09/08/99

TIP PROJECT: U–5808

CONTRACT: C204842

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

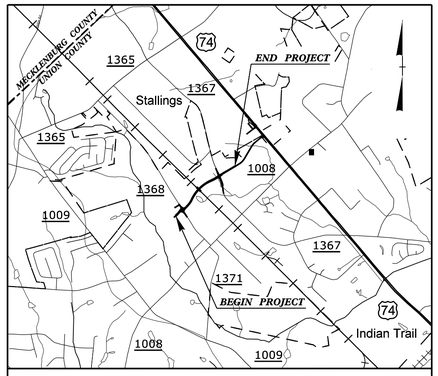
UNION COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U–5808	1	

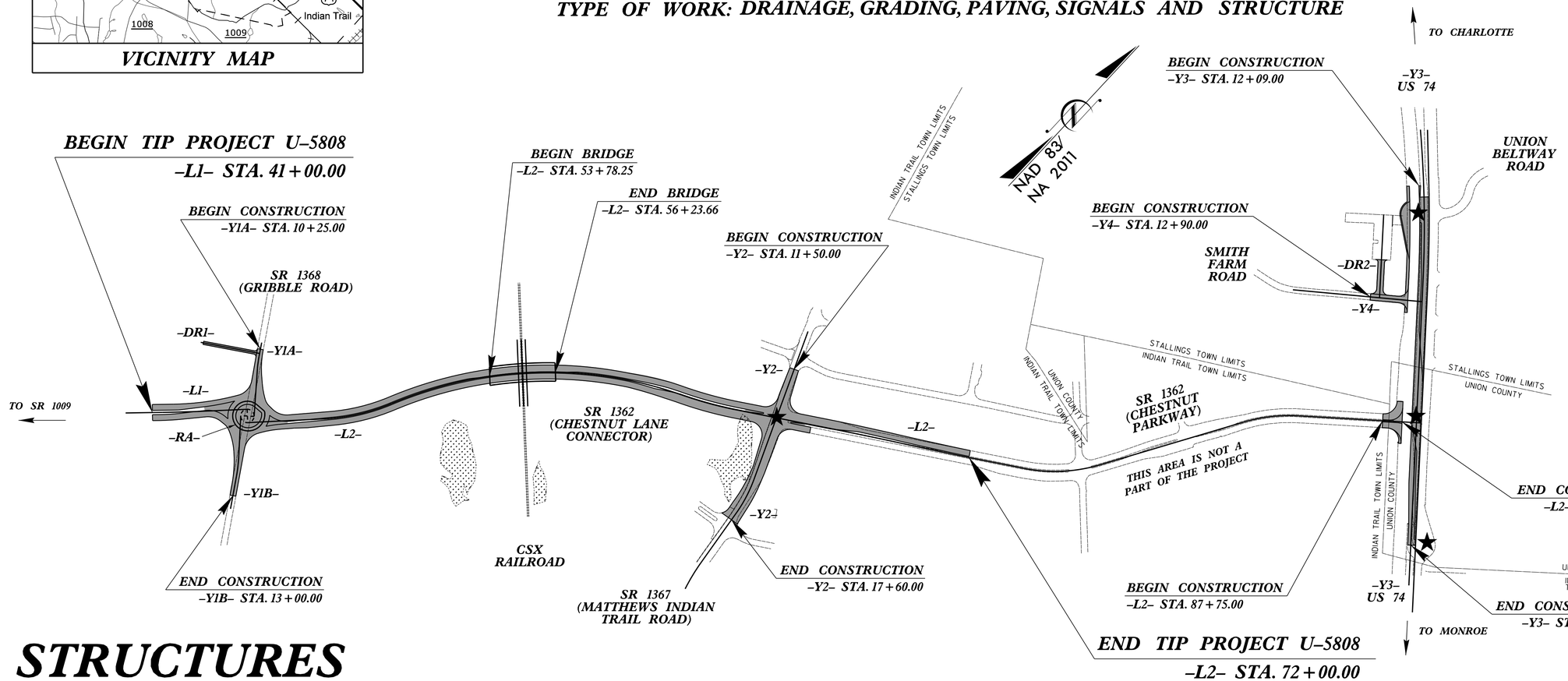
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
44381.1.1	N/A	PE
44381.2.1	N/A	R/W
44381.2.4	N/A	UTILITY
44381.3.1	N/A	CONST

LOCATION: *SR 1362 (CHESTNUT LANE CONNECTOR) FROM SR 1367 (MATTHEWS INDIAN TRAIL ROAD) TO SR 1368 (GRIBBLE ROAD). CONSTRUCT ROAD ON NEW LOCATION. INTERSECTION OF US 74 AND EXISTING SR 1362 (CHESTNUT LANE CONNECTOR). CONSTRUCT INTERSECTION IMPROVEMENTS.*

TYPE OF WORK: *DRAINAGE, GRADING, PAVING, SIGNALS AND STRUCTURE*



VICINITY MAP



STRUCTURES

DESIGN DATA

ADT 2023 = 21,950
ADT 2043 = 24,950
K = 7 %
D = 60 %
T = 4 % *
V = 40 MPH
* TTST = 3% DUAL = 1%
FUNC CLASS =
MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U–5808 = 0.541 MILES
LENGTH STRUCTURE TIP PROJECT U–5808 = 0.046 MILES

TOTAL LENGTH TIP PROJECT U–5808 = 0.587 MILES

–L1– AND –L2– USED TO DETERMINE PROJECT LENGTH

Prepared for NCDOT Division 10 in the Office of:
Mead&Hunt
111 E. Hargett Street, Suite 300
Raleigh, North Carolina 27601
919-714-8670 | meadhunt.com
NC License No. F-1235

2018 STANDARD SPECIFICATIONS

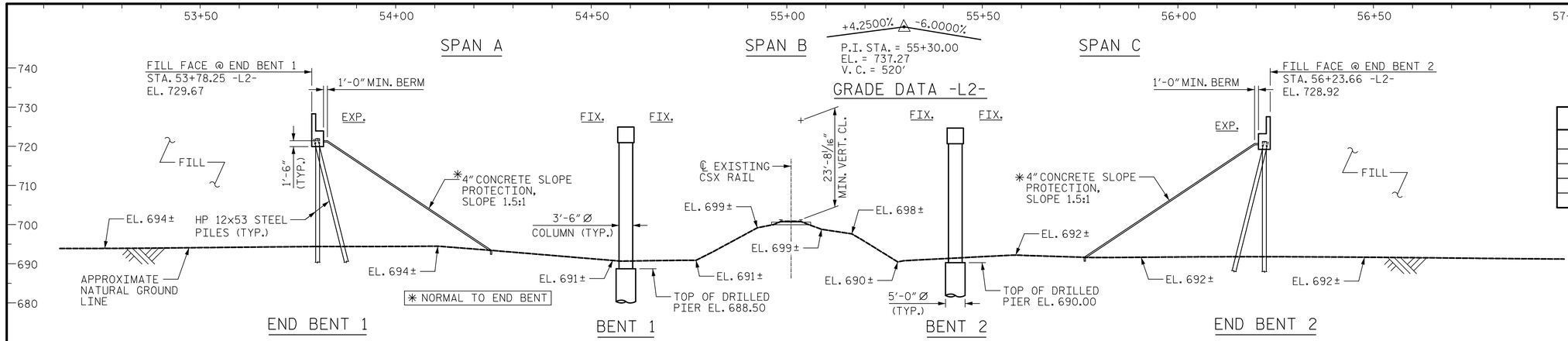
LETTING DATE:
DECEMBER 19, 2023

RICK DECOLA, PE
ROADWAY PROJECT ENGINEER

JOHN HOBSON, PE
STRUCTURES PROJECT ENGINEER

YANWEI MA, PE
NCDOT CONTACT

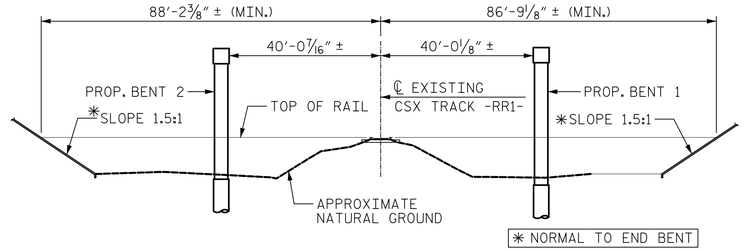
STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •



TOP OF RAIL ELEVATION		
-RR1- STATION	1st RAIL	2nd RAIL
10+50.00	701.74	701.72
11+00.00	701.15	701.12
11+50.00	700.64	700.61
12+00.00	700.11	700.09

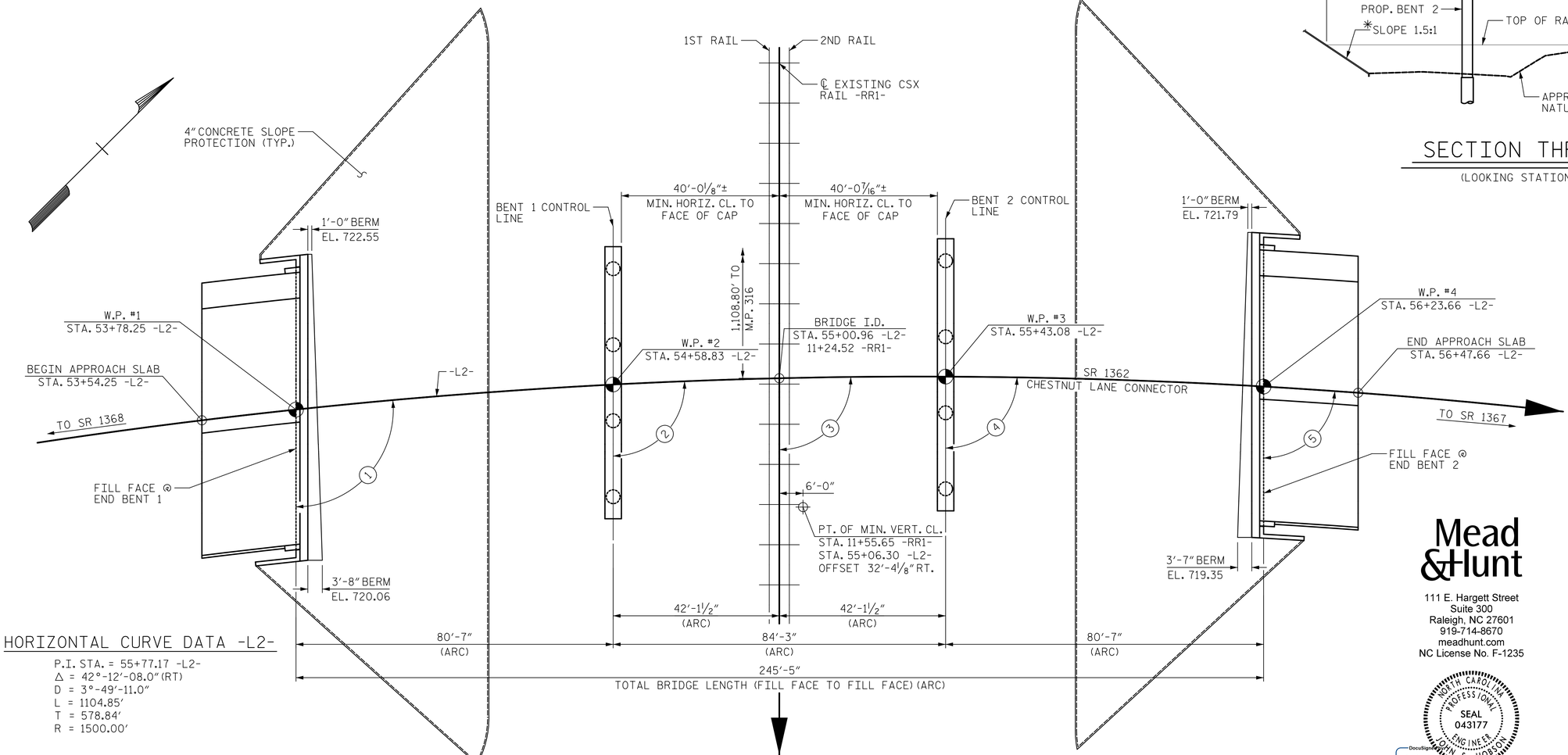
SECTION ALONG -L2-

(SECTIONS AT BENTS AND END BENTS ARE AT RIGHT ANGLES)



SECTION THROUGH RAILROAD

(LOOKING STATION AHEAD ALONG RAILROAD)



PLAN

(PILES NOT SHOWN IN PLAN VIEW)
(ALL END BENTS AND BENTS ARE PARALLEL)

HORIZONTAL CURVE DATA -L2-

P.I. STA. = 55+77.17 -L2-
Δ = 42°-12'-08.0" (RT)
D = 3°-49'-11.0"
L = 1104.85'
T = 578.84'
R = 1500.00'

TABLE OF ANGLES	
No.	ANGLE
①	96°03'01"
②	92°58'20"
③	91°21'48"
④	89°45'15"
⑤	86°40'34"

ANGLES ARE TANGENT TO CURVE

MILEPOST #315.79

PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

SHEET 1 OF 5 BRIDGE NO. 576

DRAWN BY : J.S. HOBSON DATE : 06/05/23
CHECKED BY : J.A. BOYER DATE : 06/29/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

Mead & Hunt
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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON
DocuSigned by: Jack Hobson DDEFC8B1D45F4D6...
10/5/2023

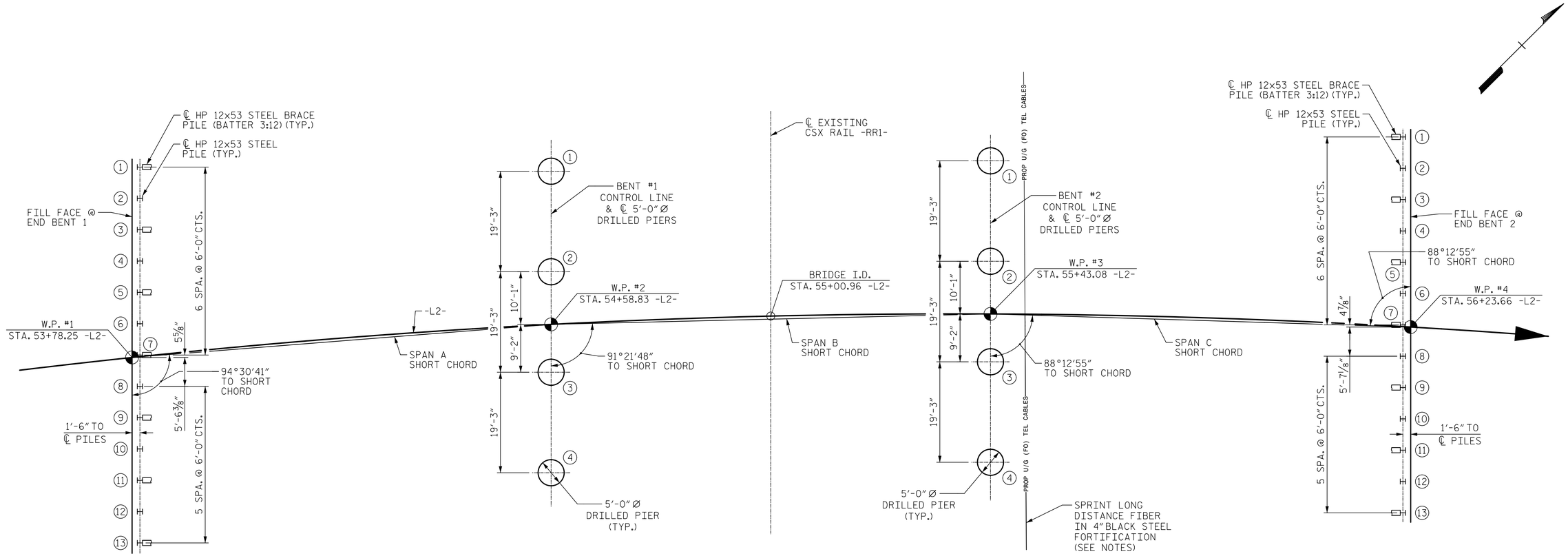
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MILEPOST #315.79
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER CSX RAILROAD ON CHESTNUT LANE CONNECTOR BETWEEN SR 1368 AND SR 1367

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-01
1			3			TOTAL SHEETS
2			4			56



END BENT 1 | BENT 1 | BENT 2 | END BENT 2

FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE)

NOTES:

FOR FOUNDATION NOTES, SEE "PILE AND DRILLED PIER FOUNDATION TABLES" SHEET.

PRIOR TO BEGINNING WORK WITHIN CSX RAILROAD RIGHT-OF-WAY:

CONTRACTOR TO SUBMIT NC811 TICKET AND CONTACT THE LOCAL LEGACY SPRINT TECH TO MEET ON SITE.

CONTRACTOR TO COORDINATE WITH SPRINT TECH AND TO POTHOLE THE EXISTING SPRINT FIBER LINE TO VERIFY THE LOCATION.

FOR ADDITIONAL UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

DRAWN BY : J.S. HOBSON DATE : 06/05/23
CHECKED BY : J.A. BOYER DATE : 06/29/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC8B1D45F4D6... 10/5/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER CSX RAILROAD ON CHESTNUT LANE CONNECTOR BETWEEN SR 1368 AND SR 1367

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-02
1			3			TOTAL SHEETS
2			4			56

SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles*			Drilled-In Piles		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
End Bent 1, Piles 1-6	100	See Structural Plans	50			165							
End Bent 1, Piles 7-13	100		55			165							
End Bent 2, Piles 1-13	100		55			165							

*Predrilling for Piles is required for end bents/bents with a predrilling length and at the Contractor's option for end bents/bents with predrilling information but no predrilling length.

$$^{**}RDR = \frac{Factored\ Resistance + Factored\ Downdrag\ Load + Factored\ Dead\ Load}{Dynamic\ Resistance\ Factor} + Nominal\ Downdrag\ Resistance + \frac{Nominal\ Scour\ Resistance}{Scour\ Resistance\ Factor}$$

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
End Bent 1, Piles 1-6	100			0.60			
End Bent 1, Piles 7-13	100			0.60			
End Bent 2, Piles 1-13	100			0.60			

*Factored Dead Load is factored weight of pile above the ground line.

SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #(-#) (e.g., "Bent 1, Piers 1-3")	Factored Resistance per Pier TONS	Minimum Pier Tip (Tip No Higher Than) Elevation FT	Required Tip Resistance per Pier TSF	Scour Critical Elevation FT	Minimum Drilled Pier Penetration Into Rock per Pier Lin FT	Drilled Pier Length* per Pier Lin FT	Drilled Pier Length Not In Soil* per Pier Lin FT	Drilled Pier Length In Soil* per Pier Lin FT	Permanent Steel Casing Required? YES or MAYBE	Permanent Steel Casing Tip Elevation (Elev Not To Extend Casing Below) FT	Permanent Steel Casing Length** per Pier Lin FT
Bent 1, Piers 1-4	560	667.0	20			21.5					
Bent 2, Piers 1-4	560	667.0	20			23.0					
TOTAL QTY:						178.0					

*Drilled Pier Lengths represent estimated drilled pier quantities and are measured and paid for as either "60-Inch Dia. Drilled Piers in accordance with Article 411-7 of the *NCDOT Standard Specifications* .

SUMMARY OF PDA/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Pile Driving Analyzer (PDA)				Pile Order Lengths	
End Bent/ Bent No	PDA Testing Required? YES or MAYBE	PDA Test Pile Length FT	Total PDA Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or PDA
End Bent 1, Piles 1-6					
End Bent 1, Piles 7-13					
End Bent 2, Piles 1-13					

*EST = Pile order lengths from estimated pile lengths; PDA = Pile order lengths based on PDA testing. For groups of end bents/bents with pile order lengths based on PDA testing, the first end bent/bent no. listed for each group is the representative end bent/bent with the PDA.

SUMMARY OF PILE ACCESSORIES

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Pipe Pile Plates Required? YES or MAYBE	Steel Pile Points			Steel Pile Tips Required? YES
		Pipe Pile Cutting Shoes Required? YES	Pipe Pile Conical Points Required? YES	H-Pile Points Required? YES	
End Bent 1, Piles 1-6					
End Bent 1, Piles 7-13					
End Bent 2, Piles 1-13					
TOTAL QTY:					

SUMMARY OF DRILLED PIER TESTING

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #(-#) (e.g., "Bent 1, Piers 1-3")	Standard Penetration Test (SPT) Required? YES or MAYBE	Crosshole Sonic Logging (CSL) Required?* YES or MAYBE	Total CSL Tube Length (For All Tubes) per Pier Lin FT	Shaft Inspection Device (SID) Required? YES or MAYBE	Pile Integrity Test (PIT) Required? MAYBE
Bent 1, Piers 1-4	YES	MAYBE	115	MAYBE	
Bent 2, Piers 1-4	YES	MAYBE	123	MAYBE	
TOTAL QTY:	8	2	950	2	

*CSL Tubes are required if CSL Testing is or may be required. The number of CSL Tubes per drilled pier is equal to one tube per foot of design pier diameter with at least 4 tubes per pier. The length of each CSL Tube is equal to the drilled pier length plus 1.5 ft.

NOTES:

1. The Pile and Drilled Pier Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Bon-Hsiang Lien, 030132) on 9-29-2023.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. The Engineer will determine the need for PDA Testing, Permanent Steel Casing, SPTs, CSL Testing, SID Inspections and PITs when these items may be required.
4. For Piles, See Piles Provision and Section 450 of the Standard Specifications.
5. Do Not begin work at End Bent No. 1 and End Bent No. 2 until fill has been placed.
6. For Drilled Piers, See Section 411 of the Standard Specifications.
7. Temporary Casing is requried for Bent No. 1 and Bent No. 2 based on CSX requirements.
8. See Roadway Plans and Section 235 of the Standard Specifications for the Settlement Gauges required at End Bent No. 1 and End Bent No. 2.
9. Observe a 1 month Waiting Period after constructing the Embankment to within 2 ft of finished grade before beginning End Bent construction at End Bent No.1 and End Bent No.2. For Bridge Waiting Periods, See Roadway Plans and Section 235 of the Standard Specifications.
10. Inspect Drilled Piers using the Shaft Inspection Device (Sid) for any pour using the wet method of concrete placement and for any Drilled Pier Excavations that cannot be visually inspected or have remained open longer than 24 hours that cannot be dewatered due to unstable soil or rock. The Engineer will determine the need for Sid Testing.

PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

SHEET 3 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 10/5/2023 0DEFC6B1D45F4D6...

SIGNATURE DATE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE AND DRILLED PIER FOUNDATION TABLES

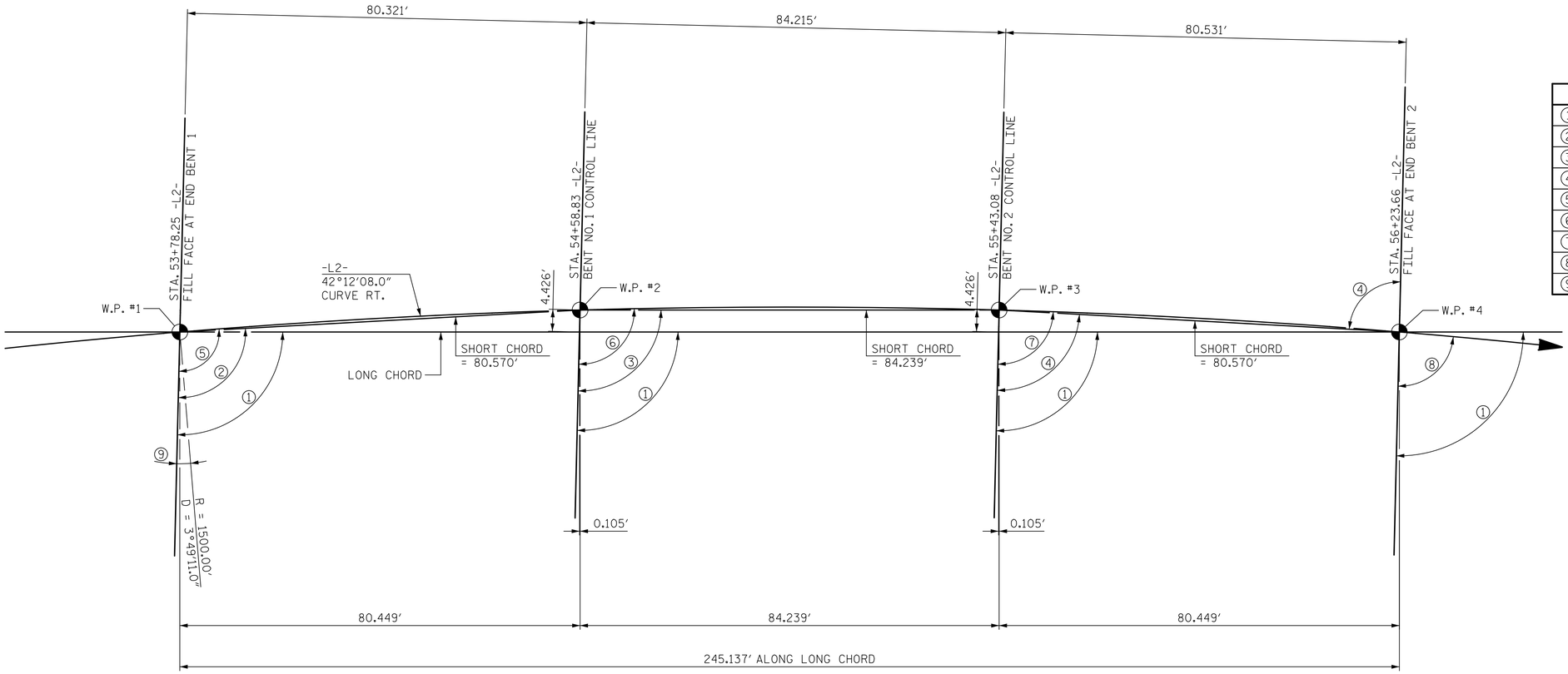
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-03

TOTAL SHEETS 56



ANGLES		
①	91°21′48″	(TO LONG CHORD)
②	94°30′41″	(TO SHORT CHORD)
③	91°21′48″	(TO SHORT CHORD)
④	88°12′55″	(TO SHORT CHORD)
⑤	96°03′01″	(TAN. TO CURVE)
⑥	92°58′20″	(TAN. TO CURVE)
⑦	89°45′15″	(TAN. TO CURVE)
⑧	86°40′34″	(TAN. TO CURVE)
⑨	6°03′01″	

LONG CHORD LAYOUT

ALL END BENTS AND BENTS ARE PARALLEL

DRAWN BY : C.C. CAMPBELL DATE : 09/01/21
CHECKED BY : J.S. HOBSON DATE : 06/26/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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10/5/2023

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PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

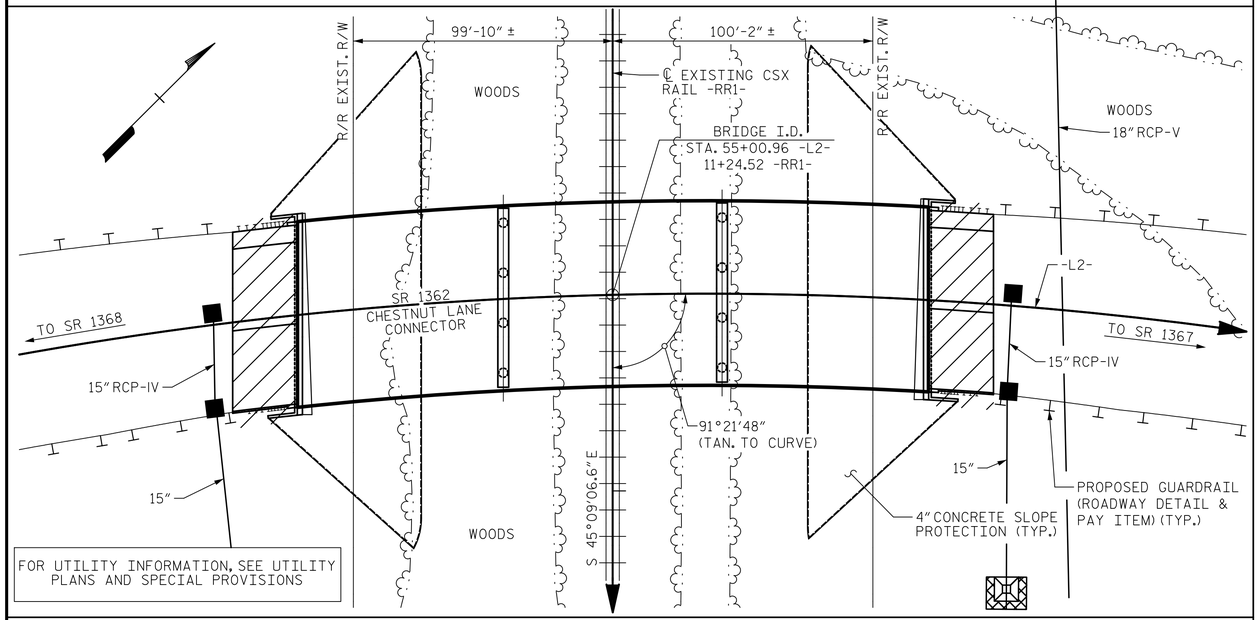
SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LONG CHORD LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-04
1			3			TOTAL SHEETS
2			4			56

BENCHMARK #53: BENCHTIE SET IN 22" OAK, 225.91' LT. OF STA. 63+63.79 -L2-, EL. 689.59 (NAD 1983)



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

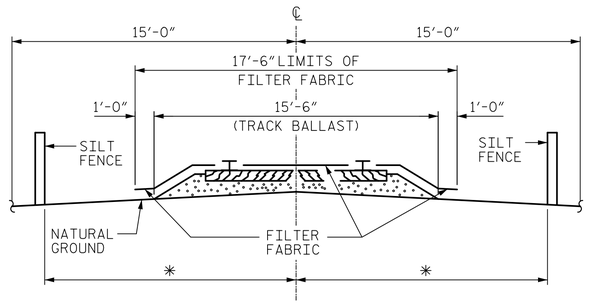
THE RAILROAD TRACK TOP OF RAIL ELEVATIONS SHOWN ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS AND REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

FOR RAILROAD PROVISIONS, SEE SPECIAL PROVISIONS.

FOR ADDITIONAL RAILROAD REQUIREMENTS AND GENERAL NOTES, SEE SHEET CSXN.

TOTAL BILL OF MATERIAL

	5'-0" DIA. DRILLED PIERS	SID INSPECTION	SPT TESTING	CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		TWO BAR METAL RAIL	1'-2" X 2'-6" CONCRETE PARAPET	72" CHAIN LINK FENCE	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	STRIP SEAL EXPANSION JOINT
	LIN. FT.	EACH	EACH	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	EA.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE					17,273	15,342		LUMP SUM			21	1,684.42				470.8	501.4	482.0		LUMP SUM	LUMP SUM
END BENT NO. 1							58.1		8,805				13	13	685				925		
BENT NO. 1	86.0						99.4		32,258	5,481											
BENT NO. 2	92.0						97.0		32,412	5,433											
END BENT NO. 2							57.9		8,787				13	13	715				886		
TOTAL	178.0	2	8	2	17,273	15,342	312.4	LUMP SUM	82,262	10,914	21	1,684.42	26	26	1,400	470.8	501.4	482.0	1,811	LUMP SUM	LUMP SUM



RAILROAD EROSION CONTROL DETAIL

* TO BE DETERMINED BY THE RESIDENT ENGINEER IN CONSULTATION WITH THE RAILROAD ENGINEER.

NOTES

RAILROAD EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO PERFORMING ANY WORK IN THE RAILROAD RIGHT-OF-WAY.

ADDITIONAL EROSION CONTROL MEASURES FOR PROTECTION OF RAILROAD DITCHES MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.

NO SEPARATE PAYMENT WILL BE MADE FOR RAILROAD EROSION CONTROL MEASURES.

LIMITS OF SILT FENCE AND FILTER FABRIC PARALLEL TO RAILROAD SHALL EXTEND A MINIMUM OF 25'-0" OUTSIDE EDGE OF SUPERSTRUCTURE OR TOE OF SLOPE ON CONSTRUCTION. A GREATER LENGTH OF SILT FENCE OR FILTER FABRIC MAY BE REQUIRED IF SO DIRECTED BY THE ENGINEER.

FILTER FABRIC TO BE NAILED TO TIMBER RAIL TIES WITH PRIME SOURCE "GRIP CAP" OR EQUIVALENT. FILTER FABRIC ON SHOULDER TO BE SECURED AS DIRECTED BY THE ENGINEER AND RAILROAD.

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFCBB1D45F4D6...
10/5/2023

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PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER CSX RAILROAD ON CHESTNUT LANE CONNECTOR BETWEEN SR 1368 AND SR 1367

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-05
1			3			TOTAL SHEETS
2			4			56

DRAWN BY : J.S. HOBSON DATE : 06/29/23
CHECKED BY : J.A. BOYER DATE : 06/29/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
							LIVE-LOAD FACTORS (γ_{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ_{LL})	MOMENT					
								DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.08	--	1.75	0.870	1.34	B	EL	40.95	1.016	1.51	A	I	15.02	0.80	0.833	1.08	B	I	40.95	
		HL-93 (OPERATING)	N/A		1.74	--	1.35	0.870	1.74	B	EL	40.95	1.016	1.97	A	I	15.02	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	1.46	52.560	1.75	0.870	1.80	B	EL	40.95	1.016	1.97	A	I	62.22	0.80	0.833	1.46	B	I	40.95	
		HS-20 (OPERATING)	36.000		2.34	84.240	1.35	0.870	2.34	B	EL	40.95	1.016	2.57	A	I	62.22	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.38	45.630	1.40	0.870	5.22	B	EL	40.95	1.016	6.07	A	I	62.22	0.80	0.833	3.38	B	I	40.95	
		SNGARBS2	20.000		2.48	49.600	1.40	0.870	3.84	B	EL	40.95	1.016	4.26	A	I	62.22	0.80	0.833	2.48	B	I	40.95	
		SNAGRIS2	22.000		2.34	51.480	1.40	0.870	3.61	B	EL	40.95	1.016	3.94	A	I	62.22	0.80	0.833	2.34	B	I	40.95	
		SNCOTTS3	27.250		1.68	45.780	1.40	0.870	2.60	B	EL	40.95	1.016	2.94	A	I	62.22	0.80	0.833	1.68	B	I	40.95	
		SNAGGRS4	34.925		1.39	48.546	1.40	0.870	2.15	B	EL	40.95	1.016	2.53	A	I	15.02	0.80	0.833	1.39	B	I	40.95	
		SNS5A	35.550		1.36	48.348	1.40	0.870	2.10	B	EL	40.95	1.016	2.50	A	I	62.22	0.80	0.833	1.36	B	I	40.95	
		SNS6A	39.950		1.24	49.538	1.40	0.870	1.92	B	EL	40.95	1.016	2.32	A	I	15.02	0.80	0.833	1.24	B	I	40.95	
		SNS7B	42.000		1.18	49.560	1.40	0.870	1.83	B	EL	40.95	1.016	2.23	A	I	62.22	0.80	0.833	1.18	B	I	40.95	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.51	49.830	1.40	0.870	2.34	B	EL	40.95	1.016	2.87	A	I	62.22	0.80	0.833	1.51	B	I	40.95	
		TNT4A	33.075		1.52	50.274	1.40	0.870	2.35	B	EL	40.95	1.016	2.62	A	I	62.22	0.80	0.833	1.52	B	I	40.95	
		TNT6A	41.600		1.24	51.584	1.40	0.870	1.91	B	EL	40.95	1.016	2.28	A	I	72.47	0.80	0.833	1.24	B	I	40.95	
		TNT7A	42.000		1.24	52.080	1.40	0.870	1.91	B	EL	40.95	1.016	2.30	A	I	15.02	0.80	0.833	1.24	B	I	40.95	
		TNT7B	42.000		1.27	53.340	1.40	0.870	1.97	B	EL	40.95	1.016	2.19	A	I	62.22	0.80	0.833	1.27	B	I	40.95	
		TNAGRIT4	43.000		1.22	52.460	1.40	0.870	1.88	B	EL	40.95	1.016	2.08	A	I	62.22	0.80	0.833	1.22	B	I	40.95	
		TNAGT5A	45.000		1.15	51.750	1.40	0.870	1.78	B	EL	40.95	1.016	2.06	A	I	62.22	0.80	0.833	1.15	B	I	40.95	
		TNAGT5B	45.000	3	1.14	51.300	1.40	0.870	1.76	B	EL	40.95	1.016	2.01	A	I	62.22	0.80	0.833	1.14	B	I	40.95	
EMERGENCY VEHICLE (EV)		EV2	28.750		1.84	52.900	1.30	0.870	3.04	B	EL	40.95	1.016	3.51	A	I	15.02	0.80	0.833	1.84	B	I	40.95	
		EV3	43.000	4	1.24	53.320	1.30	0.870	2.05	B	EL	40.95	1.016	2.40	A	I	62.22	0.80	0.833	1.24	B	I	40.95	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

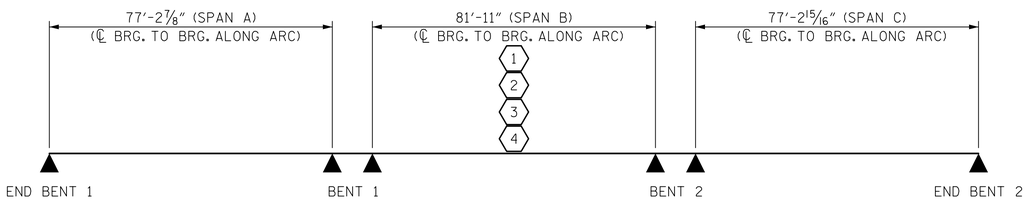
(#) CONTROLLING LOAD RATING

1. DESIGN LOAD RATING (HL-93)
2. DESIGN LOAD RATING (HS-20)
3. LEGAL LOAD RATING **
4. EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

Mead &Hunt
111 E. Hargett Street
Suite 300
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meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC861D43F406... 10/5/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

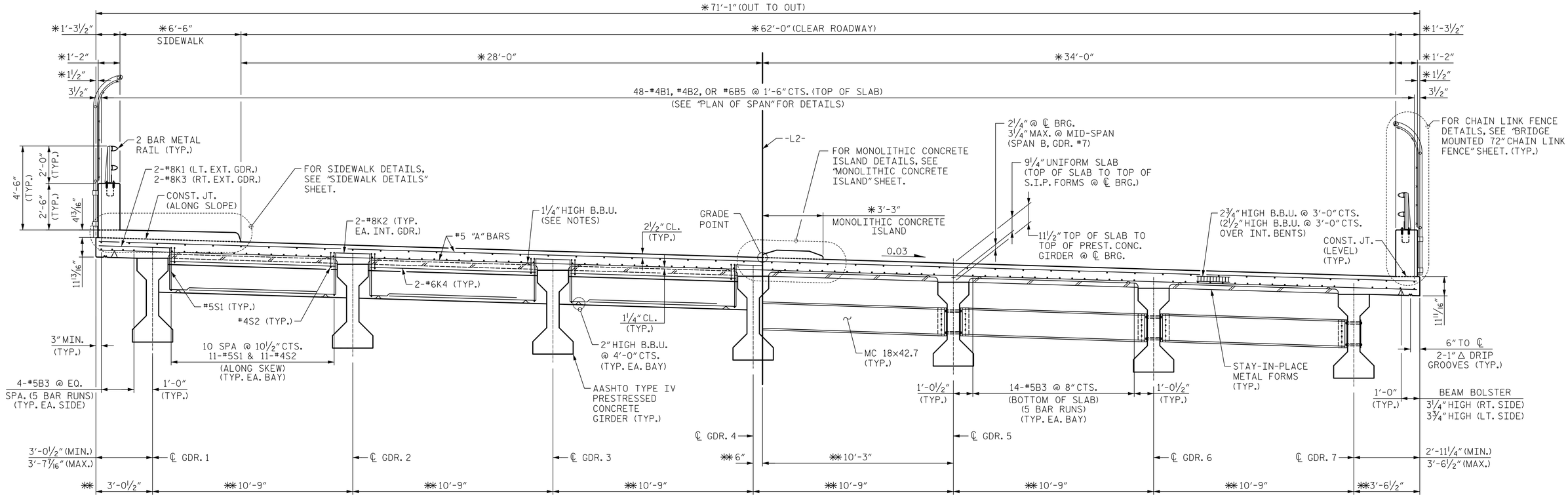
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-06
1			3			TOTAL SHEETS
2			4			56

STD. NO. LRFR1

ASSEMBLED BY : J.S. HOBSON	DATE : 03/16/22	
CHECKED BY : C.C. CAMPBELL	DATE : 06/16/23	
DESIGN E.O.R. : J.S. HOBSON	DATE : 08/30/23	
DRAWN BY : MAA 1/08	REV. 11/12/08RR	MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11	MAA/GM
	REV. 04/23	BNB/AAI



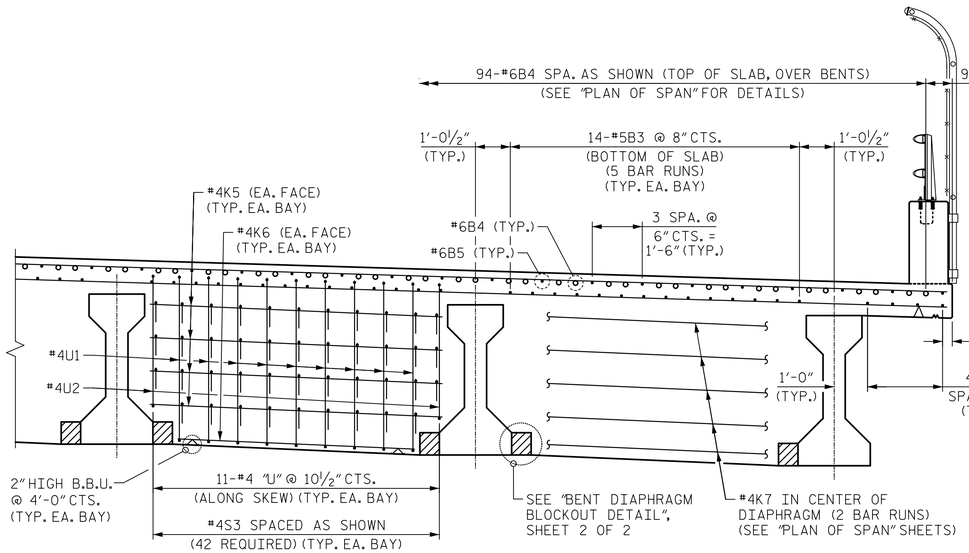
✳ RADIAL DIMENSION

✳✳ DIMENSION RADIAL TO CURVES CONCENTRIC WITH -L2-. GIRDERS ARE ON CHORDS OF THESE CONCENTRIC CIRCLES FOR ALL SPANS.

PARTIAL SECTION AT END BENT DIAPHRAGMS

PARTIAL SECTION AT INTERMEDIATE DIAPHRAGMS

TYPICAL SECTION



PARTIAL SECTION AT BENT DIAPHRAGMS

NOTES

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

PARAPETS SHALL NOT BE CAST UNTIL CONCRETE SIDEWALK HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

FOR DETAILS OF INTERMEDIATE DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGM FOR TYPE IV PRESTRESSED CONCRETE GIRDER" SHEET.

FOR ADDITIONAL INFORMATION ON DECK SLAB REINFORCEMENT, SEE "PLAN OF SPAN" SHEETS.

DRAWN BY : J.S. HOBSON DATE : 05/18/23
CHECKED BY : J.A. BOYER DATE : 06/29/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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DocuSigned by: Jack Hobson DDEFC8B1D45F4D6...
10/5/2023

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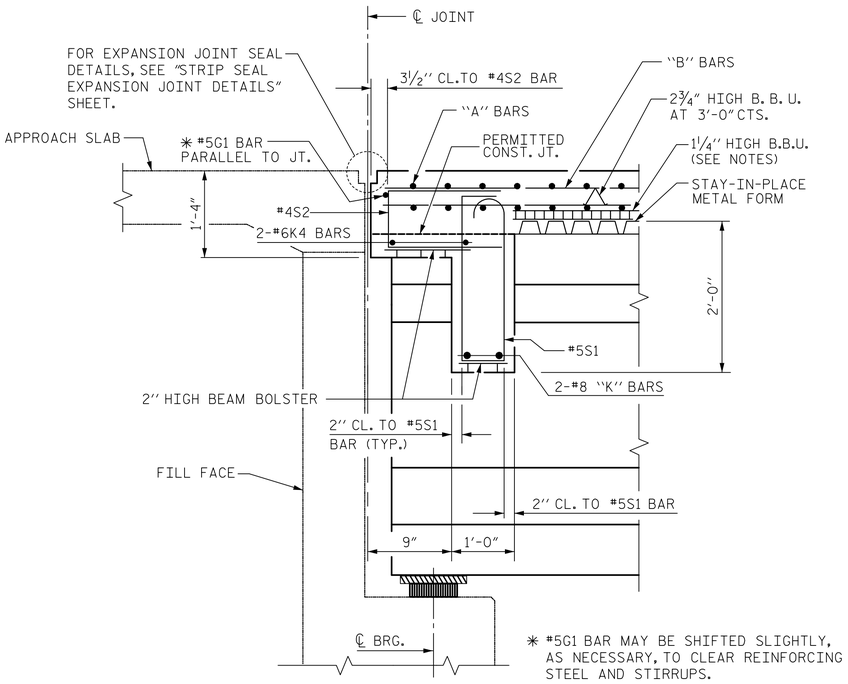
PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

SHEET 1 OF 2

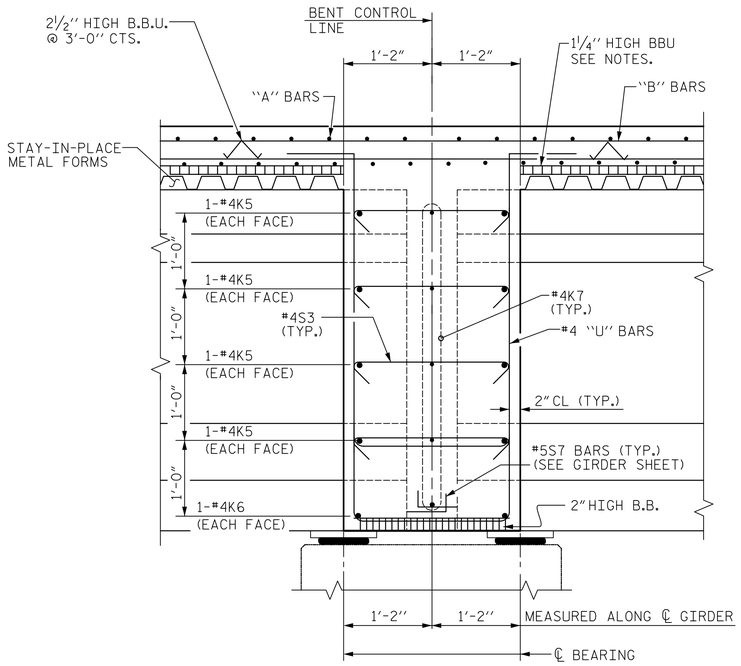
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

TYPICAL SECTIONS

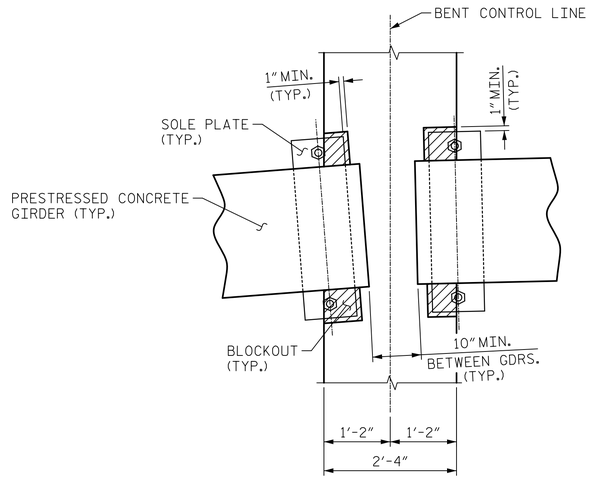
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-07
1			3			TOTAL SHEETS
2			4			56



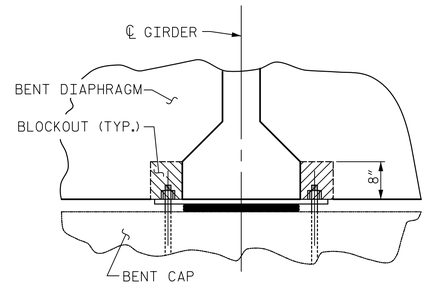
SECTION THROUGH END BENT DIAPHRAGM



SECTION THROUGH CONTINUOUS BENT DIAPHRAGM

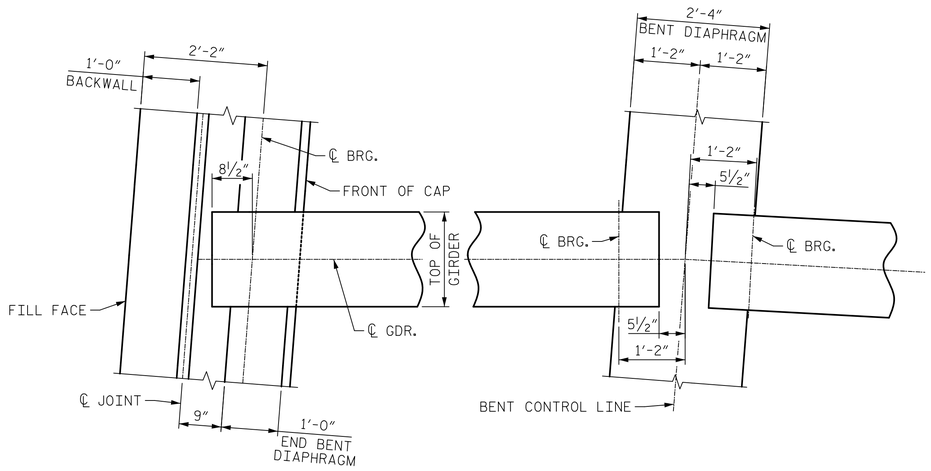


PLAN



SECTION

BENT DIAPHRAGM BLOCKOUT DETAIL



END BENT DIAPHRAGM

BENT DIAPHRAGM

PLAN

DRAWN BY : J.S. HOBSON DATE : 05/18/23
CHECKED BY : J.A. BOYER DATE : 06/29/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON
DocuSigned by: Jack Hobson DDEFCBB1D45F4D6... 10/5/2023

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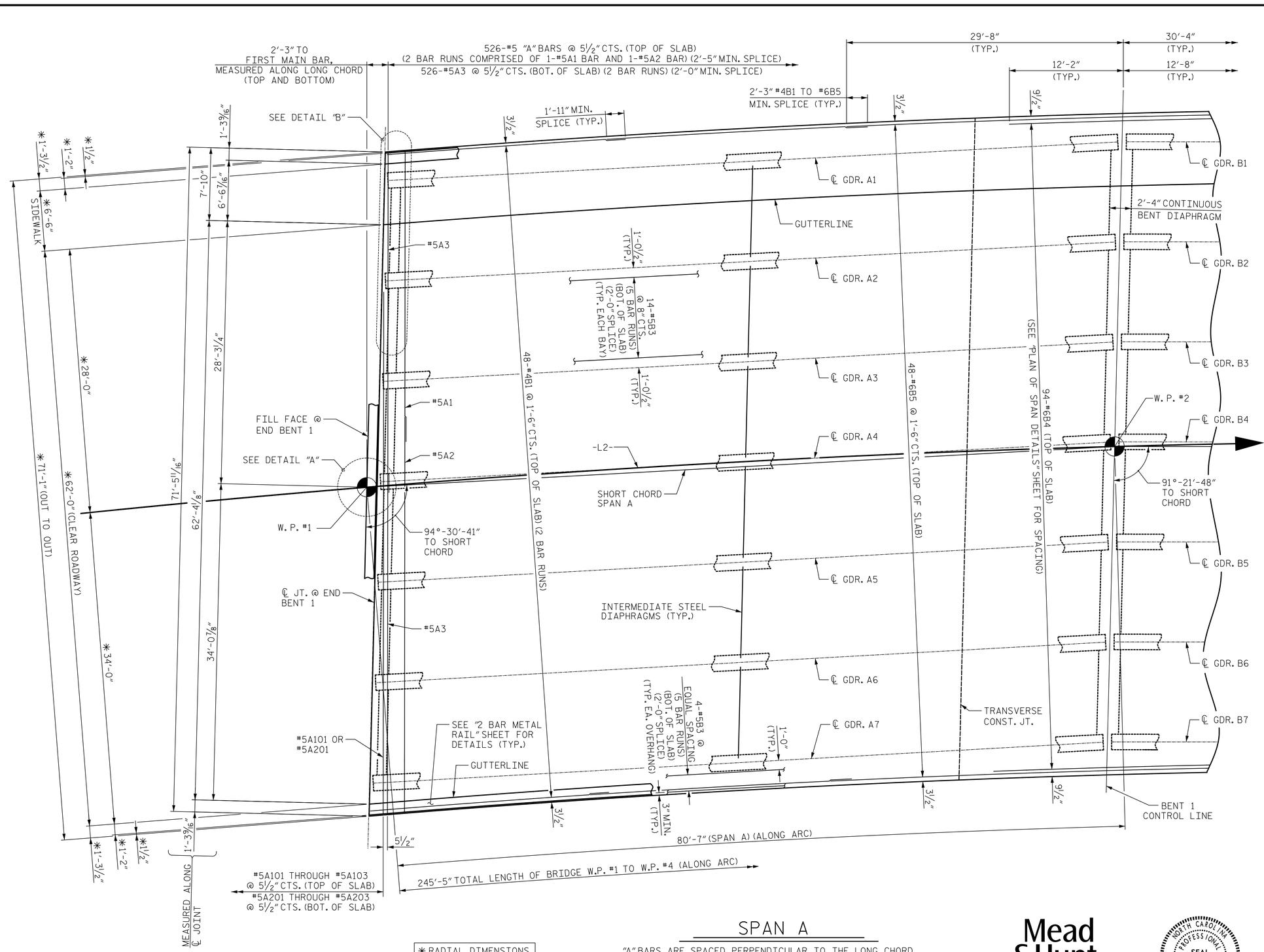
PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

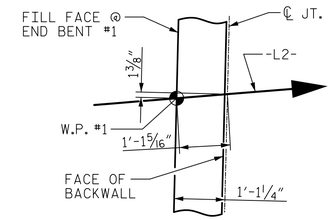
TYPICAL SECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-08
1			3			TOTAL SHEETS
2			4			56

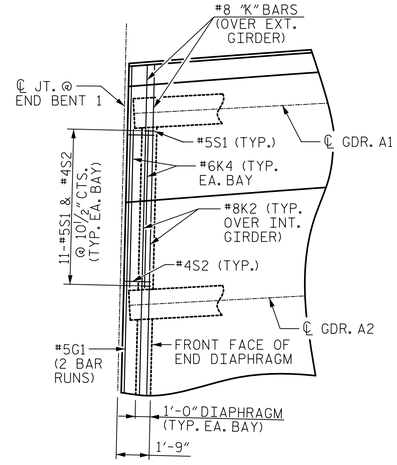


SPAN A

"A" BARS ARE SPACED PERPENDICULAR TO THE LONG CHORD



DETAIL "A"



DETAIL "B"

"A" & "B" BARS NOT SHOWN

PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-09
1			3			TOTAL SHEETS
2			4			56

DRAWN BY : J.S. HOBSON DATE : 05/23/23
CHECKED BY : J.A. BOYER DATE : 06/29/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

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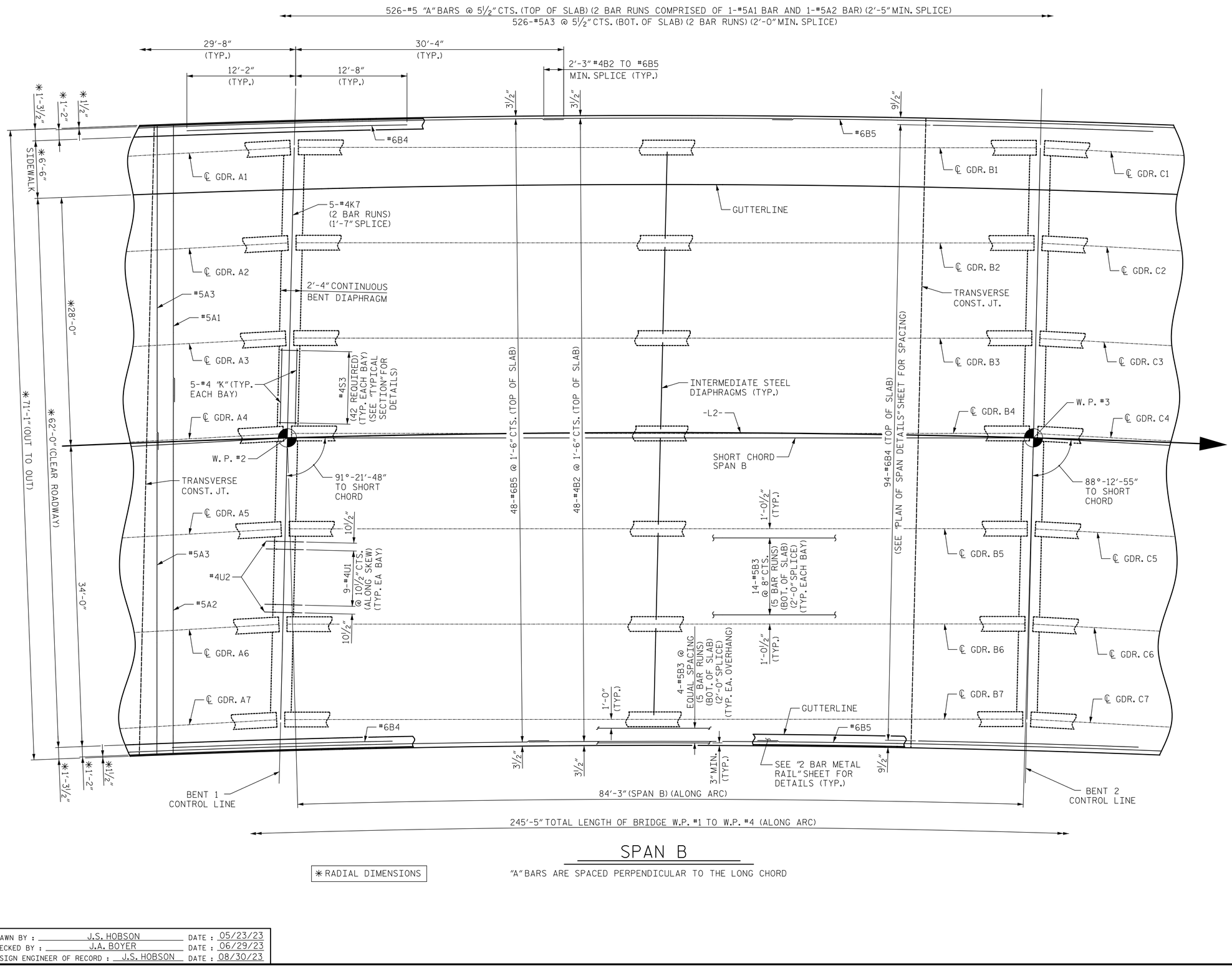

SPAN B

✳ RADIAL DIMENSIONS

"A" BARS ARE SPACED PERPENDICULAR TO THE LONG CHORD

DRAWN BY : J.S. HOBSON DATE : 05/23/23
CHECKED BY : J.A. BOYER DATE : 06/29/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

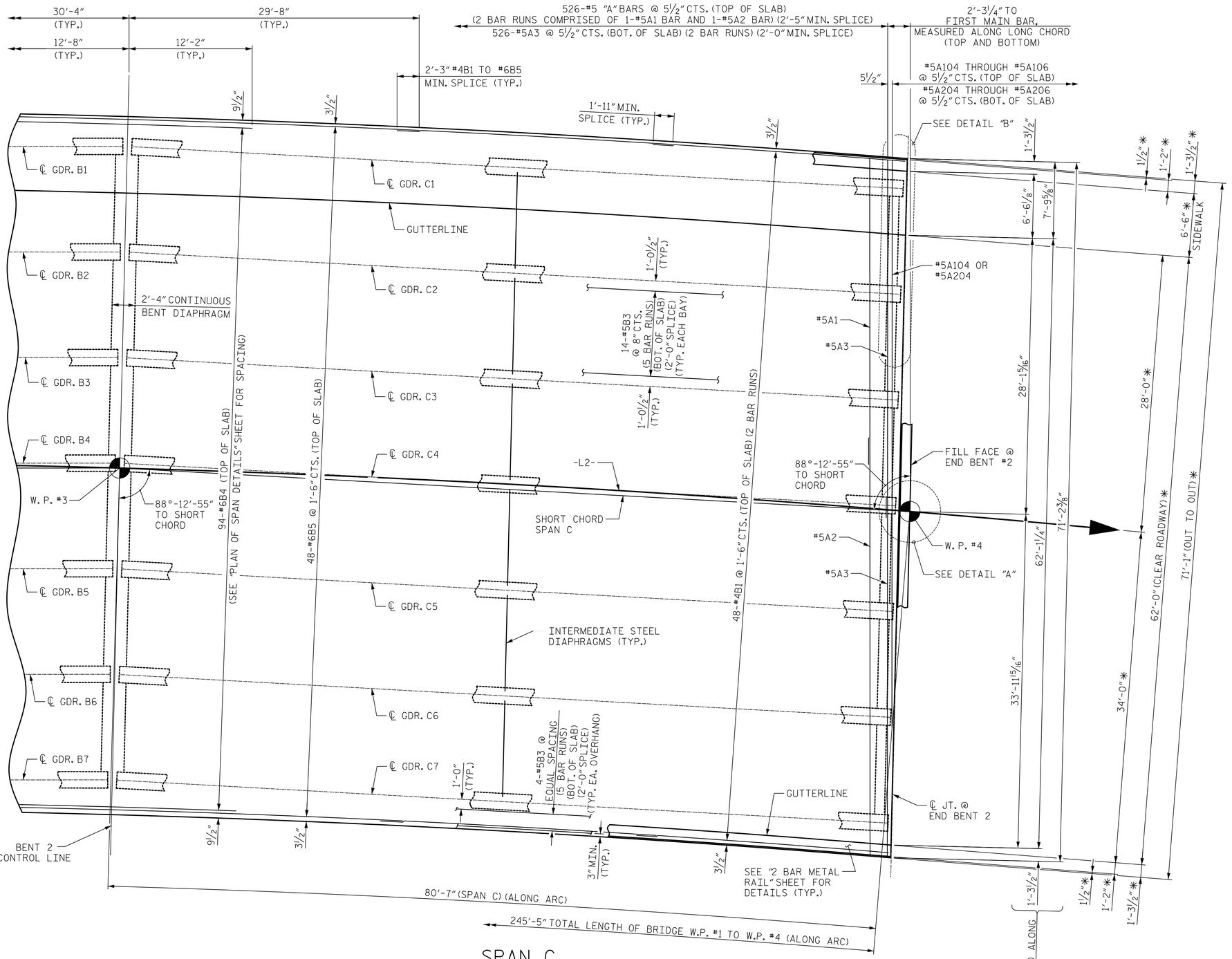
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

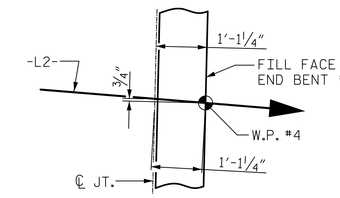
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			56



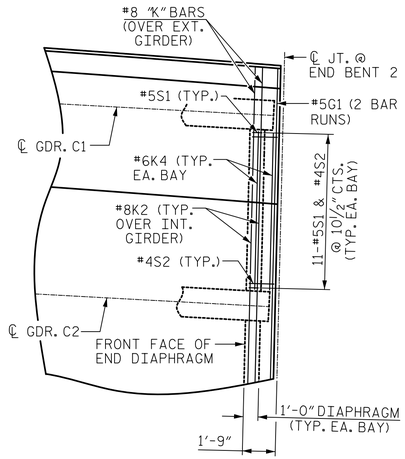
SPAN C

"A" BARS ARE SPACED PERPENDICULAR TO THE LONG CHORD

*RADIAL DIMENSIONS



DETAIL "A"



DETAIL "B"

"A" & "B" BARS NOT SHOWN

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC8B1D45F4D6... 10/5/2023

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PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

SHEET 3 OF 3

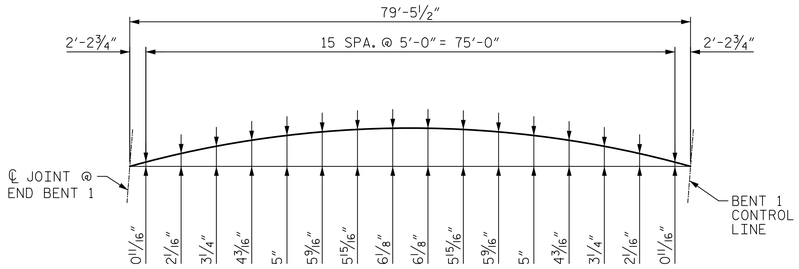
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

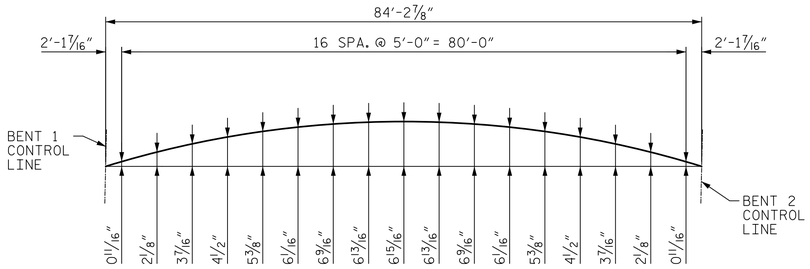
PLAN OF SPANS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			56

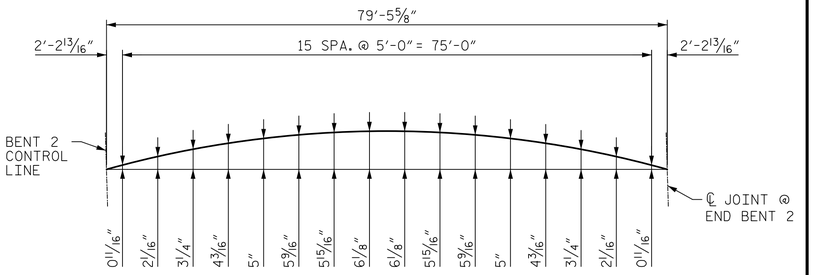
DRAWN BY : J.S. HOBSON DATE : 05/25/23
CHECKED BY : J.A. BOYER DATE : 06/29/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23



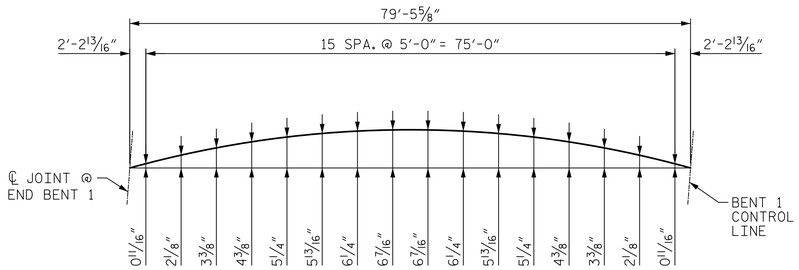
LEFT SIDE - EDGE OF SLAB



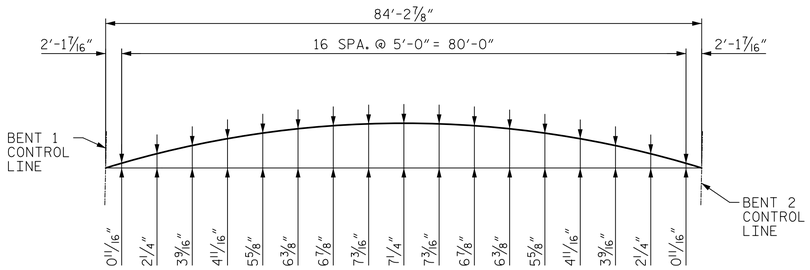
LEFT SIDE - EDGE OF SLAB



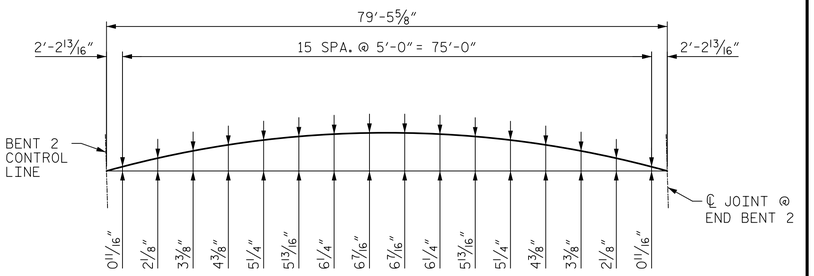
LEFT SIDE - EDGE OF SLAB



RIGHT SIDE - EDGE OF SLAB



RIGHT SIDE - EDGE OF SLAB

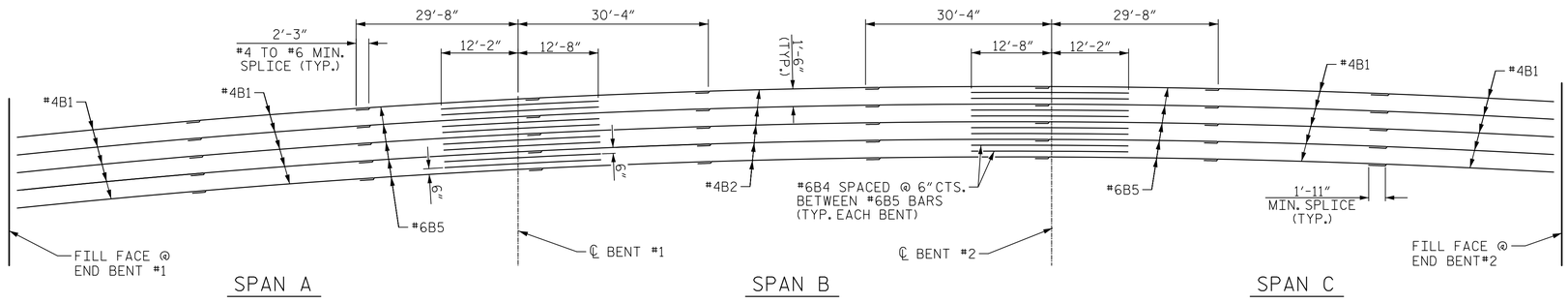


RIGHT SIDE - EDGE OF SLAB

ARC OFFSETS - SPAN "A"

ARC OFFSETS - SPAN "B"

ARC OFFSETS - SPAN "C"



TOP "B" BAR REINFORCING LAYOUT

DRAWN BY : J.S. HOBSON DATE : 05/25/23
CHECKED BY : J.A. BOYER DATE : 06/29/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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DocuSigned by: Jack Hobson DOEFCBB1D45F4DE... 10/5/2023

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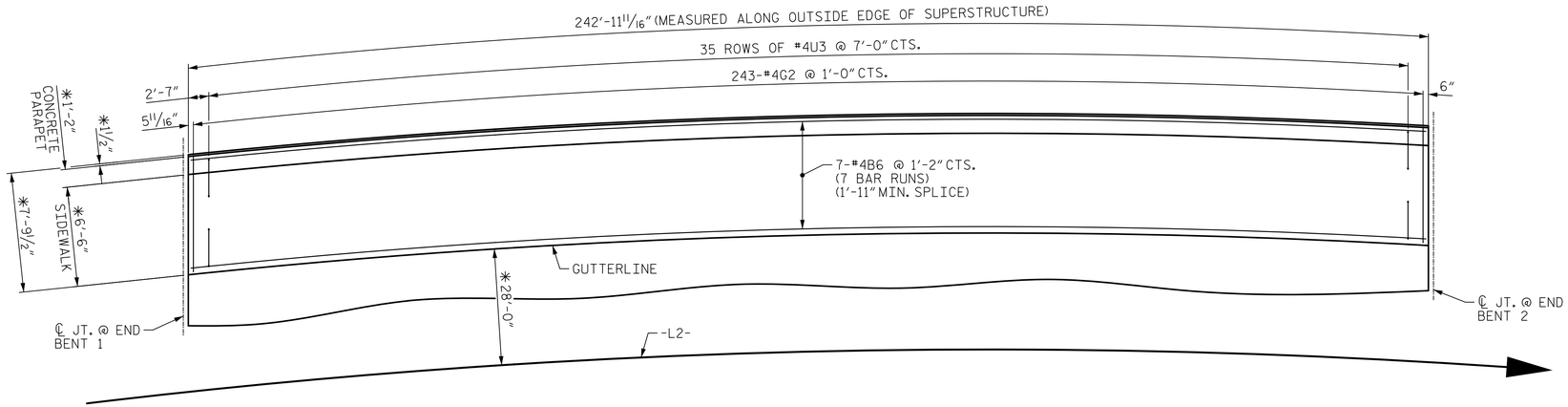
PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

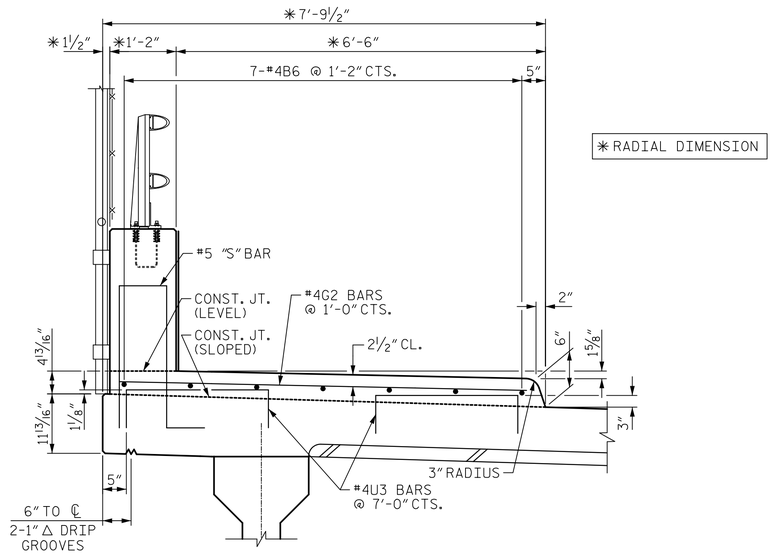
PLAN OF SPAN DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			56



PLAN OF SIDEWALK

*RADIAL DIMENSION



*RADIAL DIMENSION

SECTION THROUGH SIDEWALK

(LEFT SIDE)

NOTES

THE SIDEWALK ON A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN THE SIDEWALK AND CONCRETE PARAPET SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8-FT TO 10-FT BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10-FT IN LENGTH.

FOR REINFORCING IN CONCRETE PARAPET, SEE "PLAN OF PARAPET" & "END OF RAIL DETAILS" SHEETS.

QUANTITIES FOR SIDEWALK ON THE BRIDGE ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIAL AND PAID FOR AS PART OF THE REINFORCED CONCRETE DECK PAY ITEM.

THE #4U3 DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER DECK OR APPROACH SLAB HAS BEEN SCREEDED OFF, EXCEPT AS NOTED.

DRAWN BY : J.S. HOBSON DATE : 03/17/22
CHECKED BY : C.C. CAMPBELL DATE : 06/21/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

Mead & Hunt
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Raleigh, NC 27601
919-714-8670
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NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON
DocuSigned by: Jack Hobson DDEFC8B1D45F4D6...
10/5/2023

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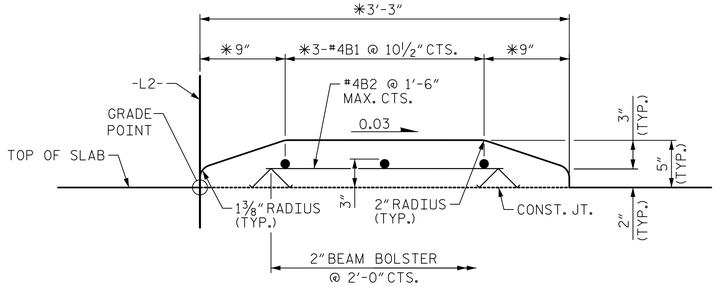
PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

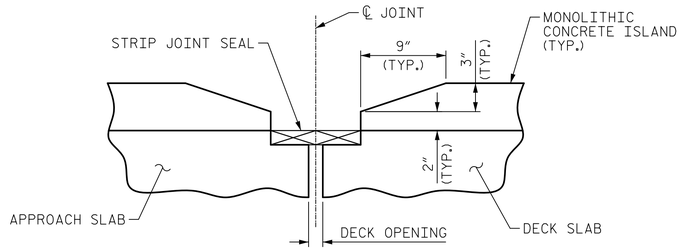
SIDEWALK DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			56



SECTION A-A

*RADIAL DIMENSION



SECTION B-B

REINFORCING STEEL IN APPROACH SLAB, DECK SLAB, AND MONOLITHIC CONCRETE ISLAND NOT SHOWN FOR CLARITY.

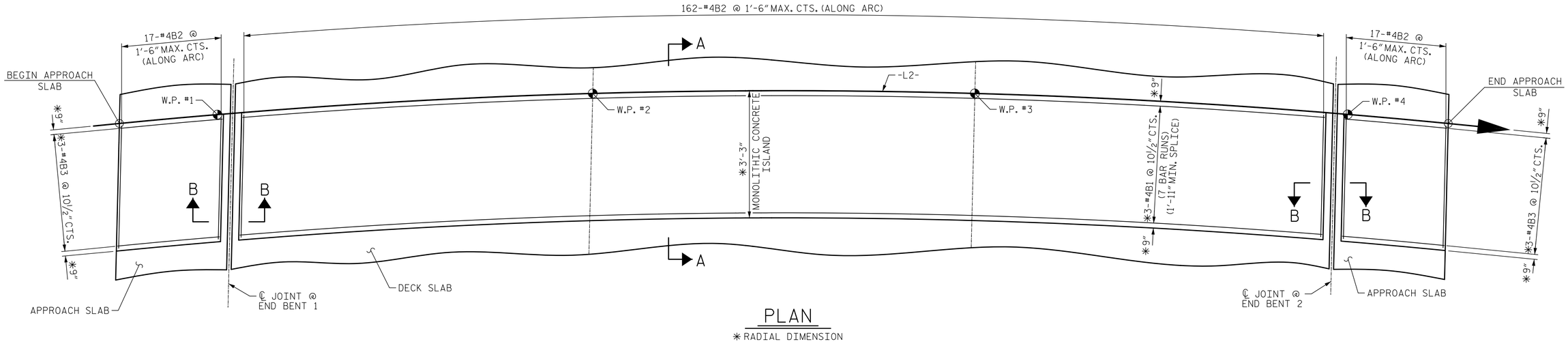
NOTES

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR MATERIALS OR LABOR TO CONSTRUCT THE MONOLITHIC CONCRETE ISLAND. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE SQUARE FOOT PRICE BID FOR THE REINFORCED CONCRETE DECK.

ALL REINFORCING STEEL IN THE MONOLITHIC CONCRETE ISLAND SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE MONOLITHIC CONCRETE ISLAND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8-FT TO 10-FT BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10-FT IN LENGTH.

MONOLITHIC CONCRETE ISLAND SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.



PLAN

*RADIAL DIMENSION

BILL OF MATERIAL					
FOR MONOLITHIC CONCRETE ISLAND					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	21	#4	STR	36'-4"	510
* B2	196	#4	STR	2'-1"	273
* B3	6	#4	STR	24'-4"	98
*EPOXY COATED REINFORCING STEEL					881 LBS.
CLASS AA CONCRETE					12.6 CU. YDS.

DRAWN BY : J.S. HOBSON DATE : 05/24/23
CHECKED BY : C.C. CAMPBELL DATE : 06/16/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC8B1D45F4D6...
10/5/2023

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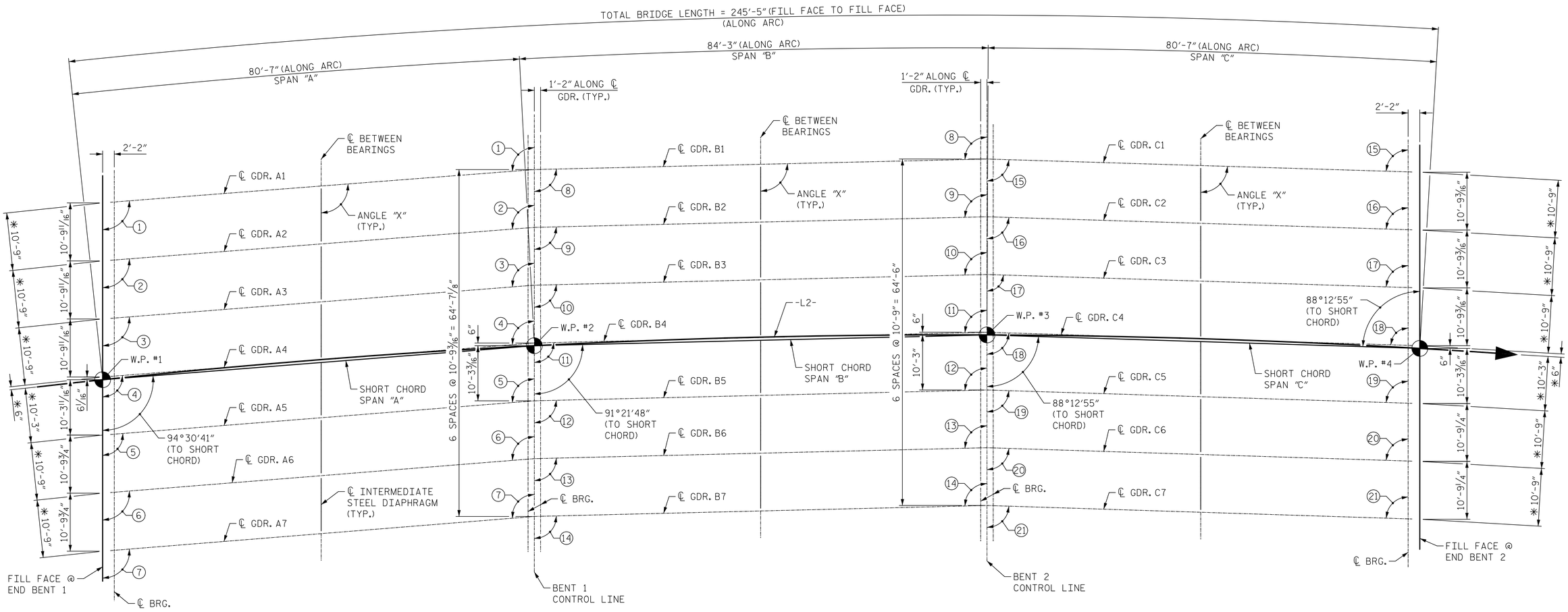
PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

MONOLITHIC CONCRETE ISLAND

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			56



EXP. (P1, E1) | FIX (P2, E2) | FIX (P3, E2) | FIX (P4, E2) | FIX (P5, E2) | EXP. (P6, E1)

✳DIMENSIONS SHOWN ARE RADIAL TO CURVES CONCENTRIC WITH -L2-. GIRDERS ARE ON CHORDS OF THESE CONCENTRIC CIRCLES FOR ALL SPANS.

FRAMING PLAN

(ALL END BENTS AND BENTS ARE PARALLEL)

NOTES

FOR STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS", SHEET S-20. FOR LOCATION OF FORMED HOLES FOR STEEL DIAPHRAGMS IN PRESTRESSED CONCRETE GIRDERS, SEE SHEETS S-16 THROUGH S-18.

ANGLE "X"			
GIRDER	SPAN "A"	SPAN "B"	SPAN "C"
1	94°24'53"	91°20'03"	88°15'12"
2	94°26'45"	91°20'37"	88°14'28"
3	94°28'40"	91°21'11"	88°13'43"
4	94°30'35"	91°21'46"	88°12'57"
5	94°32'33"	91°22'22"	88°12'10"
6	94°34'32"	91°22'58"	88°11'23"

GIRDER ANGLES					
①	94°24'53"	⑧	91°20'03"	⑮	88°15'12"
②	94°26'45"	⑨	91°20'37"	⑯	88°14'28"
③	94°28'40"	⑩	91°21'11"	⑰	88°13'43"
④	94°30'35"	⑪	91°21'46"	⑱	88°12'57"
⑤	94°32'33"	⑫	91°22'22"	⑲	88°12'10"
⑥	94°34'32"	⑬	91°22'58"	⑳	88°11'23"
⑦	94°36'33"	⑭	91°23'34"	㉑	88°10'36"

DRAWN BY : J.S. HOBSON DATE : 03/16/22
CHECKED BY : C.C. CAMPBELL DATE : 06/16/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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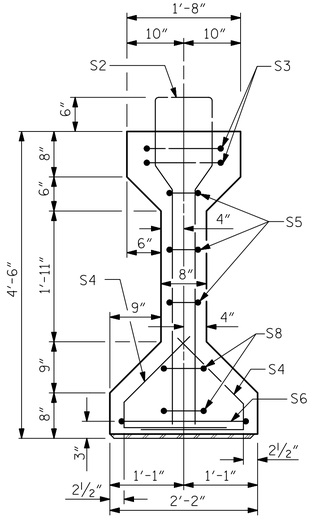
PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

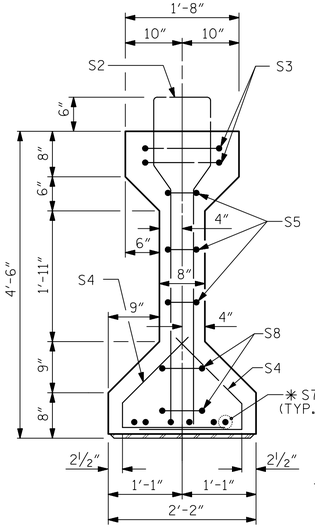
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			56

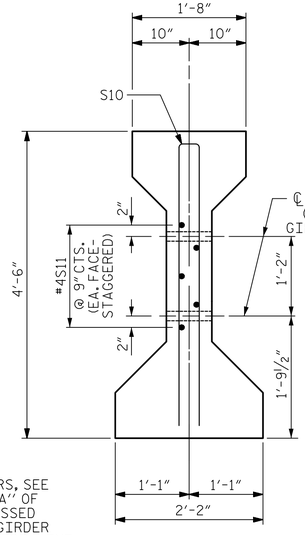


SECTION A-A



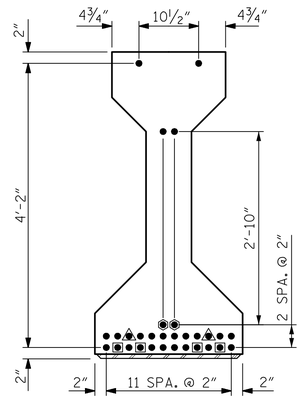
SECTION B-B

✳FOR S7 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

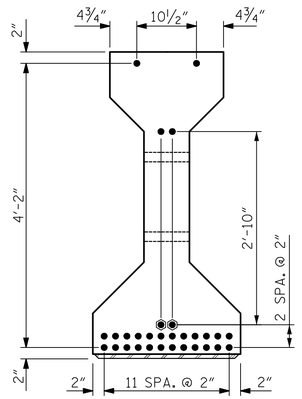


SECTION C-C

(S1 BARS NOT SHOWN)



AT END OF GIRDER

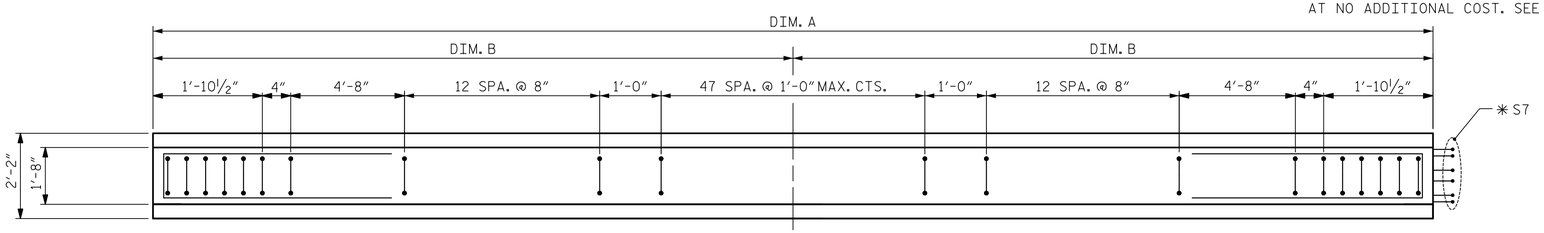


AT ℄ OF GIRDER

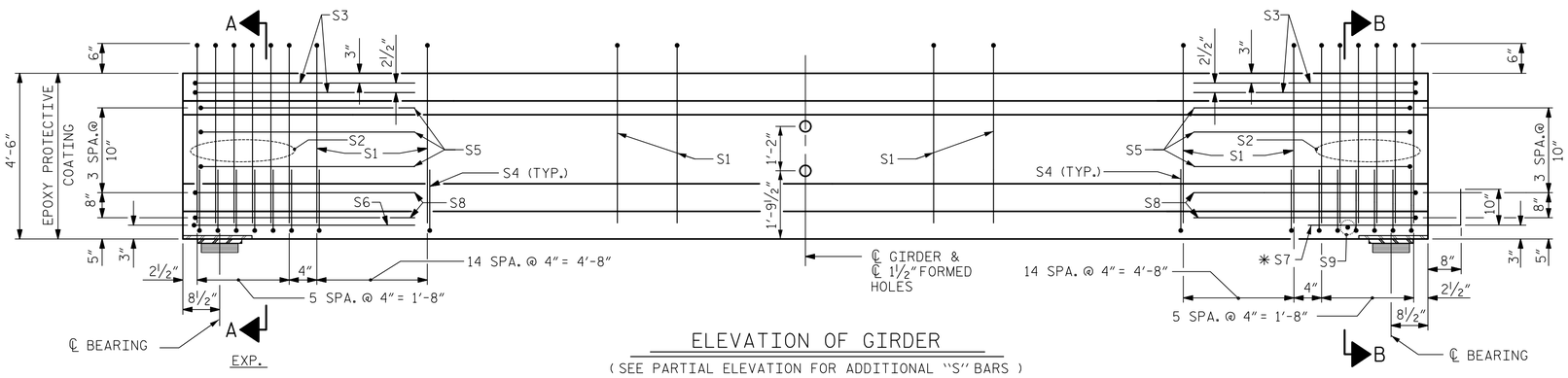
0.6" Ø LOW RELAXATION STRAND LAYOUT

(28 TOTAL STRANDS REQUIRED)

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER
- ◬ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◉ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE GIRDER, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

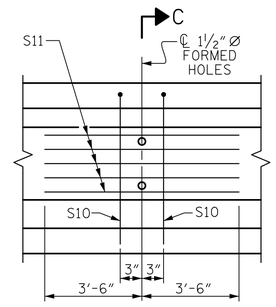


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

GDR.	DIM. A	DIM. B
A1	78'-7 11/16"	39'-3 7/8"
A2	78'-7 3/4"	39'-3 7/8"
A3	78'-7 13/16"	39'-3 7/8"
A4	78'-7 13/16"	39'-3 15/16"
A5	78'-7 7/8"	39'-3 15/16"
A6	78'-7 15/16"	39'-3 15/16"
A7	78'-7 15/16"	39'-4"

0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

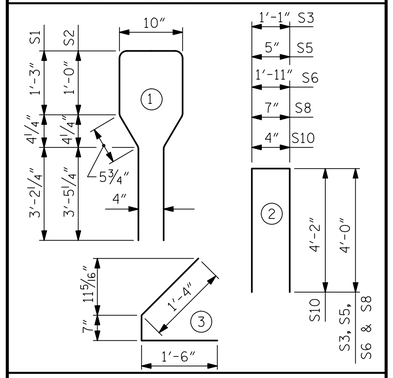
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	102	#4	1	10'-8"	727
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	84	#4	3	3'-5"	192
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
✳S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23

✳NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	5000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
GIRDER QUANTITY	1,264	16.0 (AVG.)	28

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
7	SEE TABLE	550'-6 13/16"

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DocuSigned by: Jack Hobson DDEFC861D45F406...
10/5/2023

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PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

SHEET 1 OF 5

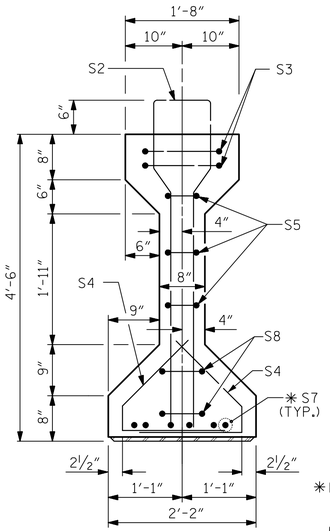
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD SPAN "A"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			56

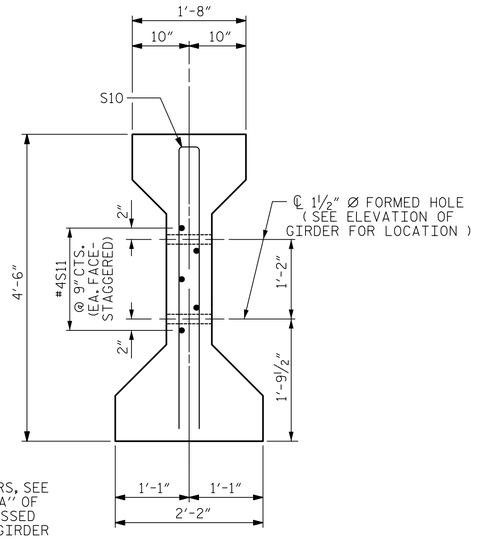
STD. NO. PCG6

ASSEMBLED BY : J.S. HOBSON	DATE : 05/17/23	
CHECKED BY : C.C. CAMPBELL	DATE : 06/19/23	
DESIGN E.O.R. : J.S. HOBSON	DATE : 08/30/23	
DRAWN BY : ELR 8/91	REV. 10/1/11	MAA/GM
CHECKED BY : GRP 8/91	REV. 1/15	MAA/TMG
	REV. 12/17	MAA/THC



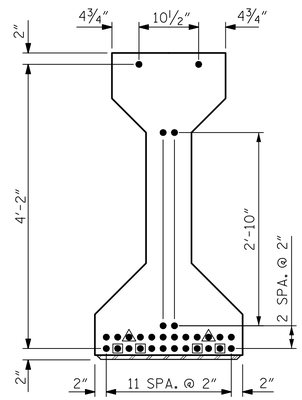
SECTION B-B

✱FOR S7 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

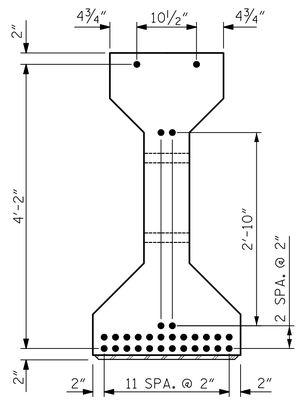


SECTION C-C

(S1 BARS NOT SHOWN)



AT END OF GIRDER

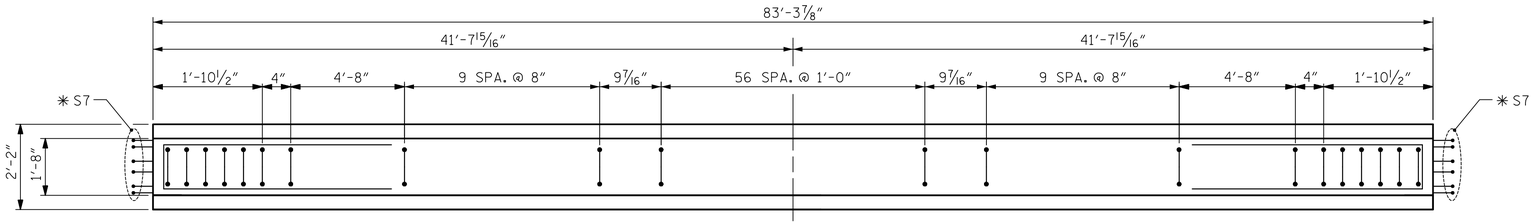


AT ℄ OF GIRDER

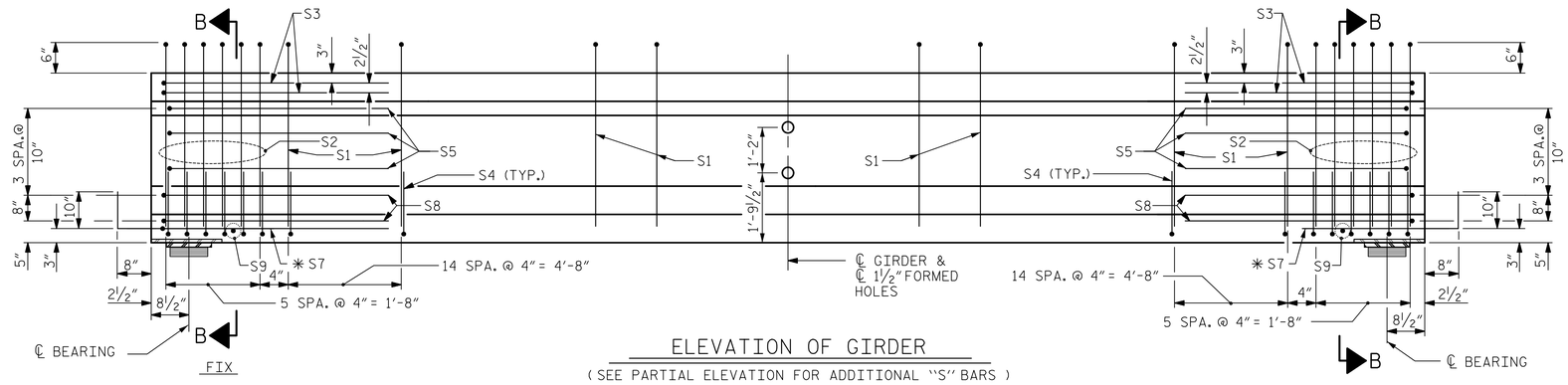
0.6" Ø LOW RELAXATION STRAND LAYOUT

(30 TOTAL STRANDS REQUIRED)

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
- ▲ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

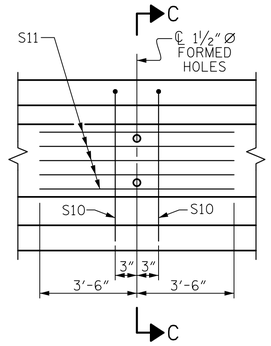


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

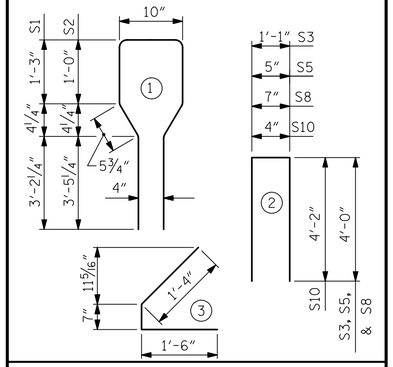
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	105	#4	1	10'-8"	748
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	84	#4	3	3'-5"	192
S5	6	#4	2	8'-5"	34
✱S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23

✱NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	6000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
GIRDER QUANTITY	1,301	16.9	30

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
7	83'-3⅞"	583'-3⅛"

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC861D45F406...

10/5/2023

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PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

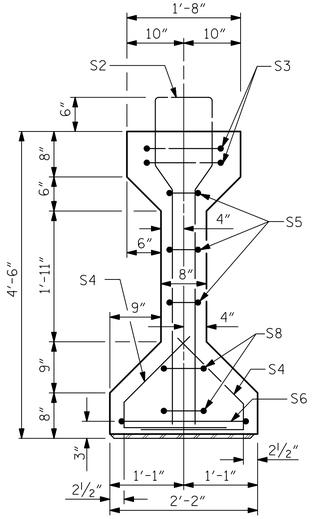
STANDARD

AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN "B"

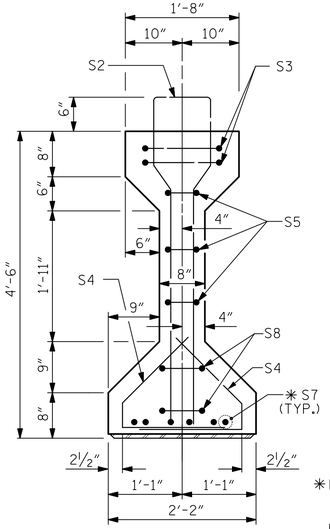
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			56

ASSEMBLED BY : J.S. HOBSON	DATE : 05/17/23	
CHECKED BY : C.C. CAMPBELL	DATE : 06/19/23	
DESIGN E.O.R. : J.S. HOBSON	DATE : 08/30/23	
DRAWN BY : ELR 8/91	REV. 10/1/11	MAA/GM
CHECKED BY : GRP 8/91	REV. 1/15	MAA/TMG
	REV. 12/17	MAA/THC

STD. NO. PCG6

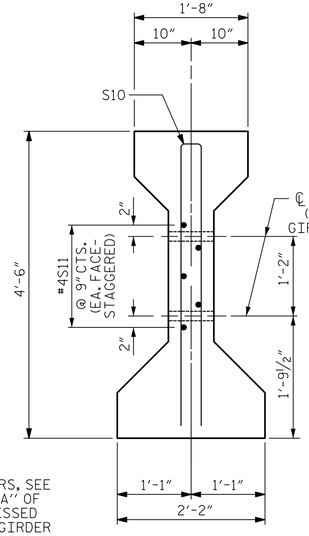


SECTION A-A



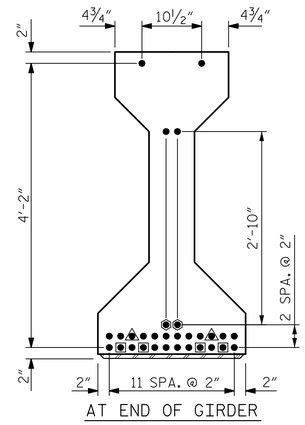
SECTION B-B

✱FOR S7 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

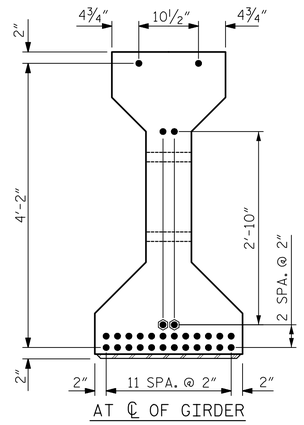


SECTION C-C

(S1 BARS NOT SHOWN)



AT END OF GIRDER

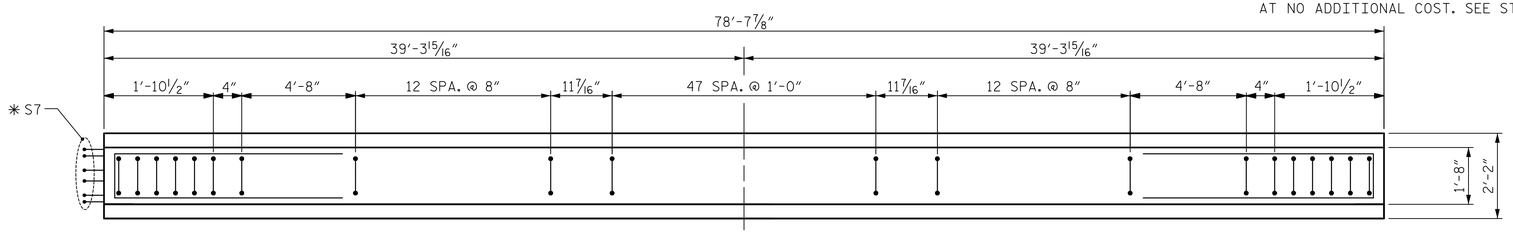


AT ℄ OF GIRDER

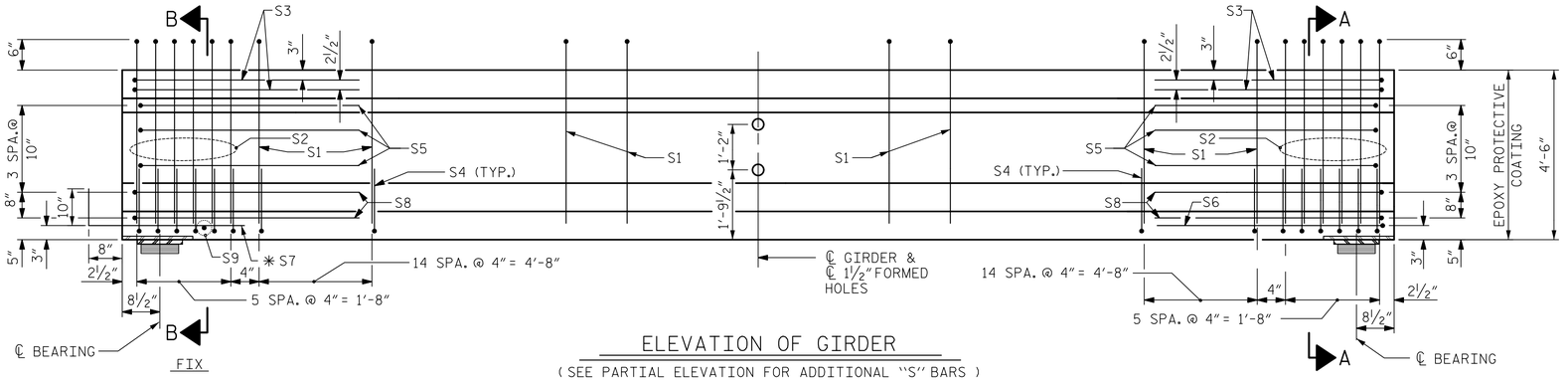
0.6" Ø LOW RELAXATION STRAND LAYOUT

(28 TOTAL STRANDS REQUIRED)

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER
- ◬ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◉ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE GIRDER, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

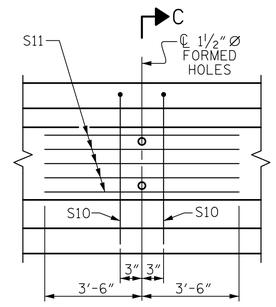


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

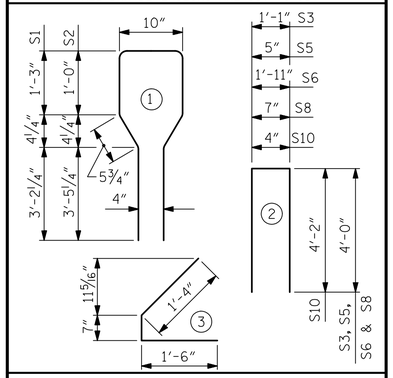
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	102	#4	1	10'-8"	727
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	84	#4	3	3'-5"	192
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
✱S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23

✱NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	5000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
GIRDER QUANTITY	1,264	16.0 (AVG.)	28

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
7	78'-7⅞"	550'-7⅛"

PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN "C"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			56

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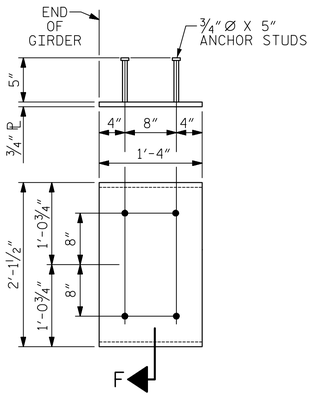
NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC861D45F406... 10/5/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

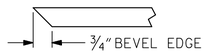
ASSEMBLED BY :	J.S. HOBSON	DATE :	05/17/23
CHECKED BY :	C.C. CAMPBELL	DATE :	06/19/23
DESIGN E.O.R. :	J.S. HOBSON	DATE :	08/30/23
DRAWN BY :	ELR 8/91	REV. 10/1/11	MAA/GM
CHECKED BY :	GRP 8/91	REV. 1/15	MAA/TMG
		REV. 12/17	MAA/THC

STD. NO. PCG6



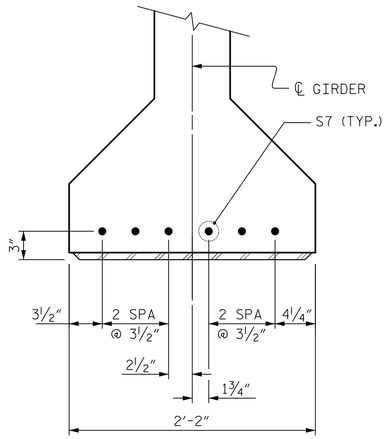
EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)



DETAIL "A"

(FOR AASHTO TYPE IV GIRDERS)

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI FOR GIRDERS IN SPANS "A" AND "C", AND A COMPRESSIVE STRENGTH OF NOT LESS THAN 4600 PSI FOR GIRDERS IN SPAN "B".

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.

ASSEMBLED BY :	J.S. HOBSON	DATE :	05/17/23
CHECKED BY :	C.C. CAMPBELL	DATE :	06/19/23
DESIGN E.O.R. :	J.S. HOBSON	DATE :	08/30/23
DRAWN BY :	ELR 11/91	REV. 1/15	MAA/TMG
CHECKED BY :	GRP 11/91	REV. 2/15	MAA/TMG
		REV. 12/17	MAA/THC

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC8B1D45F4D6...
10/5/2023

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PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

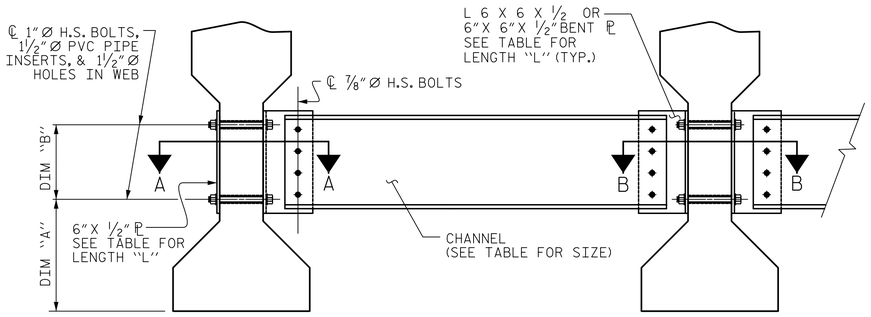
SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

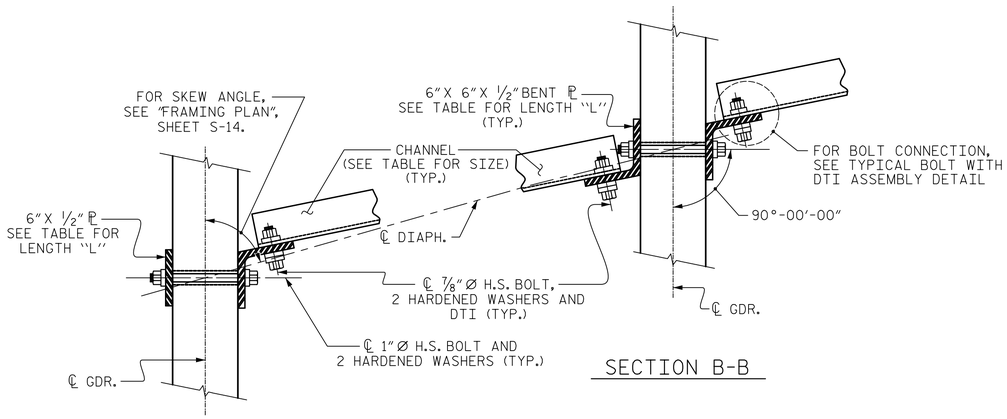
PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			56

STD. NO. PCG9 (Sht. 3)



PART SECTION AT INTERMEDIATE DIAPHRAGM

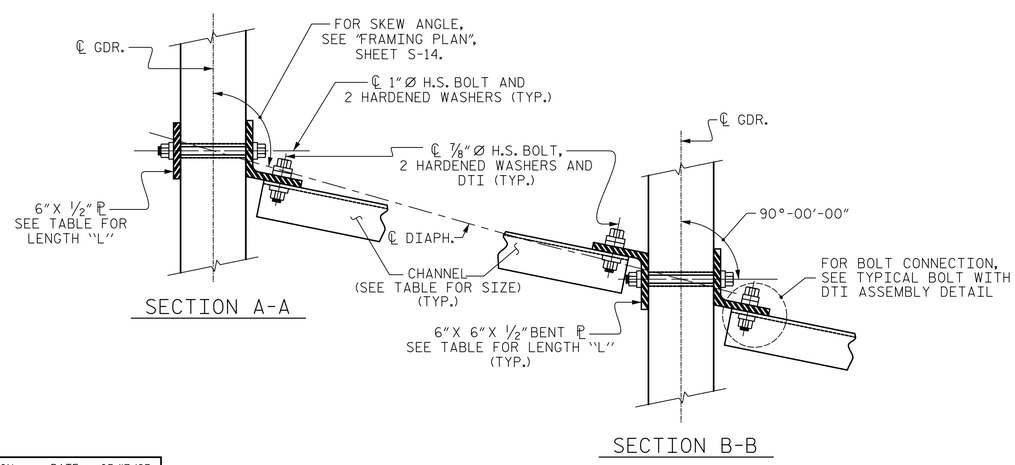


SECTION A-A

SECTION B-B

CONNECTION DETAILS

(SPAN "C")

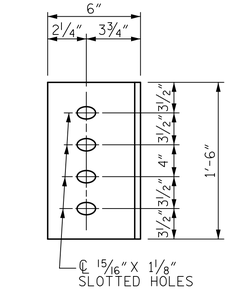


SECTION A-A

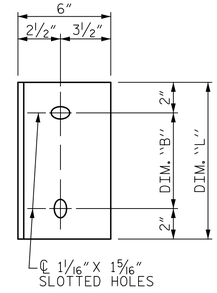
SECTION B-B

CONNECTION DETAILS

(SPANS "A" AND "B")



DIAPHRAGM FACE



WEB FACE

CONNECTION DETAILS

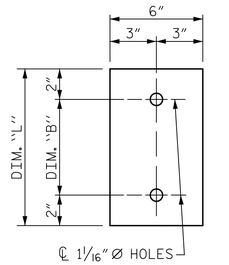
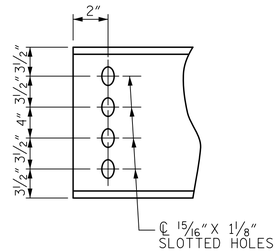
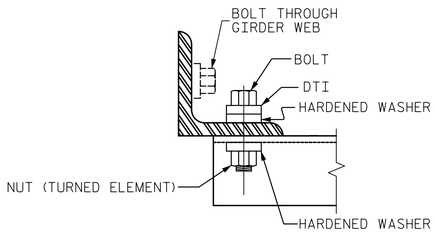


PLATE DETAILS



CHANNEL END



BOLT WITH DTI ASSEMBLY DETAIL

STRUCTURAL STEEL NOTES

ALL INTERMEDIATE DIAPHRAGM STEEL AND CONNECTOR PLATES SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

TENSION ON THE ASTM A325 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL ¼ TURN.

THE PLATES, BENT PLATES, CHANNELS, AND ANGLES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY A THERMAL SPRAYED COATING WITH A SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM, THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.

FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼"PROJECTION BEYOND THE NUT.

INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9½"	1'-2"	1'-6"

ASSEMBLED BY : J.S. HOBSON	DATE : 05/17/23	REV. 5/1/06RRR	KMM/GM
CHECKED BY : C.C. CAMPBELL	DATE : 06/19/23	REV. 10/1/11	MAA/GM
DESIGN E.O.R. : J.S. HOBSON	DATE : 08/30/23	REV. 12/17	MAA/THC
DRAWN BY : TLA 6/05			
CHECKED BY : VC 6/05			

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DOEFC8B1D45F4D6... 10/5/2023

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PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

SHEET 5 OF 5

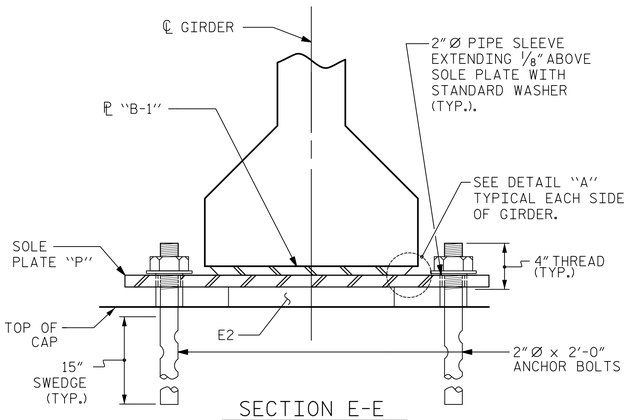
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

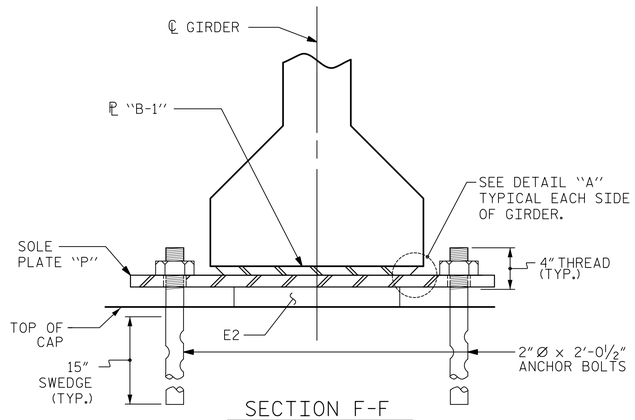
INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			56

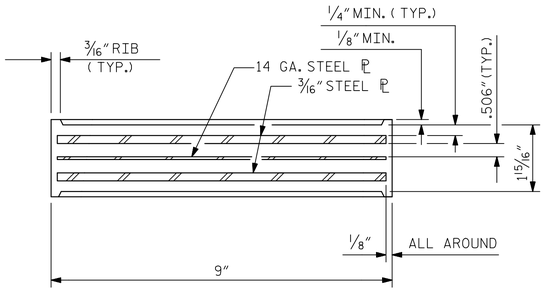
STD. NO. PCG10 (SHT 4)



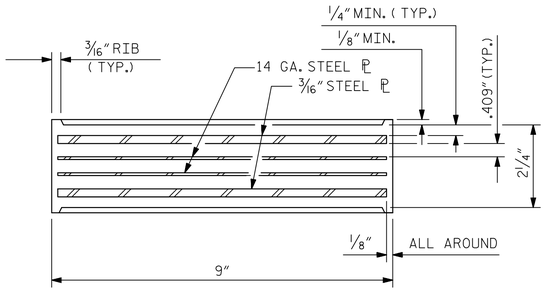
SECTION E-E
(EXPANSION)



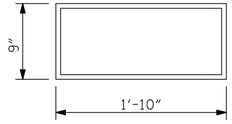
SECTION F-F
(FIXED)



TYPICAL SECTION OF ELASTOMERIC BEARINGS



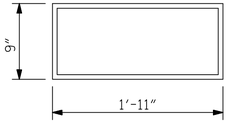
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 (14 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

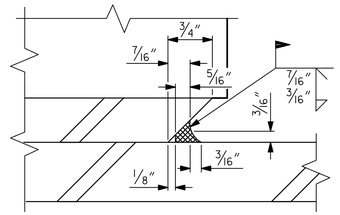
TYPE IV



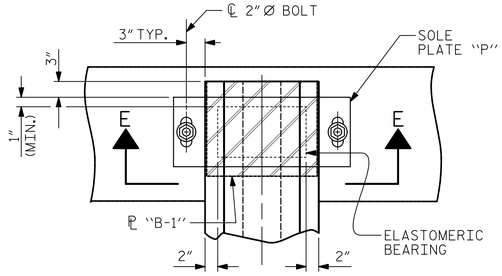
E2 (28 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

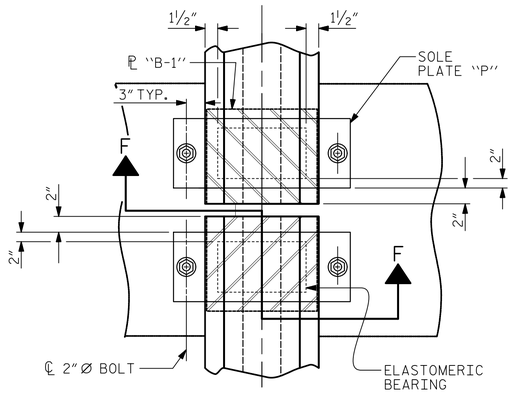
TYPE V



DETAIL "A"



TYPICAL HALF-PLAN
(SHOWING @ END BENT)



TYPICAL HALF-PLAN
(SHOWING CONTINUOUS BENT)

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 2"Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

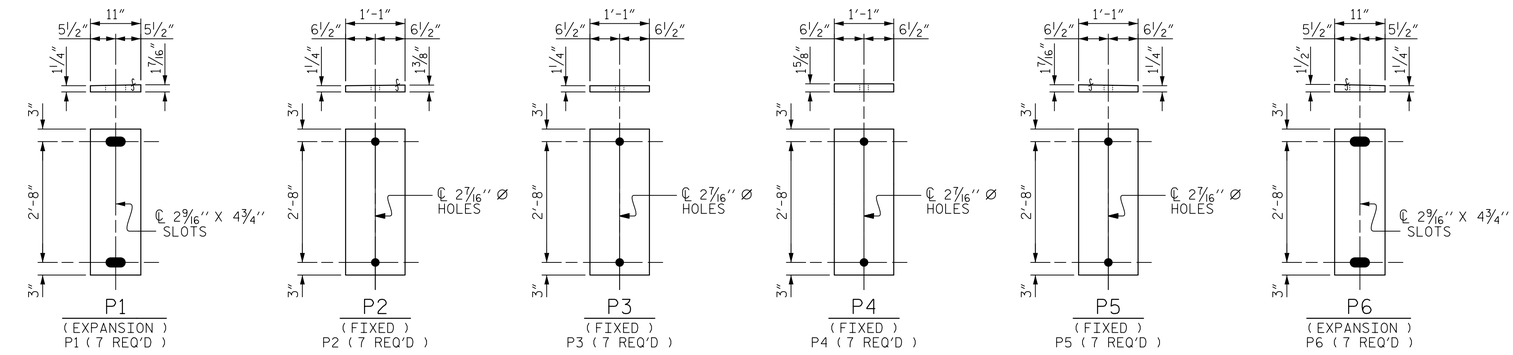
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	225 k
TYPE V	365 k



UP-STATION

SOLE PLATE DETAILS

ASSEMBLED BY : J.S. HOBSON		DATE : 05/17/23	
CHECKED BY : C.C. CAMPBELL		DATE : 06/19/23	
DESIGN E.O.R. : J.S. HOBSON		DATE : 08/30/23	
DRAWN BY : WJH 8/89	REV. 1/15		MAA/TMC
CHECKED BY : CRK 8/89	REV. 12/17		MAA/THC
	REV. 10/21		BNB/AAI

Mead & Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON
DocuSigned by: Jack Hobson DDEFC8B1D45F4D6...
10/5/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			56

STD. NO. EB3, EB4

DEAD LOAD DEFLECTION TABLE FOR GIRDERS - SPAN A

0.6"Ø LOW RELAXATION	GIRDER 1																					
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.022	0.043	0.063	0.081	0.097	0.111	0.122	0.130	0.135	0.136	0.135	0.130	0.122	0.111	0.097	0.081	0.063	0.043	0.022	0.000
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.011	0.022	0.033	0.044	0.052	0.061	0.066	0.071	0.073	0.075	0.072	0.070	0.065	0.059	0.051	0.042	0.032	0.021	0.011	0.000
FINAL CAMBER ↑	0"	1/8"	1/4"	3/8"	7/16"	9/16"	5/8"	11/16"	11/16"	3/4"	3/4"	3/4"	11/16"	11/16"	5/8"	9/16"	7/16"	3/8"	1/4"	1/8"	0"

0.6"Ø LOW RELAXATION	GIRDER 2																					
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.022	0.043	0.063	0.081	0.097	0.111	0.122	0.130	0.135	0.136	0.135	0.130	0.122	0.111	0.097	0.081	0.063	0.043	0.022	0.000
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.013	0.025	0.037	0.050	0.059	0.069	0.074	0.080	0.082	0.084	0.082	0.080	0.074	0.067	0.058	0.048	0.036	0.024	0.012	0.000
FINAL CAMBER ↑	0"	1/8"	3/16"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	5/8"	5/8"	5/8"	5/8"	9/16"	1/2"	1/2"	3/8"	5/16"	1/4"	1/8"	0"

0.6"Ø LOW RELAXATION	GIRDER 3																					
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.022	0.043	0.063	0.081	0.097	0.111	0.122	0.130	0.135	0.136	0.135	0.130	0.122	0.111	0.097	0.081	0.063	0.043	0.022	0.000
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.012	0.025	0.037	0.049	0.058	0.068	0.074	0.080	0.081	0.083	0.081	0.079	0.073	0.067	0.057	0.048	0.036	0.024	0.012	0.000
FINAL CAMBER ↑	0"	1/8"	3/16"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	5/8"	5/8"	5/8"	5/8"	9/16"	9/16"	1/2"	3/8"	5/16"	1/4"	1/8"	0"

0.6"Ø LOW RELAXATION	GIRDERS 4, 5, & 6																					
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.022	0.043	0.063	0.081	0.097	0.111	0.122	0.130	0.135	0.136	0.135	0.130	0.122	0.111	0.097	0.081	0.063	0.043	0.022	0.000
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.012	0.025	0.036	0.048	0.058	0.067	0.073	0.079	0.080	0.082	0.080	0.078	0.072	0.066	0.057	0.047	0.036	0.024	0.012	0.000
FINAL CAMBER ↑	0"	1/8"	1/4"	5/16"	3/8"	1/2"	1/2"	9/16"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	9/16"	1/2"	3/8"	5/16"	1/4"	1/8"	0"

0.6"Ø LOW RELAXATION	GIRDER 7																					
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.022	0.043	0.063	0.081	0.097	0.111	0.122	0.130	0.135	0.136	0.135	0.130	0.122	0.111	0.097	0.081	0.063	0.043	0.022	0.000
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.011	0.021	0.031	0.041	0.049	0.057	0.062	0.067	0.069	0.071	0.069	0.067	0.062	0.056	0.048	0.040	0.030	0.020	0.010	0.000
FINAL CAMBER ↑	0"	1/8"	1/4"	3/8"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	13/16"	13/16"	3/4"	3/4"	5/8"	9/16"	1/2"	3/8"	1/4"	1/8"	0"

✳ INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS - SPAN B

0.6"Ø LOW RELAXATION	GIRDER 1																					
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.025	0.048	0.071	0.092	0.110	0.126	0.138	0.147	0.153	0.154	0.153	0.147	0.138	0.126	0.110	0.092	0.071	0.048	0.025	0.000
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.012	0.024	0.036	0.048	0.057	0.067	0.073	0.079	0.081	0.083	0.081	0.079	0.073	0.067	0.057	0.048	0.036	0.024	0.012	0.000
FINAL CAMBER ↑	0"	1/8"	5/16"	7/16"	9/16"	5/8"	11/16"	13/16"	13/16"	7/8"	7/8"	7/8"	13/16"	13/16"	11/16"	5/8"	9/16"	7/16"	5/16"	1/8"	0"

0.6"Ø LOW RELAXATION	GIRDERS 2, 3, 4, 5, & 6																					
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.025	0.048	0.071	0.092	0.110	0.126	0.138	0.147	0.153	0.154	0.153	0.147	0.138	0.126	0.110	0.092	0.071	0.048	0.025	0.000
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.014	0.028	0.042	0.055	0.066	0.077	0.084	0.091	0.094	0.096	0.094	0.091	0.084	0.077	0.066	0.055	0.042	0.028	0.014	0.000
FINAL CAMBER ↑	0"	1/8"	1/4"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	11/16"	11/16"	11/16"	11/16"	5/8"	9/16"	1/2"	7/16"	3/8"	1/4"	1/8"	0"

0.6"Ø LOW RELAXATION	GIRDER 7																					
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.025	0.048	0.071	0.092	0.110	0.126	0.138	0.147	0.153	0.154	0.153	0.147	0.138	0.126	0.110	0.092	0.071	0.048	0.025	0.000
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.012	0.023	0.035	0.046	0.055	0.065	0.071	0.077	0.079	0.081	0.079	0.077	0.071	0.065	0.055	0.046	0.035	0.023	0.012	0.000
FINAL CAMBER ↑	0"	1/8"	5/16"	7/16"	9/16"	5/8"	3/4"	13/16"	7/8"	7/8"	7/8"	7/8"	7/8"	13/16"	3/4"	5/8"	9/16"	7/16"	5/16"	1/8"	0"

✳ INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DRAWN BY : J.S. HOBSON DATE : 05/17/23
CHECKED BY : C.C CAMPBELL DATE : 06/19/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

Mead &Hunt
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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DOEFCBB1D45F4D6... 10/5/2023

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PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

DEAD LOAD DEFLECTION AND CAMBER TABLES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			56

DEAD LOAD DEFLECTION TABLE FOR GIRDERS - SPAN C

0.6"Ø LOW RELAXATION	GIRDER 1																					
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.022	0.043	0.063	0.081	0.097	0.111	0.122	0.130	0.135	0.136	0.135	0.130	0.122	0.111	0.097	0.081	0.063	0.043	0.022	0.000
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.011	0.021	0.032	0.042	0.051	0.059	0.065	0.070	0.072	0.075	0.073	0.071	0.066	0.061	0.052	0.044	0.033	0.022	0.011	0.000
FINAL CAMBER ↑	0"	1/8"	1/4"	3/8"	7/16"	9/16"	5/8"	11/16"	11/16"	3/4"	3/4"	3/4"	11/16"	11/16"	5/8"	9/16"	7/16"	3/8"	1/4"	1/8"	0"

0.6"Ø LOW RELAXATION	GIRDER 2																					
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.022	0.043	0.063	0.081	0.097	0.111	0.122	0.130	0.135	0.136	0.135	0.130	0.122	0.111	0.097	0.081	0.063	0.043	0.022	0.000
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.012	0.024	0.036	0.048	0.058	0.067	0.074	0.080	0.082	0.084	0.082	0.080	0.074	0.069	0.059	0.050	0.037	0.025	0.013	0.000
FINAL CAMBER ↑	0"	1/8"	1/4"	5/16"	3/8"	1/2"	1/2"	9/16"	5/8"	5/8"	5/8"	5/8"	5/8"	9/16"	1/2"	7/16"	3/8"	5/16"	3/16"	1/8"	0"

0.6"Ø LOW RELAXATION	GIRDER 3																					
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.022	0.043	0.063	0.081	0.097	0.111	0.122	0.130	0.135	0.136	0.135	0.130	0.122	0.111	0.097	0.081	0.063	0.043	0.022	0.000
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.012	0.024	0.036	0.048	0.057	0.067	0.073	0.079	0.081	0.083	0.081	0.080	0.074	0.068	0.058	0.049	0.037	0.025	0.012	0.000
FINAL CAMBER ↑	0"	1/8"	1/4"	5/16"	3/8"	1/2"	9/16"	9/16"	5/8"	5/8"	5/8"	5/8"	5/8"	9/16"	1/2"	7/16"	3/8"	5/16"	3/16"	1/8"	0"

0.6"Ø LOW RELAXATION	GIRDERS 4, 5, & 6																					
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.022	0.043	0.063	0.081	0.097	0.111	0.122	0.130	0.135	0.136	0.135	0.130	0.122	0.111	0.097	0.081	0.063	0.043	0.022	0.000
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.012	0.024	0.036	0.047	0.057	0.066	0.072	0.078	0.080	0.082	0.080	0.079	0.073	0.067	0.058	0.048	0.036	0.025	0.012	0.000
FINAL CAMBER ↑	0"	1/8"	1/4"	5/16"	3/8"	1/2"	9/16"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	9/16"	1/2"	1/2"	3/8"	5/16"	1/4"	1/8"	0"

0.6"Ø LOW RELAXATION	GIRDER 7																					
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.022	0.043	0.063	0.081	0.097	0.111	0.122	0.130	0.135	0.136	0.135	0.130	0.122	0.111	0.097	0.081	0.063	0.043	0.022	0.000
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.010	0.020	0.030	0.040	0.048	0.056	0.062	0.067	0.069	0.071	0.069	0.067	0.062	0.057	0.049	0.041	0.031	0.021	0.011	0.000
FINAL CAMBER ↑	0"	1/8"	1/4"	3/8"	1/2"	9/16"	5/8"	3/4"	3/4"	13/16"	13/16"	13/16"	3/4"	11/16"	5/8"	9/16"	1/2"	3/8"	1/4"	1/8"	0"

✳ INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DRAWN BY : J.S. HOBSON DATE : 05/17/23
CHECKED BY : C.C CAMPBELL DATE : 06/19/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFCBB1D45F4D6... 10/5/2023

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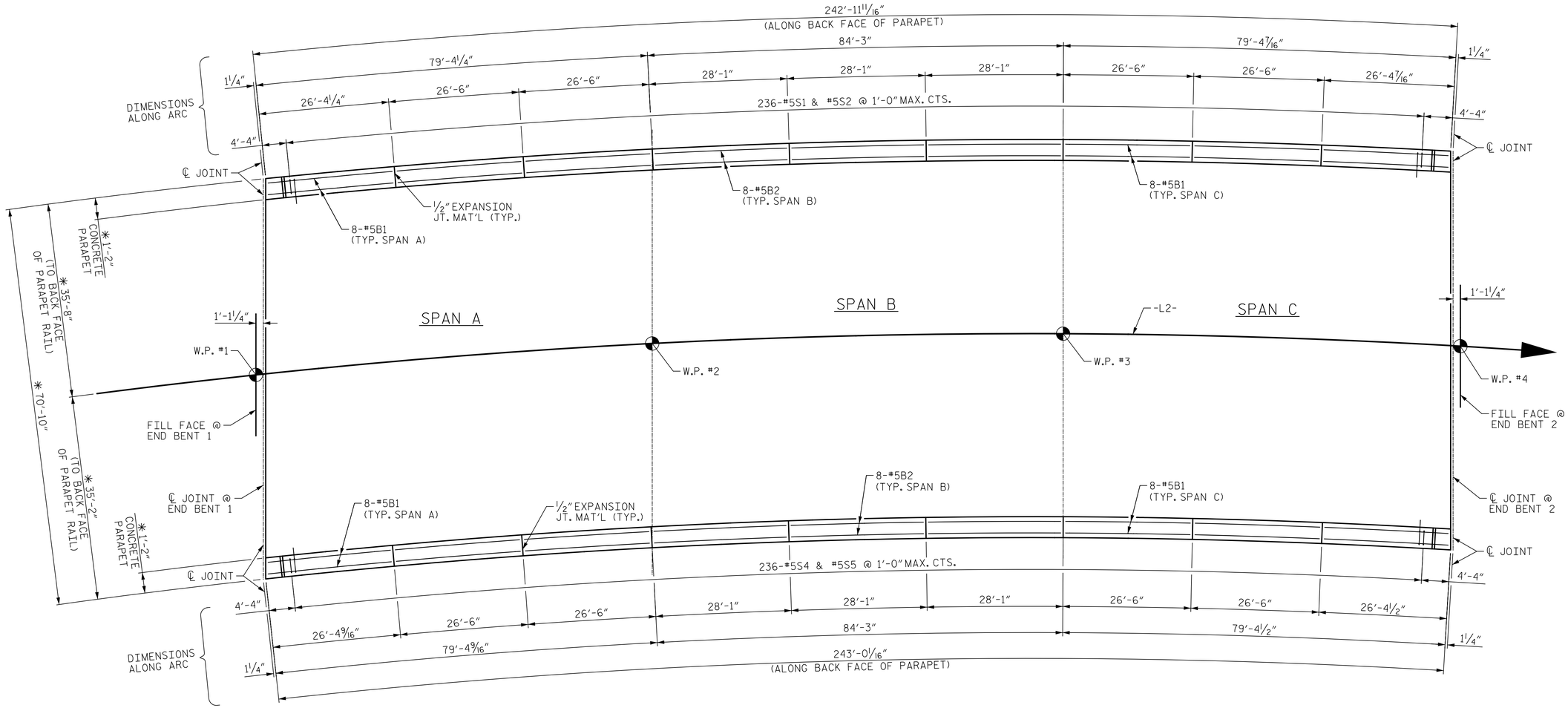
PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

DEAD LOAD DEFLECTION AND CAMBER TABLES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			56



PLAN OF PARAPET REINFORCING

✳ RADIAL DIMENSION

NOTES

THE PARAPET RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

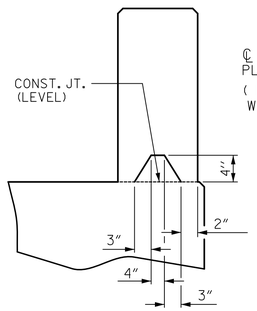
ALL REINFORCING STEEL IN PARAPET RAILS SHALL BE EPOXY COATED.

VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

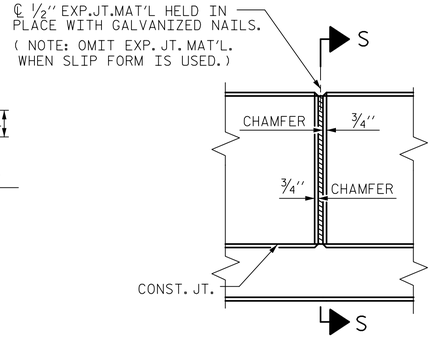
#5 "S" BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO MAINTAIN 2" CLEAR TO EXPANSION JOINT IN RAIL.

FOR PLAN AND DETAILS OF PARAPET AND END POSTS, SEE "CONCRETE PARAPET AND END POST DETAILS" SHEETS.

FOR END POST ON APPROACH SLAB DETAILS, SEE "APPROACH SLAB DETAILS" SHEET.



SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT JOINTS IN PARAPET

DRAWN BY : J.S. HOBSON DATE : 06/14/23
CHECKED BY : C.C. CAMPBELL DATE : 06/21/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFCBB1D45F4D6... 10/5/2023

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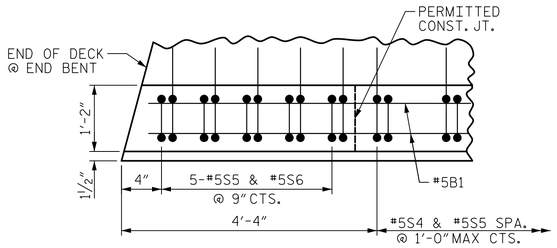
PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

SHEET 1 OF 3

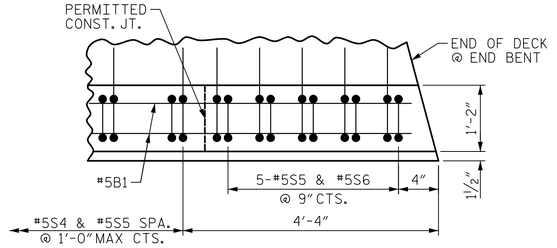
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

CONCRETE PARAPET FOR TWO BAR METAL RAIL

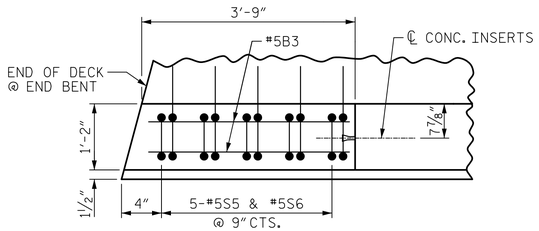
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			56



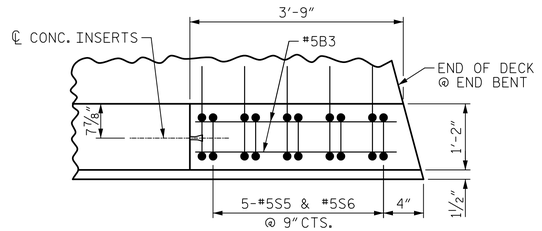
PLAN OF RIGHT PARAPET
(END BENT 1)



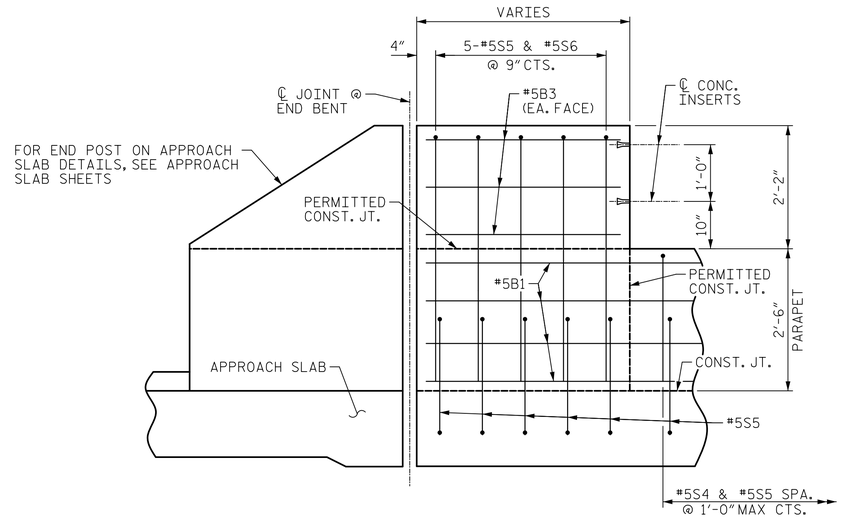
PLAN OF RIGHT PARAPET
(END BENT 2)



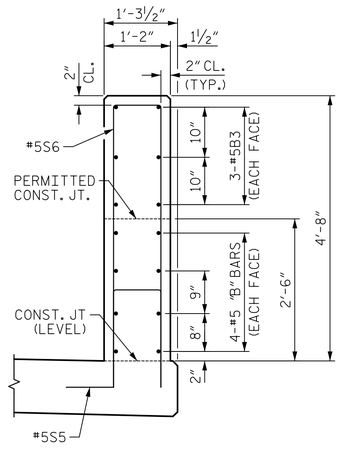
PLAN OF RIGHT END POST
(END BENT 1)



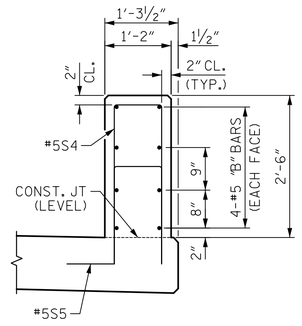
PLAN OF RIGHT END POST
(END BENT 2)



RIGHT ELEVATION
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



RIGHT END VIEW
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



RIGHT PARAPET TYPICAL SECTION
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

PARAPET AND END POST FOR TWO BAR RAIL

FOR GUARDRAIL ANCHORAGE DETAILS AND LOCATION, SEE
"GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.

DRAWN BY : J.S. HOBSON DATE : 04/14/22
CHECKED BY : C.C. CAMPBELL DATE : 06/20/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON
DocuSigned by: Jack Hobson DDEFC8B1D45F4D6...
10/5/2023

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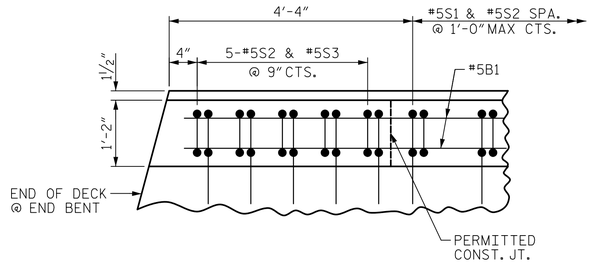
PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

SHEET 2 OF 3

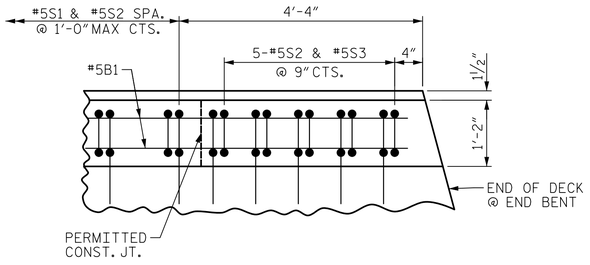
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

CONCRETE PARAPET AND END POST DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			56



PLAN OF LEFT PARAPET
(END BENT 1)



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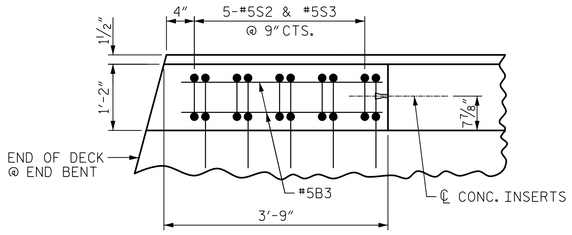
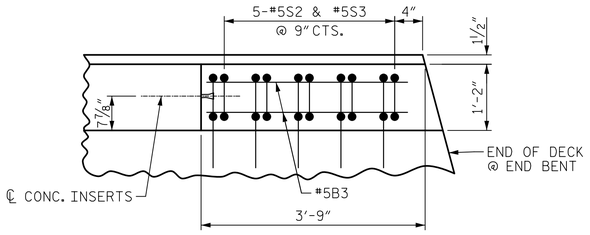
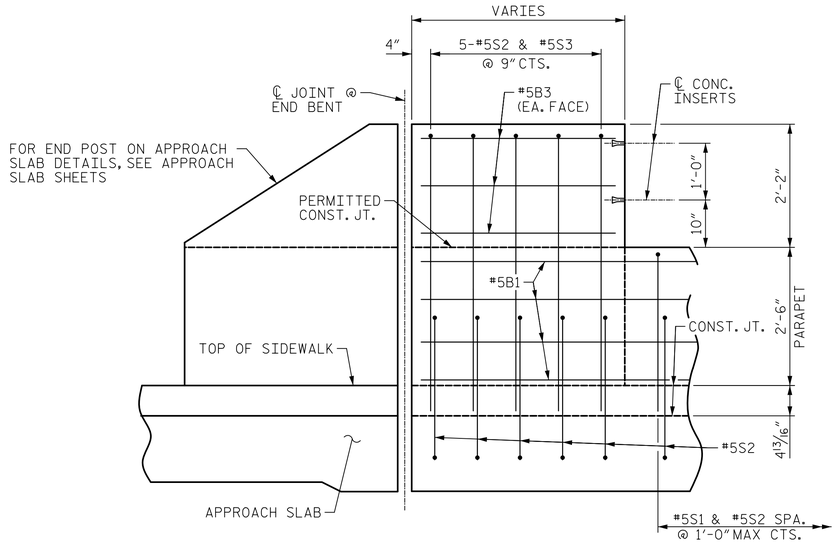
(END BENT 2)



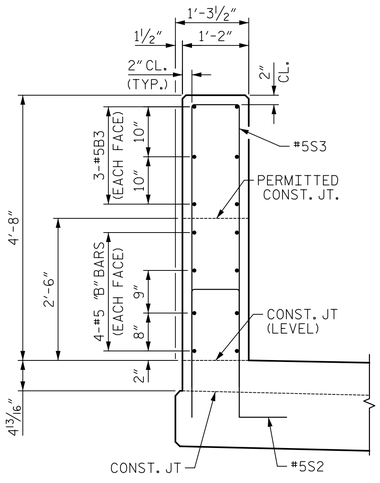
PLAN OF LEFT END POST
(END BENT 1)



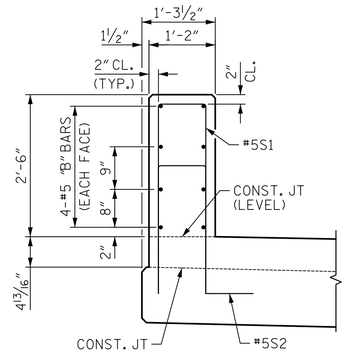
PLAN OF LEFT END POST
(END BENT 2)



LEFT ELEVATION
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

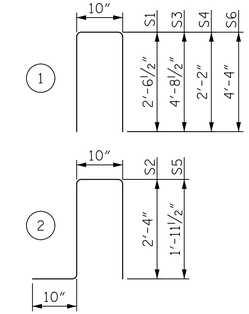


LEFT END VIEW
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



LEFT PARAPET TYPICAL SECTION
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR PARAPETS & END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	96	#5	STR	26′-1″	2612
✳ B2	48	#5	STR	27′-8″	1385
✳ B3	24	#5	STR	3′-5″	86
✳ S1	236	#5	1	5′-11″	1456
✳ S2	246	#5	2	6′-4″	1625
✳ S3	10	#5	1	10′-3″	107
✳ S4	236	#5	1	5′-2″	1272
✳ S5	246	#5	2	5′-7″	1433
✳ S6	10	#5	1	9′-6″	99

✳EPOXY COATED REINFORCING STEEL	10075 LBS.
CLASS AA CONCRETE	53.9 CU. YDS.
1′-2″X 2′-6″ CONCRETE PARAPET	486.0 LIN. FT.

PARAPET AND END POST FOR TWO BAR RAIL

FOR GUARDRAIL ANCHORAGE DETAILS AND LOCATION, SEE
"GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.

DRAWN BY : J.S. HOBSON DATE : 04/14/22
CHECKED BY : C.C. CAMPBELL DATE : 06/20/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON
DocuSigned by: Jack Hobson DDEFC861D45F406...
10/5/2023

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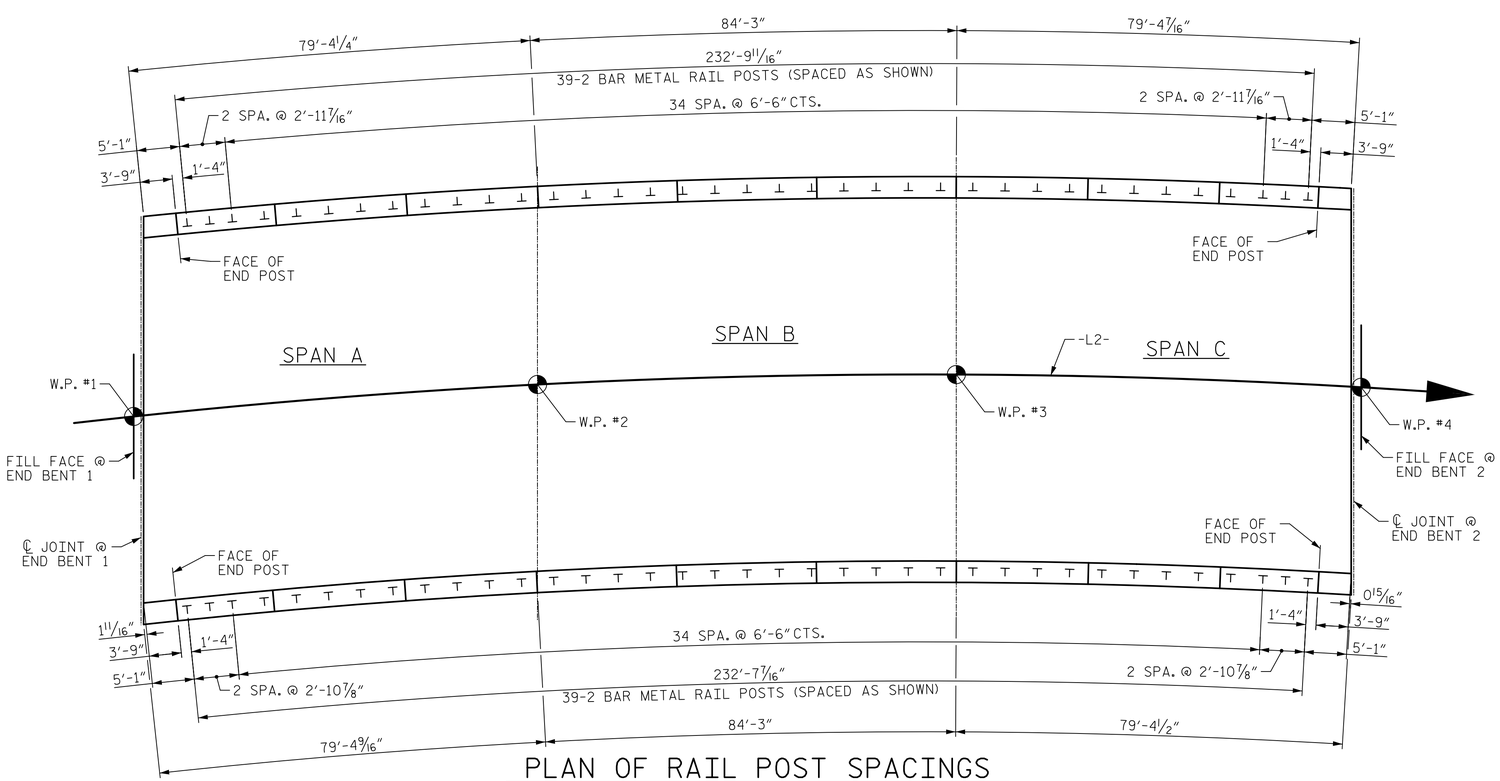
PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

CONCRETE PARAPET AND END POST DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			56



PLAN OF RAIL POST SPACINGS

(DIMENSIONS ABOVE MEASURED ALONG OUTSIDE FACE OF PARAPET)

NOTES

STRUCTURAL CONCRETE INSERT

THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½''.

B. 1 - ¾'' Ø X 1⅝'' BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾'' Ø X 1⅝'' GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. ½'' PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. ¾'' STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A ¾''Ø X 1⅝'' BOLT WITH 2'' O.D. WASHER IN PLACE. THE ¾''Ø X 1⅝'' BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.

D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).

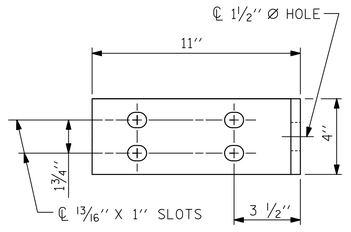
E. ½'' Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

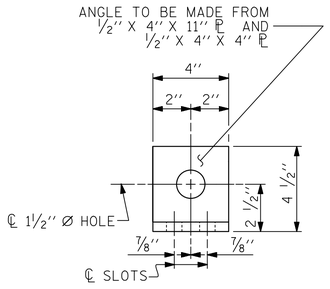
THE ¾'' STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE ¾'' STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½'' PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

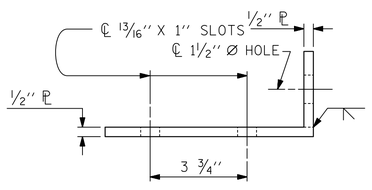
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾'' Ø X 1⅝'' BOLT WITH WASHER SHALL BE REPLACED WITH A ¾''Ø X 6½'' BOLT AND 2'' O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾'' Ø X 1⅝'' BOLT SHALL APPLY TO THE ¾''Ø X 6 ½'' BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



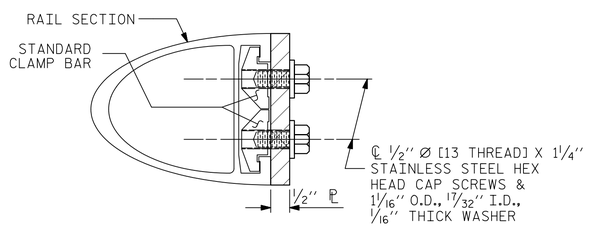
ELEVATION



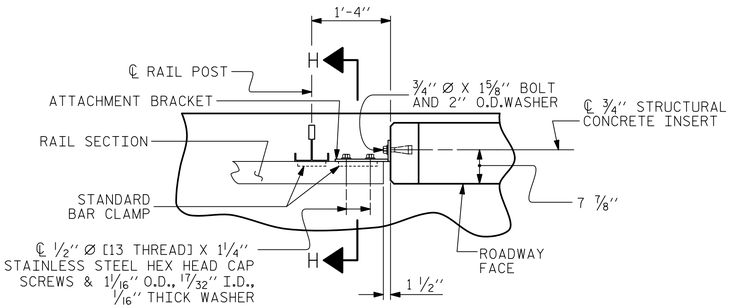
END VIEW



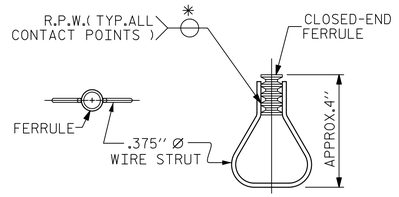
TOP VIEW



SECTION H-H



PLAN - RAIL AND END POST



STRUCTURAL CONCRETE INSERT

*EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

DETAILS FOR ATTACHING METAL RAIL TO END POST

ASSEMBLED BY :	J.S. HOBSON	DATE :	04/14/22
CHECKED BY :	C.C. CAMPBELL	DATE :	06/22/23
DESIGN E.O.R. :	J.S. HOBSON	DATE :	08/30/23
DRAWN BY :	FCJ 1/88	REV.	5/1/06 TLA/GM
CHECKED BY :	CRK 3/89	REV.	10/1/11 MAA/GM
		REV.	12/17

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER ORIN S. HOBSON

DocuSigned by: Jack Hobson 10/5/2023
DDEFC8B1D45F4D6...

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PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

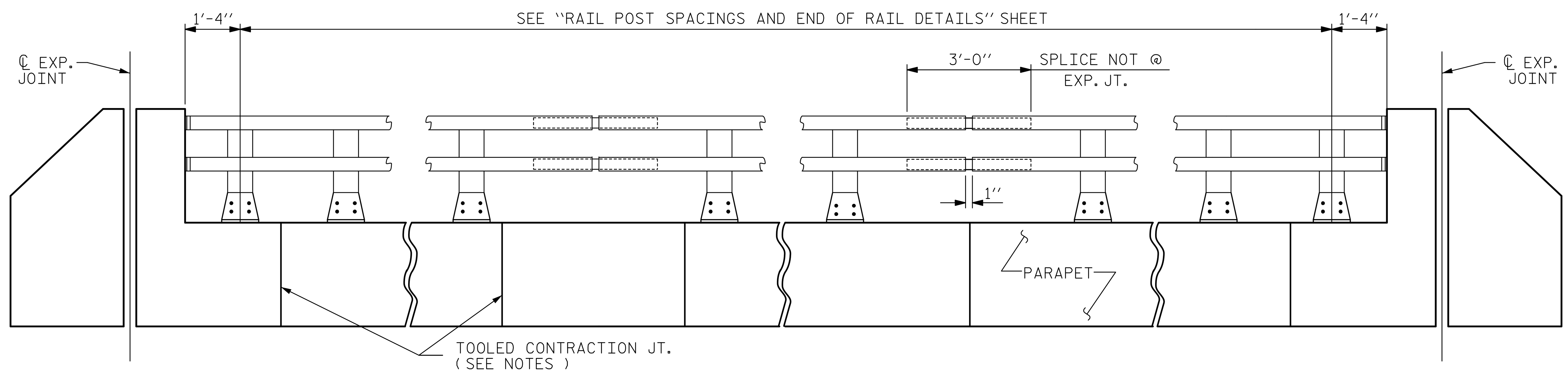
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS
FOR ONE OR TWO BAR METAL RAILS

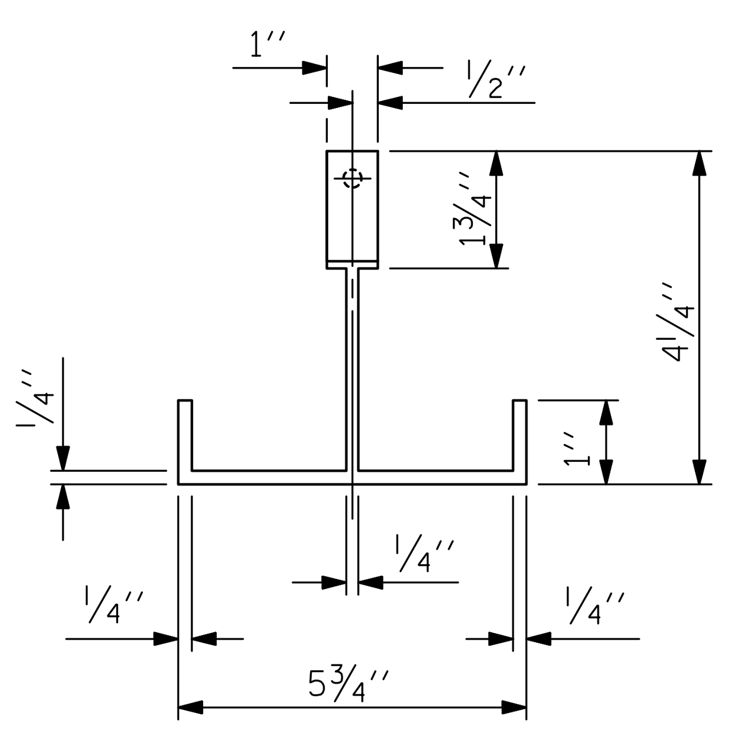
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			56

STD. NO. BMR2

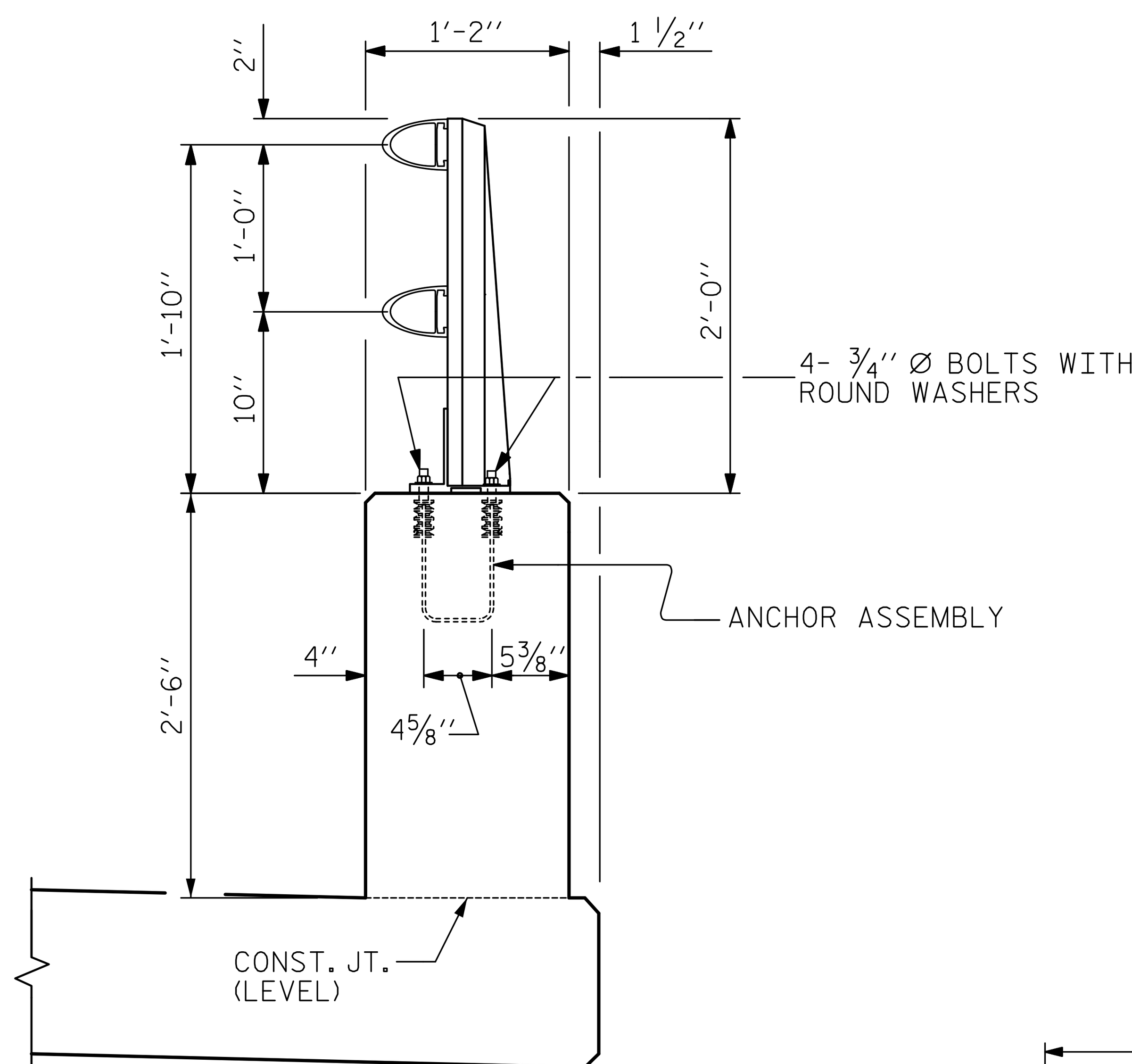


ELEVATION

NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET 1 OF 3.

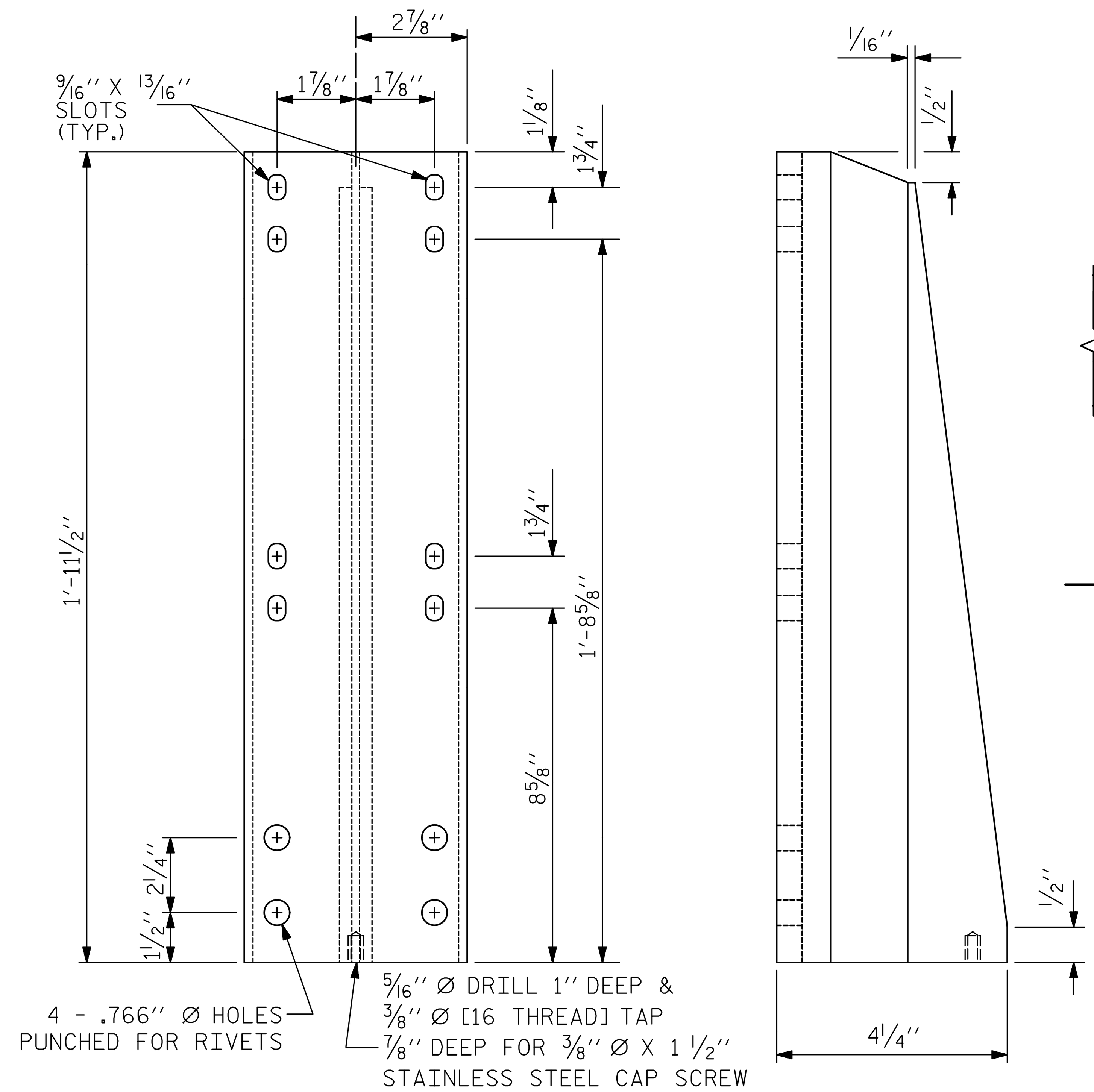


PLAN



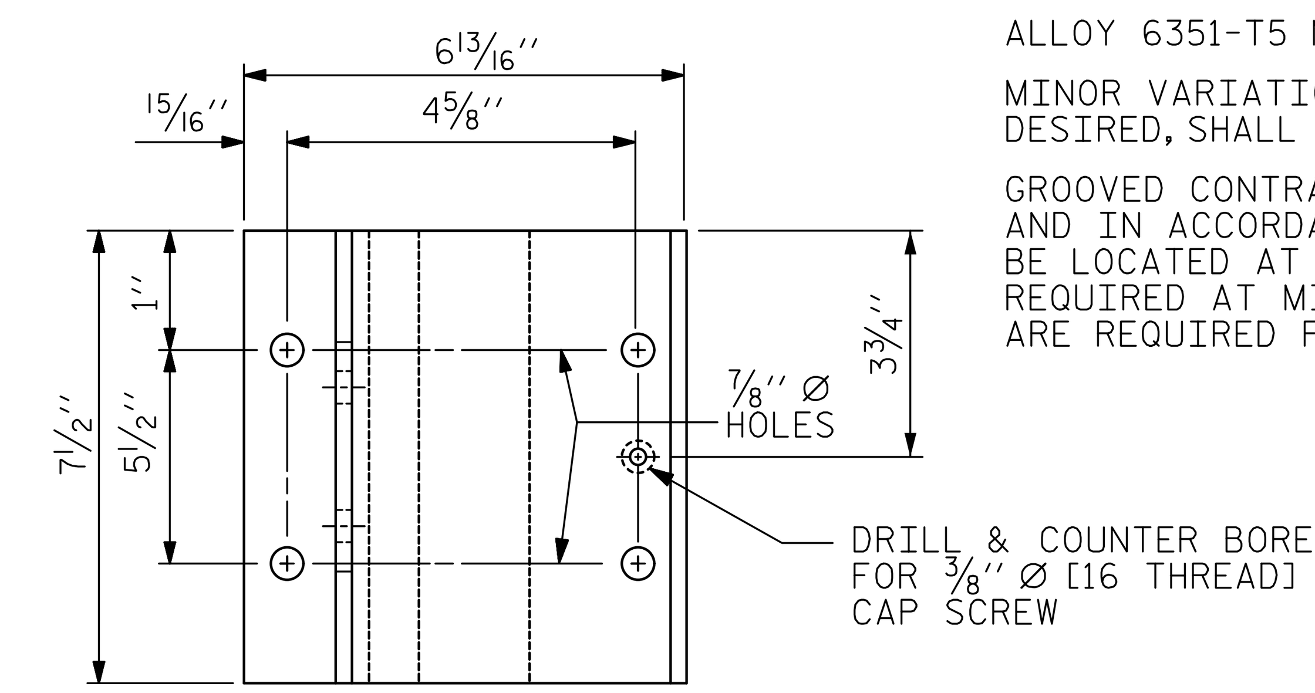
SECTION THRU PARAPET AND RAIL

(SIDEWALK NOT SHOWN)

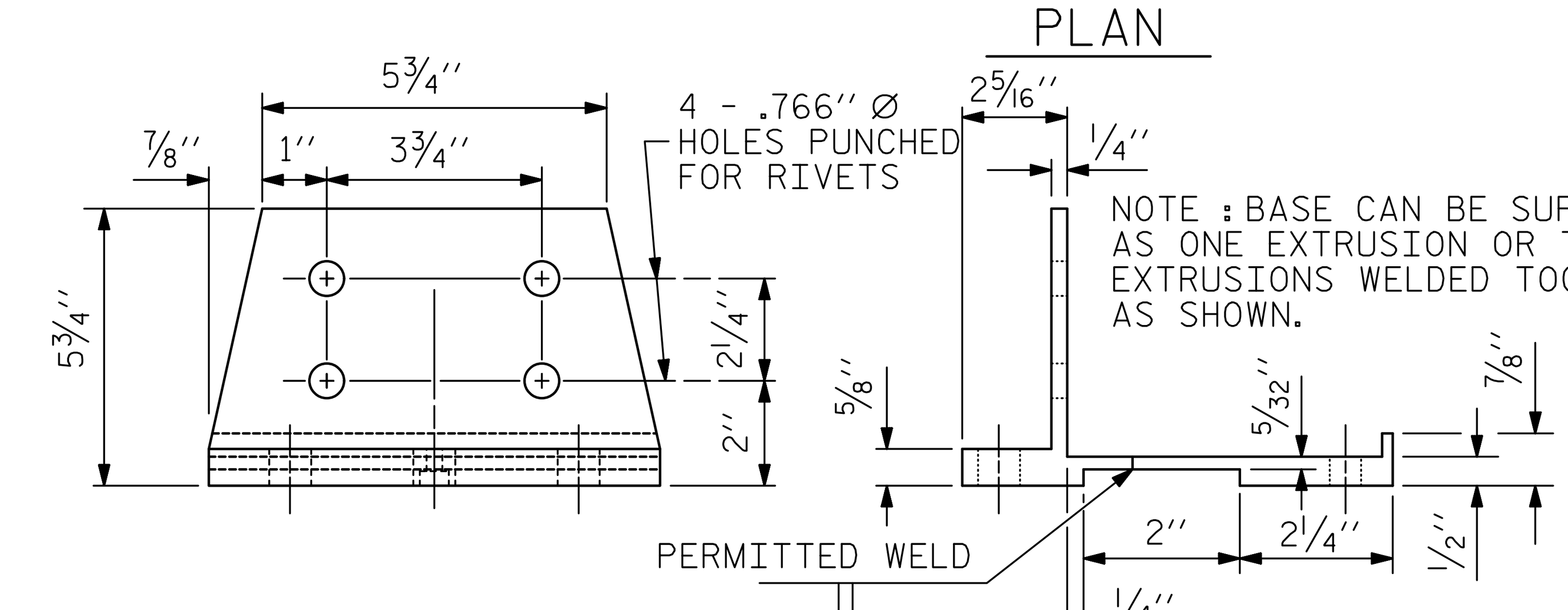


FRONT ELEVATION SIDE ELEVATION

DETAILS OF POST

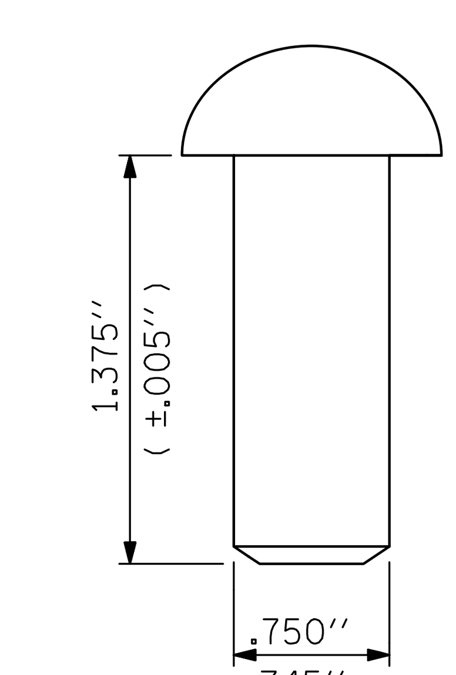


PLAN



FRONT ELEVATION SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

UNLESS OTHERWISE REQUIRED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR HAS THE OPTION TO USE AN ALTERNATE TO THE 2 BAR METAL RAIL. THE ALTERNATE RAIL SHALL MEET THE REQUIREMENTS OF THE AASHTO LRFDBRIDGE DESIGN SPECIFICATIONS AND MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST (APL) UNDER "2 BAR METAL RAIL ALTERNATE". ADJUSTMENTS TO THE CONCRETE PARAPET WILL NOT BE ALLOWED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAY LENGTH = 470.8 LIN. FT.

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 10/5/2023
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PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

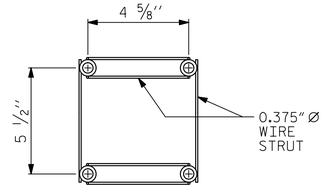
2 BAR METAL RAIL

ASSEMBLED BY :	J.S. HOBSON	DATE :	04/14/22
CHECKED BY :	C.C. CAMPBELL	DATE :	06/20/23
DESIGN E.O.R. :	J.S. HOBSON	DATE :	08/30/23

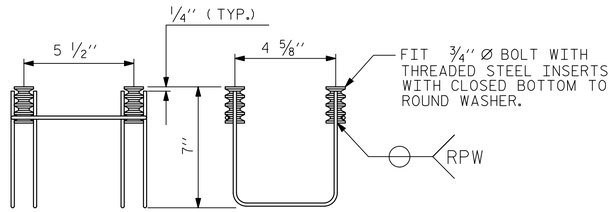
DRAWN BY : EEM 6/94	REV. 10/1/11	MAA/GM
CHECKED BY : RGW 6/94	REV. 6/13	MAA/GM
	REV. 12/17	MAA/THC

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S-28
1			3					TOTAL SHEETS
2			4					56

STD. NO. BMR3



PLAN



SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(78 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2'' FOR 3/4'' FERRULES.

B. 4 - 3/4'' Ø X 2 1/2'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4'' Ø X 2 1/2'' GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

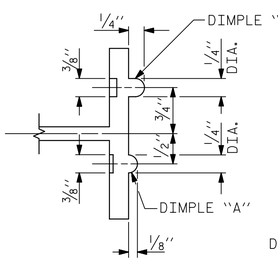
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

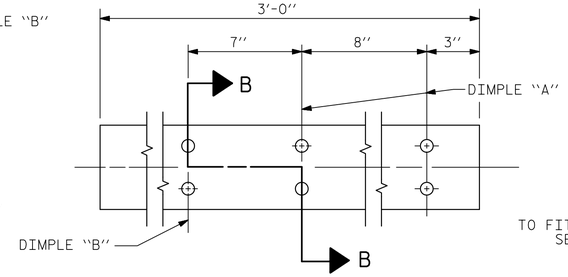
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

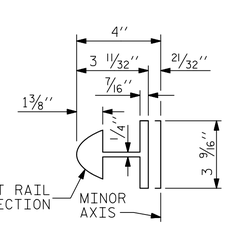
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.



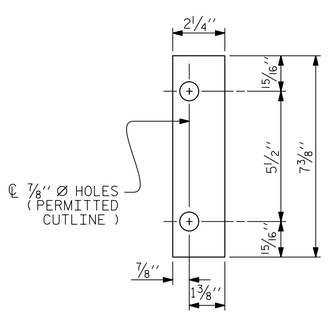
SECTION B - B



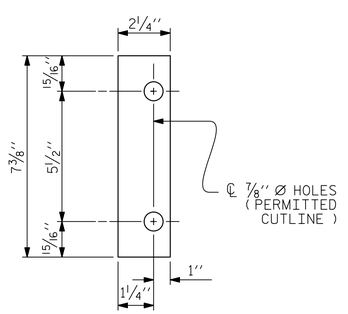
EXPANSION BAR DETAILS



BAR SECTION



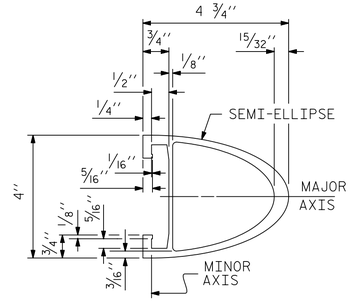
FRONT PLATE



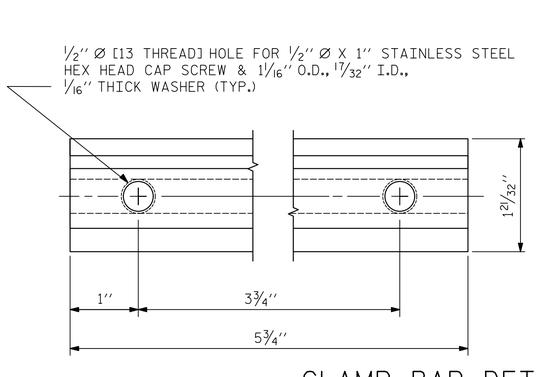
REAR PLATE

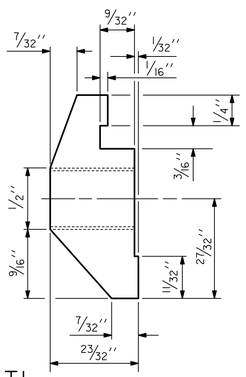
SHIM DETAILS

NOTE :
SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



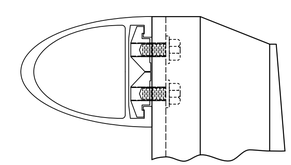
RAIL SECTION



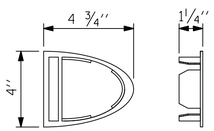


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

Mead &Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson DOEFC881D45F4DE... 10/5/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

SHEET 3 OF 3

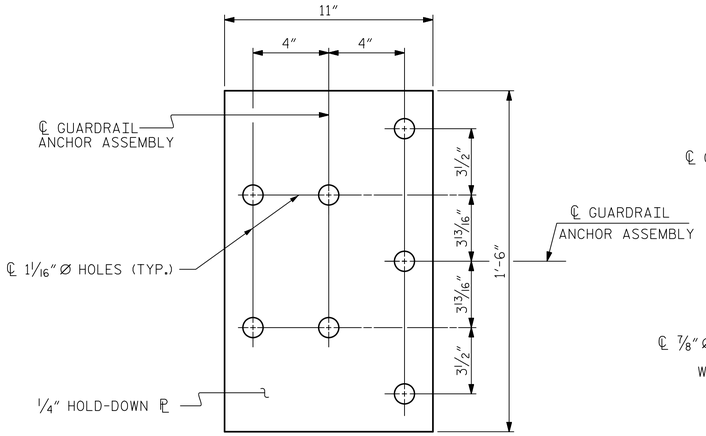
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

2 BAR METAL RAIL

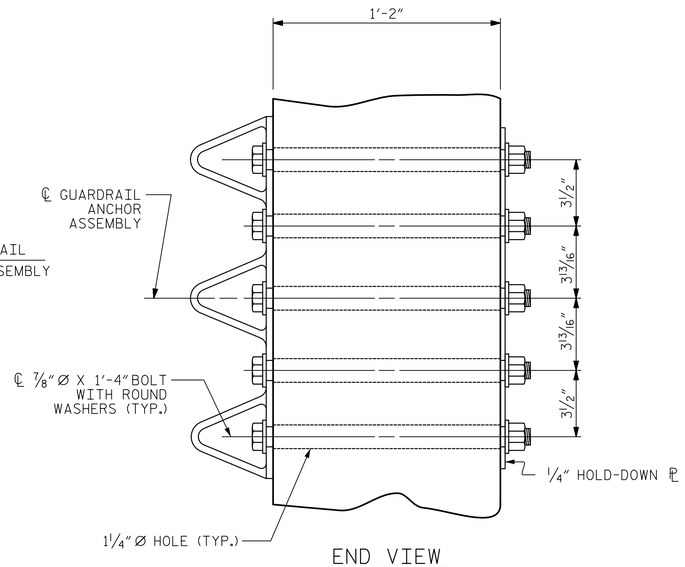
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			56

ASSEMBLED BY : J.S. HOBSON		DATE : 04/14/22
CHECKED BY : C.C. CAMPBELL		DATE : 06/20/23
DESIGN E.O.R. : J.S. HOBSON		DATE : 08/30/23
DRAWN BY : EEM 6/94	REV. 5/1/06R	KMM/GM
CHECKED BY : RGW 6/94	REV. 10/1/11	MAA/GM
	REV. 12/17	MAA/THC

STD. NO. BMR4



PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4″ HOLD DOWN PLATE AND 7 - 7/8″ Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8″ Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

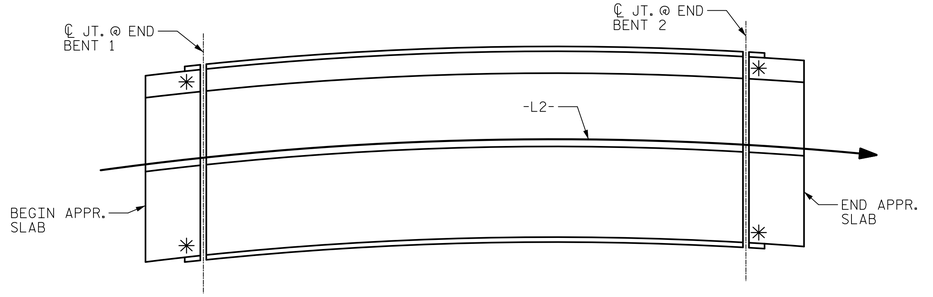
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

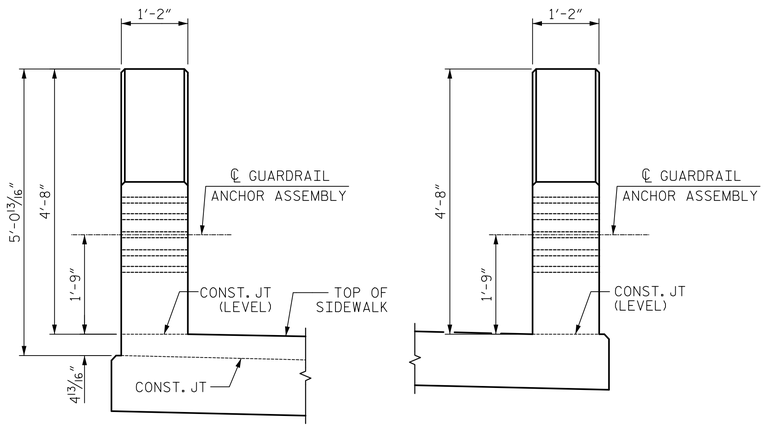
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

THE 1 1/4″ Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



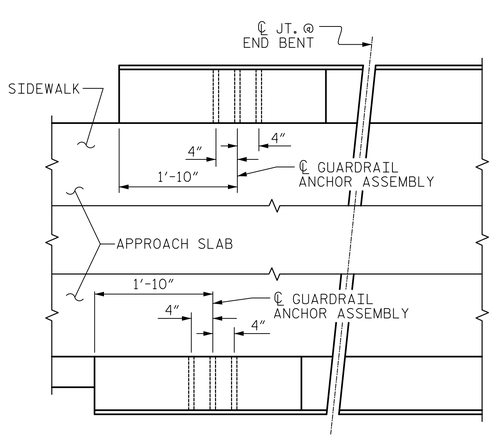
SKETCH SHOWING POINTS OF ATTACHMENT

✳LOCATION OF GUARDRAIL ATTACHMENT



LEFT END VIEW

RIGHT END VIEW



PLAN

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

LOCATION OF GUARDRAIL ANCHOR AT END POST

ASSEMBLED BY : J.S. HOBSON		DATE : 04/14/22	
CHECKED BY : C.C. CAMPBELL		DATE : 06/21/23	
DESIGN E.O.R. : J.S. HOBSON		DATE : 08/30/23	
DRAWN BY : MAA 5/10	REV. 1/15	MAA/TMG	
CHECKED BY : GM 5/10	REV. 12/17	MAA/THC	
	REV. 5/18	MAA/THC	

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Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON
DocuSigned by: Jack Hobson DDEFC8B1D45F4D6...
10/5/2023

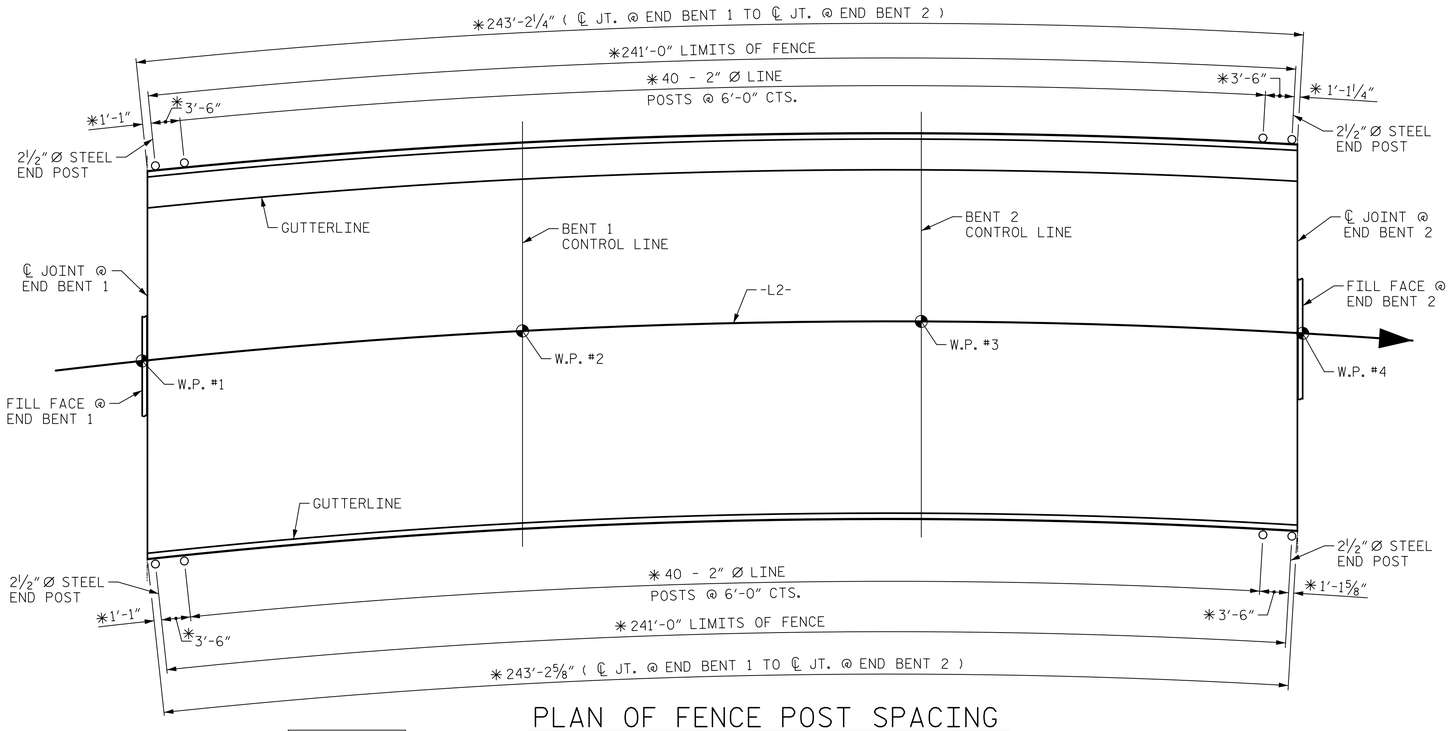
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			56

(SHT 2) STD. NO. GRA3



✳DIMENSIONS ALONG ARC

PLAN OF FENCE POST SPACING

TOTAL PAY LENGTH = 482.0 FT

NOTES

FOR BRIDGE MOUNTED 72" CHAIN LINK FENCE, SEE SPECIAL PROVISIONS.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLTS, NUTS, AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ¾" Ø GALVANIZED BOLTS, NUTS, AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

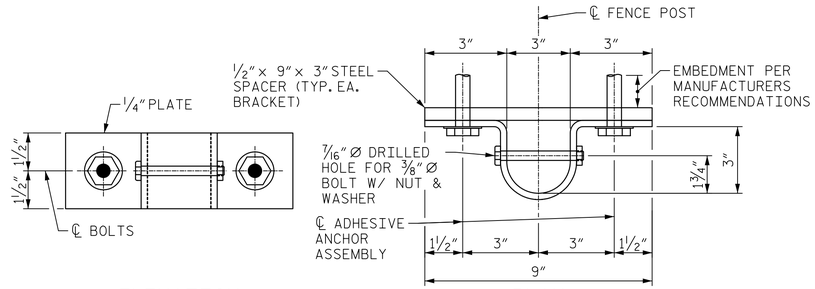
LEVEL ONE FIELD TESTING IS REQUIRED AND THE YIELD LOAD OF THE ANCHOR BOLTS IS 10.0 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS, SEE THE STANDARD SPECIFICATIONS.

ALL FENCE MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION 1050 OF THE STANDARD SPECIFICATIONS. GALVANIZE ALL STEEL PARTS AND HARDWARE IN ACCORDANCE WITH ARTICAL 1076 OF THE STANDARD SPECIFICATIONS.

FENCE POST LOCATIONS SHALL BE SHIFTED, AS NECESSARY, TO MAINTAIN 1'-0" MINIMUM DISTANCE FROM ANCHOR BOLT TO JOINTS IN PARAPET.

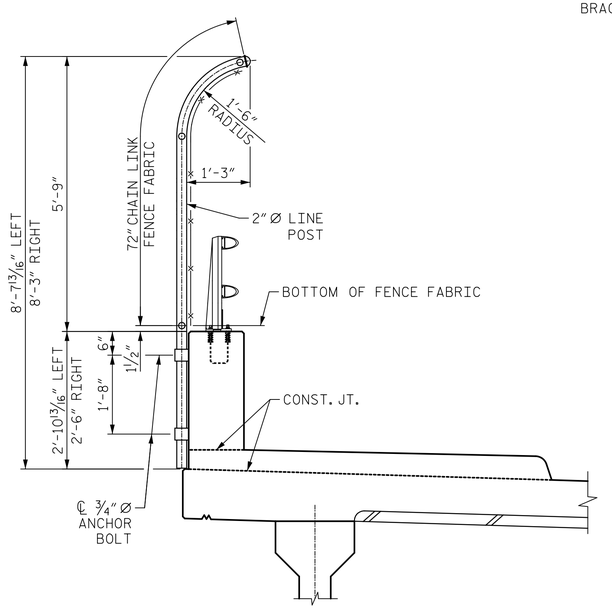
DIMENSIONS TAKEN ALONG OUTSIDE FACE OF PARAPET.

WELDING SHALL BE DONE IN ACCORDANCE WITH ARTICLE 1072-20 OF THE STANDARD SPECIFICATIONS.



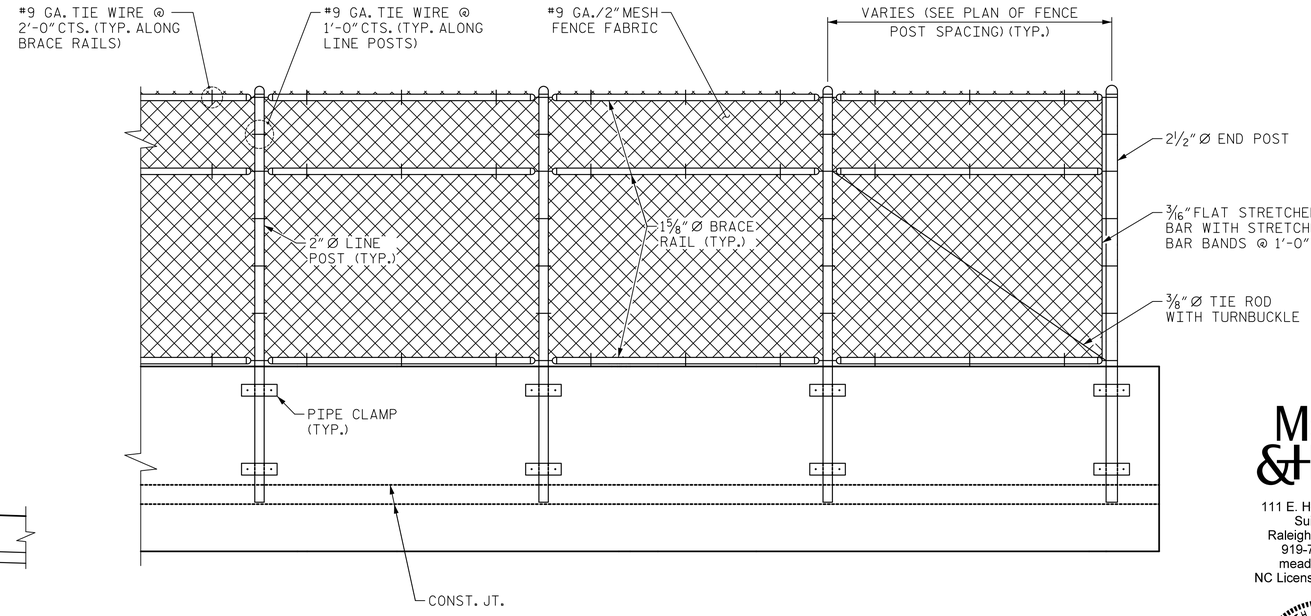
ELEVATION PLAN

PIPE CLAMP DETAILS



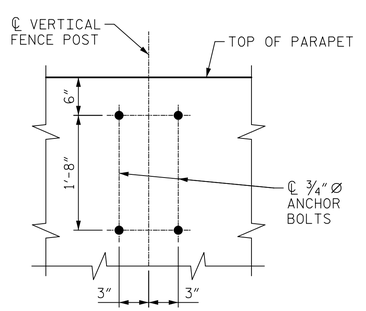
SECTION THROUGH FENCE

(LEFT SIDE WITH SIDEWALK SHOWN, RIGHT SIDE SIMILAR)



PARTIAL ELEVATION

(LEFT SIDE WITH SIDEWALK SHOWN, RIGHT SIDE SIMILAR)



BOLT SETTING DETAIL

PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

Mead & Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC8B1D45F4D6...

10/5/2023

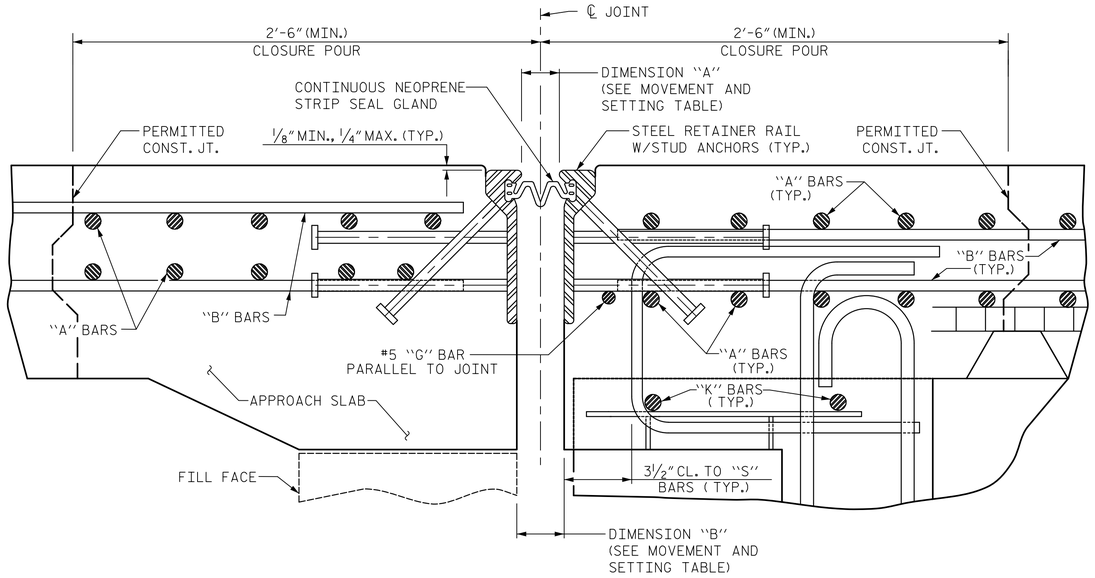
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

BRIDGE MOUNTED 72" CHAIN LINK FENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			56

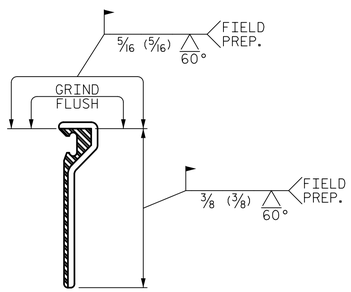
DRAWN BY : J.S. HOBSON DATE : 03/17/22
CHECKED BY : C.C. CAMPBELL DATE : 06/22/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23



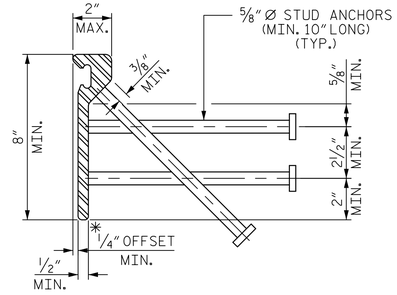
STRIP SEAL EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

MOVEMENT AND SETTING AT JOINT								
LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	DIMENSION ''A''			DIMENSION ''B''		
			PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
EB1	94°-30′-41″	3/4″	2 1/8″	2″	1 3/4″	2 5/8″	2 1/2″	2 1/4″
EB2	88°-12′-55″	3/4″	2 1/8″	2″	1 3/4″	2 5/8″	2 1/2″	2 1/4″

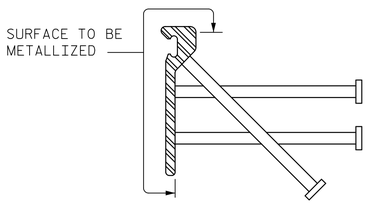


STEEL RETAINER RAIL (FIELD SPLICE DETAIL)



TYPICAL SECTION STEEL RETAINER RAIL

DIMENSION ''B'' BASED ON STEEL RETAINER RAIL TOP OFFSET TO FACE OF RAIL OF 1/4″ MINIMUM. IF ACTUAL OFFSET IS GREATER ADJUST DIMENSION ''B'' AS REQUIRED.



METALLIZING DETAIL

JOINT INSTALLATION PROCEDURE:

1. INSTALL THE STRIP SEAL EXPANSION JOINT AS RECOMMENDED BY THE MANUFACTURER.
2. A MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT DURING INSTALLATION OF THE JOINT.
3. PLACE STEEL RETAINER RAILS IN JOINT OPENING. PROPERLY ALIGN THE RAILS BOTH HORIZONTALLY AND VERTICALLY. DO NOT WELD SUPPORT SYSTEM TO THE METALLIZED SURFACES OF THE STEEL RETAINER RAILS.
4. CONFLICTING REINFORCING STEEL MAY BE SHIFTED SLIGHTLY WHEN NECESSARY.
5. DECK SLAB CONCRETE PLACEMENT OPERATIONS SHALL COMMENCE PER THE POURING SEQUENCE AFTER FINAL JOINT ALIGNMENT IS SET.
6. PROTECT THE STEEL RETAINER RAILS FROM BEING FOULED BY CONCRETE SPILLOVER DURING THE DECK POUR.
7. LOOSEN THE STEEL RETAINER RAIL SUPPORT SYSTEM TO ALLOW MOVEMENT WHILE CONCRETE CURES.
8. RE-LEVEL AND RE-ALIGN STEEL RETAINER RAIL AS REQUIRED ON OPPOSITE SIDE OF JOINT.
9. PLACE APPROACH SLAB CONCRETE.
10. ONCE THE CONCRETE HAS HARDENED SUFFICIENTLY ON BOTH SIDES OF JOINT, STEEL RETAINER RAILS SHALL BE CLEANED THOROUGHLY AND SEAL CHANNELS SHALL BE INSPECTED TO ASCERTAIN THE ABSENCE OF CONCRETE AND DEBRIS.
11. COAT THE STRIP SEAL LUGS WITH LUBRICANT-ADHESIVE AND INSTALL THE NEOPRENE STRIP SEAL GLAND AS RECOMMENDED BY THE STRIP SEAL EXPANSION JOINT MANUFACTURER.

GENERAL NOTES

FOR STRIP SEAL EXPANSION JOINTS, SEE SPECIAL PROVISIONS.

STEEL RETAINER RAILS AND COVER PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR GRADE 50 STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.

ONLY STEEL RETAINER RAILS OF ONE-PIECE CONSTRUCTION ARE PERMITTED. STEEL RETAINER RAILS CONSISTING OF TWO OR MORE COMPONENTS WELDED TOGETHER TO OBTAIN THEIR FINAL CROSS-SECTIONAL SHAPE ARE NOT PERMITTED.

STUD ANCHORS SHALL BE SHOP WELDED AND SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

SURFACES COMING IN CONTACT WITH STRIP SEAL GLAND SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.

UPON COMPLETION OF SHOP FABRICATION, THE STEEL RETAINER RAILS SHALL BE METALLIZED AS SHOWN IN THE ''METALLIZING DETAIL''. SEE SPECIAL PROVISIONS FOR THERMAL SPRAYED COATINGS (METALLIZATION).

INSTALLED STEEL RETAINER RAILS SHALL FOLLOW THE ROADWAY SLOPE.

FIELD SPLICES OF THE RETAINER RAILS SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. FINISHED WELDS SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

NEOPRENE STRIP SEAL GLAND SHALL BE CONTINUOUS THROUGHOUT THE JOINT AND SHALL BE COMPATIBLE WITH THE STEEL RETAINER RAILS. FIELD SPLICING THE GLAND IS NOT PERMITTED.

NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.

THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4″ Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

ASSEMBLED BY :	J.S. HOBSON	DATE : 06/10/23
CHECKED BY :	J.A. BOYER	DATE : 06/29/23
DESIGN E.O.R. :	J.S. HOBSON	DATE : 08/30/23
DRAWN BY :	MAA	6/20
CHECKED BY :	BNB	6/20

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NC License No. F-1235

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC8B1D45F4D6... 10/5/2023

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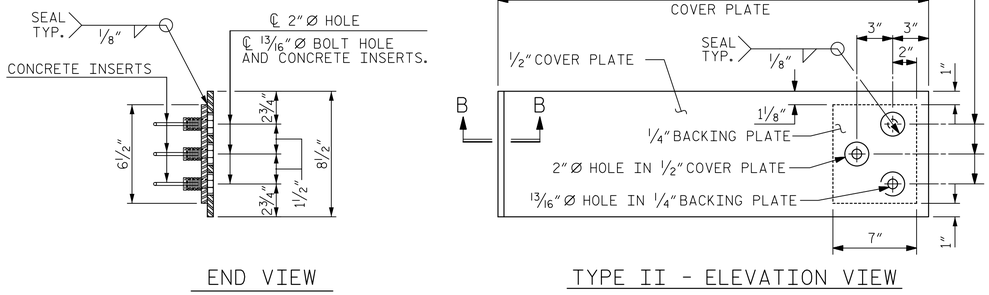
PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

SHEET 1 OF 4

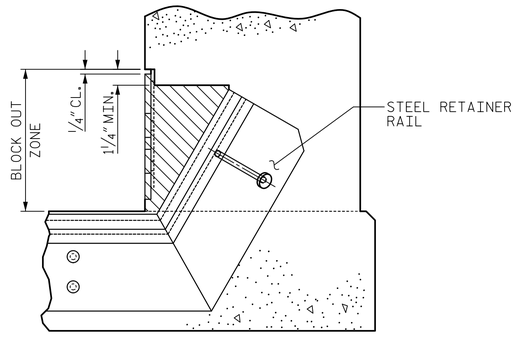
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
STRIP SEAL EXPANSION JOINT DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			56

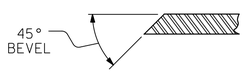
STD. NO. SSEJ1 (SHT 1)



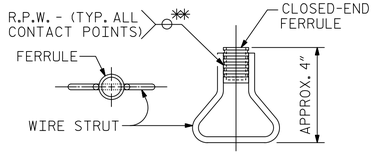
COVER PLATE DETAILS



BLOCK OUT DETAIL

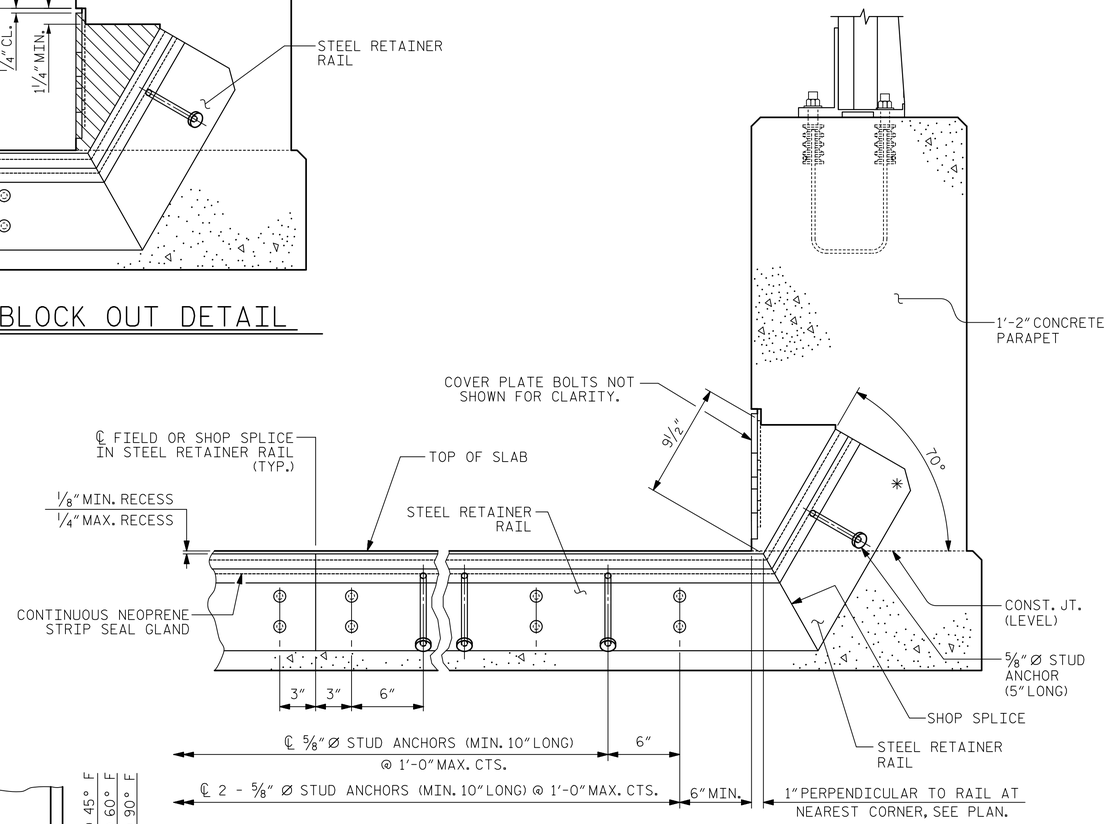


SECTION B - B



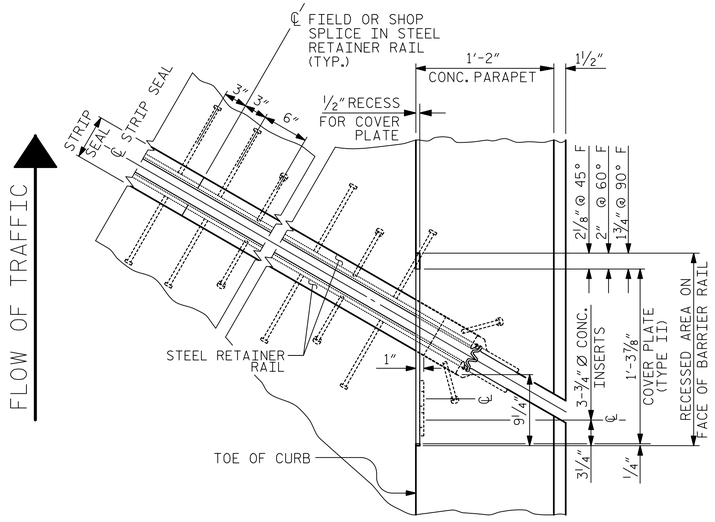
CONCRETE INSERT

** EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

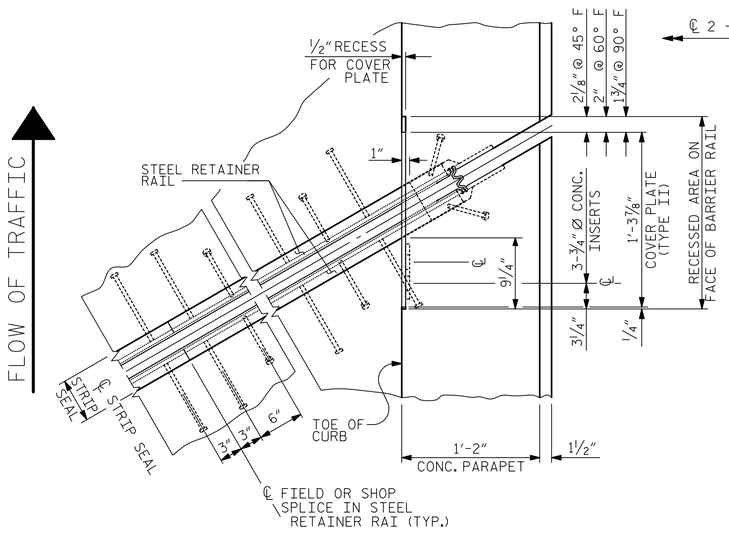


SECTION THRU RAIL NORMAL TO JOINT

* FOR STEEL RETAINER PLATE A TOP END FACING RAIL SHALL BE CLIPPED TO AVOID POSSIBLE INTERFERENCE WITH THE RAIL.



RIGHT SIDE - END BENT #1



RIGHT SIDE - END BENT #2

PLAN OF STRIP SEAL EXPANSION JOINT

ASSEMBLED BY :	J.S. HOBSON	DATE : 06/05/23
CHECKED BY :	J.A. BOYER	DATE : 06/29/23
DESIGN E.O.R. :	J.S. HOBSON	DATE : 08/30/23
DRAWN BY : MAA 6/20		
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PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

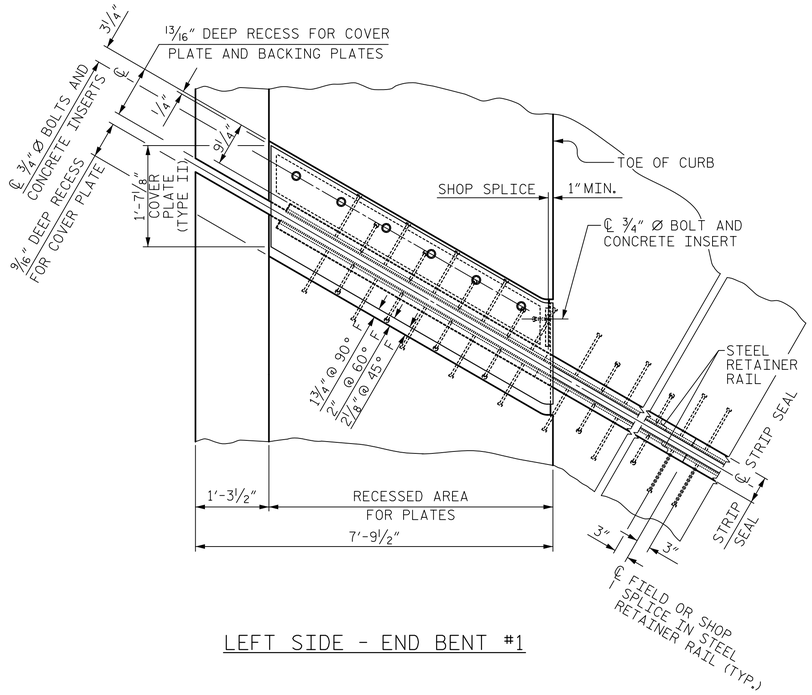
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

STRIP SEAL EXPANSION JOINT DETAILS FOR CONCRETE PARAPET

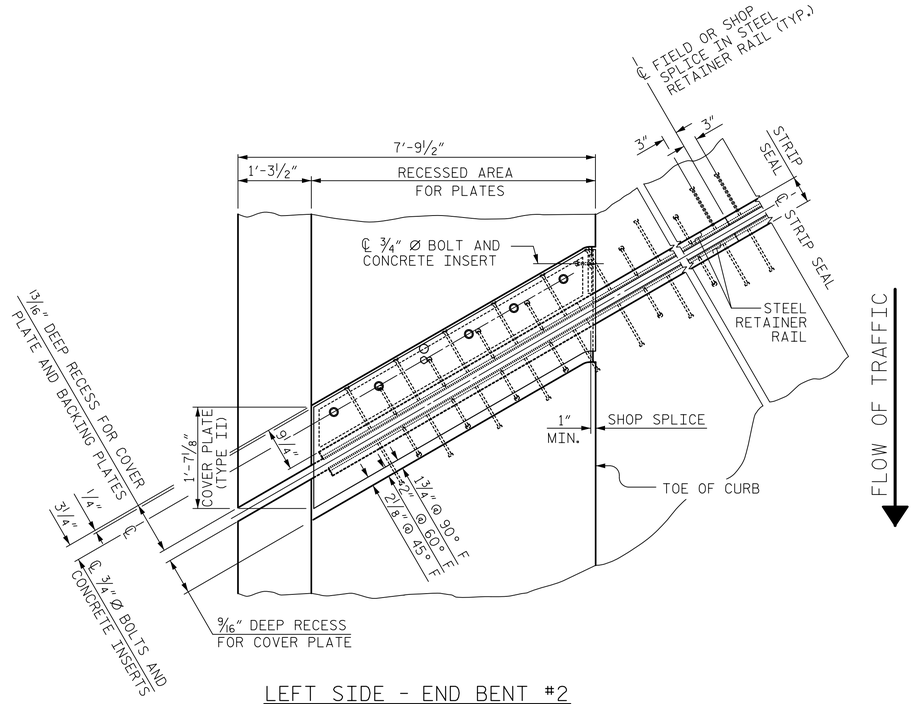
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			56

STD. NO. SSEJ2 SHT 2b



LEFT SIDE - END BENT #1

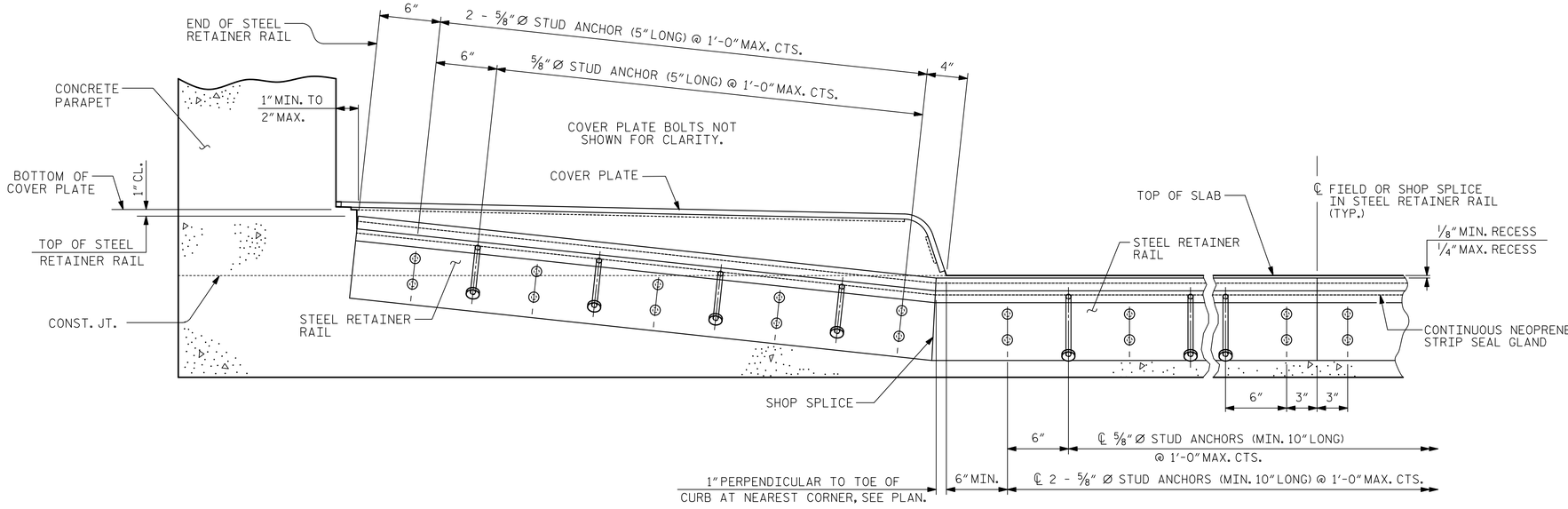
FLOW OF TRAFFIC



LEFT SIDE - END BENT #2

FLOW OF TRAFFIC

PLAN OF STRIP SEAL EXPANSION JOINT



SECTION THRU SIDEWALK NORMAL TO JOINT

ASSEMBLED BY :	J.S. HOBSON	DATE :	06/05/23
CHECKED BY :	J.A. BOYER	DATE :	06/29/23
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PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

SHEET 3 of 4

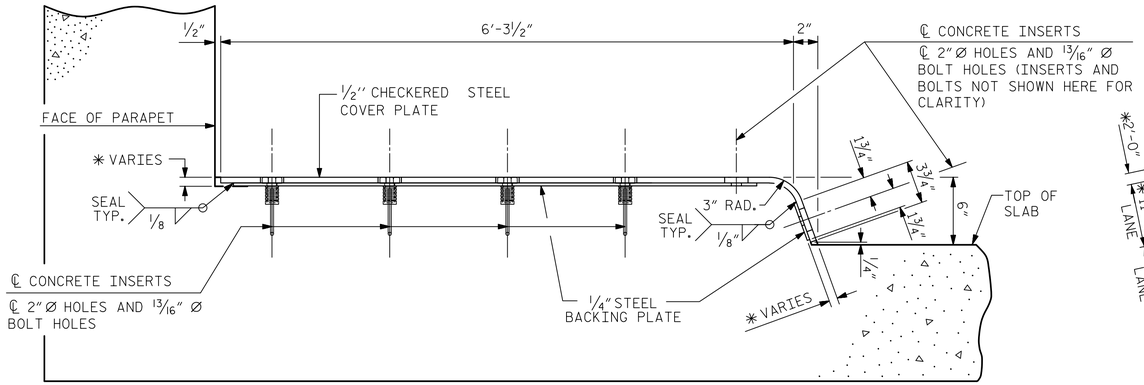
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

STRIP SEAL EXPANSION JOINT DETAILS FOR SIDEWALK

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			56

STD. NO. SSEJ3 SHT 2a

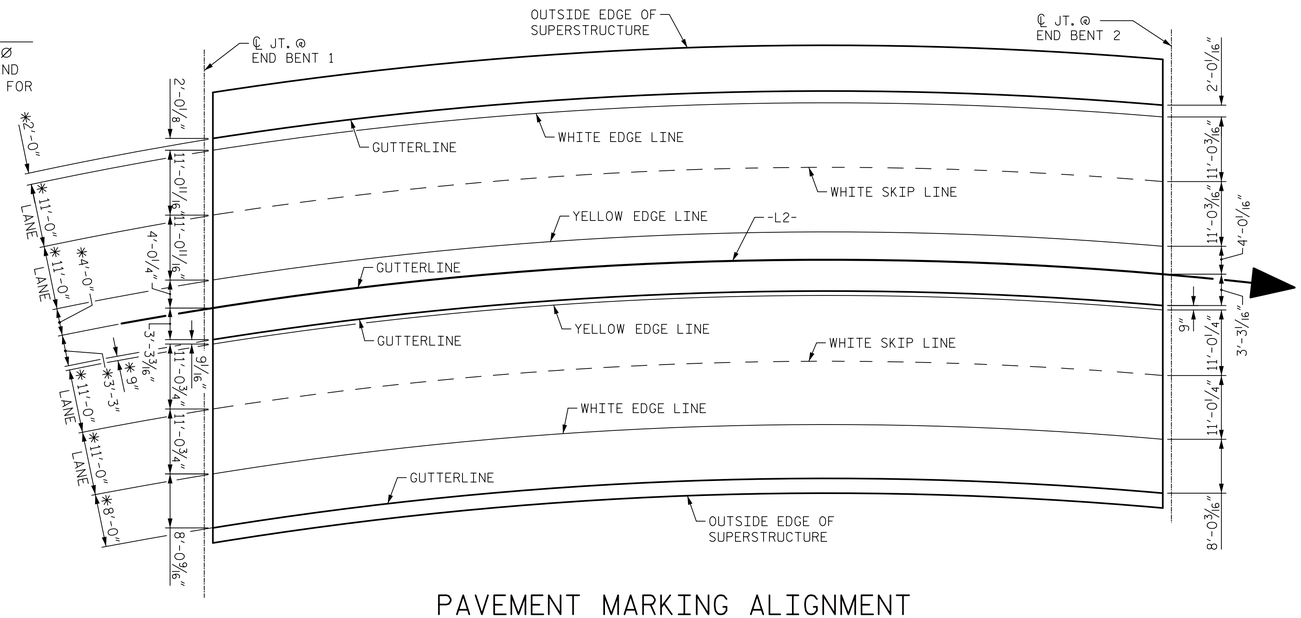


END VIEW
(NORMAL TO SIDEWALK)

* CONCRETE RECESS DIMENSIONS:

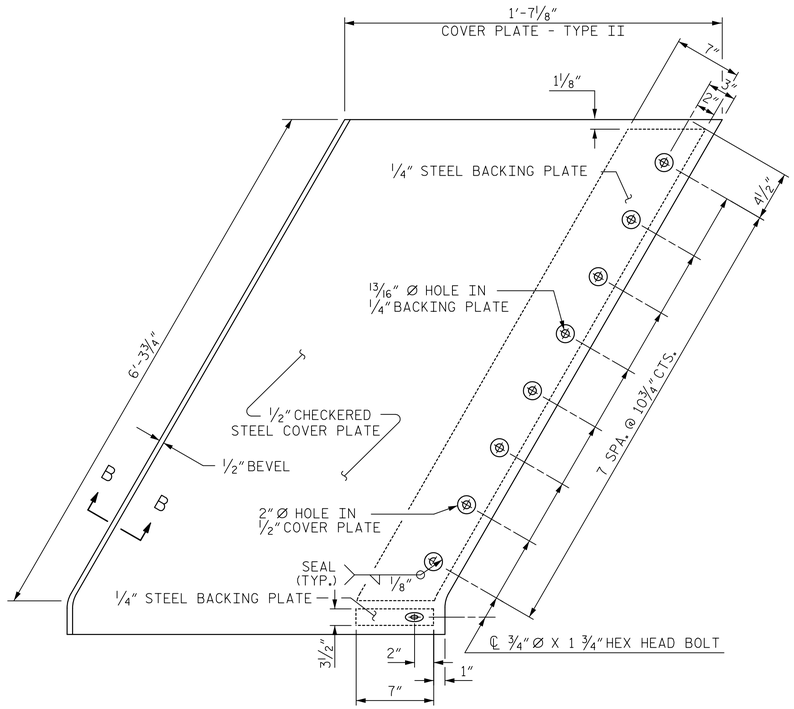
13/16" FOR THE SIDE OF THE JOINT HAVING THE 1/2" COVER PLATE WITH A 1/4" BACKING PLATE.

9/16" FOR THE SIDE OF THE JOINT HAVING ONLY THE 1/2" COVER PLATE.

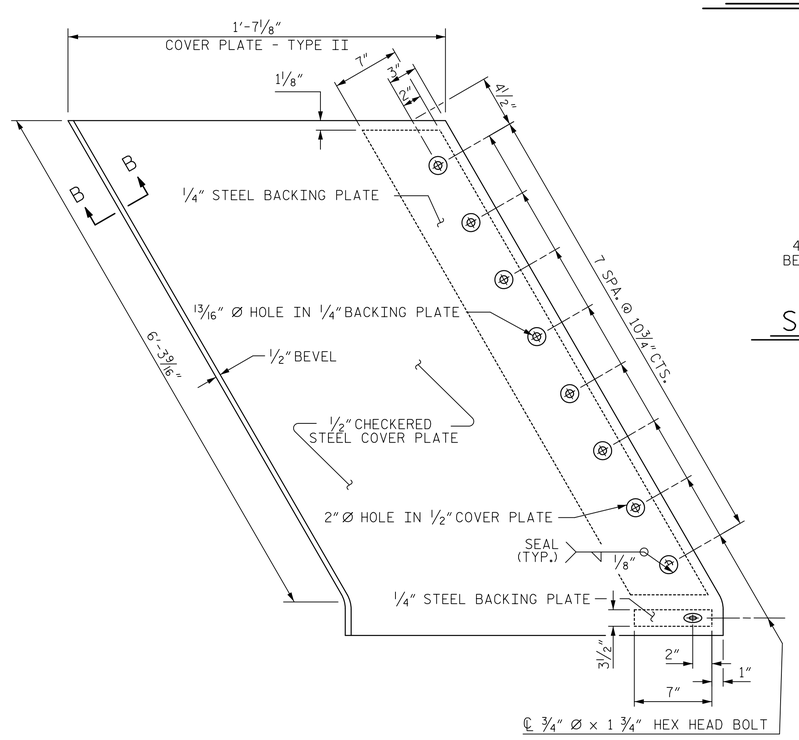


PAVEMENT MARKING ALIGNMENT

* RADIAL DIMENSION

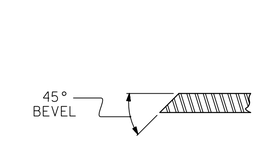


TYPE II - PLAN VIEW @ END BENT #1

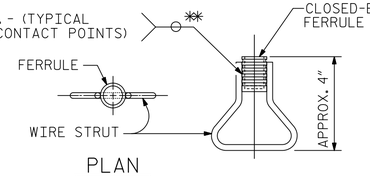


TYPE II - PLAN VIEW @ END BENT #2

COVER PLATE DETAILS



SECTION B - B



PLAN ELEVATION

CONCRETE INSERT

** EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

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10/5/2023

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PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

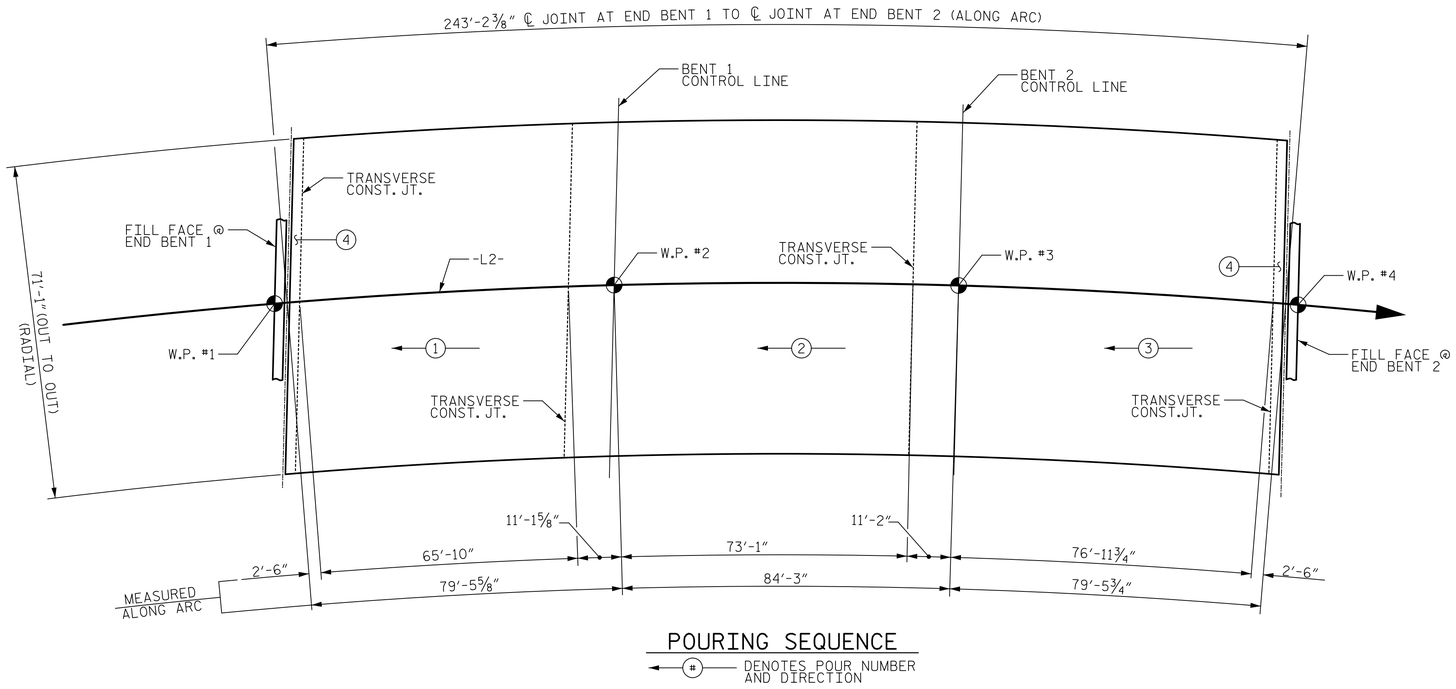
SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

STRIP SEAL EXPANSION JOINT DETAILS FOR SIDEWALK

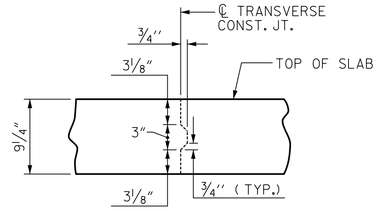
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			56

STD. NO. SSEJ4 SHT 2



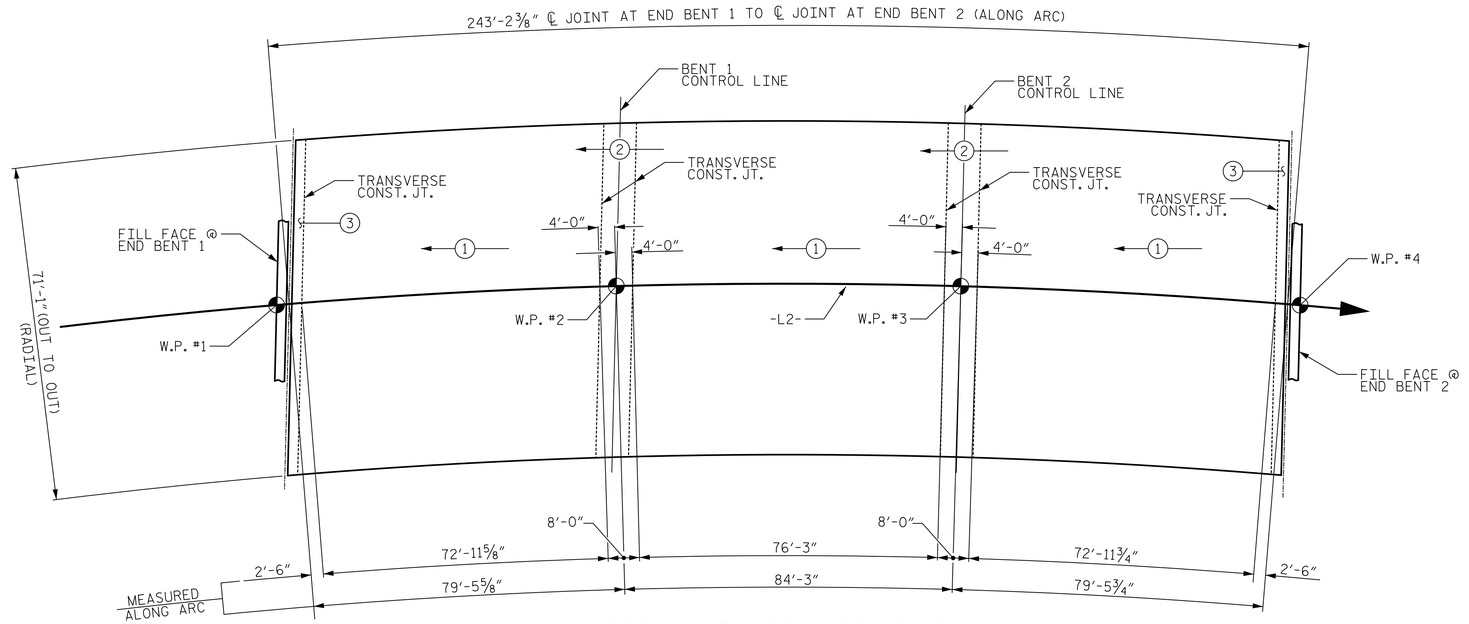
POURING SEQUENCE

(#) DENOTES POUR NUMBER AND DIRECTION



TRANSVERSE CONSTRUCTION JOINT DETAIL

NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT



OPTIONAL POURING SEQUENCE

(#) DENOTES POUR NUMBER AND DIRECTION

POUR (2) CAN NOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3000 PSI.

DRAWN BY : J.S. HOBSON DATE : 06/05/23
CHECKED BY : J.A. BOYER DATE : 06/29/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

POUR SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			56

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

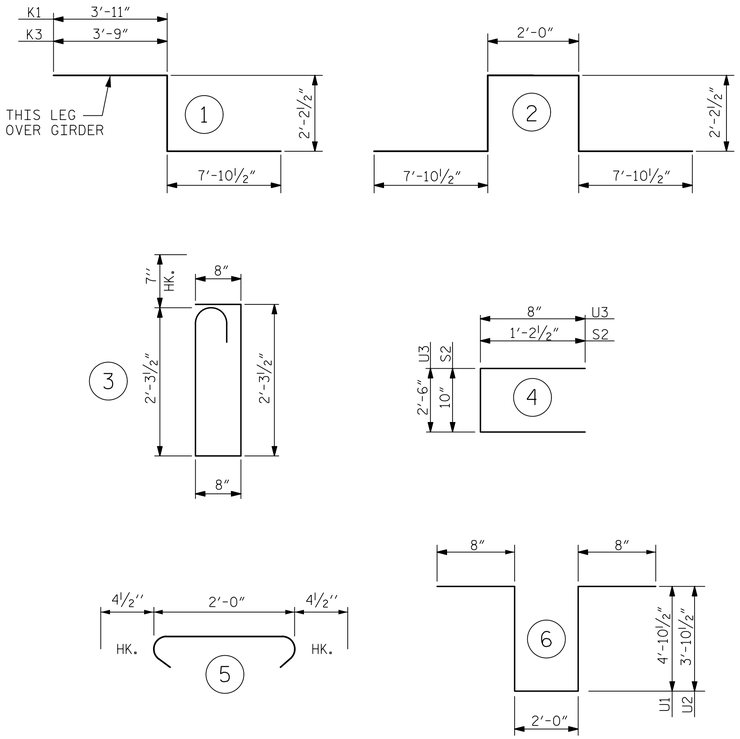
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPETS, AND BARRIER RAILS		APPROACH SLABS		PARAPETS AND BARRIER RAILS
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1′-11″	1′-7″	1′-11″	1′-7″	2′-6″
#5	2′-5″	2′-0″	2′-5″	2′-0″	3′-1″
#6	2′-10″	2′-5″	3′-7″	2′-5″	3′-8″
#7	4′-2″	2′-9″			
#8	4′-9″	3′-2″			

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
SPANS A-C		67,538	66,242
POUR 1	152.1		
POUR 2	218.0		
POUR 3	226.9		
POUR 4	20.3		
SIDEWALK	31.4		
TOTALS**	648.7	67,538	66,242

** QUANTITIES FOR BARRIER RAIL AND MONOLITHIC ISLAND ARE NOT INCLUDED.

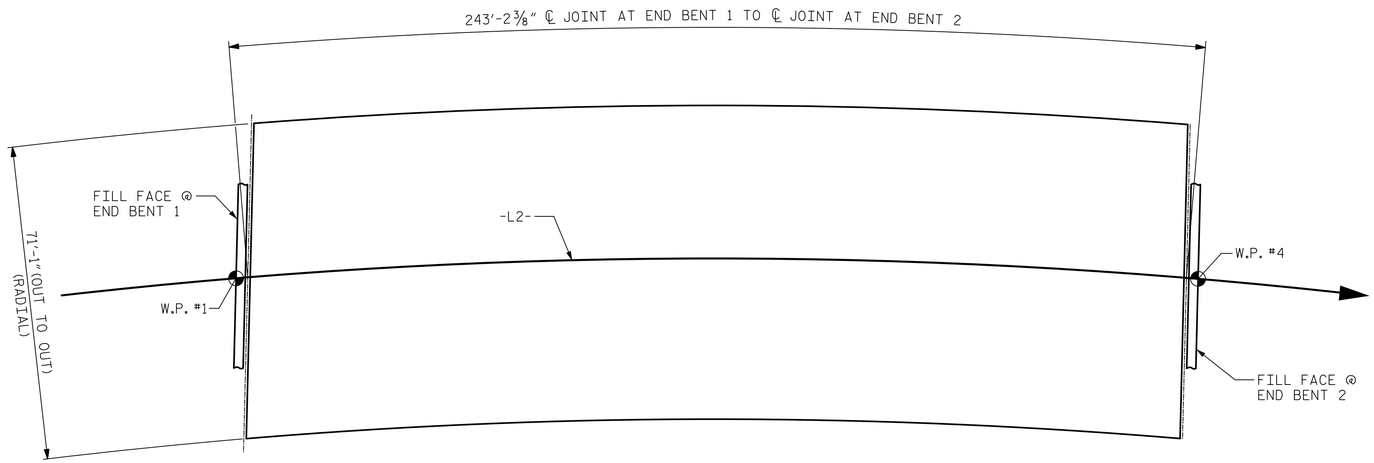
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	526	#5	STR	31′-2″	17,099
✳ A2	526	#5	STR	42′-4″	23,225
A3	1,052	#5	STR	36′-6″	40,049
✳ A101	1	#5	STR	52′-11″	55
✳ A102	1	#5	STR	33′-4″	35
✳ A103	1	#5	STR	13′-8″	14
✳ A104	1	#5	STR	54′-6″	57
✳ A105	1	#5	STR	34′-10″	36
✳ A106	1	#5	STR	15′-1″	16
A201	1	#5	STR	52′-11″	55
A202	1	#5	STR	33′-4″	35
A203	1	#5	STR	13′-8″	14
A204	1	#5	STR	54′-6″	57
A205	1	#5	STR	34′-10″	36
A206	1	#5	STR	15′-1″	16
✳ B1	192	#4	STR	27′-0″	3,463
✳ B2	48	#4	STR	28′-1″	900
B3	460	#5	STR	50′-3″	24,109
✳ B4	188	#6	STR	24′-10″	7,012
✳ B5	96	#6	STR	60′-0″	8,652
✳ B6	49	#4	STR	36′-4″	1,189
✳ G1	4	#5	STR	36′-10″	154
✳ G2	243	#4	STR	7′-3″	1,177
✳ K1	4	#8	1	14′-0″	150
✳ K2	20	#8	2	22′-2″	1,184
✳ K3	4	#8	1	13′-10″	148
✳ K4	24	#6	STR	8′-9″	315
K5	96	#4	STR	8′-9″	561
K6	24	#4	STR	7′-1″	114
K7	20	#4	STR	33′-3″	444
✳ S1	132	#5	3	6′-6″	895
✳ S2	132	#4	4	3′-3″	287
S3	504	#4	5	2′-9″	926
U1	108	#4	6	13′-1″	944
U2	24	#4	6	11′-1″	178
✳ U3	70	#4	4	3′-10″	179
✳ EPOXY COATED REINF. STEEL (LBS.)					66,242
REINF. STEEL (LBS.)					67,538



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 17,273)

GROOVING BRIDGE FLOORS

APPROACH SLABS	2,549 SQ.FT.
BRIDGE DECK	12,793 SQ.FT.
TOTAL	15,342 SQ.FT.

ASSEMBLED BY :	J.S. HOBSON	DATE : 05/30/23
CHECKED BY :	J.A. BOYER	DATE : 06/29/23
DESIGN E.O.R. :	J.S. HOBSON	DATE : 08/30/23
DRAWN BY : JMB 5/87	REV. 10/1/11	MAA/GM
CHECKED BY : SJD 9/87	REV. 12/17	MAA/THC
	REV. 06/19	BNB/THC

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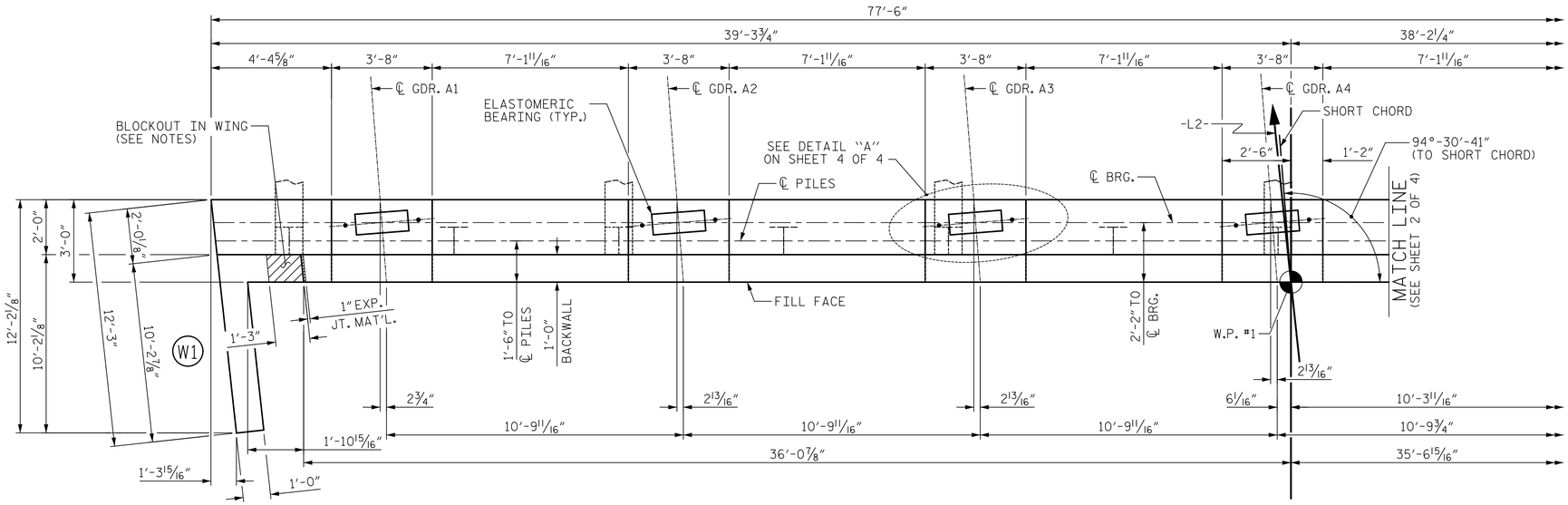
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

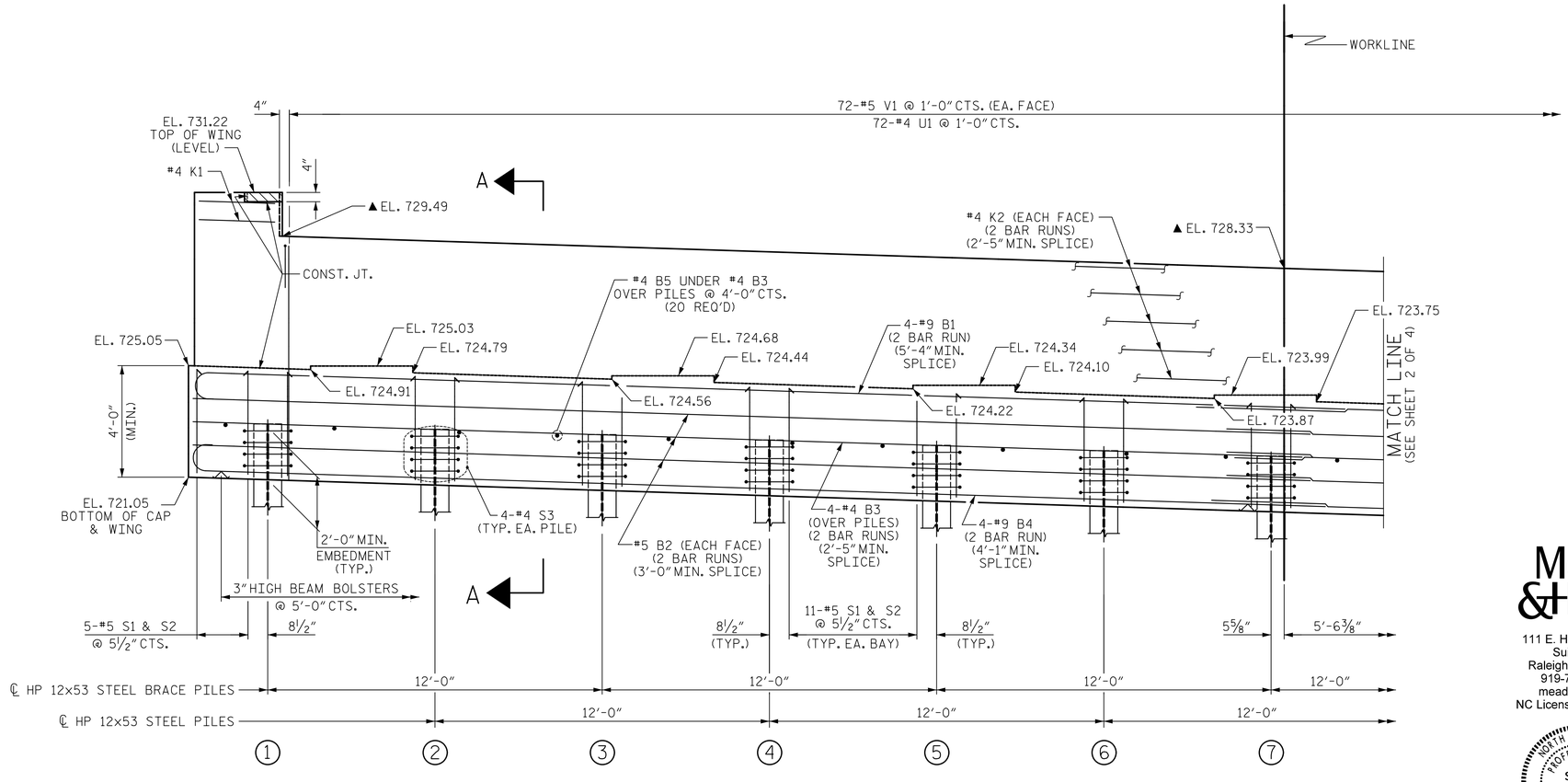
SUPERSTRUCTURE BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			56

STD. NO. BOM2



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

▲ ELEVATION TAKEN ALONG FILL FACE OF BACKWALL

THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

TOP OF PILE ELEVATIONS	
①	722.97
②	722.78
③	722.59
④	722.40
⑤	722.21
⑥	722.01
⑦	721.82

DRAWN BY : C.C. CAMPBELL DATE : 05/10/23
CHECKED BY : J.S. HOBSON DATE : 06/21/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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DDEFC8B1D45F4D6...

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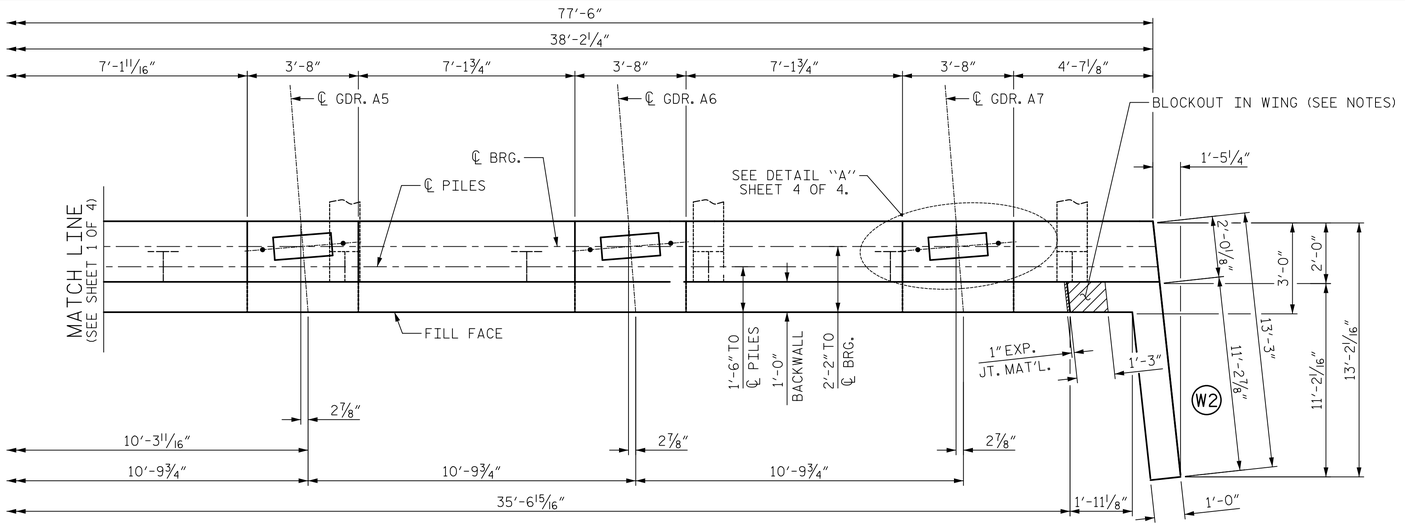
PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

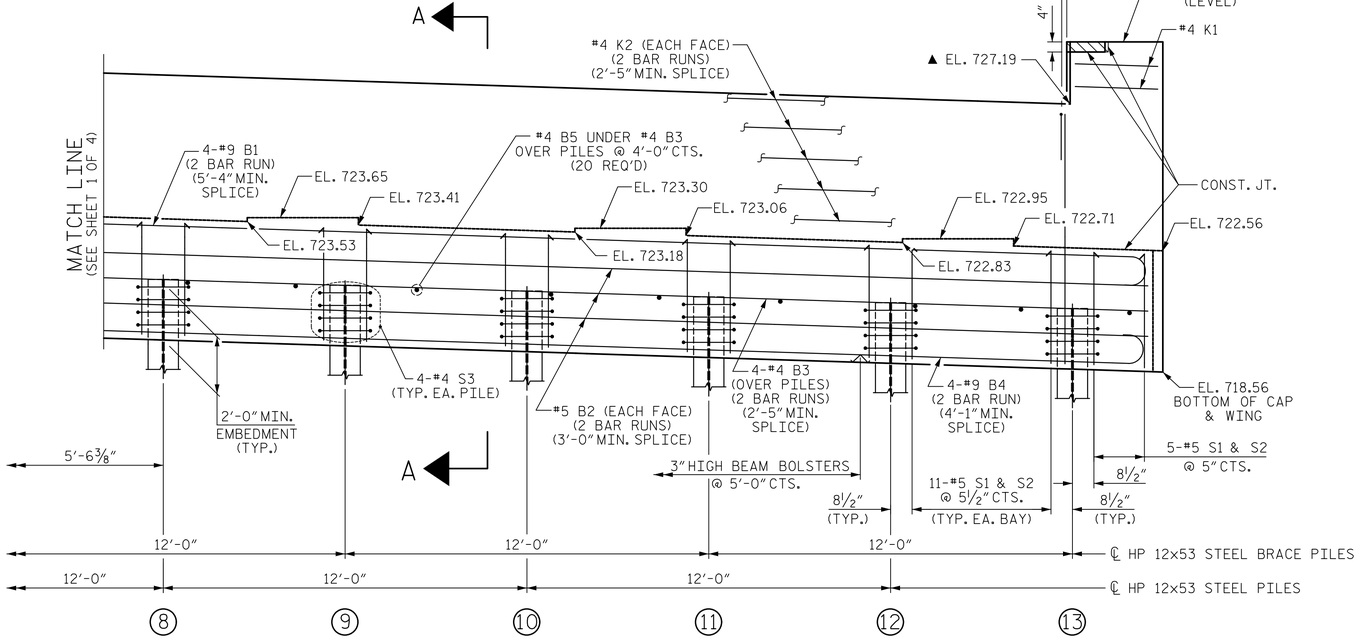
END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			56



PLAN

TOP OF PILE ELEVATIONS	
⑧	721.63
⑨	721.44
⑩	721.24
⑪	721.05
⑫	720.86
⑬	720.67



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

DRAWN BY : C.C. CAMPBELL DATE : 05/10/23
CHECKED BY : J.S. HOBSON DATE : 06/21/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON
DocuSigned by: Jack Hobson DDEFC8B1D45F4D6...
10/5/2023

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PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

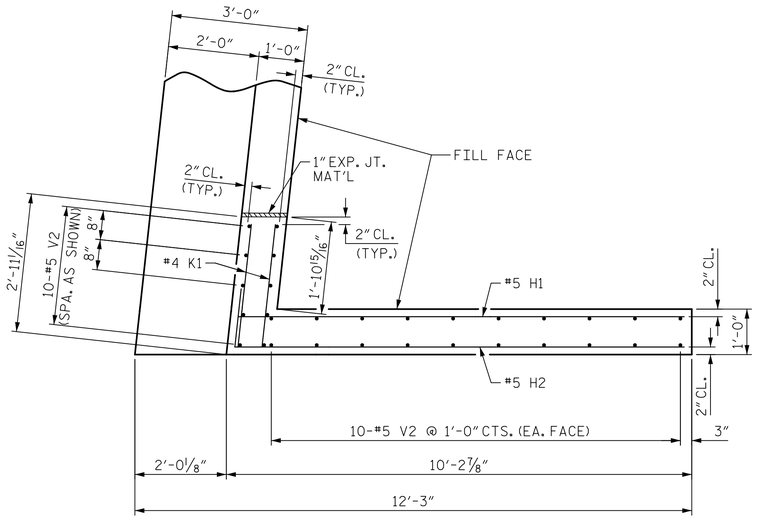
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

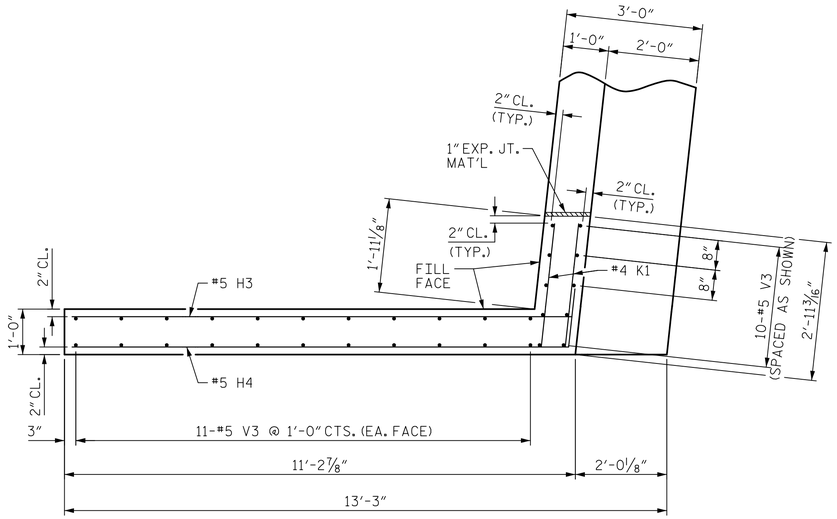
SUBSTRUCTURE

END BENT 1

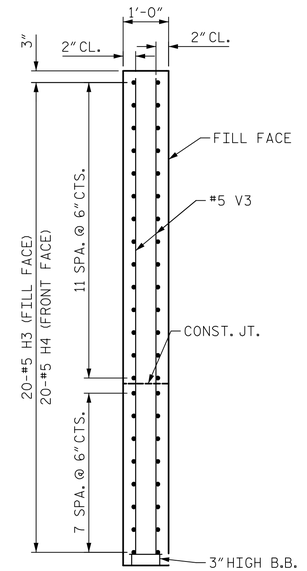
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			56



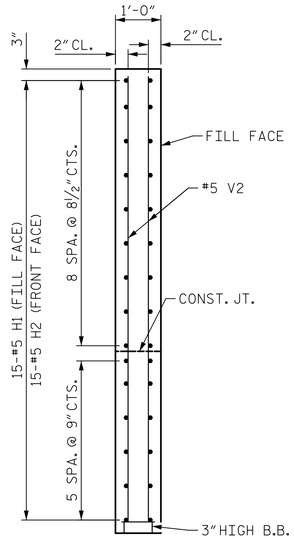
PLAN OF WING (W1)



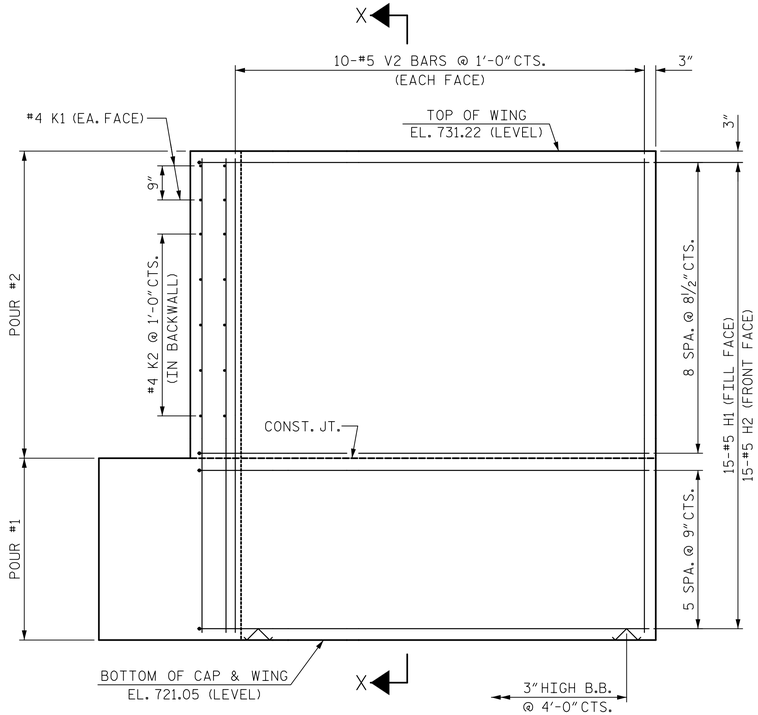
PLAN OF WING (W2)



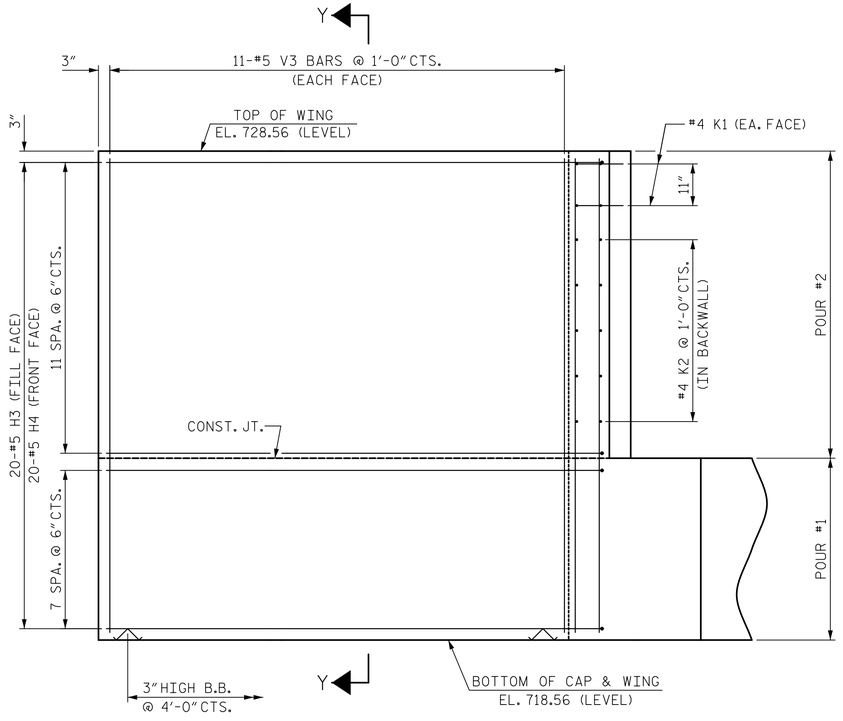
SECTION Y-Y



SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

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SHEET 3 OF 4

STATE OF NORTH CAROLINA
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RALEIGH
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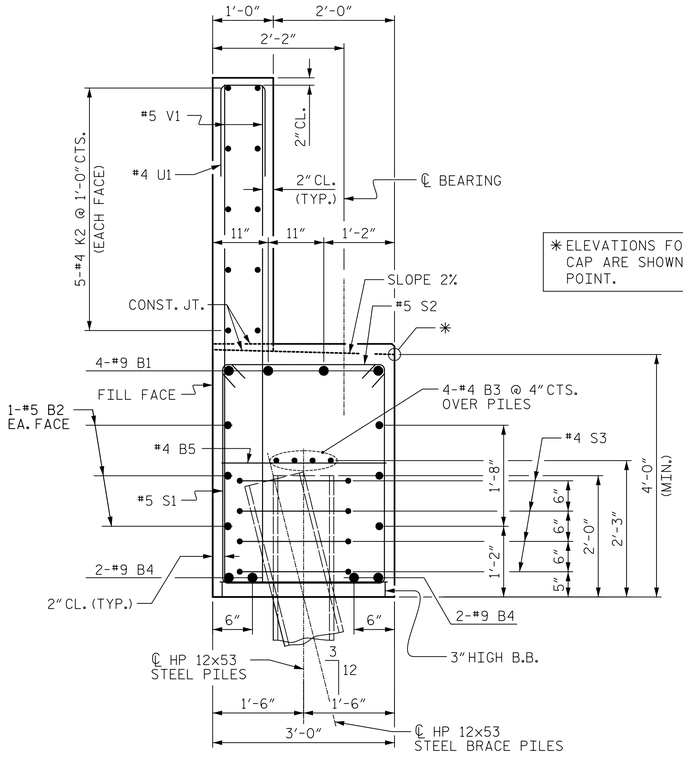
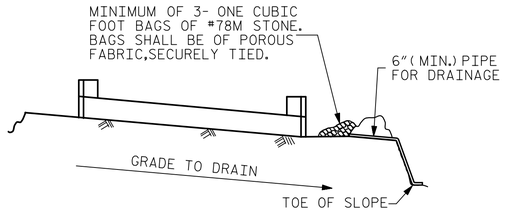
END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			56



SECTION ''A-A''

✳ ELEVATIONS FOR TOP OF CAP ARE SHOWN TO THIS POINT.

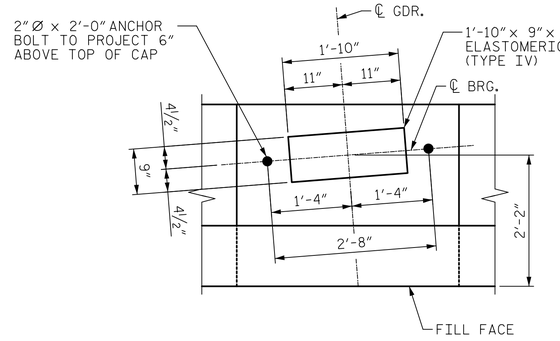


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

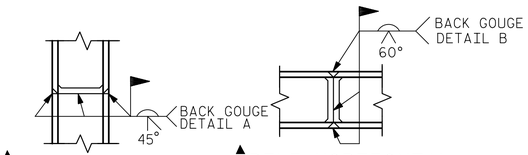
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

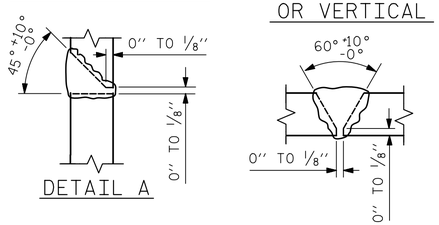


DETAIL ''A''
(TYPICAL AT EACH BEARING)



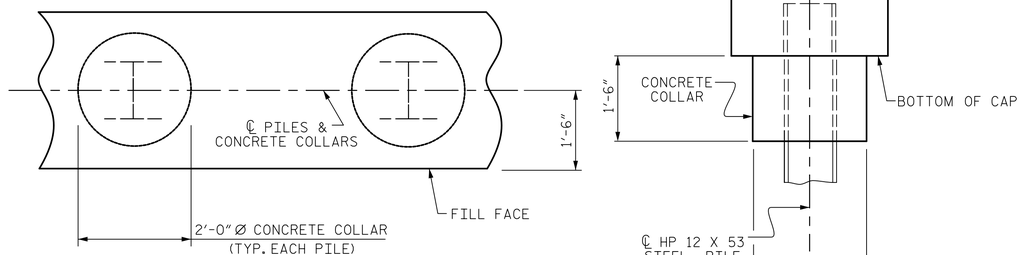
▲ PILE VERTICAL

▲ PILE HORIZONTAL OR VERTICAL



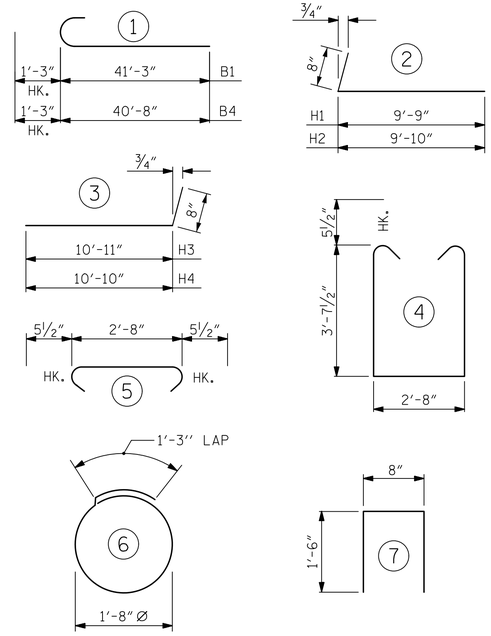
PILE SPLICE DETAILS

▲ POSITION OF PILE DURING WELDING.



CORROSION PROTECTION FOR STEEL PILES DETAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	42'-6''	1156
B2	12	#5	STR	40'-2''	503
B3	8	#4	STR	39'-10''	213
B4	8	#9	1	41'-11''	1140
B5	20	#4	STR	2'-8''	36
H1	15	#5	2	10'-5''	163
H2	15	#5	2	10'-6''	164
H3	20	#5	3	11'-7''	242
H4	20	#5	3	11'-6''	240
K1	8	#4	STR	2'-7''	14
K2	20	#4	STR	39'-11''	533
S1	142	#5	4	10'-10''	1604
S2	142	#5	5	3'-7''	531
S3	52	#4	6	6'-6''	226
U1	72	#4	7	3'-8''	176
V1	144	#5	STR	8'-3''	1239
V2	30	#5	STR	9'-9''	305
V3	32	#5	STR	9'-7''	320

REINFORCING STEEL 8805 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP & LOWER PART OF WINGS & COLLARS 40.5 C.Y.

POUR #2 BACKWALL & UPPER PART OF WINGS 17.6 C.Y.

TOTAL CLASS A CONCRETE 58.1 C.Y.

DRAWN BY : C.C. CAMPBELL DATE : 05/10/23
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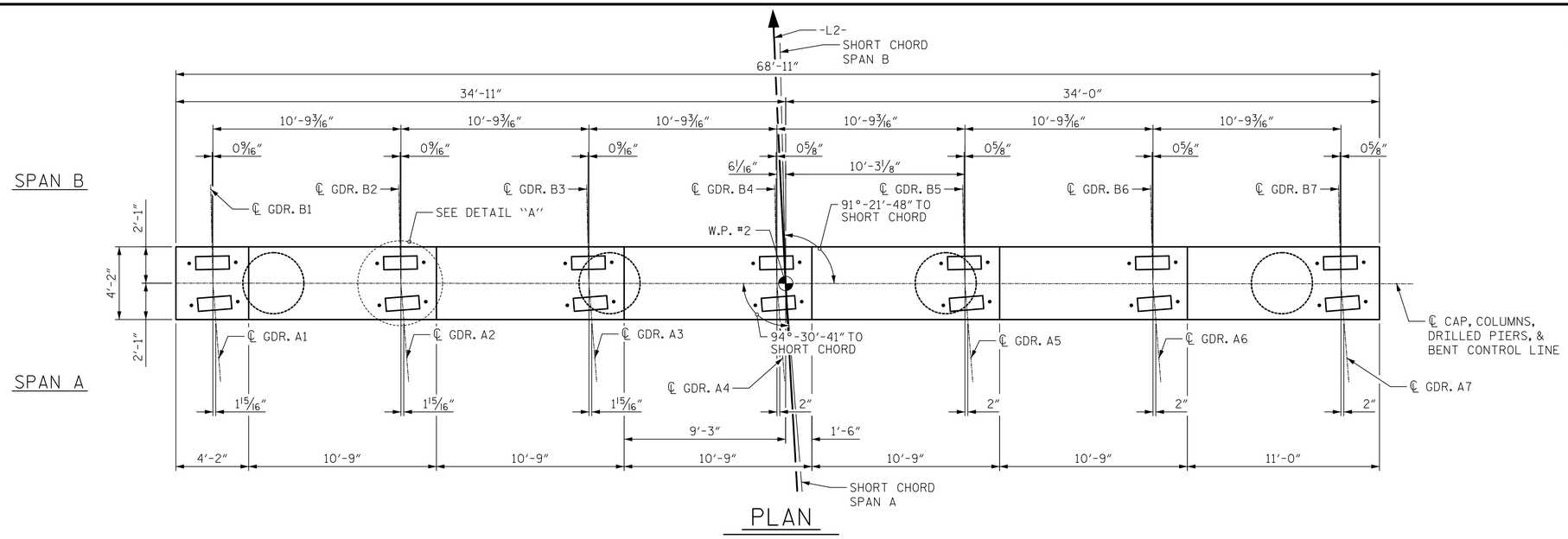
UNION COUNTY
STATION: 55+00.96 -L2-

SHEET 4 OF 4

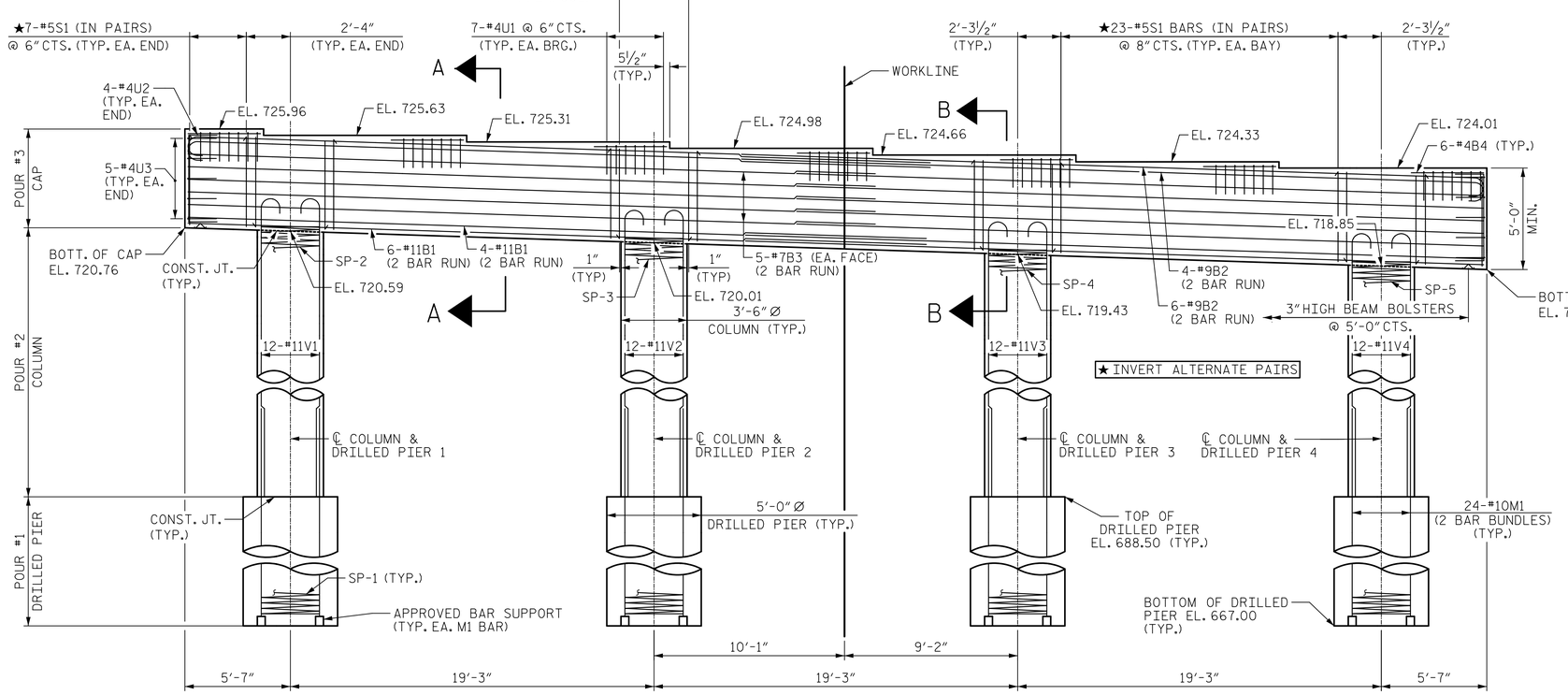
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			56



PLAN



ELEVATION

NOTES

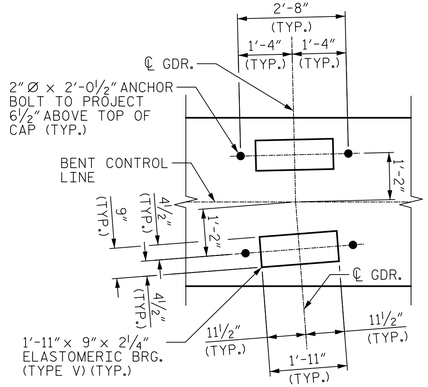
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



DETAIL "A"
(TYPICAL AT EACH BEARING)

MIN. SPLICE LENGTH	
#11B1	5'-1"
#9B2	5'-4"
#7B3	4'-2"

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SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			56

DRAWN BY : C.C. CAMPBELL DATE : 06/15/23
CHECKED BY : J.S. HOBSON DATE : 06/20/23
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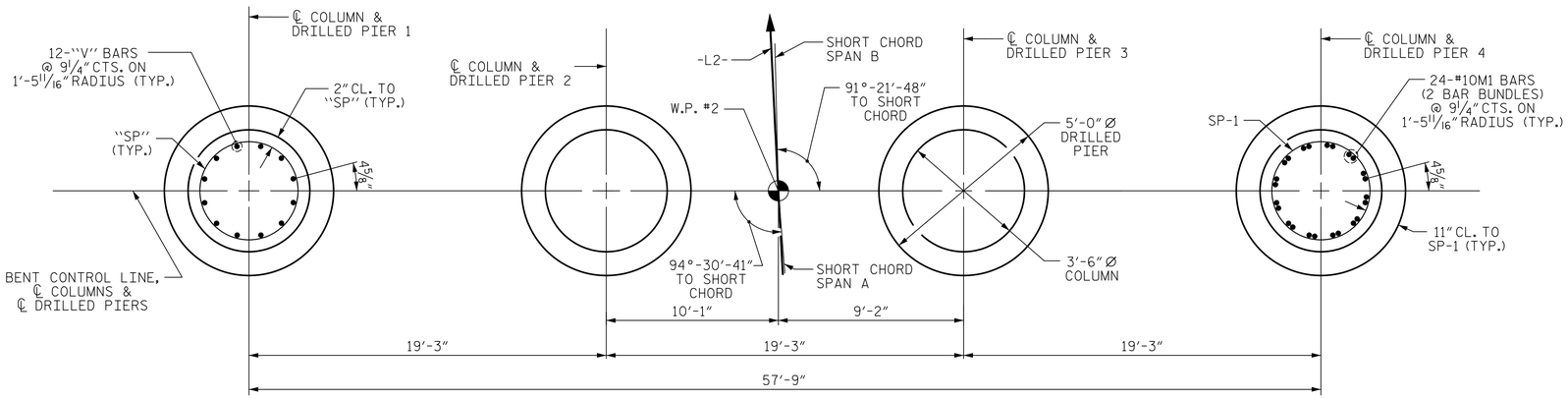
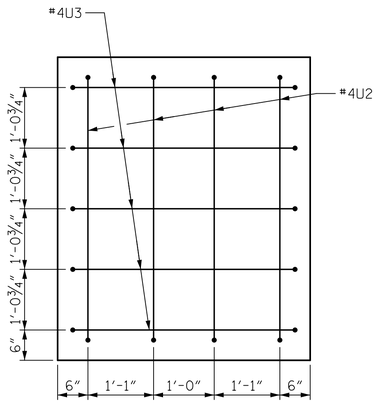


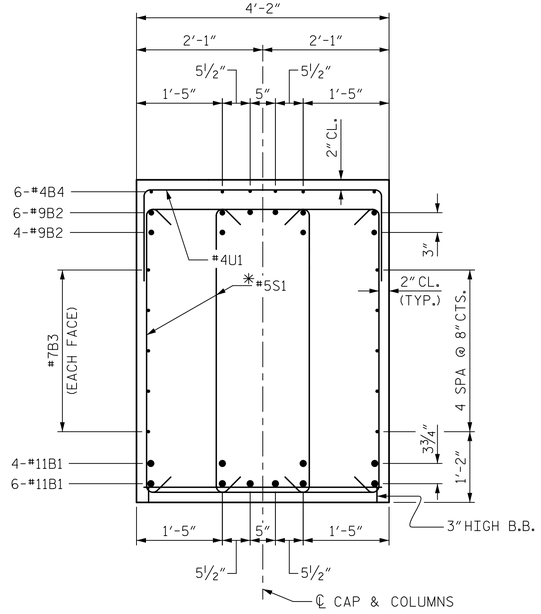
PLAN OF DRILLED PIERS & COLUMNS

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER)



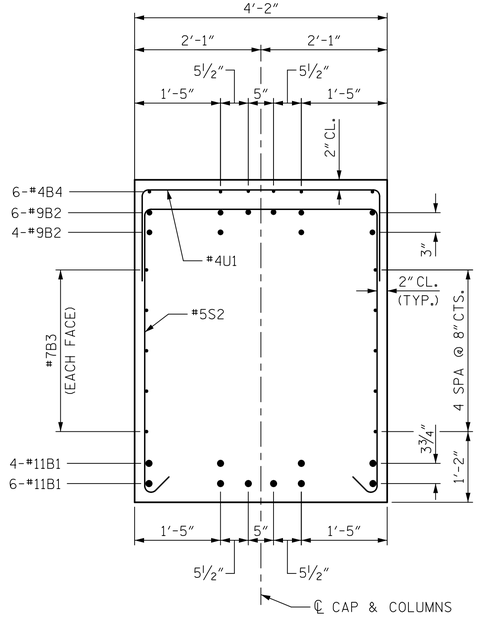
END VIEW

(TYPICAL BOTH ENDS)



SECTION A-A

✳INVERT ALTERNATIVE STIRRUPS



SECTION B-B

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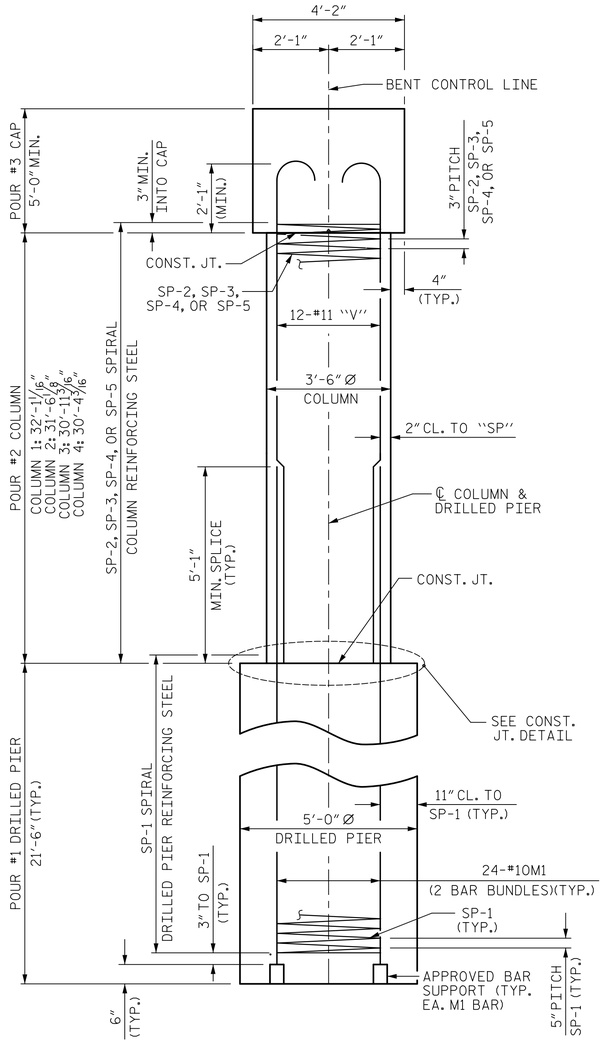
PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

SHEET 2 OF 3

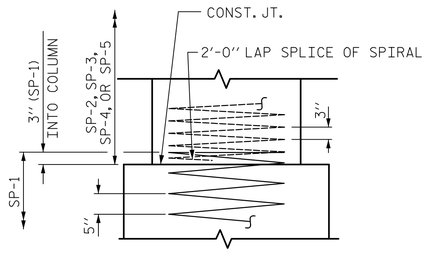
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			56

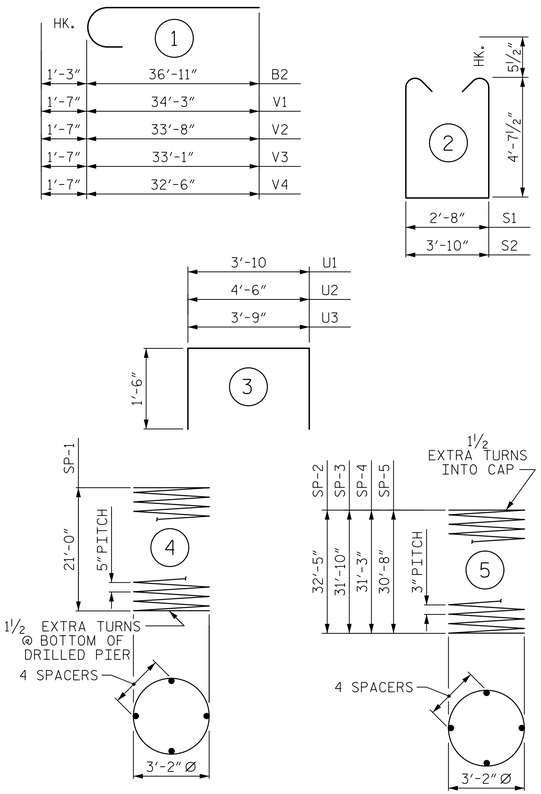


END ELEVATION



CONSTRUCTION JOINT DETAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	#11	STR	36′-9″	3905
B2	20	#9	1	38′-2″	2595
B3	20	#7	STR	36′-5″	1489
B4	42	#4	STR	3′-10″	108
M1	96	#10	STR	29′-1″	12014
S1	166	#5	2	12′-10″	2222
S2	48	#5	2	14′-0″	701
U1	49	#4	3	6′-10″	224
U2	8	#4	3	7′-6″	40
U3	10	#4	3	6′-9″	45
V1	12	#11	1	35′-10″	2285
V2	12	#11	1	35′-3″	2247
V3	12	#11	1	34′-8″	2210
V4	12	#11	1	34′-1″	2173

REINFORCING STEEL 32258 LBS.

SP-1	4	*	4	509′-4″	2125
SP-2	1	**	5	1291′-5″	863
SP-3	1	**	5	1266′-11″	846
SP-4	1	**	5	1242′-4″	830
SP-5	1	**	5	1222′-8″	817

SPIRAL COLUMN REINFORCING STEEL 5481 LBS.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

** THE SP-2, SP-3, SP-4, AND SP-5 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	44.5 C.Y.
POUR #3 (CAP)	54.9 C.Y.
TOTAL CLASS A CONCRETE	99.4 C.Y.

DRILLED PIERS:

DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	62.5 C.Y.

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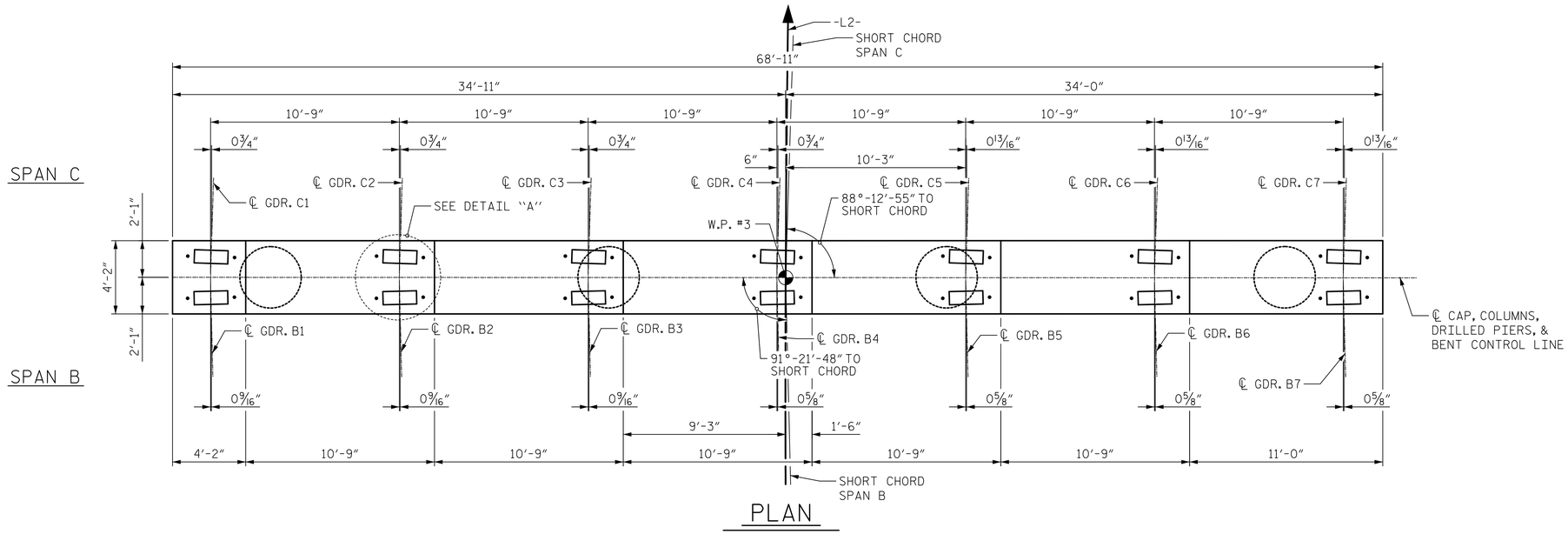
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			56



PLAN

NOTES

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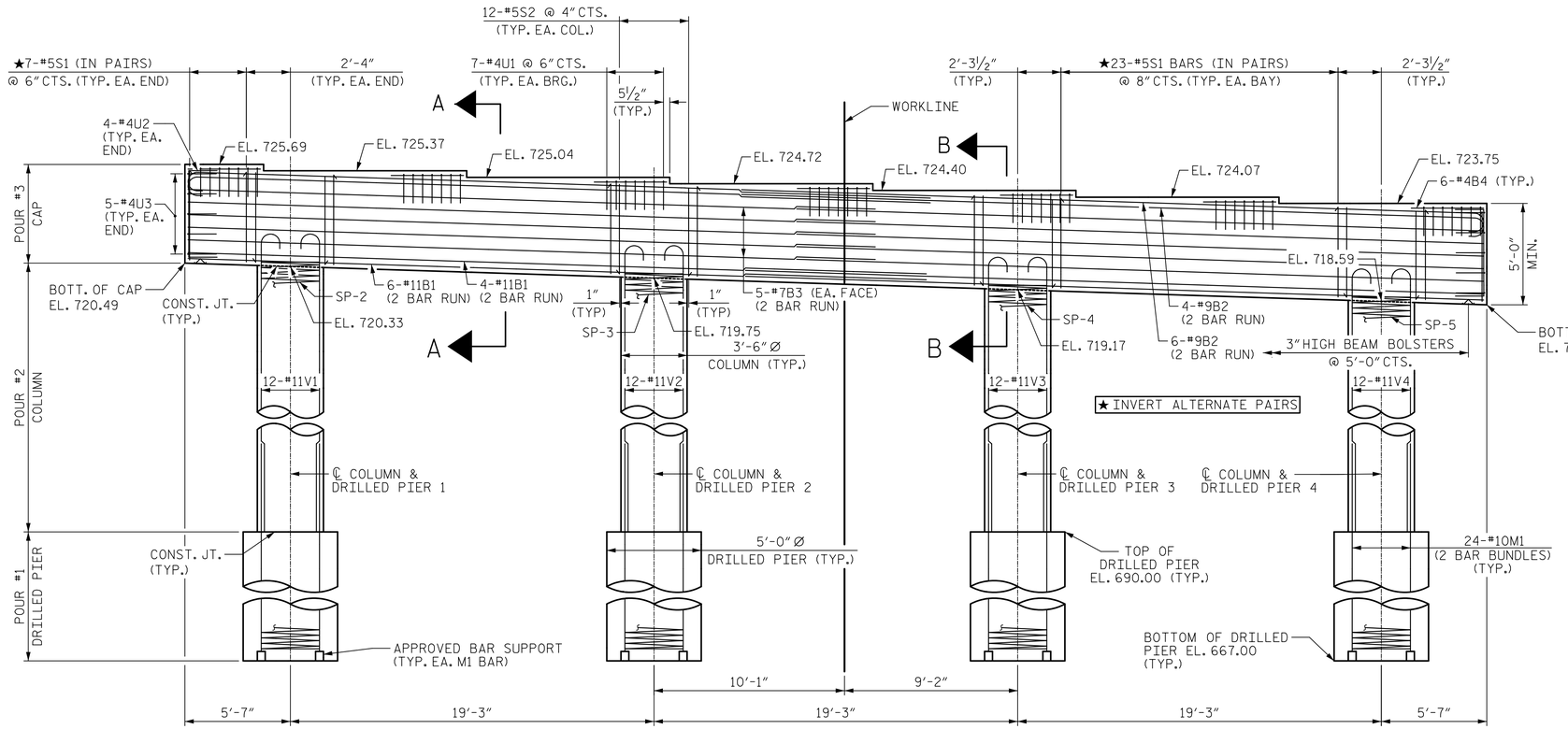
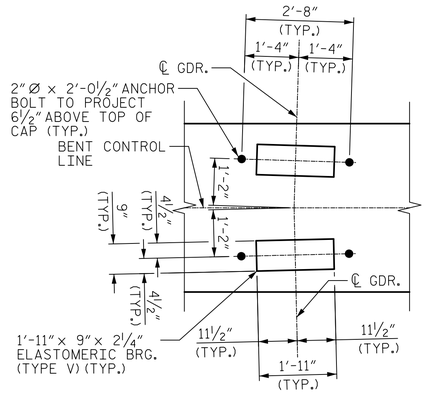


ELEVATION



DETAIL "A"
(TYPICAL AT EACH BEARING)

MIN. SPLICE LENGTH	
#11B1	5'-1"
#9B2	5'-4"
#7B3	4'-2"

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SHEET 1 OF 3

STATE OF NORTH CAROLINA
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RALEIGH
SUBSTRUCTURE

BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
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DRAWN BY : C.C. CAMPBELL DATE : 05/25/23
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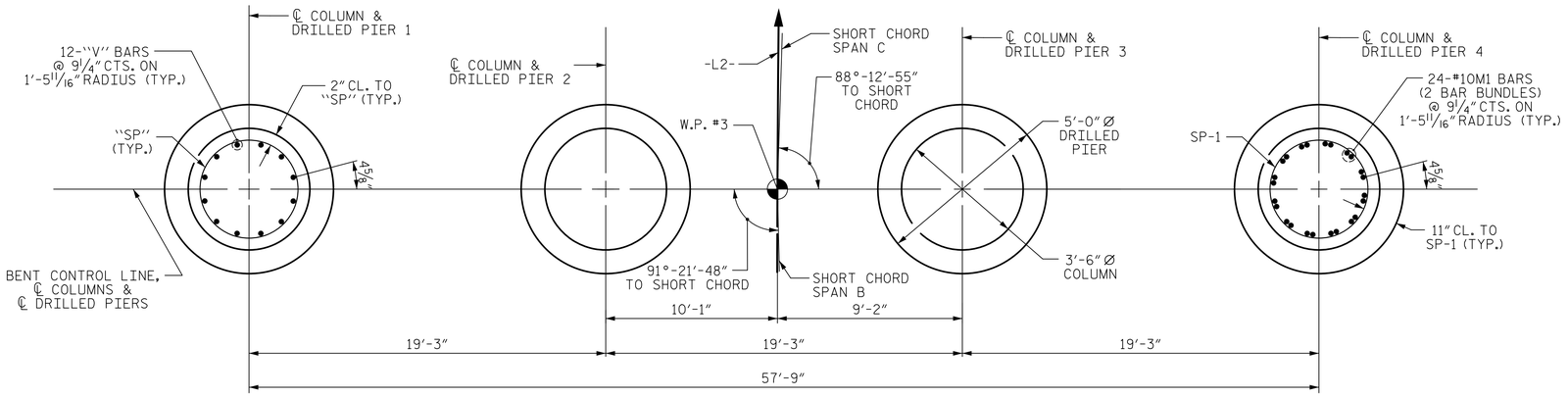
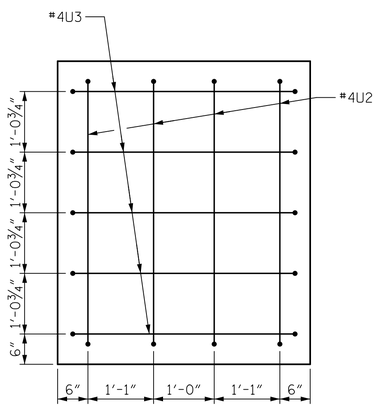


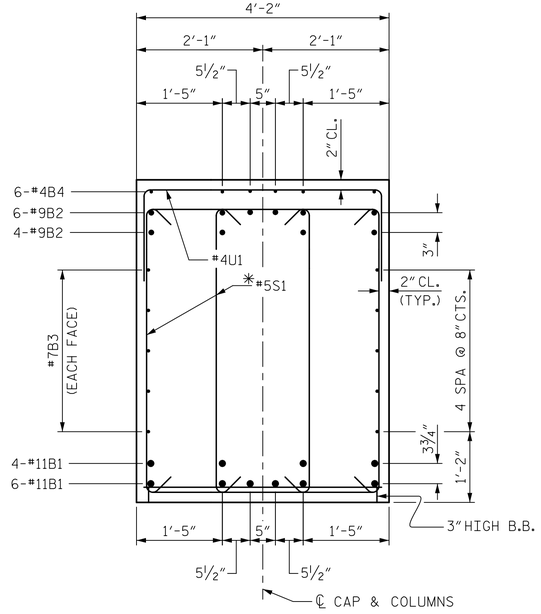
PLAN OF DRILLED PIERS & COLUMNS

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER)



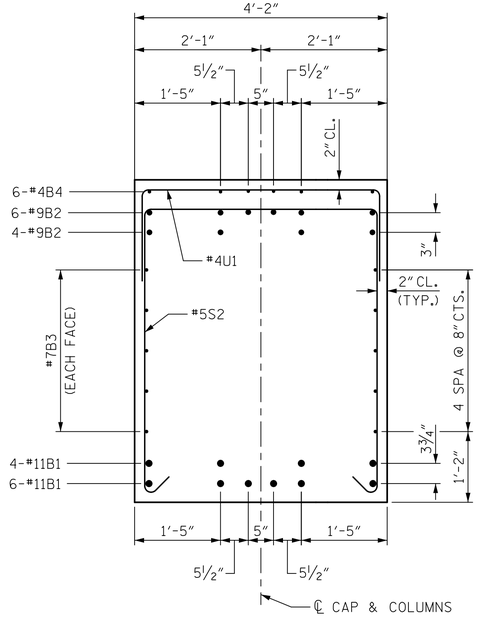
END VIEW

(TYPICAL BOTH ENDS)



SECTION A-A

✳INVERT ALTERNATIVE STIRRUPS



SECTION B-B

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC8B1D45F4D6...

10/5/2023

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PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

SHEET 2 OF 3

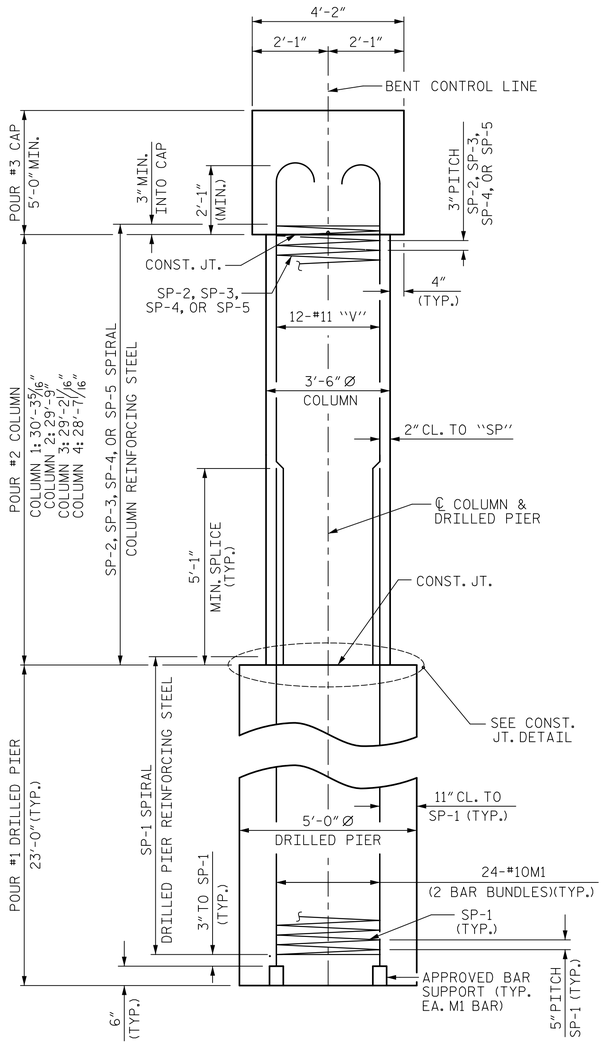
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

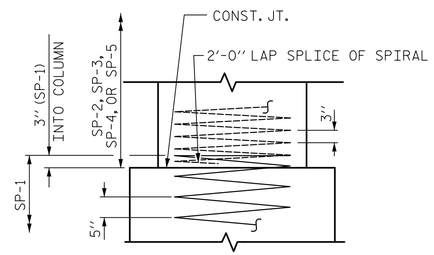
BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			56

DRAWN BY : C.C. CAMPBELL DATE : 06/15/23
CHECKED BY : J.S. HOBSON DATE : 06/20/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

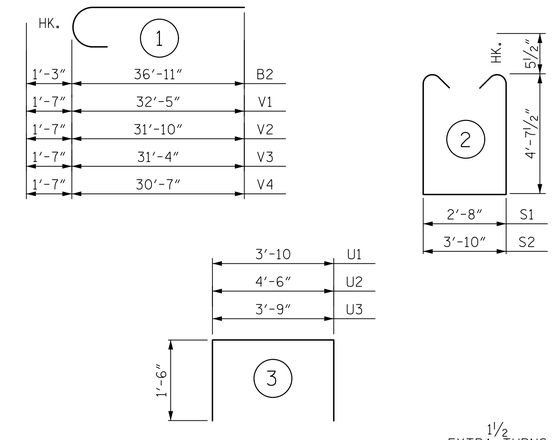


END ELEVATION



CONSTRUCTION JOINT DETAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	#11	STR	36'-9"	3905
B2	20	#9	1	38'-2"	2595
B3	20	#7	STR	36'-5"	1489
B4	42	#4	STR	3'-10"	108
M1	96	#10	STR	30'-7"	12634
S1	166	#5	2	12'-10"	2222
S2	48	#5	2	14'-0"	701
U1	49	#4	3	6'-10"	224
U2	8	#4	3	7'-6"	40
U3	10	#4	3	6'-9"	45
V1	12	#11	1	34'-0"	2168
V2	12	#11	1	33'-5"	2131
V3	12	#11	1	32'-11"	2099
V4	12	#11	1	32'-2"	2051

REINFORCING STEEL 32412 LBS.

SP-1	4	*	4	543'-7"	2268
SP-2	1	**	5	1217'-9"	813
SP-3	1	**	5	1193'-3"	797
SP-4	1	**	5	1173'-7"	784
SP-5	1	**	5	1153'-11"	771

SPIRAL COLUMN REINFORCING STEEL 5433 LBS.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

** THE SP-2, SP-3, SP-4, AND SP-5 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	42.0 C.Y.
POUR #3 (CAP)	55.0 C.Y.
TOTAL CLASS A CONCRETE	97.0 C.Y.

DRILLED PIERS:

DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	66.9 C.Y.

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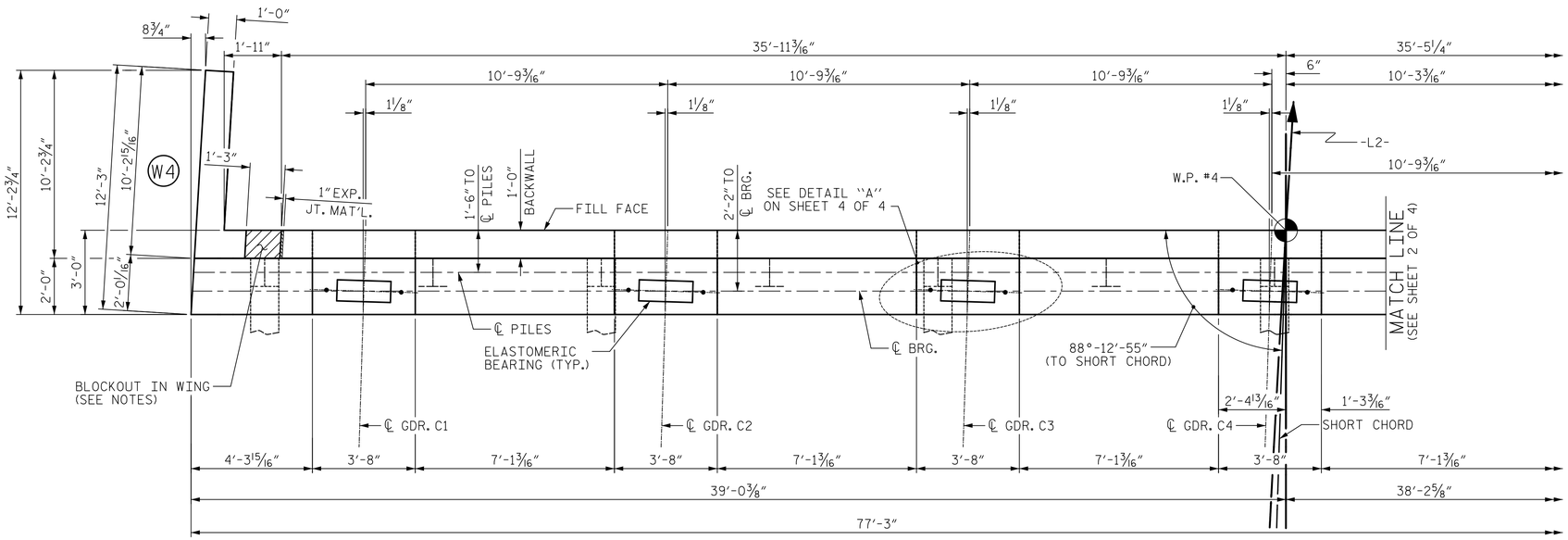
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

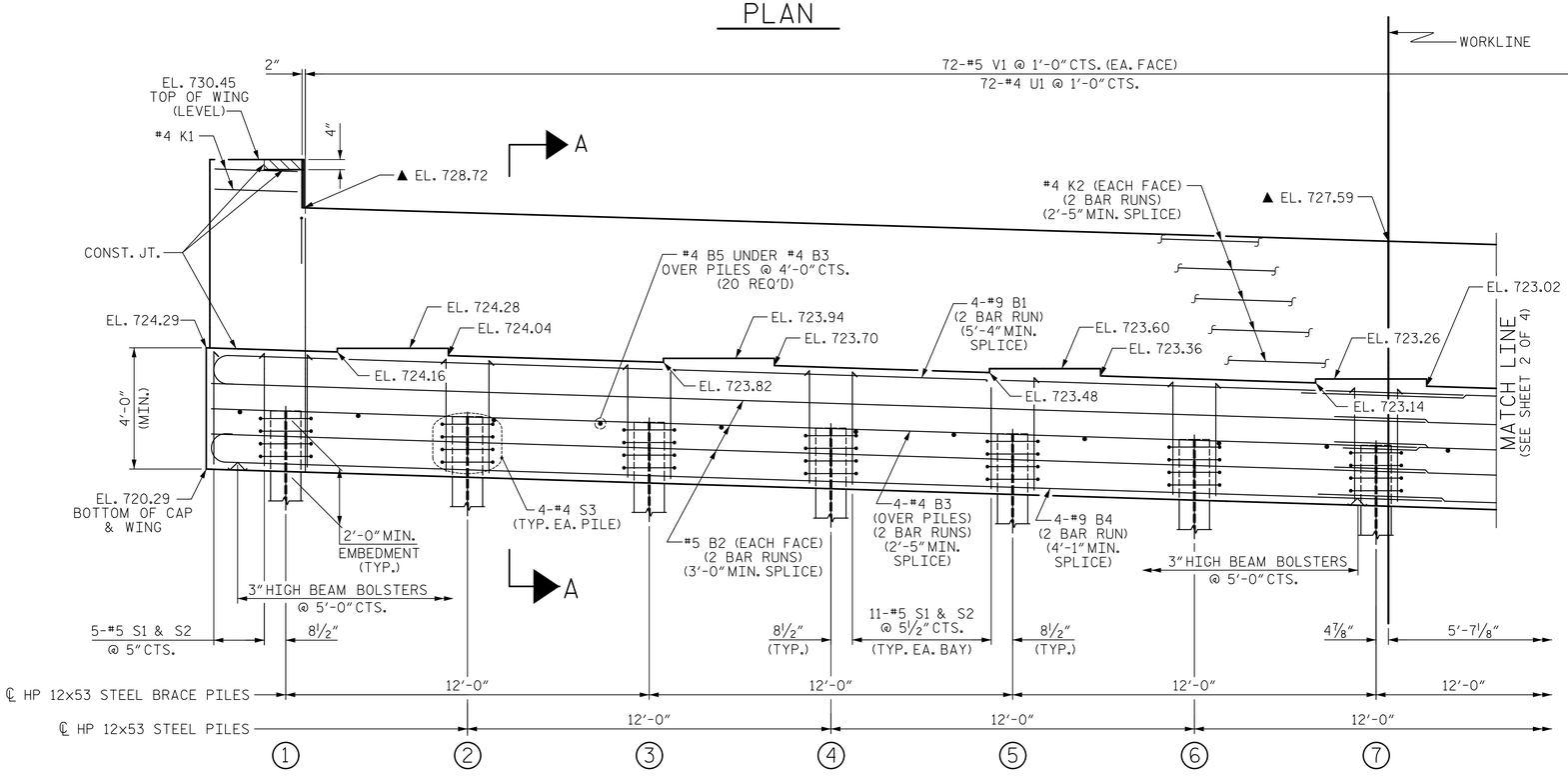
SUBSTRUCTURE

BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			56



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

▲ ELEVATION TAKEN ALONG FILL FACE OF BACKWALL

THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

TOP OF PILE ELEVATIONS

①	722.22
②	722.03
③	721.84
④	721.65
⑤	721.46
⑥	721.28
⑦	721.09

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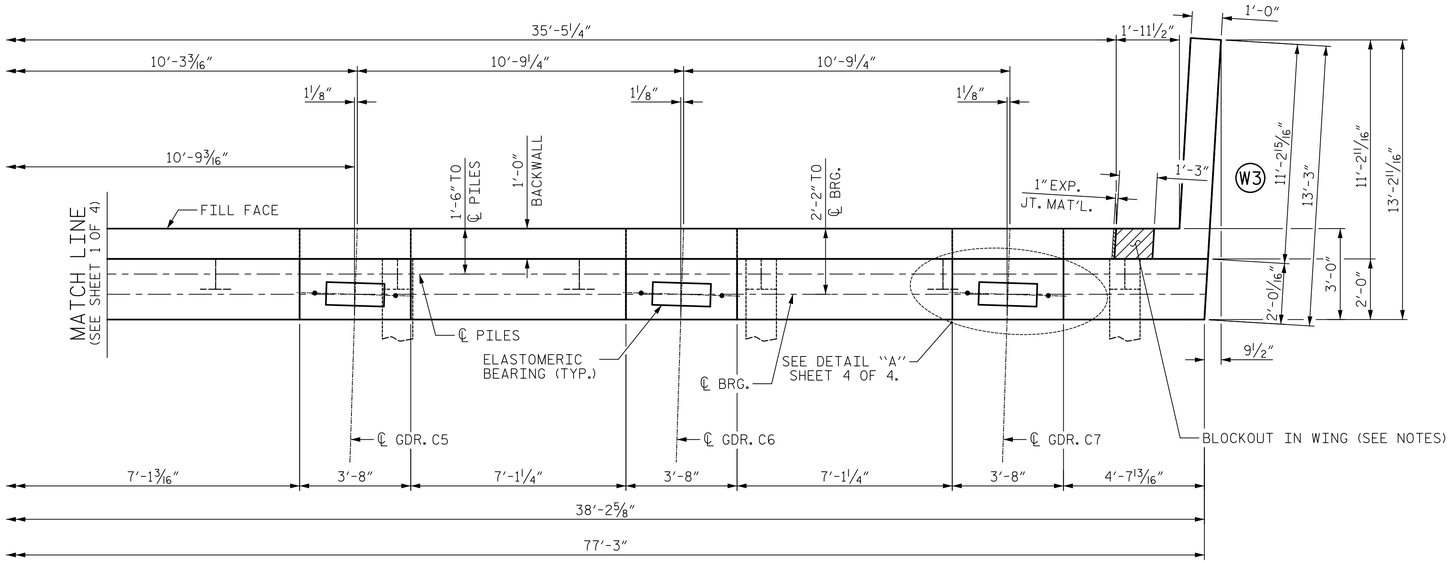
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 2

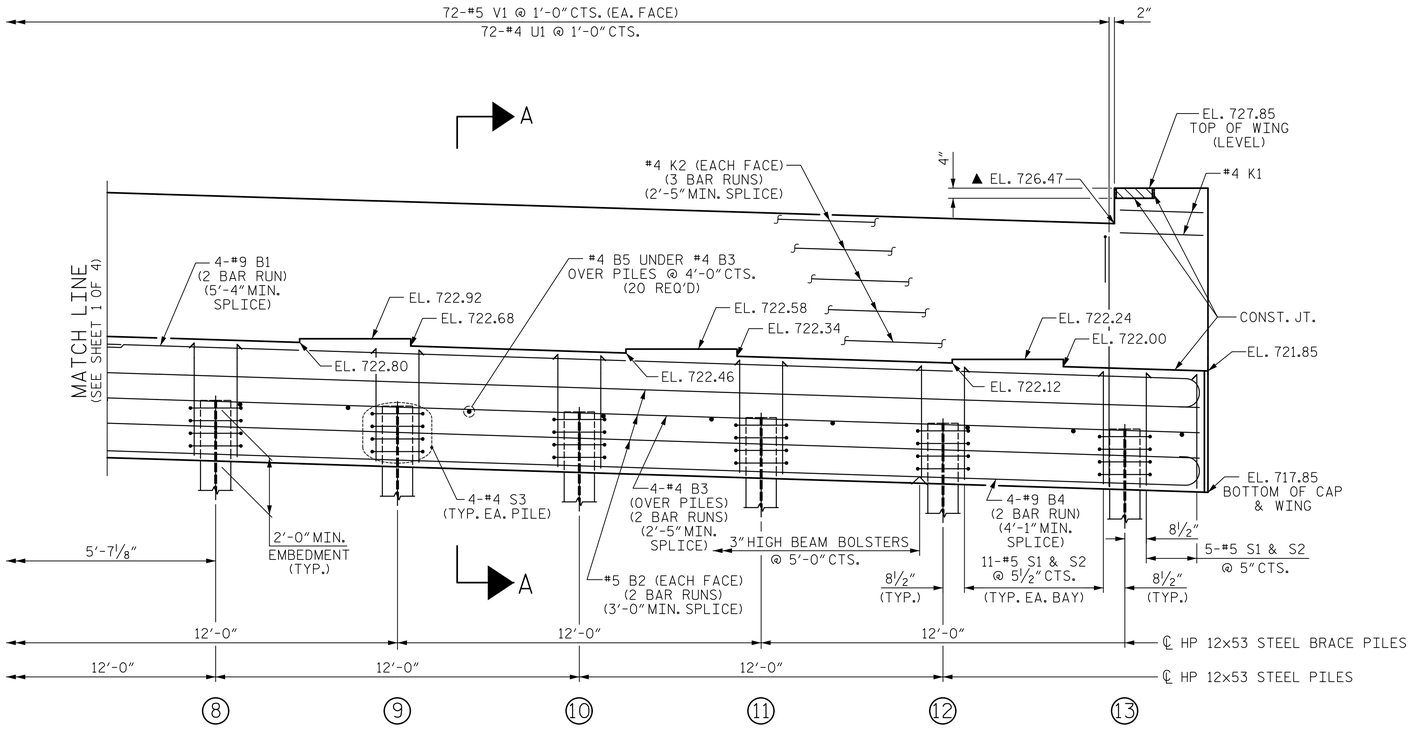
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			56

DRAWN BY : C.C. CAMPBELL DATE : 05/17/23
CHECKED BY : J.S. HOBSON DATE : 06/21/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23



PLAN

TOP OF PILE ELEVATIONS	
⑧	720.90
⑨	720.71
⑩	720.52
⑪	720.33
⑫	720.14
⑬	719.95



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

DRAWN BY : C.C. CAMPBELL DATE : 05/17/23
CHECKED BY : J.S. HOBSON DATE : 06/21/23
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PROJECT NO. U-5808
UNION COUNTY
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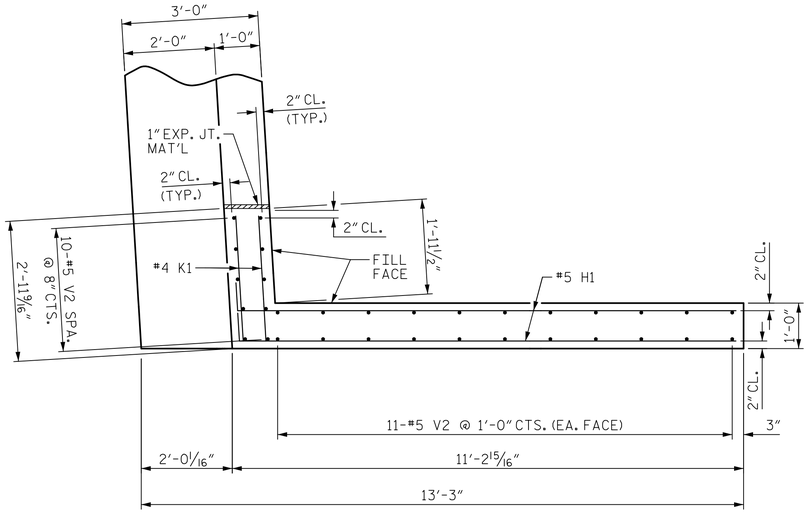
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

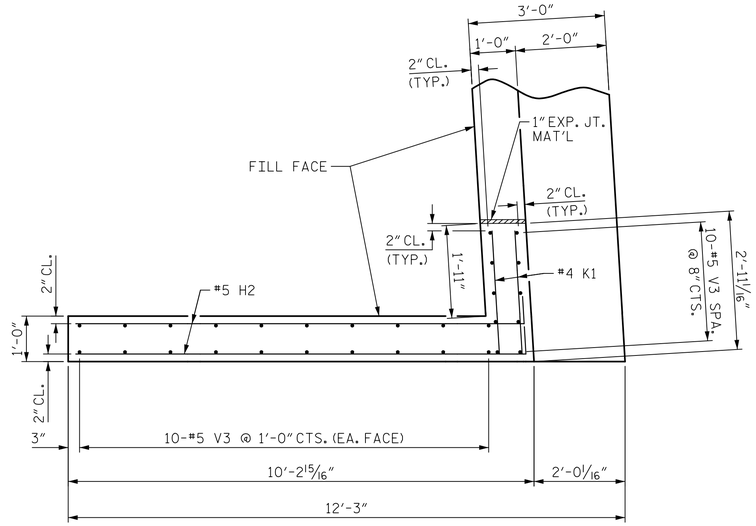
SUBSTRUCTURE

END BENT 2

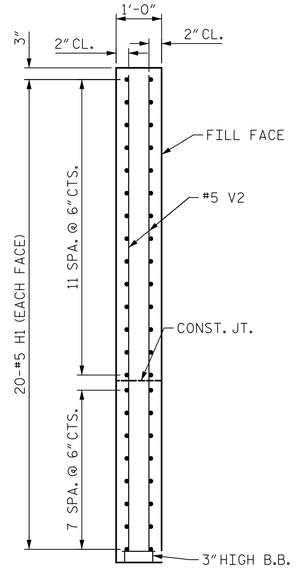
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			56



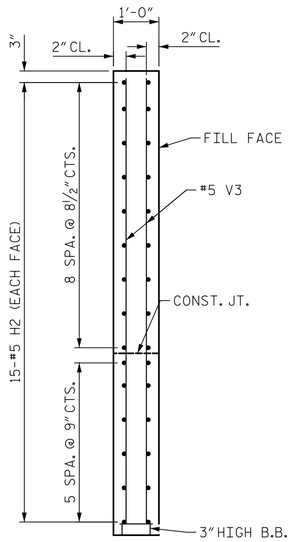
PLAN OF WING (W3)



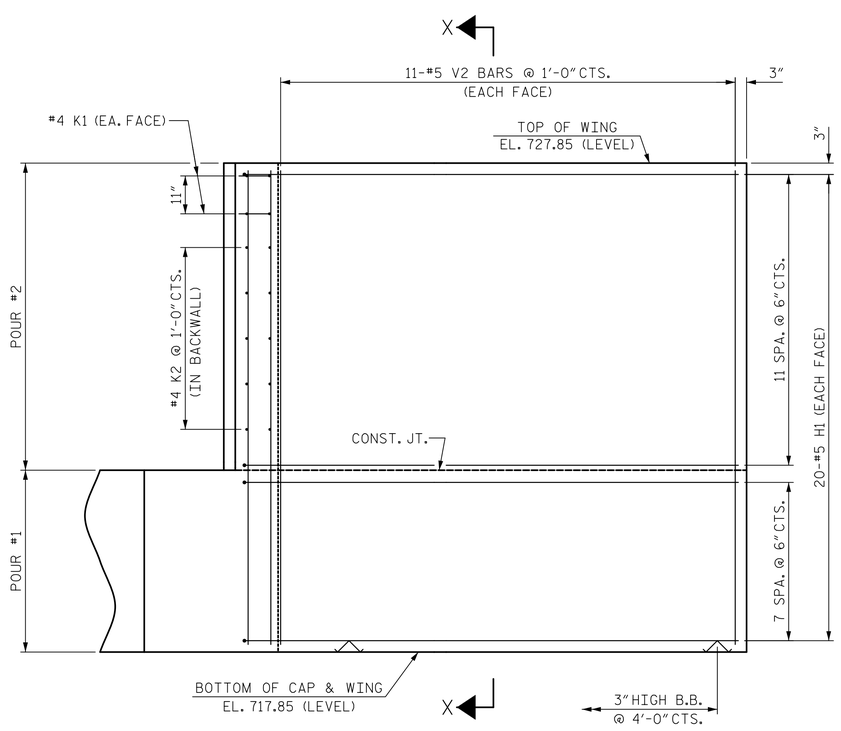
PLAN OF WING (W4)



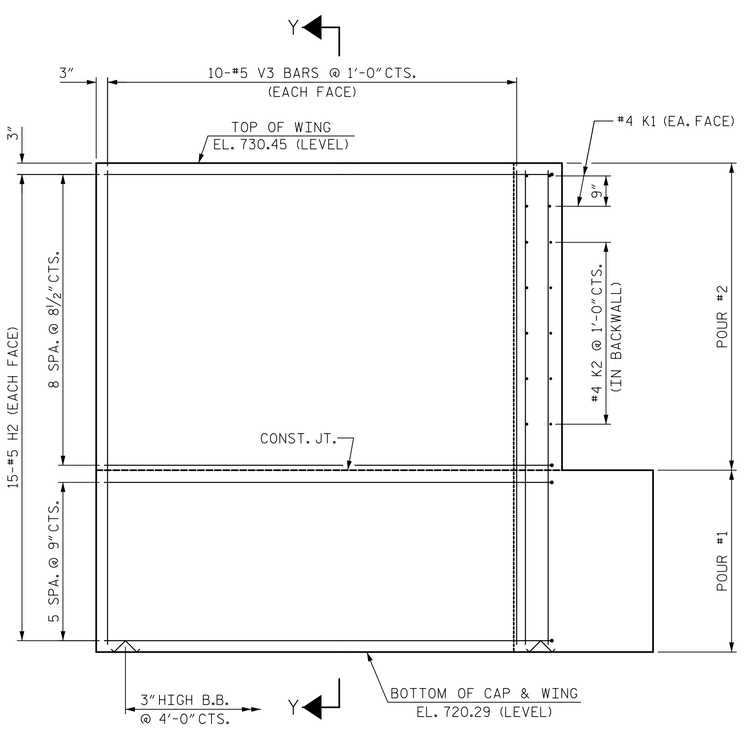
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W3)



ELEVATION OF WING (W4)

DRAWN BY : C.C. CAMPBELL DATE : 05/18/23
CHECKED BY : J.S. HOBSON DATE : 06/21/23
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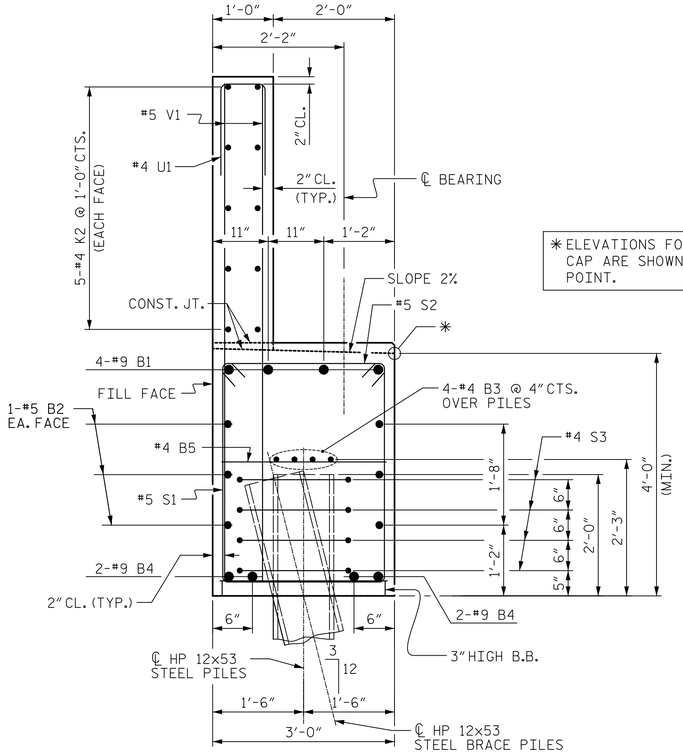
SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

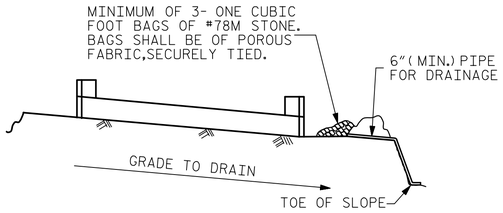
END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			56



✳ ELEVATIONS FOR TOP OF CAP ARE SHOWN TO THIS POINT.

SECTION "A-A"

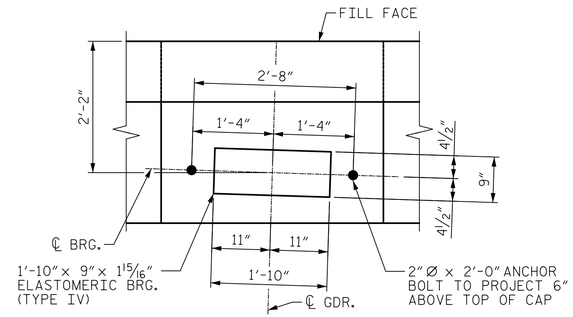


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

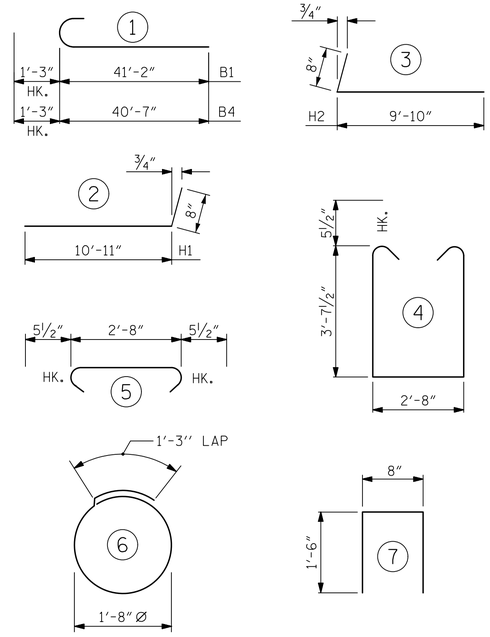
TEMPORARY DRAINAGE AT END BENT



DETAIL "A"

(TYPICAL AT EACH BEARING)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

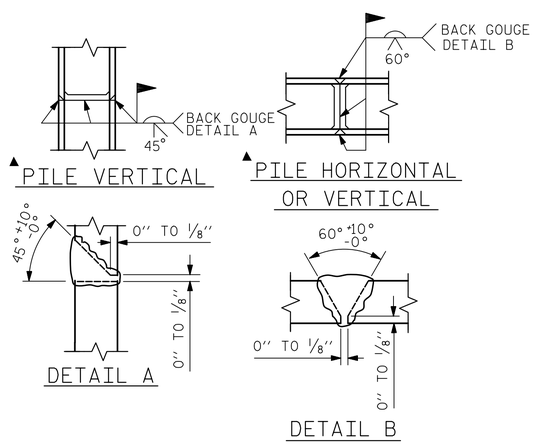
END BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	42'-5"	1154
B2	12	#5	STR	40'-0"	501
B3	8	#4	STR	39'-9"	212
B4	8	#9	1	41'-10"	1138
B5	20	#4	STR	2'-8"	36
H1	40	#5	2	11'-7"	483
H2	30	#5	3	10'-6"	329
K1	8	#4	STR	2'-7"	14
K2	20	#4	STR	39'-9"	531
S1	142	#5	4	10'-10"	1604
S2	142	#5	5	3'-7"	531
S3	52	#4	6	6'-6"	226
U1	72	#4	7	3'-8"	176
V1	144	#5	STR	8'-2"	1227
V2	32	#5	STR	9'-7"	320
V3	30	#5	STR	9'-9"	305

REINFORCING STEEL 8787 LBS.

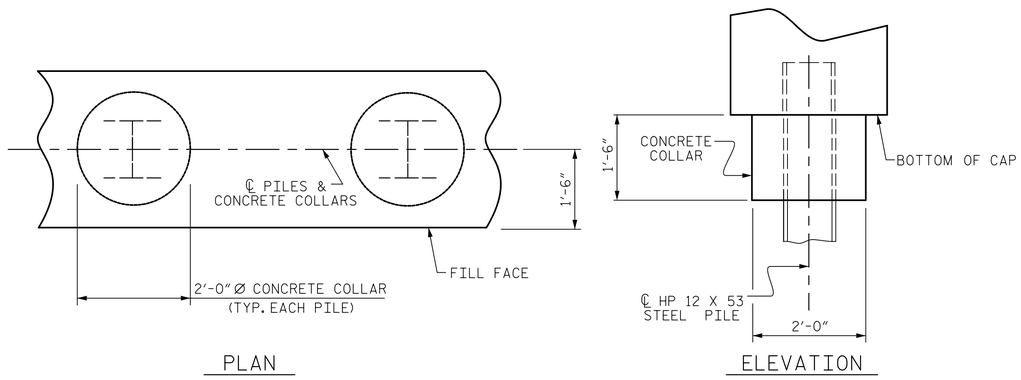
CLASS A CONCRETE BREAKDOWN

POUR #1	CAP & LOWER PART OF WINGS & COLLARS	40.3 C.Y.
POUR #2	BACKWALL & UPPER PART OF WINGS	17.6 C.Y.
TOTAL CLASS A CONCRETE		57.9 C.Y.



PILE SPLICE DETAILS

▲ POSITION OF PILE DURING WELDING.



CORROSION PROTECTION FOR STEEL PILES DETAIL

DRAWN BY : C.C. CAMPBELL DATE : 05/10/23
CHECKED BY : J.S. HOBSON DATE : 06/21/23
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 08/30/23

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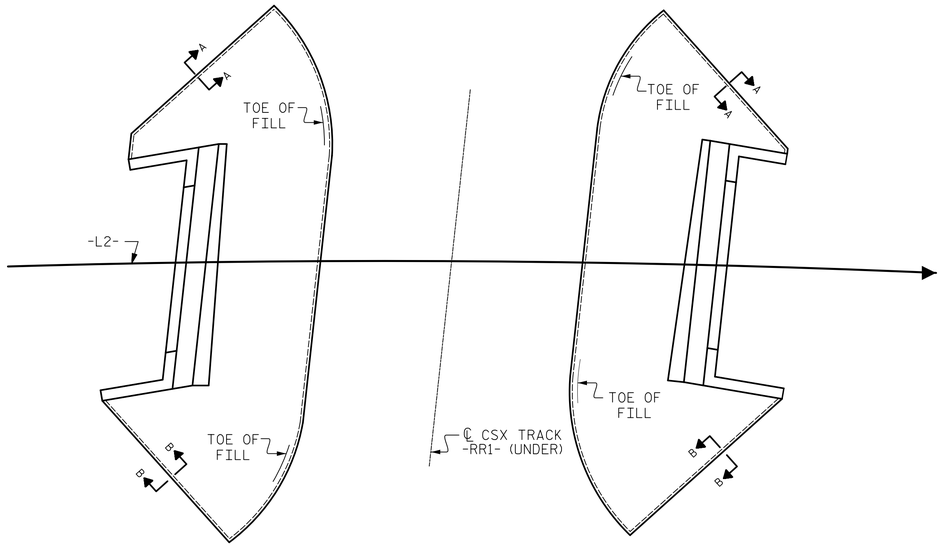
SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

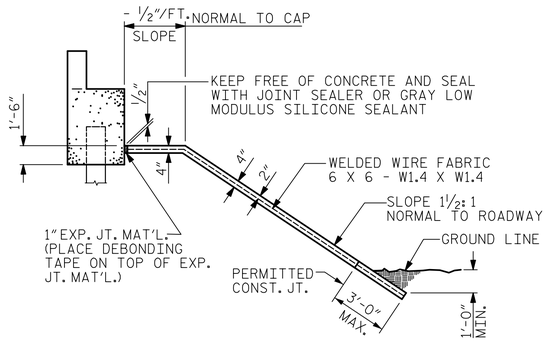
SUBSTRUCTURE

END BENT 2 DETAILS

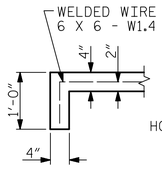
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			56



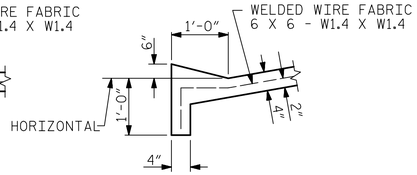
PLAN



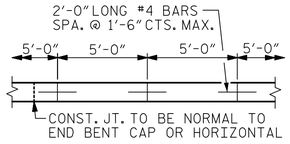
SECTION ALONG ℄ SURVEY WHEN DITCH IS NOT PROVIDED



SECTION A-A

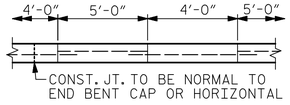


SECTION B-B



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL

GENERAL NOTES

STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING. SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 55+00.96 -L2-	4" INCH SLOPE PROTECTION	✳ WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	925	1766
END BENT 2	886	1704

✳ QUANTITY SHOWN IS BASED ON 5' POURS.

ASSEMBLED BY :	C.C. CAMPBELL	DATE :	06/13/23
CHECKED BY :	J.S. HOBSON	DATE :	06/26/23
DESIGN E.O.R. :	J.S. HOBSON	DATE :	08/30/23
DRAWN BY :	ELR 5/92	REV. 12/21/11	MAA/GM
CHECKED BY :	GRP 6/92	REV. 1/16	MAA/TMG
		REV. 12/17	MAA/THC

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC8B1D45F4D6...

10/5/2023

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PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

SHEET 1 OF 2

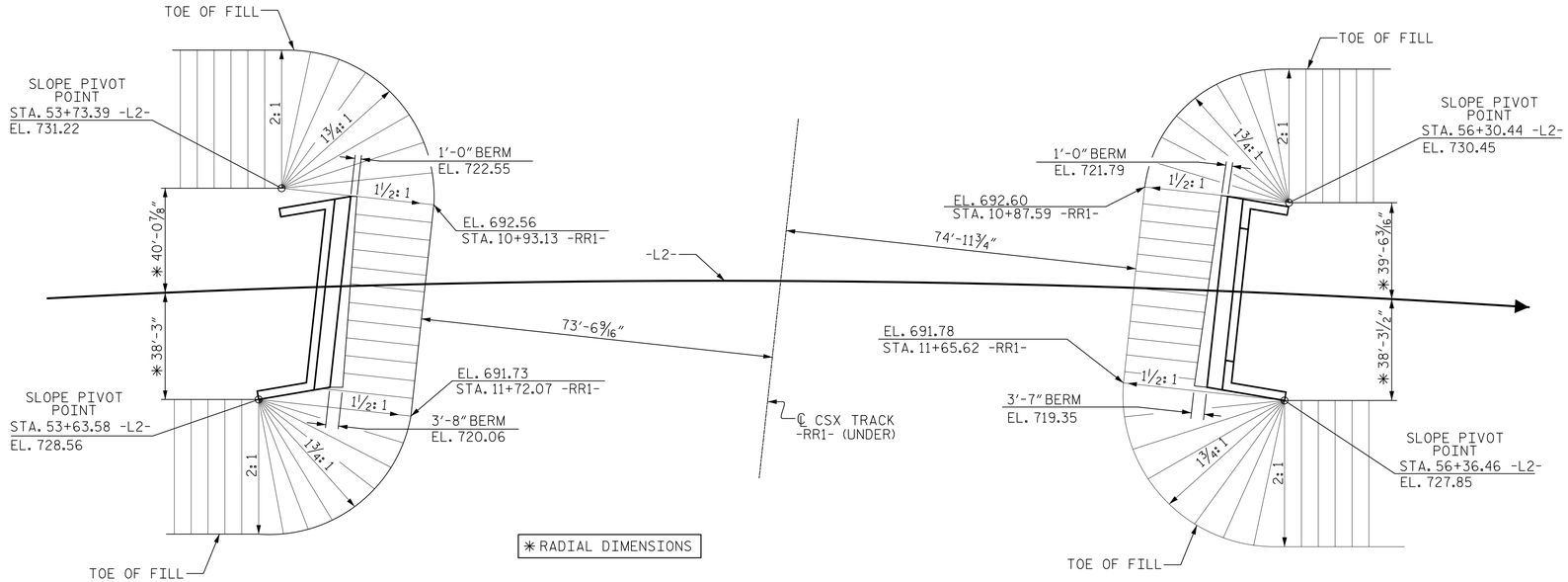
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

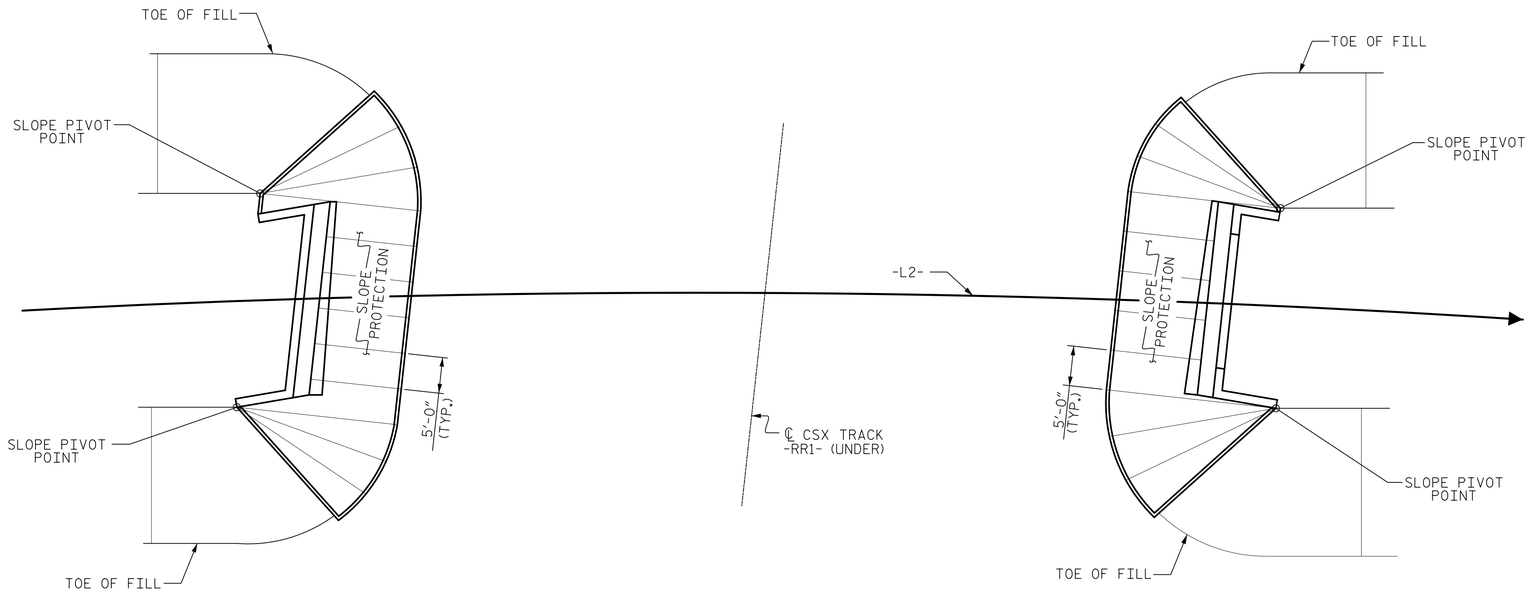
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTAL SHEETS
2			4			56

STD. NO. SP1 (SHT 6)



END BENT 1 — END BENT 2

PLAN - GRADING



END BENT 1 — END BENT 2

PLAN - CONCRETE PLACEMENT

ASSEMBLED BY :	C.C. CAMPBELL	DATE :	06/13/23
CHECKED BY :	J.S. HOBSON	DATE :	06/26/23
DESIGN E.O.R. :	J.S. HOBSON	DATE :	08/30/23
DRAWN BY : WJH 10/88	REV. 10/1/11		MAA/GM
CHECKED BY : FCJ 10/88	REV. 1/16		MAA/TMG
	REV. 12/17		MAA/THC

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DocuSigned by: Jack Hobson DDEFC8B1D45F4D6...
10/5/2023

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PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

SHEET 2 OF 2

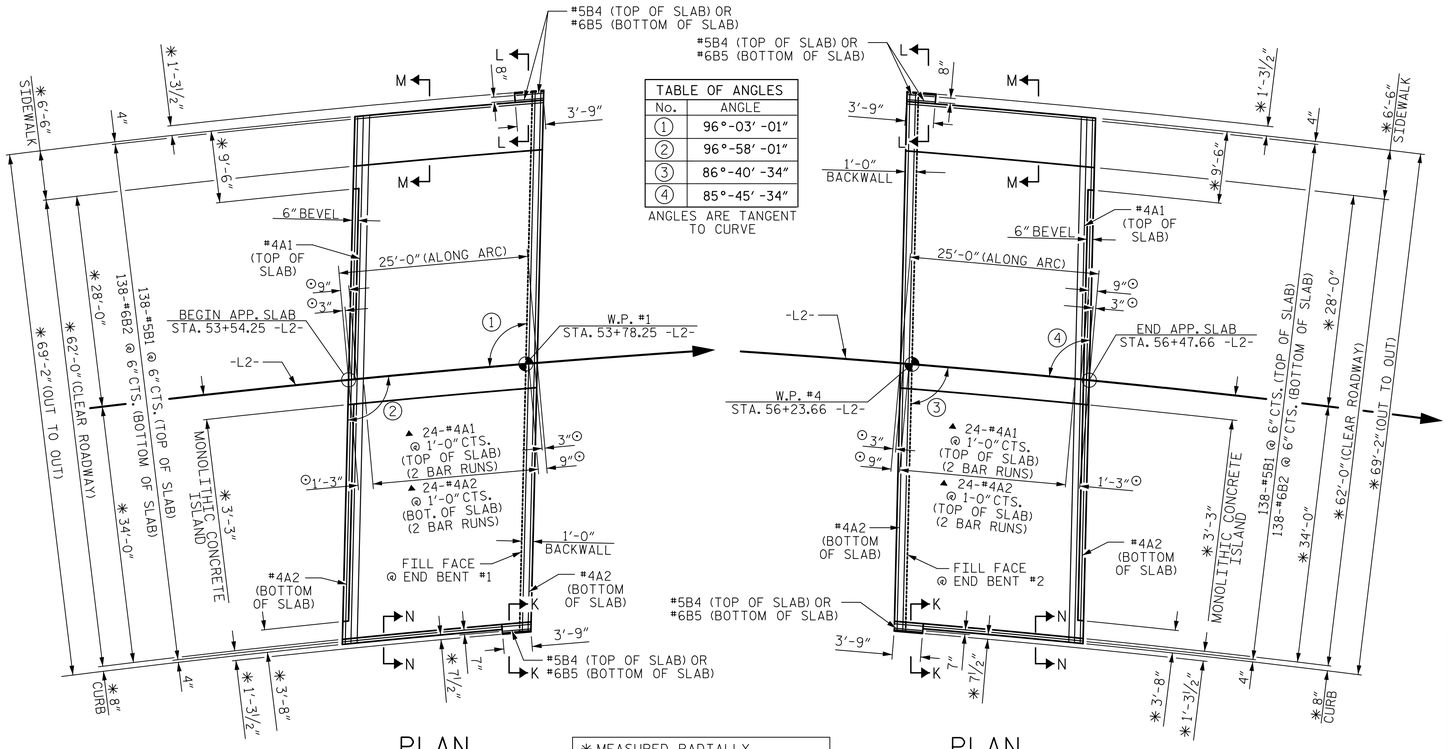
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS
2			4			56

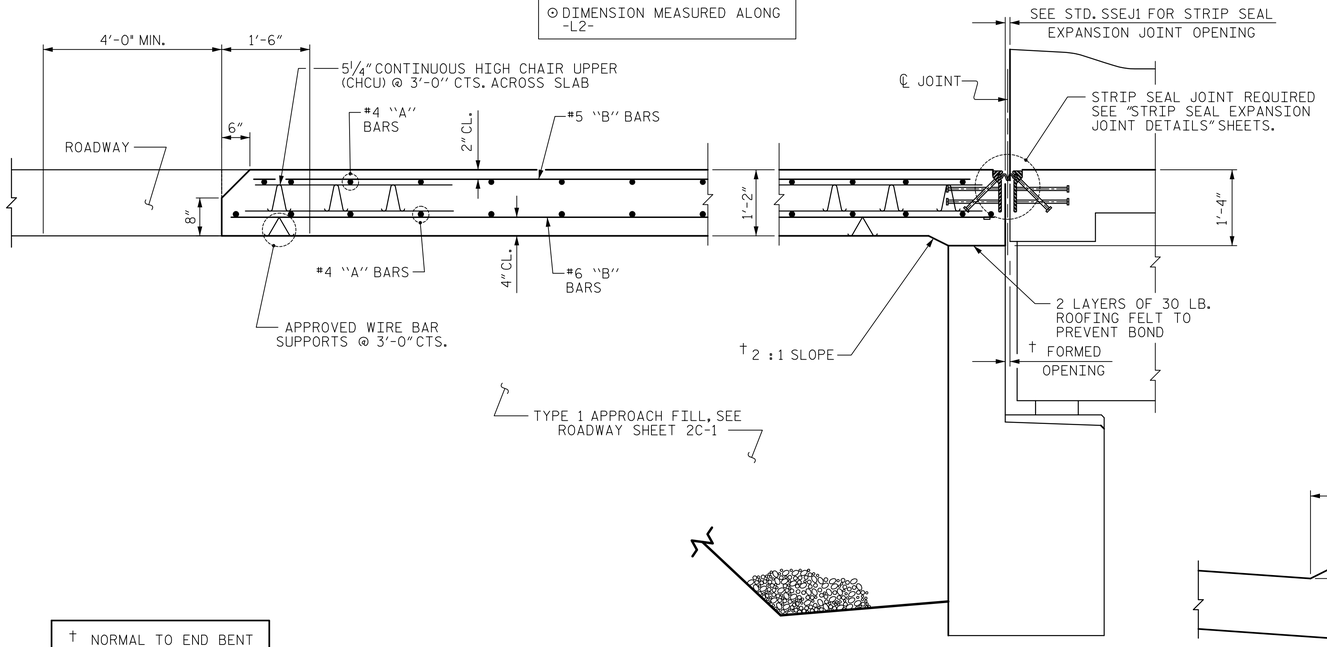
STD. NO. SP2 (SHT 6)



✳ MEASURED RADIALLY

▲ "A" BARS ARE SPACED ALONG -L2- AND PLACED PARALLEL TO FILL FACE.

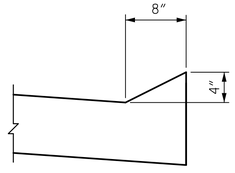
⊙ DIMENSION MEASURED ALONG -L2-



SECTION THRU SLAB

(TYPE 1 - APPROACH FILL)

† NORMAL TO END BENT



SECTION N-N

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

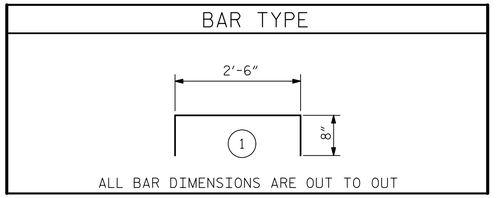
THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET AND END POST.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

FOR STRIP SEAL EXPANSION JOINTS, SEE SPECIAL PROVISIONS.

FOR REINFORCEMENT AND DETAILS OF MONOLITHIC CONCRETE ISLAND ON APPROACH SLABS, SEE "MONOLITHIC CONCRETE ISLAND" SHEET.

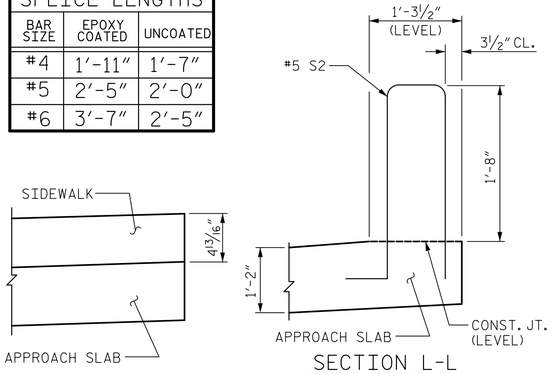
BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

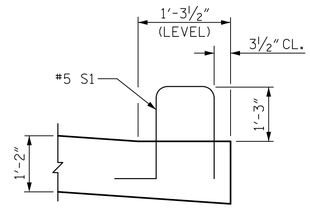
SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	1′-11″	1′-7″
#5	2′-5″	2′-0″
#6	3′-7″	2′-5″



SECTION M-M

SECTION L-L



SECTION K-K

BILL OF MATERIAL

APPROACH SLAB AT E.B. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	50	#4	STR	36′-7″	1222
A2	52	#4	STR	36-5″	1265
✳ B1	138	#5	STR	24′-2″	3478
B2	138	#6	STR	24′-8″	5113
✳ B3	6	#4	STR	24′-8″	99
✳ B4	3	#5	STR	3′-5″	11
B5	3	#6	STR	3′-5″	15
✳ G1	25	#4	STR	6′-0″	100
✳ U1	8	#4	1	3′-10″	20

REINFORCING STEEL	LBS.	6393
✳ EPOXY COATED REINFORCING STEEL	LBS.	4930
CLASS AA CONCRETE BREAKDOWN		
SLAB	C. Y.	75.4
SIDEWALK	C. Y.	3.2
TOTAL	C. Y.	78.6

APPROACH SLAB AT E.B. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	50	#4	STR	36′-7″	1222
A2	52	#4	STR	36-5″	1265
✳ B1	138	#5	STR	24′-2″	3478
B2	138	#6	STR	24′-8″	5113
✳ B3	6	#4	STR	24′-8″	99
✳ B4	3	#5	STR	3′-5″	11
B5	3	#6	STR	3′-5″	15
✳ G1	25	#4	STR	6′-0″	100
✳ U1	8	#4	1	3′-10″	20

REINFORCING STEEL	LBS.	6393
✳ EPOXY COATED REINFORCING STEEL	LBS.	4930
CLASS AA CONCRETE BREAKDOWN		
SLAB	C. Y.	75.4
SIDEWALK	C. Y.	3.2
TOTAL	C. Y.	78.6

ASSEMBLED BY :	C.C. CAMPBELL	DATE :	05/30/23
CHECKED BY :	J.S. HOBSON	DATE :	06/26/23
DESIGN E.O.R. :	J.S. HOBSON	DATE :	08/30/23
DRAWN BY : EEM	3/95	REV. 12/17	MAA/GM
CHECKED BY : VAP	3/95	REV. 6/19	MAA/THC
		REV. 07/23	BNB/SNM

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC6B1D45F4D6... 10/18/2023

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PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

SHEET 1 OF 3

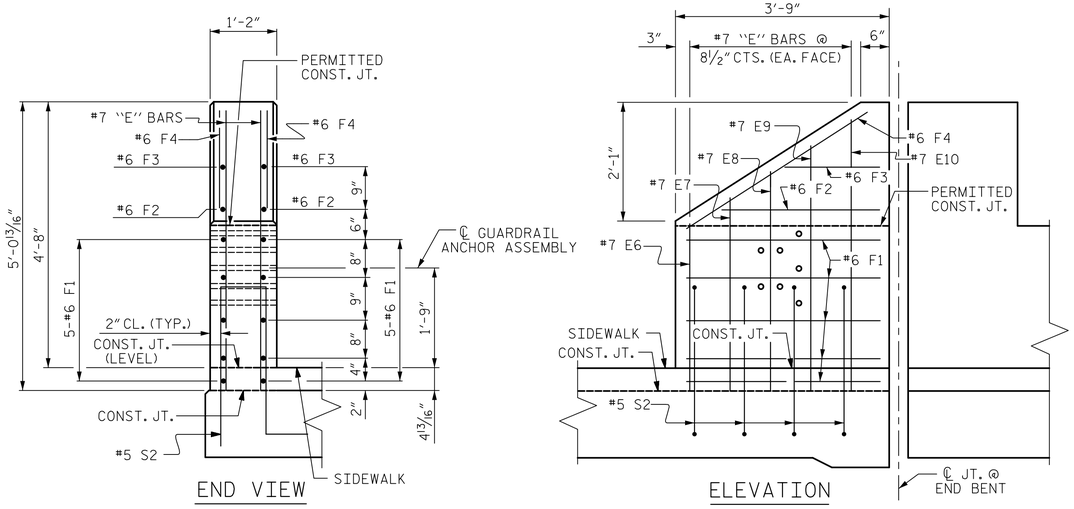
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-54
1			3			TOTAL SHEETS
2			4			56

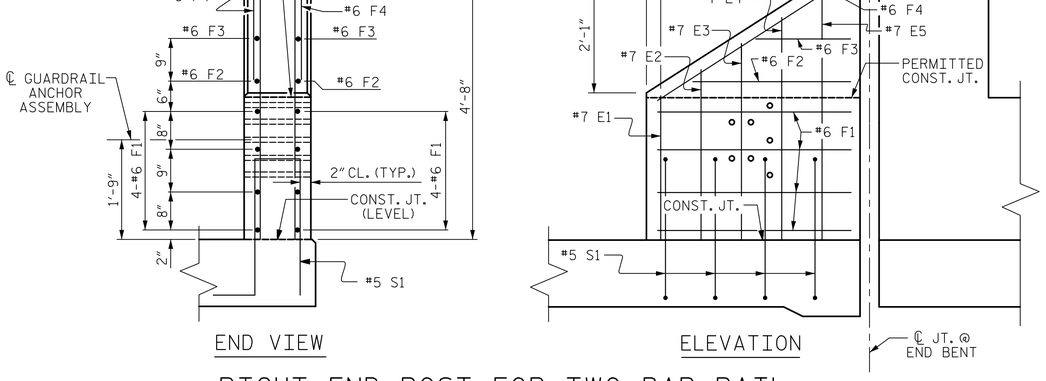
STD. NO. BAS2



END VIEW ELEVATION

LEFT END POST FOR TWO BAR RAIL

(END BENT 1 SHOWN, END BENT 2 SIMILAR)



END VIEW ELEVATION

RIGHT END POST FOR TWO BAR RAIL

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

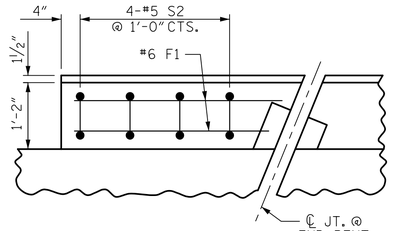
ASSEMBLED BY :	C.C. CAMPBELL	DATE :	05/31/23
CHECKED BY :	J.S. HOBSON	DATE :	06/26/23
DESIGN E.O.R. :	J.S. HOBSON	DATE :	08/30/23
DRAWN BY :	FCJ 11/88	REV. 6/13	MAA/GM
CHECKED BY :	ARB 11/88	REV. 12/17	MAA/THC
		REV. 5/18	MAA/THC

NOTES

THE COST OF THE END POST ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "1'-2"X 2'-6"CONCRETE PARAPET".

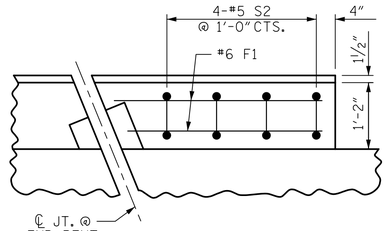
THE END POST ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN END POSTS SHALL BE EPOXY COATED.



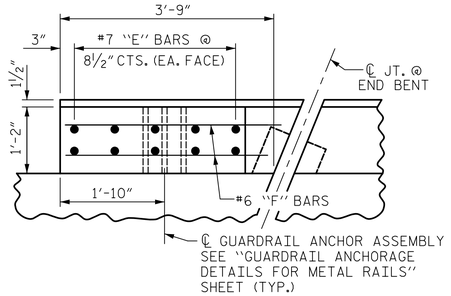
PLAN OF LEFT PARAPET

(END BENT 1)



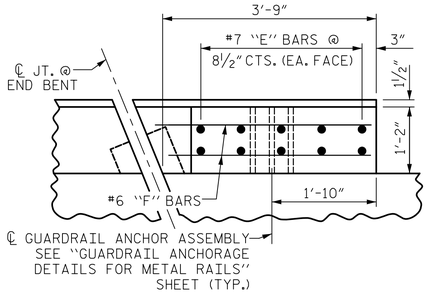
PLAN OF LEFT PARAPET

(END BENT 2)



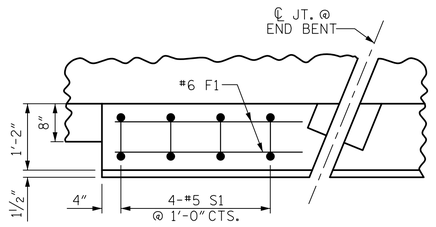
PLAN OF LEFT END POST

(END BENT 1)



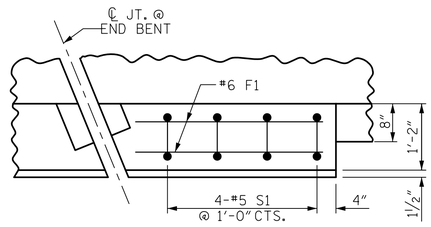
PLAN OF LEFT END POST

(END BENT 2)



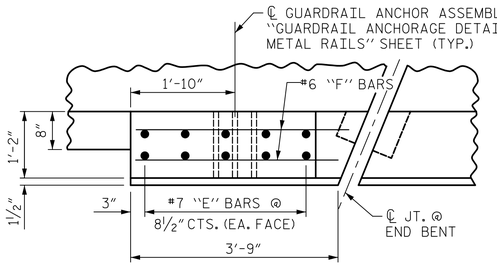
PLAN OF RIGHT PARAPET

(END BENT 1)



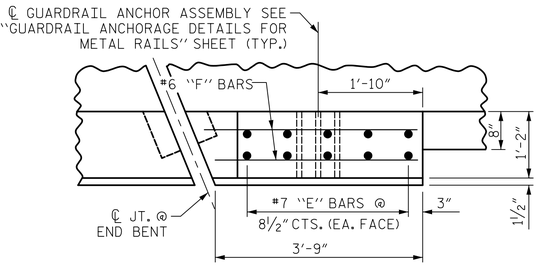
PLAN OF RIGHT PARAPET

(END BENT 2)



PLAN OF RIGHT END POST

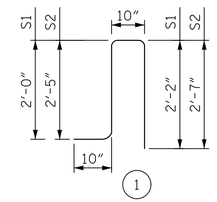
(END BENT 1)



PLAN OF RIGHT END POST

(END BENT 2)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR 4 END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳E1	4	#7	STR	2'-6"	20
✳E2	4	#7	STR	2'-11"	24
✳E3	4	#7	STR	3'-5"	28
✳E4	4	#7	STR	3'-10"	31
✳E5	4	#7	STR	4'-4"	35
✳E6	4	#7	STR	2'-10"	23
✳E7	4	#7	STR	3'-3"	27
✳E8	4	#7	STR	3'-9"	31
✳E9	4	#7	STR	4'-2"	34
✳E10	4	#7	STR	4'-8"	38
✳F1	36	#6	STR	3'-5"	185
✳F2	8	#6	STR	2'-5"	29
✳F3	8	#6	STR	1'-4"	16
✳F4	8	#6	STR	3'-8"	44
✳S1	8	#5	1	5'-10"	49
✳S2	8	#5	1	6'-8"	56

✳EPOXY COATED REINFORCING STEEL	LBS.	670
CLASS AA CONCRETE	CU.YDS.	4.1
TOTAL LIN. FT. OF CONCRETE PARAPET		15.4

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 10/5/2023

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PROJECT NO. U-5808

UNION COUNTY

STATION: 55+00.96 -L2-

SHEET 2 OF 3

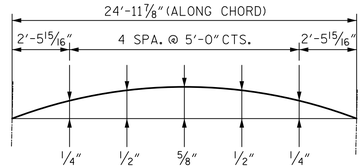
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

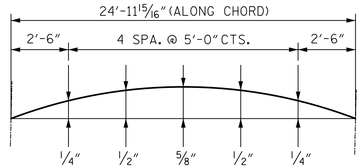
BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-55
1			3			TOTAL SHEETS
2			4			56

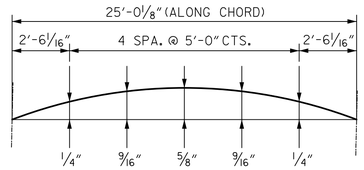
STD. NO. BAS4(SHT 6b)



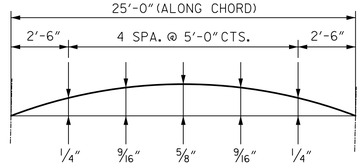
ARC OFFSET - LEFT SIDE
APPROACH SLAB @ END BENT #1



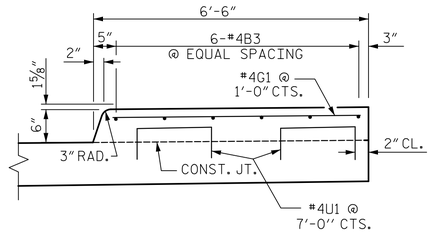
ARC OFFSET - LEFT SIDE
APPROACH SLAB @ END BENT #2



ARC OFFSET - RIGHT SIDE
APPROACH SLAB @ END BENT #1

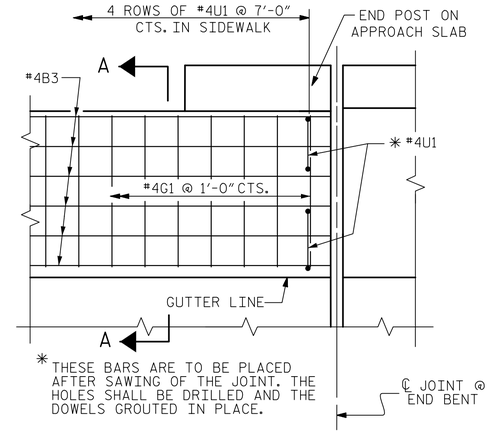


ARC OFFSET - RIGHT SIDE
APPROACH SLAB @ END BENT #2



SECTION A-A

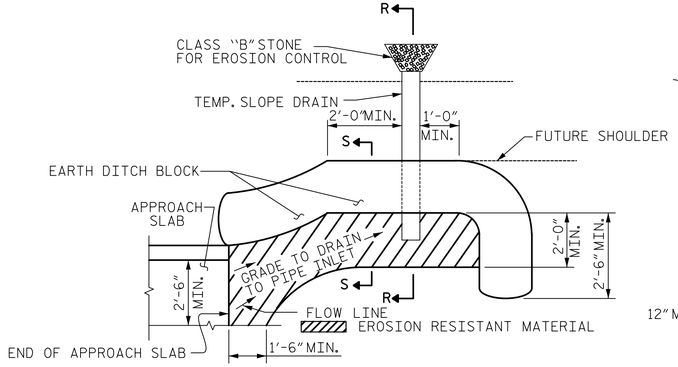
SIDEWALK DETAILS



PLAN

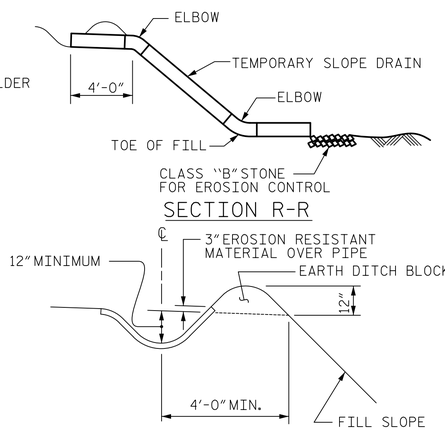
DETAILS OF SIDEWALK ON APPROACH SLAB

BEGIN APPROACH SHOWN, END APPROACH SLAB SIMILIAR



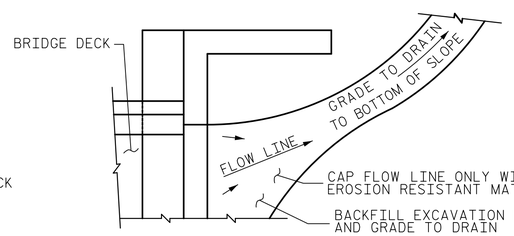
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2″ DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

PLAN VIEW



SECTION R-R

SECTION S-S



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

ASSEMBLED BY :	C.C. CAMPBELL	DATE :	05/31/23
CHECKED BY :	J.S. HOBSON	DATE :	06/26/23
DESIGN E.O.R. :	J.S. HOBSON	DATE :	08/30/23
DRAWN BY : FCJ	11/88	REV. 6/13	MAA/GM
CHECKED BY : ARB	11/88	REV. 12/17	MAA/THC
		REV. 5/18	MAA/THC

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson DDEFC8B1D45F4D6... 10/5/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. U-5808
UNION COUNTY
STATION: 55+00.96 -L2-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-56
1			3			TOTAL SHEETS
2			4			56

STD. NO. BAS4 (SHT 6b)

CSX GENERAL NOTES

THE CONTRACTOR SHALL NOT STORE EQUIPMENT OR MATERIAL OF ANY KIND ON CSXT RIGHT-OF-WAY (ROW) OR WHERE THEY MAY HAVE THE POTENTIAL TO INTERFERE WITH CSXT OPERATIONS UNLESS CONTRACTOR HAS RECEIVED PRIOR WRITTEN AUTHORIZATION BY CSXT REPRESENTATIVE.

CSXT RAILROAD FLAGMAN IS REQUIRED ANYTIME CONTRACT ACTIVITIES OCCUPY OR HAVE POTENTIAL TO IMPACT CSXT ROW OR TRACKS.

UNDER NO CONDITIONS SHALL WORK AFFECT THE SAFE PASSAGE OF TRAINS OR OTHER ON TRACK EQUIPMENT.

CONTRACTOR AND ALL SUBCONTRACTORS (IF APPLICABLE) SHALL PROCURE AND MAINTAIN RAILROAD PROTECTIVE LIABILITY INSURANCE AND COVERAGE OF INSURANCE BEFORE ACCESSING CSXT ROW.

CONTRACTOR SHALL REFER TO THE CSXT PUBLIC PROJECTS MANUAL, MOST RECENT EDITION, FOR CONSTRUCTION REQUIREMENTS WHILE WITHIN THE CSXT ROW.

CONTRACTOR MUST HAVE AN EMERGENCY ACTION AND HURRICANE PREPAREDNESS PLAN, WHICH SHOULD BE SITE SPECIFIC AND MUST INCLUDE COORDINATION WITH CSXT AND CSXT REPRESENTATIVE, WHILE WORKING WITHIN THE CSXT ROW LIMITS. THIS PLAN MUST BE PROVIDED TO CSXT FOR RECORD PRIOR TO WORK COMMENCING WHICH MAY IMPACT CSXT ROW OR FACILITIES.

AGENCY AND CONTRACTOR ARE NOT PERMITTED TO CROSS CSXT'S PROPERTY OR TRACKS, EXCEPT ON EXISTING PUBLIC ROAD CROSSINGS, WITH VEHICLES, MEN, OR EQUIPMENT OF ANY KIND WITHOUT PRIOR AUTHORIZATION FROM CSXT OR AUTHORIZED REPRESENTATIVE.

IF ANY ISSUE OR INCIDENT OCCURS WITHIN CSXT ROW, OPERATIONS ARE TO CEASE IMMEDIATELY. THE CONTRACTOR MUST CONTACT THE CSXT PUBLIC SAFETY COORDINATION CENTER AT 800-232-0144 AND NOTIFY THE CSXT REPRESENTATIVE. THE CONTRACTOR MUST RECEIVE AUTHORIZATION FROM CSXT BEFORE RESUMING CONSTRUCTION ACTIVITIES AT SITE.

ALL SOILS EXCAVATED WITHIN CSXT5#32S RAILROAD RIGHT-OF-WAY SHALL REMAIN ON CSXT5#32S RIGHT-OF-WAY. TESTING OF SOILS ON CSXT ROW IS PROHIBITED WITHOUT PRIOR WRITTEN CSXT AUTHORIZATION. ANY SOILS EXCAVATED ON CSXT ROW CAN BE REUSED ON THE ROW PROVIDED PLACING SOILS ALONG CSXT ROW POSES NO ADVERSE IMPACTS TO THE EXISTING TERRAIN, DRAINAGE OR ENVIRONMENT. SHOULD SOIL NEED TO BE REMOVED FROM CSXT ROW, THE CSXT ENVIRONMENTAL DEPARTMENT WILL SAMPLE THE SOIL FOR DISPOSITION. SOIL STAGED ON CSXT MUST FOLLOW CSXT PROTOCOL AND BE PROPERLY STORED AND/OR PROTECTED FROM THE ELEMENTS AND POTENTIAL EXPOSURE.

PIPELINE CONSTRUCTION UNDER CSX SHALL BE DONE IN ACCORDANCE TO CSX'S DESIGN AND CONSTRUCTION STANDARD SPECIFICATIONS FOR PIPELINE OCCUPANCIES, LAST REVISED FEBRUARY 10, 2017.

TEMPORARY CONSTRUCTION CLEARANCE - ENSURE ALL FALSEWORK, BRACING OR FORMS HAVE A MINIMUM HORIZONTAL CLEARANCE OF 12 FEET MEASURED PERPENDICULAR TO THE CENTERLINE OF THE NEAREST TRACK.

MEANS AND METHODS - THE CONTRACTOR SHALL DEVELOP A DETAILED SUBMISSION INDICATING THE PROGRESSION OF WORK WITH SPECIFIC TIMES WHEN TASKS WILL BE PERFORMED FOR WORK ACTIVITIES THAT ARE ON OR IN THE VICINITY OF THE CSXT PROPERTY. THIS SUBMISSION MAY REQUIRE A WALKTHROUGH AT WHICH TIME CSXT AND/OR THE REPRESENTATIVE WILL BE PRESENT. WORK WILL NOT BE PERMITTED TO COMMENCE UNTIL THE CONTRACTOR HAS PROVIDED CSXT WITH A SATISFACTORY PLAN THAT THE PROJECT WILL BE UNDERTAKEN WITHOUT SCHEDULING, PERFORMANCE OR SAFETY RELATED ISSUES. PROVIDE A LISTING OF THE ANTICIPATED EQUIPMENT TO BE USED, THE LOCATION OF ALL EQUIPMENT TO BE USED AND ENSURE A CONTINGENCY PLAN OF ACTION IS IN PLACE SHOULD A PRIMARY PIECE OF EQUIPMENT MALFUNCTION. ALL WORK IN THE VICINITY OF CSXT PROPERTY THAT HAS THE POTENTIAL OF AFFECTING CSXT TRAIN OPERATIONS MUST BE SUBMITTED AND APPROVED BY CSXT PRIOR TO WORK BEING PERFORMED. THIS SUBMISSION WILL ALSO INCLUDE A DETAILED NARRATIVE DISCUSSING THE COORDINATION OF PROJECT SAFETY ISSUES BETWEEN CONTRACTOR, CSXT AND THE REPRESENTATIVE. THE NARRATIVE SHALL ADDRESS PROJECT LEVEL COORDINATION AND DAY TO DAY, SPECIFIC WORK OPERATIONS INCLUDING CRANE AND EQUIPMENT OPERATIONS, ERECTION PLANS AND TEMPORARY WORKS.

ERECTION PROCEDURES, EXCAVATION AND SHORING PROCEDURES ARE REQUIRED TO BE SUBMITTED TO CSXT, OR THE REPRESENTATIVE, IN ACCORDANCE WITH THE CSXT CONSTRUCTION SUBMISSION CRITERIA, LAST REVISED JULY 2017. THE CSXT CONSTRUCTION SUBMISSION CRITERIA SHOULD BE REFERRED TO AND COMPLIED WITH PRIOR TO THE PREPARATION OF SUBMISSIONS, AS IT CONTAINS SPECIFIC REQUIREMENTS THAT COULD IMPACT THE CONTRACTOR5/32S MATERIAL SELECTION AND METHODS OR OPERATIONS FOR WORK NEAR THE RAILROAD. REVISIONS TO CONTRACTOR SUBMISSIONS MAY NOT BE FIELD APPROVED. ANY DEVIATION(S) FROM A PREVIOUSLY ACCEPTED PLAN INCLUDING EQUIPMENT SUBSTITUTIONS WILL REQUIRE A FORMAL RESUBMISSION OF THE PROCEDURE FOR REVIEW AND ACCEPTANCE PRIOR TO PERFORMING ANY WORK. A PROFESSIONAL ENGINEER IN THE STATE OF KENTUCKY MUST SIGN AND SEAL THE PLANS. UP TO THIRTY (30) DAYS WILL BE REQUIRED TO REVIEW ALL CONSTRUCTION SUBMISSIONS. UP TO AN ADDITIONAL THIRTY (30) DAYS WILL BE REQUIRED TO REVIEW ANY SUBSEQUENT SUBMISSIONS RETURNED NOT APPROVED.

CONSTRUCTION SCHEDULE - SUBMIT A DETAILED CONSTRUCTION SCHEDULE FOR THE DURATION OF THE PROJECT CLEARLY INDICATING THE TIME PERIODS WHILE WORKING ON AND AROUND CSXT RIGHT-OF-WAY. AS THE WORK PROGRESSES, THIS SCHEDULE SHALL BE UPDATED AND RESUBMITTED AS NECESSARY TO REFLECT CHANGES IN WORK SEQUENCE, DURATION AND METHOD, ETC.

EMERGENCY ACTION PLAN - SUBMIT AN EMERGENCY ACTION PLAN INDICATING THE LOCATION OF THE SITE, CONTACT NUMBERS, ACCESS TO THE SITE, INSTRUCTIONS FOR EMERGENCY RESPONSE AND LOCATION OF THE NEAREST HOSPITALS. THIS PLAN SHOULD COVER ALL ITEMS REQUIRED IN THE EVENT OF AN EMERGENCY AT THE SITE INCLUDING FIRE SUPPRESSION. COORDINATE THE EMERGENCY ACTION PLAN WITH THE SAFETY RELATED DISCUSSION OF THE MEANS AND METHODS SUBMISSION DISCUSSED ABOVE. THE PLAN SHOULD ALSO INCLUDE A METHOD TO PROVIDE THIS INFORMATION TO EACH PROJECT WORKER FOR EACH DAY ON SITE.

THE CONTRACTOR MUST ENSURE THAT PROPER EROSION CONTROL IS IMPLEMENTED ON AND ADJACENT TO CSXT RIGHT-OF-WAY DURING CONSTRUCTION. THE CONTRACTOR MUST PREVENT SILT AND DEBRIS ACCUMULATION IN THE RAILROAD ROADBED, DITCHES AND OTHER RAILROAD FACILITIES. THE CONTRACTOR MAY BE REQUIRED TO SUBMIT A DETAILED EROSION CONTROL PLAN FOR REVIEW AND ACCEPTANCE BY CSXT OR THEIR REPRESENTATIVE PRIOR TO PERFORMING ANY WORK.

CONTRACTOR ACCESS WILL BE LIMITED TO THE IMMEDIATE PROJECT AREA ONLY. THE CSXT RIGHT-OF-WAY OUTSIDE THE PROJECT AREA MAY NOT BE USED FOR CONTRACTOR ACCESS TO THE PROJECT SITE AND NO TEMPORARY AT-GRADE CROSSINGS WILL BE ALLOWED.

THE CONTRACTOR MAY NOT USE CSXT RIGHT-OF-WAY FOR STORAGE OF MATERIALS OR EQUIPMENT DURING CONSTRUCTION WITHOUT PRIOR CSXT APPROVAL. THE CSXT RIGHT-OF-WAY MUST REMAIN CLEAR FOR RAILROAD USE AT ALL TIMES. EQUIPMENT MAY NOT BE POSITIONED TO BLOCK THE RAILROAD ACCESS ROAD, TRACK AREA OR ANY PART OF THE CSXT RIGHT-OF-WAY WITHOUT PRIOR CSXT APPROVAL.

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990