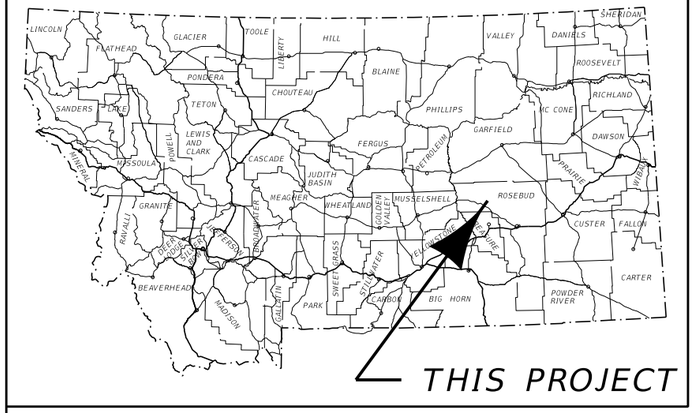
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MONTANA DEPARTMENT OF TRANSPORTATION

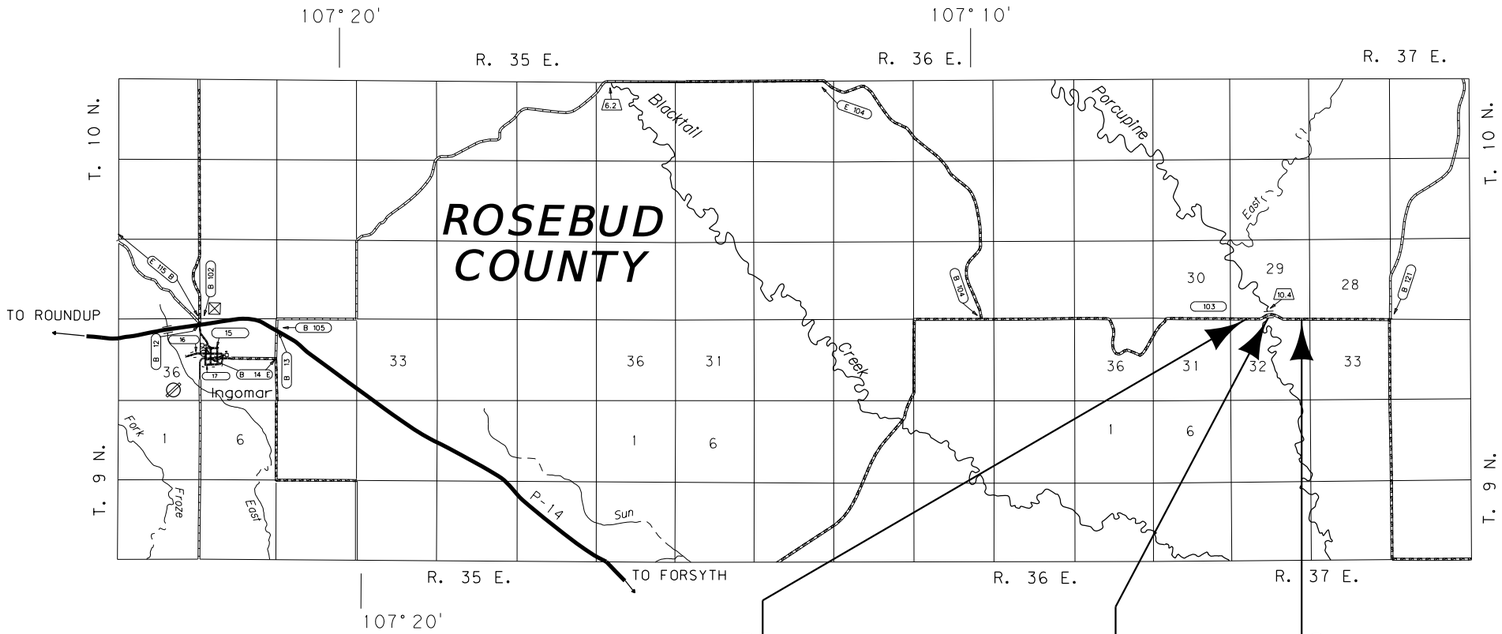
FEDERAL AID PROJECT STPB 9044(31)
BRIDGE REPLACEMENT
BIG PORCUPINE CR - 14M E INGOMAR
ROSEBUD COUNTY

DESIGN DATA		
PRESENT	2019	A.D.T. = N/A
LETTING	2019	A.D.T. = N/A
DESIGN	2039	A.D.T. = 50 (ESTIMATED)
		D.H.V. = N/A
		TRUCKS = N/A
		V. = 45 MPH
		18 KIP ESAL'S = 6 DAILY (EST.)
		GROWTH RATE = N/A

LETTING DATE - _____

SURFACING SOURCES -
CONTRACTOR FURNISHED

LENGTH 0.1 MILES



ASSOCIATED PROJECT AGREEMENT NUMBERS	
R / W	STPB 9044(38)
I.C.	
P. E.	STPB 9044(30)

MONTANA
DEPARTMENT OF TRANSPORTATION

MALCOLM "MACK" LONG
DIRECTOR OF TRANSPORTATION

APPROVED BY:

BRIDGE
ENGINEER

MONTANA
STEPHANIE L F BRANDENBERGER
13094PE
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Stephanie Brandenberger 3/11/2022
D351A85FB36C411...
DATE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED BY: DIVISION ADMINISTRATOR

DATE

3	MDT	MONTANA DEPARTMENT OF TRANSPORTATION	C:\DGN\8876000rdtl001.dgn	DESIGNED BY	A. DELAHUNT	10/20/2020
2			12/27/2021	REVIEWED BY	M. CAIL	8/10/2021
			3:35:34 PM CPS - U3825	CHECKED BY	T. JOHNSON	8/10/2021

ROAD PLANS

UPN 8876000

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NOTES

UTILITIES

CALL THE UTILITIES UNDERGROUND LOCATION CENTER (811) OR OTHER NOTIFICATION SYSTEM FOR THE MARKING AND LOCATION OF ALL LINES AND SERVICES BEFORE EXCAVATING. ALL CLEARANCES OR DEPTHS PROVIDED FOR UTILITIES ARE FROM EXISTING GROUND LINE.

SOILS INFORMATION

SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION. THE LOCATION OF GEOTECHNICAL BORINGS IS SHOWN ON THE PLAN VIEW WITH THE FOLLOWING SYMBOL:

BORING NUMBER

(GEOTECHNICAL BORING)

CLEARING AND GRUBBING

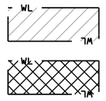
CLEAR AND GRUB TO CONSTRUCTION LIMITS. INCLUDE THE COST OF CLEARING AND GRUBBING IN THE UNIT PRICE BID FOR UNCLASSIFIED EXCAVATION.

PUBLIC LAND SURVEY MONUMENTS

ALL MONUMENTS TO BE REMOVED AND RELOCATED OR RESET BY STATE FORCES.

WETLANDS

WETLANDS EXIST ADJACENT TO THE ROADWAY AND MAY EXIST BEYOND THE PROJECT LIMITS. WETLAND AREAS AND PERMANENT WETLAND IMPACT AREAS WITHIN THE PROJECT LIMITS HAVE BEEN DELINEATED AND ARE SHOWN ON THE PLANS. ANY ACTION IMPACTING WETLAND AREAS OUTSIDE OF THE PERMANENT IMPACT AREAS SHOWN IS THE RESPONSIBILITY OF THE CONTRACTOR.



DELINEATED WETLAND AREAS

PERMANENT WETLAND IMPACTED AREAS

BRIDGE END

ROAD PLANS REFERENCE THE BACK OF WALL AS THE BRIDGE END STATION AND WILL NOT MATCH BRIDGE PLANS WHICH REFERENCE CENTERLINE OF BEARING AS THE BRIDGE END STATION

WETLAND DELINEATION TABLE

WETLAND DESIGNATION	STATION FROM	STATION TO	WETLAND AREA (acres) DELINEATED AREA #	WETLAND AREA (acres) PERMANENT IMPACTED AREA	REMARKS
	8+52	10+13	0.317	0.065	LT. & RT.
TOTAL			0.32	0.07	

AREA OF EXISTING WETLAND EXTENDS BEYOND PLAN LIMITS

APPROACHES (FOR INFORMATION ONLY)

STATION	TYPE	linear feet WIDTH	linear feet RADIUS # LEFT	linear feet RADIUS # RIGHT	linear feet LENGTH	EXISTING SURFACING	feet CTS THK.	PROPOSED SURFACE	cu. yards CRUSHED TOP SURFACING	REMARKS
11+27	FARM/FIELD	24	25	25	29.9	GRAVEL	0.60	GRAVEL	22	LT OF CENTERLINE
11+27	FARM/FIELD	24	25	25	26.5	GRAVEL	0.60	GRAVEL	21	RT OF CENTERLINE
SUBTOTAL									43	

ALL RADII MEASURED TO FRONT OF GUTTER OR EDGE OF SHOULDER

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CENTERLINE ALIGNMENT COORDINATE TABLE				
STATION	DESCRIPTION	N OR Y COORDINATE	E OR X COORDINATE	REMARKS
7+45.00	POT	860,413.410	2,572,456.974	BEGIN PROJECT
7+72.51	PC	860,417.471	2,572,484.184	
8+23.52	PI	860,425.002	2,572,534.633	
8+74.41	PT	860,438.343	2,572,583.865	
10+29.52	PC	860,478.911	2,572,733.575	
11+67.00	PI	860,514.868	2,572,866.268	
12+93.34	PT	860,457.602	2,572,991.252	
13+96.16	POT	860,414.775	2,573,084.723	END PROJECT

GPK NAME: JOB876.GPK CHAIN NAME: DESIGN PROFILE NAME: PROPOSED

LINEAR AND LEVEL DATA

LENGTH OF ROADWAY	IN ROSEBUD COUNTY	2 LANE RURAL	598.53 ft
LENGTH OF BRIDGE THIS CONTRACT	IN ROSEBUD COUNTY	2 LANE RURAL	52.63 ft
TOTAL LENGTH OF	STPB 9044(31)	2 LANE RURAL	651.16 ft

BEARING SOURCE

GRID -- MONTANA COORDINATE SYSTEM NAD 83- 2011

LEVEL DATUM SOURCE

NAVD 88 (GNSS DERIVED ELEVATIONS USING GEOID 12A AND ELEVATIONS DERIVED FROM DIFFERENTIAL LEVELS HOLDING BMS A8876)

2	MDT MONTANA DEPARTMENT OF TRANSPORTATION	C:\DGN\8876000rdtl001.dgn	DESIGNED BY	A. DELAHUNT	10/20/2020	ROAD PLANS	BIG PORCUPINE CR - 14 M E INGOMAR	STPB 9044(31)
1		12/27/2021	REVIEWED BY	M. CAIL	8/10/2021	ROSEBUD COUNTY	UPN 8876000	03
		3:35:43 PM CPS - U3829	CHECKED BY					

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CONTROL DIAGRAM

SCALE: N/A

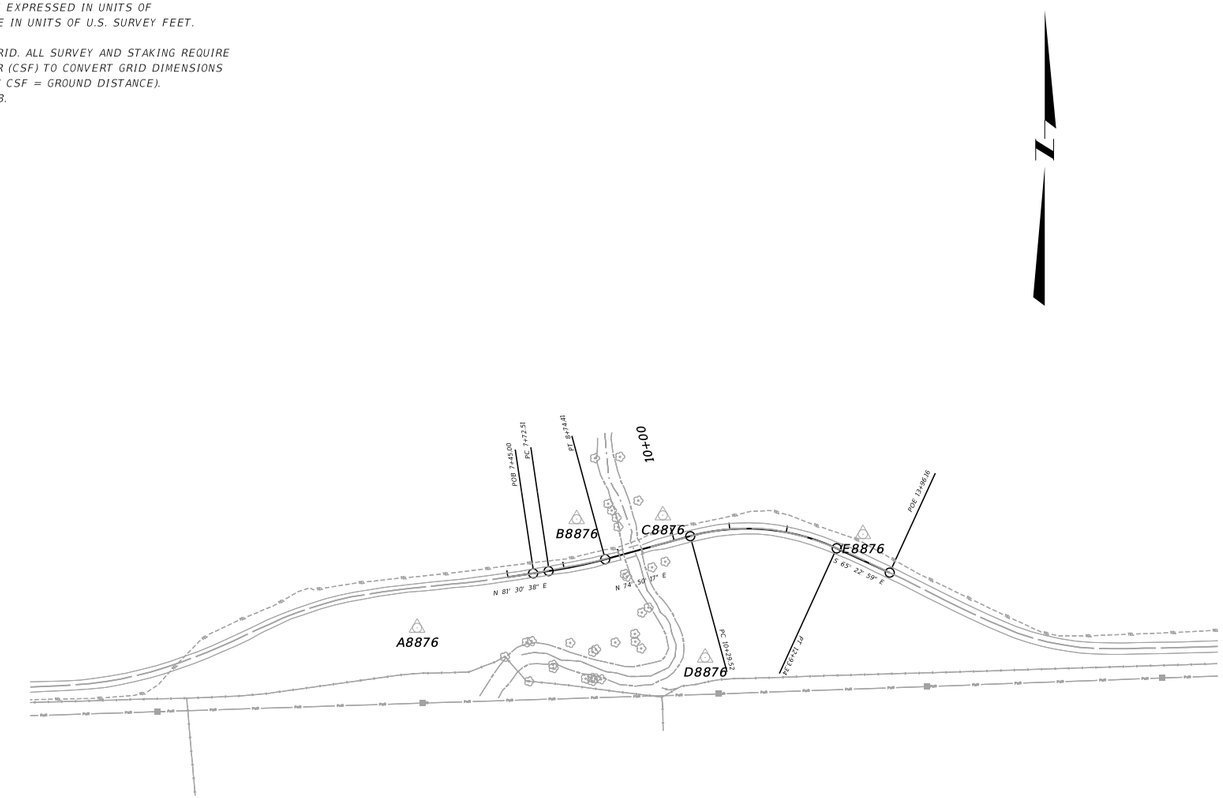
NOTE:

1. THIS PROJECT IS ON THE MONTANA COORDINATE SYSTEM NAD83-2011. NORTHING AND EASTING COORDINATES ARE EXPRESSED IN UNITS OF INTERNATIONAL FEET AND ELEVATIONS ARE IN UNITS OF U.S. SURVEY FEET.

2. DIMENSIONS SHOWN ON THE PLANS ARE GRID. ALL SURVEY AND STAKING REQUIRE THE USE OF A COMBINATION SCALE FACTOR (CSF) TO CONVERT GRID DIMENSIONS TO GROUND DIMENSIONS (GRID DISTANCE / CSF = GROUND DISTANCE). THE CSF FOR THIS PROJECT IS 0.99929253.

CONTROL ABSTRACT

POINT NAME/NUMBER	N OR Y COORDINATE	E OR X COORDINATE	POINT ELEVATION	LOCATION AND DESCRIPTION
A8876	860,317.712	2,572,252.683	2733.53	SET MDT 2 INCH A.C. ON 5/8 INCH X 30 INCH REBAR STAMPED A8876 2015. LOCATED WEST OF BRIDGE AND SOUTH OF BIG PORCUPINE CR. (BPC) ROAD ON THE ELEVATED BENCH, NORTHEAST OF OLD HOMESTEAD. THE MONUMENT LIES ABOUT 390 FT WEST OF BPC BRIDGE, 82 FT SOUTH OF BPC RD. C/L, 5.0 FT SOUTHWEST OF TOP OF SLOPE, 80.5 FT NORTH OF C/L OF GATE IN EAST-WEST FENCE, AND 38 FT NORTHEAST OF 2-TRACK TRAIL C/L. SET MDT WITNESS POST 3.0 FT SOUTH OF CAP.
B8876	860,508.882	2,572,533.574	2716.57	SET MDT 2 INCH A.C. ON 5/8 INCH X 30 INCH REBAR STAMPED B8876 2015. LOCATED WEST OF BRIDGE AND NORTH OF BIG PORCUPINE CR. (BPC) ROAD AT EAST EDGE OF BRUSH (NORTHWEST OF BRIDGE). THE MONUMENT LIES 85 FT NORTH OF BPC RD. C/L, 95 FT NORTHWEST OF NORTHWEST CORNER OF BRIDGE, AND 65 FT WEST OF 36 INCH COTTONWOOD TREE. SET MDT WITNESS POST 3.0 FT NORTH OF CAP.
C8876	860,515.692	2,572,685.288	2733.34	SET MDT 2 INCH A.C. ON 5/8 INCH X 30 INCH REBAR STAMPED C8876 2015. LOCATED EAST OF BRIDGE AND NORTH OF BIG PORCUPINE CR. (BPC) ROAD AT THE TOP OF CREEK BANK, JUST NORTHEAST OF BRIDGE. THE MONUMENT LIES ABOUT 60 FT NORTH OF BPC RD. C/L, 4.7 FT EAST OF CREEK TOP OF BANK, AND 33 FT NORTHWEST OF COMMUNICATION RISER WITH WOOD POST. SET MDT WITNESS POST 2.9 FT NORTH OF CAP.
D8876	860,265.332	2,572,759.784	2732.95	SET MDT 2 INCH A.C. ON 5/8 INCH X 30 INCH REBAR STAMPED D8876 2015. LOCATED EAST OF BRIDGE AND WELL SOUTH OF BIG PORCUPINE CR. (BPC) ROAD NEAR THE EASTERN TOP OF CREEK BANK. THE MONUMENT LIES ABOUT 250 FT SOUTH OF BPC RD. C/L, 6 FT EAST OF CREEK TOP OF BANK, 45 FT NORTH OF EAST-WEST FENCE, AND 17 FT NORTH OF 2-TRACK TRAIL C/L (TENDING SW INTO DRAINAGE). THE POSITION OVERLOOKS THE BIG BEND IN BPC SOUTH OF BRIDGE. SET MDT WITNESS POST 3.0 FT SOUTH OF CAP.
E8876	860,482.488	2,573,037.553	2733.33	SET MDT 2 INCH A.C. ON 5/8 INCH X 30 INCH REBAR STAMPED E8876 2015. LOCATED EAST OF BRIDGE AND NORTH OF BIG PORCUPINE CR. (BPC) ROAD. THE MONUMENT LIES ABOUT 380 FT EAST OF BPC BRIDGE, 45 FT NORTH OF BPC RD. C/L, AND 3 FT SOUTH OF NORTH TOP OF SLOPE FOR BERM. SET MDT WITNESS POST 3.0 FT NORTH OF CAP.



3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	C:\DGN\8876000rdtrv001.dgn	DESIGNED BY	A. DELAHUNT	10/27/2020	ROAD PLANS	BIG PORCUPINE CR - 14 M E INGOMAR	STPB 9044(31)
2		12/27/2021	REVIEWED BY	M. CAIL	8/10/2021			
		3:35:53 PM CPS - U3829	CHECKED BY			ROSEBUD COUNTY	UPN 8876000	04

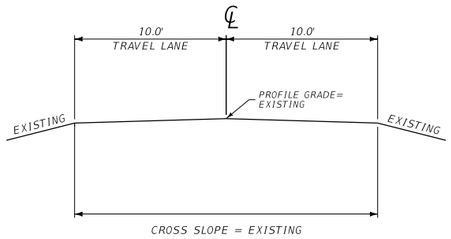
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TYPICAL SECTION NO. 1

MAINLINE

		7+45.00	ONLY
7+45.00	TO	8+40.00	TRANSITION TYPICAL NO. 1 TO TYPICAL NO. 2



* FILL SLOPES	
0' - 10'	4:1
10' <	3:1

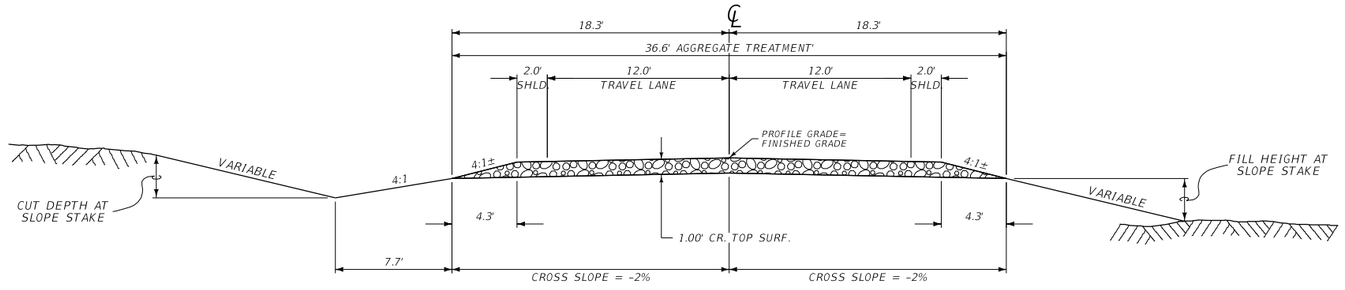
* BACK SLOPES	
0' - 5'	4:1
5' - 10'	3:1
10' <	2:1

* SEE CROSS SECTIONS FOR DEVIATIONS

TYPICAL SECTION NO. 2

MAINLINE

8+40.00	TO	8+98.41 BE	TYPICAL NO. 2
BE 9+51.04	TO	12+96.16	TYPICAL NO. 2
12+96.16	TO	13+96.16	TRANSITION TYPICAL NO. 2 TO TYPICAL NO. 3



QUANTITIES			
UNIT	AGGREGATE CRUSHED TOP SURFACE	UNIT	BITUMINOUS MATERIAL AGG. TREATMENT
AREA square feet cubic yards PER STATION tons PER STATION square yards PER STATION	32.30 119.6	square yards PER STATION tons PER STATION gallons PER STATION	407

3	MDT	MONTANA DEPARTMENT OF TRANSPORTATION	C:\DGN\8876000rdtyp001.dgn	DESIGNED BY	A. DELAHUNT	10/27/2020	ROAD PLANS
2			12/27/2021	REVIEWED BY	M. CAIL	8/10/2021	
			3:36:04 PM CPS - U3829	CHECKED BY			ROSEBUD COUNTY

BIG PORCUPINE CR - 14 M E INGOMAR	STPB 9044(31)
UPN 8876000	05

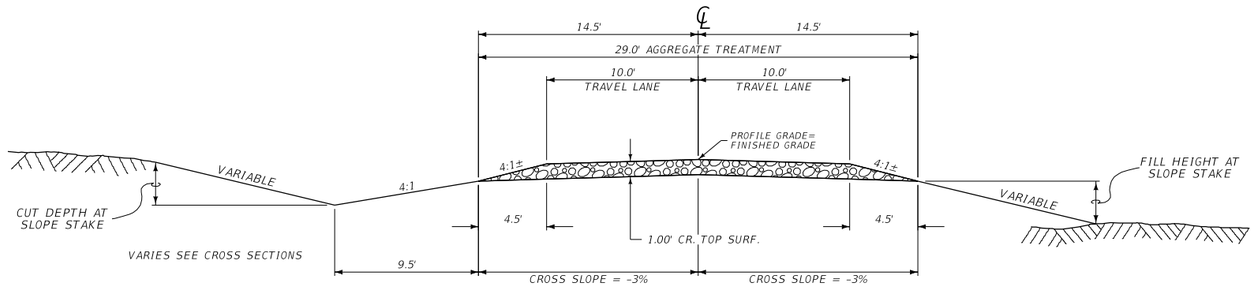
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TYPICAL SECTION NO. 3

MAINLINE

13+96.16 ONLY



QUANTITIES			
UNIT	AGGREGATE CRUSHED TOP SURFACE	UNIT	BITUMINOUS MATERIAL AGG. TREATMENT
AREA square feet cubic yards PER STATION tons PER STATION square yards PER STATION	24.50 90.7	square yards PER STATION tons PER STATION gallons PER STATION	322

3 1	MDT MONTANA DEPARTMENT OF TRANSPORTATION	C:\DGN\8876000rdtyp001.dgn 12/27/2021 3:36:10 PM CPS - U3829	DESIGNED BY REVIEWED BY CHECKED BY	A. DELAHUNT	10/27/2020	ROAD PLANS ROSEBUD COUNTY	BIG PORCUPINE CR - 14 M E INGOMAR UPN 8876000	STPB 9044(31) 06

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SUMMARY

SURFACING

STATION FROM	STATION TO	linear feet GROSS	linear feet NET	linear feet +	linear feet -	FOR	AGGREGATE cubic yards CRUSHED TOP SURFACE (CTS) TY. B GR. 3	BIT. MATERIAL square yards AGGREGATE TREATMENT	REMARKS
7+45.00	8+40.00	95.00	95.00				43	193	TRANSITION TYPICAL NO. 1 TO TYPICAL NO. 2
8+40.00	8+98.41	58.41	58.41				70	119	TYPICAL NO. 2
8+98.41									
8+98.41 BE	9+51.04 BE				52.63				NEW BRIDGE
	12+96.16	397.75	345.12				413	1,405	TYPICAL NO. 2
12+96.16	13+96.16	100.00	100.00				105	365	TRANSITION TYPICAL NO. 2 TO TYPICAL NO. 1
						ADDITIONAL SURFACING	93		
TOTAL		651.16	598.53	~	52.63		724	2,082	

ADDITIONAL SURFACING (INCLUDED IN SURFACING FRAME)

STATION FROM	STATION TO	linear feet GROSS	linear feet NET	linear feet +	linear feet -	FOR	AGGREGATE cubic yards CRUSHED TOP SURFACE (CTS) TY. B GR. 3	BIT. MATERIAL square yards AGGREGATE TREATMENT	REMARKS
7+69	8+74					GUARDRAIL WIDENING	6		RT
7+69	8+74					GUARDRAIL WIDENING	6		LT
9+76	11+16					GUARDRAIL WIDENING	19		RT
9+76	11+16					GUARDRAIL WIDENING	19		LT
11+27						FARM FIELD APPROACHES	43		LT AND RT OF MAINLINE
SUBTOTAL		~	~	~	~		93	~	

BRIDGE END BACKFILL *

STATION FROM	STATION TO	cubic yards BRIDGE END BACKFILL TYPE 3	square yards STABILIZATION GEOTEXTILE HIGH SURV.	linear feet 4" CORR. POLY PIPE #	each 1/2" x 1/2" RODENT GUARD #	REMARKS
8+59.35	8+98.41 BE	376	175			
8+98.41 BE				80	2	
9+51.04 BE				80	2	
9+51.04 BE	9+82.29	344	130			
TOTAL		720	305	160	4	

* SEE DETAILS

\# FOR INFORMATION ONLY, INCLUDED IN THE COST OF BRIDGE END BACKFILL

REMOVE STRUCTURE

STATION	lump sum REMOVE STRUCTURE	REMARKS
9+25	1.0	EXISTING BRIDGE - L44103010+04001
TOTAL	1.0	

GRADING

STATION FROM	STATION TO	cubic yards UNCL. EXC.	cubic yards EXCESS EXC.	cubic yards EMB. +	REMARKS
7+45.00	8+98.41 BE	469		25	MAINLINE
9+51.04 BE	13+96.16	1,034		45	MAINLINE
7+45.00	13+96.16			334	TOPSOIL REPLACEMENT
		894			ADDITIONAL GRADING
TOTAL		2,397	#1,993	#404	

\# FOR INFORMATION ONLY

ADDITIONAL GRADING

STATION FROM	STATION TO	cu. yards INCL. IN ROADWAY UNCL. EXC.	cu. yards INCL. IN ROADWAY EMB.+	cu. yards ADD. UNCL. EXC.	REMARKS
8+98.41 BE				447	RIPRAP AND EMBANKMENT
9+51.04 BE				447	RIPRAP AND EMBANKMENT
11+27.00		39			LT FARMFIELD APP.
11+27.00		39			RT FARMFIELD APP.
TOTAL		~	~	894	

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SUMMARY

TOPSOIL & SEEDING

STATION		cubic yards	acres							REMARKS
		TOPSOIL SALVAGING & PLACING	SEED			FERTILIZER		CONDITION SEEDBED	MULCH	
FROM	TO		NO. 1	NO. 2	NO.3	NO. 1	NO. 2			
7+45.00	8+98.41 BE	32	0.2			0.1		0.2		LEFT
7+45.00	8+98.41 BE	32	0.2			0.1		0.2		RIGHT
9+51.04 BE	13+96.16	83	0.4			0.2		0.4		LEFT
9+51.04 BE	13+96.16	79	0.4			0.2		0.4		RIGHT
8+98.41 BE		19		0.1					0.1	WEST EMBANKMENT
9+51.04 BE		22		0.1					0.1	EAST EMBANKMENT
TOTAL		267	1.2	0.2	~	0.6	~	1.2	0.2	

GUARDRAIL

STATION		linear feet		each				REMARKS
		BOX BEAM GUARDRAIL		MBEAT TERMINAL SECTION TL 3		BOX BEAM BRIDGE APPROACH SECTION TYPE 2		
FROM	TO	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	
7+92.59	8+76.61	18.0		1		1		
7+92.59	8+76.61		18.0		1		1	
9+79.12	10+63.14	18.0		1		1		
9+79.12	10+63.14		18.0		1		1	
SUBTOTAL		36.0	36.0	2	2	2	2	
TOTAL		72.0		4		4		

RANDOM RIPRAP

STATION		cubic yards		square yards			REMARKS
		RANDOM RIPRAP		GEOTEXTILE PERM. EROS. CNTRL. HIGH SURV. CLASS C	TURF REINFORCEMENT MAT	RIPRAP REVEGE-TATION	
FROM	TO	CL. I	CL. II				
8+25.61		0.8			10	4	LT. TRM CHUTE
8+25.61		0.8			9	4	RT. TRM CHUTE
8+77.23	9+19.73		136.8	230			
9+29.91	9+78.41		149.1	260			
10+30.12		0.8			9	4	LT. TRM CHUTE
10+30.12		0.8			9	4	RT. TRM CHUTE
TOTAL		3.2	285.9	490	37	16	

PERMANENT EROSION CONTROL *

STATION		square yard		linear feet	REMARKS
		EROSION CONTROL BLANKET LONG TERM	COIR EROSION CONTROL NET	COIR WATTLES **	
FROM	TO				
8+99.74	9+12.00	229	229	67	48.8' LT, 48.0' RT
9+38.00	9+49.71	236	236	57	39.8 LT, 48.0' RT
TOTAL		465	465	124	

* SEE DETAILS
** FOR INFORMATION ONLY

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HYDRAULIC DATA SUMMARY *

STATION	STREAM NAME (IF NAMED)	DRAINAGE AREA (mi.²)	SIZE / TYPE STRUCTURE (1)(1A)(4)	DESIGN FLOOD			BASE FLOOD (1%)		OVERTOPPING FLOOD (2)(3)			REMARKS (FLOOD OF RECORD, etc.) (5)
				MAGNITUDE (cfs)	FREQUENCY (%)	H.W. ELEV. (ft.)	MAGNITUDE (cfs)	H.W. ELEV. (ft.)	MAGNITUDE (cfs)	APPROX. FREQUENCY (%)	H.W. ELEV. (ft.)	
9+25	BIG PORCUPINE CREEK	450	47 FT CLEAR SPAN	4,567	10	2,719.2	13,223	2,722.5	1,390	33	2,716.2	OT ROAD 180 FT WEST OF BRIDGE @ STA 7+45

NOTES :

* H.W. ELEVATIONS SHOWN ARE BASED UPON PEAK FLOW ANALYSIS.

(1) STRUCTURE SIZE OR TYPE AND RELATED HYDRAULIC DATA MAY NOT REFLECT CHANGES MADE DUE TO R/W OR OTHER CONSIDERATIONS (I.E., STOCKPASS ADDED, STRUCTURE SIZE OR TYPE CHANGED, ROAD GRADE CHANGED DURING CONSTRUCTION, ETC.)

(1A) BRIDGE LENGTH SHOWN EQUALS THE WATER SURFACE WIDTH IN THE OPENING AT THE DESIGN H.W. ELEVATION MEASURED NORMAL TO FLOW.

(2) OVERTOPPING IS DEFINED AS FLOW OVER THE ROAD, FLOW THROUGH A SIGNIFICANT RELIEF STRUCTURE OR FLOW OVER THE BASIN DIVIDE WHICHEVER IS LOWER.

(3) FOR THOSE CROSSINGS NOTED BY Qp(max) IN THE REMARKS COLUMN OVERTOPPING DOES NOT OCCUR AND THE FLOOD MAGNITUDE LISTED CORRESPONDS TO THE FLOOD OF SECTION 650.115 (a) (1) (ii) OF FEDERAL-AID POLICY GUIDE, SUBCHAPTER G, PART 650, SUBPART A (DEC. 1991)
THE FLOOD SPECIFIED IS SUBJECT TO STATE-OF-THE-ART CAPABILITY TO ESTIMATE THE EXCEEDANCE PROBABILITY.
(PIPES 0.5%; BRIDGE .2%)

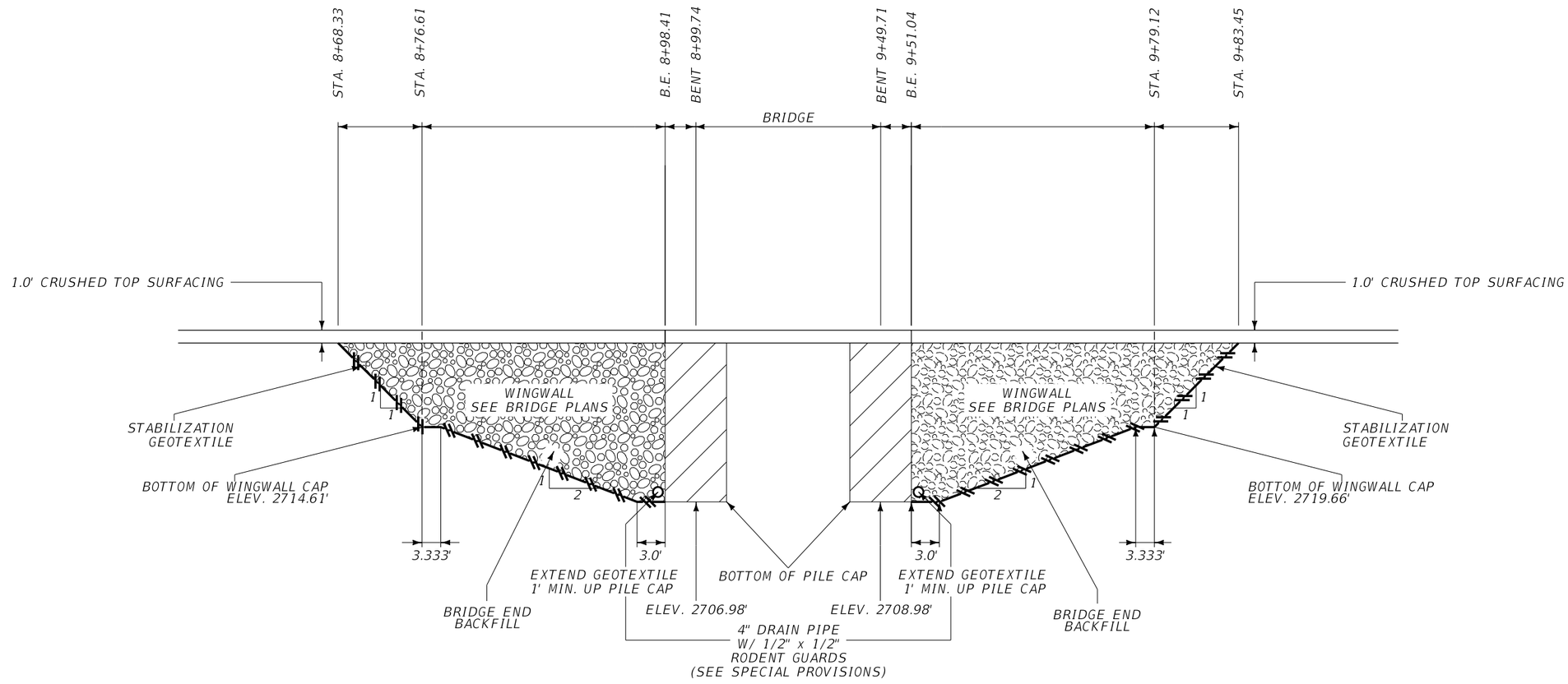
(4) HIGH WATER ELEVATIONS MAY VARY SLIGHTLY DEPENDING UPON THE PIPE OPTION SELECTED.

(5) PROCEDURE MEMORANDUM NO.10, HYDRAULICS MANUAL CHAPTER 9 APPENDIX H.

EXCEEDANCE	PROBABILITIES
2 YEAR	50% CHANCE
10 YEAR	10% CHANCE
25 YEAR	4% CHANCE
50 YEAR	2% CHANCE
100 YEAR	1% CHANCE
200 YEAR	0.5% CHANCE
500 YEAR	0.2% CHANCE

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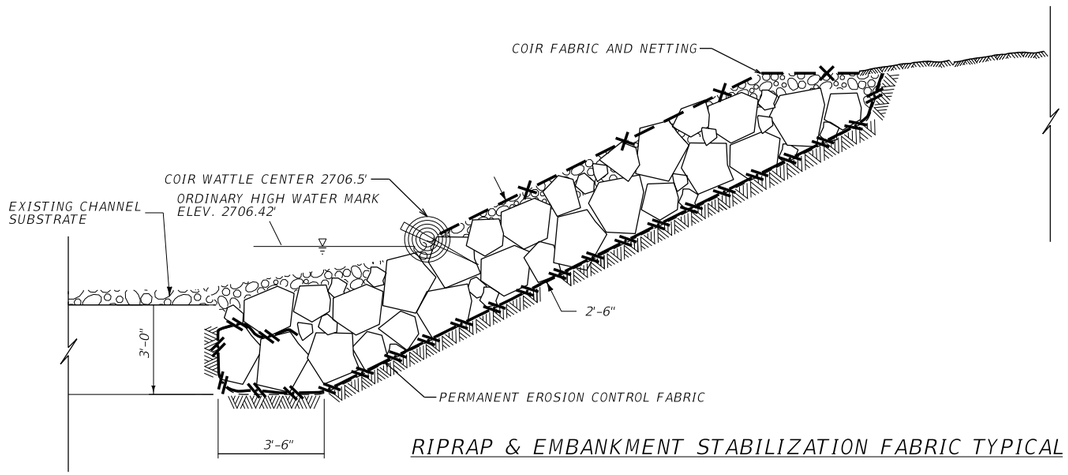
BIG PORCUPINE BRIDGE



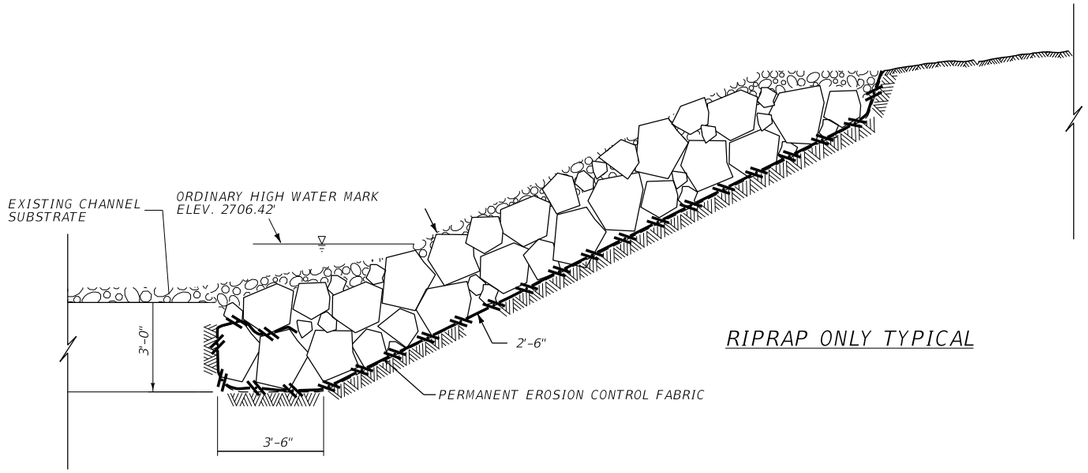
BRIDGE END BACKFILL DETAIL
(NO SCALE)

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2		12/27/2021	REVIEWED BY	M. CAIL	8/9/2021		
		3:36:56 PM CPS - U3829	CHECKED BY			ROSEBUD COUNTY	UPN 8876000 / 10

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RIPRAP & EMBANKMENT STABILIZATION FABRIC TYPICAL



RIPRAP ONLY TYPICAL

NOTES:

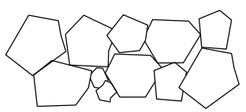
FILL RIPRAP VOIDS WITH FILTER MATERIAL NO. 2 TO PROVIDE A UNIFORM SURFACE FOR THE PLACEMENT OF TOPSOIL.

PLACE TOPSOIL WITH A MINIMUM THICKNESS OF 6".

THIS DETAIL IS TO BE USED AS A VISUAL GUIDE FOR RIPRAP REVEGETATION. REFER TO THE PLAN SHEETS AND CROSS SECTIONS FOR SPECIFIC ELEVATIONS AND GEOMETRIC CONFIGURATION OF THE RIPRAP LAYOUT.

REFER TO THE SPECIAL PROVISIONS FOR PLANTING AND SEEDING SPECIFICATIONS.

LEGEND

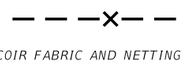


CLASS II RIPRAP

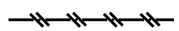


FILTER MATERIAL NO. 2

EXISTING GROUND



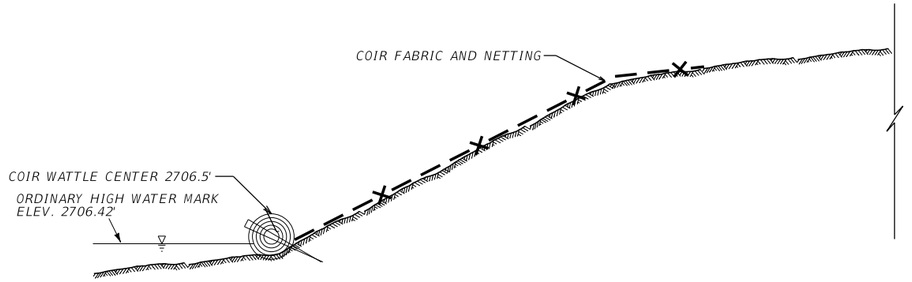
COIR FABRIC AND NETTING



PERMANENT EROSION CONTROL GEOTEXTILE HIGH SURVIVABILITY CLASS C



EXCAVATION



EMBANKMENT STABILIZATION FABRIC TYPICAL

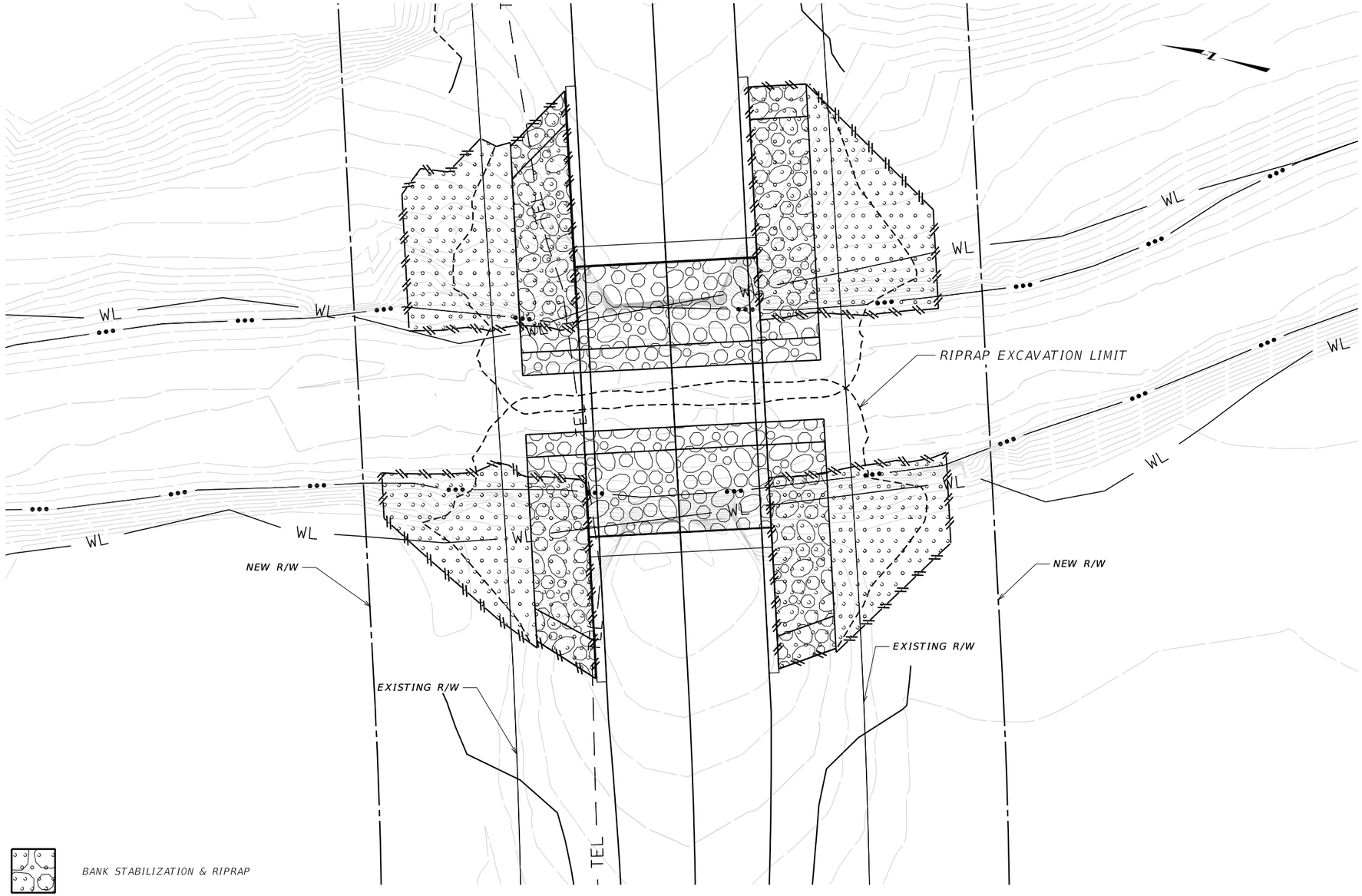
RIPRAP/BANK STABILIZATION TYPICALS DETAIL

NOT TO SCALE

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BANK STABILIZATION & RIPRAP

BANK STABILIZATION
*SEE SPECIAL PROVISION

RIPRAP

BANK STABILIZATION
PLAN VIEW
DETAIL

no scale

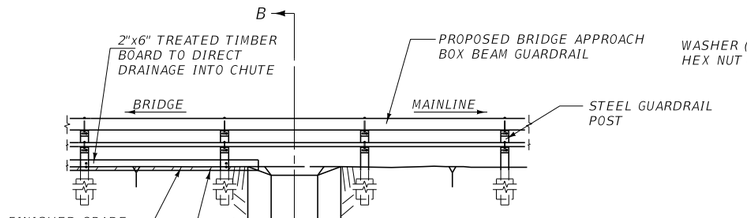
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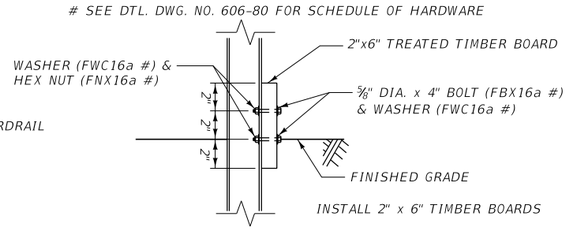
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NATURAL FIBER TURF REINFORCEMENT MAT DRAINAGE CHUTE

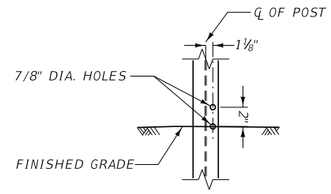
TURF REINFORCEMENT MAT DRAINAGE CHUTE						
STATION	DIMENSIONS (ft.)			TURF REIN. MAT (SQ.YD.)	CL. I RIPRAP (CU.YD.)	REMARKS
	A	B	C			
8+25.61	2.0	4.0	1.0	10	0.8	LT.
8+25.61	2.0	4.0	1.0	9	0.8	RT.
10+30.12	2.0	4.0	1.0	9	0.8	LT.
10+30.12	2.0	4.0	1.0	9	0.8	RT.



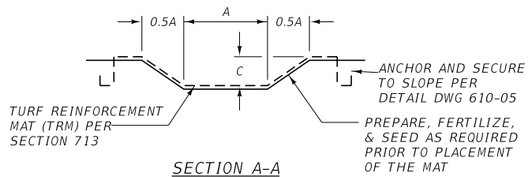
PLAN VIEW



TIMBER BOARD MOUNTING DETAIL

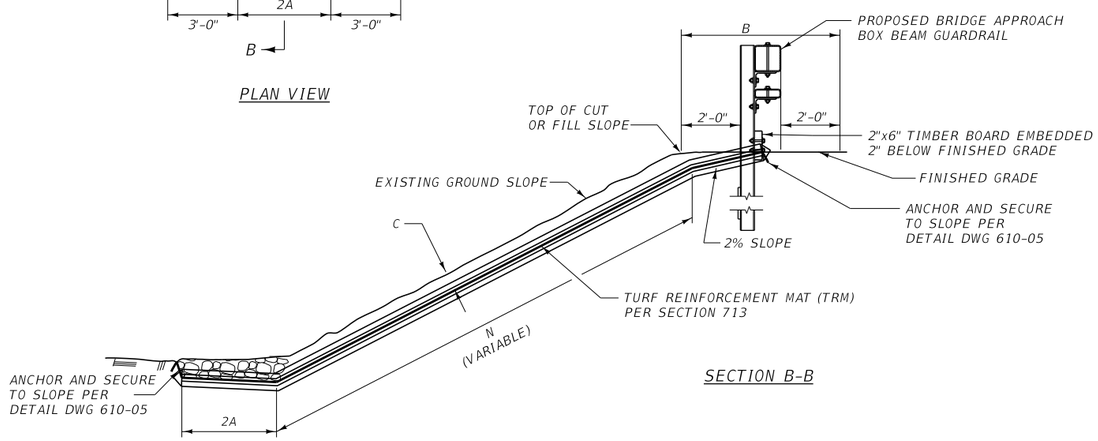


STEEL POST HOLE DETAIL



SECTION A-A

TURF REINFORCEMENT MAT CHUTE

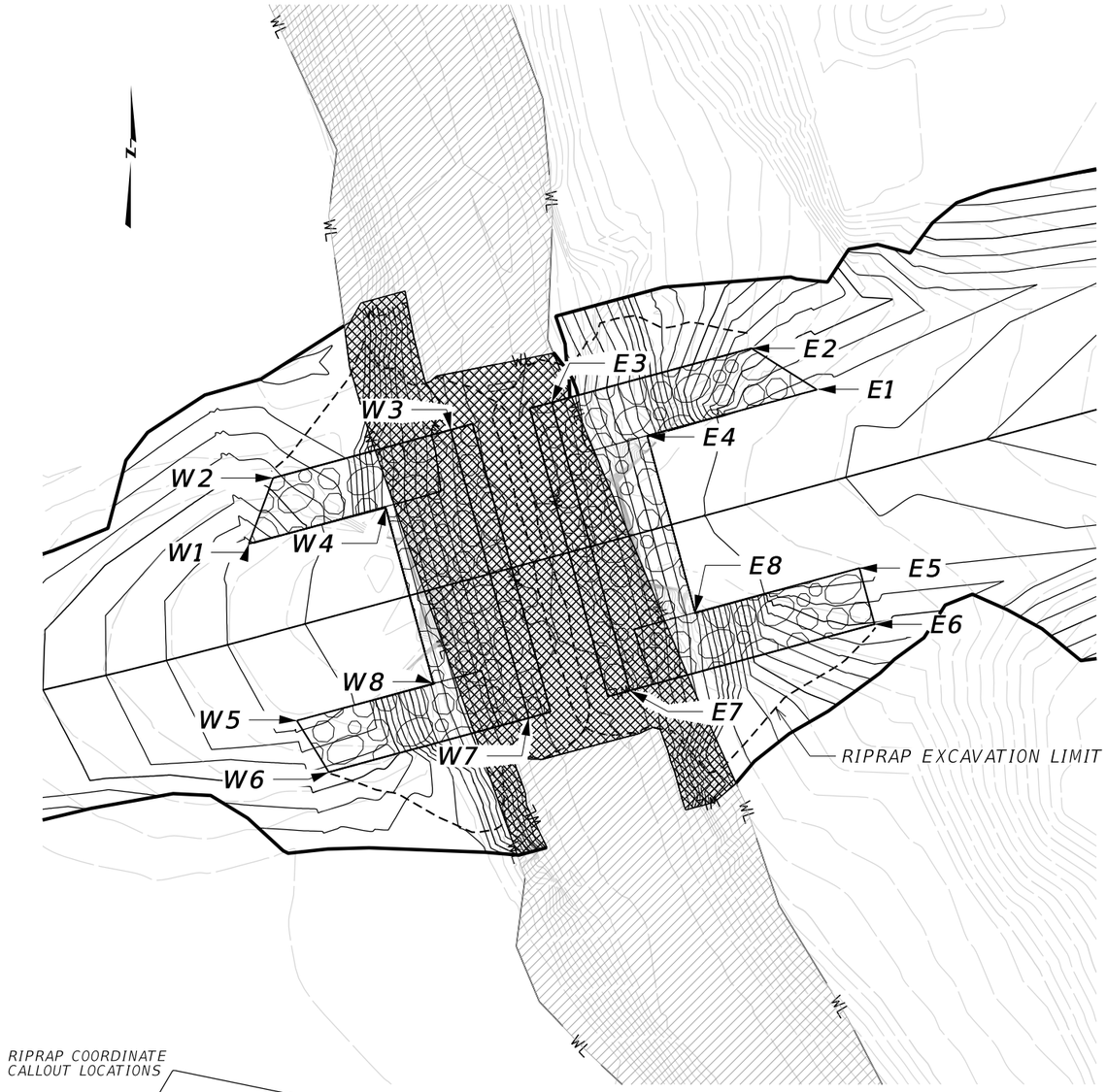


SECTION B-B

TURF REINFORCEMENT MAT DRAINAGE CHUTE DETAIL

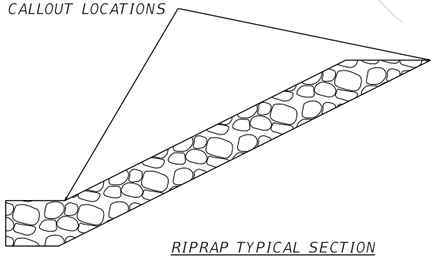
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		12/27/2021	REVIEWED BY	M. CAIL	8/9/2021		
		3:37:25 PM CPS - U3829	CHECKED BY			ROSEBUD COUNTY	UPN 8876000 / 13

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BRIDGE RIPRAP					
POINT NUMBER	N OR Y COORDINATE	E OR X COORDINATE	RIPRAP ELEVATION	FINISH GRADE ELEVATION	LOCATION AND DESCRIPTION
E1	860480.853	2,572,680.092	2,724.10	2,727.66	
E2	860487.965	2,572,668.838	2,719.60	2,723.96	
E3	860478.651	2,572,634.489	2,704.60	2,705.40	TOE OF RIPRAP
E4	860472.889	2,572,650.764	2,711.70	2,711.70	
E5	860450.159	2,572,687.379	2,723.60	2,727.68	
E6	860440.518	2,572,689.993	2,723.60	2,724.91	
E7	860429.111	2,572,647.922	2,704.60	2,705.56	TOE OF RIPRAP
E8	860442.488	2,572,659.007	2,711.70	2,711.70	
W1	860454.633	2,572,583.404	2,720.60	2,722.90	
W2	860465.673	2,572,586.627	2,717.60	2,719.45	
W3	860473.940	2,572,617.116	2,704.60	2,706.03	TOE OF RIPRAP
W4	860460.745	2,572,605.951	2,711.70	2,711.70	
W5	860423.942	2,572,590.690	2,721.10	2,723.54	
W6	860415.086	2,572,596.199	2,719.60	2,720.71	
W7	860424.400	2,572,630.549	2,704.60	2,705.33	TOE OF RIPRAP
W8	860430.334	2,572,614.227	2,711.70	2,711.70	

RIPRAP COORDINATE CALLOUT LOCATIONS



RIPRAP TYPICAL SECTION

SEE RIPRAP REVEGETATION DETAIL FOR MORE INFORMATION.

LEGEND

- EXISTING CONTOUR LINES
- FINAL CONTOUR LINES
- GRADING CONSTRUCTION LIMIT
- DELINEATED WETLAND AREAS
- PERMANENT WETLAND IMPACTED AREAS

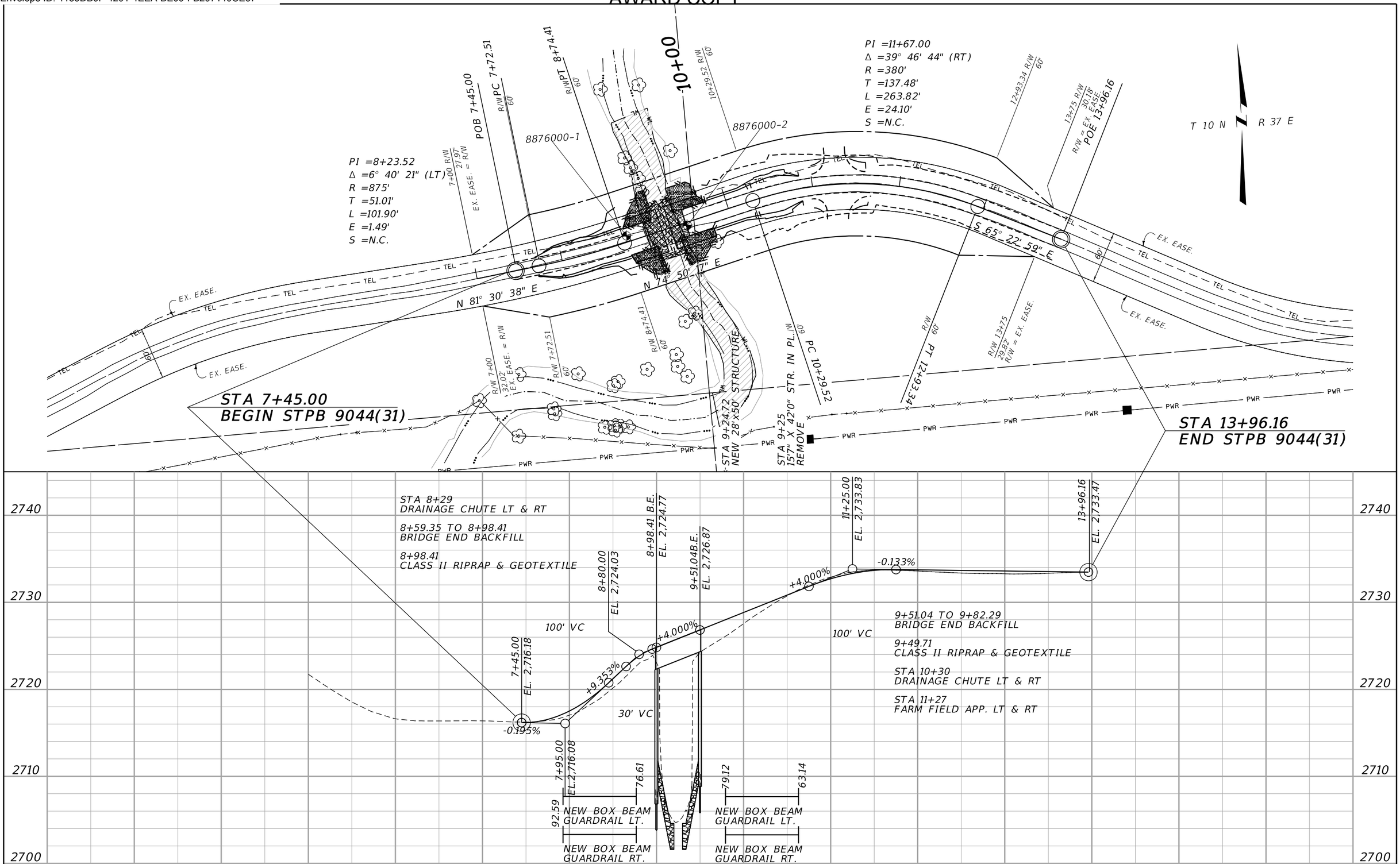
RIPRAP GRADING PLAN BIG PORCUPINE CR DETAIL

no scale

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2		12/27/2021	REVIEWED BY	M. CAIL	8/9/2021			
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ASSOCIATED PROJECT AGREEMENT NUMBERS	
P. E.	STPB 9044(30)

MONTANA DEPARTMENT OF TRANSPORTATION

DocuSigned by: Karl Yakawich 4791B33005A9454...
DATE 3/16/2022

KARL F. YAKAWICH 15133 PE — MONTANA — PROFESSIONAL LICENSED ENGINEER

SHEET NO. B1

LIST OF DRAWINGS & ESTIMATED BRIDGE PLAN QUANTITIES

BRIDGE PLANS AND QUANTITIES

FEDERAL AID PROJECT STPB 9044(31)

BIG PORCUPINE CR – 14M E INGOMAR

ROSEBUD COUNTY

BRIDGE IDENTIFICATION	
MDT STR ID	NBI NUMBER
04275	L44103010+04001

SCALES SHOWN ON BRIDGE PLAN SHEETS ARE FOR FULL SIZE (22 X 34) PRINTS REDUCED PRINTS ARE APPROXIMATELY ONE-HALF ORIGINAL SCALE

GreatWest ENGINEERING

LIST OF DRAWINGS

SHEET NO.	DWG. NO.	TITLE
BRIDGE DRAWINGS		
B1	24669	LIST OF DRAWINGS & ESTIMATED BRIDGE PLAN QUANTITIES
B2	24670	GENERAL LAYOUT AT STA. 9+24.72
B3	24671	FOOTING PLAN
B4	24672	BENT NO. 1 & NO. 2
B5	24673	BENT NO. 1 & NO. 2 SECTIONS
B6	24674	BENT & WINGWALL BILLS OF REINFORCING
B7	24675	BENT NO. 1 WINGWALL DETAILS
B8	24676	BENT NO. 2 WINGWALL DETAILS
B9	24677	ERECTION PLAN
B10	24678	TRI-DECK BEAM DETAILS
B11	24679	MISCELLANEOUS DETAILS

DWG. NO.	TITLE
STANDARD DRAWINGS	
PSD (APPROVED 1-30-15)	STANDARD PILE SPLICE DETAILS AND PILE TIPS
SBR-W830 (REVISED 3-15-17)	STANDARD BRIDGE RAIL TYPE W830

ESTIMATED BRIDGE PLAN QUANTITIES

LOCATION	LENGTH (FT)	PRESTRESSED TRI DECK BEAMS (FT)	CONCRETE-CLASS STRUCTURE (YD^3)	REINFORCING STEEL REGULAR (LB)	FURNISH STEEL PILE - HP (LB)	DRIVE STEEL PILE (FT)	PILE DRIVING POINT (EACH)	RE-DRIVE TEST PILE (EACH)	DYNAMIC LOAD TEST (EACH)	BRIDGE RAIL-W830 (FT)
BENT NO. 1			130.5	12481	33260	304.6	9	1	1	
BENT NO. 2			146.7	14061	33794	221.2	11	1	1	
SUPERSTRUCTURE	50.0	250.0								206.0
TOTAL	50.0	250.0	277.2	25542	67054	525.8	20	2	2	206.0

REVISED	REVISED	REVISED	REVISED	CHECKED	DRAWN	DESIGNED
				11-15-21	11-15-21	11-15-21
				G.C.G.	P.K.S.	K.F.Y.

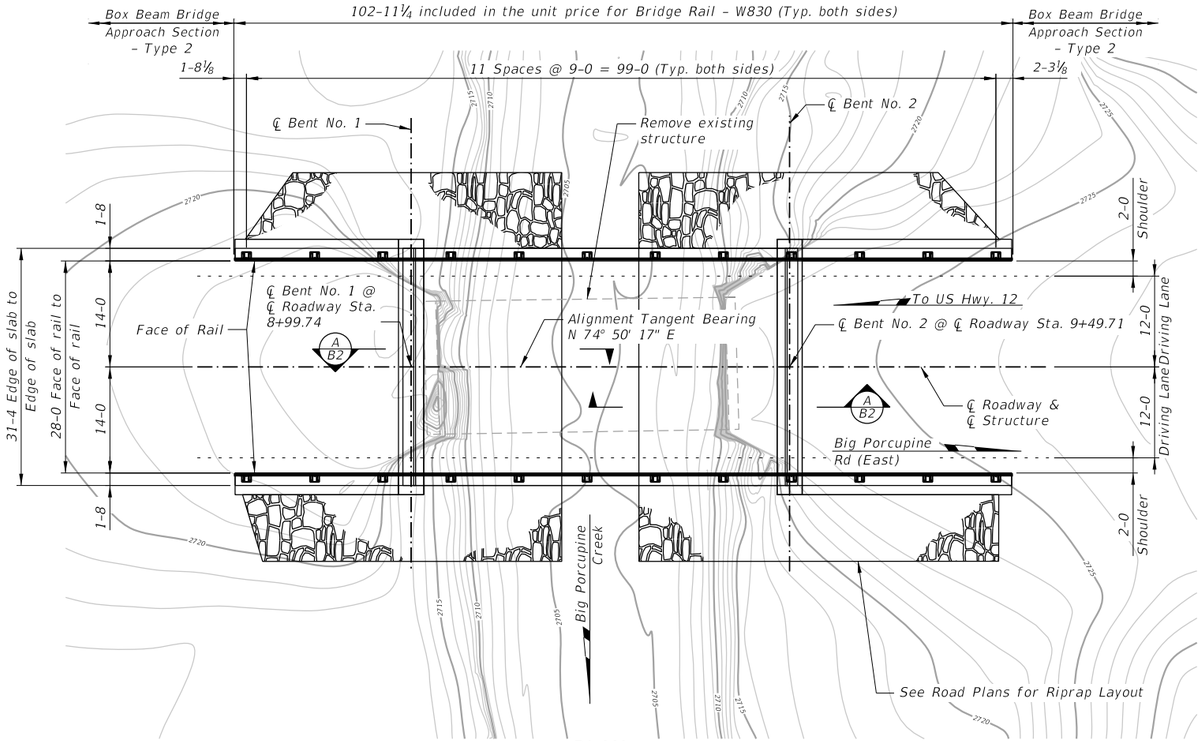
MONTANA DEPARTMENT OF TRANSPORTATION MDT BRIDGE BUREAU

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ROUTE L-44-103N
REF POINT 10+0.400
MDT STR. ID 04275
UPN NUMBER 8876000
DRAWING NO. 24669

DocuSign Envelope ID: 253BFF6E-0776-412A-90A4-7C8023BE5035

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PLAN
Scale: 1" = 10–0

HYDRAULIC DATA

Drift:	HEAVY
Low Scour Elevation:	2703.00
Ice:	LIGHT
Drainage Area:	450 sq. mi.
✱ 2–year Stage (Q2):	2716.52
100 yr. Flood Flow:	13,223 cfs
✱ 100 yr. Flood Stage (Q100):	2722.52
100yr. Flood Velocity:	6.36 fps
Actual Low Beam Elevation:	2722.36
Allowable Low Beam Elevation:	2721.50
✱ 10 yr. Flood Flow:	4567 cfs
10 yr. Flood Stage:	2719.53

✱ Also see Hydraulic Data Summary sheet. Stage elevations are measured approximately 120 feet upstream of the proposed bridge and include backwater.

NOTES

FINISHED GRADE: Finished grade of bridge at centerline roadway is the same as the Profile Grade shown on Road Plans.

LIVE LOAD: Standard HL–93 loading.

SPECIFICATIONS: Montana Department of Transportation Standard Specifications for Road and Bridge Construction; 2020 Edition; V2.3 and any amendments thereto, and the Special Provisions govern unless otherwise noted. The design was prepared in accordance with AASHTO LRFD Bridge Design Specifications, Ninth Edition with current interim revisions.

REINFORCING STEEL: Use new deformed type reinforcing steel meeting the requirements of AASHTO M 31 Grade 60. Include all costs associated with furnishing and placing new reinforcing steel in the unit price bid for Reinforcing Steel.

REINFORCING STEEL COVER: Unless specified otherwise on the drawings, the minimum concrete cover measured from the face of the concrete to the face of any reinforcing steel is 2" except as noted below:

Bottom of Slab	1"
Top of Slab	2½"
Bottom of Abutment Caps	3"
Concrete Barriers & Curbs	1½"

Concrete cover to any tie bar is ½" less than what is listed above.

CAST IN PLACE CONCRETE: Unless otherwise approved or specified, use Concrete Class Structure.

CONCRETE STRENGTH: Use f'c = 4000 p.s.i. for Concrete Class Structure. Use f'c = 4000 p.s.i. for Concrete Class Structure low slump.

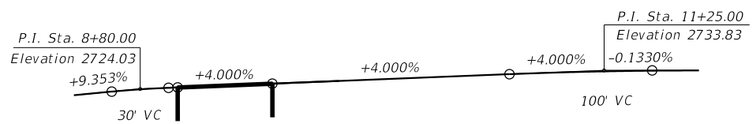
STRUCTURE EXCAVATION: Include structure excavation in the unit price bid for Concrete Class Structure.

TRAFFIC CONTROL PLAN AND SEQUENCE OF OPERATIONS: See Special Provisions.

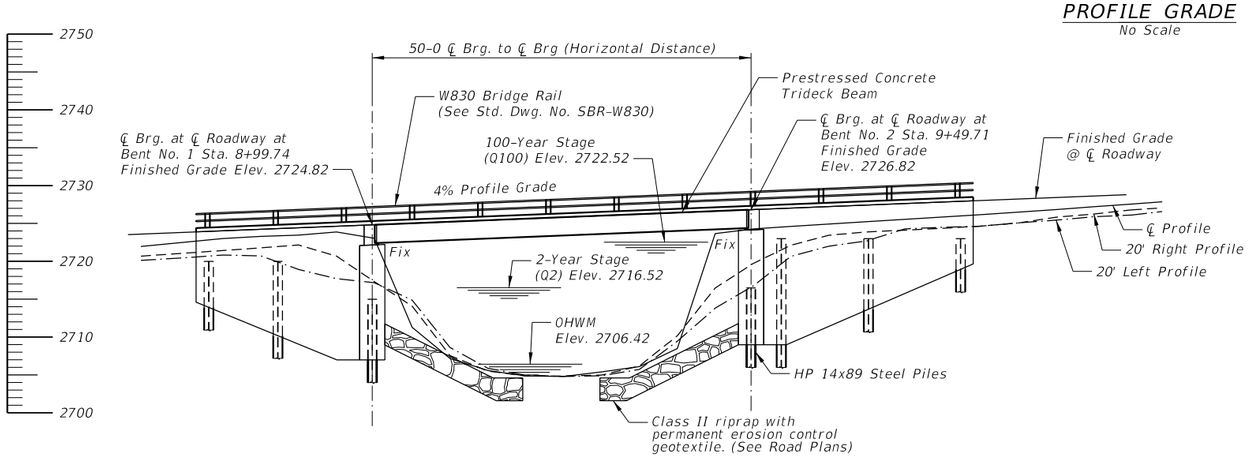
EXISTING STRUCTURE: Remove the existing structure (see Road Plan sheets and Special Provisions).

STATE PLANE COORDINATES: Stations shown on the bridge plans are state plane grid stations based on (NAD83–2011). Dimensions shown on the bridge plans are horizontal ground distances and not state plane grid distances. The combination scale factor (CSF) at this location is 0.99929253.

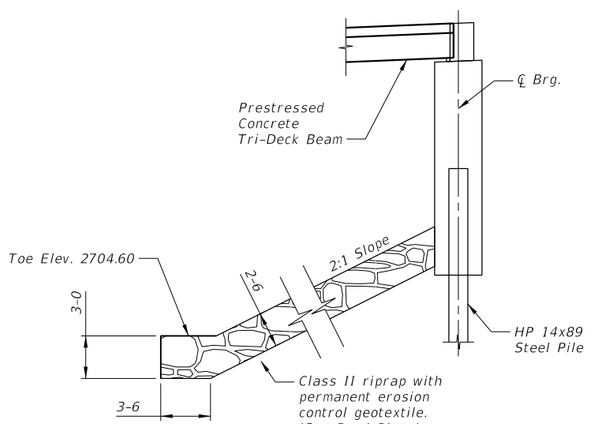
Horizontal ground distance x CSF = Grid Distance
Grid Distance/CSF = Distance to stake.



PROFILE GRADE
No Scale



ELEVATION
Scale: 1" = 10–0



A / B2 RIPRAP CROSS-SECTION
Scale: 3/16" = 1–0

SHEET NO. B2

GENERAL LAYOUT

SCALE: As Shown

BRIDGE OVER BIG PORCUPINE CREEK

AT STA. 9+24.72

FEDERAL AID PROJECT STPB 9044(31)

COUNTY ROSEBUD COUNTY

REVISED		
REVISED		
REVISED		
REVISED		
CHECKED	11-15-21	K.F.Y.
DRAWN	11-15-21	P.K.S.
DESIGNED	11-15-21	K.F.Y.

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MONTANA DEPARTMENT OF TRANSPORTATION — BRIDGE BUREAU

ROUTE L–44–103N

REF POINT 10+0.400

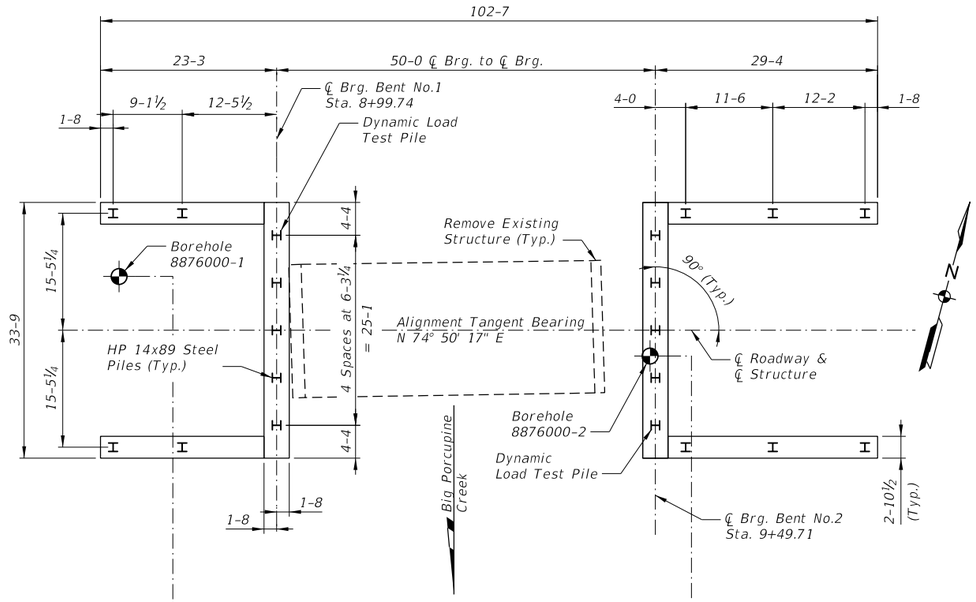
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UPN NUMBER 8876000

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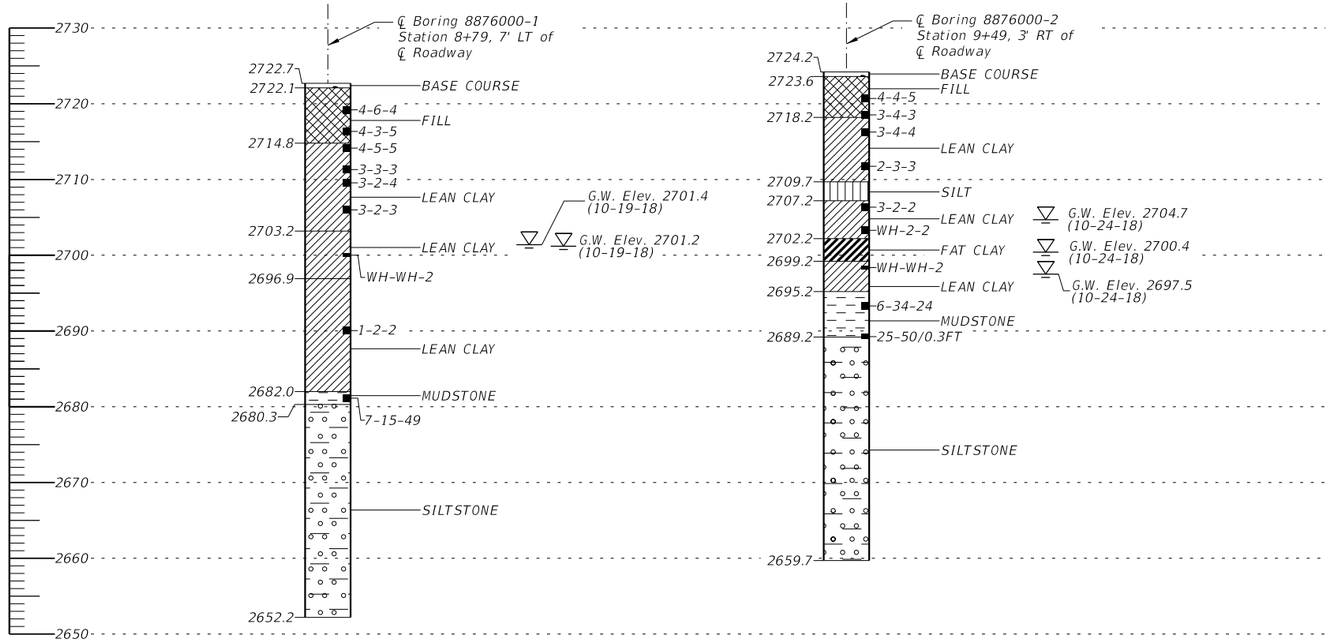
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FOOTING PLAN
Scale: 1" = 10-0

NOTE: Dimensions shown for Bent No. 1 are typical for Bent No. 2



SUMMARY OF LOG OF BORINGS
Scale: 1" = 10-0

NOTES

SOILS AND FOUNDATION MATERIALS: The Footing Plan shows points where the State of Montana, Department of Transportation, drilled boreholes.

The series of numbers on the Log of Borings shows the number of blows from a 140 pound hammer with a 30" drop required to drive a 2" split spoon sampler 6" (Standard Penetration Test). The length of the split spoon sampler is 18". The sampler length is measured as three 6" intervals. If the split spoon sampler did not penetrate 6" after 50 blows, the Log of Borings shows the measured penetration within that particular interval.

See the Special Provisions for original boring logs and additional subsurface information.

Do not start driving abutment service piles until the abutment test pile analysis is complete.

See Std. Dwg. No. PSD for pile splice and pile tip details.

STEEL H PILES: Use steel H-piles meeting the requirements of ASTM A-572 Grade 50.

NOTE: Contact the MDT Geotechnical Section at (406)444-6281 if pile tip elevations deviate more than 1 foot from the elevation indicated.

PILE INFORMATION

LOCATION	DESIGN PILE TIP ELEVATION	MAXIMUM PILE CUT-OFF ELEVATION* (FT)	PILE TIP TREATMENT	REQUIRED BEARING RESISTANCE DURING DRIVING (KIP)	MAXIMUM PILE REACTION UNDER SERVICE 1
BENT NO. 1	2676.00	2714.48	H-PILE POINT	339	228 kip
BENT NO. 2	2686.00	2716.48	H-PILE POINT	339	237 kip

* Pile cutoff elevation for Bent No. 1 wingwall piles is 2720.00. Cutoff elevation for Bent No. 2 wingwall piles is 2723.00.

COORDINATE TABLE

LOCATION	N OR Y COORDINATE	E OR X COORDINATE	DESCRIPTION
BENT NO. 1	860444.995	2572608.414	CL BEARING AT CL ROADWAY
BENT NO. 2	860458.063	2572656.639	CL BEARING AT CL ROADWAY

SHEET NO. B3

FOOTING PLAN

SCALE: 1" = 10-0

BRIDGE OVER
BIG PORCUPINE CREEK

AT STA.
9+24.72

FEDERAL AID PROJECT
STPB 9044(31)

COUNTY
ROSEBUD COUNTY

REVISED				G.C.G.	
REVISED				P.K.S.	11-15-21
REVISED				K.F.Y.	11-15-21
REVISED				CHECKED	11-15-21
				DRAWN	
				DESIGNED	

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MONTANA DEPARTMENT OF TRANSPORTATION MDT BRIDGE BUREAU

ROUTE
L-44-103N

REF POINT
10+0.400

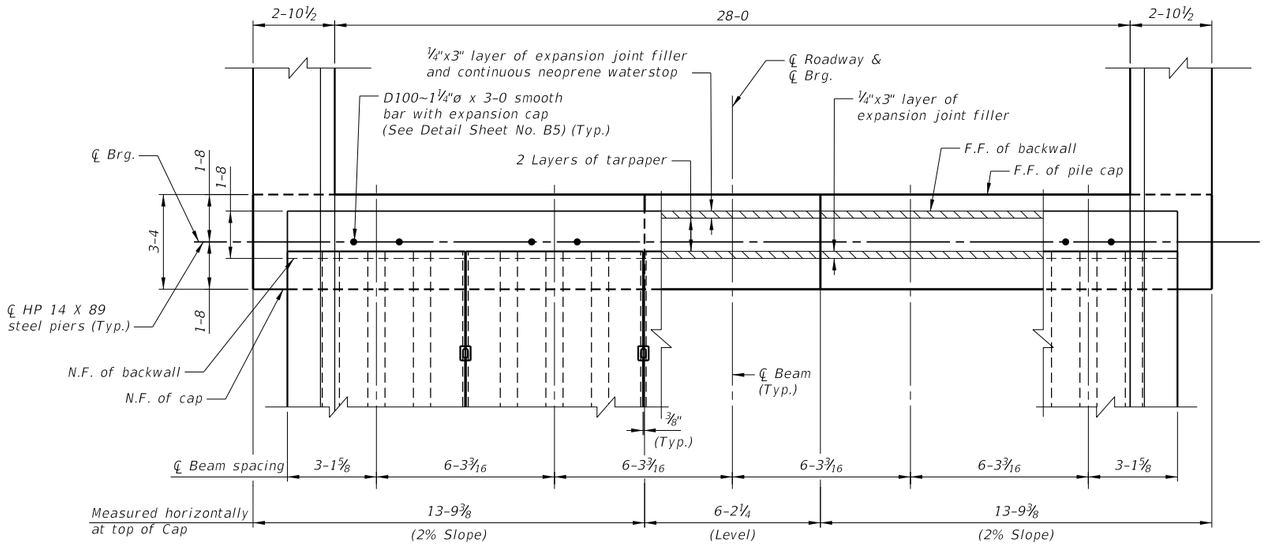
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UPN NUMBER
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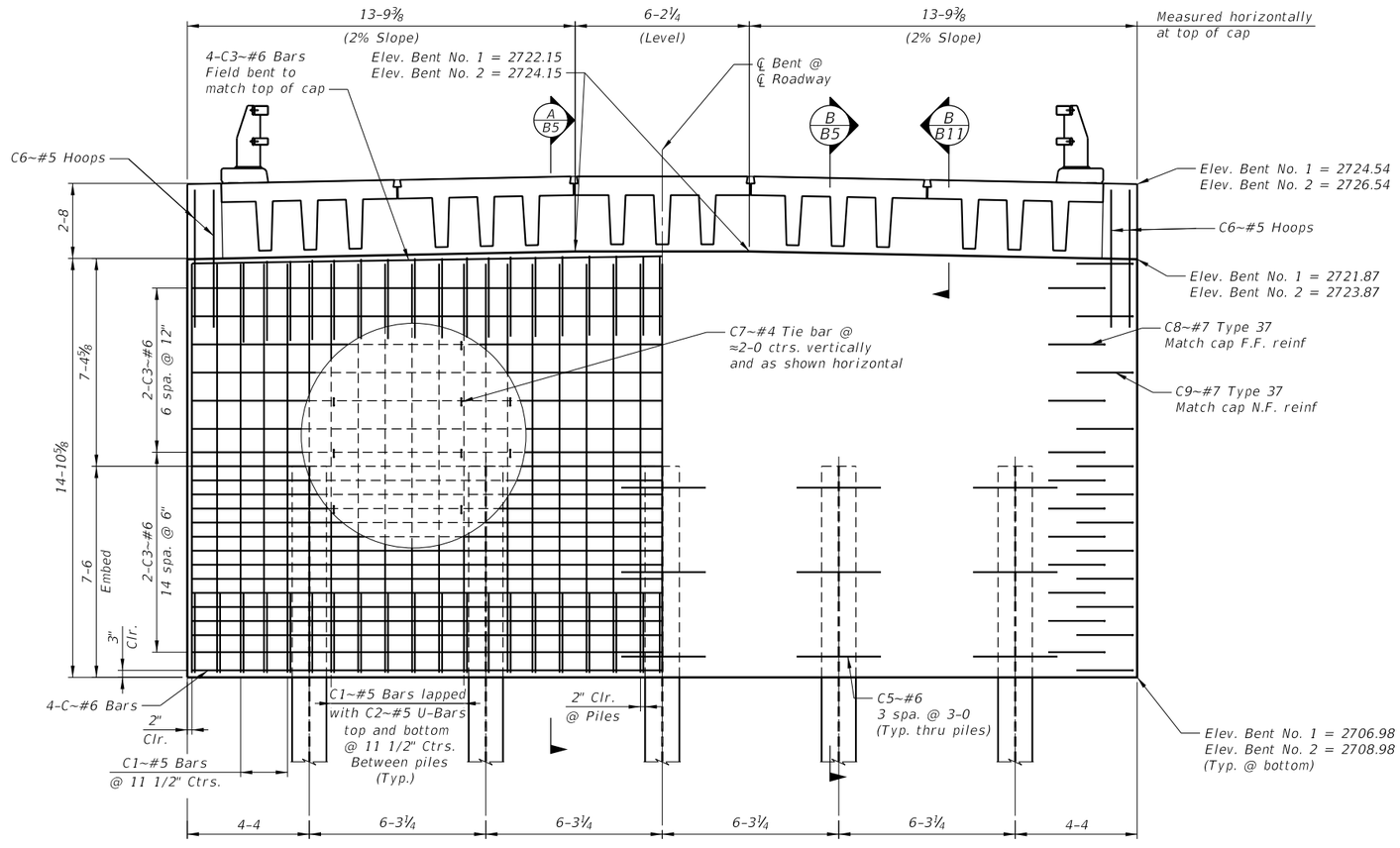
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PLAN

(Piles omitted for clarity)



ELEVATION

NOTES

N.F. Denotes near face
F.F. Denotes fill face

Include all costs associated with furnishing and placing the tarpaper, expansion joint material, waterstops, and metal expansion caps in the unit bid price for Concrete Class Structure.

SHEET NO. B4

BENT NO. 1 AND NO. 2

SCALE: 3/8" = 1-0

BRIDGE OVER BIG PORCUPINE CREEK

AT STA. 9+24.72

FEDERAL AID PROJECT STPB 9044(31)

COUNTY ROSEBUD COUNTY

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REVISED			
REVISED			
REVISED			
CHECKED	G.C.G.	11-15-21	
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MONTANA DEPARTMENT OF TRANSPORTATION MDT BRIDGE BUREAU

ROUTE L-44-103N

REF POINT 10+0.400

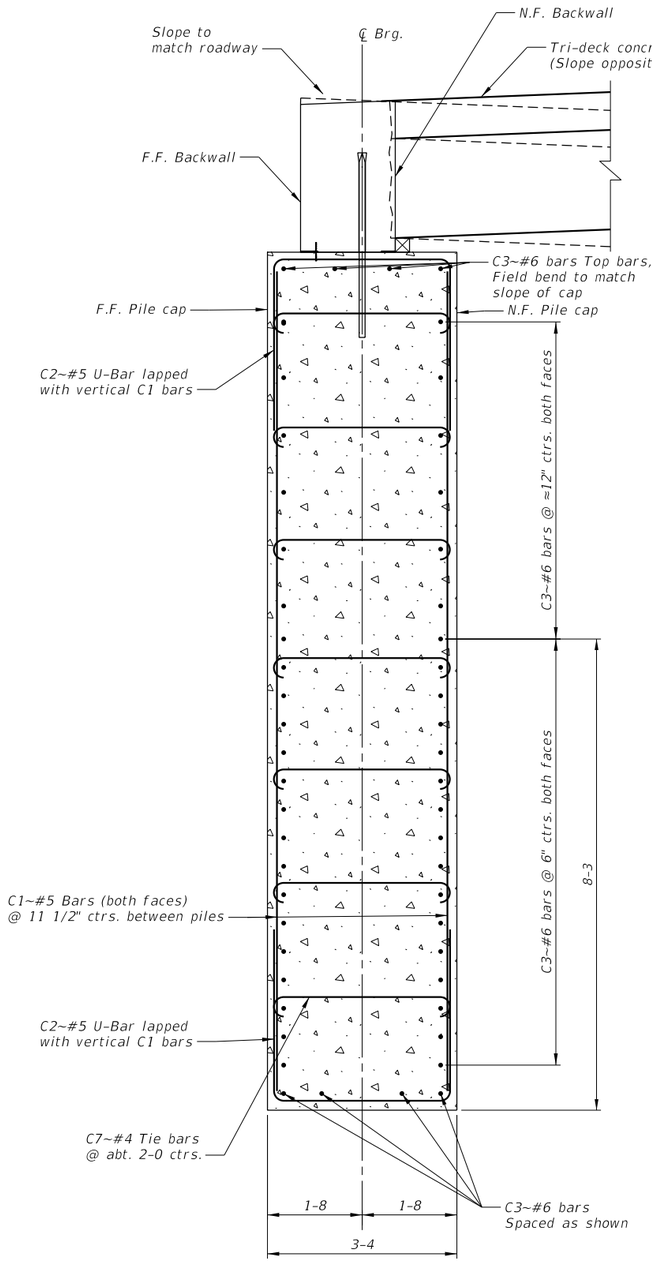
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UPN NUMBER 8876000

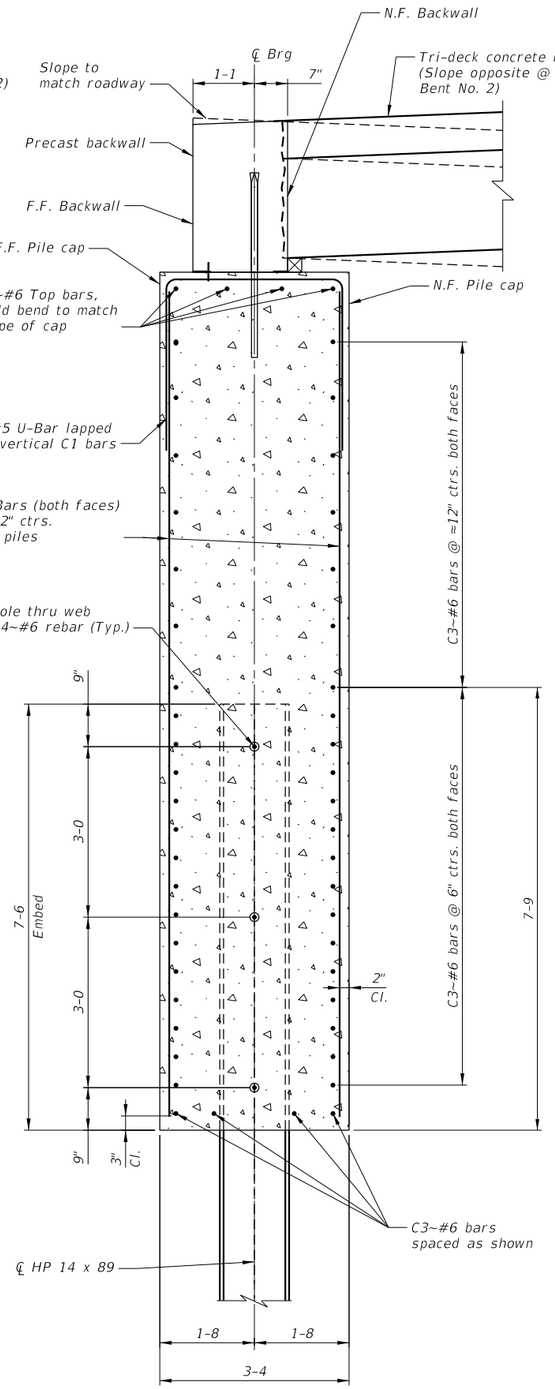
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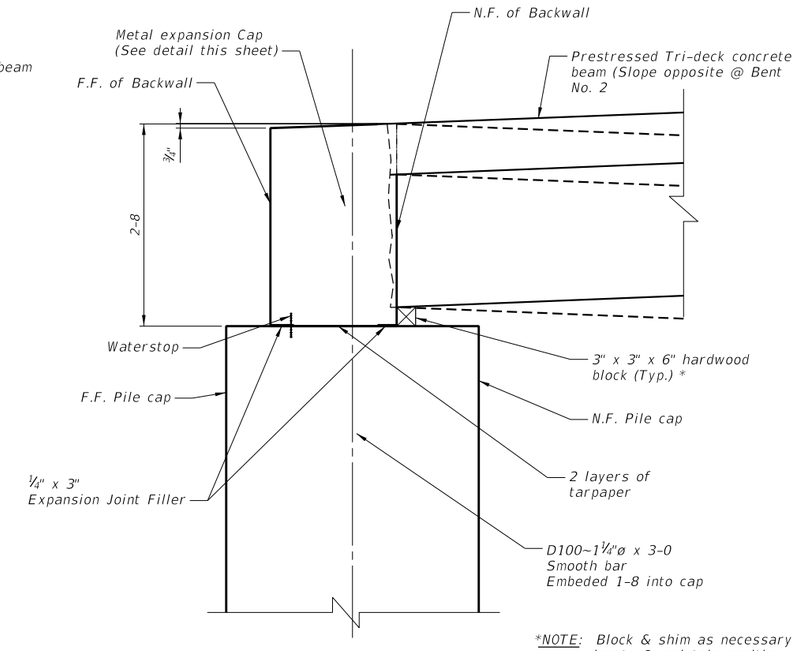
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A B5 **SECTION A**
SCALE: 3/4" = 1-0

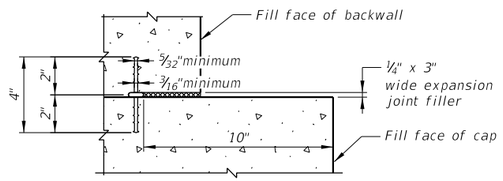


B B5 **SECTION B**
SCALE: 3/4" = 1-0



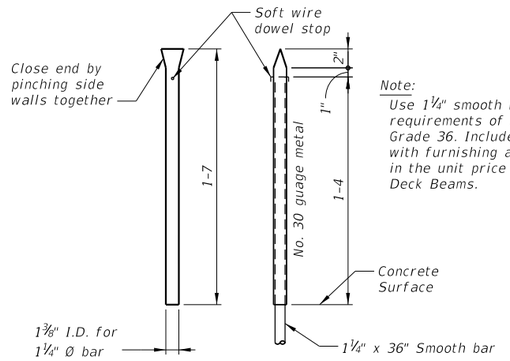
ENLARGED BACKWALL SECTION
SCALE: 1" = 1-0

*NOTE: Block & shim as necessary to accurately locate & maintain position of the Tri-deck sections during the construction of the backwalls.



WATERSTOP DETAIL
No Scale

NOTE: Hold waterstop in accurate position while placing concrete.



Note: Use 1 1/4" smooth bars meeting the requirements of AASHTO M 270 Grade 36. Include all costs associated with furnishing and placing smooth bars in the unit price for Prestressed Tri Deck Beams.

METAL EXPANSION CAP DETAIL
No Scale

SHEET NO. B5

BENT NO. 1 AND NO. 2 SECTIONS

SCALE: As Shown

BRIDGE OVER BIG PORCUPINE CREEK

AT STA. 9+24.72

FEDERAL AID PROJECT STPB 9044(31)

COUNTY ROSEBUD COUNTY

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	DESIGNED	11-15-21	K.F.Y.

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MONTANA DEPARTMENT OF TRANSPORTATION MDT BRIDGE BUREAU

ROUTE L-44-103N

REF POINT 10+0.400

MDT STR. ID 04275

UPN NUMBER 8876000

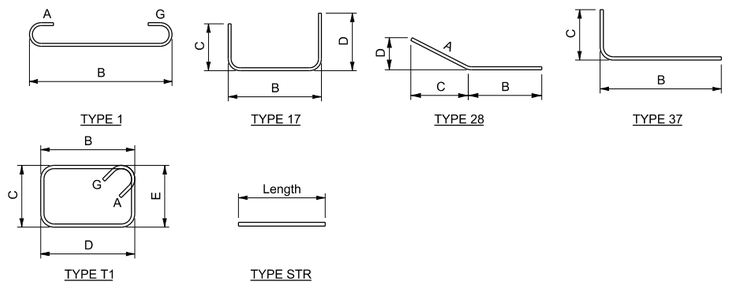
DRAWING NO. 24673

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BILL OF REINFORCING STEEL

BENT NO. 1
(ALL DIMENSIONS ARE OUT TO OUT)



Mark	Size	No.	Type	Length	A	B	C	D	E	G	N
C1	5	78	STR	14-5							
C2	5	73	17	8-0		3-0	2-6	2-6			
C3	6	50	STR	33-5							
C4	6	4	STR	33-9							
C5	6	15	STR	3-0							
C6	5	6	T1	12-4	0-5 1/2	0-10 1/2	4-10	0-10 1/2	4-10	0-5 1/2	
C7	4	70	1	4-0	0-6	3-0				0-6	
C8	7	22	37	6-0		4-4	1-8				
C9	7	24	37	9-2		7-6	1-8				
BW1	5	41	T1	7-8	0-5 1/2	1-3	2-1 1/2	1-3	2-1 1/2	0-5 1/2	
BW2	5	12	STR	33-5							
WW1	5	92	17	7-6 1/2		2-6 1/2	2-6	2-6			
WW2	5	12	STR	17-3							
WW3	5	4	STR	17-1 1/2							
WW4	5	4	STR	16-8							
WW5	5	4	STR	16-2 1/2							
WW6	5	4	STR	15-9 1/2							
WW7	5	4	STR	15-4							
WW8	5	4	STR	14-10 1/2							
WW9	5	4	STR	14-6							
WW10	5	4	STR	14-0 1/2							
WW11	5	4	STR	13-8							
WW12	5	4	STR	13-4							
WW13	5	4	STR	12-10 1/2							
WW14	5	4	STR	12-6							
WW15	5	4	STR	12-0 1/2							
WW16	5	4	STR	11-7 1/2							
WW17	5	4	STR	11-2							
WW18	5	4	STR	10-8 1/2							
WW19	5	4	STR	10-3							
WW20	5	4	STR	9-11 1/2							
WW21	5	4	STR	9-7							
WW22	5	4	STR	9-3							
WW23	5	4	STR	8-11							
WW24	6	4	28	22-8 1/2	19-11 1/2	2-9	18-5 1/2	7-7			
WW25	6	4	STR	3-7 1/2							
WW26	6	4	STR	4-10							
WW27	6	4	STR	6-0 1/2							
WW28	6	4	STR	7-3							
WW29	6	4	STR	8-6							
WW30	6	4	STR	9-8 1/2							
WW31	6	4	STR	10-11							
WW32	6	4	STR	12-1 1/2							
WW33	6	4	STR	13-4 1/2							
WW34	6	4	STR	14-7							
WW35	6	4	STR	15-9 1/2							
WW36	6	4	STR	17-0							
WW37	6	4	STR	18-3							
WW38	6	4	STR	19-5 1/2							
WW39	6	4	STR	20-8							
WW40	6	40	STR	21-3							
WW41	6	4	STR	24-7							
WW42	6	4	STR	22-1							
WW43	6	2	STR	25-6 1/2							
WW44	6	10	STR	3-0							
WW45	6	78	17	7-8 1/2		2-8 1/2	2-6	2-6			
WW46	6	6	17	7-1		0-9	3-2	3-2			

BILL OF REINFORCING STEEL

BENT NO. 2
(ALL DIMENSIONS ARE OUT TO OUT)

Mark	Size	No.	Type	Length	A	B	C	D	E	G	N
C1	5	78	STR	14-5							
C2	5	73	17	8-0		3-0	2-6	2-6			
C3	6	50	STR	33-5							
C4	6	4	STR	33-9							
C5	6	15	STR	3-0							
C6	5	6	T1	12-4	0-5 1/2	0-10 1/2	4-10	0-10 1/2	4-10	0-5 1/2	
C7	4	70	1	4-0	0-6	3-0				0-6	
C8	7	22	37	6-0		4-4	1-8				
C9	7	24	37	9-2		7-6	1-8				
BW1	5	41	T1	7-8	0-5 1/2	1-3	2-1 1/2	1-3	2-1 1/2	0-5 1/2	
BW2	5	12	STR	33-5							
WW61	5	118	17	7-6 1/2		2-6 1/2	2-6	2-6			
WW62	5	16	STR	17-6 1/2							
WW63	5	4	STR	17-6							
WW64	5	4	STR	17-2							
WW65	5	4	STR	16-9							
WW66	5	4	STR	16-4 1/2							
WW67	5	4	STR	15-11 1/2							
WW68	5	4	STR	15-7							
WW69	5	4	STR	15-2							
WW70	5	4	STR	14-9 1/2							
WW71	5	4	STR	14-4 1/2							
WW72	5	4	STR	14-0							
WW73	5	4	STR	13-7 1/2							
WW74	5	4	STR	13-4							
WW75	5	4	STR	13-0							
WW76	5	4	STR	12-7 1/2							
WW77	5	4	STR	12-3							
WW78	5	4	STR	11-10 1/2							
WW79	5	4	STR	11-6							
WW80	5	4	STR	11-1 1/2							
WW81	5	4	STR	10-9							
WW82	5	4	STR	10-4 1/2							
WW83	5	4	STR	10-0							
WW84	5	4	STR	9-7 1/2							
WW85	5	4	STR	9-3							
WW86	5	4	STR	8-10							
WW87	5	4	STR	8-6 1/2							
WW88	5	4	STR	8-3							
WW89	5	4	STR	7-11 1/2							
WW90	6	4	28	29-6	26-9	2-9	24-6 1/2	10-7 1/2			
WW91	6	4	STR	4-3 1/2							
WW92	6	4	STR	5-5							
WW93	6	4	STR	6-7							
WW94	6	4	STR	7-9							
WW95	6	4	STR	8-11							
WW96	6	4	STR	10-1							
WW97	6	4	STR	11-3							
WW98	6	4	STR	12-4 1/2							
WW99	6	4	STR	13-6 1/2							
WW100	6	4	STR	14-8 1/2							
WW101	6	4	STR	15-10							
WW102	6	4	STR	17-0							
WW103	6	4	STR	18-2							
WW104	6	4	STR	19-4							
WW105	6	4	STR	20-5 1/2							
WW106	6	4	STR	21-7 1/2							
WW107	6	4	STR	22-9 1/2							
WW108	6	4	STR	23-11							
WW109	6	4	STR	25-1							
WW110	6	4	STR	26-3							
WW111	6	26	STR	27-4							
WW112	6	6	STR	30-7							
WW113	6	4	STR	28-5							
WW114	6	6	STR	31-9 1/2							
WW115	6	78	17	7-8 1/2		2-8 1/2	2-6	2-6			
WW116	6	16	STR	3-0							
WW117	6	6	17	7-1		0-9	3-2	3-2			

SHEET NO.
B6

BENT & WINGWALL
BILLS OF REINFORCING

SCALE: As Shown

BRIDGE OVER
BIG PORCUPINE CREEK

AT STA.
9+24.72

FEDERAL AID PROJECT
STPB 9044(31)

COUNTY
ROSEBUD COUNTY

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REVISED				DRAWN	11-15-21	P.K.S.
REVISED				DESIGNED	11-15-21	K.F.Y.
REVISED				...\8876000\BR\8876000brBNT206.dgn		
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MONTANA DEPARTMENT OF TRANSPORTATION MDT BRIDGE BUREAU

ROUTE
L-44-103N

REF POINT
10+0.400

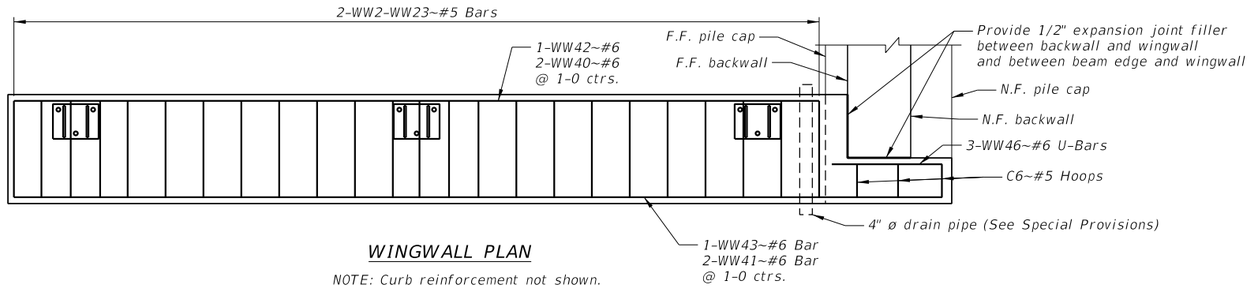
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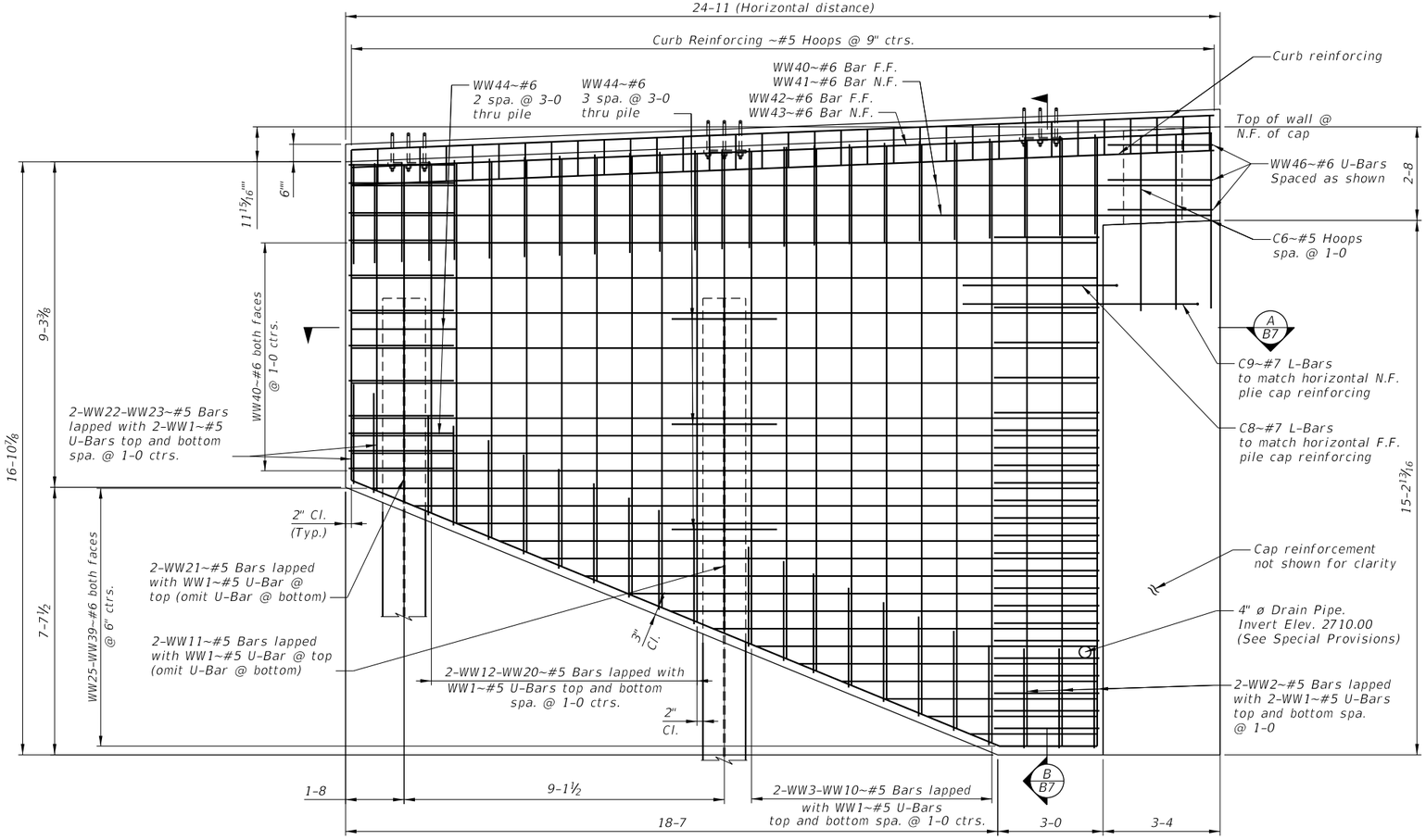
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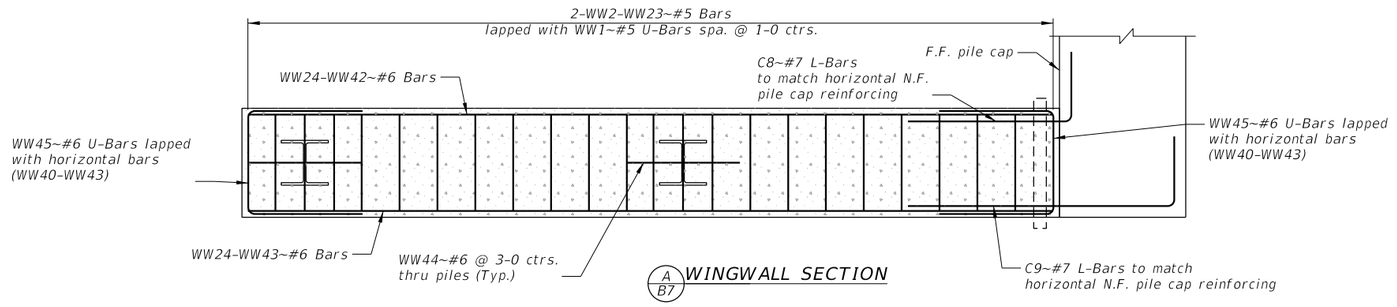


WINGWALL PLAN

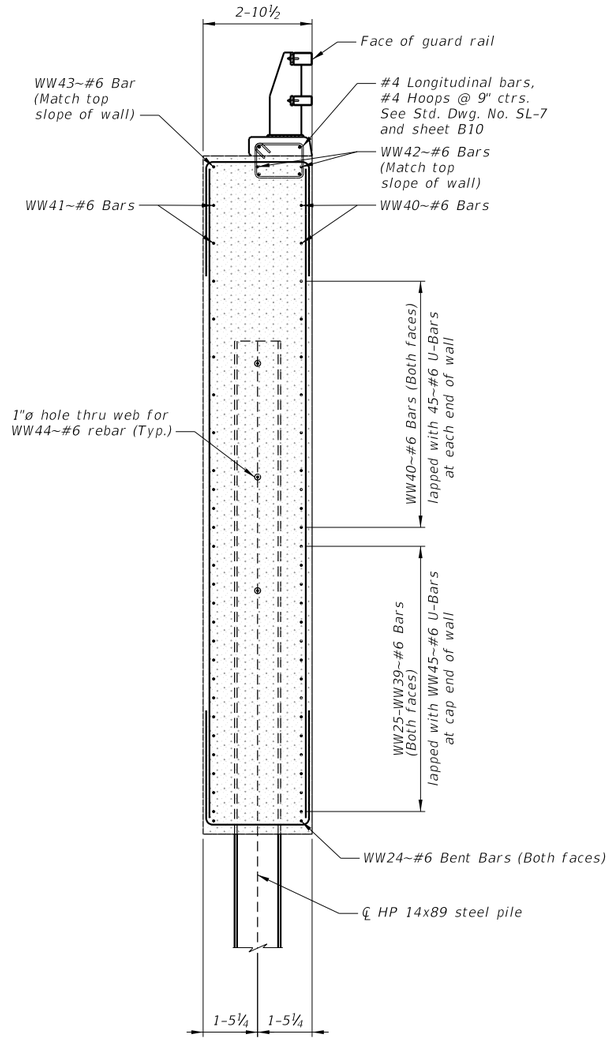
NOTE: Curb reinforcement not shown.



ELEVATION



A B7 WINGWALL SECTION



B B7 WINGWALL SECTION

NOTE:
Lap vertical wingwall bars (WW2-WW23) with WW1 U-Bars at both top and bottom of wall. Omit U-bars at bottom of wall at pile locations.

Lap horizontal wingwall bars (WW25-WW39) with WW45 U-Bars at wingwall-cap interface. Lap horizontal wingwall bars (WW40-WW43) with WW45 U-Bars at both ends of wall.

SHEET NO. B7

BENT NO. 1
WINGWALL DETAILS

SCALE: 1/2" = 1-0

BRIDGE OVER
BIG PORCUPINE CREEK

AT STA.
9+24.72

FEDERAL AID PROJECT
STPB 9044(31)

COUNTY
ROSEBUD COUNTY

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BRIDGE BUREAU

ROUTE
L-44-103N

REF POINT
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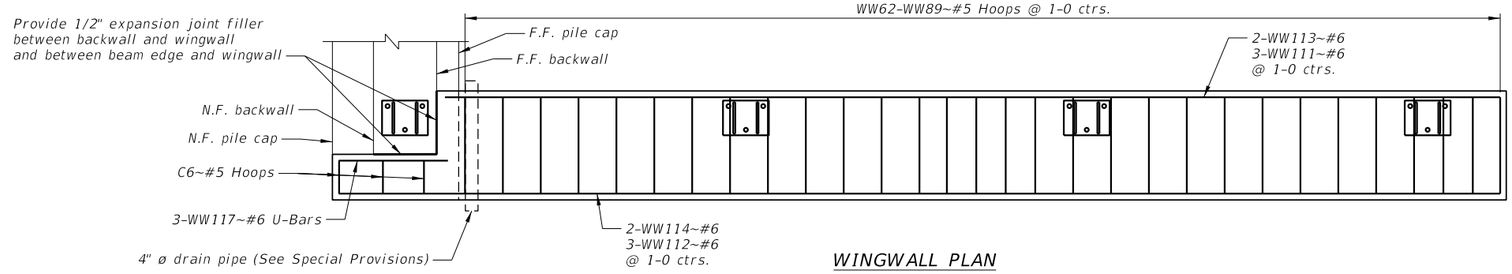
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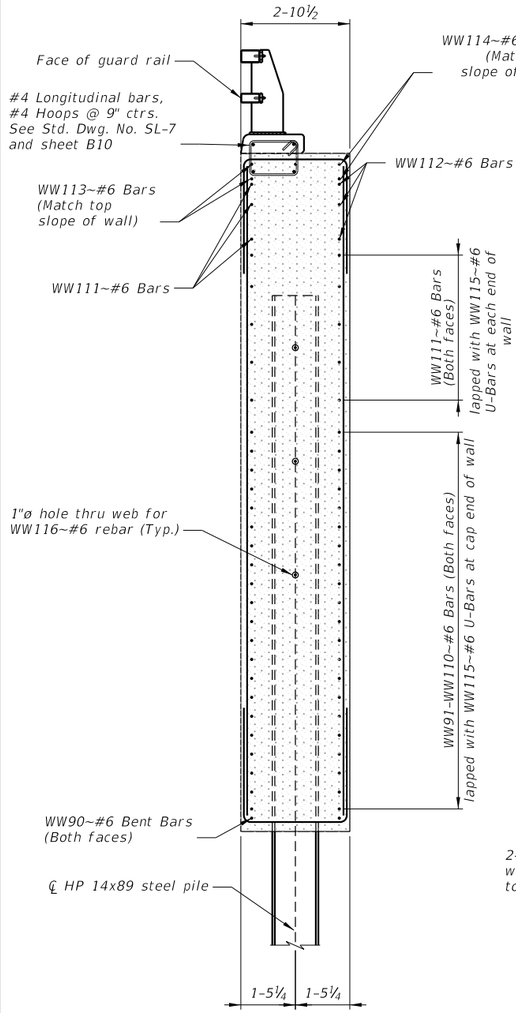
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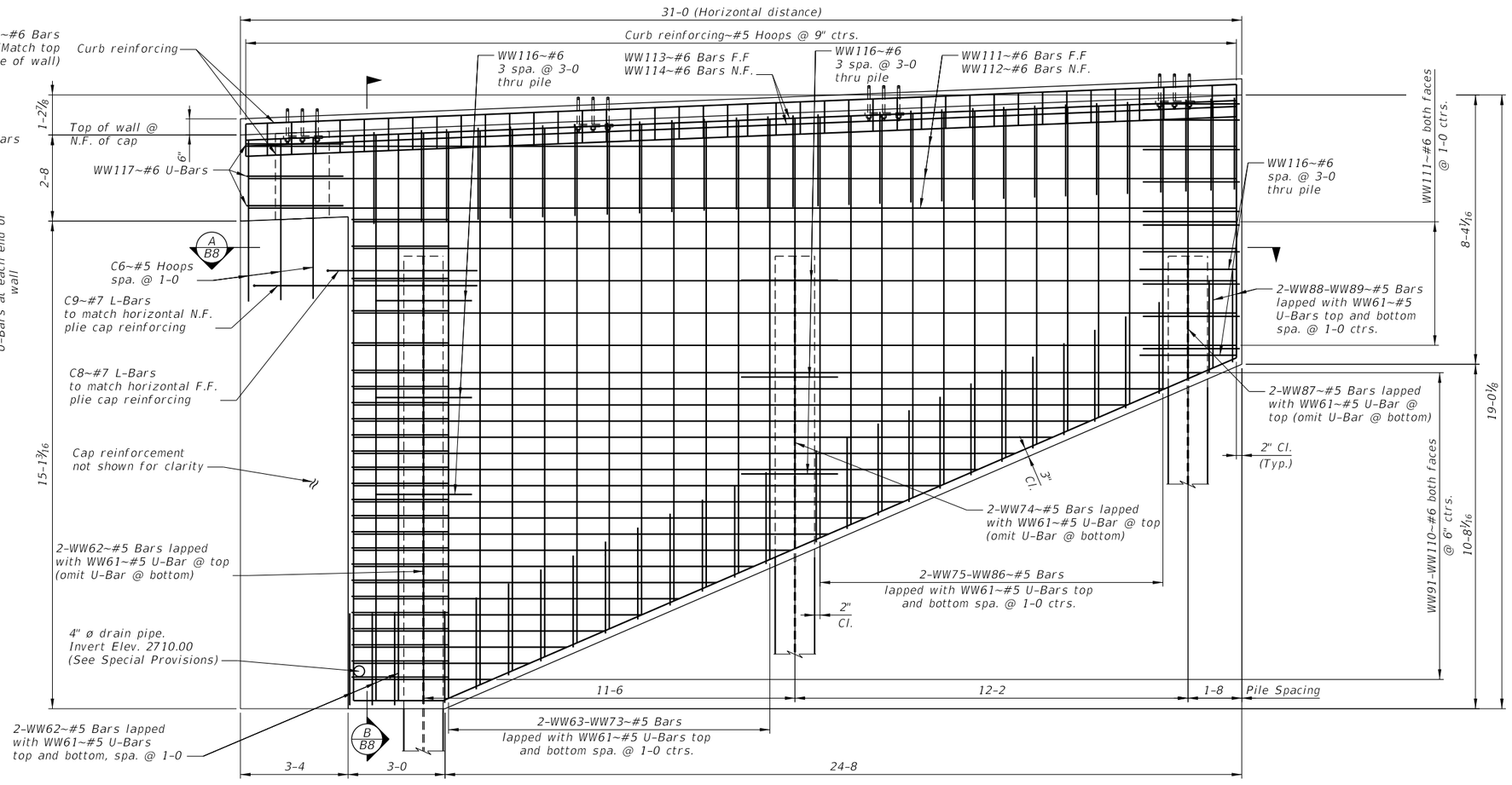


WINGWALL PLAN

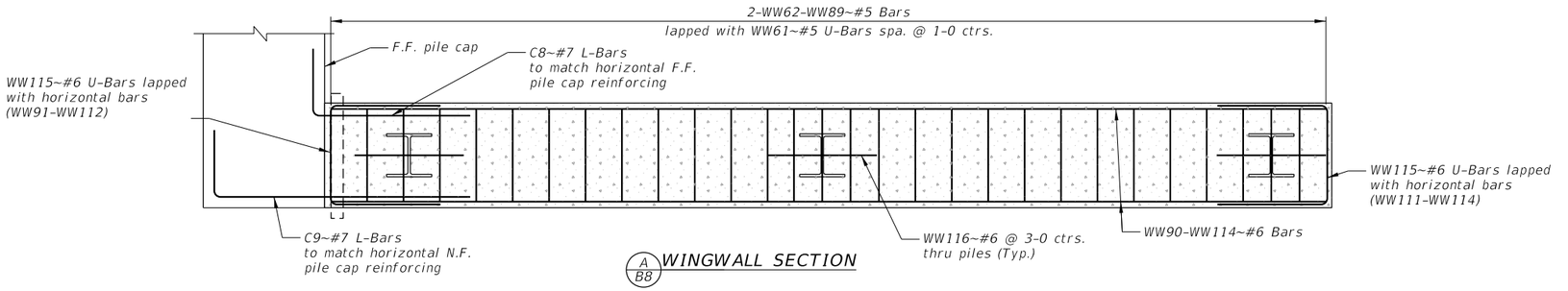
NOTE: Curb reinforcement not shown.



B/B8 WINGWALL SECTION



ELEVATION



A/B8 WINGWALL SECTION

NOTE:
Lap vertical wingwall bars (WW62-WW89) with WW61 U-Bars at both top and bottom of wall. Omit U-bars at bottom of wall at pile locations.

Lap horizontal wingwall bars (WW91-WW110) with WW115 U-Bars at wingwall-cap interface. Lap horizontal wingwall bars (WW111-WW114) with WW115 U-Bars at both ends of wall.

SHEET NO. B8

BENT NO. 2
WINGWALL DETAILS

SCALE: 1/2" = 1-0

BRIDGE OVER
BIG PORCUPINE CREEK

AT STA.
9+24.72

FEDERAL AID PROJECT
STPB 9044(31)

COUNTY
ROSEBUD COUNTY

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REVISED					P.K.S.	
REVISED				11-15-21	K.F.Y.	
REVISED				11-15-21		
CHECKED				11-15-21		
DRAWN						
DESIGNED						

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MONTANA DEPARTMENT OF TRANSPORTATION
BRIDGE BUREAU

ROUTE
L-44-103N

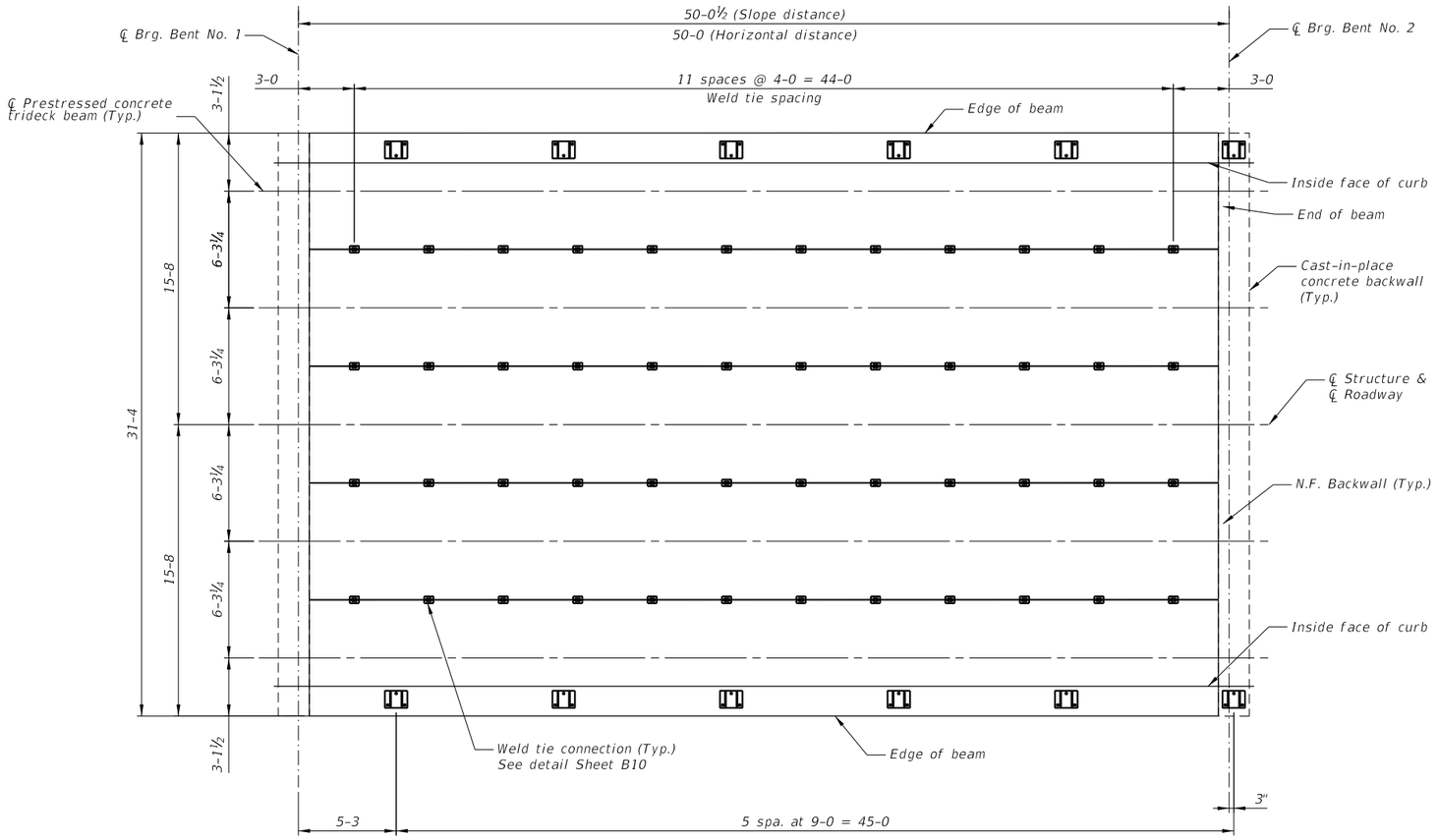
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MDT STR. ID
04275

UPN NUMBER
8876000

DRAWING NO.
24676

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ERECTION PLAN

Scale: 1/4" = 1-0

PRESTRESSED BEAM DESIGN PARAMETERS	
AASHTO Specifications	LRFD 9th edition with current interims
Structure Type	Simple Span for all loads.
Deck Concrete Strength	N/A
Deck Concrete Density	N/A
Prestressing Strand	270 ksi Low Relaxation - (0.500" or 0.600" diameter)
Shear Reinforcing	AASHTO M 31 Grade 60
Alternate Shear Reinforcing	Welded Wire Reinforcement - AASHTO M55, M221, or MS4
Section Property Calculations	Gross Section
Prestress Loss Method	Approximate Losses per LRFD 5.9.5 and 5.9.5.3
Shear Computation Method	Sectional Model per LRFD 5.8.3
Beam / Slab Interface	N/A
Load Rating Requirements	AASHTO LRFR Design Load

PRESTRESSED BEAM LOAD TABLE		
LOAD TYPE	LOADS	APPLICATION METHOD
Barrier Load	0.173 kip/ft per rail	Exterior beam
Future Wearing Surface	28 lb/ft^2 applied between curbs	Tributary Area
Additional Dead Load	--------	--------
Live Load	LRFD - HL-93	per AASHTO LRFD

NOTES

PRESTRESSED CONCRETE TRI DECK BEAMS: Fabricate the prestressed concrete tri deck beams in accordance with the details shown on this drawing, Sheet No. B10, and SBR-W830. Maximum f'c (Compressive strength of concrete in 28 days (for design) is 7000 p.s.i.). Design and fabricate beams to support the dead loads and live loads and provide a minimum ultimate moment capacity based on the design parameters shown on this sheet. Show stresses in the beam under each loading condition that is anticipated in the manufacturing, handling, and service life of the beam. All values shown in the table above are based on the beam sections shown on sheet B10. Alternate beam sections will be allowed provided they meet the requirements of these plans and the Special Provisions.

PRESTRESSING STEEL: Use 0.500" diameter or 0.600" diameter, 7 wire strand prestressing steel.

HARDWARE: Threaded inserts, hold down devices, lifting devices and any other hardware which is to be incorporated in the beam will be approved by the Engineer before fabrication is begun.

BEAM LENGTH: Increase the overall length of the beam to allow for elastic shortening, shrinkage and creep.

REINFORCING STEEL: See General Layout.

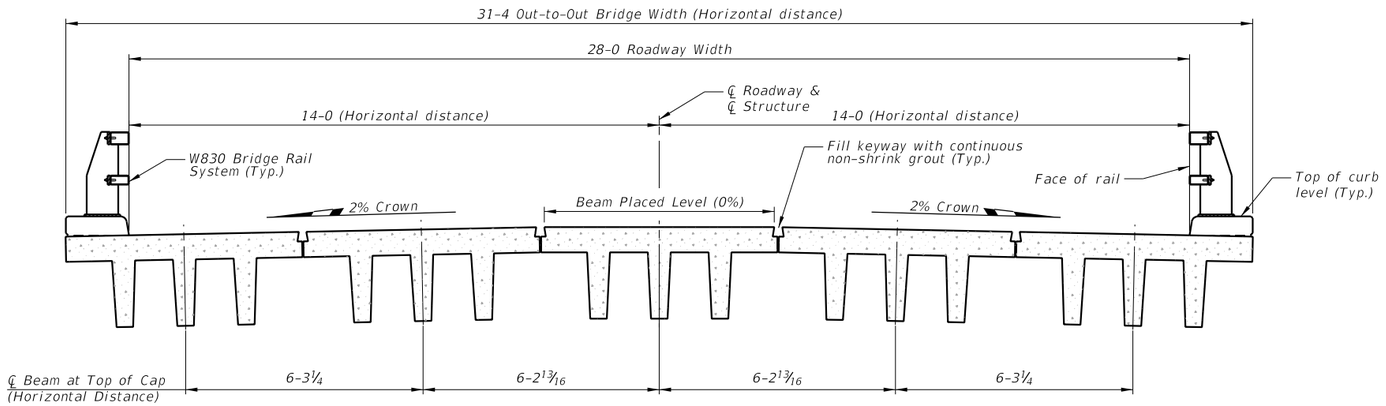
SHEAR REINFORCING: Fabricator will provide shear and end reinforcement to meet the requirements of the AASHTO code specified on the General Layout.

PAYMENT: Include all costs to furnish and install smooth bars, metal expansion caps and embedded plates in the unit price bid for Prestressed Tri Deck Beams.

FABRICATOR NOTE: Apply rail loads to the exterior beam only. Broom finish the top surface of the beam in accordance with Subsection 552.03.12(C) of the Standard Specifications.

VARIATIONS: Variations in the general shape of the deck width of span lengths from those shown on the Bridge drawings are not allowed without the approval of the Engineer. Obtain approval from the Engineer for any variation requiring the alteration of backwall and sleeve spaces as shown on the Bridge drawings.

NOTE: For Bridge Rail - W830 curb Concrete-Class Structure or Concrete-Class Pre may be used in lieu of Concrete-Class Structure Low Slump at no additional cost.



TYPICAL BRIDGE SECTION

Scale: 1/2" = 1-0

NOTE: The beam spacing varies from that along the top flanges due to the tilt of beams to match the roadway crown.

SHEET NO. B9

ERECTION PLAN

SCALE: As Shown

BRIDGE OVER BIG PORCUPINE CREEK

AT STA. 9+24.72

FEDERAL AID PROJECT STPB 9044(31)

COUNTY ROSEBUD COUNTY

REVISED			CHECKED	11-15-21	G.C.G.
REVISED			DRAWN	11-15-21	P.K.S.
REVISED			DESIGNED	11-15-21	K.F.Y.

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MONTANA DEPARTMENT OF TRANSPORTATION MDT BRIDGE BUREAU

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ROUTE L-44-103N

REF POINT 10+0.400

MDT STR. ID 04275

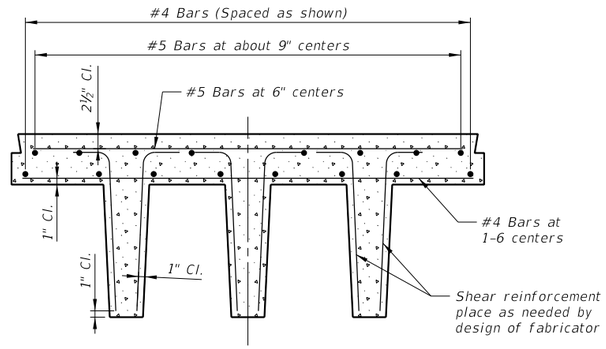
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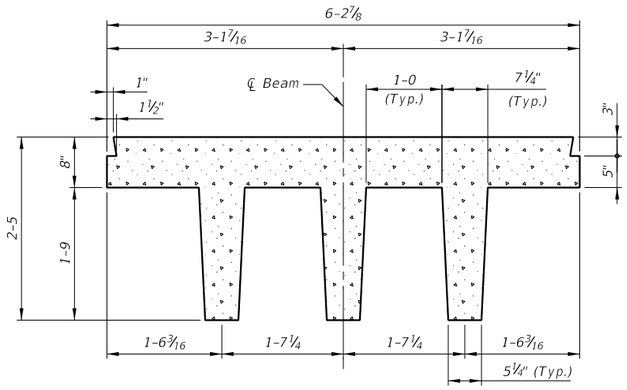
NOTE: Extend top longitudinal bars 2-6 beyond end of beam at end bents.



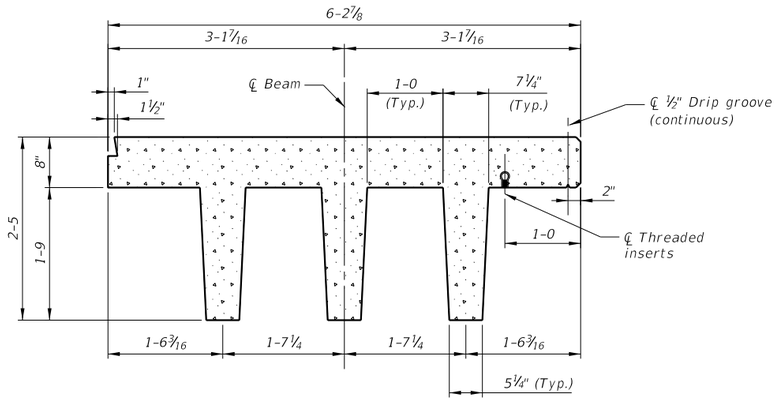
REINFORCING PLACEMENT DETAIL

Interior Beam reinforcing steel shown
Exterior Beam reinforcing steel similar

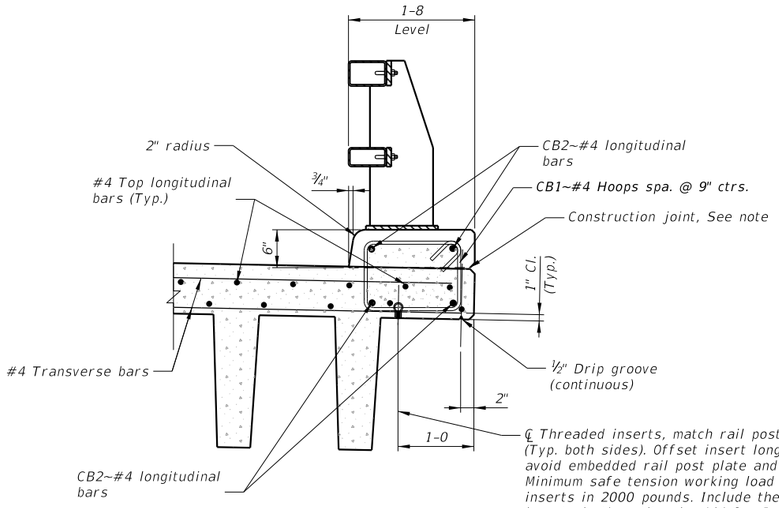
NOTE: Provide ⅝" Ø threaded inserts. Match the rail post spacing (Typ. both sides). Offset the insert longitudinally to avoid the embedded rail post plate and reinforcing. Minimum safe tension working load (capacity) for inserts is 2000 pounds. Include the cost of the inserts in the unit price bid for Prestressed Tri Deck Beams.



INTERIOR BEAM SECTION



EXTERIOR BEAM SECTION



NOTE: Plant cast curb. Do not place curb concrete for at least 72 hours after castng beam.

NOTE: Provide level top of curb in final position. maintain 6-inch face of curb dimension shown. Construction joint below curb may be parallel to top of curb of finished grade; clearly indicate casting approach on shop drawings. Vary #4 curb hoop leg dimension with slab thickness to maintain clearance.

NOTE: Clearly note any adjustments to reinforcing on shop drawings.

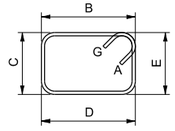
NOTE: provide ½" joint in curb at edge of backwall at each bridge end. Joint to use performed expansion joint filler.

℄ Threaded inserts, match rail post spacing (Typ. both sides). Offset insert longitudinally to avoid embedded rail post plate and reinforcing. Minimum safe tension working load (capacity) for inserts in 2000 pounds. Include the cost of inserts in the unit price bid for Prestressed Tri Deck Beams.

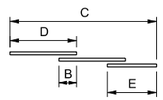
Note: Provide level top of curb. Maintain 6-inch face of curb parallel to top of curb or finished grade.

CURB REINFORCING AND SLAB EDGE DETAIL

BILL OF REINFORCING STEEL — CURB SECTION (SINGLE CURB LINE) - FOR INFORMATION ONLY
(ALL DIMENSIONS ARE OUT TO OUT)



TYPE T1



N = Number of Laps

TYPE 27

Mark	Size	No.	Type	Length	A	B	C	D	E	G	N
CB1	4	138	T1	5-3	0-4 1/2	1-4	0-11	1-4	0-11	0-4 1/2	
CB2	4	4	27	102-7		2-0		60-0	44-7		1

NOTE: Include all costs for furnishing and placing curb reinforcing steel in unit price bid for Prestressed Tri Deck Beams.

SHEET NO. B10

TRI-DECK BEAM DETAILS

SCALE: 1" = 1-0 Except As Noted

BRIDGE OVER BIG PORCUPINE CREEK

AT STA. 9+24.72

FEDERAL AID PROJECT STPB 9044(31)

COUNTY ROSEBUD COUNTY

REVISED		CHECKED	11-15-21 G.C.G.
REVISED		DRAWN	11-15-21 P.K.S.
REVISED		DESIGNED	11-15-21 K.F.Y.

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ROUTE L-44-103N

REF POINT 10+0.400

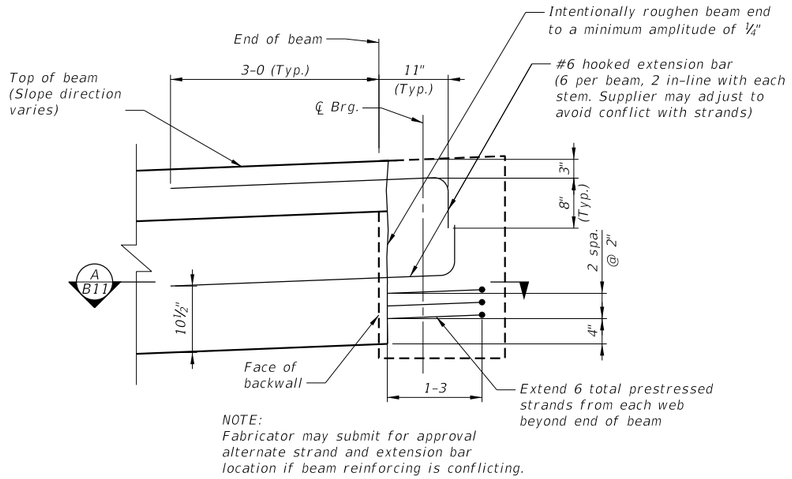
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UPN NUMBER 8876000

DRAWING NO. 24678

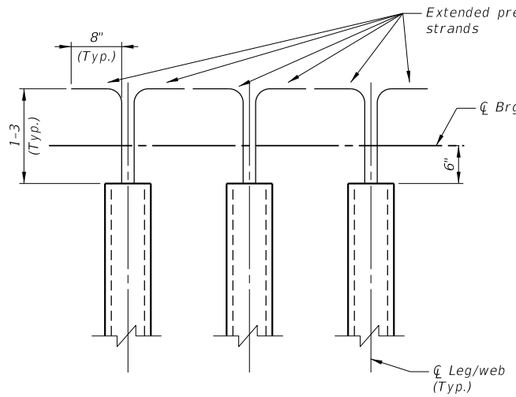
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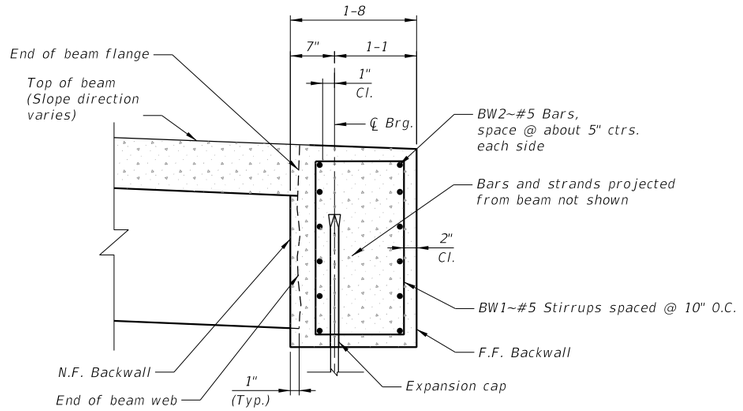


NOTE:
Fabricator may submit for approval alternate strand and extension bar location if beam reinforcing is conflicting.

BEAM END DETAIL
Scale: 1" = 1-0



A B11 SECTION A
Scale: 1" = 1-0

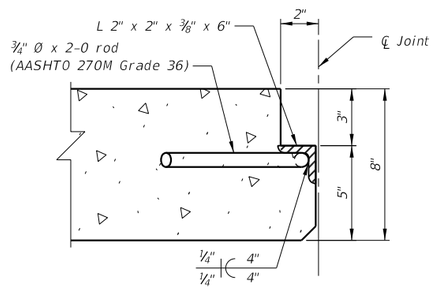


B B11 BACKWALL SECTION
Scale: 1" = 1-0

SECTION B

PLAN VIEW

WELD TIE CONNECTION DETAILS
No Scale



TRI-DECK JOINT CONNECTION DETAIL
No Scale

SHEET NO. B11

MISCELLANEOUS DETAILS

SCALE: As Shown

BRIDGE OVER
BIG PORCUPINE CREEK

AT STA.
9+24.72

FEDERAL AID PROJECT
STPB 9044(31)

COUNTY
ROSEBUD COUNTY

	REVISED	REVISED	REVISED	REVISED	CHECKED	DRAWN	DESIGNED
					11-15-21	11-15-21	11-15-21
					G.C.G.	P.K.S.	K.F.Y.

MONTANA DEPARTMENT OF TRANSPORTATION BRIDGE BUREAU

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ROUTE
L-44-103N

REF POINT
10+0.400

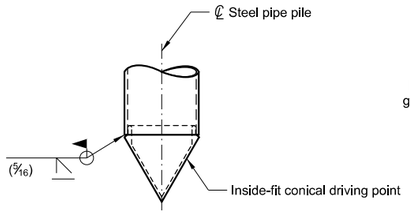
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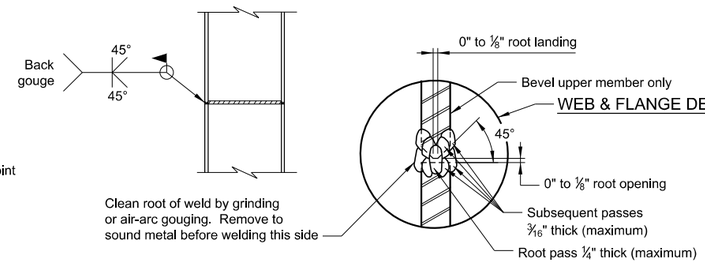
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CONICAL DRIVING POINT WELD DETAIL

Slip driving point inside pipe.

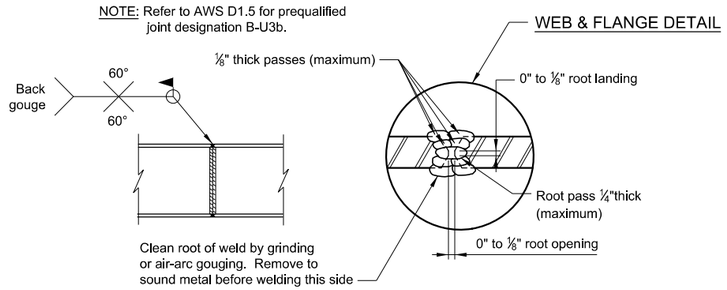
NOTE: Refer to AWS D1.5 for prequalified joint designation B-U5a.



PILE EXTENSION AFTER DRIVING

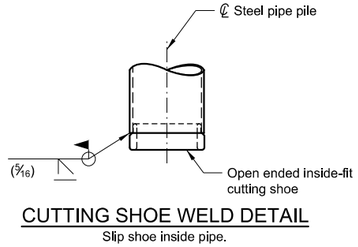
(Pile Vertical)

NOTE: Refer to AWS D1.5 for prequalified joint designation B-U3b.



PILE EXTENSION BEFORE DRIVING

WELDED SPLICES FOR STEEL HP PILES



CUTTING SHOE WELD DETAIL

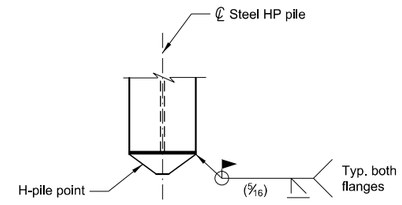
Slip shoe inside pipe.

NOTES

PILE SPLICES: Use only E7018 series electrodes. Prepare the weld surfaces to a smooth, uniform finish. Remove all fins, tears, loose scale, slag, rust, grease, moisture and other material that would prevent proper welding.

PILE TIPS: Use only E7018 series electrodes to attach pile tips.

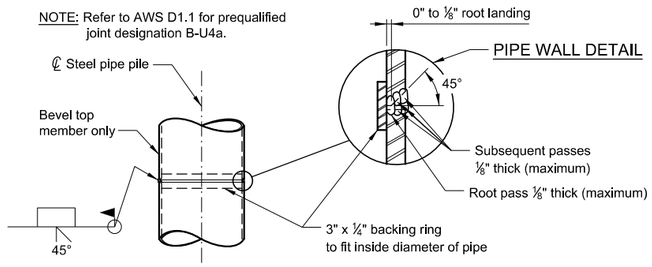
PILE TYPE: See Footing Plan sheets for correct pile type, pile tip and pile tip elevations.



H-PILE POINT WELD DETAIL

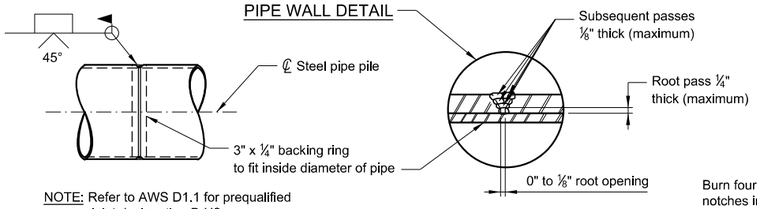
Do not weld web or inside of flanges.

NOTE: Refer to AWS D1.1 for prequalified joint designation B-U4a.



PILE EXTENSION AFTER DRIVING

(Pile Vertical)



NOTE: Refer to AWS D1.1 for prequalified joint designation B-U2a.

PILE EXTENSION BEFORE DRIVING

WELDED SPLICES FOR STEEL PIPE PILES

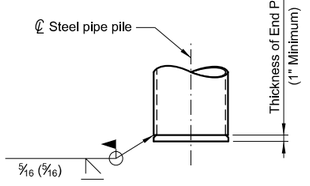
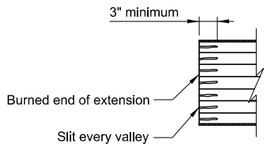


PLATE END WELD DETAIL

Align plate with outside of pipe.

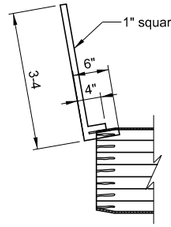
FIRST STEP:

Burn or cut slits in valleys.



SECOND STEP:

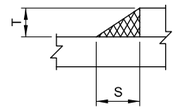
Crimp with tool or use sledge.



THIRD STEP:

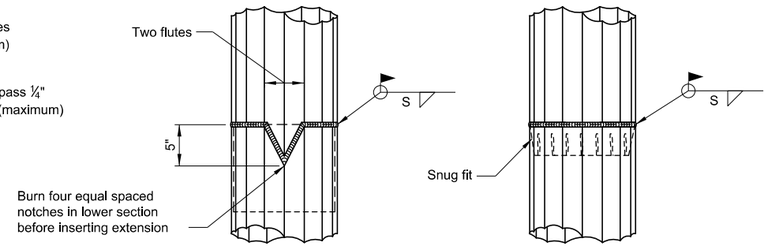
Insert field crimped end into pile to be extended. Fit snug and weld.

Gage of Pile T	Weld Size S
9 gage (0.1495")	1/4"
7 gage (0.1793")	5/16"
5 gage (0.2092")	5/16"
3 gage (0.2391")	3/8"



FIELD CRIMPING DETAIL FOR CUT-OFF EXTENSIONS

NOTE: Refer to AWS D1.1 for weld requirements.



FACTORY CRIMPED EXTENSION

FIELD CRIMPED EXTENSION

WELDED SPLICES FOR STEEL FLUTED PILES

STANDARD PILE SPLICE DETAILS AND PILE TIPS

No Scale

MDT MONTANA DEPARTMENT OF TRANSPORTATION

BRIDGE BUREAU

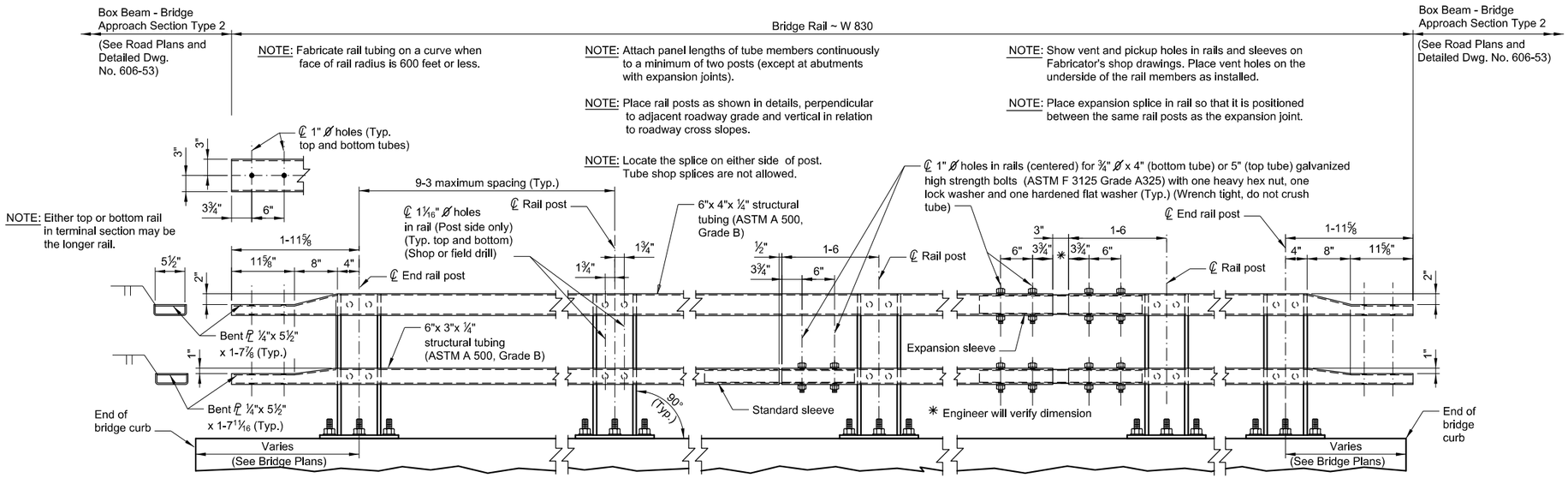
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$DATE$	$TIME$	$FILEABBREV$

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ELEVATION AT BOX BEAM GUARDRAIL CONNECTION

NOTE: Do not provide a tube splice in first panel unless it crosses an expansion joint.

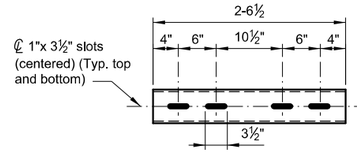
STANDARD SPLICE

(Top or bottom rail)

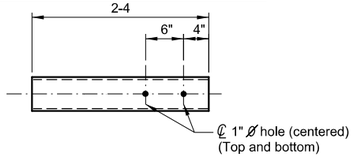
EXPANSION SPLICE

(Top and bottom rail)

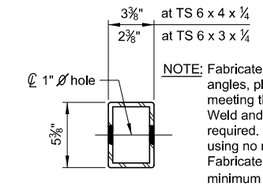
INSIDE ELEVATION OF RAIL



EXPANSION SLEEVE DETAIL



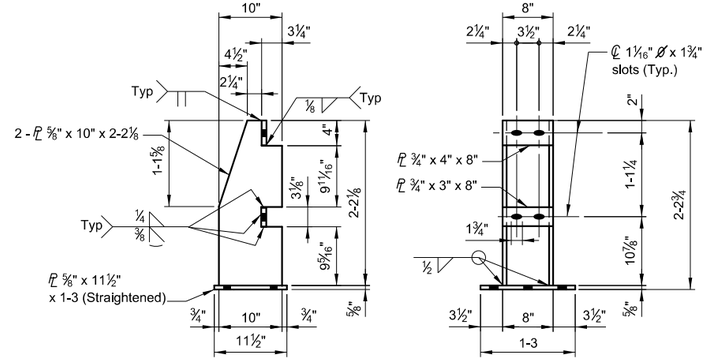
STANDARD SLEEVE DETAIL



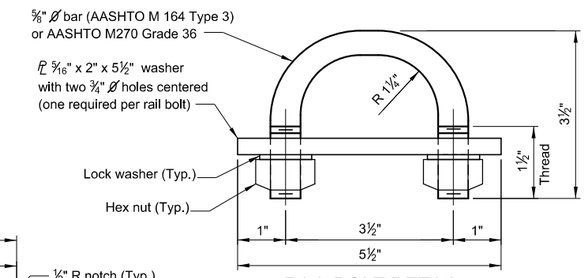
NOTE: Fabricate sleeves using channels, angles, plates, or bent plates meeting the dimensions shown. Weld and grind smooth as required. Fabricate sleeves using no more than four welds. Fabricate sleeves with a minimum wall thickness of 3/16".

SLEEVE FABRICATION OPTIONS

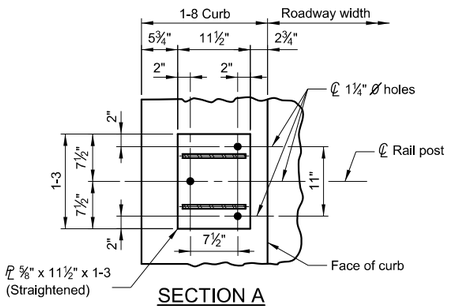
POST ASSEMBLY DETAIL



POST DETAILS

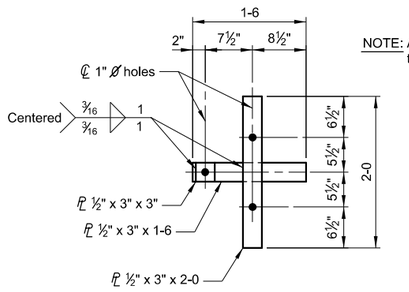


RAIL BOLT DETAIL



SECTION A

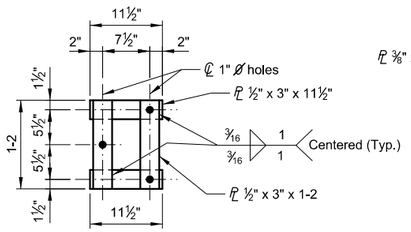
(Anchor bolts not shown)



NOTE: Anchor bolts may be tack welded to anchorage (shop or field).

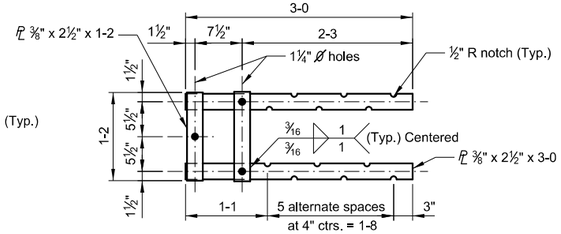
VIEW B

(Showing lower anchorage)
(Do not galvanize)
(Anchor bolts not shown)



VIEW B (U-TYPE BENT)

(Do not galvanize)
(Anchor bolts not shown)



VIEW B

(Showing upper anchorage)
(Do not galvanize)
(Anchor bolts not shown)

NOTES

GALVANIZING: Galvanize all bolts, nuts, washers and pipe sleeves in accordance with ASTM F 2329.

REFLECTORS: Place a white reflector on top of the top tube rail at equal spacing (not to exceed 30 foot spacing) between ends of rail. See Dtl. Dwg. No. 605-00 for reflector detail. Mount the reflector on the tube rail with an approved adhesive. Include the cost of reflector in the unit price bid for Bridge Rail ~ W830.

PAYMENT: Payment for Bridge Rail ~ W830 per linear foot includes compensation for the cost of Concrete Class Deck in the curb and for all resources necessary to complete the work. See the General Layout for the number of linear feet for payment of Bridge Rail ~ W830. Use rail post plates and base plates conforming to AASHTO M 270 Grade 36 T3. Use AASHTO M 270 Grade 36 for all other plates.

ERECTION: Place rail posts as shown in details, perpendicular to adjacent roadway grade and vertical in relation to roadway cross slopes. Place posts in proper alignment prior to placement of curb.

PAINTING: Paint all posts, structural tubing and plates (except as noted) in accordance with the Standard Specifications. Galvanizing the posts, structural tubing and plates in accordance with AASHTO M 111 will be allowed.

EXCEPTIONS: Use details shown on this drawing only as they apply to the project. Anchorage details may vary. Refer to other drawings for variations in these details.

FABRICATION: For the purposes of fabrication, this rail system is considered an ancillary item. The requirements of subsection 1.3.7 of AASHTO/AWS D1.5 apply.

RAIL WEIGHT: For informational purposes only, the rail weight is approximately 123.0 lb/ft for the curb and 50.0 lb/ft for the rail.

STANDARD BRIDGE RAIL TYPE W830

No Scale

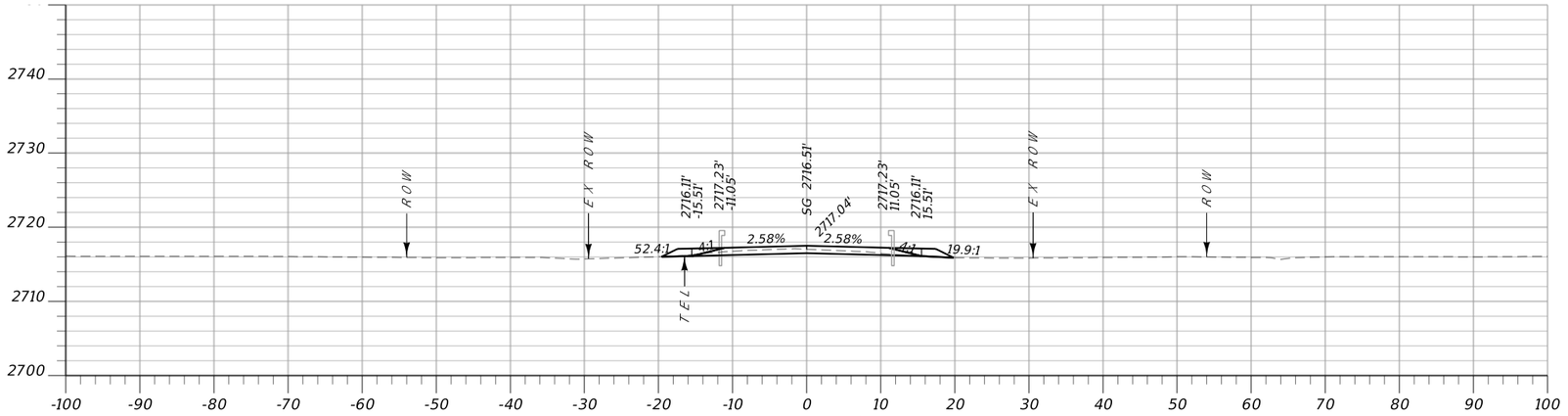
MDT MONTANA DEPARTMENT OF TRANSPORTATION — BRIDGE BUREAU

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REVISED	5-20-14	D.F.J.	
REVISED	2-1-11	D.F.J.	
APPROVED	3-26-08	D.F.J.	
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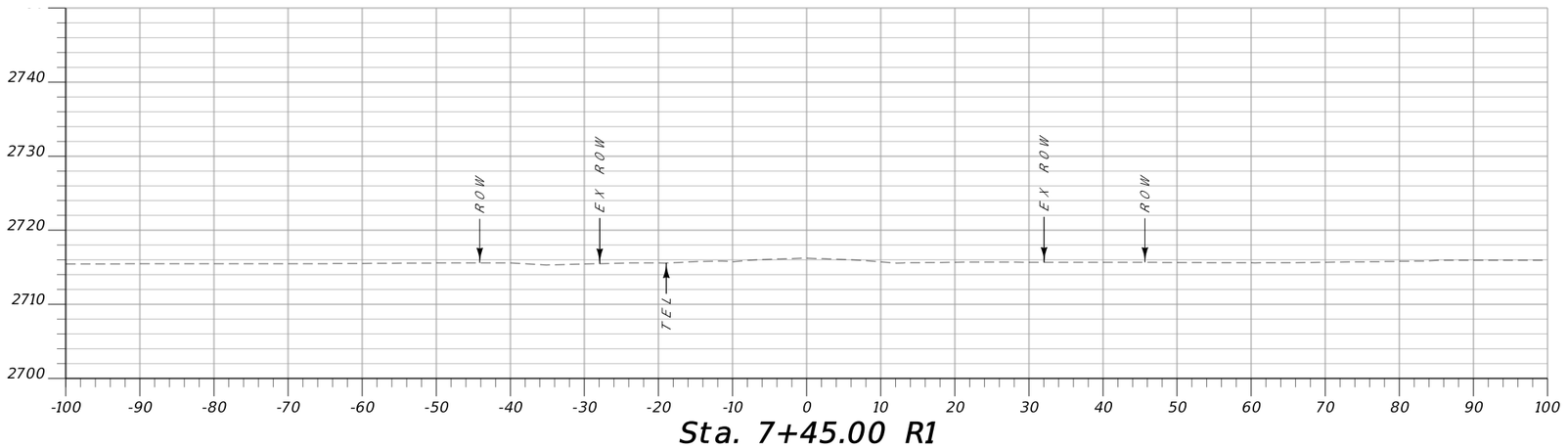
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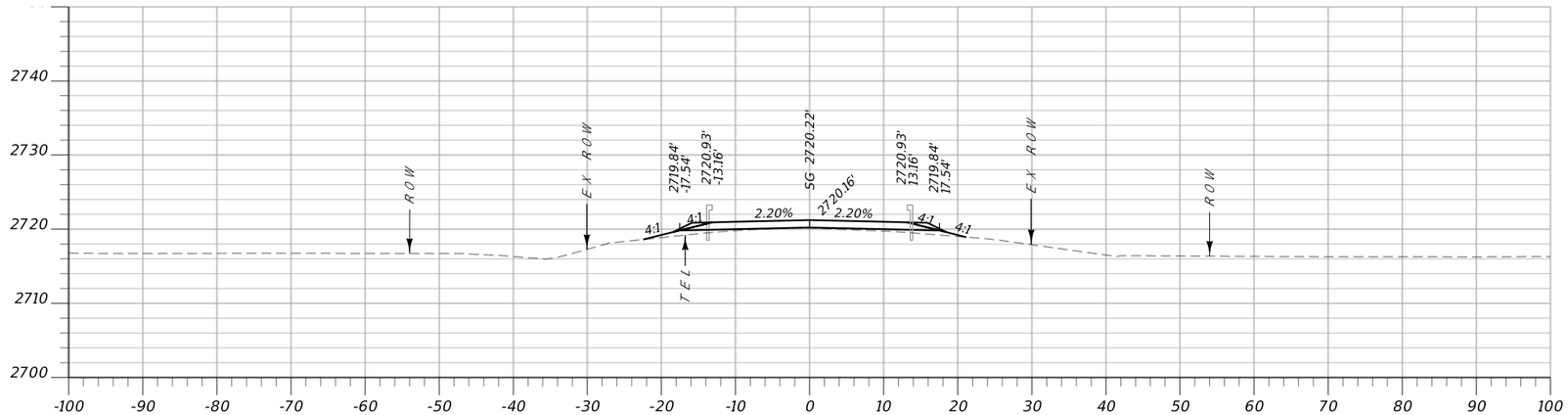


Sta. 7+45.00 R1

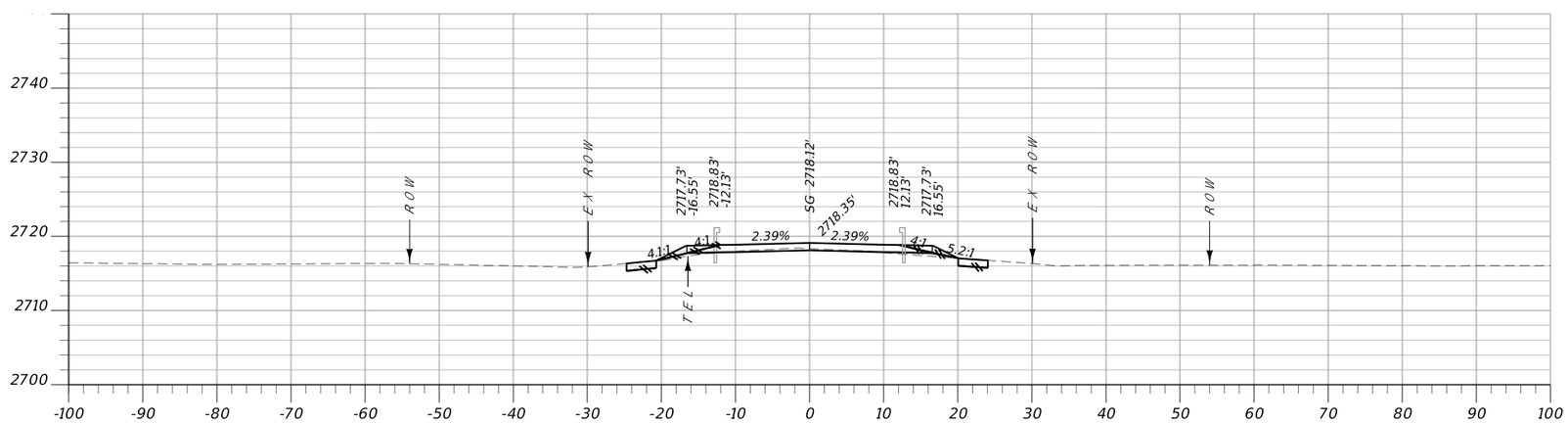
MDT MONTANA DEPARTMENT OF TRANSPORTATION	C:\DGN\8876000rdlay001.dgn	DESIGNED BY A. DELAHUNT 12/20/2021	MAINLINE CROSS SECTIONS		BIG PORCUPINE CR - 12 M E INGOMAR	STPB 9044(31)
	12/27/2021	REVIEWED BY M. CAIL 12/20/2021				
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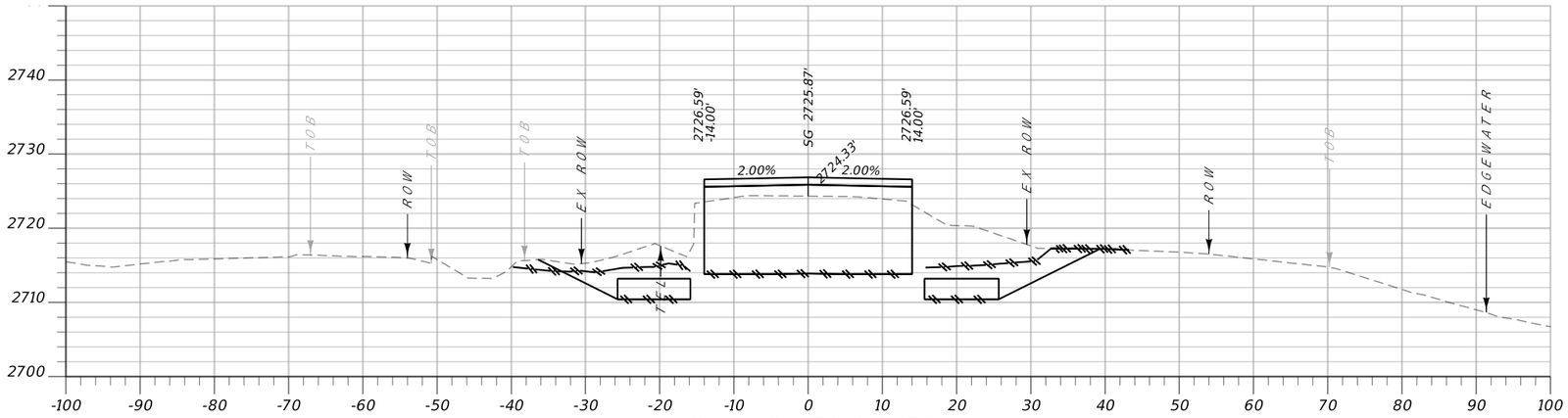
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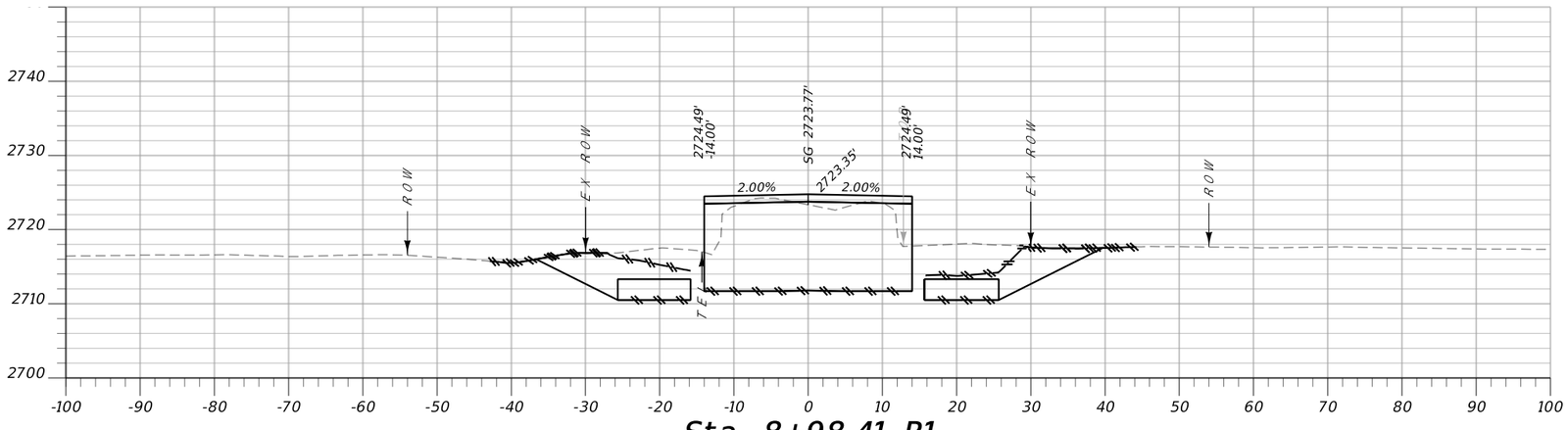
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MDT MONTANA DEPARTMENT OF TRANSPORTATION	C:\DGN\8876000rdlay001.dgn	DESIGNED BY A. DELAHUNT 12/20/2021	MAINLINE CROSS SECTIONS		BIG PORCUPINE CR - 12 M E INGOMAR	STPB 9044(31)
	12/27/2021	REVIEWED BY M. CAIL 12/20/2021				
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Sta. 9+51.04 R1

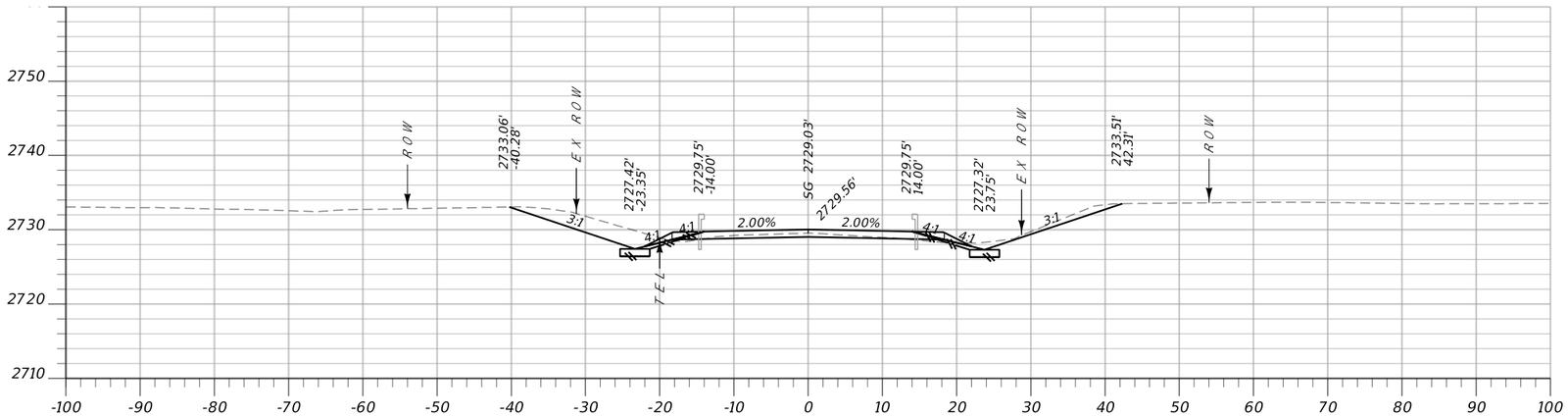


Sta. 8+98.41 R1

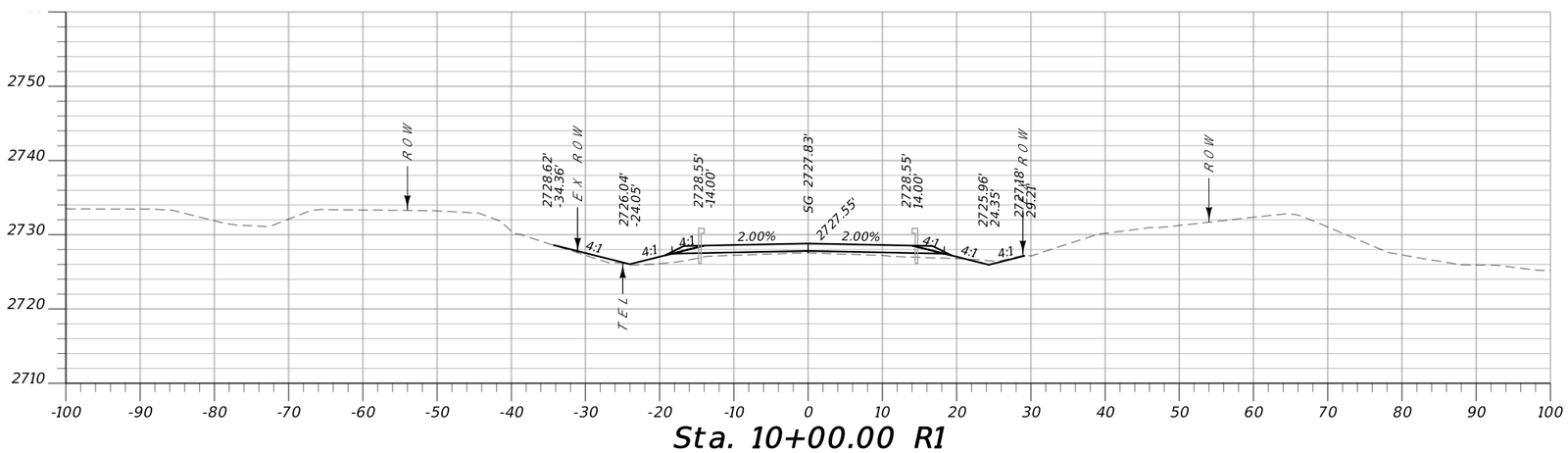
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	12/27/2021	REVIEWED BY M. CAIL	12/20/2021			
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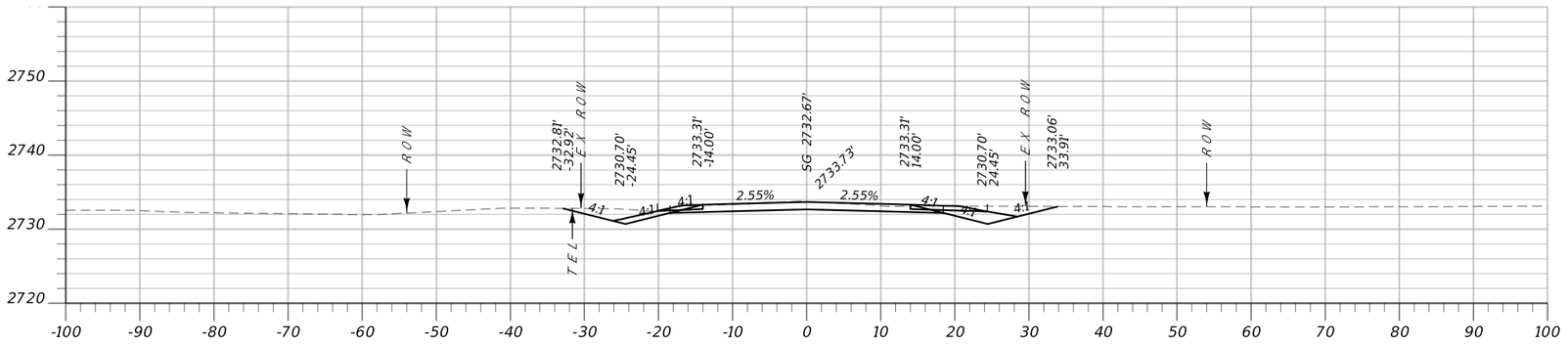
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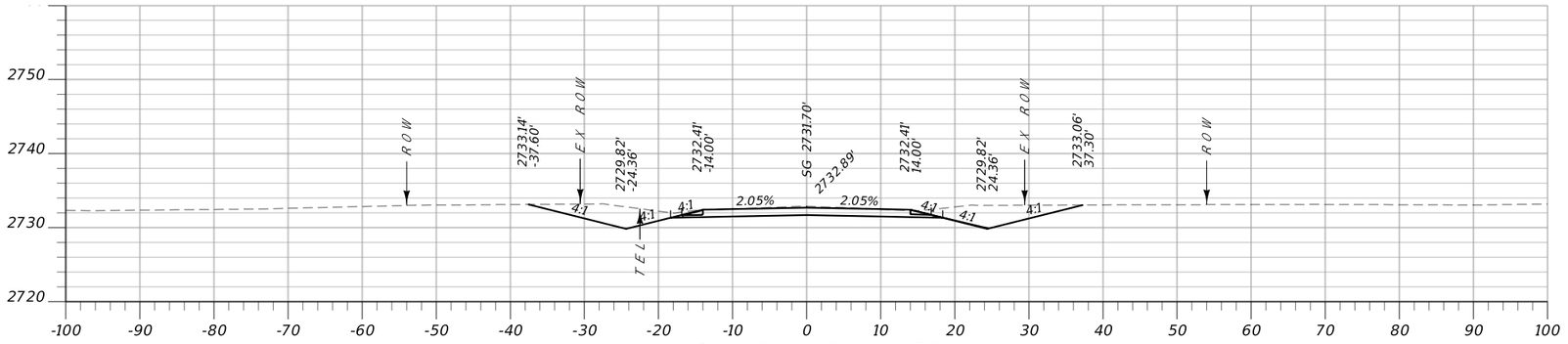
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MDT MONTANA DEPARTMENT OF TRANSPORTATION	C:\DGN\8876000rdlay001.dgn	DESIGNED BY A. DELAHUNT 12/20/2021	MAINLINE CROSS SECTIONS		BIG PORCUPINE CR - 12 M E INGOMAR	STPB 9044(31)
	12/27/2021	REVIEWED BY M. CAIL 12/20/2021				
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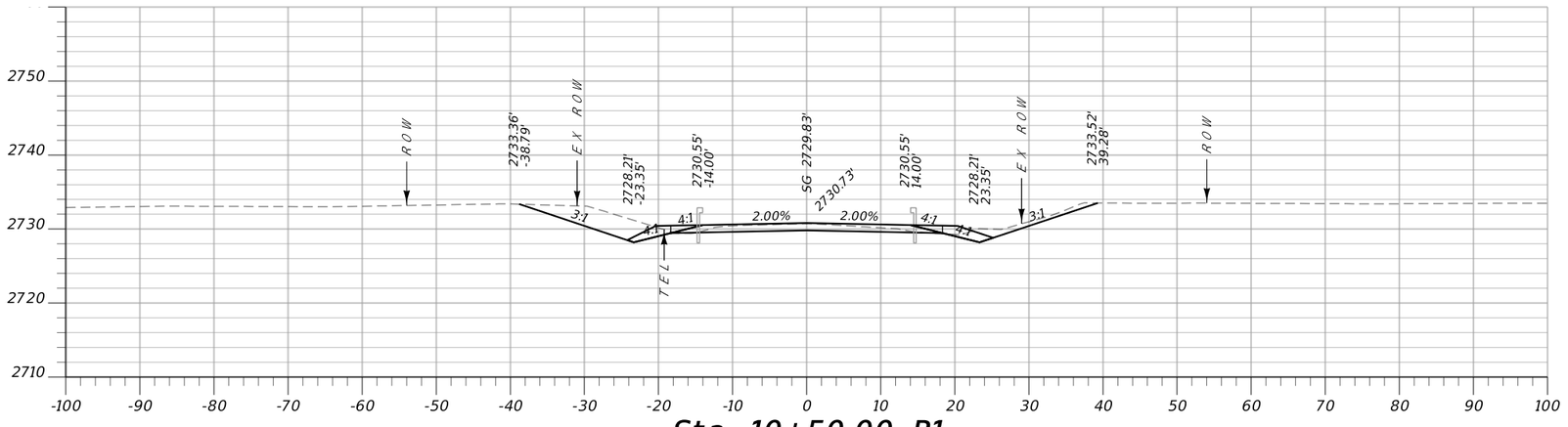
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Sta. 11+50.00 R1



Sta. 11+00.00 R1

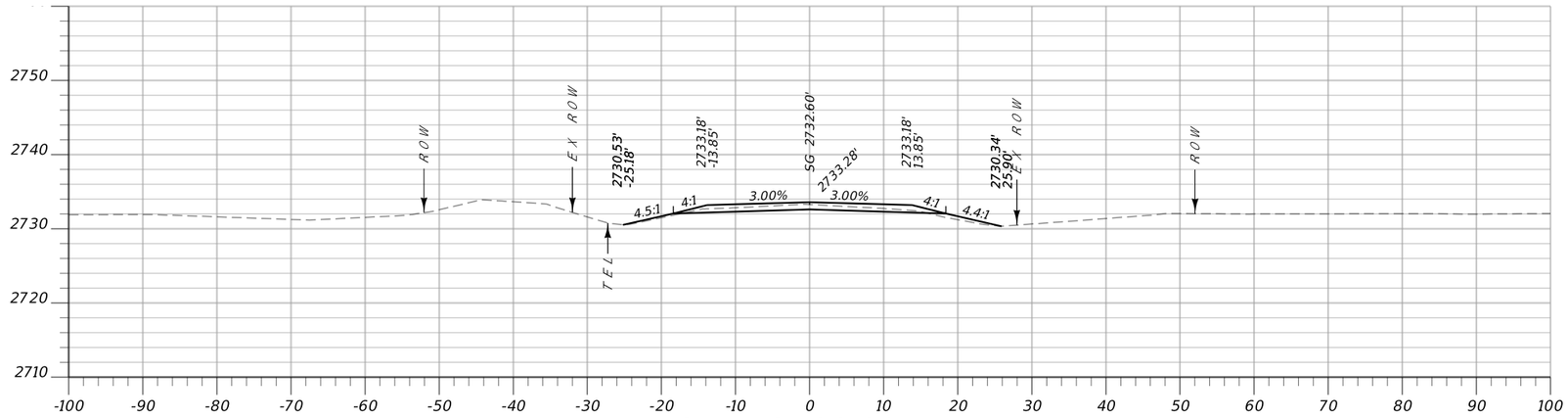


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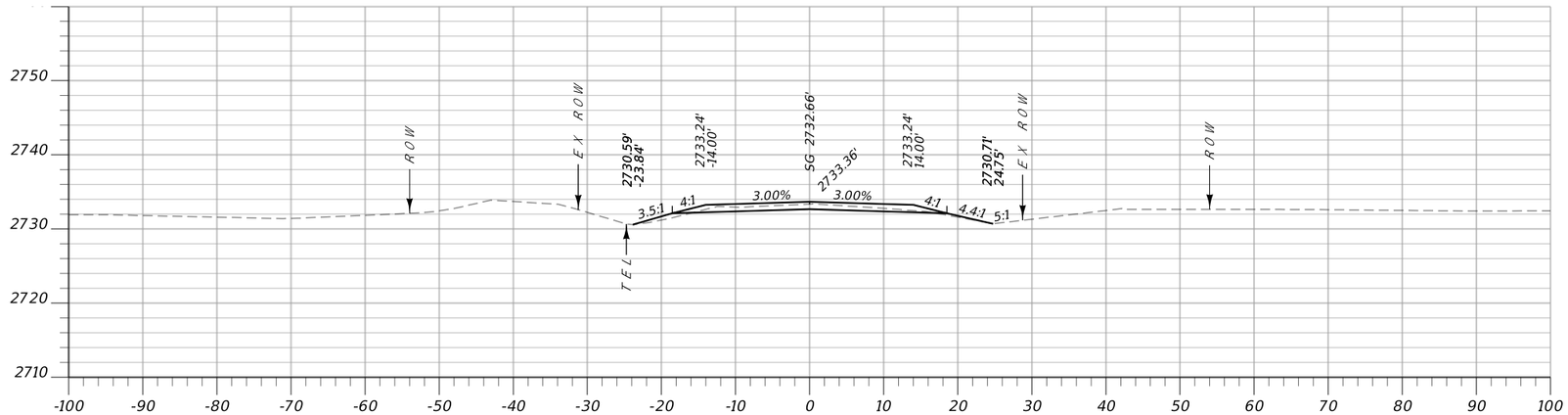
MDT MONTANA DEPARTMENT OF TRANSPORTATION	C:\DGN\8876000rdlay001.dgn	DESIGNED BY A. DELAHUNT	12/20/2021	MAINLINE CROSS SECTIONS	BIG PORCUPINE CR - 12 M E INGOMAR	STPB 9044(31)
	12/27/2021	REVIEWED BY M. CAIL	12/20/2021	ROSEBUD COUNTY	UPN 8876000	SHEET 5
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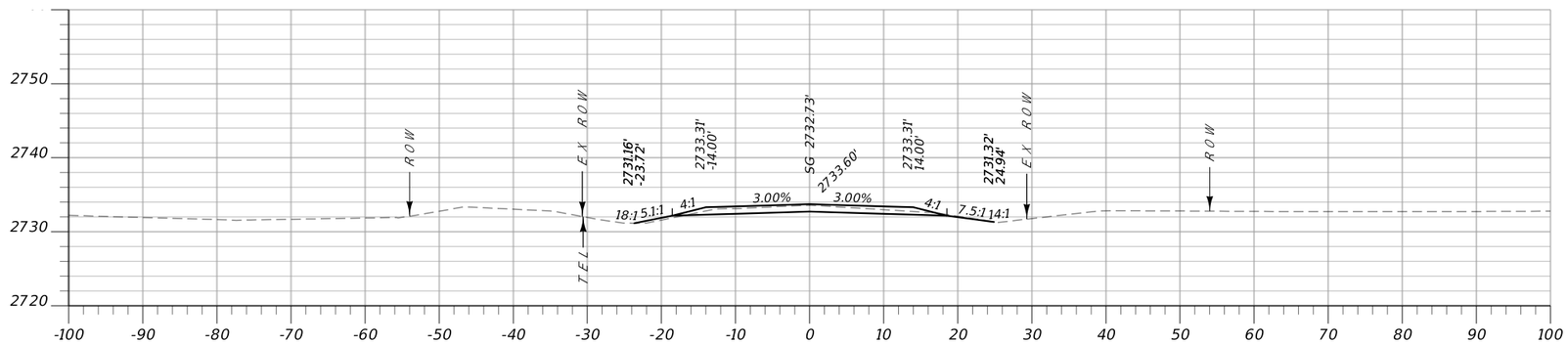
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Sta. 13+00.00 R1



Sta. 12+50.00 R1

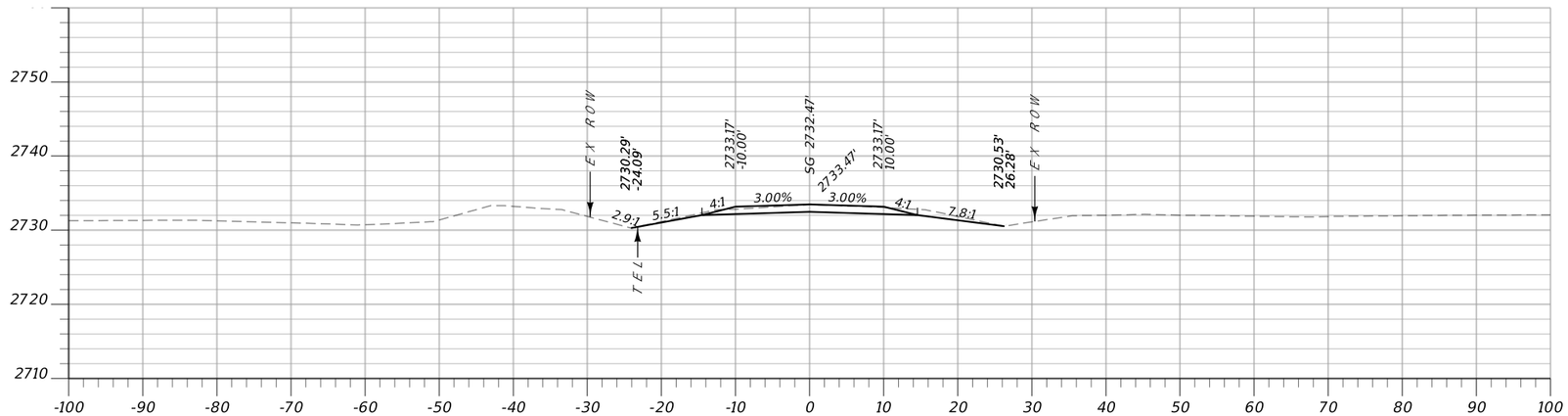


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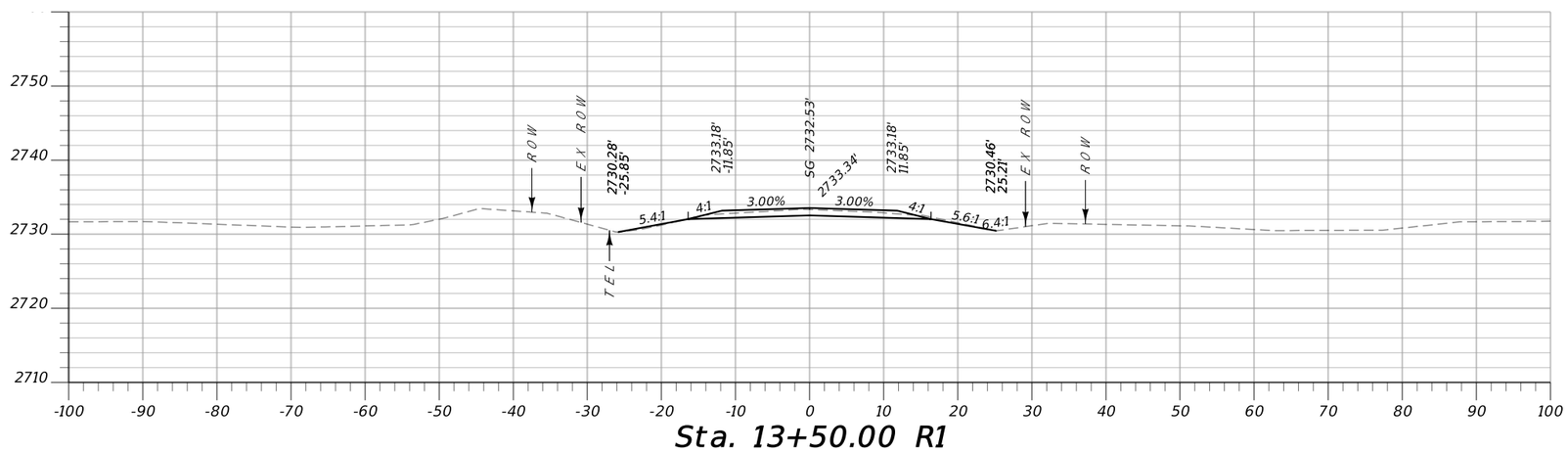
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	12/27/2021	REVIEWED BY	M. CAIL	12/20/2021			
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Sta. 13+96.16 R1



Sta. 13+50.00 R1

MDT MONTANA DEPARTMENT OF TRANSPORTATION	C:\DGN\8876000rdlay001.dgn	DESIGNED BY A. DELAHUNT 12/20/2021	MAINLINE CROSS SECTIONS		BIG PORCUPINE CR - 12 M E INGOMAR	STPB 9044(31)
	12/27/2021	REVIEWED BY M. CAIL 12/20/2021				
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