

Information for File

Applicant: Eau Claire County Highway Department

Corps Contact: Sam Woboril

Address: 1314 Contractors Boulevard, Plover, Wisconsin 54467

E-Mail: samuel.j.woboril@usace.army.mil

Phone: (651) 290-5878

Primary County: Eau Claire

Project Location: Sections 6 and 7, T. 27N., R. 6W., Eau Claire County, Wisconsin. (See attached project location map.)

Information Complete On: January 29, 2015

Posting Expires On: April 2, 2015

Authorization Type

This application is being reviewed in accordance with the practices for documenting Corps jurisdiction under Sections 9 & 10 of the Rivers and Harbor Act of 1899 and Section 404 of the Clean Water Act identified in Regulatory Guidance Letter 07-01. We have made a preliminary determination that the aquatic resources that would be impacted by the proposed project are regulated by the Corps of Engineers under Section 404 of the Clean Water Act. Our jurisdictional review and final jurisdictional determination could result in modifications to the scope of the project's regulated waterbody/wetland impacts and compensatory mitigation requirements identified above. An approved jurisdictional determination will be made prior to reaching a permit decision, and will be posted on the St. Paul District web page at <http://www.mvp.usace.army.mil/>.

Project Description:

The Eau Claire County Highway Department proposes to reconstruct a 1 mile section of CTH X. The project would consist of replacing the pavement structure, grading the roadway to provide a minimum standard 10' safety section beyond the travelled way, stabilize the embankment, and upgrade the beam guard at the bridge to current MGS guardrail standards with Energy Absorbing Terminals.

The pavement on the existing roadway exhibits signs of fatigue and distress and ultimately needs to be replaced. The roadway cross section is narrow and does not provide an adequate slope along the road to permit safe recovery in run-off-road situations. The beam guard on the approach at the existing bridge is substandard, using unsafe buried terminals. Embankment erosion along the adjacent roadway is also causing the loss of the roadway. The purpose of this project would be to improve substandard roadway conditions and improve vehicular safety travel along this portion of CTH X.

Impacts to Waters of the U.S.

The proposed project would result in the discharge of fill material into 0.98 acres of wetlands. The wetland types that would be impacted consist of the following: 0.17 acres of shallow open water, 0.06 acres of fresh wet meadow, and 0.75 acres of hardwood/coniferous forested wetlands.

Alternatives Considered:

The following alternatives were explored:

Alternative 1 – Do Nothing: This alternative would not result in any impacts to wetlands, however, this alternative does not address the current roadway concerns, including the deteriorated pavement and the substandard safety requirements. If improvements are not made to rehabilitate the existing pavement structure, the pavement will ultimately continue to deteriorate leading to a total reconstruct. This alternative would not meet the basic project purpose and need of the proposed project and is not the preferred alternative.

Alternative 2 – Pavement Replacement Only: This alternative would not result in any impacts to wetlands however, this alternative does not improve the roadway to at least the minimum standards for safety which would ultimately result in increased risk of property damage or injury in the event of a vehicle crash. This alternative would not address the current concerns regarding the deteriorating roadway, and would fail to prevent sediment materials from depositing into the wetlands due to the current erosion concerns. This alternative would cost approximately \$300,000. This alternative would provide a new pavement structure on the roadway however this project does not meet any of the project goals regarding safety improvements and therefore is not the preferred alternative.

Alternative 3 – Minimal Reconstruction: This alternative would result in 0.98 acres of wetland impacts primarily to a combination of shallow open water, fresh wet meadow, and forested wetland types. Reductions in wetland impacts associated with this alternative would be achieved by reducing the roadway width, reducing the safety section width, and increasing the roadway slopes. This alternative would cost approximately \$800,000 for the removal and replacement of the pavement, widening of the side slopes to provide a safety section, and replacing the substandard beam guard. This alternative does not have any logistical reasons that would prevent the implementation of the project. Although this alternative would meet all of the project goals regarding safety improvements and roadway improvements, it would be at a minimal level. This is the applicants preferred alternative as it results in the least environmentally damaging wetland impacts while still meeting the project goals.

Alternative 4 – Full Reconstruction: This alternative would impact approximately 2-3 acres of wetlands. Wetland impact minimization would be achieved by careful attention to the vertical geometry of the roadway and by utilizing the maximum standard slopes outside of the safety section. This alternative would cost approximately \$1,200,000 for grading the roadway and installing a new pavement structure. This alternative provides the best finished product from a usability and safety standpoint and presents no logical reasons for impracticality other than the significantly increased cost and need for additional real estate. This alternative would result in significant impacts to the adjacent tributary to Alder Creek as it would require the realignment of the entire 2500 feet of waterway in the adjacent ditch/channel. Based on these factors, this alternative would meet all of the project goals regarding safety improvements and roadway improvements, but it would also result in a significantly greater amount of impacts to wetlands. Therefore, this alternative is not preferred by the applicant.

Federally Listed Threatened and Endangered Species:

According to the USFWS Midwest Region website, which was reviewed on February 27, 2015, the Gray wolf (endangered), the Northern long-eared bat (proposed as endangered), the Sheepnose (endangered), and the Karner blue butterfly (endangered) are found in Eau Claire County, Wisconsin.

Historic Properties:

A search of the Wisconsin Historical Society Database was conducted on February 27, 2015, and no historic properties were found within or in close proximity to the proposed project location.

Mitigation:

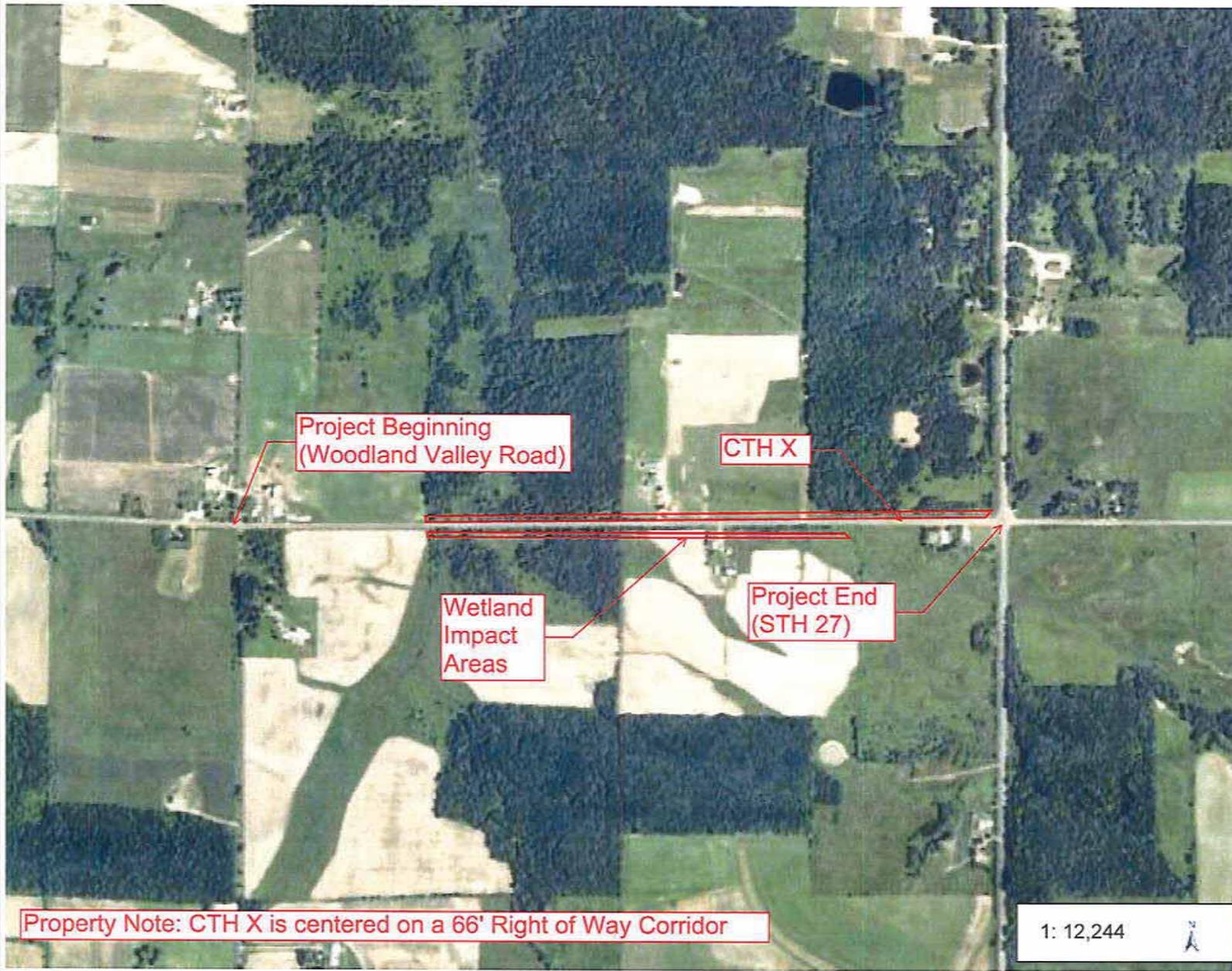
At the time of this public notice the applicant has stated that they are currently planning to utilize the Wisconsin In-Lieu Fee program to mitigate for impacts to 0.98 acres of wetlands associated with this project. The applicant's final mitigation proposal would be required to satisfy the 2008 Mitigation Rule and the Guidelines for Wetland Compensatory Mitigation in Wisconsin.

Drawings

See attached MVP-2015-00298-SJW, Page 1 of 51 through Page 51 of 51



ECCHD Project 53312-794, CTH X



Legend

Air Photo Index (2008 NAIP)

1: 12,244



Notes

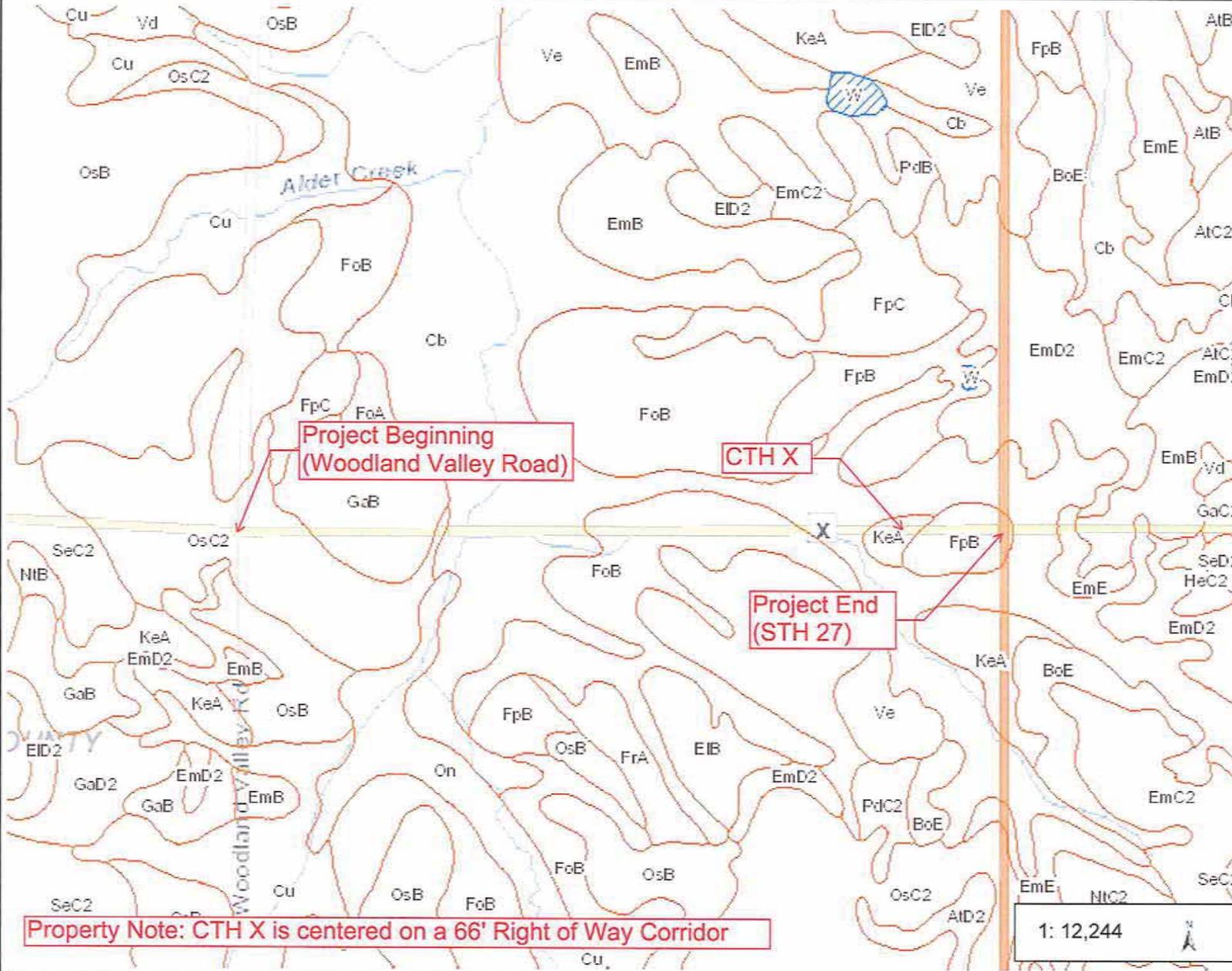
0.4 0 0.19 0.4 Miles

NAD_1983_HARN_Wisconsin_TM
© Latitude Geographics Group Ltd.

DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: <http://dnr.wi.gov/org/legal/>



ECCHD Project 53312-794, CTH X



Legend

- NRCS Wisconsin Soils
- Soil Mapping Unit
- Water
- Rivers and Streams
- Open Water

Notes

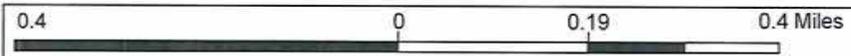
Project Beginning (Woodland Valley Road)

CTH X

Project End (STH 27)

Property Note: CTH X is centered on a 66' Right of Way Corridor

1: 12,244



NAD_1983_HARN_Wisconsin_TM
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PROJECT ID: 53312-794

COUNTY: EAU CLAIRE

ORDER OF SHEETS

- Section No. 1 Title
- Section No. 2 Typical Sections and Details
- 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 =



EAU CLAIRE COUNTY HIGHWAY DEPARTMENT

PLAN OF PROPOSED IMPROVEMENT

CTH X WOODLAND VALLEY ROAD - STH 27 TOWN OF LUDINGTON EAU CLAIRE

COUNTY PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
53312-794		

COUNTY PROJECT NUMBER
53312-794

DESIGN DESIGNATION

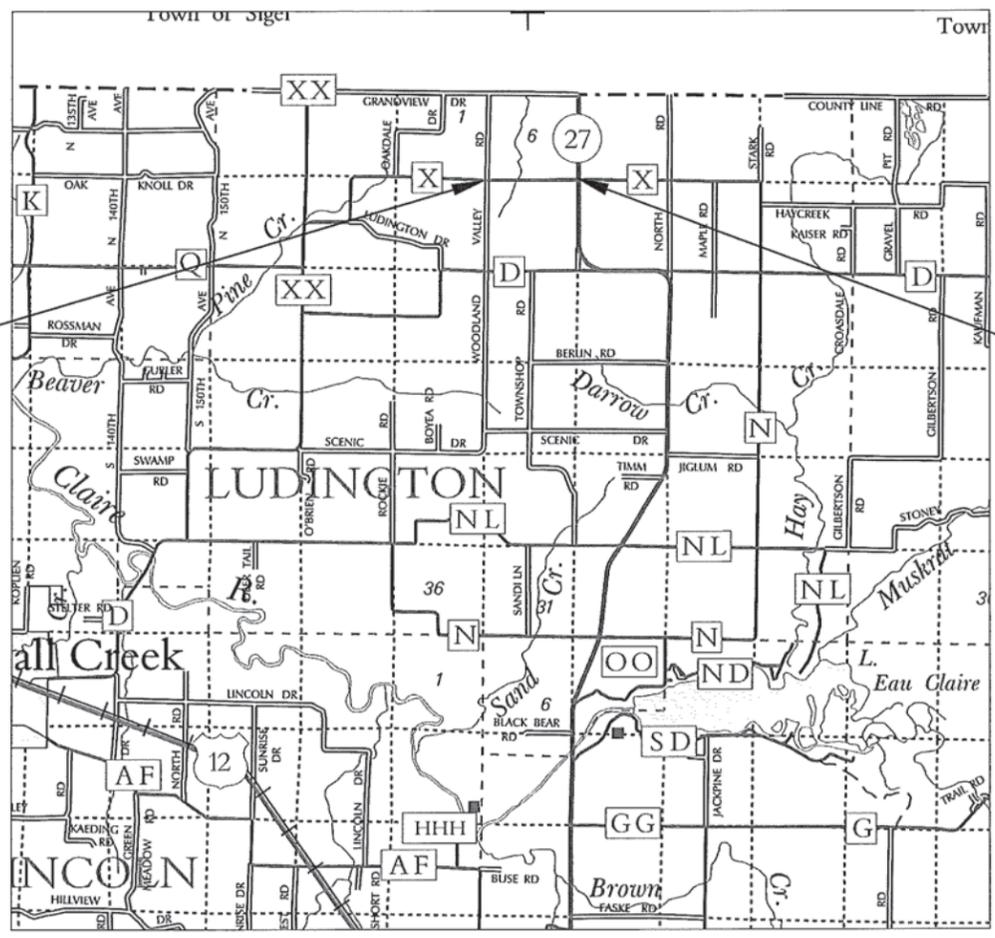
- A.A.D.T. 2015 = 130
- A.A.D.T. 2035 = 160
- D.H.V. =
- D.D. = 62/38
- T. = 5%
- DESIGN SPEED = 55 MPH
- ESALS =
- ROAD CLASS =

CONVENTIONAL SYMBOLS

PLAN		PROFILE	
CORPORATE LIMITS		GRADE LINE	
PROPERTY LINE		ORIGINAL GROUND	
LOT LINE		MARSH OR ROCK PROFILE (To be noted as such)	
LIMITED HIGHWAY EASEMENT		SPECIAL DITCH	
EXISTING RIGHT OF WAY		GRADE ELEVATION	
PROPOSED OR NEW R/W LINE		CULVERT (Profile View)	
SLOPE INTERCEPT		UTILITIES	
REFERENCE LINE		ELECTRIC	
EXISTING CULVERT		FIBER OPTIC	
PROPOSED CULVERT (Box or Pipe)		GAS	
COMBUSTIBLE FLUIDS		SANITARY SEWER	
MARSH AREA		STORM SEWER	
WOODED OR SHRUB AREA		TELEPHONE	
		WATER	
		UTILITY PEDESTAL	
		POWER POLE	
		TELEPHONE POLE	

BEGIN PROJECT
STA. 98+50

END PROJECT
STA. 151+15



LAYOUT
SCALE 0 2 MILES

TOTAL NET LENGTH OF CENTERLINE = 1.00

HORIZONTAL POSITIONS SHOWN ON THIS PLAN ARE WISCONSIN COUNTY COORDINATES, EAU CLAIRE COUNTY, NAD83 (YEAR), IN U.S. SURVEY FEET. VALUES ARE GRID COORDINATES, GRID BEARINGS, AND GRID DISTANCES. GRID DISTANCES MAY BE USED AS GROUND DISTANCES.

EAU CLAIRE COUNTY
HIGHWAY DEPARTMENT

PREPARED BY	
Surveyor	ECCHD
Designer	FAA ENGINEERS
Project Manager	CEDAR CORP.
Regional Examiner	N/A
Regional Supervisor	N/A

APPROVED FOR THE DEPARTMENT
DATE: _____ (Signature)

E

STANDARD ABBREVIATIONS

ABUT	ABUTMENT	LT	LEFT
AC	ACRE	LN	LANE
AGG	AGGREGATE	LS	LUMP SUM
ASPH	ASPHALTIC	LT	LEFT
AVG	AVERAGE	MAX	MAXIMUM
ADT	AVERAGE DAILY TRAFFIC	MH	MANHOLE
BAH	BEARING AHEAD	MIN	MINIMUM
BBK	BEARING BACK	MI	MILE
BF	BACK FACE	ML	MAINLINE
BM	BENCH MARK	N	NORTH
BR	BRIDGE	NC	NORMAL CROWN
C/L	CENTER LINE	NO	NUMBER
Δ	CENTRAL ANGLE OR DELTA	NOR	NORMAL
CE	COMMERCIAL ENTRANCE	OBLIT	OBLITERATE
CMP	CORRIGATED METAL PIPE	PAVT	PAVEMENT
CONC	CONCRETE	PC	POINT OF CURVATURE
CP	CULVERT PIPE	PE	PRIVATE ENTRANCE
CP	CONTROL POINT	PI	POINT OF INTERSECTION
CPCP	CULVERT PIPE CORRUGATED POLYETHYLENE	POB	POINT OF BEGINNING
CPRCHE	CULVERT PIPE REINFORCED CONCRETE HORIZONTAL ELLIPTICAL CLASS HE-III	POE	POINT OF ENDING
CR	CREEK	PT	POINT OF TANGENCY
CWT	HUNDREDWEIGHT	PVC	POINT OF VERTICAL CURVATURE
CY	CUBIC YARD	PVI	POINT OF VERTICAL INTERSECTION
C & G	CURB AND GUTTER	PVRC	POINT OF VERTICAL REVERSE CURVATURE
D	DEGREE OF CURVE/BOX DEPTH	PVT	POINT OF VERTICAL TANGENCY
DHV	DESIGN HOUR VOLUME	R/RAD	RADIUS
DD	DIRECTIONAL DISTRIBUTION	RCCP	REINFORCED CONCRETE CULVERT PIPE
DISCH	DISCHARGE	REQ'D	REQUIRED
DG	DITCH GRADE	RES	RESIDENCE OR RESIDENTIAL
DWY	DRIVEWAY	RHF	RIGHT-HAND FORWARD
E	EAST	R/W	RIGHT OF WAY
EL/ELEV	ELEVATION	RD	ROAD
EAT	ENERGY ABSORBING TERMINAL	RDWY	ROADWAY
ENT	ENTRANCE	RR	RAILROAD
ESALS	EQUIVALENT SINGLE AXLE LOADS	RT	RIGHT
EXC	EXCAVATION	SALV	SALVAGED
EBS	EXCAVATION BELOW SUBGRADE	SAN S	SANITARY SEWER
EXIST	EXISTING	SI	SLOPE INTERCEPT
FE	FIELD ENTRANCE	S	SOUTH
FERT	FERTILIZE	SQ	SQUARE
FF	FACE TO FACE	SF	SQUARE FEET
FL	FLOW LINE	SY	SQUARE YARD
FO	FIBER OPTIC	SDD	STANDARD DETAIL DRAWINGS
FS	FULL SUPER ELEVATION	STH	STATE TRUNK HIGHWAYS
FT	FOOT	STA	STATION
G	GRADE	SS	STORM SEWER
HMA	HOT MIX ASPHALT	SE	SUPERELEVATION
HYD	HYDRANT	T	TANGENT LENGTH
ID	INSIDE DIAMETER	T	TRUCKS (PERCENT OF)
INV	INVERT	TC	TOP OF CURB
IP	IRON PIPE OR PIN	T OR TN	TOWN
K	RATE OF VERTICAL CURVATURE	TLE	TEMPORARY LIMITED EASEMENT
LHF	LEFT-HAND FORWARD	t	TON
L	LENGTH OF CURVE	TYP.	TYPICAL
LB	POUND	VAR	VARIABLE
LF	LINEAR FOOT	VC	VERTICAL CURVE
LCB	LONG CHORD BEARING	W	WEST
LC	LONG CHORD	X	EAST GRID COORDINATE
LN	LANE	Y	NORTH GRID COORDINATE
		YD	YARD

GENERAL NOTES

ELEVATIONS SHOWN ON THE PLAN ARE REFERENCED TO USGS DATUM (NAVD 88).

WHEN THE QUANTITY OF THE ITEMS OF BASE AGGREGATE IS MEASURED FOR PAYMENT BY THE TON, THE DEPTH OR THICKNESS OF THE LAYER SHOWN ON THE PLANS IS APPROXIMATE AND THE ACTUAL THICKNESS WILL DEPEND ON THE DISTRIBUTION OF THE MATERIAL AS DIRECTED BY THE ENGINEER.

THE LOCATION 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.

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

THE EXACT LOCATION OF THE EROSION CONTROL DEVICES SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.

DISTURBED AREAS WITHIN THE RIGHT-OF-WAY, EXCEPT THE AREAS WITHIN THE FINISHED SHOULDER POINTS, SHALL BE SALVAGED TOPSOILED, FERTILIZED, SEEDED AND MULCHED

BEARINGS SHOWN ON THE PLANS ARE COUNTY BEARINGS TO THE NEAREST SECOND.

THE LOCATION OF THE DRIVEWAYS WILL BE DETERMINED BY THE ENGINEER.

SIGN PLATE DETAILS SHALL BE IN ACCORDANCE WITH THE FEDERAL HIGHWAY ADMINISTRATION "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" UNLESS OTHERWISE PROVIDED FOR IN THE PLAN.

CURVE DATA IS BASED ON THE ARC DEFINITION.

SEED MIXTURE NO. 20 SHALL BE USED THROUGHOUT THE PROJECT.

PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL CONTACT THE COUNTY LAND SURVEYOR CONCERNING MONUMENT AND PROPERTY CORNER PRESERVATION. LANDMARK REFERENCE MONUMENTS SHALL BE PERPETUATED BY THE COUNTY SURVEYOR.

RADIUS DIMENSIONS ARE SHOWN TO FLAGLINE OF CURB & GUTTER OR EDGE OF PAVEMENT.

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

USE 12.5 mm AGGREGATE IN ASPHALTIC SURFACE. PLACE ASPHALTIC SURFACE IN TWO LAYERS ON CTH X

EXISTING SITE TOPOGRAPHIC INFORMATION OBTAINED FROM SURVEY BY EAU CLAIRE COUNTY HIGHWAY DEPARTMENT (4-24-2014)

DESIGN CONTACT

FLEMING, ANDRE & ASSOCIATES, INC.
3615 N. HASTINGS WAY
SUITE 100
EAU CLAIRE, WI. 54703-0474
ATTENTION: MATT GUNDRY
PHONE: 715-832-8400

W.D.N.R. CONTACT

DEPARTMENT OF NATURAL RESOURCES
1300 W. CLAIREMONT AVE.
EAU CLAIRE, WI 54701
ATTENTION: CHRIS WILLGER
PHONE: 715-839-1609

COUNTY SURVEYOR

EAU CLAIRE COUNTY
LAND INFORMATION DIVISION
721 OXFORD AVE. SUITE 3344
EAU CLAIRE, WI 54703
ATTENTION: MATT JANIAK
PHONE: 715-839-4741

UTILITIES

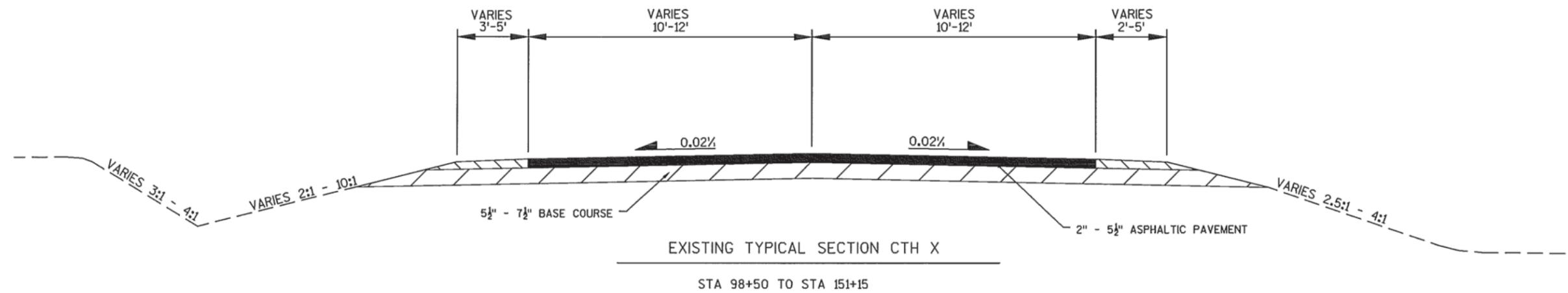
CENTURY LINK
20 S WILSON AVE
RICE LAKE, WI 54868
ATTN: MONTY PARKER
PHONE: 715-234-5528

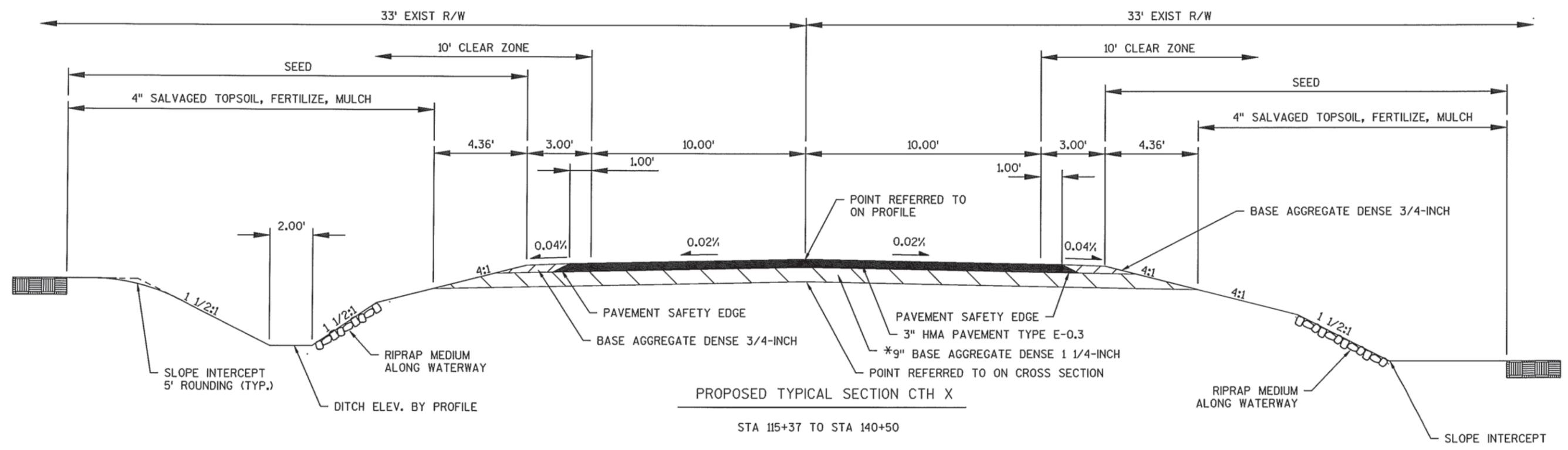
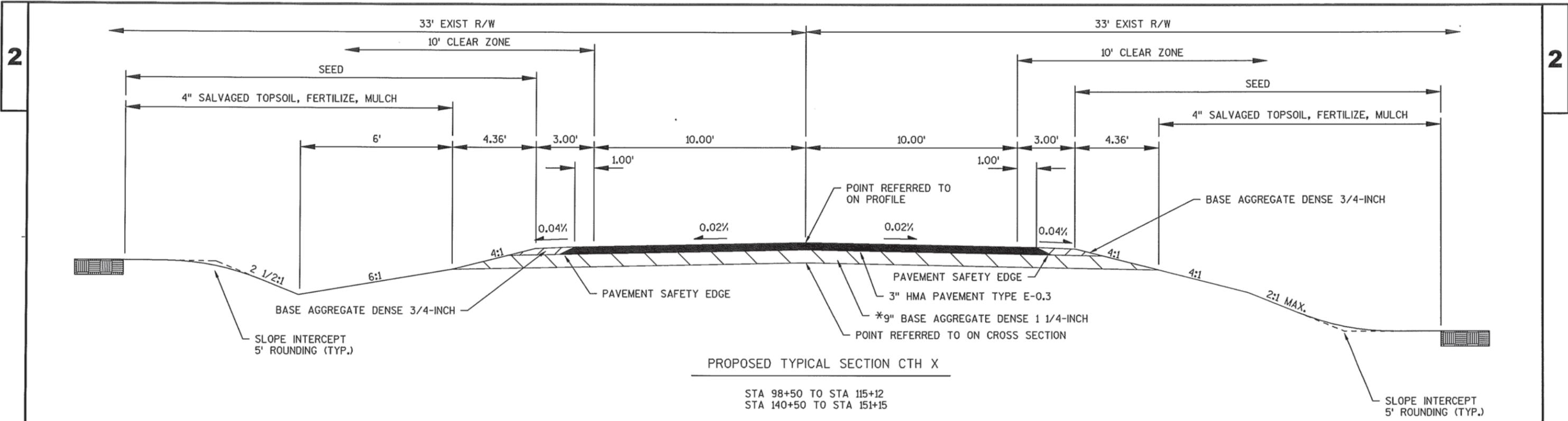
EAU CLAIRE ENERGY COOPERATIVE
8214 USH 12
FALL CREEK, WI 54742
ATTN: GARY BRECKA
PHONE: 715-832-1603



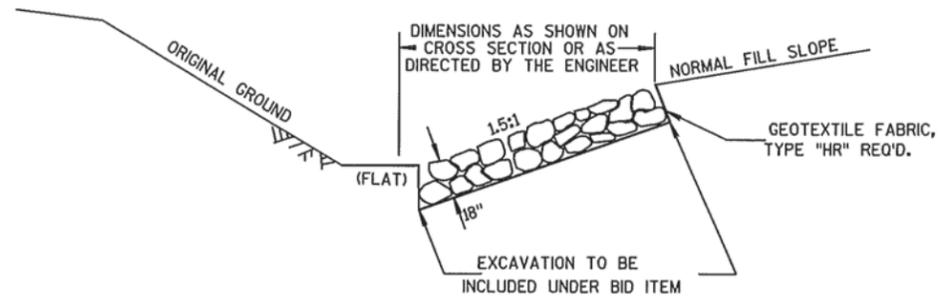
Dial **811** or (800)242-8511

www.DiggersHotline.com

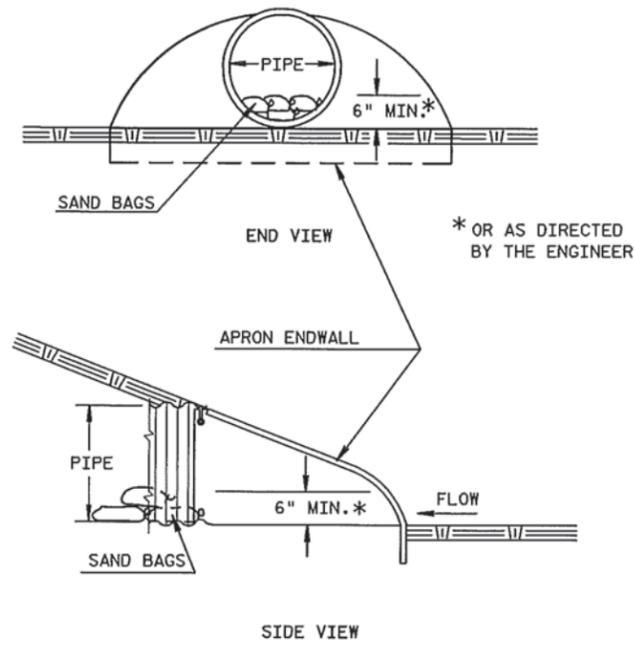




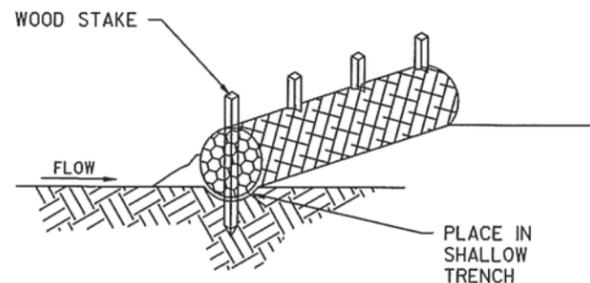
* TREAT UPPER 4" OF BASE AGGREGATE DENSE WITH AGGREGATE BASE STABILIZER



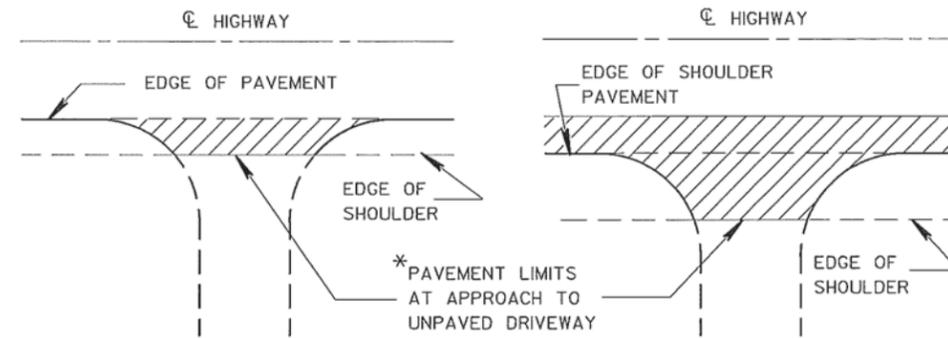
DETAIL FOR MEDIUM RANDOM RIPRAP ALONG CHANNEL



CULVERT PIPE DITCH CHECK



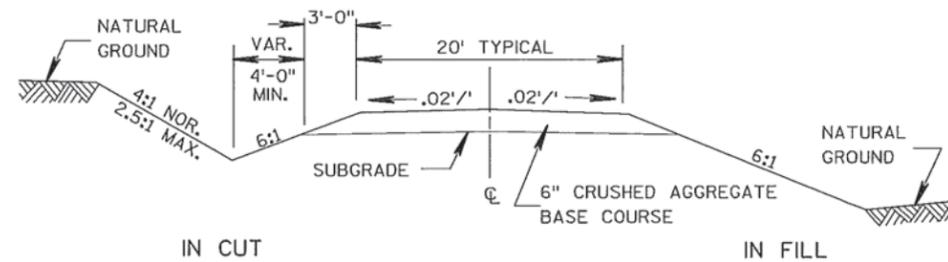
TEMPORARY DITCH CHECKS



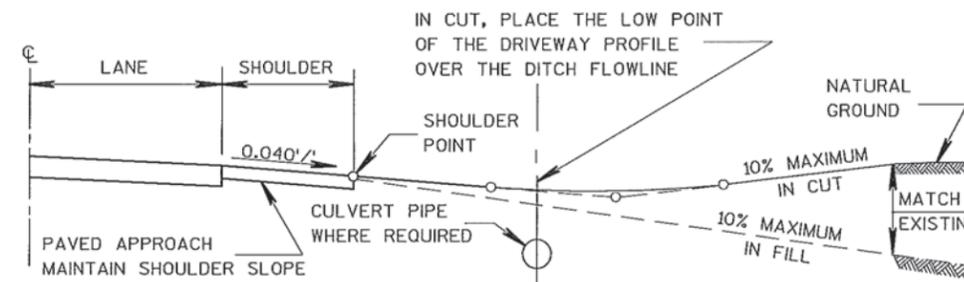
*WHERE DRIVEWAY IS PAVED, APPROACH PAVEMENT SHOULD BE EXTENDED TO MATCH DRIVEWAY PAVEMENT.

PLAN VIEW (PAVED SHOULDER ON HIGHWAY)

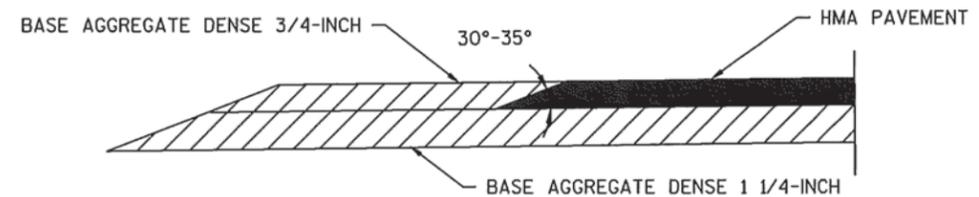
RURAL DRIVEWAY INTERSECTION DETAIL



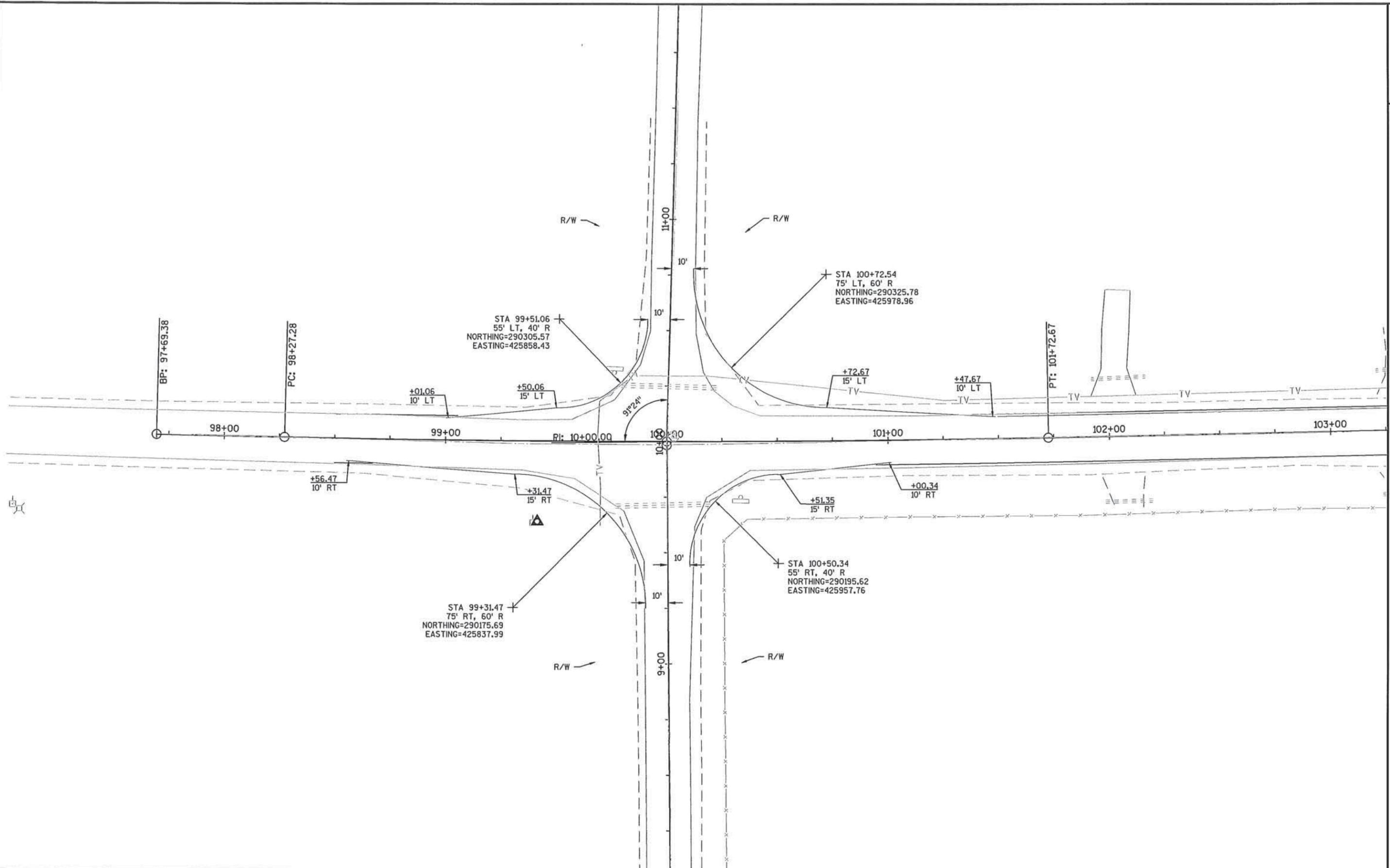
IN CUT IN FILL
TYPICAL CROSS SECTION FOR PRIVATE DRIVE OR FIELD ENTRANCE



TYPICAL DRIVEWAY PROFILES

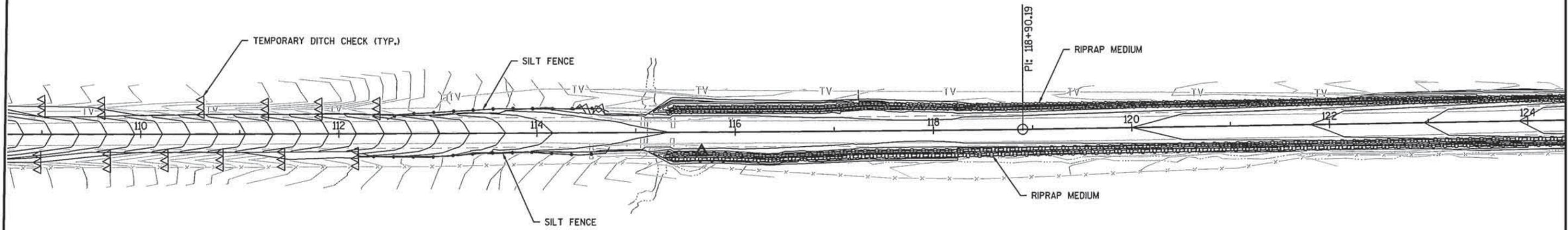
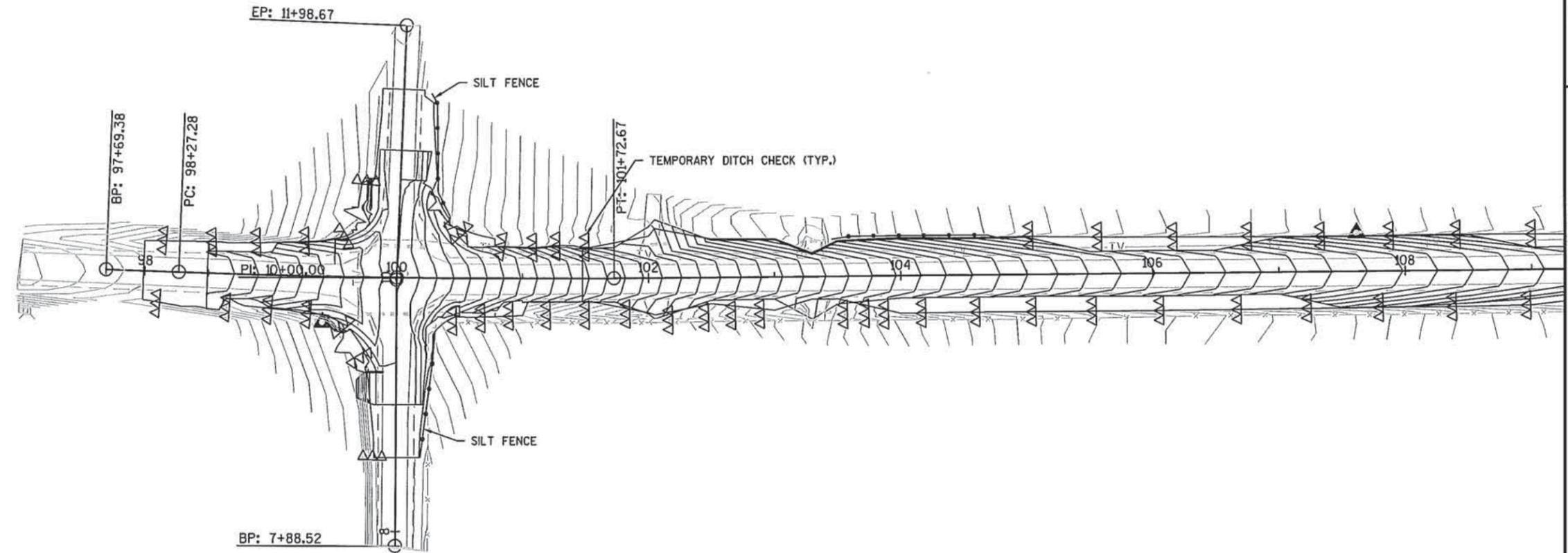


PAVEMENT SAFETY EDGE



2

2



PROJECT NO: 53312-794

HWY: CTH X

COUNTY: EAU CLAIRE

EROSION CONTROL

SHEET

E

FILE NAME : F:\DRAWINGS\2014-105\0001\C3D CTH X\SHEETSPLAN\022001-EC.DWG
LAYOUT NAME - 022001_EC

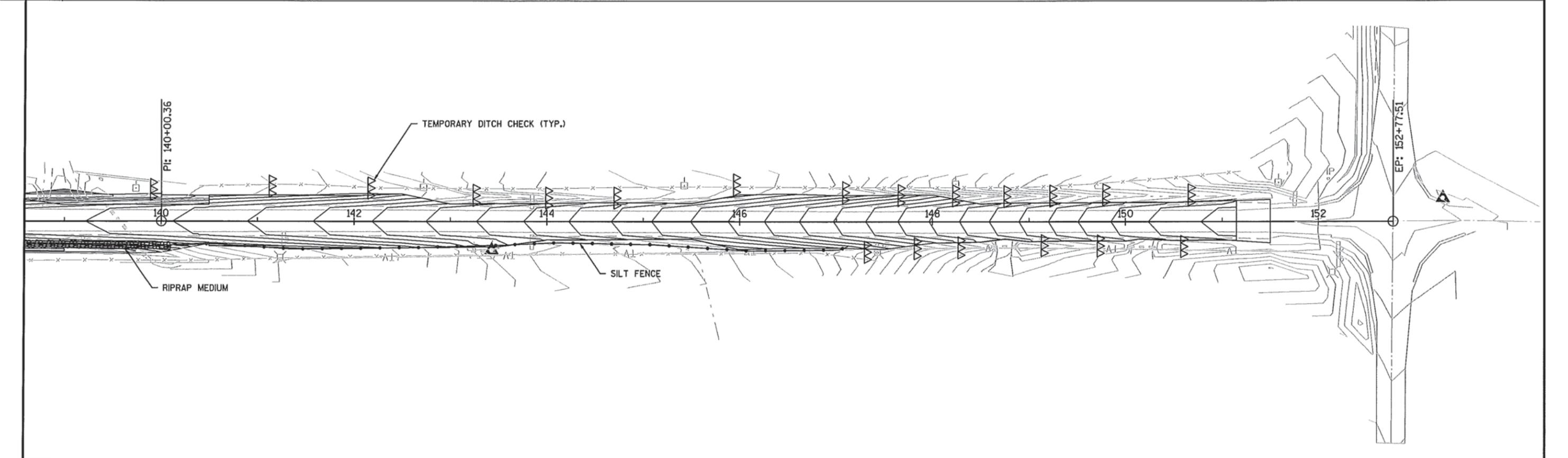
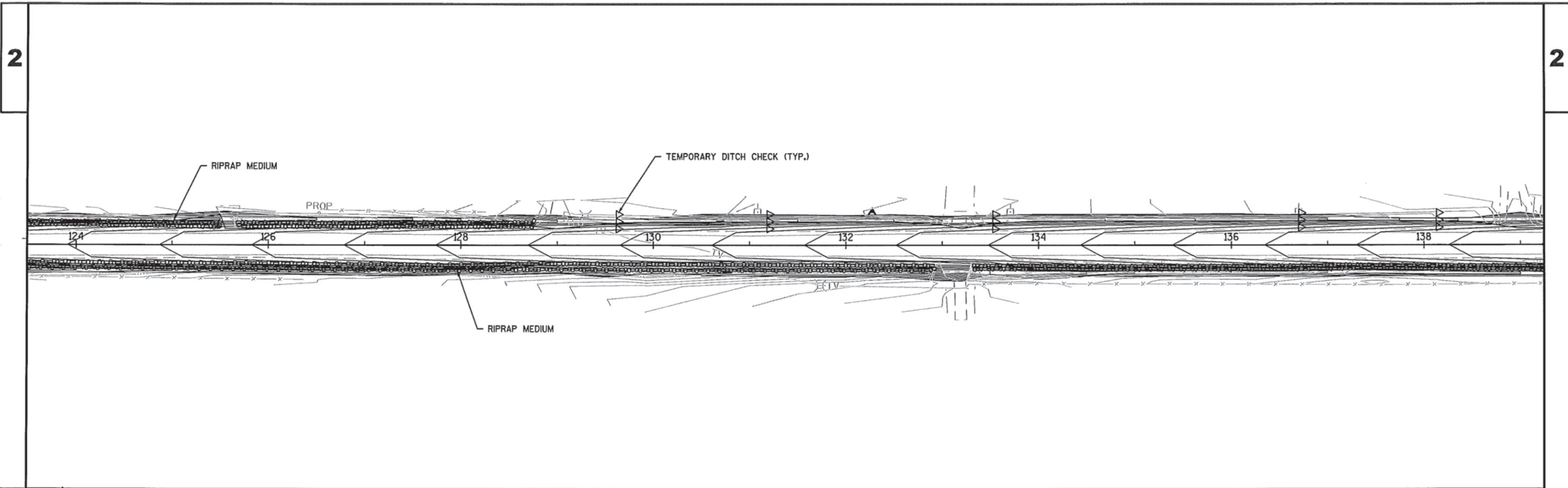
PLOT DATE : 1/14/2015 11:16 PM

PLOT BY : MATT GUNDRY

PLOT NAME :

PLOT SCALE : 1 IN:100 FT

WISDOT/CADD SHEET 42

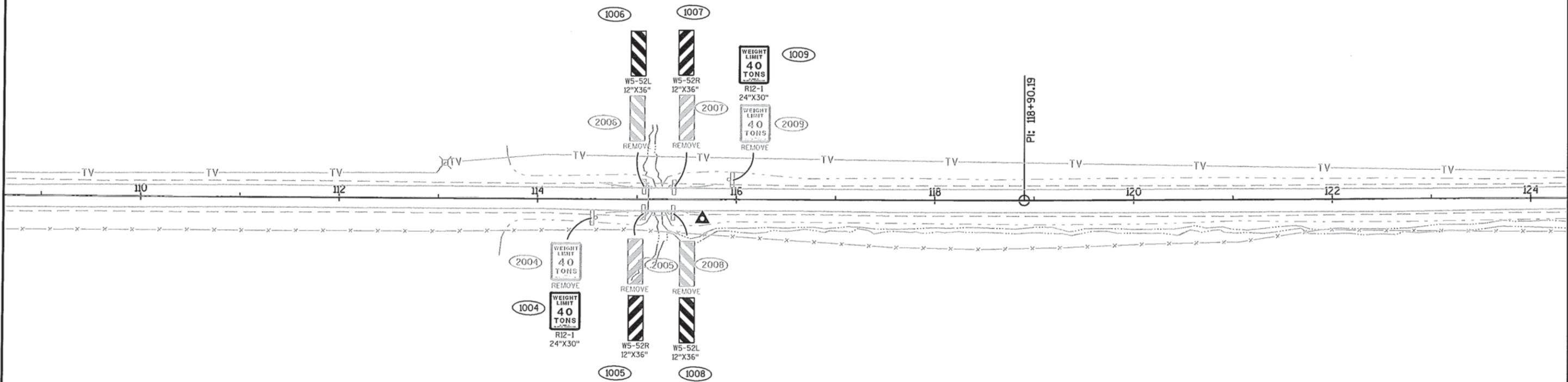
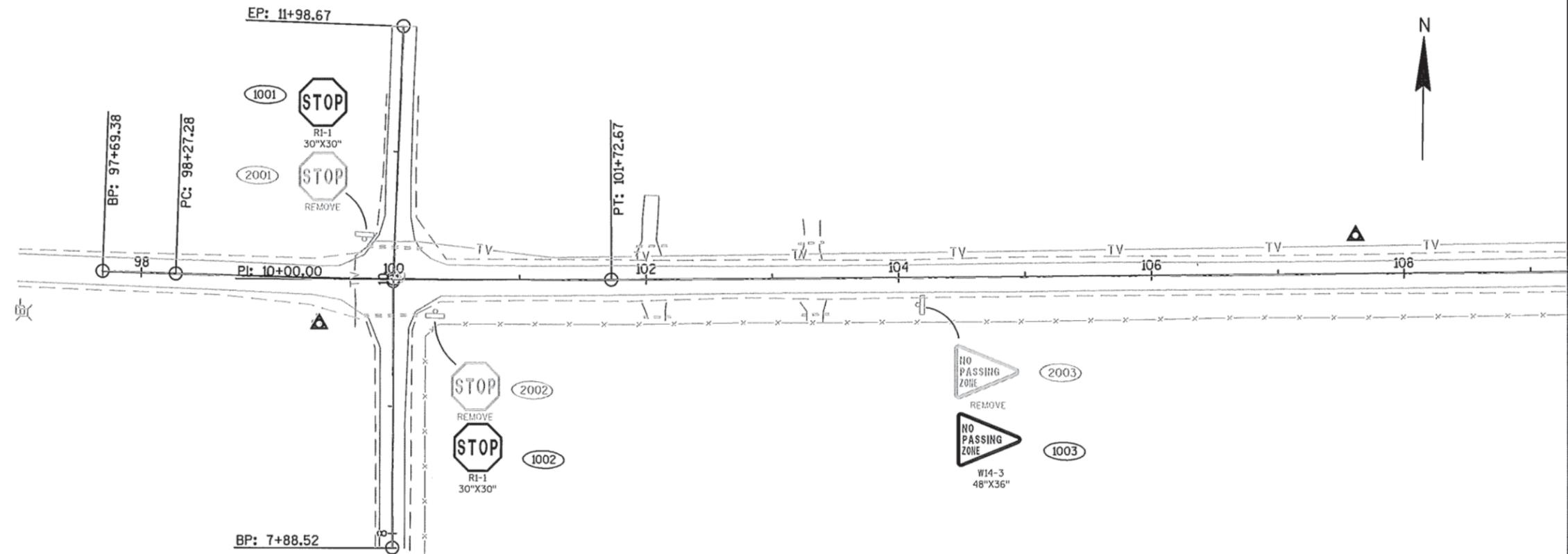


PROJECT NO: 53312-794	HWY: CTH X	COUNTY: EAU CLAIRE	EROSION CONTROL	SHEET	E
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2

2



PROJECT NO:53312-794

HWY:CTH X

COUNTY:EAU CLAIRE

PERMANENT SIGNING

SHEET

E

FILE NAME : F:\DRAWINGS\2014-105\0001\C3D CTH X\SHEETSPLAN\023201-PS.DWG
LAYOUT NAME - 023201-PS - 023201_PS

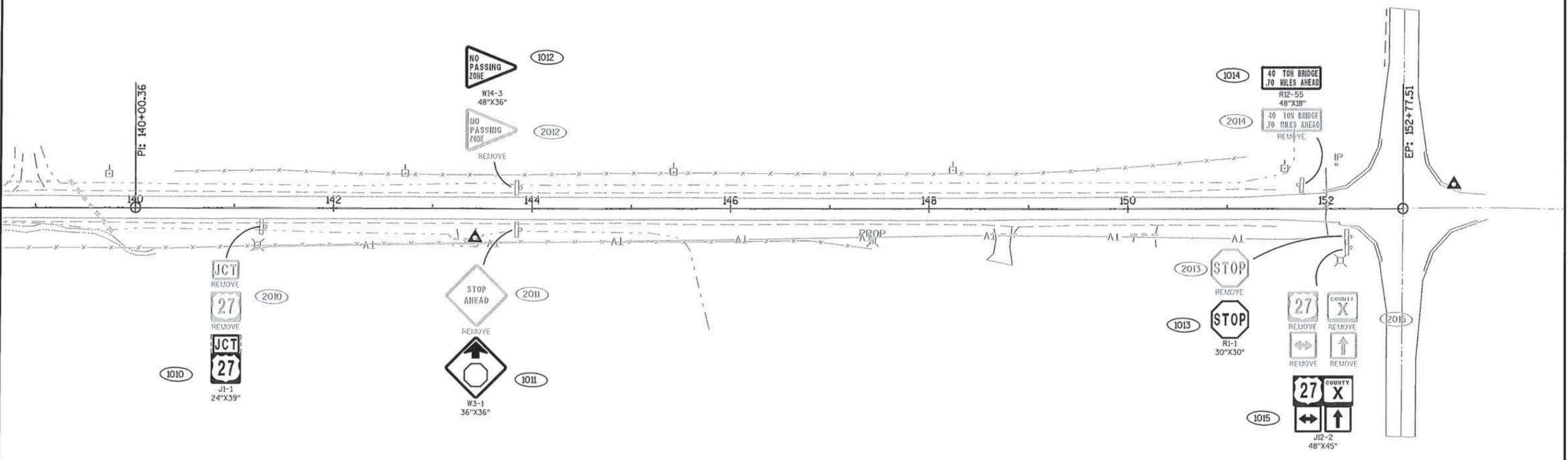
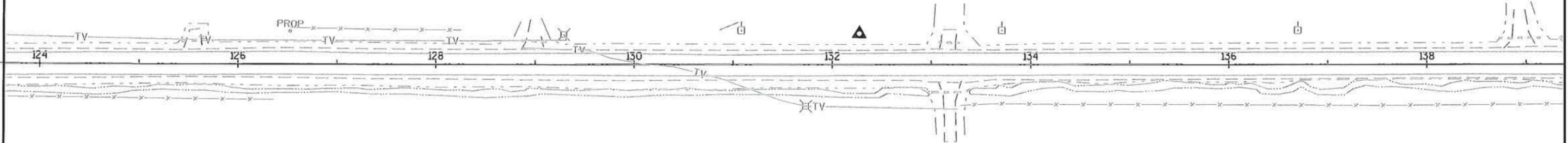
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PLOT BY : MATT GUNDRY

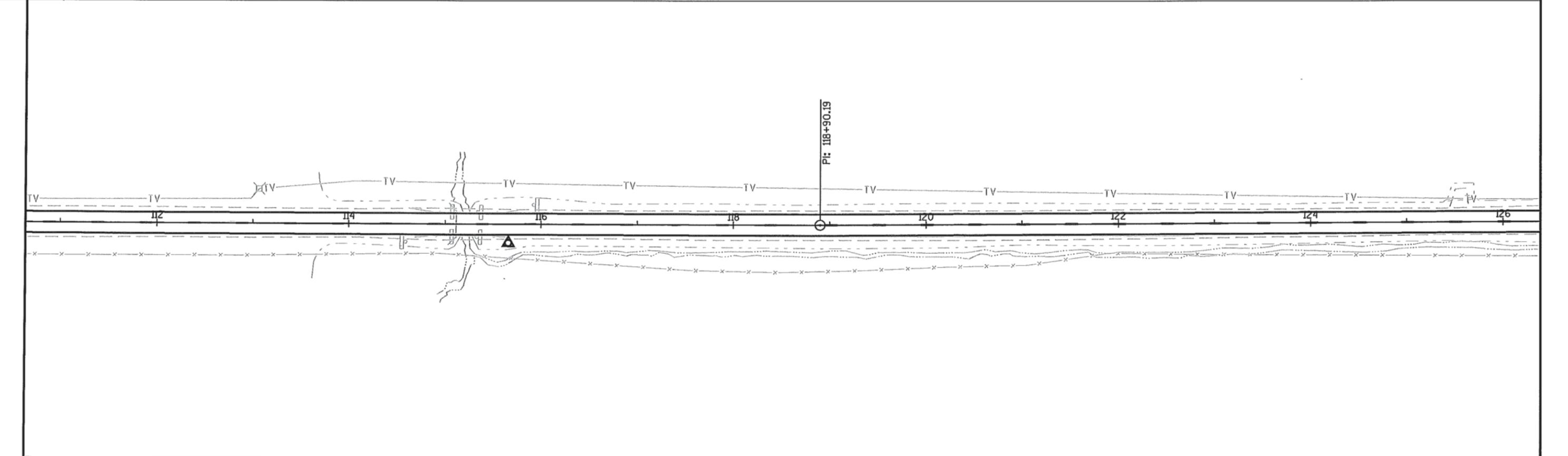
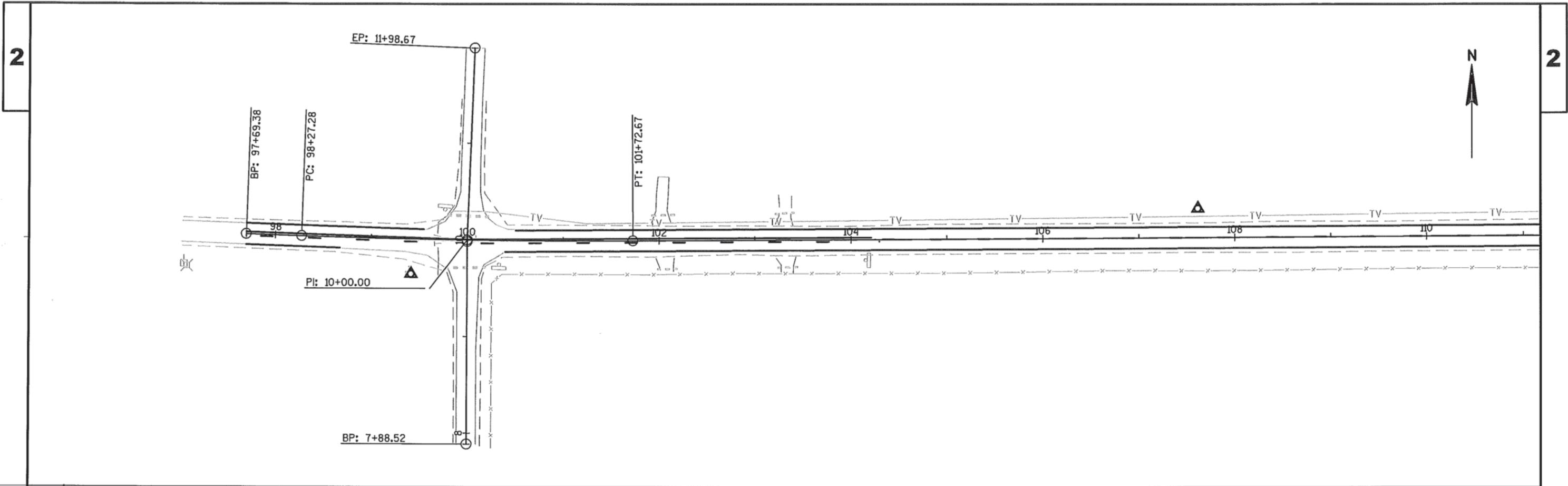
PLOT NAME :

PLOT SCALE : 1 IN:100 FT

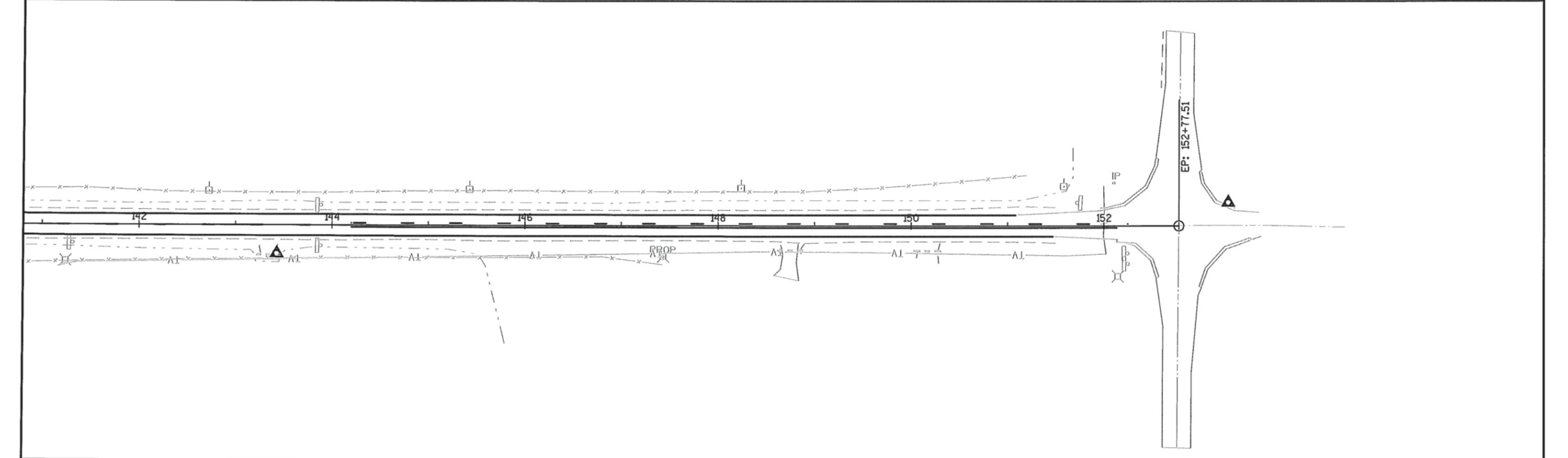
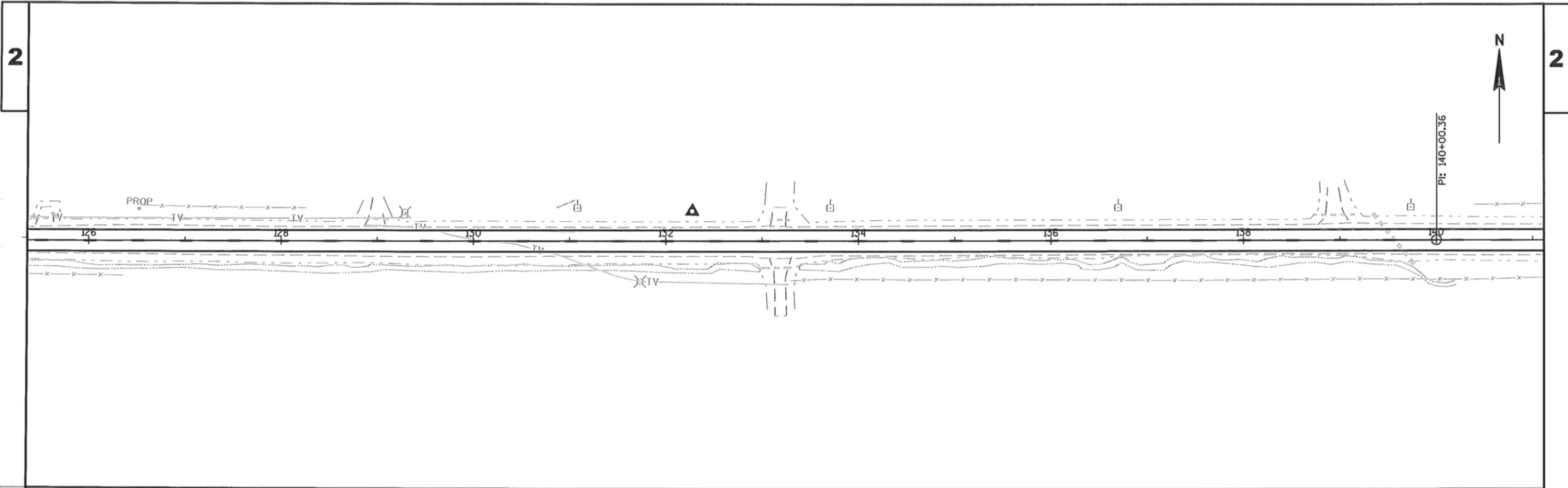
WISDOT/CADD SHEET 42



PROJECT NO: 53312-794	HWY: CTH X	COUNTY: EAU CLAIRE	PERMANENT SIGNING	SHEET	E
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PROJECT NO:53312-794	HWY:CTH X	COUNTY:EAU CLAIRE	PAVEMENT MARKING	SHEET	E
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PROJECT NO:53312-794	HWY:CTH X	COUNTY:EAU CLAIRE	PAVEMENT MARKING	SHEET	E
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LAYOUT NAME - 024502.PM

PLOT DATE : 1/14/2015 11:17 PM

PLOT BY : MATT GUNDRY

PLOT NAME :

PLOT SCALE : 1 IN:100 FT

WISDOT/CADD SHEET 42

Division	From/To Station	Location	Common Excavation (1)	(item # 205.0100)	Salvaged/Unusable Pavement Material (4)	Available Material (5)	Reduced EBS in Fill (9)	Expanded EBS Backfill (11)	Unexpanded Fill	Expanded Fill (13)	Mass Ordinate +/- (14)	Waste	Borrow	Comment
			Cut (2)	EBS Excavation (3)			Factor 0.80	Factor 1.30		Factor 1.25				
1	98+00 to 151+00	CTH X	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
Division 1 Subtotal			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
2	8+75 to 11+35	WOODLAND VALLEY RD	22	#DIV/0!	21	1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			
Division 2 Subtotal			22	#DIV/0!	21	1	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		#DIV/0!	See Note 15
Grand Total			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0	#DIV/0!	

- 1) Common Excavation is the sum of the Cut and EBS Excavation columns. Item number 205.0100
 - 2) Salvaged/Unusable Pavement Material is included in Cut.
 - 3) EBS Excavation to be backfilled with Select Borrow material. Note: this is designers choice, can be backfilled with Borrow, or Cut as well.
 - 4) Salvaged/Unusable Pavement Material
 - 5) Available Material = Cut - Salvaged/Unusable Pavement Material
 - 6) Marsh Excavation - to be backfilled with Select Borrow Material. Note: this is designers choice, can be backfilled with Borrow, or Cut as well. Item number 205.0500
 - 7) Rock Excavation item number 205.0200
 - 8) Reduced Marsh in Fill - Excavated Marsh material is usable in Fills outside the 1:1 slope. Marsh in Fill Reduction factor = 0.6
 - 9) Reduced EBS in Fill - Excavated EBS material is usable in Fills outside the 1:1 slope. EBS in Fill Reduction factor = 0.8
 - 10) Expanded Marsh Backfill - This is to be filled with Select Borrow material. Marsh Backfill Factor = 1.5. Item number 208.11
 - 11) Expanded EBS Backfill - This is to be filled with Select Borrow material. EBS Backfill Factor = 1.3. Item number 208.11
 - 12) Expanded Rock - Factor = 1.1.
 - 13) Expanded Fill. Factor = 1.25
- Depending on selections:
- Expanded Fill = (Unexpanded Fill - Rock* Rock Factor - Reduced Marsh - Reduced EBS) * Fill Factor
 - Or
 - Expanded Fill = (Unexpanded Fill - Rock* Rock Factor - Reduced EBS) * Fill Factor
 - Or
 - Expanded Fill = (Unexpanded Fill - Rock* Rock Factor - Reduced Marsh) * Fill Factor
 - Or
 - Expanded Fill = (Unexpanded Fill - Rock* Rock Factor) * Fill Factor
- 14) The Mass Ordinate + or - Qty calculated for the Division. Plus quantity indicates an excess of material within the Division. Minus indicates a shortage of material within the Division.
 - 15) Use 113,641 CY of material from Division 1. Borrow Excavation item number 208.0100

3

REMOVING SMALL PIPE CULVERTS				203.0100	
STATION	TO	STATION	LOCATION	EACH	CATEGORY
102+05			P.E. LT	1	010
102+05			F.E. RT	1	010
103+30			F.E. LT	1	010
103+30			F.E. RT	1	010
125+55			F.E. LT	1	010
129+00			P.E. LT	1	010
133+20			F.E. LT	1	010
133+20			P.E. RT	1	010
139+57			CTH X MAINLINE	1	010
143+40			F.E. RT	1	10
148+75			P.E. RT	1	010
150+15			F.E. LT	1	010
9+70			WOODLAND VALLEY RD	1	010
10+25			WOODLAND VALLEY RD	1	010
ITEM TOTAL				14	

SELECT BORROW				208.1100	
STATION	TO	STATION	LOCATION	C.Y.	CATEGORY
98+50	TO	151+50	STH 27	2900	010
ITEM TOTAL				2900	

PREPARE FOUNDATION FOR ASPHALTIC PAVING				211.0100	
STATION	TO	STATION	LOCATION	EACH	CATEGORY
98+00	TO	102+00	CTH X	1	010
ITEM TOTAL				1	

PREPARE FOUNDATION FOR BASE AGGREGATE				211.0500	
STATION	TO	STATION	LOCATION	STA	CATEGORY
98+00	TO	102+00	CTH X	1	010
ITEM TOTAL				1	

FINISHING ROADWAY (PROJECT)				213.0100	
STATION	TO	STATION	LOCATION	EACH	CATEGORY
98+00	TO	151+15	MAINLINE	1	010
ITEM TOTAL				1	

BASE AGGREGATE DENSE 3/4-INCH				305.0110	
STATION	TO	STATION	LOCATION	TON	CATEGORY
98+50	TO	99+80	CTH X SHOULDERS	10	010
98+50	TO	99+80	CTH X SHOULDERS	10	010
100+20	TO	151+15	CTH X SHOULDERS	238	010
100+20	TO	151+15	CTH X SHOULDERS	238	010
8+75	TO	9+80	W.V.R. SHOULDERS	5	010
8+75	TO	9+80	W.V.R. SHOULDERS	5	010
10+20	TO	11+35	W.V.R. SHOULDERS	5	010
10+20	TO	11+35	W.V.R. SHOULDERS	5	010
ITEM TOTAL				516	

BASE AGGREGATE DENSE 1 1/4-INCH				305.0120	
STATION	TO	STATION	LOCATION	TON	CATEGORY
98+50	TO	151+15	CTH X	8980	010
8+75	TO	9+84	WOODLAND VALLEY RD	264	010
10+16	TO	11+35	WOODLAND VALLEY RD	281	010
ITEM TOTAL				9525	

ASPHALTIC MATERIAL PG 58-28				455.0105	
STATION	TO	STATION	LOCATION	TON	CATEGORY
98+50	TO	151+15	CTH X	125	010
8+75	TO	9+88	WOODLAND VALLEY ROAD	5	010
10+12	TO	11+35	WOODLAND VALLEY ROAD	5	010
ITEM TOTAL				135	

TACK COAT				455.0605	
STATION	TO	STATION	LOCATION	GAL	CATEGORY
98+50	TO	151+15	CTH X	330	010
8+75	TO	9+88	WOODLAND VALLEY ROAD	15	010
10+12	TO	11+35	WOODLAND VALLEY ROAD	15	010
ITEM TOTAL				360	

3

HMA PAVEMENT TYPE E-03				460.1100	
STATION	TO	STATION	LOCATION	TON	CATEGORY
98+50	TO	151+15	CTHX	2220	010
8+75	TO	9+88	WOODLAND VALLEY ROAD	75	010
10+12	TO	11+35	WOODLAND VALLEY ROAD	80	010
ITEM TOTAL				2375	

ASPHALTC SURFACE DRIVEWAYS AND FIELD ENTRANCES				465.0120	
STATION	TO	STATION	LOCATION	TON	CATEGORY
102+05			P.E., LT	5	010
148+75			P.E., RT	5	010
ITEM TOTAL				10	

CULVERT PIPE CLASS II 72-INCH				520.0172	
STATION	TO	STATION	LOCATION	LENGTH	CATEGORY
				L.F.	
		133+20	P.E. RT	42	010
ITEM TOTAL				42	

CULVERT PIPE AND APRON ENDWALLS													
STATION	LOCATION	520.0118 CULVERT PIPE CLASS II 18-INCH L.F.	520.0124 CULVERT PIPE CLASS III 24-INCH L.F.	520.0136 CULVERT PIPE CLASS II 36-IN L.F.	520.0172 CULVERT PIPE CLASS II 72-INCH L.F.	520.1018 APRON ENDWALLS FOR CULVERT PIPE 18-INCH EACH	520.1024 APRON ENDWALLS FOR CULVERT PIPE 24-INCH EACH	520.1036 APRON ENDWALLS FOR CULVERT PIPE 36-IN EACH	520.1072 APRON ENDWALLS FOR CULVERT PIPE 72-INCH EACH	522.0124 CULVERT PIPE RC CLASS II 24-INCH L.F.	522.0136 CULVERT PIPE RC CLASS II 36-INCH L.F.	522.1024 APRON ENDWALLS FOR CPRC 24-INCH EACH	522.1036 APRON ENDWALLS FOR RPRC 36-INCH EACH
9+70	WOODLAND VALLEY RD	--	--	--	--	--	--	--	--	80	--	2	--
10+25	WOODLAND VALLEY RD	--	--	--	--	--	--	--	--	102	--	2	--
102+05	F.E. RT	--	38	--	--	--	2	--	--	--	--	--	--
102+05	P.E. LT	--	40	--	--	--	2	--	--	--	--	--	--
103+30	F.E. RT	--	38	--	--	--	2	--	--	--	--	--	--
103+30	F.E. LT	--	40	--	--	--	2	--	--	--	--	--	--
125+55	F.E. LT	--	--	38	--	--	--	2	--	--	--	--	--
129+00	P.E. LT	--	--	40	--	--	--	2	--	--	--	--	--
133+20	P.E. RT	--	--	--	42	--	--	--	2	--	--	--	--
133+20	F.E. LT	--	--	40	--	--	--	2	--	--	--	--	--
139+40	CTHX	--	--	--	--	--	--	--	--	--	--	--	--
143+40	F.E. RT	40	--	--	--	2	--	--	--	--	--	--	--
148+75	P.E. RT	40	--	--	--	2	--	--	--	--	--	--	--
150+15	P.E. RT	44	--	--	--	2	--	--	--	--	--	--	--
ITEM TOTAL		124	156	118	42	6	8	6	2	182	44	4	2

SALVAGED RAIL				614.0920	
STATION	TO	STATION	LOCATION	L.F.	CATEGORY
114+65	TO	115+09	RT	45	010
114+65	TO	115+09	LT	45	010
115+35	TO	115+75	RT	40	010
115+35	TO	115+75	LT	40	010
ITEM TOTAL				170	

MGS GUARDRAIL TERMINAL EAT				614.2610	MFS
STATION	TO	STATION	LOCATION	EACH	CATEGORY
113+09	TO	113+59	RT	1	010
114+09	TO	114+59	LT	1	010
116+85	TO	117+35	LT	1	010
115+85	TO	116+35	RT	1	010
ITEM TOTAL				4	

MGS GUARDRAIL 3				614.2300	MFS
STATION	TO	STATION	LOCATION	L.F.	CATEGORY
113+59	TO	115+09	RT	150.0	010
114+59	TO	115+09	LT	50.0	010
115+35	TO	116+85	LT	150.0	010
115+35	TO	115+85	RT	50.0	010
ITEM TOTAL				400	

MOBILIZATION				619.1000	
STATION	TO	STATION	LOCATION	EACH	CATEGORY
98+00	TO	151+15	MAINLINE	1.0	010
ITEM TOTAL				1	

3

SILT FENCE & SILT FENCE MAINTENANCE				628.1504	628.1520
STATION	TO	STATION	LOCATION	SILT FENCE	SILT FENCE MAINTENANCE
				L.F.	L.F.
8+50	TO	9+45	RT (WOODLAND)	100.0	100.0
10+30	TO	11+40	RT (WOODLAND)	110.0	110.0
103+50	TO	104+85	LT	135.0	135.0
112+25	TO	114+60	EAT, RT	250.0	250.0
112+30	TO	114+60	EAT, LT	230.0	230.0
140+00	TO	147+00	RT	705.0	705.0
UNDISTRIBUTED				150.0	150.0
ITEM TOTAL				1680	1680

TEMPORARY DITCH CHECKS				628.7504	
STATION	TO	STATION	LOCATION	L.F.	CATEGORY
98+00	TO	151+15	DITCH LT & RT	1260	010
UNDISTRIBUTED				150	010
ITEM TOTAL				1410	

3

MOBILIZATIONS EROSION CONTROL				628.1905	
STATION	TO	STATION	LOCATION	EACH	CATEGORY
98+00	TO	151+15	PROJECT	3	010
ITEM TOTAL				3	

SALVAGED TOPSOIL, MULCHING, FERTILIZING, & SEEDING							
STATION	TO	STATION	LOCATION	625.0500	627.0200	629.0210	630.0120
				SALVAGED TOPSOIL	MULCHING	FERTILIZER	SEEDING MIXTURE
				S.Y.	S.Y.	TYPE B	NO. 20
						C.W.T.	LB
98+00	TO	100+00	LT & RT	800	800	0.5	14
100+00	TO	115+10	LT & RT	3575	3570	2.2	64
115+10	TO	151+15	LT & RT	11900	10440	7.5	214
UNDISTRIBUTED						0.3	3
ITEM TOTAL				16275	14810	11	295

MOBILIZATIONS EMERGENCY EROSION CONTROL				628.1910	
STATION	TO	STATION	LOCATION	EACH	CATEGORY
98+00	TO	151+15	PROJECT	4	010
ITEM TOTAL				4	

MARKERS CULVERT END				633.5200	
STATION	TO	STATION	LOCATION	EACH	CATEGORY
10+25			LT & RT	2	010
9+70			LT & RT	2	010
139+40			LT & RT	2	010
ITEM TOTAL				6	

EROSION MAT CLASS II TYPE B				628.2023	
STATION	TO	STATION	LOCATION	S.Y.	CATEGORY
113+25	TO	115+00	RT	107	010
118+25	TO	122+50	RT	130	010
115+50	TO	116+50	LT	49	010
119+50	TO	126+50	LT	342	010
123+00	TO	137+50	RT	443	010
128+00	TO	137+25	LT	284	010
UNDISTRIBUTED				100	010
ITEM TOTAL				1455	

FIELD OFFICE TYPE B				642.5001	
STATION	TO	STATION	LOCATION	EACH	CATEGORY
98+00	TO	151+15	PROJECT	1	010
ITEM TOTAL				1	

PAVEMENT MARKING EPOXY 4-INCH				646.0106	
STATION	TO	STATION	LOCATION	L.F.	CATEGORY
98+00	TO	151+15	MAINLINE	13725	010
ITEM TOTAL				13725	

3

CONSTRUCTION STAKING SUBGRADE					650.4500	
STATION	TO	STATION	LOCATION	L.F.	CATEGORY	
98+50	TO	151+15	MAINLINE	5265	010	
8+75	TO	9+80	WOODLAND VALLEY ROAD	105	010	
10+20	TO	11+35	WOODLAND VALLEY ROAD	115	010	
ITEM TOTAL				5485		

CONSTRUCTION STAKING BASE					650.5000	
STATION	TO	STATION	LOCATION	L.F.	CATEGORY	
98+50	TO	151+15	MAINLINE	5265	010	
8+75	TO	9+80	WOODLAND VALLEY ROAD	105	010	
10+20	TO	11+35	WOODLAND VALLEY ROAD	115	010	
ITEM TOTAL				5485		

CONSTRUCTION STAKING PIPE CULVERTS					650.6000	
STATION	TO	STATION	LOCATION	EACH	CATEGORY	
139+57			CTH X MAINLINE	1	010	
9+80			WOODLAND VALLEY RD	1	010	
10+20			WOODLAND VALLEY RD	1	010	
ITEM TOTAL				3		

3

CONSTRUCTION STAKING SUPPLEMENTAL CONTROL (PROJECT)					650.9910	
STATION	TO	STATION	LOCATION	L.S.	CATEGORY	
98+50	TO	151+15	MAINLINE	1	010	
ITEM TOTAL				1		

CONSTRUCTION STAKING SLOPE STAKES					650.9920	
STATION	TO	STATION	LOCATION	L.F.	CATEGORY	
98+50	TO	151+15	MAINLINE	5265	010	
8+75	TO	9+80	WOODLAND VALLEY ROAD	105	010	
10+20	TO	11+35	WOODLAND VALLEY ROAD	115	010	
ITEM TOTAL				5485		

SAWING ASPHALT					690.0150	
STATION	TO	STATION	LOCATION	L.F.	CATEGORY	
98+50			MAINLINE	22	010	
151+15			MAINLINE	22	010	
8+75			WOODLAND VALLEY ROAD	20	010	
11+35			WOODLAND VALLEY ROAD	20	010	
102+05			P.E. LT	12	010	
148+75			P.E. RT	12	010	
ITEM TOTAL				108		

3

3

PERMANENT SIGNING										
SIGN NUMBER	STATION	LOCATION	SIGN CODE	SIGN DESCRIPTION	637.2210	637.2230	634.0616	634.0618	638.2602	638.3000
					SIGNS, TYPE I, REFLECTIVE H (S.F.)	SIGNS, TYPE I, REFLECTIVE F (S.F.)	WOOD POSTS, 4X6-INCH X 16 FT (EACH)	WOOD POSTS, 4X6-INCH X 16 FT (EACH)	REMOVING SIGNS TYPE II (EACH)	REMOVING SMALL SIGN SUPPORTS (EACH)
1001	10+26	LT	R1-1	STOP	5.81	--	1	--	--	--
1002	9+68	RT	R1-1	STOP	5.81	--	1	--	--	--
1003	104+10	RT	W14-3	NO PASSING ZONE	--	6.00	--	1	--	--
1004	114+50	RT	R12-1	WEIGHT LIMIT 40 TONS	5.00	--	--	1	--	--
1005	115+09	LT	W5-52R	CLEARANCE STRIPPER DOWN RIGHT	--	3.00	--	1	--	--
1006	115+09	RT	W5-52L	CLEARANCE STRIPPER DOWN LEFT	--	3.00	--	1	--	--
1007	115+35	LT	W5-52R	CLEARANCE STRIPPER DOWN RIGHT	--	3.00	--	1	--	--
1008	115+35	RT	W5-52L	CLEARANCE STRIPPER DOWN LEFT	--	3.00	--	1	--	--
1009	115+95	LT	R12-1	WEIGHT LIMIT 40 TONS	5.00	--	--	1	--	--
1010	141+25	RT	J1-1	JUNCTION STH 27	6.50	--	--	1	--	--
1011	143+90	RT	W3-1	STOP AHEAD	--	9.00	--	1	--	--
1012	143+90	LT	W14-3	NO PASSING ZONE	--	6.00	--	1	--	--
1013	152+20	RT	R1-1	STOP	5.81	--	--	1	--	--
1014	151+80	LT	R12-55	40 TON BRIDGE .70 MILES AHEAD	6.00	--	2.00	--	--	--
1015	152+20	RT	J12-2	J ASSEMBLY	15.00	--	--	2	--	--
2001	10+26	LT	R1-1	STOP	--	--	--	--	1	1
2002	9+68	RT	R1-1	STOP	--	--	--	--	1	1
2003	104+10	RT	W14-3	NO PASSING ZONE	--	--	--	--	1	1
2004	114+50	RT	R12-1	WEIGHT LIMIT 40 TONS	--	--	--	--	1	1
2005	115+09	LT	W5-52R	CLEARANCE STRIPPER DOWN RIGHT	--	--	--	--	1	1
2006	115+09	RT	W5-52L	CLEARANCE STRIPPER DOWN LEFT	--	--	--	--	1	1
2007	115+35	LT	W5-52R	CLEARANCE STRIPPER DOWN RIGHT	--	--	--	--	1	1
2008	115+35	RT	W5-52L	CLEARANCE STRIPPER DOWN LEFT	--	--	--	--	1	1
2009	115+95	LT	R12-1	WEIGHT LIMIT 40 TONS	--	--	--	--	1	1
2010	141+25	RT	J1-1	JUNCTION STH 27	--	--	--	--	1	1
2011	143+90	RT	W3-1	STOP AHEAD	--	--	--	--	1	1
2012	143+90	LT	W14-3	NO PASSING ZONE	--	--	--	--	1	1
2013	152+20	RT	R1-1	STOP	--	--	--	--	1	1
2014	151+80	LT	R12-55	40 TON BRIDGE .70 MILES AHEAD	--	--	--	--	1	
2015	152+20	RT	J12-2	J ASSEMBLY	--	--	--	--	1	1
GRAND TOTAL					54.93	33.00	4	13	15	14

PROJECT NO: 1195-01-74

HWY: USH 53

COUNTY: DOUGLAS

MISCELLANEOUS QUANTITIES

SHEET

E

FILE NAME : F:\PROJECTS\2014-105\0001\DRAWINGS\C3D CTH X\SHEETS\PLAN\030201.MQ.DWG

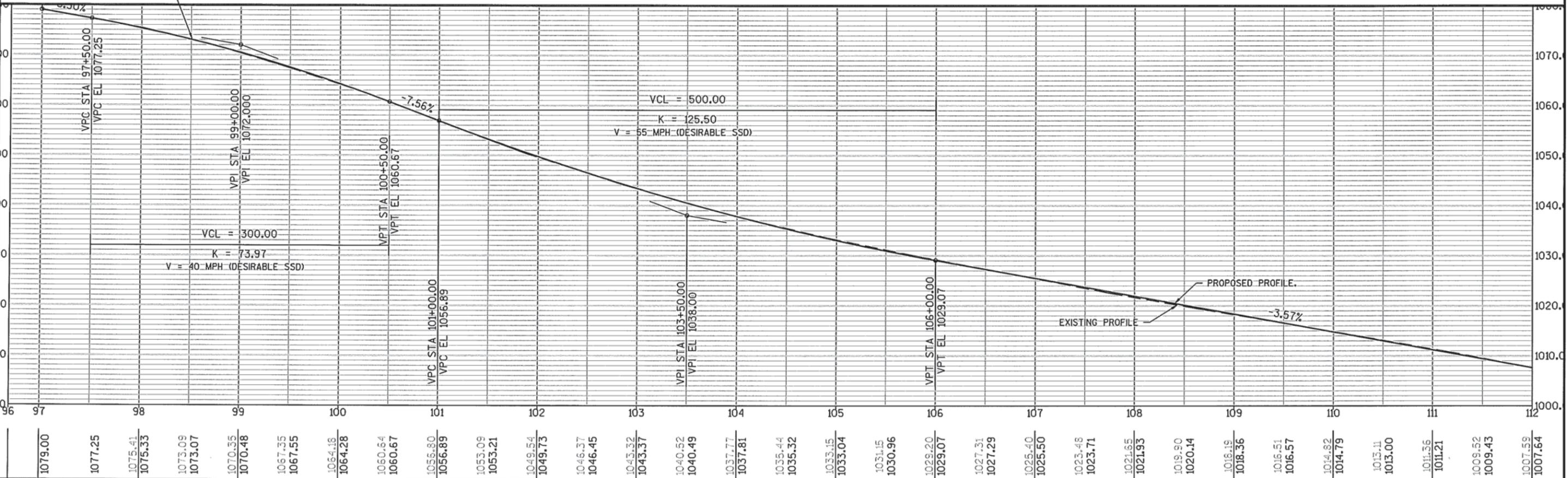
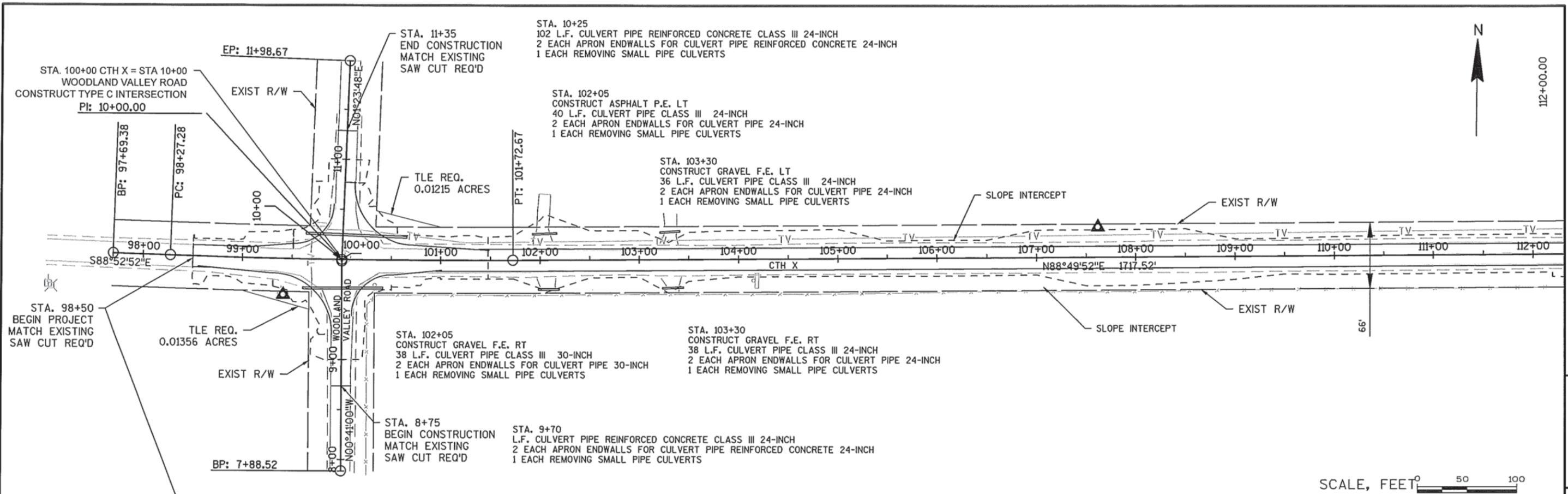
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PLOT BY : MATT GUNDRY

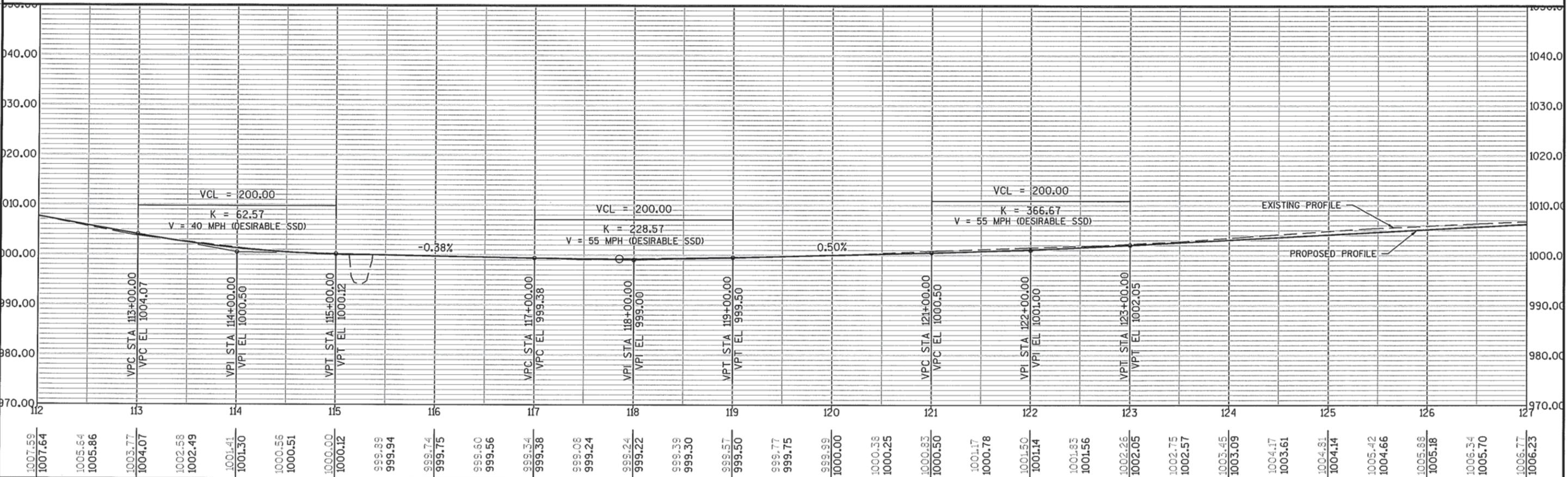
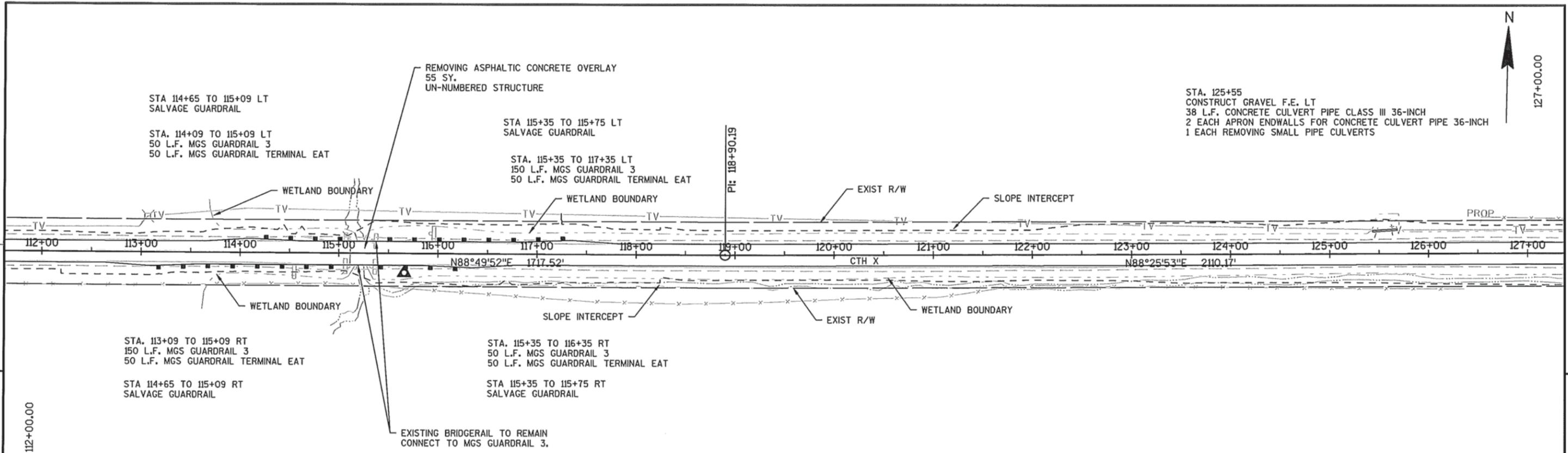
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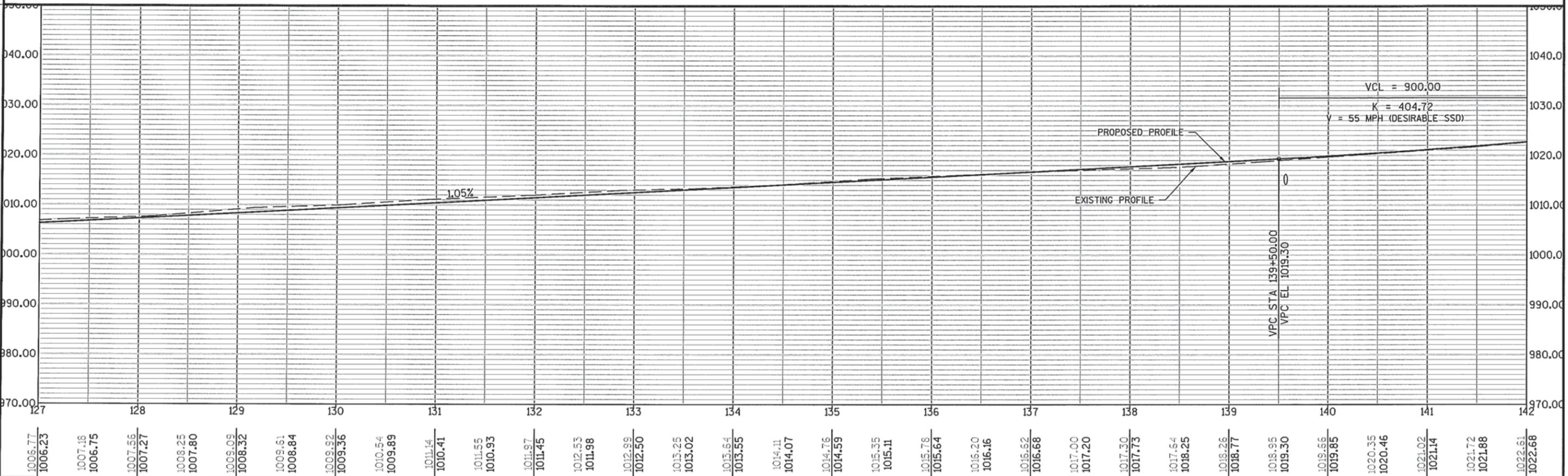
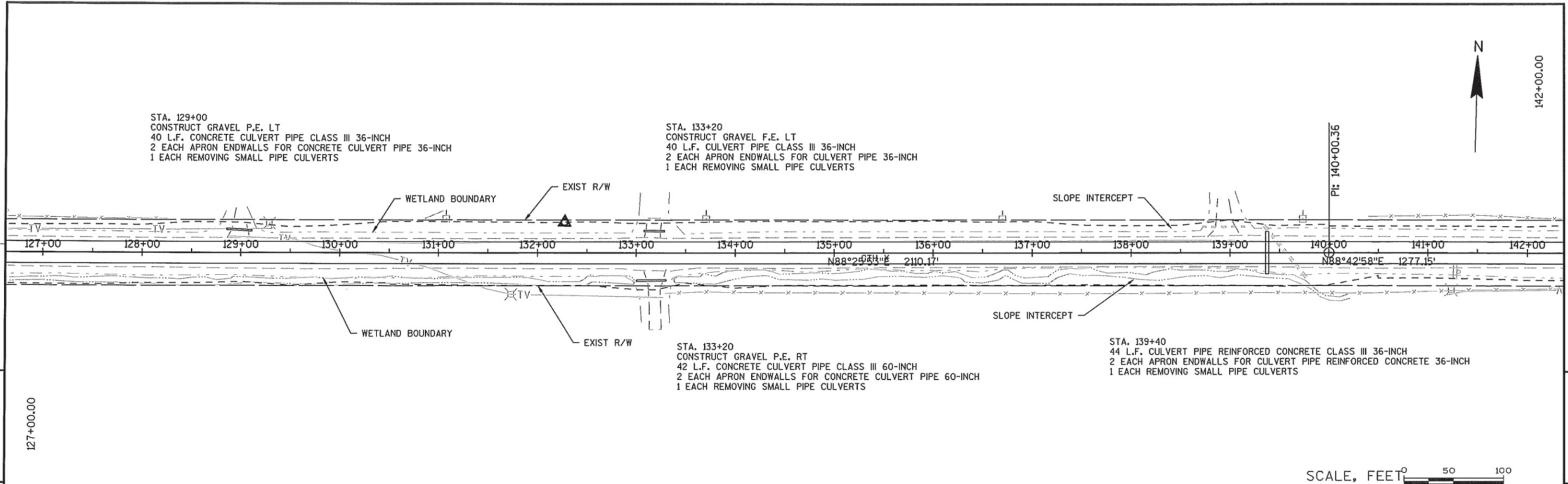
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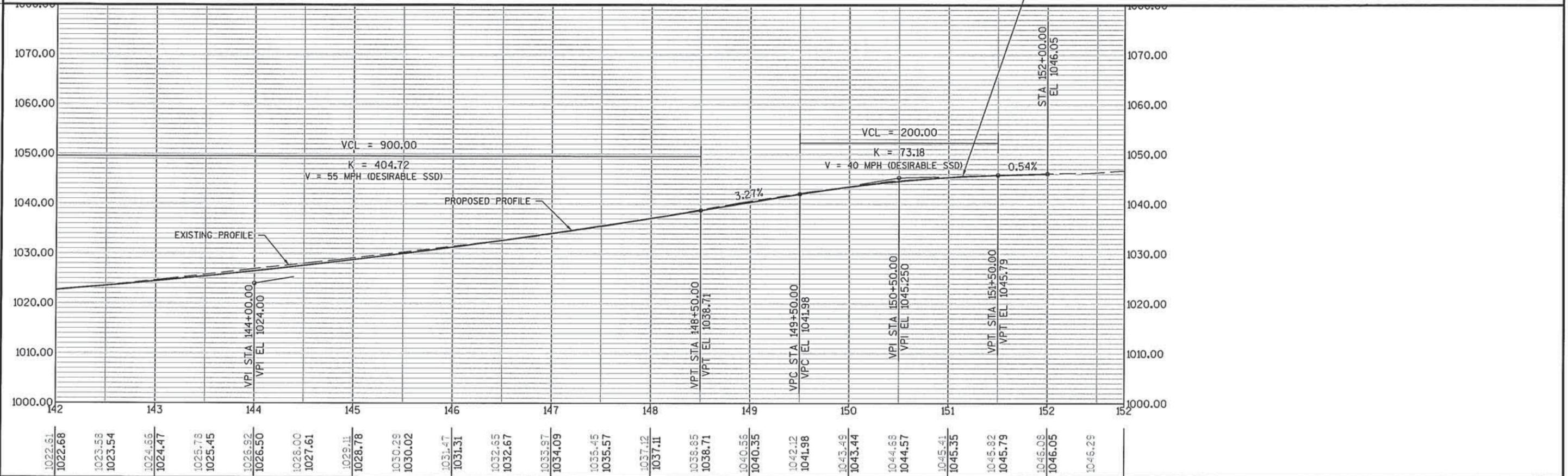
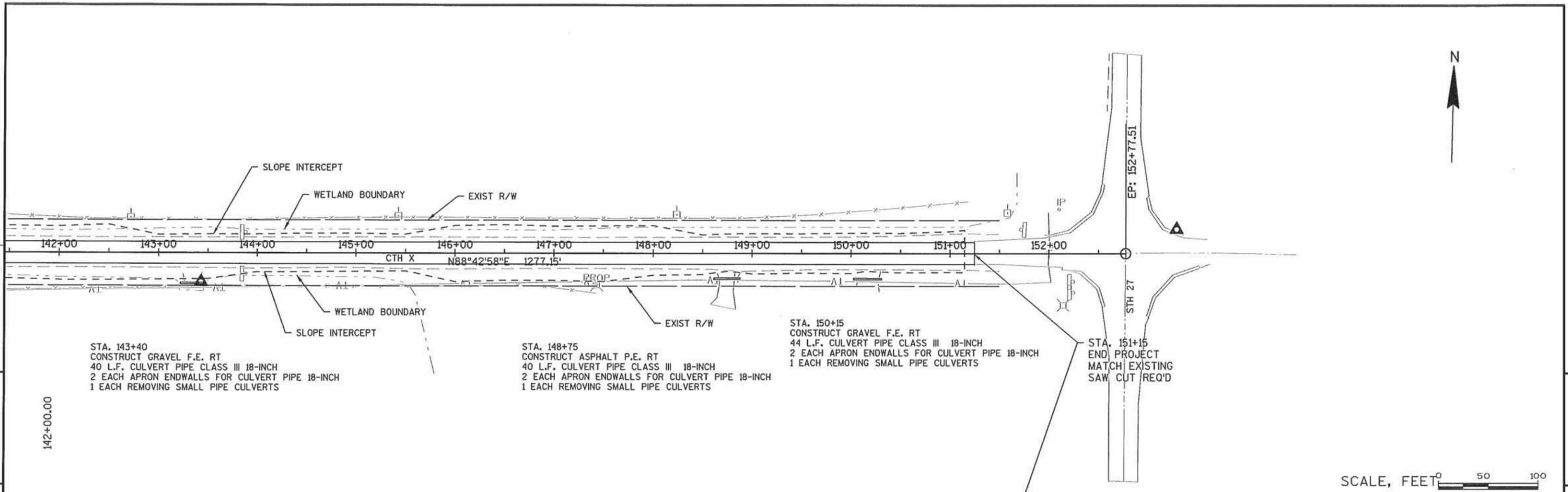
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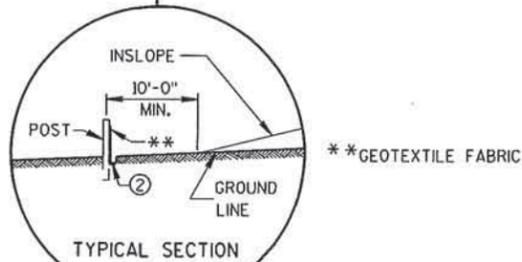
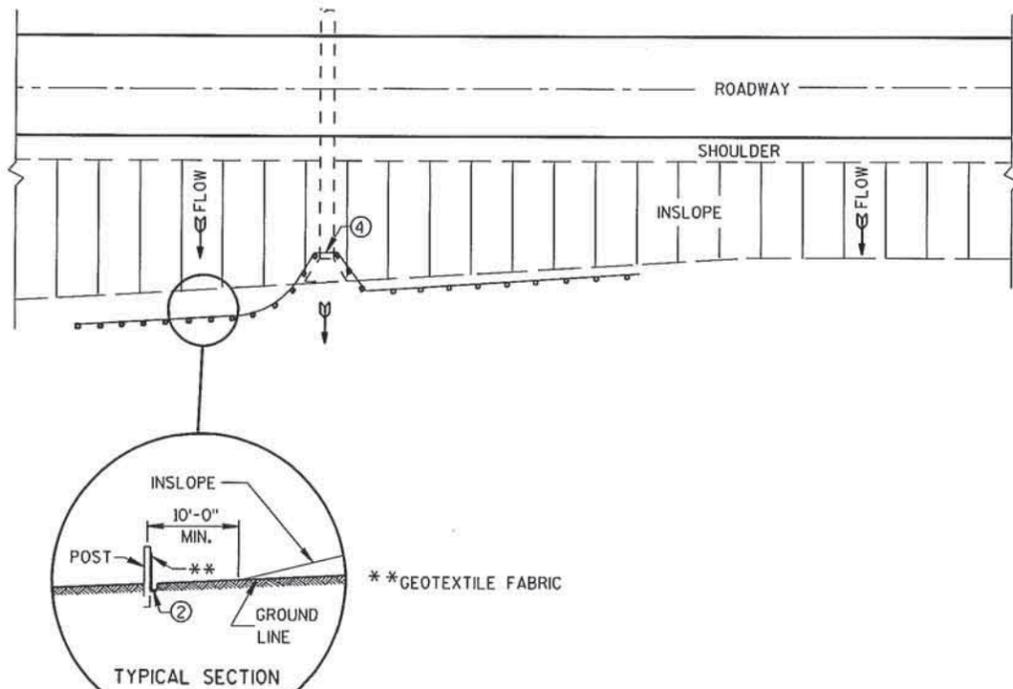
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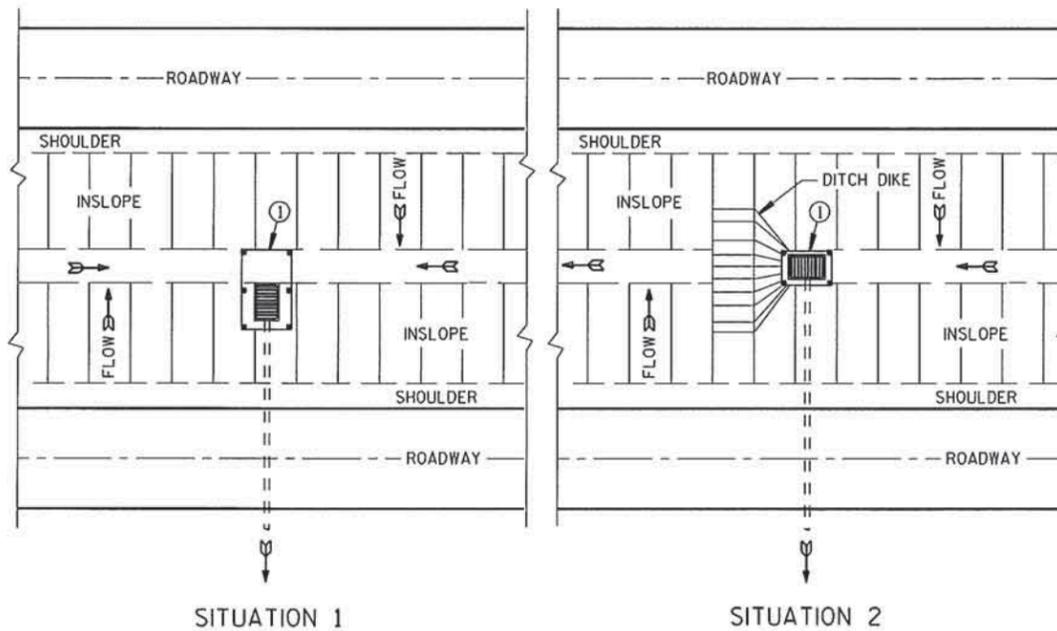
PROJECT NO: 53312-794 HWY: CTH X COUNTY: EAU CLAIRE PLAN AND PROFILE: MAINLINE SHEET E



PROJECT NO: 53312-794 HWY: CTH X COUNTY: EAU CLAIRE PLAN AND PROFILE: MAINLINE SHEET E



PLAN VIEW
TYPICAL APPLICATION OF SILT FENCE

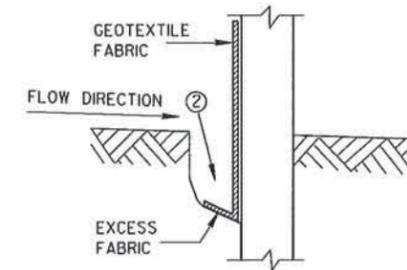


PLAN VIEW
SILT FENCE AT MEDIAN SURFACE DRAINS

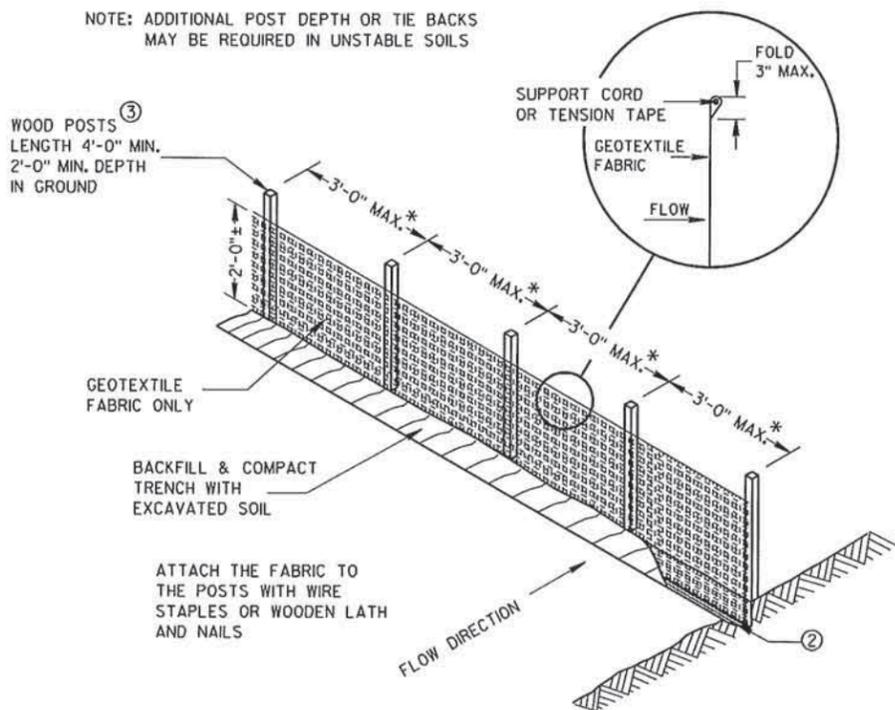
GENERAL NOTES

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

- 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 1/8" X 1/8" 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.

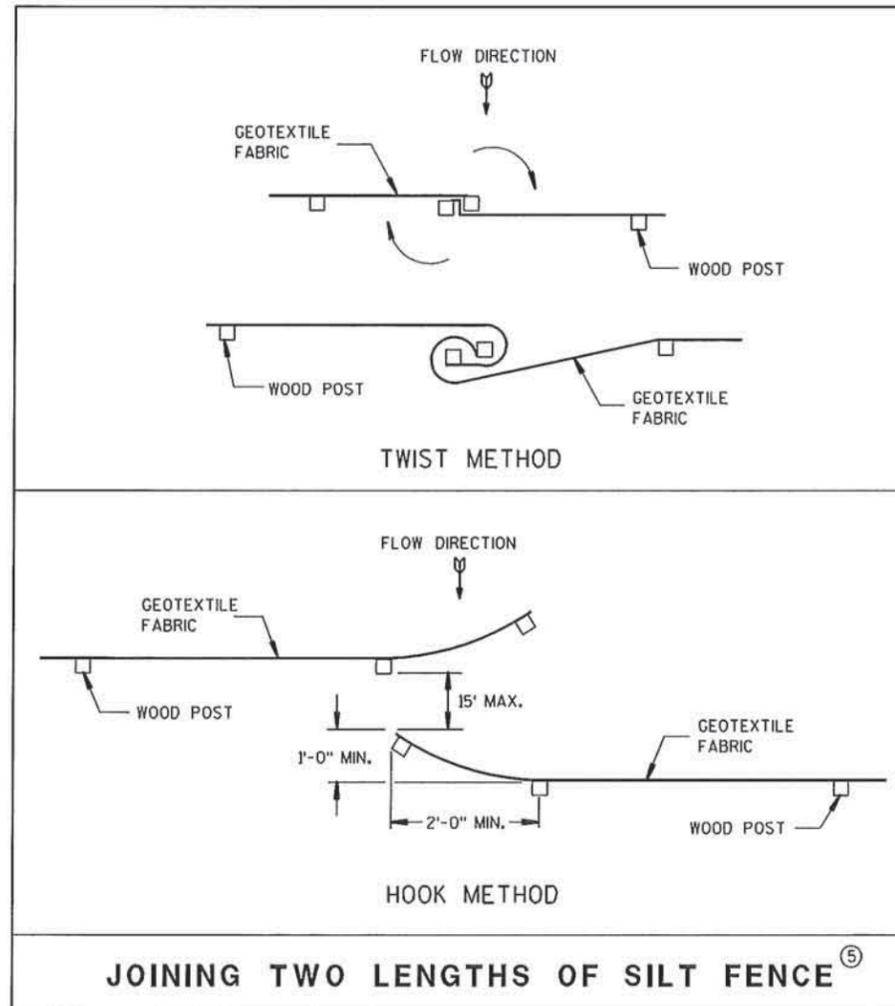


TRENCH DETAIL

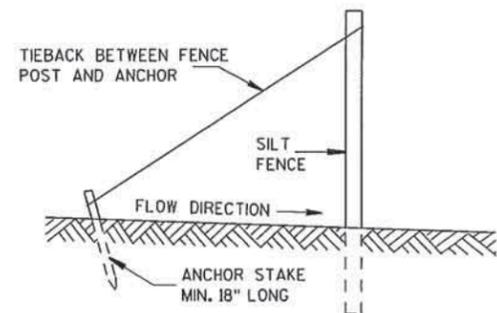


SILT FENCE

* NOTE: 8'-0" POST SPACING ALLOWED IF A WOVEN GEOTEXTILE FABRIC IS USED.



JOINING TWO LENGTHS OF SILT FENCE ⑤



SILT FENCE TIE BACK
(WHEN REQUIRED BY THE ENGINEER)

SILT FENCE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
4-29-05 /S/ Beth Cannestra
DATE CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

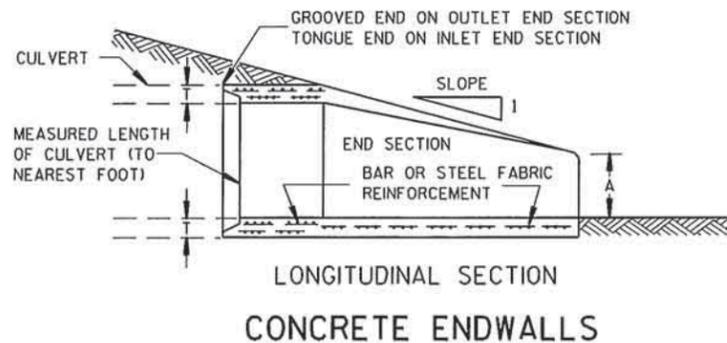
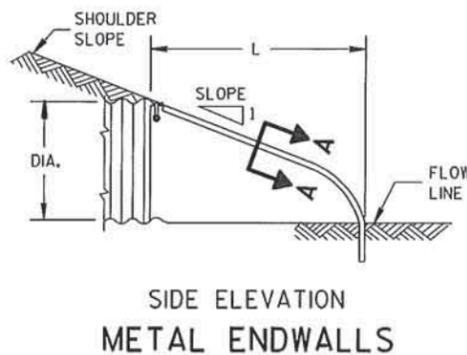
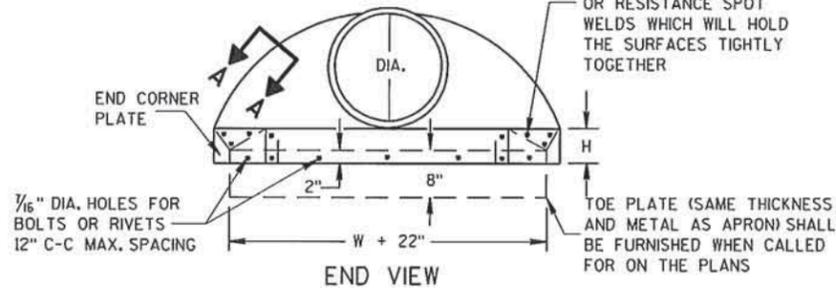
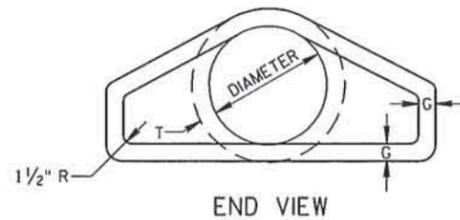
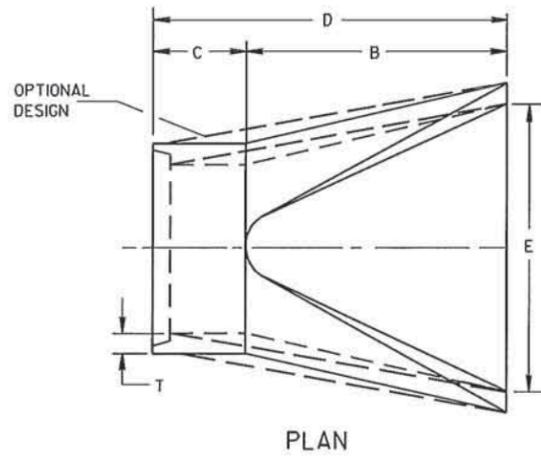
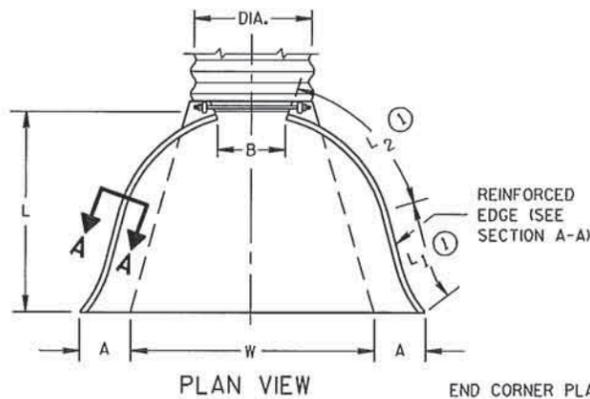
8F1: Apron Endwalls for Culvert Pipe

METAL APRON ENDWALLS											
PIPE DIA. (IN.)	MIN. THICK. (Inches)		DIMENSIONS (Inches)							APPROX. SLOPE	BODY
	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±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 1/2 to 1	3 Pc.
54	.109	.105	18	30	12	84	30	85 1/2	102	2 1/2 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.

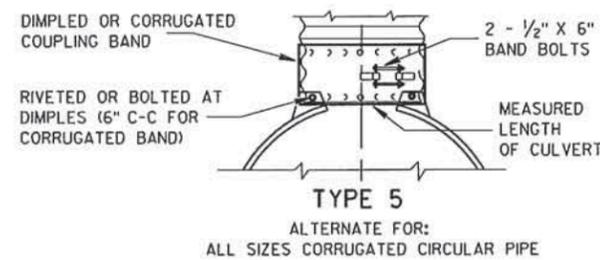
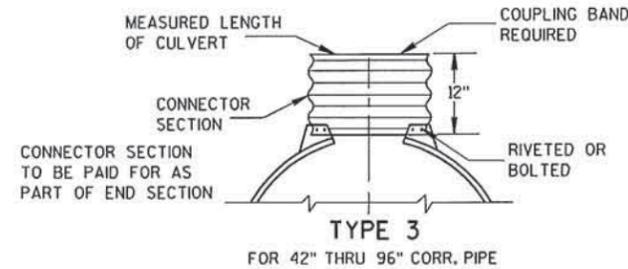
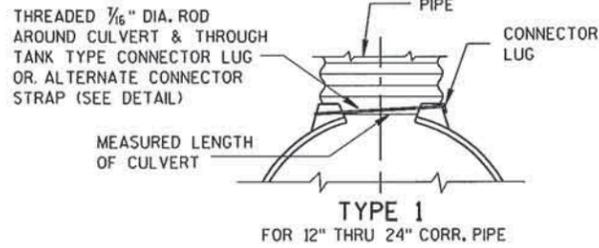
* EXCEPT CENTER PANEL SEE GENERAL NOTES

REINFORCED CONCRETE APRON ENDWALLS									
PIPE DIA. (IN.)	DIMENSIONS (Inches)							APPROX. SLOPE	
	T	A	B	C	D	E	G		
12	2	4	24	48 1/8	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 1/4	73 1/2	60	3 1/2	3 to 1	
36	4	15	63	34 3/4	97 1/4	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	30-35	72-78	21-27	99	102	5 1/2	2 to 1	
72	7	30-35	78	21	99	108	6	2 to 1	
78	7 1/2	30-35	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



ALTERNATE FOR TYPE 1 CONNECTION END SECTION CONNECTOR STRAP



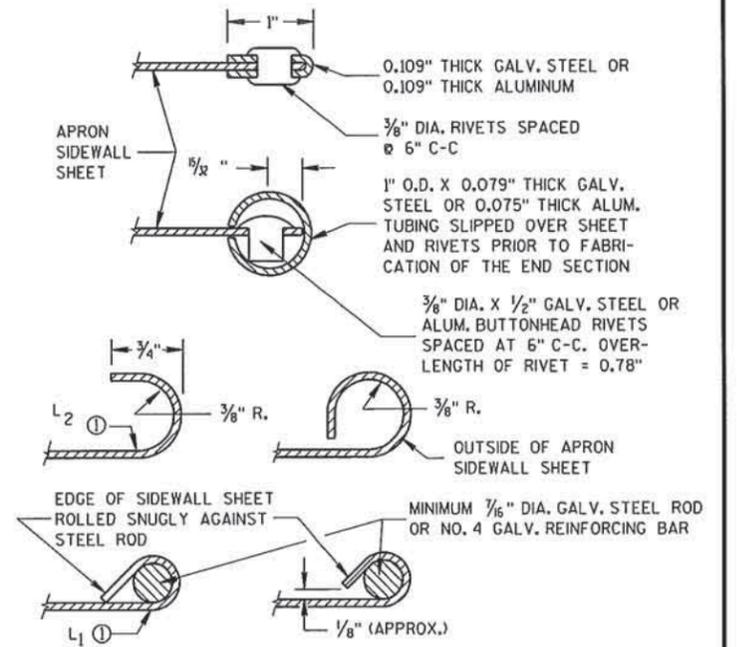
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

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.

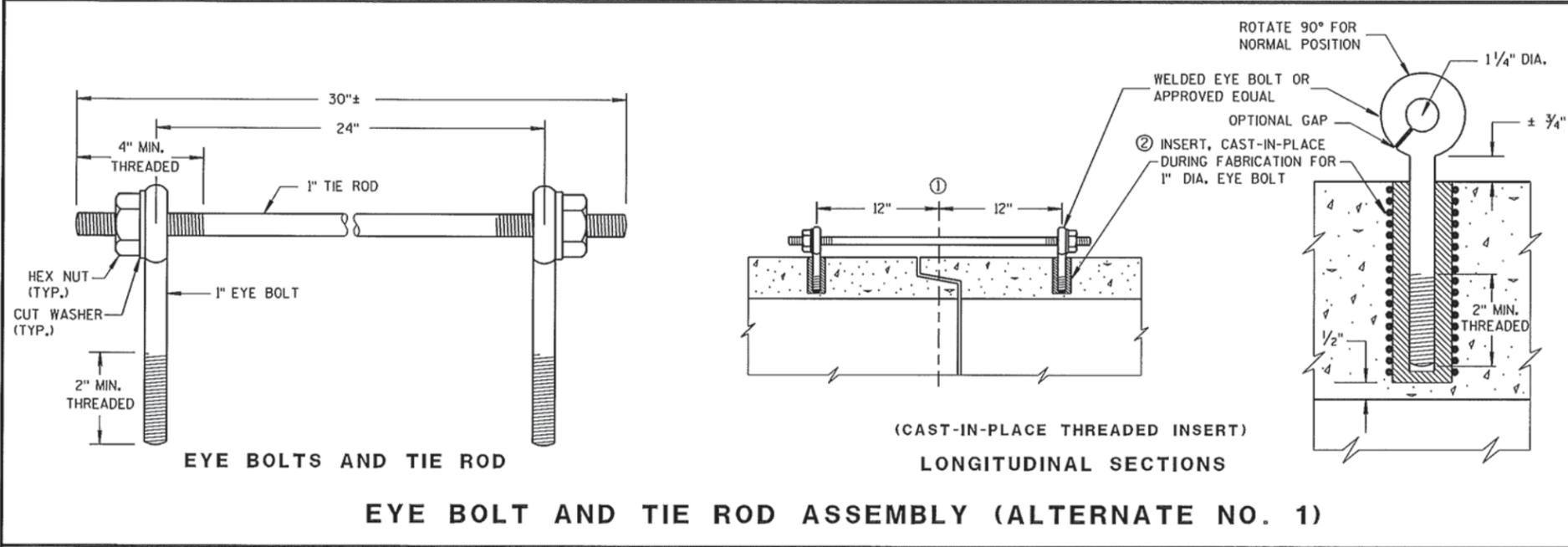
① FOR PIPE SIZES UP TO 60" DIAMETER, A 180° ROLLED EDGE MAY BE USED INSTEAD OF STEEL ROD REINFORCEMENT. SEE SECTION A-A.

APRON ENDWALLS FOR CULVERT PIPE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
11/30/94 DATE /S/ Rory L. Rhinesmith
CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

8F4: Joint Ties for Concrete Pipe



GENERAL NOTES

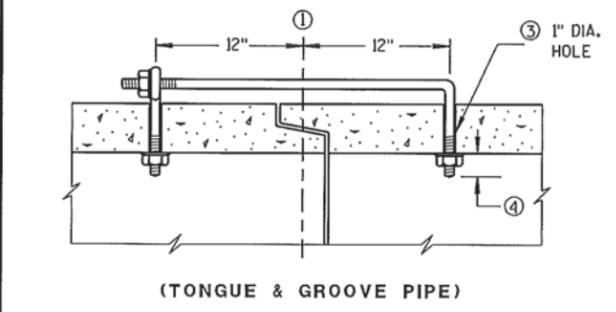
DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

CONCRETE CULVERT AND STORM SEWER PIPE SHALL BE TIED TOGETHER IN THE MANNER ILLUSTRATED BY THIS DETAIL AT LOCATIONS DESIGNATED IN THE STANDARD SPECIFICATIONS AND THE PLAN. THE CONTRACTOR MAY USE EITHER ALTERNATE 1, 2 OR 3 FOR DRAINAGE STRUCTURES. ONLY ALTERNATE 1 AND 3 MAY BE USED FOR CATTLE PASSES, UNLESS OTHERWISE STATED IN THE CONTRACT. THE MATERIALS, FABRICATION AND WORK NECESSARY TO TIE THE PIPE BY THIS DETAIL WILL BE CONSIDERED INCIDENTAL TO THE PIPE AND APRON ENDWALLS IF REQUIRED.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR JOINT TIES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

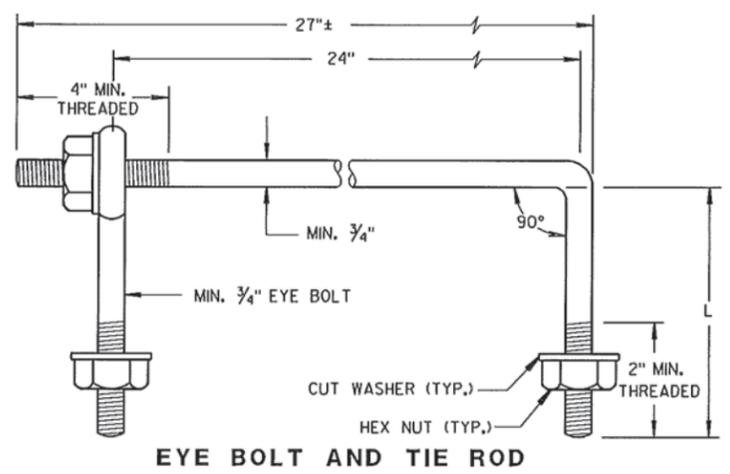
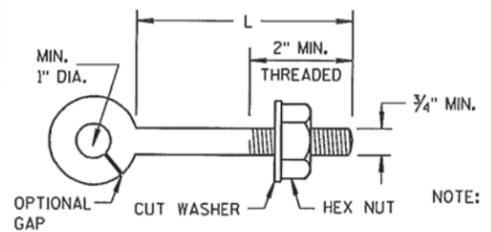
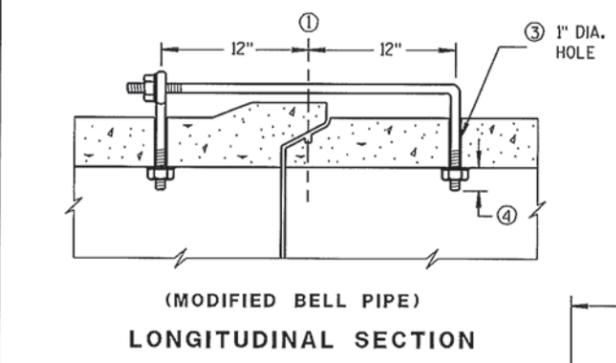
JOINT TIES TO BE HOT-DIP GALVANIZED PER ASTM A 153.

- ① ϕ OF TONGUE AND GROOVE OR BELL AND SPIGOT JOINTS.
- ② THE INSIDE OF THE THREADED INSERTS SHALL BE CLEAN TO ALLOW THE INSERTION OF THREADED EYE BOLTS.
- ③ HOLES SHALL BE CAST-IN-PLACE OR DRILLED 12 INCHES FROM ϕ OF TONGUE AND GROOVE.
- ④ BOLT PROJECTION INSIDE OF PIPE SHALL NOT EXCEED 2 INCHES.
- ⑤ OPENING TO BE ROD DIAMETER PLUS 1 INCH.
- ⑥ LENGTH ADEQUATE TO EXTEND TO WITHIN 1/2 INCH OF THE INNER SURFACE OF THE PIPE.



EYE BOLT DIMENSION TABLE

PIPE SIZE	L = LENGTH	
	TONGUE & GROOVE PIPE	MODIFIED BELL PIPE
18" TO 24"	4 1/2"	6 1/4"
30"	5"	7"
36"	5 1/2"	7"
42"	6"	
48"	6 1/2"	
60"	7 1/2"	
66"	8"	



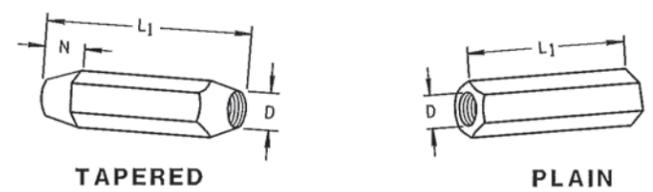
(JOINT TIES FOR 18" TO 66" DIA. CONCRETE PIPE)

EYE BOLT AND TIE ROD ASSEMBLY (ALTERNATE NO. 2)

ADJUSTABLE TIE ROD TABLE

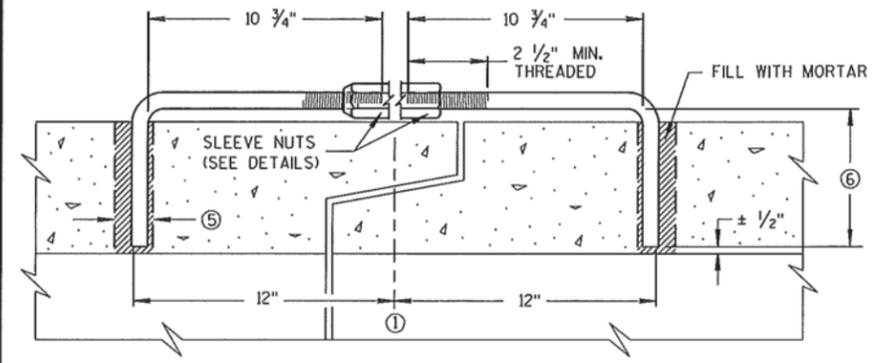
PIPE DIAMETER	TIE ROD DIAMETER	D	L ₁	N
12-60	5/8	5/8	5	1/2
66-84	3/4	3/4	5	1/2
90-108	1	1	7	1 1/16

DIMENSIONS SHOWN ARE IN INCHES



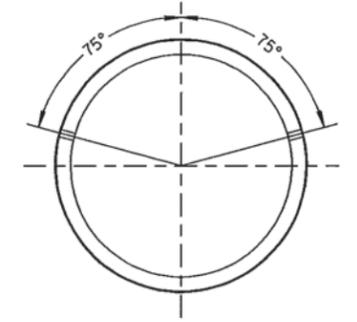
RIGHT AND LEFT THREADS

SLEEVE NUTS

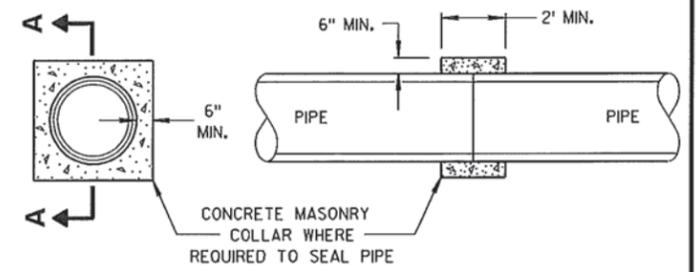


(JOINT TIES FOR 12" TO 108" DIA. CONCRETE PIPE)

ADJUSTABLE TIE ROD (ALTERNATE NO. 3)



PLACEMENT OF (2) CAST-IN-PLACE INSERTS OR HOLES DURING FABRICATION FOR PIPE SECTIONS REQUIRING TIE RODS



JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
6/5/2012 /S/ Jerry H. Zogg
DATE ROADWAY STANDARDS DEVELOPMENT
FHWA ENGINEER

6

6

S.D.D. 8 F 4-7

S.D.D. 8 F 4-7

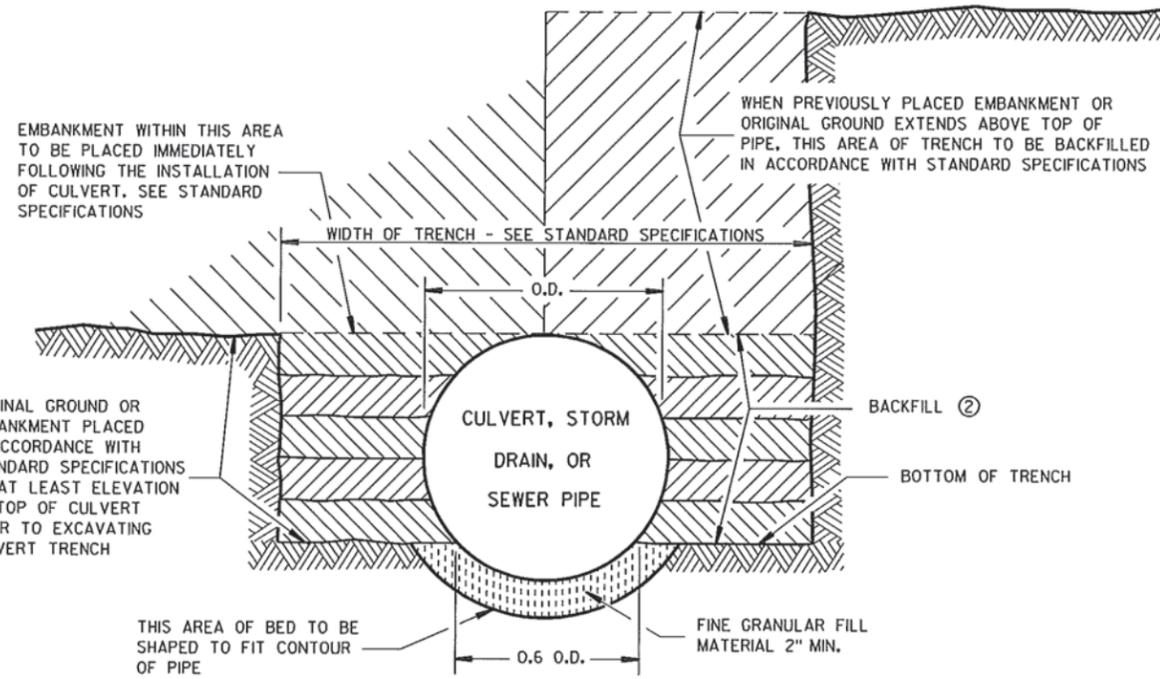
8F5: Class 'B' Bedding for Culvert Pipe or Storm Sewer

GENERAL NOTES

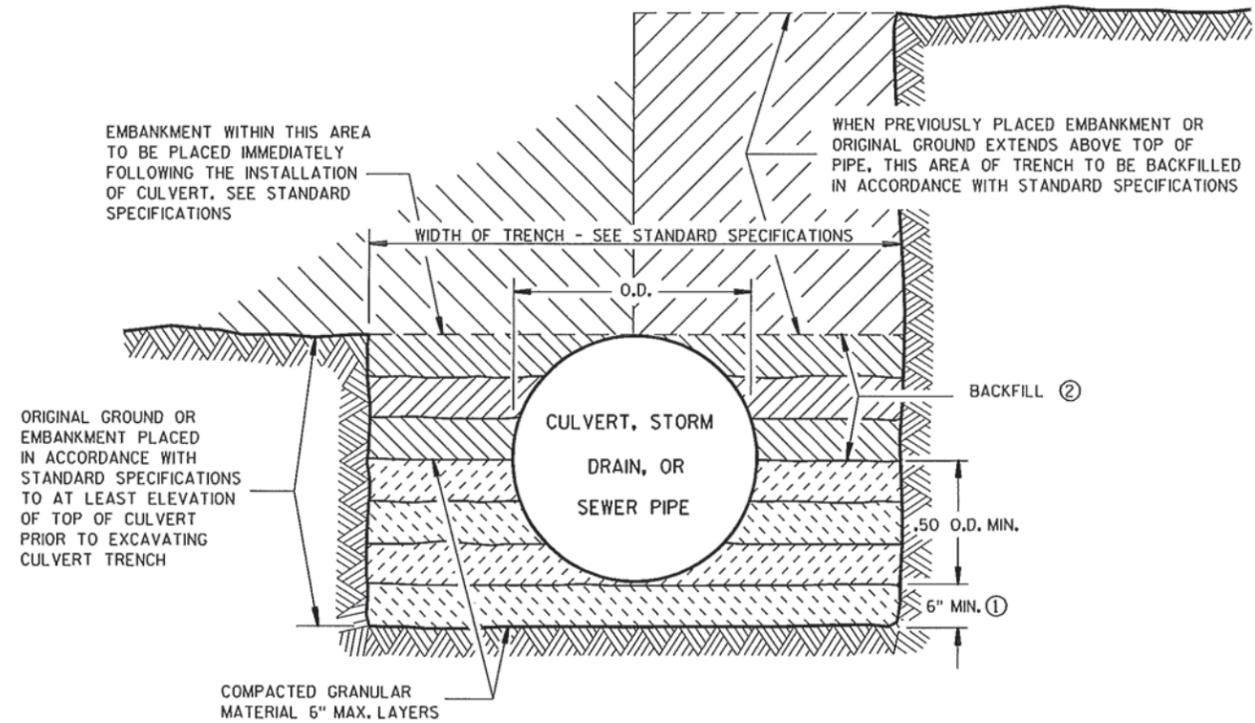
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

THE SHAPED SUBGRADE WITH GRANULAR FOUNDATION IS AN EQUAL ALTERNATE TO THE GRANULAR FOUNDATION EXCEPT WHERE ROCK IS ENCOUNTERED.

- ① WHERE ROCK, HARD PAN OR FRAGMENTED MATERIAL IS ENCOUNTERED, THE TRENCH SHALL BE EXCAVATED BELOW THE BOTTOM OF THE PIPE AN AMOUNT EQUAL TO 1/2 INCH PER FOOT OF PROPOSED EMBANKMENT ABOVE THE TOP OF THE PIPE, BUT NOT LESS THAN 6 INCHES.
- ② TRENCH SHALL BE BACKFILLED AS REQUIRED BY STANDARD SPECIFICATIONS; SECTION 520 FOR PIPE CULVERTS AND SECTION 607 FOR STORM SEWERS.



SHAPED SUBGRADE WITH GRANULAR FOUNDATION



GRANULAR FOUNDATION

CLASS "B" BEDDING

CLASS "B" BEDDING FOR
CULVERT PIPE OR STORM SEWER

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED

4/7/83 DATE /S/ D.L. Strand
STATE DESIGN ENGINEER FOR HWYS

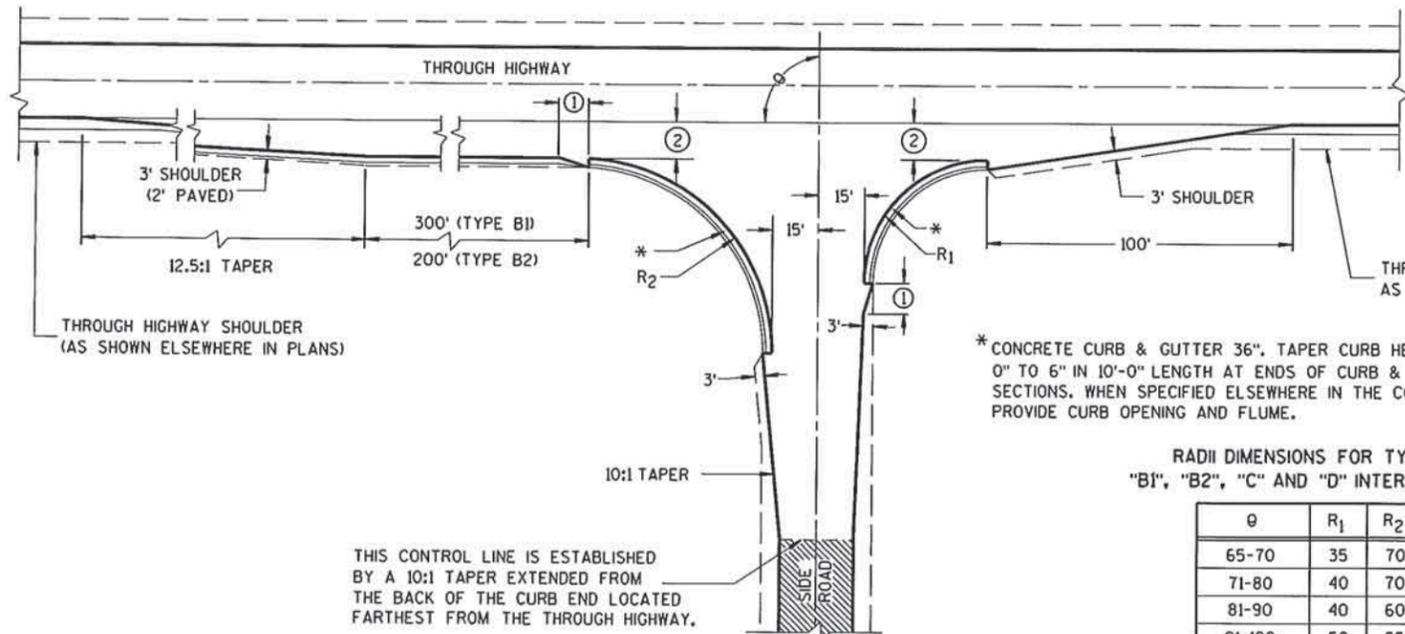
FHWA

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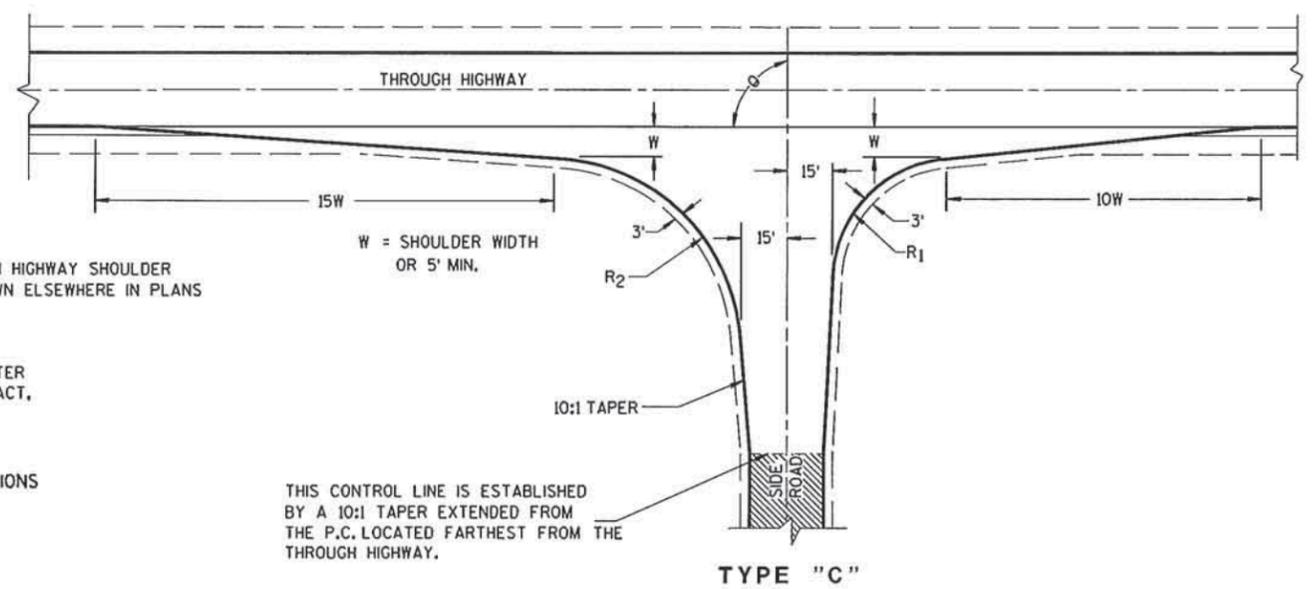
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S.D.D. 8 F 5-1

S.D.D. 8 F 5-1



TYPE "B1" AND "B2"



TYPE "C"

RADI DIMENSIONS FOR TYPES "B1", "B2", "C" AND "D" INTERSECTIONS

θ	R ₁	R ₂
65-70	35	70
71-80	40	70
81-90	40	60
91-100	50	55
101-110	60	45

GENERAL NOTES

DESIGNS MAY BE USED INTERCHANGEABLY IN COMBINATION OR SEPARATELY FOR ANY ONE COMPLETE INTERSECTION DEPENDING UPON INTERSECTION ANGLE AND SURFACING OF EACH APPROACH ROADWAY.

SIDE ROAD SURFACING NOTE

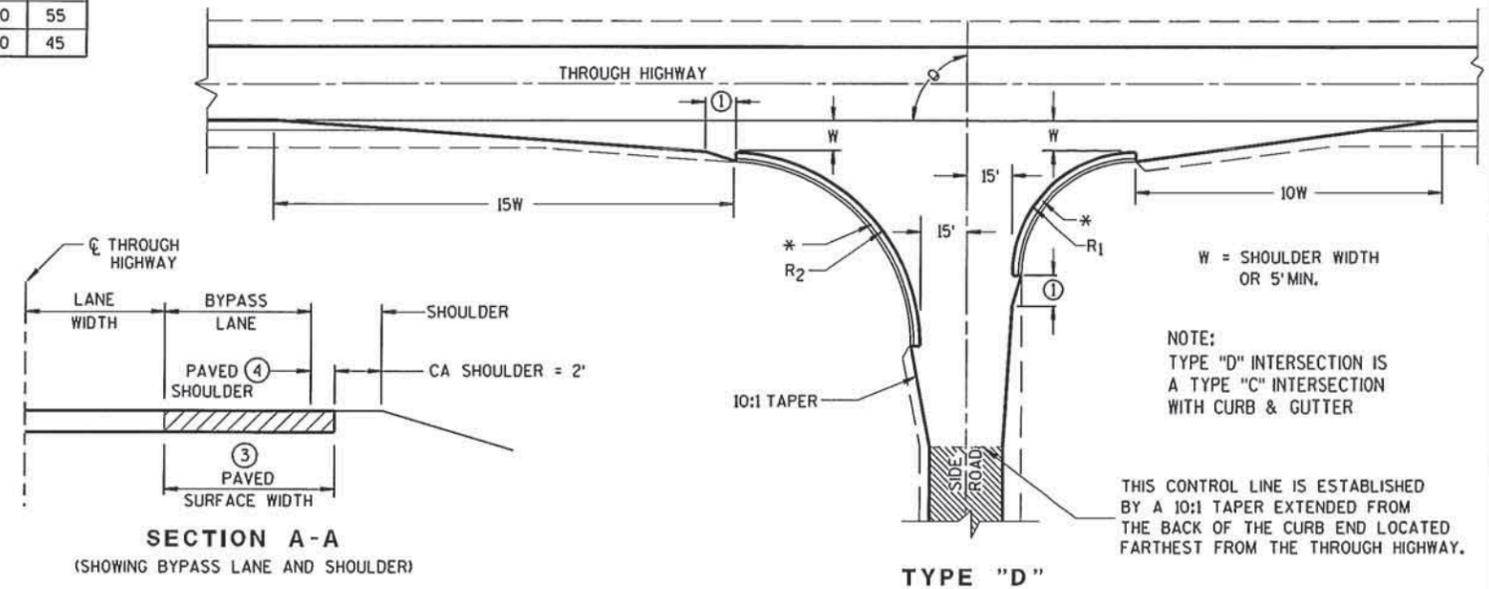
WHEN THE SIDE ROAD IS NOT PRESENTLY PAVED, PAVEMENT SHALL BE PLACED TO THE LIMITS SHOWN UNLESS OTHERWISE PROVIDED IN THE CONTRACT. WHERE THE CONSTRUCTION LIMITS ARE BEYOND THE PAVING LIMITS, CRUSHED AGGREGATE SURFACING SHALL BE PLACED BETWEEN THE PAVING LIMITS AND CONSTRUCTION LIMITS.

WHEN THE SIDE ROAD IS PRESENTLY PAVED, NEW PAVEMENT SHALL BE PLACED TO THE LIMITS OF DESIGN AS SHOWN AND BEYOND, IF NECESSARY, TO MEET EXISTING PAVEMENT.

WHEN THE SIDE ROAD IS THE CONSTRUCTION PROJECT, THE INTERSECTION SURFACING SHALL BE THE SAME AS FOR THE PROJECT.

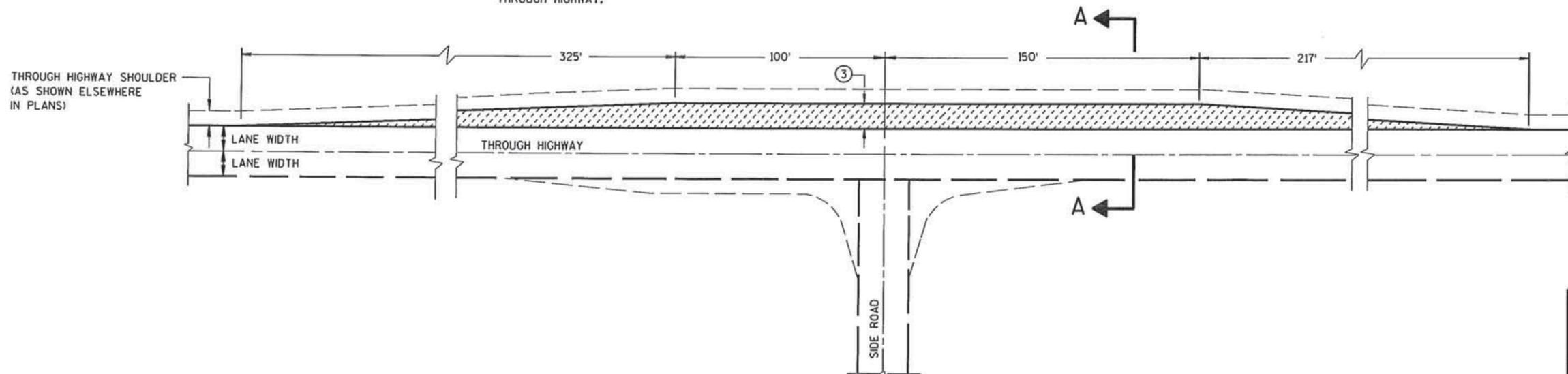
- EXISTING PAVED SURFACE
- BYPASS LANE

- ① 10-FT TYPICAL.
- ② 12-FT** PLUS ADDITIONAL WIDTH FOR BIKE LANE IF SHOWN ELSEWHERE IN THE PLAN.
**10-FT MAY BE USED ON TYPE B2 ON RESURFACING PROJECTS IF SPECIFIED IN THE CONTRACT.
- ③ BYPASS LANE PAVED SURFACE WIDTH OUTSIDE OF TRAVEL LANE
-ASPHALT = 12-FT PLUS PAVED SHOULDER WIDTH,
-PC CPNCRETE = 13-FT PLUS PAVED SHOULDER WIDTH.
- ④ BYPASS LANE PAVED SHOULDER WIDTH = THE GREATER OF 1-FT OR THE PAVED SHOULDER WIDTH OF THE THROUGH HIGHWAY.



TYPE "D"

SECTION A-A (SHOWING BYPASS LANE AND SHOULDER)



TEE INTERSECTION BYPASS LANE DETAIL

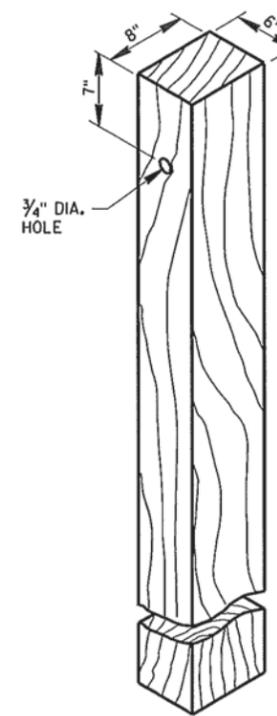
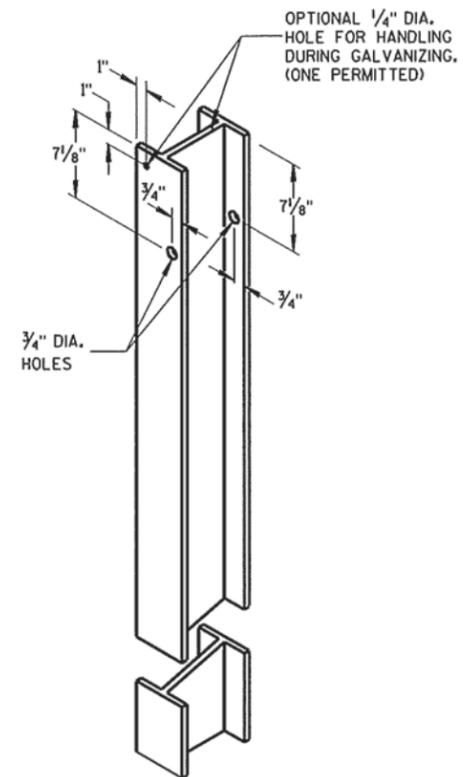
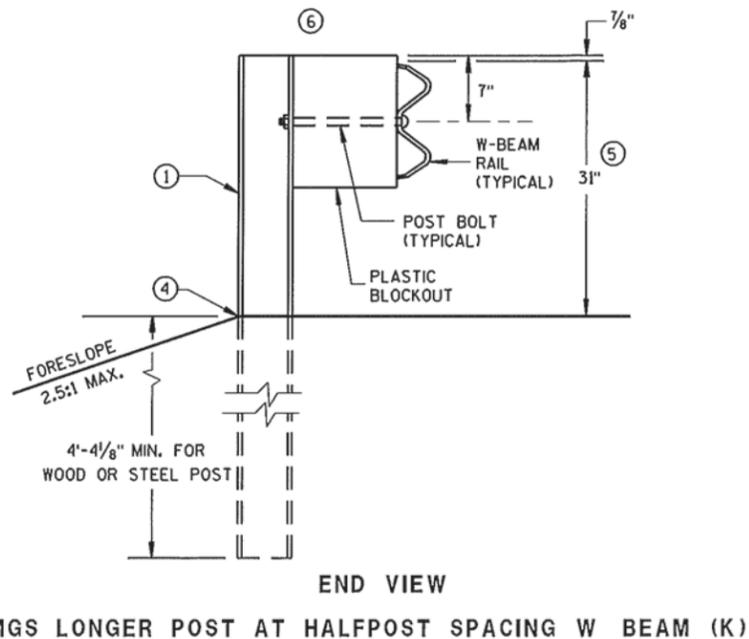
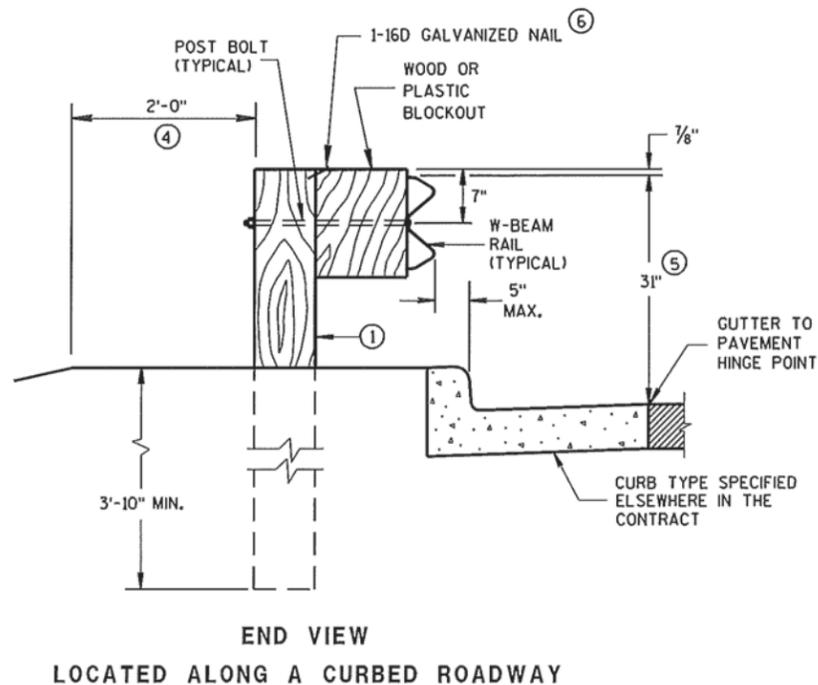
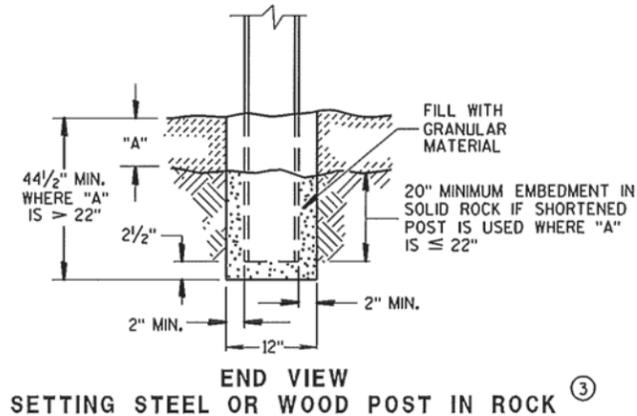
AT-GRADE SIDE ROAD INTERSECTION, TYPES "B1", "B2", "C" AND "D" AND TEE INTERSECTION BYPASS LANE
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

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6

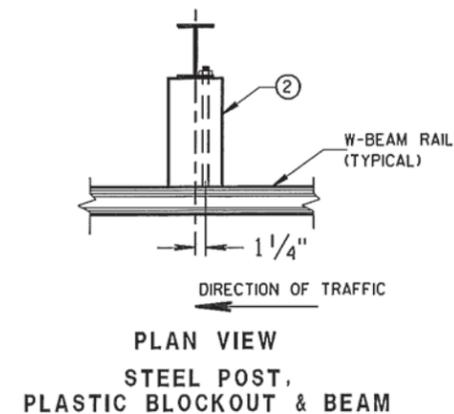
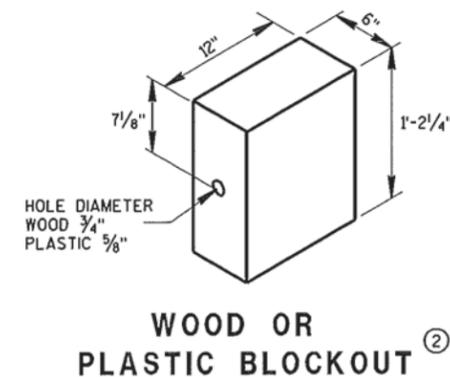
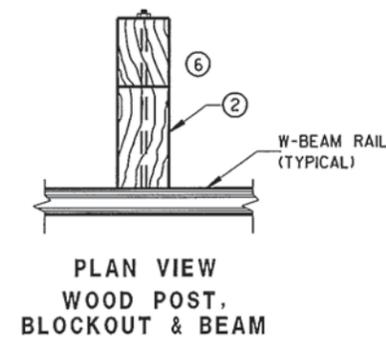
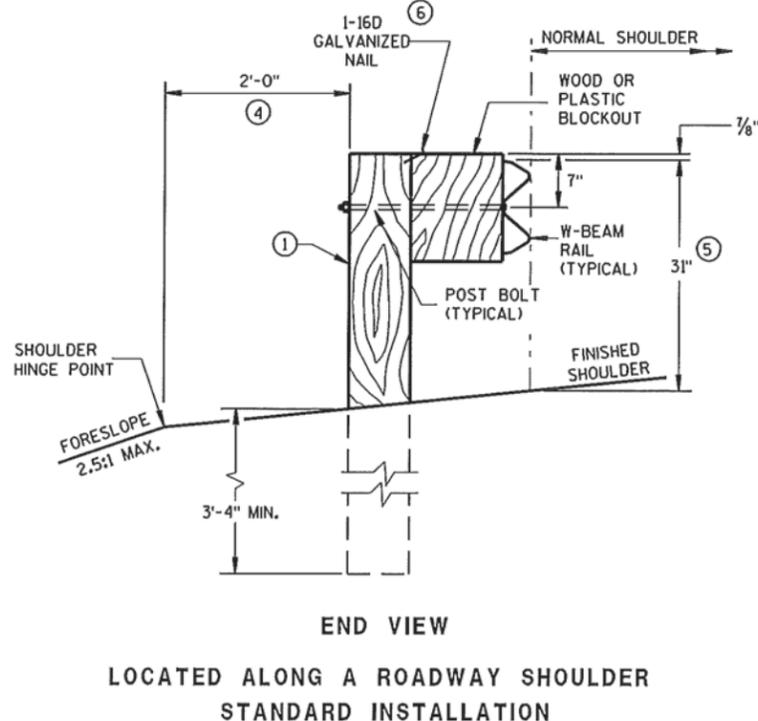
GENERAL NOTES

- ① WOOD OR STEEL POSTS (w6X9 OR w6X8.5) MAY BE USED. DO NOT INTERMIX WOOD AND STEEL POSTS. INSTALL STEEL POSTS WITH HOLES ON APPROACHING TRAFFIC SIDE.
- ② USE WOOD OR APPROVED PLASTIC BLOCKOUTS. WOOD BLOCKOUTS MAY BE CONSTRUCTED OUT OF TWO OR MORE WOOD BLOCKOUTS. SEE ALTERNATE WOOD BLOCKOUT DETAIL. DIMENSIONS OF APPROVED PLASTIC BLOCKOUTS MAY VARY.
- ③ IF ROCK IS ENCOUNTERED DURING EXCAVATION, PROVIDE A HOLE 12 INCHES IN DIAMETER EXTENDING 20 INCHES DEEP INTO THE ROCK. PLACE APPROXIMATELY 2½ INCHES OF GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE. CUT THE POSTS TO THE LENGTH AND INSTALL. BACKFILL WITH EXCAVATED MATERIAL AND COMPACT. BACKFILL IS TO BE FREE OF LARGE ROCKS.
- ④ WHEN THE DISTANCE FROM BACK OF POST TO SHOULDER HINGE POINT IS LESS THAN 2 FEET INSTALL LONGER POST AT HALF POST SPACING (K).
- ⑤ FOR NEW MGS INSTALLATION TOP OF W-BEAM RAIL TOLERANCE IS ± 1". FOR EXISTING MGS INSTALLATION TOP OF W-BEAM IS BETWEEN 27¾" TO 32".
- ⑥ WHEN USING STEEL POST AND WOOD BLOCKOUTS INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.



**STEEL POST &
HOLE PUNCHING DETAIL
(w6X9)** ①

**WOOD POST
(6" X 8") NOMINAL** ①



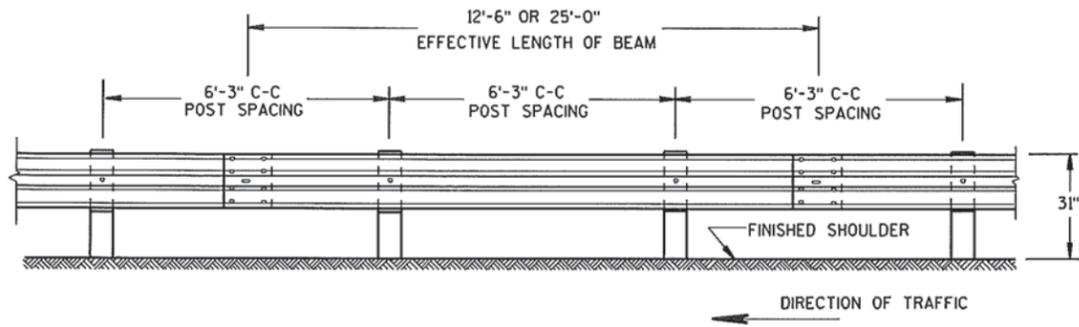
MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

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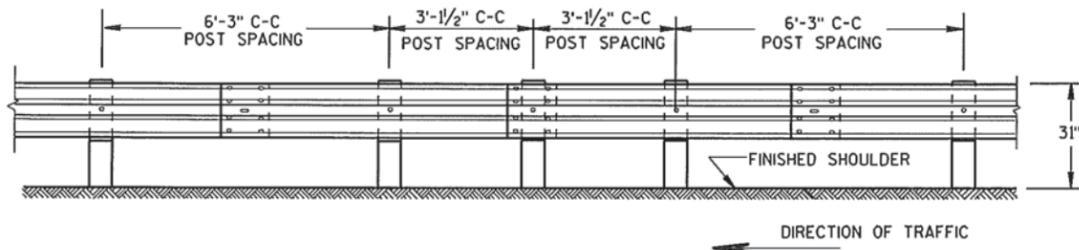
S.D.D. 14 B 42-3a

S.D.D. 14 B 42-3a



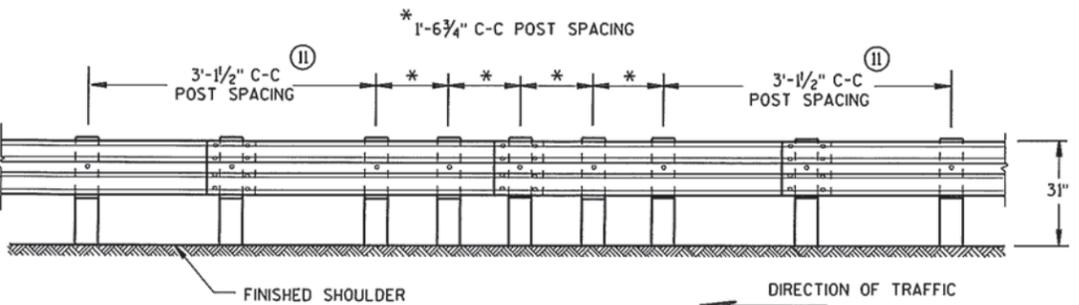
FRONT VIEW

POST SPACING STANDARD INSTALLATION



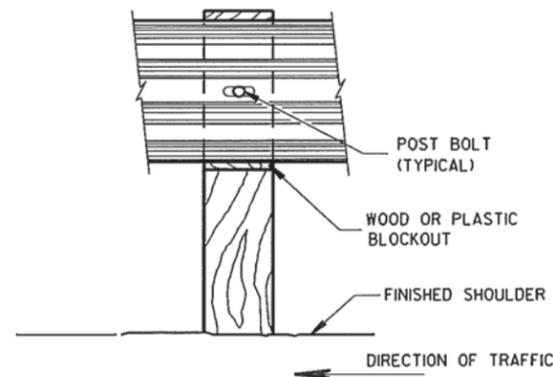
FRONT VIEW

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

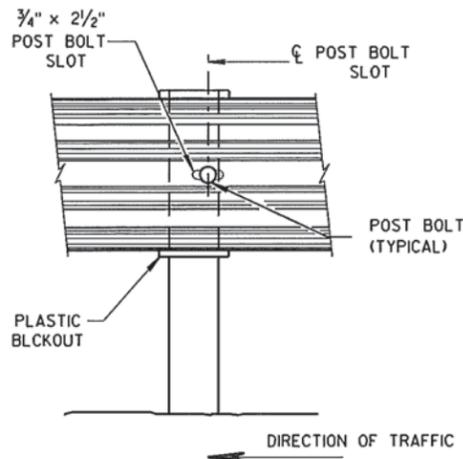


FRONT VIEW

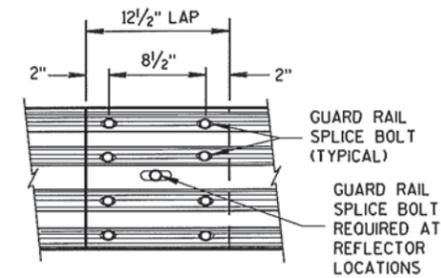
QUARTER POST SPACING (QS)



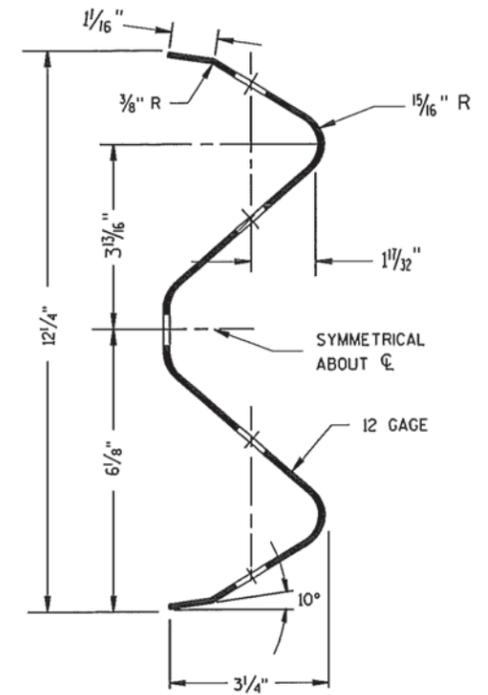
FRONT VIEW AT WOOD POST



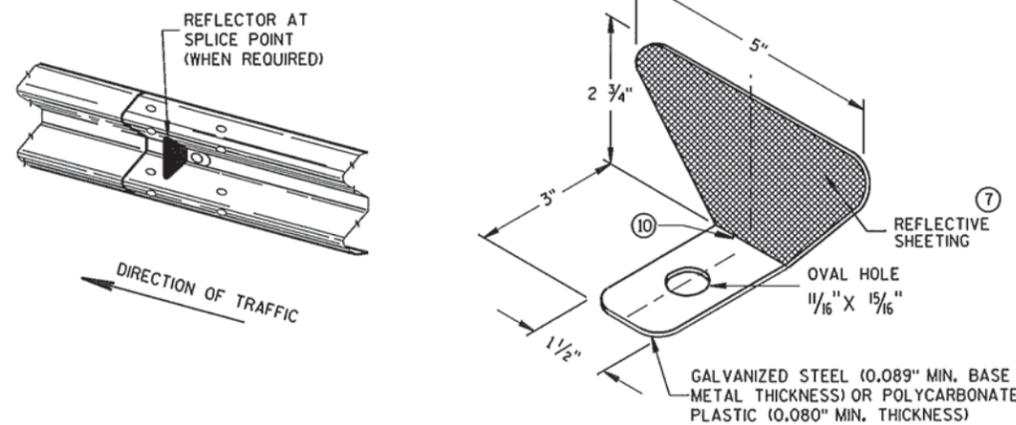
FRONT VIEW AT STEEL POST



FRONT VIEW
MID-SPAN BEAM SPLICE



SECTION THRU W-BEAM RAIL



ONE SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION

GENERAL NOTES

- ⑦ PROVIDE SILVER REFLECTIVE SHEETING ON ALL REFLECTORS EXCEPT THOSE LOCATED ALONG THE LEFT EDGE OF ONE-WAY ROADWAYS, WHICH SHALL BE PROVIDED WITH YELLOW REFLECTIVE SHEETING. SHEETING IS TYPE H. SEE STANDARD SPECIFICATION 637.
- ⑧ 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.
- ⑨ REVERSE EVERY OTHER REFLECTOR FOR 2-WAY VISIBILITY. THE CONTRACTOR MAY FURNISH TWO-SIDED REFLECTORS IN LIEU OF ONE-SIDED REFLECTORS.
- ⑩ PROVIDE AN ANGLE OF BEND OF $90^\circ \pm 1^\circ$ FOR TWO-SIDED REFLECTORS.
- ⑪ 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 RAIL LENGTH	REFLECTOR SPACING	NO. SURFACES REFLECTORIZED	MIN. NO. REFLECTORS
ONE WAY TRAFFIC	< 200'	50' C-C	1	3
	> 200'	100' C-C	1	3
TWO WAY TRAFFIC	< 200'	25' C-C	1 ⑨	6
	> 200'	50' C-C	1 ⑨	6
TWO WAY TRAFFIC	< 200'	50' C-C	2 ⑩	3
	> 200'	100' C-C	2 ⑩	3

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

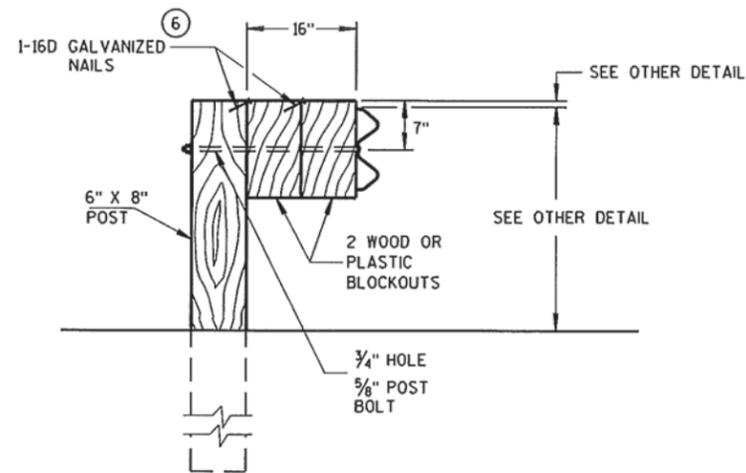
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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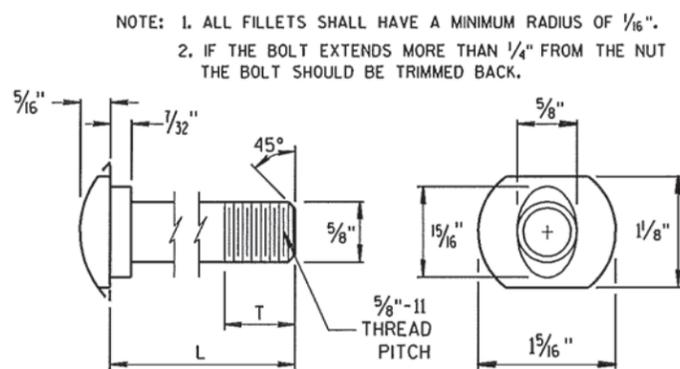
S.D.D. 14 B 42-3b

S.D.D. 14 B 42-3b



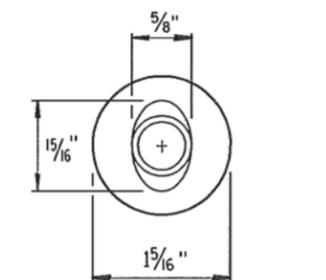
DETAIL FOR 16" BLOCKOUT DEPTH

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.

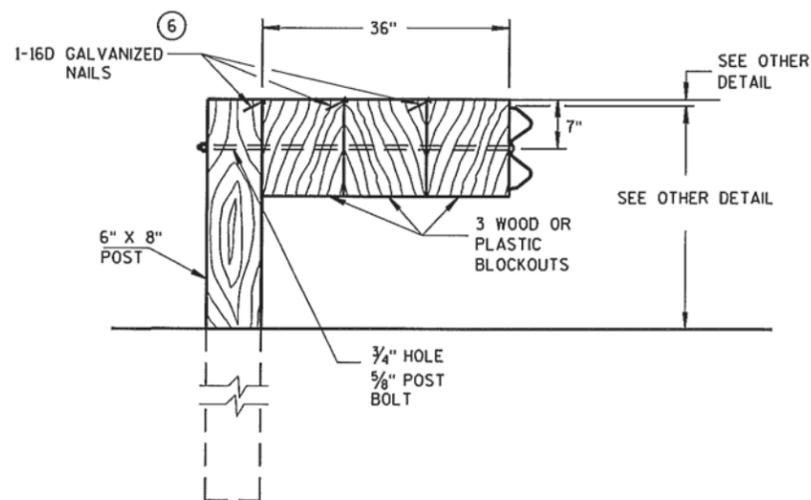


POST BOLT TABLE

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



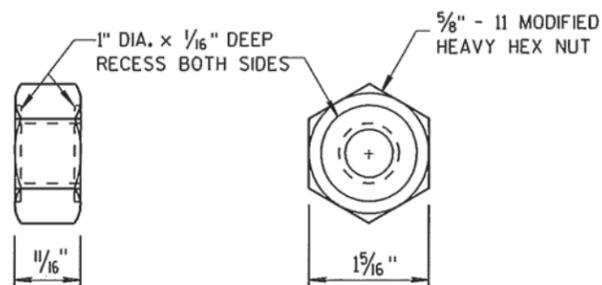
ALTERNATE BOLT HEAD



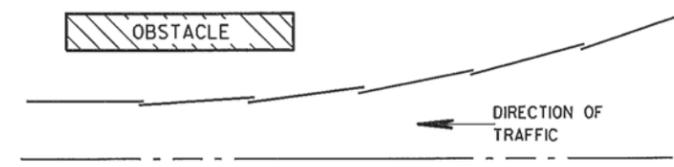
DETAIL FOR 36" BLOCKOUT DEPTH

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.

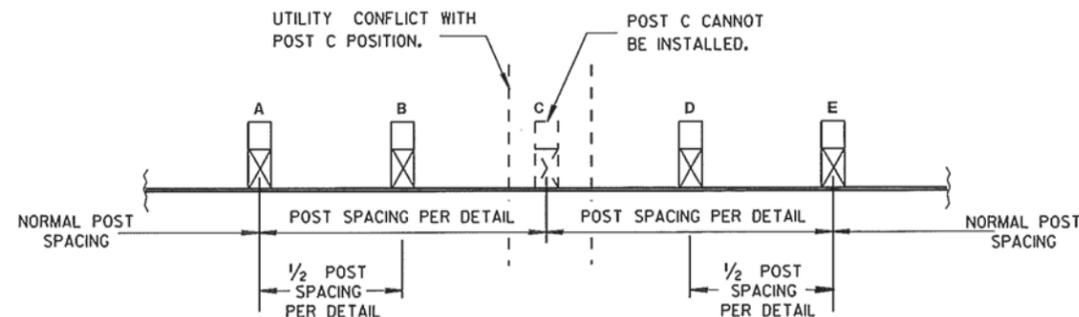
DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.



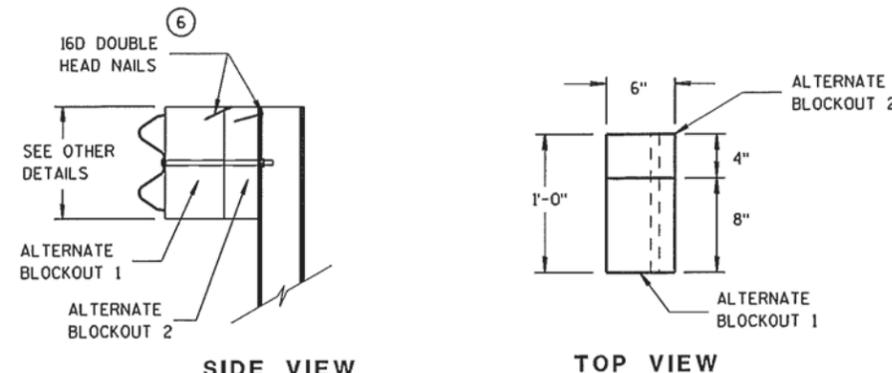
POST BOLT AND RECESS NUT



**PLAN VIEW
BEAM LAPPING DETAIL**



POST DRIVING FOR CONTINUOUS UNDERGROUND OBSTRUCTION



ALTERNATE WOOD BLOCKOUT DETAIL

MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
June 2014 /S/ Jerry H. Zogg
DATE ROADWAY STANDARDS DEVELOPMENT ENGINEER

6

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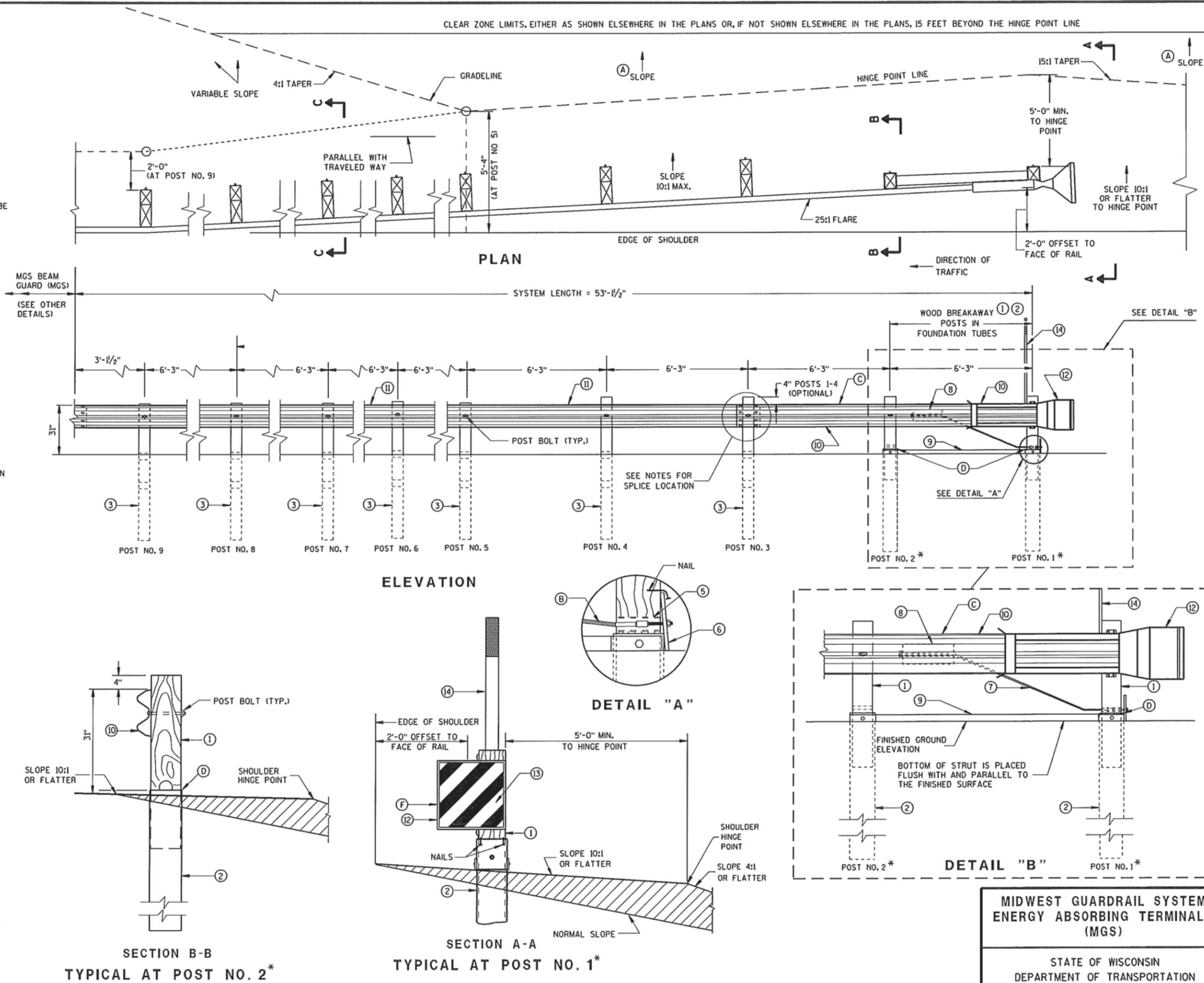
S.D.D. 14 B 42-3c

S.D.D. 14 B 42-3c

GENERAL NOTES

- (A) THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE (HPL), AND THE CLEAR ZONE LIMITS (CZL) SHALL BE 4:1 OR FLATTER.
- (B) AFTER FINAL ASSEMBLY, RECHECK CABLE TO BE SURE IT IS TAUT AND HAS NOT RELAXED.
- (C) DIFFERENT MANUFACTURERS REQUIRE DIFFERENT PERFORATED W-BEAM RAIL END PANELS. SEE MANUFACTURER'S INFORMATION.
- (D) THE TOP OF THE STEEL TUBE ON POST 1 AND POST 2 SHALL NOT BE MORE THAN 3" ABOVE THE FINISH GROUND ELEVATION.
- (E) ATTACH ALUMINUM SHEET TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF-TAPPING SCREWS, ONE SCREW PER CORNER.
- (F) 1/2" DIAMETER X 3" LONG LAG BOLT AND WASHER.
- (G) HARDWARE VARIES BETWEEN DIFFERENT MANUFACTURERS. SEE MANUFACTURER'S DRAWING FOR INFORMATION.
- (H) DIMENSIONS MAY VARY. SEE MANUFACTURER'S INFORMATION.

SEE SDD 14B42 FOR MORE INFORMATION.
 * DO NOT ATTACH BLOCKOUTS TO POSTS 1 AND 2.
 DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.
 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 3/2" DIAMETER HOLE ON POST NUMBER 3 THROUGH POST 9 IS TO BE FLUSH WITH THE GROUND LINE UP TO A MAXIMUM OF 2" ABOVE GROUND LINE.

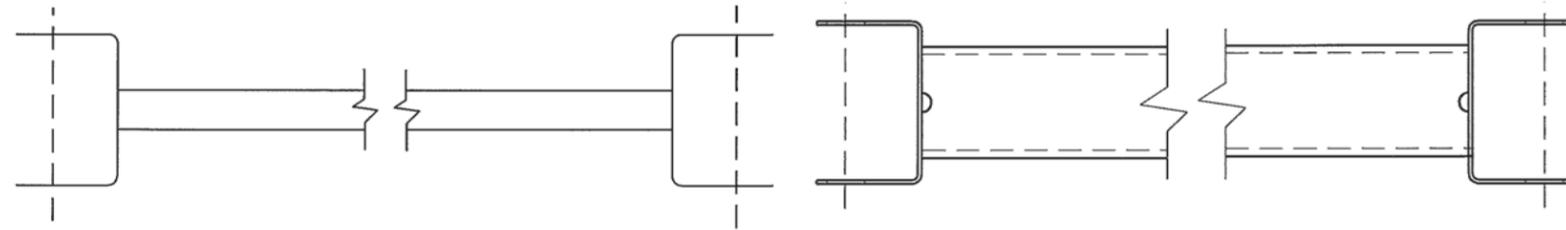


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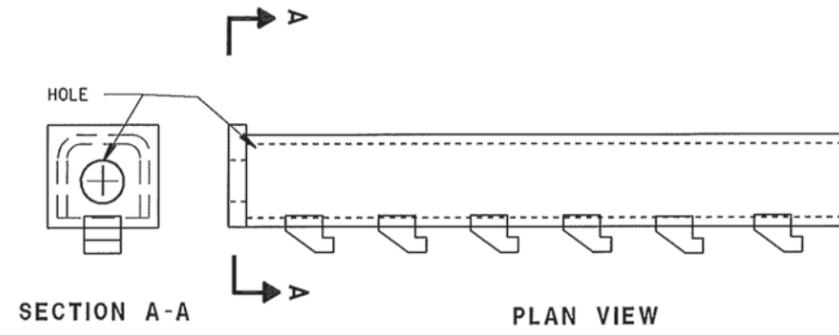
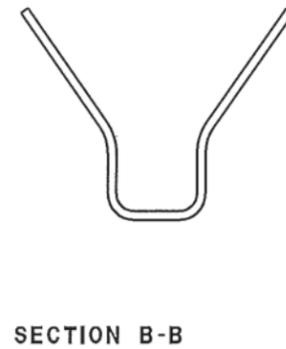
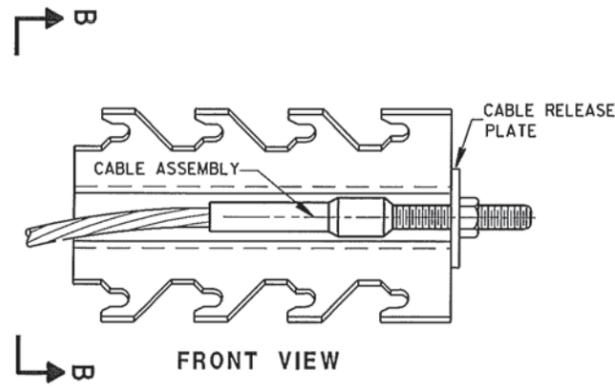
S.D.D. 14 B 44-2a

S.D.D. 14 B 44-2a



GENERIC GROUND STRUT

(9) (H)

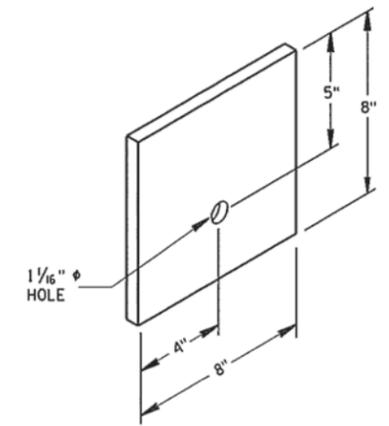


GENERIC ANCHOR CABLE BOX

(8) (H)

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 F PER SECTION 637 OF THE STANDARD SPECIFICATIONS
(14)	EAT MARKER POST - YELLOW (SEE APPROVED PRODUCTS LIST)



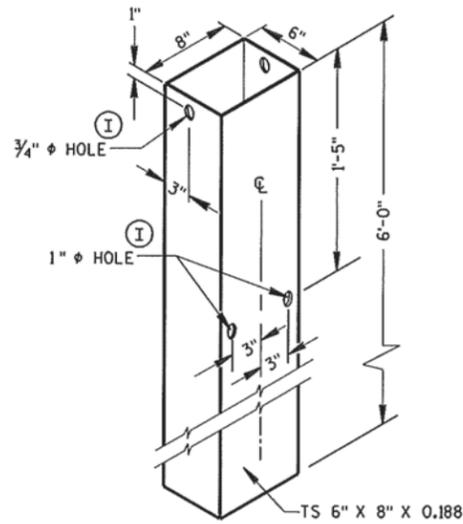
BEARING PLATE (6)

MIDWEST GUARDRAIL SYSTEM
ENERGY ABSORBING TERMINAL
(MGS)

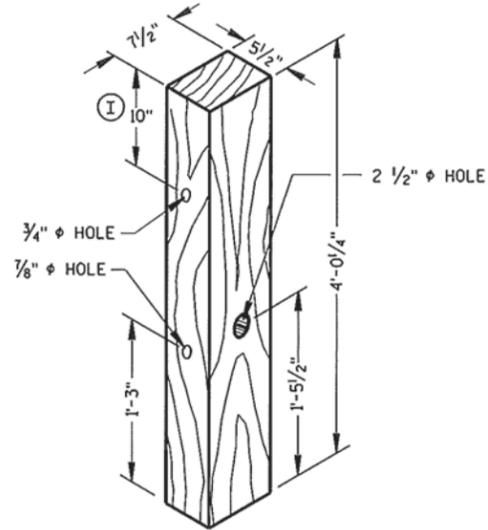
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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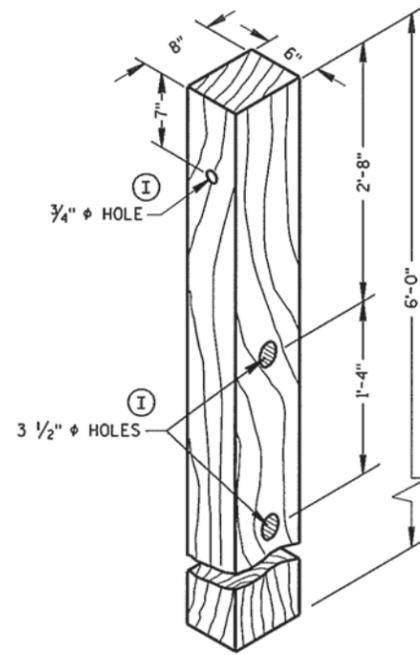
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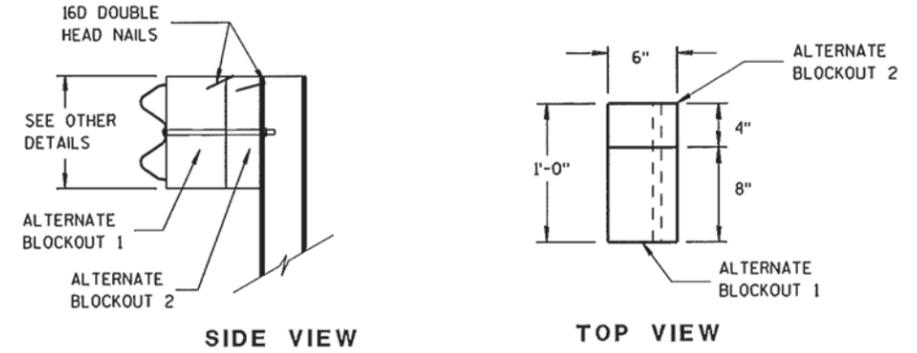
FOUNDATION TUBE ②



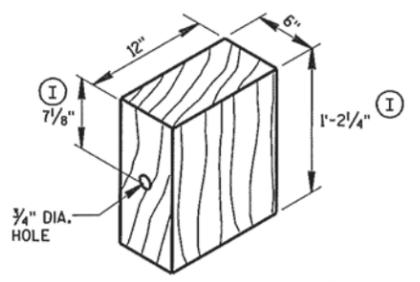
POSTS NUMBER 1 AND 2
WOOD BREAKAWAY POST ①



POSTS NUMBER 3-9
WOOD CRT POST ③

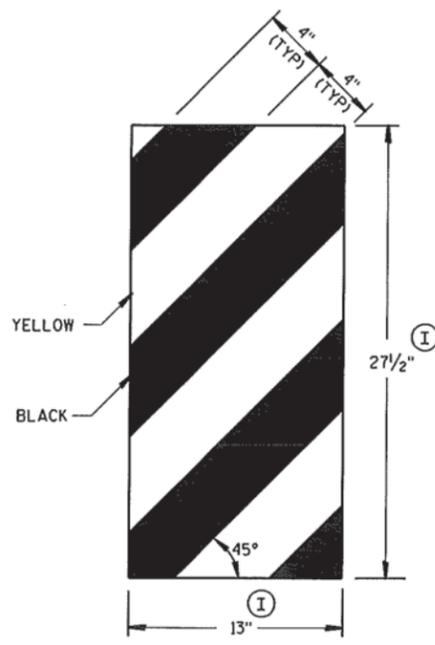


ALTERNATE WOOD BLOCKOUT DETAIL

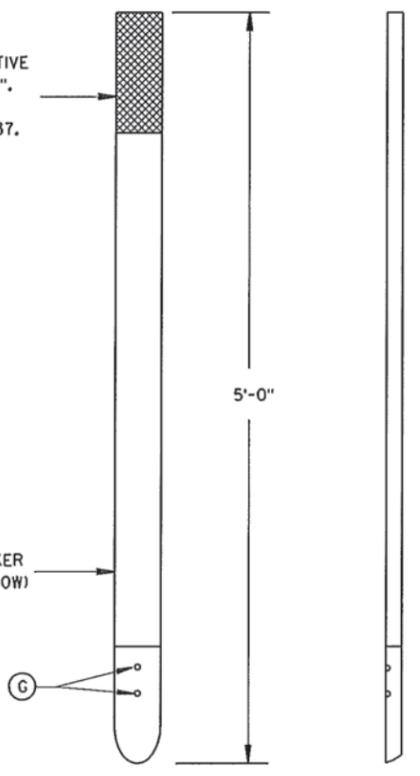
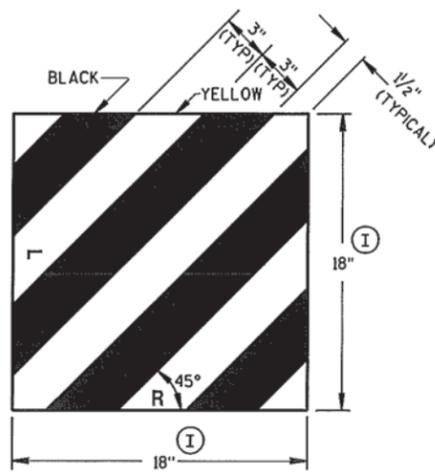


WOOD BLOCKOUT ④
REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2

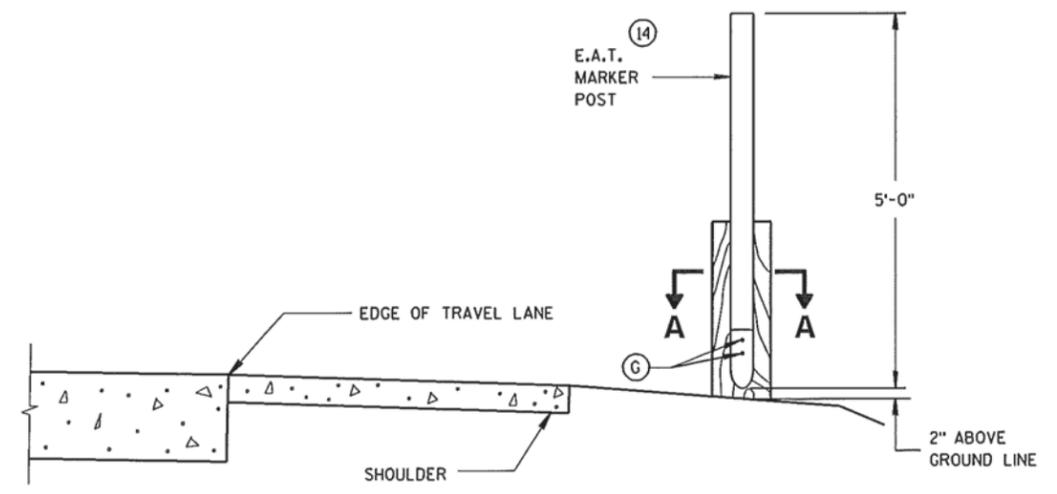
TYPE H YELLOW REFLECTIVE SHEETING 3" X 9". SEE STANDARD SPECIFICATION 637.



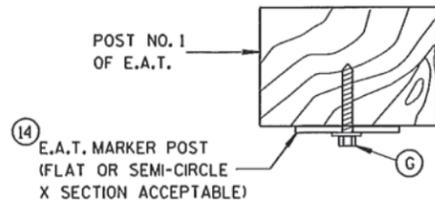
GENERIC REFLECTIVE SHEETING ⑬ ⑨



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

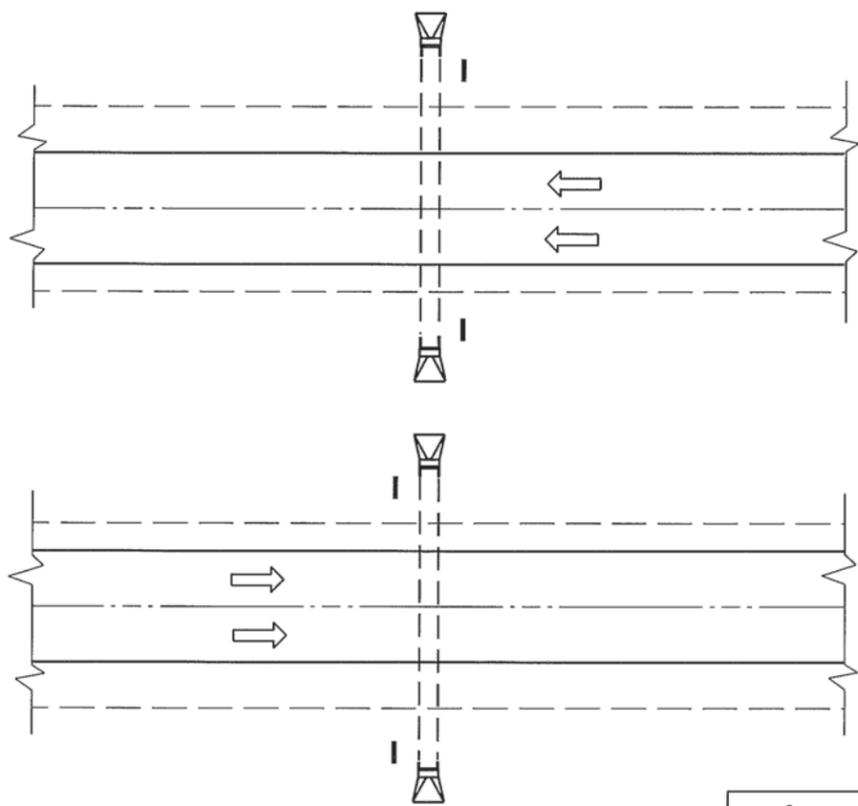
MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED June 2014	/s/ Jerry H. Zogg
DATE	ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA	

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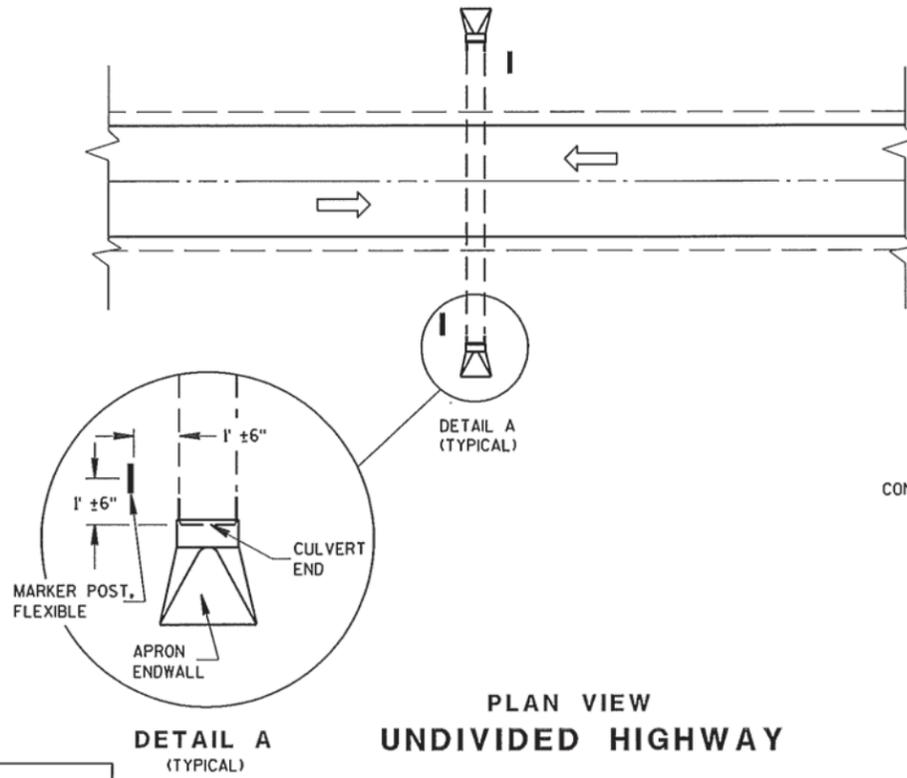
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S.D.D. 14 B 44-2c

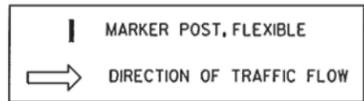
S.D.D. 14 B 44-2c



PLAN VIEW
DIVIDED HIGHWAY



PLAN VIEW
UNDIVIDED HIGHWAY

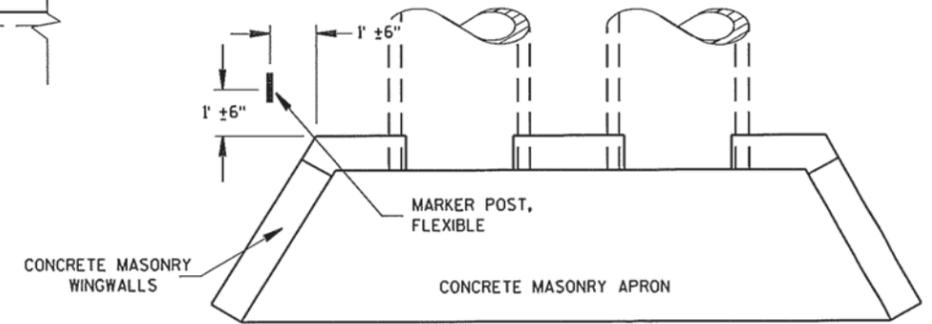


DETAIL A
(TYPICAL)

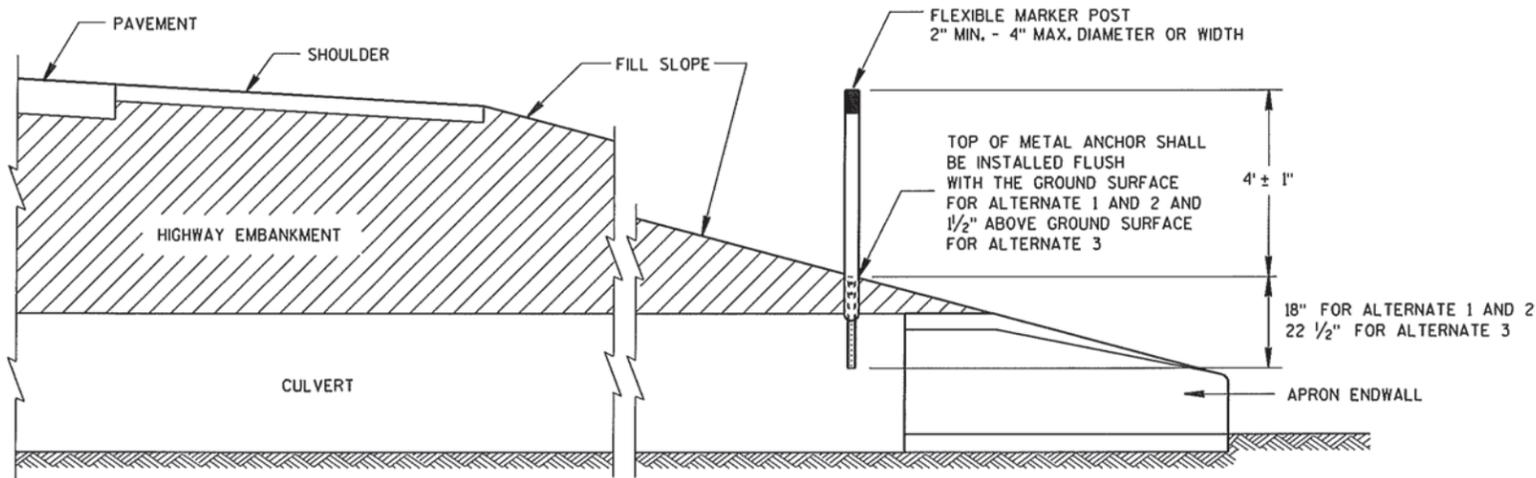
FLEXIBLE MARKER POST LOCATION

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

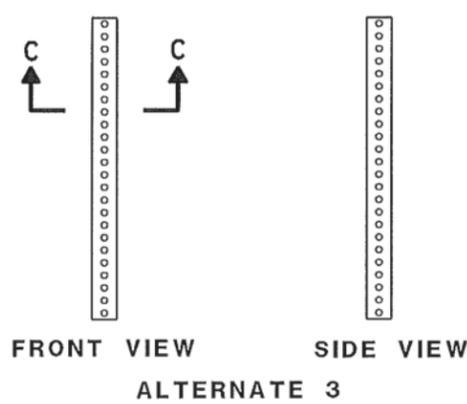
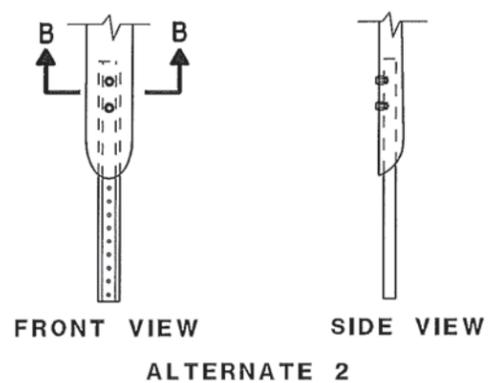
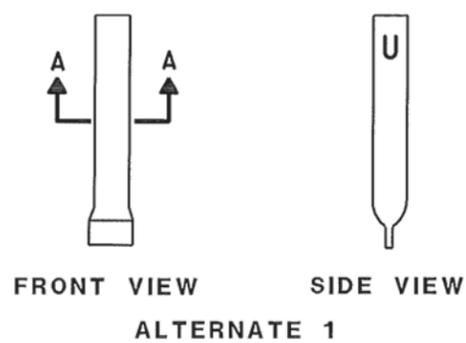
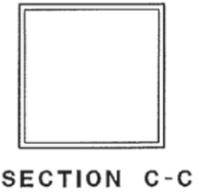
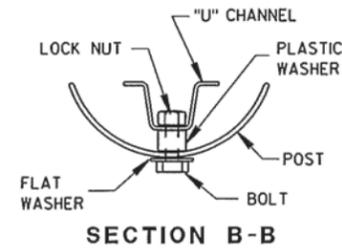
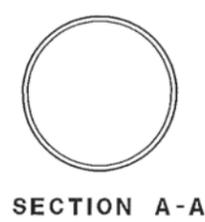
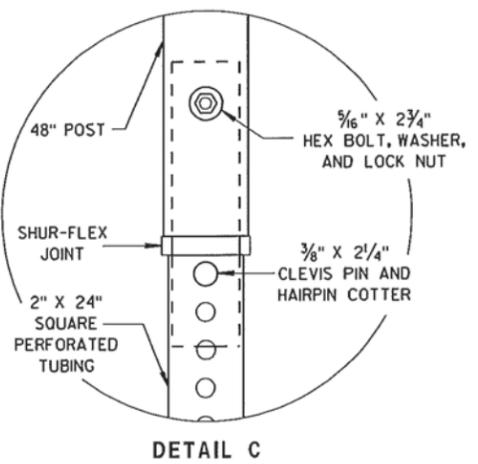
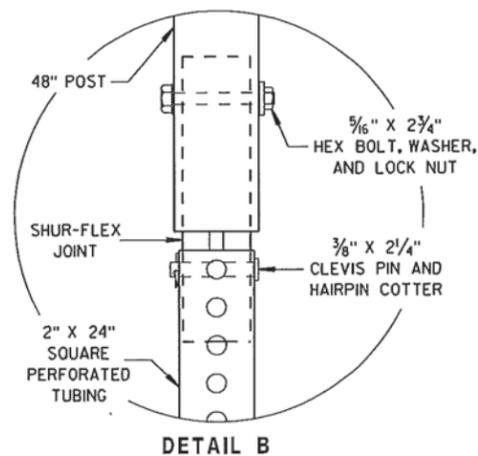
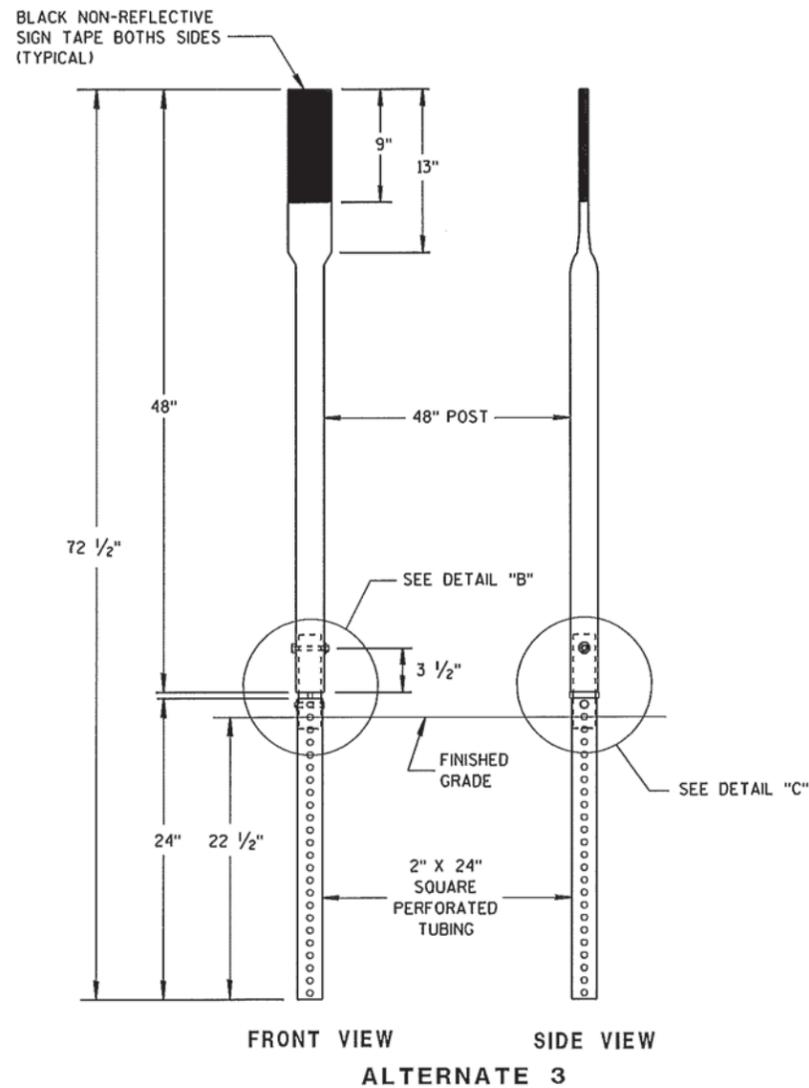
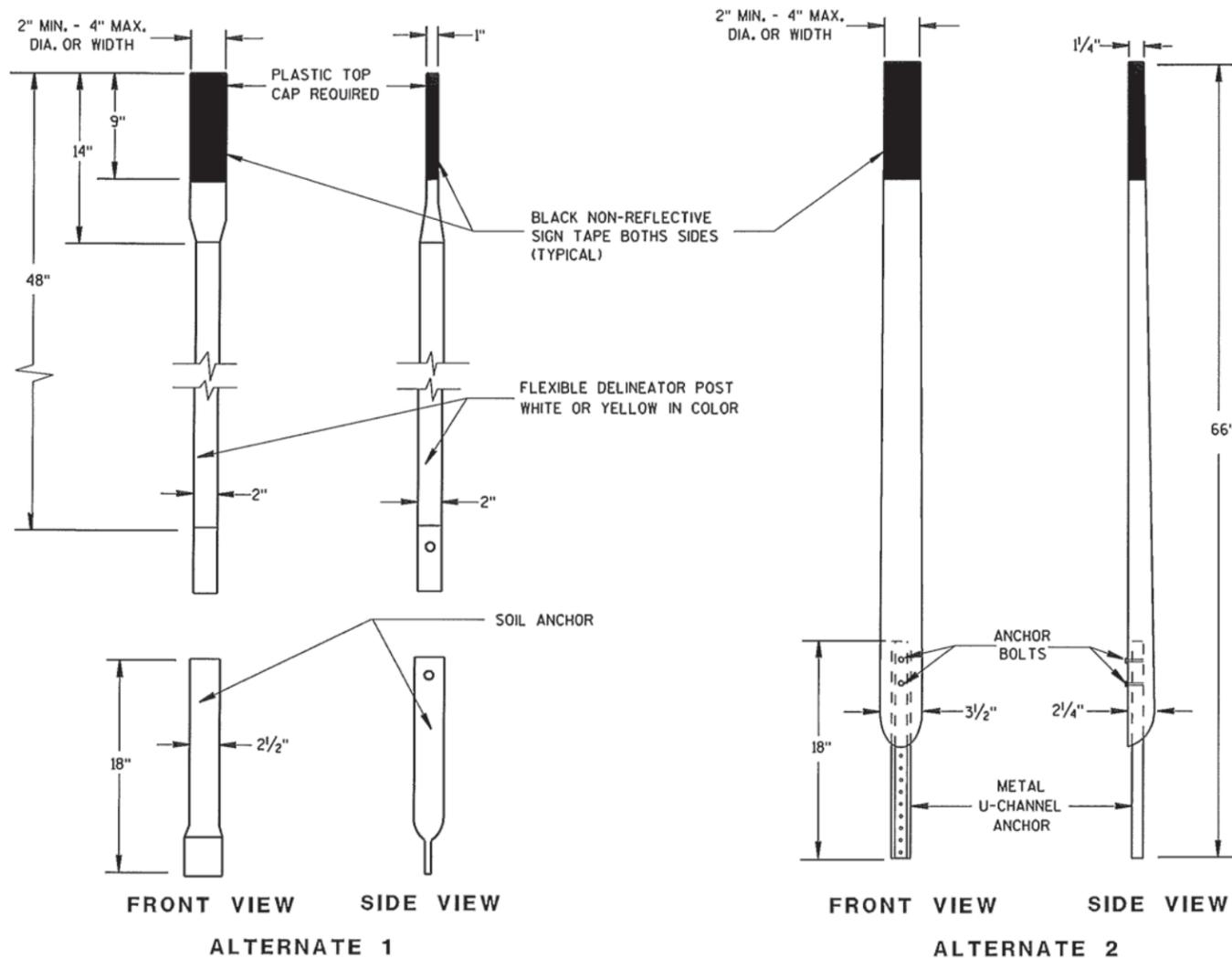
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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S.D.D. 15 A 3-2a

S.D.D. 15 A 3-2a



FLEXIBLE MARKER POST ANCHORS

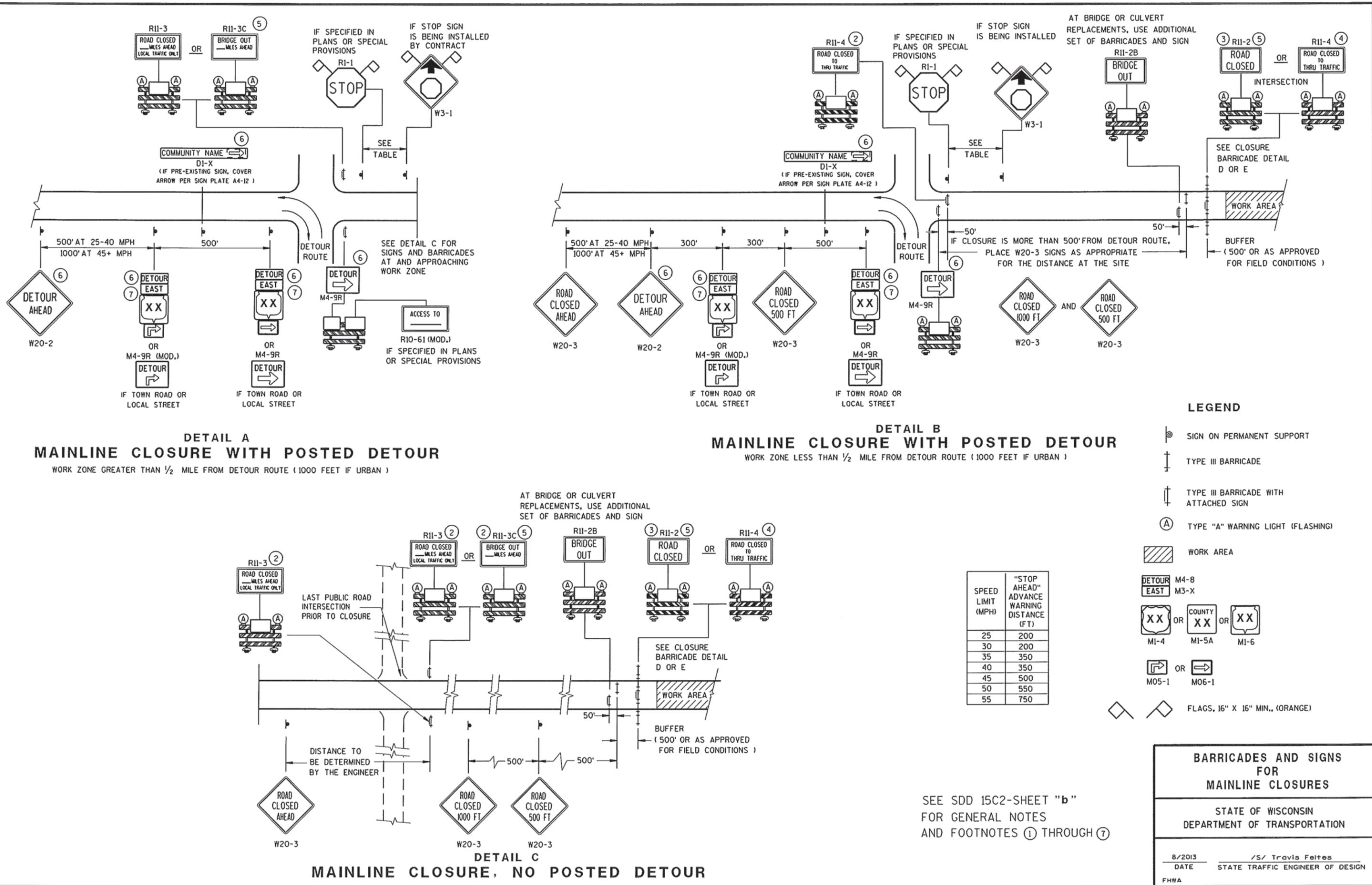
FLEXIBLE MARKER POST FOR CULVERT END	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 10/1/2012 DATE	/S/ Travis Feltes STATE TRAFFIC ENGINEER OF DESIGN
FHWA	

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S.D.D. 15 A 3-2b

S.D.D. 15 A 3-2b



DETAIL A
MAINLINE CLOSURE WITH POSTED DETOUR
 WORK ZONE GREATER THAN 1/2 MILE FROM DETOUR ROUTE (1000 FEET IF URBAN)

DETAIL B
MAINLINE CLOSURE WITH POSTED DETOUR
 WORK ZONE LESS THAN 1/2 MILE FROM DETOUR ROUTE (1000 FEET IF URBAN)

DETAIL C
MAINLINE CLOSURE, NO POSTED DETOUR

- LEGEND**
- ⊙ SIGN ON PERMANENT SUPPORT
 - ⊥ TYPE III BARRICADE
 - ⊥ TYPE III BARRICADE WITH ATTACHED SIGN
 - Ⓐ TYPE "A" WARNING LIGHT (FLASHING)
 - ▨ WORK AREA
 - DETOUR EAST M4-8 M3-X
 - XX OR COUNTY XX OR XX MI-4 MI-5A MI-6
 - ↪ OR ↩ M05-1 M06-1
 - ◇ ◇ FLAGS, 16" X 16" MIN., (ORANGE)

SPEED LIMIT (MPH)	"STOP AHEAD" ADVANCE WARNING DISTANCE (FT)
25	200
30	200
35	350
40	350
45	500
50	550
55	750

BARRICADES AND SIGNS FOR MAINLINE CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

8/2013 /S/ Travis Fettes
DATE STATE TRAFFIC ENGINEER OF DESIGN

FHWA

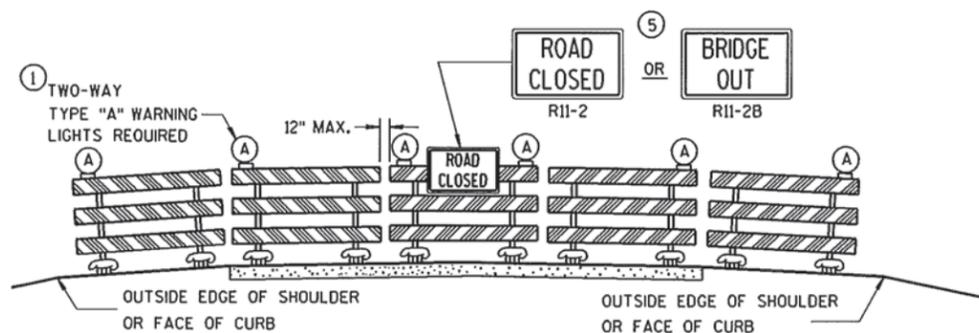
SEE SDD 15C2-SHEET "b"
 FOR GENERAL NOTES
 AND FOOTNOTES ① THROUGH ⑦

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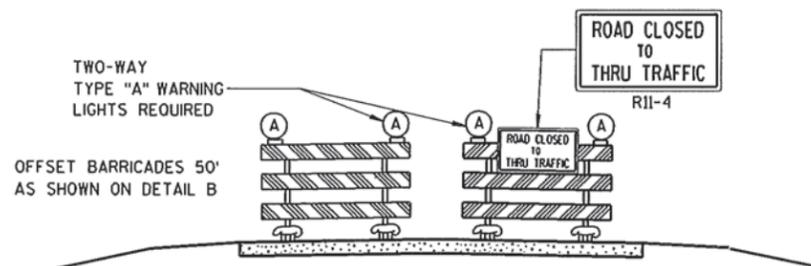
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S.D.D. 15 C 2-5a

S.D.D. 15 C 2-5a



DETAIL D
ROAD CLOSURE BARRICADE DETAIL
APPROACH VIEW



DETAIL E
LANE CLOSURE BARRICADE DETAIL
APPROACH VIEW

SEE SDD 15C2-SHEET "a" FOR LEGEND

GENERAL NOTES

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

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.

THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND SHOULD PROVIDE A DESIRABLE MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

BARRICADES THAT MUST BE MOVED FOR A WORK OPERATION SHALL BE IMMEDIATELY RE-ESTABLISHED UPON COMPLETION OF THE OPERATION OR, FOR CONTINUING OPERATIONS, AT THE END OF EACH WORKING DAY.

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

ALL TYPE III BARRICADES SHALL HAVE RAILS REFLECTORIZED ON BOTH FACES. STRIPES SHALL BE PROPERLY SLOPED DOWN TOWARD THE TRAFFIC SIDE OR AS SHOWN IN THE ROAD CLOSURE BARRICADE DETAIL D FOR FULL ROAD CLOSURES.

TYPE "A" LOW-INTENSITY FLASHING WARNING LIGHTS SHALL BE VISIBLE ON BOTH SIDES OF THE BARRICADE.

THE R11-2, R11-3, M4-9, R11-4 AND R10-61 SIGNS PLACED ON BARRICADES SHALL COVER NO MORE THAN THE TOP RAIL. THE SIGNS SHALL NOT COVER ANY PORTION OF THE MIDDLE OR BOTTOM RAILS.

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

ALL SIGNS SHALL BE 48" X 48" UNLESS OTHERWISE NOTED BELOW:

- R11-2 SHALL BE 48" X 30".
- R11-3, R11-4 AND R10-61 SHALL BE 60" X 30".
- M4-9 SHALL BE 30" X 24".
- M3-X SHALL BE 24" X 12", (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS.)
- M4-8 SHALL BE 24" X 12", (30" X 15" IF NEEDED TO MATCH EXISTING SIGNS.)
- M1-4, M1-5A, AND M1-6 SHALL BE 24" X 24", (36" X 36" IF NEEDED TO MATCH EXISTING SIGNS.)
- M05-1 AND M06-1 SHALL BE 21" X 21", (30" X 30" IF NEEDED TO MATCH EXISTING SIGNS.)
- D1-X SHALL BE AS SHOWN ON SPECIFIC PROJECT SIGNING DETAIL SHEETS.
- R1-1 SHALL BE 36" X 36".

- 1 TWO WARNING LIGHTS SHALL BE PROVIDED ON THE CENTER BARRICADE AND A MINIMUM OF ONE WARNING LIGHT SHALL BE PROVIDED ON EACH OF THE OTHER BARRICADES WITHIN THE ROADWAY LIMITS. SPACING OF THE WARNING LIGHTS SHALL BE UNIFORM TO THE EDGE OF ROADWAY AS SHOWN (APPROX. 8-FOOT LIGHT SPACING).
- 2 THESE SIGNS AND BARRICADES ARE NOT REQUIRED IF ROAD CLOSURE BEGINS AT INTERSECTION.
- 3 FOR ROAD CLOSURE WITHOUT LOCAL ACCESS TO PROJECT, SEE ROAD CLOSURE BARRICADE DETAIL D.
- 4 FOR ROAD CLOSURE WITH LOCAL ACCESS TO PROJECT, SEE LANE CLOSURE BARRICADE DETAIL E.
- 5 FOR BRIDGE OR CULVERT REPLACEMENTS, SUBSTITUTE "BRIDGE OUT" INSTEAD OF "ROAD CLOSED" ON R11-2 AND R11-3 SIGNS.
- 6 INSTALL DETOUR AND COMMUNITY GUIDE SIGNS AND ARROWS ONLY IF SPECIFIED IN THE CONTRACT. IF THERE ARE EXISTING ROUTE MARKER ASSEMBLIES THAT WILL REMAIN IN PLACE, ADJUST THE LOCATION OF THE DETOUR ROUTE SIGNS TO CORRESPOND WITH THE EXISTING ASSEMBLIES. MODIFY EXISTING SIGNS WHERE POSSIBLE. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS. IF DETOUR SIGNS ARE BEING INSTALLED BY OTHERS, PLACE THE CONTRACTED TRAFFIC CONTROL SIGNS TO ALLOW FOR PLACEMENT OF ALL WARNING, DETOUR AND GUIDE SIGNS AS SHOWN.
- 7 "EAST" CARDINAL DIRECTION MARKERS AND RIGHT TURN ARROWS ARE SHOWN. USE OTHER CARDINAL DIRECTIONS AND ARROWS AS APPROPRIATE.

**BARRICADES AND SIGNS
FOR
MAINLINE CLOSURES**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

8/2013 /S/ Travis Feltes
DATE STATE TRAFFIC ENGINEER OF DESIGN
FHWA

6

6

S.D.D. 15 C 2-5b

S.D.D. 15 C 2-5b

THIS DRAWING PROVIDES GENERAL GUIDANCE ON TYPICAL DETOUR SIGN LAYOUT AND SPACING. SEE PROJECT DETOUR SIGNING SHEETS FOR SPECIFIC DETAILS FOR EACH PROJECT.

GENERAL NOTES

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

IF THERE ARE EXISTING ROUTE MARKER ASSEMBLIES THAT WILL REMAIN IN PLACE, ADJUST THE LOCATION OF THE DETOUR ROUTE SIGNS TO CORRESPOND WITH THE EXISTING ASSEMBLIES. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS. MODIFY EXISTING SIGNS WHERE POSSIBLE.

THE SPACING BETWEEN TRAFFIC CONTROL AND DETOUR SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A DESIRABLE MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

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.

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

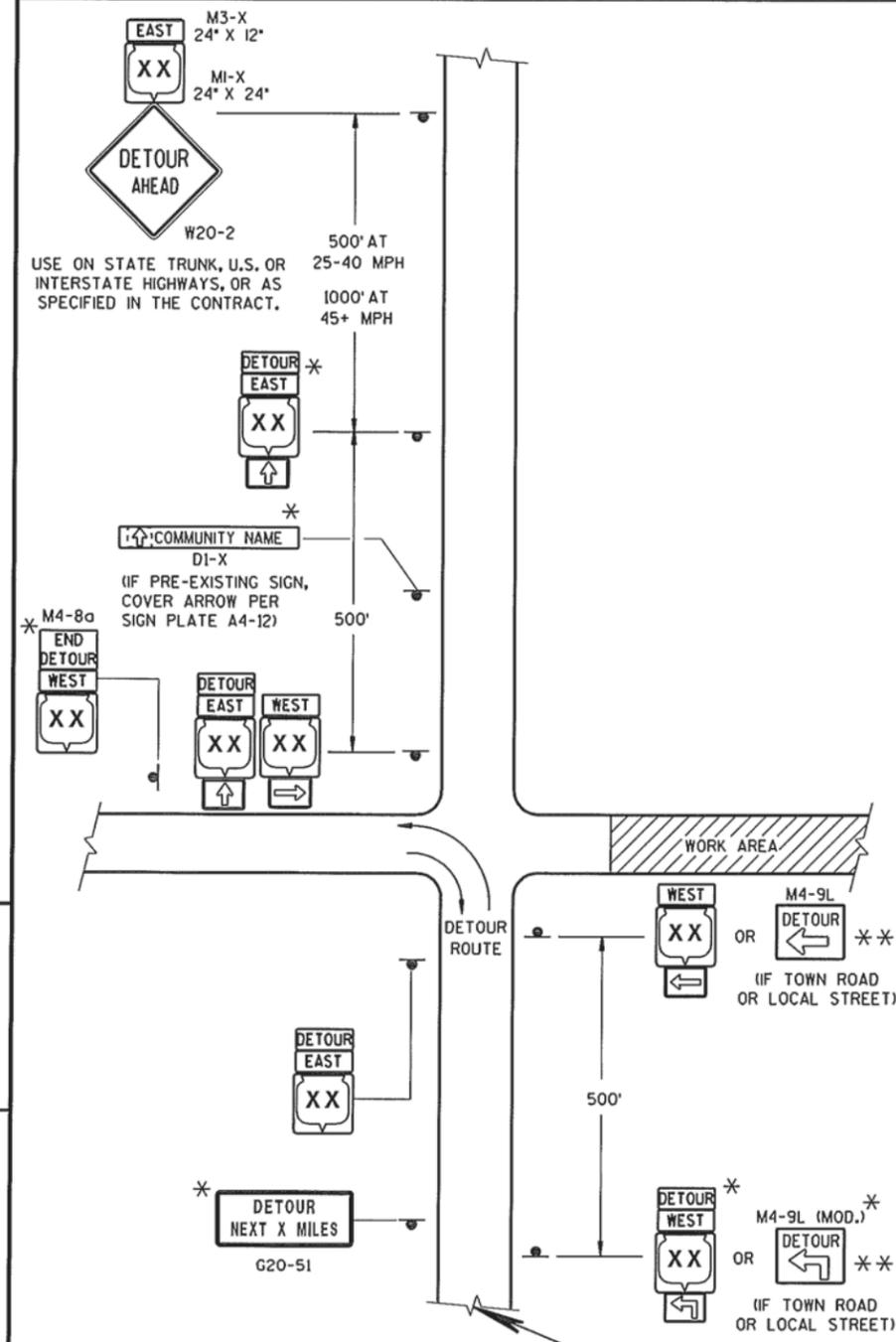
"M0" SIGNS ARE THE SAME AS "M" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

SIGN SIZES SHALL BE AS FOLLOWS:

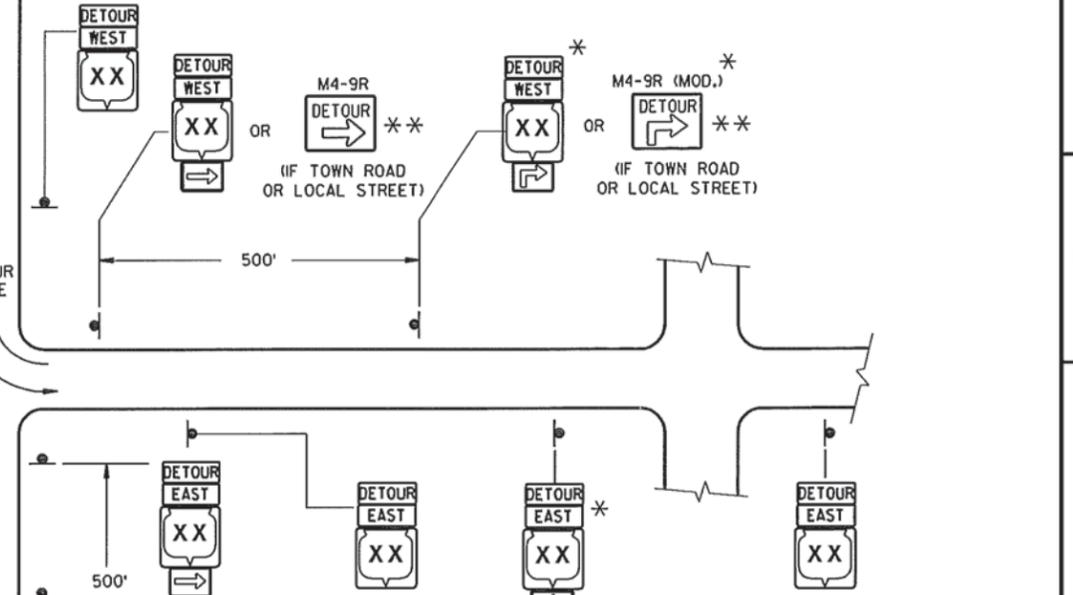
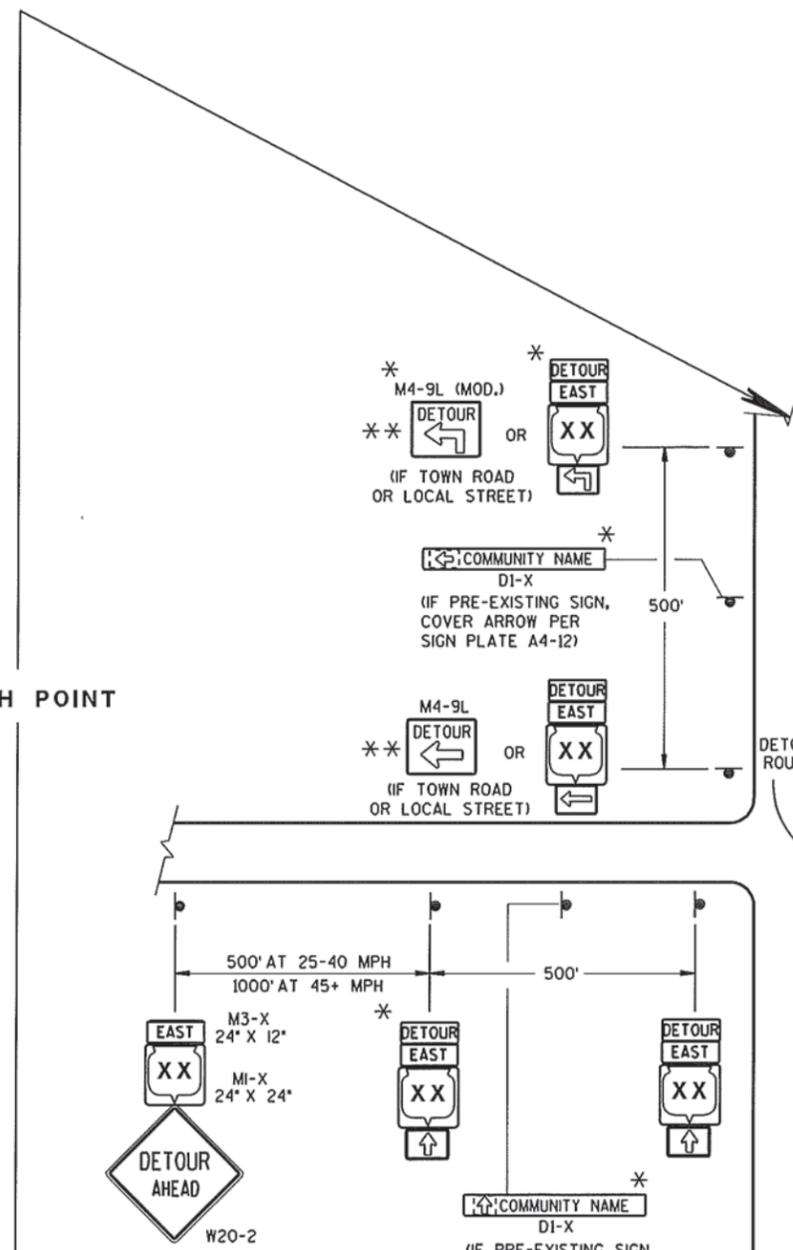
- M3-X SHALL BE 24" X 12". (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS.)
- M4-8 SHALL BE 24" X 12". (30" X 15" IF NEEDED TO MATCH EXISTING SIGNS.)
- M1-4, MI-5A, AND MI-6 SHALL BE 24" X 24". (36" X 36" IF NEEDED TO MATCH EXISTING SIGNS.)
- M05-1 AND M06-1 SHALL BE 21" X 21". (30" X 30" IF NEEDED TO MATCH EXISTING SIGNS.)
- M4-9 SHALL BE 30" X 24".
- M4-8a SHALL BE 24" X 18".
- G20-51 SHALL BE 60" X 24".
- W20-2 SHALL BE 48" X 48".
- D1-X SHALL BE AS SHOWN ON SPECIFIC PROJECT SIGNING DETAIL SHEETS.

* OPTIONAL SIGNS. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS.

** FOR A TOWN ROAD OR LOCAL STREET DETOURED ONTO A STATE TRUNK HIGHWAY, PLACE A ROAD NAME PLAQUE ABOVE THE M4-9 SIGN AS SPECIFIED IN THE CONTRACT.



MATCH POINT



LEGEND

- SIGN ON PERMANENT SUPPORT
- WORK AREA
- M4-8
- M3-X
- MI-4
- MI-5A
- MI-6
- M05-1
- M06-1
- M06-1

SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS AND DETAIL A OR B ON SDD 15C2-SHEET "a"

USE ON STATE TRUNK, U.S. OR INTERSTATE HIGHWAYS, OR AS SPECIFIED IN THE CONTRACT.

USE ON STATE TRUNK, U.S. OR INTERSTATE HIGHWAYS, OR AS SPECIFIED IN THE CONTRACT.

USE ON STATE TRUNK, U.S. OR INTERSTATE HIGHWAYS, OR AS SPECIFIED IN THE CONTRACT.

**DETAIL F
DETOUR SIGNING**

DETOUR SIGNING FOR MAINLINE CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
8/2013 /S/ Travis Feltes
DATE STATE TRAFFIC ENGINEER OF DESIGN
FHWA

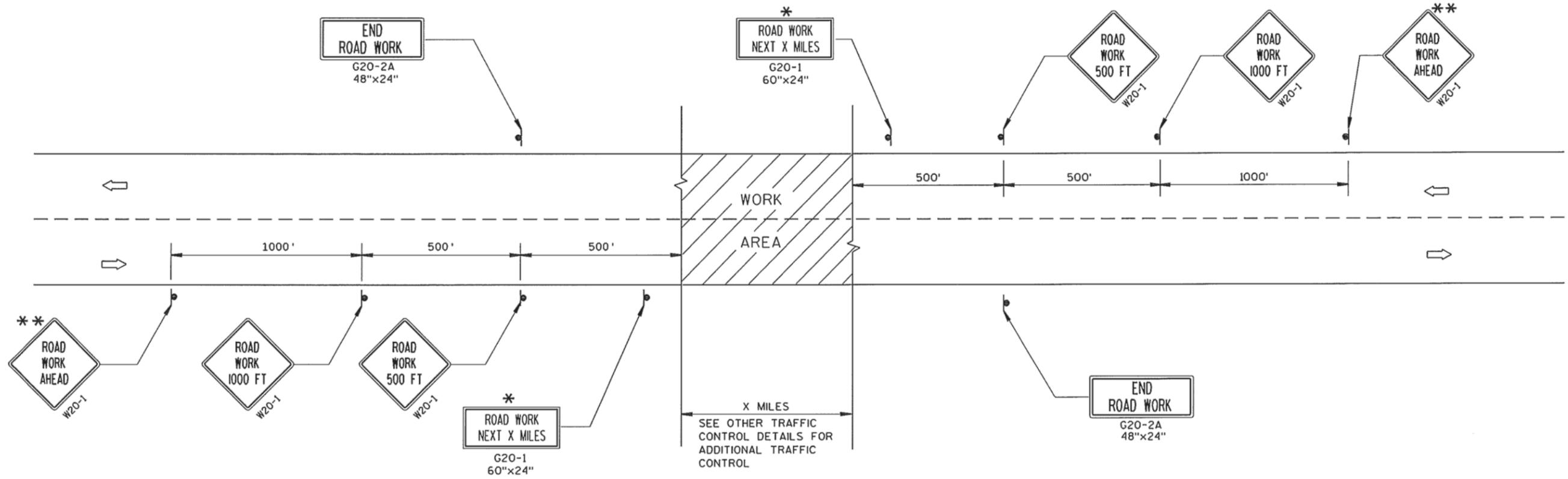
6

6

S.D.D. 15 C 2-5c

S.D.D. 15 C 2-5c

15C4: Traffic Control, Advance Warning Signs 45 M.P.H. or Greater, Two Way Undivided Road Open to Traffic



TYPICAL SIDEROAD APPROACH WARNING SIGN DETAIL

GENERAL NOTES

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

THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND SHOULD PROVIDE A MINIMUM OF 200 FEET (500 FEET DESIRABLE) CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

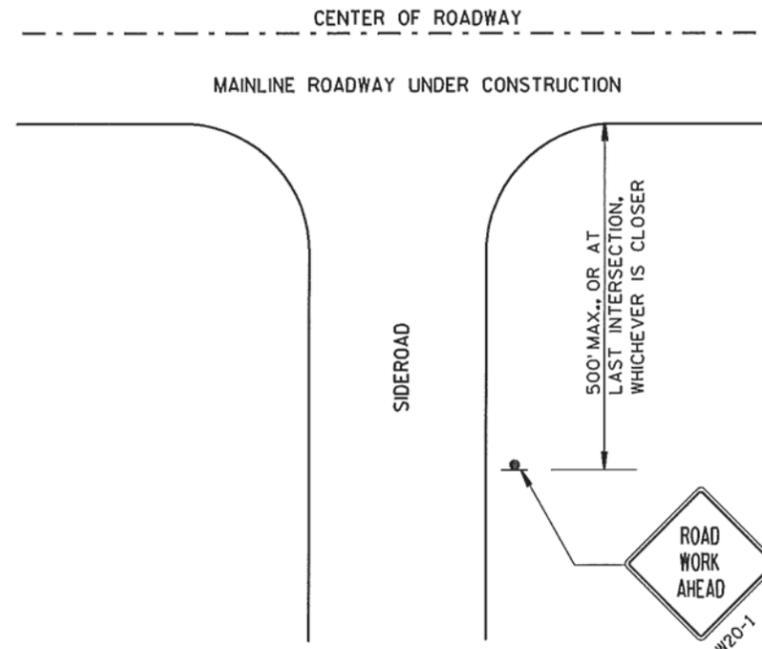
ALL SIGNS ARE 48"x48" UNLESS OTHERWISE NOTED.

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

IF A "STOP" SIGN MUST BE REMOVED FOR A WORK OPERATION, A TEMPORARY "STOP" SIGN SHALL BE PLACED PRIOR TO THE SIGN REMOVAL, OR A FLAGGER SHALL BE PROVIDED UNTIL THE SIGN IS RE-ESTABLISHED.

* OMIT G20-1 SIGNS IF LENGTH OF WORK AREA IS 2 MILES OR LESS.

** PLACE ADDITIONAL W20-1 "ROAD WORK AHEAD" SIGN IF WORK AREA WITHIN THE PROJECT IS SEPARATED BY MORE THAN 2 MILES FROM PREVIOUS WORK AREA.



LEGEND

- ⊙ SIGN ON PERMANENT SUPPORT
- ➡ DIRECTION OF TRAFFIC
- ▨ WORK AREA

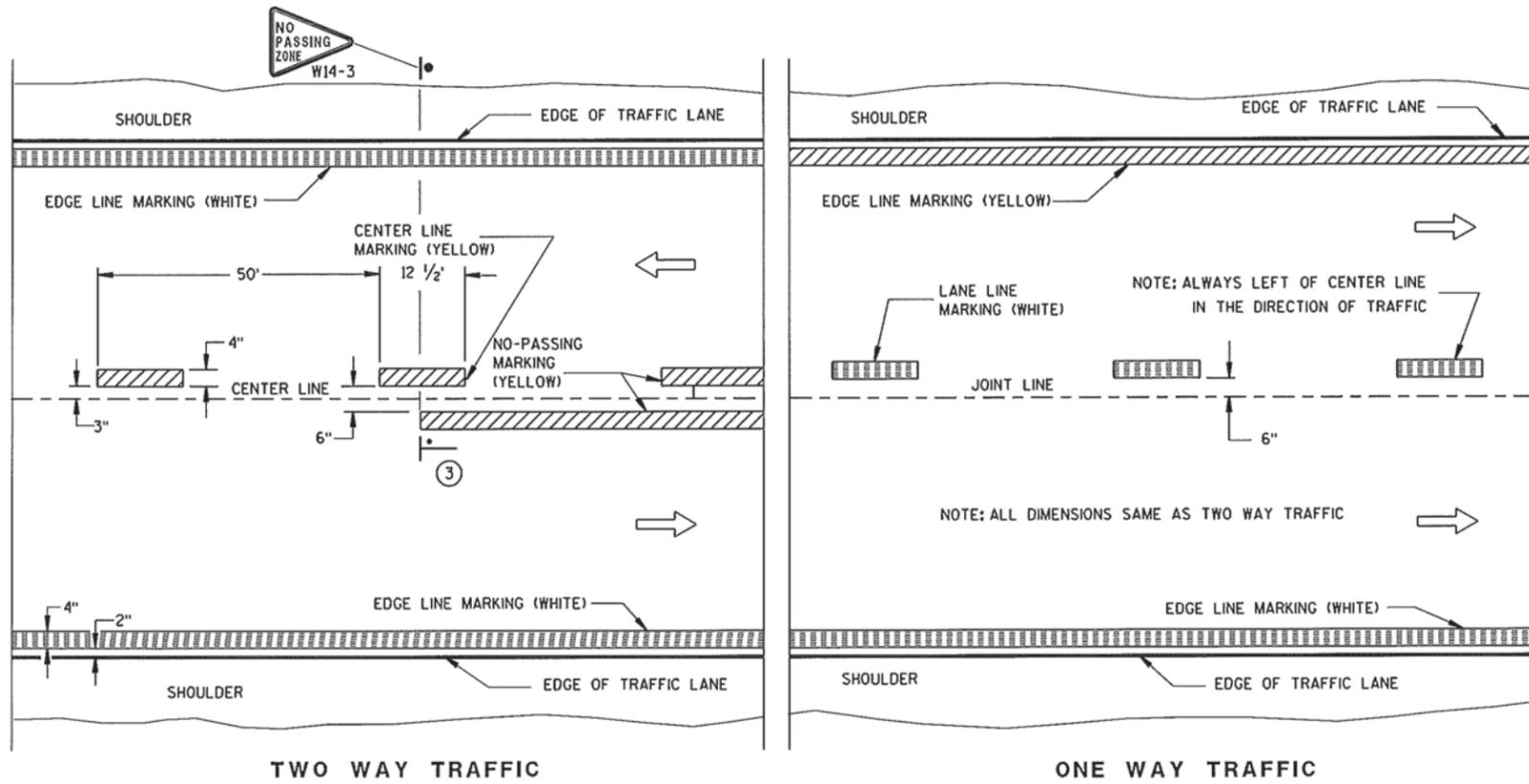
TRAFFIC CONTROL, ADVANCE WARNING SIGNS 45 M.P.H. OR GREATER TWO-WAY UNDIVIDED ROAD OPEN TO TRAFFIC	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 8/2013 DATE	/S/ Travis Feltz STATE TRAFFIC ENGINEER OF DESIGN
FHWA	

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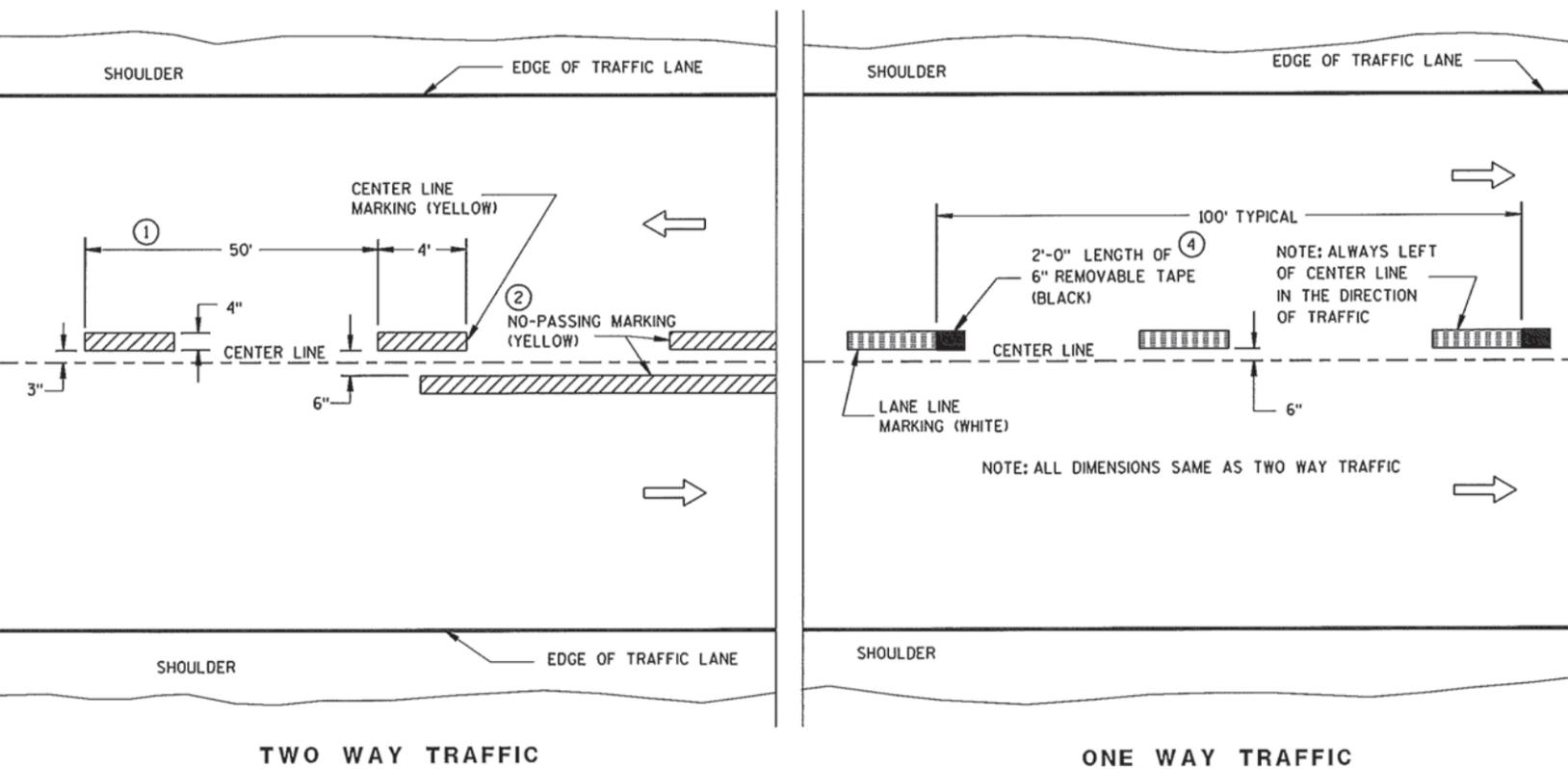
6

S.D.D. 15 C 4-2

S.D.D. 15 C 4-2



PERMANENT PAVEMENT MARKING



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

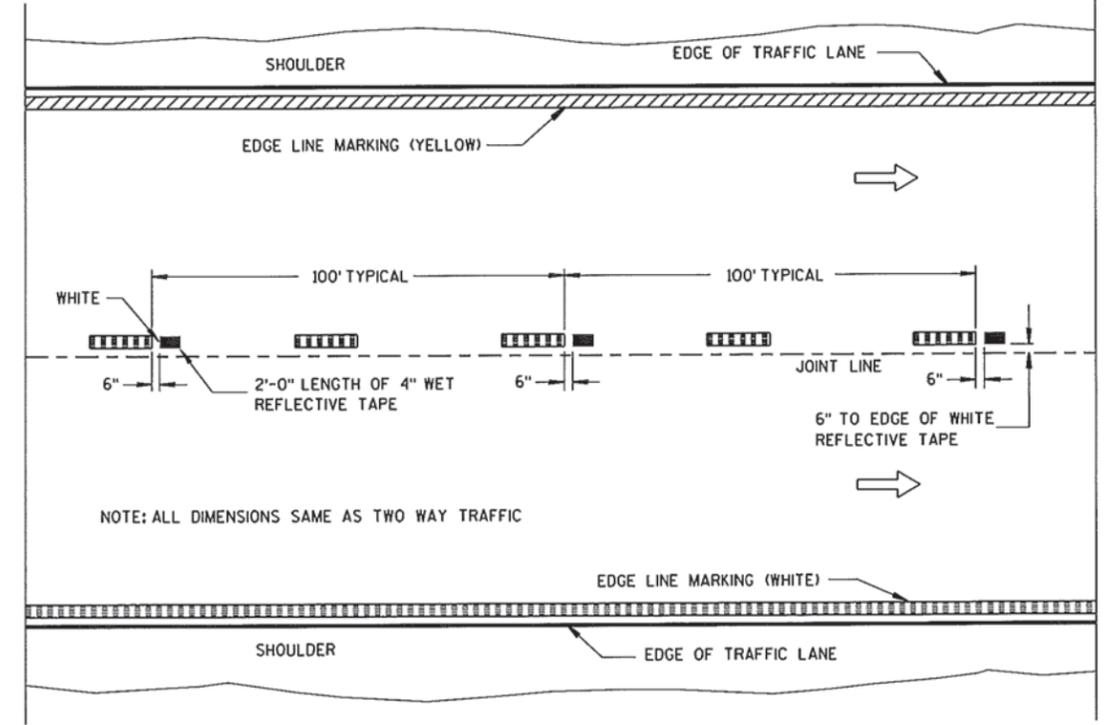
GENERAL NOTES

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

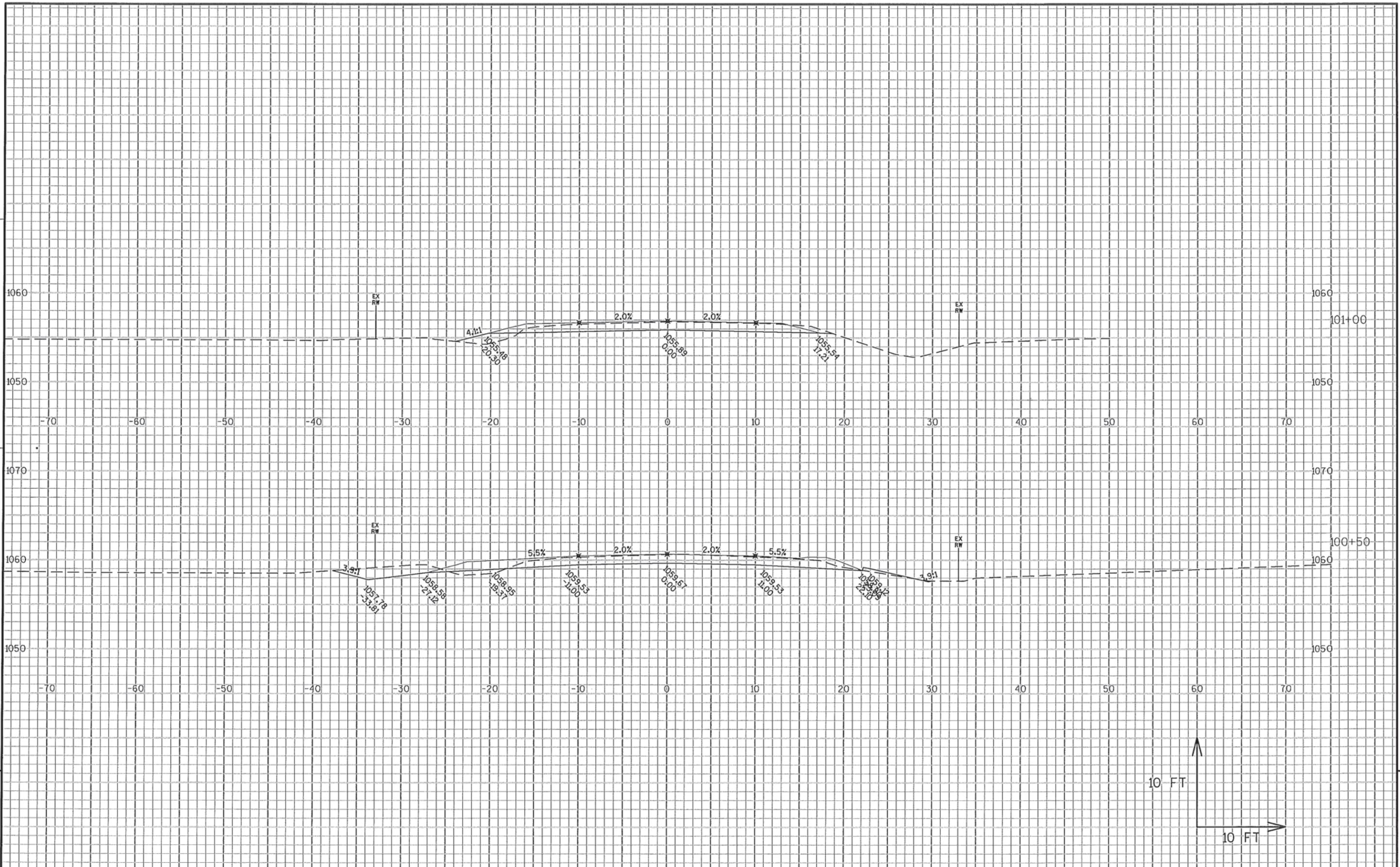
PAVEMENT MARKING (MAINLINE)	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED 5-13-2013 DATE	/S/ Travis Feltus STATE TRAFFIC ENGINEER
FHWA	

6

6

S.D.D. 15 C 8-16a

S.D.D. 15 C 8-16a



9

9

PROJECT NO: 53312-794

HWY: CTH X

COUNTY: EAU CLAIRE

CROSS SECTIONS: CTH X

SHEET

E

FILE NAME : F:\DRAWINGS\2014-105\0001\C3D CTH X\SHEETS\PLAN\090201-XS.DWG
LAYOUT NAME - 090202_XS

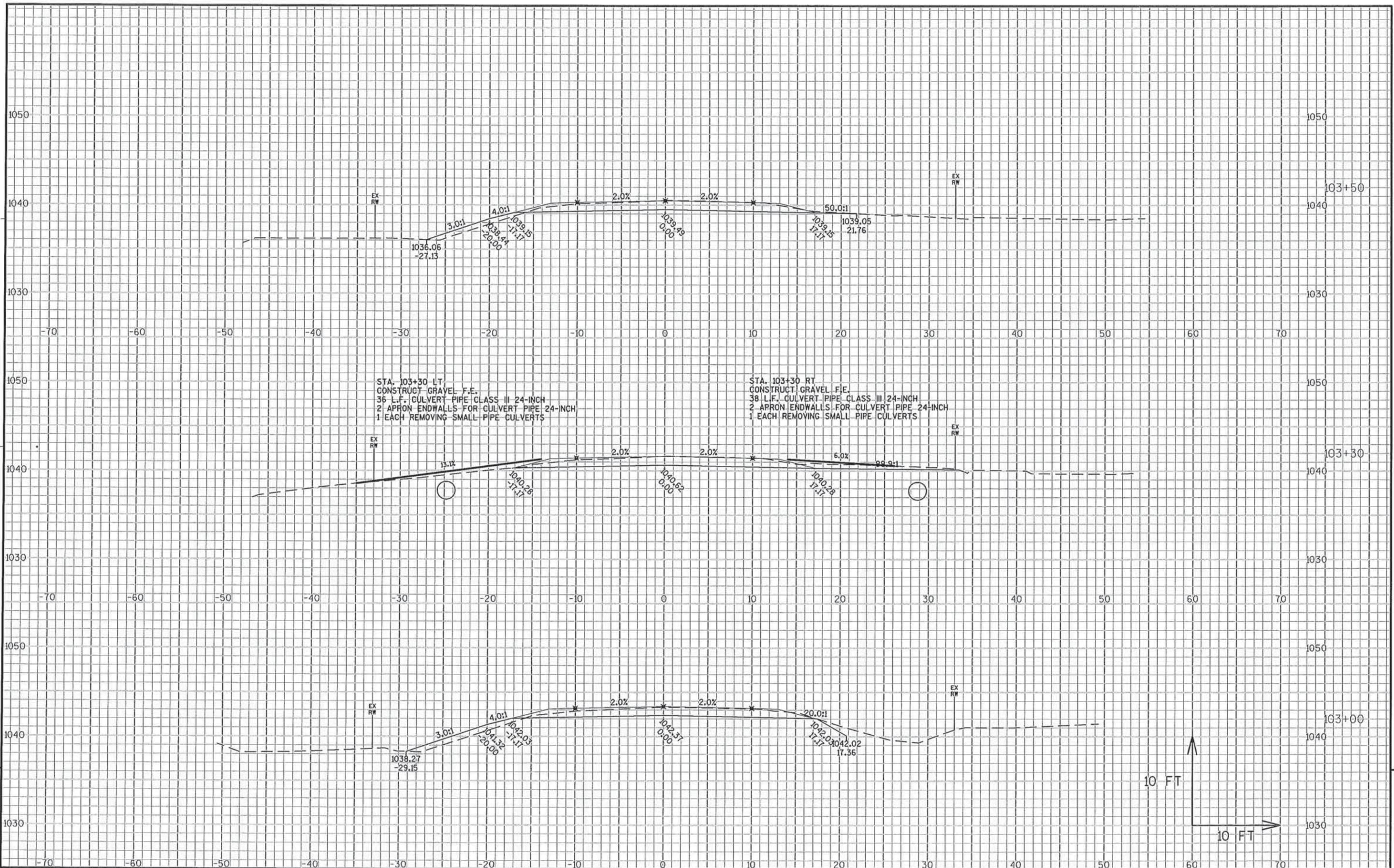
PLOT DATE : 1/14/2015 11:18 PM

PLOT BY : MATT GUNDRY

PLOT NAME :

PLOT SCALE : 1 IN:10 FT

WISDOT/CADDS SHEET 49

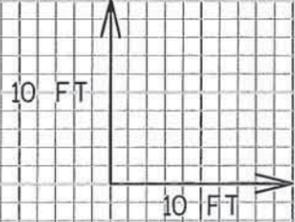


STA. 103+30 LT
 CONSTRUCT GRAVEL F.E.
 36 L.F. CULVERT PIPE CLASS III 24-INCH
 2 APRON ENDWALLS FOR CULVERT PIPE 24-INCH
 1 EACH REMOVING SMALL PIPE CULVERTS

STA. 103+30 RT
 CONSTRUCT GRAVEL F.E.
 38 L.F. CULVERT PIPE CLASS III 24-INCH
 2 APRON ENDWALLS FOR CULVERT PIPE 24-INCH
 1 EACH REMOVING SMALL PIPE CULVERTS

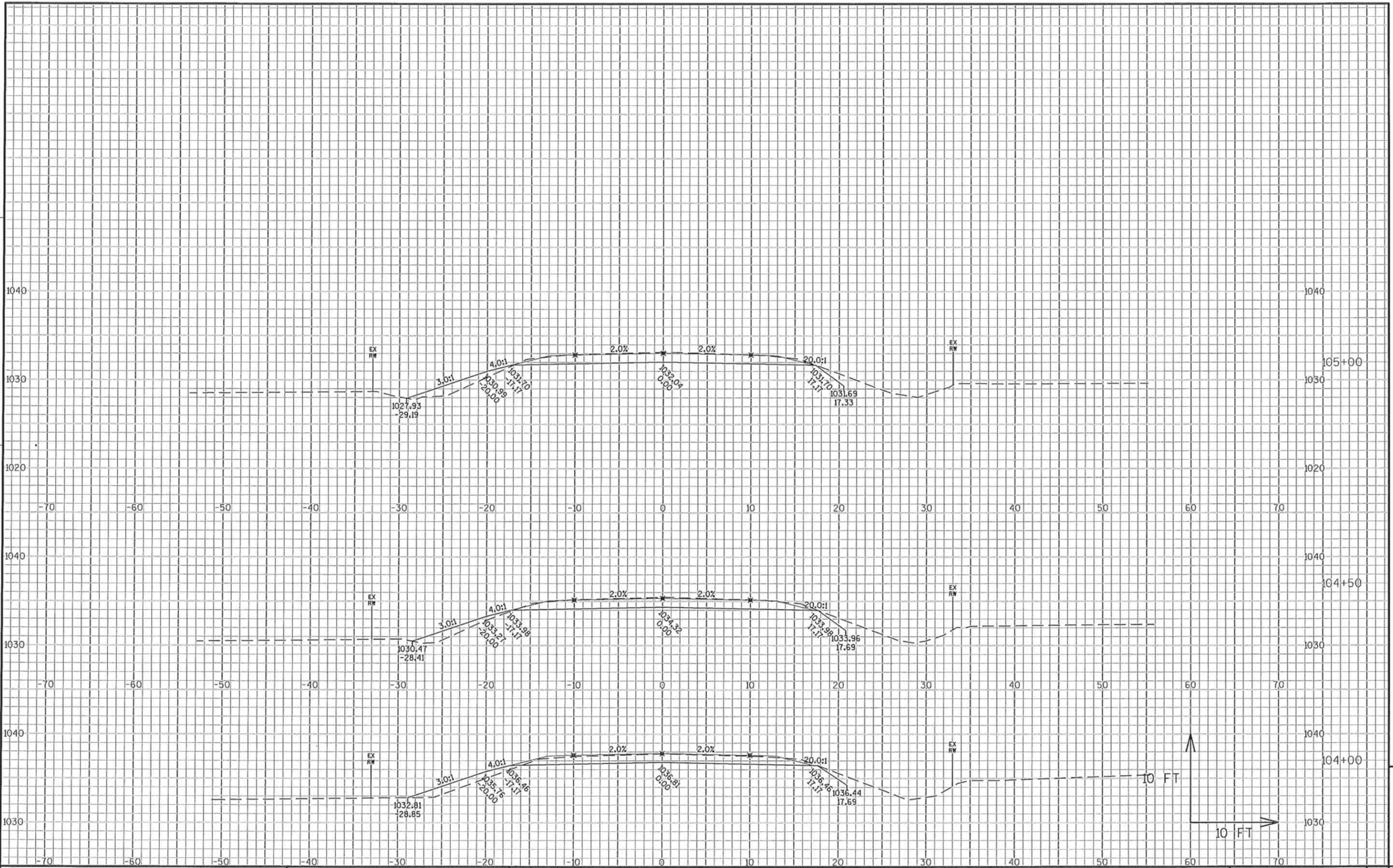
9

9



PROJECT NO: 53312-794 HWY: CTH X COUNTY: EAU CLAIRE CROSS SECTIONS: CTH X SHEET E

FILE NAME : F:\DRAWINGS\2014-105\0001\C3D CTH X\SHEETS\PLAN\090201-XS.DWG PLOT DATE : 1/14/2015 11:19 PM PLOT BY : MATT GUNDRY PLOT NAME : PLOT SCALE : 1 IN:10 FT WISDOT/CADD SHEET 49



PROJECT NO:53312-794

HWY:CTH X

COUNTY:EAU CLAIRE

CROSS SECTIONS:CTH X

SHEET

E

FILE NAME : F:\DRAWINGS\2014-105\0001\C3D CTH X\SHEETSPLAN\090201-XS.DWG
LAYOUT NAME - 090205_XS

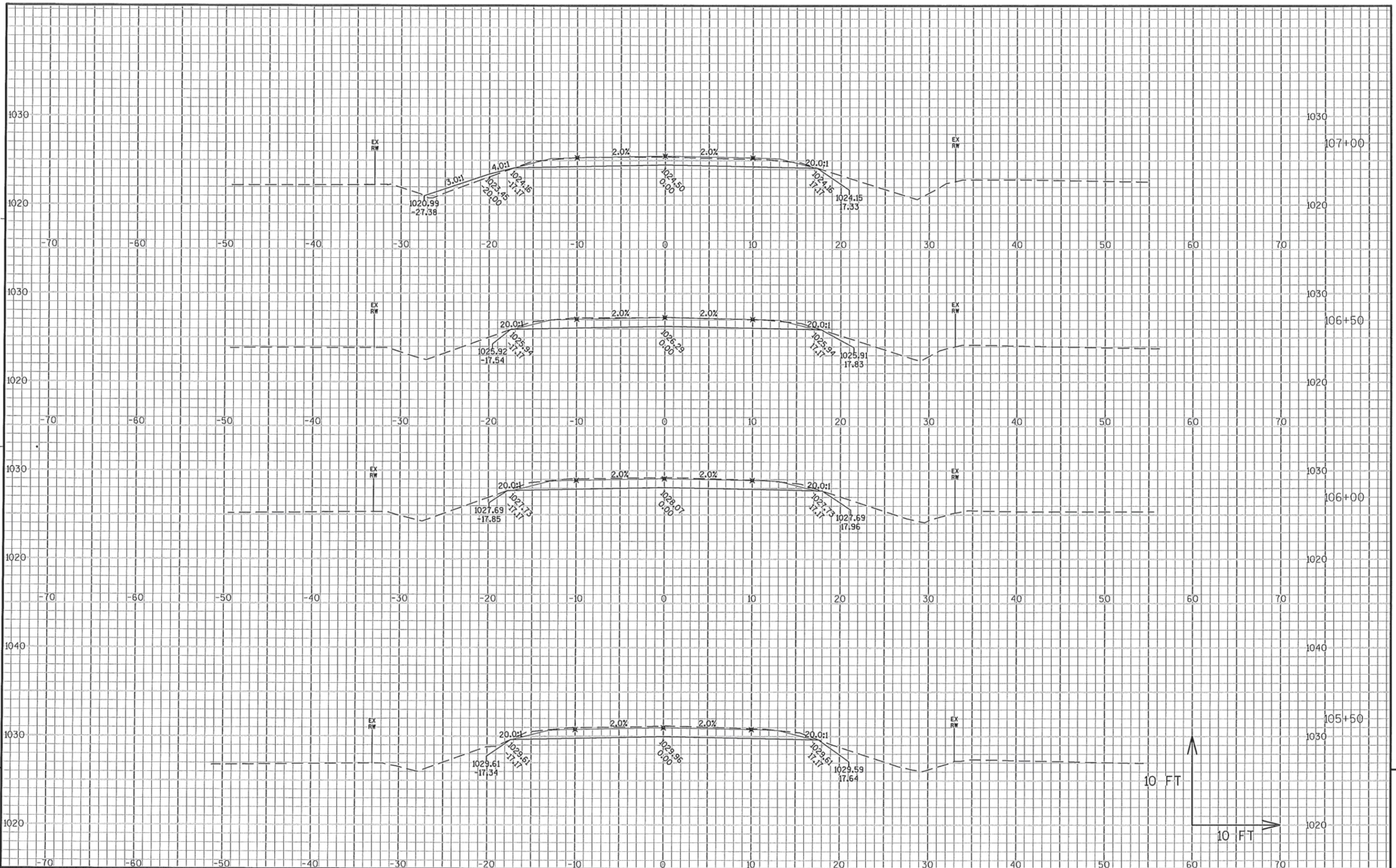
PLOT DATE : 1/14/2015 11:19 PM

PLOT BY : MATT GUNDRY

PLOT NAME :

PLOT SCALE : 1 IN:10 FT

WISDOT/CADDs SHEET 49



9

9

PROJECT NO:53312-794

HWY:CTH X

COUNTY:EAU CLAIRE

CROSS SECTIONS:CTH X

SHEET

E

FILE NAME : F:\DRAWINGS\2014-105\0001\C3D CTH X\SHEETSPLAN\090201-XS.DWG
LAYOUT NAME - 090206_XS

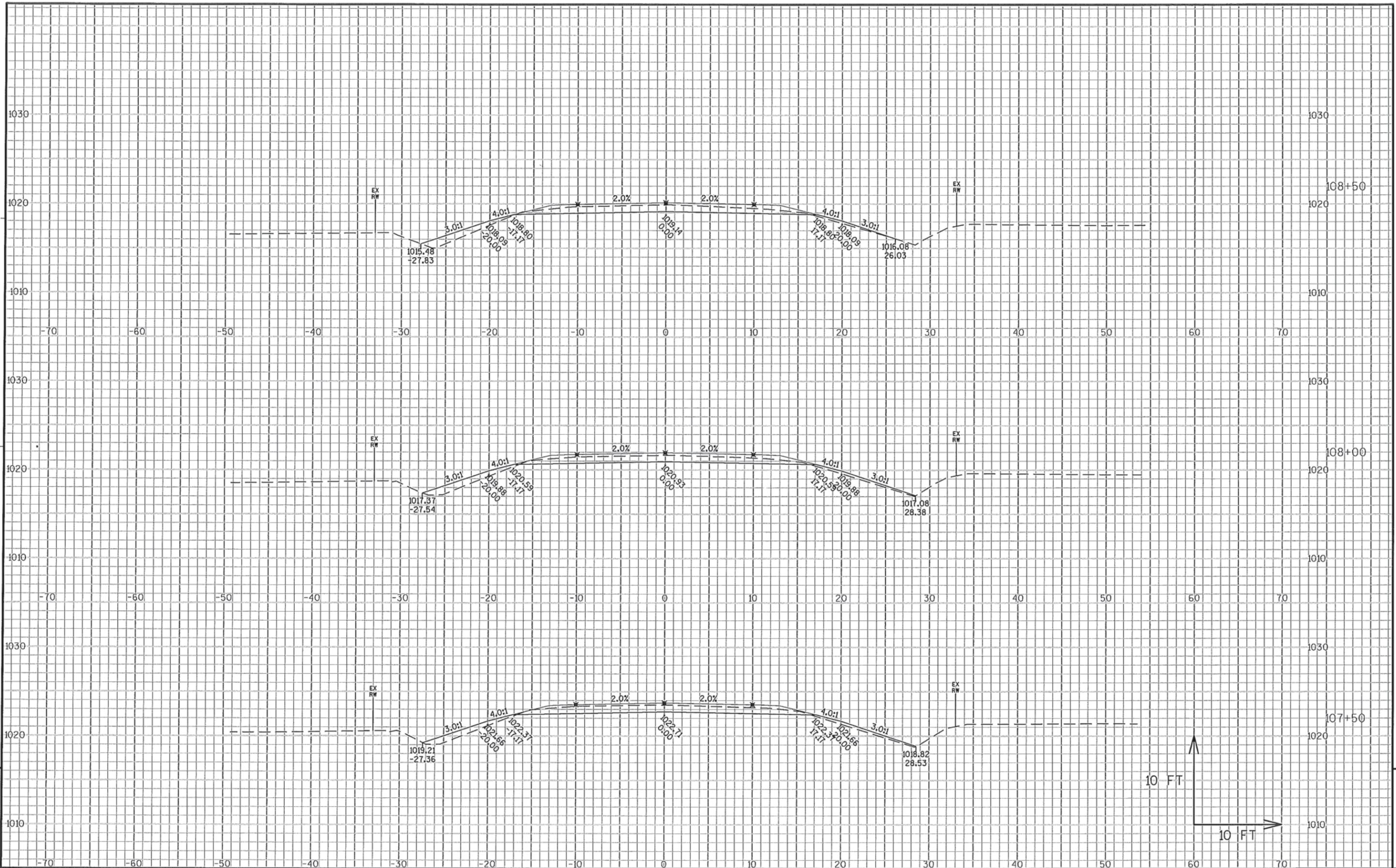
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PLOT BY : MATT GUNDRY

PLOT NAME :

PLOT SCALE : 1 IN:10 FT

WISDOT/CADDs SHEET 49

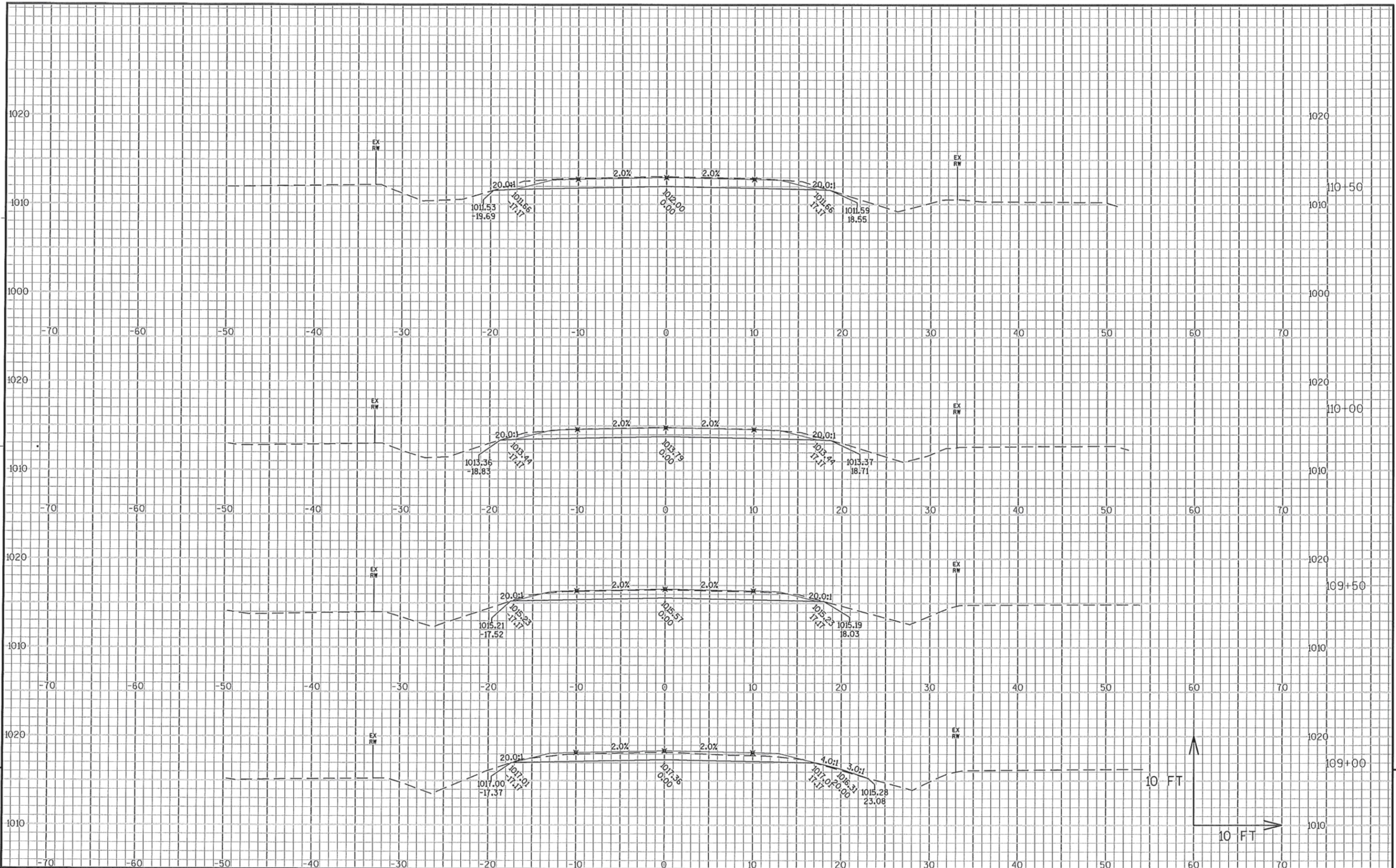


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9

PROJECT NO: 53312-794 HWY: CTH X COUNTY: EAU CLAIRE CROSS SECTIONS: CTH X SHEET E

FILE NAME : F:\DRAWINGS\2014-105\0001\C3D CTH X\SHEETSPLAN\090201-XS.DWG PLOT DATE : 1/14/2015 11:19 PM PLOT BY : MATT GUNDRY PLOT NAME : PLOT SCALE : 1 IN:10 FT WISDOT/CADDs SHEET 49



PROJECT NO: 53312-794

HWY: CTH X

COUNTY: EAU CLAIRE

CROSS SECTIONS: CTH X

SHEET

E

FILE NAME : F:\DRAWINGS\2014-105\0001\C3D CTH X\SHEETS\PLAN\090201-XS.DWG
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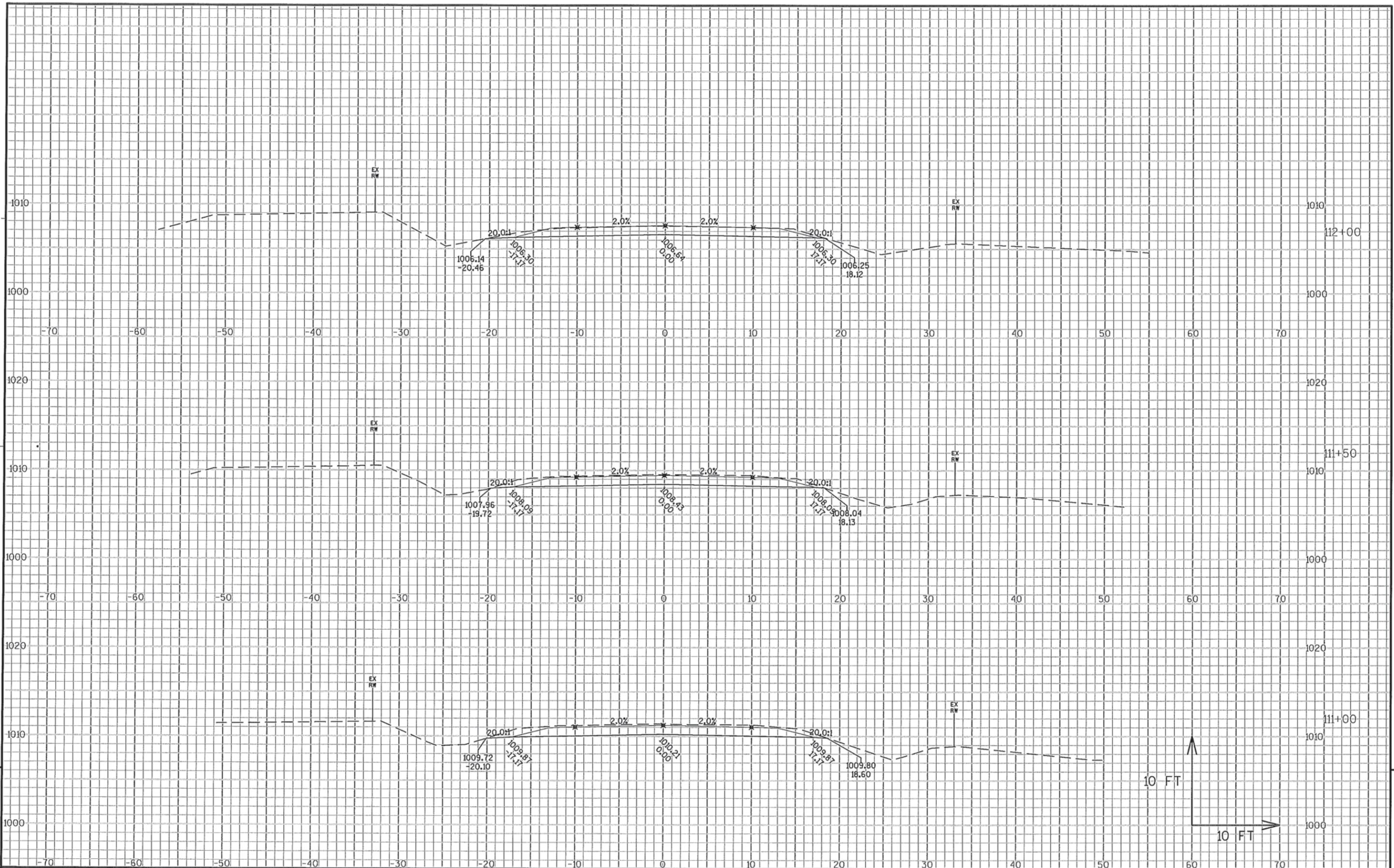
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PLOT BY : MATT GUNDRY

PLOT NAME :

PLOT SCALE : 1 IN:10 FT

WISDOT/CADDs SHEET 49



PROJECT NO: 53312-794

HWY: CTH X

COUNTY: EAU CLAIRE

CROSS SECTIONS: CTH X

SHEET

E

FILE NAME : F:\DRAWINGS\2014-105\0001\C3D CTH X\SHEETSPLAN\090201-XS.DWG
LAYOUT NAME - 090209_XS

PLOT DATE : 1/14/2015 11:20 PM

PLOT BY : MATT GUNDRY

PLOT NAME :

PLOT SCALE : 1 IN:10 FT

WISDOT/CADDs SHEET 49