

SUP  
PROJECT ID:  
WITH: 8120-02-76

8120-02-66

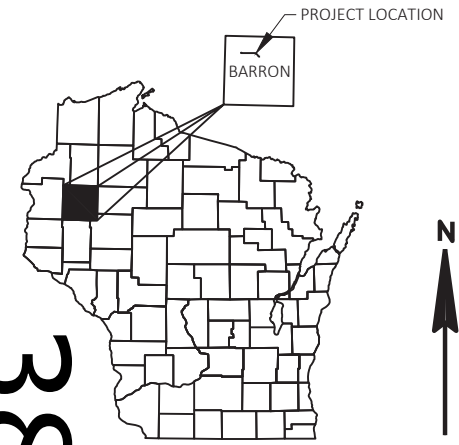
COUNTY:  
BARRON

FEBRUARY 2024

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 = 134



DESIGN DESIGNATION 8120-02-06

A.A.D.T.	2022	=	5500
A.A.D.T.	2042	=	6100
D.H.V.	2042	=	659
D.D.		=	60/40
T.		=	10.4
DESIGN SPEED		=	60 MPH
ESALS		=	1,500,000

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

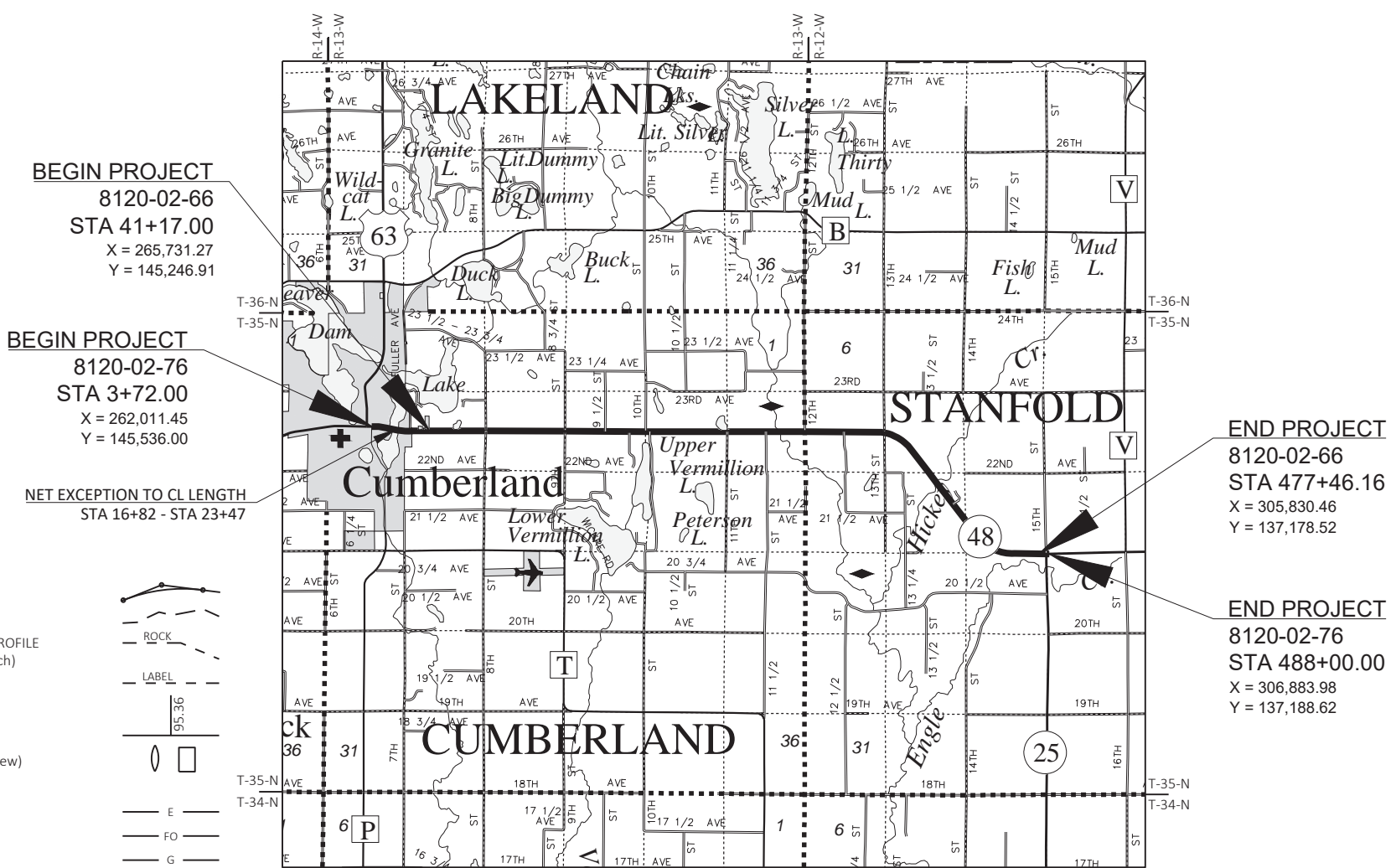
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION  
PLAN OF PROPOSED IMPROVEMENT

MCKINLEY - RICE LAKE  
USH 63 NORTH TO STH 25  
STH 48  
BARRON

MCKINLEY - RICE LAKE  
USH 63 NORTH TO STH 25  
STH 48  
BARRON

STATE PROJECT NUMBER  
8120-02-66

STATE PROJECT NUMBER  
8120-02-76



LAYOUT  
SCALE 0 2 MI  
TOTAL NET LENGTH OF CENTERLINE = 9.172

HORIZONTAL POSITIONS SHOWN ON THIS PLAN ARE WISCONSIN COORDINATE REFERENCE SYSTEM (WISCRS), BARRON COUNTY, NAD83 ( 2011 ), IN U.S. SURVEY FEET. POSITIONS SHOWN ARE GRID COORDINATES, GRID BEARINGS, AND GRID DISTANCES. GRID DISTANCES ARE THE SAME AS GROUND DISTANCES. ELEVATIONS ARE REFERENCED TO NAVD 88 ( 2012 ). GPS DERIVED ELEVATIONS ARE BASED ON GEOID 12A.

STATE PROJECT	FEDERAL PROJECT	
	PROJECT	CONTRACT
8120-02-66	WISC 2024236	1
8120-02-76		

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

PREPARED BY  
Surveyor \_\_\_\_\_ NW REGION  
Designer \_\_\_\_\_ MATTHEW BECKLIN, PE  
Project Manager \_\_\_\_\_ BETH CUNNINGHAM, PE  
Regional Examiner \_\_\_\_\_ TOU YANG  
Regional Supervisor \_\_\_\_\_ TYLER RONGSTAD, PE

APPROVED FOR THE DEPARTMENT  
DATE: \_\_\_\_\_ Tyler Rongstad  
(Signature)

**GENERAL NOTES**

THE ENGINEER WILL DETERMINE ANY DETAILS OF CONSTRUCTION NOT SHOWN ON THE PLAN.

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS ARE APPROXIMATE AND MAY BE ADJUSTED TO FIT FIELD CONDITIONS.

THE CONTRACTOR SHALL PRESERVE PAVEMENT MARKING TRANSITIONS AND ENSURE NEW PAVEMENT MARKING MATCHES THAT WHICH EXISTED PRIOR TO RESURFACING.

RIGHT OF WAY WAS NOT SURVEYED AND IS FOR INFORMATIONAL USE ONLY.

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

THE CONTRACTOR SHALL NOTIFY DIGGERS HOTLINE AND AFFECTED UTILITIES PRIOR TO THE START OF WORK. ANY UTILITY WHICH IS NOT A MEMBER OF THE DIGGERS HOTLINE MUST BE CONTACTED SEPARATELY.

ACCESS TO ALL RESIDENCES SHALL BE MAINTAINED DURING CONSTRUCTION.

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

THE EXACT LOCATIONS OF EROSION CONTROL ITEMS SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD. ALL EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL SUCH TIME AS THE ENGINEER DETERMINES THE MEASURE IS NO LONGER NECESSARY.

CURVE DATA SHOWN IS "ARC DEFINITION".

HMA PAVEMENT LONGITUDINAL CONSTRUCTIONS JOINTS SHALL NOT BE PLACED IN WHEEL PATHS.

WHEN THE QUANTITY OF THE ITEM OF BASE AGGREGATE DENSE OR HMA PAVEMENT IS MEASURED BY THE TON, THE DEPTH OR THICKNESS OF THE COURSE SHOWN ON THE PLANS IS APPROXIMATE, AND THE ACTUAL THICKNESS WILL DEPEND ON THE DISTRIBUTION OF THE MATERIAL AS DIRECTED BY THE ENGINEER.

HMA PAVEMENT AND ASPHALTIC SURFACE WEIGHT CALCULATIONS ARE BASED ON 112 LB/SY-IN.

**COMMUNICATIONS**

WDNR - NORTHERN REGION HQ  
ATTN: AMY CRONK  
810 W. MAPLE STREET  
SPOONER, WI 54801  
PHONE: (715) 635-4229  
EMAIL: AMY.CRONK@WISCONSIN.GOV

BARRON COUNTY HIGHWAY DEPARTMENT  
MICHAEL HOEFS - HIGHWAY COMMISSIONER  
518 260 N. 7TH STREET  
BARRON, WI 54812  
PHONE: (715) 635-6775  
EMAIL: MICHAEL.HOEFS@CO.BARRON.WI.US

WISCONSIN STATE PATROL SPOONER POST  
W7102 GREEN VALLEY ROAD  
SPOONER, WI 54801  
PHONE: (715) 635-2141  
EMERGENCY: (715) 635-7725  
FAX: (715) 635-6373

BARRON COUNTY SHERIFF DEPARTMENT  
COMMUNICATIONS CENTER DISPATCH  
1420 STATE HIGHWAY 25 NORTH, ROOM 1200  
BARRON, WI 54812  
EMERGENCY 911  
NON-EMERGENCY DISPATCH (715) 537-3106

**UTILITIES**

**COMMUNICATIONS LINE**

CENTURYTEL OF NORTHERN WISCONSIN, LLC D/B/A  
CENTURYLINK  
ATTN: KYLE SCHLAMPP  
20 S WILSON AVE  
RICE LAKE, WI 54868  
PHONE: (715) 475-2029  
MOBILE: (715) 292-0082  
EMAIL: KYLE.SCHLAMPP@LUMEN.COM

CENTURYTEL OF THE MIDWEST-KENDALL, LLC D/B/A  
CENTURYLINK  
ATTN: MICHAEL VANDEN BOS  
2426 75TH/ AVE  
OSCEOLA, WI 54020  
MOBILE: (715) 292-4278  
EMAIL: MIKE.VANDENBOS@LUMEN.COM

CHARTER COMMUNICATIONS  
ATTN: JAMEY OLDEEN  
2304 S. MAIN ST  
RICE LAKE, WI 54868  
PHONE: (715) 719-0561  
MOBILE: (715) 651-7488  
EMAIL: JAMEY.OLDEEN@CHARTER.COM

**ELECTRICITY - DISTRIBUTION**

BARRON ELECTRIC COOPERATIVE  
ATTN: JEFF NELSON  
1434 HWY 25 N  
BARRON, WI 54812  
PHONE: (715) 537-3171  
MOBILE: (715) 418-1167  
EMAIL: JNELSON@BARRONELECTRIC.COM

CUMBERLAND MUNICIPAL UTILITY  
ATTN: DEAN BERGSTROM  
1265 2ND AVE  
P.O. BOX 726  
CUMBERLAND, WI 54829-0726  
PHONE: (715) 822-2595  
EMAIL: DEAN@CMUTILITY.COM

DAIRYLAND POWER COOPERATIVE  
ATTN: ROB MALY  
3200 EAST AVENUE  
P.O. BOX 817  
LA CROSSE, WI 54602-0817  
PHONE: (608) 787-1427  
MOBILE: (608) 518-2633  
EMAIL: ROB.MALY@DAIRYLANDPOWER.COM

**GAS/PETROLEUM**

WE ENERGIES  
ATTN: STEVEN CHAVERS  
104 W. SOUTH STREET  
RICE LAKE, WI 54868  
PHONE: (715) 234-9605  
MOBILE: (715) 213-4327  
EMAIL: STEVEN.CHAVERS@WE-ENERGIES.COM

**SEWER AND WATER**

CUMBERLAND MUNICIPAL UTILITY - SEWER & WATER  
ATTN: DEAN BERGSTROM  
1265 2ND AVE  
P.O. BOX 726  
CUMBERLAND, WI 54829  
PHONE: (715) 822-2595  
EMAIL: DEAN@CMUTILITY.COM

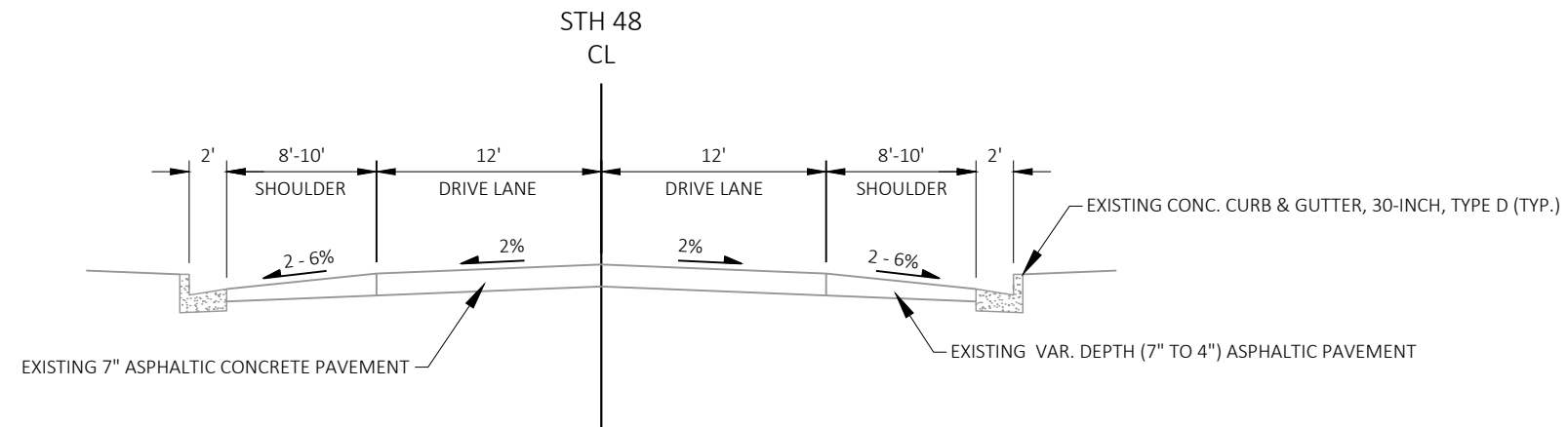


**STANDARD ABBREVIATIONS**

ABUT.	ABUTMENT	ESALS	EQUIVALENT SINGLE AXLE LOADS	REQ'D	REQUIRED
AGG.	AGGREGATE	E.B.S.	EXCAVATION BELOW SUBGRADE	R/L	REFERENCE LINE
AH.	AHEAD	EL.	EXISTING	RT	RIGHT
AADT	ANNUAL AVERAGE DAILY TRAFFIC	FERT.	FERTILIZE	R.H.F.	RIGHT-HAND FORWARD
APPROX.	APPROXIMATE	FE	FIELD ENTRANCE	R/W	RIGHT-OF-WAY
AEW	APRON END WALL	FIN.	FINISHED	RD	ROAD
ASPH.	ASPHALTIC	FL OR T	FLOW LINE	SHLD	SHOULDER
BK.	BACK	HOR.	HORIZONTAL	S.	SOUTH
BEG.	BEGIN	INL.	INLET	SDD	STANDARD DETAIL DRAWINGS
B.M.	BENCH MARK	INTER.	INTERSECTION	SR	SIDE ROAD
C/L OR C	CENTER LINE	INV.	INVERT	SSPRC	STORM SEWER PIPE REINFORCED CONCRETE
C.E.	COMMERCIAL ENTRANCE	LT	LEFT	STH	STATE TRUNK HIGHWAYS
CONC.	CONCRETE	L.H.F.	LEFT-HAND FORWARD	STA.	STATION
CONSTRUT.	CONSTRUCTION	LF	LINEAR FOOT	STRUCT.	STRUCTURE
CO.	COUNTY	LS	LUMP SUM	TEL	TELEPHONE
CTH	COUNTY TRUNK HIGHWAY	MAX.	MAXIMUM	TEMP.	TEMPORARY
X-SEC.	CROSS SECTION	MISC.	MISCELLANEOUS	T	TOWN
CR.	CRUSHED	N.	NORTH	T.	TRUCKS (PERCENT OF)
CULV.	CULVERT	NE	NORTHEAST	TYP.	TYPICAL
DOT	DEPARTMENT OF TRANSPORTATION	NW	NORTHWEST	UG	UNDERGROUND
D.H.V.	DESIGN HOUR VOLUME	PAVT.	PAVEMENT	VAR.	VARIABLE
DIA.	DIAMETER	PC	POINT OF CURVATURE	V	VELOCITY OR DESIGN SPEED
DISCH.	OR DIS. DISCHARGE	PI	POINT OF INTERSECTION	VC	VERTICAL CURVE
E.	EAST	PT	POINT OF TANGENCY	W.	WEST
EB	EASTBOUND	POT	POINT ON TANGENT	WB	WESTBOUND
EA.	EACH	PE	PRIVATE ENTRANCE	WD	WORKING DAY
ELEC.	ELECTRIC	PROJ.	PROJECT	WZ	WORK ZONE
OR ELEV.	ELEVATION	R	RANGE	X	EAST GRID COORDINATE
				Y	NORTH GRID COORDINATE

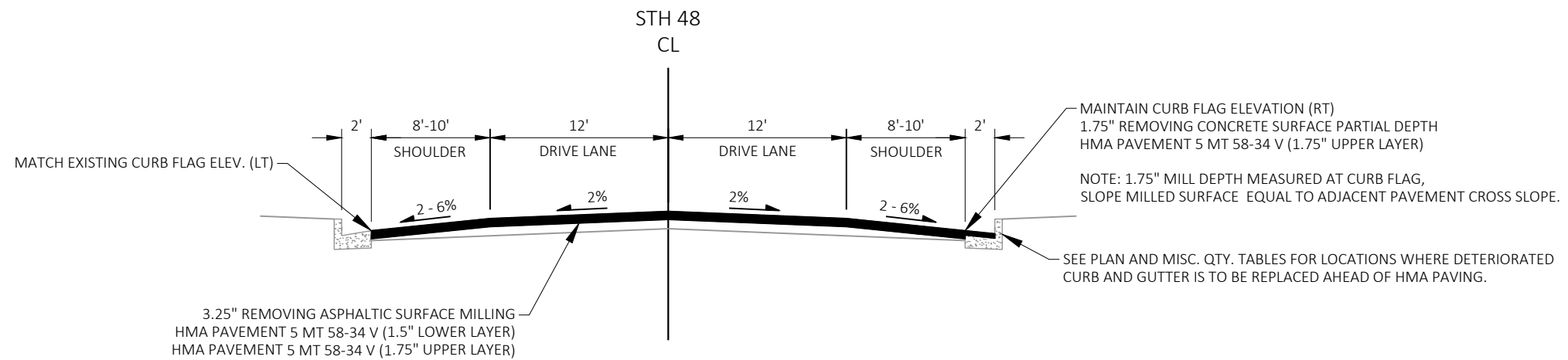
**RUNOFF COEFFICIENT TABLE**

	HYDROLOGIC SOIL GROUP											
	A			B			C			D		
	SLOPE RANGE (PERCENT)			SLOPE RANGE (PERCENT)			SLOPE RANGE (PERCENT)			SLOPE RANGE (PERCENT)		
LAND USE:	0-2	2-6	6 & OVER	0-2	2-6	6 & OVER	0-2	2-6	6 & OVER	0-2	2-6	6 & OVER
ROW CROPS	.08	.16	.22	.12	.20	.27	.15	.24	.33	.19	.28	.38
	.22	.30	.38	.26	.34	.44	.30	.37	.50	.34	.41	.56
MEDIAN STRIP-TURF	.19	.20	.24	.19	.22	.26	.20	.23	.30	.20	.25	.30
	.24	.26	.30	.25	.28	.33	.26	.30	.37	.27	.32	.40
SIDE SLOPE-TURF			.25			.27			.28			.30
			.32			.34			.36			.38
PAVEMENT:												
ASPHALT	.70 - .95											
CONCRETE	.80 - .95											
BRICK	.70 - .80											
DRIVES, WALKS	.75 - .85											
ROOFS	.75 - .95											
GRAVEL ROADS, SHOULDERS	.40 - .60											



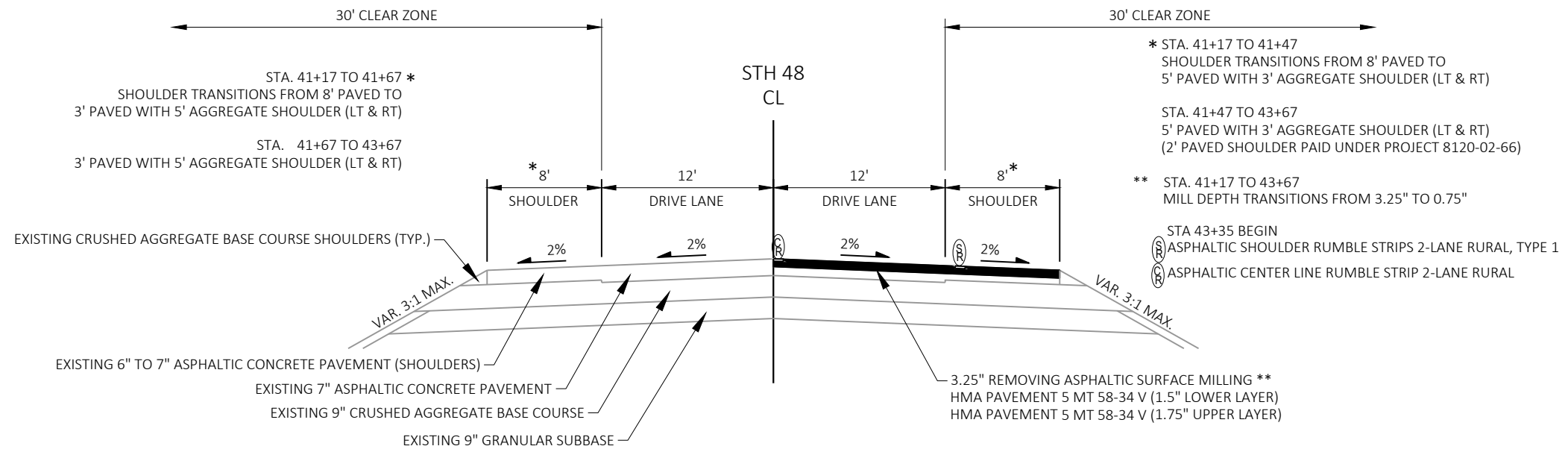
**TYPICAL EXISTING SECTION**

STA. 3+72 TO 8+69 LT  
STA. 3+72 TO 11+24 RT



**TYPICAL FINISHED SECTION**

STA. 3+72 TO 8+69 LT  
STA. 3+72 TO 11+24 RT



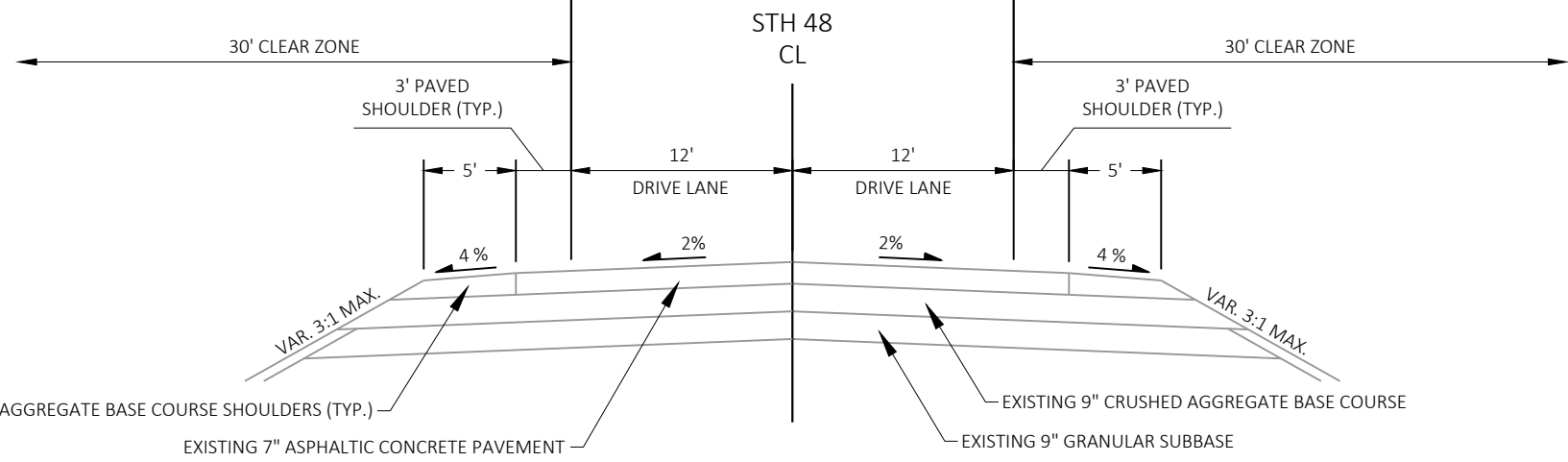
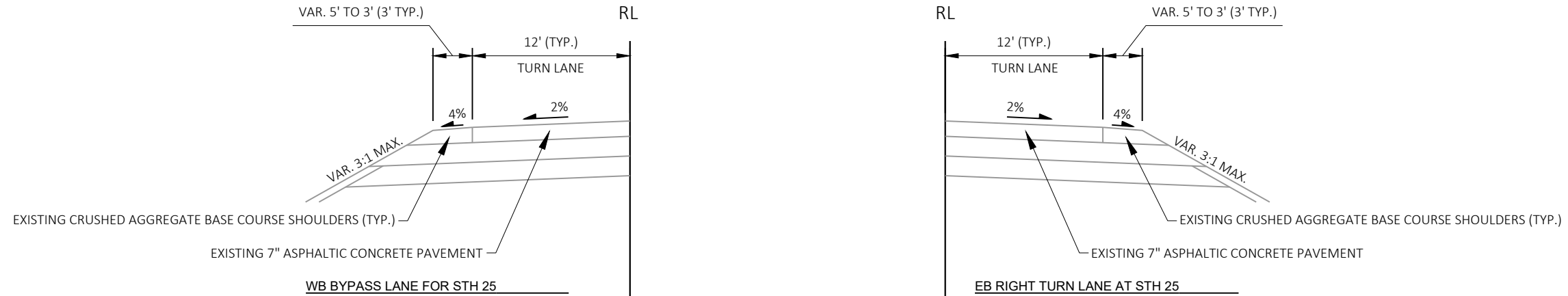
TYPICAL EXISTING HALF-SECTION

STA. 8+69 TO 16+82 LT  
STA. 11+24 TO 16+82 RT  
STA. 23+47 TO 43+67 LT & RT

TYPICAL FINISHED HALF-SECTION

STA. 8+69 TO 16+82 LT  
STA. 11+24 TO 16+82 RT  
STA. 23+47 TO 43+67 LT & RT

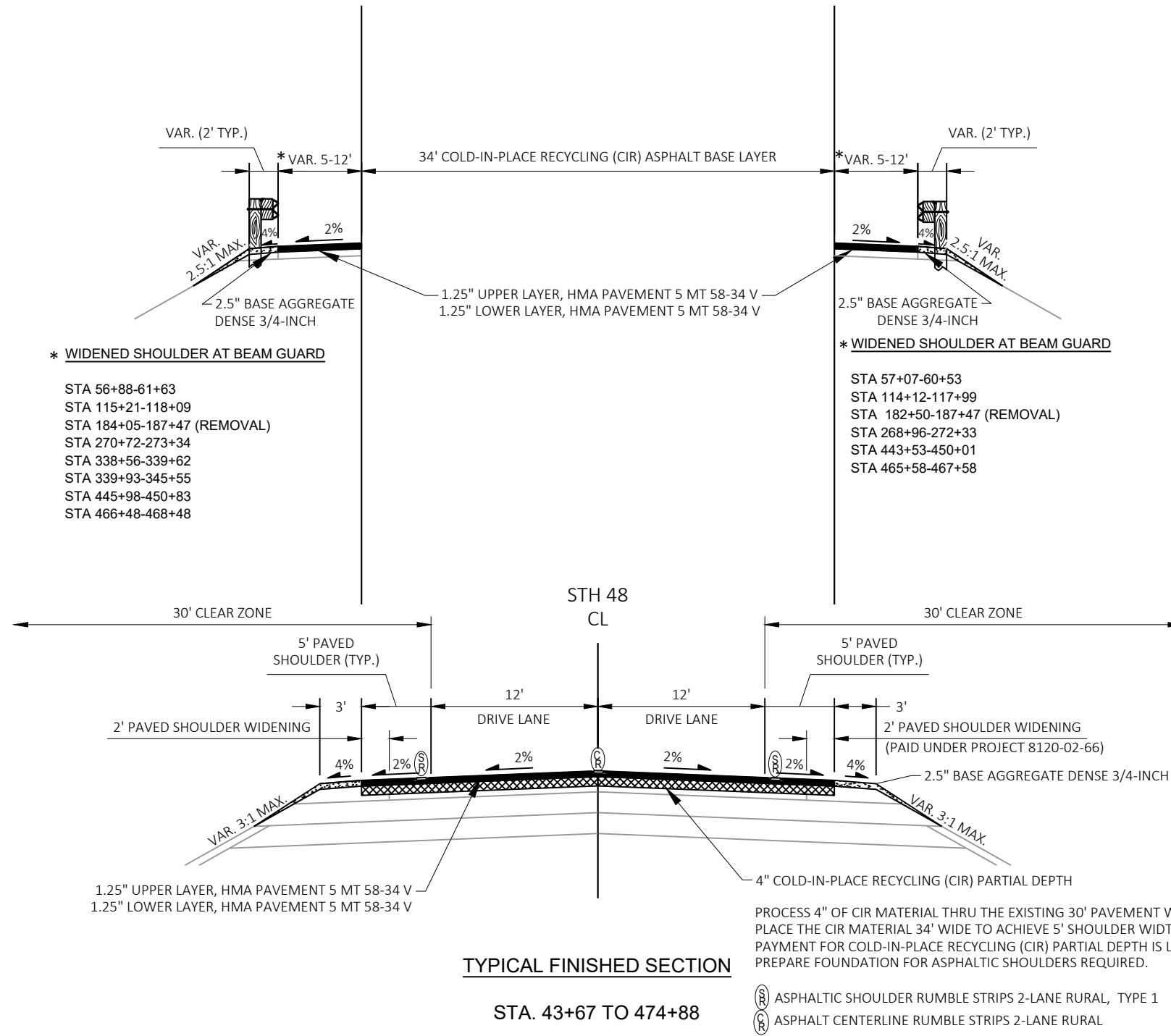
NOTE: NET EXCEPTION TO CL LENGTH  
HAY RIVER FLOWAGE, C-03-0008  
STA 16+82 to STA 23+47

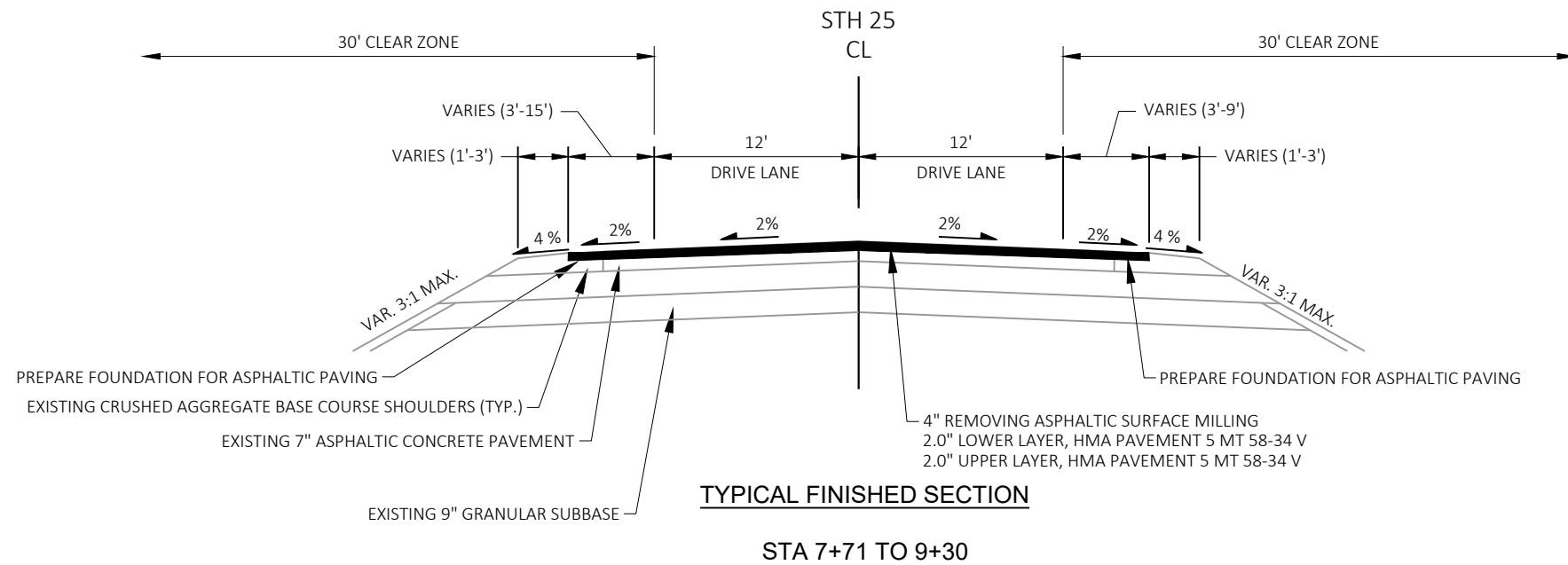
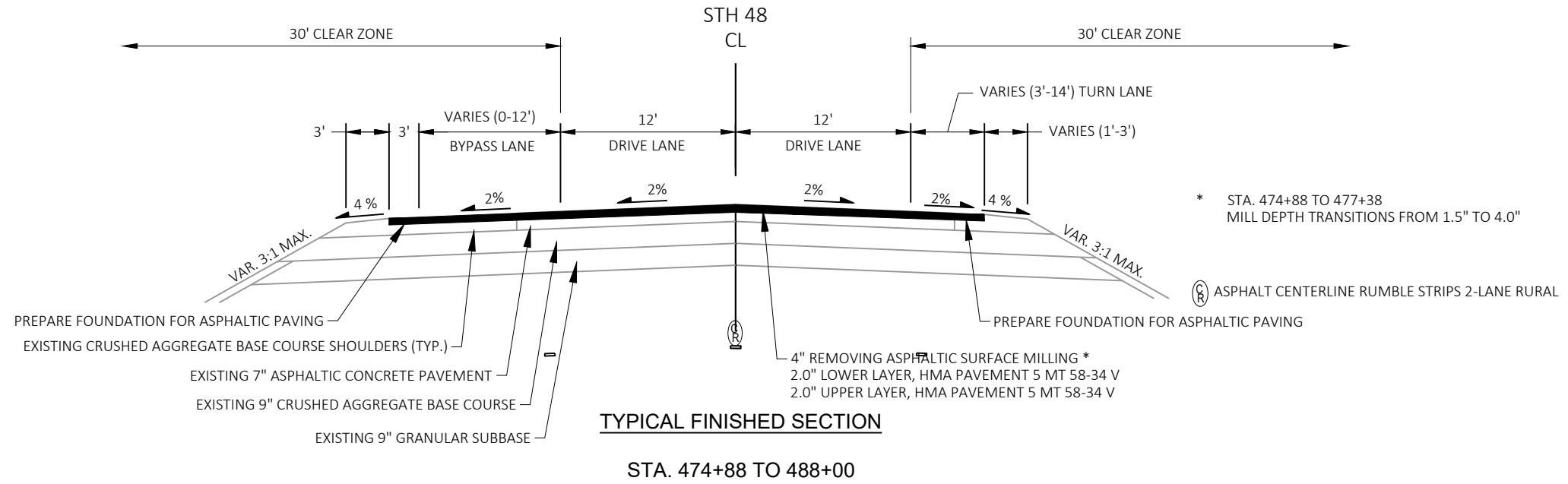


**TYPICAL EXISTING SECTION**

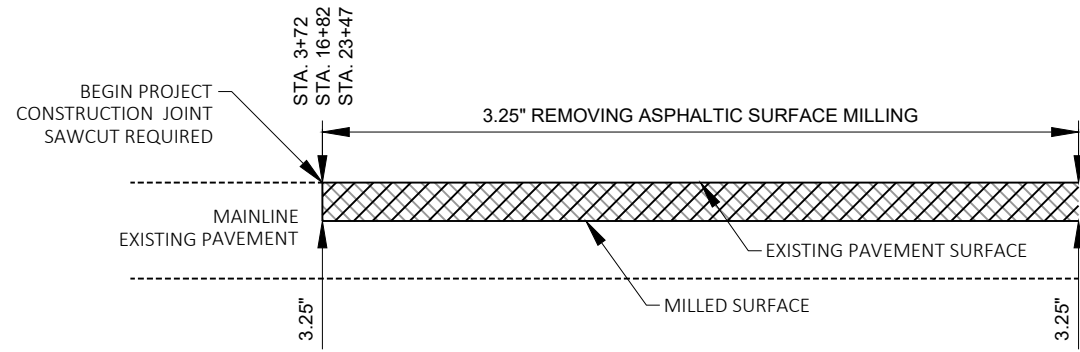
STA. 43+67 TO 488+00

**NOTES:**  
 BEAM GUARD SECTIONS WITHOUT WIDENED SHOULDERS ARE NOT NOTED WITHIN THE TYPICAL SECTIONS.  
 STATED CROSS SLOPES ARE TYPICAL; SEE SUPER ELEVATION TABLE FOR EXISTING AND PROPOSED SE.








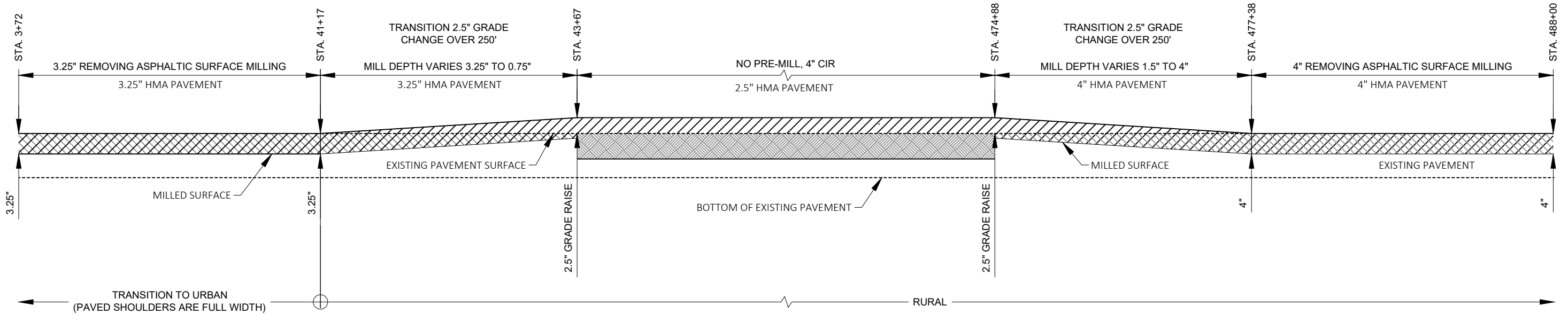
SUPER ELEVATION TABLE - STH 48			
CURVE START STA.	CURVE END STA.	EXISTING SE	PROPOSED SE
6+19.39	10+70.32	NC	NC
19+13.12	26+92.37	2.8%	2.8%
175+13.87	178+27.07	NC	NC
334+85.73	361+01.62	4.7%	4.7%
433+05.18	458+79.91	4.7%	4.7%



DETAIL OF MAINLINE CONSTRUCTION JOINT - NO GRADE RAISE






-  = HMA PAVEMENT 5 MT 58-34 V, DEPTH VARIES
-  = REMOVING ASPHALTIC SURFACE MILLING, DEPTH VARIES
-  = 4" COLD-IN-PLACE RECYCLING (CIR) PARTIAL DEPTH

NOTES:  
 NOT TO SCALE  
 EXACT DIMENSIONS TO BE DETERMINED BY THE ENGINEER IN THE FIELD.

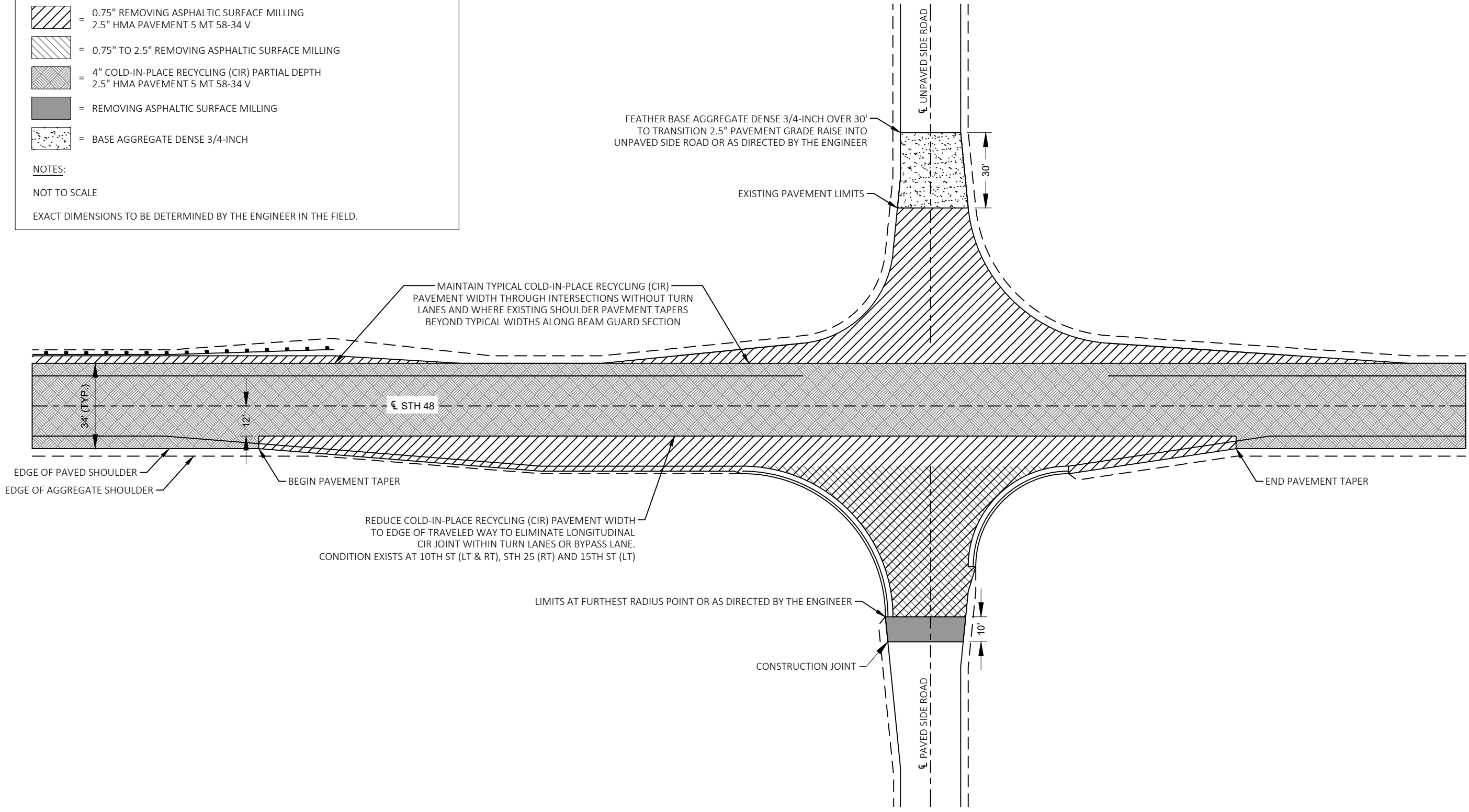


DETAIL OF PAVEMENT GRADE RAISE TRANSITION

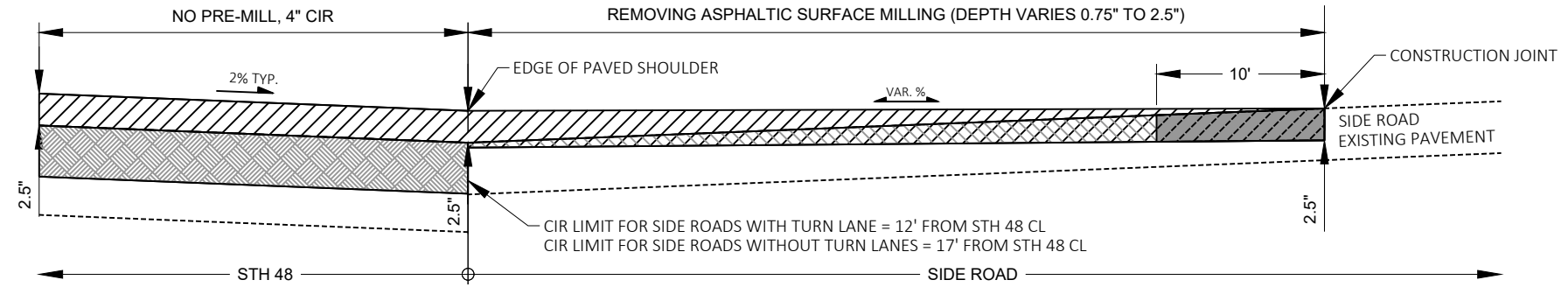


-  = 0.75" REMOVING ASPHALTIC SURFACE MILLING  
2.5" HMA PAVEMENT 5 MT 58-34 V
-  = 0.75" TO 2.5" REMOVING ASPHALTIC SURFACE MILLING
-  = 4" COLD-IN-PLACE RECYCLING (CIR) PARTIAL DEPTH  
2.5" HMA PAVEMENT 5 MT 58-34 V
-  = REMOVING ASPHALTIC SURFACE MILLING
-  = BASE AGGREGATE DENSE 3/4-INCH

**NOTES:**  
 NOT TO SCALE  
 EXACT DIMENSIONS TO BE DETERMINED BY THE ENGINEER IN THE FIELD.



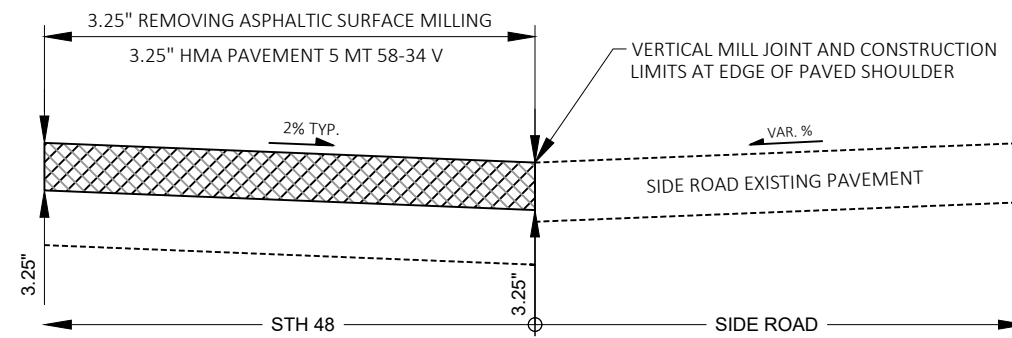
SIDE ROAD INTERSECTION DETAILS - WITH MAINLINE GRADE RAISE



**DETAIL OF PAVED SIDE ROAD BUTT JOINT - WITH MAINLINE GRADE RAISE**

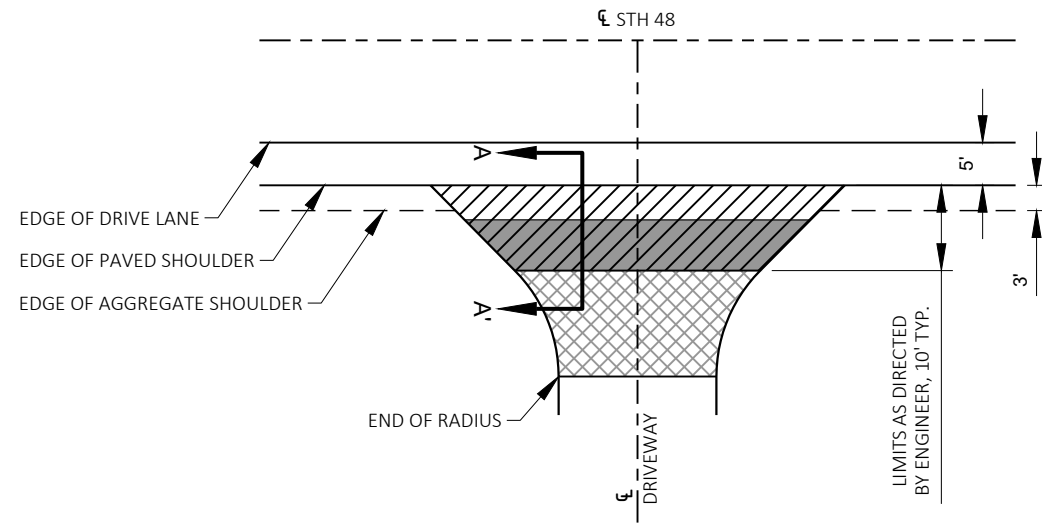
- |                   |                |
|-------------------|----------------|
| 8TH ST (LT & RT)  | 11TH ST (RT)   |
| 9TH ST (RT)       | 11 1/2 ST (RT) |
| 9 1/2 ST (LT)     | 12TH ST (LT)   |
| 9 3/4 ST (RT)     | 13TH ST (LT)   |
| 10TH ST (LT & RT) | STH 25 (RT)    |

	= HMA PAVEMENT 5 MT 58-34 V, DEPTH VARIES
	= REMOVING ASPHALTIC SURFACE MILLING, DEPTH VARIES
	= 4" COLD-IN-PLACE RECYCLING (CIR) PARTIAL DEPTH
	= REMOVING ASPHALTIC SURFACE MILLING



**DETAIL OF PAVED SIDE ROAD CONSTRUCTION JOINT - NO MAINLINE GRADE RAISE**




- BABCOCK AVE (LT)  
 FULLER AVE (RT)  
 7TH AVE (LT)



**RESTORE PAVED DRIVEWAY DETAIL - WITH MAINLINE GRADE RAISE**

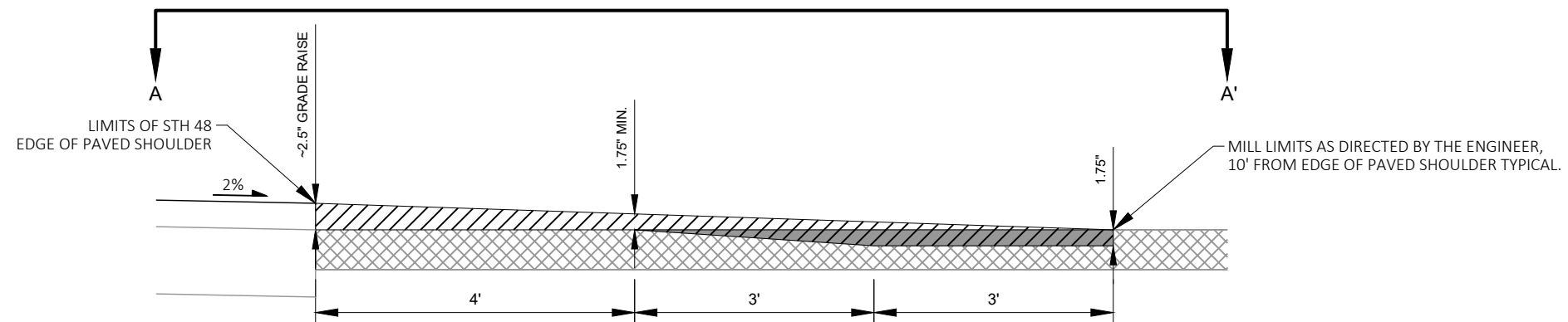
45+72 LT	48+14 LT	67+93 LT	114+27 LT
47+74 RT	49+17 RT	75+53 RT	406+34 RT

**LEGEND**

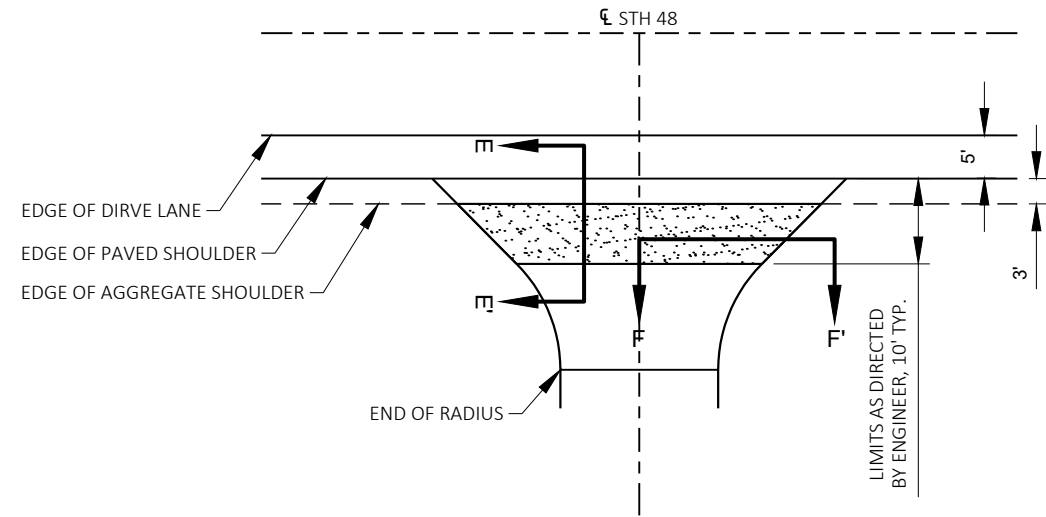
-  = ASPHALTIC SURFACE DRIVEWAYS AND FIELD ENTRANCES (DEPTH VARIES 2.5" TO 1.75")
-  = REMOVING ASPHALTIC SURFACE MILLING
-  = EXISTING ASPHALTIC DRIVEWAY

**NOTES**

- NOT TO SCALE.
- MATCH EXISTING PAVED SURFACE WIDTH, RADII AND TAPERS.
- ANY ADDITIONAL BASE AGG. DENSE REQUIRED SHALL BE PAID UNDER ITEM 'BASE AGGREGATE DENSE 3/4-INCH'.




**DETAIL OF PAVED DRIVEWAY BUTT JOINT (A-A')**

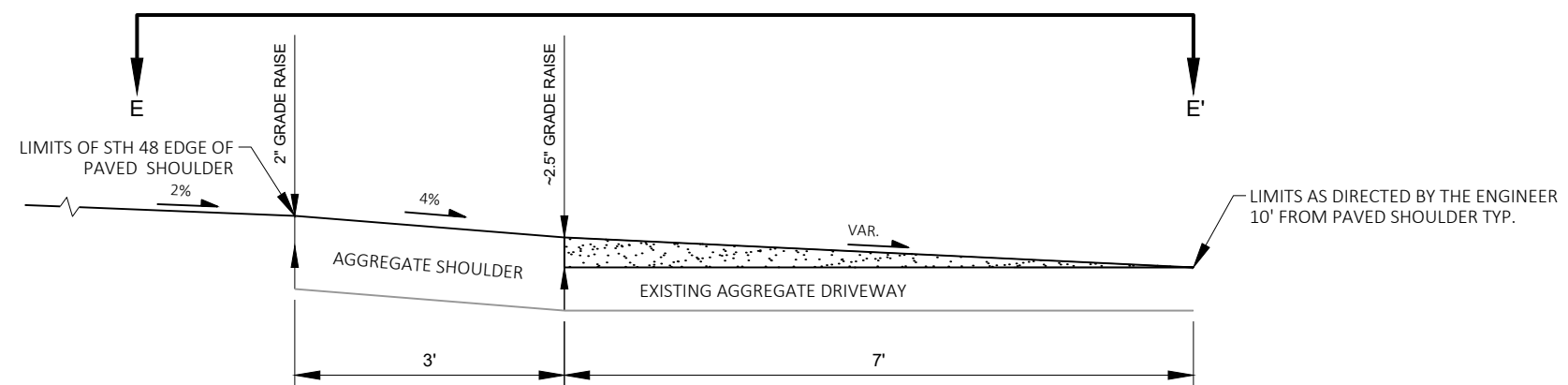


**RESTORE AGGREGATE DRIVEWAY DETAIL - WITH MAINLINE GRADE RAISE**

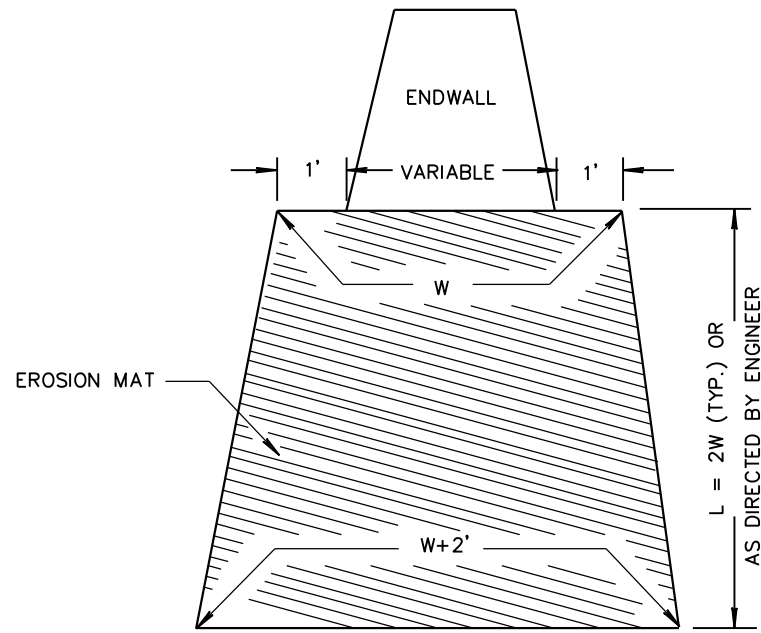
46+00 RT	108+19 RT	193+85 LT	237+59 LT	299+93 LT	379+63 RT	433+07 LT
53+57 RT	108+72 LT	196+69 RT	249+29 LT	307+79 RT	379+87 RT	433+10 RT
55+64 LT	123+38 LT	198+15 LT	249+31 RT	318+56 LT	381+07 RT	445+21 LT
62+11 LT	152+10 RT	200+99 RT	256+48 LT	321+40 RT	383+07 LT	450+47 RT
80+77 RT	155+44 LT	210+22 RT	257+85 RT	330+37 LT	395+75 LT	458+63 RT
95+68 LT	157+31 RT	221+19 LT	273+16 RT	349+87 LT	397+11 RT	462+26 LT
96+76 LT	176+36 LT	225+30 RT	280+99 LT	351+66 RT	418+95 RT	464+75 LT
105+15 LT	177+70 RT	226+28 LT	286+43 RT	355+89 LT	424+74 RT	473+84 LT
107+54 RT	190+49 RT	232+26 RT	259+88 RT	356+03 RT	430+28 LT	484+91 RT

**LEGEND**

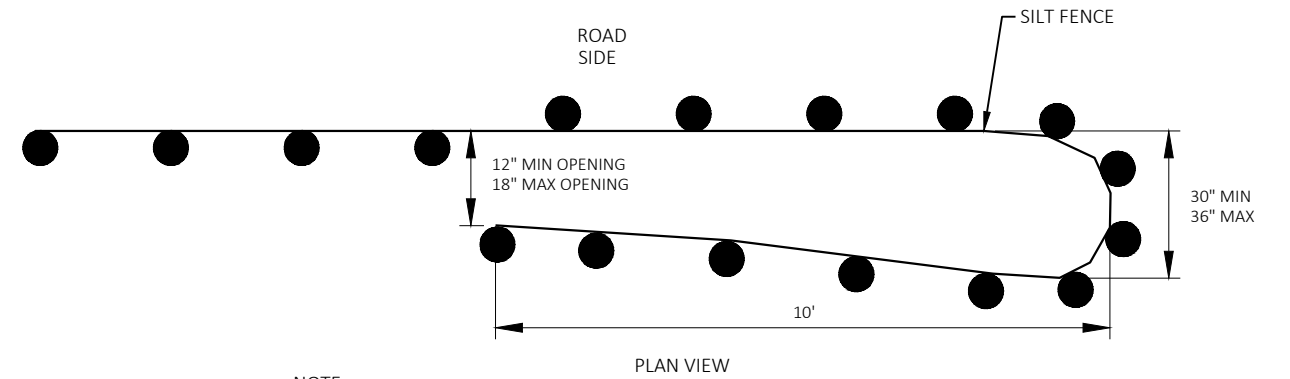
 = EACH ENTRANCE SHALL RECEIVE ADEQUATE BASE AGGREGATE DENSE 3/4-INCH AFTER MAINLINE PAVING TO BRING ENTRANCE UP TO SHOULDER PAVEMENT GRADE. MATCH EXISTING DRIVEWAY WIDTH AND RADII.



**DETAIL OF AGGREGATE DRIVEWAY (E-E')**



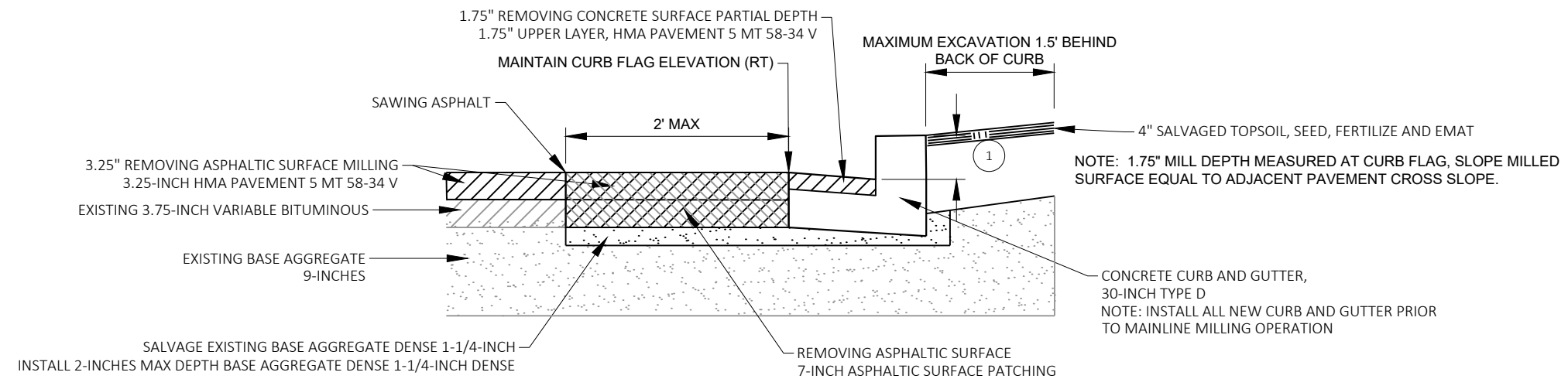
EROSION MAT TREATMENT AT CULVERTS



NOTE:  
SILT FENCE POST FOR THE TURN-AROUND SHOULD BE ON THE OUTSIDE OF THE TURN-AROUND AND TRENCHED IN ACCORDING TO SILT FENCE REQUIREMENTS.

TEMPORARY SMALL ANIMAL TURN-AROUND DETAIL

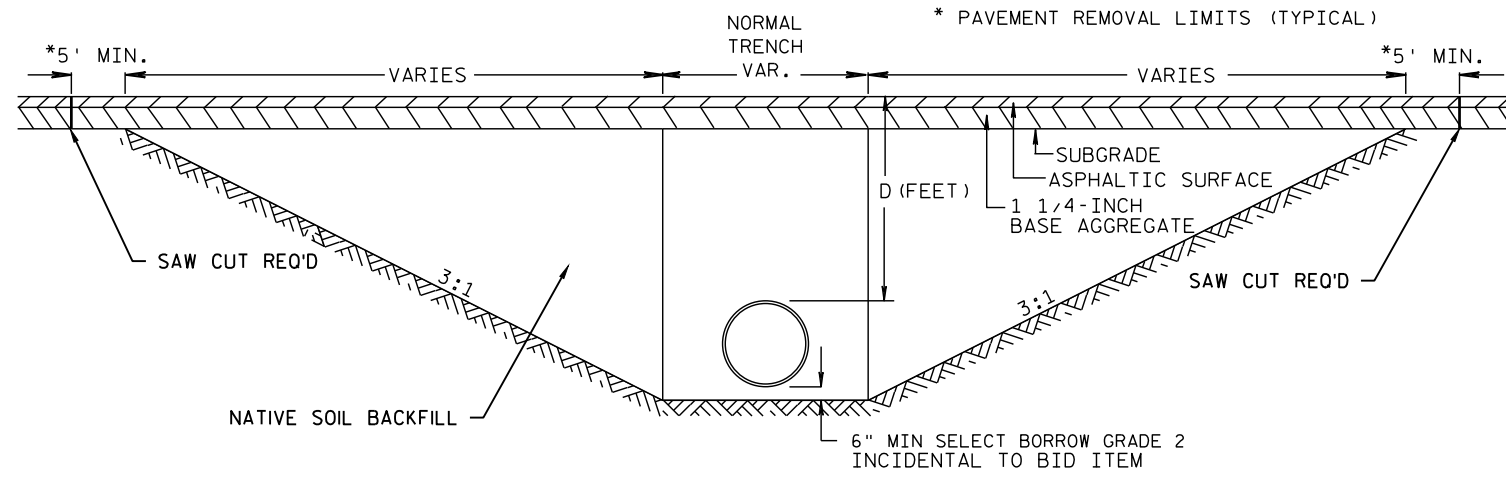
STA 57+00 - 62+00 LT & RT  
STA 270+50 LT  
STA 273+00 LT  
STA 268+50 RT  
STA 272+75 RT



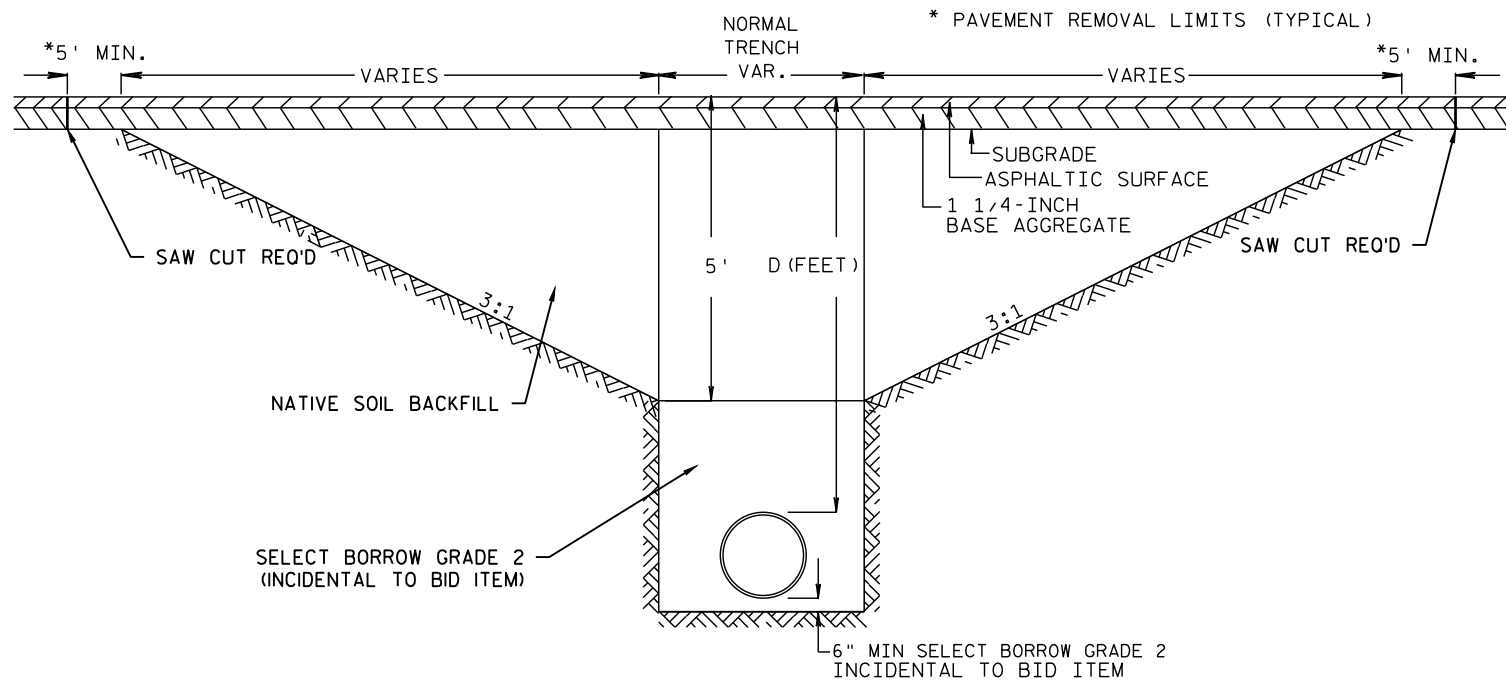
1 MATCH EXISTING ADJACENT CURB HEIGHTS

DETAIL OF NEW CONCRETE CURB & GUTTER WITH HMA OVERLAY

STA 3+75 - 4+37  
STA 5+11 - 6+16  
STA 7+61 - 7+86  
STA 8+56 - 8+71  
STA 9+14 - 9+56

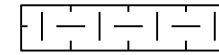


CROSS DRAIN INSTALLATION DETAIL  
FOR D ≤ 5'



CROSS DRAIN INSTALLATION DETAIL  
FOR D > 5'

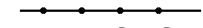
LEGEND



EROSION MAT CLASS I TYPE B, SEED, FERTILIZER, SALVAGED TOPSOIL



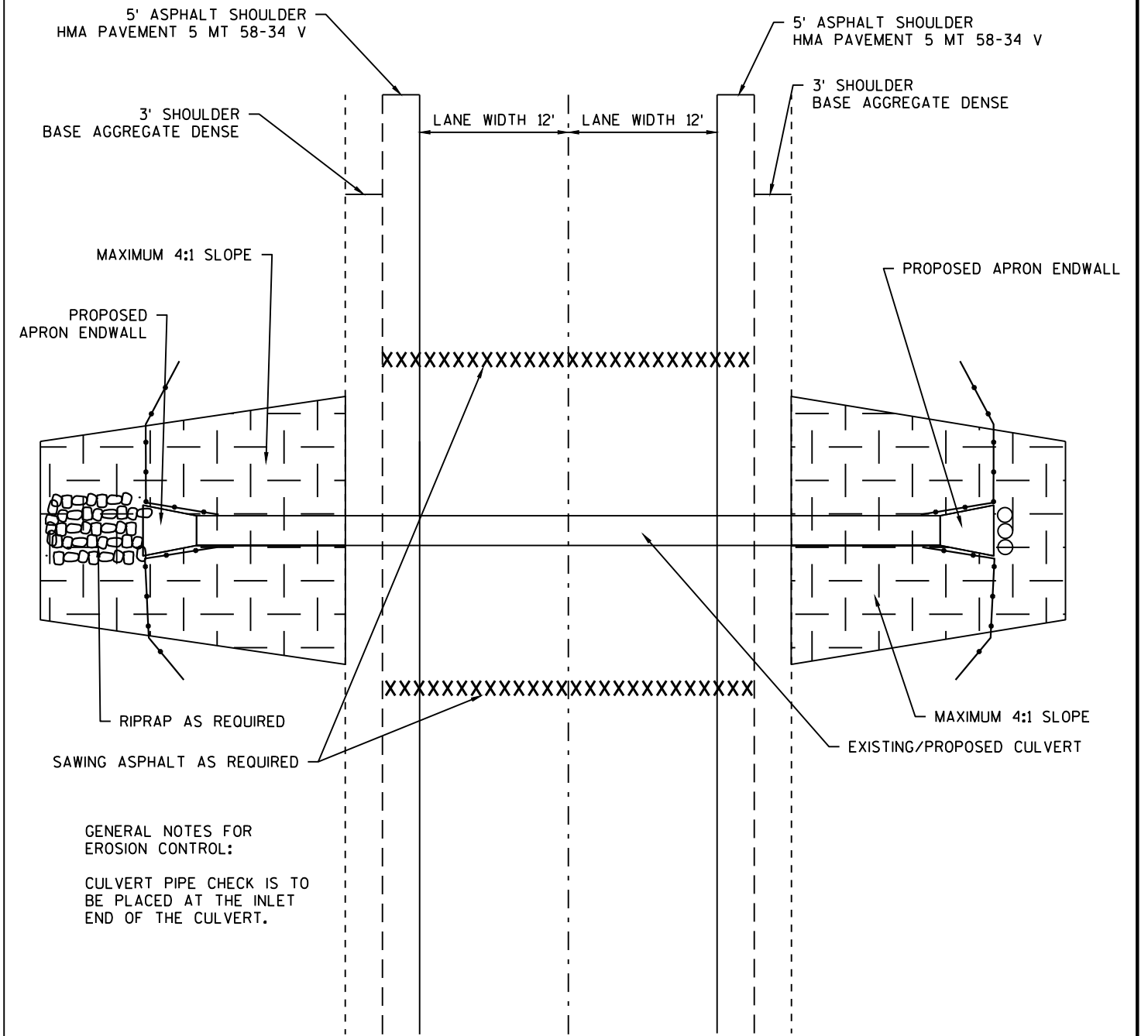
CULVERT PIPE CHECK



SILT FENCE



RIPRAP MEDIUM, GEOTEXTILE FABRIC TYPE HR

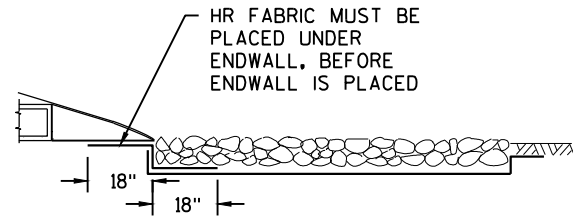


GENERAL NOTES FOR  
EROSION CONTROL:

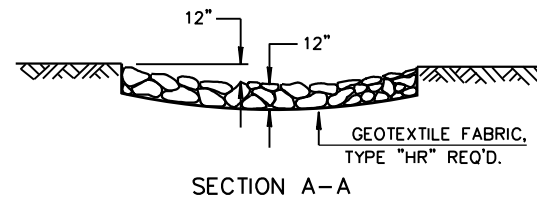
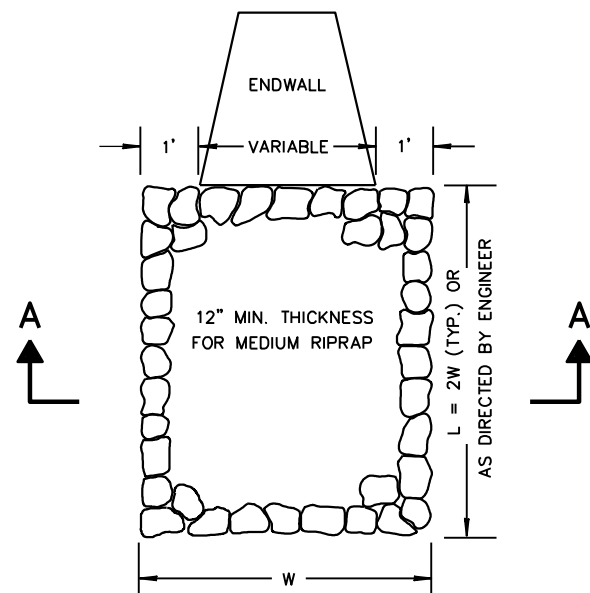
CULVERT PIPE CHECK IS TO  
BE PLACED AT THE INLET  
END OF THE CULVERT.

CULVERT RESTORATION

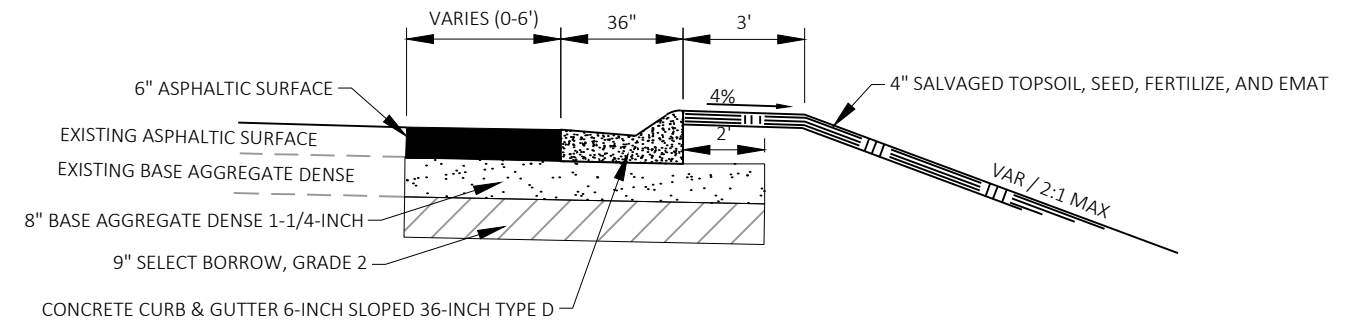
HR FABRIC MAY BE INSTALLED AS TWO SEPARATE PIECES, OVERLAPPING AS SHOWN OR AS APPROVED BY THE ENGINEER IN THE FIELD. EXTRA QUANTITY FOR OVERLAP IS INCIDENTAL TO THE CONTRACT.



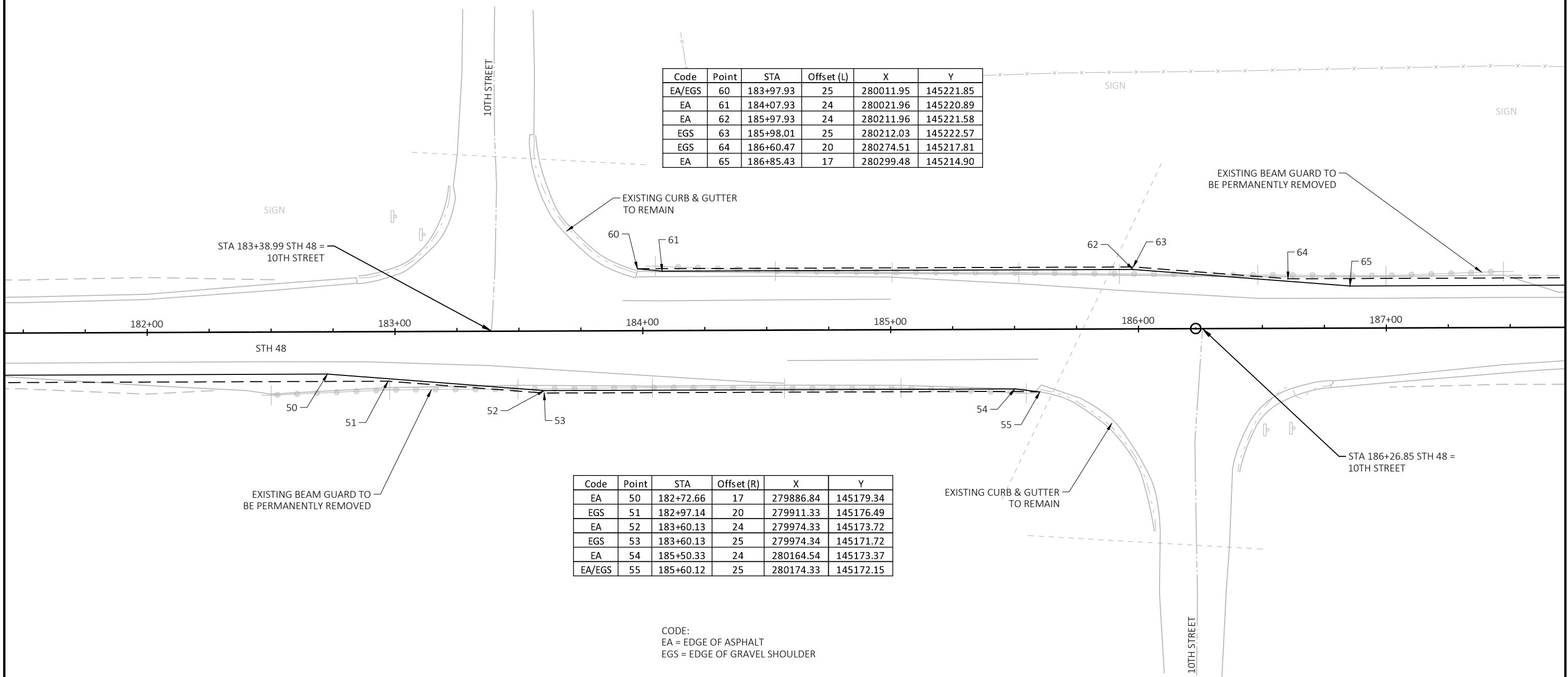
HR FABRIC INSTALLATION



MEDIUM RIPRAP TREATMENT AT CULVERTS



DETAIL OF CURB & GUTTER INSTALLATION AT STH 25 INTERSECTION

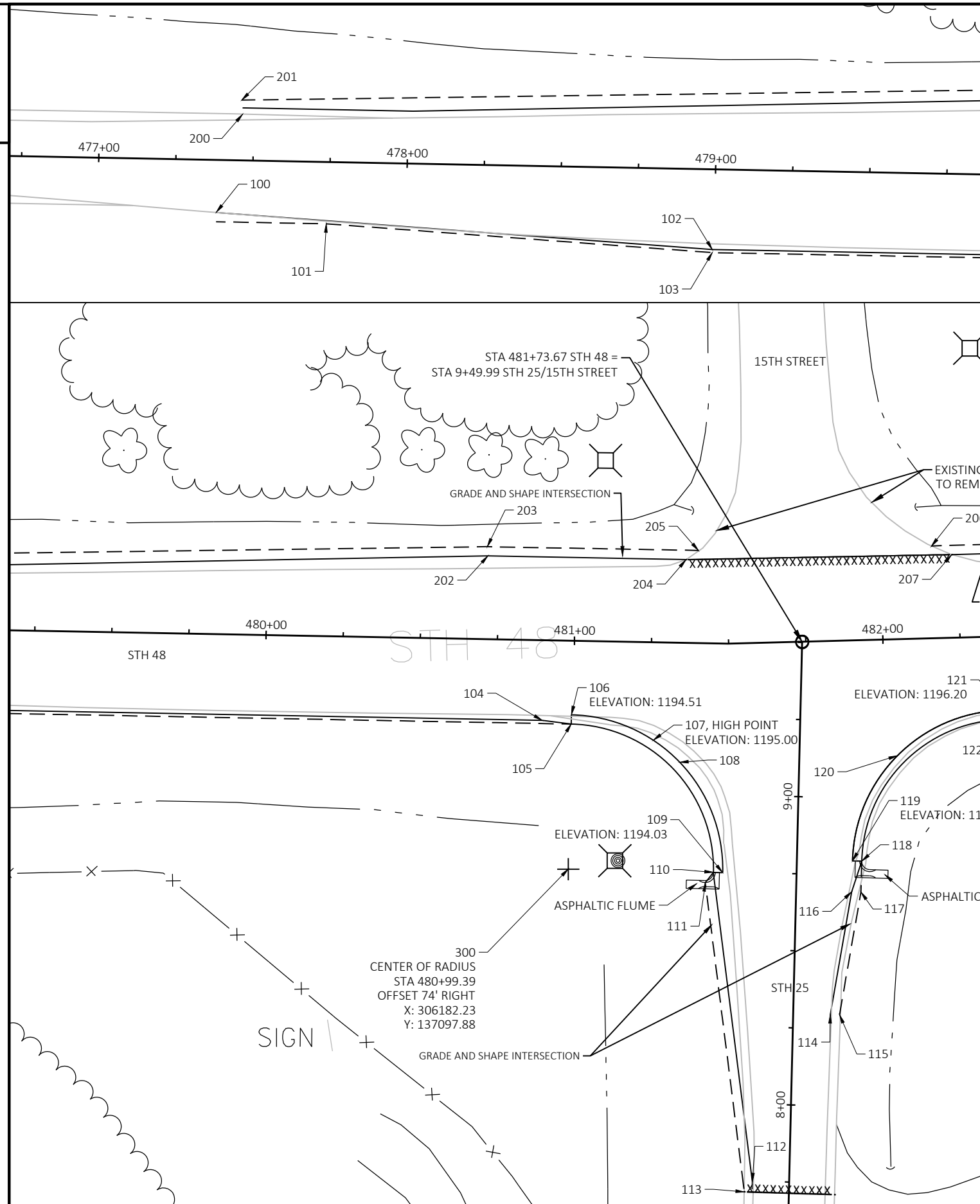


Code	Point	STA	Offset (L)	X	Y
EA/EGS	60	183+97.93	25	280011.95	145221.85
EA	61	184+07.93	24	280021.96	145220.89
EA	62	185+97.93	24	280211.96	145221.58
EGS	63	185+98.01	25	280212.03	145222.57
EGS	64	186+60.47	20	280274.51	145217.81
EA	65	186+85.43	17	280299.48	145214.90

Code	Point	STA	Offset (R)	X	Y
EA	50	182+72.66	17	279886.84	145179.34
EGS	51	182+97.14	20	279911.33	145176.49
EA	52	183+60.13	24	279974.33	145173.72
EGS	53	183+60.13	25	279974.34	145171.72
EA	54	185+50.33	24	280164.54	145173.37
EA/EGS	55	185+60.12	25	280174.33	145172.15

CODE:  
 EA = EDGE OF ASPHALT  
 EGS = EDGE OF GRAVEL SHOULDER





Code	Point	STA	Offset (R)	X	Y	Radius
EA	100	477+38.36	17	305822.34	137161.67	
EGS	101	477+74.13	20	305858.04	137158.00	
EA	102	478+99.42	26	305983.20	137149.65	
EGS	103	478+99.42	27	305983.18	137148.65	
EA	104	480+90.00	26	306173.75	137146.08	
EGS/EA	105	480+99.42	27	306183.15	137144.91	
FLAG	106	480+99.42	24	306183.20	137147.91	50
FLAG	107	481+34.85	38.74	306218.35	137132.50	50
FLAG	108	480+99.42	24	306183.20	137147.91	50
FLAG	109	481+49.42	74.244	306232.25	137095.73	50
EGS/EA	110	481+46.42	74.23	306229.25	137096.80	
EGS	111	481+43.88	77.63	306226.65	137093.45	
EA	112	481+53.06	174.63	306241.89	136996.48	
EGS	113	481+50.37	117.91	306239.29	136993.13	
EA	114	481+79.73	121.11	306267.14	137050.68	
EGS	115	481+82.73	121.26	306270.14	137050.61	
EA	116	481+87.74	81.46	306274.10	137090.52	
EGS	117	481+90.73	81.61	306277.09	137090.45	
EGS/EA	118	481+91.24	71.63	306277.33	137100.45	
FLAG	119	481+88.24	71.48	306274.34	137100.52	50
FLAG	120	482+03.72	37.76	306288.92	137134.63	50
FLAG	121	482+38.17	24	306323.00	137149.31	50
EGS/EA	122	482+38.17	27	306323.08	137146.31	
EGS	123	482+43.39	29.24	306328.35	137144.19	
EA	124	483+04.72	17	306389.34	137158.05	
EGS	125	482+04.94	20	306389.64	137155.06	

CODE:  
EA = EDGE OF ASPHALT  
EGS = EDGE OF GRAVEL SHOULDER

Code	Point	STA	Offset (L)	X	Y
EA	200	477+46.31	15	305830.89	137193.47
EGS	201	477+45.95	20	305830.61	137198.08
EA	202	480+71.47	27	306156.14	137199.42
EGS	203	480+71.13	30	306155.93	137202.41
EA	204	481+35.66	27	306220.39	137198.15
EGS	205	481+39.68	30	306224.47	137201.20
EGS	206	482+16.62	30	306300.03	137202.65
EA	207	482+22.88	27	306306.36	137199.92
EA	208	483+22.94	27	306406.4	137202.57
EGS	209	483+22.86	30	306406.34	137205.52
EA	210	485+40.46	15	306624.13	137196.38
EGS	211	485+40.40	18	306623.99	137199.45

Estimate Of Quantities

8120-02-66 8120-02-76

Line	Item	Item Description	Unit	Total	Qty	Qty
0002	203.0100	Removing Small Pipe Culverts	EACH	1.000		1.000
0004	203.0220	Removing Structure (structure) 01. B-03-95	EACH	1.000		1.000
0006	204.0109.S	Removing Concrete Surface Partial Depth	SF	3,747.000		3,747.000
0008	204.0110	Removing Asphaltic Surface	SY	78.000		78.000
0010	204.0120	Removing Asphaltic Surface Milling	SY	27,660.000		27,660.000
0012	204.0150	Removing Curb & Gutter	LF	355.000		355.000
0014	204.0165	Removing Guardrail	LF	4,744.000		4,744.000
0016	206.2001	Excavation for Structures Culverts (structure) 01. B-03-95	EACH	1.000		1.000
0018	206.5001	Cofferdams (structure) 01. B-03-95	EACH	1.000		1.000
0020	208.1100	Select Borrow	CY	60.000		60.000
0022	208.1500.S	Temporary Lane Shift During Culvert Work	EACH	1.000		1.000
0024	210.2100	Backfill Structure Type B	CY	162.000		162.000
0026	211.0101	Prepare Foundation for Asphaltic Paving (project) 01. 8120-02-76	EACH	1.000		1.000
0028	211.0400	Prepare Foundation for Asphaltic Shoulders	STA	890.000	890.000	
0030	211.0700.S	Prepare Foundation for CIR Base Layer (project) 01. 8120-02-76	EACH	1.000		1.000
0032	211.0800.S	Base Repair for CIR Layer	CY	800.000		800.000
0034	213.0100	Finishing Roadway (project) 01. 8120-02-76	EACH	1.000		1.000
0036	305.0110	Base Aggregate Dense 3/4-Inch	TON	5,688.000		5,688.000
0038	305.0120	Base Aggregate Dense 1 1/4-Inch	TON	510.000		510.000
0040	305.0500	Shaping Shoulders	STA	945.000		945.000
0042	311.0115	Breaker Run	CY	16.000		16.000
0044	327.1000.S	CIR Asphaltic Base Layer	SY	162,902.000		162,902.000
0046	416.0610	Drilled Tie Bars	EACH	20.000		20.000
0048	455.0605	Tack Coat	GAL	25,822.000	2,742.000	23,080.000
0050	455.0770.S	Asphalt Stabilizing Agent	TON	753.000		753.000
0052	460.0105.S	HMA Percent Within Limits (PWL) Test Strip Volumetrics	EACH	1.000		1.000
0054	460.0110.S	HMA Percent Within Limits (PWL) Test Strip Density	EACH	3.000		3.000
0056	460.6645	HMA Pavement 5 MT 58-34 V	TON	28,436.000	2,720.000	25,716.000
0058	460.9000.S	Material Transfer Vehicle	EACH	1.000		1.000
0060	465.0105	Asphaltic Surface	TON	655.000		655.000
0062	465.0110	Asphaltic Surface Patching	TON	50.000		50.000
0064	465.0120	Asphaltic Surface Driveways and Field Entrances	TON	160.000		160.000
0066	465.0315	Asphaltic Flumes	SY	16.000		16.000
0068	465.0520	Asphaltic Rumble Strips, Shoulder	LF	75,312.000	75,312.000	
0070	465.0560	Asphaltic Rumble Strips, Centerline	LF	40,065.000		40,065.000
0072	504.0100	Concrete Masonry Culverts	CY	24.000		24.000
0074	505.0600	Bar Steel Reinforcement HS Coated Structures	LB	1,950.000		1,950.000
0076	511.1200	Temporary Shoring (structure) 01. B-03-95	SF	550.000		550.000
0078	516.0500	Rubberized Membrane Waterproofing	SY	15.000		15.000
0080	520.1024	Apron Endwalls for Culvert Pipe 24-Inch	EACH	4.000		4.000
0082	520.3624	Culvert Pipe Class III-B Non-metal 24-Inch	LF	64.000		64.000
0084	520.8700	Cleaning Culvert Pipes	EACH	1.000		1.000
0086	520.9700.S	Culvert Pipe Liners (size) 01. 24-Inch	LF	244.000		244.000
0088	520.9750.S	Cleaning Culvert Pipes for Liner Verification	EACH	2.000		2.000
0090	521.1235	Apron Endwalls for Pipe Arch Steel 35x24-Inch	EACH	1.000		1.000
0092	524.0624	Apron Endwalls for Culvert Pipe Salvaged 24-Inch	EACH	1.000		1.000
0094	601.0411	Concrete Curb & Gutter 30-Inch Type D	LF	249.000		249.000
0096	601.0557	Concrete Curb & Gutter 6-Inch Sloped 36-Inch Type D	LF	156.000		156.000
0098	606.0200	Riprap Medium	CY	25.000		25.000
0100	606.0300	Riprap Heavy	CY	93.000		93.000

Estimate Of Quantities

8120-02-66 8120-02-76

Line	Item	Item Description	Unit	Total	Qty	Qty
0102	614.0010	Barrier System Grading Shaping Finishing	EACH	12.000		12.000
0104	614.2300	MGS Guardrail 3	LF	3,037.000		3,037.000
0106	614.2350	MGS Guardrail Short Radius	LF	260.000		260.000
0108	614.2610	MGS Guardrail Terminal EAT	EACH	22.000		22.000
0110	614.2630	MGS Guardrail Short Radius Terminal	EACH	2.000		2.000
0112	618.0100	Maintenance and Repair of Haul Roads (project) 01. 8120-02-76	EACH	1.000		1.000
0114	619.1000	Mobilization	EACH	1.000	0.100	0.900
0116	624.0100	Water	MGAL	82.000		82.000
0118	625.0500	Salvaged Topsoil	SY	1,382.000		1,382.000
0120	628.1504	Silt Fence	LF	7,527.000		7,527.000
0122	628.1520	Silt Fence Maintenance	LF	7,527.000		7,527.000
0124	628.1905	Mobilizations Erosion Control	EACH	4.000		4.000
0126	628.1910	Mobilizations Emergency Erosion Control	EACH	2.000		2.000
0128	628.2004	Erosion Mat Class I Type B	SY	1,294.000		1,294.000
0130	628.2006	Erosion Mat Urban Class I Type A	SY	88.000		88.000
0132	628.7555	Culvert Pipe Checks	EACH	21.000		21.000
0134	629.0210	Fertilizer Type B	CWT	1.000		1.000
0136	630.0120	Seeding Mixture No. 20	LB	39.000		39.000
0138	630.0500	Seed Water	MGAL	33.000		33.000
0140	633.5200	Markers Culvert End	EACH	54.000		54.000
0142	638.2102	Moving Signs Type II	EACH	9.000		9.000
0144	642.5001	Field Office Type B	EACH	1.000	0.100	0.900
0146	643.0300	Traffic Control Drums	DAY	4,850.000		4,850.000
0148	643.0900	Traffic Control Signs	DAY	2,410.000		2,410.000
0150	643.3165	Temporary Marking Line Paint 6-Inch	LF	131,200.000		131,200.000
0152	643.3170	Temporary Marking Line Epoxy 6-Inch	LF	63,952.000		63,952.000
0154	643.5000	Traffic Control	EACH	1.000		1.000
0156	645.0120	Geotextile Type HR	SY	247.000		247.000
0158	646.2040	Marking Line Grooved Wet Ref Epoxy 6-Inch	LF	157,645.000		157,645.000
0160	646.4040	Marking Line Grooved Wet Ref Epoxy 10-Inch	LF	455.000		455.000
0162	646.6120	Marking Stop Line Epoxy 18-Inch	LF	30.000		30.000
0164	650.5500	Construction Staking Curb Gutter and Curb & Gutter	LF	405.000		405.000
0166	650.6000	Construction Staking Pipe Culverts	EACH	1.000		1.000
0168	650.6501	Construction Staking Structure Layout (structure) 01. B-03-95	EACH	1.000		1.000
0170	650.8000	Construction Staking Resurfacing Reference	LF	47,763.000		47,763.000
0172	650.9911	Construction Staking Supplemental Control (project) 01. 8120-02-76	EACH	1.000		1.000
0174	690.0150	Sawing Asphalt	LF	691.000		691.000
0176	690.0250	Sawing Concrete	LF	30.000		30.000
0178	715.0502	Incentive Strength Concrete Structures	DOL	500.000		500.000
0180	740.0440	Incentive IRI Ride	DOL	36,185.000		36,185.000
0182	ASP.1T0A	On-the-Job Training Apprentice at \$5.00/HR	HRS	1,500.000		1,500.000
0184	ASP.1T0G	On-the-Job Training Graduate at \$5.00/HR	HRS	990.000		990.000
0186	SPV.0055	Special 01. Incentive Density PWL HMA Pavement	DOL	18,233.000		18,233.000
0188	SPV.0055	Special 02. Incentive Air Voids HMA Pavement	DOL	25,336.000		25,336.000
0190	SPV.0055	Special 03. Incentive Density HMA Pavement Longitudinal Joints	DOL	50,390.000		50,390.000
0192	SPV.0060	Special 01. Ditch Cleaning	EACH	2.000		2.000
0194	SPV.0060	Special 02. Box Culvert Joint Repair C-3-31	EACH	2.000		2.000
0196	SPV.0060	Special 03. Box Culvert Joint Repair C-3-32	EACH	3.000		3.000
0198	SPV.0060	Special 04. Grading and Shaping Intersection	EACH	2.000		2.000
0200	SPV.0090	Special 01. Concrete Curb and Gutter Cure and Seal Treatment	LF	405.000		405.000

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HMA ACCEPTANCE TABLE -										
LOCATION	STATION			MIXTURE USE	UNDERLYING SURFACE	ASPHALT	TONS	THICKNESS	QUALITY MANAGEMENT PROGRAM TO BE USED FOR:	
						BID ITEM			MIXTURE ACCEPTANCE	DENSITY ACCEPTANCE
12 FOOT DRIVING LANE	3+72	to	43+67	LOWER LAYER	REMAINING MILLED ASPHALTIC CONCRETE PAVEMENT	460.6645 HMA 5 MT 58-34 V	746	1.5 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	PWL INCENTIVE DENSITY HMA PAVEMENT SPV.0055.01
12 FOOT DRIVING LANE	3+72	to	43+67	UPPER LAYER	1.5 IN HMA 5 MT 58-34 V	460.6645 HMA 5 MT 58-34 V	871	1.75 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	PWL INCENTIVE DENSITY HMA PAVEMENT SPV.0055.01
8-10 FOOT SHOULDERS	3+72	to	43+67	LOWER LAYER	REMAINING MILLED ASPHALTIC CONCRETE PAVEMENT SHLD	460.6645 HMA 5 MT 58-34 V	485	1.5 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	ACCEPTED BY DEPARTMENT TESTING, NOT ELIGIBLE FOR INCENTIVE
8-10 FOOT SHOULDERS	3+72	to	43+67	UPPER LAYER	1.5 IN HMA 5 MT 58-34 V	460.6645 HMA 5 MT 58-34 V	565	1.75 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	ACCEPTED BY DEPARTMENT TESTING, NOT ELIGIBLE FOR INCENTIVE
5 FOOT SHOULDERS	41+17	to	43+67	LOWER LAYER	3' MILLED ASPHALTIC CONCRETE PAVEMENT SHLD AND 2' AGGREGATE SHLD	460.6645 HMA 5 MT 58-34 V	25	1.5 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	ACCEPTED BY DEPARTMENT TESTING, NOT ELIGIBLE FOR INCENTIVE
5 FOOT SHOULDERS	41+17	to	43+67	UPPER LAYER	1.5 IN HMA 5 MT 58-34 V	460.6645 HMA 5 MT 58-34 V	29	1.75 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	ACCEPTED BY DEPARTMENT TESTING, NOT ELIGIBLE FOR INCENTIVE
12 FOOT DRIVING LANE	43+67	to	474+88	LOWER LAYER	CIR BASE	460.6645 HMA 5 MT 58-34 V	8096	1.25 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	PWL INCENTIVE DENSITY HMA PAVEMENT SPV.0055.01
12 FOOT DRIVING LANE	43+67	to	474+88	UPPER LAYER	1.25 IN HMA 5 MT 58-34 V	460.6645 HMA 5 MT 58-34 V	8096	1.25 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	PWL INCENTIVE DENSITY HMA PAVEMENT SPV.0055.01
5 FOOT SHOULDERS	43+67	to	474+88	LOWER LAYER	CIR BASE	460.6645 HMA 5 MT 58-34 V	3373	1.25 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	ACCEPTED BY DEPARTMENT TESTING, NOT ELIGIBLE FOR INCENTIVE
5 FOOT SHOULDERS	43+67	to	474+88	UPPER LAYER	1.25 IN HMA 5 MT 58-34 V	460.6645 HMA 5 MT 58-34 V	3373	1.25 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	ACCEPTED BY DEPARTMENT TESTING, NOT ELIGIBLE FOR INCENTIVE
12 FOOT DRIVING LANE	474+88	to	488+00	LOWER LAYER	REMAINING MILLED ASPHALTIC CONCRETE PAVEMENT	460.6645 HMA 5 MT 58-34 V	317	2.0 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	PWL INCENTIVE DENSITY HMA PAVEMENT SPV.0055.01
12 FOOT DRIVING LANE	474+88	to	488+00	UPPER LAYER	2.0 IN HMA 5 MT 58-34 V	460.6645 HMA 5 MT 58-34 V	317	2.0 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	PWL INCENTIVE DENSITY HMA PAVEMENT SPV.0055.01
SHOULDERS, RT TURN LANE, BY PASS LANE AND STH 25 INTERSECTION	474+88	to	488+00	LOWER LAYER	3' MILLED ASPHALTIC CONCRETE PAVEMENT SHLD AND 2' AGGREGATE SHLD	460.6645 HMA 5 MT 58-34 V	192	2.0 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	ACCEPTED BY DEPARTMENT TESTING, NOT ELIGIBLE FOR INCENTIVE
SHOULDERS, RT TURN LANE, BY PASS LANE AND STH 25 INTERSECTION	474+88	to	488+00	UPPER LAYER	2.0 IN HMA 5 MT 58-34 V	460.6645 HMA 5 MT 58-34 V	192	2.0 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	ACCEPTED BY DEPARTMENT TESTING, NOT ELIGIBLE FOR INCENTIVE
EB & WB RT TURN LANE AT 10TH ST WIDENED SHLD AT BEAM GUARD	181+11 182+00 182+00	to	187+90 187+70 451+20	Lower Layer	BASE AGGREGATE DENSE or REMAINING MILLED ASPHALTIC CONCRETE PAVEMENT	460.6645 HMA 5 MT 58-34 V	266	1.25 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	ACCEPTED BY DEPARTMENT TESTING, NOT ELIGIBLE FOR INCENTIVE
EB & WB RT TURN LANE AT 10TH ST WIDENED SHLD AT BEAM GUARD	181+11 182+00 182+00	to	187+90 187+70 451+20	Upper Layer	1.25 IN HMA 5 MT 58-34 V	460.6645 HMA 5 MT 58-34 V	310	1.25 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	ACCEPTED BY DEPARTMENT TESTING, NOT ELIGIBLE FOR INCENTIVE
SIDERoads	VARIOUS			Lower Layer	MILLED ASPHALTIC CONCRETE PAVEMENT	460.6645 HMA 5 MT 58-34 V	373	1 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	ACCEPTED BY DEPARTMENT TESTING, NOT ELIGIBLE FOR INCENTIVE
SIDERoads	VARIOUS			Upper Layer	1 IN HMA 5 MT 58-34 V	460.6645 HMA 5 MT 58-34 V	560	1.5 IN	PWL INCENTIVE AIR VOIDS HMA PAVEMENT SPV.0055.02	ACCEPTED BY DEPARTMENT TESTING, NOT ELIGIBLE FOR INCENTIVE
DRIVEWAYS	VARIOUS			Upper Layer	EXISTING ASPHALTIC DRIVEWAY	ASPHALTIC SURFACE DRIVEWAYS AND FIELD ENTRANCES	160	1.75 IN	ACCEPTED PER SS 465	ACCEPTED PER SS 465
CULVERT REPLACEMENTS, WEDGING AND LEVELING	VARIOUS			Lower Layer	VARIES	465.0105 ASPHALTIC SURFACE	615	VARIES	ACCEPTED PER SS 465	ACCEPTED PER SS 465
PATCHING	VARIOUS			Lower Layer	VARIES	ASPHALTIC SURFACE PATCHING	100	VARIES	ACCEPTED PER SS 465	ACCEPTED PER SS 465

PROJECT NO: 8120-02-66, 8120-02-76

HWY: STH 48

COUNTY: BARRON

MISCELLANEOUS QUANTITIES

SHEET:

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3

211.0400 PREPARE FOUNDATION FOR ASPHALTIC SHOULDERS				
CATEGORY	STATION	TO	STATION	LOCATION
0010	41+17	-	486+00	STH 48
				890
			8120-02-66	TOTAL 0010
				890

8120-02-66 HMA SUMMARY							
CATEGORY	STATION	TO	STATION	LOCATION	455.0605 TACK COAT GAL	460.6645 HMA PAVEMENT 5 MT 58-34 V TON	465.0520 ASPHALTIC RUMBLE STRIPS, SHOULDER LF
0010	41+47	-	477+38	STH 48	2,742	2,720	
0010	43+35	-	477+38	STH 48			75,312
			8120-02-66	TOTAL 0010	2,742	2,720	75,312

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619.1000 MOBILIZATION				
CATEGORY	STATION	TO	STATION	LOCATION
0010	41+17	-	486+00	STH 48
				0.10
			8120-02-66	TOTAL 0010
				0.10

642.5001 FIELD OFFICE TYPE B				
CATEGORY	STATION	TO	STATION	LOCATION
0010	41+17	-	486+00	STH 48
				0.10
			8120-02-66	TOTAL 0010
				0.10

				<b>PROJECT ITEMS</b>					
CATEGORY	STATION TO	STATION	LOCATION	213.0100.01 FINISHING ROADWAY (PROJECT) (01. 8120-02-76) EACH	618.0100.01 MAINTENANCE AND REPAIR OF HAUL ROADS (PROJECT) (01. 8120-02-76) EACH	619.1000 MOBILIZATION EACH	628.1905 MOBILIZATIONS EROSION CONTROL EACH	628.1910 MOBILIZATIONS EMERGENCY EROSION CONTROL EACH	642.5001 FIELD OFFICE TYPE B EACH
0010	3+72 -	488+00	STH 48	1	1	0.9	4	2	0.9
		8120-02-76	TOTAL 0010	1	1	0.9	4	2	0.9

<b>REMOVING SURFACE</b>										
CATEGORY	STATION TO	STATION	LOCATION	MILLING DEPTH (IN)	204.0109.S REMOVING CONCRETE SURFACE PARTIAL DEPTH SF	204.0110 REMOVING ASPHALTIC SURFACE SY	204.0120 REMOVING ASPHALTIC SURFACE MILLING SY	690.0150 SAWING ASPHALT LF	690.0250 SAWING CONCRETE LF	REMARKS
0010	3+72		BEGIN PROJECT							BEGIN PROJECT CONSTRUCTION JOINT
0010	3+72 -	16+82	STH 48	2.50			5,823	44		MAINLINE PAVEMENT
0010	3+72 -	8+69	LT	1.75	1,243					GUTTER PAN
0010	3+72 -	11+24	RT	1.75	1,880					GUTTER PAN
0010	3+75 -	4+37	STH 48 RT	1.75	155	14		65	6	CURB & GUTTER REPLACEMENT
0010	5+11 -	6+16	STH 48 RT	1.75	263	23		108	6	CURB & GUTTER REPLACEMENT
0010	7+61 -	7+86	STH 48 RT	1.75	63	6		28	6	CURB & GUTTER REPLACEMENT
0010	8+56 -	8+71	STH 48 RT	1.75	38	3		18	6	CURB & GUTTER REPLACEMENT
0010	9+14 -	9+56	STH 48 RT	1.75	105	9		45	6	CURB & GUTTER REPLACEMENT
0010	16+82		BEGIN EXCEPTION TO CL					40		CONSTRUCTION JOINT
0010	23+47		END EXCEPTION TO CL					40		CONSTRUCTION JOINT
0010	23+47 -	41+17	STH 48	2.50			8,067			MAINLINE PAVEMENT
0010	41+17 -	43+67	STH 48	VAR. 0.75 TO 2.5			945			TRANSITION TO 2.5" GRADE RAISE, CIR
0010	138+62 -		STH 48					60		REMOVING SMALL PIPE CULVERTS
0010	480+97 -	481+53	STH 48 RT			12		160		STH 25 INTERSECTION
0010	481+92 -	482+42	STH 48 RT			11		53		STH 25 INTERSECTION
0010	474+88 -	477+38	STH 48	VAR. 1.5 TO 4			867			TRANSITION TO 4" MILL
0010	477+38 -	488+00	STH 48	4.00			5,182			MAINLINE, TURNLANE, PASS LANE & STH 25
0010	488+00		END PROJECT					30		END PROJECT CONSTRUCTION JOINT
0010	7+78 -	8+69	SIDE ROAD LT	1.25			112			BABCOCK AVE.
0010			SIDE ROADS	1.25			6,664			BUTT JOINTS
	8120-02-76		TOTAL 0010		3,747	78	27,660	691	30	

**BASE AGGREGATE DENSE SUMMARY**

CATEGORY	STATION	TO	STATION	LOCATION	208.1100 SELECT BORROW CY	305.0110 BASE AGGREGATE DENSE 3/4-INCH TON	305.0120 BASE AGGREGATE DENSE 1 1/4-INCH TON	624.0100 WATER MGAL	REMARKS
0010	40+57	-	488+00	STH 48 LT		2,500		38	SHOULDERS
0010	40+57	-	488+00	STH 48 RT		2,500		38	SHOULDERS
0010	477+38	-	488+00	STH 48	60	338	260	6	TURN LANE, BY PASS LANE & STH 25
0010				DRIVEWAYS/SIDEROADS		350			
0010				CURB & GUTTER REPLACEMENT			100		
0010				CULVERTS			150		
			8120-02-76	TOTAL 0010	60	5,688	510	82	

\* GRADE 2

305.0500  
SHAPING  
SHOULDERS

CATEGORY	STATION	TO	STATION	LOCATION	STA	REMARKS
0010	8+69	-	16+82	LT	9	FROM END OF C&G SEGMENT TO EXCEPTION TO NET CL LENGTH
0010	11+24	-	16+82	RT	6	FROM END OF C&G SEGMENT TO EXCEPTION TO NET CL LENGTH
0010	23+47	-	488+00	LT	465	
0010	23+47	-	488+00	RT	465	
	8120-02-76			TOTAL 0010	945	

**CIR PAVEMENT**

CATEGORY	STATION	TO	STATION	LOCATION	211.0700.S.01 PREPARE FOUNDATION FOR CIR BASE LAYER (PROJECT) (01. 8120-02-76) EACH	211.0800.S BASE REPAIR FOR CIR LAYER CY	327.1000.S CIR ASPHALTIC BASE LAYER SY	455.0770.S ASPHALT STABILIZING AGENT TON
0010	43+67	-	474+88	STH 48	1	800	162,902	753
				TOTAL 0010	1	800	162,902	753

460.0105.S  
HMA PERCENT  
WITHIN LIMITS  
(PWL) TEST STRIP  
VOLUMETRICS  
EACH

460.0110.S  
HMA PERCENT  
WITHIN LIMITS  
(PWL) TEST STRIP  
DENSITY  
EACH

CATEGORY	STATION	TO	STATION	LOCATION	460.0105.S EACH	460.0110.S EACH
0010	3+72	-	16+82	STH 48	1	3
				TOTAL 0010	1	3





3

3

**CURB AND GUTTER**

CATEGORY	STATION	TO	STATION	LOCATION	SIDE	204.0150		416.0610		601.0411		601.0557		650.5500		SPV.0090.01 SPECIAL (01. CONCRETE CURB AND GUTTER, CURE AND SEAL TREATMENT)		
						REMOVING CURB & GUTTER LF	DRILLED TIE BARS EACH	CONCRETE CURB & GUTTER 30- INCH TYPE D LF	CONCRETE CURB & GUTTER 6-INCH SLOPED 36-INCH TYPE D LF	CONSTRUCTION STAKING CURB GUTTER AND CURB & GUTTER LF	CONCRETE CURB AND GUTTER, CURE AND SEAL TREATMENT) LF							
0010	3+75	-	4+37	STH 48	RT	62	4	62		62		62		62				
0010	5+11	-	6+16	STH 48	RT	105	4	105		105		105		105				
0010	7+61	-	7+86	STH 48	RT	25	4	25		25		25		25				
0010	8+56	-	8+71	STH 48	RT	15	4	15		15		15		15				
0010	9+14	-	9+56	STH 48	RT	42	4	42		42		42		42				
0010	480+97	-	481+53	STH 48/STH 25	RT	56				79		79		79				
0010	481+92	-	482+42	STH 48/STH 25	RT	50				77		77		77				
8120-02-76																		
						355	20	249	156	405		405						

**RIPRAP & GEOTEXTILE SUMMARY**

CATEGORY	STATION	LOCATION	#		REMARKS
			606.0200 RIPRAP MEDIUM CY	645.0120 GEOTEXTILE TYPE HR SY	
0010	70+77	STH 48	3	15	APPROXIMATE SIZE 6'X12'
0010	94+53	STH 48	3	15	APPROXIMATE SIZE 6'X12'
0010	102+44	STH 48	3	15	APPROXIMATE SIZE 6'X12'
0010	185+78	STH 48	6	25	APPROXIMATE SIZE 7'X15'
0010	235+08	STH 48	3	15	APPROXIMATE SIZE 6'X12'
0010	366+86	STH 48	3	15	APPROXIMATE SIZE 6'X12'
0010	399+39	STH 48	4	20	APPROXIMATE SIZE 6'X13'
TOTAL 0010			25	120	

# SHOWN ELSEWHERE IN PLANS (STRUCTURE PLAN)

**GUARDRAIL SUMMARY**

CATEGORY	STATION	TO	STATION	LOCATION	204.0165		614.0010		614.2300		614.2350		614.2610		614.2630		*	*	*	*	*
					REMOVING GUARDRAIL LF	SHAPING FINISHING EACH	BARRIER SYSTEM GRADING MGS GUARDRAIL 3 LF	MGS SHORT RADIUS LF	MGS GUARDRAIL EAT EACH	MGS GUARDRAIL SHORT RADIUS EACH	SALVAGED TOPSOIL & EMAT CLASS I TYPE B SY	FERTILIZER TYPE B LB	SEED #20 LB	STAKING EACH							
0010	57+07	-	60+53	STH 48 RT	355	1	338				2			228	1027	65	28	1			
0010	56+88	-	61+63	STH 48 LT	355	1	362				2			269	933	59	26	1			
0010	114+12	-	117+99	STH 48 RT	380	1	275				2			99	748	48	21	1			
0010	115+21	-	118+09	STH 48 LT	255	1	175				2			118	601	38	17	1			
0010	182+50	-	185+55	STH 48 RT	305																
0010	184+05	-	187+48	STH 48 LT	343																
0010	268+96	-	272+33	STH 48 RT	330	1	225				2			246	1057	67	29	1			
0010	270+72	-	273+34	STH 48 LT	180	1	150				2			175	681	43	19	1			
0010	338+56	-	339+62	STH 48 LT	138	1				120	1	1		61	272	18	8	1			
0010	339+93	-	345+55	STH 48 LT	612	1	425			140	1	1		180	720	46	20	1			
0010	443+53	-	450+01	STH 48 RT	649	1	538				2			253	1300	82	36	1			
0010	445+98	-	450+83	STH 48 LT	482	1	375				2			669	2251	142	61	1			
0010	465+58	-	467+58	STH 48 RT	180	1	88				2			95	533	34	15	1			
0010	466+48	-	468+48	STH 48 LT	180	1	88				2			169	704	45	20	1			
8120-02-76																					
					4,744	12	3,037	260	22	2											

\* FOR INFORMATION ONLY AND INCIDENTAL TO BID ITEM 614.0010

SOIL TO SEED SUMMARY

CATEGORY	STATION TO	STATION	LOCATION	625.0500 SALVAGED TOPSOIL SY	628.2004 EROSION MAT CLASS I TYPE B SY	628.2006 EROSION MAT URBAN CLASS I TYPE A SY	629.0210 FERTILIZER TYPE B CWT	630.0120 SEEDING MIXTURE NO. 20 LB	630.0500 SEED WATER MGAL	REMARKS
0010	3+75 -	4+37	RT	22		22	0.02	0.6	0.5	CURB & GUTTER REPLACEMENT
0010	5+11 -	6+16	RT	36		36	0.03	1.0	0.9	CURB & GUTTER REPLACEMENT
0010	7+61 -	7+86	RT	9		9	0.01	0.3	0.3	CURB & GUTTER REPLACEMENT
0010	8+56 -	8+71	RT	6		6	0.01	0.2	0.2	CURB & GUTTER REPLACEMENT
0010	9+14 -	9+56	RT	15		15	0.01	0.5	0.4	CURB & GUTTER REPLACEMENT
0010	182+50 -	185+55	STH 48 RT	450	450		0.29	13.0	10.2	
0010	184+05 -	187+48	STH 48 LT	620	620		0.40	17.0	14.0	
0010	480+97 -	481+53	STH 48 & STH 25	20	20		0.02	0.6	0.5	
0010	481+92 -	482+42	STH 48 & STH 25	18	18		0.02	0.5	0.5	
0010	138+62		STH 48	40	40		0.03	1.1	0.9	REMOVING SMALL PIPE CULVERTS
0010	102+44		STH 48	10	10		0.01	0.3	0.3	
0010	170+21		STH 48	10	10		0.01	0.3	0.3	
0010	194+66		STH 48	10	10		0.01	0.3	0.3	
0010	217+53		STH 48	10	10		0.01	0.3	0.3	
0010	235+08		STH 48	10	10		0.01	0.3	0.3	
0010	366+86		STH 48	10	10		0.01	0.3	0.3	
0010	386+84		STH 48	60	60		0.04	1.7	1.4	
0010	7+72 -	9+25	STH 25	25	25		0.02	0.7	0.6	WIDENING, CURB & GUTTER
8120-02-76 TOTAL 0010				1,382	1,294	88	1.0	39.0	33	

CATEGORY	STATION	LOCATION	633.5200 MARKERS CULVERT END EACH
0010	39+60	STH 48	2
0010	69+69	STH 48	2
0010	70+77	STH 48	2
0010	94+53	STH 48	2
0010	102+44	STH 48	2
0010	113+06	STH 48	2
0010	116+66	STH 48	2
0010	138+62	STH 48	2
0010	153+90	STH 48	2
0010	170+14	STH 48	2
0010	185+78	STH 48	2
0010	194+66	STH 48	2
0010	217+53	STH 48	2
0010	235+08	STH 48	2
0010	284+57	STH 48	2
0010	325+07	STH 48	2
0010	341+22	STH 48	2
0010	344+82	STH 48	2
0010	366+86	STH 48	2
0010	379+68	STH 48	2
0010	382+12	STH 48	2
0010	386+44	STH 48	2
0010	399+39	STH 48	2
0010	416+78	STH 48	2
0010	421+36	STH 48	2
0010	448+63	STH 48	2
0010	471+02	STH 48	2
8120-02-76 TOTAL 0010			54

SILT FENCE

CATEGORY	STATION TO	STATION	LOCATION	628.1504 SILT FENCE LF	628.1520 SILT FENCE MAINTENANCE LF	REMARKS
0010	55+75 -	62+01	LT	626	626	SMALL ANIMAL TURN AROUND
0010	55+80 -	62+82	RT	702	702	SMALL ANIMAL TURN AROUND
0010	112+83 -	119+24	RT	641	641	
0010	114+49 -	119+39	LT	490	490	
0010	182+53	185+66	LT	313	313	
0010	183+91	186+93	RT	302	302	
0010	267+67 -	273+11	RT	544	544	SMALL ANIMAL TURN AROUND
0010	269+48 -	274+63	LT	515	515	SMALL ANIMAL TURN AROUND
0010	337+24	339+58	LT	234	234	
0010	339+98	346+86	LT	688	688	
0010	442+24 -	450+19	LT	795	795	
0010	444+68 -	452+14	RT	746	746	
0010	464+28 -	468+93	RT	465	465	
0010	465+11 -	469+77	LT	466	466	
8120-02-76 TOTAL 0010				7,527	7,527	

CATEGORY	STATION	LOCATION	638.2102 MOVING SIGNS TYPE II EACH	REMARKS
0010	60+67	STH 48	1	RIGHT
0010	86+73	STH 48	1	LEFT
0010	270+61	STH 48	1	RIGHT
0010	271+03	STH 48	1	LEFT
0010	339+59	STH 48	1	LEFT
0010	446+23	STH 48	1	LEFT
0010	468+68	STH 48	1	RIGHT
0010	481+30	STH 48	1	RIGHT
0010	481+44	STH 48	1	RIGHT
TOTAL 0010			9	

**TRAFFIC CONTROL SUMMARY**

CATEGORY	STATION TO	STATION	LOCATION	DAY	DAY	EACH	REMARKS
0010	3+72 -	488+00	STH 48	2,100	1,760	1	
0010			STH 48	1,000	250		CURB AND GUTTER REPLACEMENT
0010			STH 48	500	100		STRUCUTRE WORK
0010			STH 48	750	200		BEAM GUARD
0010			STH 48	500	100		CULVERT WORK
	8120-02-76	TOTAL 0010		4,850	2,410	1	

**PAVEMENT MARKING SUMMARY**

CATEGORY	STATION TO	STATION	LOCATION	LF	LF	LF	LF	LF	REMARKS
0010	3+72 -	16+82	STH 48		1,495				CENTERLINE
0010	8+58 -	16+82	STH 48			1,648			EDGELINE
0010	23+47 -	488+00	STH 48			92,906			EDGELINE
0010	23+47 -	488+00	STH 48		62,457				CENTERLINE (PRE RUMBLES)
0010	23+47 -	488+00	STH 48			62,457			CENTERLINE (POST RUMBLES)
0010	3+72 -	488+00	STH 48	65,600					CIR LAYER, CENTERLINE
0010	3+72 -	488+00	STH 48	65,600					LOWER LIFT, CENTERLINE
0010	184+17 -	185+33	STH 48 & 10TH ST				116		TURN LANE
0010	184+32 -	185+47	STH 48 & 10TH ST				115		TURN LANE
0010	478+91 -	481+15	STH 48 & STH 25				224		TURN LANE
0010	7+31 -	9+26	STH 25			244			CENTERLINE
0010	7+31 -	9+26	STH 25			390			EDGELINE
0010	9+15		STH 25					30	
	8120-02-76	TOTAL 0010		131,200	63,952	157,645	455	30	

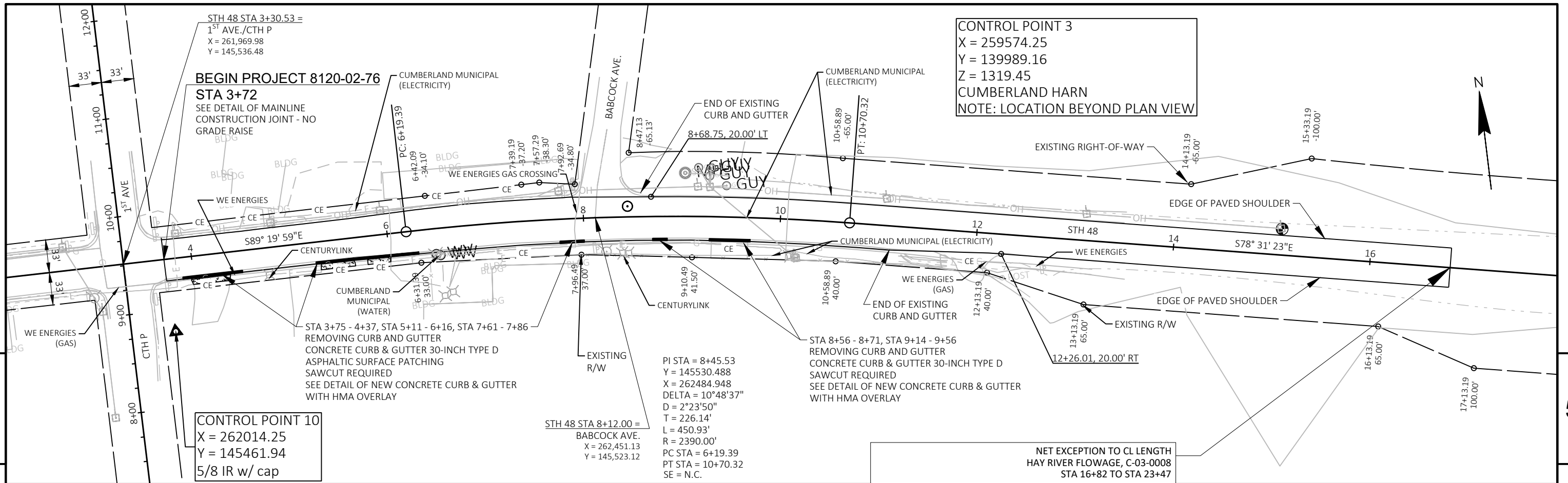
**CONSTRUCTION STAKING SUMMARY**

CATEGORY	STATION TO	STATION	LOCATION	LF	LF	REMARKS
0010	3+72 -	488+00	STH 48			
0010	3+72 -	16+82	STH 48	1,310		
0010	23+47 -	488+00	STH 48	46,453		
	8120-02-76	TOTAL 0010		47,763		

CATEGORY	STATION TO	STATION	LOCATION	EACH	BORROW CY	COMMON CY	REMARKS
0010	183+00 -	187+00	STH 48	1	215		10 ST INTERSECTION, NORTH AND SOUTH
0010	478+00 -	486+00	STH 48	1		110	STH 25/15TH INTERSECTION
	8120-02-76	TOTAL 0010		2			

\* FOR INFORMATION ONLY AND INCIDENTAL TO BID ITEM SPV.0060.03



STH 48 STA 3+30.53 =  
1<sup>ST</sup> AVE./CTH P  
X = 261,969.98  
Y = 145,536.48

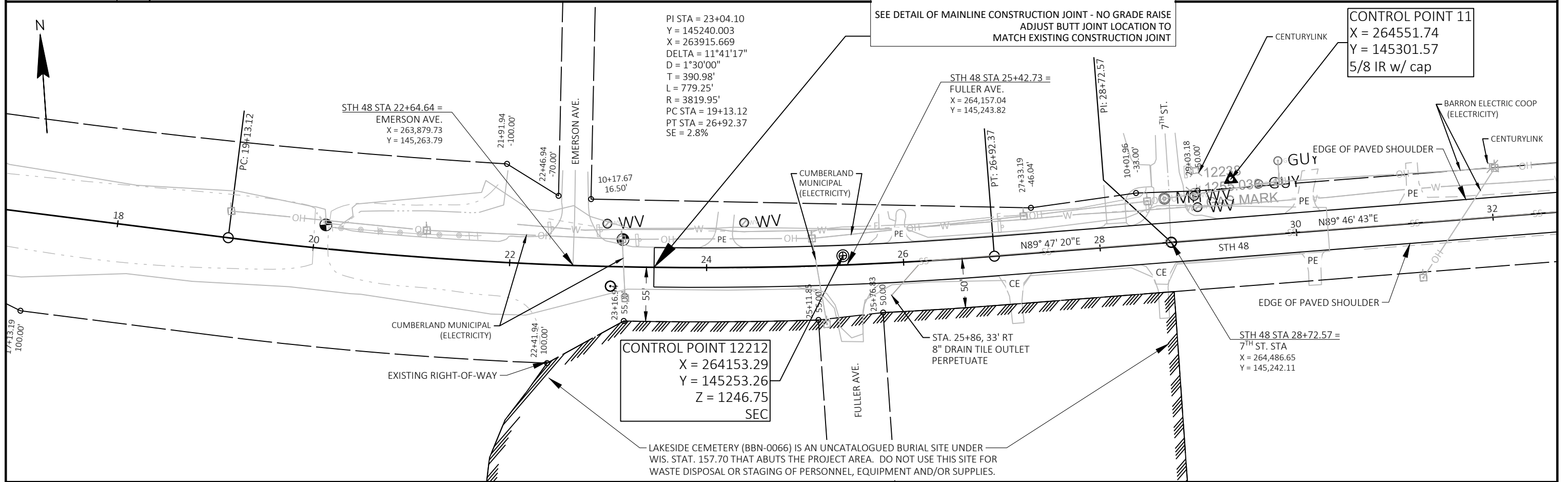
**BEGIN PROJECT 8120-02-76**  
**STA 3+72**  
SEE DETAIL OF MAINLINE  
CONSTRUCTION JOINT - NO  
GRADE RAISE

**CONTROL POINT 3**  
X = 259574.25  
Y = 139989.16  
Z = 1319.45  
CUMBERLAND HARN  
NOTE: LOCATION BEYOND PLAN VIEW

**CONTROL POINT 10**  
X = 262014.25  
Y = 145461.94  
5/8 IR w/ cap

PI STA = 8+45.53  
Y = 145530.488  
X = 262484.948  
DELTA = 10°48'37"  
D = 2°23'50"  
T = 226.14'  
L = 450.93'  
R = 2390.00'  
PC STA = 6+19.39  
PT STA = 10+70.32  
SE = N.C.

NET EXCEPTION TO CL LENGTH  
HAY RIVER FLOWAGE, C-03-0008  
STA 16+82 TO STA 23+47  
SEE DETAIL OF MAINLINE CONSTRUCTION JOINT - NO GRADE RAISE  
ADJUST BUTT JOINT LOCATION TO  
MATCH EXISTING CONSTRUCTION JOINT



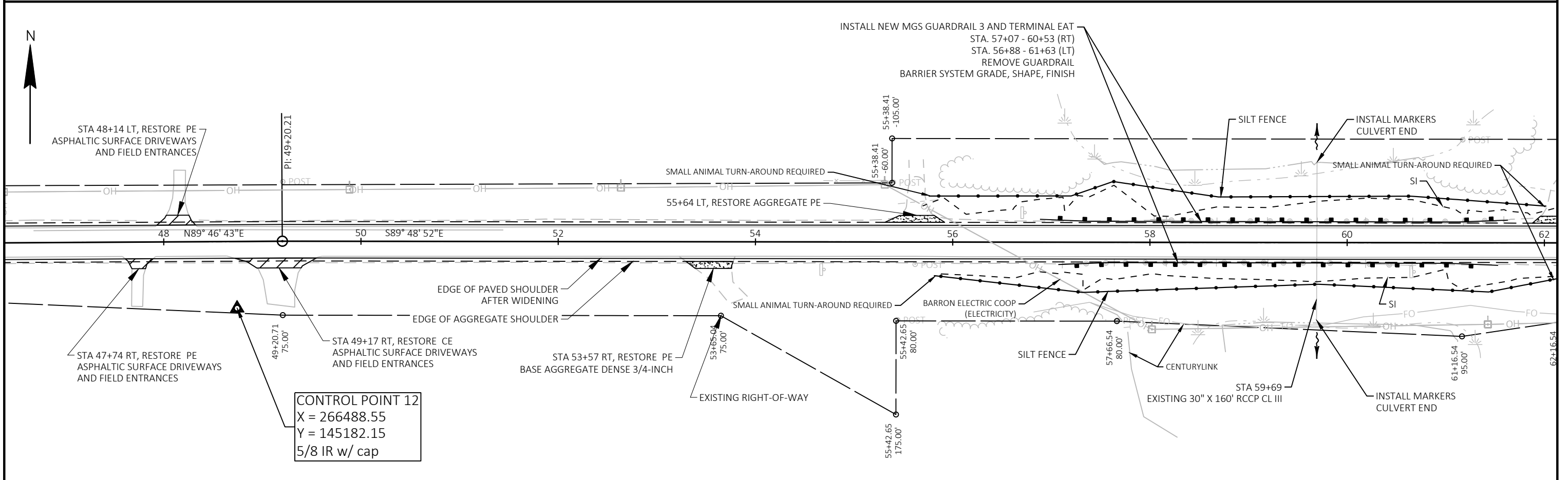
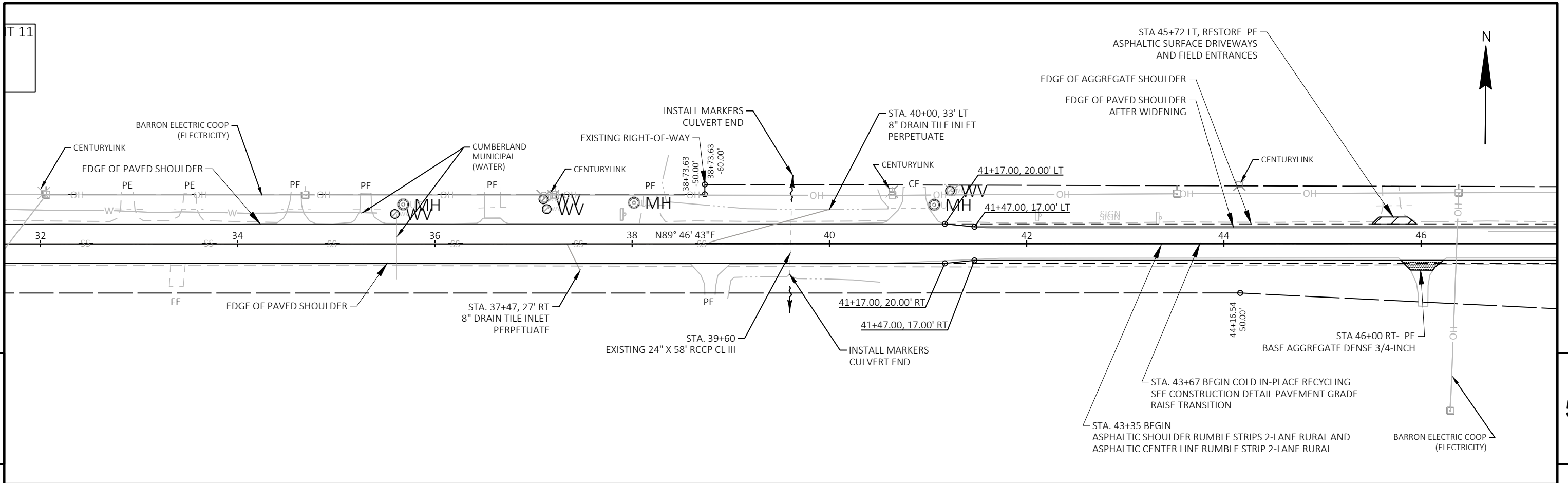
PI STA = 23+04.10  
Y = 145240.003  
X = 263915.669  
DELTA = 11°41'17"  
D = 1°30'00"  
T = 390.98'  
L = 779.25'  
R = 3819.95'  
PC STA = 19+13.12  
PT STA = 26+92.37  
SE = 2.8%

**CONTROL POINT 11**  
X = 264551.74  
Y = 145301.57  
5/8 IR w/ cap

**CONTROL POINT 12212**  
X = 264153.29  
Y = 145253.26  
Z = 1246.75  
SEC

LAKESIDE CEMETERY (BBN-0066) IS AN UNCATALOGUED BURIAL SITE UNDER WIS. STAT. 157.70 THAT ABUTS THE PROJECT AREA. DO NOT USE THIS SITE FOR WASTE DISPOSAL OR STAGING OF PERSONNEL, EQUIPMENT AND/OR SUPPLIES.

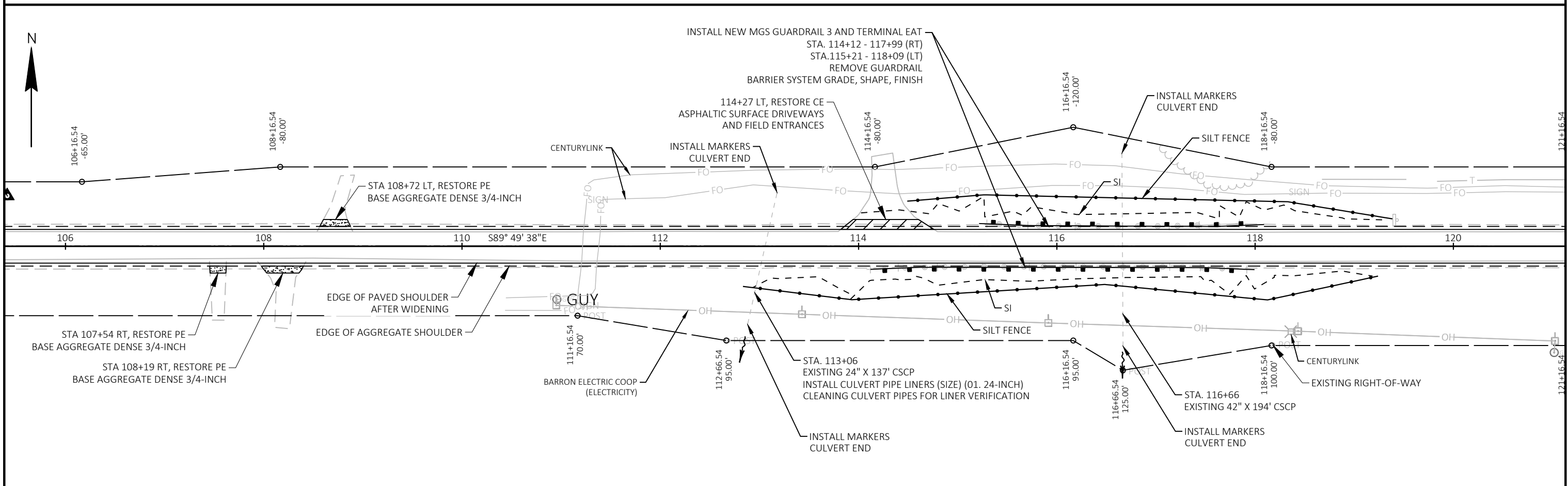
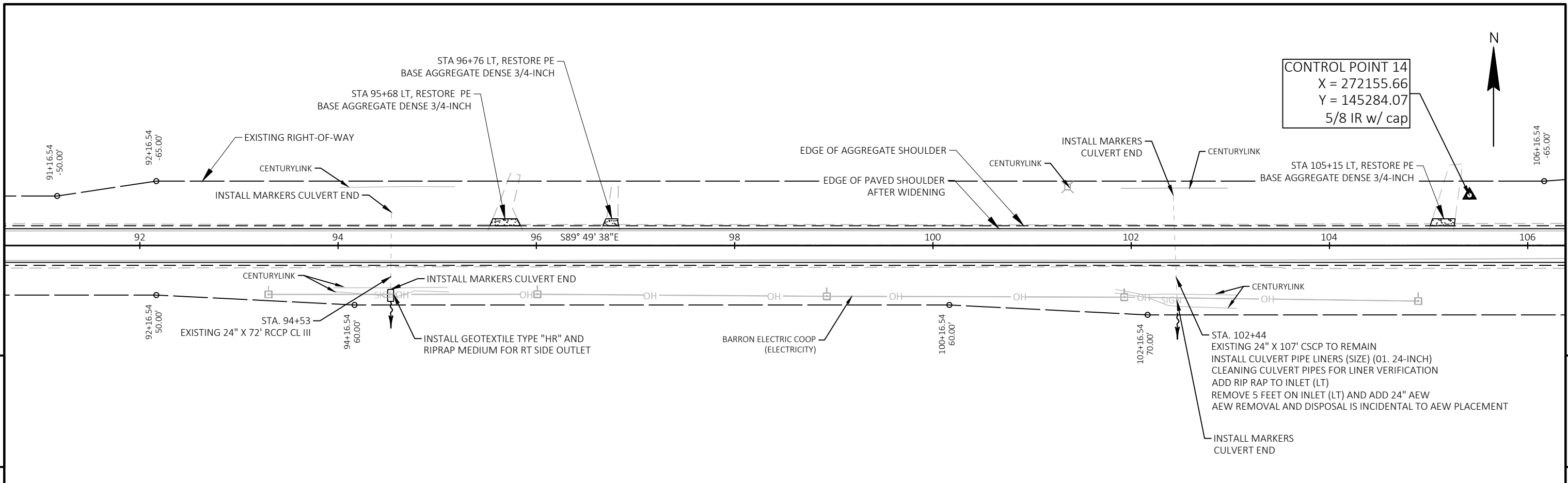
PROJECT NO: 8120-02-66 & 8120-02-76	HWY: STH 48	COUNTY: BARRON	PLAN	SHEET	E
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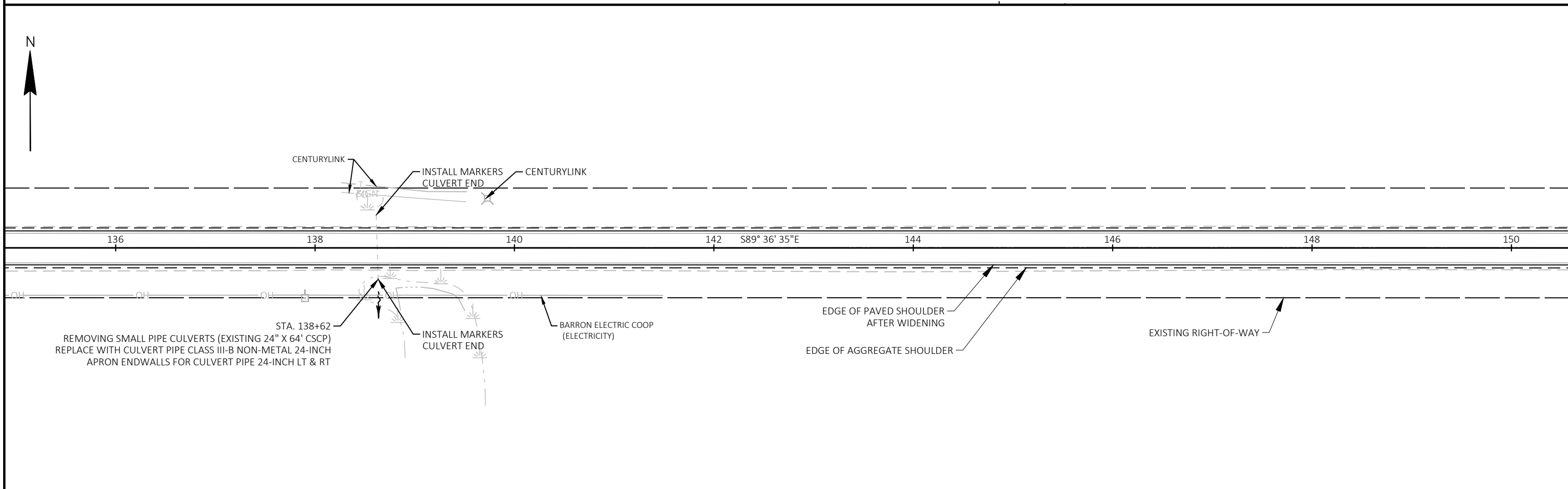
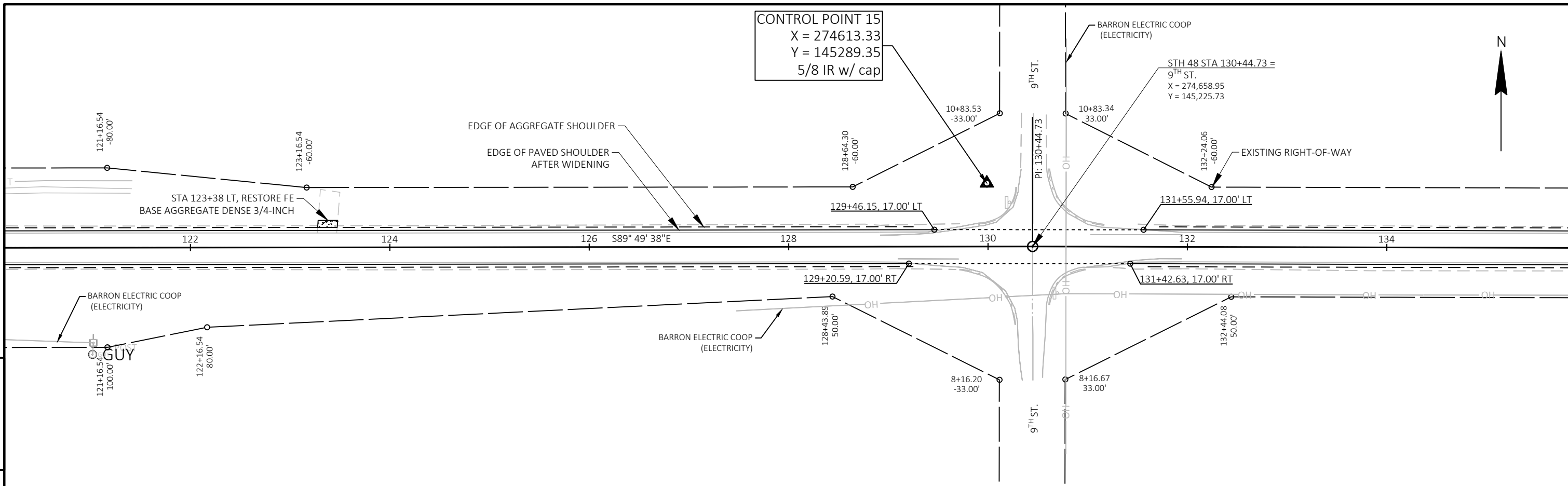
CONTROL POINT 12  
 X = 266488.55  
 Y = 145182.15  
 5/8 IR w/ cap

PROJECT NO: 8120-02-66 & 8120-02-76	HWY: STH 48	COUNTY: BARRON	PLAN	SHEET	E
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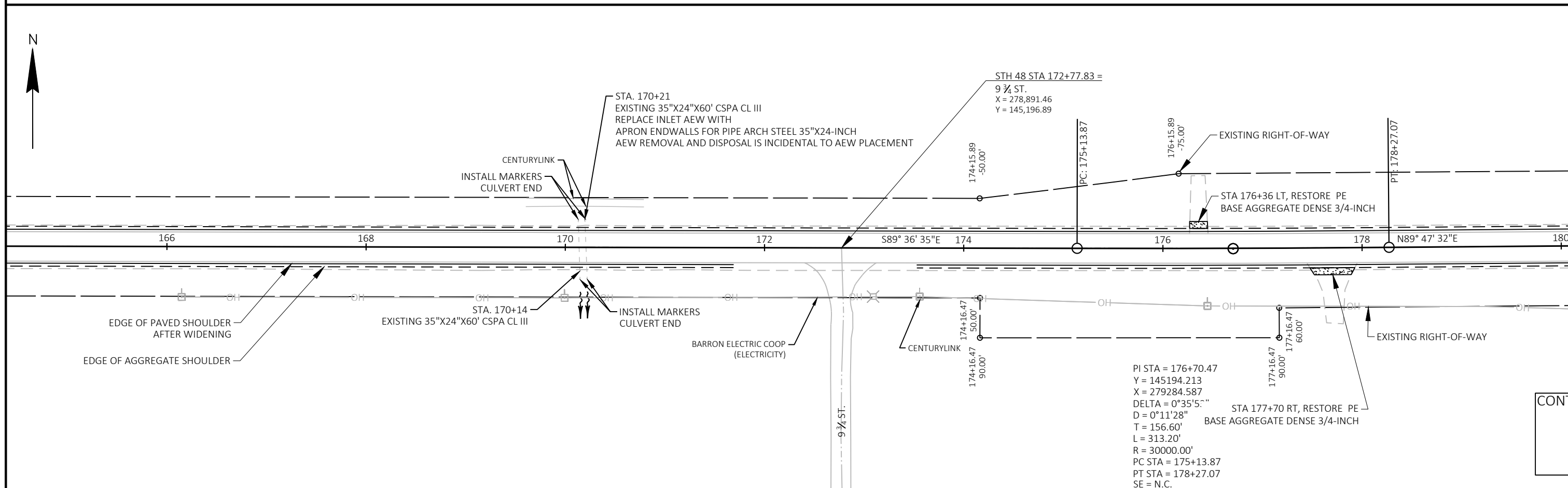
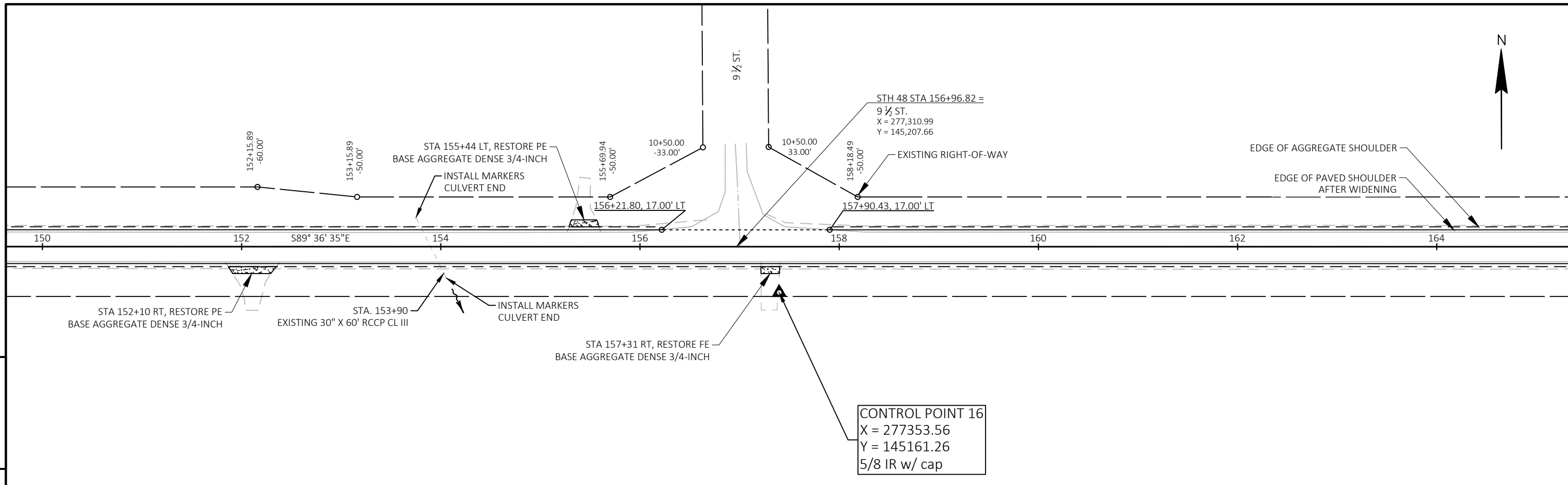


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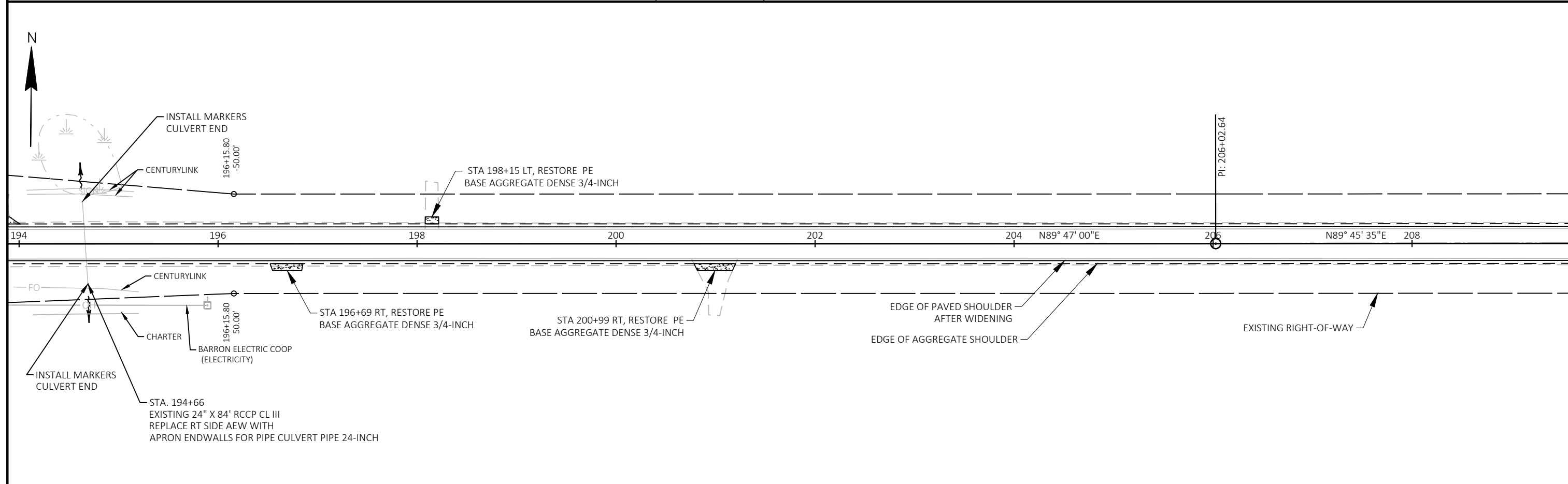
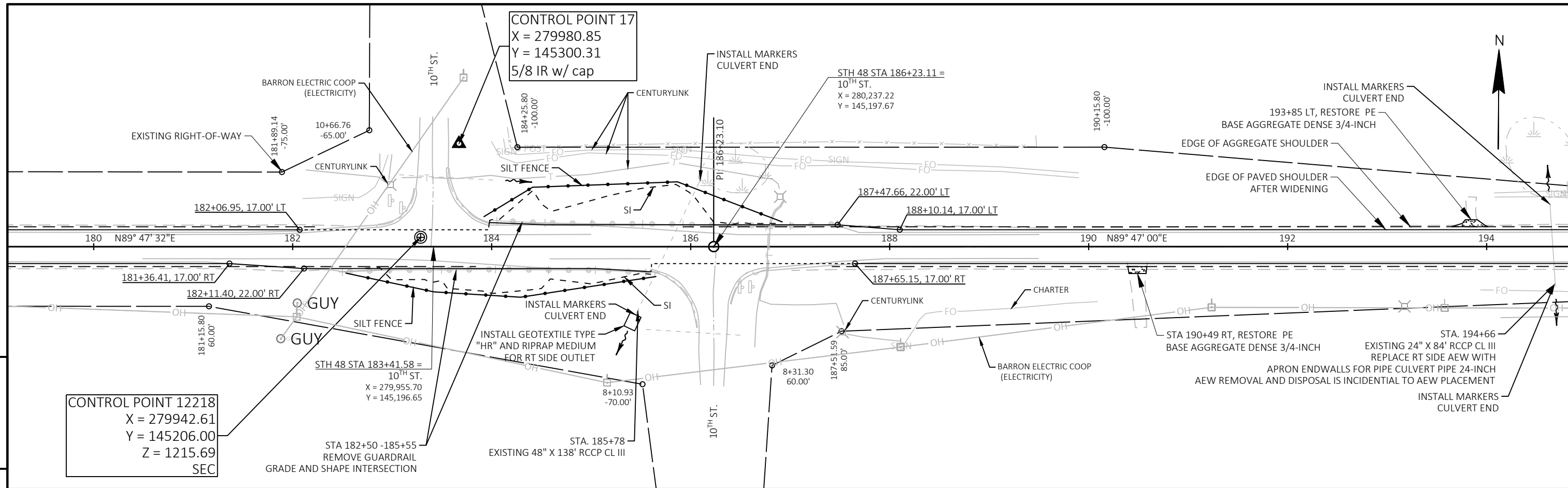


PROJECT NO: 8120-02-66 & 8120-02-76	HWY: STH 48	COUNTY: BARRON	PLAN	SHEET	E
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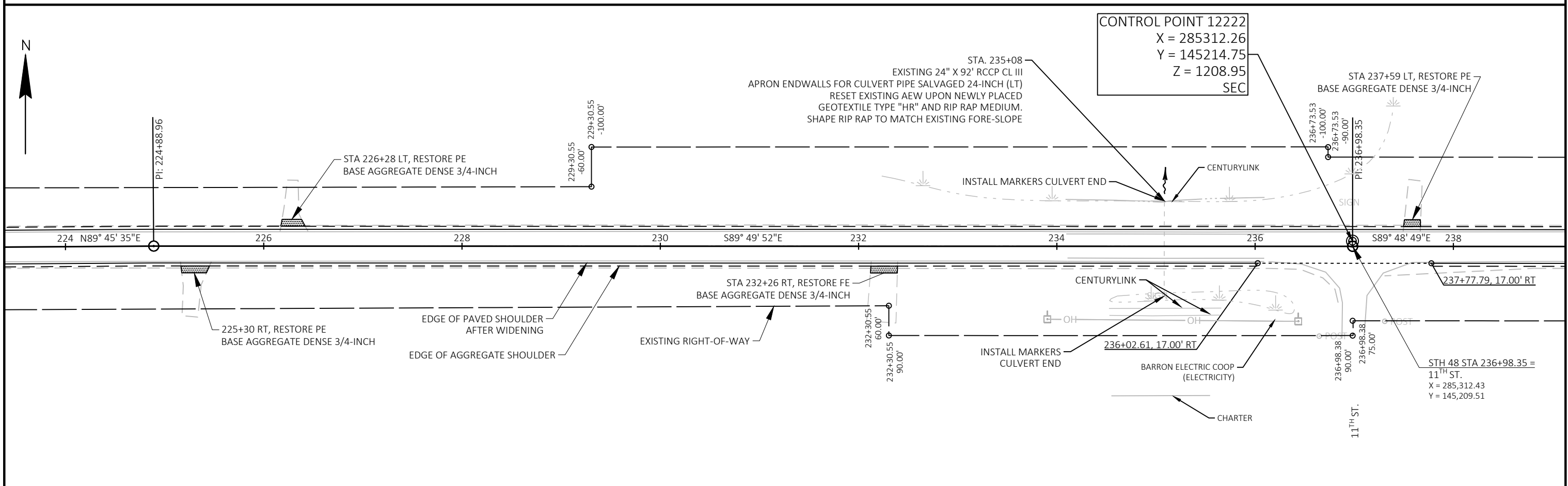
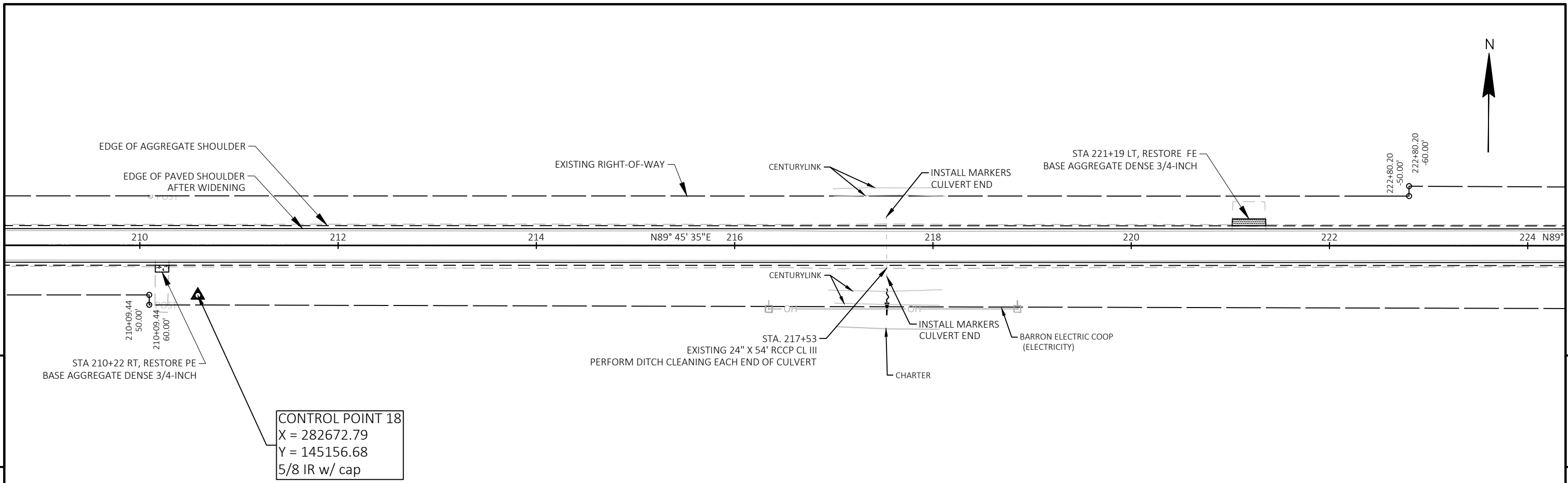




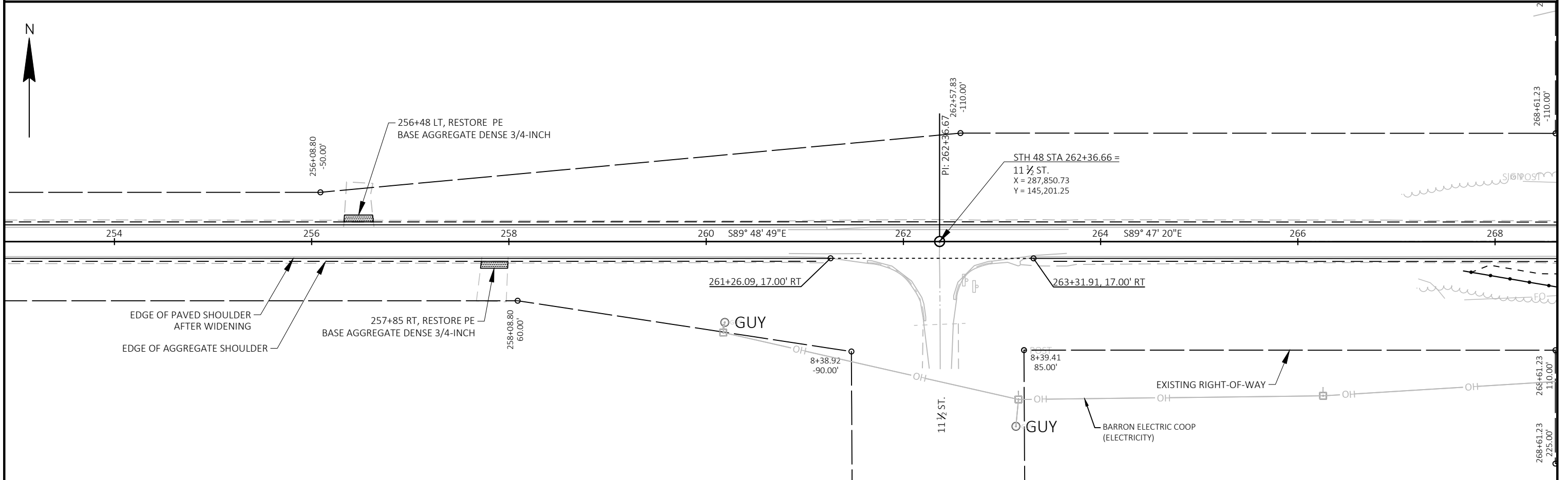
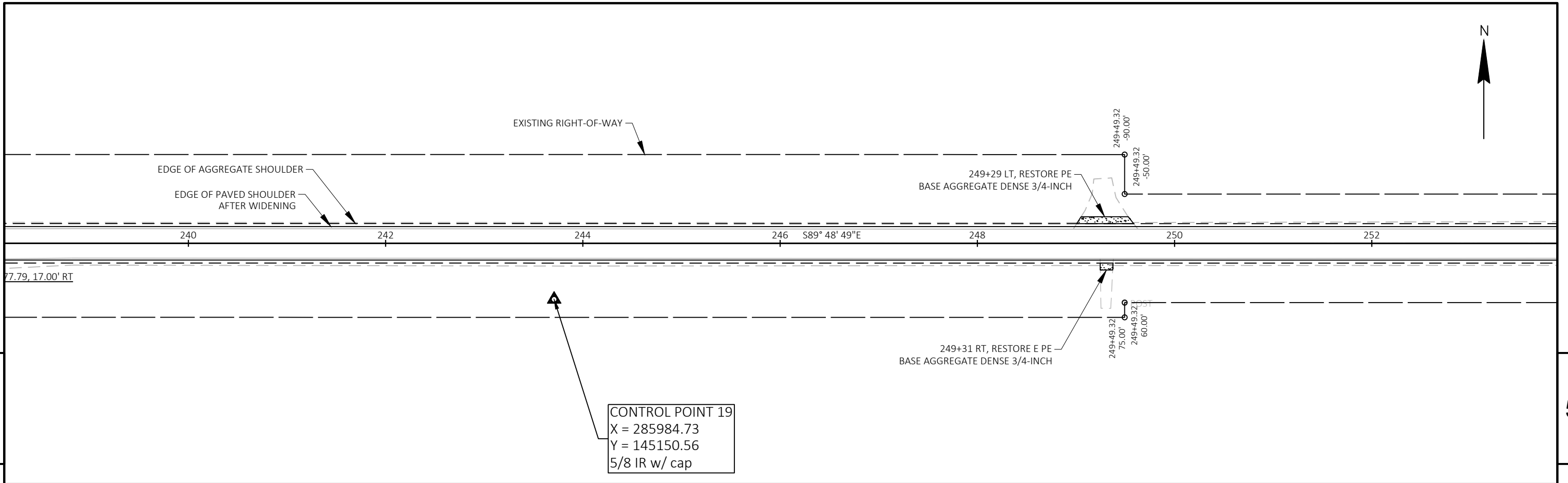
PROJECT NO: 8120-02-66 & 8120-02-76	HWY: STH 48	COUNTY: BARRON	PLAN	SHEET	E
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PROJECT NO: 8120-02-66 & 8120-02-76	HWY: STH 48	COUNTY: BARRON	PLAN	SHEET	E
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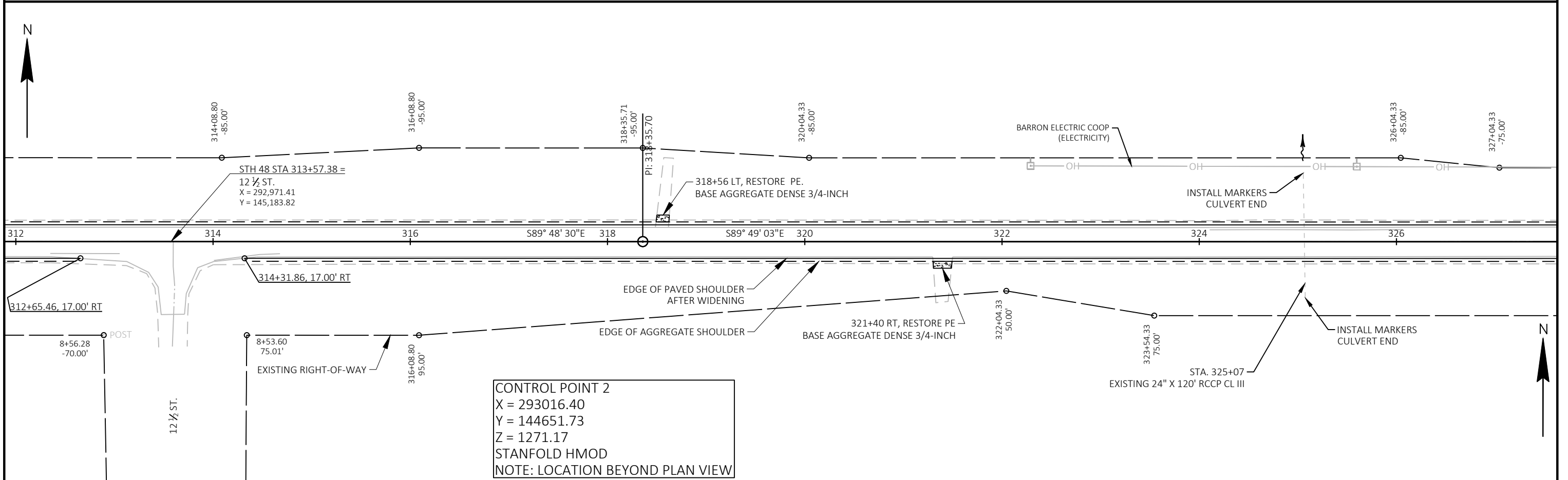
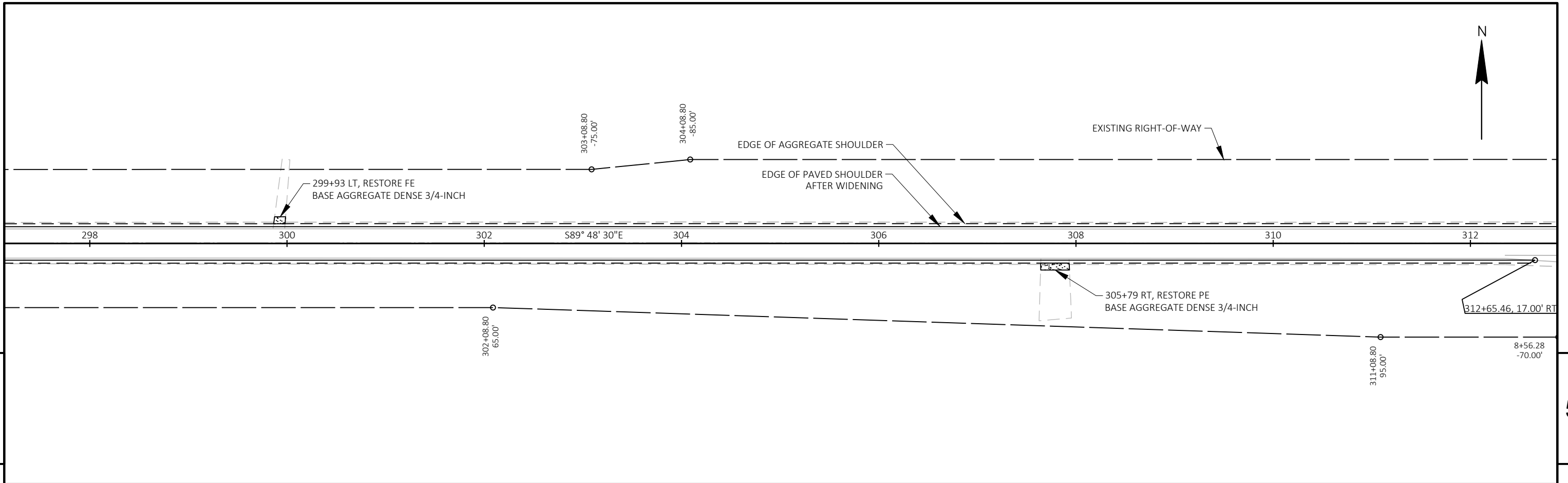


PROJECT NO: 8120-02-66 & 8120-02-76	HWY: STH 48	COUNTY: BARRON	PLAN	SHEET	E
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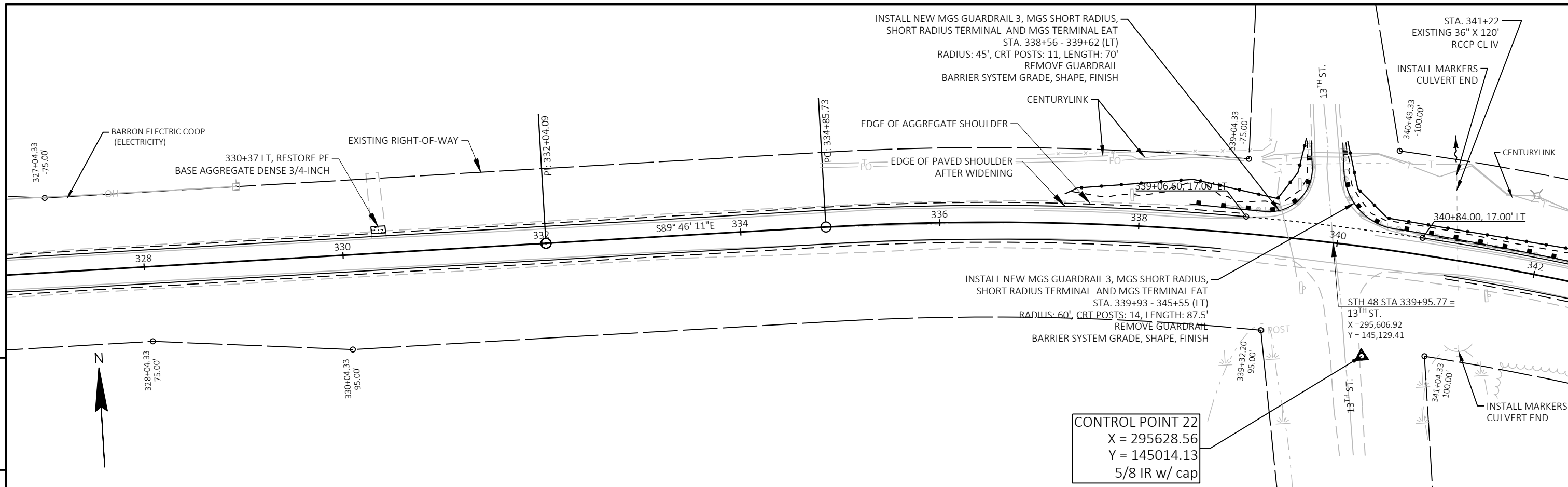
PROJECT NO: 8120-02-66 & 8120-02-76	HWY: STH 48	COUNTY: BARRON	PLAN	SHEET	E
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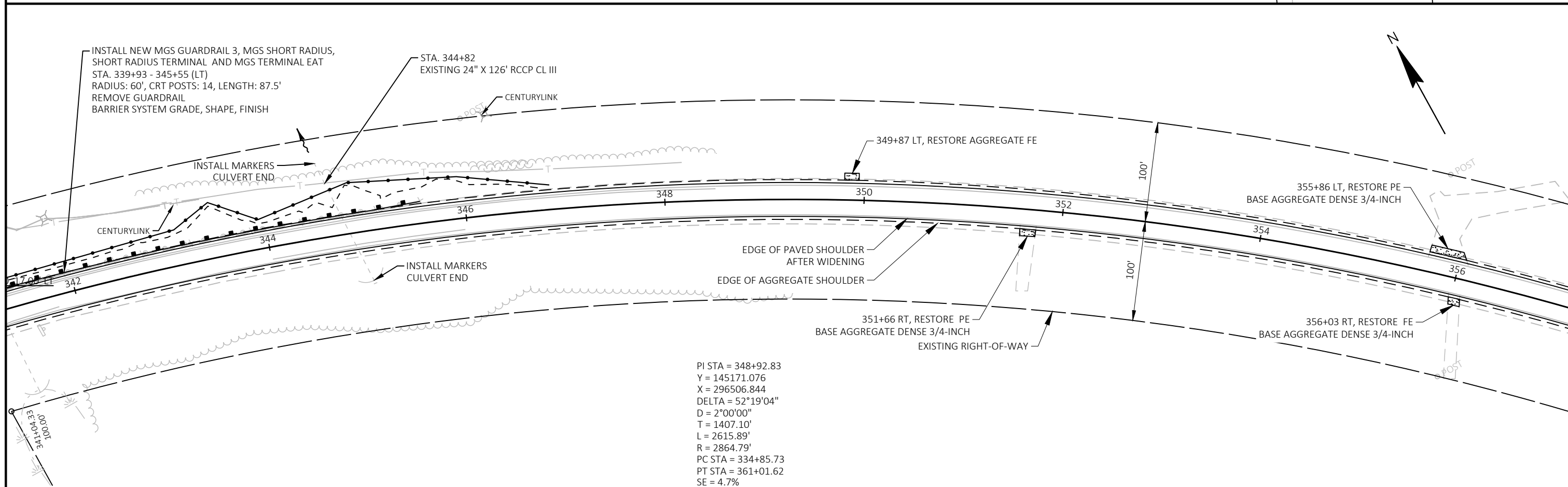


CONTROL POINT 2  
 X = 293016.40  
 Y = 144651.73  
 Z = 1271.17  
 STANFOLD HMOD  
 NOTE: LOCATION BEYOND PLAN VIEW

PROJECT NO: 8120-02-66 & 8120-02-76	HWY: STH 48	COUNTY: BARRON	PLAN	SHEET	E
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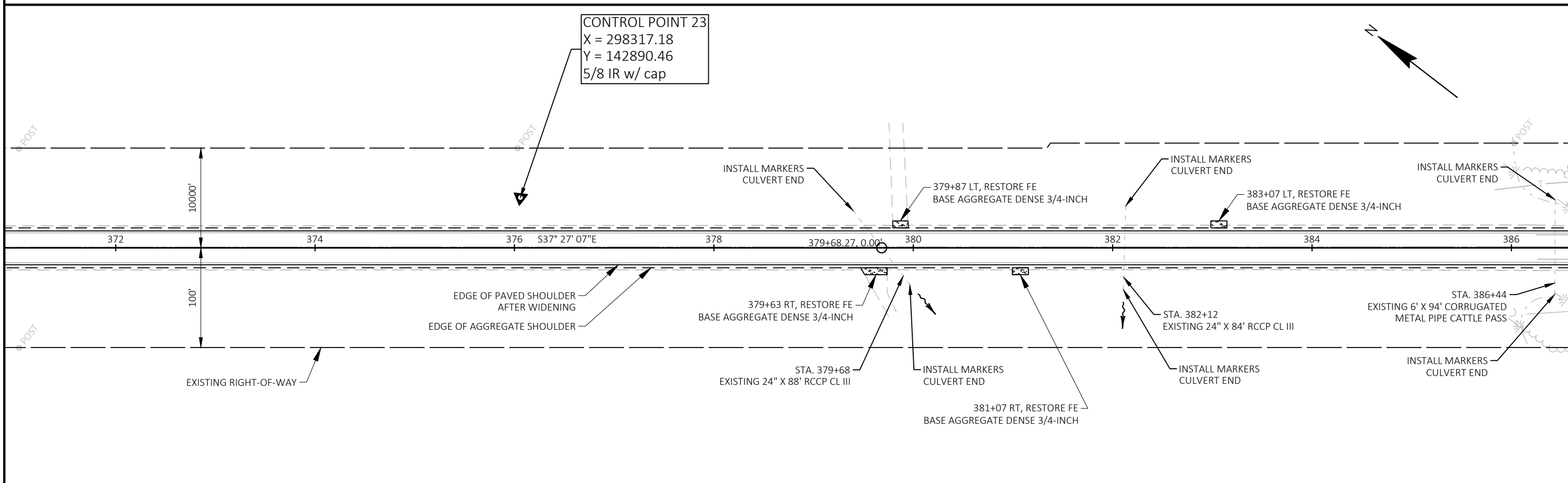
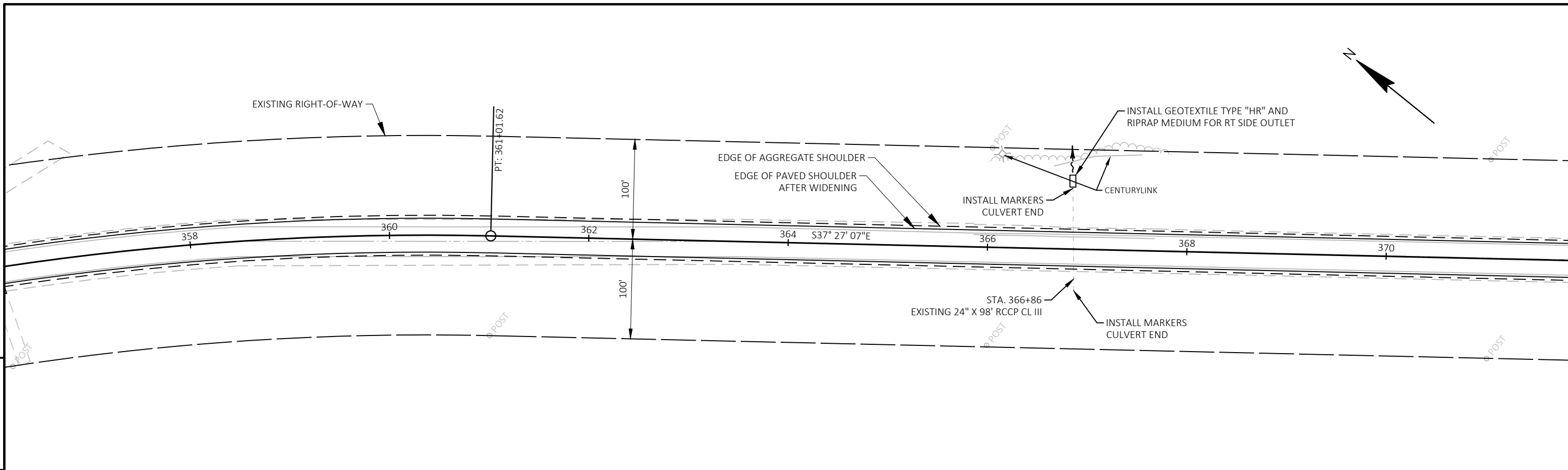


CONTROL POINT 22  
 X = 295628.56  
 Y = 145014.13  
 5/8 IR w/ cap



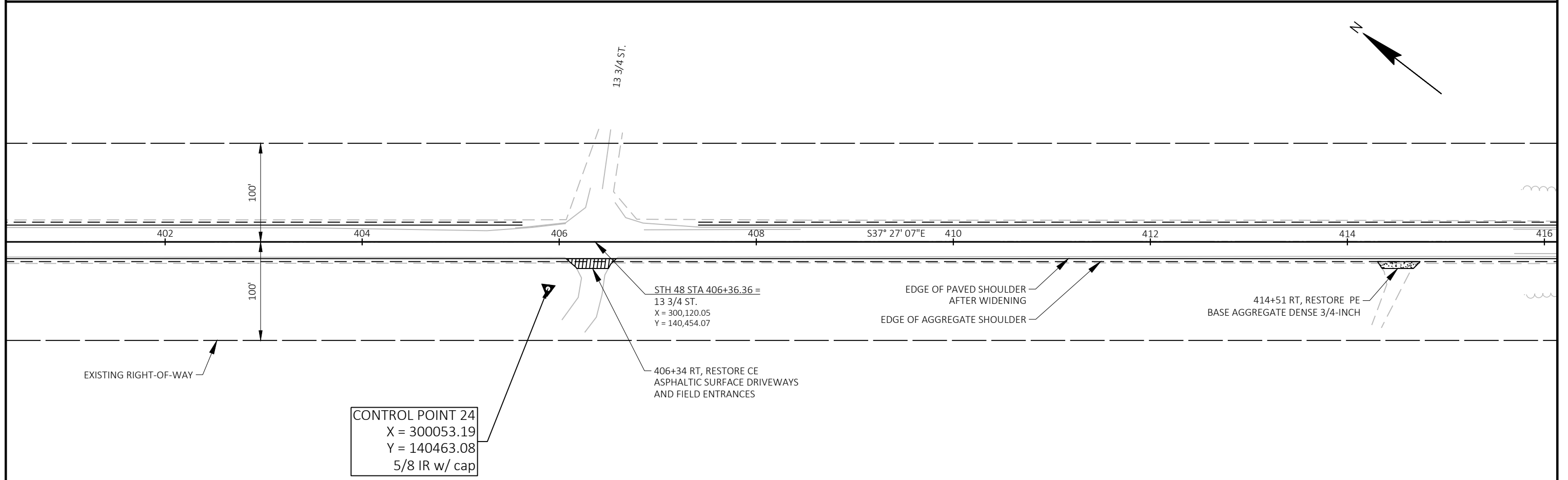
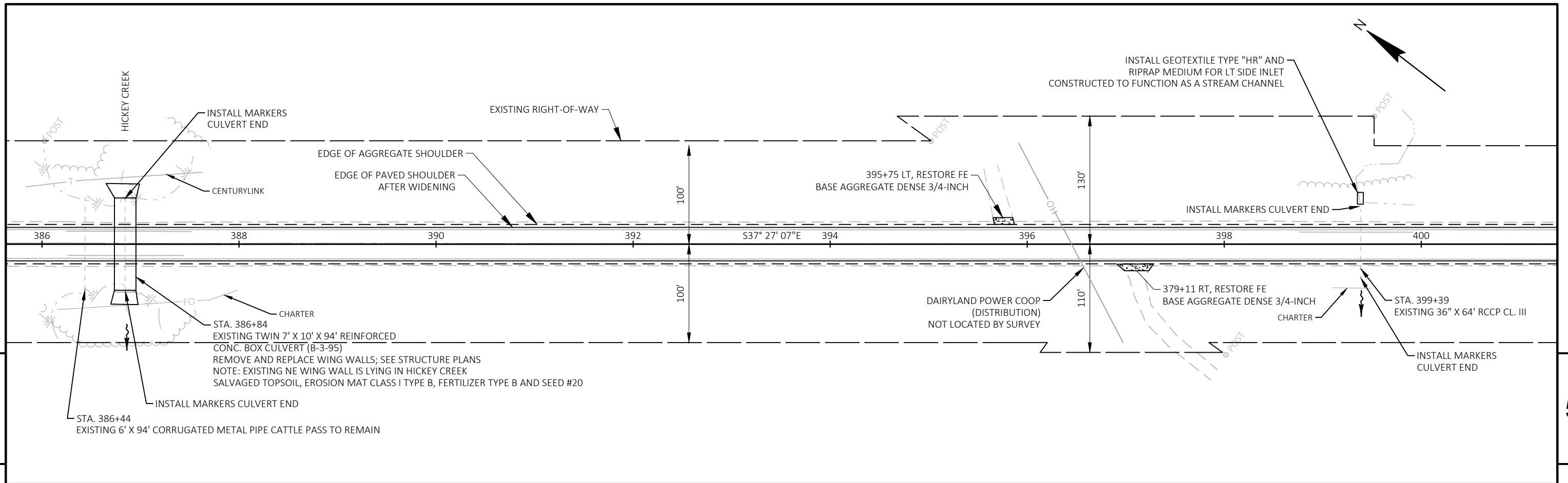
PI STA = 348+92.83  
 Y = 145171.076  
 X = 296506.844  
 DELTA = 52°19'04"  
 D = 2°00'00"  
 T = 1407.10'  
 L = 2615.89'  
 R = 2864.79'  
 PC STA = 334+85.73  
 PT STA = 361+01.62  
 SE = 4.7%

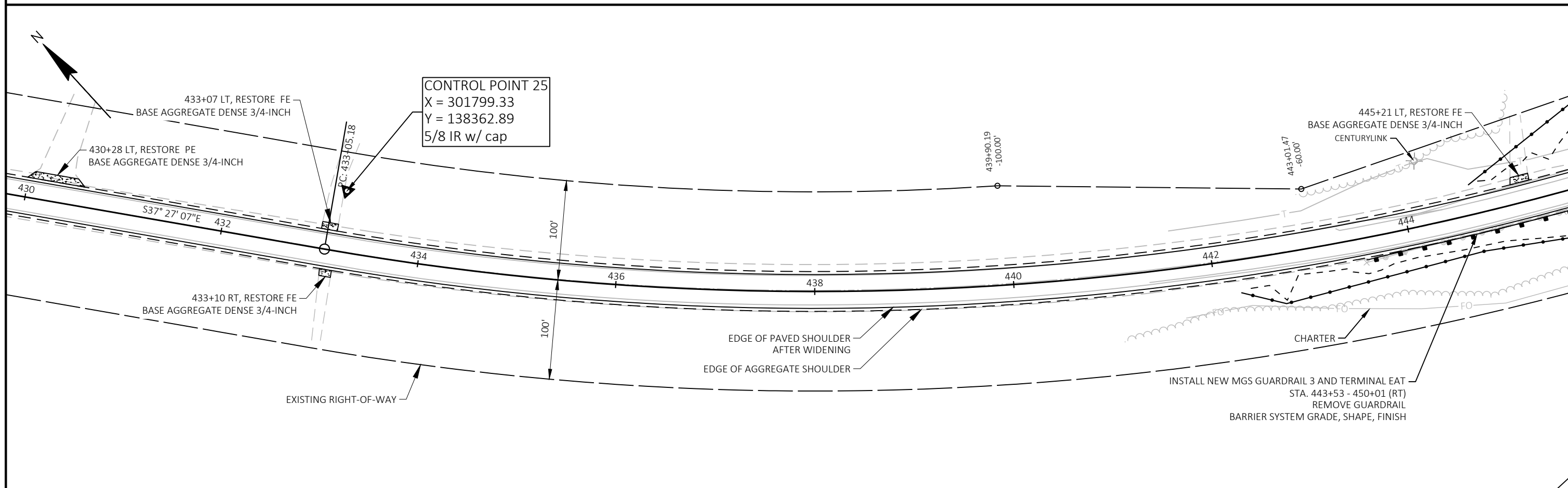
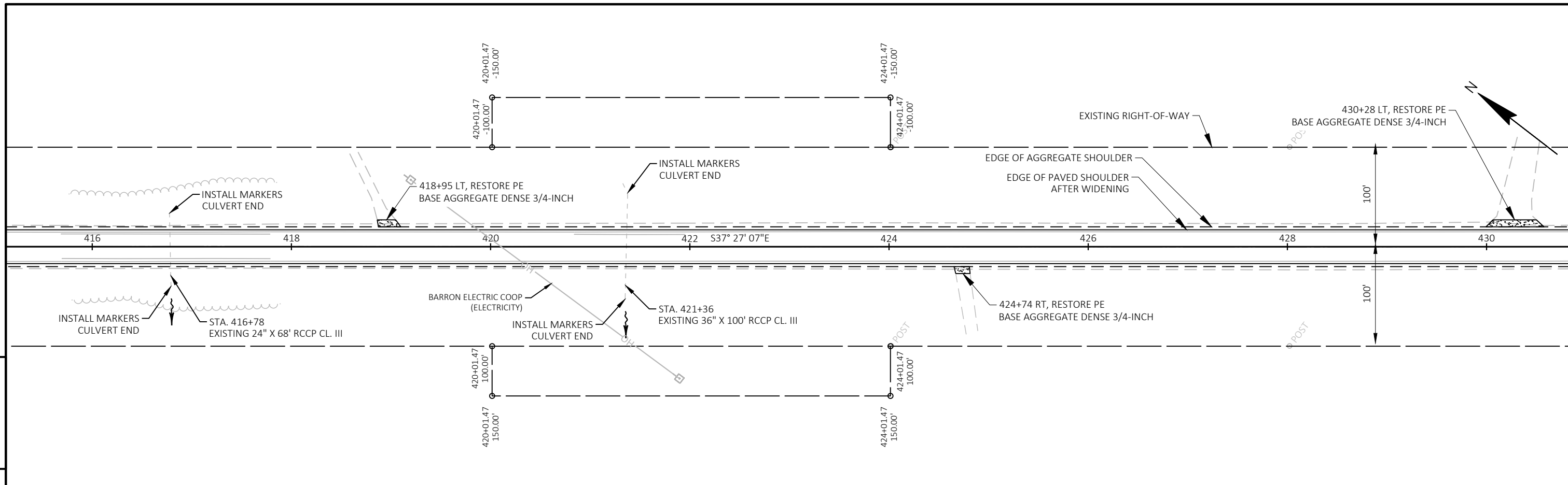
PROJECT NO: 8120-02-66 & 8120-02-76	HWY: STH 48	COUNTY: BARRON	PLAN	SHEET	E
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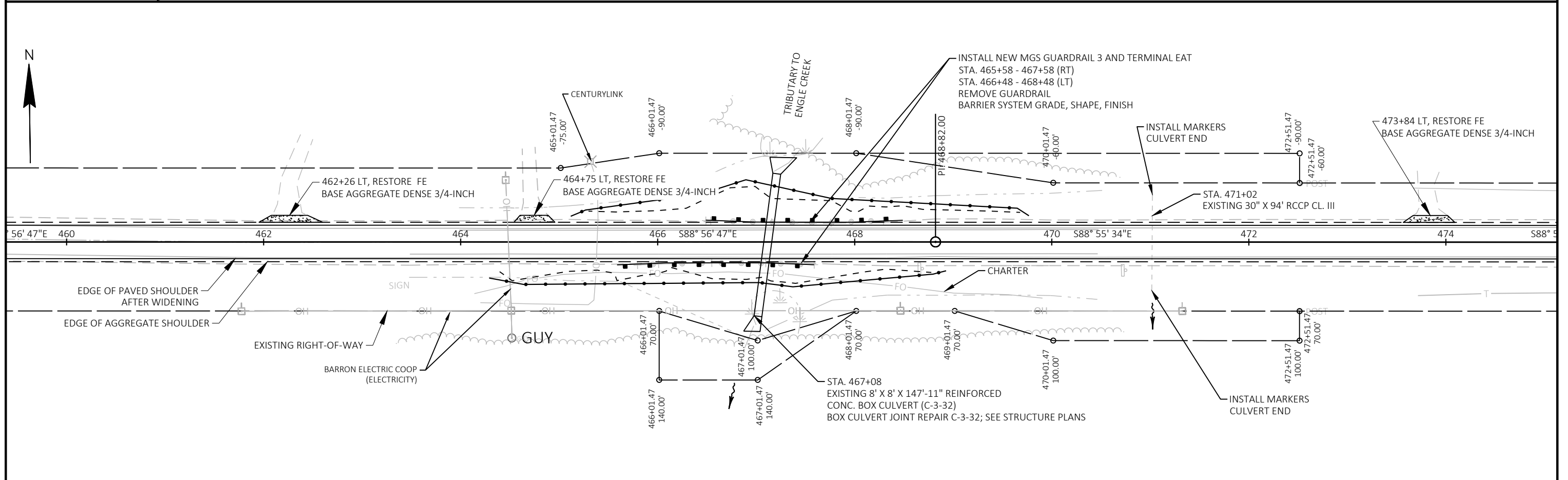
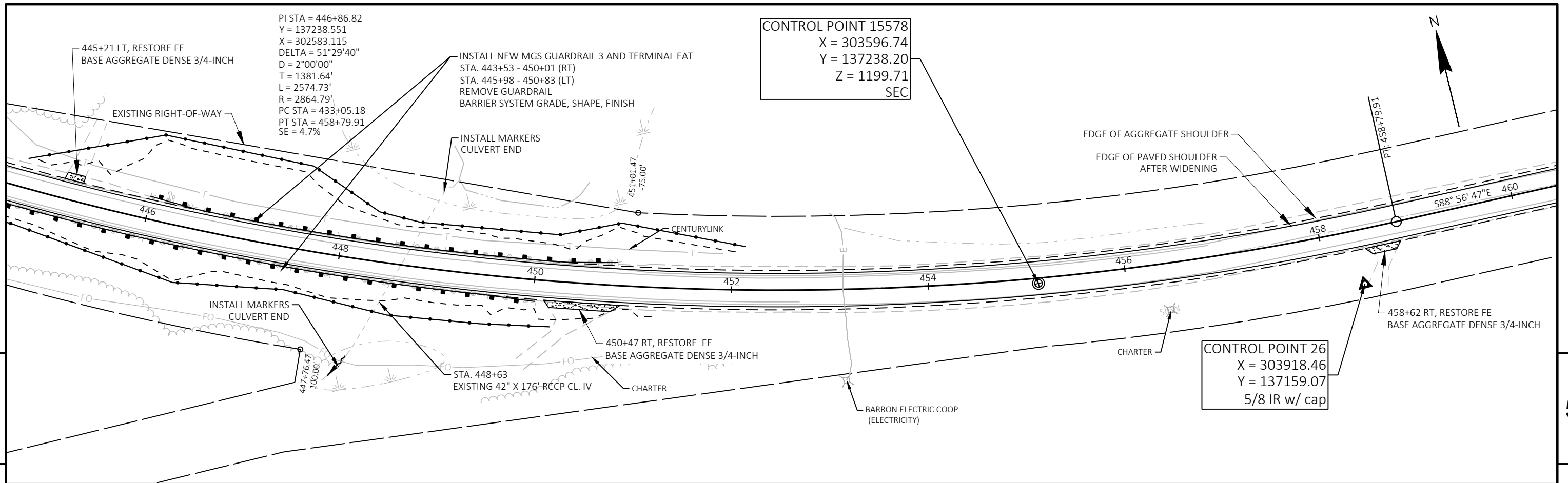
PROJECT NO: 8120-02-66 & 8120-02-76	HWY: STH 48	COUNTY: BARRON	PLAN	SHEET	E
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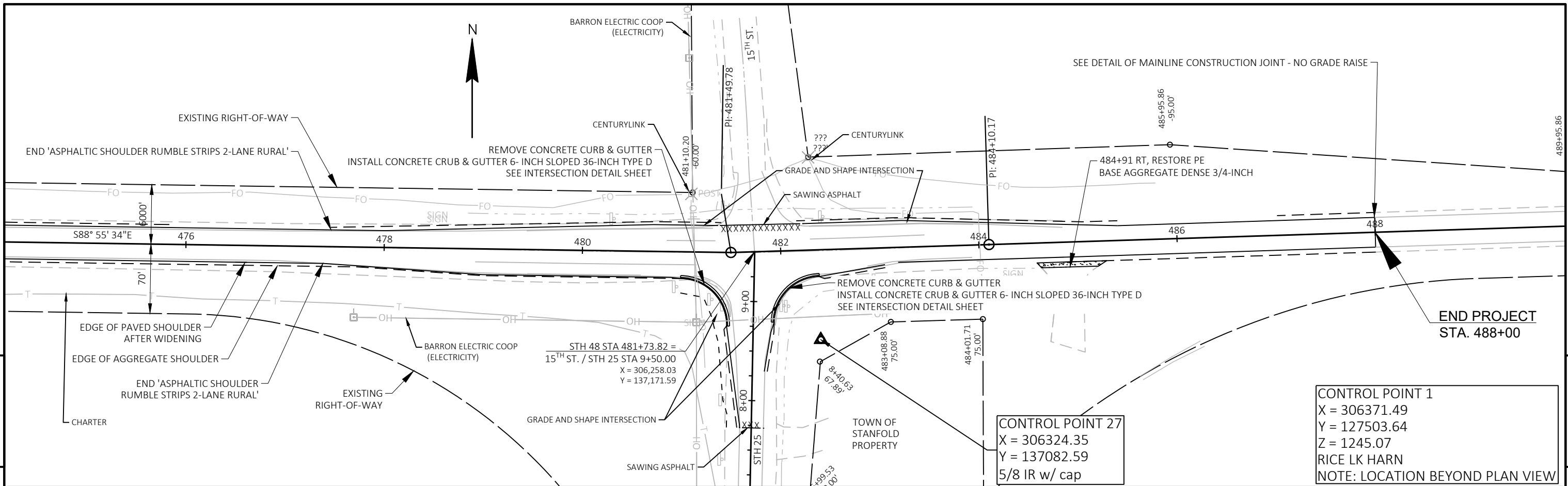




PROJECT NO: 8120-02-66 & 8120-02-76	HWY: STH 48	COUNTY: BARRON	PLAN	SHEET	<b>E</b>
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PROJECT NO: 8120-02-66 & 8120-02-76	HWY: STH 48	COUNTY: BARRON	PLAN	SHEET	E
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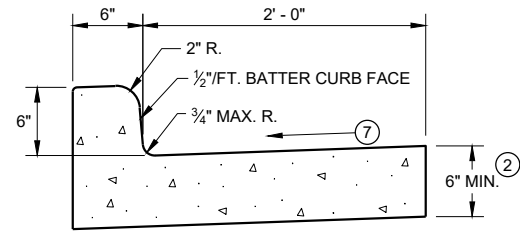
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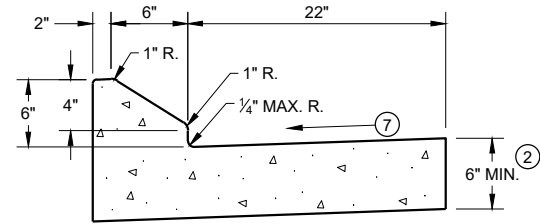
PROJECT NO: 8120-02-66 & 8120-02-76	HWY: STH 48	COUNTY: BARRON	PLAN	SHEET	E
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## Standard Detail Drawing List

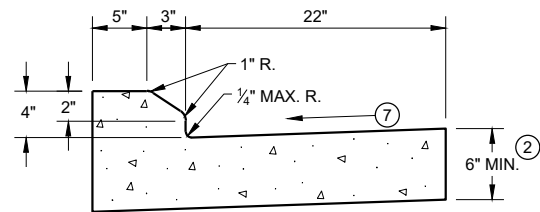
08D01-23A	CONCRETE CURB & GUTTER
08D01-23B	CONCRETE CURB, TIES AND CURB AND GUTTER APPLICATIONS
08D04-07	CONCRETE SURFACE DRAINS & ASPHALTIC FLUMES
08D21-01	DRIVEWAYS WITHOUT CURB & GUTTER
08D22-01	DRIVEWAYS WITHOUT CURB & GUTTER RESURFACING PROJECTS RURAL
08E08-03	TYPICAL INSTALLATIONS OF EROSION BALES / TEMPORARY DITCH CHECKS
08E09-06	SILT FENCE
08E15-01	CULVERT PIPE CHECK
08F01-11	APRON ENDWALLS FOR CULVERT PIPE
08F02-01	APRON ENDWALLS FOR PIPE ARCH AND ELLIPTICAL PIPE
08F04-08	JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL
09A01-14A	AT-GRADE SIDE ROAD INTERSECTION, TYPES "B1", "B2", "C" AND D AND TEE INTERSECTION BYPASS LANE
09A01-14B	AT-GRADE SIDE ROAD INTERSECTION, TYPE "A1" & "A2"
12A03-10	NAME PLATE (STRUCTURES)
13A10-03A	SHOULDER RUMBLE STRIPS - ASPHALT
13A10-03G	SHOULDER AND EDGE LINE RUMBLE STRIPS - CROSSINGS, INTERSECTIONS, BRIDGES, DRIVEWAYS
13A10-03H	SHOULDER AND EDGE LINE RUMBLE STRIPS - RAILROAD, PASSING, CLIMBING AND BYPASS LANES
13A11-04A	CENTERLINE RUMBLE STRIPS - ASPHALT
13A11-04D	CENTERLINE RUMBLE STRIPS - INTERSECTIONS, DRIVEWAYS, BRIDGES, RAILROADS
13C19-03	HMA LONGITUDINAL JOINTS
14B29-01	SAFETY EDGE
14B42-07A	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-07B	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-07C	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B42-07D	MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL
14B44-04A	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-04B	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B44-04C	MIDWEST GUARDRAIL SYSTEM ENERGY ABSORBING TERMINAL (MGS)
14B53-02A	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-02B	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-02C	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-02D	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-02E	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-02F	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-02G	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-02H	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
14B53-02I	SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)
15A03-02A	FLEXIBLE MARKER POST FOR CULVERT END
15A03-02B	FLEXIBLE MARKER POST FOR CULVERT END
15C04-05	TRAFFIC CONTROL, ADVANCE WARNING SIGNS 45 M.P.H. OR GREATER TWO-WAY UNDIVIDED ROAD OPEN TO TRAFFIC
15C08-23A	PERMANENT LONGITUDINAL PAVEMENT MARKINGS
15C08-23B	TEMPORARY LONGITUDINAL PAVEMENT MARKING
15C11-10B	CHANNELIZING DEVICES DRUMS, CONES, BARRICADES AND VERTICAL PANELS
15C12-09A	TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION
15C12-09B	TRAFFIC CONTROL, LANE CLOSURE WITH AUTOMATED FLAGGER ASSISTANCE DEVICE
15C33-04	STOP LINE AND CROSSWALK PAVEMENT MARKING
15C35-06A	PAVEMENT MARKING (INTERSECTIONS)
15D28-04	TRAFFIC CONTROL, WORK ON SHOULDER OR PARKING LANE, UNDIVIDED ROADWAY
15D44-02	TRAFFIC CONTROL, SIGNING ON ROADWAYS WITH MILLED SURFACES
15D45-03	TRAFFIC CONTROL, SIGNING ON ROADWAYS WITH LOOSE GRAVEL
15D48-01	TRAFFIC CONTROL, LANE SHIFT IN FLAGGING OPERATION
15D51-01	TRAFFIC CONTROL, MOBILE OPERATIONS ON AN UNDIVIDED ROADWAY



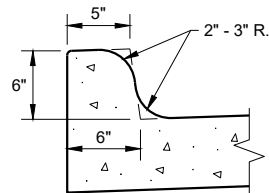
**TYPES A<sup>①</sup> & D**



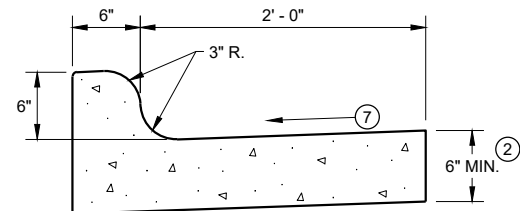
**6" SLOPED CURB TYPES G<sup>①</sup> & J**



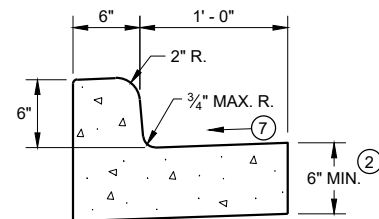
**4" SLOPED CURB TYPES G<sup>①</sup> & J**



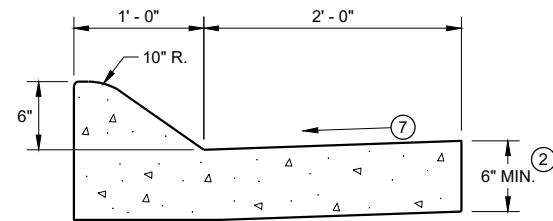
**TYPES K<sup>①</sup> & L**  
(OPTIONAL CURB SHAPE)



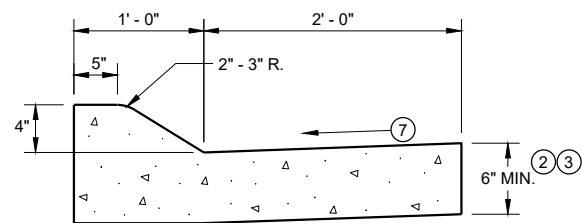
**TYPES K<sup>①</sup> & L**  
**CONCRETE CURB AND GUTTER 30"**



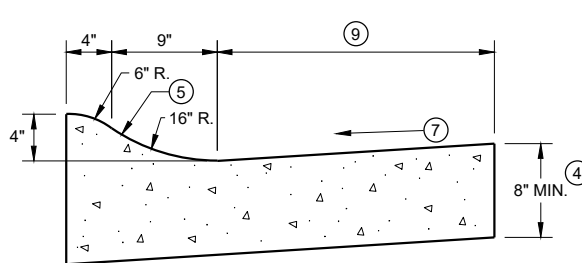
**TYPES A<sup>①</sup> & D**  
**CONCRETE CURB AND GUTTER 18"**



**6" SLOPED CURB TYPES A<sup>①</sup> & D**

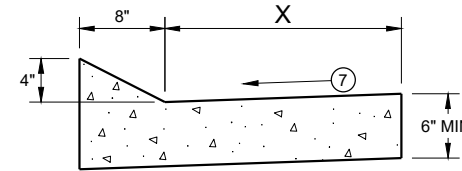


**4" SLOPED CURB TYPES A<sup>①</sup> & D**  
**CONCRETE CURB AND GUTTER 36"**



**4" SLOPED CURB TYPES R<sup>①</sup> & T**

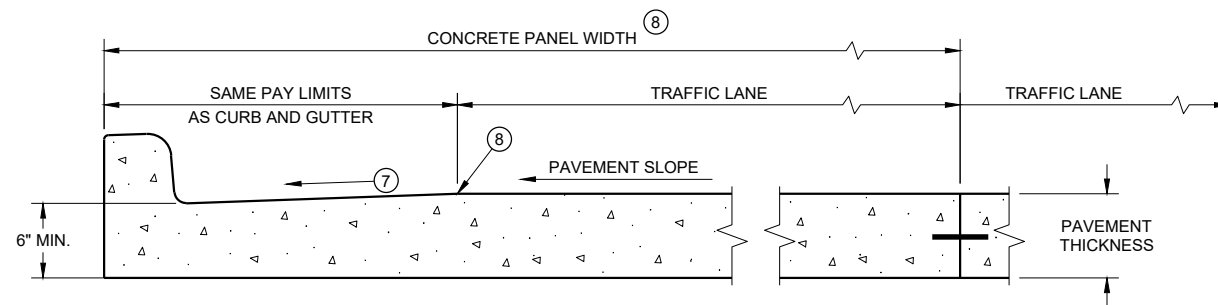
TBT & TBTT	X
30"	22"
36"	28"



**TYPES TBT & TBTT<sup>①</sup>**  
**CONCRETE CURB AND GUTTER**

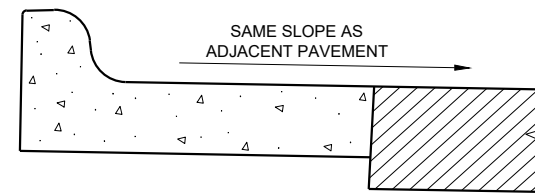
**PAVEMENT THICKNESS AND MAXIMUM CONCRETE PANEL WIDTH TABLE**

PAVEMENT THICKNESS	MAXIMUM PANEL WIDTH
LESS THAN 10"	12'
10" & ABOVE	15'



**PARTIAL SECTION OF PAVEMENT\* WITH INTEGRAL CURB AND GUTTER**

\* BIKE LANE IS NOT SHOWN



**REVERSE SLOPE GUTTER<sup>⑥</sup>**  
(TYPICAL FOR ALL CURB & GUTTER TYPES)

**GENERAL NOTES**

DETAILS OF CONSTRUCTION AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

PAVEMENT TIES AND TIE BARS SHALL BE EPOXY COATED IN CONFORMANCE WITH SUBSECTION 505.2.6.2 OF THE STANDARD SPECIFICATIONS.

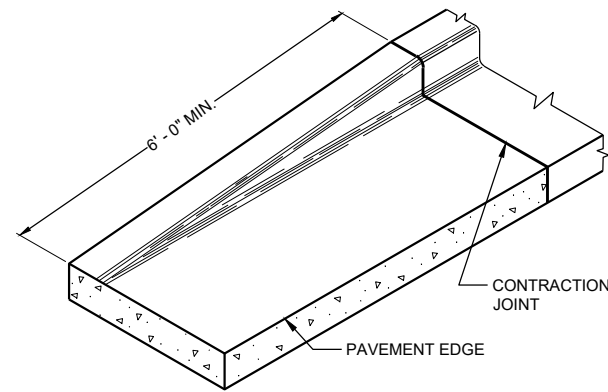
INTEGRAL CURB AND GUTTER SHALL CONFORM TO THE DETAILS SHOWN FOR CONCRETE CURB AND GUTTER INCLUDING THE TRANSVERSE GUTTER SLOPE.

UNLESS OTHERWISE SHOWN ON THE TYPICAL CROSS SECTIONS, THE BASE AGGREGATE AND COMMON EXCAVATION LIMITS ARE 2' - 0" BEHIND THE BACK OF CURBS.

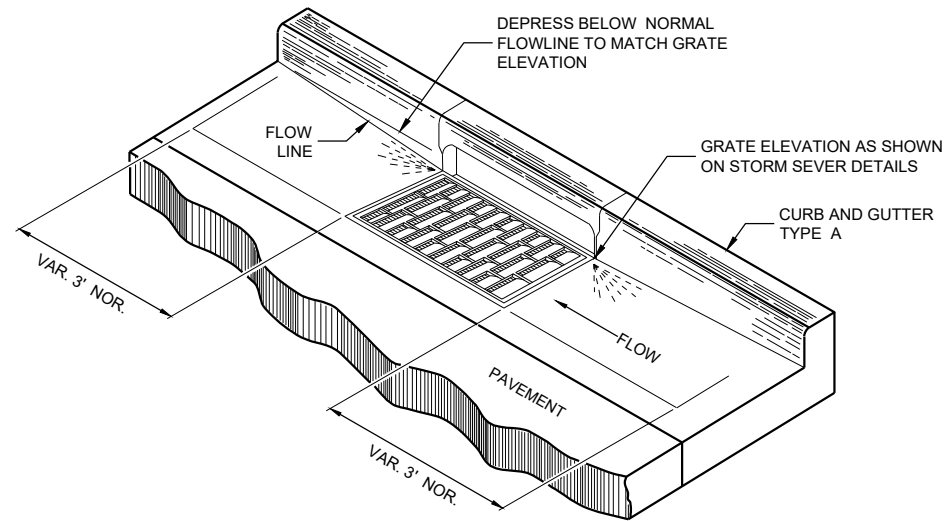
- ① TIE BARS ARE REQUIRED FOR CURB AND GUTTERS TYPES A, G, K, R, AND TBTT.
- ② THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- ③ USE 8" MINIMUM GUTTER THICKNESS WHEN USED WITH AN ADJACENT CONCRETE TRUCK APRON PLACED BEHIND BACK OF CURB.
- ④ THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 8" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- ⑤ UNLESS OTHERWISE NOTED, FOR STAKING PURPOSES THE FACE OF CURB IS 6" FROM THE BACK OF CURB.
- ⑥ WHEN REVERSE SLOPE GUTTER IS REQUIRED, THE LOCATION(S) WILL BE SHOWN ELSEWHERE IN THE PLAN.
- ⑦ USE 4% GUTTER CROSS SLOPE UNLESS OTHERWISE NOTED IN THE PLANS.
- ⑧ INCLUDE LONGITUDINAL JOINT AND TIE BARS ALONG LANE EDGE WHEN CONCRETE PANEL WIDTH EXCEEDS THE MAXIMUM WIDTH PER TABLE BELOW. LONGITUDINAL JOINT(S) ARE NOT ALLOWED WITHIN TRAFFIC LANES AND BIKE LANES. LONGITUDINAL JOINT MAY BE SAWED.
- ⑨ CONCRETE CURB AND GUTTER 4-INCH SLOPED 30-INCH TYPE "R" AND "T" = 17 INCHES  
CONCRETE CURB AND GUTTER 4-INCH SLOPED 36-INCH TYPE "R" AND "T" = 23 INCHES

**CONCRETE CURB AND GUTTER**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



**END SECTION CURB AND GUTTER**



**DETAIL OF CURB AND GUTTER AT INLETS**

(TYPICAL H INLET COVER SHOWN)

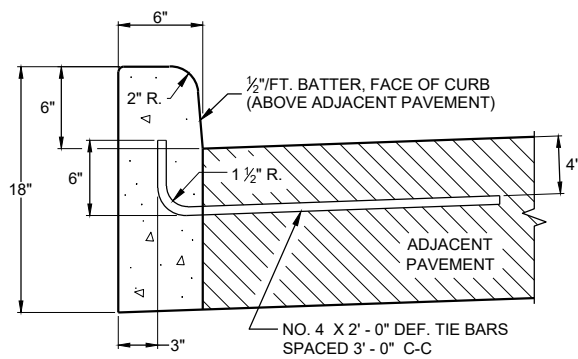
**GENERAL NOTES**

DETAILS OF CONSTRUCTION AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

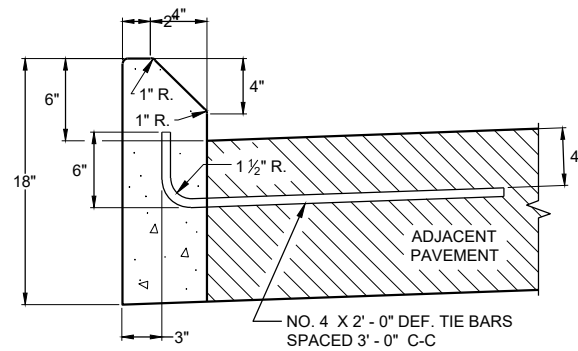
PAVEMENT TIES AND TIE BARS SHALL BE EPOXY COATED IN CONFORMANCE WITH SUBSECTION 505.2.6.2 OF THE STANDARD SPECIFICATIONS.

UNLESS OTHERWISE SHOWN ON THE TYPICAL CROSS SECTIONS, THE BASE AGGREGATE AND COMMON EXCAVATION LIMITS ARE 2' - 0" BEHIND THE BACK OF CURBS.

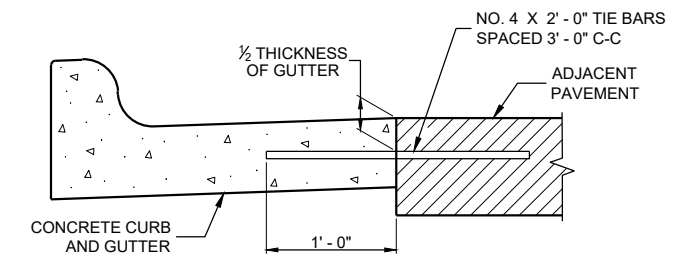
- ① TIE BARS ARE REQUIRED FOR CURB AND GUTTERS TYPES A, G, K, R, AND TBTT.
- ② THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE AGGREGATE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.
- ⑩ REFER TO SDD 08D18 AND 08D19 FOR ADDITIONAL DRIVEWAY ENTRANCE CURB DETAILS.
- ⑪ PLACE 1" THICK EXPANSION JOINT MATERIAL BETWEEN VERTICAL FACE CURB TYPES EXTENDING FROM THE TOP OF CURB TO 1 INCH BELOW THE ADJOINING CONCRETE SURFACE. RIGID CONCRETE STRUCTURES INCLUDE RAISED CONCRETE MEDIANS, CONCRETE SAFETY ISLANDS, SPLITTER ISLANDS, OR LOCATIONS IDENTIFIED ON THE PLANS.



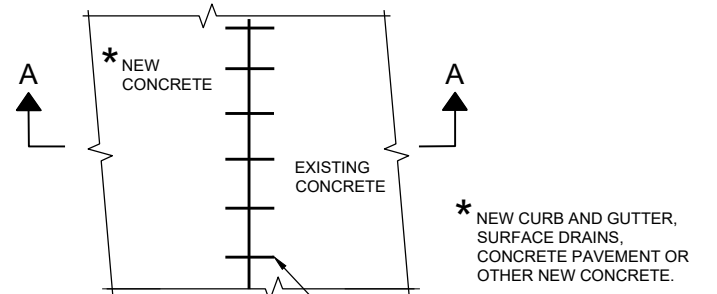
**TYPES A<sup>①</sup> & D**



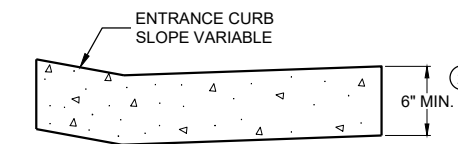
**TYPES G<sup>①</sup> & J  
CONCRETE CURB**



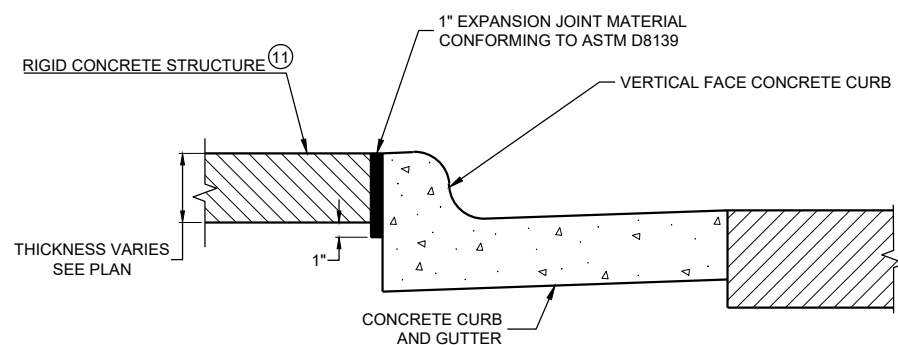
**TYPICAL TIE BAR LOCATION<sup>①</sup>**



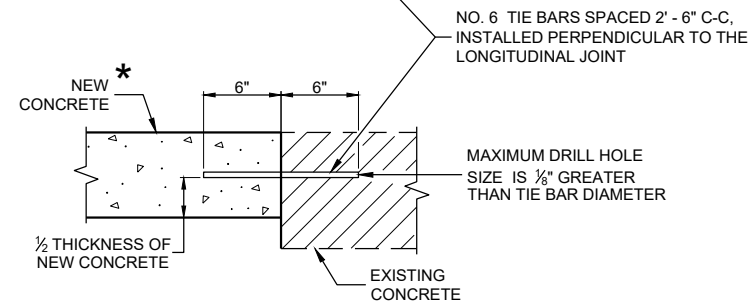
**PLAN VIEW**



**DRIVEWAY ENTRANCE CURB<sup>⑩</sup>  
(WHEN DIRECTED BY THE ENGINEER)**



**EXPANSION JOINT DETAIL FOR VERTICAL CURB ABUTTING A RIGID STRUCTURE<sup>⑪</sup>**



**SECTION A - A  
TIE BARS DRILLED INTO EXISTING PAVEMENT**

**CONCRETE CURB, TIES AND CURB AND GUTTER APPLICATIONS**

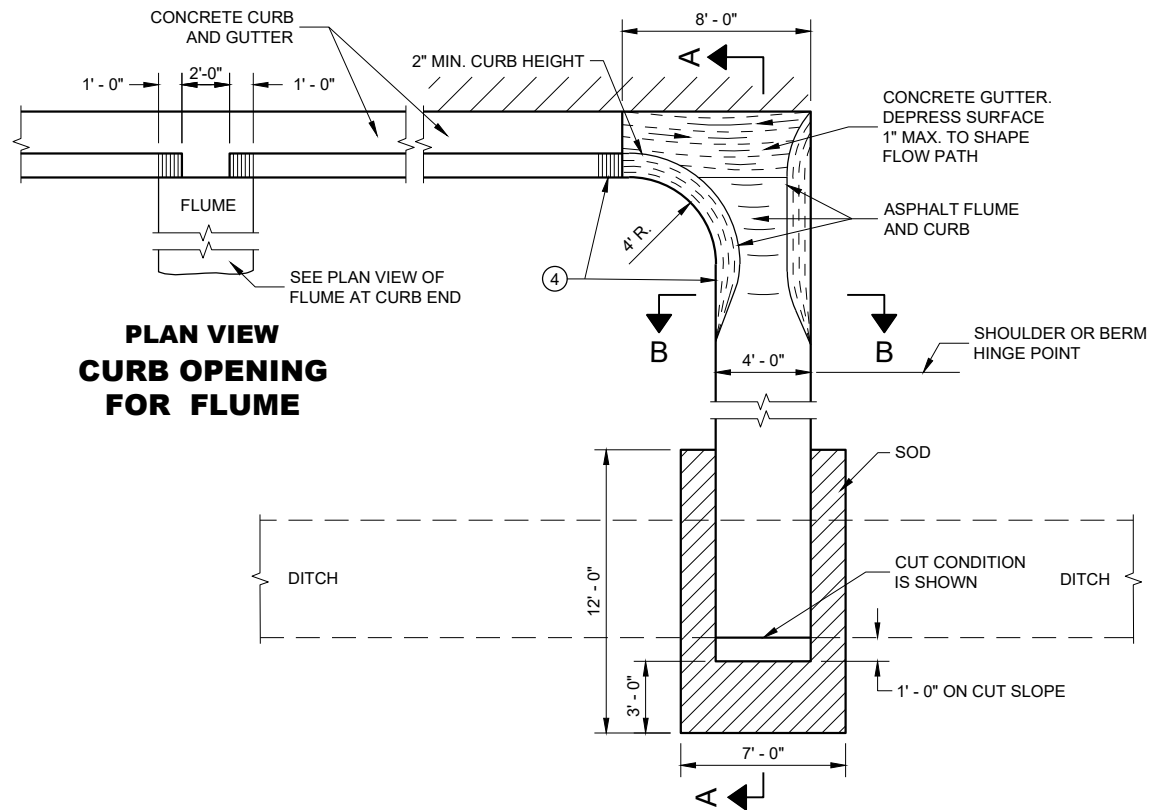
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
DATE May 2023 /S/ Rodney Taylor  
ROADWAY STANDARDS DEVELOPMENT ENGINEER

FHWA

NOTE: TAPER CURB ENDS TO GUTTER IN 1' - 0"

### ASPHALTIC FLUME



**PLAN VIEW  
CURB OPENING  
FOR FLUME**

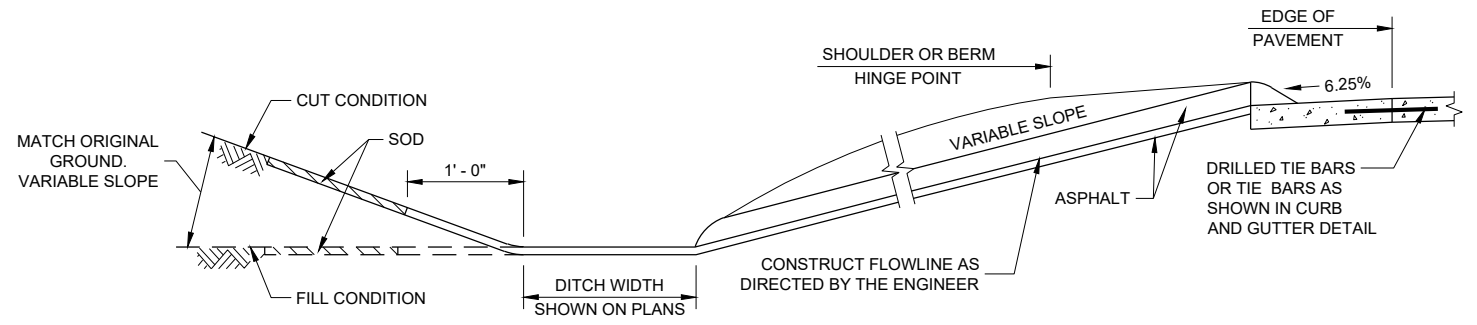
**PLAN VIEW  
FLUME AT CURB END**

### GENERAL NOTES

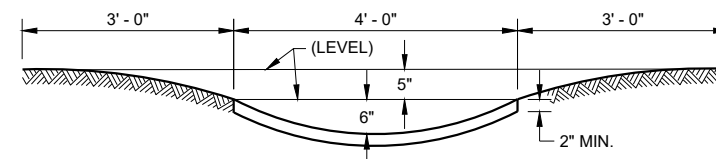
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

4" X 4" - W3.0 X W3.0 CONCRETE REINFORCEMENT SHALL BE IN ACCORDANCE WITH AASHTO SPECIFICATION M55.

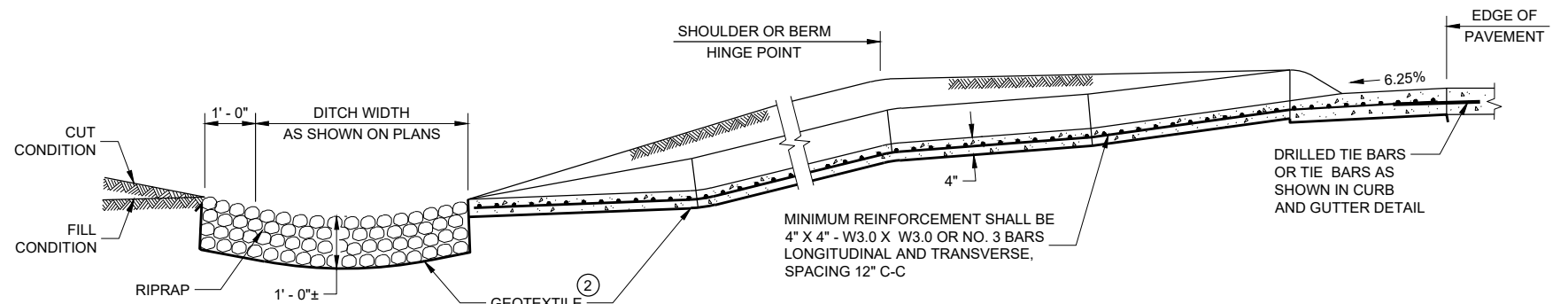
- ① JOINTS SHALL BE 1/8" TO 1/4" WIDE BY 1 1/2" DEEP AND SPACED AT UNIFORM INTERVALS OF APPROXIMATELY 4 FEET.
- ② GEOTEXTILE TYPE "R" SHALL UNDERLAY THE FULL LENGTH AND WIDTH OF THE CONCRETE SURFACE DRAIN AND RIPRAP.
- ③ CONCRETE SURFACE DRAIN WITHOUT CURB AND GUTTER MAY BE USED ON BACKSLOPES WHEN SPECIFIED.
- ④ ANGLE OF FLUME IN RELATION TO BACK OF CURB TO BE CONSTRUCTED PER THE PLAN DETAILS OR AS DIRECTED BY THE ENGINEER. ANGLE OF FLUME MAY BE OTHER THAN 90 DEGREES AS SHOWN.



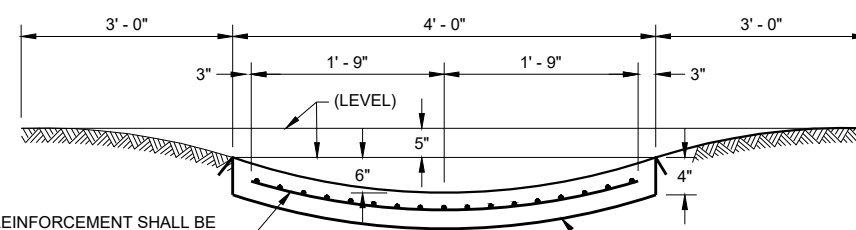
**SECTION A - A**



**SECTION B - B**

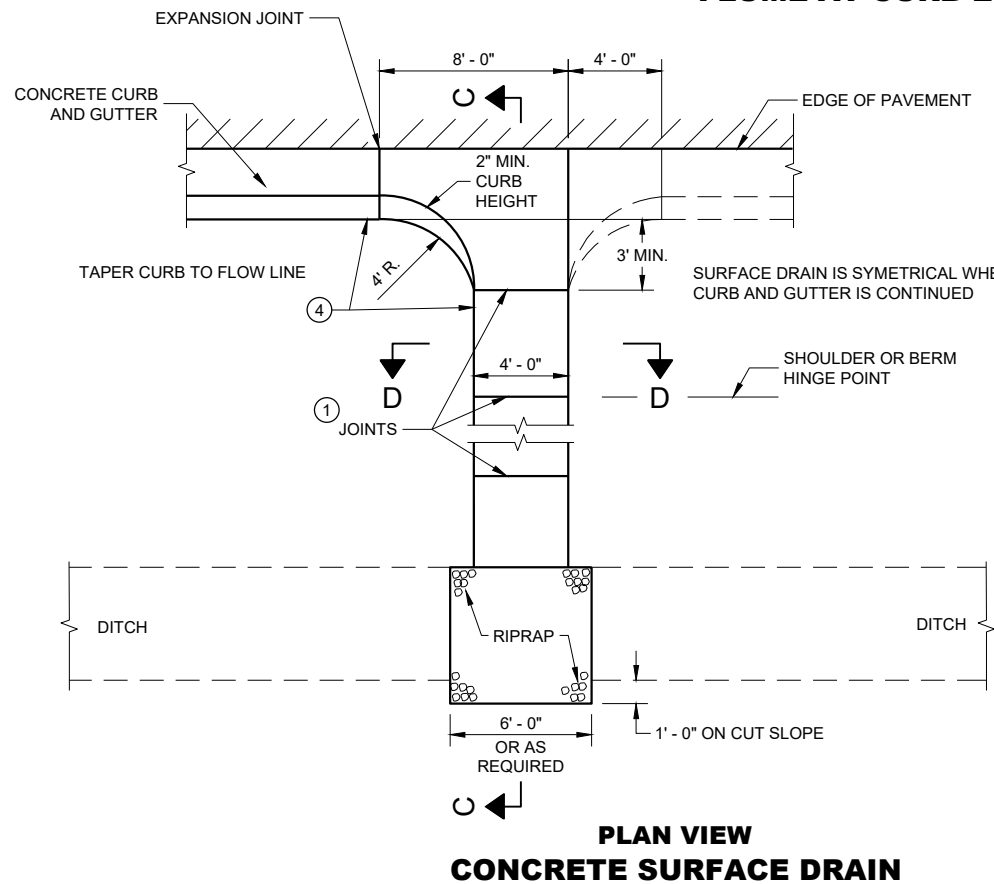


**SECTION C - C**



**SECTION D - D**

MINIMUM REINFORCEMENT SHALL BE 4" X 4" - W3.0 X W3.0 OR NO. 3 BARS LONGITUDINAL AND TRANSVERSE, SPACING 12" C-C



**PLAN VIEW  
CONCRETE SURFACE DRAIN**

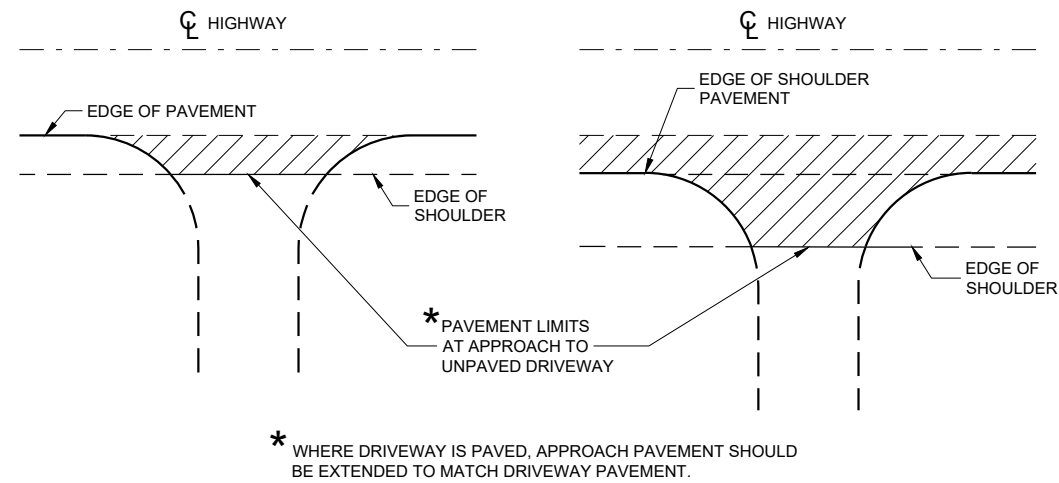
### CONCRETE SURFACE DRAINS AND ASPHALTIC FLUMES

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
May 2023 /S/ Rodney Taylor  
DATE ROADWAY STANDARDS DEVELOPMENT  
ENGINEER

FHWA



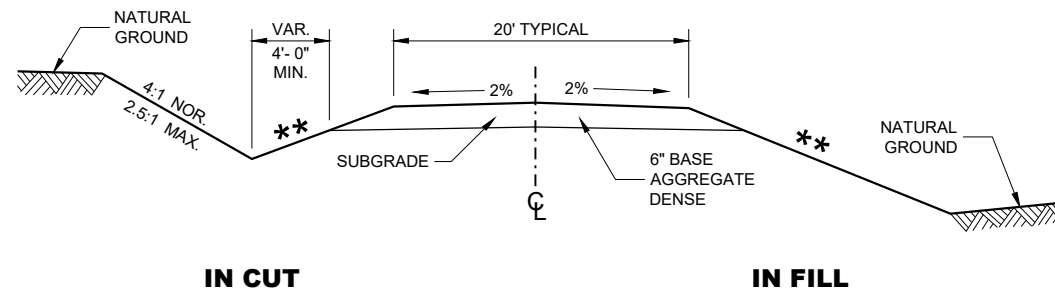


**PLAN VIEW**  
(UNPAVED SHOULDER ON HIGHWAY)

**PLAN VIEW**  
(PAVED SHOULDER ON HIGHWAY)

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

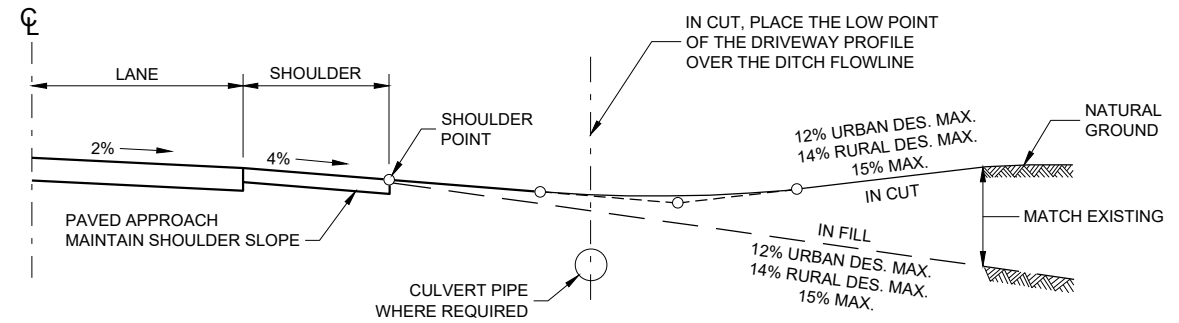
**RURAL DRIVEWAY INTERSECTION DETAIL  
(NO CURB AND GUTTER OR SIDEWALK)**



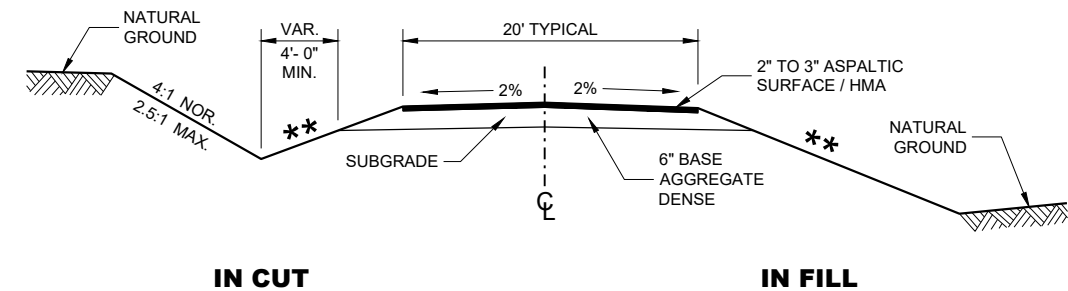
**TYPICAL CROSS SECTION FOR  
PRIVATE DRIVE OR FIELD ENTRANCE  
AGGREGATE SURFACE**

\*\* SLOPE CAN VARY WITH SPEED. SEE 11-45-30.6.2

POSTED SPEED MPH	MAX. SLOPE
<35	4:1
≥ 35 TO < 60	6:1
≥60	10:1



**TYPICAL DRIVEWAY PROFILES**



**TYPICAL CROSS SECTION FOR  
PRIVATE DRIVE OR FIELD ENTRANCE  
ASPHALTIC SURFACE**

**DRIVEWAYS WITHOUT CURB AND GUTTER**

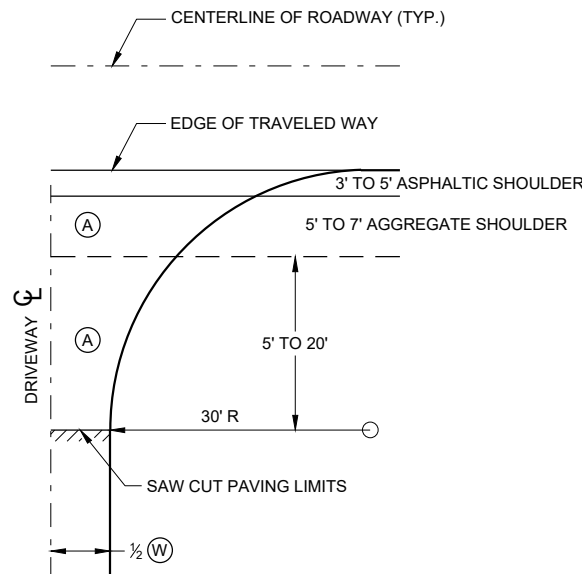
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
December 2017 /S/ Rodney Taylor  
DATE ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR

FHWA

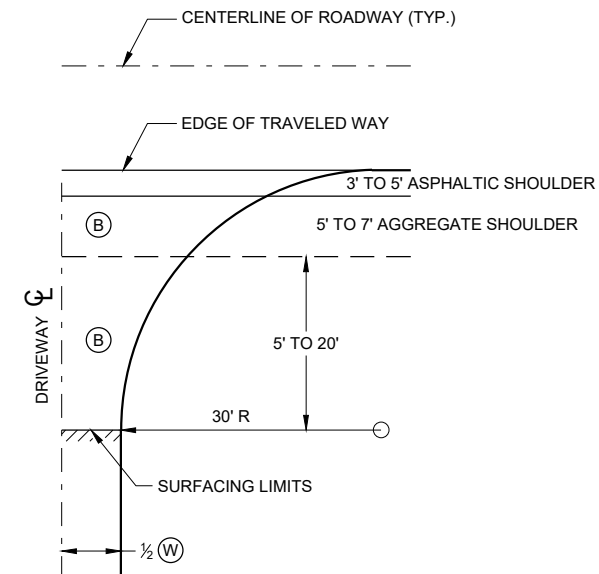
**GENERAL NOTES**

- ① DESIGN WILL DETERMINE FINAL DRIVEWAY ASPHALTIC THICKNESS BASED ON TYPE OF USAGE AND LOADINGS.

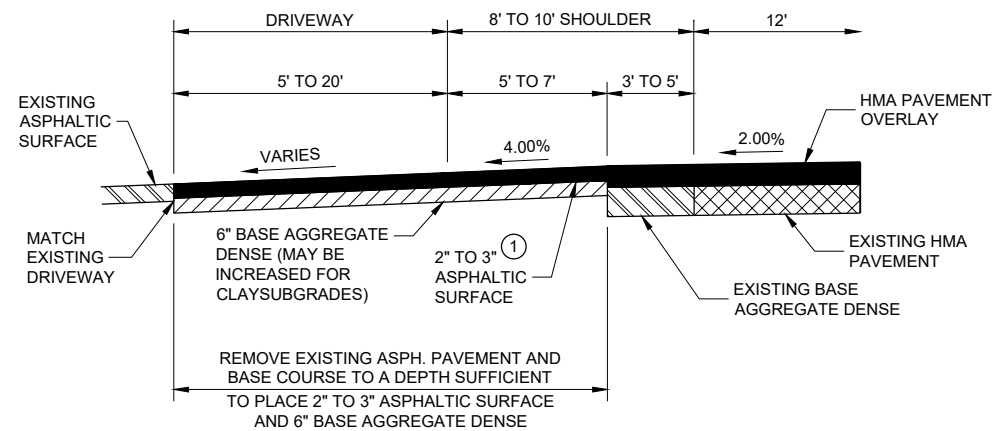


- Ⓐ : PAID FOR AS ASPHALTIC SURFACE DRIVEWAYS AND FIELD ENTRANCES. (TON)
- Ⓑ : PAID FOR AS BASE AGGREGATE DENSE 1 1/4" (TON)
- ⒲ : DRIVEWAY WIDTH 16' MIN. - 24' MAX.

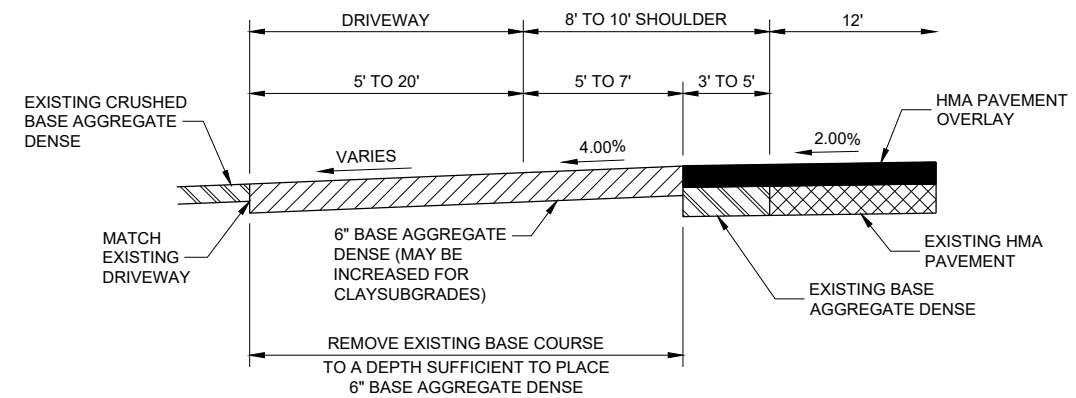
**PLAN VIEW  
HALF SECTION**



**PLAN VIEW  
HALF SECTION**



**PROFILE VIEW  
RURAL ENTRANCE  
WITH ASPHALTIC SURFACE  
RESURFACING PROJECTS**



**PROFILE VIEW  
RURAL ENTRANCE  
WITH AGGREGATE SURFACE  
6" BASE AGGREGATE DENSE  
RESURFACING PROJECTS**

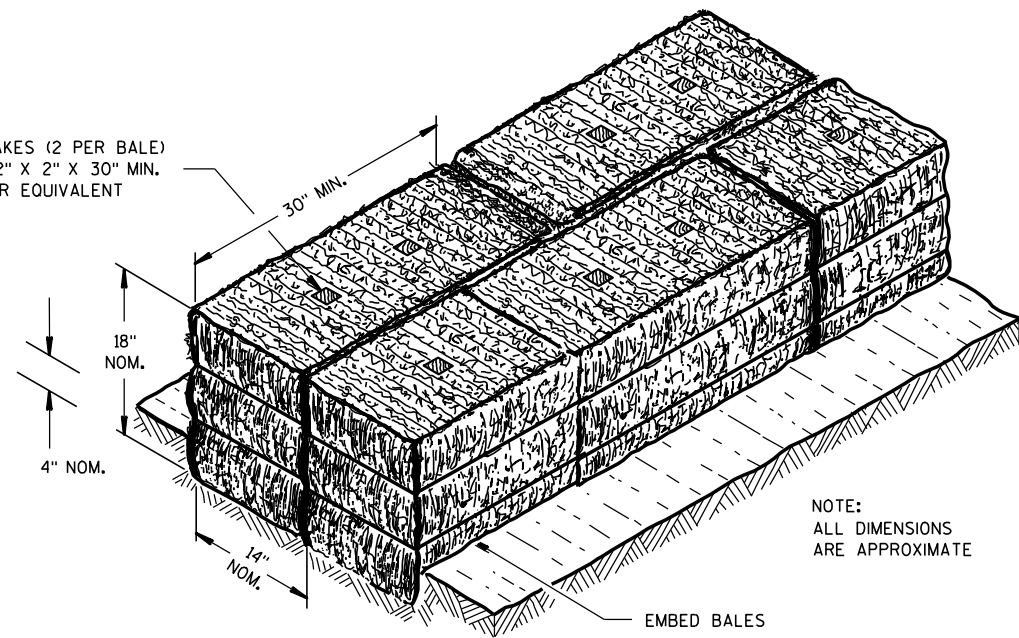
**DRIVEWAYS WITHOUT CURB  
AND GUTTER RESURFACING  
PROJECTS RURAL**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
December 2016 /S/ Rodney Taylor  
DATE ROADWAY STANDARDS DEVELOPMENT  
ENGINEER

FHWA

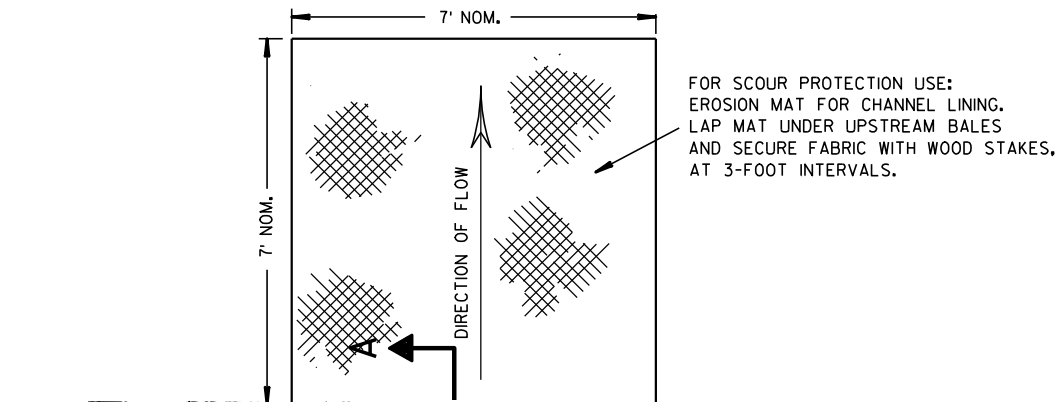
WOOD STAKES (2 PER BALE)  
NOMINAL 2" X 2" X 30" MIN.  
LENGTH OR EQUIVALENT



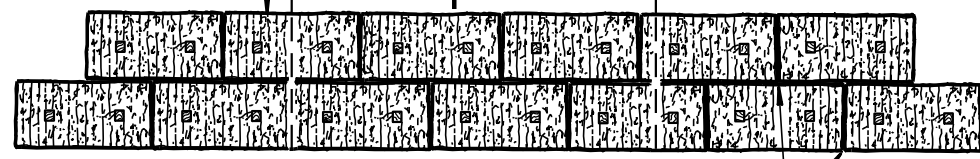
NOTE:  
ALL DIMENSIONS  
ARE APPROXIMATE

EMBED BALES

SECTION A-A



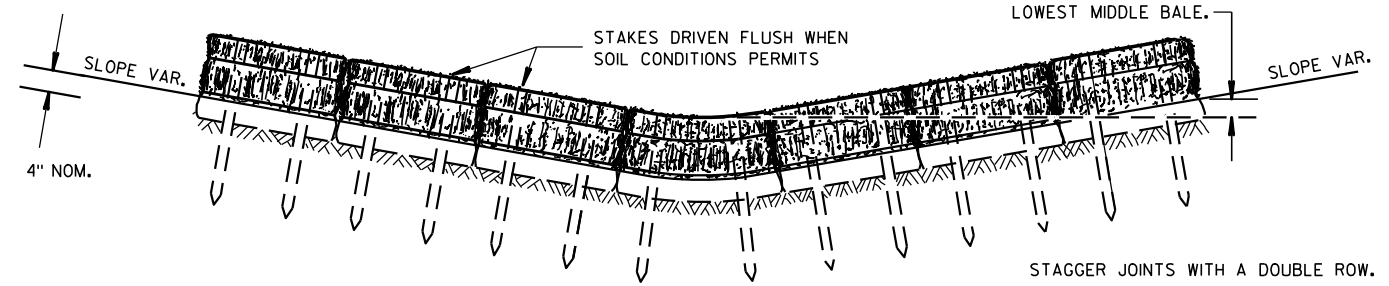
FOR SCOUR PROTECTION USE:  
EROSION MAT FOR CHANNEL LINING.  
LAP MAT UNDER UPSTREAM BALES  
AND SECURE FABRIC WITH WOOD STAKES,  
AT 3-FOOT INTERVALS.



STAGGER JOINTS BETWEEN ADJACENT  
ROWS OF BALES.

PLAN VIEW

BOTTOM ELEVATION OF END BALE SHALL  
BE EQUAL TO OR GREATER THAN TOP OF  
LOWEST MIDDLE BALE.



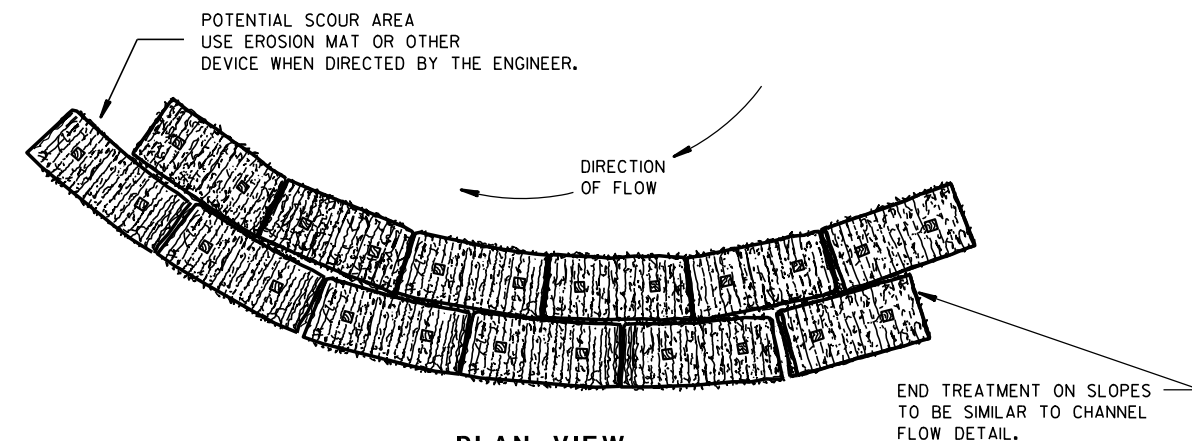
FRONT ELEVATION

TEMPORARY DITCH CHECK USING EROSION BALES ①

GENERAL NOTES

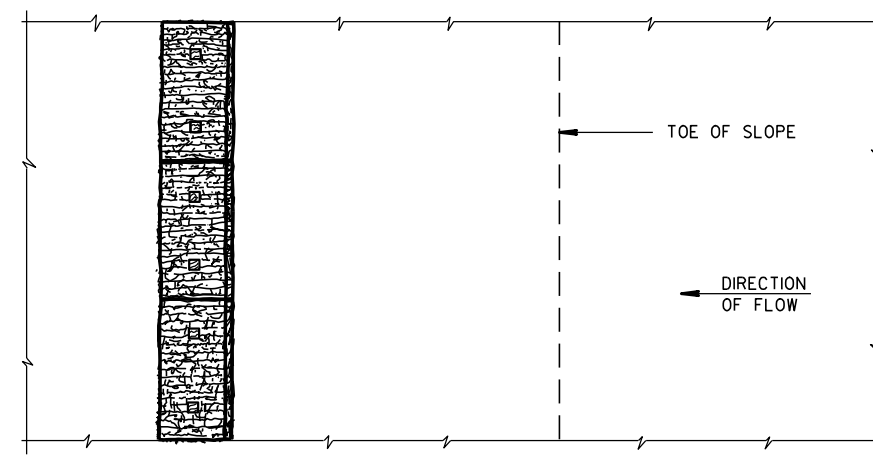
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

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

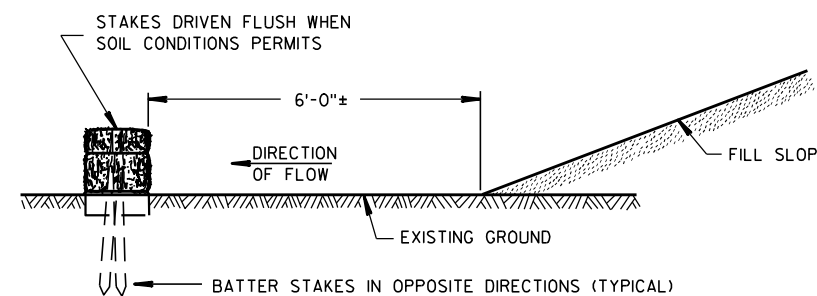


PLAN VIEW

WHEN ALTERING THE DIRECTION OF FLOW



PLAN VIEW



FRONT ELEVATION

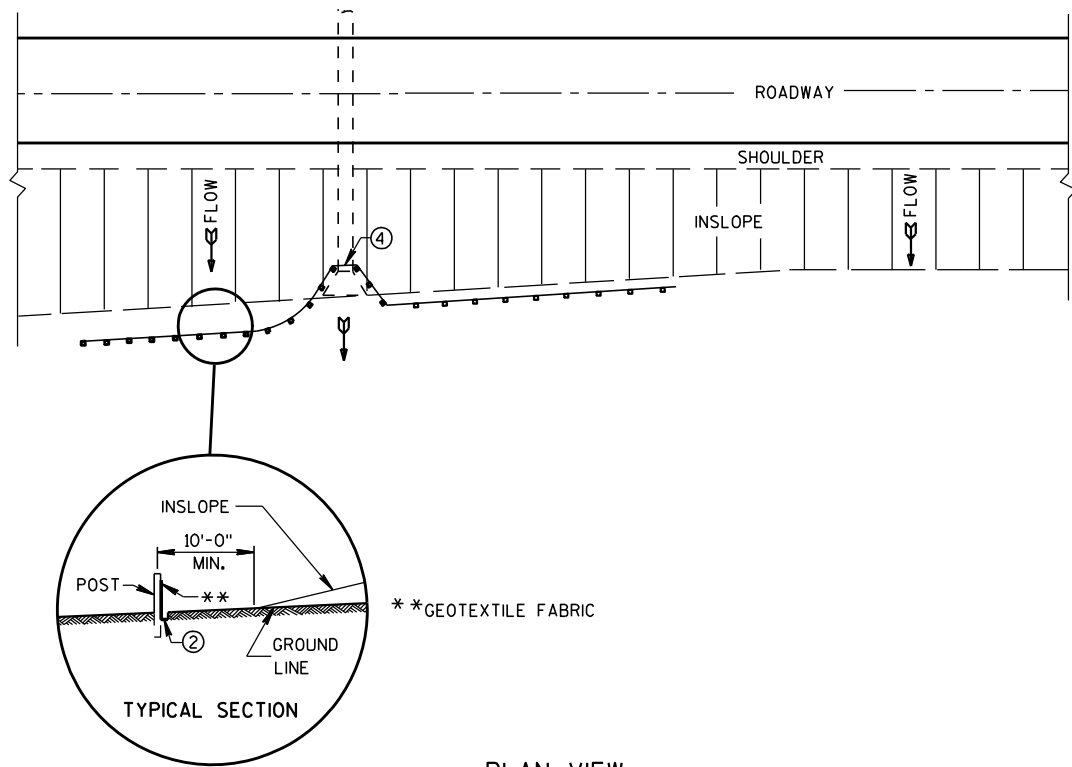
WHEN EXISTING GROUND SLOPES AWAY FROM FILL SLOPE

EROSION BALES FOR SHEET FLOW

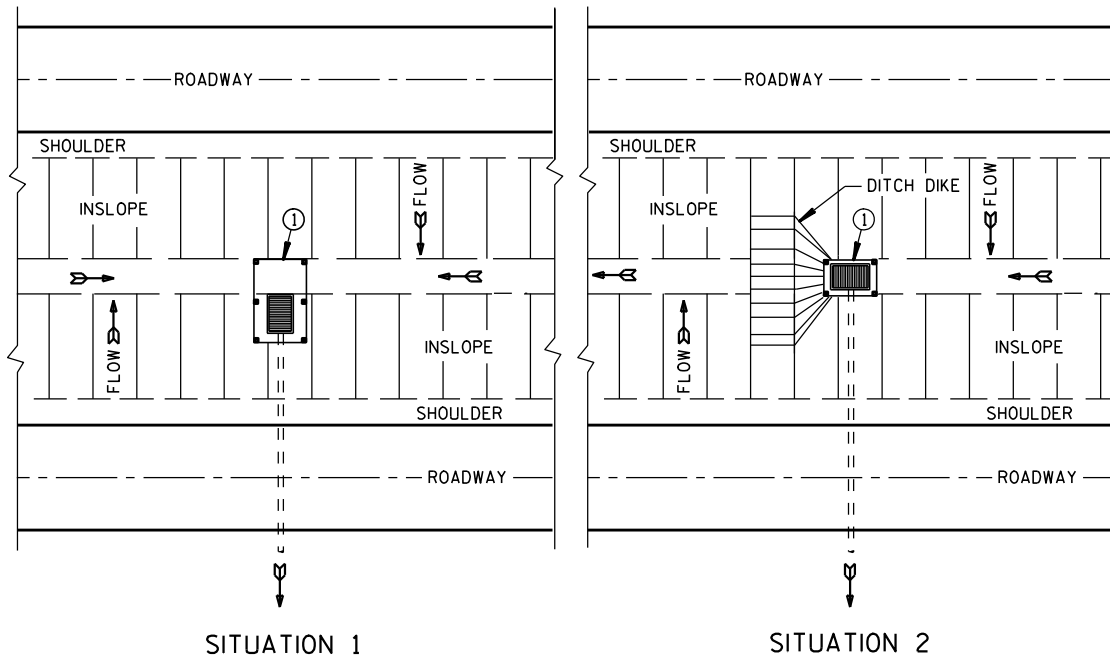
TYPICAL INSTALLATIONS OF  
EROSION BALES / TEMPORARY  
DITCH CHECKS

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
 6/04/02 /S/ Beth Canestra  
 DATE CHIEF ROADWAY DEVELOPMENT ENGINEER  
 FHWA



PLAN VIEW  
TYPICAL APPLICATION OF SILT FENCE

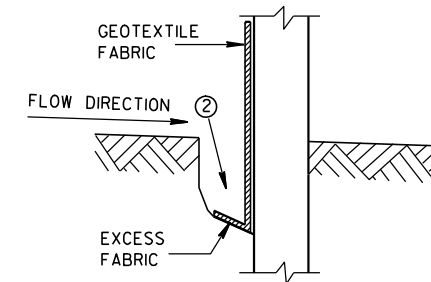


SITUATION 1 SITUATION 2  
PLAN VIEW  
SILT FENCE AT MEDIAN SURFACE DRAINS

**GENERAL NOTES**

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

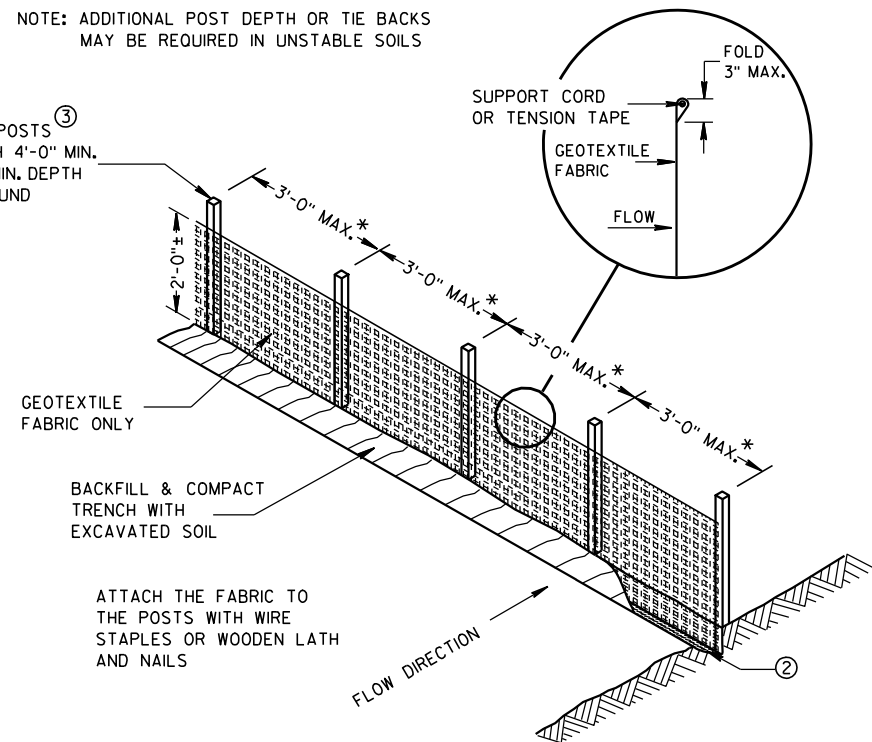
- ① HORIZONTAL BRACE REQUIRED WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS.
- ② FOR MANUAL INSTALLATIONS THE TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.
- ③ WOOD POSTS SHALL BE A MINIMUM SIZE OF 1 1/8" X 1 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

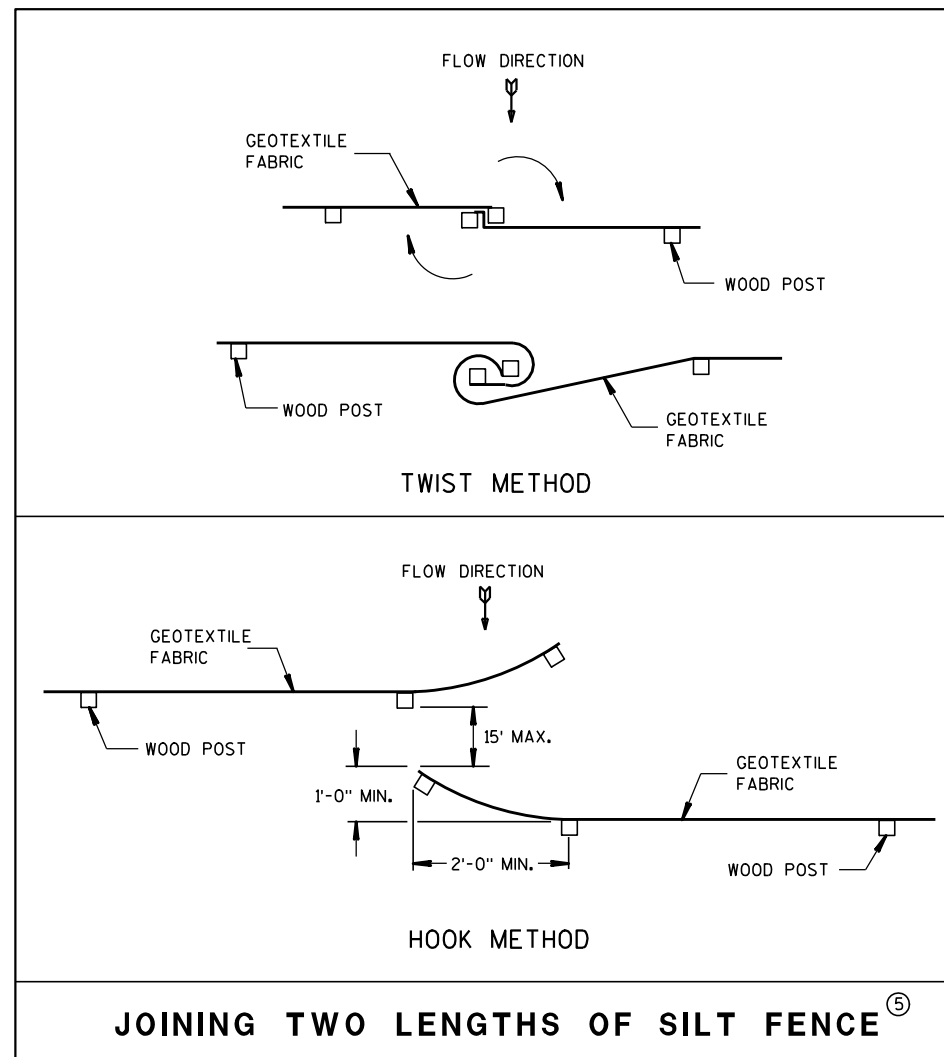
NOTE: ADDITIONAL POST DEPTH OR TIE BACKS MAY BE REQUIRED IN UNSTABLE SOILS

WOOD POSTS ③  
LENGTH 4'-0" MIN.  
2'-0" MIN. DEPTH  
IN GROUND

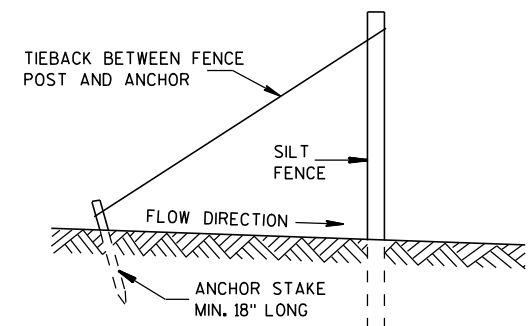


\* NOTE: 8'-0" POST SPACING ALLOWED IF A WOVEN GEOTEXTILE FABRIC IS USED.

SILT FENCE



JOINING TWO LENGTHS OF SILT FENCE ⑤



SILT FENCE TIE BACK  
(WHEN REQUIRED BY THE ENGINEER)

**SILT FENCE**

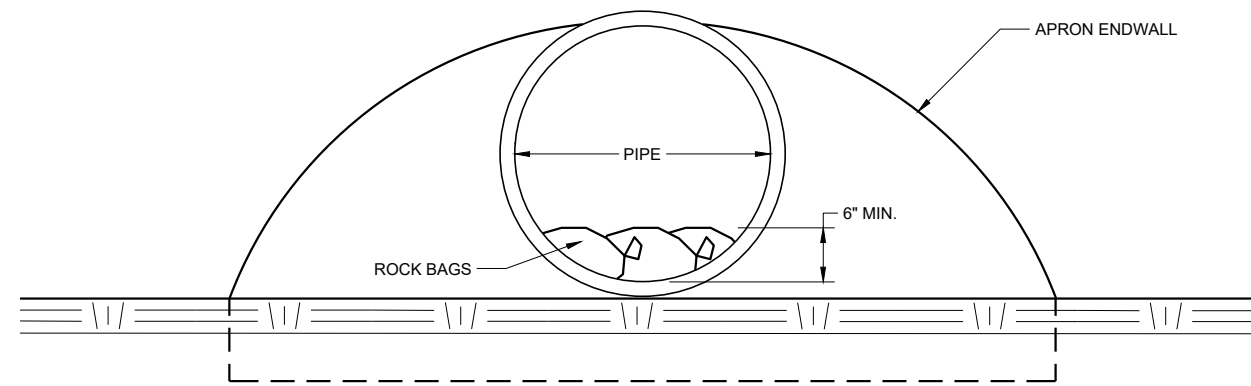
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED

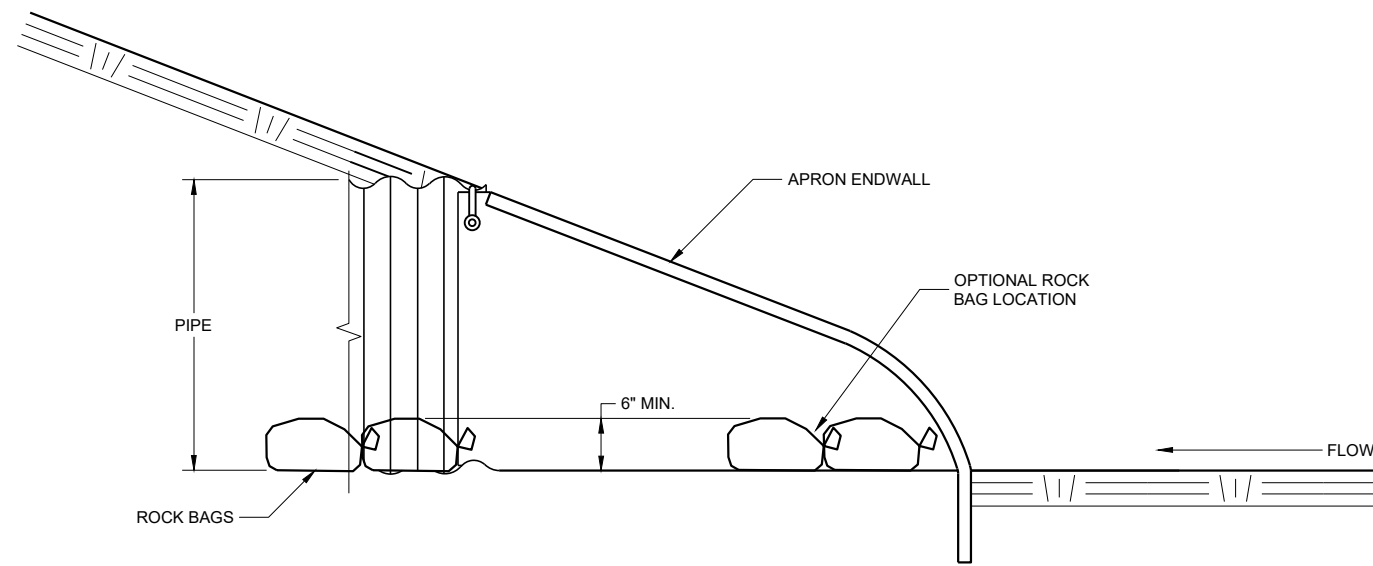
4-29-05  
DATE

FHWA

/S/ Beth Canestra  
CHIEF ROADWAY DEVELOPMENT ENGINEER



**END VIEW**



**SIDE VIEW**

**CULVERT PIPE CHECK**  
(INSTALL ON INLET END ONLY)

**CULVERT PIPE CHECK**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
May 2019 /S/ Daniel Schave  
DATE EROSION CONTROL ENGINEER

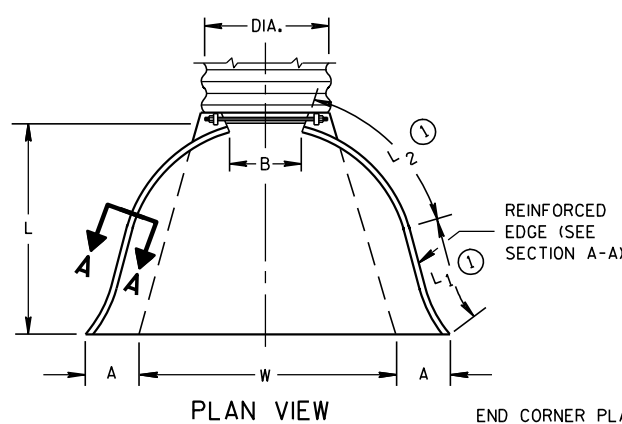
FHWA

METAL APRON ENDWALLS											
PIPE DIA. (IN.)	MIN. THICK. (Inches)		DIMENSIONS (Inches)							APPROX. SLOPE	BODY
	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1	L2	W (±2")		
12	.064	.060	6	6	6	21	12	17 1/2	24	2 1/2 to 1	1 Pc.
15	.064	.060	7	8	6	26	14	21 3/4	30	2 1/2 to 1	1 Pc.
18	.064	.060	8	10	6	31	15	28 1/4	36	2 1/2 to 1	1 Pc.
21	.064	.060	9	12	6	36	18	29 5/8	42	2 1/2 to 1	1 Pc.
24	.064	.075	10	13	6	41	18	37 1/4	48	2 1/2 to 1	1 Pc.
30	.079	.075	12	16	8	51	18	52 1/4	60	2 1/2 to 1	1 Pc.
36	.079	.105	14	19	9	60	24	59 3/4	72	2 1/2 to 1	2 Pc.
42	.109	.105	16	22	11	69	24	75 5/8	84	2 1/2 to 1	2 Pc.
48	.109	.105	18	27	12	78	24	81	90	2 1/4 to 1	3 Pc.
54	.109	.105	18	30	12	84	30	85 1/2	102	2 1/4 to 1	3 Pc.
60	.109x	.105x	18	33	12	87	—	—	114	2 to 1	3 Pc.
66	.109x	.105x	18	36	12	87	—	—	120	2 to 1	3 Pc.
72	.109x	.105x	18	39	12	87	—	—	126	2 to 1	3 Pc.
78	.109x	.105x	18	42	12	87	—	—	132	1 1/2 to 1	3 Pc.
84	.109x	.105x	18	45	12	87	—	—	138	1 1/2 to 1	3 Pc.
90	.109x	.105x	18	37	12	87	—	—	144	1 1/2 to 1	3 Pc.
96	.109x	.105x	18	35	12	87	—	—	150	1 1/2 to 1	3 Pc.

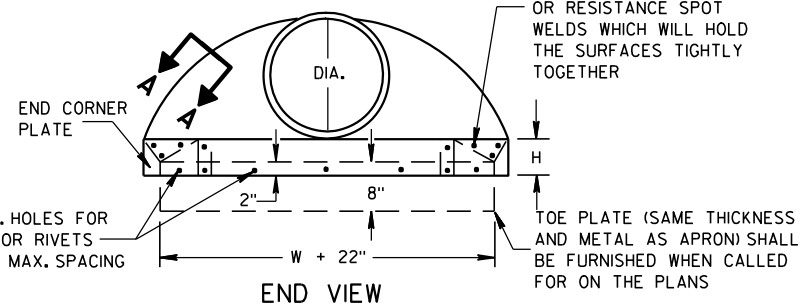
\* EXCEPT CENTER PANEL SEE GENERAL NOTES

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 3/4	73 1/2	60	3 1/2	3 to 1	
36	4	15	63	34 3/4	97 3/4	72	4	3 to 1	
42	4 1/2	21	63	35	98	78	4 1/2	3 to 1	
48	5	24	72	26	98	84	5	3 to 1	
54	5 1/2	27	65	33 1/4-35	98 1/4-100	90	5 1/2	2 1/2 to 1	
60	6	30-35	60	39	99	96	5	2 to 1	
66	6 1/2	24-30	72-78	21-27	99	102	5 1/2	2 to 1	
72	7	24-36	78	21	99	108	6	2 to 1	
78	7 1/2	24-36	78	21	99	114	6 1/2	2 to 1	
84	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2 to 1	
90	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	1 1/2 to 1	

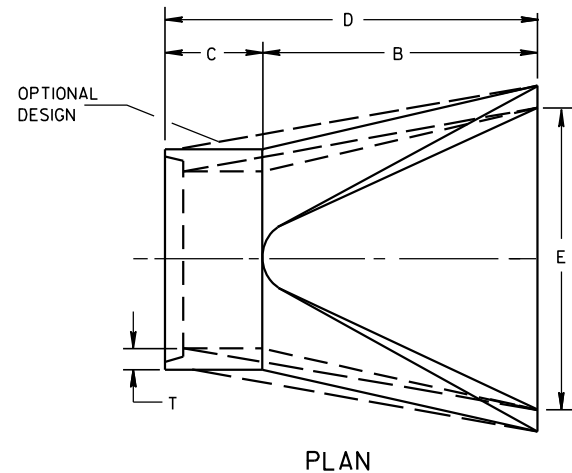
\* MINIMUM  
\*\* MAXIMUM



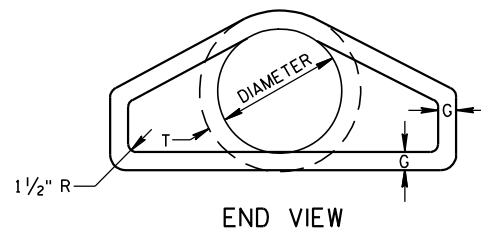
END CORNER PLATES MAY BE FASTENED TO APRON PROPER BY BOLTS, RIVETS, OR RESISTANCE SPOT WELDS WHICH WILL HOLD THE SURFACES TIGHTLY TOGETHER



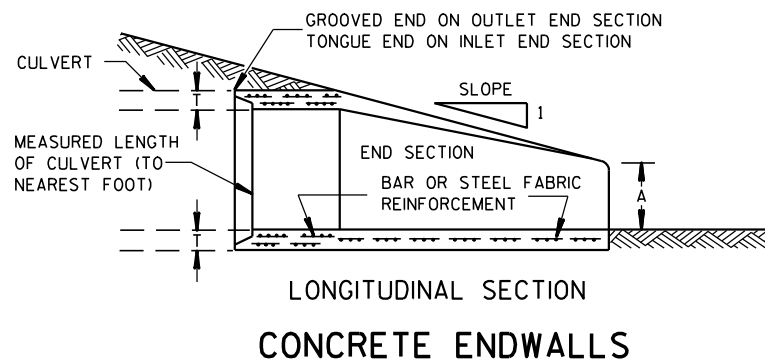
SIDE ELEVATION  
METAL ENDWALLS



PLAN

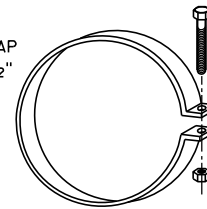


END VIEW

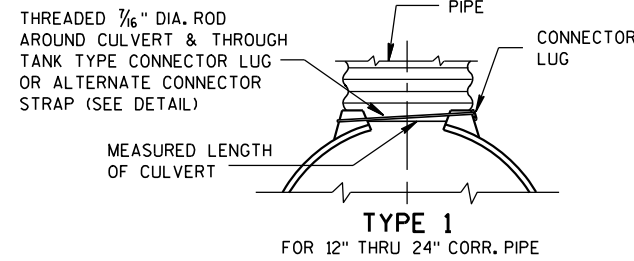


LONGITUDINAL SECTION  
CONCRETE ENDWALLS

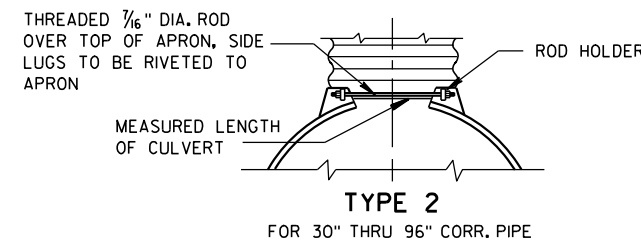
1" WIDE, 12 GA. (0.109" THICK) GALVANIZED STRAP WITH STANDARD 6" X 1/2" BAND BOLT AND NUT



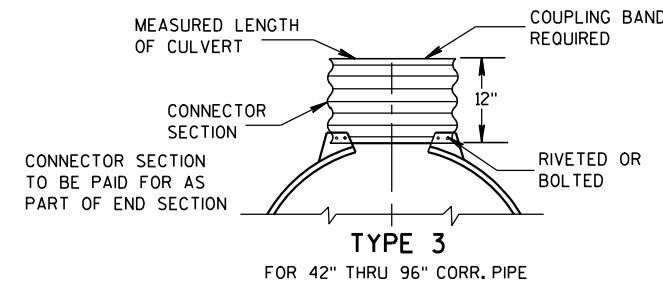
ALTERNATE FOR TYPE 1 CONNECTION  
END SECTION CONNECTOR STRAP



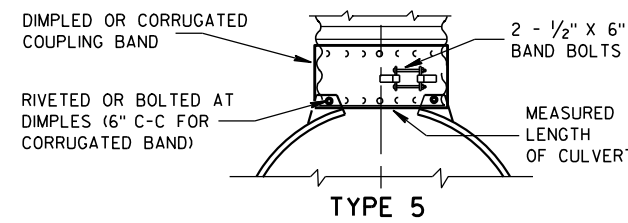
TYPE 1  
FOR 12" THRU 24" CORR. PIPE



TYPE 2  
FOR 30" THRU 96" CORR. PIPE



TYPE 3  
FOR 42" THRU 96" CORR. PIPE



ALTERNATE FOR:  
ALL SIZES CORRUGATED CIRCULAR PIPE

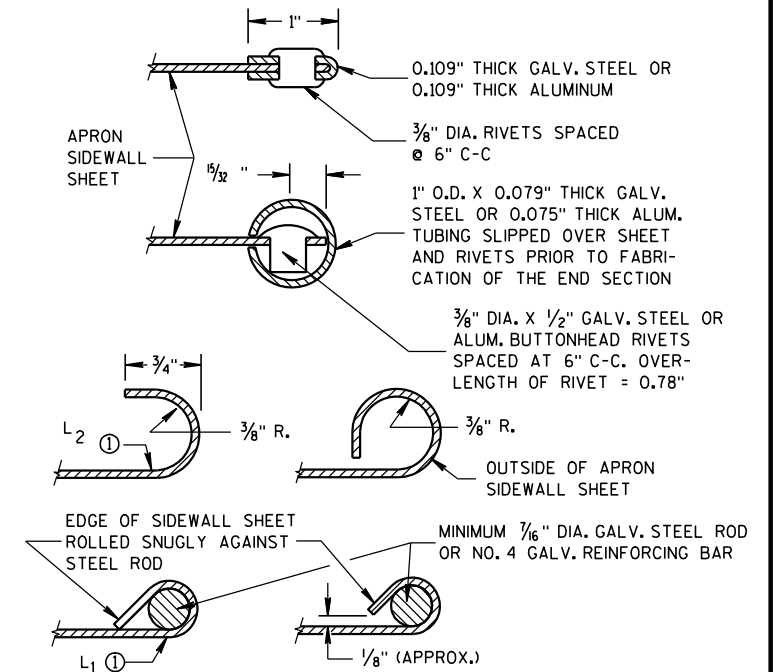
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE.

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



SECTION A-A

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 VICE 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.

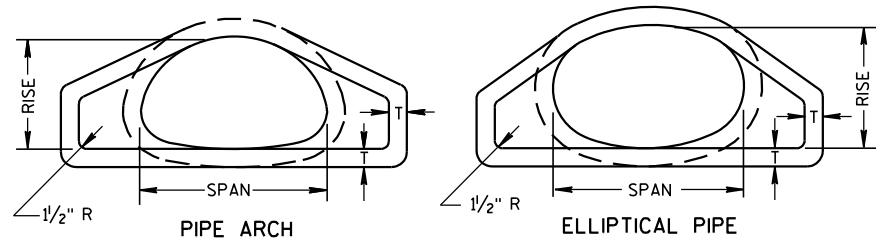
WHERE TWO OR MORE PIPES WITH APRON ENDWALLS ARE LAID ADJACENT TO EACH OTHER, THEY SHALL BE SEPARATED BY A DISTANCE SUFFICIENT TO PROVIDE A MINIMUM CLEARANCE OF 6 INCHES BETWEEN APRON ENDWALLS.

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

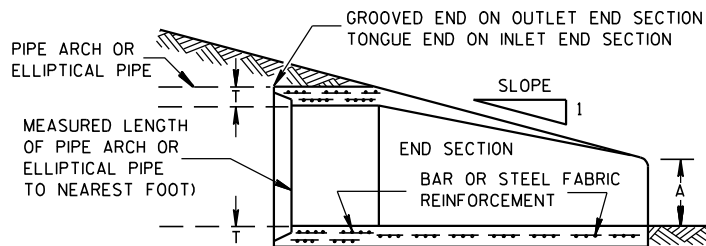
APRON ENDWALLS FOR  
CULVERT PIPE

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

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

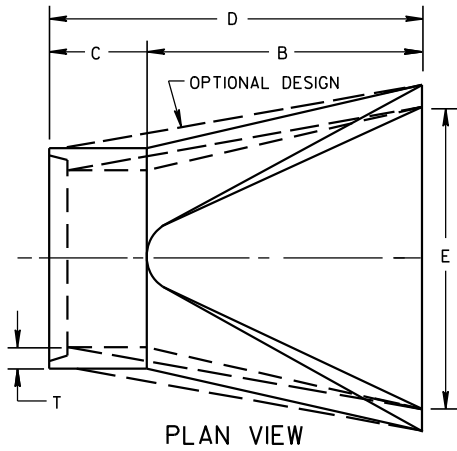


END VIEW



LONGITUDINAL SECTION

CONCRETE ENDWALLS



PLAN VIEW

2- 2/3" X 1/2" CORRUGATIONS													
EQUIV. DIA. (Inches)	(Inches)		MIN. THICK. (Inches)		DIMENSIONS (Inches)							APPROX. SLOPE	BODY
	SPAN	RISE	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1 (⓪)	L2 (⓪)	W (±2")		
15	17	13	.064	.060	7	9	6	19	14	16	30	2 1/2 to 1	1 Pc.
18	21	15	.064	.060	7	10	6	23	14	19 3/8	36	2 1/2 to 1	1 Pc.
21	24	18	.064	.060	8	12	6	28	18	21 3/4	42	2 1/2 to 1	1 Pc.
24	28	20	.064	.060	9	14	6	32	18	27 1/2	48	2 1/2 to 1	1 Pc.
30	35	24	.079	.075	10	16	6	39	18	37 5/8	60	2 1/2 to 1	1 Pc.
36	42	29	.079	.075	12	18	8	46	24	45 3/8	75	2 1/2 to 1	1 Pc.
42	49	33	.109	.105	13	21	9	53	24	54 3/4	85	2 1/2 to 1	2 Pc.
48	57	38	.109	.105	18	26	12	63	24	68	90	2 1/2 to 1	3 Pc.
54	64	43	.109	.105	18	30	12	70	24	72 3/4	102	2 1/4 to 1	3 Pc.
60	71	47	.109*	.105*	18	33	12	77	30	82 1/4	114	2 1/4 to 1	3 Pc.
66	77	52	.109*	.105*	18	36	12	77	—	—	126	2 to 1	3 Pc.
72	83	57	.109*	.105*	18	39	12	77	—	—	138	2 to 1	3 Pc.

3" X 1" CORRUGATIONS													
EQUIV. DIA. (Inches)	(Inches)		MIN. THICK. (Inches)		DIMENSIONS (Inches)							APPROX. SLOPE	BODY
	SPAN	RISE	STEEL	ALUM.	A (±1")	B (MAX.)	H (±1")	L (±1 1/2")	L1 (⓪)	L2 (⓪)	W (±2")		
48	53	41	.109	.105	18	26	12	63	24	72 3/4	90	2 1/2 to 1	2 Pc.
54	60	46	.109	.105	18	30	12	70	30	82 1/4	102	2 to 1	2 Pc.
60	66	51	.109*	.105*	18	33	12	77	—	—	114	1 1/2 to 1	3 Pc.
66	73	55	.109*	.105*	18	36	12	77	—	—	126	1 1/2 to 1	3 Pc.
72	81	59	.109*	.105*	18	39	12	77	—	—	138	2 to 1	3 Pc.
78	87	63	.109*	.105*	22	38	12	77	—	—	148	1 1/2 to 1	3 Pc.
84	95	67	.109*	.105*	22	34	12	77	—	—	162	1 1/2 to 1	3 Pc.
90	103	71	.109*	.105*	22	38	12	77	—	—	174	1 1/2 to 1	3 Pc.
96	112	75	.109*	.105*	24	40	12	77	—	—	174	1 1/2 to 1	3 Pc.

NOTE: ALL SPLICES TO BE LAP RIVETED OR BOLTED. \* EXCEPT CENTER PANEL SEE GENERAL NOTES

REINFORCED CONCRETE PIPE ARCH										
EQUIV. DIA. (Inches)	DIMENSIONS (Inches)									APPROX. SLOPE
	**SPAN	**RISE	T	A	B	C	D	E		
24	29	18	3	8 1/2	39	33	72	48	3 to 1	
30	36	22	3 1/2	9 1/2	50	46	96	60	3 to 1	
36	44	27	4	11 1/8	60	36	96	72	3 to 1	
42	51	31	4 1/2	15 5/16	60	36	96	78	3 to 1	
48	58	36	5	21	60	36	96	84	3 to 1	
54	65	40	5 1/2	25 1/2	60	36	96	90	3 to 1	
60	73	45	6	31	60	36	96	96	3 to 1	
72	88	54	7	31	60	39	99	120	2 to 1	
84	102	62	8	28 1/2	83	19	102	144	2 to 1	

REINFORCED CONCRETE ELLIPTICAL PIPE										
EQUIV. DIA. (Inches)	DIMENSIONS (Inches)									APPROX. SLOPE
	**SPAN	**RISE	T	A	B	C	D	E		
24	30	19	3 1/4	8 1/2	39	33	72	48	3 to 1	
30	38	24	3 3/4	9 1/2	54	18	72	60	3 to 1	
36	45	29	4 1/2	11 1/8	60	24	84	72	2 1/2 to 1	
42	53	34	5	15 3/4	60	36	96	78	2 1/2 to 1	
48	60	38	5 1/2	21	60	36	96	84	2 1/2 to 1	
54	68	43	6	25 1/2	60	36	96	90	2 1/2 to 1	
60	76	48	6 1/2	30	60	36	96	96	2 1/2 to 1	

\*\*NOMINAL SIZE

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.

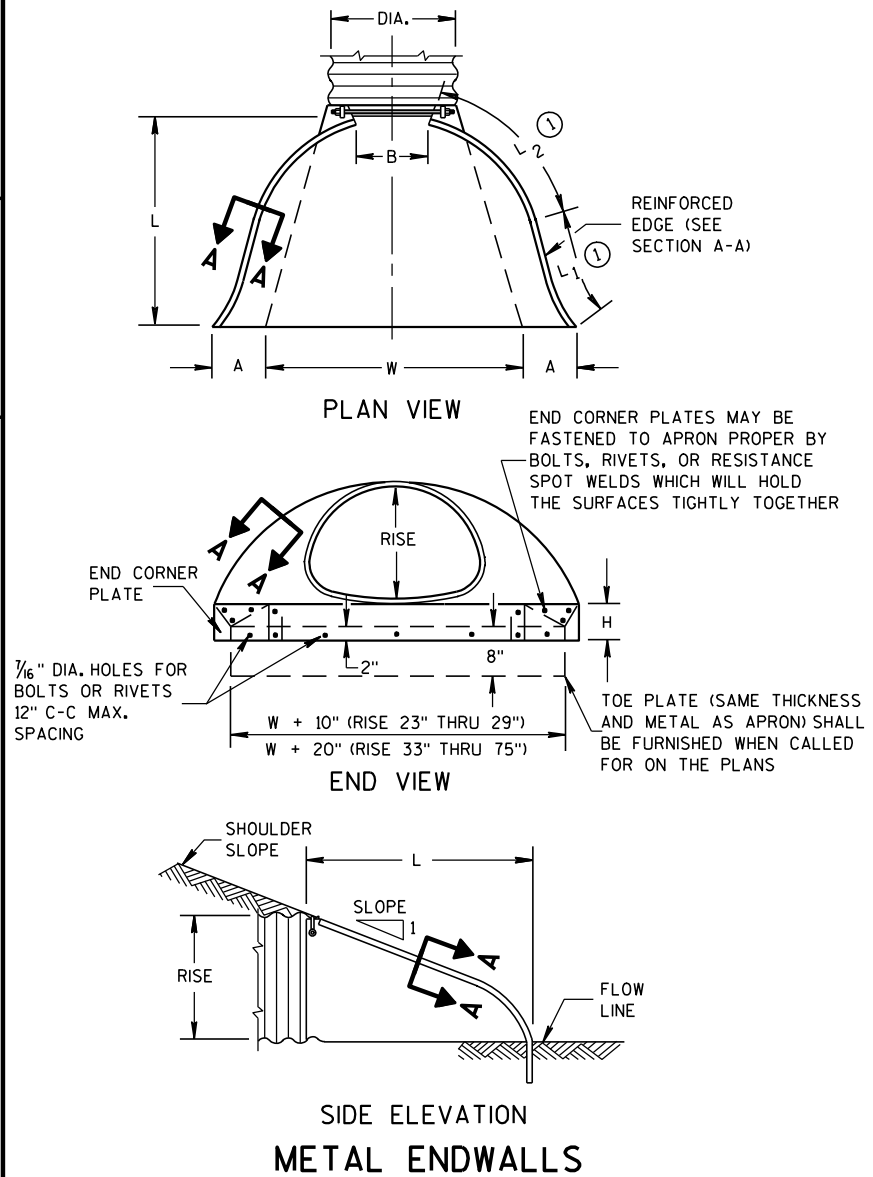
CONCRETE APRON ENDWALLS MAY NOT BE USED WITH GALVANIZED STEEL OR ALUMINUM CULVERT PIPE OR VISE VERSA. GALVANIZED STEEL OR ALUMINUM APRON ENDWALLS SHALL NORMALLY BE INSTALLED ON CULVERT PIPE OF THE SAME METAL.

ALL THREE PIECE STEEL APRON ENDWALLS FOR 66" X 51" PIPE ARCH AND LARGER SHALL HAVE 0.109" SIDES AND 0.138" CENTER PANELS. ALL THREE PIECE ALUMINUM APRON ENDWALLS FOR 66" X 51" PIPE ARCH 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 ARCH PERIMETER.

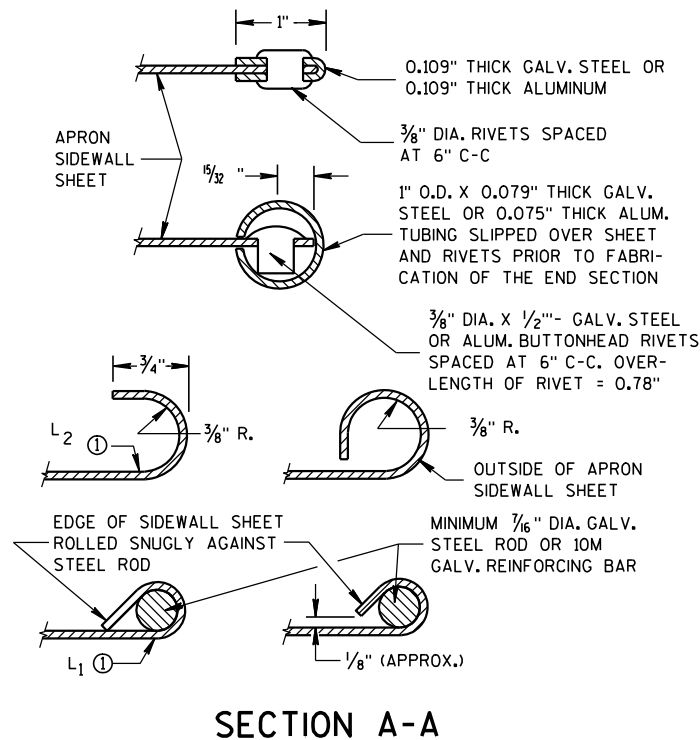
LAP SEAMS SHALL BE TIGHTLY JOINED BY GALVANIZED RIVETS OR BOLTS FOR STEEL UNITS AND ALUMINUM RIVETS AND BOLTS FOR ALUMINUM UNITS. FOR THE 77" X 52" THROUGH 112" X 75" APRON ENDWALL SIZES, THE REINFORCED EDGES AND CENTER PANEL SEAMS SHALL BE FURTHER REINFORCED WITH GALVANIZED STEEL OR ALUMINUM STIFFENER 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.

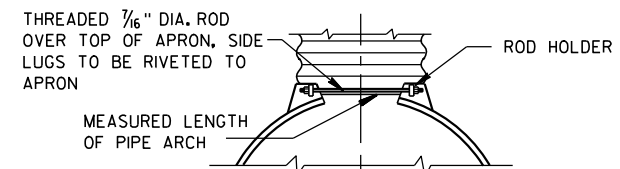
⓪ FOR PIPE ARCH SIZES UP TO 73" X 55" A 180° ROLLED EDGE MAY BE USED INSTEAD OF STEEL ROD REINFORCEMENT. SEE SECTION A-A.



SIDE ELEVATION METAL ENDWALLS

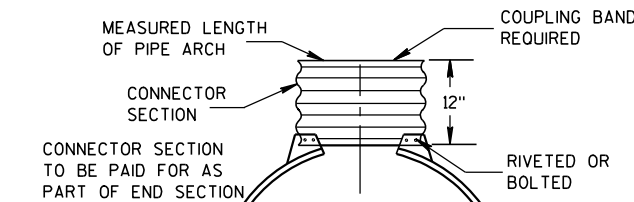


SECTION A-A



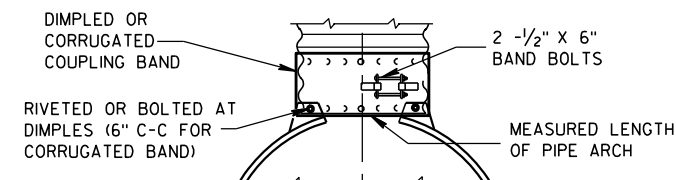
TYPE 2

FOR 17" X 13" THRU 112" X 75" PIPE ARCH



TYPE 3

FOR 64" X 43" THRU 112" X 75" PIPE ARCH



TYPE 5

ALTERNATE FOR: ALL SIZES CORRUGATED PIPE ARCHES

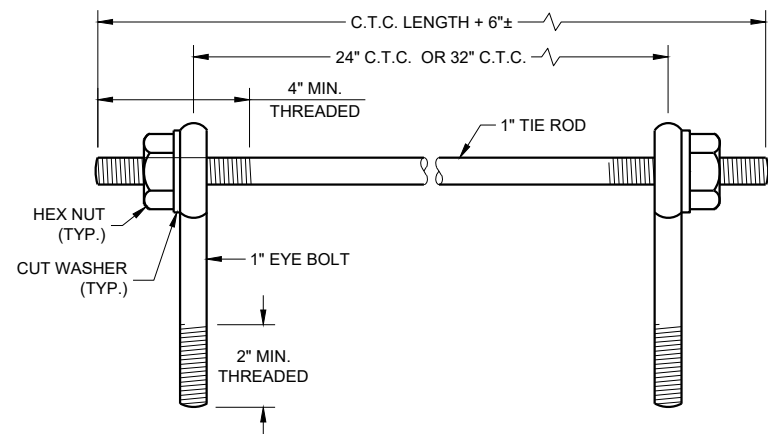
NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL, AND CORRUGATED BAND FITS INSIDE ENDWALL.

CONNECTION DETAILS

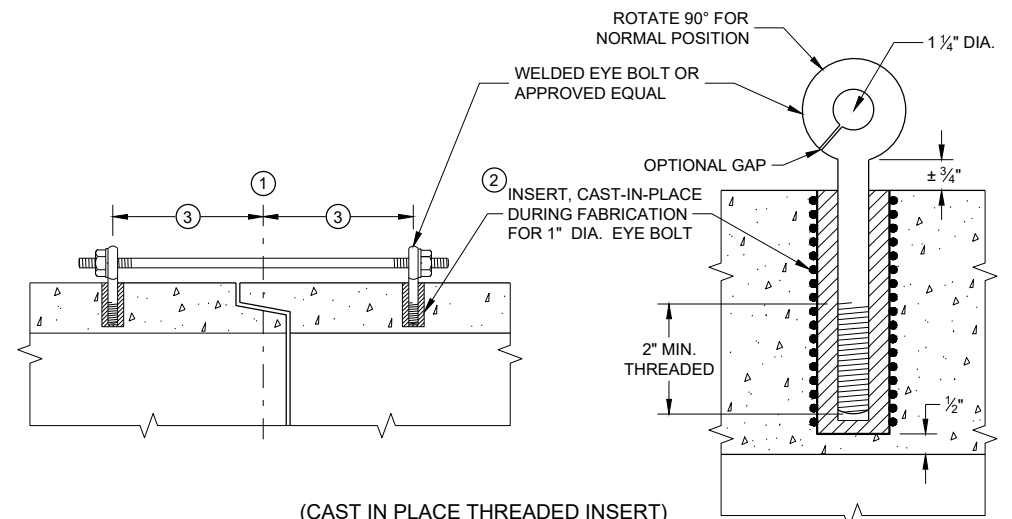
APRON ENDWALLS FOR PIPE ARCH AND ELLIPTICAL PIPE

STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION

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



**EYE BOLTS AND TIE ROD**  
**EYE BOLT AND TIE ROD ASSEMBLY (ALTERNATE NO. 1)**



(CAST IN PLACE THREADED INSERT)  
**LONGITUDINAL SECTIONS**

**GENERAL NOTES**

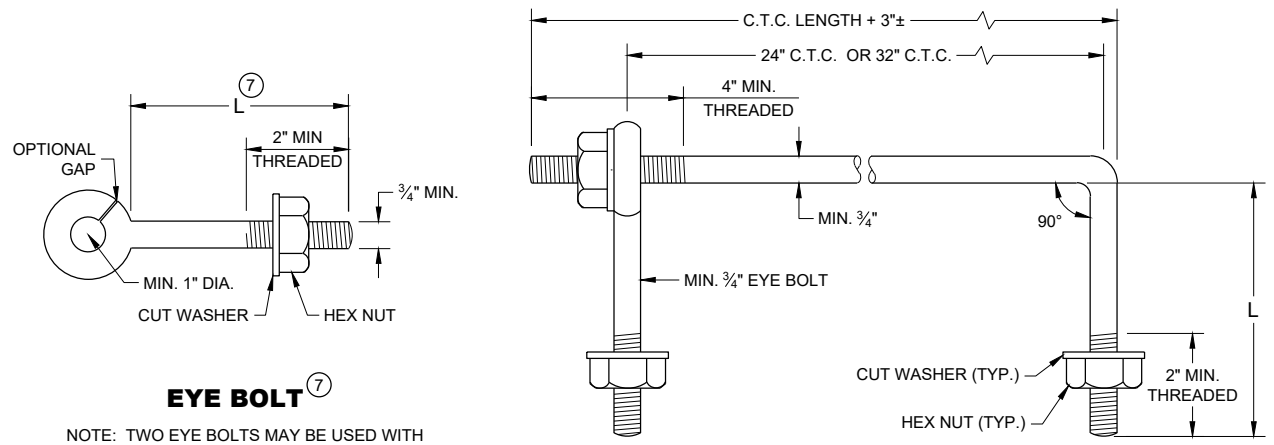
DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

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.

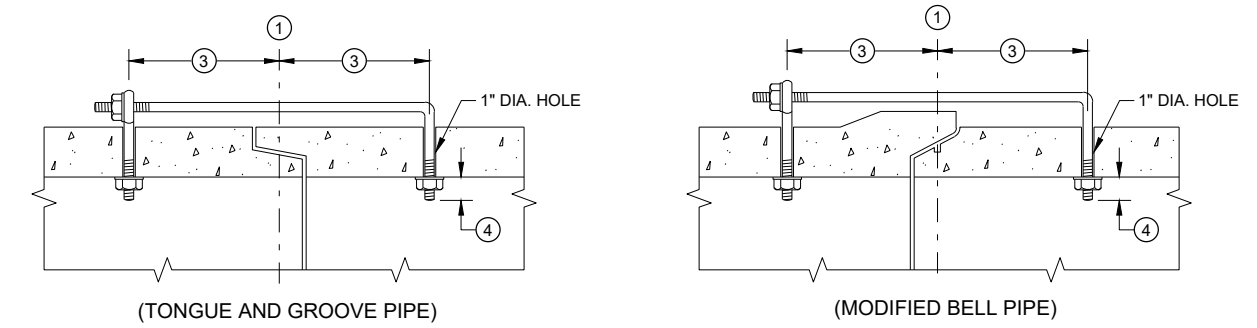
JOINT TIES TO BE HOT-DIP GALVANIZED PER ASTM A 153.

- ① CENTER LINE 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 PER THE APPLICABLE DETAIL, AND EQUAL DISTANCE FROM THE CENTERLINE OF THE JOINT.
- 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.
- ⑦ EYE BOLT LENGTH DETERMINED BY WALL THICKNESS, BELL THICKNESS AND BOLT PROJECTION INSIDE PIPE.



**EYE BOLT AND TIE ROD**

**EYE BOLT**  
 NOTE: TWO EYE BOLTS MAY BE USED WITH A 30" OR 38" LONG THREADED ROD IN LIEU OF THE 90° BENT TIE ROD.



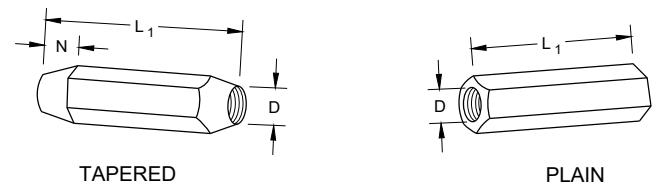
**LONGITUDINAL SECTION**  
 (JOINT TIES FOR 18" TO 66" DIA. CONCRETE PIPE)

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

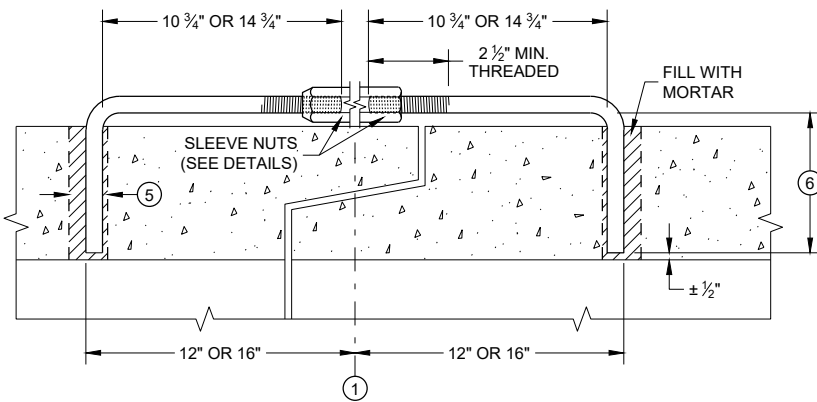
**ADJUSTABLE TIE ROD TABLE**

PIPE DIAMETER	TIE ROD DIAMETER	D	L <sub>1</sub>	N
12 - 60	5/8	5/8	5	1/2
66 - 84	3/4	3/4	5	1/2
90 - 144	1	1	7	1 1/16

DIMENSIONS SHOWN ARE IN INCHES

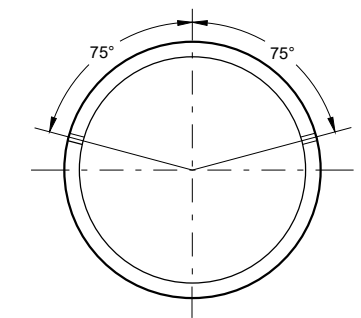


**RIGHT AND LEFT THREADS SLEEVE NUTS**



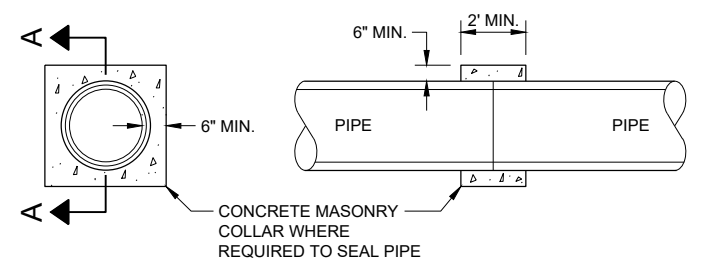
**LONGITUDINAL SECTION**

**ADJUSTABLE TIE ROD (ALTERNATE NO. 3)**



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

**TRANSVERSE SECTION**



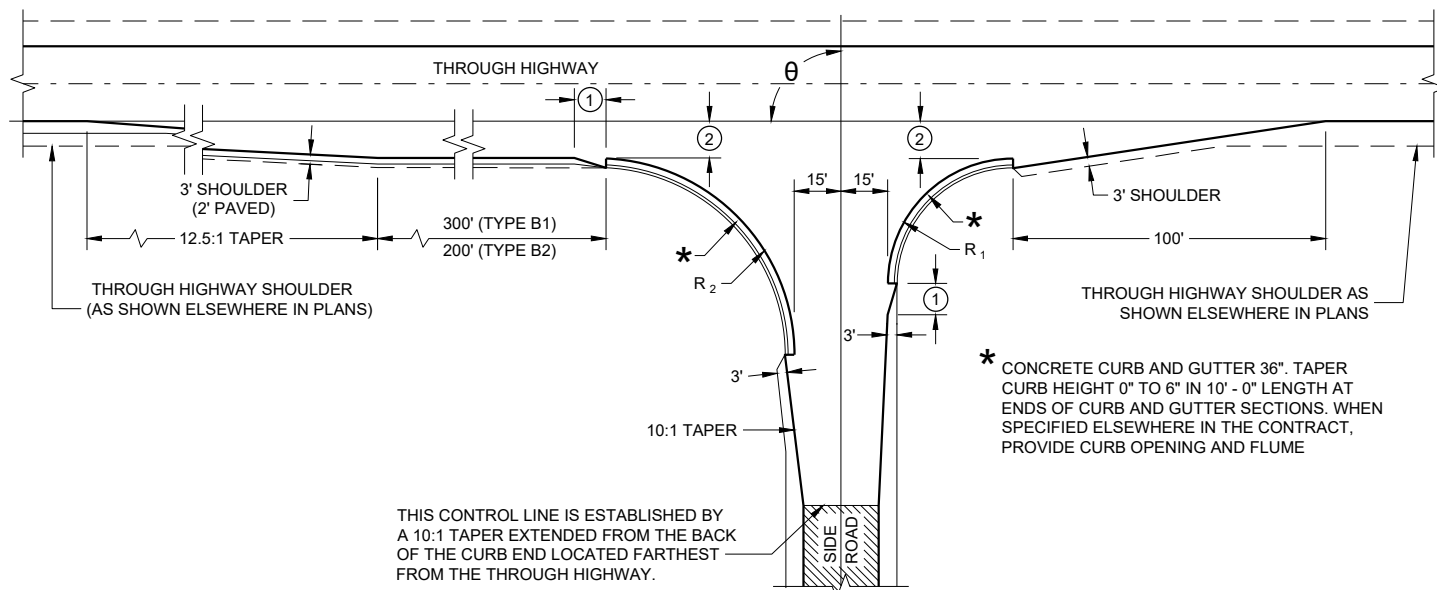
**SECTION A - A**  
**CONCRETE COLLAR DETAIL**

**JOINT TIES FOR CONCRETE PIPE AND CONCRETE COLLAR DETAIL**

STATE OF WISCONSIN  
 DEPARTMENT OF TRANSPORTATION

APPROVED  
 November 2021 /S/ Rodney Taylor  
 DATE ROADWAY STANDARDS DEVELOPMENT  
 ENGINEER  
 FHWA





**TYPE "B1" AND "B2"**

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

$\theta$	$R_1$	$R_2$
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.

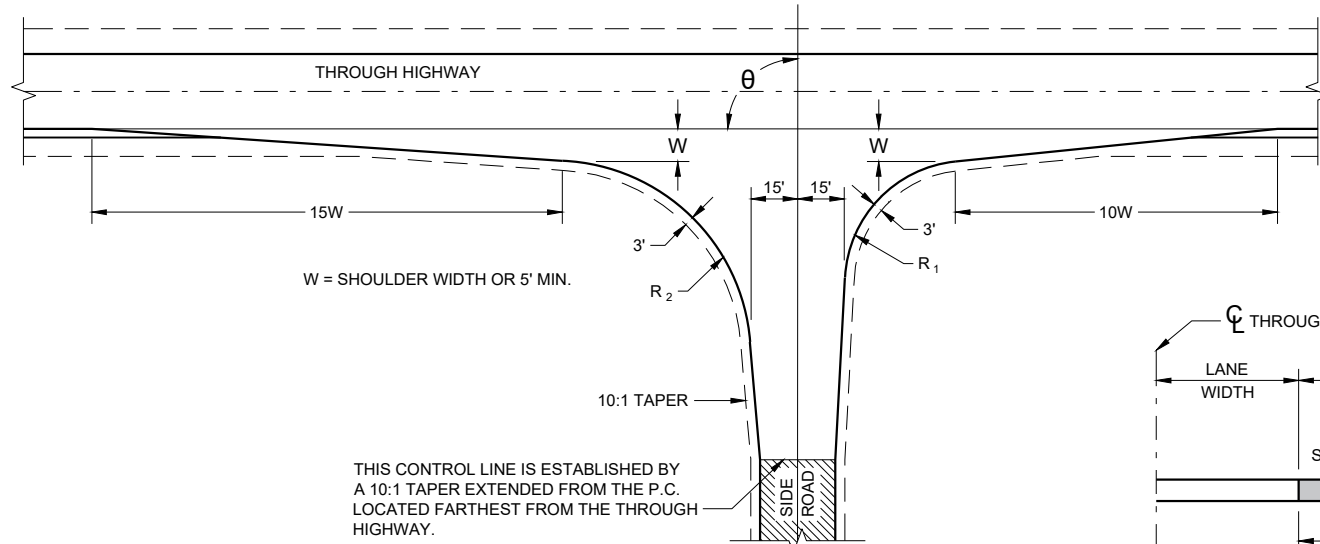
**SIDE ROAD SURFACING NOTE**

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.

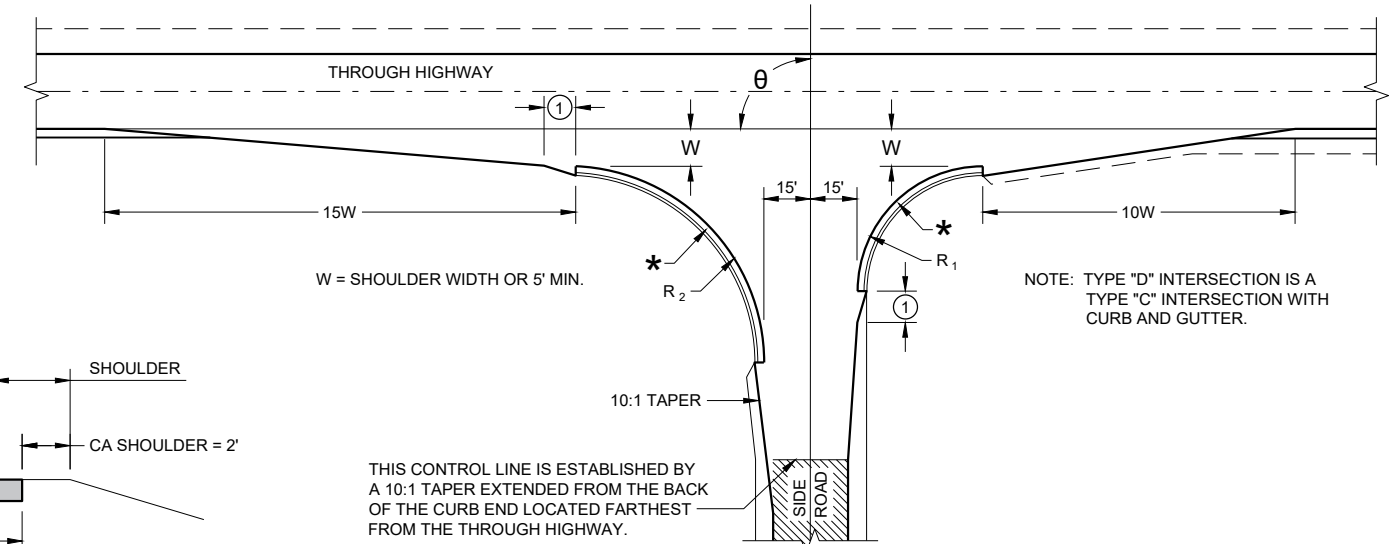
WHEN THE SIDE ROAD IS PRESENTLY PAVED, NEW PAVEMENT SHALL BE PLACED TO THE LIMITS OF DESIGN AS SHOWN AND BEYOND, IF NECESSARY, TO MEET EXISTING PAVEMENT.

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

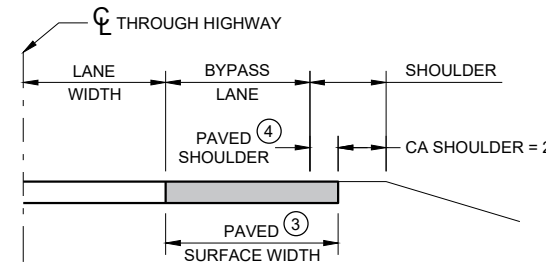
- ① 10-FT TYPICAL.
- ② 12-FT\*\* PLUS ADDITIONAL WIDTH FOR BIKE LANE IF SHOWN ELSEWHERE IN THE PLAN.  
\*\*10-FT MAY BE USED ON TYPE B2 ON RESURFACING PROJECTS IF SPECIFIED IN THE CONTRACT.
- ③ BYPASS LANE PAVED SURFACE WIDTH OUTSIDE OF TRAVEL LANE  
- ASPHALT = 12-FT PLUS PAVED SHOULDER WIDTH  
- PC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



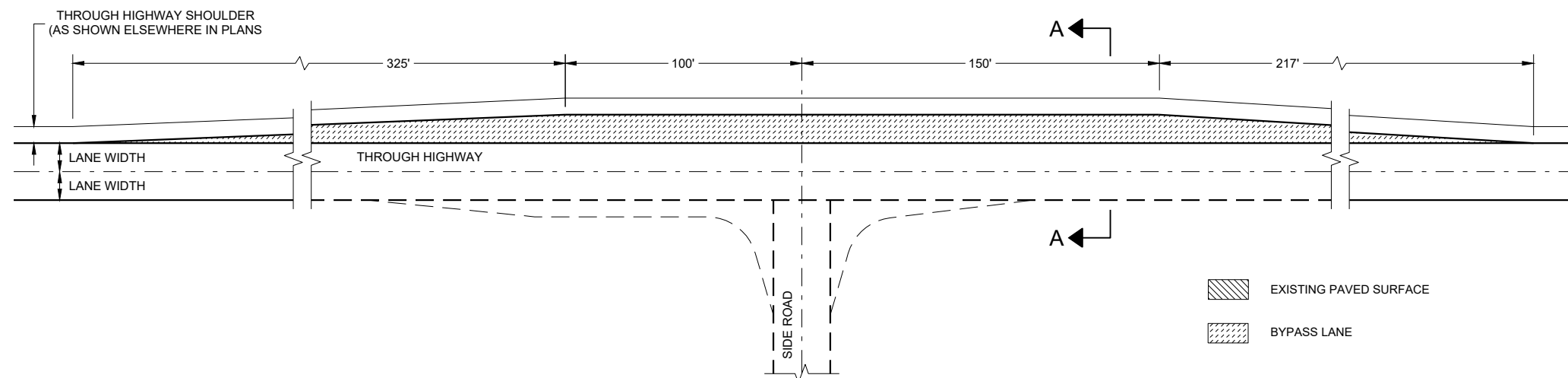
**TYPE "C"**



**TYPE "D"**



**SECTION A - A**  
(SHOWING BYPASS LANE AND SHOULDER)

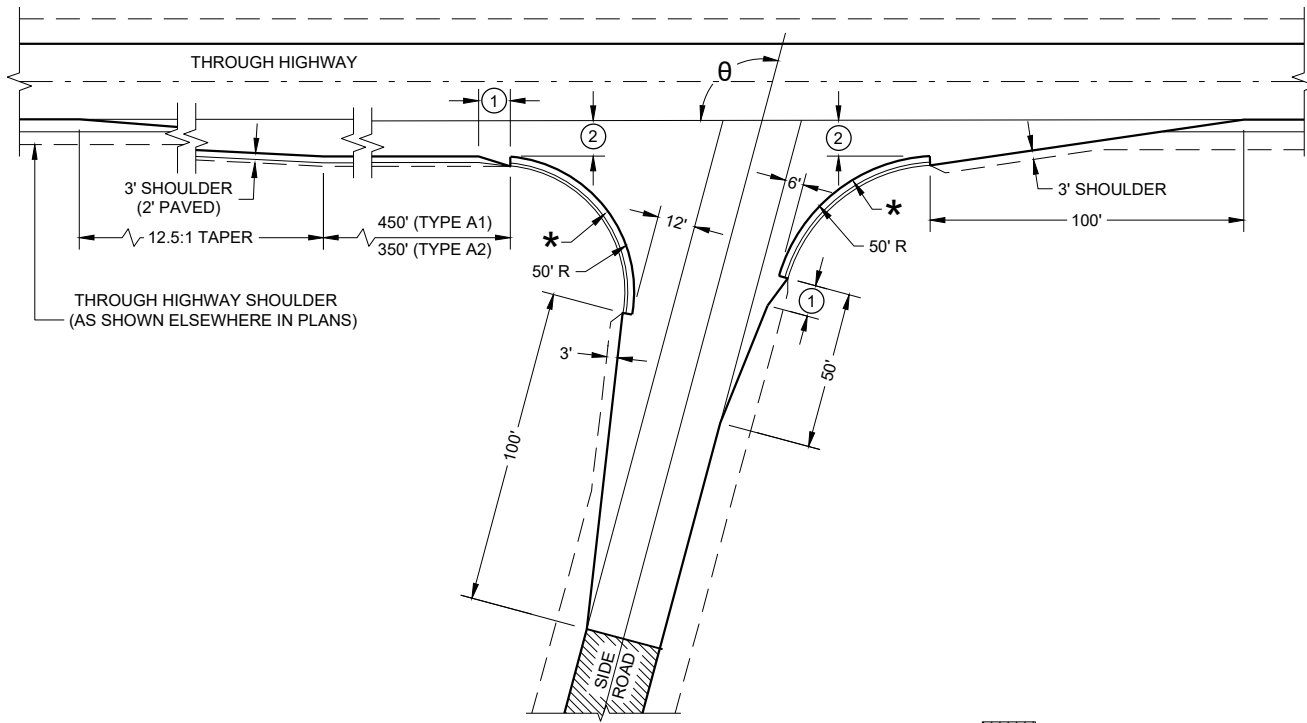


**TEE INTERSECTION BYPASS LANE DETAIL**

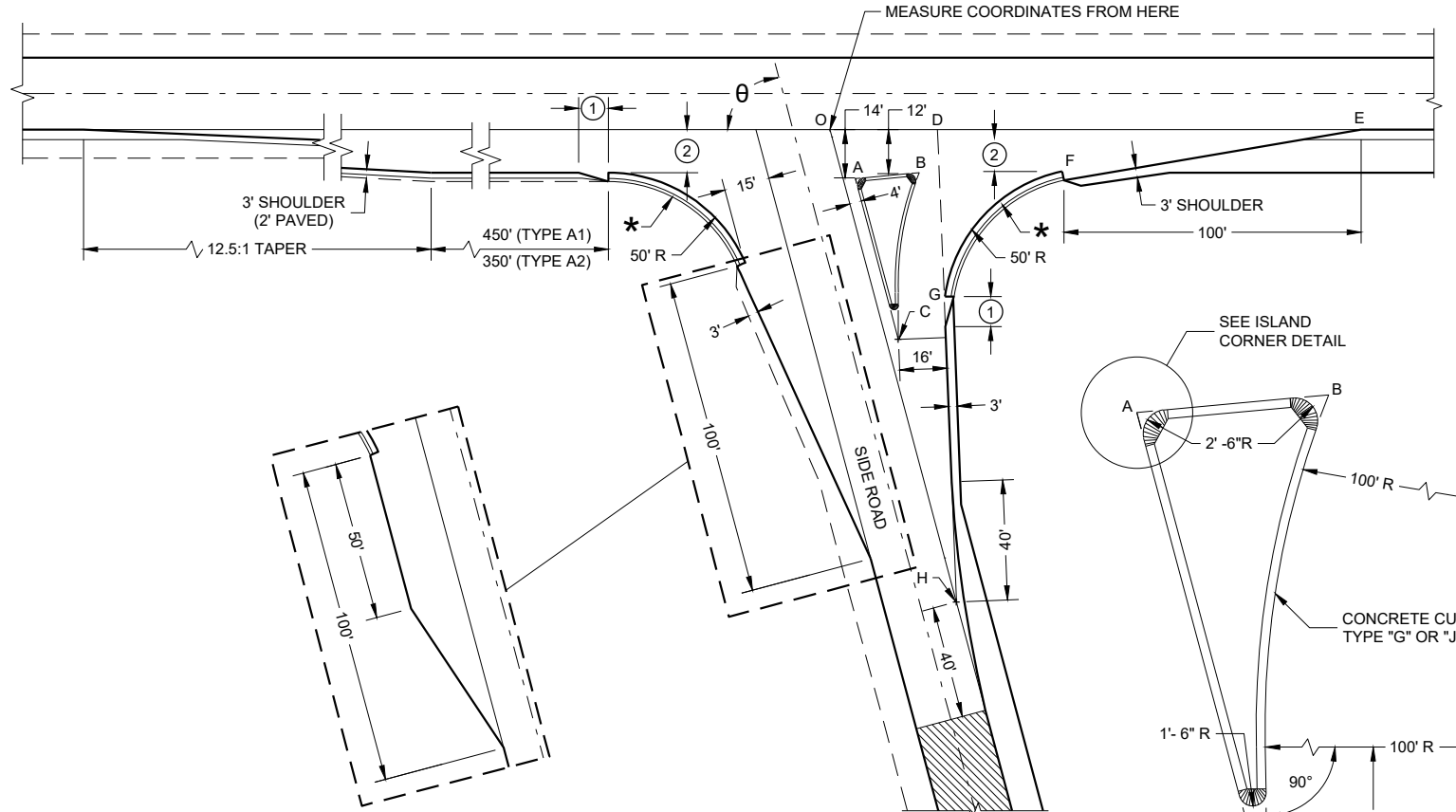
- EXISTING PAVED SURFACE
- BYPASS LANE

**AT GRADE SIDE ROAD INTERSECTION TYPES "B1", "B2", "C", "D" AND TEE INTERSECTION BYPASS LANE**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



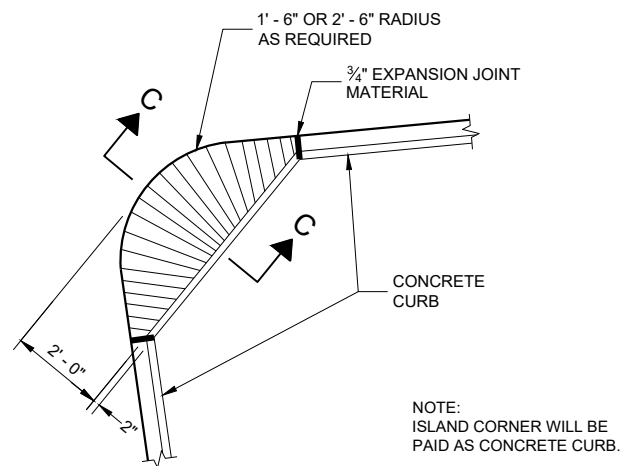
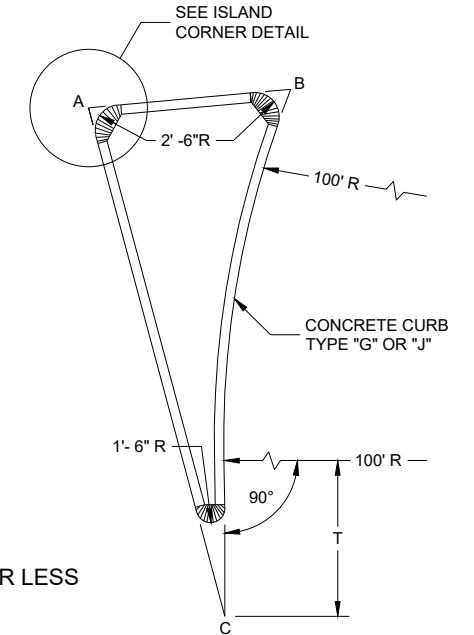
$\theta = \text{MORE THAN } 80^\circ$



SIDE ROAD WIDENING AND TAPER REQUIRED WHERE THE THROUGH HIGHWAY CARRIES TWO-WAY TRAFFIC  
 $\theta = \text{ACUTE ANGLES } 70^\circ \text{ OR LESS}$

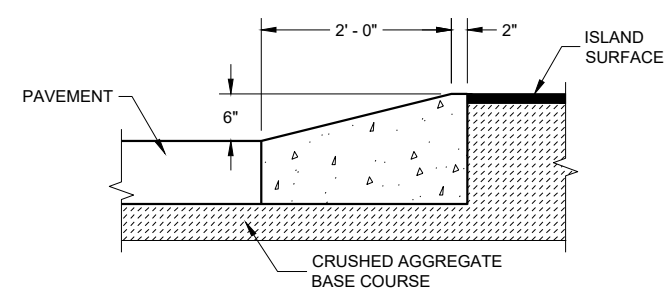
$\theta = \text{ACUTE ANGLES } 80^\circ \text{ OR LESS}$

EXISTING PAVED SURFACE



PLAN VIEW

NOTE: ISLAND CORNER WILL BE PAID AS CONCRETE CURB.



SECTION C - C

ISLAND CORNER DETAIL  
 (TO BE CONSTRUCTED AT ALL ISLAND CORNERS)

TABLE OF DIMENSIONS FOR VARIABLE SIDE ROAD INTERSECTION ANGLES  
 (INTERPOLATE VALUES FOR ANGLES NOT SHOWN)

ANGLE $\theta$ DEGREES	COORDINATES IN FEET (MEASURED FROM POINT 'O')								LENGTH IN FEET				
	A	B	C	D	E	F	G	H	AB	AC	T	OJ	OH
60	12.7	44.9	46.4	41.9	205.0	104.6	64.0	85.0	32.3	67.4	4.9	85.9	169.9
65	10.9	39.0	37.8	39.4	196.1	95.7	54.1	70.5	28.2	63.6	8.5	80.9	166.9
70	9.4	33.9	29.8	37.4	188.3	87.8	45.6	56.1	24.6	59.7	11.5	76.1	164.1
75	7.9	29.3	22.3	35.7	181.2	80.7	38.2	41.8	21.5	55.8	13.8	71.4	161.4
80	6.5	25.4	15.6	34.4	174.8	74.4	31.8	27.6	18.9	52.0	15.6	66.9	158.9

TYPE 'A1" AND "A2" SIDE ROAD INTERSECTION DETAILS

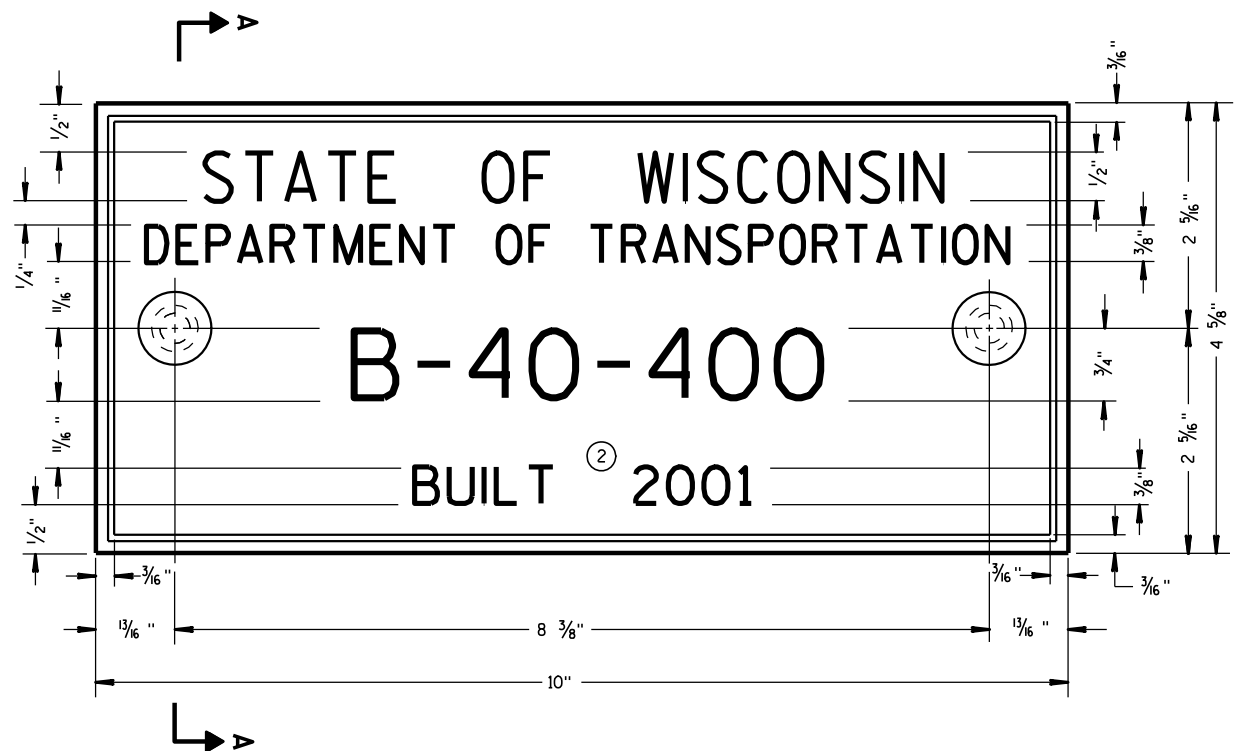
AT GRADE SIDE ROAD INTERSECTIONS  
 TYPES "A1" AND "A2"

STATE OF WISCONSIN  
 DEPARTMENT OF TRANSPORTATION

APPROVED  
 November 2022 /S/ John Jenkins  
 DATE ROADWAY STANDARDS DEVELOPMENT  
 ENGINEER  
 FHWA

SDD09A01 - 14b

SDD09A01 - 14b



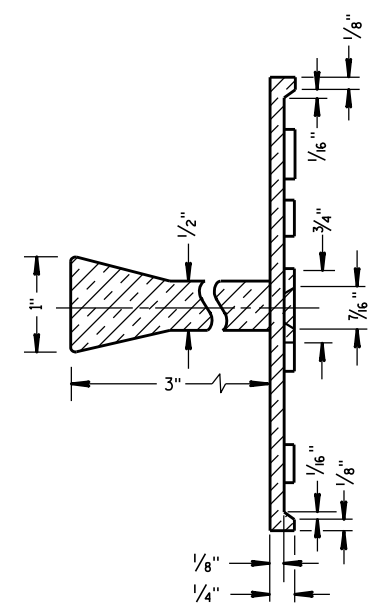
**TYPICAL NAME PLATE**  
(BRIDGES, CULVERTS, AND RETAINING WALLS)

**GENERAL NOTES**

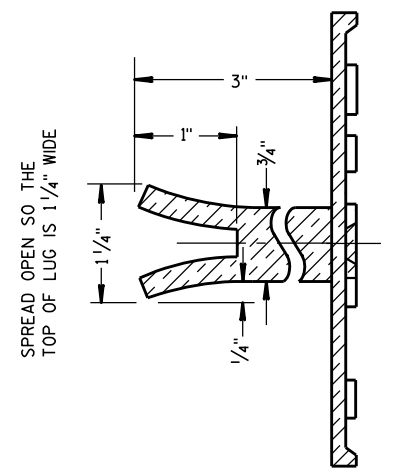
NAME PLATES TO BE INSTALLED ON BRIDGES, CULVERTS, AND RETAINING WALLS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 502.3.11 OF THE STANDARD SPECIFICATIONS.

THE BRIDGE NUMBER AND YEAR BUILT SHOWN ON THIS DRAWING ARE EXAMPLES ONLY. SEE CONSTRUCTION PLANS FOR INDIVIDUAL NUMBERING AND YEAR BUILT.

- ① EPOXY RESIN SHALL BE FROM AN APPROVED MANUFACTURER AND USED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- ② REHABILITATION OF AN EXISTING STRUCTURE SHOULD USE THE DATE OF ORIGINAL STRUCTURE CONSTRUCTION.



**SECTION A-A**



SPREAD OPEN SO THE TOP OF LUG IS 1 1/4" WIDE

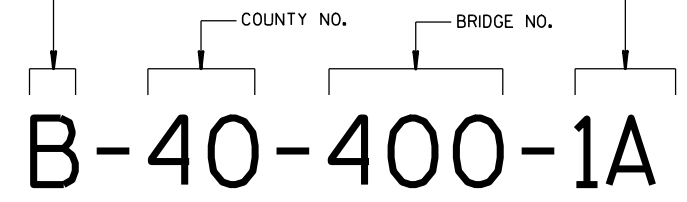
**ALTERNATE LUG**

6

6

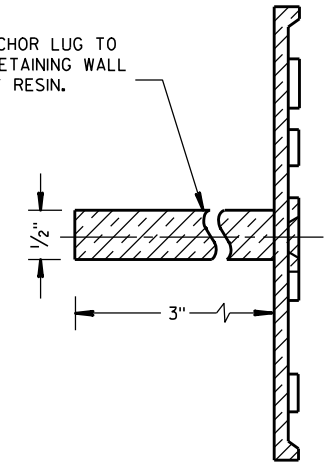
FOR MULTI-UNIT STRUCTURES  
LINE 3 ABOVE SHALL READ

- B = BRIDGE
- C = CULVERT
- R = RETAINING WALL
- UNIT NO. FOR MULTIPLE UNIT BRIDGE



**NUMBERING DESIGNATION  
MULTI-UNIT STRUCTURES**

- ① ADHERE ANCHOR LUG TO PRECAST RETAINING WALL WITH EPOXY RESIN.



**ALTERNATE LUG**  
(FOR ATTACHMENT TO PRECAST STRUCTURES)

S.D.D. 12 A 3-10

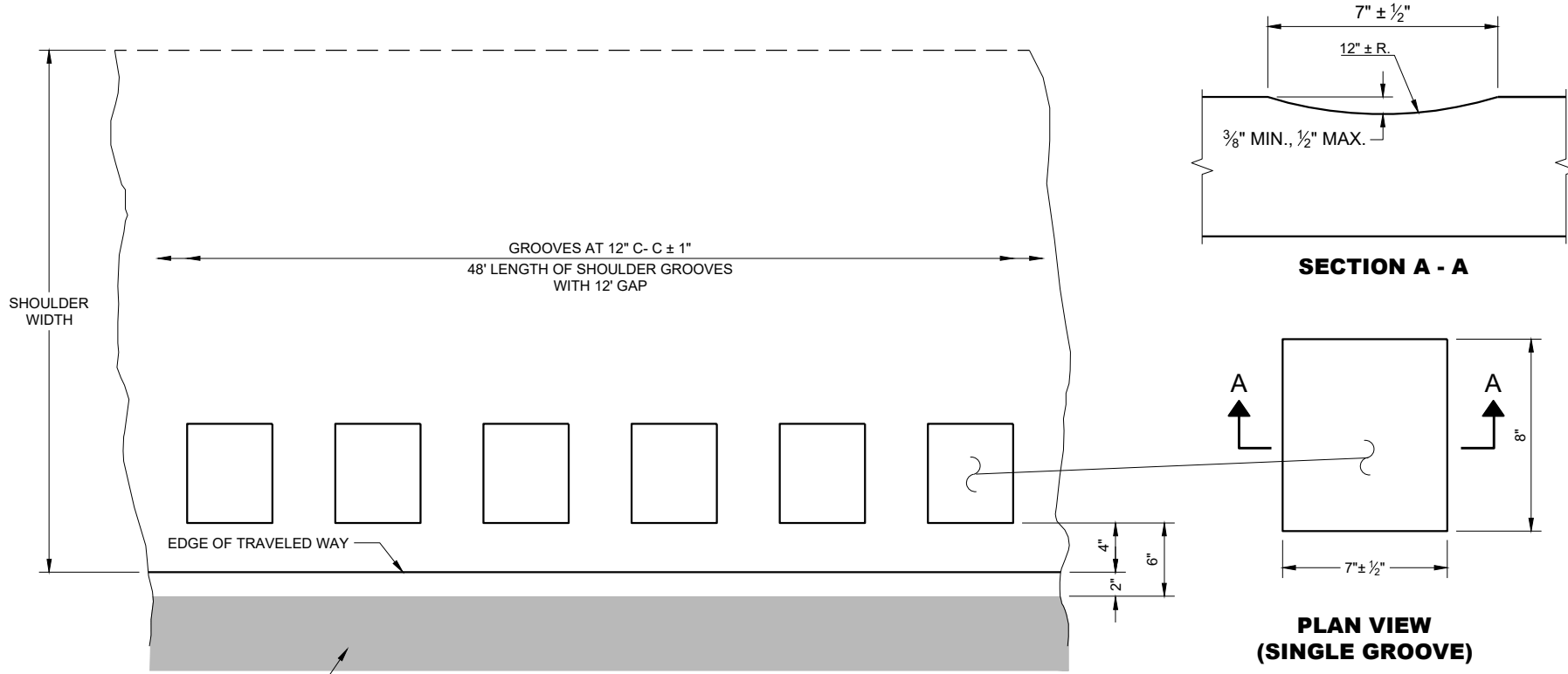
S.D.D. 12 A 3-10

<b>NAME PLATE (STRUCTURES)</b>	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED DATE 3/26/10	/S/ Scot Becker CHIEF STRUCTURAL DEVELOPMENT ENGINEER
FHWA	

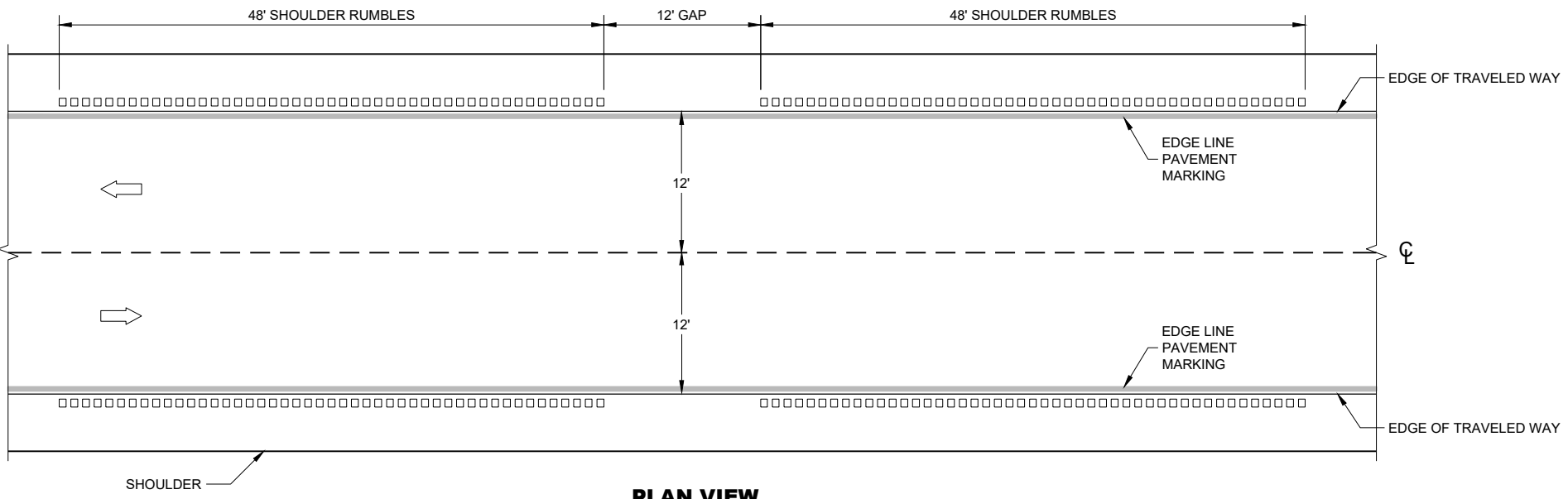
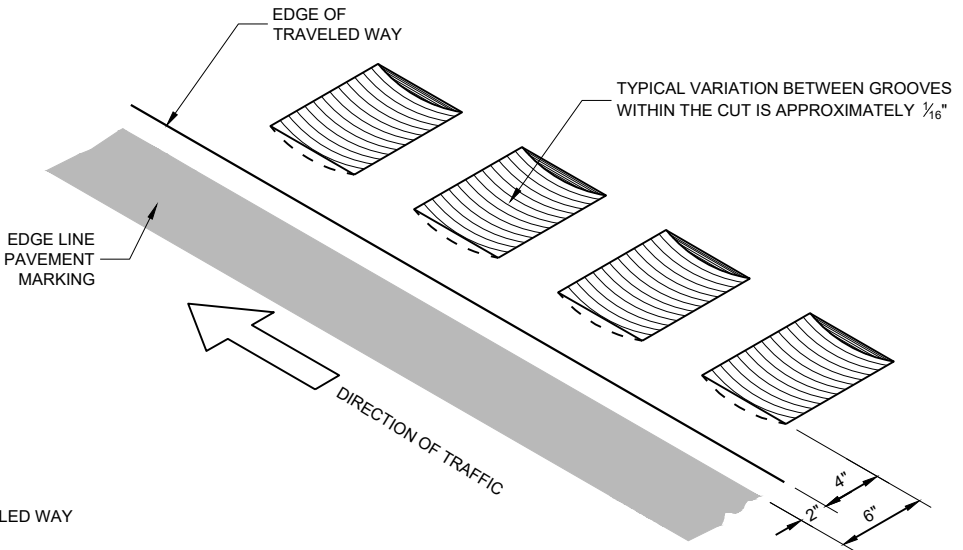
**GENERAL NOTES**

DO NOT MILL SHOULDER GROOVES THROUGH INTERSECTIONS, MARKED CROSSWALKS, NON-MOTORIZED PATH CROSSINGS, ETC. REFER TO SDD 13A10 SHEETS "g" AND "h".

SHOULDER GROOVES MAY BE OMITTED IN AREAS WITH HIGH CONCENTRATIONS OF DRIVEWAYS WHEN DIRECTED BY THE ENGINEER.

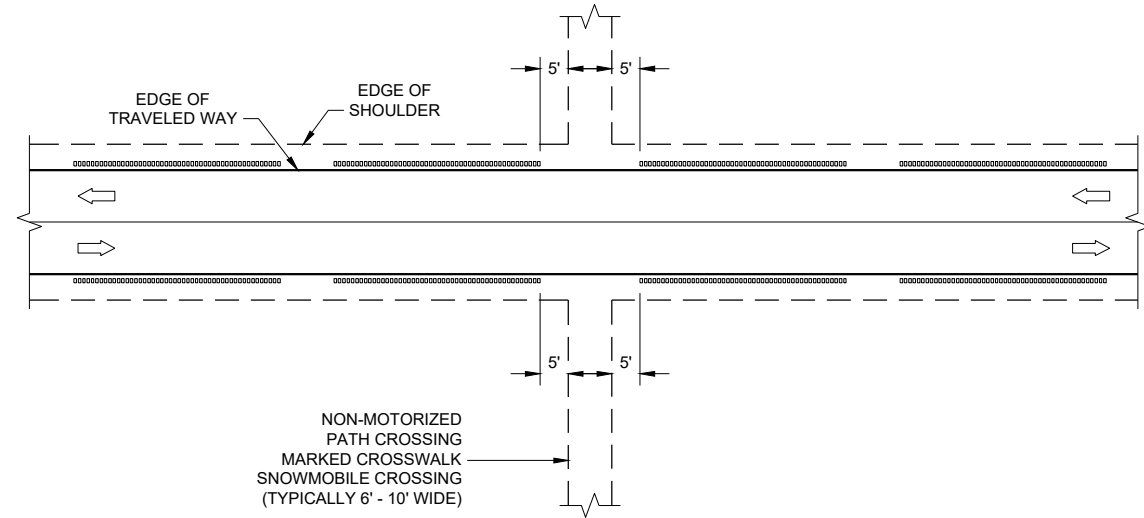


**PLAN DETAIL VIEW SHOULDER WITH GROOVES**

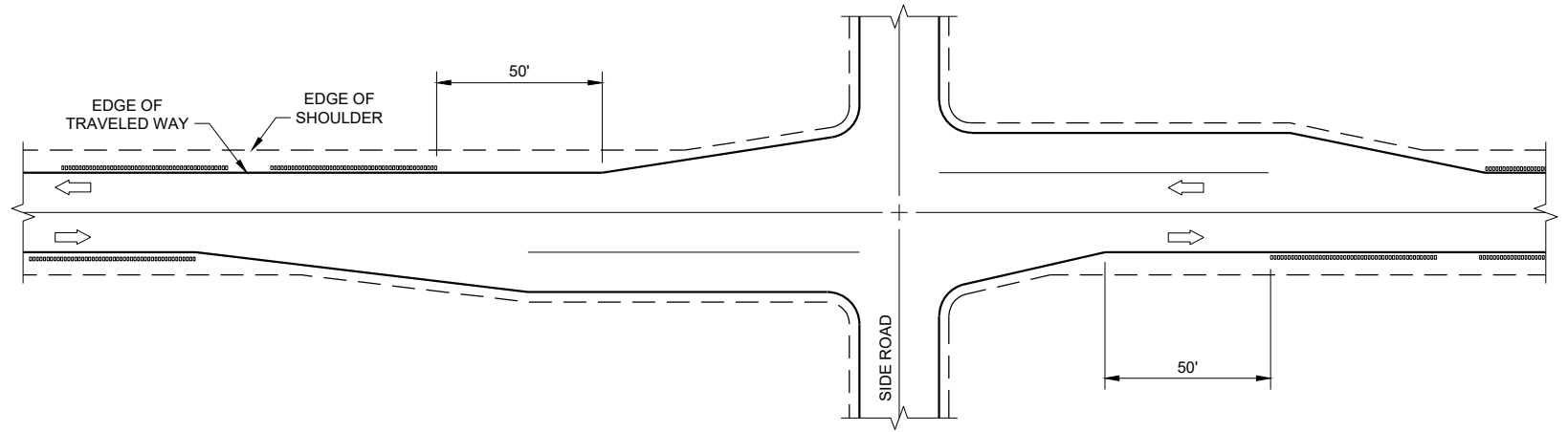


**SHOULDER RUMBLE STRIPS - ASPHALT**

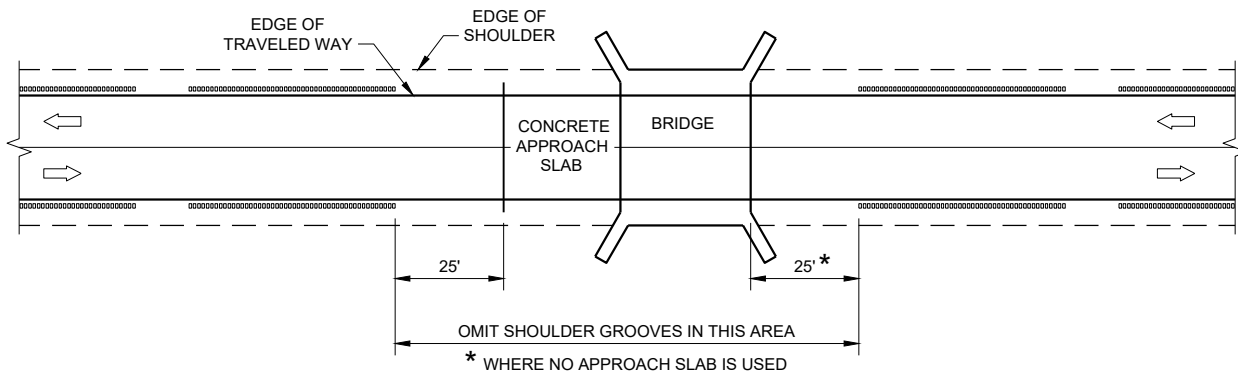
<b>SHOULDER RUMBLE STRIPS ASPHALT</b>
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION



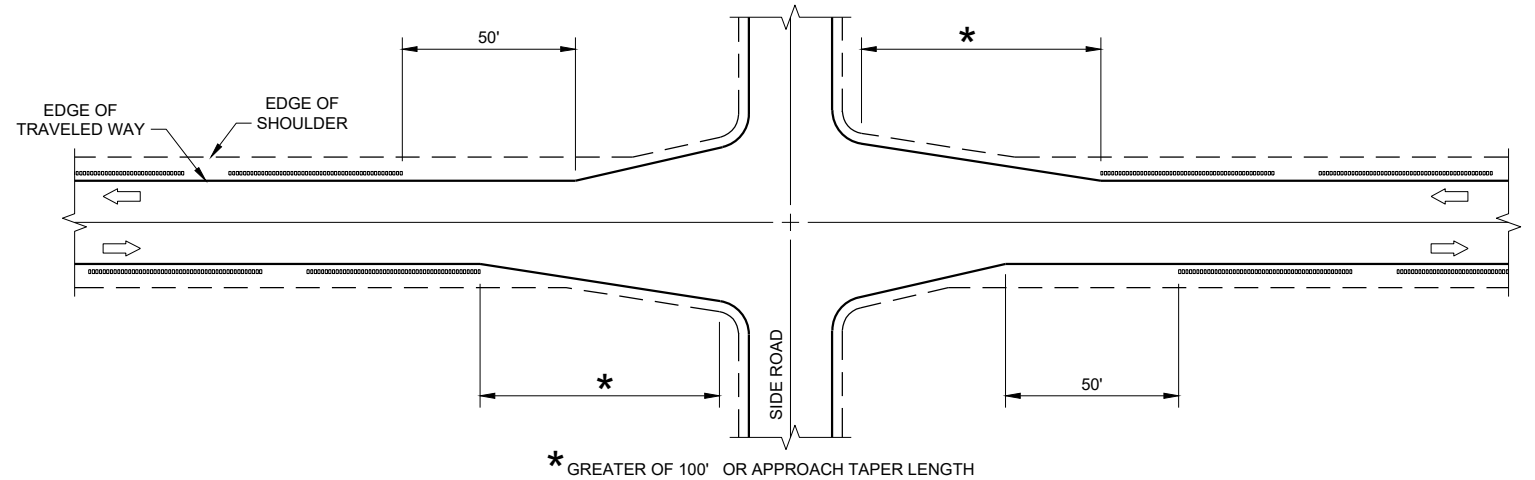
**GROOVES AT MISCELLANEOUS CROSSINGS**



**GROOVES AT RIGHT TURN LANE**

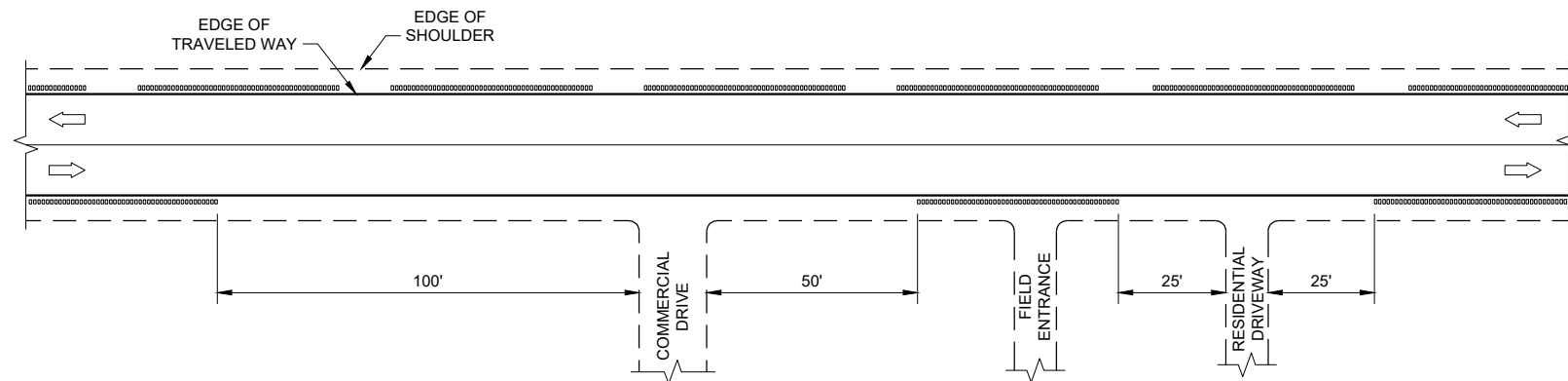


**GROOVES AT BRIDGES**



**GROOVES AT INTERSECTIONS WITH APPROACH TAPER**

\* GREATER OF 100' OR APPROACH TAPER LENGTH



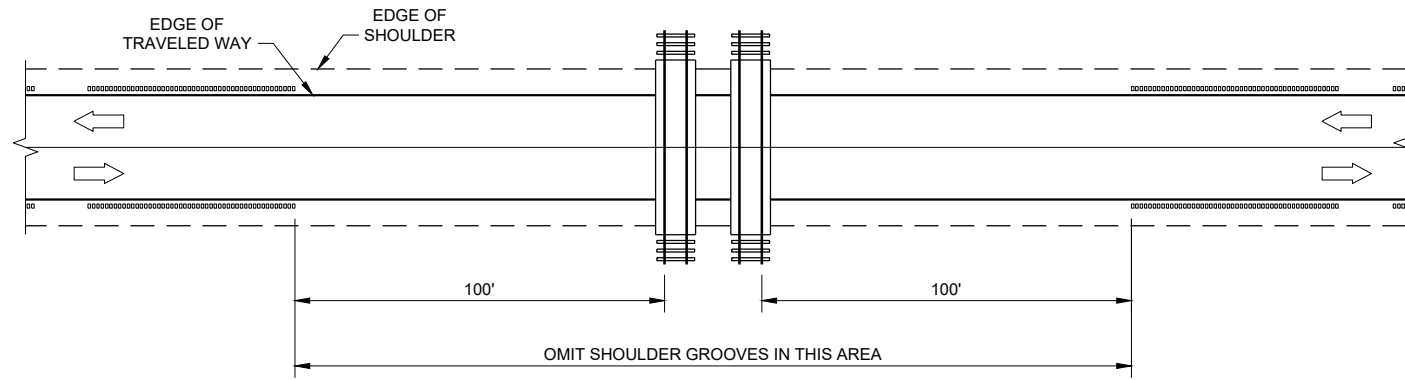
**GROOVES AT DRIVEWAYS**

**GENERAL NOTES**

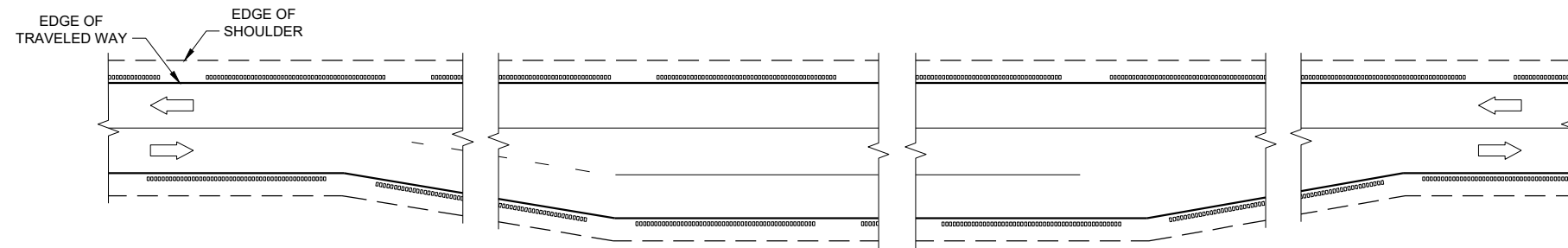
- ① SHOULDER GROOVES MAY BE OMITTED IN AREAS WITH HIGH CONCENTRATIONS OF DRIVEWAYS. WHEN DIRECTED BY THE ENGINEER.

**SHOULDER AND EDGE LINE  
RUMBLE STRIPS  
CROSSINGS, INTERSECTIONS,  
BRIDGES, DRIVEWAYS**

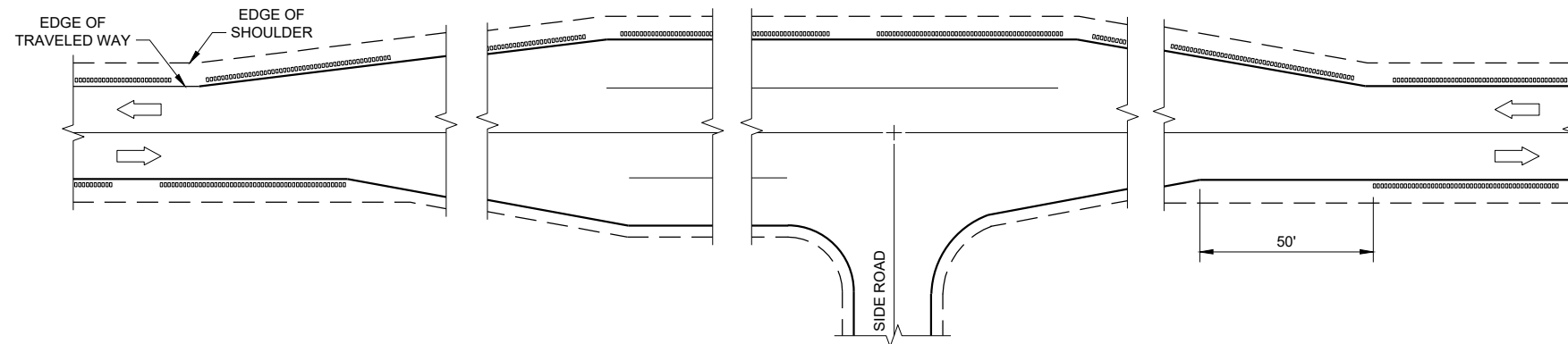
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



**GROOVES AT RAILROADS**



**GROOVES AT PASSING AND CLIMBING LANES**



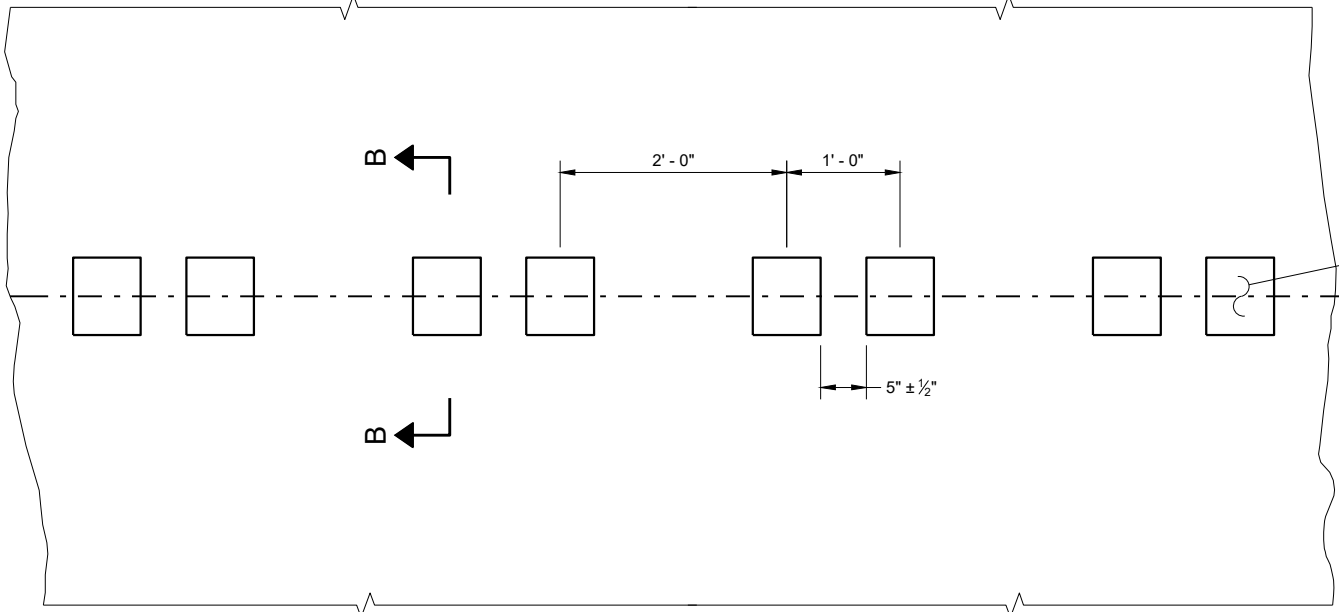
**GROOVES AT BYPASS LANES**

<b>SHOULDER AND EDGE LINE RUMBLE STRIPS - RAILROAD, PASSING, CLIMBING AND BYPASS LANES</b>	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED May 2023 DATE	/S/ John Jenkins ROADWAY STANDARDS DEVELOPMENT ENGINEER
<small>FHWA</small>	

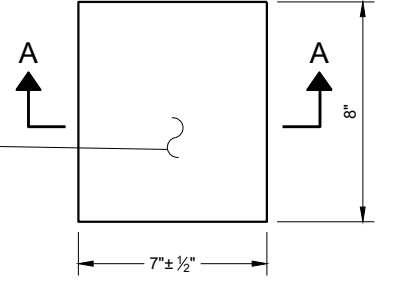
**GENERAL NOTES**

DO NOT MILL SHOULDER GROOVES THROUGH INTERSECTIONS, MARKED CROSSWALKS, NON-MOTORIZED PATH CROSSINGS, ETC. REFER TO SDD 13A11 SHEETS "d" AND "e".

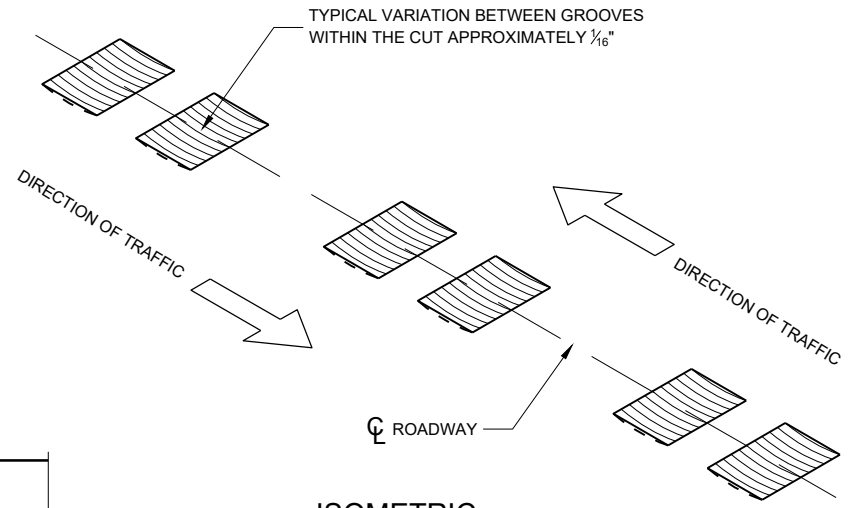
CENTERLINE GROOVES MAY BE OMITTED IN AREAS WITH HIGH CONCENTRATIONS OF DRIVEWAYS WHEN DIRECTED BY THE ENGINEER.



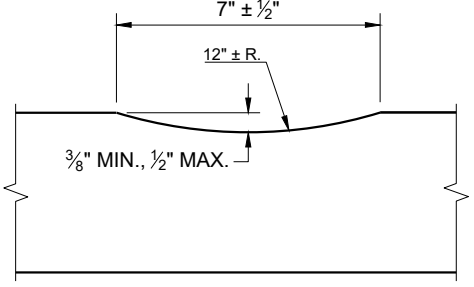
**PLAN DETAIL VIEW**



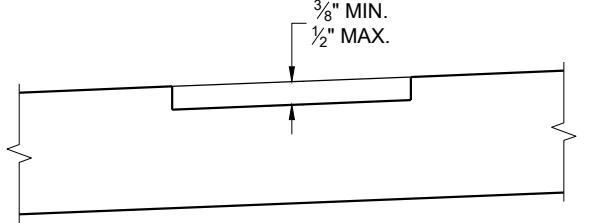
**PLAN VIEW (SINGLE GROOVE)**



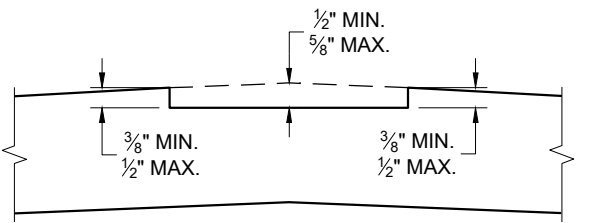
**ISOMETRIC**



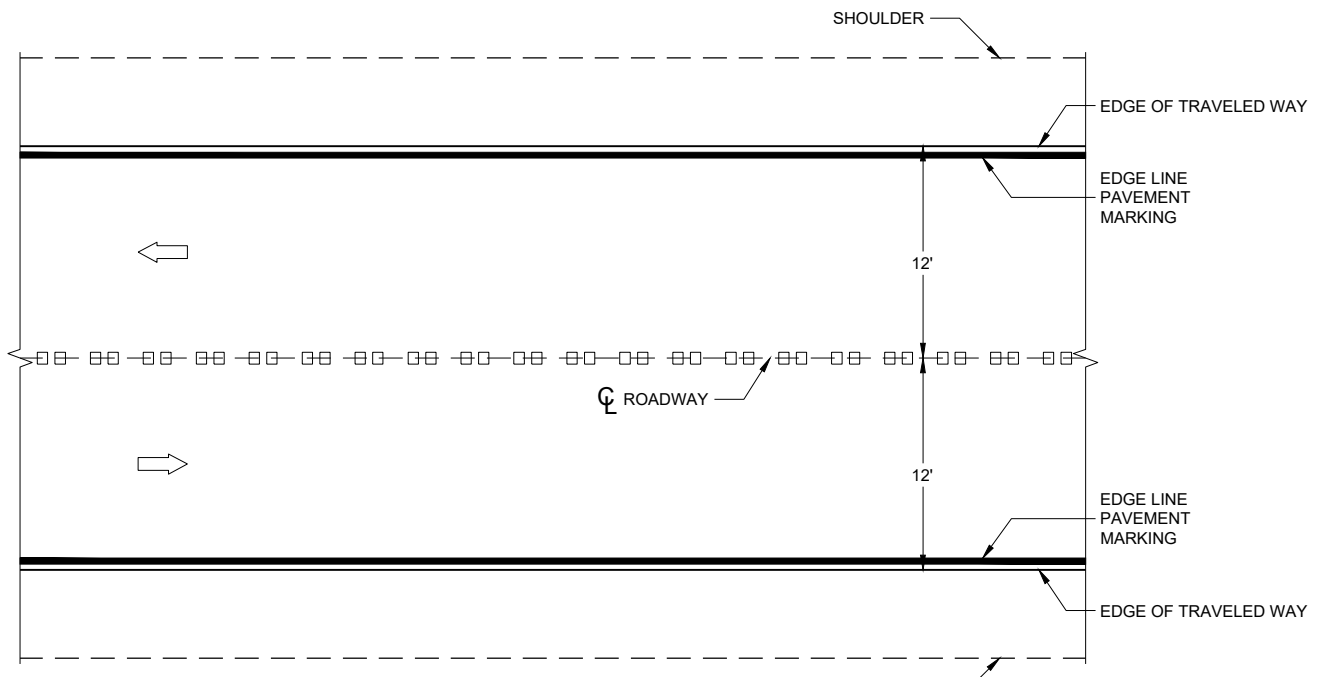
**SECTION A - A**



**SECTION B - B SUPERELEVATED ROADWAY**



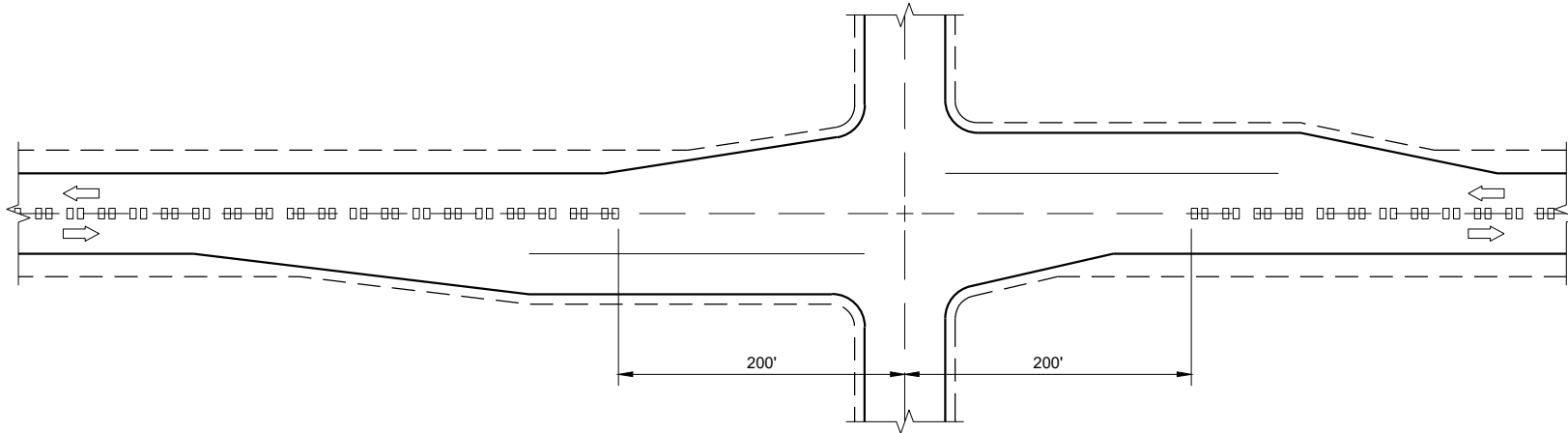
**SECTION B - B CROWNED ROADWAY**



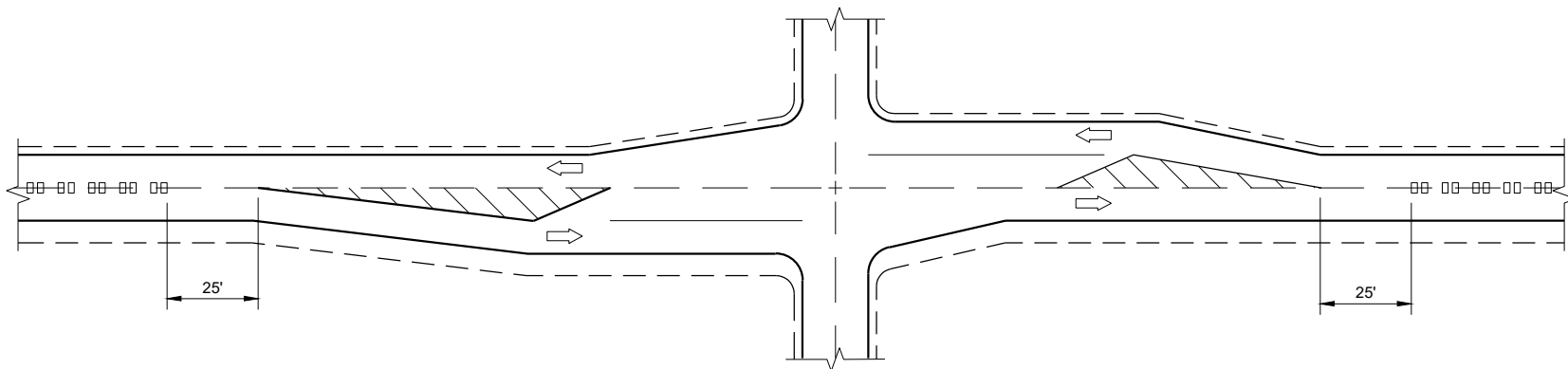
**PLAN VIEW**

**CENTERLINE RUMBLE STRIPS - ASPHALT**

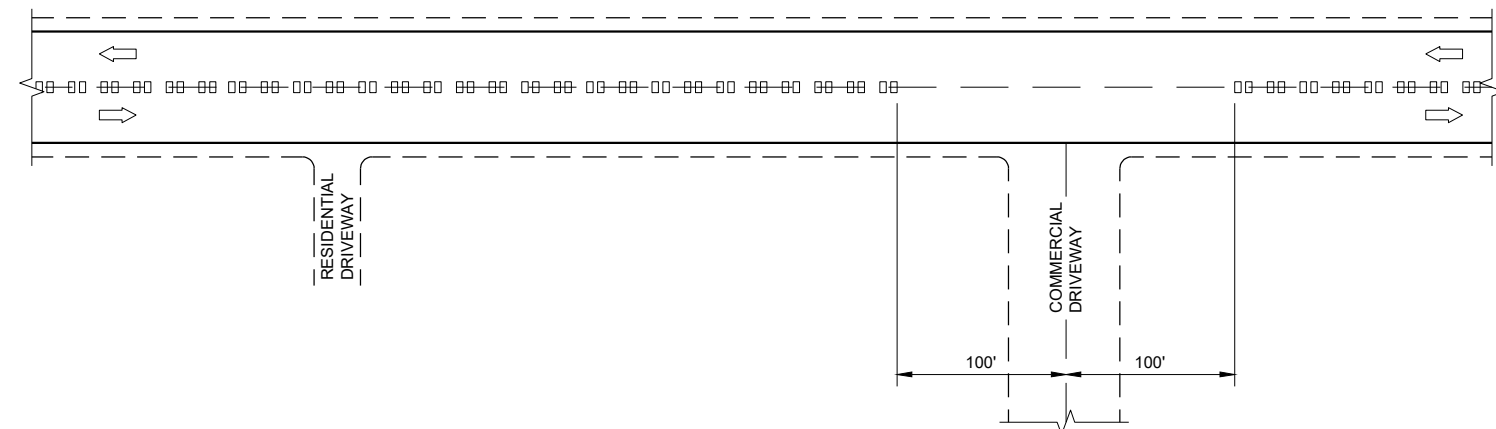
<b>CENTERLINE RUMBLE STRIPS - ASPHALT</b>
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION



**CENTERLINE GROOVES AT INTERSECTIONS**



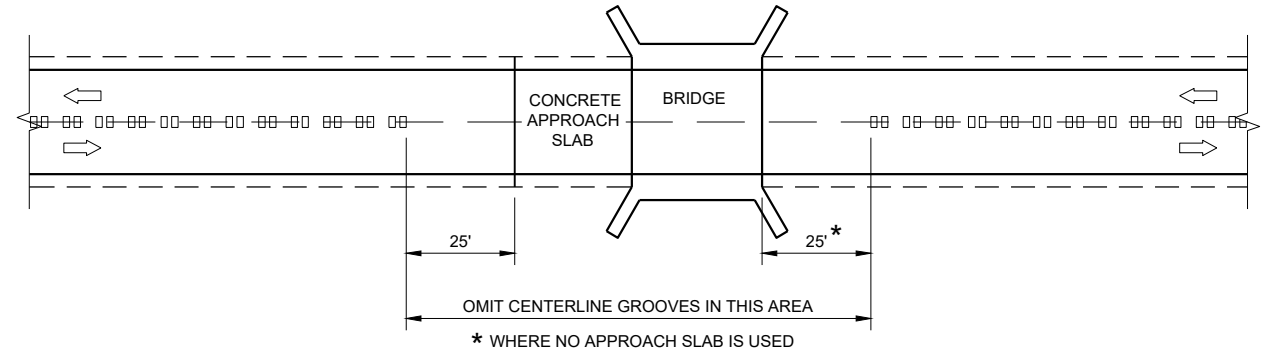
**CENTERLINE GROOVES AT INTERSECTIONS  
(WITH LEFT TURN LANES)**



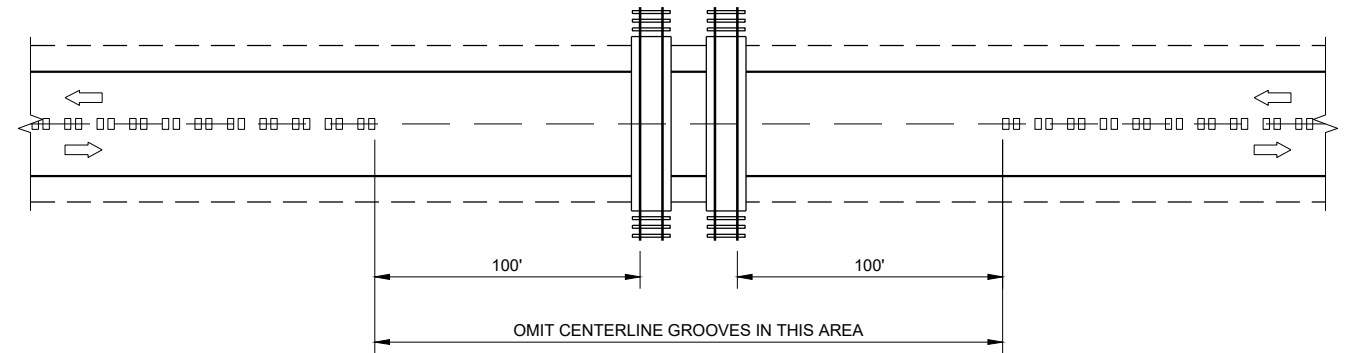
**CENTERLINE GROOVES AT DRIVEWAYS<sup>①</sup>**

**GENERAL NOTES**

- ① CENTERLINE GROOVES MAY BE OMITTED IN AREAS WITH HIGH CONCENTRATIONS OF DRIVEWAYS WHEN DIRECTED BY THE ENGINEER.



**CENTERLINE GROOVES AT BRIDGES**



**CENTERLINE GROOVES AT RAILROADS**

6

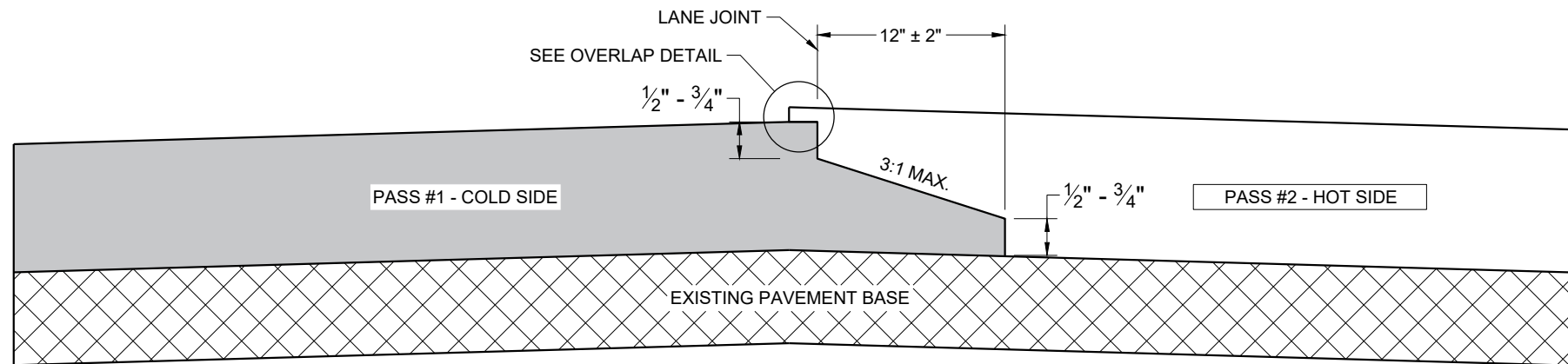
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SDD 13A11 - 04d

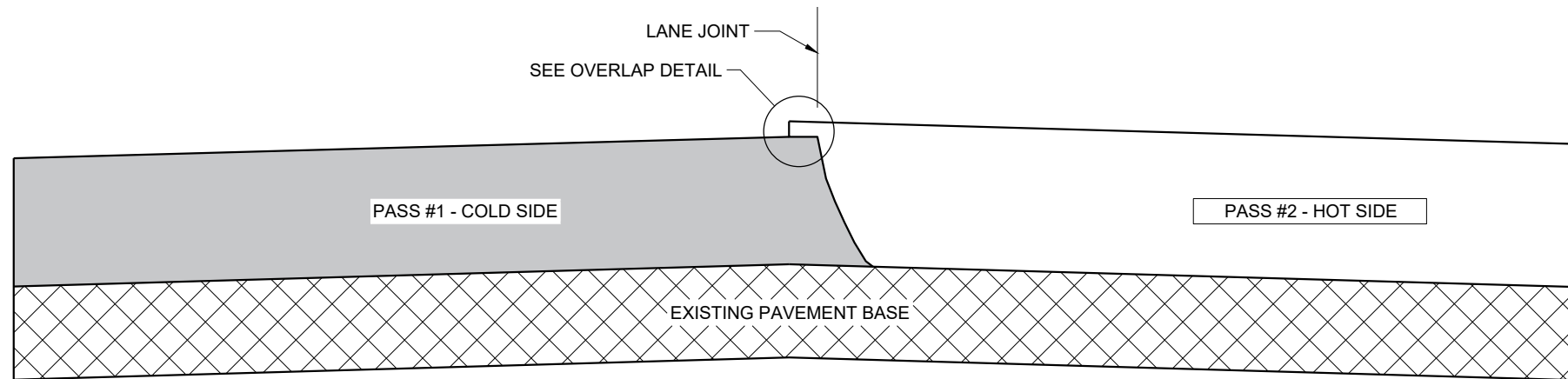
SDD 13A11 - 04d

<b>CENTER LINE RUMBLE STRIPS - INTERSECTIONS, DRIVEWAYS, BRIDGES, RAIL ROADS</b>	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED May 2023 DATE	/S/ John Jenkins ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA	

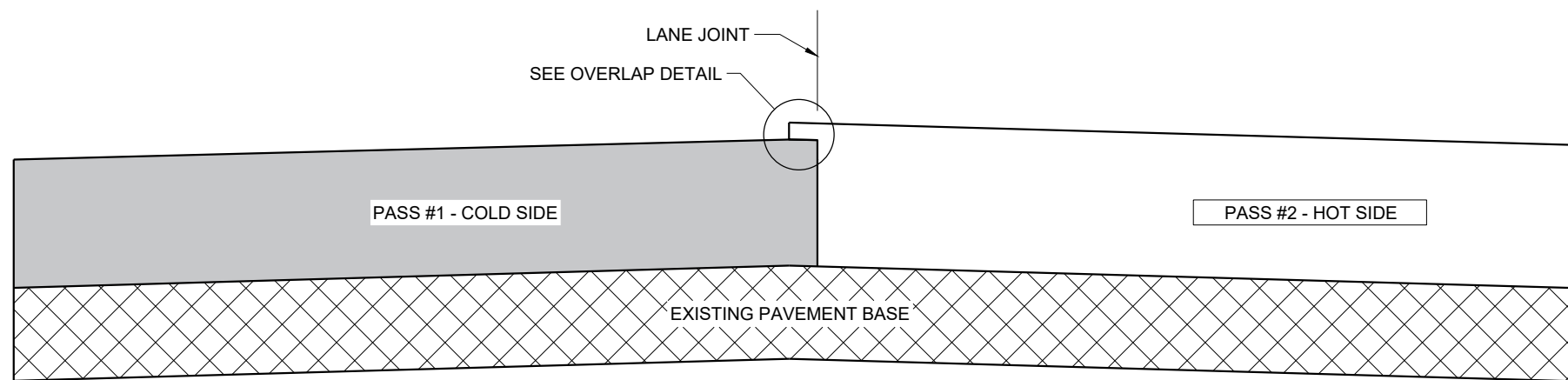




**TYPICAL PAVEMENT CROSS SECTION  
NOTCHED WEDGE JOINT**



**TYPICAL PAVEMENT CROSS SECTION  
VERTICAL JOINT**



**TYPICAL PAVEMENT CROSS SECTION  
VERTICAL JOINT (MILLED)**

**GENERAL NOTES**

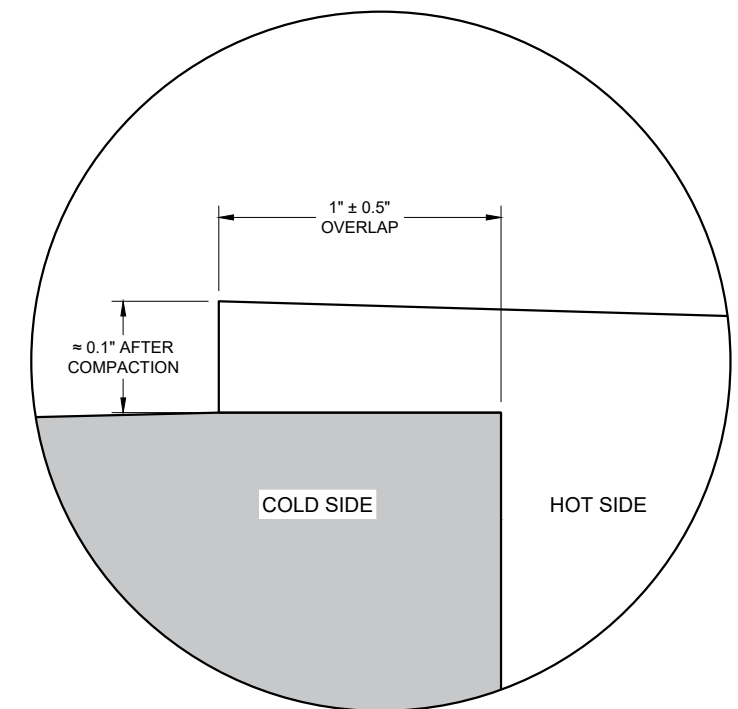
IN ADDITION TO THE DETAILS PROVIDED IN THIS DRAWING, CONFORM TO STANDARD SPECIFICATION 450.3.2.8 FOR WHEN A NOTCHED WEDGE JOINT IS REQUIRED AND FOR GENERAL JOINT CONSTRUCTION REQUIREMENTS.

FOR ALL LONGITUDINAL JOINTS, ENSURE THE PAVER SCREED OVERLAPS THE PREVIOUSLY PLACED PAVEMENT BY  $1" \pm 0.5"$  AND THE HOT SIDE OF THE JOINT REMAINS HIGHER THAN THE COLD SIDE BY APPROXIMATELY 0.1" AFTER FINAL COMPACTION. (IT WILL BE FLUSH WHEN PAVING IN ECHELON.)

ONLY REMOVE THE LONGITUDINAL NOTCHED WEDGE JOINT FOR SMA PAVEMENT OR AS DIRECTED BY THE ENGINEER TO ADDRESS SPECIFIC LENGTHS OF JOINT DAMAGED BY TRAFFIC.

WHEN MILLING BACK OR REMOVING ANY LONGITUDINAL JOINT, LIMIT THE MATERIAL REMOVED TO 2" FROM THE TOP NOTCH OR FROM THE VERTICAL JOINT EDGE ON THE COLD SIDE OF THE JOINT.

USE LONGITUDINAL MILLED JOINT AS PLANS SHOW OR THE AS THE ENGINEER DIRECTS.



**OVERLAP DETAIL (TYPICAL)**

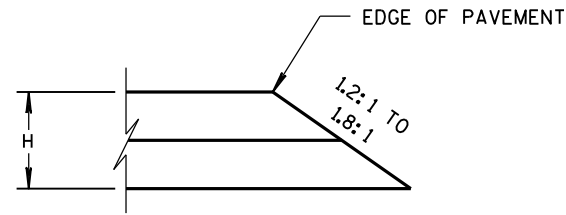
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6

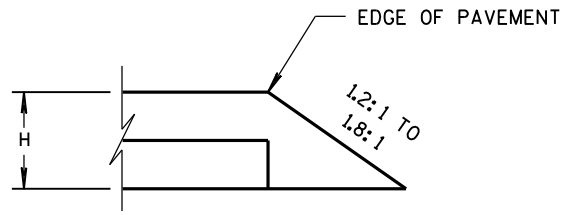
SDD 13C19 - 03

SDD 13C19 - 03

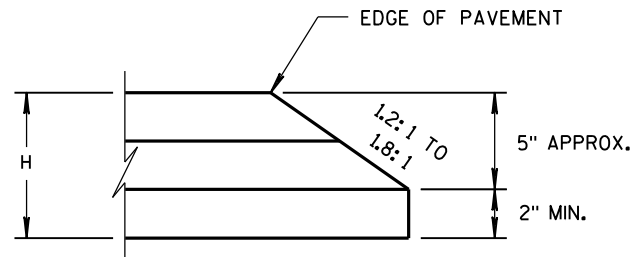
<b>HMA LONGITUDINAL JOINTS</b>	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED November 2020 DATE	/S/ Steven Hefel HMA PAVEMENT ENGINEER
FHWA	



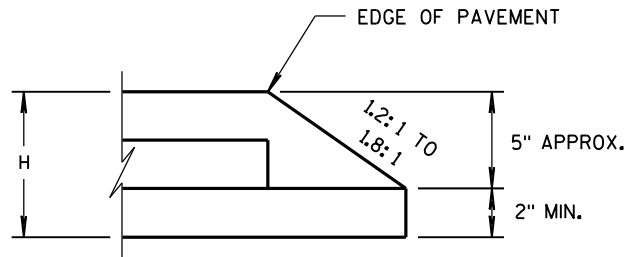
CONSTRUCTED WITH FINAL TWO LAYERS  
FOR H 5" OR LESS



CONSTRUCTED WITH FINAL LAYER  
FOR H 5" OR LESS

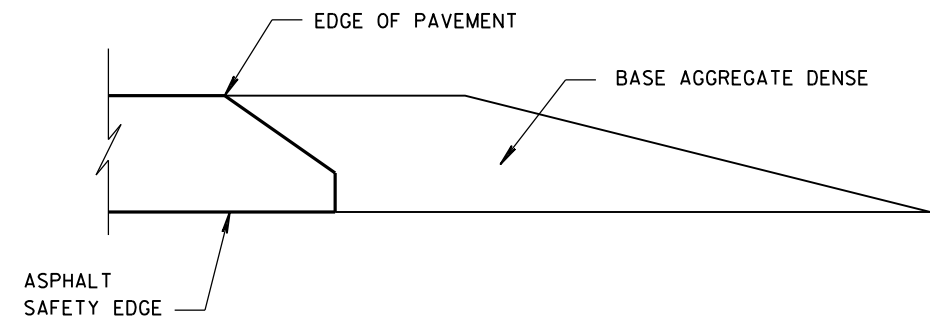


CONSTRUCTED WITH FINAL TWO LAYERS  
FOR H GREATER THAN 5"



CONSTRUCTED WITH FINAL LAYER  
FOR H GREATER THAN 5"

HMA PAVEMENT AND HMA OVERLAYS



FINISHED SHOULDER AGGREGATE PLACEMENT

6

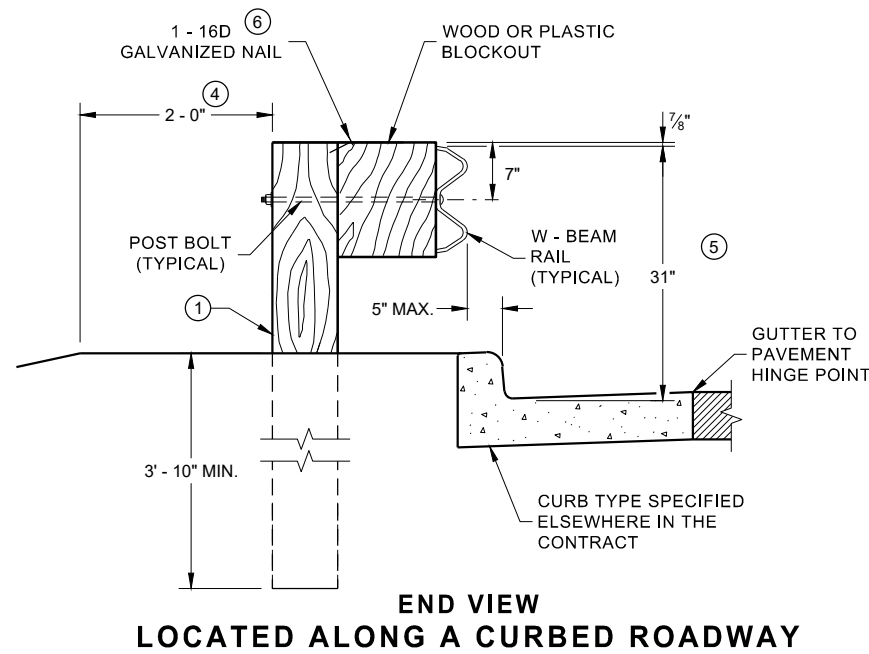
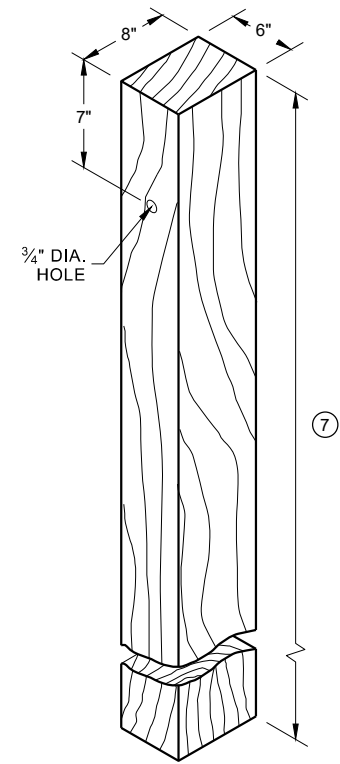
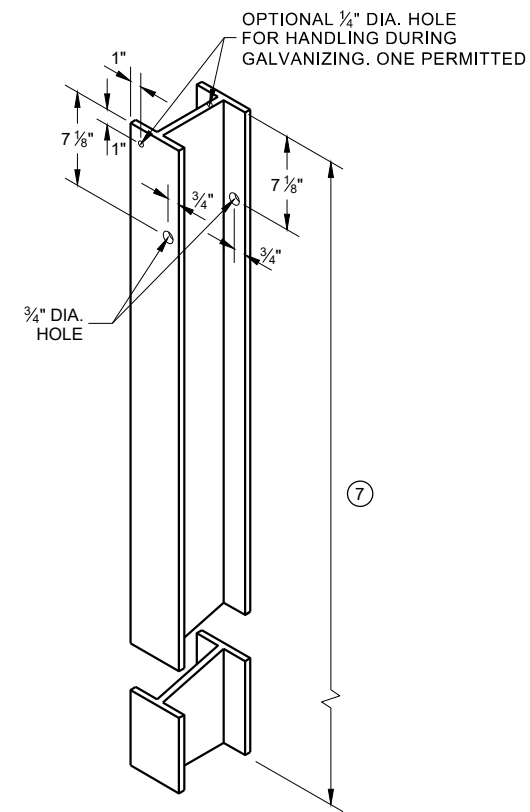
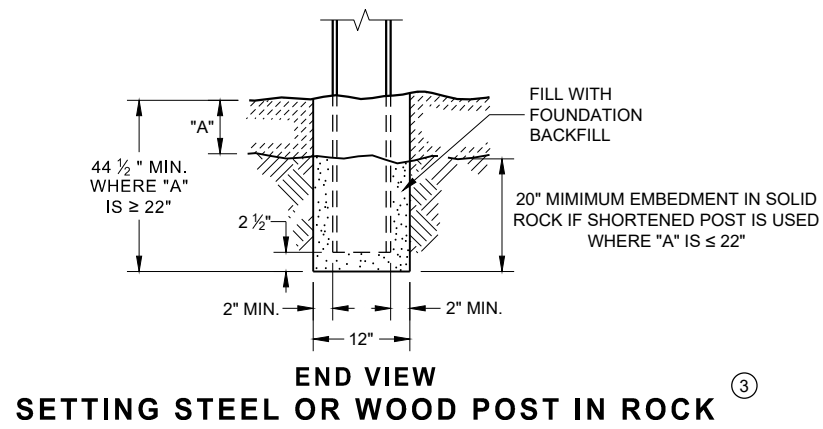
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S.D.D. 14 B 29-1

S.D.D. 14 B 29-1

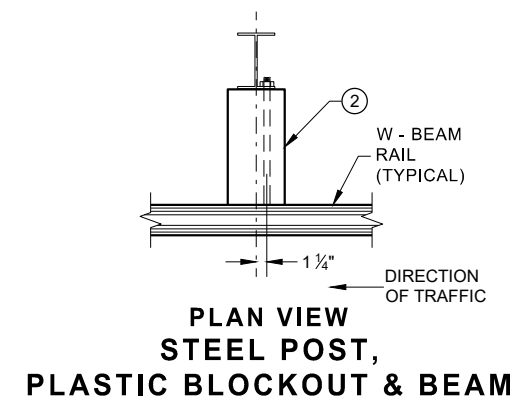
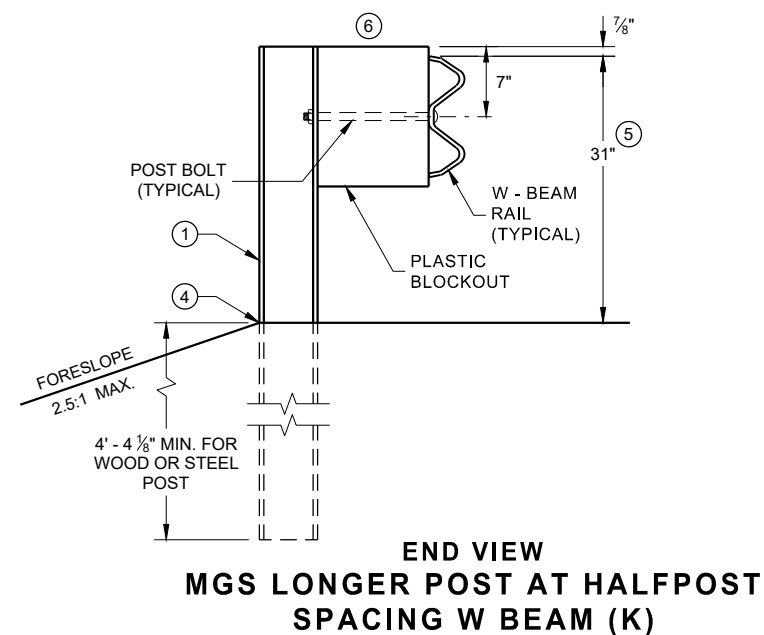
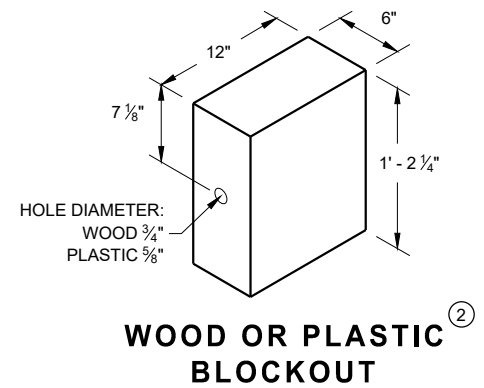
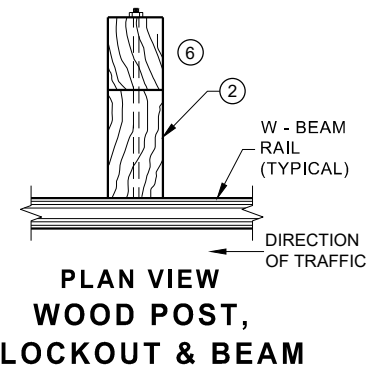
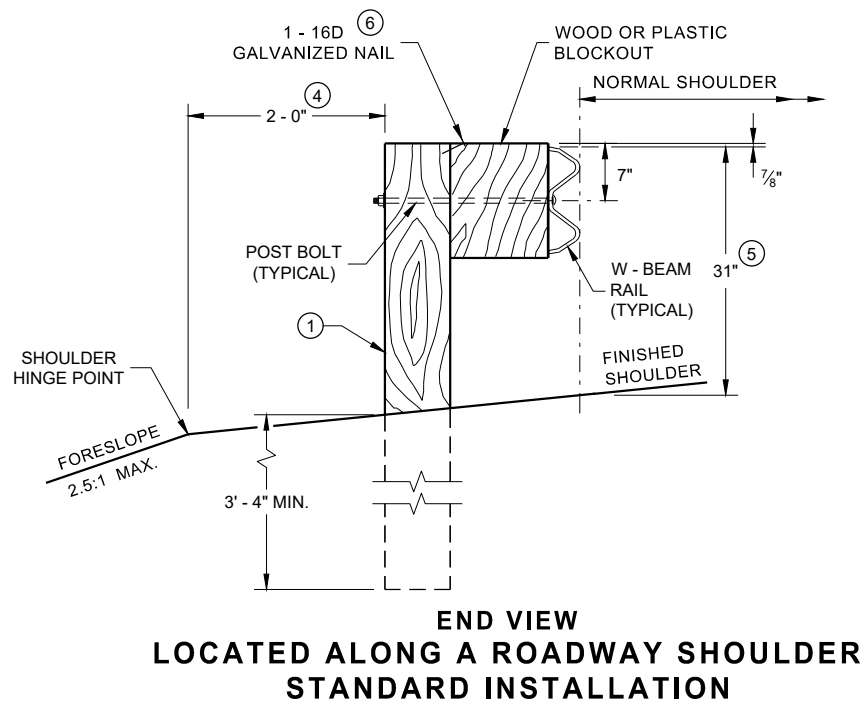
SAFETY EDGE <sub>SM</sub>	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED DATE	/s/ Jerry H. Zogg ROADWAY STANDARDS DEVELOPMENT ENGINEER
FHWA	

- 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 2 1/2" INCHES OF GRANULAR MATERIAL IN THE BOTTOM OF THE HOLE. CUT THE POSTS THE TO 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  $\pm 1"$ . FOR EXISTING MGS INSTALLATION TOP OF W-BEAM IS BETWEEN 27 3/4" 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.
- ⑦ TOTAL POST LENGTH FOR TYPE K IS 7' - 0". TOTAL POST LENGTH FOR OTHER MGS TYPES IS 6' - 0".



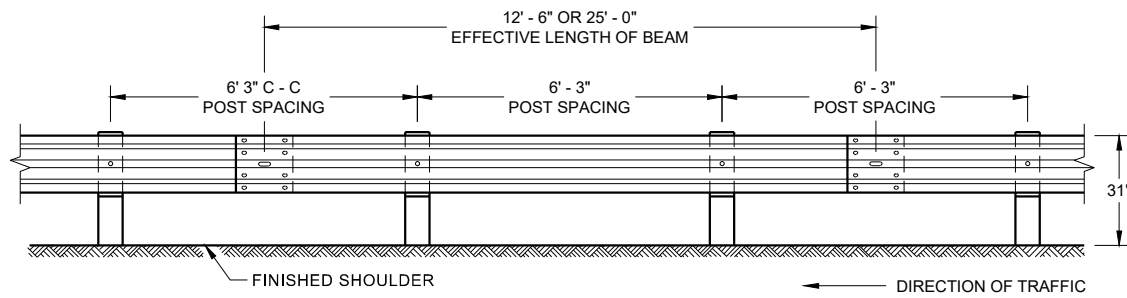
**STEEL POST & HOLE  
PUNCHING DETAIL** ①  
(W 6 X 9) ①

**WOOD POST  
(6" X 8") NOMINAL** ①

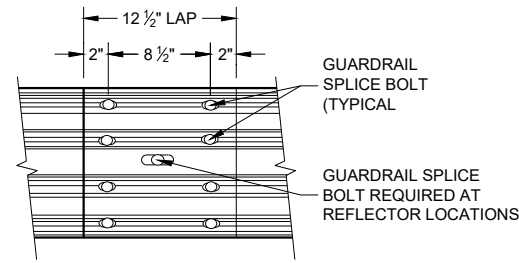


**MIDWEST GUARDRAIL SYSTEM  
(MGS) GUARDRAIL**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



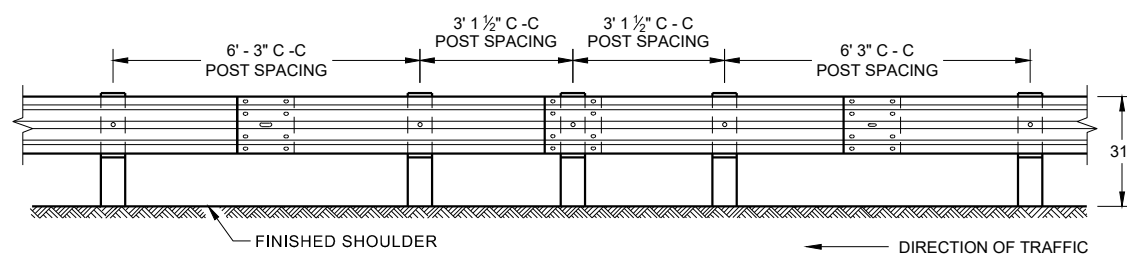
**FRONT VIEW  
POST SPACING STANDARD INSTALLATION**



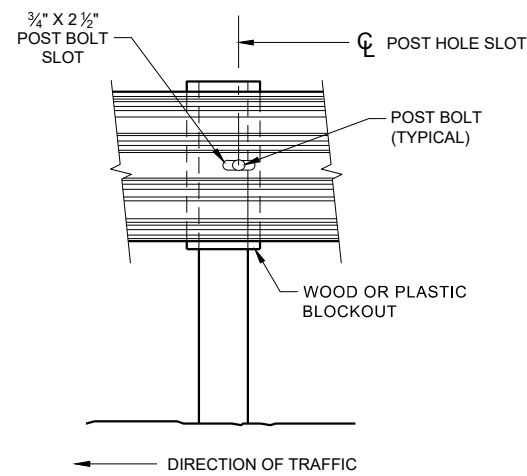
**FRONT VIEW  
MID-SPAN BEAM SPLICE**

**GENERAL NOTES**

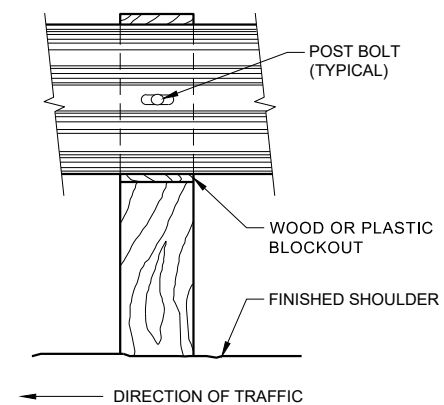
- ⑧ DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.
  - ⑨ 25 FEET OF HALF POST SPACING IS REQUIRED ON APPROACH AND DEPARTURE ENDS OF QUARTER POST SPACING.
- POST BOLTS ARE A 3/8" DIAMETER ASTM A307 GUARDRAIL BOLT. A POST BOLT REQUIRES 3/4" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT AND 3/8" DIAMETER F844 FLAT WASHER. POST BOLTS MAY BE LONGER IF MULTIPLE BLOCKOUTS ARE BEING USED.
- GUARD RAIL SPLICE BOLTS ARE A 3/8" DIAMETER ASTM A307 GUARDRAIL HEAD BOLT. A GUARDRAIL SPLICE BOLT REQUIRES 3/8" DIAMETER A563A DOUBLE RECESSED (DR) HEAVY HEX NUT.



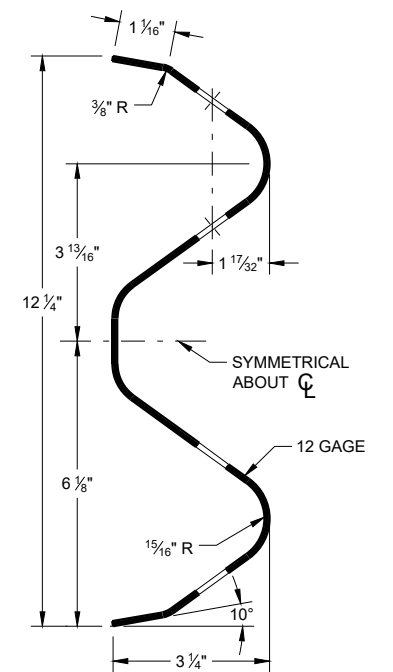
**FRONT VIEW  
HALF POST SPACING (HS) AND  
HALF POST SPACING WITH LONGER POSTS (K)**



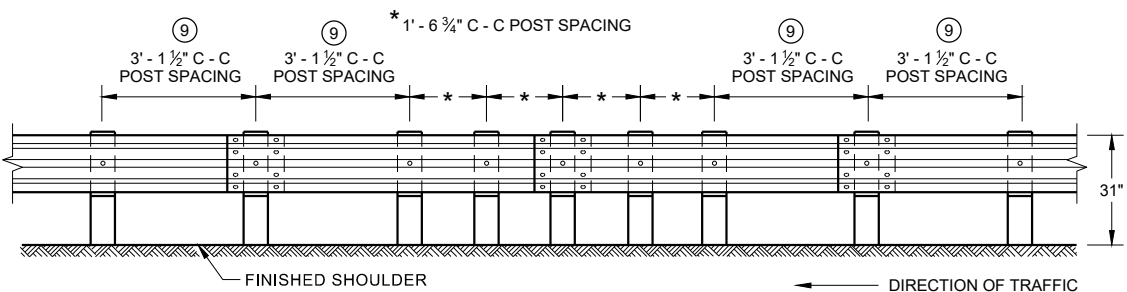
**FRONT VIEW AT STEEL POST**



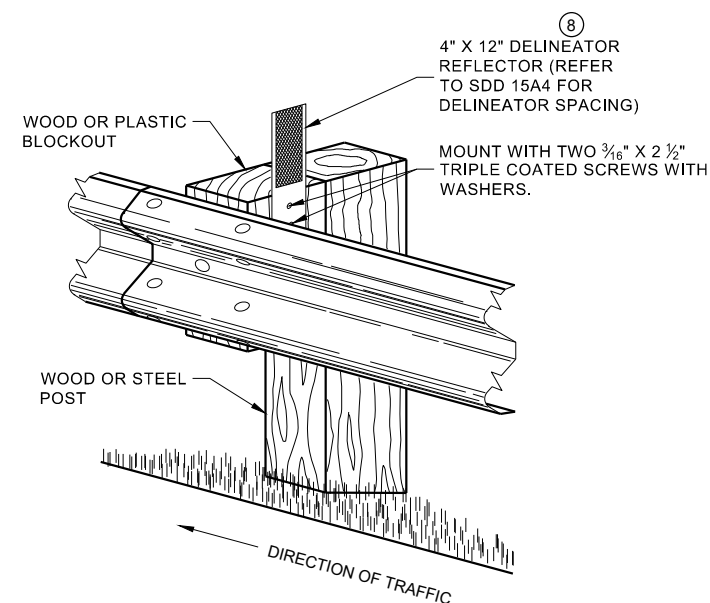
**FRONT VIEW AT WOOD POST**



**SECTION THRU W-BEAM RAIL**



**FRONT VIEW  
QUARTER POST SPACING (QS)**



**ONE SIDED REFLECTOR DETAIL  
AND TYPICAL INSTALLATION**

**MIDWEST GUARDRAIL SYSTEM  
(MGS) GUARDRAIL**

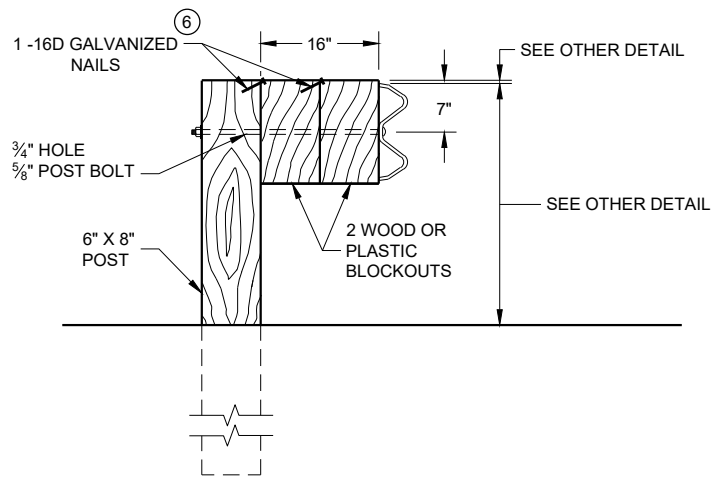
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

6

6

SDD 14B42 - 07b

SDD 14B42 - 07b

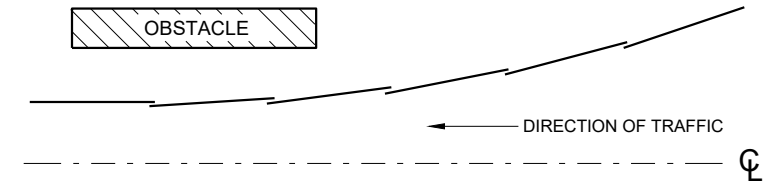
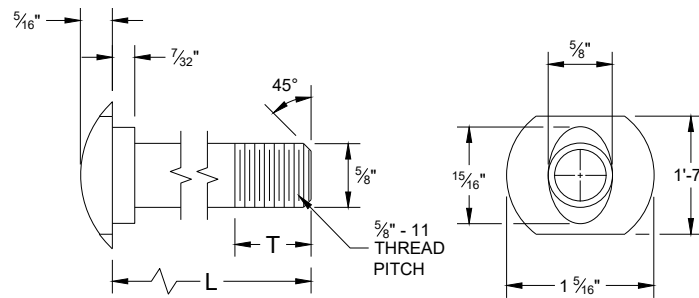


**DETAIL FOR 16" BLOCKOUT DEPTH**

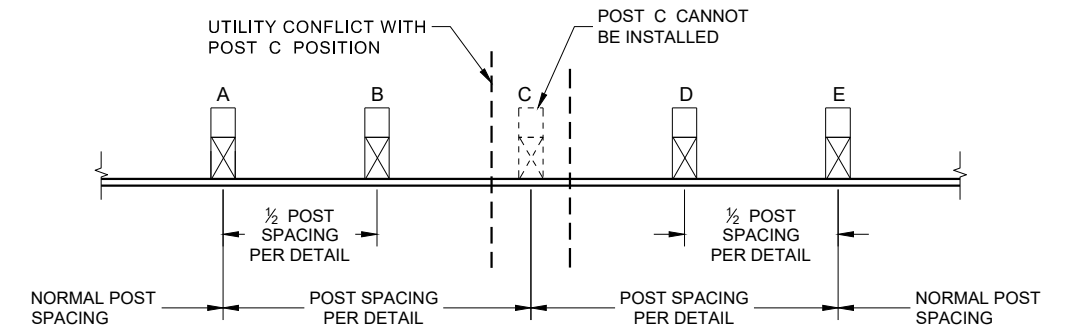
IT IS ACCEPTABLE TO USE BLOCKOUTS UP TO 16" DEEP TO INCREASE THE POST OFFSET TO AVOID UNDERGROUND OBSTACLES. THERE IS NO LIMIT TO THE NUMBER OF POSTS THAT CAN HAVE ADDITIONAL BLOCKOUTS UP TO 16" DEEP.

**NOTE:**

1. ALL FILLETS SHALL HAVE A MINIMUM RADIUS OF 3/16".
2. IF THE BOLT EXTENDS MORE THAN 1/4" FROM THE NUT THE BOLT SHOULD BE TRIMMED BACK.



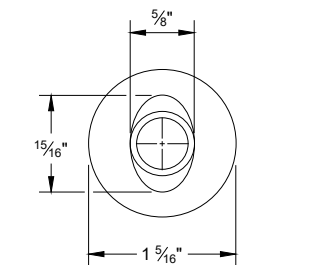
**PLAN VIEW  
BEAM LAPPING DETAIL**



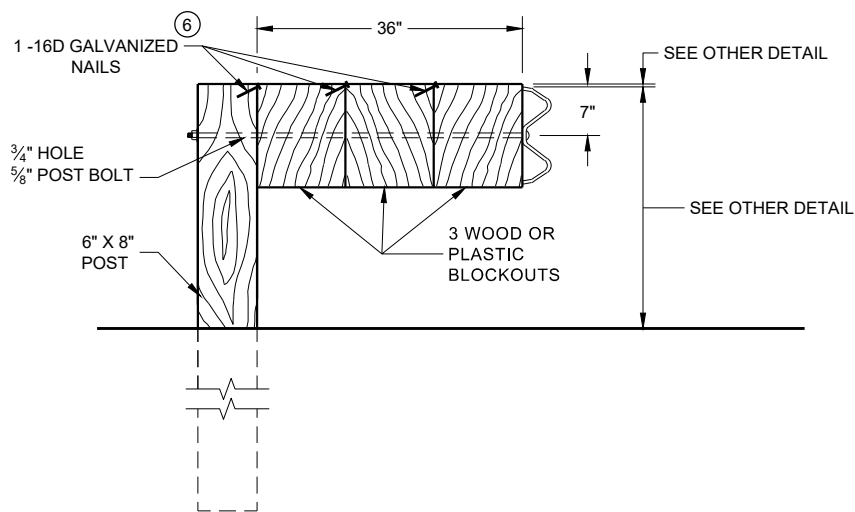
**POST DRIVING FOR CONTINUOUS  
UNDERGROUND OBSTRUCTION**

**POST BOLT TABLE**

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

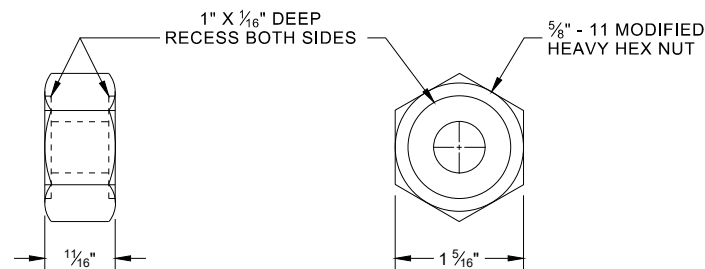


**ALTERNATE BOLT HEAD**

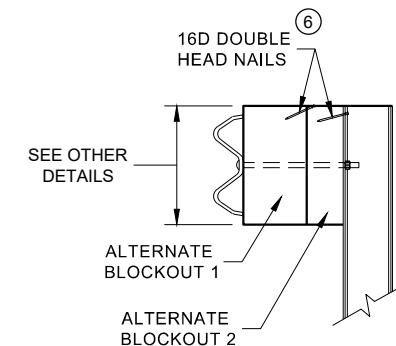


**DETAIL FOR 36" BLOCKOUT DEPTH**

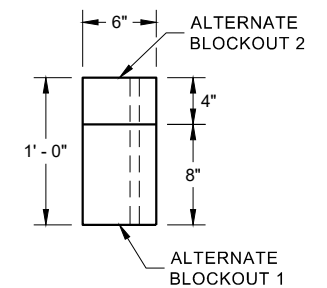
NOTES: UNDER SPECIAL CIRCUMSTANCES, SUCH AS AVOIDING OBSTACLES THAT ARE NOT RELOCATED, IT IS ACCEPTABLE TO INSTALL ADDITIONAL BLOCKOUTS TO OBTAIN UP TO 36" DEPTH FOR ONE OR TWO POSTS IN A SECTION OF GUARDRAIL.  
DO NOT USE 16" OR 36" BLOCKOUTS IF IT CAUSES THE POST TO BE DRIVEN BEYOND SHOULDER HINGE POINT OR CAUSES A FIXED OBJECT TO BE WITHIN THE DEFLECTION DISTANCE OF THE BARRIER.



**POST BOLT, SPLICE BOLT  
AND RECESS NUT**



**SIDE VIEW**



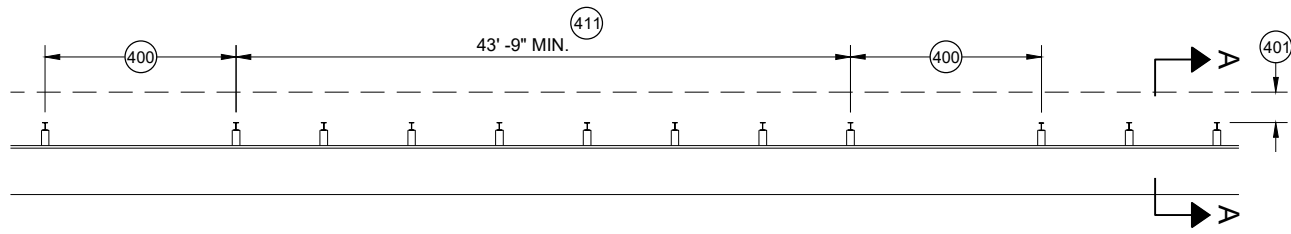
**PLAN VIEW**

**ALTERNATE WOOD  
BLOCKOUT DETAIL**

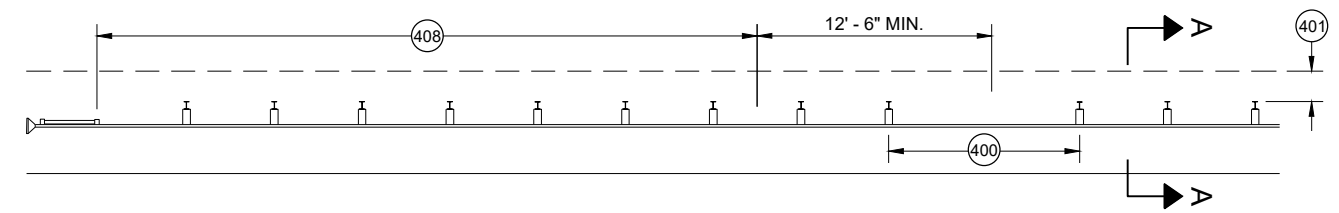
6 WHEN USING STEEL POST AND WOOD BLOCKOUTS, INSTALL FOUR 16D GALVANIZED NAILS. INSTALL NAILS AT THE BACK CORNERS OF THE BLOCK AND BEND THE NAILS OVER THE FLANGE OF THE STEEL POST.

**MIDWEST GUARDRAIL SYSTEM  
(MGS) GUARDRAIL**

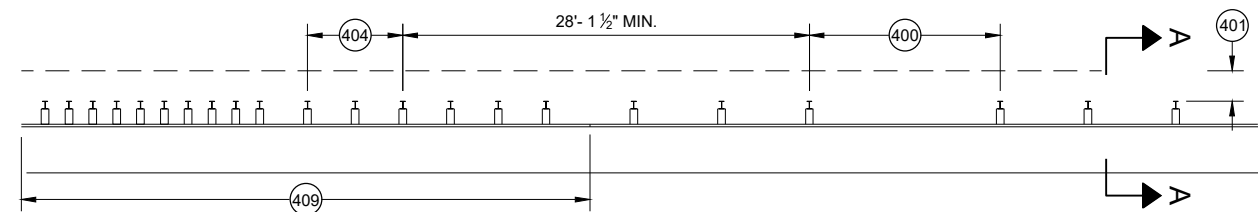
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



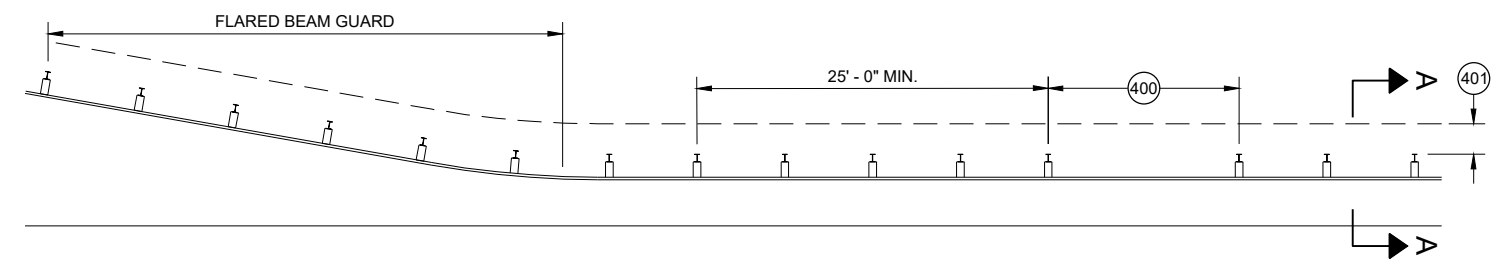
**MISSING POST IN MGS GUARDRAIL**



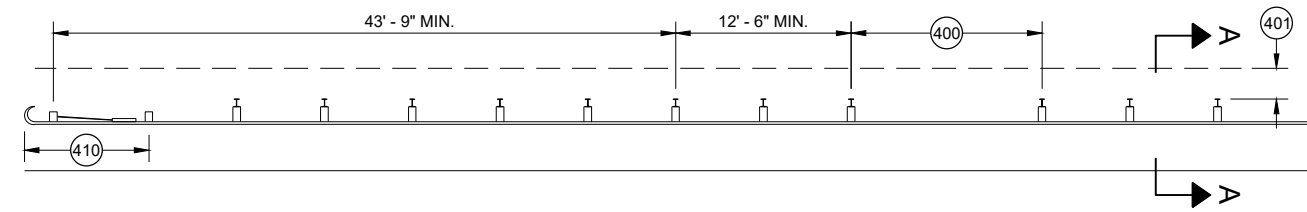
**MISSING POST IN MGS GUARDRAIL NEAR EAT**



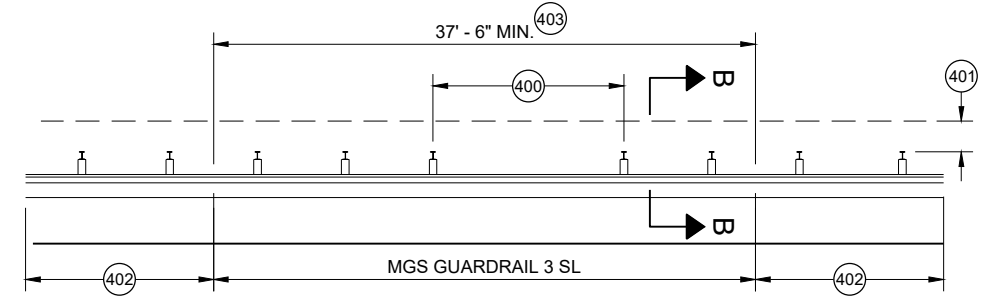
**MISSING POST IN MGS GUARDRAIL NEAR AN APPROACH TRANSITION**



**MISSING POST IN MGS GUARDRAIL NEAR FLARED BEAM GUARD**

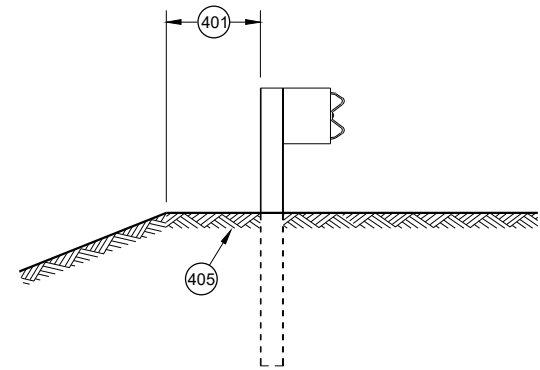


**MISSING POST IN MGS GUARDRAIL NEAR A TYPE 2 END TERMINAL**

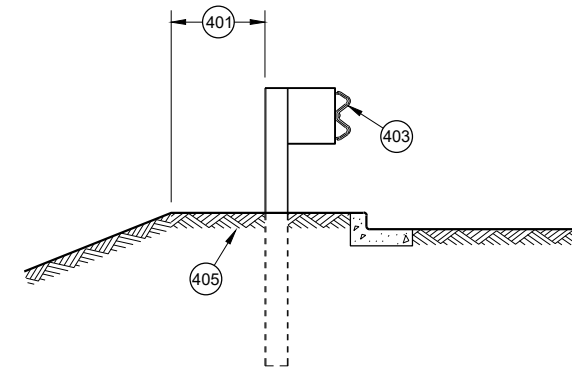


**MISSING POST IN SHORT SPAN MGS GUARDRAIL NEAR CURB (SL)**

- ④00 MAX SPAN 12' - 6"
- ④01 2' MIN.
- ④02 MGS GUARDRAIL 3
- ④03 NESTING BEAM GUARD
- ④04 ASYMMETRIC TRANSITION
- ④05 SOIL WELL DRAINED AND COMPACTED
- ④06 SEE OTHER DRAWINGS IN THIS SDD
- ④07 SEE OTHER DRAWINGS FOR MIN. SPACING BETWEEN SPANS
- ④08 SEE SDD 14B44
- ④09 SEE SDD 14B45
- ④10 SEE SDD 14B47
- ④11 MINIMUM DISTANCE BETWEEN MISSING POST SPANS.



**SECTION A - A**



**SECTION B - B**

<b>MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL</b>	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED May 2021 DATE	/S/ Rodney Taylor ROADWAY STANDARDS DEVELOPMENT UNIT SUPERVISOR
<small>FHWA</small>	

**GENERAL NOTES**

- (A) THE SLOPE IN THE AREA BOUNDED BY THE GRADELINE, THE HINGE POINT LINE 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) ATTACH ALUMINUM SHEET TO E.A.T. HEAD USING 4 STAINLESS STEEL SELF - TAPPING SCREWS. ONE SCREW PER CORNER.
  - (E) HARDWARE MAY VARY BETWEEN MANUFACTURER. SEE MANUFACTURER'S DRAWING FOR INFORMATION.
- DIMENSIONS MAY VARY, MANUFACTURER'S INFORMATION.

SEE SDD 14B42 FOR MORE INFORMATION.

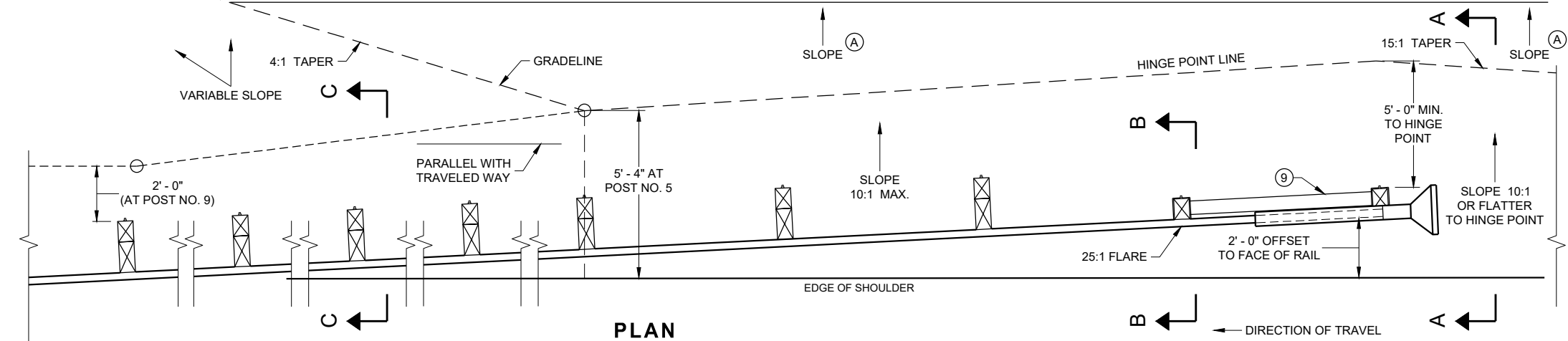
\* DO NOT ATTACH BLOCKOUTS TO POST 1 AND 2.

DO NOT INSTALL REFLECTORS ON THE FIRST 50 FEET OF THE APPROACH END OF THE ENERGY ABSORBING TERMINAL.

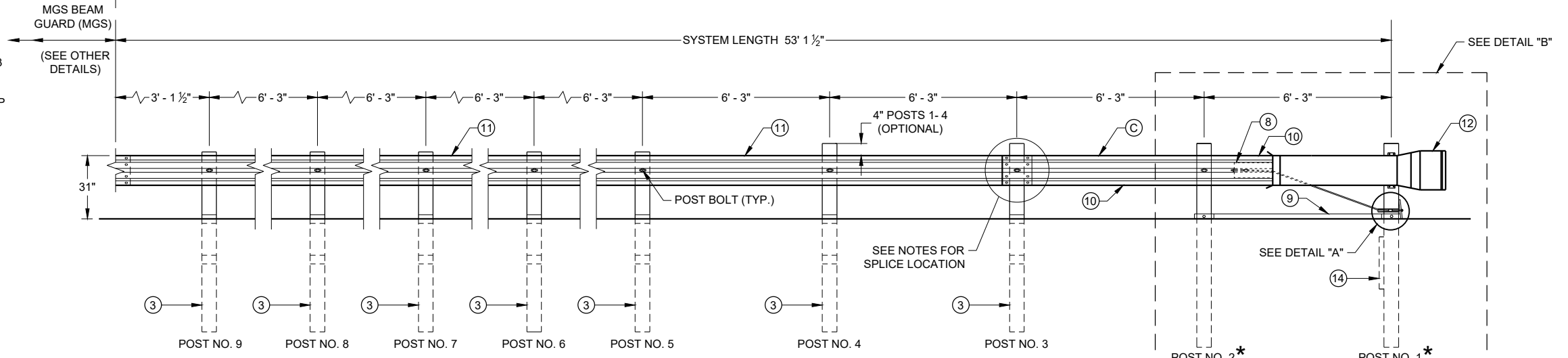
SEE MANUFACTURER'S DRAWING FOR SPLICE LOCATION, HARDWARE DIMENSIONS AND INSTALLATION INSTRUCTIONS.

THE CENTER OF THE UPPER 3 1/2" DIAMETER HOLE ON POST NUMBER 3 THROUGH POST 9 IS TO BE FLUSH WITH THE GROUND LINE UP TO A MAXIMUM OF 2" ABOVE GROUND LINE. WOOD BLOCKS ON POSTS NUMBERED 3 THROUGH 9 MAY BE ADJUSTED UP TO 3" ABOVE THE TOP OF POST.

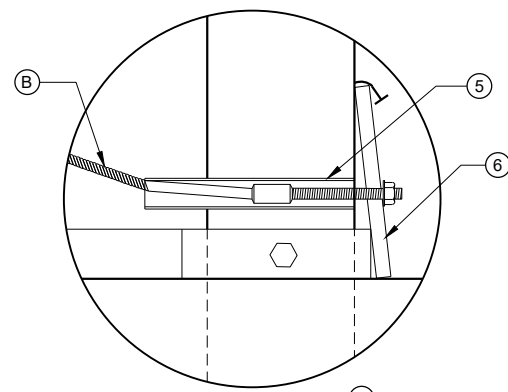
CLEAR ZONE LIMITS, EITHER AS SHOWN ELSEWHERE IN THE PLANS OR, IF NOT SHOWN ELSEWHERE IN THE PLANS, 15 FEET BEYOND THE HINGE POINT LINE



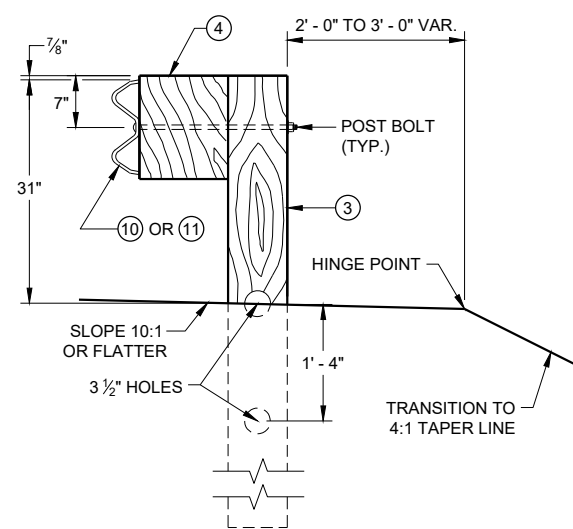
**PLAN**



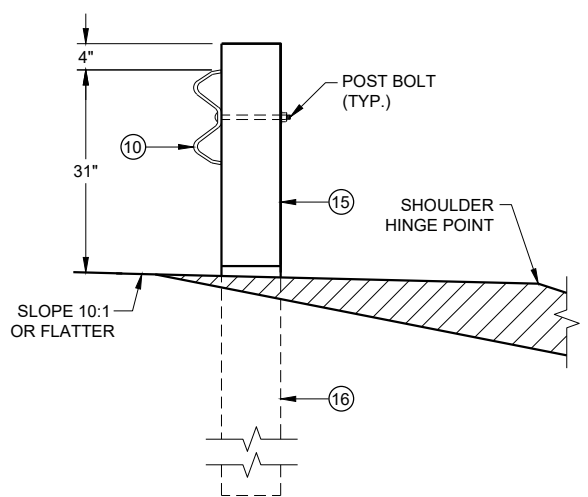
**ELEVATION**



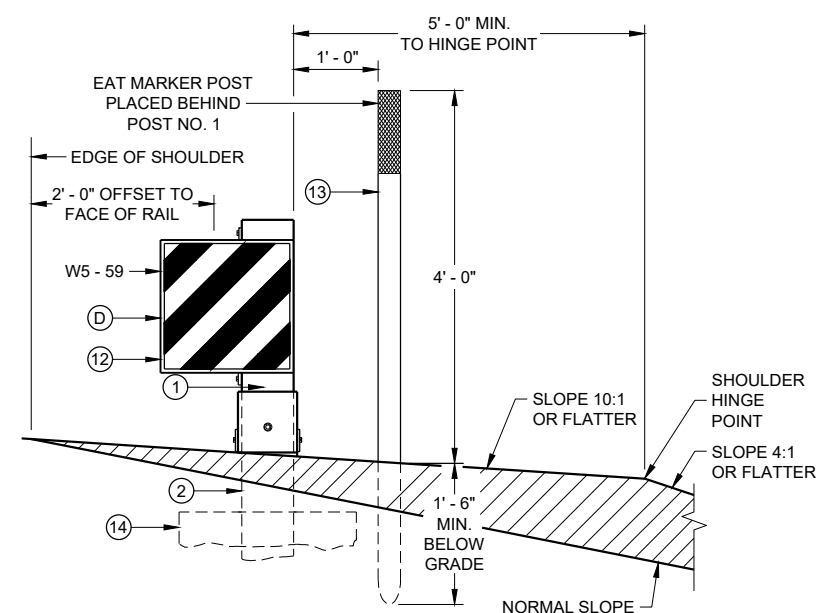
**DETAIL "A"**



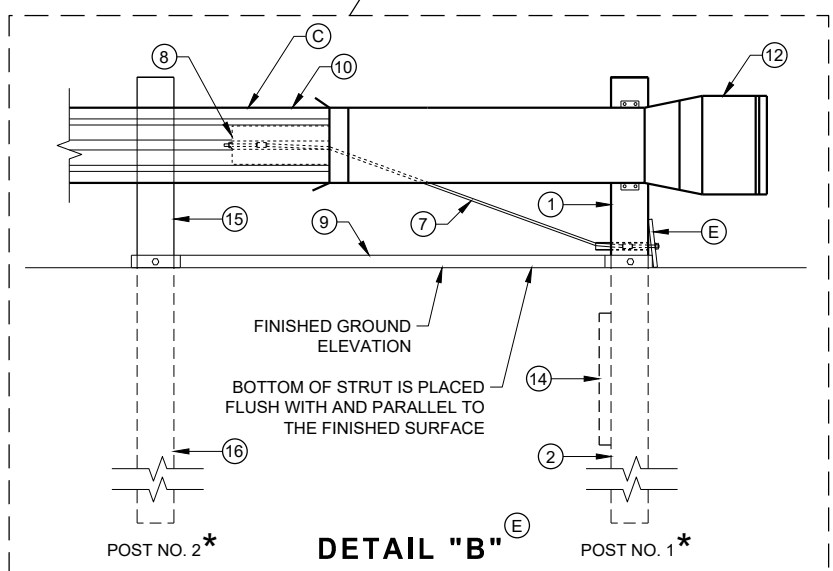
**SECTION C - C  
TYPICAL AT POST NOS. 3 - 9**



**SECTION B - B  
TYPICAL AT POST NO. 2\***



**SECTION A - A  
TYPICAL AT POST NO. 1\***



**DETAIL "B"**

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

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

6

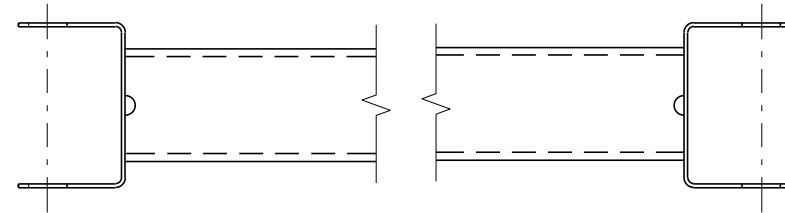
6

SDD 14B44 - 04a

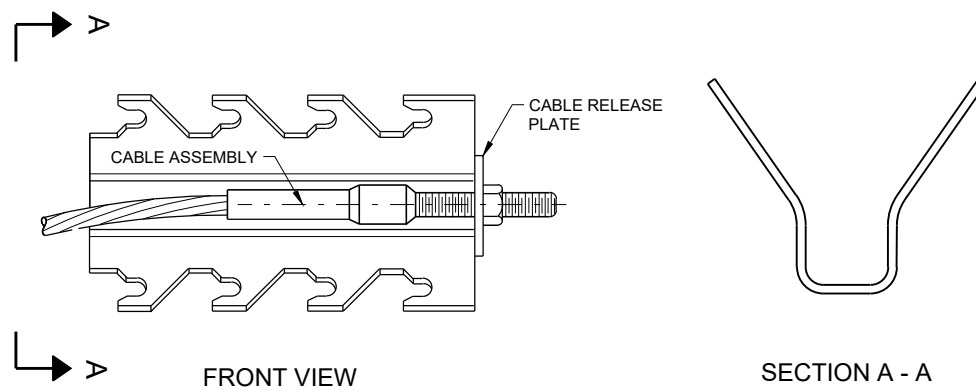
SDD 14B44 - 04a

**BILL OF MATERIALS**

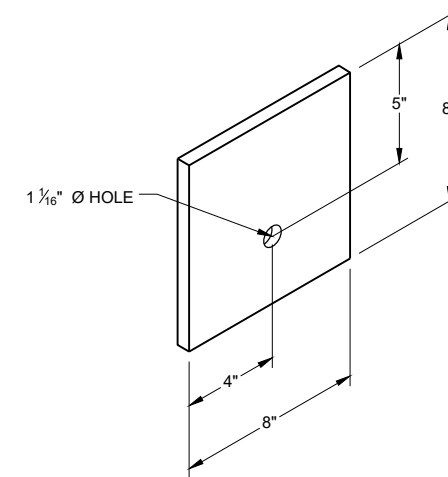
PART NO.	DESCRIPTION MATERIALS PROVIDED BY MGS EAT MANUFACTURER. SEE MANUFACTURER'S DETAILS FOR MORE INFORMATION.
①	UPPER POST NO. 1 6" X 6" TUBE
②	LOWER POST NO. 1
③	WOOD CRT
④	WOOD BLOCKOUT
⑤	PIPE SLEEVE
⑥	BEARING PLATE
⑦	BCT CABLE ASSEMBLY
⑧	ANCHOR CABLE BOX
⑨	GROUND STRUT
⑩	PERFORATED W-BEAM RAIL END PANEL, 12'-6" LONG.
⑪	STANDARD W-BEAM RAIL. MULTIPLE SECTIONS REQUIRED. SECTIONS VARY IN LENGTH.
⑫	IMPACT HEAD
⑬	EAT MARKER POST - YELLOW (SEE APPROVED PRODUCTS LIST)
⑭	SOIL PLATE
⑮	UPPER POST NO. 2
⑯	LOWER POST NO. 2



**GENERIC GROUND STRUT** ⑨ ⑤



**GENERIC ANCHOR CABLE BOX** ⑨ ⑤

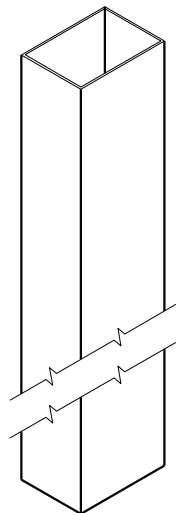


**BEARING PLATE** ⑥ ⑤

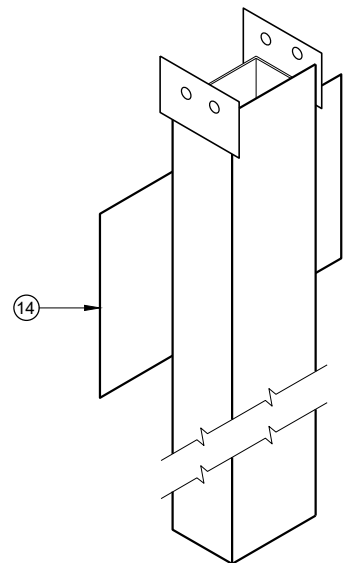
**MIDWEST GUARDRAIL SYSTEM  
ENERGY ABSORBING TERMINAL  
(MGS)**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

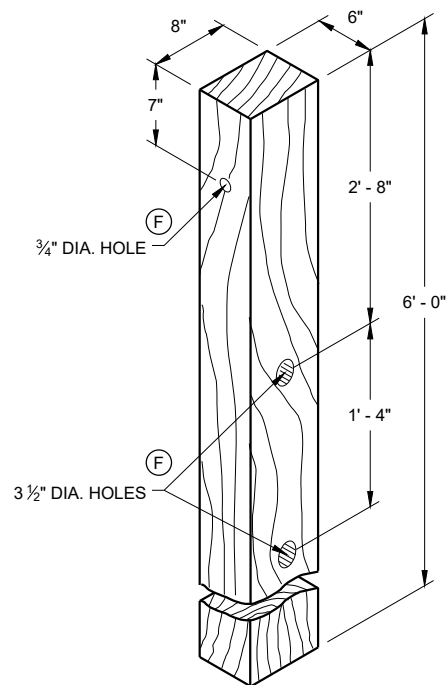




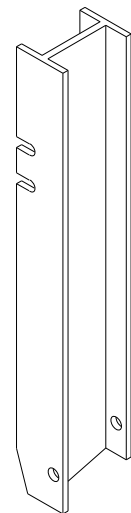
UPPER POST NO. 1 <sup>(1)</sup> (E)



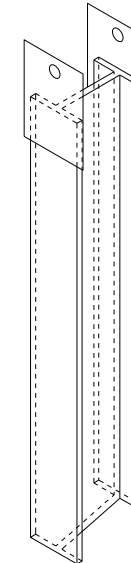
LOWER POST NO. 1 <sup>(2)</sup> (E)



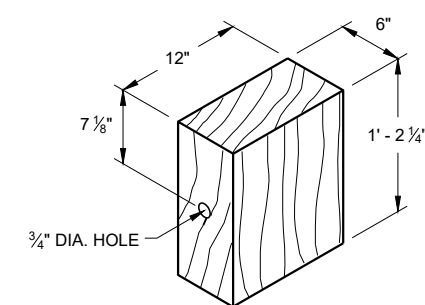
WOOD CRT POST <sup>(3)</sup> (E)  
POSTS NUMBER 3-9



UPPER POST NO. 2 <sup>(15)</sup> (E)

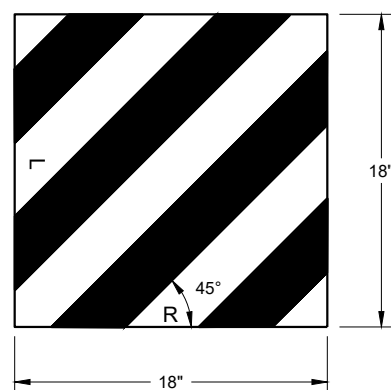


LOWER POST NO. 2 <sup>(16)</sup> (E)



WOOD BLOCKOUT <sup>(4)</sup>  
REQ'D. AT ALL POSTS EXCEPT POST NO'S 1 & 2

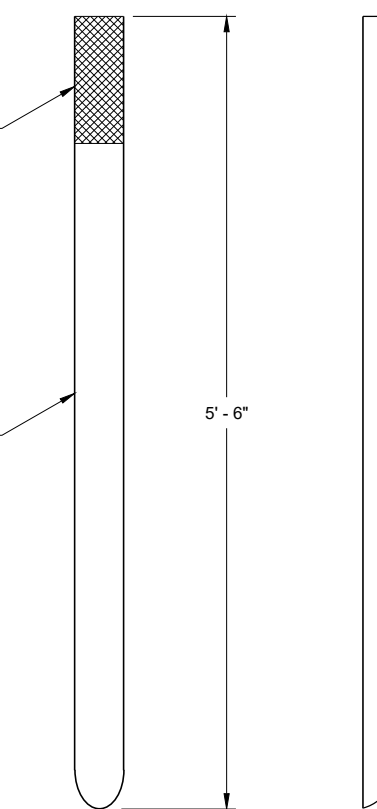
6



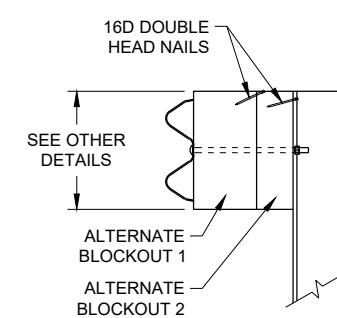
W5 - 59  
REFLECTIVE SHEETING DETAIL <sup>(E)</sup>

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

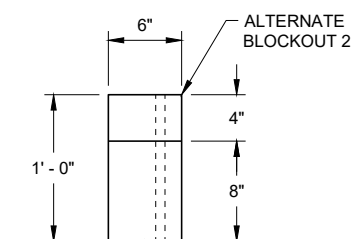
E.A.T. MARKER  
POST (YELLOW)



FRONT VIEW SIDE VIEW  
E.A.T. MARKER POST <sup>(13)</sup>



SIDE VIEW



TOP VIEW

ALTERNATE WOOD  
BLOCKOUT DETAIL

6

SDD 14B44 - 04c

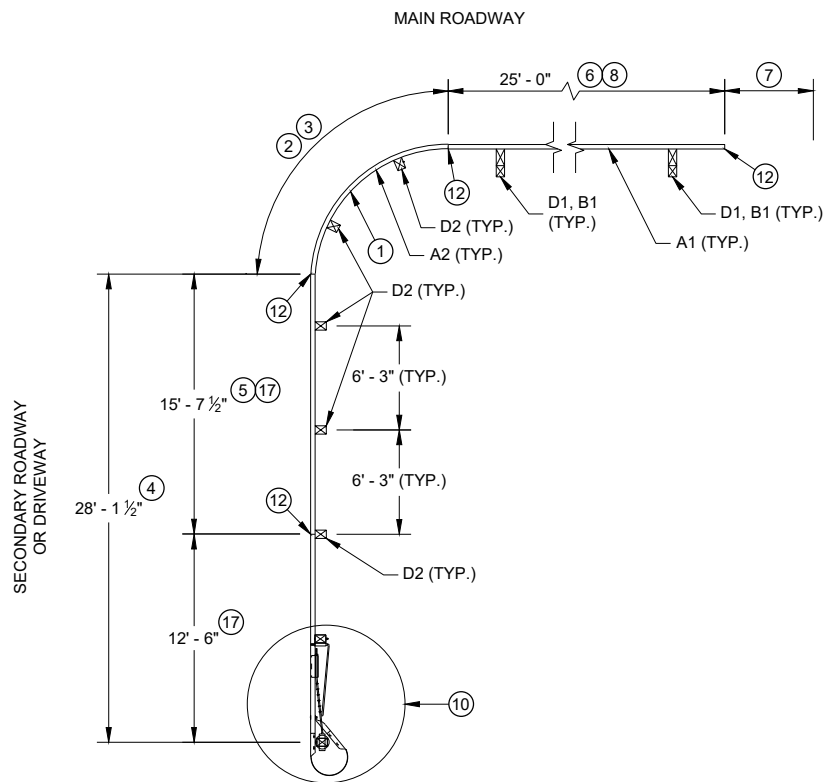
SDD 14B44 - 04c

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

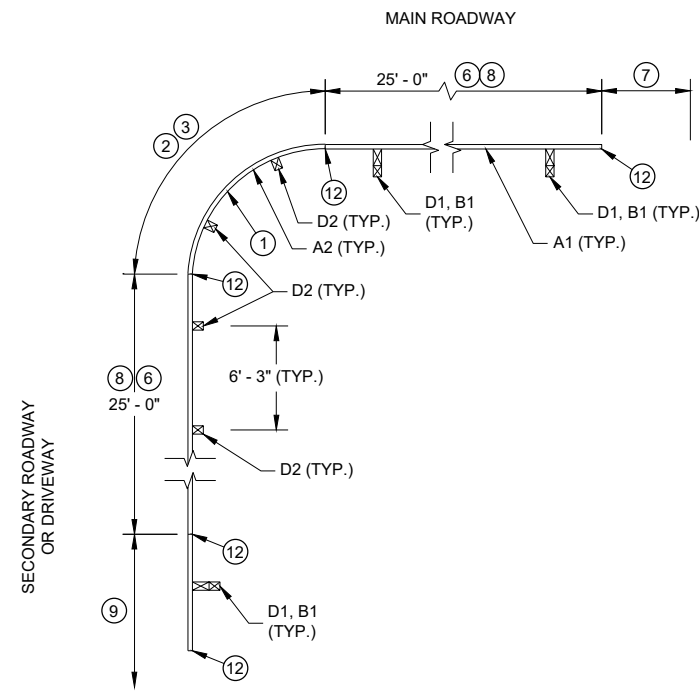
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
7/2018 DATE /S/ Rodney Taylor  
ROADWAY STANDARDS DEVELOPMENT  
UNIT SUPERVISOR

FHWA



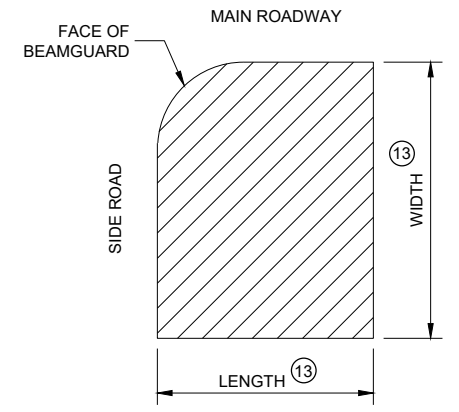
**PLAN VIEW**  
**SHORT RADIUS BEAM GUARD WITH**  
**SHORT RADIUS TERMINAL ON**  
**SECONDARY ROAD OR DRIVEWAY**



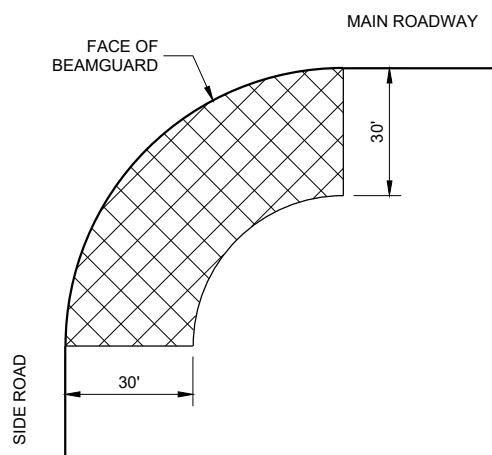
**PLAN VIEW**  
**SHORT RADIUS BEAM GUARD WITH**  
**EAT, ADDITIONAL BEAM GUARD**  
**OR**  
**TRANSITION TO RIGID BARRIER ON**  
**SECONDARY ROAD OR DRIVEWAY**

**TABLE FOR RADIUS OF 32' AND LESS**

RADIUS (FT)	LENGTH (FT)	WIDTH (FT)
8	25	15
16	30	15
24	40	20
32	50	30



**AREA FREE OF FIXED**  
**OBJECTS FOR RADIUS**  
**32' AND LESS**

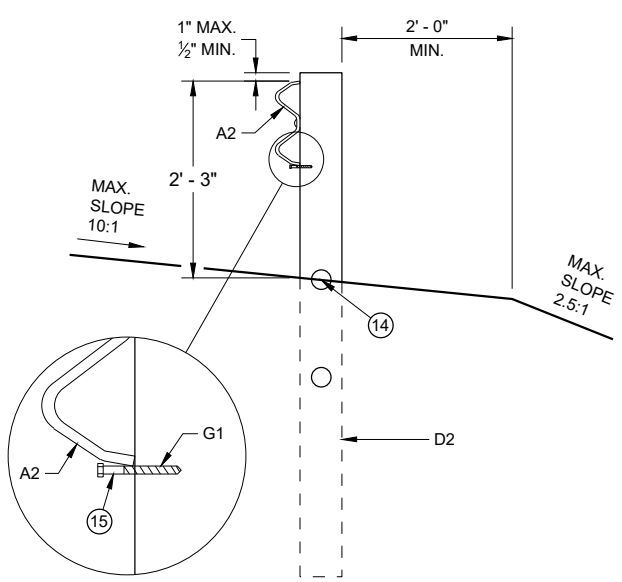


**AREA FREE OF FIXED**  
**OBJECTS FOR RADIUS**  
**GREATER THAN 32'**

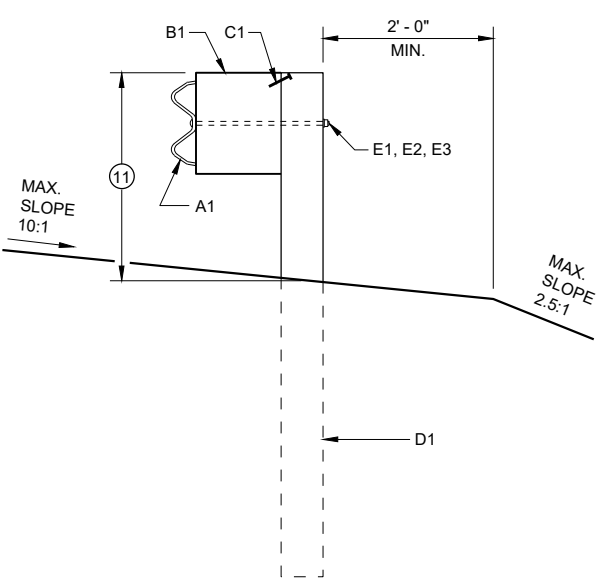
**GENERAL NOTES**

- SEE PLANS FOR OTHER BARRIER SYSTEM AND LOCATION SPECIFICS.
- SEE SDD 14B42 FOR MORE INFORMATION ON BEAM GUARD INSTALLATION, PARTS, MATERIALS, AND INSTALLATION INFORMATION.
- GALVANIZE PARTS AFTER FABRICATION.
- WELDING TO FOLLOW CURRENT REQUIREMENTS OF THE AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE ANSI / AWS D1.1.
- UNLESS NOTED OTHERWISE, ALL PLATES ARE FLAT AND FREE OF WARP.
- UNLESS NOTED OTHERWISE, ALL EDGES ARE SMOOTH, STRAIGHT AND VERTICAL.
- ALL CUTS AND HOLES, EXCEPT IN BEAM GUARD RAIL ARE TO BE MACHINED OR MACHINE FLAME CUT.
- UNLESS NOTED OTHERWISE, CUT OR PROVIDE BOLTS THAT ARE 1/4" TO 1/2" BEYOND THE NUT.
- DRAWINGS ARE NOT TO SCALE.

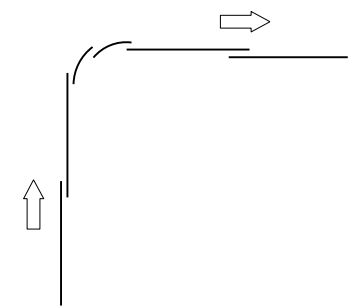
- ① RADIUS MEASURE FROM INSIDE OF RAIL. LENGTH OF BEAM GUARD SHORT RADIUS GUARD MEASURED ALONG TRAFFIC SIDE OF RAIL. RADIUS BETWEEN 8 FEET TO 150 FEET. SEE PLAN FOR REQUIRED RADIUS. BEAM GUARD RAIL IN RADIUS IS SHOP BENT. ODD RAIL LENGTH OR FIELD CUTS MAY BE REQUIRED.
- ② CONTROLLED RELEASE TERMINAL (CRT) POSTS ARE USED IN THE RADIUS. CONTROLLED RELEASE TERMINAL (CRT) POSTS ARE SPACED 6' - 3". SEE PLAN FOR NUMBER OF CONTROLLED RELEASE (CRT) POSTS.
- ③ WITHIN RADIUS BEAM GUARD RAILS ARE NOT BOLTED TO POSTS. BEAM GUARD RAIL IS RESTED ON TOP OF LAG SCREW.
- ④ MINIMUM LENGTH OF BEAM GUARD ALONG SIDE ROAD OR DRIVEWAY TO INSTALL SHORT RADIUS TERMINAL. BEAM GUARD IS PAID WITH BEAM GUARD ITEM.
- ⑤ ODD LENGTH OF BEAM GUARD REQUIRED TO INSTALL SHORT RADIUS TERMINAL.
- ⑥ MINIMUM AMOUNT OF BEAM GUARD TO BE INSTALLED PRIOR TO TRANSITION TO RIGID BARRIER, ADDITIONAL BEAM GUARD, OR EAT. BEAM GUARD PAID FOR WITH BEAM GUARD ITEM. SEE PLANS FOR MORE DETAIL.
- ⑦ BEAM GUARD, EAT, OR TRANSITION TO RIGID BARRIER. SEE PLAN.
- ⑧ TOP OF BEAM GUARD BY THE RADIUS IS 27". HEIGHT OF BEAM GUARD IS 31" BY TRANSITION TO RIGID BARRIER, ADDITIONAL BEAM GUARD OR EAT.
- ⑨ ADDITIONAL BEAM GUARD, EAT OR TRANSITION TO RIGID BARRIER. BEAM GUARD SHOWN. SEE PLAN FOR DETAILS.
- ⑩ SHORT RADIUS TERMINAL (SEE OTHER DETAILS).
- ⑪ HEIGHT VARIES. SEE NOTE ⑧ AND ⑧.
- ⑫ BEAM GUARD RAIL SPLICE LOCATION. SPLICE LOCATION REQUIRES PART F1 AND F2. SEE SDD 14B42 FOR DETAILS.
- ⑬ SEE TABLE FOR VALUES.
- ⑭ MAXIMUM HEIGHT FOR CENTER OF HOLE IS 3/4" ABOVE FINISHED GROUND ±1".
- ⑮ DRILL POST 1 5/8" DIA. PILOT HOLE. DO NOT HAMMER LAG SCREW INTO POST.
- ⑯ SMALL SIGNS ON BREAKAWAY HARDWARE ARE ACCEPTABLE.
- ⑰ TOP OF RAIL HEIGHT IS 27" WHEN USING A SHORT RADIUS TERMINAL (CRT).



**CONTROLLED RELEASE**  
**TERMINAL POST (CRT) IN RADIUS**



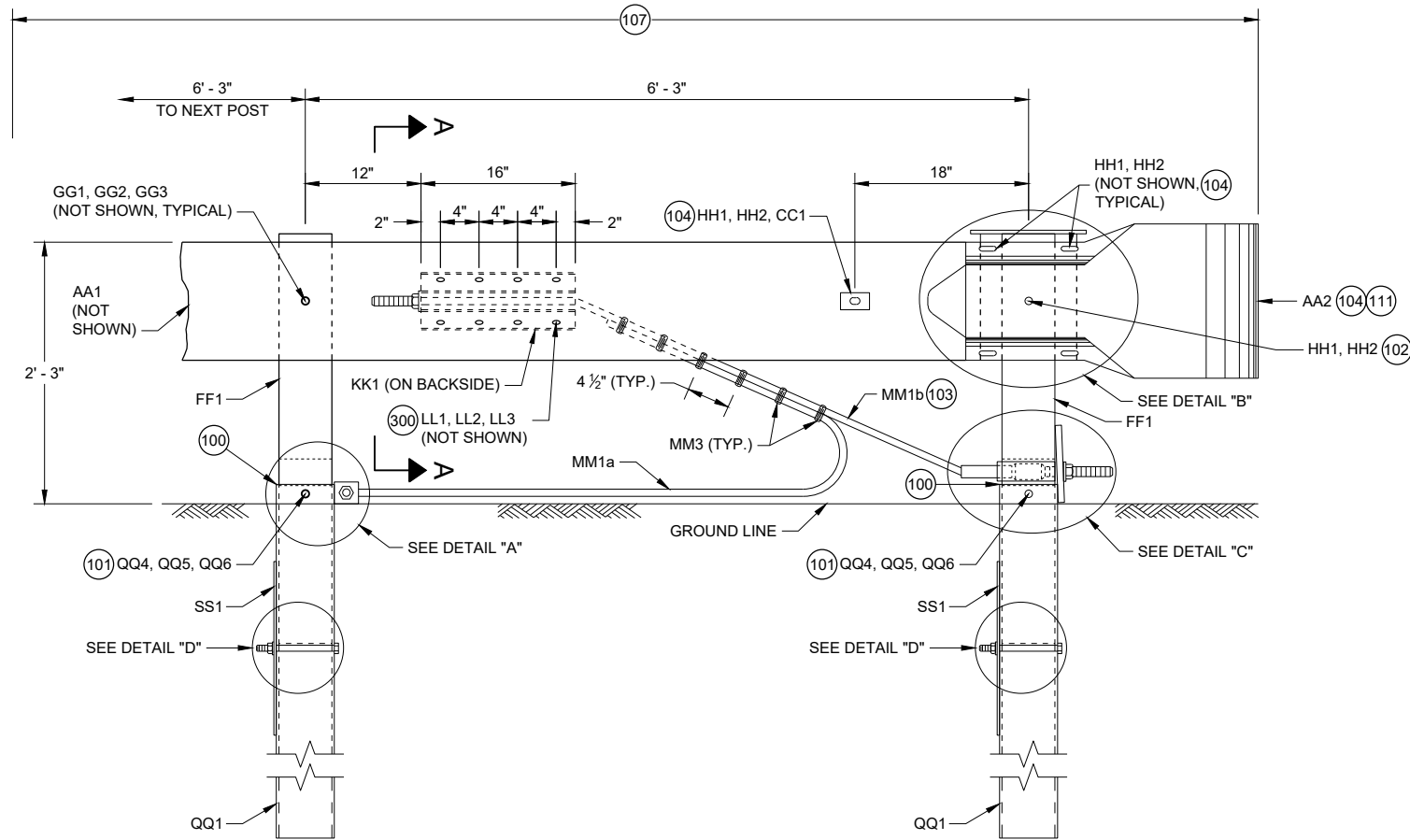
**BEAM GUARD POSTS**  
**IN HEIGHT TRANSITION**



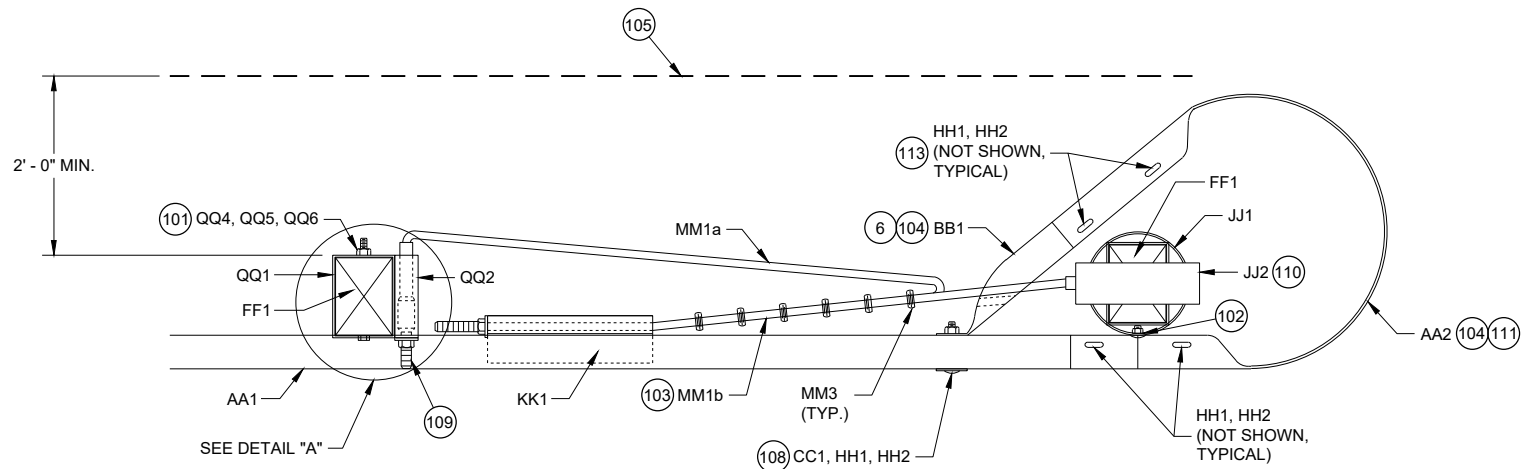
**LAP SPLICE DETAIL**

**SHORT RADIUS BEAM**  
**GUARD (MGS) SHORT**  
**RADIUS TERMINAL (MGS)**

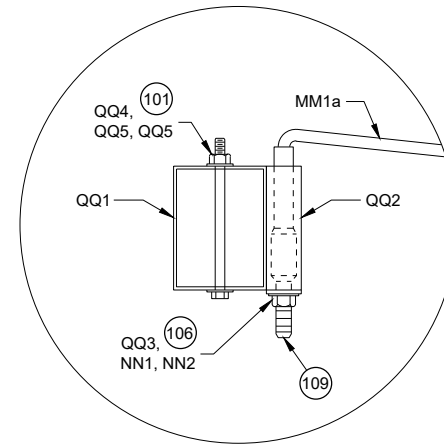
STATE OF WISCONSIN  
 DEPARTMENT OF TRANSPORTATION



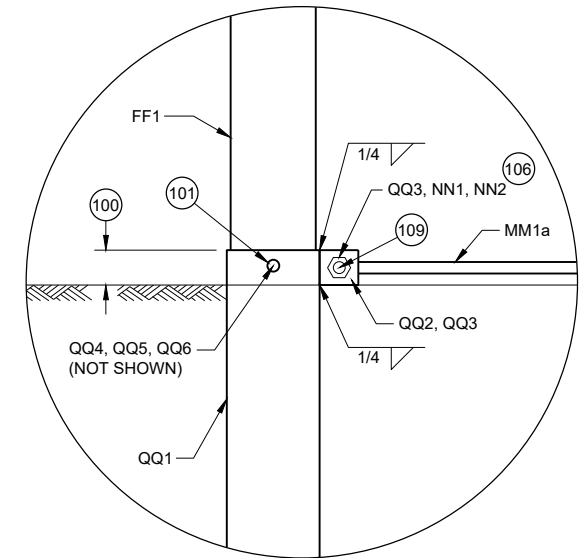
**PROFILE VIEW  
SHORT RADIUS TERMINAL**



**TOP VIEW  
SHORT RADIUS TERMINAL**



**TOP VIEW  
DETAIL "A"  
(WOOD BREAKAWAY AND BEAM  
GUARD RAIL POSTS NOT SHOWN)**



**PROFILE VIEW  
DETAIL "A"**

**GENERAL NOTES**

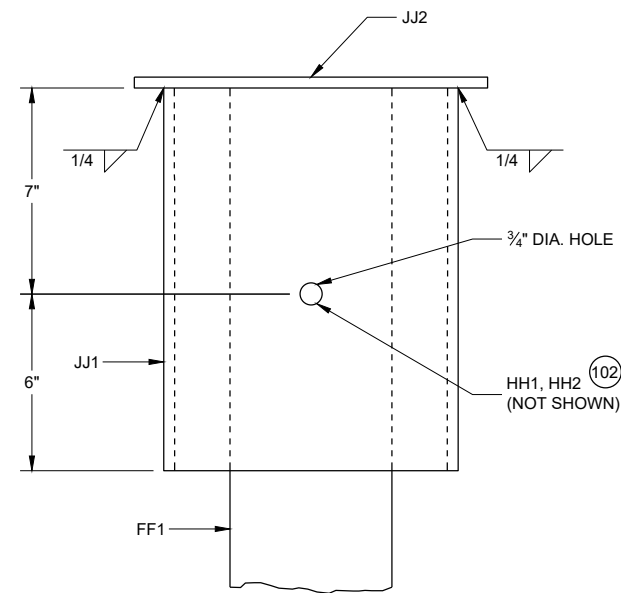
- 100 TOP OF FOUNDATION TUBE 2 INCHES MAXIMUM ABOVE FINISHED GROUND.
- 101 WASHERS REQUIRED BETWEEN BOLT HEAD AND FOUNDATION TUBE AND BETWEEN NUT AND FOUNDATION TUBE.
- 102 SPLICE BOLT AND NUT CONNECTS BEAM GUARD RAIL, W-BEAM SECTION BUFFER, AND STEEL PIPE ASSEMBLY. NO WASHER REQUIRED. SEE DETAIL "B".
- 103 CABLE IS TAUT.
- 104 ADJUST AA2 AND BB1 TO FIT.
- 105 BREAK POINT OF SHOULDER.
- 106 TACK WELD CABLE CONNECTOR TUBE PLATE TO CABLE CONNECTION TUBE. SEE DETAIL "A" PROFILE VIEW.
- 107 PAY LIMIT FOR BEAM GUARD.
- 108 SQUARE WASHER BETWEEN HEAD OF BOLT AND TRAFFIC FACE OF BEAM GUARD. ROUND WASHER REQUIRED BETWEEN NUT AND BB1.
- 109 CUT OR PROVIDE THREADED STUD THAT IS FLUSH WITH FACE OF BEAM GUARD RAIL KK1 (PLUS OR MINUS 1/2" TOLERANCE). DEBURR AFTER CUTTING.
- 110 SEE STEEL PIPE ASSEMBLY DETAILS.
- 111 ATTACH UU2 WITH UU3. SHOP APPLY UU1 TO UU2.
- 112 FOUR (4) HH1 AND HH2 REQUIRED TO ATTACH AA1 TO AA2.
- 113 FOUR (4) HH1 AND HH2 REQUIRED TO ATTACH AA2 TO BB1.

**SHORT RADIUS BEAM  
GUARD (MGS) SHORT  
RADIUS TERMINAL (MGS)**

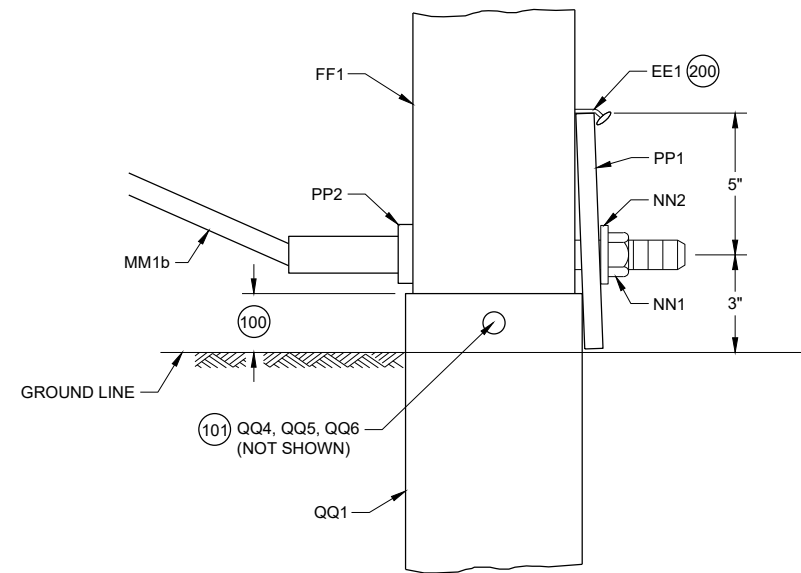
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

**GENERAL NOTES**

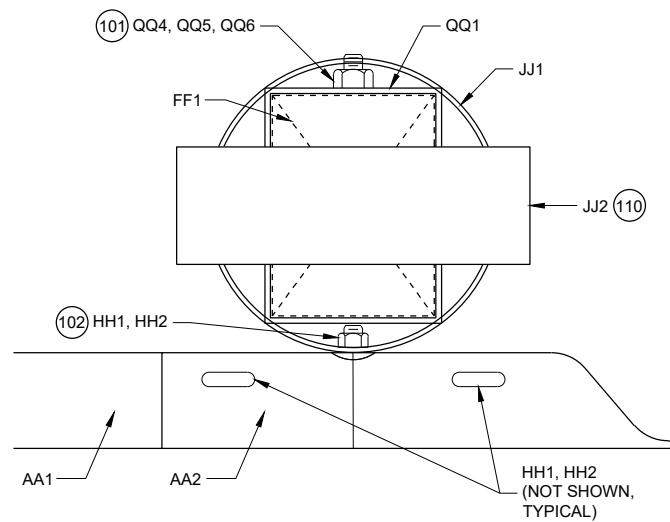
(200) TWO (2) NAILS SPACED 4 INCHES CENTER TO CENTER.



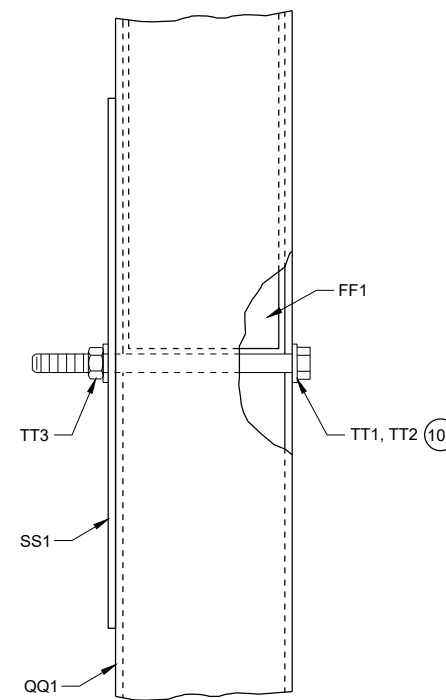
**PROFILE VIEW  
DETAIL "B"  
STEEL PIPE ASSEMBLY  
(BEAM GUARD AND W BEAM  
END SECTION NOT SHOWN)**



**PROFILE VIEW  
DETAIL "C"**



**PLAN VIEW  
DETAIL "B"  
STEEL PIPE ASSEMBLY**



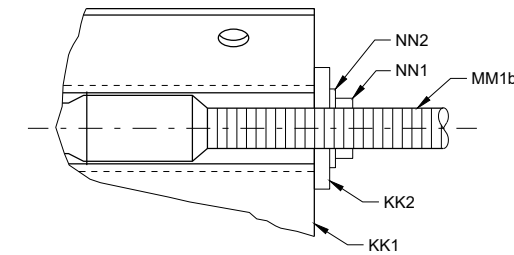
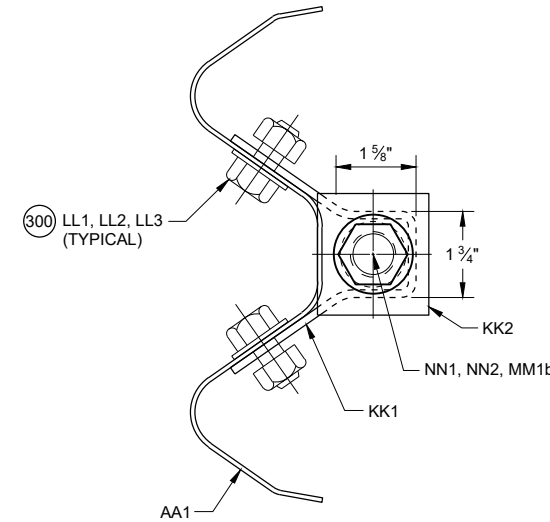
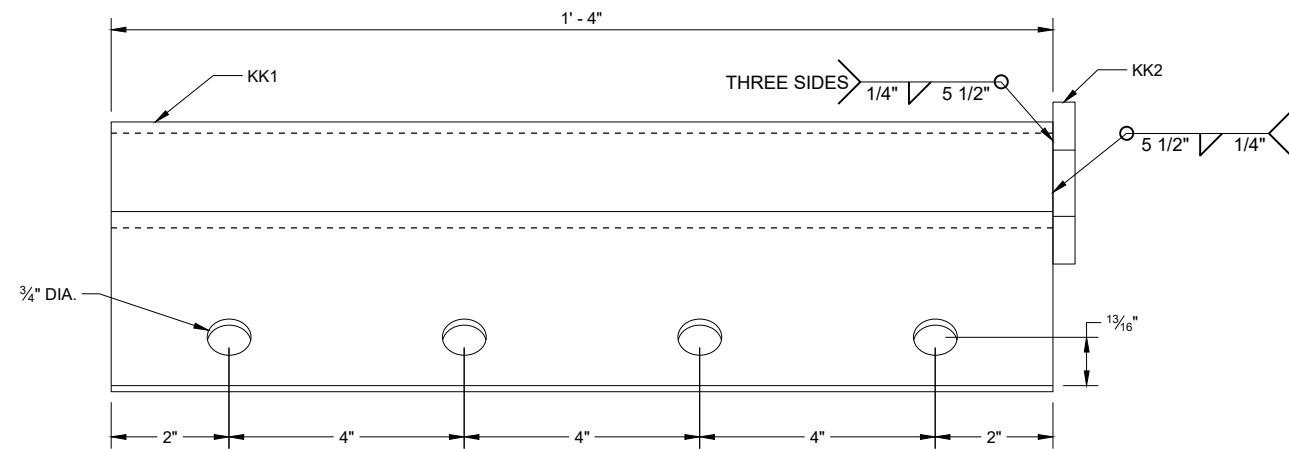
**PROFILE VIEW  
DETAIL "D"**

**SHORT RADIUS BEAM  
GUARD (MGS) SHORT  
RADIUS TERMINAL (MGS)**

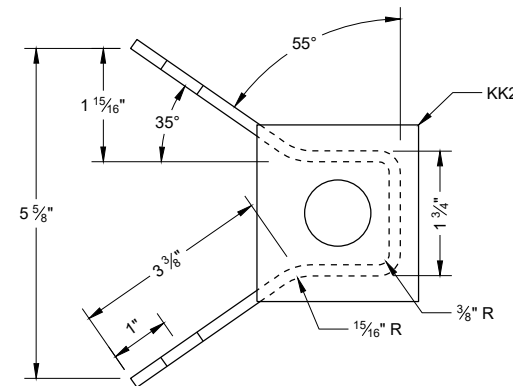
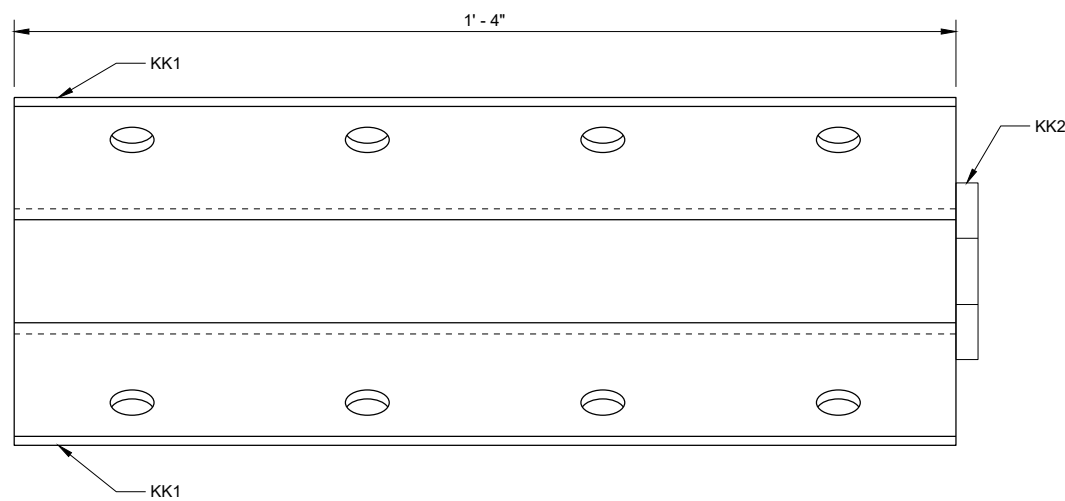
STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

**GENERAL NOTES**

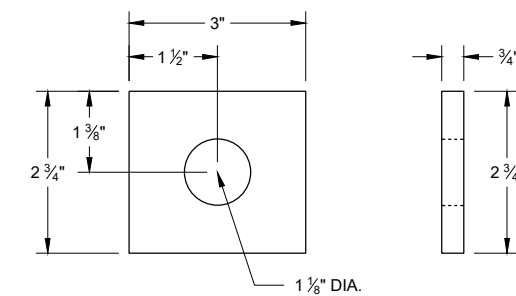
300 WASHERS REQUIRED BETWEEN BOLT HEAD AND BEAM GUARD RAIL AND BETWEEN NUT AND ANCHOR BRACKET. EIGHT (8) LL1 AND LL3 REQUIRED. SIXTEEN (16) LL2 REQUIRED.



**SECTION A - A**



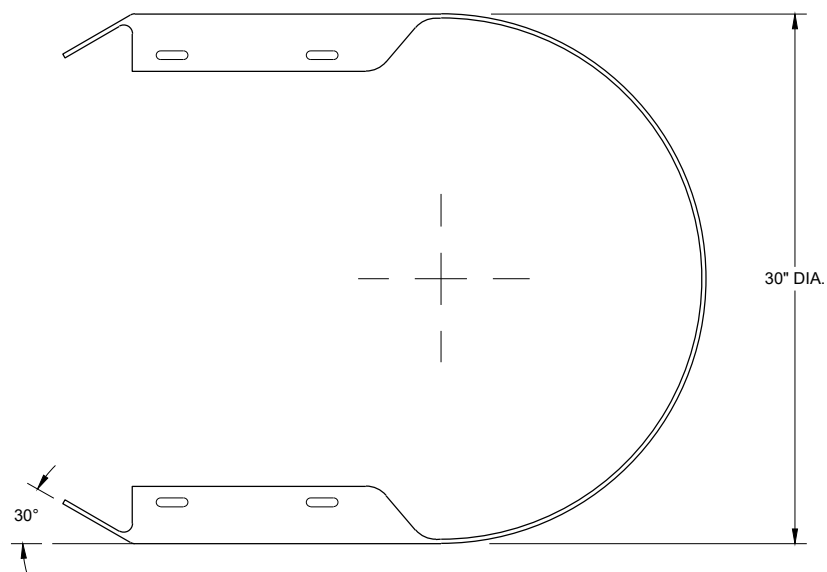
**ANCHOR BRACKET BEARING PLATE (KK2)**



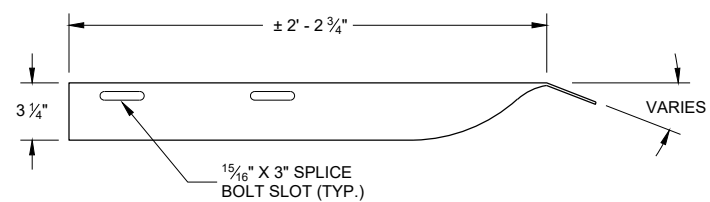
**ANCHOR BRACKET (KK1, KK2)**

**SHORT RADIUS BEAM  
GUARD (MGS) SHORT  
RADIUS TERMINAL (MGS)**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



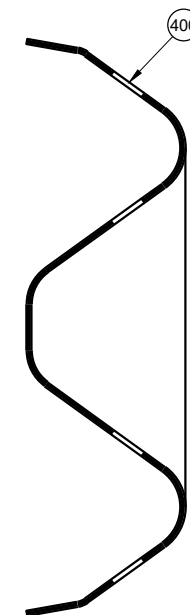
**TOP VIEW**



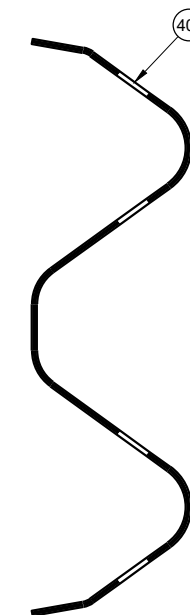
**TOP VIEW**

**GENERAL NOTES**

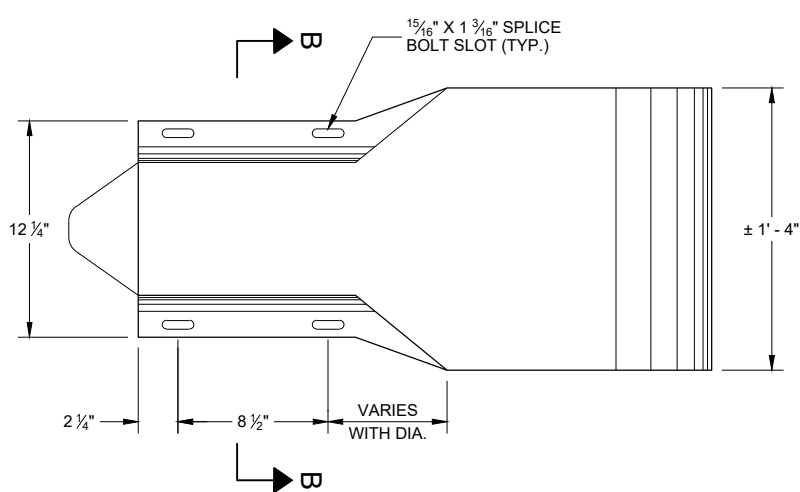
- (400) CROSS SECTION OF PART IS TO FIT OVER AA1 .
- (401) CROSS SECTION OF PART IS TO FIT OVER OR UNDER AA1 .



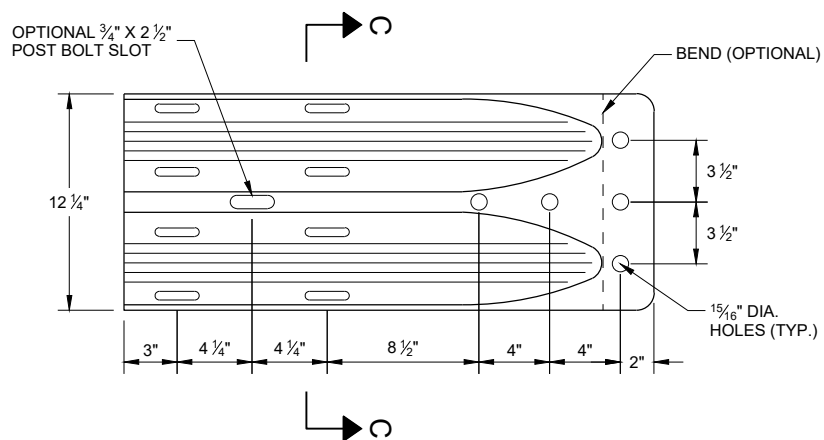
**SECTION B - B**



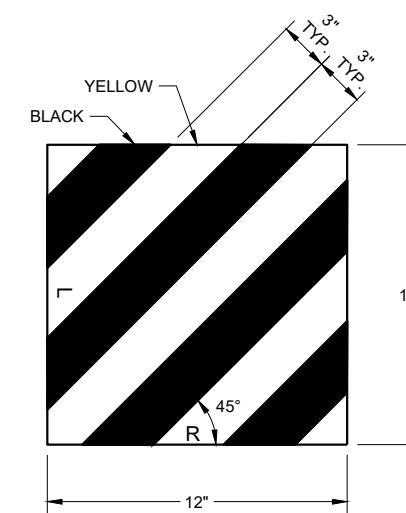
**SECTION C - C**



**PROFILE VIEW  
W BEAM  
END SECTION BUFFER (AA2)**



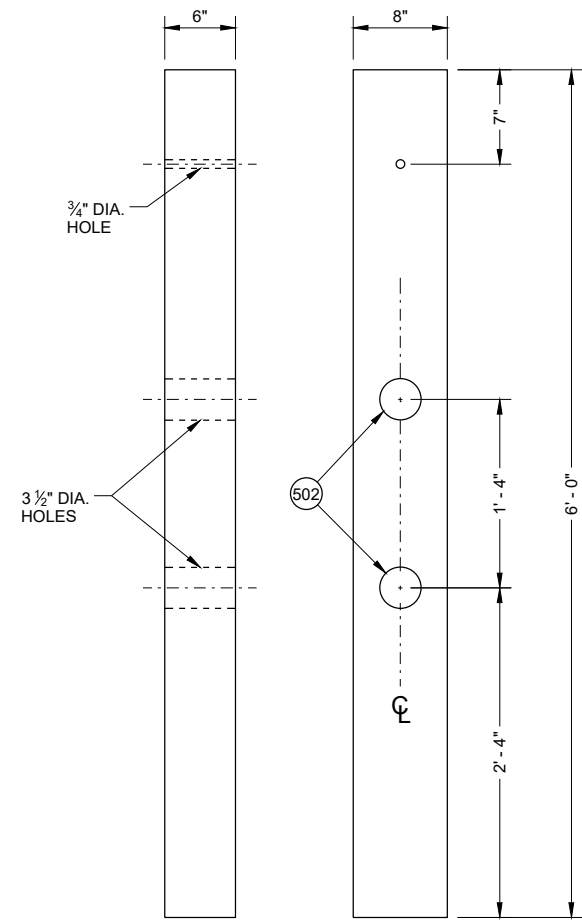
**PROFILE VIEW  
W BEAM  
TERMINAL CONNECTOR (BB1)**



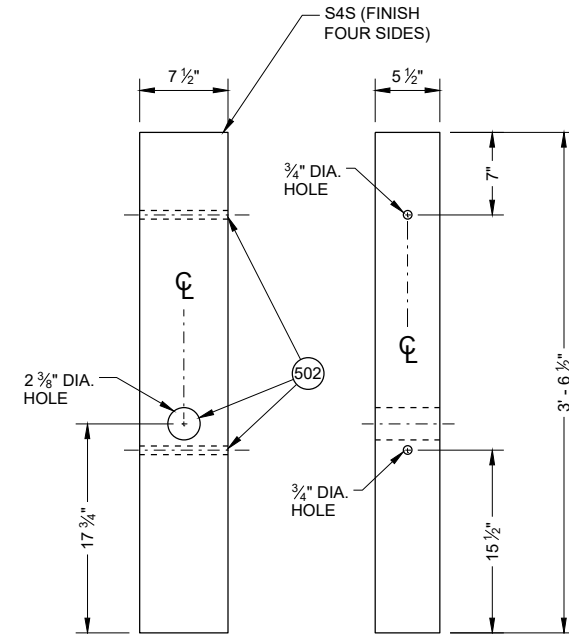
**REFLECTIVE SHEETING (UU1, UU2)**

**SHORT RADIUS BEAM  
GUARD (MGS) SHORT  
RADIUS TERMINAL (MGS)**

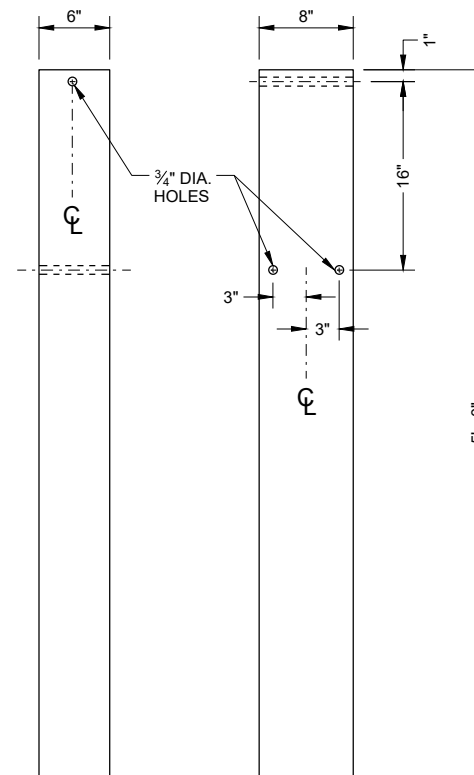
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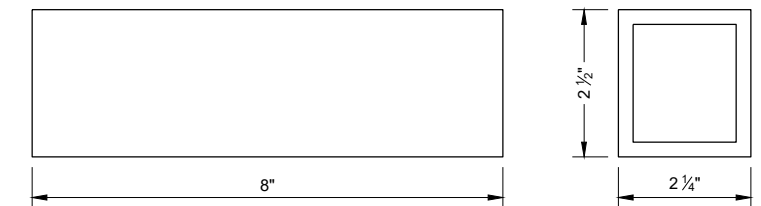
**FRONT VIEW SIDE VIEW  
CONTROLLED RELEASE  
POST (CRT) (DD2)**



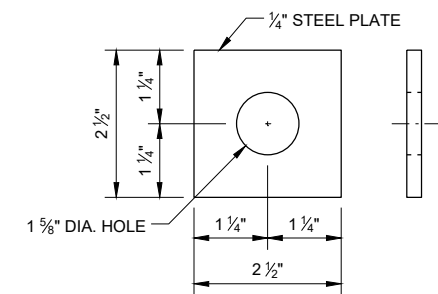
**FRONT VIEW SIDE VIEW  
WOOD BREAKAWAY POST (FF1)**



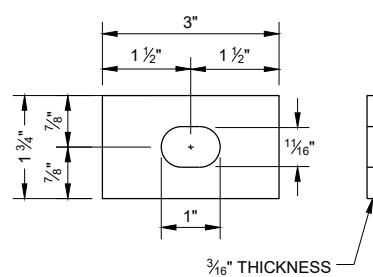
**FRONT VIEW SIDE VIEW  
FOUNDATION TUBE (QQ1)**



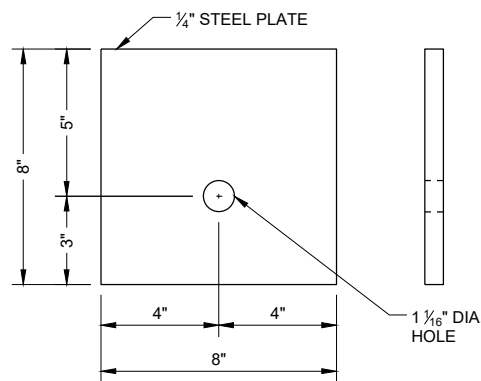
**FOUNDATION TUBE -  
ANCHOR CABLE TUBE (QQ2)**



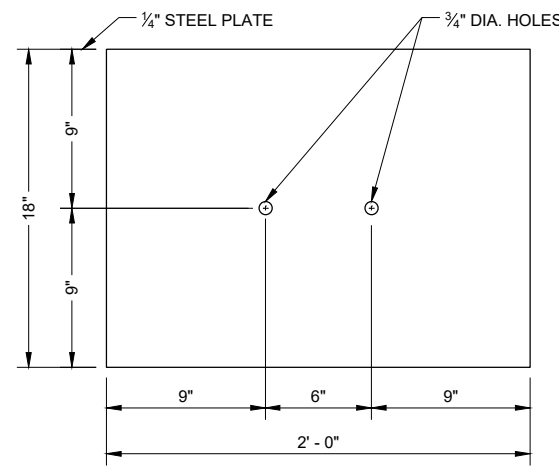
**ANCHOR CABLE TUBE  
END PLATE (QQ3)**



**RECTANGULAR PLATE  
WASHER (CC1)**

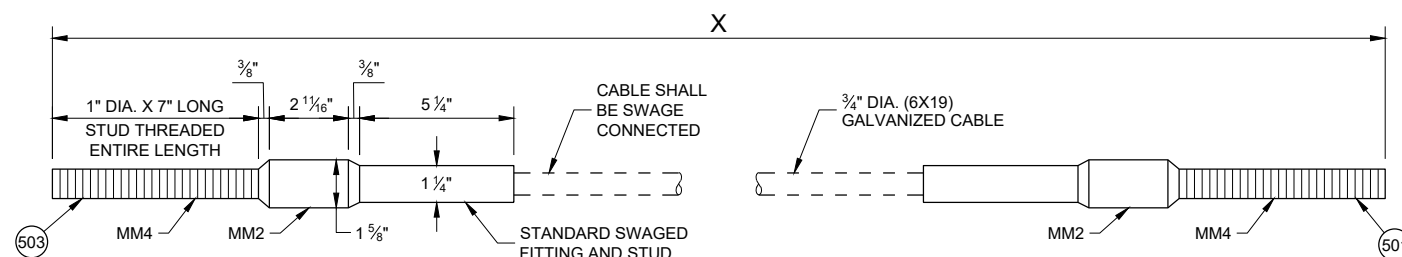


**BEARING PLATE (PP1)**



**SOIL PLATE (SS1)**

- GENERAL NOTES**
- (500) SEE DETAIL "D" FOR LOCATION AND ATTACHMENT OF SS1.
  - (501) FOR MM1a THREADED STUD ONLY REQUIRED ON ONE END. SWAGED FITTING REQUIRED.
  - (502) LOCATE HOLES ON THE CENTERLINE OF THE SIDE OF THE POST.
  - (503) MM1a MAY HAVE ONE THREADED STUD 4 INCHES LONG. SEE NOTE (109).



**CABLE ASSEMBLY (MM1a, MM1b)**

**"X" LENGTH**

MM1b	9' - 0"
MM1b	6' - 8"

**SHORT RADIUS BEAM  
GUARD (MGS) SHORT  
RADIUS TERMINAL (MGS)**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

**BILL OF MATERIALS - SHORT RADIUS BEAM GUARD (MGS)**

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
A1	BEAM GUARD RAIL	AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
A2	BEAM GUARD RAIL - SHOP BENT	INDICATE ON BACK OF RAIL THE RADIUS THAT RAIL WAS BENT TO. SHOP BEND RADIUS IS TO THE NEAREST FOOT. FOLLOW AASHTO M180 ON HOW TO MARK RADIUS INFORMATION.	
		AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
B1	BLOCK - WOOD	WISDOT SPEC. 614	SEE SDD 14B42
C1	NAIL	ASTM A153 HOT DIP CLASS D	
		ASTM F1667 TYPE 1 STYLE 12 (16 DOUBLE HEAD)	
D1	POST-STRONG POST-WOOD	WISDOT SPEC. 614	SEE SDD 14B42
D2	POST-CRT-WOOD	WISDOT SPEC. 614	
E1	POST BOLT	ASTM A307 GRADE A OR SAE J429 GRADE 2	5/8" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		AASHTO M180	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		UNC	
E2	POST BOLT - WASHER	ASTM F436 TYPE 1 (HARDEN TYPICALLY USED WITH STEEL) OR ASTM F844 (UNHARDENED TYPICALLY WITH WOOD)	5/8" DIA.
		GALV. AASHTO M111 / ASTM A 123 OR GALV. HOT DIP. TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	
E3	POST BOLT - NUT	AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	5/8" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		UNC	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		ASTM A563 GRADE A HEAVY HEX HEAD	
F1	SPLICE BOLT	GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	5/8" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		ASTM A307 GRADE A OR SAE J429 GRADE 2	
		UNC	
		AASHTO M180	

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
F2	SPLICE BOLT - NUT	ASTM A563 GRADE A	5/8" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C/ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		UNC	
G1	LAG SCREW	ASTM A308 GRADE A ASTM A153 CLASS D	1/2" DIA. 6" LONG
H1	DELINEATOR - BEAM GUARD		SEE SDD 14B42 FOR MORE INFORMATION
H2	DELINEATION - SHEETING	YELLOW OR WHITE	
		WISDOT SPEC 637 TYPE SH	
		APPROVED PRODUCT LIST	
J1	FOUNDATION BACKFILL	STANDARD SPEC. 614	
AA1	BEAM GUARD RAIL - PUNCHED	AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
AA2	BEAM GUARD RAIL - END SECTION BUFFER	AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
BB1	BEAM GUARD RAIL - TERMINAL CONNECTOR MODIFIED	AASHTO M180, CLASS A, TYPE 2	
		APPROVED PRODUCER	
CC1	SHORT RADIUS - SQUARE WASHER	AASHTO M180	
		GALV. AASHTO M111 / ASTM A123	
EE1	NAIL	ASTM A153 HOT DIP CLASS D	
		ASTM F1667 TYPE 1 STYLE 12 (16 DOUBLE HEADED)	
FF1	POST - BCT - WOOD	S4S FINISH ON 4 SIDES	
		WISDOT SPEC. 614	
GG1	POST BOLT	ASTM A307 GRADE A OR SAE J429 GRADE 2	5/8" DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		AASHTO M180	
		GALV. HOT DIP TO AASHTO M232 CLASS C/ASTM A153 CLASS C/ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1/ASTM B695 CLASS 50, TYPE 1	
		UNC	
GG2	POST BOLT - WASHER	ASTM F436 TYPE 1 (HARDEN TYPICALLY USED WITH STEEL) OR ASTM F844 (UNHARDENED TYPICALLY WITH WOOD)	5/8" DIA.
		GALV. AASHTO M111 / ASTM A 123 OR GALV. HOT DIP. TO AASHTO M232 CLASS C/ASTM A153 CLASS C / ASTM F2329	

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SDD 14B53 - 02g

**SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION



**BILL OF MATERIALS - SHORT RADIUS BEAM GUARD (MGS)**

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
GG3	POST BOLT - NUT	ASTM A563 GRADE A	$\frac{3}{8}$ " DIA. SEE 14B42 FOR GEOMETRY
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		UNC	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
ASTM A563 GRADE A HEAVY HEX HEAD			
HH1	SPLICE BOLT	GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	$\frac{3}{8}$ " DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		ASTM A307 GRADE A OR SAE J429 GRADE 2	
		UNC	
		AASHTO M180 HEAD GEOMETRY	
HH2	SPLICE BOLT - NUT	ASTM A563 GRADE A	$\frac{3}{8}$ " DIA. SEE SDD 14B42 FOR BOLT GEOMETRY
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		UNC	
JJ1	PIPE - STEEL	ASTM A53 GALVANIZED GRADE B SCHEDULE 40	10" O.D.
JJ2	TOP PLATE	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	DIMENSIONS $\frac{3}{8}$ " X 4" X 1' - 0"
		GALV. AASHTO M111 / ASTM A123	
KK1	ANCHOR BRACKET	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	
		GALV. AASHTO M111 / ASTM A123	
KK2	ANCHOR BRACKET - BEARING PLATE	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	
		GALV. AASHTO M111 / ASTM A123	
LL1	ANCHOR BRACKET - BOLT	ASTM A307 GRADE B HEAVY HEX HEAD OR SAE J429 GRADE 2 HEAVY HEX HEAD	$\frac{3}{8}$ " DIA.
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		UNC	

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
LL2	ANCHOR BRACKET - WASHER	ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	$\frac{3}{8}$ " DIA.
		GALV. AASHTO M111 / ASTM A123 OR GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	
LL3	ANCHOR BRACKET - NUT	ASTM A563 GRADE A	$\frac{3}{8}$ " DIA.
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		UNC	
MM1a	ANCHOR CABLE	AASHTO M30 / ASTM A741 INDEPENDENT WIRE CORE (IWRC) OR WIRE STRAND CORE (WCS), IMPROVED PLOW STEEL (IPS), 6X19, TYPE II OR IIc CLASS C ZINC COATED	
MM1b	ANCHOR CABLE	AASHTO M30 / ASTM A741 INDEPENDENT WIRE CORE (IWRC) OR WIRE STRAND CORE (WCS), IMPROVED PLOW STEEL (IPS), 6X19, TYPE II OR IIc CLASS C ZINC COATED	
MM2	ANCHOR CABLE - SWAGE FITTING	ASTM A576 GRADE 1035	
		SWAGE FITTINGS ARE TO BE FACTORY SWEDGED. WITH A BREAKING STRENGTH 40,000 LBS.	
		GALV. AASHTO M111 / ASTM A123	
		ASME B30.26 FORGED, CAST, OR DIE STAMPED WITH THE FOLLOWING INTO CONNECTION: NAME OF MANUFACTURER OR TRADEMARK OF CONNECTION'S MANUFACTURER, SIZE OR RATED LOAD, GRADE.	
MM3	WIRE ROPE CABLE CLAMPS	FF-C-450D TYPE 1 CLASS 1	$\frac{3}{4}$ "
		ASTM A153 HOT DIP CLASS D	
MM4	ANCHOR CABLE - SWAGE FITTING - STUD	ASTM F3125 GRADE A325 TYPE 1 OR SAE GRADE 5 OR ASTM A449 TYPE 1 HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		UNC	
NN1	ANCHOR CABLE - NUT	ASTM A563 GRADE A	1" DIA.
		AASHTO M180 DOUBLE RECESSED HEAVY HEX HEAD	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		OVER TAPPED NUTS OVER-SIZE AS SPECIFIED IN AASHTO 291 / ASTM A 563	
NN2	ANCHOR CABLE - NUT - WASHER	UNC	1" DIA.
		ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	
		GALV. AASHTO M111 / ASTM A123 OR GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	

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SDD 14B53 - 02h

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**SHORT RADIUS BEAM  
GUARD (MGS) SHORT  
RADIUS TERMINAL (MGS)**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

**BILL OF MATERIALS - SHORT RADIUS BEAM GUARD (MGS)**

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
PP1	BEARING PLATE AT POST	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	
		GALV. AASHTO M111 / ASTM A123	
PP2	PIPE - STEEL	ASTM A53 GALVANIZED GRADE B SCHEDULE 40	2" DIA. x 6" LONG
QQ1	FOUNDATION TUBE	ASTM A500 GRADE B	8" X 6" X 3/8"
		GALV. AASHTO M111 / ASTM A123	
QQ2	SHORT RADIUS - FOUNDATION TUBE - ANCHOR CABLE - TUBE	ASTM A500 GRADE B	DIMENSIONS 2 1/2" X 2 1/4" X 1/4" X 8"
		GALV. AASHTO M111 / ASTM A123	
QQ3	SHORT RADIUS - SOIL TUBE - ANCHOR CABLE - TUBE - END PLATE	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	DIMENSIONS 2 1/2" X 2 1/2" X 1/4"
		GALV. AASHTO M111 / ASTM A123	
QQ4	GROUND STRUT AND YOKE - BOLT	GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	5/8 DIA.
		ASTM A307 GRADE B HEAVY HEX HEAD OR SAE J429 GRADE 2 HEAVY HEX HEAD	
		UNC	
QQ5	GROUND PLATE AND YOKE - WASHER	ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	5/8 DIA.
		GALV. AASHTO M111 / ASTM A123 OR GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	
QQ6	GROUND STRUT AND YOKE - NUT	HEAVY HEX	5/8 DIA.
		UNC	
		ASTM A563 GRADE A	
		OVER TAPPED NUTS AS SPECIFIED IN AASHTO 291 / ASTM A 563	
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	

PART	DESCRIPTION	MATERIALS SPECIFICATIONS	NOTES
SS1	SOIL PLATE	ASTM A36 MIN. STRENGTH 36 KSI, OR ASTM A529 MAX. STRENGTH 50 KSI, OR ASTM A572 MAX STRENGTH 50 KSI OR ASTM A709 MAX STRENGTH 50 KSI OR ASTM A992 MAX STRENGTH 50 KSI	
		GALV. AASHTO M111 / A123	
TT1	SOIL PLATE - BOLT	ASTM A307 GRADE B HEAVY HEX HEAD OR SAE J429 GRADE 2 HEAVY HEX HEAD	5/8 DIA.
		GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	
		UNC	
TT2	SOIL PLATE - WASHER	ASTM F436 TYPE 1 (HARDEN WASHER ONLY)	5/8 DIA.
		GALV. AASHTO M111 / ASTM A123 OR GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329	
TT3	SOIL PLATE - NUT	GALV. HOT DIP TO AASHTO M232 CLASS C / ASTM A153 CLASS C / ASTM F2329 OR GALV. MECHANICALLY TO AASHTO M298 CLASS 50, TYPE 1 / ASTM B695 CLASS 50, TYPE 1	5/8 DIA.
UU1	OBJECT MARKER - SHEETING	MUTCD / WISDOT OBJECT MARKER TYPE 3	PATTERN AND COLOR FOR SHEETING. SHEETING TYPE FOR MARKER.
		WISDOT SPEC 637 TYPE F	
		APPROVED PRODUCT LIST	
UU2	OBJECT MARKER - ALUMINUM PLATE	WISDOT SPEC 637 ALUMINUM PLATE	MATERIAL AND THICKNESS OF MATERIALS
UU3	OBJECT MARKER - SCREWS	STAINLESS SELF-TAPPING SCREWS	
VV1	FOUNDATION BACKFILL	WISDOT SPEC 614	

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SDD 14B53 - 02i

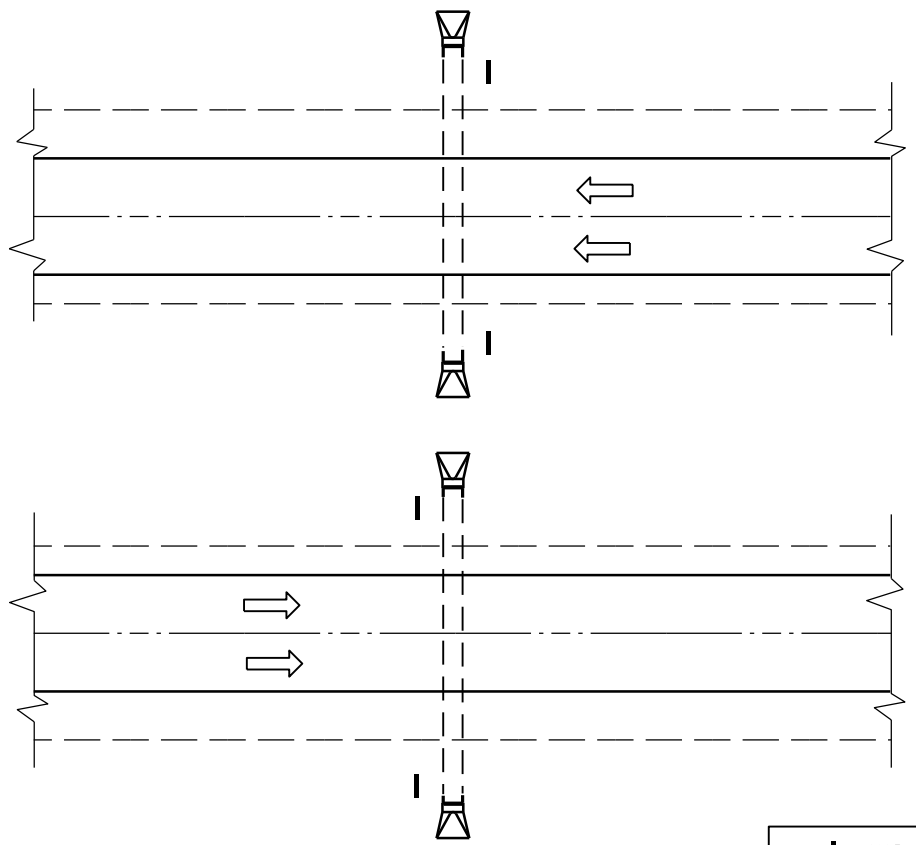
SDD 14B53 - 02i

**SHORT RADIUS BEAM GUARD (MGS) SHORT RADIUS TERMINAL (MGS)**

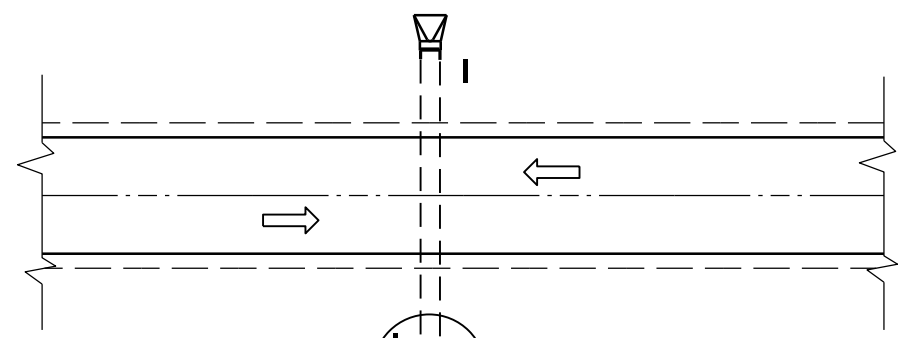
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APPROVED  
May 2022 /S/ Rodney Taylor  
DATE ROADWAY STANDARDS DEVELOPMENT ENGINEER

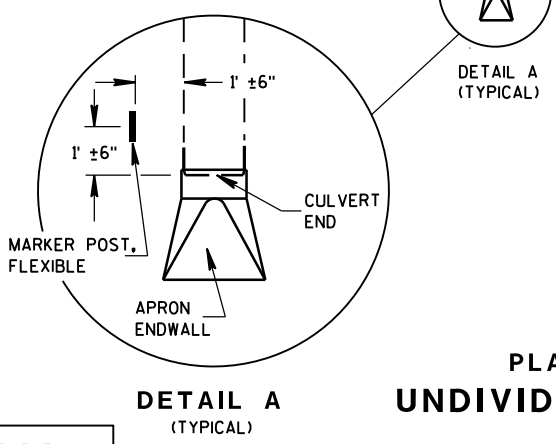
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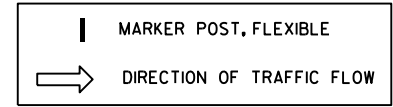
PLAN VIEW  
DIVIDED HIGHWAY



PLAN VIEW  
UNDIVIDED HIGHWAY

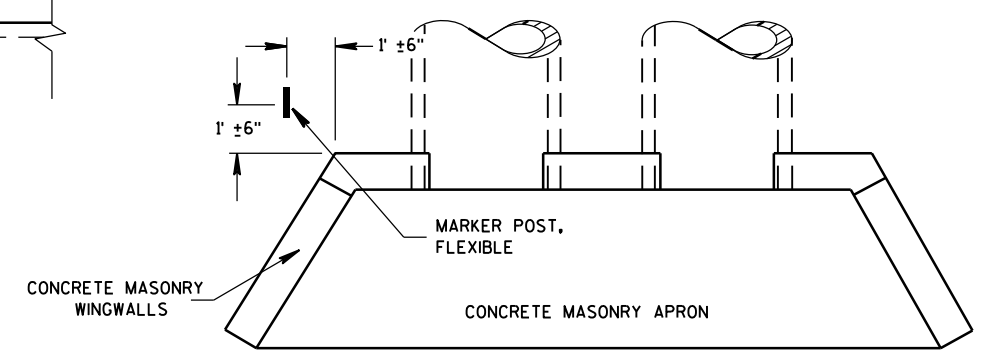


DETAIL A  
(TYPICAL)



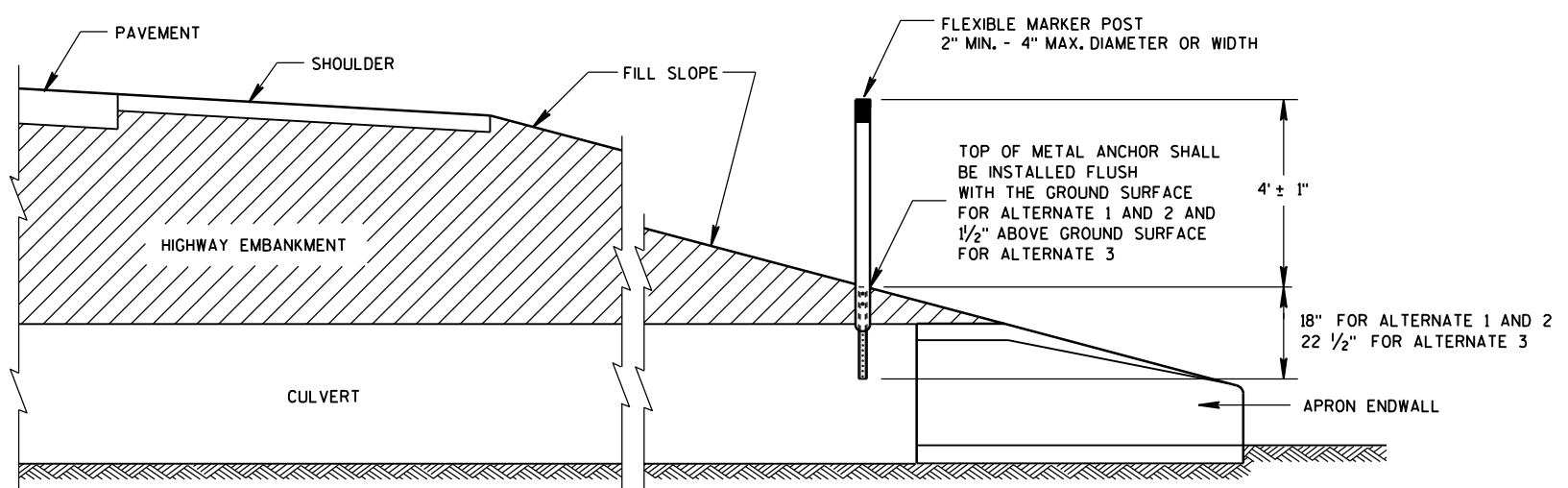
**GENERAL NOTES**

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

**FLEXIBLE MARKER POST LOCATION**



CROSS SECTION  
FLEXIBLE MARKER POST

**FLEXIBLE MARKER POST  
FOR CULVERT END**

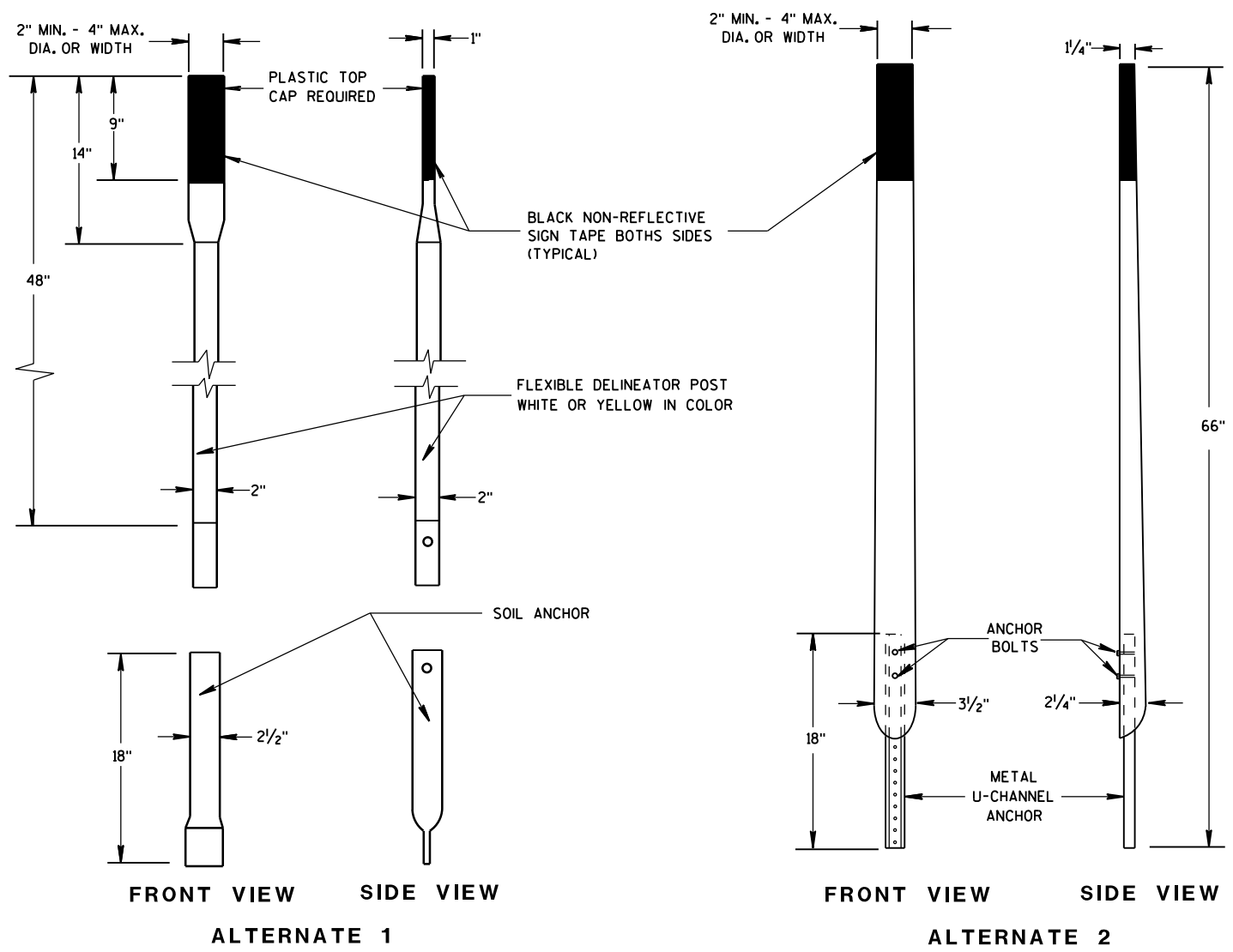
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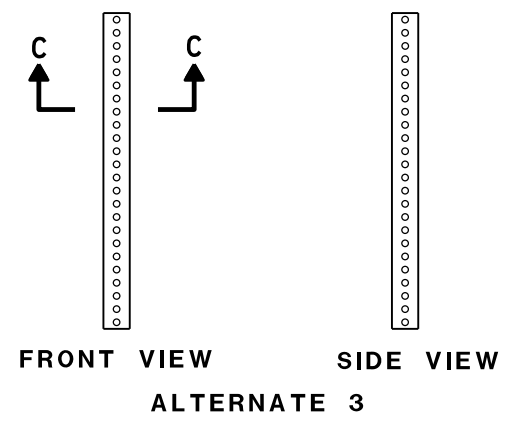
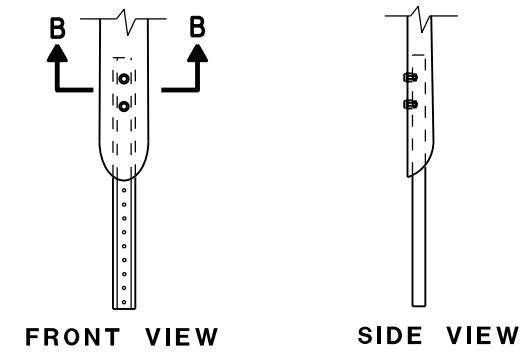
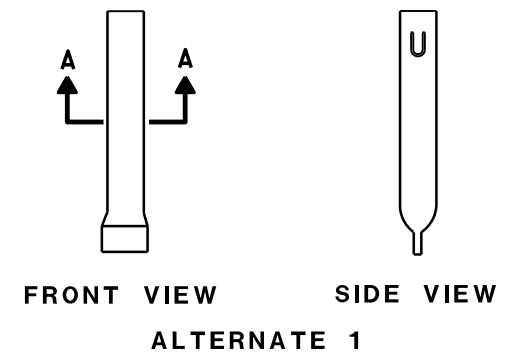
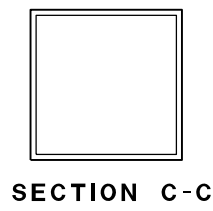
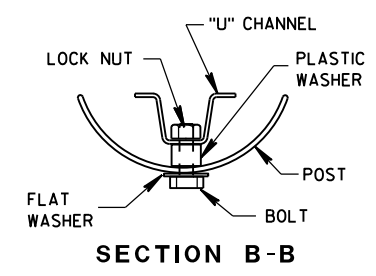
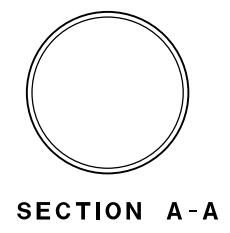
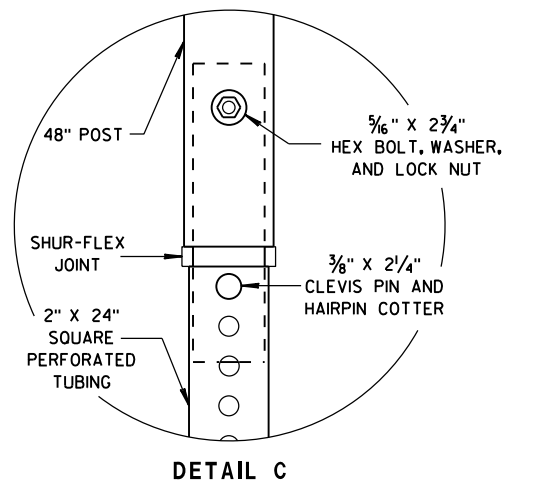
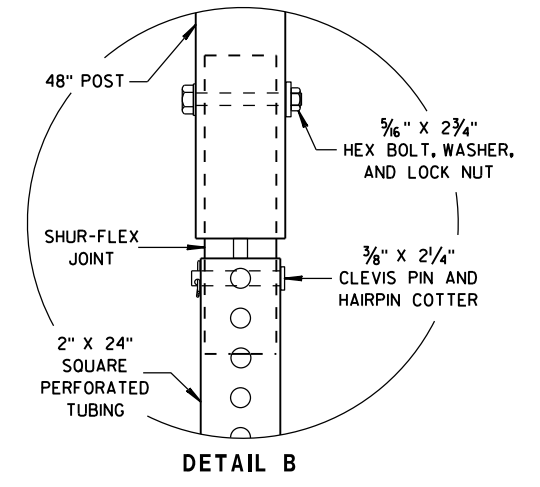
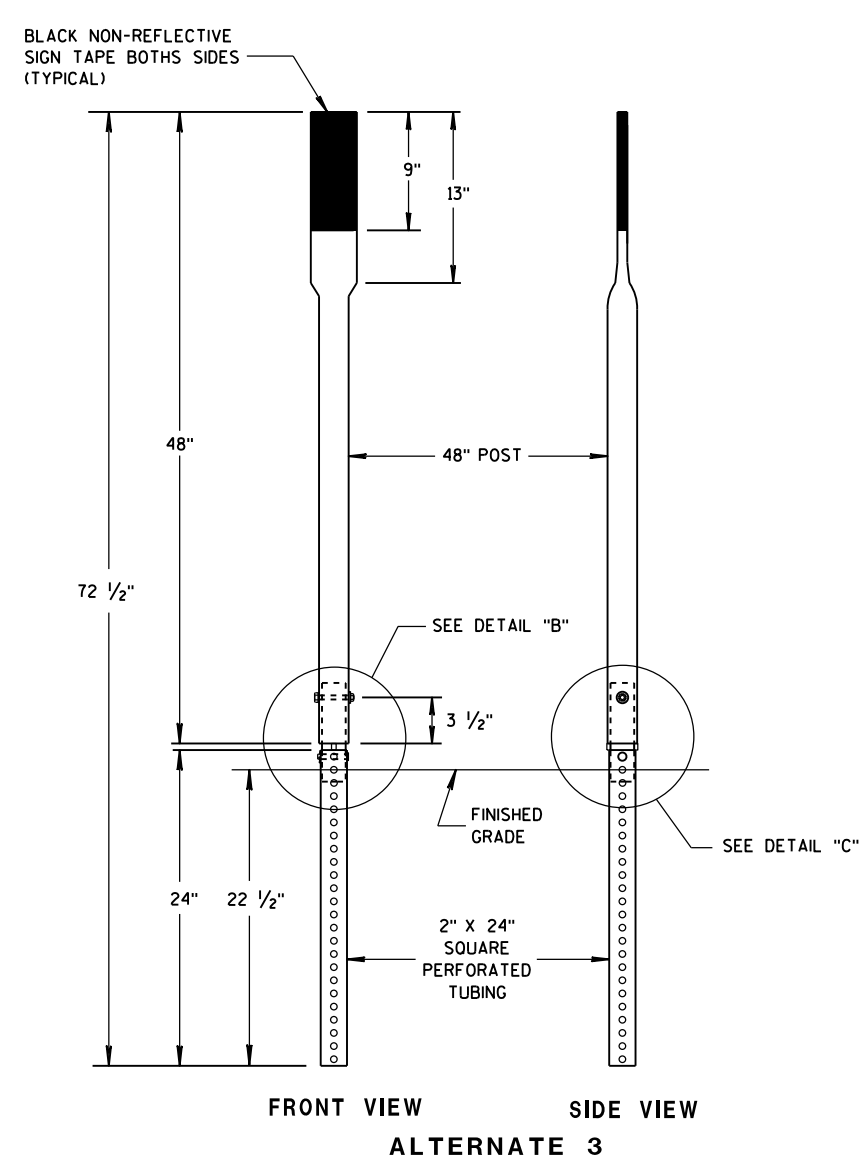
6

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

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



FLEXIBLE MARKER POSTS



FLEXIBLE MARKER POST ANCHORS

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

**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" X 48" UNLESS OTHERWISE NOTED.

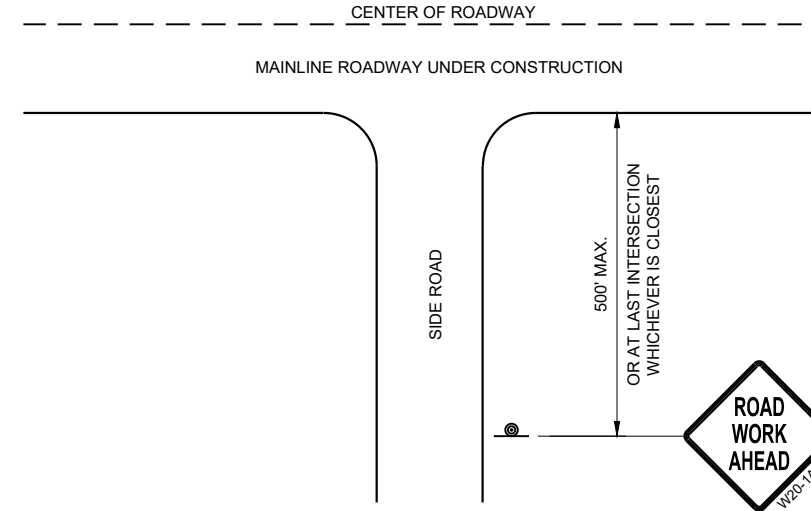
SIGNS THAT WILL BE IN PLACE LESS THAN SEVEN CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

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 REESTABLISHED.

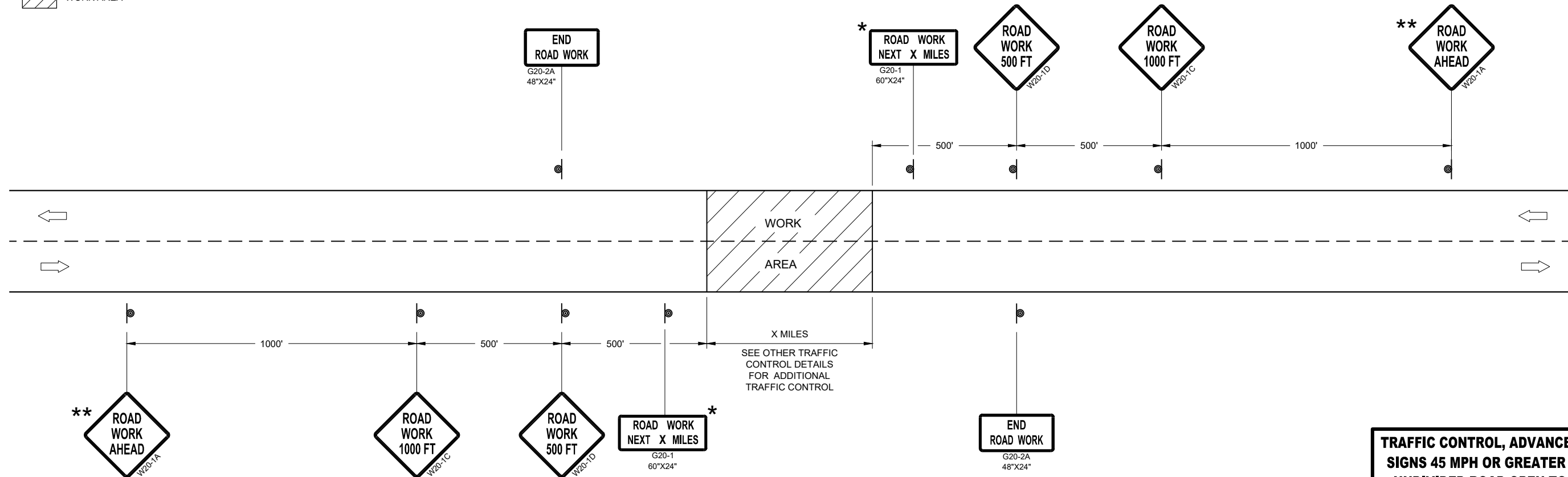
- \* OMIT G20-1 SIGNS IF LENGTH OF WORK AREA IS 2 MILES OR LESS
- \*\* PLACE AN ADDITIONAL W20-1A "ROAD WORK AHEAD" SIGN IF WORK AREA WITHIN THE PROJECT IS SEPARATED BY MORE THAN 2 MILES FROM PREVIOUS WORK AREA.

**LEGEND**

-  SIGN ON PERMANENT SUPPORT
-  DIRECTION OF TRAFFIC
-  WORK AREA



**TYPICAL SIDE ROAD APPROACH  
WARNING SIGN DETAIL**



**TRAFFIC CONTROL, ADVANCE WARNING SIGNS 45MPH OR GREATER**

**TRAFFIC CONTROL, ADVANCE WARNING  
SIGNS 45 MPH OR GREATER TWO-WAY  
UNDIVIDED ROAD OPEN TO TRAFFIC**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
DATE July 2018 /S/ Andrew Heidtke  
WORK ZONE ENGINEER




FHWA

**GENERAL NOTES**

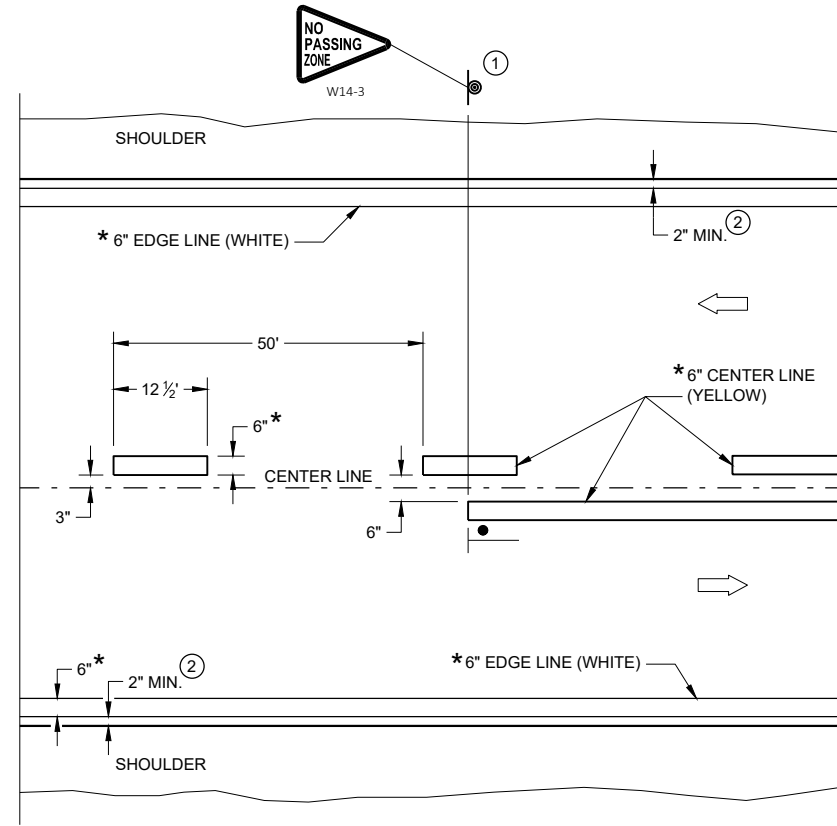
DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS.

- ① LOCATE THE NO PASSING ZONE W14-3 SIGN WITHIN 50 FEET OF THE "T" MARKING
- ② MEASURE FROM EDGE OF MARKING TO JOINT LINE. THIS DOES NOT INCLUDE SPACE NEEDED FOR GROOVING OPERATIONS.

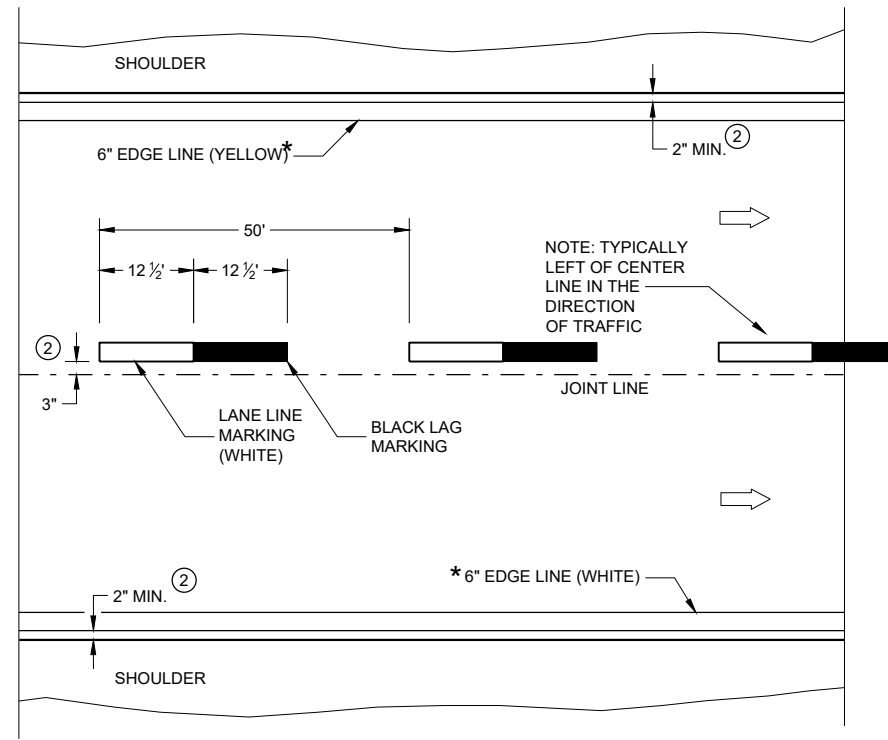
**LEGEND**

-  "T" MARKING
-  SIGN ON PERMANENT SUPPORT
-  DIRECTION OF TRAFFIC

\* CONFIRM MARKING LINE WIDTH WITH THE MISCELLANEOUS QUANTITIES



**TWO WAY TRAFFIC**



**ONE WAY TRAFFIC**

**PERMANENT PAVEMENT MARKING**

6

6

SDD 15C08-23a

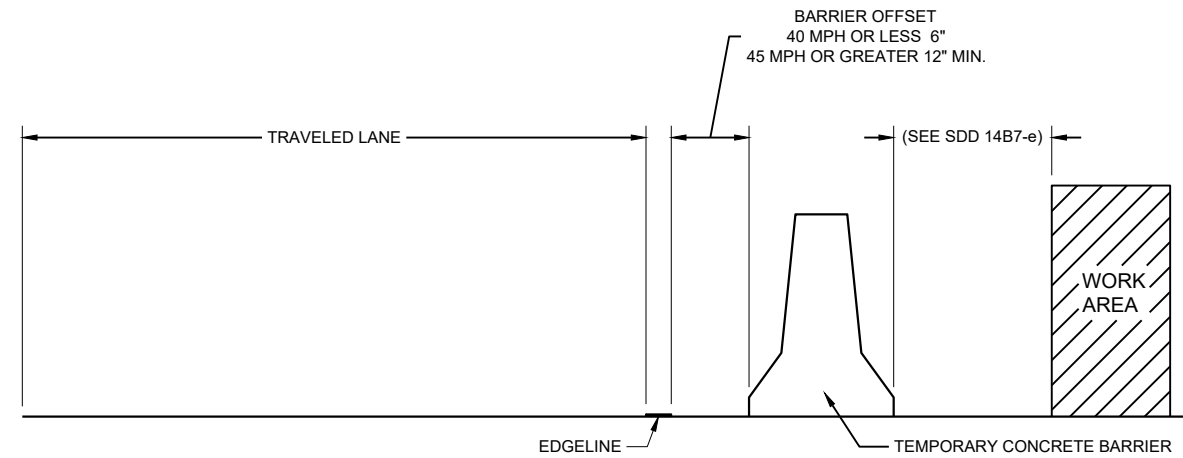
SDD 15C08-23a

**PERMANENT LONGITUDINAL PAVEMENT MARKINGS**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
May 2023 /S/ Jeannie Silver  
DATE STATEWIDE SIGNING AND MARKING ENGINEER

FHWA



**TEMPORARY BARRIER OFFSET FROM EDGELINE**

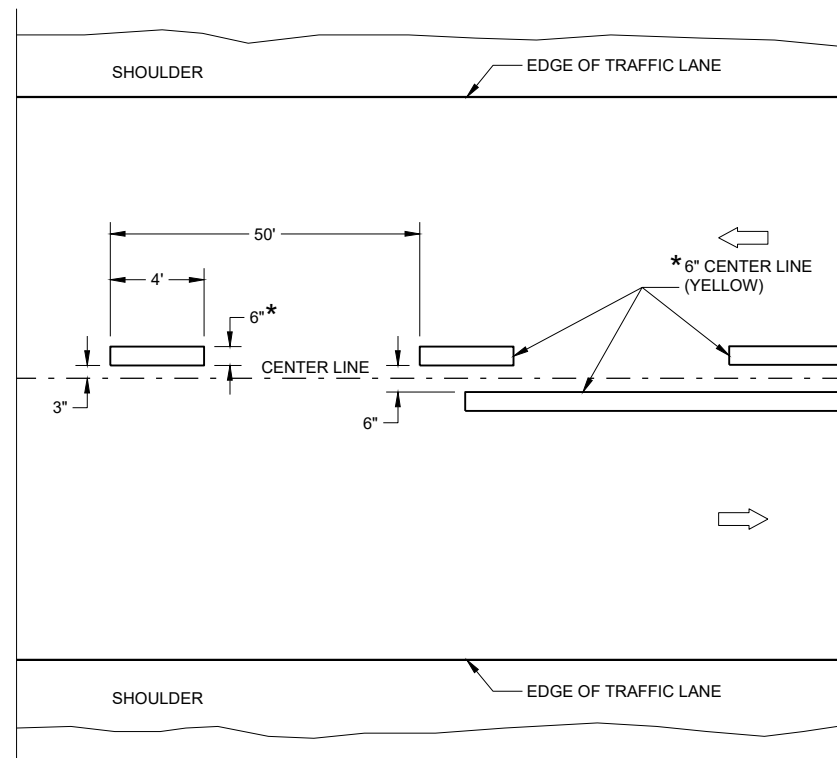
**GENERAL NOTES**

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

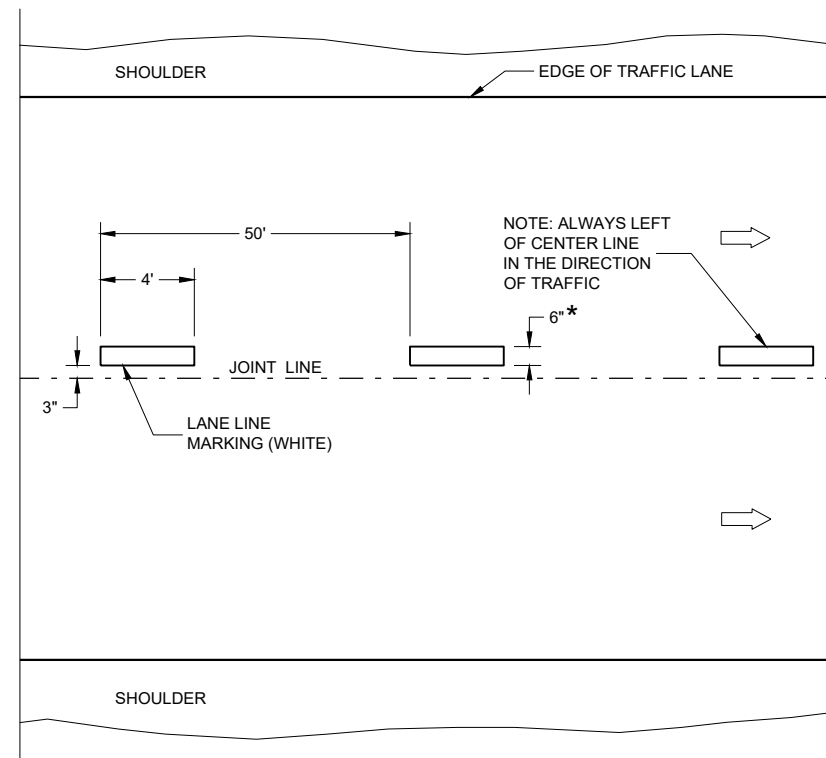
**LEGEND**

➡ DIRECTION OF TRAFFIC

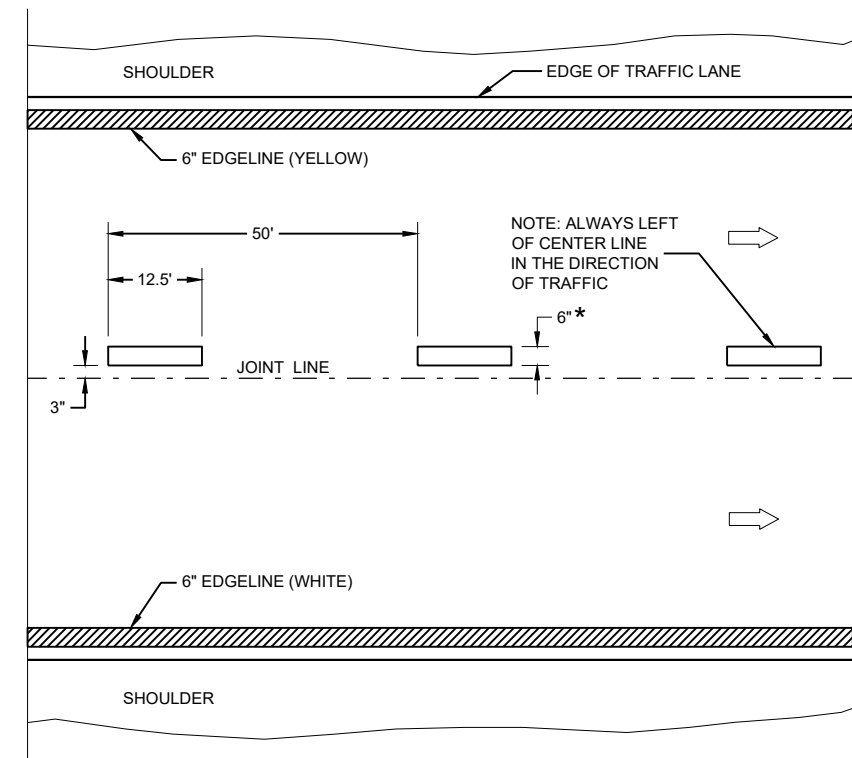
\* CONFIRM MARKING LINE WIDTH WITH THE MISCELLANEOUS QUANTITIES



**TWO WAY TRAFFIC**



**ONE WAY TRAFFIC**



**FREEWAYS AND EXPRESSWAYS**

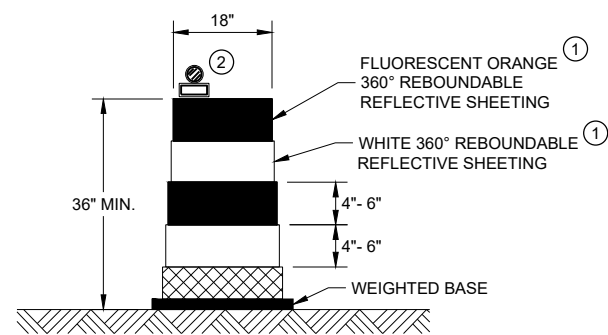
**TEMPORARY PAVEMENT MARKING**

**TEMPORARY LONGITUDINAL PAVEMENT MARKING**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

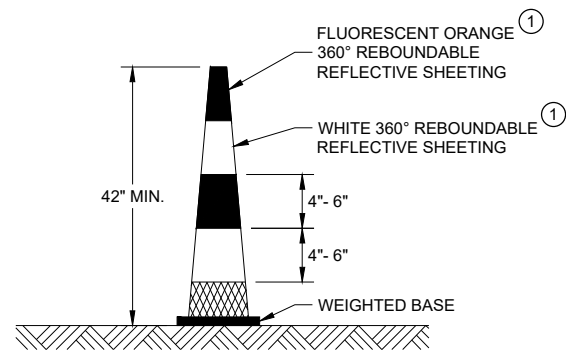
APPROVED  
May 2023 /S/ Jeannie Silver  
DATE STATEWIDE SIGNING AND MARKING ENGINEER

FHWA



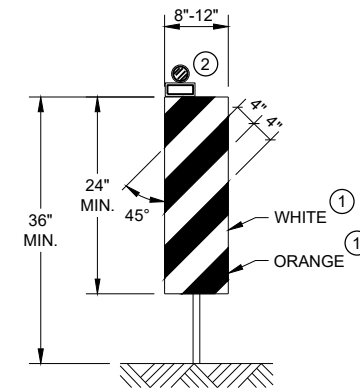
**DRUM**

BALLAST WIDTHS  
RANGE FROM 24"-36"



**42" CONE**

DO NOT USE IN TAPERS  
½ SPACING OF DRUMS  
BALLAST WIDTHS  
RANGE FROM 14"-20"

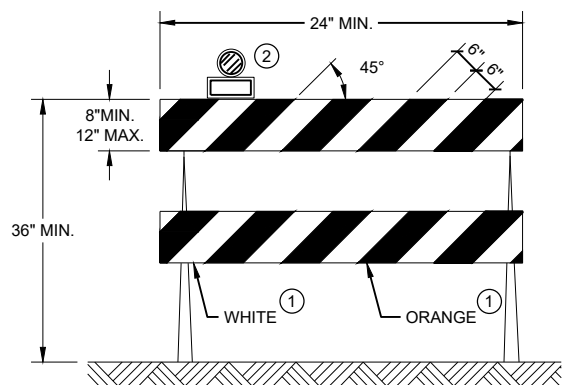


**VERTICAL PANEL**

THE STRIPES SHALL SLOPE DOWNWARD TO  
THE TRAFFIC SIDE FOR CHANNELIZATION.

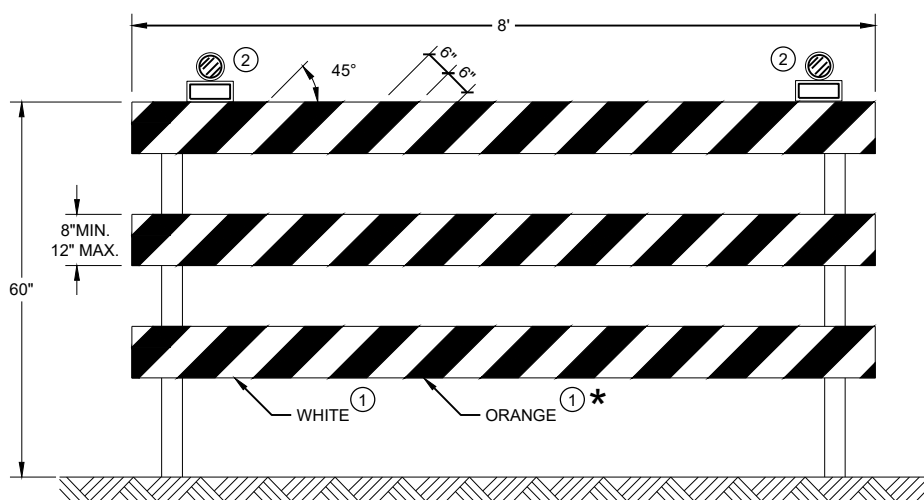
**GENERAL NOTES**

- ① REFLECTIVE SHEETING SHALL FOLLOW THE REQUIREMENTS IN THE APPROVED PRODUCTS LISTING FOR SIGN SHEETING.
- ② LOCATION OF WARNING LIGHTS WHEN SHOWN ON THE PLAN.



**TYPE II BARRICADE**

FOR RAILS LESS THAN 36" LONG, 4" WIDE STRIPES  
MAY BE USED. ALL STRIPES SHALL SLOPE DOWNWARD  
TO THE TRAFFIC SIDE FOR CHANNELIZATION.



**TYPE III BARRICADE**






IF SIGN MOUNTED, DO NOT COVER MORE THAN 50% OF THE TOP  
TWO RAILS OR 33% OF THE TOTAL AREA OF THE THREE RAILS.

\* IF USED FOR A PERMANENT APPLICATION USE RED SHEETING.

<b>CHANNELIZING DEVICES DRUMS, CONES, BARRICADES AND VERTICAL PANELS</b>	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION	
APPROVED November 2022 DATE	/S/ Andrew Heidtke WORK ZONE ENGINEER
FHWA	



**LEGEND**

-  SIGN ON PORTABLE OR PERMANENT SUPPORT
-  TEMPORARY PORTABLE RUMBLE STRIP ARRAY
-  DIRECTION OF TRAFFIC
-  WORK AREA
-  FLAGGER, EQUIPPED WITH STOP/SLOW PADDLE FASTENED ON SUPPORT STAFF

**GENERAL NOTES**

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

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

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

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

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

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

**FLAGGING**

FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES. THEY SHALL BE EQUIPPED WITH STOP/SLOW PADDLES FASTENED ON SUPPORT STAFFS. WHEN THE FLAGGING OPERATION IS NOT IN EFFECT REMOVE TEMPORARY PORTABLE RUMBLE STRIPS PRIOR TO COVERING OR REMOVING ALL ADVANCE SIGNING.

- ① FOR MOVING WORK OPERATIONS, POST ADDITIONAL W20-7A FLAGGER SIGNS AT APPROXIMATELY 3,500' INTERVALS IN THE MOVING WORK OPERATION OR AS APPROVED BY THE ENGINEER.
- ② SIGN NOT REQUIRED IF FLAGGING OPERATION OCCURS WITHIN A SIGNED ROAD WORK ZONE AREA.

WHEN THE DISTANCE BETWEEN FLAGGERS EXCEEDS 2 MILES, A PILOT CAR IS REQUIRED. WHEN CURVES REDUCE SIGHT DISTANCE BELOW 400', A PILOT CAR IS REQUIRED.

**TEMPORARY PORTABLE RUMBLE STRIPS**

UTILIZE TEMPORARY PORTABLE RUMBLE STRIPS ON ALL FLAGGING OPERATIONS.

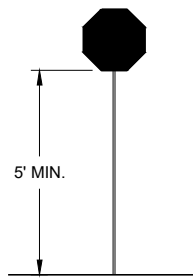
- ③ EACH TEMPORARY PORTABLE RUMBLE STRIP ARRAY CONSISTS OF THREE RUMBLE STRIPS PLACED TRANSVERSE ACROSS THE LANE AT THE LOCATIONS SHOWN. WITHIN EACH ARRAY, SPACING BETWEEN RUMBLE STRIPS SHALL BE 15 FEET ON CENTER

ONLY USE TEMPORARY PORTABLE RUMBLE STRIPS FROM THE APPROVED PRODUCTS LIST.

INSTALL TEMPORARY RUMBLE STRIPS PER MANUFACTURER'S RECOMMENDATIONS.

PLACE ADVANCE SIGNING PRIOR TO INSTALLING TEMPORARY RUMBLE STRIPS.

DO NOT INSTALL TEMPORARY PORTABLE RUMBLE STRIPS ON GRAVEL, MILLED SURFACES, OR ASPHALT THAT HAS BEEN PAVED LESS THAN 12 HOURS.



**STOP/SLOW PADDLE ON SUPPORT STAFF**

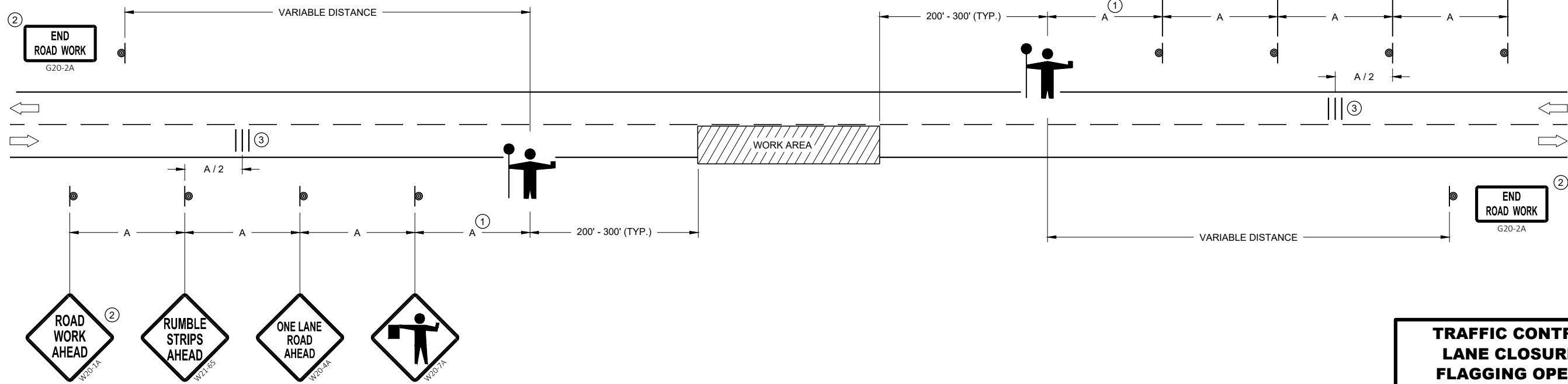
**SIGN AND TEMPORARY RUMBLE STRIP ARRAY SPACING TABLE**

SPEED LIMIT	SPACING "A"
25-30 MPH	200'
35-40 MPH	350'
45-55 MPH	500'



W03-4

USE OF W03-4 SIGN IS OPTIONAL. WHEN USED, THIS SIGN SHALL BE LOCATED BETWEEN THE W20-7A AND W20-4A SIGNS, USING SPACING "A".










**TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
DATE: May 2022 /S/ Andrew Heidtke  
WORK ZONE ENGINEER

FHWA

**GENERAL NOTES**

-  SIGN ON PERMANENT SUPPORT
-  TRAFFIC CONTROL CONE 42-INCH
-  TRAFFIC CONTROL DRUM
-  TEMPORARY PORTABLE RUMBLE STRIP ARRAY
-  DIRECTION OF TRAFFIC
-  WORK AREA
-  **AFAD** AUTOMATED FLAGGER ASSISTANCE DEVICE (AFAD)

**GENERAL NOTES**

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

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

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

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

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

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

**FLAGGING**

IF THE AUTOMATED FLAGGER ASSISTANCE DEVICE (AFAD) STOPS WORKING, FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES. THEY SHALL BE EQUIPPED WITH STOP/SLOW PADDLES FASTENED ON SUPPORT STAFFS. WHEN THE FLAGGING OPERATION IS NOT IN EFFECT REMOVE TEMPORARY PORTABLE RUMBLE STRIPS PRIOR TO COVERING OR REMOVING ALL ADVANCE SIGNING.

WHEN THE DISTANCE BETWEEN FLAGGERS EXCEEDS 2 MILES, A PILOT CAR IS REQUIRED. WHEN CURVES REDUCE SIGHT DISTANCE BELOW 400', A PILOT CAR IS REQUIRED.

- ① SIGN NOT REQUIRED IF FLAGGING OPERATION OCCURS WITHIN A SIGNED ROAD WORK ZONE AREA.
- ② IF FLAGGERS ARE PHYSICALLY NEEDED TO FLAG, REPLACE WO3-4 SIGNS WITH W20-7A SIGNS.

**TEMPORARY PORTABLE RUMBLE STRIPS**

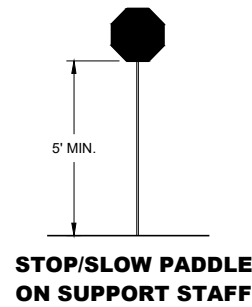
UTILIZE TEMPORARY PORTABLE RUMBLE STRIPS ON ALL FLAGGING OPERATIONS.

ONLY USE TEMPORARY PORTABLE RUMBLE STRIPS FROM THE APPROVED PRODUCTS LIST.

PLACE ADVANCE SIGNING PRIOR TO INSTALLING TEMPORARY RUMBLE STRIPS.

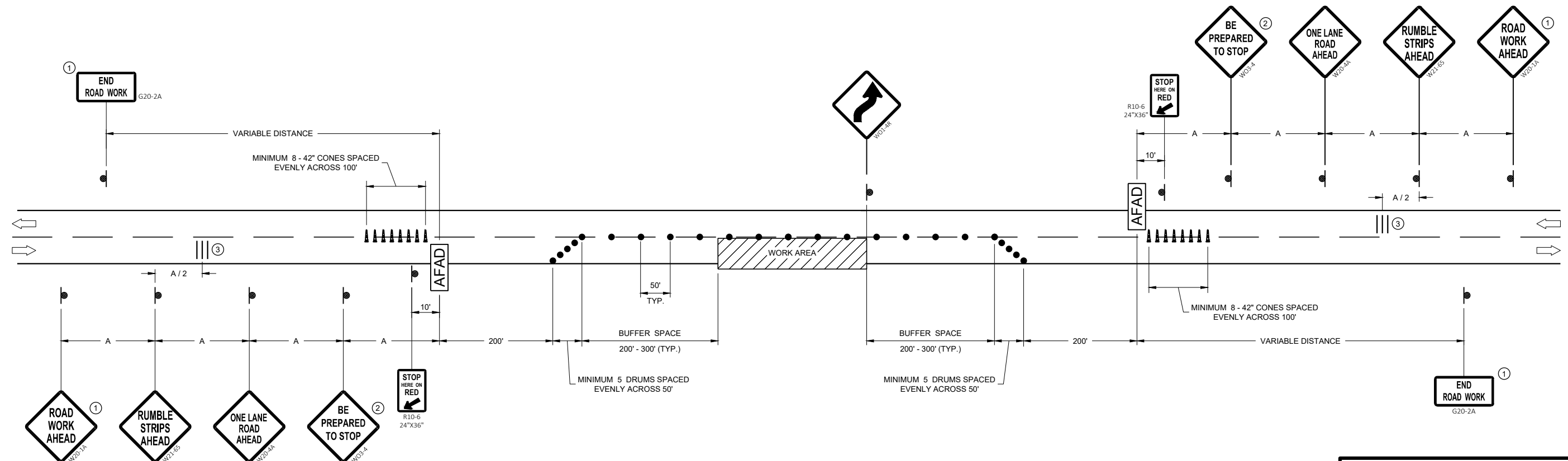
DO NOT INSTALL TEMPORARY PORTABLE RUMBLE STRIPS ON GRAVEL, MILLED SURFACES, OR ASPHALT THAT HAS BEEN PAVED LESS THAN 12 HOURS.

③ EACH TEMPORARY PORTABLE RUMBLE STRIP ARRAY CONSISTS OF THREE RUMBLE STRIPS PLACED TRANSVERSELY AT THE LOCATIONS SHOWN. WITHIN EACH ARRAY, SPACING BETWEEN RUMBLE STRIPS SHALL BE 15 FEET ON CENTER.



**SIGN AND TEMPORARY RUMBLE STRIP ARRAY SPACING TABLE**

SPEED LIMIT	SPACING "A"
25-30 MPH	200'
35-40 MPH	350'
45-55 MPH	500'



**TRAFFIC CONTROL, LANE CLOSURE WITH AUTOMATED FLAGGER ASSISTANCE DEVICE**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
May 2022 /S/ Andrew Heidtke  
DATE WORK ZONE ENGINEER

FHWA

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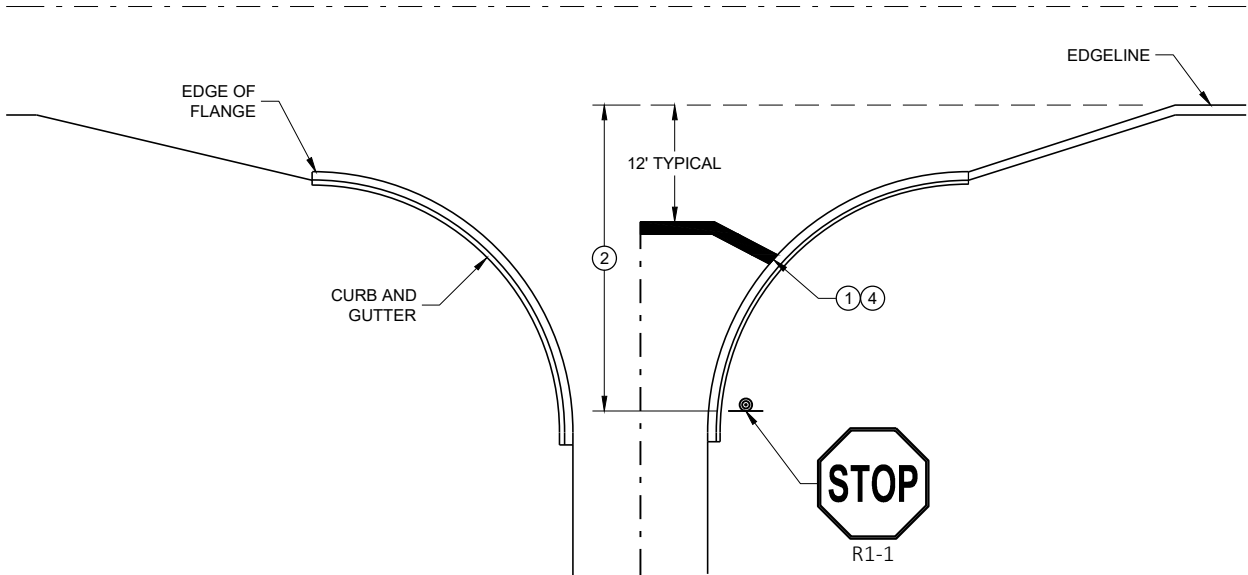
SDD 15C12 - 09b

SDD 15C12 - 09b

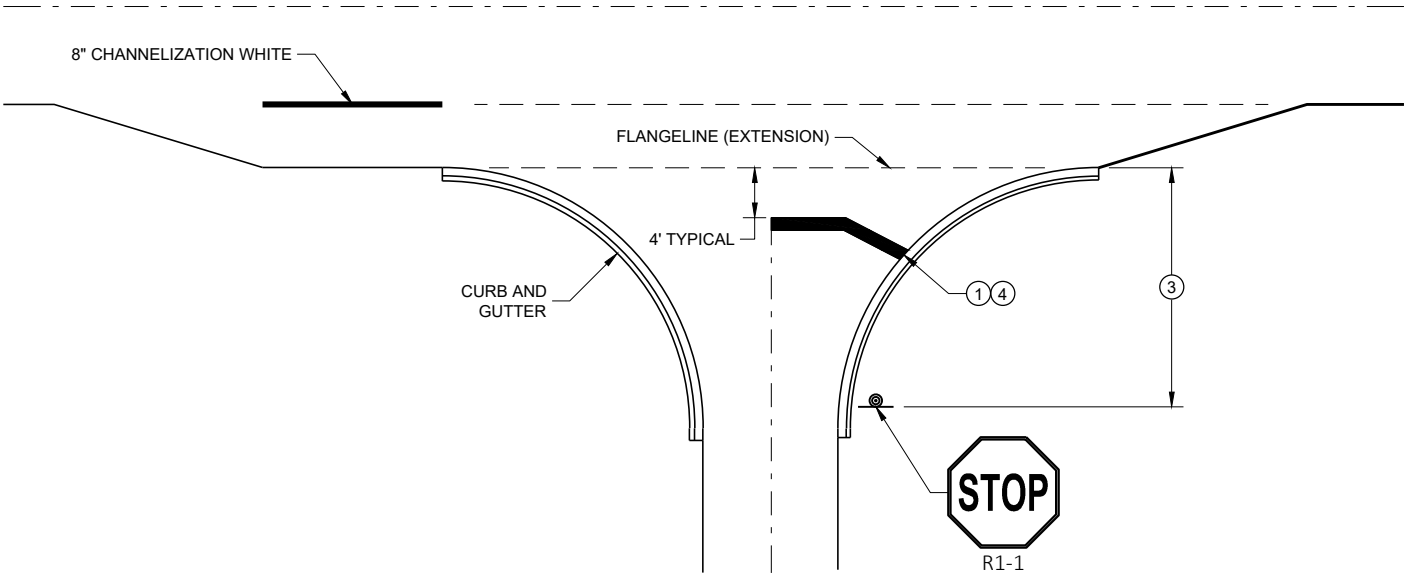
**GENERAL NOTES**

STOP SIGN SHALL BE PLACED A MINIMUM OF 6 FEET TO A MAXIMUM OF 50 FEET FROM THE EDGELINE LOCATION.

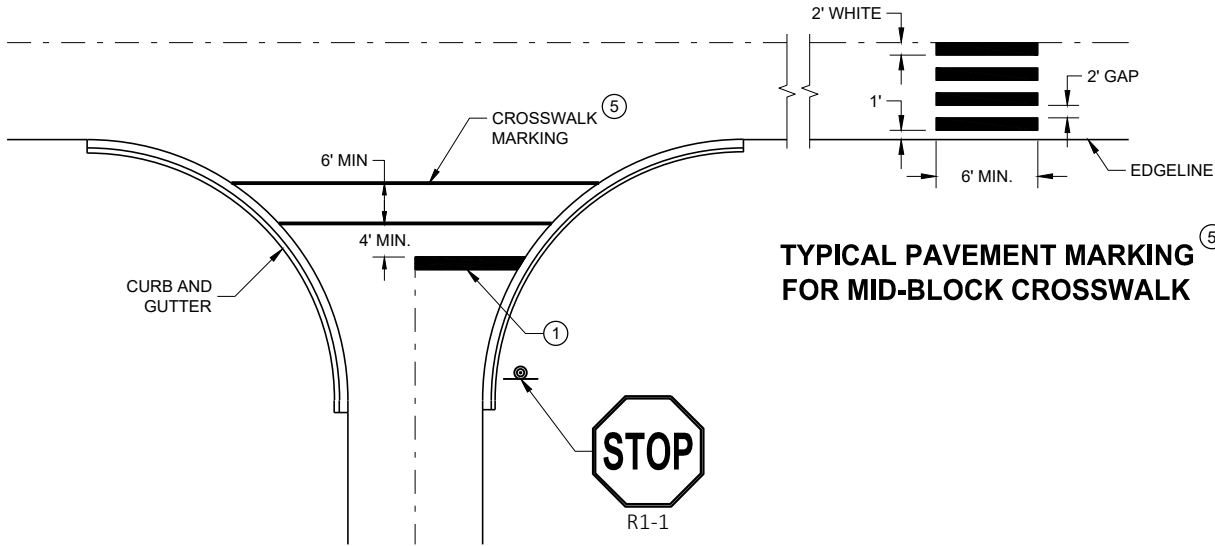
- ① 18-INCH STOP LINES MAY BE DELETED OR ADDED BY THE REGION MARKING ENGINEER BASED ON VISIBILITY AND SIGHT LINES.
- ② NO STOP LINE IS REQUIRED IF STOP SIGN IS LESS THAN OR EQUAL TO 40 FEET FROM THE EDGELINE.
- ③ NO STOP LINE IS REQUIRED IF STOP SIGN IS LESS THAN OR EQUAL TO 30 FEET FROM THE FLANGELINE EXTENSION.
- ④ MOVE CLOSER TO THE EDGE OF TRAVEL LINE AS NEEDED FOR VISIBILITY AND SIGHT LINES (NO CLOSER THAN 4 FEET).
- ⑤ LADDER BAR CROSSWALKS SHOULD ONLY BE USED FOR MID BLOCK CROSSINGS. USE 2 - 6" TRANSVERSE LINES INSTEAD.



**TYPICAL STOP LINE PAVEMENT MARKING WITH CURB AND GUTTER**

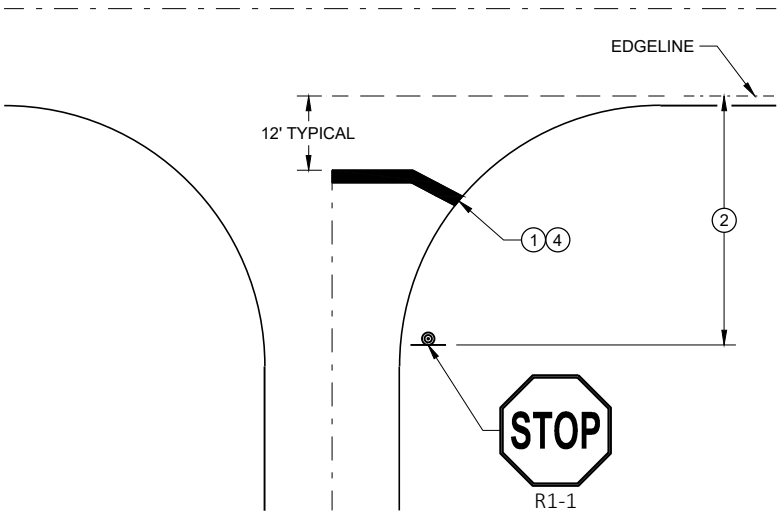


**TYPICAL STOP LINE PAVEMENT MARKING FOR SIDEROADS WITH RIGHT TURN LANE**



**TYPICAL STOP LINE PAVEMENT MARKING FOR SIDEROADS WITH CROSSWALK MARKING**

**TYPICAL PAVEMENT MARKING FOR MID-BLOCK CROSSWALK**



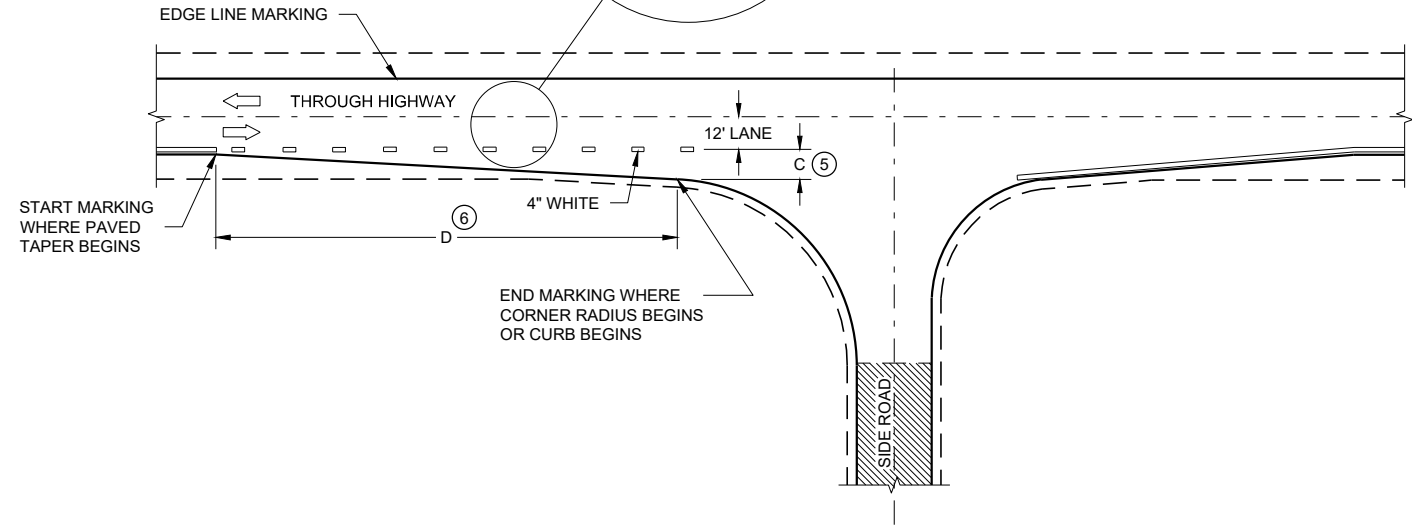
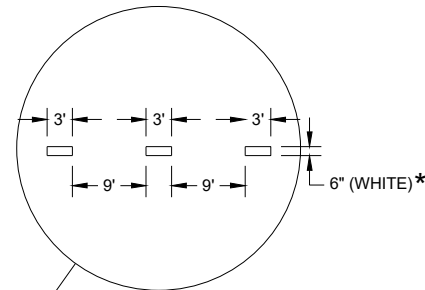
**TYPICAL STOP LINE PAVEMENT MARKING WITHOUT CURB AND GUTTER**

**STOP LINE AND CROSSWALK PAVEMENT MARKING**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
November 2019 /S/ Matthew Rauch  
DATE STATE SIGNING AND MARKING ENGINEER

FHWA



**MINOR INTERSECTION**

\* CONFIRM MARKING LINE WIDTH WITH THE MISCELLANEOUS QUANTITIES

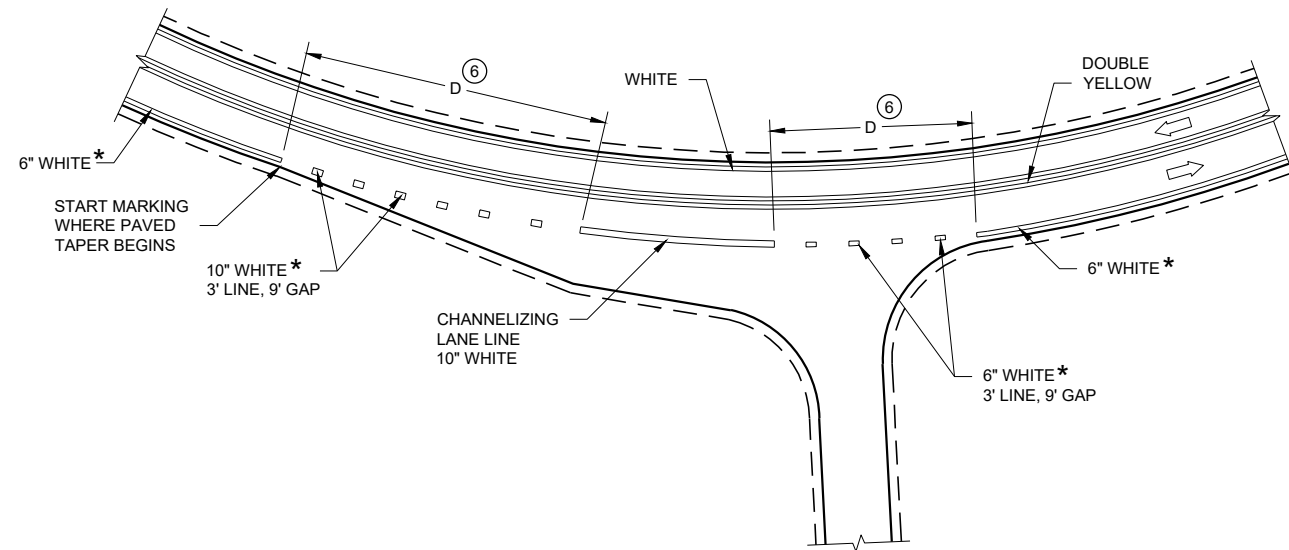
**GENERAL NOTES**

OMIT EDGE LINES THROUGH INTERSECTIONS. CONTINUE EDGE LINES THROUGH DRIVEWAYS.

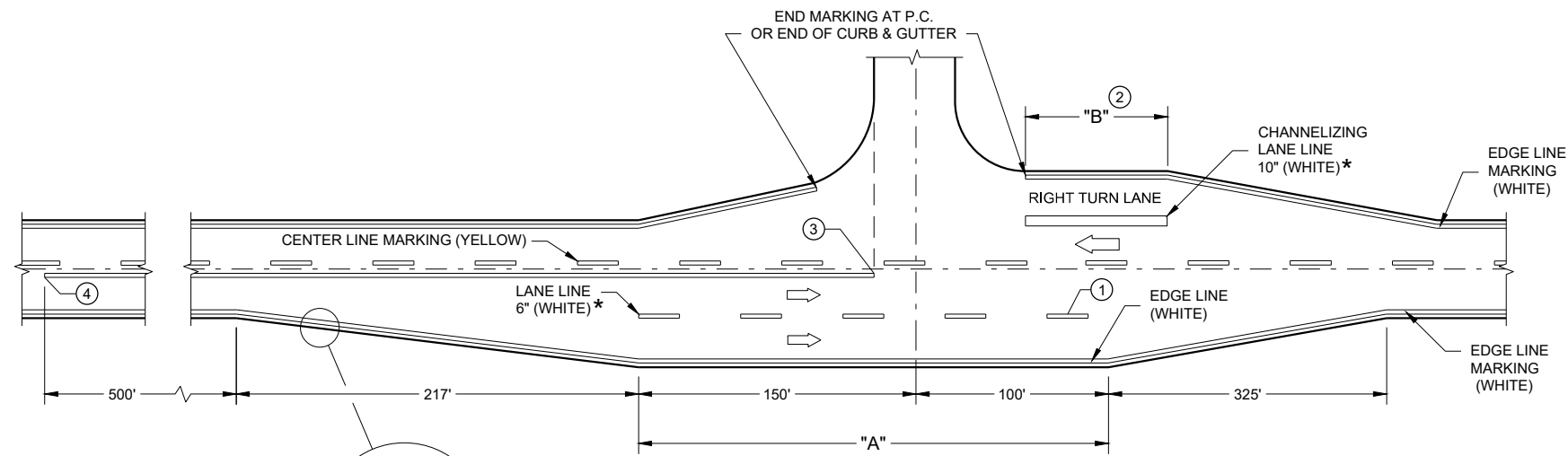
- ① WHEN DISTANCE "A" IS LESS THAN 250 FEET, OMIT LANE LINE.
- ② WHEN DISTANCE "B" IS LESS THAN 100 FEET, OMIT CHANNELIZING LANE LINE.
- ③ BARRIER LINE ENDS AT SIDE ROAD PAVEMENT / SURFACE EDGE EXTENSION.
- ④ BARRIER LINE STARTS 500 FEET PRIOR TO THE BYPASS TAPER.
- ⑤ WHEN DISTANCE "C" IS LESS THAN 4 FEET, OMIT DOTTED EXTENSION.
- ⑥ WHEN DISTANCE "D" IS LESS THAN 50 FEET, OMIT DOTTED EXTENSION.

**LEGEND**

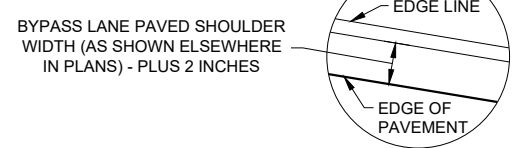
➔ DIRECTION OF TRAVEL



**INTERSECTION ON OUTSIDE OF CURVE**



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







BYPASS LANE PAVED SHOULDER WIDTH (AS SHOWN ELSEWHERE IN PLANS) - PLUS 2 INCHES

**PAVEMENT MARKING  
(INTERSECTIONS)**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

**LEGEND**

-  SIGN ON PERMANENT SUPPORT
-  TRAFFIC CONTROL DRUM
-  DIRECTION OF TRAFFIC
-  WORK ZONE

**GENERAL NOTES**

ALL SIGNS ARE 48"X48" UNLESS OTHERWISE NOTED. IF NECESSARY DUE TO SPACE CONSTRAINTS IN URBAN AREAS, 36" X 36" SIGNS MAY BE USED IF APPROVED BY THE REGIONAL TRAFFIC UNIT.

"WO" SIGN IS THE SAME AS "W" SIGN EXCEPT THE BACKGROUND IS ORANGE.

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

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

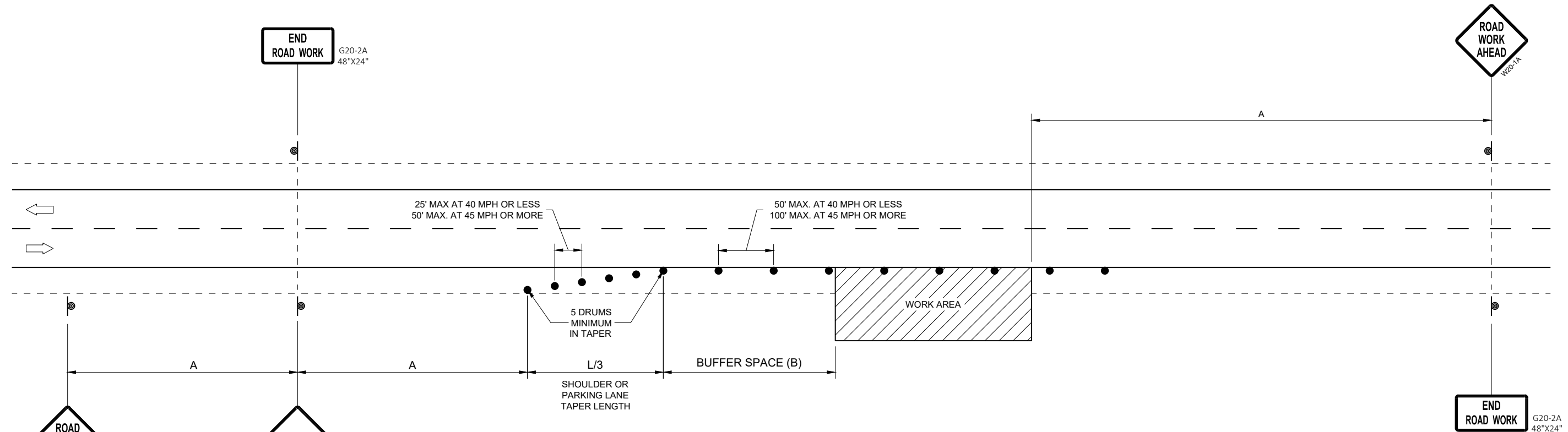
CHANNELIZING DEVICES PLACED ADJACENT TO WORK AREA SHALL BE PULLED BACK FROM THE TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

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

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

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POSTED SPEED LIMIT PRIOR TO WORK STARTING (MPH)	ADVANCE WARNING SIGN SPACING (A) FEET	SHOULDER TAPER L / 3 W, LATERAL OFFSET (FT)						BUFFER SPACE (B) FEET
		3	4	5	6	7	8	
25	200'	10	14	17	21	24	28	55
30	200'	15	20	25	30	35	40	85
35	350'	20	27	34	40	47	54	120
40	350'	26	35	44	53	62	70	170
45	500'	45	59	74	89	104	119	220
50	500'	50	66	83	99	116	132	280
55	500'	54	73	91	109	127	145	335'

OR  
IF TRAFFIC CONTROL DEVICES  
ENCROACH ONTO TRAVELED WAY, USE



**TRAFFIC CONTROL, WORK ON SHOULDER OR PARKING LANE, UNDIVIDED ROADWAY**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
May 2020 /S/ Andrew Heidtke  
DATE STATEWIDE WORK ZONE TRAFFIC SAFETY ENGINEER

FHWA

SDD 15D28 - 04

SDD 15D28 - 04

**GENERAL NOTES**

DRAWING NOT TO SCALE. ALL SIGNS AND POSTS ON THIS SHEET SHALL BE PAID FOR WITH 'TRAFFIC CONTROL SIGNS' BID ITEM. ALL SIDE ROADS WHICH ARE UNDER CONSTRUCTION OF CURB AND GUTTER AND/OR GRADING SHALL BE ADEQUATELY SIGNED.

ALL SIGNS AND DEVICES SHALL BE IN CONFORMANCE WITH THE WISCONSIN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (WMUTCD). SIGN LAYOUTS SHALL BE IN ACCORDANCE WITH THE WISDOT STANDARD SIGN PLATES.

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

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

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

ALL SIGNS INAPPROPRIATE TO THE STATUS OF THE CONTROL ZONE, INCLUDING PRE-EXISTING SIGNS IN THE VICINITY, SHALL BE COVERED OR REMOVED AS DIRECTED BY THE ENGINEER.

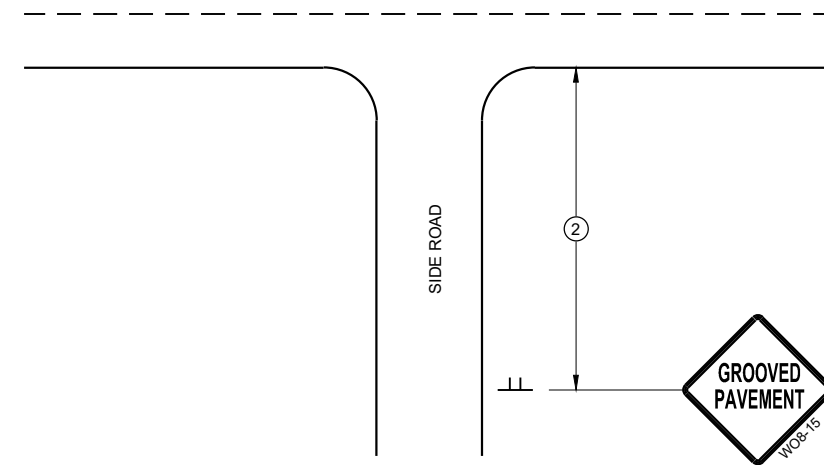
SEE 15C34 FOR ADDITIONAL TRAFFIC CONTROL SIGNING WHEN CENTERLINE PAVEMENT MAKINGS ARE MISSING. 'DO NOT PASS' SIGNS MUST BE INSTALLED ON THE SAME DAY AS MILLING OPERATIONS.

- ① PLACE SIGNS 350' IN ADVANCE OF MILLED SURFACES AND AT 1 MILE INTERVALS, OR AS DIRECTED BY THE ENGINEER.
- ② PLACE SIGN 200' MIN. FROM INTERSECTION AND 200' MIN. AFTER ADVANCE WARNING SIGN SHOWN IN SDD 15C04.

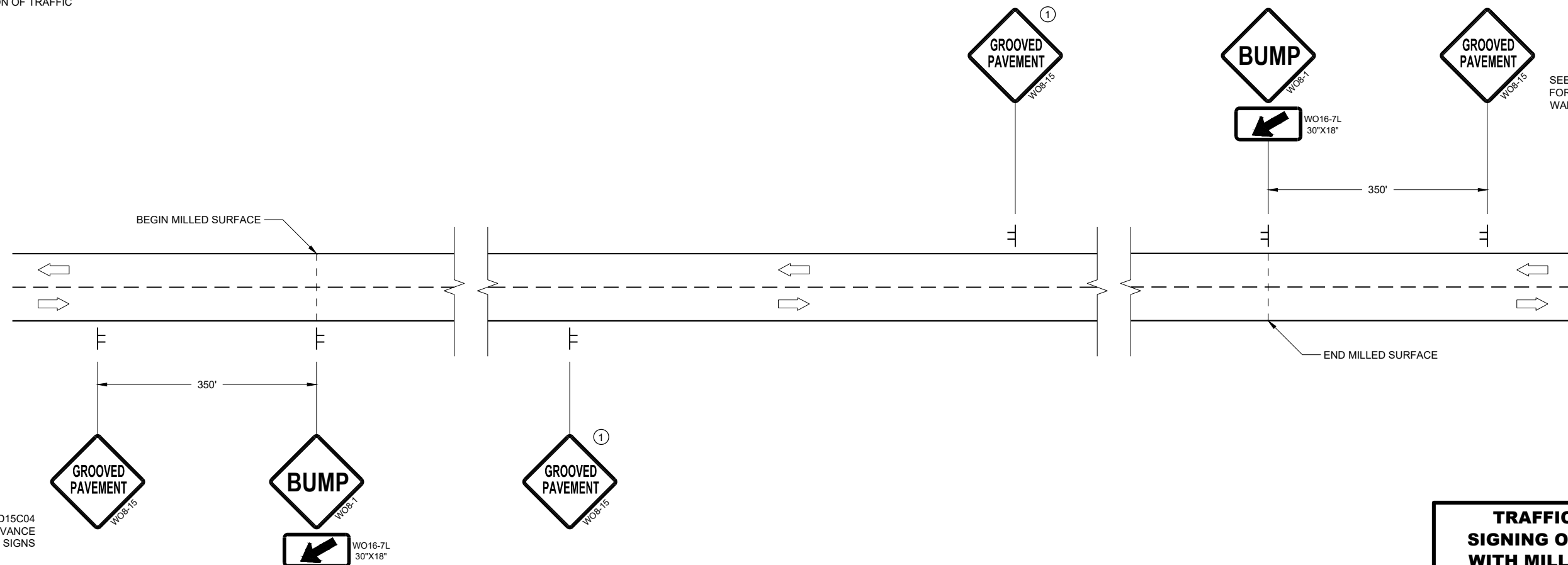
**LEGEND**

⊥ SIGN ON TEMPORARY SUPPORT

➡ DIRECTION OF TRAFFIC



**TYPICAL SIDE ROAD APPROACH SIGN DETAIL**



SEE SDD15C04 FOR ADVANCE WARNING SIGNS

SEE SDD15C04 FOR ADVANCE WARNING SIGNS

**DETAIL FOR SIGNING ON MILLED SURFACES**

**TRAFFIC CONTROL, SIGNING ON ROADWAYS WITH MILLED SURFACES**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
February 2020 /S/ Andrew Heidtke  
DATE WORK ZONE ENGINEER

FHWA

**GENERAL NOTES**

DRAWING NOT TO SCALE. ALL SIGNS AND POSTS ON THIS SHEET SHALL BE PAID FOR WITH 'TRAFFIC CONTROL SIGNS' BID ITEM. ALL SIDE ROADS WHICH ARE UNDER CONSTRUCTION OF CURB AND GUTTER AND/OR GRADING SHALL BE ADEQUATELY SIGNED.

ALL SIGNS AND DEVICES SHALL BE IN CONFORMANCE WITH THE WISCONSIN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (WMUTCD). SIGN LAYOUTS SHALL BE IN ACCORDANCE WITH THE WISDOT STANDARD SIGN PLATES.

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

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

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

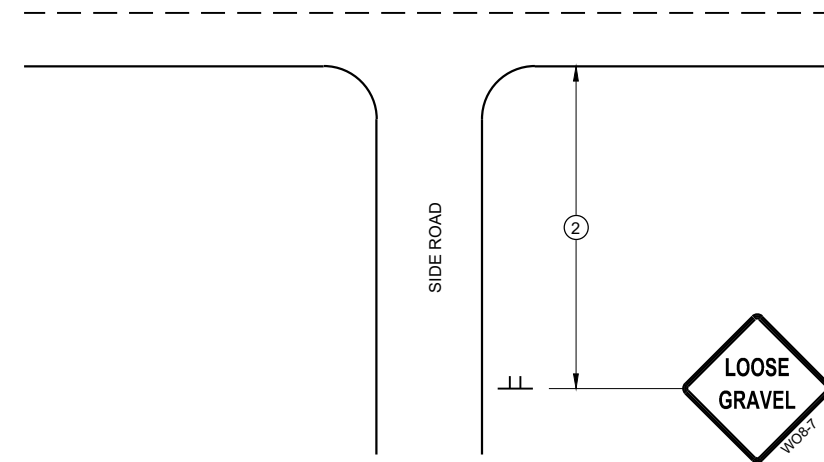
ALL SIGNS INAPPROPRIATE TO THE STATUS OF THE CONTROL ZONE, INCLUDING PRE-EXISTING SIGNS IN THE VICINITY, SHALL BE COVERED OR REMOVED AS DIRECTED BY THE ENGINEER.

SEE 15C34 FOR ADDITIONAL TRAFFIC CONTROL SIGNING WHEN CENTERLINE PAVEMENT MAKINGS ARE MISSING. 'DO NOT PASS' SIGNS MUST BE INSTALLED ON THE SAME DAY AS MILLING OPERATIONS.

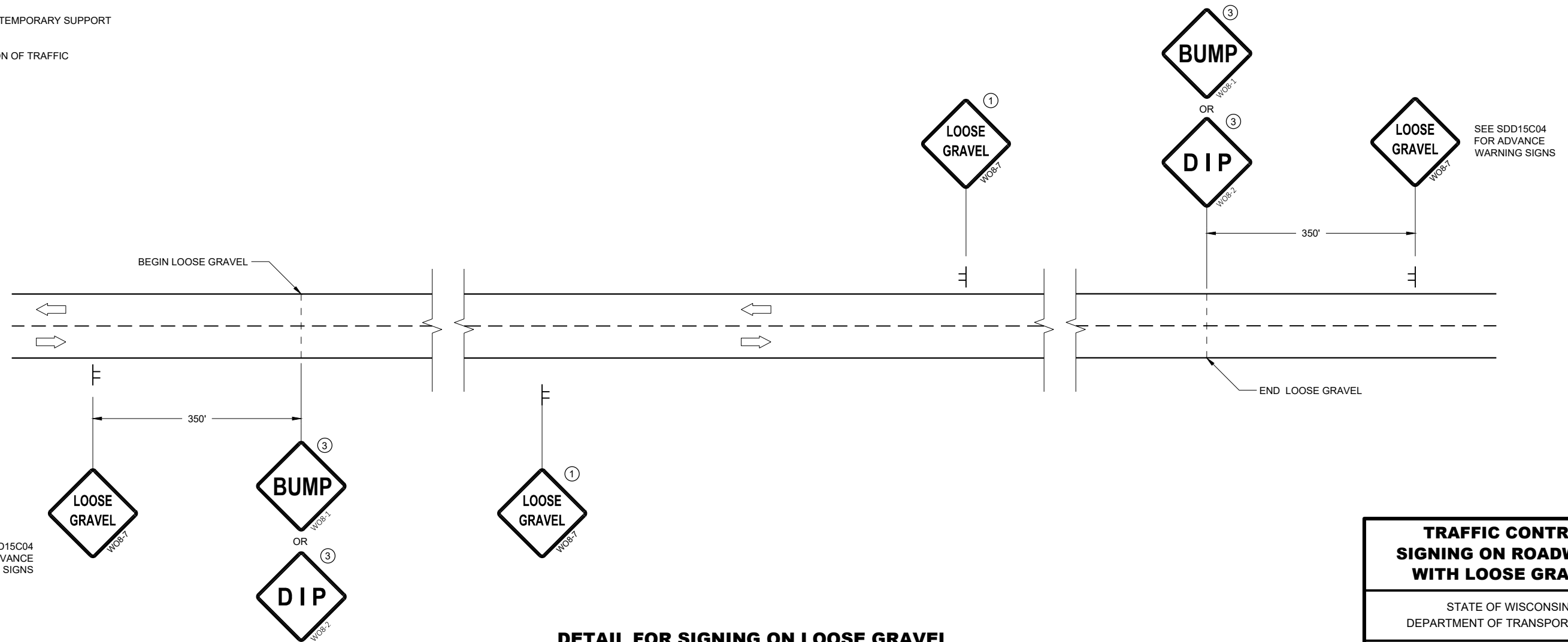
- ① PLACE SIGNS 350' IN ADVANCE OF CHIP SEALED OR LOOSE GRAVEL SURFACES AND AT 1 MILE INTERVALS, OR AS DIRECTED BY THE ENGINEER.
- ② PLACE SIGN 200' MIN. FROM INTERSECTION AND 200' MIN. AFTER ADVANCE WARNING SIGN SHOWN IN SDD 15C04.
- ③ ADD WO8-1 OR WO8-2 SIGN WHEN THE CONDITION IS PRESENT.

**LEGEND**

- ⊥ SIGN ON TEMPORARY SUPPORT
- ➡ DIRECTION OF TRAFFIC



**TYPICAL SIDE ROAD APPROACH SIGN DETAIL**



**DETAIL FOR SIGNING ON LOOSE GRAVEL OR CHIP SEALED SURFACES**

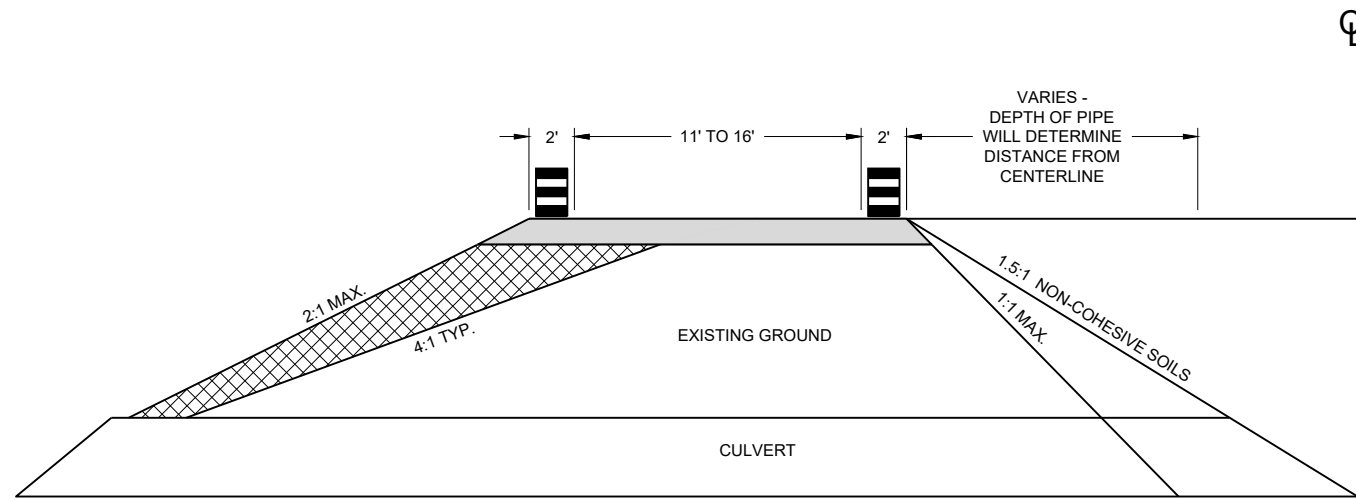
SEE SDD15C04 FOR ADVANCE WARNING SIGNS

**TRAFFIC CONTROL SIGNING ON ROADWAYS WITH LOOSE GRAVEL**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
February 2021 /S/ Andrew Heidtke  
DATE WORK ZONE ENGINEER

FHWA



**CROSS SECTION**

**GENERAL NOTES**

USE 1:1 FOR COHESIVE CLAYS AND SILTS, LOAMS, SANDY CLAYS AND ANGULAR GRAVEL SOILS.  
 USE 1.5:1 FOR NON-COHESIVE SOILS.

THE TAPER SHOULD EXTEND ACROSS THE SHOULDER UNLESS DOING SO WOULD GREATLY CONFLICT WITH THE WORK OPERATION.






ALL LANE CLOSURE SIGNS SHALL BE REMOVED OR COVERED AND ALL DEVICES REMOVED BEYOND THE SHOULDER WHEN WORK IS NOT IN PROGRESS AND THE LANE IS RESTORED TO A SAFE OPERATING CONDITION.

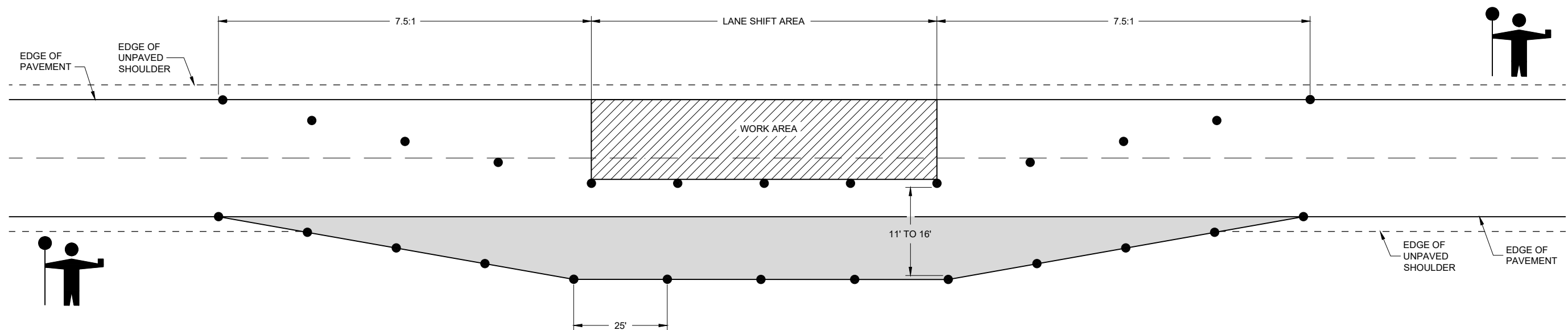
CHANNELIZING DEVICES PLACED ADJACENT TO WORK AREA SHALL BE PULLED BACK FROM TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

USE WITH SDD 15C12 "TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATIONS"

USE WITH SDD 15D45 "SIGNING ON ROADWAYS WITH LOOSE GRAVEL"

**LEGEND**

-  DRUM WITHOUT WARNING LIGHT
-  6" BASE AGGREGATE DENSE 1 1/2" - INCIDENTAL TO LANE SHIFT ITEM
-  FILL - INCIDENTAL TO LANE SHIFT ITEM
-  WORK AREA
-  FLAGGER, EQUIPPED WITH STOP/SLOW PADDLE FASTENED ON SUPPORT STAFF



**LANE SHIFT IN FLAGGING OPERATION**

**TRAFFIC CONTROL,  
 TEMPORARY LANE SHIFT  
 DURING CULVERT WORK**

STATE OF WISCONSIN  
 DEPARTMENT OF TRANSPORTATION

APPROVED  
 February 2021 /S/ Andrew Heidtke  
 DATE WORK ZONE ENGINEER

FHWA

6





6

SDD 15D48 - 01

SDD 15D48 - 01



**LEGEND**

- V1 WORK VEHICLE
- V2 SHADOW VEHICLE
-  TRUCK MOUNTED ATTENUATOR (TMA)
-  FLASHING ARROW PANEL (CAUTION)
-  WORK AREA
-  DIRECTION OF TRAFFIC

POSTED SPEED PRIOR TO WORK STARTING (MPH)	DECISION SIGHT DISTANCE (D)
0 - 25	550'
30	550'
35	700'
40	700'
45	900'
50	900'
55	1200'

**GENERAL NOTES**

ALL SIGNS ARE 48"X48" UNLESS OTHERWISE NOTED.

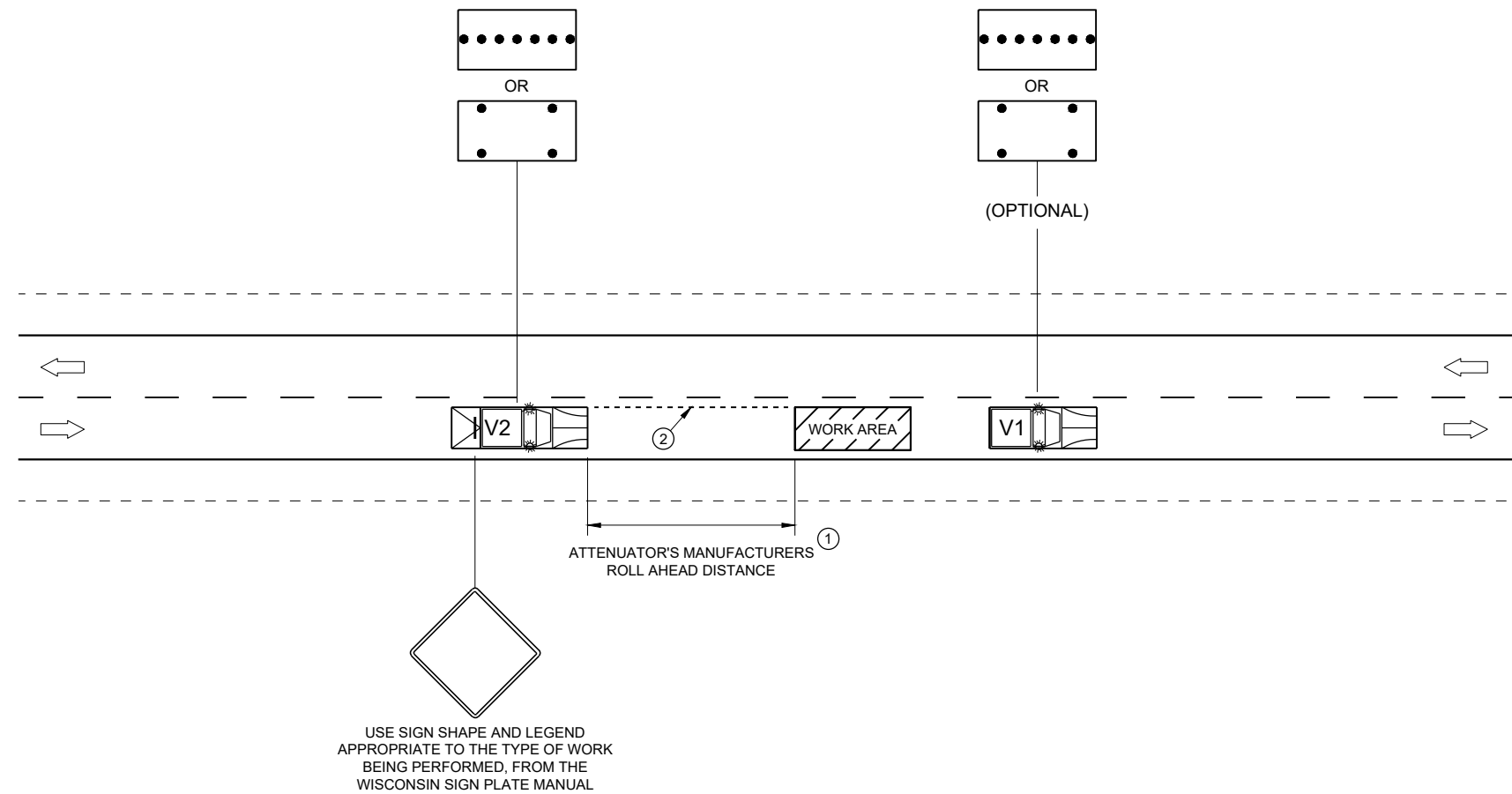
MOBILE IS WORK THAT MOVES CONTINUOUSLY OR MOVES AT LEAST THE DECISION SIGHT DISTANCE EVERY 15 MINUTES.

ALL VEHICLES SHALL BE EQUIPPED WITH TWO 360 DEGREE HIGH INTENSITY YELLOW FLASHING LIGHTS OR STROBE LIGHTS AND OPERATED WITH HEADLIGHTS TURNED ON.

ALL ARROW PANELS SHALL BE REAR FACING, TYPE "B" OR "C", AND DISPLAYING THE FLASHING CAUTION MODE. SIGNS PLACED ON VEHICLES MUST NOT OBSCURE THE ARROW PANEL.

USE AN ATTENUATOR ON THE REARMOST VEHICLE THAT BLOCKS ALL OR PART OF THE TRAFFIC LANE.

- ① DISTANCE BETWEEN VEHICLES MAY INCREASE FROM THE ATTENUATOR'S ROLL AHEAD BASED ON TERRAIN, SIGHT DISTANCE, AND OTHER FACTORS. WHENEVER ADEQUATE STOPPING SIGHT DISTANCE EXISTS TO THE REAR, SHADOW VEHICLES SHOULD MAINTAIN THE MINIMUM DISTANCE FROM THE WORK VEHICLE AND PROCEED AT THE SAME SPEED AS THE WORK VEHICLE. SHADOW VEHICLES SHOULD SLOW DOWN IN ADVANCE OF VERTICAL OR HORIZONTAL CURVES THAT RESTRICT SIGHT DISTANCE.
- ② ALIGN LEFT SIDE OF SHADOW VEHICLE WITH EDGE OF WORK AREA.



6

6

SDD 15D51 - 01

SDD 15D51 - 01

**TRAFFIC CONTROL,  
MOBILE OPERATIONS ON  
AN UNDIVIDED ROADWAY**

STATE OF WISCONSIN  
DEPARTMENT OF TRANSPORTATION

APPROVED  
February 2021 /S/ Andrew Heidtke  
DATE STATEWIDE WORK ZONE TRAFFIC SAFETY ENGINEER

FHWA

- ◐ SEE CORNER DETAILS ON "DETAILS" SHEET
- NAME PLATE LOCATION (SEE BELOW)
- INDICATES WING NUMBER

**DESIGN DATA**

**MATERIAL PROPERTIES:**

CONCRETE MASONRY: \_\_\_\_\_ f'c = 3,500 P.S.I.  
 BAR STEEL REINFORCEMENT: \_\_\_\_\_ fy = 60,000 P.S.I.

**GENERAL NOTES**



- DRAWINGS SHALL NOT BE SCALED.
- DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.
- BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2" CLEAR UNLESS OTHERWISE SHOWN OR NOTED.
- THE FIRST OR FIRST TWO DIGITS OF THE BAR MARK SIGNIFIES THE BAR SIZE.
- BEVEL EXPOSED EDGES OF CONCRETE 3/4" UNLESS OTHERWISE NOTED.
- THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES CULVERTS B-3-95" SHALL BE THE EXISTING GROUNDLINE.
- ALL VOLUME WHICH CANNOT BE PLACED BEFORE CULVERT CONSTRUCTION AND NOT OCCUPIED BY THE NEW STRUCTURE SHALL BE BACKFILLED WITH STRUCTURE BACKFILL WITHIN THE LENGTH OF THE CULVERT INCLUDING THE APRON WING WALLS.
- THE QUANTITY FOR BACKFILL STRUCTURE IS CALCULATED BASED ON THE DETAIL SHOWN IN THE PLANS.
- PLACE 18" (MIN.) WIDE SHEET OF "RUBBERIZED MEMBRANE WATERPROOFING" ON VERTICAL AND HORIZONTAL WING CONSTRUCTION JOINTS.
- THE CONTRACTOR SHALL SUPPLY A NEW NAME PLATE IN ACCORDANCE WITH SECTION 504.3.4 OF THE STANDARD SPECIFICATIONS AND THE STANDARD DETAIL DRAWINGS. NAME PLATE TO SHOW ORIGINAL CONSTRUCTION YEAR 1985 WORK SHALL BE INCLUDED IN THE BID ITEM "CONCRETE MASONRY CULVERTS".

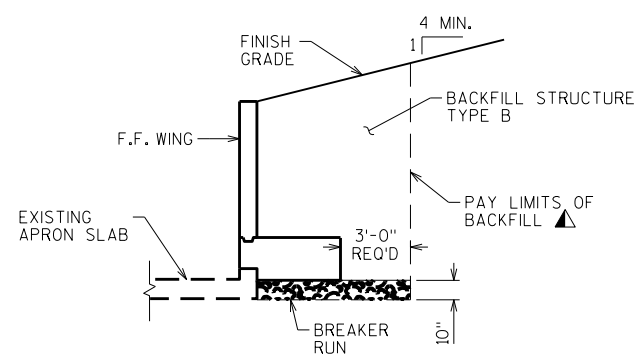
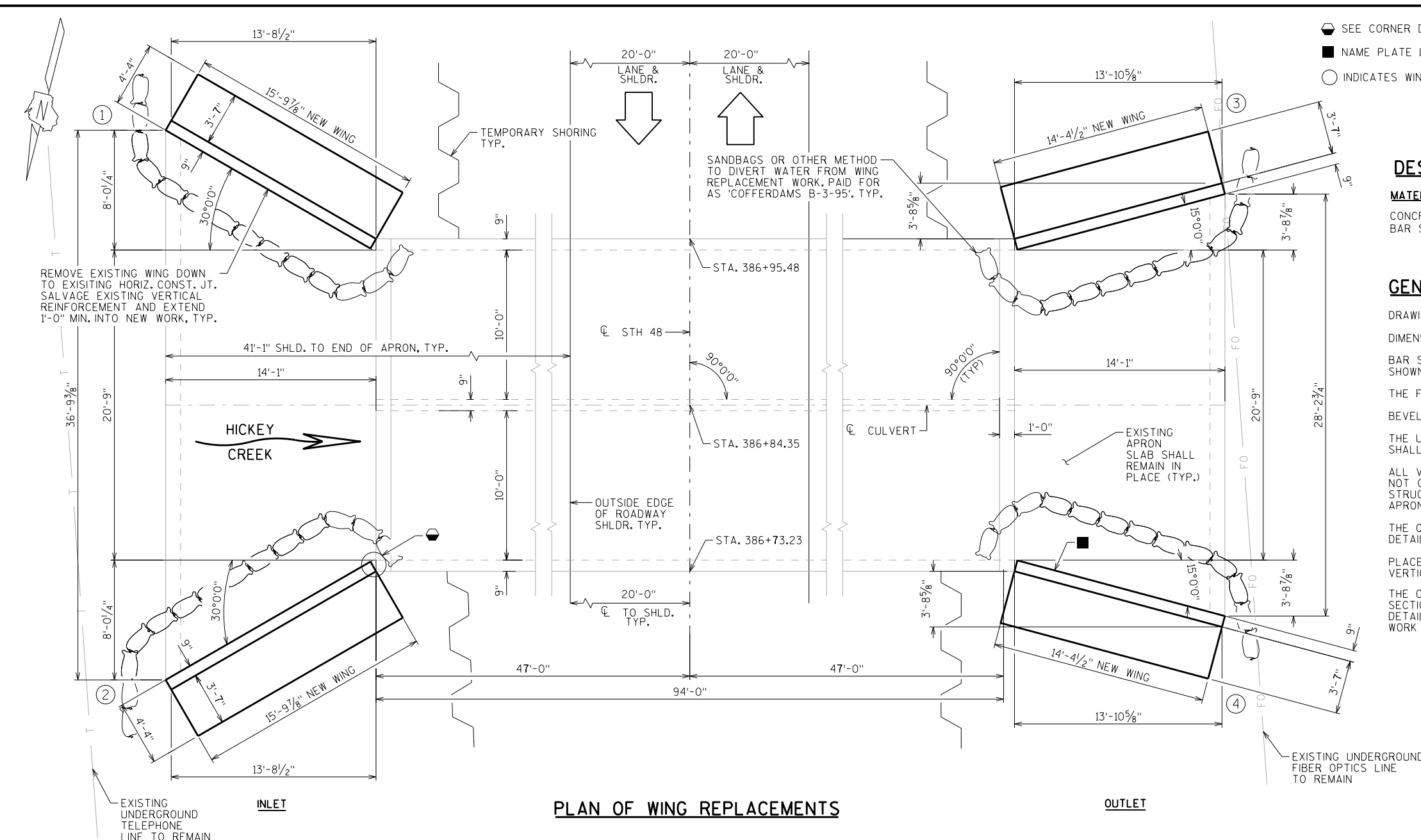
**LIST OF DRAWINGS**

- 1. WING REPLACEMENTS
- 2. WING DETAILS

**STRUCTURE DESIGN CONTACTS:**

ALEXIS HANLEY (608) 266-3350  
 DOMINIQUE BECHLE (608) 261-8205

NO.	DATE	REVISION	BY
			
ACCEPTED			DATE
<b>STRUCTURE B-3-95</b>			
STH 48 OVER HICKEY CREEK			
COUNTY	BARRON	TOWN	STANFOLD
DESIGN SPEC.	REHABILITATION N/A		
DESIGNED BY	DESIGNED CK'D.	DRAWN BY	PLANS CK'D.
LIH	ABS	LIH	ABS
<b>WING REPLACEMENTS</b>			SHEET 1 OF 2



▲ BACKFILL PAY LIMITS. BACKFILL BEYOND BACKFILL PAY LIMITS SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES. LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR.

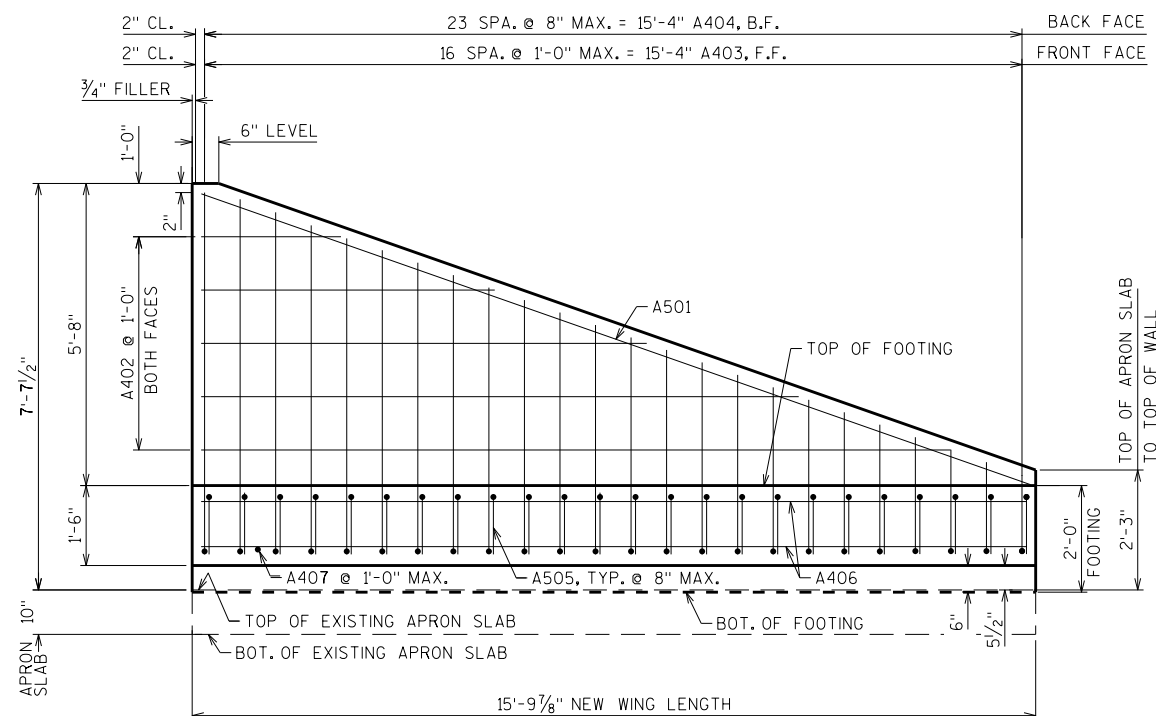
**TOTAL ESTIMATED QUANTITIES**

BID ITEM NUMBER	BID ITEMS	UNIT	TOTALS
203.0220	REMOVING STRUCTURE B-03-95	EACH	1
206.2001	EXCAVATION FOR STRUCTURES CULVERTS B-03-95	EACH	1
206.5001	COFFERDAMS B-03-95	EACH	1
210.2500	BACKFILL STRUCTURE TYPE B	TONS	162
311.0115	BREAKER RUN	CY	16
504.0100	CONCRETE MASONRY CULVERTS	CY	24
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	1,950
511.1200	TEMPORARY SHORING B-03-95	SF	550
516.0500	RUBBERIZED MEMBRANE WATERPROOFING	SY	15
NON-BID ITEMS			
	FILLER	SIZE	3/4"

8

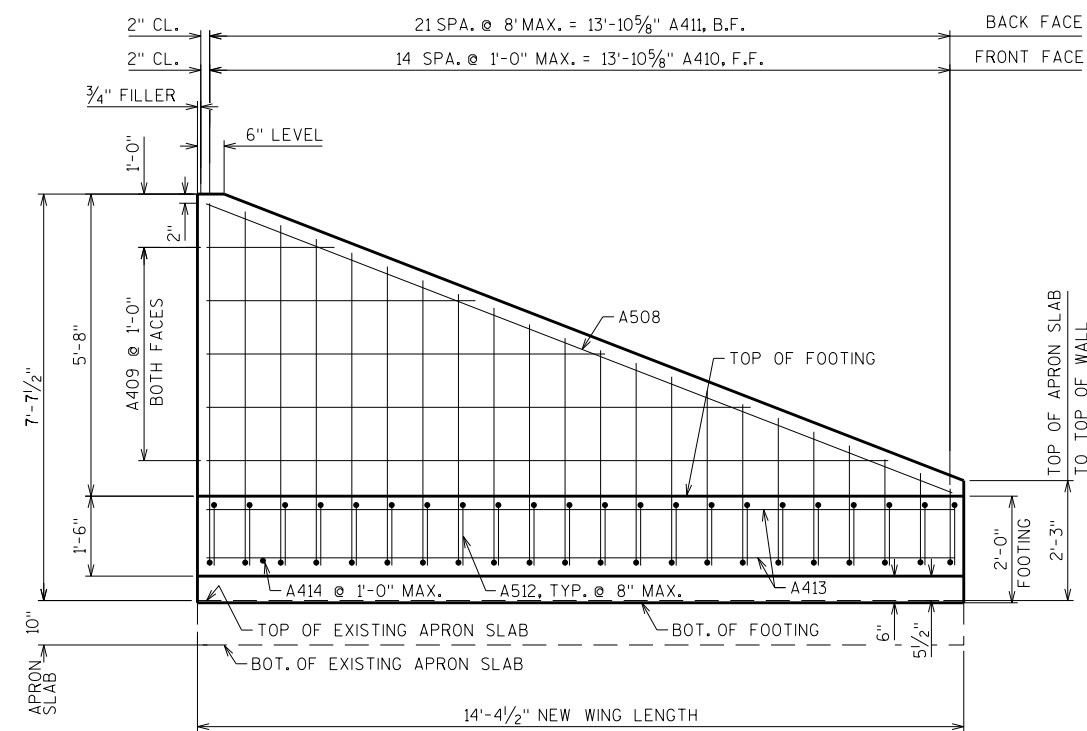
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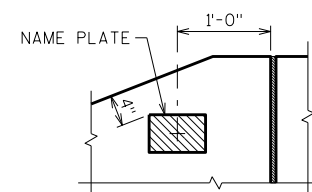
**ELEVATION WING 1 & 2**

LOOKING NORTH  
SHOWING WING 2 B.F. REINF.  
WING 1 SIMILAR

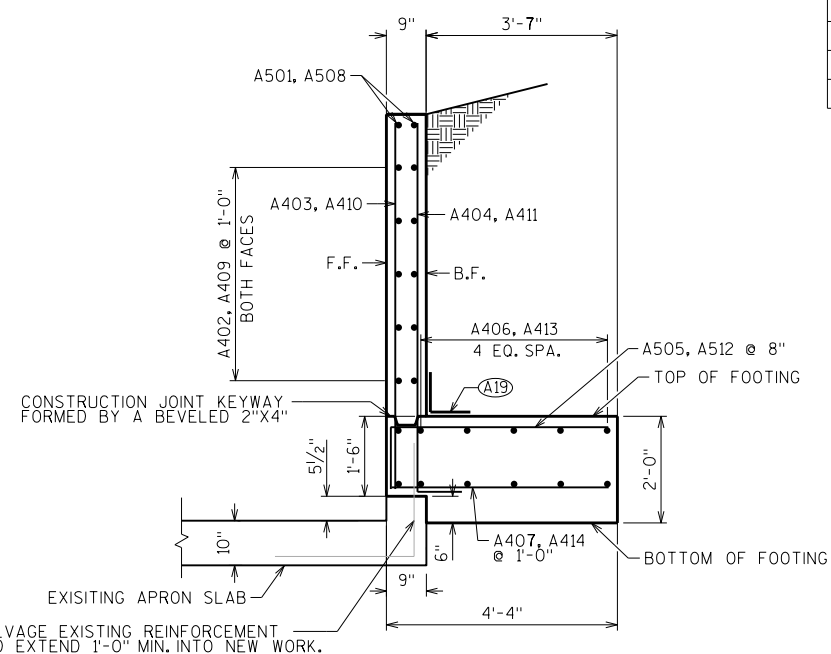


**ELEVATION WING 3 & 4**

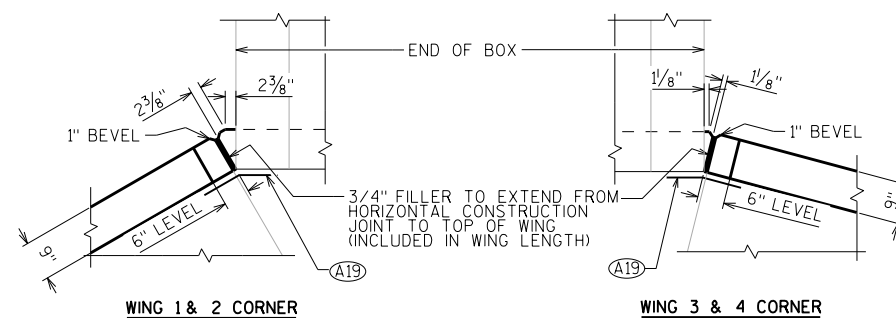
LOOKING SOUTH  
SHOWING WING 3 B.F. REINF.  
WING 4 SIMILAR



**NAME PLATE LOCATION  
WING 4**



**SECTION THRU WING DETAIL**



**CORNER DETAILS**

**BILL OF BARS**

NOTE: THE FIRST OR FIRST TWO DIGITS OF THE BAR MARK SIGNIFIES THE BAR SIZE

BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	BAR SERIES	LOCATION
A501	X	4	16'-5"	NO		WING 1 AND 2 - HORIZ. BOTH FACES -TOP
A402	X	20	8'-4"	NO	▲	WING 1 AND 2 - HORIZ. BOTH FACES
A403	X	34	4'-2"	NO	▲	WING 1 AND 2 - VERT. FRONT FACE
A404	X	48	4'-9"	8"	▲	WING 1 AND 2 - VERT. BACK FACE
A505	X	48	5'-1"	1'-2"		WING 1 AND 2 - FOOTING - TOP
A406	X	24	15'-5"	NO		WING 1 AND 2 - FOOTING - LONGIT.
A407	X	34	4'-0"	NO		WING 1 AND 2 - FOOTING - BOTTOM
A508	X	4	15'-0"	NO		WING 3 AND 4 - HORIZ. BOTH FACES -TOP
A409	X	20	7'-6"	NO	▲	WING 3 AND 4 - HORIZ. BOTH FACES
A410	X	30	4'-2"	NO	▲	WING 3 AND 4 - VERT. FRONT FACE
A411	X	44	4'-9"	8"	▲	WING 3 AND 4 - VERT. BACK FACE
A512	X	44	5'-1"	1'-2"		WING 3 AND 4 - FOOTING - TOP
A413	X	24	14'-0"	NO		WING 3 AND 4 - FOOTING - LONGIT.
A414	X	30	4'-0"	NO		WING 3 AND 4 - FOOTING - BOTTOM

▲ LENGTH SHOWN FOR BAR IS AN AVERAGE LENGTH AND SHOULD ONLY BE USED FOR BAR WEIGHT CALCULATIONS. SEE BAR SERIES TABLE FOR ACTUAL LENGTHS.

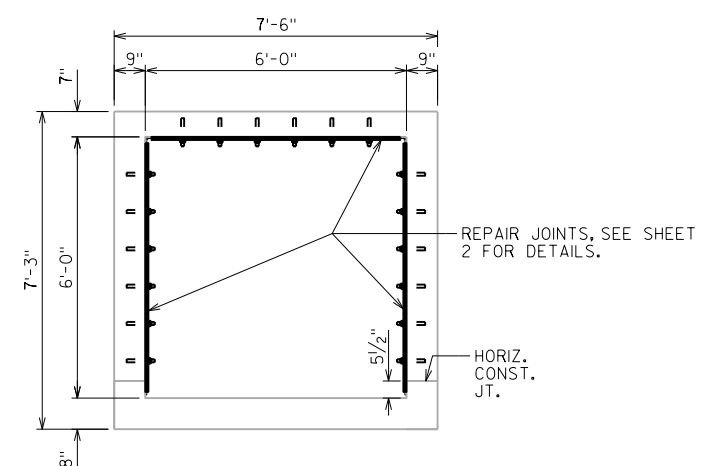
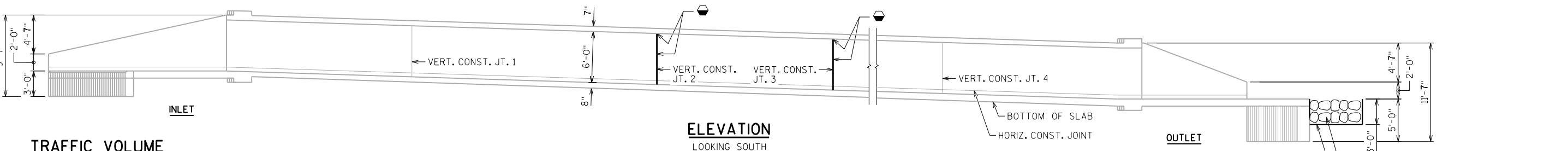
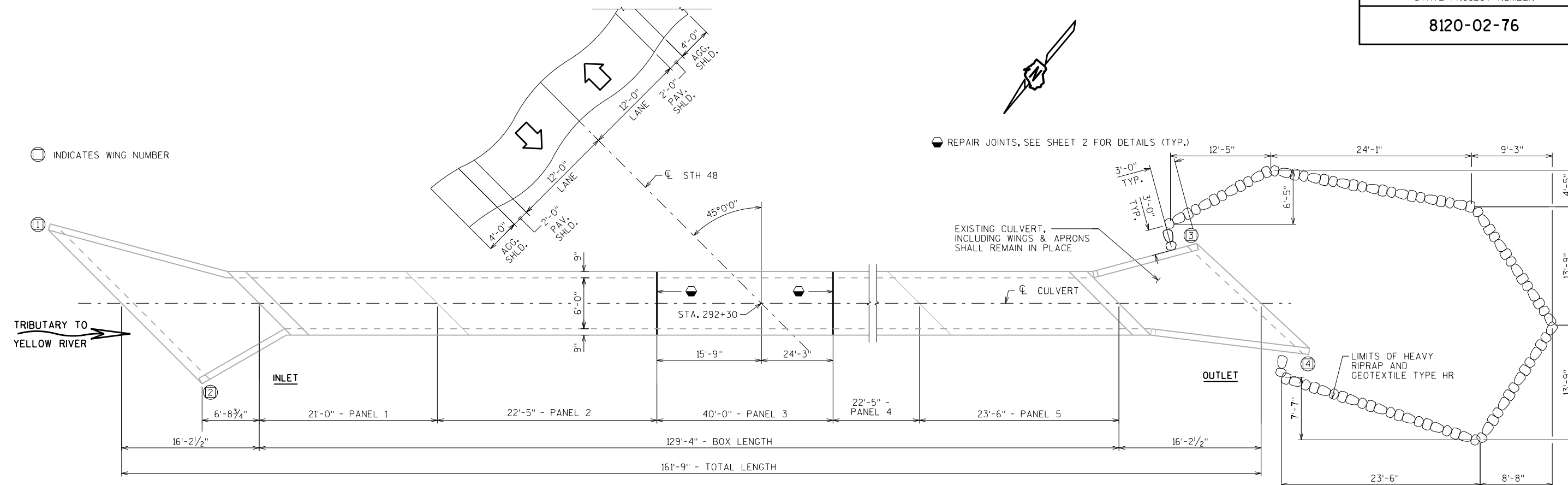
**BAR SERIES TABLE**

BAR MARK	NO. REQ'D.	LENGTH
A402	2 SERIES OF 5	2'-7" TO 14'-0"
A403	1 SERIES OF 17	1'-6" TO 6'-9"
A404	1 SERIES OF 24	2'-1" TO 7'-4"
A409	2 SERIES OF 5	2'-4" TO 12'-9"
A410	1 SERIES OF 15	1'-6" TO 6'-9"
A411	1 SERIES OF 22	2'-1" TO 7'-4"

BUNDLE AND TAG EACH SERIES SEPARATELY.

(A19) 18" WIDE RUBBERIZED MEMBRANE WATERPROOFING SEAL ALL HORIZ. & VERT. JOINTS AT BACKFACE.

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DESIGN SECTION			
<b>STRUCTURE B-3-95</b>			
DRAWN BY		PLANS CK'D.	ABS
WING DETAILS		SHEET 2	



- LIST OF DRAWINGS**
- 1. CULVERT REPAIR
  - 2. REPAIR DETAILS

**STRUCTURE DESIGN CONTACTS:**  
 JOHN SENDOR (608) 266-5163  
 DOMINIQUE BECHLE (608) 261-8205

NO.	DATE	REVISION	BY

ACCEPTED *[Signature]* **BUREAU OF STRUCTURES** **11/03/23**  
 CHIEF STRUCTURES DESIGN ENGINEER DATE

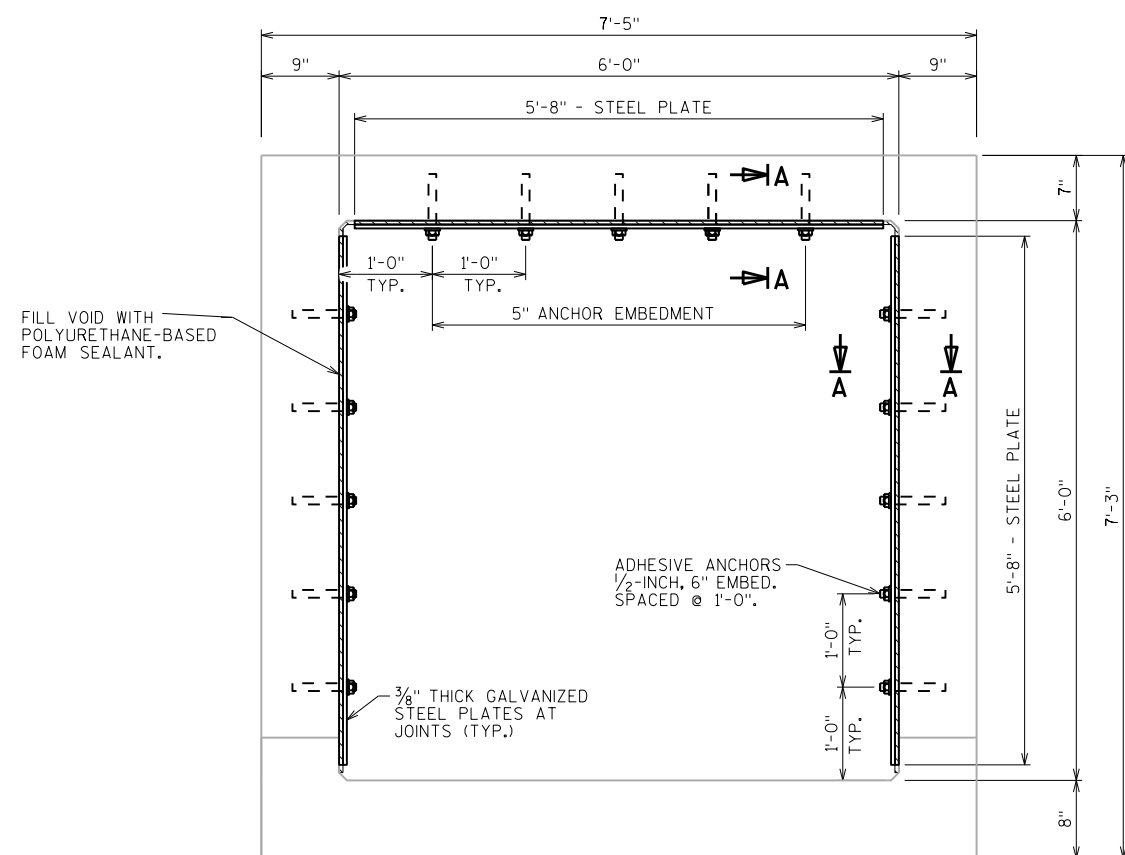
**STRUCTURE C-3-31**

STH 48 OVER TRIBUTARY TO YELLOW RIVER

COUNTY BARRON TOWN STANFORD

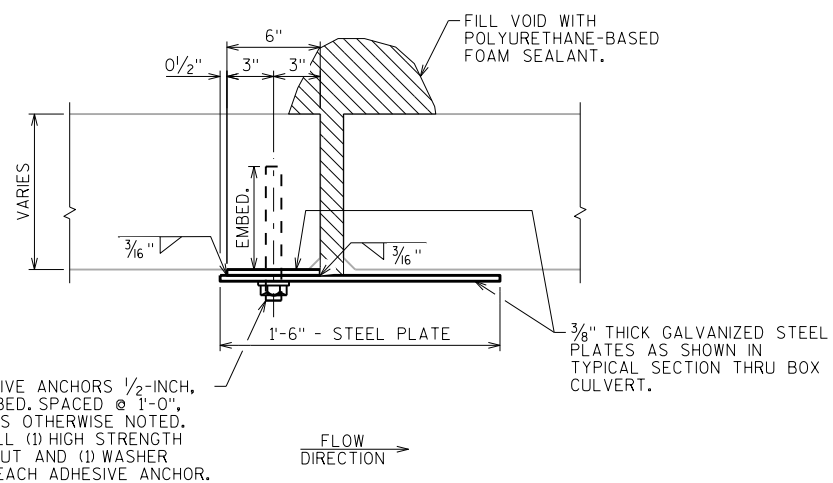
DESIGN SPEC. N/A - REHABILITATION  
 DESIGNED BY JJS DESIGNED CK'D. ACT DRAWN BY JJS PLANS CK'D. ACT

**CULVERT REPAIR** SHEET 1 OF 2



**SECTION THRU BOX CULVERT JOINT REPAIR AT JOINTS 2 & 3**

ANCHORS IN TOP SLAB INSTALLATION SHALL HAVE AN EMBEDMENT OF 5".



ADHESIVE ANCHORS 1/2-INCH, 6" EMBED. SPACED @ 1'-0", UNLESS OTHERWISE NOTED. INSTALL (1) HIGH STRENGTH HEX NUT AND (1) WASHER WITH EACH ADHESIVE ANCHOR.

**SECTION A-A**

**NOTES**

REPAIR JOINTS (AT THE TWO CONSTRUCTION JOINT LOCATIONS SHOWN ON SHEET 1) TO BE PAID FOR UNDER BID ITEM "BOX CULVERT JOINT REPAIR C-3-31".

ADHESIVE ANCHORS, STEEL PLATES, POLYURETHANE-BASED FOAM SEALANT, AND ANY OTHER MISCELLANEOUS WORK ASSOCIATED WITH BOX CULVERT JOINT REPAIRS TO BE INCLUDED IN BID ITEM "BOX CULVERT JOINT REPAIR C-3-31".

ALL STRUCTURAL STEEL PLATES SHALL BE FURNISHED AND FABRICATED IN ACCORDANCE WITH SECTION 506 OF THE STANDARD SPECIFICATIONS. GALVANIZE THE STRUCTURAL STEEL PLATES IN ACCORDANCE WITH ASTM A123.

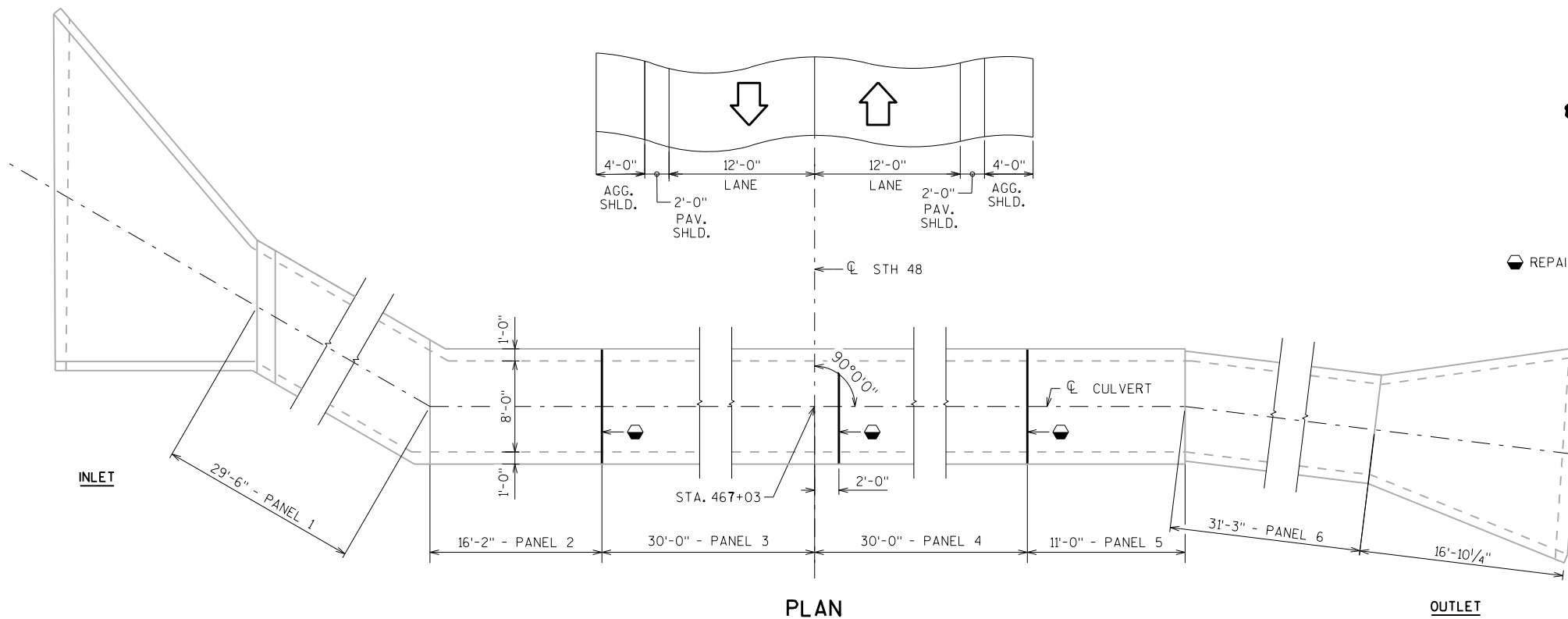
ALL ADHESIVE ANCHORS, NUTS, AND WASHERS SHALL BE FURNISHED AND GALVANIZED IN ACCORDANCE WITH SECTION 502.2.12 OF THE STANDARD SPECIFICATIONS. ENSURE THAT THE SAME GALVANIZATION PROCESS IS USED FOR ALL PARTS OF THE ANCHOR/NUT/WASHER ASSEMBLY.

NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DESIGN SECTION			
<b>STRUCTURE C-3-31</b>			
		DRAWN BY JJS	PLANS CK'D. ACT
<b>REPAIR DETAILS</b>		SHEET 2	

TRIBUTARY TO ENGLE CREEK

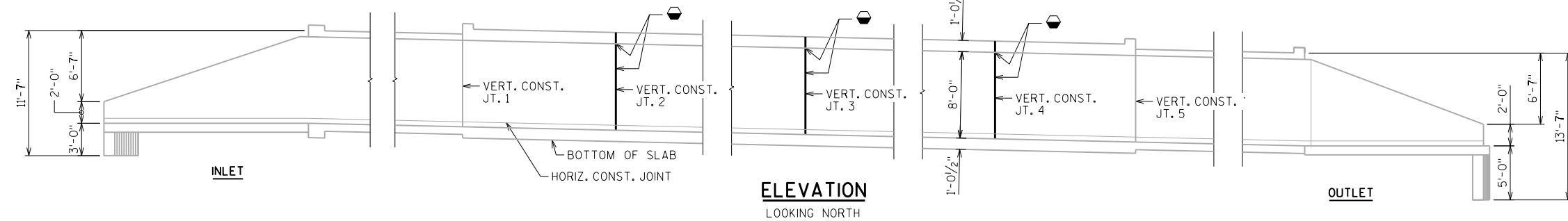


REPAIR JOINTS, SEE SHEET 2 FOR DETAILS (TYP.)



PLAN

OUTLET



ELEVATION  
LOOKING NORTH

OUTLET

**TRAFFIC VOLUME**

STH 48  
ADT = 6,100  
R.D.S. = 55 M.P.H.

**DESIGN DATA**

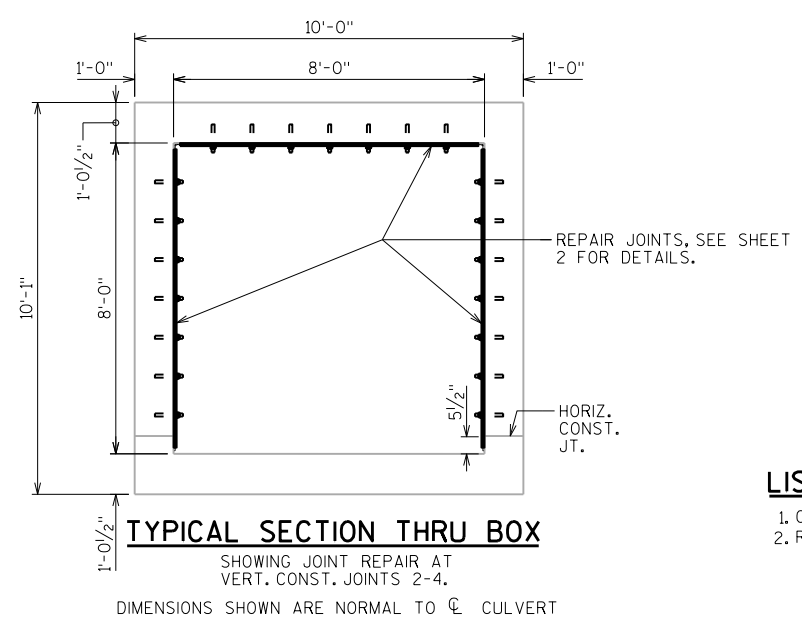
**MATERIAL PROPERTIES:**  
HIGH STRENGTH STRUCTURAL STEEL:  
ASTM A36, GRADE 36  $f_y = 36,000$  P.S.I.

**GENERAL NOTES**

DRAWINGS SHALL NOT BE SCALED.  
DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.  
REPAIR JOINTS (AT ALL FIVE VERT. CONST. JOINT LOCATIONS) TO BE PAID FOR UNDER BID ITEM "BOX CULVERT JOINT REPAIR C-3-32."

**TOTAL ESTIMATED QUANTITIES**

BID ITEM NUMBER	BID ITEMS	UNIT	TOTALS
SPV.0060	BOX CULVERT JOINT REPAIR C-3-32	EACH	3



**TYPICAL SECTION THRU BOX**  
SHOWING JOINT REPAIR AT VERT. CONST. JOINTS 2-4.  
DIMENSIONS SHOWN ARE NORMAL TO CULVERT

**LIST OF DRAWINGS**

- 1. CULVERT REPAIR
- 2. REPAIR DETAILS

**STRUCTURE DESIGN CONTACTS:**  
JOHN SENDOR (608) 266-5163  
DOMINIQUE BECHLE (608) 261-8205

NO.	DATE	REVISION	BY

**BUREAU OF STRUCTURES**  
 ACCEPTED *[Signature]* **DMB** **11/03/23**  
 CHIEF STRUCTURES DESIGN ENGINEER DATE

**STRUCTURE C-3-32**

STH 48 OVER TRIBUTARY TO ENGLE RIVER

COUNTY BARRON TOWN STANFORD

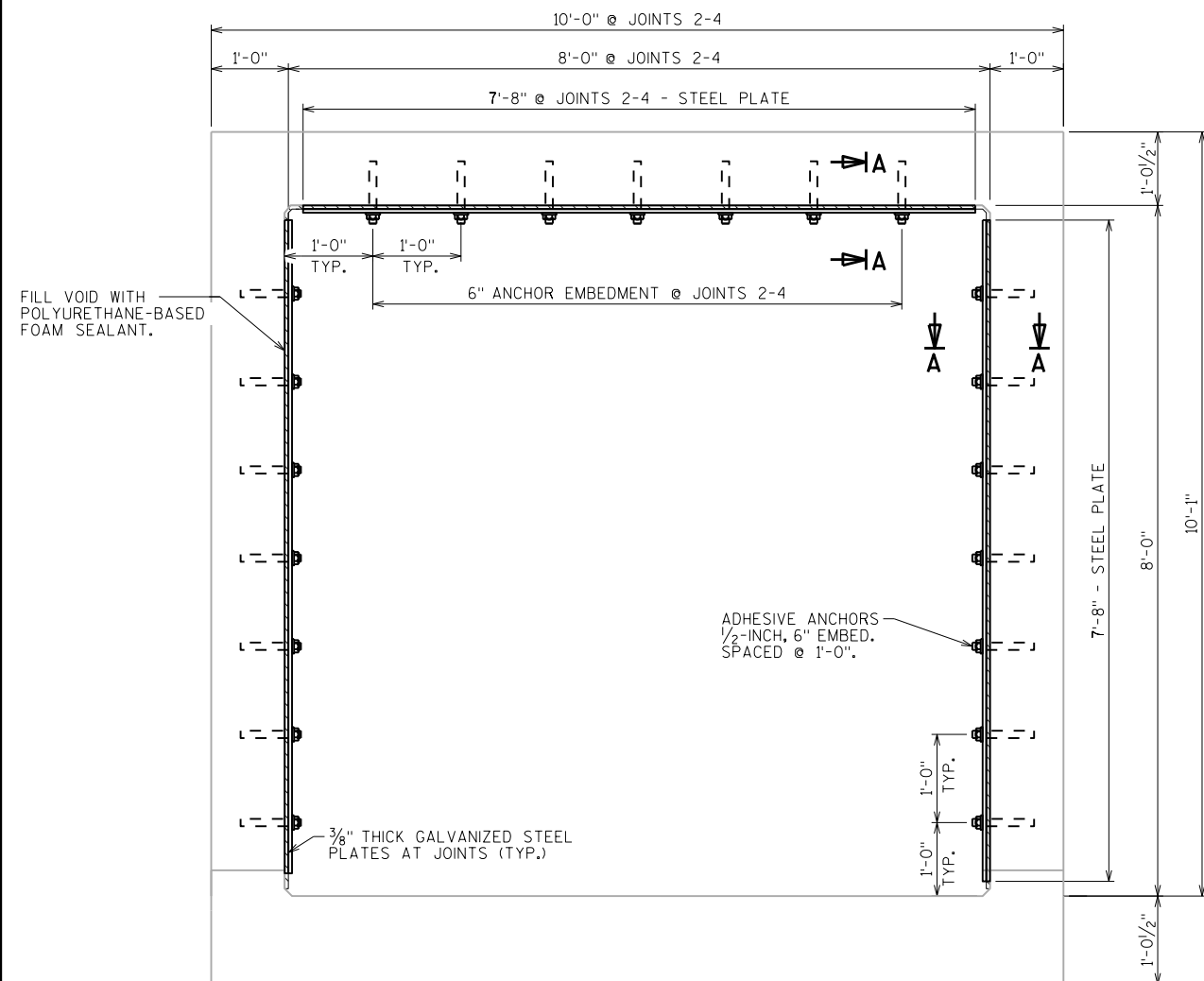
DESIGN SPEC. N/A - REHABILITATION  
 DESIGNED BY JJS DESIGNED CK'D. ACT DRAWN BY JJS PLANS CK'D. ACT

**CULVERT REPAIR** SHEET 1 OF 2

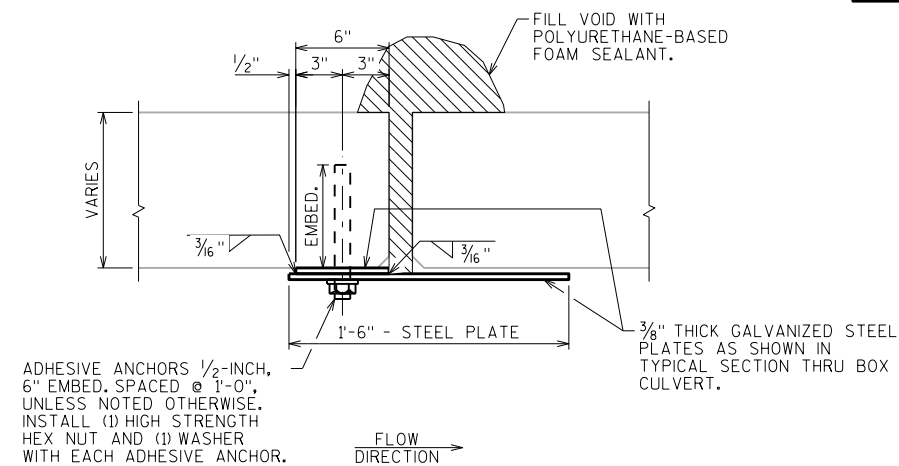
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8

SCALE = 6.00



SECTION THRU BOX CULVERT JOINT REPAIR AT JOINTS 2-4



SECTION A-A

**NOTES**

REPAIR JOINTS (AT THE THREE CONSTRUCTION JOINT LOCATIONS SHOWN ON SHEET 1) TO BE PAID FOR UNDER BID ITEM "BOX CULVERT JOINT REPAIR C-3-32".

ADHESIVE ANCHORS, STEEL PLATES, POLYURETHANE-BASED FOAM SEALANT, AND ANY OTHER MISCELLANEOUS WORK ASSOCIATED WITH BOX CULVERT JOINT REPAIRS TO BE INCLUDED IN BID ITEM "BOX CULVERT JOINT REPAIR C-3-32".

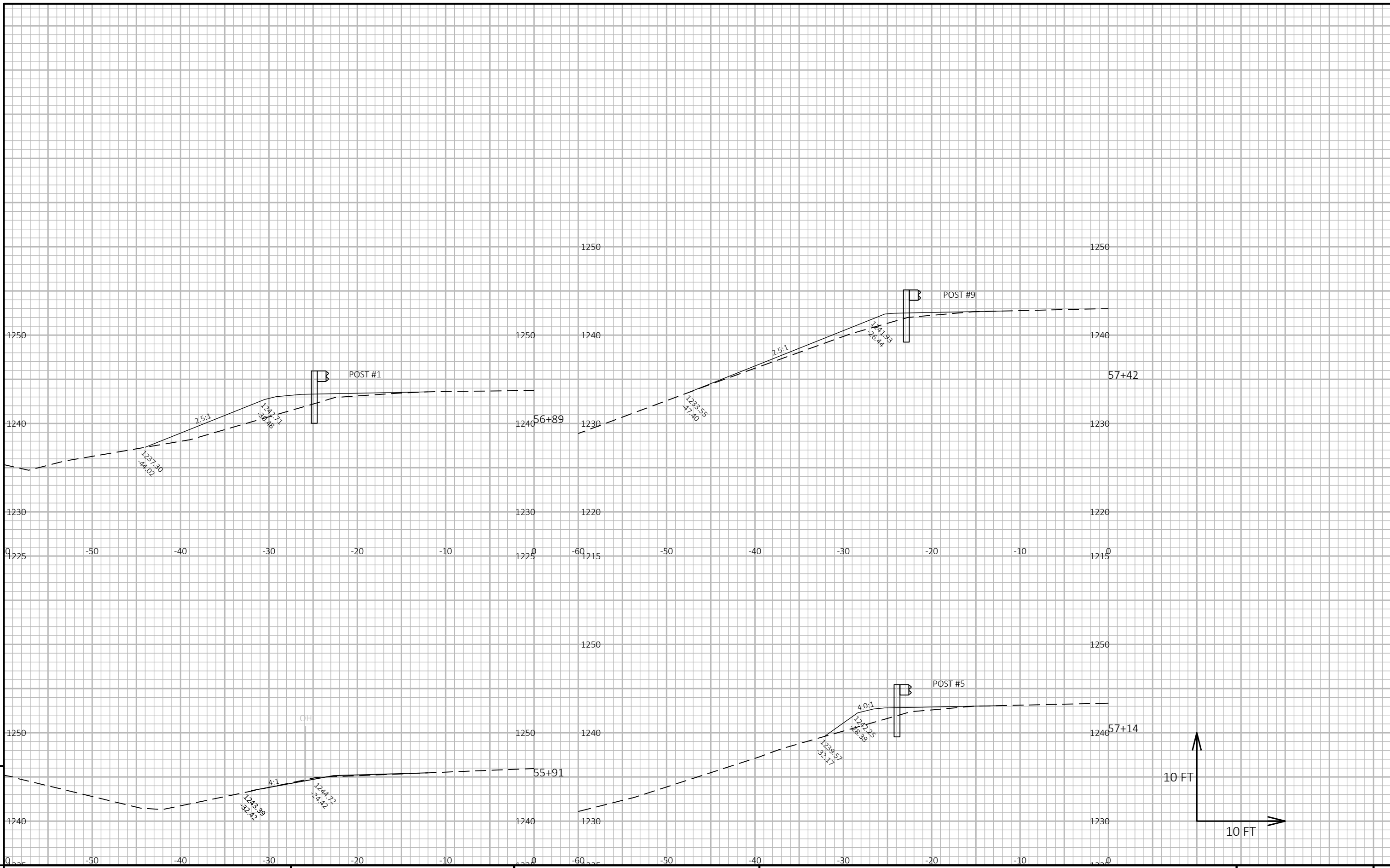
ALL STRUCTURAL STEEL PLATES SHALL BE FURNISHED AND FABRICATED IN ACCORDANCE WITH SECTION 506 OF THE STANDARD SPECIFICATIONS. GALVANIZE THE STRUCTURAL STEEL PLATES IN ACCORDANCE WITH ASTM A123.

ALL ADHESIVE ANCHORS, NUTS, WASHERS SHALL BE FURNISHED AND GALVANIZED IN ACCORDANCE WITH SECTION 502.2.12 OF THE STANDARD SPECIFICATIONS. ENSURE THAT THE SAME GALVANIZATION PROCESS IS USED FOR ALL PARTS OF THE ANCHOR/NUT/WASHER ASSEMBLY.

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NO.	DATE	REVISION	BY
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DESIGN SECTION			
<b>STRUCTURE C-3-32</b>			
		DRAWN BY JJS	PLANS CK'D. ACT
<b>REPAIR DETAILS</b>		SHEET 2	



PROJECT NO: 8120-02-76

HWY: STH 48

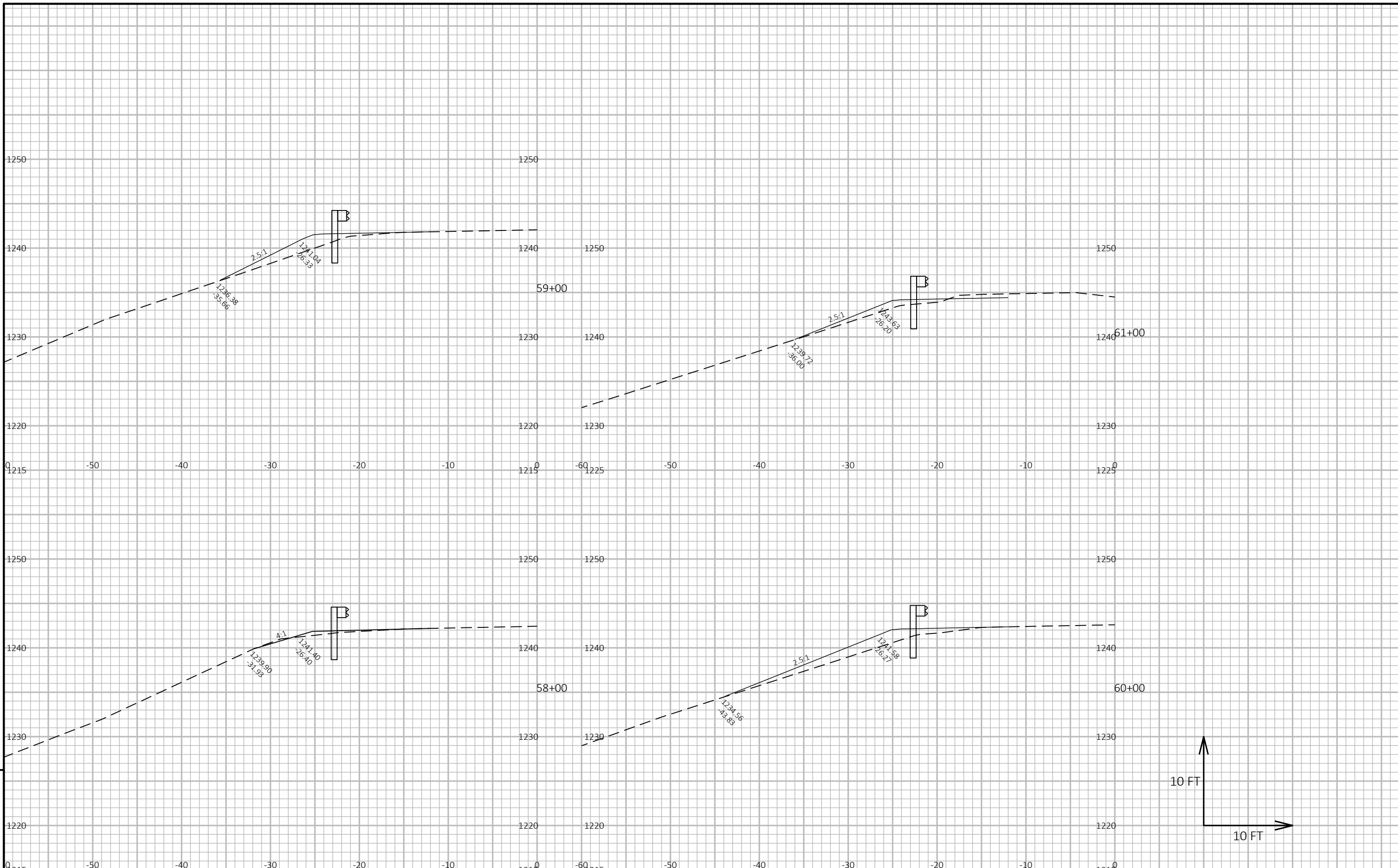
COUNTY: BARRON

CROSS SECTIONS: STH 48 (BG 56+89-61+63)

SHEET

E



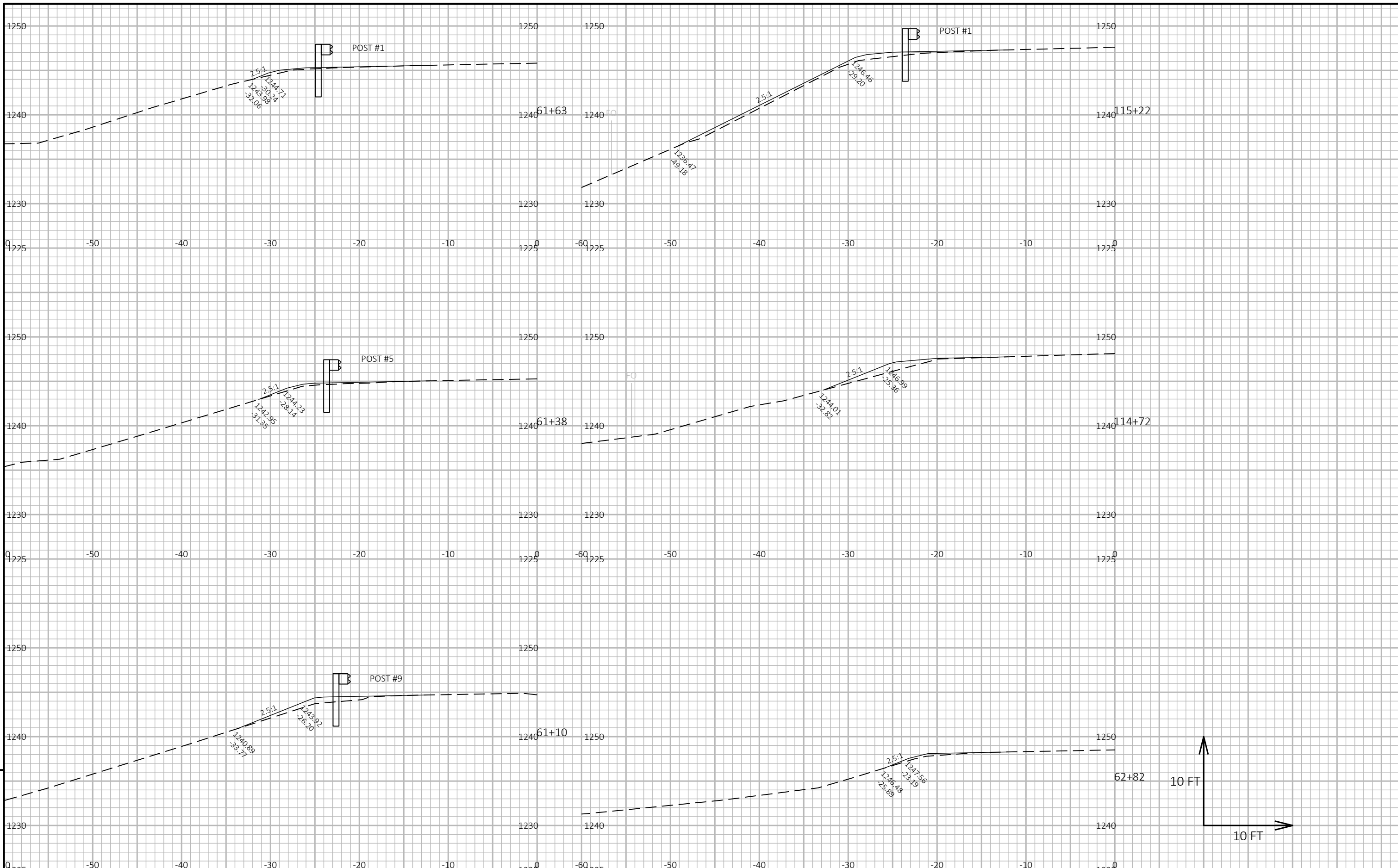


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PROJECT NO: 8120-02-76	HWY: STH 48	COUNTY: BARRON	CROSS SECTIONS: STH 48 (BG 56+89-61+63)	SHEET	E
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FILE NAME : C:\WISDOT\DESIGN\81200206\SHEETSPLAN\090203\_XS LEFT NEW.DWG  
 LAYOUT NAME - 02  
 PLOT DATE : 12/4/2023 10:23 AM  
 PLOT BY : BECKLIN, MATTHEW R  
 PLOT NAME :  
 PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.  
 WISDOT/CADD SHEET 49



PROJECT NO: 8120-02-76

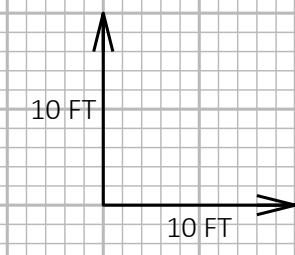
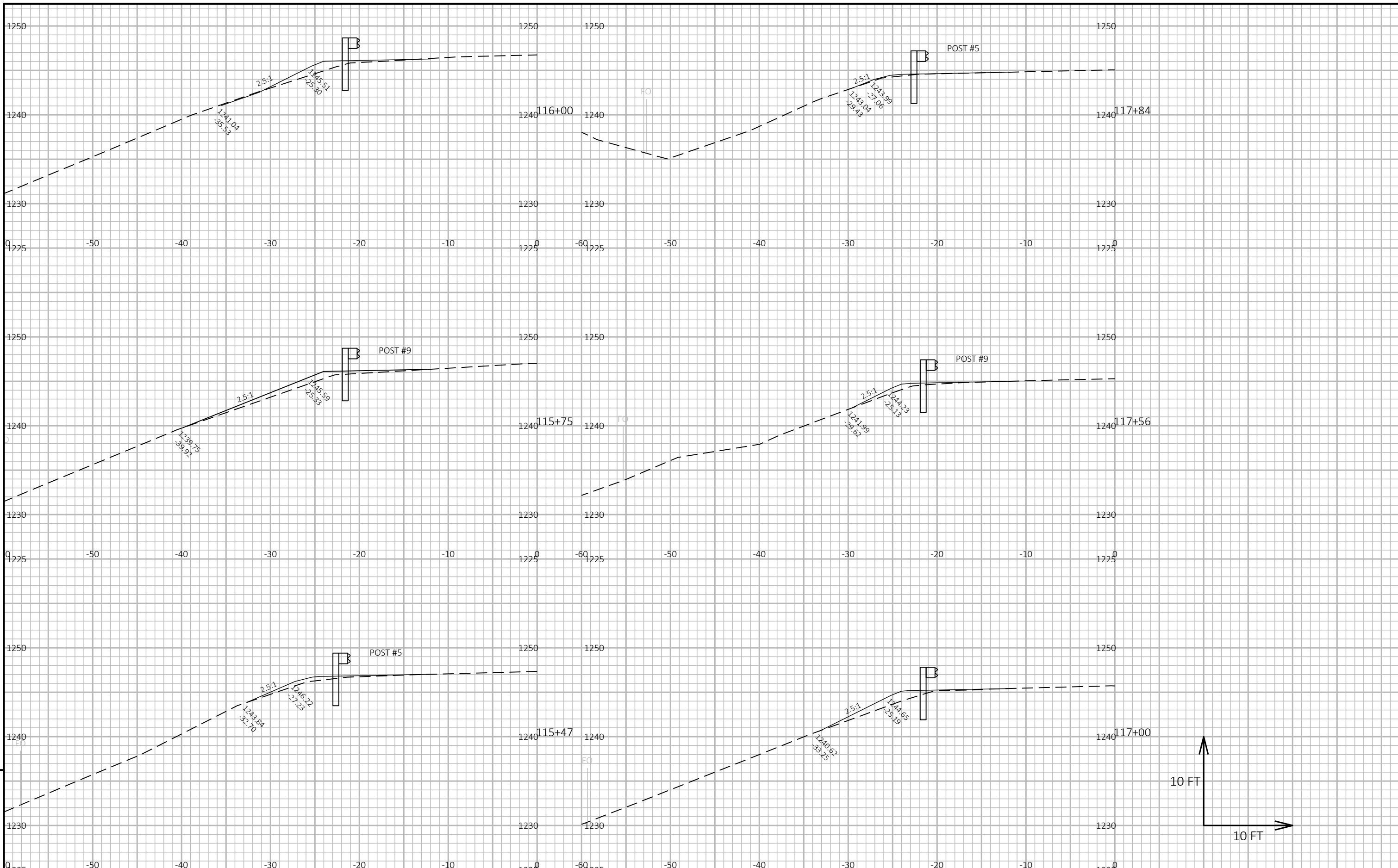
HWY: STH 48

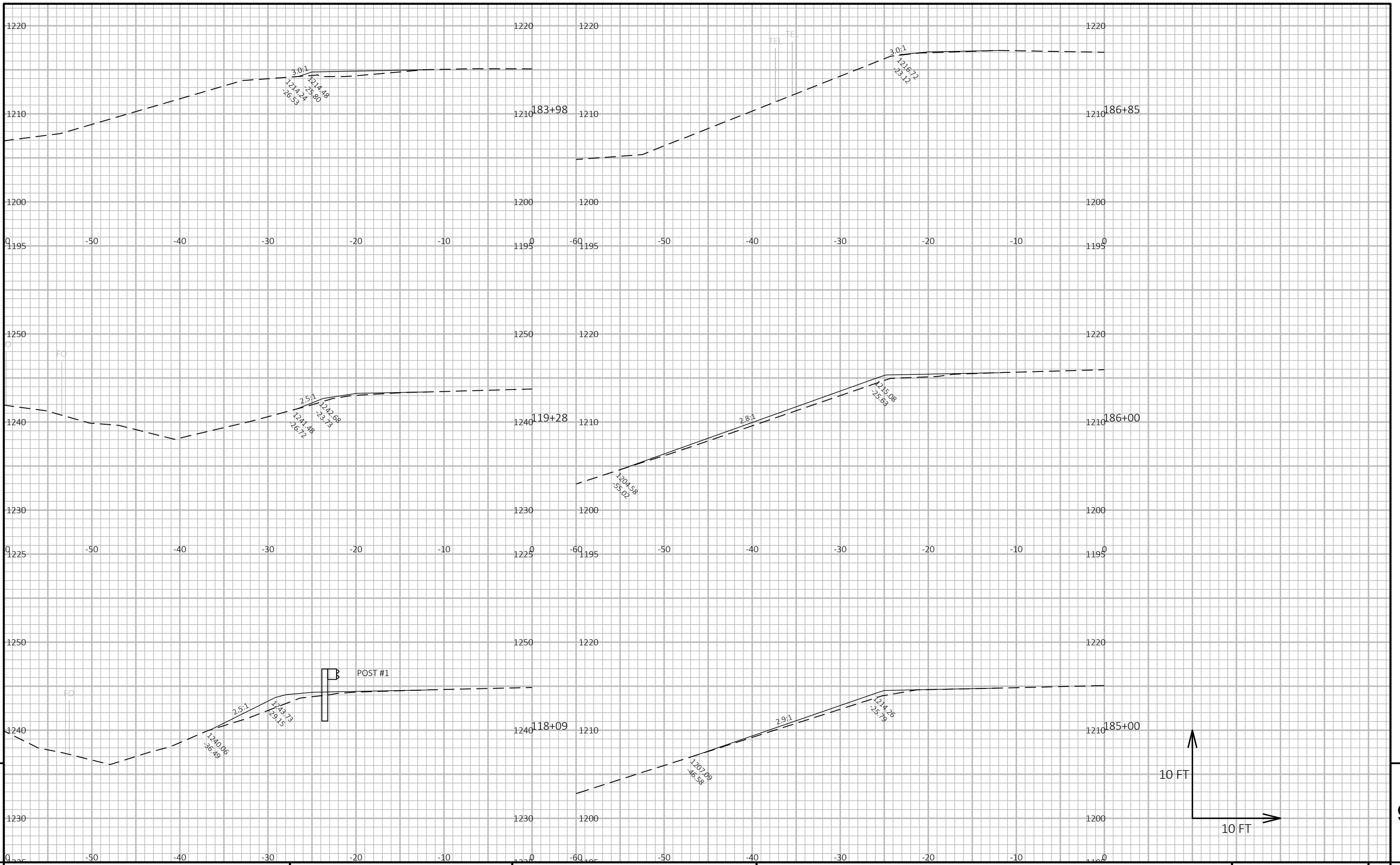
COUNTY: BARRON

CROSS SECTIONS: STH 48 (BG 56+89-61+63, 115+22-118+09)

SHEET

E



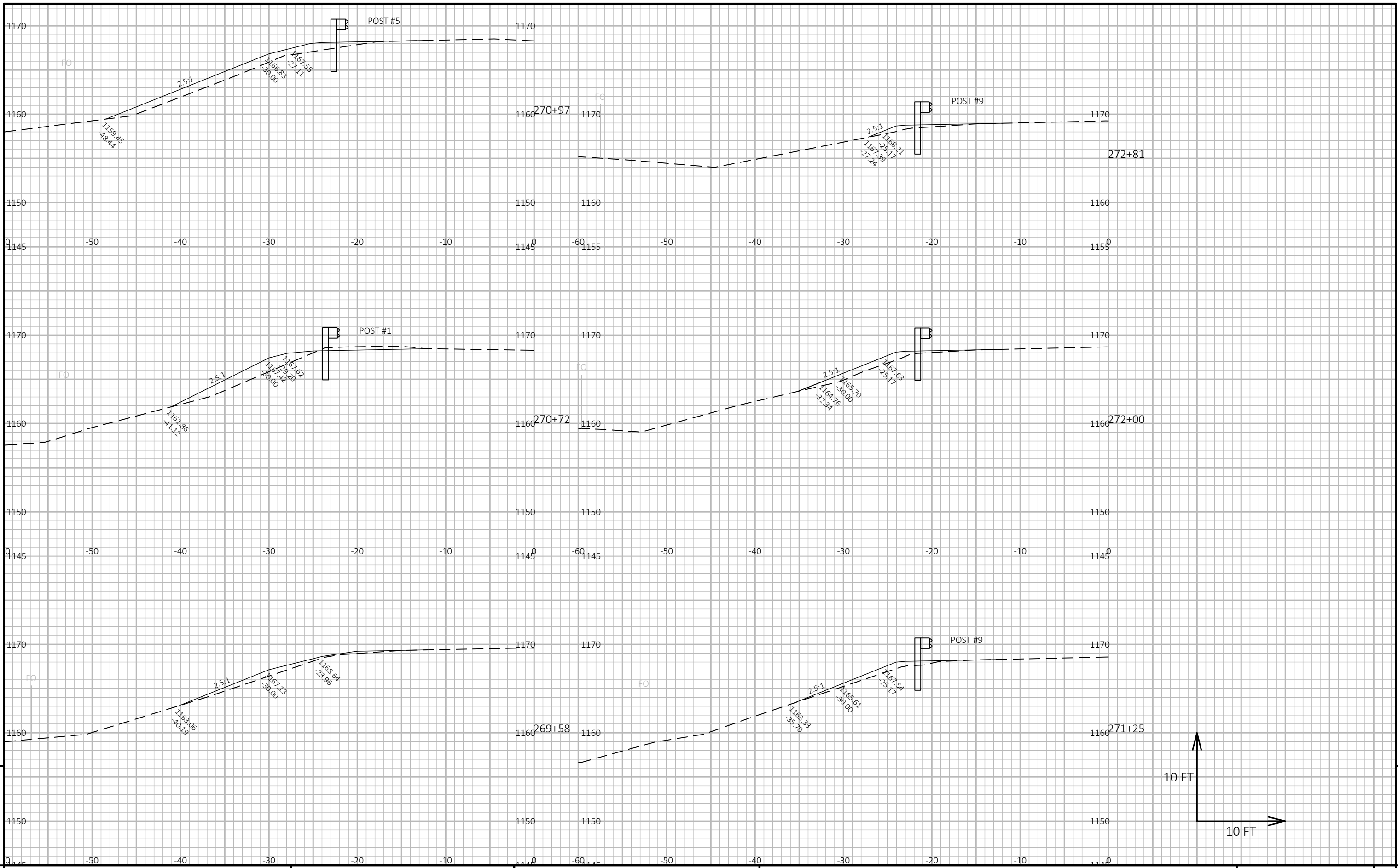


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PROJECT NO: 8120-02-76	HWY: STH 48	COUNTY: BARRON	CROSS SECTIONS: STH 48 (BG 115+22-118+09)	SHEET	E
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FILE NAME : C:\WISDOT\DESIGN\81200206\SHEETSPLAN\090203\_XS LEFT NEW.DWG PLOT DATE : 12/4/2023 10:23 AM PLOT BY : BECKLIN, MATTHEW R PLOT NAME : LAYOUT NAME - 05 PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT. WISDOT/CADD SHEET 49



PROJECT NO: 8120-02-76

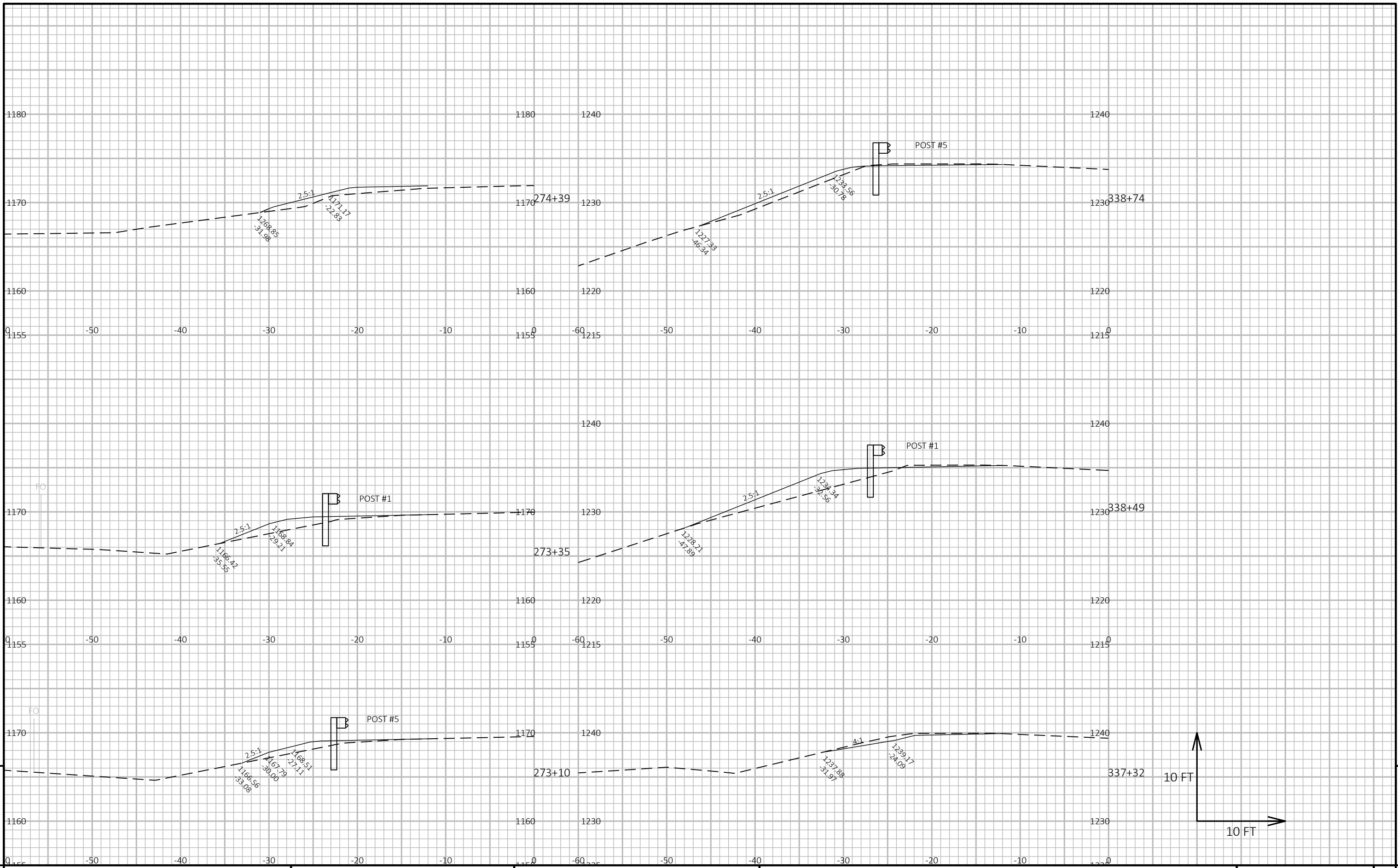
HWY: STH 48

COUNTY: BARRON

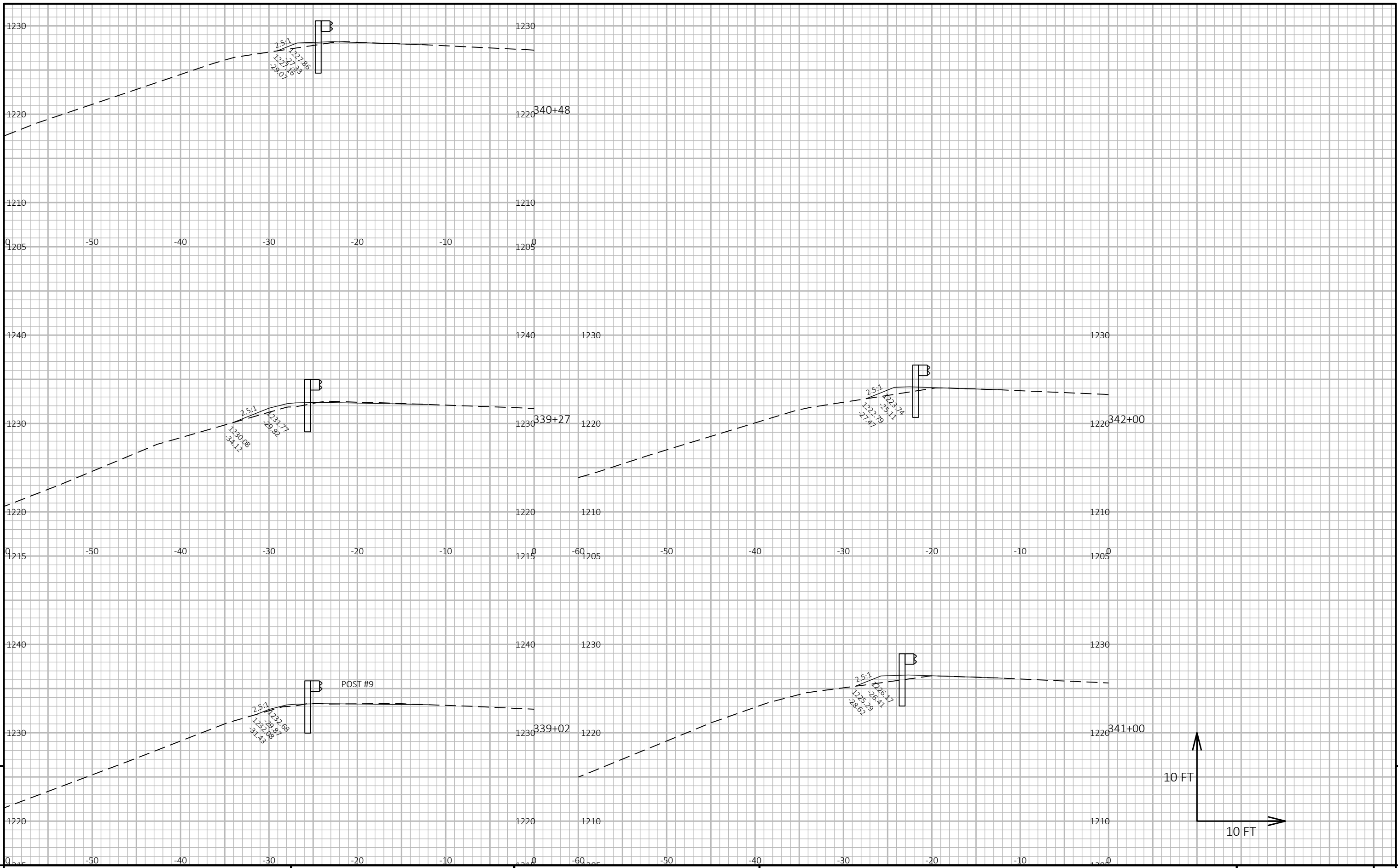
CROSS SECTIONS: STH 48 (BG 270+72-273+35)

SHEET

E



PROJECT NO: 8120-02-76      HWY: STH 48      COUNTY: BARRON      CROSS SECTIONS: STH 48 (BG 270+72-273+35, 338+49-339+62)      SHEET      E



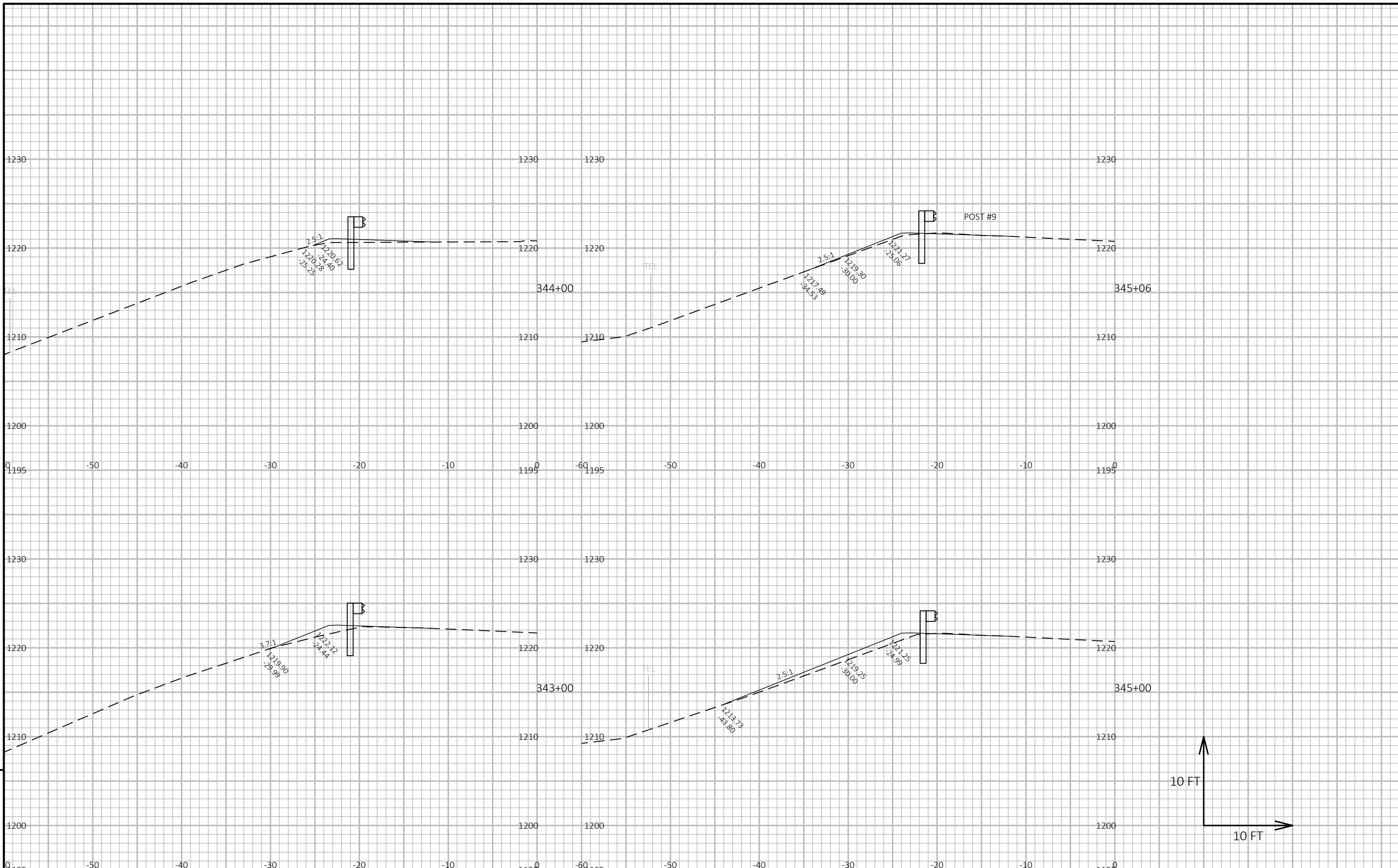
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PROJECT NO: 8120-02-76      HWY: STH 48      COUNTY: BARRON      CROSS SECTIONS: STH 48 (BG 338+48-339+62, 339+93-345+56)      SHEET      E

FILE NAME : C:\WISDOT\DESIGN\81200206\SHEETS\PLAN\090203\_XS LEFT NEW.DWG      PLOT DATE : 12/4/2023 10:23 AM      PLOT BY : BECKLIN, MATTHEW R      PLOT NAME :      PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.      WISDOT/CADD SHEET 49

LAYOUT NAME - 08

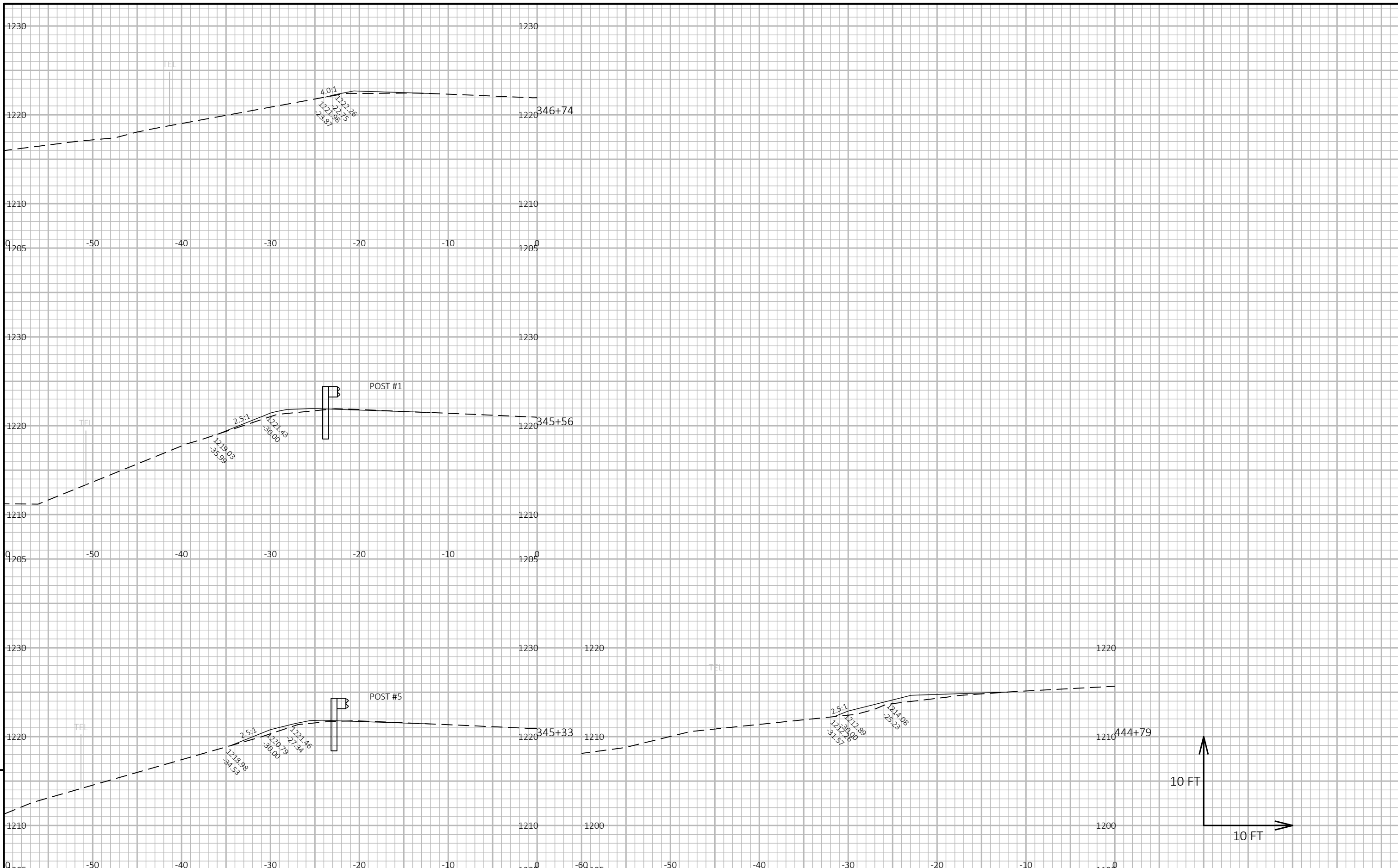


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PROJECT NO: 8120-02-76	HWY: STH 48	COUNTY: BARRON	CROSS SECTIONS: STH 48 (BG 339+93-345+56)	SHEET	E
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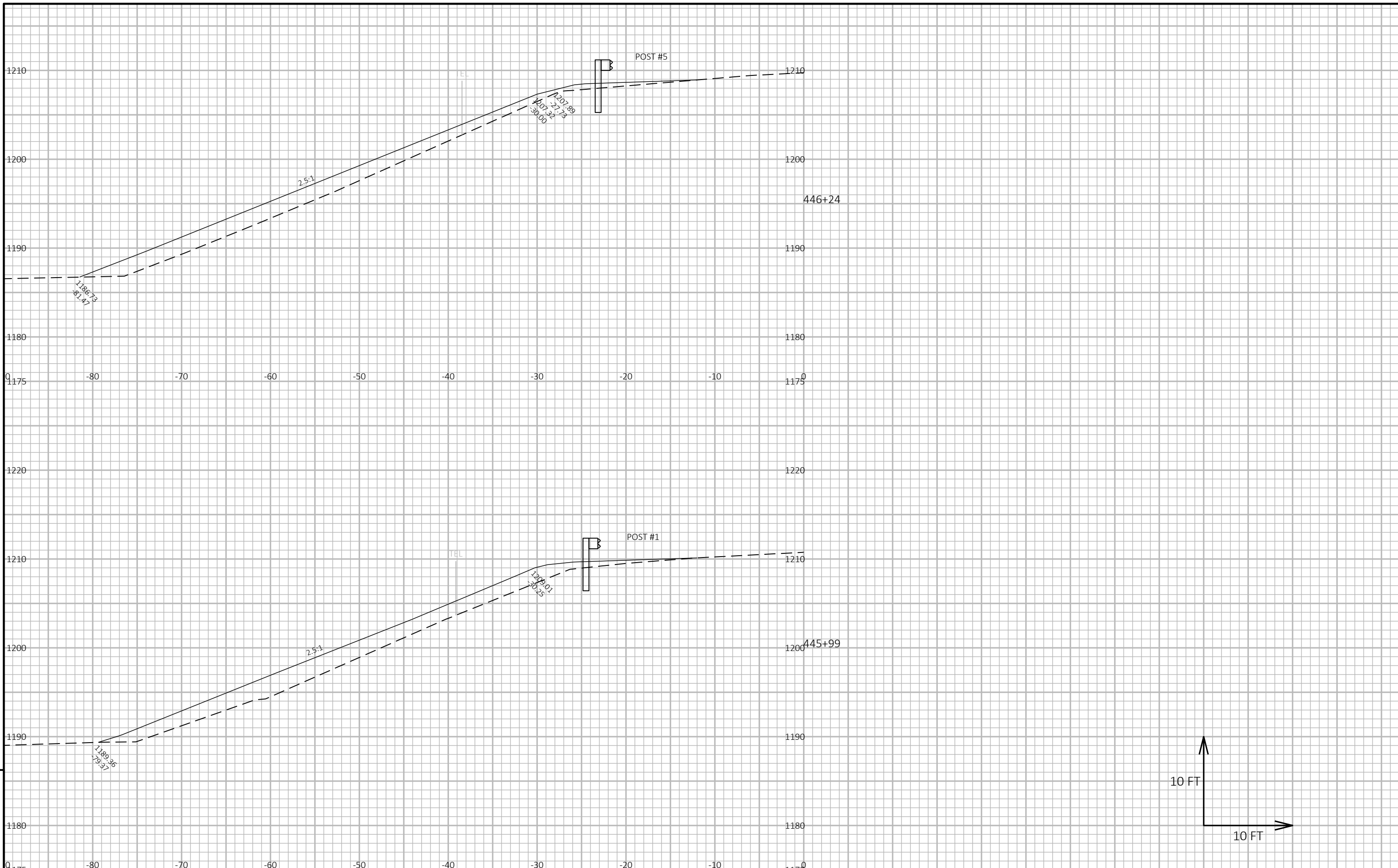
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PROJECT NO: 8120-02-76      HWY: STH 48      COUNTY: BARRON      CROSS SECTIONS: STH 48 (BG 339+93-345+56, 445+99-450+83)      SHEET      E

FILE NAME: C:\WISDOT\DESIGN\81200206\SHEETSPLAN\090203\_XS LEFT NEW.DWG      PLOT DATE: 12/4/2023 10:24 AM      PLOT BY: BECKLIN, MATTHEW R      PLOT NAME:      PLOT SCALE: 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.      WISDOT/CADD SHEET 49

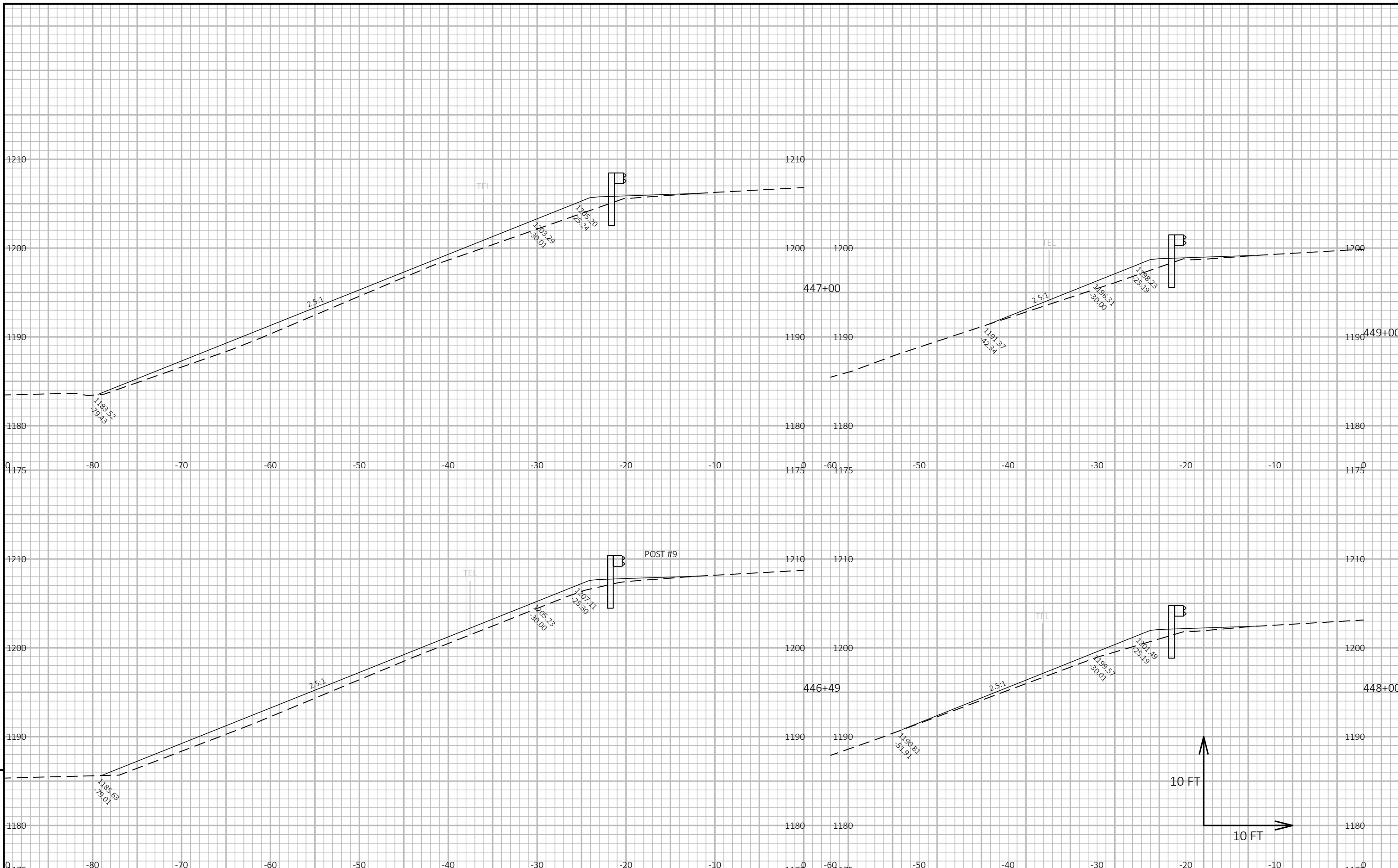
LAYOUT NAME - 10



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PROJECT NO: 8120-02-76	HWY: STH 48	COUNTY: BARRON	CROSS SECTIONS: STH 48 (BG 445+99-450+83)	SHEET	E
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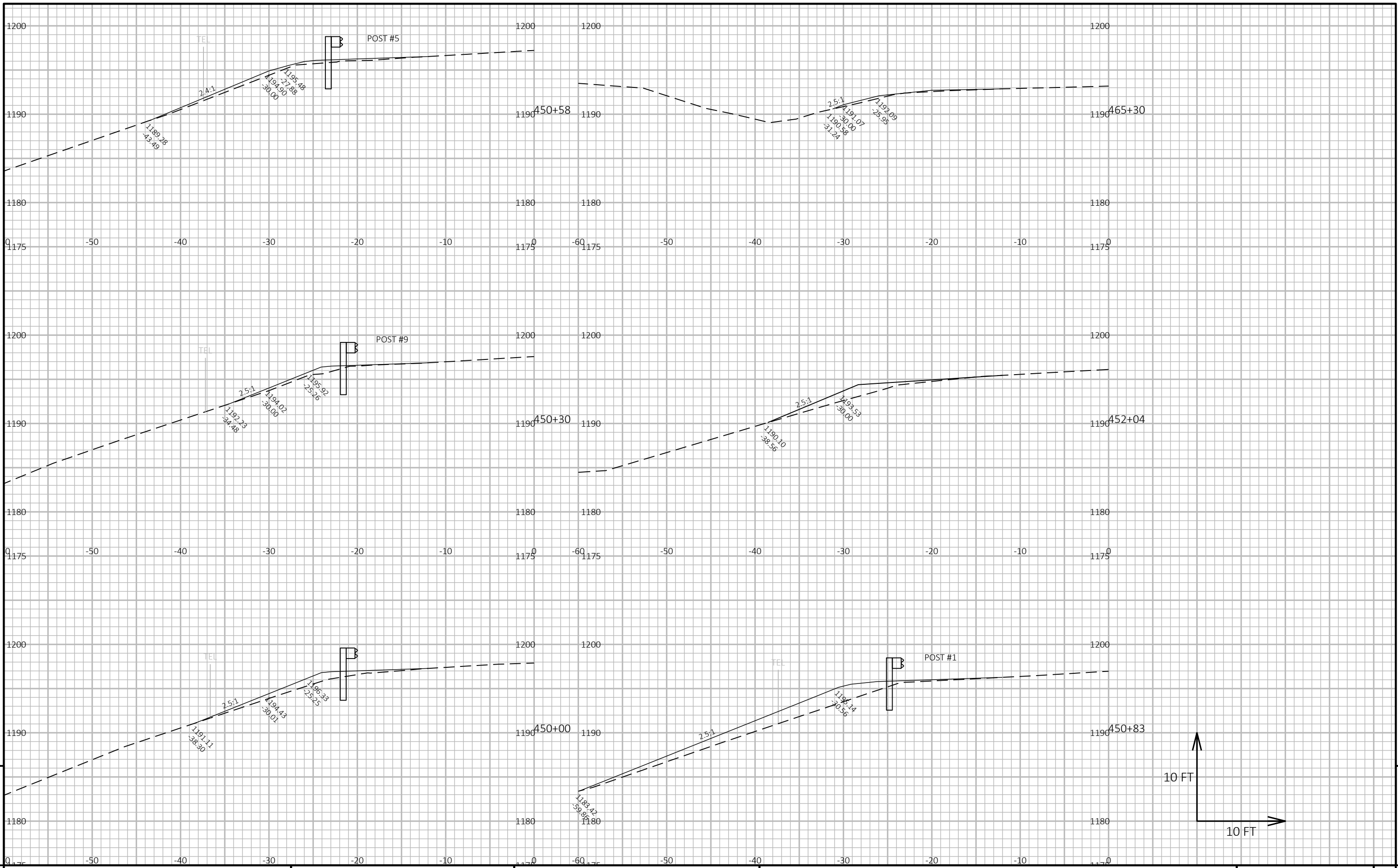
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PROJECT NO: 8120-02-76      HWY: STH 48      COUNTY: BARRON      CROSS SECTIONS: STH 48 (BG 445+99-450+83)      SHEET      E

FILE NAME : C:\WISDOT\DESIGN\81200206\SHEETS\PLAN\090203\_XS LEFT NEW.DWG      PLOT DATE : 12/4/2023 10:24 AM      PLOT BY : BECKLIN, MATTHEW R      PLOT NAME :      PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.      WISDOT/CADD SHEET 49

LAYOUT NAME - 12



PROJECT NO: 8120-02-76

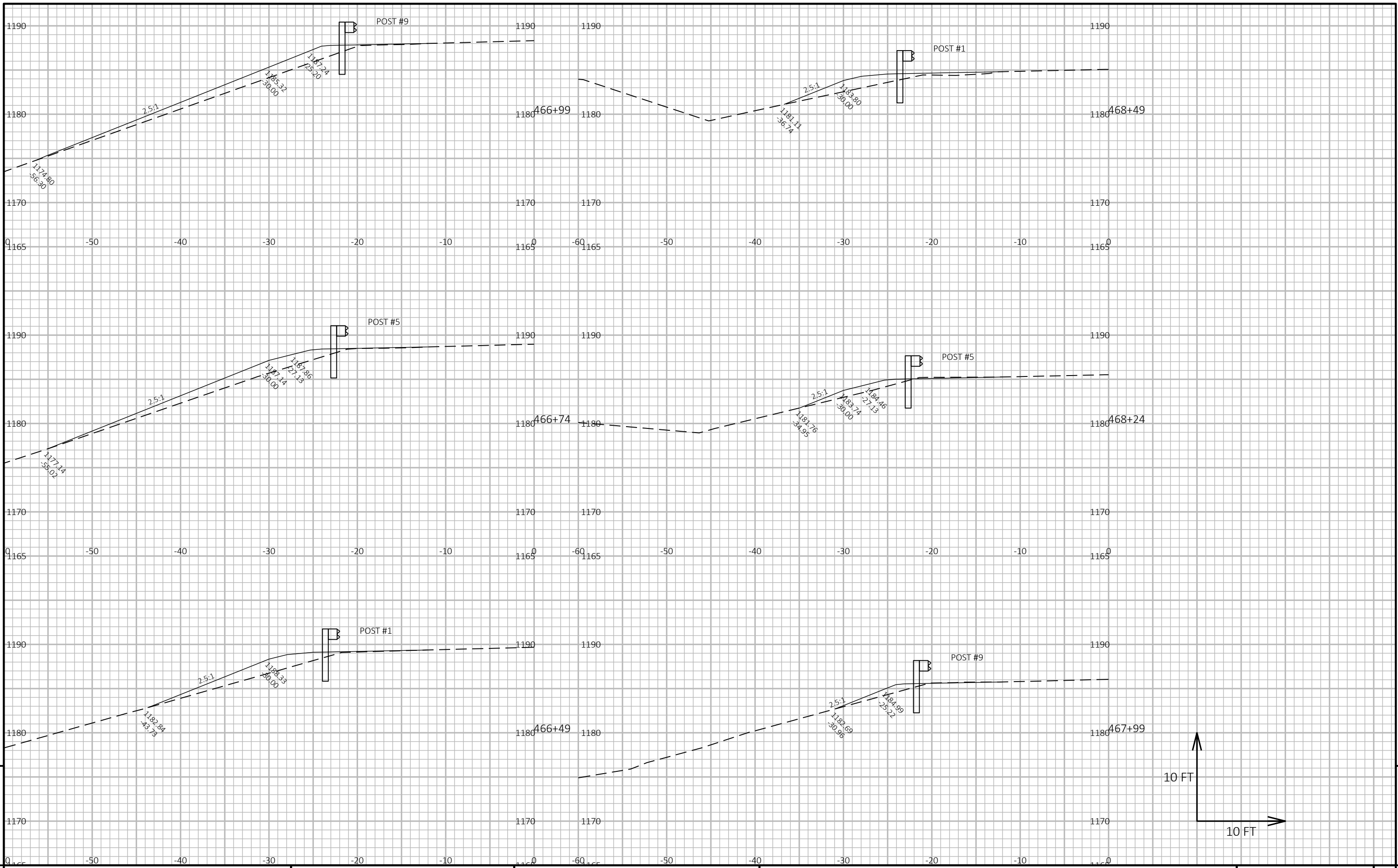
HWY: STH 48

COUNTY: BARRON

CROSS SECTIONS: STH 48 (BG 445-99-450+83, 466+49-468+49)

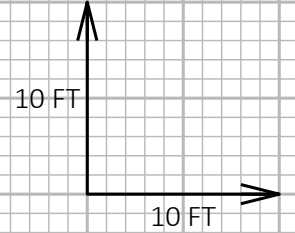
SHEET

E



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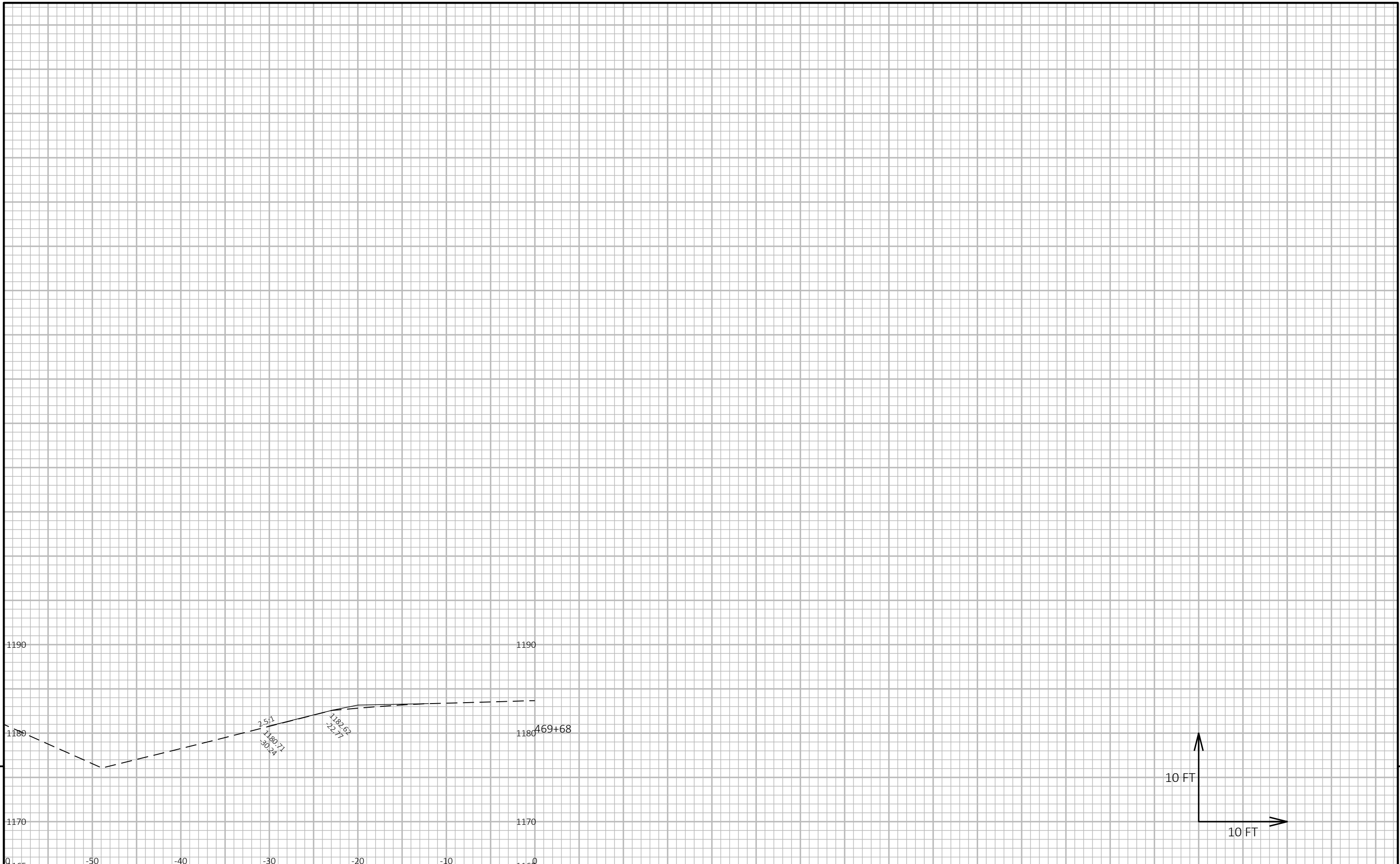
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PROJECT NO: 8120-02-76      HWY: STH 48      COUNTY: BARRON      CROSS SECTIONS: STH 48 (BG 466+49-468+49)      SHEET      E

FILE NAME: C:\WISDOT\DESIGN\81200206\SHEETSPLAN\090203\_XS LEFT NEW.DWG      PLOT DATE: 12/4/2023 10:24 AM      PLOT BY: BECKLIN, MATTHEW R      PLOT NAME:      PLOT SCALE: 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.      WISDOT/CADD SHEET 49

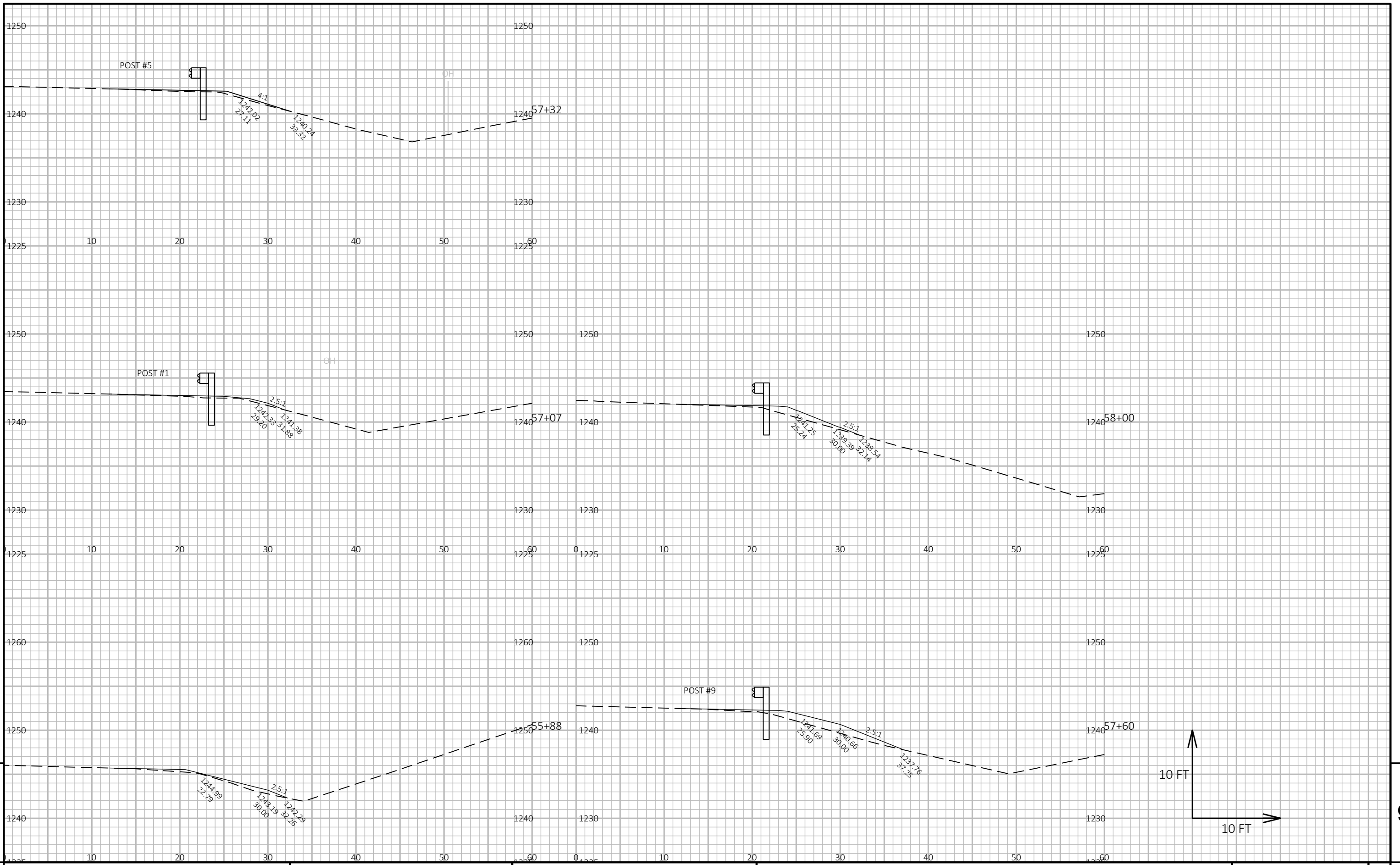
LAYOUT NAME - 14



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PROJECT NO: 8120-02-76	HWY: STH 48	COUNTY: BARRON	CROSS SECTIONS: STH 48 (BG 466+49-468+49)	SHEET	E
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PROJECT NO: 8120-02-76

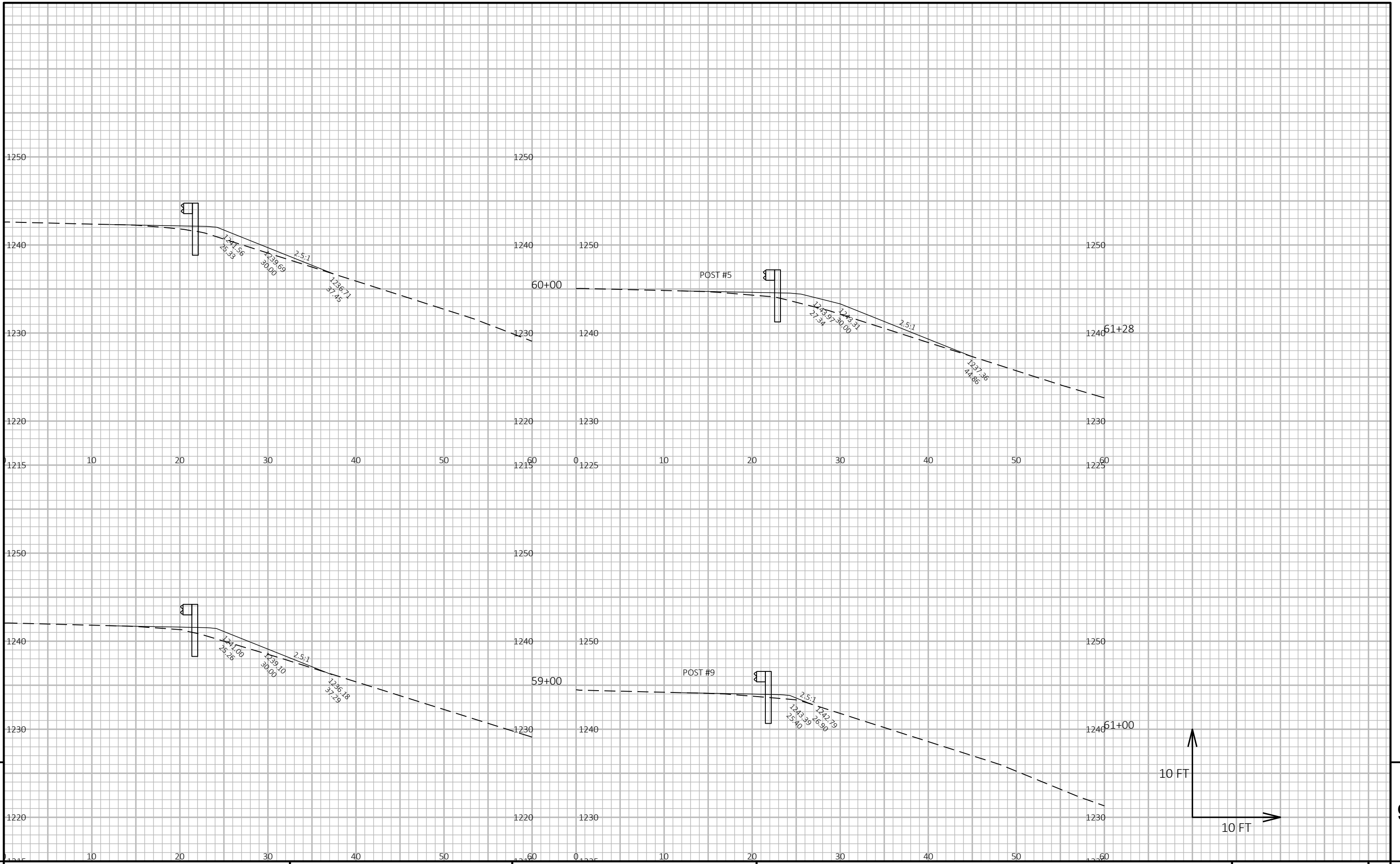
HWY: STH 48

COUNTY: BARRON

CROSS SECTIONS: STH 48 (BG 57+07-61+53)

SHEET

E



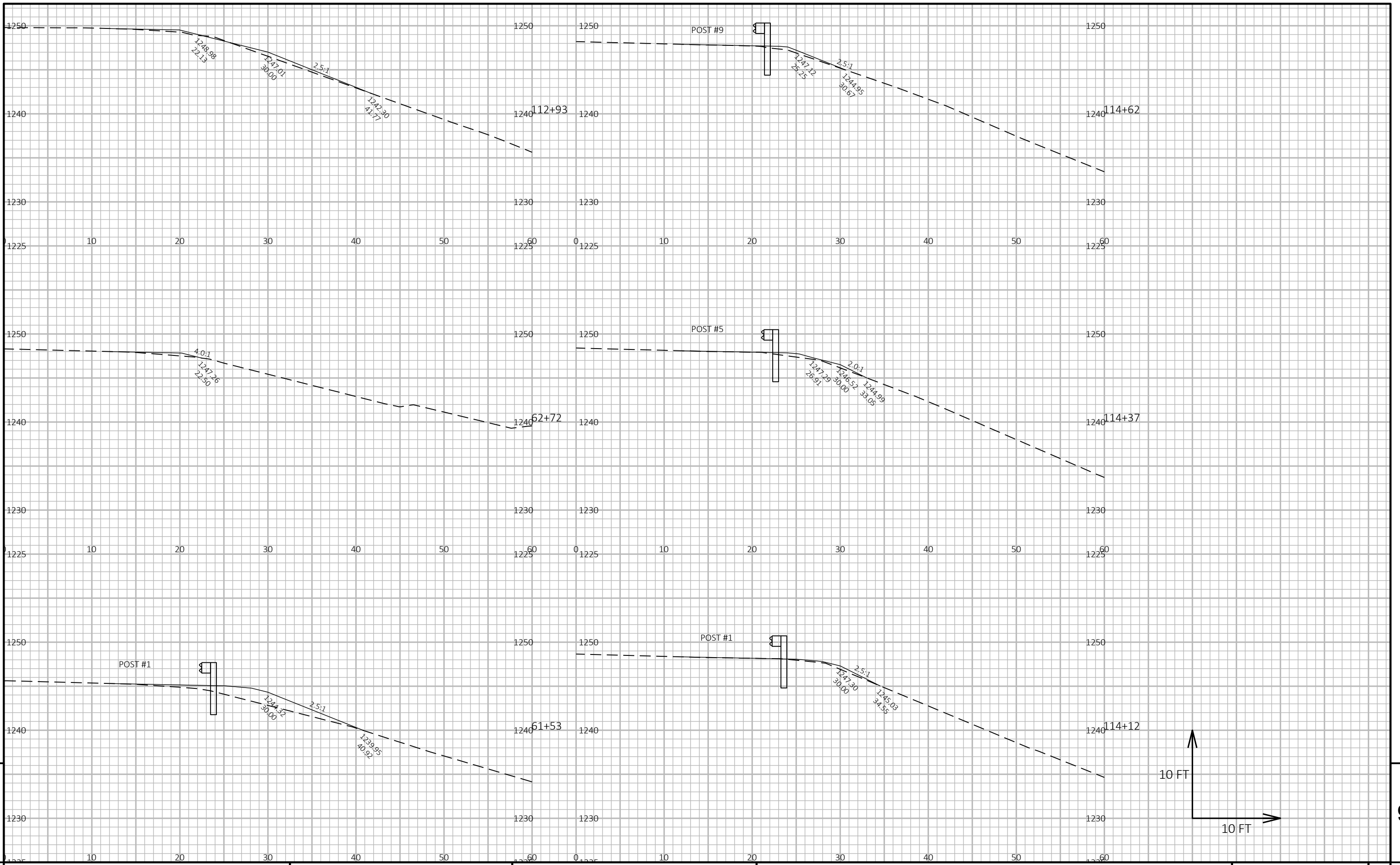
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PROJECT NO: 8120-02-76      HWY: STH 48      COUNTY: BARRON      CROSS SECTIONS: STH 48 (BG 57+07-60+53)      SHEET      E

FILE NAME: C:\WISDOT\DESIGN\81200206\SHEETSPLAN\090203\_XS RIGHT NEW.DWG      PLOT DATE: 12/4/2023 10:29 AM      PLOT BY: BECKLIN, MATTHEW R      PLOT NAME:      PLOT SCALE: 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.      WISDOT/CADD SHEET 49





PROJECT NO: 8120-02-76

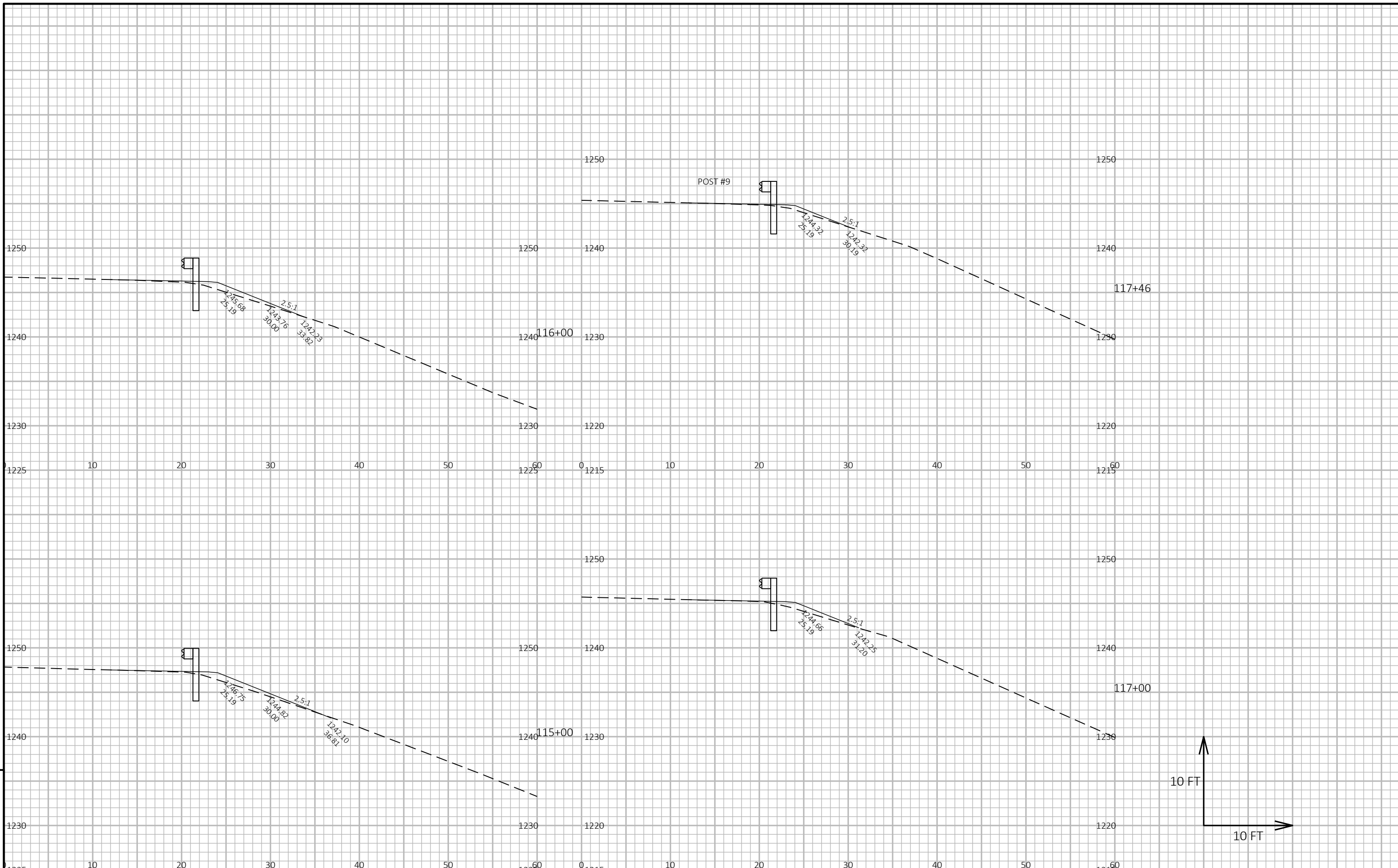
HWY: STH 48

COUNTY: BARRON

CROSS SECTIONS: STH 48 (BG 57+07-60+53, 114+12-117+99)

SHEET

E



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PROJECT NO: 8120-02-76

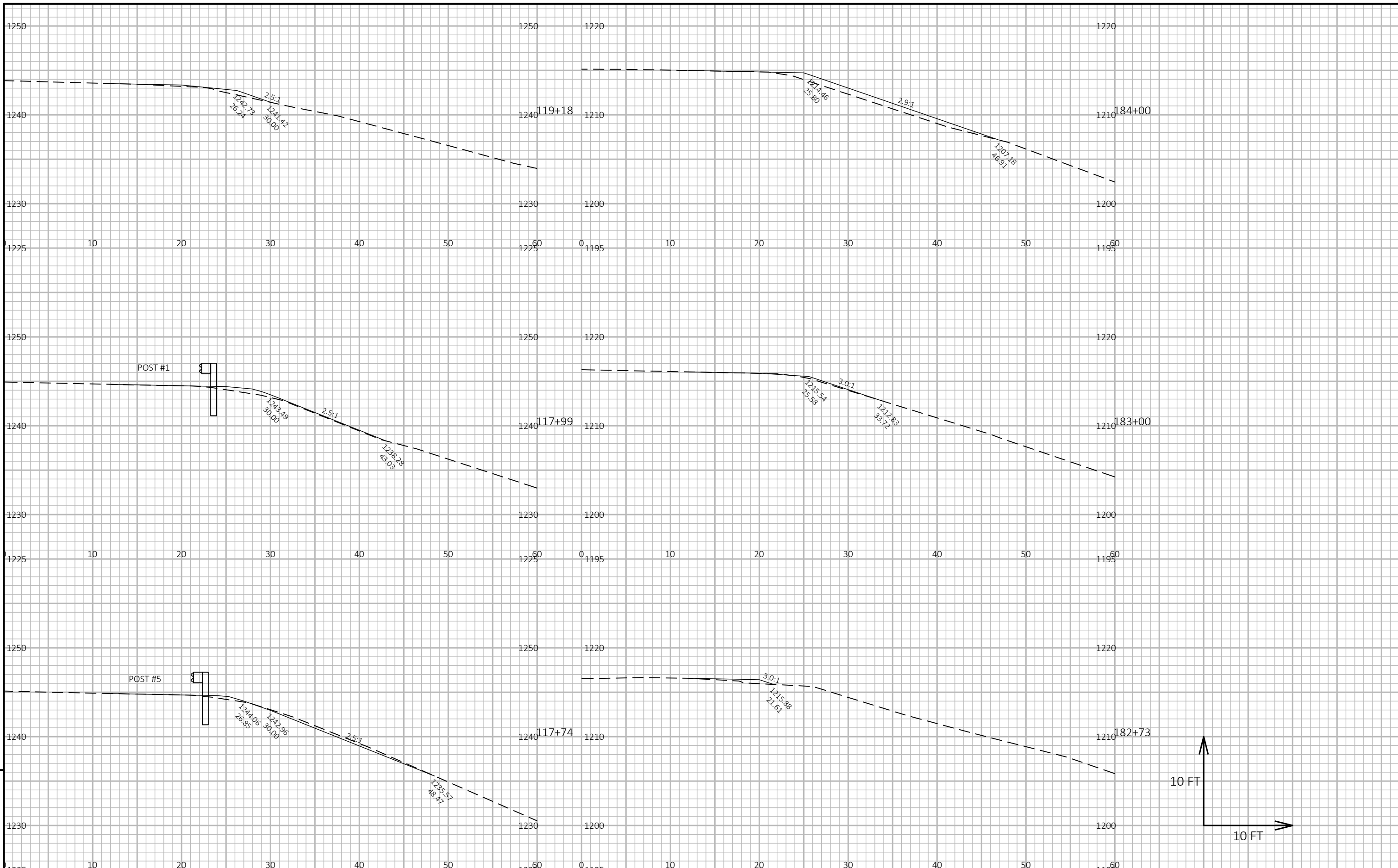
HWY: STH 48

COUNTY: BARRON

CROSS SECTIONS: STH 48 (BG 114+12-117+99)

SHEET

E



PROJECT NO: 8120-02-76

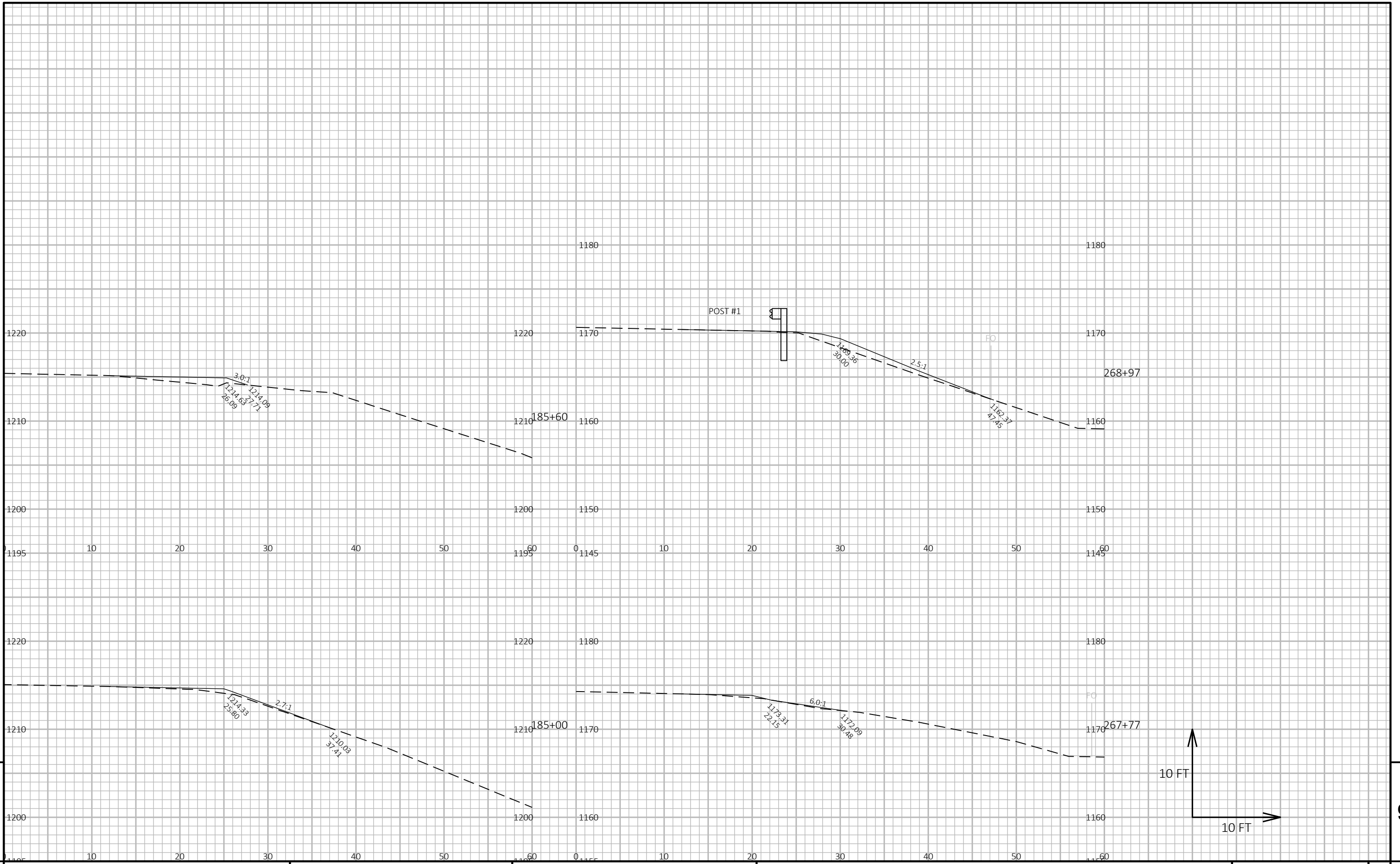
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COUNTY: BARRON

CROSS SECTIONS: STH 48 (BG 114+12-117+99)

SHEET

E



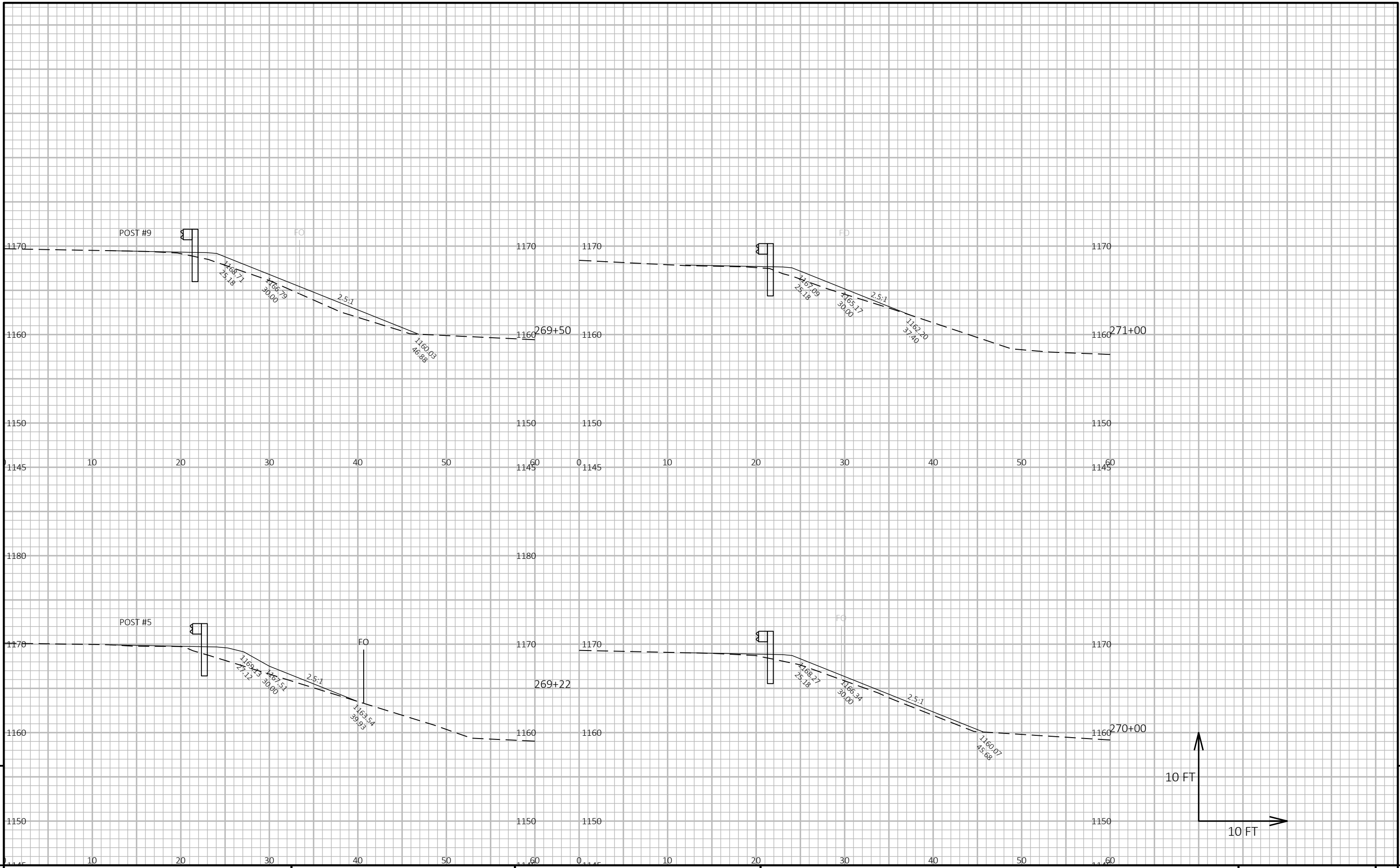
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PROJECT NO: 8120-02-76	HWY: STH 48	COUNTY: BARRON	CROSS SECTIONS: STH 48 (BG 268+97-272+33)	SHEET	E
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FILE NAME : C:\WISDOT\DESIGN\81200206\SHEETSPLAN\090203\_XS RIGHT NEW.DWG PLOT DATE : 12/4/2023 10:29 AM PLOT BY : BECLIN, MATTHEW R PLOT NAME : PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT. WISDOT/CADD SHEET 49

LAYOUT NAME - 06

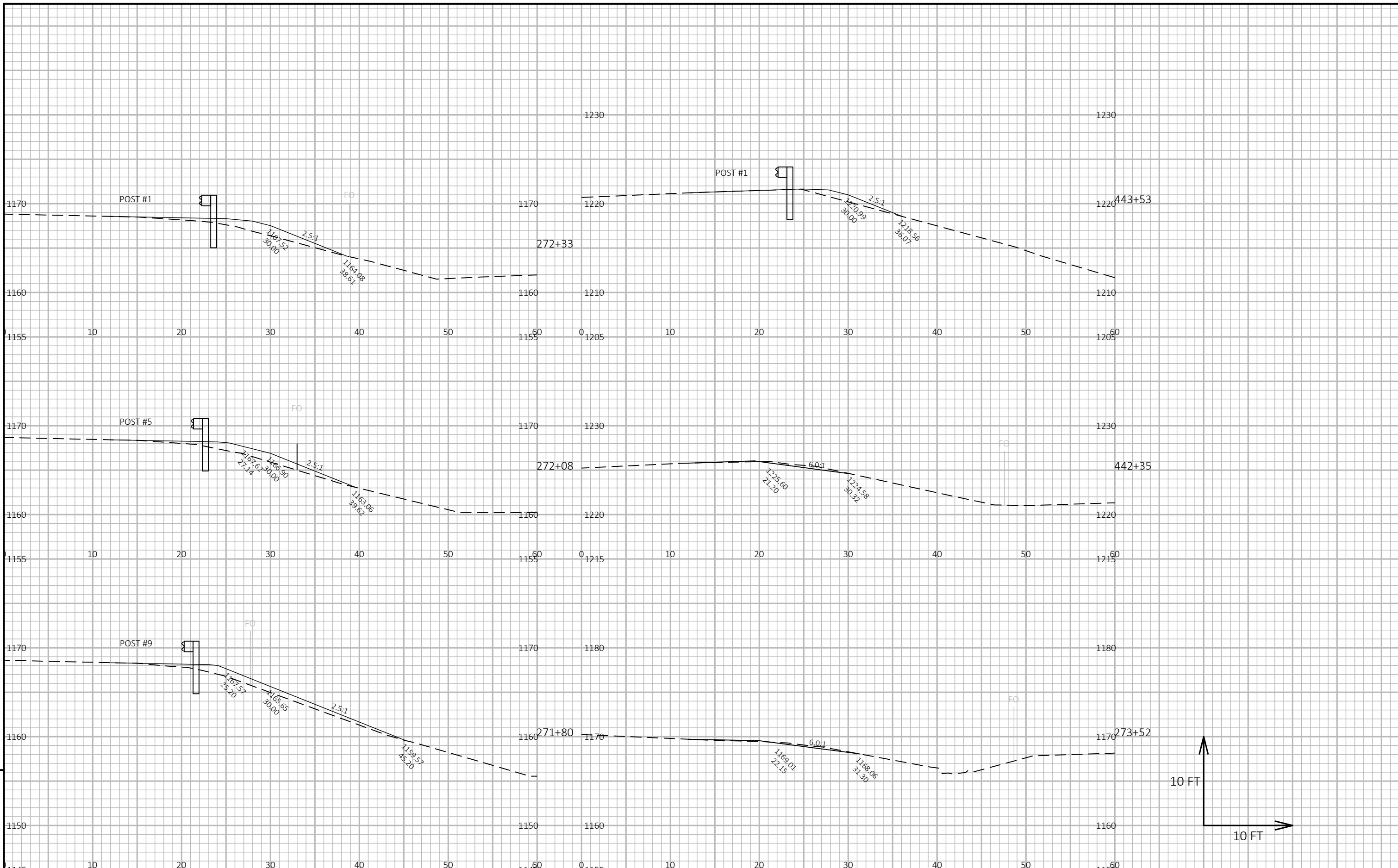


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PROJECT NO: 8120-02-76	HWY: STH 48	COUNTY: BARRON	CROSS SECTIONS: STH 48 (BG 268+97-273+33)	SHEET	E
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FILE NAME : C:\WISDOT\DESIGN\81200206\SHEETSPLAN\090203\_XS RIGHT NEW.DWG  
 LAYOUT NAME - 07  
 PLOT DATE : 12/4/2023 10:29 AM  
 PLOT BY : BECKLIN, MATTHEW R  
 PLOT NAME :  
 PLOT SCALE : 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.  
 WISDOT/CADD SHEET 49



PROJECT NO: 8120-02-76

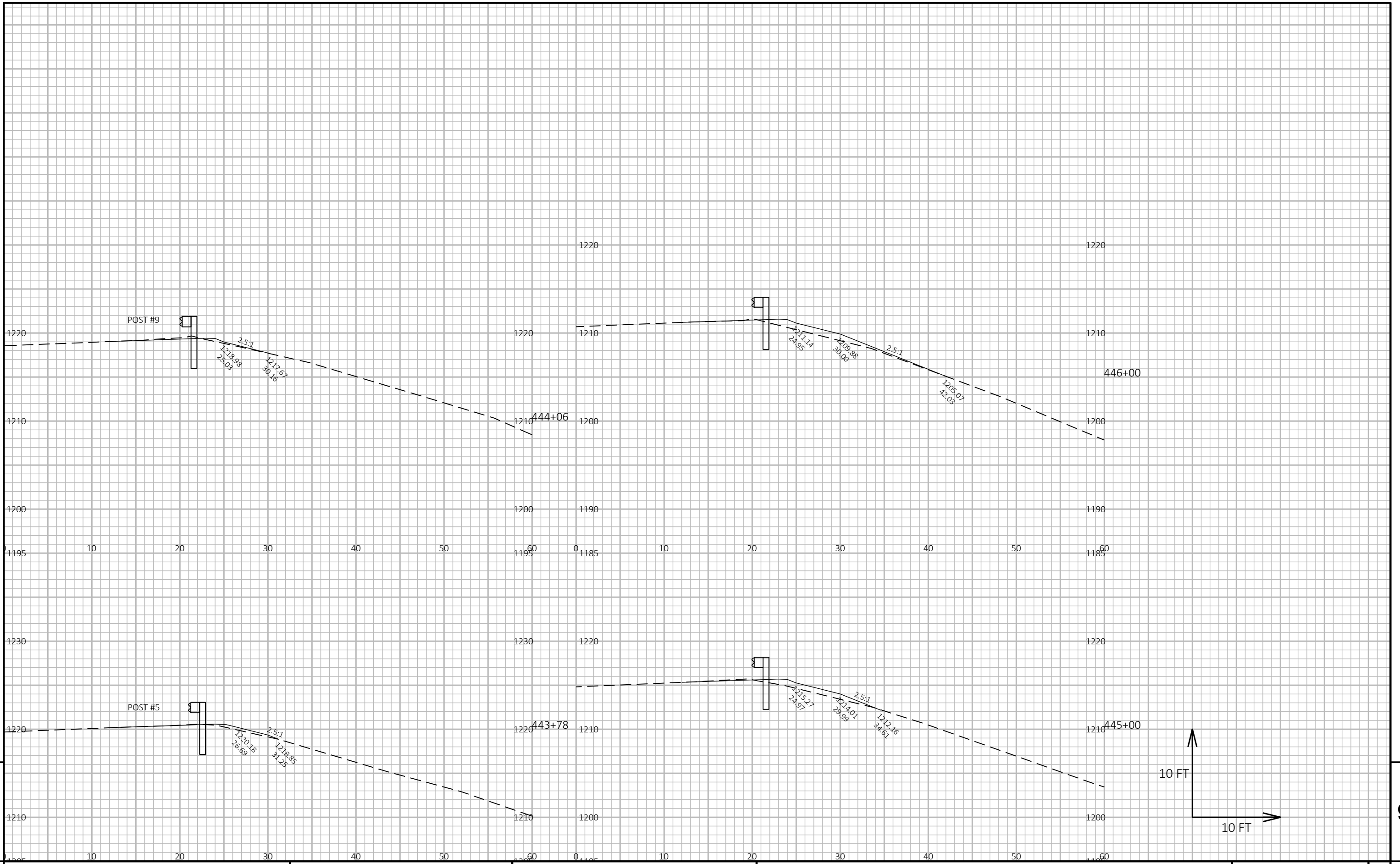
HWY: STH 48

COUNTY: BARRON

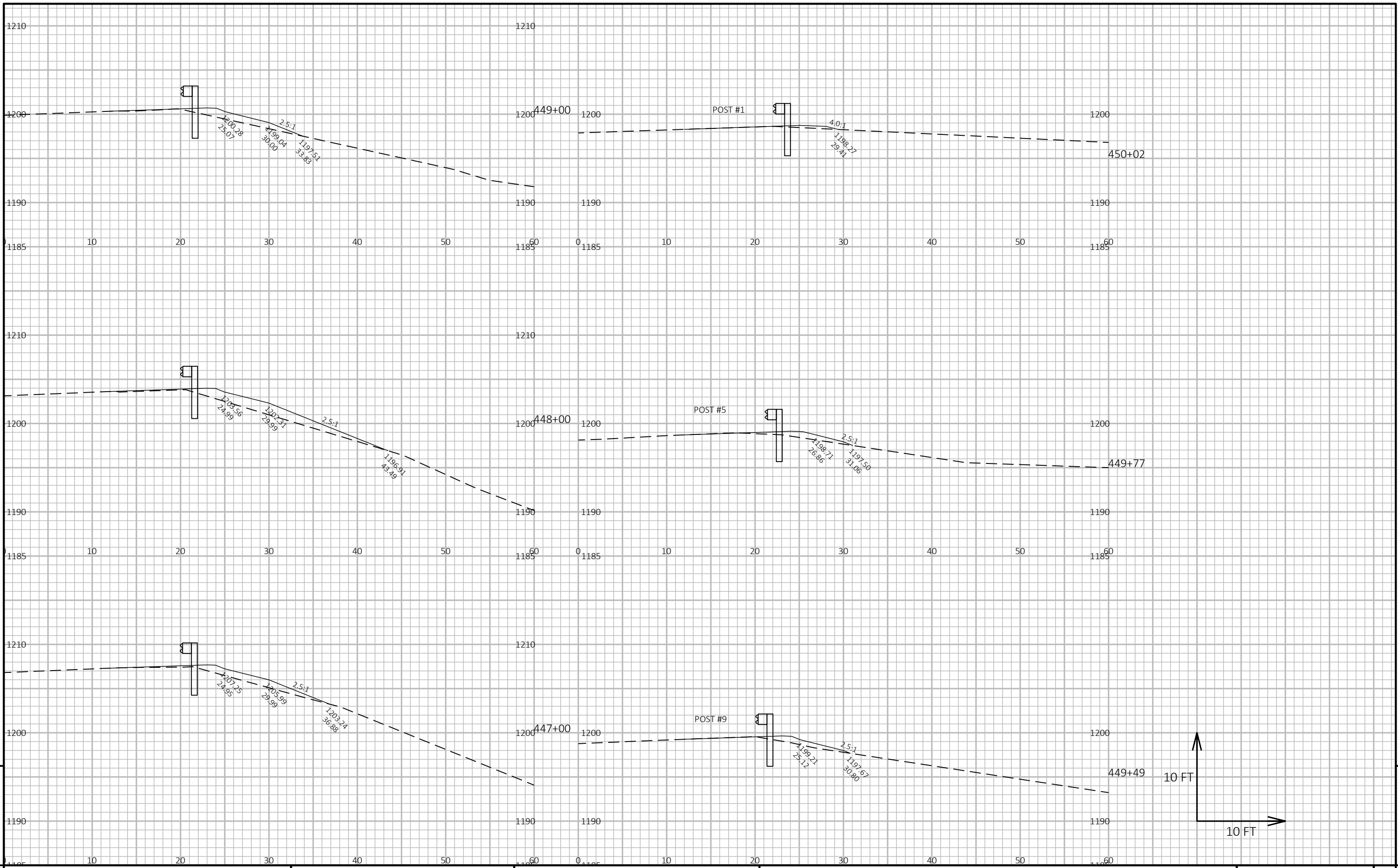
CROSS SECTIONS: STH 48 (BG 268+97-272+33, 443+53-450+02)

SHEET

E



PROJECT NO: 8120-02-76      HWY: STH 48      COUNTY: BARRON      CROSS SECTIONS: STH 48 (BG 443+53-450+02)      SHEET      E



PROJECT NO: 8120-02-76

HWY: STH 48

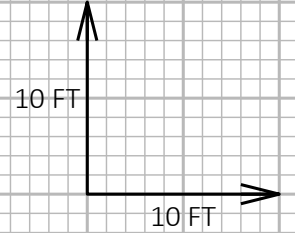
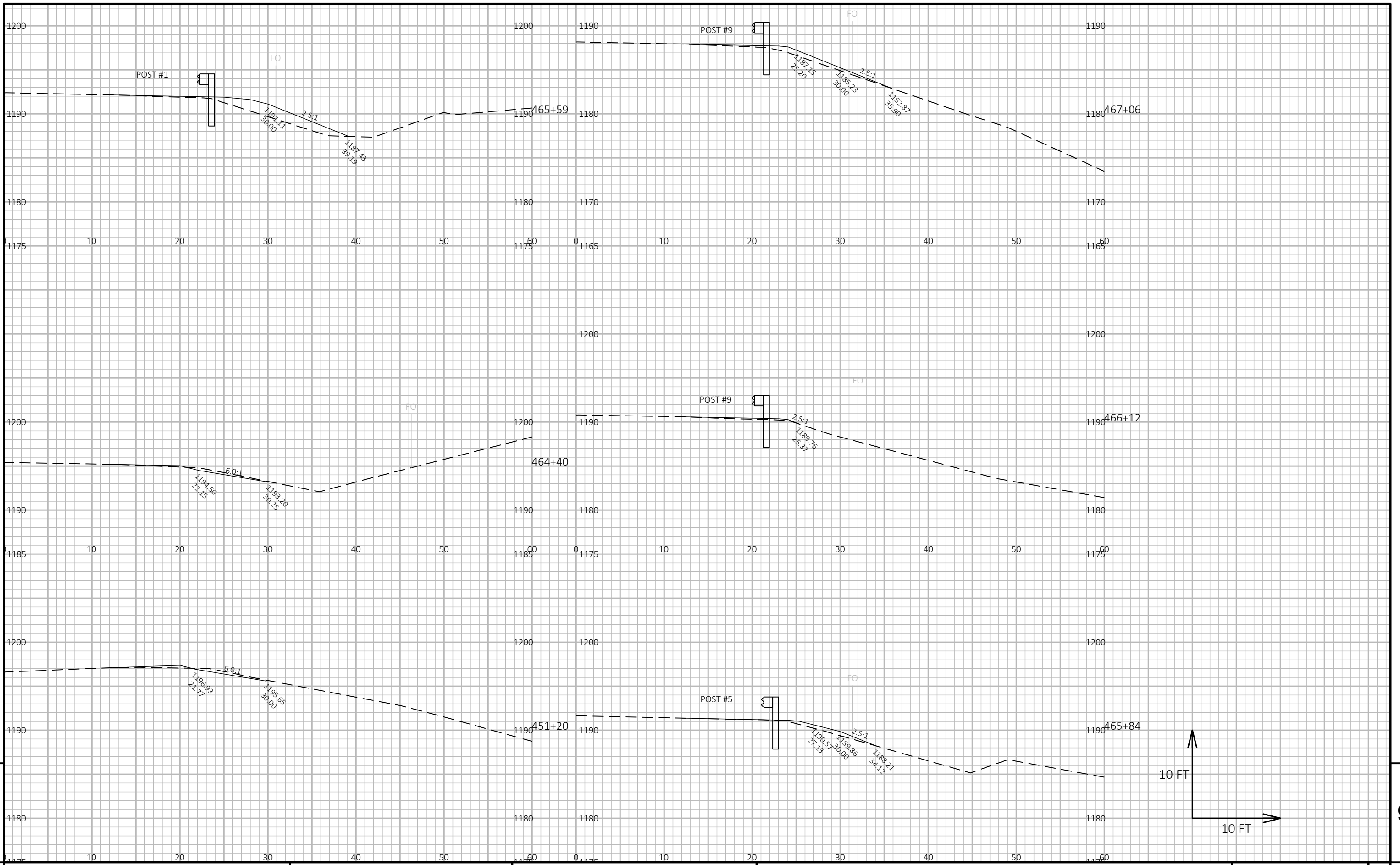
COUNTY: BARRON

CROSS SECTIONS: STH 48 (BG 443+53-450+02)

SHEET

E





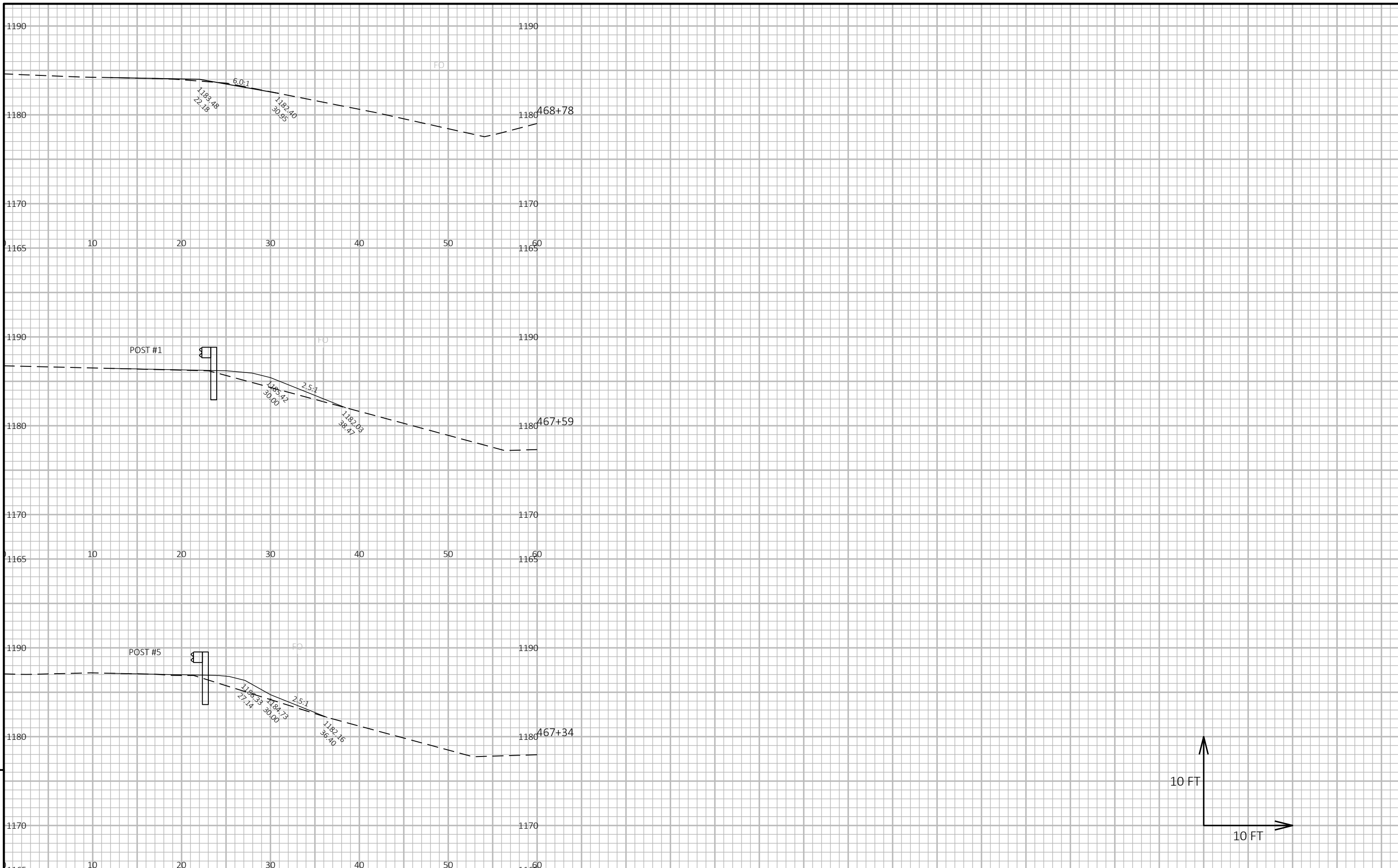
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PROJECT NO: 8120-02-76      HWY: STH 48      COUNTY: BARRON      CROSS SECTIONS: STH 48 (BG 465+59-467+59)      SHEET      E

FILE NAME: C:\WISDOT\DESIGN\81200206\SHEETS\PLAN\090203\_XS RIGHT NEW.DWG      PLOT DATE: 12/4/2023 10:30 AM      PLOT BY: BECKLIN, MATTHEW R      PLOT NAME:      PLOT SCALE: 1 IN:10 FT HORZ. / 1 IN:10 FT VERT.      WISDOT/CADD SHEET 49

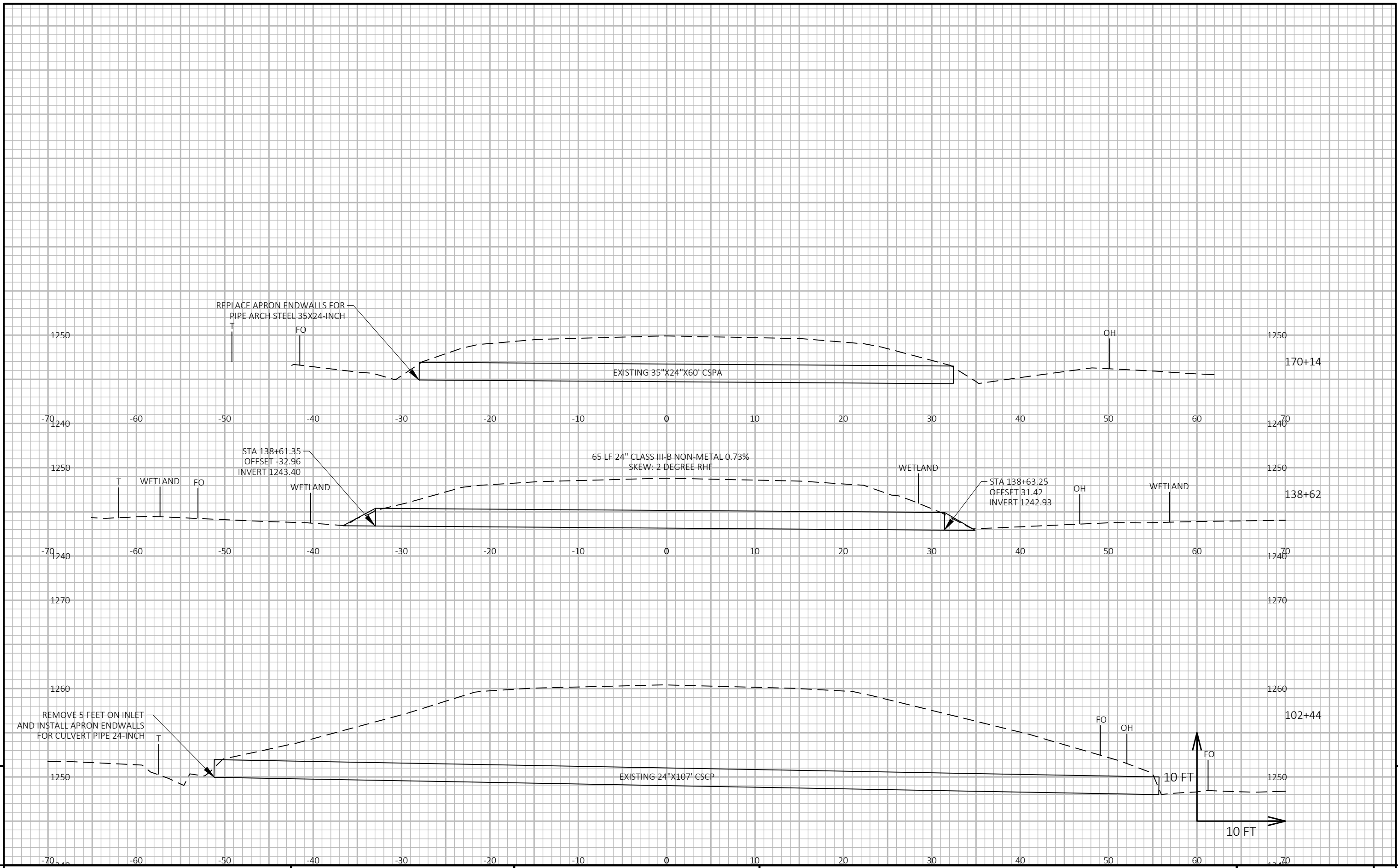
LAYOUT NAME - 11



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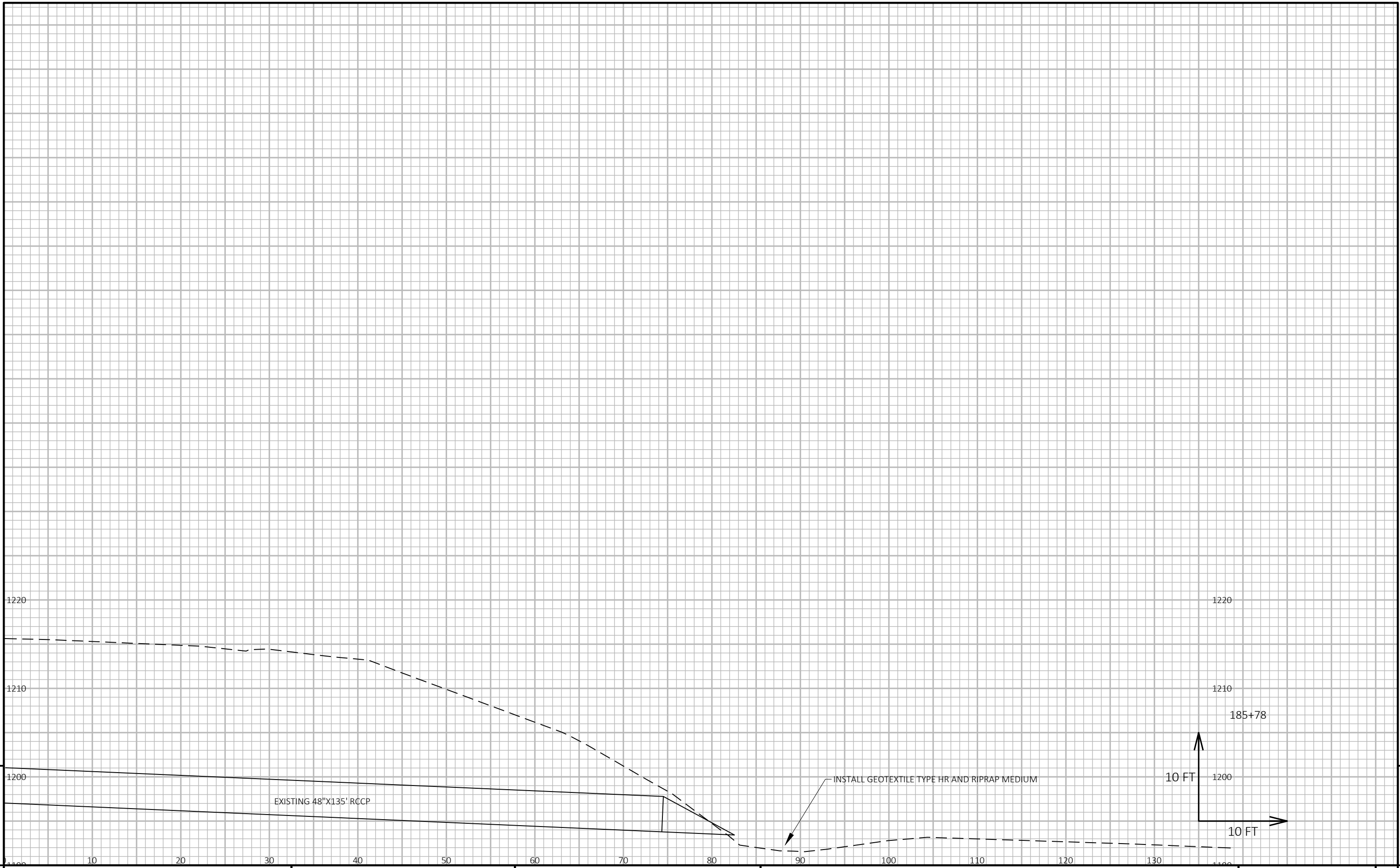
PROJECT NO: 8120-02-76	HWY: STH 48	COUNTY: BARRON	CROSS SECTIONS: STH 48 (BG 465+59-467+59)	SHEET	E
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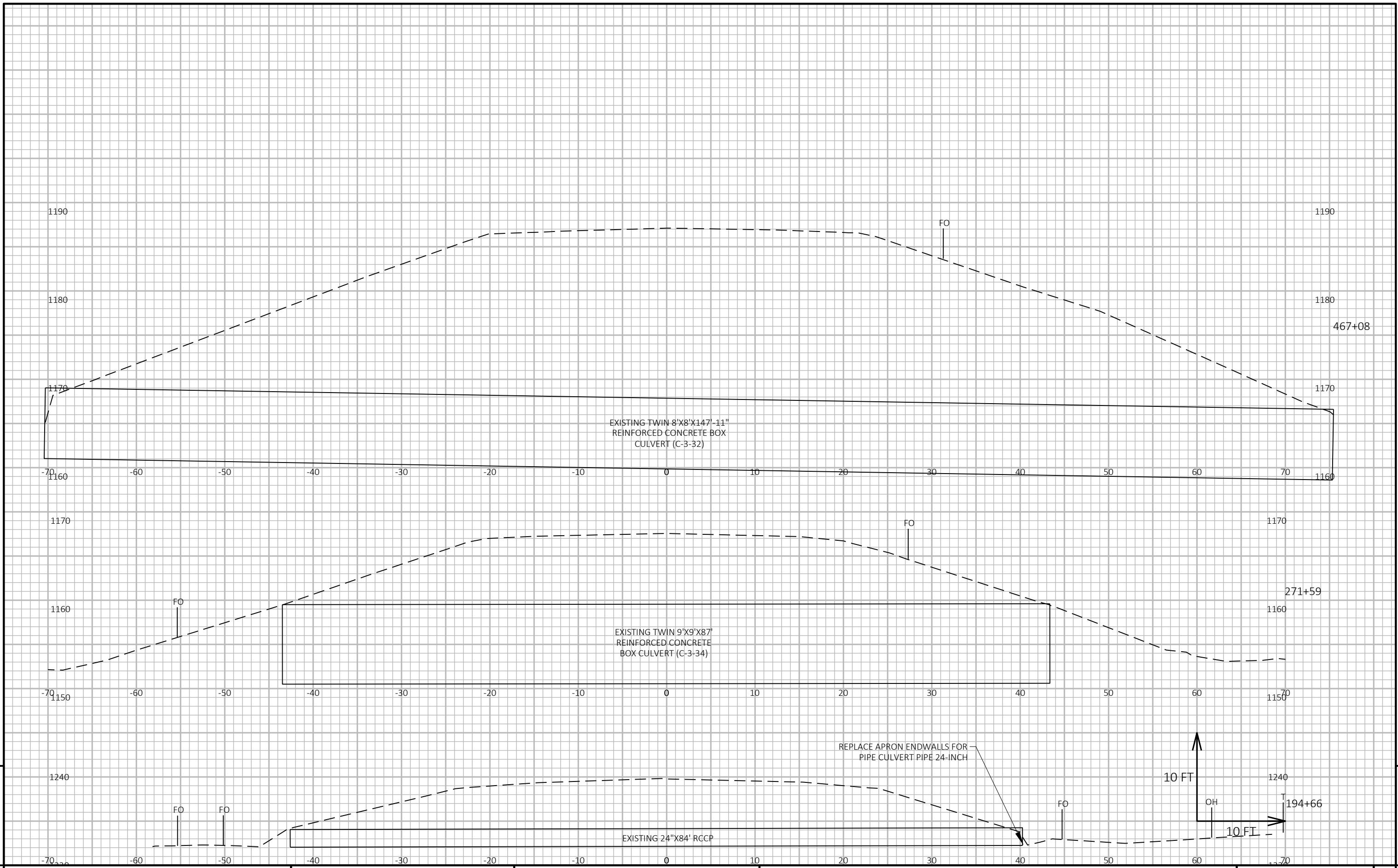
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PROJECT NO: 8120-02-76	HWY: STH 48	COUNTY: BARRON	CROSS SECTIONS: STH 48 CULVERTS	SHEET	E
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PROJECT NO: 8120-02-76	HWY: STH 48	COUNTY: BARRON	CROSS SECTIONS: STH 48 CULVERTS	SHEET	E
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PROJECT NO: 8120-02-76	HWY: STH 48	COUNTY: BARRON	CROSS SECTIONS: STH 48 CULVERTS	SHEET	E
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## ***Wisconsin Department of Transportation***

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