	---	---	---	0.06	0.3
O-T-7	CTH O	239+50	---	LT	15	15	---	---	---	---	---	0.06	0.3
O-T-8	CTH O	669+63	---	LT	15	15	---	---	---	---	---	0.06	0.3
O-T-9	CTH O	670+00	---	LT	15	15	---	---	---	---	---	0.06	0.3
P-D-1	CTH P	71+90	---	RT	35	35	---	---	---	10	3	0.02	1
P-D-5	CTH P	135+10	---	LT	35	35	---	---	---	10	2	0.02	1
P-D-6	CTH P	155+87	---	RT	20	20	---	---	---	5	2	0.01	0.5
P-D-7	CTH P	158+33	---	RT	20	20	---	---	---	5	2	0.01	0.5
P-D-8	CTH P	159+30	---	LT	20	20	---	---	---	5	2	0.01	1
P-D-9	CTH P	166+49	---	RT	35	35	---	---	---	10	2	0.02	1
P-D-10	CTH P	167+07	---	LT	35	35	---	---	---	10	2	0.02	1
P-D-11	CTH P	167+94	---	RT	35	35	---	---	---	10	2	0.02	1
P-D-12	CTH P	170+76	---	LT	35	35	---	---	---	10	2	0.02	1
P-D-13	CTH P	170+76	---	RT	35	35	---	---	---	10	2	0.02	1
P-D-14	CTH P	185+10	---	LT	35	35	---	---	---	10	2	0.02	1
P-D-15	CTH P	197+60	---	RT	35	35	---	---	---	10	2	0.02	1
P-D-16	CTH P	201+34	---	RT	35	35	---	---	---	10	2	0.02	1
P-D-17	CTH P	212+15	---	RT	35	35	---	---	---	10	2	0.02	1
P-D-18	CTH P	217+92	---	RT	35	35	---	---	---	10	2	0.02	1
P-D-19	CTH P	230+90	---	RT	35	35	---	---	---	10	2	0.02	1
P-D-20	CTH P	244+80	---	RT	35	35	---	---	---	10	2	0.02	1
P-BMG-1	CTH P	181+28	182+20	RT	100	---	---	---	100	---	---	0.06	3
P-BMG-1A	CTH P	184+53	185+58	RT	100	---	---	---	100	---	---	0.06	3
P-BMG-2	CTH P	245+06	248+25	LT	445	---	400	800	445	40	---	0.24	12
P-BMG-3	CTH P	256+50	257+15	LT	90	90	---	---	---	20	---	.05	2.5
P-BMG-4	CTH P	252+00	253+50	LT	90	90	---	---	---	20	---	0.05	2.5
P-BMG-5	CTH P	426+40	427+70	RT	300	---	200	400	300	30	---	0.16	8
P-BMG-6	CTH P	426+12.5	427+80	LT	335	---	250	500	335	40	---	0.18	9
P-BMG-7	CTH P	429+15	431+45	LT	445	---	280	560	445	40	---	0.24	12
P-BMG-8	CTH P	429+10	430+52.5	RT	215	---	175	350	215	30	---	0.12	6
P-BMG-9	CTH P	529+50	530+03	LT	90	90	---	---	---	20	---	0.05	2.5
P-BMG-10	CTH P	529+50	530+03	RT	90	90	---	---	---	20	---	0.05	2.5
P-BMG-11	CTH P	535+30	535+83	LT	90	90	---	---	---	20	---	0.05	2.5
P-BMG-12	CTH P	534+30	534+83	RT	90	90	---	---	---	20	---	0.05	2.5
TOTALS					12015	4850	5085	10170	7165	1625	148	8	337

GEOTEXTILE FABRIC TYPE HR, ITEM NO. 645.0120 AND RIPRAP MEDIUM, ITEM NO. 606.0200					
				ITEM NO. 606.0200 RIPRAP MEDIUM CY	ITEM NO. 645.0120 GEOTEXTILE FABRIC TYPE HR SY
SITE	STATION	ROADWAY	LOCATION		
A-X-55	364+66	CTH A	RT	20	35
A-X-65	426+48	CTH A	RT	20	35
P-D-1	71+00	CTH P	RT	25	50
P-D-6	155+87	CTH P	RT	10	20
P-D-7	158+33	CTH P	RT	10	20
TOTALS				85	160

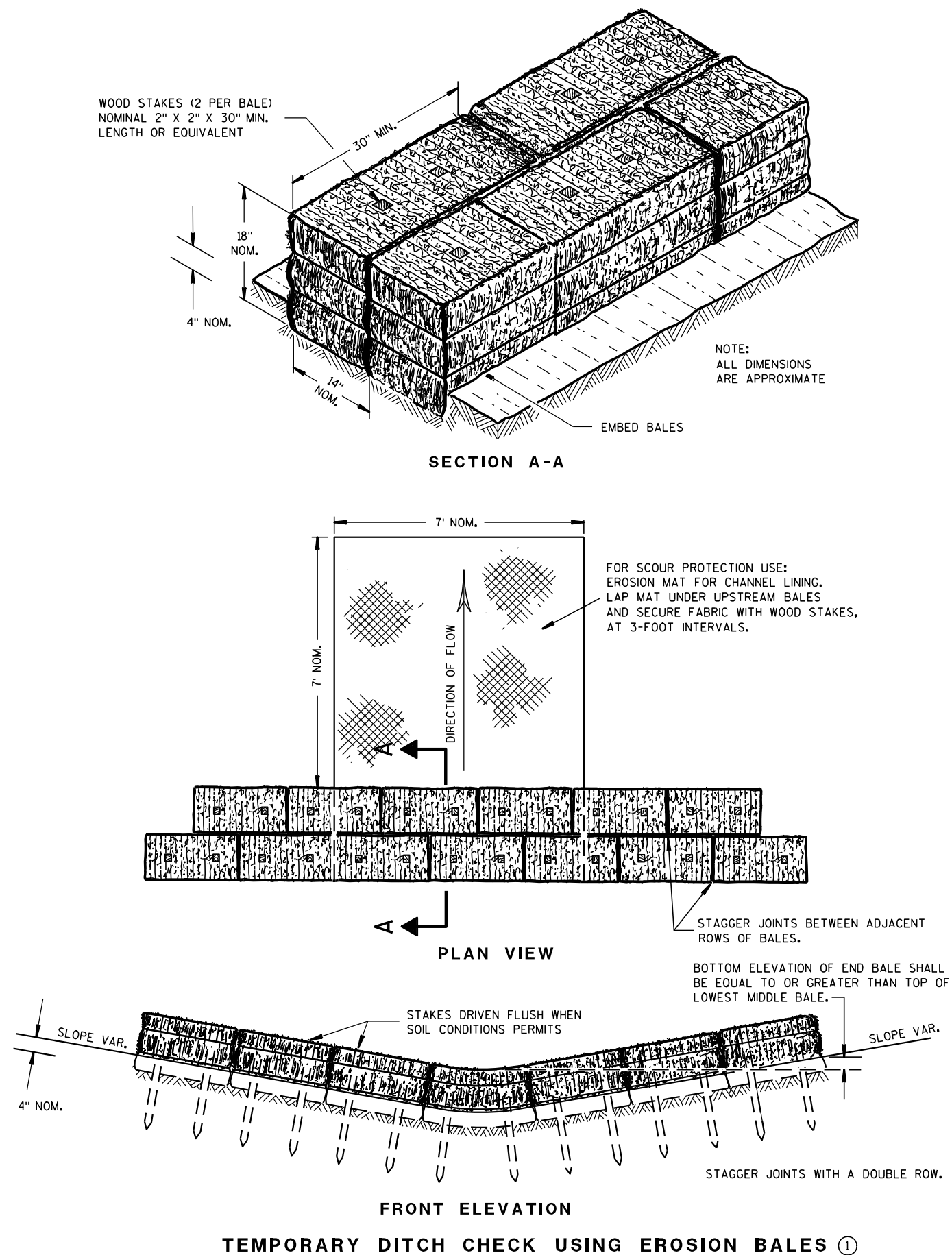
SAWING PAVEMENT						
					ITEM NO. 690.0150 SAWING ASPHALT LF	ITEM NO. 690.0250 SAWING CONCRETE LF
SITE	FROM	TO	ROADWAY	LOCATION		
A-BMG-1	77+95	84+45	CTH A	LT	1000	---
A-BMG-3	176+05	180+00	CTH A	LT	400	---
A-BMG-4	326+80	329+00	CTH A	RT, UP RAMP	500	---
O-BMG-6	727+15	728+75	CTH O	RT	100	---
O-BMG-7	728+85	733+50	CTH O	LT	500	---
O-BMG-8	729+10	729+73	CTH O	RT	100	---
P-BMG-1	181+28	182+20	CTH P	RT	---	80
P-BMG-1A	184+53	185+58	CTH P	RT	---	70
P-BMG-2	245+06	248+25	CTH P	LT	400	---
P-BMG-3	256+55	257+18	CTH P	LT	125	---
P-BMG-4	262+00	264+12.5	CTH P	LT	250	---
B-BMG-9	528+75	530+00	CTH P	LT	125	---
P-BMG-10	528+75	530+00	CTH P	RT	125	---
P-BMG-11	535+25	536+75	CTH P	LT	150	---
P-BMG-12	534+25	535+75	CTH P	RT	150	---
TOTALS					3925	150

PAVEMENT MARKING EPOXY 4-INCH, ITEM NO. 646.0106					
SITE	STATION		ROADWAY	LOCATION	LF
	FROM	TO			
A-BMG-1	77+95	84+45	CTH A	LT	1000
A-BMG-3	176+05	180+00	CTH A	LT	400
A-BMG-4	326+80	329+00	CTH A	RT, UP RAMP	500
O-BMG-6	727+15	728+75	CTH O	RT	100
O-BMG-7	728+85	733+50	CTH O	LT	500
O-BMG-8	729+10	729+73	CTH O	RT	100
P-BMG-2	245+06	248+25	CTH P	LT	400
P-BMG-3	256+55	257+18	CTH P	LT	125
P-BMG-4	262+00	264+12.5	CTH P	LT	250
B-BMG-9	528+75	530+00	CTH P	LT	125
P-BMG-10	528+75	530+00	CTH P	RT	125
P-BMG-11	535+25	536+75	CTH P	LT	140
P-BMG-12	534+25	535+75	CTH P	RT	140
TOTALS					3905

UTILITY LINE OPENING, ITEM NO. SPV.0060.01			
SITE	ROADWAY	LOCATION	EACH
A-BMG-3	CTH A	LEFT	1
A-BMG-4	CTH A	RIGHT	1
O-BMG-5	CTH O	LEFT	1
O-BMG-6	CTH O	RIGHT	3
P-BMG-1A	CTH P	RIGHT	1
P-BMG-4	CTH P	LEFT	1
A-X-11	CTH A	RIGHT AND LEFT	2
A-X-18	CTH A	LEFT	1
A-X-39	CTH A	LEFT	1
A-X-44	CTH A	LEFT	1
A-X-55	CTH A	RIGHT AND LEFT	2
A-X-60	CTH A	RIGHT AND LEFT	2
A-X-65	CTH A	RIGHT	1
P-D-06	CTH P	RIGHT	1
TOTALS			19

Standard Detail Drawing List

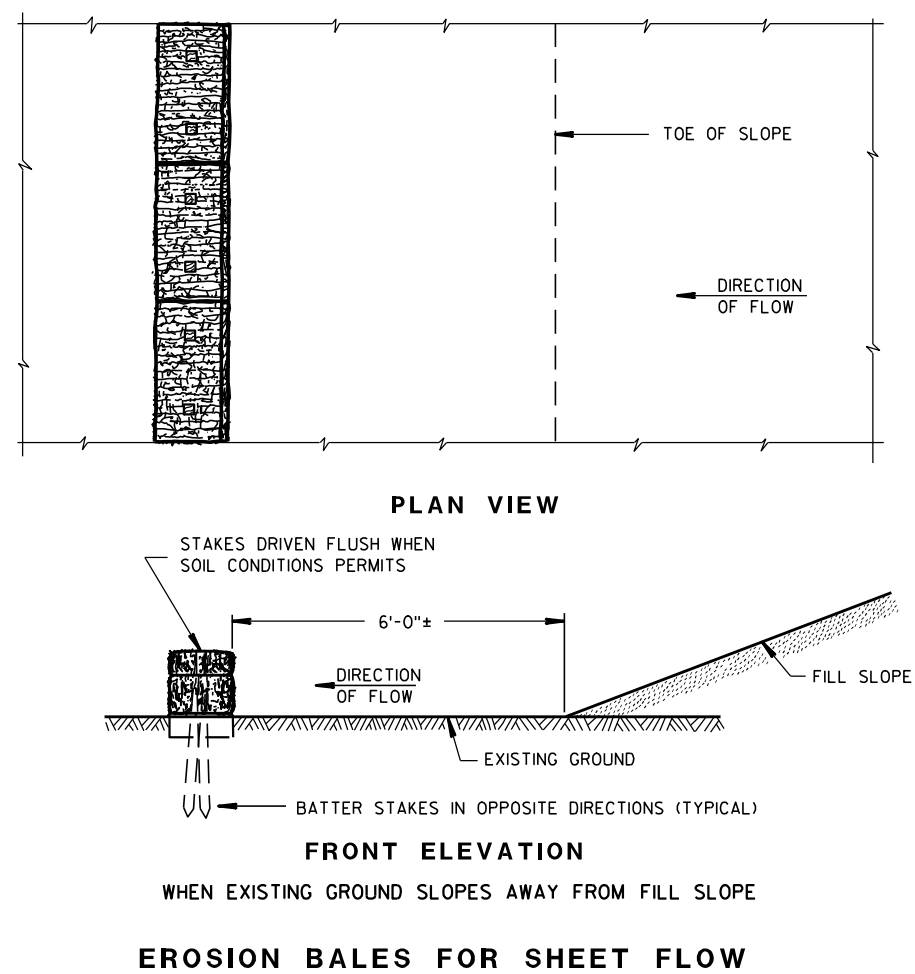
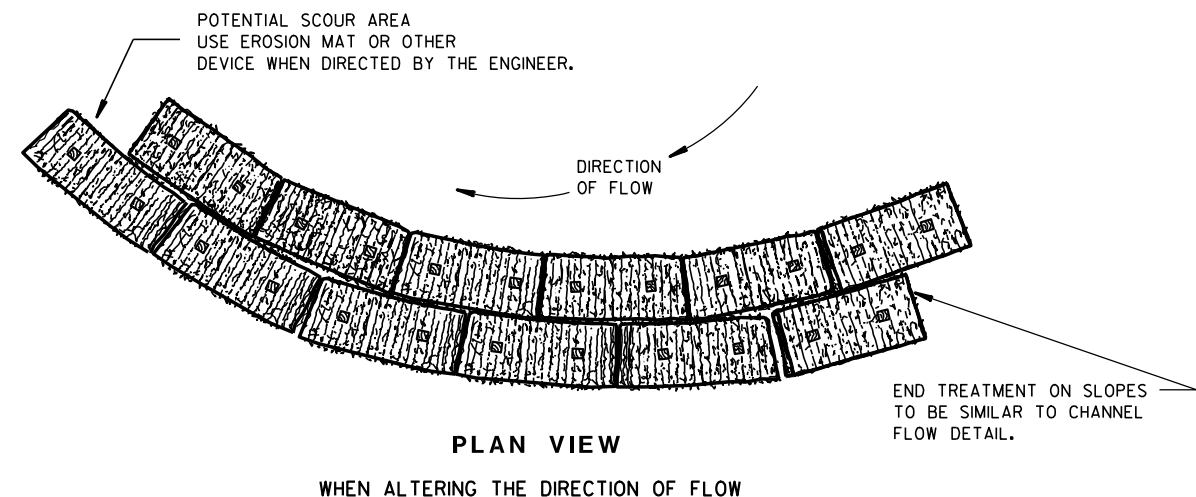
08E08-03	TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS
08E09-06	SILT FENCE
08F01-11	APRON ENDWALLS FOR CULVERT PIPE
08F04-07	JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL
08F07-05	STEEL APRON ENDWALLS FOR CULVERT PIPE AND PIPE ARCH SLOPED SIDE FRAINS
08F08-02	STEEL APRON ENDWALLS FOR CULVERT PIPE AND PIPE ARCH SLOPED CROSS DRAINS
14B15-07A	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
14B15-07B	STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATION & ELEMENTS
14B15-07C	STEEL PLATE BEAM GUARD, CLASS "A", INSTALLATION & ELEMENTS
14B18-06A	STEEL PLATE BEAM GUARD, CLASS "A" (AT BRIDGES, OBSTACLES AND SIDEROADS/DRIVEWAYS)
14B20-11A	STEEL THRIE BEAM STRUCTURE APPROACH
14B20-11B	STEEL THRIE BEAM STRUCTURE APPROACH, CONNECTION TO SQUARE END PARAPETS
14B20-11C	STEEL THRIE BEAM STRUCTURE APPROACH, CONNECTION TO VERTICAL FACED PARAPETS
14B20-11D	STEEL THRIE BEAM STRUCTURE APPROACH, CONNECTION TO SLOPED END PARAPETS
14B20-11E	STEEL THRIE BEAM STRUCTURE APPROACH, CONNECTION TO BRIDGE RAILING TYPES "F" AND "W"
14B20-11F	STEEL THRIE BEAM STRUCTURE APPROACH, CONNECTION TO BRIDGE RAILING TYPE "M"
14B20-11G	STEEL THRIE BEAM STRUCTURE APPROACH, CONNECTOR PLATE DETAIL
14B24-07A	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
14B24-07B	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
14B24-07C	STEEL PLATE BEAM GUARD ENERGY ABSORBING TERMINAL
14B27-01A	STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL
14B27-01B	STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL
14B27-01C	STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL
14B42-02A	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-02B	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-02C	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B44-01A	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-01B	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-01C	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B45-03A	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03B	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03C	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03D	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03E	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03F	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03G	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03H	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03I	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
14B45-03J	MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)
15A03-02A	FLEXIBLE MARKER POST FOR CULVERT END
15A03-02B	FLEXIBLE MARKER POST FOR CULVERT END
15C08-16A	PAVEMENT MARKING (MAINLINE)
15C08-16B	PAVEMENT MARKING (INTERSECTIONS)
15C12-03	TRAFFIC CONTROL FOR LANE CLOSURE (SUITABLE FOR MOVING OPERATIONS)
15D28-01	TRAFFIC CONTROL, WORK ON SHOULDER OR PARKING LANE, UNDIVIDED ROADWAY



GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

- ① TEMPORARY DITCH CHECKS EITHER EROSION BALES OR MANUFACTURED SHALL BE PAID FOR UNDER THE BID ITEM OF TEMPORARY DITCH CHECK. THE DEPARTMENT WILL NOT PAY FOR TEMPORARY DITCH CHECKS CONSTRUCTED OF A SINGLE ROW OF EROSION BALES.



TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

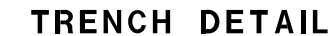
6/04/02
DATE

/S/ Beth Conn
CHIEF ROADWAY DEVELOPER 114 ENGINEER

FHWA



- ① HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.
- ② FOR MANUAL INSTALLATIONS THE TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.
- ③ WOOD POSTS SHALL BE A MINIMUM SIZE OF 1½" X 1½" OF OAK OR HICKORY.
- ④ SILT FENCE TO EXTEND ACROSS THE TOP OF THE PIPE.
- ⑤ CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS; A) OVERLAP THE END POSTS AND TWIST, OR ROTATE, AT LEAST 180 DEGREES, B) HOOK THE END OF EACH SILT FENCE LENGTH.



SILT FENCE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

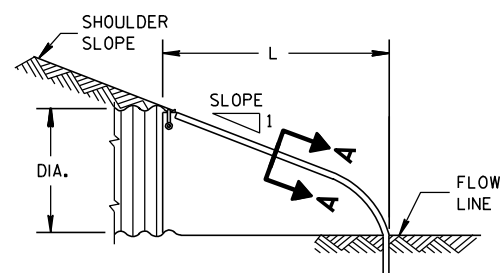
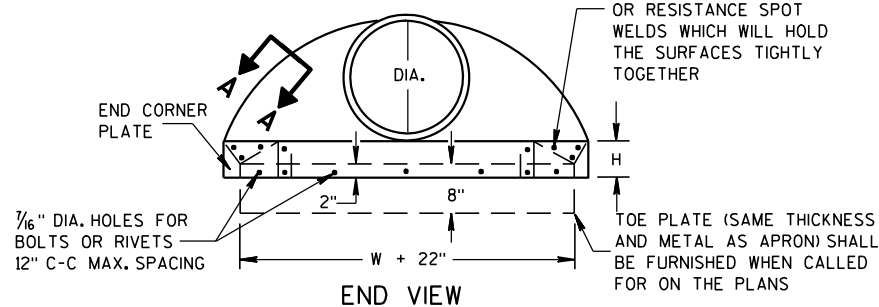
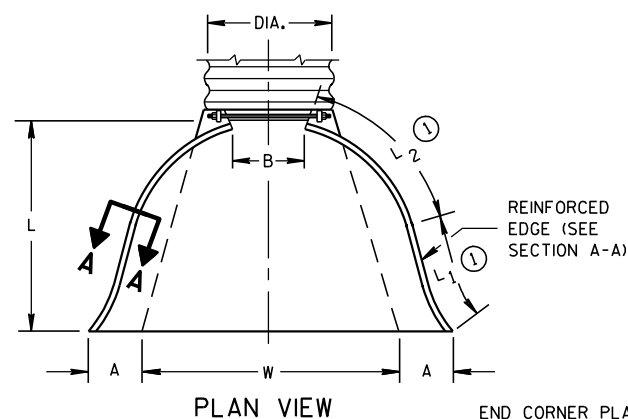
APPROVED
4-29-05 /S/ Beth Connolly
DATE CHIEF ROADWAY DEVELOPMENT 115 INCHES

FHWA

METAL APRON ENDWALLS

PIPE DIA. (IN.)	MIN. THICK. (Inches)		DIMENSIONS (Inches)							APPROX. SLOPE	BODY
	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L ₁ ①	L ₂ ①	W (±2")		
12	.064	.060	6	6	6	21	12	17 1/2	24	2 1/2 to 1	1 Pc.
15	.064	.060	7	8	6	26	14	21 3/4	30	2 1/2 to 1	1 Pc.
18	.064	.060	8	10	6	31	15	28 1/4	36	2 1/2 to 1	1 Pc.
21	.064	.060	9	12	6	36	18	29 5/8	42	2 1/2 to 1	1 Pc.
24	.064	.075	10	13	6	41	18	37 1/4	48	2 1/2 to 1	1 Pc.
30	.079	.075	12	16	8	51	18	52 1/4	60	2 1/2 to 1	1 Pc.
36	.079	.105	14	19	9	60	24	59 3/4	72	2 1/2 to 1	2 Pc.
42	.109	.105	16	22	11	69	24	75 5/8	84	2 1/2 to 1	2 Pc.
48	.109	.105	18	27	12	78	24	81	90	2 1/4 to 1	3 Pc.
54	.109	.105	18	30	12	84	30	85 1/2	102	2 1/4 to 1	3 Pc.
60	.109x	.105x	18	33	12	87	—	—	114	2 to 1	3 Pc.
66	.109x	.105x	18	36	12	87	—	—	120	2 to 1	3 Pc.
72	.109x	.105x	18	39	12	87	—	—	126	2 to 1	3 Pc.
78	.109x	.105x	18	42	12	87	—	—	132	1 1/2 to 1	3 Pc.
84	.109x	.105x	18	45	12	87	—	—	138	1 1/2 to 1	3 Pc.
90	.109x	.105x	18	37	12	87	—	—	144	1 1/2 to 1	3 Pc.
96	.109x	.105x	18	35	12	87	—	—	150	1 1/2 to 1	3 Pc.

* EXCEPT CENTER PANEL
SEE GENERAL NOTES

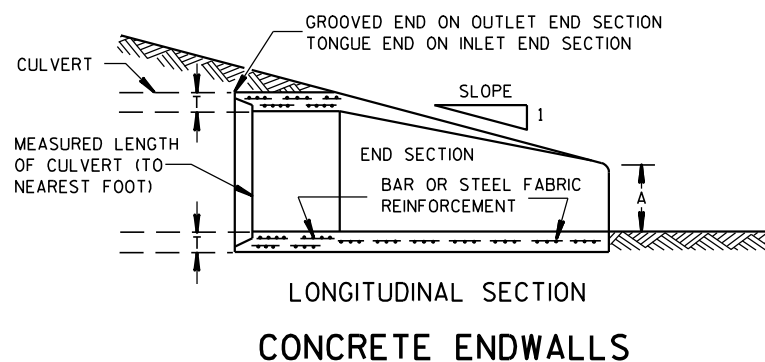
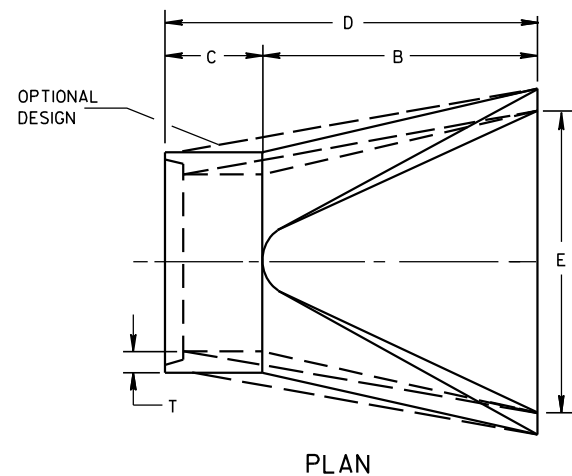


METAL ENDWALLS

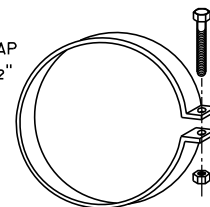
REINFORCED CONCRETE APRON ENDWALLS

PIPE DIA. (IN.)	DIMENSIONS (Inches)							APPROX. SLOPE
	T	A	B	C	D	E	G	
12	2	4	24	48 7/8	72 1/8	24	2	3 to 1
15	2 1/4	6	27	46	73	30	2 1/4	3 to 1
18	2 1/2	9	27	46	73	36	2 1/2	3 to 1
21	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	3 to 1
24	3	9 1/2	43 1/2	30	73 1/2	48	3	3 to 1
27	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	3 to 1
30	3 1/2	12	54	19 3/4	73 1/2	60	3 1/2	3 to 1
36	4	15	63	34 3/4	97 3/4	72	4	3 to 1
42	4 1/2	21	63	35	98	78	4 1/2	3 to 1
48	5	24	72	26	98	84	5	3 to 1
54	5 1/2	27	65	33 1/4-35	98 1/4-100	90	5 1/2	2 1/2 to 1
60	6	30-35	60	39	99	96	5	2 to 1
66	6 1/2	24-30	72-78	21-27	99	102	5 1/2	2 to 1
72	7	24-36	78	21	99	108	6	2 to 1
78	7 1/2	24-36	78	21	99	114	6 1/2	2 to 1
84	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2 to 1
90	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	1 1/2 to 1

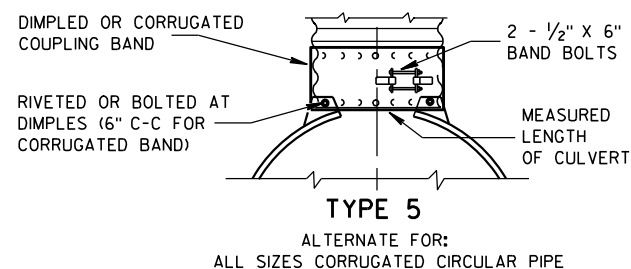
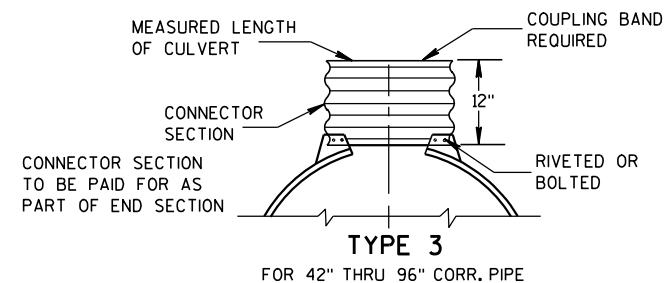
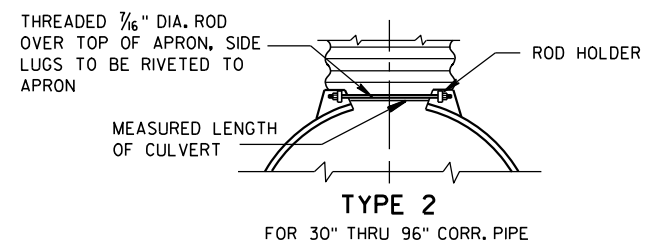
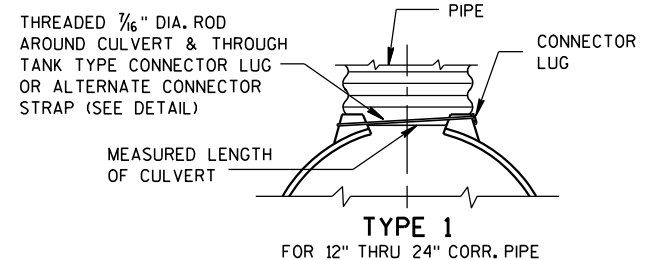
* MINIMUM
** MAXIMUM



1" WIDE, 12 GA. (0.109" THICK) GALVANIZED STRAP WITH STANDARD 6" X 1/2" BAND BOLT AND NUT



ALTERNATE FOR TYPE 1 CONNECTION
END SECTION CONNECTOR STRAP



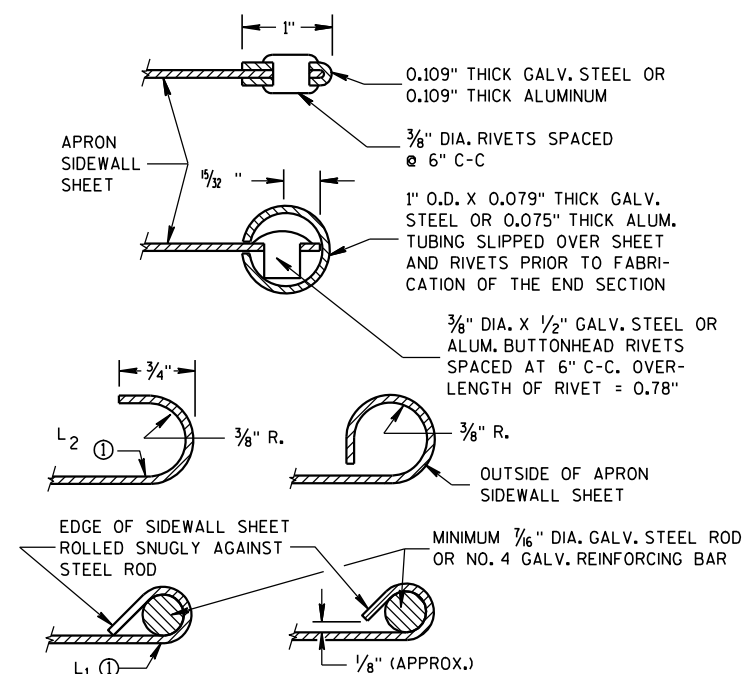
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

FOR CIRCUMFERENTIALLY CORRUGATED PIPE USE ENDWALL CONNECTION DETAILS 1, 2, 3 OR 5 AS APPLICABLE.

FOR HELICALLY CORRUGATED PIPE USE ENDWALL CONNECTION DETAILS 1, 2 OR 5.

FOR HELICALLY CORRUGATED PIPES WITH TWO CIRCUMFERENTIAL CORRUGATIONS AT EACH END USE ENDWALL CONNECTION DETAILS 1, 2 OR 3.

CONNECTION DETAILS



GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

CONCRETE CULVERT ENDWALLS MAY NOT BE USED WITH GALVANIZED STEEL OR ALUMINUM CULVERT PIPE OR VISE VERSA. GALVANIZED STEEL OR ALUMINUM ENDWALLS SHALL NORMALLY BE INSTALLED ON CULVERT PIPE OF THE SAME METAL.

ALL THREE PIECE STEEL APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.109" SIDES AND 0.138" CENTER PANELS. ALL THREE PIECE ALUMINUM APRON ENDWALLS FOR 60" DIAMETER PIPE AND LARGER SHALL HAVE 0.105" SIDES AND 0.134" CENTER PANELS. THE WIDTH OF CENTER PANELS SHALL BE GREATER THAN 20 PERCENT OF THE PIPE PERIMETER.

LAP SEAMS SHALL BE TIGHTLY JOINED BY GALVANIZED RIVETS OR BOLTS FOR STEEL UNITS AND ALUMINUM RIVETS AND BOLTS FOR ALUMINUM UNITS. FOR THE 60" THROUGH 96" DIAMETER APRON ENDWALL SIZES, THE REINFORCED EDGES AND CENTER PANEL SEAMS SHALL BE FURTHER REINFORCED WITH GALVANIZED STEEL OR ALUMINUM STIFFENER ANGLES. THE ANGLES SHALL BE ATTACHED BY GALVANIZED NUTS AND BOLTS FOR STEEL UNITS AND ALUMINUM NUTS AND BOLTS FOR ALUMINUM UNITS.

WHERE TWO OR MORE PIPES WITH APRON ENDWALLS ARE LAID ADJACENT TO EACH OTHER, THEY SHALL BE SEPARATED BY A DISTANCE SUFFICIENT TO PROVIDE A MINIMUM CLEARANCE OF 6 INCHES BETWEEN APRON ENDWALLS.

① FOR PIPE SIZES UP TO 60" DIAMETER, A 180° ROLLED EDGE MAY BE USED INSTEAD OF STEEL ROD REINFORCEMENT. SEE SECTION A-A.

APRON ENDWALLS FOR CULVERT PIPE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

11/30/94

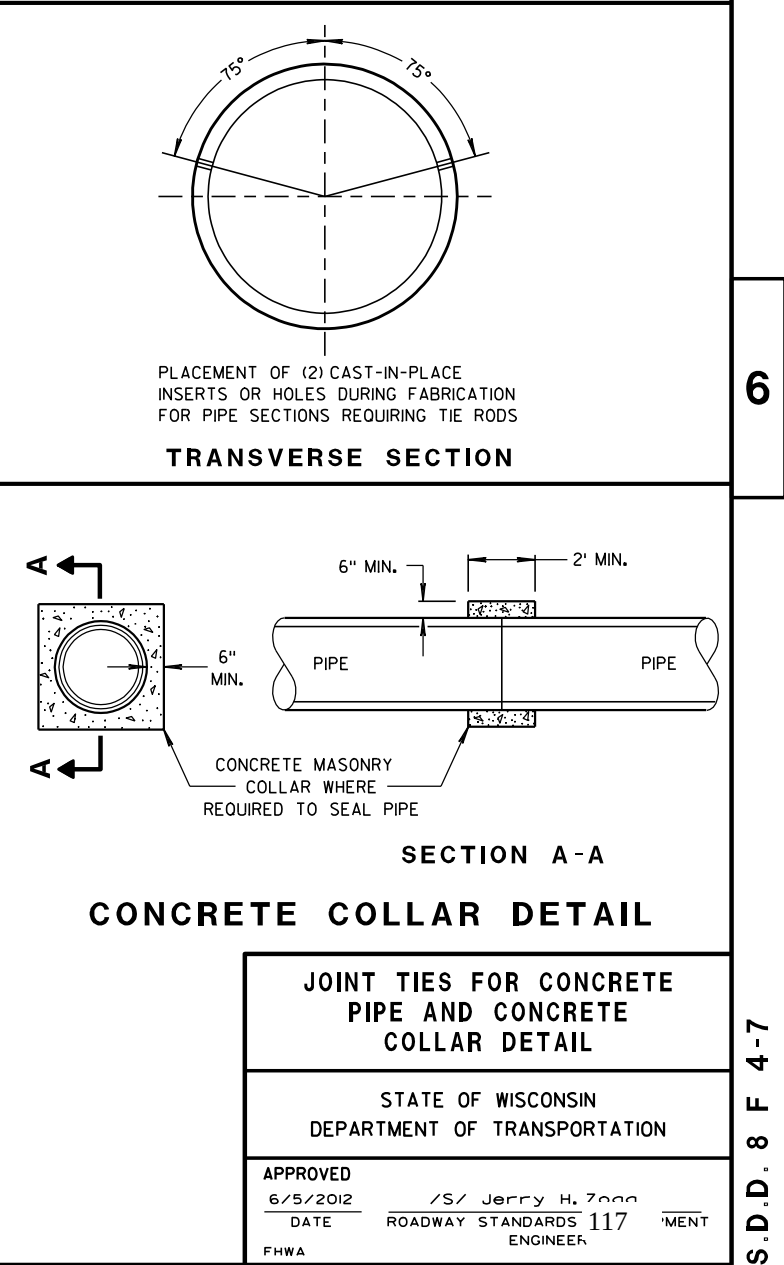
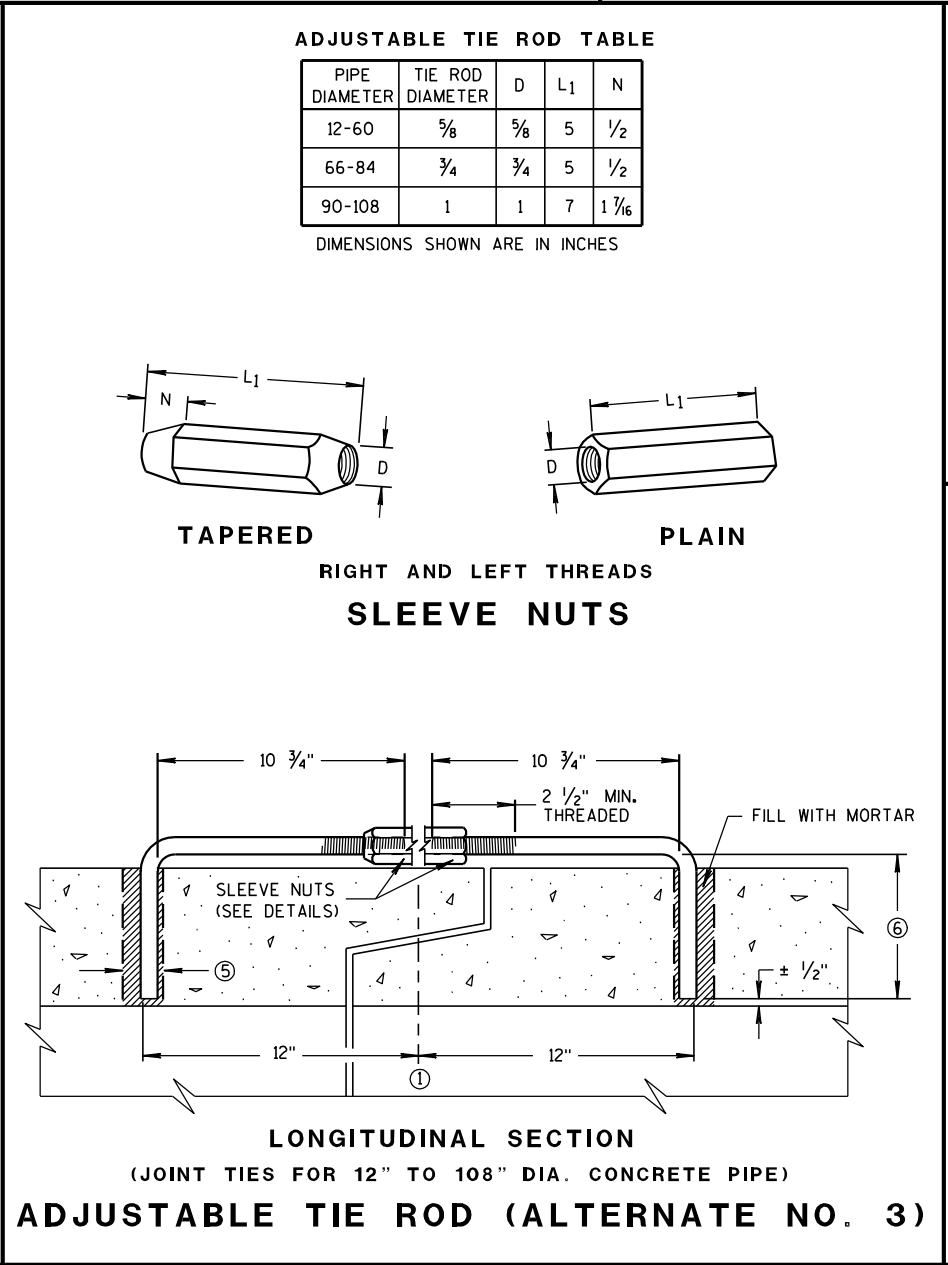
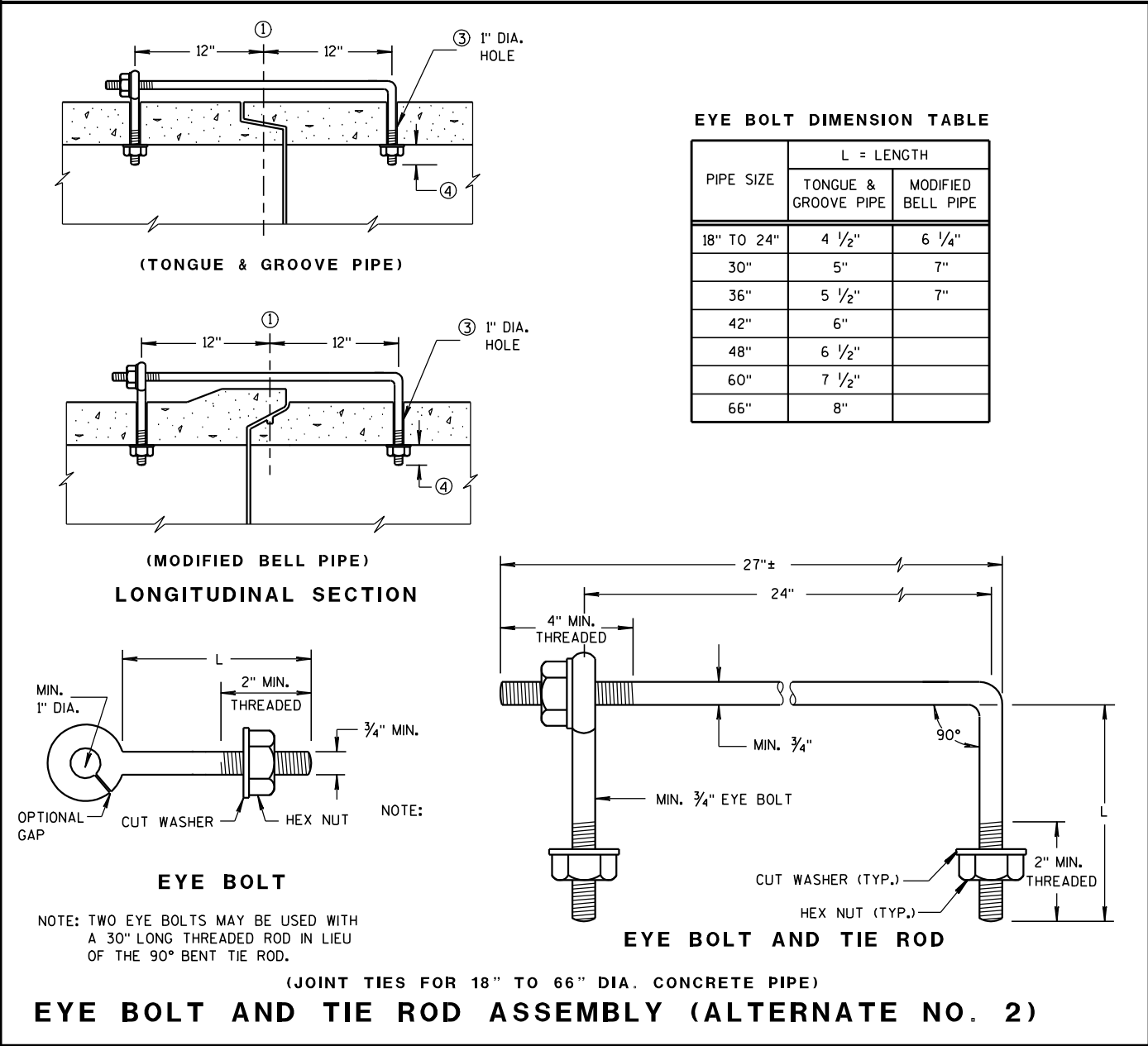
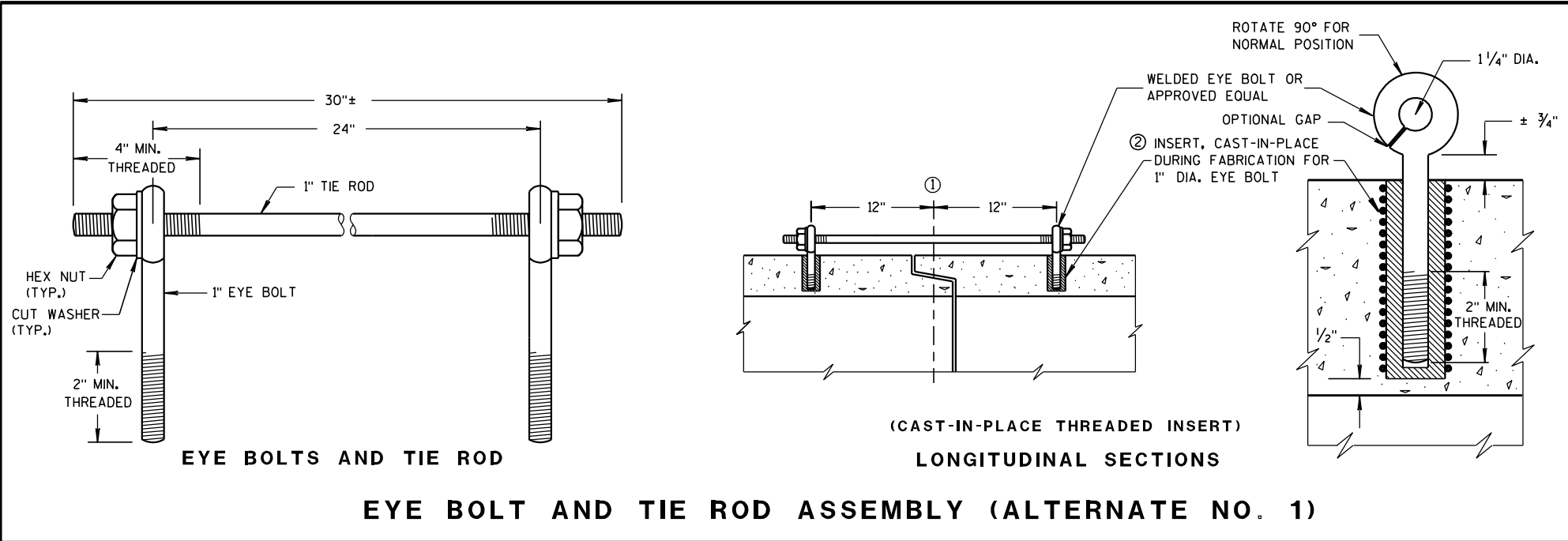
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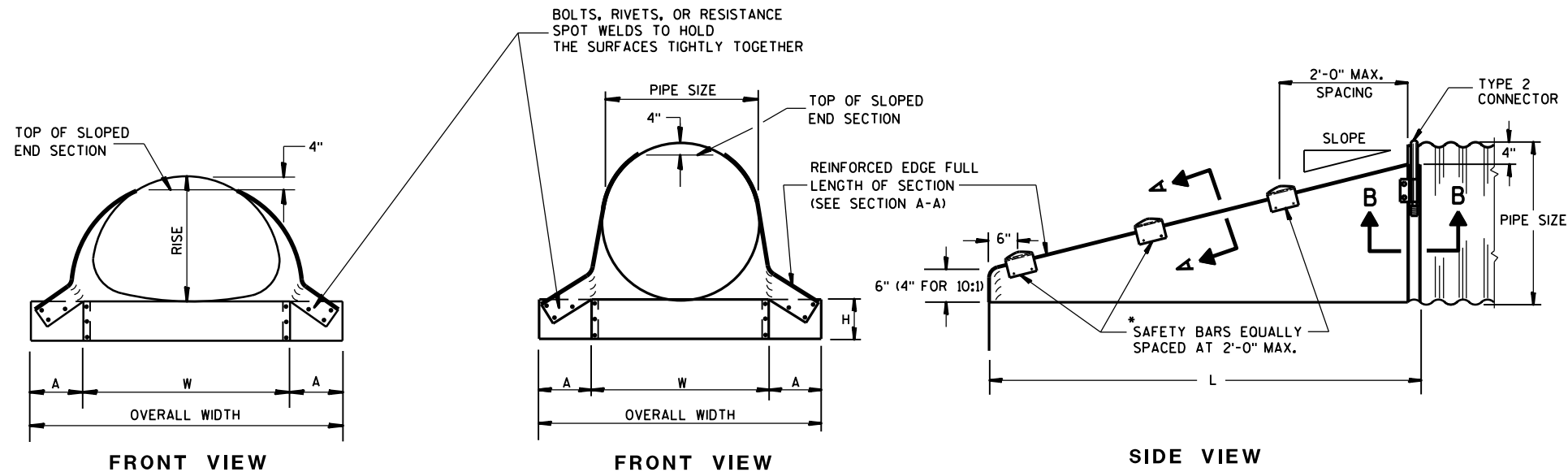
/S/ Rory L. Rhinehart

CHIEF ROADWAY DEVELOP 116

NEER

FHWA





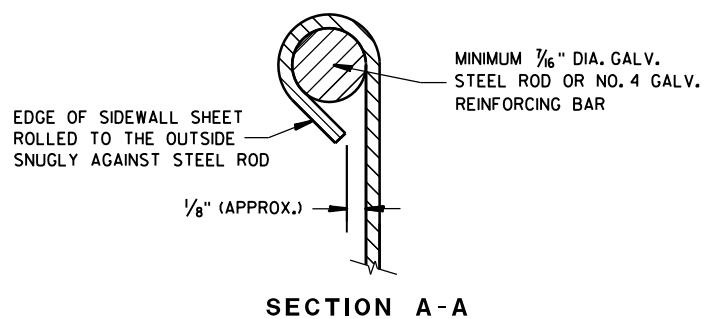
GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

SLOPED END SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS, SECTION 521 FOR STEEL APRON ENDWALLS.

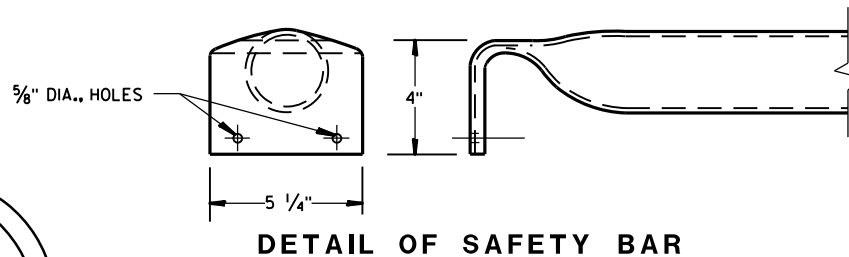
SAFETY BARS SHALL BE FABRICATED FROM GALVANIZED STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A-53, GRADE B, SCHEDULE 40 OR APPROVED EQUAL.

STEEL APRON ENDWALLS FOR CULVERT PIPE SLOPED SIDE DRAINS											
PIPE DIA. (IN.)	MIN. THICK. (Inches)	DIMENSIONS (Inches)				L DIMENSIONS					
		A	H	W	OVERALL WIDTH	SLOPE	LENGTH INCHES	SLOPE	LENGTH INCHES	SLOPE	LENGTH INCHES
15	.064	8	6	21	37	4:1	20	6:1	30	10:1	70
18	.064	8	6	24	40	4:1	32	6:1	48	10:1	100
21	.064	8	6	27	43	4:1	44	6:1	66	10:1	130
24	.064	8	6	30	46	4:1	56	6:1	84	10:1	160
30	.109	12	9	36	60	4:1	80	6:1	120	10:1	220
36	.109	12	9	42	66	4:1	104	6:1	156	10:1	280
42	.109	16	12	48	80	4:1	128	6:1	192	—	—
48	.109	16	12	54	86	4:1	152	6:1	228	—	—
54	.109	16	12	60	92	4:1	176	6:1	264	—	—
60	.109	16	12	66	98	4:1	200	6:1	300	—	—



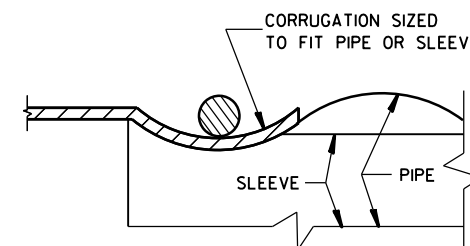
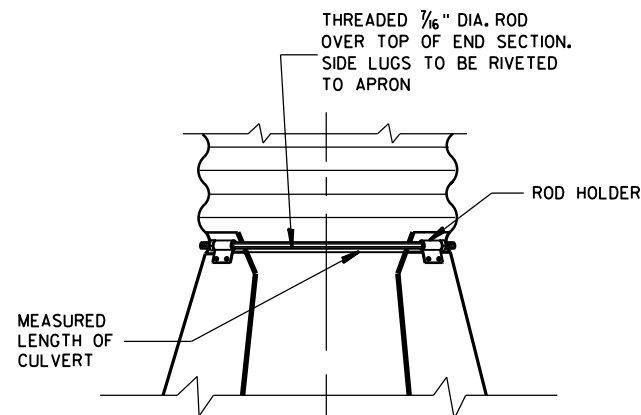
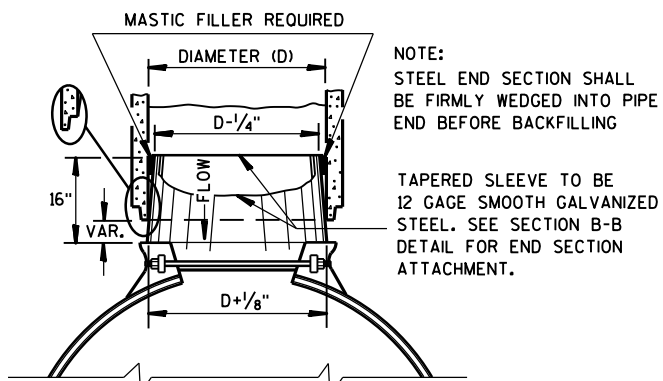
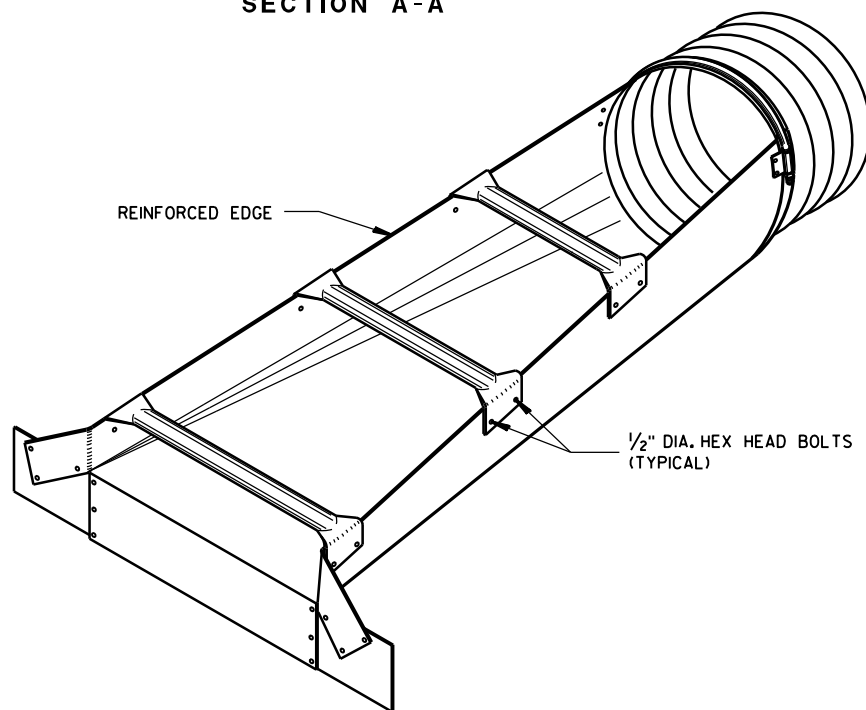
*NOTE:
THREE SAFETY BARS ARE SHOWN.
ACTUAL NUMBER OF BARS REQUIRED AT
A 2'-0" C-C MAX. SPACING WILL VARY
DEPENDING ON THE LENGTH OF THE
END SECTION.

3" GALVANIZED PIPE, FLATTEN
ENDS, THEN BEND OUTSIDE 4"
TO MATCH END SECTION SIDES.



STEEL APRON ENDWALLS FOR PIPE ARCH SLOPED SIDE DRAINS											
EQUIV. DIA. (Inches)	(Inches)		MIN. THICK. (Inches) ①	DIMENSIONS (Inches)				L DIMENSIONS			
	SPAN	RISE		A	H	W	OVERALL WIDTH	SLOPE	LENGTH INCHES	SLOPE	LENGTH INCHES
15	17	13	.064 *	7	6	30	44	4:1	19	6:1	30
18	21	15	.064 *	8	6	27	43	4:1	20	6:1	30
21	24	18	.064 *	8	6	30	46	4:1	32	6:1	48
24	28	20	.064 *	8	6	34	50	4:1	40	6:1	60
30	35	24	.079 *	12	9	41	65	4:1	56	6:1	84
36	42	29	.109 *	12	9	48	72	4:1	76	6:1	114
42	49	33	.109	16	12	55	87	4:1	92	6:1	138
48	57	38	.109	16	12	63	95	4:1	112	6:1	168
54	64	43	.109	16	12	70	102	4:1	132	6:1	198

① * MINIMUM THICKNESS OF ALL 10:1 SLOPED SIDE DRAINS IS 0.109".
② ACTUAL SLOPE GREATER THAN 10:1.



STEEL APRON ENDWALLS FOR CULVERT PIPE AND PIPE ARCH SLOPED SIDE DRAINS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

9/14/2012

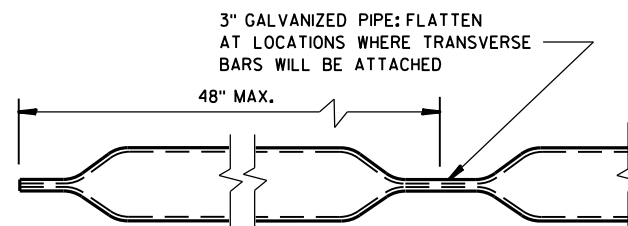
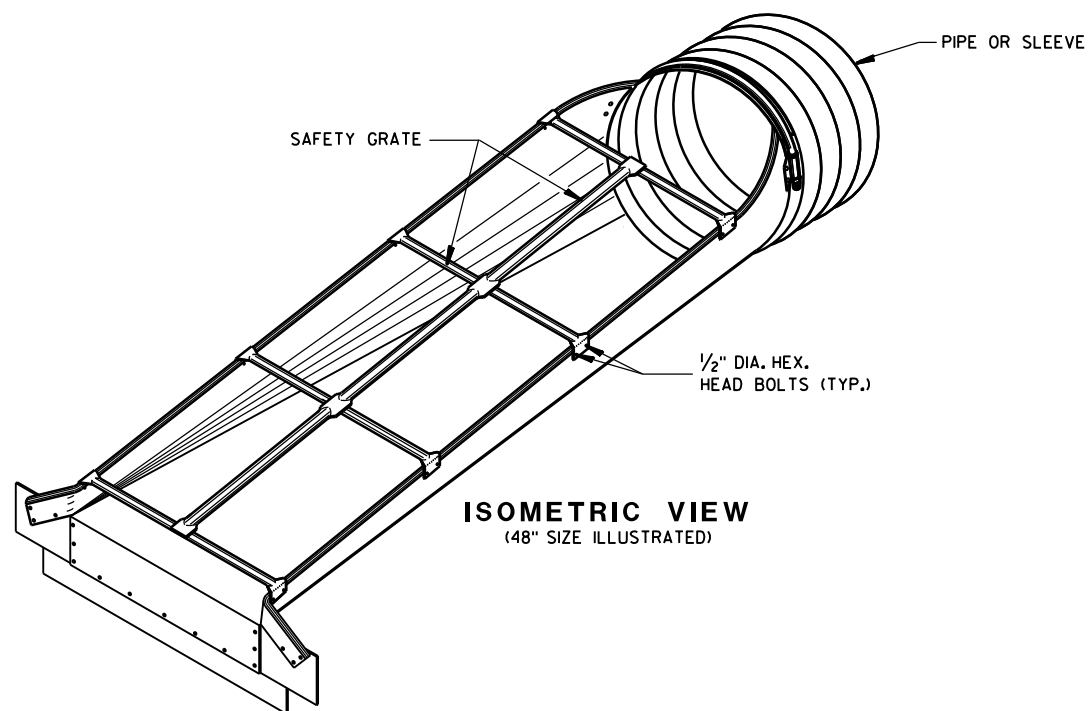
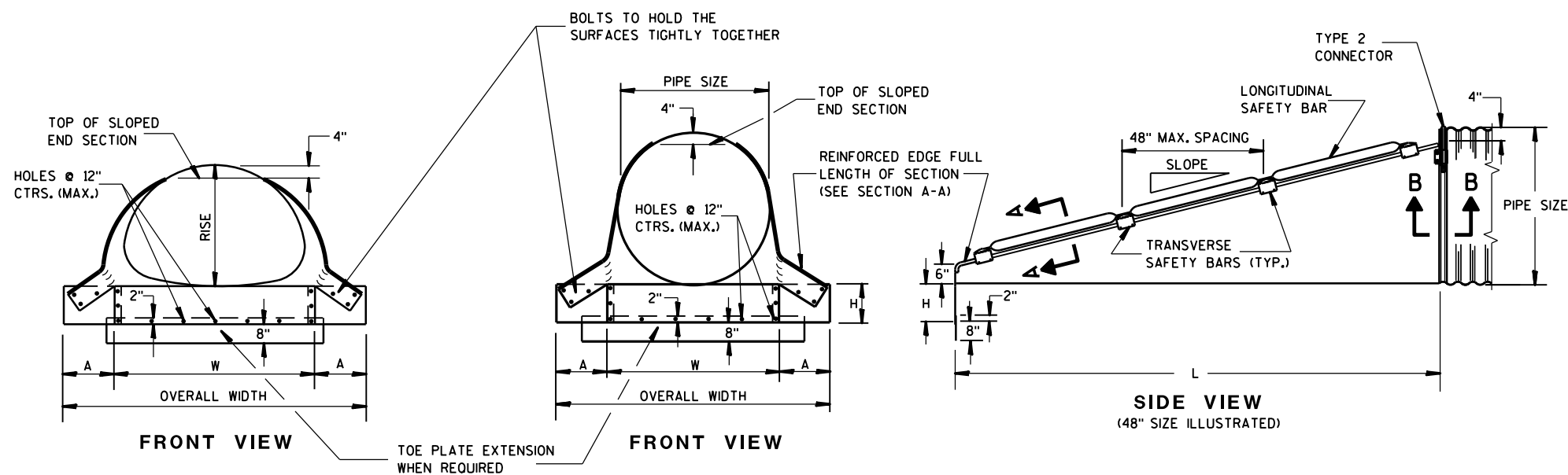
DATE

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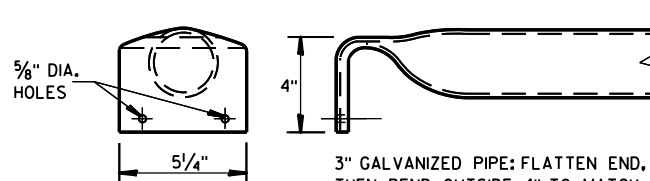
/S/ Jerry H. Zoog
ROADWAY STANDARDS ENGINEER

118

NT



LONGITUDINAL SAFETY BAR



TRANSVERSE SAFETY BAR

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

SAFETY GRATES SHALL BE FABRICATED FROM 3-INCH DIAMETER GALVANIZED PIPE MEETING THE REQUIREMENTS OF ASTM A-53, GRADE B, SCHEDULE 40 OR APPROVED EQUAL. THE LONGITUDINAL BAR SHALL BE WELDED TO THE TRANSVERSE BARS WHERE THE BARS CROSS. THE NUMBER OF TRANSVERSE BARS REQUIRED WILL VARY DEPENDING ON THE LENGTH OF THE END SECTION.

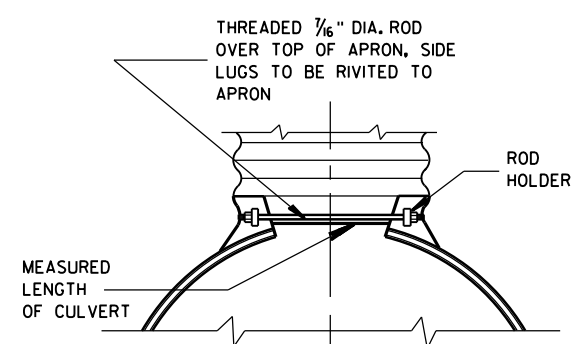
SLOPED STEEL ENDWALLS LOCATED AT THE ENDS OF CONCRETE CULVERT PIPE SHALL BE FURNISHED WITH STEEL ADAPTER SLEEVES.

STEEL APRON ENDWALLS FOR CULVERT PIPE CROSS DRAINS

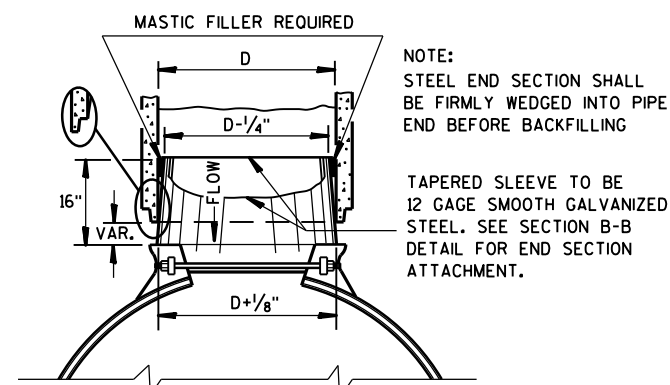
PIPE DIA. (IN.)	MIN. THICK. IN.	GAGE	DIMENSIONS (inches)				L DIMENSIONS			
			A	H	W	OVERALL WIDTH	SLOPE	LENGTH INCHES	SLOPE	LENGTH INCHES
36	.109	12	12	9	42	66	4:1	104	6:1	156
42	.109	12	16	12	48	80	4:1	128	6:1	192
48	.109	12	16	12	54	86	4:1	152	6:1	228
54	.109	12	16	12	60	92	4:1	176	6:1	264
60	.109	12	16	12	66	98	4:1	200	6:1	300

STEEL APRON ENDWALLS FOR PIPE ARCH SLOPED CROSS DRAINS

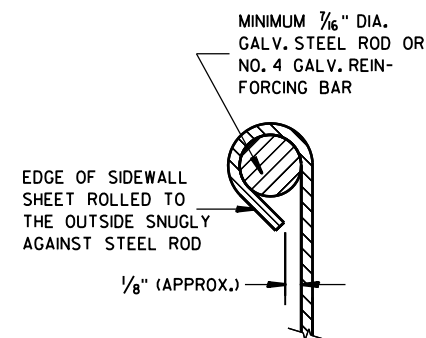
EQUIV. DIA. (IN.)	INCHES		MIN. THICK. IN.	GAGE	DIMENSIONS (inches)				L DIMENSIONS			
	SPAN	RISE			A	H	W	OVERALL WIDTH	SLOPE	LENGTH INCHES	SLOPE	LENGTH INCHES
30	35	24	.079	14	12	9	41	65	4:1	56	6:1	84
36	42	29	.109	12	12	9	48	72	4:1	76	6:1	114
42	49	33	.109	12	16	12	55	87	4:1	92	6:1	138
48	57	38	.109	12	16	12	63	95	4:1	112	6:1	168
54	64	43	.109	12	16	12	70	102	4:1	132	6:1	198
60	71	47	.109	12	16	12	77	109	4:1	148	6:1	222



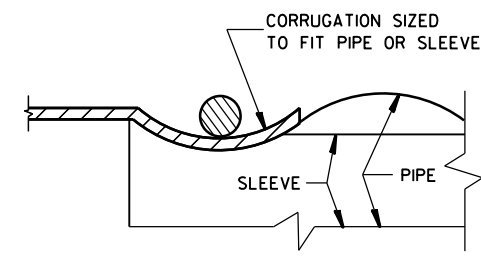
TYPE 2 CONNECTOR DETAIL



STEEL ADAPTER SLEEVE FOR CONCRETE PIPE



SECTION A-A



SECTION B-B

STEEL APRON ENDWALLS FOR CULVERT PIPE AND PIPE ARCH SLOPED CROSS DRAINS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

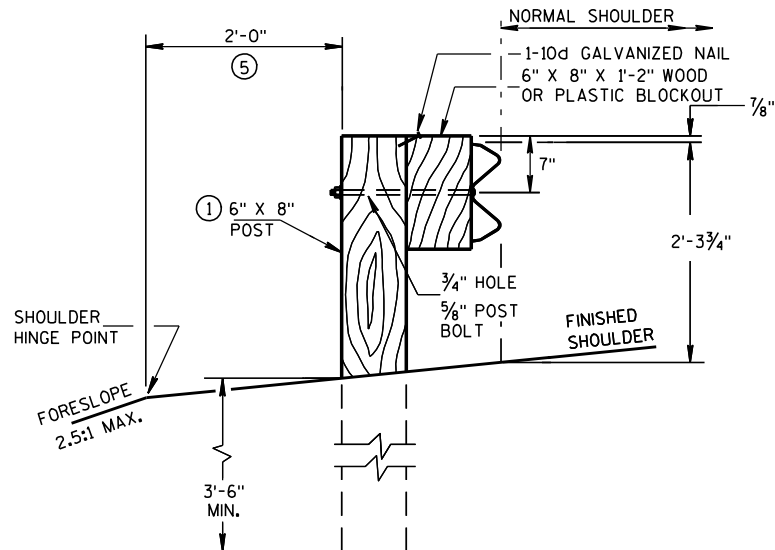
APPROVED
DATE 6/5/2012 /S/ Jerry H. Zoag
ROADWAY STANDARDS ENGINEER 119
FWHA

GENERAL NOTES

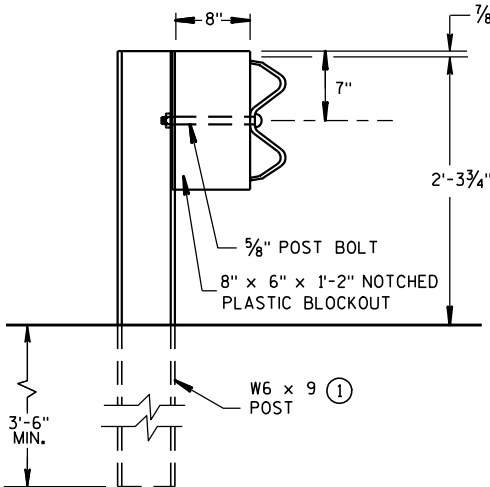
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS, AND THE APPLICABLE SPECIAL PROVISIONS.

- 1 W6 X 9 OR W6 X 8.5 STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POSTS WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS. APPROVED PLASTIC BLOCKOUT DESIGNS MAY VARY FROM THIS TYPICAL DETAIL WHEN USED IN CONJUNCTION WITH STEEL POSTS.
- 2 DO NOT MIX STEEL POSTS AND WOOD POSTS IN A SINGLE INSTALLATION.
- 3 USE STRUCTURAL STEEL POSTS CONFORMING TO ASTM A 36. GALVANIZED POSTS ACCORDING TO AASHTO M 111 EITHER SET THE POSTS IN DRILLED HOLES OR DRIVE TO GRADE. REMOVE MUSHROOMING CAUSED BY DRIVING AND REPAIR DAMAGED SPALTER COATING ON GALVANIZED POSTS.
- 4 INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.
- 5 USE EITHER WOOD OR APPROVED PLASTIC BLOCKOUTS ON WOOD POSTS.
- 6 IF THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING, W BEAM (LHW).
- 7 IF ROCK IS ENCOUNTERED DURING EXCAVATION, THE ENGINEER MAY APPROVE USING A 12 INCH DIAMETER POST HOLE EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE APPROXIMATELY 2 1/2 INCHES DEEP. CUT THE POSTS TO LENGTH AND PLACE IN THE HOLE. BACKFILL WITH MATERIAL EXCAVATED FROM THE HOLE AND COMPACT ADEQUATELY.

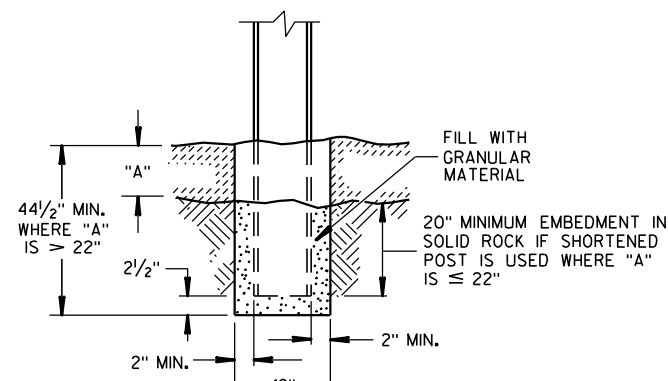
INSTALL BEAM GUARD SECTIONS AND ALL NECESSARY HARDWARE ACCORDING TO THE APPLICABLE PLAN AND CURRENT STANDARD AND SUPPLEMENTAL SPECIFICATIONS. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURER'S TOLERANCES EXCEPT WHERE ALLOWABLE TOLERANCES ARE SHOWN.



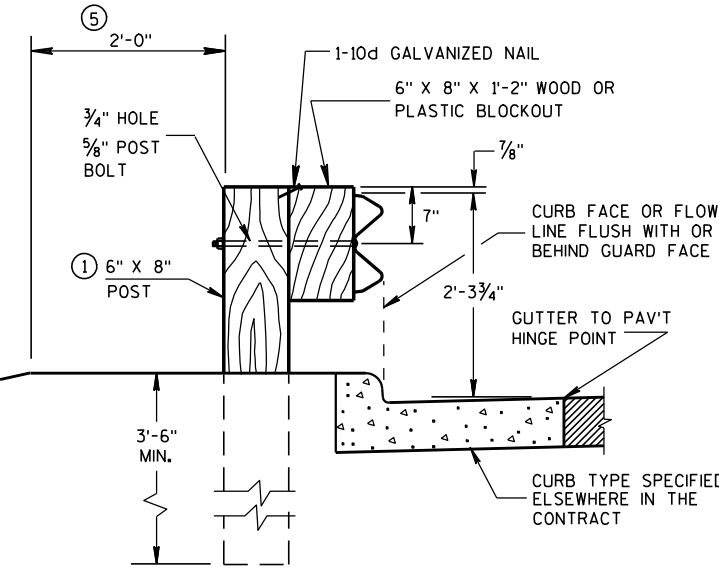
END VIEW
LOCATED ALONG A ROADWAY SHOULDER
STANDARD INSTALLATION



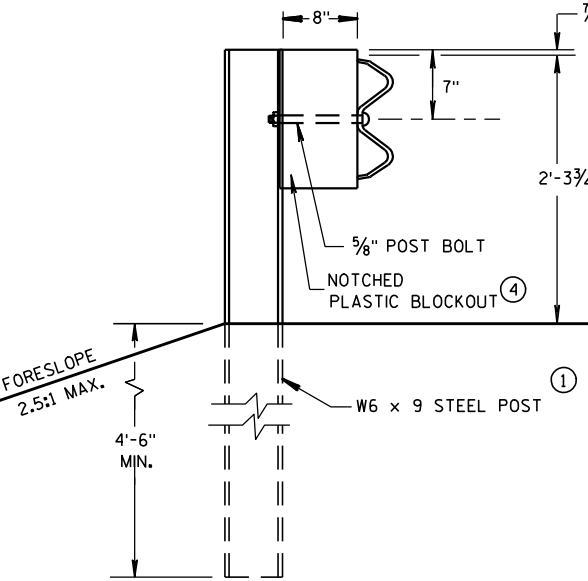
END VIEW
STEEL POST & NOTCHED
PLASTIC BLOCKOUT ALTERNATIVE
STANDARD INSTALLATION



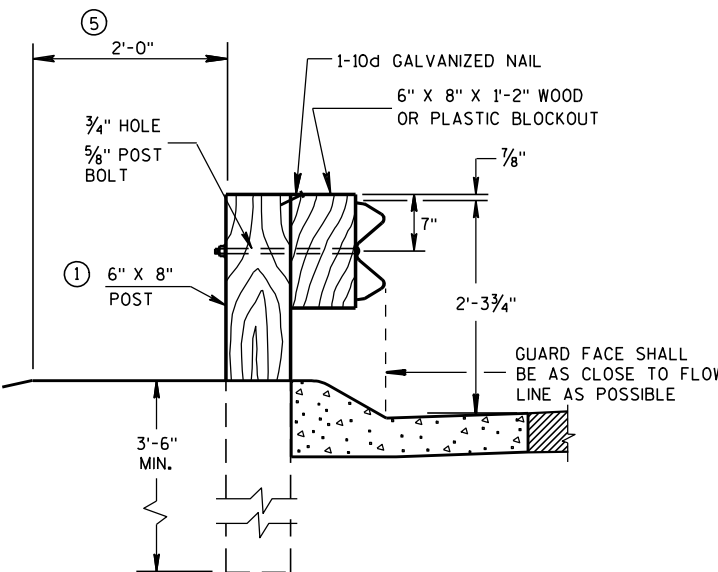
END VIEW
SETTING STEEL OR WOOD POST IN ROCK 6



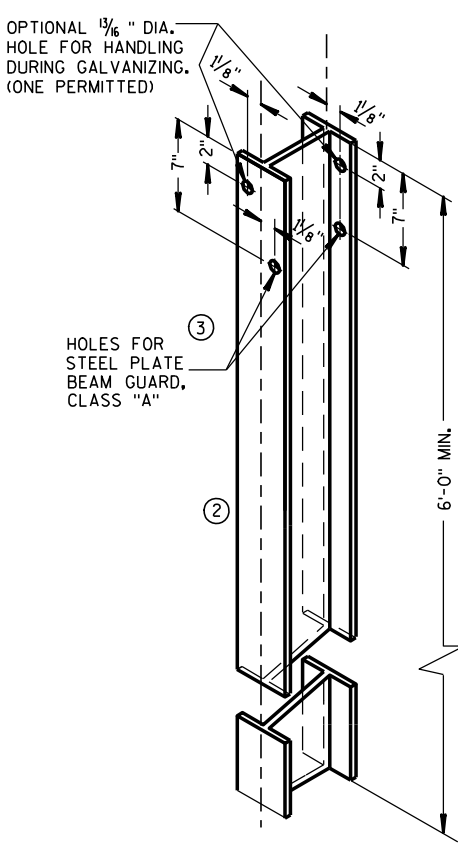
END VIEW
LOCATED ALONG A CURBED ROADWAY



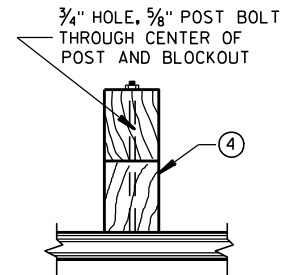
END VIEW
LONGER POST AT HALF
POST SPACING W BEAM
(LHW)



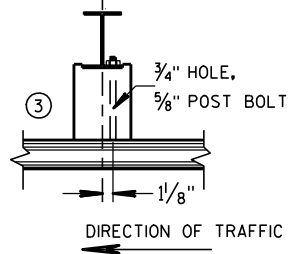
END VIEW
LOCATED ALONG A
MOUNTABLE CURBED ROADWAY



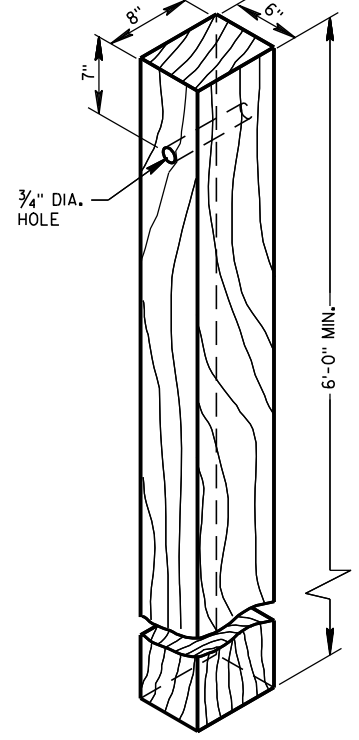
STEEL POST &
HOLE PUNCHING DETAIL
(W6 X 9) 1
ALL HOLES 1/8" DIAMETER EXCEPT AS NOTED



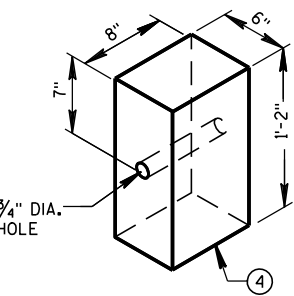
PLAN VIEW
WOOD POST,
BLOCKOUT & BEAM



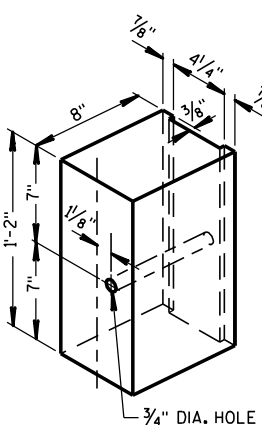
PLAN VIEW
STEEL POST, NOTCHED
PLASTIC BLOCKOUT & BEAM



WOOD POST
(6"X8") NOMINAL



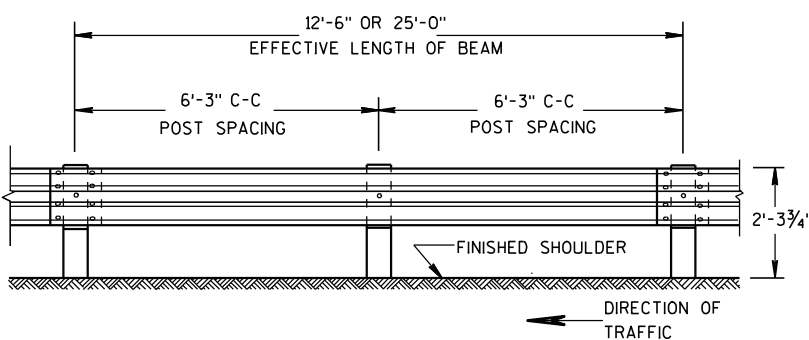
WOOD OR PLASTIC
BLOCKOUT FOR
WOOD POSTS



TYPICAL NOTCHED
PLASTIC BLOCKOUT
FOR STEEL POSTS 1

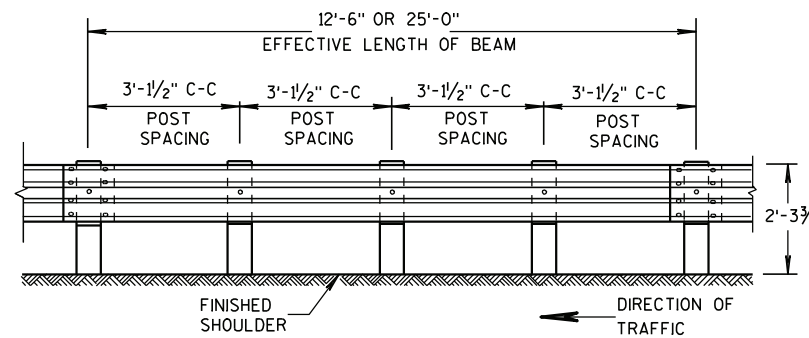
STEEL PLATE BEAM GUARD,
CLASS "A"
INSTALLATION & ELEMENTS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



FRONT VIEW

POST SPACING STANDARD INSTALLATION

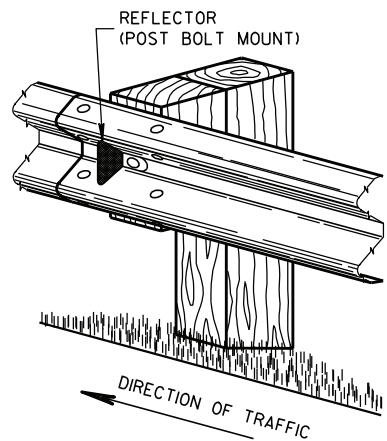


FRONT VIEW

POST SPACING FOR LONGER POST
AT HALF POST SPACING W BEAM (LHW)

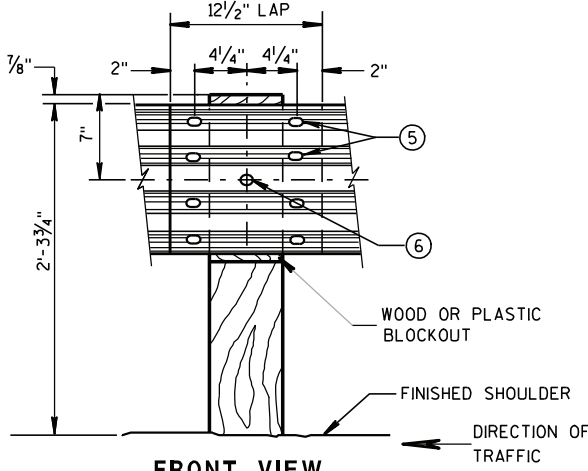
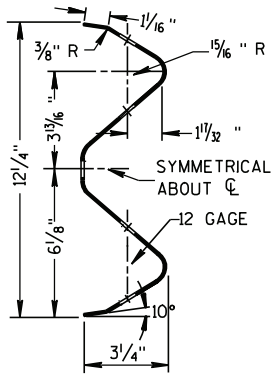
REFLECTOR SPACING^②

	BEAM GUARD LENGTH	REFLECTOR SPACING	NO. SURFACES REFLECTORIZED	MIN. NO. REFLECTORS
ONE WAY TRAFFIC	< 200'	50' C-C	1	3
	> 200'	100' C-C	1	
TWO WAY TRAFFIC	< 200'	25' C-C	1 ③	6
	> 200'	50' C-C	1	
TWO WAY TRAFFIC	< 200'	50' C-C	2 ④	3
	> 200'	100' C-C	2	



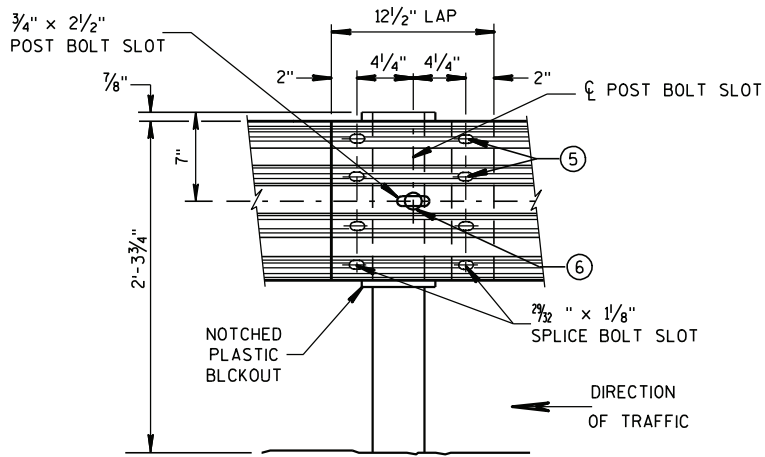
ONE SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION

SECTION THRU W BEAM



FRONT VIEW

BEAM SPLICE AT WOOD POST
AND POST MOUNTING DETAIL



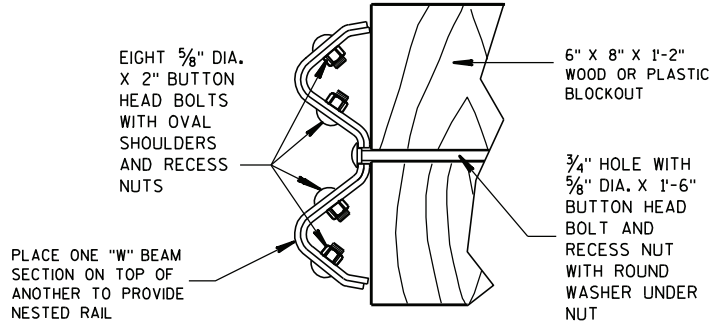
FRONT VIEW

BEAM SPLICE AT STEEL POST

TYPICAL SPLICING DETAILS
OF STEEL PLATE BEAM GUARD

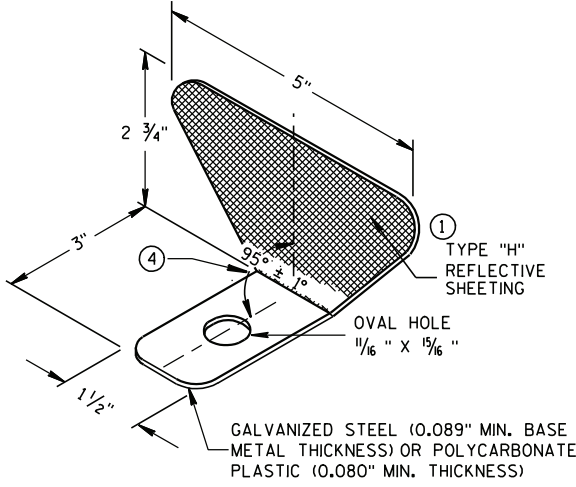
GENERAL NOTES

- ① PROVIDE TYPE "H" SILVER REFLECTIVE SHEETING ON ALL REFLECTORS EXCEPT THOSE LOCATED ALONG THE LEFT EDGE OF ONE-WAY ROADWAYS, WHICH SHALL BE PROVIDED WITH TYPE "H" YELLOW REFLECTIVE SHEETING.
- ② DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.
- ③ REVERSE EVERY OTHER REFLECTOR FOR 2-WAY VISIBILITY. THE CONTRACTOR MAY FURNISH TWO-SIDED REFLECTORS IN LIEU OF ONE-SIDED REFLECTORS.
- ④ PROVIDE AN ANGLE OF BEND OF 90° ± 1° FOR TWO-SIDED REFLECTORS.
- ⑤ 8 - 5/8" φ X 2" BUTTON HEAD BOLTS WITH OVAL SHOULDERS & RECESS NUTS.
- ⑥ 5/8" φ X 1'-6" BUTTON HEAD BOLT AND AND RECESS NUT WITH ROUND WASHER UNDER NUT.



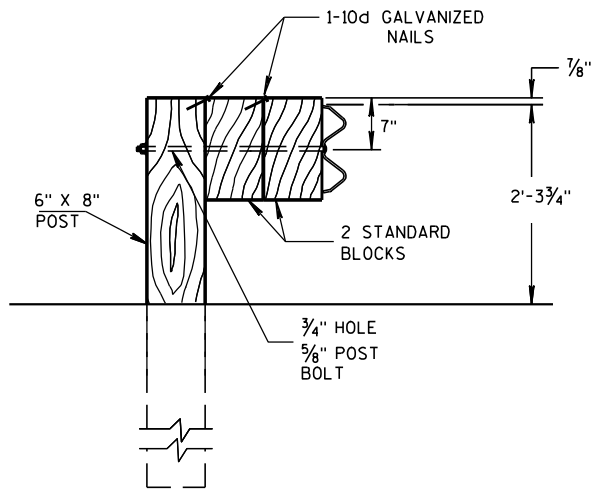
NESTED W BEAM (NW)

USE ALL OTHER STANDARD BEAM GUARD DETAILS FOR
CONSTRUCTING NESTED W BEAM (NW)



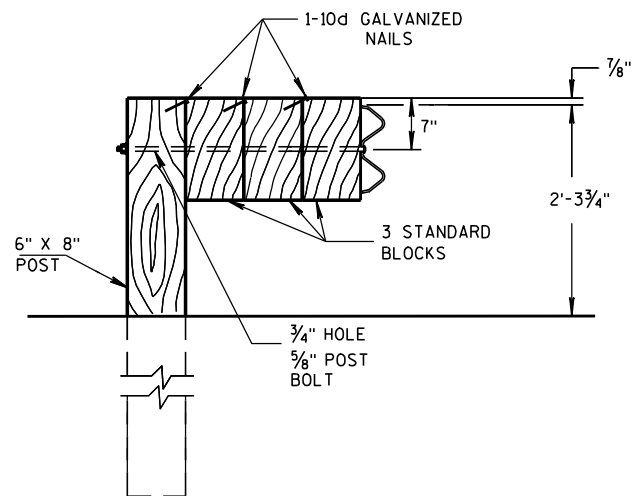
STEEL PLATE BEAM GUARD,
CLASS "A",
INSTALLATION & ELEMENTS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



DETAIL FOR DOUBLE BLOCKS

THE NUMBER OF DOUBLE BLOCK POSTS
WITHIN A BARRIER RUN IS UNLIMITED

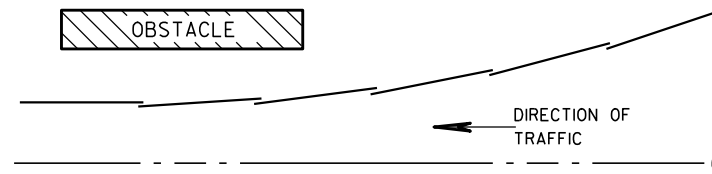


DETAIL FOR TRIPLE BLOCKS

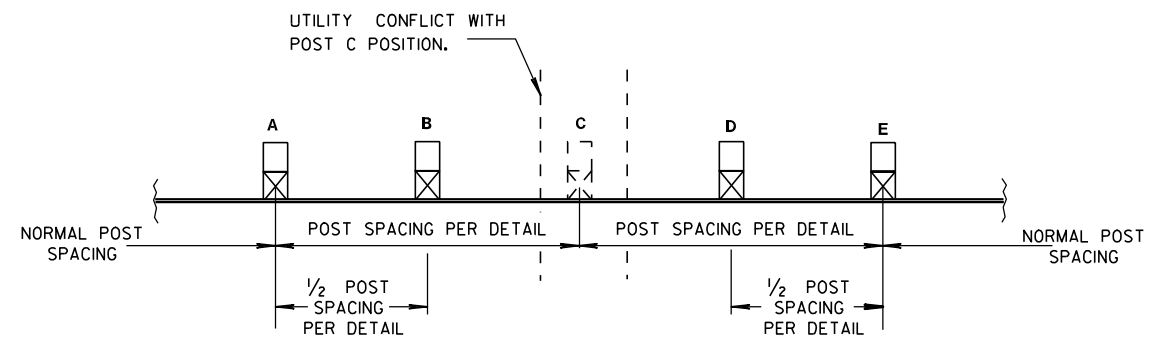
TRIPLE BLOCK DETAIL IS LIMITED TO ONE
LOCATION WITHIN A BEAM GUARD RUN.

NOTES: USE DOUBLE OR TRIPLE BLOCKS WHEN UNDERGROUND OBSTACLES
PREVENT THE POST FROM BEING INSTALLED.

DO NOT USE EXTRA BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND
SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION
DISTANCE OF THE BARRIER.



PLAN VIEW BEAM LAPPING DETAIL

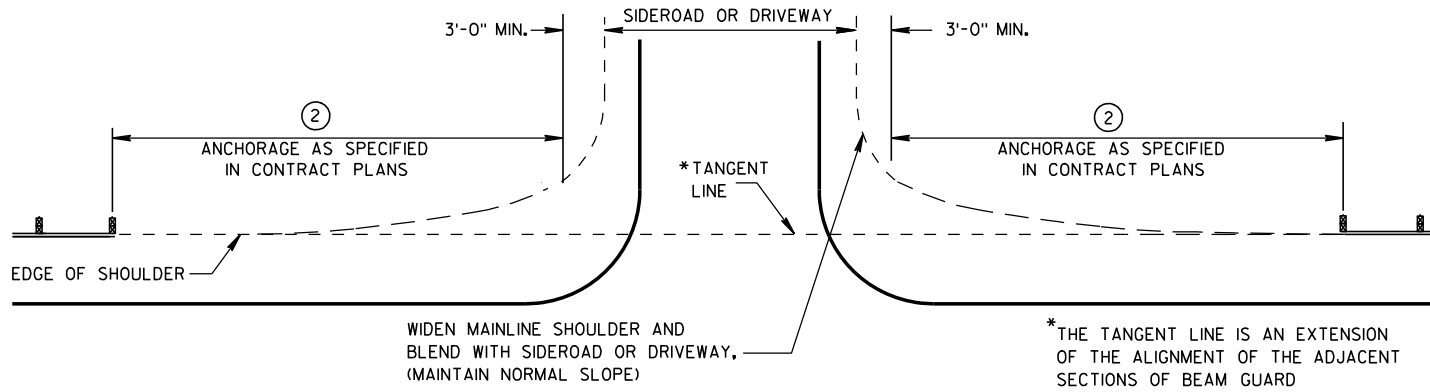


POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION

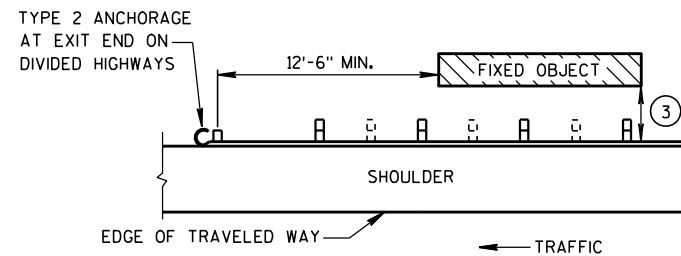
STEEL PLATE BEAM GUARD, CLASS "A", INSTALLATION & ELEMENTS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

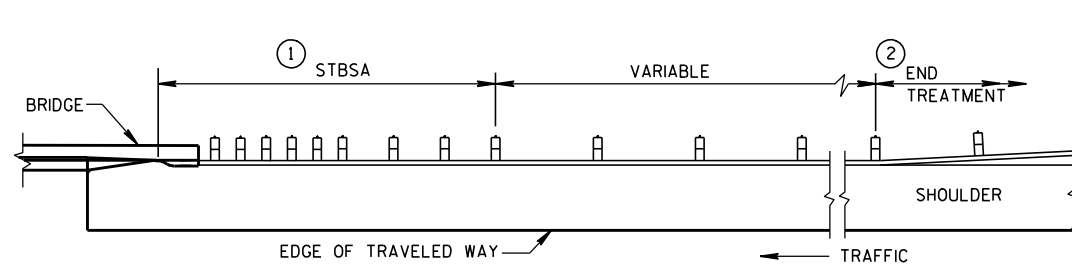
APPROVED
5/23/11
DATE
/S/ Jerry H. Zogg
ROADWAY STANDARDS 122 ENT
ENGINEER
FHWA



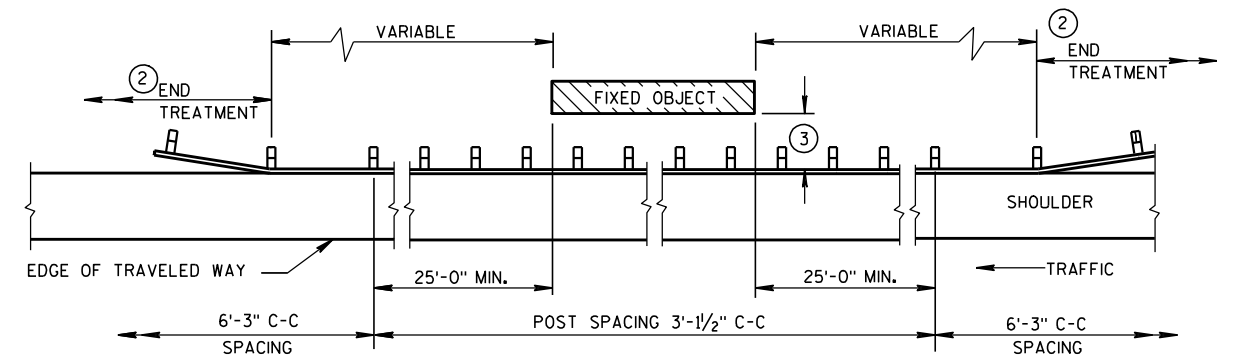
BEAM GUARD AT SIDEROADS OR DRIVEWAYS



BEAM GUARD AT OBSTACLES EXIT END - ONE WAY TRAFFIC



BEAM GUARD AT FULL WIDTH BRIDGES

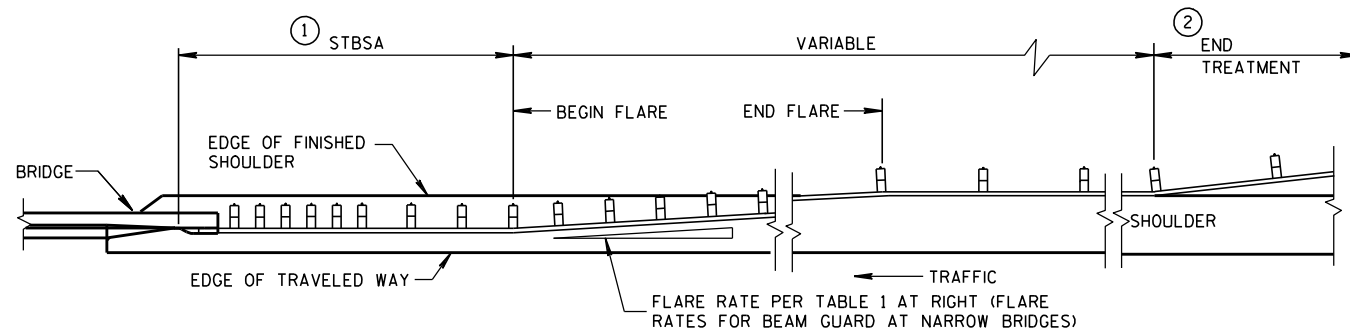


BEAM GUARD AT OBSTACLES - TWO WAY TRAFFIC

(RAIL TO OBSTACLE CLEARANCE 3'-6" TO 4'-6")

TABLE 1
FLARE RATES FOR BEAM
GUARD AT NARROW BRIDGES

POSTED SPEED (MPH)	FLARE RATE
25	13:1
30	15:1
35	16:1
40	18:1
45	21:1
50	24:1
55	26:1
65	30:1



BEAM GUARD AT NARROW BRIDGES (FLARED TO SHOULDER EDGE, THEN PARALLEL TO ROADWAY)

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE PERTINENT STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

W6 X 9 OR W6 X 8.5 STEEL POSTS WITH NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POSTS WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS.

THE LOCATIONS AND LENGTHS OF BEAM GUARD ARE SHOWN ELSEWHERE IN THE PLAN.

- STEEL THRIE BEAM STRUCTURAL APPROACH (STBSA) - SEE CURRENT SDD 14B20.
- USE AN APPROVED END TREATMENT FOR THE TRAFFIC APPROACH SIDE OF BRIDGE/OBSTACLES. USE TYPE 2 ANCHORAGE ONLY AT THE DOWNSTREAM ENDS OF BEAM GUARD LOCATED ALONG ROADWAYS WITH ONE WAY TRAFFIC.

MINIMUM LATERAL DISTANCE FROM FACE OF BEAM GUARD TO FIXED OBJECT	POST SPACING
3'-6"	3' - 1 1/2"
4'-6"	6' - 3"

STEEL PLATE BEAM GUARD
CLASS "A"
AT BRIDGES, OBSTACLES
AND SIDEROADS/DRIVEWAYS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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8-21-07

DATE

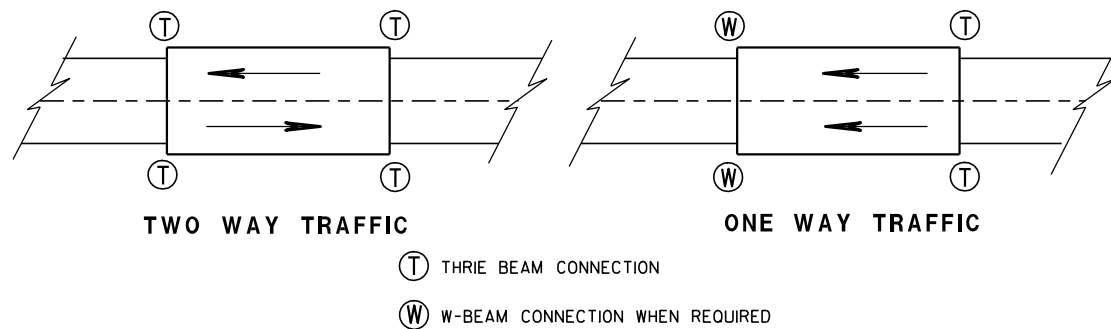
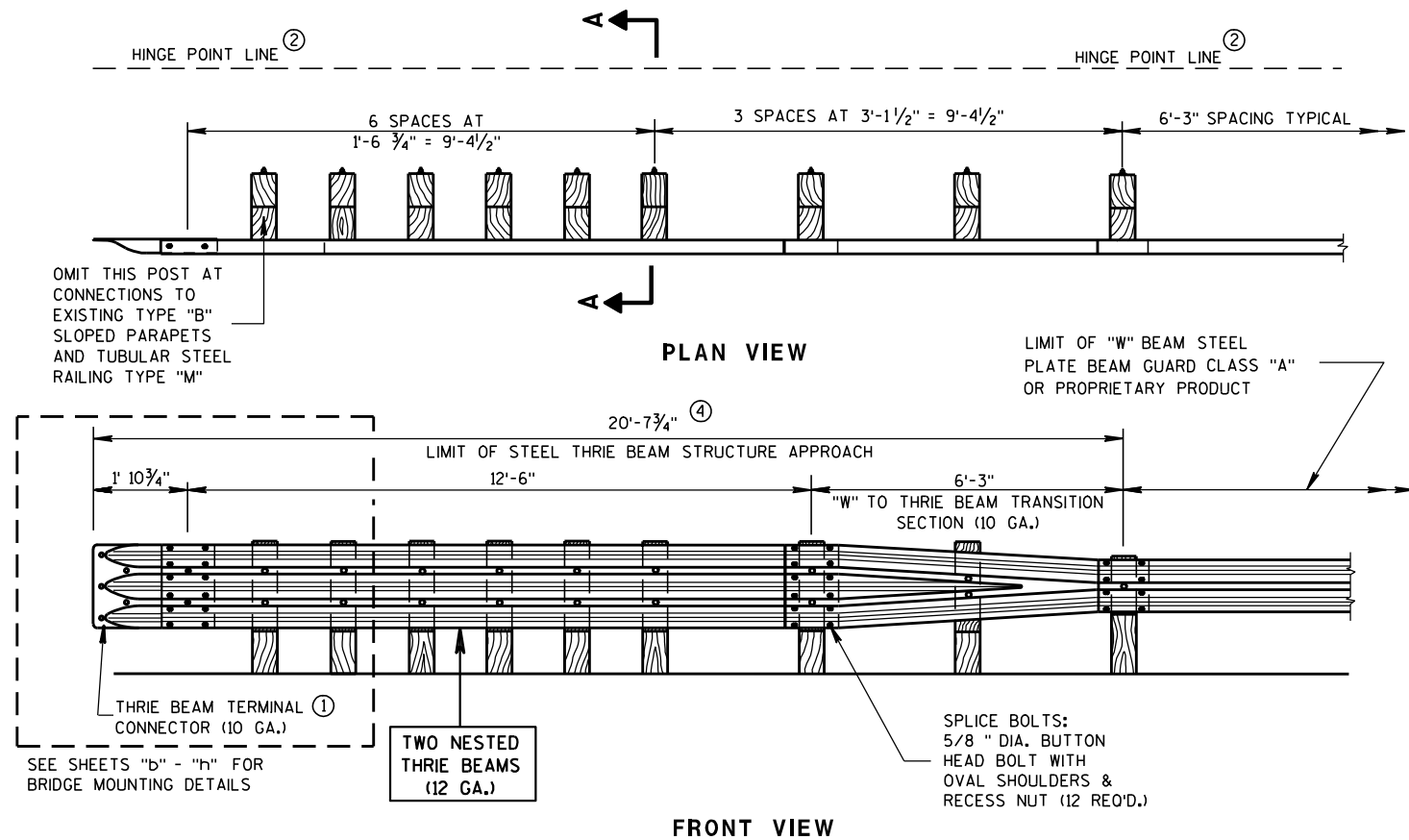
FHWA

/s/ Jerry H. Zoon

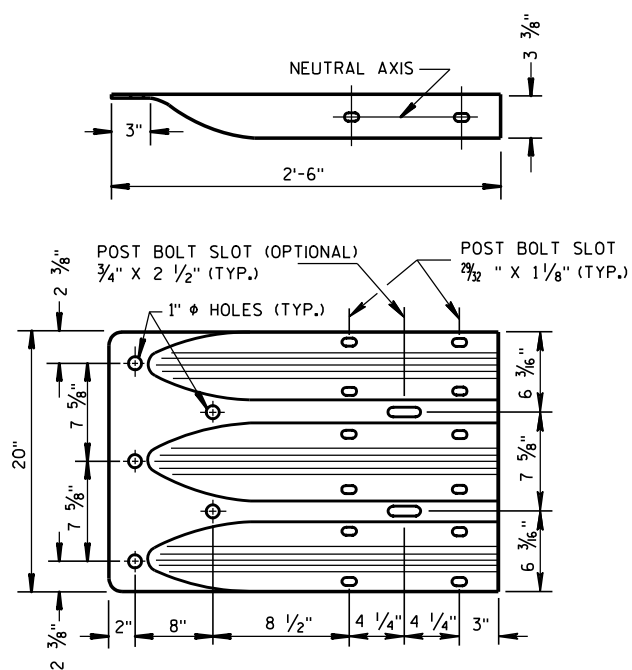
ROADWAY STANDARDS 123

ENGINEER

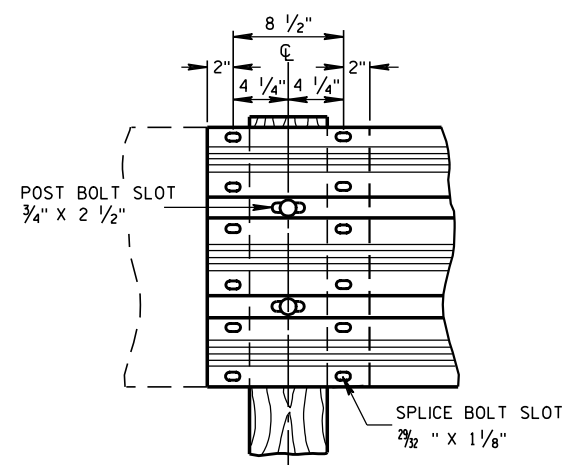
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TYPICAL LOCATIONS OF THRIE BEAM AND W-BEAM CONNECTIONS TO BRIDGE



THRIE BEAM TERMINAL CONNECTOR



THRIE BEAM SPLICE

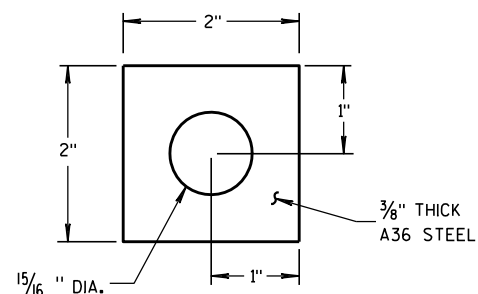
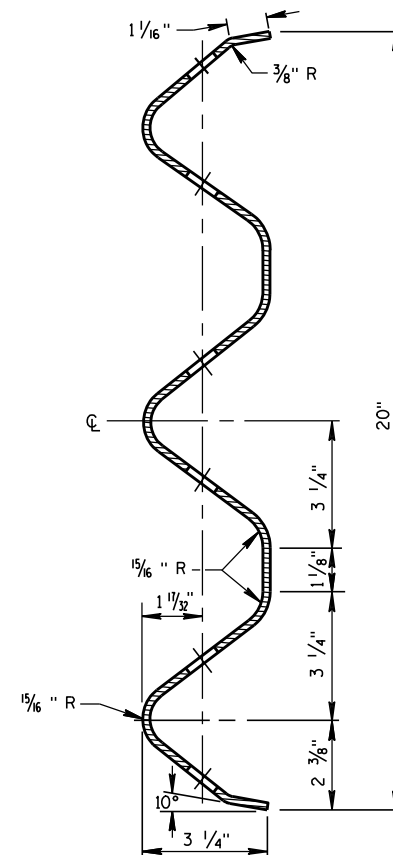


PLATE WASHER DETAIL



SECTION THRU THRIE BEAM RAIL ELEMENT

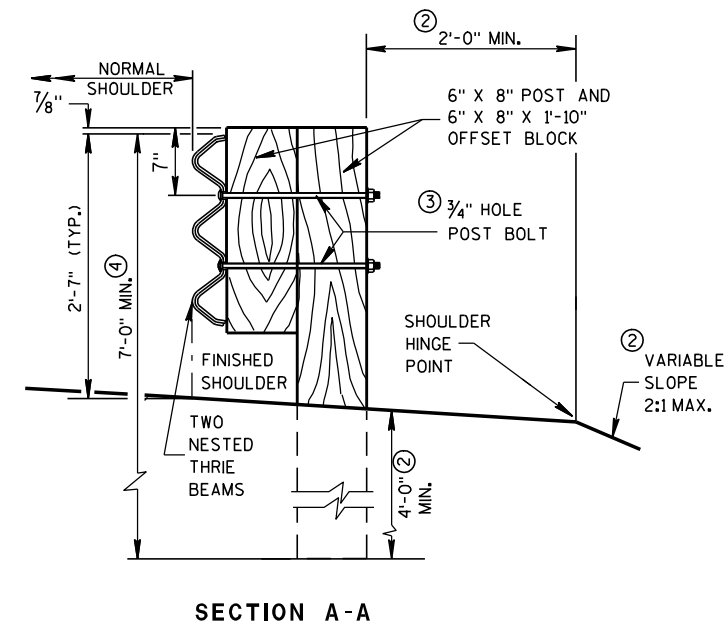
GENERAL NOTES

BOLT THE THRIE BEAM TO ALL POSTS AND BLOCKOUTS. DRILL OR PUNCH BOLT HOLES IN THE BEAM IF THE POST SPACING IS LESS THAN 6'-3".

DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THRIE BEAM STRUCTURAL APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.

IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2 1/2", AND 12" DIAMETER AROUND POST. SEE 14B15 FOR MORE DETAILS.

- ① BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.
- ② MINIMUM EMBEDMENT SHALL BE 4'-0". WHERE EXISTING CONDITIONS DO NOT PERMIT THE APPROPRIATE EARTHWORK SHOWN ON THE PLAN TYPICAL SECTIONS OR DETAILS, THE ENGINEER MAY ALLOW THE REDUCTION OR ELIMINATION OF THE 2 FOOT DISTANCE TO THE HINGE POINT. OTHERWISE BUILD AS THE PLAN SHOWS OR AS THE ENGINEER DIRECTS. IF THE 2 FOOT DISTANCE TO THE HINGE POINT IS REDUCED OR ELIMINATED, INCREASE THE POST EMBEDMENT DEPTH TO 4'-6" OR MORE.
- ③ POST BOLTS ARE 5/8" DIAMETER ASTM A307 BUTTON HEAD BOLT. A POST BOLT REQUIRES A 5/8" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX AND A 5/8" DIAMETER F844 FLAT WASHER. LENGTH OF POST BOLT MAY VARY.
- ④ ALL WOOD POSTS MUST BE 6" X 8" AND AT LEAST 7'-0" LONG.



STEEL THRIE BEAM STRUCTURE APPROACH

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

8/31/2012

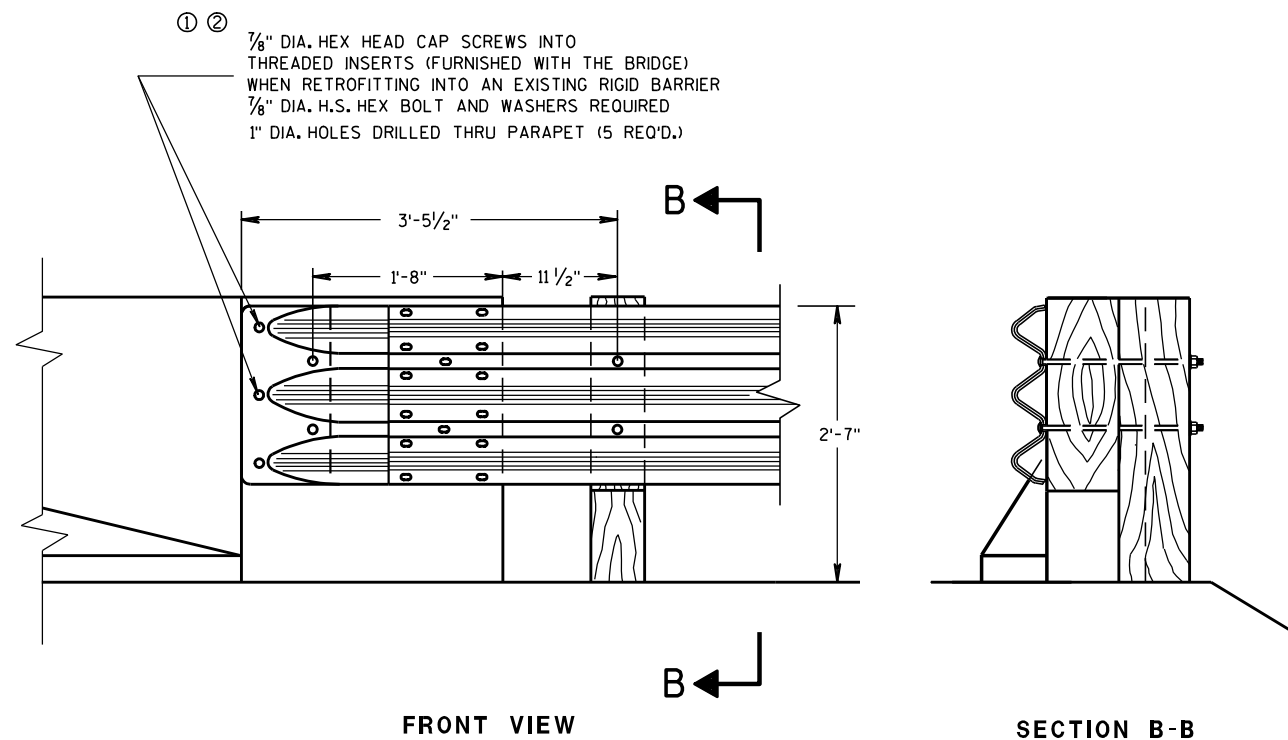
DATE

FHWA

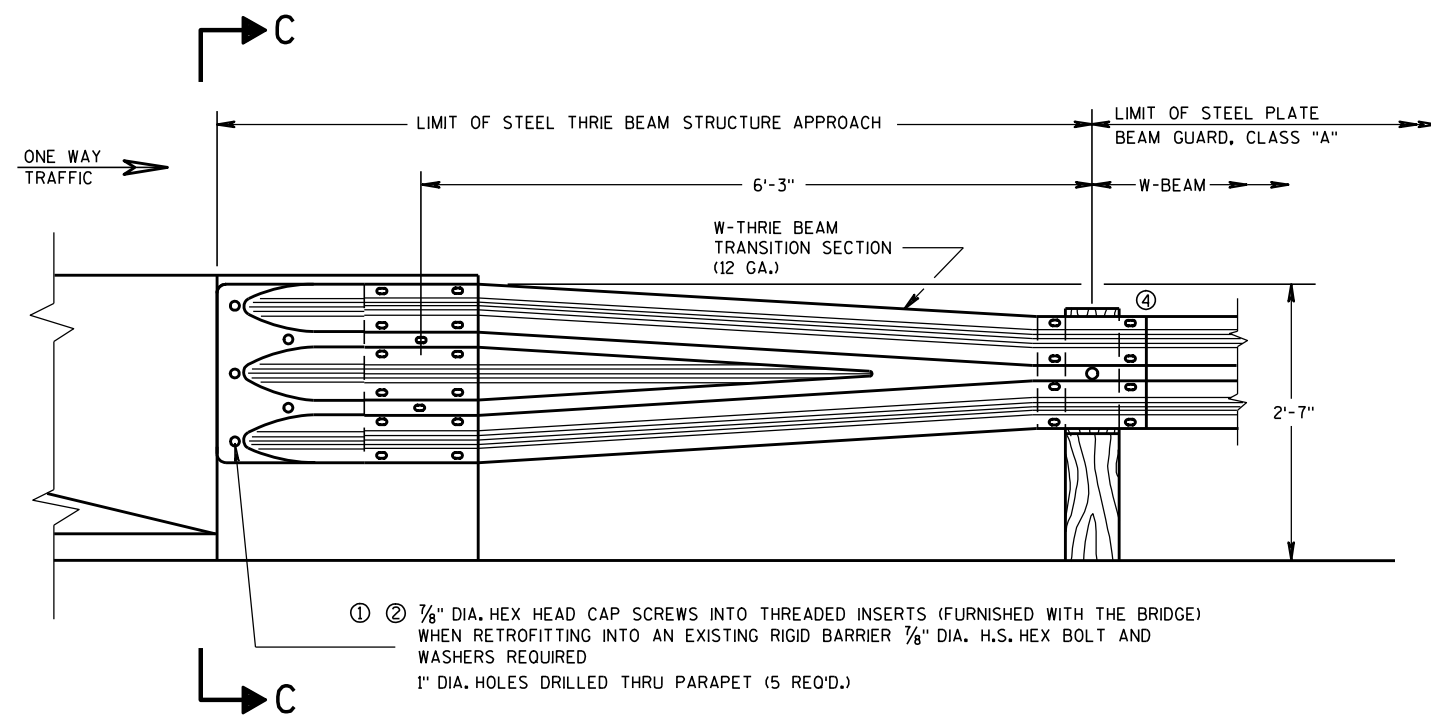
/s/ Jerry H. Zoon

ROADWAY STANDARDS 124

ENGINEER



THRIE BEAM CONNECTION TO BRIDGE
PARAPET WITH SQUARE ENDS



W BEAM TRANSITION AND CONNECTION TO
BRIDGE PARAPETS WITH SQUARE ENDS
(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

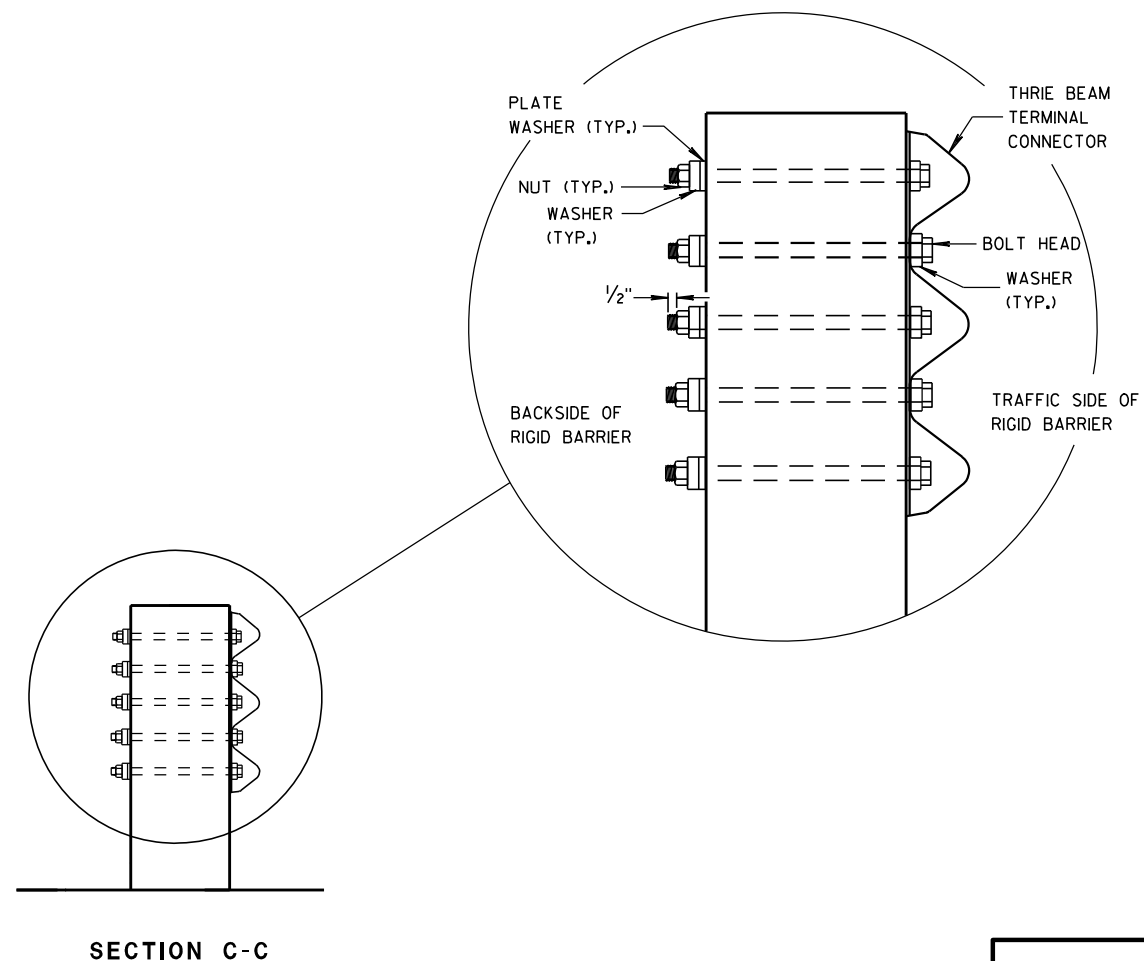
GENERAL NOTES

THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSITION OF CONNECTIONS TO EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.

BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A325, A449 AND GALVANIZED PER STANDARD SPECIFICATIONS 614.

- ① DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ② BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM TERMINAL CONNECTOR. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
- ③ THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 1/2".
- ④ W6 X 9 OR W6 X 8.5 STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POST WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS.

DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THRIE BEAM STRUCTURAL APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.



STEEL THRIE BEAM STRUCTURE APPROACH, CONNECTION TO SQUARE END PARAPETS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

8/31/2012
DATE

FHWA

/S/ Jerry H. Zapp
ROADWAY STANDARDS ENGINEER

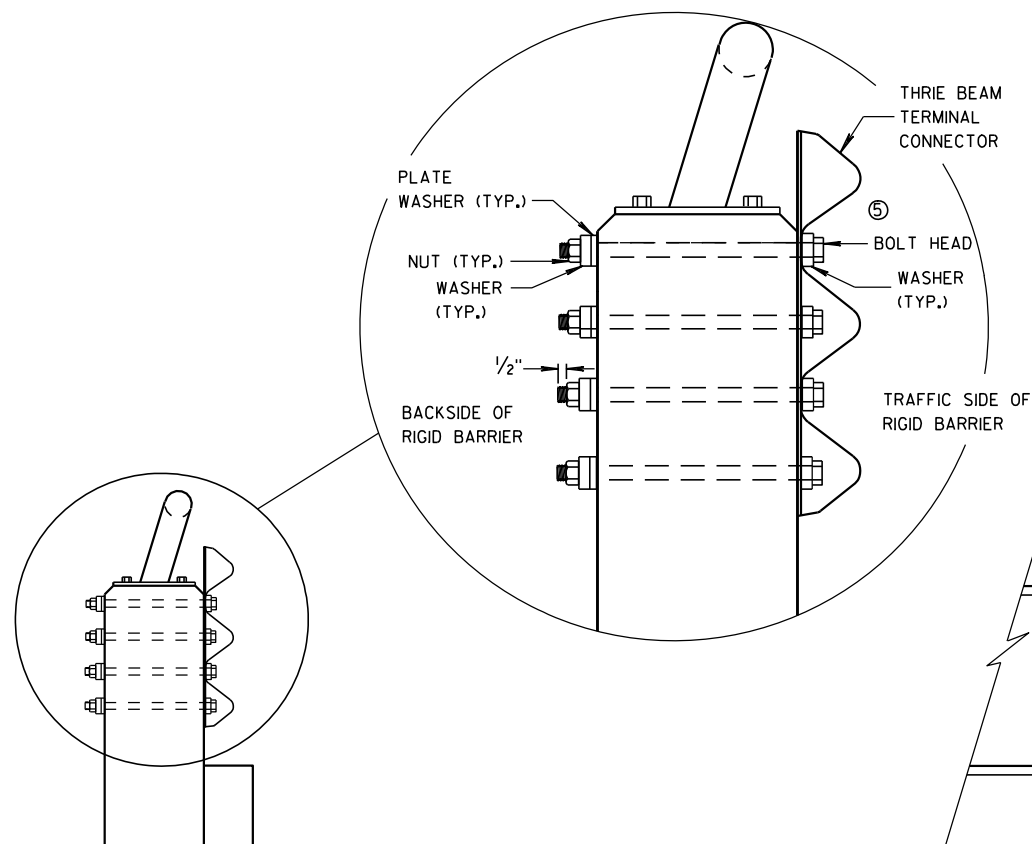
ENT

GENERAL NOTES

THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSITION OF CONNECTIONS TO EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.

BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A325, A449 AND GALVANIZED PER STANDARD SPECIFICATIONS 614.

- ① DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
 - ② BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM TERMINAL CONNECTOR. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X $\frac{5}{8}$ " THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
 - ③ THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 $\frac{1}{2}$ ".
 - ④ W6 X 9 OR W6 X 8.5 STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POST WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS.
 - ⑤ BOLT, NUT AND WASHERS NOT REQUIRED FOR THIS LOCATION WHEN RETROFITTING AN EXISTING PARAPET AND THE HOLE IS EITHER ABOVE PARAPET OR WITHIN 4 INCHES OF THE EDGE OF PARAPET.
- DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THRIE BEAM STRUCTURAL APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.

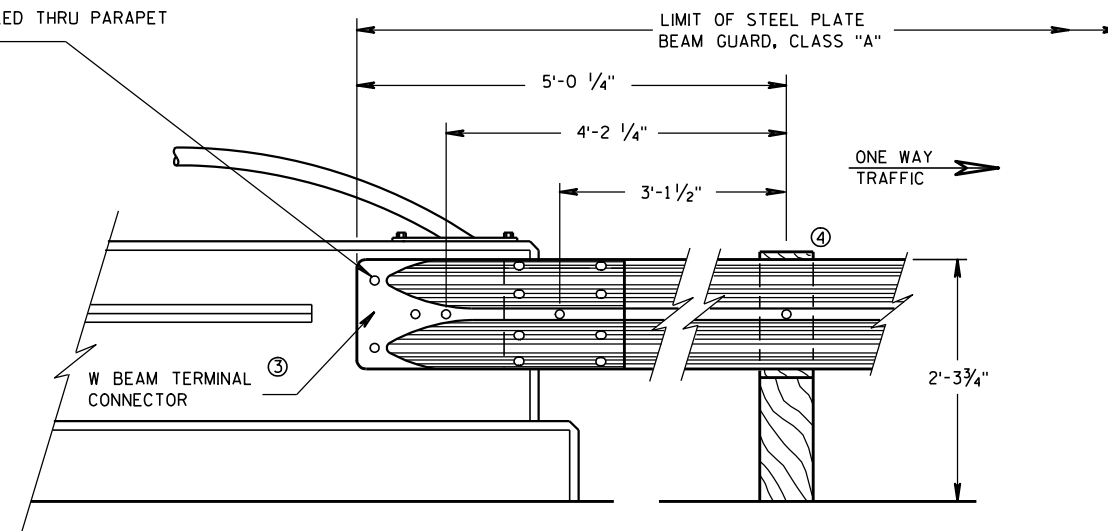


SECTION E-E

- ① ② $\frac{7}{8}$ " DIA. HEX HEAD CAP SCREWS INTO THREADED INSERTS (FURNISHED WITH THE BRIDGE) WHEN RETROFITTING INTO AN EXISTING RIGID BARRIER $\frac{7}{8}$ " DIA. H.S. HEX BOLT AND WASHERS REQUIRED
- 1" DIA. HOLES DRILLED THRU PARAPET (4 REQ'D.)

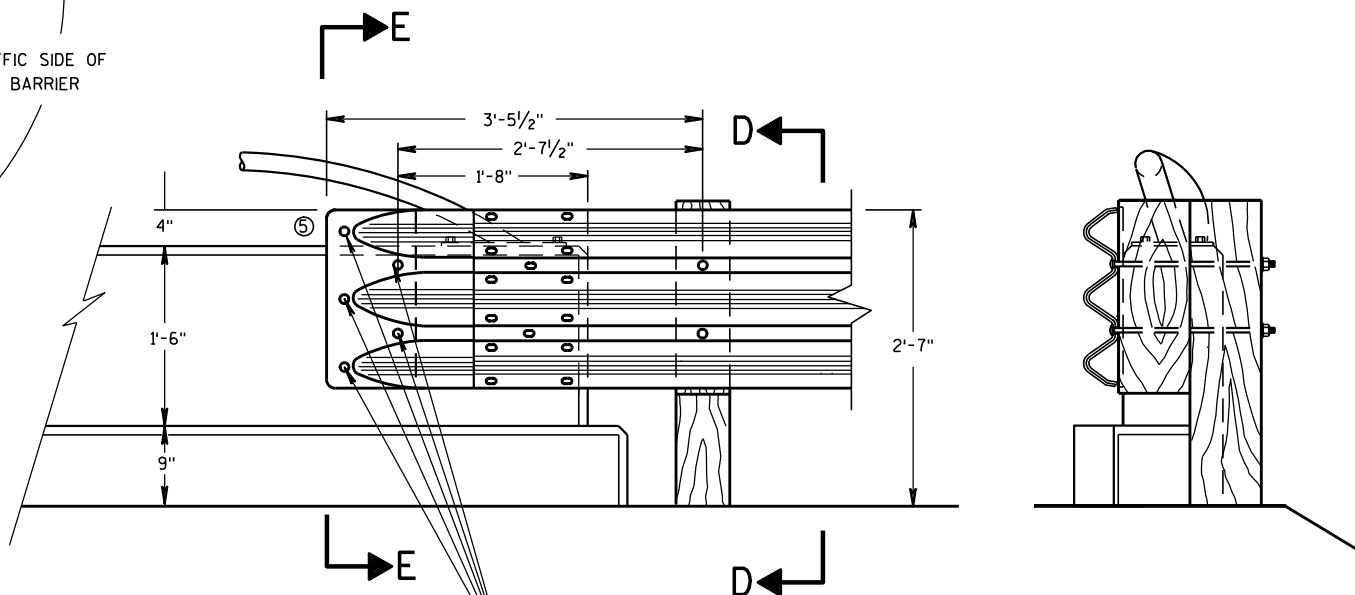
THRIE BEAM CONNECTION TO VERTICAL FACED PARAPETS

- ① ② $\frac{7}{8}$ " DIA. HEX HEAD CAP SCREWS INTO THREADED INSERTS (FURNISHED WITH THE BRIDGE) WHEN RETROFITTING INTO AN EXISTING RIGID BARRIER $\frac{7}{8}$ " DIA. H.S. HEX BOLT AND WASHERS REQUIRED
- 1" DIA. HOLES DRILLED THRU PARAPET (4 REQ'D.)



FRONT VIEW

W BEAM CONNECTION TO VERTICAL FACE PARAPET
(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)



FRONT VIEW

SECTION D-D

STEEL THRIE BEAM STRUCTURE
APPROACH, CONNECTION TO
VERTICAL FACED PARAPETS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

8/31/2012

DATE

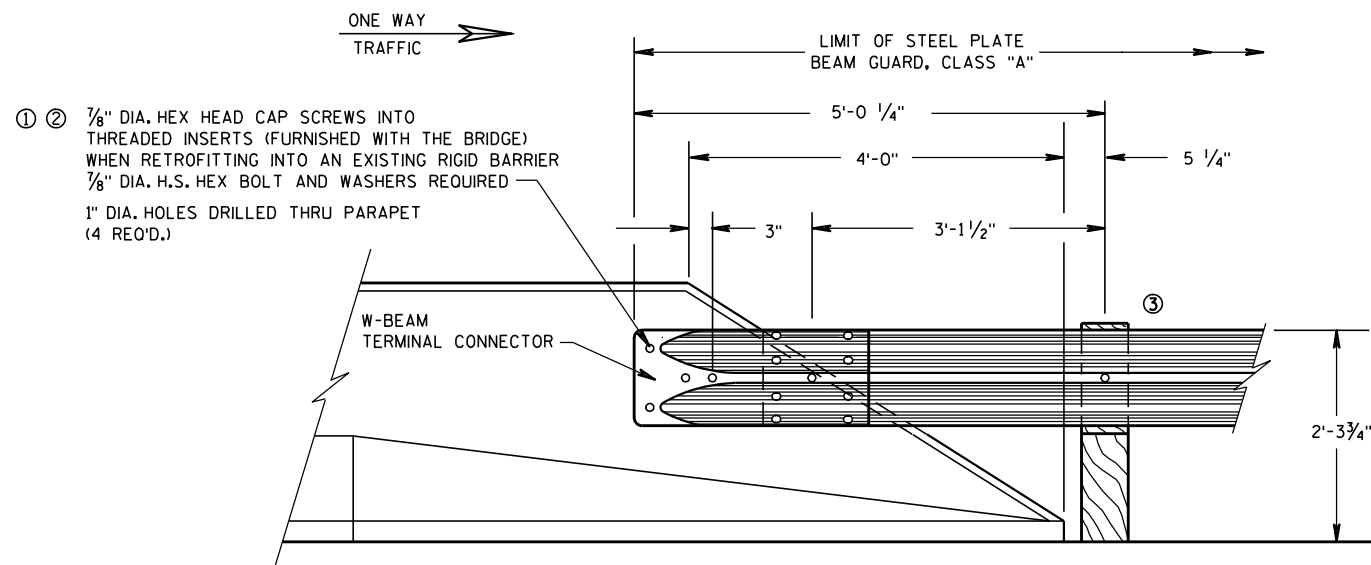
FHWA

/S/ Jerry H. Zoon

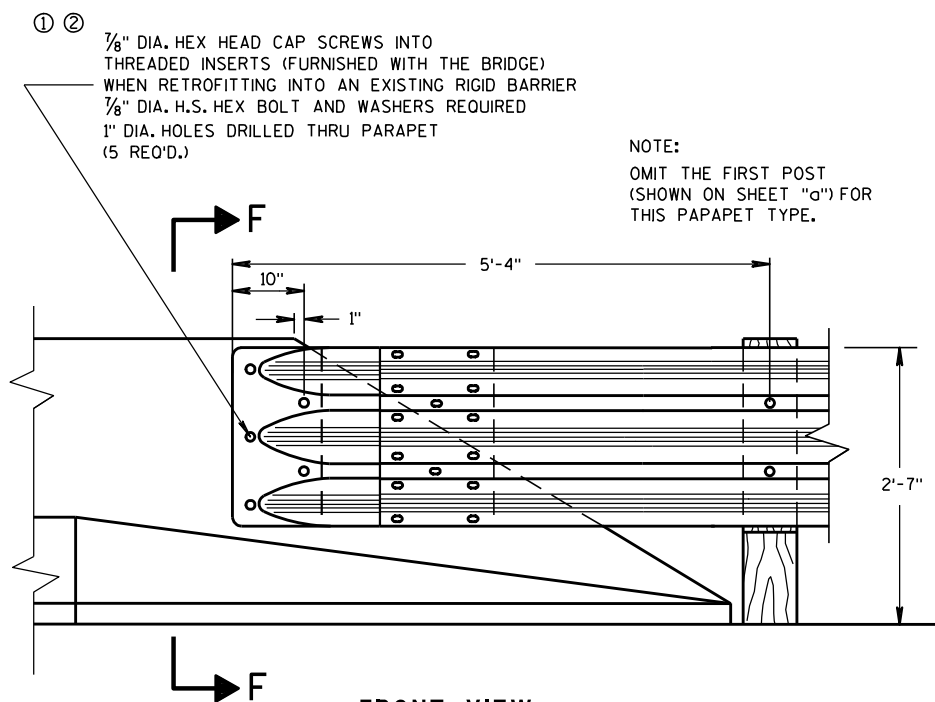
ROADWAY STANDARDS 126

ENGINEER

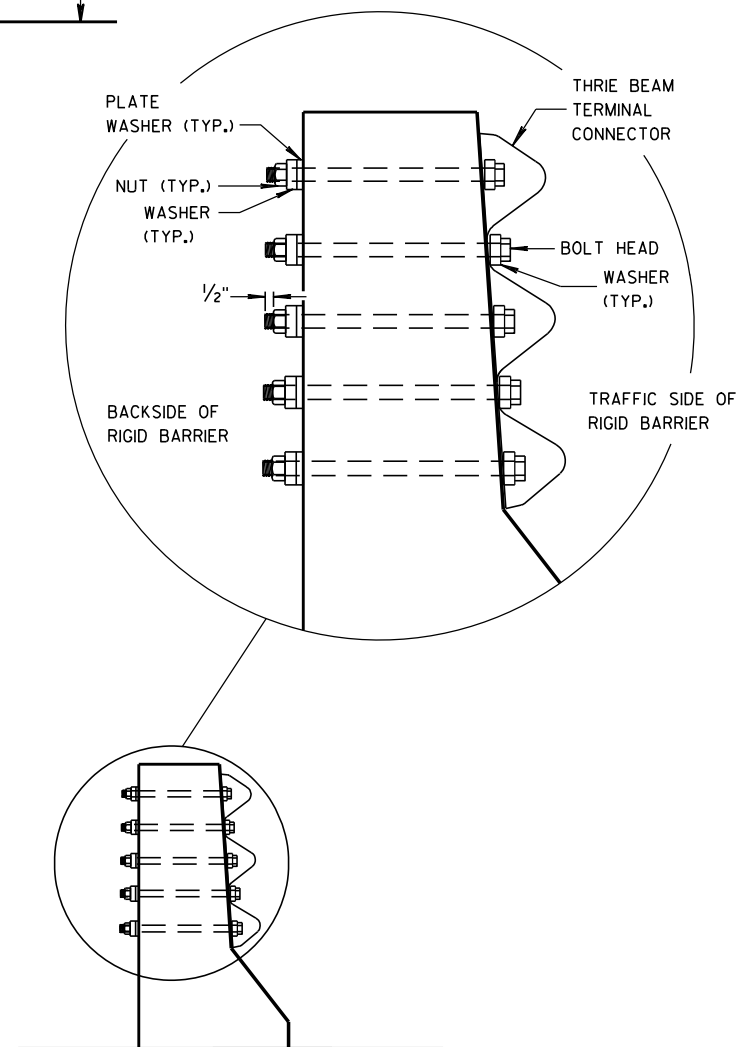
INT



FRONT VIEW
W BEAM CONNECTION TO
PARAPETS WITH SLOPED ENDS
(USE ONLY AT TRAFFIC EXIT END OF ONE WAY BRIDGE)



FRONT VIEW
THRIE BEAM CONNECTION TO BRIDGE
PARAPETS WITH SLOPED ENDS



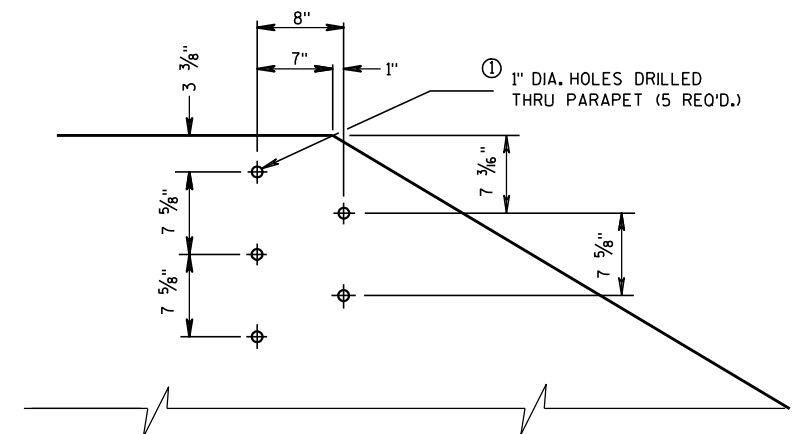
SECTION F-F

GENERAL NOTES

THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSITION OF CONNECTIONS TO EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.

BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A325, A449 AND GALVANIZED PER STANDARD SPECIFICATIONS 614.

- ① DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ② BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM TERMINAL CONNECTOR. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
- ③ W6 X 9 OR W6 X 8.5 STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS ARE ACCEPTABLE ALTERNATIVES FOR 6" X 8" WOOD POST WITH WOOD OR PLASTIC BLOCKOUTS. USE APPROVED NOTCHED PLASTIC BLOCKOUTS WITH STEEL POSTS.
 DO NOT USE STEEL POSTS AND NOTCHED PLASTIC BLOCKOUTS IN THE STEEL THRIE BEAM STRUCTURAL APPROACH AND THE TRANSITION SECTION OF STEEL PLATE BEAM GUARD, CLASS "A" INSTALLATIONS.

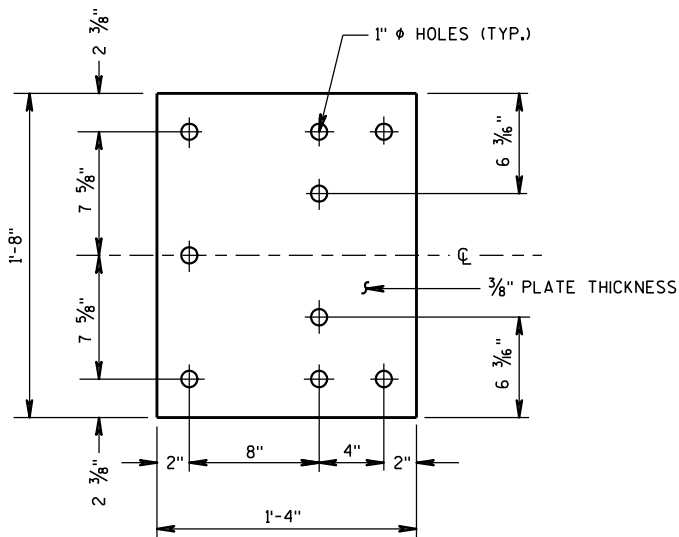


DRILL HOLE LOCATION AND PATTERN
FOR THRIE BEAM CONNECTION

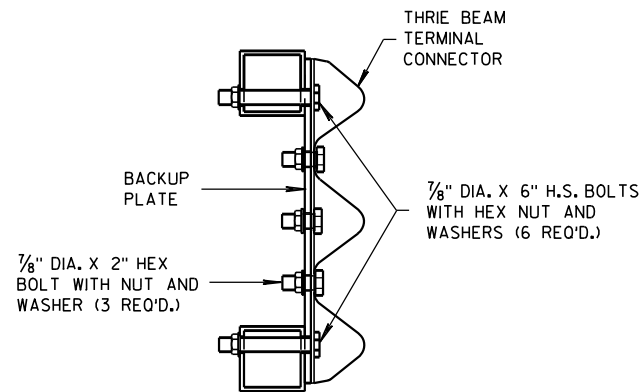
STEEL THRIE BEAM STRUCTURE
APPROACH CONNECTION TO
SLOPED END PARAPETS

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION

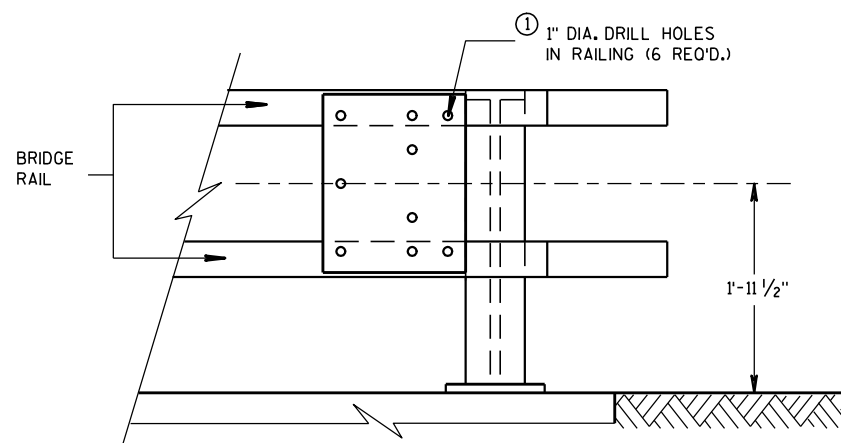
APPROVED
 8/31/2012 DATE /S/ Jerry H. Zopp
 ROADWAY STANDARDS 127 ENT
 FHWA ENGINEER



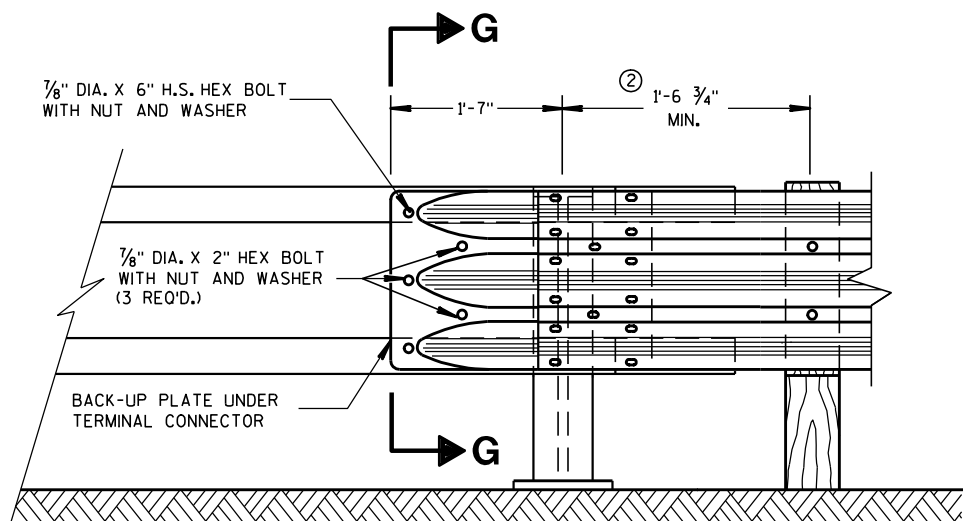
BACK-UP PLATE DETAIL



SECTION G-G

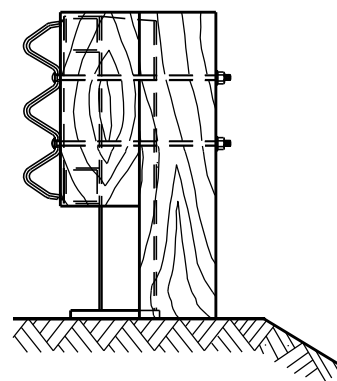


BACK-UP PLATE MOUNTING ONTO BRIDGE RAILING



FRONT VIEW

THRIE BEAM CONNECTION TO TUBULAR RAILING TYPE "F"

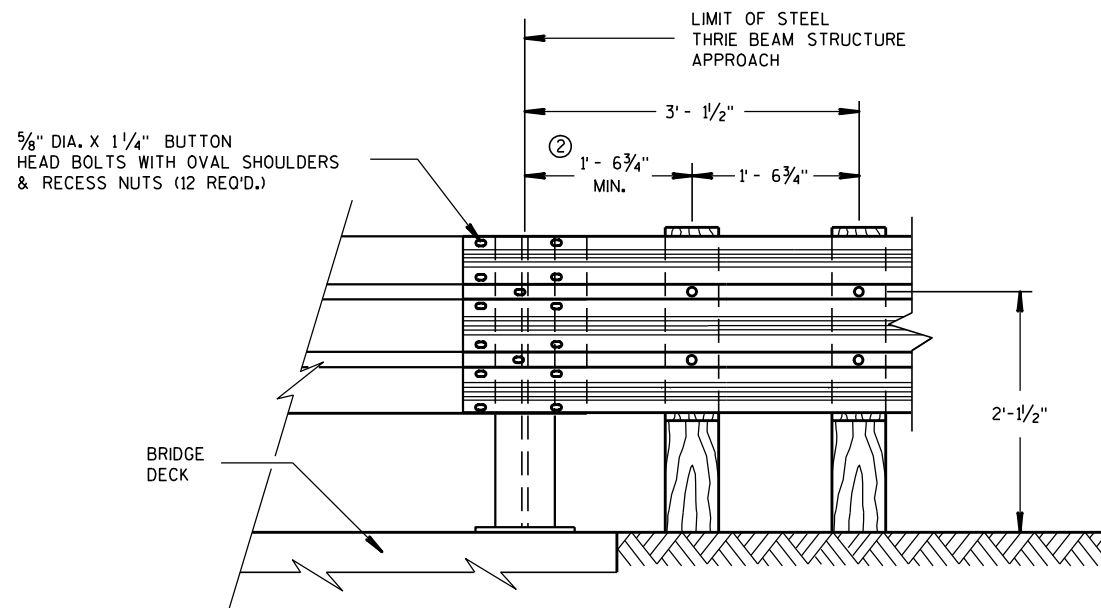


END VIEW

GENERAL NOTES

BOLTS, PLATES, NUTS AND WASHERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATION A 325 AND BE GALVANIZED IN ACCORDANCE WITH ASTM A 153.

- ① DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ② VARY THIS DIMENSION DEPENDING ON ABUTMENT TYPE, WINGWALL DETAILS, AND ANGLE OF SKEW. PLACE THE FIRST WOOD POST OFF THE BRIDGE SHALL AS CLOSE AS FEASIBLE TO THE STEEL END POST.



FRONT VIEW

THRIE BEAM CONNECTION TO STEEL RAILING TYPE "W"

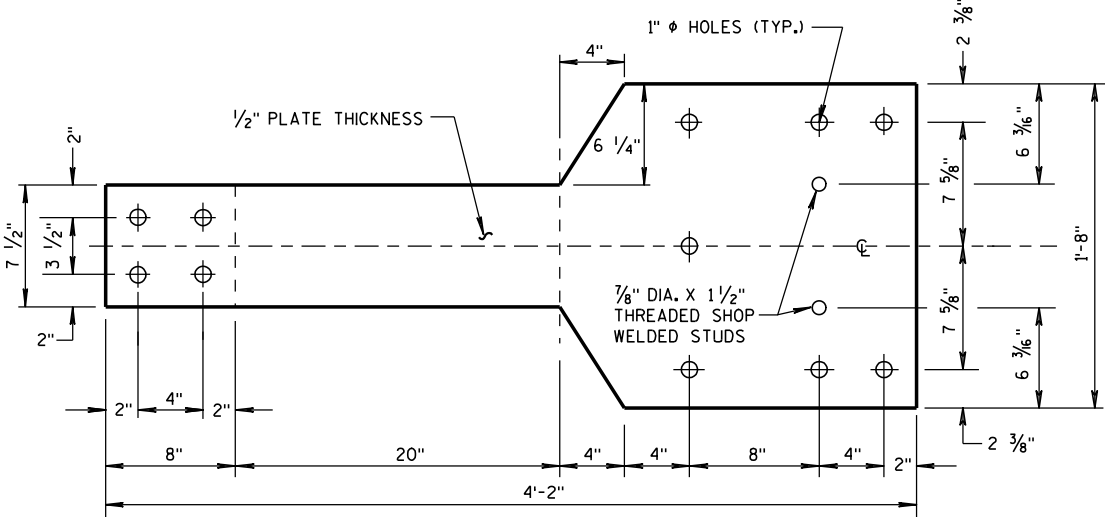
STEEL THRIE BEAM STRUCTURE
APPROACH, CONNECTION TO BRIDGE
RAILING TYPES "F" AND "W"

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

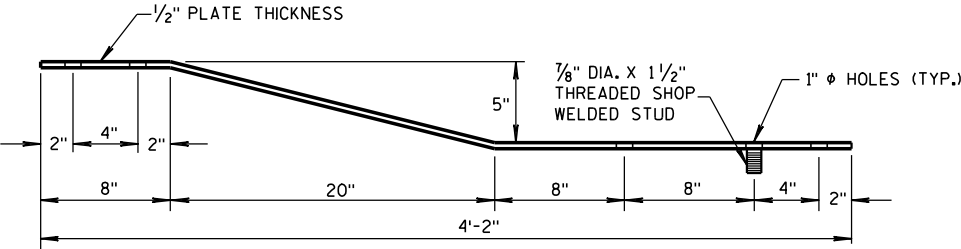
APPROVED
8/31/2012 DATE /S/ Jerry H. Zapp
ROADWAY STANDARDS 128 ENT
ENGINEER

GENERAL NOTES

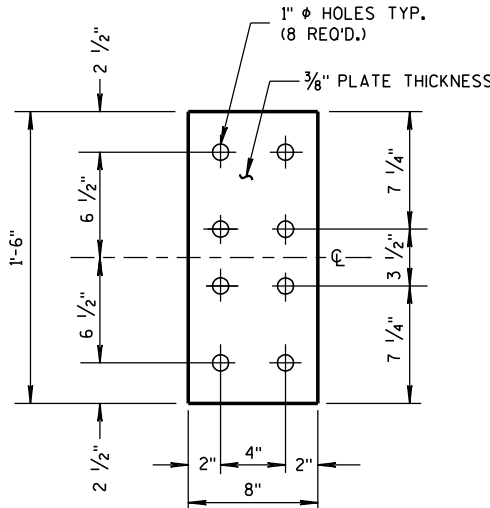
① VARY THIS DIMENSION DEPENDING ON ABUTMENT TYPE, WINGWALL DETAILS, AND ANGLE OF SKEW. PLACE THE FIRST WOOD POST OFF THE BRIDGE SHALL BE AS CLOSE AS FEASIBLE TO THE STEEL END POST.



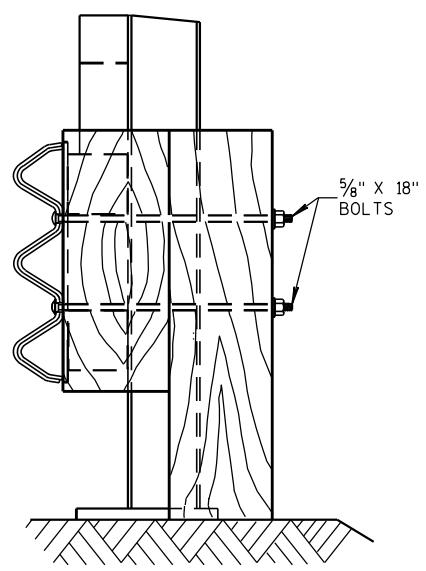
FRONT VIEW



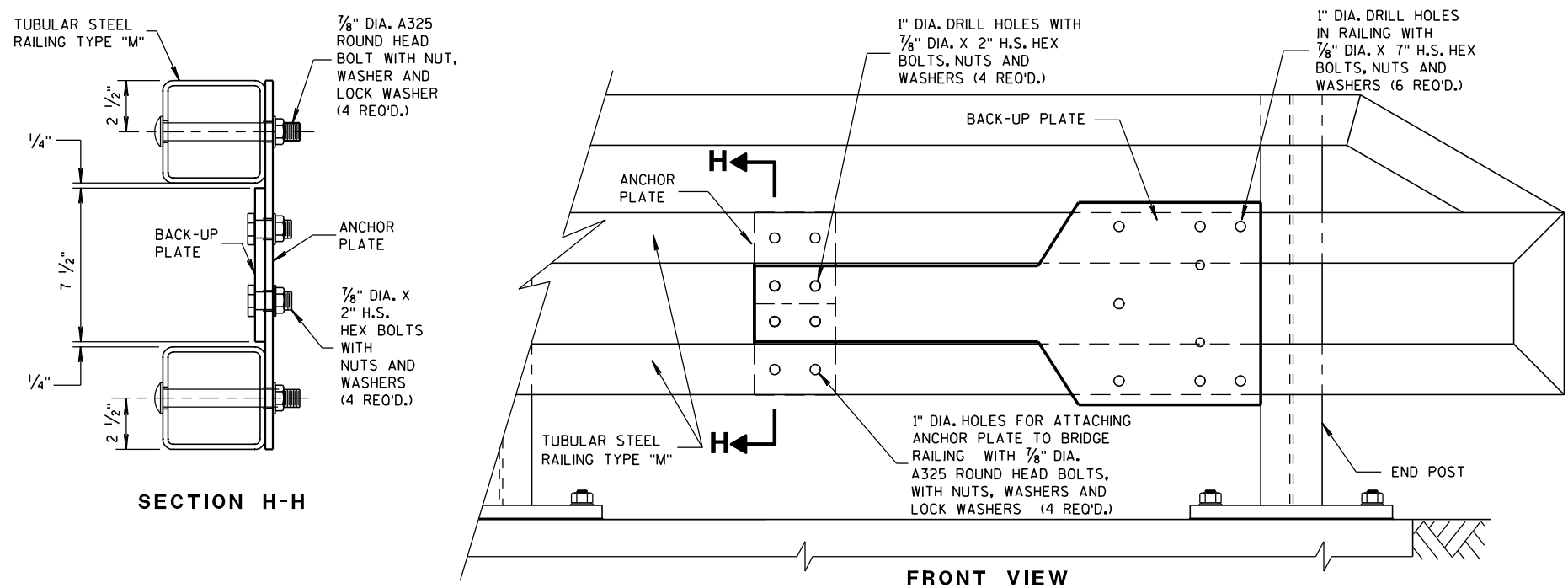
PLAN VIEW
BACK-UP PLATE DETAIL, TYPE "M"



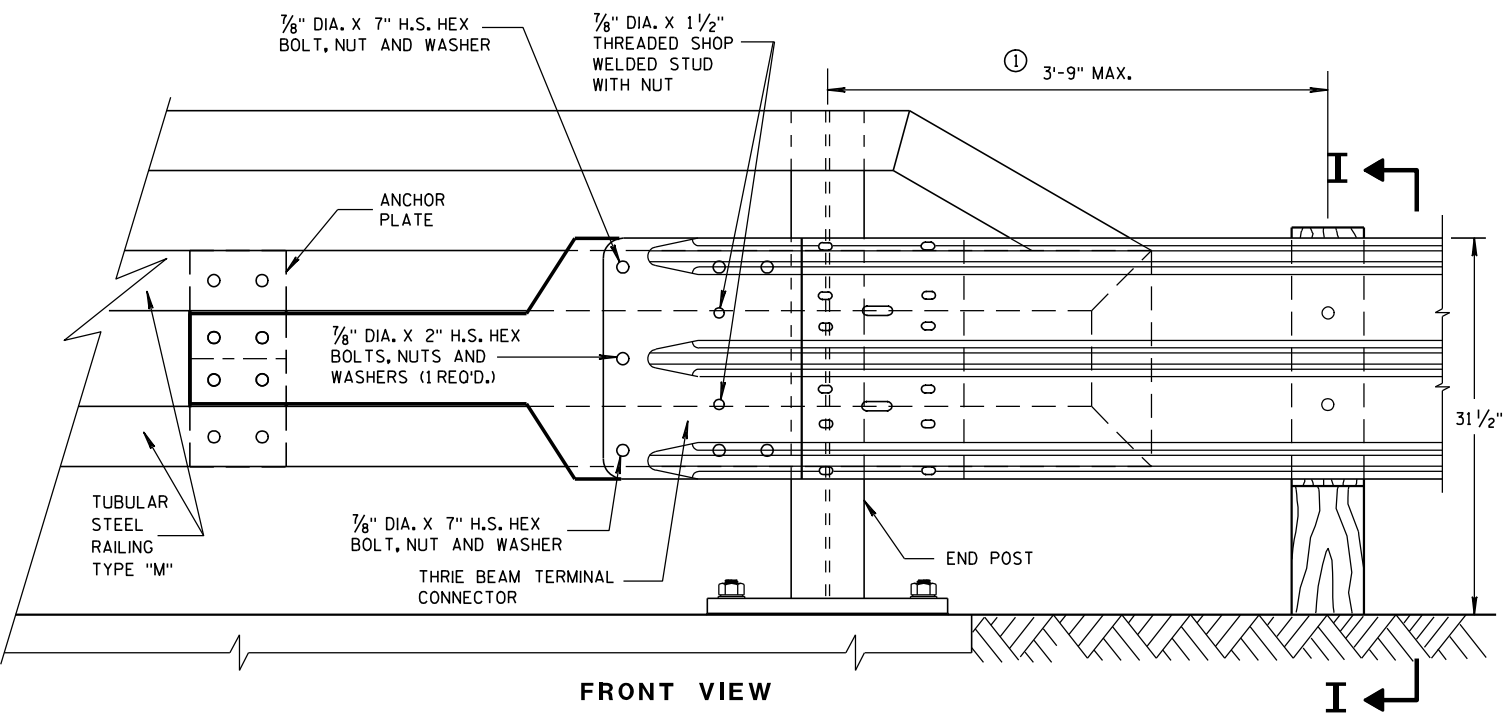
FRONT VIEW
ANCHOR PLATE DETAIL, TYPE "M"



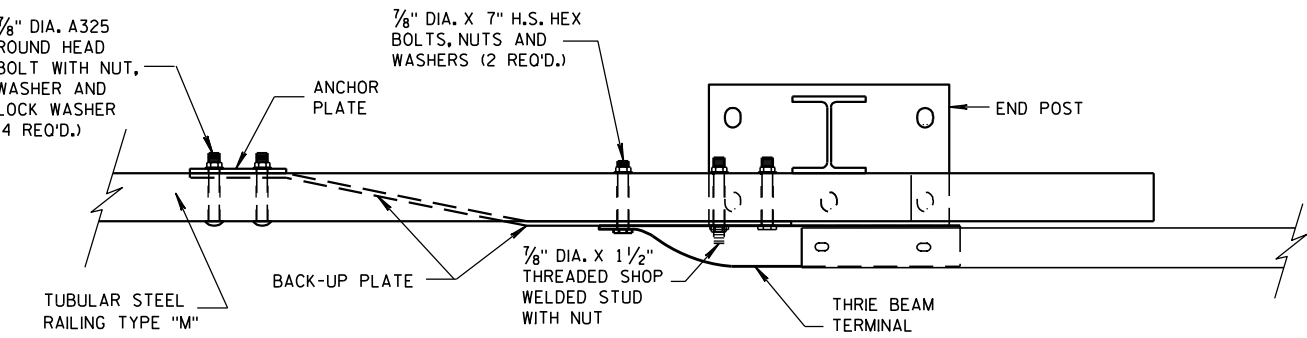
SECTION I-I



ANCHOR AND BACK-UP PLATE MOUNTING TO BRIDGE RAILING, TYPE "M"



FRONT VIEW



PLAN VIEW
THRIE BEAM CONNECTION TO TUBULAR RAILING, TYPE "M"

**STEEL THRIE BEAM STRUCTURE
APPROACH CONNECTION TO
BRIDGE RAILING TYPE "M"**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8/31/2012 DATE /S/ Jerry H. 2000
FHWA ROADWAY STANDARDS 129 ENT
ENGINEER



CONNECTOR PLATE DIMENSION (PER ASSEMBLY)				
PLATE	QUANTITY	SHAPE	SIZE (A x B x C x D)	THICKNESS
P1	1		20" x 20"	3/16"
P2	1		20" x 20" x 28 3/8"	3/16"
P3	1		39" x 3 3/8" x 20" x 19 1/8"	3/16"
S1	4		18 1/8" x 3 3/8" x 18 3/4"	1/4"
S2	1		10 1/4" x 2 1/8" x 10 3/8" x 1/2"	1/4"
S3	1		3" x 1 1/16" x 3 1/8" x 1/2"	1/4"
S4	1		6 1/8" x 2 1/8"	1/4"
S5	1		6 1/8" x 1 1/16"	1/4"
S6	1		7 3/4" x 1 3/4"	1/4"
S7	1		2 1/8" x 6" x 3 5/8" x 5 7/8"	1/4"
S8	1		1 5/32" x 7 1/2" x 2 1/2" x 7 3/8"	1/4"
S9	1		6 1/16" x 6 3/16" x 1 1/32"	1/4"
S10	1		1 7/8" x 9 7/8" x 3 5/8" x 9 1/16"	1/4"
S11	1		8 1/2" x 8 3/4" x 1 1/8"	1/4"

STEEL THRIE BEAM STRUCTURE APPROACH

COVER PLATE PANELS ARE $\frac{3}{16}$ " THICK.

ALL STIFFENERS ARE $\frac{1}{4}$ " THICK.

CONNECTOR PLATE SHALL BE FABRICATED FROM ASTM GRADE A36 STEEL AND GALVANIZED.

FOR GALVANIZED REQUIREMENTS, SEE SECTION 614 OF THE STANDARD SPECIFICATIONS.

ALL HOLE DIAMETERS SHALL BE 1".

FOR OPPOSITE SIDE INSTALLATION MIRROR DRAWINGS.

- ① STIFFENERS LOCATED AT THE OUTSIDE EDGES OF THE COVER PLATES SHALL BE WELDED AS FOLLOWS:
SINGLE BEVEL GROOVE WELD ON EXTERNAL SIDES AND $\frac{3}{16}$ " FILLET WELD BY 1" LONG SPACED AT 2" ON INTERNAL SIDES.
- ② STIFFENERS LOCATED ON THE INSIDE OF THE COVER PLATE SHALL BE WELDED AS FOLLOWS:
 $\frac{3}{16}$ " FILLET WELD BY 1" LONG SPACED AT 2".

**STEEL THRIE BEAM
STRUCTURE APPROACH,
CONNECTOR PLATE DETAIL**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8/31/2012 /S/ Jerry H. Zapp
DATE ROADWAY STANDARDS 130 ENT
ENGINEER
FHWA

6

S.D.D. 14 B 24-7a

5 WOOD OFFSET BLOCK

7/8"

7"

1'-9 5/8"

2'-0" TO 3'-0" VAR.

BUTTON HEAD BOLT
5/8" ϕ X 1'-6" AND
RECESS NUT WITH
ROUND WASHER
UNDER NUT

4 WOOD
BREAKAWAY
CRT POST

HINGE POINT

SLOPE 10:1
OR FLATTER

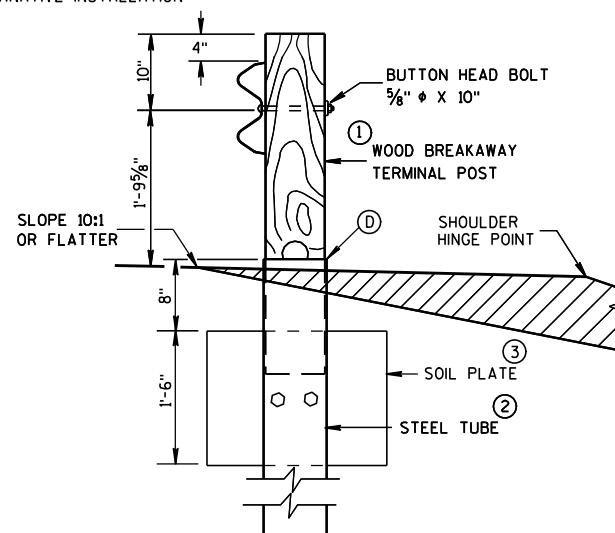
3 1/2" HOLES

1'-4"

TRANSITION TO
4:1 TAPER LINE

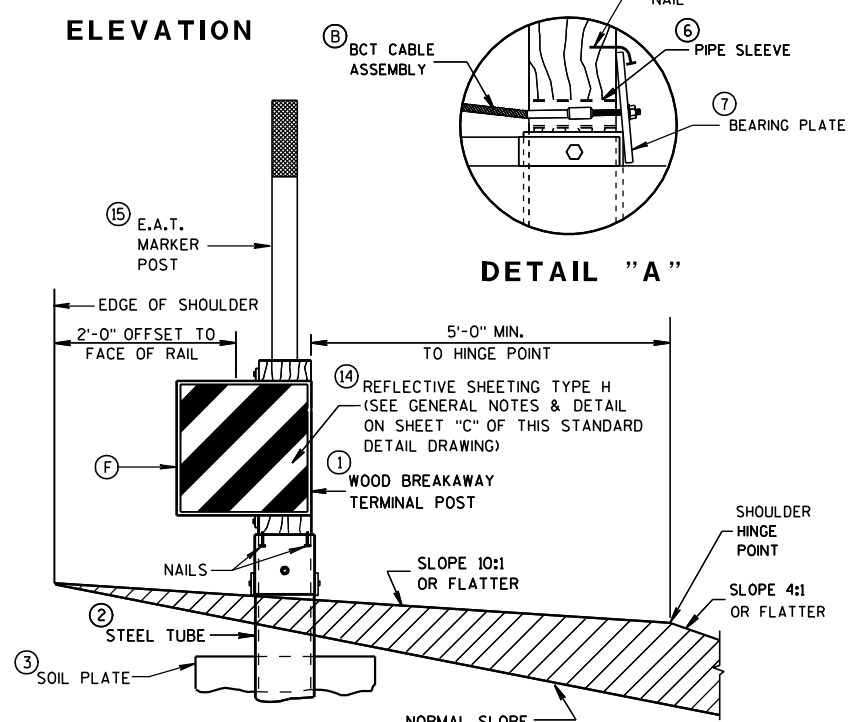
(E)

SECTION B-B
TYPICAL AT POST NO. 2*

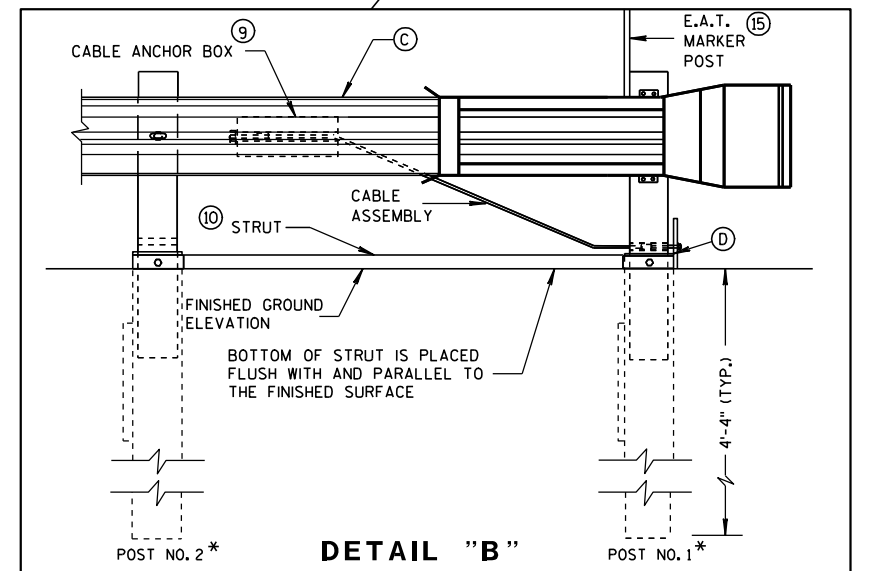


SECTION B-B
TYPICAL AT POST NO. 2*

DETAIL "A"

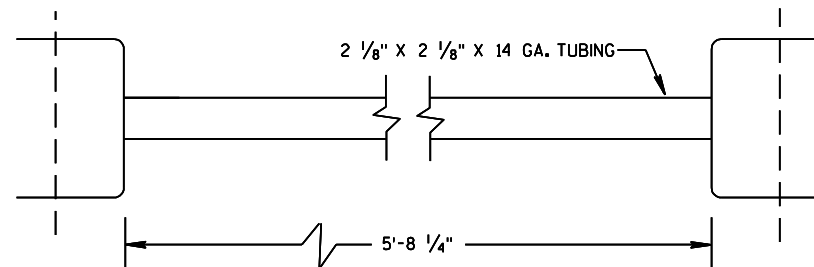


SECTION A-A
TYPICAL AT POST NO. 1*

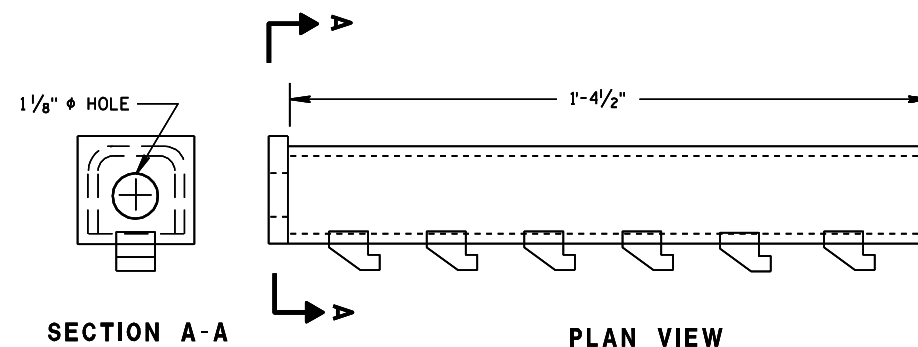


DETAIL "B"

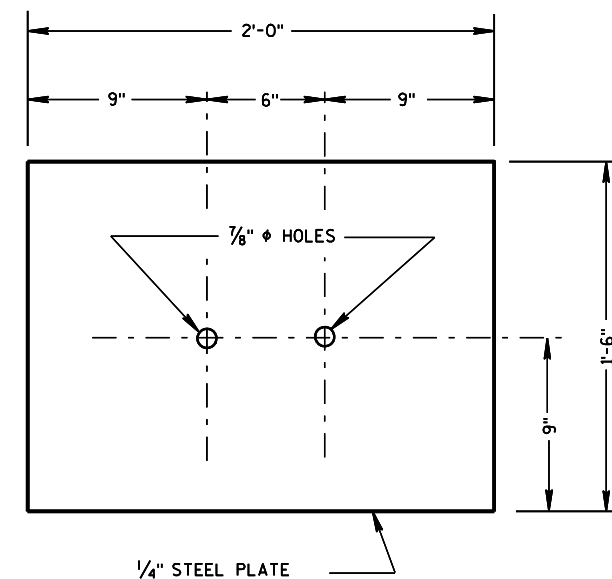
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



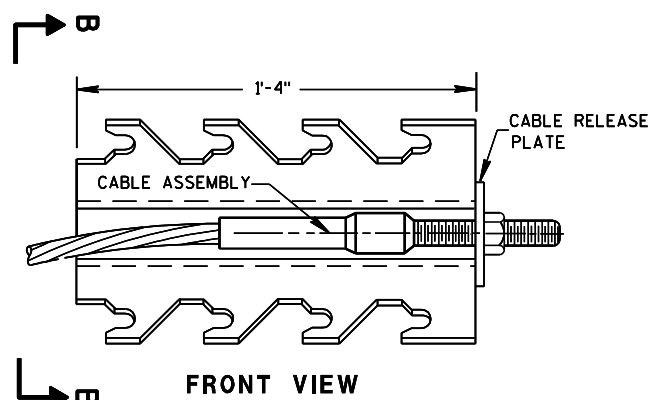
⑩ STRUT DETAIL (SKT-350)



⑨ CABLE ANCHOR BOX (ET-2000/ET-2000 PLUS)

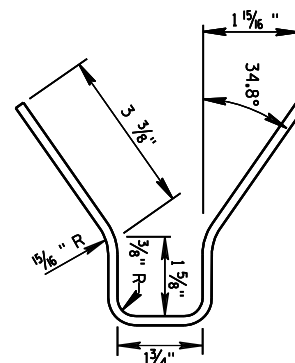


③ SOIL PLATE
(SKT-350, ET-2000/ET-2000 PLUS)

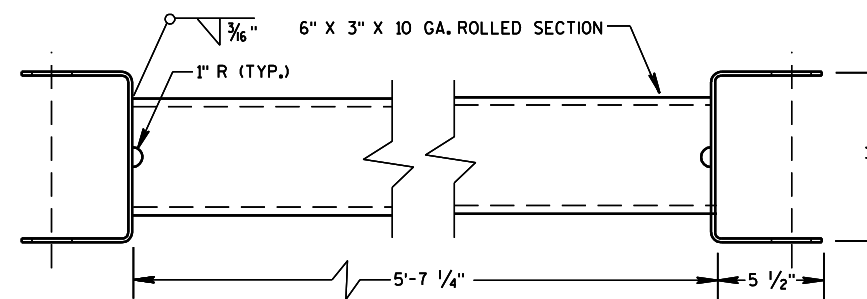


⑨ CABLE ANCHOR BOX (SKT-350)

(SKT-350)

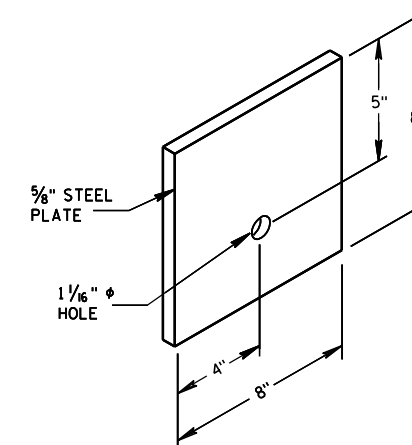


SECTION B-B



⑩ STRUT DETAIL (ET-2000/ET-2000 PLUS)

(ET-2000/ET-2000 PLUS)



⑦ STEEL BEARING PLATE
(SKT-350, ET-2000/ET-2000 PLUS)

STEEL PLATE BEAM GUARD
ENERGY ABSORBING TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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⑤ **WOOD OFFSET BLOCK**
REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2



ET-2000 PLUS ONLY



14 REFLECTIVE SHEETING DETAILS

(G) 1/2" DIA. X 3" LAG BOLT WITH WASHER.

6

S.D.D. 14 B 24-7c

6

S.D.D. 14 B 24-7c

STEEL PLATE BEAM GUARD
ENERGY ABSORBING TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

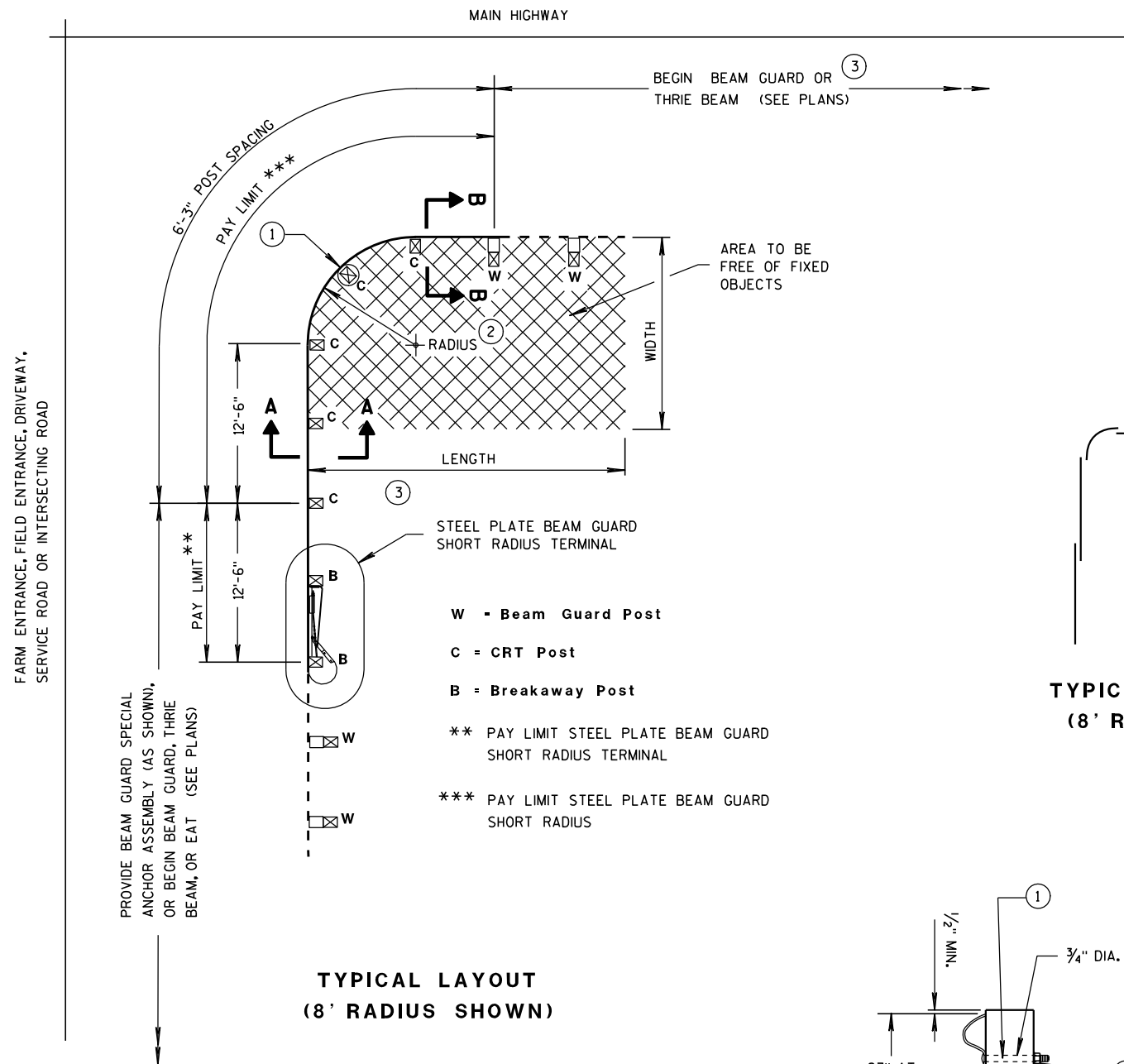
APPROVED

4-12-10
DATE

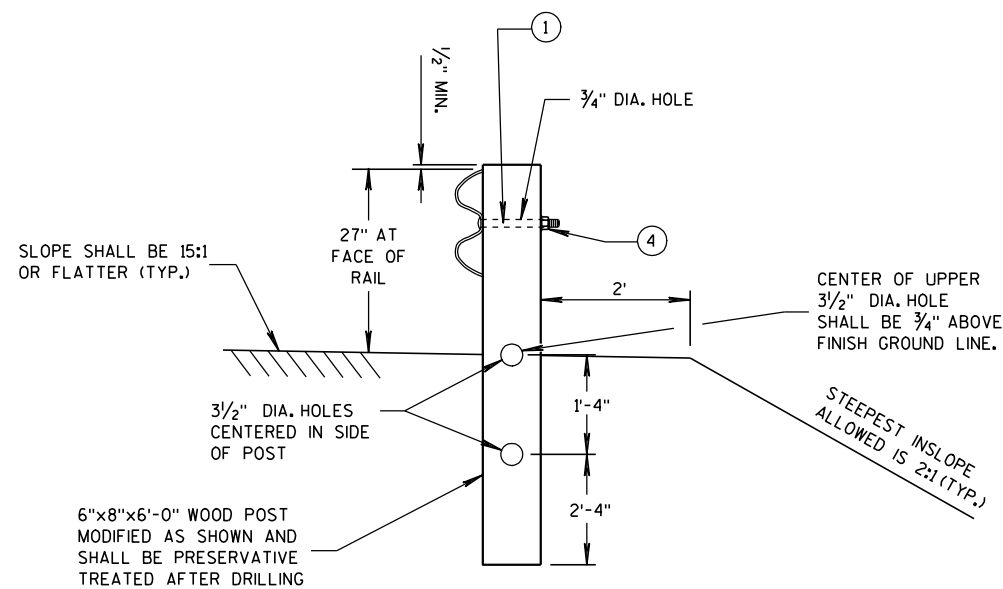
Ehwa

/S/ Jerry H. Zogg
ROADWAY STANDARDS 133

ENGINEER



TYPICAL LAYOUT
(8' RADIUS SHOWN)



SECTION A-A
(CRT POST)

TYPICAL LAP SPLICES
(8' RADIUS SHOWN)

GENERAL NOTES

ALL ANGLES, CHANNELS, AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36 AND THE STRUCTURAL TUBING SHALL CONFORM TO ASTM A 500. WELDING SHALL MEET THE CURRENT REQUIREMENTS OF THE AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE ANSI/AWS D1.1. ALL STRUCTURAL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 123. PUNCHING, DRILLING, CUTTING, OR WELDING WILL NOT BE PERMITTED AFTER GALVANIZING. FURNISH AND INSTALL HARDWARE PER STANDARD SPECIFICATION 614.2, UNLESS NOTED OTHERWISE.

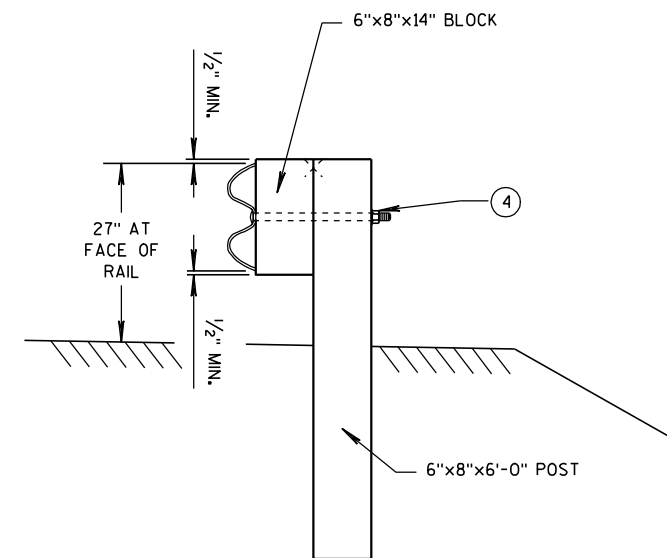
SHOP BEND CURVED RAIL SECTIONS.

SEE STANDARD DETAIL DRAWING 14 B 15 FOR OTHER DETAIL.

- 1 ON THE 8 FOOT RADIUS INSTALLATION, DO NOT INSTALL BUTTON HEAD BOLT AT CENTER CRT POST.
- 2 RADIUS FROM 8' - 36'. SEE PLAN.
- 3 HEIGHT TRANSITION MAY BE REQUIRED. SEE PLAN OR PROJECT ENGINEER.
- 4 5/8" ϕ X 1'-6" BUTTON HEAD BOLT AND RECESS NUT WITH ROUND WASHER UNDER NUT.

RADIUS	NUMBER OF CRT POSTS	*NUMBER AND LENGTH OF CURVED RAILS	REQUIRED AREA FREE OF FIXED OBJECTS (LENGTH x WIDTH)
8'	5	1 at 12.5'	25' x 15'
16'	7	1 at 25'	30' x 15'
24'	9	1 at 25' and 1 at 12.5'	40' x 20'
32'	11	2 at 25'	50' x 20'

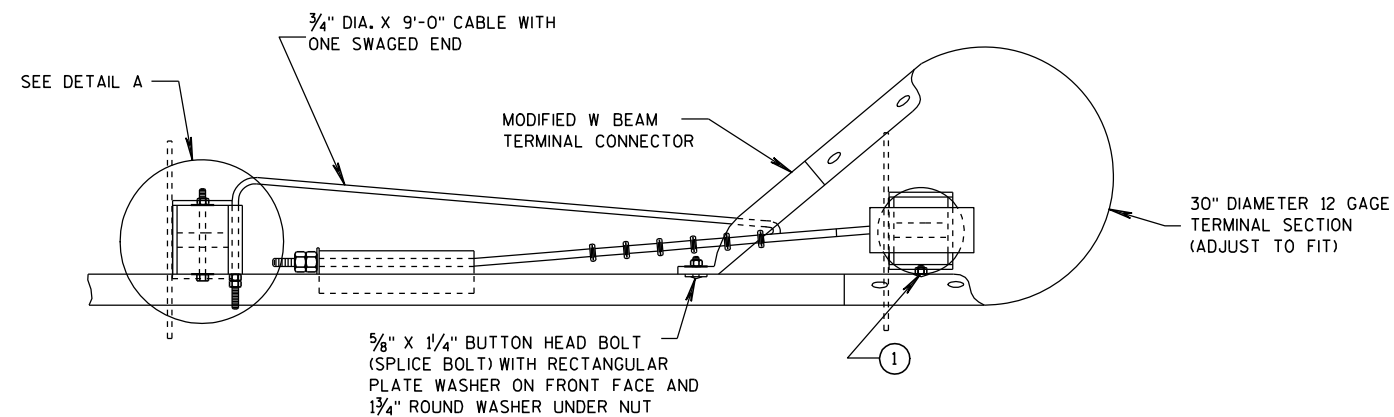
* THE NUMBER OF RAILS IS BASED ON A 90° INTERSECTION. SEE PLAN FOR NON 90° INSTALLATIONS.



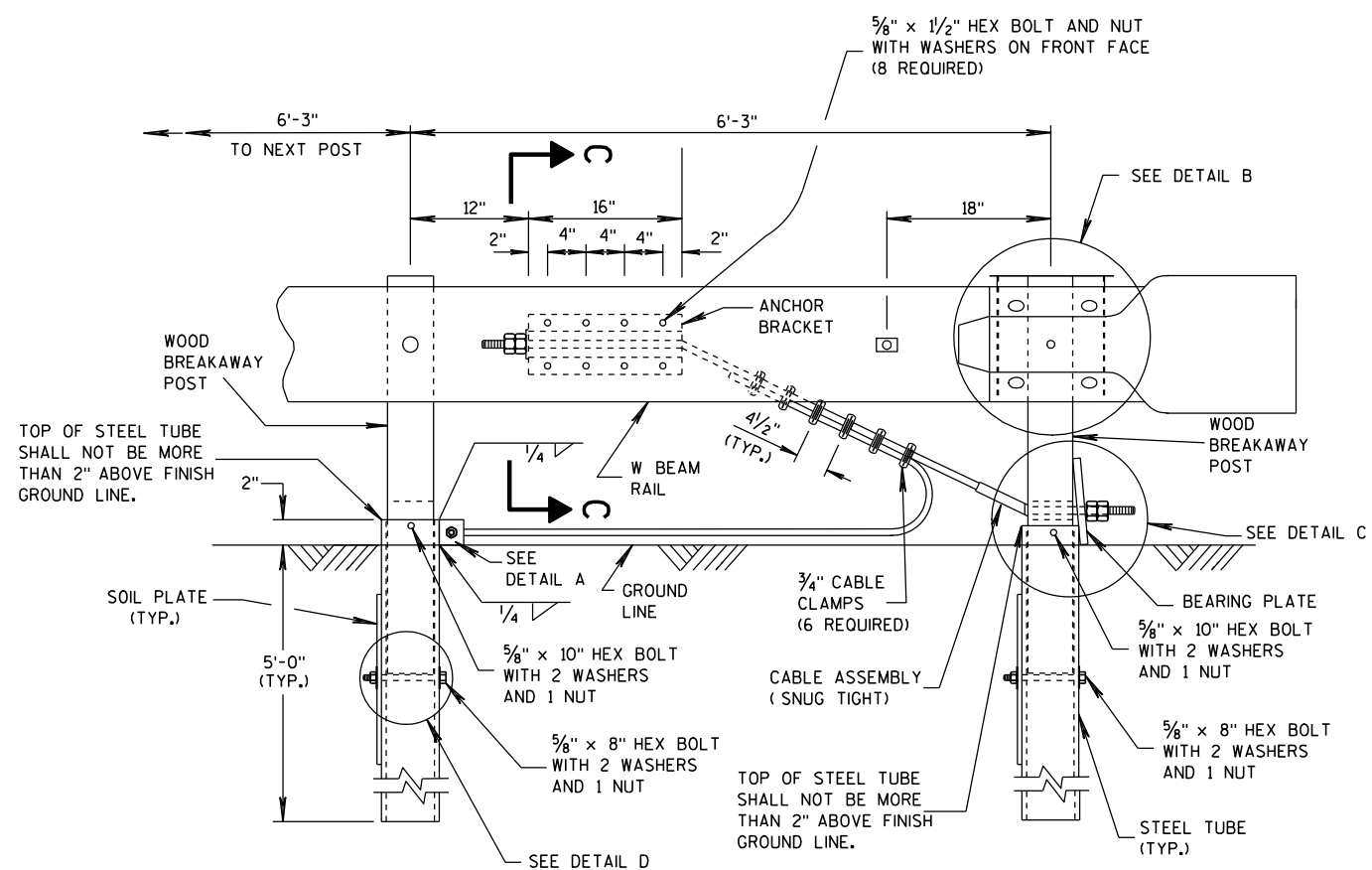
SECTION B-B
(BEAM GUARD POST)

STEEL PLATE BEAM GUARD
SHORT RADIUS TERMINAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
134



PLAN VIEW

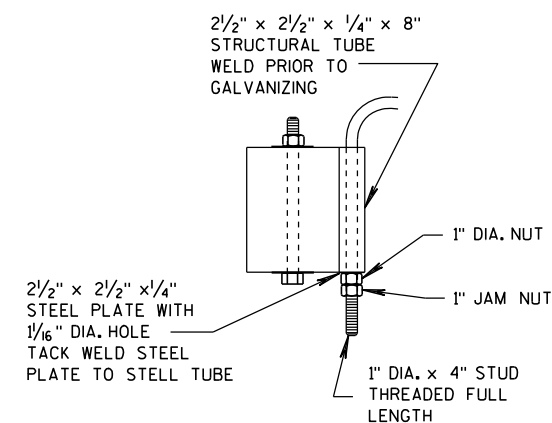


ELEVATION VIEW

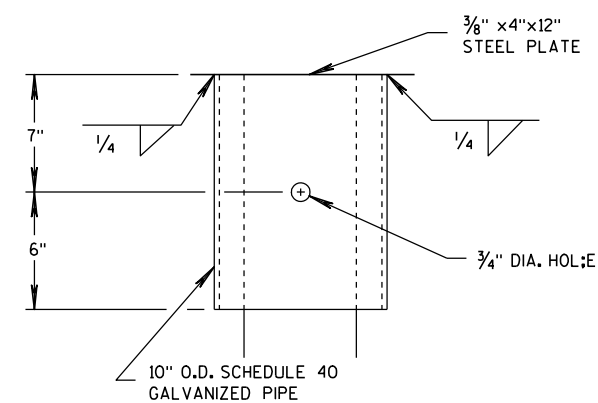
STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL

GENERAL NOTES

- 1 ATTACH W BEAM RAIL TO THE STEEL PIPE WITH A $\frac{5}{8}$ " X 2" BUTTON HEAD BOLT WITH NO WASHER. CONNECTION TO THE POST IS NOT REQUIRED.
- INSTALL GALVANIZED $\frac{3}{4}$ " (6X19) PREFORMED WIRE OR INDEPENDENT WIRE ROPE CORE CONFORMING TO AASHTO M 30. MANUFACTURE WIRE ROPE OUT OF IMPROVED FLOW STEEL WITH A MINIMUM BREAKING STRENGTH OF 42,800 PSI.



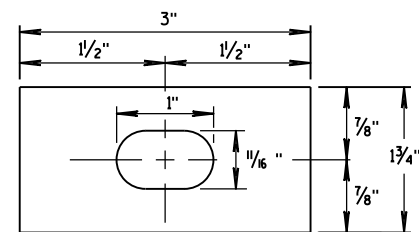
DETAIL A



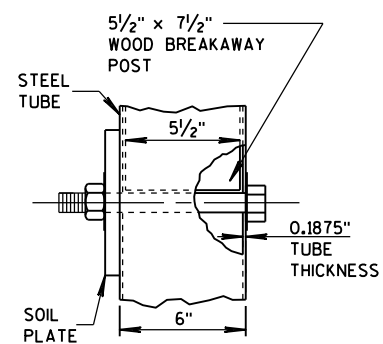
DETAIL B

(BEAM GUARD AND TERMINAL SECTION NOT SHOWN)

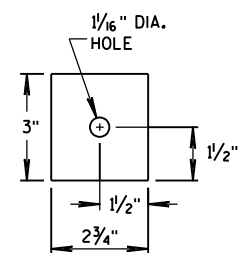
STEEL PLATE BEAM GUARD
SHORT RADIUS TERMINALSTATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



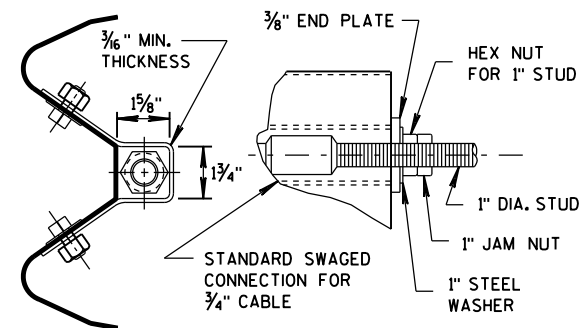
RECTANGULAR PLATE WASHER



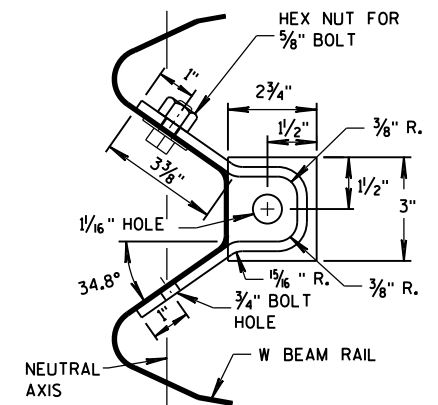
DETAIL D



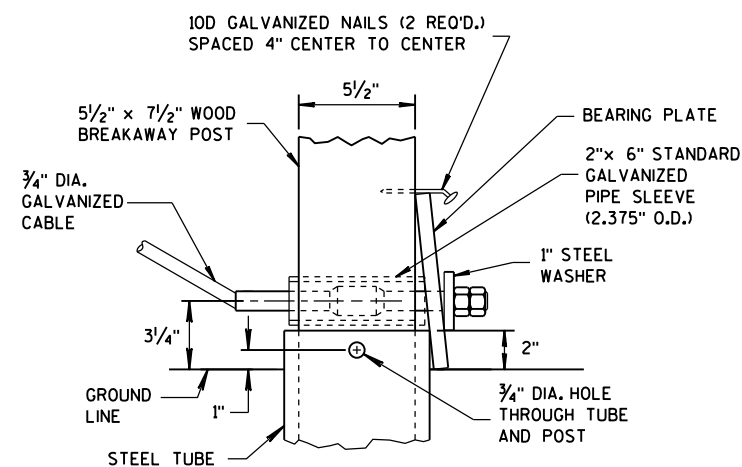
END PLATE



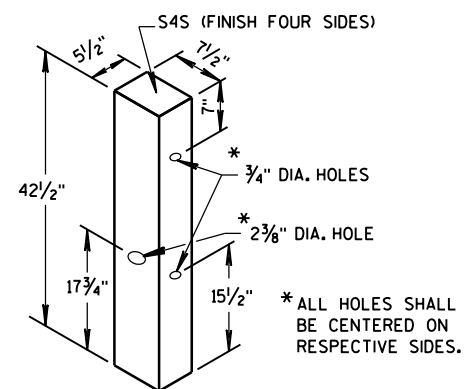
SECTION C-C
(END PLATE REMOVED)



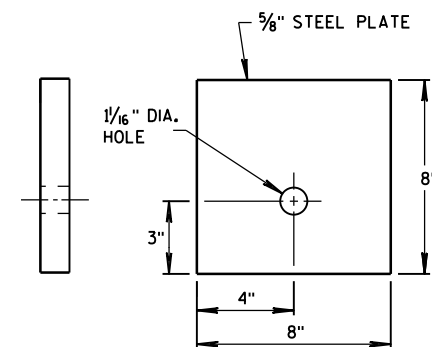
ANCHOR BRACKET



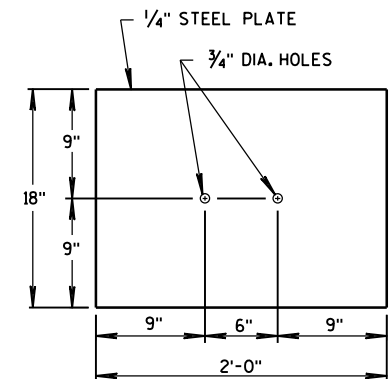
DETAIL C



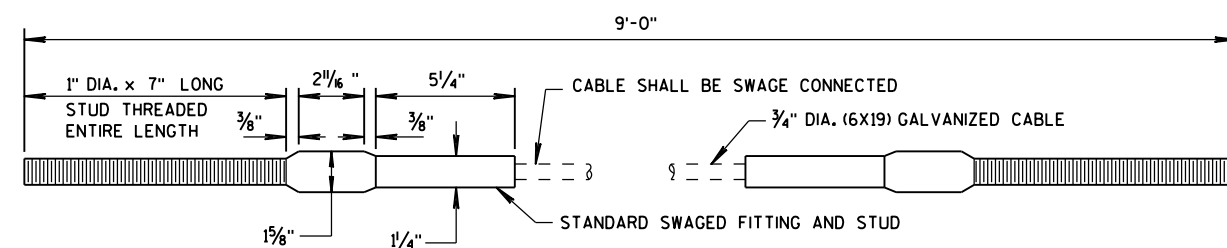
WOOD BREAKAWAY POST



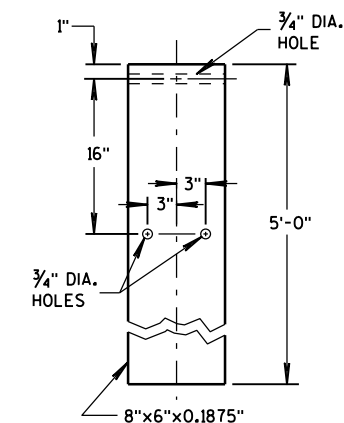
BEARING PLATE



SOIL PLATE



CABLE ASSEMBLY

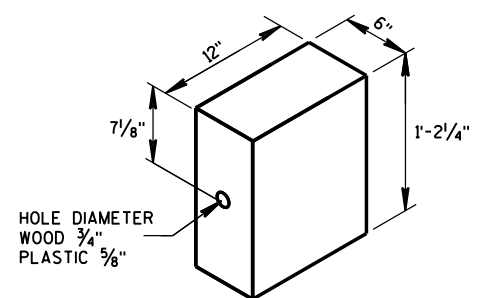
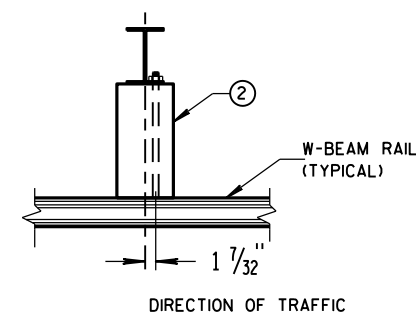
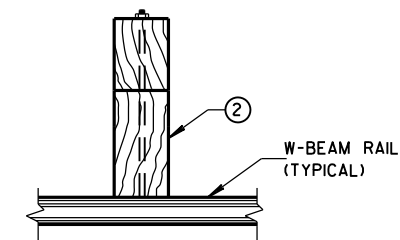
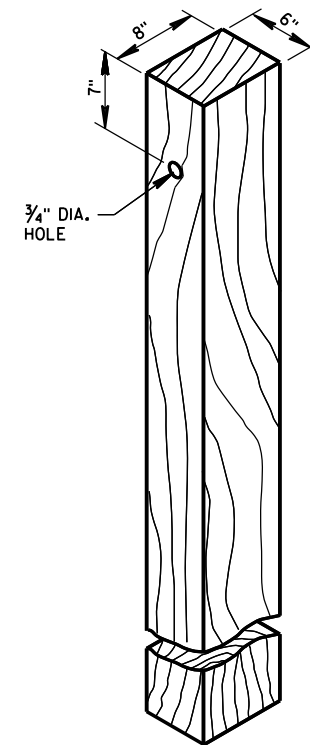
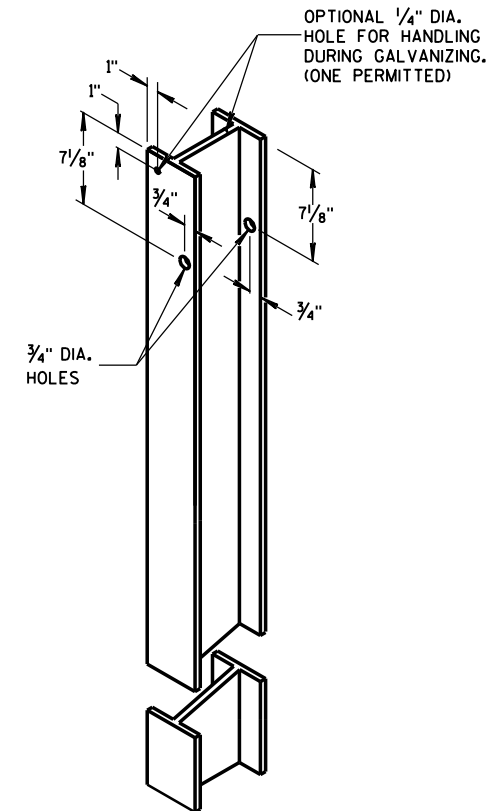
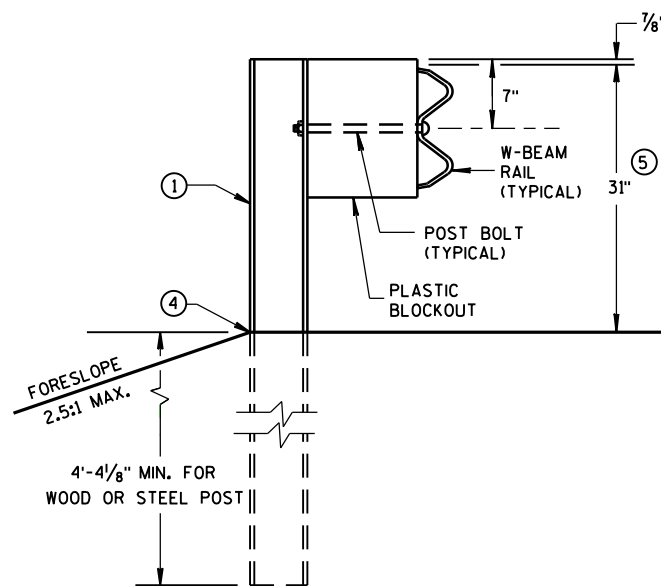
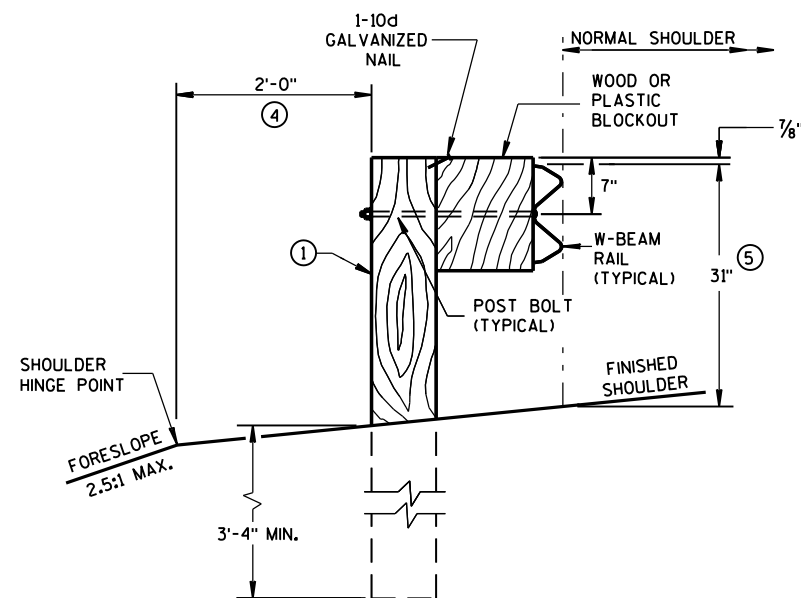
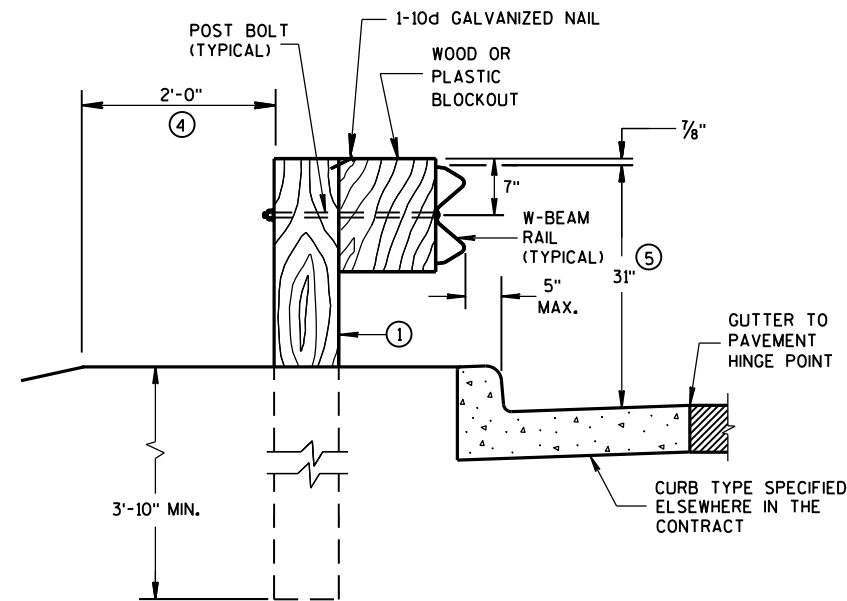
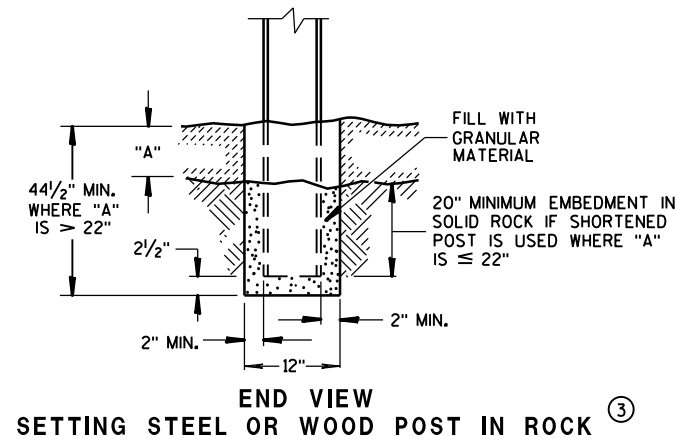


STEEL TUBE

STEEL PLATE BEAM GUARD SHORT RADIUS TERMINAL	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED <u>12/18/08</u> <u>DATE</u>	<u>/S/ Jerry H. Zogg</u> <u>ROADWAY STANDARDS</u> <u>136</u> <u>INT</u> <u>ENGINEER</u>

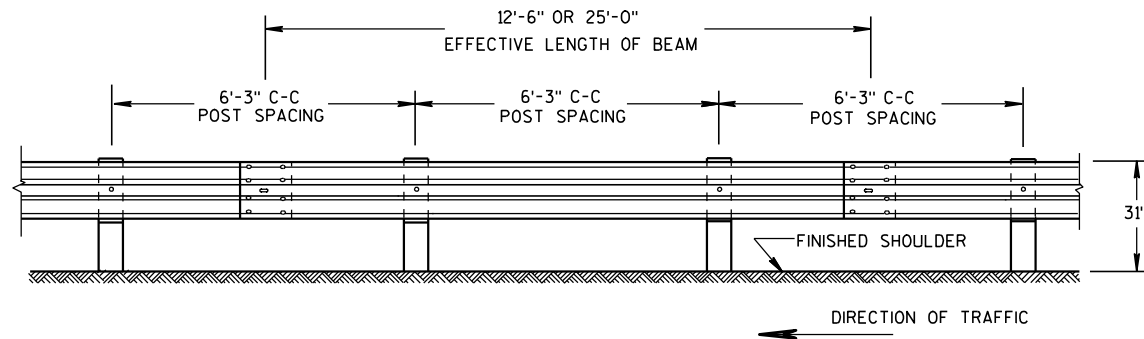
S.D.D. 14 B 42-2a

- S.D.D. 14 B 42-2a**



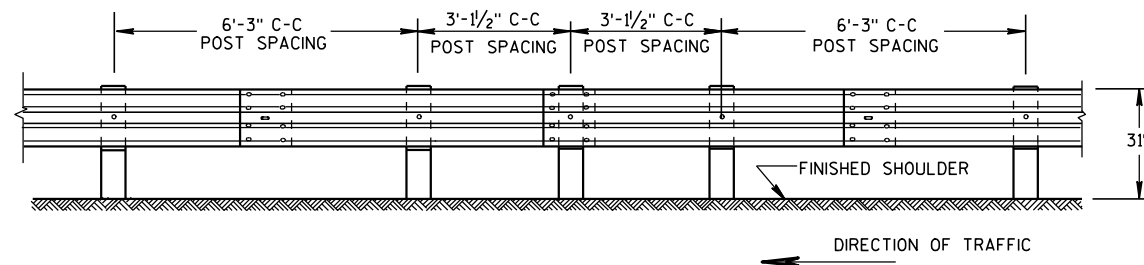
**MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION 137



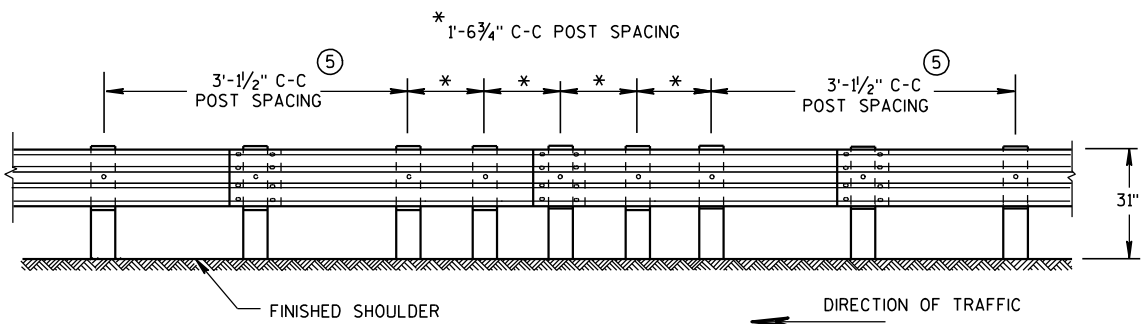
FRONT VIEW

POST SPACING STANDARD INSTALLATION



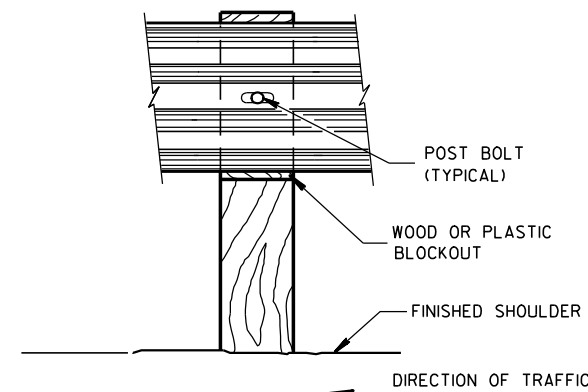
FRONT VIEW

HALF POST SPACING (HS) AND HALF POST SPACING WITH LONGER POSTS (K)

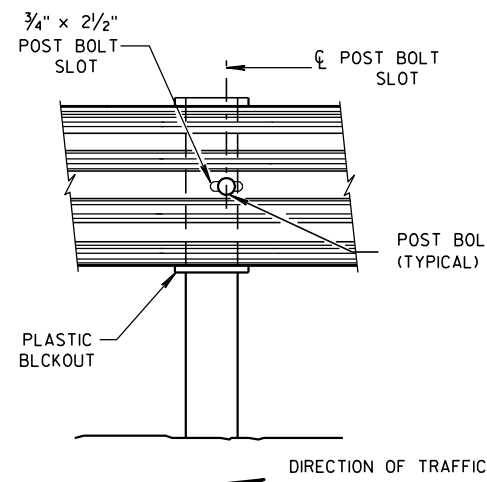


FRONT VIEW

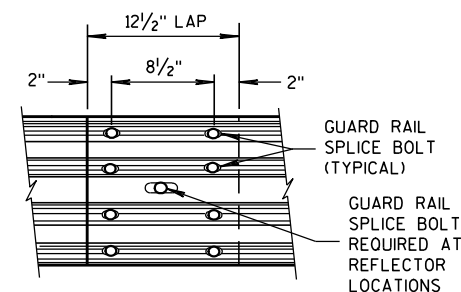
QUARTER POST SPACING (QS)



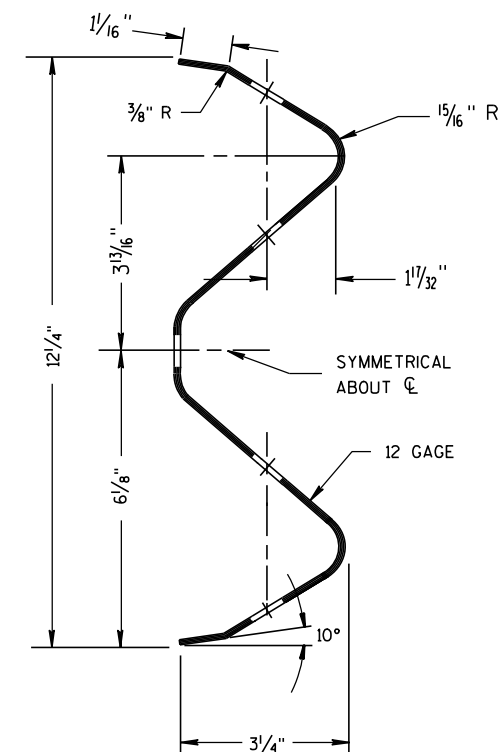
FRONT VIEW AT WOOD POST



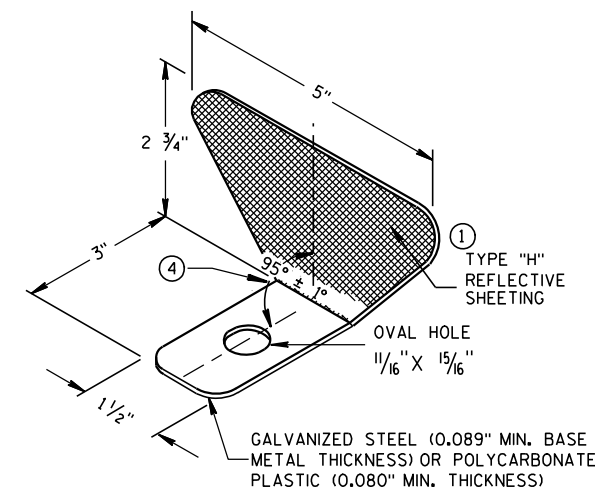
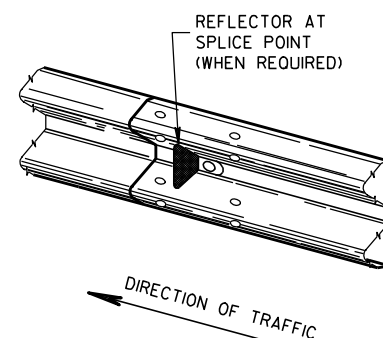
FRONT VIEW AT STEEL POST



FRONT VIEW
MID-SPAN BEAM SPLICE



SECTION THRU W-BEAM RAIL



ONE SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION

GENERAL NOTES

- 1 PROVIDE TYPE "H" SILVER REFLECTIVE SHEETING ON ALL REFLECTORS EXCEPT THOSE LOCATED ALONG THE LEFT EDGE OF ONE-WAY ROADWAYS, WHICH SHALL BE PROVIDED WITH TYPE "H" YELLOW REFLECTIVE SHEETING.
- 2 DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL. RAIL SPLICE LOCATIONS ARE THE ONLY ACCEPTABLE LOCATIONS FOR REFLECTORS.
- 3 REVERSE EVERY OTHER REFLECTOR FOR 2-WAY VISIBILITY. THE CONTRACTOR MAY FURNISH TWO-SIDED REFLECTORS IN LIEU OF ONE-SIDED REFLECTORS.
- 4 PROVIDE AN ANGLE OF BEND OF $90^\circ \pm 1^\circ$ FOR TWO-SIDED REFLECTORS.
- 5 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.

POST BOLTS ARE A $\frac{5}{8}$ " DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES $\frac{5}{8}$ " DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND $\frac{5}{8}$ " DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.

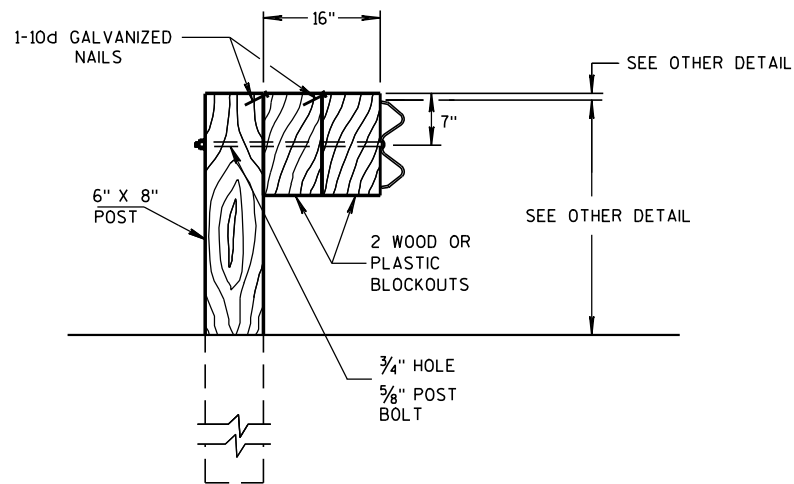
GUARD RAIL SPLICE BOLTS ARE A $\frac{5}{8}$ " DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES $\frac{5}{8}$ " DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.

REFLECTOR SPACING

	BEAM GUARD LENGTH	REFLECTOR SPACING	NO. SURFACES REFLECTORIZED	MIN. NO. REFLECTORS
ONE WAY TRAFFIC	< 200'	50' C-C	1	3
	> 200'	100' C-C	1	
TWO WAY TRAFFIC	< 200'	25' C-C	1	6
	> 200'	50' C-C	1	
TWO WAY TRAFFIC	< 200'	50' C-C	2	3
	> 200'	100' C-C	2	

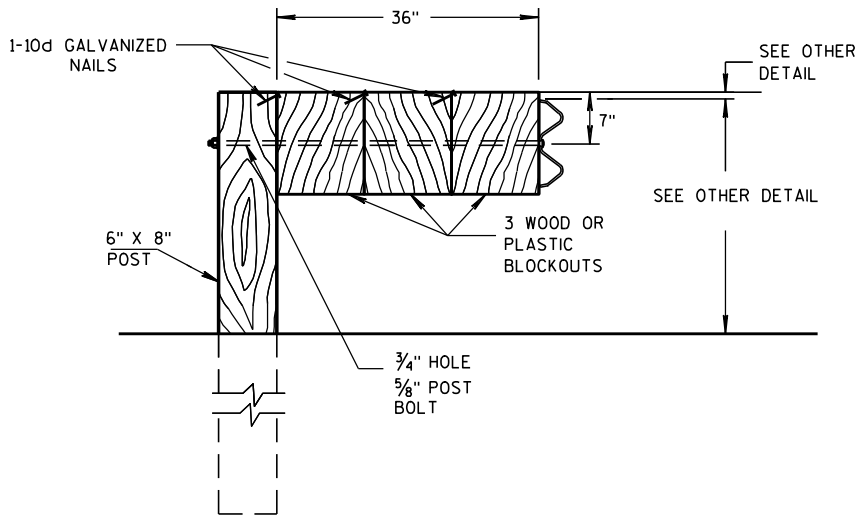
MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



DETAIL FOR 16" BLOCKOUT DEPTH

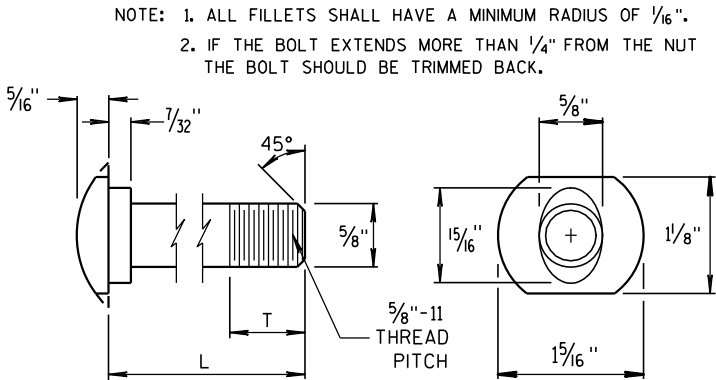
IT IS ACCEPTABLE TO USE BLOCKOUTS UP TO 16" DEEP TO INCREASE THE POST OFFSET TO AVOID UNDERGROUND OBSTACLES. THERE IS NO LIMIT TO THE NUMBER OF POSTS THAT CAN HAVE ADDITIONAL BLOCKOUTS UP TO 16" DEEP.



DETAIL FOR 36" BLOCKOUT DEPTH

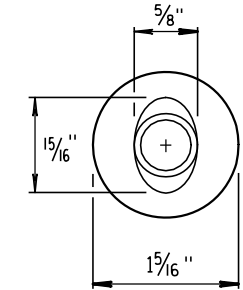
NOTES: UNDER SPECIAL CIRCUMSTANCES, SUCH AS AVOIDING OBSTACLES THAT ARE NOT RELOCATED, IT IS ACCEPTABLE TO INSTALL ADDITIONAL BLOCKOUTS TO OBTAIN UP TO 36" DEPTH FOR ONE OR TWO POSTS IN A SECTION OF GUARDRAIL.

DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.

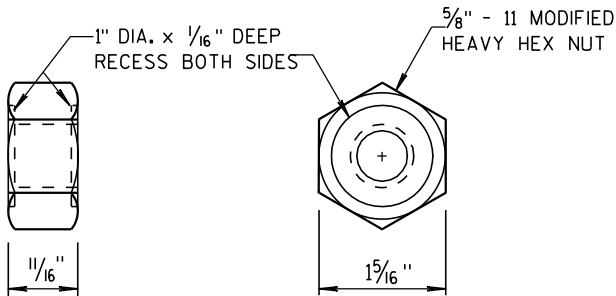


POST BOLT TABLE

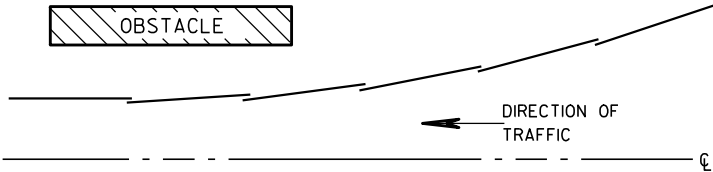
L	T (MIN.)
1 1/4"	1 1/8"
2"	1 3/4"
10"	4"
14"	4 1/16"
18"	4"
21"	4 1/16"
25"	4"



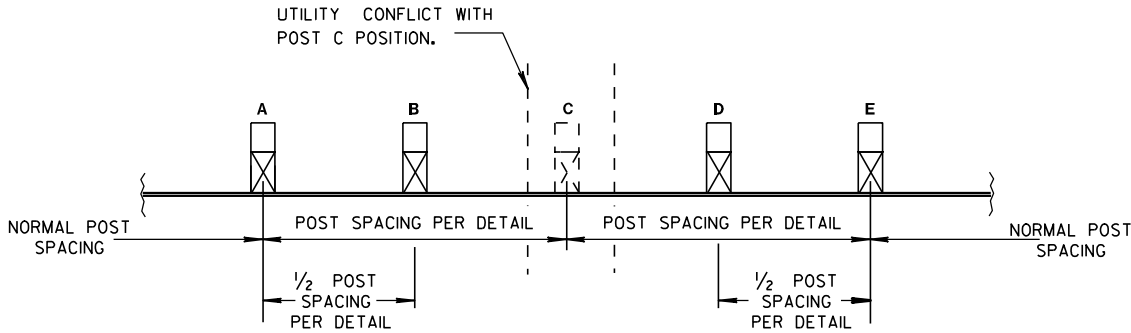
ALTERNATE BOLT HEAD



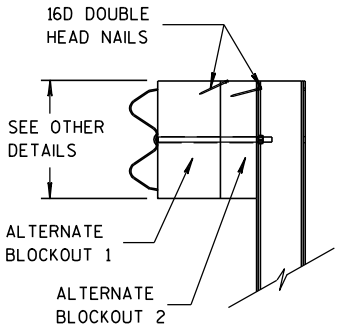
POST BOLT AND RECESS NUT



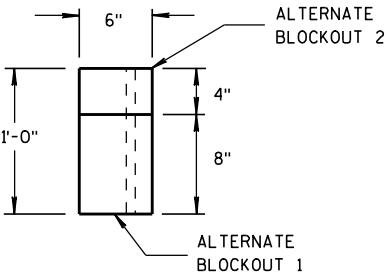
PLAN VIEW BEAM LAPPING DETAIL



POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION



SIDE VIEW



TOP VIEW

ALTERNATE WOOD BLOCKOUT DETAIL

MIDWEST GUARDRAIL SYSTEM
(MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
DATE 11/15/2011
FHW

139
ROADWAY STANDARDS
ENGINEER

S.D.D. 14 B 42-2c

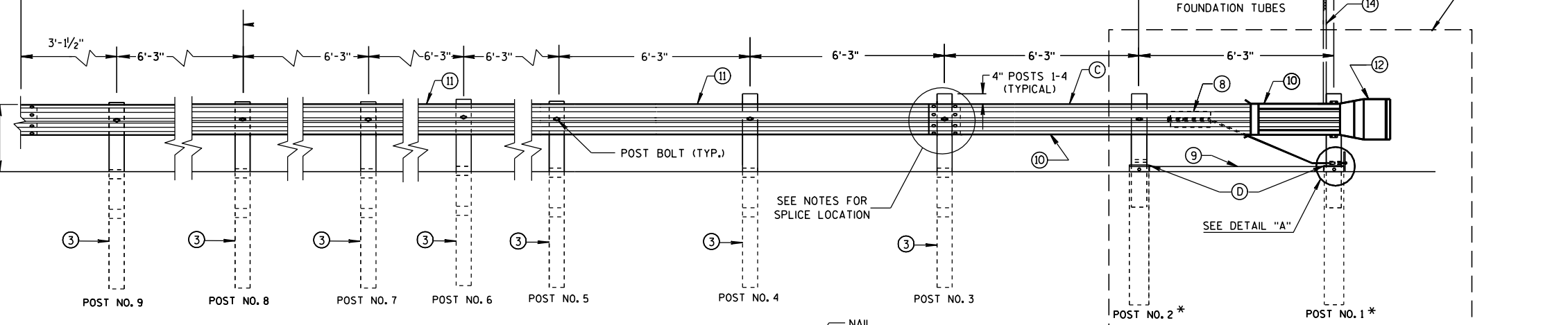
6

- S.D.D. 14 B 44-1a

* DO NOT ATTACH BLOCKOUTS TO POSTS 1 AND 2.

W-BEAM RAIL SPLICES ARE LOCATED AT POST NUMBER 3, AND BETWEEN POST 5 AND 6, BETWEEN POSTS 7 AND 8, AND MIDDLE OF THE SPAN AFTER POST 9.

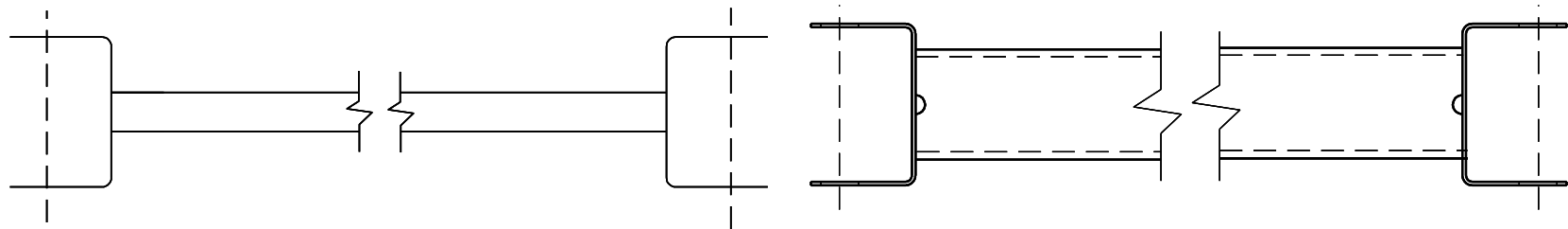
THE CENTER OF THE UPPER 3 1/2" DIAMETER HOLE ON POST NUMBER 3
THROUGH POST 9 IS TO BE FLUSH WITH THE GROUND LINE (+ 3/4")

[illegible]

Technical drawing of Detail "B" showing a cross-section of a structure. The drawing includes labels for various components: 1, 2, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100. The drawing also includes a note: "BOTTOM OF STRUT IS PLACED FLUSH WITH AND PARALLEL TO THE FINISHED SURFACE".

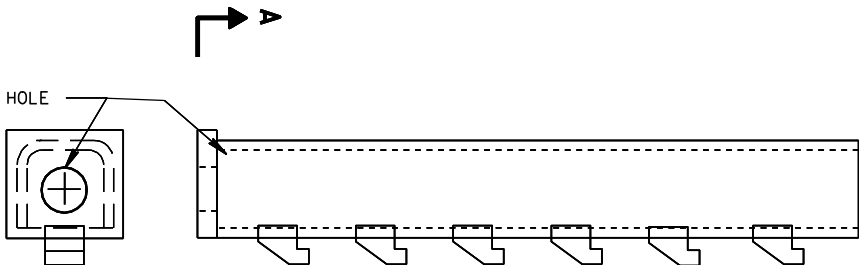
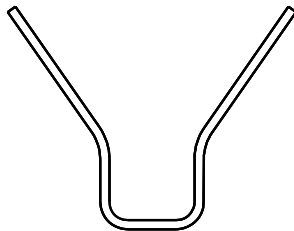
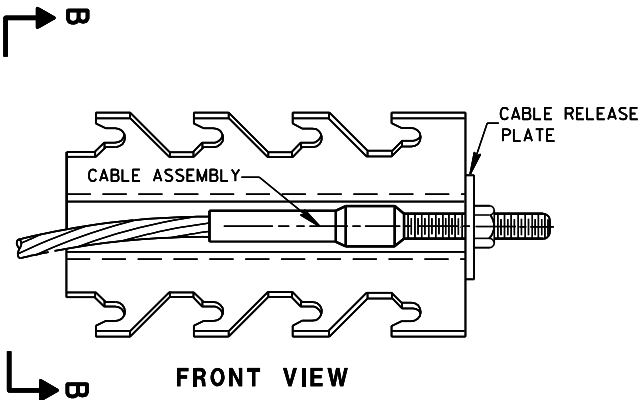
**MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



9 H

GENERIC GROUND STRUT

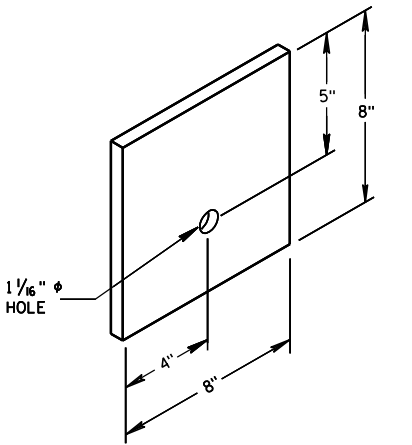


8 H

GENERIC ANCHOR CABLE BOX

BILL OF MATERIALS

PART NO.	DESCRIPTION
MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.	
①	WOOD BREAKAWAY POST
②	6" X 8" X 0.188", 6'-0" LONG FOUNDATION TUBE AT POSTS 1 AND 2
③	WOOD CRT
④	WOOD BLOCKOUT
⑤	PIPE SLEEVE
⑥	BEARING PLATE
⑦	BCT CABLE ASSEMBLY
⑧	ANCHOR CABLE BOX
⑨	GROUND STRUT
⑩	PERFORATED W-BEAM RAIL END PANEL, 12'-6" LONG.
⑪	STANDARD W-BEAM RAIL, MULTIPLE SECTIONS REQUIRED. SECTIONS VARY IN LENGTH.
⑫	END SECTION EAT
⑬	0.040" ALUMINUM SHEET WITH REFLECTIVE SHEETING TYPE H (ONLY THE SHEETING IS SUPPLIED BY THE MANUFACTURER)
⑭	EAT MARKER POST - YELLOW (SEE APPROVED PRODUCTS LIST)

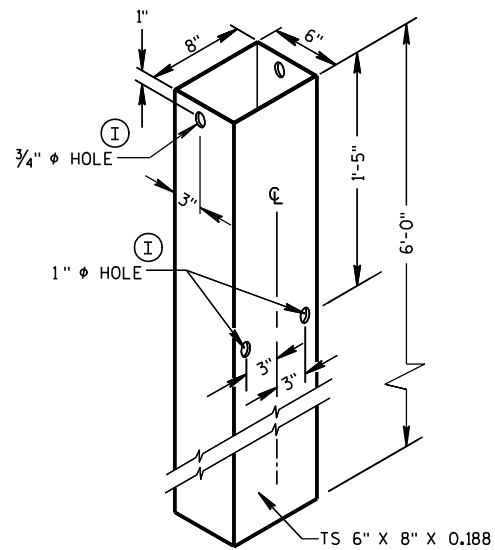


6

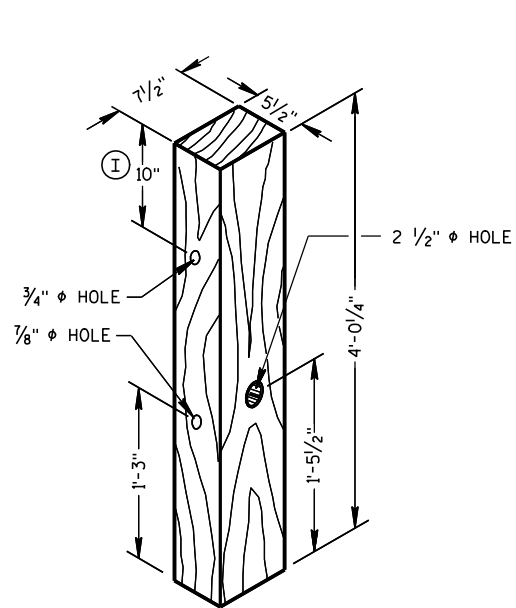
BEARING PLATE

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

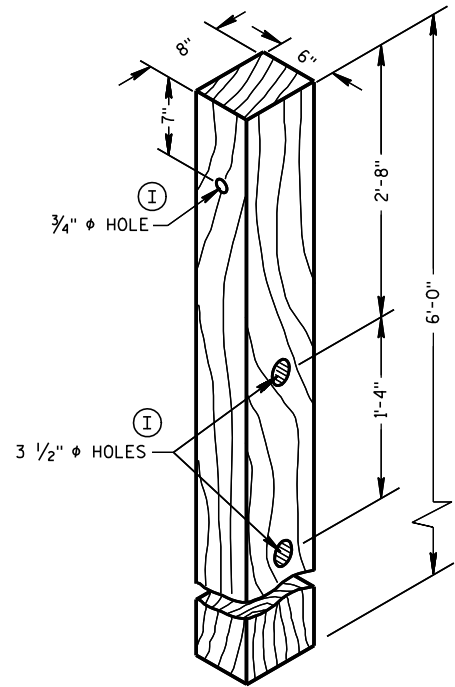
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



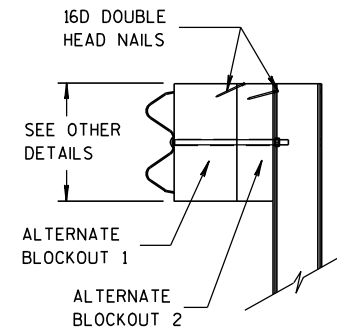
FOUNDATION TUBE ②



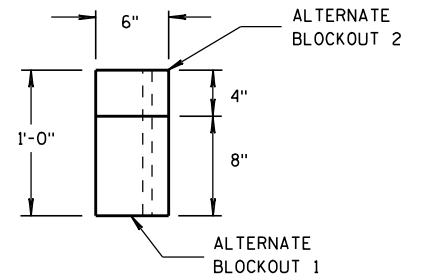
WOOD BREAKAWAY POST ①



WOOD CRT POST ③

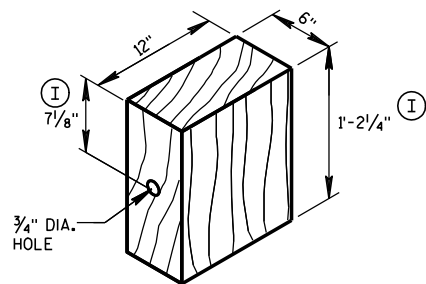


SIDE VIEW



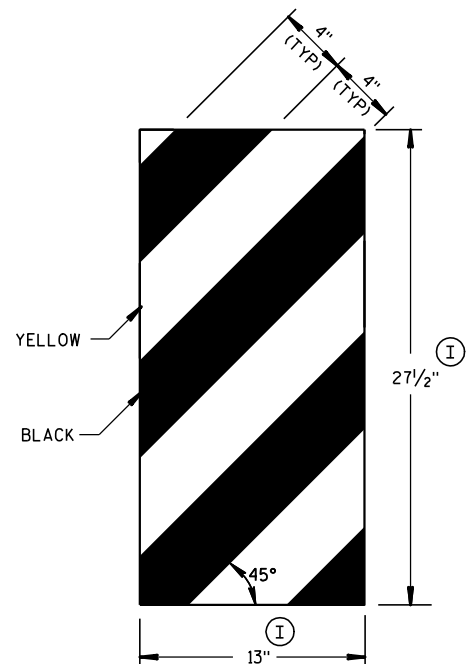
TOP VIEW

ALTERNATE WOOD
BLOCKOUT DETAIL

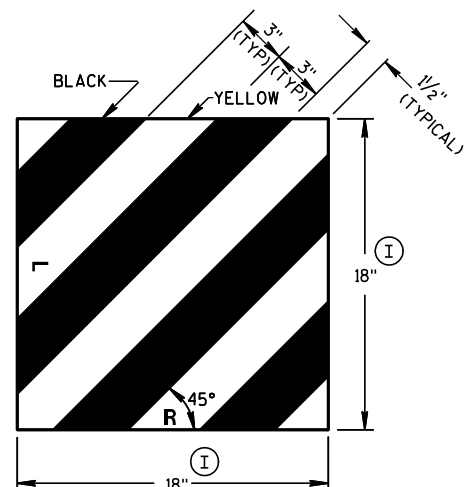


WOOD BLOCKOUT ④

YELLOW REFLECTIVE TAPE
3" X 9" TYPE H
REFLECTIVE SHEETING



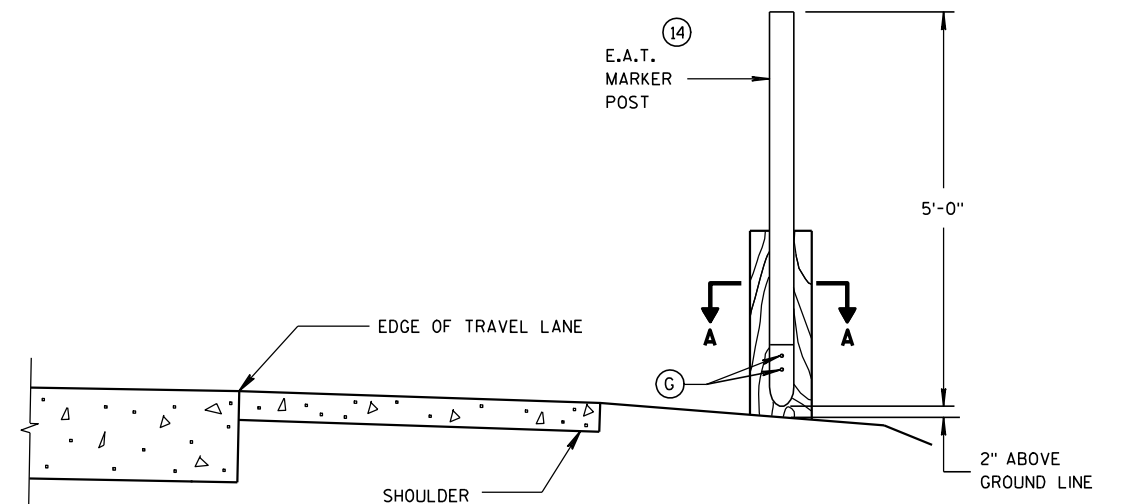
GENERIC REFLECTIVE SHEETING ⑬ ④



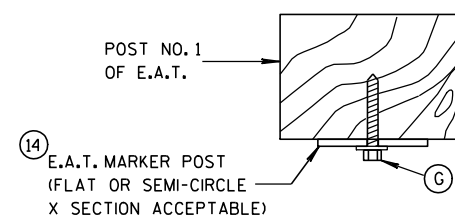
FRONT VIEW

SIDE VIEW

E.A.T. MARKER POST ⑭



TYPICAL INSTALLATION OF E.A.T.
MARKER POST BACKSIDE OF POST NO. 1
(E.A.T. AND RAIL REMOVED FOR CLARITY)

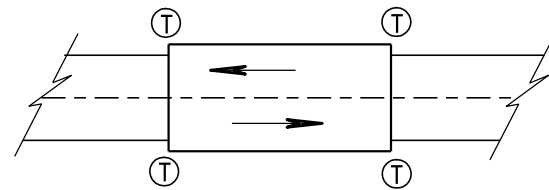


SECTION A-A

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

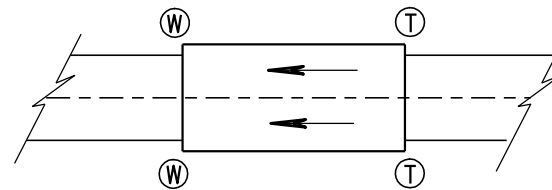
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
5/23/2011 /S/ Jerry H. 3000
DATE ROADWAY STANDARDS 142
FHWA ENGINEER



TWO WAY TRAFFIC

Ⓣ THRIE BEAM CONNECTION



ONE WAY TRAFFIC

Ⓦ W-BEAM CONNECTION WHEN REQUIRED

GENERAL NOTES

BOLT THE THRIE BEAM TO ALL POSTS AND BLOCKOUTS. DRILL OR PUNCH BOLT HOLES IN THE BEAM IF THE POST SPACING IS LESS THAN 6'-3".

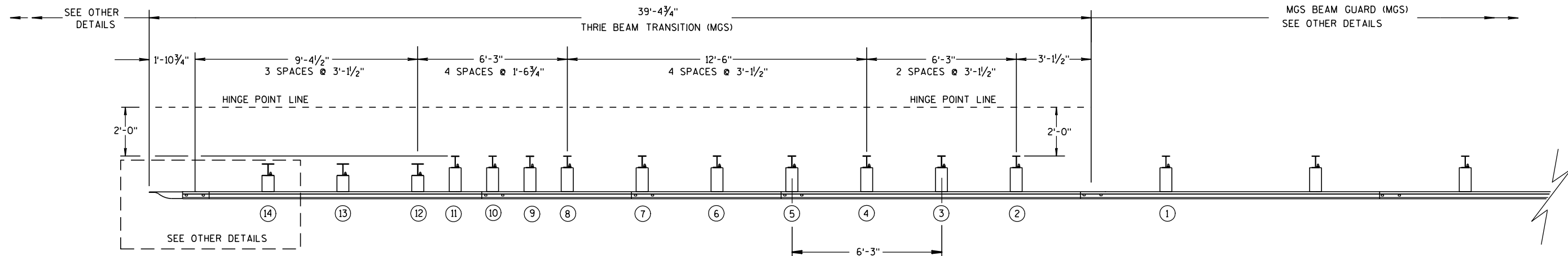
IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2 1/2", AND 12" DIAMETER AROUND POST. SEE 14B42 FOR MORE DETAILS.

TRANSITION USES STEEL POSTS ONLY.

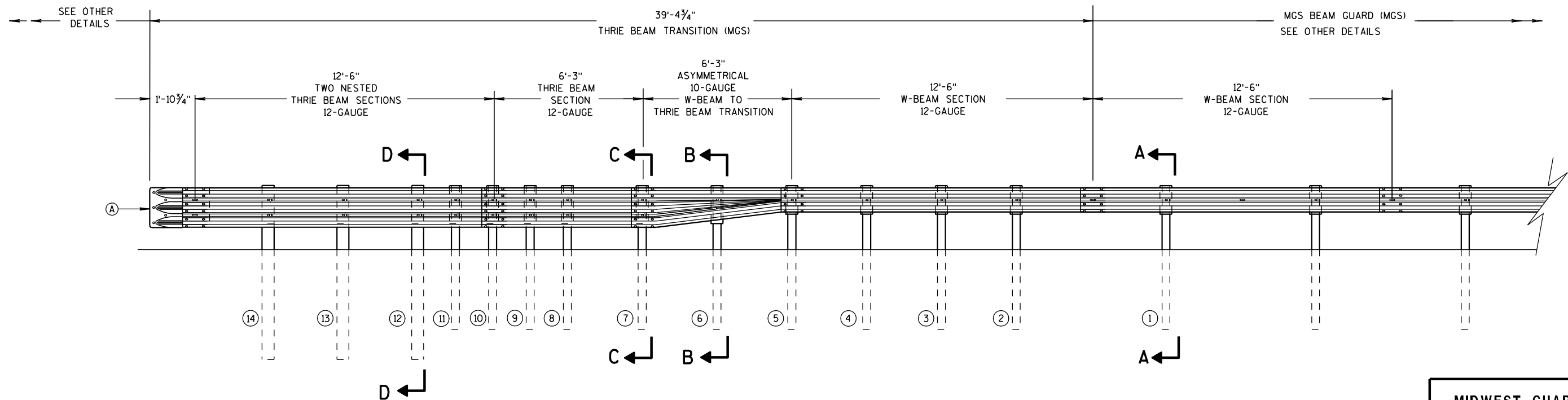
SEE STANDARD DETAIL DRAWING 14 B 42 FOR MORE INFORMATION.

Ⓐ BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.

TYPICAL LOCATIONS OF THRIE BEAM AND W-BEAM CONNECTIONS TO BRIDGE



PLAN VIEW



ELEVATION VIEW

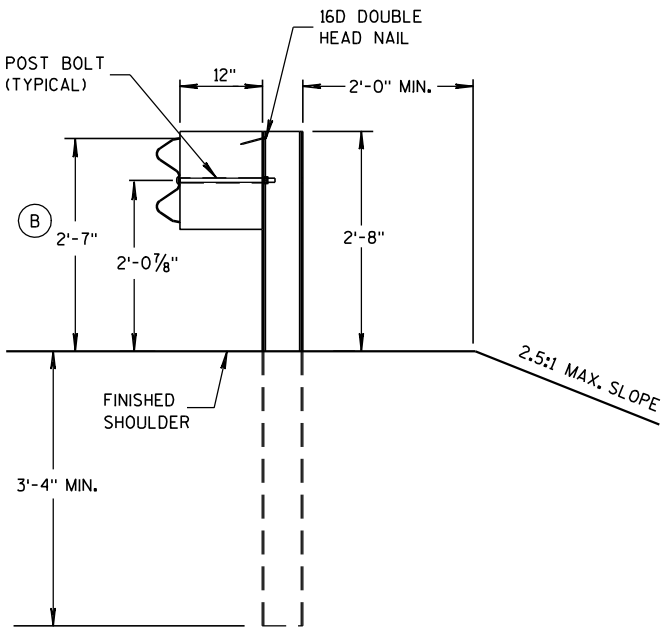
MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

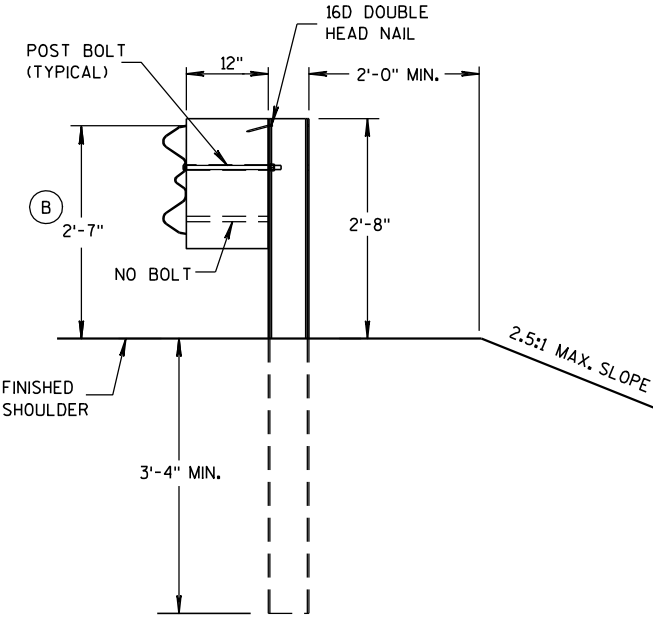
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
143

GENERAL NOTES

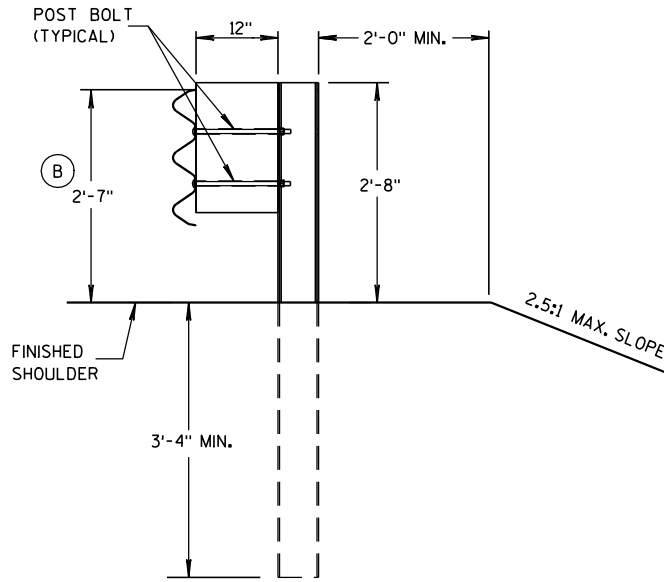
(B) TOLERANCE FOR TOP OF W-BEAM RAIL IS ± 1".



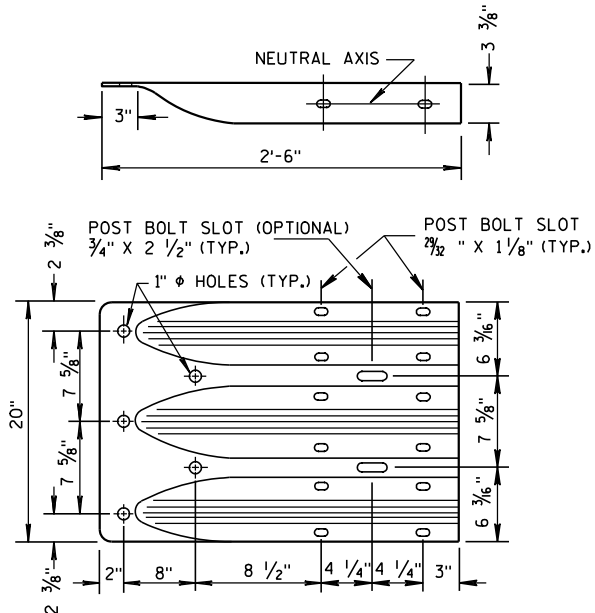
SECTION A-A
POSTS 1-5



SECTION B-B
POST 6



SECTION C-C
POSTS 7-11



THRIE BEAM
TERMINAL CONNECTOR

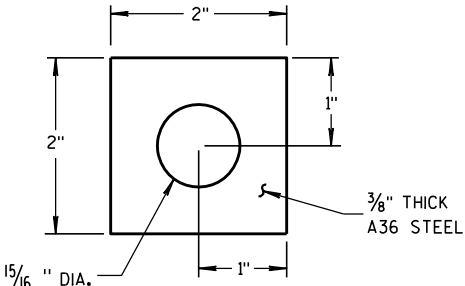
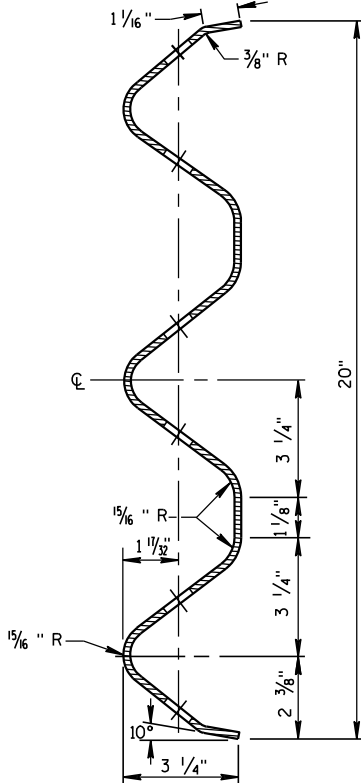
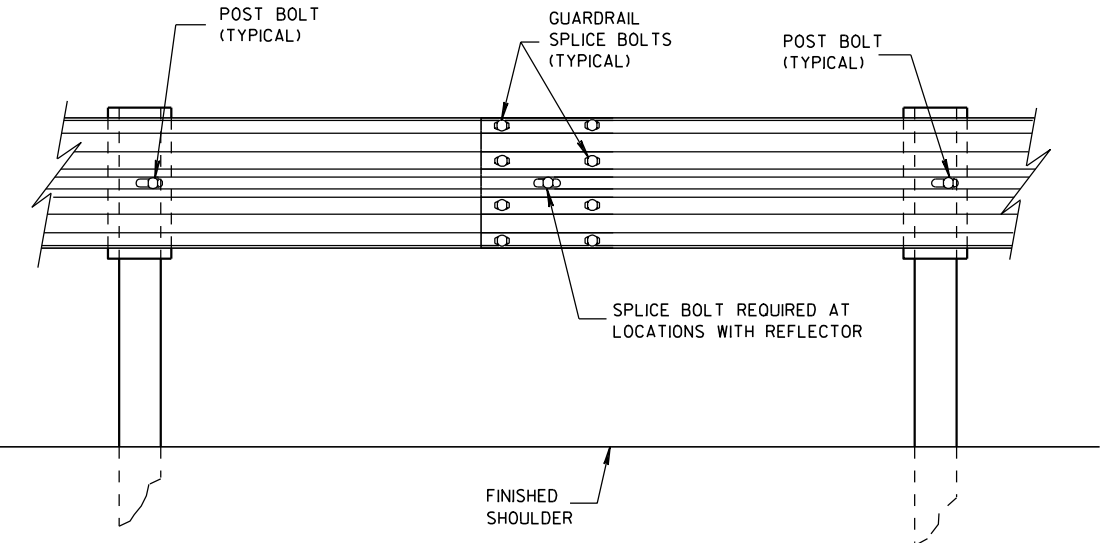


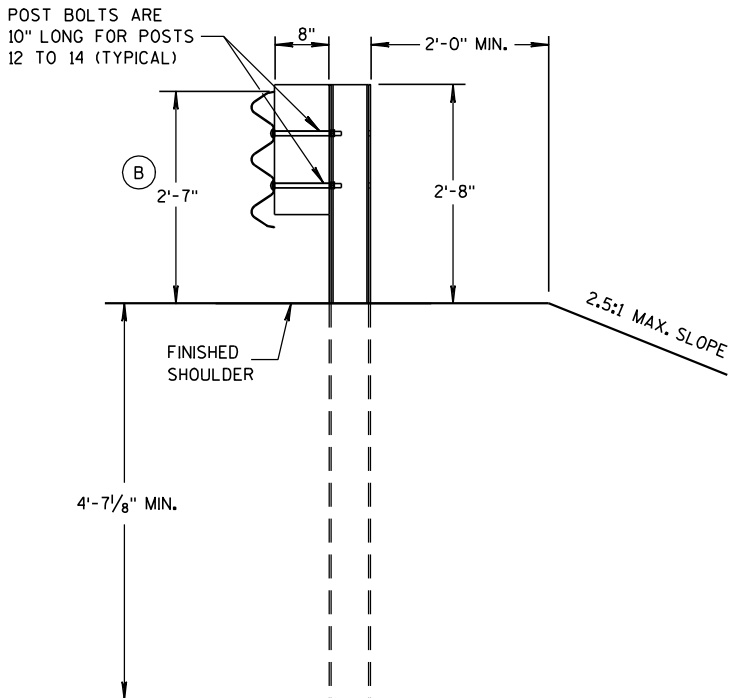
PLATE WASHER DETAIL



SECTION THRU THRIE
BEAM RAIL ELEMENT



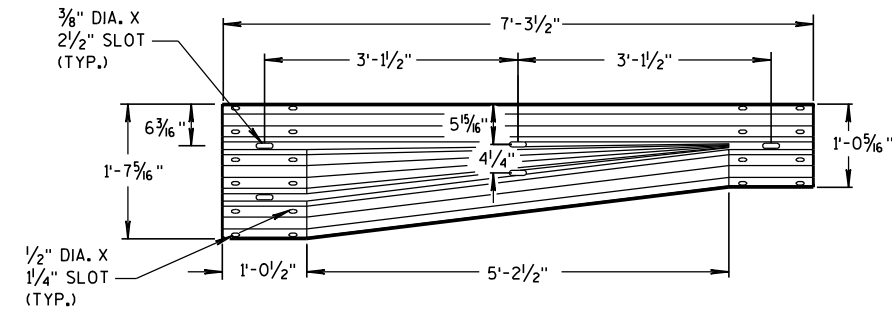
SPLICE DETAIL



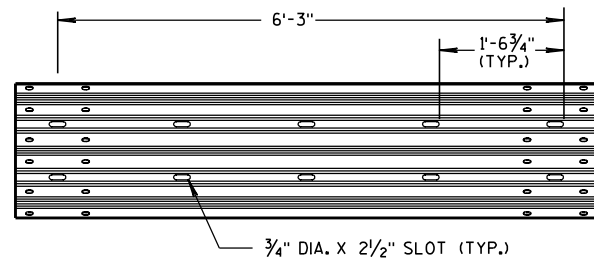
SECTION D-D
POSTS 12-14

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

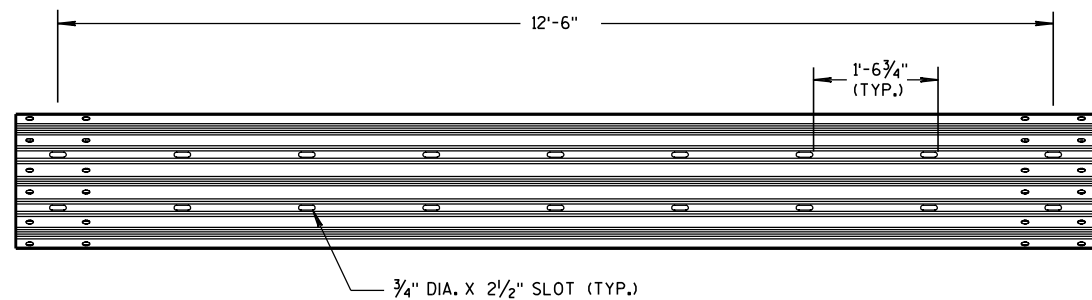
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



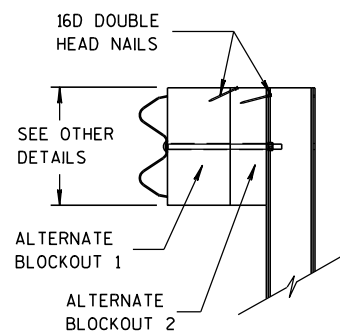
W-BEAM TO THRIE BEAM TRANSITION SECTION



6'-3" THRIE BEAM SECTION

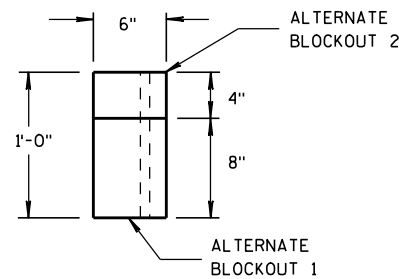


12'-6" THRIE BEAM SECTION

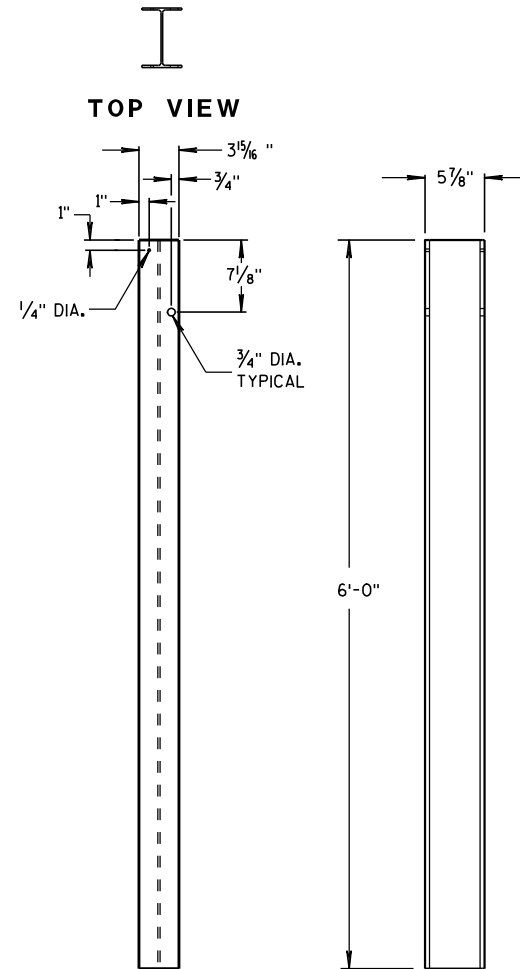


SIDE VIEW

ALTERNATE WOOD
BLOCKOUT DETAIL



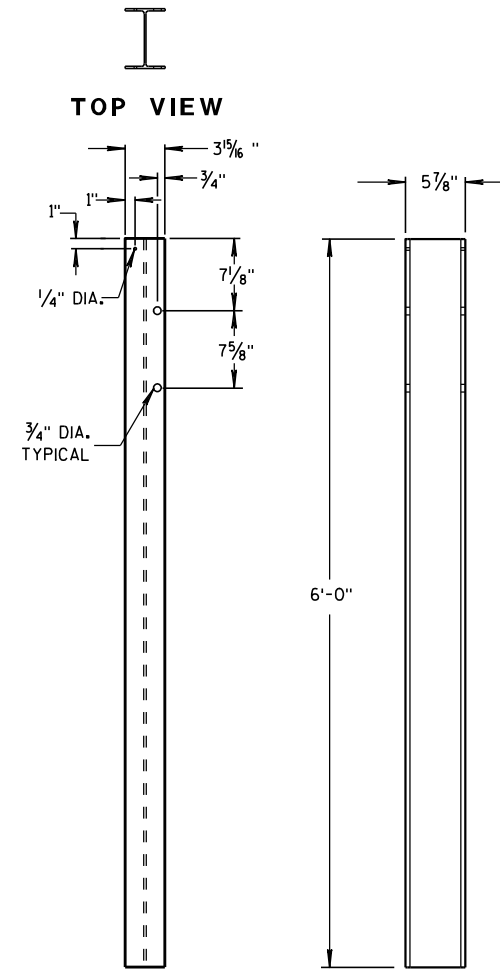
TOP VIEW



FRONT VIEW

SIDE VIEW

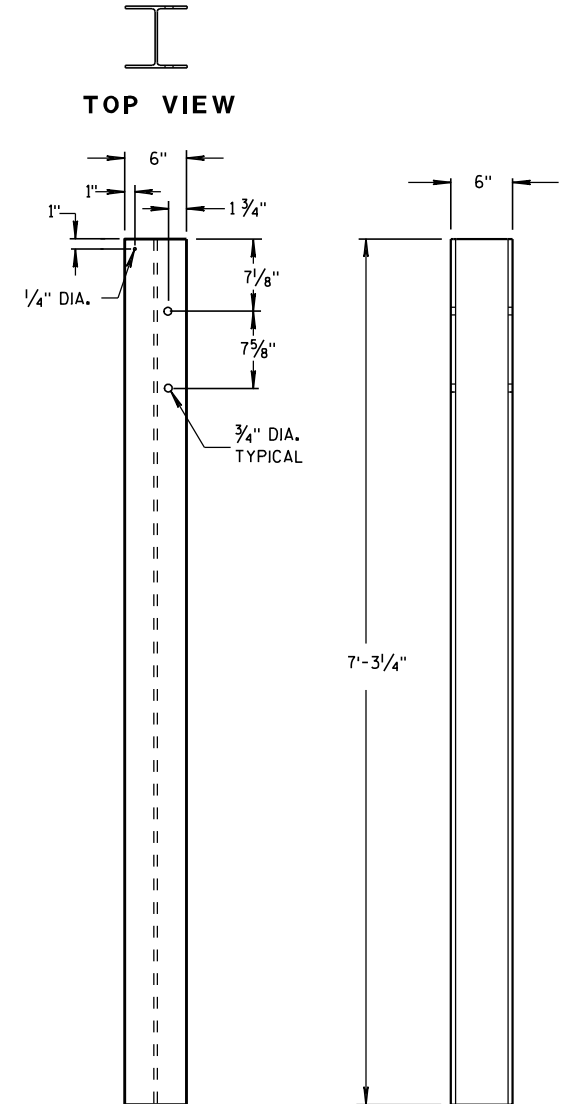
STEEL POSTS 1-5



FRONT VIEW

SIDE VIEW

STEEL POSTS 6-11



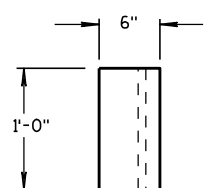
FRONT VIEW

SIDE VIEW

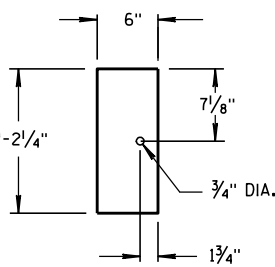
STEEL POSTS 12-14

STEEL POST SIZES

POST NUMBER	SECTION TYPE	LENGTH
①	W6x9	72"
②	W6x9	72"
③	W6x9	72"
④	W6x9	72"
⑤	W6x9	72"
⑥	W6x9	72"
⑦	W6x9	72"
⑧	W6x9	72"
⑨	W6x9	72"
⑩	W6x9	72"
⑪	W6x9	72"
⑫	W6x15	87 1/8"
⑬	W6x15	87 1/8"
⑭	W6x15	87 1/8"

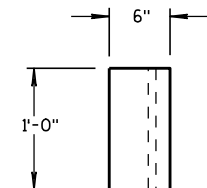


TOP VIEW

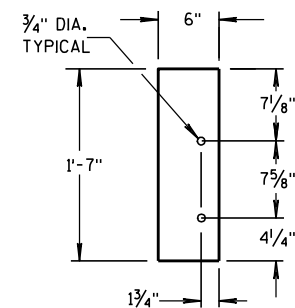


FRONT VIEW

BLOCKOUT
POSTS 1-5

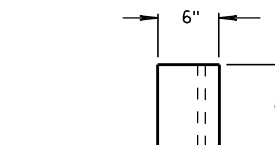


TOP VIEW

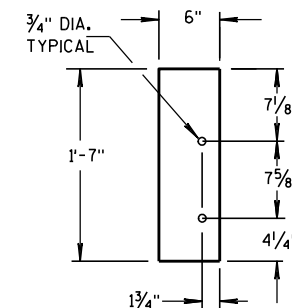


FRONT VIEW

BLOCKOUT
POSTS 6-11



TOP VIEW

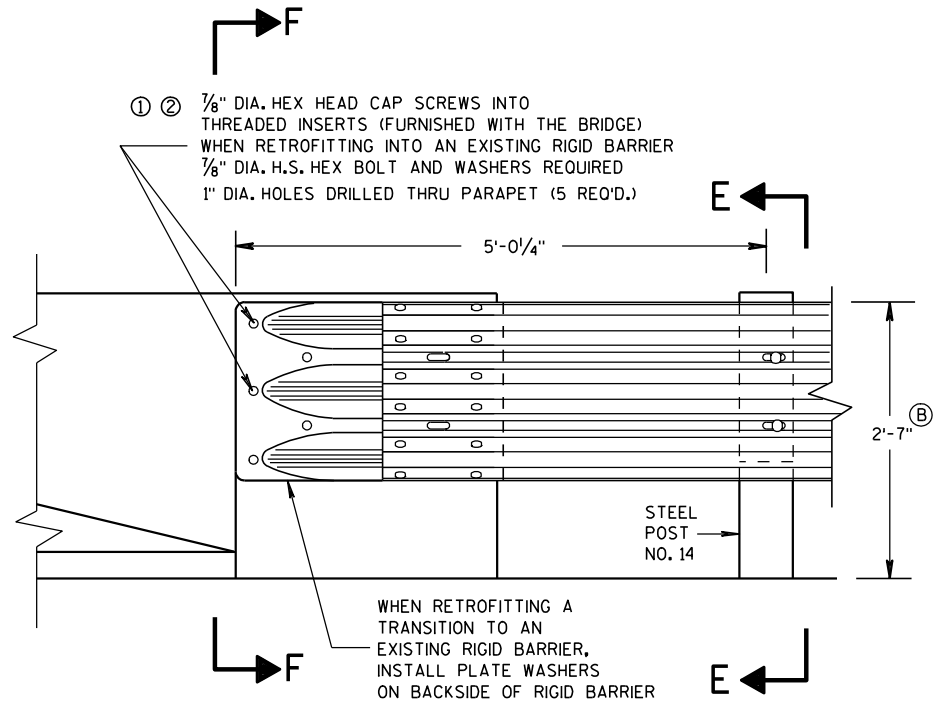


FRONT VIEW

BLOCKOUT
POSTS 12-14

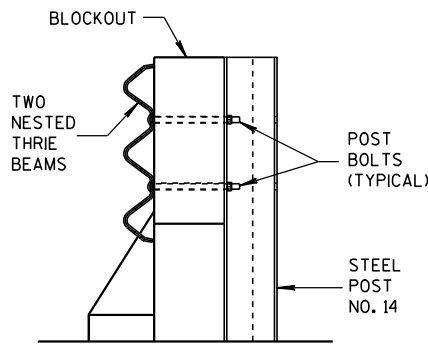
MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION



FRONT VIEW

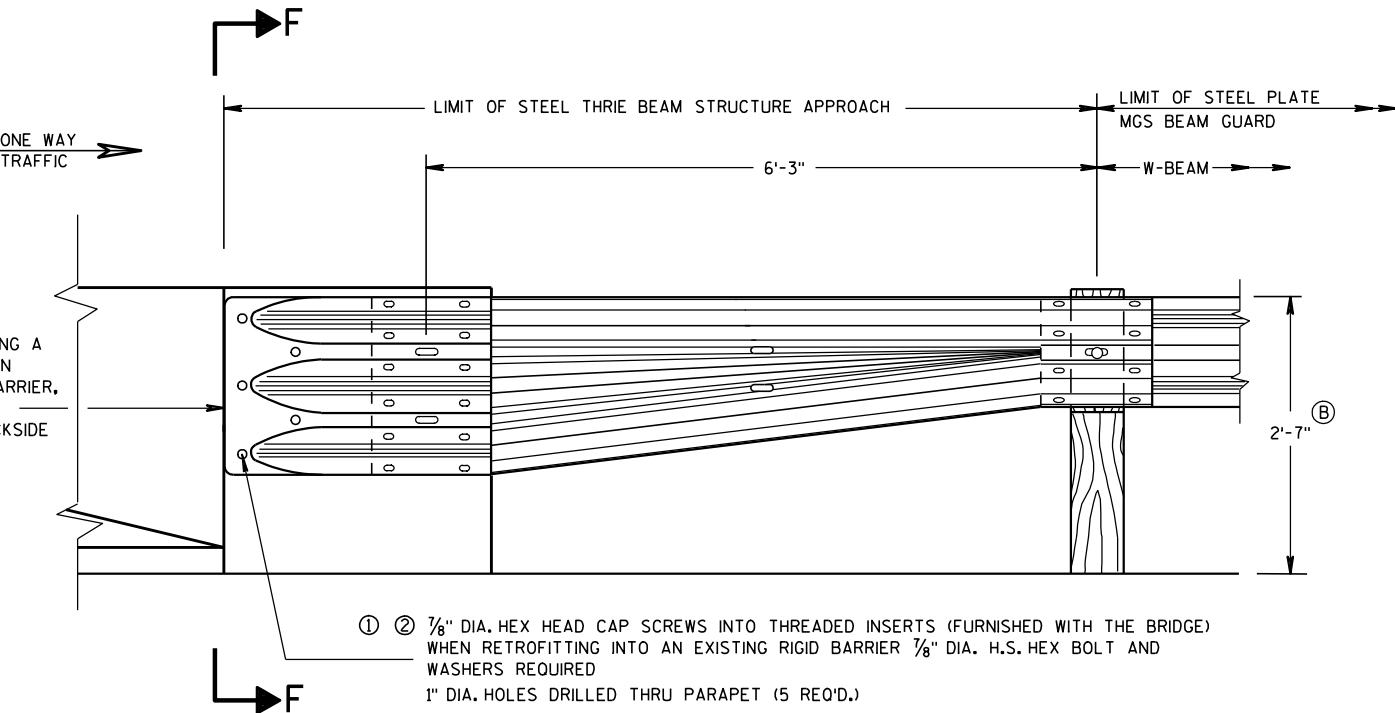
THRIE BEAM CONNECTION TO BRIDGE
PARAPET WITH SQUARE ENDS



SECTION E-E

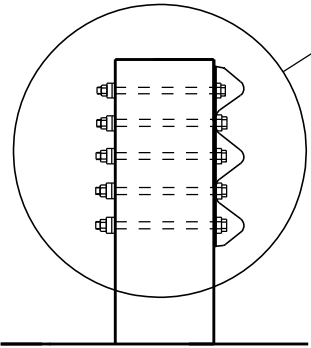
GENERAL NOTES

- THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSTION OF CONNECTIONS TO EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.
- ① DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
 - ② BOLTS MAY BE A325 BOLTS OR A449 BOLTS, BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
 - ③ THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 1/2".
- ⓑ TOLERANCE FOR TOP OF BEAM IS ± 1".

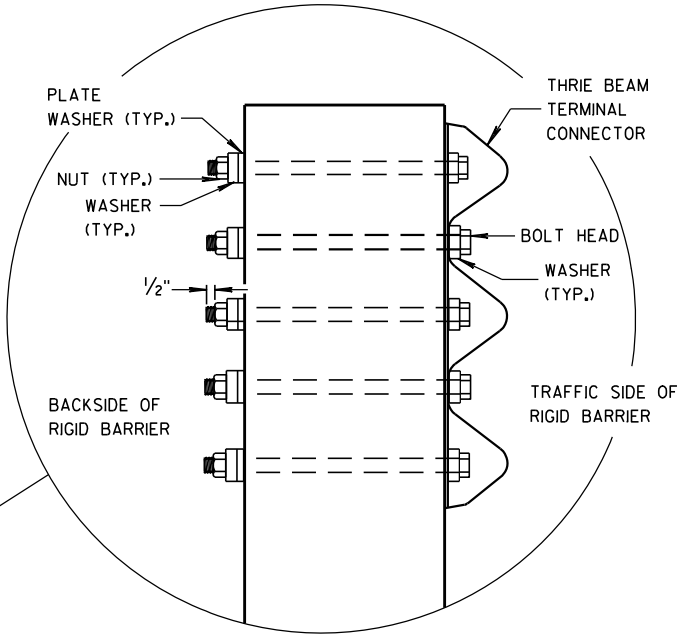


FRONT VIEW

W BEAM TRANSITION AND CONNECTION TO
BRIDGE PARAPETS WITH SQUARE ENDS
(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)



SECTION F-F

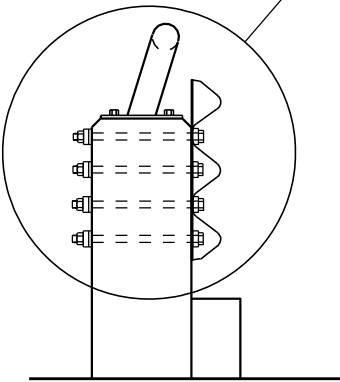
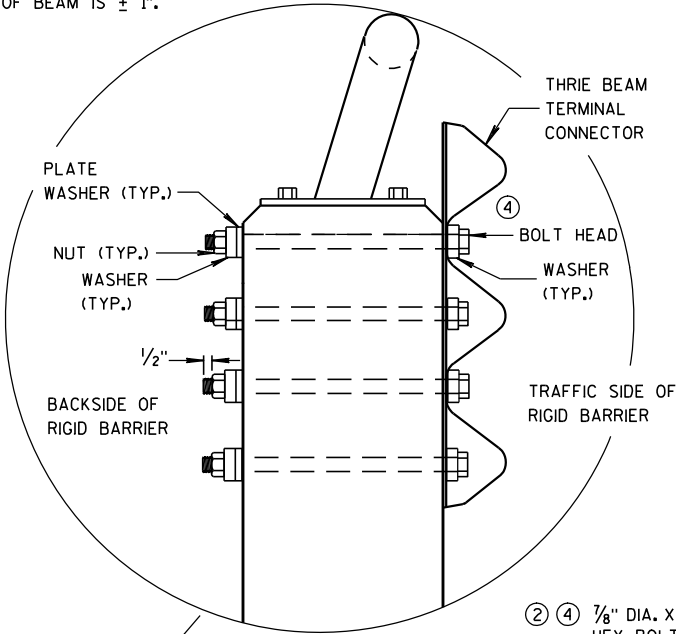


MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)		
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION		
APPROVED 8/31/2012 DATE	/S/ Jerry H. Zapp ROADWAY STANDARDS 146 ENGINEER	ENT
FHWA		

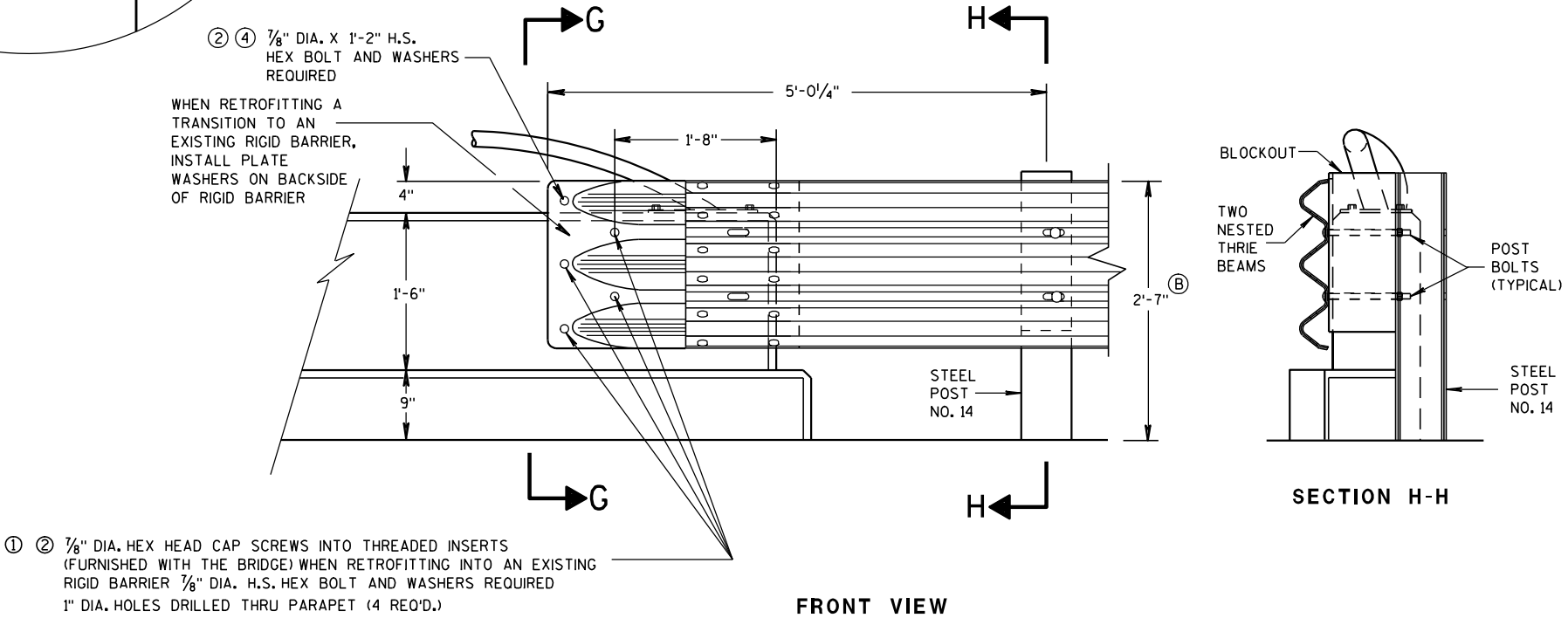
GENERAL NOTES

THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSITION OF CONNECTIONS TO EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.

- ① DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ② BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X $\frac{5}{8}$ " THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
- ③ THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3 $\frac{1}{2}$ ". BLOCK IS INCIDENTAL TO THE CONTRACT.
- ④ BOLT, NUT AND WASHERS NOT REQUIRED FOR THIS LOCATION WHEN RETROFITTING AN EXISTING PAPAPET AND THE HOLE IS EITHER ABOVE PARAPET OR WITHIN 4 INCHES OF THE EDGE OF PARAPET.
- ⑤ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.

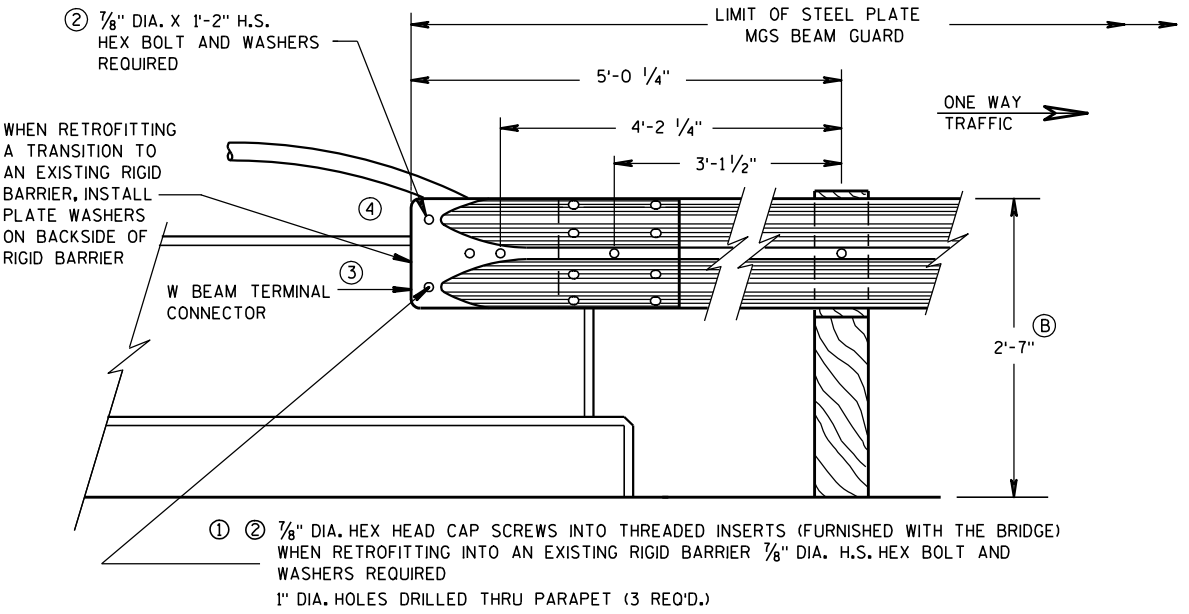


SECTION G-G



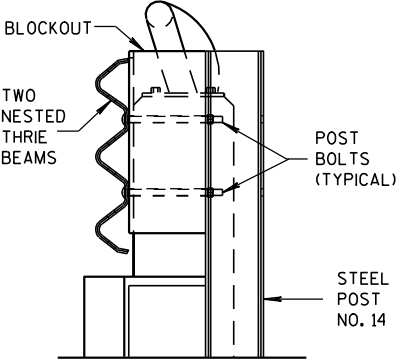
FRONT VIEW

THRIE BEAM CONNECTION TO VERTICAL FACED PARAPETS



FRONT VIEW

W BEAM CONNECTION TO VERTICAL FACE PARAPET
(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

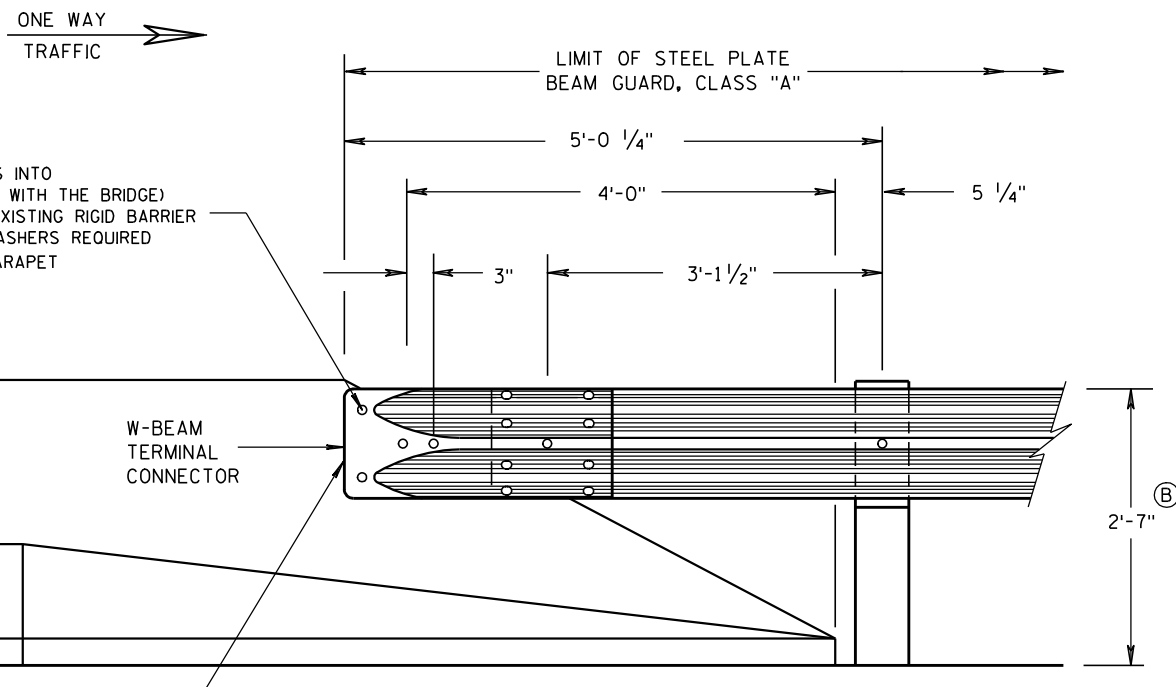


SECTION H-H

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8-31-2012 /S/ Jerry H. Zogg
DATE ROADWAY STANDARDS 147 ENT
FHWA ENGINEER



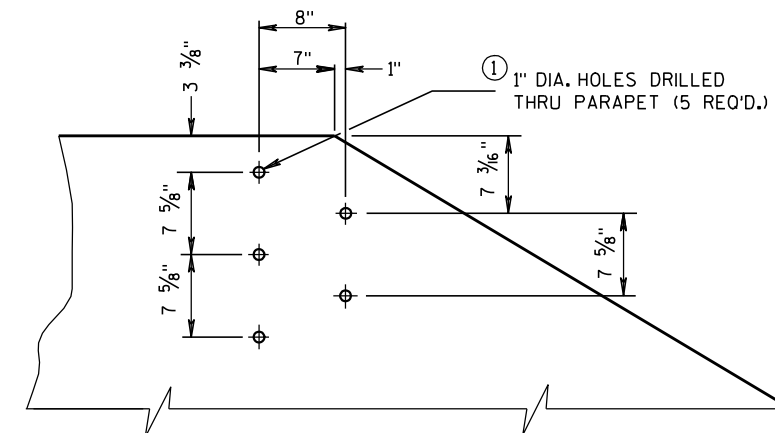
FRONT VIEW

W BEAM CONNECTION TO PARAPETS WITH SLOPED ENDS

(USE ONLY AT TRAFFIC EXIT END OF ONE WAY BRIDGE)

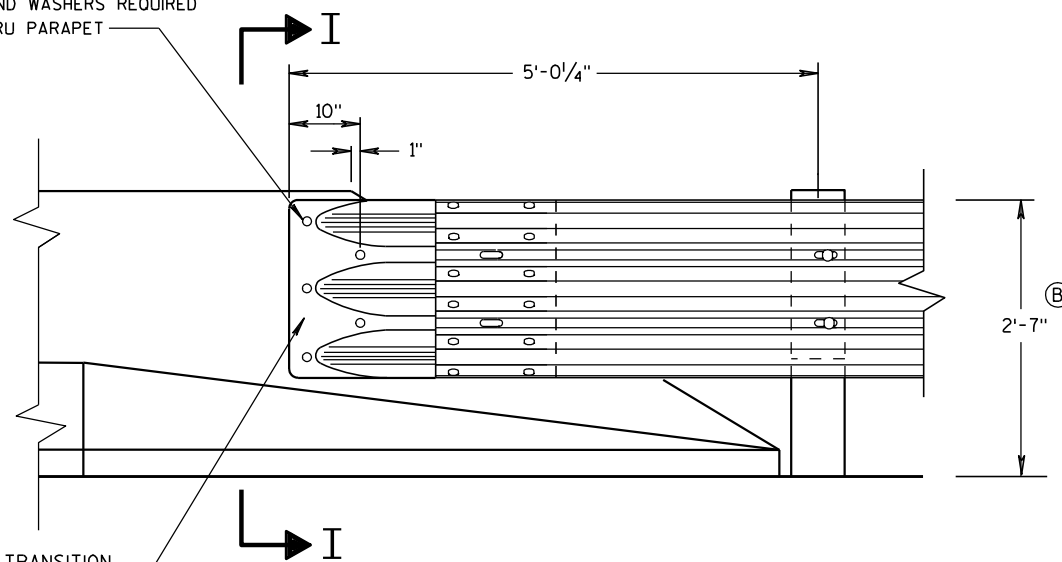
GENERAL NOTES

- ① DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ② BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.
- ③ TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.



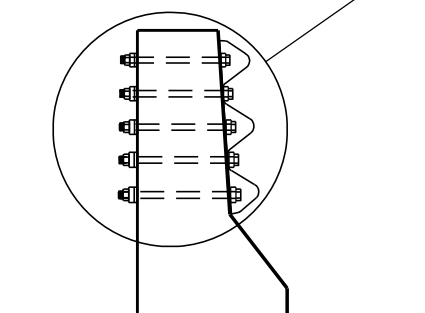
DRILL HOLE LOCATION AND PATTERN FOR THRIE BEAM CONNECTION

- ① ② 1/8" DIA. HEX HEAD CAP SCREWS INTO
THREADED INSERTS (FURNISHED WITH THE BRIDGE)
WHEN RETROFITTING INTO AN EXISTING RIGID BARRIER
1/8" DIA. H.S. HEX BOLT AND WASHERS REQUIRED
1" DIA. HOLES DRILLED THRU PARAPET
(5 REQ'D.)

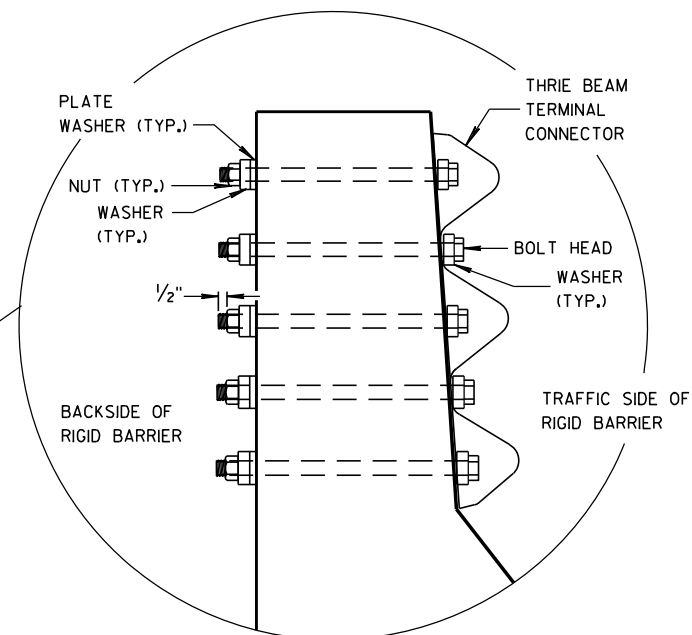


FRONT VIEW

THRIE BEAM CONNECTION TO BRIDGE PARAPETS WITH SLOPED ENDS



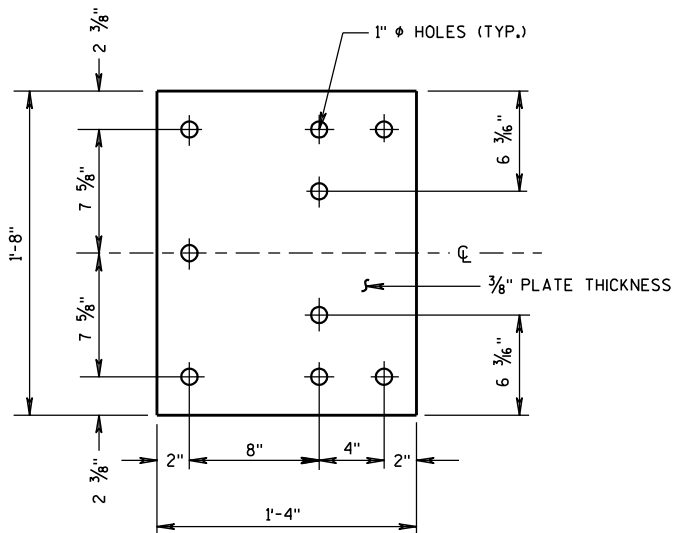
SECTION I-I



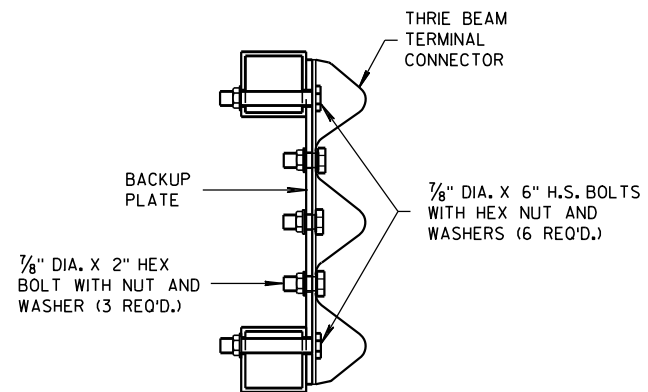
MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

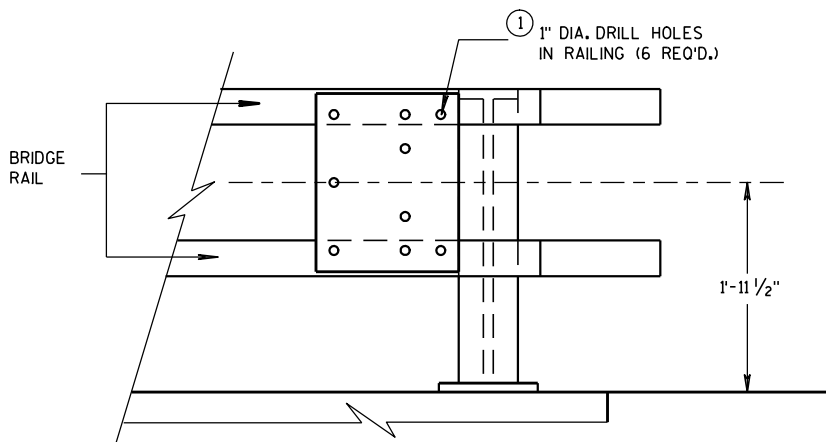
APPROVED
8/31/2012 /S/ Jerry H. Zapp
DATE ROADWAY STANDARDS 148 ENT
FHWA ENGINEER



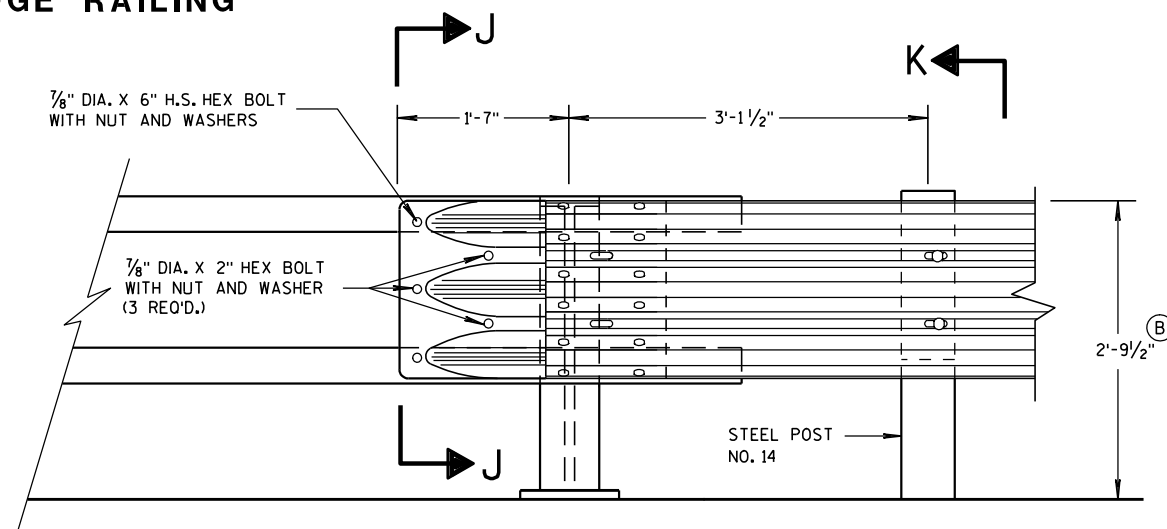
BACK-UP PLATE DETAIL



SECTION J-J

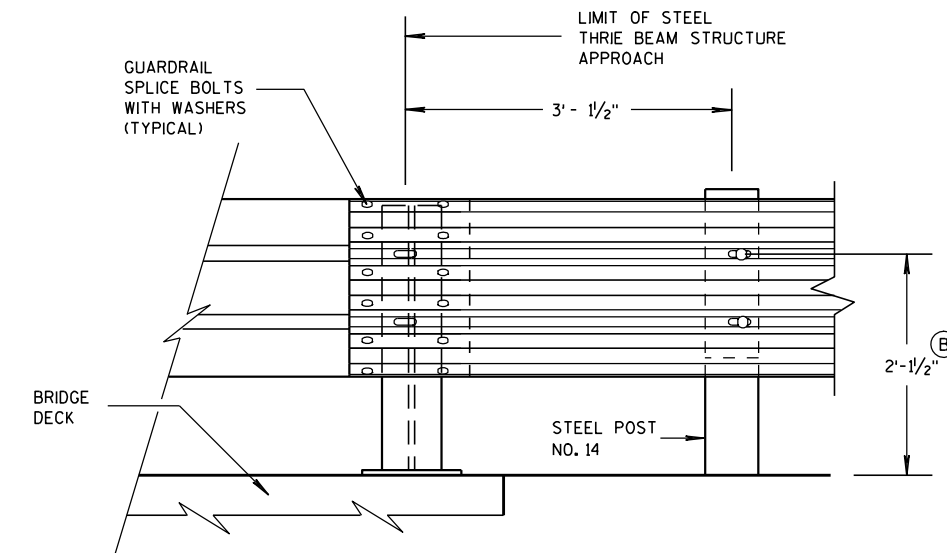


BACK-UP PLATE MOUNTING ONTO BRIDGE RAILING



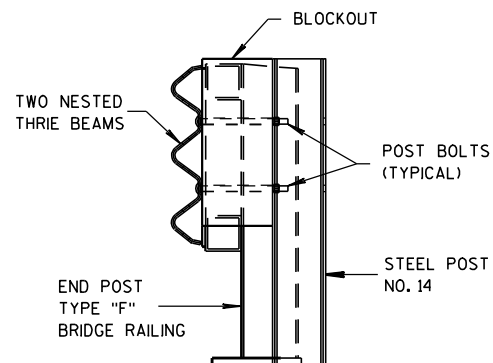
FRONT VIEW

THRIE BEAM CONNECTION TO TUBULAR RAILING TYPE "F"



FRONT VIEW

THRIE BEAM CONNECTION TO STEEL RAILING TYPE "W"



SECTION K-K

GENERAL NOTES

- ① DRILLING HOLES THROUGH THE PAPER, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.
- ② TOLERANCE FOR TOP OF BEAM IS $\pm 1"$.

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

8/31/2012

DATE

FHWA

/S/ Jerry H. Zeng

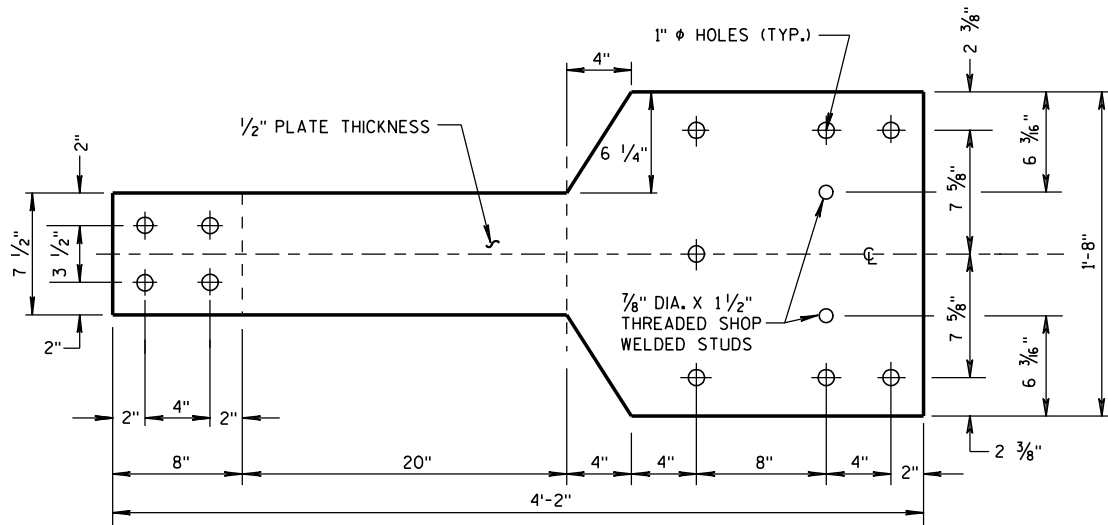
ROADWAY STANDARDS 149

ENGINEER

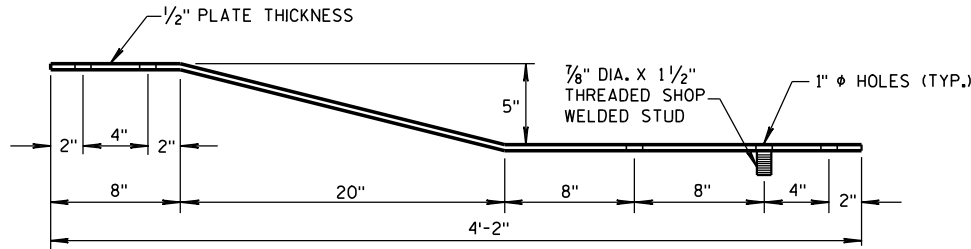
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GENERAL NOTES

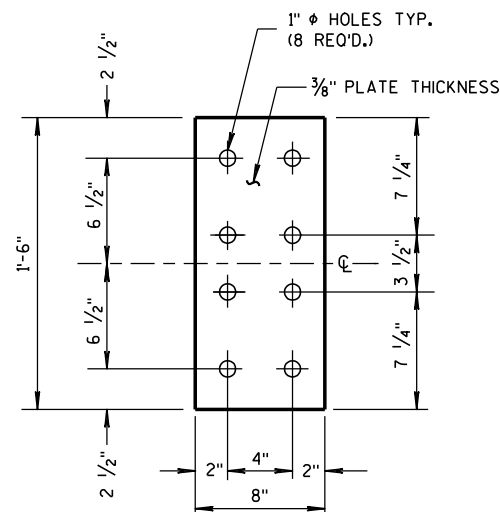
(B) TOLERANCE FOR TOP OF W-BEAM RAIL IS $\pm 1"$.



FRONT VIEW

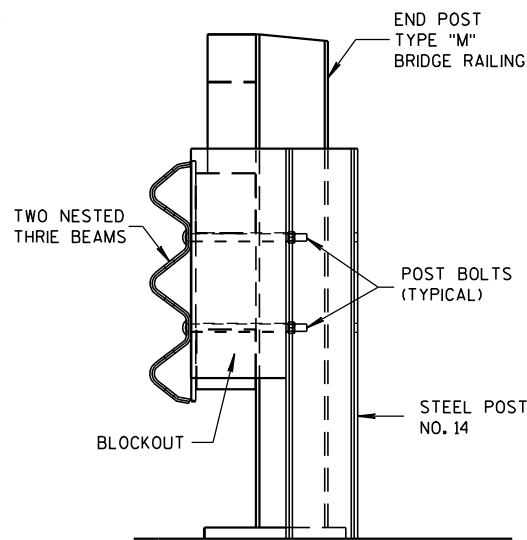


PLAN VIEW
BACK-UP PLATE DETAIL, TYPE "M"

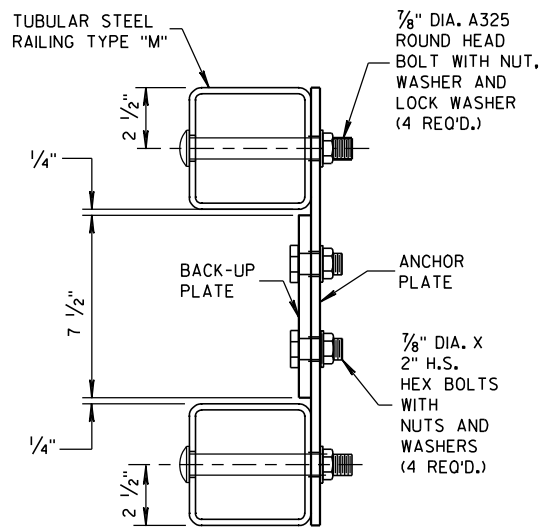


FRONT VIEW

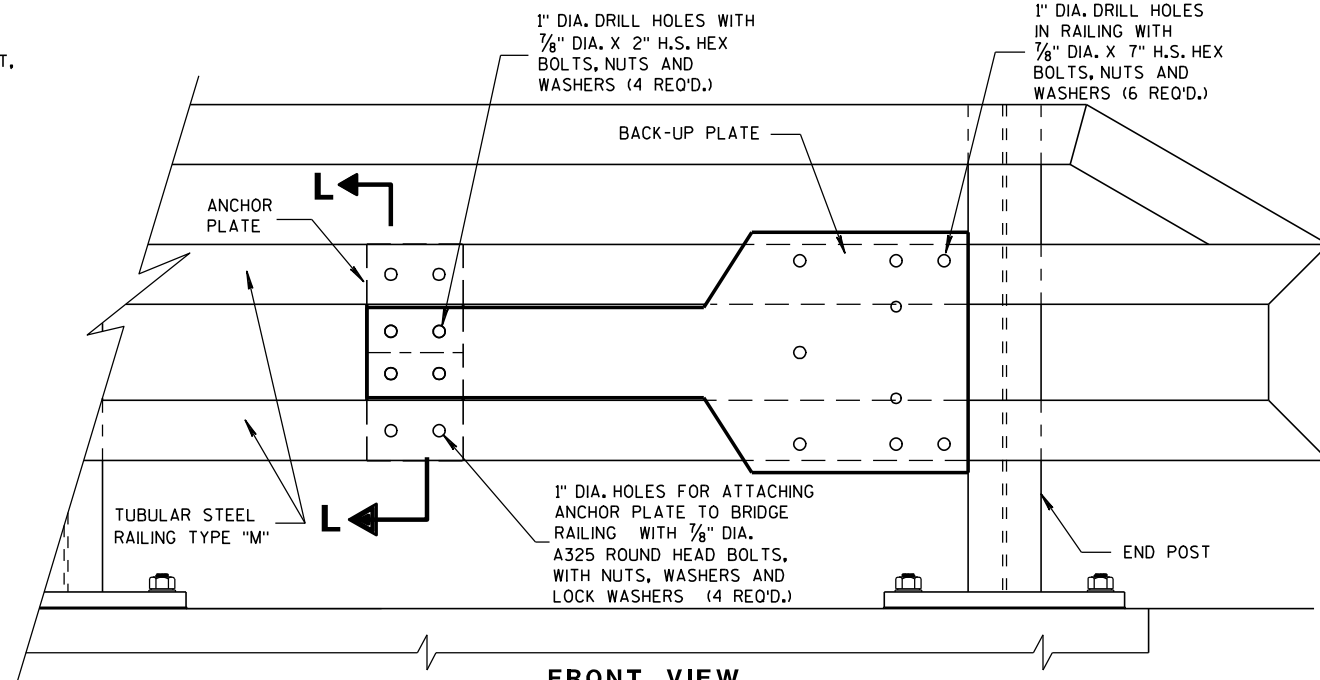
ANCHOR
PLATE DETAIL,
TYPE "M"



SECTION M-M

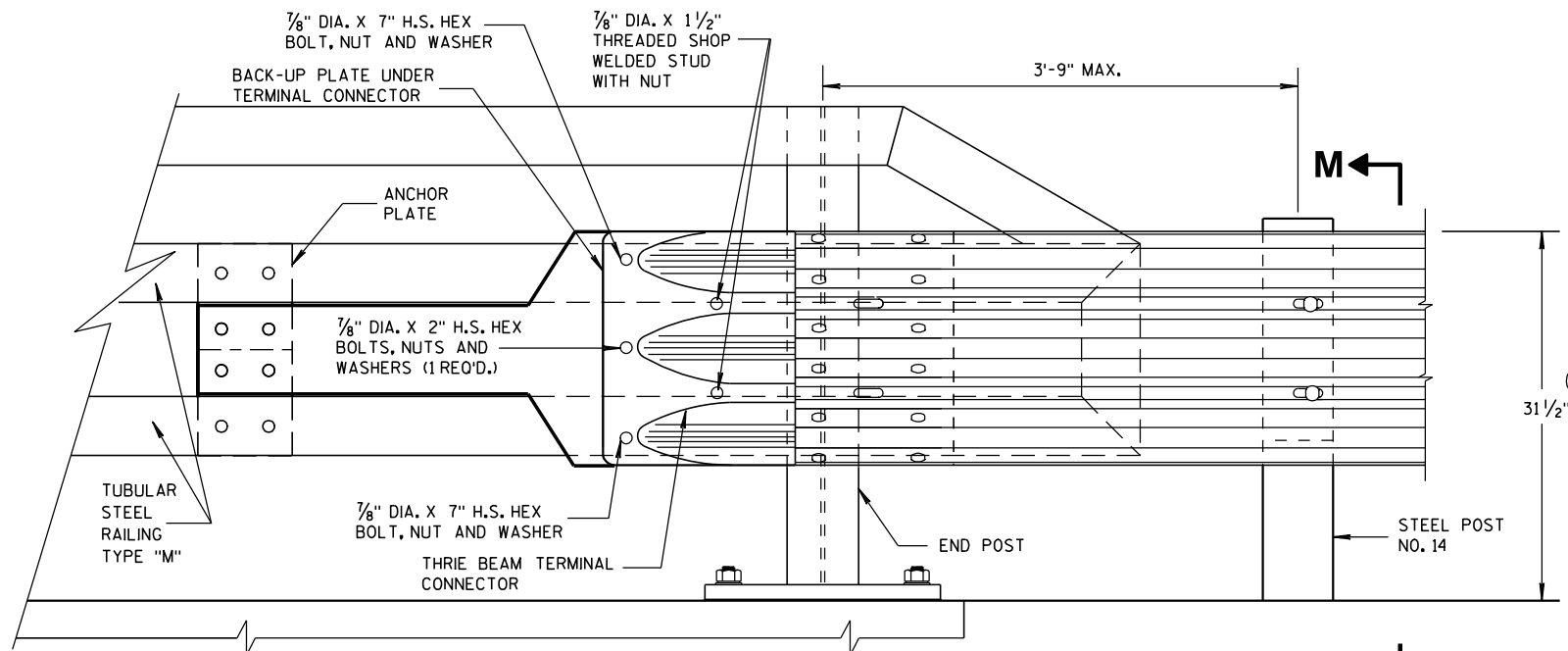


SECTION L-L

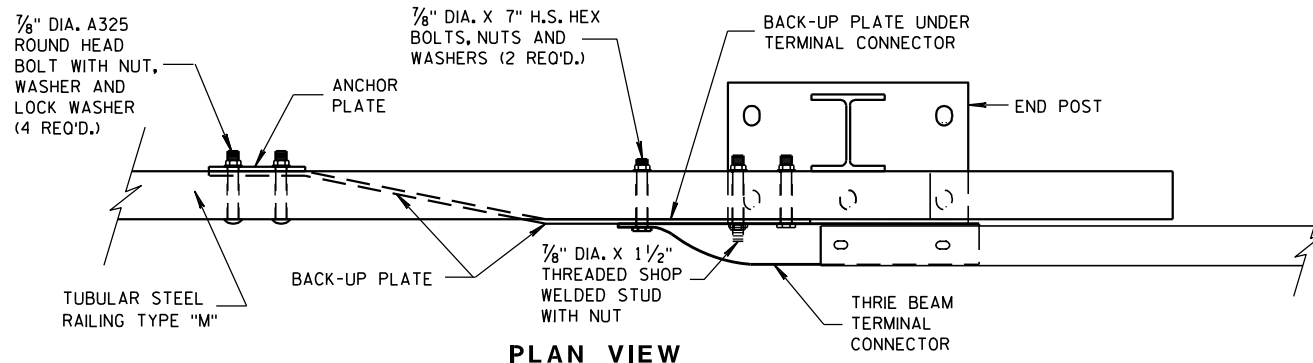


FRONT VIEW

ANCHOR AND BACK-UP PLATE MOUNTING TO BRIDGE RAILING, TYPE "M"



FRONT VIEW



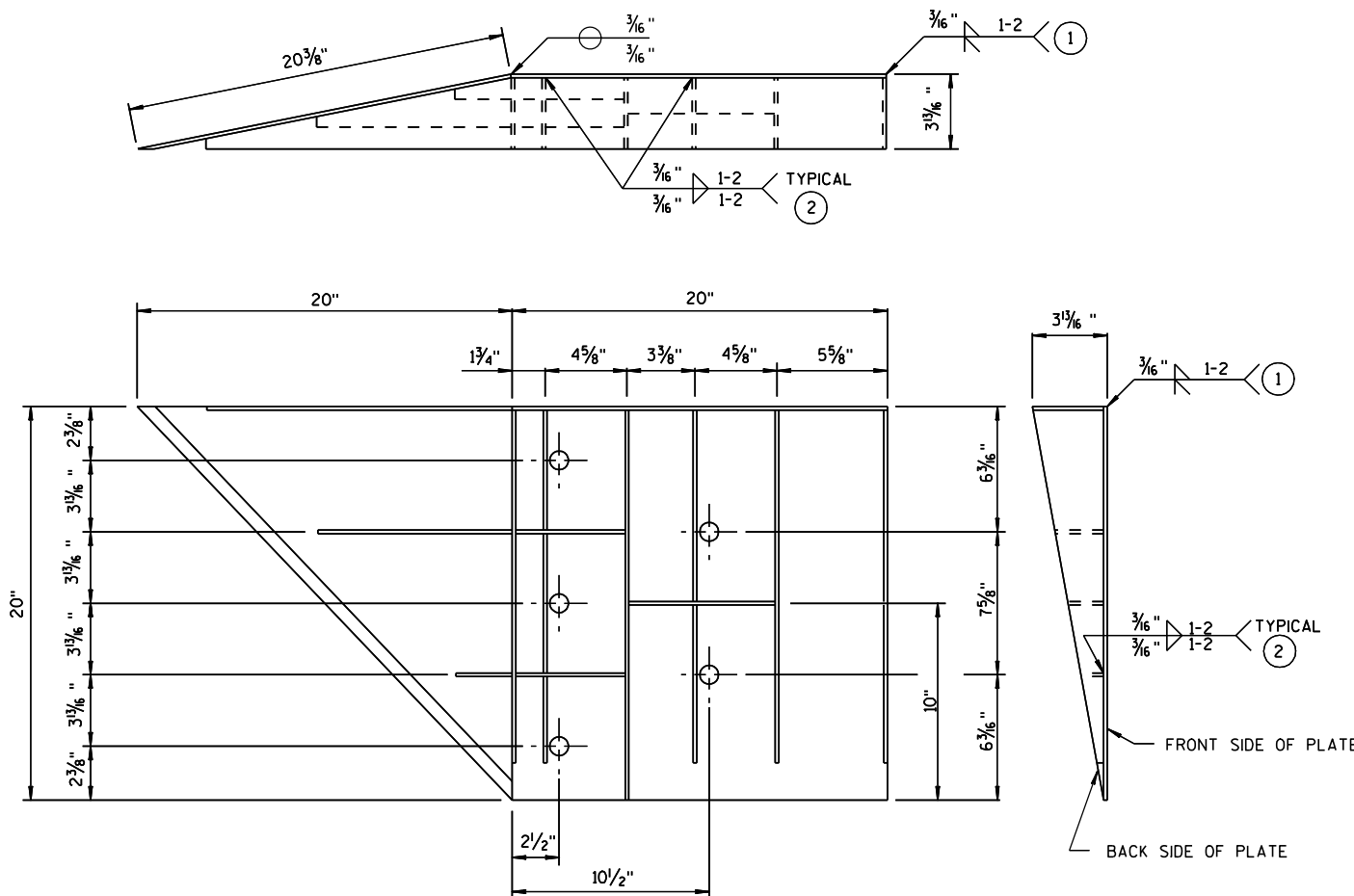
PLAN VIEW

THRIE BEAM CONNECTION TO TUBULAR RAILING, TYPE "M"

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8-31-2012 DATE /S/ Jerry H. Zapp ROADWAY STANDARDS 150 ENT
FHWA ENGINEER

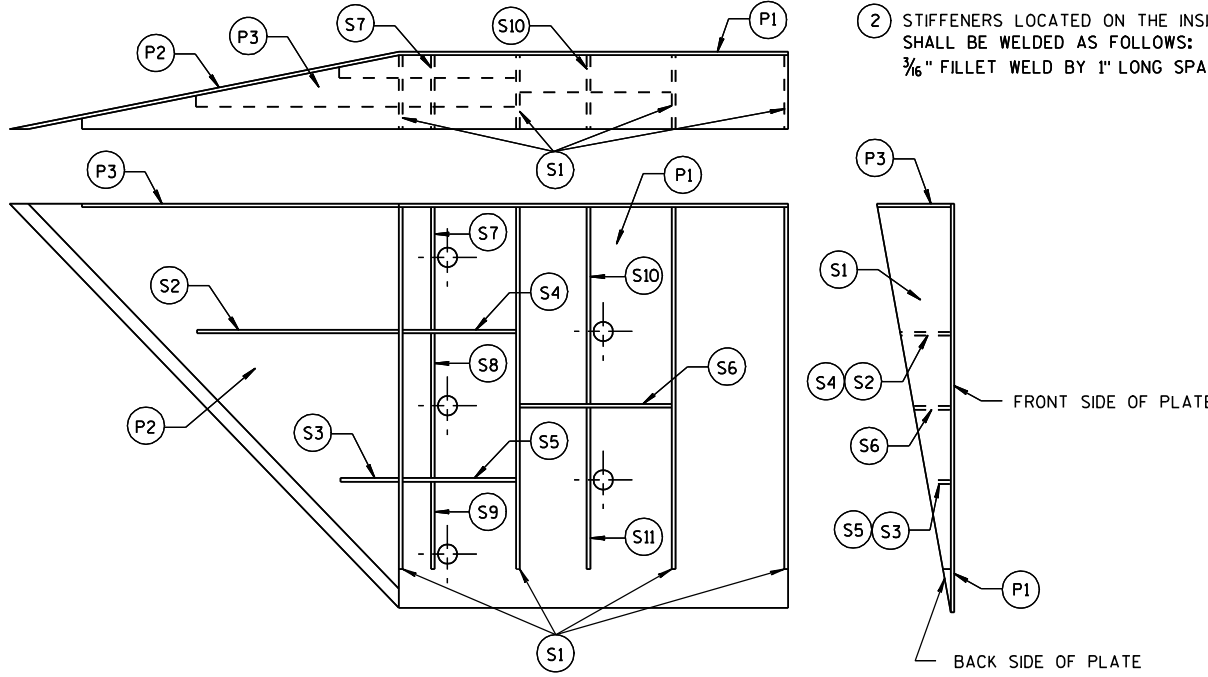


WELDING INSTRUCTION
(VIEWED FROM BACK SIDE OF PLATE)

SINGLE SLOPE CONNECTION PLATE

CONNECTOR PLATE DIMENSION (PER ASSEMBLY)				
PLATE	QUANTITY	SHAPE	SIZE (A x B x C x D)	THICKNESS
P1	1		20" x 20"	3/16"
P2	1		20" x 20" x 28 5/16"	3/16"
P3	1		39" x 3 5/8" x 20" x 19 5/16"	3/16"
S1	4		18 7/16" x 3 5/8" x 18 3/4"	1/4"
S2	1		10 1/4" x 2 7/16" x 10 3/8" x 1/2"	1/4"
S3	1		3" x 1 1/16" x 3 1/8" x 1/2"	1/4"
S4	1		6 1/8" x 2 1/16"	1/4"
S5	1		6 1/8" x 1 1/16"	1/4"
S6	1		7 3/4" x 1 3/4"	1/4"
S7	1		2 9/16" x 6" x 3 5/8" x 5 7/8"	1/4"
S8	1		1 7/32" x 7 1/2" x 2 1/2" x 7 3/8"	1/4"
S9	1		6 1/16" x 6 3/16" x 1 1/32"	1/4"
S10	1		1 7/8" x 9 7/8" x 3 5/8" x 9 1/16"	1/4"
S11	1		8 1/2" x 8 3/4" x 1 1/16"	1/4"

PLATE AND STIFFENER IDENTIFICATION
(VIEWED FROM BACK SIDE OF PLATE)



GENERAL NOTES

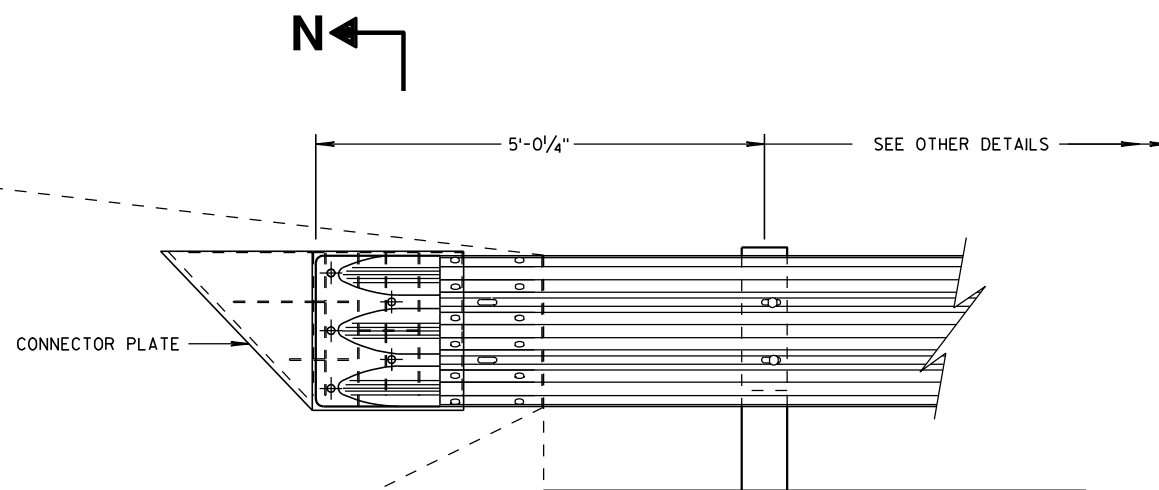
- COVER PLATE PANELS ARE 3/16" THICK.
- ALL STIFFENERS ARE 1/4" THICK.
- CONNECTOR PLATE SHALL BE FABRICATED FROM ASTM GRADE A36 STEEL AND GALVANIZED.
- FOR GALVANIZED REQUIREMENTS, SEE SECTION 614 OF THE STANDARD SPECIFICATIONS.
- ALL HOLE DIAMETERS SHALL BE 1".
- FOR OPPOSITE SIDE INSTALLATION MIRROR DRAWINGS.

- 1 STIFFENERS LOCATED AT THE OUTSIDE EDGES OF THE COVER PLATES SHALL BE WELDED AS FOLLOWS:
SINGLE BEVEL GROOVE WELD ON EXTERNAL SIDES AND 3/16" FILLET WELD BY 1" LONG SPACED AT 2" ON INTERNAL SIDES.
- 2 STIFFENERS LOCATED ON THE INSIDE OF THE COVER PLATE SHALL BE WELDED AS FOLLOWS:
3/16" FILLET WELD BY 1" LONG SPACED AT 2".

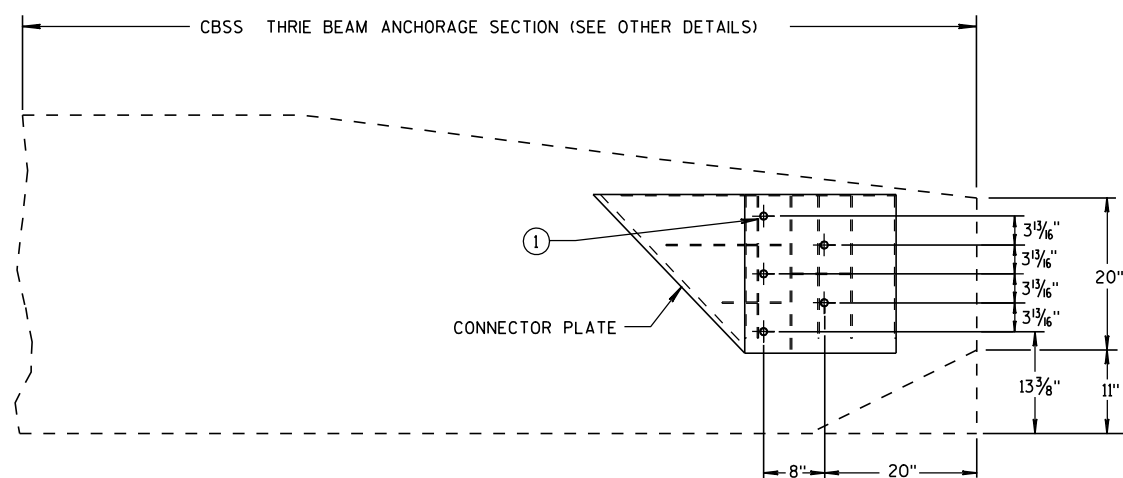
MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8/31/2012 DATE /S/ Jerry H. 7---
FHWA ROADWAY STANDARDS 151 WENT
ENGINEER



THRIE BEAM CONNECTION TO SINGLE SLOPE BARRIER

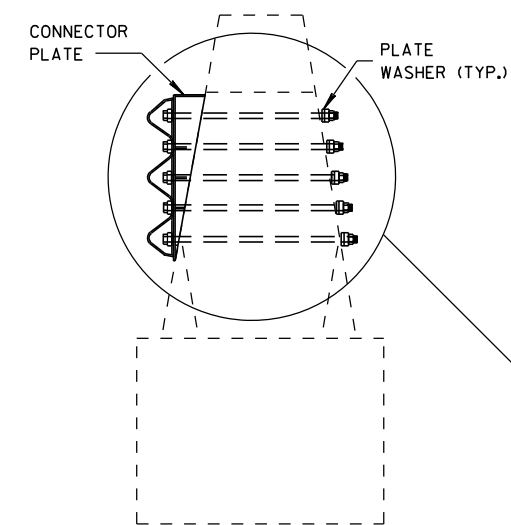


SINGLE SLOPE CONNECTION PLATE PLACEMENT

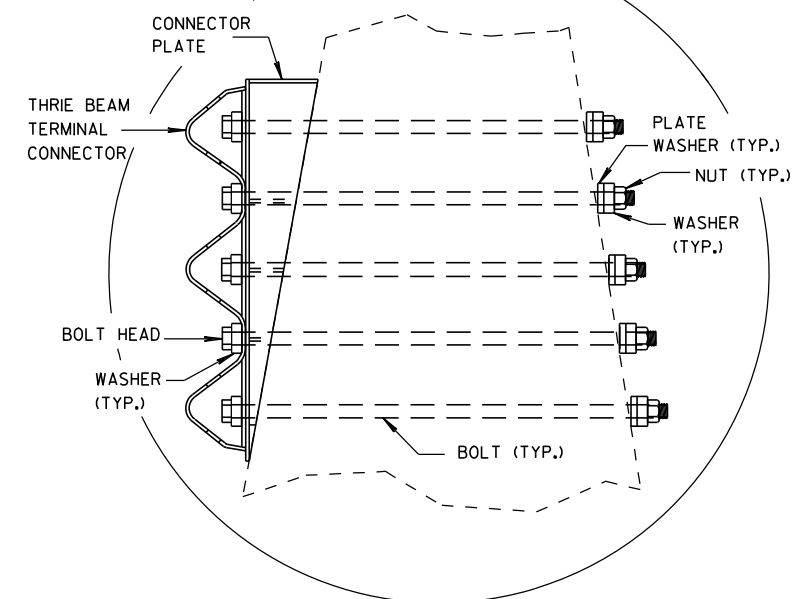
GENERAL NOTES

CONNECTOR PLATE, DRILLING BOLT HOLES THROUGH THE PARAPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE INCIDENTAL TO THE CONTRACT.

- ① BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNECTOR PLATE. BOLTS THAT EXTEND THROUGH THE PARAPET AND OUT THE BACK FACE REQUIRE A HARDENED ROUND STEEL WASHER THAT IS 2" O.D. X 5/8" THICK AND ONE PLATE WASHER. REPAIR ANY DAMAGED CONCRETE FROM BOLT INSTALLATION.



SECTION N-N



**MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

8/31/2012

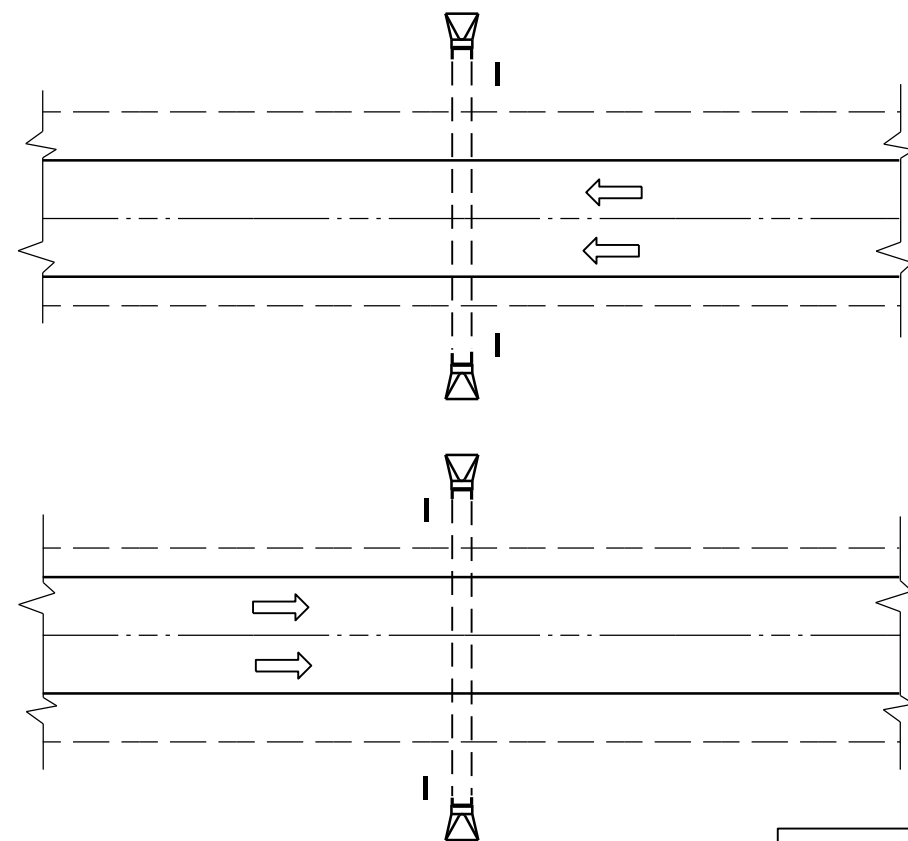
DATE

FHWA

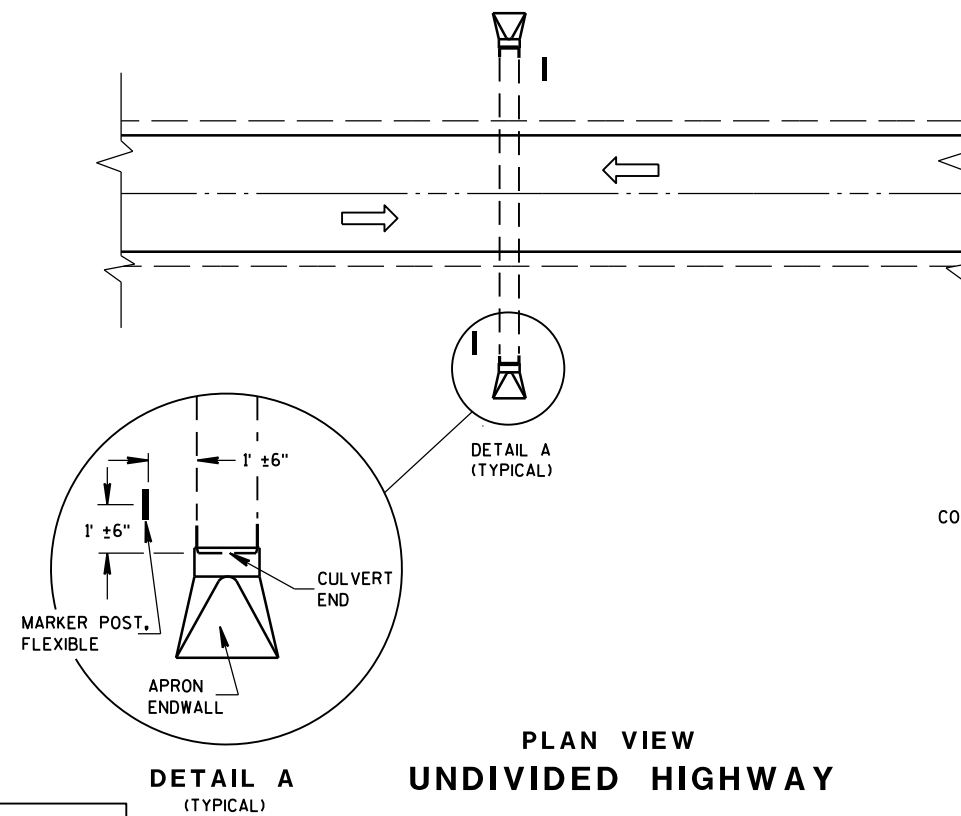
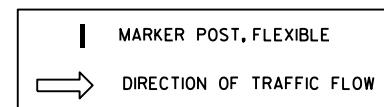
/S/ Jerry H. [Signature]

ROADWAY STANDARDS i 152 ENT

ENGINEER



PLAN VIEW
DIVIDED HIGHWAY



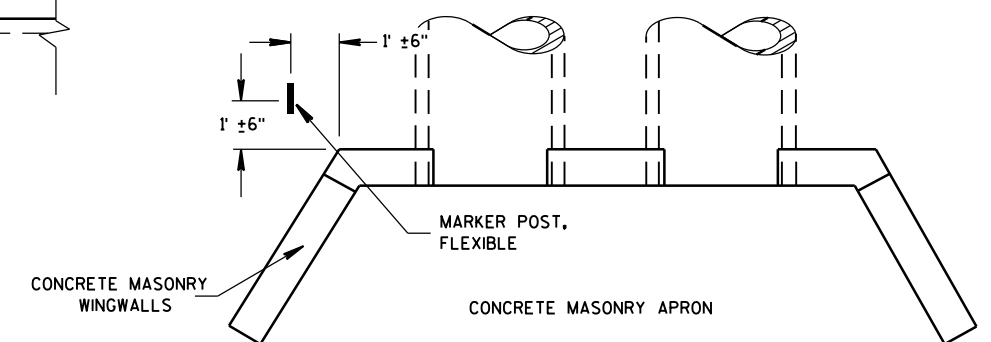
DETAIL A
(TYPICAL)

PLAN VIEW
UNDIVIDED HIGHWAY

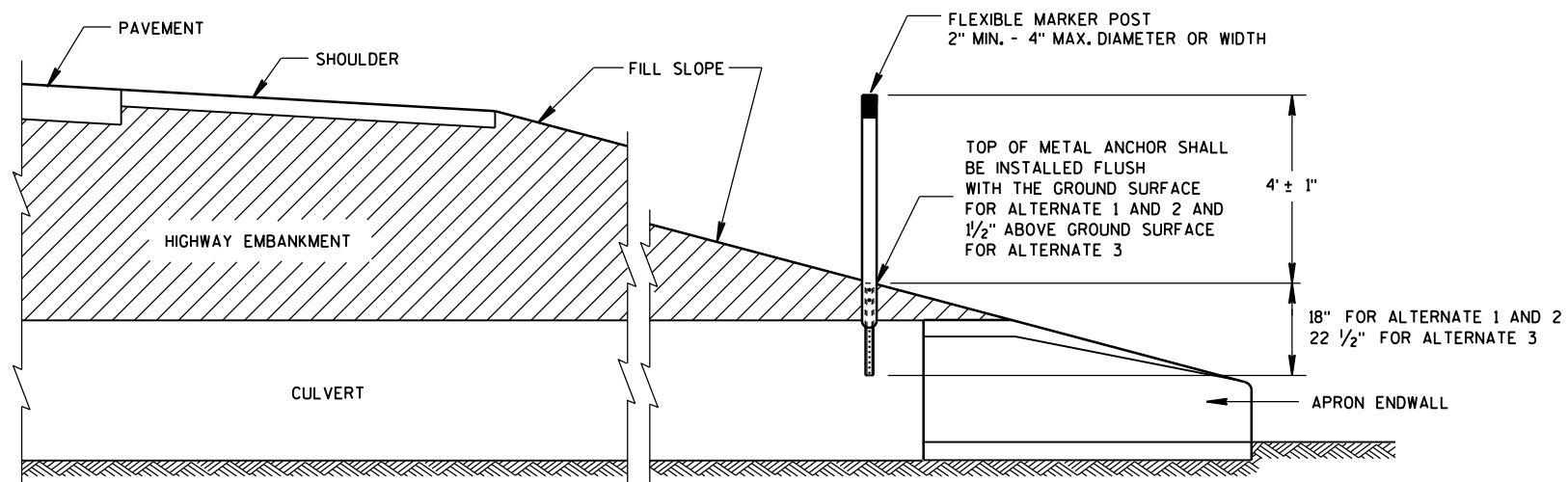
FLEXIBLE MARKER POST LOCATION

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.



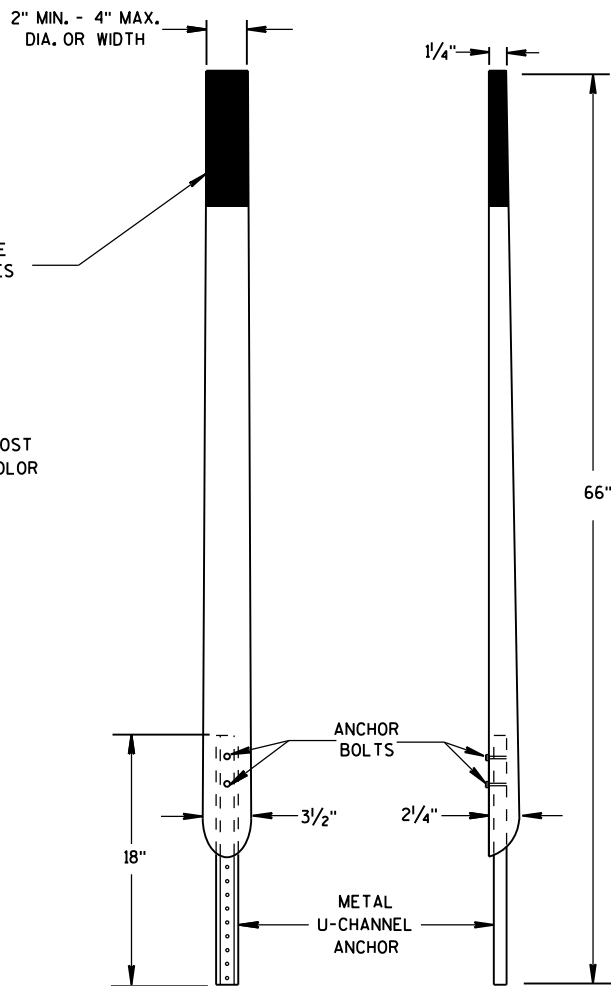
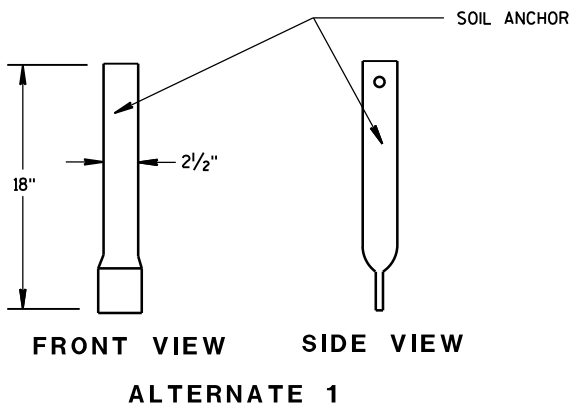
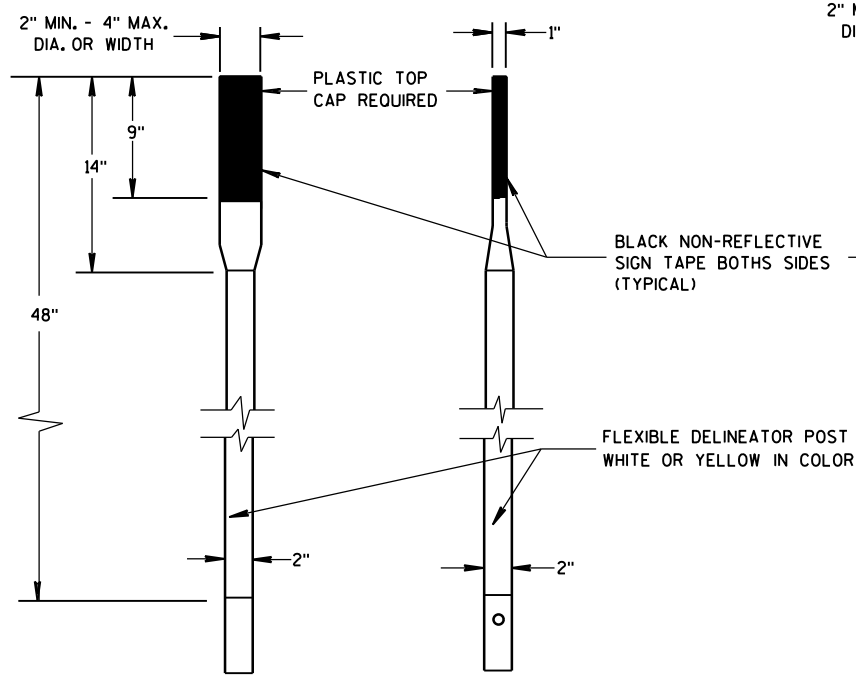
PLAN VIEW
CONCRETE MASONRY ENDWALLS FOR
CULVERT PIPE AND PIPE ARCH



CROSS SECTION
FLEXIBLE MARKER POST

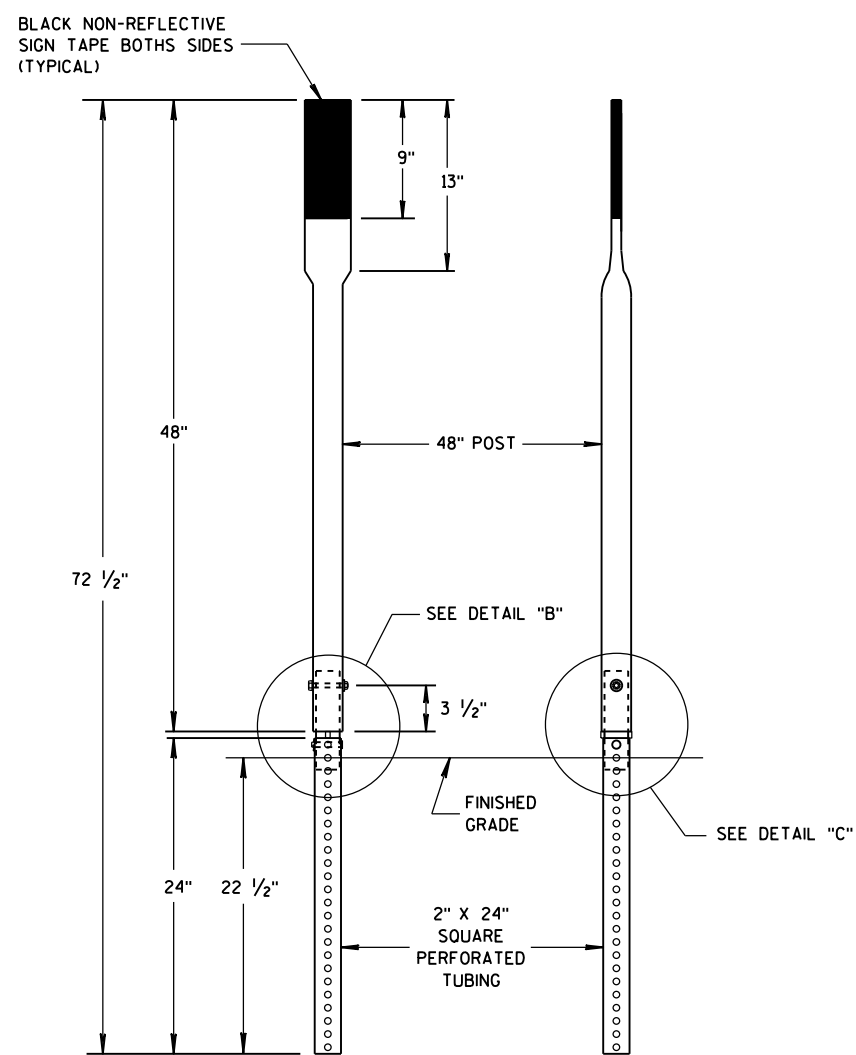
FLEXIBLE MARKER POST
FOR CULVERT END

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION 153

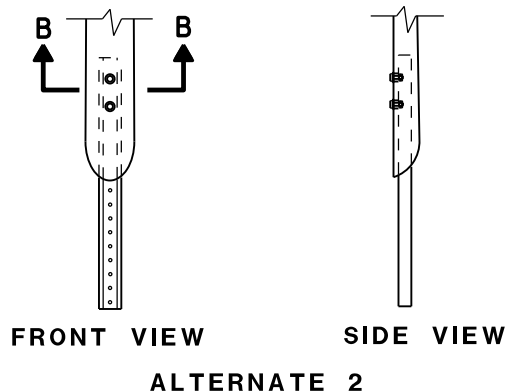
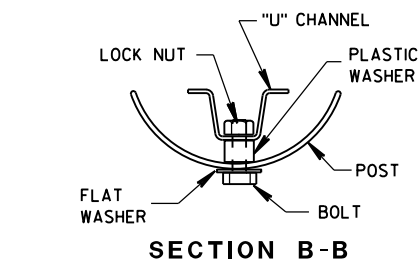
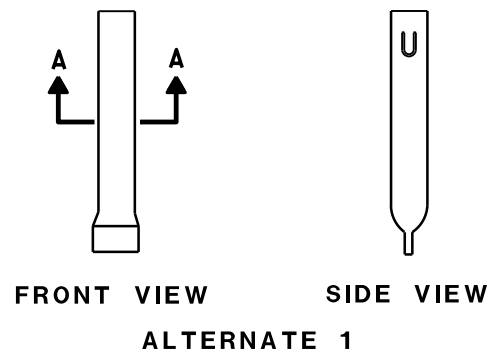
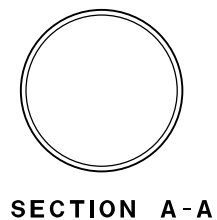
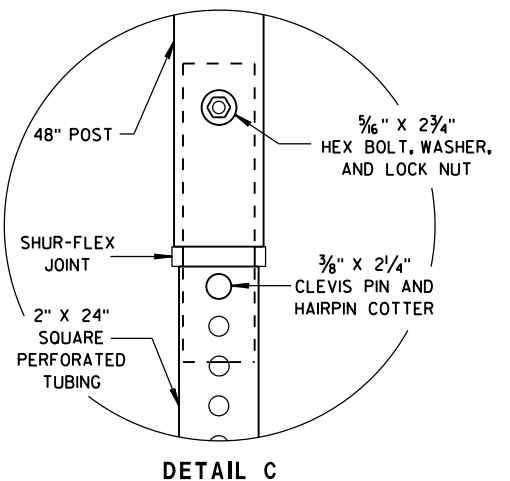
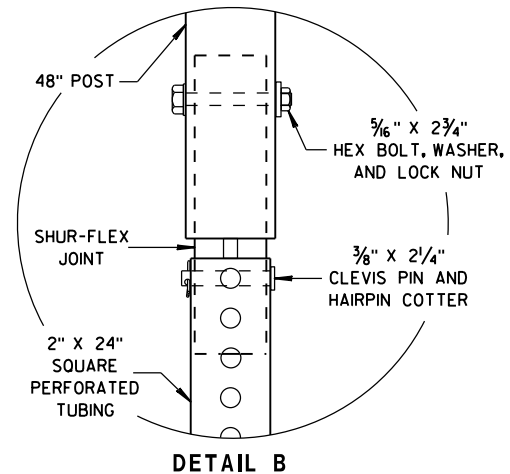
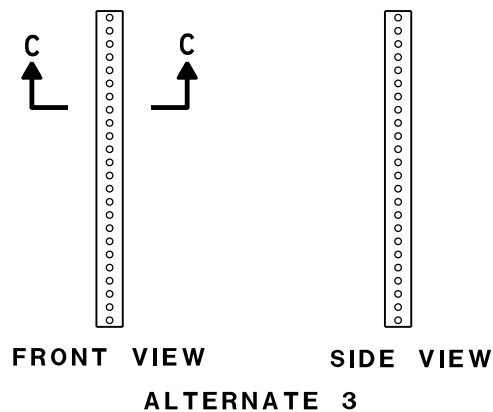
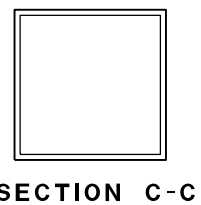


FRONT VIEW SIDE VIEW
ALTERNATE 2

FLEXIBLE MARKER POSTS



FRONT VIEW SIDE VIEW
ALTERNATE 3

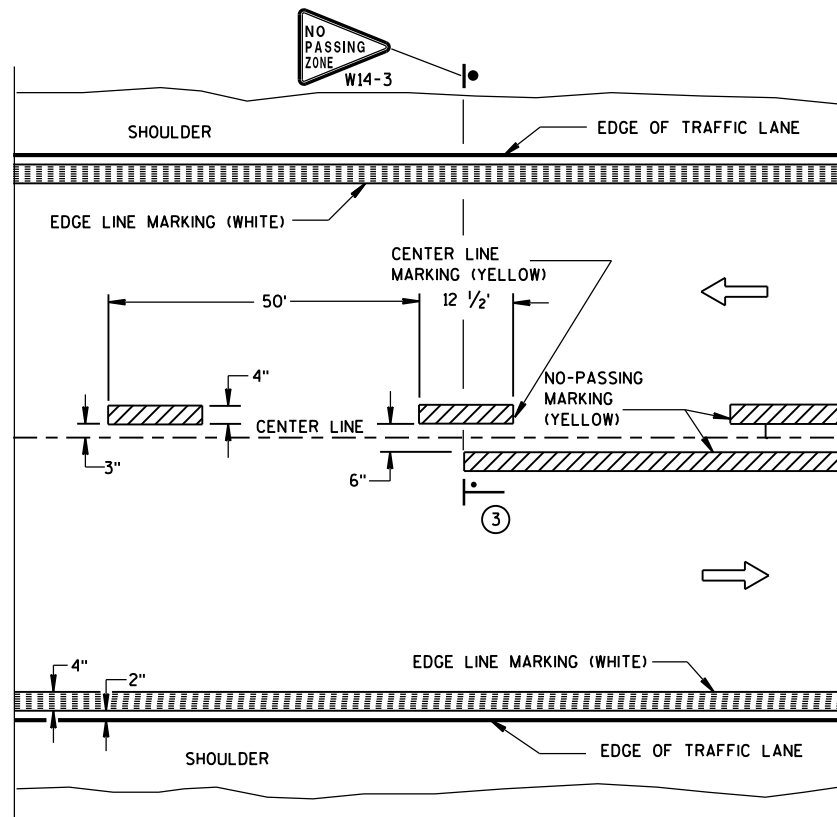


FLEXIBLE MARKER POST ANCHORS

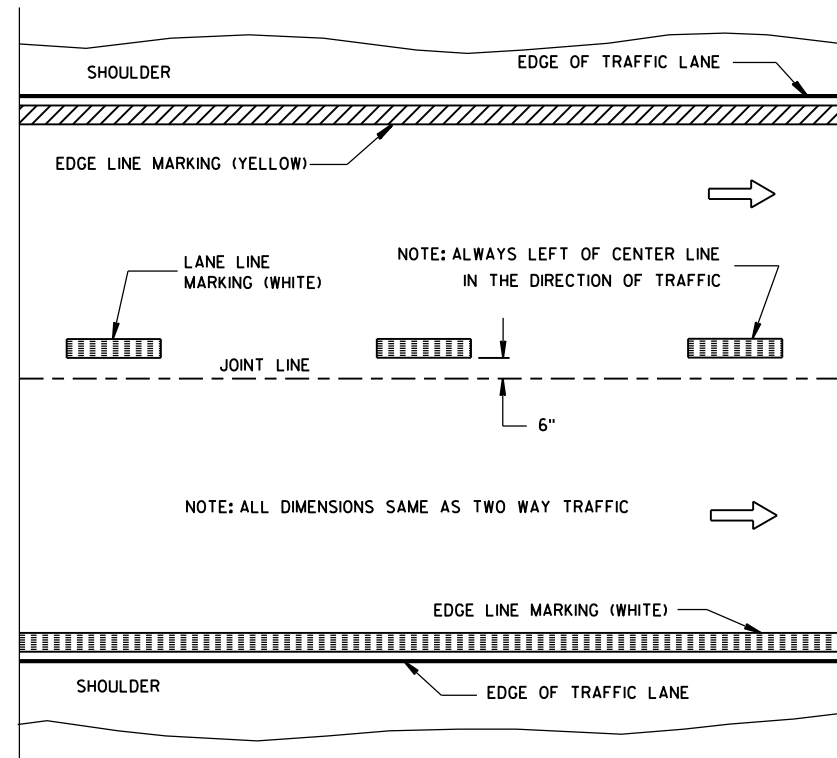
FLEXIBLE MARKER POST
FOR CULVERT END

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
10/1/2012 /S/ Travis Feltes
DATE STATE TRAFFIC ENGINEER 154 IGN
FHWA

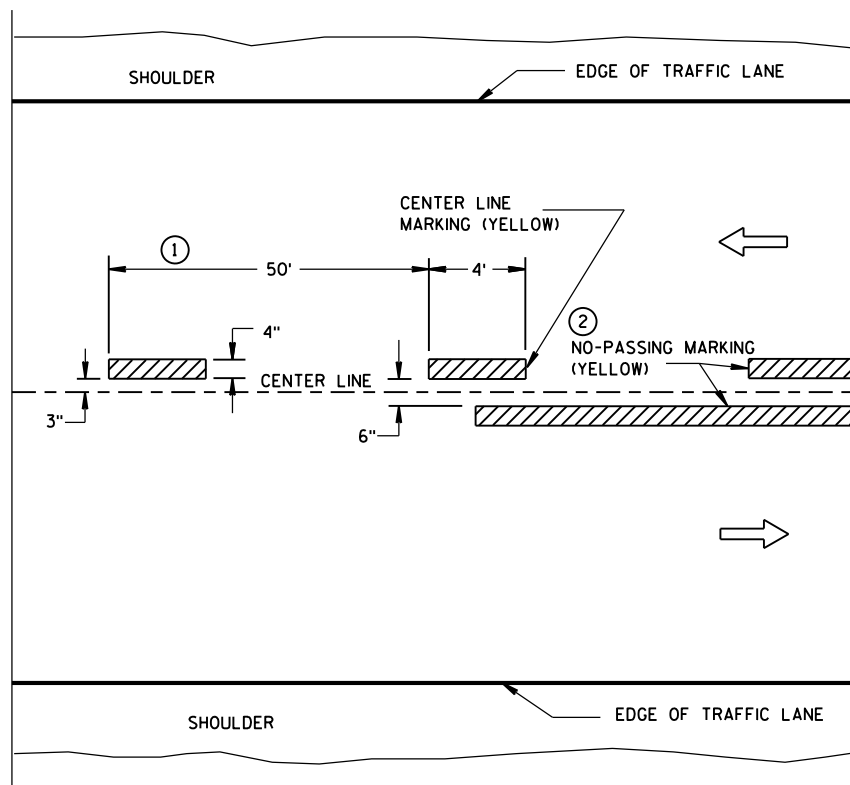


TWO WAY TRAFFIC

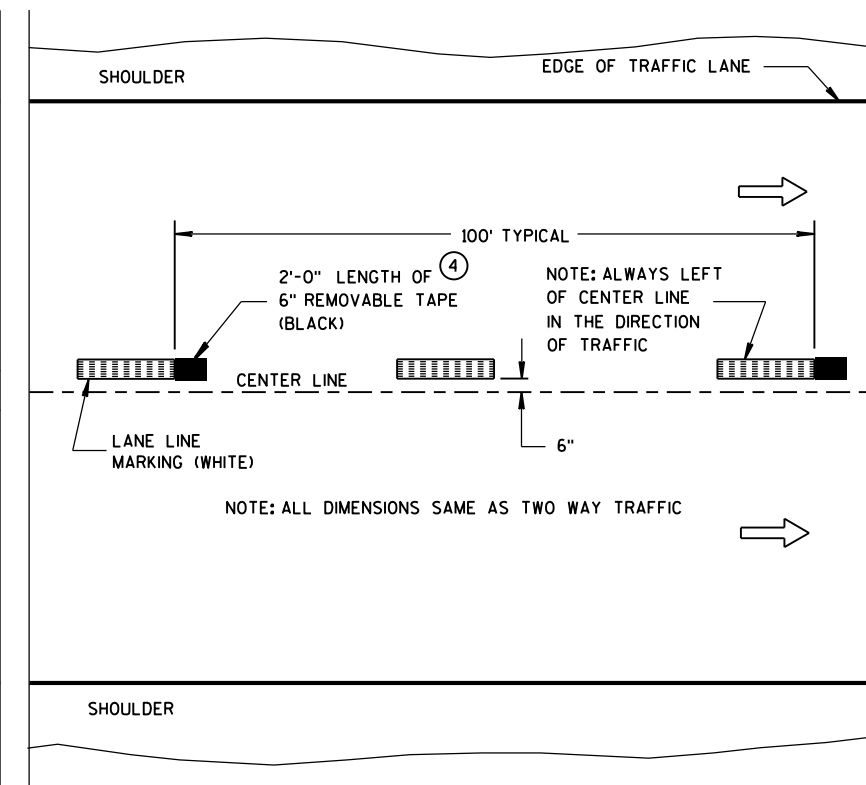


ONE WAY TRAFFIC

PERMANENT PAVEMENT MARKING



TWO WAY TRAFFIC



ONE WAY TRAFFIC

TEMPORARY (INTERMEDIATE) PAVEMENT MARKING
(SHOWS CYCLE FOR TEMPORARY CENTER LINE OR TEMPORARY LANE LINE MARKING)

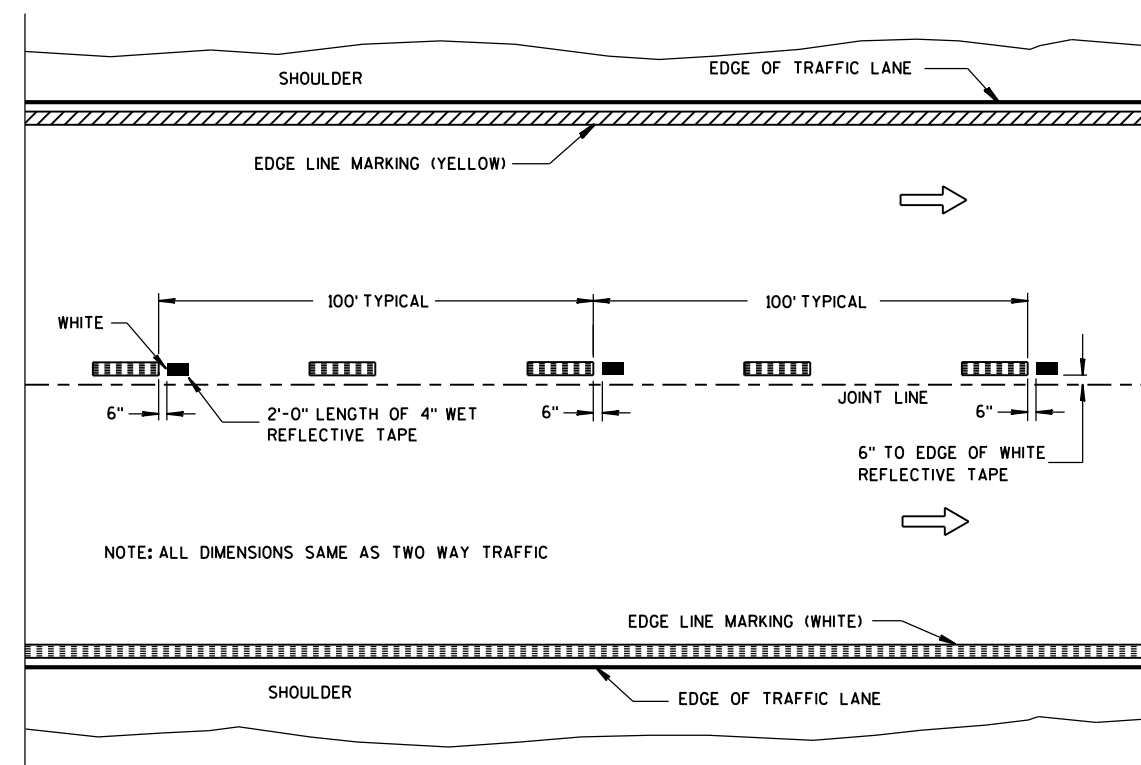
GENERAL NOTES

DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.

- ① HALF CYCLE LENGTHS (25'±) WITH 2' MINIMUM STRIPE LENGTHS SHALL BE PROVIDED ON ROADWAYS (INCLUDING TEMPORARY TRAVELED WAYS) WITH REVERSE CURVATURE, CURVATURE OF OVER 5 DEGREES OR WHEN DIRECTED BY THE ENGINEER TO MARK UNUSUAL ALIGNMENT OF THE TRAVELED WAY.
- ② NO PASSING ZONE TEMPORARY PAVEMENT MARKING IS REQUIRED TO BE PLACED, WHERE APPROPRIATE, ALONG WITH CENTERLINE TEMPORARY PAVEMENT MARKING WHEN A SAME DAY PERMANENT PAVEMENT MARKING ITEM IS INCLUDED IN THE CONTRACT.
- ③ NO PASSING ZONE MARKINGS ARE PLACED ACCORDING TO "T" MARKINGS. IF EXISTING NO PASSING ZONE W14-3 SIGNS ARE BEYOND 50 FEET IN EITHER DIRECTION, THE SIGNS SHALL BE MOVED TO THE "T" MARKINGS.
- ④ CONCRETE ONLY.

NOTE

ARROW SYMBOL (→) SHOWS DIRECTION OF TRAVEL



WET REFLECTIVE TAPE SUPPLEMENT TO
SPRAYED OR NON WET REFLECTIVE TAPE LANE LINE

LEGEND

- "T" MARKING
- POST MOUNTED SIGN

PAVEMENT MARKING
(MAINLINE)

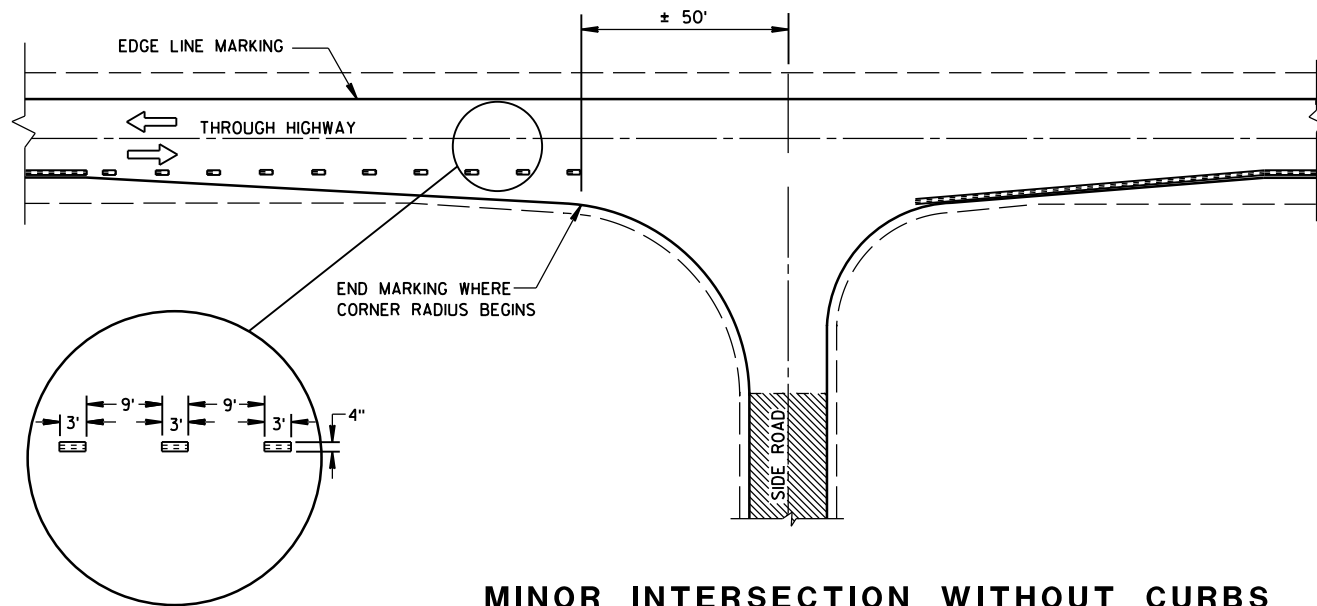
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

5-13-2013
DATE

FHWA

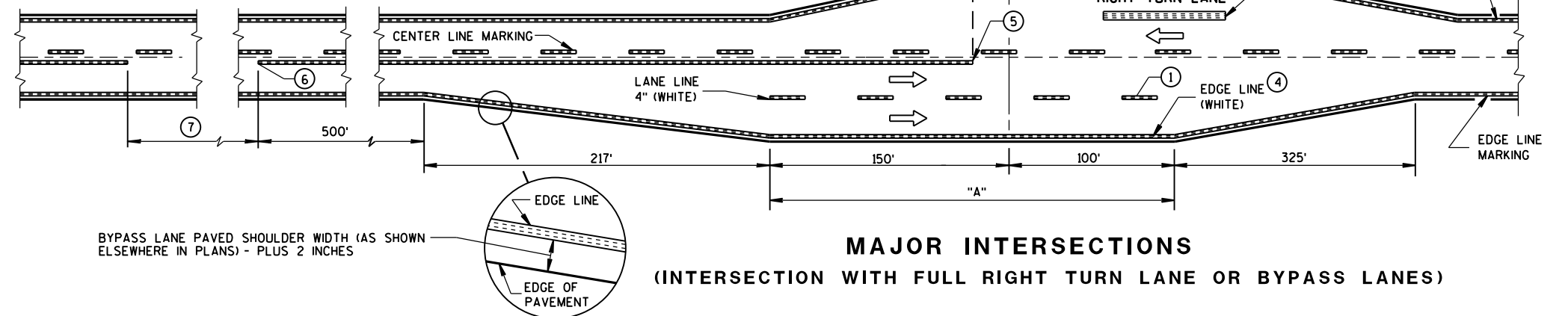
/S/ Travis Feltes
STATE TRAFFIC E 155



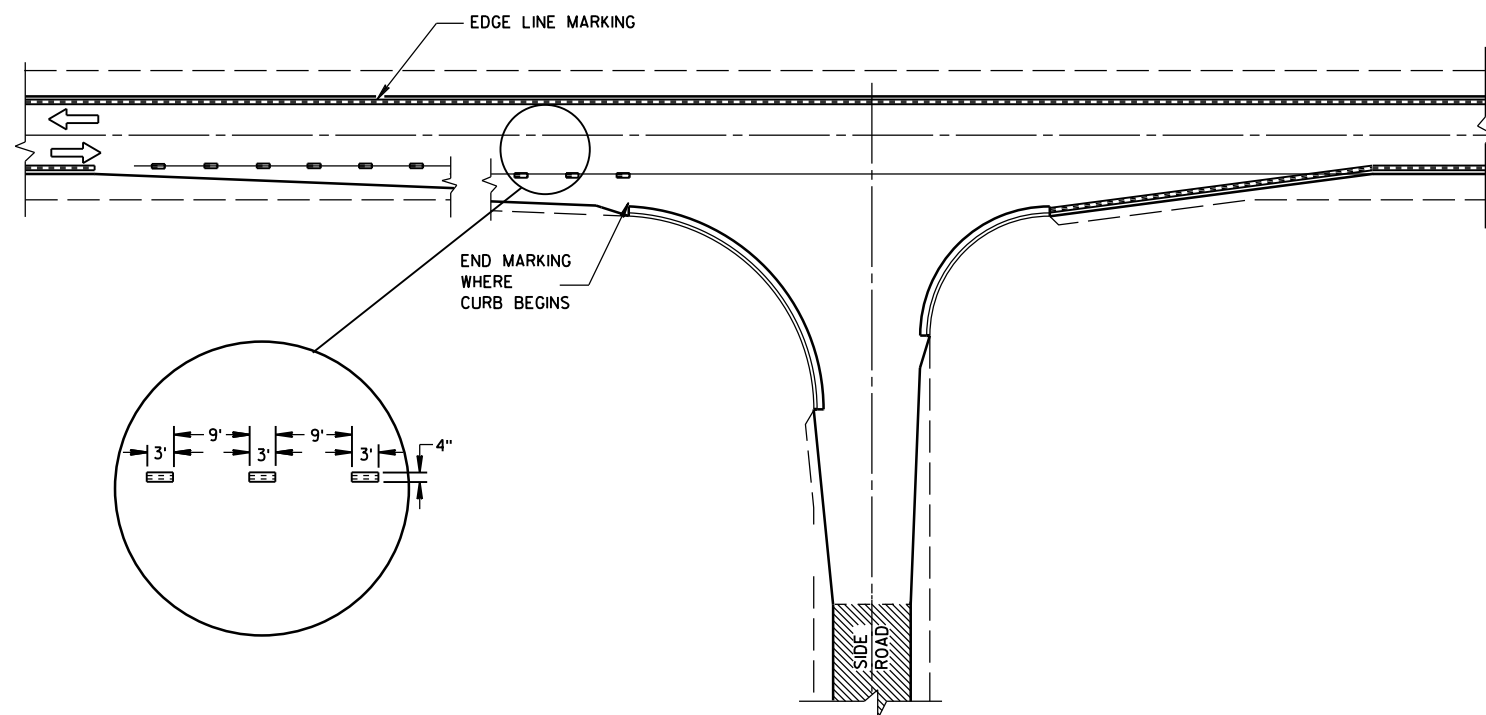
MINOR INTERSECTION WITHOUT CURBS

⑦

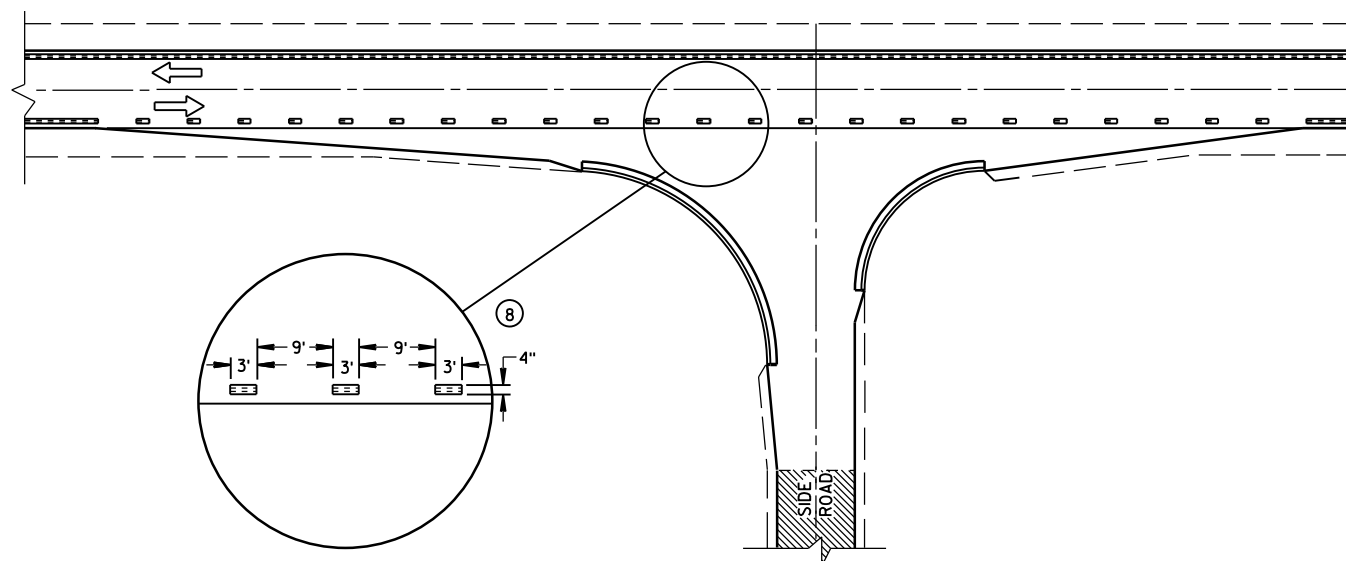
POSTED SPEED (MPH)	MINIMUM DISTANCE BETWEEN ZONES (FEET)
25 - 30	528
35 - 40	528
45 - 50	686
55	792



MAJOR INTERSECTIONS
(INTERSECTION WITH FULL RIGHT TURN LANE OR BYPASS LANES)



MINOR INTERSECTION WITH CURBS
(TYPICAL MARKING)



MINOR INTERSECTION WITH CURBS
③ (FOR SPECIAL CONDITIONS AS SPECIFIED)

GENERAL NOTES

- EDGE LINES SHALL BE OMITTED THROUGH INTERSECTIONS. EDGE LINES SHALL BE CONTINUED THROUGH DRIVEWAYS.
- ① WHEN DISTANCE "A" IS LESS THAN 250 FEET, OMIT LANE LINE.
 - ② WHEN DISTANCE "B" IS LESS THAN 100 FEET, OMIT CHANNELIZING LANE LINE.
 - ③ ALTERNATIVE MARKING SHALL BE PROVIDED WHEN SPECIFIED IN THE CONTRACT. TYPICAL SITUATIONS WHERE THIS MARKING MAY BE REQUIRED ARE WHERE THE INTERSECTION IS ON A SHARP HORIZONTAL CURVE OR CREST VERTICAL CURVE IN AN UNLIGHTED AREA SUCH THAT THE EDGE LINE MAY BE MISLEADING TO THE MOTORIST OR DISAPPEAR FROM SIGHT.
 - ④ THE EDGE LINE IN THE TAPER AREAS OF THE BYPASS LANE AND THE BYPASS LANE SHALL BE LOCATED 1-FOOT FROM EDGE OF PAVEMENT TO THE OUTSIDE EDGE OF EDGE LINE.
 - ⑤ BARRIER LINE ENDS AT SIDE ROAD PAVEMENT/SURFACE EDGE EXTENSION.
 - ⑥ BARRIER LINE STARTS 500 FEET PRIOR TO THE BYPASS TAPER.
 - ⑦ IF THE DISTANCE BETWEEN 2 SUCCESSIVE NO-PASSING ZONES IS LESS THAN THE MINIMUM DISTANCE BETWEEN ZONES, CONNECT THE 2 ZONES.
 - ⑧ 3' LINE 9' GAP, EXCEPT RETRACE THE EXISTING LINE - GAP PATTERN WHERE EXISTING MARKINGS ARE IN PLACE.
- ARROW SYMBOL (→) SHOWS DIRECTION OF TRAVEL

PAVEMENT MARKING
(INTERSECTIONS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION 156

TWO-LANE ROADWAY

SYMBOLS



WORK AREA



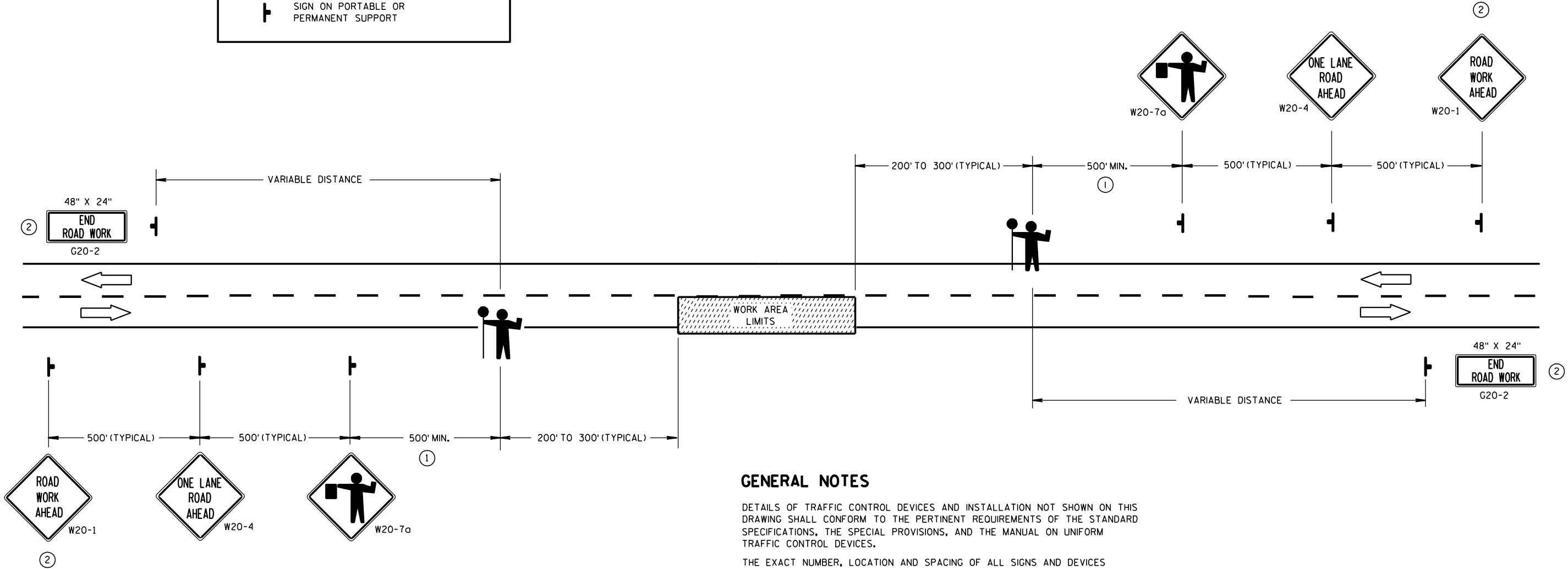
FLAGGER, EQUIPPED WITH STOP/SLOW PADDLE FASTENED ON SUPPORT STAFF



SIGN ON PORTABLE OR PERMANENT SUPPORT



USE OF THE "BE PREPARED TO STOP" SIGN IS OPTIONAL. WHEN USED, THIS SIGN SHALL BE LOCATED BETWEEN THE W20-7a AND W20-4 SIGNS. A 500' TYPICAL SPACING SHALL BE PROVIDED BETWEEN THE SIGNS.



GENERAL NOTES

DETAILS OF TRAFFIC CONTROL DEVICES AND INSTALLATION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

THE EXACT NUMBER, LOCATION AND SPACING OF ALL SIGNS AND DEVICES (AND THE LOCATION OF ALL FLAGGERS) SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

THE FIRST ADVANCE WARNING SIGN SHOULD TYPICALLY BE LOCATED IN ADVANCE OF THE ANTICIPATED TRAFFIC BACKUP OR QUEUE.

WHEN A SIDE ROAD OR RAMP INTERSECTS THE FACILITY ON WHICH THE WORK IS BEING PERFORMED, ADDITIONAL TRAFFIC CONTROLS SHALL BE PROVIDED AS SPECIFIED IN THE PLANS AND/OR THE SPECIAL PROVISIONS OR AS APPROVED BY THE ENGINEER.

FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES. THEY SHALL BE EQUIPPED WITH STOP/SLOW PADDLES FASTENED ON SUPPORT STAFFS. WHEN THE FLAGGING OPERATION IS NOT IN EFFECT, THE "FLAGGER AHEAD", THE "ROAD WORK AHEAD" AND THE ONE LANE ROAD AHEAD" SIGNS SHALL BE COVERED OR REMOVED AND THE HIGHWAY RESTORED TO NORMAL OPERATION.

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED.

- ① FOR A MOVING WORK OPERATION, SIGNING FOR BOTH DIRECTIONS SHALL BE REESTABLISHED (AS SIMULTANEOUSLY AS PRACTICAL) AT APPROXIMATELY 3500 FOOT INTERVALS IN THE MOVING WORK OPERATION OR AS APPROVED BY THE ENGINEER.
- ② SIGN NOT REQUIRED IF FLAGGING OPERATION OCCURS WITHIN A SIGNED ROAD WORK ZONE AREA.

TRAFFIC CONTROL FOR LANE CLOSURE (SUITABLE FOR MOVING OPERATIONS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED	/S/ Thomas N. Nothnau
9/5/06	DATE
STATE TRAFFIC ENGINE 157	DESIGN

FHWA

GENERAL NOTES

THE EXACT NUMBER, LOCATION AND SPACING OF ALL SIGNS AND DEVICES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED. IF NECESSARY DUE TO SPACE CONSTRAINTS IN URBAN AREAS, 36" X 36" SIGNS MAY BE USED IF APPROVED BY DISTRICT TRAFFIC UNIT.

"WO" SIGNS ARE THE SAME AS "W" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

W20-1 AND G20-2A SIGNS ARE NOT REQUIRED IF THE WORK AREA IS WITHIN A LARGER WORK ZONE WHERE THESE SIGNS ARE ALREADY PRESENT. G20-2A SIGNS MAY ALSO BE OMITTED IF DURATION OF WORK IS LESS THAN 7 CONTINUOUS DAYS AND NIGHTS.

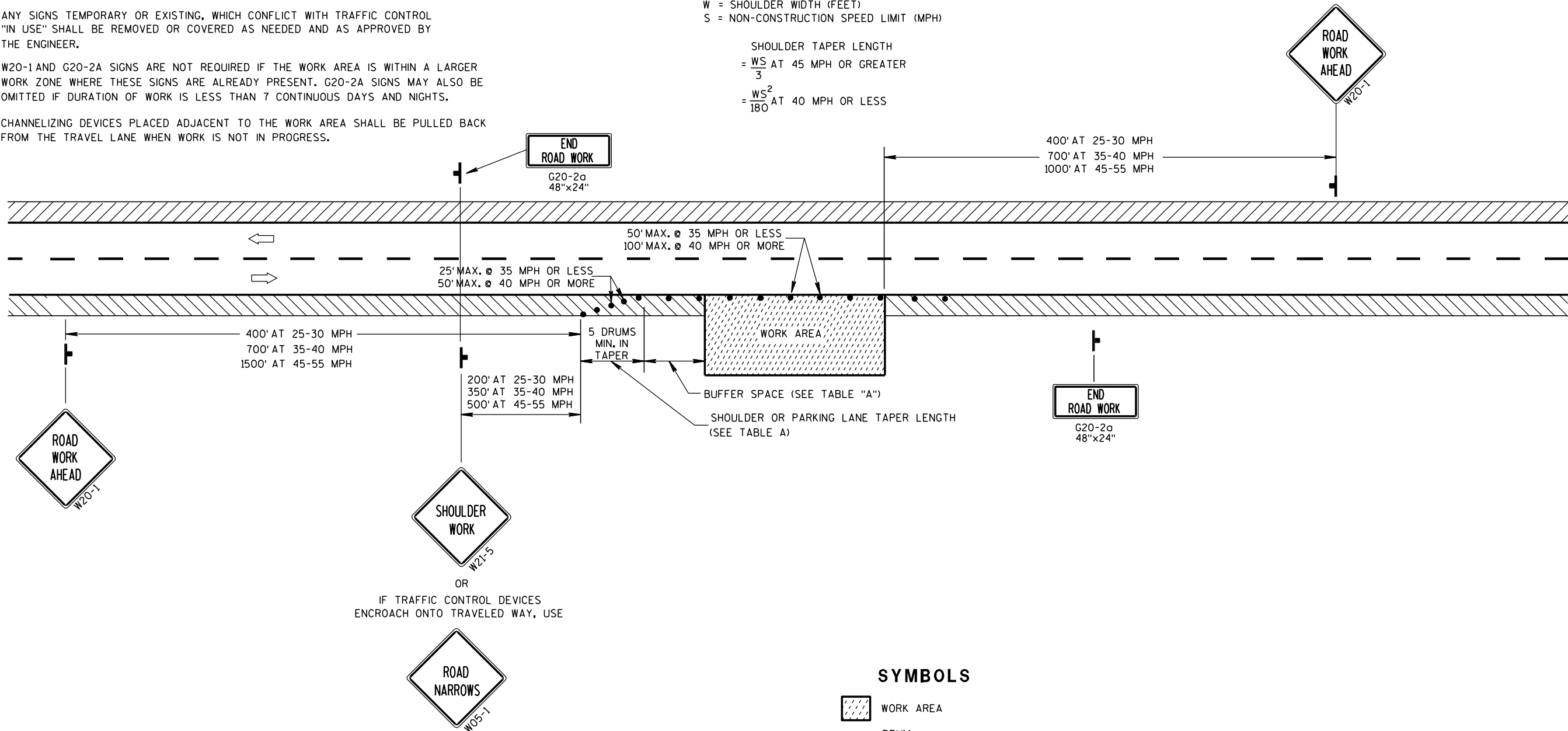
CHANNELIZING DEVICES PLACED ADJACENT TO THE WORK AREA SHALL BE PULLED BACK FROM THE TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

TABLE A

SHOULDER TAPER LENGTH (FEET)					BUFFER SPACE (FEET)
S	W	4	6	8	
30	20	30	40	50	85
35	30	45	55	70	120
40	40	55	75	90	170
45	60	90	120	150	220
50	70	100	135	170	280
55	75	110	150	185	335

W = SHOULDER WIDTH (FEET)
S = NON-CONSTRUCTION SPEED LIMIT (MPH)

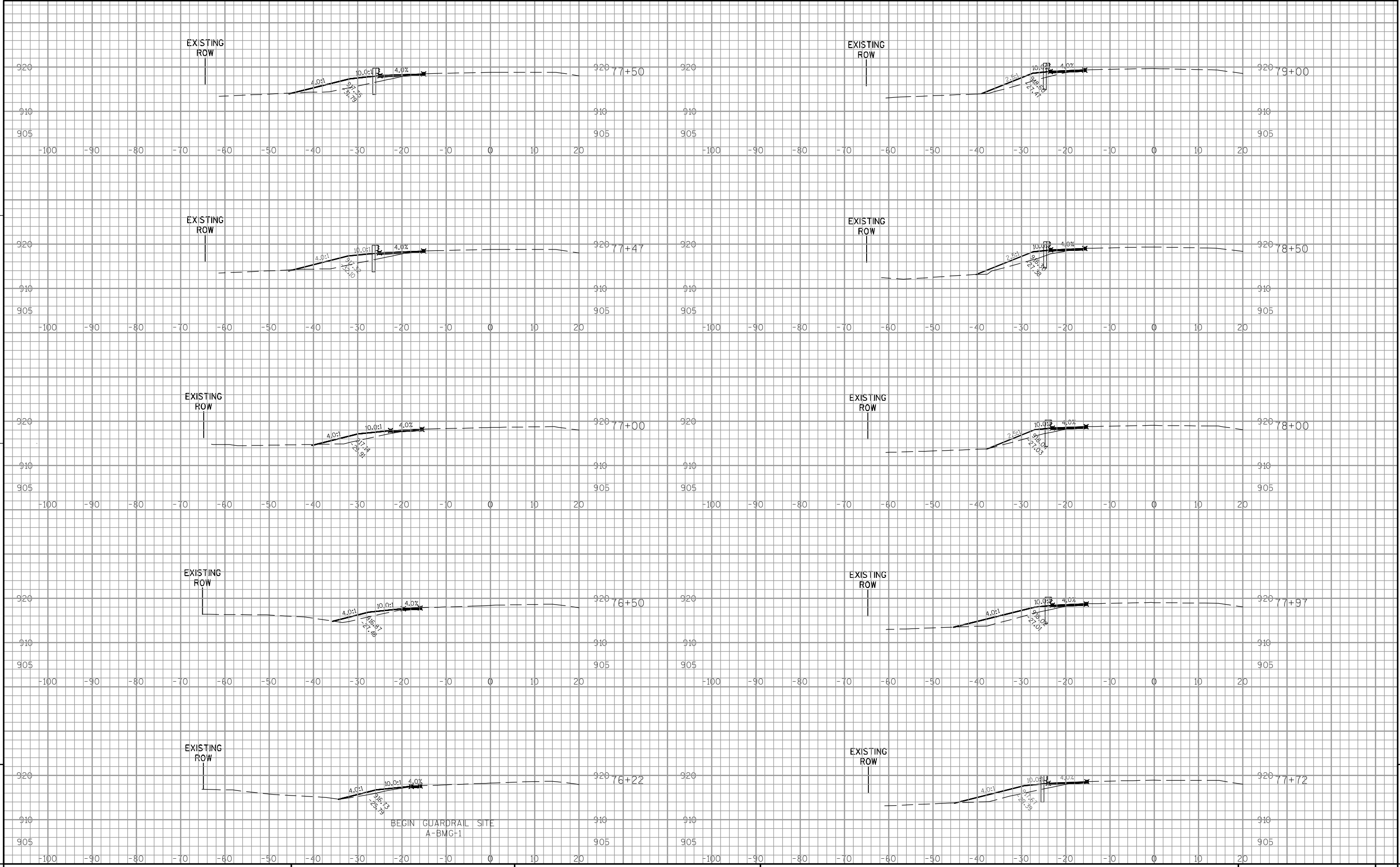
SHOULDER TAPER LENGTH
= $\frac{WS}{3}$ AT 45 MPH OR GREATER
= $\frac{WS^2}{180}$ AT 40 MPH OR LESS



SYMBOLS

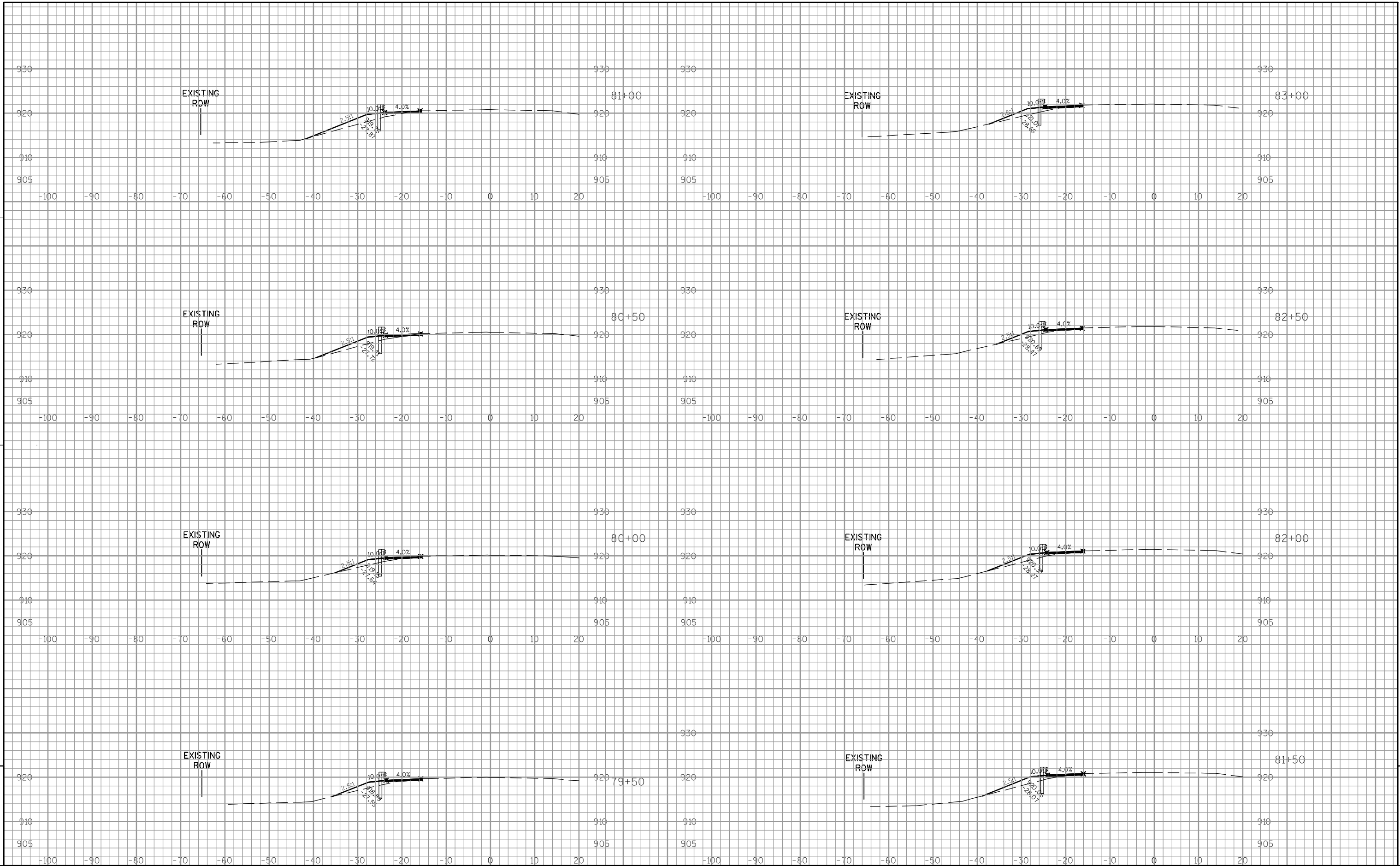
- WORK AREA
- DRUM
- POST MOUNTED SIGN
- DIRECTION OF TRAFFIC FLOW

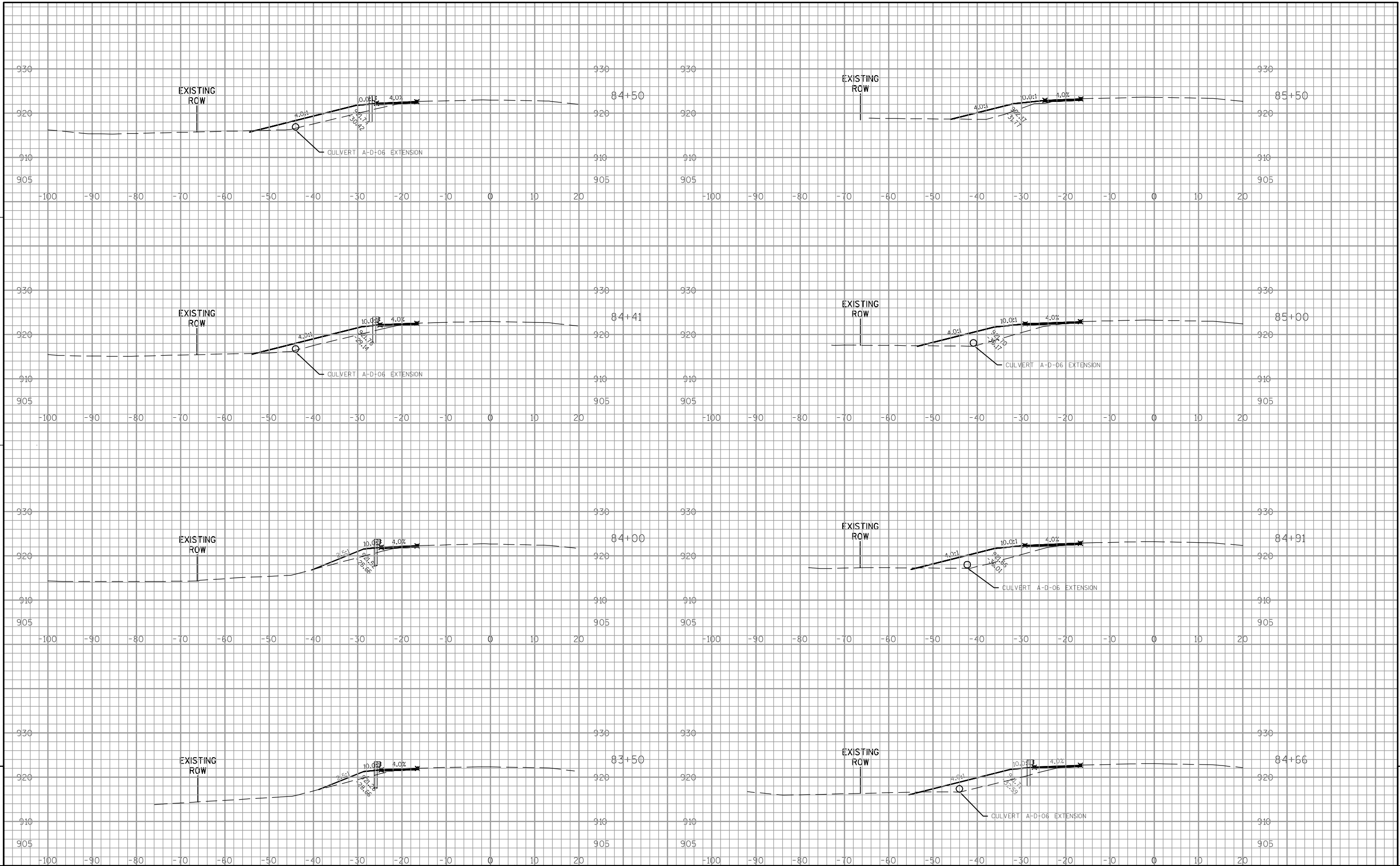
TRAFFIC CONTROL, WORK ON SHOULDER OR PARKING LANE, UNDIVIDED ROADWAY		
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION		
APPROVED 5/23/00 DATE	/S/ Chester J. CHIEF SIGNS AND MARK	158 NNEER
FHWA		

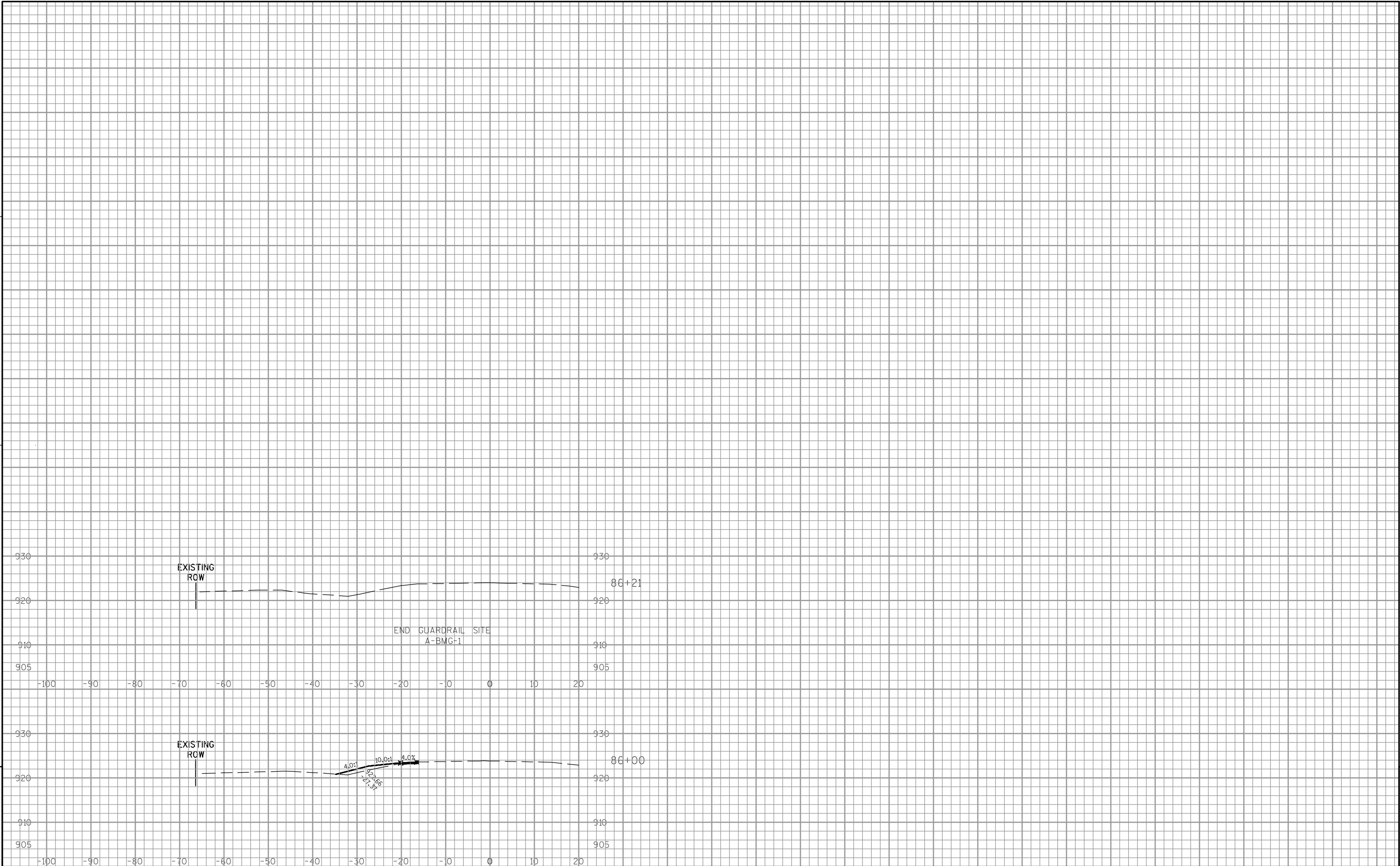


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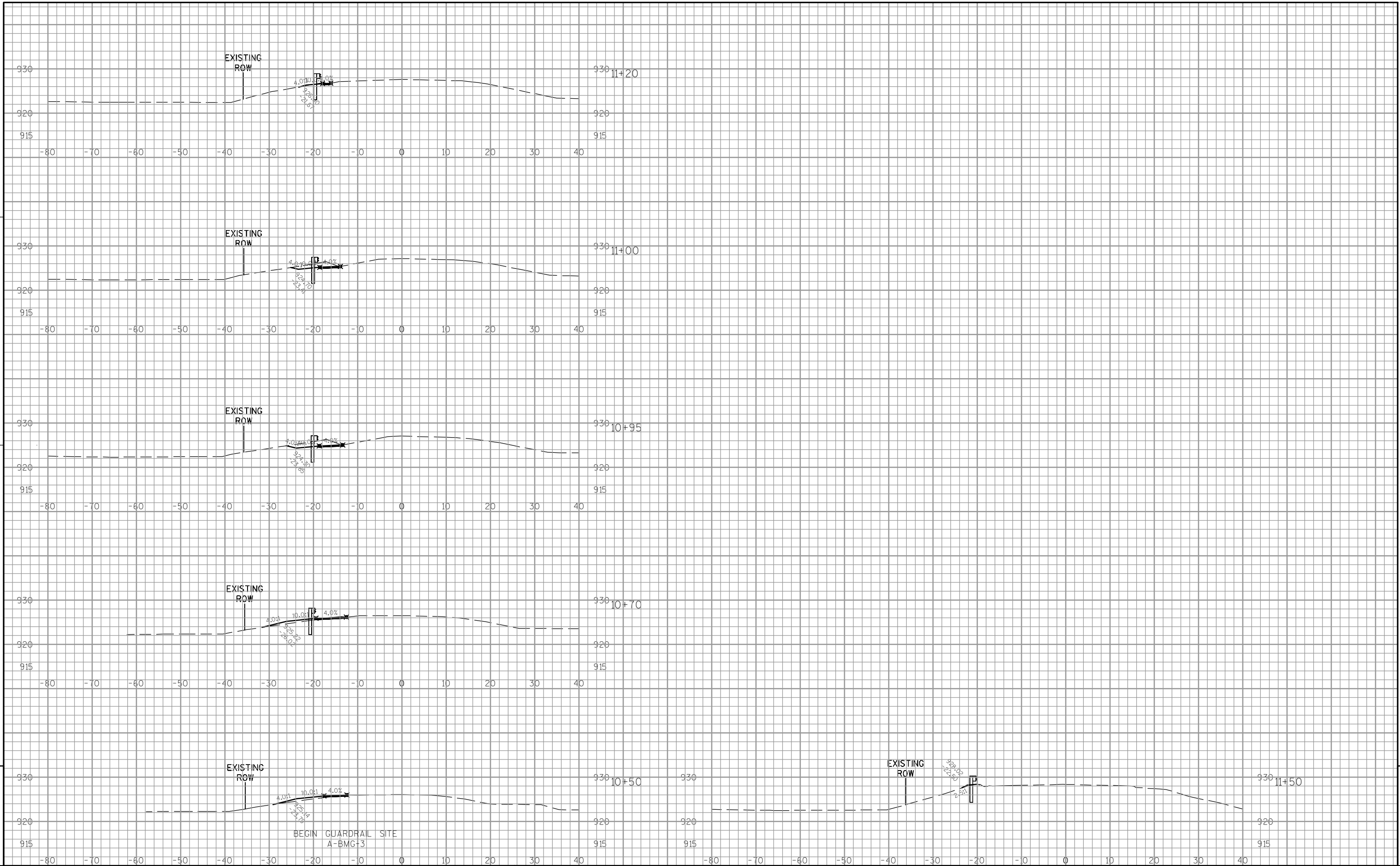


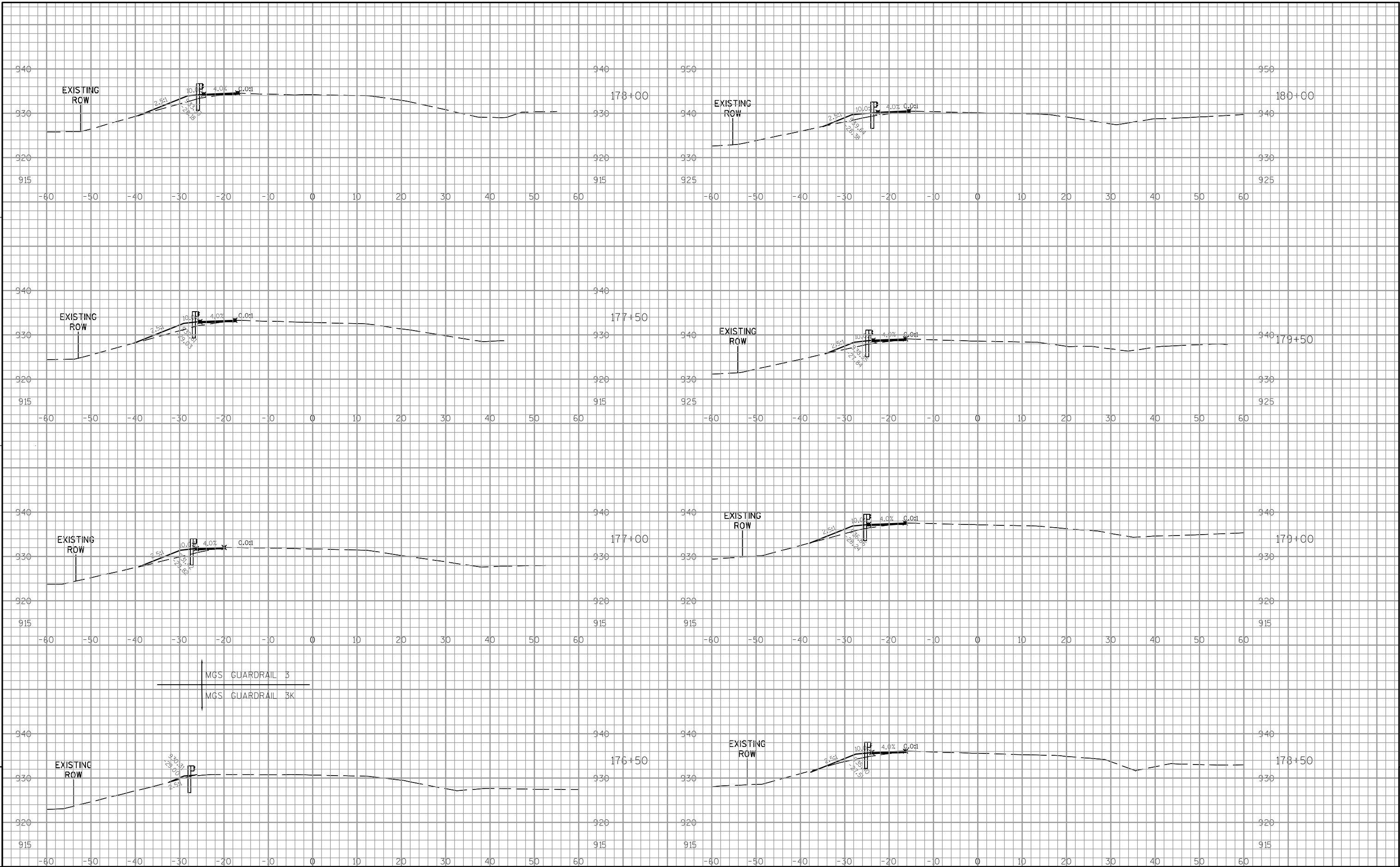


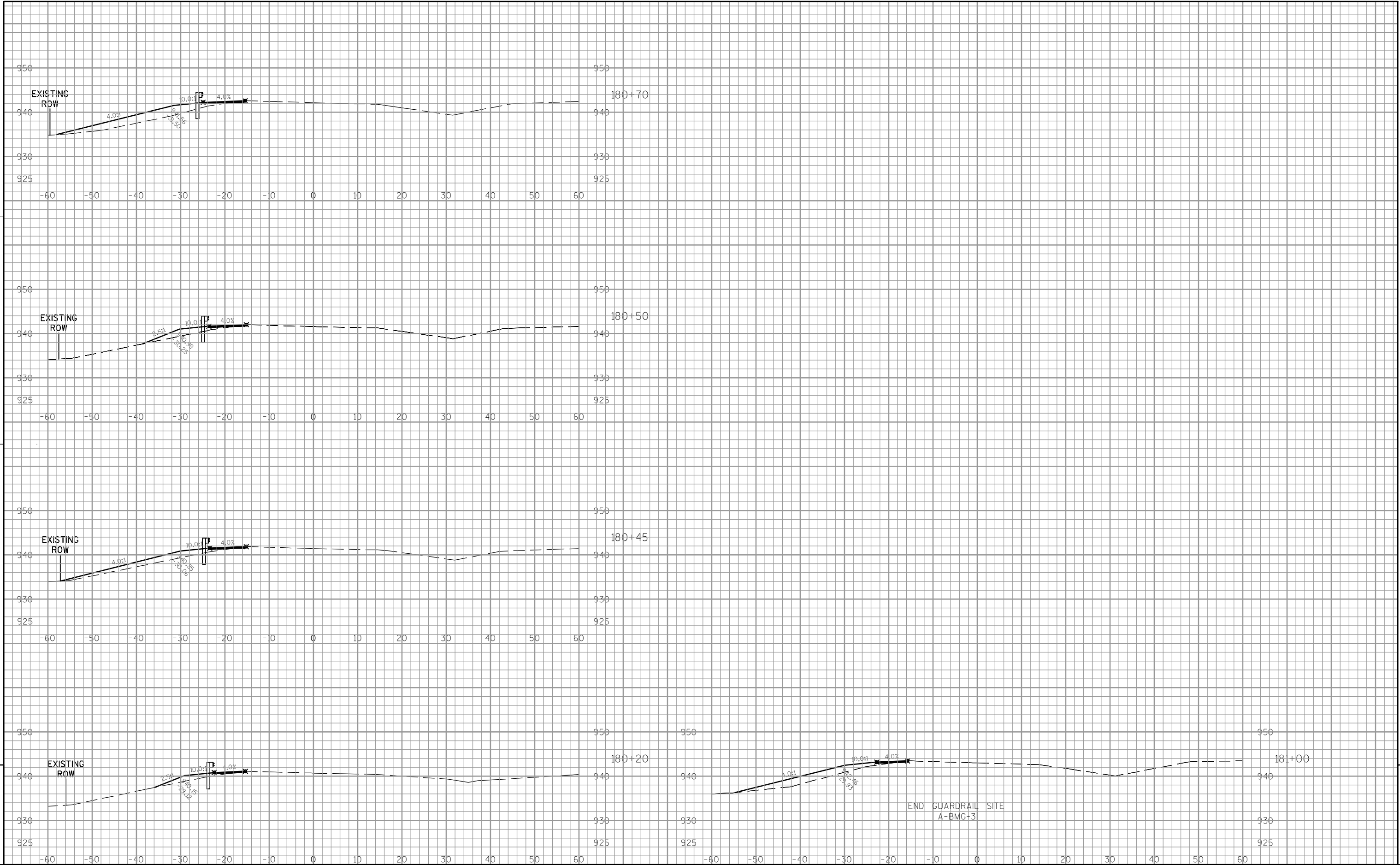


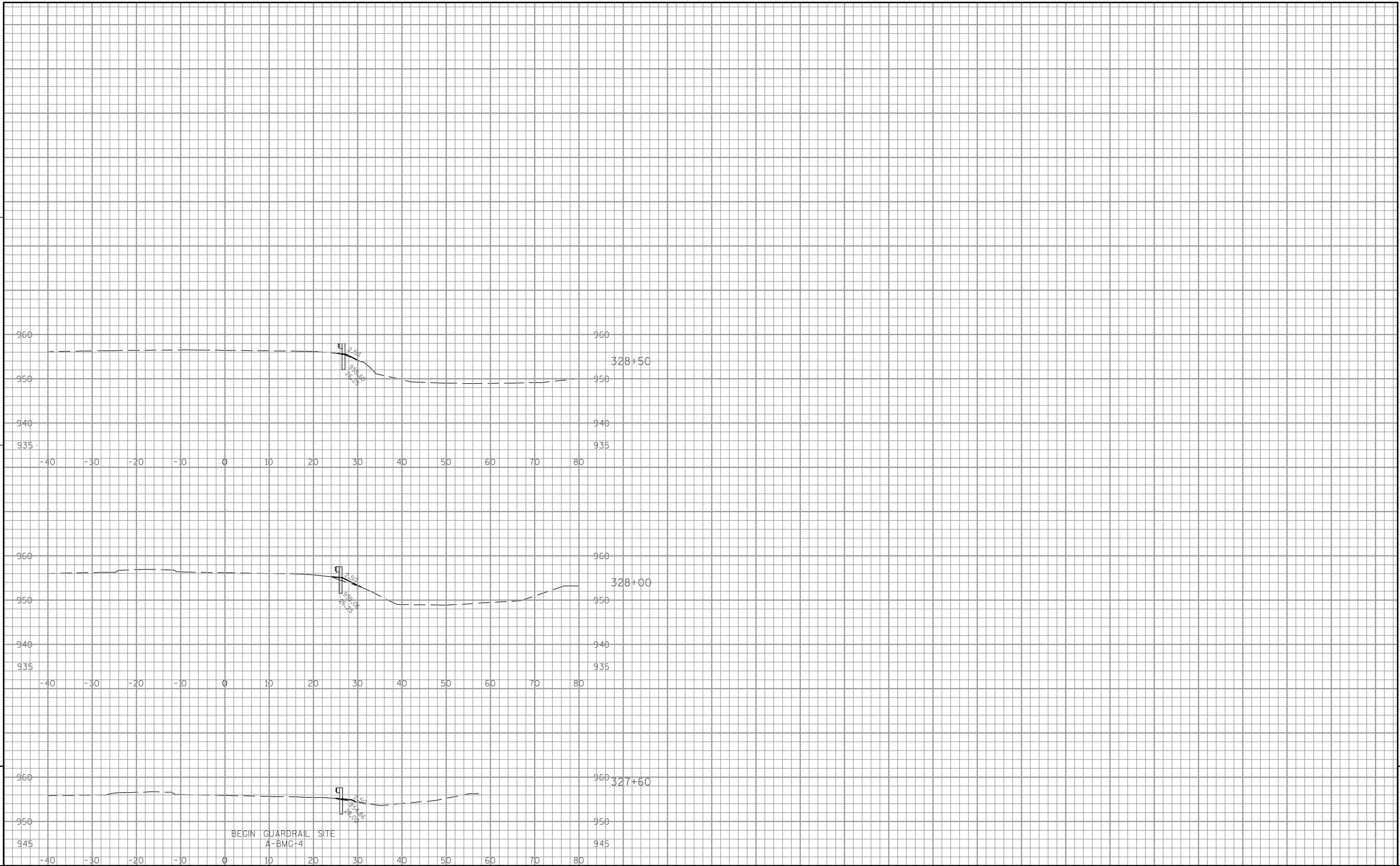
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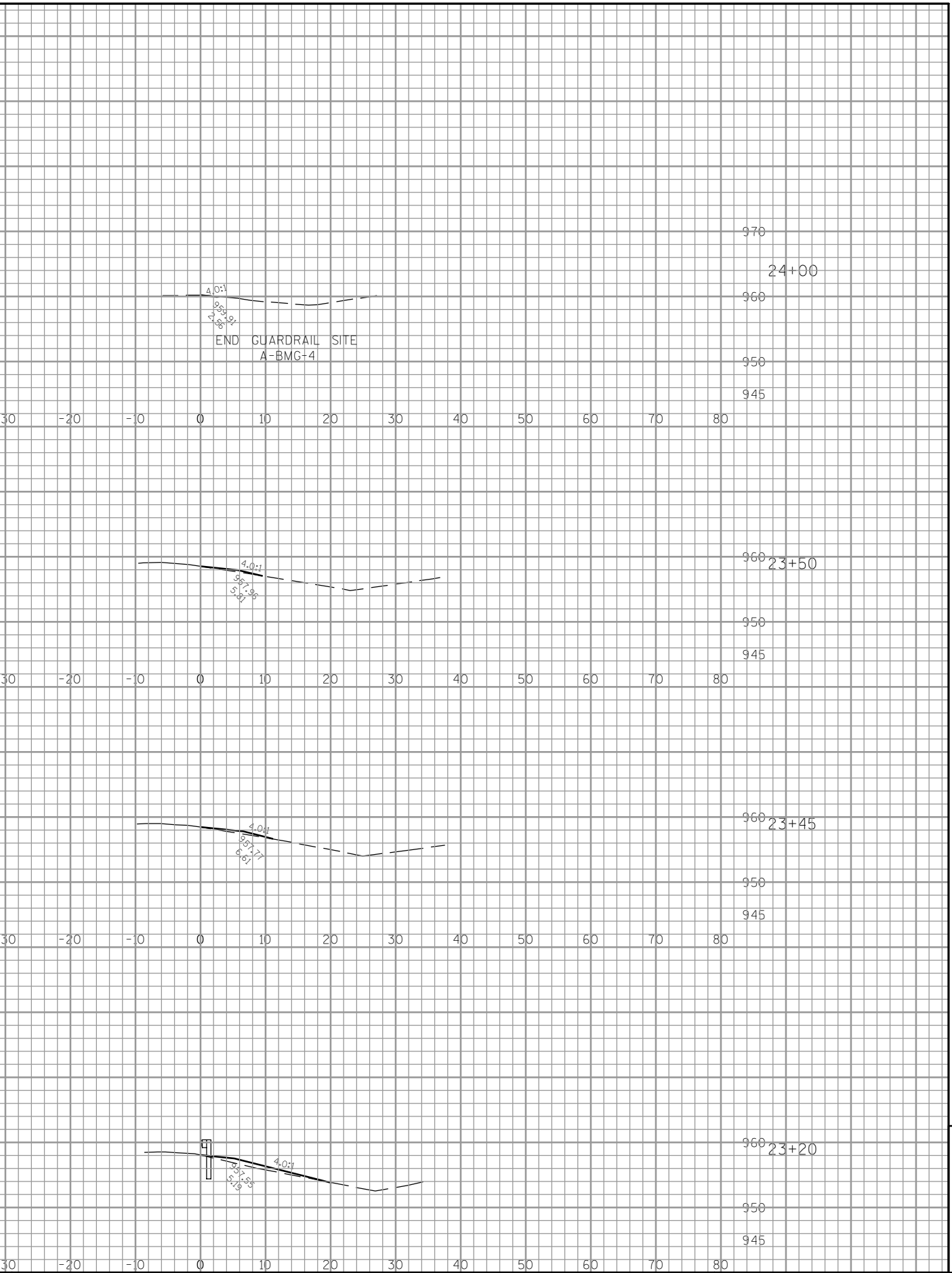
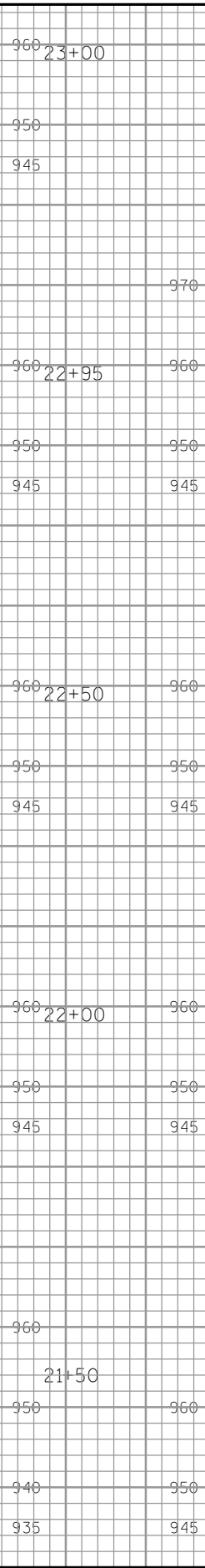
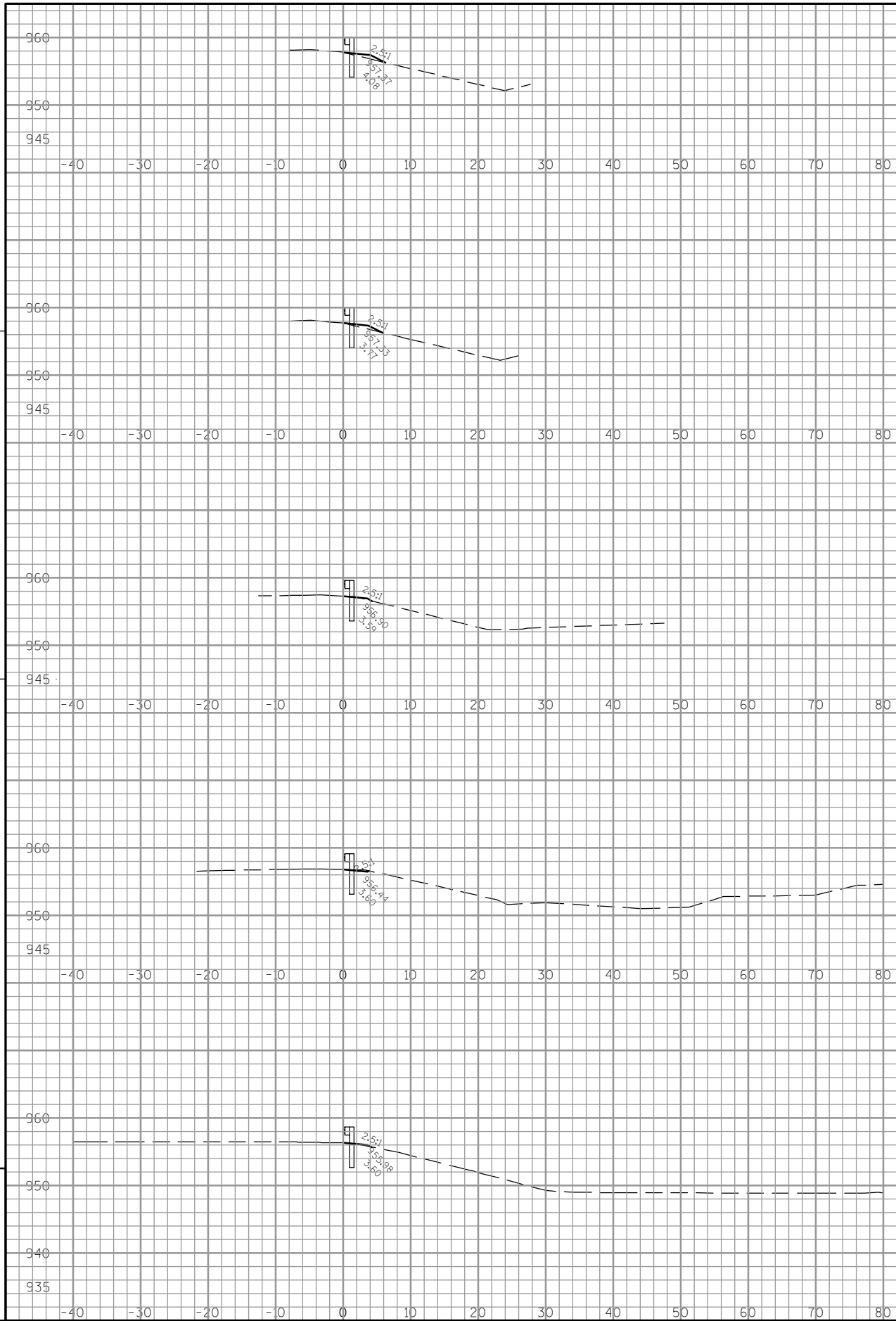




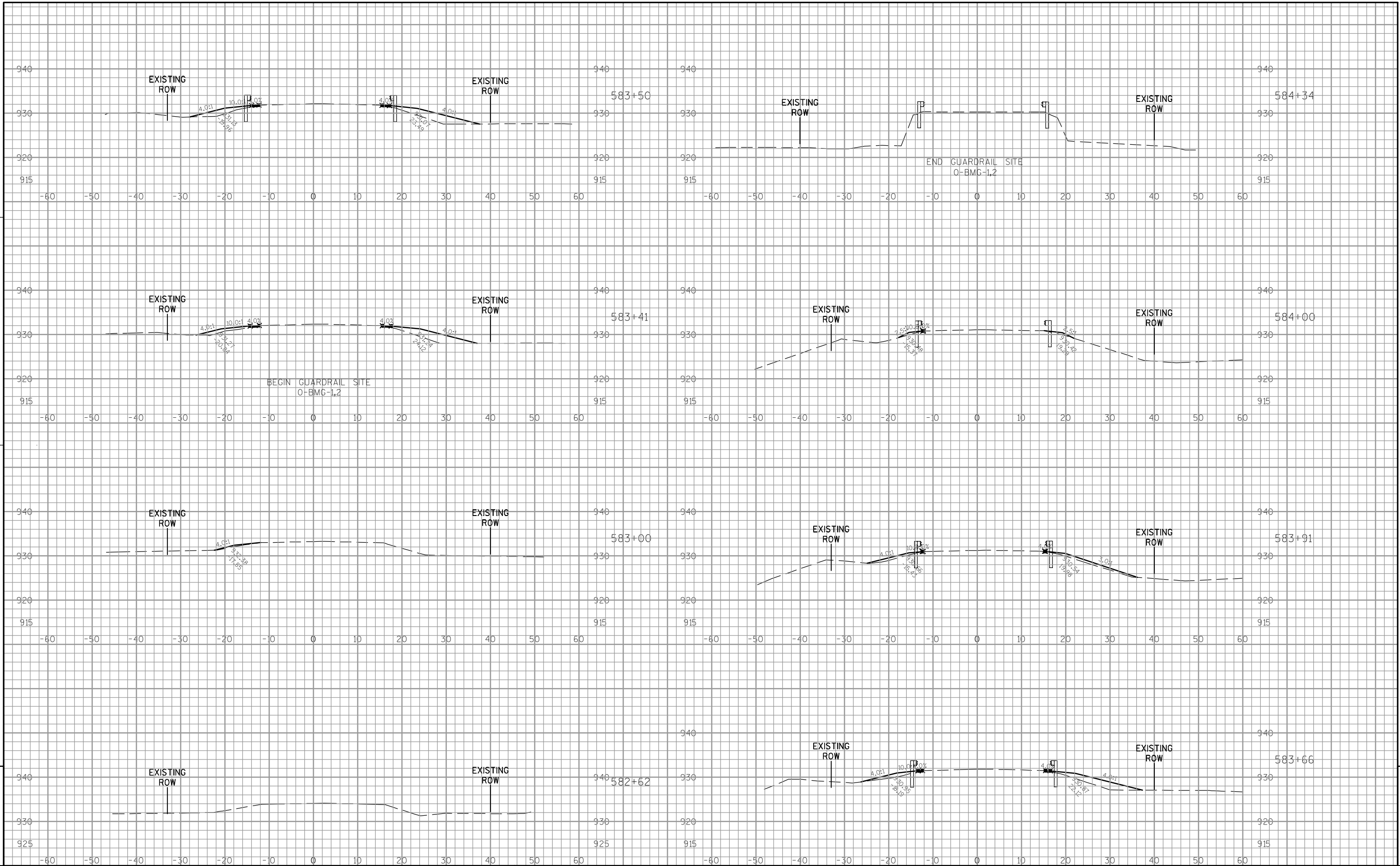


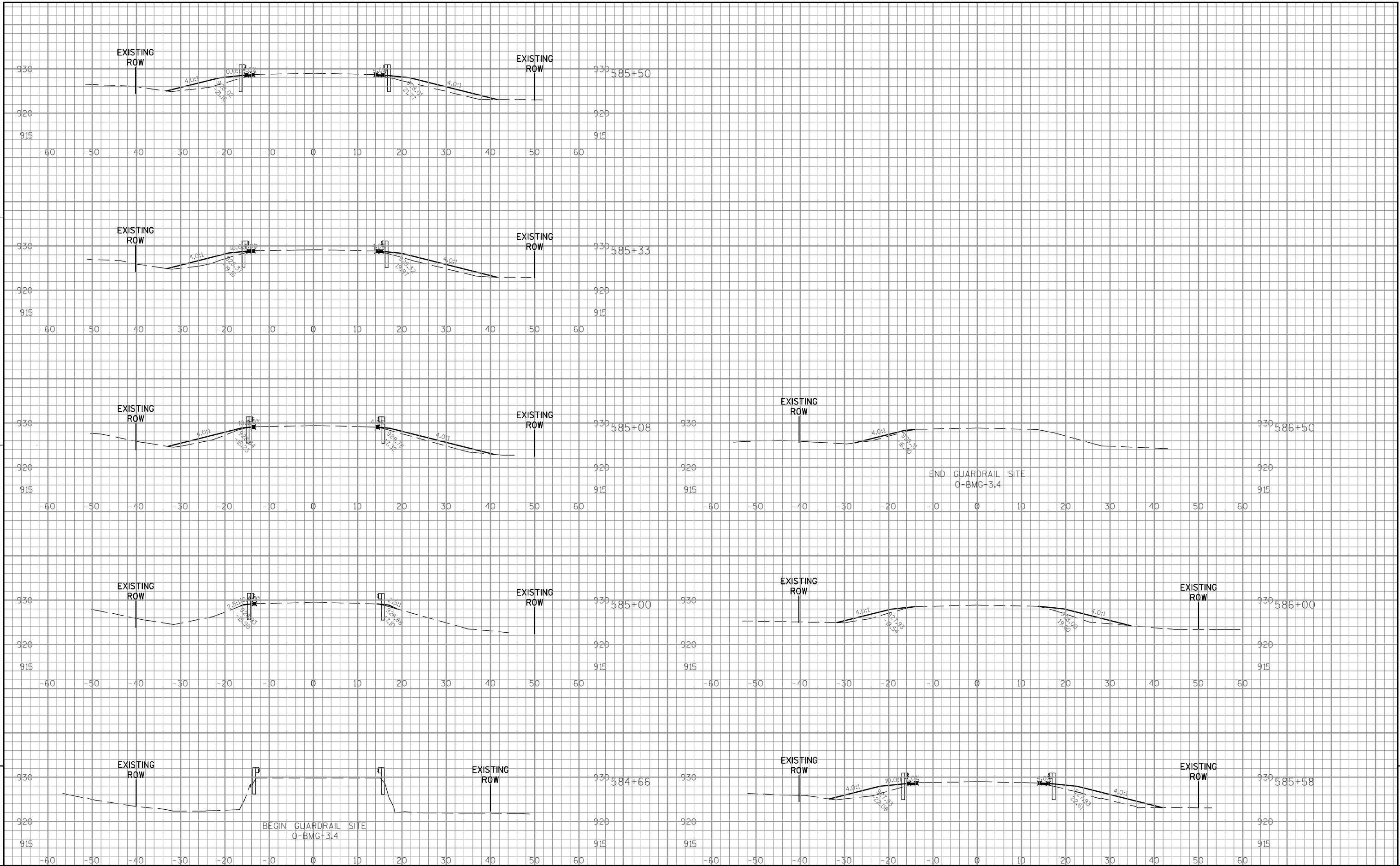


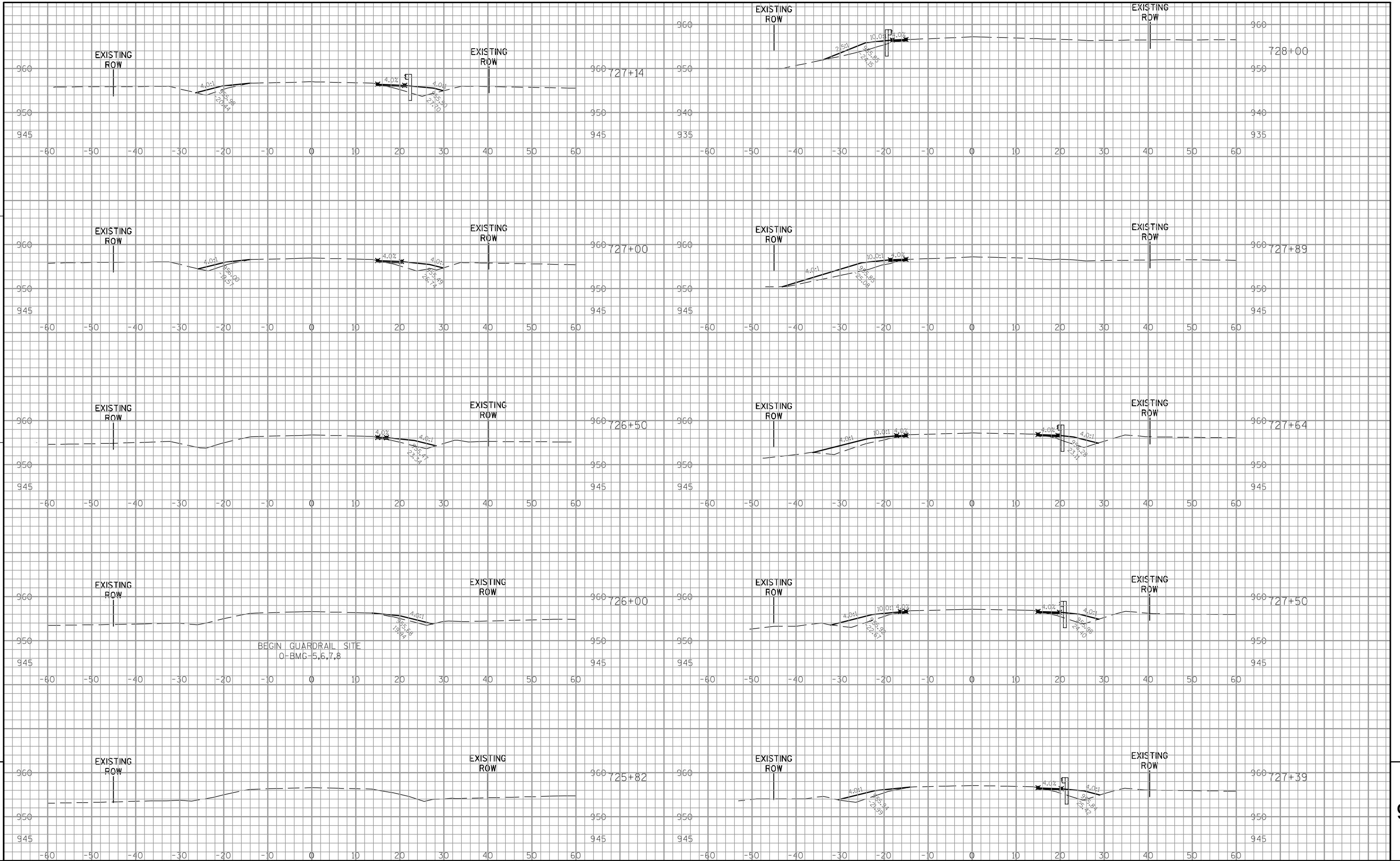
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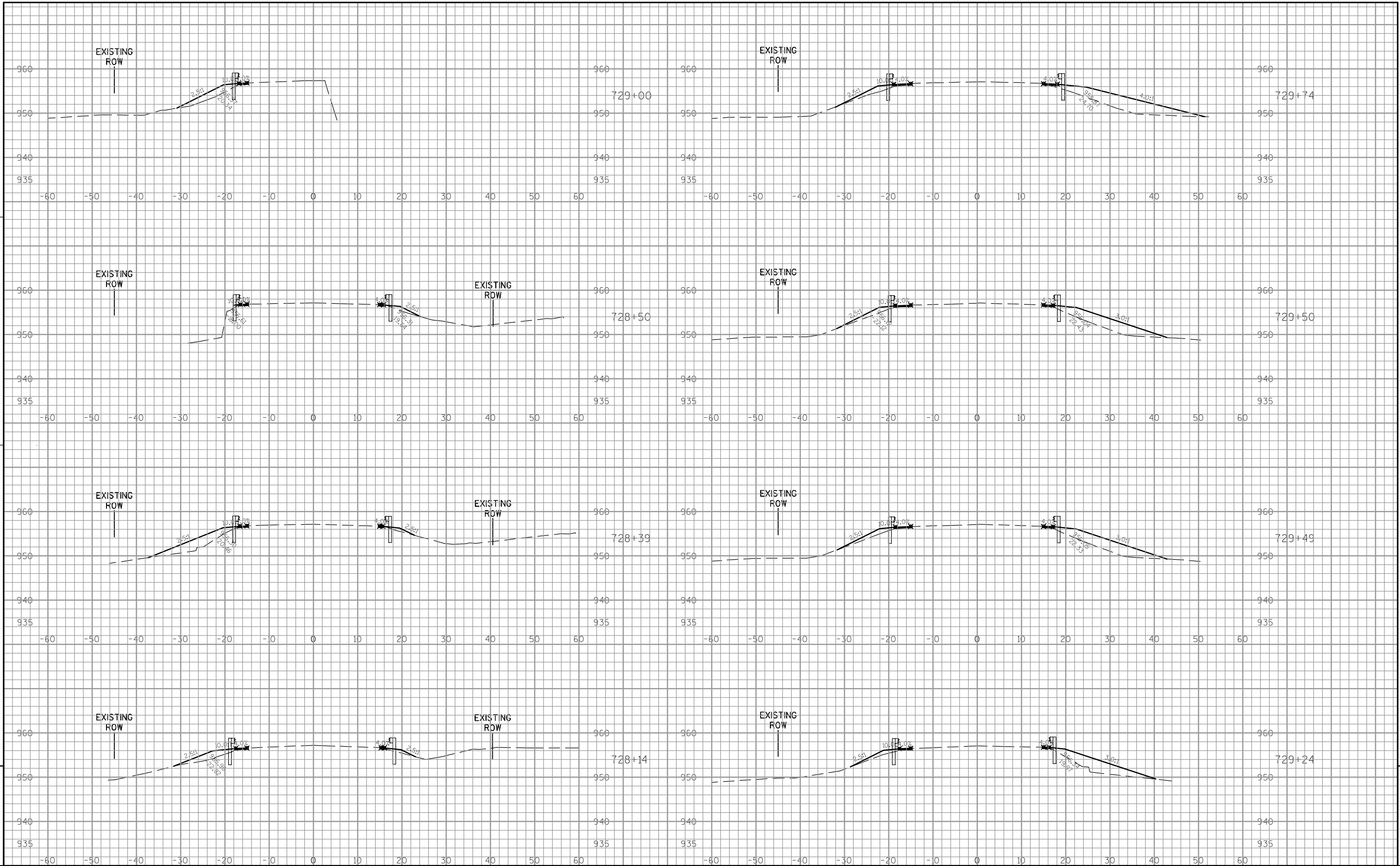


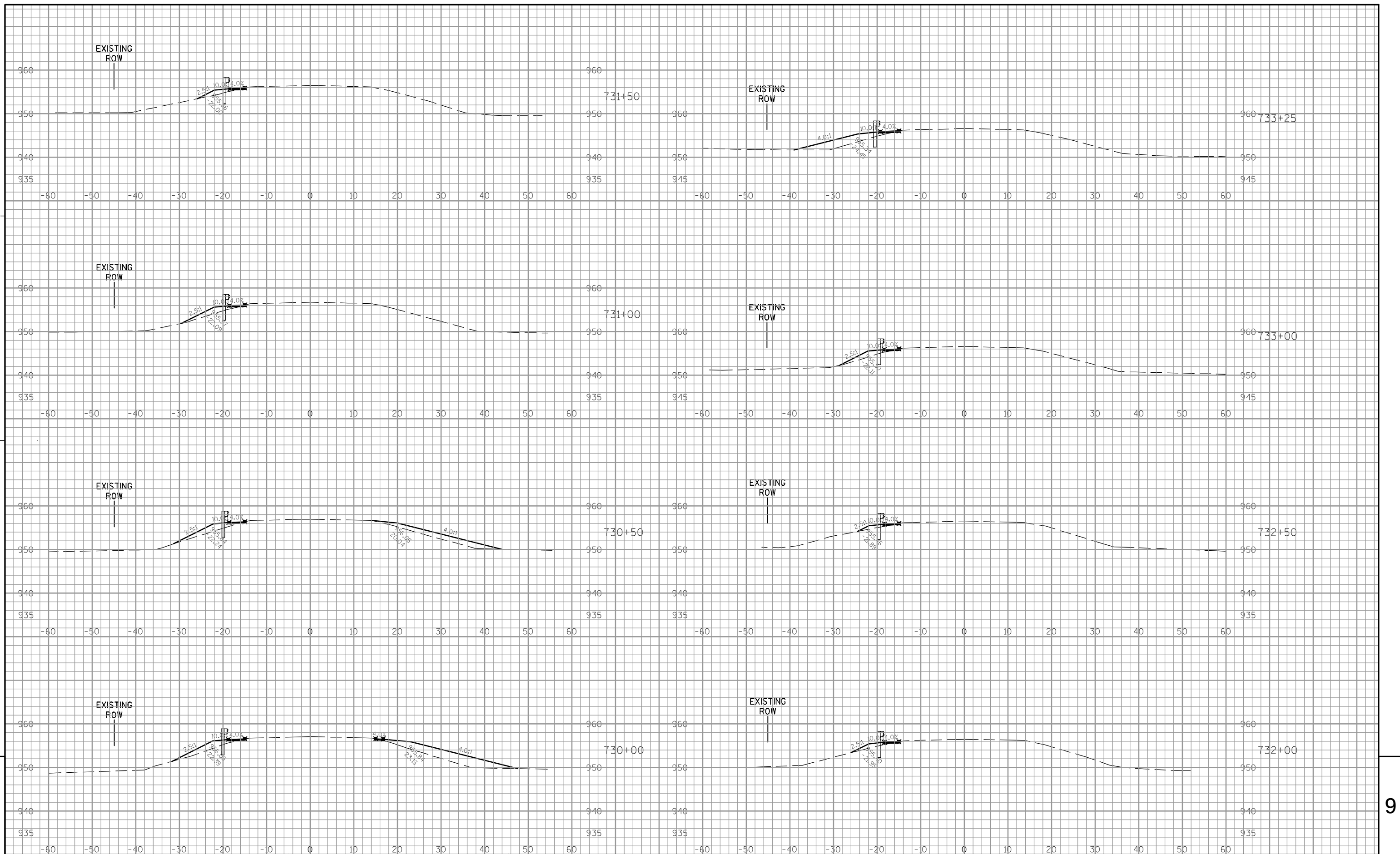
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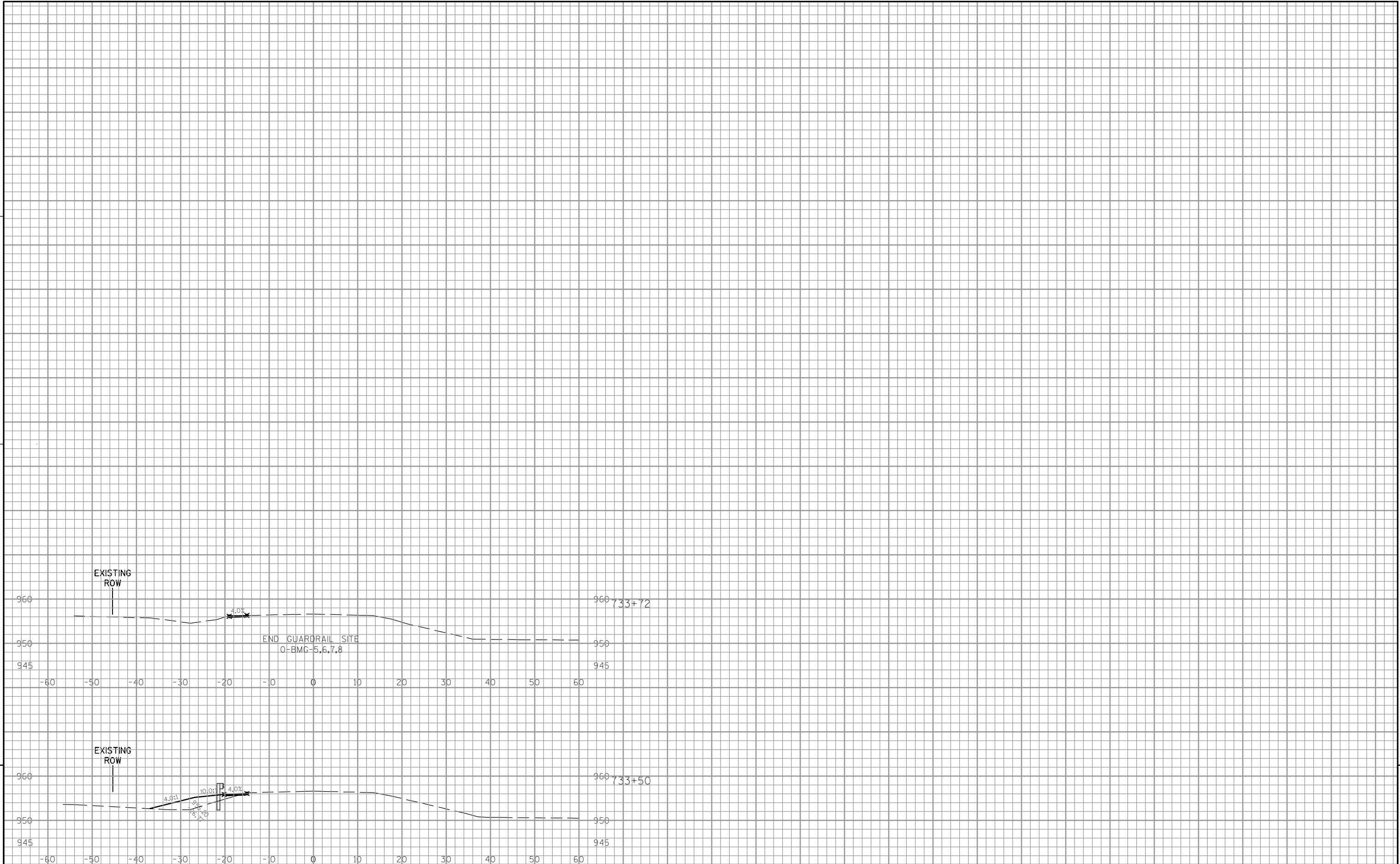


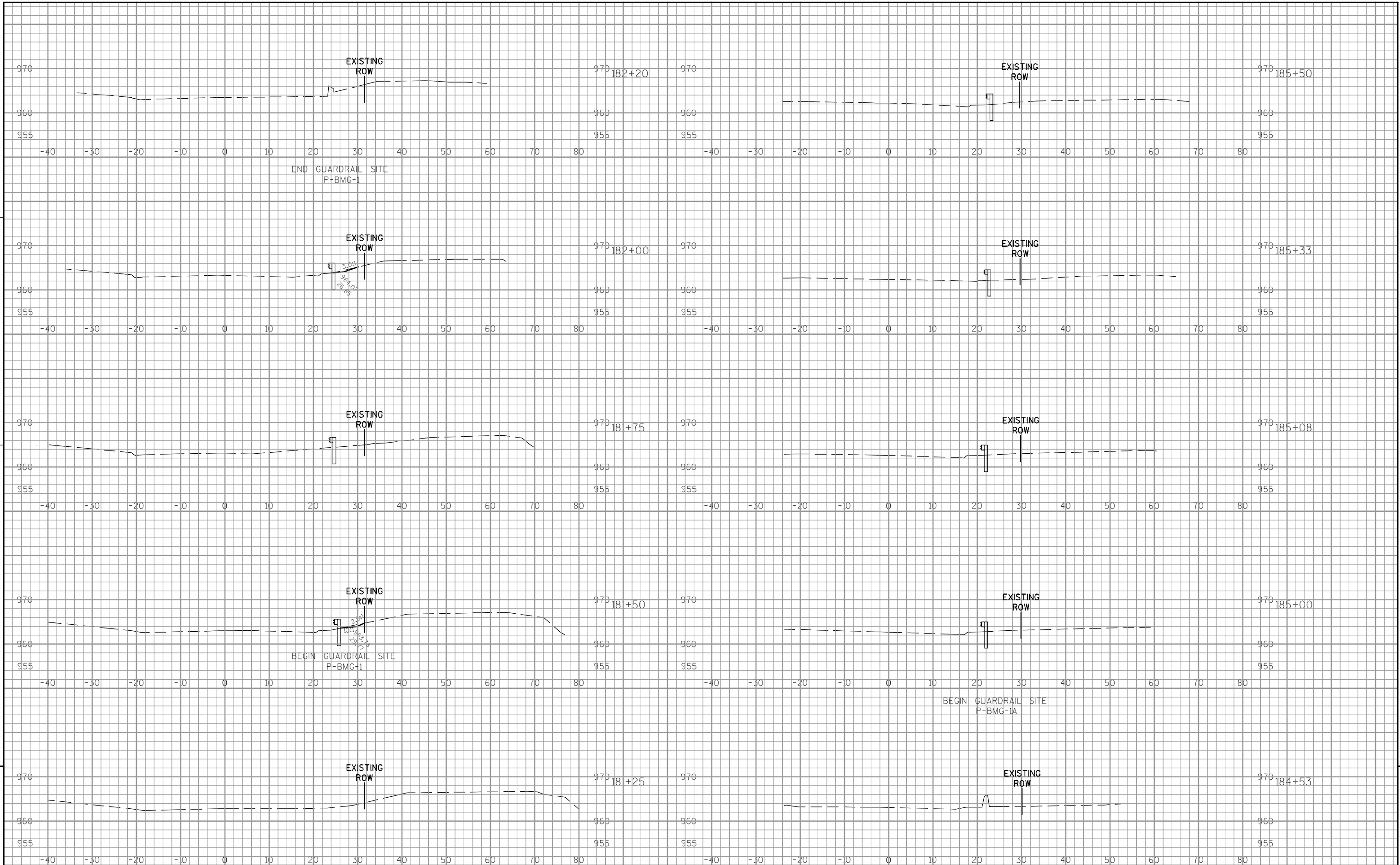


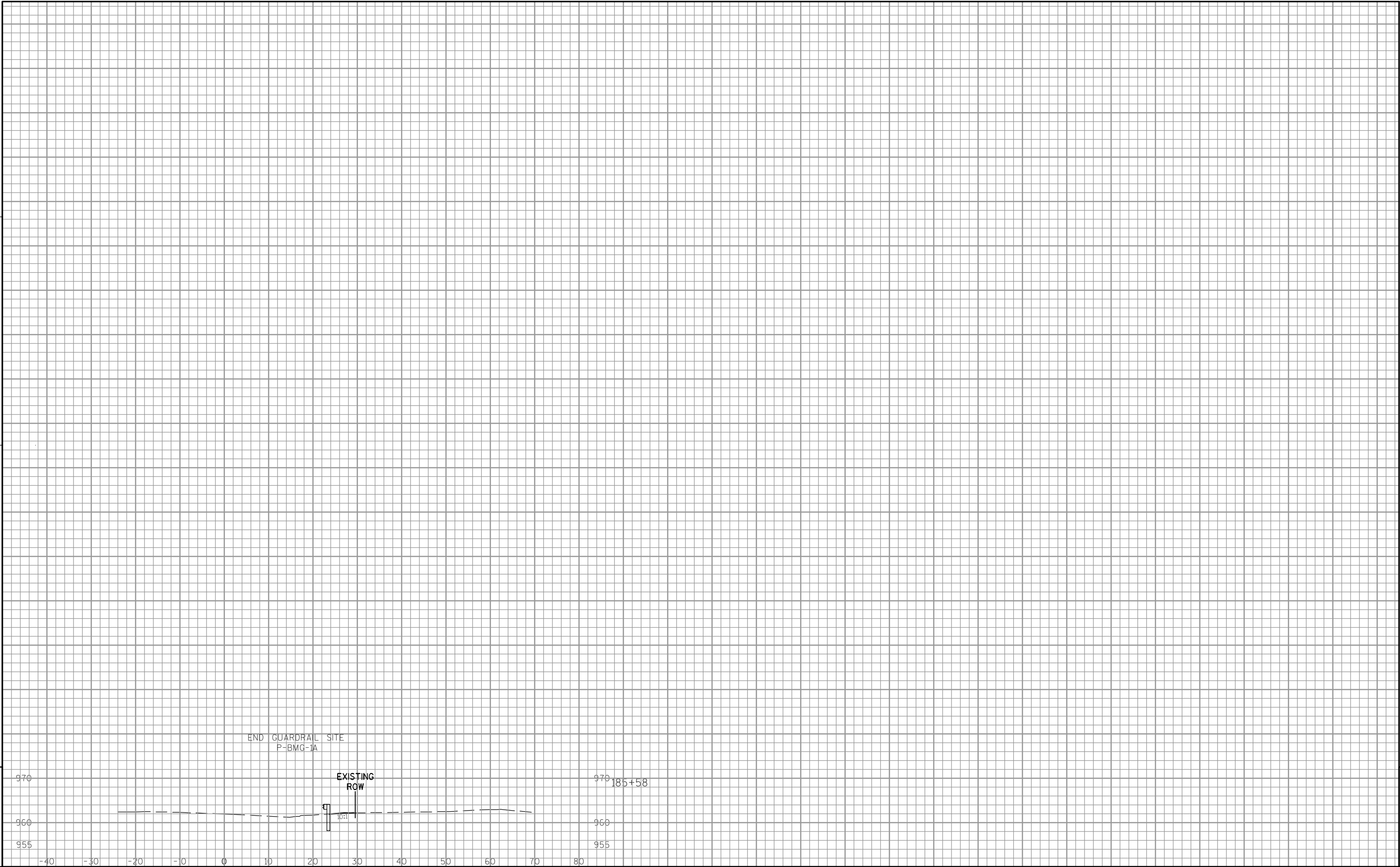








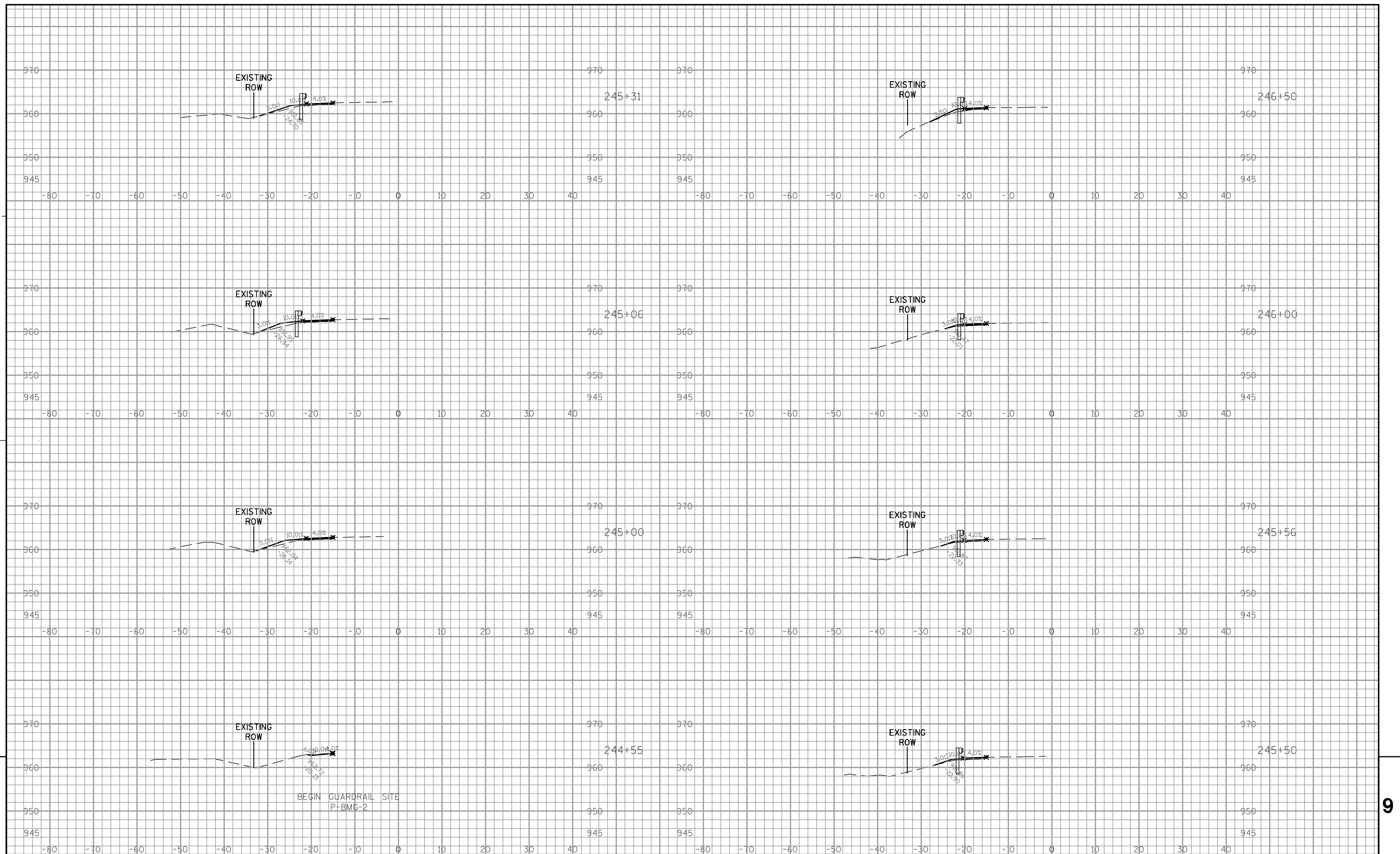


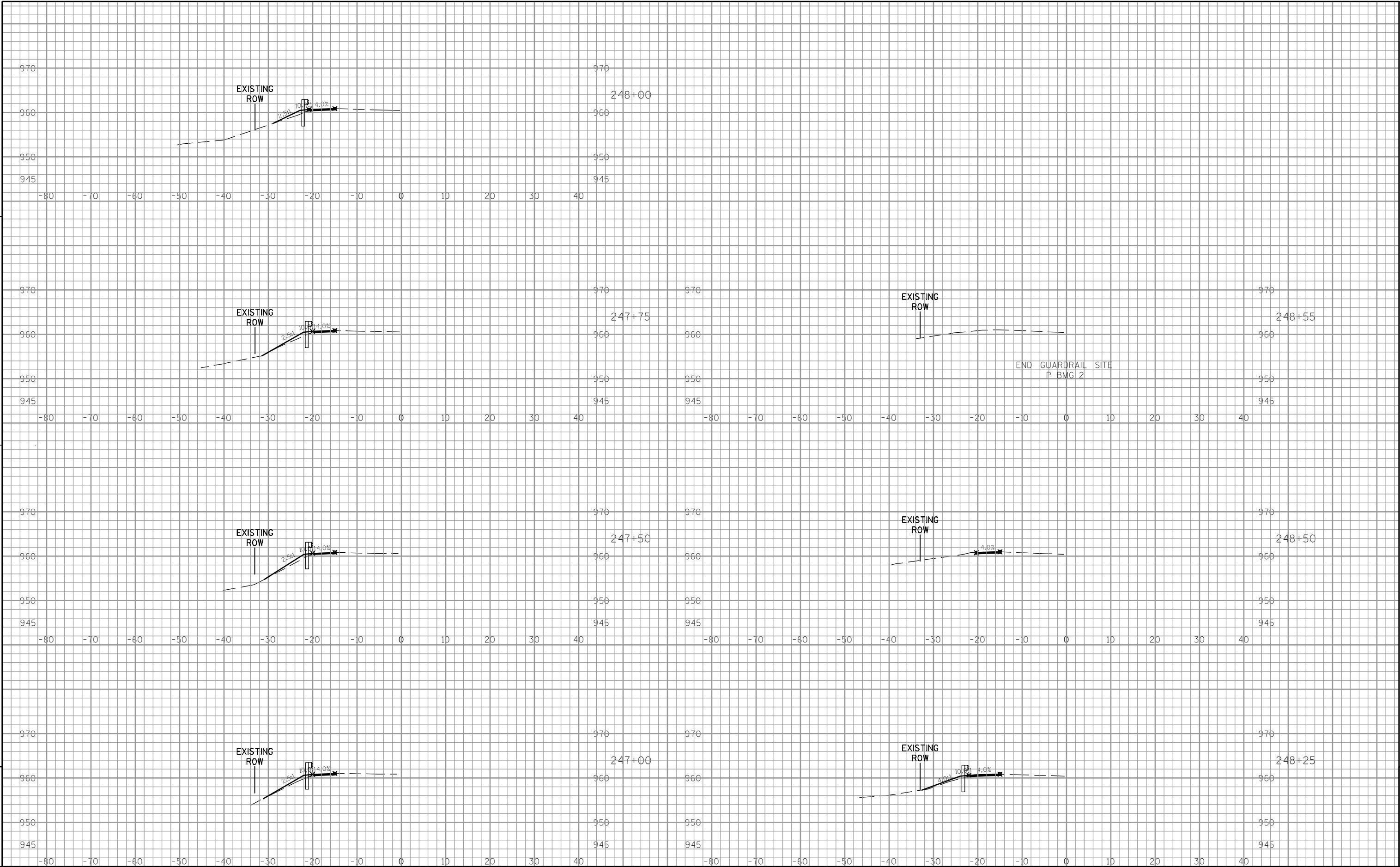


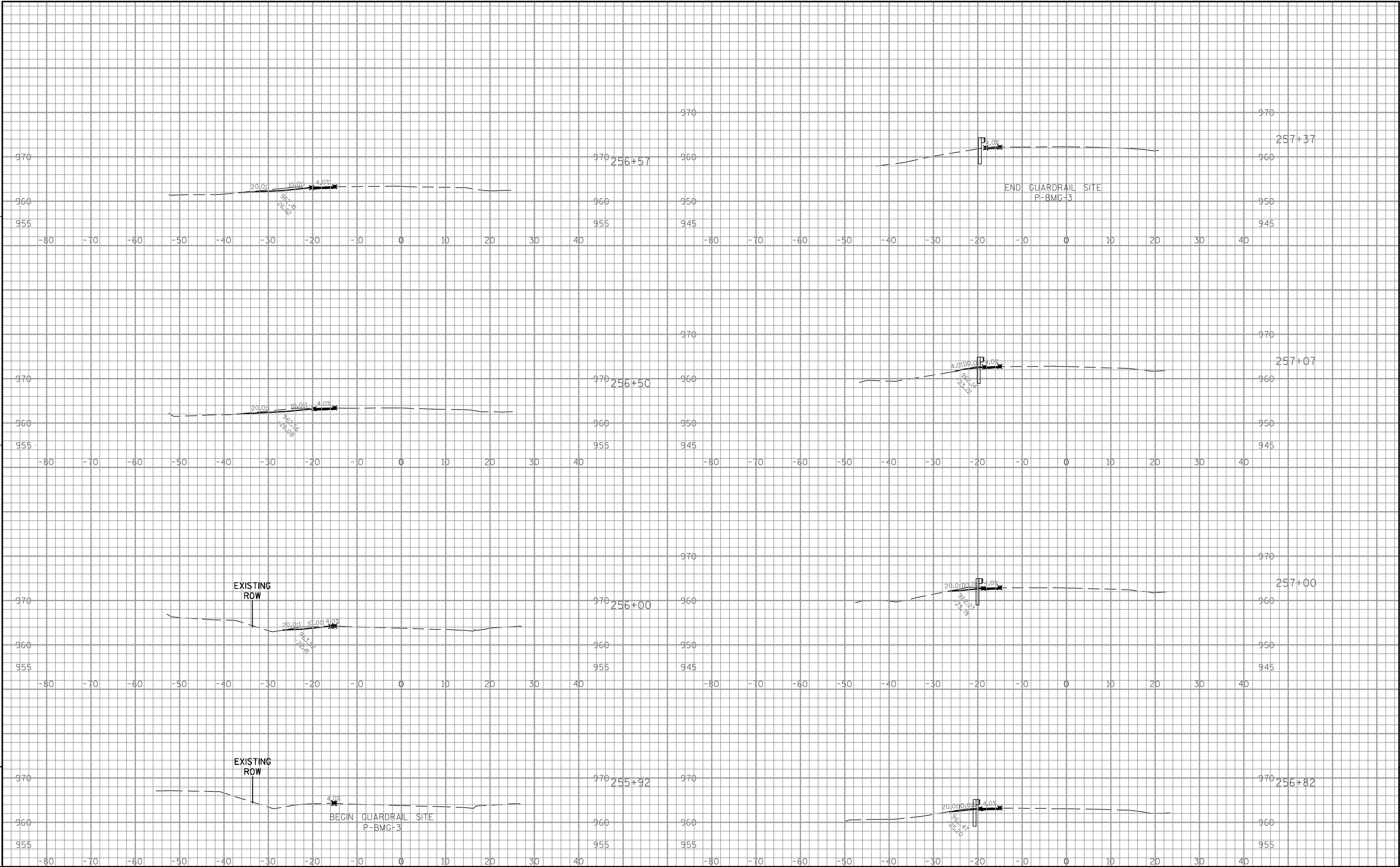
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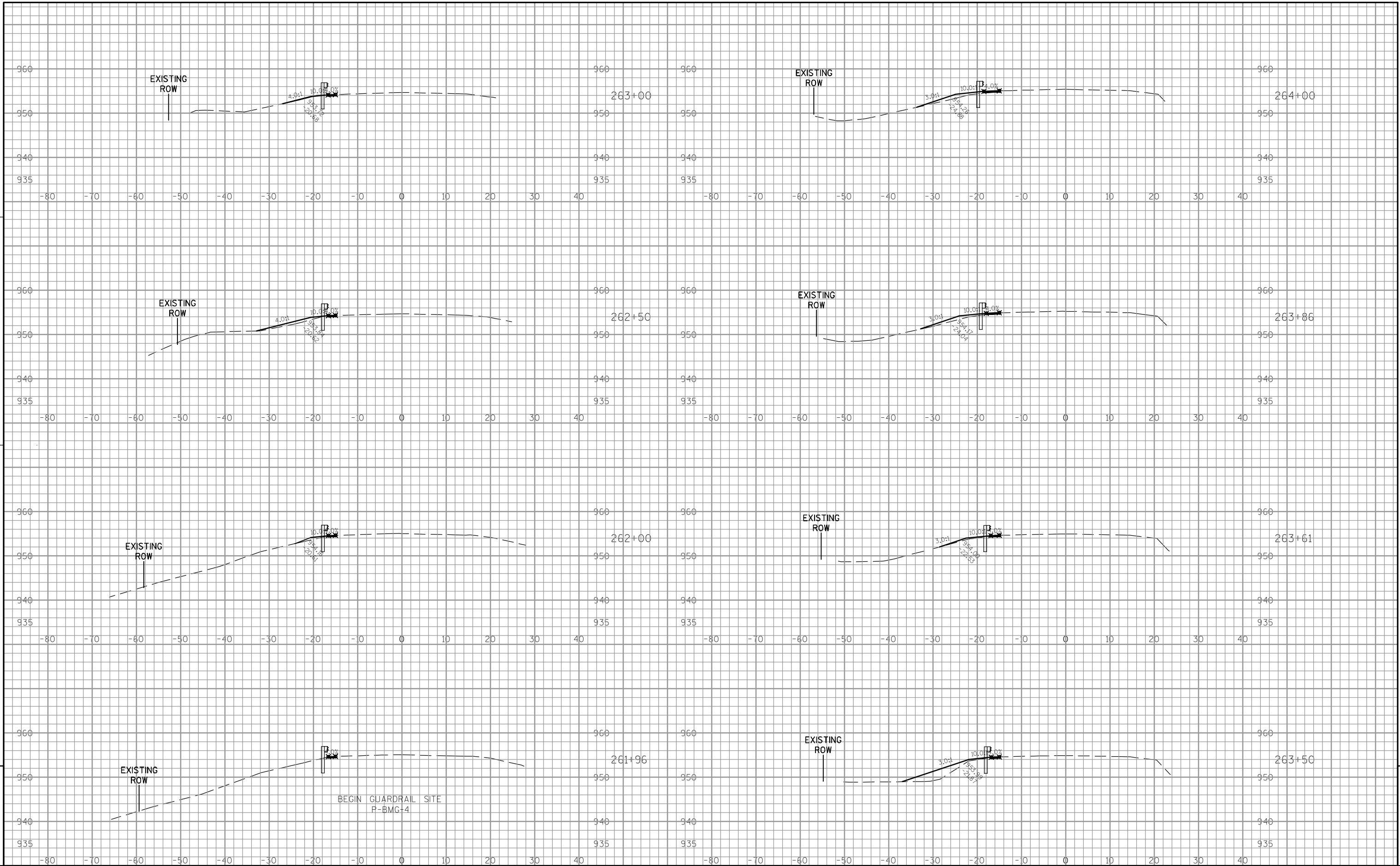
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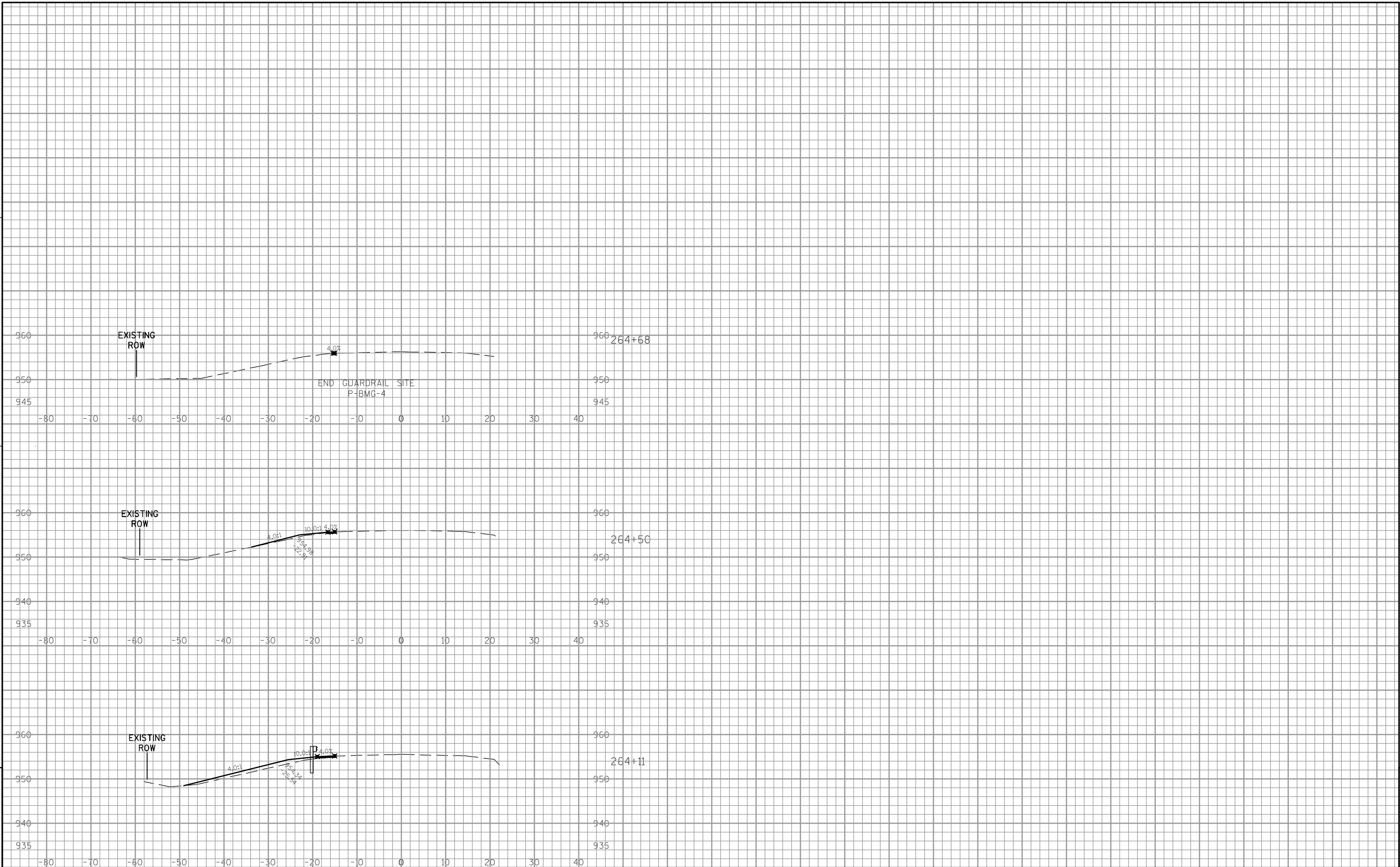
PROJECT NO:6207-03-71	HWY: CTH P	COUNTY: DODGE	CROSS SECTIONS	SHEET 175	E
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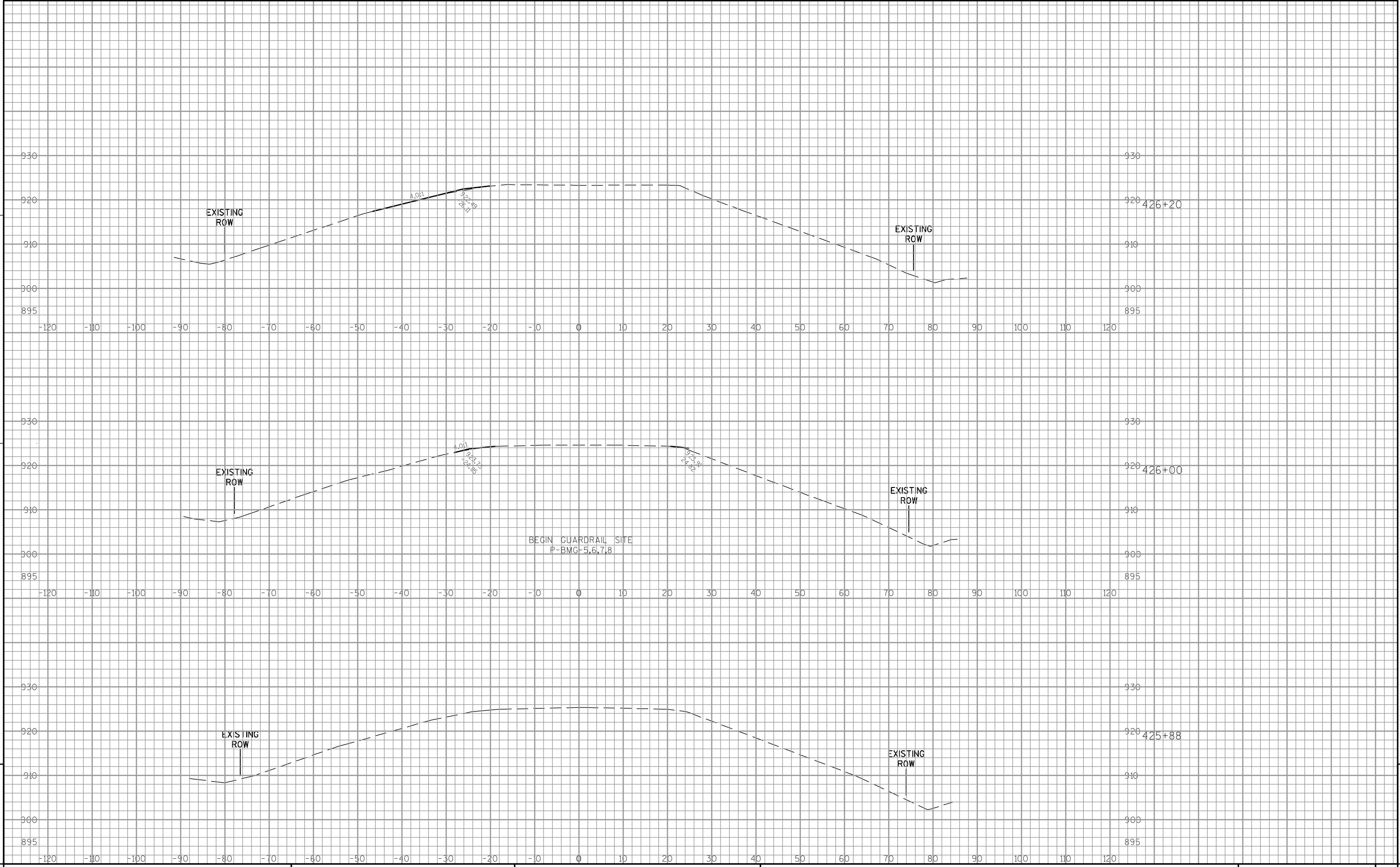






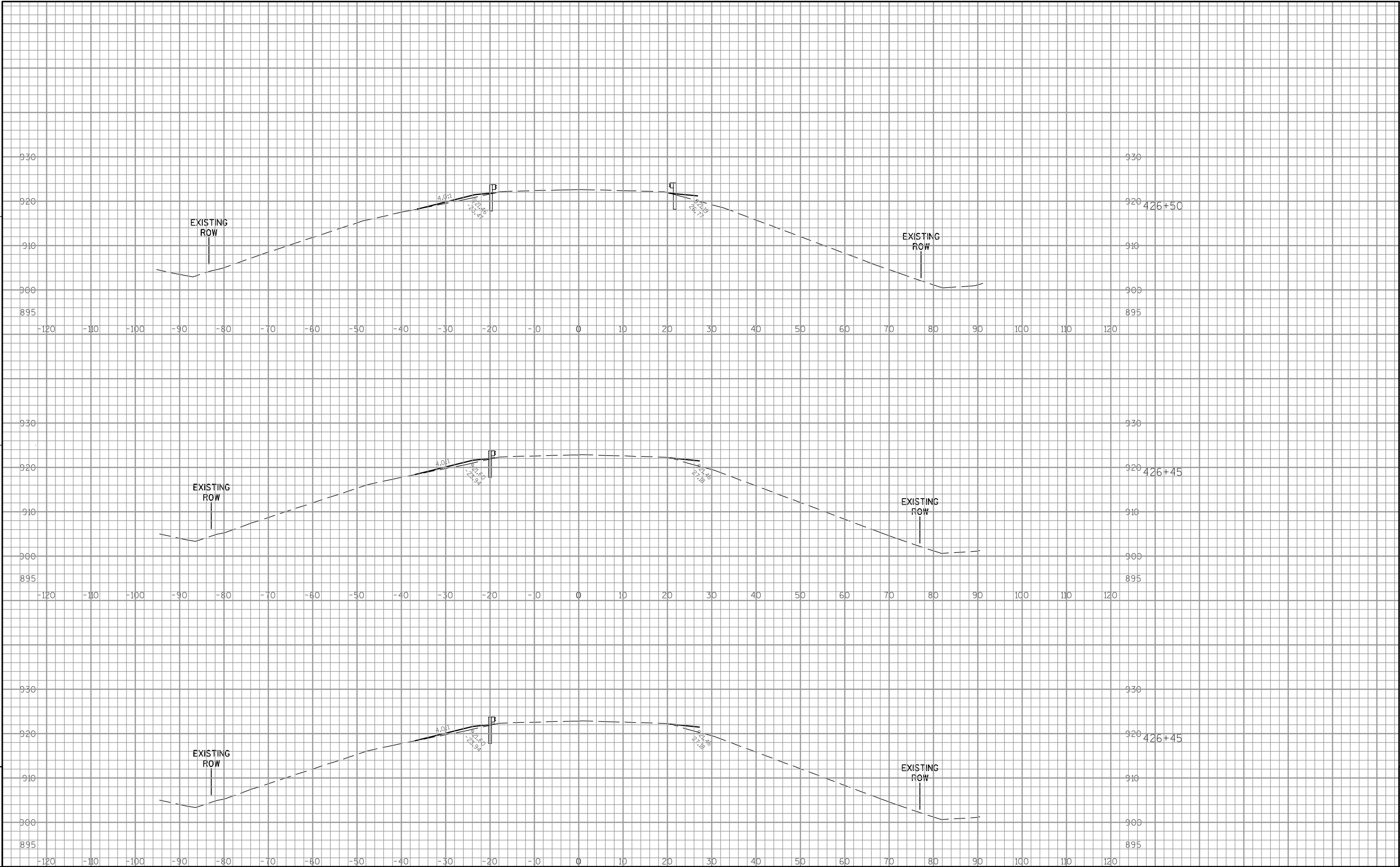


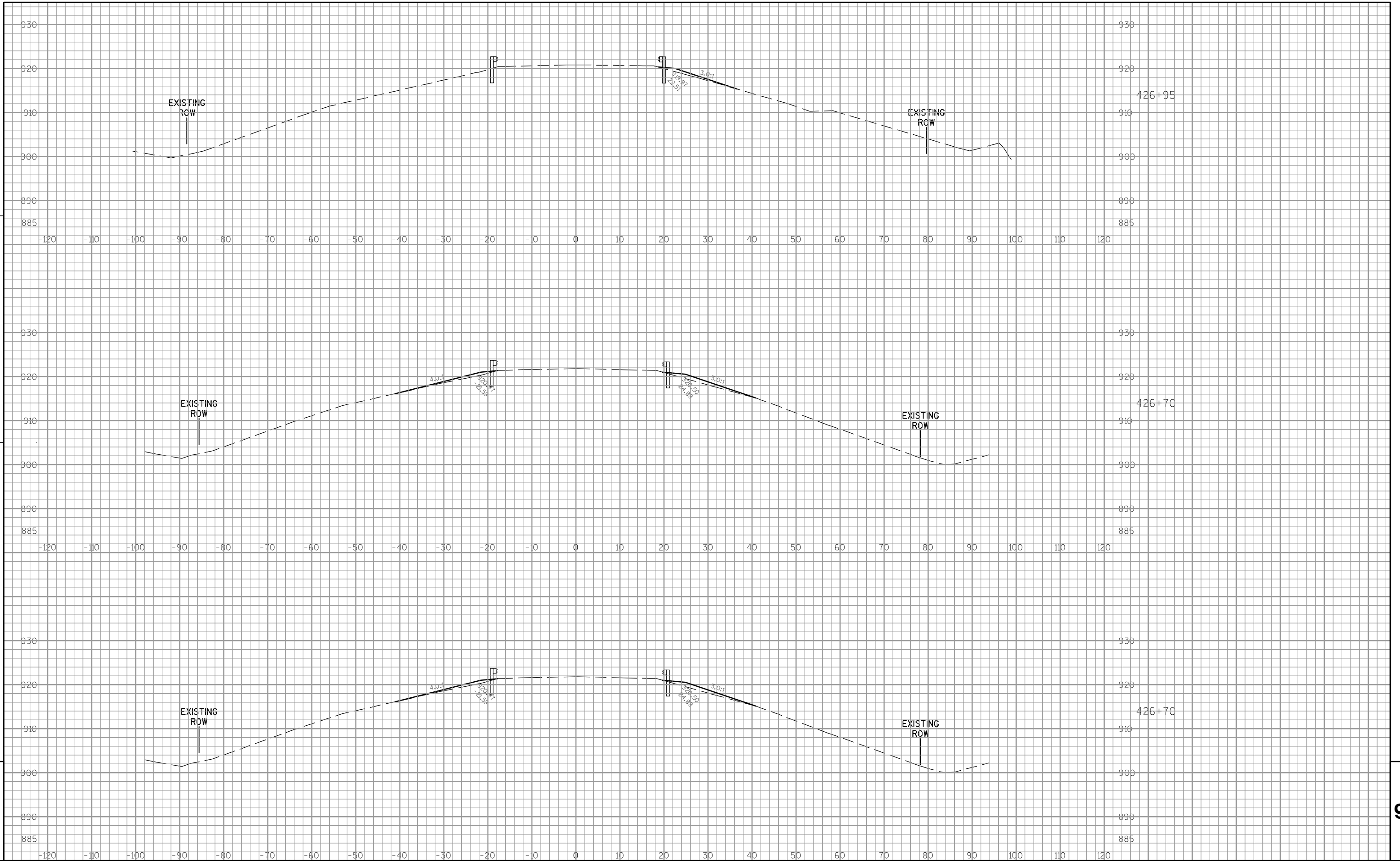


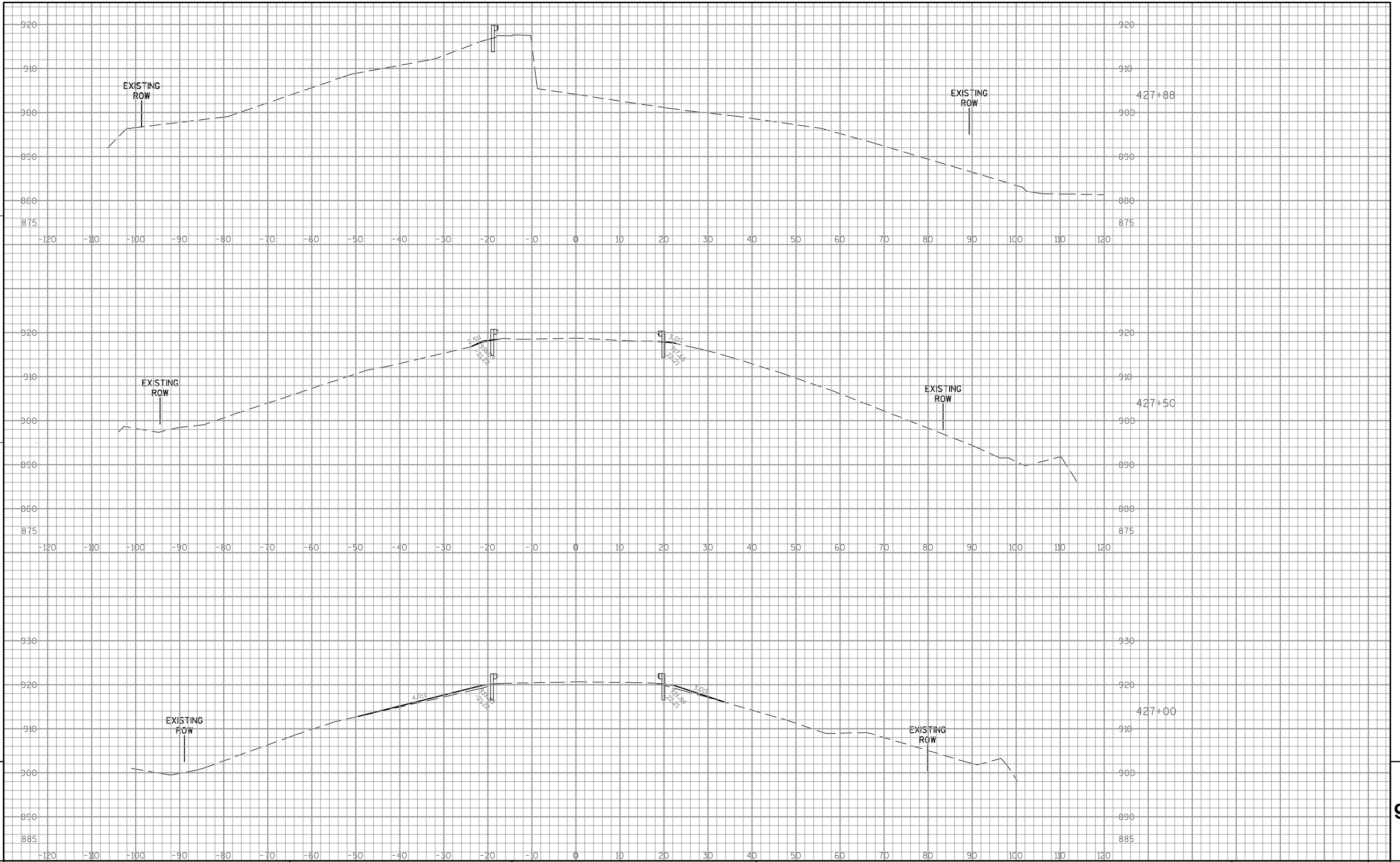


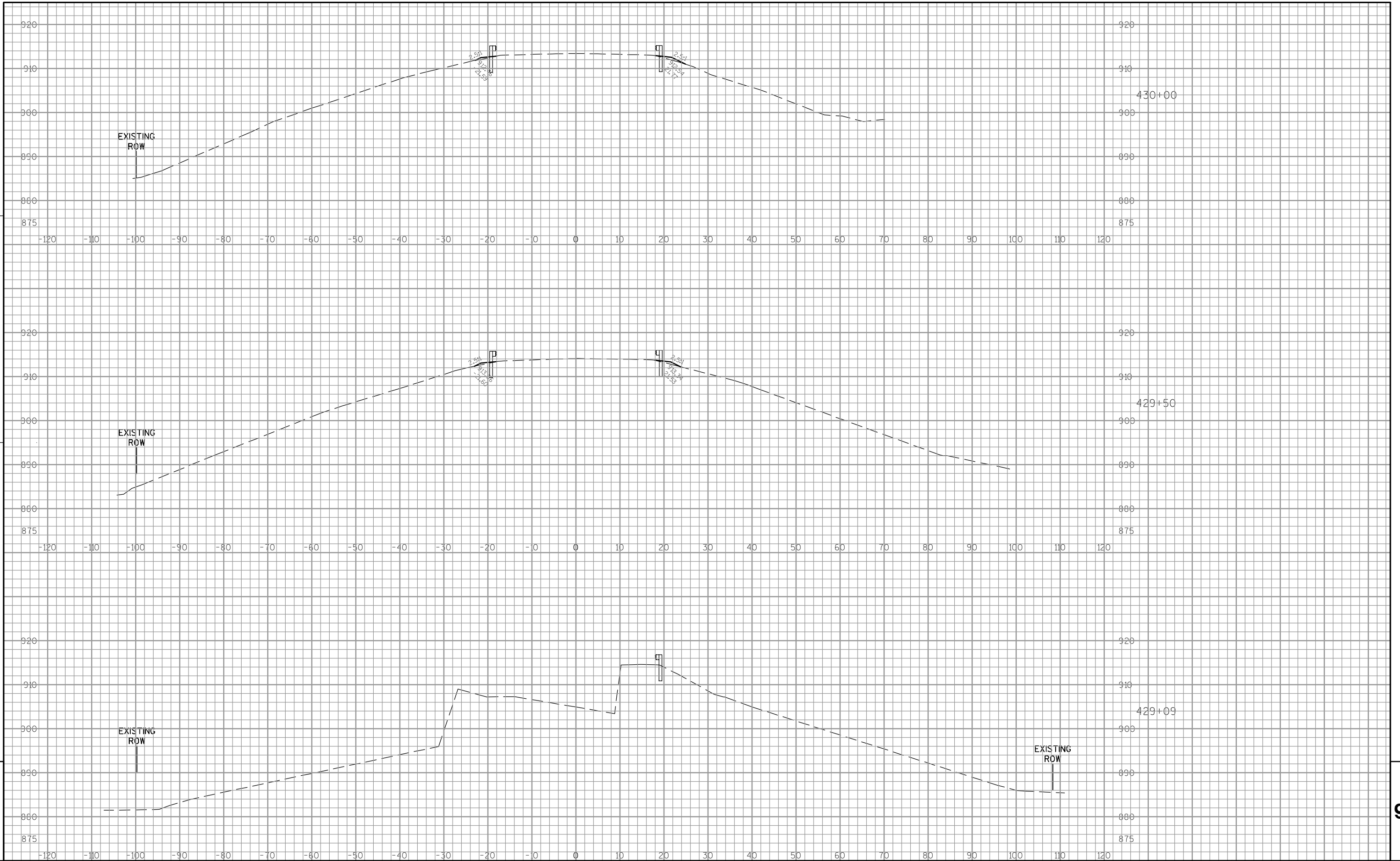
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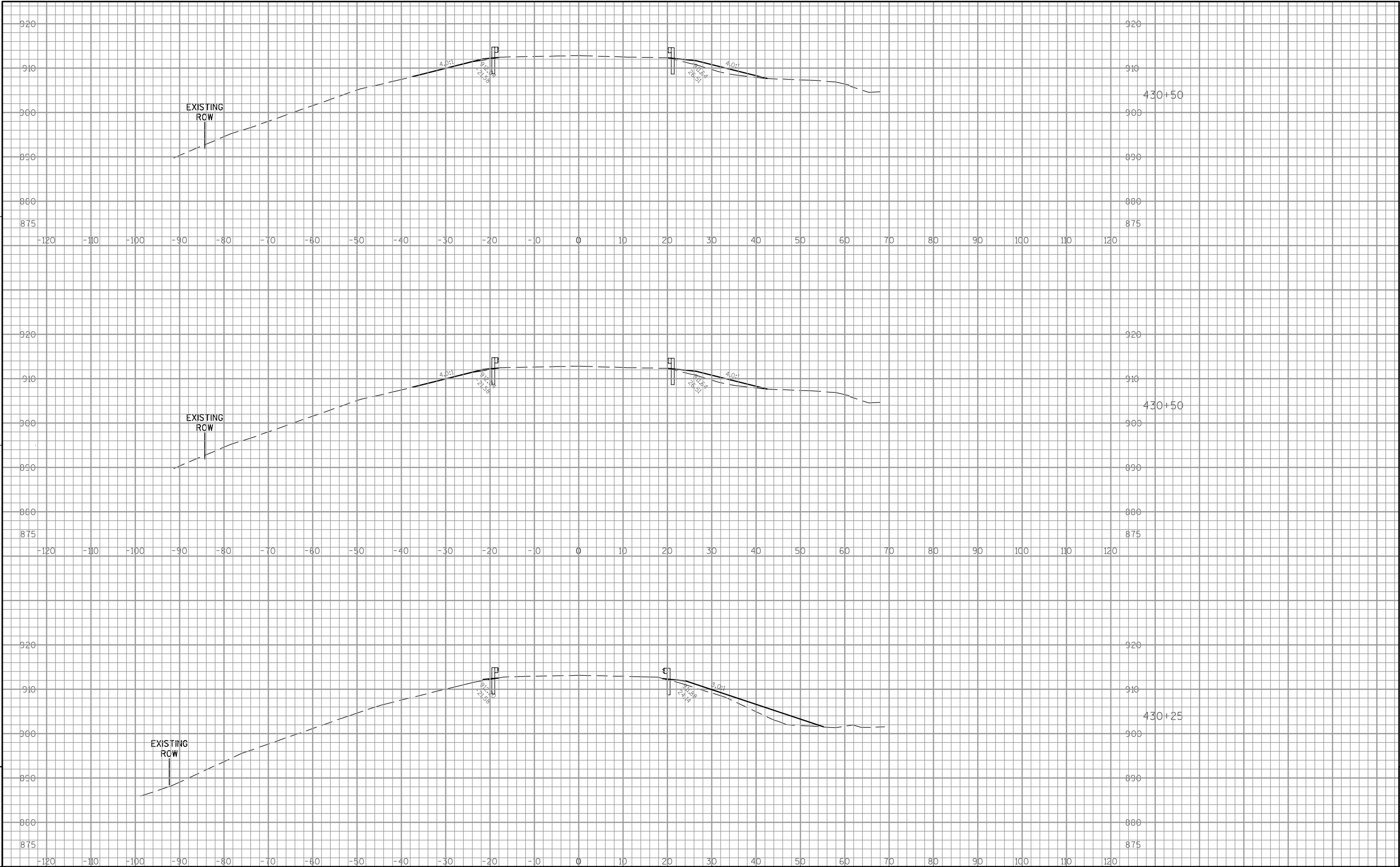
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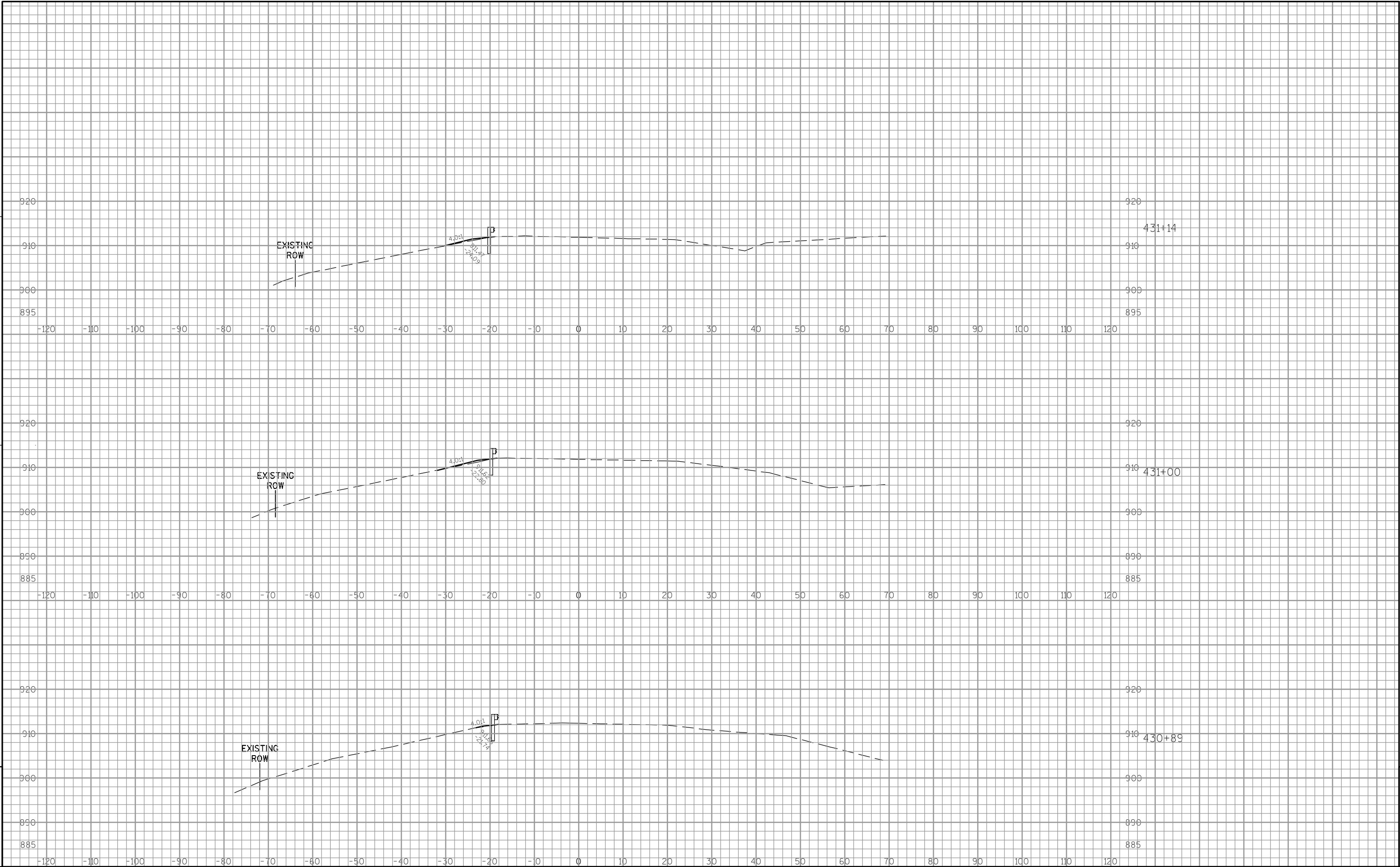


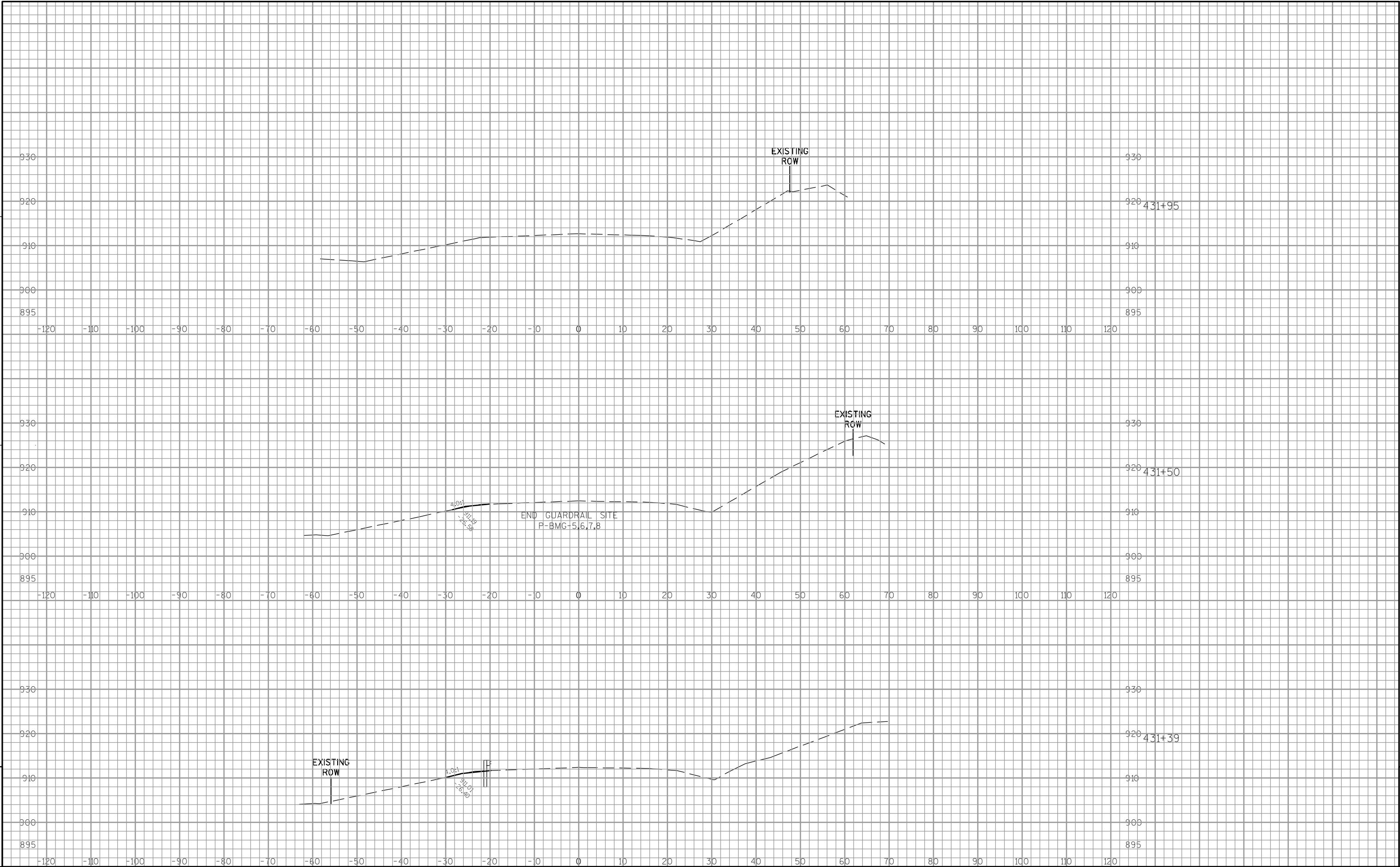


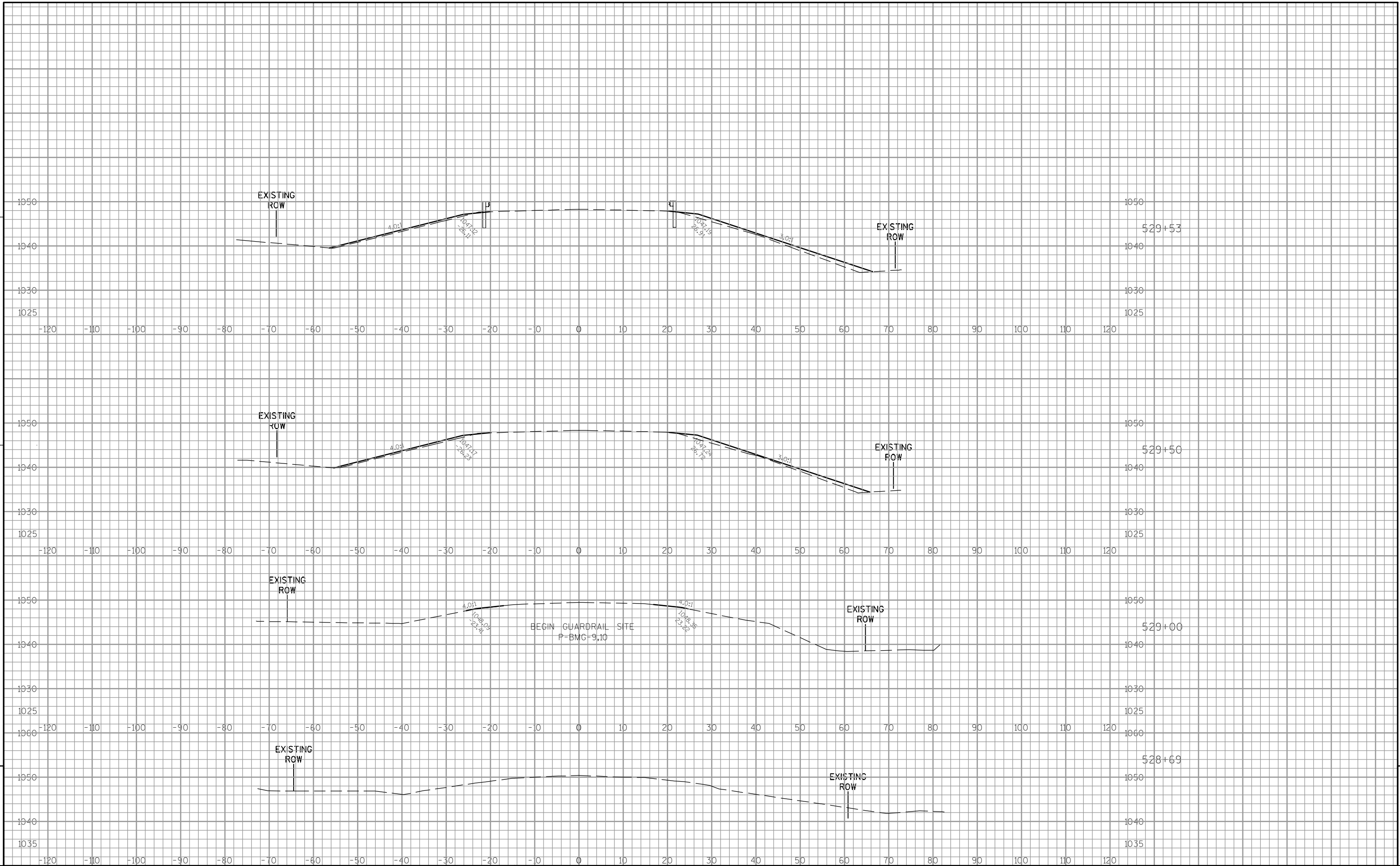


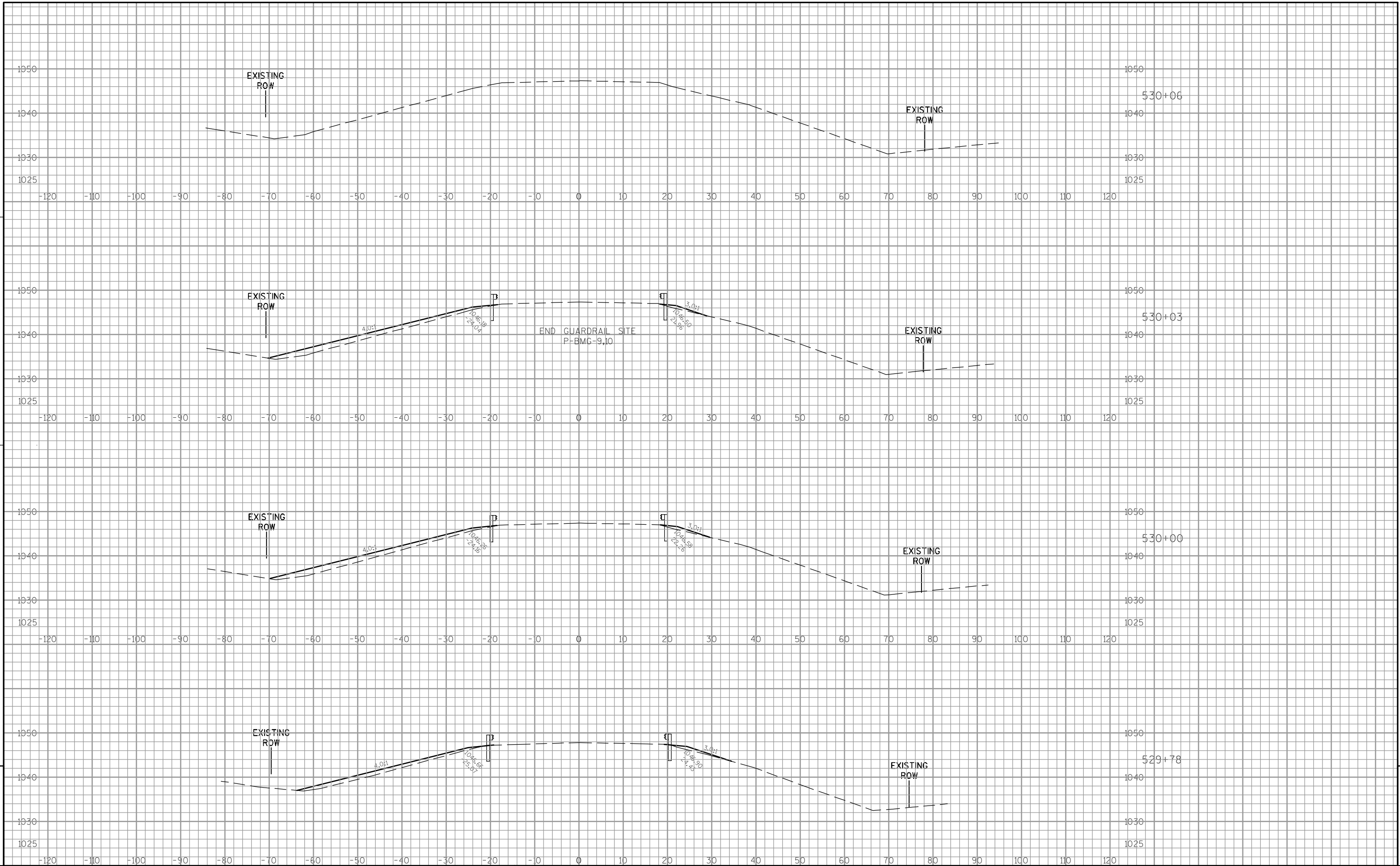
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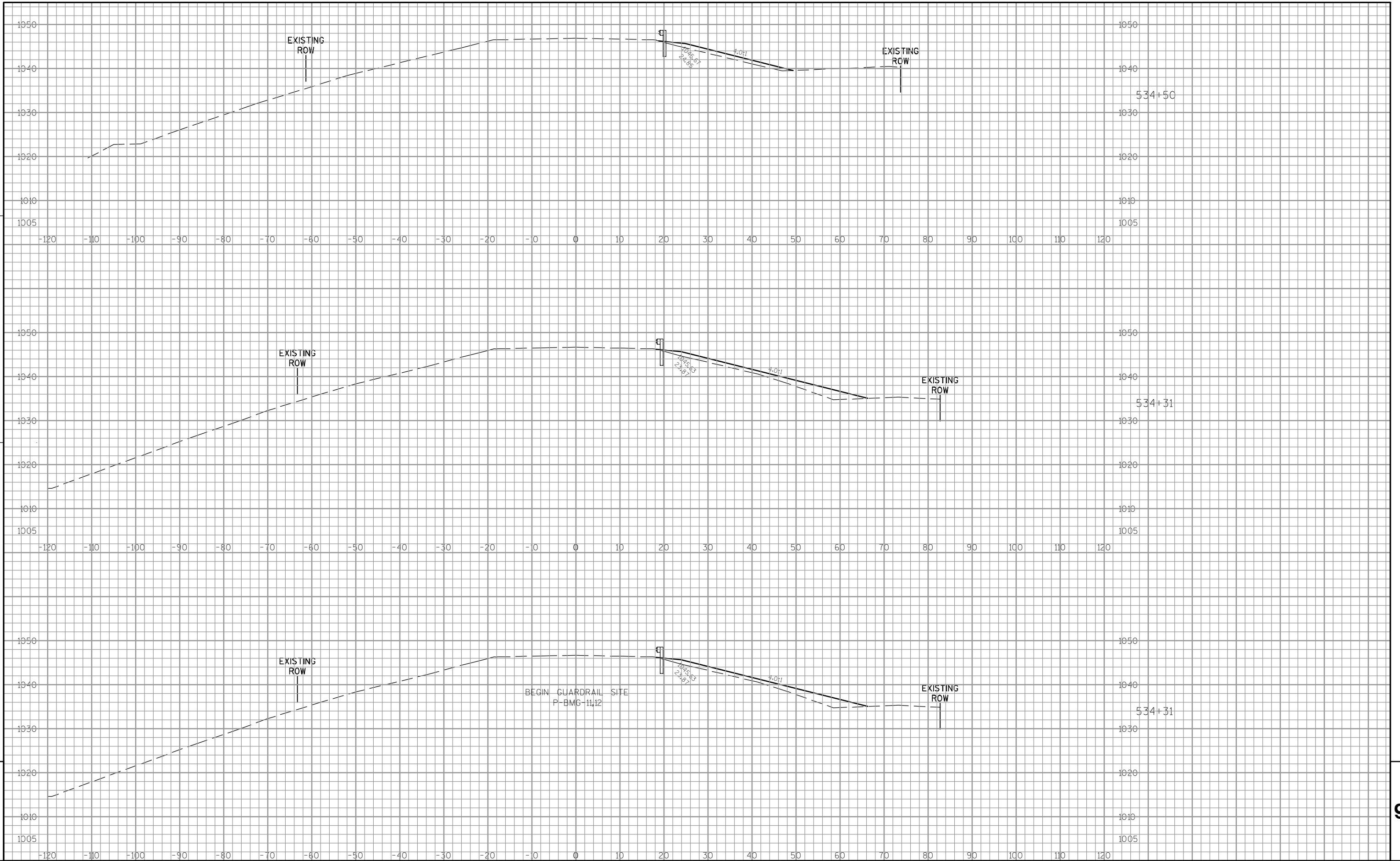
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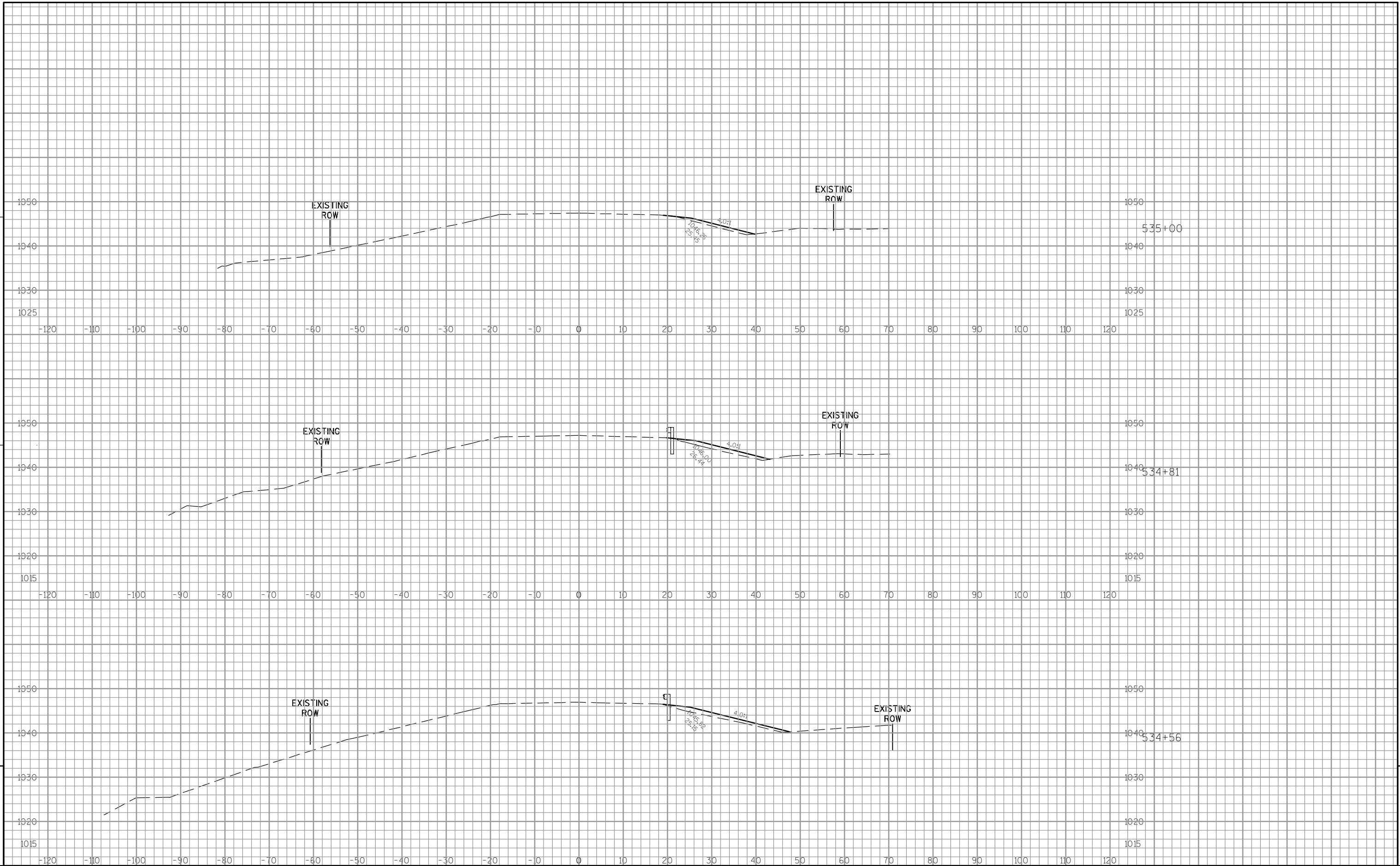


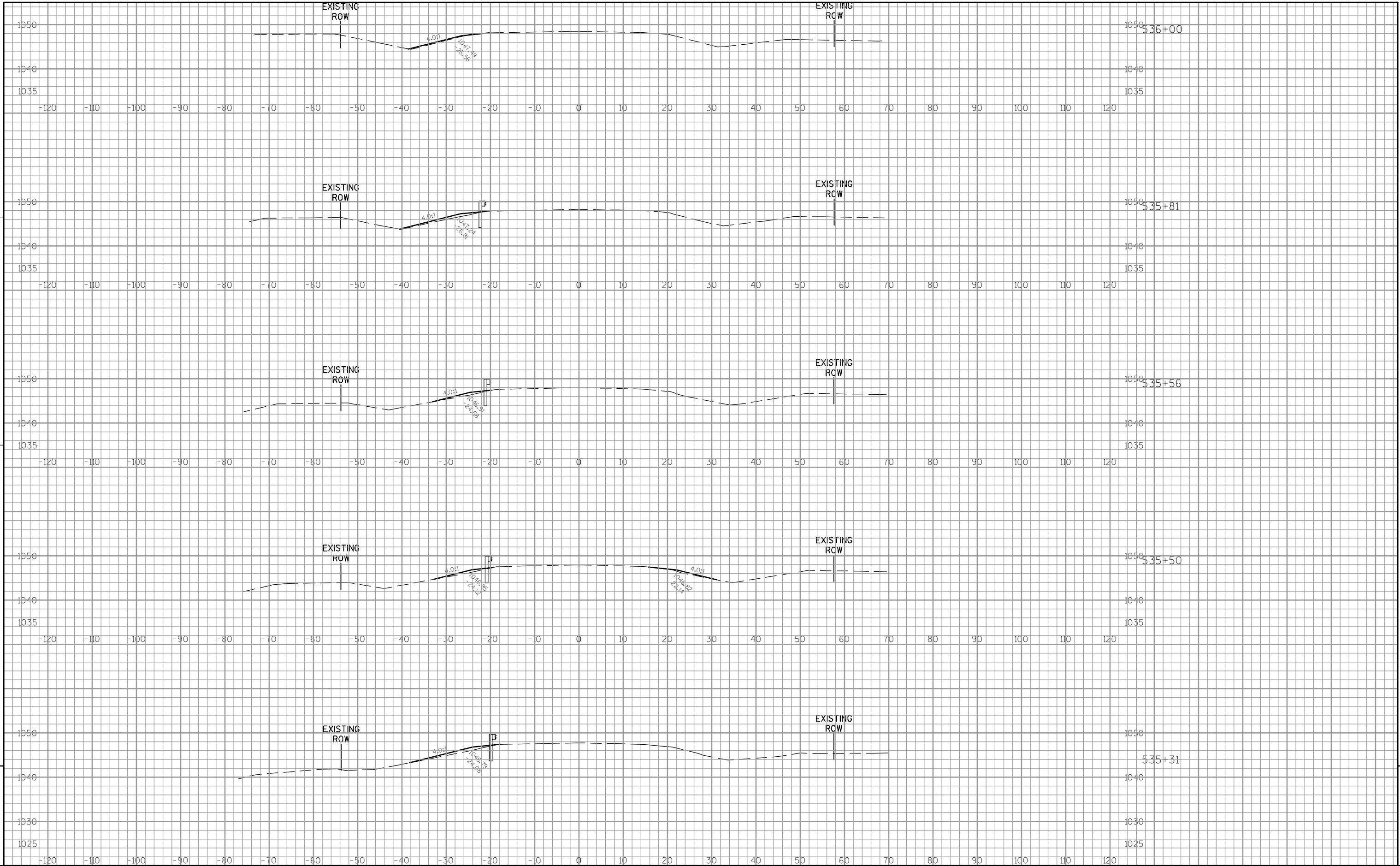


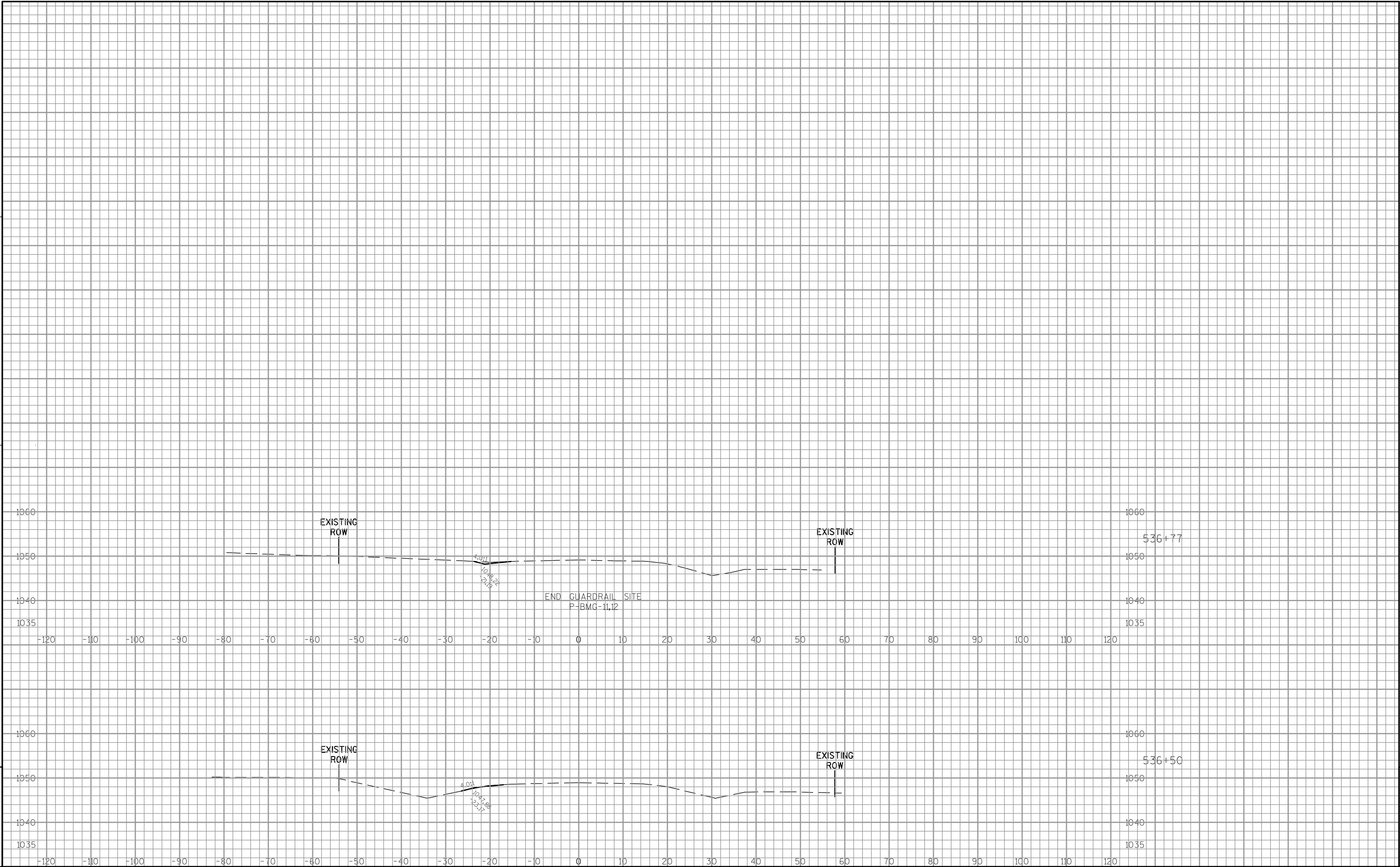




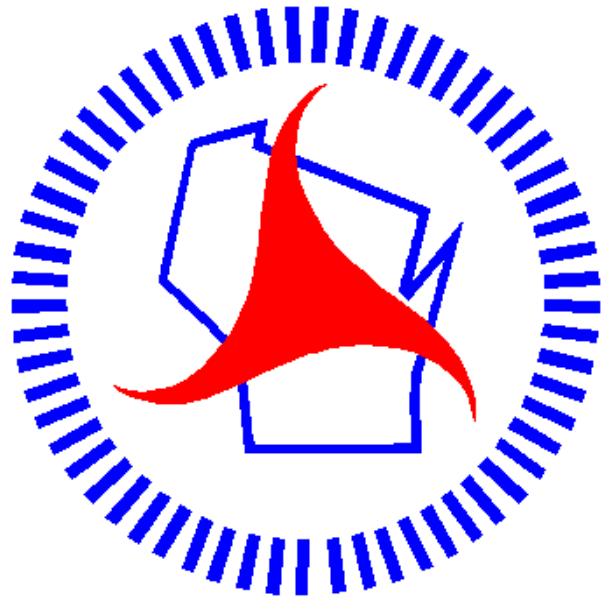








Notes



Wisconsin Department of Transportation

Dedicated people creating transportation solutions
through innovation and exceptional service.

<http://www.dot.wisconsin.gov>