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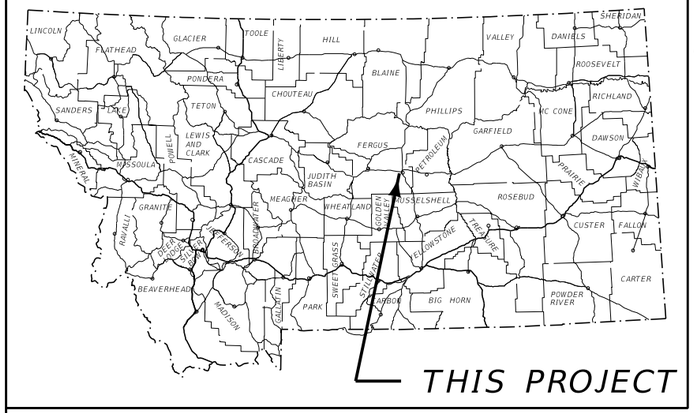
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MONTANA DEPARTMENT OF TRANSPORTATION

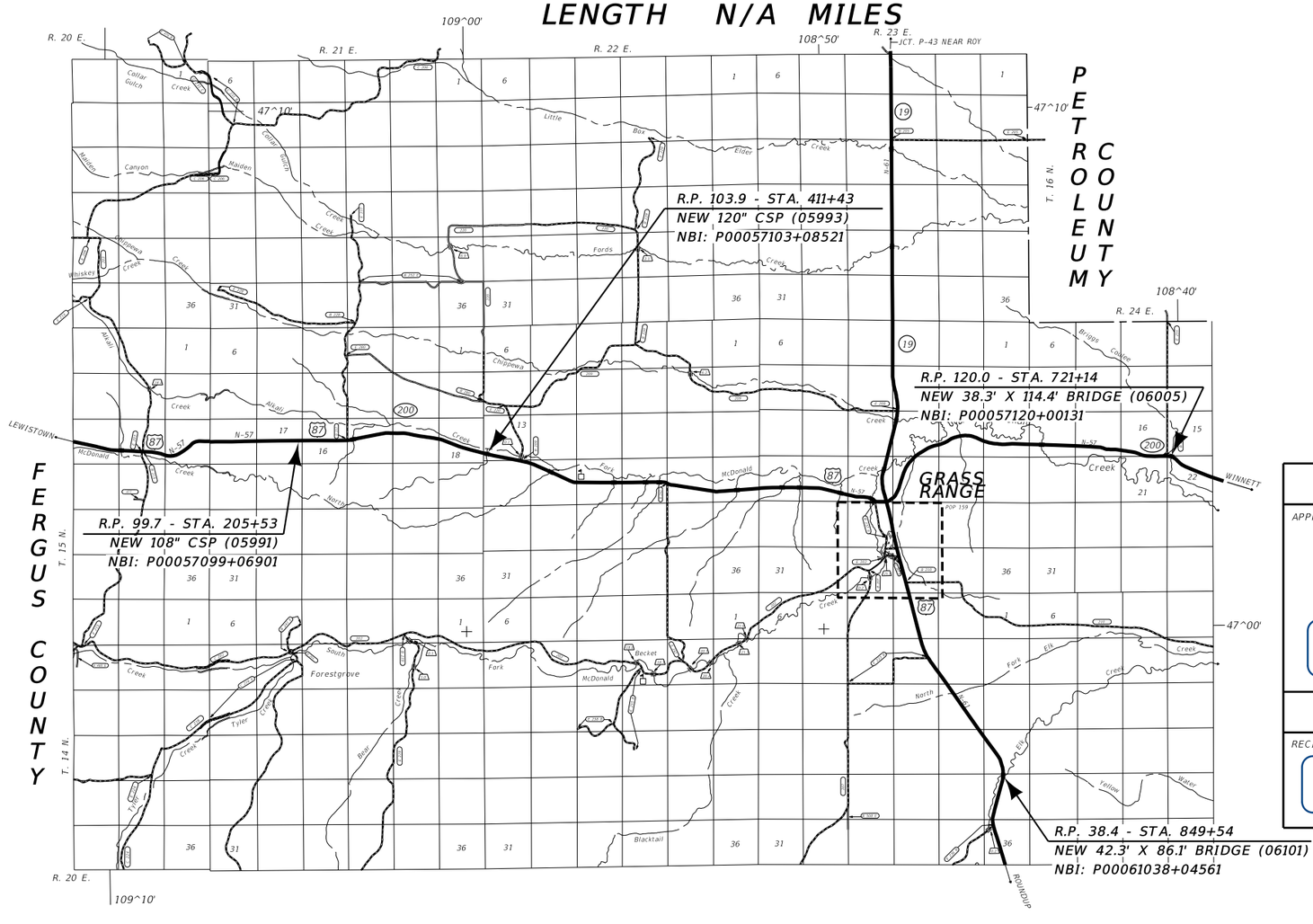
FEDERAL AID PROJECT NO. NHPB STW-0(002)
BRIDGE REPLACEMENT
MT-200 BRIDGES-LEWISTOWN EWP#1
FERGUS COUNTY

PROJECT DESIGN DATA

SEE SHEET 2



LENGTH N/A MILES



PLANS PREPARED BY

DOWL
1300 CEDAR STREET
HELENA, MONTANA 59601
(406) 442-0370

APPROVED BY:

MONTANA PROFESSIONAL ENGINEER
CODY W. SALO
16385 PE
LICENSED

DocuSigned by:
Cody Salo
DBA20FEF43C54B6...
2/22/2024
DATE

MONTANA
DEPARTMENT OF TRANSPORTATION

RECIEVED BY: CONSULTANT DESIGN ENGINEER

DocuSigned by:
Kelly Williams
EF7F5DDAB5A7471...
2/22/2024
DATE

ASSOCIATED PROJECT AGREEMENT NUMBERS

R / W	
I.C.	
P. E.	

3	MONTANA Department of Transportation	...\9884001\RD\9884001RDTT.dgn	DESIGNED BY			ROAD PLANS
2		2/9/2024	REVIEWED BY			
		8:54:55 AM nperius	CHECKED BY			FERGUS COUNTY

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TABLE OF CONTENTS

ROAD PLANS	SHEET NO.
TITLE SHEET	1
TABLE OF CONTENTS	2
NOTES	2
PROJECT DESIGN DATA	2
LEVEL DATA, CONTROL TRAVERSE DIAGRAMS, AND CENTERLINE COORDINATE TABLES	3-6
TYPICAL SECTIONS	7
SUMMARIES	8
CLEARING	8
ENVIRONMENTAL ITEMS	8
DETOUR	8
SURFACING	7
GUARDRAIL	7
TEMPORARY GUARDRAIL	7
REMOVE STRUCTURE	8
DETAILS	9-12
CLEARING DETAILS	9-11
CONCEPTUAL DETOUR SITE 06005	12

BRIDGE PLANS	
LIST OF DRAWINGS	B1
STRUCTURAL NOTES AND SPECIFICATIONS	B3
STRUCTURE 06005	B22, B36-B37
STRUCTURE 06101	B39, B53-B54

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.

DO NOT DISTURB

PROPERTY PINS OR MONUMENTS

PUBLIC LAND SURVEY MONUMENTS

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

CONSTRUCTION NOTES

USE EXTREME CAUTION WHEN WORKING AROUND TRANSMISSION LINE.

UTILITY SURVEY

THE UTILITY SURVEY WAS COMPLETED IN NOVEMBER 2021 (PHASE 1) AND APRIL/MAY 2023 (PHASE II) BY A CERTIFIED SUE CONTRACTOR. QUALITY LEVELS DETAILED BELOW ARE USED TO DEPICT THE DEGREE OF RELIABILITY. SEE THE UTILITY PLANS FOR SPECIFIC QUALITY LEVELS.

LEVEL A – PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE AND SUBSEQUENT MREASUREMENT OF THE SUBSURACE UTILITY AT A SPECIFIC POINT.

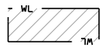
LEVEL B – INFORMATION REPRODUCED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTING AND APPROXIMATE HORIZONTAL POSITION OF THE SUBSURFACE UTILITIES.

LEVEL C – INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGEMENT IN CORRELATING INFORMATION TO QL D DATA.

LEVEL D – INFORMATINO DERIVED FROM EXISTING RECORDS AND/OR ORAL RECOLLECTIONS.

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



TEMPORARY WETLAND IMPACT AREAS

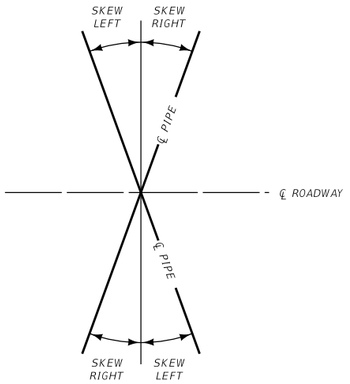
WETLAND DELINEATION TABLE

WETLAND DESIGNATION	STATION FROM	STATION TO	WETLAND AREA (ACRES) DELINEATED AREA	** IMPACTED AREA (TEMP.)	IMPACTED AREA (PERM.)	REMARKS
WL6C	839+94	845+52	0.501			RT.
WL6B2	841+26	846+80	0.164*			LT.
WL6B1	848+79	849+61	0.029*			LT.
WL6A	849+39	853+62	0.156*			RT.
TOTAL			0.85			

* AREA OF EXISTING WETLAND EXTENDS BEYOND PLAN LIMITS

** TEMPORARY IMPACT AREAS ARE ESTIMATED AND PROVIDED FOR INFORMATIONAL PURPOSES ONLY. TEMPORARY WETLAND IMPACTS SHOWN IN THE TABLE AND ANY OTHER IMPACTS ASSOCIATED WITH CONTRACTOR OPERATIONS ARE TO BE PERMITTED BY CONTRACTOR.

SKEW DIAGRAM



PROJECT DESIGN DATA

MDT STR. NO.	FEATURE INTERSECTED	ROUTE	RP	PRESENT 2019 ADT	LETTING 2024 ADT	DESIGN 2044 ADT	D.H.V.	TRUCKS	V (MPH)	18 KIP ESAL	GROWTH RATE
05991	STOCKPASS	MT-200	99.7	1,241	1,270	1,410	210	14.6%	70	113	0.5%
05993	STOCKPASS	MT-200	103.9	1,241	1,270	1,410	210	14.6%	70	113	0.5%
06005	BRIGGS COULEE	MT-200	120.0	534	540	610	90	15.9%	70	56	0.5%
06101	ELK CREEK	US-87	38.4	981	1,000	1,110	1170	11.6%	70	65	0.5%

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LEVEL DATA AND CONTROL TRAVERSE DIAGRAM

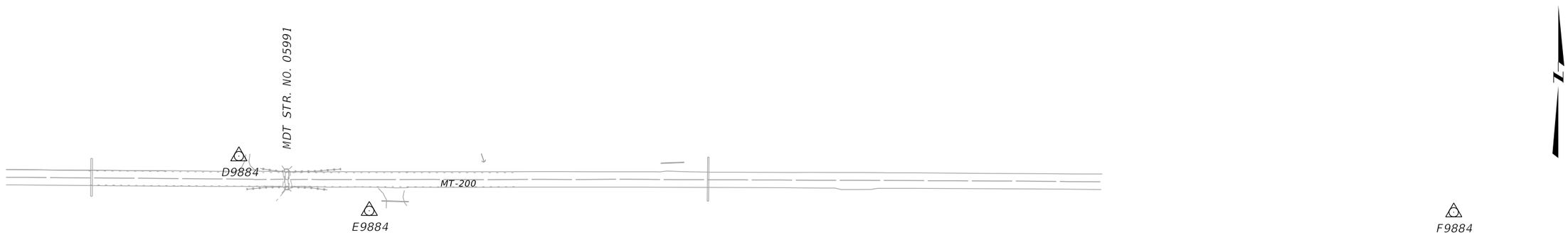
MDT STR. NO. #05991

BEARING SOURCE

GRID -- MONTANA COORDINATE SYSTEM NAD 83-2011
CSF = 0.99920131

LEVEL DATUM SOURCE

NAVD 88 (GNSS DERIVED ELEVATIONS USING GEOID 12A AND HOLDING OPUS ELEVATION AT G174 AND EXISTING MDT MARKS D9422 AND F174.)



CONTROL ABSTRACT

POINT NAME/NUMBER	N OR Y COORDINATE	E OR X COORDINATE	POINT ELEVATION	LOCATION AND DESCRIPTION
D9884	1,025,524.965	2,073,220.586	3,876.83	SET A MDT 2 IN. ALUMINUM CAP ON 5/8-INCH X 30-INCH REBAR STAMPED D9884 2021, 0.60 MILES EAST OF MM 99, NORTHWEST OF BRIDGE AND WEST OF FARM APPROACH, 7.0 FT. WEST-SOUTHWEST OF WEST GATE POST, 4.5 FT. SOUTH OF
				RIGHT-OF-WAY FENCE, 1 FT. SOUTH OF REFERENCE POST.
E9884	1,025,423.349	2,073,462.518	3,881.10	SET A MDT 2 IN. ALUMINUM CAP ON 5/8-INCH X 30-INCH REBAR STAMPED E9884 2021, 0.30 MILES WEST OF MM 100, SOUTHEAST OF BRIDGE AND WEST OF FARM APPROACH, 45 FT. WEST OF WEST GATE POST, 2.5 FT. NORTH OF RIGHT-OF-WAY
				FENCE, 1 FT. NORTH OF REFERENCE POST.
F9884	1,025,420.604	2,075,475.103	3,857.53	SET A MDT 2 IN. ALUMINUM CAP ON 5/8-INCH X 30-INCH REBAR STAMPED F9884 2021, 175 FT. EAST OF MM 100, ON SOUTH SIDE OF HIGHWAY AND WEST OF FARM APPROACH, 16 FT. NORTHWEST OF NORTHWEST CORNER OF CATTLEGUARD, 6.4 FT.
				NORTH OF RIGHT-OF-WAY FENCE ANGLE POINT, 1 FT. NORTH OF REFERENCE POST.

CENTERLINE COORDINATE TABLE

STATION	DESCRIPTION	N OR Y COORDINATE	E OR X COORDINATE	REMARKS
200+00.00	POB	1,025,485.269	2,072,742.176	
205+00.00	POT	1,025,482.306	2,073,242.165	BEGIN CONSTRUCTION
206+00.00	POT	1,025,481.714	2,073,342.165	END CONSTRUCTION
206+75.41	PC	1,025,481.267	2,073,417.576	
207+30.12	PI	1,025,480.943	2,073,472.279	
207+84.82	PT	1,025,481.015	2,073,526.984	
213+28.98	PC	1,025,481.733	2,074,071.147	

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LEVEL DATA AND CONTROL TRAVERSE DIAGRAM

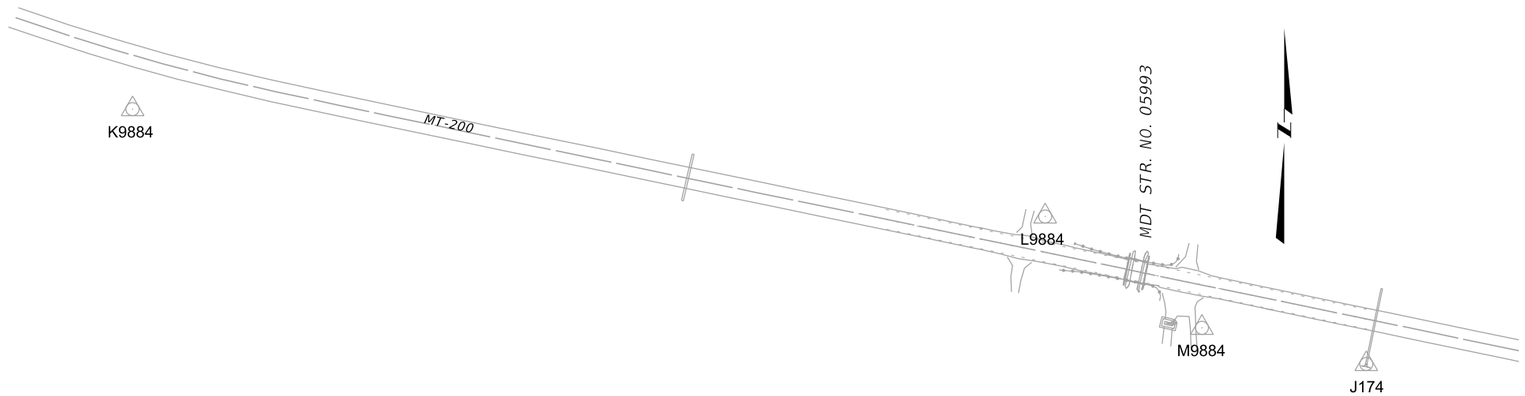
MDT STR. NO. #05993

BEARING SOURCE

GRID -- MONTANA COORDINATE SYSTEM NAD 83-2011
CSF = 0.99922751

LEVEL DATUM SOURCE

NAVD 88 (GNSS DERIVED ELEVATIONS USING GEOID 12A AND HOLDING OPUS ELEVATION AT J174 AND EXISTING MDT MARKS 6038539 AND 6068539.)



CONTROL ABSTRACT

POINT NAME/NUMBER	N OR Y COORDINATE	E OR X COORDINATE	POINT ELEVATION	LOCATION AND DESCRIPTION
J174	1,023,813.095	2,095,429.335	3,678.16	FOUND 3.25 IN. BRASS CAP STAMPED J174 1961 IN TOP OF IRRIGATION STRUCTURE ON SOUTH SIDE OF HIGHWAY, 0.05 MILES WEST IF MM 104, ON SOUTH SIDE OF HIGHWAY, 48 FT. EAST OF YELLOW FENCE POST.
K9884	1,024,149.506	2,093,800.423	4,065.93	SET MDT 2 IN. ALUMINUM CAP ON 5/8-INCH X 30-INCH REBAR STAMPED K9884 2021, 0.35 MILES WEST OF MM 104, ON SOUTH SIDE OF HIGHWAY, 2.0 FT. NORTH OF RIGHT-OF-WAY FENCE, 250 FT. WEST OF "FIBER OPTIC" SIGN, 1 FT. NORTH OF REFERENCE POST.
L9884	1,024,007.907	2,095,005.413	3,670.99	SET MDT 2 IN. ALUMINUM CAP ON 5/8-INCH X 30-INCH REBAR STAMPED L9884 2021, 0.15 MILES WEST OF MM 104, NORTHWEST OF BRIDGE AND EAST OF FARM APPROACH, GUARDRAIL, 12.0 FT. EAST OF EAST GATE POST, 4.0 FT. SOUTH OF RIGHT-OF-WAY FENCE, 1 FT. SOUTH OF REFERENCE POST.
M9884	1,023,860.920	2,095,212.336	3,672.88	SET A MDT 2 IN. ALUMINUM CAP ON 5/8-INCH X 30-INCH REBAR STAMPED M9884 2021, 0.10 MILES WEST OF MM 104, SOUTHEAST OF BRIDGE AND EAST OF FARM APPROACH, 4.0 FT. NORTH OF RIGHT-OF-WAY FENCE, 5.7 FT. NORTHWEST OF "FIBER OPTIC" SIGN, 30.0 FT. EAST OF MAILBOX, 1 FT. NORTH OF REFERENCE POST.

CENTERLINE COORDINATE TABLE

STATION	DESCRIPTION	N OR Y COORDINATE	E OR X COORDINATE	REMARKS
400+00.00	POB	1,024,166.500	2,094,014.433	
411+00.00	POT	1,023,942.835	2,095,091.454	BEGIN CONSTRUCTION
412+00.00	POT	1,023,922.502	2,095,189.365	END CONSTRUCTION
431+34.70	PI	1,023,529.118	2,097,083.645	
462+69.39	POE	1,022,891.735	2,100,152.857	

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LEVEL DATA AND CONTROL TRAVERSE DIAGRAM

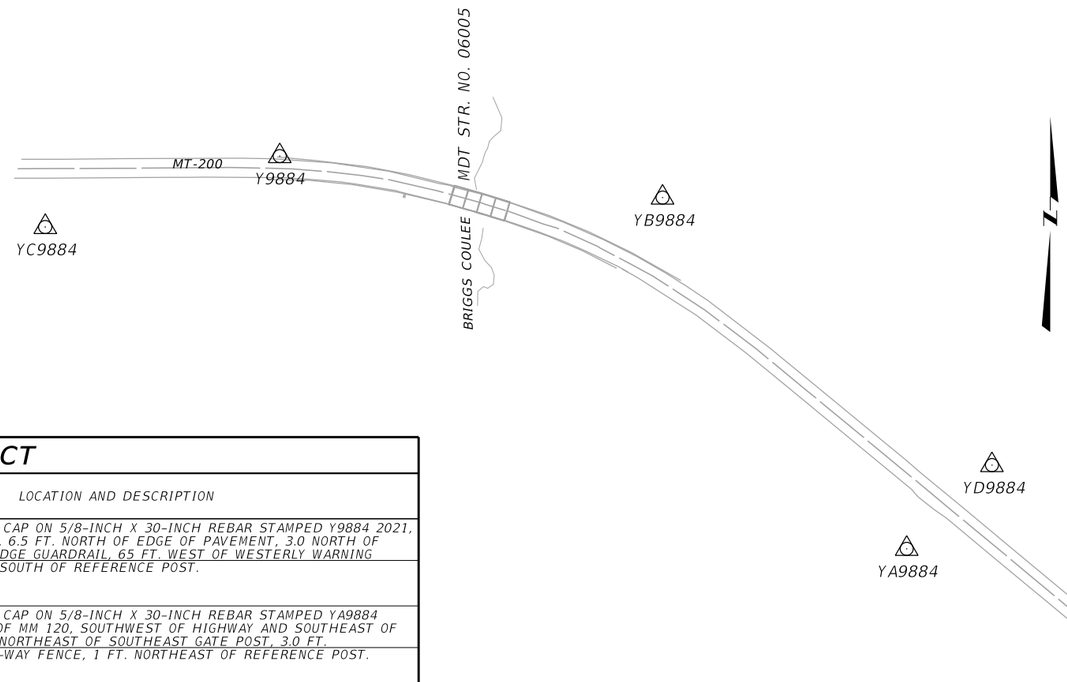
MDT STR. NO. #06005

BEARING SOURCE

GRID -- MONTANA COORDINATE SYSTEM NAD 83-2011
CSF = 0.99923888

LEVEL DATUM SOURCE

NAVD 88 (GNSS DERIVED ELEVATIONS USING GEOID 18 AND HOLDING OPUS ELEVATION OPUS ELEVATION AT YD9884.)



CONTROL ABSTRACT

POINT NAME/NUMBER	N OR Y COORDINATE	E OR X COORDINATE	POINT ELEVATION	LOCATION AND DESCRIPTION
Y9884	1,023,435.910	2,174,783.122	3,269.72	SET MDT 2 IN. ALUMINUM CAP ON 5/8-INCH X 30-INCH REBAR STAMPED Y9884 2021, 180 FT. WEST OF MM 120, 6.5 FT. NORTH OF EDGE OF PAVEMENT, 3.0 NORTH OF WEST END OF NORTH BRIDGE GUARDRAIL, 65 FT. WEST OF WESTERLY WARNING
				ARROW SIGN POST, 1 FT. SOUTH OF REFERENCE POST.
YA9884	1,022,917.489	2,175,610.788	3,273.39	SET MDT 2 IN. ALUMINUM CAP ON 5/8-INCH X 30-INCH REBAR STAMPED YA9884 2021, 0.15 MILES EAST OF MM 120, SOUTHWEST OF HIGHWAY AND SOUTHEAST OF FARM APPROACH, 3.0 FT. NORTHEAST OF SOUTHEAST GATE POST, 3.0 FT.
				NORTHEAST OF RIGHT-OF-WAY FENCE, 1 FT. NORTHEAST OF REFERENCE POST.
YB9884	1,023,381.149	2,175,288.544	3,266.40	SET MDT 2 IN. ALUMINUM CAP ON 5/8-INCH X 30-INCH REBAR STAMPED YB9884 2021, 0.05 MILES EAST OF MM 120, NORTH OF HIGHWAY AND EAST OF BRIDGE, 75 FT. WEST OF RR TIE FENCE POST AT BEND IN FENCE, 3.0 FT. SOUTH OF
				RIGHT-OF-WAY FENCE, 1 FT. SOUTH OF REFERENCE POST.
YC9884	1,023,342.345	2,174,473.407	3,265.37	SET MDT 2 IN. ALUMINUM CAP ON 5/8-INCH X 30-INCH REBAR STAMPED YC9884 2021, 0.1 MILES WEST OF MM 120, ON SOUTH SIDE OF HIGHWAY AND WEST OF BRIDGE, 270 FT. EAST OF "45 MPH" SIGN, 3.0 FT. NORTH OF RIGHT-OF-WAY FENCE, 1
				FT. NORTH OF REFERENCE POST.
YD9884	1,023,027.992	2,175,723.428	3,279.33	SET MDT 3.25 IN. FLARED BASE ALUMINUM MONUMENT IN CONCRETE STAMPED YD9884 2021, 0.15 MILES EAST OF MM 120, ON NORTHEAST SIDE OF HIGHWAY AND SOUTHEAST OF FARM APPROACH, 18 FT. EAST OF EAST GATE POST, 1 FT. SOUTH OF
				REFERENCE POST.

CENTERLINE COORDINATE TABLE

STATION	DESCRIPTION	N OR Y COORDINATE	E OR X COORDINATE	REMARKS
699+99.98	POB	1,023,415.734	2,172,948.580	
712+00.00	POT	1,023,419.297	2,174,148.598	BEGIN CONSTRUCTION
712+47.22	PI	1,023,419.437	2,174,195.822	
713+99.72	TS	1,023,421.216	2,174,348.307	
715+59.76	PI	1,023,421.691	2,174,508.343	
716+39.72	SC	1,023,416.626	2,174,588.216	
721+62.45	PI	1,023,383.544	2,175,109.898	
726+57.49	CS	1,023,077.430	2,175,533.619	
727+37.52	PI	1,023,030.561	2,175,598.494	
728+97.49	ST	1,022,928.454	2,175,721.725	
730+49.98	PI	1,022,830.141	2,175,838.299	
731+00.00	POT	1,022,798.228	2,175,876.814	END CONSTRUCTION
735+69.84	PC	1,022,498.461	2,176,238.596	

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LEVEL DATA AND CONTROL TRAVERSE DIAGRAM

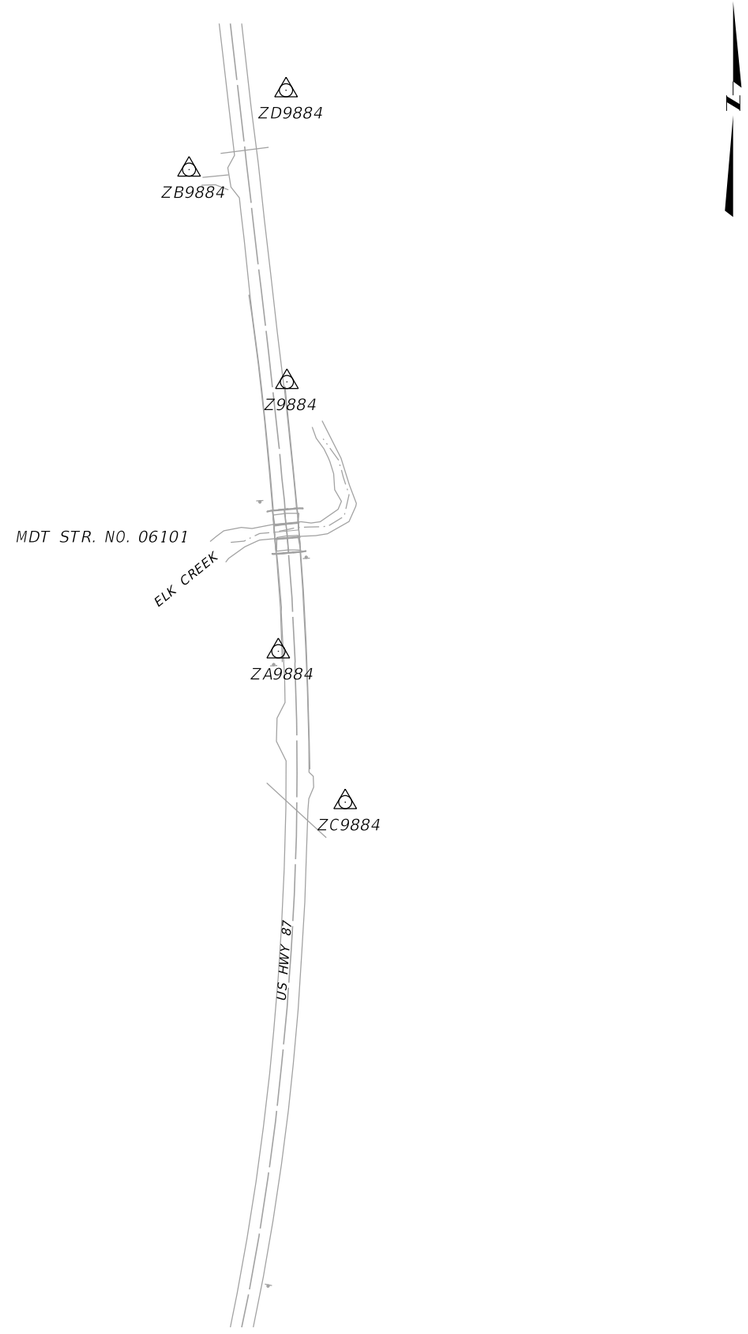
MDT STR. NO. #06101

BEARING SOURCE

GRID -- MONTANA COORDINATE SYSTEM NAD 83-2011
CSF = 0.99921448

LEVEL DATUM SOURCE

NAVD 88 (GNSS DERIVED ELEVATIONS USING GEOID 18 AND HOLDING OPUS ELEVATION OPUS ELEVATION AT ZD9884.)



CENTERLINE COORDINATE TABLE

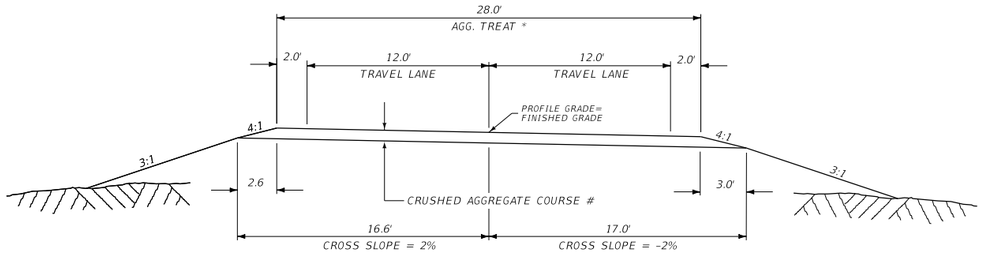
STATION	DESCRIPTION	N OR Y COORDINATE	E OR X COORDINATE	REMARKS
800+00.00	POB	981,508.730	2,154,688.911	
834+00.00	POT	984,798.717	2,155,546.804	BEGIN CONSTRUCTION
837+23.96	PC	985,112.196	2,155,628.546	
843+49.01	PI	985,717.018	2,155,786.259	
849+60.25	PT	986,338.386	2,155,718.552	
860+07.30	PI	987,379.274	2,155,605.133	
861+52.09	TS	987,523.344	2,155,590.701	
863+12.12	PI	987,682.435	2,155,573.366	
863+92.09	SC	987,761.293	2,155,559.718	
865+25.00	POC	987,891.363	2,155,532.517	END CONSTRUCTION
868+16.54	PI	988,179.525	2,155,487.339	
872+27.41	PT	988,527.738	2,155,244.637	

CONTROL ABSTRACT

POINT NAME/NUMBER	N OR Y COORDINATE	E OR X COORDINATE	POINT ELEVATION	LOCATION AND DESCRIPTION
Z9884	986,527.122	2,155,724.396	3,784.20	SET MDT 2 IN. ALUMINUM CAP ON 5/8-INCH X 30-INCH REBAR STAMPED Z9884 2021, 0.45 MILES NORTH OF MM 38, 4.6 FT. EAST OF EDGE OF PAVEMENT, 5.6 FT. NORTH OF NORTH END OF EAST BRIDGE GUARDRAIL, 95 FT. SOUTH OF DELINIATOR, 1 FT. WEST OF REFERENCE POST.
ZA9884	986,171.542	2,155,713.090	3,775.36	SET MDT 2 IN. ALUMINUM CAP ON 5/8-INCH X 30-INCH REBAR STAMPED ZA9884 2021, 0.4 MILES NORTH OF MM 38, 16.8 FT. NORTH-NORTHWEST OF SOUTH END OF WEST BRIDGE GUARDRAIL, 18.1 FT. NORTH OF "NO PASSING ZONE" SIGN POST, 1 FT. EAST OF REFERENCE POST.
ZB9884	986,807.394	2,155,595.261	3,794.18	SET A MDT 2 IN. ALUMINUM CAP ON 5/8-INCH X 30-INCH REBAR STAMPED ZB9884 2021, 0.55 MILES NORTH OF MM 38, 60 FT. WEST OF EDGE OF PAVEMENT, 7.5 FT. NORTH-NORTHEAST OF NORTH GATE POST AT FARM APPROACH, 1 FT. EAST OF REFERENCE POST.
ZC9884	985,972.378	2,155,801.421	3,780.12	SET A MDT 2 IN. ALUMINUM CAP ON 5/8-INCH X 30-INCH REBAR STAMPED ZC9884 2021, 0.4 MILES NORTH OF MM 38, 60 FT. SOUTHEAST OF SOUTH END OF EAST BRIDGE GUARDRAIL, 27 FT. SOUTH OF SOUTH GATE POST AT FARM APPROACH, 1 FT. WEST OF REFERENCE POST.
ZD9884	986,912.186	2,155,723.127	3,796.53	SET A MDT 3.25 IN. FLARED BASE ALUMINUM MONUMENT STAMPED ZD9884 2021, 0.55 MILES NORTH OF MM 38, 50 FT EAST OF EDGE OF PAVEMENT, 100 FT. NORTH OF WEST FARM APPROACH, 16.3 FT. WEST OF RIGHT-OF-WAY FENCE, 1 FT. WEST OF REFERENCE POST.

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TWO-LANE DETOUR TYPICAL SECTION NO. 1



* PLACE AGG. TREATMENT OVER CRUSHED AGGREGATE COURSE.
AGG. TREATMENT IS INCIDENTAL TO "DETOUR-CONSTRUCT, MAINTAIN, REMOVE" BID ITEM

\# DEPTH TO BE DETERMINED BY THE CONTRACTOR
ASSUMED 0.7' DEPTH SHOWN USED FOR ESTIMATING PURPOSES ONLY

DOWL

3	MONTANA Department of Transportation	...\9884001\RD\9884001RDTY.DGN	DESIGNED BY			ROAD PLANS	MT-200 BRIDGES-LEWISTOWN EWP#1	NHPB STW-0(002)
2		2/9/2024	REVIEWED BY					
		8:55:02 AM nperius	CHECKED BY			FERGUS COUNTY	UPN 9884001	SHEET 7

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SUMMARY

CLEARING

STATION		acres	REMARKS
FROM	TO	CLEARING	
409+00	412+00	0.5	LT. (MDT STR. NO. 05993)
410+75	412+00	0.2	RT. (MDT STR. NO. 05993)
716+00	724+00	2.2	LT. & RT. (MDT STR. NO. 06005)
839+25	850+50	1.3	LT. (MDT STR. NO. 06101)
839+25	845+50	1.1	RT. (MDT STR. NO. 06101)
848+50	851+95	0.6	RT. (MDT STR. NO. 06101)
849+75	854+00	0.4	RT. (MDT STR. NO. 06101)
858+90	860+00	0.2	LT. (MDT STR. NO. 06101)
859+00	859+50	0.1	RT. (MDT STR. NO. 06101)
TOTAL		6.6	

ENVIRONMENTAL ITEMS

STATION	lump sum	each	REMARKS
	MISCELLANEOUS ITEMS - LS	MISCELLANEOUS ITEMS - EACH	
	BAT BOX	MBTA - STR.	
205+67		1	38.3' x 7.9' BRIDGE MDT STR. NO. 05991
411+35		1	30.3' x 25.1' BRIDGE MDT STR. NO. 05993
720+94		1	25.7' x 75.8' BRIDGE MDT STR. NO. 06005
721+70	0.5		BRIGGS COULEE
845+20	0.5		ELK CREEK
849+51		1	58.3' x 32.2' BRIDGE MDT STR. NO. 06101
TOTAL	1	4	

DETOUR

STATION		lump sum	days	REMARKS
FROM	TO	CONST., MAINTAIN, & REMOVE	MISC. ITEMS - DAY	
1+00.00	10+81.81	1		MDT STR. NO. 06005
1+00.00	10+81.81		11	06005 DETOUR MAINTENANCE
TOTAL		1	11	

SEE DETAILS

SURFACING

STATION		AGGREGATE cu. yards	REMARKS
FROM	TO	TRAFFIC GRAVEL	
1+00.00	10+81.08	174	
TOTAL		174	

GUARDRAIL

STATION		linear feet		REMARKS
		REMOVE GUARDRAIL		
FROM	TO	LEFT	RIGHT	
REMOVE RAIL				
3+74.06	8+65.10		475.2	SEE SPECIALS FOR LEAD-BASED PAINT
3+82.04	9+46.28	562.8		SEE SPECIALS FOR LEAD-BASED PAINT
SUBTOTAL		562.8	475.2	
TOTAL		1,038.0		

TEMPORARY GUARDRAIL

STATION		linear feet		each		REMARKS
		TEMPORARY BARRIER RAIL		TEMPORARY IMPACT ATTENUATOR		
FROM	TO	LEFT	RIGHT	LEFT	RIGHT	
5+55.28	7+65.28		210		2	
5+55.58	7+85.58	230		2		
SUBTOTAL		230	210	2	2	
TOTAL		440		4		

REMOVE STRUCTURE *

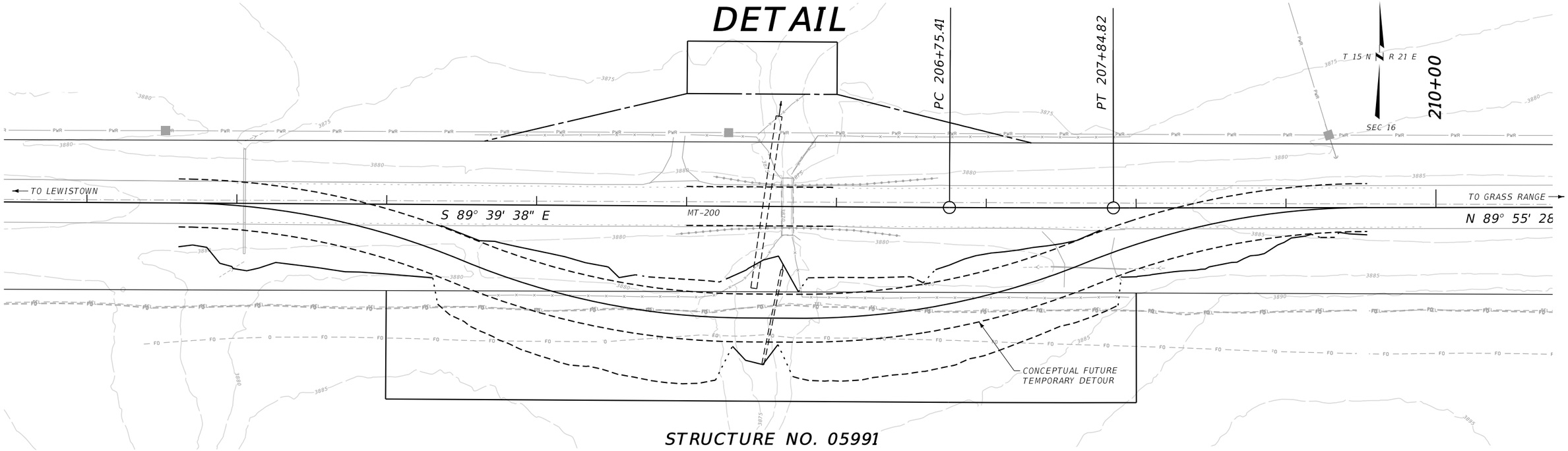
STATION	lump sum	REMARKS
	REMOVE STRUCTURE	
6+61	1.0	25.7' x 75.8' BRIDGE MDT STR. NO. 06005
TOTAL	1	

* SEE SPECIAL PROVISIONS FOR SALVAGING REQUIREMENTS

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DETAIL

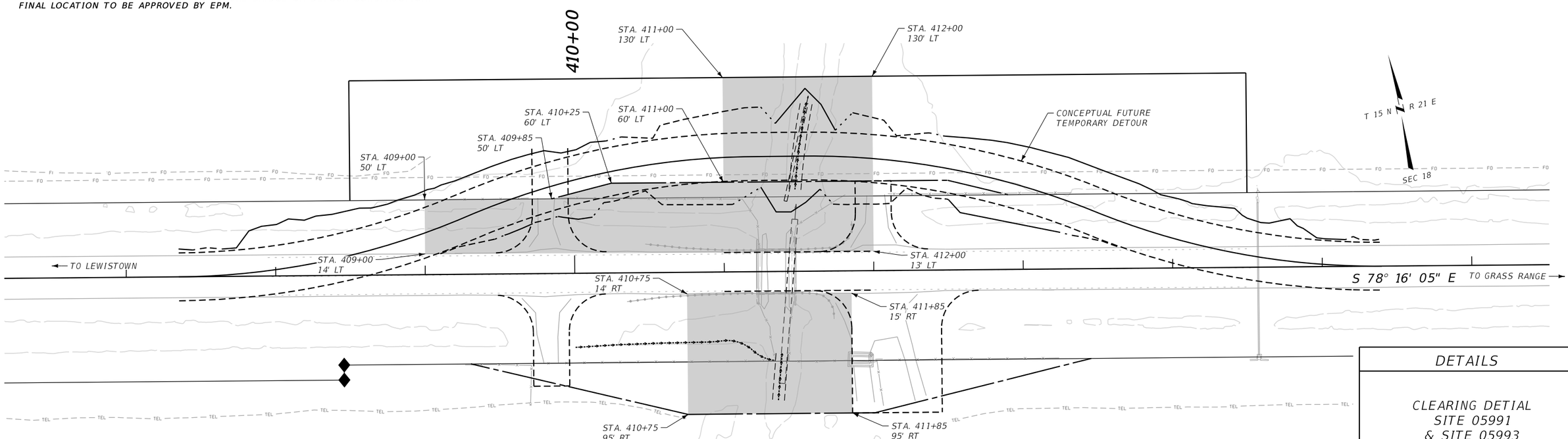


STRUCTURE NO. 05991

(FOR REFERENCE ONLY)

CLEAR BRUSH/SHRUBS TO COMPLY WITH MBTA

NOTE: SALVAGE AND STOCKPILE ALL SHRUBS AND WILLOWS FROM CLEARING AREAS SHOWN ON DETAIL. LOCATE STOCKPILE NEAR EXISTING STRUCTURE WITHIN R/W OR CONSTRUCTION PERMIT IN AN AREA THAT WILL NOT BE IMPACTED BY THE FUTURE BRIDGE OR DETOUR CONSTRUCTION. FINAL LOCATION TO BE APPROVED BY EPM.



CLEAR BRUSH/SHRUBS TO COMPLY WITH MBTA

STRUCTURE NO. 05993

DETAILS

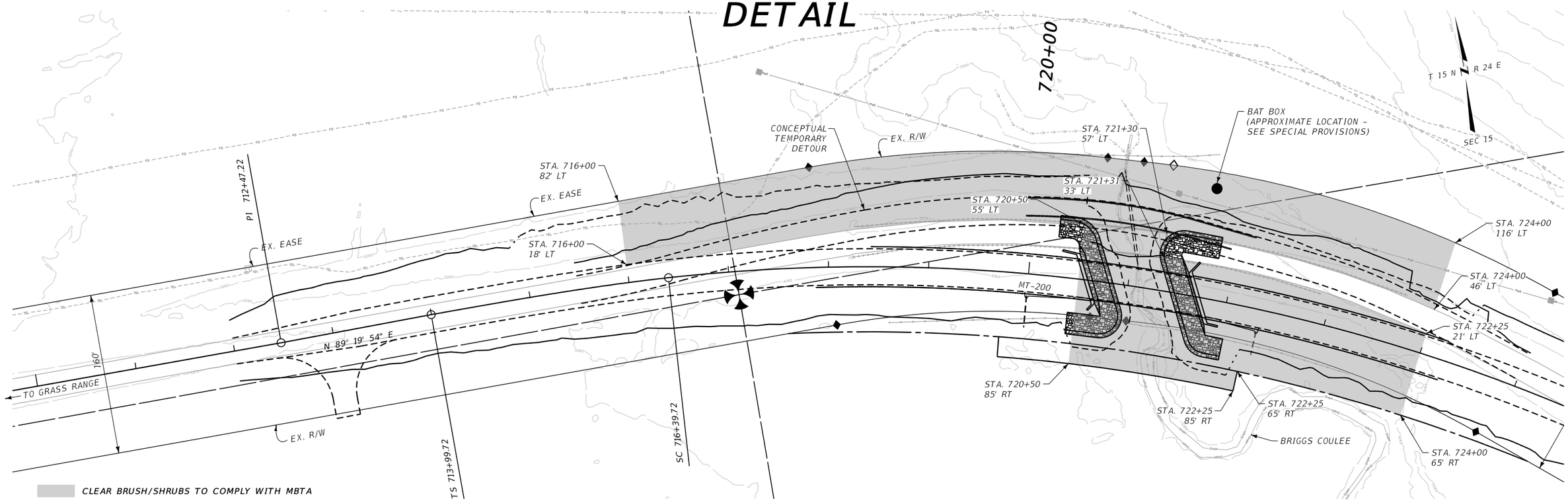
CLEARING DETIAL
SITE 05991
& SITE 05993

3	MONTANA Department of Transportation	...\9884001\RD\9884001RDD01.DGN	DESIGNED BY		ROAD PLANS	MT-200 BRIDGES-LEWISTOWN EWP#1	NHPB STW-0(002)
2		2/9/2024	REVIEWED BY				
		8:55:13 AM nperius	CHECKED BY		FERGUS COUNTY	UPN 9884001	SHEET 9

DocuSign Envelope ID: EFE95EE3-13A0-4D0F-AD63-CD3C3AF1D565

AWARD COPY

DETAIL



NOTE: SALVAGE AND STOCKPILE ALL SHRUBS AND WILLOWS FROM CLEARING AREAS SHOWN ON DETAIL. LOCATE STOCKPILE NEAR EXISTING STRUCTURE WITHIN R/W OR CONSTRUCTION PERMIT IN AN AREA THAT WILL NOT BE IMPACTED BY THE FUTURE BRIDGE OR DETOUR CONSTRUCTION. FINAL LOCATION TO BE APPROVED BY EPM.

STRUCTURE NO. 06005

DETAILS

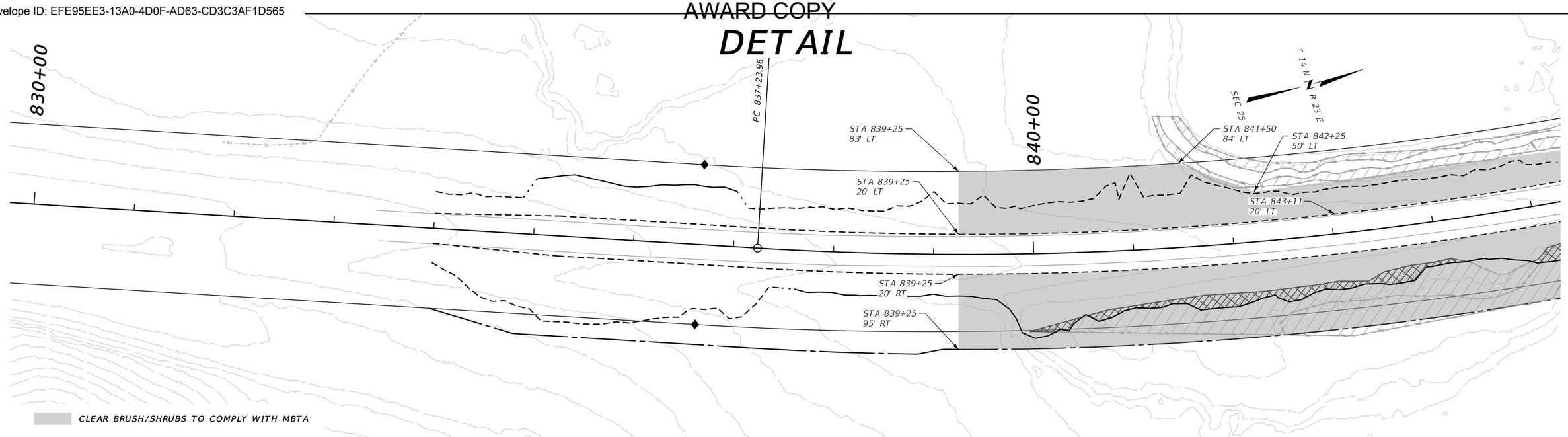
CLEARING DETIAL
SITE 06005

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		2/9/2024	REVIEWED BY					
1		8:55:14 AM nperius	CHECKED BY		FERGUS COUNTY		UPN 9884001	SHEET 10

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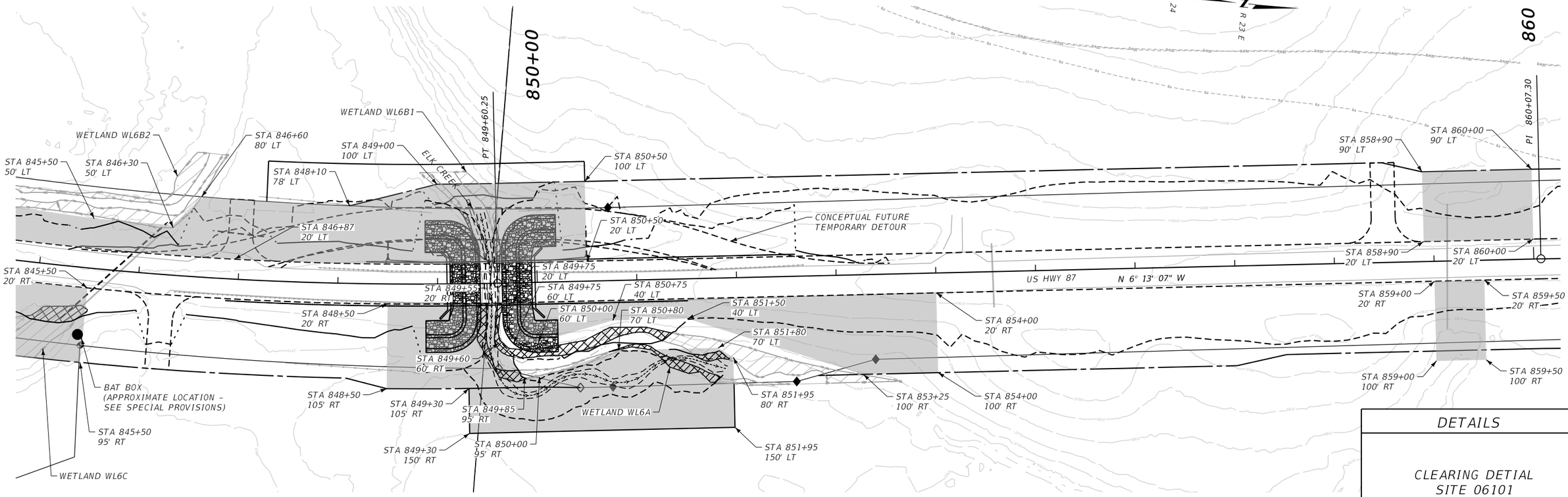
AWARD COPY

DETAIL



NOTE: SALVAGE AND STOCKPILE ALL SHRUBS AND WILLOWS FROM CLEARING AREAS SHOWN ON DETAIL. LOCATE STOCKPILE NEAR EXISTING STRUCTURE WITHIN R/W OR CONSTRUCTION PERMIT IN AN AREA THAT WILL NOT BE IMPACTED BY THE FUTURE BRIDGE OR DETOUR CONSTRUCTION. FINAL LOCATION TO BE APPROVED BY EPM.

STRUCTURE NO. 6101



STRUCTURE NO. 6101 (CONT.)

DETAILS

CLEARING DETIAL
SITE 06101

2	MONTANA Department of Transportation	...\9884001\RD\9884001RDDET01.dgn	DESIGNED BY		ROAD PLANS	MT-200 BRIDGES-LEWISTOWN EWP#1	NHPB STW-0(002)
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		8:55:16 AM nperius	CHECKED BY		FERGUS COUNTY	UPN 9884001	SHEET 11

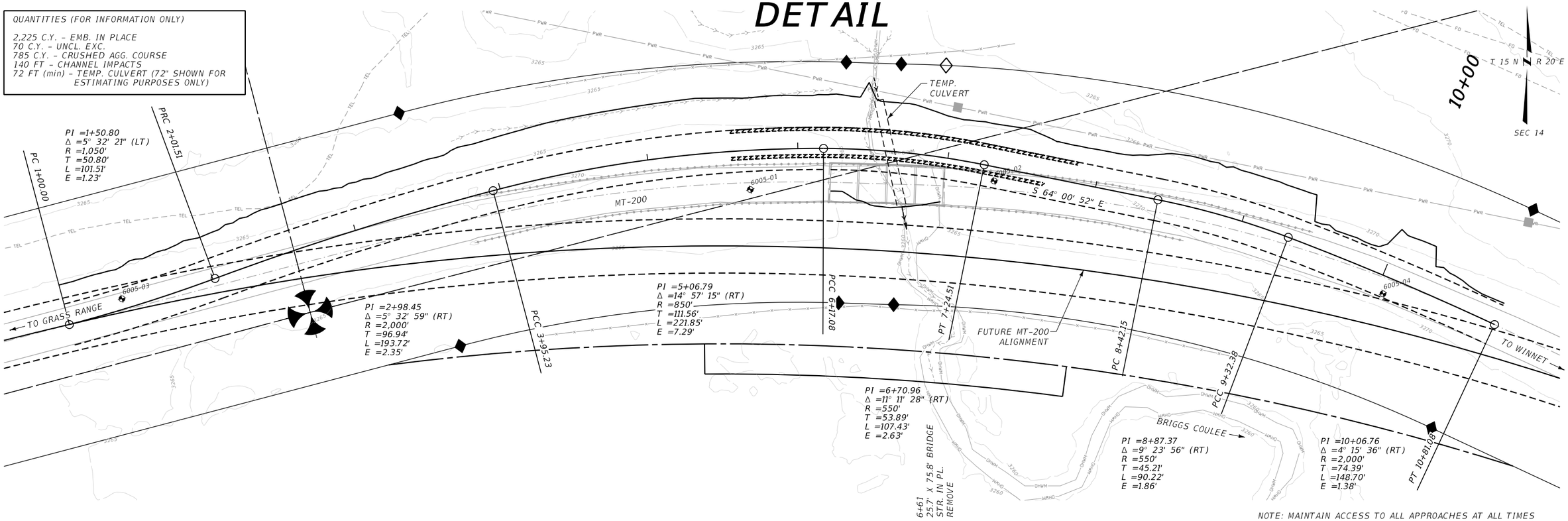
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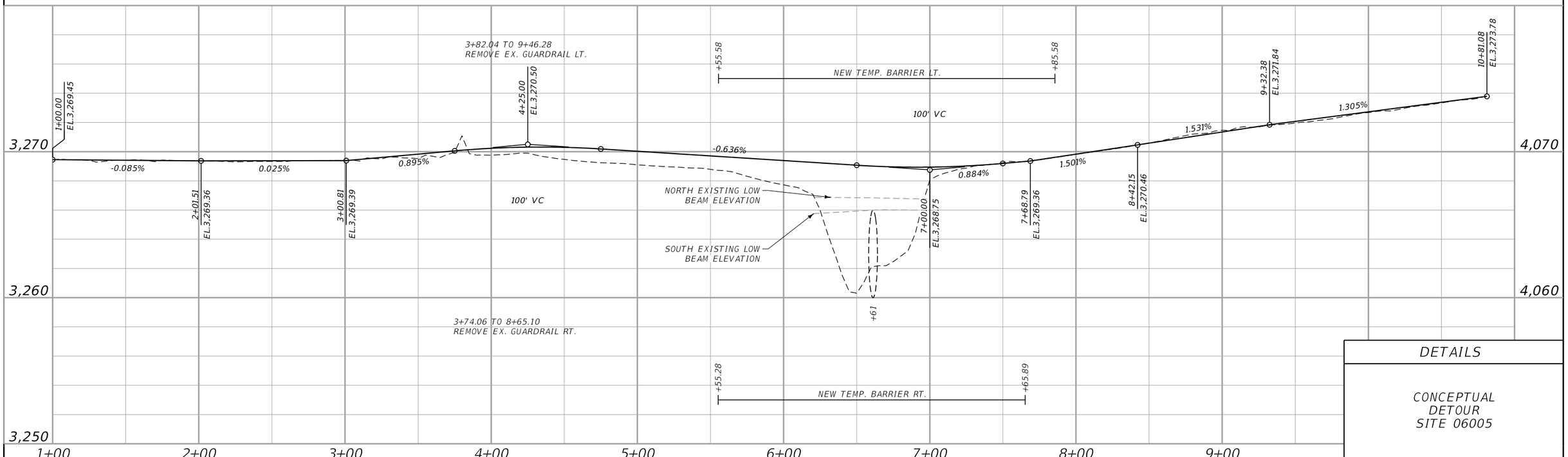
DETAIL

QUANTITIES (FOR INFORMATION ONLY)

2,225 C.Y. - EMB. IN PLACE
70 C.Y. - UNCL. EXC.
785 C.Y. - CRUSHED AGG. COURSE
140 FT - CHANNEL IMPACTS
72 FT (min) - TEMP. CULVERT (72" SHOWN FOR ESTIMATING PURPOSES ONLY)



NOTE: MAINTAIN ACCESS TO ALL APPROACHES AT ALL TIMES



DETAILS

CONCEPTUAL
DETOUR
SITE 06005

3	MONTANA Department of Transportation	...\9884001\RD\9884001RDPLDETAIL	DESIGNED BY		ROAD PLANS	MT-200 BRIDGES-LEWISTOWN EWP#1	NHPB STW-0(002)
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ASSOCIATED PROJECT AGREEMENT NUMBERS	
P.E.	NHPB STWD (787)

MONTANA DEPARTMENT OF TRANSPORTATION

BRIDGE PLANS AND QUANTITIES
FEDERAL AID PROJECT NHPB STW-0 (002)
BRIDGE REPLACEMENT MT-200 BRIDGES - LEWISTOWN EWP #1
FERGUS COUNTY

BRIDGE IDENTIFICATION	
MDT STR ID	NBI NUMBER
05990	P00057095+05731
05994	P00057105+03871
06005	P00057120+00131
06101	P00061038+04561

DocuSigned by: Kenton C. Alldritt
DA8C727B2E50456...
2/22/2024
DATE
For Str. ID 06005 and 06101

MONTANA
KENTON C. ALLDRITT
NO. 86402 PE
LICENSED PROFESSIONAL ENGINEER

SCALE SHOWN ON BRIDGE PLANS SHEETS ARE FOR HALF SIZE (11X17) PRINTS FULL SIZE PRINTS ARE APPROXIMATELY TWICE ORIGINAL SCALE

LIST OF DRAWINGS

SHEET NO.	TITLE
B1	LIST OF DRAWINGS
~~B2~~	~~ESTIMATED BRIDGE PLAN QUANTITIES~~
B3	STRUCTURAL NOTES AND SPECIFICATIONS
~~B4~~	~~GENERAL LAYOUT AT STA. 111+09.50~~
~~B5~~	~~FOOTING PLAN~~
~~B6~~	~~BENT NO. 1 AND BENT NO. 2~~
~~B7~~	~~BENT NO. 1 AND BENT NO. 2 DETAILS~~
~~B8~~	~~BILL OF REINFORCING STEEL~~
~~B9~~	~~BRIDGE TYPICAL SECTION~~
~~B10~~	~~ERECTION PLAN~~
~~B11~~	~~GENERAL LAYOUT AT STA. 523+14.25~~
~~B12~~	~~FOOTING PLAN~~
~~B13~~	~~BENT NO. 1 AND BENT NO. 3~~
~~B14~~	~~BENT NO. 1 AND NO. 3 DETAILS~~
~~B15~~	~~BENT NO. 1 AND BENT NO. 3 WINGWALL DETAILS~~
~~B16~~	~~PIER NO. 2~~
~~B17~~	~~PIER NO. 2 DETAILS~~
~~B18~~	~~BILL OF REINFORCING STEEL~~
~~B19~~	~~BRIDGE TYPICAL SECTION~~
~~B20~~	~~ERECTION PLAN~~
~~B21~~	~~RAIL CURB DETAILS~~
B22	GENERAL LAYOUT AT STA. 721+14.14
~~B23~~	~~FOOTING PLAN~~
~~B24~~	~~BENT NO. 1~~
~~B25~~	~~BENT NO. 1 REINFORCEMENT~~
~~B26~~	~~BENT NO. 1 BACKWALL REINFORCEMENT~~
~~B27~~	~~BENT NO. 1 DETAILS~~
~~B28~~	~~BENT NO. 1 BILL OF REINFORCING STEEL~~
~~B29~~	~~BENT NO. 2~~
~~B30~~	~~BENT NO. 2 REINFORCEMENT~~
~~B31~~	~~BENT NO. 2 BACKWALL REINFORCEMENT~~
~~B32~~	~~BENT NO. 2 DETAILS~~
~~B33~~	~~BENT NO. 2 BILL OF REINFORCING STEEL~~
~~B34~~	~~BENT NO. 1 WINGWALL DETAILS~~
~~B35~~	~~BENT NO. 2 WINGWALL DETAILS~~
B36	ERECTION PLAN
B37	SLAB DETAILS
~~B38~~	~~SLAB BILL OF REINFORCING STEEL~~
B39	GENERAL LAYOUT AT STA. 849+53.70
~~B40~~	~~FOOTING PLAN~~
~~B41~~	~~BENT NO. 1~~
~~B42~~	~~BENT NO. 1 REINFORMENT~~
~~B43~~	~~BENT NO. 1 BACKWALL REINFORMENT~~
~~B44~~	~~BENT NO. 1 DETAILS~~
~~B45~~	~~BENT NO. 1 BILL OF REINFORCING STEEL~~
~~B46~~	~~BENT NO. 2~~
~~B47~~	~~BENT NO. 2 REINFORCEMENT~~
~~B48~~	~~BENT NO. 2 BACKWALL REINFORCEMENT~~
~~B49~~	~~BENT NO. 2 DETAILS~~
~~B50~~	~~BENT NO. 2 BILL OF REINFORCING STEEL~~
~~B51~~	~~BENT NO. 1 WINGWALL DETAILS~~
~~B52~~	~~BENT NO. 2 WINGWALL DETAILS~~
B53	ERECTION PLAN
B54	SLAB DETAILS
~~B55~~	~~SLAB BILL OF REINFORCING STEEL~~

LIST OF STANDARD DRAWINGS

DWG. NO.	DATE	TITLE
MTS	REVISED 5-20-14	STANDARD PRESTRESSED CONCRETE BEAM TYPE MTS
PSD	REVISED 1-30-15	STANDARD PILE SPLICE DETAILS AND PILE TIPS
SBR-OR42	REVISED 9-17-19	STANDARD BRIDGE RAIL TYPE OPEN RAIL 42"
SL-8	REVISED 3-15-17	STANDARD SLAB AND DIAPHRAGM DETAILS

NOTE: This plan set includes Sheet Nos. B1, B3, B22, B36, B37, B39, B53, and B54 from UPN 984000 and represents an Early Work Package for that project.

SHEET NO. B1

LIST OF DRAWINGS

REVISED	REVISED	REVISED	REVISED	CHECKED	DRAWN	DESIGNED	FILENAME: 9884000BRRVT001.RVT
				S.D.K.	C.J.W.	K.C.A.	
				11-8-23	11-8-23	11-8-23	2/5/2024 8:06:42 AM

MONTANA DEPARTMENT OF TRANSPORTATION — BRIDGE BUREAU

ROUTE MULTIPLE

REF POINT MULTIPLE

MDT STR. ID MULTIPLE

UPN NUMBER 9884001

DRAWING NO.

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GENERAL NOTES:

Finished Grade at centerline roadway is the same as the Profile Grade shown on the Road Plans.

Live load is standard HL-93 loading.

Montana Department of transportation and the Montana Transportation Commission Standard Specifications for Road and Bridge Construction, current edition, 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 - 2020.

See Special Provisions and/or Standard Specifications for Traffic Control and Sequence of Operations.

Remove the existing structures (See Road Plan sheets and Special Provisions).

Include structure excavation in the unit price bid for Concrete - Class Structure.

Stations and coordinates shown on the bridge plans are Montana State Plane Grid based on NAD83-2011.

Elevations shown on the bridge plans are NAVD88 Elevations. See Road Plans for additional Elevation Datum information.

Dimension shown on the bridge plans are horizontal ground distances and not Montana State Plane Grid distances. The combination scale factor (CSF) for each location is noted below:

BR05990	0.99920131
BR05994	0.99922751
BR06005	0.99923888
BR06101	0.99921448

Horizontal ground distance x CSF = Grid Distance
Grid Distance / CSF = Horizontal ground distance (Distance to stake)

FOUNDATION NOTES:

The Footing Plan shows points where DOWL 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.

Contact DOWL's Helena office at (406)442-0370 if pile tip elevations deviate more than 1 foot from the elevation indicated.

If the project manager requires a re-drive of the test pile, re-drive the pile not less than 12 hours or more than 24 hours after driving.

REINFORCING STEEL NOTES:

Use new deformed type reinforcing steel meeting the requirements of AASHTO M 30 Grade 60. Include all costs associated with furnishing and placing new reinforcing steel in the unit price bid for either Reinforcing Steel or Reinforcing Steel - Epoxy Coated.

The suffix E denotes epoxy coated reinforcing steel.

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

Bottom of Slab	1"
Top of Slab	2 1/2"
Bottom of Abutment Caps	3"
Concrete Barriers and Curbs	1 1/2"

Concrete cover to any tie bar is 1/2" less than what is listed above.

Ensure reinforcing steel does not interfere with anchor bolt placement.

Provide reinforcing lap splice lengths according to the Rebar Lap Lengths table on this sheet.

CONCRETE NOTES:

Unless otherwise approved or specified, use Concrete - Class Structure for all substructure and backwall concrete and Concrete - Class Structure Low Slump for all deck concrete.

Use f'c = 4000 p.s.i. for Concrete - Class Structure. Use f'c = 4000 p.s.i. for Concrete - Class Structure Low Slump.

See Special Provisions for polymer overlay specifications.

ABUTMENT NOTES:

Include all costs associated with furnishing and placing the expansion joint filler, tarpaper, beadboard, fabric reinforced neoprene joint seal, and PVC waterstop in the unit price bid for Concrete - Class Structure.

Use smooth bars meeting the requirements of AASHTO M270 Grade 36. Use galvanized anchor bolts meeting the requirements of ASTM F1554 Grade 36. Include all costs associated with furnishing and placing smooth bars and anchor bolts in the unit price bid for Reinforcing Steel.

Finish beam seats level to the elevations shown.

Securely nail expansion joint filler to wingwall concrete and hold in proper position while placing reinforced concrete beams.

Provide fabric reinforced neoprene waterproofing membrane as shown. Place waterproofing at the abutments from the top location specified to a minimum of 6" below the bearing seats. Place waterproofing horizontally across the entire abutment including wingwalls. Place additional 3' wide strip of waterstop vertically at wingwall and reinforced concrete beam interface, centered horizontally between the wingwalls and the reinforced concrete beams. See Special Provisions for additional information.

Place white polystyrene foam insulation at the location shown in the plans and hold in accurate position while placing bridge end backfill.

BEARING NOTES:

Provide elastomeric bearings at the locations shown in the plans.

Use unreinforced elastomeric bearings meeting the requirements of low temperature Grade 4 60 durometer hardness on the Shore A scale.

Include all costs associated with furnishing and installing elastomeric bearings in the unit price bid for Elastomeric Bearing Devices.

DESIGN INFORMATION:

Future wearing surface = 10 psf

Concrete Sacrificial wearing surface = 1/2"

Design Method = Load and Resistance Factor Design (LRFD)

STRUCTURAL STEEL NOTES:

Use structural steel meeting the requirements of AASHTO M 270 Grade 50 except as noted. Estimated weight of steel nosing on BR05994 is 300 lbs. Estimated weight of steel diaphragms for BR06005 is 1900 lbs. and for BR06101 is 2100 lbs.

Furnish shear connector studs in accordance with AWS D1.5 Section 7 specification for Stud Welding and the contract.

Hot dip galvanized steel nosing, steel diaphragms, diaphragm support plates, bolts, nuts and washers in accordance with the Standard Specifications.

Include all costs associated with furnishing and placing steel diaphragms, plates, angles and bolts incidental to the diaphragms in the lump sum bid for Structural Steel - Misc.

Provide bolts in accordance with ASTM F3125, Grade A325 Type 1. See Standard Specifications for the requirements of nuts and washers.

Provide adequate girder bracing for the specific wind and weather conditions to be encountered. Install diaphragms immediately after setting the beams in place.

ABBREVIATIONS:

N.F. denotes near face.
F.F. denotes fill face.
E.F. denotes each face.

REBAR LAP LENGTHS

BAR DIAMETER	PLAIN	EPOXY (E)
#3	1' - 10"	2' - 3"
#4	2' - 5"	2' - 11"
#5	3' - 0"	3' - 8"
#6	3' - 7"	4' - 5"
#7	4' - 6"	5' - 6"
#8	5' - 11"	7' - 2"
#9	7' - 6"	9' - 1"
#10	9' - 6"	11' - 6"
#11	11' - 8"	14' - 2"
#14	Mechanical Splice Only	Mechanical Splice Only
#18	Mechanical Splice Only	Mechanical Splice Only

4" Additional per lap splice has been provided for construction tolerances for all slab and rail reinforcing.

PRESTRESSED GIRDER - VOIDED SLAB NOTES:

Design and fabricate the girder to support the dead load and live load stresses and provide a minimum ultimate moment capacity shown on the Erection Plan. Show stresses in the beam under each loading condition that is anticipated in the manufacture, handling, and service life of the beam.

Use 0.500" diameter or 0.600" diameter, 7 wire strand prestressing steel meeting the requirements of ASTM A416 (AASHTO M203).

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

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

Fabricator will provide longitudinal, shear, and end reinforcement to meet the requirements of the AASHTO code specified.

Use structural steel meeting the requirements of ASTM A276 Type 304 for all connection hardware. Use headed shear studs meeting the requirements of AASHTO M 169 Grades 1010 through 1020. Use embedded bearing plates conforming to ASTM A709 Grade 36 (AASHTO M270) and galvanized to A123 (M111) after fabrication.

Apply rail loads to the exterior beam only. Broom finish the top surface of the beam in accordance with Subsection 552.03.11 of the Standard Specifications.

Variations in the general shape of the deck and width of span lengths from those shown on the Bridge drawings are not allowed without approval from the Engineer for any variations requiring the alteration of abutment and/or pier layout as shown on the Bridge drawings.

See Bridge Plans for the type of rail used and for any anchorages and reinforcing incorporated into the beam. Include all costs to furnish and place curbs in the unit price bid for Prestressed Girder - Voided Slab.

When post tensioning is required, Fabricator to design the location, spacing, details, and local zone reinforcing for the anticipated loading conditions over the service life of the beam. Fabricator to verify the adequacy of the supplied post tensioning system requirements.

Fill holes at beam ends after setting with a non-shrink, high-strength grout.

Seal gaps between reinforced concrete beams with expandable spray foam after placing slab beam.

Use only corrugated plastic transverse PT ducts. 2 1/2" ⌀ Schedule 40 PVC may be substituted for corrugated plastic duct for Single Steel Bar post tensioning.

Use 0.500" diameter or 0.600" diameter, low relaxation, Grade 270 7 wire strand conforming to the requirements of ASTM A416 (AASHTO M203) or 7/8" ⌀ minimum Grade 150 Threaded bar meeting the requirements of ASTM A449 post tensioning. Provide heavy hexagonal nuts conforming to A563 (M291) and hardened steel washers conforming to F436 (M293). Galvanize all listed hardware to A123 (M111) after fabrication.

Pressure grout post-tensioning ducts in accordance with Subsection 553.03.13 of the Standard Specifications and with a fiber reinforced non-shrink, non-metallic, and non-gaseous grout. Fabricator's recommendations for exact placement and requirements.

Install and tension transverse post tensioning before grouting beam keyways.

Confirm apparent modulus of elasticity and friction and wobble coefficients by site friction tests prior to commencement of post tension work.

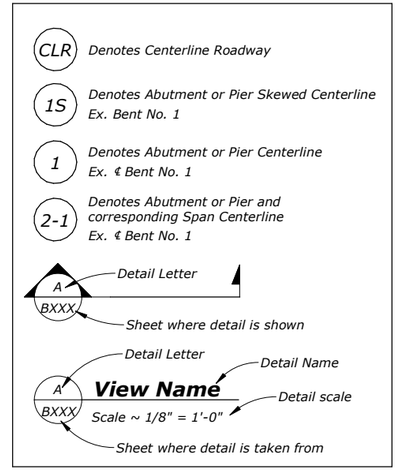
No more than 1/6th of the total jacking force is to be eccentric about the post tensioning centroid at any one time during stressing.

Provide wedges at each post tensioning duct on both sides of center girder. Include all costs associated with furnishing and placing wedges in the unit price bid for Prestressed Girder - Voided Slab.

Include all costs to furnish and install metal expansion caps, furnishing and placing local zone reinforcing, post tension anchorages, steel plates and wedges, expandable spray foam, impregnated foam, and silicone sealant in the unit price bid for Prestressed Girder - Voided Slab. Include all costs associated with stressing the tendons and grouting the ducts and post tensioning blockouts in the unit price bid for Prestressed Girder - Voided Slab as well.

Include all costs associated with furnishing and installing reinforcing steel embedded in the beams in the unit price bid for Prestressed Girder - Voided Slab.

Provide backer rod below keyway on both sides of the center girder. Include all costs associated with the backer rod, welding connections, and high-strength, non-shrink grout in the unit price bid for Prestressed Girder - Voided Slab.



BRIDGE SYMBOLOGY

DOWL

SHEET NO.
B3

STRUCTURAL NOTES AND SPECIFICATIONS

SCALE: No Scale

FEDERAL AID PROJECT NO.
NHPB STW-0 (002)

COUNTY
FERGUS

REVISED						S.D.K.		
REVISED						11-8-23	C.J.W.	
REVISED						11-8-23	K.C.A.	
REVISED						11-8-23		

CHECKED
DRAWN
DESIGNED
FILENAME: 98840008RKVT001.RVT

MONTANA DEPARTMENT OF TRANSPORTATION
BRIDGE BUREAU
2/5/2024 8:06:43 AM

ROUTE
MULTIPLE

REF POINT
MULTIPLE

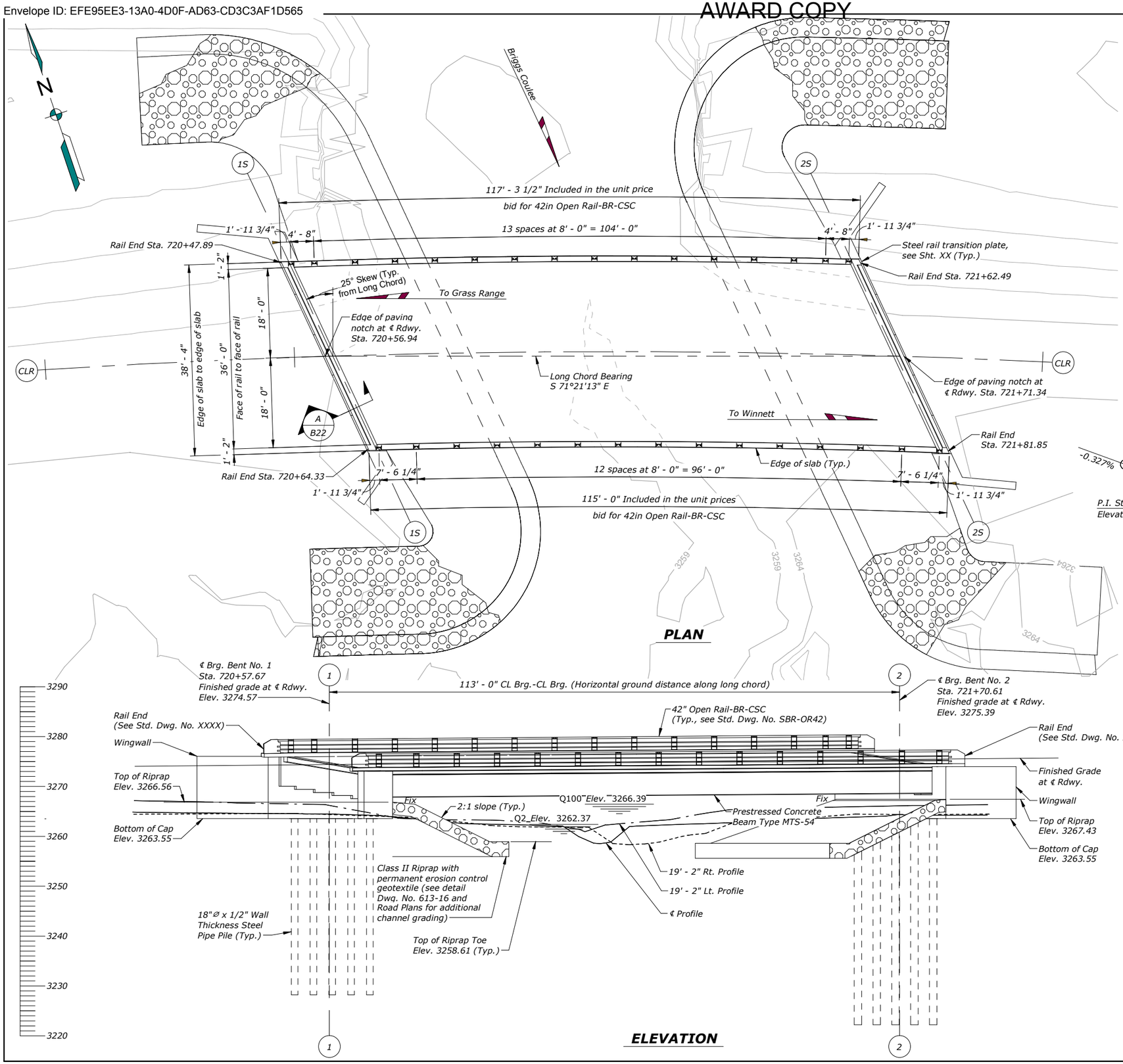
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MULTIPLE

UPN NUMBER
9884001

DRAWING NO.

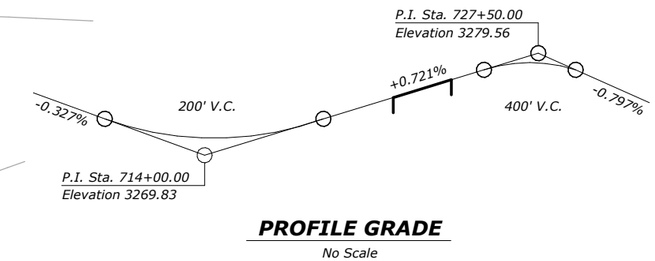
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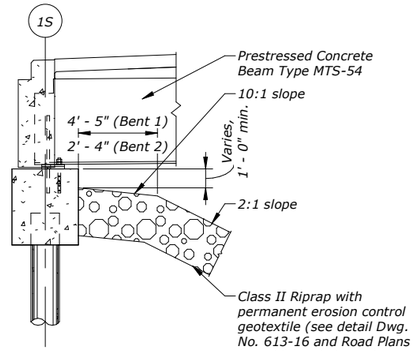
PLAN

ELEVATION



PROFILE GRADE

No Scale



A / B22 **SECTION**

Scale ~ 1/8" = 1'-0"
Bent 1 Shown
Bent 2 Similar

HYDRAULIC DATA

Drift:	Light
Ice:	Light
Low Scour Elevation (Q100):	3258.61
Drainage Area:	13.4 sq. mi.
Q2 Elevation:	3262.37
* Q100 Flow:	1008 cfs
Q100 Elevation:	3266.39
Q100 Velocity:	6.24 fps
Actual Low Beam Elevation:	3267.82
Allowable Low Beam Elevation:	3267.39

Also see Hydraulic Data Summary sheet.
* Q100 Elevations include backwater.

CURVE DATA

PI	721+75.19
Δ	39° 48' 53" (RT)
R	1,810'
T	655.47'
Lc	1,257.77'
E	115.03'
S	8%

DOWL

SHEET NO. B22

GENERAL LAYOUT
AT STA. 721+14.14

SCALE: 1" = 20'-0" Except As Noted

BRIDGE OVER BRIGGS COULEE

AT STA. 721+14.14

FEDERAL AID PROJECT NO. NHPB STW-0 (002)

COUNTY FERGUS

REVISED		W.O.D.	
REVISED		11-8-23	M.T.G.
REVISED		11-8-23	K.C.A.
REVISED		11-8-23	FILENAME: 9884001BRVT001.RVT
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MONTANA DEPARTMENT OF TRANSPORTATION — BRIDGE BUREAU

2/5/2024 8:11:33 AM

ROUTE N-57E

REF POINT 119+0.541

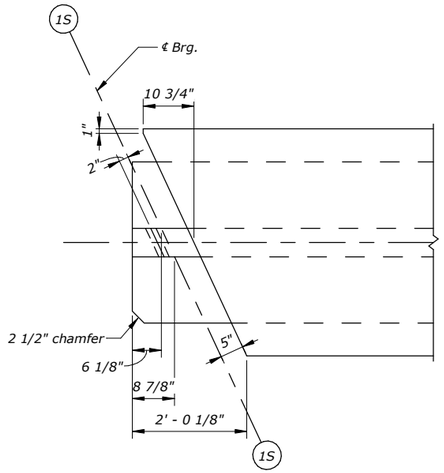
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UPN NUMBER 9884001

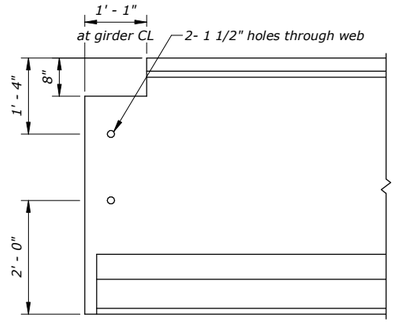
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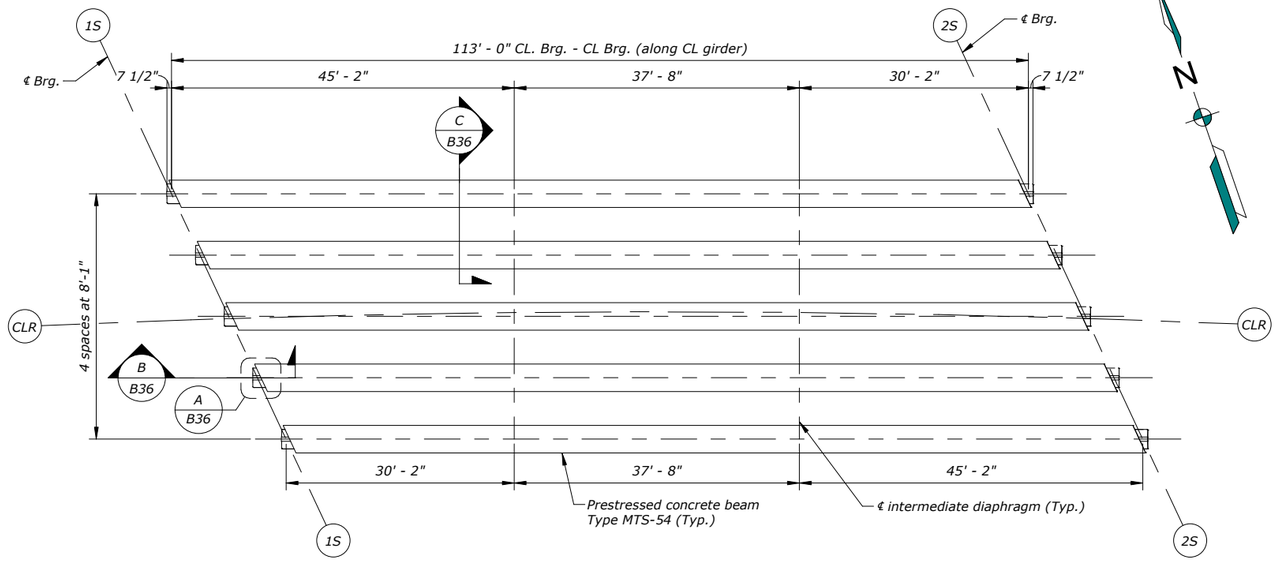
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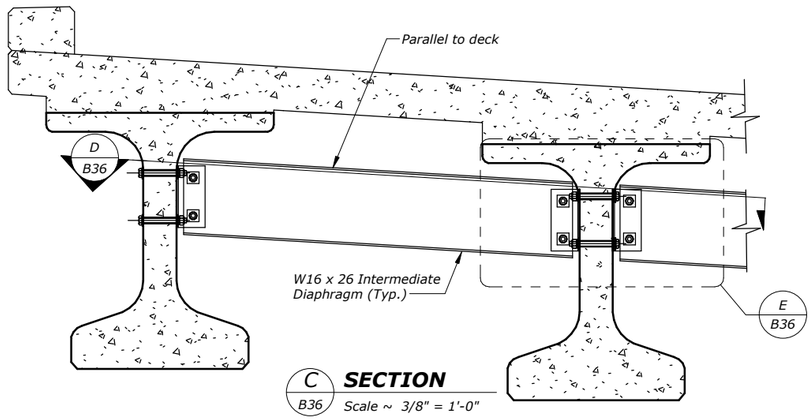


A B36 SECTION
Scale ~ 3/8" = 1'-0"
Bent 1 shown
Bent 2 similar

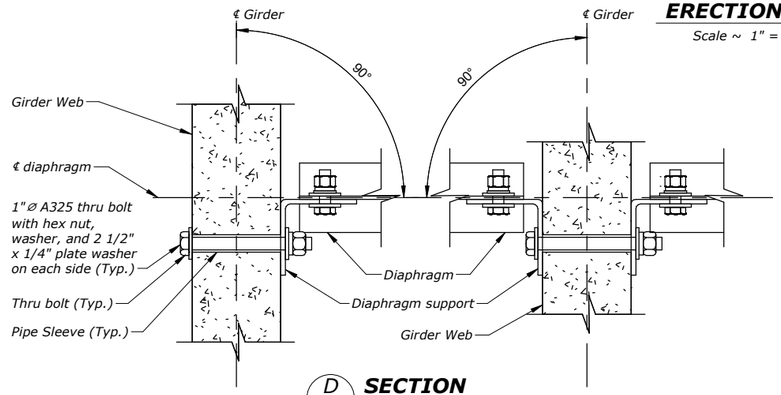


B B36 SECTION
Scale ~ 3/8" = 1'-0"
Bent 1 shown
Bent 2 similar





C B36 SECTION
Scale ~ 3/8" = 1'-0"



D B36 SECTION
Scale ~ 1" = 1'-0"

ERECTION PLAN
Scale ~ 1" = 20'-0"

DEAD LOAD DEFLECTION TABLE

TYPE MTS-54 PRESTRESSED CONCRETE BEAM					
SPAN LENGTH 113'-0"					
	TENTH POINT				
	0.1	0.2	0.3	0.4	0.5
INT.	13/16"	1 9/16"	2 3/16"	2 1/2"	2 5/8"
EXT.	3/4"	1 7/16"	1 15/16"	2 5/16"	2 7/16"

NOTE: Deflections symmetrical about 0.5 point and do not include beam dead load.

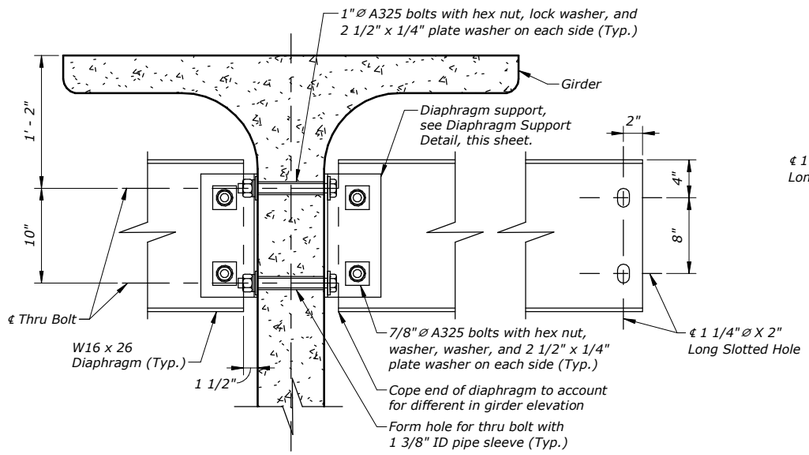
PRESTRESSED BEAM DESIGN PARAMETERS

AASHTO Specification	LRFD 9th Edition
Structure Type	Simple Span
Deck Concrete Strength	4000 psi
Deck Concrete Density	150 lb/ft3
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 M5S, 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	Intentionally Roughened to 1/4" amplitude
Load Rating Requirements	AASHTO LRFR Design Load

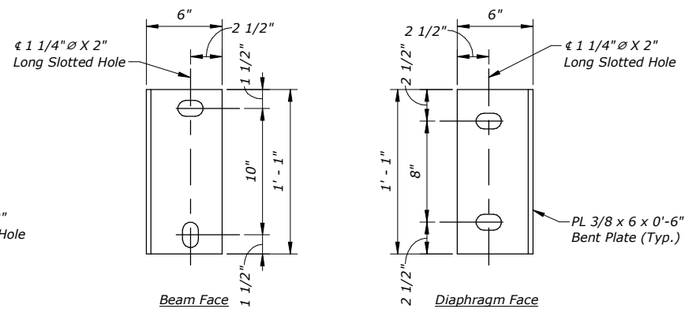
PRESTRESSED BEAM LOAD TABLE

LOAD TYPE	LOADS	APPLICATION METHOD
Barrier Load	0.203 kip/ft per rail	Equally to all beams
Future Wearing Surface	10 lb/ft2 applied between curbs	Equally to all beams
Interior Diaphragm	0.230 kip/diaphragm	At point load
Exterior Diaphragm	0.115 kip/diaphragm	At point load
Additional Dead Load	-----	----
Live Load	LRFD - HL-93	per AASHTO LRFD
Strength I Factored Moment at Section	Mu = 8200 kip-ft	Factored moment provided to verify design assumptions and demands. Demand is for interior beam.

Mu = 1.0 [1.25 DC = 1.50 DW + 1.75 (LL + IM)]



E B36 DIAPHRAGM CONNECTION DETAIL
Scale ~ 3/4" = 1'-0"



DIAPHRAGM SUPPORT DETAIL
Scale ~ 1" = 1'-0"

DOWNBOWL

SHEET NO. B36

ERECTION PLAN

SCALE: As noted

BRIDGE OVER BRIGGS COULEE

AT STA. 721+14.14

FEDERAL AID PROJECT NO. NHPB STW-0 (002)

COUNTY FERGUS

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REVISED				M.T.G.	
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ROUTE N-57E

REF POINT 119+0.541

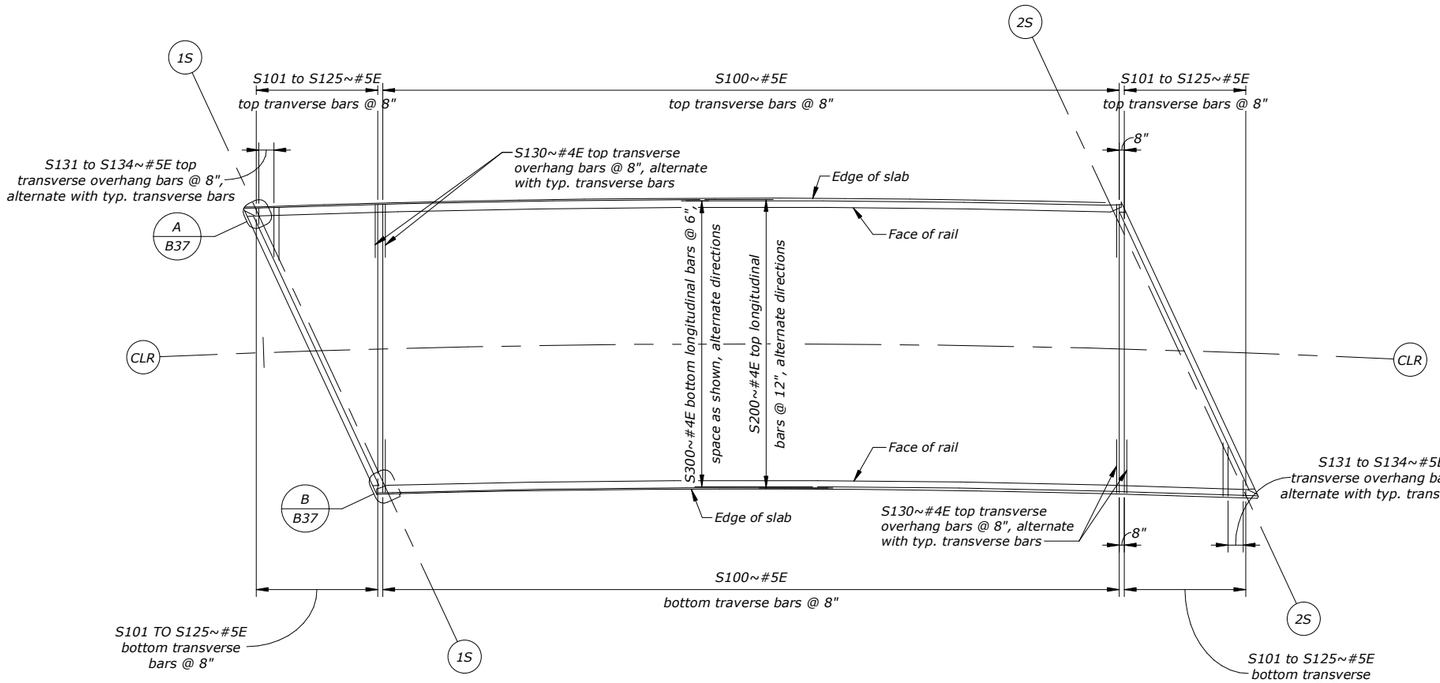
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UPN NUMBER 9884001

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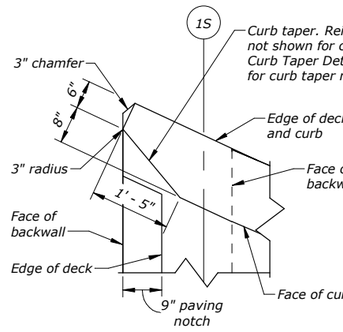
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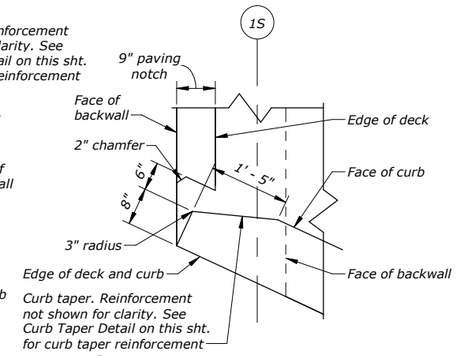
REINFORCING STEEL PLACEMENT DIAGRAM

Scale ~ 1" = 20'-0"



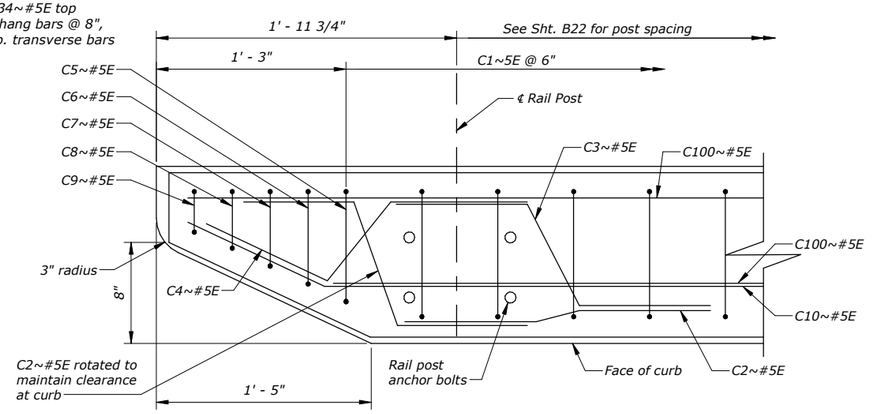
A B37 SLAB CORNER DETAIL

Scale ~ 3/8" = 1'-0"
Bent 1 shown
Bent 2 similar



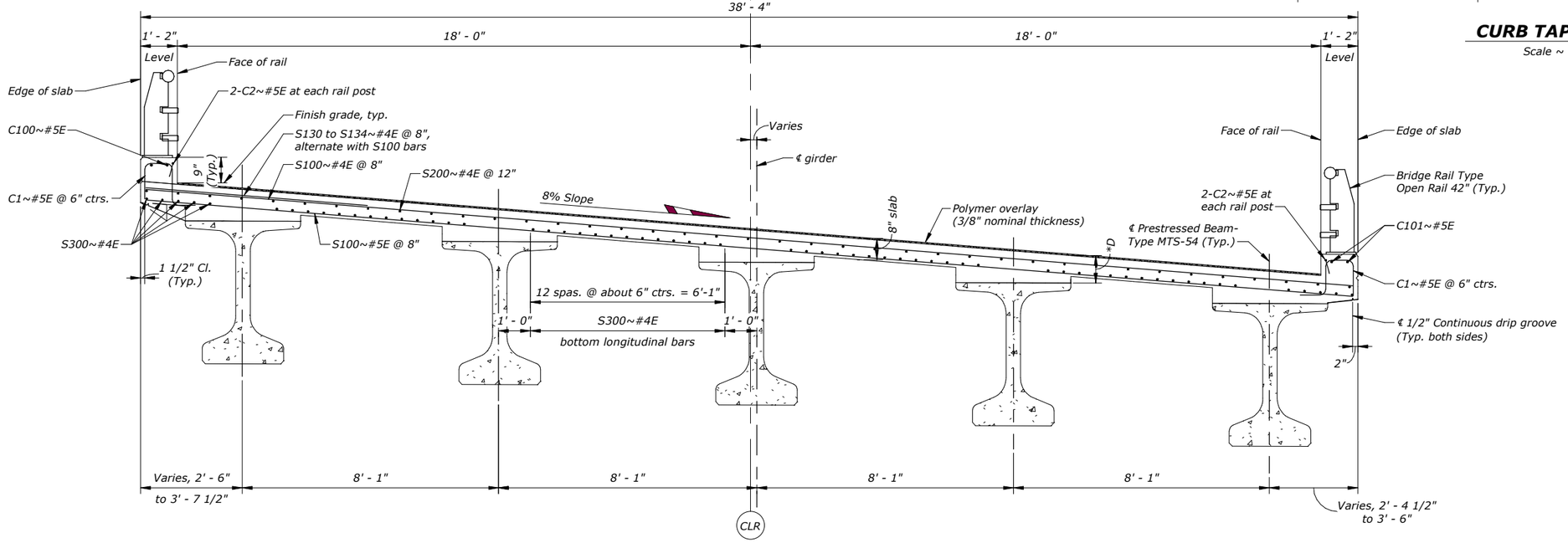
B B37 SLAB CORNER DETAIL

Scale ~ 3/8" = 1'-0"
Bent 1 shown
Bent 2 similar



CURB TAPER DETAIL

Scale ~ 1" = 1'-0"



TRANSVERSE SECTION

Scale ~ 1/4" = 1'-0"

*NOTE: Dimension D = 10 3/8" (int. girder) and 10 5/8" (ext. girder).

NOTE: Place transverse slab bars perpendicular to the structure Long Chord.

NOTE: Place longitudinal bars along an arc parallel to ℄ Roadway.

NOTE: See Standard Drawing No. SL-8 and SBR-OR42 for additional slab and rail details.

NOTE: See Bill of Reinforcing on Sheet No. B38.

DOWL

SHEET NO. B37

SLAB DETAILS

SCALE: As noted

BRIDGE OVER BRIGGS COULEE

AT STA. 721+14.14

FEDERAL AID PROJECT NO. NHPB STW-0 (002)

COUNTY FERGUS

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REVISED			
REVISED			
REVISED			
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DESIGNED		11-8-23	K.C.A.

FILENAME: 9884000BRVT001.RVT

MONTANA DEPARTMENT OF TRANSPORTATION MDT BRIDGE BUREAU

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ROUTE N-57E

REF POINT 119+0.541

MDT STR. ID 06005

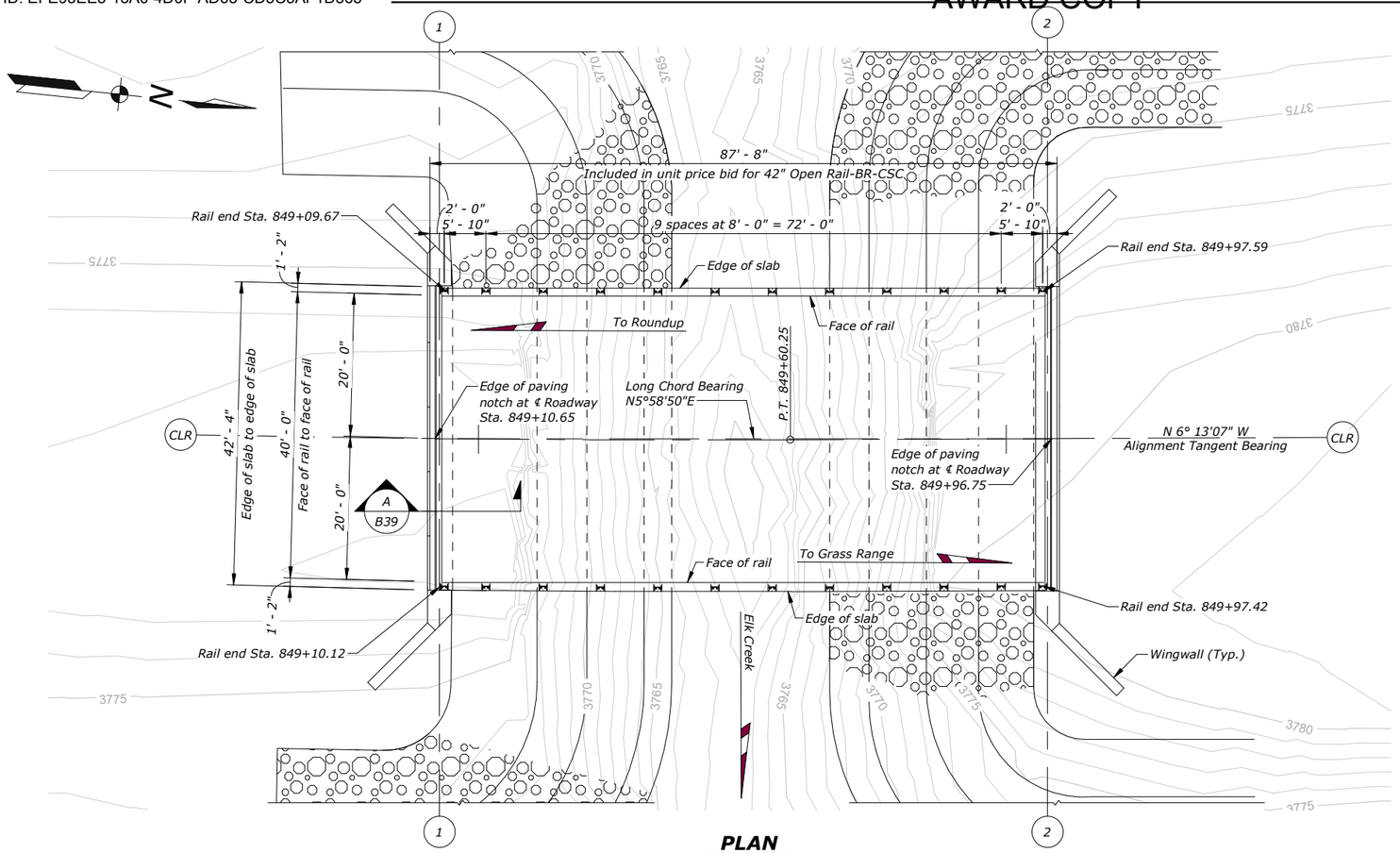
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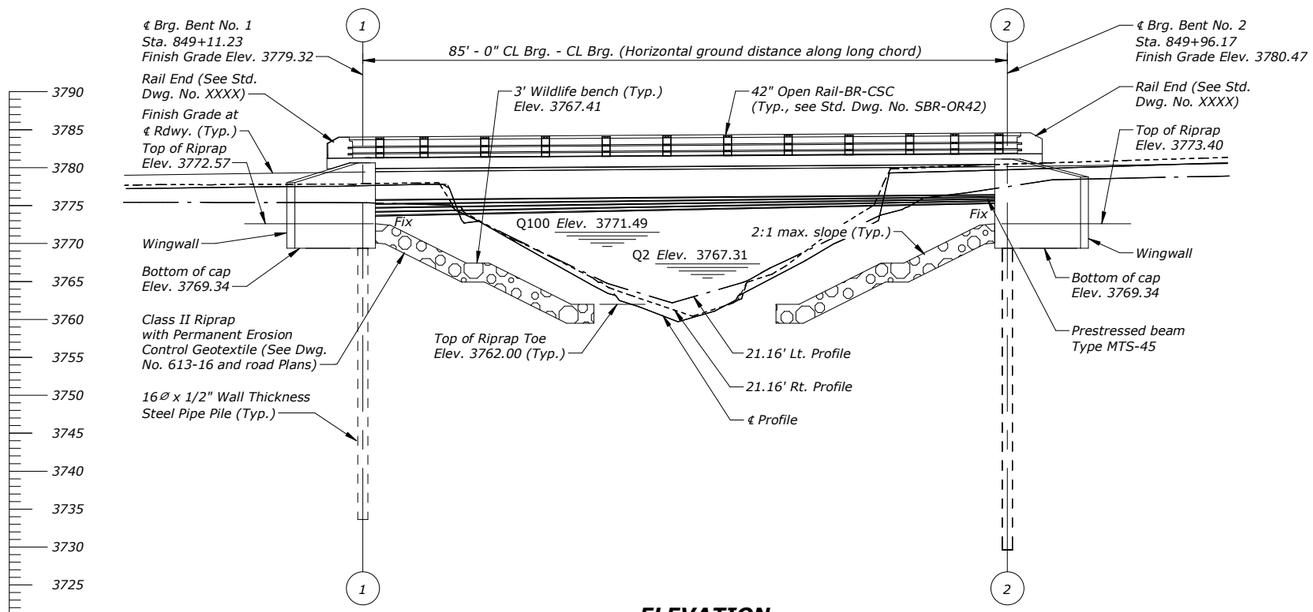
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DOWNBOWL



PLAN

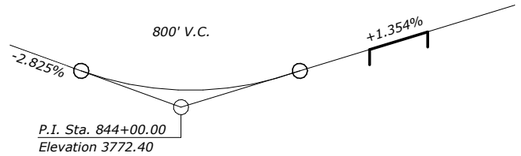


ELEVATION

NOTE: Water surface on date of survey Elev. 3764.82 (8/11/21)

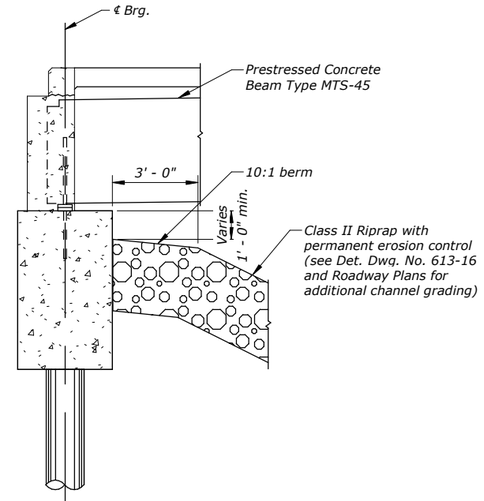
HYDRAULIC DATA	
Drift:	Moderate
Ice:	Light
Low Scour Elevation (Q500):	3758.3
Drainage Area:	42.9 sq. mi.
Q2 Elevation:	3,767.31
* Q100 Flow:	1,776 cfs
Q100 Elevation:	3,771.49
Q100 Velocity:	4.93 fps
Actual Low Beam Elevation:	3773.57
Allowable Low Beam Elevation:	3,772.49

Also see Hydraulic Data Summary sheet.
* Q100 Elevations include backwater



PROFILE GRADE

No Scale



A / B39 **SECTION**

Scale ~ 3/16" = 1'-0"
Bent No. 1 shown
Bent No. 2 similar

CURVE DATA	
PI	843+49.01
Δ	20° 50' 01" (LT)
R	3,400'
T	625.05'
Lc	1,236.29'
E	56.98'
S	6%

SHEET NO. B39

GENERAL LAYOUT AT STA. 849+53.70

SCALE: 1" = 20'-0" Except As Noted

BRIDGE OVER ELK CREEK

AT STA. 849+53.70

FEDERAL AID PROJECT NO. NHPB STW-0 (002)

COUNTY FERGUS

REVISED			K.C.A.	
REVISED			M.T.G.	
REVISED			W.O.D.	
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DESIGNED				

FILENAME: 9884008RVT001.RVT

MONTANA DEPARTMENT OF TRANSPORTATION — BRIDGE BUREAU

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ROUTE N-61N

REF POINT 37+0.961

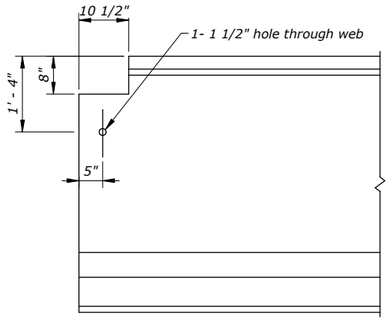
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UPN NUMBER 9884001

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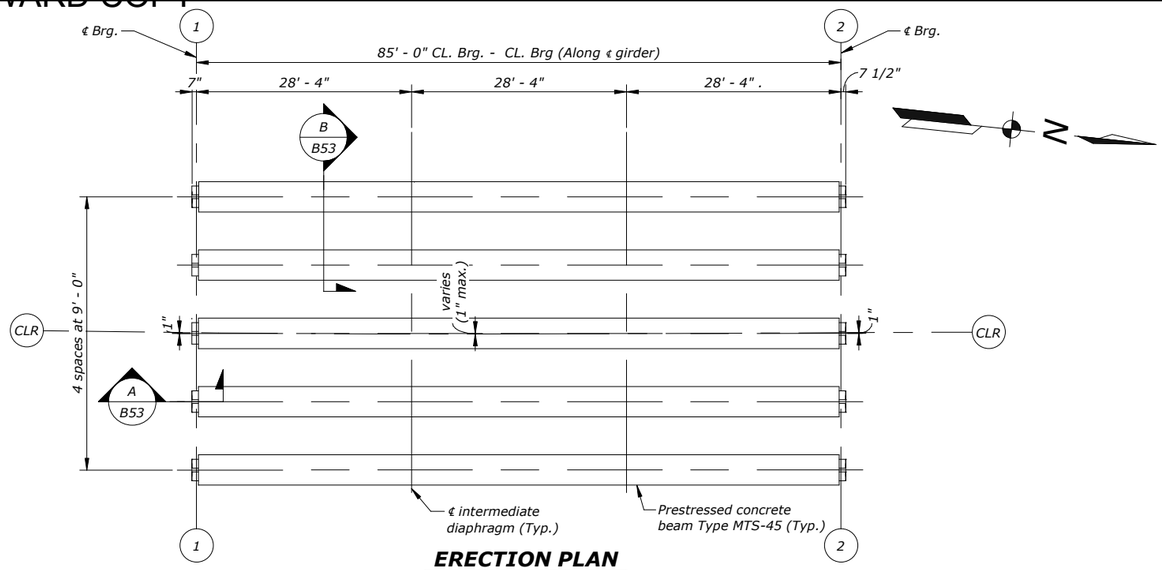
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A B53 **SECTION**

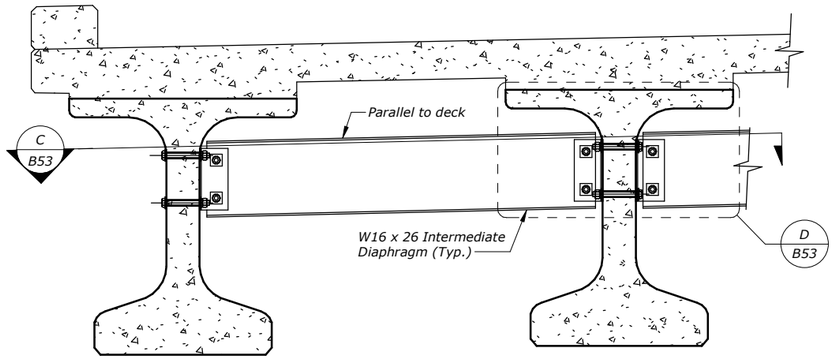
Scale ~ 3/8" = 1'-0"

Bent No. 1 shown
Bent No. 2 similar



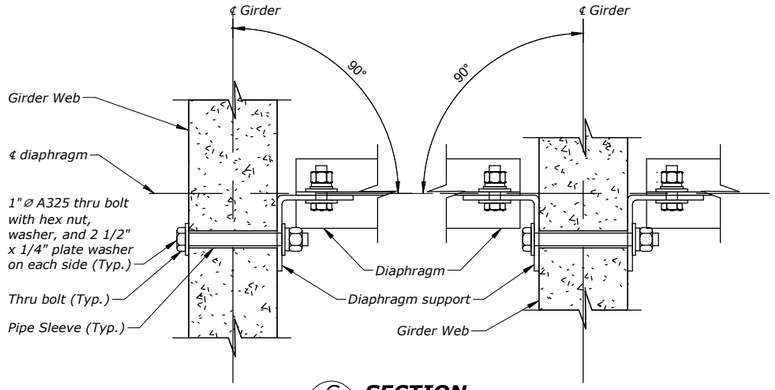
ERECTION PLAN

Scale ~ 1" = 20'-0"



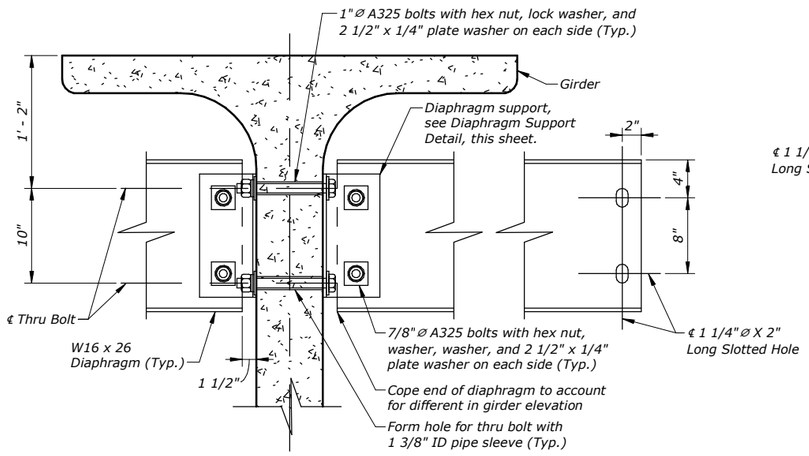
B B53 **SECTION**

Scale ~ 3/8" = 1'-0"



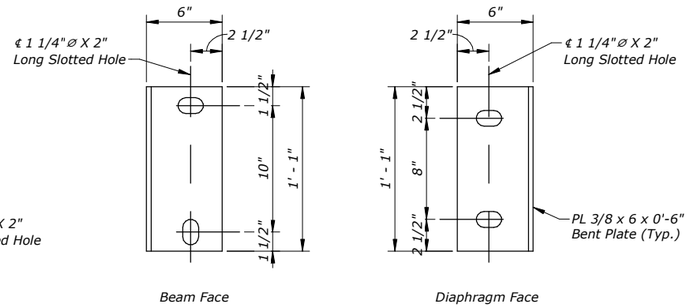
C B53 **SECTION**

Scale ~ 1" = 1'-0"



D B53 **DIAPHRAGM CONNECTION DETAIL**

Scale ~ 3/4" = 1'-0"



DIAPHRAGM SUPPORT DETAIL

Scale ~ 1" = 1'-0"

DEAD LOAD DEFLECTION TABLE

TYPE MTS-45 PRESTRESSED CONCRETE BEAM

SPAN LENGTH 85'-0"

	TENTH POINT				
	0.1	0.2	0.3	0.4	0.5
INT.	7/16"	13/16"	1 1/8"	1 1/4"	1 3/8"
EXT.	3/8"	11/16"	15/16"	1 1/16"	1 1/8"

NOTE: Deflections symmetrical about 0.5 point and do not inlcude beam dead load.

PRESTRESSED BEAM DESIGN PARAMETERS

AASHTO Specification	LRFD 9th Edition
Structure Type	Simple Span
Deck Concrete Strength	4000 psi
Deck Concrete Density	150 lb/ft3
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 M5S, 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	Intentionally Roughened to 1/4" amplitude
Load Rating Requirements	AASHTO LRFR Design Load

PRESTRESSED BEAM LOAD TABLE

LOAD TYPE	LOADS	APPLICATION METHOD
Barrier Load	0.203 kip/ft per rail	Equally to all beams
Future Wearing Surface	10 lb/ft2 applied between curbs	Equally to all beams
Interior Diaphragm	0.260 kip/diaphragm	At point load
Exterior Diaphragm	0.130 kip/diaphragm	At point load
Additional Dead Load	-----	----
Live Load	LRFD - HL-93	per AASHTO LRFD
Strength I Factored Moment at Section	Mu = 5400 kip*ft	Factored moment provided to verify design assumptions and demands. Demand is for exterior beam.

Mu = 1.0 [1.25 DC + 1.50 DW + 1.75 (LL + IM)]

DOWNLOAD

SHEET NO. B53

ERECTION PLAN

SCALE: As Noted

BRIDGE OVER ELK CREEK

AT STA. 849+53.70

FEDERAL AID PROJECT NO. NHPB STW-0 (002)

COUNTY FERGUS

REVISED		CHECKED	K.C.A.
REVISED		DRAWN	M.T.G.
REVISED		DESIGNED	W.O.D.
REVISED		11-8-23	FILENAME: 9884I00BRVT001.RVT

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ROUTE N-61N

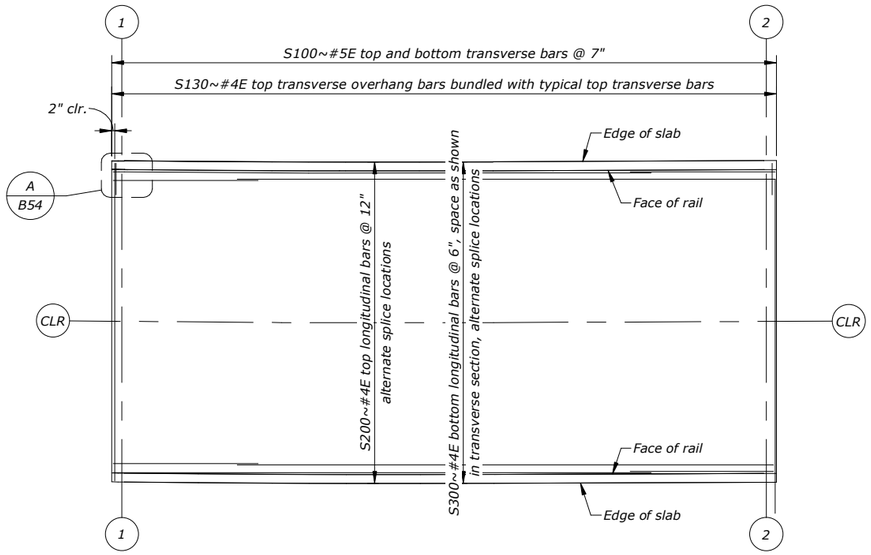
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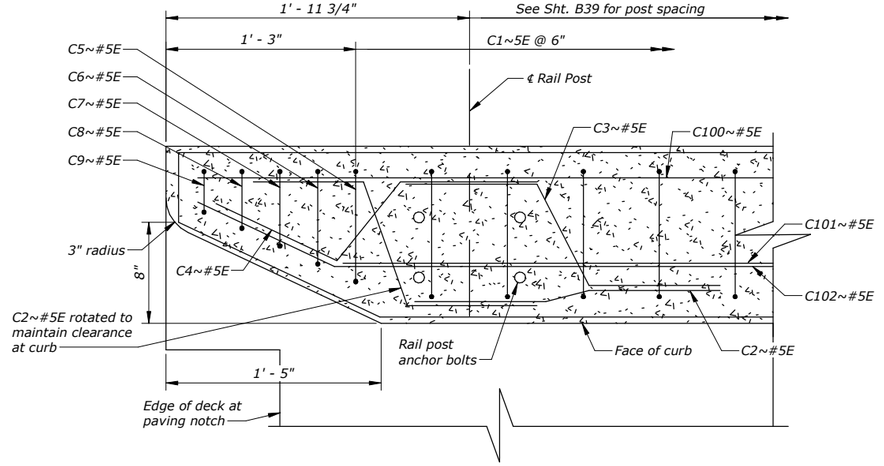
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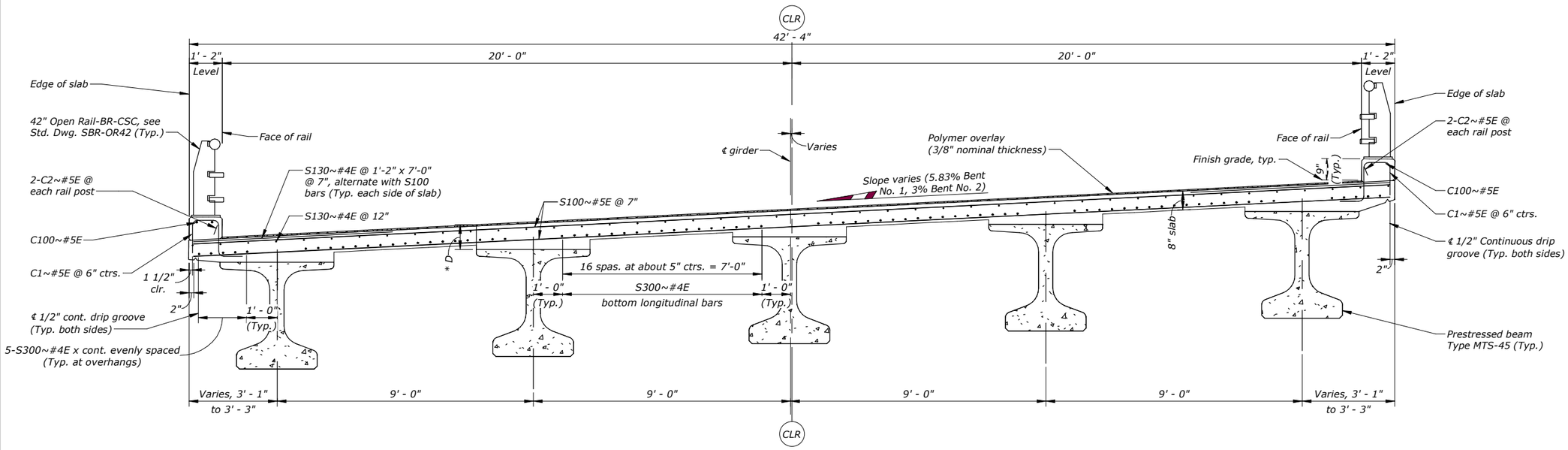
REINFORCING STEEL PLACEMENT DIAGRAM

Scale ~ 1" = 20'-0"



A B54 **CURB TAPER DETAIL**

Scale ~ 1" = 1'-0"



TRANSVERSE SECTION

Scale ~ 1/4" = 1'-0"

*NOTE: Dimesion D = 10" (int. girder) and 10 1/8" (ext. girder).

NOTE: See Standard Drawing No. SBR-OR42 for additional slab and rail details.

NOTE: See Bill of Reinforcing on Sheet No. B55.

SHEET NO. B54

SLAB DETAILS

SCALE: As Noted

BRIDGE OVER ELK CREEK

AT STA. 849+53.70

FEDERAL AID PROJECT NO. NHPB STW-0 (002)

COUNTY FERGUS

REVISED		K.C.A.	11-8-23
REVISED		M.T.G.	11-8-23
REVISED		W.O.D.	11-8-23
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		DESIGNED	

FILENAME: 9884001BRVT001.RVT

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ROUTE N-61N

REF POINT 37+0.961

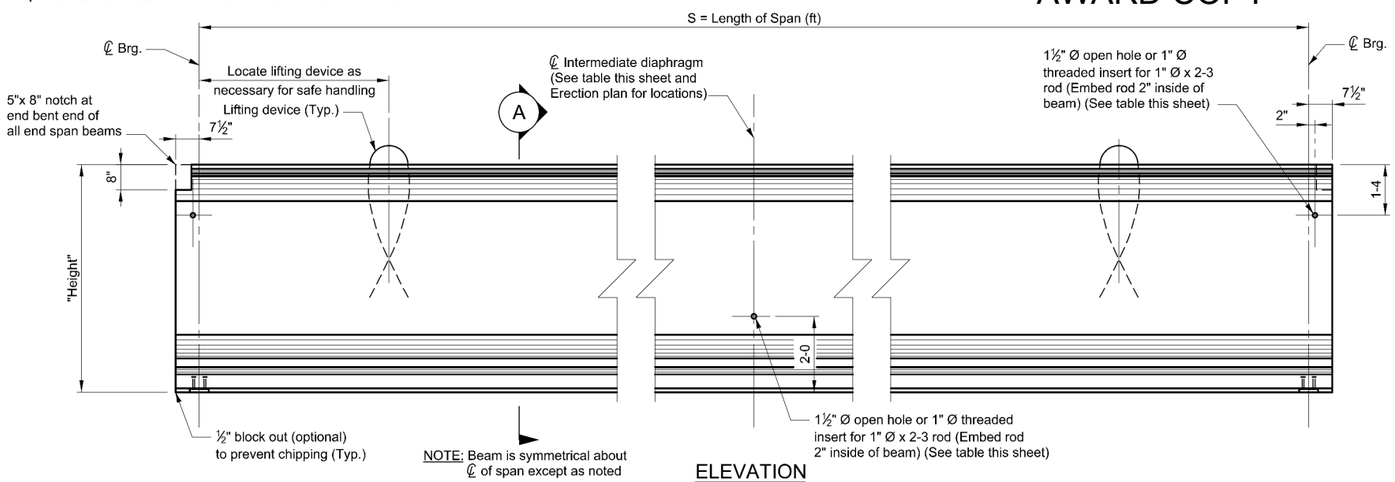
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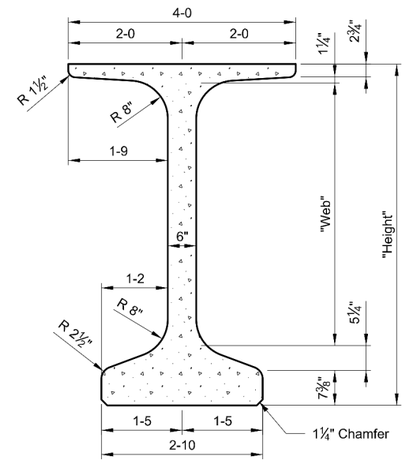
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ELEVATION



SECTION A

NOTES

SPECIFICATIONS: For design specifications, see General Layout. Design and fabricate the beam to support the dead load and live load stresses and provide a minimum ultimate moment capacity shown on the Erection Plan. Show stresses in the beam under each loading condition that is anticipated in the manufacture, handling and service life of the beam.

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.

DIAPHRAGMS: See Erection Plan for location of diaphragms when structure is skewed.

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

SHOES: Paint shoes in accordance to Standard Specifications. See details on Bridge Plans if expansion shoes are required. See General layout for type of shoes required.

REINFORCING STEEL: See General Layout. The suffix E denotes epoxy coated reinforcing.

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 anchor bolts, nuts, smooth bars, metal expansion caps, shoes, fiber-reinforced pads and embedded plates in the unit price bid for Prestressed Beams Type MTS.

STRUCTURAL STEEL: Use structural steel meeting the requirements of AASHTO M 270 Grade 36 for embedded plates, smooth bars and shoes. Use structural steel meeting the requirements of AASHTO M 314 Grade 55 for anchor bolts. Galvanize the anchor bolts meeting the requirements of AASHTO M 232. Use headed shear studs meeting the requirements of AASHTO M 169 Grades 1010 through 1020.

HORIZONTAL INTERFACE SHEAR REINFORCEMENT: Fabricator will provide spacing that meets the requirements of the AASHTO code specified on the General Layout.

MONTANA SUPER GIRDER PROPERTIES

NAME	Girder Depth "Height"	"Web"	A (in²)	Ycg (in)	Ixo (in⁴)	Sx (Top) (in³)	Sx (Bot) (in³)	Weight (lb/ft)
MTS-36	36"	19⅜"	670	16.44	112 100	5 732	6 818	700
MTS-45	45"	28⅜"	724	20.28	197 679	7 998	9 746	755
MTS-54	54"	37⅜"	778	24.22	312 050	10 477	12 886	810
MTS-63	63"	46⅜"	832	28.22	457 505	13 155	16 210	865
MTS-72	72"	55⅜"	886	32.29	636 312	16 024	19 706	925
MTS-81	81"	64⅜"	940	36.41	850 718	19 077	23 368	980
MTS-96	96"	79⅜"	1030	43.36	1 293 240	24 566	29 829	1075

DIAPHRAGM LOCATIONS

SPAN LENGTH	DIAPHRAGM LOCATION
0 - 40 ft	NONE
40 - 80 ft	½ S
80 - 120 ft	⅓ S
120 - 160 ft	¼ S
greater than 160 ft	See Erection Plan

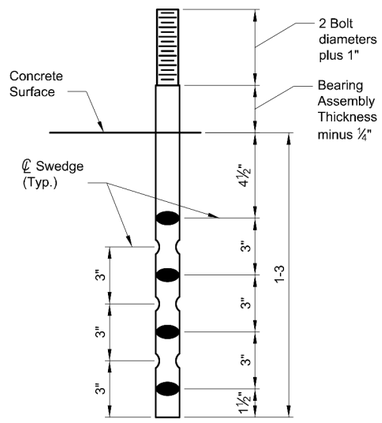
ANCHOR BOLT DIAMETERS

SPAN LENGTH	ANCHOR BOLT OR SMOOTH BAR DIAMETER	EXPANSION CAP DIAMETER
0 - 50 ft	1"	1⅛"
50 - 100 ft	1¼"	1⅜"
100 - 150 ft	1½"	1⅝"
greater than 150 ft	1¾"	1⅞"

WEB THREADED INSERT / HOLE

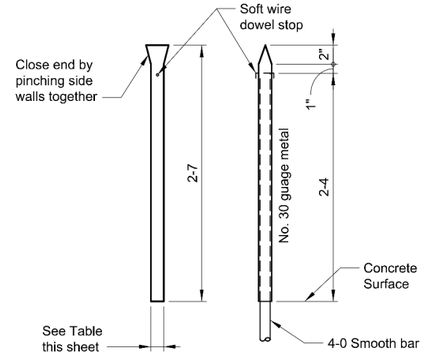
CONDITION	EXTERIOR BEAM	INTERIOR BEAM
End Bent Fixed Bearing	Open Hole	Open Hole
End Bent Exp Bearing	Threaded Insert	Open Hole
Intermediate Bent	Threaded Insert	Open Hole
Intermediate Diaphragm	Threaded Insert	Open Hole

NOTE: Place threaded inserts at diaphragm face of beam only.

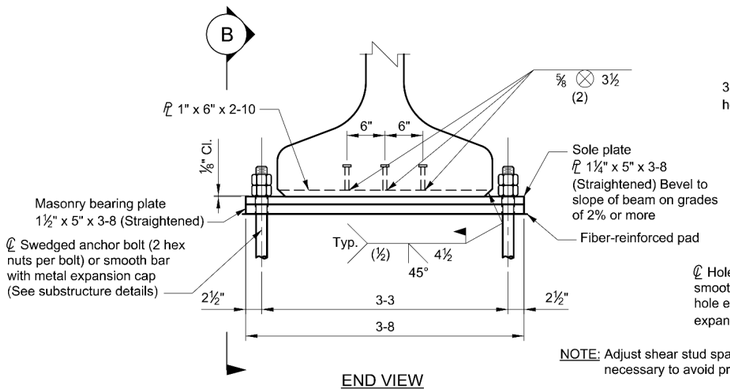


NOTE: Make swedge deformations 3/16" deep minimum without removing metal.

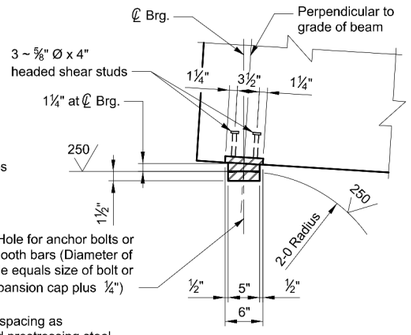
ANCHOR BOLT DETAIL



METAL EXPANSION CAP DETAIL



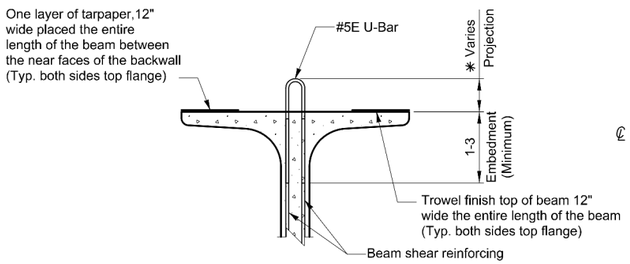
END VIEW



NOTE: Adjust shear stud spacing as necessary to avoid prestressing steel.

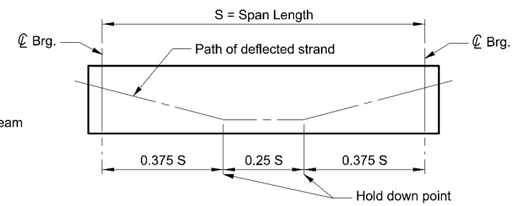
VIEW B

FIXED BEARING DETAILS



HORIZONTAL INTERFACE SHEAR REINFORCEMENT

✱NOTE: Extend horizontal interface shear reinforcement such that is located between top and bottom deck mat reinforcing layers.



TYPICAL DEFLECTED STRAND FOR PRE-TENSIONING SYSTEM

STANDARD PRESTRESSED CONCRETE BEAM TYPE MTS

No Scale

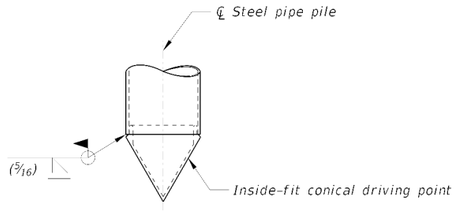
MDT MONTANA DEPARTMENT OF TRANSPORTATION BRIDGE BUREAU

REVISED				
REVISED				
REVISED		5-20-14	D.F.J.	
APPROVED		3-6-12	D.F.J.	
CHECKED		3-6-12	D.F.J.	
DRAWN		3-6-12	T.J.B.	$FILEABBREV$
$DATE$		$TIME$		

DRAWING NO. MTS

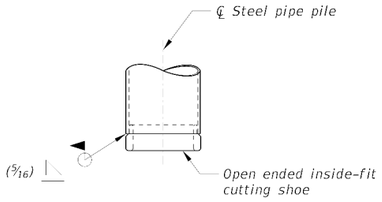
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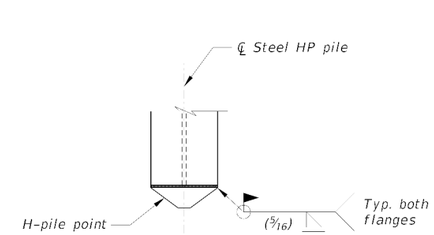
CONICAL DRIVING POINT WELD DETAIL

Slip driving point inside pipe.



CUTTING SHOE WELD DETAIL

Slip shoe inside pipe.



H-PILE POINT WELD DETAIL

Do not weld web or inside of flanges.

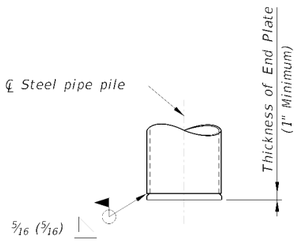
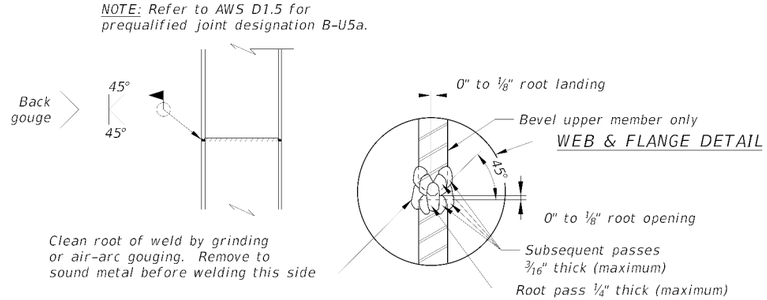


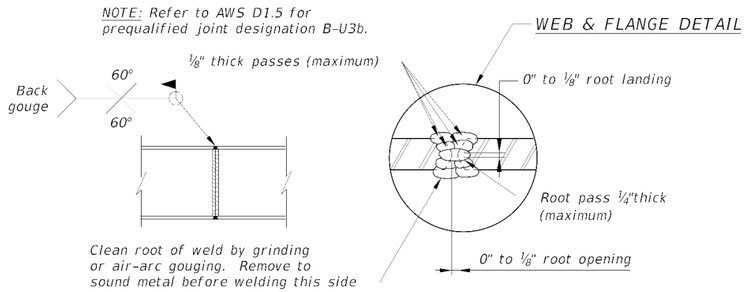
PLATE END WELD DETAIL

Align plate with outside of pipe.



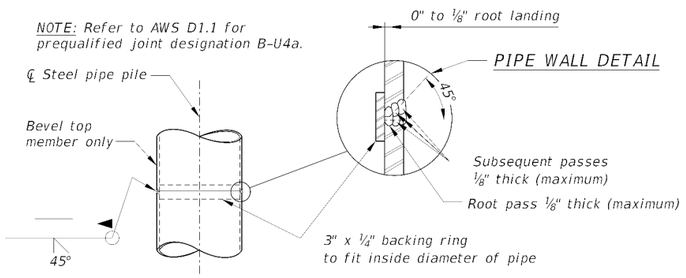
PILE EXTENSION AFTER DRIVING

(Pile Vertical)



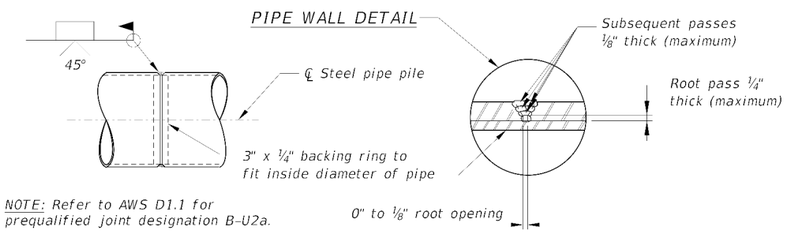
PILE EXTENSION BEFORE DRIVING

WELDED SPLICES FOR STEEL HP PILES



PILE EXTENSION AFTER DRIVING

(Pile Vertical)



PILE EXTENSION BEFORE DRIVING

WELDED SPLICES FOR STEEL PIPE PILES

PIPE PILE WEIGHTS

PIPE PILE DIAMETER	WALL THICKNESS	WEIGHT (LBS / FT)
12"	1/2"	62
16"	1/2"	83
20"	1/2"	104
24"	1/2"	126
24"	3/4"	186
30"	3/4"	235

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.

STANDARD PILE SPLICE DETAILS AND PILE TIPS

No Scale

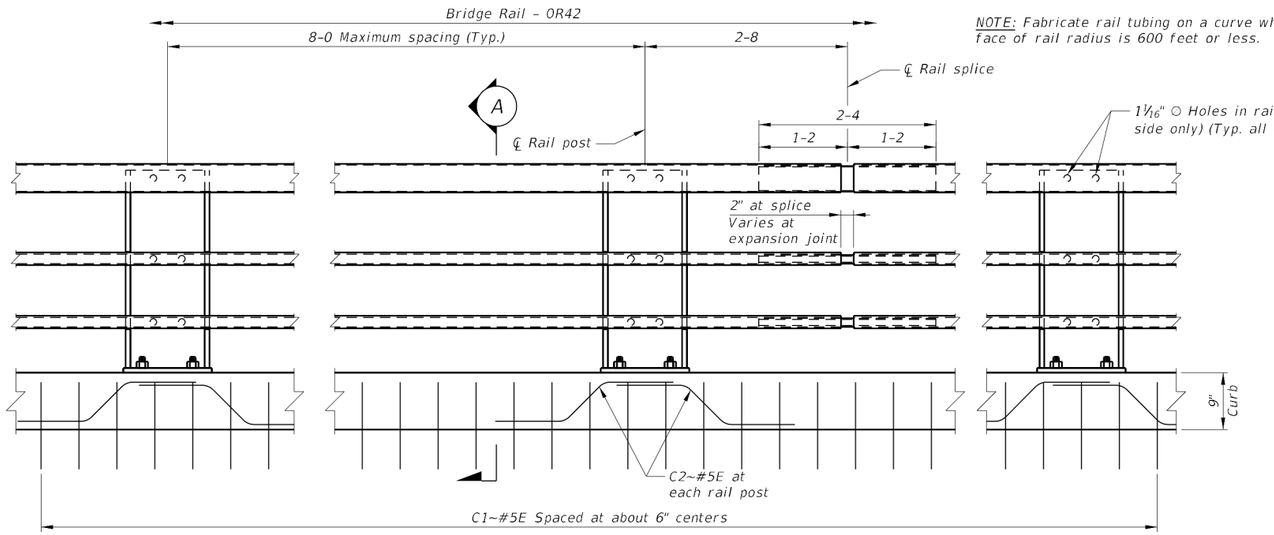
MONTANA MDT DEPARTMENT OF TRANSPORTATION — BRIDGE BUREAU

REVISED		
REVISED	10-10-19	N.A.H.
REVISED	12-27-18	T.J.B.
APPROVED	1-30-15	D.F.J.
CHECKED	1-30-15	D.F.J.
DRAWN	1-23-15	T.J.B.
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NOTE: Fabricate rail tubing on a curve when face of rail radius is 600 feet or less.

NOTE: Locate the splice on either side of post. Tube shop splices are not allowed.

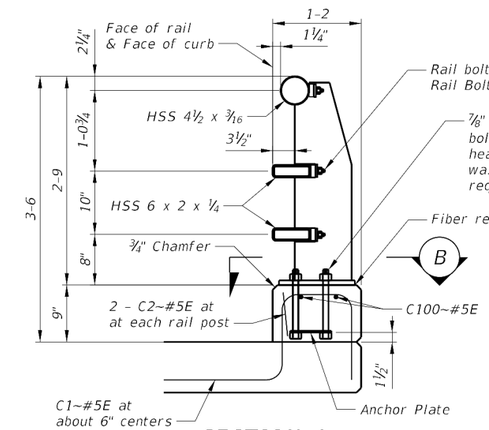
NOTE: Show vent and pickup holes in rails and sleeves on Fabricator's shop drawings. Place vent holes on the underside of the rail members as installed.

NOTE: Attach panel lengths of tube members continuously to a minimum of two posts (except at abutments with expansion joints).

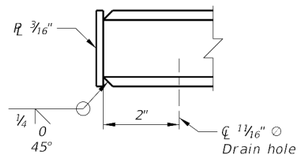
NOTE: Do not provide a tube splice in first panel unless it crosses an expansion joint.

NOTE: Place expansion splice in rail such that it is positioned between the same rail posts as the expansion joint.

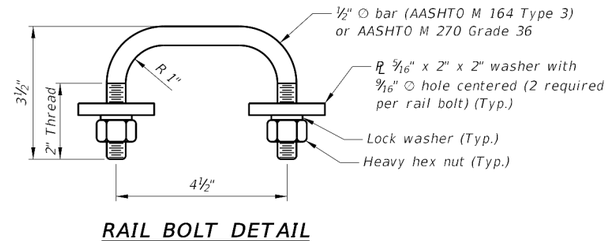
INSIDE ELEVATION OF RAIL



SECTION A



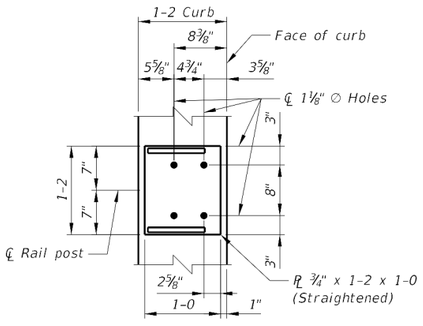
TUBE CAP DETAIL



RAIL BOLT DETAIL

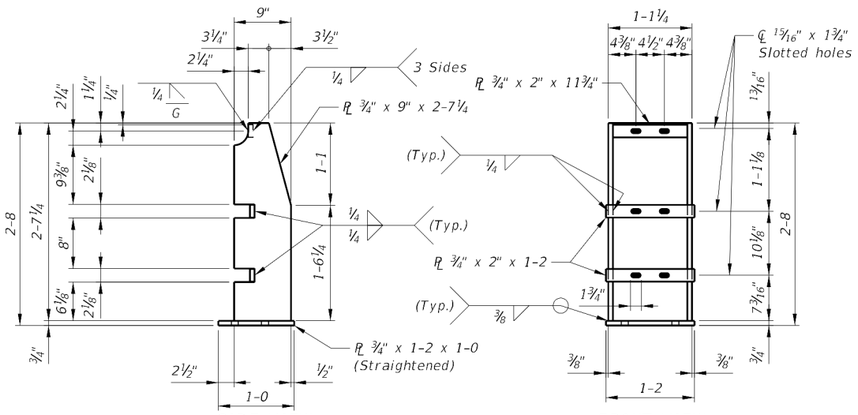
NOTE: Finish the top of slab under each rail post to a smooth and uniform surface to assure a proper alignment of the post and a tight fit between the fiber reinforced pad and concrete. Bush hammering is acceptable only to remove high spots.

NOTE: Use fiber reinforced pads meeting the requirements of subsection 711.16 of the Standard Specifications. Size and position the pads such that not less than 1/2" of the pad protrudes on all sides of the base plate. Punch slotted holes in pads to match base plate.

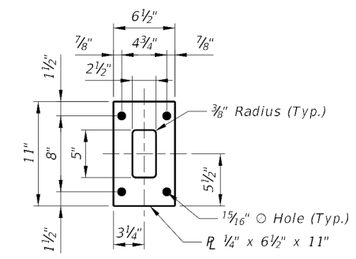


SECTION B

(Anchor bolts not shown)

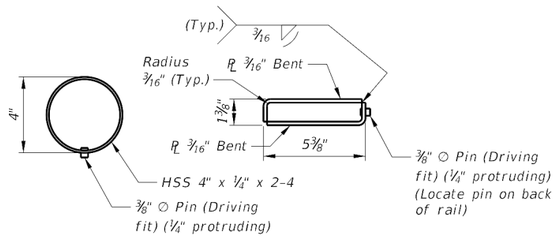


RAIL POST DETAIL



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

ANCHOR PLATE DETAIL



NOTE: Locate 3/8" ∅ Pin at mid-length of sleeve.

SLEEVE FABRICATION DETAILS

NOTES

PLACEMENT: Do not disturb the deck cure to construct the curb and rail.

CONCRETE STRENGTH: Do not place construction vehicles or equipment on the deck until the concrete has reached 90% of its specified 28-day compressive strength or without approval from the Project Manager.

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 42 IN Open Rail – BR.

PAYMENT: Payment for 42 IN Open Rail – BR 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 42 IN Open Rail – BR. Use rail post plates and base plates conforming to AASHTO M 270 Grade 50 T3. Use AASHTO M 270 Grade 50 for all other plates and ASTM A500 Grade B for structural tubing.

ERECTION: Place rail posts as shown in details, perpendicular to adjacent roadway grade and vertical in relation to roadway cross slopes.

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.

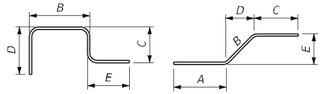
RAIL WEIGHT: For informational purposes only, the rail weight is approximately:
Curb weight = 131.3 lb/ft
Curb volume = 0.875 cu. ft / ft
Rail weight = 52.9 lb/ft

PICKETS: See Std. Dwg. No. SBR-OR42-PK for rail pickets when called for in the Bridge Plans.

CRASH TEST: This rail has been evaluated and approved to be of equal strength to railings with like geometry, which have been crash tested to meet MASH TL-4 criteria.

BILL OF REINFORCING STEEL

FOR ONE CURB ONLY
(ALL DIMENSIONS ARE OUT TO OUT)



NOTE: See Bridge Plans for number of bars required and longitudinal bars.

Mark	Size	Type	Length	A	B	C	D	E	G	N
C1	#5E	526	4-0 1/2		11"	1-1 3/4	1-1 3/4	10"		
C2	#5E	41	2-6 3/4	11"	8 3/4"	11"	6 1/4"	6 1/4"		

STANDARD BRIDGE RAIL TYPE OPEN RAIL 42"

No Scale

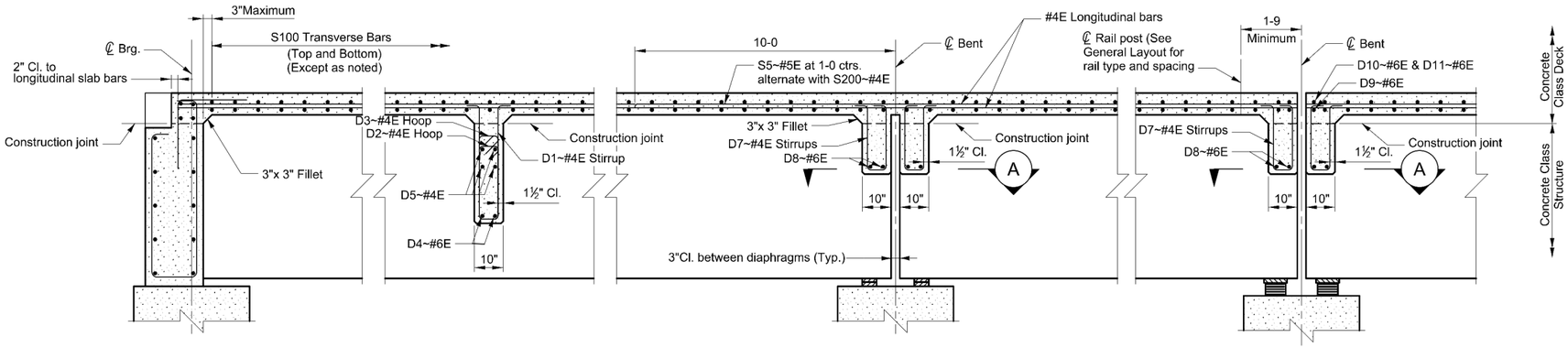
MONTANA DEPARTMENT OF TRANSPORTATION MDT BRIDGE BUREAU

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REVISED						
APPROVED	9-17-19	N.A.H.				
CHECKED	2-7-19	L.M.M.				
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DETAIL AT FIXED END BENT | INTERMEDIATE DIAPHRAGM | CONTINUOUS SLAB AT INTERMEDIATE BENT | EXPANSION JOINT AT INTERMEDIATE BENT

LONGITUDINAL SECTION

**NOTE: Use a detail for end bents with expansion joints similar to the detail for an expansion joint at an intermediate bent.

NOTES

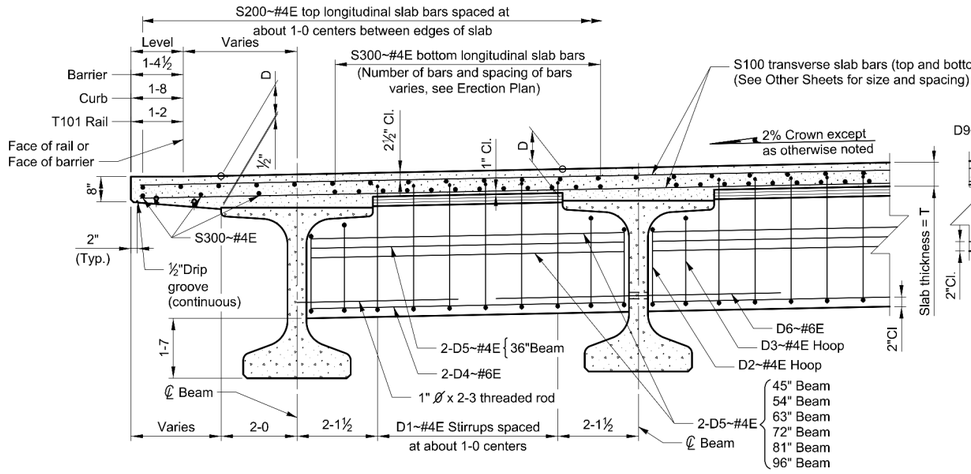
Use details shown on this sheet only as they apply to the project. See the General Layout or Other Sheets for beam spacing, slab thickness, size and spacing of S100 bars, number and spacing of S200 and S300~#4 bars, deck joint arrangement, rail and curb length, rail post spacing, bill of reinforcing steel and roadway width.

When adjoining spans have a different number of longitudinal slab bars, make the longitudinal bars of the shorter span continuous over the bent and extend them 3-0 into the longer span.

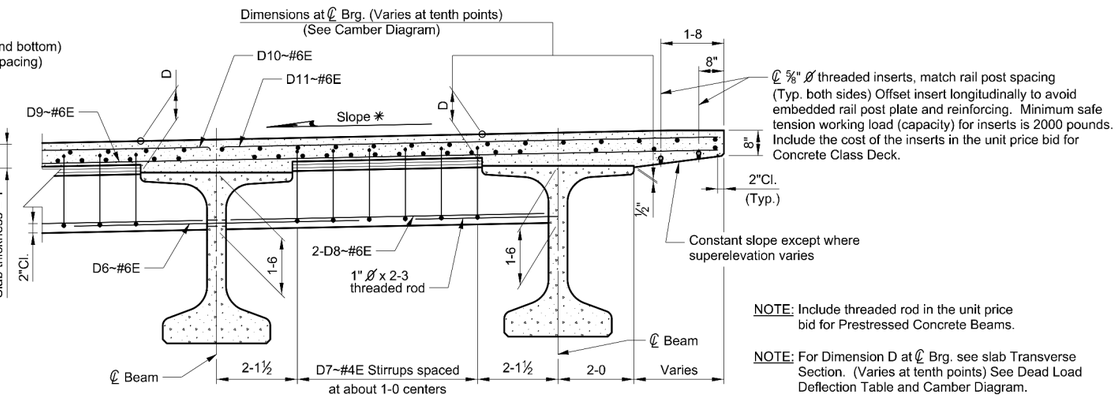
If the bridge is skewed, place the transverse slab reinforcing steel as shown on Other Sheets.

See Standard Bridge Rail drawings for rail details.

The suffix E denotes epoxy coated reinforcing.



TRANSVERSE SECTION NEAR INTERMEDIATE DIAPHRAGM AT LOW SIDE

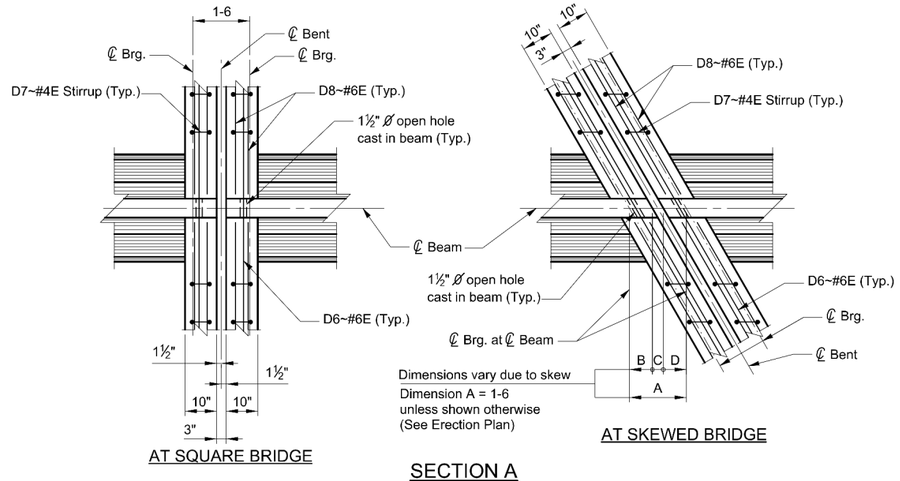


NOTE: Include threaded rod in the unit price bid for Prestressed Concrete Beams.

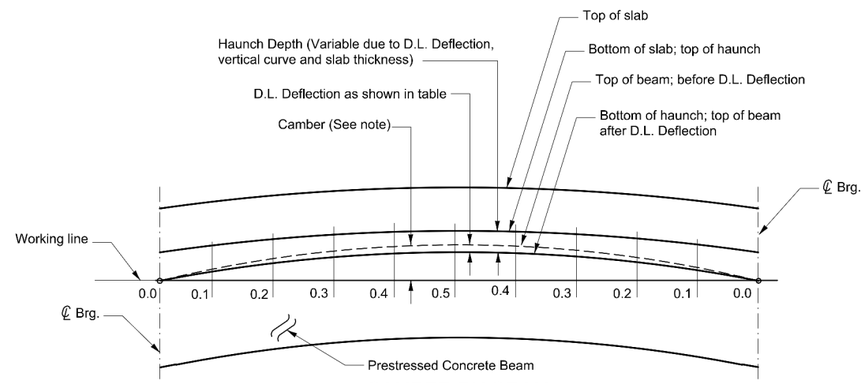
NOTE: For Dimension D at ℄ Brg. see slab Transverse Section. (Varies at tenth points) See Dead Load Deflection Table and Camber Diagram.

TRANSVERSE SECTION NEAR INTERMEDIATE BENT AT HIGH SIDE

✳NOTE: Detail shown is for superelevations other than normal crown.



SECTION A



CAMBER DIAGRAM

NOTE: See Erection plan for theoretical D.L. Deflection Table for Prestressed Concrete Beams.

NOTE: Camber is noted as the distance from the working line to the top of beam and may vary from theoretically calculated D.L. deflection.

STANDARD SLAB AND DIAPHRAGM DETAILS

No Scale

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REVISED	3-15-17	D.F.J.	
REVISED	5-20-14	D.F.J.	
APPROVED	3-6-12	D.F.J.	
CHECKED	3-6-12	D.F.J.	
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